basketBoard 7

Professional Led Display Scoreboard Software

USER MANUAL

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LANGUAGE SUPPORT

basketBoard supports all languages. You can use special characters from any language such as Arabic, Chinese, Hebrew, and other Asian alphabets in the application.

Contents

1. Introduction 8
   1.1 What basketBoard 7 Does 8
   1.2 Rules Presets 9
   1.3 Display Modes 9
   1.4 What's New in 7.6.7.14 10
   1.5 System Requirements 10
   1.6 How to Read This Guide 11
2. Installation and Licensing 12
   2.1 Before You Install 12
   2.2 Installing 12
   2.3 First Start 13
   2.4 Upgrading to a Newer Version 14
   2.5 Uninstalling 15
   2.6 Licensing 15
   2.7 The License Page 16
   2.8 A Key for This PC 18
   2.9 A Key on a USB Stick 19
   2.10 Demo Mode 21
   2.11 Messages When the Licence Cannot Be Checked 22
3. Main Window 24
   3.1 Title Bar and Window Sizes 25
   3.2 Menu Tabs 26
   3.3 Questions and Messages 27
   3.4 Board Windows and Screens 27
   3.5 Closing the Program 28
4. Rules Presets 30
   4.1 Switching the Preset 30
   4.2 What a Preset Changes 31
   4.3 The Presets on the Control Panel 34
   4.4 Limits of the Presets 36
5. Control Panel 37
   5.1 Display Mode and Design 38
   5.2 Team Names, Logos and Free Text Lines 39
   5.3 Score 40
   5.4 Game Clock 41
   5.5 Periods and Overtime 44

5.6 Shot Clock 46
5.7 Team Fouls and the Bonus 49
5.8 Time-Outs 50
5.9 Player Fouls and Foul-Out 53
5.10 Possession Arrow 53
5.11 Sound and Horn 54
5.12 Tool Icons 55
5.13 End of a Match 57
5.14 Restart During a Match 57
6. Time and Rules Settings 59
6.1 Opening the Dialog 59
6.2 The Fields 62
6.3 Rule Values Without a Field 64
6.4 Changing the Rules During a Match 65
7. Teams and Players 67
7.1 Team Names 67
7.2 Logos 68
7.3 Team Colours 68
7.4 Squads: Home Team and Guest Team 70
7.5 The Team Database 74
7.6 The Player Stats Window 76
8. External Shot Clock Window and Outputs 81
8.1 Opening the External Shot Clock Window 81
8.2 What the Window Shows 81
8.3 Position and Size of the Shot Clock Window 82
8.4 Position and Size of the Board Window 85
8.5 The Board on a Second Monitor 87
8.6 NDI Output of the Board 87
9. Display Modes St, Sp, Ad and CK 89
9.1 The Four Modes 89
9.2 Switching the Mode 90
9.3 Sponsored Mode (Sp) 91
9.4 Advertisement Mode (Ad) 100
9.5 Chroma Key Mode (CK) 118
9.6 Which Mode for Which Output 132
10. Info Screens 134
10.1 The Info Page 134
10.2 The Info Screens Window 137

10.3 The Screen Editor ... 139
10.4 Teams, Players and the Match Data ... 140
10.5 Showing and Hiding a Screen ... 141
10.6 What Changes With the Rules Preset ... 143
10.7 Teams and Players ... 144
10.8 Fouls and Timeouts ... 146
10.9 Review and Results ... 147
10.10 Statistics and Awards ... 150
10.11 Competition ... 152
10.12 From the Phone and the API ... 155
10.13 The Info Page Graphics ... 156
10.14 Banner and Announce ... 157
10.15 Squads, Line-Up and Team Slide ... 167
10.16 Player Pictures ... 171
10.17 Referees ... 172
10.18 Substitution and Multiple ... 174
10.19 Sponsors and Team Database ... 179
10.20 The Stats Page ... 181
11. Designs and the Design Editor ... 189
11.1 Factory Designs, Working Designs and Own Designs ... 189
11.2 The Chroma Key Designs ... 190
11.3 The Design List ... 191
11.4 The Design Editor ... 194
11.5 Saving ... 202
11.6 Factory Settings ... 204
11.7 Info Screen Designs ... 205
11.8 What an Update Does to the Designs ... 205
12. Media Player, Sponsors, Camera, Screen Capture and NDI ... 207
12.1 The Media Player Page ... 207
12.2 Playlists ... 210
12.3 Adding, Ordering and Removing Clips ... 211
12.4 Playing a Single Clip ... 211
12.5 Running a Playlist ... 213
12.6 Sound, Display Mode and Picture Duration ... 213
12.7 The Output Window ... 214
12.8 The Demo Clip ... 214
12.9 Web Videos ... 215
12.10 Starting a Playlist from the Phone or the API ... 217

12.11 The Media Player of the Advertisement Board ... 217
12.12 The Media Player of the Chroma Key Board ... 220
12.13 Sponsor Images ... 223
12.14 Player Pictures ... 227
12.15 Camera ... 227
12.16 An NDI Source as Camera Input ... 230
12.17 Screen Capture ... 231
12.18 NDI Output of the Board ... 234
12.19 What Stops and What Goes On ... 236
12.20 Files ... 237
13. Remote Control ... 238
13.1 Switching the Remote Control On ... 238
13.2 The Firewall ... 240
13.3 Opening the Page ... 241
13.4 Staying Logged On ... 242
13.5 The Header ... 242
13.6 The HOME Tab ... 243
13.7 The CLOCK Tab ... 244
13.8 The SHOT Tab ... 245
13.9 The SCORE Tab ... 246
13.10 The INFO Tab ... 247
13.11 The MORE Tab ... 249
13.12 The Sheets ... 250
13.13 Bonus, Time-outs and Possession on the Page ... 252
13.14 Several Phones at Once ... 254
13.15 Phones and Tablets ... 255
13.16 Limits and Security ... 256
14. Integration: HTTP, TCP and UDP ... 257
14.1 The Three Channels ... 257
14.2 Switching the Channels On ... 257
14.3 Only One Side Drives Each Clock ... 259
14.4 HTTP on Port 1907 ... 259
14.5 TCP Data Socket on Port 2907 ... 265
14.6 UDP State Broadcast on Port 2908 ... 269
14.7 Ports Busy and Firewall ... 272
15. Settings Reference ... 273
15.1 The Settings Page and Its Tabs ... 273
15.2 License ... 275

15.3 Screen Properties ... 275
15.4 Board Design ... 276
15.5 Remote Control ... 276
15.6 Language ... 277
15.7 Youtube Tutorials ... 281
15.8 Where the Settings Are Kept ... 281
16. Troubleshooting and FAQ ... 282
16.1 The Board Is Black or Empty ... 282
16.2 Display Scaling ... 282
16.3 Fonts ... 282
16.4 Licence and USB Stick ... 283
16.5 NDI ... 283
16.6 The Remote Control Is Not Reachable ... 283
16.7 A Port Is Busy ... 284
16.8 Restoring the Last Match ... 285
16.9 Damaged Files ... 285
16.10 The Log Folder ... 286
16.11 FAQ ... 287
Appendix A: Keyboard Shortcuts ... 289
A.1 Global Shortcuts ... 289
A.2 Keys in the Program ... 291
Appendix B: Rules Quick Reference ... 292
B.1 Values With a Field in the Rules Dialog ... 292
B.2 Values Without a Field (start.xml RULES) ... 292
B.3 The Rules in Words ... 293
Appendix C: HTTP API, TCP and UDP Reference ... 295
C.1 HTTP Request and Replies (Port 1907) ... 295
C.2 HTTP Commands ... 296
C.3 Info Screens and Fields ... 298
C.4 cmd=GET Elements ... 300
C.5 TCP Data Socket (Port 2907) ... 301
C.6 UDP State Broadcast (Port 2908) ... 303
Appendix D: Files and Folders ... 305
D.1 The Program Folder ... 305
D.2 The common Folder ... 306
D.3 The media Folder ... 306
D.4 Backup Copies ... 307
D.5 Outside the Program Folder ... 307

1. Introduction

1.1 What basketBoard 7 Does

basketBoard 7 is scoreboard and match-graphics software for basketball. You run the game from the main window on the operator PC. The program draws the scoreboard in a separate board window that you place on a second display, a projector or an LED wall, or that you send over the network as an NDI video stream.



Figure 1. The Standard board in the third quarter: 58-54, game clock 6:42, shot clock 17, team fouls 3 and 5 (the guest team is in the bonus), possession arrow to the home team.

The board shows the team names and logos, the score, the game clock, the period (Q1 to Q4, or 1H and 2H in a game of two halves, then OT1, OT2 and so on), the shot clock, the team fouls with the bonus mark, the time-outs with their countdown, the possession arrow and two free text lines. In the last minute of a period the game clock shows tenths of a second.

On top of the scoreboard basketBoard 7 shows:

- the 15 basketball info screens: "Starting Five", "Player Intro", "Score", "Foul", "Team Fouls", "Timeout", "Instant Replay", "Period Result", "Final Result", "Game Leaders", "Box Score", "Player of the Game", "Standings", "Results" and "Officials" (chapter 10);
- the player panel with the points and fouls of each player and the foul-out mark (chapter 7);
- line-ups, a team slide, player pictures, the referees, substitutions, a banner and an announcement (chapter 10);
- match statistics, standings, results and fixtures (chapter 10);
- sponsor images, scrolling texts, the pictures and clips of the media player, a camera, an NDI source and a screen capture (chapter 12).

You can also run the game from a phone or a tablet (the remote control, chapter 13) and connect other programs and consoles over HTTP, TCP and UDP (chapter 14).

1.2 Rules Presets

A preset sets all rule values of a game in one step: period length, number of periods, overtime, shot clock, team-foul bonus, time-outs and the foul-out limit. You choose the preset in the "Period & Penalty Settings" dialog (chapter 6). Every value can then be changed by hand. A new installation uses the FIBA preset.

Preset	Button	Periods	Shot Clock	Team-Foul Bonus	Foul-Out
FIBA	"FIBA"	4 quarters of 10 min, overtime 5 min	24 / 14 s	From the 5th foul in a quarter	5 fouls
FIBA 4x8	"U/W"	4 quarters of 8 min, overtime 5 min	24 / 14 s	From the 5th foul in a quarter	5 fouls
NBA	"NBA"	4 quarters of 12 min, overtime 5 min	24 / 14 s	From the 5th foul in a quarter; in the last 2 minutes from the 2nd foul; in overtime from the 4th foul	6 fouls
NCAA M	"NCAA M"	2 halves of 20 min (1H, 2H), overtime 5 min	30 / 20 s	From the 7th foul in a half, double bonus from the 10th	5 fouls
NCAA W	"NCAA W"	4 quarters of 10 min, overtime 5 min	30 / 20 s	From the 5th foul in a quarter	5 fouls

The time-outs differ as well. FIBA and FIBA 4x8 give each team 2 time-outs in the first half and 3 in the second half; NBA gives 7, NCAA M 6 and NCAA W 5 for the whole game. Chapter 4 describes each preset and Appendix B lists every value.

1.3 Display Modes

The board has four display modes. You choose the mode with the "St", "Sp", "Ad" and "CK" buttons at the top left of the Game page. The choice is saved and used again at the next start. Chapter 9 describes the modes.

Mode	Button	What the Board Shows
Standard	"St"	The full-screen scoreboard.
Sponsored	"Sp"	The Standard scoreboard and a strip at the top or the bottom for sponsor images or a scrolling text.
Advertisement	"Ad"	A scoreboard column, up to two banners and a large area for a playlist, a camera, an NDI source or a screen capture.
Chroma Key	"CK"	A compact scorebug and lower-third info screens on a key colour (green in a new installation), to be keyed over a live picture in a vision mixer.

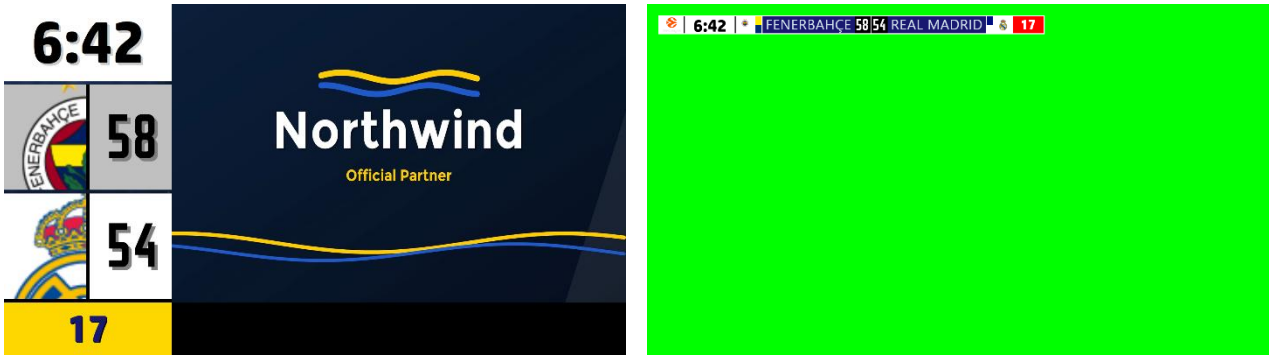


Figure 2. The Advertisement board with the demo clip in the media area (left) and the Chroma Key scorebug on the green key colour (right).

1.4 What's New in 7.6.7.14

- Basketball info screens. Fifteen new info screens show the game on the Standard board as a full page and on the Chroma Key board as a lower third. Their fields and choices follow the rules preset, for example the foul kinds "Unsportsmanlike Foul" and "Disqualifying Foul" under FIBA and "Flagrant Foul 1" and "Flagrant Foul 2" under NBA and NCAA. The "Foul" screen marks a player who has reached the foul-out limit of the preset. The "Info Screens" button on the Info page and on the CK page opens them (chapter 10).
- Three new Chroma Key scorebugs: the masters Navy, Charcoal and Clay. They show the period, the shot clock, the team fouls with the bonus, the time-outs left and the possession arrow. Applying a CK master in the design list now replaces the working scorebug and its lower thirds (chapter 11).
- Remote control: the phone page has a new INFO tab. It shows and hides the info screens of the preset and fills the score and foul screens (chapter 13).
- HTTP API: the new commands "info_show", "info_hide", "info_set" and "info_list" control the info screens, and cmd=GET reports the screen on air (InfoOnAir) and the screens of the preset (chapter 14 and Appendix C).
- HTTP API: a value that contains an encoded & or $, for example a team name "A&B", now arrives complete.
- Chroma Key board: the graphics wait until the board page has loaded, so a scorebug or lower third that is on air stays on air when the page loads again.
- Demo data: the demo game is FENERBAHÇE against REAL MADRID with the EuroLeague logo, both squads, and EuroLeague standings and results.
- Demo media: the clip Northwind_Promo.mp4 is in playlist 1 of the media player, of the Advertisement page and of the Chroma Key page.
- Languages: the texts of the info screens and of the INFO tab are in all 46 interface languages. At its start the program adds new texts of an update to your own lang.xml; texts you have edited stay as they are (chapter 2.4).

1.5 System Requirements

Item	Requirement
Windows	Windows 10 (version 22H2) or Windows 11, 64-bit. Setup does not install on a 32-bit Windows.
Processor and memory	At least an Intel Core i5 of the 8th generation, or an equivalent processor, and 8 GB of RAM
Video, NDI and screen capture	A dedicated graphics card and 16 GB of RAM are recommended

Item	Requirement
Screens	An operator screen of 1920 x 1080 and a second display output for the board. An NDI receiver can take the place of the second output.
.NET Framework	4.7.2 or later. Setup checks it and offers the download page of Microsoft.
Microsoft Edge WebView2 Runtime	Required: every board is drawn with it. Setup checks it and offers the download page of Microsoft.
Rights	Administrator rights for Setup. The desktop shortcut starts the program as administrator.
Network	Only for the remote control (port 1907), the network interfaces (chapter 14) and NDI
Phones and tablets	Up to four phones or tablets at the same time for the remote control

1.6 How to Read This Guide

Chapters 2 and 3 cover the installation, the licence and the main window. Chapters 4 to 8 are the work during a game: the rules presets, the control panel, the time and rules settings, the teams and players, and the external shot clock window. Chapters 9 to 12 describe the board output, the info screens, the designs and the media. Chapters 13 and 14 cover the remote control and the integration with other programs, chapter 15 every setting and chapter 16 troubleshooting. The appendices list the keyboard shortcuts (A), the rules of each preset (B), the HTTP, TCP and UDP commands (C) and the files and folders (D).

- A pair block shows the board output on the left and the control page that produced it on the right.
- A picture with numbered badges is followed by a table with the same numbers: the control as it looks, its name and what it does.
- Names of buttons and labels are written in "double quotes" as the English interface shows them. In another interface language the captions differ; the places are the same.
- Steps are numbered. Do them in this order.

> **Note:** The pictures show the demo data of a new installation: FENERBAHÇE (home) and REAL MADRID (guest) with the EuroLeague logo. The sponsor logos and the Northwind clip are invented. Scores, clocks, fouls, time-outs and periods were set for the pictures, and the sound was switched off. The program ran with a licence; without a licence the boards show DEMO (chapter 2). The pictures whose file names begin with demo show the real Demo look. The main window is 640 x 480 pixels and the boards 1920 x 1080 pixels.

Website and support:

- Website: www.footballscoreboardsoftware.com, shown in the title bar and on the License page of Settings.
- Support: arslan.ziya@gmail.com, shown on the License page with the version of the program.

2. Installation and Licensing

This chapter covers the installation, the first start, an update to a newer version, the removal of the program and the licence.

2.1 Before You Install

Setup checks three things when it starts. If one of them is missing it shows a message and ends.

Check	Message of Setup	What to Do
64-bit Windows	"For 32-bit systems, you can use basketBoard6. Would you like to download basketBoard6?"	basketBoard 7 runs only on a 64-bit Windows.
.NET Framework 4.7.2 or later	".NET Framework 4.7.2 or later is required but not installed. Click OK to download it."	OK opens the download page of Microsoft. Install the .NET Framework and start Setup again.
Microsoft Edge WebView2 Runtime	"Microsoft WebView2 Runtime is required but not installed. Click OK to download it."	OK opens the download page of Microsoft. Install the runtime and start Setup again.

Setup needs administrator rights. When it is started without them, it asks "Administrator privileges are required to install this application. Would you like to restart the setup as administrator?". Yes starts Setup again with the Windows question for administrator rights.

2.2 Installing

1. Close basketBoard 7 if it is running.
2. Start basketBoard7Setup.exe and confirm the Windows question for administrator rights.
3. Follow the wizard. The program is always installed in C:\basketBoard7. The folder cannot be chosen: the factory settings, the demo data and the playlists refer to files in this folder.
4. Wait until Setup has finished.

At the end Setup does three more things:

- It installs the fonts of the boards in Windows ("Installing fonts..."), from the folder C:\basketBoard7\common\font.
- It adds the Windows firewall rules for port 1907 (the remote control and the HTTP API, TCP and UDP, in and out), for incoming TCP port 2907 (the scoreboard console, chapter 14) and for UDP port 2908 (the state broadcast) ("Configuring firewall rule..."). The rules are named "basketBoard 1907 TCP IN" and so on. The script that adds them, open_firewall_1907.bat, stays in the program folder.
- It puts two shortcuts on the desktop: "basketBoard7" starts the program as administrator, "basketBoard7 Help" opens this guide, the file basketBoard7Help.pdf in the program folder.

> **Note:** The program also loads the fonts from C:\basketBoard7\common\font for its own session at every start and unloads them when it closes. The boards therefore show the right fonts even when the font installation of Setup failed.

A new installation runs in Demo until a licence is entered (section 2.6). It contains:

- the FIBA rules preset, the Standard display mode, the sound switched on and the remote control switched off;

- the demo game FENERBAHÇE (home) against REAL MADRID (guest) with their logos, the EuroLeague logo on the board, both squads, referees, EuroLeague standings and results, sponsor images, a banner text and scrolling texts;
- the clip Northwind_Promo.mp4 in playlist 1 of the Media Player page, of the Advertisement page and of the Chroma Key page, and the background video BlueWonder.mp4 of the boards.

> **Note:** The sponsor logos and the Northwind clip are invented. Replace the demo content with your own before the first game: team names and logos on the Game page (chapter 5), squads and referees on the Info page (chapters 7 and 10), standings and results on the Stats page (chapter 10), playlists on the Media Player page (chapter 12).

2.3 First Start

Start the program with the desktop shortcut "basketBoard7". A small status window appears in the middle of the screen while the parts of the program load. Its last line changes from "basketBoard Started..." to "Renderer Initialized...", "Controls Initialized..." and "Entering Main Loop...".

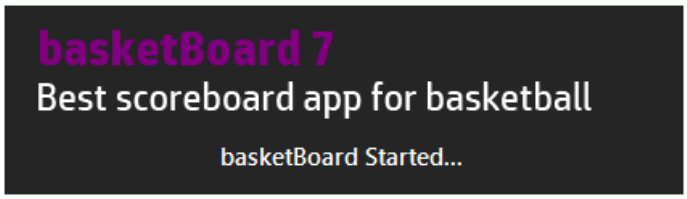


Figure 3. The status window that is shown while the program starts.

At the first start the program creates its settings file start.xml from start.xml.default. It takes the interface language from the regional format of Windows; when the program does not have that language, the interface is English. Chapter 15.6 describes how to choose another language.

Then two windows open:

- The main window opens in the lower right corner of the main screen, 640 x 480 pixels, with the Game page. It stays in front of other windows (chapter 3).
- The board window opens at the top left corner of the main screen, 960 x 540 pixels, in Standard mode. It has no frame and no button in the Windows task bar. Set its place and size on the board display in Settings > "Screen Properties" (chapter 15.3).

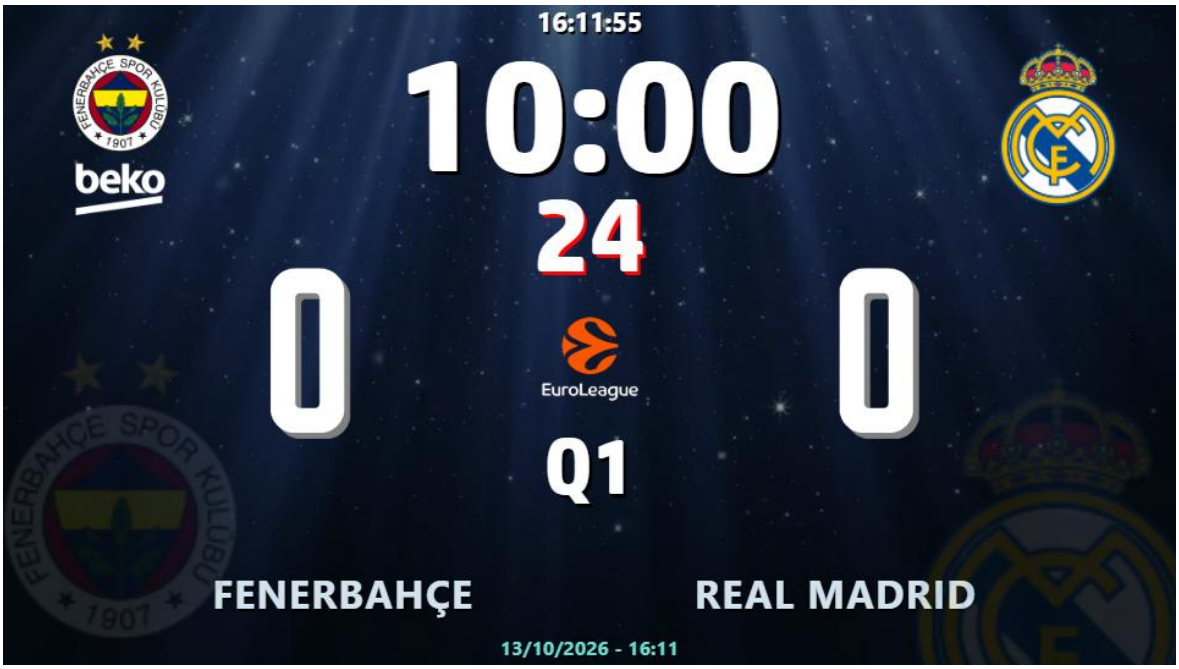


Figure 4. The board window as it opens on a new installation: 960 x 540 pixels, Standard design.

After the main window has opened, the program can show two things before you start to work:

- A message with notices of the start, for example that a damaged settings file was restored (chapter 16.9), that the licence could not be checked (section 2.11) or that port 1907 is used by another program (chapter 16.7).
- The question "Restore last match?" when a game was in progress the last time the program ran (chapter 16.8).

Only one copy of basketBoard 7 runs at a time. A second start does not open a second copy: it brings the main window of the running copy to the front, also when that window was minimized.

2.4 Upgrading to a Newer Version

Close basketBoard 7, then run the Setup of the newer version over the existing installation. Setup replaces the program and the factory content and keeps everything you entered or changed.

Kept on Update	Replaced on Update
start.xml: all settings of the program. Setup never contains this file.	basketBoard7.exe, its library files and the runtimes folder
The licence file basket7License.xml, the saved game state matchstate.xml and the logs folder	start.xml.default, the factory settings from which start.xml is made at the first start
config.xml, configSp.xml, configAd.xml and configCK.xml: the settings of the info graphics and of the Sponsored, Advertisement and Chroma Key pages	common\vizrt\storage: the factory designs. Setup writes this folder again. Do not keep files of your own in it.
common\data: squads, team database, player data, referees, sponsors, playlists, standings, results and fixtures	The rest of the common folder: images, sounds, fonts, scripts, the pages of the remote control and langFactory.xml, the factory copy of the interface texts
common\vizrt\current: the designs in use, with your changes. Setup adds nothing to this folder when a file exists.	basketBoard7Help.pdf and API_Commands.txt. Setup removes the file basketBoard7Help.pdf (the name of the guide in version 7.6.7.14).
common\vizrt\custom: your own designs and your design list. Setup never writes to this folder.	The pictures and clips that Setup delivers in the media folder
common\xml\lang.xml and common\xml\title.xml with your interface texts and board titles	
Your own files in the media folder	

How Setup treats the kept files:

- If a kept file does not exist yet, Setup installs the factory version. This is the case at the first installation and for a file that a newer version adds.
- If the file exists, Setup leaves it as it is and writes the new factory version next to it with the ending .default, for example config.xml.default or playList_0.xml.default. You can compare the two files. The program uses a .default file to repair a damaged file when it has no backup of it (chapter 16.9).
- Files in common\vizrt\current get no .default companion.
- Your data files are kept, so an updated installation does not get new demo data by itself: squads, referees, tables, texts and playlists stay as they are, and the demo data of the new version lies beside them as .default files.
- Setup never packs backup or temporary files (.bak, .tmp, .corrupt, .default).

What the program does itself at the next start:

- start.xml stays as it is. The program creates it from start.xml.default only when it does not exist.
- New interface texts reach your lang.xml. The program adds every text of langFactory.xml that your lang.xml does not have yet, and fills a language that is empty in your file. A text that exists in your lang.xml is never changed and nothing is removed. Before the first change it keeps a copy of your file as lang.xml.bak_premigration, and it lists every addition in lang.migration.log in the program folder.
- New factory designs appear in the design list. The program adds the factory designs that your list in common\vizrt\custom does not have to the end of your list. Your own entries and names are not changed.
- Own designs of an older version, which were kept in the factory folder, are copied to common\vizrt\custom. Setup copies the old design list there before it writes the factory folder.

2.5 Uninstalling

Remove basketBoard 7 in Windows Settings > Apps, or with the uninstall program in C:\basketBoard7.

The uninstall removes the files that Setup copied: the program and its libraries, the factory content of the common and media folders, the help file and the two desktop shortcuts. These stay in C:\basketBoard7:

- the files that the program created: start.xml, matchstate.xml, the licence file basket7License.xml, the logs folder, your own designs in common\vizrt\custom, lang.migration.log and every .bak, .corrupt and .default file;
- the files that Setup installed as protected data, because Setup copies them itself and the uninstall does not know them: config.xml, configSp.xml, configAd.xml, configCK.xml, the files of common\data, the designs in common\vizrt\current, lang.xml and title.xml;
- files you added yourself, for example pictures and clips in the media folder.

The fonts that Setup installed in Windows and the firewall rules also stay.

> **Note:** To keep your data, copy the folder C:\basketBoard7 to a safe place before you uninstall. To remove everything, delete the folder after the uninstall.

2.6 Licensing

Without a licence the program runs in Demo: every page can be tried, with the limits of section 2.10. A licence is a key that the vendor makes for one ID: the Computer ID of the operator PC (PC licence) or the USB ID of a USB stick (USB licence). The key is stored in a file named basket7License.xml.

State	Icon at the Right End of the Menu Strip	Where the Key Is
Demo	Padlock, tool tip "No License"	No valid key was found.

State	Icon at the Right End of the Menu Strip	Where the Key Is
PC licence	Processor symbol, tool tip "CPU License Found"	basket7License.xml in C:\basketBoard7. The key works only on the PC whose Computer ID it was made for.
USB licence	USB symbol, tool tip "USB License Found"	basket7License.xml in the root folder of the USB stick. The key works only with this stick, on any PC.

The program looks for the licence when it starts:

1. It reads every removable drive that is plugged in. A drive with a basket7License.xml whose key fits the USB ID of that drive gives the USB licence.
2. When no stick gives a licence, it reads basket7License.xml in the program folder. A key that fits the Computer ID of this PC gives the PC licence.
3. When neither is found, the program runs in Demo.

The stick is read only at the start. Plug it in before you start the program.

A key carries an expiry date. The program refuses the licence after that date, and while the clock of the PC is earlier than the last run of the program. This date check is made at the start, each time you open Settings, each time you change a value in Screen Properties and when a key is typed in the "License Key" field. A key with the expiry year 2099 has no expiry date and is not checked against the clock.

The icon in the menu strip shows the state that was found at the start. It changes only when the program is started again.

2.7 The License Page

Click "Settings" in the menu strip. Settings opens with the License page; from another tab click "License".

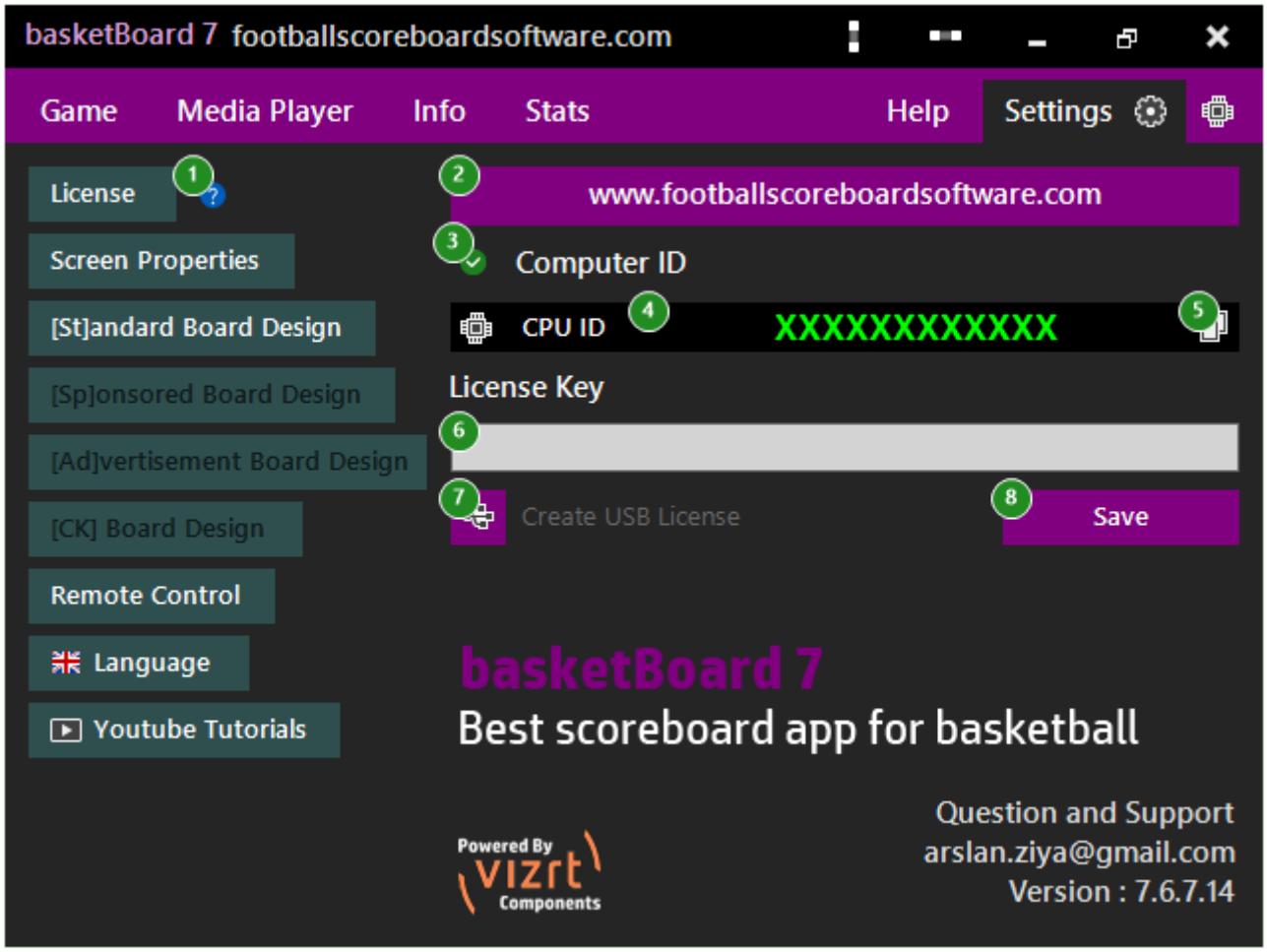
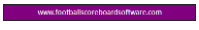
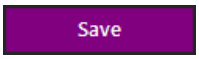


Figure 5. Settings, License page. The Computer ID is masked in this guide.

No.	Control	Name	What It Does
1		**License Info (question mark)**	Opens the window License Info with the state of the licence: Validation, Max Resolution, Expire Date, Model, GPU Enabled, Extra Player, Record & Replay.
2		**www.footballscoreboardsoftware.com**	Opens the web site of the vendor in the standard browser.
3		**CPU License Terms**	Opens the page CPU License Terms in the work area: the terms of the vendor for a PC licence and how to order one. The icon is a question mark without a valid key and a green tick when the key in the License Key field fits this PC.
4		**Computer ID**	Shows the Computer ID of this PC, which the program reads from the hardware at the start. The field cannot be edited; a click selects the whole ID. This is the ID the vendor needs for a PC key.
5		**Copy Computer ID**	Copies the Computer ID to the Windows clipboard, so that you can paste it into the order for the key.
6		**License Key**	Takes the PC key; type or paste it here. The field turns green when the key fits the Computer ID, stays grey when it does not fit and turns pink when the key fits but its date check fails. A green key ends the Demo limits of the control panel at once; it is stored only with Save.

No.	Control	Name	What It Does
7		**Create USB License**	Opens the USB License Creator in the work area, where a key is written to a USB stick.
8		**Save**	Checks the key in the License Key field against the Computer ID. A key that fits is stored in basket7License.xml in the program folder and its Max Resolution in start.xml, with the message License Key Valid. Please Restart Application. A key that does not fit is answered with License Key Not Valid! and the field returns to the stored key.

Below the key field the page shows "Question and Support" with the address for questions and the version of the program.

When the program found a USB licence at the start, the upper part of the page shows "USB License Detected" with the USB ID of the stick and its key, in place of the Computer ID and the "License Key" field.

The ? button beside "License" opens the "License Info" box with what the program read from the current key:

Line	Meaning
Validation	Yes when a PC licence or a USB licence is active, No in Demo
Max Resolution	The largest board width and height in pixels that the key allows. In Demo the value is 38400.
Expire Date	The expiry date of the key as year.month.day
Model	A field of the key: the number of its licence model; 0 in Demo
GPU Enabled	Whether the key contains the GPU option for screen capture (chapter 12)
Extra Player, Record & Replay	Two more fields of the key. The box shows them as the key holds them.
Last line	The result of the date check, for example "All license checks passed."

To order a key, send the ID by e-mail to the address that the License page shows under "Question and Support".

2.8 A Key for This PC

1. Open Settings. The License page shows the Computer ID of this PC in the "CPU ID" field.
2. Click the copy button at the right end of the field. The Computer ID is now in the Windows clipboard.
3. Paste the Computer ID into an e-mail to the vendor and order the key.
4. When you have the key, click into the "License Key" field and paste it. The field turns green when the key fits this PC. It stays grey when the key does not fit, and it turns pink when the key fits but its date check fails.

5. Click "Save". The program stores the key in basket7License.xml in the program folder and shows "License Key Valid. Please Restart Application.". A key that does not fit is answered with "License Key Not Valid!" and the field goes back to the stored key.
6. Close the program and start it again. The icon in the menu strip is now the processor symbol.

A green key ends the Demo limits of the control panel and the DEMO text in the board clock at once. The key is kept only when you click "Save".

> **Note:** The PC key is bound to the hardware of the PC. Copying the folder C:\basketBoard7 to another computer does not move the licence. The information button beside "Computer ID" opens the page CPU License Terms with the terms of the vendor for a broken or changed PC.

2.9 A Key on a USB Stick

A USB licence turns a USB stick into the licence. The stick licenses every PC on which basketBoard 7 is started with the stick plugged in.

1. Plug the USB stick into the PC.
2. Open Settings and click the USB button "Create USB License". The USB License Creator opens.
3. Open the "Select USB Device" list and choose the stick. The list shows the drive letter and the name of each stick; "License Key Found" behind the name means that the stick already holds a key. The USB ID of the stick appears in the "USB ID" field.
4. Click the copy button at the right end of the "USB ID" field, paste the USB ID into an e-mail to the vendor and order the key.
5. When you have the key, open the USB License Creator again, choose the same stick and paste the key into the "License Key" field. The field turns green when the key fits the stick.
6. Click "Save". The program writes the key to basket7License.xml in the root folder of the stick and shows "License Key Valid. Please Restart Application.".
7. Close the program and start it again with the stick plugged in. The icon in the menu strip is now the USB symbol, and the License page shows "USB License Detected".

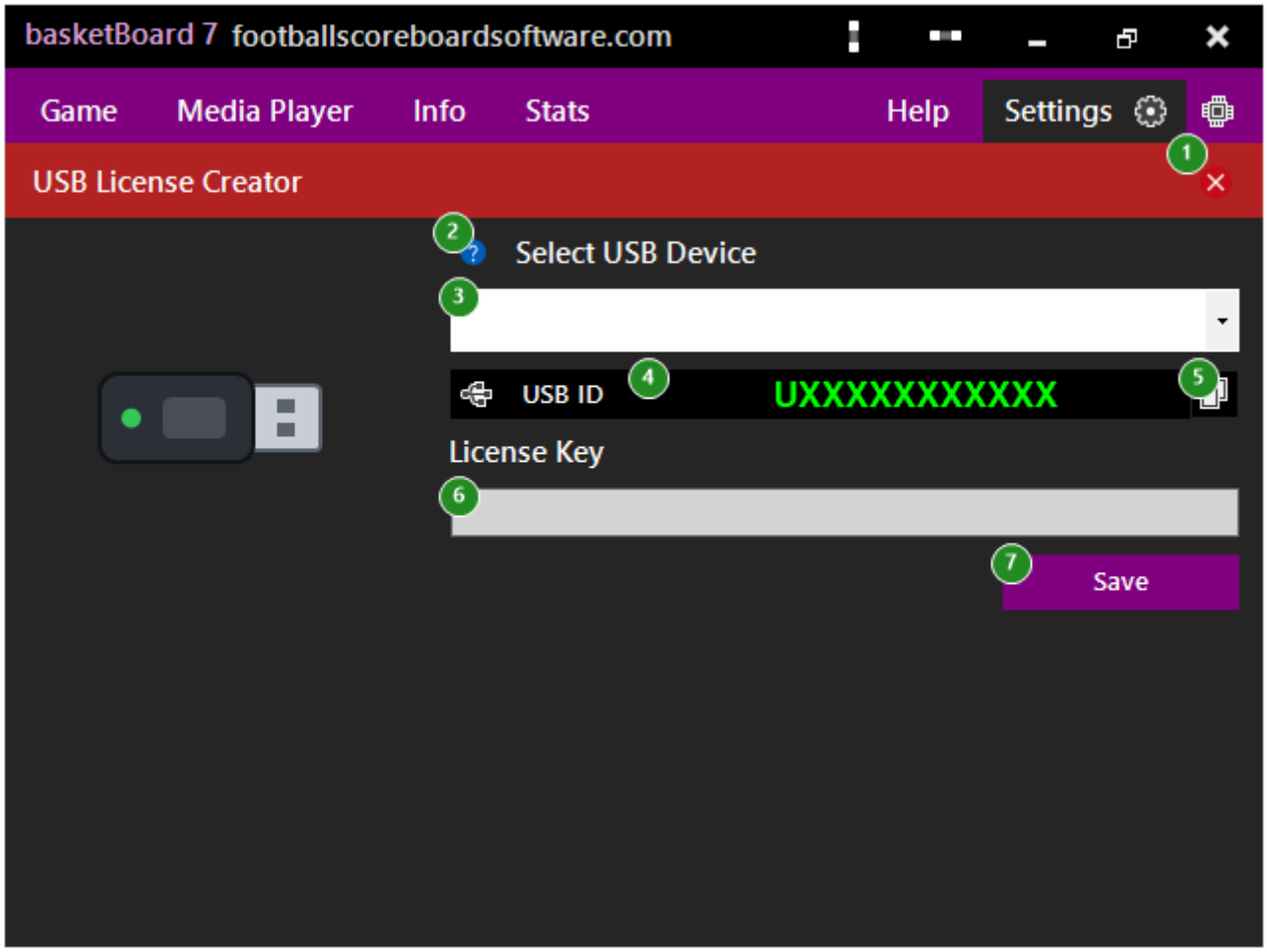
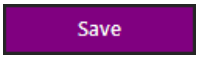


Figure 6. The USB License Creator. No stick was plugged in when the picture was made; the USB ID is masked.

No.	Control	Name	What It Does
1		**Close**	Closes the USB License Creator and returns to Settings. The Esc key does the same.
2		**USB License Terms**	Opens the page USB License Terms in the work area: the terms of the vendor for a USB licence and how to order one.
3		**Select USB Device**	Lists the removable USB sticks that were plugged in when the window opened, with drive letter and name; License Key Found marks a stick that already holds a key. Choosing a stick shows its USB ID and loads the key that is on the stick into the License Key field.
4	UXXXXXXXXXX	**USB ID**	Shows the USB ID of the chosen stick: the letter U and eleven characters. The field cannot be edited; a click selects the whole ID. This is the ID the vendor needs for a USB key.
5		**Copy USB ID**	Copies the USB ID of the chosen stick to the Windows clipboard, so that you can paste it into the order for the key.
6		**License Key**	Takes the key for the chosen stick; type or paste it here. The field turns green when the key fits the USB ID of the stick, stays grey when it does not fit and turns pink when the key fits but its date check fails. The key is written to the stick only with Save.

No.	Control	Name	What It Does
7		**Save**	Checks the key against the USB ID of the chosen stick. A key that fits is written to basket7License.xml in the root folder of the stick, with the message License Key Valid. Please Restart Application. A key that does not fit is answered with License Key Not Valid! and nothing is written. Without a chosen stick the answer is Please select a valid USB device.

- The list contains the sticks that were plugged in when the USB License Creator was opened. Close it and open it again after you plug in a stick.
- "Save" without a chosen stick answers "Please select a valid USB device.". A key that does not fit the stick is answered with "License Key Not Valid!".
- Do not delete basket7License.xml from the stick. Other files on the stick do not disturb the licence.

2.10 Demo Mode

A program without a licence is complete. These limits apply until a licence is entered:

Limit	What Happens in Demo
DEMO in the clock	The board shows the word DEMO in place of the game clock for about one second in every ten seconds, in all four display modes. The clock itself keeps running.
Score limit	A score above 12 is set back to 12, for both teams.
Home score buttons	The buttons +3, +2, +1 and -1 of the home team and the keyboard key for the home score show the message "License Required !" and do not change the score. The guest team is not locked.
Home team fouls	The two arrows of the home team fouls show the same message.
Home logo	The logo of the home team cannot be changed or removed.
DEMO label	A label DEMO lies on the info graphics window, the media player window and the media area of the Advertisement board.
Downloads	On the download page of the Stats page the third and every later download shows the message.

Board Output **Control Panel**

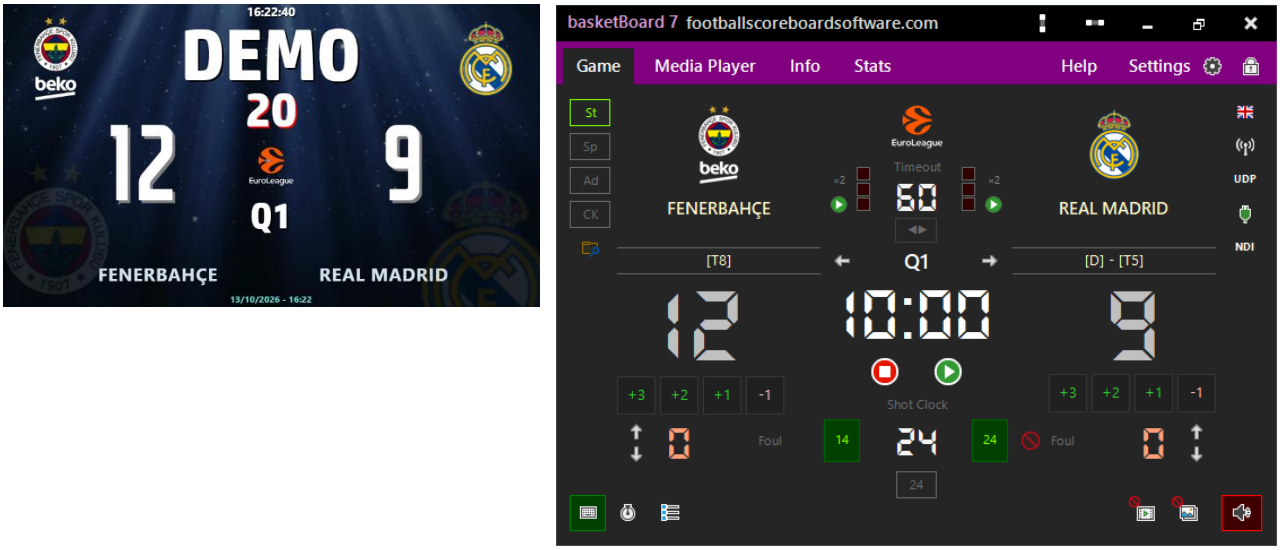


Figure 7. Demo: the board shows DEMO in place of the game clock, and a home score above 12 is set back to 12.

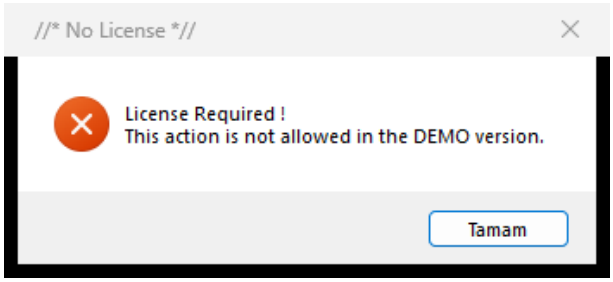


Figure 8. The message of an action that needs a licence: "License Required !" with "This action is not allowed in the DEMO version.". The button of this Windows message is labelled in the language of Windows.

The size of the board is not limited in Demo: Max Resolution is 38400.



Figure 9. The main window in Demo: the padlock at the right end of the menu strip.

No.	Control	Name	What It Does
1		**Licence icon**	Shows the licence state that was found at the start: a padlock without a licence (tool tip No License), a processor symbol for a PC licence (CPU License Found) or a USB symbol for a USB licence (USB License Found). It cannot be clicked and changes only when the program is started again.

2.11 Messages When the Licence Cannot Be Checked

When the program cannot accept a licence that is present, it does not stop. It runs in Demo and says why in a message after the main window has opened. The same text is written to the log file (chapter 16.10).

Message Begins With	Cause	What to Do
"The hardware ID of this computer could not be read from Windows (WMI: ...)."	Windows did not answer the hardware query at the start, and a licence file exists in the program folder or on a stick.	Restart the program. If the message returns, check that the Windows service "Windows Management Instrumentation" is running.
"The licence could not be checked (...)."	An unexpected error during the licence check	Restart the program. If the message returns, send the log file to the vendor.
"The computer clock has been set back."	The date and time of the PC are earlier than the last run of the program. The message shows both times.	Set the correct date and time in Windows and restart the program. A PC that loses its date needs a new clock battery.
"The licence expired on ..."	The expiry date of the key has passed.	Order a new key.

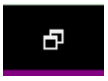
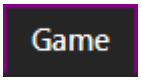
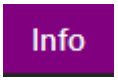
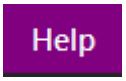
> **Note:** The time of the last run is stored in local time. When the clocks are set back one hour in autumn, the message about the computer clock can appear once if the program is started again within that hour.

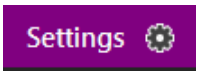
3. Main Window

The main window is the control window of basketBoard 7. It has its own title bar in place of the Windows frame. Below the title bar is the purple menu strip, and below the menu strip the work area in which every control page opens. The window stays in front of other windows.



Figure 10. The main window as it opens: title bar, menu strip and the Game page.

No.	Control	Name	What It Does
1		**Vertical dock**	Switches the main window between its normal size of 640 x 480 in the lower right corner of the screen and a column 640 pixels wide at the right edge, as high as the screen without the task bar.
2		**Horizontal dock**	Switches the main window between its normal size of 640 x 480 in the lower right corner of the screen and a strip 480 pixels high along the bottom edge, as wide as the screen.
3		**Minimize**	Reduces the main window to its button in the Windows task bar. The board window stays on the screen.
4		**Maximize**	Enlarges the main window to the whole screen. A second click returns it to its former size and place.
5		**Close**	Asks The Application Will Be Closed! Are You Sure? Yes saves the team names, the two text lines and the state of the game, stops the outputs and ends the program; No returns to the program. Alt+F4 asks the same question.
6		**Game**	Opens the control panel of the game. It also puts the scoreboard of the current display mode back on the board: a running media clip is stopped and a full-screen info graphic is closed.
7		**Media Player**	Opens the Media Player page with the playlists of pictures, clips and web videos. A player picture show that was started from the Info page is ended.
8		**Info**	Opens the Info page with the info graphics (banner, announcement, squads, referees, substitutions, sponsors) and the Info Screens button with the 15 basketball info screens.
9		**Stats**	Opens the Stats page: match statistics, standings, results and fixtures. The button does not react while the download window of the Stats page is open.
10		**Help**	Opens this guide, basketBoard7Help.pdf in the program folder, in the PDF viewer of Windows. If the file is missing, a message names its path. In a narrow menu strip the tab shows a question mark.

No.	Control	Name	What It Does
11		**Settings**	Opens Settings: License, Screen Properties, Board Design, Remote Control, Language and the tutorial videos. While a media clip plays, the tab shows the played time of the clip in place of its caption.
12		**Licence icon**	Shows the licence state that was found at the start: a padlock without a licence (tool tip No License), a processor symbol for a PC licence (CPU License Found) or a USB symbol for a USB licence (USB License Found). It cannot be clicked and changes only when the program is started again.

3.1 Title Bar and Window Sizes

The left part of the title bar shows the name of the program and the web address of the vendor. Drag the title bar to move the window. Drag an edge of the window to change its size; it cannot be made smaller than 640 x 480 pixels. Near a screen edge or another window of the program the main window snaps to it.

The main window opens with 640 x 480 pixels in the lower right corner of the main screen. When the operator PC has only one screen, dock the main window to an edge so that the board stays visible beside it. The two dock buttons at the left of the title bar buttons do this:

- Vertical dock: the main window becomes a column at the right edge of the screen, 640 pixels wide and as high as the screen without the task bar. A second click returns it to 640 x 480 in the lower right corner.
- Horizontal dock: the main window becomes a strip along the bottom of the screen, as wide as the screen and 480 pixels high. A second click returns it to 640 x 480 in the lower right corner.

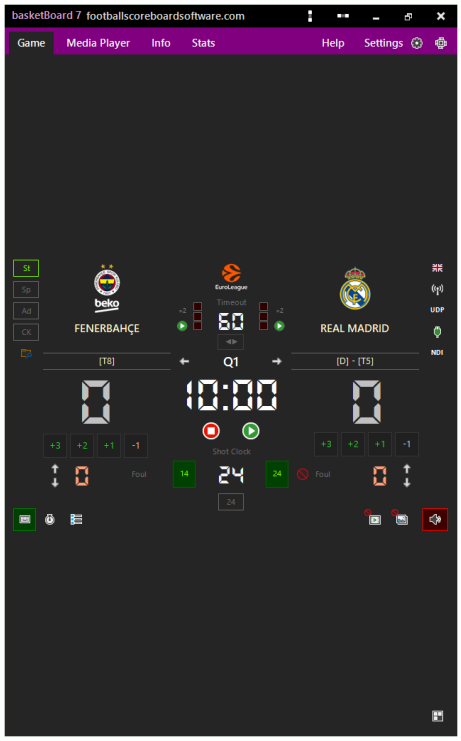


Figure 11. Vertical dock: the main window at the full height of the screen. The controls of the Game page stay together in the middle.

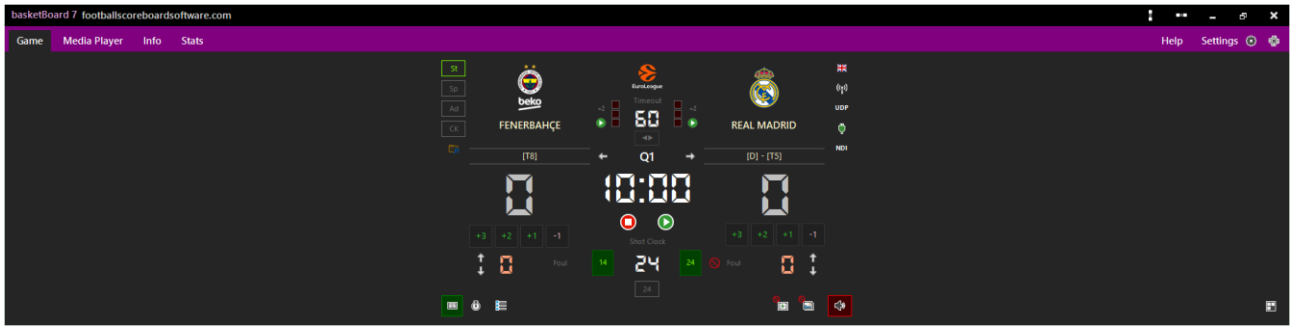


Figure 12. Horizontal dock: the main window at the full width of the screen.

In a docked or enlarged window the Game page shows a small button in its lower right corner. This button, and a double-click on an empty place of the Game page, return the main window to 640 x 480 in the lower right corner.

When the main window is minimized, the board window stays on the screen.

3.2 Menu Tabs

Tab	What It Opens	Chapter
"Game"	The control panel of the game. A click on "Game" also puts the scoreboard back on the board when a media clip or a full-screen info graphic was shown.	5
"Media Player"	Playlists of pictures, clips and web videos	12
"Info"	The info graphics (banner, announcement, squads, referees, substitutions, sponsors) and the "Info Screens" button with the 15 basketball info screens	10
"Stats"	Match statistics, standings, results and fixtures	10
"Sp", "Ad" or "CK"	The control page of the current display mode. The tab carries the abbreviation of the mode and is hidden in Standard mode.	9
"Help"	This guide	-
"Settings"	License, Screen Properties, Board Design, Remote Control, Language and the tutorial videos	15

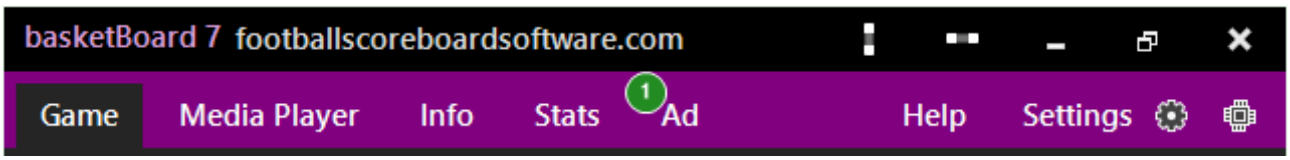


Figure 13. The menu strip in Advertisement mode with the mode tab "Ad".

No.	Control	Name	What It Does
1	Ad	**Sp / Ad / CK**	Opens the control page of the current display mode: Sponsored, Advertisement or Chroma Key. The caption is the abbreviation of the mode chosen on the Game page; the tab is hidden in Standard mode. The caption flashes while a playlist, a camera, an NDI source or a screen capture runs on the Advertisement or Chroma Key page.

- The tab of the open page has a dark background; the others are purple.
- The caption of the mode tab flashes while a playlist, a camera, an NDI source or a screen capture runs on the Advertisement or Chroma Key page.
- While a media clip plays, the "Settings" tab shows the played time of the clip in place of its caption.
- "Help" opens this guide, the file basketBoard7Help.pdf in the program folder, in the PDF viewer of Windows. If the file is not there, the message "The help file was not found:" appears with the path of the file; if Windows cannot open it, the message reads "The help file could not be opened.". When the menu strip is too narrow for the caption, for example with a long translation, the tab shows "?" in place of "Help".
- The icon at the right end shows the licence state that was found at the start: a padlock in Demo, a processor symbol for a PC licence, a USB symbol for a USB licence (chapter 2.6). It cannot be clicked.

3.3 Questions and Messages

Questions and messages of the program cover the work area of the main window until you answer them. The coloured bar at the top carries the title: red for a warning or a question, green for a success message.

- A question has the buttons "Yes" and "No". "Yes" has the focus, so the Enter key answers Yes. The Esc key answers No.
- A message has one button, "Ok". Enter and Esc close it.

Some notices are ordinary Windows messages instead, for example "License Required !" in Demo, the notices of the start and the restart message of the Language page. Their button is labelled by Windows in the language of Windows.

3.4 Board Windows and Screens

The board is a separate window without a frame and without a button in the Windows task bar. You place it where the spectators or the vision mixer see it: on a second monitor, a projector or an LED wall controller.

1. Connect the board display to the PC and choose "Extend these displays" in the display settings of Windows. Arrange the board display to the right of or below the main screen.
2. Open Settings > "Screen Properties" (chapter 15.3).
3. Set "L: Left" and "T: Top" to the position of the board display on the Windows desktop in pixels. With a main screen of 1920 x 1080, a display to the right of it begins at Left 1920, Top 0.
4. Set "W: Width" and "H: Height" to the size of the board, normally the resolution of the display, for example 1920 and 1080.

The board moves and changes its size as soon as you leave the cell. The same place and size are used by every board window: the scoreboard of the Standard and Sponsored modes, the Advertisement board, the Chroma Key board, the info graphics and the media player output.

- A new installation has Left 0, Top 0, Width 960 and Height 540.
- Width and Height cannot be larger than "Max Resolution", the value of the licence (chapter 2.7).
- A negative Left or Top is treated as 0. A board display that Windows places to the left of or above the main screen can therefore not be reached; arrange it to the right or below.

Other outputs:

- The external shot clock window shows the game clock and the shot clock in a window of its own, for a second display near the court (chapter 8).

- The NDI button at the right edge of the Game page sends the board over the network as an NDI video stream, in place of or beside a second display (chapter 9).

> **Note:** We recommend a Windows display scaling of 100 % for the operator screen and the board display. The program was tested at 100 % (chapter 16.2).

3.5 Closing the Program

Click the close button at the right end of the title bar. The program asks before it ends:

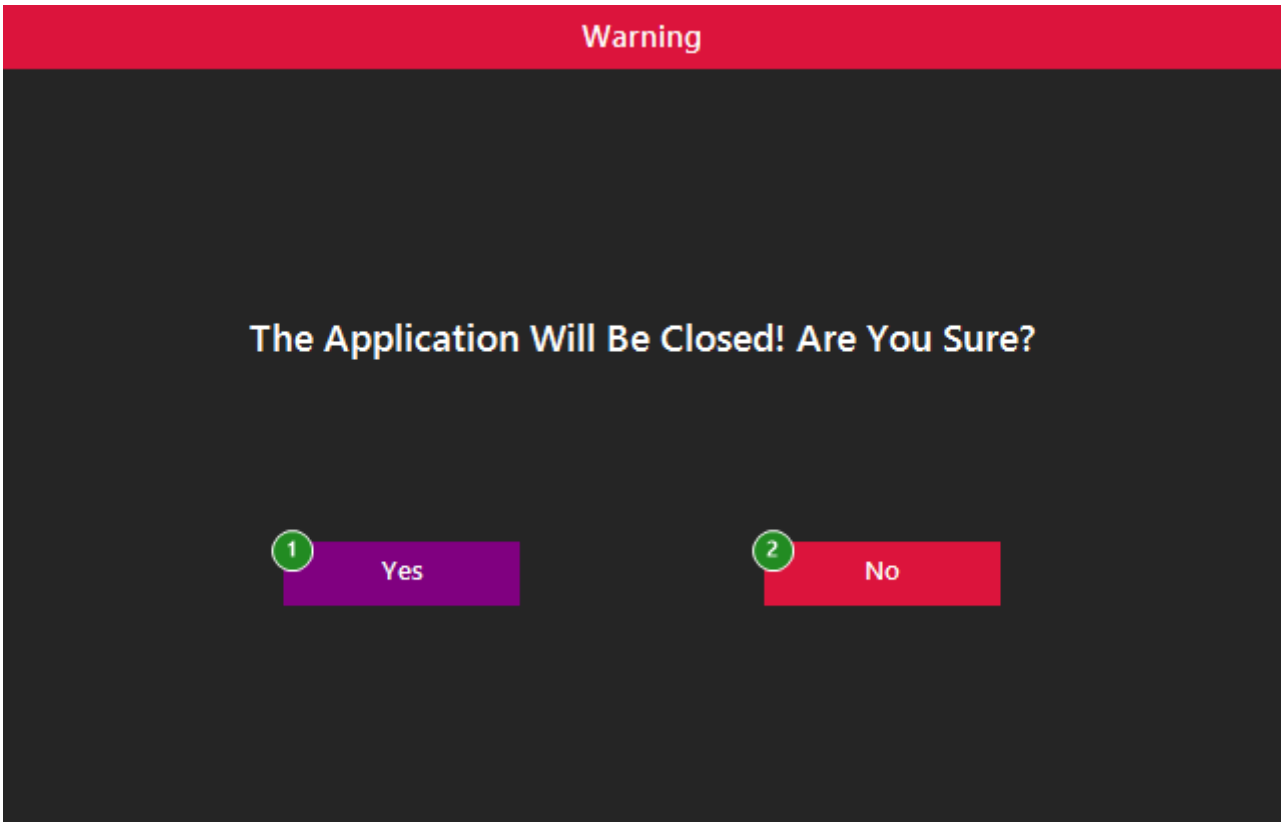


Figure 14. The question of the close button.

No.	Control	Name	What It Does
1	Yes	**Yes**	Confirms the question; the action that asked goes ahead. In the question of the close button the program then saves and ends. The button has the focus when the question opens, so the Enter key also answers Yes.
2	No	**No**	Closes the question without carrying out the action. The Esc key does the same.

"No" returns to the program; nothing is stopped. "Yes" ends the program in this order:

1. The names of the home and the guest team and the two free text lines of the Game page are saved to start.xml.
2. The state of the game is saved to matchstate.xml: score, team fouls, time-outs, period, game clock, shot clock and possession arrow. If a game was in progress, the next start offers "Restore last match?" (chapter 16.8).

3. The refresh of the board, the UDP broadcast, the scoreboard console and the remote control are stopped, all windows of the program including the board are closed and the program ends.

Everything else is already saved, because the pages store their values when you change them or when you click their save buttons.

- Alt+F4 in the main window asks the same question.
- When Windows shuts down or restarts, when you sign out, or when the program is ended with "End task" in the Task Manager, the program saves in the same way without asking and then ends.
- If the program cannot finish closing within ten seconds, it ends itself. The data was saved before that point.

4. Rules Presets

basketBoard 7 applies the playing rules itself. It resets the team fouls, shows the bonus, counts the time-outs against the allowance, blanks the shot clock and numbers the overtimes. Every limit is a value of a rules preset. A new installation plays by FIBA rules.

The rules dialog offers five presets:

Button	Preset	For
FIBA	FIBA	FIBA rules: four quarters of 10 minutes
U/W	FIBA 4x8	FIBA rules with four quarters of 8 minutes, for youth and other competitions with shorter periods
NBA	NBA	NBA rules: four quarters of 12 minutes
NCAA M	NCAA men	two halves of 20 minutes
NCAA W	NCAA women	four quarters of 10 minutes with the NCAA shot clock and time-outs

The values of each preset are listed in full in Appendix B. The dialog and its fields are described in chapter 6.

4.1 Switching the Preset

Choose the preset before the match, with the game clock stopped.

1. On the Game page click the stopwatch icon at the bottom left (Timing Settings). The "Period & Penalty Settings" dialog opens.
2. The button of the stored preset is green. The buttons stand in this order from left to right: "FIBA", "U/W", "NBA", "NCAA M", "NCAA W".
3. Click the button of the preset you want. It turns green and the fields of the dialog are filled with the values of the preset.
4. Change a field if your competition needs it, for example a shorter period.
5. Click "Save & Apply". "Cancel" closes the dialog without saving.

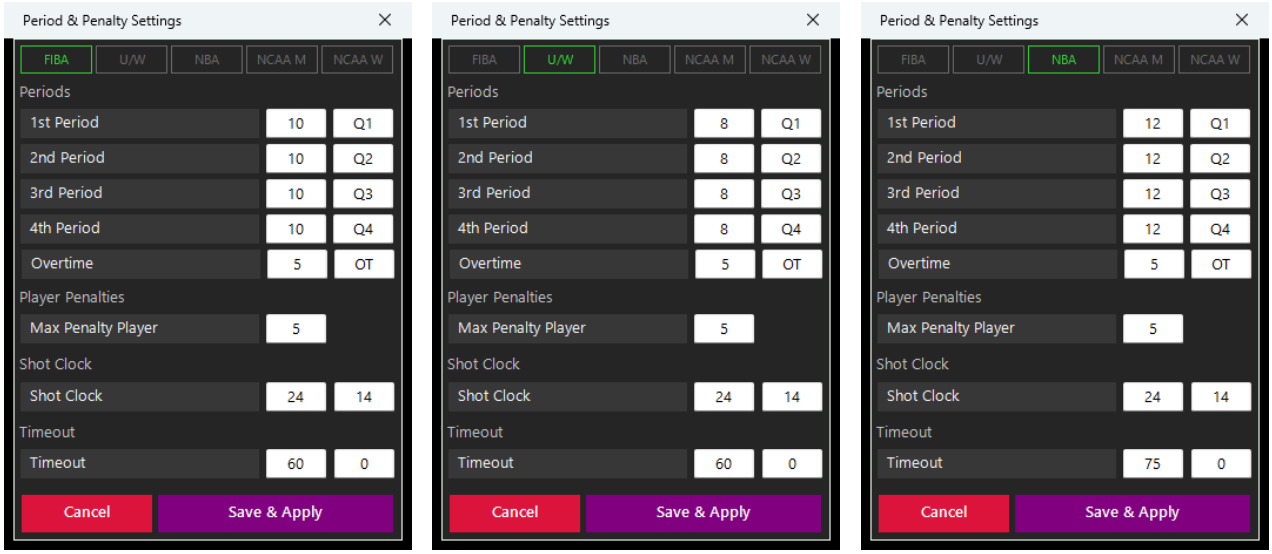


Figure 15. The dialog after a click on FIBA, U/W and NBA.

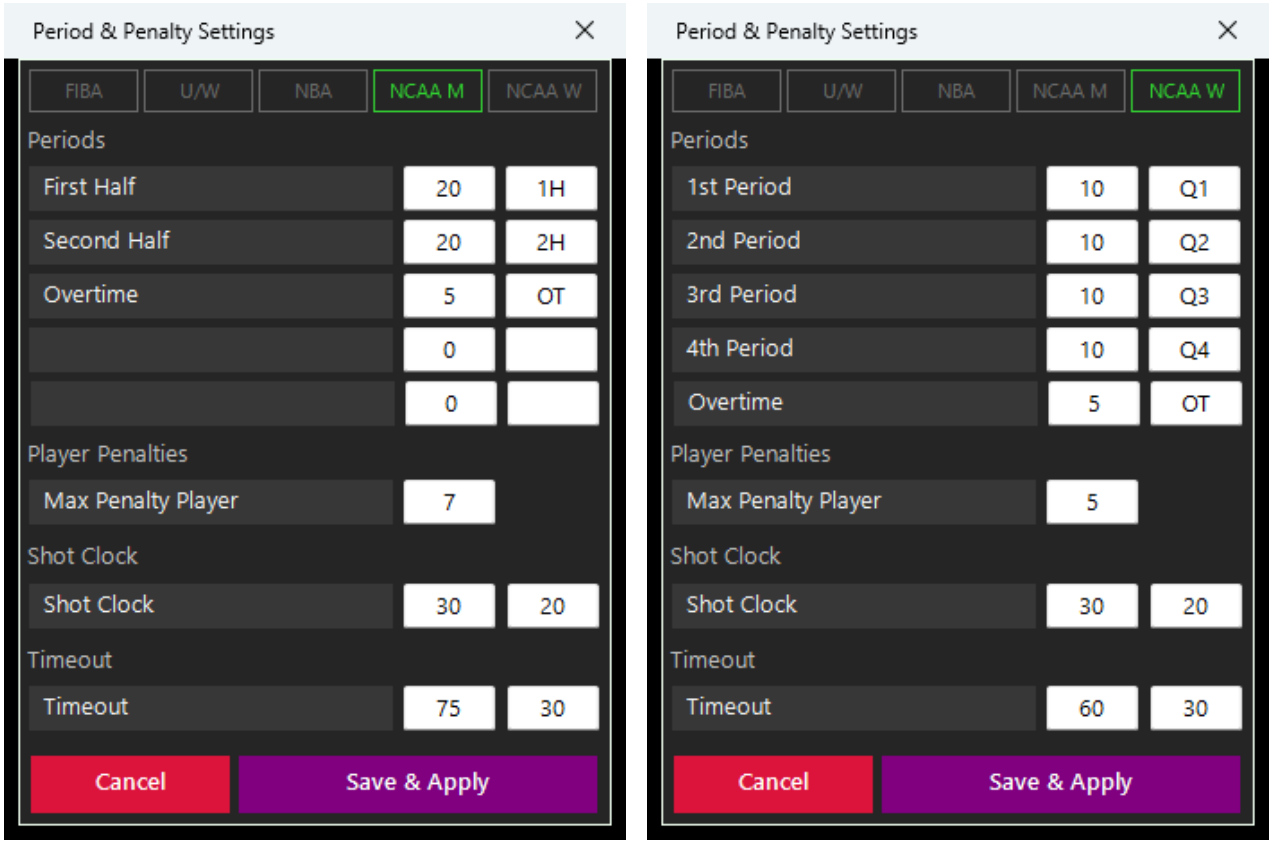


Figure 16. The dialog after a click on NCAA M (two halves, overtime in the third row) and NCAA W.

What "Save & Apply" does:

- The preset is stored (start.xml, BOARD/Mode) together with the values of the fields.
- The rule values of the preset that have no field in the dialog are written too (chapter 6.3). This happens only when a preset button was clicked in the dialog.
- The control panel takes the new values at once: the captions of the shot clock buttons, the time-out length and the period label.
- When neither the game clock nor a time-out is running, the game clock is set to the full length of the current period and the shot clock to its full value. Score, team fouls and used time-outs stay as they are.

> **Note:** Switch between a preset with quarters and one with halves (NCAA M) only before the match. The period number stays, so the third quarter of a FIBA match becomes the first overtime under NCAA M. After the change select the first period with the arrows of the control panel (chapter 5.5).

4.2 What a Preset Changes

4.2.1 Periods and Overtime

	FIBA	FIBA 4x8	NBA	NCAA M	NCAA W
Regulation periods	4 quarters	4 quarters	4 quarters	2 halves	4 quarters
Period length	10 min	8 min	12 min	20 min	10 min
Period labels	Q1 to Q4	Q1 to Q4	Q1 to Q4	1H, 2H	Q1 to Q4

	FIBA	FIBA 4x8	NBA	NCAA M	NCAA W
Overtime length	5 min	5 min	5 min	5 min	5 min
Overtime labels	OT1, OT2 ...	OT1, OT2 ...	OT1, OT2 ...	OT1, OT2 ...	OT1, OT2 ...

- Every period after the last regulation period is an overtime. The program adds the number to the overtime label: OT1, OT2 and so on, up to period 20.
- The program never changes the period by itself. The operator moves on with the arrows of the control panel (chapter 5.5).

4.2.2 Shot Clock

	FIBA	FIBA 4x8	NBA	NCAA M	NCAA W
Full reset	24	24	24	30	30
Short reset	14	14	14	20	20

The two reset buttons of the control panel carry these values as their captions.

4.2.3 Team Fouls and the Bonus

	FIBA	FIBA 4x8	NBA	NCAA M	NCAA W
Bonus from the team foul	5th	5th	5th	7th	5th
Bonus in overtime from	5th	5th	4th	7th	5th
Last 2 minutes of a period	no rule	no rule	bonus from the 2nd foul inside them	no rule	no rule
Double bonus	none	none	none	from the 10th foul	none
Team fouls reset	each quarter	each quarter	each quarter	each half	each quarter
In overtime	count goes on	count goes on	starts at 0	count goes on	count goes on

- In the bonus the foul box of the team turns red on the control panel, and the foul field on the board turns red with a white number.
- NCAA M: from the 10th team foul of a half the foul box turns a brighter red (double bonus). The board shows the same red as for the bonus.
- NBA: in the last two minutes of every period, the overtime included, the bonus also starts with the second team foul committed inside those two minutes, even when the total is below five.
- When the count goes on in overtime, the overtime starts with the team fouls of the last regulation period, and every further overtime with those of the overtime before.

- The team fouls are counted by hand on the control panel (chapter 5.7). The fouls of single players do not change them.

4.2.4 Player Foul-Out

	FIBA	FIBA 4x8	NBA	NCAA M	NCAA W
A player fouls out with	5 fouls	5 fouls	6 fouls	5 fouls	5 fouls

At this number of personal fouls the row of the player in the Player Stats window is marked, and the Foul info screen shows "Fouled Out" (chapters 7 and 10). The program does not stop you from adding more fouls.

4.2.5 Time-Outs

The presets use two time-out models:

- HALF (FIBA, FIBA 4x8): each team has an allowance for the first half and one for the second half. Unused time-outs of the first half are lost.
- GAME (NBA, NCAA M, NCAA W): each team has one allowance for the whole of regulation. The used time-outs are not cleared at half time.

	FIBA	FIBA 4x8	NBA	NCAA M	NCAA W
Model	HALF	HALF	GAME	GAME	GAME
Time-outs per team	2 in the first half, 3 in the second	2 in the first half, 3 in the second	7 per game	6 per game	5 per game
Most in the last regulation period	no limit	no limit	4	no limit	no limit
Most at the end of the last regulation period	2 in the last 2 minutes	2 in the last 2 minutes	2 in the last 3 minutes	no limit	no limit
Per overtime	1	1	2	1	1
Unused time-outs carried into overtime	no	no	no	yes	yes
Time-out length	60 s	60 s	75 s	75 s or 30 s	60 s or 30 s

- The label above each time-out button of the control panel shows the time-outs the team has left (×2). The limits are already part of this number: in the last two minutes of a FIBA fourth quarter a team with three time-outs left shows ×2.
- With carry-over, the unused time-outs of regulation are added to the time-outs of the first overtime. Example (NCAA M): a team with all 6 time-outs unused starts the first overtime with 7.
- With two time-out lengths (NCAA M, NCAA W) two small buttons under the time-out box select the length before a time-out (chapter 5.8). The program does not count the two kinds separately.

4.2.6 Clock Display

All five presets have the same values:

- The board shows the game clock with tenths of a second while less than 60 seconds remain (for example 28.5).
- The board shows the shot clock with tenths from 5 seconds down (for example 4.2).
- The shot clock is switched off (blank) when the game clock has less time left than the shot clock.

4.3 The Presets on the Control Panel

The pictures show the same match moment (6:42 in the second half, 58-54) under each preset. Look at the shot clock buttons, the period label, the time-outs left above the time-out buttons and the foul boxes.

Board Output **Control Panel**

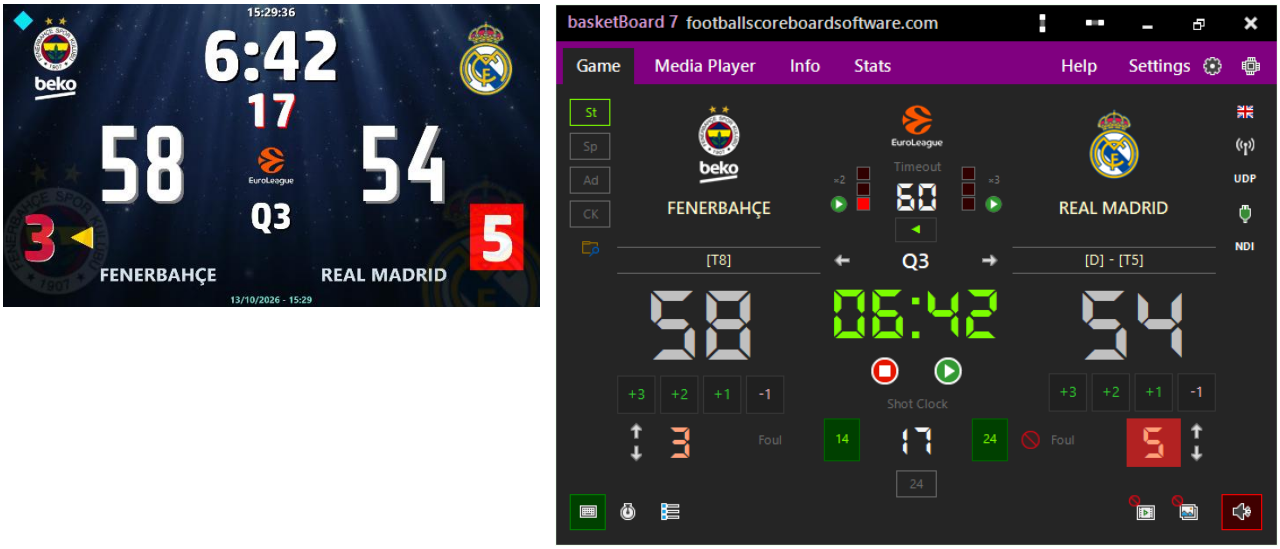


Figure 17. FIBA: Q3, shot clock buttons 14 and 24, time-outs left ×2 and ×3 in the second half; the guest team is in the bonus with 5 fouls.

Board Output **Control Panel**

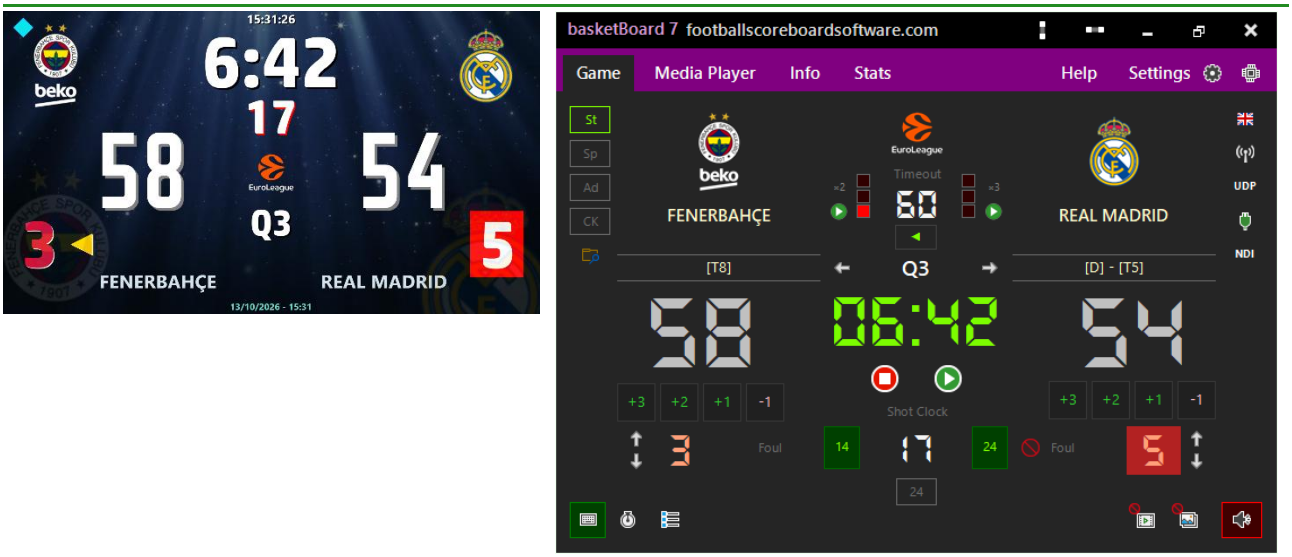


Figure 18. FIBA 4x8: the same as FIBA with 8-minute quarters.

Board Output **Control Panel**

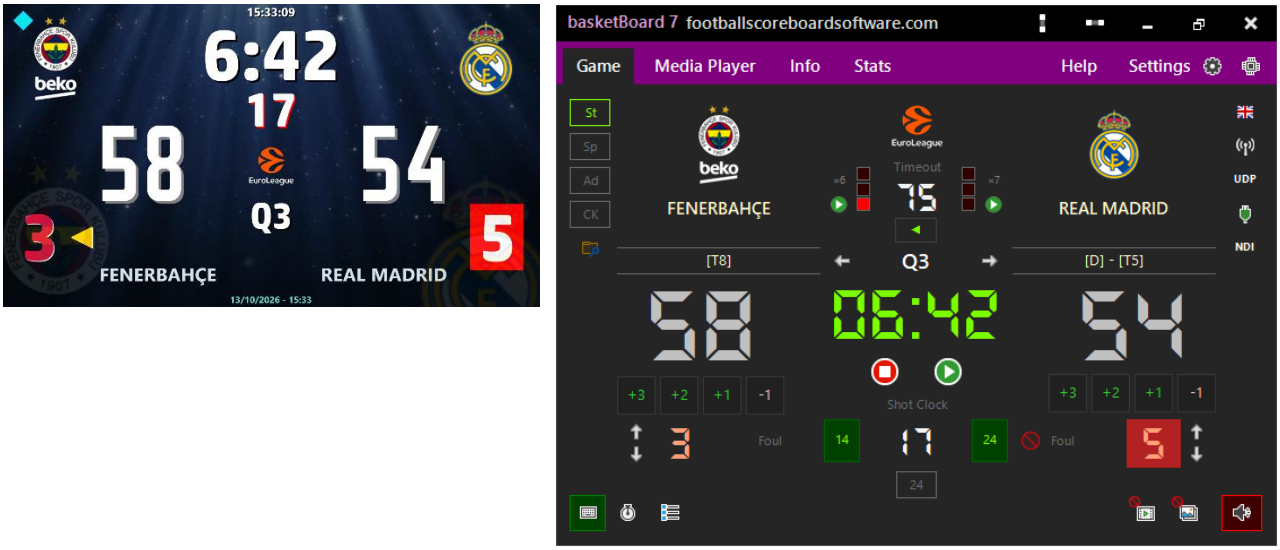


Figure 19. NBA: time-out length 75, time-outs left ×6 and ×7 for the whole game.

Board Output **Control Panel**

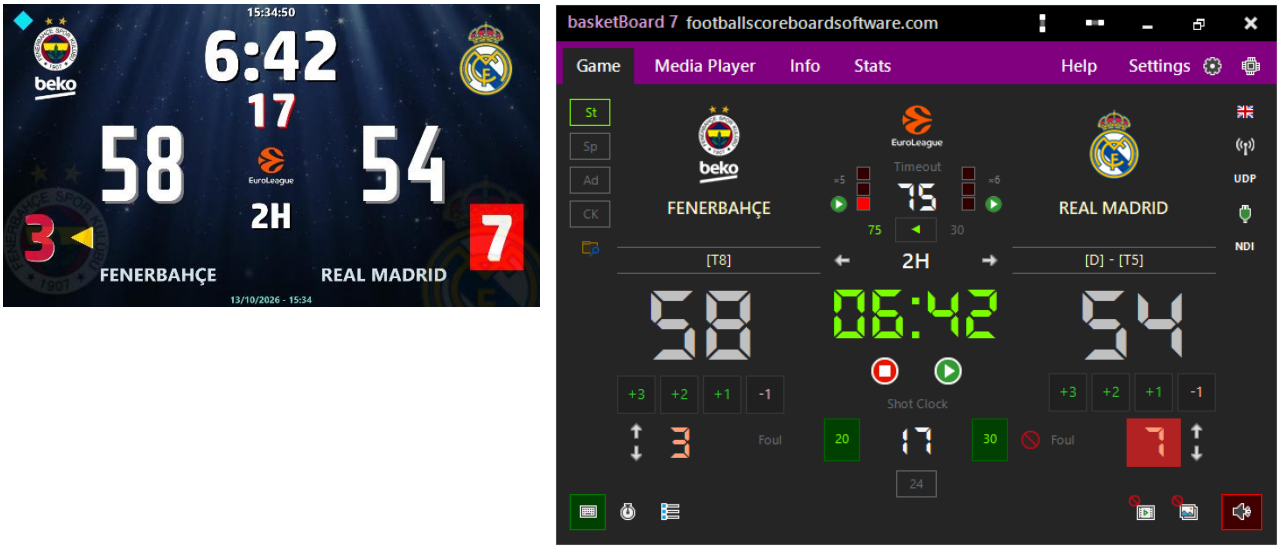


Figure 20. NCAA M: second half 2H, shot clock buttons 20 and 30, two time-out lengths 75 and 30; the guest team is in the bonus with 7 fouls.

Board Output **Control Panel**

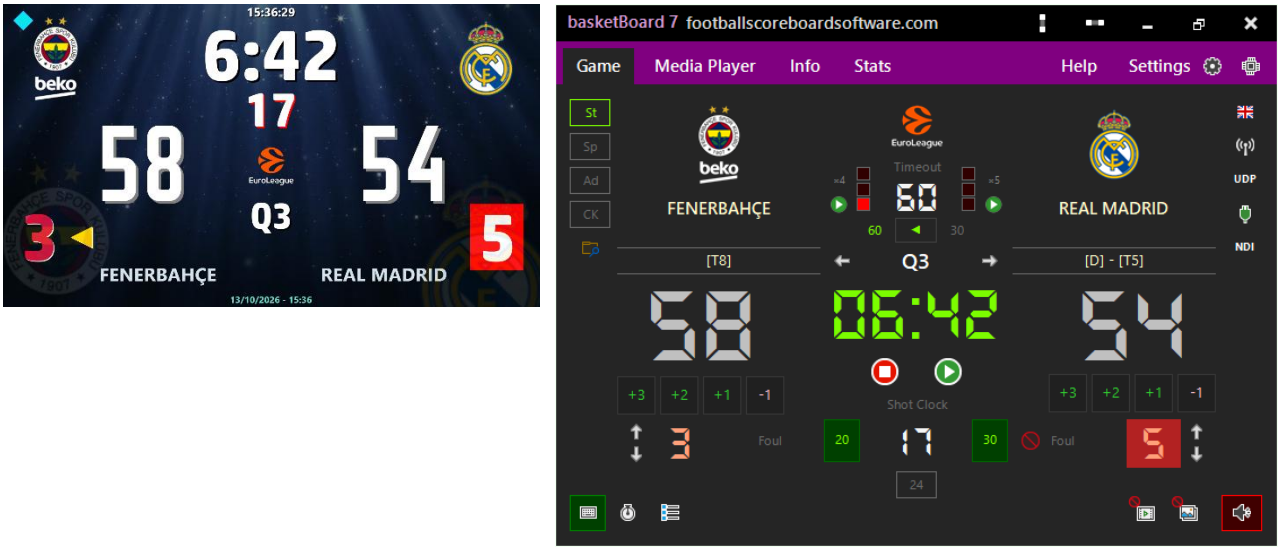


Figure 21. NCAA W: quarters, shot clock buttons 20 and 30, two time-out lengths 60 and 30, time-outs left ×4 and ×5.

4.4 Limits of the Presets

- NBA: the mandatory (television) time-outs are not modelled. The limit of two time-outs at the end of the fourth quarter starts at the 3:00 mark.
- NCAA: the presets hold the format without media time-outs (men 6, women 5 time-outs). For a game with media time-outs the allowance must be changed in start.xml (chapter 6.3).
- Time-outs are counted without their kind: the two lengths only set the countdown.
- The presets do not decide when a period ends or a match is over. The operator selects the periods and the overtimes.

5. Control Panel

The Game page is the control panel of the match: score, game clock, period, shot clock, team fouls, time-outs and possession arrow. It is shown when the program starts. Click "Game" in the menu strip to come back to it from another page. What you change here reaches the board within a tenth of a second.

Board Output **Control Panel**

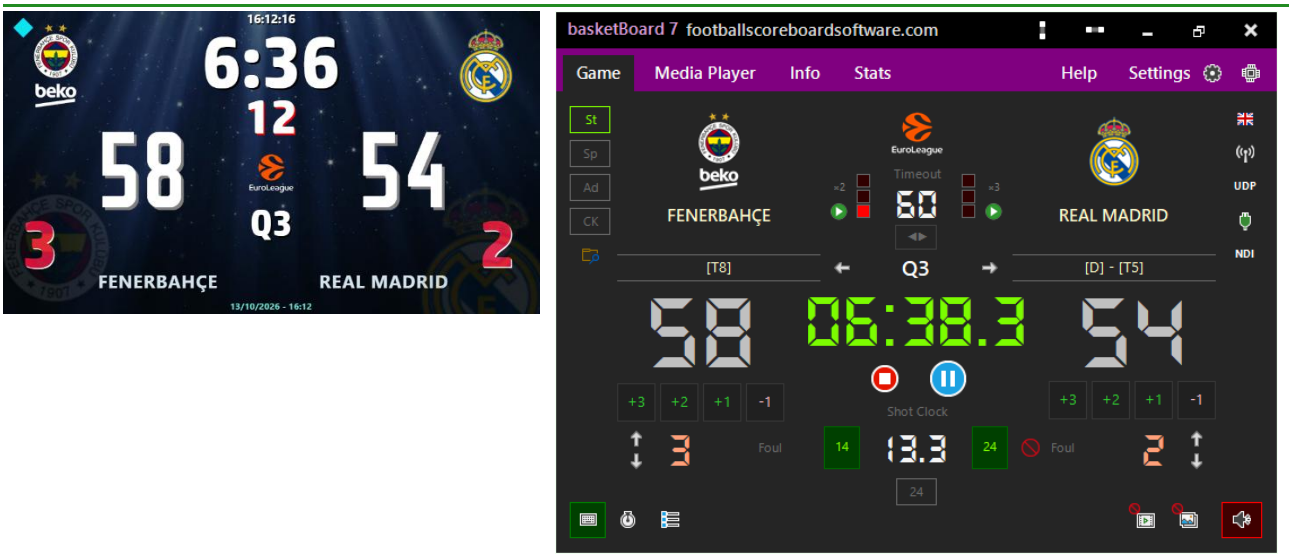


Figure 22. The Standard board in the third quarter and the control panel that drives it.

This chapter shows the panel with the FIBA preset, the factory setting. The other presets change the values (period length, shot clock, limits), not the way of working. They are described in chapter 4.

Where the controls are:

Place	Controls	Section
Left edge	display mode buttons St, Sp, Ad, CK and the design button	5.1
Top	logos, team names, free text lines	5.2
Top centre	time-out block with the possession arrow button under it	5.8, 5.10
Centre	period label with its arrows, game clock with its two round buttons	5.4, 5.5
Left and right of the clock	scores and score buttons	5.3
Below the clock	shot clock, and at its sides the team fouls	5.6, 5.7, 5.9
Bottom row and right edge	tool icons and the sound button	5.11, 5.12

> **Note:** The pictures were taken with the sound switched off: the loudspeaker button at the bottom right is red and the HORN button is missing. In a new installation the sound is on (chapter 5.11).

5.1 Display Mode and Design



Figure 23. The display mode buttons and the design button at the left edge of the Game page.

No.	Control	Name	What It Does
1	St	**St**	Selects the Standard mode: the full scoreboard on the board. The caption of the active mode is green. The match values go on unchanged, and the mode is stored in start.xml (BOARD/DisplayMode) for the next start.
2	Sp	**Sp**	Selects the Sponsored View: the scoreboard with a sponsor strip. The caption turns green, the menu strip gets the item Sp, and the mode is stored in start.xml (BOARD/DisplayMode).
3	Ad	**Ad**	Selects the Advertisement View: advertisements with the scoreboard values in banners. The caption turns green, the menu strip gets the item Ad, and the mode is stored in start.xml (BOARD/DisplayMode).
4	CK	**CK**	Selects the Chroma Key View: the scoreboard on a key colour for a video mixer. The caption turns green, the menu strip gets the item CK, and the mode is stored in start.xml (BOARD/DisplayMode).
5		**Select Design (folder icon)**	Opens the list of the board designs of the current display mode beside the button. Choose a design there to change the look of the board.

- The four buttons select what the board window shows: St (Standard), Sp (Sponsored), Ad (Advertisement) and CK (Chroma Key). The caption of the active mode is green. The display modes are described in chapter 9.
- Score, clocks, fouls, time-outs and period stay as they are when you change the mode.
- The folder icon under the four buttons opens the list of the board designs of the current mode (chapter 11).

5.2 Team Names, Logos and Free Text Lines

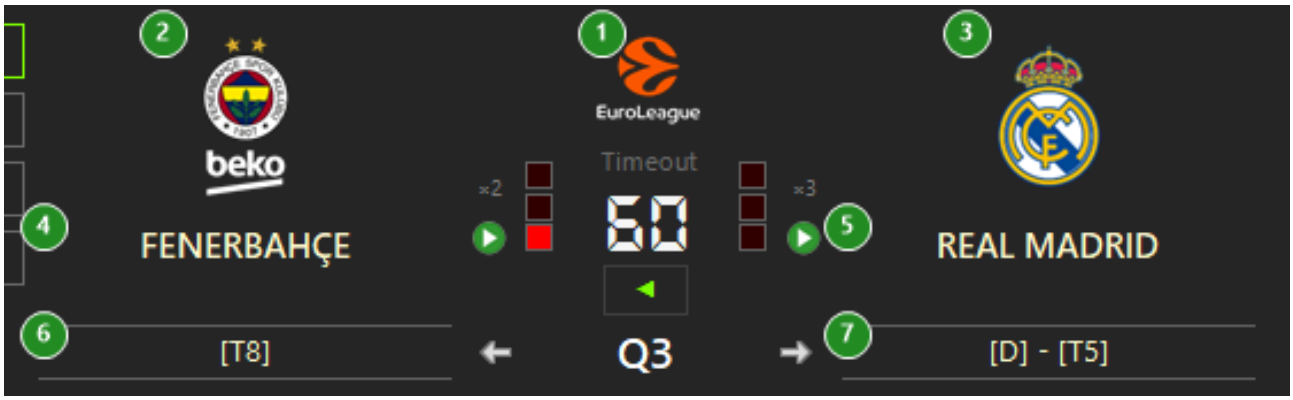
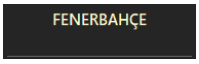


Figure 24. Logos, team names and free text lines.

No.	Control	Name	What It Does
1		**Board logo**	Opens the dialog Select Media File to choose the small logo in the middle of the board, for example the logo of the competition. The path of the file is stored in start.xml (BOARD/LogoBoard). With the mouse over the logo a small erase button appears beside it.
2		**Home logo**	Opens the dialog Select Media File in the folder media\downloads\images to choose the logo of the home team (bmp, gif, jpeg, jpg, png). The panel and the board show the new logo; the path of the file is stored in start.xml (BOARD/LogoHome). With the mouse over the logo a small erase button appears beside it. In the Demo version the licence message is shown instead.
3		**Guest logo**	Opens the dialog Select Media File in the folder media\downloads\images to choose the logo of the guest team (bmp, gif, jpeg, jpg, png). The panel and the board show the new logo; the path of the file is stored in start.xml (BOARD/LogoGuest). With the mouse over the logo a small erase button appears beside it.
4		**Home team name**	Holds the name of the home team; the board follows while you type. Press Enter for a second line; with more than two lines the box turns black as a warning. The name is written to start.xml (BOARD/NameHome) when the program is closed.
5		**Guest team name**	Holds the name of the guest team; the board follows while you type. Press Enter for a second line; with more than two lines the box turns black as a warning. The name is written to start.xml (BOARD/NameGuest) when the program is closed.
6		**Free text line 1 (under the home name)**	Holds a free text line for the board; in the factory Standard design it is shown at the top centre. The placeholders [D], [T] and their forms with a number such as [T5] or [T8] are replaced by the date and the time of the PC. One line only; the text is written to start.xml (BOARD/ExtraText01) when the program is closed.

No.	Control	Name	What It Does
7	[D] - [T5]	**Free text line 2 (under the guest name)**	Holds a free text line for the board; in the factory Standard design it is shown at the bottom centre. The placeholders [D], [T] and their forms with a number such as [D5] or [T5] are replaced by the date and the time of the PC. One line only; the text is written to start.xml (BOARD/ExtraText02) when the program is closed.

- Click a team name and type. The board follows while you type. Enter starts a second line.
- Click a logo to choose another picture. With the mouse over a logo a small erase button appears beside it.
- The box under each team name holds a free text line for the board. The placeholders [D] and [T] show the date and the time of the PC; [T5] gives hours and minutes.
- Teams, logos and rosters are described in chapter 7.

5.3 Score

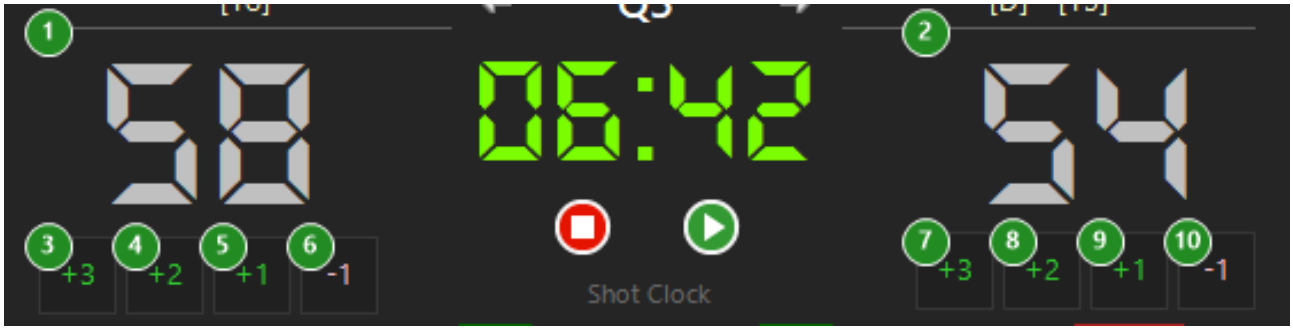


Figure 25. The scores and the score buttons of both teams.

No.	Control	Name	What It Does
1	58	**Home score**	Shows the score of the home team. Click it and type a number to set the score directly; the board follows at once. In the Demo version a score above 12 is set back to 12.
2	54	**Guest score**	Shows the score of the guest team. Click it and type a number to set the score directly; the board follows at once. In the Demo version a score above 12 is set back to 12.
3	+3	**+3**	Adds three points to the home score. In the Demo version the licence message is shown instead.
4	+2	**+2**	Adds two points to the home score. In the Demo version the licence message is shown instead.
5	+1	**+1**	Adds one point to the home score. In the Demo version the licence message is shown instead.
6	-1	**-1**	Takes one point off the home score; the score does not go below 0. In the Demo version the licence message is shown instead.

No.	Control	Name	What It Does
7		**+3**	Adds three points to the guest score.
8		**+2**	Adds two points to the guest score.
9		**+1**	Adds one point to the guest score.
10		**-1**	Takes one point off the guest score; the score does not go below 0.

- Click +3, +2 or +1 under the score of a team for a three-point basket, a two-point basket or a free throw.
- Click -1 to take one point back. The score does not go below 0.
- To correct a score, click the score, type the number and press Enter. The board follows at once.
- The keyboard shortcuts add one point for the home team (F9) and the guest team (F12) in a new installation (Appendix A).
- The points of single players are kept in the Player Stats window (chapter 7). They do not change the team score.

> **Note:** In the Demo version a score above 12 is set back to 12, and the home score buttons show the licence message (chapter 2).

5.4 Game Clock

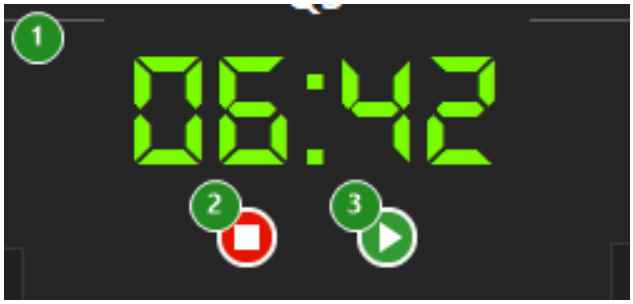


Figure 26. The game clock with the round Stop and Start buttons.

No.	Control	Name	What It Does
1		**Game clock**	Shows the remaining time of the period: the full period length before the start, minutes, seconds and tenths while it runs. While the clock stands you can click it, type a time as mm:ss or mm:ss.t and press Enter; a time that is not valid or longer than the period is not accepted, the time from before comes back and a short message explains the format.
2		**Stop / Reset (round button, left)**	Stops the game clock and the shot clock while they run. Pressed while the clock stands, also after a pause, it sets the game clock back to the full length of the current period without a question. The button is grey during a time-out countdown.

No.	Control	Name	What It Does
3		**Start / Pause (round button, right)**	Starts the game clock and with it the shot clock, unless the shot clock is off or expired; the button shows the pause symbol while the clock runs. A second click pauses both clocks and the next click goes on from the same time. Nothing happens at 00:00, and the button is grey during a time-out countdown.

The game clock counts down from the length of the period to 00:00. The two round buttons under it control it.

Button	While the clock runs	While the clock stands
Start (right)	Pauses the game clock and the shot clock.	Starts the clock, or goes on from the time shown. While the clock runs the button shows the pause symbol.
Stop (left)	Stops the game clock and the shot clock at the time shown.	Sets the game clock back to the full length of the current period, for example 10:00.

> **Note:** Stop pressed while the clock stands sets the clock back to the full period length without a question, also after a pause. To hold the clock during play use Start (pause). If the time was reset by mistake, type it in again.

To run a period:

1. Check the period label and the time.
2. Click Start, or press the start key (Escape in a new installation). The shot clock starts together with the game clock.
3. At every stoppage click Start again: both clocks pause.
4. Click Start to go on.

While the game clock runs, the time-out buttons, the time-out length box and the period arrows are hidden, and the time cannot be edited.

5.4.1 What the Clock Shows

Place	Display
Control panel	The full period length before the start. While the clock runs: minutes, seconds and tenths, for example 06:38.3.
Board	Minutes and seconds without a leading zero, for example 6:42. While less than 60 seconds remain: seconds and tenths, from 59.9 down to 0.0.

Board Output **Control Panel**

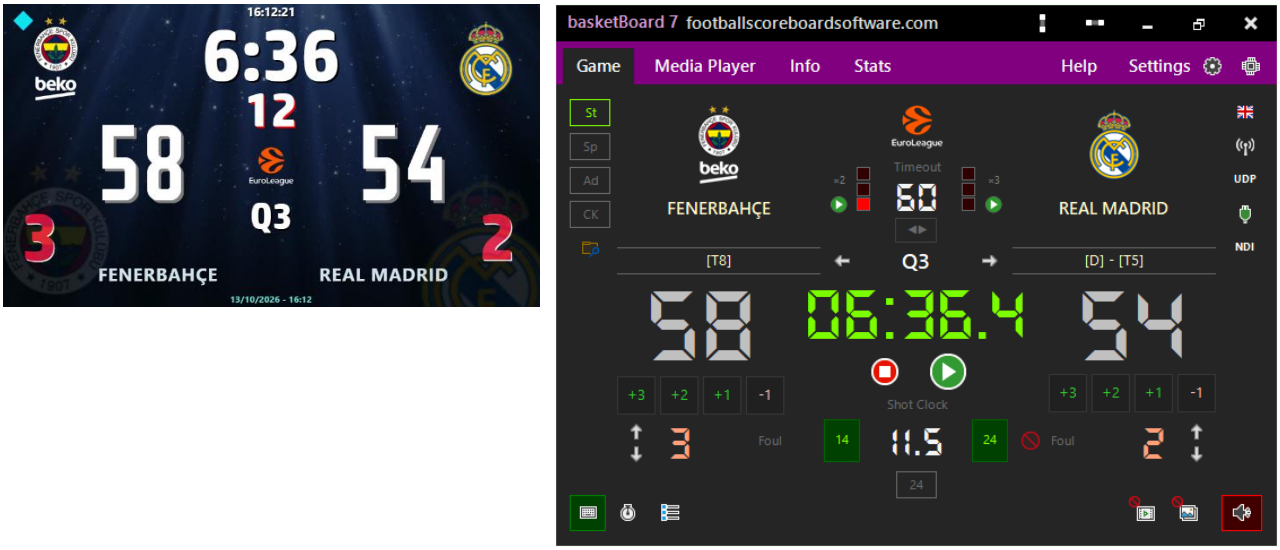


Figure 27. Clock paused: the Start button shows the play symbol, the time and the shot clock stand.

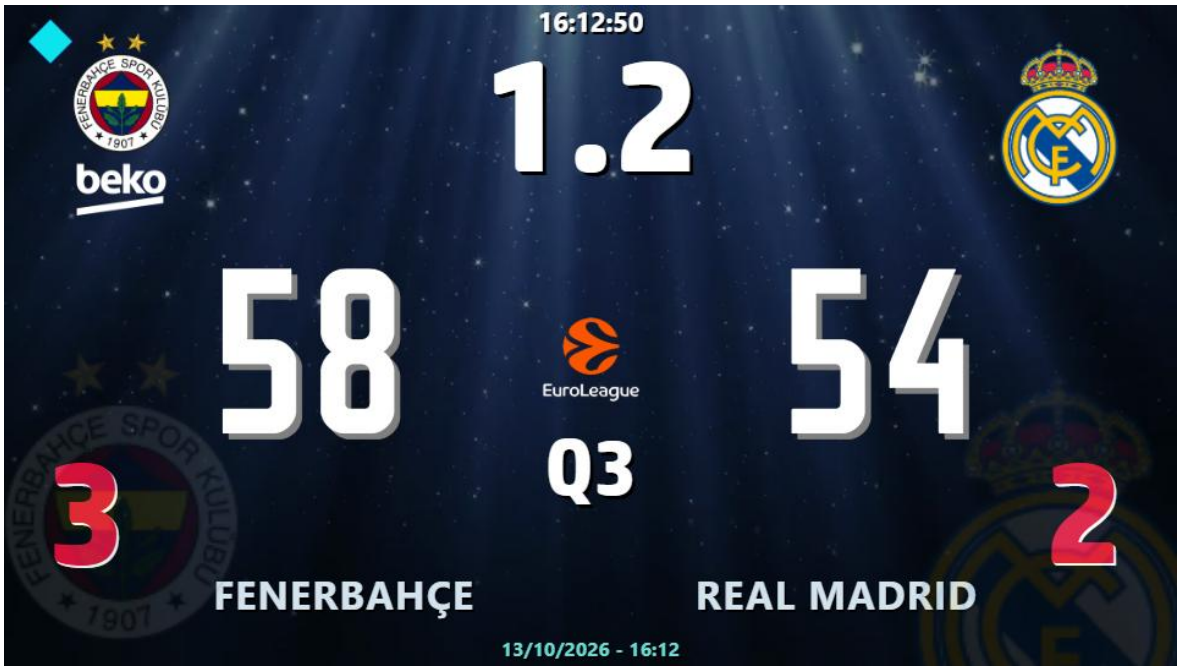


Figure 28. The last minute on the board: the game clock shows seconds and tenths.

5.4.2 Typing a Time

1. Pause or stop the clock.
2. Click the time.
3. Type the time as minutes, a colon and two digits for the seconds, for example 07:45 or 00:20. 5:00 is shown as 05:00. Tenths can follow after a point: 00:04.5.
4. Press Enter, or click another place of the panel. An accepted time turns green.
5. Click Start.

A text that is not a time (for example 99:99), or a time longer than the period, is not accepted. The box turns red for a second, the time from before comes back, and a "Warning" message explains the format: "Not accepted: 99:99. Type the game clock as minutes:seconds, at most the length of the period (10:00). The clock keeps its time." Click OK.

The shot clock box and the time-out length box check their values in the same way:

Box	Accepted	Message when not accepted
Shot clock	seconds, with a tenth if you like (8 or 8.5), from 0 to the full shot clock value	"Not accepted: ... Type the shot clock in seconds, from 0 to 24. The shot clock keeps its value."
Time-out length	whole seconds from 1 to 300	"Not accepted: ... Type the time-out length in whole seconds, from 1 to 300. The time-out length keeps its value."

5.4.3 The End of a Period

When the game clock reaches 00:00:

- the clock stops by itself and shows 00:00; the board shows 0.0;
- the period-end horn sounds once (with the sound on);
- the shot clock is switched off and blank, without a shot clock horn;
- Start does nothing at 00:00;
- the period label does not change. Select the next period yourself (chapter 5.5).

Board Output **Control Panel**

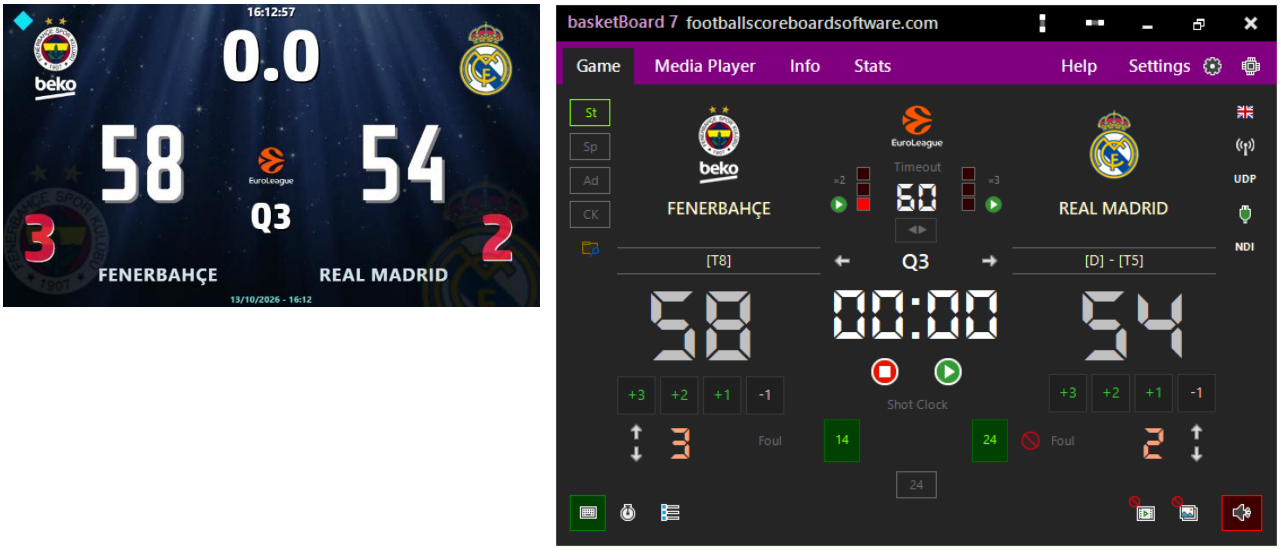


Figure 29. End of the period: the panel shows 00:00, the board 0.0, the shot clock is blank.

5.5 Periods and Overtime



Figure 30. The period label with its two arrows above the game clock, here in the second overtime.

No.	Control	Name	What It Does
1		**Previous period (left arrow)**	Selects the period before the current one, not below the first period; the game clock is set to the full length of that period and the shot clock to its full value. Going straight back after an accidental change, before the clock has run, brings back the team fouls and time-outs of that period. Hidden while the game clock runs and during a time-out countdown.
2		**Period label**	Shows the label of the current period: Q1 to Q4 (NCAA M: 1H, 2H), then OT1, OT2 and so on. The board shows this text in the period field unless a time-out countdown runs; a typed text stays until the next period change.
3		**Next period (right arrow)**	Selects the next period (Q1 to Q4 or 1H and 2H, then OT1, OT2 ...); the game clock is set to the full length of the new period and the shot clock to its full value. The team fouls and the used time-outs are reset or kept as the rules preset says. Hidden while the game clock runs and during a time-out countdown.

The arrows left and right of the period label select the previous and the next period. The period can be changed only while the game clock is stopped and no time-out runs: the arrows are hidden otherwise.

A period change does this:

- The label changes: Q1, Q2, Q3, Q4 (NCAA M: 1H, 2H), then OT1, OT2 and so on. The left arrow stops at the first period.
- The game clock is set to the full length of the new period, for example 10:00 for a FIBA quarter and 05:00 for an overtime.
- The shot clock is set to its full value (24, NCAA 30).
- The team fouls of both teams are set to 0 at the start of each regulation period. In overtime they go on or start at 0, as the preset says (chapter 4.2.3).
- The used time-outs are cleared when a new part of the game starts: the second half under FIBA and FIBA 4x8, and each overtime under every preset (chapter 4.2.5).
- The time-out length box shows the first time-out length again.

You can click the label and type another text. It stays on the board until the next period change. The labels and lengths are set in the rules dialog (chapter 6).

Board Output **Control Panel**

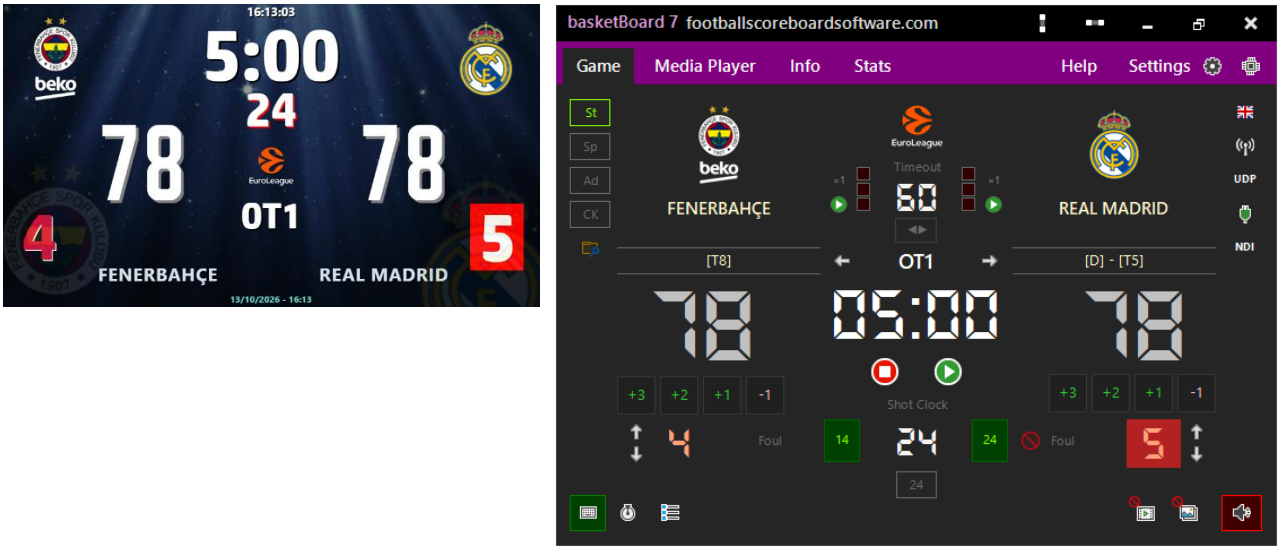


Figure 31. First overtime under FIBA: label OT1, five minutes, one time-out for each team; the team fouls of the fourth quarter go on.

5.5.1 Undo of an Accidental Period Change

If you change the period by mistake and go straight back, before the game clock has run, the team fouls and the time-out counts of the period you left come back. Example: in Q2 with 3 and 2 team fouls you click the right arrow (Q3, fouls 0 and 0); click the left arrow and Q2 shows 3 and 2 again.

- The undo covers one step only, and only until the game clock is started.
- The game clock is not part of the undo: it shows the full period length. Type the remaining time again.

5.5.2 When the Period Cannot Be Changed

A period change asked for while the game clock or a time-out runs is refused. On the control panel a "Warning" message says "The period cannot be changed while the game clock is running. Stop the clock first." During a time-out it says "The period cannot be changed while a time-out is running. Wait for the time-out to end or stop it first." A change from the remote page or the API is refused without a message (chapters 13 and 14).

5.6 Shot Clock

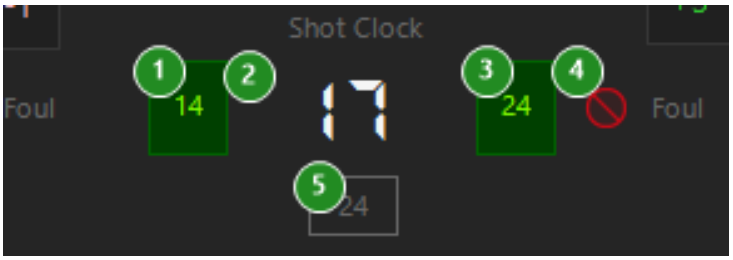


Figure 32. The shot clock row: short reset, value box, full reset and Clear; under it the 24 button of the external shot clock window.

No.	Control	Name	What It Does
1		**Short shot clock reset (14 / 20)**	Sets the shot clock to the short value of the rules (14, NCAA 20) and removes the expired state; if the game clock runs, the shot clock starts again at once. If less time is left on the game clock than the value, the shot clock is switched off (blank) instead.
2		**Shot clock value**	Shows the remaining seconds of the shot clock with tenths; blank means the shot clock is off, 00.0 means it has expired. While the clock stands you can click the box, type the seconds (8 or 8.5, at most the full shot clock value) and press Enter or click another control: the value is set and an expired state is removed. Another value brings back the value from before with a short message. An emptied box switches the shot clock off.
3		**Full shot clock reset (24 / 30)**	Sets the shot clock to the full value of the rules (24, NCAA 30) and removes the expired state; if the game clock runs, the shot clock starts again at once. If less time is left on the game clock than the value, the shot clock is switched off (blank) instead.
4		**Clear (red icon)**	Switches the shot clock off: the value box and the shot clock on the board are blank. No horn sounds and no expired state is shown. Press 24 or 14 or type a value to switch it on again.
5		**24 (under the shot clock)**	Opens the external shot clock window at the place and in the size stored in start.xml (section SC24); the caption of the button turns aqua. A second click closes the window.

The shot clock runs together with the game clock: it starts when the game clock starts and pauses when the game clock pauses.

- The button right of the value (24, NCAA 30) sets the full value for a new possession. If the game clock runs, the shot clock starts again at once.
- The button left of the value (14, NCAA 20) sets the short value, for example after an offensive rebound.
- The value box shows the remaining seconds with tenths while it runs, for example 13.3. To set another value, stop the clock, click the box, type the seconds and press Enter (chapter 5.4.2).
- Clear (the red icon right of the full reset) switches the shot clock off: the box and the shot clock on the board are blank. No horn sounds.
- The small 24 button under the value box opens the external shot clock window (chapter 8).

The board shows whole seconds above 5 seconds and seconds with tenths from 5 seconds down, for example 4.2.

5.6.1 When the Shot Clock Reaches Zero

- The shot clock horn sounds once (with the sound on). It is a different sound from the period-end horn.
- The board shows 0.0 in red until the next reset.
- The game clock keeps running.
- The expired state ends with a reset, with Clear, with a typed value or with a period change. Pausing and starting the game clock does not start an expired shot clock again.
- If the shot clock and the game clock reach zero at the same moment, only the period-end horn sounds.

Board Output **Control Panel**

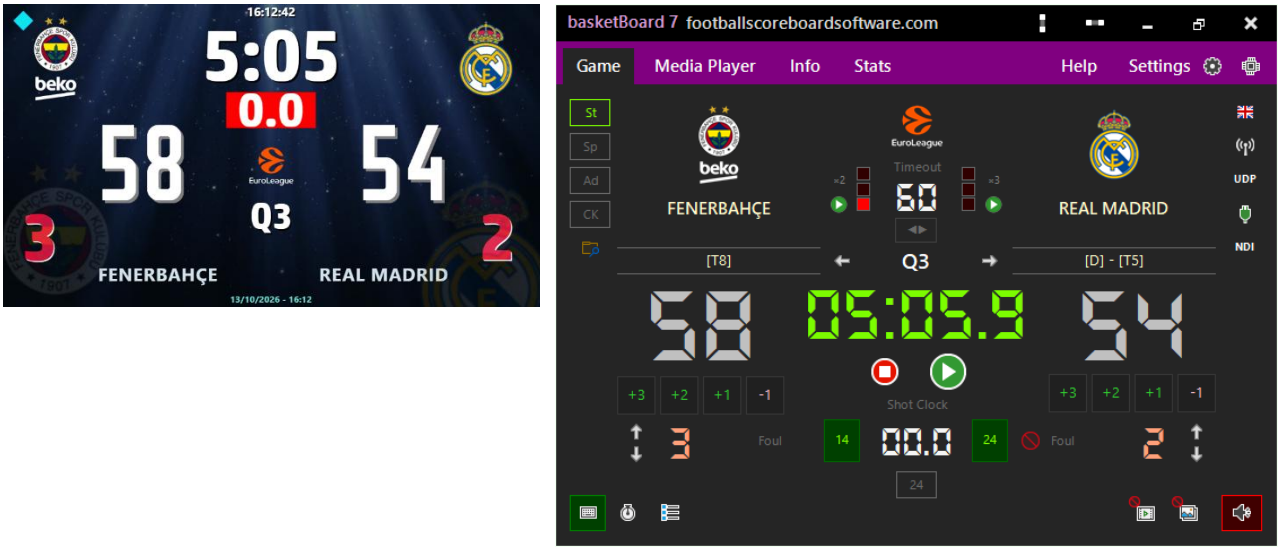


Figure 33. Shot clock expired: 0.0 in red on the board, the game clock keeps running.

5.6.2 Blank When the Game Clock Is Lower

The shot clock is switched off when less time is left in the period than on the shot clock:

- When you press a reset button and the game clock shows less than that value, the shot clock stays blank. With 20 seconds left under FIBA, 24 gives a blank shot clock and 14 gives 14.
- While both clocks run, the shot clock goes blank at the moment the game clock falls below it. No horn sounds.
- If you start the game clock with a blank shot clock, only the game clock runs.

Board Output **Control Panel**

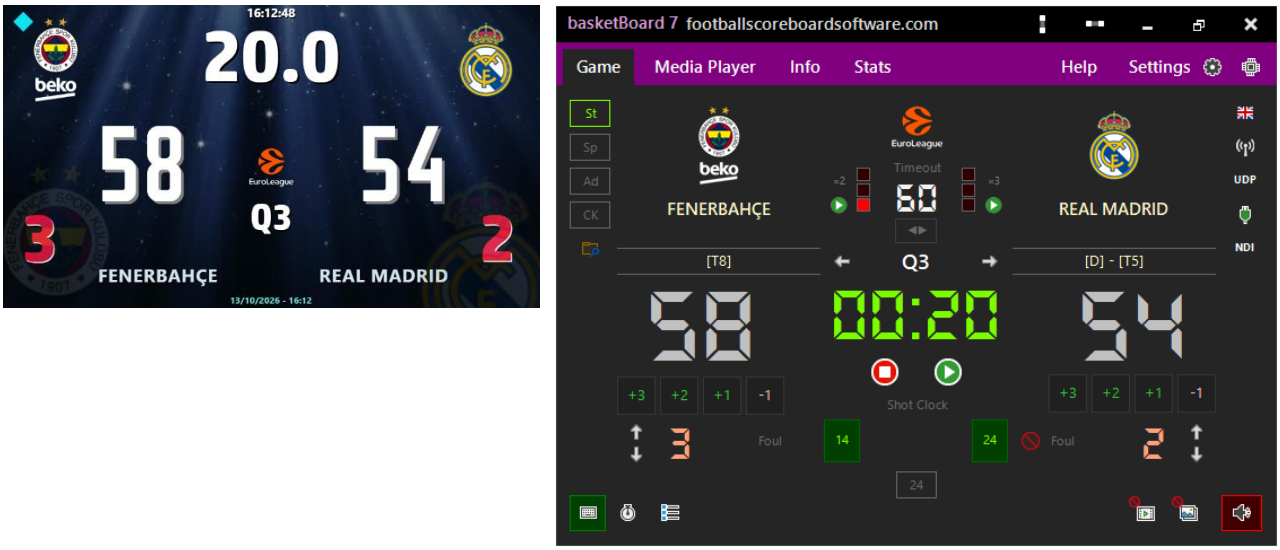


Figure 34. Twenty seconds left in the period: the shot clock is blank on the panel and on the board.

5.7 Team Fouls and the Bonus



Figure 35. The team fouls: arrows and foul box of each team. The home team has five fouls and is in the bonus.

No.	Control	Name	What It Does
1	↑	**Home foul up (upper arrow)**	Adds one team foul for the home team. In the Demo version the licence message is shown instead.
2	5	**Home team fouls**	Shows the team fouls of the home team in the current period; you can also type the number. From the bonus limit of the rules (FIBA, NBA, NCAA W 5, NCAA M 7) the box turns red and the foul field on the board turns red; from the double-bonus foul (NCAA M 10) the box turns a brighter red.
3	2	**Guest team fouls**	Shows the team fouls of the guest team in the current period; you can also type the number. From the bonus limit of the rules (FIBA, NBA, NCAA W 5, NCAA M 7) the box turns red and the foul field on the board turns red; from the double-bonus foul (NCAA M 10) the box turns a brighter red.
4	↑	**Guest foul up (upper arrow)**	Adds one team foul for the guest team.
5	↓	**Home foul down (lower arrow)**	Takes one team foul of the home team back; the count does not go below 0. In the Demo version the licence message is shown instead.
6	↓	**Guest foul down (lower arrow)**	Takes one team foul of the guest team back; the count does not go below 0.

- Click the upper arrow beside a foul box to add a team foul, the lower arrow to take one back. The count does not go below 0.
- You can also click the box and type the number.
- When the team reaches the bonus, the foul box on the panel turns red and the foul field on the board turns red with a white number. FIBA, FIBA 4x8, NBA and NCAA W: from the 5th team foul; NCAA M: from the 7th.
- NCAA M: from the 10th team foul of a half the foul box turns a brighter red (double bonus). The board keeps the same red.
- NBA: in overtime the bonus starts with the 4th team foul. In the last two minutes of a period the bonus also starts with the second team foul committed inside those two minutes.
- The team fouls are reset at each new period and go on (or start at 0) in overtime as the preset says (chapter 4.2.3).
- The fouls of single players are entered in the Player Stats window and do not change the team fouls (chapter 5.9).

Board Output **Control Panel**

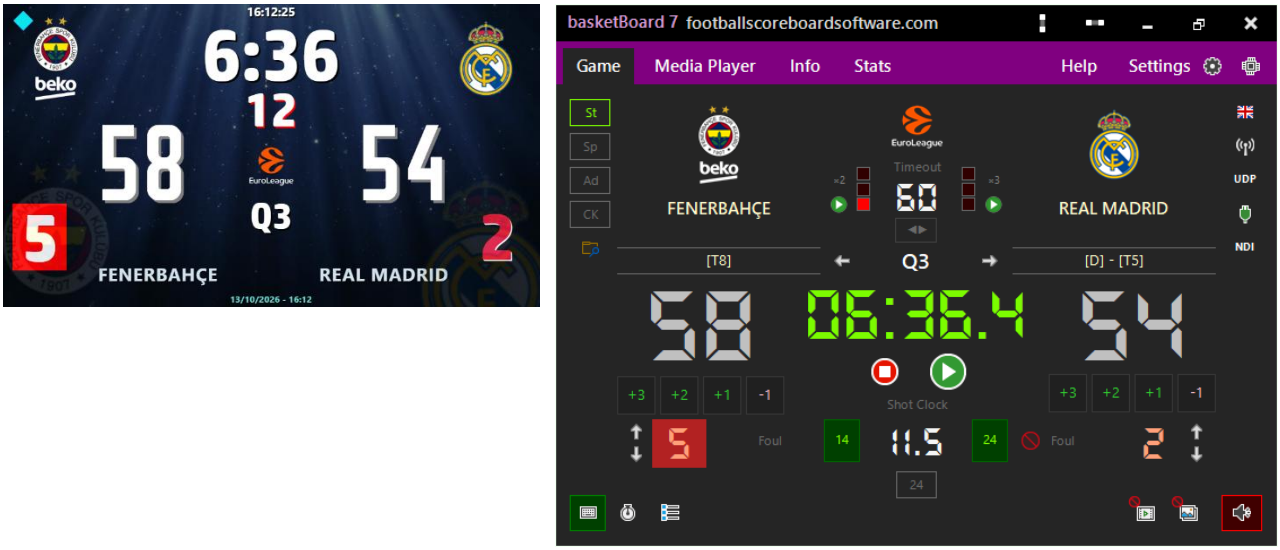


Figure 36. Bonus: the fifth team foul of the home team. The foul box is red on the panel and on the board.

5.8 Time-Outs

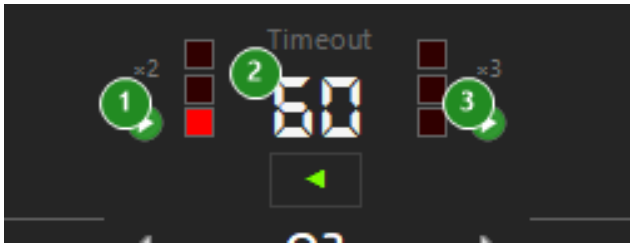


Figure 37. The time-out block: the start button of each team, the time-outs-used indicators and the time-out length box.

No.	Control	Name	What It Does
1		**Start time-out, home (round button)**	Starts a time-out of the home team: the used time-out is counted at once, the box counts down and the Start and Stop buttons of the game clock are grey. During the countdown the button shows a stop symbol; a click on it cancels the time-out and gives it back to the team. If the team has no time-out left, the program asks whether to start one anyway. Hidden while the game clock runs.
2		**Time-out length / countdown**	Shows the length of a time-out in seconds (60). During a time-out it counts down in red, and the board shows the countdown in place of the period label. Type another number (whole seconds, 1 to 300) before you start a time-out to use a different length once; another value brings back the length from before with a short message. Hidden while the game clock runs.
3		**Start time-out, guest (round button)**	Starts a time-out of the guest team: the used time-out is counted at once, the box counts down and the Start and Stop buttons of the game clock are grey. During the countdown the button shows a stop symbol; a click on it cancels the time-out and gives it back to the team. If the team has no time-out left, the program asks whether to start one anyway. Hidden while the game clock runs.

Each team has a round start button, three indicators for the time-outs it has used, and a label such as ×2 above the button for the time-outs it has left in the current part of the game. The box in the middle shows the length of a time-out in seconds.

5.8.1 Taking a Time-Out

1. Stop or pause the game clock. The time-out buttons are hidden while it runs.
2. Click the start button of the team: left for the home team, right for the guest team.
3. The box counts down in red. The button of the team shows a stop symbol and the button of the other team is hidden. Start and Stop of the game clock are grey and the period arrows are hidden.
4. The time-out is counted at once: one more indicator is red and flashes, and the label of time-outs left goes down by one.
5. The board shows the countdown in place of the period label, and a symbol for the used time-out.
6. At 0 a signal sounds (with the sound on), the buttons come back and the box shows the time-out length again. The time-out stays counted.

To use another length once, type the seconds into the box before you click the start button.

Board Output **Control Panel**

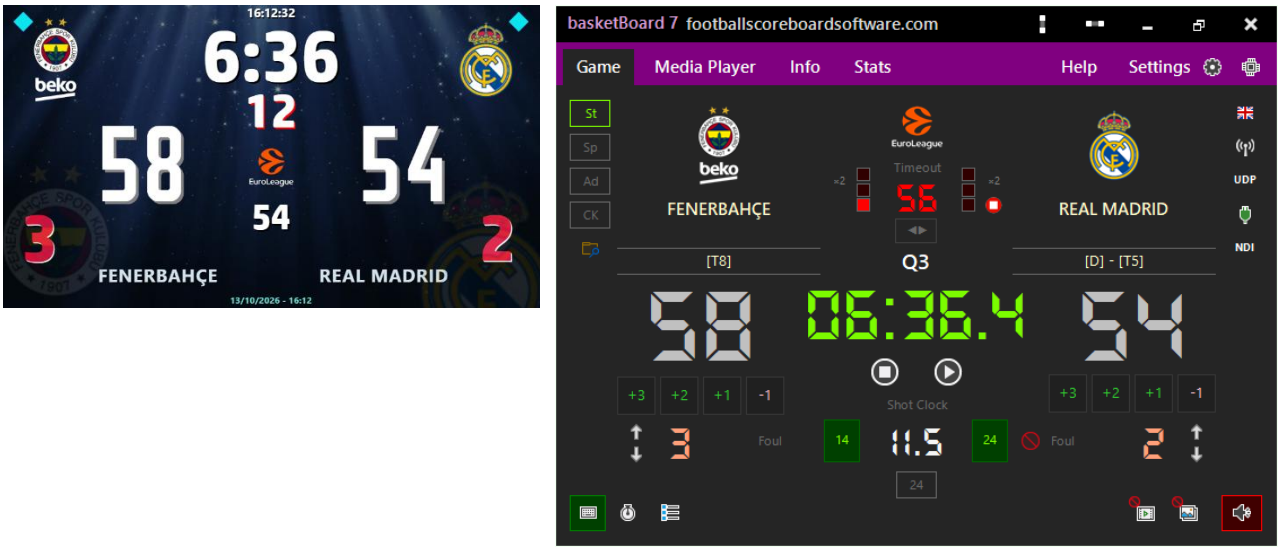


Figure 38. Time-out of the guest team: the box counts down, the board shows the countdown in place of the period label.

5.8.2 Stopping a Time-Out Early

Click the stop symbol during the countdown. The countdown ends and the time-out is given back to the team: the indicator goes dark and the label of time-outs left goes up again.

> **Note:** To end a time-out early and keep it counted, stop it and then set the count on the indicators (chapter 5.8.3).

5.8.3 Indicators and Time-Outs Left

- The three small squares of a team show its used time-outs from the bottom up. Red means used.
- A click on an indicator corrects the count: the lowest one sets 1, or 0 when it is 1; the middle one sets 2; the top one sets 3. The board and the label of time-outs left follow. The indicators do not react while the game clock runs.
- The label above each start button (×2, ×3) shows how many time-outs the team has left. It is grey, and black at ×0. The limits of the preset are part of the number (chapter 4.2.5).

Preset	Time-outs left at the start	After half time	Each overtime
FIBA, FIBA 4x8	×2	×3	×1
NBA	×7	goes on	×2
NCAA M	×6	goes on	×1 plus the unused ones
NCAA W	×5	goes on	×1 plus the unused ones

5.8.4 No Time-Out Left

When the team shows ×0 and you click its start button, the program asks before it starts one.

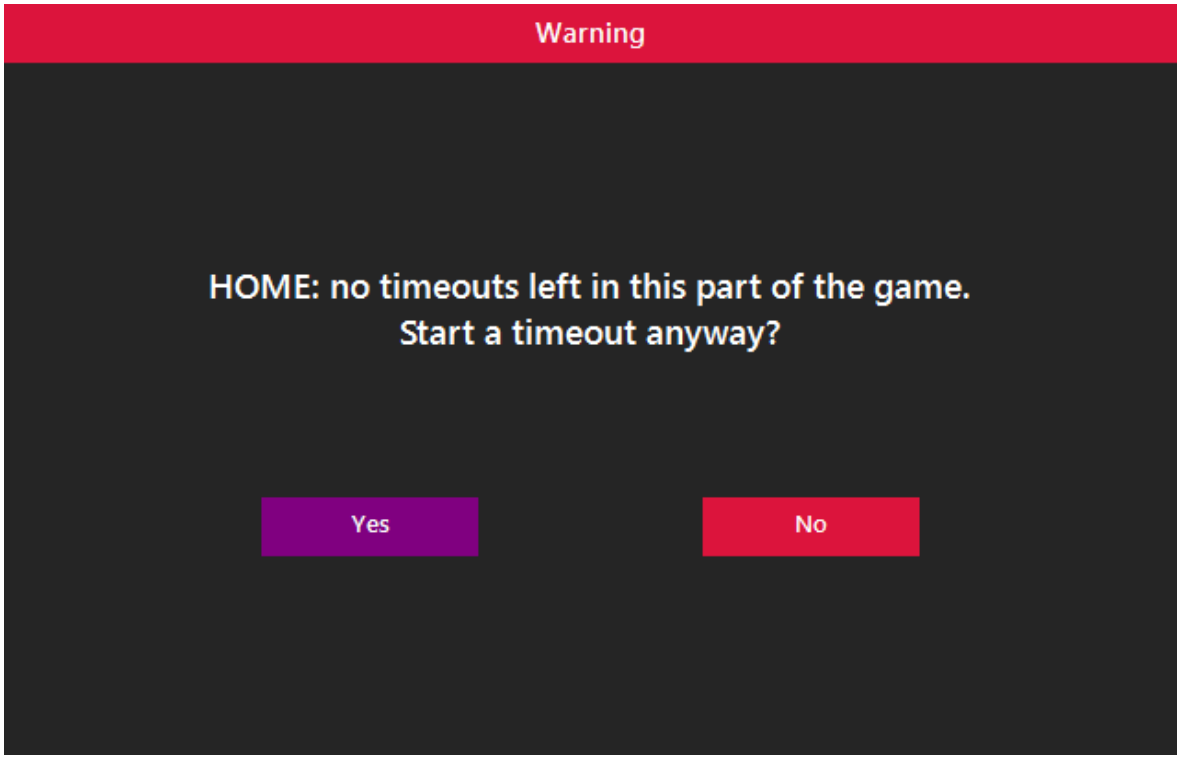


Figure 39. The question when the team has no time-out left in this part of the game.

- "Yes" starts the time-out and counts it.
- "No" closes the question; nothing is counted.
- From the remote page or the API a time-out without allowance is not started and no question appears.

5.8.5 Two Time-Out Lengths

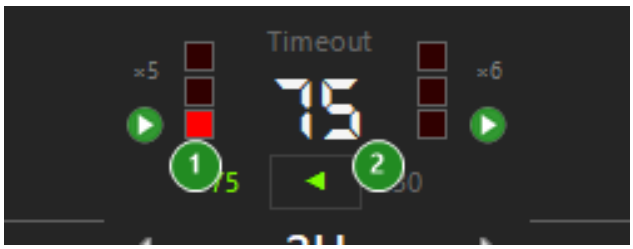


Figure 40. NCAA M: two time-out lengths, 75 and 30 seconds, left and right of the possession arrow button.

No.	Control	Name	What It Does
1	75	**Time-out length 1**	Selects the first time-out length and writes it into the time-out box; the caption of the selected length is green. Shown only when the rules dialog holds two time-out lengths (NCAA M 75 and 30, NCAA W 60 and 30).
2	30	**Time-out length 2**	Selects the second time-out length and writes it into the time-out box; the caption of the selected length is green. Shown only when the rules dialog holds two time-out lengths (NCAA M 75 and 30, NCAA W 60 and 30).

When the rules dialog holds two time-out lengths (NCAA M 75 and 30, NCAA W 60 and 30), two small buttons with these numbers appear under the box. Click one before you start the time-out: the selected length is green and is written into the box. With one length (FIBA, NBA) the buttons are hidden.

5.9 Player Fouls and Foul-Out

The personal fouls and the points of each player are entered in the Player Stats window. Open it with the list icon at the bottom left of the Game page (chapter 7).

- When a player reaches the foul-out limit of the preset, the row of the player is marked: 5 fouls under FIBA, FIBA 4x8, NCAA M and NCAA W, 6 fouls under NBA.
- The Foul info screen then shows "Fouled Out" with the player (chapter 10).
- The program does not stop you from adding more fouls.

5.10 Possession Arrow

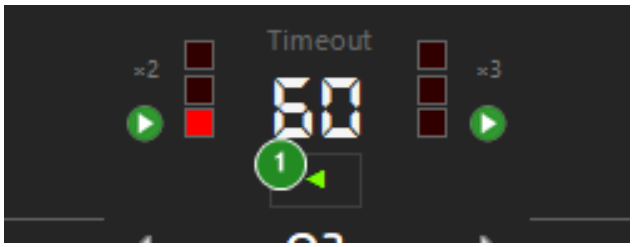


Figure 41. The possession arrow button under the time-out box, here set to the home team.

No.	Control	Name	What It Does
1	◀	**Possession arrow**	Sets the alternating-possession arrow: a click switches it from off to the home team (◀), then between guest (▶) and home. A right-click switches it off (◀ ▶ in grey); the board shows the arrow where the board design places it.

- A left click switches the arrow. From off the first click sets it to the home team (◀, green); each further click changes the side (▶ for the guest team, then ◀ again).
- A right click switches the arrow off. The button shows ◀ ▶ in grey.
- The board shows the arrow beside the team fouls of the team when the board design places it, as the factory Standard designs do.

Board Output **Control Panel**

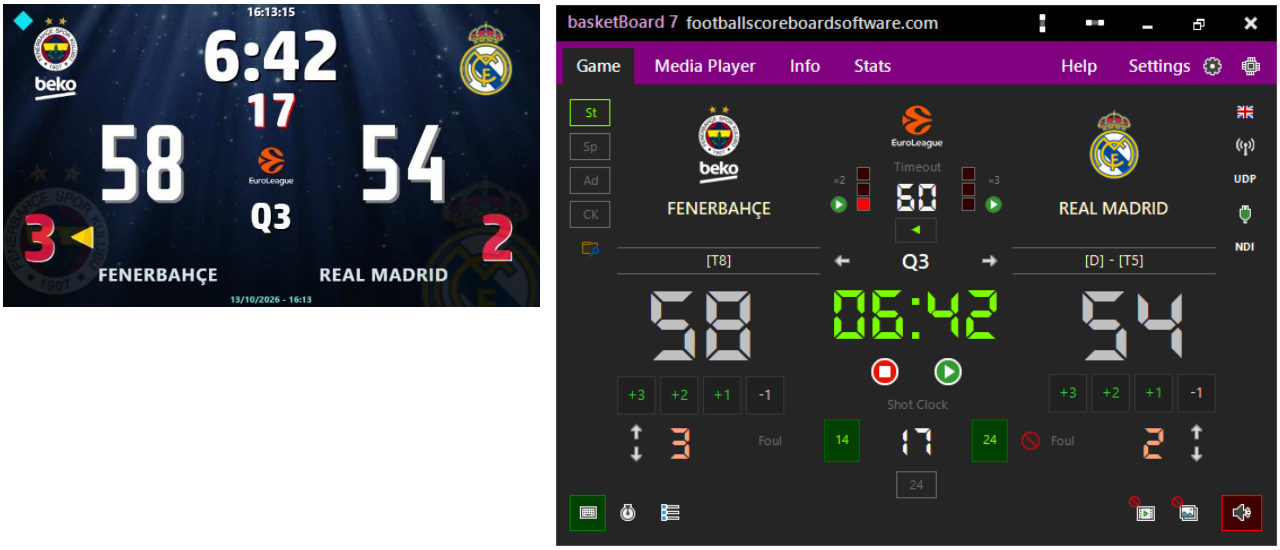


Figure 42. Possession arrow set to the home team.

Board Output **Control Panel**

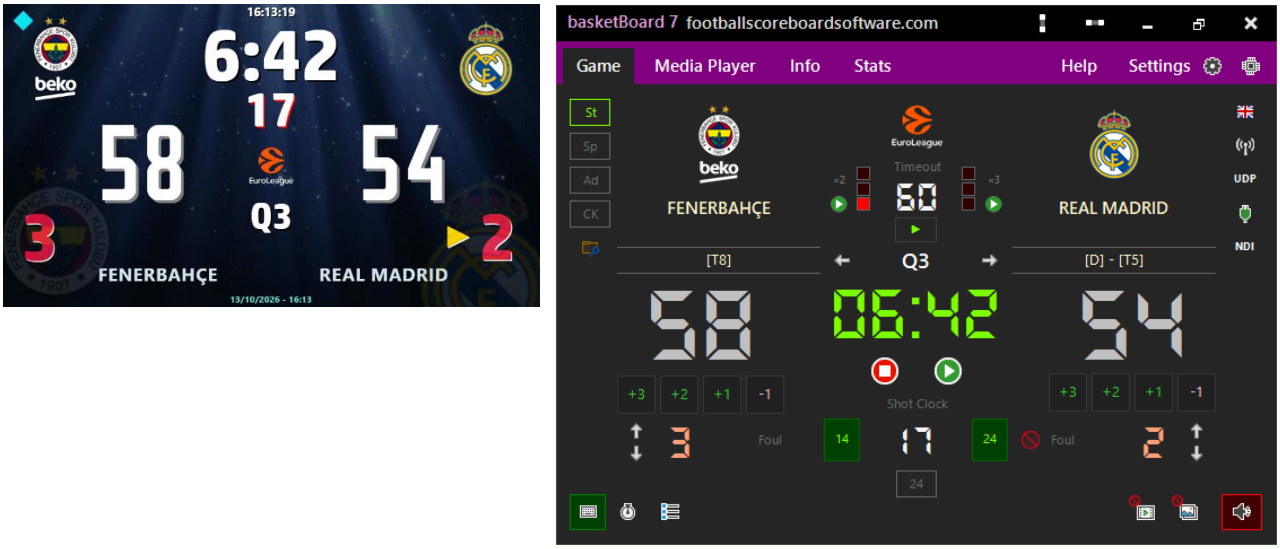


Figure 43. Possession arrow set to the guest team.

5.11 Sound and Horn



Figure 44. The sound button at the bottom right of the Game page (here: sound off).

No.	Control	Name	What It Does
1		**Sound on / off (loudspeaker)**	Switches the sounds of the program on or off: start and stop of the game clock, period-end horn, shot clock horn and the end of a time-out. Green means on, red means off; with the sound on the HORN button is shown. The setting is stored in start.xml (BOARD/Sound).

- The loudspeaker button switches the sounds of the program on and off. Green means on, red means off. In a new installation the sound is on.
- With the sound on, the HORN button is shown under the small 24 button. Click HORN to sound the period-end horn by hand.

Sound	When it is played
01.wav	the game clock is started
02.wav	the game clock reaches 00:00 (period-end horn); the HORN button
03.wav	a time-out countdown reaches 0
04.wav	the shot clock reaches zero (shot clock horn)
05.wav	the game clock is paused or stopped

The files are in the folder common\sounds of the program (Appendix D).

5.12 Tool Icons

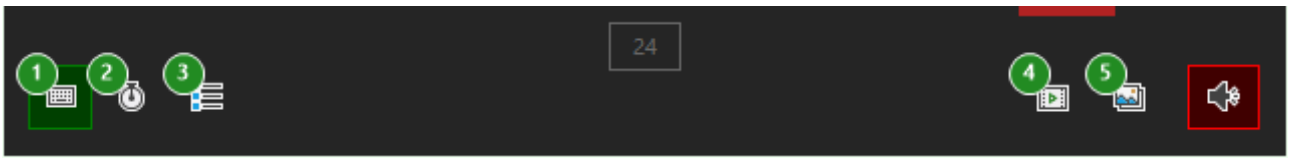


Figure 45. The tool icons of the bottom row.

No.	Control	Name	What It Does
1		**Keyboard Active (keyboard icon)**	Opens the Keyboard Hook Manager dialog, where the keys of the six keyboard shortcuts are assigned and the shortcuts are switched on or off. The button is green while the shortcuts are on and red while they are off.
2		**Timing Settings (stopwatch icon)**	Opens the Period & Penalty Settings dialog: rules preset, period lengths and labels, team-foul limit, shot clock values and time-out lengths.
3		**Player Stats (list icon)**	Opens the Player Data window with the fouls and points of the players of both teams. A player who reaches the foul-out limit of the rules is marked there.

No.	Control	Name	What It Does
4		**Background video (film icon)**	Opens the dialog Select Media File in the folder media\videos to choose the background video of the board (mp4, webm, ogg). The path is stored in start.xml (BOARD/BackVideoFile) and the board is redrawn with the video running in a loop, without sound, behind the scoreboard.
5		**Middle layer image (picture icon)**	Opens the dialog Select Media File to choose an image (bmp, gif, jpeg, jpg, png) that is laid over the background of the board. The path is stored in start.xml (BOARD/MiddleImageFile) and the board is redrawn.



Figure 46. The tool icons at the right edge.

No.	Control	Name	What It Does
1		**Language Settings (flag)**	Opens the Language page of the settings. The flag shows the language in use.
2		**Remote Control (antenna icon)**	Opens the Remote Control page of the settings, where the remote control from a phone or tablet is set up.
3		**UDP**	Starts or stops the UDP broadcast of the match state on port 2908; the button is green while it runs. The state is stored in start.xml (UDP/Open) and the broadcast starts by itself at the next start; if it cannot be started, a message names the error.
4		**Scoreboard Console (plug icon)**	Starts the data server on TCP port 2907 after a confirmation, so that an external scoreboard console can send score, clocks and fouls; the icon is green while it runs. While it runs, the manual controls for score, fouls, clocks, period and time-outs are hidden; a second click stops the server and shows them again.
5		**NDI**	Starts the NDI output of the board under the sender name stored in start.xml (NDI/SenderName); the button blinks red while the stream runs. A second click stops the stream; if NDI cannot be started, a message gives the reason.

Icon	Opens or switches	Chapter
Keyboard	the keyboard shortcuts dialog; green while the shortcuts are on	Appendix A
Stopwatch	the rules dialog "Period & Penalty Settings"	6
List	the Player Stats window	7
Film and picture	the background video and the middle layer image of the board; the small red marks remove them	9
Flag	the Language page of the settings	15
Antenna	the Remote Control page of the settings	13, 15
UDP	the UDP broadcast of the match state on port 2908; green while it runs	14
Plug (Scoreboard Console)	the data server on TCP port 2907 for an external scoreboard console; green while it runs	14
NDI	the NDI output of the board	9, 12

> **Note:** While the Scoreboard Console connection runs, the score buttons, the foul arrows, the clock buttons, the shot clock buttons, the period arrows and the time-out buttons are hidden: the values come from the console.

The keyboard shortcuts (start and pause, full and short shot clock reset, shot clock clear, +1 for each team) are listed in Appendix A.

5.13 End of a Match

basketBoard 7 has no final or lock state. When the last period ends, the clock stands at 00:00 and every control keeps working: the score can still be corrected with the buttons or by typing.

To prepare the next match:

1. Type 0 in both scores and both foul boxes.
2. Click the left period arrow until the first period is selected.
3. Click the lowest time-out indicator of each team until all three are dark (the first click sets 1, the next one 0), and check the labels of time-outs left.
4. Right-click the possession arrow button to switch the arrow off.
5. Reset the player data in the Player Stats window (chapter 7).

5.14 Restart During a Match

The program saves the match state to matchstate.xml in the program folder at every change and every 2 seconds: score, team fouls, used time-outs, period, game clock, shot clock and possession.

When the program starts after a crash, a power cut or a normal close during a match, it asks "Restore last match?" with the score, the period, the clock and the time of the save, for example "61 - 57 Q3 04:16.9".

- "Yes" restores the match. The game clock is restored stopped at the saved time; click Start to go on.
- "No" starts with 0-0 in the first period. The saved state is replaced at the next save.

The question is not asked when the saved state is empty (0-0 in the first period at the full period length).

6. Time and Rules Settings

The rules dialog "Period & Penalty Settings" holds the period lengths and labels, the team-foul limit, the shot clock values and the time-out lengths, and it selects the rules preset. This chapter describes the dialog field by field, the rule values that have no field, and what happens when the rules are changed during a match. The presets themselves are described in chapter 4; all their values are listed in Appendix B.

6.1 Opening the Dialog

- On the Game page click the stopwatch icon at the bottom left (Timing Settings).
- Or open Settings > Screen Properties, click the row "Periods & Penalty Settings", then the small clock button at the right of the row (chapter 15).

The dialog opens with the stored values. The green button in the top row is the stored preset.

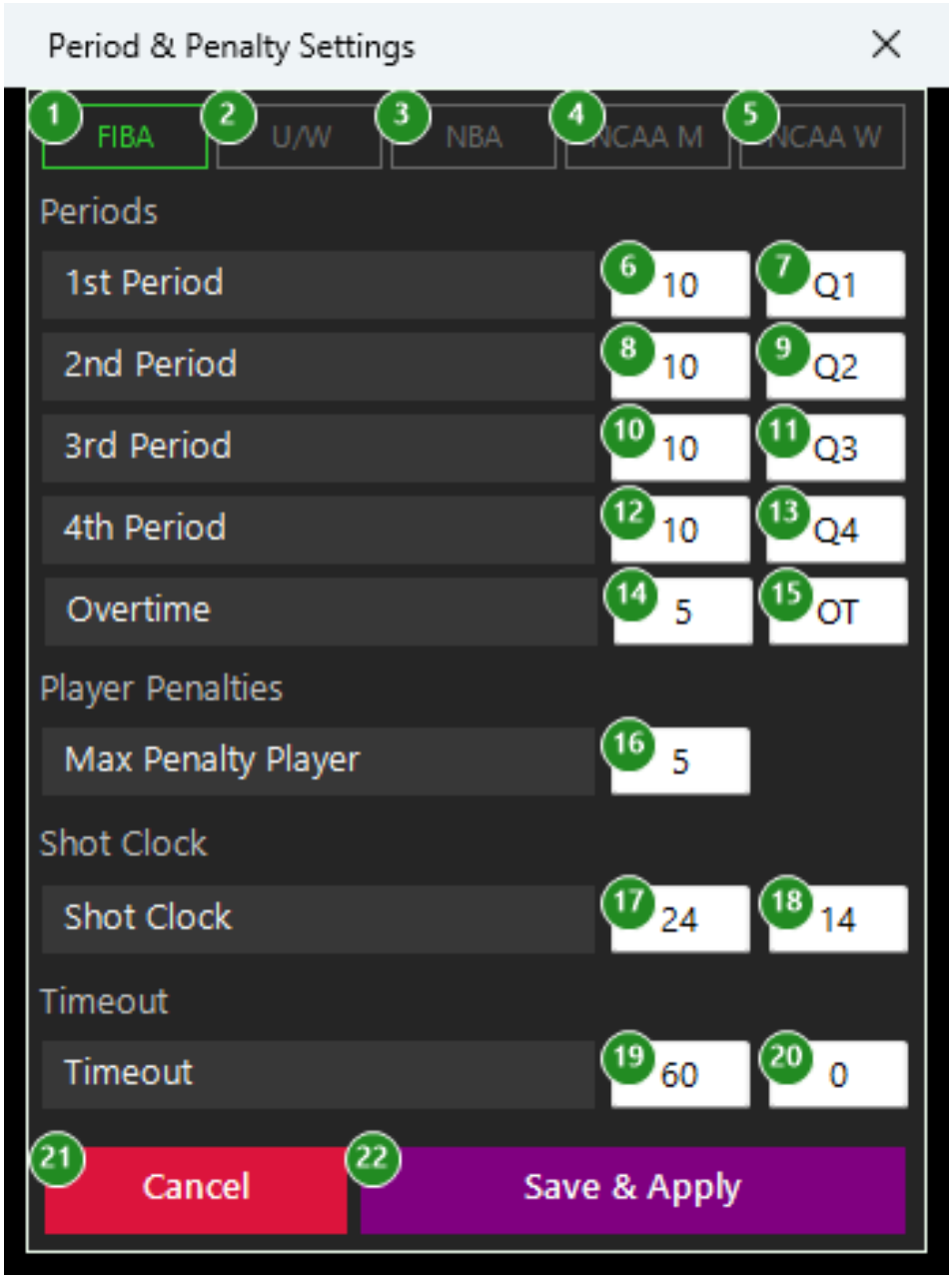
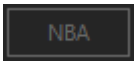
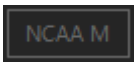
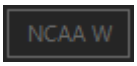
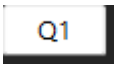
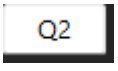
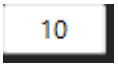
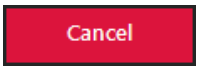
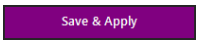


Figure 47. The rules dialog as it opens with the factory setting (FIBA).

No.	Control	Name	What It Does
1		**FIBA**	Fills the dialog with the FIBA preset: four quarters of 10 minutes (Q1 to Q4), overtime 5 minutes (OT), team-foul limit 5, shot clock 24 / 14, time-out 60 seconds. The button turns green; nothing is saved until you click Save & Apply. Save & Apply then also writes the FIBA rule values to start.xml: time-outs 2 in the first half and 3 in the second, at most 2 in the last 2 minutes, 1 per overtime, player foul-out at 5.
2		**U/W**	Fills the dialog with the FIBA 4x8 preset for competitions with shorter periods: four quarters of 8 minutes; everything else as FIBA (overtime 5 minutes, team-foul limit 5, shot clock 24 / 14, time-out 60 seconds, FIBA time-out and foul rules). Nothing is saved until you click Save & Apply.
3		**NBA**	Fills the dialog with the NBA preset: four quarters of 12 minutes, overtime 5 minutes, team-foul limit 5, shot clock 24 / 14, time-out 75 seconds. Save & Apply then also writes the NBA rule values: 7 time-outs per game, at most 4 in the fourth quarter and 2 in its last 3 minutes, 2 per overtime; bonus in overtime from the 4th team foul and in the last 2 minutes of a period from the 2nd foul committed there; overtime starts the team fouls at 0; player foul-out at 6.
4		**NCAA M**	Fills the dialog with the NCAA men's preset: two halves of 20 minutes (1H, 2H), overtime 5 minutes in the third row, rows four and five empty, team-foul limit 7, shot clock 30 / 20, time-outs 75 and 30 seconds. Save & Apply then also writes the rule values: two regulation periods, double bonus from the 10th team foul, 6 time-outs per game, 1 more per overtime with the unused ones carried over, player foul-out at 5.
5		**NCAA W**	Fills the dialog with the NCAA women's preset: four quarters of 10 minutes, overtime 5 minutes, team-foul limit 5, shot clock 30 / 20, time-outs 60 and 30 seconds. Save & Apply then also writes the rule values: 5 time-outs per game, 1 more per overtime with the unused ones carried over, player foul-out at 5.
6		**1st row: minutes**	Sets the length of the first period in minutes (PERIOD/P1). The game clock is set to this value when the period is selected. Text that is not a whole number becomes 0 when you leave the box.
7		**1st row: label**	Sets the label of the first period (PERIOD/P1Text), for example Q1 or 1H. The label is shown as the period on the control panel, on the board and on the remote page.
8		**2nd row: minutes**	Sets the length of the second period in minutes (PERIOD/P2). Text that is not a whole number becomes 0 when you leave the box.
9		**2nd row: label**	Sets the label of the second period (PERIOD/P2Text), for example Q2 or 2H.
10		**3rd row: minutes**	Sets the length of the third period in minutes (PERIOD/P3). With a rule set of two halves (NCAA M) this row is the overtime and its value is the length of every overtime. Text that is not a whole number becomes 0 when you leave the box.

No.	Control	Name	What It Does
11	Q3	**3rd row: label**	Sets the label of the third period (PERIOD/P3Text), for example Q3. With a rule set of two halves this is the overtime label, to which the program adds the number of the overtime (OT1, OT2).
12	10	**4th row: minutes**	Sets the length of the fourth period in minutes (PERIOD/P4). With a rule set of two halves the row is not used and holds 0. Text that is not a whole number becomes 0 when you leave the box.
13	Q4	**4th row: label**	Sets the label of the fourth period (PERIOD/P4Text), for example Q4. With a rule set of two halves the box is empty and not used.
14	5	**5th row: minutes**	Sets the length of every overtime in minutes when the rule set has four regulation periods (PERIOD/P5); with two halves the row is not used and holds 0. This box is not corrected when you leave it: if it is empty or not a whole number, Save & Apply keeps all five period lengths as they were.
15	OT	**5th row: label**	Sets the overtime label when the rule set has four regulation periods (PERIOD/P5Text). The program adds the number of the overtime: OT becomes OT1, OT2 and so on. An empty label counts as OT.
16	5	**Max Penalty Player**	Sets the team-foul limit, in spite of its caption: the number of team fouls in a period from which the team is in the bonus (BOARD/TeamFoulsLimit; FIBA 5, NCAA M 7). From that foul on the foul box is red on the control panel and on the board. The saved limit is read again at every start of the program. Text that is not a whole number becomes 0 when you leave the box, and 0 counts as the limit of the stored rule set (5, NCAA M 7).
17	24	**Shot Clock: full reset**	Sets the full shot clock time in seconds (PERIOD/ShotClock; 24, NCAA 30). It becomes the caption and the value of the first shot clock reset button of the control panel and of its keyboard shortcut. If the box does not hold a whole number, 24 is saved.
18	14	**Shot Clock: short reset**	Sets the short shot clock reset in seconds (PERIOD/ShotClock2; 14, NCAA 20). It becomes the caption and the value of the second shot clock reset button of the control panel and of its keyboard shortcut. If the box does not hold a whole number, 14 is saved.
19	60	**Timeout: length**	Sets the length of a time-out in seconds (PERIOD/Timeout; FIBA 60). The time-out countdown of the control panel starts from this value. Text that is not a whole number becomes 0 when you leave the box; if both time-out boxes hold 0 the control panel uses 60 seconds.
20	0	**Timeout: second length**	Sets a second time-out length in seconds (PERIOD/Timeout2) for rule sets with two kinds of time-out (NCAA M 75 and 30); 0 means there is no second length. When both boxes are above 0 the control panel shows two buttons to choose the length before a time-out is started. If the box does not hold a whole number, 30 is saved.

No.	Control	Name	What It Does
21		**Cancel**	Closes the dialog without saving; the X of the window does the same. A preset that was pressed and every typed value are discarded.
22		**Save & Apply**	Saves the values to start.xml and closes the dialog: the rule set and the team-foul limit (BOARD/Mode, BOARD/TeamFoulsLimit) and the period lengths, labels, shot clock and time-out values (PERIOD). The rule values of the RULES section are written only when a preset button was pressed in this dialog; otherwise they stay as stored. The control panel takes the new values at once; when neither the game clock nor a time-out is running, the game clock is set to the full length of the current period and the shot clock to its full value.

While the dialog is open the keyboard shortcuts of the control panel do nothing. Close the dialog before you go on with the match.

6.2 The Fields

6.2.1 Preset Buttons

The top row holds the preset buttons in this order: "FIBA", "U/W" (FIBA 4x8), "NBA", "NCAA M", "NCAA W".

- A click fills every field of the dialog with the values of the preset, and the button turns green.
- Nothing is saved until you click "Save & Apply".
- With "Save & Apply" after a preset click, the rule values without a field are written too (chapter 6.3).

6.2.2 Periods

Five rows, each with the length in minutes and the label.

Row	Four quarters (FIBA, FIBA 4x8, NBA, NCAA W)	Two halves (NCAA M)
1	"1st Period": length and label Q1	"First Half": length and label 1H
2	"2nd Period": length and label Q2	"Second Half": length and label 2H
3	"3rd Period": length and label Q3	"Overtime": length of every overtime, label OT
4	"4th Period": length and label Q4	empty, 0
5	"Overtime": length of every overtime, label OT	empty, 0

- The row after the last regulation period is the overtime. The program adds the number of the overtime to its label: OT becomes OT1, OT2 and so on. An empty overtime label counts as OT.
- The period label is shown on the control panel, on the board and on the remote page.
- The minute boxes of rows 1 to 4 turn text that is not a whole number into 0 when you leave them. If the overtime box of row 5 is empty or not a whole number, "Save & Apply" keeps all five period lengths as they were.

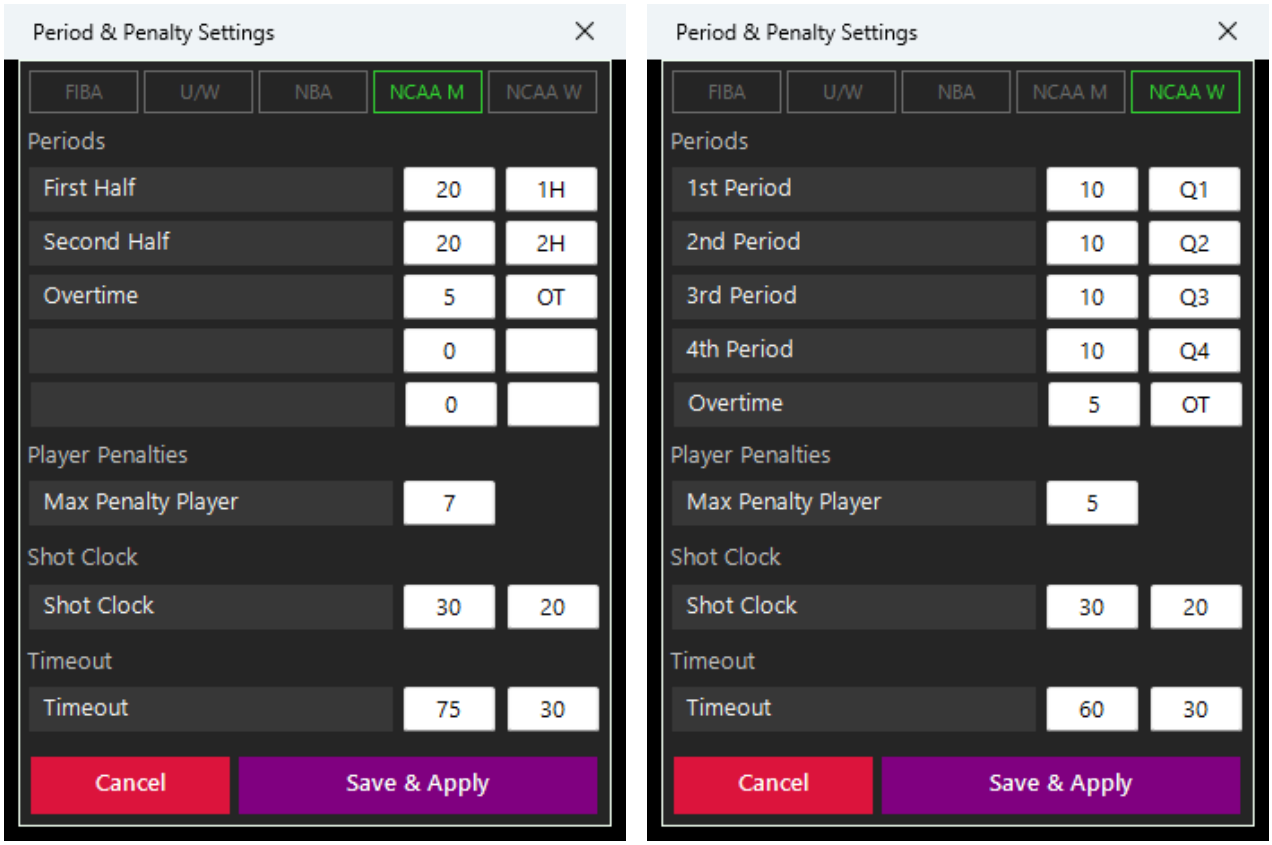


Figure 48. The period rows with two halves (NCAA M) and with four quarters (NCAA W).

6.2.3 Player Penalties: Max Penalty Player

The section "Player Penalties" has one field, "Max Penalty Player". In spite of its caption it is the team-foul limit: the team foul of a period from which the team is in the bonus (FIBA 5, NCAA M 7).

- From this foul on the foul box of the team is red on the control panel and on the board.
- The value is stored in start.xml (BOARD/TeamFoulsLimit) and is read again at every start of the program.
- 0 or an empty box counts as the limit of the stored preset.
- The foul-out limit of a single player is not this field. It is a rule value without a field (chapter 6.3).

6.2.4 Shot Clock

Two boxes: the full reset (24, NCAA 30) and the short reset (14, NCAA 20), in seconds.

- They become the captions and values of the two reset buttons of the control panel and of their keyboard shortcuts.
- A typed shot clock value on the control panel can be at most the full value.

6.2.5 Timeout

Two boxes: the first and the second time-out length in seconds.

- The time-out countdown of the control panel starts from the first length.
- 0 in the second box means one length only. When both boxes are above 0 (NCAA M 75 and 30, NCAA W 60 and 30), the control panel shows two small buttons to choose the length before a time-out (chapter 5.8.5).
- If both boxes hold 0, the control panel uses 60 seconds.

6.2.6 Save & Apply and Cancel

"Save & Apply" saves and closes the dialog:

start.xml section	Keys	Written
BOARD	Mode (the preset), TeamFoulsLimit	always
PERIOD	P1 to P5 (minutes), P1Text to P5Text (labels), ShotClock, ShotClock2, Timeout, Timeout2	always
RULES	the twenty rule values of chapter 6.3	only when a preset button was clicked in the dialog

After saving, the program reads the rule values again and the control panel takes the new values at once (chapter 6.4).

"Cancel" or the X of the window closes the dialog without saving. A preset that was clicked and every typed value are discarded.

> **Note:** Saving without a preset click keeps the stored rule values. You can open the dialog, change a period length and save: the preset and every value of the RULES section stay as they are.

6.3 Rule Values Without a Field

A preset writes these values to the RULES section of start.xml when you click its button and then "Save & Apply". They have no field in the dialog.

Key	Meaning
RegulationPeriods	Number of regulation periods: 4 quarters or 2 halves. Every later period is an overtime.
GameClockTenthsBelowSec	The board shows tenths on the game clock while less than this number of seconds remain. 0 = never.
ShotClockTenthsBelowSec	The board shows tenths on the shot clock from this number of seconds down. 0 = never.
ShotClockOffWhenGameClockLower	true: the shot clock is blank when the game clock has less time left than the shot clock.
TeamFoulsResetEachPeriod	true: the team fouls go to 0 when a new period is selected.
OvertimeContinuesTeamFouls	true: an overtime keeps the team fouls of the period before it. false: every overtime starts at 0.
PlayerFoulOut	Number of personal fouls at which a player is marked as fouled out. 0 = no mark.
TimeoutModel	HALF: one allowance for each half. GAME: one allowance for the whole of regulation.
TimeoutsFirstHalf	Time-outs per team in the first half (HALF only).
TimeoutsSecondHalf	Time-outs per team in the second half (HALF only).
TimeoutsPerGame	Time-outs per team in regulation (GAME only).

Key	Meaning
TimeoutsLastMinutes	Length in minutes of the window at the end of the last regulation period for the next key. 0 = no rule.
TimeoutsLastMinutesMax	Most time-outs a team can take inside that window. 0 = no rule.
TimeoutsPerOvertime	Time-outs per team in each overtime.
TimeoutsLastPeriodMax	Most time-outs a team can take in the last regulation period. 0 = no limit.
TimeoutsCarryIntoOvertime	true: the unused time-outs are added to the allowance of the next overtime.
TeamFoulBonusOvertime	Team foul from which the bonus starts in overtime. 0 = the same as in regulation.
TeamFoulBonus2	Team foul from which the double bonus starts. 0 = none.
TeamFoulLastMinutes	Length in minutes of the window at the end of every period for the next key. 0 = no rule.
TeamFoulLastMinutesBonus	The bonus starts with this number of team fouls committed inside that window. 0 = no rule.

The values of each preset are in Appendix B.

To change one rule value by hand:

1. Close basketBoard 7.
2. Open start.xml in the program folder (C:\basketBoard7) with a text editor.
3. Change the value between the tags of the key, for example <TimeoutsPerGame>4</TimeoutsPerGame> for an NCAA game with media time-outs.
4. Save the file and start basketBoard 7.

- The program reads the RULES section at its start and after "Save & Apply" in the dialog.
- A key that is missing, empty or not a number takes the value of the stored preset. A negative number counts as 0. Write true or false for the yes/no keys.
- Your value stays until a preset button is clicked in the dialog and saved.

6.4 Changing the Rules During a Match

Change the rules before the match. If you must change them during a match:

1. Pause the game clock and wait for a running time-out to end.
2. Note the time on the game clock.
3. Open the dialog, change the values and click "Save & Apply".
4. The game clock is set to the full length of the current period and the shot clock to its full value. Type the noted time again (chapter 5.4.2).

- Score, team fouls, used time-outs and the period stay as they are. Within two seconds the labels of time-outs left show the new allowance.
- If the game clock or a time-out runs while you save, the clocks are not touched. The new period length is used from the next period change or the next Stop with the clock standing.

- A new team-foul limit is in force at once on the board. The foul boxes of the control panel follow at the next foul change.
- Switching between quarters and halves keeps the period number: do it only before the match (chapter 4.1).

7. Teams and Players

This chapter covers everything the program knows about the two teams: the names and logos on the control panel, the board logo, the team colours, the squads with their player photos, the team database and the Player Stats window with the points and fouls of every player. A new installation contains demo data: FENERBAHÇE as the home team, with real player photos, and REAL MADRID as the guest team, with the EuroLeague mark as the board logo.

7.1 Team Names

The two name boxes of the control panel hold the team names that the board shows. Click Game in the menu strip to open the control panel.

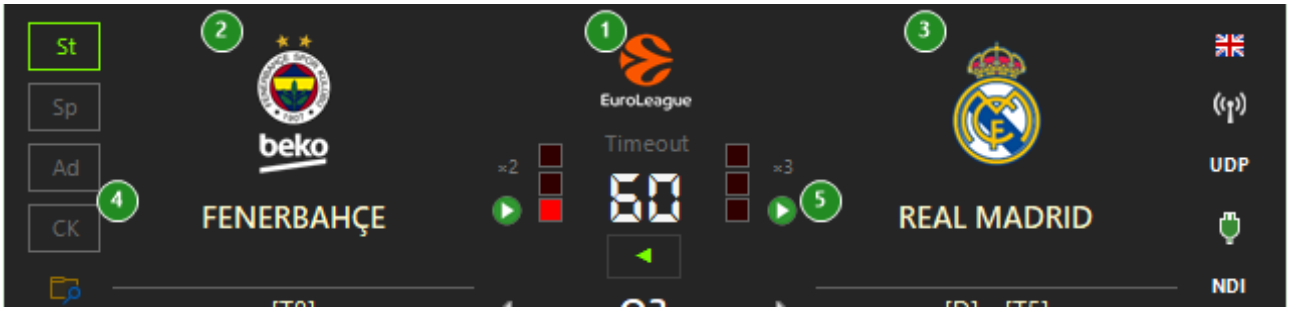
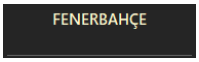
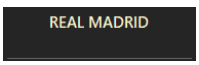


Figure 49. The team names and the three logos of the control panel.

No.	Control	Name	What It Does
1		**Board logo**	Opens the dialog Select Media File to choose the small logo in the middle of the board, for example the logo of the competition. The path of the file is stored in start.xml (BOARD/LogoBoard). With the mouse over the logo a small erase button appears beside it.
2		**Home logo**	Opens the dialog Select Media File in the folder media\downloads\images to choose the logo of the home team (bmp, gif, jpeg, jpg, png). The panel and the board show the new logo; the path of the file is stored in start.xml (BOARD/LogoHome). With the mouse over the logo a small erase button appears beside it. In the Demo version the licence message is shown instead.
3		**Guest logo**	Opens the dialog Select Media File in the folder media\downloads\images to choose the logo of the guest team (bmp, gif, jpeg, jpg, png). The panel and the board show the new logo; the path of the file is stored in start.xml (BOARD/LogoGuest). With the mouse over the logo a small erase button appears beside it.
4		**Home team name**	Holds the name of the home team; the board follows while you type. Press Enter for a second line; with more than two lines the box turns black as a warning. The name is written to start.xml (BOARD/NameHome) when the program is closed.
5		**Guest team name**	Holds the name of the guest team; the board follows while you type. Press Enter for a second line; with more than two lines the box turns black as a warning. The name is written to start.xml (BOARD/NameGuest) when the program is closed.

1. Click into the name box of the team.
2. Type the name. The board follows while you type.
3. Press Enter to start a second line. A name with two lines is shown on two lines on the board.

- With more than two lines the box turns black as a warning. Delete the extra line.
- The names are stored in start.xml (BOARD/NameHome and BOARD/NameGuest) and come back after a restart.
- While the cursor is in a name box, the keyboard shortcuts of the control panel do not work: the keys go into the box.

The names can also be set from another program:

Channel	Command	Line break
HTTP 1907	cmd=set_home_team&value=... and cmd=set_guest_team&value=...	The character _ in the value starts a new line.
TCP 2907	HOMENAME=... and GUESTNAME=... in a scoreboard data line	\n in the value starts a new line.

Chapter 14 and Appendix C describe both channels.

7.2 Logos

The control panel shows three logos: the home logo at the left, the guest logo at the right and the small board logo in the middle. In a new installation the board logo is the EuroLeague mark.

To change a logo:

1. Click the logo on the control panel. The dialog "Select Media File" opens in the folder media\downloads\images of the program.
2. Choose an image file (bmp, gif, jpeg, jpg or png) and click Open.

The panel and the board show the new logo at once. The program stores the full path of the file in start.xml (BOARD/LogoHome, BOARD/LogoGuest, BOARD/LogoBoard) and does not copy the file. Leave the file where it is.

To remove a logo, move the mouse over it and click the small erase button that appears beside it. The panel then shows a placeholder and the board shows no logo in that place.

- In Demo mode the home logo cannot be changed or removed; the message "License Required !" appears (chapter 2).
- Where and how large the logos appear belongs to the board design (chapter 11).

7.3 Team Colours

Each team has two colours. They are set on the Info page with the two small squares beside "Home Team" and "Guest Team".

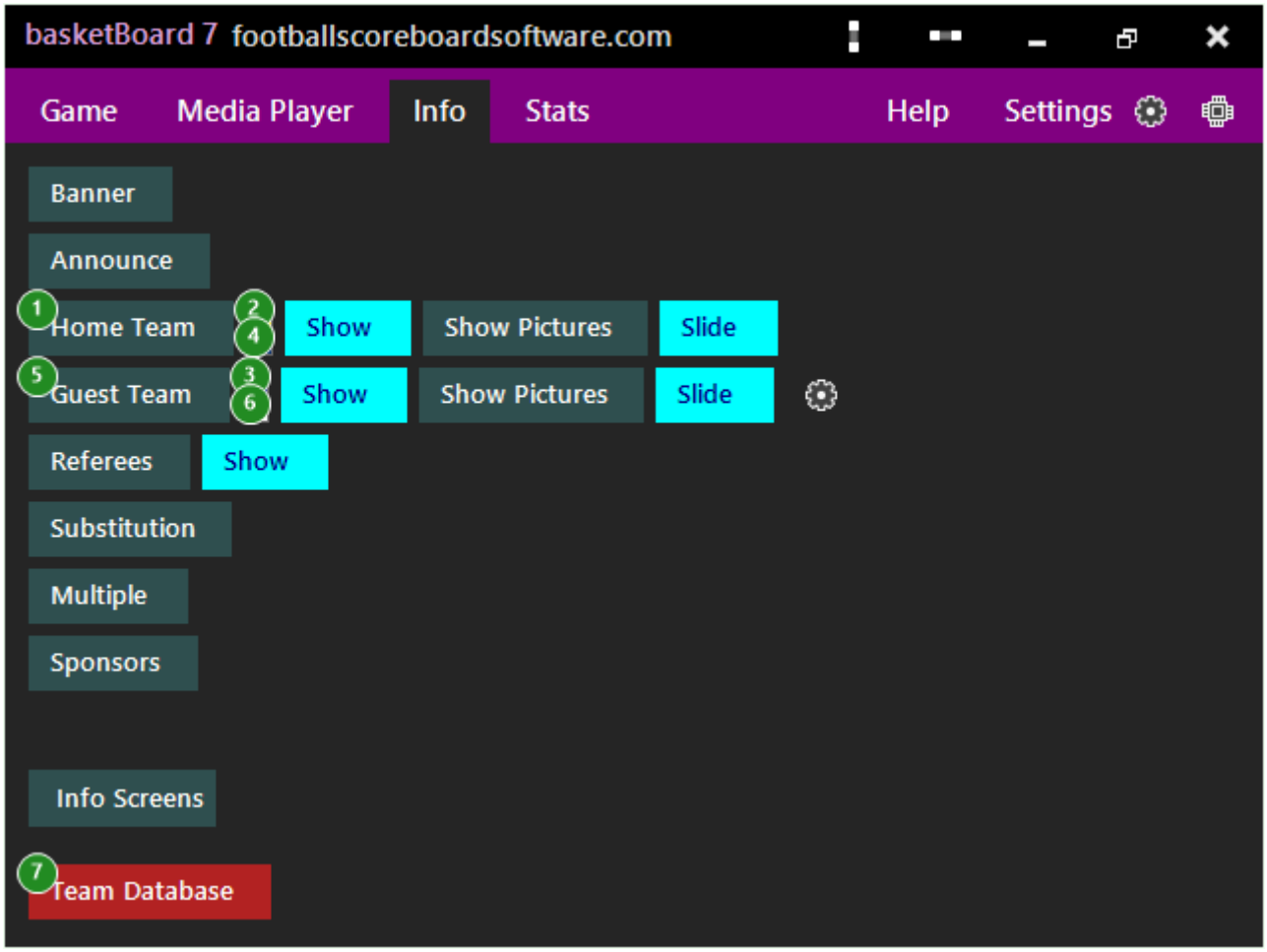


Figure 50. The Info page with the two colour squares of each team, the squad editors and the team database.

No.	Control	Name	What It Does
1	Home Team	**Home Team**	Opens the squad editor with the players of the home team: groups, numbers, names and photos.
2		**Home colour 1 (upper square)**	Opens the colour dialog for the first colour of the home team and saves the four team colours in start.xml. The line-up uses it as the background of its heading, number cells and coach line; the Chroma Key scorebug and designs with team colour marks take it when the board is drawn again.
3		**Guest colour 1 (upper square)**	Opens the colour dialog for the first colour of the guest team and saves the four team colours in start.xml. The line-up uses it as the background of its heading, number cells and coach line; the Chroma Key scorebug and designs with team colour marks take it when the board is drawn again.
4		**Home colour 2 (lower square)**	Opens the colour dialog for the second colour of the home team and saves the four team colours in start.xml. The line-up uses it as the text colour of its heading, number cells and coach line; the Chroma Key scorebug and designs with team colour marks take it when the board is drawn again.
5	Guest Team	**Guest Team**	Opens the squad editor with the players of the guest team: groups, numbers, names and photos.

No.	Control	Name	What It Does
6		**Guest colour 2 (lower square)**	Opens the colour dialog for the second colour of the guest team and saves the four team colours in start.xml. The line-up uses it as the text colour of its heading, number cells and coach line; the Chroma Key scorebug and designs with team colour marks take it when the board is drawn again.
7		**Team Database**	Opens the team database: saved squads that can be loaded as the home or the guest squad of the match.

1. Click Info in the menu strip.
2. Click the upper or the lower square beside the team. The colour dialog opens.
3. Choose the colour and confirm it.

The four colours are saved in start.xml at once (BOARD/Color11, Color12 for the home team, Color21, Color22 for the guest team).

Where the colours appear	Colour 1 (upper square)	Colour 2 (lower square)
Line-up of the team on the board	Background of the heading, the number cells and the coach line	Text of the same parts
Chroma Key scorebug	The two colour fields beside the team name	
Board designs with team colour marks	As the design defines	As the design defines

The boards take the new colours the next time the scoreboard is drawn again, for example after a change of the display mode. On the CK page click Scoreboard to redraw the scorebug with the new colours (chapter 9).

The demo colours are yellow and navy for FENERBAHÇE and navy and white for REAL MADRID.

7.4 Squads: Home Team and Guest Team

The squad of a team is its list of players. The board graphics, the Player Stats window and the CK pages read the players from it. Click Info, then "Home Team" or "Guest Team". Both buttons open the same editor; the title bar shows which team you edit.

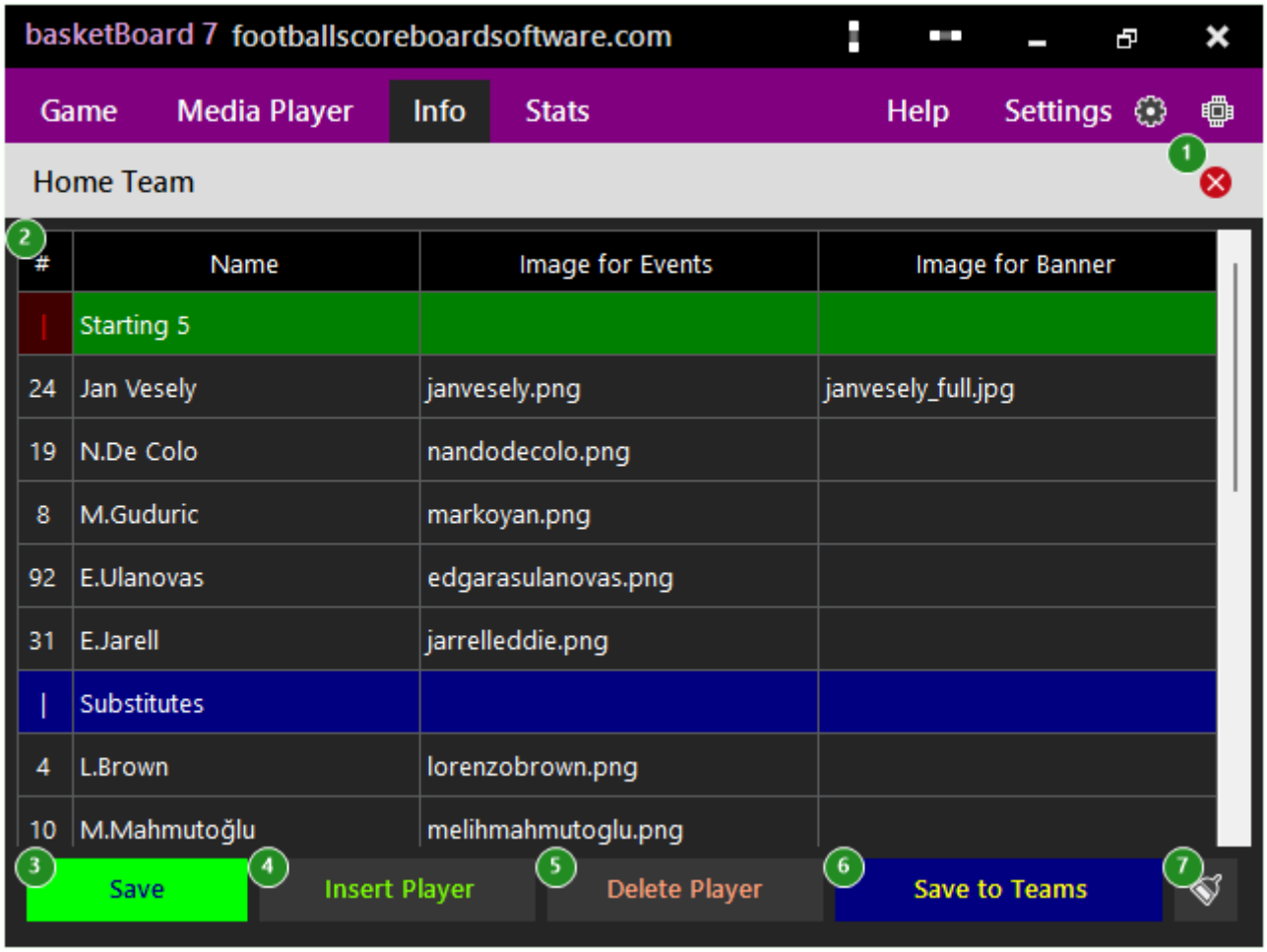
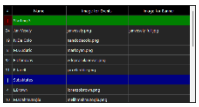
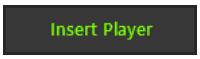


Figure 51. The squad editor of the home team with the demo squad of FENERBAHÇE and its player photos.

No.	Control	Name	What It Does
1		**Close (red x)**	Closes the squad editor and brings back the screen behind it; Esc does the same. Changes that are not saved are lost.
2		**Squad table**	Shows the squad: the coloured group headings Starting 5, Substitutes, Other Players and Trainer, and under each its players with the columns #, Name, Image for Events and Image for Banner. Type to replace the content of the selected cell or press F2 to edit it; click a picture cell to get the picture button and a preview. Drag the # or Name cell of a player with the left mouse button to move the row to another place or group. A file name in red means that the file is not found.
3		**Save**	Writes the table to the squad file of the team named in the title bar (common\data\playersHome.xml, playersGuest.xml or the file of a team database entry) and removes empty rows first. The button is green while the table has changes and right after the editor opens. The board graphics read the saved file.
4		**Insert Player**	Adds an empty player row at the end of the group that holds the selected cell. The Trainer group (the head coach) takes one row only: the button does nothing when the group already has a row.

No.	Control	Name	What It Does
5	Delete Player	**Delete Player**	Deletes the row of the selected cell without a question. A group heading cannot be deleted. The squad file changes only when you click Save.
6	Save to Teams	**Save to Teams**	Asks for a name and stores a copy of the table as a new entry of the team database. It does not write the squad file of the match; click Save as well when the changes are for this match.
7		**Clear All (brush icon)**	Removes all players from the table and leaves the four empty group headings Starting 5, Substitutes, Other Players and Trainer. There is no question. The squad file changes only when you click Save.

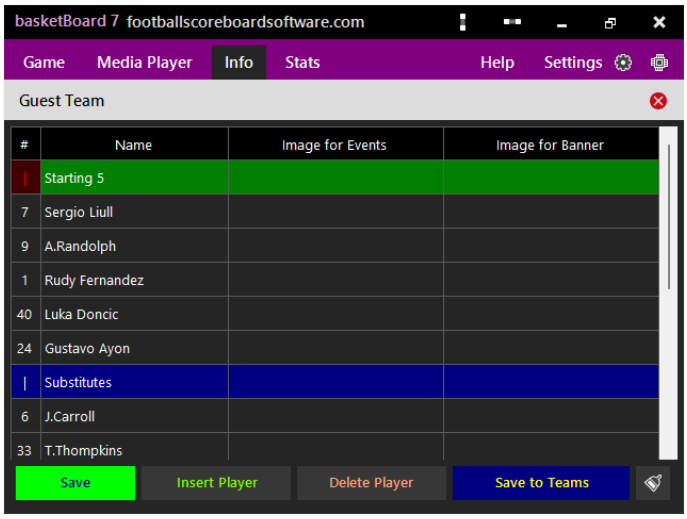


Figure 52. The squad editor of the guest team. The demo squad of REAL MADRID has no photos.

7.4.1 Groups

The table has four coloured group headings. Every player row belongs to the heading above it.

Group	Meaning	Where it is used
"Starting 5"	The five players who start the game	Line-up, team slide, player pictures, Player Stats window, substitution lists
"Substitutes"	The bench	The same as "Starting 5"
"Other Players"	Players of the club who are not on the roster of this game	Substitution lists only
"Trainer"	The head coach, one row only	Line-up (under the team name), team slide, player pictures

The program does not count the rows of a group. "Starting 5" can hold more or fewer than five players; the board shows what you enter.

7.4.2 Columns

Column	Content
#	The shirt number. In a heading row the cell shows a vertical bar.
Name	The name as the board shows it.
"Image for Events"	The photo of the player for events: the team slide, the substitution with pictures and the info screens that show a player with a photo (chapter 10). Image files: bmp, gif, jpeg, jpg, png.
"Image for Banner"	The picture or video clip of the player for show: the player pictures page, which puts it on the whole board.

7.4.3 Adding, Changing and Deleting Players

1. Click a cell of the group: its heading or one of its players.
2. Click "Insert Player". An empty row appears at the end of that group.
3. Click the # cell and type the number, then click the Name cell and type the name. Typing replaces the content of the cell; F2 edits it; Enter confirms.
4. Click "Save".

- "Delete Player" removes the row of the selected cell without a question. A heading cannot be deleted.
- "Clear All" (the brush button) removes all players and leaves the four empty headings.
- The "Trainer" group takes one row. "Insert Player" does nothing when the group already has a row.
- To move a player, drag its # or Name cell with the left mouse button and release it on the row under which the player should stand. Release it on a heading to make the player the first of that group. The board graphics use the order of the table.

> **Note:** Do not drag the group headings. The editor does not prevent it, and the groups of the board graphics follow the position of the headings.

7.4.4 Player Photos

1. Click the "Image for Events" or the "Image for Banner" cell of the player. A small purple button appears at the right end of the cell.
2. Click the button and choose the file. The file name appears in the cell.
3. Click "Save".

- The program stores the full path and does not copy the file. A file name in red means that the file is not at the stored place any more.
- When the file of the selected cell exists, a preview appears under the name of the player. The folder button on the preview opens Windows Explorer at the file.
- Photos are optional. A player without a photo is shown with number and name only.
- The demo photos of FENERBAHÇE are in the folder media\images\players\fenerbahce of the program.

> **Note:** The editor has no button that removes a photo from a player. To remove it, delete the player row and insert the player again.

7.4.5 Saving

- "Save" writes the table to the squad file of the team (common\data\playersHome.xml or playersGuest.xml). Empty rows are removed first. The button is green while the table has changes.

- Closing the editor without "Save" loses the changes.
- "Save to Teams" asks for a name and stores a copy of the table in the team database (7.5). It does not write the squad file of the match; click "Save" as well when the changes are for this match.

The line-up ("Show"), the team slide ("Slide") and the player pictures ("Show Pictures") beside "Home Team" and "Guest Team" put the saved squad on the board. Chapter 10 describes these graphics.

7.5 The Team Database

"Team Database", the red button at the bottom of the Info page, keeps squads for later use. Enter a squad once and load it into a match with two clicks.

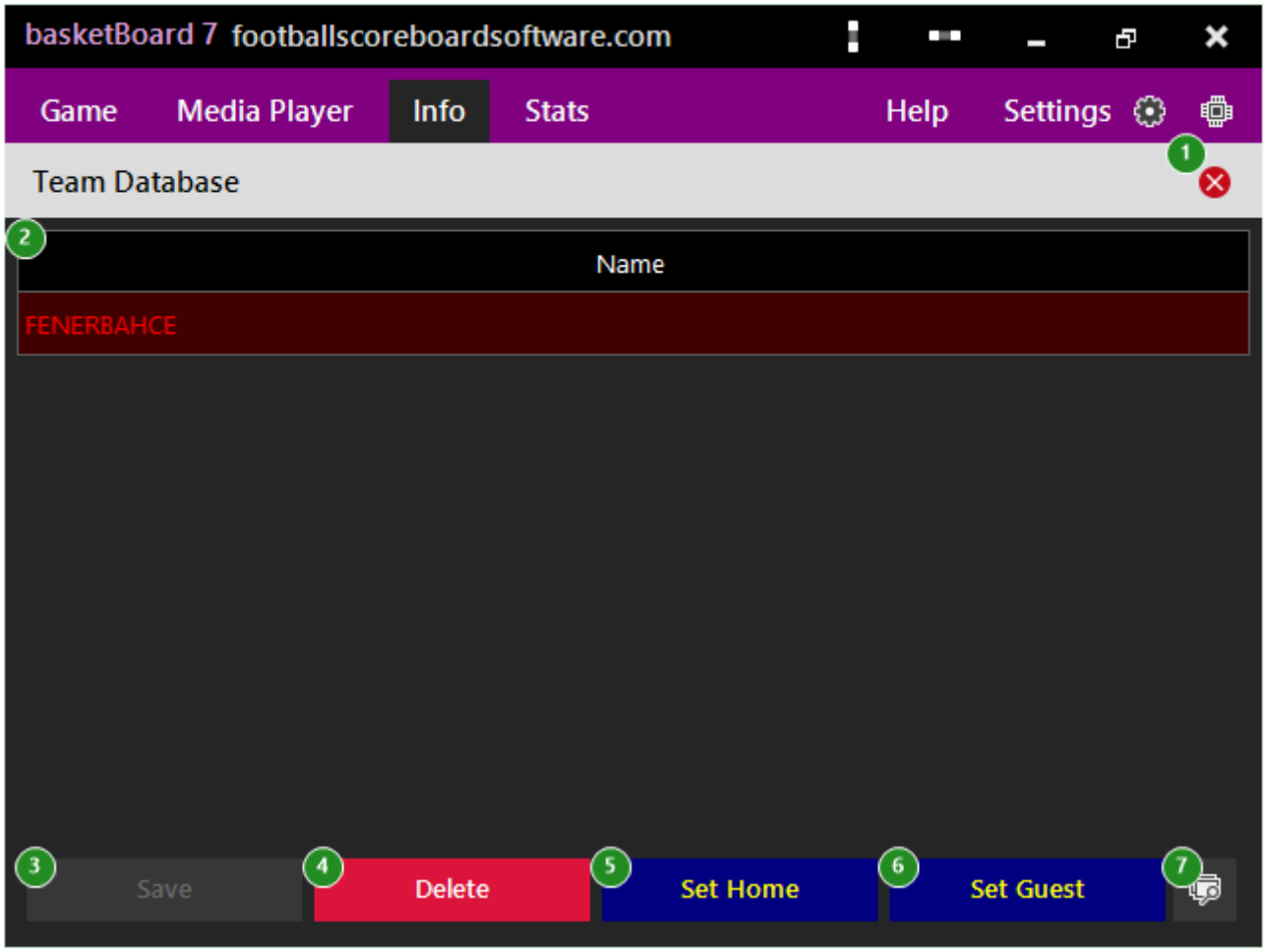
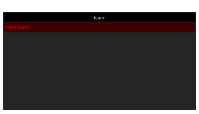
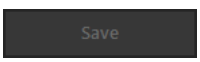
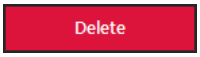


Figure 53. The team database with the demo entry FENERBAHCE.

No.	Control	Name	What It Does
1		**Close (red x)**	Closes the team database and brings back the Info page; Esc does the same. A changed name that is not saved is lost.
2		**Team list**	Lists the entries of the team database, sorted by name. Click an entry to select it for the buttons below. Type or press F2 to rename it, then click Save.
3		**Save**	Saves the names of the list after you renamed an entry. The button is green while a name has changed.
4		**Delete**	Deletes the selected entry after a question that you answer with Yes: the name leaves the list and the squad file of the entry is removed. The squads of the current match are not touched.

No.	Control	Name	What It Does
5	Set Home	**Set Home**	Loads the squad of the selected entry as the home squad of the match after a question that you answer with Yes: the saved squad replaces common\data\playersHome.xml, and a message confirms it. The team name and the logo of the control panel are not changed.
6	Set Guest	**Set Guest**	Loads the squad of the selected entry as the guest squad of the match after a question that you answer with Yes: the saved squad replaces common\data\playersGuest.xml, and a message confirms it. The team name and the logo of the control panel are not changed.
7		**Show (icon)**	Opens the squad editor with the saved squad of the selected entry, so that you can check or change its players. Save in that editor writes to the database entry and not to the squad of the match. Nothing is shown on the board.

An entry is a name and a complete copy of a squad: groups, numbers, names and the paths of the photos. The team name of the board, the logo and the team colours are not part of it.

To save a squad in the database:

1. Open "Home Team" or "Guest Team" and enter the squad.
2. Click "Save to Teams", type a name and confirm.

Every "Save to Teams" creates a new entry, also when the name exists already.

To load a squad into the match:

1. Click "Team Database" on the Info page.
2. Click the entry.
3. Click "Set Home" or "Set Guest" and answer the question with Yes. The saved squad replaces the squad of that side.
4. Type the team name and choose the logo on the control panel (7.1, 7.2). The database does not change them.

Task	How
Rename an entry	Click the name, type the new name, press Enter and click "Save".
Check or change the players of an entry	Click the entry and click the button at the bottom right ("Show"). The squad editor opens with the saved squad; "Save" there writes to the entry, not to the match.
Delete an entry	Click the entry, click "Delete" and answer the question with Yes.

> **Note:** "Set Home" and "Set Guest" overwrite the current squad of that side without keeping a copy. Save it with "Save to Teams" first if you need it again.

The database is stored in common\data\dataTeams.xml (the names) and one file common\data\team_<ID>.xml per entry.

7.6 The Player Stats Window

The Player Stats window keeps the personal fouls and the points of every player of both teams and can show them on the board. Click the list icon at the bottom left of the control panel (tool tip "Player Stats") to open it. The window is separate from the main window: move it by its title, change its size at its edges, or use the two placing buttons of its title bar.

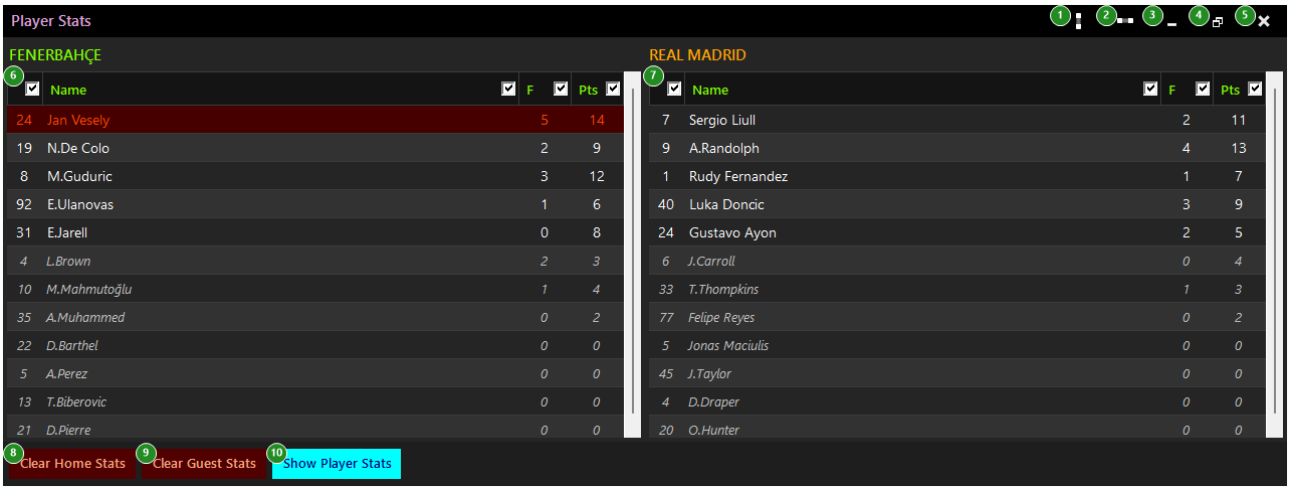
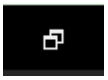
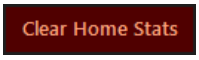
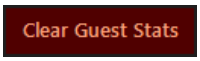


Figure 54. The Player Stats window: home team at the left, guest team at the right. Jan Vesely has five fouls and is marked as fouled out.

No.	Control	Name	What It Does
1		**Place above (first title icon)**	Places the window above the main window: same left edge and width, from the top of the screen down to the main window. When the main window is at the left edge of the screen, the window becomes a column 400 pixels wide at the left edge over the full height of the screen.
2		**Place beside (second title icon)**	Places the window beside the main window with the same top and height: it fills the space to the left of the main window, or the space to its right when there is no room on the left. When the main window lies across the full width at the bottom of the screen, the window becomes a strip of full width above it.
3		**Minimise**	Minimises the window to the task bar. The data and the board stay as they are.
4		**Maximise / restore**	Maximises the window over the screen; a second click restores the previous size.
5		**Close**	Hides the window; the values and the player panel on the board stay as they are. While the window is hidden, player values sent with the PLAYER command over TCP 2907 are ignored. With the factory keys Escape starts and stops the game clock and does not close the window.

No.	Control	Name	What It Does
6		**Home team grid**	Lists the starters and substitutes of the home team with number, Name, F (personal fouls) and Pts (points); substitutes are grey and in italics, a fouled-out player is red. Type a value into a cell and press Enter, or right-click an F or Pts cell for the menu (Foul +1, -1, = 0; Pts +3, +2, +1, -1, = 0); drag a row to change the order. The check box in each column header shows or hides that column on the player panel of the board for both teams, at once and with its values. Every change is saved at once to common\data\playerDataHome.xml and sent to the board.
7		**Guest team grid**	Lists the starters and substitutes of the guest team with number, Name, F (personal fouls) and Pts (points); substitutes are grey and in italics, a fouled-out player is red. Type a value into a cell and press Enter, or right-click an F or Pts cell for the menu (Foul +1, -1, = 0; Pts +3, +2, +1, -1, = 0); drag a row to change the order. The check box in each column header shows or hides that column on the player panel of the board for both teams, at once and with its values. Every change is saved at once to common\data\playerDataGuest.xml and sent to the board.
8		**Clear Home Stats**	Clears the player data of the home team without a question: deletes common\data\playerDataHome.xml, loads the starters and substitutes again from the squad of the Info page in the order of the squad and sets all fouls and points to 0. The board panel is updated at once.
9		**Clear Guest Stats**	Clears the player data of the guest team without a question: deletes common\data\playerDataGuest.xml, loads the starters and substitutes again from the squad of the Info page in the order of the squad and sets all fouls and points to 0. The board panel is updated at once.
10		**Show Player Stats**	Shows the player panels of both teams on the board; a second click hides them. The panels exist on the Standard and Sponsored boards only. The button does not change its look, and the state is not saved: after a restart the panels are off.

Each grid lists the players of the groups "Starting 5" and "Substitutes" of the squad (7.4).

Column	Content
(number)	Shirt number
Name	Player name
F	Personal fouls
Pts	Points

- Starters are white, substitutes grey and in italics, a fouled-out player red on dark red.
- Drag a row and drop it on another row of the same grid to change the order. The board panel uses the order of the grid.

- The team names above the grids are the names of the control panel.
- Close (X) hides the window. The values and the board stay as they are. Click the list icon again to bring it back.

> **Note:** With the factory keys Escape is the start/stop key of the game clock. In this window it then starts or stops the clock and does not close the window. Use Close (X).

7.6.1 Entering Fouls and Points

With the mouse, right-click the F or the Pts cell of the player. A menu opens under the cell.

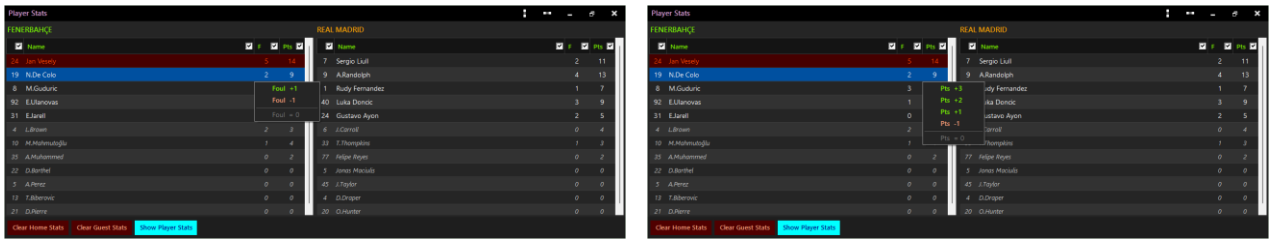


Figure 55. The right-click menus of the F column (left) and of the Pts column (right).

Menu item	What it does
"Foul +1"	Adds one personal foul.
"Foul -1"	Takes one foul back; the value does not go below 0.
"Foul = 0"	Sets the fouls of the player to 0.
"Pts +3", "Pts +2", "Pts +1"	Adds three, two or one points.
"Pts -1"	Takes one point back; the value does not go below 0.
"Pts = 0"	Sets the points of the player to 0.

With the keyboard, click the cell, type the new value and press Enter. F2 edits the value in the cell; Escape during the entry brings the old value back. Type whole numbers only.

Every change is saved at once and the board panel follows.

> **Note:** The points and fouls of the players are separate from the score and the team fouls of the control panel. A basket entered for a player does not change the score; count it on the control panel as well (chapter 5).

7.6.2 Foul-Out Mark

A player whose fouls reach the limit of the rules preset is marked: the row is red in the window, and on the board the foul cell of the player is white on red.

Preset	Foul-out limit
FIBA, FIBA 4x8 ("U/W"), NCAA M, NCAA W	5
NBA	6

- The limit comes with the preset (chapter 4). It has no field of its own in the rules dialog.
- The mark goes when the fouls drop below the limit again.
- The mark is information only. You can still add fouls and points.

7.6.3 The Player Panel on the Board

Click "Show Player Stats" to show the player panels of both teams on the board; click it again to hide them. The home panel is at the left edge, the guest panel at the right edge. A value of 0 is shown as an empty cell.

Board Output **Control Panel**

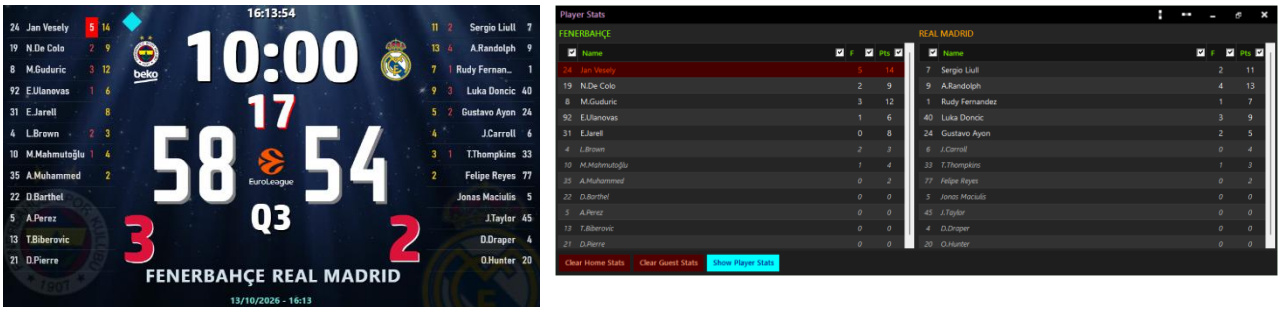


Figure 56. The player panels on the Standard board and the Player Stats window that fills them. The foul cell of the fouled-out player is red.

- The check box at the right of each column header chooses whether that column is on the board. The choice applies to both teams and is kept after a restart.
- The panels are part of the Standard and Sponsored boards. The Advertisement and Chroma Key boards have no player panel.
- The button does not change its look. Look at the board to see whether the panels are on. After a restart the panels are off.
- The look of the panels belongs to the board design (chapter 11).

7.6.4 Clearing the Values

Before a new match click "Clear Home Stats" and "Clear Guest Stats".

- Each button works without a question. It loads the starters and substitutes again from the squad of the team, in the order of the squad, and sets all fouls and points to 0.
- The board panel follows at once.
- Nothing else clears the player values: not a new period and not a restart of the program.
- When you load another squad (7.4, 7.5), click the Clear button of that team so that the window takes the new players.

> **Note:** A number or a name edited in a grid is also written back to the squad of the team, row by row in the order of the grid. When the order of the grid differs from the order of the squad, edit numbers and names in the squad editor instead.

7.6.5 Where the Values Are Stored

File in common\data	Content
playerDataHome.xml, playerDataGuest.xml	One entry per player in the order of the grid: number, name, fouls, points, starter or substitute. Written at every change.
playerDataColumns.xml	The four column check boxes of the board panel.

File in common\data	Content
playersHome.xml, playersGuest.xml	The squads (7.4). The grids are filled from them when no player data file exists.

The values survive a restart: the window loads the player data files when it opens.

7.6.6 Values From a Console or Statistics Program

A scoreboard console or a statistics program can fill this window over TCP 2907. ROSTER loads the players of a team and clears their values; PLAYER sets the fouls and points of one player by shirt number. PLAYER values are taken only while the Player Stats window is open. Chapter 14 describes both commands.

8. External Shot Clock Window and Outputs

Besides the board window, basketBoard 7 has two more outputs: a small external shot clock window for a separate display, and the NDI output that sends the board over the network. This chapter also shows how to place the board window on a second monitor.

Output	Opened with	What it shows
Board window	Opens with the program	The board of the current display mode, the info graphics and the media player
External shot clock window	The "24" button of the control panel	Game clock and shot clock
NDI output	The "NDI" button of the control panel	The board window as a network video stream

8.1 Opening the External Shot Clock Window

The external shot clock window is a separate window without a title bar. Put it on a monitor or LED display near the basket or at the scorer's table.



Figure 57. The "24" button under the shot clock of the control panel. Its caption is aqua while the window is open.

No.	Control	Name	What It Does
1		**24 (under the shot clock)**	Opens the external shot clock window at the place and in the size stored in start.xml (section SC24); the caption of the button turns aqua. A second click closes the window.

1. Click Game in the menu strip.
2. Click "24" under the shot clock. The caption turns aqua and the window opens at its stored place and size.
3. Click "24" again to close the window.

- The window is not opened by itself at the next start of the program. Click "24" again after a restart.
- The window does not stay in front of other windows by itself. Keep its monitor free of other windows.

8.2 What the Window Shows

The window shows the game clock at the top in yellow and the shot clock below it in large digits. It follows the control panel about ten times per second.

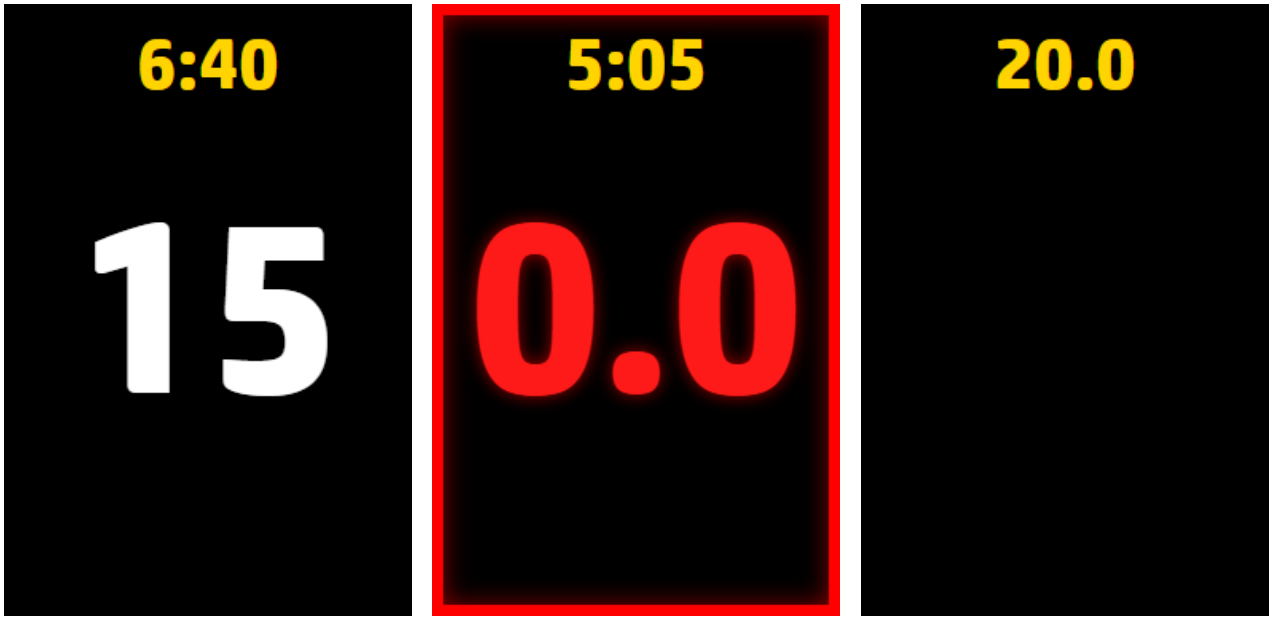


Figure 58. The window while the shot clock runs (left), after the shot clock expired (middle) and with the shot clock switched off (right).

State on the control panel	What the window shows
Shot clock running or stopped	The shot clock in white. When it shows tenths of a second, the digits are red.
Shot clock expired	0.0 (or 0) in red and a red alarm frame around the window, until the shot clock is reset.
Shot clock off (blank)	No shot clock and no frame. The game clock stays.
Game clock	As on the board, for example 6:40, or 20.0 with tenths in the last minute of a period.

The shot clock of the control panel is described in chapter 5.

8.3 Position and Size of the Shot Clock Window

The window has no title bar and cannot be dragged. Its place and size are set in its own settings panel.

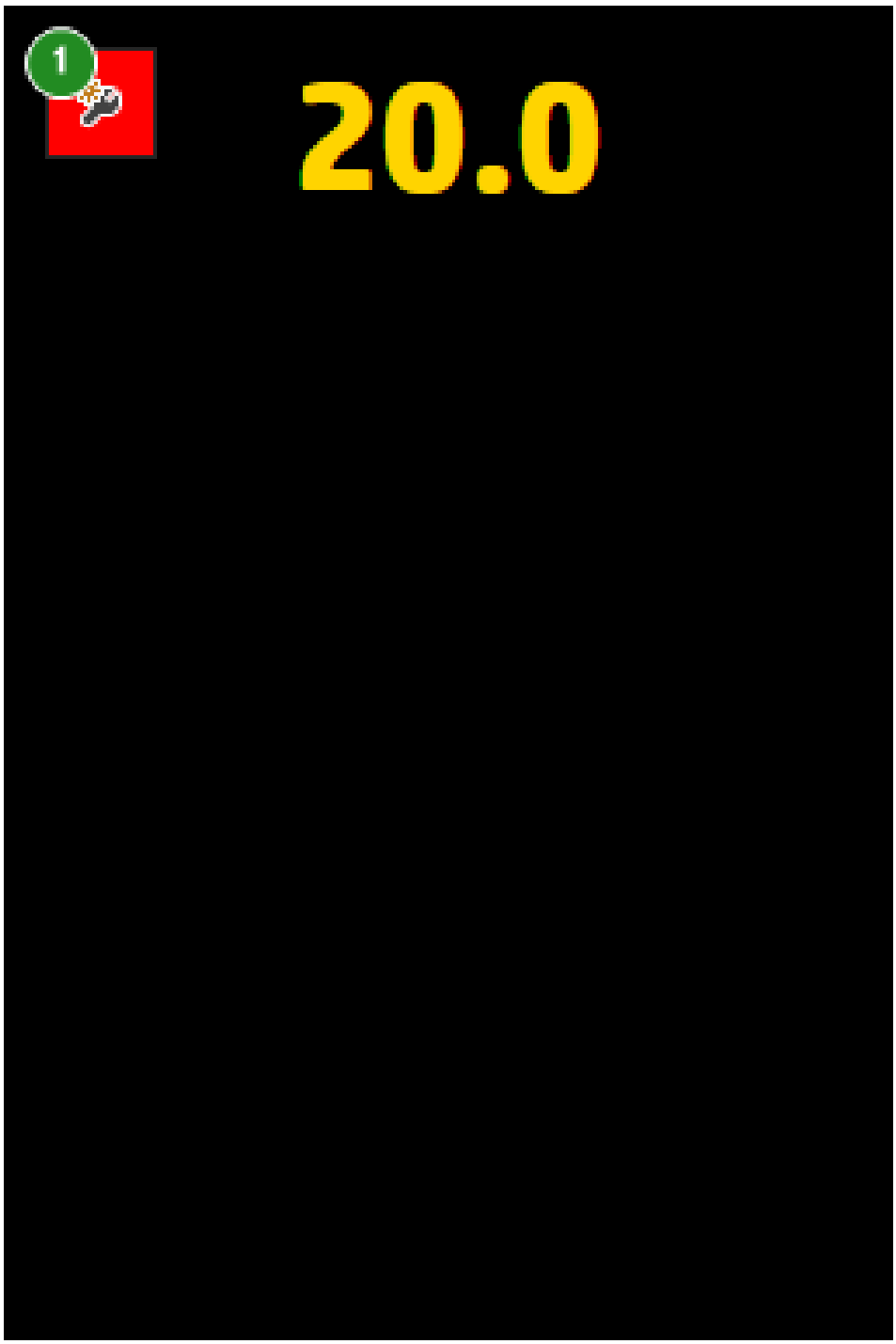


Figure 59. With the mouse over the window, the red settings button appears at the top left.

No.	Control	Name	What It Does
1		**Settings (red button, top left)**	Opens or closes the settings panel of the external shot clock window with the values Left, Top, Width and Height. The button is shown only while the mouse is over the window or the panel is open.

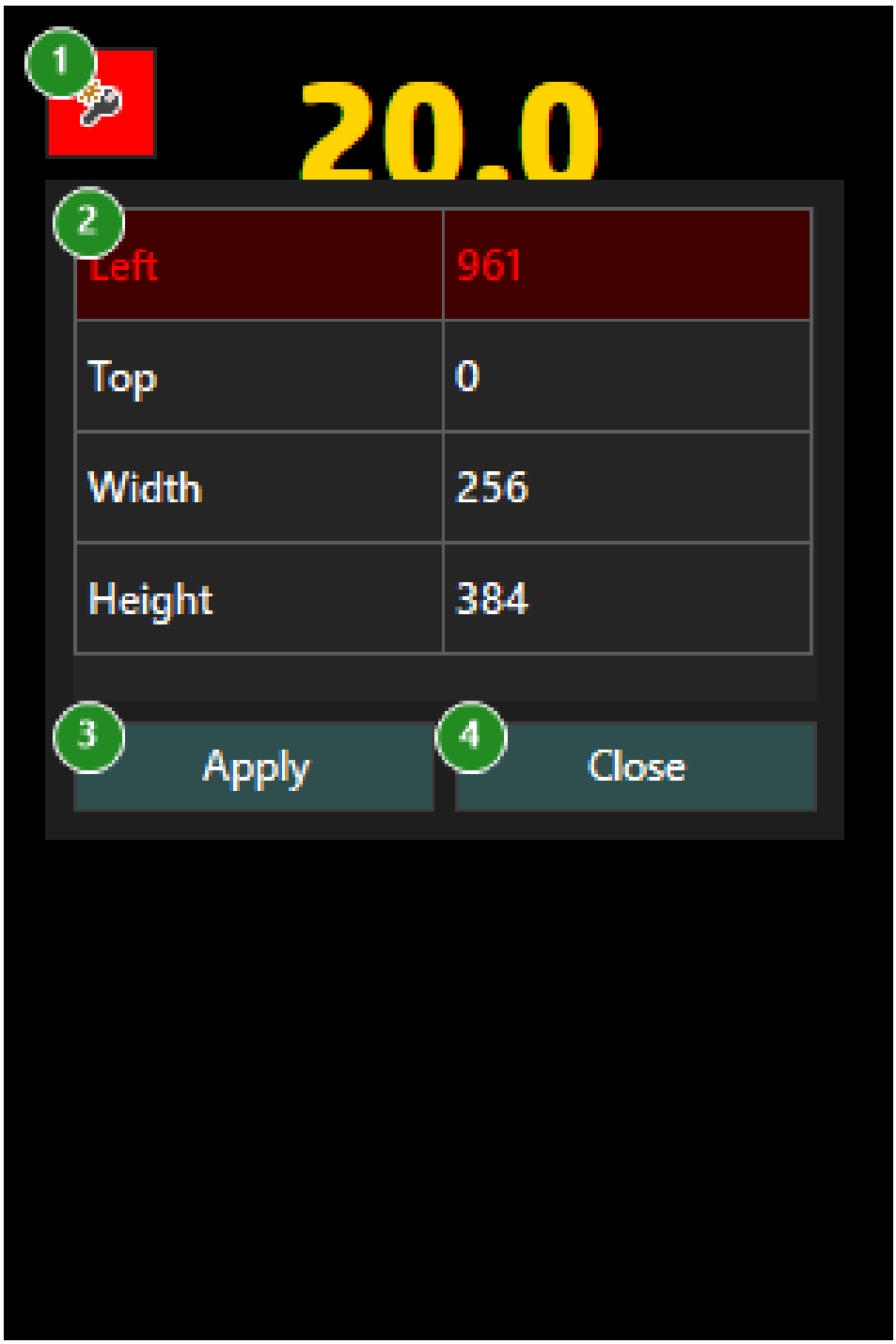
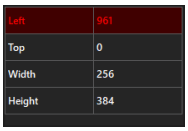


Figure 60. The settings panel of the external shot clock window.

No.	Control	Name	What It Does
1		**Settings (red button, top left)**	Opens or closes the settings panel of the external shot clock window with the values Left, Top, Width and Height. The button is shown only while the mouse is over the window or the panel is open.
2		**Left / Top / Width / Height**	Shows the position and the size of the window in pixels. Click a value in the right column, type the new number and press Enter; the window changes when you click Apply. Negative values for Left and Top are treated as 0; a width or height of 0 is replaced by 320.

No.	Control	Name	What It Does
3	Apply	**Apply**	Moves the window to the typed position, gives it the typed size and writes the four values to start.xml (section SC24: Left, Top, Width, Height). They are used every time the window is opened.
4	Close	**Close**	Hides the settings panel. Values that were not applied are not stored.

1. Move the mouse over the window. The red settings button appears at the top left.
2. Click it. The settings panel opens with the current values.
3. Click a value in the right column, type the new number and press Enter.
4. Click "Apply". The window moves and changes its size, and the values are stored.
5. Click "Close" or press Esc to hide the panel.

Value	Meaning	Value of a new installation
Left	Distance from the left edge of the Windows desktop, in pixels	961
Top	Distance from the top edge of the desktop, in pixels	0
Width	Width of the window in pixels	256
Height	Height of the window in pixels	384

- A negative Left or Top is treated as 0. A width or height of 0 is replaced by 320.
- The values are stored in start.xml (section SC24) and used every time the window opens.
- Values that were typed but not applied are not stored.
- To put the window on a second monitor, use the desktop position of that monitor, as for the board window (8.5).

8.4 Position and Size of the Board Window

The board window has no frame either. Its place and size are set on the Settings page.

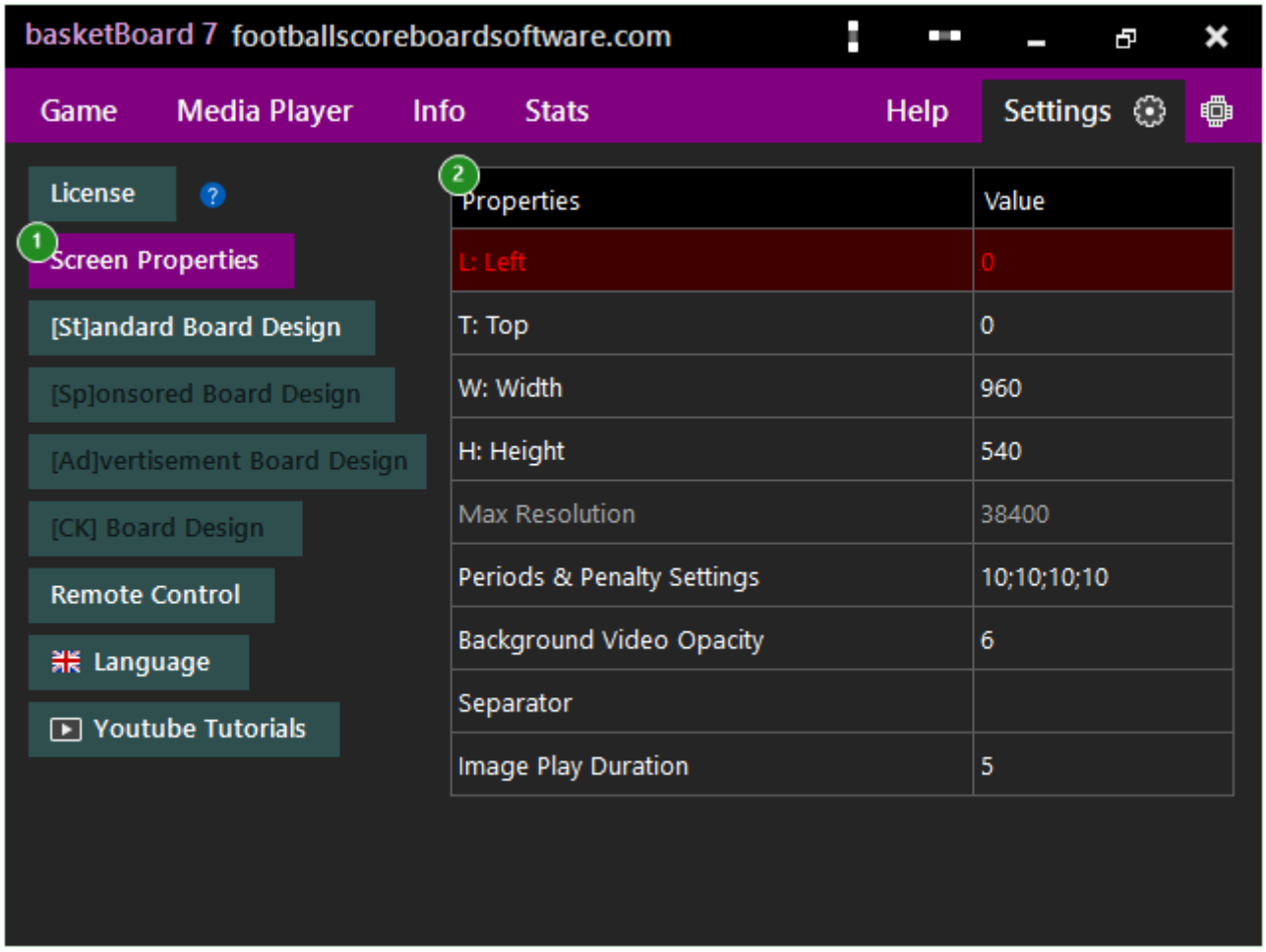
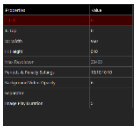


Figure 61. Settings > Screen Properties: the first four rows place and size the board window.

No.	Control	Name	What It Does
1	Screen Properties	**Screen Properties**	Shows the Screen Properties table on the right side of the Settings page: place and size of the board window, background video opacity, score separator and image play duration.
2		**Properties table**	Shows the Screen Properties. Click a value, type and press Enter: Left, Top, Width and Height place and size the board window (Width and Height not above Max Resolution), Background Video Opacity is 0 to 10, Separator is the text between the scores, Image Play Duration is 1 to 120 seconds. Each change is saved in start.xml at once and the board is redrawn. Max Resolution is read only; the Periods & Penalty Settings row opens the rules dialog with the button in its cell.

1. Click Settings in the menu strip, then "Screen Properties".
2. Click the value of "L: Left", "T: Top", "W: Width" or "H: Height".
3. Type the new number and press Enter.

The board window moves or changes its size at once, and the value is stored in start.xml (BOARD/Left, Top, Width, Height).

Row	Meaning	Value of a new installation
"L: Left"	Distance of the board window from the left edge of the Windows desktop, in pixels	0
"T: Top"	Distance from the top edge of the desktop, in pixels	0
"W: Width"	Width of the board in pixels	960
"H: Height"	Height of the board in pixels	540
"Max Resolution"	The largest width and height your licence allows. Read only.	From the licence

- A width or height above "Max Resolution" is set back to "Max Resolution".
- A negative Left or Top is treated as 0.
- The same place and size are used in all four display modes, for the info graphics and for the media player.
- The other rows of the table are described in chapter 15.

The pictures of the boards in this guide were made with a board of 1920 x 1080 pixels.

8.5 The Board on a Second Monitor

1. Connect the board monitor, LED wall or projector to the PC.
2. In the display settings of Windows choose "Extend these displays". Place the board monitor to the right of or below the main monitor.
3. Open Settings > "Screen Properties" (8.4).
4. Set "L: Left" and "T: Top" to the position of the board monitor on the desktop. With a main monitor of 1920 x 1080 and the board monitor to its right, this is Left 1920 and Top 0.
5. Set "W: Width" and "H: Height" to the resolution of the board monitor, for example 1920 and 1080.

> **Note:** A monitor to the left of or above the main monitor has negative desktop coordinates, which Left and Top do not accept. Arrange the monitors in Windows so that the board monitor is to the right of or below the main monitor.

- The operator screen then keeps the main window; chapter 3 shows how to dock it.
- The external shot clock window (8.3) can go to a third monitor in the same way.

8.6 NDI Output of the Board

The "NDI" button sends the board over the network as an NDI video stream. A vision mixer, streaming software or an NDI monitor on the same network can then use the board as a video source, without a cable from the board monitor.

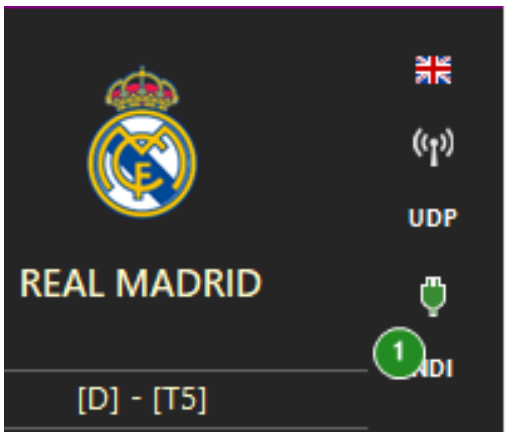


Figure 62. The "NDI" button in the column of small buttons at the right of the control panel (tool tip "Start/Stop NDI Camera Stream").

No.	Control	Name	What It Does
1	NDI	**NDI**	Starts the NDI output of the board under the sender name stored in start.xml (NDI/SenderName); the button blinks red while the stream runs. A second click stops the stream; if NDI cannot be started, a message gives the reason.

1. Click Game in the menu strip.
2. Click "NDI". The button blinks red once per second while the stream is sent.
3. In the receiving program choose the sender. A new installation sends under the name B7_NDI, usually shown together with the name of the computer.
4. Click "NDI" again to stop the stream.

What is sent:

- The board window in use: the board of the current display mode, an info graphic or the media player. When you change the display mode or show a graphic, the stream follows without a restart. The display modes can be changed while NDI is on.
- The size of the board window (8.4), with 60 frames per second as the target.
- Video only: no sound and no transparency. With the key colour Transparent of Chroma Key mode, choose one of the other key colours for NDI (chapter 9).

Good to know:

- The output is not remembered. After a restart it is off; click "NDI" again.
- The sender name is the entry NDI/SenderName of start.xml. It has no field in the program: close the program, change the entry and start the program again. Give every board PC on the same network its own name.
- The files that NDI needs are installed by Setup.
- On a slow PC or with a very large board the control panel can react more slowly while NDI is on. Switch NDI off when you do not need it.

If NDI cannot start, the button stays dark and a red message "Warning" appears. Its text begins with "NDI:" and gives the reason. The reason is also written to the log (chapter 16).

9. Display Modes St, Sp, Ad and CK

The display mode decides what the board window looks like. basketBoard 7 has four modes. The control panel and the match work the same in all of them; only the board and the extra page of the menu strip change.

9.1 The Four Modes

Mode	Button and tool tip	What the board shows	Use it for
Standard (St)	"St", "Standard View"	The full scoreboard	An LED wall, a monitor or a projector in the hall
Sponsored (Sp)	"Sp", "Sponsored View"	The scoreboard and a strip with sponsor images or a scrolling text	A hall board with sponsor messages
Advertisement (Ad)	"Ad", "Advertisement View"	A scoreboard box, a large media area and up to two banners	Commercials, a camera or a screen capture beside the score
Chroma Key (CK)	"CK", "Chroma Key View"	A compact scorebug and keyed graphics on a key colour	TV and streaming: a vision mixer keys the graphics over the live picture



Figure 63. Standard board (left) and Sponsored board with the still empty strip at the bottom (right).

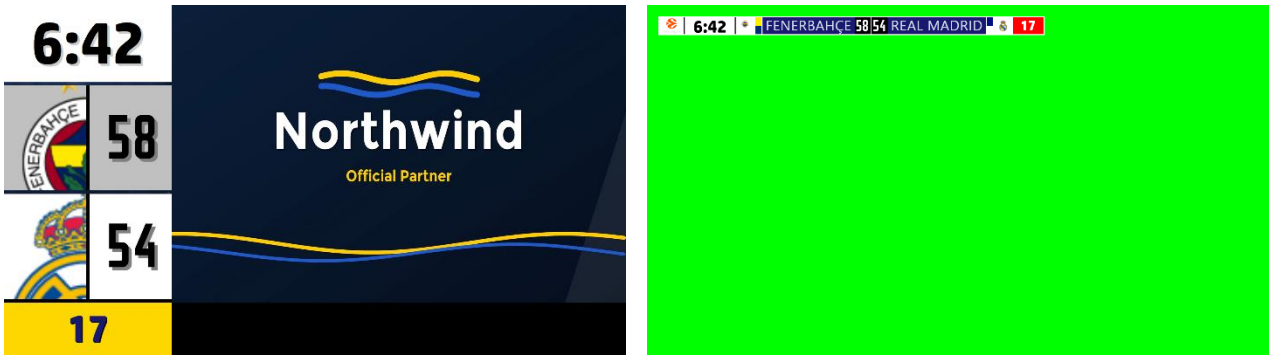


Figure 64. Advertisement board with the demo clip Northwind_Promo in the media area (left) and Chroma Key board with the scorebug on green (right).

9.2 Switching the Mode

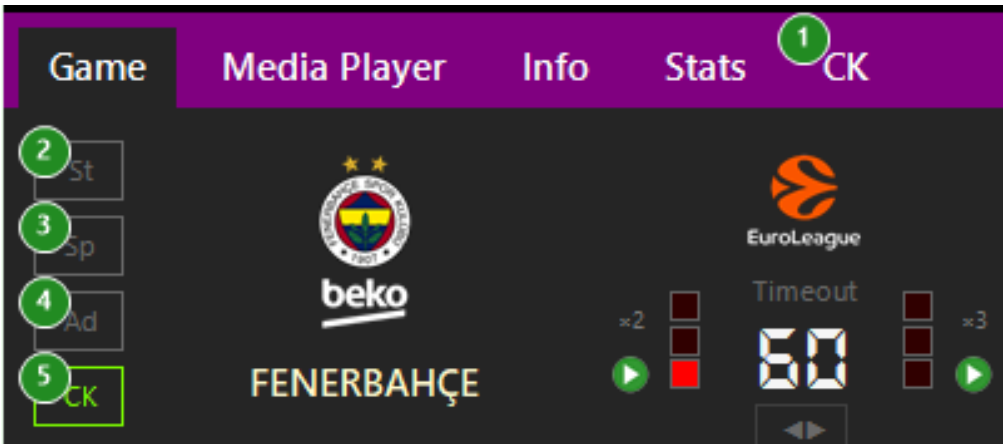


Figure 65. The four mode buttons of the control panel and the mode button of the menu strip, here in Chroma Key mode.

No.	Control	Name	What It Does
1	CK	**Sp / Ad / CK**	Opens the control page of the current display mode: Sponsored, Advertisement or Chroma Key. The caption is the abbreviation of the mode chosen on the Game page; the tab is hidden in Standard mode. The caption flashes while a playlist, a camera, an NDI source or a screen capture runs on the Advertisement or Chroma Key page.
2	St	**St**	Selects the Standard mode: the full scoreboard on the board. The caption of the active mode is green. The match values go on unchanged, and the mode is stored in start.xml (BOARD/DisplayMode) for the next start.
3	Sp	**Sp**	Selects the Sponsored View: the scoreboard with a sponsor strip. The caption turns green, the menu strip gets the item Sp, and the mode is stored in start.xml (BOARD/DisplayMode).
4	Ad	**Ad**	Selects the Advertisement View: advertisements with the scoreboard values in banners. The caption turns green, the menu strip gets the item Ad, and the mode is stored in start.xml (BOARD/DisplayMode).
5	CK	**CK**	Selects the Chroma Key View: the scoreboard on a key colour for a video mixer. The caption turns green, the menu strip gets the item CK, and the mode is stored in start.xml (BOARD/DisplayMode).

1. Click Game in the menu strip.
2. Click "St", "Sp", "Ad" or "CK" in the column at the left of the control panel. The caption of the active mode is green and the board changes at once.
3. In Sp, Ad and CK mode a button with the name of the mode appears in the menu strip between Stats and Settings. Click it to open the page of the mode (9.3 to 9.5). In St mode there is no such button.

Another program can switch the mode over HTTP with cmd=click&value=st, sp, ad or ck (chapter 14).

What a change of mode does:

- The game clock, the shot clock, the score and all other match values go on unchanged. The mode can be changed while the clock runs.
- The board loads the current design of the new mode (chapter 11).
- The mode is stored in start.xml (BOARD/DisplayMode). The program starts in this mode the next time.
- Leaving Ad mode stops the playlist, the camera, the screen capture and the banner playlists of the Ad page. Leaving CK mode stops the playlist, the camera and the screen capture of the CK page.
- The NDI output (chapter 8) goes on and sends the board of the new mode.

Info graphics, statistics and the main media player cover the whole board in St, Sp and Ad mode. Click Game to return to the scoreboard. In CK mode the info screens appear as lower thirds under the scorebug (9.5.4).

9.3 Sponsored Mode (Sp)

Sponsored mode shows the Standard scoreboard and, below or above it, a strip with an endless row of sponsor images or a scrolling text. The strip stays empty until you click "Apply" on the Sp page for the first time.

Board Output **Control Panel**

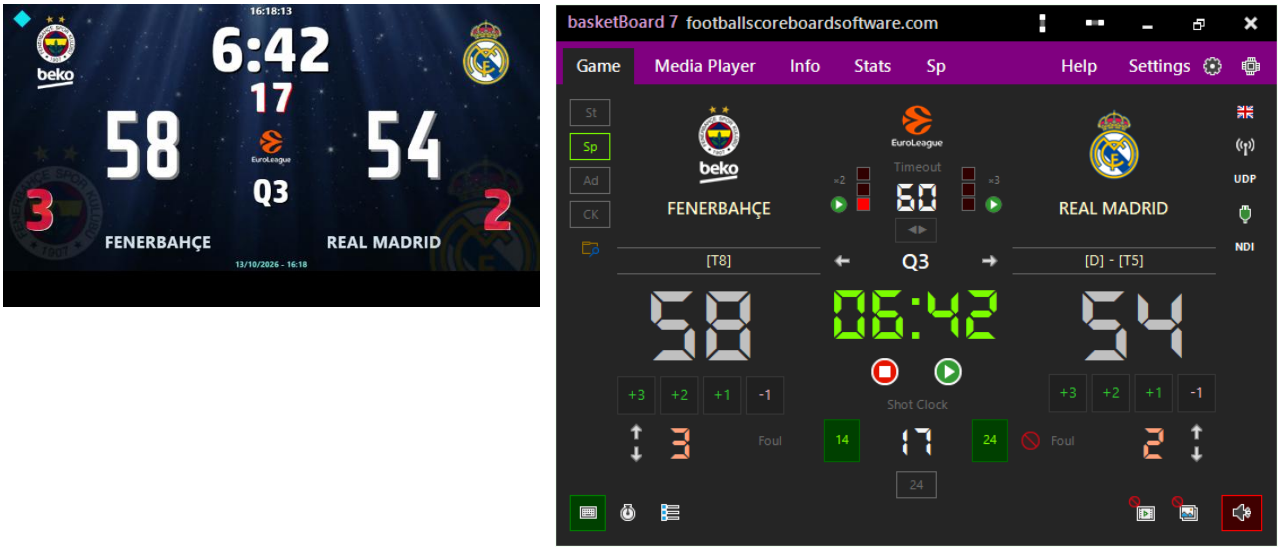


Figure 66. Sponsored mode: the board with the empty strip at the bottom and the control panel with "Sp" selected.

Click "Sp" in the menu strip to open the Sp page. It has three tabs: "Sponsors", "Scrolling Text" and "Settings". It opens on the tab whose content is on the strip.

9.3.1 Sponsor Images

The strip shows all images of the sponsor list, in the order of the list. The sponsor list is the one of Info > "Sponsors" (chapter 12).

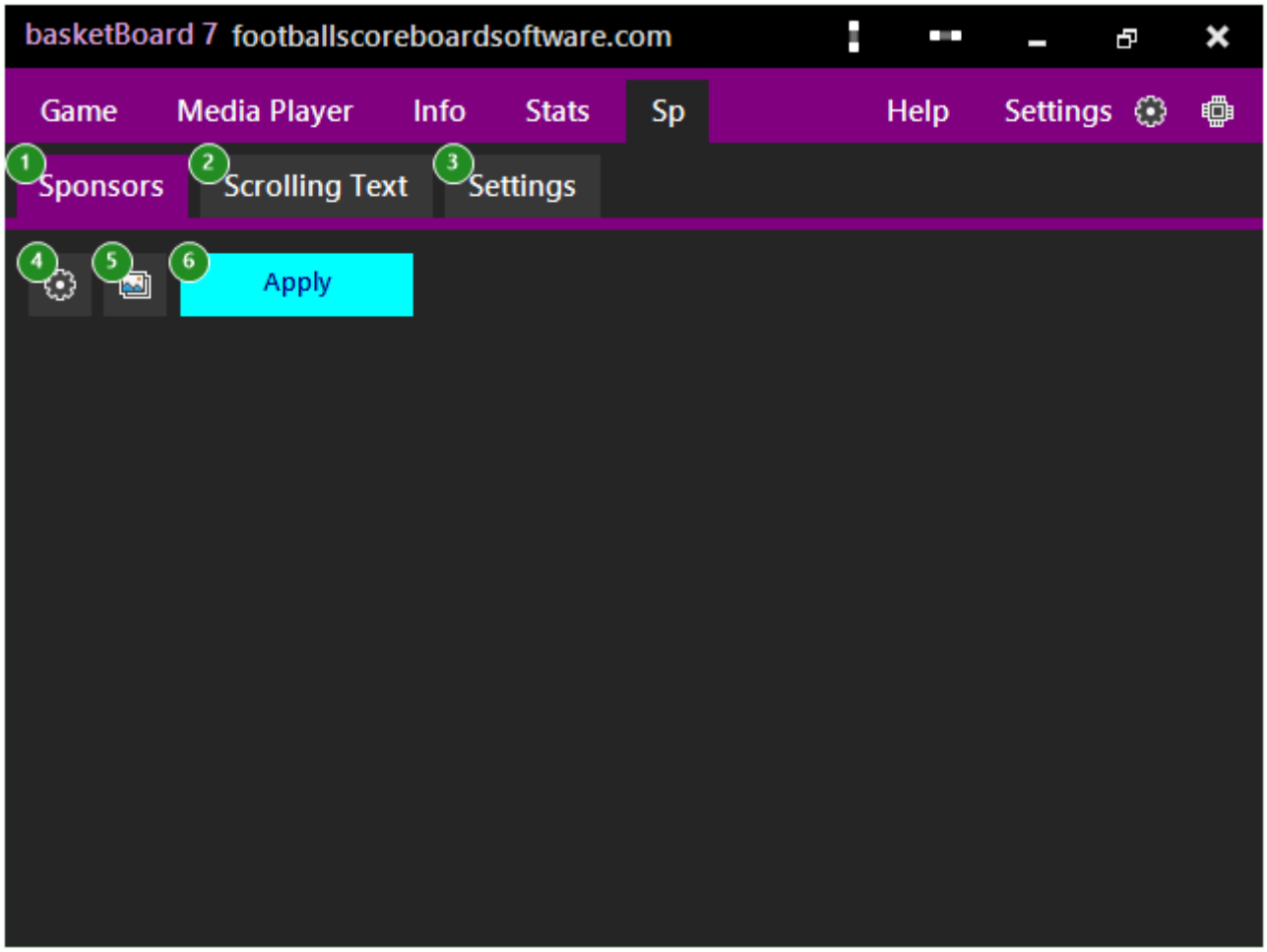


Figure 67. The "Sponsors" tab of the Sp page.

No.	Control	Name	What It Does
1	Sponsors	**Sponsors**	Opens the Sponsors tab of the Sponsored page: the sponsor images that run on the strip of the board.
2	Scrolling Text	**Scrolling Text**	Opens the Scrolling Text tab with its four text slots. The tab always opens on slot 1 and puts the cursor at the end of the text.
3	Settings	**Settings**	Opens the Settings tab and loads the saved location and height of the strip from start.xml.
4		**Style (gear)**	Opens or closes the style panel of the sponsor images (image-height, padding, top, speed, direction).
5		**Sponsor list (picture)**	Opens the sponsor list of the Info page, where the sponsor images are added, removed and sorted. Click Sp in the menu strip to come back.
6	Apply	**Apply**	Builds the endless row of sponsor images from the sponsor list and the values that stand in the style panel, saved or not, and shows it on the strip of the board. The background is the first colour square of the scrolling text style. Saves Slide as the content of the strip in start.xml, so the images return after a restart, and closes the style panel.

1. Click the picture button to open the sponsor list. Add, remove or sort the images there.
2. Click "Sp" in the menu strip to come back.
3. Click "Apply". The images run on the strip.



Figure 68. The Sponsored board with the sponsor images on the strip.

Click "Apply" again after a change of the list or of the style; the strip is not rebuilt by itself.

The gear button opens the style panel of the images. Click a value, type and press Enter.

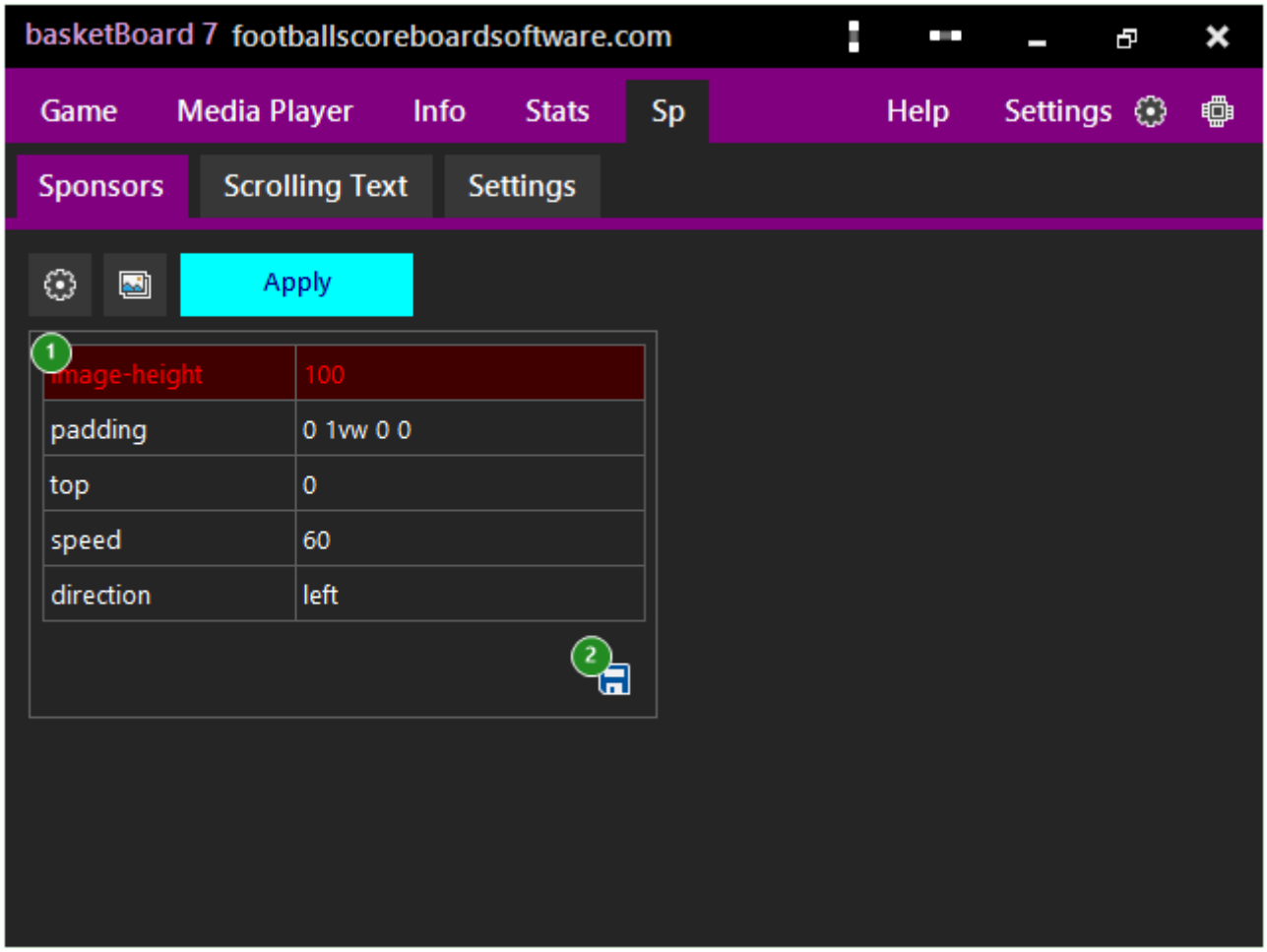
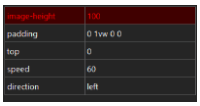


Figure 69. The style panel of the sponsor images.

No.	Control	Name	What It Does
1		**Style table of the images**	Shows the style of the sponsor images: image-height, padding, top, speed (pixels per second) and direction (left or right). Click a value and type; a number without a unit is a percentage of the strip height. The values are used by Apply and saved by the disk button.
2		**Save (disk)**	Saves the style table of the sponsor images to configSp.xml (ScrollImgStyle) and closes the panel. The board changes only with Apply.

Row	Factory value	Meaning
image-height	100	Height of the images. A number without a unit is a percentage of the strip height.
padding	0 1vw 0 0	Space around each image: top, right, bottom, left. 1vw is 1 % of the board width.
top	0	Moves the images down (positive) or up (negative).
speed	60	Speed in pixels per second.
direction	left	left or right.

"Apply" uses the values as they stand. The disk button saves them and closes the panel.

9.3.2 Scrolling Texts

The "Scrolling Text" tab holds four texts in the slots 1 to 4. The strip shows the one you applied last. Slot 1 of a new installation holds a sample with EuroLeague results.

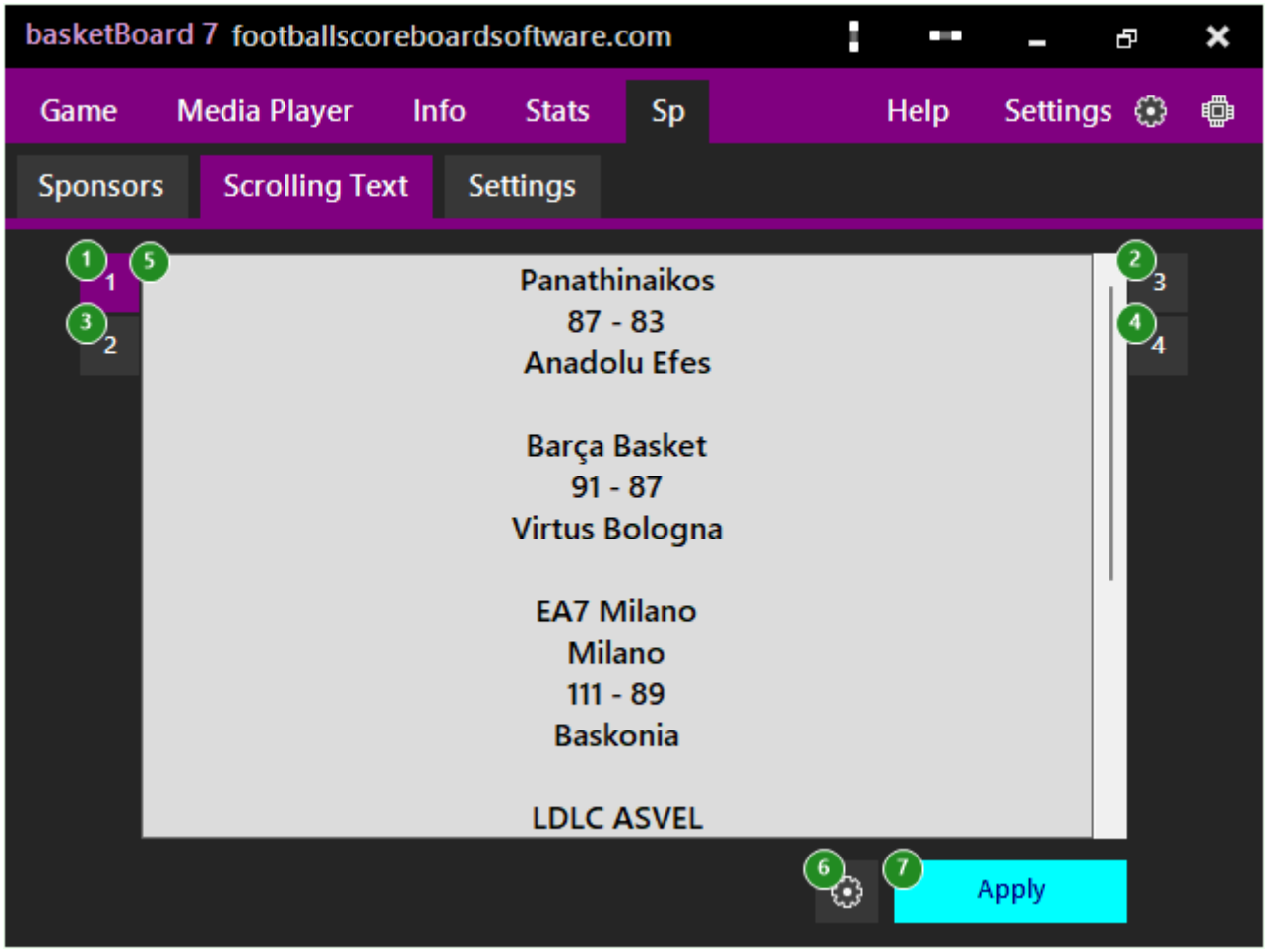


Figure 70. The "Scrolling Text" tab with the sample text of slot 1.

No.	Control	Name	What It Does
1		1	Selects text slot 1 and loads its saved text into the box. Text typed into another slot and not yet applied is lost.
2		3	Selects text slot 3 and loads its saved text into the box. Text typed into another slot and not yet applied is lost.
3		2	Selects text slot 2 and loads its saved text into the box. Text typed into another slot and not yet applied is lost.
4		4	Selects text slot 4 and loads its saved text into the box. Text typed into another slot and not yet applied is lost.
5		Text box	Holds the text of the selected slot. Every line becomes one item of the scrolling text; the lines take the two text colours in turn and an empty line makes a wider gap. The text is saved by Apply only.

No.	Control	Name	What It Does
6		**Style (gear)**	Opens or closes the style panel of the scrolling text (font, size, weight, line height, shadow, padding, top, speed, direction and three colours).
7		**Apply**	Saves the text of the selected slot to configSp.xml and runs it on the strip of the board with the style and colours that stand in the style panel, saved or not. Saves Scroll as the content of the strip in start.xml, so the text returns after a restart, and closes the style panel.

1. Click a slot button 1 to 4. The text of the slot appears in the box.
2. Type the text. Every line becomes one item. The lines take two colours in turn; an empty line makes a wider gap.
3. Click "Apply". The text is saved in the slot and runs on the strip.



Figure 71. The Sponsored board with the scrolling text of slot 1.

> **Note:** The text of a slot is saved only by "Apply". Changes are lost when you click another slot or leave the tab before "Apply".

The gear button beside "Apply" opens the style panel of the text.

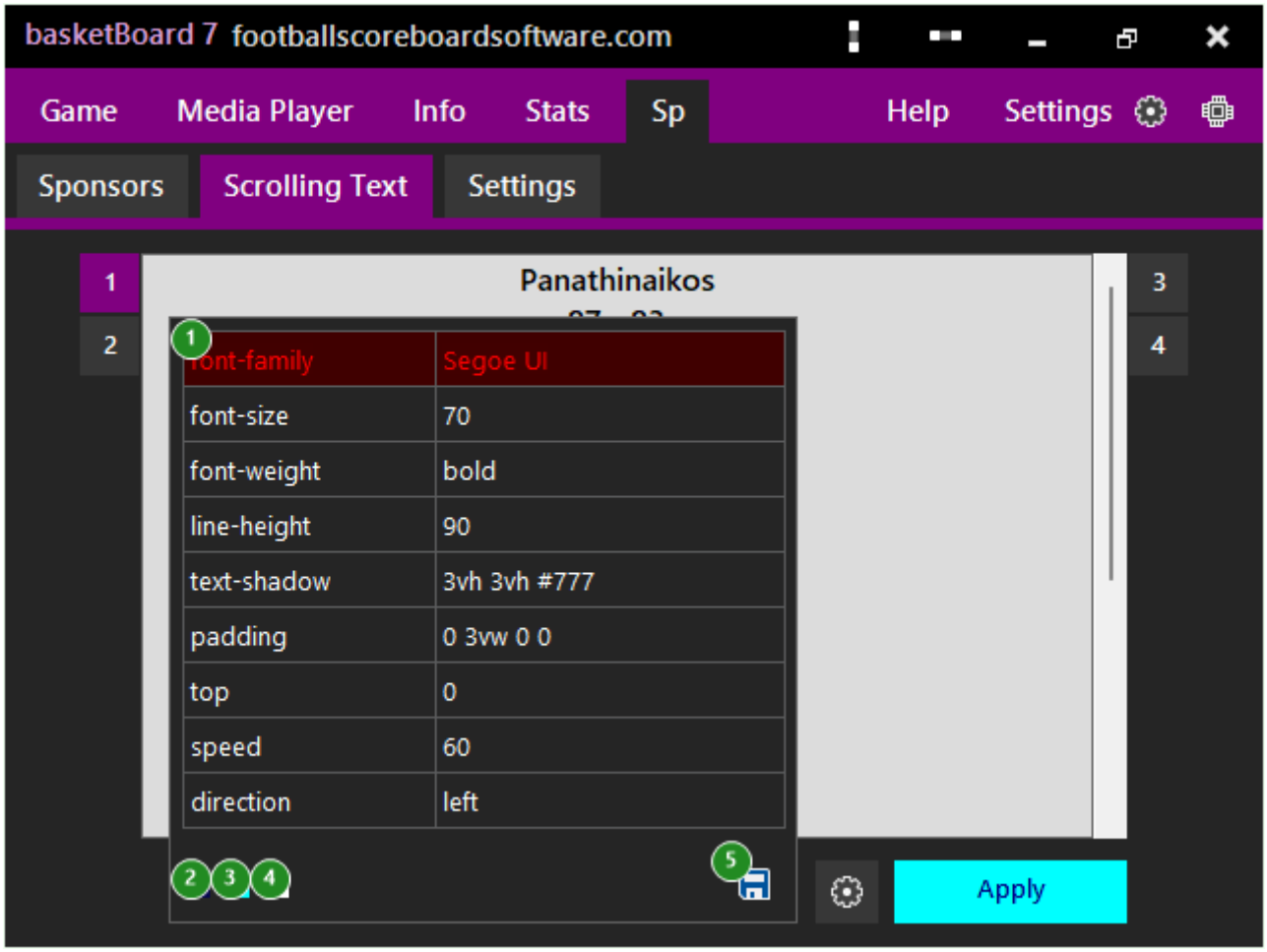
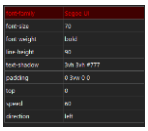


Figure 72. The style panel of the scrolling text with the three colour squares.

No.	Control	Name	What It Does
1		**Style table of the text**	Shows the style of the scrolling text: font-family, font-size, font-weight, line-height, text-shadow, padding, top, speed (pixels per second) and direction (left or right). Click a value and type; in the font-family row a font button appears that opens the font dialog. A number without a unit is a percentage of the strip height.
2		**Background colour**	Opens the colour dialog for the background of the strip. The colour is also used behind the sponsor images. It is saved to configSp.xml at once and shown on the board with the next Apply.
3		**Colour of lines 1, 3, 5**	Opens the colour dialog for the first, third, fifth line of the text and so on. The colour is saved to configSp.xml at once and shown on the board with the next Apply.
4		**Colour of lines 2, 4, 6**	Opens the colour dialog for the second, fourth, sixth line of the text and so on. The colour is used by the next Apply. Unlike the other two squares this colour is not saved at once but only by the disk button.
5		**Save (disk)**	Saves the style table and the three colours of the scrolling text to configSp.xml (ScrollTextStyle) and closes the panel. The board changes only with Apply.

Row	Factory value	Meaning
font-family	Segoe UI	The font; the button at the end of the value opens the font dialog.
font-size	70	Size of the letters; a number without a unit is a percentage of the strip height.
font-weight	bold	normal or bold.
line-height	90	Height of the text line in percent of the strip height.
text-shadow	3vh 3vh #777	Shadow: offset right, offset down, colour; none for no shadow.
padding	0 3vw 0 0	Space around each item: top, right, bottom, left.
top	0	Moves the text down (positive) or up (negative).
speed	60	Speed in pixels per second.
direction	left	left or right.

The three colour squares are, from left to right: the background of the strip (also behind the sponsor images), the colour of the lines 1, 3, 5 and the colour of the lines 2, 4, 6.

> **Note:** Click the disk button after changing a colour. The third square is saved only by the disk button.

9.3.3 Strip Location and Height

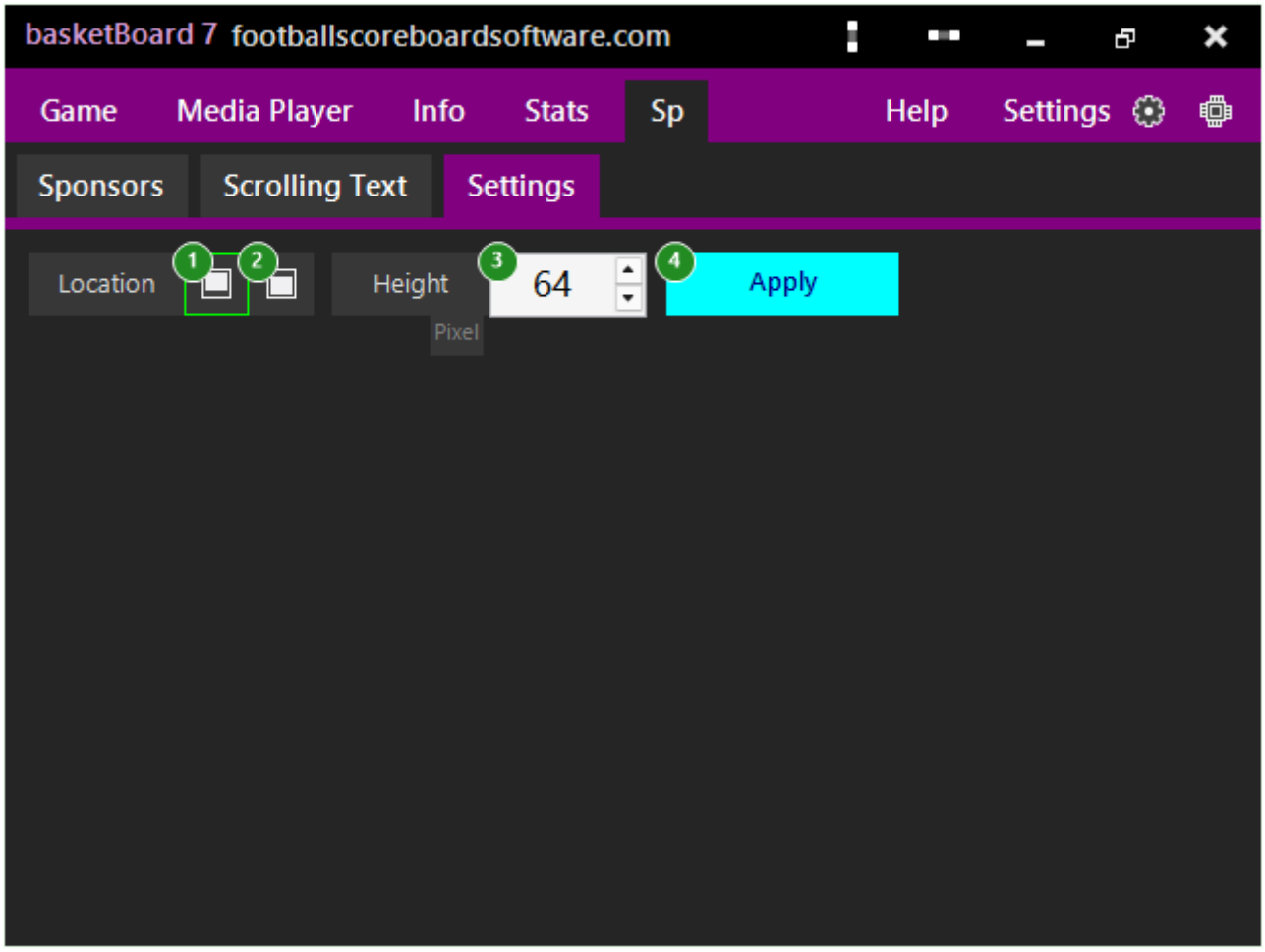


Figure 73. The "Settings" tab of the Sp page.

No.	Control	Name	What It Does
1		**Location: bottom (left button)**	Puts the strip at the bottom of the board. A green frame marks the chosen location; the board changes with Apply.
2		**Location: top (right button)**	Puts the strip at the top of the board. A green frame marks the chosen location; the board changes with Apply.
3		**Height**	Sets the height of the strip in pixels of the board window, 0 to 1920 (factory value 64). The scoreboard uses the rest of the board height. The board changes with Apply.
4		**Apply**	Saves the location and the height of the strip to start.xml (Sp/Location, Sp/Height) and resizes the board at once.

1. Click the left "Location" button for a strip at the bottom of the board or the right one for a strip at the top. A green frame marks the choice.
2. Set "Height" in pixels of the board (0 to 1920; factory value 64).
3. Click "Apply". The board changes at once.

The scoreboard uses the rest of the board height. The size of the board is set in Settings > "Screen Properties" (chapter 8).

9.3.4 Designs and Files of Sp Mode

Sponsored mode uses the Standard designs. "[Sp]onsored Board Design" in Settings edits the Standard scoreboard (chapter 11). An own design saved there appears in the design list of Sp mode.

File	Content
start.xml, section Sp	Location, Height, and Start (what the strip shows after a restart: Slide or Scroll)
configSp.xml	The four texts and the two style tables

9.4 Advertisement Mode (Ad)

Advertisement mode divides the board into a scoreboard box, a large media area and up to two banners. The media area shows a playlist, a camera, an NDI source or a part of the operator's screen; a banner shows sponsor images, a scrolling text or a playlist of its own.

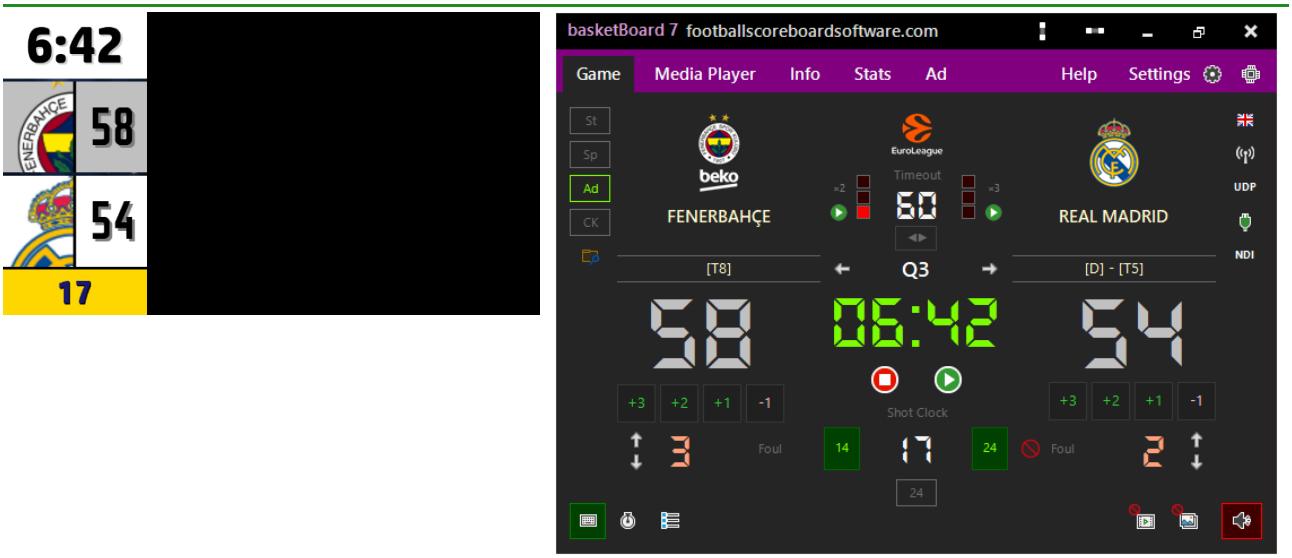


Figure 74. Advertisement mode right after the switch: the scoreboard box at the left and the control panel with "Ad" selected.

The scoreboard box of the factory design shows the game clock, the logos, the two scores and, in the field at the bottom, the shot clock. The board picture board_ad.png in 9.1 shows the factory layout: box at the left with 27 % of the board width and the second banner at the bottom with 15 % of the height.

9.4.1 The Ad Page

Click "Ad" in the menu strip. The page has five tabs: "Media Player", "Camera", "Screen Capture", "Banner" and "Settings". It opens on the tab of the source used last; a new installation opens on "Media Player".

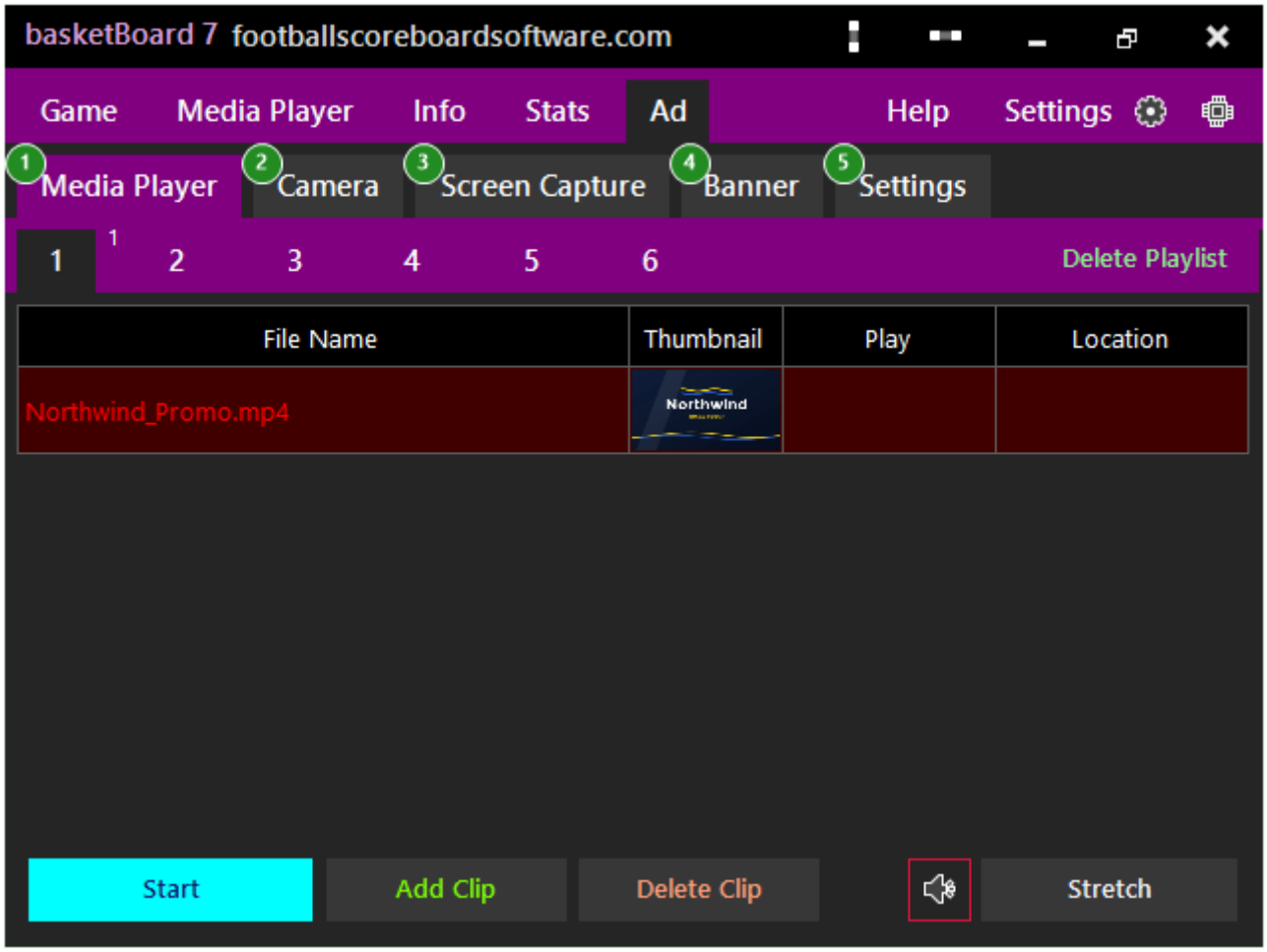


Figure 75. The Ad page as it opens in a new installation, on the "Media Player" tab.

No.	Control	Name	What It Does
1	Media Player	**Media Player**	Opens the Media Player tab: the six playlists of the media area. The caption blinks while a clip or a playlist is on the board.
2	Camera	**Camera**	Opens the Camera tab for a camera or an NDI source and reads the list of cameras again. The caption blinks while the camera or NDI source runs.
3	Screen Capture	**Screen Capture**	Opens the Screen Capture tab and loads the saved capture area. The caption blinks while a capture runs.
4	Banner	**Banner**	Opens the banner editor for the two banners. A banner that is switched off in the settings is grey there.
5	Settings	**Settings**	Opens the Settings tab with the layout of the board, on the sub-tab Scoreboard. The page opens on this tab when no playlist, camera or capture was used last.

- Only one source feeds the media area at a time. Starting a playlist, a camera or a capture stops the other two.
- While a source is on the board, the caption of its tab and the "Ad" button of the menu strip blink.
- The sources keep running while you work on the control panel. Leaving Ad mode stops them.
- After a restart the banners show their images or text again. A playlist, a camera or a capture does not start by itself.

9.4.2 Layout Settings

The "Settings" tab places the scoreboard box and the two banners; the media area takes the rest. Each of the four sub-tabs shows a small table.

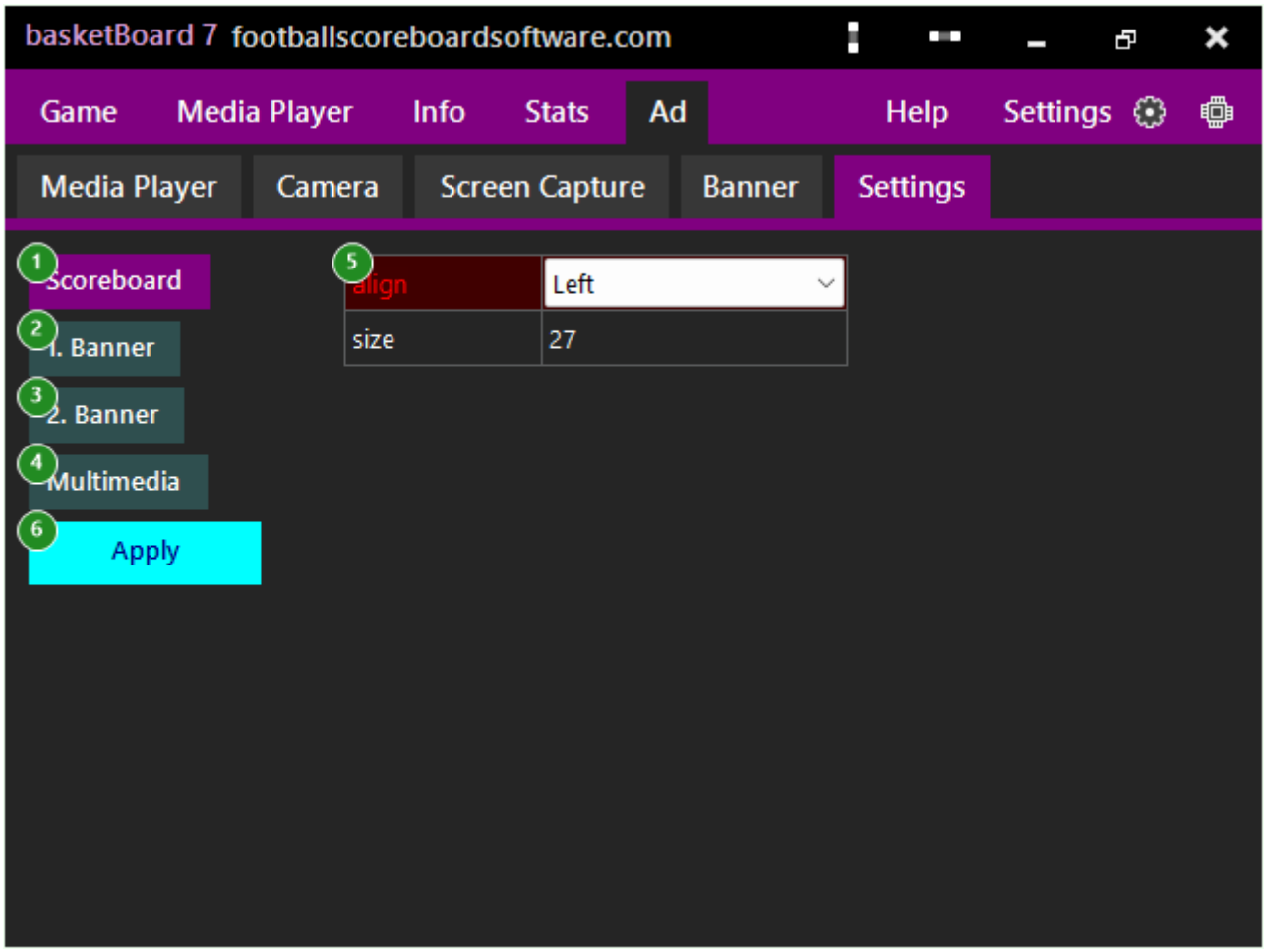
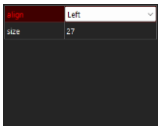


Figure 76. The "Settings" tab with the sub-tab "Scoreboard".

No.	Control	Name	What It Does
1	Scoreboard	**Scoreboard**	Loads the saved side (align) and size of the scoreboard box into the table. Changes of another sub-tab that were not applied are lost.
2	1. Banner	**1. Banner**	Loads the saved values of the first banner into the table: align, size, dock and visible. Changes of another sub-tab that were not applied are lost.
3	2. Banner	**2. Banner**	Loads the saved values of the second banner into the table: align, size, dock and visible. Changes of another sub-tab that were not applied are lost.
4	Multimedia	**Multimedia**	Loads the saved display mode of the media area into the table.
5		**Settings table**	Shows the values of the open sub-tab. Click a value: align offers Top, Bottom, Left and Right, dock and visible offer Yes and No, displayMode offers the seven display modes; size is typed as a whole number (percent). The values are saved by Apply.

No.	Control	Name	What It Does
6	Apply	**Apply**	Saves the table of the open sub-tab to configAd.xml and rebuilds the board layout at once. A banner with size 0 or visible No is emptied and its playlist is stopped. A size that is not a whole number is saved as well, but the layout is then not rebuilt and no message appears.

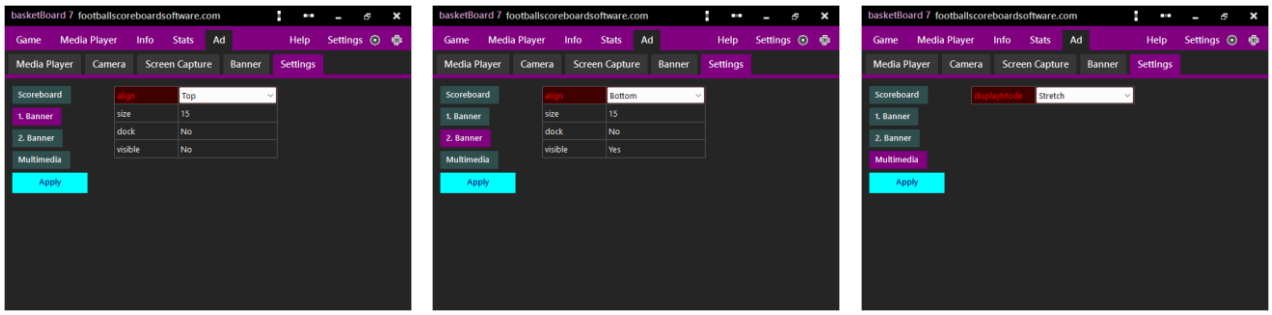


Figure 77. The sub-tabs "1. Banner", "2. Banner" and "Multimedia" with the factory values.

Sub-tab	Row	Values	Meaning
Scoreboard	align	Top, Bottom, Left, Right	The side of the scoreboard box.
Scoreboard	size	Whole number	Width (Left, Right) or height (Top, Bottom) of the box in percent of the board. Factory value 27.
1. Banner, 2. Banner	align	Top, Bottom, Left, Right	The side of the banner.
1. Banner, 2. Banner	size	Whole number	Thickness of the banner in percent of the board height. 0 switches the banner off. Factory value 15.
1. Banner, 2. Banner	dock	Yes, No	No: the banner lies beside the scoreboard box. Yes: the banner runs across the whole board.
1. Banner, 2. Banner	visible	Yes, No	No removes the banner from the board.
Multimedia	displayMode	Stretch, CoverCenter, ZoomCenter, SizeToFitCenter, SizeToFit, Center, Original	How a picture is fitted into the media area. Factory value Stretch.

1. Click the sub-tab and change the values.
2. Click "Apply" before you open another sub-tab. "Apply" saves the open sub-tab and rebuilds the board.

- In a new installation the first banner is off and the second banner lies at the bottom beside the scoreboard box.
- Give the two banners different sides; two banners on the same side lie on top of each other.

- Type size as a whole number. Other text is saved, but the layout is not rebuilt.

9.4.3 Media Player Tab

The "Media Player" tab plays videos, sound files and images in the media area. It has six playlists. Playlist 1 of a new installation holds the demo clip Northwind_Promo.

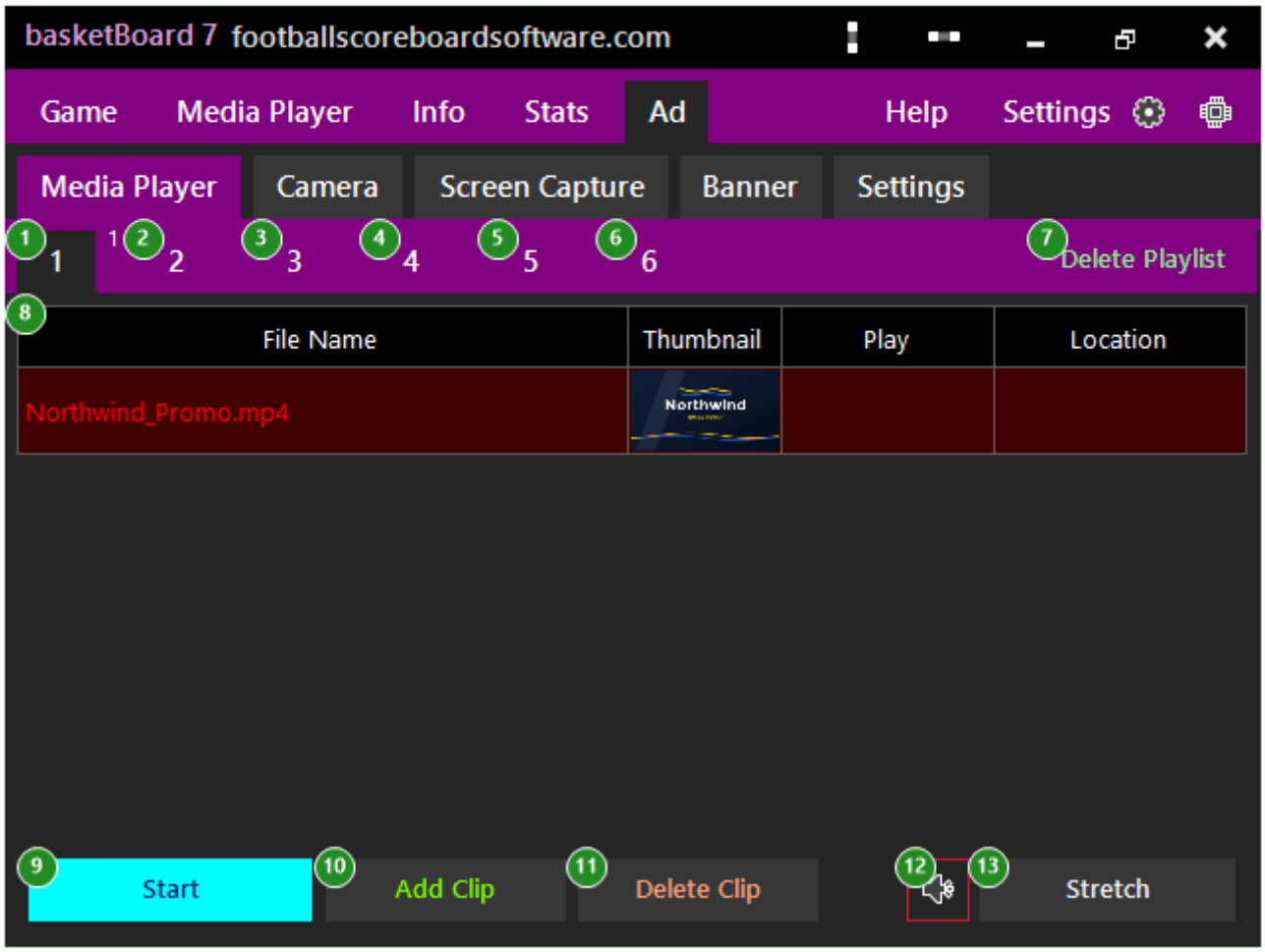
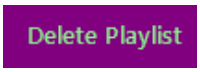
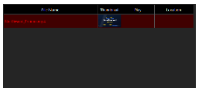
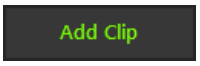
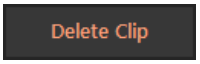


Figure 78. The "Media Player" tab of the Ad page with the demo clip in playlist 1.

No.	Control	Name	What It Does
1	1	1	Selects playlist 1 of the media area and loads its clips. The small number beside the button is the number of clips. Does nothing while a clip or a playlist plays.
2	2	2	Selects playlist 2 of the media area and loads its clips. The small number beside the button is the number of clips. Does nothing while a clip or a playlist plays.
3	3	3	Selects playlist 3 of the media area and loads its clips. The small number beside the button is the number of clips. Does nothing while a clip or a playlist plays.
4	4	4	Selects playlist 4 of the media area and loads its clips. The small number beside the button is the number of clips. Does nothing while a clip or a playlist plays.
5	5	5	Selects playlist 5 of the media area and loads its clips. The small number beside the button is the number of clips. Does nothing while a clip or a playlist plays.

No.	Control	Name	What It Does
6		**6**	Selects playlist 6 of the media area and loads its clips. The small number beside the button is the number of clips. Does nothing while a clip or a playlist plays.
7		**Delete Playlist**	Removes all clips from the selected playlist and saves the empty list, without a question. The files themselves are not deleted. Hidden while something plays.
8		**Playlist**	Lists the clips of the selected playlist with file name and thumbnail. Click a row to select it; a Play button appears in its Play column. The Location column shows the time left of the clip that plays. A row whose file is missing gets a red selection and no Play button.
9		**Start / Finish**	Plays the playlist in the media area from the selected row on and stops the camera and the screen capture. The button reads Finish while the list runs; after the last clip the list begins again, and a missing file is skipped. Finish ends the list and empties the media area.
10		**Add Clip**	Opens the file dialog for one or more videos, sound files or images and adds them at the end of the selected playlist. The list is saved at once with the full path of each file. Hidden while something plays.
11		**Delete Clip**	Removes the selected row from the playlist and saves the list. The file itself is not deleted. Hidden while something plays.
12		**Sound on / off (speaker)**	Switches the sound of the clips on (green frame) or off (red frame) and saves the choice in start.xml. The sound is off in a new installation.
13		**Display mode (Stretch)**	Opens the list of display modes for the media area: Center, CoverCenter, Original, SizeToFit, SizeToFitCenter, Stretch, ZoomCenter. The choice is saved, shown on the button and applied to the clip that plays.

1. Click a playlist button 1 to 6.
2. Click "Add Clip" and choose one or more files. "Delete Clip" removes the selected row; "Delete Playlist" empties the list without a question.
3. Click a row. A Play button appears in the row: it plays this clip once.
4. Or click "Start" to play the list from the selected row on, in a loop. The button reads "Finish" while the list runs.
5. Click "Finish" (or Stop) to end. The media area becomes empty.

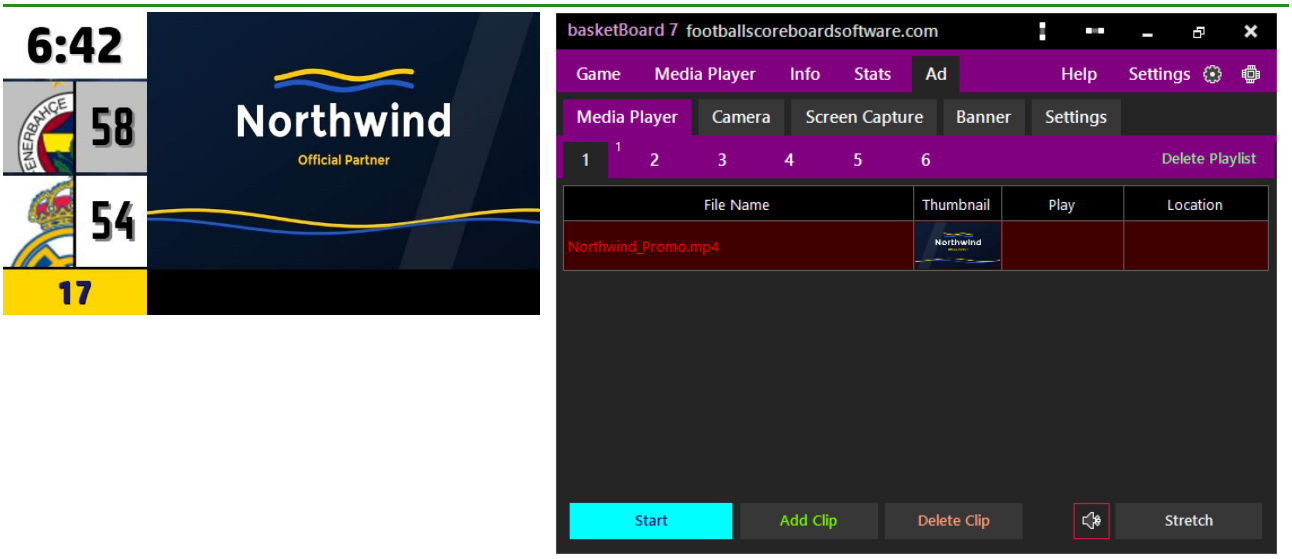


Figure 79. The demo clip of playlist 1 in the media area of the board.

- The speaker button switches the sound of the clips on (green frame) and off (red frame). It is off in a new installation.
- The display mode button (Stretch) sets how the clips fit the media area, as the Multimedia sub-tab does.
- Another program can start a playlist with the HTTP command start_playlist_ad_screen (chapter 14).
- The playlists, the players and the display modes are explained in chapter 12.

9.4.4 Camera and NDI Source

The "Camera" tab brings a live picture into the media area: a camera or video capture device of this PC, or an NDI source of the network.

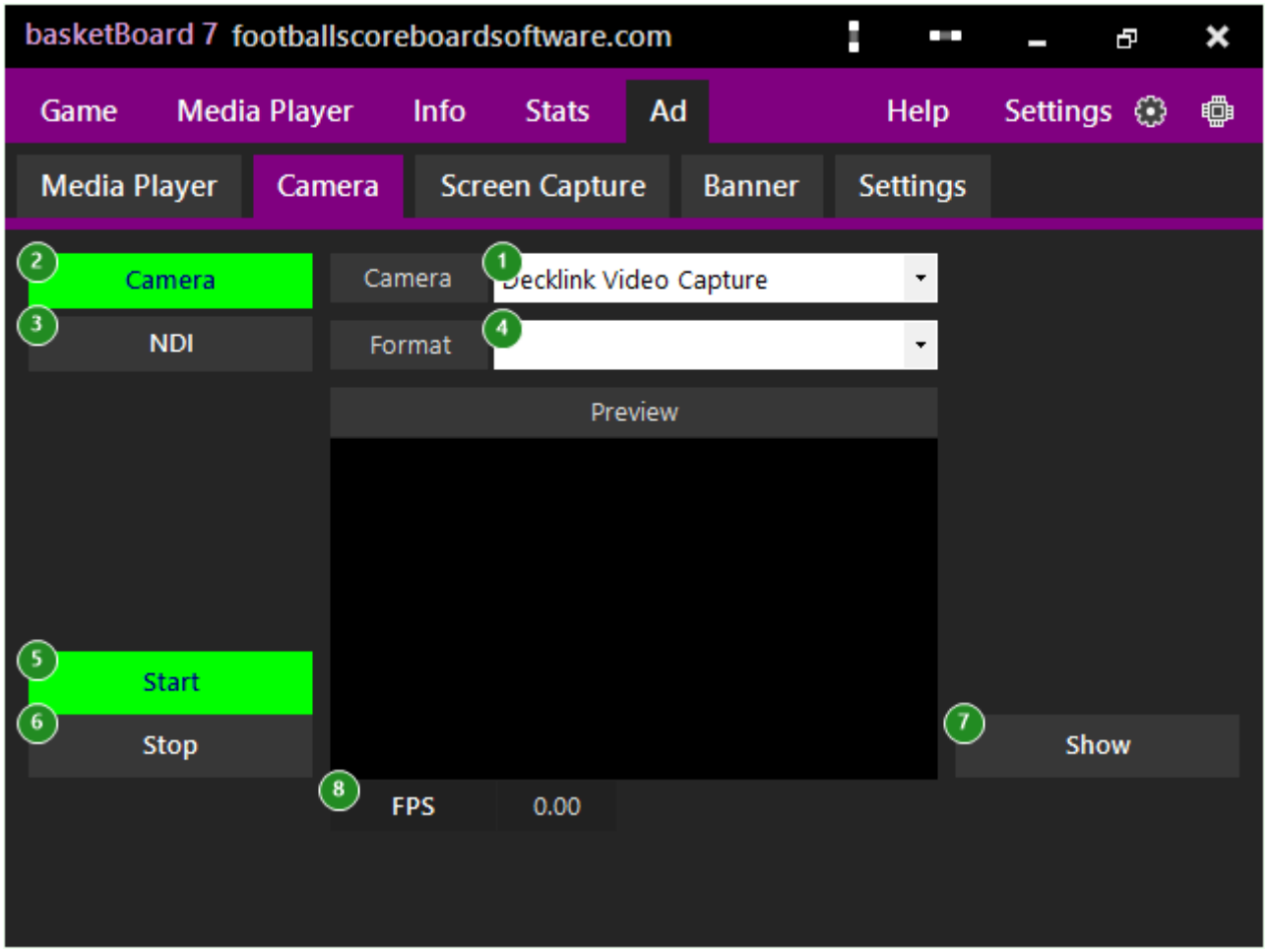


Figure 80. The "Camera" tab with the source Camera. The device in the list belongs to the test PC.

No.	Control	Name	What It Does
1	Decklink Video Capture	**Camera list**	Lists the video devices Windows knows; the first one is preselected. The list is read again every time the Camera tab is opened and after a camera stopped by itself. Choosing a device fills the Format list.
2	Camera	**Camera**	Selects a camera or video capture device of this PC as the source and shows the Camera and Format lists. A source that already runs is not stopped by the change.
3	NDI	**NDI**	Selects an NDI source of the network as the source and shows the NDI list. The first time, the network is searched for about two seconds. A source that already runs is not stopped by the change.
4		**Format list**	Lists the resolutions and frame rates the chosen device offers. The chosen format is used by Start. The list is empty when the device offers none, for example a video capture device without a signal.
5	Start	**Start**	Starts the chosen camera with the chosen format, or connects the chosen NDI source, and shows the picture in the Preview box. The three buttons are hidden for about two seconds. Without a camera and format, or without a valid NDI source, a message appears and nothing starts. Use Show to bring the picture to the board.

No.	Control	Name	What It Does
6	Stop	**Stop**	Stops the camera and the NDI source, whichever runs, empties the Preview box and the media area of the board and ends the blinking of the Camera tab.
7	Show	**Show**	Sends the running camera or NDI picture to the media area of the board and stops the playlist and the screen capture. Saves the source in start.xml as the one used last. Light blue while a source runs.
8	FPS	**FPS**	Shows the frame rate received at that moment in the field beside the button. The figure is approximate.

1. Click "Camera" at the top left (green when selected).
2. Choose the device in the camera list and a resolution and frame rate in the format list.
3. Click "Start". The picture appears in the Preview box.
4. Click "Show". The playlist and the capture stop and the camera picture moves to the media area.
5. Click "Stop" to switch the camera off.

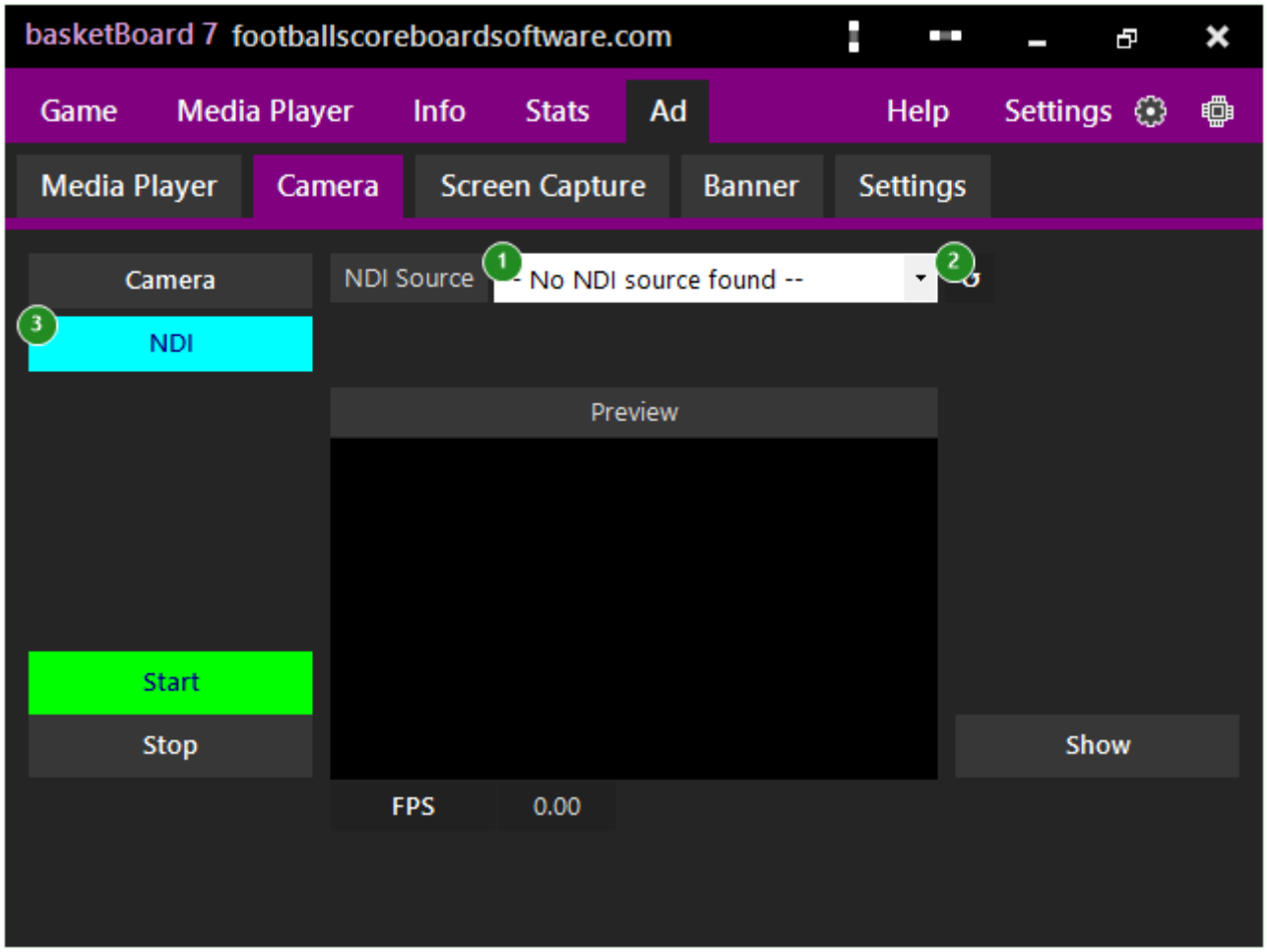


Figure 81. The "Camera" tab with the source NDI. No NDI source was on the network when the picture was made.

No.	Control	Name	What It Does
1	-- No NDI source found --	**NDI list**	Lists the NDI sources found on the network. It reads Searching... during the search and -- No NDI source found -- when there is none.
2		**Refresh (round arrow)**	Searches the network again for NDI sources, for about two seconds, and fills the NDI list.
3	NDI	**NDI**	Selects an NDI source of the network as the source and shows the NDI list. The first time, the network is searched for about two seconds. A source that already runs is not stopped by the change.

1. Click "NDI" at the top left (light blue when selected). The program searches the network for about two seconds.
2. Choose the source in the list beside the label "NDI Source". If the list reads "-- No NDI source found --", start the sender and click the refresh button.
3. Click "Start", then "Show", as for a camera. "Stop" ends it.

Devices, formats, the FPS display and the limits of cameras and NDI sources are described in chapter 12.

9.4.5 Screen Capture

The "Screen Capture" tab copies a rectangle of the operator's screen into the media area, for example a browser with live statistics.

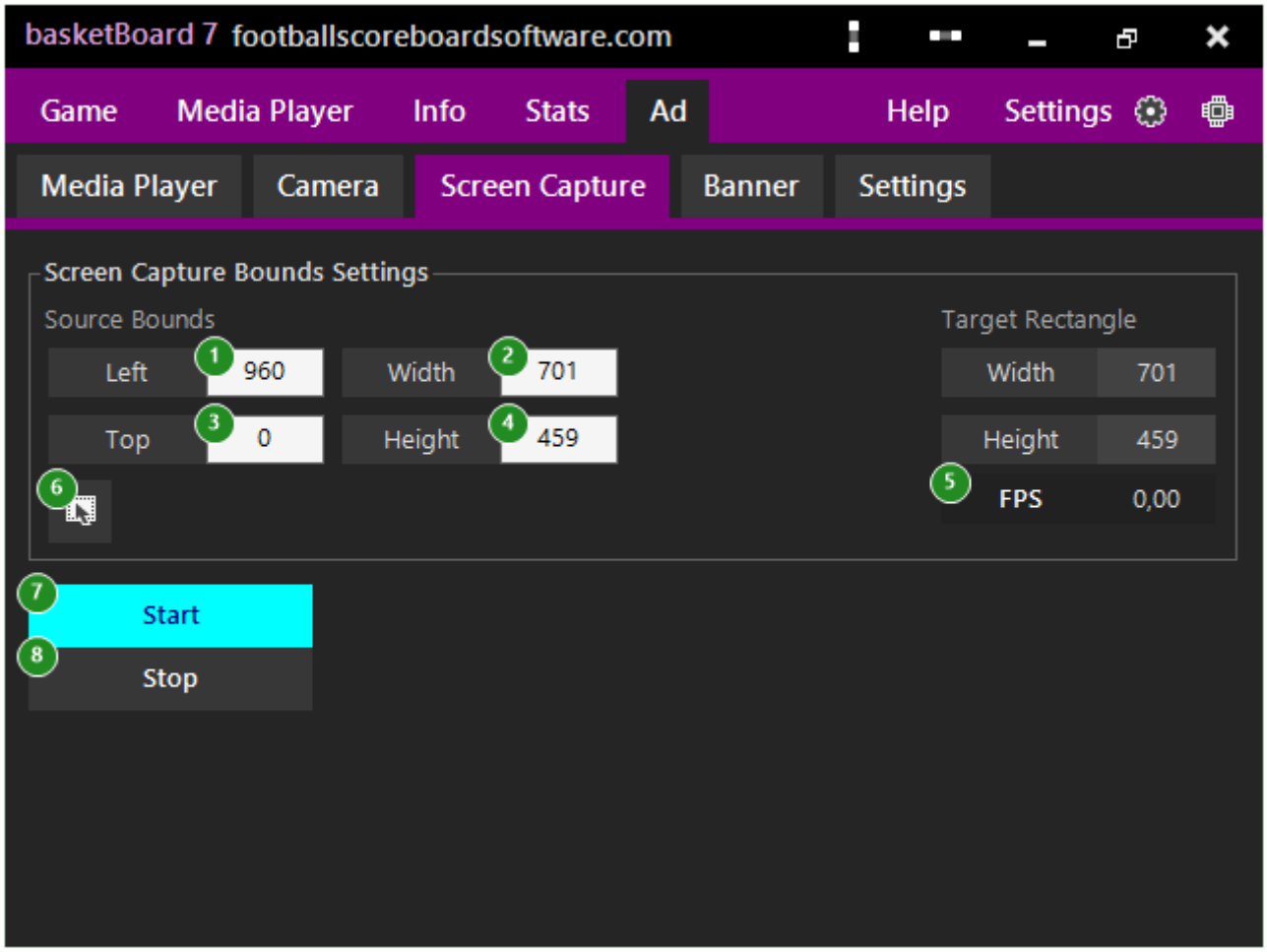
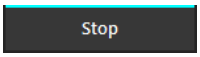


Figure 82. The "Screen Capture" tab.

No.	Control	Name	What It Does
1	960	**Left**	Holds the left edge of the capture area in screen pixels. Type it or use the selection button. Other text is turned into a number when the field is left. Saved by Start.
2	701	**Width**	Holds the width of the capture area in pixels. Type it or use the selection button. Compare with the width under Target Rectangle, the size of the media area. Saved by Start.
3	0	**Top**	Holds the top edge of the capture area in screen pixels. Type it or use the selection button. Other text is turned into a number when the field is left. Saved by Start.
4	459	**Height**	Holds the height of the capture area in pixels. Type it or use the selection button. Compare with the height under Target Rectangle, the size of the media area. Saved by Start.
5	FPS	**FPS**	Shows the capture rate of that moment in the field beside the button.
6		**Select Rectangle**	Dims the screen and marks the saved area in light blue. Drag the new area with the left mouse button and release: the four fields are filled. Esc or another mouse button changes nothing.

No.	Control	Name	What It Does
7		**Start**	Stops the camera and the playlist, saves the area in configAd.xml and shows the capture in the media area of the board. A width or height of 0 gives a message and nothing starts. While a capture runs the button only saves the area; click Stop and Start to use it.
8		**Stop**	Ends the capture and empties the media area of the board. The blinking of the Screen Capture tab ends.

1. Type Left, Top, Width and Height of the area under "Source Bounds", or click the selection button and drag the rectangle with the mouse.
2. Compare it with "Target Rectangle", the size of the media area. An area with the same proportions is shown without distortion.
3. Click "Start". The capture appears in the media area.
4. Click "Stop" to end it.

To capture another area, click "Stop", change the area and click "Start" again. Chapter 12 describes the two capture methods and their limits.

9.4.6 Banners

The "Banner" tab fills the two banners. The upper row chooses the banner, the row below it what the banner shows: "Sponsors", "Scrolling Text" or "Multimedia".

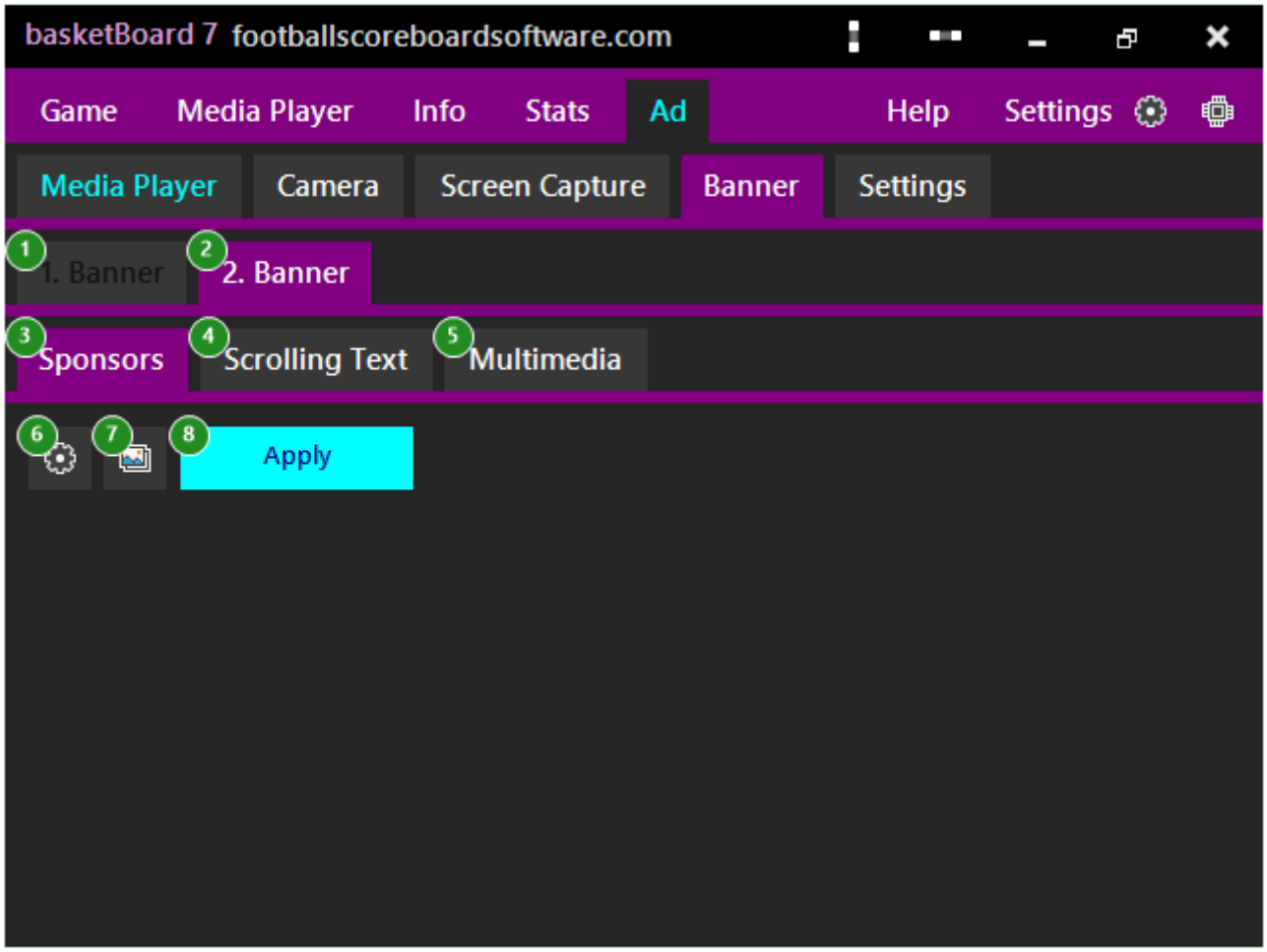


Figure 83. The banner editor: "2. Banner" with the "Sponsors" tab. "1. Banner" is off in the settings and therefore grey.

No.	Control	Name	What It Does
1	1. Banner	**1. Banner**	Opens the editor of the first banner on the tab of what the banner shows. Grey and without function while the first banner has visible No or size 0 in the settings.
2	2. Banner	**2. Banner**	Opens the editor of the second banner on the tab of what the banner shows. Grey and without function while the second banner has visible No or size 0 in the settings.
3	Sponsors	**Sponsors**	Opens the Sponsors tab of the selected banner: the sponsor images as an endless row.
4	Scrolling Text	**Scrolling Text**	Opens the Scrolling Text tab of the selected banner with its four text slots, on slot 1.
5	Multimedia	**Multimedia**	Opens the Multimedia tab of the selected banner: six playlists that play inside the banner without sound.
6		**Style (gear)**	Opens or closes the style panel of the sponsor images of this banner (image-height, padding, top, speed, direction).
7		**Sponsor list (picture)**	Opens the sponsor list of the Info page, where the sponsor images are added, removed and sorted. Click Ad in the menu strip to come back.

No.	Control	Name	What It Does
8	Apply	**Apply**	Stops a playlist of this banner, builds the endless row of sponsor images from the sponsor list and the values of the style panel and shows it in the banner. Saves Slide in start.xml as the content of the banner.

- A banner that is off in the settings (9.4.2) cannot be selected.
- Each banner has its own texts, styles and playlists. A banner shows one thing at a time.
- "Sponsors" and "Scrolling Text" work as on the Sp page (9.3.1, 9.3.2). Sizes without a unit are percentages of the banner height. Slot 1 of both banners holds a sample with EuroLeague results.

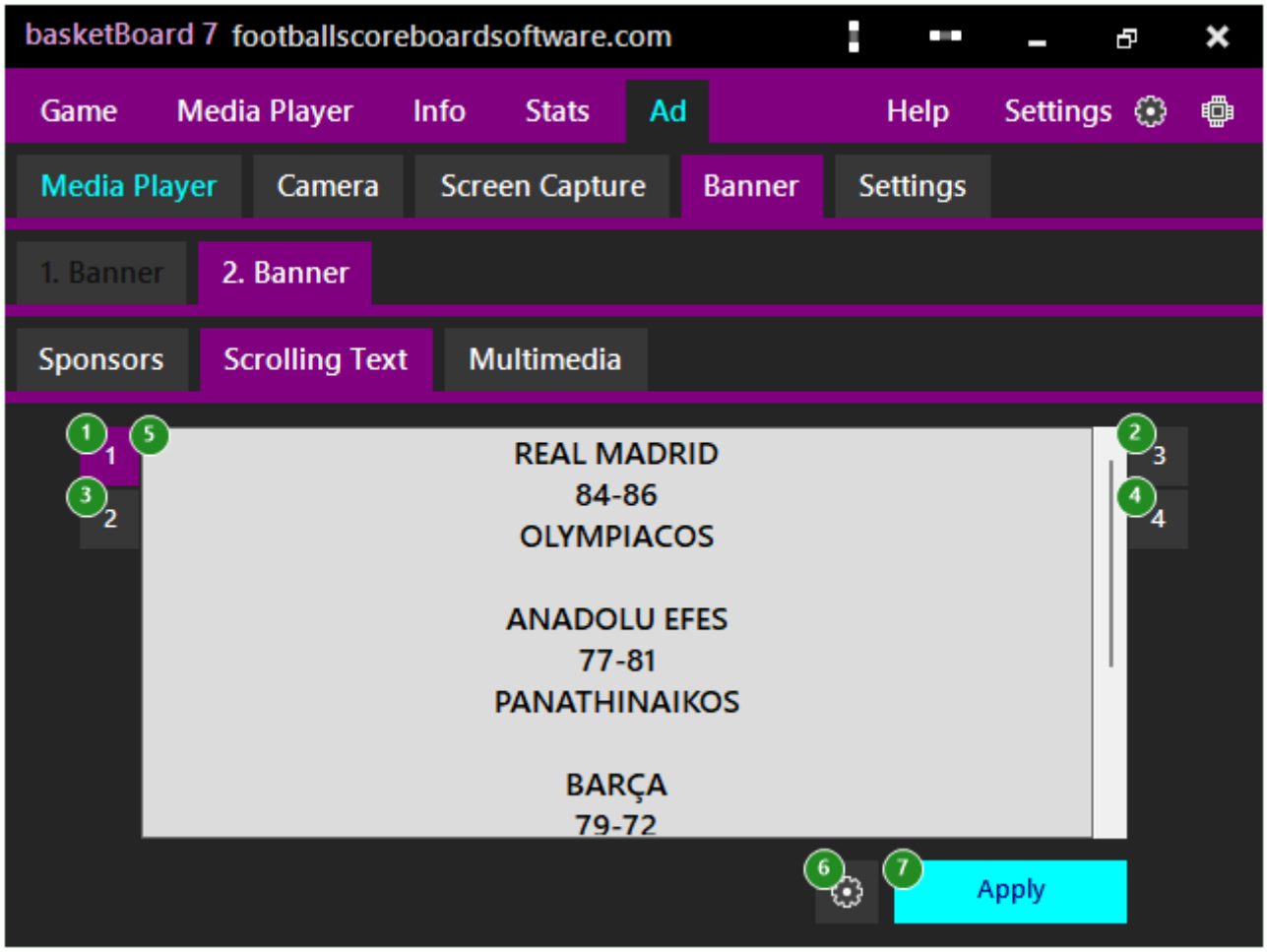


Figure 84. The "Scrolling Text" tab of the banner editor with the sample text.

No.	Control	Name	What It Does
1	1	**1**	Selects text slot 1 of this banner and loads its saved text. Text typed into another slot and not yet applied is lost.
2	3	**3**	Selects text slot 3 of this banner and loads its saved text. Text typed into another slot and not yet applied is lost.
3	2	**2**	Selects text slot 2 of this banner and loads its saved text. Text typed into another slot and not yet applied is lost.

No.	Control	Name	What It Does
4		**4**	Selects text slot 4 of this banner and loads its saved text. Text typed into another slot and not yet applied is lost.
5		**Text box**	Holds the text of the selected slot. Every line becomes one item of the scrolling text; the lines take the two text colours in turn and an empty line makes a wider gap. The text is saved by Apply only. The factory text is a sample to replace.
6		**Style (gear)**	Opens or closes the style panel of the scrolling text of this banner (font, size, weight, line height, shadow, padding, top, speed, direction and three colours).
7		**Apply**	Stops a playlist of this banner, saves the text of the selected slot to configAd.xml and runs it in the banner with the style and colours of the style panel. Saves Scroll in start.xml as the content of the banner.

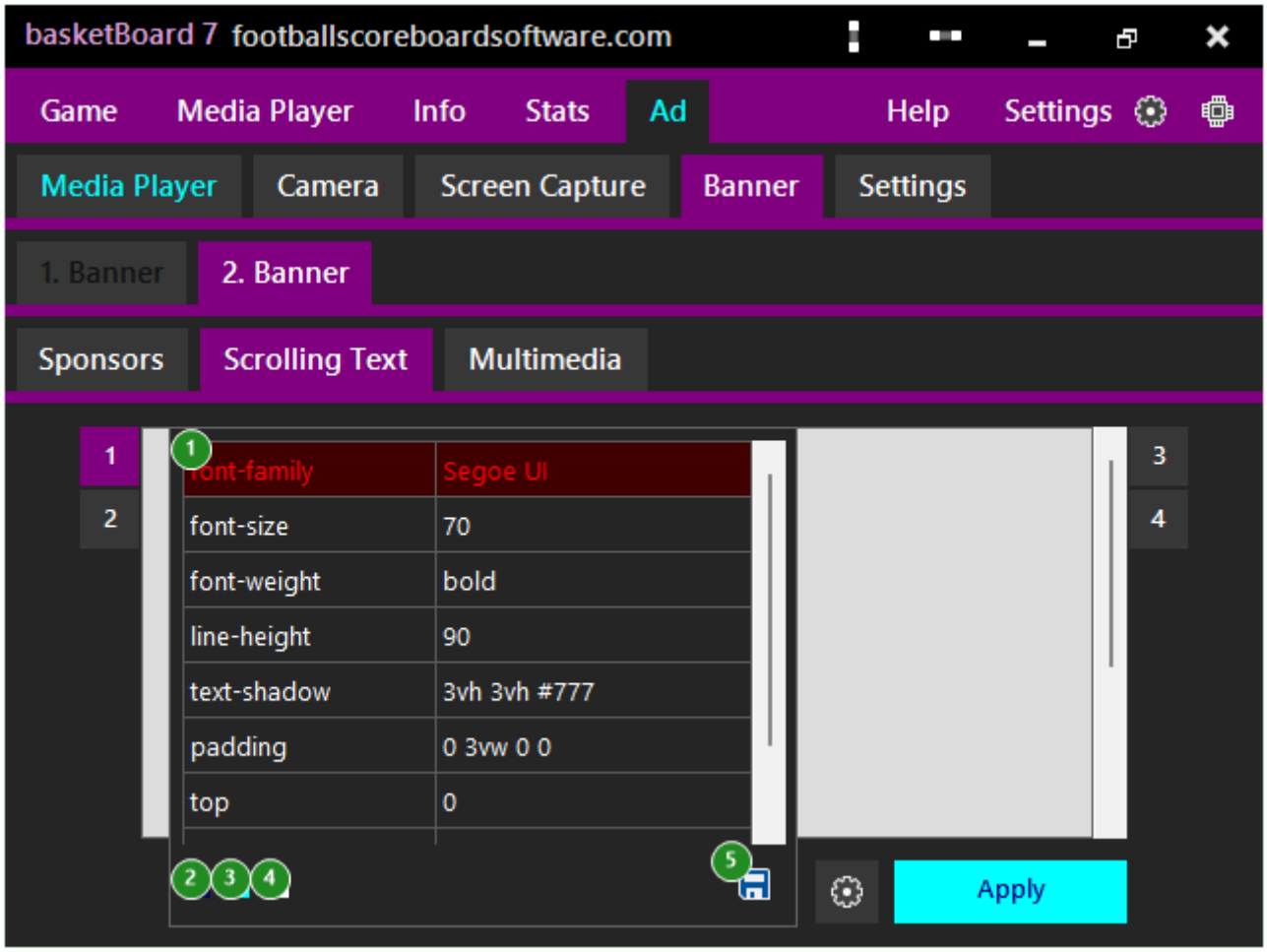
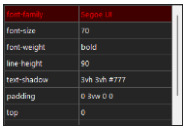


Figure 85. The style panel of the banner text.

No.	Control	Name	What It Does
1		**Style table of the text**	Shows the style of the scrolling text of this banner: font-family, font-size, font-weight, line-height, text-shadow, padding, top, speed and direction. Click a value and type; in the font-family row a font button opens the font dialog. A number without a unit is a percentage of the banner height. Scroll down for speed and direction.
2		**Background colour**	Opens the colour dialog for the background of the banner, behind the text and behind the sponsor images. Saved to configAd.xml at once and shown with the next Apply.
3		**Colour of lines 1, 3, 5**	Opens the colour dialog for the first, third, fifth line of the text and so on. Saved to configAd.xml at once and shown with the next Apply.
4		**Colour of lines 2, 4, 6**	Opens the colour dialog for the second, fourth, sixth line of the text and so on. The colour is used by the next Apply. Unlike the other two squares this colour is not saved at once but only by the disk button.
5		**Save (disk)**	Saves the style table and the three colours of the scrolling text of this banner to configAd.xml and closes the panel. The board changes only with Apply.

"Multimedia" is a playlist that plays inside the banner, without sound.

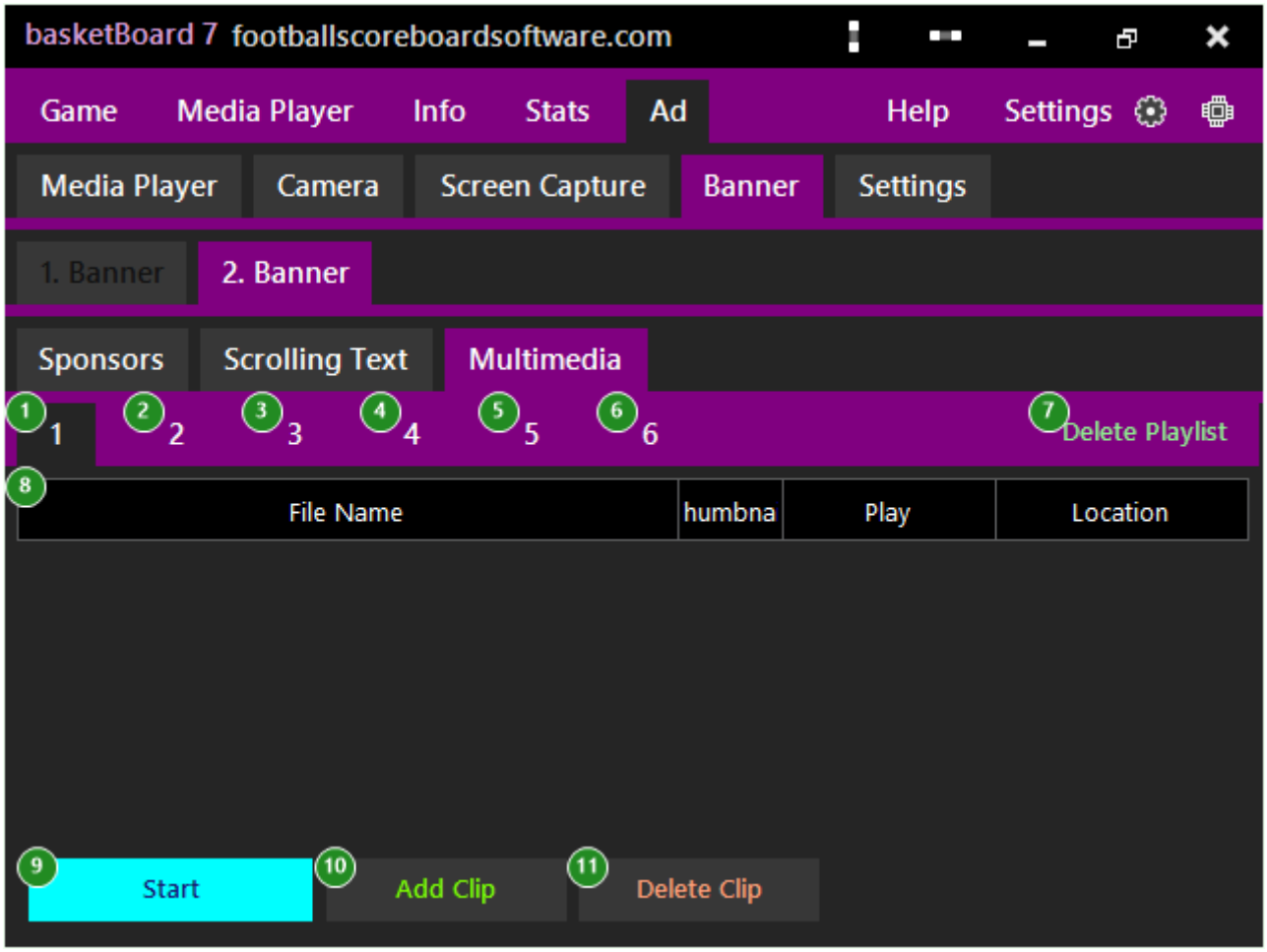
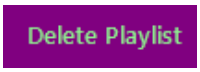
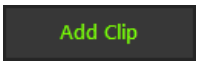
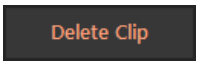


Figure 86. The "Multimedia" tab of the banner editor with an empty playlist.

No.	Control	Name	What It Does
1	1	1	Selects playlist 1 of this banner and loads its clips. The small number beside the button is the number of clips. Does nothing while the banner plays.
2	2	2	Selects playlist 2 of this banner and loads its clips. The small number beside the button is the number of clips. Does nothing while the banner plays.
3	3	3	Selects playlist 3 of this banner and loads its clips. The small number beside the button is the number of clips. Does nothing while the banner plays.
4	4	4	Selects playlist 4 of this banner and loads its clips. The small number beside the button is the number of clips. Does nothing while the banner plays.
5	5	5	Selects playlist 5 of this banner and loads its clips. The small number beside the button is the number of clips. Does nothing while the banner plays.
6	6	6	Selects playlist 6 of this banner and loads its clips. The small number beside the button is the number of clips. Does nothing while the banner plays.

No.	Control	Name	What It Does
7		**Delete Playlist**	Removes all clips from the selected playlist of this banner and saves the empty list, without a question. The files themselves are not deleted. Hidden while the banner plays.
8		**Playlist**	Lists the clips of the selected playlist of this banner with file name and thumbnail. Click a row to select it; a Play button appears in its Play column. The Location column shows the time left of the clip that plays. A row whose file is missing gets a red selection and no Play button.
9		**Start / Finish**	Plays the playlist in the banner from the selected row on, without sound, in place of the sponsor images or the text. The button reads Finish while the list runs; after the last clip the list begins again, and a missing file is skipped. Finish ends the list.
10		**Add Clip**	Opens the file dialog for one or more videos or images and adds them at the end of the selected playlist of this banner. The list is saved at once. Hidden while the banner plays.
11		**Delete Clip**	Removes the selected row from the playlist of this banner and saves the list. The file itself is not deleted. Hidden while the banner plays.

- The six playlists, "Add Clip", "Delete Clip" and "Delete Playlist" work as on the "Media Player" tab. Each banner has its own six lists.
- The clip is stretched to the size of the banner. Prepare clips in the shape of the banner.
- A banner playlist does not start by itself after a restart or a change of mode.

9.4.7 The Ad Scoreboard Design

The scoreboard box is a board design of its own. "[Ad]vertisement Board Design" in Settings edits it, and "Factory Settings" there brings back the factory look of the box shown in 9.1 (chapter 11).

9.4.8 Files of Ad Mode

File	Content
start.xml, section Ad	Start (the source used last), DisplayMode, Banner01Start and Banner02Start
configAd.xml	The layout tables, the capture area, the camera and NDI source used last, the texts and styles of both banners
common\data\playListAd_0.xml to playListAd_5.xml	Playlists 1 to 6 of the media area
common\data\playListAd_010.xml to _015.xml, playListAd_020.xml to _025.xml	Playlists 1 to 6 of the first and the second banner

9.5 Chroma Key Mode (CK)

Chroma Key mode is made for productions with a vision mixer or streaming software. The board shows a compact scorebug and keyed graphics on a plain key colour, and the mixer keys them over the live picture.

Board Output **Control Panel**

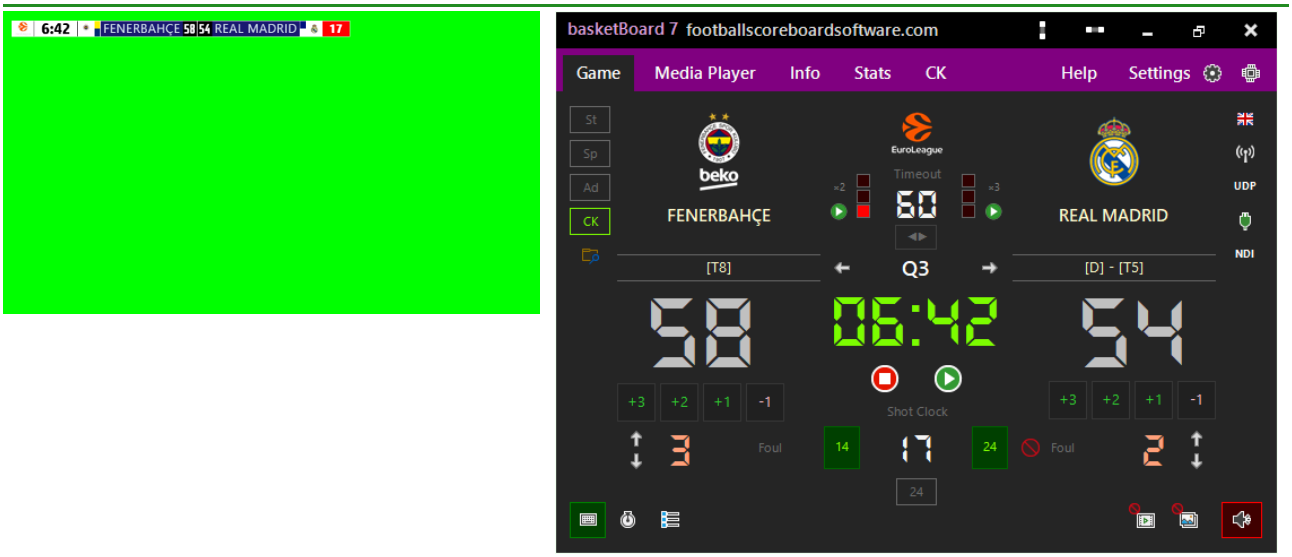


Figure 87. The scorebug on the green key colour and the control panel that drives it: third quarter, 06:42, 58 to 54, shot clock 17.

On the control panel	On the scorebug of the factory design
Board logo, team logos, team names	Shown
Team colours (chapter 7)	Two colour fields beside each team name
Scores, game clock	Shown
Shot clock	In the red field at the right end
Time-out countdown	In the red field while a time-out runs
Period	In the red field while the shot clock is off
Team fouls, time-outs left, possession arrow, player panel	Not part of the scorebug

9.5.1 The CK Page

Click "CK" in the menu strip. The page opens on the "Info" tab.

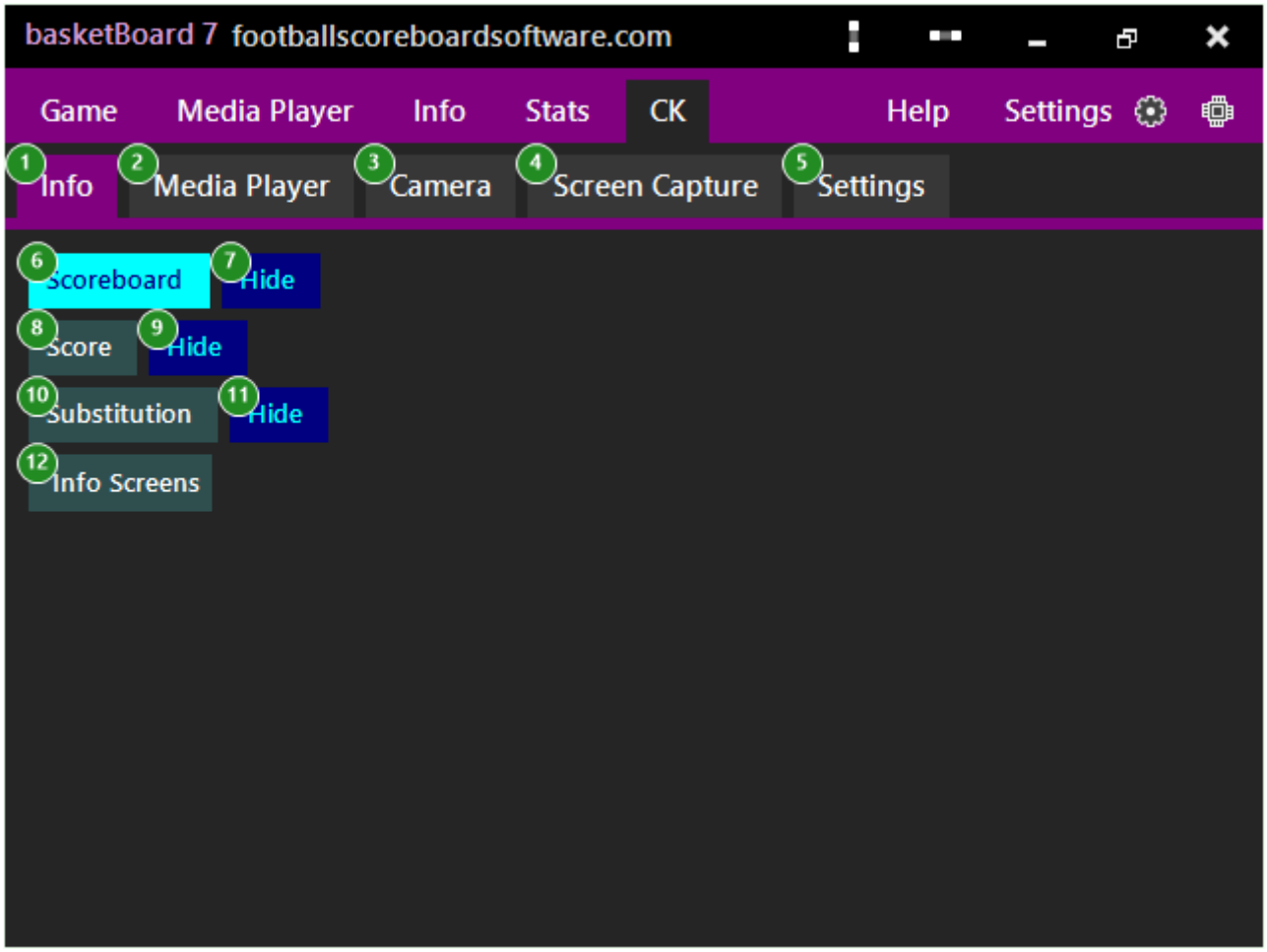
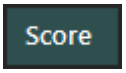
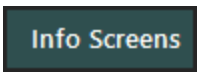


Figure 88. The "Info" tab of the CK page: one row for each keyed graphic and the "Info Screens" button.

No.	Control	Name	What It Does
1	Info	**Info**	Opens the Info tab of the CK page with the rows Scoreboard, Score and Substitution and the Info Screens button. The CK page always opens on this tab.
2	Media Player	**Media Player**	Opens the Media Player tab with the six playlists of the Chroma Key board. The caption blinks between white and light blue while a clip or a playlist of this tab plays.
3	Camera	**Camera**	Opens the Camera tab for a camera or an NDI source on the Chroma Key board. The list of cameras is read again each time the tab is opened. The caption blinks while a source of this tab is started.
4	Screen Capture	**Screen Capture**	Opens the Screen Capture tab and fills the Source Bounds boxes with the area saved in configCK.xml. The caption blinks while the capture runs.
5	Settings	**Settings**	Opens the key colour page. The colour saved in start.xml (CK/KeyColor) is marked with a red border and its R, G, B and A values are shown.
6	Scoreboard	**Scoreboard**	Shows the scorebug on the Chroma Key board, about half a second after the click. The scorebug is written again with the current logos and team colours. It is shown automatically when you switch to Chroma Key mode.

No.	Control	Name	What It Does
7		**Hide (Scoreboard row)**	Takes the scorebug off the Chroma Key board. The key colour and a Score or Substitution graphic that is shown stay on the board.
8		**Score**	Opens the Score page, on which you choose the team, the value of the basket (3, 2 or 1) and the player for the keyed Score graphic. The page opens with the home team, 3 points and an empty player box.
9		**Hide (Score row)**	Takes the lower third off the Chroma Key board: the Score or Substitution graphic of this page or an info screen. They all use the same layer, so this button and the Hide button of the Substitution row do the same. The scorebug stays.
10		**Substitution**	Opens the Substitution page, on which you choose the team, the player who comes in and the player who goes out for the keyed Substitution graphic. The page opens with the home team and the minutes of the game clock in the Min box.
11		**Hide (Substitution row)**	Takes the lower third off the Chroma Key board: the Substitution or Score graphic of this page or an info screen. They all use the same layer, so this button and the Hide button of the Score row do the same. The scorebug stays.
12		**Info Screens**	Opens the info screens of the active rules preset, the same page as on the Info page. In Chroma Key mode a screen is shown as a lower third under the scorebug.

Tab	Use
"Info"	The scorebug, the keyed graphics Score and Substitution, and the info screens
"Media Player"	Six playlists that play behind the scorebug and the graphics
"Camera"	A camera or an NDI source behind the scorebug and the graphics
"Screen Capture"	An area of the desktop behind the scorebug and the graphics
"Settings"	The key colour

9.5.2 Scorebug

The scorebug is shown when you switch to CK mode. Click "Hide" in the "Scoreboard" row to take it off the board, and "Scoreboard" to show it again. "Scoreboard" also draws it again with the current logos and team colours.



Figure 89. The scorebug on the key colour as the board sends it to the mixer.

9.5.3 Score and Substitution

"Score" opens a page that puts a keyed line on the board with the player who scored and the value of the basket.

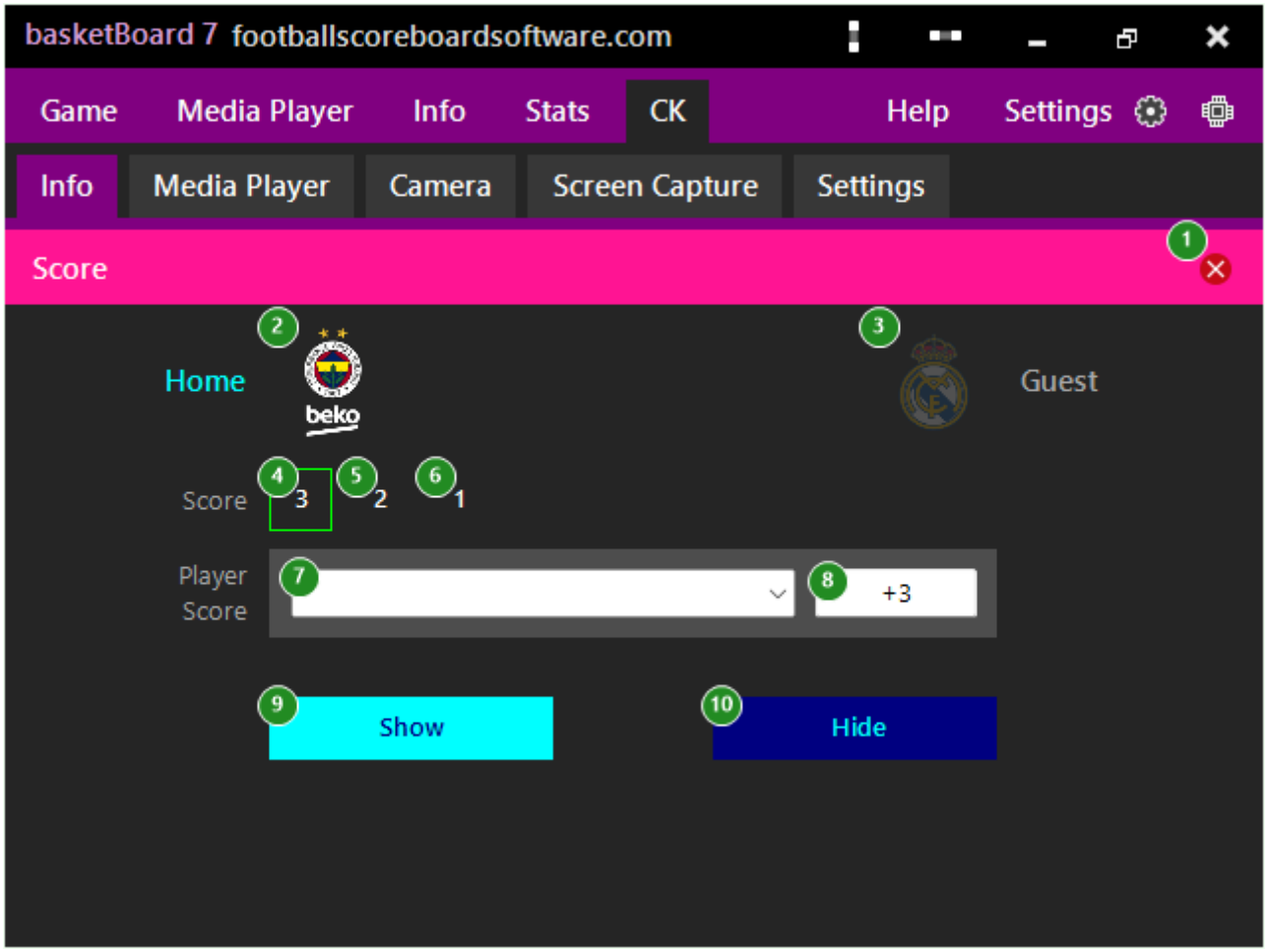
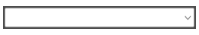
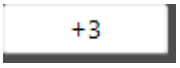


Figure 90. The Score page as it opens: home team and 3 points selected, the player box empty.

No.	Control	Name	What It Does
1		**Close (red X)**	Closes the Score page and returns to the rows of the Info tab; the Esc key does the same. A graphic that is on the board stays there.

No.	Control	Name	What It Does
2		**Home logo**	Selects the home team for the Score graphic. The name Home turns light blue, the guest logo is dimmed, the player box is emptied and its list is filled with the home squad.
3		**Guest logo**	Selects the guest team for the Score graphic. The name Guest turns light blue, the home logo is dimmed, the player box is emptied and its list is filled with the guest squad.
4		**3**	Selects a three-point basket: the value box beside the player box is set to +3 and the button gets a green border. Selected when the page opens.
5		**2**	Selects a two-point basket: the value box beside the player box is set to +2 and the button gets a green border.
6		**1**	Selects a free throw: the value box beside the player box is set to +1 and the button gets a green border.
7		**Player (list)**	Holds the player who scored. The list shows the players of the selected team from the squad (number-name, sorted by number, without the coaching staff). You can also type a text; a number at the beginning or at the end is shown as the player number, the rest as the name.
8		**Value (+3)**	Shows the value that is put in the red field of the graphic: +3, +2 or +1 according to the selected button. The text can be changed by hand. If the box is empty, the graphic is shown without the red field.
9		**Show**	Shows the Score graphic on the Chroma Key board, about half a second after the click: the title Score, the board logo, the logo and name of the team, the number and name of the player and the value. If the player box is empty, it turns red for a second and nothing is shown. The score of the match and the player statistics are not changed. The graphic stays until Hide is clicked.
10		**Hide**	Takes the Score graphic (or a Substitution graphic) off the Chroma Key board. The scorebug stays.

1. Click the logo of the team. The player list changes to the squad of that team (chapter 7).
2. Click "3", "2" or "1". The box beside the player row shows +3, +2 or +1.
3. Choose the player in the list, or type a number and a name.
4. Click "Show". The graphic stays until you click "Hide".

Board Output **Control Panel**

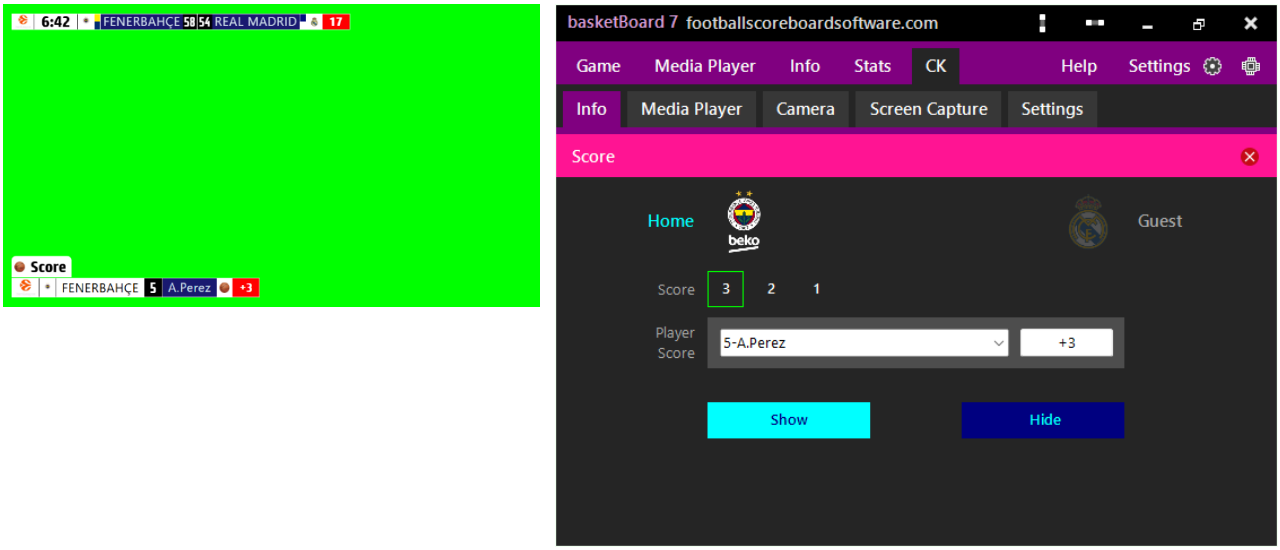


Figure 91. A three-point basket of player 5 of the home team: the Score graphic at the bottom left, the scorebug at the top.

"Substitution" opens a page for a keyed line with the player who comes in and the player who goes out.

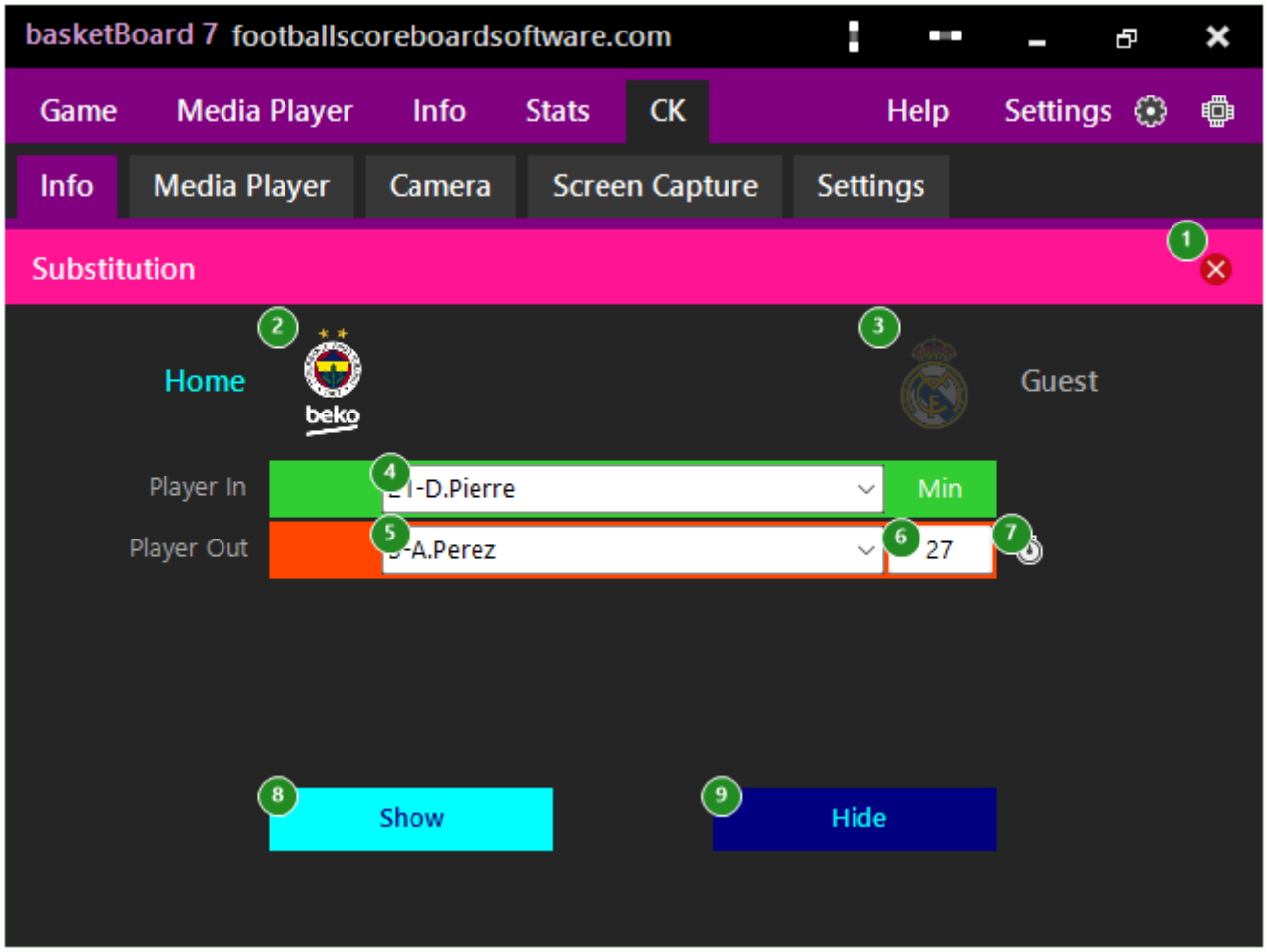


Figure 92. The Substitution page with both players chosen.

No.	Control	Name	What It Does
1		**Close (red X)**	Closes the Substitution page and returns to the rows of the Info tab; the Esc key does the same. A graphic that is on the board stays there.
2		**Home logo**	Selects the home team for the Substitution graphic. The name Home turns light blue, the guest logo is dimmed, both player boxes are emptied and their lists are filled with the home squad.
3		**Guest logo**	Selects the guest team for the Substitution graphic. The name Guest turns light blue, the home logo is dimmed, both player boxes are emptied and their lists are filled with the guest squad.
4		**Player In (list)**	Holds the player who comes in. The list shows the players of the selected team from the squad (number-name, sorted by number, without the coaching staff). You can also type a text; a number at the beginning or at the end is shown as the player number, the rest as the name.
5		**Player Out (list)**	Holds the player who goes out. The list and the typing rules are the same as for Player In.
6		**Min**	Holds the value for the red field between the two players on the graphic. When the page opens it is filled with the minutes that the game clock shows (the minutes left in the period, for example 6 at 06:42). Type another value if you want to show the minute of play.
7		**Min on/off (stopwatch)**	Hides the Min box and empties it, so that the graphic is shown without the red field. A second click shows the box again, filled with the minutes of the game clock.
8		**Show**	Shows the Substitution graphic on the Chroma Key board, about half a second after the click: the title Substitution, the board logo, the logo and name of the team, number and name of the player who comes in, the Min value, number and name of the player who comes out. If one of the two player boxes is empty, it turns red for a second and nothing is shown. The player data is not changed. The graphic stays until Hide is clicked.
9		**Hide**	Takes the Substitution graphic (or a Score graphic) off the Chroma Key board. The scorebug stays.

1. Click the logo of the team.
2. Choose the player who comes in (green row) and the player who goes out (red row).
3. Check the minute box. It holds the minutes of the game clock when the page opens; type another value, or hide the box with the stopwatch button.
4. Click "Show", and "Hide" to take the graphic off.



Figure 93. The Substitution graphic on the board.

- The Score and Substitution graphics share one layer: a new one replaces the one on the board, and either "Hide" button takes it off. The scorebug stays.
- If a player box is empty, it turns red for a moment and nothing is shown.
- These pages only show graphics. They do not change the score or the Player Stats window.

9.5.4 Info Screens as Lower Thirds

"Info Screens" opens the info screens of the active rules preset, the same page as on the Info page. In CK mode a screen appears as a lower third under the scorebug, on the key colour. Chapter 10 describes the screens.

9.5.5 Media Player, Camera and Screen Capture

The "Media Player", "Camera" and "Screen Capture" tabs work as on the Ad page (9.4.3 to 9.4.5), with two differences: the picture fills the whole board in place of the key colour, and the scorebug and the keyed graphics stay in front of it. Playlist 1 of a new installation holds the demo clip Northwind_Promo.

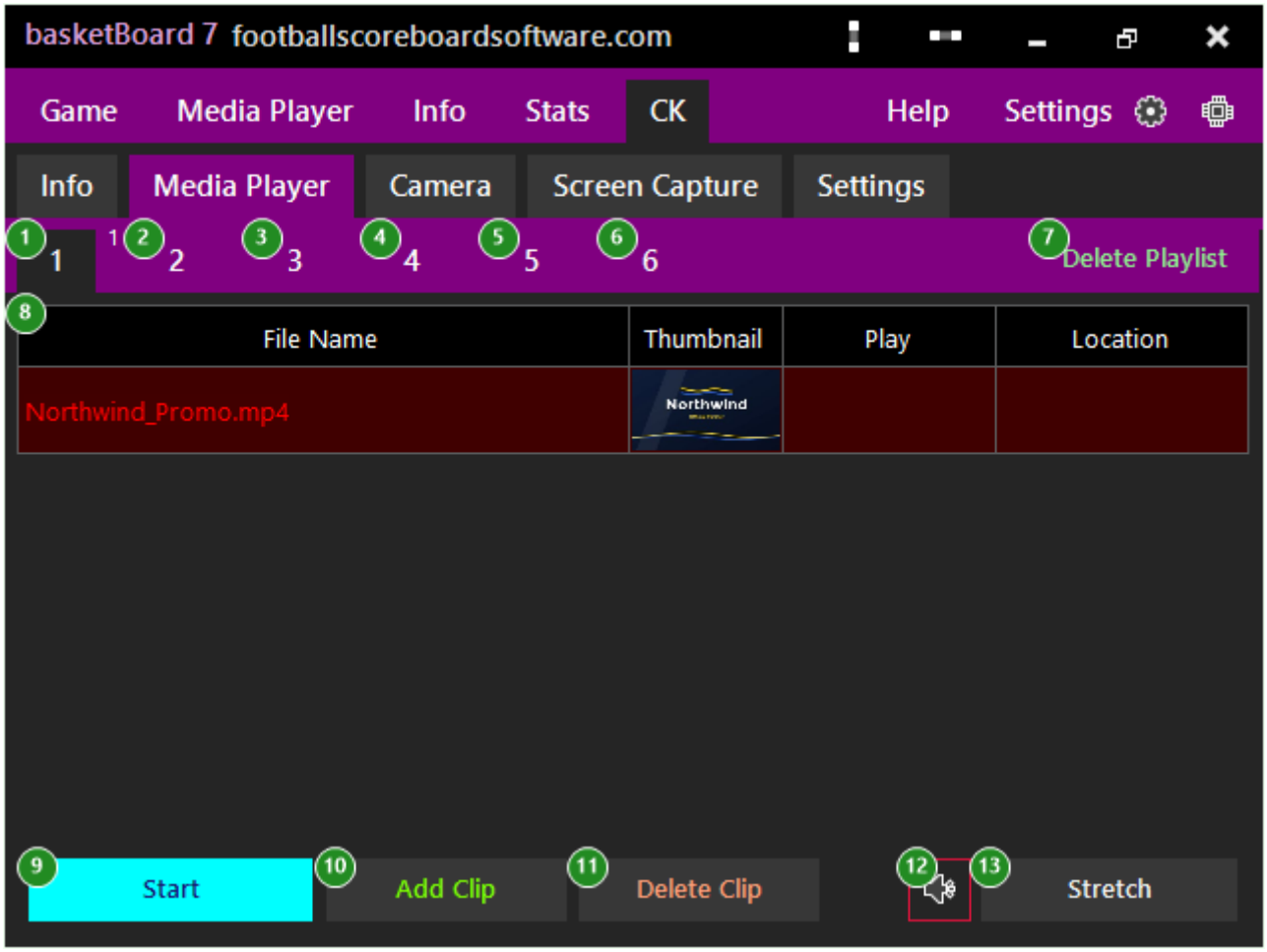
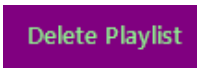
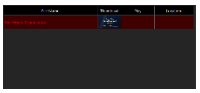
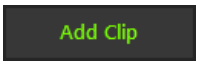
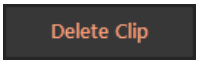


Figure 94. The "Media Player" tab of the CK page.

No.	Control	Name	What It Does
1	1	1	Selects playlist 1 and shows its clips in the list. The small number above the button is the number of clips in the playlist. The button does not react while a clip or a playlist plays.
2	2	2	Selects playlist 2 and shows its clips in the list. The small number above the button is the number of clips in the playlist. The button does not react while a clip or a playlist plays.
3	3	3	Selects playlist 3 and shows its clips in the list. The small number above the button is the number of clips in the playlist. The button does not react while a clip or a playlist plays.
4	4	4	Selects playlist 4 and shows its clips in the list. The small number above the button is the number of clips in the playlist. The button does not react while a clip or a playlist plays.
5	5	5	Selects playlist 5 and shows its clips in the list. The small number above the button is the number of clips in the playlist. The button does not react while a clip or a playlist plays.
6	6	6	Selects playlist 6 and shows its clips in the list. The small number above the button is the number of clips in the playlist. The button does not react while a clip or a playlist plays.

No.	Control	Name	What It Does
7		**Delete Playlist**	Removes all clips from the selected playlist at once, without a question, and saves the empty playlist. The files themselves are not deleted. The button is hidden while a clip or a playlist plays.
8		**Clip list**	Shows the clips of the selected playlist: File Name, Thumbnail, Play and Location (the time left of the running clip). Click a row to select it; a Play button then appears in its Play column. Drag a row to change the order; the new order is saved with the next Add Clip or Delete Clip. A selected row whose file no longer exists is white on red.
9		**Start**	Stops the camera and the screen capture of the CK page and plays the playlist on the Chroma Key board, from the selected row to the last clip and then again from the first. The button is red and reads Finish while the playlist runs; click it to stop and to return to the key colour. A clip whose file is missing is skipped. Nothing plays if no row with an existing file is selected.
10		**Add Clip**	Opens a file dialog (video, audio and picture files; several files can be selected) and adds the files to the end of the selected playlist. The playlist is saved at once in common\data\playListCK_n.xml. The button is hidden while a clip or a playlist plays.
11		**Delete Clip**	Removes the selected row from the playlist and saves the playlist. The file itself is not deleted. The button is hidden while a clip or a playlist plays.
12		**Sound on/off (speaker)**	Switches the sound of the clips on (green border) or off (red border) and saves the choice in start.xml (MEDIAPLAYER/Volume). On a new installation the sound is off.
13		**Scaling mode (Stretch)**	Opens the list of scaling modes: Center, CoverCenter, Original, SizeToFit, SizeToFitCenter, Stretch, ZoomCenter. The button shows the selected mode. The mode is applied to the player at once and saved in start.xml (CK/DisplayMode) and configCK.xml; the camera, the NDI source and the screen capture of the CK page use it the next time they are started.

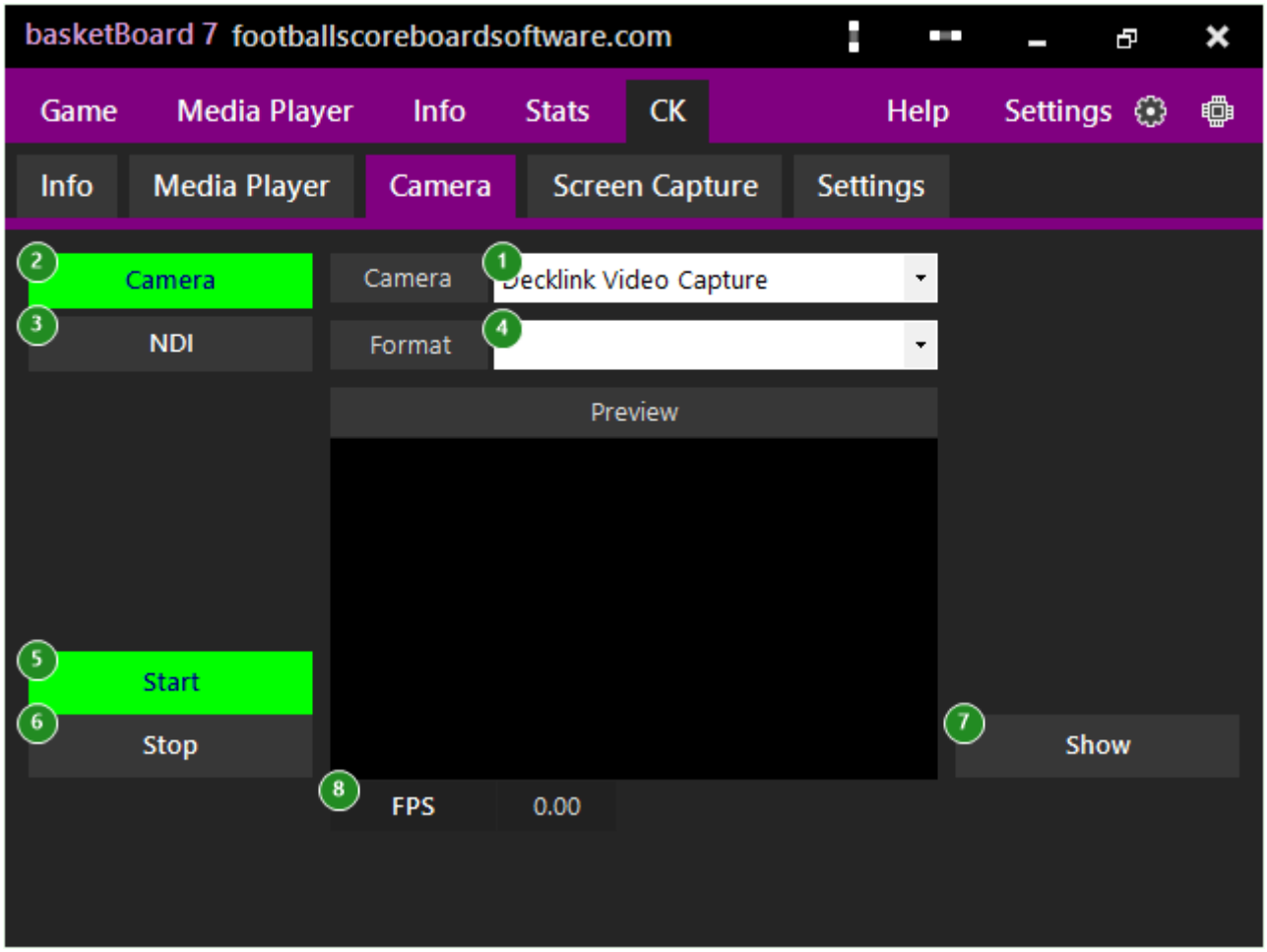


Figure 95. The "Camera" tab of the CK page. The device in the list belongs to the test PC.

No.	Control	Name	What It Does
1	Decklink Video Capture	**Camera (list)**	Lists the video input devices of the PC: webcams, video capture devices, virtual cameras. The list is read again each time the tab is opened and after a camera stopped by itself; the first device is then selected. Selecting a device fills the Format list.
2	Camera	**Camera (selector)**	Selects a camera as the source of the tab: the Camera and Format lists are shown. The button is green while it is selected. A running NDI source is not stopped by the change.
3	NDI	**NDI (selector)**	Selects an NDI source as the source of the tab: the Camera and Format lists are replaced by the list of NDI sources. The button is light blue while it is selected. At the first click the network is searched for about two seconds. A running camera is not stopped by the change.
4		**Format (list)**	Lists the resolutions and frame rates of the selected device, for example 1920x1080 @ 30fps. The selected format is used at Start. The list is empty if the device offers no format.
5	Start	**Start**	Starts the selected camera with the selected format, or the selected NDI source, in the Preview field. The three buttons are hidden for about two seconds; then Start is grey, Stop red and Show light blue. Without a camera and format the warning Please select a camera and format appears; without a valid NDI source the warning Please select a valid NDI source. The selection is written to configCK.xml.

No.	Control	Name	What It Does
6	Stop	**Stop**	Stops the camera and the NDI source, whichever is running, clears the Preview field and the board and ends the blinking of the tab. The device is free for other programs again.
7	Show	**Show**	Stops the playlist and the screen capture of the CK page and moves the running picture from the Preview field to the Chroma Key board, behind the scorebug and the keyed graphics. Click it after Start; without a running source nothing is shown.
8	FPS	**FPS**	Shows the current frame rate of the running camera or NDI source in the field beside the button; 0 while nothing runs. The value is also refreshed about two seconds after Start. It is an indication only.

The NDI source of the CK "Camera" tab has the same label as on the Ad page (9.4.4).

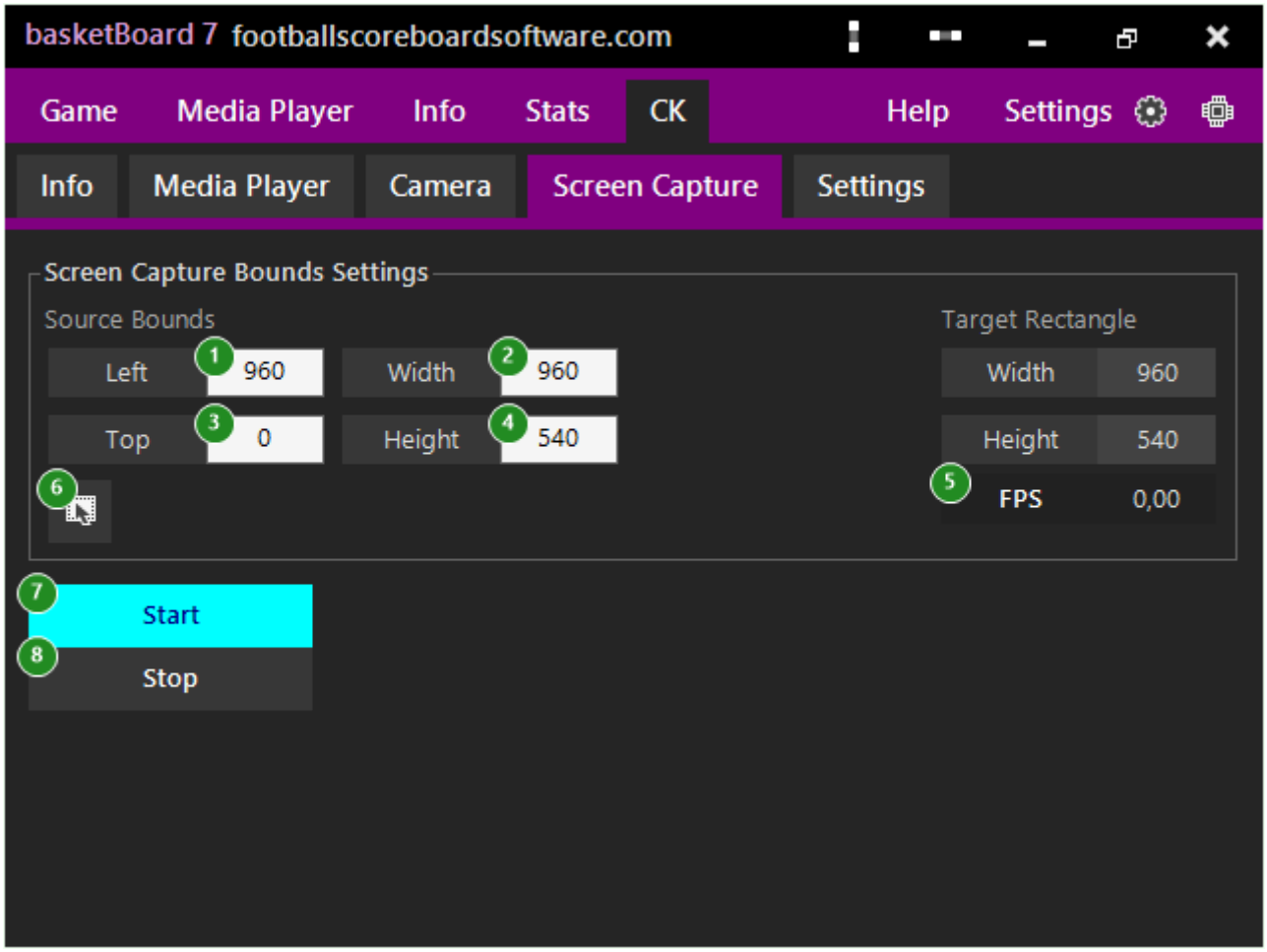
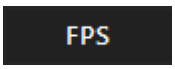
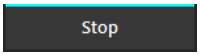


Figure 96. The "Screen Capture" tab of the CK page. "Target Rectangle" is the size of the board.

No.	Control	Name	What It Does
1	960	**Left**	Left edge of the desktop area to capture, in pixels from the left edge of the main screen. Typed, or filled by the selection button. When you leave the box, the text is turned into a number; a negative value becomes 0. Saved in configCK.xml with Start.

No.	Control	Name	What It Does
2		**Width**	Width of the desktop area to capture, in pixels. Typed, or filled by the selection button. It must be greater than 0. Saved in configCK.xml with Start.
3		**Top**	Top edge of the desktop area to capture, in pixels from the top edge of the main screen. Typed, or filled by the selection button. When you leave the box, the text is turned into a number; a negative value becomes 0. Saved in configCK.xml with Start.
4		**Height**	Height of the desktop area to capture, in pixels. Typed, or filled by the selection button. It must be greater than 0. Saved in configCK.xml with Start.
5		**FPS**	Shows the current capture rate in the field beside the button; 0 while nothing runs. The value is also refreshed about two seconds after Start. It is an indication only.
6		**Select Rectangle**	Dims all screens and marks the saved area in light blue. Drag the new area with the left mouse button; when you release it, Left, Top, Width and Height are filled. A very small rectangle is ignored. Esc or the right mouse button cancels.
7		**Start**	Stops the camera and the playlist of the CK page, saves the area in configCK.xml and copies it to the whole Chroma Key board, behind the scorebug and the keyed graphics. Start is grey and Stop red while the capture runs. With a width or height of 0 a warning appears and nothing starts; while a capture runs, the click only saves the area.
8		**Stop**	Stops the screen capture, clears the board to the key colour and ends the blinking of the tab.

- Only one of the three sources can be on the board at a time. Starting one stops the other two.
- While a source runs, the caption of its tab and the "CK" button of the menu strip blink.
- Click "Stop" or "Finish" and the board returns to the key colour.

9.5.6 Key Colour

The "Settings" tab (title "Chroma Key Color") sets the colour behind the scorebug and the graphics.

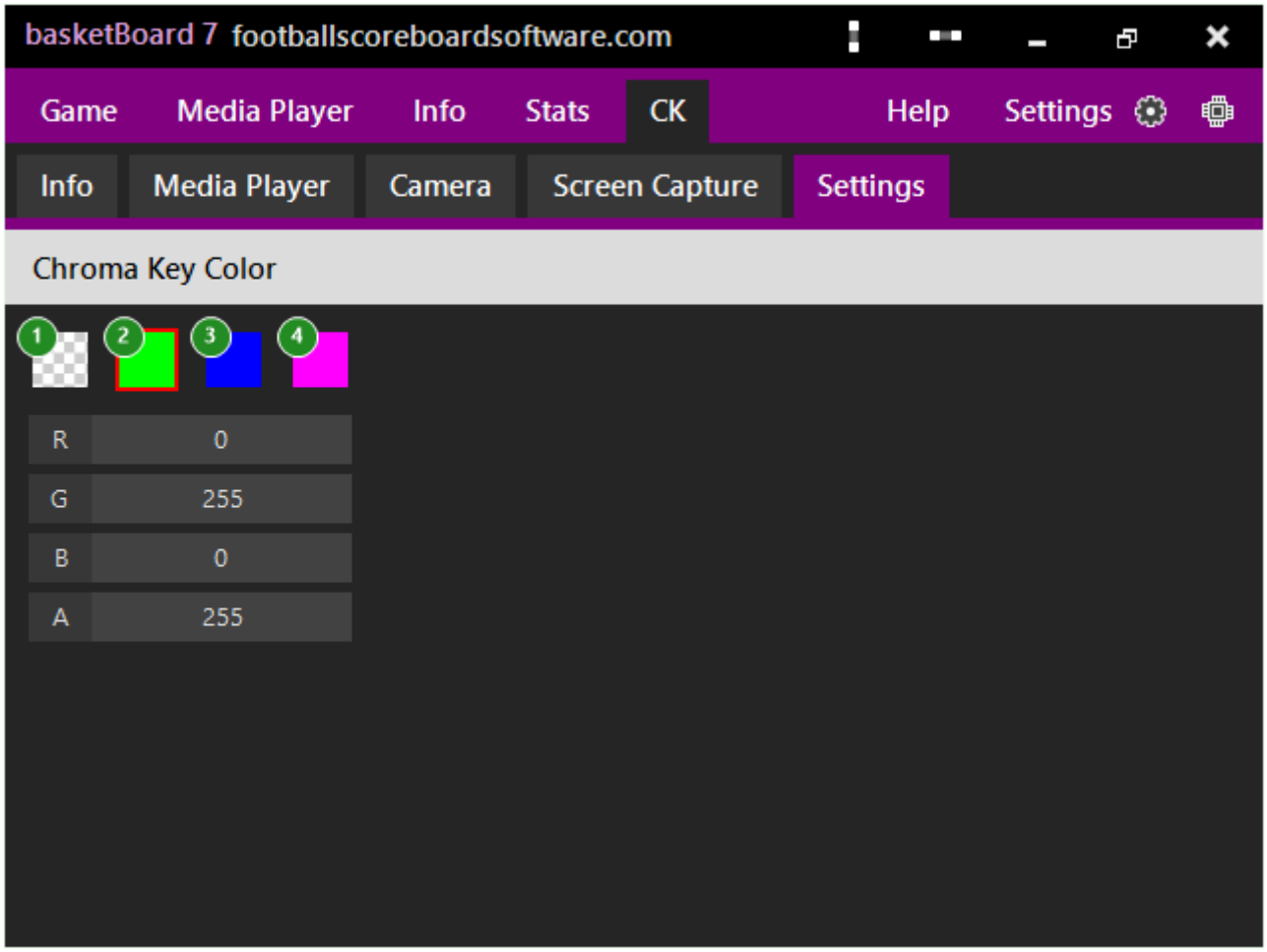


Figure 97. The key colour page with Green selected.

No.	Control	Name	What It Does
1		**Transparent (chequered square)**	Selects Transparent as key colour and saves it in start.xml (CK/KeyColor). The board window gets no background, so the scorebug and the graphics lie over whatever is behind the window on that monitor. The square gets a red border and the values R 255, G 255, B 255, A 0 are shown. The board window is hidden for a moment while the colour changes.
2		**Green (green square)**	Selects Green as key colour and saves it in start.xml (CK/KeyColor). The board fills its background with green at once. The square gets a red border and the values R 0, G 255, B 0, A 255 are shown for the keyer of the mixer. Green is the colour of a new installation.
3		**Blue (blue square)**	Selects Blue as key colour and saves it in start.xml (CK/KeyColor). The board fills its background with blue at once. The square gets a red border and the values R 0, G 0, B 255, A 255 are shown for the keyer of the mixer.
4		**Magenta (magenta square)**	Selects Magenta as key colour and saves it in start.xml (CK/KeyColor). The board fills its background with magenta at once. The square gets a red border and the values R 255, G 0, B 255, A 255 are shown for the keyer of the mixer.

1. Click one of the four squares. The selected square has a red border.
2. Enter the R, G, B values shown under the squares in the keyer of the mixer.

Square	Key colour	R	G	B	A
Chequered	Transparent	255	255	255	0
Green	Green	0	255	0	255
Blue	Blue	0	0	255	255
Magenta	Magenta	255	0	255	255

The colour applies at once and is stored in start.xml (CK/KeyColor). A new installation uses Green.



Figure 98. The CK board after Blue was selected.

- Choose a colour that does not occur in the logos and in the scorebug.
- With Transparent the board window has no background: on its monitor the scorebug lies over what is behind the window.
- The NDI output has no transparency. Use Green, Blue or Magenta when the mixer takes the board over NDI.

9.5.7 CK Designs

The scorebug and the keyed graphics belong to the Chroma Key design. The factory CK designs Navy, Charcoal and Clay, the design list and the editor are described in chapter 11.

9.6 Which Mode for Which Output

Output	Recommended mode
LED wall or hall monitor	St, or Sp with sponsors
Hall screen with commercials or a camera	Ad
Vision mixer or streaming software, by cable or NDI	CK with Green, Blue or Magenta

The NDI output (chapter 8) sends whatever the board shows, in every mode.

10. Info Screens

Info screens are the graphics that you put on the board between the moments of the game: the starting five, a player, a basket, a foul, the team fouls, a time-out, a review, the score after a period, the final result, the leaders, the box score, the player of the game, the standings, the results and the officials. basketBoard 7 has 15 such screens for basketball. They fill the whole board in the display modes St, Sp and Ad, and they appear as a lower third under the scorebug in CK mode.

The Info page also keeps the older graphics of the program: the banner, the announcement, the line-up and team slide, the player pictures, the referees, the substitutions and the sponsors. The Stats page holds the tables of match statistics, standings, results and fixtures. Both are described at the end of this chapter.

The pictures of this chapter show the demo match FENERBAHÇE against REAL MADRID and the standings and results of EuroLeague clubs that come with a new installation.

10.1 The Info Page

Click "Info" in the menu strip of the main window. The left column opens the editors; the buttons beside Home Team, Guest Team and Referees act on the board directly.

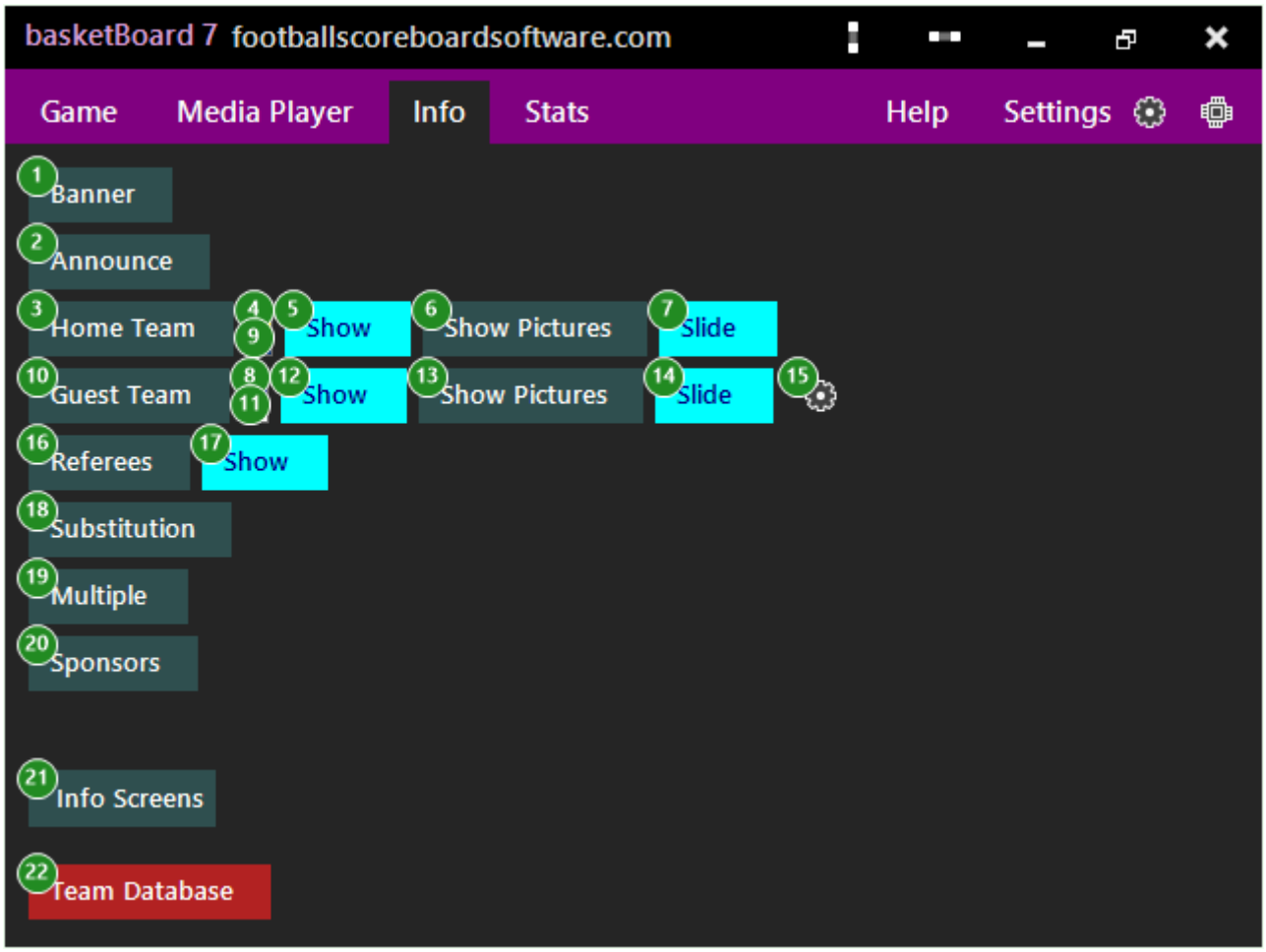
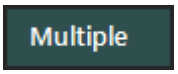
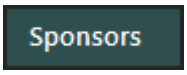
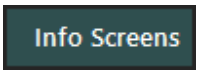
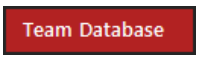


Figure 99. The Info page. "Info Screens" opens the 15 basketball info screens.

No.	Control	Name	What It Does
1	Banner	**Banner**	Opens the Banner editor in the work area. The board does not change until you click Show in the editor.

No.	Control	Name	What It Does
2	Announce	**Announce**	Opens the Announce editor in the work area. The board does not change until you click Show in the editor.
3	Home Team	**Home Team**	Opens the squad editor with the players of the home team: groups, numbers, names and photos.
4		**Home colour 1 (upper square)**	Opens the colour dialog for the first colour of the home team and saves the four team colours in start.xml. The line-up uses it as the background of its heading, number cells and coach line; the Chroma Key scorebug and designs with team colour marks take it when the board is drawn again.
5	Show	**Show (Home Team)**	Shows the line-up list of the home team on the board at once, over the background of the background settings. A clip of the media player that is playing is stopped. The list stays until you show another graphic or click Game.
6	Show Pictures	**Show Pictures (Home Team)**	Opens the player pictures page of the home team in the work area. The board does not change until you start the pictures there.
7	Slide	**Slide (Home Team)**	Shows the team slide of the home team on the board at once, over the background of the background settings. A clip of the media player that is playing is stopped.
8		**Guest colour 1 (upper square)**	Opens the colour dialog for the first colour of the guest team and saves the four team colours in start.xml. The line-up uses it as the background of its heading, number cells and coach line; the Chroma Key scorebug and designs with team colour marks take it when the board is drawn again.
9		**Home colour 2 (lower square)**	Opens the colour dialog for the second colour of the home team and saves the four team colours in start.xml. The line-up uses it as the text colour of its heading, number cells and coach line; the Chroma Key scorebug and designs with team colour marks take it when the board is drawn again.
10	Guest Team	**Guest Team**	Opens the squad editor with the players of the guest team: groups, numbers, names and photos.
11		**Guest colour 2 (lower square)**	Opens the colour dialog for the second colour of the guest team and saves the four team colours in start.xml. The line-up uses it as the text colour of its heading, number cells and coach line; the Chroma Key scorebug and designs with team colour marks take it when the board is drawn again.
12	Show	**Show (Guest Team)**	Shows the line-up list of the guest team on the board at once, over the background of the background settings. A clip of the media player that is playing is stopped. The list stays until you show another graphic or click Game.
13	Show Pictures	**Show Pictures (Guest Team)**	Opens the player pictures page of the guest team in the work area. The board does not change until you start the pictures there.
14	Slide	**Slide (Guest Team)**	Shows the team slide of the guest team on the board at once, over the background of the background settings. A clip of the media player that is playing is stopped.

No.	Control	Name	What It Does
15		**Background settings (gear)**	Opens and closes the panel with the background settings for the line-up list, the team slide, the referee list and the info screens.
16		**Referees**	Opens the editor of the referee list. The Officials info screen also uses this list when its own list is empty.
17		**Show (Referees)**	Shows the referee list on the board at once, over the background of the background settings. A clip of the media player that is playing is stopped.
18		**Substitution**	Opens the Substitution page for one player coming in and one player going out.
19		**Multiple**	Opens the page for several substitutions of one team at once.
20		**Sponsors**	Opens the list of sponsor images. Its first five entries are the sponsor pictures offered in the Banner, Announce and Substitution editors.
21		**Info Screens**	Opens the Info Screens window with the 15 basketball info screens of the active rules preset. A screen button there opens the editor of that screen.
22		**Team Database**	Opens the team database: saved squads that can be loaded as the home or the guest squad of the match.

Button	What it opens or shows	Section
"Info Screens"	The Info Screens window with the 15 basketball screens	10.2
"Banner"	The banner editor	10.14
"Announce"	The announcement editor	10.14
"Home Team", "Guest Team"	The squad editor of the team; beside it "Show" (line-up), "Show Pictures" (player pictures), "Slide" (team slide) and the two team colours	10.15, 10.16
"Referees"	The referee list; beside it "Show"	10.17
"Substitution", "Multiple"	The substitution pages	10.18
"Sponsors"	The sponsor image list	10.19
"Team Database"	The saved squads	10.19
Gear at the end of the Guest Team row	The background settings of the info graphics	10.13

> **Note:** Opening an editor never changes the board. The board changes when you click "Show" in the editor or one of the direct buttons on the page.

10.2 The Info Screens Window

Click "Info Screens" on the Info page. In CK mode the same button is on the Info tab of the CK page. The window opens in the work area of the main window and shows one button for every screen of the active rules preset, three in a row, in the order below.

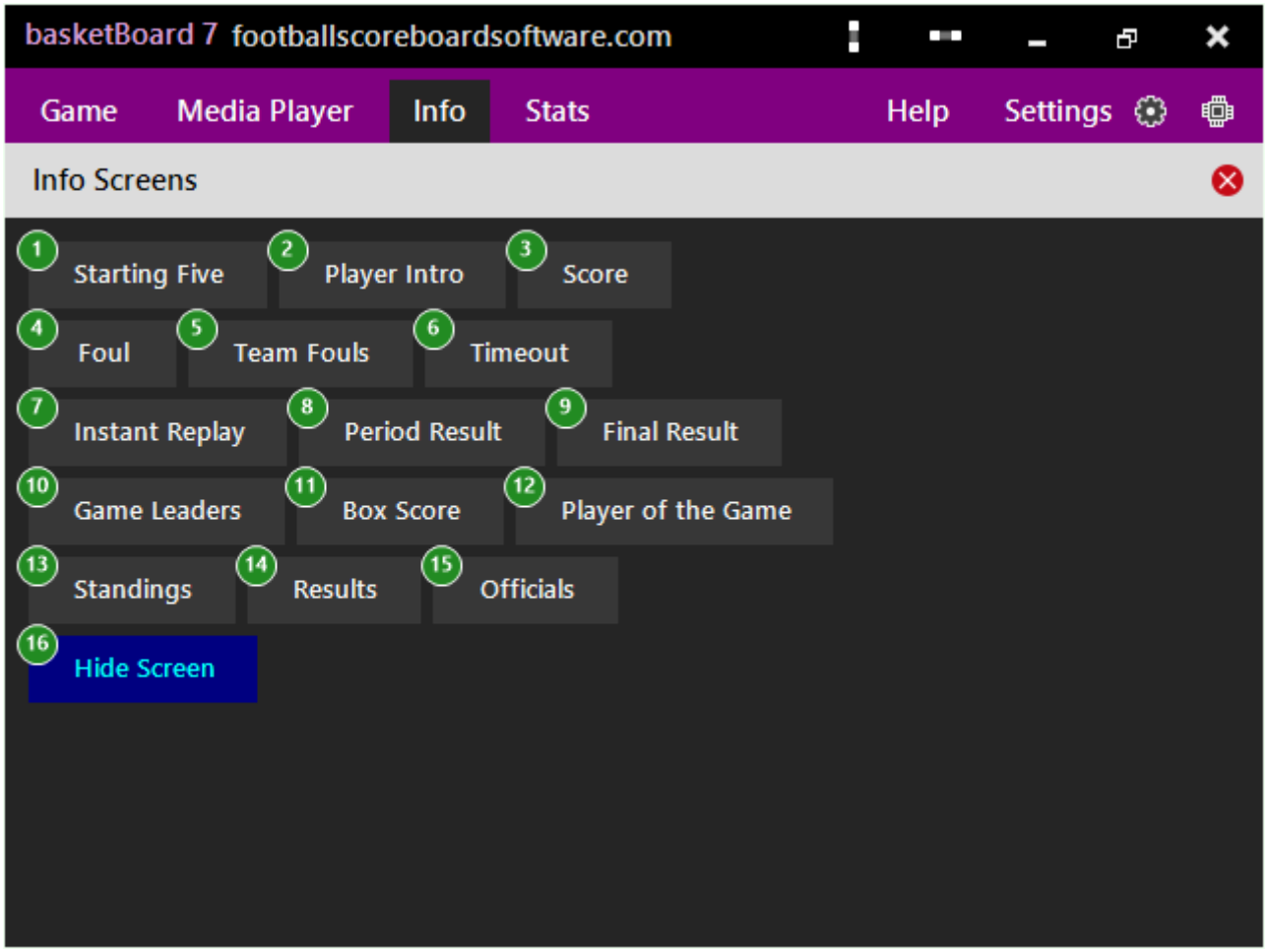
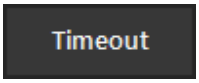
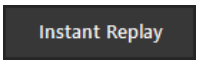
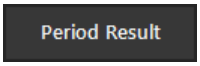
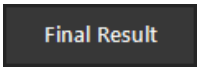
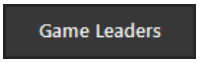
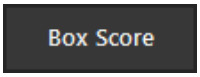
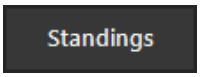
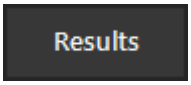
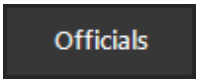


Figure 100. The Info Screens window: 15 screen buttons and "Hide Screen".

No.	Control	Name	What It Does
1	Starting Five	**Starting Five**	Opens the editor of the Starting Five screen: the first five players of the Starting 5 group of a team with their photos, and the coach. The button is aqua while this screen is on the board.
2	Player Intro	**Player Intro**	Opens the editor of the Player Intro screen: one player with photo, number, name and team. The button is aqua while this screen is on the board.
3	Score	**Score**	Opens the editor of the Score screen: the scorer, the kind of basket, the player's points in the game and the score. The button is aqua while this screen is on the board.
4	Foul	**Foul**	Opens the editor of the Foul screen: the player, the kind of foul, the player's fouls with Fouled Out or Ejected, and the team fouls. The button is aqua while this screen is on the board.
5	Team Fouls	**Team Fouls**	Opens the editor of the Team Fouls screen: the team fouls of both teams and the penalty or bonus situation. The screen has nothing to fill in. The button is aqua while this screen is on the board.

No.	Control	Name	What It Does
6		**Timeout**	Opens the editor of the Timeout screen: both teams with their timeouts left and the running time-out countdown. The button is aqua while this screen is on the board.
7		**Instant Replay**	Opens the editor of the Instant Replay screen: an instant replay review or a coach's challenge with subject and result. The button is aqua while this screen is on the board.
8		**Period Result**	Opens the editor of the Period Result screen: the score after the last completed period, with the points per period. The button is aqua while this screen is on the board.
9		**Final Result**	Opens the editor of the Final Result screen: the final score with the points per period, overtime included, and the winner. The button is aqua while this screen is on the board.
10		**Game Leaders**	Opens the editor of the Game Leaders screen: the top scorer of each team from the player data, and rebound and assist leaders that you type. The button is aqua while this screen is on the board.
11		**Box Score**	Opens the editor of the Box Score screen: the players of one team with fouls and points from the player data. The button is aqua while this screen is on the board.
12		**Player of the Game**	Opens the editor of the Player of the Game screen: one player with picture, team, points, rebounds and assists. The button is aqua while this screen is on the board.
13		**Standings**	Opens the editor of the Standings screen: the league table of the Stats page with the playing teams marked. The button is aqua while this screen is on the board.
14		**Results**	Opens the editor of the Results screen: the results table of the Stats page. The button is aqua while this screen is on the board.
15		**Officials**	Opens the editor of the Officials screen: the officials of the game with their roles. The button is aqua while this screen is on the board.
16		**Hide Screen**	Takes the info screen off: the scoreboard comes back, in Chroma Key mode the lower third disappears.

Row	Buttons
1	"Starting Five", "Player Intro", "Score"
2	"Foul", "Team Fouls", "Timeout"
3	"Instant Replay", "Period Result", "Final Result"
4	"Game Leaders", "Box Score", "Player of the Game"
5	"Standings", "Results", "Officials"
6	"Hide Screen"

- A screen button opens the editor of that screen (10.3).
- The button of the screen that is on the board is aqua. The others are grey. The colour follows the board: when the screen leaves the board in another way, the button turns grey again.
- "Hide Screen" (navy) takes the screen off the board.
- The red x at the right end of the title strip, or Esc, closes the window. The screen on the board stays.
- The buttons are built again when the rules preset changes.

10.3 The Screen Editor

A screen button opens the editor of the screen in the work area. The title strip names the screen. The left column holds the names of the fields, the right column the values.

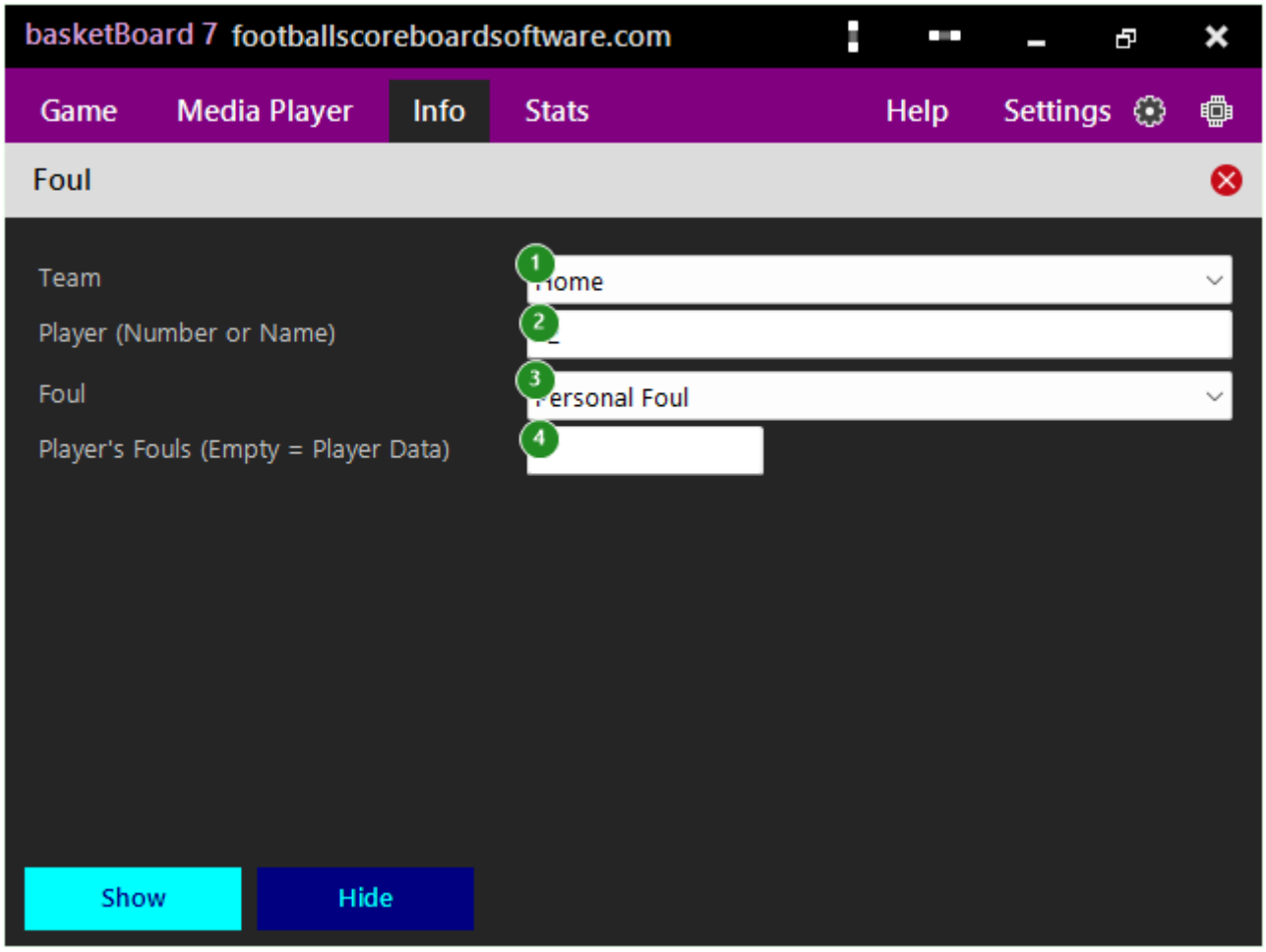


Figure 101. The editor of the Foul screen under the rules preset FIBA.

No.	Control	Name	What It Does
1		**Team**	Chooses the team of the player who committed the foul. The player is looked up in the squad of this team, and the team fouls on the screen are those of this team.
2		**Player (Number or Name)**	Takes the shirt number, the name or a unique part of the name of the player. A player who is not in the squad is shown as typed, without a photo.

No.	Control	Name	What It Does
3		**Foul**	Chooses the kind of foul. FIBA and FIBA 4x8: Personal, Technical, Unsportsmanlike or Disqualifying Foul; NBA, NCAA M and NCAA W: Personal, Technical, Flagrant Foul 1 or Flagrant Foul 2. Disqualifying Foul and Flagrant Foul 2 add Ejected to the screen.
4		**Player's Fouls (Empty = Player Data)**	Takes the number of fouls of the player. Leave it empty to use the count of the Player Data window. At the foul-out limit of the rules preset (5; NBA 6) the screen adds Fouled Out.

The editor shows only the fields and choices of the active rules preset. A field is one of these kinds:

Kind	How you fill it
List box	Choose an entry, for example the team or the kind of foul.
Text box	Type a text. A player is typed as shirt number or name (10.4).
Number box	Type a whole number. Many number boxes may stay empty: then the program takes the value from the match data, as the caption says, for example "Player's Fouls (Empty = Player Data)".
Check box	Switch an option on or off, for example "Show Points per Period".
Table	Type rows, for example the officials. The last row adds a new row; Delete removes the selected row.

- Every change is saved at once with the match in start.xml. The values are still there after a restart of the program.
- "Show" (aqua) at the bottom puts the screen on the board. "Hide" (navy) takes it off.
- A change in the editor reaches the board with the next "Show". The running values of 10.5 are the exception.
- A screen without fields says "This screen shows the match data as it is. Nothing to fill in." It still has "Show" and "Hide".
- The red x at the right end of the title strip, or Esc, closes the editor. The screen on the board stays. Esc in an open list or in a table cell that is being edited only ends that first.

10.4 Teams, Players and the Match Data

The screens take most of their content from the match itself. You only type what the program cannot know.

Data	Where it comes from
Team names, scores, team fouls, period, game clock	The control panel (chapter 5)
Team logos	The logos of the control panel
Players, numbers, photos, coach	The squads of the Info page: "Home Team" and "Guest Team" (10.15)
Player points and fouls	The Player Stats window (chapter 7), also fed by the TCP 2907 PLAYER command (chapter 14)

Data	Where it comes from
Timeouts left, the running time-out	The control panel and the rules preset
Score at the end of each period	Recorded by the program when the period goes up on the control panel
Standings and results	The Standings and Results tables of the Stats page (10.20)
Officials	The Officials field of the screen, else the referee list of the Info page (10.17)
Rebounds, assists, review subject and result	Typed by you in the editor

A player field takes the shirt number, the name, or a part of the name that only one player of the squad has. The search ignores capital letters. A player who is not in the squad is shown as you typed him, without a photo. The photo of a player is the picture of the column "Image for Events" of the squad editor; when it is empty, the picture of "Image for Banner" is used.

> **Note:** The score at the end of a period is recorded when you change the period on the control panel. Change the period after the end of the period, as usual; the score at that moment is the end score of the period before. If you set the period back (a correction), the recorded scores of that period and the later ones are dropped and recorded again.

10.5 Showing and Hiding a Screen

1. Open the Info Screens window and click the screen button.
2. Fill the fields of the editor.
3. Click "Show".

Display mode	Where the screen appears	How it leaves the board
St, Sp, Ad	The whole board, over the background of the info graphics (10.13.1). A clip of the media player that is playing is stopped.	"Hide", "Hide Screen", "Game" in the menu strip, or another graphic that replaces it
CK	A lower third at the bottom left, under the scorebug. The key colour stays around it.	"Hide", "Hide Screen", or the Hide button of the Score or Substitution row on the CK page (they share the layer)

- Only one screen is on the board at a time. "Show" of another screen replaces it.
- The scoreboard is only covered. The game clock and the shot clock keep running.
- After a change of the display mode the screen is no longer on air: show it again in the new mode.
- These values follow the match while the screen is on the board, without a new "Show": the countdown of the Timeout screen, and the team fouls and the penalty or bonus marker of the Foul and Team Fouls screens. When a time-out of the other team starts while the Timeout screen is on the board, the screen is drawn again for that team.

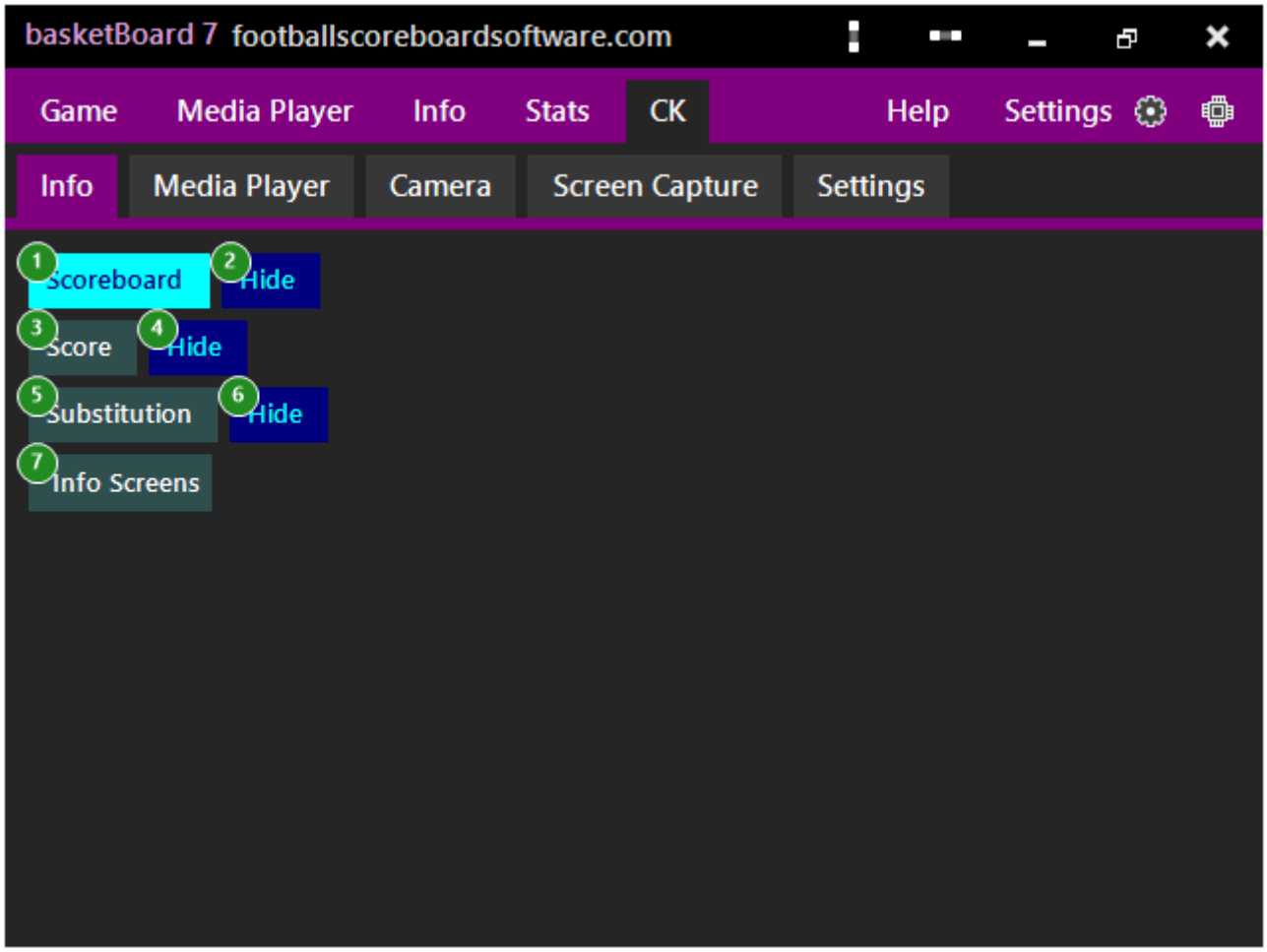
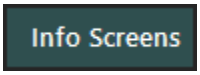


Figure 102. The CK page (CK mode): "Info Screens" under the rows Scoreboard, Score and Substitution.

No.	Control	Name	What It Does
1	Scoreboard	**Scoreboard**	Shows the scorebug on the Chroma Key board, about half a second after the click. The scorebug is written again with the current logos and team colours. It is shown automatically when you switch to Chroma Key mode.
2	Hide	**Hide (Scoreboard row)**	Takes the scorebug off the Chroma Key board. The key colour and a Score or Substitution graphic that is shown stay on the board.
3	Score	**Score**	Opens the Score page, on which you choose the team, the value of the basket (3, 2 or 1) and the player for the keyed Score graphic. The page opens with the home team, 3 points and an empty player box.
4	Hide	**Hide (Score row)**	Takes the lower third off the Chroma Key board: the Score or Substitution graphic of this page or an info screen. They all use the same layer, so this button and the Hide button of the Substitution row do the same. The scorebug stays.
5	Substitution	**Substitution**	Opens the Substitution page, on which you choose the team, the player who comes in and the player who goes out for the keyed Substitution graphic. The page opens with the home team and the minutes of the game clock in the Min box.

No.	Control	Name	What It Does
6		**Hide (Substitution row)**	Takes the lower third off the Chroma Key board: the Substitution or Score graphic of this page or an info screen. They all use the same layer, so this button and the Hide button of the Score row do the same. The scorebug stays.
7		**Info Screens**	Opens the info screens of the active rules preset, the same page as on the Info page. In Chroma Key mode a screen is shown as a lower third under the scorebug.

The lower thirds come with the Chroma Key designs Navy, Charcoal and Clay (chapter 11). The pictures of this chapter show them under the Navy scorebug. The first Chroma Key design has no lower thirds of its own; while it is active, the info screens use the lower thirds of the Navy design.

The screens were shown in the test on the Standard board at 1920 x 1080, 1280 x 1024 and 1920 x 480, and in CK mode at 1920 x 1080 and 1920 x 480.

10.6 What Changes With the Rules Preset

All 15 screens exist in every rules preset: FIBA, FIBA 4x8, NBA, NCAA M and NCAA W. The preset changes these details:

Detail	FIBA, FIBA 4x8	NBA	NCAA M	NCAA W
Foul kinds of the Foul screen	Personal Foul, Technical Foul, Unsportsmanlike Foul, Disqualifying Foul	Personal Foul, Technical Foul, Flagrant Foul 1, Flagrant Foul 2	as NBA	as NBA
Ejected at once	Disqualifying Foul	Flagrant Foul 2	Flagrant Foul 2	Flagrant Foul 2
Fouled Out at	5 fouls	6 fouls	5 fouls	5 fouls
Team foul marker	"Penalty"	"Penalty"	"Bonus", then "Double Bonus"	"Penalty"
Period labels	Q1 to Q4	Q1 to Q4	1H, 2H	Q1 to Q4
Roles of the referee list (Officials)	Crew Chief, then Umpire	Crew Chief, then Referee	Referee, then Umpire	Referee, then Umpire

Overtime periods are labelled OT1, OT2 and so on. The foul-out limit and the team foul limits are those of the rules dialog (chapter 6).

A choice that does not exist in the new preset is not lost but replaced: a Foul screen saved as "Unsportsmanlike Foul" under FIBA reads "Personal Foul" after a change to NBA.

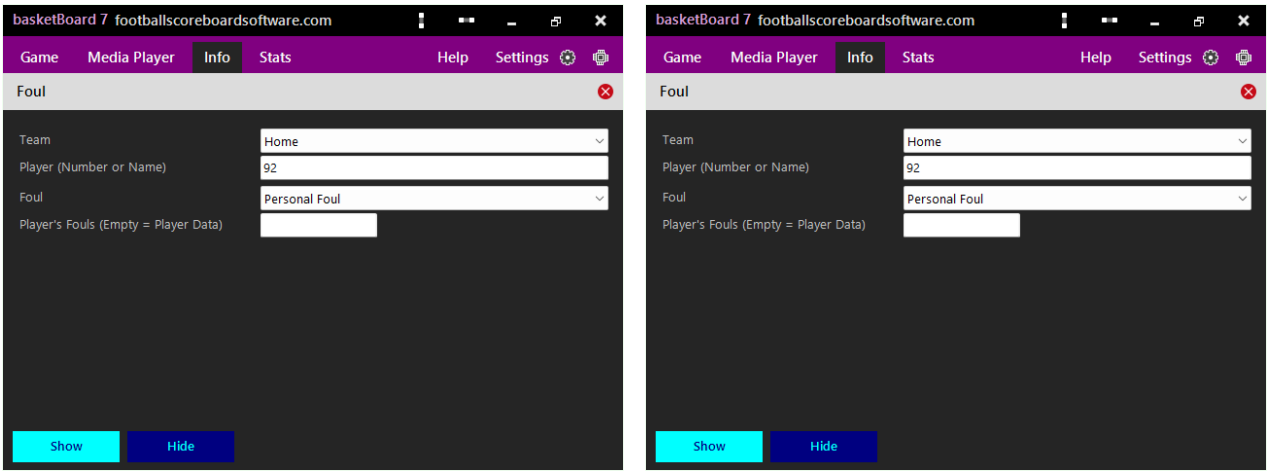


Figure 103. The Foul editor under FIBA (left) and NBA (right): the list of foul kinds follows the preset.

10.7 Teams and Players

10.7.1 Starting Five

The first five players of the group "Starting 5" of a team's squad, each with photo, number and name, the team logo and name, and the coach (the row of the group "Trainer") under the label "Coach".

Field	Choices	Note
"Team"	"Home", "Guest"	

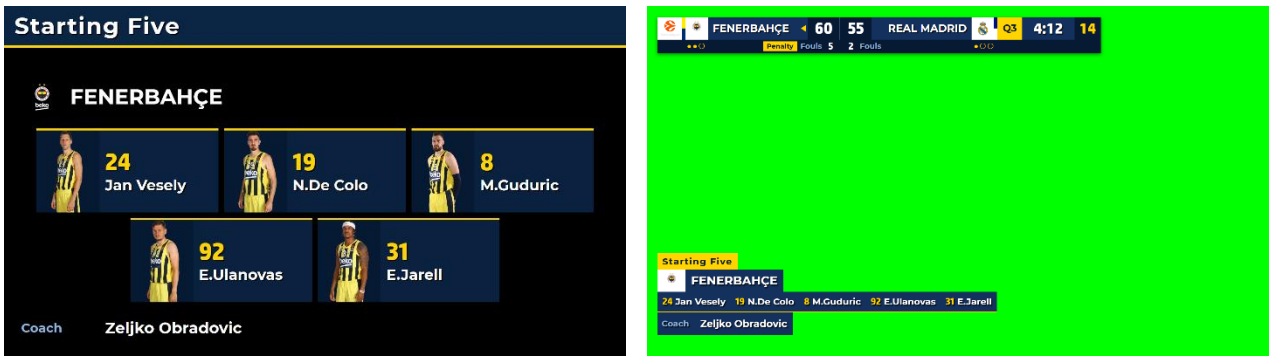


Figure 104. Starting Five on the Standard board (left) and as CK lower third (right).

The order of the players is the order of the squad editor. Without a coach the coach line is left out.

10.7.2 Player Intro

One player: photo, number, name, team logo and team name.

Field	Choices	Note
"Team"	"Home", "Guest"	
"Player (Number or Name)"	text	Empty: the first player of "Starting 5"

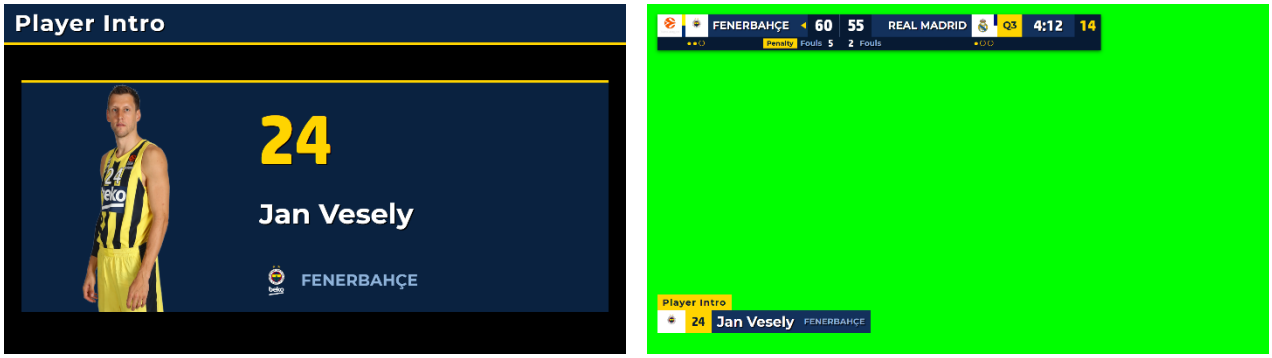


Figure 105. Player Intro on the Standard board and as CK lower third.

10.7.3 Score

The scorer of a basket: photo, number, name, team, the kind of basket, the player's points in the game, the time of the basket and the score with both teams.

Field	Choices	Note
"Team"	"Home", "Guest"	
"Scorer (Number or Name)"	text	
"Basket"	"2 Points", "3 Points", "Free Throw"	
"Player's Points (Empty = Player Data)"	number	Empty: the points of the player in the Player Stats window. Without player data the line "Points in the Game" is left out.
"Time (Empty = Period and Clock)"	text	Empty: the period and the game clock at the moment of "Show", for example Q3 04:12

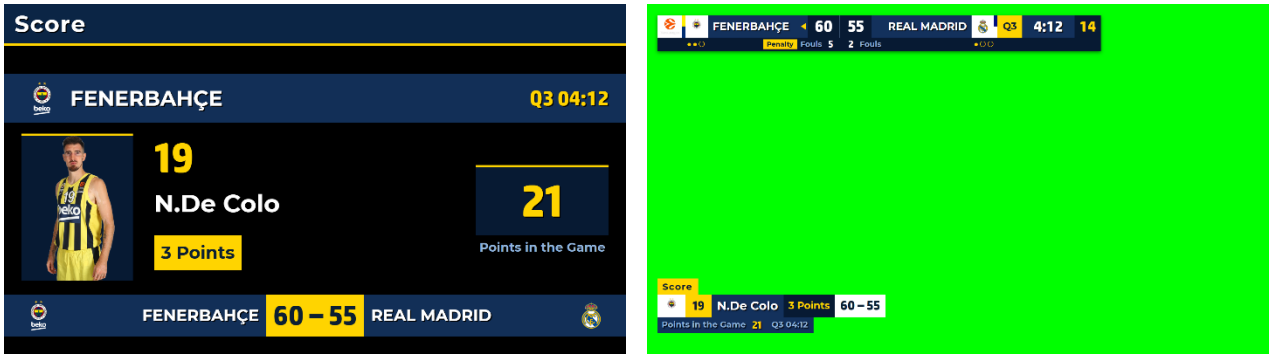


Figure 106. Score on the Standard board and as CK lower third.

> **Note:** The Score screen does not change the score. Add the points on the control panel (chapter 5) and in the Player Stats window as usual; the screen shows what they hold.

10.8 Fouls and Timeouts

10.8.1 Foul

The player who committed a foul: photo, number, name, team, the kind of foul, the player's fouls, and the team fouls of his team with the penalty or bonus marker.

Field	Choices	Note
"Team"	"Home", "Guest"	
"Player (Number or Name)"	text	
"Foul"	FIBA: "Personal Foul", "Technical Foul", "Unsportsmanlike Foul", "Disqualifying Foul". NBA, NCAA: "Personal Foul", "Technical Foul", "Flagrant Foul 1", "Flagrant Foul 2"	Every kind but a personal foul is shown in the warning colour.
"Player's Fouls (Empty = Player Data)"	number	Empty: the fouls of the player in the Player Stats window

- "Fouled Out" appears when the player's fouls reach the foul-out limit of the rules preset: 5, or 6 under NBA. The scripted test matches checked it for every preset: at the limit the screen reads "Fouled Out", one foul below it does not.
- "Ejected" appears for a Disqualifying Foul (FIBA) or a Flagrant Foul 2 (NBA, NCAA), whatever the count.

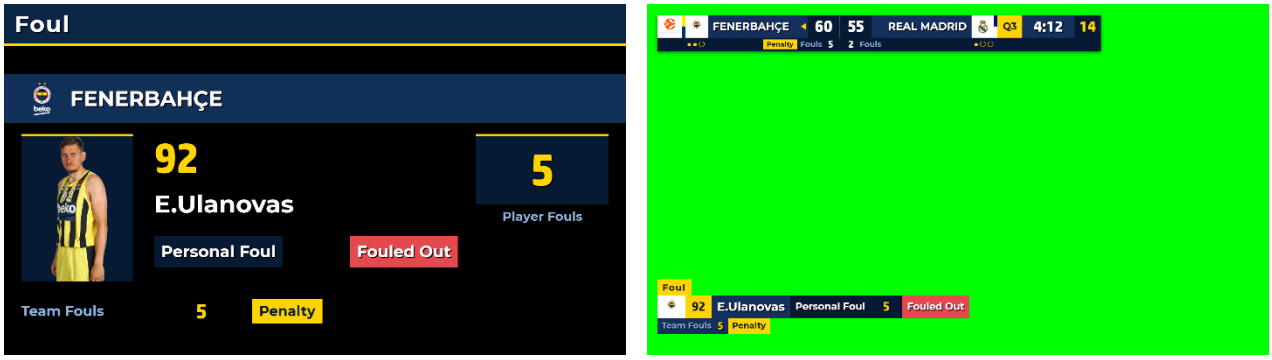


Figure 107. The fifth personal foul of number 92 under FIBA: "Fouled Out", and the team in the penalty.

10.8.2 Team Fouls

The team fouls of both teams with their logos and names, the period, and for each team the marker of the penalty or bonus situation. The marker is dimmed while the team is not in the penalty. The screen has no fields.

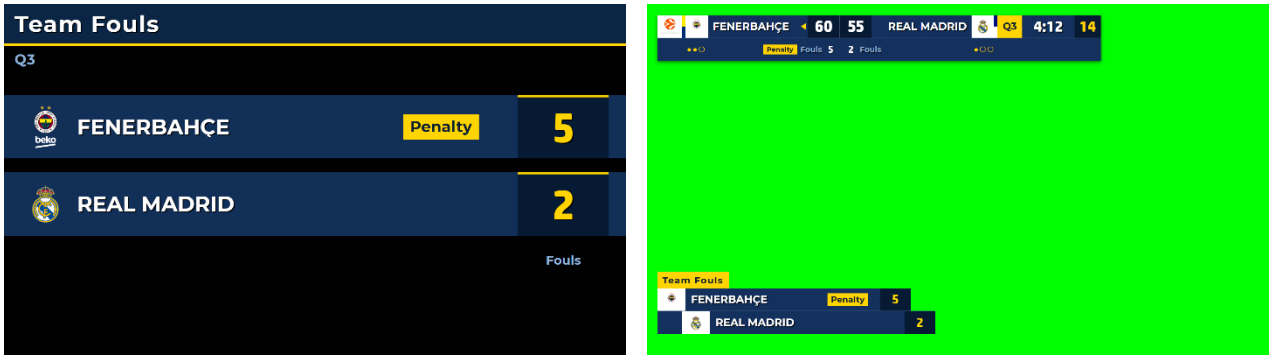


Figure 108. Team Fouls on the Standard board and as CK lower third.

The numbers and the marker follow the control panel while the screen is on the board.

10.8.3 Timeout

Both teams with logo, name and score, the timeouts left of each team as dots, and the countdown of the running time-out. The team that called the time-out is marked.

Field	Choices	Note
"Calling Team"	"Home", "Guest"	Used when no time-out runs. While a time-out runs on the control panel, its team is the calling team.

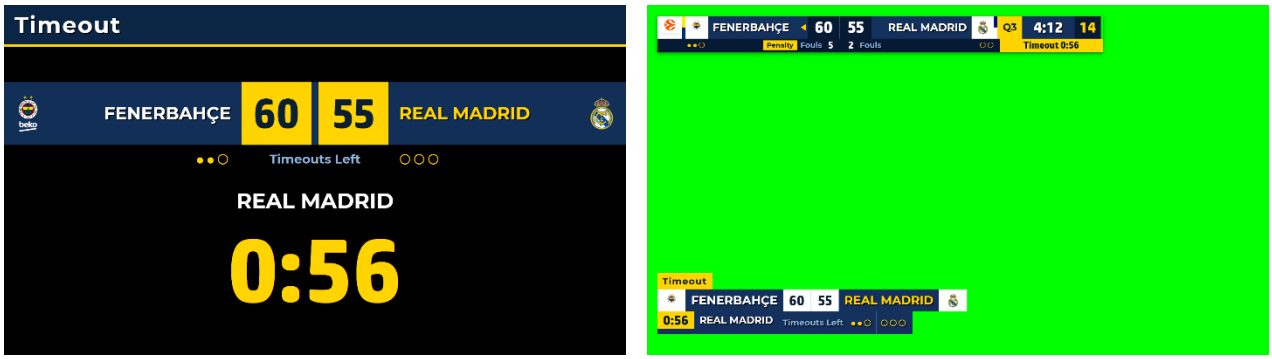


Figure 109. Timeout on the Standard board and as CK lower third.

The countdown runs on the screen with the time-out clock of the control panel. Without a running time-out the countdown is left out.

10.9 Review and Results

10.9.1 Instant Replay and Coach's Challenge

The button and the editor are called "Instant Replay". The screen shows an instant replay review of the officials or a coach's challenge: who asked for it, what is reviewed and the result.

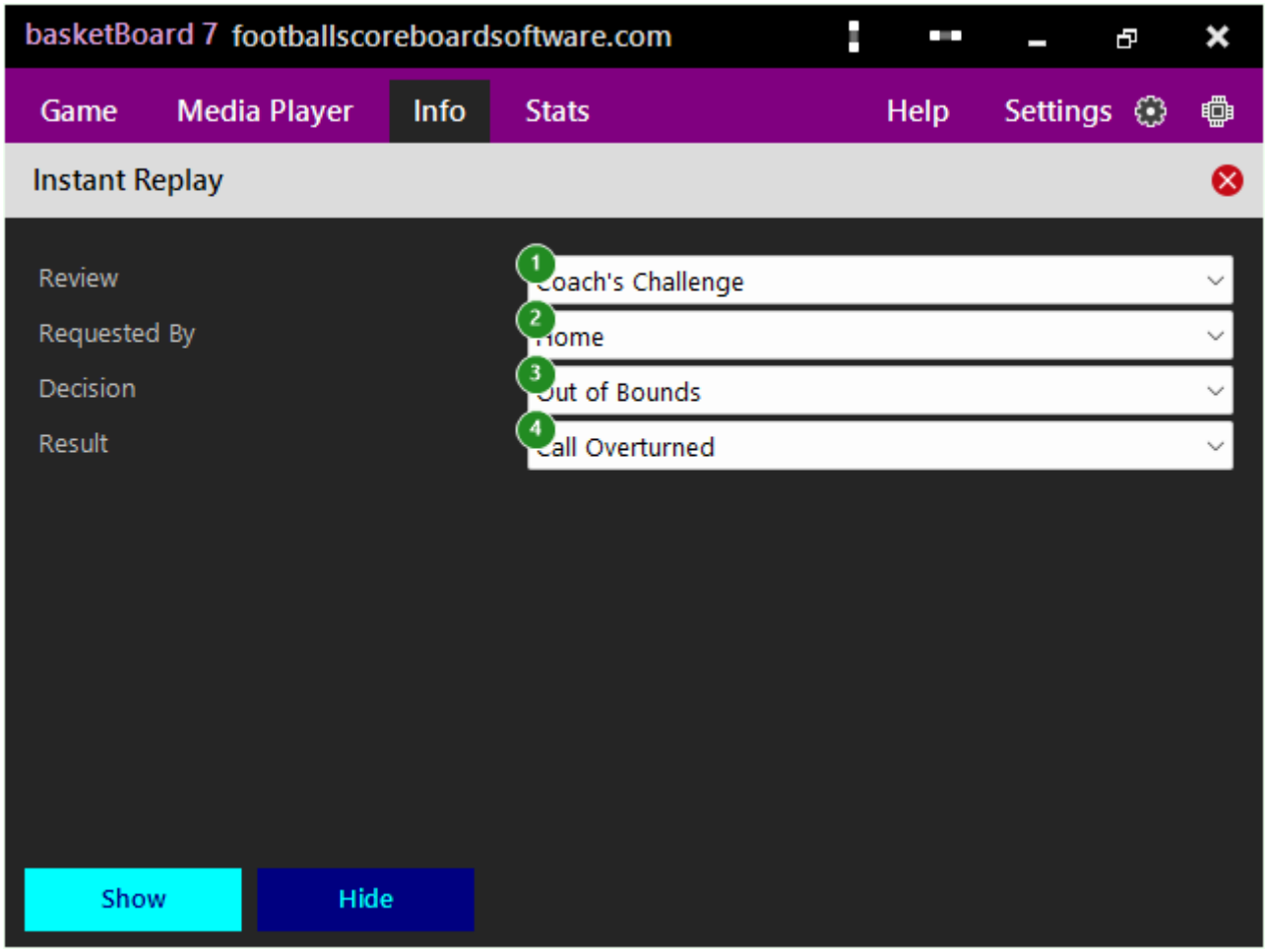


Figure 110. The editor of the Instant Replay screen: a coach's challenge of the home team, call overturned.

No.	Control	Name	What It Does
1		**Review**	Chooses Instant Replay or Coach's Challenge. The choice is the title of the screen.
2		**Requested By**	Chooses who asked for the review: Officials, Home or Guest. A team is shown with its logo and name; Officials is shown as the word Officials.
3		**Decision**	Chooses what is reviewed: 2 or 3 Points, Out of Bounds, Shot Clock, Game Clock, Goaltending / Interference, Type of Foul or Other Decision.
4		**Result**	Chooses the result: Pending (the screen reads Under Review), Call Stands or Call Overturned. For a coach's challenge of a team the screen adds Challenge Successful or Challenge Unsuccessful.

Field	Choices
"Review"	"Instant Replay", "Coach's Challenge" (the title of the screen)
"Requested By"	"Officials", "Home", "Guest"

Field	Choices
"Decision"	"2 or 3 Points", "Out of Bounds", "Shot Clock", "Game Clock", "Goaltending / Interference", "Type of Foul", "Other Decision"
"Result"	"Pending", "Call Stands", "Call Overturned"

- "Pending" is shown as "Under Review".
- For a coach's challenge of a team the result is coloured: "Call Overturned" with "Challenge Successful", "Call Stands" with "Challenge Unsuccessful".
- A review of the officials shows the result without a winner colour.

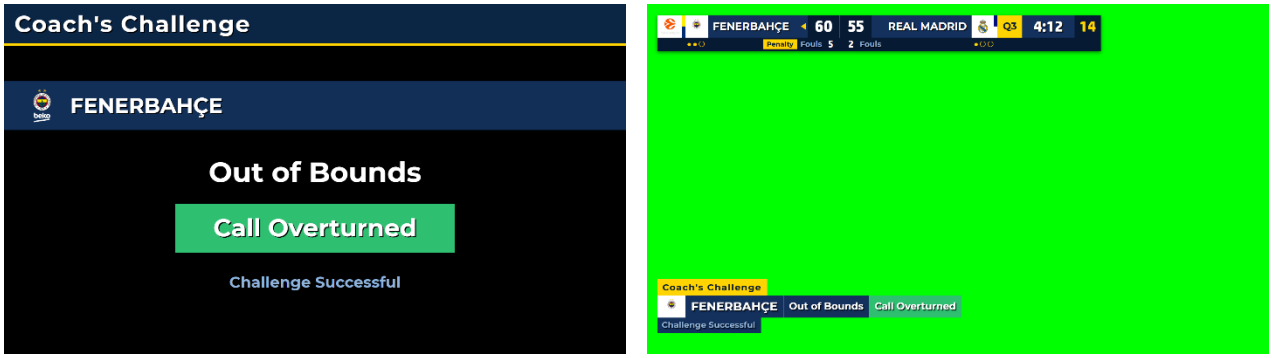


Figure 111. A successful coach's challenge on the Standard board and as CK lower third.

10.9.2 Period Result

The score after the last completed period, with the title "After" and the period, for example "After Q2", and a table with the points of both teams in every period and the total "T".

Field	Choices	Note
"Show Points per Period"	check box, on	Off: only the total

Points scored in a period that has started do not count: the screen shows the end score of the last completed period. Before the first period change the title is "Score" and the screen shows the present score.

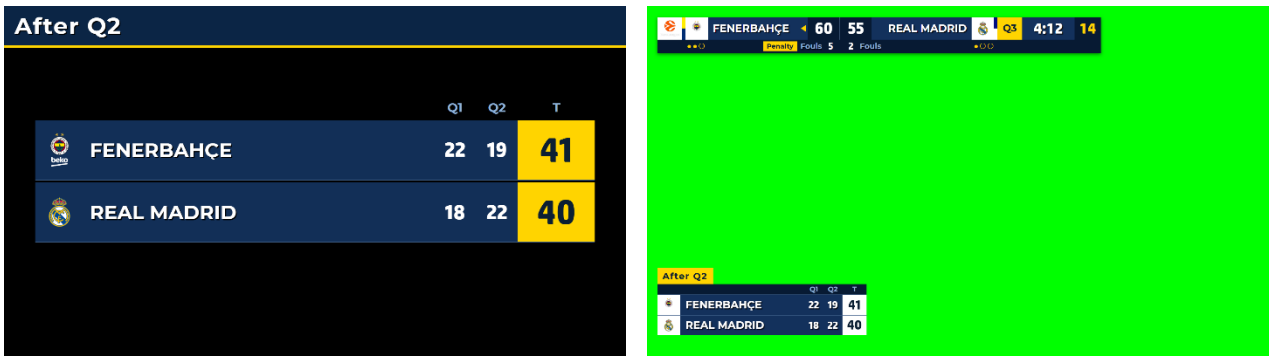


Figure 112. Period Result on the Standard board and as CK lower third.

10.9.3 Final Result

The final score with the points per period, overtime periods included, and the line "{team} Wins" for the winner, for example "FENERBAHÇE Wins". The winning team is marked. A draw shows no winner line.

Field	Choices	Note
"Show Points per Period"	check box, on	The same setting as on the Period Result screen

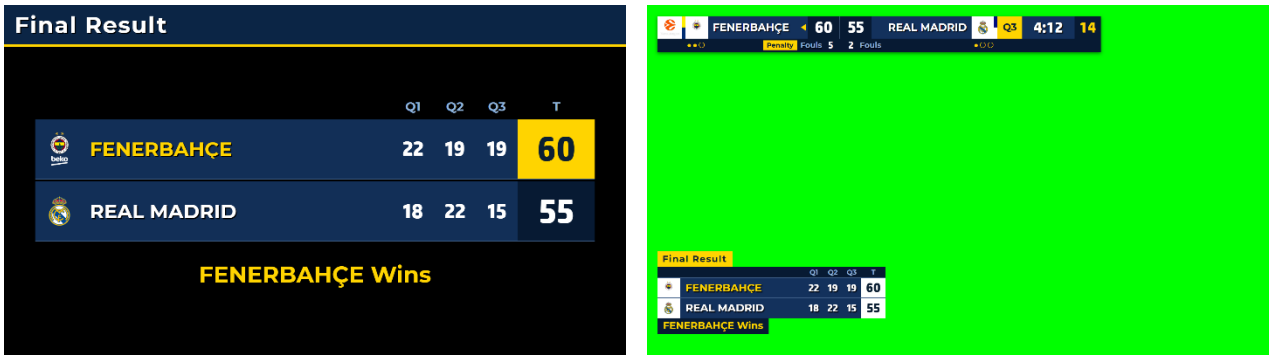


Figure 113. Final Result on the Standard board and as CK lower third.

10.10 Statistics and Awards

10.10.1 Game Leaders

Up to three lines with the leader of each team: points, rebounds and assists. The points leaders are the top scorers of the Player Stats window. Rebounds and assists are not counted by the program: type the player and the number.

Field	Note
"Rebounds Home (Number or Name)", "Rebounds Home (Count)"	Rebound leader of the home team and his number of rebounds
"Rebounds Guest (Number or Name)", "Rebounds Guest (Count)"	The same for the guest team
"Assists Home (Number or Name)", "Assists Home (Count)"	Assist leader of the home team
"Assists Guest (Number or Name)", "Assists Guest (Count)"	The same for the guest team

A line is left out when neither team has a leader for it, for example when no player data exists and no rebounds are typed.

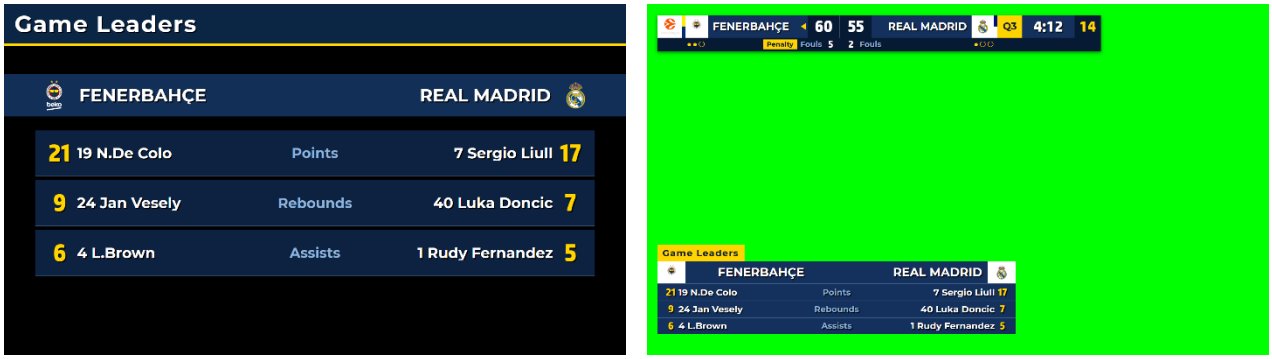


Figure 114. Game Leaders on the Standard board and as CK lower third.

10.10.2 Box Score

The players of one team with number, name, fouls and points, sorted by points, from the Player Stats window. A player at the foul-out limit is marked.

Field	Choices
"Team"	"Home", "Guest"

Without player data the screen shows only the title, the team and the line "No Player Data".

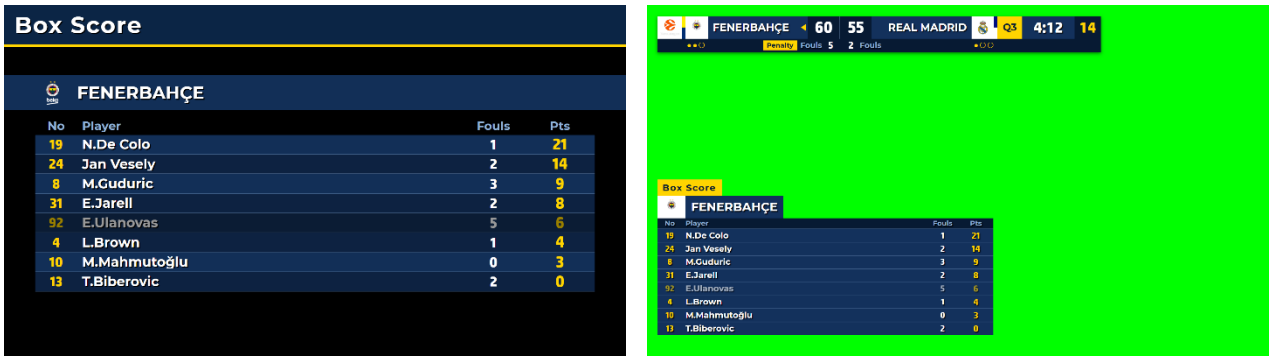


Figure 115. Box Score on the Standard board and as CK lower third.

10.10.3 Player of the Game

One player with a large picture, number, name and team, and up to three values: PTS, REB and AST.

Field	Choices	Note
"Award"	"Player of the Game", "Most Valuable Player"	The title of the screen
"Team"	"Home", "Guest"	
"Player (Number or Name)"	text	Empty: only the title is shown
"Points (Empty = Player Data)"	number	Empty: the points of the Player Stats window
"Rebounds", "Assists"	number	Empty: left out

The picture is the PNG file of "Image for Banner" of the squad editor when there is one, else the photo of "Image for Events".

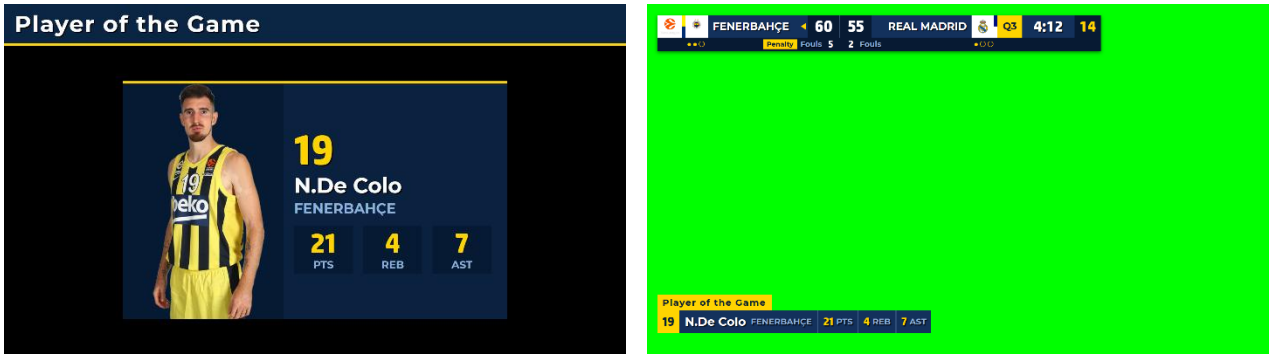


Figure 116. Player of the Game on the Standard board and as CK lower third.

10.11 Competition

10.11.1 Standings

The league table of the Stats page (10.20, file common\data\dataStandings.xml) with the columns Pos, logo, Team, P, W, L, +/- and Pts. The column D of the table is not shown on this screen.

Field	Note
"Heading (Competition, Group)"	A line under the title, for example Regular Season. Empty: no line.

The two playing teams are marked when the name in the table is the same as the team name on the control panel; capital letters do not matter. In the demo data REAL MADRID matches the row Real Madrid, but FENERBAHÇE does not match the row Fenerbahçe Beko. Type the name of the table row on the control panel, or the other way round, when the team should be marked.

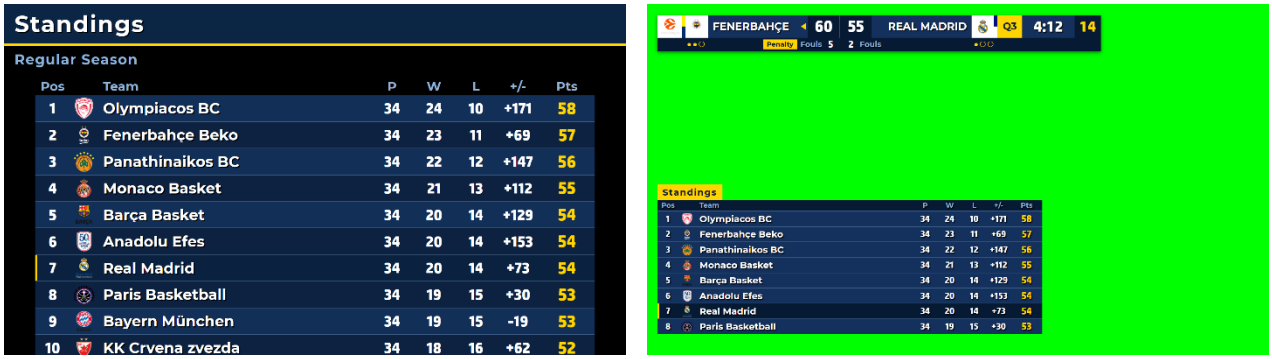


Figure 117. Standings of EuroLeague clubs: the row of Real Madrid is marked.

10.11.2 Results

The results table of the Stats page (10.20, file common\data\dataResults.xml): per game the home logo, the home team, the score, the guest team and the guest logo. A game whose Min text starts with OT is marked with that text.

A date row of the table (Min "!") is shown as a small heading above its games. The screen shows the first rows of the table that fit: up to 8 rows with at most 7 games on the full board, up to 6 rows as CK lower third, dates included. A date at the end without a game under it is left out. To show other games, put them at the top of the table.

Field	Note
"Heading (Round, Day)"	A line under the title, for example Round 12. Empty: no line.

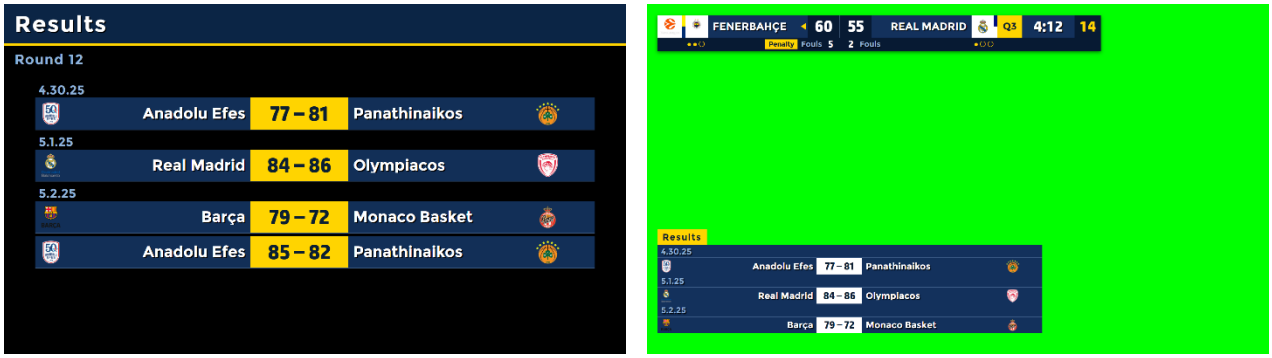


Figure 118. Results of EuroLeague games on the Standard board and as CK lower third.

10.11.3 Officials

The officials of the game, one line each with role and name. The first line is emphasised.

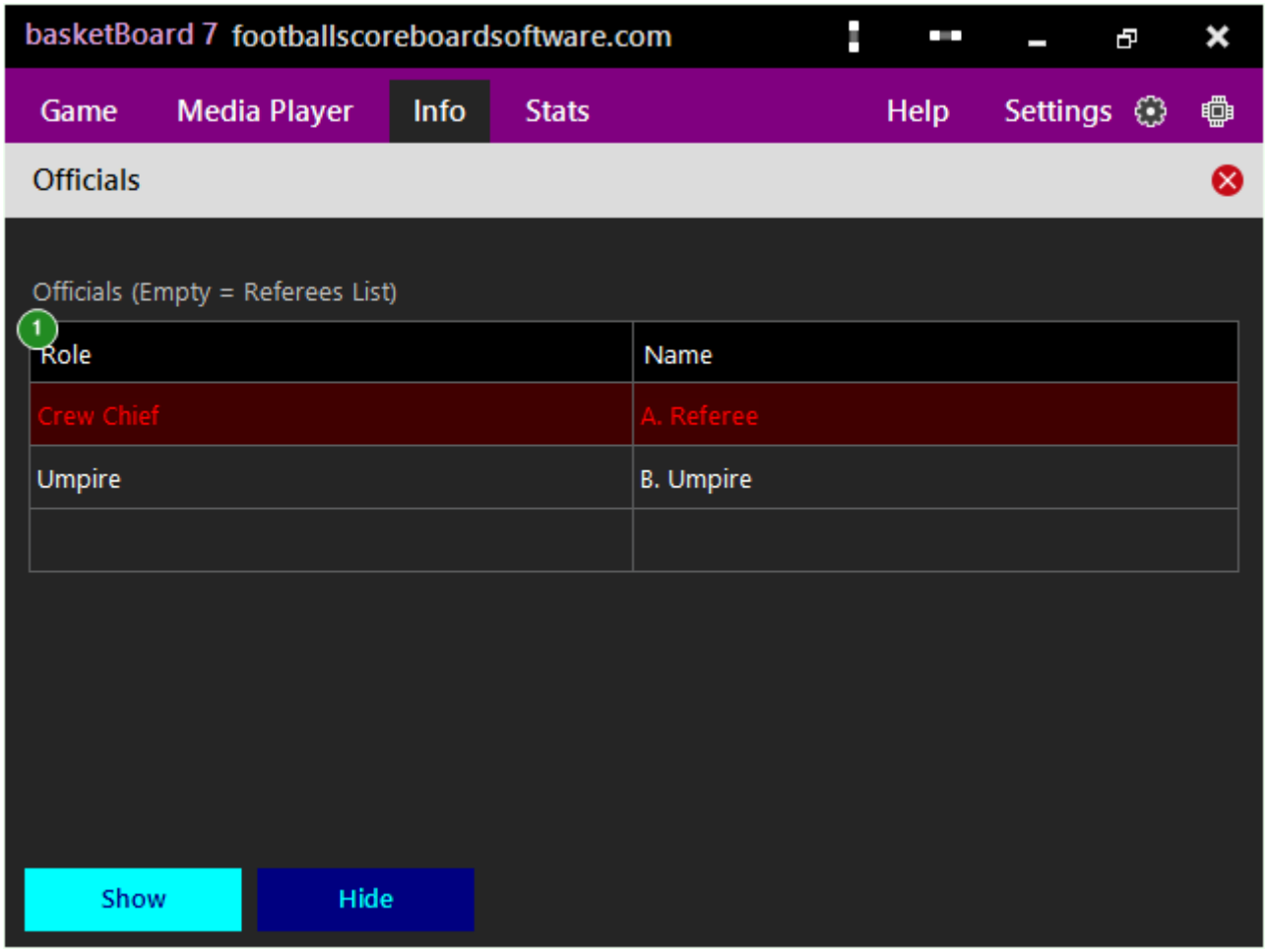


Figure 119. The editor of the Officials screen: the table of roles and names.

No.	Control	Name	What It Does
1		**Officials (Empty = Referees List)**	Holds the officials of the screen, one per row with Role and Name. Type in the last row to add an official; Delete removes the selected row. Every finished cell is saved at once. When the list is empty, the screen uses the referee list of the Info page with the roles of the rules preset.

Field	Note
"Officials (Empty = Referees List)"	A table with the columns "Role" and "Name". Empty: the referee list of the Info page (10.17), with the roles of the rules preset (10.6).

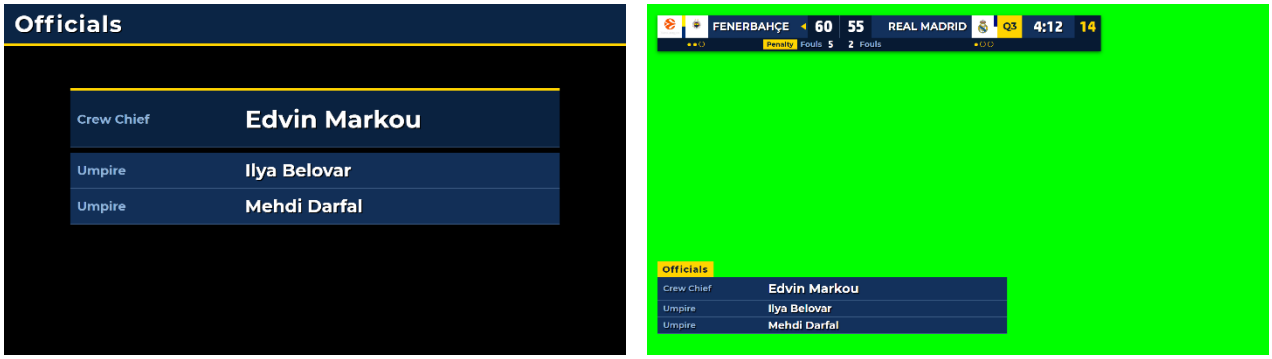


Figure 120. Officials on the Standard board and as CK lower third.

10.12 From the Phone and the API

The remote page on a phone or tablet has an INFO tab with the screens of the active rules preset, the team buttons Home and Guest, a player field and "Hide Screen". The screen that is on the board is marked "On Air". Chapter 13 describes the tab.

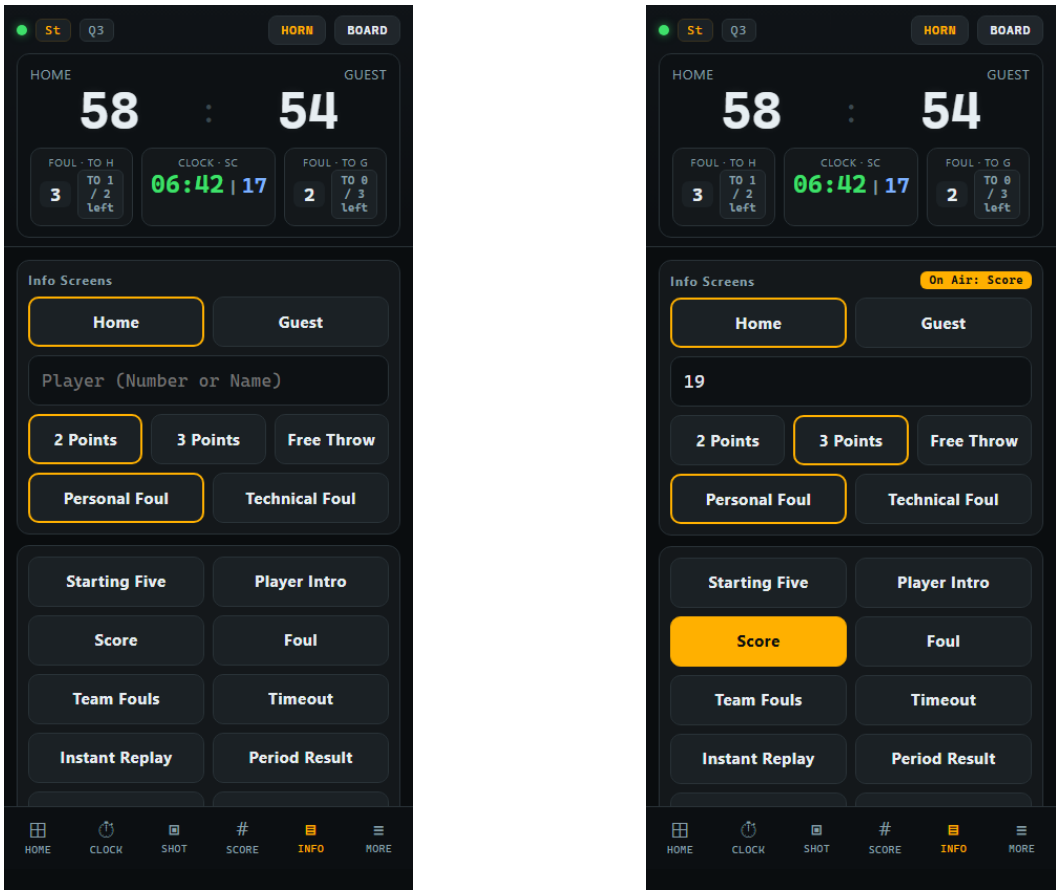


Figure 121. The INFO tab of the remote page, without and with a screen on the board.

The HTTP interface on port 1907 has four commands for the info screens: info_show, info_hide, info_set and info_list. An example that shows a three-point basket of number 24 of the home team:

http://127.0.0.1:1907/api.html?pin=123456&cmd=info_show&value=Score%7CScore.Side%3DHome%7CScore.Player%3D24%7CScore.Kind%3DThreePoints$

- info_show takes the screen and, separated by |, fields of the form Field=value. The fields are saved first, then the screen is shown.
- A choice must be one of the options of the active rules preset. A value that does not apply, for example Foul.Kind=Flagrant1 under FIBA, is ignored.
- The info screens are not part of the TCP 2907 data socket or the UDP 2908 broadcast.

Chapter 14 and Appendix C describe the commands. The file API_Commands.txt in the program folder lists every screen, field and option under HOW TO SHOW INFO SCREENS.

10.13 The Info Page Graphics

The other buttons of the Info page show the older graphics of the program. They work in a different way from the info screens:

- "Show" (or "Slide") puts the graphic on the board at once. A clip of the media player that is playing is stopped.
- There is no Hide button. The graphic stays until you show another graphic or click "Game" in the menu strip.
- Closing an editor with its red x or with Esc only closes the editor. The graphic stays on the board.
- Text that you change in an editor reaches the board with the next "Show".

10.13.1 Background of the Graphics

Every graphic is drawn over a background. For the line-up, the team slide, the referees and the 15 info screens the background is chosen on the Info page: click the gear at the end of the Guest Team row. A panel with three buttons opens; the selected one has a green frame and its name is written beside the buttons.

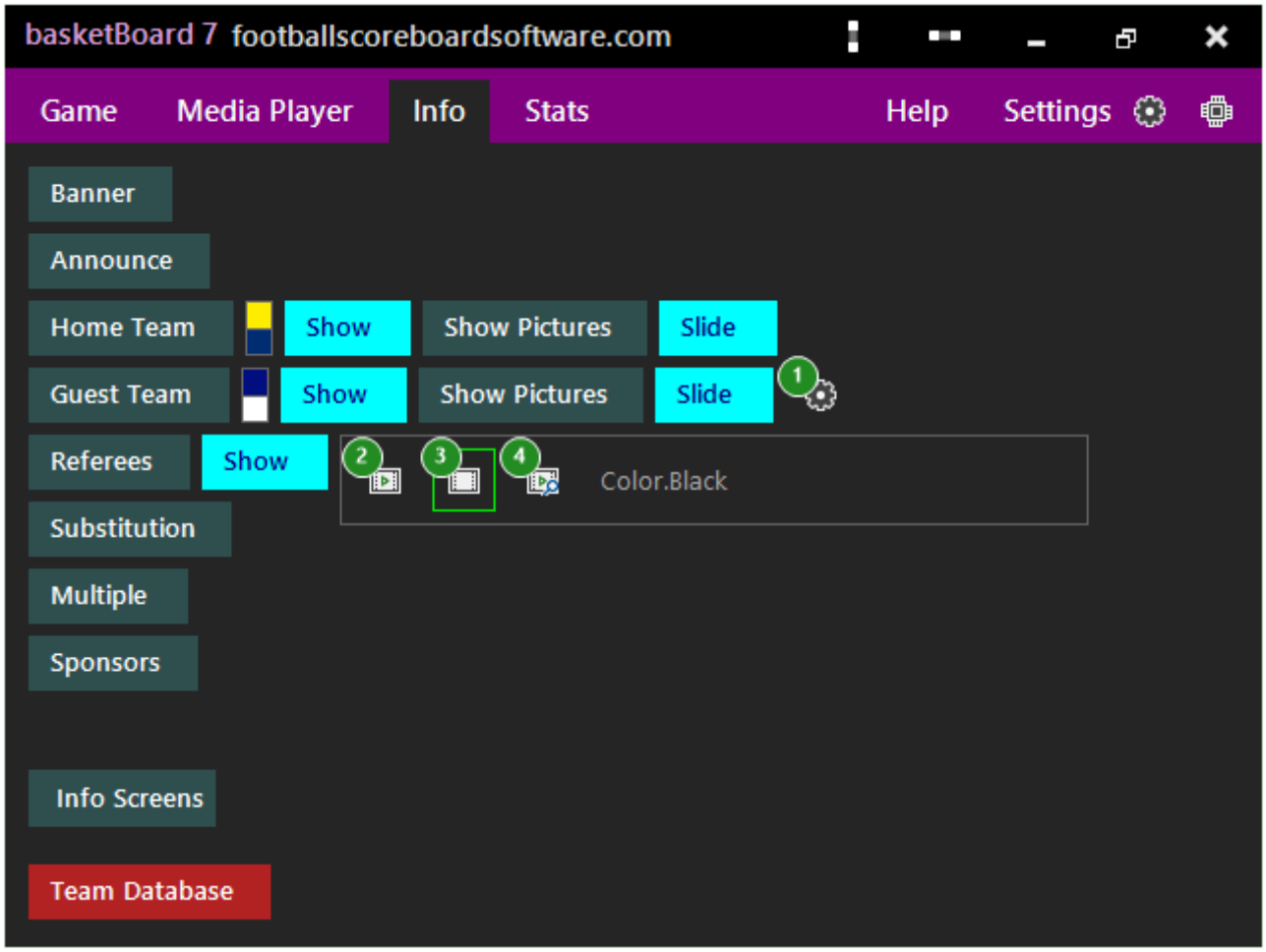


Figure 122. The background settings of the Info page, opened with the gear.

No.	Control	Name	What It Does
1		**Background settings (gear)**	Opens and closes the panel with the background settings for the line-up list, the team slide, the referee list and the info screens.
2		**Scoreboard background (first icon)**	Selects the background video of the scoreboard as the background of the line-up list, the team slide and the referee list. The button gets a green frame, the text beside the buttons reads Scoreboard.Background and the choice is saved at once in config.xml. It is used from the next Show or Slide.
3		**Black background (second icon)**	Selects a plain black background for the line-up list, the team slide and the referee list. The button gets a green frame, the text beside the buttons reads Color.Black and the choice is saved at once in config.xml. It is used from the next Show or Slide.
4		**Selected file (third icon)**	Selects a video file of your own as the background of the line-up list, the team slide and the referee list and shows the file button beside the three buttons. The button gets a green frame, the name of the chosen file is shown and the choice is saved at once in config.xml. If no file was ever chosen, the program goes back to the black background at the next start.

Button	Text beside the buttons	Background
First	Scoreboard.Background	The background video of the scoreboard. Without such a video the background is black.
Second	Color.Black	Plain black
Third	Name of the file	A video file of your own, chosen with the file button that appears

- The choice is saved at once in config.xml and is used from the next "Show".
- The strength of the background is "Background Video Opacity" under Settings > "Screen Properties" (chapter 15).
- The banner, the announcement and the substitution pages have the same three buttons in their own editors, each with its own setting.

> **Note:** Choose an MP4 file with H.264 video. WebM and MOV with H.264 also play; AVI does not. A picture file gives no background for the banner, the announcement and the substitutions: the graphic then appears on black.

10.14 Banner and Announce

10.14.1 Banner

The banner is a full-screen welcome page: two short rows at the top between the two team logos, a large master text in the middle and, if you want, a sponsor logo. In place of the master text it can show the time of day or a countdown, for example to the tip-off.

Board Output **Control Panel**

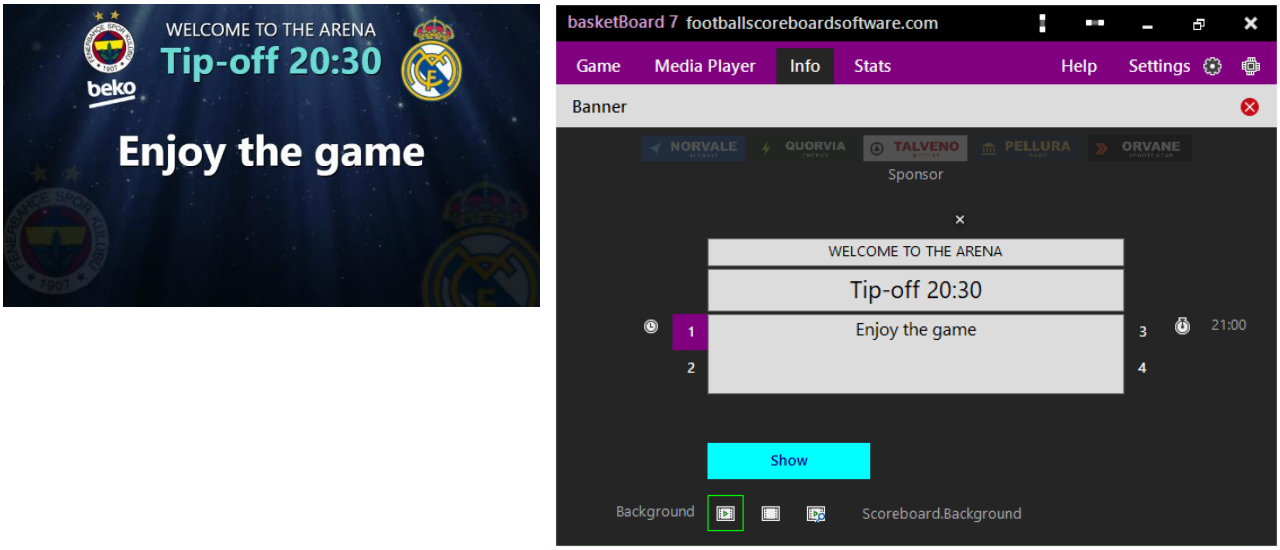


Figure 123. The banner on the board and the Banner editor.

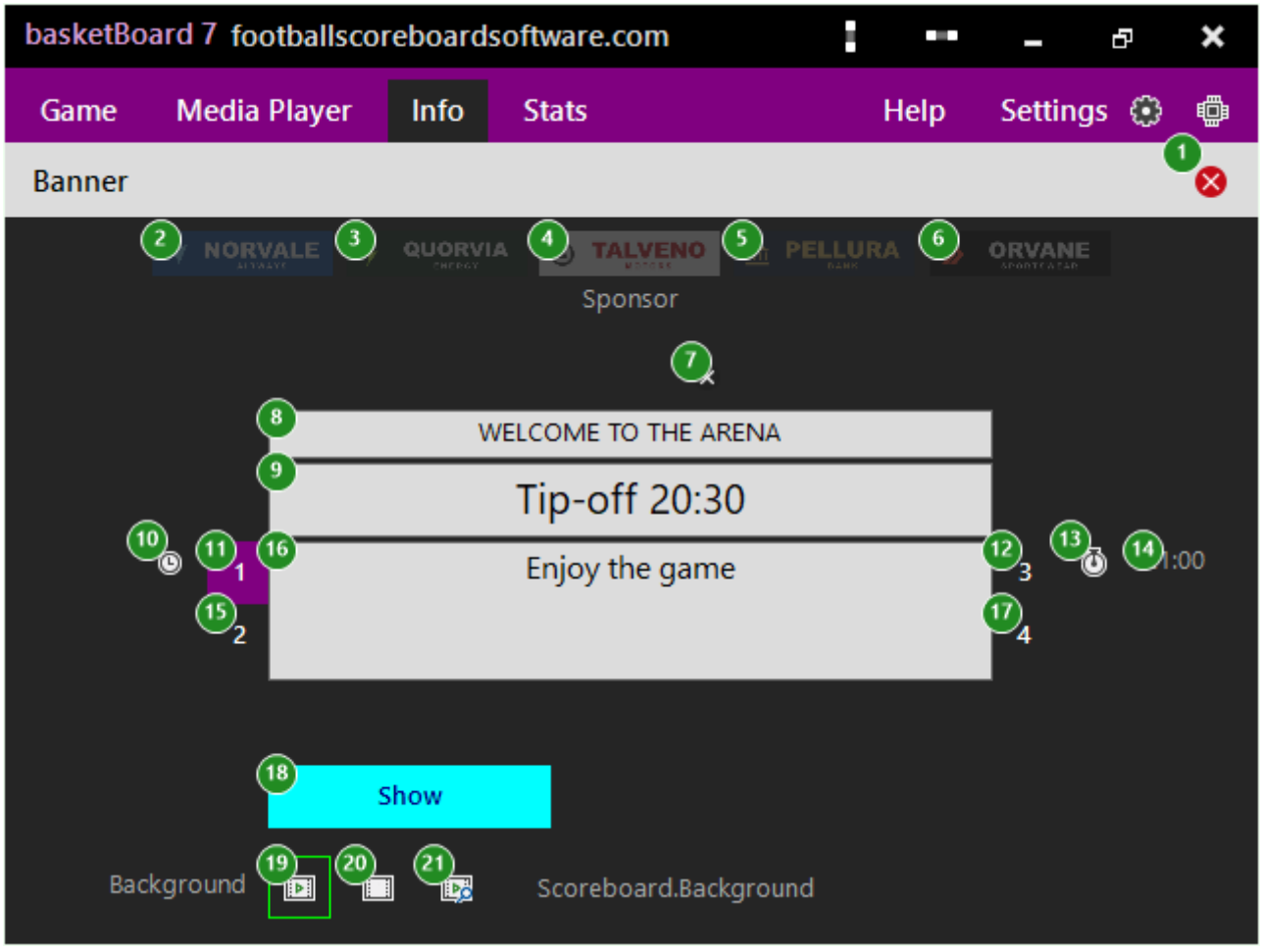
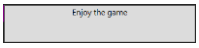


Figure 124. The Banner editor.

No.	Control	Name	What It Does
1		**Close (red button)**	Closes the Banner editor and returns to the Info page. Esc does the same. A banner that is on the board stays there.

No.	Control	Name	What It Does
2		**Sponsor picture 1**	Selects the first entry of the sponsor list as the sponsor logo of the info graphics. The selected logo is repeated in full brightness under the row, the other pictures are dimmed, and the choice is saved at once in start.xml. It is on the board from the next Show.
3		**Sponsor picture 2**	Selects the second entry of the sponsor list as the sponsor logo of the info graphics. The selected logo is repeated in full brightness under the row, the other pictures are dimmed, and the choice is saved at once in start.xml. It is on the board from the next Show.
4		**Sponsor picture 3**	Selects the third entry of the sponsor list as the sponsor logo of the info graphics. The selected logo is repeated in full brightness under the row, the other pictures are dimmed, and the choice is saved at once in start.xml. It is on the board from the next Show.
5		**Sponsor picture 4**	Selects the fourth entry of the sponsor list as the sponsor logo of the info graphics. The selected logo is repeated in full brightness under the row, the other pictures are dimmed, and the choice is saved at once in start.xml. It is on the board from the next Show.
6		**Sponsor picture 5**	Selects the fifth entry of the sponsor list as the sponsor logo of the info graphics. The selected logo is repeated in full brightness under the row, the other pictures are dimmed, and the choice is saved at once in start.xml. It is on the board from the next Show.
7		**Remove sponsor logo (small cross)**	Removes the sponsor logo from the info graphics: the selection is cleared in start.xml and all five sponsor pictures are dimmed. The logo is gone from the board with the next Show.
8		**Row 1**	Holds the small upper row of the banner. The tags <b> <i> <u> are allowed. The text is put on the board and saved in config.xml when you click Show; a click on a memory button 1 to 4 loads the row as it was at the last Show.
9		**Row 2**	Holds the larger second row of the banner. The tags <b> <i> <u> are allowed. The text is put on the board and saved in config.xml when you click Show; a click on a memory button 1 to 4 loads the row as it was at the last Show.
10		**Show Clock (clock icon)**	Replaces the master text with the code {00:00}, which shows the time of day of the PC in hours and minutes on the board; a second click changes it to {00:00:00}, with seconds, and a third click back. Visible while the master text has the focus. The board changes when you click Show.
11		**1**	Selects memory 1 of the master text (purple) and loads its stored text; rows 1 and 2 are loaded as they were at the last Show. Text typed since the last Show is lost. The next Show saves the master text in this memory.

No.	Control	Name	What It Does
12		**3**	Selects memory 3 of the master text (purple) and loads its stored text; rows 1 and 2 are loaded as they were at the last Show. Text typed since the last Show is lost. The next Show saves the master text in this memory.
13		**Show Remaining Time (stopwatch icon)**	Replaces the master text with the time of the small box in curly brackets, for example {21:00}, which shows a countdown to that time in hours and minutes on the board; a second click changes it to {21:00:00}, with seconds, and a third click back. Visible while the master text has the focus. The board changes when you click Show.
14		**Target time**	Holds the target time of the countdown as hours:minutes in 24-hour form, for example 20:30. An entry that is not a valid time becomes 23:59 when you leave the box. The time is used when you click Show Remaining Time.
15		**2**	Selects memory 2 of the master text (purple) and loads its stored text; rows 1 and 2 are loaded as they were at the last Show. Text typed since the last Show is lost. The next Show saves the master text in this memory.
16		**Master text**	Holds the large text in the middle of the banner; Enter starts a new line and the tags <b> <i> <u> are allowed. A time code as the only content shows the time of day ({00:00}, {00:00:00}) or a countdown to a time ({20:30}, {20:30:00}) in its place. Show puts it on the board and saves it in the selected memory 1 to 4.
17		**4**	Selects memory 4 of the master text (purple) and loads its stored text; rows 1 and 2 are loaded as they were at the last Show. Text typed since the last Show is lost. The next Show saves the master text in this memory.
18		**Show**	Shows the banner on the board at once with the two rows, the master text or its clock or countdown, the team logos, the selected sponsor logo and the selected background. Saves row 1, row 2 and the master text of the selected memory in config.xml and stops a clip of the media player that is playing. The banner stays until you show another graphic or click Game.
19		**Use Scoreboard Background**	Selects the background video of the scoreboard as the background of the banner. The button gets a green frame, the text beside the buttons reads Scoreboard.Background and the choice is saved at once in config.xml. It is used from the next Show.
20		**Use Black Background**	Selects a plain black background for the banner. The button gets a green frame, the text beside the buttons reads Color.Black and the choice is saved at once in config.xml. It is used from the next Show.
21		**Use Selected Background**	Selects a file of your own as the background of the banner and shows the file button beside the three buttons. The button gets a green frame, the name of the chosen file is shown and the choice is saved at once in config.xml. If no file was ever chosen, the black background is selected the next time the editor opens.

1. Type row 1 (the small upper row) and row 2.
2. Click one of the buttons 1 to 4 beside the large box and type the master text. The four buttons are four memories; the selected one is purple.
3. Click a sponsor picture at the top if a sponsor logo is to be shown.
4. Choose the background with the three buttons at the bottom.
5. Click "Show".

- "Show" saves row 1, row 2 and the master text of the selected memory in config.xml. Nothing is saved before "Show".
- The tags <b>, <i>, <u> and <br> are allowed in the three texts. Any other text between angle brackets is shown as typed.
- The banner has no style panel. Its look belongs to the design: page Banner in the design editor (chapter 11).

The two icon buttons beside the master text are visible while the master text has the focus:

Master text	The board shows
{00:00} (button "Show Clock")	Time of day, hours and minutes; a second click gives {00:00:00} with seconds
{20:30} (button "Show Remaining Time", target time in the small box)	Time left until 20:30; a second click gives {20:30:00} with seconds
Any other text	The text itself



Figure 125. The banner with the time of day (left) and with the countdown to the target time (right).

- The code must be the only content of the master text. The time of day is the clock of the PC, not the game clock.
- If the target time has already passed today, the countdown runs to that time tomorrow. At zero it stops.
- A target time that is not a valid time becomes 23:59 when you leave the small box.

10.14.2 Announce

The announcement is a full-screen text with the logo of one team and, if you want, a sponsor logo: a safety message, a car that blocks the exit, a welcome.

Board Output **Control Panel**

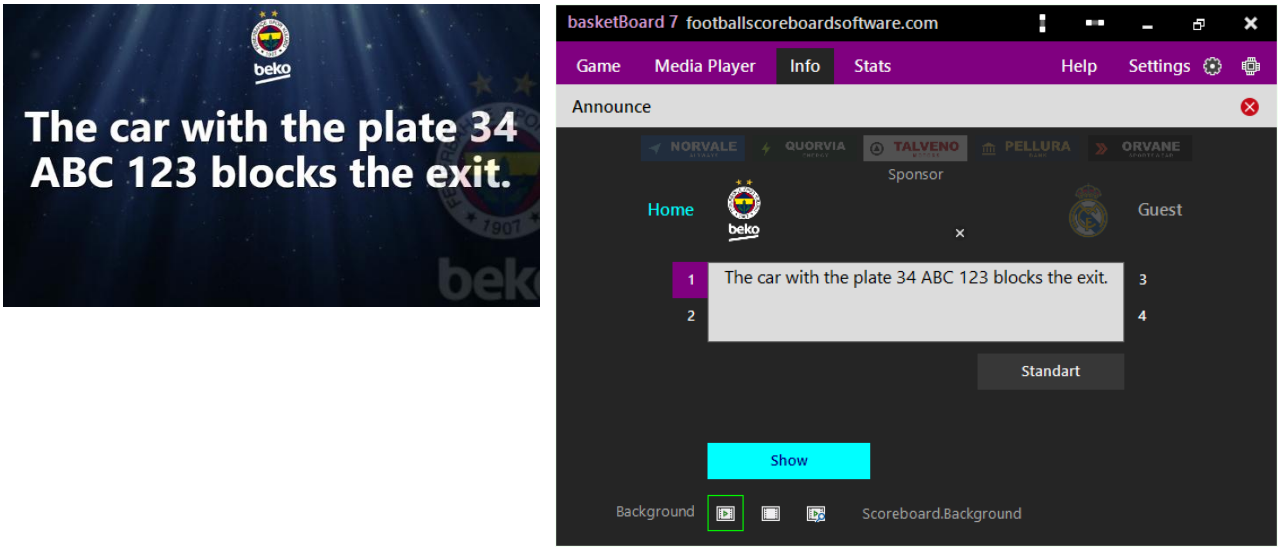


Figure 126. An announcement in the mode Standart on the board and the Announce editor.

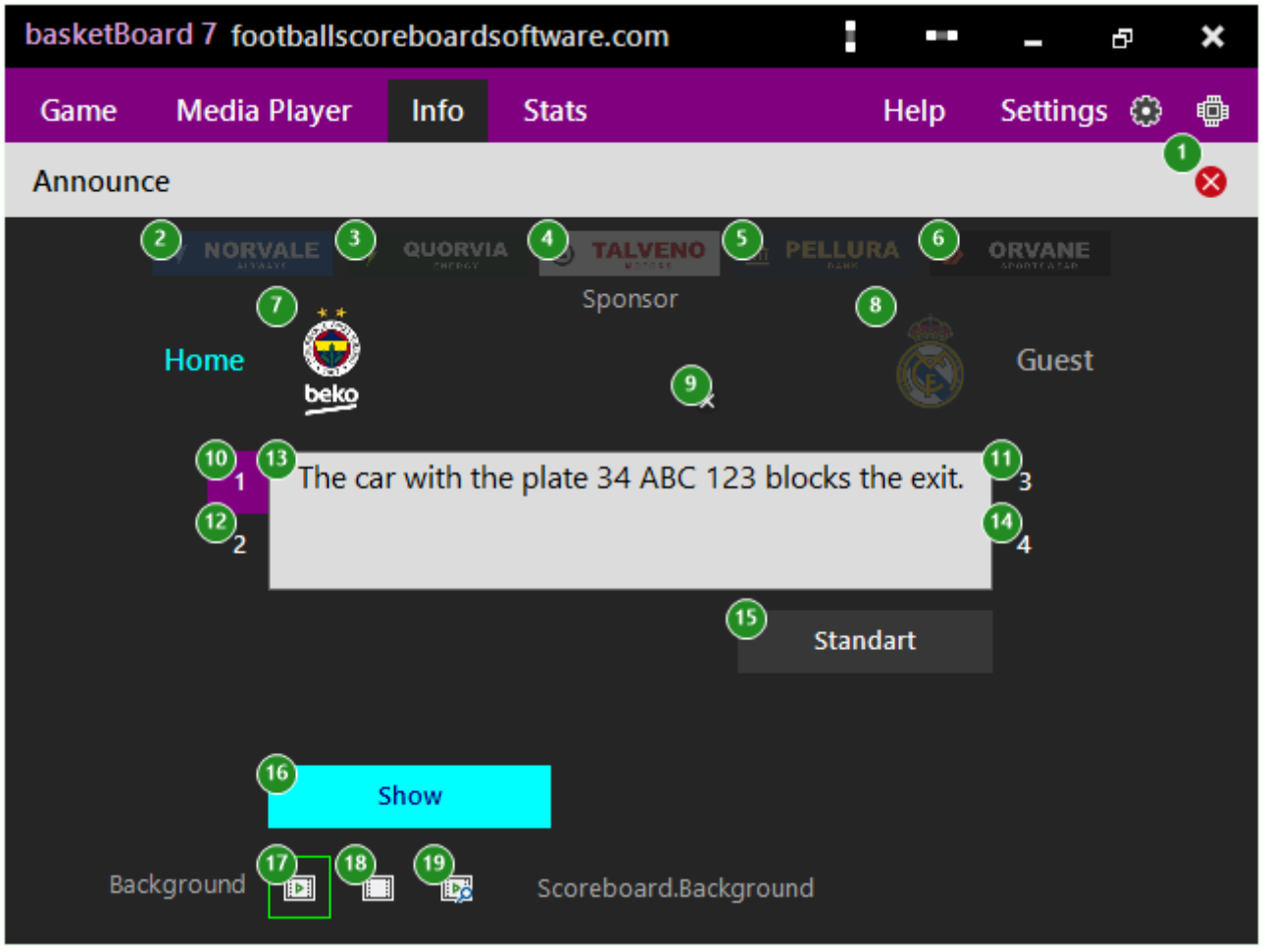
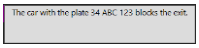
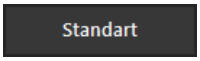


Figure 127. The Announce editor.

No.	Control	Name	What It Does
1		**Close (red button)**	Closes the Announce editor and returns to the Info page. Esc does the same. An announcement that is on the board stays there.

No.	Control	Name	What It Does
2		**Sponsor picture 1**	Selects the first entry of the sponsor list as the sponsor logo of the info graphics. The selected logo is repeated in full brightness under the row, the other pictures are dimmed, and the choice is saved at once in start.xml. It is on the board from the next Show.
3		**Sponsor picture 2**	Selects the second entry of the sponsor list as the sponsor logo of the info graphics. The selected logo is repeated in full brightness under the row, the other pictures are dimmed, and the choice is saved at once in start.xml. It is on the board from the next Show.
4		**Sponsor picture 3**	Selects the third entry of the sponsor list as the sponsor logo of the info graphics. The selected logo is repeated in full brightness under the row, the other pictures are dimmed, and the choice is saved at once in start.xml. It is on the board from the next Show.
5		**Sponsor picture 4**	Selects the fourth entry of the sponsor list as the sponsor logo of the info graphics. The selected logo is repeated in full brightness under the row, the other pictures are dimmed, and the choice is saved at once in start.xml. It is on the board from the next Show.
6		**Sponsor picture 5**	Selects the fifth entry of the sponsor list as the sponsor logo of the info graphics. The selected logo is repeated in full brightness under the row, the other pictures are dimmed, and the choice is saved at once in start.xml. It is on the board from the next Show.
7		**Home logo**	Selects the home team: its logo is shown above the announcement text on the board from the next Show. The home logo is in full brightness and the guest logo is dimmed. The home team is selected each time the editor opens.
8		**Guest logo**	Selects the guest team: its logo is shown above the announcement text on the board from the next Show. The guest logo is in full brightness and the home logo is dimmed.
9		**Remove sponsor logo (small cross)**	Removes the sponsor logo from the info graphics: the selection is cleared in start.xml and all five sponsor pictures are dimmed. The logo is gone from the board with the next Show.
10		**1**	Selects memory 1 of the announcement text (purple) and loads its stored text. Text typed since the last Show is lost. The next Show saves the text in this memory.
11		**3**	Selects memory 3 of the announcement text (purple) and loads its stored text. Text typed since the last Show is lost. The next Show saves the text in this memory.
12		**2**	Selects memory 2 of the announcement text (purple) and loads its stored text. Text typed since the last Show is lost. The next Show saves the text in this memory.

No.	Control	Name	What It Does
13		**Announcement text**	Holds the text of the announcement; Enter starts a new line. In the Standart mode long lines are wrapped and the tags <b> <i> <u> are allowed; in the other modes the tags are shown as typed and a line that is too long is cut off. Show puts the text on the board and saves it in the selected memory 1 to 4. Clicking into the box closes the style panel.
14		**4**	Selects memory 4 of the announcement text (purple) and loads its stored text. Text typed since the last Show is lost. The next Show saves the text in this memory.
15		**Display mode (shows the current mode)**	Opens the list of display modes: Standart, Gradient, Shape, Stripe-H, Stripe-V and Stroke. The chosen mode is written on the button, saved at once in config.xml and used by the next Show. Choosing a mode also sets the display mode of the media player to Stretch.
16		**Show**	Shows the announcement on the board at once with the text in the selected display mode, the logo of the selected team, the selected sponsor logo and the selected background. Saves the text in the selected memory in config.xml, closes the style panel and stops a clip of the media player that is playing. The announcement stays until you show another graphic or click Game.
17		**Use Scoreboard Background**	Selects the background video of the scoreboard as the background of the announcement. The button gets a green frame and the text beside the buttons reads Scoreboard.Background. It is used from the next Show. This choice is selected each time the editor opens.
18		**Use Black Background**	Selects a plain black background for the announcement. The button gets a green frame and the text beside the buttons reads Color.Black. It is used from the next Show. When the editor opens again, Use Scoreboard Background is selected: click this button again before Show.
19		**Use Selected Background**	Selects a file of your own as the background of the announcement and shows the file button beside the three buttons. The button gets a green frame and the name of the chosen file is shown. When the editor opens again, Use Scoreboard Background is selected: click this button again before Show. The chosen file is kept.

1. Click one of the buttons 1 to 4 beside the text box and type the text. Enter starts a new line.
2. Click the logo of the home or the guest team; it is shown above the text. The home team is selected each time the editor opens.
3. Click a sponsor picture if a sponsor logo is to be shown.
4. Click the button under the text box and choose the display mode.
5. Choose the background and click "Show".

Mode	Look on the board	Colours
Standart	Plain text in the font of the design. Long lines are wrapped; the tags <b> <i> <u> work.	none
Gradient	Letters filled with a moving colour gradient	2
Shape	Letters filled with five coloured bands	5
Stripe-H	Horizontal stripes of two colours moving down	2
Stripe-V	Vertical stripes of two colours moving right	2
Stroke	Coloured dashes running around the outlines	5



Figure 128. The same announcement in the modes Gradient, Shape and Stripe-H.

In every mode except Standart a gear appears beside the mode button. It opens the style panel of the mode: font-family, font-size (percent of the board height), font-weight, bottom, and in some modes text-shadow and text-stroke, plus the colour squares.

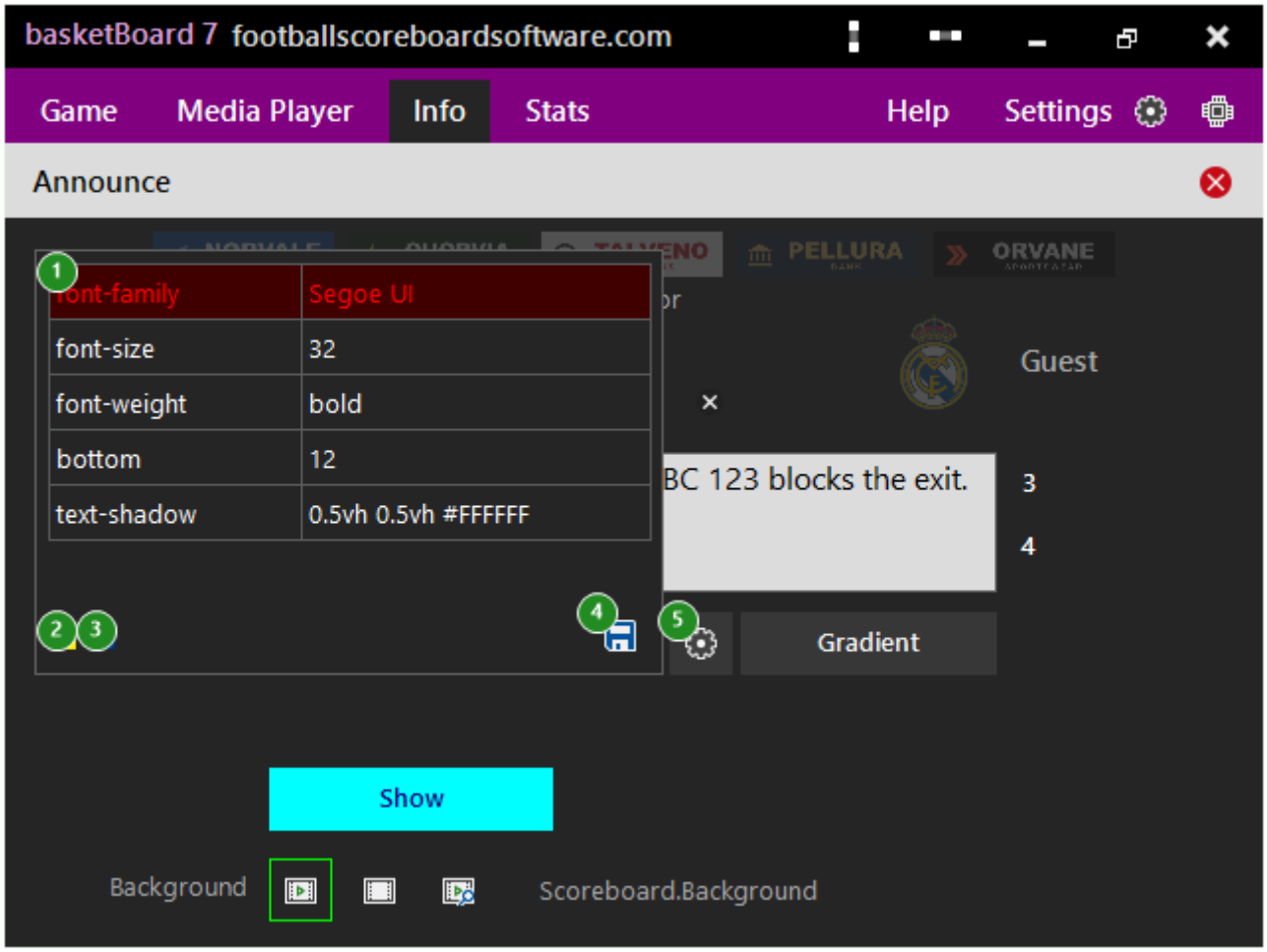


Figure 129. The style panel of the mode Gradient.

No.	Control	Name	What It Does
1		**Style table**	Lists the values of the selected display mode: font-family, font-size, font-weight, bottom and, depending on the mode, text-shadow and text-stroke. Click a value in the right column and type, or press F2, then Enter; on the font-family row a button at the right end opens the font dialog. The values are used after you click the disk button and then Show.
2		**Colour 1**	Opens the colour dialog for the first colour of the selected display mode: first gradient colour, first stripe colour, or the first of five band or outline colours. The colours of the mode are saved at once in config.xml and used by the next Show.
3		**Colour 2**	Opens the colour dialog for the second colour of the selected display mode: second gradient colour, second stripe colour, or the second of five band or outline colours. The colours of the mode are saved at once in config.xml and used by the next Show.
4		**Save (disk)**	Saves the rows of the style table and the colours of the selected display mode in config.xml. The next Show uses them; an announcement that is on the board does not change.

No.	Control	Name	What It Does
5		**Style panel (gear)**	Opens and closes the style panel of the selected display mode with its table of font values, the colour squares and the disk button. Not shown in the Standart mode. The panel also closes when you click into the text box, choose another mode or click Show.

1. Click a value in the right column, type the new value and press Enter.
2. Click the disk button to save the rows.
3. Click "Show".

A colour is saved as soon as you close the colour dialog with "Ok". The colour and font dialogs are described in chapter 11.

> **Note:** The drawn modes do not wrap the text. A line that is too long is cut off at both sides of the board: type short lines and press Enter where the line is to break.
>
> **Note:** Each time the Announce editor opens, "Use Scoreboard Background" is selected. Choose the black background or your own file again before "Show".

10.15 Squads, Line-Up and Team Slide

10.15.1 Squad Editor

"Home Team" and "Guest Team" open the same editor with the squad of that team. The squad is the source of the info screens, the line-up, the team slide, the player pictures and the substitution lists.

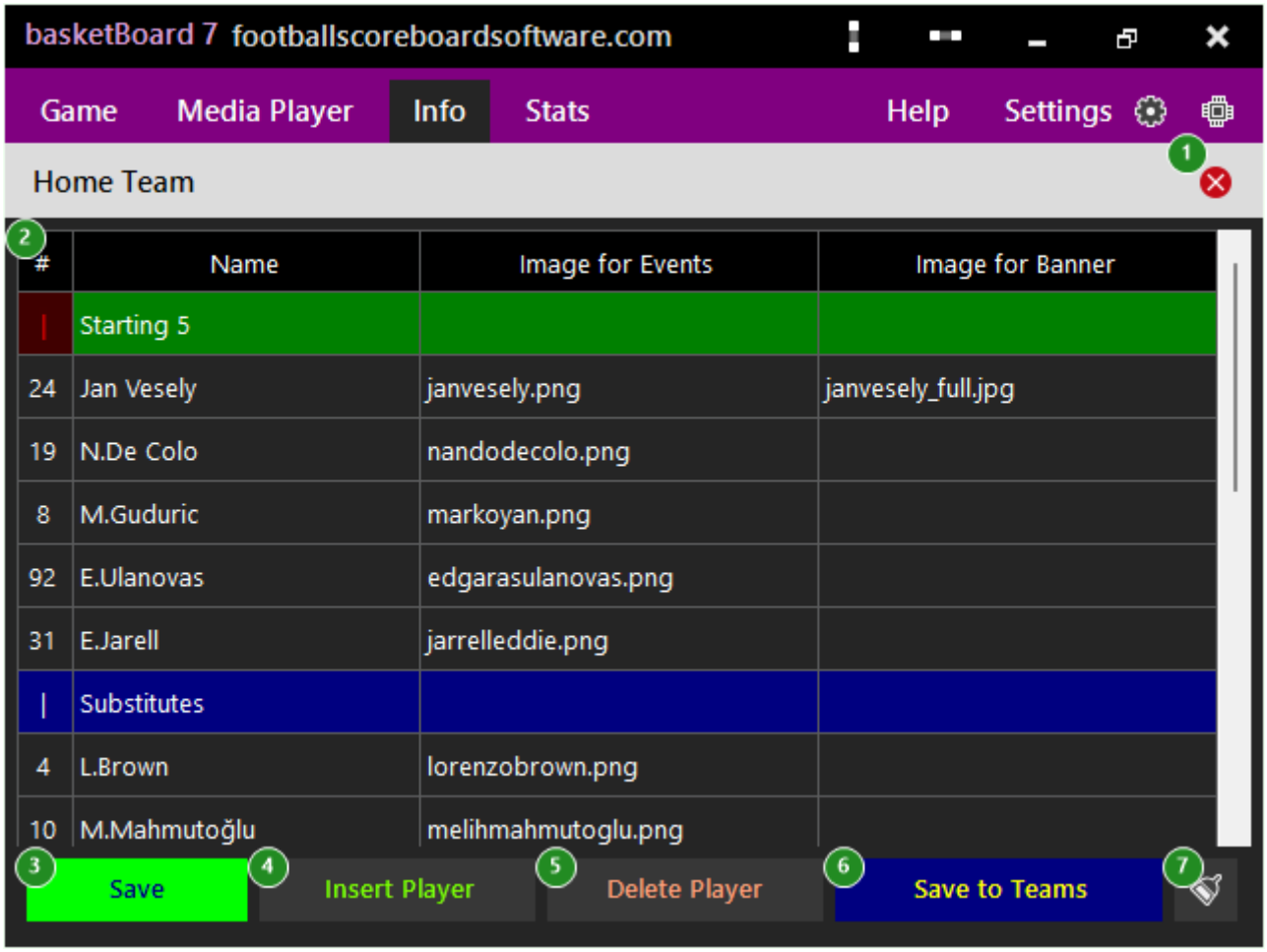
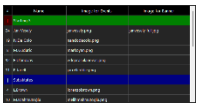
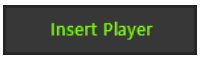
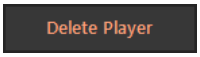


Figure 130. The squad editor of the home team.

No.	Control	Name	What It Does
1		**Close (red x)**	Closes the squad editor and brings back the screen behind it; Esc does the same. Changes that are not saved are lost.
2		**Squad table**	Shows the squad: the coloured group headings Starting 5, Substitutes, Other Players and Trainer, and under each its players with the columns #, Name, Image for Events and Image for Banner. Type to replace the content of the selected cell or press F2 to edit it; click a picture cell to get the picture button and a preview. Drag the # or Name cell of a player with the left mouse button to move the row to another place or group. A file name in red means that the file is not found.
3		**Save**	Writes the table to the squad file of the team named in the title bar (common\data\playersHome.xml, playersGuest.xml or the file of a team database entry) and removes empty rows first. The button is green while the table has changes and right after the editor opens. The board graphics read the saved file.
4		**Insert Player**	Adds an empty player row at the end of the group that holds the selected cell. The Trainer group (the head coach) takes one row only: the button does nothing when the group already has a row.

No.	Control	Name	What It Does
5		**Delete Player**	Deletes the row of the selected cell without a question. A group heading cannot be deleted. The squad file changes only when you click Save.
6		**Save to Teams**	Asks for a name and stores a copy of the table as a new entry of the team database. It does not write the squad file of the match; click Save as well when the changes are for this match.
7		**Clear All (brush icon)**	Removes all players from the table and leaves the four empty group headings Starting 5, Substitutes, Other Players and Trainer. There is no question. The squad file changes only when you click Save.

Group	Meaning	Used by
"Starting 5"	The five players who start	Starting Five screen (first five rows), Player Intro, line-up, team slide, player pictures, substitutions
"Substitutes"	The bench	Line-up, team slide, player pictures, substitutions
"Other Players"	Players of the club not on the roster of this game	Substitution lists
"Trainer"	The head coach; one row only	Starting Five screen, line-up, team slide, player pictures

Column	Content
#	Shirt number
"Name"	The name as the board shows it
"Image for Events"	The photo of the player: info screens, team slide, substitution with pictures
"Image for Banner"	A picture or clip for the player pictures page; also the large picture of the Player of the Game screen

1. Click a cell of the group, then "Insert Player". An empty row appears at the end of the group.
2. Type the number and the name. Typing replaces the content of the cell; F2 edits it; Enter confirms.
3. Click a picture cell, then the small purple button in it, and choose the file.
4. Click "Save".

- "Save" writes the squad to common\data\playersHome.xml or playersGuest.xml. Changes that are not saved are lost when the editor closes.
- Drag the # or Name cell of a player to move him to another place or group.
- The program stores the full path of a picture and does not copy the file. A file name in red is not found.
- "Save to Teams" stores a copy in the team database (10.19), not in the match.

10.15.2 Line-Up and Team Slide on the Board

"Show" beside Home Team or Guest Team shows the line-up: team name, coach, the columns Starting 5 and Substitutes with number and name, and the team logo in the background. The rows appear one after the other. The two colour squares beside the team button set the colours of its heading, number boxes and coach line.

Board Output **Control Panel**

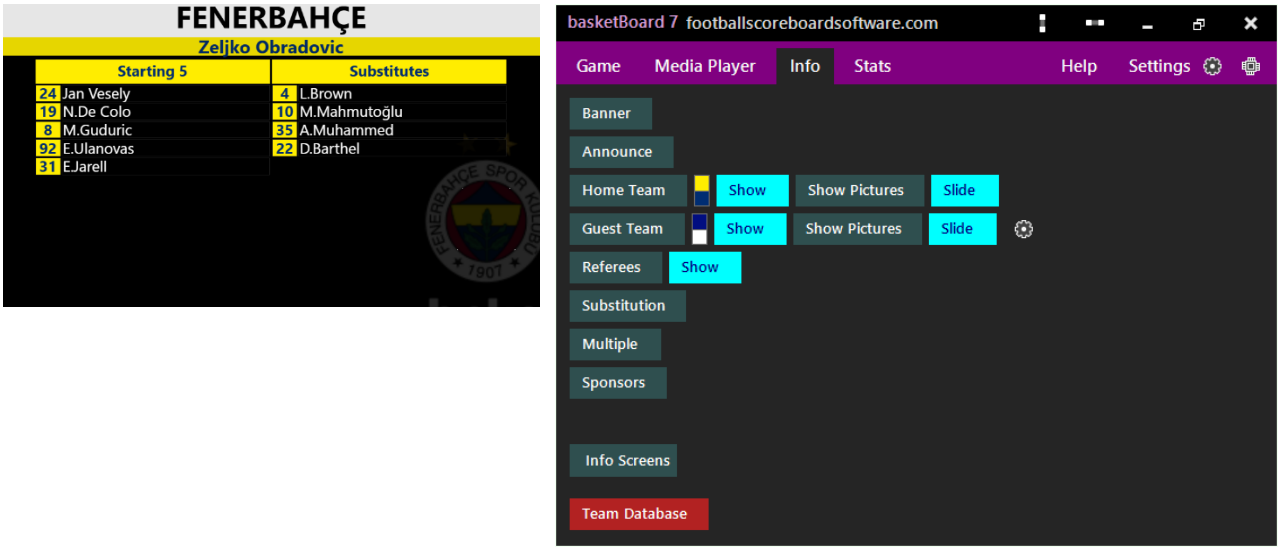


Figure 131. The line-up of the home team.

"Slide" beside the team shows the team one player at a time, a slide every 4 seconds: a title slide Starting 5 and one slide per starter with the photo, then Substitutes, then Trainer. After the last slide it starts again.

Board Output **Control Panel**

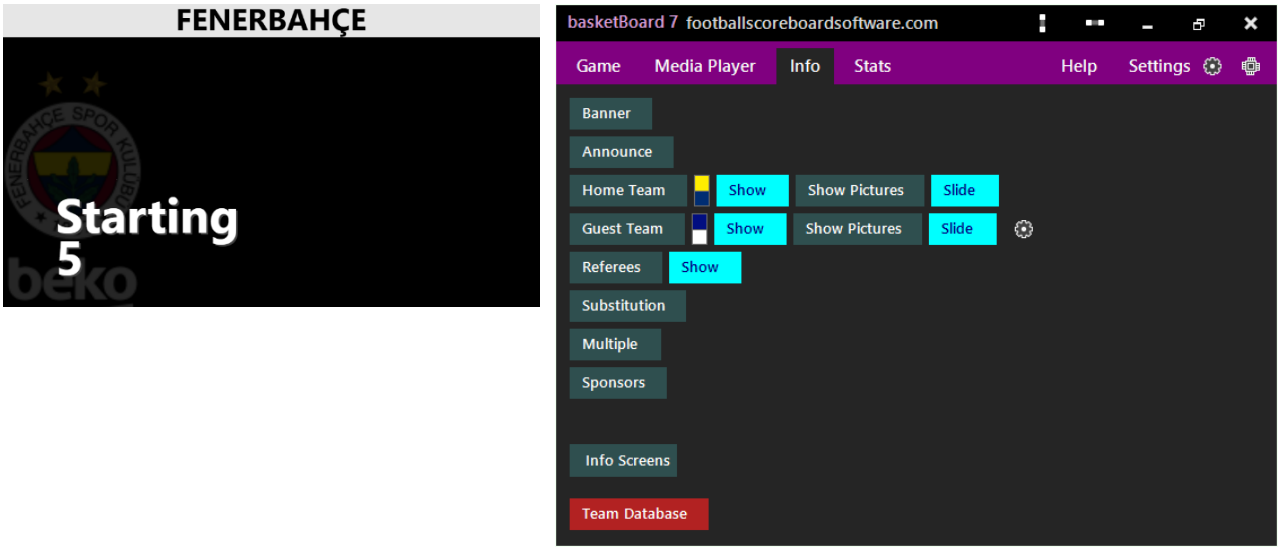


Figure 132. The team slide of the home team.

The column titles Starting 5, Substitutes and Trainer are board titles: Settings > Language, titles (chapter 15).

> **Note:** The Starting Five info screen (10.7.1) is the newer form of the line-up: it shows the photos of the starters and also works in CK mode.

10.16 Player Pictures

"Show Pictures" beside Home Team or Guest Team opens a page that shows the picture or clip of a player (column "Image for Banner") on the board, one player or the whole group in turn.

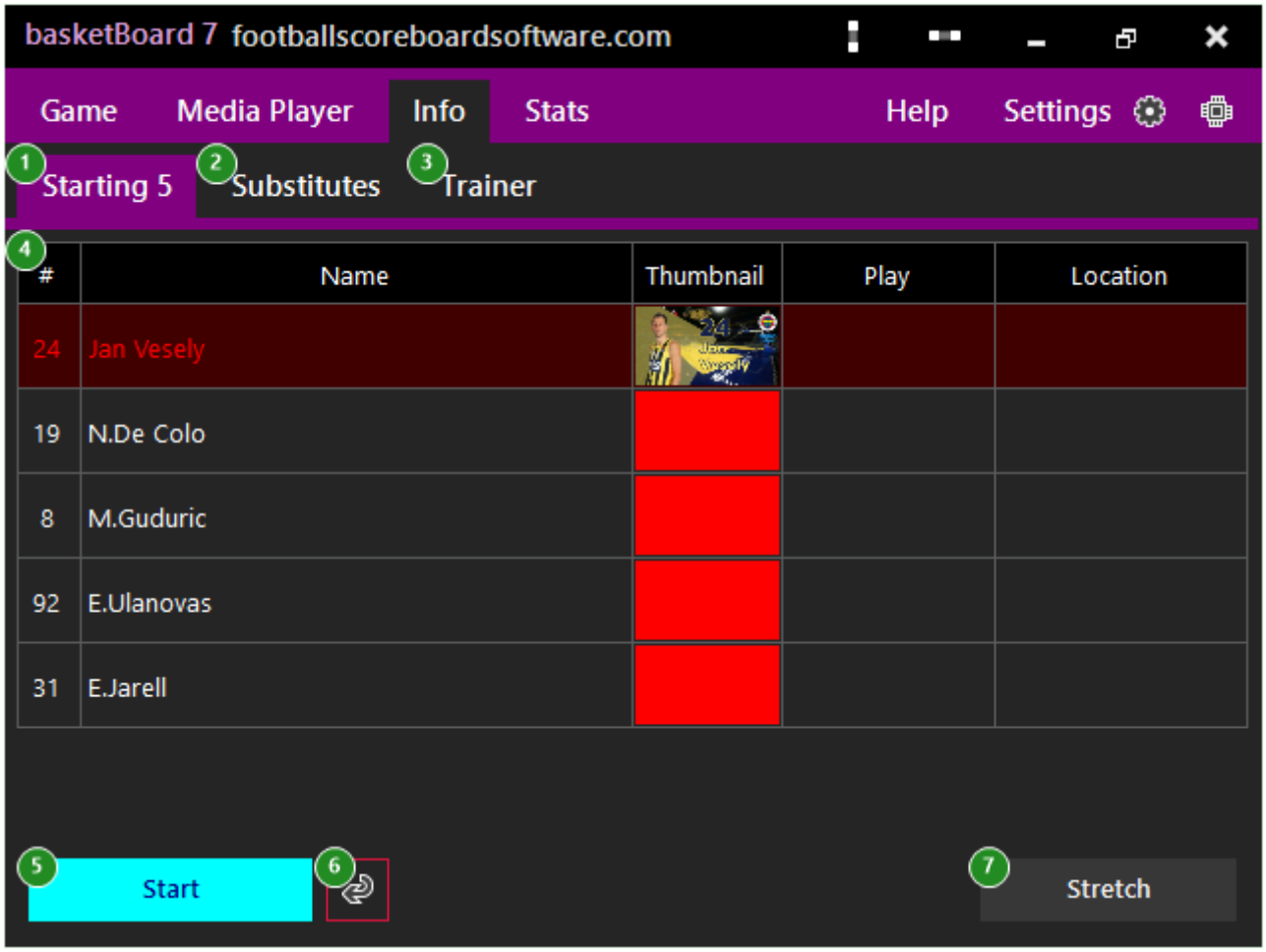
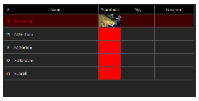


Figure 133. The player pictures page with the starting five of the home team.

No.	Control	Name	What It Does
1	Starting 5	**Starting 5**	Loads the starting five of the team into the list. The button does nothing while a picture or a show runs.
2	Substitutes	**Substitutes**	Loads the bench players of the team into the list. The button does nothing while a picture or a show runs.
3	Trainer	**Trainer**	Loads the head coach (the row of the Trainer group of the squad editor) into the list. The button does nothing while a picture or a show runs.
4		**Player list**	Lists the players of the loaded group with number, name, a thumbnail of the file of the column Image for Banner, the Play button and the remaining time (column Location). Click a row to select the player; a red thumbnail means that the player has no file or that the file is not found. The cells cannot be edited.

No.	Control	Name	What It Does
5		**Start**	Starts a show of the loaded group from the selected row: the picture or clip of every player is shown in turn, rows without a file are skipped. The button then reads Finish; click it to stop the show. Nothing happens when the selected row has no file.
6		**Return to scoreboard (arrow icon)**	Switches the option Return to Scoreboard Screen When Playlist Ends on (green border) or off (red border). When it is on, the board returns to the scoreboard after the last row of a show started with Start; when it is off, the show starts again with the first row. The option is shared with the media player.
7		**Display mode (Stretch)**	Shows the display mode of the media window and opens the list of the modes: Center, CoverCenter, Original, SizeToFit, SizeToFitCenter, Stretch, ZoomCenter. The mode decides how a picture or clip is fitted to the board; it is the same setting as the display mode of the media player.

1. Click "Starting 5", "Substitutes" or "Trainer" to load the group.
2. Click the row of a player, then "Play" in the column Play. Click "Stop" to end it.
3. Or click a row and "Start": the board shows that player and the following ones in turn; the button reads "Finish" while the show runs.

- A still picture stays for "Image Play Duration" of the Screen Properties (chapter 15); a clip plays to its end.
- A red thumbnail means that the player has no file or the file is not found.
- The page has no close button. Click another menu button to leave it; the picture leaves the board.

10.17 Referees

"Referees" opens the list of the officials. "Show" beside it puts the list on the board: the title, the first name in large letters and the other names below.

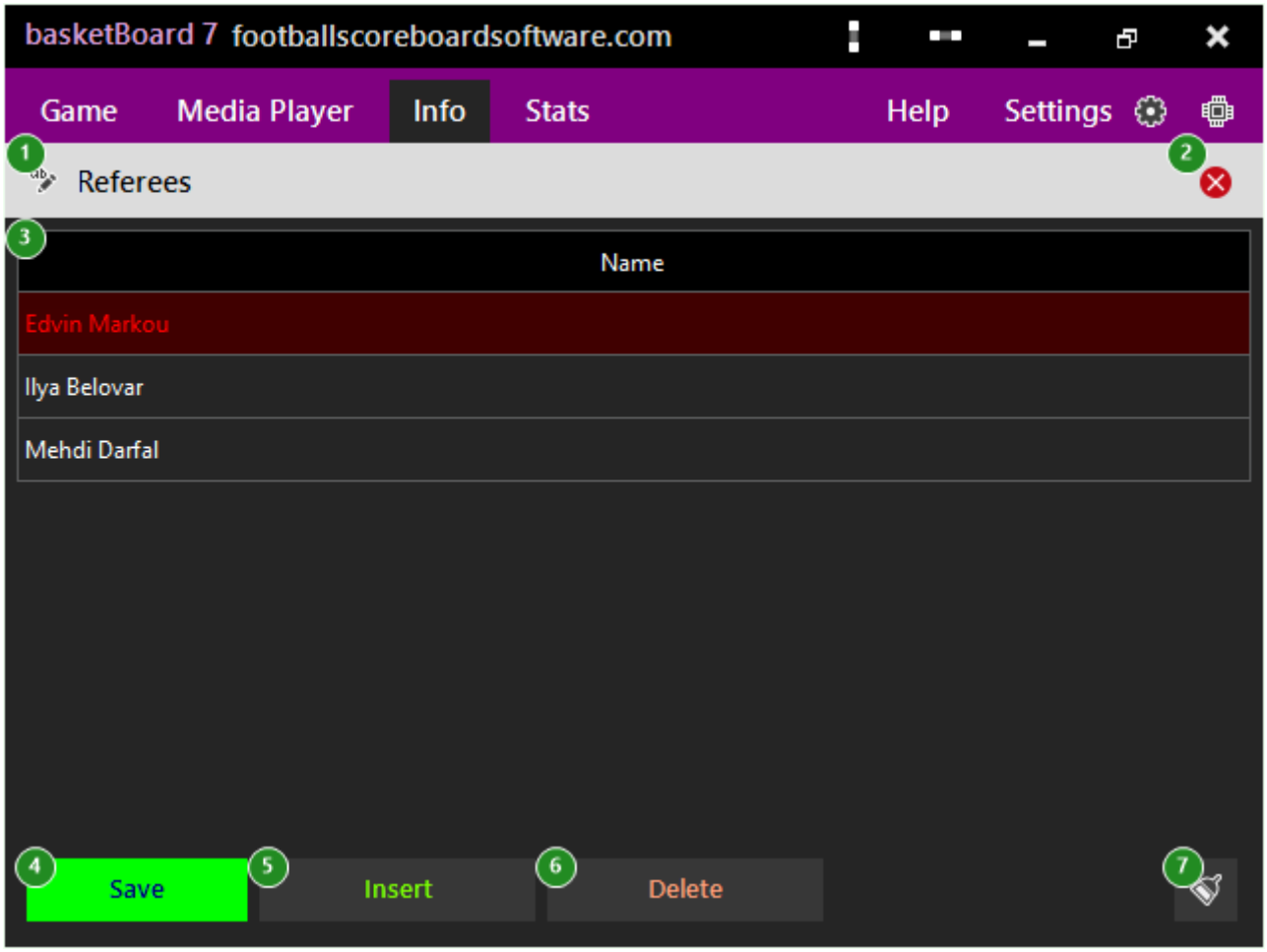
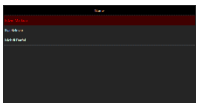
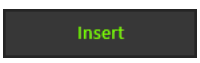
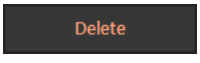


Figure 134. The referee list.

No.	Control	Name	What It Does
1		**Edit titles (pencil icon)**	Opens the board titles in the language settings, where you change the title Referees of the board graphic.
2		**Close (red x)**	Closes the referee list and brings back the Info page; Esc does the same. Changes that are not saved are lost.
3		**Referee table**	Lists the officials of the game, one name in each row. Type to replace the selected name or press F2 to edit it; drag a row with the left mouse button to change the order. Enter the crew chief (NCAA: the referee) first: the board graphic shows the first name in large letters and the Officials info screen gives it the first role.
4		**Save**	Writes the list to common\data\referees.xml and removes empty rows first. The button is green while the table has changes. The board graphic reads the saved file: save before you click Show beside Referees on the Info page.
5		**Insert**	Adds an empty row at the end of the list. Click the row and type the name.
6		**Delete**	Removes the row of the selected cell from the table. The referee file changes only when you click Save. The first row of the list is not removed; drag another row above it first or overwrite the name.

No.	Control	Name	What It Does
7		**Clear (brush icon)**	Empties the whole table without a question. The referee file changes only when you click Save.

1. Click "Insert", type the name and press Enter.
2. Drag a row to change the order.
3. Click "Save". The list is written to common\data\referees.xml.

Enter the crew chief first (NCAA: the referee). The Officials info screen (10.11.3) uses this list when its own table is empty and gives the first name the first role of the rules preset.

Board Output **Control Panel**

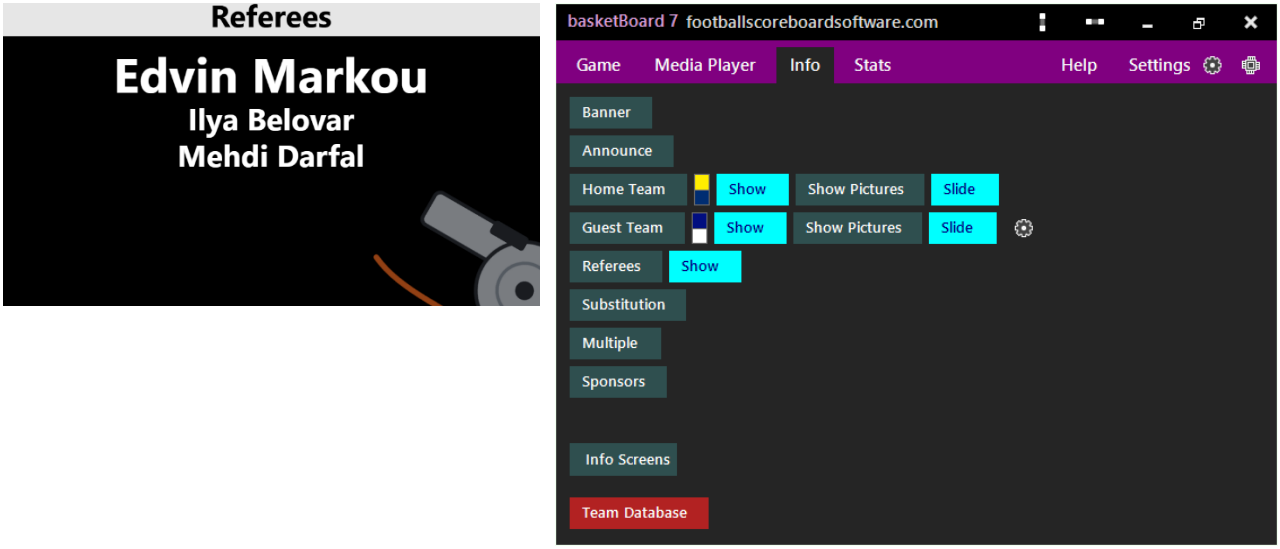


Figure 135. The referees on the board.

> **Note:** "Delete" does not remove the first row of the list. Drag another row above it first, or overwrite the name.

10.18 Substitution and Multiple

"Substitution" announces one substitution: the player coming in on a green bar and the player going out on a red bar.

Board Output **Control Panel**

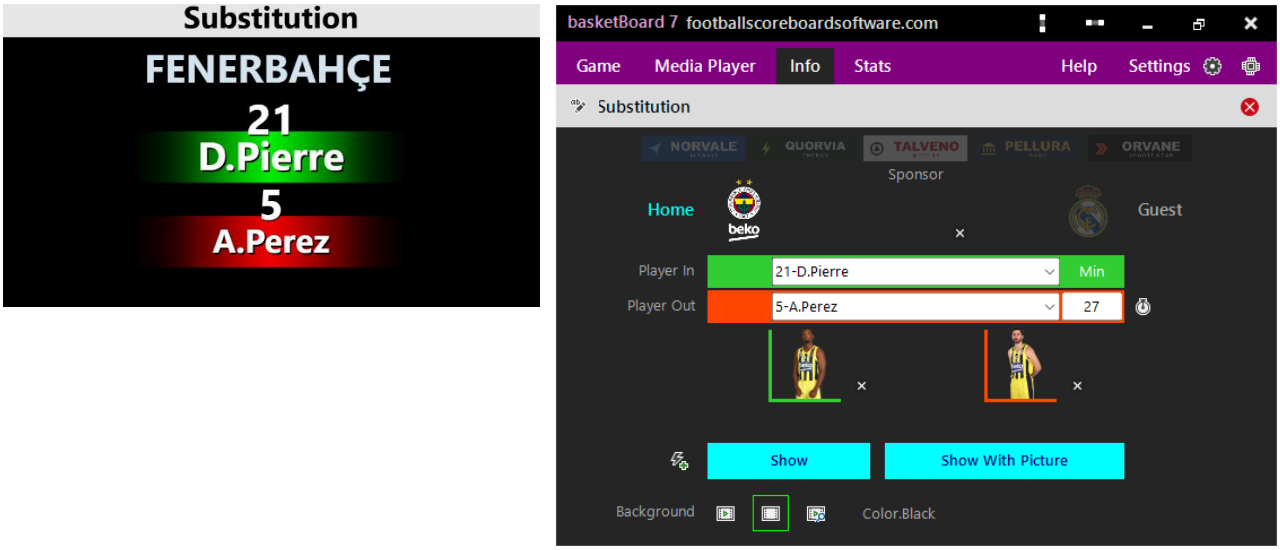


Figure 136. A substitution of the home team after "Show".

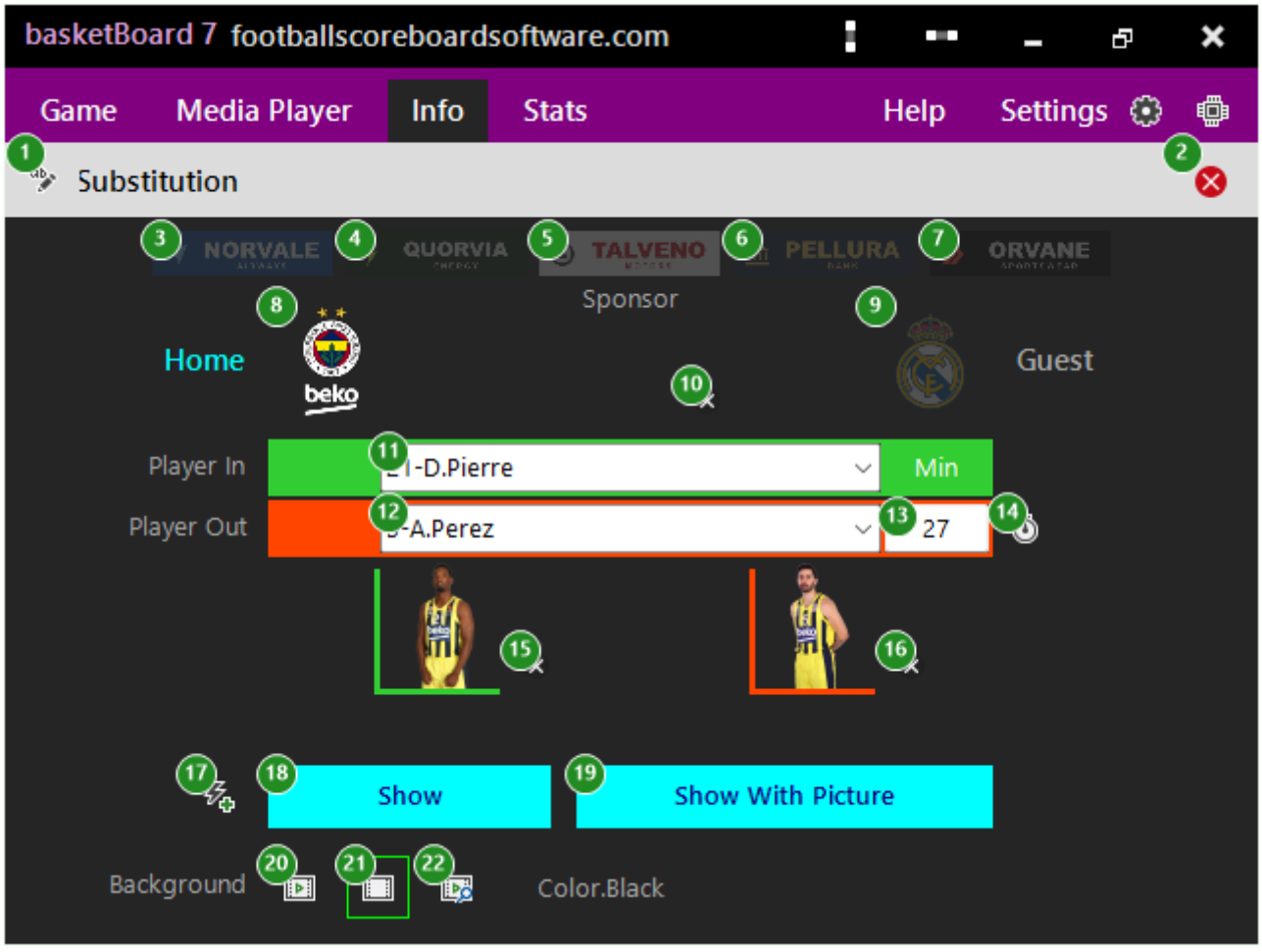


Figure 137. The Substitution page.

No.	Control	Name	What It Does
1		**Edit titles (pencil icon)**	Opens the board titles in the language settings, where you change the title Substitution of the board graphic.

No.	Control	Name	What It Does
2		**Close (red x)**	Closes the substitution page and brings back the Info page; Esc does the same. A graphic that is on the board stays.
3		**Sponsor picture 1**	Selects the first image of the sponsor list as the sponsor logo of the graphic. The selected picture is bright, the others are dimmed. The choice is saved and shared with the banner and the announcement.
4		**Sponsor picture 2**	Selects the second image of the sponsor list as the sponsor logo of the graphic. The selected picture is bright, the others are dimmed.
5		**Sponsor picture 3**	Selects the third image of the sponsor list as the sponsor logo of the graphic. The selected picture is bright, the others are dimmed.
6		**Sponsor picture 4**	Selects the fourth image of the sponsor list as the sponsor logo of the graphic. The selected picture is bright, the others are dimmed.
7		**Sponsor picture 5**	Selects the fifth image of the sponsor list as the sponsor logo of the graphic. The selected picture is bright, the others are dimmed.
8		**Home logo**	Selects the home team for the substitution: its squad fills both player lists, and both player fields and pictures are cleared. The home team is selected when the page opens.
9		**Guest logo**	Selects the guest team for the substitution: its squad fills both player lists, and both player fields and pictures are cleared. The logo of the selected team is bright, the other one is dimmed.
10		**Remove sponsor (x)**	Removes the sponsor logo from the graphic; the five sponsor pictures are all dimmed again. The choice is shared with the banner and the announcement.
11		**Player In**	Chooses the player who comes on the court. The list holds the starting five, the bench and the other players of the selected team, sorted by number; you can also type number and name of a player who is not listed. Choosing a listed player loads his picture under the list.
12		**Player Out**	Chooses the player who goes to the bench. The list holds the starting five, the bench and the other players of the selected team, sorted by number; you can also type number and name of a player who is not listed. Choosing a listed player loads his picture under the list.
13		**Min**	Holds the time of the substitution for the match timeline. The box is filled with the minute figure of the game clock when the page opens, and you can overwrite it. The board graphic does not show the value.
14		**Time on or off (clock icon)**	Clears and hides the Min box when it holds a value. When the box is empty, shows it again and fills it with the minute figure of the game clock.

No.	Control	Name	What It Does
15		**Remove picture of the player coming in (x)**	Removes the picture of the player coming in, so that Show With Picture shows the graphic without it. The name in the list stays.
16		**Remove picture of the player going out (x)**	Removes the picture of the player going out, so that Show With Picture shows the graphic without it. The name in the list stays.
17		**Add to Match Timeline (icon)**	Switches on or off whether every Show also writes the substitution into the match timeline file (common\data\dataEvents.xml). A green border means on; it is off after every start. The timeline page is hidden in basketBoard 7, so the entry is not shown anywhere.
18		**Show**	Puts the substitution on the board: title, team name, number and name of the player coming in on a green bar and of the player going out on a red bar, and the sponsor logo when one is selected. Both player fields must be filled; an empty one turns red for a moment. With Add to Match Timeline on, a timeline line with the time of the Min box is added. A clip that runs on the board is stopped.
19		**Show With Picture**	Puts the substitution on the board with the pictures of both players (column Image for Events of the squad editor): the player coming in on the left, the player going out on the right. Both player fields must be filled; an empty one turns red for a moment. With Add to Match Timeline on, the timeline line carries the shirt number of the player going out in place of the time; Show writes the time.
20		**Use Scoreboard Background (icon)**	Shows the substitution graphic on the background video of the scoreboard. The chosen icon gets a green border and the box beside the icons reads Scoreboard.Background. The choice is saved for this graphic.
21		**Use Black Background (icon)**	Shows the substitution graphic on a black background. The chosen icon gets a green border and the box beside the icons reads Color.Black. The choice is saved for this graphic.
22		**Use Selected Background (icon)**	Shows the substitution graphic on a file of your own and shows the folder button with which you choose the file; the box shows the file name. When no file was chosen, the page returns to the black background the next time it opens. The board plays the file as a video: choose a video file (MP4 or WebM). A picture file, which the file dialog also offers, gives no background; the graphic then appears on black.

1. Click the logo of the team. The home team is selected when the page opens.
2. Choose "Player In" and "Player Out" from the lists, or type number and name of a player who is not in the squad.
3. Click "Show", or "Show With Picture" for the version with the photos of both players.

Board Output **Control Panel**

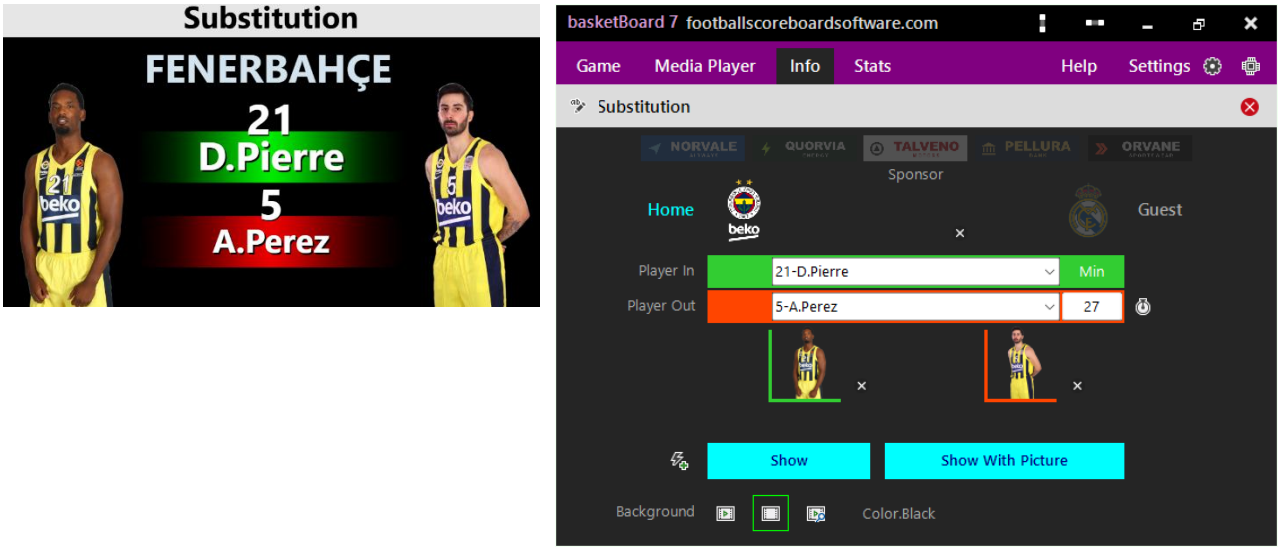


Figure 138. The same substitution with pictures.

- An empty player field turns red for a moment and nothing is shown.
- The five sponsor pictures at the top are the first five images of the sponsor list; the choice is shared with the banner and the announcement.
- The box Min and the icon "Add to Match Timeline" belong to a match timeline that basketBoard 7 does not show. The board graphic does not show the time.

"Multiple" announces several substitutions of one team at once. Choose a player coming in (left list) and a player going out (right list), click the green add icon, repeat, and click "Show". The board shows the players coming in and the players going out in turn. The red icon removes the selected pair. Typed names are not accepted on this page.

Board Output **Control Panel**

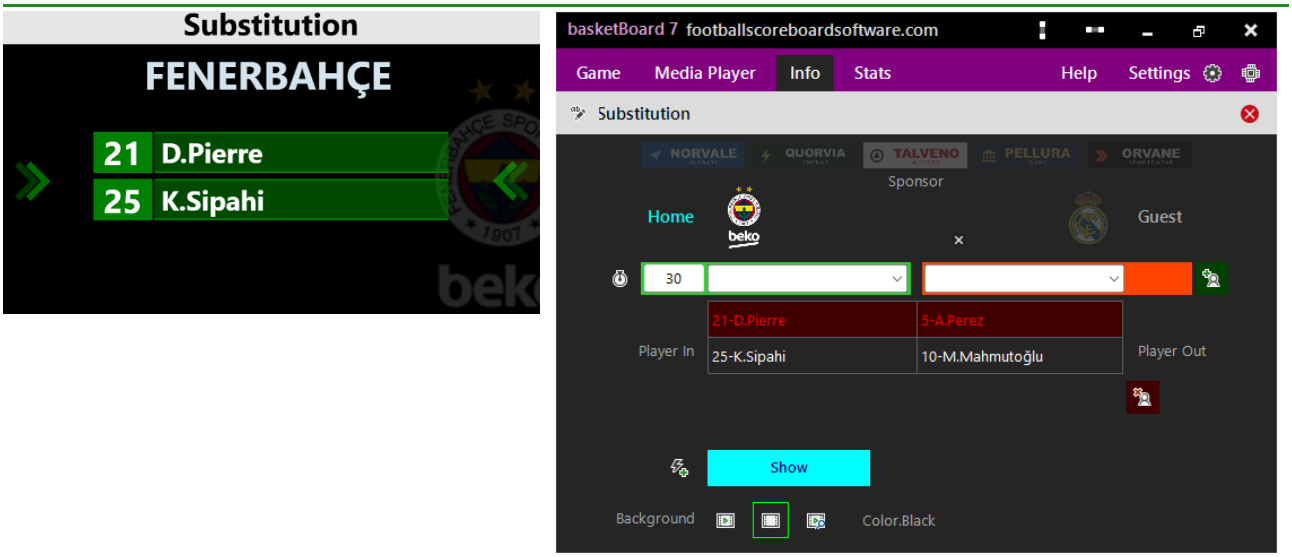


Figure 139. Two substitutions of the home team.

10.19 Sponsors and Team Database

10.19.1 Sponsors

"Sponsors" opens the list of sponsor images. The first five images are the sponsor pictures of the banner, announcement and substitution pages; the Sponsored and Advertisement modes use the list as well (chapter 12).

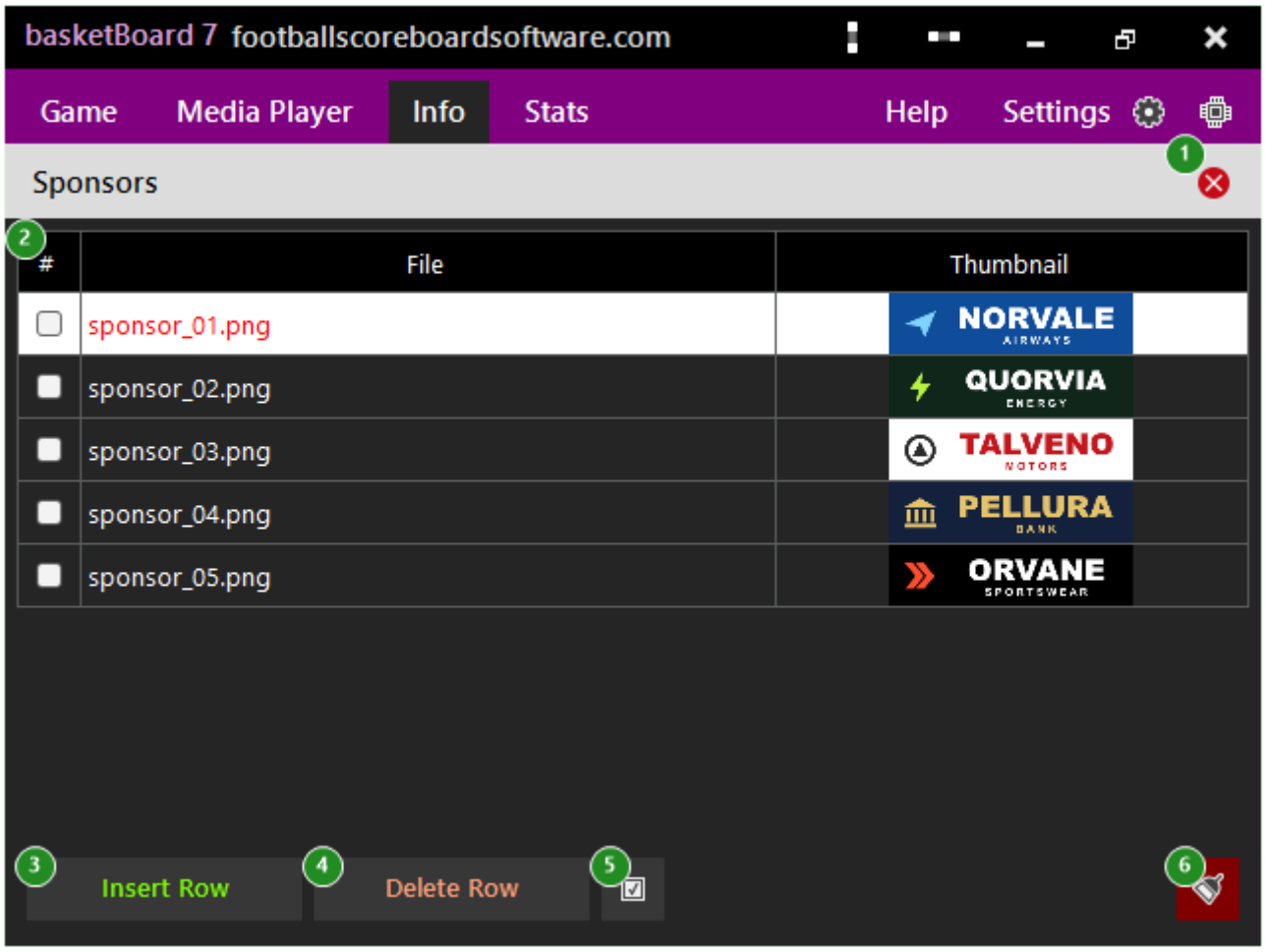
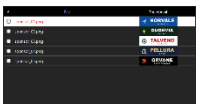
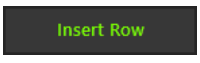
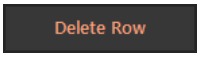


Figure 140. The sponsor list.

No.	Control	Name	What It Does
1		**Close (red x)**	Closes the sponsor list and brings back the screen behind it; Esc does the same. Nothing is lost: every change was saved at once.
2		**Sponsor table**	Lists the sponsor images with the default tick (#), the file name and a thumbnail. Click a row to select it; drag a row with the left mouse button to change the order, which is saved at once. The first five images are the sponsor pictures of the banner, announcement and substitution pages.
3		**Insert Row**	Opens a file dialog for one or several image files (bmp, gif, jpeg, jpg, png), adds them at the end of the list and saves the list at once. The files are not copied; the list stores their full paths.
4		**Delete Row**	Removes the selected image from the list and saves the list at once. The image file itself is not deleted.

No.	Control	Name	What It Does
5		**Set Default (check box icon)**	Makes the selected image the sponsor logo of the info graphics: the row gets the tick in the column #, the other rows lose it, and the row moves to the top of the list. On the row that already has the tick, it takes the tick and the sponsor logo away. Taking the tick away is written to the sponsor file only with the next change of the list; until then the tick is shown again when the page opens.
6		**Clear All (brush icon)**	Removes all images from the list without a question and saves the empty list at once. The image files themselves are not deleted.

- "Insert Row" adds one or several image files at the end. "Delete Row" removes the selected image. Drag a row to change the order.
- "Set Default" makes the selected image the sponsor logo of the info graphics and moves it to the top.
- Every change is saved at once in common\data\sponsors.xml. The files are not copied.

10.19.2 Team Database

"Team Database" holds saved squads. Enter a squad once and load it into the match with two clicks.

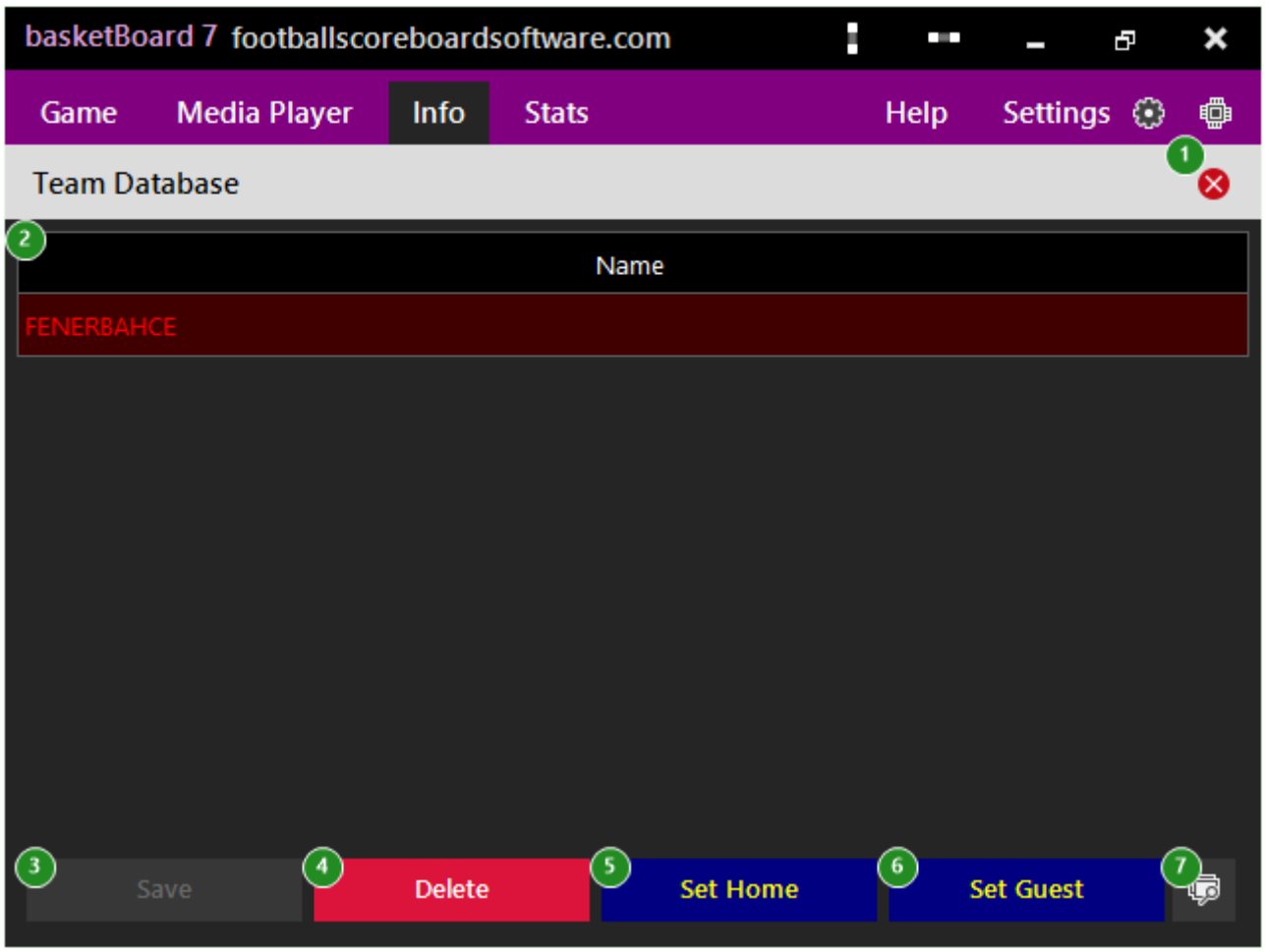
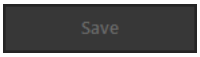
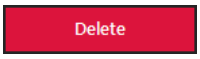


Figure 141. The team database.

No.	Control	Name	What It Does
1		**Close (red x)**	Closes the team database and brings back the Info page; Esc does the same. A changed name that is not saved is lost.
2		**Team list**	Lists the entries of the team database, sorted by name. Click an entry to select it for the buttons below. Type or press F2 to rename it, then click Save.
3		**Save**	Saves the names of the list after you renamed an entry. The button is green while a name has changed.
4		**Delete**	Deletes the selected entry after a question that you answer with Yes: the name leaves the list and the squad file of the entry is removed. The squads of the current match are not touched.
5		**Set Home**	Loads the squad of the selected entry as the home squad of the match after a question that you answer with Yes: the saved squad replaces common\data\playersHome.xml, and a message confirms it. The team name and the logo of the control panel are not changed.
6		**Set Guest**	Loads the squad of the selected entry as the guest squad of the match after a question that you answer with Yes: the saved squad replaces common\data\playersGuest.xml, and a message confirms it. The team name and the logo of the control panel are not changed.
7		**Show (icon)**	Opens the squad editor with the saved squad of the selected entry, so that you can check or change its players. Save in that editor writes to the database entry and not to the squad of the match. Nothing is shown on the board.

1. Open the squad editor and click "Save to Teams" to store the squad under a name.
2. Later, open "Team Database", click the team and click "Set Home" or "Set Guest".
3. Answer "The selected team will be assigned to the match squad! Are you sure?" with "Yes".
4. Set the team name and the logo on the control panel; the database does not store them.

> **Note:** "Set Home" and "Set Guest" overwrite the squad of that side without keeping a copy. Save it with "Save to Teams" first if you need it again.

10.20 The Stats Page

Click "Stats" in the menu strip. Four buttons choose the table: "Stats" (match statistics), "Standings", "Results" and "Fixtures". Each table can be shown full screen with its "Show" button. The Standings and Results tables also feed the info screens Standings and Results (10.11).

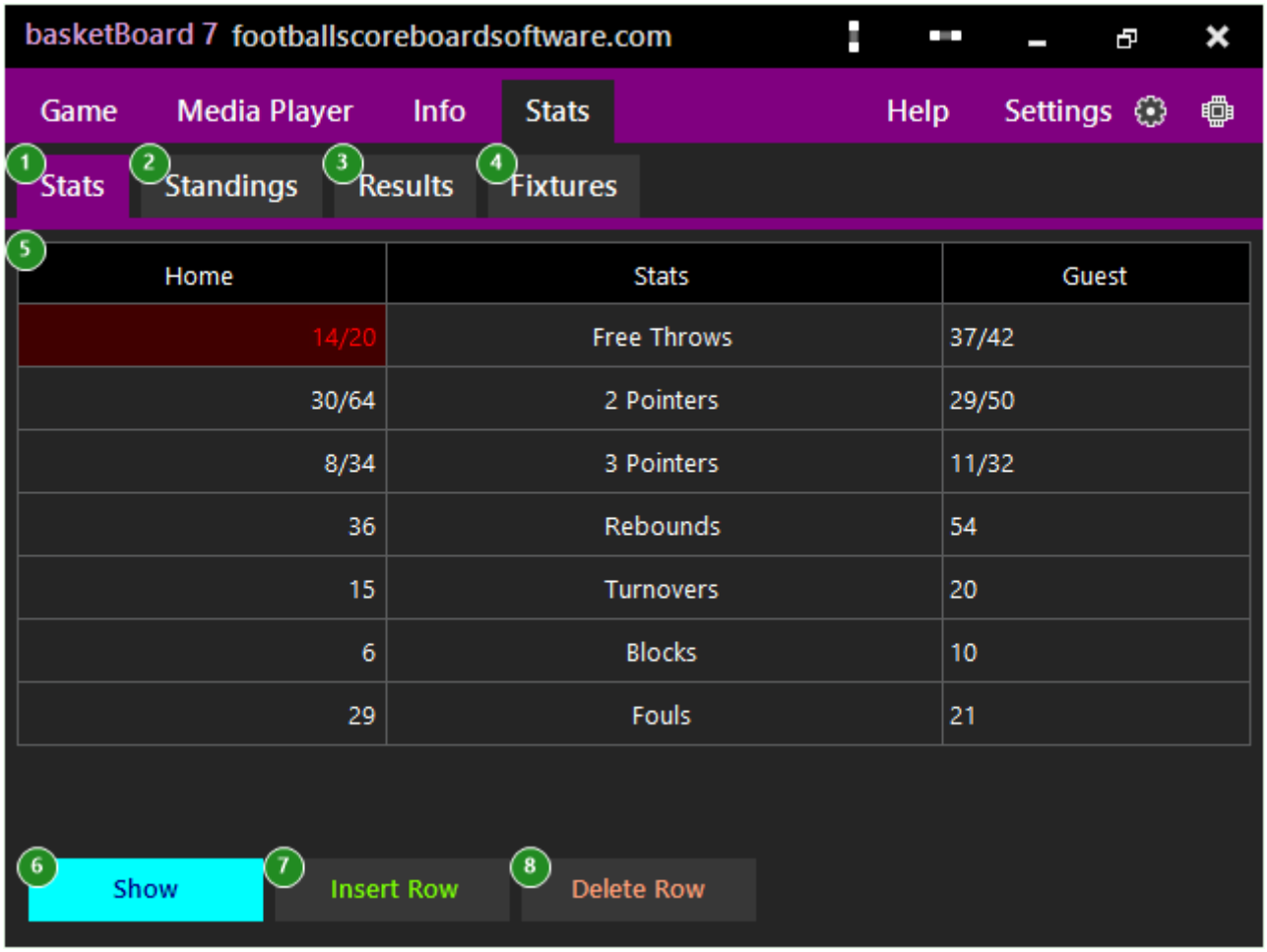
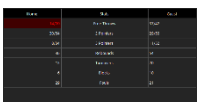


Figure 142. The Stats page with the match statistics table.

No.	Control	Name	What It Does
1	Stats	**Stats**	Opens the match statistics table and reads it from its file (common\data\dataStats.xml). The button of the open table is purple.
2	Standings	**Standings**	Opens the standings table and reads it from its file (common\data\dataStandings.xml). Changes of the table that were not saved with Save are lost by this click.
3	Results	**Results**	Opens the results table and reads it from its file (common\data\dataResults.xml). Results and Fixtures share one window: click Save before you change from one to the other.
4	Fixtures	**Fixtures**	Opens the fixtures table and reads it from its file (common\data\dataFixtures.xml). It is the results table without the two score columns.
5		**Statistics table**	Holds one row per statistic: Home value, name of the statistic (Stats), Guest value. Type in a cell or press F2 to edit it; every finished entry is saved at once (common\data\dataStats.xml). The first number of a Home or Guest cell sets the length of the bar on the board (14/20 counts as 14).

No.	Control	Name	What It Does
6	Show	**Show**	Shows the match statistics on the board as they stand in the table: the team logos and the present score at the top, then one line per row with the two values, a bar and the name of the statistic. The page replaces the scoreboard until you click Game in the menu strip.
7	Insert Row	**Insert Row**	Inserts an empty row above the row of the selected cell, or at the end when the table is empty. The table is saved at once; a row that is still empty is not written to the file.
8	Delete Row	**Delete Row**	Deletes the row of the selected cell without asking and saves the table at once.

- Click a cell and type; F2 edits; Enter confirms. "Insert Row" adds a row above the selected one; "Delete Row" removes it.
- "Show" sends the table to the board as it stands in the grid. There is no Hide button: click "Game" to bring the scoreboard back.
- The match statistics are saved after every change. Standings, results and fixtures are saved only with "Save"; a click on one of the four table buttons reads the table from its file again.

10.20.1 Match Statistics

One row per statistic: home value, name, guest value. The program does not count these values: type them, for example rebounds, assists or turnovers. The board shows a bar per row; the first number of a cell counts (14/20 counts as 14).

Board Output **Control Panel**

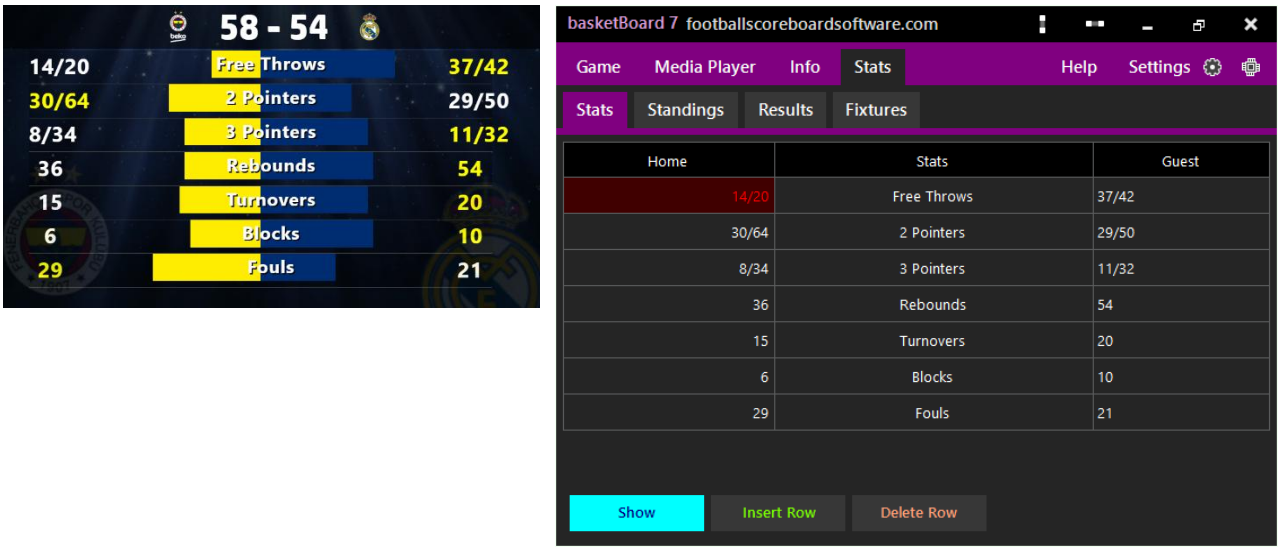


Figure 143. The match statistics on the board and the table.

10.20.2 Standings

The league table: #, logo, Team, P, W, D, L, Diff, Pts. The check boxes above the table choose the columns of the Stats page graphic. The info screen Standings always shows Pos, logo, Team, P, W, L, +/- and Pts.

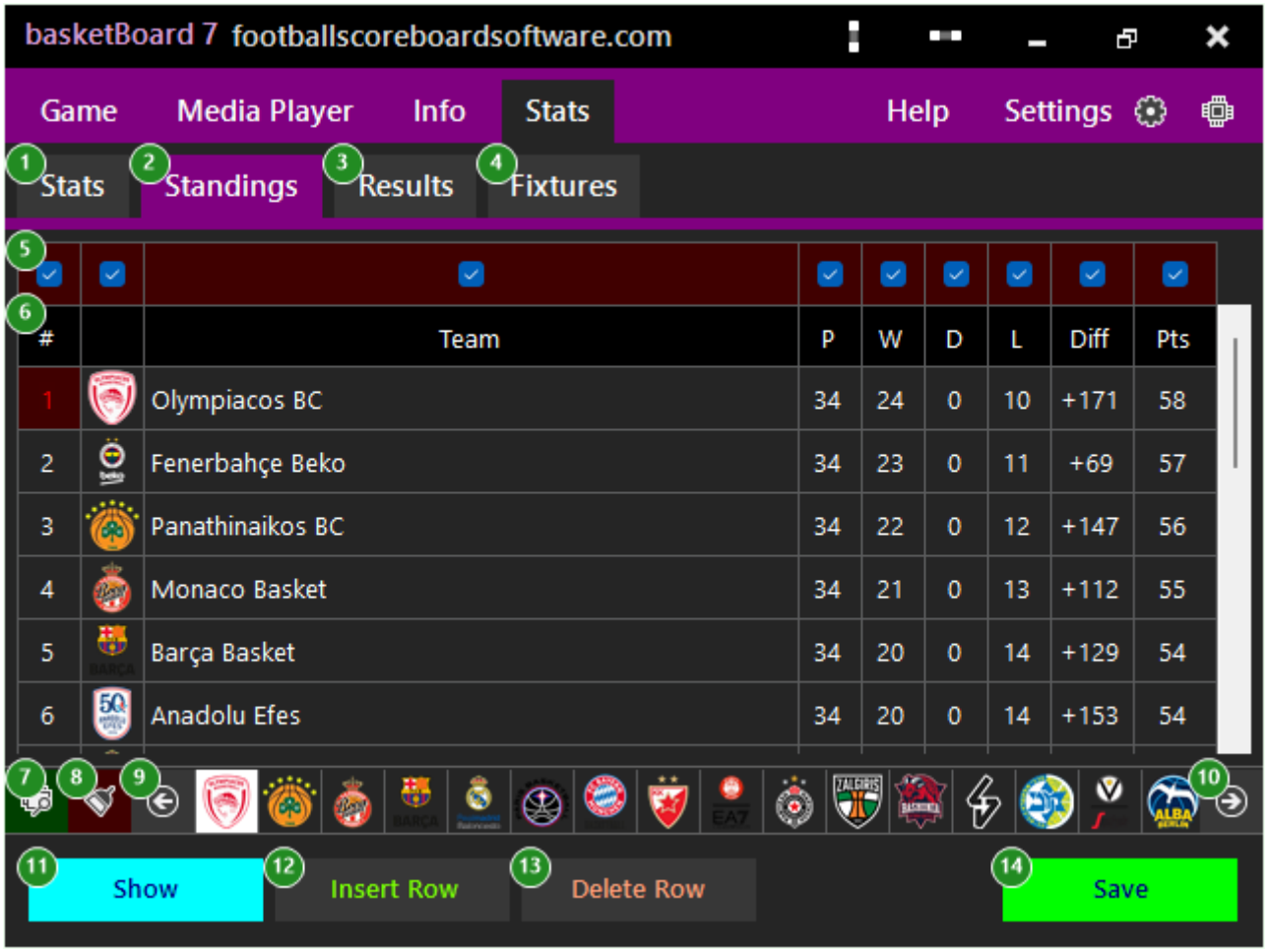
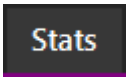
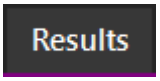
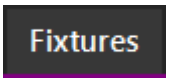
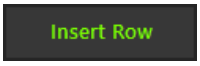
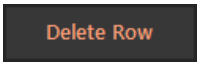


Figure 144. The standings table with the EuroLeague clubs of the demo data.

No.	Control	Name	What It Does
1		**Stats**	Opens the match statistics table and reads it from its file (common\data\dataStats.xml). The button of the open table is purple.
2		**Standings**	Opens the standings table and reads it from its file (common\data\dataStandings.xml). Changes of the table that were not saved with Save are lost by this click.
3		**Results**	Opens the results table and reads it from its file (common\data\dataResults.xml). Results and Fixtures share one window: click Save before you change from one to the other.
4		**Fixtures**	Opens the fixtures table and reads it from its file (common\data\dataFixtures.xml). It is the results table without the two score columns.
5		**Select Column (check boxes)**	Chooses the columns that Show sends to the board: a column is sent when the box above it is ticked. The first box ticks or clears all boxes. The choice is saved at once (common\data\dataStandingsColumns.xml).
6		**Standings table**	Holds one row per team: # (position), logo, Team, P, W, D, L, Diff, Pts; the cells take any text. Type in a cell or press F2 to edit it, drag a row to change the order. To give a team a logo click a logo in the strip below, then a cell of the team's row. Changes are kept only with Save.

No.	Control	Name	What It Does
7		**Select Picture (picture icon)**	Opens a file dialog for one or more picture files (bmp, gif, jpeg, jpg, png), adds them to the logo strip and saves the strip (common\data\dataLogos.xml, shared with Results and Fixtures).
8		**Clear (brush icon)**	Removes all logos from the logo strip and saves the empty strip (common\data\dataLogos.xml, shared with Results and Fixtures). Logos already placed in rows stay there.
9		**Scroll (left arrow)**	Moves the logo strip to the right while the button is held down, to bring logos at its left end back into view.
10		**Scroll (right arrow)**	Moves the logo strip to the left while the button is held down, to bring the logos beyond the right edge into view.
11		**Show**	Shows the standings on the board as they stand in the table, saved or not, with the columns whose check box is ticked and the title Standings. A table longer than the page moves slowly up and down. The page replaces the scoreboard until you click Game in the menu strip.
12		**Insert Row**	Inserts an empty row above the row of the selected cell, or at the end when the table is empty, and numbers the # column again. The change is kept only with Save.
13		**Delete Row**	Deletes the row of the selected cell without asking and numbers the # column again. The change is kept only with Save.
14		**Save**	Saves the standings to common\data\dataStandings.xml and reads them again. The button is then greyed out until the Standings button of the page is clicked again, and that click reads the table from the file: finish all changes before you click Save.

To give a team a logo, click "Select Picture" (the first button of the logo strip) and add picture files; then click a logo in the strip and click the row of the team. Click "Save" when the table is complete.

> **Note:** Finish all changes before you click "Save". After "Save" the button is greyed out until you click "Standings" again, and that click reads the table from the file.

Board Output **Control Panel**

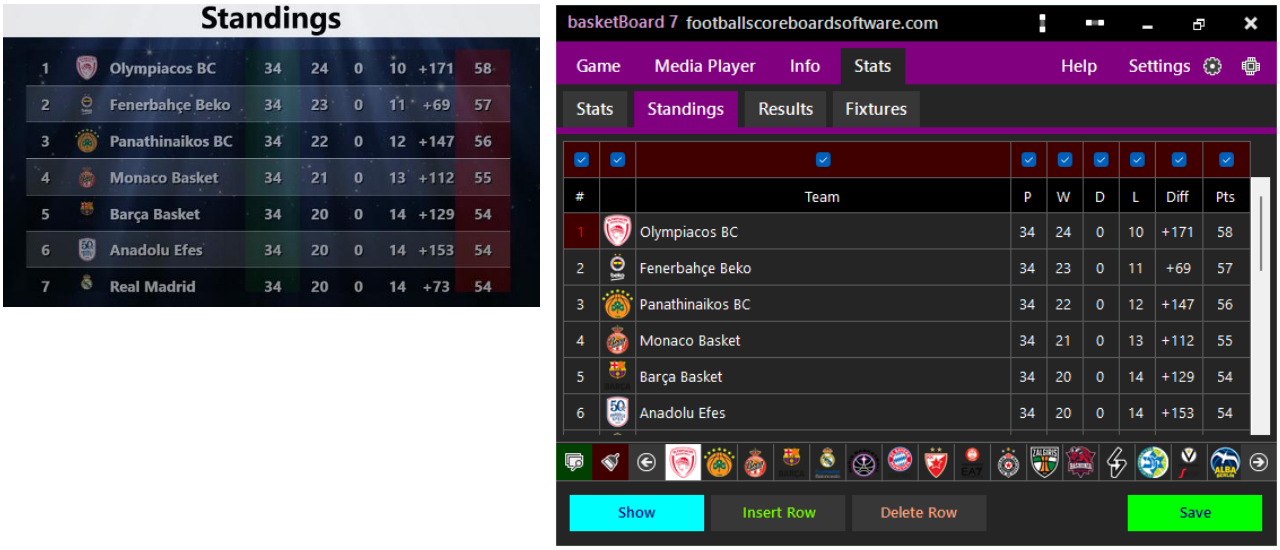


Figure 145. The standings on the board (Stats page graphic).

10.20.3 Results and Fixtures

The results table holds one row per game: #, Min, home logo, Home, home score, separator, guest score, Guest, guest logo. An exclamation mark (!) in Min makes the row a heading, for example a date. The Fixtures table is the same without the scores. Results and Fixtures are one window with two files: click "Save" before you change from one to the other.

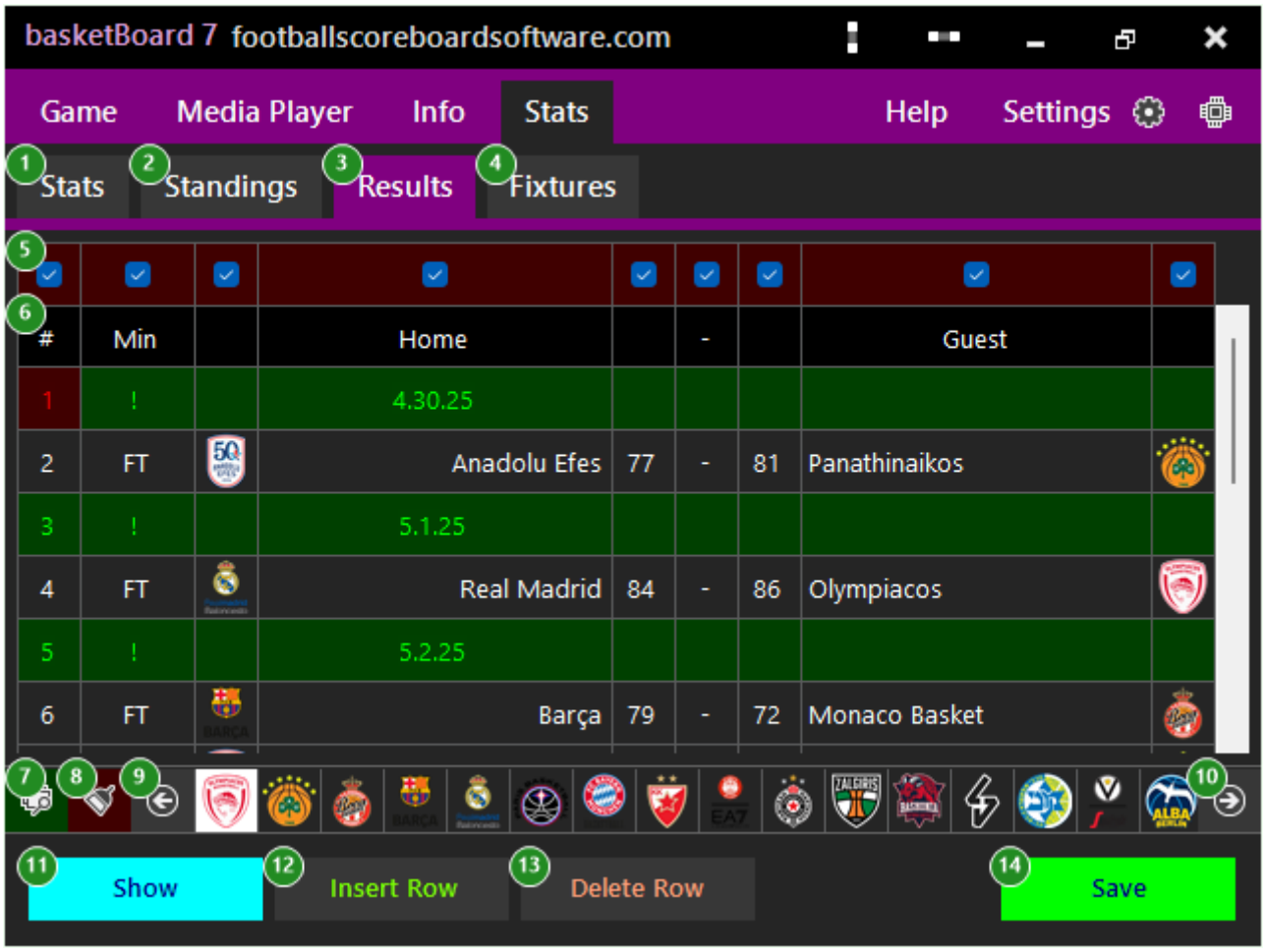
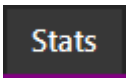
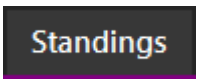
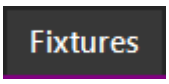
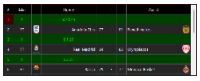
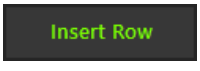
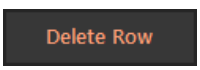


Figure 146. The results table.

No.	Control	Name	What It Does
1		**Stats**	Opens the match statistics table and reads it from its file (common\data\dataStats.xml). The button of the open table is purple.
2		**Standings**	Opens the standings table and reads it from its file (common\data\dataStandings.xml). Changes of the table that were not saved with Save are lost by this click.
3		**Results**	Opens the results table and reads it from its file (common\data\dataResults.xml). Results and Fixtures share one window: click Save before you change from one to the other.
4		**Fixtures**	Opens the fixtures table and reads it from its file (common\data\dataFixtures.xml). It is the results table without the two score columns.
5		**Select Column (check boxes)**	Chooses the columns that Show sends to the board: a column is sent when the box above it is ticked. The first box ticks or clears all boxes. The choice is saved at once, separately for Results and Fixtures (common\data\dataStandingsColumns.xml).
6		**Results / Fixtures table**	Holds one row per game: #, Min, home logo, Home, home score, separator, guest score, Guest, guest logo (Fixtures has no score columns). An exclamation mark in Min makes the row a heading row whose text is typed in Home. To place a logo click it in the strip, then click the left part of the row for the home team or the right part for the guest team. Changes are kept only with Save.
7		**Select Picture (picture icon)**	Opens a file dialog for one or more picture files (bmp, gif, jpeg, jpg, png), adds them to the logo strip and saves the strip (common\data\dataLogos.xml, shared with Standings).
8		**Clear (brush icon)**	Removes all logos from the logo strip and saves the empty strip (common\data\dataLogos.xml, shared with Standings). Logos already placed in rows stay there.
9		**Scroll (left arrow)**	Moves the logo strip to the right while the button is held down, to bring logos at its left end back into view.
10		**Scroll (right arrow)**	Moves the logo strip to the left while the button is held down, to bring the logos beyond the right edge into view.
11		**Show**	Shows the open table on the board as it stands in the grid, saved or not, with the ticked columns and the title Results or Fixtures. A game is one line (Min text, home team, logos, score, guest team); a row with ! in Min is a heading across the table. The page replaces the scoreboard until you click Game in the menu strip.
12		**Insert Row**	Inserts an empty row above the row of the selected cell, or at the end when the table is empty, and numbers the # column again. The change is kept only with Save.
13		**Delete Row**	Deletes the row of the selected cell without asking and numbers the # column again. The change is kept only with Save.

No.	Control	Name	What It Does
14	Save	**Save**	Saves the open table, Results to common\data\dataResults.xml or Fixtures to common\data\dataFixtures.xml, and reads it again. Rows without any content are dropped.

Board Output **Control Panel**

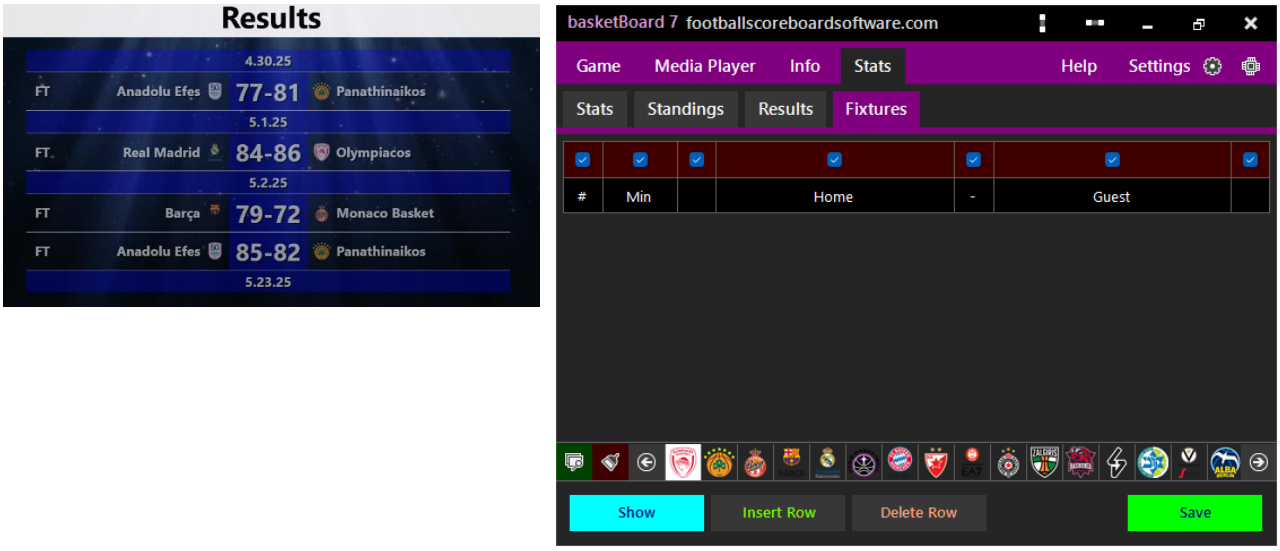


Figure 147. The results on the board, and the Fixtures table of a new installation, which is empty.

10.20.4 Titles and Files

The titles of the Stats page graphics are board titles: Settings > Language, titles (chapter 15).

File	Content
common\data\dataStats.xml	Match statistics
common\data\dataStandings.xml	Standings (also the Standings info screen)
common\data\dataResults.xml	Results (also the Results info screen)
common\data\dataFixtures.xml	Fixtures
start.xml, MATCH/INFO	The fields of the 15 info screens and the recorded period scores

11. Designs and the Design Editor

A board design fixes where every element of the board stands and how it looks: game clock, scores, logos, team names, team fouls, shot clock, time-out icons, possession arrow and the free text lines. basketBoard 7 comes with factory designs for every display mode. You can change the design in use in the design editor and keep the result as a design of your own.

- The design list opens with the "Select Design" icon of the control panel (the folder icon, chapter 5).
- The design editor opens from the Settings page with the Board Design button of the current display mode (chapter 15).



Figure 148. The three factory Standard designs with the same match: design 1, design 2 and design 3.

11.1 Factory Designs, Working Designs and Own Designs

The designs are kept in three folders below the program folder. Each folder has one task.

Kind	Folder	What it holds	Who writes it
Factory designs	common\vizrt\storage	The delivered designs, the factory page templates, the info screen designs and the factory list of designs (dataBoards.xml)	Setup only. The program reads this folder and never writes to it. Every update replaces it.
Working designs (design in use)	common\vizrt\current	The pages the board shows now: the scoreboard (Game), the info graphics and the info screens	The program, when you activate a design, click "Save & Apply" or use "Factory Settings"
Own designs	common\vizrt\custom	The designs you saved with "Save Design As", and your list of all designs	The program, when you save, rename or delete an own design. Setup never touches this folder.

- You always work on the working design. Activating a design copies it from the factory designs or from your own designs over the working design.
- The design editor changes the working design only. "Save Design As" copies the scoreboard of the working design to your own designs under a new name.
- Nothing you do in the program changes a factory design. A factory design cannot be renamed, deleted or overwritten. The test checked this: the 241 files of the factory folder were unchanged after all edits, saves and reverts in the four display modes.
- Standard and Sponsored mode share one working scoreboard; Advertisement and Chroma Key mode each have their own. When you change the display mode, the program puts back the design that was in use in that mode.

> **Note:** If any function tries to write to common\vizrt\storage, the program blocks it, writes a line to the log and shows "The factory designs folder is read-only." with the hint "Activate the design, edit it and use 'save as' to keep your own copy." A damaged file in this folder is left untouched and a message asks you to run Setup again.

The factory designs of version 7.6.7.14:

Display mode	Factory designs in the design list
St, Sp	_Master - [St]andart Design [1], [2] and [3]
Ad	_Master - [Ad]vertise Design [1], [2] and [3]
CK	_Master - [CK]Chroma Key Design [1], [2] Navy, [3] Charcoal and [4] Clay

A new installation starts with design [1] in every mode. In Ad mode design [1] is the board shown in 9.1, and "Factory Settings" on the Game page brings back the same look.

11.2 The Chroma Key Designs

The Chroma Key board is a scorebug on the key colour that a video mixer replaces with the camera picture (chapter 9). Four factory designs exist:

Design	Scorebug	Info screens
[1]	Competition logo, game clock, team logos and colours, names, scores and the shot clock	No lower thirds of its own: the info screens use those of Navy
[2] Navy, [3] Charcoal, [4] Clay	The basketball scorebug: names, scores, period, game clock, shot clock, possession arrow, team fouls with the "Penalty" or "Bonus" marker, timeouts left as dots and, during a time-out, the time-out countdown	15 lower thirds in the colours of the design

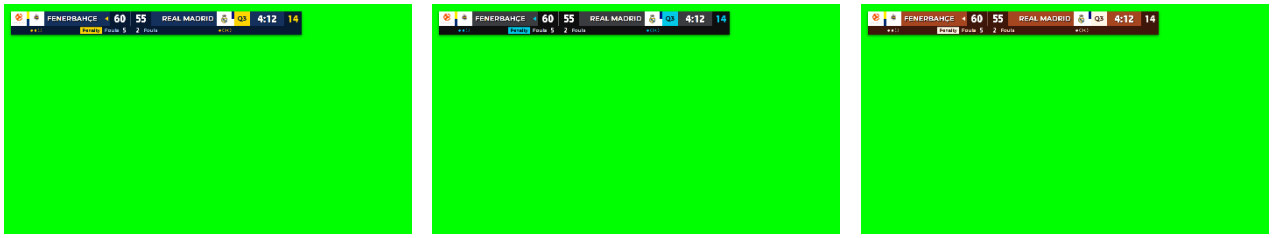


Figure 149. The basketball scorebug of the designs Navy, Charcoal and Clay.



Figure 150. The scorebug of design [1], the Chroma Key design of a new installation.

A new installation starts with design [1]. To use the basketball scorebug, open the design list in CK mode, select Navy, Charcoal or Clay and click "Apply" (11.3).

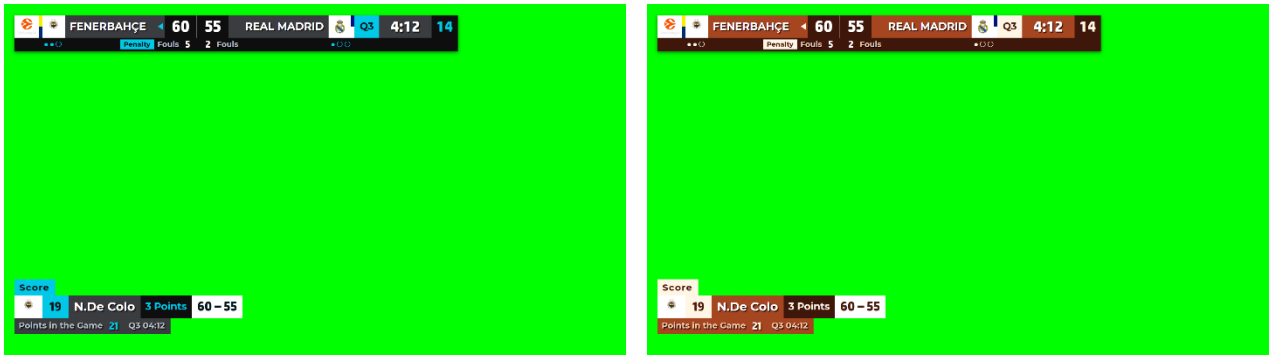


Figure 151. The Score screen as lower third under the Charcoal and the Clay scorebug.

11.3 The Design List

Click the "Select Design" icon on the control panel. The window "Open Design" lists the designs of the current display mode by name; the preview on the right shows the board with the selected design and the values of the running match.



Figure 152. The design list in Standard mode: three factory designs and one own design.

- Factory designs are grey and italic. Their tool tip reads "Factory design (read-only): cannot be renamed or deleted".
- Own designs are green. Their tool tip reads "Your design".
- The selected row is red.

- The close button, Esc or a click outside the window closes it without a change.



Figure 153. The design list with an own design selected: "Delete" and "Rename" are shown.

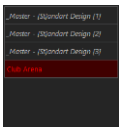
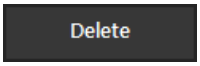
No.	Control	Name	What It Does
1		**Close**	Closes the design list without changing the design in use. Esc or a click outside the window does the same.
2		**Design list**	Lists the designs of the current display mode by name: factory designs grey and italic, own designs green. Click a row to see the board with that design in the preview on the right; the selected row is the one Apply, Rename and Delete work on. In Sponsored mode the list shows the Standard designs.
3		**Delete**	Deletes the selected own design. The first click turns the button red, the second click removes the design from the list and deletes its file from common\vizrt\custom; selecting another row after the first click cancels. It cannot be undone. Shown only when an own design is selected.
4		**Rename**	Starts editing the name of the selected own design in the list; press Enter to save the new name. Shown only when an own design is selected.
5		**Apply**	Makes the selected design the design in use of the current display mode, redraws the board and closes the window. The choice is stored in start.xml (CURRENT). Changes of the design in use that were not saved with Save Design As are lost. A factory design also puts back the factory page template; an Advertisement design also puts back the layout of the scoreboard and the banners.



Figure 154. A factory design selected: "Delete" and "Rename" are hidden.

11.3.1 Activating a Design

1. Click the "Select Design" icon on the control panel.
2. Click a design in the list. The preview shows it.
3. Click "Apply". The board changes at once and the window closes.

The choice is stored in start.xml (CURRENT, one entry per display mode) and is used again at the next start.

> **Note:** "Apply" replaces the working design. Changes made in the design editor and not saved with "Save Design As" are lost. Activating a factory design also puts back the factory page template; activating an own design leaves the page template as it is.

In CK mode "Apply" replaces the working scorebug, the master page and the lower thirds of the info screens with those of the chosen design.

11.3.2 Renaming an Own Design

1. Select the own design.
2. Click "Rename", the icon between "Delete" and "Apply". The name becomes a text field.
3. Type the new name and press Enter. The name is saved at once.

11.3.3 Deleting an Own Design

1. Select the own design.
2. Click "Delete". The button turns red; nothing is deleted yet.
3. Click "Delete" again. The design disappears from the list and its file is deleted from common\vizrt\custom.

Selecting another row after the first click cancels the deletion. A deleted design cannot be brought back. The working design is not changed: if you delete the active design, the board keeps its look.

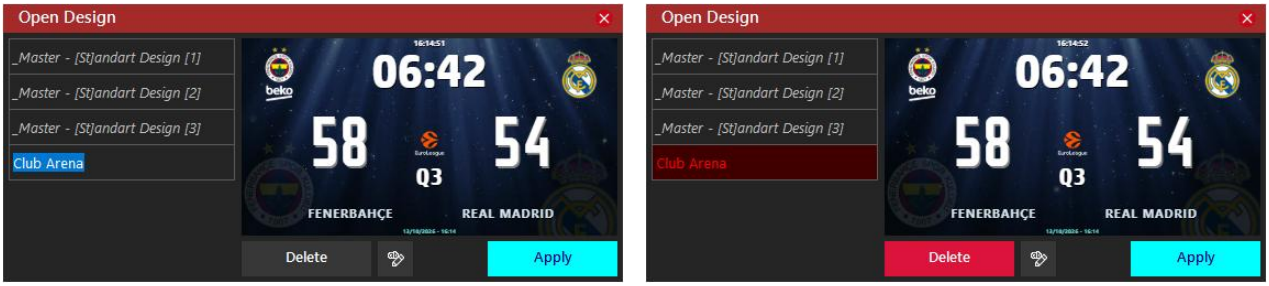


Figure 155. Left: the name of an own design being edited. Right: "Delete" clicked once; the second click deletes the design.

11.3.4 The List in the Four Display Modes

Display mode	The list shows	Remarks
St	The factory Standard designs and your own Standard designs	
Sp	The same Standard designs	The Sponsored board is the Standard scoreboard with the sponsor strip. "Apply" stores the choice as the Standard design.
Ad	The factory Advertisement designs and your own Advertisement designs	An Advertisement design also carries the layout of the board: side and size of the scoreboard and of the two banners. "Apply" puts this layout back as well.
CK	The four factory Chroma Key designs	Own Chroma Key designs cannot be saved (11.5).

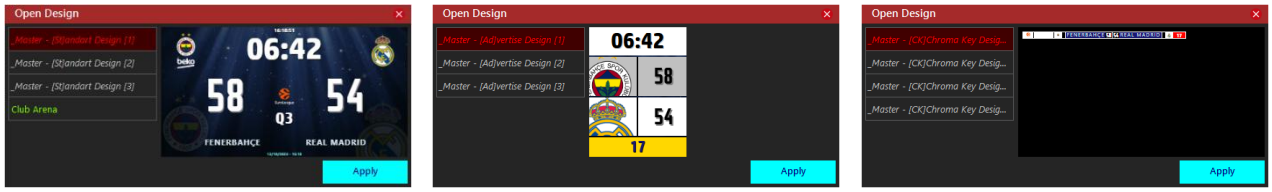


Figure 156. The design list in Sponsored, Advertisement and Chroma Key mode.

11.4 The Design Editor

Open Settings and click the Board Design button of the current display mode: "[St]andard Board Design", "[Sp]onsored Board Design", "[Ad]vertisement Board Design" or "[CK] Board Design". Only the button of the current mode can be clicked. The title bar of the editor shows the mode and the page, for example "[St]andard Board Design - Game".

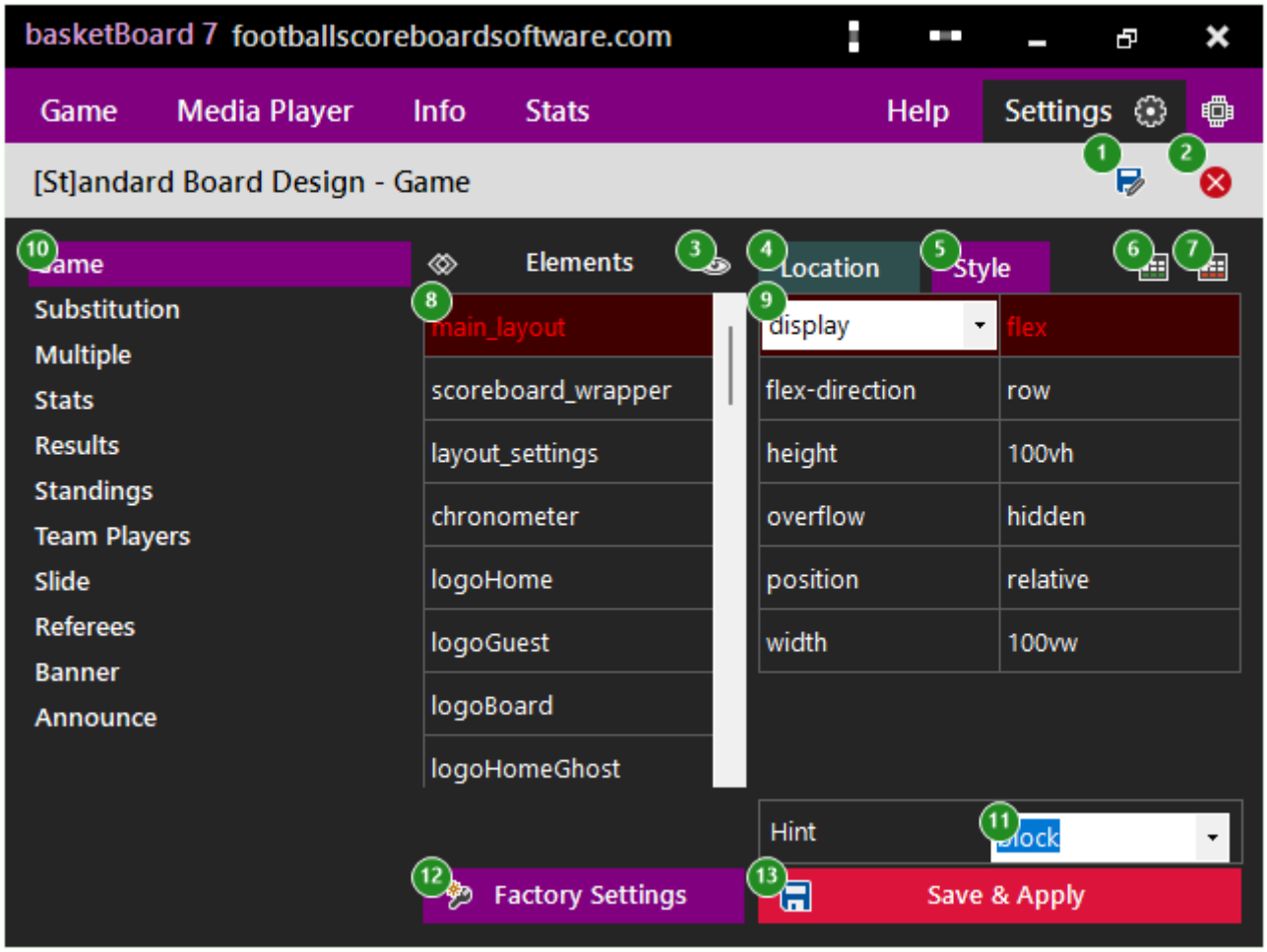
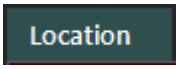
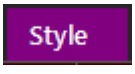
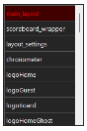
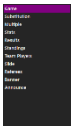
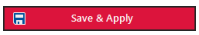


Figure 157. The design editor in Standard mode: the Game page, the element main_layout and its Style properties.

No.	Control	Name	What It Does
1		**Save Design As (disk icon)**	Asks for a name and saves the Game page of the design in use as a new own design in common\vizrt\custom; it appears in green in the design list of the mode. In Advertisement mode the layout of the scoreboard and the banners is saved with it. In Chroma Key mode the program answers Sorry, Design Saving Is Not Supported For CK Mode Yet! and saves nothing.
2		**Close**	Closes the design editor and returns to the Settings page. Changes in the table that were not saved with Save & Apply are lost.
3		**Show or Hide (eye icon)**	Hides or shows the selected element: switches the property display in the table between none and block, or adds display block when the row is missing. The icon shows the state. The change reaches the board with Save & Apply.
4		**Location**	Shows the Location properties of the selected element in the table: place and size of its box (left, top, width, height, alignment). The active group is purple. Changes of the other group that were not saved are lost.
5		**Style**	Shows the Style properties of the selected element in the table: font, size, colour, shadow. The active group is purple. Changes of the other group that were not saved are lost.

No.	Control	Name	What It Does
6		**Insert Row**	Adds an empty row at the end of the property table. Choose the property name in the drop-down list of the row and type its value.
7		**Delete Row**	Removes the selected row from the property table. The property is removed from the design with Save & Apply.
8		**Elements**	Lists the elements of the selected page; hidden elements are grey, names that start with a dot are styles shared by several elements. Selecting an element loads its properties into the table on the right and redraws the board with a dotted red frame around the element.
9		**Property table**	Shows the properties of the selected element and group as name and value, sorted by name. Click a value and type to change it; a drop-down list on the name cell changes the property; a colour button or a font button appears in the row of a colour or of font-family. A number without a unit is a percentage of the board width or height.
10		**Pages**	Selects the page to edit: Game (the scoreboard) or one of the info graphics Substitution, Multiple, Stats, Results, Standings, Team Players, Slide, Referees, Banner, Announce; in Chroma Key mode Game and Substitution. The title bar shows the page and the Elements list is filled with its elements.
11		**Hint**	Lists the values that the property of the selected row accepts, for example block and none for display. It is for reading only: choosing an entry does not change the table; type the value into the Value cell.
12		**Factory Settings**	Asks Factory Settings Will Be Restored. Are You Sure? and, after Yes, puts back the selected page of the design in use: the Game page from the stored version of the active design with the factory page template, an info graphic from the factory page, a Chroma Key page from the active Chroma Key master. In Advertisement mode the layout of the scoreboard and the banners comes back as well. Own designs and factory designs are not changed.
13		**Save & Apply**	Stores the properties shown in the table (one group of one element) in the design in use and redraws the board. On the Game page the stored state is also kept as the design in use of the display mode. On the Stats and Standings pages the change is stored but the board is redrawn only when an element is selected again.

> **Note:** The editor works on the live board. When you select an element, the board is redrawn and marks it; when you select an info graphic, the board shows it with sample content. Edit designs before the match, not during it.

11.4.1 Pages

The list on the left selects the page.

Display mode	Pages
St, Sp, Ad	Game, Substitution, Multiple, Stats, Results, Standings, Team Players, Slide, Referees, Banner, Announce
CK	Game, Substitution

Game is the scoreboard (in CK mode the scorebug). The other pages are the Info page graphics and the Stats page graphics of chapter 10. In St, Sp and Ad mode these pages are shared: a change made in one mode is valid in all three.

> **Note:** The 15 info screens of chapter 10 are not pages of the editor. Their look comes with the factory designs (11.7).

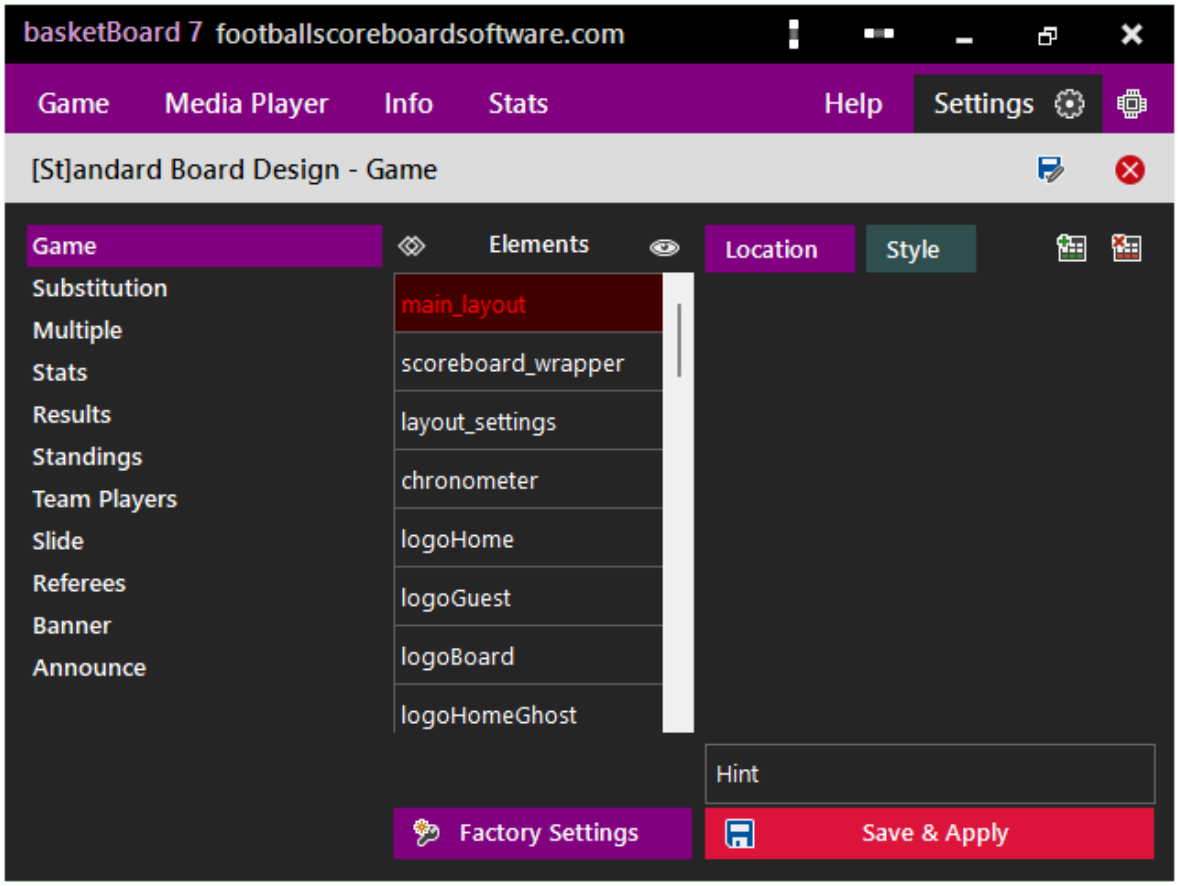


Figure 158. The editor as it opens: the Game page with the first element selected and the Location properties.

11.4.2 Elements

The "Elements" list shows the elements of the page.

- A white name is a visible element, a grey name a hidden one.
- A name that starts with a dot, for example .row_home, is a style shared by several elements.
- The eye icon above the list hides or shows the selected element (the property display none or block). The change reaches the board with "Save & Apply".
- Selecting an element redraws the board with a dotted red frame around it. The frame disappears when you click "Game" in the menu strip.

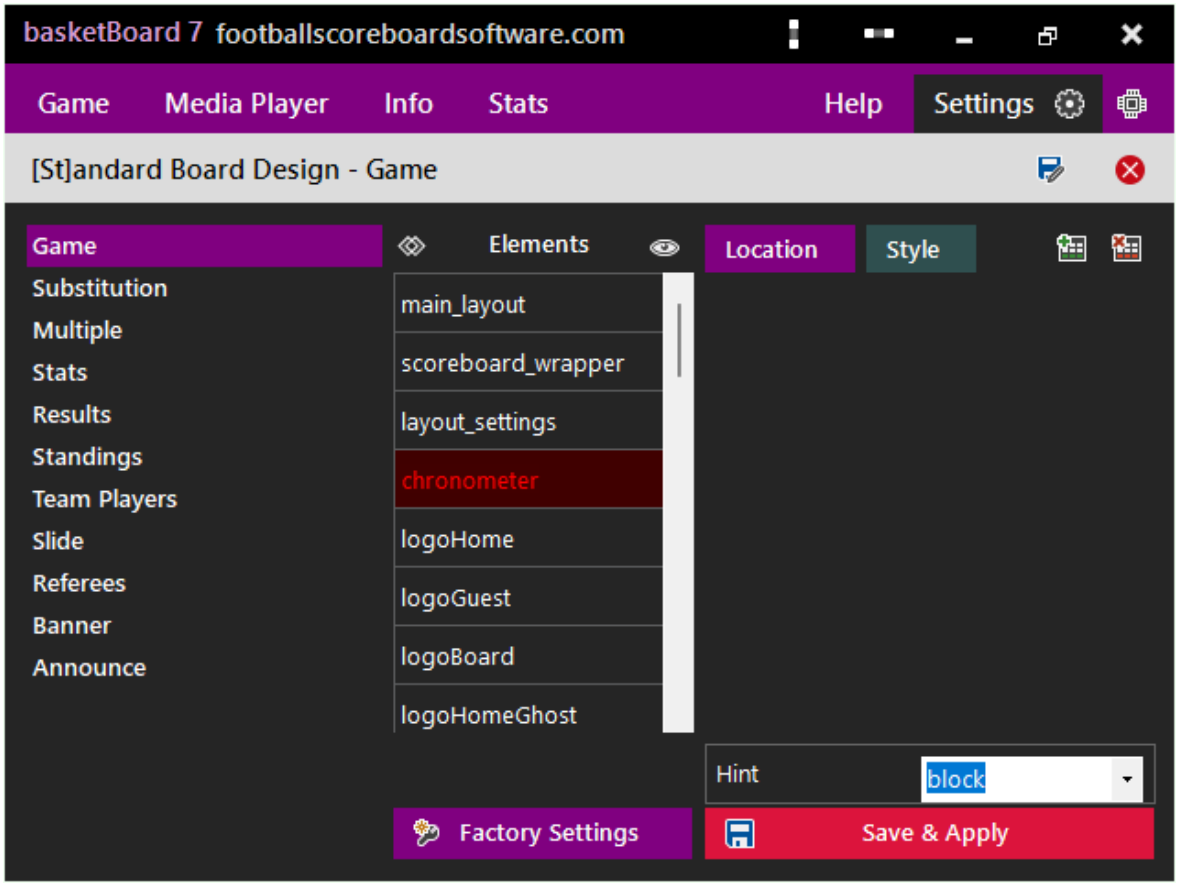


Figure 159. The element chronometer selected (red row): on the board it is marked with a red dotted frame.

Elements of the Game page in the factory Standard designs:

Element	On the board
main_layout, scoreboard_wrapper	The frame of the whole page. Leave these as they are.
chronometer	Game clock
logoHome, logoGuest, logoBoard	Team logos and competition logo
logoHomeGhost, logoGuestGhost	The large, pale team logos in the background
nameHome, nameGuest	Team names
scoreHome, scoreGuest	Scores
foulHome, foulGuest	Team fouls; the cell turns red in the bonus
possessionHome, possessionGuest	Possession arrow, one element for each side
timeoutHome, timeoutGuest	Time-out icons
timeoutTime	The period and, during a time-out, the time-out countdown
shotClock	Shot clock
extraText01, extraText02	The two free text lines (chapter 5)
panel_home, panel_guest	The player panels (chapter 7)

> **Note:** On the Standard board the possession arrow needs the elements possessionHome and possessionGuest, which the factory Standard designs have. The Chroma Key designs Navy, Charcoal and Clay show the arrow in their scorebug. An own design saved before the arrow existed does not have them, and the editor cannot add them: activate a factory design, make your changes again and save a new own design.

11.4.3 Location and Style

Every element has up to two groups of properties. The buttons "Location" and "Style" above the property table switch between them; the active one is purple.

- "Location": where the element stands and how large its box is, for example left, top, width, height, text-align.
- "Style": how the content looks, for example color, font-family, font-size, font-weight, text-shadow.

The names and values are those of CSS, the style language of web pages.

1. Click a value, type the new value and press Enter.
2. To change the name of a property, select the row and choose the name in the list that appears on the name cell. The "Hint" box below the table lists the values this property accepts; it is for reading only.
3. "Insert Row" adds an empty row at the end; "Delete Row" removes the selected row.
4. In the row of a colour property a colour button appears, in the row of font-family a font button (11.4.5).

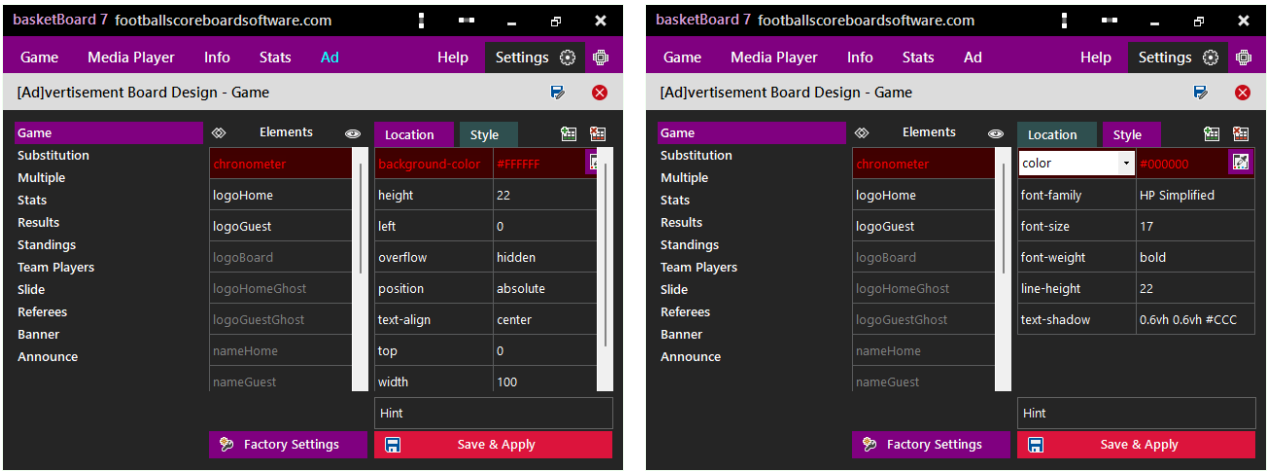


Figure 160. Advertisement mode: the Location and the Style properties of the game clock.

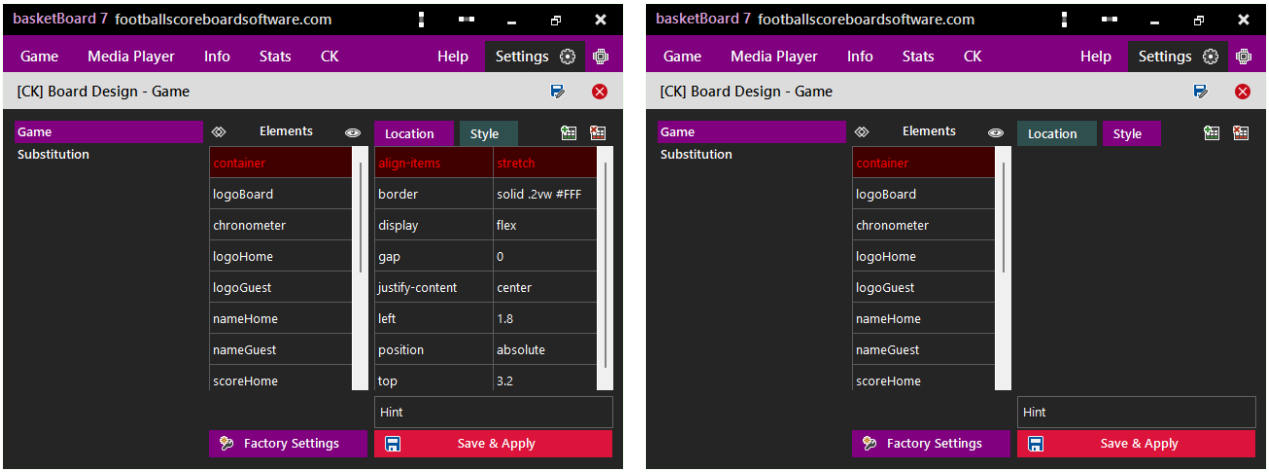


Figure 161. Chroma Key mode: the pages Game and Substitution.

11.4.4 Units

Value	Meaning
A plain number in left, right, width, margin-left, padding-left and similar	Percent of the board width
A plain number in top, bottom, height, font-size, line-height and similar	Percent of the board height
A number with u, for example 17u	The board unit: 1u is one percent of the board height on a 16:9 board, and less on a taller board, so that the element keeps its proportions
A value with its own unit (px, em, %, vh, vw), or a word such as auto	Used as typed

top 66 puts an element at 66 percent of the board height; font-size 24 makes the text 24 percent of the board height tall. The Chroma Key designs Navy, Charcoal and Clay and the info screens use the unit u. A font-family may be a list separated by commas; the board uses the first installed font of the list.

11.4.5 The Colour Dialog and the Font Dialog

Every colour button and every font button of the program opens the same two dialogs: in the design editor, in the Info page and Announce style panel (chapter 10) and in the style panels of the Sponsored and Advertisement modes.

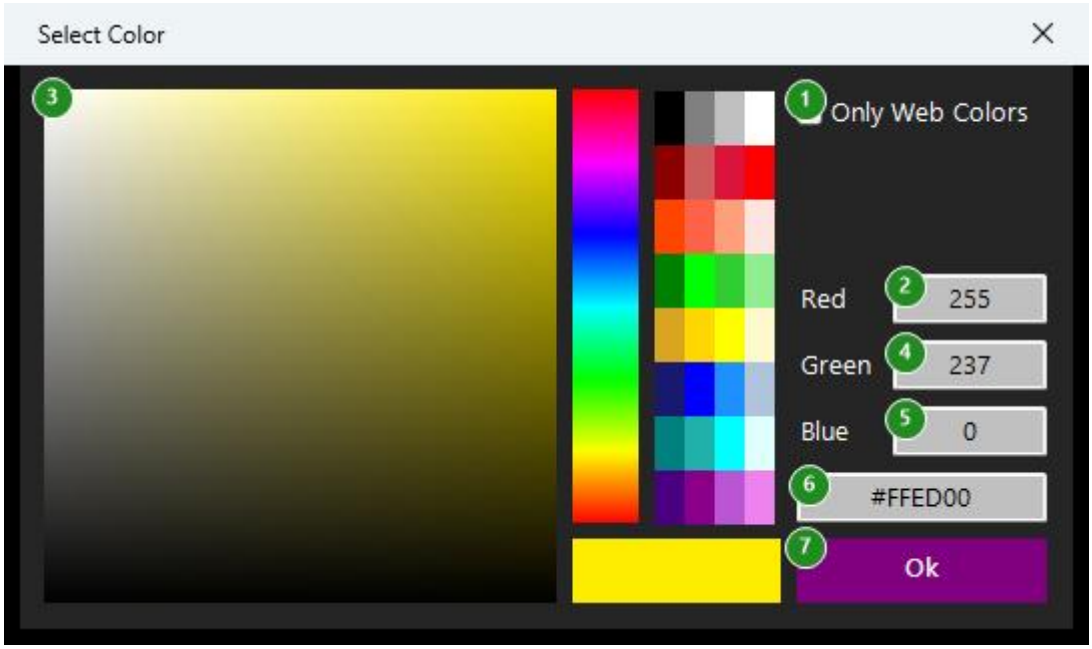
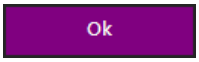


Figure 162. The colour dialog.

No.	Control	Name	What It Does
1	Only Web Colors	**Only Web Colors**	Limits the palette to the 216 web-safe colours when ticked; unticked, the palette offers every shade of the hue.

No.	Control	Name	What It Does
2		**Red**	Holds the red part of the selected colour, 0 to 255. Typing a number changes the selected colour and the colour code at once; a number above 255 becomes 255.
3		**Colour palette**	Takes the colour of the point you click as the selected colour and writes it into the fields Red, Green, Blue and the colour code. The palette shows the current hue from light (top) to dark (bottom) and from pale (left) to strong (right); the hue is changed with the narrow bar beside it or by clicking a basic colour.
4		**Green**	Holds the green part of the selected colour, 0 to 255. Typing a number changes the selected colour and the colour code at once; a number above 255 becomes 255.
5		**Blue**	Holds the blue part of the selected colour, 0 to 255. Typing a number changes the selected colour and the colour code at once; a number above 255 becomes 255.
6		**Colour code**	Holds the selected colour as a web colour code: # and six hexadecimal digits, for example #FFED00. Type or paste a code to select that colour; it is taken as soon as it is complete, and Red, Green and Blue follow.
7		**Ok**	Closes the dialog and gives the selected colour to the colour square that opened it; the place that opened the dialog saves it. Esc or the cross of the title bar closes the dialog without a change.

- Click a point of the large palette, a basic colour, or type Red, Green, Blue or the colour code.
- "Ok" closes the dialog and applies the colour. Esc or the cross of the title bar closes it without a change.
- The place that opened the dialog saves the colour.

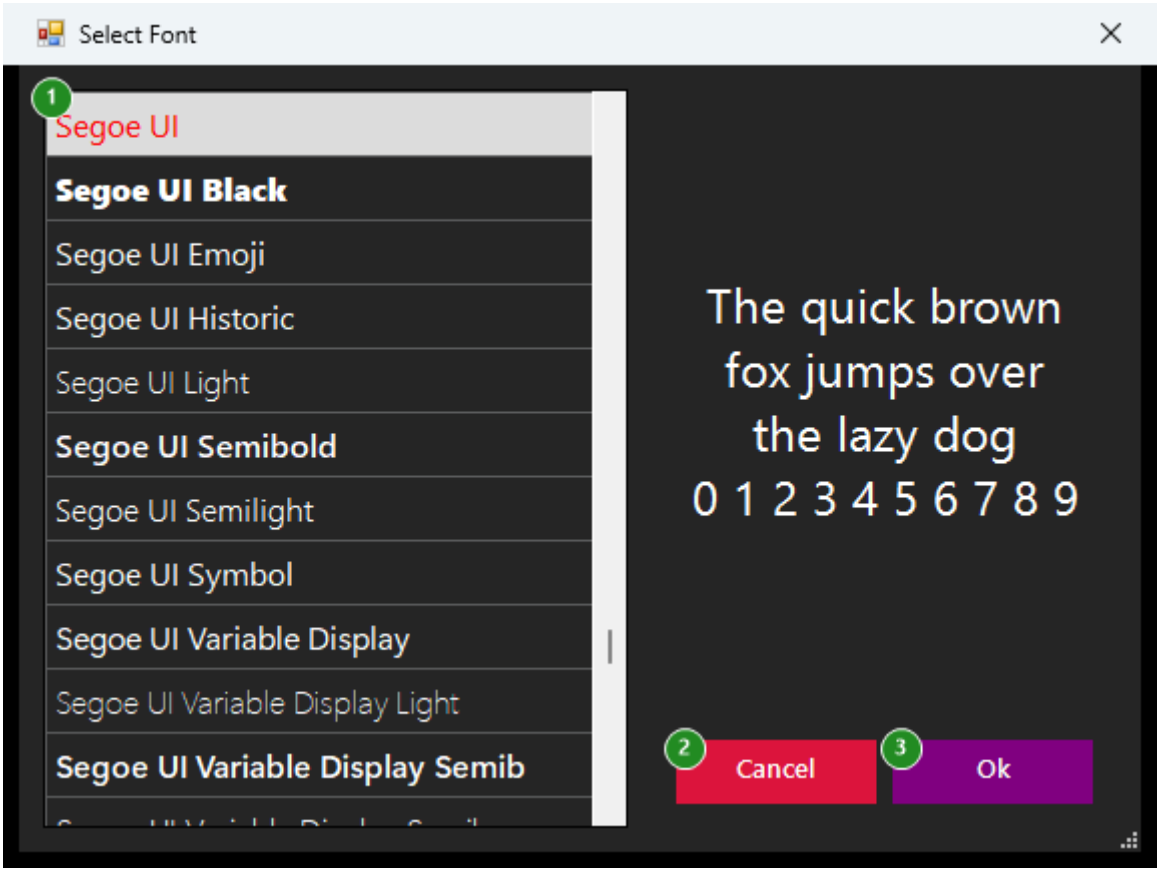


Figure 163. The font dialog.

No.	Control	Name	What It Does
1		**Font list**	Lists the fonts installed in Windows in alphabetical order, each name written in its own font, and opens at the font in use. Click a font or type the first letters of its name to select it; the sample at the right shows the selected font.
2	Cancel	**Cancel**	Closes the dialog without changing the font. Esc and the cross of the title bar do the same.
3	Ok	**Ok**	Closes the dialog and writes the name of the selected font into the row that opened it. Enter in the list does the same once the list has found a font. The place that opened the dialog saves the name.

- The list shows the fonts installed in Windows, each name in its own font. Click a font or type the first letters of its name.
- "Ok", or Enter in the list, writes the name into the row that opened the dialog. "Cancel" or Esc closes it without a change.
- A font must be installed in Windows on the scoreboard PC to appear on the board.

11.5 Saving

11.5.1 Save & Apply

1. Select the page and the element.
2. Choose "Location" or "Style" and change the values.

3. Click "Save & Apply". The properties shown in the table are stored in the working design and the board is redrawn.

> **Note:** "Save & Apply" stores only what the table shows: one group of one element. Click it before you select another element, another page or the other group; otherwise the changes in the table are lost. A row without a name or without a value is not stored.

On the Stats and Standings pages "Save & Apply" stores the change, but the board is redrawn only when you select an element again.

The test changed the colour of scoreHome and saved it with "Save & Apply" in all four display modes; the board showed the new colour each time.

11.5.2 Save as Own Design

"Save & Apply" changes the working design. To keep this state under a name, save it as a design of your own.

1. Click "Save Design As", the disk icon in the title bar of the editor.
2. Type a name ("Please Enter a Name") and click "Save". "Cancel" or Esc closes the dialog without saving.
3. The message "The data has been successfully saved." confirms it.

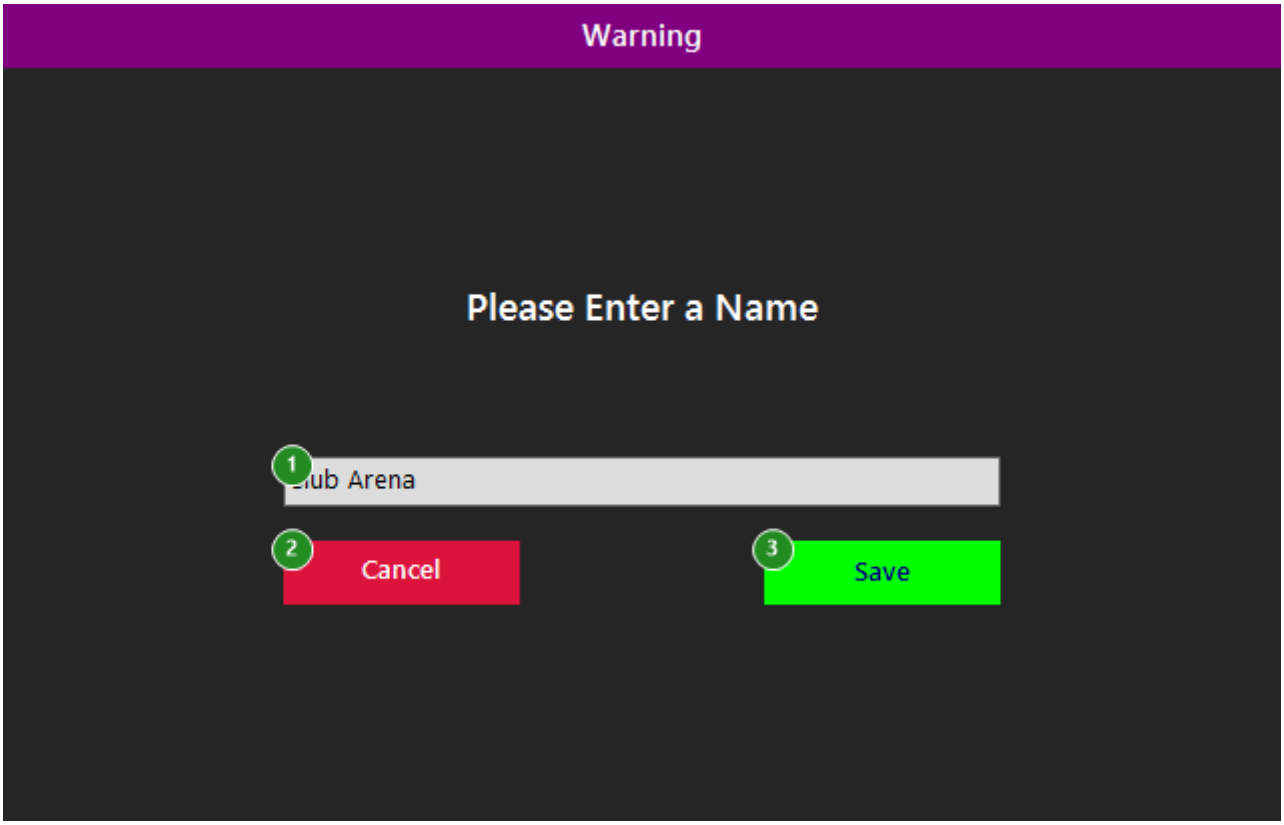


Figure 164. The name of the new own design.

No.	Control	Name	What It Does
1		**Name**	Takes the name of the new own design as it will be listed in the design list.
2	Cancel	**Cancel**	Closes the dialog without saving. Esc does the same.
3	Save	**Save**	Closes the dialog and saves the design under the name typed. With an empty name nothing is saved.

- The scoreboard (Game page) of the working design is copied to common\vizrt\custom and appears, in green, in the design list of the mode.
- In Advertisement mode the layout of the scoreboard and the banners is saved with it.
- Every "Save Design As" creates a new design; an own design cannot be overwritten. To replace one, save under a new name and delete the old one.
- Only the Game page belongs to a saved design. Changes to the info graphics stay in the working design.
- In Sponsored mode the design is saved as a Standard design, because the Sponsored board uses the Standard scoreboard; it appears in the design list of St and Sp mode.

11.5.3 Chroma Key Designs

In CK mode "Save & Apply" and "Factory Settings" work as in the other modes, but "Save Design As" is not available. The program answers "Sorry, Design Saving Is Not Supported For CK Mode Yet!" and saves nothing. Your changes stay in the working CK design until you activate a Chroma Key design in the design list, which replaces them.

11.6 Factory Settings

There are two ways back to the delivered look.

To put a complete factory design on the board, open the design list, select a factory design and click "Apply" (11.3). This is the direct way for the scoreboard.

To discard the changes of one page, use "Factory Settings" in the design editor:

1. Select the page in the list on the left.
2. Click "Factory Settings". The question names the display mode and the page (for example "Display : St" and "Type : Game") and asks "Factory Settings Will Be Restored. Are You Sure?".
3. Click "Yes".
4. Select an element, for example chronometer, to redraw the board with the restored page.

Page	What Factory Settings does
Game in St or Sp mode	Copies the stored version of the active design over the working design: the factory design, or your own design as you saved it. The factory page template comes back as well. Sponsored mode uses the active Standard design.
Game in Ad mode	As in St, and the layout of the active Advertisement design (side and size of the scoreboard box and of both banners) is applied again. The board looks as it did when the mode was first switched on.
An info graphic (Substitution to Announce)	Replaces the page by the factory version, the same file for St, Sp and Ad mode.
Game or Substitution in CK mode	Replaces the page by the version of the active Chroma Key design.



Figure 165. The Advertisement board of a new installation (left) and after "Factory Settings" on the Game page (right): the scoreboard box has the same look. On the right the clip was stopped.

"Factory Settings" changes the working design only. Your own designs and the factory designs stay as they are. If a file that it needs is missing, the message "File Not Found!" names the file, nothing is changed and the log gets a line. Run Setup again to repair a missing factory file.

11.7 Info Screen Designs

The 15 info screens of chapter 10 have their own design files, one pair (.txt and .xml) per screen:

Where	Used in	Files
common\vizrt\storage\St	St, Sp and Ad mode (full page)	InfoLineup, InfoIntro, InfoScore, InfoFoul, InfoTeamFouls, InfoTimeout, InfoReview, InfoPeriodResult, InfoMatchResult, InfoLeaders, InfoBoxScore, InfoMVP, InfoStandings, InfoResults, InfoOfficials
common\vizrt\storage\CK\ followed by the folder of a Chroma Key design	CK mode (lower third)	The same names with the prefix CK_, in the colours of Navy, Charcoal or Clay

- When a screen is shown for the first time, the program copies its files into the working designs (common\vizrt\current) if they are not there. The board shows the working copy.
- In CK mode the working lower thirds come from the active Chroma Key design. Design [1] has none; then those of Navy are used.
- Activating a Chroma Key design in the design list replaces the working lower thirds with those of the chosen design.
- The design editor does not list the info screens.

11.8 What an Update Does to the Designs

Folder	During an update
Factory designs (common\vizrt\storage)	Replaced by the designs of the new version. Changes made to these files by hand are lost.
Working designs (common\vizrt\current)	Kept. Setup adds files that are missing and never changes a file that exists.
Own designs (common\vizrt\custom)	Kept. Setup does not touch the folder.

- At the next start the program compares the factory list of designs with your list and adds the factory designs that are new, for example the Chroma Key designs Navy, Charcoal and Clay. They appear in the design list, grey and italic. Your entries, their names and their order are not changed.
- The board looks the same as before the update, because the working design is kept. To get a new or changed factory design, select it in the design list and click "Apply".
- Info screen files that are missing in the working designs are copied from the new factory designs the first time the screen is shown.
- An installation of an earlier version kept the list of own designs in the factory folder. Setup copies it to common\vizrt\custom before it replaces the factory folder, so the own designs stay in the design list.

12. Media Player, Sponsors, Camera, Screen Capture and NDI

basketBoard 7 plays clips, pictures and sound files on the board, runs sponsor images on a strip or a banner, and brings live pictures onto the board: a camera, an NDI source of the network or a part of the operator's screen. It can also send the board itself as an NDI stream. This chapter describes all of these functions.

Function	Where you operate it	Where the picture goes
Media player	Media Player in the menu strip	An output window in front of the scoreboard (all display modes)
Media player of the Advertisement board	Ad page, Media Player tab	The media area of the Advertisement board
Media player of the Chroma Key board	CK page, Media Player tab	The whole Chroma Key board, behind the scorebug
Sponsor images	Sp page (Sponsored mode); Banner tab of the Ad page	The strip of the Sponsored board; a banner of the Advertisement board
Camera and NDI source	Camera tab of the Ad page and of the CK page	Media area of the Advertisement board; whole Chroma Key board
Screen capture	Screen Capture tab of the Ad page and of the CK page	The same
NDI output	NDI button of the Game page	NDI receivers on the network

12.1 The Media Player Page

The Media Player page plays video clips, pictures and sound files in a window of its own that covers the scoreboard, for example a sponsor reel before tip-off or a clip during a time-out. It works in every display mode (St, Sp, Ad and CK). Click Media Player in the menu strip of the main window to open the page.

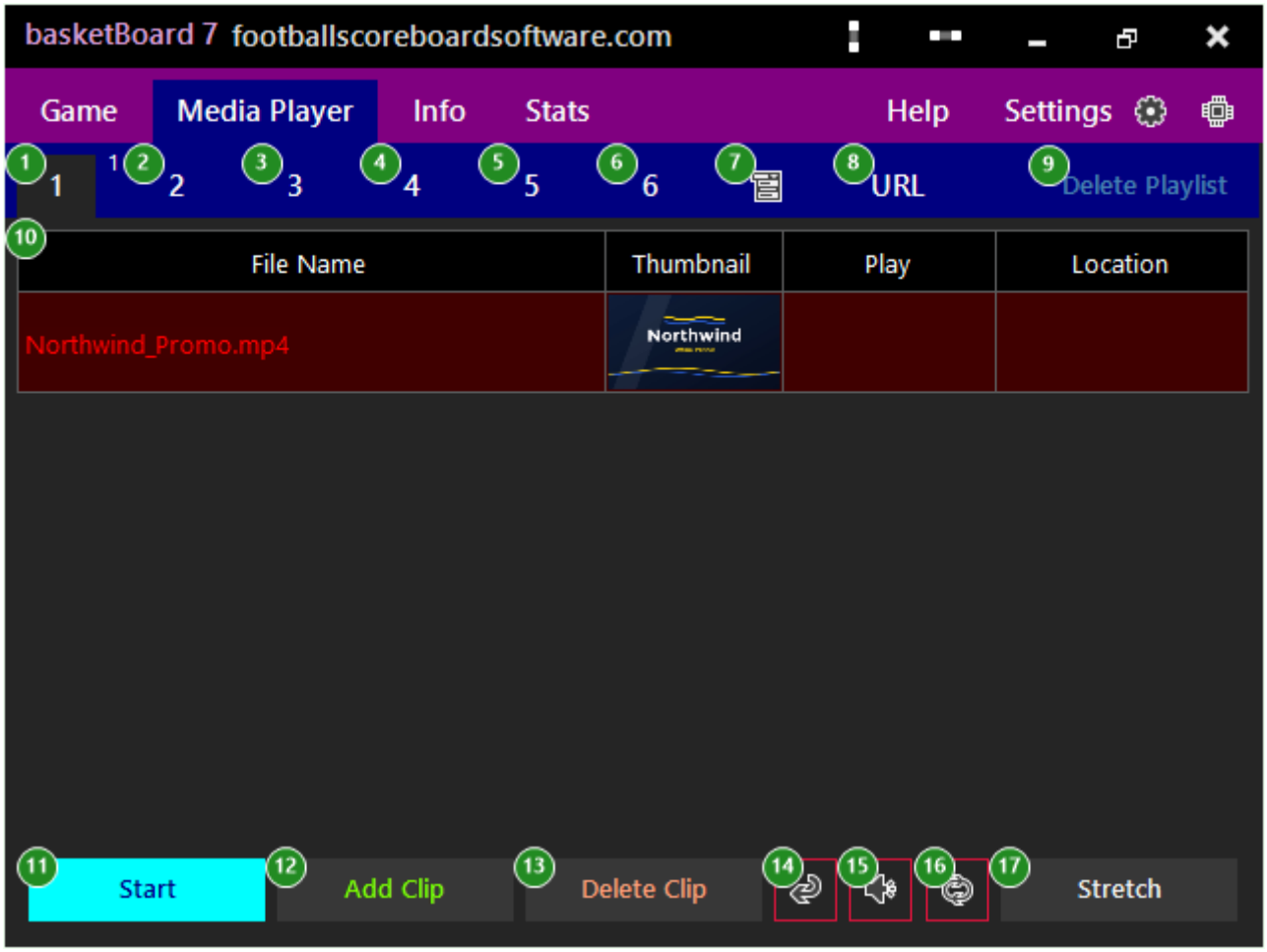
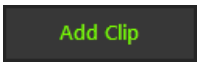
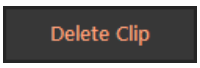
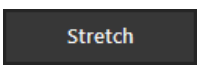


Figure 166. The Media Player page with the demo playlist of a new installation: playlist 1 holds the clip Northwind_Promo.mp4.

No.	Control	Name	What It Does
1	1	**1 (playlist 1)**	Opens playlist 1 and shows its clips. The small number beside the button is the number of clips in the list. Does nothing while a clip or a playlist is playing.
2	2	**2 (playlist 2)**	Opens playlist 2 and shows its clips. The small number beside the button is the number of clips in the list. Does nothing while a clip or a playlist is playing.
3	3	**3 (playlist 3)**	Opens playlist 3 and shows its clips. The small number beside the button is the number of clips in the list. Does nothing while a clip or a playlist is playing.
4	4	**4 (playlist 4)**	Opens playlist 4 and shows its clips. The small number beside the button is the number of clips in the list. Does nothing while a clip or a playlist is playing.
5	5	**5 (playlist 5)**	Opens playlist 5 and shows its clips. The small number beside the button is the number of clips in the list. Does nothing while a clip or a playlist is playing.
6	6	**6 (playlist 6)**	Opens playlist 6 and shows its clips. The small number beside the button is the number of clips in the list. Does nothing while a clip or a playlist is playing.

No.	Control	Name	What It Does
7		**More playlists (list icon)**	Opens a drop-down list with the numbers 7 to 20; choosing a number opens that playlist. These lists have no clip counter and cannot be started from the phone or the API. Does nothing while a clip or a playlist is playing.
8		**URL**	Opens the Web URL page, a list of web addresses that can be loaded onto the board. Does nothing while a clip or a playlist is playing.
9		**Delete Playlist**	Removes all clips from the open playlist without asking and saves the empty list. The files themselves are not deleted. The button is hidden while a clip or a playlist is playing.
10		**Clip list**	Shows the clips of the open playlist: File Name, Thumbnail, Play and Location (the time left while the clip plays). Click a row to select it; drag a row to change the order, which is saved at once. A row whose file is missing has a red thumbnail and no Play button.
11		**Start / Finish**	Starts the playlist with the selected row; the clips then play one after another and the button reads Finish, which ends the playlist. At the end of the last clip the list starts again with the first row, or the scoreboard returns when Return to Scoreboard Screen When Playlist Ends is on. Start switches Auto Repeat off.
12		**Add Clip**	Opens a file dialog for one or more video, sound or picture files and adds them at the end of the open playlist, which is saved at once. The button is hidden while a clip or a playlist is playing.
13		**Delete Clip**	Removes the selected clip from the open playlist and saves the list. The file itself is not deleted. The button is hidden while a clip or a playlist is playing.
14		**Return to Scoreboard Screen When Playlist Ends (arrow)**	Switches the return to the scoreboard on (green frame) or off (red frame). When it is on, the Game page opens and the scoreboard is back on the board after the last clip of a playlist; when it is off, the playlist starts again. It is off at every start of the program.
15		**Sound (speaker)**	Switches the sound of the clips on (green frame) or off (red frame). The setting is saved in start.xml; on a new installation it is off.
16		**Auto Repeat (loop)**	Switches the repeat of a single clip on (green frame) or off (red frame): a clip started with Play then repeats until it is stopped. It is off at every start of the program, and Start switches it off.
17		**Display mode (Stretch)**	Shows the present display mode and opens the list of modes: Center, CoverCenter, Original, SizeToFit, SizeToFitCenter, Stretch, ZoomCenter. The chosen mode fits the clip into the output window at once and is saved in start.xml.

The page has three parts:

- The playlist row at the top: the buttons 1 to 6, the list icon for the playlists 7 to 20, URL and Delete Playlist.

- The clip list in the middle, with the columns "File Name", "Thumbnail", "Play" and "Location".
- The button row at the bottom: Start, Add Clip, Delete Clip, Auto Repeat, Sound, Return to Scoreboard Screen When Playlist Ends and the display mode button (Stretch).

12.2 Playlists

A playlist is a list of files that are played one after another.

- Buttons 1 to 6 open playlists 1 to 6. The small number beside a button is the number of clips in that list; an empty list has no number.
- The button with the list icon opens a drop-down list with the numbers 7 to 20: fourteen more playlists. They have no clip counter and cannot be started from the phone or the API.
- URL opens the Web URL page, a list of web addresses (section 12.9). It is not a playlist of files.
- The open playlist has the dark button. You cannot open another playlist while a clip or a playlist is playing.
- Every playlist is a file of its own in common\data. Every change of a list is saved at once.

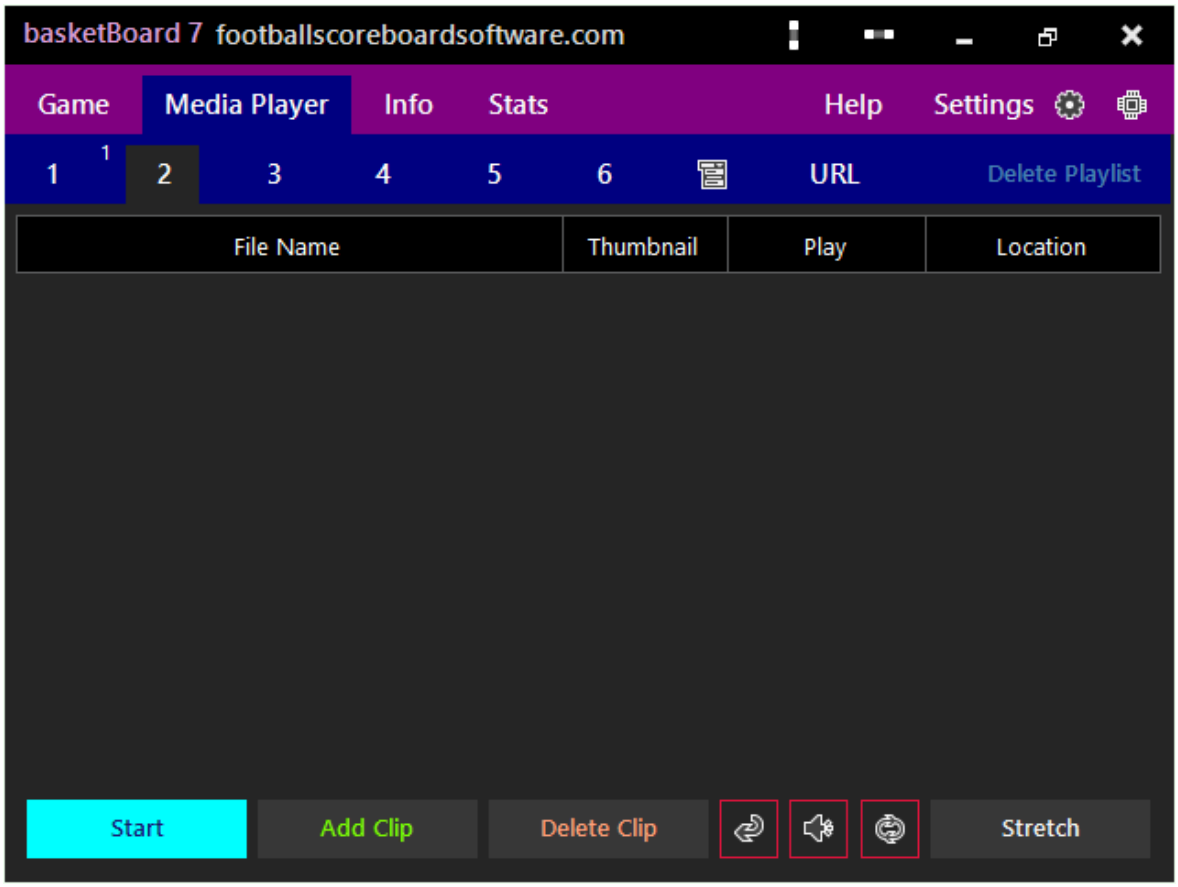


Figure 167. An empty playlist: no clip rows and no number beside its button.

> **Note:** The number of the open playlist is one value for all media players of the program (this page, the player pictures of the Info page, the media players of the Ad and CK pages and the banner playlists). When you have used another media player in between, click the playlist button of this page again before you change a list. Otherwise Add Clip, Delete Clip, Delete Playlist and dragging can write into the list of the number chosen on the other page.
>
> **Note:** A list of the drop-down (7 to 20) cannot be chosen twice in a row. After list 7 and then list 1, choosing 7 again does nothing; choose another number of the drop-down first and then 7.

12.3 Adding, Ordering and Removing Clips

1. Open the playlist with its button.
2. Click Add Clip. The Windows file dialog opens. Choose one or more files (hold Ctrl or Shift to select several) and click Open. The files are added at the end of the list.
3. Drag a row with the mouse to move it to another place.
4. To remove a clip, click its row and click Delete Clip. Delete Playlist removes all clips of the open list without asking.

- The cells of the list cannot be typed in.
- The playlist stores the full path of each file; the files are not copied and stay where they are. A row whose file is missing has a red thumbnail and no Play button, and a running playlist skips it.
- The names of picture files are grey.
- Add Clip, Delete Clip and Delete Playlist are hidden while something plays. Rows cannot be dragged while a single clip plays.
- Delete Clip and Delete Playlist never delete the file itself.

The file dialog of Add Clip offers three filters. "Media files" is chosen when the dialog opens.

Filter	File types
Media files	all types of the two rows below
Video files	3g2, 3gp, 3gp2, 3gpp, asf, avi, hevc, m2ts, m4v, mkv, mov, mp4, mpeg, mpg, mts, vob, webm, wmv; also the sound and other types aac, adts, m4a, mp3, wav, wma, sami, smi, chap
Image files	bmp, gif, jpeg, jpg, png

> **Note:** The filter only decides which files the dialog shows. Whether a file plays depends on the codecs installed in Windows. Test every clip on the board PC before the match.

12.4 Playing a Single Clip

1. Click the row of the clip. A Play button appears in the Play column of the row.
2. Click Play. The clip starts in the output window on the board. The button turns red and shows the stop sign, and a Pause button appears beside it.
3. Click the red button to stop, or the Pause button to hold the picture and to go on.

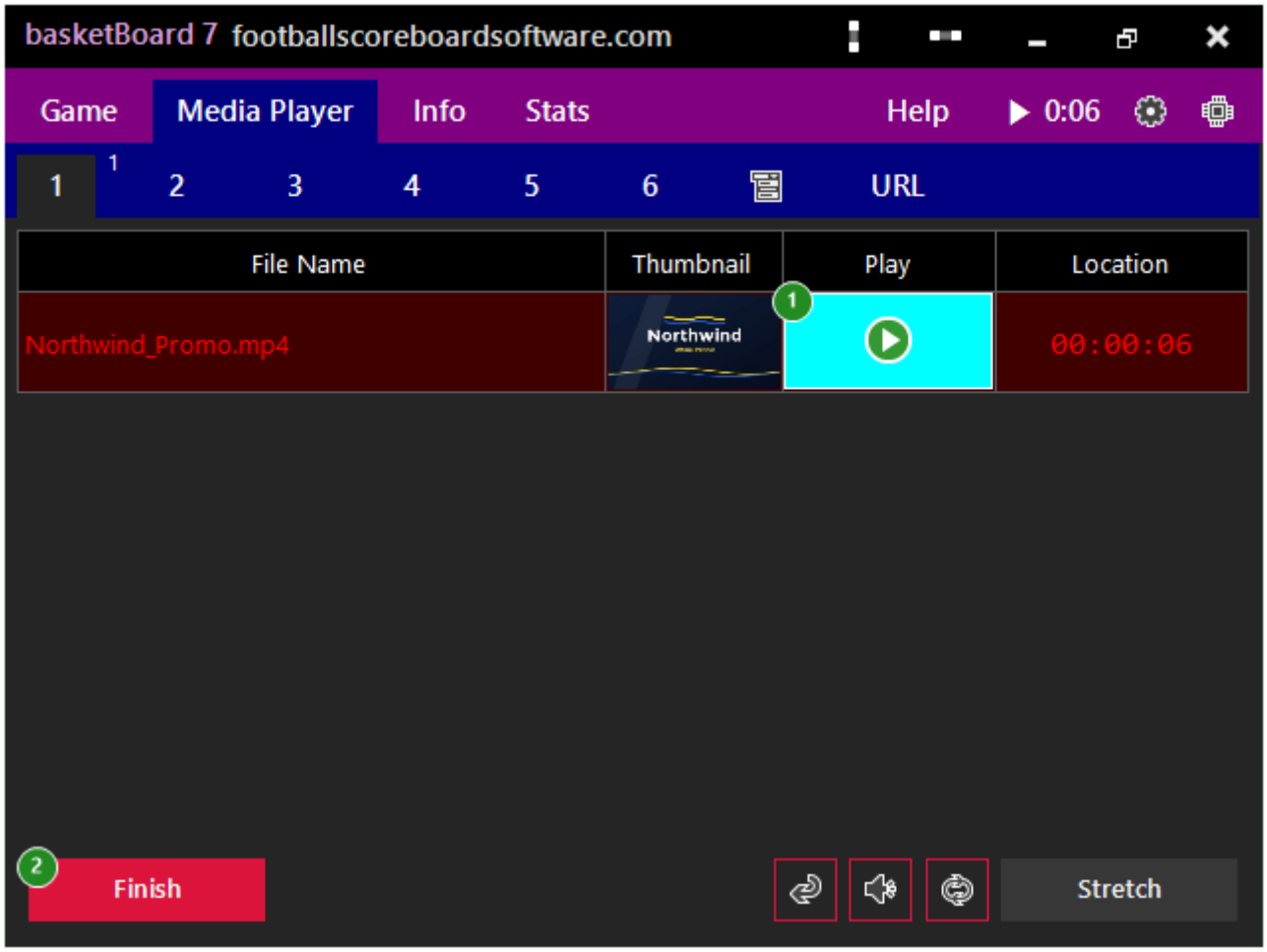


Figure 168. The page while media is playing: the button in the Play column, the remaining time in the Location column, Finish in place of Start.

No.	Control	Name	What It Does
1		**Play / Stop (in the Play column)**	Plays the selected clip in the output window on the board; the button turns red with the stop sign and then stops the clip. It is shown only in a row whose file exists. Clicked while a playlist is running, it ends the playlist and plays the row as a single clip.
2		**Start / Finish**	Starts the playlist with the selected row; the clips then play one after another and the button reads Finish, which ends the playlist. At the end of the last clip the list starts again with the first row, or the scoreboard returns when Return to Scoreboard Screen When Playlist Ends is on. Start switches Auto Repeat off.

- The Location column shows the time left to the end of the clip. The Settings button of the menu strip shows a play sign and the same time until the playback ends.
- While a clip plays, click another row: a second Play button appears in that row. It changes to that clip directly.
- When the clip has ended the player stops. The output window stays in front of the scoreboard and shows the last picture of the clip (section 12.7).
- **Auto Repeat** (the loop button): switch it on (green frame) before you click Play, and the clip is repeated until you stop it. The button is off at every start of the program.

12.5 Running a Playlist

1. Click the row the playlist is to start with.
2. Click Start. The clips play one after another from that row down. The button reads Finish and is red.
3. Click Finish to end the playlist.

Board Output **Control Panel**

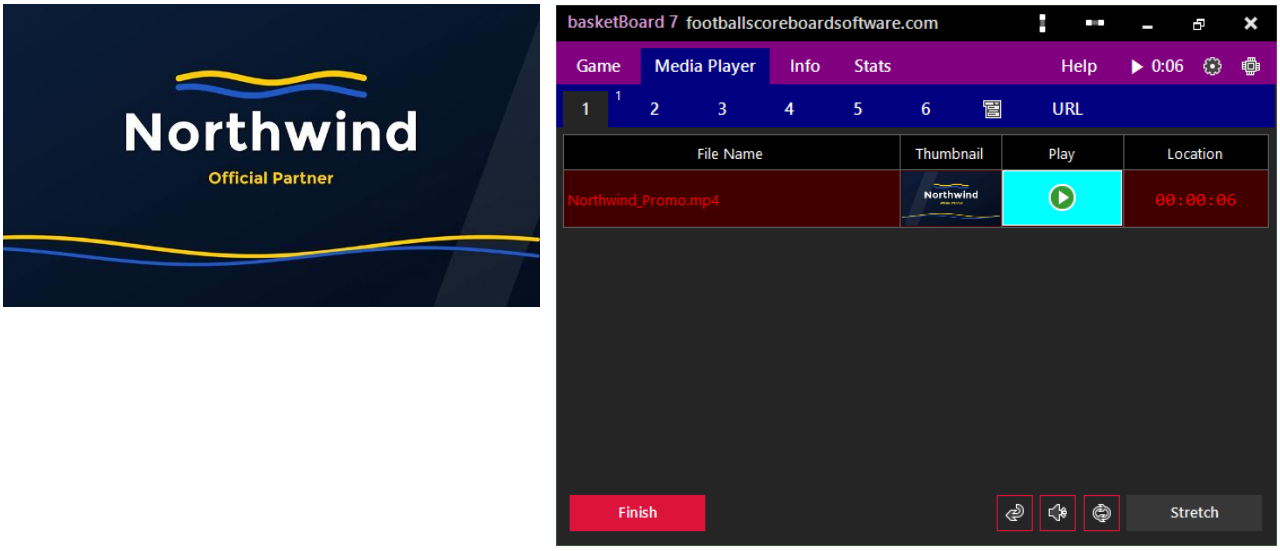


Figure 169. A playlist running: the output window on the board and the Media Player page.

- At the end of the last clip the playlist starts again with the first row and runs until you click Finish.
- **Return to Scoreboard Screen When Playlist Ends** (the arrow button): with the green frame the program opens the Game page at the end of the last clip and the scoreboard is back on the board. The button is off at every start of the program. It is one switch for all media players of the program.
- There is no Next button. The clip that follows is always the row under the selected row: click a row while the playlist runs, and the playlist goes on with the row below it when the present clip ends.
- A click on the Play button of a row ends the playlist and plays that row as a single clip.
- Start switches Auto Repeat off.

12.6 Sound, Display Mode and Picture Duration

- **Sound** (the speaker button): green frame = the sound of the clips is on, red frame = off. On a new installation it is off: switch it on before you play clips with sound. The setting is saved in start.xml. It does not act on the horn and the other sounds of the match.
- **Display mode** (the wide button at the right, "Stretch" on a new installation): click it and choose how a clip is fitted into the output window. The choice acts at once, also on a running clip, and is saved.
- **Picture duration** : a picture of a playlist stays on the board for the time set in Settings > Screen Properties > "Image Play Duration": 1 to 120 seconds, 5 on a new installation. A value outside this range is set back to 5.

The display mode button offers seven modes. Each was measured with a small clip (320 x 240) and a large clip (2560 x 1920) on a 960 x 540 output window.

Display mode	A clip smaller than the output window	A clip larger than the output window
Stretch	Enlarged to the whole window; the proportions of the clip are not kept.	Reduced to the whole window; the proportions are not kept.

Display mode	A clip smaller than the output window	A clip larger than the output window
CoverCenter	Enlarged with the proportions kept until the window is full; what does not fit is cut off at two edges.	Reduced in the same way: the window is full and two edges of the clip are cut off.
ZoomCenter	Enlarged with the proportions kept until it touches two edges of the window; in the middle, the rest of the window is black.	Reduced in the same way: the whole clip is seen, in the middle.
SizeToFitCenter	Original size, in the middle; not enlarged.	Reduced as with ZoomCenter.
SizeToFit	Original size, at the top left; not enlarged.	Reduced until the whole clip is seen, at the top left.
Center	Original size, in the middle.	Original size: only the middle part of the clip is seen.
Original	Original size, at the top left.	Original size: only the top left part of the clip is seen.

The same seven modes are offered by the media players of the Ad and CK pages and by the player pictures of the Info page.

12.7 The Output Window

- The clips play in a separate window without a frame. It has the place and the size of the board (Settings > Screen Properties) and lies in front of the scoreboard. Its background is black.
- The NDI output follows the window while media plays (section 12.18).
- Without a licence the word DEMO is shown in the middle of the window.
- The game clock and the shot clock keep running behind the window.

The window closes and the scoreboard returns:

- when you click Game in the menu strip: this also stops the clip,
- at the end of a playlist, when Return to Scoreboard Screen When Playlist Ends is on,
- when you show an info screen or a table of the Stats page: the playback stops and the graphic takes the board,
- when the BOARD button of the remote page is tapped.

Stop, Finish and the end of a single clip leave the window in front of the scoreboard:

- A single clip that ends by itself leaves its last picture in the window. The picture stays until you play something else or click Game.
- After Stop (the red button) and after Finish the window is black.

12.8 The Demo Clip

A new installation has one clip in playlist 1 of each media player: media\videos\Northwind_Promo.mp4, a fictional sponsor reel. It lets you try the media functions before you add your own clips.

Media player	Playlist file	Where the clip plays
Media Player page (St and Sp)	common\data\playList_0.xml	The output window in front of the board
Ad page, Media Player tab	common\data\playListAd_0.xml	The media area beside the scoreboard box

Media player	Playlist file	Where the clip plays
CK page, Media Player tab	common\data\playListCK_0.xml	The whole Chroma Key board, behind the scorebug

To play it:

1. Open the media player of the mode (Media Player in the menu strip, or the Media Player tab of the Ad or CK page).
2. Click 1, click the row Northwind_Promo.mp4 and click Start.
3. Click Finish to end it.



Figure 170. The demo clip on the board: in Standard mode (output window), in the media area of the Advertisement board, and behind the scorebug of the Chroma Key board.

- In Sponsored mode the clip plays in the same output window as in Standard mode and covers the strip.
- The clip was tested in all four modes, on a new installation and after a restart of the program.
- The playlists name the clip with its full path in the program folder C:\basketBoard7. Replace or delete the row when you build your own lists; the file itself stays in media\videos.
- An update installation keeps the playlists you have changed.

12.9 Web Videos

The URL button opens the Web URL page, a list of web addresses. A page of the list can be loaded onto the board, for example a video of a video site. The board PC needs an internet connection.

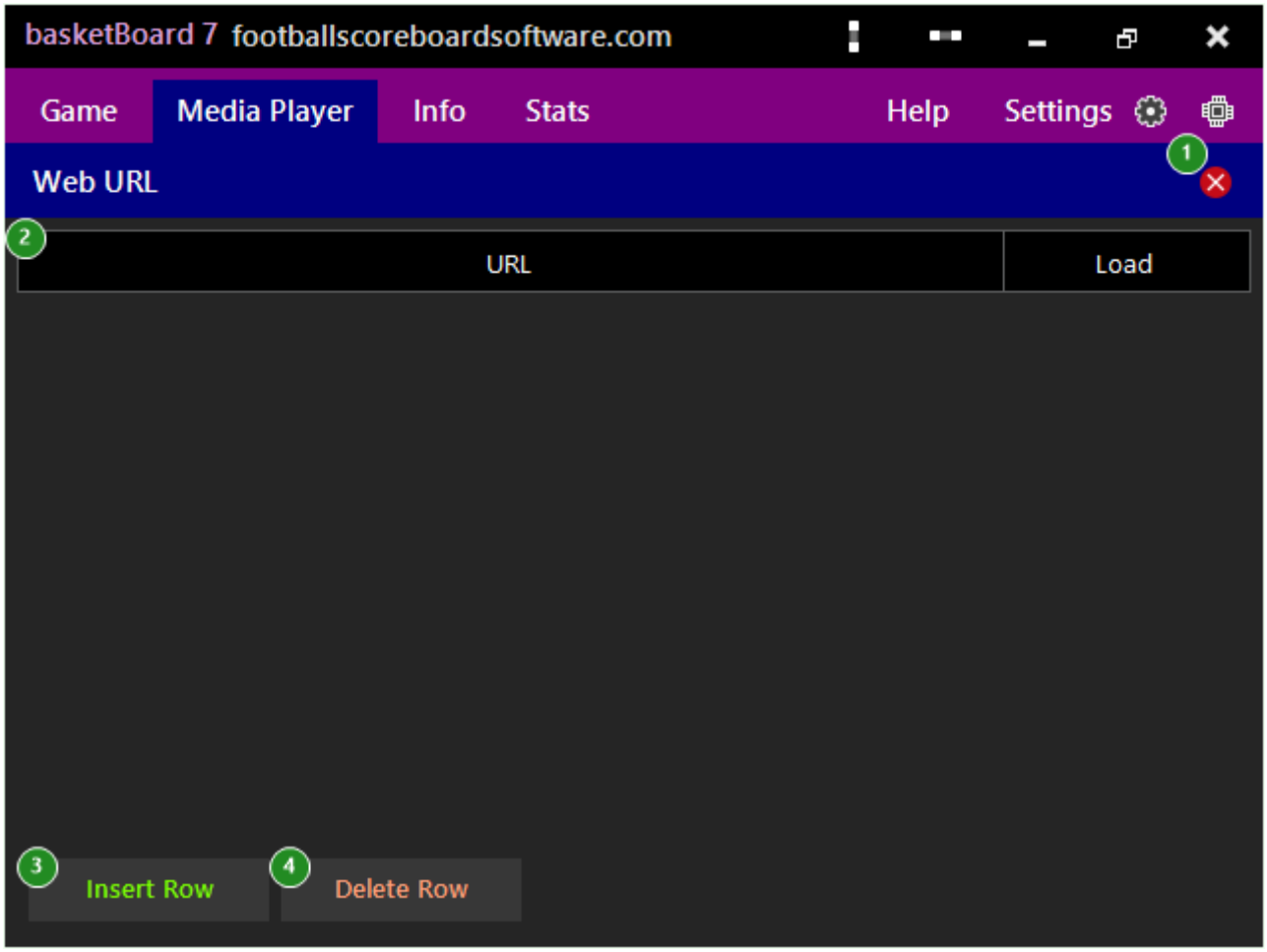
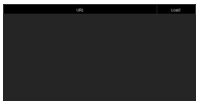
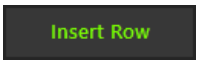
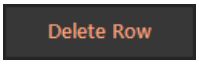


Figure 171. The Web URL page. On a new installation the list is empty.

No.	Control	Name	What It Does
1		**Close (red cross)**	Closes the Web URL page and returns to the Media Player page; Esc does the same. A web page that was loaded stays on the board.
2		**URL list**	Holds one web address per row in the URL column. Type in a cell or press F2 to edit it; every finished entry saves the list (common\data\playList_url.xml). The Load button appears in the Load column of the selected row.
3		**Insert Row**	Inserts an empty row above the row of the selected cell, or at the end when the list is empty, for a new web address. The list is written to its file only when a cell entry is finished or Load is clicked.
4		**Delete Row**	Deletes the row of the selected cell without asking. The list is not saved by this button: the address is back after a restart unless a cell entry was finished or Load was clicked afterwards.

1. Click URL on the Media Player page.
2. Click Insert Row and type or paste the address in the URL column. Press Enter.
3. Click a cell of the row. The Load button moves into the Load column of that row. If it does not appear, click a cell of another row and then the row again.

4. Click Load. The board shows the web page in front of the scoreboard.
5. Click Game in the menu strip to take the page off the board.

- The board window shows the page as a web browser does. You can work in the page with the mouse on the board window.
- The speaker button of the Media Player page does not act on a web page.
- A web page stays loaded behind a clip that you start afterwards. Click Game first when the page plays sound.
- The red cross at the top right, or Esc, closes the Web URL page and returns to the Media Player page. The web page stays on the board.
- The list is saved in common\data\playList_url.xml when a cell entry is finished and when you click Load.
- The keyboard shortcuts of the control panel do nothing while a cell of the list is being edited.

> **Note:** Delete Row and Insert Row do not save the list by themselves. A deleted address is back after the next start unless a cell entry was finished or Load was clicked afterwards. Load on a new row whose URL cell was never filled loads nothing.

12.10 Starting a Playlist from the Phone or the API

A playlist can be started without touching the PC:

- The MORE tab of the remote page has a MEDIA card with the playlist numbers 1 to 6 and the buttons START PLAYLIST and START AD (chapter 13).
- The HTTP command start_playlist with the playlist number as value does the same as START PLAYLIST; start_playlist_ad_screen does the same as START AD.

start_playlist opens the Media Player page, opens the playlist and starts it. Sent while a playlist is running, it ends that playlist instead, like a click on Finish. Sound, display mode and the Return switch are used as they are set on the page. Only the playlists 1 to 6 can be started this way; any other value starts playlist 1.

start_playlist_ad_screen switches the board to Advertisement mode, opens the Media Player tab of the Ad page and starts the playlist with the given number in the media area.

12.11 The Media Player of the Advertisement Board

In Advertisement mode the board has a media area beside the scoreboard box. The Media Player tab of the Ad page plays clips and pictures in this area; the scoreboard stays visible. Click Ad in the menu strip and then Media Player.

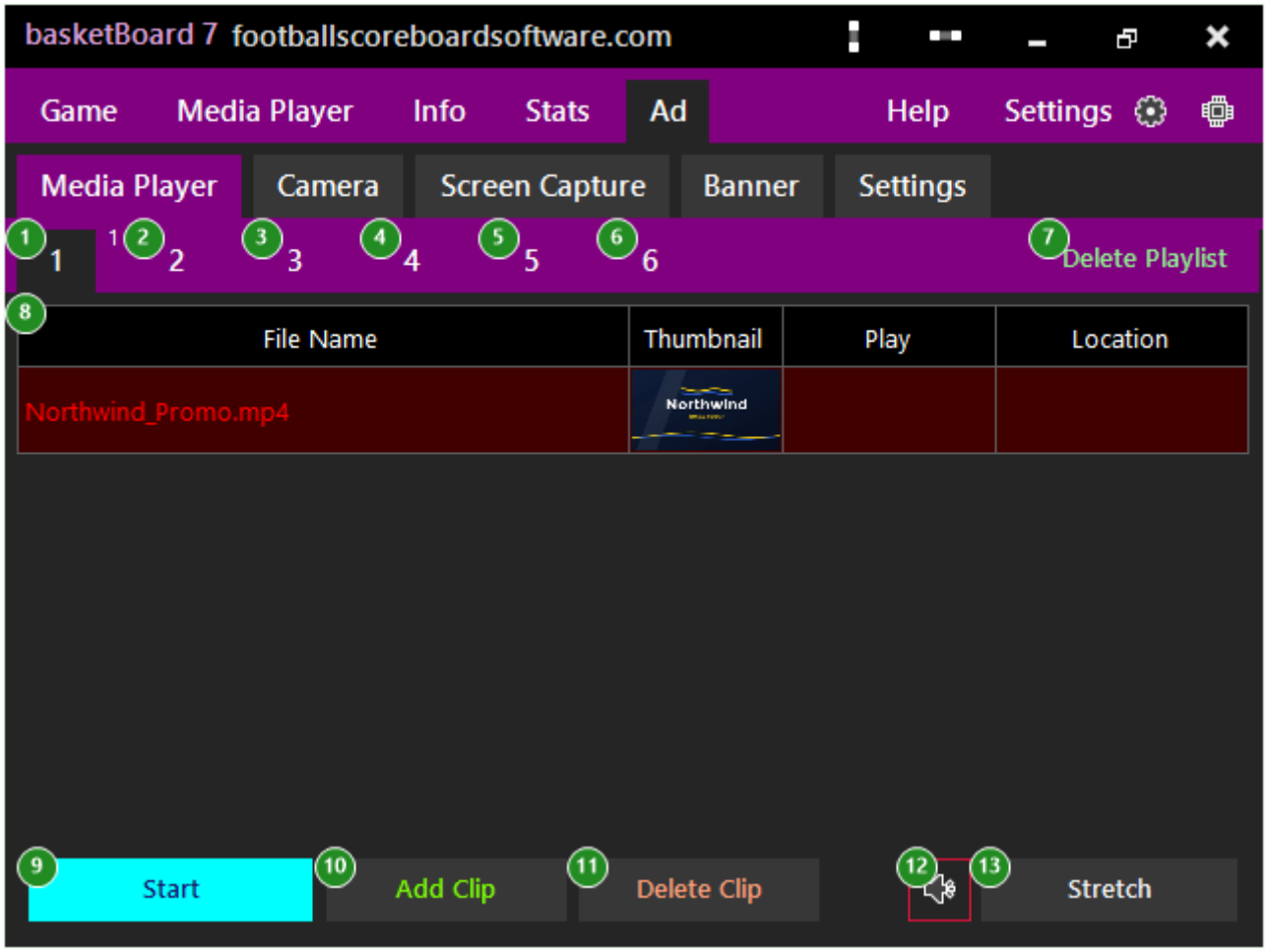
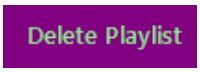
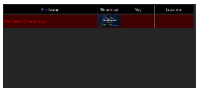
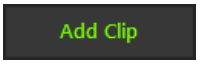
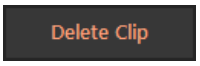


Figure 172. The Media Player tab of the Ad page with the demo clip in playlist 1.

No.	Control	Name	What It Does
1	1	1	Selects playlist 1 of the media area and loads its clips. The small number beside the button is the number of clips. Does nothing while a clip or a playlist plays.
2	2	2	Selects playlist 2 of the media area and loads its clips. The small number beside the button is the number of clips. Does nothing while a clip or a playlist plays.
3	3	3	Selects playlist 3 of the media area and loads its clips. The small number beside the button is the number of clips. Does nothing while a clip or a playlist plays.
4	4	4	Selects playlist 4 of the media area and loads its clips. The small number beside the button is the number of clips. Does nothing while a clip or a playlist plays.
5	5	5	Selects playlist 5 of the media area and loads its clips. The small number beside the button is the number of clips. Does nothing while a clip or a playlist plays.
6	6	6	Selects playlist 6 of the media area and loads its clips. The small number beside the button is the number of clips. Does nothing while a clip or a playlist plays.

No.	Control	Name	What It Does
7		**Delete Playlist**	Removes all clips from the selected playlist and saves the empty list, without a question. The files themselves are not deleted. Hidden while something plays.
8		**Playlist**	Lists the clips of the selected playlist with file name and thumbnail. Click a row to select it; a Play button appears in its Play column. The Location column shows the time left of the clip that plays. A row whose file is missing gets a red selection and no Play button.
9		**Start / Finish**	Plays the playlist in the media area from the selected row on and stops the camera and the screen capture. The button reads Finish while the list runs; after the last clip the list begins again, and a missing file is skipped. Finish ends the list and empties the media area.
10		**Add Clip**	Opens the file dialog for one or more videos, sound files or images and adds them at the end of the selected playlist. The list is saved at once with the full path of each file. Hidden while something plays.
11		**Delete Clip**	Removes the selected row from the playlist and saves the list. The file itself is not deleted. Hidden while something plays.
12		**Sound on / off (speaker)**	Switches the sound of the clips on (green frame) or off (red frame) and saves the choice in start.xml. The sound is off in a new installation.
13		**Display mode (Stretch)**	Opens the list of display modes for the media area: Center, CoverCenter, Original, SizeToFit, SizeToFitCenter, Stretch, ZoomCenter. The choice is saved, shown on the button and applied to the clip that plays.

The tab has its own six playlists. Building a list works as on the Media Player page: Add Clip, Delete Clip and Delete Playlist.

1. Click a row. A Play button appears in its Play column.
2. Click Play to play this clip once; the button reads Stop while it plays. Or click Start to play the list from the selected row on. Start reads Finish while the list runs; after the last clip the list begins again with the first one.
3. Click Finish (or Stop) to end. The media area becomes empty.

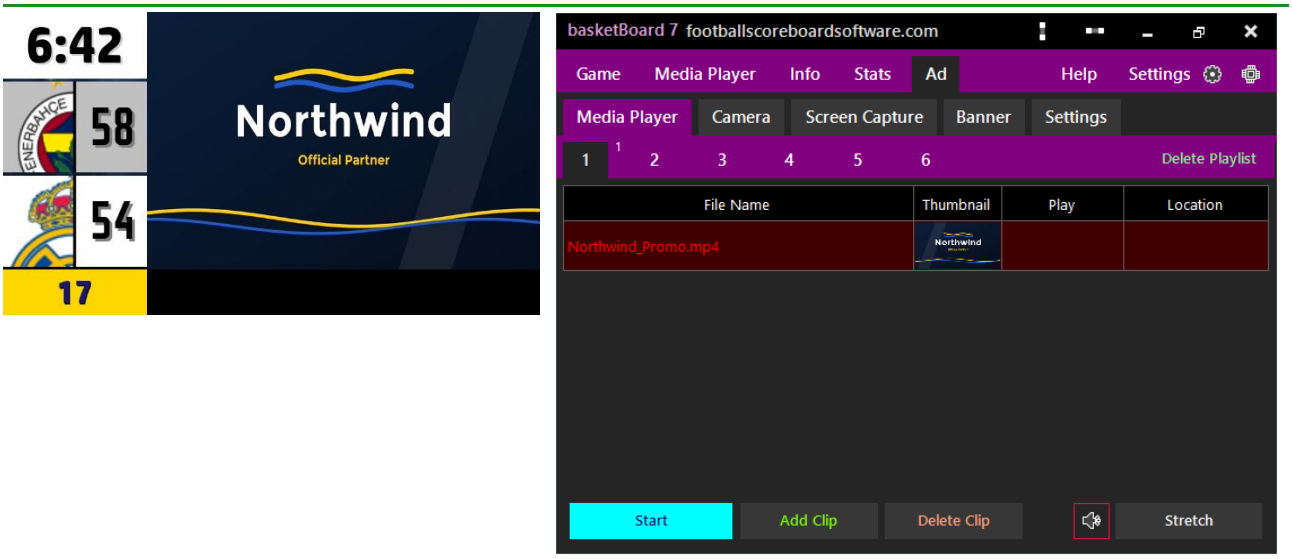


Figure 173. A clip of playlist 1 in the media area of the Advertisement board.

- Only one source feeds the media area at a time. Starting a clip or a playlist stops the camera and the screen capture of the Ad page.
- While a source is on the board, the caption of its tab and the Ad button of the menu strip blink.
- The speaker button and the display mode button work as on the Media Player page. The tab has no Auto Repeat and no Return button.
- A picture of a playlist stays on the board for 5 seconds. This cannot be changed; "Image Play Duration" of the Screen Properties acts on the Media Player page only.
- Switching to St, Sp or CK stops the playlist. A playlist is not started again by itself after a restart.
- The playlists are saved in common\data\playListAd_0.xml to playListAd_5.xml.

12.12 The Media Player of the Chroma Key Board

The Media Player tab of the CK page plays clips on the Chroma Key board. A clip fills the board in place of the key colour; the scorebug stays in front of it. Click CK in the menu strip and then Media Player.

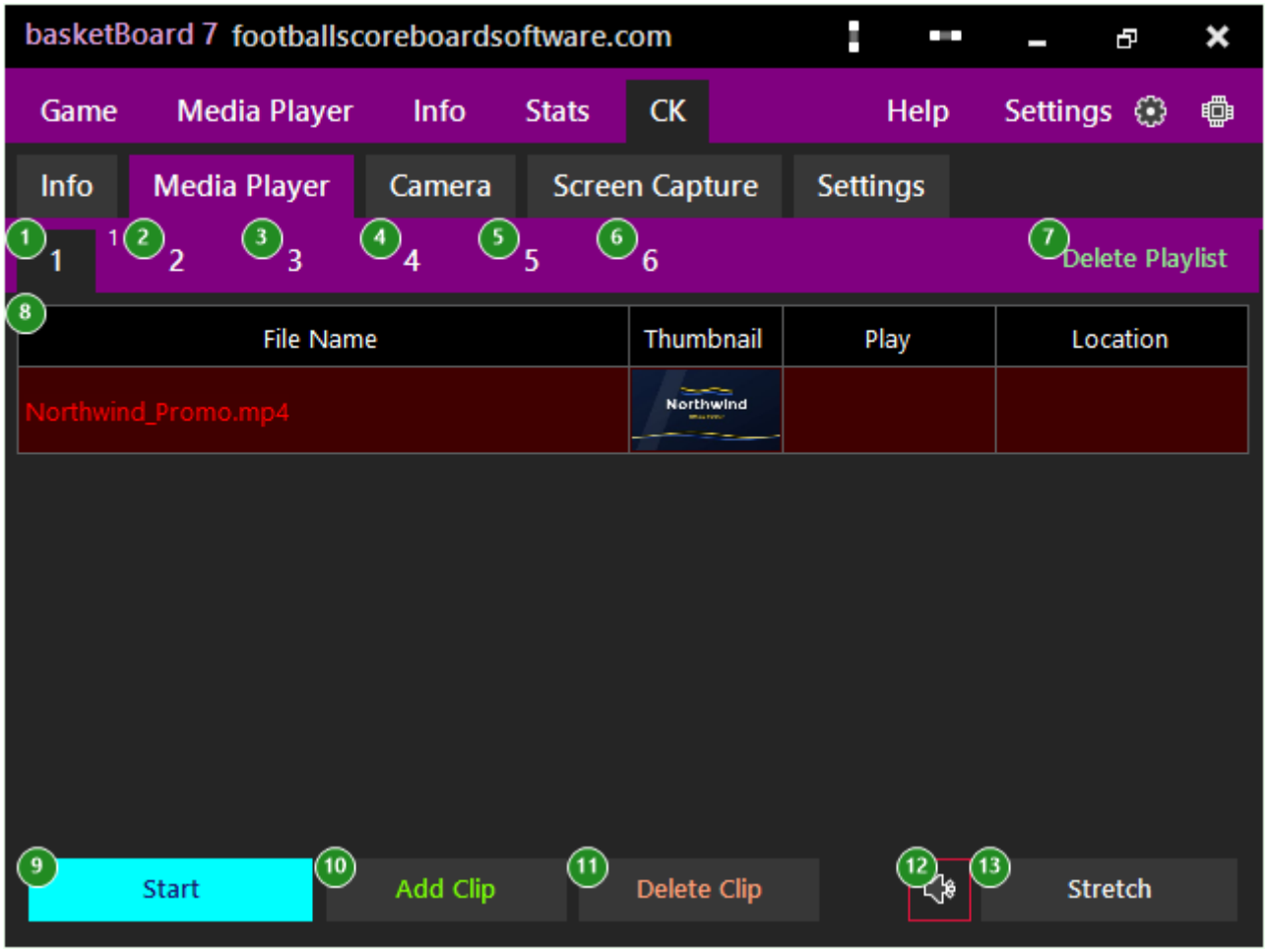
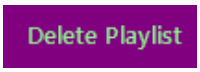
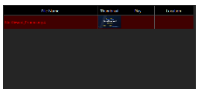
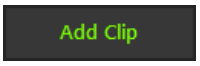
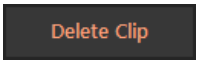


Figure 174. The Media Player tab of the CK page with the demo clip in playlist 1.

No.	Control	Name	What It Does
1	1	1	Selects playlist 1 and shows its clips in the list. The small number above the button is the number of clips in the playlist. The button does not react while a clip or a playlist plays.
2	2	2	Selects playlist 2 and shows its clips in the list. The small number above the button is the number of clips in the playlist. The button does not react while a clip or a playlist plays.
3	3	3	Selects playlist 3 and shows its clips in the list. The small number above the button is the number of clips in the playlist. The button does not react while a clip or a playlist plays.
4	4	4	Selects playlist 4 and shows its clips in the list. The small number above the button is the number of clips in the playlist. The button does not react while a clip or a playlist plays.
5	5	5	Selects playlist 5 and shows its clips in the list. The small number above the button is the number of clips in the playlist. The button does not react while a clip or a playlist plays.
6	6	6	Selects playlist 6 and shows its clips in the list. The small number above the button is the number of clips in the playlist. The button does not react while a clip or a playlist plays.

No.	Control	Name	What It Does
7		**Delete Playlist**	Removes all clips from the selected playlist at once, without a question, and saves the empty playlist. The files themselves are not deleted. The button is hidden while a clip or a playlist plays.
8		**Clip list**	Shows the clips of the selected playlist: File Name, Thumbnail, Play and Location (the time left of the running clip). Click a row to select it; a Play button then appears in its Play column. Drag a row to change the order; the new order is saved with the next Add Clip or Delete Clip. A selected row whose file no longer exists is white on red.
9		**Start**	Stops the camera and the screen capture of the CK page and plays the playlist on the Chroma Key board, from the selected row to the last clip and then again from the first. The button is red and reads Finish while the playlist runs; click it to stop and to return to the key colour. A clip whose file is missing is skipped. Nothing plays if no row with an existing file is selected.
10		**Add Clip**	Opens a file dialog (video, audio and picture files; several files can be selected) and adds the files to the end of the selected playlist. The playlist is saved at once in common\data\playListCK_n.xml. The button is hidden while a clip or a playlist plays.
11		**Delete Clip**	Removes the selected row from the playlist and saves the playlist. The file itself is not deleted. The button is hidden while a clip or a playlist plays.
12		**Sound on/off (speaker)**	Switches the sound of the clips on (green border) or off (red border) and saves the choice in start.xml (MEDIAPLAYER/Volume). On a new installation the sound is off.
13		**Scaling mode (Stretch)**	Opens the list of scaling modes: Center, CoverCenter, Original, SizeToFit, SizeToFitCenter, Stretch, ZoomCenter. The button shows the selected mode. The mode is applied to the player at once and saved in start.xml (CK/DisplayMode) and configCK.xml; the camera, the NDI source and the screen capture of the CK page use it the next time they are started.

- The tab has its own six playlists, separate from the playlists of the Media Player page. The small number above a button is the number of clips.
- Add Clip, Delete Clip, Delete Playlist, Play, Start / Finish, the speaker button and the display mode button work as on the Ad page.
- The display mode of this tab is also used by the camera, the NDI source and the screen capture of the CK page the next time they are started.
- Starting a clip stops the camera and the screen capture of the CK page. Stop or Finish returns the board to the key colour.
- A picture of a playlist stays for 5 seconds, as on the Ad page.
- The playlists are saved in common\data\playListCK_0.xml to playListCK_5.xml.

> **Note:** The order of the rows after dragging is not saved at once on this tab. It is saved with the next Add Clip or Delete Clip in that playlist; if you change the playlist or close the program before that, the old order returns.

> **Note:** When a single clip that was started with Play ends by itself, the caption of the Media Player tab and the CK button keep blinking although nothing plays. Click Play and Stop once to end the blinking.

12.13 Sponsor Images

The sponsor images are one list for the whole program. It is filled on the "Sponsors" tab of the Info page and used in three places:

- the strip of the Sponsored board (Sp page, Sponsors tab), as an endless row of images,
- the banners of the Advertisement board (Ad page, Banner tab, Sponsors), in the same way,
- the sponsor pictures of the info graphics (chapter 10).

12.13.1 The Sponsor List

1. Open the list: the picture button of the Sponsors tab of the Sp page, or the "Sponsors" tab of the Info page.
2. Click Insert Row. The Windows file dialog opens with the image types bmp, gif, jpeg, jpg and png. Choose one or more images.
3. Drag a row with the mouse to change the order. Delete Row removes the selected image, the brush icon removes all images.

- Every change is saved at once in common\data\sponsors.xml. The image files are not copied; the list stores their full paths.
- On a new installation the list holds five fictional logos, media\images\sponsors\sponsor_01.png to sponsor_05.png. The folder holds a sixth logo, sponsor_06.png, that you can add.

12.13.2 The Sponsor Strip of the Sponsored Board

In Sponsored mode a strip below or above the scoreboard shows the sponsor images as an endless row that moves across the board.

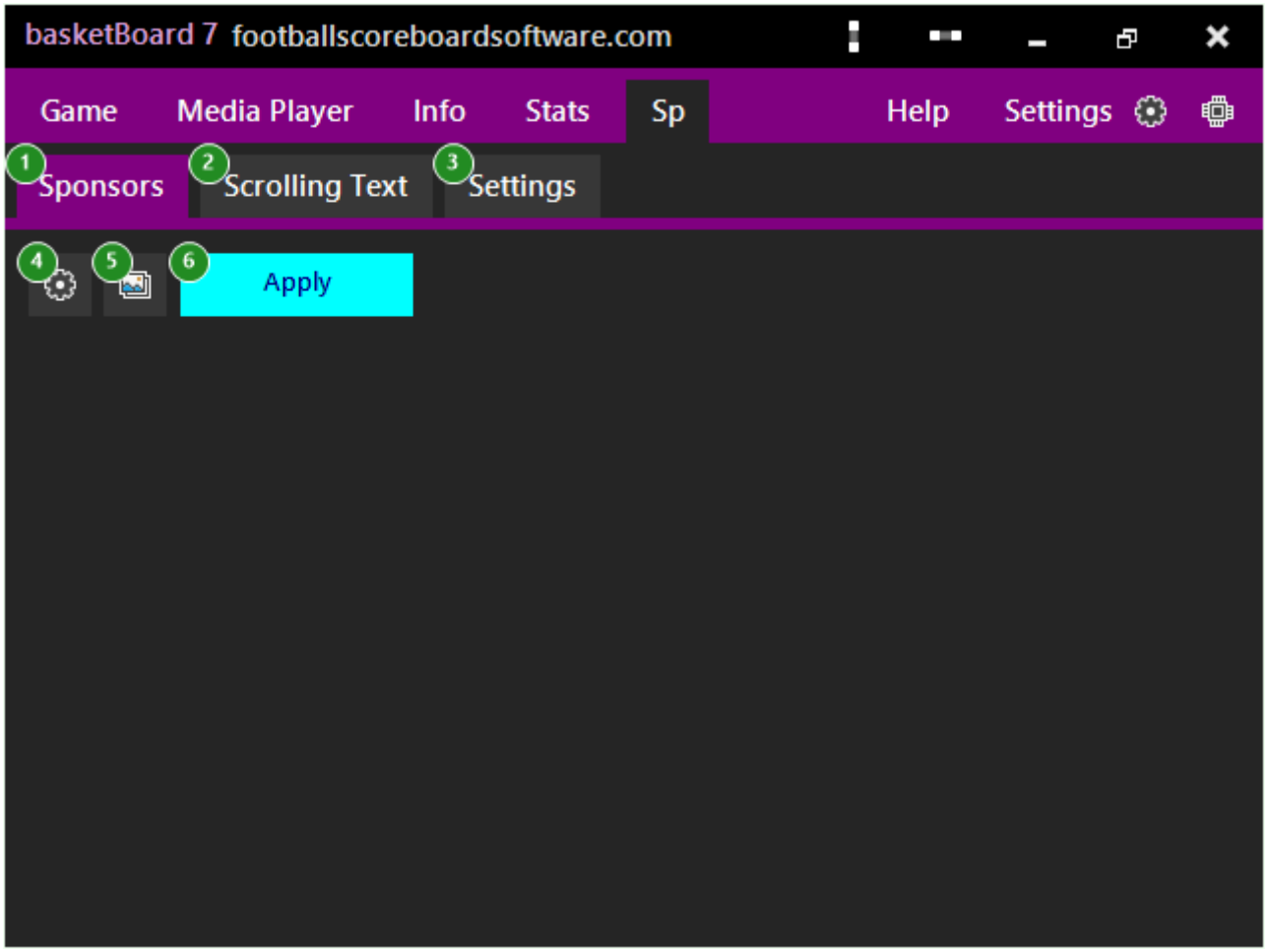


Figure 175. The Sponsors tab of the Sp page.

No.	Control	Name	What It Does
1	Sponsors	**Sponsors**	Opens the Sponsors tab of the Sponsored page: the sponsor images that run on the strip of the board.
2	Scrolling Text	**Scrolling Text**	Opens the Scrolling Text tab with its four text slots. The tab always opens on slot 1 and puts the cursor at the end of the text.
3	Settings	**Settings**	Opens the Settings tab and loads the saved location and height of the strip from start.xml.
4		**Style (gear)**	Opens or closes the style panel of the sponsor images (image-height, padding, top, speed, direction).
5		**Sponsor list (picture)**	Opens the sponsor list of the Info page, where the sponsor images are added, removed and sorted. Click Sp in the menu strip to come back.
6	Apply	**Apply**	Builds the endless row of sponsor images from the sponsor list and the values that stand in the style panel, saved or not, and shows it on the strip of the board. The background is the first colour square of the scrolling text style. Saves Slide as the content of the strip in start.xml, so the images return after a restart, and closes the style panel.

1. Switch to Sponsored mode (Sp on the control panel) and click Sp in the menu strip.
2. Click the picture button and fill the sponsor list. Click Sp in the menu strip to return.
3. Click Apply. The images run on the strip.



Figure 176. The Sponsored board with the sponsor images on the strip.

Click Apply again after you changed the sponsor list or the style; the strip is not rebuilt by itself. After a restart the strip shows again what was applied last.

The gear button opens the style panel of the slideshow. Click a value, type the new value and press Enter.

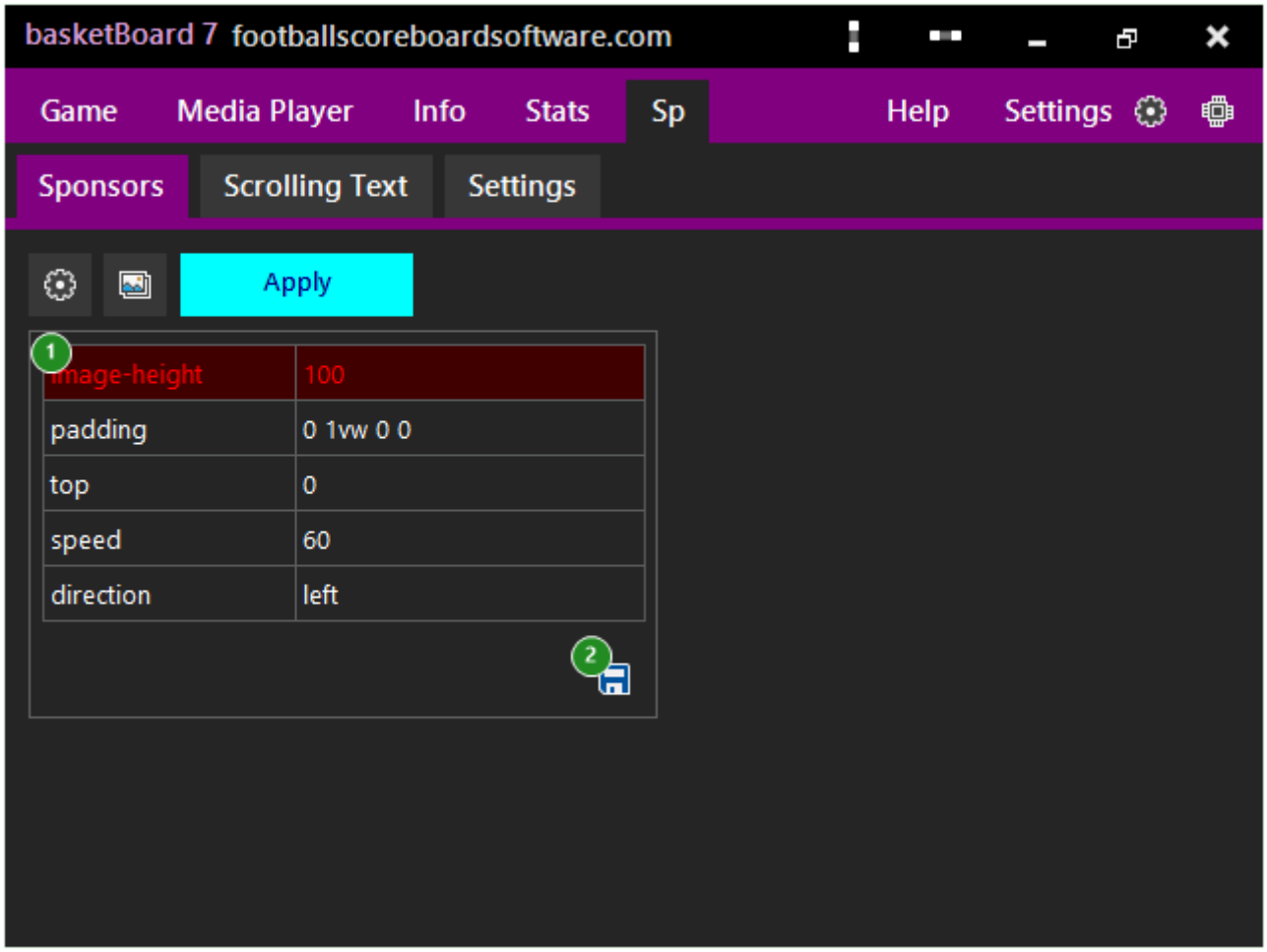
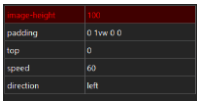


Figure 177. The style panel of the sponsor images.

No.	Control	Name	What It Does
1		**Style table of the images**	Shows the style of the sponsor images: image-height, padding, top, speed (pixels per second) and direction (left or right). Click a value and type; a number without a unit is a percentage of the strip height. The values are used by Apply and saved by the disk button.
2		**Save (disk)**	Saves the style table of the sponsor images to configSp.xml (ScrollImgStyle) and closes the panel. The board changes only with Apply.

Row	Factory value	Meaning
image-height	100	Height of the images. A number without a unit is a percentage of the strip height: 100 fills the strip.
padding	0 1vw 0 0	Free space around each image in the order top, right, bottom, left. 1vw is 1 % of the board width.
top	0	Moves the row of images down (positive number) or up (negative number), in percent of the strip height.
speed	60	Speed of the movement in pixels per second.

Row	Factory value	Meaning
direction	left	left or right: the direction in which the images move.

- A value with a unit (px, %, vh, vw) is used as typed.
- Apply uses the values as they stand in the table, saved or not. The disk button saves the table to configSp.xml and closes the panel.
- The background colour behind the images is the first colour square of the scrolling text style of the Sp page.
- The scrolling text, the location and the height of the strip are described with the Sponsored mode in chapter 9.

12.13.3 Sponsor Images in a Banner of the Advertisement Board

The Banner tab of the Ad page has the same Sponsors tab for each of the two banners: the picture button, the gear button with the same style rows, and Apply. A number without a unit is then a percentage of the banner height. A banner can also show a scrolling text or a playlist of its own (Multimedia tab, without sound; a picture stays 5 seconds); see chapter 9 for the banner layout.

12.14 Player Pictures

The buttons Show Pictures (Home Team) and Show Pictures (Guest Team) of the Info page open a picture show of the players of one team: Starting 5, Substitutes and Trainer. It works like a media player with Play, Start / Finish, Return to Scoreboard Screen When Playlist Ends and the display mode button, and it uses the output window of the Media Player page. The page is described in chapter 10.

12.15 Camera

The Camera tab of the Ad page and of the CK page brings a live picture from a camera or a video capture device of this PC onto the board: into the media area of the Advertisement board, or onto the whole Chroma Key board behind the scorebug. The two buttons at the top left choose the kind of source: Camera or NDI (section 12.16).

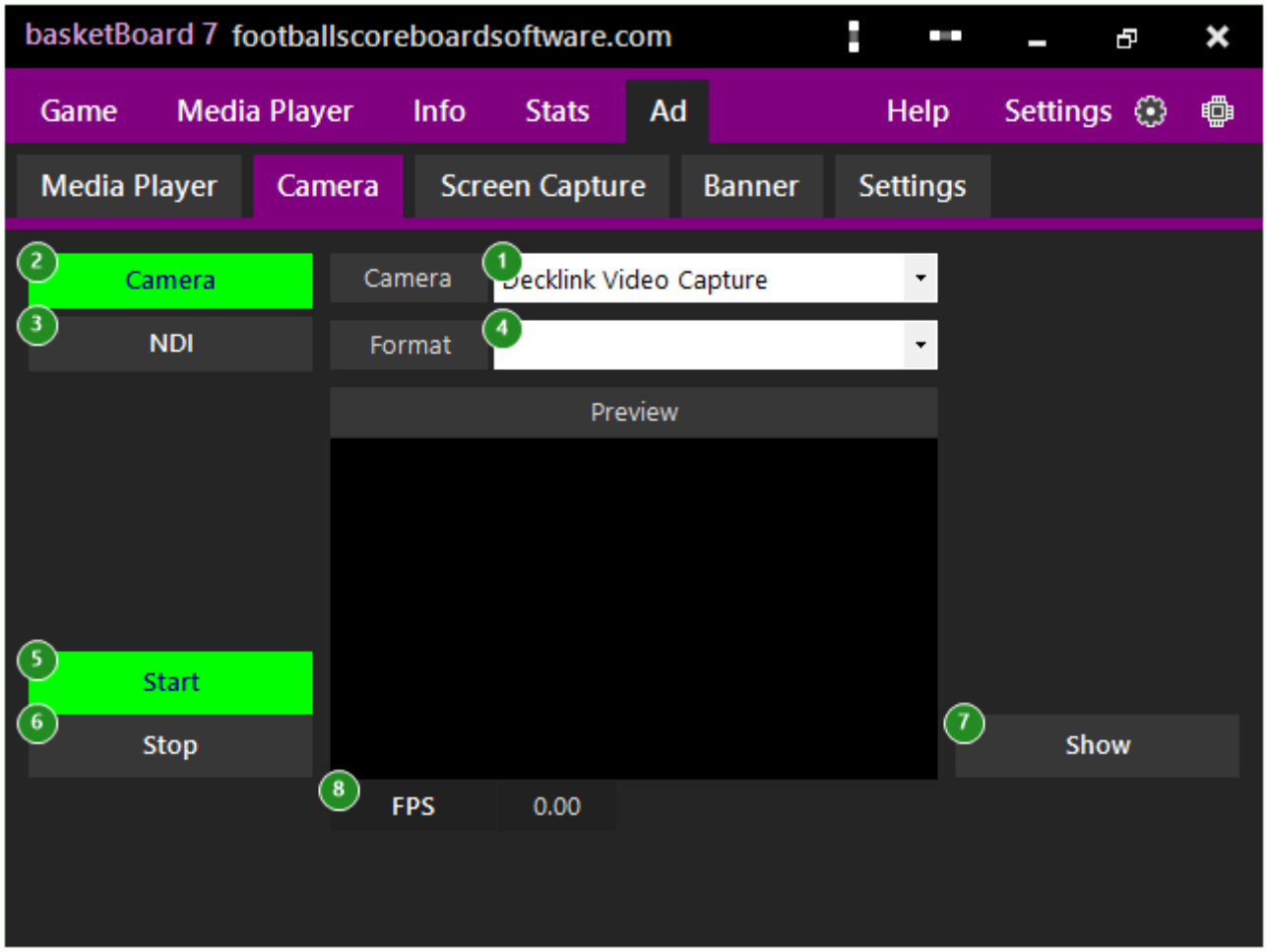


Figure 178. The Camera tab of the Ad page with the source Camera. The device in the list is a video capture device of the PC on which the pictures were made; it offered no format at that moment.

No.	Control	Name	What It Does
1	Decklink Video Capture	**Camera list**	Lists the video devices Windows knows; the first one is preselected. The list is read again every time the Camera tab is opened and after a camera stopped by itself. Choosing a device fills the Format list.
2	Camera	**Camera**	Selects a camera or video capture device of this PC as the source and shows the Camera and Format lists. A source that already runs is not stopped by the change.
3	NDI	**NDI**	Selects an NDI source of the network as the source and shows the NDI list. The first time, the network is searched for about two seconds. A source that already runs is not stopped by the change.
4		**Format list**	Lists the resolutions and frame rates the chosen device offers. The chosen format is used by Start. The list is empty when the device offers none, for example a video capture device without a signal.
5	Start	**Start**	Starts the chosen camera with the chosen format, or connects the chosen NDI source, and shows the picture in the Preview box. The three buttons are hidden for about two seconds. Without a camera and format, or without a valid NDI source, a message appears and nothing starts. Use Show to bring the picture to the board.

No.	Control	Name	What It Does
6	Stop	**Stop**	Stops the camera and the NDI source, whichever runs, empties the Preview box and the media area of the board and ends the blinking of the Camera tab.
7	Show	**Show**	Sends the running camera or NDI picture to the media area of the board and stops the playlist and the screen capture. Saves the source in start.xml as the one used last. Light blue while a source runs.
8	FPS	**FPS**	Shows the frame rate received at that moment in the field beside the button. The figure is approximate.

1. Click Camera at the top left (green when selected).
2. Choose the device in the Camera list and a resolution and frame rate in the Format list, for example 1920x1080 @ 30fps.
3. Click Start. The three buttons are hidden for about two seconds while the device starts; then the picture runs in the Preview box, Start is grey, Stop is red and Show is light blue.
4. Click Show. The playlist and the screen capture of the page are stopped and the camera picture moves to the board.
5. Click Stop to switch the camera off. The board area and the preview become empty, and the device is free for other programs again.

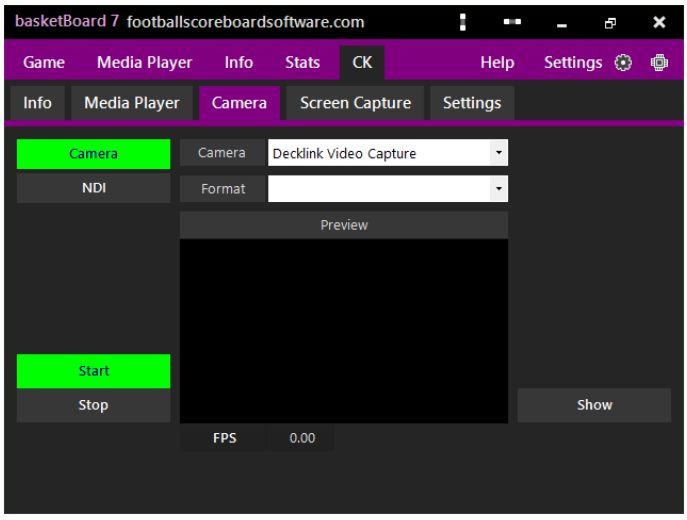


Figure 179. The Camera tab of the CK page. It works in the same way; the picture goes to the whole Chroma Key board.

- The Camera list holds every video input device Windows knows: webcams, video capture devices and virtual cameras of other programs. A capture device is listed also when it has no signal.
- If the Format list is empty, the device offers no format at the moment and cannot be started.
- Start without a device or without a format shows the message "Please select a camera and format.".
- The device list is read every time the tab is opened. A camera that was plugged in after the program started appears when you click another tab and then Camera again. The first device is then selected: check the Camera list before you click Start.
- When you choose another device and click Start while the camera is on the board, the picture returns to the Preview box. Click Show again.
- A camera that is in use by another program shows no picture after Start. Close the other program and start again.

- The FPS button shows the frame rate received at that moment in the field beside it. The figure is approximate.
- The picture is fitted with the display mode of the page (Ad: the display mode button of the Media Player tab or the Multimedia tab of Settings; CK: the display mode button of the Media Player tab). The mode is read when the source is started.

When the camera is unplugged or fails while it runs, the program notices it within a few seconds: the board area and the preview are cleared, the buttons return to the stopped state (Start green), the blinking ends and the device list is read again. Plug the camera in, click the Camera tab again, then Start and Show.

12.16 An NDI Source as Camera Input

An NDI stream of another device, for example a camera with NDI or the program output of a vision mixer, can be shown on the Advertisement or Chroma Key board. It is operated on the Camera tab.

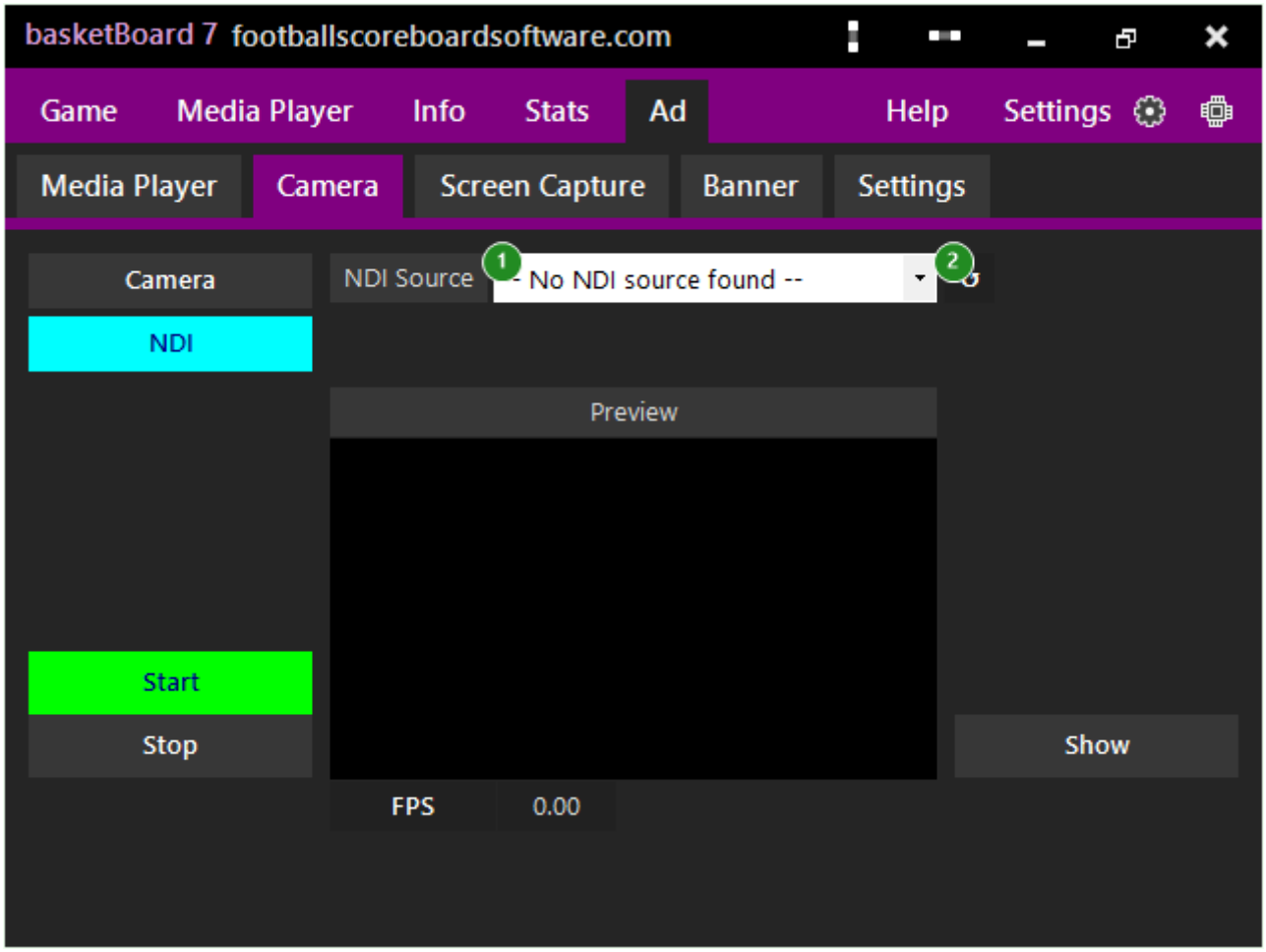


Figure 180. The Camera tab with the source NDI. No NDI source was on the network when the picture was made.

No.	Control	Name	What It Does
1	-- No NDI source found --	**NDI list**	Lists the NDI sources found on the network. It reads Searching... during the search and -- No NDI source found -- when there is none.
2	↻	**Refresh (round arrow)**	Searches the network again for NDI sources, for about two seconds, and fills the NDI list.

1. Click NDI at the top left (light blue when selected). The Camera and Format lists are replaced by the NDI list. The first time, the program searches the network for about two seconds; the list reads "Searching..." during that time.
2. Choose the source in the NDI list. If the list reads "-- No NDI source found --", start the sender and click the refresh button (round arrow) beside the list.
3. Click Start, then Show, as for a camera. After Show the Preview box keeps its last picture.
4. Click Stop to end.

- The list also holds NDI streams of this PC. If the NDI output of the board is on, its own sender name is in the list; do not choose it.
- Only the video is used. Sound of the NDI source is not played.
- The picture is drawn about 30 times per second, also if the source sends more.
- Stop ends whatever runs, the camera and the NDI source, whichever of the two source buttons is selected. Changing between Camera and NDI does not stop a running source.
- Start with no valid entry in the NDI list shows the message "Please select a valid NDI source.".
- If the source goes off the network while it is shown, the last picture stays on the board. No notice appears. Click Stop to clear it.
- When the source used last on the Ad page was an NDI source, the Ad page opens on its Settings tab. Click Camera to return to the NDI source.

12.17 Screen Capture

The Screen Capture tab of the Ad page and of the CK page copies a rectangle of the operator's screen to the board, many times per second: for example a browser window with live statistics or the output of a replay program. On the Ad page the capture fills the media area, on the CK page the whole Chroma Key board behind the scorebug.

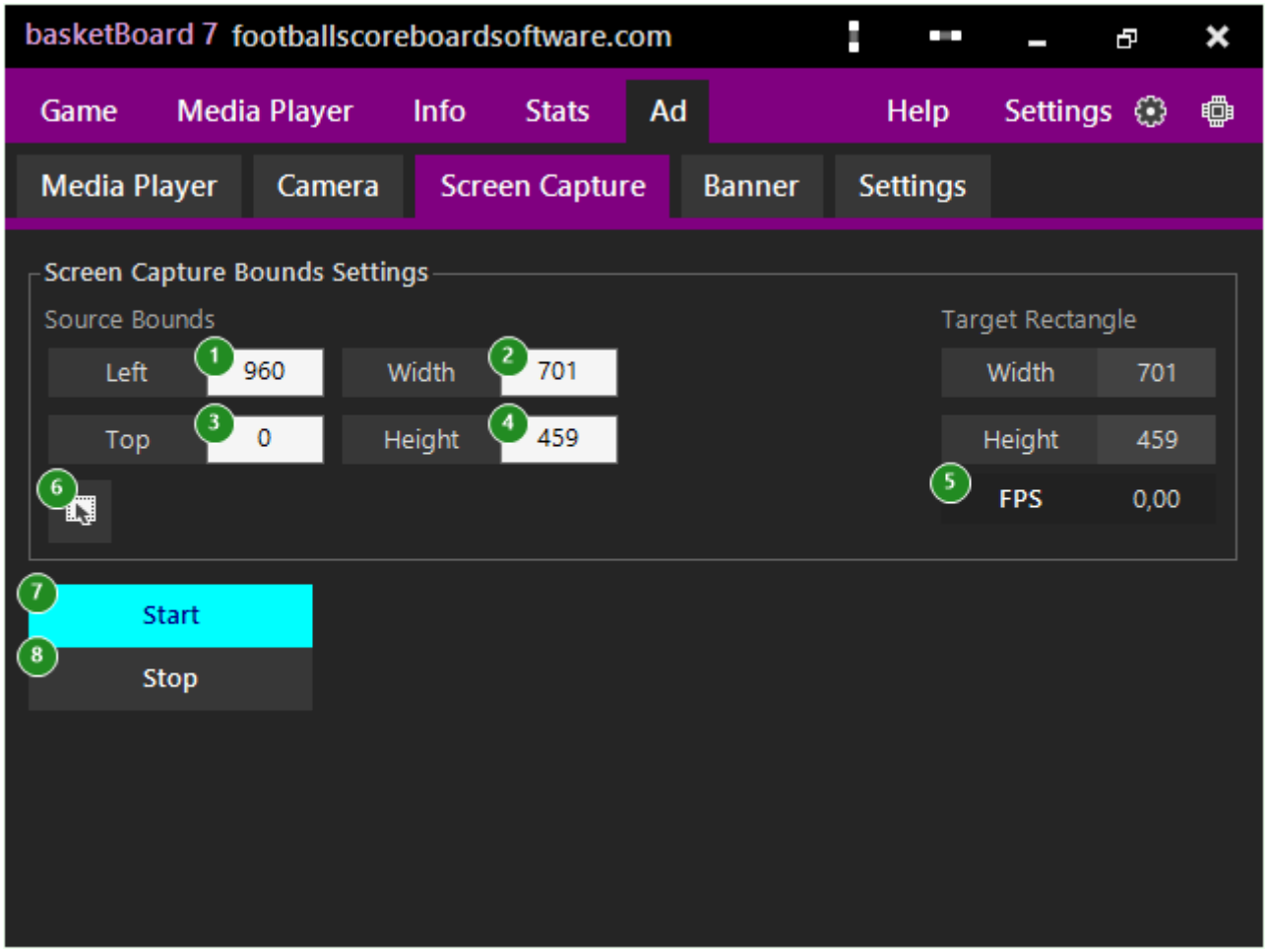


Figure 181. The Screen Capture tab of the Ad page. Target Rectangle shows the size of the media area of the Advertisement board.

No.	Control	Name	What It Does
1	960	**Left**	Holds the left edge of the capture area in screen pixels. Type it or use the selection button. Other text is turned into a number when the field is left. Saved by Start.
2	701	**Width**	Holds the width of the capture area in pixels. Type it or use the selection button. Compare with the width under Target Rectangle, the size of the media area. Saved by Start.
3	0	**Top**	Holds the top edge of the capture area in screen pixels. Type it or use the selection button. Other text is turned into a number when the field is left. Saved by Start.
4	459	**Height**	Holds the height of the capture area in pixels. Type it or use the selection button. Compare with the height under Target Rectangle, the size of the media area. Saved by Start.
5	FPS	**FPS**	Shows the capture rate of that moment in the field beside the button.
6		**Select Rectangle**	Dims the screen and marks the saved area in light blue. Drag the new area with the left mouse button and release: the four fields are filled. Esc or another mouse button changes nothing.

No.	Control	Name	What It Does
7	Start	**Start**	Stops the camera and the playlist, saves the area in configAd.xml and shows the capture in the media area of the board. A width or height of 0 gives a message and nothing starts. While a capture runs the button only saves the area; click Stop and Start to use it.
8	Stop	**Stop**	Ends the capture and empties the media area of the board. The blinking of the Screen Capture tab ends.

1. Set the area under "Source Bounds". Either type Left, Top, Width and Height in screen pixels, or click the selection button below the fields (tool tip "Select Rectangle"): the screens are dimmed and the saved area is marked light blue. Drag the new rectangle with the left mouse button and release. Esc or the right mouse button leaves the area as it was.
2. Compare with "Target Rectangle". It shows the size of the area on the board in pixels. An area with the same proportions is shown without distortion.
3. Click Start. The camera and the playlist of the page are stopped, the area is saved and the capture appears on the board. Start turns grey and Stop red.
4. Click Stop to end the capture. The board area becomes empty (CK: the key colour).

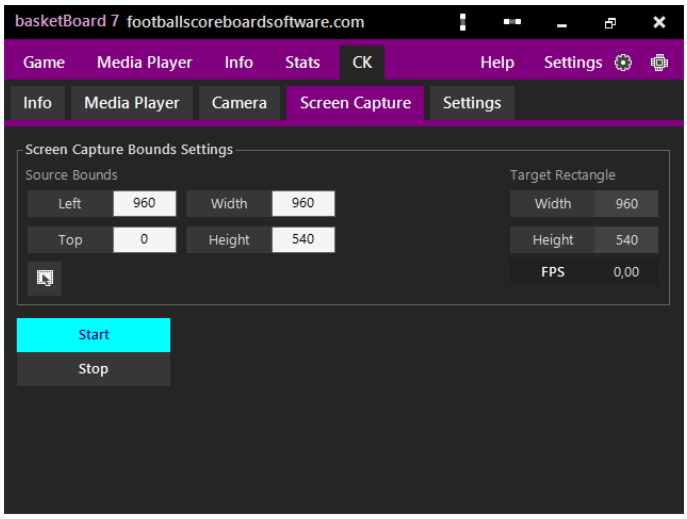


Figure 182. The Screen Capture tab of the CK page. Target Rectangle shows the size of the Chroma Key board.

- Start with a width or height of 0 shows the message "Select a capture area first (width and height must be greater than 0).".
- While a capture runs, Start only saves a changed area. Click Stop and Start to capture the new area.
- The FPS button shows the capture rate of that moment in the field beside it.
- Do not capture the area of the screen that holds the board window itself.
- The area is saved in configAd.xml or configCK.xml.

The program has two capture methods. Which one is used is decided when the program starts.

Property	GDI capture	GPU capture
Used when	GPU / UseGPU in start.xml is 0, or the licence has no GPU option	GPU / UseGPU is 1, or the licence has the GPU option
Screens	Every screen of the desktop	Only the first screen of the first graphics adapter

Property	GDI capture	GPU capture
Scaling	The display mode of the page	Always stretched to the target area
Load	On the processor	On the graphics adapter; suited to large areas and high frame rates

- The entry GPU / UseGPU of start.xml is -1 on a new installation: the licence decides. Set it to 0 or 1 while the program is closed to force a method.
- In GPU mode a change of the screen resolution, a Windows permission prompt or locking and unlocking the PC interrupts the capture. It resumes by itself within one or two seconds; you do not have to click Start again.
- If GPU capture cannot be opened on the PC, no picture appears although the buttons show a running capture. Click Stop and set UseGPU to 0.

> **Note:** Capture from the main screen or from a screen to the right of or below it. A negative value typed into Left or Top becomes 0 when you leave the box. Arrange the screens in Windows so that the main screen is at the upper left.

12.18 NDI Output of the Board

The NDI button in the column of small buttons at the right of the Game page (tool tip "Start/Stop NDI Camera Stream") sends the board as an NDI stream. Vision mixers, streaming software and NDI monitors on the same network can then use the board as a video source, without a cable from the board monitor.

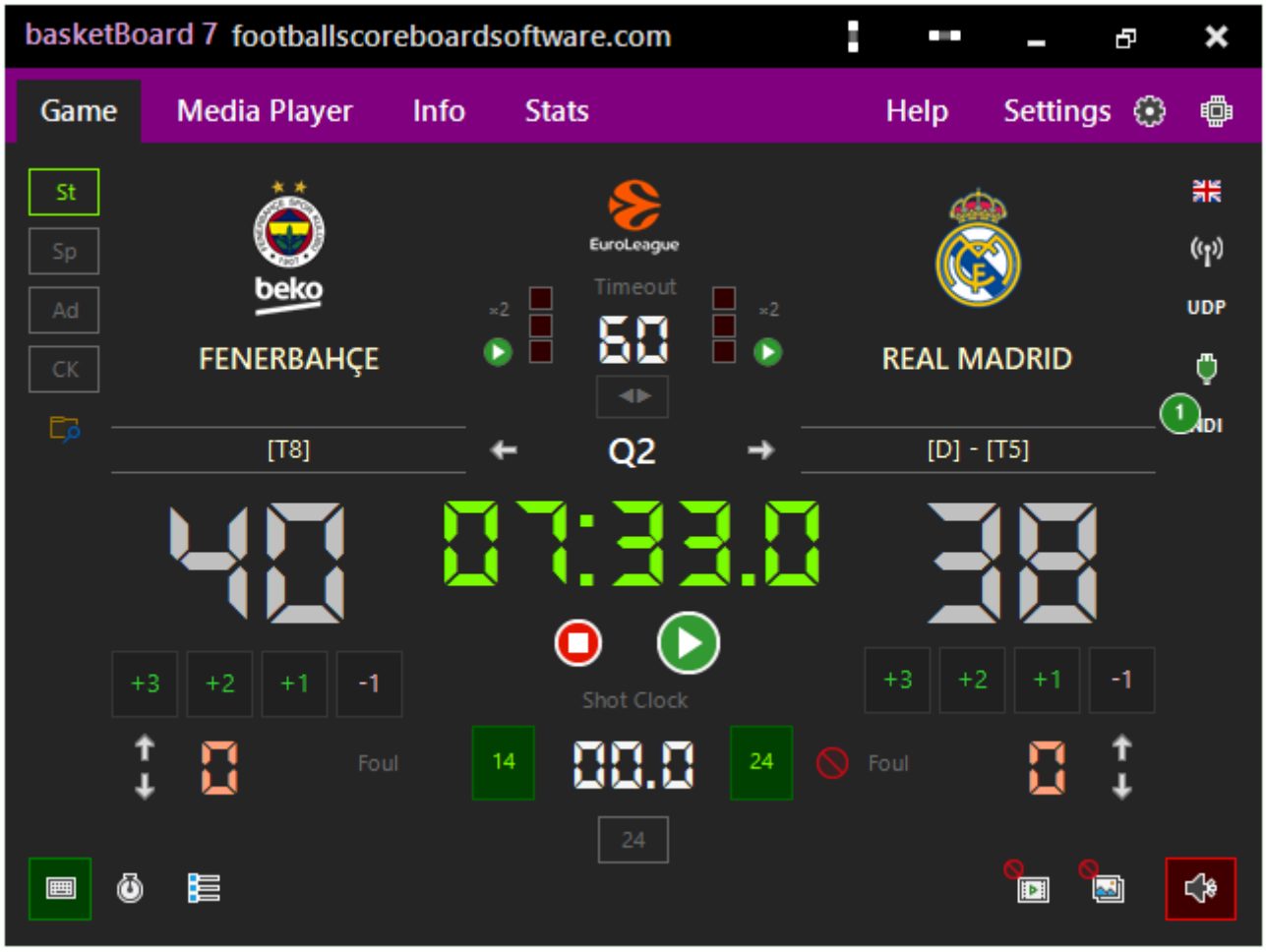


Figure 183. The NDI button of the Game page while the stream is sent.

No.	Control	Name	What It Does
1	NDI	**NDI**	Starts the NDI output of the board under the sender name stored in start.xml (NDI/SenderName); the button blinks red while the stream runs. A second click stops the stream; if NDI cannot be started, a message gives the reason.

1. Click NDI. The button turns red and blinks once per second while the stream is sent.
2. Click NDI again to stop. The button is grey again.

- The stream sends the board window that is in use: the Standard, Sponsored, Advertisement or Chroma Key board, an info or statistics graphic, or the output window of the Media Player page. When you change the mode or show a graphic, the stream follows without a restart.
- The picture has the size of the board window (Settings > Screen Properties). It is sent with 60 frames per second as target, video only, no sound and no transparency.
- Receivers find the stream by its sender name: the entry NDI / SenderName of start.xml, B7_NDI on a new installation (BB7_NDI when the entry is empty). The name cannot be changed in the interface; change the entry while the program is closed. Give every board PC on the same network its own sender name.
- The output is not remembered. After a restart of the program it is off.
- The files that NDI needs are installed by Setup. No other NDI program is needed on the board PC.

- When the output cannot start, the button stays grey and a red message with the title "Warning" appears. It starts with "NDI:" and gives the reason, for example a missing file Processing.NDI.Lib.x64.dll (run Setup again).

> **Note:** The picture for NDI is taken from the board window up to 60 times per second. On a slow PC, or with a very large board, the control panel can react more slowly while NDI is on. Switch NDI off when you do not need it.

12.19 What Stops and What Goes On

Action	Effect
Start a playlist, a camera, an NDI source or a capture on the Ad page or on the CK page	The other sources of the same page are stopped. One source at a time.
Change from Advertisement mode to another mode	Playlist, camera, NDI source and capture of the Ad page are stopped, also the playlists of the two banners.
Change from Chroma Key mode to another mode	Playlist, camera, NDI source and capture of the CK page are stopped.
Click Game, or open another page of the menu strip, without changing the mode	The source goes on.
Show an info or statistics graphic, or play a clip on the Media Player page	The graphic or clip covers the board; a source of the Ad or CK page goes on behind it.
Change the mode while the NDI output is on	The NDI output goes on and sends the board of the new mode.
Close the program	Everything is stopped. Nothing is started again by itself at the next start.

Function	Frame rate
NDI output	60 per second as target; less on a slow PC
NDI input	Drawn about 30 times per second
Camera	The frame rate of the selected format
Screen capture	A new picture about every 10 milliseconds at most; with GPU capture only when the screen content changed

Tips:

- Test every clip and every source before the match, with the cables and the network of the hall.
- Set the display mode first, then start the source. A source does not move with you to another mode.
- For a camera choose a format with the frame rate of the production and not a higher resolution than the board needs.
- For video, NDI and screen capture a dedicated graphics card and 16 GB RAM are recommended.

12.20 Files

File	Content
common\data\playList_0.xml to playList_5.xml	Playlists 1 to 6 of the Media Player page (playlist 1 holds the demo clip)
common\data\playList_7.xml to playList_20.xml	Playlists 7 to 20 of the drop-down list
common\data\playList_url.xml	The Web URL list
common\data\playListAd_0.xml to playListAd_5.xml	Playlists 1 to 6 of the Advertisement media area
common\data\playListCK_0.xml to playListCK_5.xml	Playlists 1 to 6 of the Chroma Key media player
common\data\sponsors.xml	The sponsor list
start.xml, entry MEDIAPLAYER	Display mode and sound of the Media Player page
start.xml, entries Ad/DisplayMode and CK/DisplayMode	Display modes of the Ad and CK pages
start.xml, entry NDI/SenderName	The sender name of the NDI output
start.xml, entry GPU/UseGPU	The capture method: -1 licence, 0 GDI, 1 GPU
configAd.xml, configCK.xml	Capture area, camera, format and NDI source that were started last
configSp.xml	Style of the sponsor images of the strip
media\videos	The demo clip Northwind_Promo.mp4 and the background videos of the boards
media\images\sponsors	The demo sponsor logos sponsor_01.png to sponsor_06.png

13. Remote Control

basketBoard 7 contains a small web server. A phone, a tablet or any computer with a browser opens the remote page over the network and controls the score, the team fouls, the game clock, the shot clock, the periods, the time-outs, the possession arrow, the info screens, the display mode and the media playlists. Nothing is installed on the phone. Up to four phones or tablets can use the page at the same time, for example one for each official at the scorer's table.

13.1 Switching the Remote Control On

The server is switched on and off on the Remote Control page of the settings. To open it, click Settings and then "Remote Control", or click the Remote Control button of the Game page (tool tip "Remote Control").

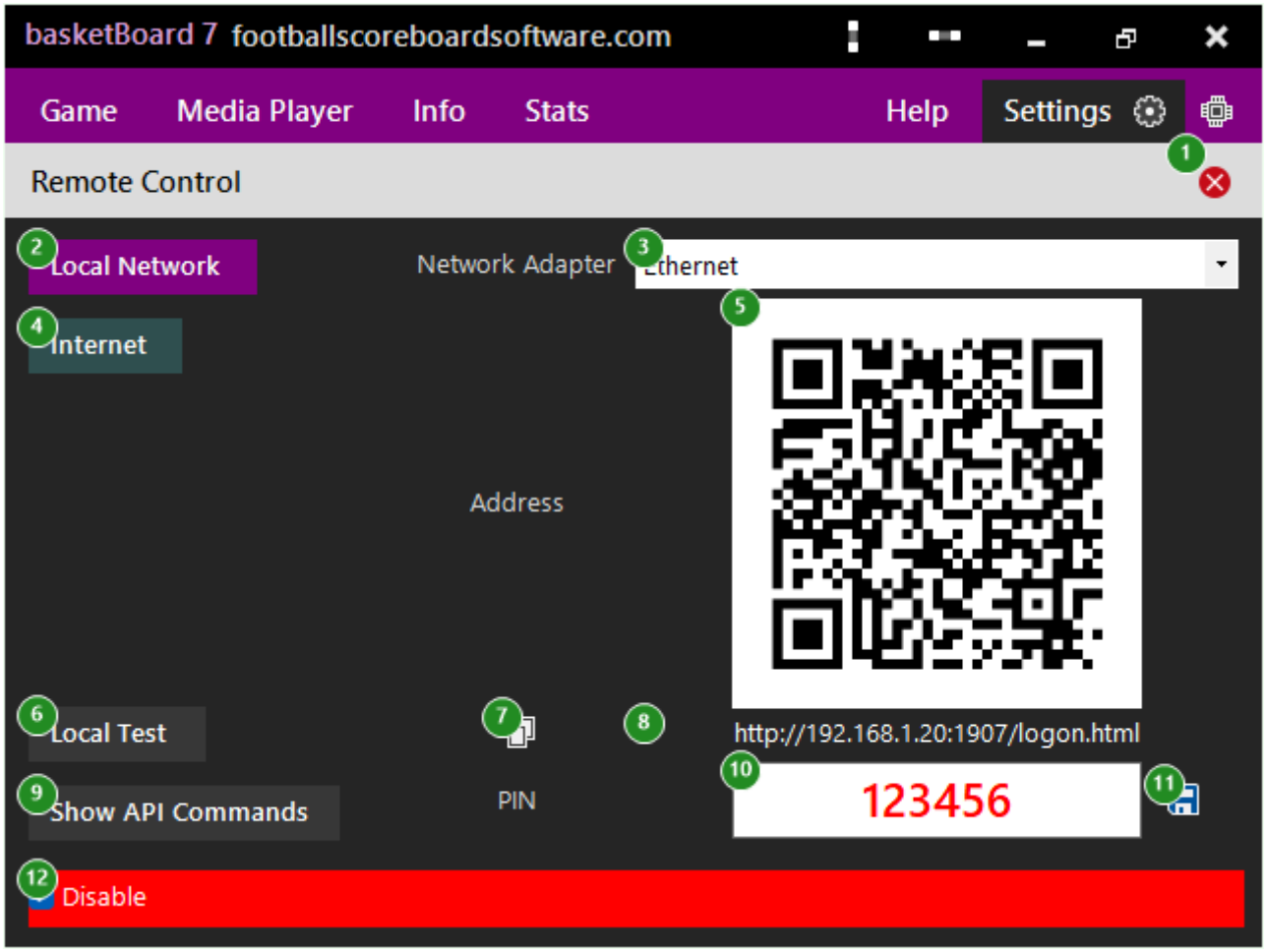
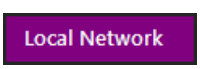
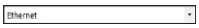
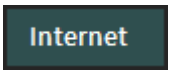
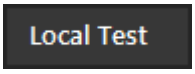
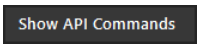


Figure 184. Settings > Remote Control. The Disable box is ticked and red: the remote control is off, as on a new installation.

No.	Control	Name	What It Does
1		**Close**	Closes the Remote Control page and returns to the Settings page. Esc does the same. The server keeps its state.
2		**Local Network**	Shows the address of the remote page for phones in the same network: the Network Adapter list appears, and the address and the QR code are built from the IP address of the chosen adapter.

No.	Control	Name	What It Does
3		**Network Adapter**	Lists the active Ethernet and wireless adapters of the PC that have an IPv4 address. Choosing one rebuilds the address and the QR code with its IP address. Hidden on the Internet tab.
4		**Internet**	Asks the external web service api.ipify.org for the public internet address of the connection and shows the address of the remote page and its QR code for use over the internet. Without a connection the address field shows No Internet Connection. The router must forward TCP port 1907 to this PC.
5		**QR code**	Shows the address of the logon page as a QR code. Scan it with the phone to open the remote page.
6		**Local Test**	Opens the address shown in the web browser of this PC, to test the remote page.
7		**Copy**	Copies the address to the clipboard.
8		**Address**	Shows the address of the logon page, http://IP address:1907/logon.html. When the server cannot start it shows Port 1907: port busy.
9		**Show API Commands**	Opens the command reference API_Commands.txt in Notepad.
10		**PIN**	Holds the PIN that every remote request must carry: digits only, at most six, 123456 as delivered. A change is used only after you click the save icon beside the field.
11		**Save PIN**	Saves the PIN in start.xml (REMOTE/PIN) and makes it valid at once. The icon appears when the PIN field is changed and disappears after saving.
12		**Disable**	Switches the remote control server on port 1907 off (ticked, red bar) or on (cleared) and saves the state in start.xml (REMOTE/Open). On a new installation it is ticked. If the port is used by another program, the bar turns orange and a message says that the remote control could not be started.

1. Clear the Disable box. The red bar disappears and the server starts.
2. Choose the network adapter that connects the PC to the network of the phones in the "Network Adapter" list. The address and the QR code are built from its IP address.
3. Read the address under the QR code. It has the form http://IP address of the PC:1907/logon.html.
4. Read the PIN. It is 123456 until you save a PIN of your own.

- The choice is stored in start.xml. From now on the server starts together with the program, until you tick Disable again.
- The port is 1907 and cannot be changed.
- If another program already uses port 1907, the bar turns orange, the address field shows "Port 1907:" with the reason, and a message says "Remote control could not be started.". The program works on without the remote control. Close the other program and clear Disable again.

- "Local Test" opens the address in the web browser of this PC: use it to check the page before you take a phone.
- "Show API Commands" opens the command reference API_Commands.txt. The HTTP commands are described in chapter 14 and Appendix C.

13.1.1 Changing the PIN

1. Click into the PIN field and type the new PIN: digits only, at most six.
2. Click the save icon beside the field. The icon disappears and the new PIN is valid at once.

Until you click the save icon the old PIN stays valid. A phone that is logged on with the old PIN must log on again (section 13.4).

13.1.2 The Internet Tab

The Internet tab shows the address of the page for use from outside the local network.

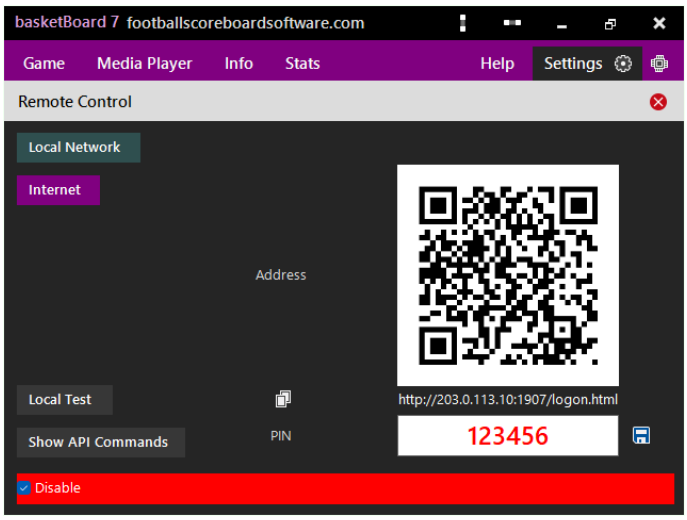


Figure 185. The Internet tab of the Remote Control page. The address is built from the public internet address of the connection.

- The tab asks the web service api.ipify.org for the public address of the internet connection. Without a connection the address field shows "No Internet Connection".
- The router of the network must forward TCP port 1907 to this PC. Set this up in the router; basketBoard 7 does not do it.
- The connection is the same unencrypted one as in the local network (section 13.15). Use it only when you know who can reach the address.

13.2 The Firewall

Setup adds rules for the remote control to the Windows firewall. It runs the file open_firewall_1907.bat from the program folder, which opens port 1907 (TCP and UDP, in and out), port 2907 (TCP, in; the scoreboard console) and port 2908 (UDP, in and out). The rules are named "basketBoard 1907 TCP IN" and so on.

If a phone cannot reach the page although the PC and the phone are in the same network:

1. Open the program folder C:\basketBoard7.
2. Right-click open_firewall_1907.bat and choose "Run as administrator".
3. Read the window: every rule is listed as "Added" or "Exists". Press a key to close it.

> **Note:** Some networks keep the devices apart (guest Wi-Fi, "client isolation"). The phones then cannot reach the PC, whatever the firewall says. Use a network in which the devices can see each other.

13.3 Opening the Page

1. Connect the phone to the same network as the PC.
2. Scan the QR code of the Remote Control page with the camera of the phone, or type the address into the browser of the phone.
3. Type the PIN on the keypad.
4. Tap the green check mark.

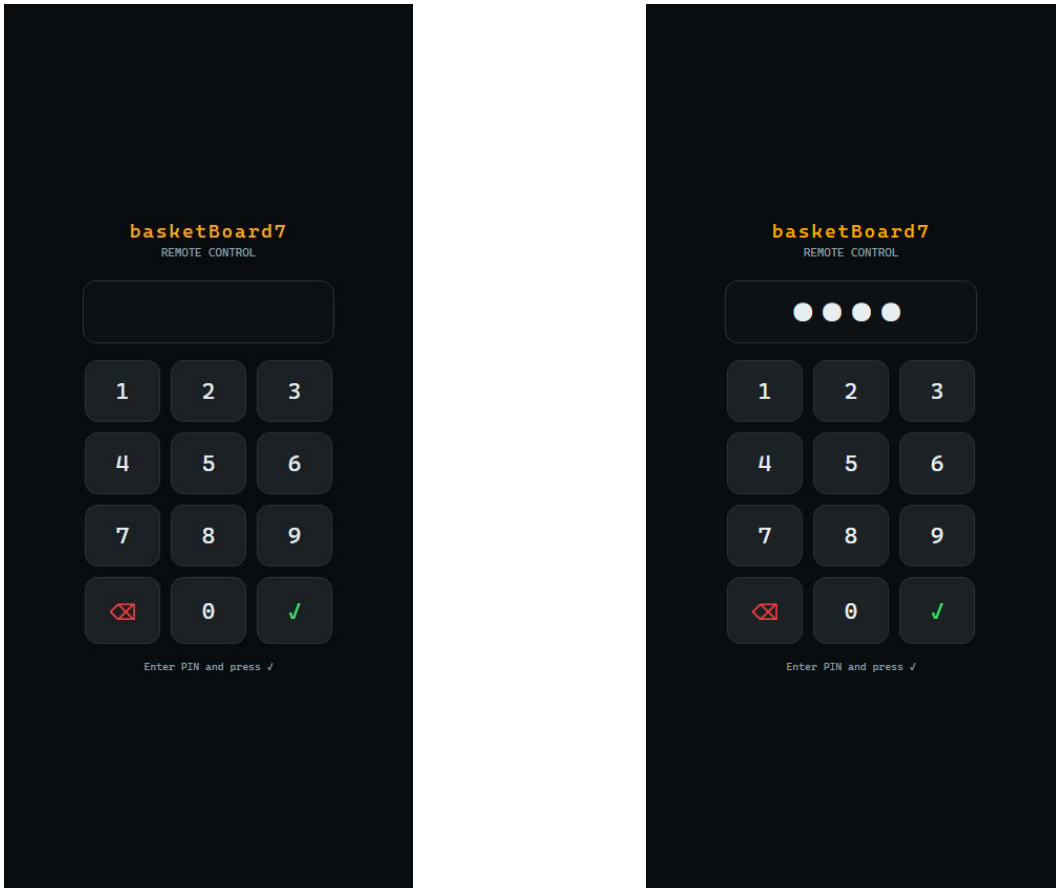


Figure 186. The logon page as it opens, and with four digits typed.

The pictures of the page carry no number badges. The tables of this chapter list the controls from top to bottom and from left to right.

No.	Control	What it does
1	**PIN field (above the keys)**	Shows one dot for every digit you have typed. The page takes up to eight digits; a PIN saved in the program has at most six.
2	**Keys 1 to 9 and 0**	Add a digit to the PIN.
3	**Delete key (red, bottom left)**	Removes the last digit.
4	**Check mark (green, bottom right)**	Sends the PIN. With the correct PIN the remote page opens. With a wrong PIN the empty keypad comes back; there is no message. Nothing happens while the PIN field is empty.

> **Note:** Logging on also acts like the BOARD button of the page: the board returns to the scoreboard, and a running media playlist or an info screen is closed. Log on before the match, not while a sponsor clip is on the board.

13.4 Staying Logged On

The page stays open as long as the browser tab is open. There is no logout and no time limit.

- When the PIN is changed in the program, open the address again and log on with the new PIN.
- After a PIN change an open page keeps its green dot and its last values, but it no longer follows the program and its buttons have no effect: the program answers every request of the page with "#Invalid PIN". The page does not return to the keypad by itself.
- When the program is closed or the network is lost, the dot turns red. The page goes on by itself when the program answers again with the same PIN.

13.5 The Header

The upper part of the page is the same on every tab. It shows the state of the match and gives access to the values that are corrected by typing.

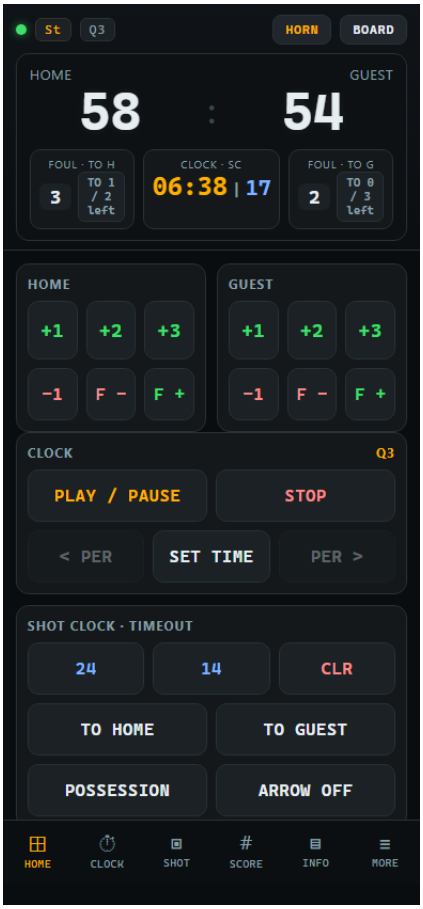


Figure 187. The remote page, HOME tab, during the third quarter. The pictures of the page were made with fixed sample values.

No.	Control	What it does
1	**Dot (top left)**	Green while the program answers the page. Red when the last request got no answer: the program is closed, the remote control is switched off or the network is lost.

No.	Control	What it does
2	**St (first chip)**	Shows the display mode of the board: St, Sp, Ad or CK. Display only; the mode is changed on the MORE tab.
3	**Q3 (second chip)**	Shows the period label of the control panel (Q1 to Q4, OT1, OT2 ...). Tap it to open the period sheet (section 13.12). The tap does nothing while the game clock or a time-out runs.
4	**TO and the seconds (red chip, only during a time-out)**	Shows the seconds left of the running time-out countdown.
5	**HORN**	Sounds the horn on the PC. Nothing is heard while the sound of the control panel is switched off.
6	**BOARD**	Returns the board to the scoreboard from any info screen, statistic or media clip, and the main window of the PC to the Game page.
7	**HOME and GUEST (team names)**	Show the team names of the control panel in one line. Tap a name to edit it.
8	**58 : 54 (scores)**	Show the scores. Tap a score to type a new one.
9	**FOUL · TO H and FOUL · TO G (boxes left and right)**	The number on the left is the team fouls; tap it to type a new number. It turns red in the bonus (section 13.13). "TO 1 / 2 left" shows the time-outs used and the time-outs left; tap it to correct the number used.
10	**CLOCK · SC (box in the middle)**	The game clock, green while stopped and amber while it runs, and the shot clock in blue. The shot clock shows -- when it is blank. Display only.
11	**HOME, CLOCK, SHOT, SCORE, INFO, MORE (bar at the bottom)**	Open the six tabs. The name of the open tab is amber.

The page asks the program for the state every 0.6 seconds, and once more a quarter of a second after each tap. A change made on the control panel or on another phone therefore appears within about a second. A small grey line under the tab bar shows OK with the time of the last answer, or "fetch err" when the program did not answer.

> **Note:** The pictures show fixed sample values. With the program, the page shows both clocks exactly as the control panel does, with the tenths of a second: for example 06:38.3 and 13.3 while the clock has been running, 10:00 and 24 after a period was selected or the shot clock was reset.

13.6 The HOME Tab

The HOME tab holds every match control on one page. It is the tab for a single person who runs the whole match from the phone. The picture is the one of section 13.5.

No.	Control	What it does
1	**+1, +2, +3 (HOME card and GUEST card, upper row)**	Add one, two or three points to the score of that team.
2	**−1 (lower row, left)**	Takes one point back. The score does not go below 0.

No.	Control	What it does
3	**F − and F + (lower row)**	Take one team foul back or add one team foul.
4	**Q3 (CLOCK card, top right)**	Shows the period. Tap it to open the period sheet.
5	**PLAY / PAUSE**	Works like the Start / Pause button of the control panel: it starts the game clock, or pauses it and keeps the time left. The shot clock runs and stops with the game clock. The tap is ignored during a time-out countdown and when the clock stands at 00:00.
6	**STOP**	Works like the Stop button of the control panel. While the clock runs it stops the clock. Tapped while the clock is already stopped, it sets the game clock back to the full length of the period.
7	**< PER and PER >**	Select the period before or the next period. The game clock is set to the length of that period, the shot clock is reset and the rules of the period change are applied. After the last regulation period, PER > goes on to OT1, OT2 and so on. Both buttons are grey while the game clock or a time-out runs.
8	**SET TIME**	Opens the sheet "SET TIME (mm:ss)" to type the game clock.
9	**24 and 14 (SHOT CLOCK · TIMEOUT card)**	Reset the shot clock to the full value or to the short value. If the game clock runs, the shot clock starts at once. If less time is left on the game clock than the value, the shot clock goes blank instead.
10	**CLR**	Blanks the shot clock. No horn sounds.
11	**TO HOME and TO GUEST**	Start a time-out of that team: the countdown starts and the time-out is counted (section 13.13).
12	**POSSESSION**	Switches the possession arrow (section 13.13).
13	**ARROW OFF**	Removes the possession arrow.

- The page adds your tap to the score it shows and sends the new total to the program. The same holds for the team fouls. This matters when several people count (section 13.14).
- The numbers on the buttons 24 and 14 are the two shot clock values of the active rules preset. The page reads them, and the period names of the period sheet, when it is opened. After a change of the rules preset, open the page again.

13.7 The CLOCK Tab

The CLOCK tab is the tab of the timekeeper: the game clock in large digits and nothing that can be hit by mistake.

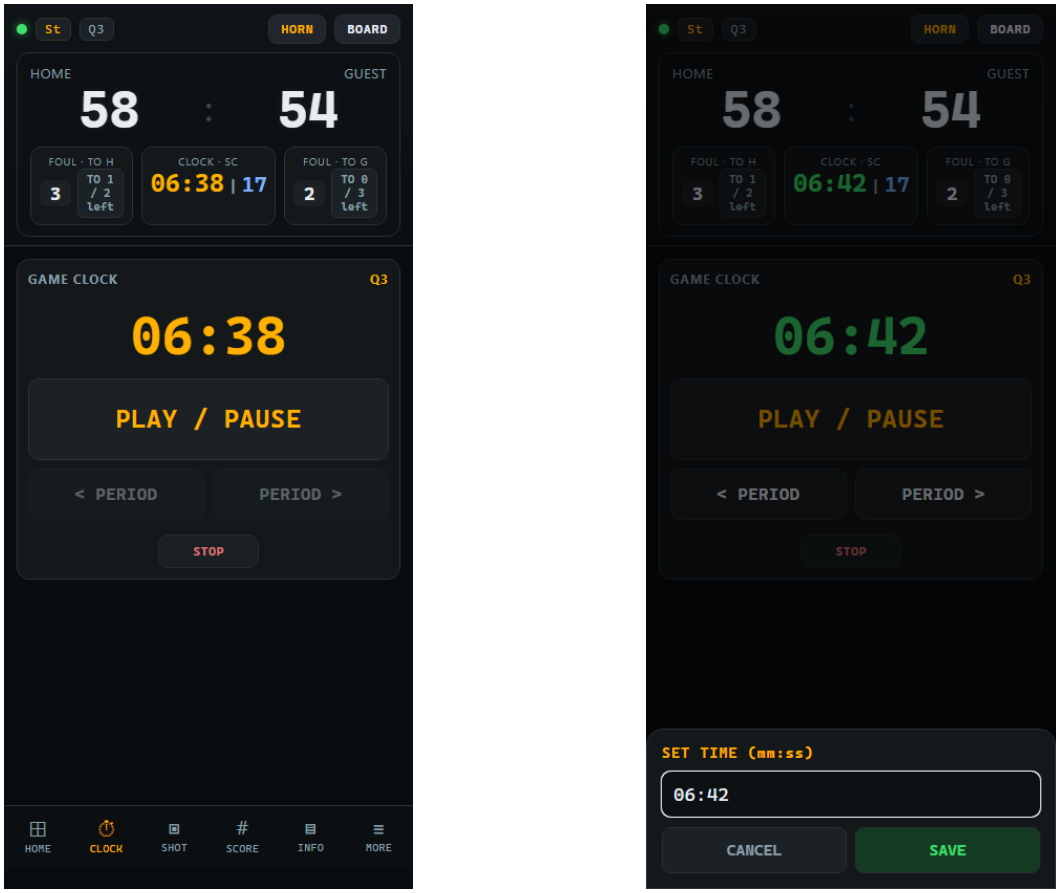


Figure 188. The CLOCK tab, and the sheet SET TIME (mm:ss).

No.	Control	What it does
1	**Q3 (GAME CLOCK card, top right)**	Shows the period. Tap it to open the period sheet.
2	**06:38 (large clock)**	Shows the game clock: amber while it runs, green while it is stopped. Tap it to open the sheet "SET TIME (mm:ss)".
3	**PLAY / PAUSE (large button)**	Starts or pauses the game clock, as on the HOME tab.
4	**< PERIOD and PERIOD >**	Select the period before or the next period, as < PER and PER > on the HOME tab. Grey while the game clock or a time-out runs.
5	**STOP (small red button at the bottom)**	Stops the running clock. Tapped while the clock is stopped, it sets the clock back to the full length of the period. It is small on purpose.

To pause the clock use PLAY / PAUSE. Keep STOP for the case that the clock must go back to the full period time.

13.8 The SHOT Tab

The SHOT tab is the tab of the shot clock operator.

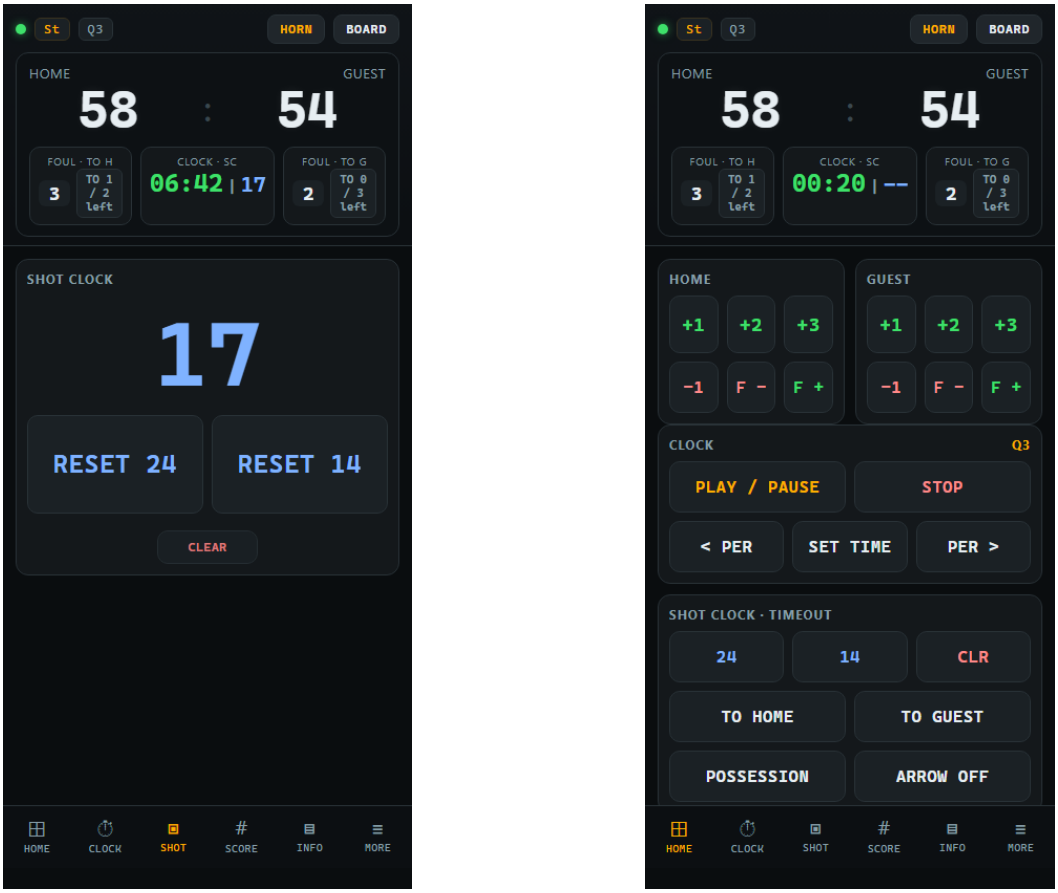


Figure 189. The SHOT tab, and the header with a blank shot clock: fewer seconds are left in the period than the shot clock value.

No.	Control	What it does
1	**17 (large number)**	Shows the shot clock, or -- when it is blank. Tap it to open the sheet "SET SHOT CLOCK (sec)" and type a value in seconds, for example 8 or 8.5. If the game clock runs, the shot clock goes on from the typed value.
2	**RESET 24 (left)**	Resets the shot clock to the full value.
3	**RESET 14 (right)**	Resets the shot clock to the short value.
4	**CLEAR (small red button at the bottom)**	Blanks the shot clock. No horn sounds and the board does not show the red expiry state.

- The shot clock starts and stops with the game clock. There is no separate start button.
- When the shot clock runs out, the shot clock horn sounds on the PC and the value stays at zero until the next reset.
- A reset to a value that is higher than the time left on the game clock gives a blank shot clock. With 0:20 on the game clock, RESET 24 blanks the shot clock and RESET 14 sets 14.
- Under the NCAA presets the buttons read RESET 30 and RESET 20.

13.9 The SCORE Tab

The SCORE tab is the tab of the scorer: the score and the team fouls of both teams.

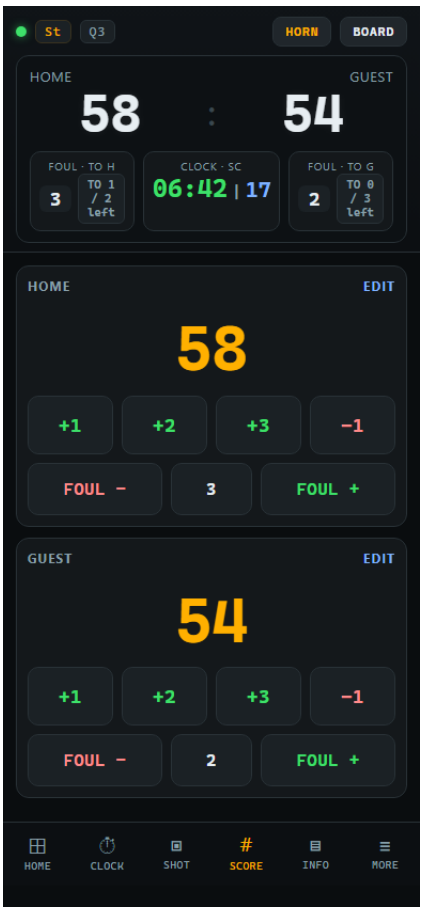


Figure 190. The SCORE tab.

No.	Control	What it does
1	**EDIT (HOME card and GUEST card, top right)**	Opens the sheet HOME SCORE or GUEST SCORE to type the score.
2	**58 and 54 (large numbers)**	Show the scores. A tap opens the same sheet as EDIT.
3	**+1, +2, +3**	Add one, two or three points.
4	**−1**	Takes one point back.
5	**FOUL −**	Takes one team foul back.
6	**3 and 2 (between the foul buttons)**	Show the team fouls. A tap opens the sheet HOME FOUL or GUEST FOUL to type the number.
7	**FOUL +**	Adds one team foul.

The page has no controls for the points and fouls of single players. They are entered in the Player Stats window on the PC (chapter 7).

13.10 The INFO Tab

The INFO tab puts the info screens of the active rules preset on the board: in Standard, Sponsored and Advertisement mode as a full page, in Chroma Key mode as a lower third under the scorebug. The screens and their contents are described in chapter 10.

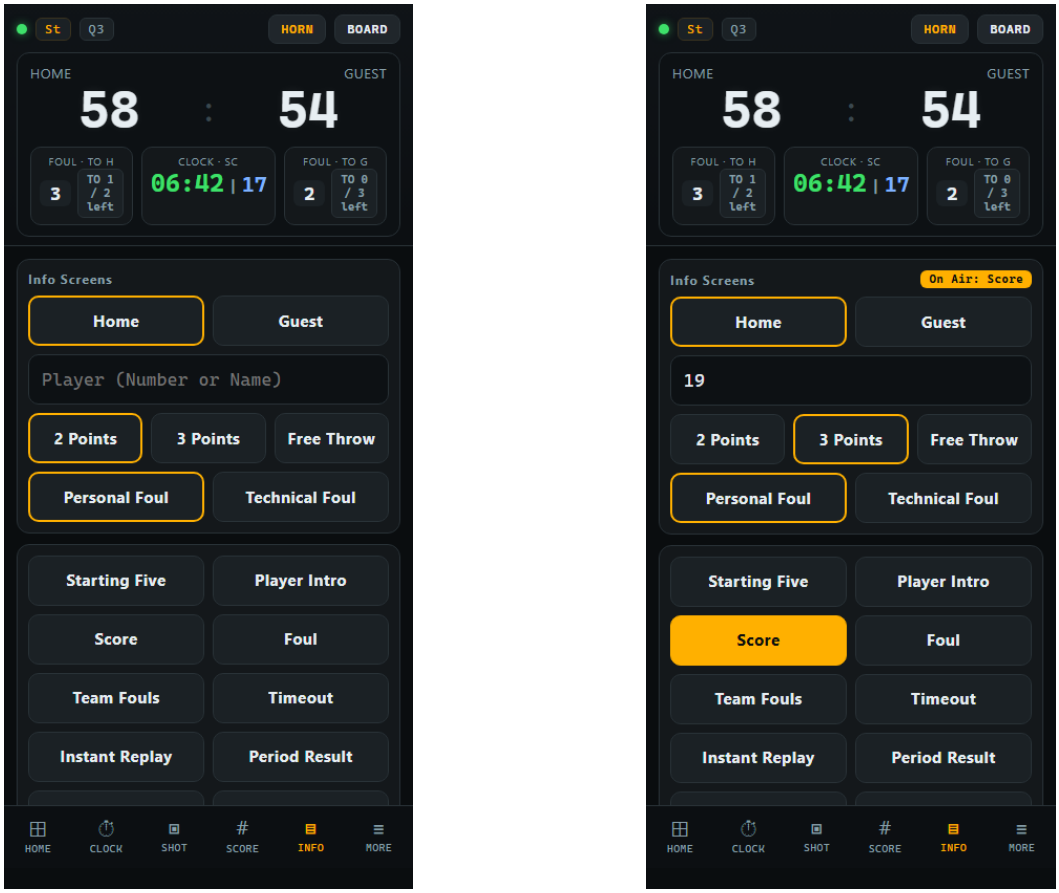


Figure 191. The INFO tab, and the same tab while the Score screen is on the board: the Score button is amber and the card shows "On Air: Score".

No.	Control	What it does
1	**On Air (amber label, top right of the card)**	Shows the name of the info screen that is on the board. It is hidden while no screen is shown.
2	**Home and Guest**	Choose the team for the screens that belong to one team: Starting Five, Player Intro, Score, Foul, Timeout, Box Score and Player of the Game. The chosen button has an amber frame.
3	**Player (Number or Name)**	The player for Player Intro, Score, Foul and Player of the Game: type the shirt number or the name as in the roster. Leave it empty to use the player that is set on the Info page of the PC.
4	**2 Points, 3 Points, Free Throw**	The kind of basket for the Score screen.
5	**Personal Foul, Technical Foul**	The kind of foul for the Foul screen.
6	**Screen buttons (two columns)**	One button for each info screen of the active rules preset, with its name: Starting Five, Player Intro, Score, Foul, Team Fouls, Timeout, Instant Replay, Period Result and the others below. A tap shows the screen with the choices above. The button of the screen on the board is amber; a tap on it takes the screen off.
7	**Hide Screen (red)**	Takes the info screen off: the scoreboard returns (in Chroma Key mode the lower third fades out).

1. Choose Home or Guest, type the player and choose the kind, for example Home, 19 and 3 Points.
2. Tap the screen, for example Score. The screen appears on the board and its button turns amber.
3. Tap Hide Screen, or the amber button again, to take it off.

- The choices of the card stay on the phone until you change them. They are sent with every tap of a screen button.
- The other fields of the screens (for example the foul kinds Unsportsmanlike or Flagrant, the review of Instant Replay, the officials) are set on the Info page of the PC. The phone uses what is set there.
- The screen buttons follow the active rules preset and the language of the program. The rest of the page is in English.

13.11 The MORE Tab

The MORE tab holds the display mode, the texts and the media.

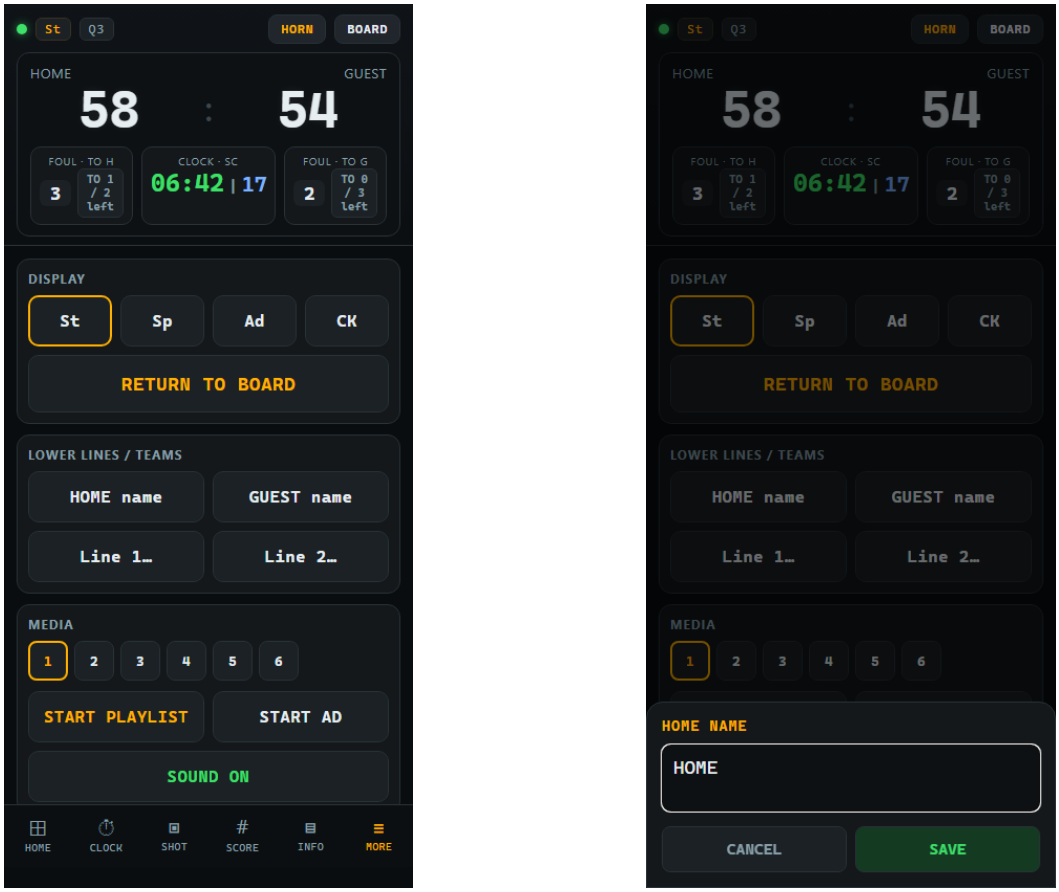


Figure 192. The MORE tab, and the sheet HOME NAME.

No.	Control	What it does
1	**St, Sp, Ad, CK (DISPLAY card)**	Select the display mode of the board: Standard, Sponsored, Advertisement or Chroma Key, and return the board to the scoreboard. The button of the active mode has an amber frame.
2	**RETURN TO BOARD**	Does the same as BOARD in the header.

No.	Control	What it does
3	**HOME name and GUEST name (LOWER LINES / TEAMS card)**	Open the sheet HOME NAME or GUEST NAME.
4	**Line 1... and Line 2...**	Open the sheet LOWER LINE 1 or LOWER LINE 2 for the two text lines of the control panel.
5	**1 to 6 (MEDIA card)**	Choose the playlist for the two buttons below: one of the playlists 1 to 6 of the program. The chosen number has an amber frame.
6	**START PLAYLIST**	Opens the Media Player page on the PC, opens the playlist and starts it, so it plays on the board. While a playlist is playing, the tap stops it.
7	**START AD**	Switches the board to Advertisement mode and starts the playlist with the same number of the Ad media player in the media area.
8	**SOUND ON or MUTED**	Shows and switches the sound of the control panel (the clock sounds and the horns). SOUND ON: the sound is on; a tap switches it off. MUTED, in red: the sound is off; a tap switches it on.

- The sound button follows the program: it shows the state of the loudspeaker button of the control panel, also when the sound was switched on the PC or on another phone.
- The six playlist buttons are the playlists 1 to 6 of the Media Player page; the playlists 7 to 20 cannot be started from the page. On a new installation playlist 1 holds the demo clip Northwind_Promo.mp4 (chapter 12).

13.12 The Sheets

A value that is typed opens a sheet at the bottom of the page. CANCEL closes the sheet without a change. SAVE sends the value to the program.

Sheet	Opened by	What you enter
SELECT PERIOD	The period chip in the header; the period label of the CLOCK card and of the CLOCK tab	Tap a period. It is selected at once; this sheet has no SAVE.
SET TIME (mm:ss)	SET TIME; the large clock of the CLOCK tab	The game clock as minutes and seconds, for example 05:00 or 00:45. See the note below.
SET SHOT CLOCK (sec)	The large number of the SHOT tab	Seconds, for example 8 or 8.5.
HOME SCORE, GUEST SCORE	A score in the header; EDIT and the large score of the SCORE tab	The score as a number.
HOME FOUL, GUEST FOUL	The foul number in the header; the number between the foul buttons of the SCORE tab	The team fouls as a number.
HOME TIMEOUTS [0-9], GUEST TIMEOUTS [0-9]	"TO n / m left" in the header	The number of time-outs the team has used, 0 to 9. The time-outs left follow from it.

Sheet	Opened by	What you enter
HOME NAME, GUEST NAME	A team name in the header; HOME name and GUEST name on the MORE tab	The team name. A new line in the sheet starts the second line of the name on the board. The underscore cannot be part of a name: the program reads it as a new line.
LOWER LINE 1, LOWER LINE 2	Line 1... and Line 2... on the MORE tab	The text of the line. The codes for the date and the time of day work as on the control panel: [D], [T], [T8], [T5].

> **Note:** The time can be at most the length of the current period. A value that is not a time (for example 99:99), or a longer time, is not accepted: the page shows the message "Time not accepted: type minutes:seconds, at most the length of the period. The clock keeps its time.", and the clock keeps its time and goes on running if it runs. The shot clock sheet takes seconds from 0 to the full shot clock value; another value gives the message "Shot clock not accepted: ..." and changes nothing.

13.12.1 The Period Sheet and Overtime

The period sheet lists the regulation periods of the active rules preset with their names (Q1 to Q4, or 1H and 2H) and then the overtimes: OT1 up to one more than the overtime being played. In regulation time the list ends with OT1; during OT2 it ends with OT3. The current period has an amber frame.

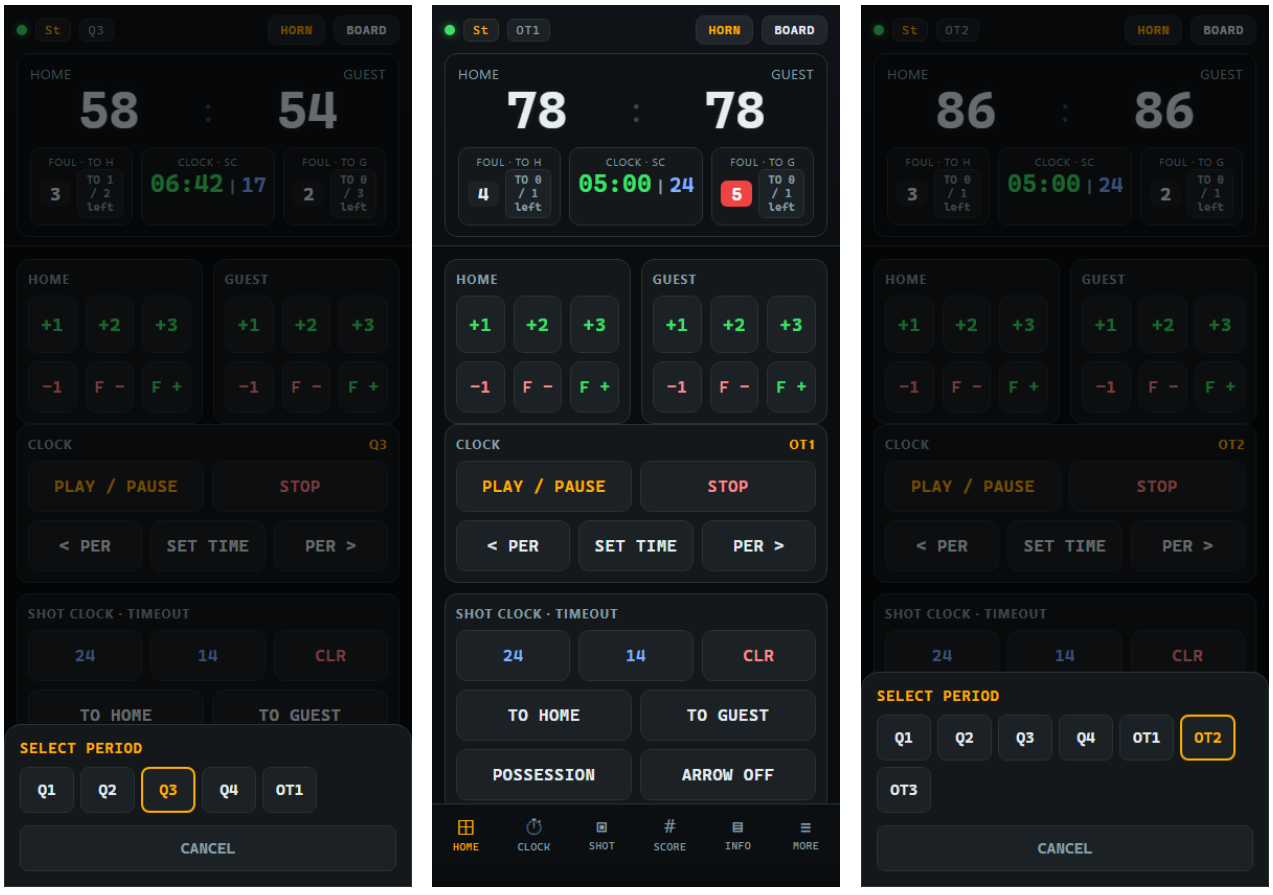


Figure 193. The period sheet in the third quarter; the page in the first overtime; the period sheet in the second overtime, which offers OT3.

Selecting a period does the same as selecting it on the control panel: the game clock is set to the length of the period (the overtime length for every overtime), the shot clock is reset, and the team fouls and time-outs are handled by the rules preset (chapter 6). The sheet does not open while the game clock or a time-out runs.

13.13 Bonus, Time-outs and Possession on the Page

13.13.1 Bonus

The foul number in the header gets a red background as soon as the team is in the bonus.

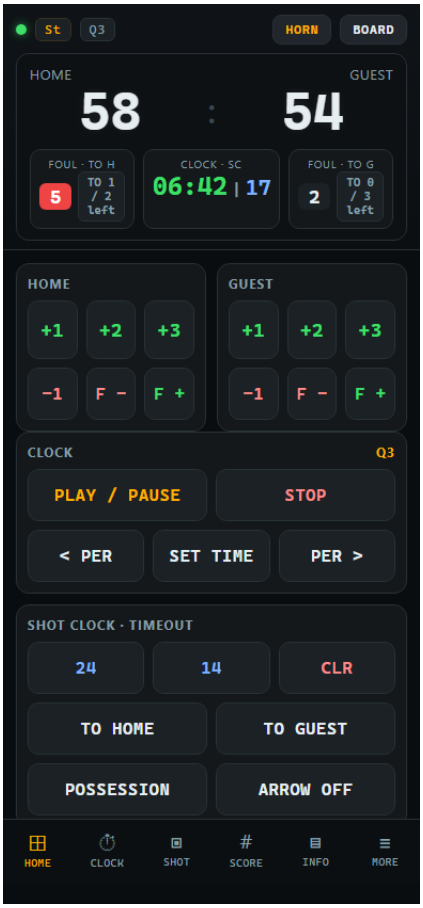


Figure 194. The home team has five team fouls and is in the bonus.

- The page takes the bonus from the program, so every limit of the active rules preset counts: the team-foul limit, a different limit in overtime and the rule of the last two minutes of the NBA preset.
- With a preset that has a second limit (NCAA M, the tenth team foul) the number also gets a white frame at that limit.
- For 1.2 seconds after you have changed a foul number on this phone, the page decides by the plain team-foul limit alone. Then it follows the program again.

13.13.2 Time-outs

"TO 1 / 2 left" in the header means: this team has used one time-out and has two left. The number used counts within the current half, match or overtime, as the rules preset defines it; the number left also respects the limits of the last period and of the last minutes.

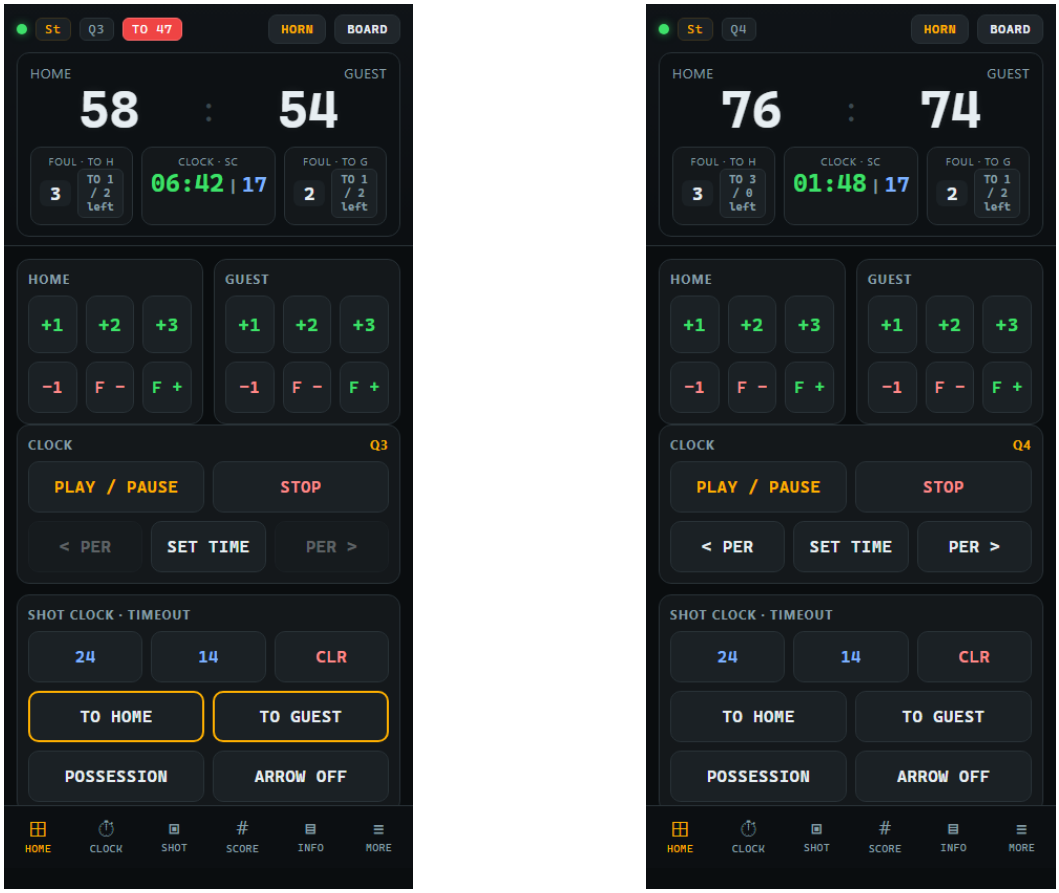


Figure 195. Left: a time-out of the guest team is running. Right: fourth quarter under two minutes, the home team has used three time-outs and has none left.

1. Stop the game clock. A time-out cannot be started from the page while the game clock runs.
2. Tap TO HOME or TO GUEST. The countdown starts with the time-out length of the control panel, the time-out is counted and the red chip TO with the seconds appears in the header. Both time-out buttons get an amber frame, and the period buttons are grey.
3. Wait for the end of the countdown. The signal sounds on the PC and the game clock can be started again.

- To cancel a running time-out, tap TO HOME or TO GUEST again; either button stops the countdown. A cancelled time-out is given back to the team. To end a time-out early and keep it counted, correct the number used afterwards (tap "TO n / m left").
- A time-out is refused when the team has none left. Nothing starts, the numbers do not change, and neither the page nor the PC shows a message. On the control panel the operator is asked in this case and can start the time-out anyway; from the page this is not possible.
- PLAY / PAUSE is ignored while the time-out countdown runs.

13.13.3 Possession Arrow

- POSSESSION: the first tap gives the arrow to the home team. Every further tap switches the side. The button shows the side in amber: "<< HOME BALL" or "GUEST BALL >>".
- ARROW OFF removes the arrow; the button reads POSSESSION again.
- The board shows the arrow in the designs that have a place for it (chapter 5).

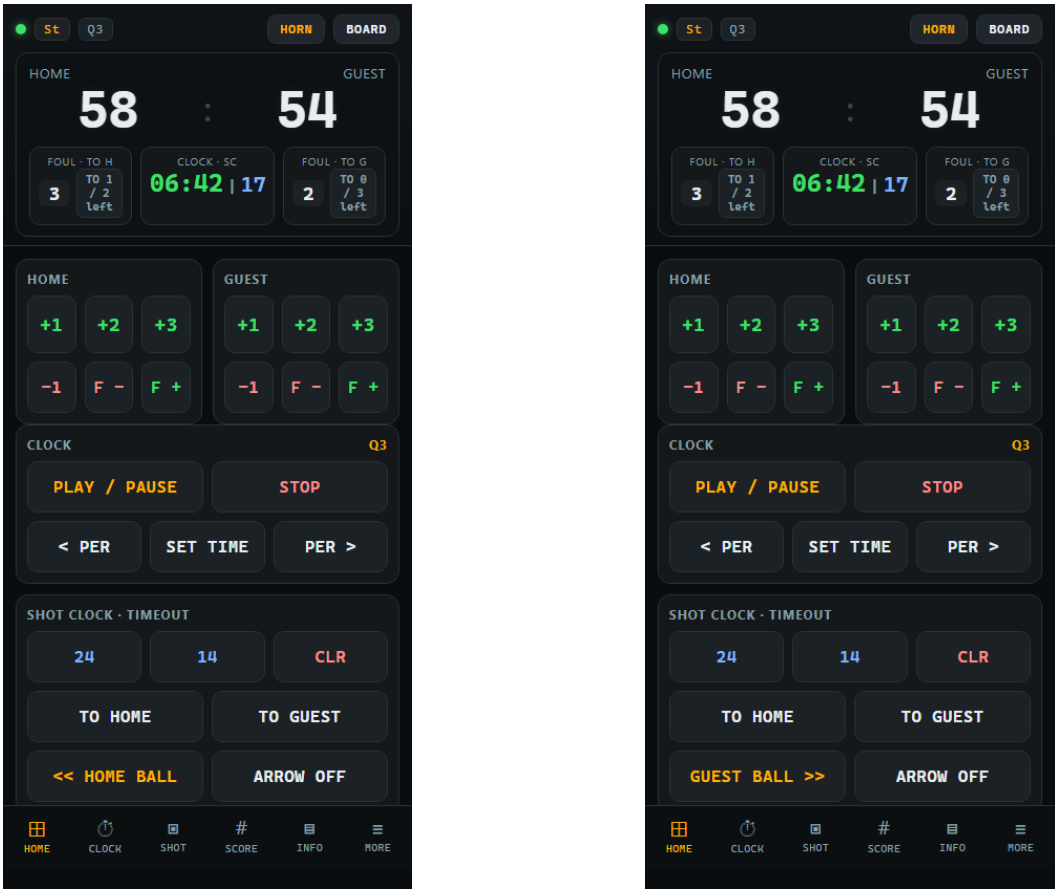


Figure 196. The possession button with the arrow on the home side and on the guest side.

13.14 Several Phones at Once

The page can be open on several devices at the same time. All of them log on with the same PIN and see the same page. The program keeps no list of devices.

Use up to four phones or tablets at the same time. This is the recommended number; it covers the usual set-up of one to four referees or operators. In a load test on one PC with four and with eight simulated phones the program answered every request in a few milliseconds and the control panel did not become slower.

13.14.1 One Device for Each Task

Give each official a device of his or her own and one task. The tabs CLOCK, SHOT and SCORE are made for this: each shows one task with large buttons.

Official	Tab	Controls of this person
Timekeeper	CLOCK; HOME for the time-outs	PLAY / PAUSE, the period, SET TIME; TO HOME and TO GUEST
Shot clock operator	SHOT	RESET 24, RESET 14, CLEAR, the shot clock value
Scorer	SCORE; HOME for the arrow	Points, team fouls; POSSESSION and ARROW OFF
Graphics operator	INFO; MORE	Info screens, display mode, media, names and text lines

The operator at the PC counts as one more device: the control panel and the pages change the same values.

13.14.2 When Two People Change the Same Value

Value	How the page sends it	When two devices act at the same moment
Score, team fouls, time-outs used	As the new total. The page adds your tap to the number it shows and sends the result.	The later request wins. A phone that has not yet received the change of the other phone sends a total without it, and that change is lost.
PLAY / PAUSE, POSSESSION, TO HOME, TO GUEST	As a press of the button.	The two presses undo each other: the clock starts and is paused again; the time-out starts and is cancelled.
< PER, PER >	As one step.	Two steps: the period moves on twice.
STOP	As a press of the Stop button.	The first press stops the clock; the second press sets it back to the full period time.
24, 14, CLR, a typed value, a display mode, an info screen	As the value itself.	No conflict: both requests give the same result.

After you tap a score or foul button, or save a score, a foul number or a time-out number, your phone shows your own number for 1.2 seconds and ignores the numbers the program reports during that time. After that the page shows the numbers of the program again; a correction by another person appears then.

13.14.3 What the Program Refuses

Request	Refused when
Start of the game clock	A time-out countdown is running; the clock stands at 00:00
Start of a time-out	The game clock is running; the team has no time-out left
Period sheet, < PER, PER >	The game clock or a time-out countdown is running

Everything else is accepted at any time. The page gets no message when a request is refused; you see that nothing has changed.

13.15 Phones and Tablets

- The page is made for a phone held upright. The pictures of this chapter show it at 390 x 844 points, the size of a common phone.
- On a tablet or a computer the page keeps the width of a phone (at most 560 pixels) and stands in the middle of the screen. There is no separate tablet layout.
- The phone must stay awake: set the screen lock of the phone to a longer time for the match.

13.16 Limits and Security

- The page is served over plain HTTP. There is no HTTPS. The PIN is part of the address of every request and travels through the network in clear text; after the logon it is also visible in the address bar and in the history of the browser.
- There is one PIN for everybody, made of digits, with no user names and no roles. Every device with the address and the PIN can change everything the page offers. A wrong PIN is not counted and never locks the page.
- Change the PIN from 123456 to your own before the first match, and tick Disable when the remote control is not needed.
- The page is in English, except the texts of the INFO tab, which follow the language of the program.
- The page has no controls for player points and player fouls, statistics tables, the banner or the designs. Use the PC for these.

14. Integration: HTTP, TCP and UDP

Other programs and devices can exchange live data with basketBoard 7. A remote control or an automation sends commands. A scoreboard console drives the board. An LED controller or a graphics system reads the state. This chapter is for the person who connects such a system. Appendix C lists every command, key and reply in tables.

14.1 The Three Channels

Channel	Direction	Use it for	Access
HTTP, TCP port 1907	In and out	Single commands sent as web addresses, and reading the state on request (cmd=GET). The remote page of chapter 13 uses this channel.	PIN in every request
Data Socket, TCP port 2907	In	A scoreboard console or a statistics program that keeps sending score, clocks, team fouls, names and player values.	No PIN
State broadcast, UDP port 2908	Out	Listeners that need the state ten times a second without asking: LED frames of the backboards, extra displays, stream overlays.	None, one way

Which channel to use:

- **Single commands.** You send a command now and then (a button on a phone, a macro of a production switcher): HTTP 1907.
- **Reading the state now and then.** A graphics system or a logger reads the score every second or less often: HTTP 1907 with cmd=GET.
- **A console that drives the board.** A table console or a statistics system sends score, clocks and fouls all the time: TCP 2907.
- **Fast state without asking.** An LED controller needs the horn moments and the clocks at once: UDP 2908.

The three channels are independent and can run at the same time. A common set-up: a table console drives the board over TCP 2907, while the LED controller of the backboards listens to UDP 2908.

All servers listen on every network adapter of the PC. From a program on the same PC use 127.0.0.1. From another device use the IP address of the PC, for example 192.168.1.50. The Remote Control settings show this address (chapter 13).

The ports are fixed. They cannot be changed.

14.2 Switching the Channels On

Each channel is switched on by the operator. The program remembers the choice in start.xml and opens the channel again at the next start.

Channel	Switched on with	Shown as on	Remembered in start.xml
HTTP 1907	Settings > "Remote Control": clear the "Disable" box (chapter 13)	No red bar on the "Disable" box	REMOTE/Open

Channel	Switched on with	Shown as on	Remembered in start.xml
TCP 2907	Game page: the "Scoreboard Console" button (plug icon at the right edge), then answer the question with Yes	The button is green	DATASOCKET/Open
UDP 2908	Game page: the "UDP" button at the right edge	The button is green	UDP/Open

14.2.1 HTTP 1907

1. Click Settings, then "Remote Control". The antenna button at the right edge of the Game page opens the same page.
2. Clear the "Disable" box. The server starts.
3. Note the PIN. It is 123456 on a new installation. To change it, type a new PIN (digits only, at most six) and click the save icon beside the field.

Every request must carry this PIN. "Show API Commands" on the same page opens the file API_Commands.txt, the reference of the program maker.

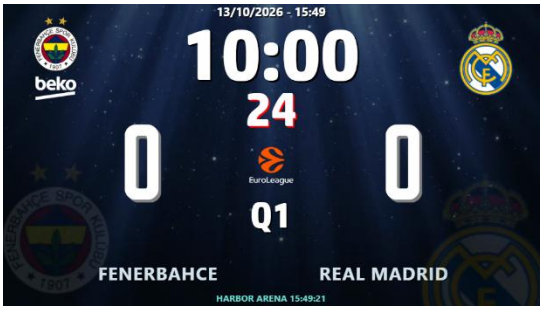
14.2.2 TCP 2907: the Scoreboard Console Button

1. On the Game page, click the "Scoreboard Console" button (the plug icon, below "UDP").
2. The program asks: "Data Will Be Read Via TCP Port 2907. The System Will Automatically Switch To Electronic Controller Mode And Received Data Will Be Displayed On The Scoreboard."
3. Answer Yes. The button turns green and the server listens on port 2907.

While the console mode is on, the manual controls of the Game page are hidden: the score buttons, the team-foul arrows, Start and Stop, the shot clock buttons, the period arrows, the time-out buttons and the time-out indicators. The console is now the source of the board.

- A second click on the button switches the console mode off, without a question. The controls come back.
- After a restart with the console mode remembered, the server starts without the question and the controls stay hidden. Click the green button to get them back.

Board Output **Control Panel**



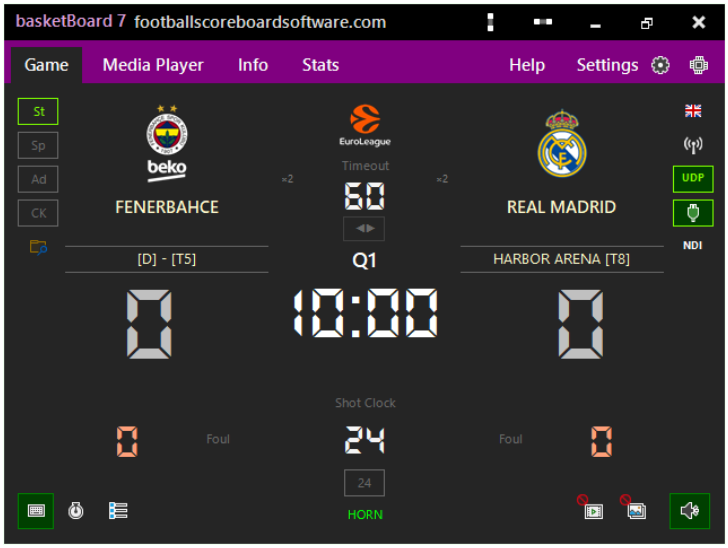


Figure 197. Console mode on: the board (left) and the Game page (right). "UDP" and "Scoreboard Console" are green; the score, foul, clock, shot clock, period and time-out buttons are hidden.

14.2.3 UDP 2908

Click the "UDP" button on the Game page (tool tip "UDP Broadcast"). It turns green and the broadcast starts. A second click stops it.

14.3 Only One Side Drives Each Clock

Each clock must be driven by one side only. The values of a console are written into the same boxes as the values of the control panel.

- If a console sends the game clock (CHRONO), the shot clock (SC) or the time-out countdown (TIMEOUT), the operator must not run the clock of the program at the same time. Nobody may start it from the remote page or over HTTP either.
- A running clock of the program overwrites the value of the console ten times a second. The two sources then fight, and the board jumps.
- In console mode Start and Stop are hidden for this reason. The keyboard shortcuts, the remote page and HTTP still work: do not use them for the values the console sends.
- The period is not sent by the console. The operator selects it, or an HTTP client sends set_period (chapter 14.4.5).

14.4 HTTP on Port 1907

14.4.1 Request Format

```
http://<address>:1907/api.html?pin=<PIN>&cmd=<command>&value=<value>$
http://192.168.1.50:1907/api.html?pin=123456&cmd=set_home_score&value=12$
```

- A request is a plain HTTP GET to /api.html. A browser, curl, a script or any program can send it.
- Every request ends with the character $. Without it the answer is #Invalid API Request.
- The parameters pin, cmd and value can come in any order.
- The PIN is the one of the Remote Control settings. A PIN with other characters than digits counts as wrong.
- Write the command names exactly as in Appendix C: lower case, and GET in capitals. A command in other letters may be carried out, but the answer is #Invalid API Command.
- Leave value out for a command without a value.
- The server reads one request per connection and closes the connection after the answer. It reads the first 1024 bytes of a request; keep a request shorter, or its end (with the $) is lost.

Values are written in URL encoding (UTF-8):

Character in the value	Write it as
Space	%20 or +
+	%2B
&	%26
$	%24
| (info screen commands)	%7C
= (info screen commands)	%3D
Other characters (Ç, Ş, Ü ...)	Their UTF-8 code, for example %C3%9C for Ü

- The program splits the request first and decodes each value after. An encoded & or $ stays text: set_home_team with A%26B%24C sets the name A&B$C.
- In team names (set_home_team, set_guest_team) and in the text lines (line_text_1, line_text_2) the underscore _ starts a new line: FENERBAHCE_BEKO shows two lines.
- In the text fields of the info screens the underscore _ is a space (chapter 14.4.8).

A browser that repeats the same address may answer from its cache. When you poll from a browser page, put a changing parameter in front of pin, for example:

```
http://192.168.1.50:1907/api.html?_=1736500000001&pin=123456&cmd=GET$
```

Scripts and programs do not need it.

14.4.2 Replies

Every answer is a short text inside html tags, for example <html>!12::set_home_score</html>. The answer to cmd=GET is an XML document.

Answer	Meaning
!command	The request was understood (command without a value), for example !horn.
!value::command	The request was understood. The value is repeated, for example !12::set_home_score.
#Invalid API Request	The address has the wrong form: the $ is missing, the path is not /api.html or the method is not GET.
#Invalid PIN	The PIN is wrong or missing.
#Invalid API Command	The command is not known.
#BAD_TIME::set_chronometer	The time is not valid or is longer than the current period. Nothing was changed.
#BAD_TIME::set_shotclock	The shot clock value is not valid, is empty or is above the full shot clock value of the rules. Nothing was changed.
#BAD_VALUE::command	set_home_score, set_guest_score, set_home_foul or set_guest_foul with a value that is not a whole number from 0 to 999, or set_period with a value that is not a whole number from 1 to 20. Nothing was changed.
# followed by a text	An internal error with its message.

- The PIN is checked first. A wrong PIN is answered with #Invalid PIN, whatever the command.
- For #BAD_TIME and #BAD_VALUE the program log has a line with the value and the reason (chapter 16).
- An answer that starts with ! says that the request was understood. It does not say that something changed. A time-out refused because none is left, or a period change refused while the clock runs, is answered with ! all the same. Read the state with cmd=GET to see the result.

14.4.3 Score and Team Fouls

Command	Value	What it does
set_home_score, set_guest_score	Whole number, 0 to 999	Sets the score.
set_home_score_up, set_guest_score_up	None	Adds one point.
set_home_score_down, set_guest_score_down	None	Takes one point back, not below 0.
set_home_foul, set_guest_foul	Whole number, 0 to 999	Sets the team fouls. The bonus follows the rules.

Any other value (a text such as abc, a negative or a decimal number) is answered with #BAD_VALUE and changes nothing.

> **Note:** In Demo mode set_home_score_up and set_home_score_down open the message License Required on the PC and do not change the score. The request is answered only after the operator closes the message. set_home_score with a value works in Demo mode up to 12.

14.4.4 Game Clock and Shot Clock

Command	Value	What it does
set_chronometer	play	Starts the game clock or lets it go on. Ignored while it already runs, during a time-out countdown and at 00:00.
set_chronometer	pause	Pauses the game clock. The time left is kept.
set_chronometer	stop	Like the Stop button: a running clock stops; a stopped clock goes back to the full length of the period.
set_chronometer	Time	Stops the clock and sets it, for example 01:23, 5:00 or 00:42.7. At most the length of the current period.
click	playpause	Like the Start / Pause button.
click	stop	Like set_chronometer with stop.
reset_shotclock	None	Resets the shot clock to the full value of the rules (24).
reset_shotclock14	None	Resets the shot clock to the short value of the rules (14).
clear_shotclock	None	Blanks the shot clock without a horn.
set_shotclock	Seconds	Sets the shot clock, for example 14 or 8.5, from 0 to the full value of the rules. If the game clock runs, the shot clock goes on from this value.

A time that is not valid is answered with #BAD_TIME and changes nothing. The clock keeps its time and goes on running if it runs.

14.4.5 Periods, Time-outs and Possession

Command	Value	What it does
set_period	1 to 20	Selects the period. 1 to N are the regulation periods (N is 4 with quarters, 2 with halves). N + 1 is OT1, N + 2 is OT2 and so on.
click	previous_period, next_period	Selects the period before, or the next period.
timeout_home, timeout_guest	None	Starts the time-out countdown of the team and counts the time-out. Sent again during the countdown, it stops it and gives the time-out back. Not started when the team has no time-out left.
set_home_timeout, set_guest_timeout	0 to 9	Sets the number of time-outs the team has used.
possession	home, guest, none, toggle	Sets the possession arrow to a team, removes it, or switches the side.

- Selecting a period sets the game clock to the period length, resets the shot clock and applies the rules of the period change (chapter 5).
- set_period and the two period clicks are refused while the game clock or a time-out countdown runs. Nothing changes, the answer still starts with !, and the log gets a line with the reason.

14.4.6 Texts, Views, Horn, Sound and Media

Command	Value	What it does
set_home_team, set_guest_team	Text	Sets the team name. _ starts the second line.
line_text_1, line_text_2	Text	Sets the two text lines. [D] is the date, [T] the time of day, [T8] its first eight characters (hh:mm:ss), [T5] its first five (hh:mm).
match	None	Returns the board to the scoreboard and the main window to the Game page.
click	st, sp, ad, ck	Selects the display mode Standard, Sponsored, Advertisement or Chroma Key, and returns to the scoreboard.
horn	None	Sounds the horn on the PC. Silent while the sound is off.
volume	0 or 1	Switches the sound of the control panel (horns and buzzers) off or on. It is not the volume of the media player.
start_playlist	1 to 6	Opens the Media Player page and starts the playlist. While a playlist plays, the command stops it. Without a value: playlist 1.
start_playlist_ad_screen	1 to 6	Switches to Advertisement mode and does the same with the playlists of the Advertisement media player.

14.4.7 Examples

In a browser or as a link:

```
http://192.168.1.50:1907/api.html?pin=123456&cmd=set_home_team&value=FENERBAHCE$
http://192.168.1.50:1907/api.html?pin=123456&cmd=set_guest_team&value=REAL%20MADRID$
```

```
http://192.168.1.50:1907/api.html?pin=123456&cmd=possession&value=toggle$
```

With curl:

```
curl "http://192.168.1.50:1907/api.html?pin=123456&cmd=reset_shotclock$"
curl "http://192.168.1.50:1907/api.html?pin=123456&cmd=set_chronometer&value=05:00$"
curl "http://192.168.1.50:1907/api.html?pin=123456&cmd=GET$"
```

With PowerShell (single quotes, so that $ stays as it is):

```
$base = 'http://127.0.0.1:1907/api.html?pin=123456&cmd='
(Invoke-WebRequest -UseBasicParsing ($base + 'timeout_home$')).Content
$xml = [xml](Invoke-WebRequest -UseBasicParsing ($base + 'GET$')).Content
$xml.Response.Item.HomeScore
$xml.Response.Item.Timeout_H_Left
```

14.4.8 Info Screens over HTTP

Four commands put the info screens of chapter 10 on the air. The screens are those of the active rules preset. In St, Sp and Ad they show as a full page; in CK as a lower third under the scorebug.

Command	Value	What it does
info_show	Screen[|Field=value|...]	Saves the fields given, then shows the screen.
info_hide	None	Takes the info screen off: back to the scoreboard, or the lower third fades out.
info_set	Field=value	Saves one field without showing a screen.
info_list	List=c1~c2|c1~c2	Replaces a list (the officials). An empty list clears it.

Example: the 3-point basket of number 24 of the home team. The value is Score|Score.Side=Home|Score.Player=24|Score.Kind=ThreePoints, encoded:

```
http://127.0.0.1:1907/api.html?pin=123456&cmd=info_show&value=Score%7CScore.Side%3DHome%7CScore
.Player%3D24%7CScore.Kind%3DThreePoints$
http://127.0.0.1:1907/api.html?pin=123456&cmd=info_hide$
http://127.0.0.1:1907/api.html?pin=123456&cmd=info_set&value=Foul.Kind%3DTechnical$
http://127.0.0.1:1907/api.html?pin=123456&cmd=info_list&value=Officials.Rows%3DCrew_Chief~A._Re
f%7CUmpire~B._Ref$
```

- A player is given by shirt number or by name, from the squad of the team.
- A choice must be one of the options of the active rules preset, for example Foul.Kind=Unsportsmanlike under FIBA, Flagrant1 under NBA or NCAA. A value that does not apply is ignored and logged.
- A screen name that is not known is ignored. The answer starts with ! all the same; read InfoOnAir with cmd=GET.
- Appendix C lists every screen and field.
- The info screens are not part of TCP 2907 or UDP 2908.

14.4.9 Reading the State: cmd=GET

```
http://192.168.1.50:1907/api.html?pin=123456&cmd=GET$
```

The answer is an XML document: a Response element with one Item. Read the elements by name, not by position. A shortened example:

```
<Response>
  <Item>
    <BoardType>St</BoardType>
    <Home>FENERBAHCE</Home>
    <HomeScore>42</HomeScore>
    <Guest>REAL MADRID</Guest>
    <GuestScore>38</GuestScore>
    <Period>2</Period>
    <PeriodText>Q2</PeriodText>
    <Chronometer>07:35.4</Chronometer>
    <StatusChronometer>true</StatusChronometer>
    <ShotClock>17.6</ShotClock>
    <Possession>H</Possession>
    <InfoOnAir></InfoOnAir>
  </Item>
</Response>
```

Element	Meaning
BoardType	Display mode: St, Sp, Ad or CK
Home, Guest	Team names. A name of two lines contains a line break.
HomeScore, GuestScore	Scores
HomeFoul, GuestFoul	Team fouls
HomeBonus, GuestBonus	true when the team is in the bonus, else false
HomeBonusLevel, GuestBonusLevel	0 = no bonus, 1 = bonus, 2 = double bonus (second limit)
Period	Period number. Above the regulation periods it is an overtime.
PeriodText	Period label as shown: Q1 to Q4, 1H, 2H, OT1, OT2 ...
RegulationPeriods	Regulation periods of the active rules: 4 or 2
OvertimeNumber	0 in regulation time, 1 = OT1, 2 = OT2 ...
Possession	Possession arrow: H, G or empty
Chronometer	Game clock, the text of the clock box of the control panel
StatusChronometer	true while the game clock of the program runs
ShotClock	Shot clock, the text of its box; empty when blank
StatusTimeout	true while a time-out countdown runs
Timeout_Timer	Time-out countdown in seconds; the time-out length while none runs
Timeout_H, Timeout_G	Time-outs used in the current half, game or overtime
Timeout_H_Left, Timeout_G_Left	Time-outs left under the active rules
Extra01, Extra02	The two text lines as typed, with their codes ([D], [T5] ...)
PlaylistStarted	Playlist started on the media player (0 = none)
AdPlaylistStarted	Playlist started on the Advertisement media player (0 = none)
Sound	Sound switch of the control panel: 1 = on, 0 = muted

Element	Meaning
InfoOnAir	The key of the info screen on the air, for example Score; empty when none
InfoScreens	The info screens of the active rules preset: Key~Label|Key~Label ...
Labels	The texts of the INFO card of the remote page in the active language: Key~Text|...

- To follow the state, poll cmd=GET, for example every 600 milliseconds. For horn moments and LED control use UDP 2908 instead.
- Chronometer and ShotClock are the raw texts of the control panel: mm:ss.t with tenths while the clock has been running (06:38.3), mm:ss after a period was selected (10:00); the shot clock as 13.3, 04.3, 24 or empty. UDP 2908 uses another form (chapter 14.6.3). A client must accept both.

14.5 TCP Data Socket on Port 2907

The Data Socket is made for an electronic scoreboard console or a statistics system that keeps the board up to date by itself. The operator starts it with the "Scoreboard Console" button (chapter 14.2.2). There is no PIN on this channel: switching it on is the operator's decision.

14.5.1 Line Format

- Connect once with TCP and keep the connection open. Several clients can be connected at the same time.
- Send text lines in UTF-8, each ended with LF or CR LF. One line is one message.
- The fields of a line are separated by semicolons. A field has the form KEY=VALUE. The keys are not case sensitive, and the order does not matter. A value cannot contain a semicolon.
- A field without = is a command name: ROSTER or PLAYER. A line without a command name is scoreboard data.
- The program answers every line with one line. An answer that starts with ! is a success, # is an error. An empty line gets no answer.
- The program keeps no state per connection. After a lost connection, connect again and go on.

14.5.2 Scoreboard Data

```
HOMESCORE=78;GUESTSCORE=65;CHRONO=07:42;SC=14
```

Only the keys you send are changed. Everything else keeps its value.

Key	Example	Meaning
HOMESCORE, GUESTSCORE	78	Scores
HOMENAME, GUESTNAME	REAL\nMADRID	Team names. The two characters \n start a second line.
CHRONO	07:42	Game clock: mm:ss, m:ss or mm:ss.t up to 99:59.9, or ss.t (seconds only, up to 59.9)
SC	14	Shot clock: seconds, 0 to 99.9, tenths allowed (4.3). 0 is the expired shot clock; an empty value blanks it.

Key	Example	Meaning
HOMEFOUL, GUESTFOUL	3	Team fouls. The bonus follows the rules of the program.
TIMEOUT	45	Time-out countdown in whole seconds, 0 to 300. An empty value ends it.
EXTRA1, EXTRA2	FINAL FOUR	The two text lines. \n starts a new line.
POSS	H	Optional. Possession arrow: H or G; an empty value removes it.
HOMETO, GUESTTO	2	Optional. Time-outs used by the team, 0 to 9.

- The console is the authority for the clocks. CHRONO, SC and TIMEOUT are checked only for their form and their upper limit; the period length and the shot clock value of the rules do not limit them.
- A key with a bad value is skipped alone. The other keys of the line are still taken.
- TIMEOUT takes whole seconds only. Send TIMEOUT=45, not 0:45. Send the value every second during the time-out. TIMEOUT only shows the countdown; send HOMETO or GUESTTO for the number used.
- There is no key for the period. A console that wants its period shown sends it as text in EXTRA1.
- POSS, HOMETO and GUESTTO were added later (protocol v1.1). A console that does not send them is not affected.

14.5.3 ROSTER and PLAYER

ROSTER sends the squad of a team:

```
ROSTER;TEAM=H;LIST=4,John Smith,P|7,Mike Doe,P|11,Alan Poe,S
```

- TEAM is H (home) or G (guest), in capital letters.
- LIST holds the players, separated by |. Each player is number,name or number,name,group. The group is P for the starting five (assumed when left out) or S for a substitute. A name cannot contain a comma, | or a semicolon.
- The squad is stored, and the points and fouls of that team's players are cleared. If the Player Stats window is open, its list is refreshed at once (chapter 7).

PLAYER sends the totals of one player:

```
PLAYER;TEAM=H;NO=4;FOUL=2;PTS=7
```

- TEAM, NO, FOUL and PTS are all required. FOUL and PTS are totals, not steps.
- The number is matched without leading zeros: 07 is the same as 7.
- The line is applied only while the Player Stats window is open on the PC. Otherwise the answer is !IGNORED:FORM_CLOSED, which is not an error.
- Send ROSTER first, so that the numbers match.

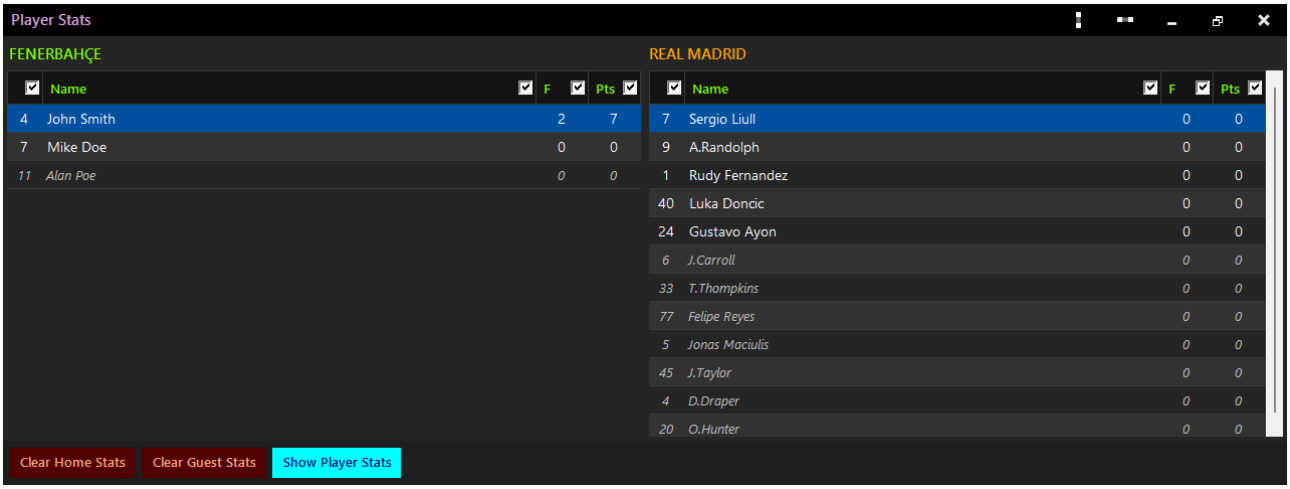


Figure 198. The Player Stats window after the ROSTER line above and PLAYER;TEAM=H;NO=4;FOUL=2;PTS=7. The substitute is shown in italics.

14.5.4 Replies

The program uses these replies. Where they differ from the reply list of API_Commands.txt, the program's reply is given.

Reply	Meaning
!OK:n	Scoreboard data taken; n = number of KEY=VALUE fields taken. A key the program does not know is counted and ignored.
!OK:n #BAD_TIME:K1,K2	Scoreboard data taken except the keys named (CHRONO, SC or TIMEOUT with a bad value). n counts the keys taken and is 0 when none was. A client that checks only the !OK at the start needs no change.
!OK:ROSTER:n	Squad stored; n players
!OK:PLAYER	Player values taken
!IGNORED:FORM_CLOSED	PLAYER received while the Player Stats window is closed
#NO_DATA	The line has no KEY=VALUE field
#UNKNOWN_COMMAND:name	The command name is not ROSTER or PLAYER
#INVALID_TEAM	TEAM is missing or is not H or G
#INVALID_LIST	ROSTER without LIST, or with an empty LIST
#EMPTY_ROSTER	LIST holds no usable player (for example LIST=abc)
#ROSTER_WRITE_FAILED	The squad file could not be written
#INVALID_NO	PLAYER without NO, or with an empty NO
#MISSING_FOUL, #MISSING_PTS	PLAYER without FOUL or without PTS
#PLAYER_NOT_FOUND:no	The number is not in the squad of that team (also a number like x)
#APP_CLOSING	The program is closing
#ERROR:text	An unexpected error with its message

14.5.5 Example Session

Lines that start with an arrow are the answers of the program.

```
ROSTER;TEAM=H;LIST=4,John Smith,P|7,Mike Doe,P|11,Alan Poe,S
  -> !OK:ROSTER:3
HOMENAME=FENERBAHCE;GUESTNAME=REAL MADRID;HOMESCORE=0;GUESTSCORE=0;CHRONO=10:00
  -> !OK:5
HOMESCORE=12;GUESTSCORE=8;CHRONO=06:31;SC=18
  -> !OK:4
POSS=H;HOMETO=1
  -> !OK:2
TIMEOUT=60
  -> !OK:1
TIMEOUT=
  -> !OK:1
CHRONO=99:99;HOMESCORE=14
  -> !OK:1 #BAD_TIME:CHRONO
PLAYER;TEAM=H;NO=4;FOUL=2;PTS=7
  -> !OK:PLAYER
PLAYER;TEAM=H;NO=99;FOUL=0;PTS=0
  -> #PLAYER_NOT_FOUND:99
```

A quick test from PowerShell on the same PC:

```
$c = New-Object Net.Sockets.TcpClient('127.0.0.1', 2907)
$s = $c.GetStream()
$w = New-Object IO.StreamWriter($s, (New-Object Text.UTF8Encoding $false))
$w.AutoFlush = $true
$r = New-Object IO.StreamReader($s, [Text.Encoding]::UTF8)
$w.WriteLine('HOMESCORE=78;GUESTSCORE=65;CHRONO=07:42')
$r.ReadLine()
$c.Close()
```

14.5.6 A Clock Driven by a Console

When a console sends the game clock and the shot clock, the clock of the program stands still. The program works out the running state and the horn fields of the UDP broadcast from the values it receives.

Field of UDP 2908	With a console-driven clock
RUN	1 while the CHRONO values count down. A value counts as a step when it is lower than the value before by at most two seconds. RUN stays 1 for 1.5 seconds after the last step.
HORN_MAIN	1 for about three seconds when CHRONO steps down to zero, for example 00:01 followed by 00:00
HORN_SC	1 for about three seconds when SC steps down to zero, for example SC=1 followed by SC=0
SC	0 after SC=0; empty after an empty SC
PERIOD, OT	The period of the program, selected by the operator

- Send CHRONO at least once a second while the clock runs. Otherwise RUN drops to 0 in between.
- A value that jumps is not a step: a reset to 10:00, a correction, a step of more than two seconds, or 00:00 sent while the clock was not counting. It raises no horn field.

- An empty SC blanks the shot clock and is not an expiry. A console that blanks its shot clock at the violation instead of showing 0 produces no HORN_SC.
- The program plays no horn sound for a console-driven clock. The console has its own horn.

14.5.7 The EFAB UART Bridge

The bridge (basketBoard7Bridge, also called ScoreboardBridge) is a separate program. It connects a scoreboard console of EFAB LED Solutions to basketBoard 7. It reads the serial port (UART) of the console and sends what the console shows over TCP 2907, to the same PC (127.0.0.1) or to the PC of basketBoard 7 in the network.

> **Note:** The bridge and the console hardware were not tested with this version. Its line format (CHRONO as mm:ss, SC in whole seconds or empty, scores, team fouls, EXTRA1, PLAYER) was sent over TCP 2907 and works as described in this chapter.

1. Start basketBoard 7 and switch on the "Scoreboard Console" button.
2. Connect the console to the PC with the serial cable or a USB serial adapter.
3. In the bridge choose the COM port of the console and the baud rate 9600. Enter the address of the basketBoard 7 PC and port 2907.
4. Press START.

The bridge sends	As
Game clock	CHRONO, as mm:ss
Shot clock	SC, whole seconds; an empty SC when the console blanks it
Scores	HOMESCORE, GUESTSCORE
Team fouls	HOMEFOUL, GUESTFOUL
Period of the console	Text in EXTRA1 (option "Send period to EXTRA1", on by default)
Player number, fouls and points	PLAYER lines (option "Forward player stats (PLAYER)", off by default); a ROSTER built from the numbers (option "Auto-send roster (numbers as names)", off by default)

- The bridge does not send POSS, HOMETO or GUESTTO, and it does not listen to UDP 2908.
- The period of the console appears only as text in the first text line. The period of basketBoard 7 (team-foul reset, time-outs left, PERIOD and OT of UDP 2908) is still selected by the operator.
- PLAYER lines need the open Player Stats window and a squad with the same numbers as on the console.
- With the bridge, RUN, HORN_MAIN and HORN_SC of the UDP broadcast follow the clock of the console (chapter 14.5.6).

14.6 UDP State Broadcast on Port 2908

The broadcast sends the state of the match to everybody who listens. It is one way: a listener sends nothing back. There is no connection and no PIN.

14.6.1 Transport

- UDP to port 2908. The port cannot be changed.
- The destination is the broadcast address 255.255.255.255. To send to one device only, close the program and write its IP address into start.xml, section UDP, value TargetIP.

- One packet about every 100 milliseconds, ten a second (start.xml, UDP, SendIntervalMs). Do not rely on the exact interval.
- A packet is one line of UTF-8 text, ended with LF, about 210 bytes long and never above 256 bytes.
- The listener opens a UDP socket on port 2908 on all its interfaces and reads the packets.
- A broadcast does not pass a router. The listener must be in the same network segment, or be addressed with TargetIP. Some managed switches and Wi-Fi access points filter broadcasts.

14.6.2 Packet Format

```
BB7;SEQ=1024;PERIOD=2;CHRONO=07:32;RUN=1;SC=14;HORN_MAIN=0;HORN_SC=0;HOMESCORE=52;GUESTSCORE=48
;HOMEFOUL=3;GUESTFOUL=5;TO_ACTIVE=0;TO_TIMER=;TO_H=2;TO_G=1;BONUS_H=0;BONUS_G=1;TO_LEFT_H=0;TO_
LEFT_G=1;POSS=H;OT=0
```

The first field is always the text BB7. All other fields have the form KEY=VALUE, separated by semicolons. Appendix C lists every key.

Read a packet like this:

1. Split the line at the semicolons.
2. Drop the packet if the first part is not BB7.
3. Split every other part at its first = sign into key and value.
4. Treat the keys as not case sensitive and do not rely on positions.
5. Accept an empty value (SC= means a blank shot clock).
6. Skip keys you do not know. Later versions may add keys at the end.

14.6.3 Values, Tenths and Overtime

- CHRONO always has two digits for the minutes and two for the seconds: 07:32, 00:00. Below one minute a tenth is added: 00:42.7. The limit is a rules setting (60 seconds by default; chapter 6).
- SC is a whole number of seconds above five seconds (14) and has one tenth at five seconds and below (4.3). SC is 0 after the shot clock has expired. SC is empty when the shot clock is blank: cleared, switched off or after the end of a period. Blank your display then.
- RUN is the game clock. It stays 1 after a shot clock violation until the game clock is stopped.
- TO_TIMER is filled only while TO_ACTIVE is 1.
- PERIOD counts through the whole match. N + 1 is the first overtime, where N is the number of regulation periods. OT gives the overtime number alone.

Rules	Regulation	First overtime	Second overtime
Four quarters (FIBA, FIBA 4x8, NBA, NCAA W)	PERIOD=1 to 4, OT=0	PERIOD=5, OT=1	PERIOD=6, OT=2
Two halves (NCAA M)	PERIOD=1 to 2, OT=0	PERIOD=3, OT=1	PERIOD=4, OT=2

14.6.4 Horn Windows: HORN_MAIN and HORN_SC

The two horn fields are states, not single events. When the game clock runs down to zero, HORN_MAIN is 1 in every packet for about three seconds (start.xml, UDP, HornWindowMs, 3000), then 0 again. HORN_SC does the same when the shot clock expires.

- Let a lamp follow the field: on while the newest packet says 1, off while it says 0.
- Do not wait for the single change from 0 to 1. UDP packets can be lost; the three seconds are there so that a lost packet does not hide the horn.

- The fields come from real expiries only. A reset, Clear, a period change, a clock typed as 00:00 or a start at 00:00 do not raise them.
- If no packet arrives for more than two seconds, switch every lamp off. The operator may have stopped the broadcast, or the program was closed.
- SEQ is for diagnosis. A gap means lost packets, which is normal. A SEQ that jumps far back means that the program was restarted.

Examples:

```
Last minute, shot clock under five seconds:
BB7;SEQ=1650;PERIOD=4;CHRONO=00:42.7;RUN=1;SC=4.3;HORN_MAIN=0;HORN_SC=0;HOMESCORE=71;GUESTSCORE
=70;HOMEFOUL=4;GUESTFOUL=5;TO_ACTIVE=0;TO_TIMER=;TO_H=2;TO_G=3;BONUS_H=0;BONUS_G=1;TO_LEFT_H=1;
TO_LEFT_G=0;POSS=G;OT=0

Shot clock expired, game clock still running:
BB7;SEQ=1893;PERIOD=2;CHRONO=05:11;RUN=1;SC=0;HORN_MAIN=0;HORN_SC=1;HOMESCORE=52;GUESTSCORE=48;
HOMEFOUL=3;GUESTFOUL=5;TO_ACTIVE=0;TO_TIMER=;TO_H=2;TO_G=1;BONUS_H=0;BONUS_G=1;TO_LEFT_H=0;TO_L
EFT_G=1;POSS=H;OT=0

End of the period:
BB7;SEQ=2210;PERIOD=2;CHRONO=00:00;RUN=0;SC=;HORN_MAIN=1;HORN_SC=0;HOMESCORE=52;GUESTSCORE=48;H
OMEFOUL=3;GUESTFOUL=5;TO_ACTIVE=0;TO_TIMER=;TO_H=2;TO_G=1;BONUS_H=0;BONUS_G=1;TO_LEFT_H=0;TO_LE
FT_G=1;POSS=H;OT=0
```

14.6.5 A Minimal Listener

To see whether packets arrive at all, run this in PowerShell on the listening computer (stop with Ctrl+C):

```
$u = New-Object System.Net.Sockets.UdpClient(2908)
$ep = New-Object System.Net.IPEndPoint([System.Net.IPAddress]::Any, 0)
while ($true) { [Text.Encoding]::UTF8.GetString($u.Receive([ref]$ep)) | Write-Host -NoNewline }
```

With the broadcast on, about ten lines a second appear. Set the game clock to 00:05, start it and let it run out: lines with HORN_MAIN=1 follow for about three seconds.

Python 3, with the two-second fail-safe:

```
import socket

s = socket.socket(socket.AF_INET, socket.SOCK_DGRAM)
s.setsockopt(socket.SOL_SOCKET, socket.SO_REUSEADDR, 1)
s.bind(("0.0.0.0", 2908))
s.settimeout(2.0)

while True:
    try:
        data, addr = s.recvfrom(1024)
    except socket.timeout:
        print("no packets for 2 s: all lamps off")
        continue
    line = data.decode("utf-8").strip()
    if not line.startswith("BB7"):
        continue
    f = {}
    for part in line.split(";")[1:]:
        if "=" in part:
            k, v = part.split("=", 1)
            f[k.upper()] = v
    red_frame = f.get("HORN_MAIN") == "1"
    yellow_lamp = f.get("HORN_SC") == "1"
    print(f.get("CHRONO"), f.get("SC"), red_frame, yellow_lamp)
```

A receiver in C# is part of API_Commands.txt.

14.7 Ports Busy and Firewall

14.7.1 A Port Is Already in Use

Each channel needs its port. If another program holds the port, basketBoard 7 does not stop: it tells you and works on without that channel.

Port	What you see
TCP 1907	At the start, when the remote control is on: "Remote control is not available: TCP port 1907 could not be opened (port busy). Another program is probably using this port. The scoreboard itself works normally." On the Remote Control page the address field reads "Port 1907: port busy".
TCP 2907	When you switch the console on, and at the start when it was remembered: "Port 2907: port busy" and "The scoreboard console connection could not be started." The button does not turn green, its tool tip shows the reason, and the manual controls stay visible.
UDP 2908	The program only sends on this port, so another program cannot block it. "UDP 2908:" with a reason and "The UDP broadcast could not be started." appear when the broadcast cannot be set up, for example when TargetIP in start.xml is not a valid address.

- The program log has a line for each case (chapter 16).
- To find and close the other program, see chapter 16. Then switch the channel on again, or restart basketBoard 7.

14.7.2 Firewall

Setup adds Windows firewall rules for TCP and UDP port 1907, for incoming TCP port 2907 and for UDP port 2908 (it runs open_firewall_1907.bat from the program folder). If a phone, a console or a bridge on another computer cannot connect, run that file again as administrator.

An installation of an earlier version has no rule for TCP 2907. Run the file of this version, or add the rule in a command prompt started as administrator:

```
netsh advfirewall firewall add rule name="basketBoard 2907 TCP IN" dir=in action=allow
protocol=TCP localport=2907
```

The computer that listens to UDP 2908 needs its own rule for incoming UDP on port 2908:

```
netsh advfirewall firewall add rule name="BB7 UDP 2908" dir=in action=allow protocol=UDP
localport=2908
```

15. Settings Reference

The Settings page holds the licence, the place and size of the board, the entries to the design editor, the remote control, the language and the tutorial videos. Click "Settings" in the menu strip of the main window (chapter 3).

15.1 The Settings Page and Its Tabs

The buttons on the left are the tabs. "License" and "Screen Properties" show their content on the right side of the page. The Board Design, "Remote Control" and "Language" buttons open a page of their own that covers the Settings page until you close it with the red close button at its top right. The Remote Control and Language pages also close with the Esc key.

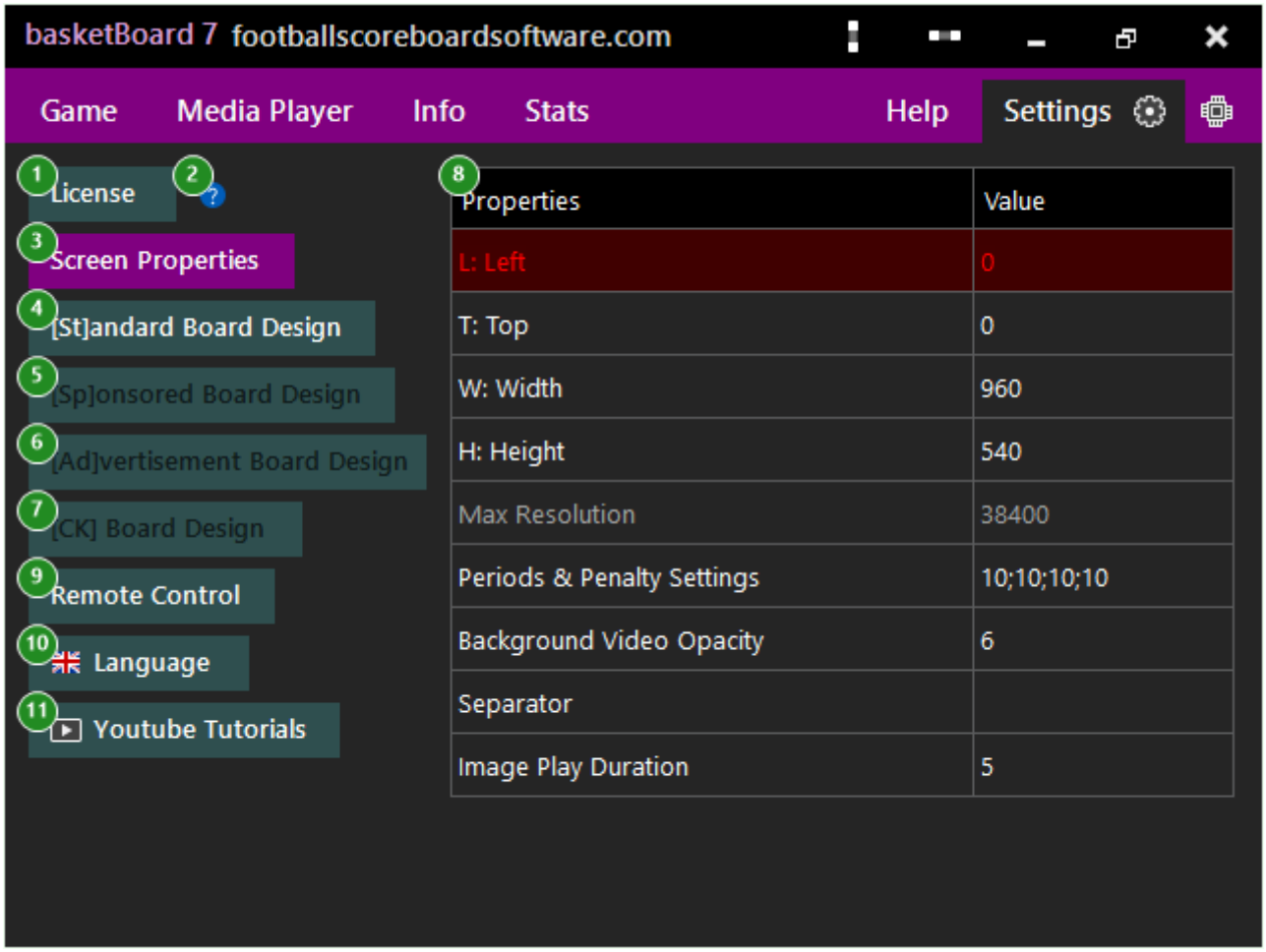
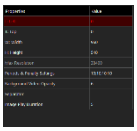


Figure 199. The Settings page with the Screen Properties tab.

No.	Control	Name	What It Does
1	License	**License**	Shows the License tab on the right side of the Settings page: Computer ID, licence key and the way to a USB licence.
2	?	**License Info (question mark)**	Opens the window License Info with the state of the licence: Validation, Max Resolution, Expire Date, Model, GPU Enabled, Extra Player, Record & Replay.
3	Screen Properties	**Screen Properties**	Shows the Screen Properties table on the right side of the Settings page: place and size of the board window, background video opacity, score separator and image play duration.

No.	Control	Name	What It Does
4	[St]andard Board Design	**[St]andard Board Design**	Opens the design editor for the Standard board. Can be clicked only while the display mode is St.
5	[Sp]onsored Board Design	**[Sp]onsored Board Design**	Opens the design editor in Sponsored mode; it edits the Standard scoreboard, which the Sponsored board uses. Can be clicked only while the display mode is Sp.
6	[Ad]vertisement Board Design	**[Ad]vertisement Board Design**	Opens the design editor for the scoreboard of the Advertisement board. Can be clicked only while the display mode is Ad.
7	[CK] Board Design	**[CK] Board Design**	Opens the design editor for the Chroma Key design (pages Game and Substitution). Can be clicked only while the display mode is CK.
8		**Properties table**	Shows the Screen Properties. Click a value, type and press Enter: Left, Top, Width and Height place and size the board window (Width and Height not above Max Resolution), Background Video Opacity is 0 to 10, Separator is the text between the scores, Image Play Duration is 1 to 120 seconds. Each change is saved in start.xml at once and the board is redrawn. Max Resolution is read only; the Periods & Penalty Settings row opens the rules dialog with the button in its cell.
9	Remote Control	**Remote Control**	Opens the Remote Control page: server on or off, address and QR code of the remote page, PIN.
10	Language	**Language**	Opens the Language page: interface language, interface texts and board titles.
11	Youtube Tutorials	**Youtube Tutorials**	Opens the tutorial videos of the Board7 family on YouTube in the web browser of the PC. The operation they show is shared by basketBoard 7.

Tab	Content	Section
"License"	Computer ID, licence key, USB licence	15.2
"Screen Properties"	Place and size of the board window and some values of the board	15.3
"[St]andard Board Design", "[Sp]onsored Board Design", "[Ad]vertisement Board Design", "[CK] Board Design"	The design editor for the current display mode	15.4
"Remote Control"	The built-in web server for phones, tablets and other programs	15.5
"Language"	Interface language, interface texts and board titles	15.6
"Youtube Tutorials"	The tutorial videos in the web browser	15.7

Of the four Board Design buttons only the one of the current display mode can be clicked; the other three are grey.

15.2 License

The License tab shows the Computer ID of this PC, takes the licence key and leads to the USB licence. Chapters 2.6 to 2.11 describe licensing step by step.

The blue question mark beside "License" is shown on every tab of the Settings page. It opens the "License Info" box with the state of the licence: Validation, Max Resolution, Expire Date, Model, and whether GPU, Extra Player and Record & Replay are part of the licence (chapter 2.7).

15.3 Screen Properties

"Screen Properties" is a table of values. Click a value, type the new one and press Enter or click another row; F2 also starts editing the selected value. The value is saved in start.xml at once and the board is redrawn. An empty entry is not accepted, except for "Separator": the old value comes back.

Property	Meaning	Limits	In start.xml
"L: Left"	Distance of the board window from the left edge of the Windows desktop, in pixels	0 or more. An entry that starts with a minus sign or a letter becomes 0.	BOARD/Left
"T: Top"	Distance of the board window from the top edge of the desktop, in pixels	As Left	BOARD/Top
"W: Width"	Width of the board window in pixels	Not more than Max Resolution; a larger entry is set to Max Resolution	BOARD/Width
"H: Height"	Height of the board window in pixels	As Width	BOARD/Height
"Max Resolution"	The largest width and height that the licence allows (chapter 2.7). The row is grey.	Read only	LICENSE/MaxResolution
"Periods & Penalty Settings"	The lengths of the four periods in minutes, for example 10;10;10;10. Click the row and then the button that appears at the right end of the cell: it opens the "Period & Penalty Settings" dialog with the rules presets (chapter 6).	Changed in the dialog	PERIOD/P1 to P4
"Background Video Opacity"	How strongly the background video shows behind the scoreboard and the info graphics: 0 is invisible, 10 is full strength. The delivered value is 6.	0 to 10; any other entry becomes 6	BOARD/BackVideoOpacity
"Separator"	Text between the two scores. Empty: each score stands in its own place of the design. With a text, for example a hyphen, the board writes both scores as one text (58-54) in the place of the home score and leaves the place of the guest score empty.	Any text, may be empty	BOARD/ScoreSeperator

Property	Meaning	Limits	In start.xml
"Image Play Duration"	Seconds a picture stays on the board when the media player plays a playlist (chapter 12). The delivered value is 5.	1 to 120; any other entry becomes 5	BOARD/ImagePlayDuration

- Left and Top place the board on the display that carries it. Chapter 3.4 describes the set-up with a second display.
- Width and Height are the size of the board window, for example 1920 and 1080 for a full-HD display, or the pixel size of an LED wall. The same place and size are used by every board window.
- The background video itself is chosen on the Info page (chapter 10). The factory designs are made for two separate scores; check the board after you set a Separator.

> **Note:** A display to the left of or above the main display has negative desktop coordinates. Left and Top do not take negative values, so the board cannot be placed there. Arrange the displays in the Windows display settings so that the board display is to the right of or below the main display.
>
> **Note:** One value of the BOARD section in start.xml has no control on this page: IconSize (64 as delivered). Leave it as it is.

15.4 Board Design

The four buttons "[St]andard Board Design", "[Sp]onsored Board Design", "[Ad]vertisement Board Design" and "[CK] Board Design" open the design editor. Only the button of the display mode that is active on the Game page can be clicked. To edit the design of another mode, choose that mode with the "St", "Sp", "Ad" or "CK" button of the Game page and return to Settings.

- "[St]andard Board Design" edits the Standard scoreboard and its graphics.
- "[Sp]onsored Board Design" edits the same Standard scoreboard: the Sponsored board uses it.
- "[Ad]vertisement Board Design" edits the scoreboard column of the Advertisement board.
- "[CK] Board Design" edits the Chroma Key scorebug and its graphics.

Chapter 11 describes the editor, saving a design of your own, the design list and the way back to the factory design.

15.5 Remote Control

basketBoard 7 contains a small web server. Through it a phone, a tablet or another program controls the game over the network on port 1907. The "Remote Control" page switches the server on and off, shows the address and the QR code of the remote page and sets the PIN. Open it with Settings > "Remote Control" or with the remote control icon on the right side of the Game page.

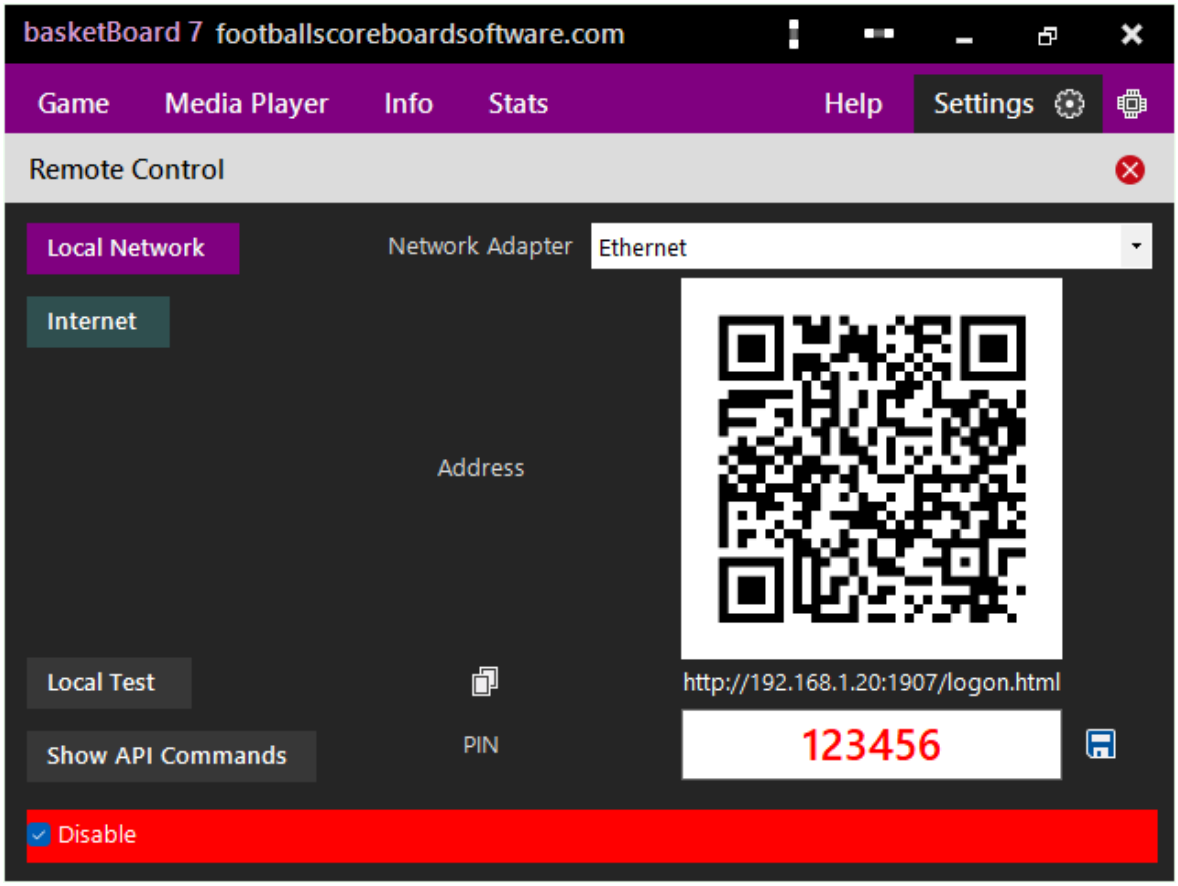


Figure 200. The Remote Control page, Local Network tab. The remote control is off, as on a new installation.

Chapter 13 describes the page, the PIN and the phone page step by step; chapter 14 describes the HTTP API on the same port.

15.6 Language

The Language page has two tabs: "Language" for the interface language and the texts of the interface, "Titles" for the titles that the info graphics print on the board. Open it with Settings > "Language" or with the flag icon at the top right of the Game page.

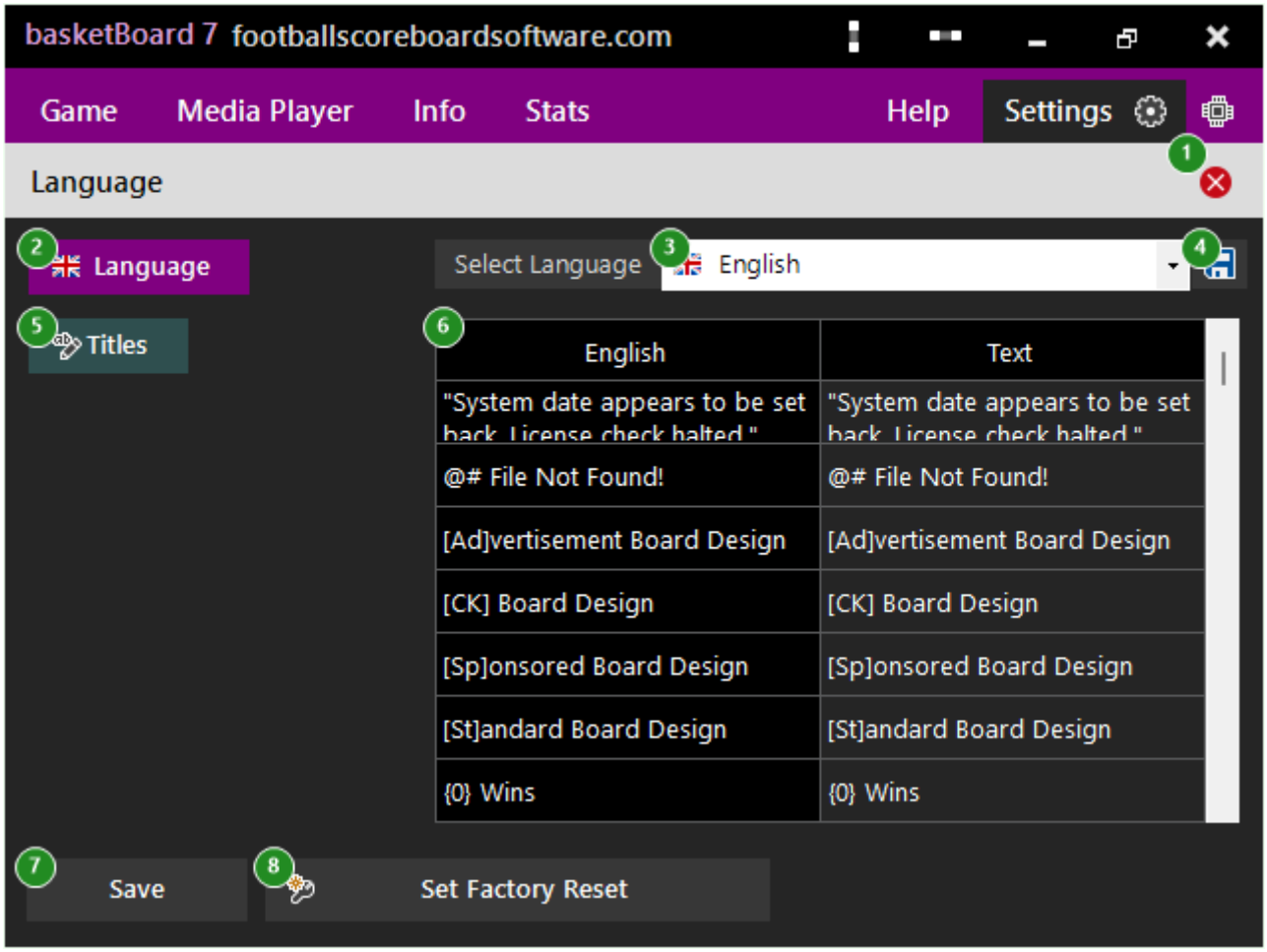
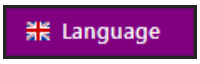
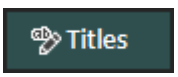
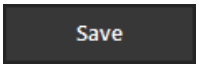
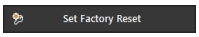


Figure 201. The Language page, Language tab.

No.	Control	Name	What It Does
1		**Close**	Closes the Language page and returns to the Settings page. Esc does the same. Changes that were not saved are lost.
2		**Language**	Shows the interface texts of the language chosen in the Select Language list, for choosing the language and editing texts.
3		**Select Language**	Lists the languages with their flags. Choosing one loads its texts into the table; the interface language changes only after a click on the save icon beside the list. Used while the Titles tab is open, it replaces the titles in the table by the interface texts: click Language first.
4		**Save language**	Makes the language chosen in the list the interface language: stores it in start.xml (BOARD/Lang), fills the board titles with the texts of this language and shows the message to restart the program. The interface changes after the restart.
5		**Titles**	Shows the titles that the info graphics print on the board (Substitution, Referees, Standings, Results, Fixtures and the headings of the squad graphics) for editing.
6		**Text table**	Shows the English text and the text in the chosen language (Language tab) or the board titles (Titles tab). Select a cell of the column Text, press F2, type and press Enter; the Save button turns green.

No.	Control	Name	What It Does
7		**Save**	Writes the changed rows to common\xml\lang.xml (Language tab) or common\xml\title.xml (Titles tab). Interface texts are shown after a restart of the program; titles are used the next time the graphic is shown.
8		**Set Factory Reset**	Language tab: puts back the delivered texts of all languages at once, without a question; changed texts are lost. Titles tab: fills every title with the text of the interface language.

15.6.1 Choosing the Language

1. Choose the language in the "Select Language" list. The table shows the texts of this language.
2. Click the save icon to the right of the list. The message "New language selected. Please restart basketBoard 7 to use it." appears with the title "Warning" in the new language (the message text exists in English and Turkish; the other languages show the English text, which can be changed in the Language tab).
3. Close basketBoard 7 and start it again. The interface is in the new language.

Choosing a language in the list alone does not change the interface; the save icon does. The language is stored in start.xml (BOARD/Lang). At the first start the program takes the language of the regional format of Windows (chapter 2.3). The interface is available in 46 languages.

> **Note:** Saving a language also fills the board titles of the Titles tab with the texts of the new language. Titles you changed by hand are replaced.

15.6.2 Editing the Texts

The table lists every text of the interface: the column "English" is fixed, the column "Text" holds the text in the language chosen in the list.

1. Choose the language whose texts you want to change.
2. Select a cell in the column "Text" and press F2.
3. Type the new text and press Enter. The "Save" button turns green.
4. Click "Save". The changed rows are written to common\xml\lang.xml.
5. Restart the program; most texts are read when the program starts.

If you close the page without "Save", the changes are lost.

"Set Factory Reset" on the Language tab puts back the delivered texts of all languages at once, without a question. Every text you changed is lost.

An update keeps your lang.xml. New texts of the update are added to it at the next start, and your own texts stay (chapter 2.4).

15.6.3 The Board Titles

The "Titles" tab holds the titles and headings that the info graphics print on the board. There is one text for each title; it does not change with the "Select Language" list.

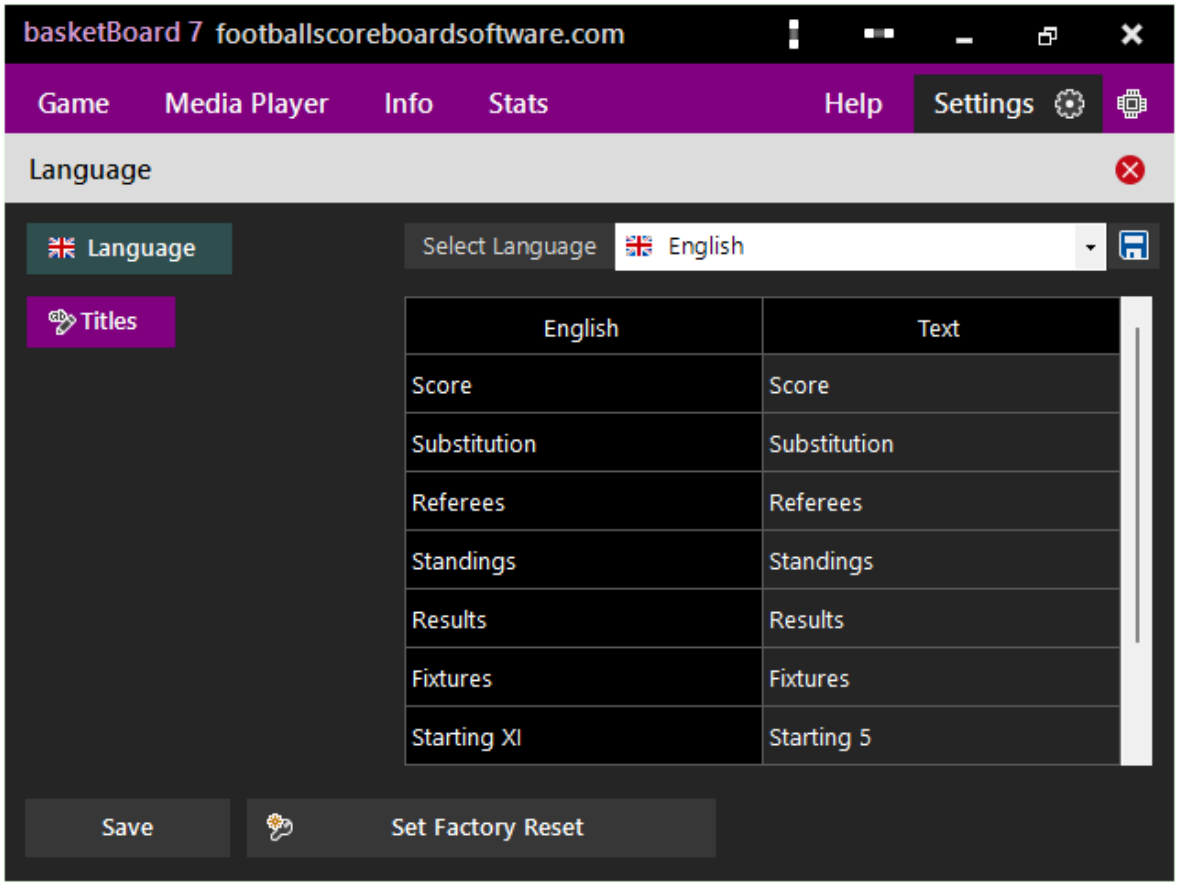


Figure 202. The Titles tab: the board titles.

Title (Column "English")	Printed On
"Score"	Reserved: not used by any graphic in this version
"Substitution"	The substitution graphics (chapter 10)
"Referees"	The referees graphic (chapter 10)
"Standings"	The standings table (chapter 10)
"Results"	The results table (chapter 10)
"Fixtures"	The fixtures table (chapter 10)
"Starting XI"	The heading of the starting players in the squad graphics; delivered as "Starting 5"
"Substitutes"	The heading of the bench players in the squad graphics
"Trainer"	The heading of the coach in the squad graphics

1. Click "Titles".
2. Select the cell in the column "Text", press F2, type the title and press Enter.
3. Click "Save". The titles are written to common\xml\title.xml and are used the next time the graphic is shown.

Saved titles are kept when the program is started again. At a start the program only fills a title that is empty with the text of the interface language. "Set Factory Reset" on the Titles tab fills every title with the text of the interface language.

The 15 basketball info screens (chapter 10) take their texts from the interface texts of the Language tab, not from these titles.

> **Note:** Do not use the "Select Language" list while the Titles tab is open; click "Language" first. If you choose another entry in the list on the Titles tab, the table shows the interface texts although "Titles" stays marked, and "Save" then writes the changed rows into the titles file.

15.7 Youtube Tutorials

"Youtube Tutorials" opens the tutorial videos of the Board7 family in the web browser of the PC. The operation they show is shared by basketBoard 7. An internet connection is needed.

15.8 Where the Settings Are Kept

What	File
Board place and size, rules, keyboard keys, remote control, language, display mode, team names	start.xml (Appendix D)
Licence	basket7License.xml in the program folder or on the USB stick
Info graphics and the Sponsored, Advertisement and Chroma Key pages	config.xml, configSp.xml, configAd.xml, configCK.xml
Interface texts	common\xml\lang.xml
Board titles	common\xml\title.xml

The program saves start.xml, the config files and the files of the common folder safely: it writes a new copy first and keeps the previous version as a .bak file (chapter 16.9).

16. Troubleshooting and FAQ

This chapter lists what to check when something does not work, and what the program does to protect a running game and your files.

16.1 The Board Is Black or Empty

The boards and the info graphics are drawn by the Microsoft Edge WebView2 Runtime. Setup checks that it is installed (chapter 2.1).

If the runtime is missing or cannot be used when basketBoard 7 starts, the program writes a line to the log and shows the message "basketBoard 7 - Microsoft Edge WebView2 Runtime": the runtime is not installed or cannot be started, and basketBoard 7 closes. OK opens the download page of Microsoft (the address is in the message), Cancel only closes the program. Without the runtime no board can be drawn, so the program does not go on.

1. Install the Microsoft Edge WebView2 Runtime from the download page of Microsoft, or run Setup again: it checks the runtime and offers the download.
2. Restart basketBoard 7.

Other causes of a black or missing board:

What You See	Cause	What to Do
The board is not on the board display	Left, Top, Width or Height of Screen Properties do not match the display.	Set them in Settings > "Screen Properties" (chapters 3.4 and 15.3).
The media output window is black	A clip or a playlist was stopped with Stop or Finish.	Click "Game" to put the scoreboard back on the board (chapter 12).
A background video does not play; the graphic stands on black	The file type cannot be played by the board (for example AVI).	Use an MP4 file with H.264 video (chapter 10).

16.2 Display Scaling

We recommend a Windows display scaling of 100 % (Windows Settings > System > Display > Scale) for the operator screen and for the board display. The program was tested at 100 %. With other values the windows and texts of the program can be enlarged or cut, and the place and size of the board in Screen Properties may need to be set again so that they match the pixels of the output.

16.3 Fonts

Setup installs the fonts of the boards in Windows, and the program also loads them from C:\basketBoard7\common\font at every start and unloads them when it closes. If a board shows a wrong font, run the font installation again in a PowerShell window opened as administrator, then restart the program:

```
powershell -ExecutionPolicy Bypass -File C:\basketBoard7\install_fonts.ps1
```

16.4 Licence and USB Stick

Symptom	Cause	What to Do
The board shows DEMO in place of the game clock for a moment every ten seconds	The program runs without a valid licence. In Demo a score also stops at 12 and some controls of the home team answer "License Required !".	Enter the licence or plug in the USB stick and restart (chapter 2.6).
The USB stick is plugged in, but the program stays in Demo	The stick is read only at the start.	Restart the program with the stick plugged in.
"License Key Not Valid!" when you save a key	The key was made for another Computer ID or another stick.	Check the ID on the License page. After a hardware change, send the new Computer ID to the vendor.
A message at the start says that the hardware ID could not be read, that the computer clock has been set back or that the licence expired	The licence file exists but was not accepted.	See chapter 2.11.

16.5 NDI

- The NDI button at the right edge of the Game page flashes red while the board is sent. A new installation sends under the name B7_NDI (start.xml, section NDI, SenderName).
- If NDI cannot be started, a message beginning with "NDI:" gives the reason and the button stays dark. Check that Processing.NDI.Lib.x64.dll is in C:\basketBoard7 (run Setup again if it is missing) and read the log (section 16.10).
- The board does not appear in the receiver: the PC and the receiver must be in the same network, and the firewall of the receiver must let NDI through.
- The NDI source list of a camera page shows "-- No NDI source found --": no NDI sender was found in the network. Start the sender, check the network and search again (chapter 12).

16.6 The Remote Control Is Not Reachable

Symptom	Cause	What to Do
The phone cannot open the page	The remote control is off; the phone is in another network; the firewall blocks port 1907; the port is busy.	Clear "Disable" in Settings > "Remote Control". Connect the phone to the network of the PC and use the address shown there, with :1907. For a busy port see section 16.7.
"Local Test" works on the PC, the phone does not connect	The firewall or the network, not the program	Run C:\basketBoard7\open_firewall_1907.bat as administrator: it adds the firewall rules for port 1907 if they are missing. Check that the Wi-Fi of the phone is not a guest network that separates its devices.
The keypad of the logon page comes back after the PIN	The PIN is wrong.	Read the PIN on the Remote Control page. A changed PIN counts only after its save icon was clicked.

Symptom	Cause	What to Do
The dot of the remote page is red	The program does not answer: it was closed, the remote control was switched off or the network is lost.	Check the program and the Wi-Fi. The page goes on by itself when the program answers again.
The address of the Internet tab does not work	The router does not forward TCP port 1907 to the PC.	Set the forwarding in the router (chapter 13).

Use up to four phones or tablets at the same time. Chapter 13 describes the remote control in full.

16.7 A Port Is Busy

Each network channel needs its port. If another program holds the port, basketBoard 7 does not stop: it tells you and works on without that channel.

Port	When It Is Opened	What You See
TCP 1907, remote control and HTTP API	At the start when the remote control is on; when you clear "Disable"	At the start a message: "Remote control is not available: TCP port 1907 could not be opened (port busy)." and "Another program is probably using this port. The scoreboard itself works normally.". On the Remote Control page the "Disable" bar turns orange, the address field reads "Port 1907: port busy" and a message says "Remote control could not be started."
TCP 2907, scoreboard console	When you press the Scoreboard Console button and answer Yes; at the start when the console was on	The message "Port 2907: port busy" and "The scoreboard console connection could not be started.". The console mode stays off.
UDP 2908, state broadcast	When you press "UDP"; at the start when the broadcast was on	The program only sends on this port, so another program cannot block it. When the broadcast cannot be set up, a message begins with "UDP 2908:" and ends with "The UDP broadcast could not be started."

The UDP broadcast keeps running while ports 1907 and 2907 are busy.

To find the program that holds a port:

1. Open a command prompt and type the first line below with the port in question.
2. Read the number at the end of the line that ends with LISTENING. It is the process ID.
3. Type the second line with that number to see the name of the program, or look the number up in the Task Manager, tab Details, column PID.
4. Close that program.
5. Switch the channel on again: for port 1907 tick "Disable" and clear it again on the Remote Control page; for port 2907 press the Scoreboard Console button again. Or restart basketBoard 7.

```
netstat -ano | findstr ":1907"
tasklist /FI "PID eq 1234"
```

Only one copy of basketBoard 7 runs at a time, so the port is held by another program.

16.8 Restoring the Last Match

During a game the program keeps writing the state of the game into matchstate.xml in the program folder. After a crash, a power cut or a restart of Windows you go on from the saved state.

Saved	Detail
Scores	Both teams
Team fouls	Both teams, and the counters of the last-minutes rules
Time-outs	The number used by each team, and the counters of the limits of the last period and the last minutes
Period	The period number, overtime included
Game clock	The time left
Shot clock	The value, or blank
Possession arrow	Home, guest or off

The file is written when one of these values changes, every two seconds while a clock runs, and once more when the program closes. The previous version is kept as matchstate.xml.bak.

After the main window has opened, the program asks "Restore last match?" and shows the saved score, the period, the game clock and the time of the save, for example 61 - 57 Q3 04:16.9. The question appears only when the saved game is not empty: a score, a team foul or a used time-out is not zero, the period is not the first, or the game clock is not at the full period time.

- "Yes": the period, the scores, the team fouls, the time-outs used, the game clock, the shot clock and the possession arrow are set to the saved values. The game clock is stopped at the saved time, at most two seconds older than the moment of the crash. Press Start to go on.
- "No", or the Esc key: a new game starts with 0 - 0 in the first period. The saved state is overwritten.

Not restored:

- The running state: the clocks are restored stopped, and a time-out countdown is not continued; the time-out stays counted.
- The info graphic, statistic or media clip that was on the board.
- The points and fouls of the players; the Player Stats window keeps them in its own files (chapter 7).

Team names, text lines, logos, the display mode and all settings are not part of the saved game; they are in start.xml. The team names and the two text lines are written there when the program closes. After a power cut the names of the last normal close come back.

16.9 Damaged Files

A power cut during a save can leave a file empty or cut off. The program protects itself in two ways:

- Every XML file is saved in two steps: the new content goes into a new file (.tmp) first, which then replaces the old one. The old version remains as the .bak file.
- At every start the program checks start.xml, the four config files, matchstate.xml and every XML file under common\xml, common\data and common\vizrt. A file that is empty or cannot be read is repaired.

The repair:

1. The damaged file is copied to a file with the ending .corrupt.
2. The file is restored from its .bak copy.
3. If there is no usable .bak, the .default copy of Setup is taken.
4. If there is neither, start.xml and the config files are made again with factory values, and lang.xml from langFactory.xml.
5. Any other file is removed and made again when it is needed. The .corrupt copy is kept.

When the main window has opened, one message lists what was done:

Message	Meaning
"A damaged settings file was restored from its backup: ..."	The file was replaced by its .bak or .default copy. The last change may be lost.
"A damaged settings file was replaced with defaults: ..."	No copy was found. The file has factory content.
"A damaged file was set aside (....corrupt); it will be re-created when needed."	The data of this file are gone, unless you have a copy of your own.
"A factory design file is damaged: ..." with "It was left untouched. Run the setup program again to repair the factory designs."	A file in common\vizrt\storage is damaged. The program never changes that folder.

- If lang.xml is missing, it is made from langFactory.xml without a message.
- If start.xml is missing, it is made from start.xml.default with the language of Windows.

What you can do:

1. Read the name of the file in the message and check the part of the program that belongs to it (Appendix D).
2. After a restore from the backup, repeat the last change you had made.
3. After a replacement with defaults, close the program and copy the file from your own safety copy of the program folder, if you have one.
4. For a damaged factory design, run Setup again. It writes the factory designs again and keeps your data.
5. Keep the .corrupt file and the log of that day for the support.

In a test the program was ended six times while it was saving; every file could be read at the next start.

16.10 The Log Folder

The program writes a log file for every day into the folder logs in the program folder: logs\bb7_yyyymmdd.log, for example bb7_20261013.log. The program never deletes log files; remove old ones by hand when you wish.

Every line starts with the date and the time and a level:

Level	Meaning
INFO	Normal events: the start with the version number, the end, a restored game, a factory design added to your list

Level	Meaning
WARN	Remarks, most of which the operator also saw as a message: a restored file, a licence remark, a busy port
ERROR	A failed action with its reason: a file that could not be saved, a server that could not start, NDI or camera errors
FATAL	An unexpected error with its technical details
CONSOLE	Internal remarks of the program that mention a failure, for example a sound file that was not found

A line that repeats within five seconds is written once, followed by a line with the number of repeats. The first line of each start reads "basketBoard7", the version and "starting".

An unexpected error in the main window does not close the program during a game and shows no error window; it is written to the log as FATAL.

Send these to the support address on the License page (arslan.ziya@gmail.com) when you report a problem:

1. The log file of the day of the problem.
2. What you did, what you expected and what happened, with the time of day.
3. A picture of the main window and of the board.
4. For a message about a damaged file: the .corrupt file.
5. For licence questions: the Computer ID or the USB ID of the License page.

16.11 FAQ

Question	Answer
The home score does not go up.	The program runs in Demo: the home score buttons answer "License Required !". Enter a licence (chapter 2).
A keyboard shortcut does nothing.	The cursor is in a text box, a list or a number box of basketBoard 7, a cell of a table is being edited, or a question or dialog of basketBoard 7 is open. Or the shortcuts are switched off, or Ctrl, Shift or Alt is held down. See Appendix A.
The period cannot be changed.	The game clock or a time-out countdown is running. Stop the clock, or wait for the end of the time-out.
The shot clock is blank.	It was cleared, the period has ended, or the game clock is lower than the shot clock (chapter 5). Press 24 or 14 when enough time is left on the game clock.
No sound: no horn at the end of the period.	The sound is switched off (the loudspeaker button at the bottom right of the Game page is red), or Windows plays to another audio device, or its volume is down.
A second start of the program only brings its window to the front.	The program is already running; only one copy runs at a time. If it does not react, end basketBoard7.exe in the Task Manager and start again: the game is offered for restore.

Question	Answer
"Restore last match?" does not appear after a crash.	The saved game was empty: 0 - 0, first period, full clock, no fouls and no time-outs.
The team names are the old ones after a power cut.	Names and text lines are written to start.xml when the program closes. Type them again.
A message says the factory designs folder is read-only.	An action tried to write into common\vizrt\storage. Nothing is lost. Save the design under your own name (chapter 11).

Appendix A: Keyboard Shortcuts

A.1 Global Shortcuts

Six actions of the control panel have a keyboard key. The keys work while "Enable Keyboard Hook" is ticked, which is the case in a new installation. They work in every program, also when basketBoard 7 is not the active window. Open the "Keyboard Hook Manager" with the keyboard icon at the bottom left of the Game page (chapter 5).

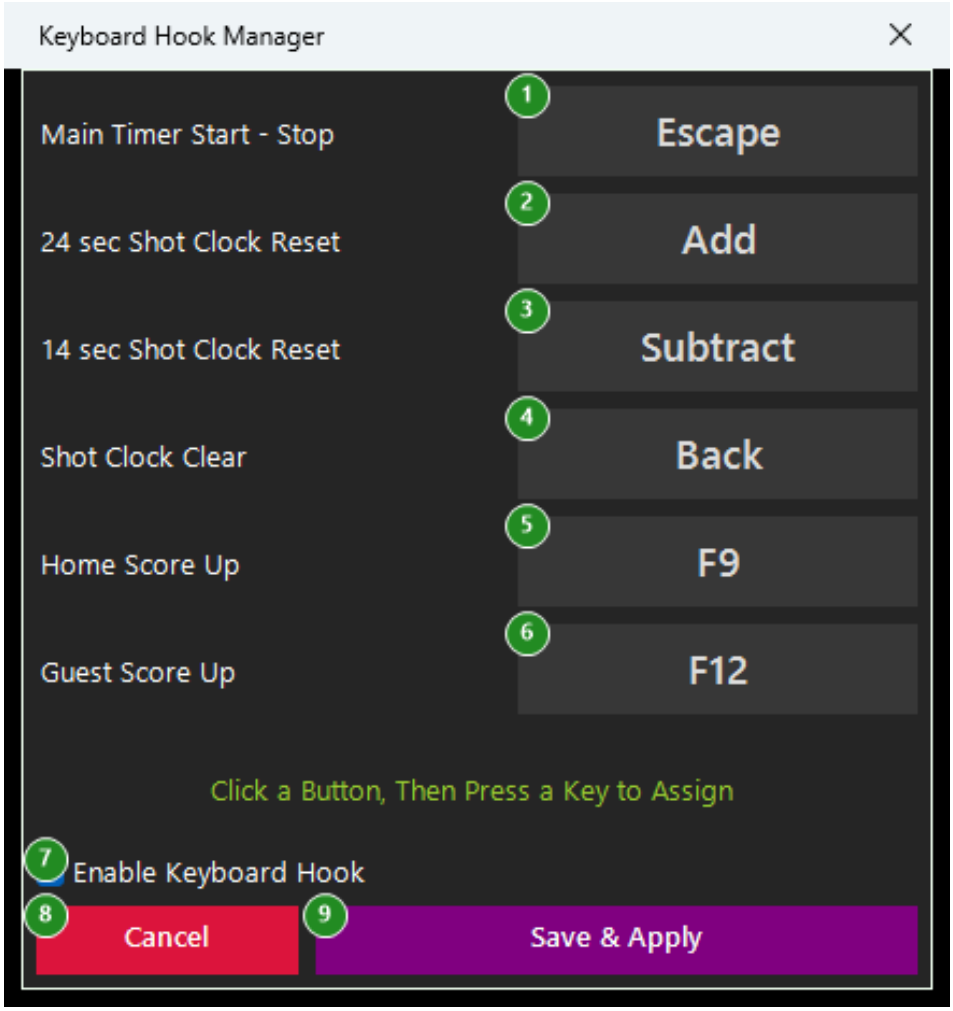
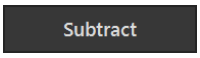
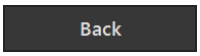
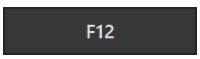
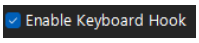
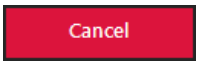
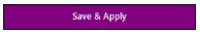


Figure 203. The Keyboard Hook Manager with the keys of a new installation.

No.	Control	Name	What It Does
1	Escape	**Main Timer Start - Stop (key field)**	Shows the key that starts and pauses the game clock, like the Start button (Escape in a new installation). Click the field (it turns green) and press the new key; the key is stored with Save & Apply.
2	Add	**24 sec Shot Clock Reset (key field)**	Shows the key that resets the shot clock to its full value (24 s, 30 s under NCAA M and NCAA W); Add, the + key of the numeric keypad, in a new installation. Click the field (it turns green) and press the new key; the key is stored with Save & Apply.

No.	Control	Name	What It Does
3		**14 sec Shot Clock Reset (key field)**	Shows the key that resets the shot clock to its short value (14 s, 20 s under NCAA M and NCAA W); Subtract, the - key of the numeric keypad, in a new installation. Click the field (it turns green) and press the new key; the key is stored with Save & Apply.
4		**Shot Clock Clear (key field)**	Shows the key that switches the shot clock off, like the Clear button (Back, the Backspace key, in a new installation). Click the field (it turns green) and press the new key; the key is stored with Save & Apply.
5		**Home Score Up (key field)**	Shows the key that adds one point to the home score (F9 in a new installation). Click the field (it turns green) and press the new key; the key is stored with Save & Apply.
6		**Guest Score Up (key field)**	Shows the key that adds one point to the guest score (F12 in a new installation). Click the field (it turns green) and press the new key; the key is stored with Save & Apply.
7		**Enable Keyboard Hook**	Switches the six keyboard shortcuts on or off when the dialog is saved (start.xml, BOARD/GlobalKeyboardKey). While it is ticked the keys work in every program, also when basketBoard 7 is not the active window, but not while the cursor is in an input field of basketBoard 7 or a cell of one of its tables is being edited; cleared, there are no keyboard shortcuts.
8		**Cancel**	Closes the dialog without saving; the keys stay as they were.
9		**Save & Apply**	Writes the six keys to start.xml (section KEY) and the state of Enable Keyboard Hook to BOARD/GlobalKeyboardKey, activates them at once and closes the dialog.

Action	Key in a New Installation	What It Does
"Main Timer Start - Stop"	Esc (shown as Escape)	Starts or pauses the game clock, like the start button of the control panel
"24 sec Shot Clock Reset"	+ of the numeric keypad (shown as Add)	Resets the shot clock to its full value, like the full reset button of the shot clock (24 s; 30 s under NCAA M and NCAA W)
"14 sec Shot Clock Reset"	- of the numeric keypad (shown as Subtract)	Resets the shot clock to its short value, like the short reset button (14 s; 20 s under NCAA M and NCAA W)
"Shot Clock Clear"	Backspace (shown as Back)	Clears the shot clock, like the clear button
"Home Score Up"	F9	Adds one point to the home score
"Guest Score Up"	F12	Adds one point to the guest score

To give an action another key:

1. Click the key field of the action. It turns green.
2. Press the new key. The field shows its name.
3. Click "Save & Apply". The keys are stored in start.xml (section KEY) and work at once. "Cancel" closes the dialog without a change.

- A key does nothing while the cursor is in a text box, a list or a number box of basketBoard 7, while a cell of a table is being edited, or while a question, a message or a dialog of basketBoard 7 or a Windows file dialog is open. Press Enter in the box, or click an empty place of the Game page.
- A key pressed together with Ctrl, Shift or Alt is ignored.
- The key is not taken away from the program that has the focus: it also does its own work there.
- Clear "Enable Keyboard Hook" and click "Save & Apply" to switch all six keys off.
- In Demo the home score cannot be changed: F9 shows "License Required !" (chapter 2.10).

> **Note:** The + and - keys of the numeric keypad work with NumLock on and off. If you assign a digit key of the numeric keypad, keep NumLock on: with NumLock off these keys send other key names (for example Insert or End) and the action does not start.

A.2 Keys in the Program

Key	Where	What It Does
Enter	A question of the program	Answers "Yes"
Esc	A question of the program	Answers "No"
Enter or Esc	A message of the program	Closes it
Enter	A score, team foul or time box of the control panel	Takes the typed value
Esc	The Remote Control page, the Language page, the USB License Creator, the Info Screens page	Closes the page
F2	The Screen Properties table and the Language table of Settings	Starts editing the selected value
Alt+F4	The main window	Asks "The Application Will Be Closed! Are You Sure?", like the close button

> **Note:** With the shortcuts on, Esc is the key that starts and pauses the game clock. While a question or a dialog of basketBoard 7 is open the shortcuts rest, so Esc only answers the question. Some pages of basketBoard 7 also close with Esc; assign another key to "Main Timer Start - Stop" if you close pages with Esc during a game.

Appendix B: Rules Quick Reference

The table lists every value of the five rules presets of basketBoard 7 (chapter 4). The first part holds the values of the fields of the rules dialog (chapter 6.2); the preset button fills them in. The second part holds the rule values without a field, which the preset writes to the RULES section of start.xml (chapter 6.3). A value of 0 means that the rule is not used.

B.1 Values With a Field in the Rules Dialog

Value	FIBA	FIBA 4x8 (U/W)	NBA	NCAA M	NCAA W
Preset number (BOARD/Mode)	0	4	1	2	5
Period length (minutes)	10	8	12	20	10
Period labels	Q1, Q2, Q3, Q4	Q1, Q2, Q3, Q4	Q1, Q2, Q3, Q4	1H, 2H	Q1, Q2, Q3, Q4
Overtime length (minutes)	5	5	5	5	5
Overtime label	OT	OT	OT	OT	OT
Team-foul limit: bonus from this foul ("Max Penalty Player")	5	5	5	7	5
Shot clock, full reset (seconds)	24	24	24	30	30
Shot clock, short reset (seconds)	14	14	14	20	20
Time-out length 1 (seconds)	60	60	75	75	60
Time-out length 2 (seconds)	0	0	0	30	30

B.2 Values Without a Field (start.xml RULES)

Key	FIBA	FIBA 4x8 (U/W)	NBA	NCAA M	NCAA W
RegulationPeriods	4	4	4	2	4
GameClockTenthsBelowSec	60	60	60	60	60
ShotClockTenthsBelowSec	5	5	5	5	5
ShotClockOffWhenGameClockLower	true	true	true	true	true
TeamFoulsResetEachPeriod	true	true	true	true	true
OvertimeContinuesTeamFouls	true	true	false	true	true
PlayerFoulOut	5	5	6	5	5
TeamFoulBonusOvertime	0	0	4	0	0
TeamFoulBonus2	0	0	0	10	0
TeamFoulLastMinutes	0	0	2	0	0

Key	FIBA	FIBA 4x8 (U/W)	NBA	NCAA M	NCAA W
TeamFoulLastMinutesBonus	0	0	2	0	0
TimeoutModel	HALF	HALF	GAME	GAME	GAME
TimeoutsFirstHalf	2	2	2	2	2
TimeoutsSecondHalf	3	3	3	3	3
TimeoutsPerGame	0	0	7	6	5
TimeoutsLastMinutes	2	2	3	0	0
TimeoutsLastMinutesMax	2	2	2	0	0
TimeoutsPerOvertime	1	1	2	1	1
TimeoutsLastPeriodMax	0	0	4	0	0
TimeoutsCarryIntoOvertime	false	false	false	true	true

- TimeoutsFirstHalf and TimeoutsSecondHalf are used only with the HALF model; the GAME presets write them with the general values 2 and 3.
- TimeoutsPerGame is used only with the GAME model.

B.3 The Rules in Words

Rule	FIBA	FIBA 4x8 (U/W)	NBA	NCAA M	NCAA W
Regulation	4 x 10 min	4 x 8 min	4 x 12 min	2 x 20 min	4 x 10 min
Overtime	5 min, OT1, OT2 ...	5 min, OT1, OT2 ...	5 min, OT1, OT2 ...	5 min, OT1, OT2 ...	5 min, OT1, OT2 ...
Bonus	from the 5th team foul of a quarter	from the 5th team foul of a quarter	from the 5th team foul of a quarter; in overtime from the 4th; in the last 2 minutes of a period from the 2nd foul inside them	from the 7th team foul of a half; double bonus from the 10th	from the 5th team foul of a quarter
Team fouls in overtime	go on	go on	start at 0	go on	go on
Player fouls out with	5	5	6	5	5
Time-outs	2 in the first half, 3 in the second; at most 2 in the last 2 minutes of Q4	2 in the first half, 3 in the second; at most 2 in the last 2 minutes of Q4	7 per game; at most 4 in Q4 and 2 in its last 3 minutes	6 per game	5 per game

Rule	FIBA	FIBA 4x8 (U/W)	NBA	NCAA M	NCAA W
Time-outs per overtime	1	1	2	1 plus the unused ones	1 plus the unused ones
Clock display	tenths below 60 s (game clock) and from 5 s (shot clock)	as FIBA	as FIBA	as FIBA	as FIBA
Shot clock blank when the game clock is lower	yes	yes	yes	yes	yes

Appendix C: HTTP API, TCP and UDP Reference

This appendix lists every command, field, key and reply of the three integration channels, as the program handles them. Chapter 14 explains how to use them. The examples use the PIN 123456 and the address 127.0.0.1 (the same PC).

C.1 HTTP Request and Replies (Port 1907)

```
http://127.0.0.1:1907/api.html?pin=123456&cmd=<command>&value=<value>$
```

Part	Rule
Method and path	HTTP GET to /api.html
pin	The PIN of the Remote Control settings, digits only
cmd	The command, as written in C.2 (lower case; GET in capitals)
value	The value, URL encoded (UTF-8). Leave it out for a command without a value.
$	Closes every request. Without it: #Invalid API Request.
Order	pin, cmd and value can come in any order
Cache buster	A browser may put a changing parameter first, for example &_=1736500000001
Length	The first 1024 bytes of a request are read

Character in a value	Encoded
Space	%20 or +
+	%2B
&	%26
$	%24
|	%7C
=	%3D

Reply	Meaning
<html>!command</html>	Understood; command without a value
<html>!value::command</html>	Understood; the value is repeated
<html>#Invalid API Request</html>	Wrong form: no $, wrong path or not GET

Reply	Meaning
<html>#Invalid PIN</html>	Wrong or missing PIN (checked before the command)
<html>#Invalid API Command</html>	Unknown command
<html>#BAD_TIME::set_chronometer</html>	Time not valid or longer than the period; nothing changed
<html>#BAD_TIME::set_shotclock</html>	Shot clock value not valid, empty or above the full value; nothing changed
<html>#BAD_VALUE::command</html>	Score or foul not a whole number 0 to 999, period not a whole number 1 to 20; nothing changed
<html>#text</html>	Internal error with its message
XML document	The answer to cmd=GET (C.4)

A reply with ! means the request was understood, not that something changed. Check the result with cmd=GET.

C.2 HTTP Commands

Command	Value	What it does	Reply
GET	None	Returns the state as XML (C.4)	XML
set_home_team	Text; _ = new line	Home team name	!value::set_home_team
set_guest_team	Text; _ = new line	Guest team name	!value::set_guest_team
line_text_1	Text; _ = new line; [D] [T] [T8] [T5]	Text line 1	!value::line_text_1
line_text_2	Text, as line_text_1	Text line 2	!value::line_text_2
set_home_score	0 to 999	Sets the home score	!value::set_home_score or #BAD_VALUE::set_home_score
set_guest_score	0 to 999	Sets the guest score	!value::set_guest_score or #BAD_VALUE::set_guest_score
set_home_score_up	None	Home score + 1	!set_home_score_up
set_home_score_down	None	Home score - 1, not below 0	!set_home_score_down
set_guest_score_up	None	Guest score + 1	!set_guest_score_up
set_guest_score_down	None	Guest score - 1, not below 0	!set_guest_score_down
set_home_foul	0 to 999	Sets the home team fouls	!value::set_home_foul or #BAD_VALUE::set_home_foul
set_guest_foul	0 to 999	Sets the guest team fouls	!value::set_guest_foul or #BAD_VALUE::set_guest_foul
set_period	1 to 20	Selects the period; N + 1 = OT1 (N = 4 or 2). Refused while a clock runs.	!value::set_period or #BAD_VALUE::set_period

Command	Value	What it does	Reply
set_home_timeout	0 to 9	Time-outs used by home; above 9 counts as 9	!value::set_home_timeout
set_guest_timeout	0 to 9	Time-outs used by guest; above 9 counts as 9	!value::set_guest_timeout
timeout_home	None	Starts the home time-out; again during the countdown: stops it and gives it back. Not started without a time-out left.	!timeout_home
timeout_guest	None	The same for the guest team	!timeout_guest
possession	home, guest, none, toggle	Possession arrow to home or guest, off, or switched	!value::possession
set_chronometer	play	Starts or resumes the game clock	!play::set_chronometer
set_chronometer	pause	Pauses the game clock	!pause::set_chronometer
set_chronometer	stop	Stops; a stopped clock goes back to the period length	!stop::set_chronometer
set_chronometer	mm:ss, m:ss, mm:ss.t	Stops the clock and sets the time, at most the period length	!value::set_chronometer or #BAD_TIME::set_chronometer
reset_shotclock	None	Shot clock to the full value (24)	!reset_shotclock
reset_shotclock14	None	Shot clock to the short value (14)	!reset_shotclock14
clear_shotclock	None	Blanks the shot clock	!clear_shotclock
set_shotclock	Seconds, 0 to the full value, tenths allowed	Sets the shot clock; goes on from it if the game clock runs	!value::set_shotclock or #BAD_TIME::set_shotclock
click	playpause	Start / Pause button	!playpause::click
click	stop	Stop button	!stop::click
click	previous_period, next_period	Period before / next period. Refused while a clock runs.	!value::click
click	st, sp, ad, ck	Display mode Standard, Sponsored, Advertisement, Chroma Key; back to the scoreboard	!value::click
match	None	Back to the scoreboard and the Game page	!match
horn	None	Sounds the horn (silent while the sound is off)	!horn
volume	0 or 1	Sound of the control panel off or on	!value::volume

Command	Value	What it does	Reply
start_playlist	1 to 6 (empty = 1)	Starts (or stops) a playlist of the media player	!value::start_playlist
start_playlist_ad_screen	1 to 6 (empty = 1)	Advertisement mode and its playlist	!value::start_playlist
info_show	Screen[|Field=value|...]	Saves the fields, shows the info screen (C.3)	!value::info_show
info_hide	None	Takes the info screen off	!info_hide
info_set	Field=value	Saves one field	!value::info_set
info_list	List=c1~c2|c1~c2	Replaces a list; empty = clear	!value::info_list

- start_playlist_ad_screen replies with ::start_playlist, not ::start_playlist_ad_screen.
- possession also takes h, g, 1, 2, off and 0. Any other value switches the side, like toggle.
- volume: 1 or on switches the sound on; any other value switches it off.
- The click values are not case sensitive (St, ST and st are the same).

C.3 Info Screens and Fields

The screens are those of the active rules preset (all fifteen exist in every preset). Field keys are not case sensitive. A choice must be one of its options; an option marked FIBA or NBA, NCAA exists only in those presets.

Screen	Label	Fields
Lineup	Starting Five	Lineup.Side
Intro	Player Intro	Intro.Side, Intro.Player
Score	Score	Score.Side, Score.Player, Score.Kind, Score.Points, Score.Time
Foul	Foul	Foul.Side, Foul.Player, Foul.Kind, Foul.Count
TeamFouls	Team Fouls	None
Timeout	Timeout	Timeout.Side
Review	Instant Replay	Review.Kind, Review.Side, Review.Subject, Review.Result
PeriodResult	Period Result	Summary.Periods
MatchResult	Final Result	Summary.Periods
Leaders	Game Leaders	Leaders.RebHome, Leaders.RebHomeN, Leaders.RebGuest, Leaders.RebGuestN, Leaders.AstHome, Leaders.AstHomeN, Leaders.AstGuest, Leaders.AstGuestN
BoxScore	Box Score	BoxScore.Side
MVP	Player of the Game	MVP.Award, MVP.Side, MVP.Player, MVP.Points, MVP.Rebounds, MVP.Assists
Standings	Standings	Standings.Title
Results	Results	Results.Title

Screen	Label	Fields
Officials	Officials	Officials.Rows

Field	Kind	Values
Lineup.Side, Intro.Side, Score.Side, Foul.Side, Timeout.Side, BoxScore.Side, MVP.Side	Choice	Home, Guest
Intro.Player, Score.Player, Foul.Player, MVP.Player	Text	Shirt number or name from the squad of the team
Score.Kind	Choice	TwoPoints, ThreePoints, FreeThrow
Score.Points	Number	Points of the player; empty = from the player data
Score.Time	Text	Time shown; empty = period and clock
Foul.Kind	Choice	Personal, Technical; FIBA: Unsportsmanlike, Disqualifying; NBA, NCAA: Flagrant1, Flagrant2
Foul.Count	Number	Fouls of the player; empty = from the player data
Review.Kind	Choice	InstantReplay, CoachChallenge
Review.Side	Choice	Officials, Home, Guest
Review.Subject	Choice	TwoOrThree, OutOfBounds, ShotClockReview, GameClockReview, Goaltending, FoulType, OtherDecision
Review.Result	Choice	Pending, CallStands, CallOverturned
Summary.Periods	Check	1 (or true, yes) = show the points per period; anything else = 0
Leaders.RebHome, Leaders.RebGuest, Leaders.AstHome, Leaders.AstGuest	Text	Rebound and assist leaders: number or name
Leaders.RebHomeN, Leaders.RebGuestN, Leaders.AstHomeN, Leaders.AstGuestN	Number	Their counts
MVP.Award	Choice	PlayerOfTheGame, MostValuablePlayer
MVP.Points	Number	Empty = from the player data
MVP.Rebounds, MVP.Assists	Number	Counts
Standings.Title	Text	Heading; the table comes from common\data\dataStandings.xml
Results.Title	Text	Heading; the rows come from common\data\dataResults.xml
Officials.Rows	List (info_list only)	Rows of role~name separated by |; empty = the referees list

- In text fields and list cells, _ is a space (Crew_Chief shows Crew Chief).
- A number field takes whole numbers from 0, or empty.
- A value that is not valid is ignored and written to the log; the reply still starts with !.
- The points leaders, the box score and empty point or foul fields come from the Player Stats window (chapter 7), which TCP 2907 PLAYER also feeds.

C.4 cmd=GET Elements

The answer is <Response><Item> ... </Item></Response> with these 33 elements, in this order.

Element	Example	Meaning
BoardType	St	Display mode: St, Sp, Ad, CK
Home	FENERBAHCE	Home team name (a line break for two lines)
HomeScore	42	Home score
Guest	REAL MADRID	Guest team name
GuestScore	38	Guest score
HomeFoul	3	Home team fouls
GuestFoul	4	Guest team fouls
HomeBonus	false	Home team in the bonus: true or false
GuestBonus	false	Guest team in the bonus
HomeBonusLevel	0	0 = none, 1 = bonus, 2 = double bonus
GuestBonusLevel	0	The same for the guest team
Period	2	Period number; above the regulation periods = overtime
PeriodText	Q2	Period label as shown (Q1 to Q4, 1H, 2H, OT1 ...)
RegulationPeriods	4	4 or 2
OvertimeNumber	0	0 in regulation, 1 = OT1 ...
Possession	H	H, G or empty
Chronometer	07:35.4	Game clock box of the control panel
StatusChronometer	true	Game clock of the program running
ShotClock	17.6	Shot clock box; empty when blank
StatusTimeout	false	Time-out countdown running
Timeout_Timer	60	Time-out countdown; the time-out length while none runs
Timeout_H	2	Time-outs used by home (current half, game or overtime)
Timeout_G	1	Time-outs used by guest
Timeout_H_Left	1	Time-outs left for home
Timeout_G_Left	2	Time-outs left for guest

Element	Example	Meaning
Extra01	[D] - [T5]	Text line 1 as typed
Extra02	HARBOR ARENA [T8]	Text line 2 as typed
PlaylistStarted	0	Playlist started on the media player (0 = none)
AdPlaylistStarted	0	Playlist started on the Advertisement media player (0 = none)
Sound	1	1 = sound on, 0 = muted
InfoOnAir	Score	Info screen on the air; empty = none
InfoScreens	Lineup~Starting Five|Intro~Player Intro|...	Info screens of the preset: Key~Label, separated by |
Labels	RcInfoScreens~Info Screens|...	Texts of the remote INFO card: Key~Text, separated by |

The Labels keys are RcInfoScreens, RcHideScreen, RcPlayerField, RcOnAir, OptHome, OptGuest, OptTwoPoints, OptThreePoints, OptFreeThrow, OptPersonal and OptTechnical.

C.5 TCP Data Socket (Port 2907)

TCP, UTF-8, one line per message, ended with LF or CR LF. Fields KEY=VALUE separated by ;. No PIN.

C.5.1 Scoreboard Data Keys

Key	Values	Meaning
HOMESCORE	Number	Home score
GUESTSCORE	Number	Guest score
HOMENAME	Text; \n = new line	Home team name
GUESTNAME	Text; \n = new line	Guest team name
CHRONO	mm:ss, m:ss, mm:ss.t up to 99:59.9, or ss.t up to 59.9	Game clock
SC	0 to 99.9, tenths allowed; empty = blank	Shot clock; 0 = expired
HOMEFOUL	Number	Home team fouls
GUESTFOUL	Number	Guest team fouls
TIMEOUT	Whole seconds 0 to 300; empty = end	Time-out countdown
EXTRA1	Text; \n = new line	Text line 1
EXTRA2	Text; \n = new line	Text line 2
POSS	H or G (also HOME, GUEST); empty, NONE or 0 = off	Possession arrow (optional, v1.1)
HOMETO	0 to 9	Time-outs used by home (optional, v1.1)

Key	Values	Meaning
GUESTTO	0 to 9	Time-outs used by guest (optional, v1.1)

C.5.2 Commands

Command	Fields	What it does	Success reply
ROSTER	TEAM=H or G; LIST=no,name[,P or S]|...	Stores the squad and clears the player values of the team	!OK:ROSTER:n
PLAYER	TEAM=H or G; NO; FOUL; PTS (all required)	Sets the fouls and points totals of one player; only while the Player Stats window is open	!OK:PLAYER

C.5.3 Reply Codes

These are the replies of the program.

Reply	When
!OK:n	Scoreboard data; n = KEY=VALUE fields taken (an unknown key is counted and ignored)
!OK:n #BAD_TIME:K1,K2	Scoreboard data; the keys named (CHRONO, SC, TIMEOUT) had a bad value and were skipped, the others were taken
!OK:ROSTER:n	ROSTER stored; n players
!OK:PLAYER	PLAYER taken
!IGNORED:FORM_CLOSED	PLAYER while the Player Stats window is closed (not an error)
#NO_DATA	No KEY=VALUE field in the line
#UNKNOWN_COMMAND:name	Command name other than ROSTER or PLAYER
#INVALID_TEAM	TEAM missing or not H or G
#INVALID_LIST	ROSTER: LIST missing or empty
#EMPTY_ROSTER	ROSTER: no usable player in LIST
#ROSTER_WRITE_FAILED	ROSTER: the squad file could not be written
#INVALID_NO	PLAYER: NO missing or empty
#MISSING_FOUL	PLAYER: FOUL missing
#MISSING_PTS	PLAYER: PTS missing
#PLAYER_NOT_FOUND:no	PLAYER: the number is not in the squad (also a number like x)
#APP_CLOSING	The program is closing
#ERROR:message	Unexpected error

C.6 UDP State Broadcast (Port 2908)

UDP to 255.255.255.255 (or start.xml UDP/TargetIP), port 2908, about ten packets a second, one line of UTF-8 text ended with LF. The first field is BB7; the keys follow in this order.

Key	Values	Meaning
SEQ	Number (64-bit)	Packet counter, + 1 per packet, from 1 at the program start
PERIOD	1 to 20	Period; N + 1 = OT1 (N = 4 or 2)
CHRONO	mm:ss or mm:ss.t	Game clock; tenths below the limit of the rules (60 s by default)
RUN	0 or 1	Game clock running (also for a console-driven clock)
SC	14, 4.3, 0 or empty	Shot clock; tenths at 5 s and below; 0 = expired; empty = blank
HORN_MAIN	0 or 1	1 for about 3 s after the game clock ran down to zero
HORN_SC	0 or 1	1 for about 3 s after the shot clock expired
HOMESCORE	Number	Home score
GUESTSCORE	Number	Guest score
HOMEFOUL	Number	Home team fouls
GUESTFOUL	Number	Guest team fouls
TO_ACTIVE	0 or 1	Time-out countdown running
TO_TIMER	Number or empty	Time-out countdown; empty while TO_ACTIVE is 0
TO_H	Number	Time-outs used by home
TO_G	Number	Time-outs used by guest
BONUS_H	0, 1 or 2	Home bonus: none, bonus, double bonus
BONUS_G	0, 1 or 2	Guest bonus
TO_LEFT_H	Number	Time-outs left for home
TO_LEFT_G	Number	Time-outs left for guest
POSS	H, G or empty	Possession arrow
OT	Number	0 in regulation, 1 = OT1, 2 = OT2 ...

start.xml, section UDP	Default	Meaning
TargetIP	255.255.255.255	Destination address; one device's IP for unicast
SendIntervalMs	100	Time between packets in milliseconds
HornWindowMs	3000	How long HORN_MAIN and HORN_SC stay 1
Open	Not present (off)	Broadcast on at the start; written by the "UDP" button

REMOTE/Open and DATASOCKET/Open work the same way for HTTP 1907 and TCP 2907. On a new installation none of the three is present, so all channels are off.

Appendix D: Files and Folders

Everything basketBoard 7 needs is in its program folder, C:\basketBoard7. Setup always installs there. To keep your data safe, copy the whole folder while the program is closed.

D.1 The Program Folder

File or Folder	Content	Written By
basketBoard7.exe, basketBoard7.exe.config and the .dll files	The program and its libraries, among them Processing.NDI.Lib.x64.dll for NDI	Setup
runtimes	The loader of the Microsoft Edge WebView2 Runtime (WebView2Loader.dll)	Setup
start.xml	All settings: language, board place and size, display mode, team names, logos, period lengths and rules, keyboard keys, PIN and the network channels that were on	The program, at the first start from start.xml.default; never touched by Setup
start.xml.default	The factory settings	Setup, at every installation
config.xml	The info graphics: backgrounds, banner, announcement and the other graphics of the Info page	Setup at the first installation; then the program
configSp.xml, configAd.xml, configCK.xml	The settings of the Sponsored, Advertisement and Chroma Key pages	Setup at the first installation; then the program
matchstate.xml	The saved state of the game (chapter 16.8)	The program
basket7License.xml	The PC licence (chapter 2.8). For a USB licence the same file is in the root folder of the stick.	The program, when a key is saved
lang.migration.log	The interface texts that an update added to lang.xml (chapter 2.4)	The program
logs	The log files bb7_yyyymmdd.log, one for each day (chapter 16.10)	The program
API_Commands.txt	The reference of the HTTP, TCP and UDP commands (Appendix C). Settings > "Remote Control" > "Show API Commands" opens it.	Setup
open_firewall_1907.bat	Adds the firewall rules for port 1907, TCP port 2907 and UDP port 2908 (chapter 16.6)	Setup
install_fonts.ps1	Installs the fonts of common\font in Windows (chapter 16.3)	Setup
basketBoard7Help.pdf	This guide. The "Help" tab and the desktop shortcut "basketBoard7 Help" open it.	Setup
common	The program content and your data (D.2)	Setup and the program
media	Videos and pictures (D.3)	Setup and you

D.2 The common Folder

Folder or File	Content
common\data	Your data: squads (playersHome.xml, playersGuest.xml), team database, player data (playerDataHome.xml, playerDataGuest.xml), referees, sponsors, playlists (playList_0.xml, playListAd_0.xml, playListCK_0.xml), web video list, statistics, standings, results and fixtures. Kept by an update.
common\vizrt\storage	The factory designs and the factory design list. Read-only for the program; written again by every Setup. Do not keep files of your own here.
common\vizrt\current	The designs in use, as the boards show them, with your changes. Kept by an update.
common\vizrt\custom	Your own designs and your design list dataBoards.xml. Made by the program; Setup never writes here.
common\vizrt\preview	Pages written by the design preview. Temporary.
common\xml\lang.xml	The interface texts in 46 languages, with your edits. Kept by an update.
common\xml\langFactory.xml	The factory copy of the interface texts. Replaced by every Setup; "Set Factory Reset" on the Language page and the repair of a damaged lang.xml copy it.
common\xml\title.xml	The board titles of the Titles tab. Kept by an update.
common\xml\CPULicense.html, USBLicense.html	The licence terms that the License page and the USB License Creator show
common\font	The fonts of the boards
common\images	The logos of the demo game (team_home.png, team_guest.png, team_board.png) and the icons of the program
common\sounds	The sounds of the clocks: 01.wav clock start, 02.wav end of a period and the horn, 03.wav end of a time-out, 04.wav shot clock horn, 05.wav clock pause and stop
common\remote	The pages of the remote control (logon.html, rcpanel.html) and a second copy of API_Commands.txt

D.3 The media Folder

Folder	Content
media\videos	The demo clip Northwind_Promo.mp4 (playlist 1 of the three media players), the background video of the boards BlueWonder.mp4 and further sample clips
media\images\players	The player photos of the demo squads
media\images\sponsors	The sponsor logos of the demo

Folder	Content
media\images\backgrounds	Sample background pictures
media\downloads	Standings, results and club logos of the demo, and the files that the download page of Stats saves

Your own pictures and clips can be kept anywhere; the media folder is a good place, because an update keeps your files there. Setup writes its own sample files again under their names.

D.4 Backup Copies

Beside the files you find copies with these endings:

Ending	Written By	Meaning
.bak	The program, at every save of an XML file	The version before the last save. start.xml.bak is start.xml as it was one save earlier.
.tmp	The program, during a save	Exists only for a moment
.corrupt	The program, when it finds a damaged file	The damaged file, set aside before the repair (chapter 16.9). A later damage of the same file overwrites it.
.default	Setup, during an update	The new factory version of a file of yours that Setup did not overwrite, for example config.xml.default or lang.xml.default. Your own file stays in use.
.bak_premigration	The program, once	lang.xml as it was before an update added new texts to it (chapter 2.4)

D.5 Outside the Program Folder

- The fonts of the boards are installed in the Windows fonts folder by Setup.
- The firewall rules "basketBoard 1907 TCP IN", "basketBoard 1907 UDP IN", "basketBoard 1907 TCP OUT", "basketBoard 1907 UDP OUT", "basketBoard 2907 TCP IN", "basketBoard 2908 UDP IN" and "basketBoard 2908 UDP OUT" are in the Windows Defender Firewall.
- The desktop shortcuts "basketBoard7" and "basketBoard7 Help".
- A USB licence: basket7License.xml in the root folder of the USB stick.

A copy of the program folder on another PC brings teams, playlists and designs along. A PC licence stays bound to its computer; a USB licence travels with the stick.