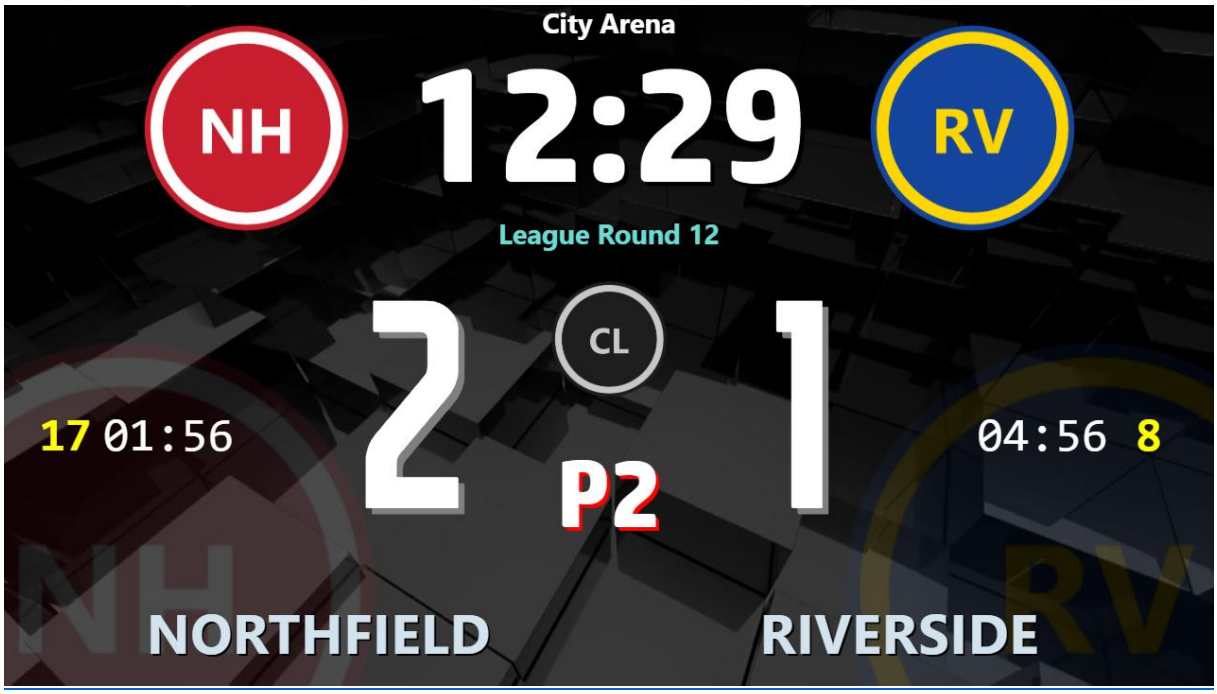
hockeuBoard 7

Professional Led Display Scoreboard Software

USER MANUAL

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LANGUAGE SUPPORT



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

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1. Introduction

hockeyBoard 7 is scoreboard software for hockey. It runs on a Windows PC and shows the score, the match clock, the period, penalties and match graphics on an LED wall, a video screen, a projector or as a video signal for a broadcast or a live stream. The operator controls everything from one small window, from a phone or tablet, or from other programs over the network.

1.1 What hockeyBoard 7 Does

- Counts the match time down per period, with tenths in the last minute if you want them, and sounds the horn at the end of a period.
- Keeps the score and the period, and counts timeouts.
- Runs penalty and card timers with the rules of the selected sport: power-play goals in ice hockey, green and yellow cards in field and indoor hockey, blue and red cards and the second period of inferiority in rink hockey.
- Counts penalty corners and video referrals (field and indoor hockey), team fouls and the 45-second attack time (rink hockey).
- Records a penalty shoot-out attempt by attempt, including sudden death.
- Shows match graphics on the board: goal, card, substitution, line-ups, match timeline, match statistics, standings, results, banners and announcements.
- Plays videos and pictures, shows sponsors, and can combine the scoreboard with advertising on one screen.
- Sends the board as an NDI video source to production software such as vMix, OBS or a hardware NDI receiver.
- Can be controlled from a phone or tablet in the same network (remote control) and from other programs (HTTP API).

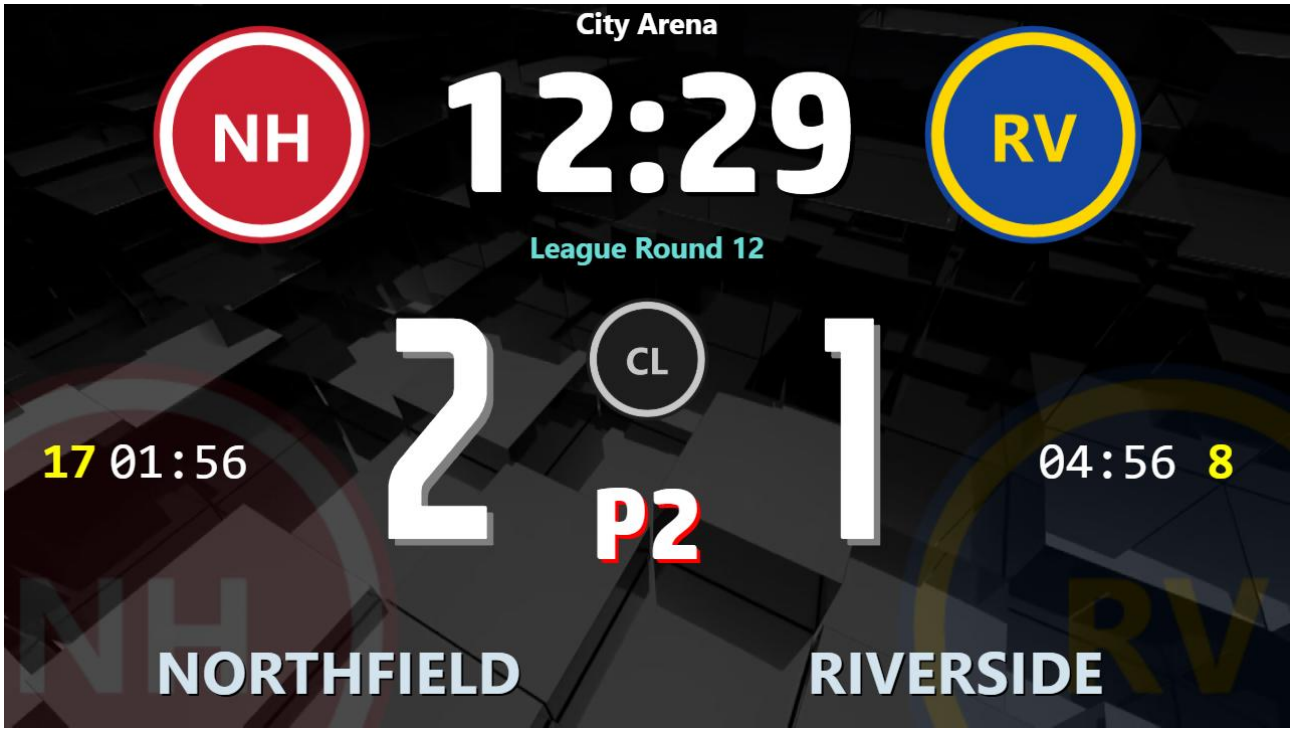


Figure 1. The scoreboard during an ice hockey match: score, clock, period and the running penalties of both teams.

1.2 Supported Sports

hockeyBoard 7 has four sport modes. The mode sets the periods, the penalty buttons, the penalty rules and the sport-specific controls of the control panel. Chapter 6 explains what each mode sets.

Mode	Periods (default)	Penalties	Special Features
Ice Hockey	3 × 20 min, overtime 5 min	Minor 2, major 5, misconduct 10 min; up to 2 running penalties per team; a power-play goal ends a minor penalty	Shoot-out
Field Hockey	4 × 15 min (quarters)	Green card 2 min, yellow card 5 or 10 min, red card	Penalty corners, video referral, shoot-out
Indoor Hockey	4 × 10 min (quarters)	Green card 1 min, yellow card 2 min, red card	Penalty corners, shoot-out
Rink Hockey	2 × 25 min, extra time 2 × 5 min	Blue card 2 min, red card 4 min; one running period of inferiority per team	Team fouls with direct-free-hit warnings, 45-second attack clock, card accumulation, shoot-out

1.3 Display Modes

The board can run in four display modes. Switch between them on the control panel (chapter 5) at any time.

Mode	What the Board Shows
St (Standard)	The full-screen scoreboard.
Sp (Sponsored)	The scoreboard with a sponsor strip: sliding sponsor logos or a scrolling text.
Ad (Advertisement)	A compact scoreboard beside a large media area for videos, pictures, a camera or a screen capture, with banner areas.
CK (Chroma Key)	A compact scorebug on a key colour (green, blue, magenta or transparent) for mixing into a video picture.

1.4 What's New in 7.6.7

- **Four sport modes with their own rules.** Ice, field, indoor and rink hockey each have their own penalty model: the type of an ice hockey penalty comes from its duration, a power-play goal ends the minor penalty with the least time on the clock (IIHF 16.2), field and indoor cards never end on a goal, and a second rink hockey penalty waits until the first one ends.

- **Field and indoor hockey:** penalty corner counters, the video referral indicator (field hockey), red cards (team plays one player short), indoor hockey with 4 × 10 minute quarters.
- **Rink hockey:** World Skate rules, team fouls with the warnings at the 9th and 10th foul, the 45-second attack clock and automatic card accumulation (sections 8.2 and 7.4).
- **Standings:** GF, GA and GD columns, an optional calculation from the results with the FIH tiebreak order, two points schemes (standard and FIH Hockey Pro League) and a shoot-out column for the results (chapter 12).
- **Clock:** no more drift when the clock is paused and restarted, and penalty timers pause and resume with the exact remaining time.
- **Remote control:** PIN login with lockout after wrong attempts, sessions instead of a PIN in the address, and a new phone and tablet panel (chapter 14).
- **NDI:** the frame rate of the NDI output can be chosen in the settings (default 59.94).

1.5 How to Read This Guide

- Chapters 2 to 4 set up the program. Chapter 5 is the control panel you use during a match; chapters 6 to 8 explain the sport modes, penalties and the sport-specific features.
- Chapters 9 to 13 cover the board output, designs, match graphics, statistics and media. Chapters 14 to 18 are reference chapters.
- Names of buttons and boxes are written as they appear on the screen, for example **Save & Apply**. Numbers in a picture match the numbers in the table under it.
- The pictures were taken from the program with fictional teams and players. Without a licence the program runs as DEMO and shows the word DEMO on the graphics (chapter 3); you can see it in some pictures.

1.6 Website and Support

- Website: www.footballscoreboardsoftware.com
- Questions and support: arslan.ziya@gmail.com
- Video tutorials: **Settings** → **Youtube Tutorials**

2. Installation and First Start

2.1 System Requirements

- 64-bit Windows 10 or 11. On 32-bit Windows the setup offers hockeyBoard 6 instead.
- Microsoft .NET Framework 4.7.2 or later.
- Microsoft Edge WebView2 Runtime (the boards are web pages drawn by WebView2).
- Administrator rights for the installation; the program itself is started as administrator by its shortcut.
- A second screen, LED controller or video output for the board. For NDI output, a network to the receiving computer.
- Windows display scaling of 100 % on the board screen gives pixel-exact boards (chapter 19).

2.2 Installing

1. Run **hockeyBoard7Setup.exe**. If it is not started as administrator, it offers to restart itself with administrator rights.
2. The setup checks Windows, .NET Framework and the WebView2 Runtime first. If a component is missing, it opens the Microsoft download page and stops: install the component and run the setup again.
3. The program is always installed to **C:\hockeyBoard7**; there is no folder to choose.
4. The setup creates two desktop shortcuts for all users: **hockeyBoard7** (set to run as administrator) and **hockeyBoard7 Help** (this guide as PDF).



Figure 2. The setup wizard.

The fonts of the board designs are in C:\hockeyBoard7\common\font. The setup installs them, and the program installs any missing ones again at every start.

For the remote control (chapter 14) the Windows firewall must allow port 1907. Run **open_firewall_1907.bat** in the program folder as administrator: it adds the four rules "hockeyBoard 1907 TCP IN", "UDP IN", "TCP OUT" and "UDP OUT" and skips rules that already exist, so it can be run again safely.

2.3 First Start

At the first start the program writes its settings file (start.xml) with these defaults:

Setting	Default
Sport	Field hockey, 4 × 15 minute quarters

Setting	Default
Language	The language of Windows (English if it is not available)
Display mode	St (Standard)
Board position and size	Left 0, Top 0, 960 × 540 pixels
Sound	On
Remote control	Off; PIN 123456 until you set your own
NDI	Sender name Ho7_NDI, 59.94 frames per second
Licence	DEMO until a licence key is entered (chapter 3)

The main window opens at the bottom right of the screen at 640 × 480 pixels, and the board window opens at the position and size of the settings. Choose your sport first (chapter 6), then set the board position and size (chapter 9).

2.4 Folders and Files

Folder or File	Contents
C:\hockeyBoard7\start.xml	All settings, the team names and the state of the match.
common\data	Players, referees, sponsors, events, statistics, standings, results, fixtures and playlists.
common\vizrt\storage	The factory board designs (masters). The program never changes them.
common\vizrt\current	The designs in use and the board pages made from them.
common\images, common\font, common\sounds	Pictures, fonts and the five sounds (start, horn, timeout end, penalty end, pause).
media	Background videos, sponsor pictures, player pictures and downloaded league data.
API_Commands.txt	The list of the HTTP API commands (chapter 15).
hockey7License.xml	The PC licence (chapter 3).

2.5 Updating to a New Version

Close the program and run the new setup. Your settings, data files and saved designs stay in place. The program checks old settings at the first start of the new version and changes only values that are still at an old factory default, for example the rink hockey red card (4 minutes) or the indoor hockey quarters (4 × 10 minutes). Values you changed are kept.

2.6 Uninstalling

Uninstall **hockeyBoard7** in Windows Settings → Apps. To remove everything, delete C:\hockeyBoard7 afterwards; it also holds your data files and designs. Remove the firewall rules in Windows Defender Firewall → Advanced settings if you no longer need them.

2.7 Quick Start: The First Match

1. Click the sport button at the top of the control panel (for example **Field**) and choose your sport in **Period & Penalty Settings**; click **Save & Apply** (chapter 6).
2. In **Settings** → **Screen Properties** set the position and size of the board (chapter 9).
3. Type the team names and click the logos to choose the team logos (chapter 5).
4. Select the first period and press **Start**. Use the arrows for goals and the penalty buttons for penalties.
5. For graphics, open **Info** (chapter 11); press **Game** to bring the scoreboard back.

3. Licensing

3.1 PC Licence and USB Licence

hockeyBoard 7 needs a licence key. A key is made for one computer or for one USB drive:

- **PC licence:** the key belongs to the Computer ID of one PC. It is stored in hockey7License.xml in the program folder.
- **USB licence:** the key belongs to one USB drive and is stored in the root folder of that drive. Plug the drive into any PC with hockeyBoard 7 and the program runs with the licence. The program looks for a USB licence first.

A key also carries the maximum board resolution, the expiry date and the licensed options (GPU, extra media player, record and replay). Click the question mark on the License page to see them.

If the clock of the PC is set back before the last time the program ran, or the expiry date has passed, the program runs as DEMO until the date is correct or a new key is entered.

3.2 DEMO Mode

Without a licence the program runs as DEMO. You can try every screen, but:

- the score arrows, the team-foul arrows and changing the team logos show the message "License Required!";
- the board clock shows the word DEMO for one second every ten seconds;
- the match graphics, the Ad media area and the media player show a magenta DEMO label;
- period lengths typed in the Screen Properties grid are not saved.

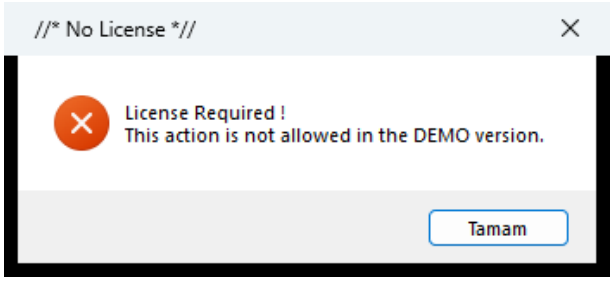


Figure 3. The message for a function that needs a licence.

3.3 Entering a PC Licence

1. Open **Settings** → **License**.
2. Click the copy button next to **Computer ID** and send the ID with your order.
3. Paste the key you receive into **License Key**. The box turns green for a valid key, pink for an expired key and grey for an invalid key.
4. Click **Save**. The program writes the licence file and reports "Valid key".

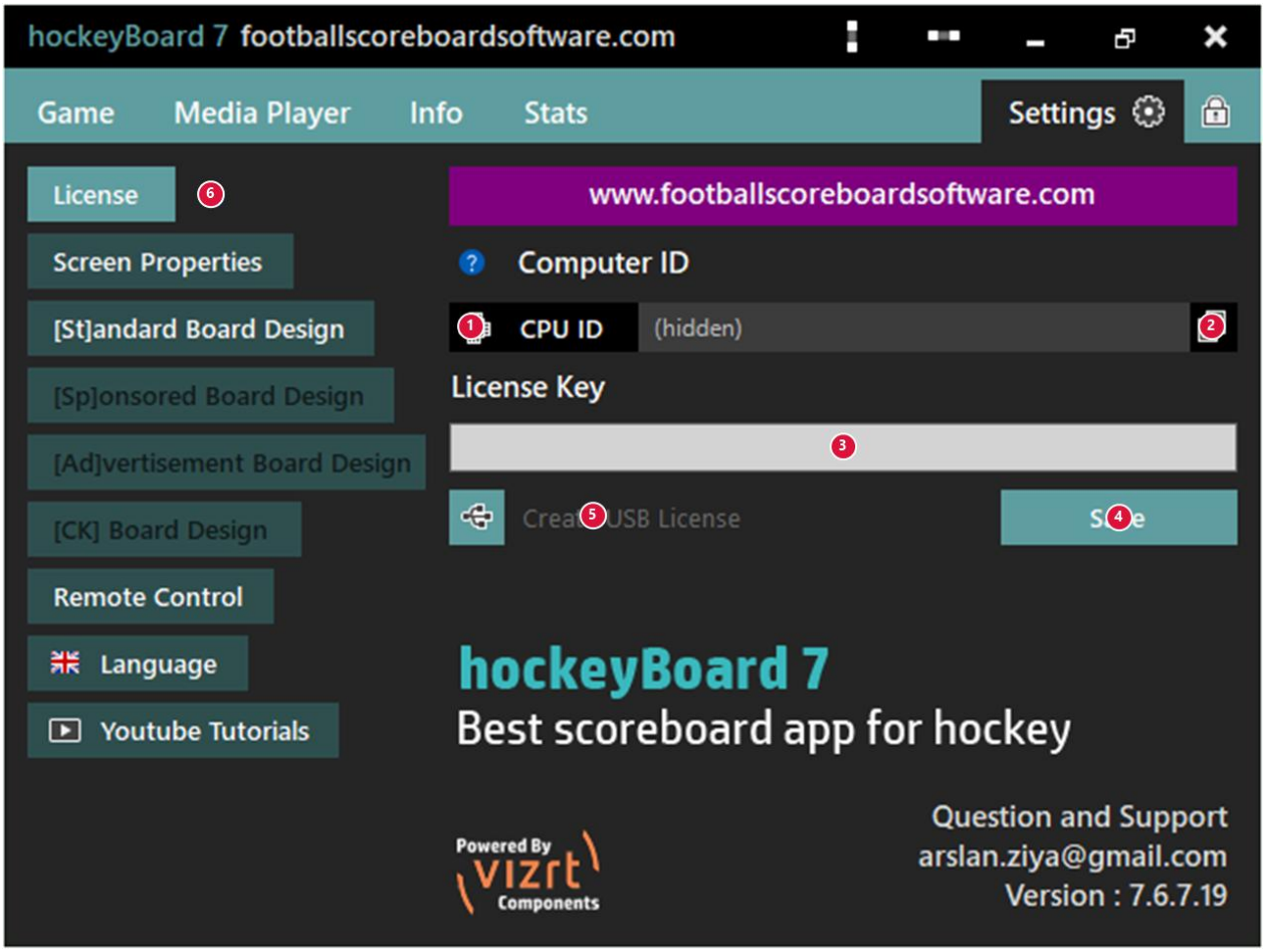


Figure 4. The License page. The Computer ID is hidden in this picture.

No.	Control	What It Does
1	**Computer ID**	The ID of this PC. A PC licence key is made for this ID.
2	**Copy**	Copies the Computer ID to the clipboard.
3	**License Key**	Paste your key here. Green = valid, pink = expired, grey = not valid.
4	**Save**	Saves the key as the PC licence.
5	**Create USB License**	Saves a key to a USB drive (section 3.4). Available when a USB drive is plugged in.
6	**Question mark**	Shows the details of the licence: validation, maximum resolution, expiry date, model and options.

3.4 Creating a USB Licence

1. Plug in the USB drive and open **Settings** → **License**.
2. Click **Create USB License**, choose the drive and send its **USB Device ID** with your order.
3. Paste the key you receive and save it to the drive.

When a USB licence is found, the License page shows "USB License Detected" with the USB ID and the key.



Figure 5. The Create USB License dialog.

3.5 Licence Status Icon

The icon at the right end of the menu bar shows the licence state: a USB stick ("USB License Found"), a processor ("CPU License Found") or a padlock ("No License"). Point at the icon to see the text.

4. Main Window and Menus

4.1 Title Bar and Window Sizes

The main window has its own dark title bar. It starts at 640 × 480 pixels at the bottom right of the screen, sticks to the screen edges and other windows when you move it, and can be resized at any edge.

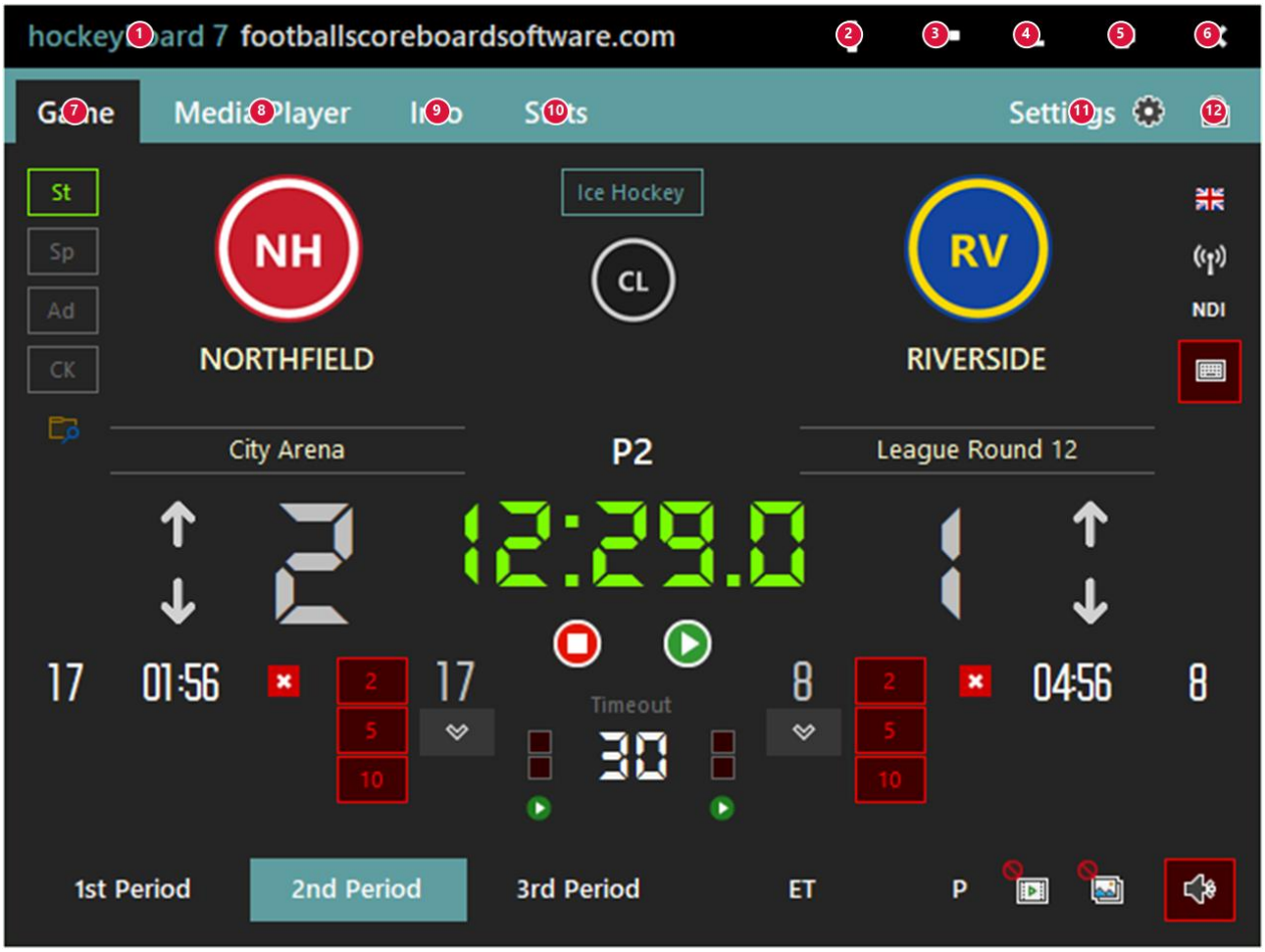


Figure 6. The main window: title bar, menu bar and the Game tab (control panel).

No.	Control	What It Does
1	**Title**	Program name and website.
2	**Column**	Switches between 640 × 480 and a column of 640 pixels over the full screen height at the right edge.
3	**Strip**	Switches between 640 × 480 and a strip of 480 pixels over the full screen width at the bottom.
4	**Minimise**	Minimises the main window. The board stays on.
5	**Maximise**	Maximises the main window or restores it.
6	**Close**	Asks for confirmation, saves the state of the match and closes the program.
7	**Game**	The control panel (chapter 5). Pressing Game also takes any graphic or media off the board and shows the scoreboard again.

No.	Control	What It Does
8	**Media Player**	Videos and pictures on the board (chapter 13).
9	**Info**	Match graphics: goal, cards, substitutions, line-ups, banners (chapter 11).
10	**Stats**	Timeline, statistics, standings, results and fixtures (chapter 12).
11	**Settings**	Licence, screen properties, designs, remote control, language (chapter 18).
12	**Licence icon**	USB licence, PC licence or no licence (chapter 3).

4.2 The Display-Mode Menu

In the Sp, Ad and CK display modes a fifth menu appears between **Stats** and **Settings**, named after the mode. It holds the pages of that mode: sponsors and scrolling text (Sp); the banners, media player, camera and screen capture of the media area (Ad); media, camera, screen capture and the CK graphics (CK). See chapter 9.

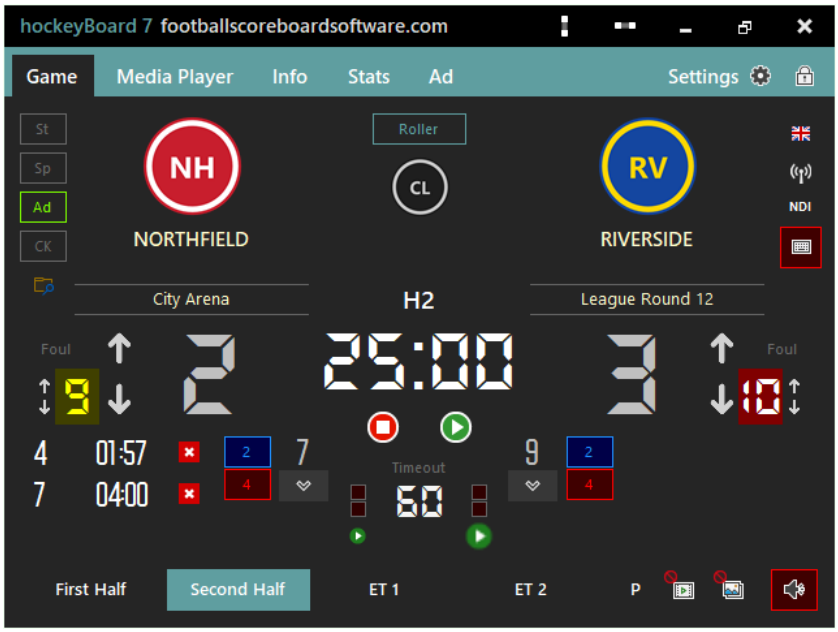


Figure 7. The Ad menu appears in the Advertisement display mode.

4.3 Board Windows

The board is a separate window without a frame at the position and size of **Settings → Screen Properties**. Match graphics, videos and the Ad and CK boards use their own windows at the same place. Put the board on the LED screen or the video output, or send it as NDI (chapter 9).

Double-click an empty part of the control panel to put the board window at 640 × 480 at the bottom right of the screen, for example to check it on a single-screen laptop. Restore the real size in Screen Properties.

4.4 Closing the Program

Close the program with the close button and confirm. The scores, names, period, penalties and settings are saved and come back at the next start.

5. Control Panel

The control panel is the Game tab of the main window. Everything you need during a match is on this page: the clock, periods, scores, timeouts, penalties and the display mode. The controls of the selected sport are added automatically: penalty corners and the video referral in field hockey, team fouls and the attack clock in rink hockey (chapter 8).

5.1 The Game Tab at a Glance

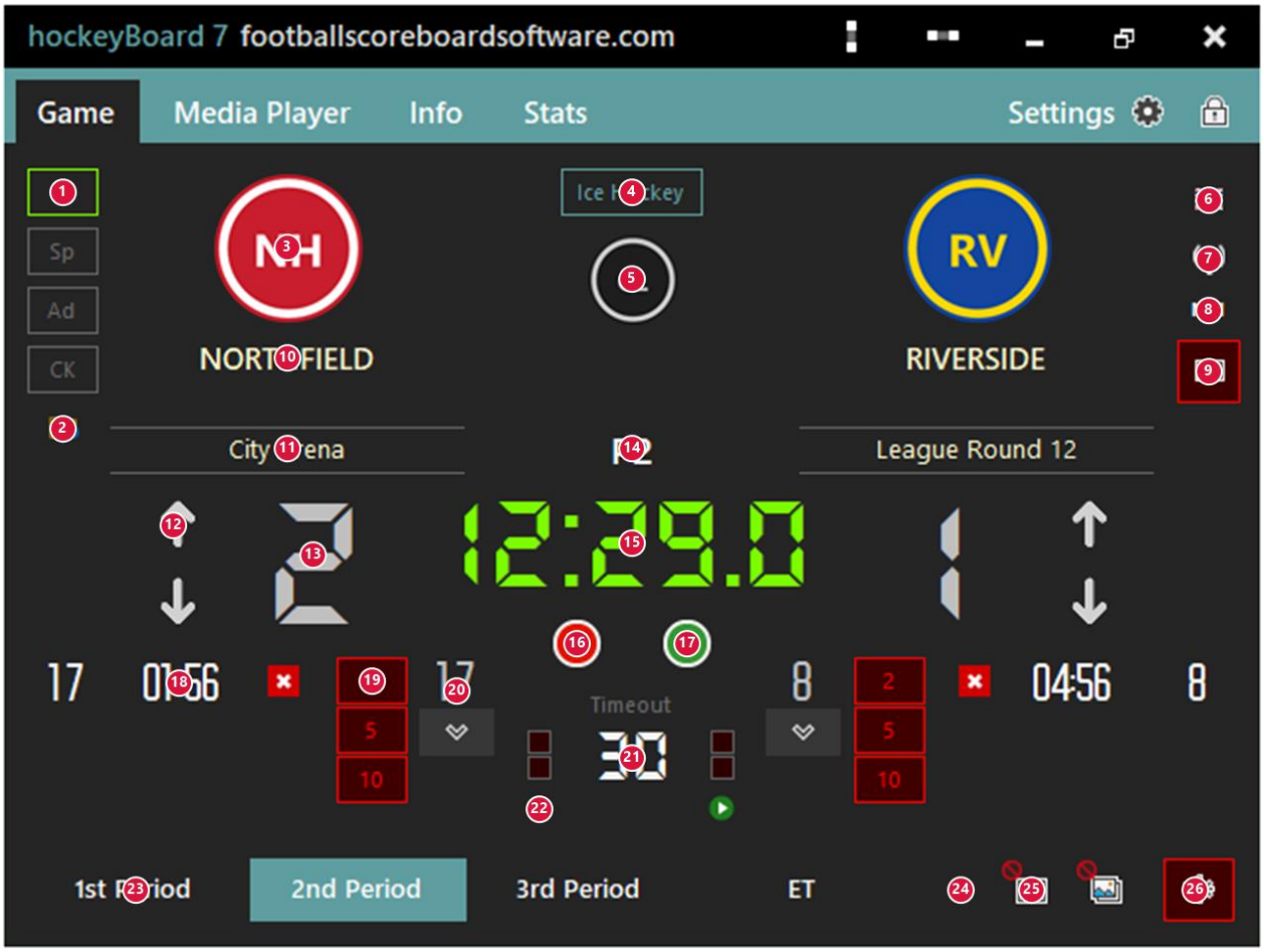


Figure 8. The control panel in ice hockey mode during the second period, with three running penalties.

No.	Control	What It Does
1	**St, Sp, Ad, CK**	Switch the board between the Standard, Sponsored, Advertisement and Chroma Key display modes (chapter 9). The active mode is green.
2	**Select Design**	Opens the design gallery of the current display mode (chapter 10).
3	**Team logo**	Click to choose the logo of the team. The small X that appears over a selected logo removes it. The guest logo is on the right.
4	**Sport**	Shows the sport mode (Ice Hockey, Field, Indoor, Roller) and opens Period & Penalty Settings (chapter 6).
5	**Board logo**	The centre logo of the board, for example the league or tournament logo.
6	**Language**	Opens the language page of the settings (chapter 17).

No.	Control	What It Does
7	**Remote control**	Opens the remote control settings (chapter 14).
8	**NDI**	Starts and stops the NDI output of the board (chapter 9). Blinks red while it sends.
9	**Keyboard**	Opens the Keyboard Hook Manager (chapter 16). Green while the global shortcuts are on, red while they are off.
10	**Team name**	The team name; a line break makes a two-line name. The box turns black as a warning for more than two lines.
11	**Extra line**	One text line under each name, for example the venue and the round. [D5] and [T8] insert the date and the time.
12	**Score arrows**	Up arrow: +1 goal. Down arrow: −1 goal (never below 0). The guest arrows are on the right.
13	**Score**	The score. You can also click it and type a score.
14	**Period**	The period text shown on the board (P1, Q3, H2...).
15	**Clock**	The match clock. Type a time while the clock is stopped (section 5.2). Green while the clock runs or is paused.
16	**Stop**	First press: pause. Second press while stopped: resets the clock to the full period length.
17	**Start / Pause**	Starts and pauses the clock. Penalty timers start and pause with it.
18	**Penalty list**	The running and waiting penalties of the team: player number and time. The red X cancels a penalty. The guest list is on the right.
19	**Penalty buttons**	Start a penalty for the player number in the box beside them. The buttons follow the sport mode (chapter 7).
20	**Player number**	Type the player number for the next penalty, or pick it from the list with the arrow below.
21	**Timeout**	The length of a timeout in seconds; counts down while a timeout runs.
22	**Timeout start**	Starts the timeout of the team (left: home, right: guest). The squares above show the timeouts taken.
23	**Periods**	Select the period. Going back to the first period starts a new match (section 5.4).
24	**P**	The penalty shoot-out (section 8.4).
25	**Background**	Choose the background video and the middle-layer picture of the board; the small red buttons remove them.
26	**Sound**	Switches the sounds on (green) and off (red). With sound on, a horn button appears above the clock.

5.2 The Match Clock

- Select the period first: the clock shows the full length of the period.

- **Start** runs the clock down; **Start** again (now **Pause**) pauses it. The clock keeps the exact remaining time, also over many pauses.
- To correct the time, pause the clock, click the clock box and type the time: 12:34, 2:05, 45 (seconds) or 12:34.5 (with tenths). The next **Start** continues from the typed time. An unreadable time is replaced by the full period length.
- **Stop** pauses a running clock. Pressed again while the clock is stopped, it resets the clock to the full length of the period. Penalties are not deleted by Stop: they carry over into the next period.
- At 0:00 the clock stops by itself and the horn sounds (if sound is on).
- **Show Milliseconds** (Period & Penalty Settings, chapter 6) shows tenths of a second: mm:ss.t above one minute and ss.t below. Without it the clock shows mm:ss.

5.3 Scoring

Use the arrows beside the score. In ice hockey a goal can end a penalty of the other team (section 7.2). If **Stop Chronometer on Goal** is on (the default), a goal also pauses the running clock. Typing a score into the score box changes only the number: it does not end penalties and does not stop the clock, so use it for corrections.

5.4 Periods and a New Match

The period buttons follow the sport: 1st, 2nd and 3rd Period and ET in ice hockey; 1st to 4th Period (quarters) in field and indoor hockey; First Half, Second Half, ET 1 and ET 2 in rink hockey. The active period is blue. Periods cannot be changed while the clock or a timeout runs.

Going back to the first period from a later period starts a new match. hockeyBoard asks first:

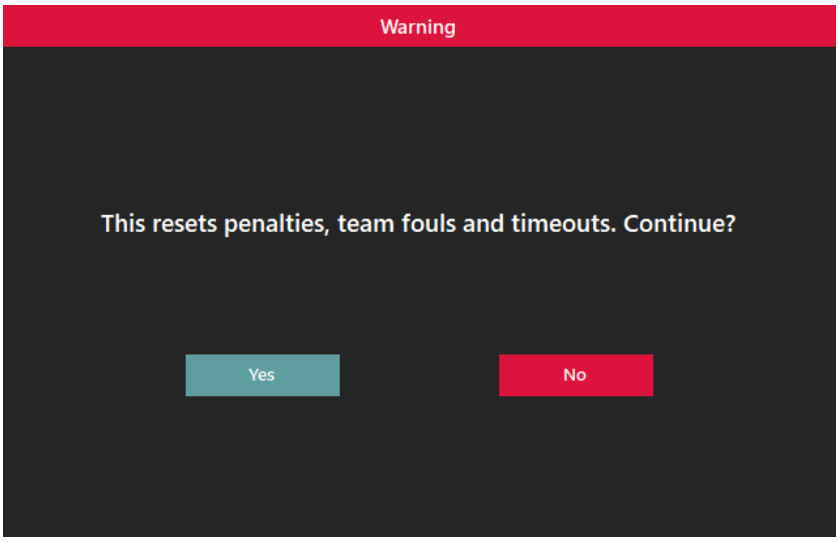


Figure 9. The question before a new match.

Yes clears the penalties, team fouls, timeouts, red cards, penalty corners and video referrals. The scores and team names stay; set them for the new match. Saving Period & Penalty Settings with another sport asks the same question.

5.5 Timeouts

The timeout length comes from Period & Penalty Settings. Press the green button under the timeout box of a team: the timeout counts down, the clock buttons are locked and the team's timeout square blinks; the board shows the countdown. Press the button again to end the timeout early. At 0 the timeout sound plays.

Board Output **Control Panel**

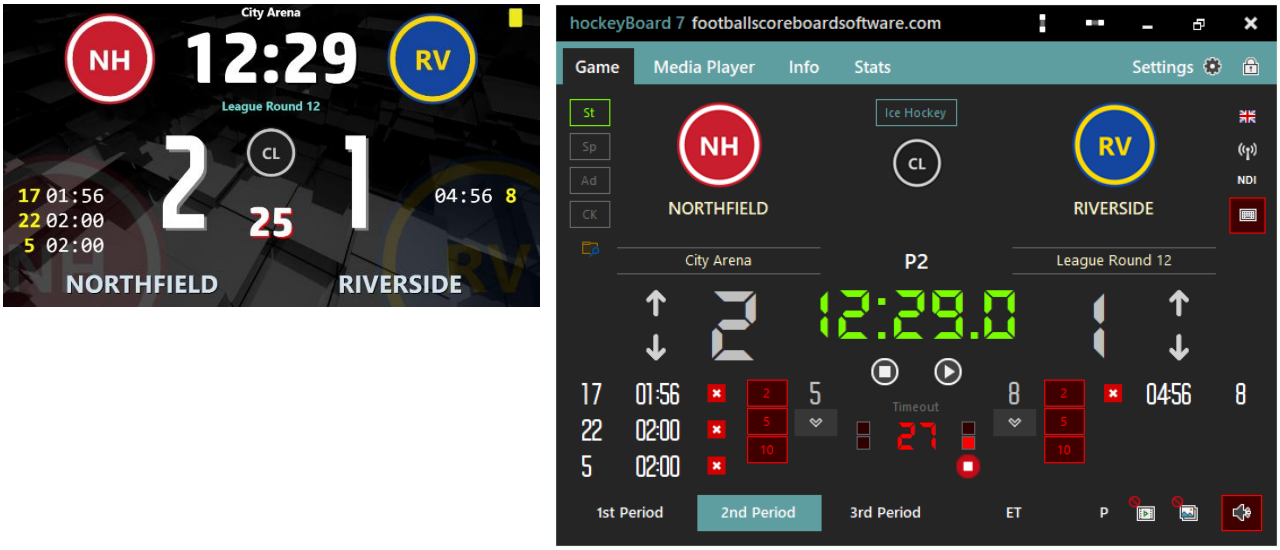


Figure 10. A guest timeout: the board shows the countdown and a timeout mark; the panel shows the remaining seconds.

- The squares above the timeout buttons show the timeouts taken. While the clock is stopped, click a square to correct the count.
- A team can take up to two timeouts. In rink hockey the count goes back to zero at the second half, a third timeout in a half is refused and there are no timeouts in extra time; a warning sound plays 15 seconds before the end of a timeout.
- If timeouts are switched off in Period & Penalty Settings, the timeout area is hidden.

5.6 Sounds and the Horn

The program has five sounds: start, horn (end of a period, direct free hit warning), timeout end, penalty end and pause. The sound button switches them all on or off. With sound on, the horn button above the clock plays the horn by hand.

5.7 Remote Control and Keyboard

Everything on the control panel can also be done from a phone or tablet (chapter 14), from other programs (chapter 15) and, for the clock and the goals, with global keyboard shortcuts (chapter 16).

6. Sports and Match Rules

The sport mode decides the periods, the penalty buttons and rules, and which special controls the control panel shows. Choose it in **Period & Penalty Settings**: click the sport button at the top of the control panel, or the "..." button of **Periods & Penalty Settings** in **Settings** → **Screen Properties**.

6.1 Period & Penalty Settings

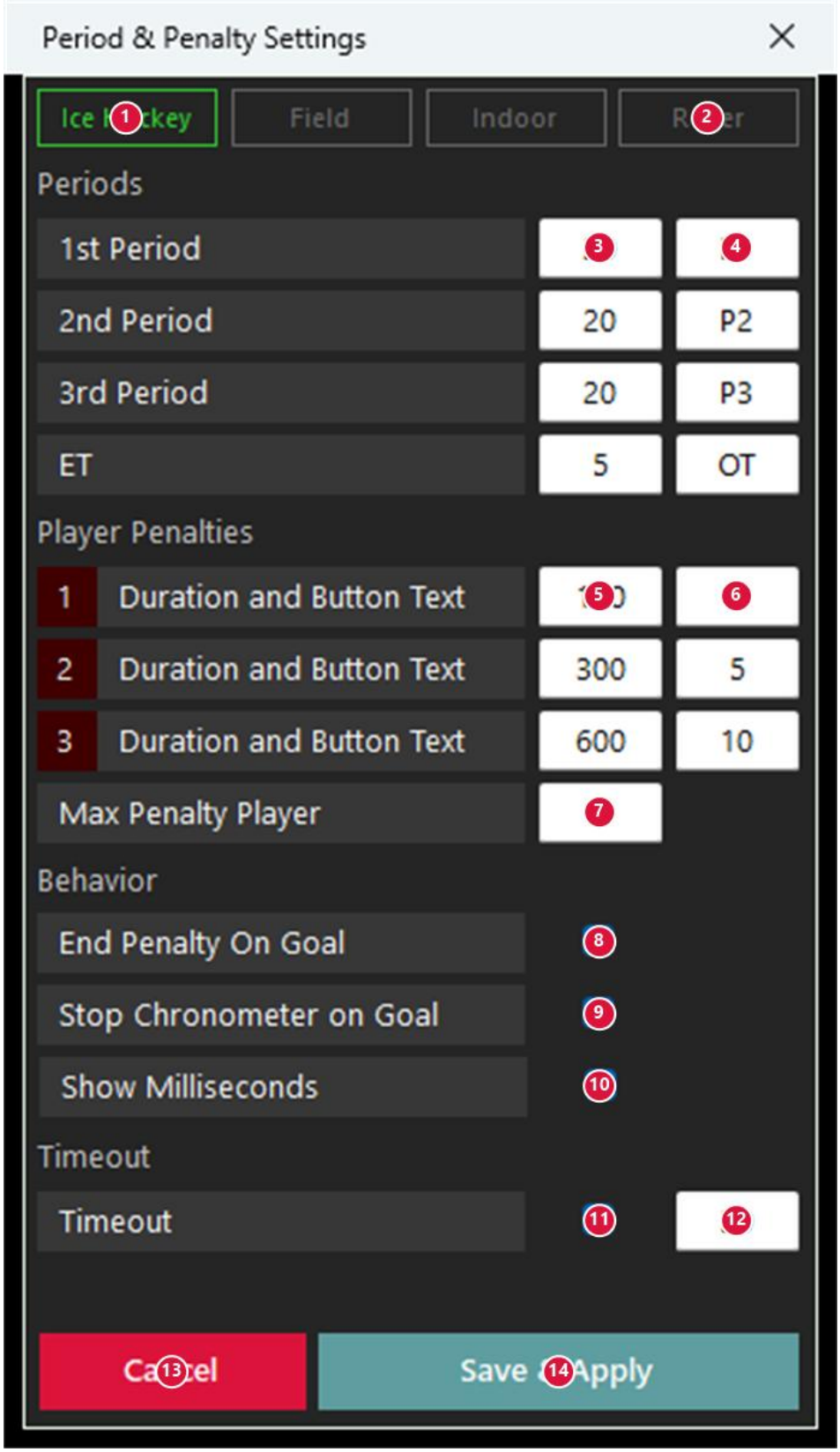


Figure 11. Period & Penalty Settings with the ice hockey preset.

No.	Control	What It Does
1	**Sport buttons**	Ice Hockey, Field, Indoor, Roller (rink hockey). Clicking a sport fills in its preset; nothing is saved yet. The active sport is green.

No.	Control	What It Does
2	**Roller**	Rink hockey (World Skate).
3	**Period minutes**	The length of each of the four periods in minutes.
4	**Period text**	The text shown on the board for the period (P1, Q1, H1, OT, ET1...).
5	**Penalty seconds**	The duration of each of the three penalty buttons in seconds. 0 hides the button.
6	**Button text**	The caption of the penalty button (2, 5, 10...).
7	**Max Penalty Player**	How many penalties of a team run at the same time. Further penalties wait in the list. 0 = no limit.
8	**End Penalty On Goal**	A goal ends a penalty of the other team. Used in ice hockey only (section 7.2).
9	**Stop Chronometer on Goal**	A goal pauses the running clock.
10	**Show Milliseconds**	The clock shows tenths of a second.
11	**Timeout**	Timeouts on or off.
12	**Timeout seconds**	The length of a timeout.
13	**Cancel**	Closes without saving.
14	**Save & Apply**	Saves and applies the settings. If the sport changed, or the match is past the first period, the program asks first and then starts a new match (section 5.4).

6.2 What Each Sport Sets

Setting	Ice Hockey	Field Hockey	Indoor Hockey	Rink Hockey
Periods	3 × 20 min + 5 min	4 × 15 min	4 × 10 min	2 × 25 min + 2 × 5 min
Board period texts	P1, P2, P3, OT	Q1 to Q4	Q1 to Q4	H1, H2, ET1, ET2
Period buttons	1st, 2nd, 3rd Period, ET	1st to 4th Period	1st to 4th Period	First Half, Second Half, ET 1, ET 2
Penalty buttons	2, 5, 10 min	Green 2, yellow 5, yellow 10 min, red card	Green 1, yellow 2 min, red card	Blue 2, red 4 min
Running penalties per team	2	No limit	No limit	1 (the next one waits)
Goal ends a penalty	Yes (minor penalties)	No	No	No

Setting	Ice Hockey	Field Hockey	Indoor Hockey	Rink Hockey
Timeouts	On, 30 s	Off	On, 60 s	On, 60 s, 2 per half
Clock with tenths	On	Off	Off	Off
Special controls	–	Red cards, penalty corners, video referral	Red cards, penalty corners	Team fouls, attack clock, yellow cards

All values can be changed before **Save & Apply**, for example shorter periods for youth matches.

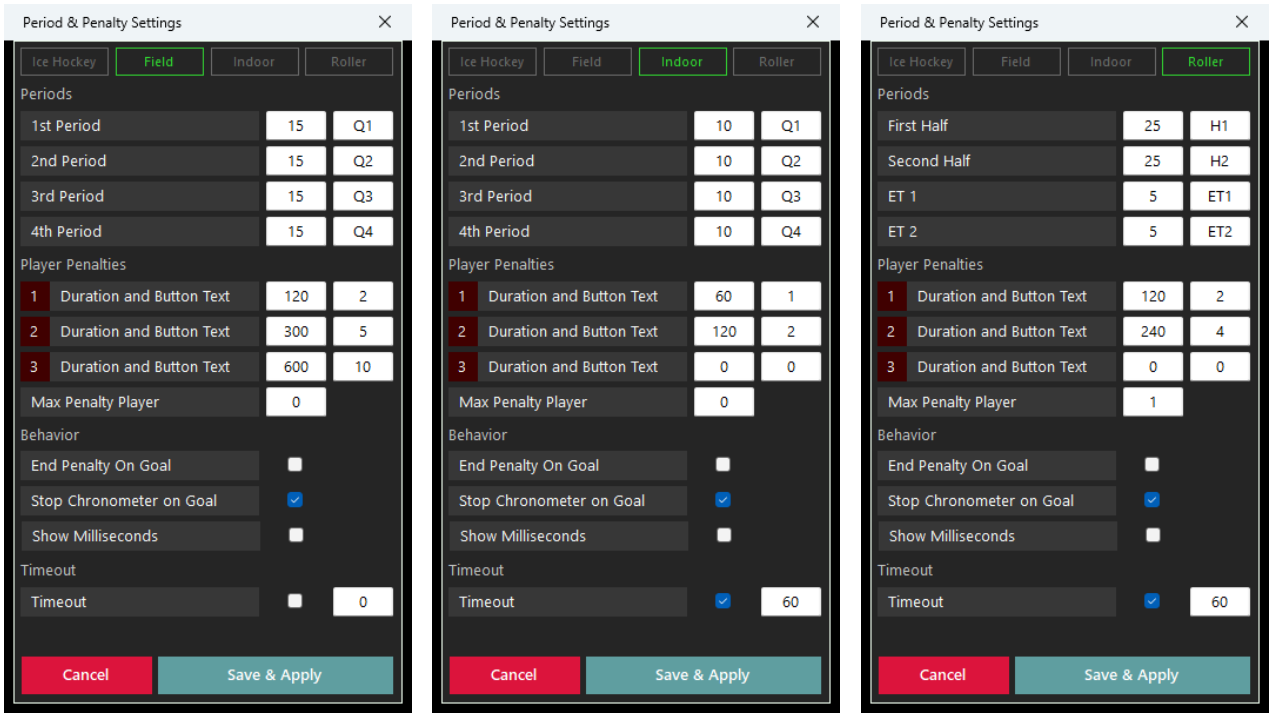


Figure 12. The presets of field, indoor and rink hockey.

6.3 Rule References

hockeyBoard follows the published rules of each sport. Check the edition your competition uses before an event.

Ice hockey. The penalty types, the power-play rule and the order of penalties follow the current IIHF Official Rule Book (Rules 16 to 20); when a power-play goal is scored, the minor penalty with the least time remaining on the clock ends (Rule 16.2).

Field hockey. Quarters, green and yellow cards and penalty corners follow the FIH Rules of Hockey, effective from 1 March 2026 (Rules 5 and 14); a green card is a temporary suspension of 2 minutes and a yellow card one of at least 5 minutes. The video referral follows the FIH General Tournament Regulations for outdoor competitions (Appendix 17).

Indoor hockey. Quarters of 10 minutes and the card durations follow the FIH Rules of Indoor Hockey, effective from 1 December 2023 (Rules 5 and 14); a green card suspends a player for 1 minute and a yellow card for at least 2 minutes. The indoor tournament regulations have no video referral.

Rink hockey. Playing time, team fouls, cards, periods of inferiority and the attack time follow the World Skate Rink Hockey Rules of the Game, update of June 2026 (Articles 3, 4, 22 to 24 and 31); a team has "a maximum time of forty-five (45) seconds of play to finish their attacks" (Article 4.3.a).

The points schemes and the tiebreak order of the standings are described in chapter 12.

7. Penalties and Cards

7.1 Starting, Waiting and Cancelling Penalties

1. Type the player number in the box beside the penalty buttons of the team, or click the arrow under it and pick a player.
2. Click the penalty button. The penalty appears in the list of the team with the player number and the time.

Penalties run with the match clock: they pause when the clock pauses and continue with the exact remaining time. A penalty that ends is removed from the list with a sound, and the board shows it until then.

- **Waiting penalties.** When a team already has the maximum number of running penalties (Max Penalty Player, chapter 6), a new penalty waits in the list with its full time. It starts when a running penalty ends and the clock runs.
- **Cancelling.** Click the red X of a penalty to remove it, for example after a mistake.
- **Correcting the time.** While the clock is stopped, double-click the number or the time of a penalty and type the new value (m:ss or mm:ss). The type of the penalty does not change.
- **Next period.** Penalties are not deleted at the end of a period or by **Stop**: they carry over into the next period and into overtime or extra time. A new match (section 5.4) clears them.

7.2 Ice Hockey

Board Output **Control Panel**

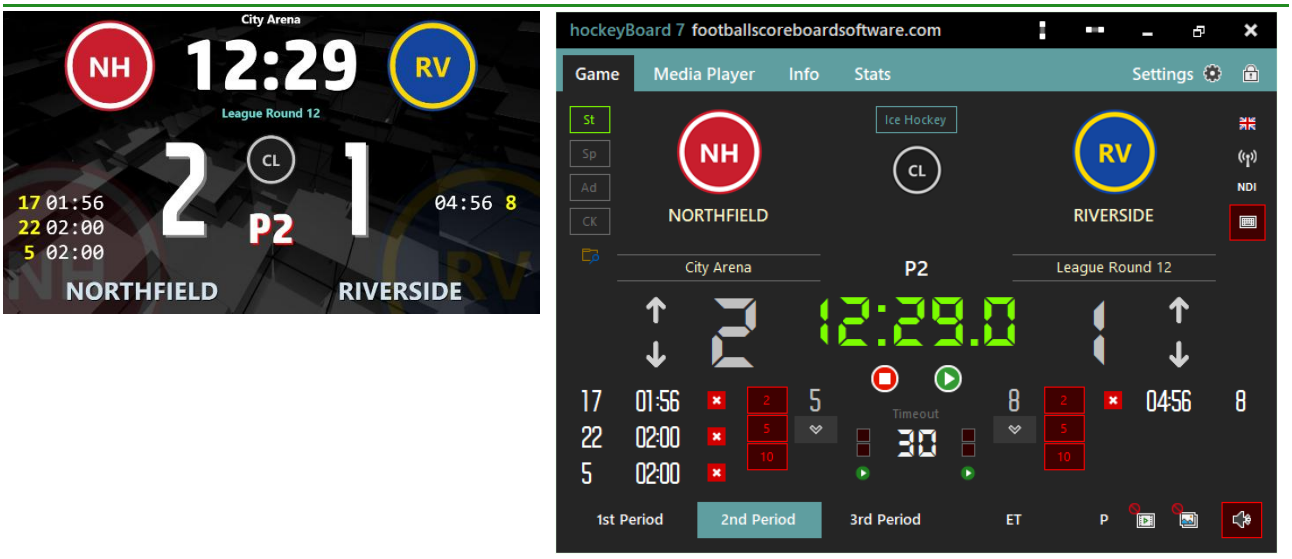


Figure 13. Ice hockey: two minor penalties run for the home team; the third (#5) waits until one of them ends.

The type of an ice hockey penalty comes from its duration:

Duration	Type	Effect
2:00 (button 2)	Minor penalty	Team plays short-handed. Ends on a power-play goal.
4:00	Double minor penalty	Team plays short-handed. A power-play goal ends the current 2 minutes only. Add a 240-

Duration	Type	Effect
		second button in Period & Penalty Settings to use it.
5:00 (button 5)	Major penalty	Team plays short-handed. Not ended by a goal.
10:00 (button 10)	Misconduct	The player sits out; the team is not short-handed. Runs at once and does not use a penalty place.

Power-play goal. With **End Penalty On Goal** on (the ice hockey default), a goal ends a penalty of the other team only when that team has more running penalties than the scoring team. Of its running minor and double minor penalties, the one with the least time on the clock ends; a double minor with more than 2:00 left drops to 2:00. Major penalties and misconducts never end on a goal, and nothing ends at equal strength (for example 4 on 4).

7.3 Field and Indoor Hockey

Board Output **Control Panel**

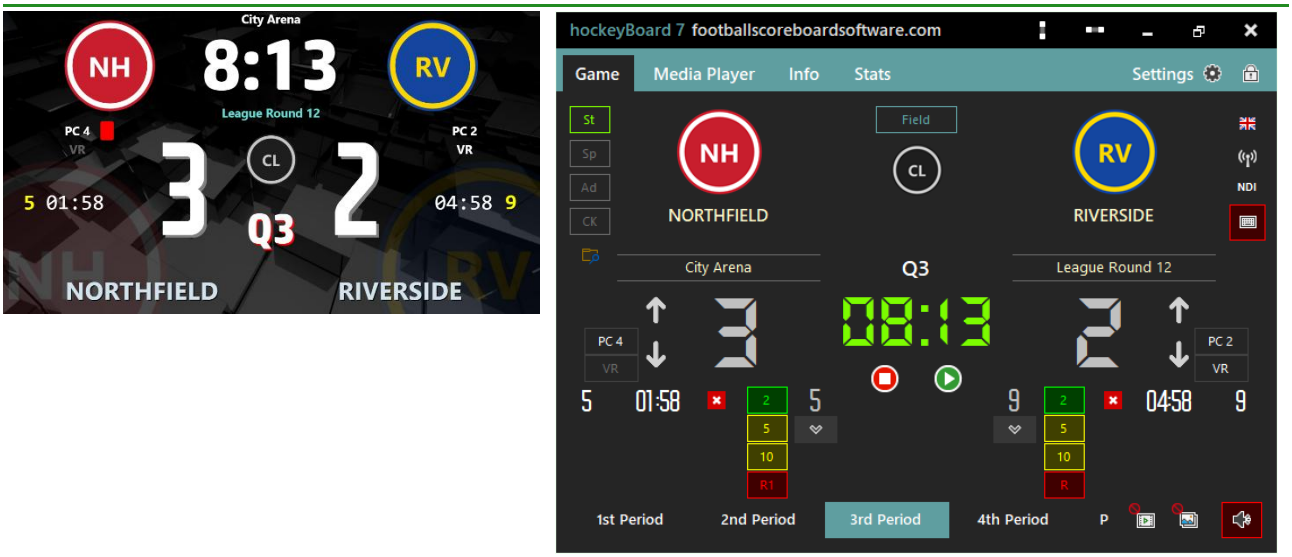


Figure 14. Field hockey: a green card for the home team and a yellow card for the guests; the home team has a red card and has used its video referral.

Button	Field Hockey	Indoor Hockey
Green	2 minutes	1 minute
Yellow	5 or 10 minutes	2 minutes
R (red card)	The team plays one player short for the rest of the match	The same

- Green and yellow card suspensions are not ended by a goal.

- **R** counts the red cards of the team (up to 4): left click +1, right click −1. The board shows a red card symbol per red card. The first click also opens the Red Card graphic page of the Info area (chapter 11), where the counts can be changed as well.
- The player count on the field is not calculated; the red cards and the running suspensions are shown on the board for the spectators.

7.4 Rink Hockey

Board Output **Control Panel**

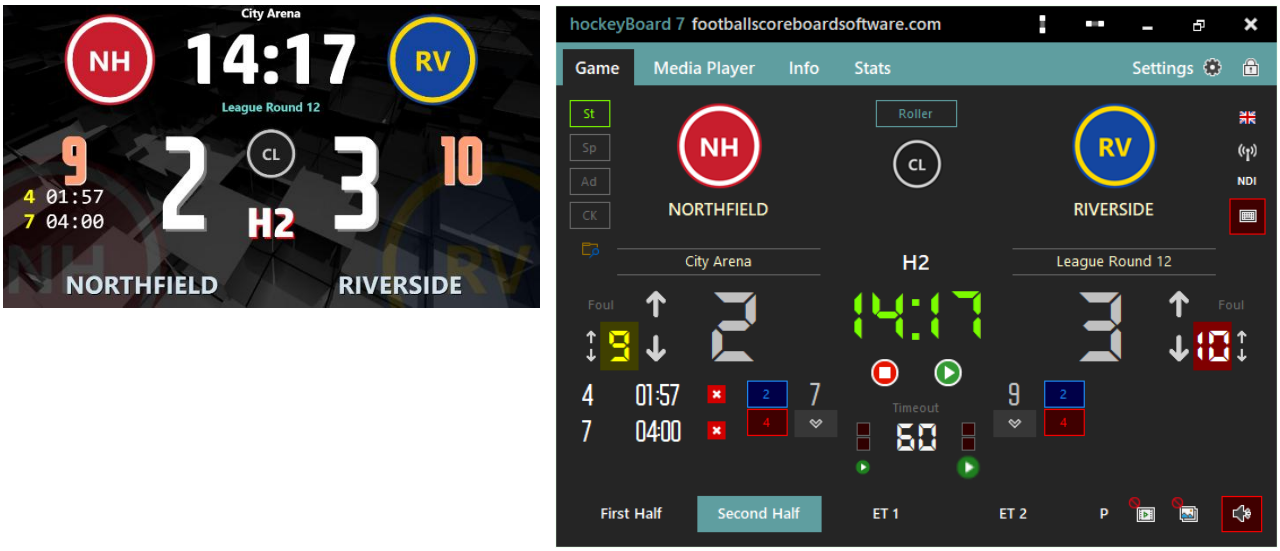


Figure 15. Rink hockey: a blue card (#4) runs, the red card (#7) waits behind it; the home team has 9 team fouls, the guests 10.

Button	Card	Period of Inferiority
Blue (2)	Blue card	2 minutes
Red (4)	Red card	4 minutes
Y	Yellow card	None (warning, counted for the player)

- One period of inferiority runs per team at a time. A second blue or red card of the same team waits and starts when the first one ends.
- A goal does not end a period of inferiority.

Card accumulation. When a card is given with a player number, hockeyBoard counts the cards of that player in the match and applies the rules automatically:

When	Result
Second yellow card of a player	Blue card (2 minutes) instead of the yellow card.
Any further yellow card	Blue card.
Third blue card of a player	Red card (4 minutes) instead of the blue card.
Penalty shoot-out after extra time	Yellow cards of the match do not count; a second yellow card in the shoot-out is a red card.

The control panel shows a notice with the rule, for example "Home #7: 2nd Yellow Card → Blue Card (Art. 22.1.a)". Click the notice to close it; it closes by itself after 8 seconds.

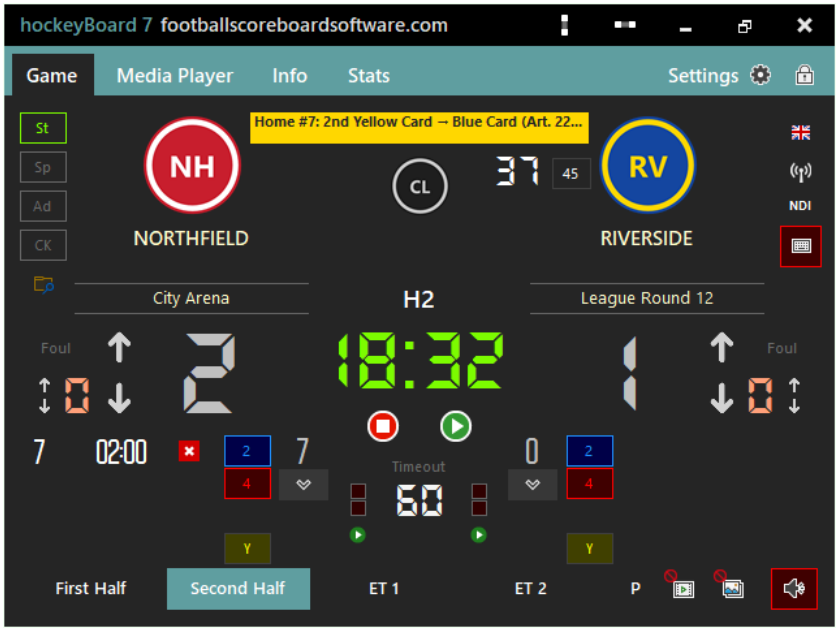


Figure 16. A second yellow card for #7 has become a blue card; the notice names the rule.

- Cards without a player number are not counted and never converted.
- A card for a player on the bench or a team official cannot be told apart by the program; a numbered card counts as a player on the rink.
- A new match clears the counts.

8. Sport-Specific Features

8.1 Team Fouls and Warnings (Rink Hockey)

In rink hockey the control panel shows a **Foul** box per team. Use the arrows beside it to count the team fouls, or click the box and type the number. Team fouls carry over through all periods, including extra time.

Team Fouls	Box	Meaning
9, 14, 19 …	Yellow on dark yellow	Warning: the next team foul gives a direct free hit.
10, 15, 20 …	White on dark red, horn	Direct free hit.

The board shows the team fouls of both teams beside the score. A new match sets them to 0.

8.2 The Attack Clock (Rink Hockey)

A rink hockey team has 45 seconds of play to finish an attack. The attack clock counts these 45 seconds on the control panel and on the board.

Board Output **Control Panel**

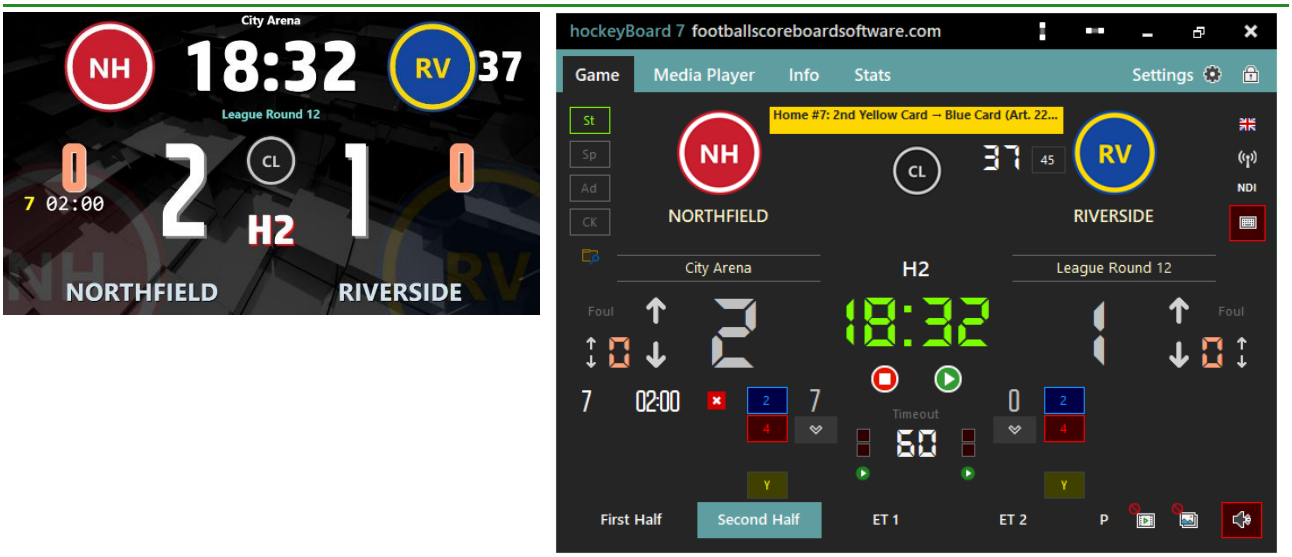


Figure 17. The attack clock: 37 seconds left, on the board (top right) and on the control panel (beside the board logo).

- The attack clock runs and stops with the match clock.
- Press **45** beside it to start a new attack: a direct free hit or penalty for the team in possession, a shot that hits a post or the crossbar or is touched by the goalkeeper, a clear change of possession, or after a faceoff.
- A goal, a new period and a new match start a new attack automatically.
- In the last 5 seconds the attack clock turns gold on the panel and changes colour on the board.
- At 0 the attack horn sounds once (a different sound from the period horn) and the clock waits at 0. The match clock keeps running: the horn is only a signal, the referees stop the game.
- To set another time, click the attack clock, type the seconds (or m:ss) and press Enter.

- Right-click the attack clock to hide it on the board (the panel shows it grey) and again to show it. **45** shows it again as well.
- Switch the attack clock off in **Settings** → **Screen Properties** → **Attack Clock (Rink)** (chapter 18). It is on by default.

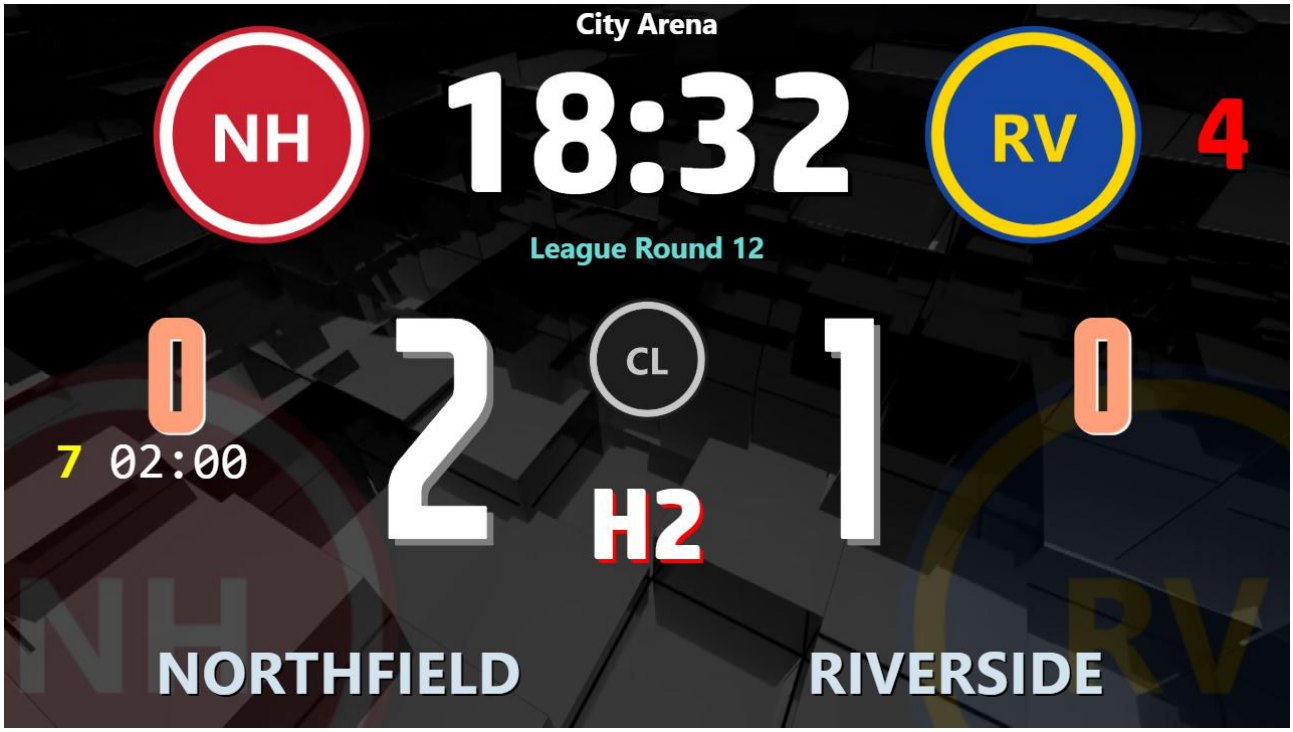


Figure 18. The last 5 seconds: the attack clock turns gold on the panel and red on the board.

8.3 Penalty Corners and Video Referral (Field and Indoor Hockey)

Penalty corners. In field and indoor hockey the **PC** buttons beside the score count the penalty corners of each team: left click +1, right click −1. The board shows "PC 4" under the team logo, and the "Penalty Corners" row of the match statistics (chapter 12) follows the count.

Video referral (field hockey only). Each team has one team referral during the match. The **VR** button shows its state:

- Click **VR** when a referral was unsuccessful: the referral is used, the button and the board show VR greyed.
- A successful referral, or one where the video umpire cannot advise, keeps the referral: nothing to press.
- Right-click **VR** to give the referral back after a mistake.
- At the penalty shoot-out each team gets a new referral for the shoot-out.

A new match resets the penalty corners and the referrals. Indoor hockey has no video referral, so the VR buttons are hidden.

8.4 Penalty Shoot-Out

Press **P** after the last period to start the shoot-out. The clock shows 00:00 and the shoot-out entry appears in the middle of the control panel; nothing else is reset.

Board Output **Control Panel**

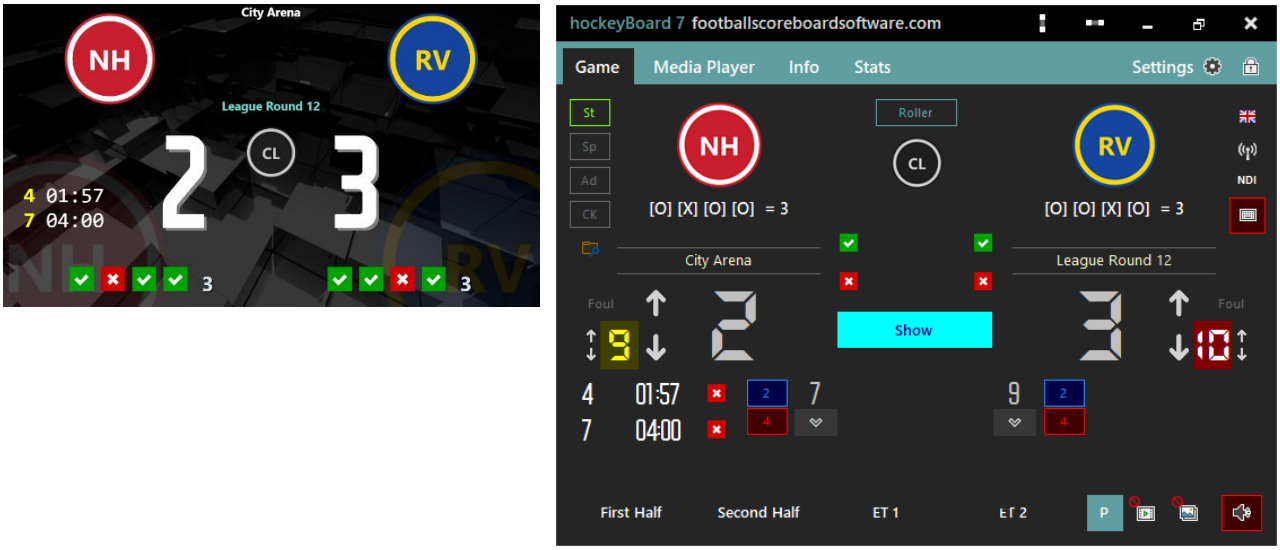


Figure 19. A penalty shoot-out in sudden death: 3 – 3 after four attempts each.

- The green tick records a scored attempt [O], the red cross a missed one [X], for the home team on the left and the guest team on the right. The line above shows all attempts and the score, for example "[O] [X] [O] [O] = 3".
- All attempts are kept, also in sudden death. You can also type or correct the marks in the line; only [O] and [X] count.
- The board shows the last five attempts of each team as ticks and crosses, with the shoot-out score.
- **Show** puts the shoot-out on the board again; the erase button beside a team clears its attempts.
- The winner is decided by the operator: the program does not end the shoot-out by itself.

9. Display Modes and Board Output

9.1 Board Position and Size

Set the board window in **Settings** → **Screen Properties**: **L: Left** and **T: Top** are the position of the top left corner on the Windows desktop, **W: Width** and **H: Height** the size in pixels. For an LED wall, use the exact resolution of the LED controller input; for a second monitor or a video output, use its full resolution (for example Left 1920, Top 0, 1920 × 1080 for a full-HD screen to the right of the main screen). The maximum size comes from the licence (**Max Resolution**).

The board designs scale with the window and are checked at 16:9 (1920 × 1080), 5:4 (1280 × 1024) and 4:1 LED strips (1920 × 480).

9.2 Standard (St)

The full-screen scoreboard: team logos and names, the score, the clock, the period, the running penalties, and the sport extras (team fouls, penalty corners, video referral, attack clock).

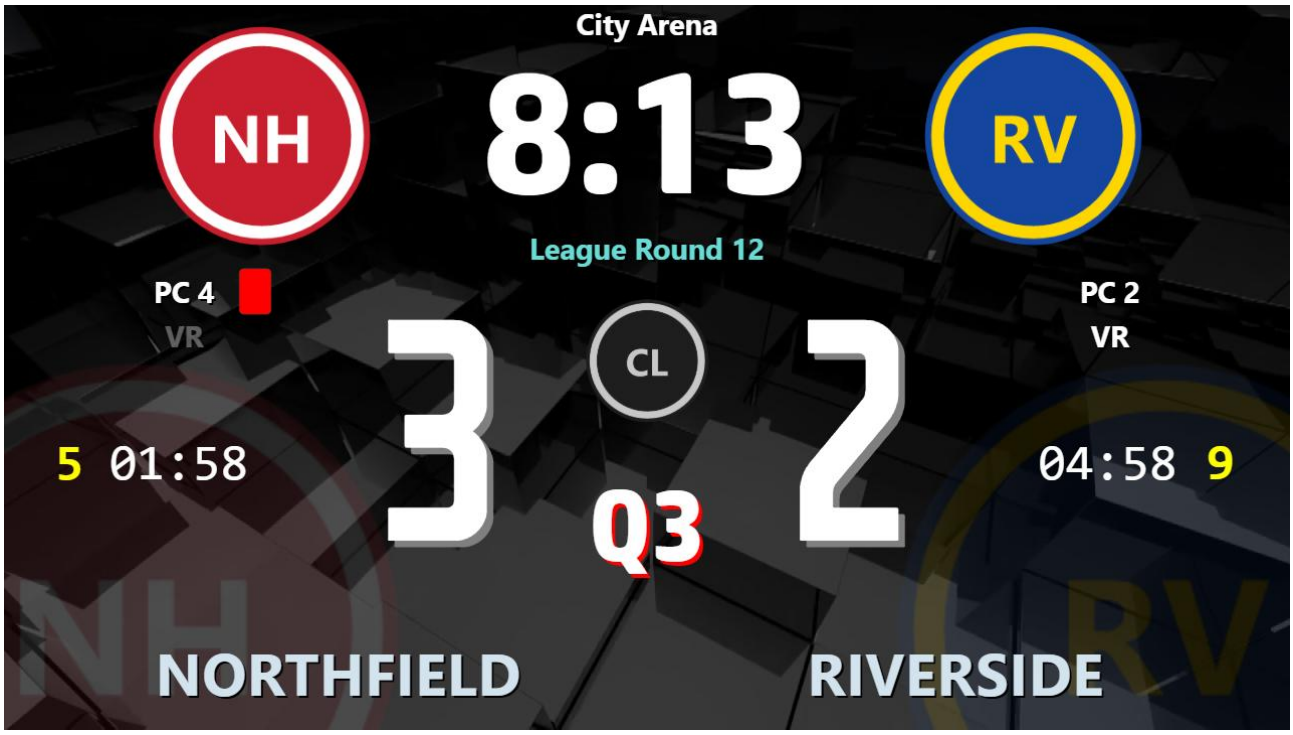


Figure 20. The Standard board in field hockey: penalty corners under the logos, the home team's red card and used video referral, a green and a yellow card running.

9.3 Sponsored (Sp)

The Standard board with a sponsor strip at the bottom: sliding sponsor logos or a scrolling text. Set them up in the **Sp** menu: **Sponsors** (the logo list), **Scrolling Text** (the text, its style and speed) and **Settings** (the position and height of the strip and which one starts).

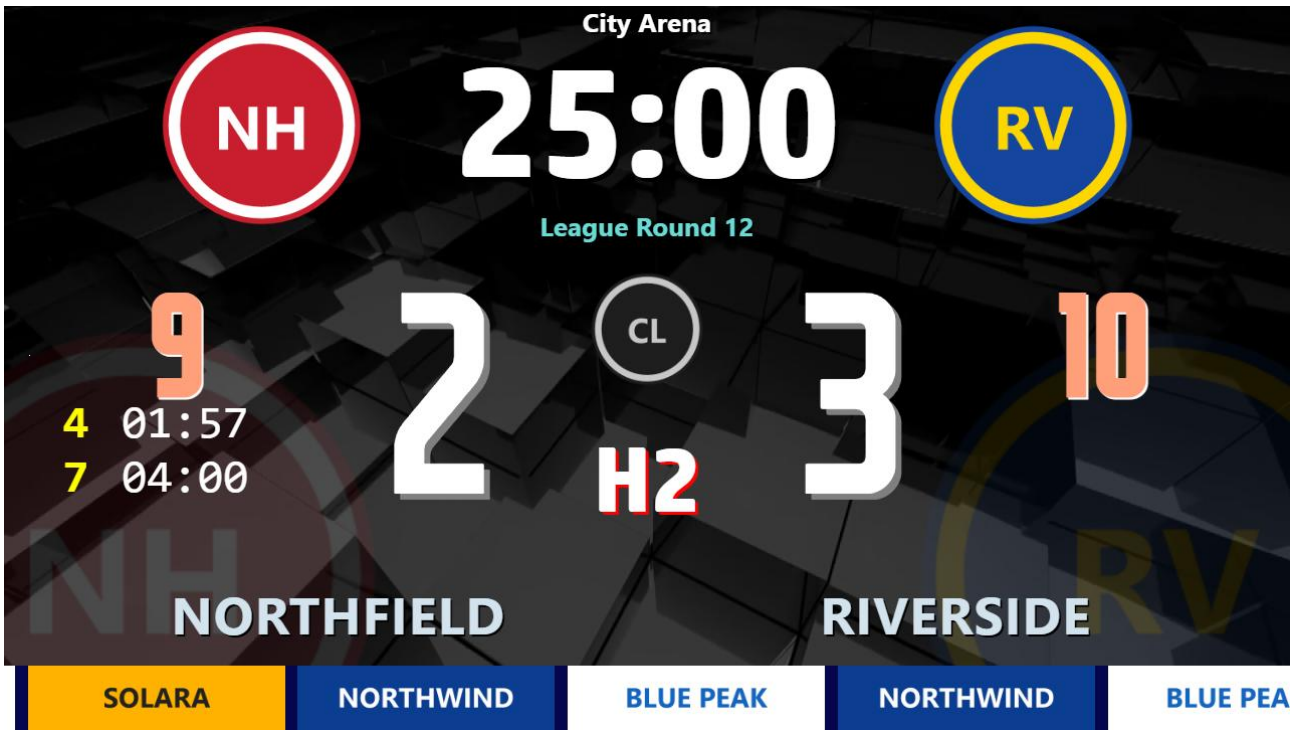


Figure 21. The Sponsored board with the sliding sponsor strip.

9.4 Advertisement (Ad)

A compact scoreboard beside a large media area, with a banner area at the bottom. The **Ad** menu holds the pages of the areas: **Scoreboard**, **1. Banner**, **2. Banner** and **Multimedia**, with the media player, camera, screen capture, banner and settings pages. The media area plays videos and pictures from the Ad playlists, a live camera or a part of the screen.

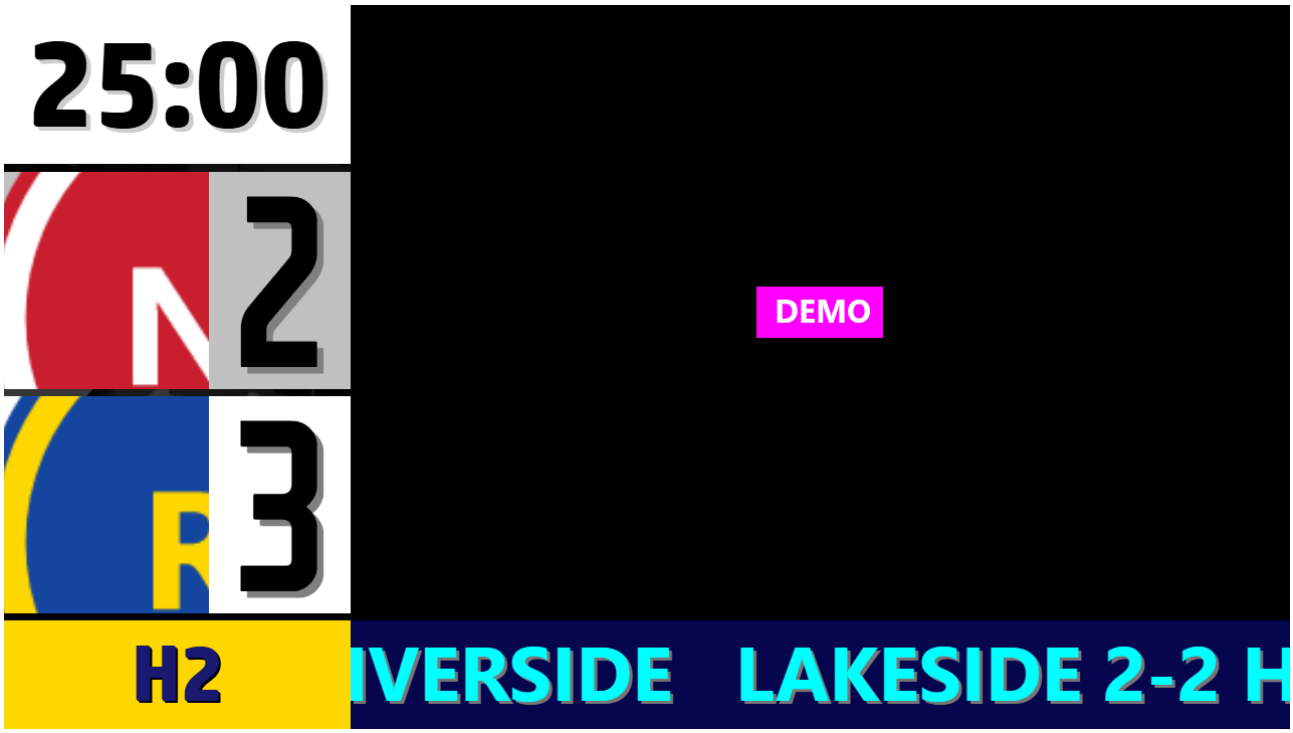


Figure 22. The Advertisement board: scoreboard on the left, the media area and a scrolling banner. The media area is empty and shows the DEMO label in this picture.

9.5 Chroma Key (CK)

A compact scorebug on a key colour for a video mixer: green, blue, magenta or transparent (**CK** menu → settings). Key the colour out in the mixer, or use NDI with the transparent setting in production software that supports it. The CK menu also has CK versions of the goal, card and substitution graphics with their own **Hide** buttons.



Figure 23. The Chroma Key scorebug at the top left of the CK window.

9.6 NDI Output

NDI sends the board over the network as a video source for vMix, OBS, a TriCaster or an NDI hardware receiver.

1. Set the frame rate in **Settings** → **Screen Properties** → **NDI Frame Rate**: 23.976, 25, 29.97, 30, 50, 59.94 (default) or 60. Use the frame rate of your production; 29.97, 59.94 and 23.976 are sent as exact NTSC rates.
2. Press **NDI** on the control panel. The button blinks red while the program sends. The source appears in the network as **Ho7_NDI**.
3. Press **NDI** again to stop.

The NDI picture is the area of the board window on the screen (Left, Top, Width, Height of Screen Properties). Keep the board window visible and not covered by other windows while NDI runs. Changing the frame rate restarts a running NDI output at once.

9.7 Background Video and Middle Layer

The two buttons at the bottom right of the control panel choose a background video (behind the scoreboard) and a middle-layer picture (between the background and the scoreboard) for the board. Their small red buttons remove them. **Background Video Opacity** in Screen Properties (0 to 10) sets how strong the background video is.

10. Designs

Every board page (the scoreboard and each match graphic) is an HTML page made from a template and a design file. The design file holds the position, size, font and colour of every object, so you can change the look without touching HTML.

10.1 The Design Gallery

Click **Select Design** (the folder icon under CK) on the control panel. The gallery lists the designs of the current display mode with a live preview.

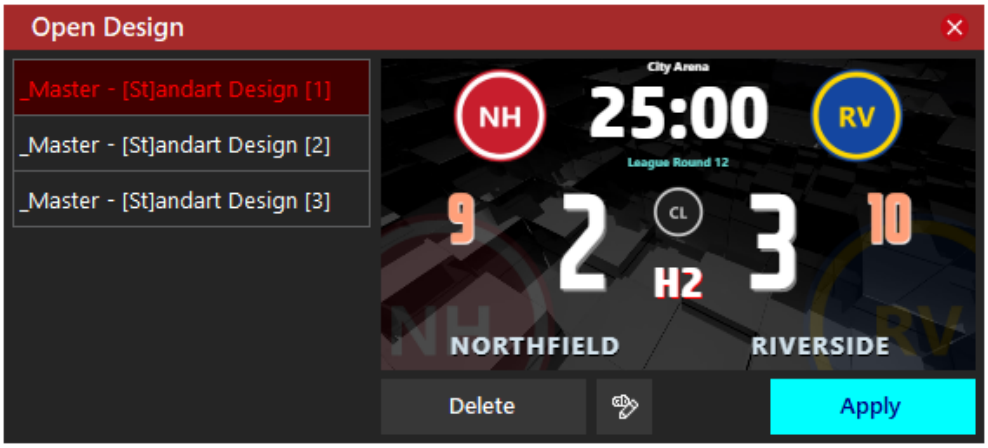


Figure 24. The design gallery with the three Standard masters.

- **Masters** are the factory designs: Standard [1], [2] and [3] (also used by the Sponsored mode), Advertisement [1] to [3] and Chroma Key [1]. They cannot be renamed or deleted, and the program never changes them.
- **Apply** puts the selected design on the board.
- Your own saved designs appear in the same list. They can be renamed (pencil button) and deleted (**Delete**, after a question).

10.2 The Design Editor

Open **Settings** → the design tab of the current display mode: **[St]andard Board Design**, **[Sp]onsored Board Design**, **[Ad]vertisement Board Design** or **[CK] Board Design**. Only the tab of the display mode in use can be opened.

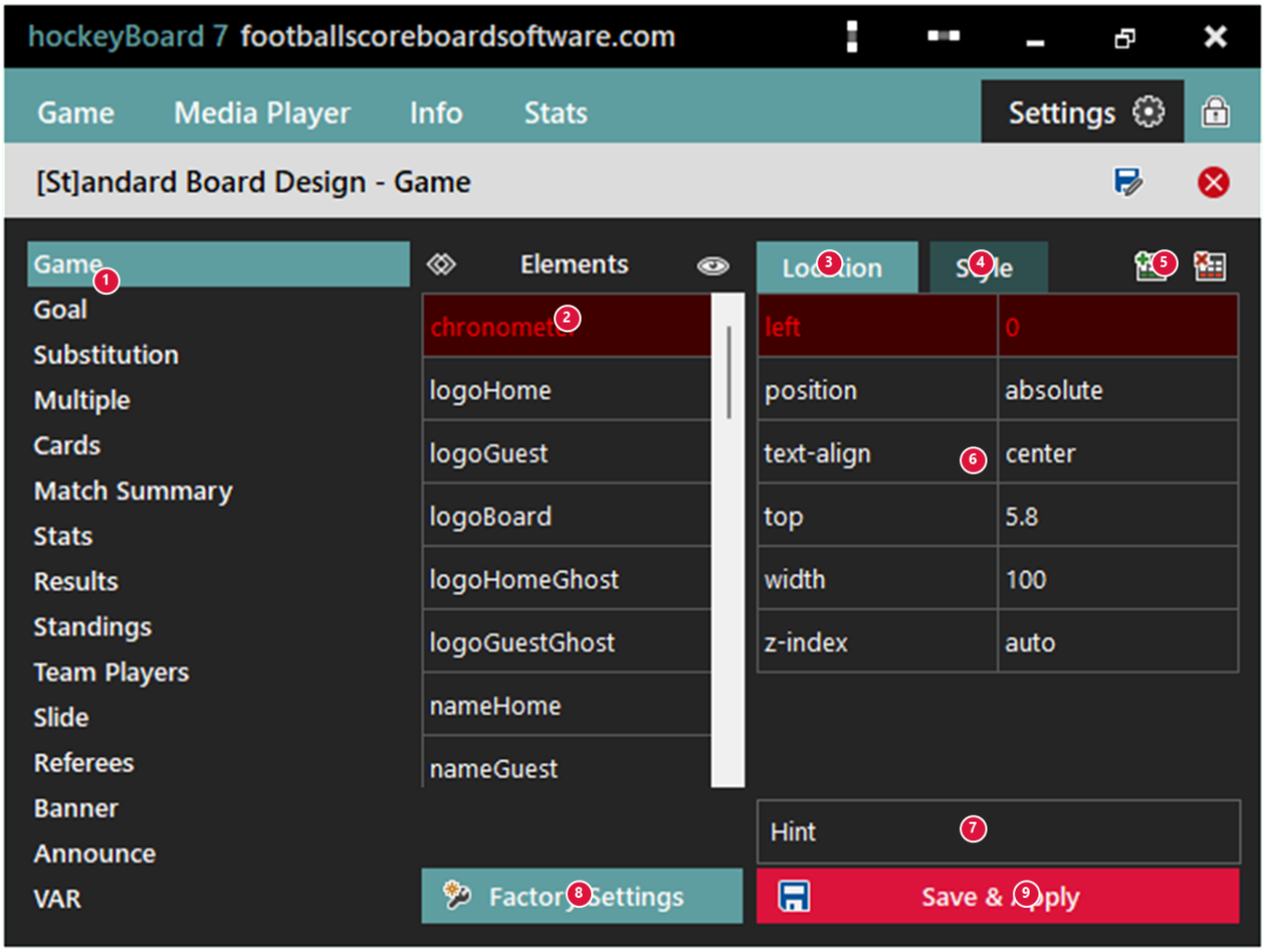


Figure 25. The design editor with the scoreboard page (Game) and the clock object selected.

No.	Control	What It Does
1	**Pages**	The board pages of this display mode: Game (the scoreboard), Goal, Substitution, Multiple, Cards, Match Summary, Stats, Results, Standings, Team Players, Slide, Referees, Banner, Announce and VAR. CK has Game, Goal, Substitution, Cards, Match Summary, Penalty and VAR.
2	**Elements**	The objects of the page (chronometer, logoHome, nameHome...). The eye buttons show or hide an object.
3	**Location**	The position and size of the selected object.
4	**Style**	The font, size and colour of the selected object.
5	**Add / remove row**	Add a property row or remove the selected one.
6	**Properties**	Click a value to change it. Colours and fonts open a picker. Numbers are percentages of the board height or width.
7	**Hint**	Explains the selected property.
8	**Factory Settings**	Puts back the factory design of this page.
9	**Save & Apply**	Saves the page and shows it on the board.

Save Design As (scoreboard page) saves the current scoreboard design as a new design in the gallery. It is not available for Chroma Key designs.

10.3 Objects of the Scoreboard

The scoreboard has an object for each value: logos, names, score, clock, period, extra lines, penalties of both teams, the team fouls, penalty corners (pcHome, pcGuest), video referrals (referralHome, referralGuest) and the attack clock (attackClock). Objects the selected sport does not use are hidden automatically, so one design works for all four sports.

10.4 Updates Keep Your Designs

The factory masters are in common\vizrt\storage and are replaced by an update. The designs in use and your saved designs are kept.

11. Info Graphics

The **Info** menu puts match graphics on the board: goals, cards, substitutions, line-ups, referees, banners and announcements. A graphic covers the scoreboard until you press **Game** in the menu bar or show another graphic. The match keeps running underneath: the clock and the penalties continue.

11.1 The Info Page

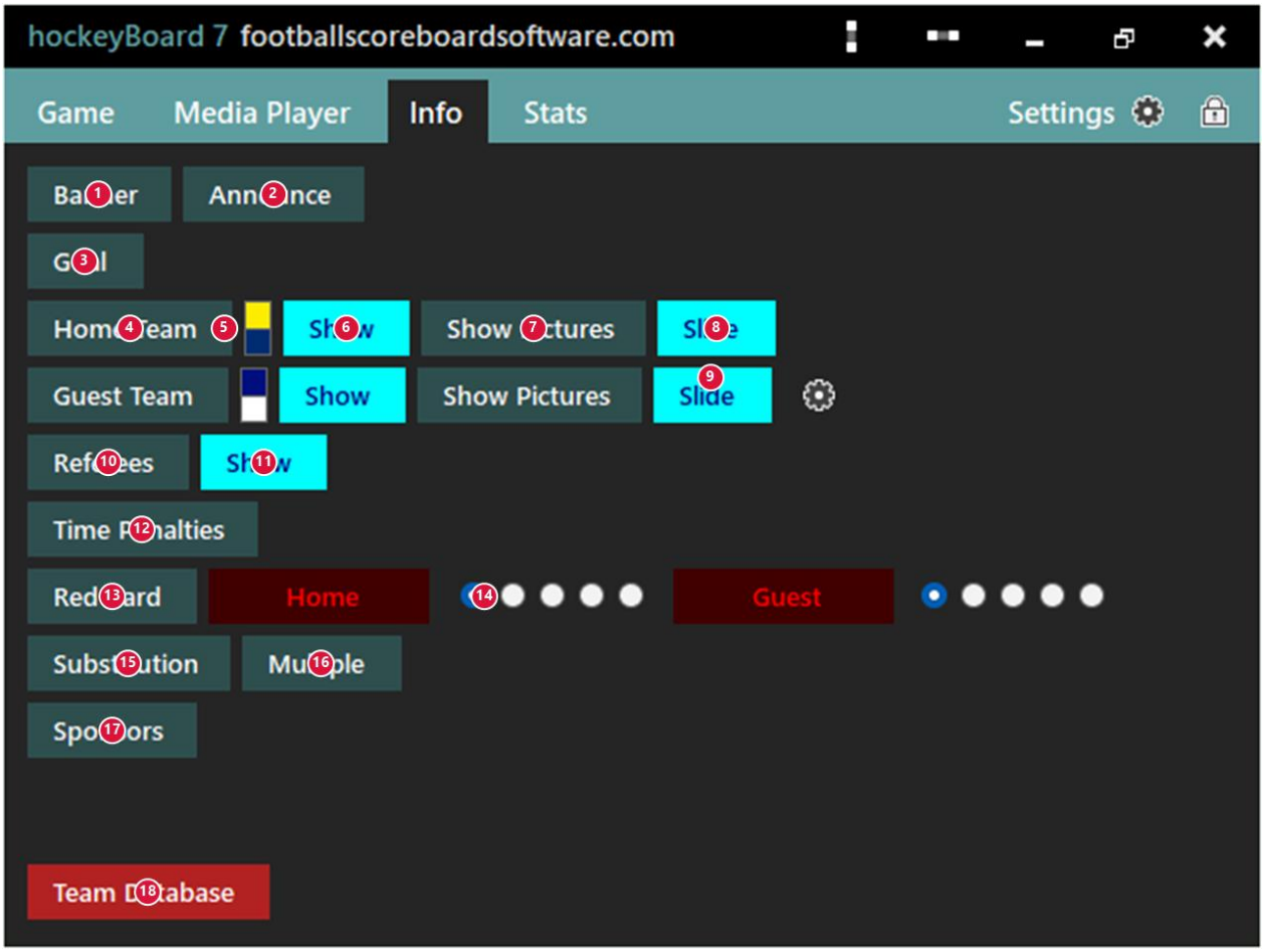


Figure 26. The Info page.

No.	Control	What It Does
1	**Banner**	Up to three text rows, with a live clock or a countdown to a time (section 11.7).
2	**Announce**	A large text with a choice of styles (section 11.7).
3	**Goal**	The goal graphic (section 11.2).
4	**Home Team**	Opens the player list of the home team (section 11.5). The guest team is below.
5	**Team colours**	The two team colours used by the line-up graphics. Click a colour to change it.
6	**Show**	Shows the line-up of the team.
7	**Show Pictures**	Plays the pictures and videos of the players one after the other.

No.	Control	What It Does
8	**Slide**	Shows the players one by one with number and name.
9	**Background**	Chooses the background of the line-up graphics: the scoreboard background, black or a video.
10	**Referees**	The list of officials (section 11.6).
11	**Show**	Shows the list of officials.
12	**Time Penalties**	The card and penalty graphic (section 11.3).
13	**Red Card**	The red card graphic.
14	**Red card counts**	The red cards of the home and guest team (field and indoor hockey; the same counts as the R buttons of the control panel).
15	**Substitution**	One substitution (section 11.4).
16	**Multiple**	Several substitutions at once.
17	**Sponsors**	The sponsor list used by the sponsor strip of the graphic pages.
18	**Team Database**	Saved teams with their players (section 11.5).

11.2 Goal

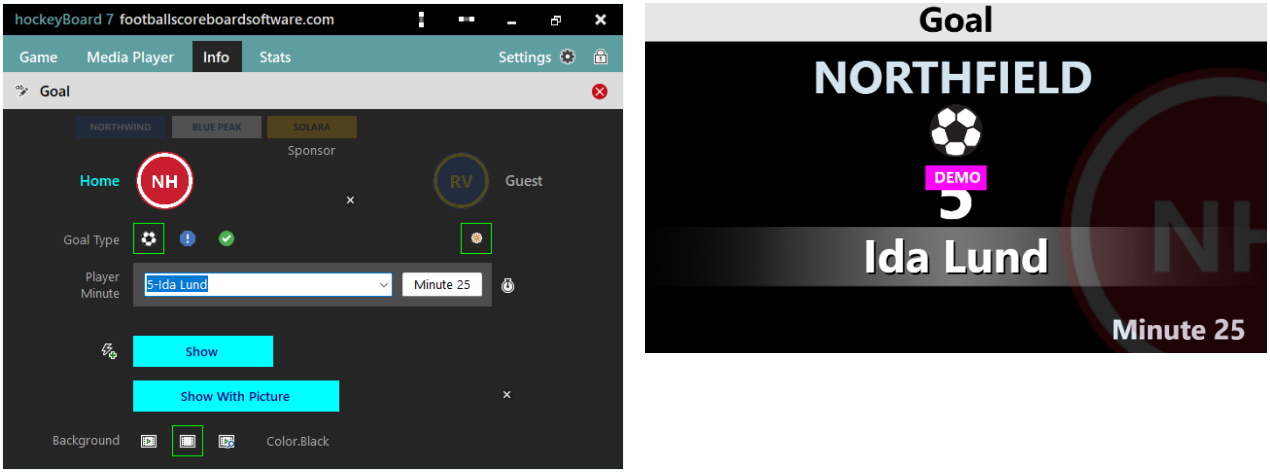


Figure 27. The Goal page and the goal graphic on the board (with the DEMO label of an unlicensed copy).

1. Click the logo of the scoring team.
2. Choose the goal type: goal, own goal (credited to the other team) or penalty goal.
3. Choose the player from the list (number and name) or type it.
4. Check the minute: it is filled in from the match clock (section 11.8).
5. Click **Show**, or **Show With Picture** to include the player's picture.

Play Animation switches the animation of the graphic on or off. With **Add to Match Timeline** on, the goal is also written to the match timeline (chapter 12). The background buttons at the bottom choose the scoreboard background video, black or a selected video for this graphic.

11.3 Cards and Penalties

Time Penalties and **Red Card** open the card graphic. The card buttons follow the sport:

Sport	Card Buttons
Ice hockey	2, 5 and 10 minute penalties and R (game misconduct)
Field and indoor hockey	Green, yellow, yellow and R (red card) with their minutes
Rink hockey	B (blue card) and R (red card)

Choose the team, the card and the player, then **Show** or **Show With Picture**. The card graphic is only a graphic: start the penalty timer with the penalty buttons of the control panel (chapter 7).

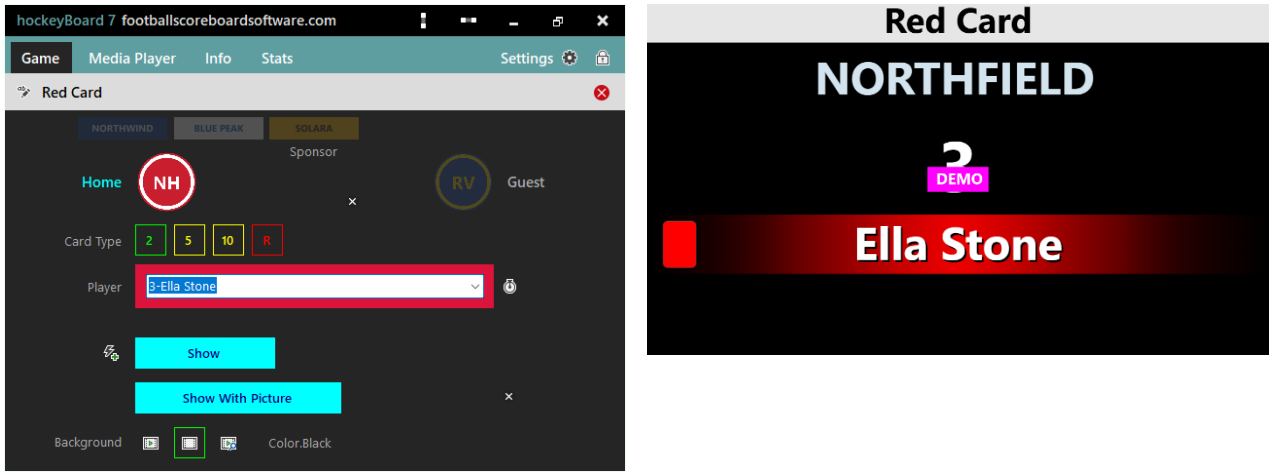


Figure 28. The Red Card page in field hockey and the red card graphic.

11.4 Substitutions

Choose the team, **Player In** and **Player Out** and click **Show**. **Multiple** builds a list of in/out pairs and shows them together.

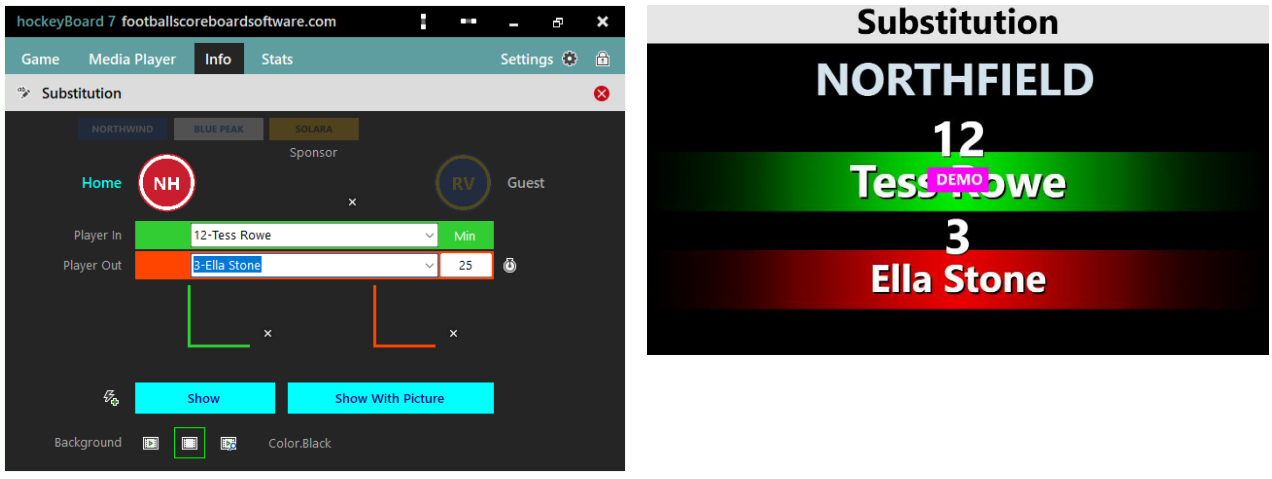


Figure 29. A substitution and its graphic.

11.5 Players, Line-Ups and the Team Database

Home Team and **Guest Team** open the player list: number, name and two optional pictures (one for the goal, card and substitution graphics, one for the player slide). Players are grouped into starting players, substitutes, other players and the coach. The lists fill the player choice of all graphics and the player number list of the control panel.

Save to Teams stores the list in the **Team Database**. In the Team Database, **Set Home** and **Set Guest** load a saved team for the next match.

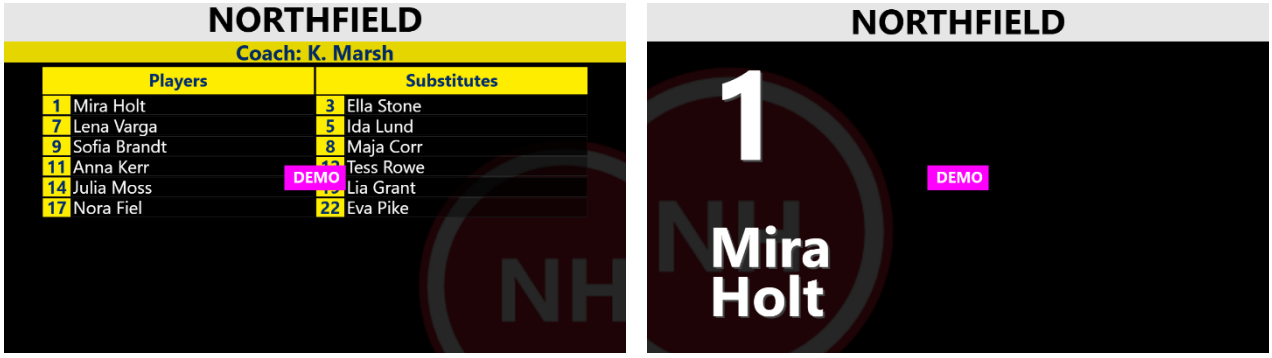


Figure 30. The line-up (Show) and the player slide (Slide).

11.6 Referees and VAR

Referees holds the names of the match officials; **Show** puts the list on the board. **VAR** shows a video review graphic: **Show** for "check" and **Show Decision** for the decision, with up to three lines of information.

11.7 Banner and Announce

- **Banner**: three text rows; the third row has four prepared texts. **Show Clock** inserts the time of day, **Show Remaining Time** a countdown to the time you enter (for example the start of the match).
- **Announce**: one large text with a style (standard, gradient, shape, stripes, stroke) whose font and colours can be changed.

11.8 The Event Minute

The minute of goals, cards and substitutions is filled in from the match clock: the full length of the earlier periods plus the time played in the current period, rounded up to the next whole minute. Example: four quarters of 15 minutes, 0:40 played in the third quarter → 30:40 → minute 31. In the penalty shoot-out the minute is the full match time. The minute can always be changed by hand before **Show**.

12. Statistics, Standings and Results

The **Stats** menu has five pages: Timeline, Stats, Standings, Results and Fixtures. Each page has **Show**, which puts its graphic on the board. The data is saved in common\data and stays until you change it.

12.1 Match Timeline

The timeline lists the events of the match: goals, own goals, penalty goals, missed penalties, substitutions and cards, each with the minute and the player. Goals, cards and substitutions shown from the Info pages are added when **Add to Match Timeline** is on.

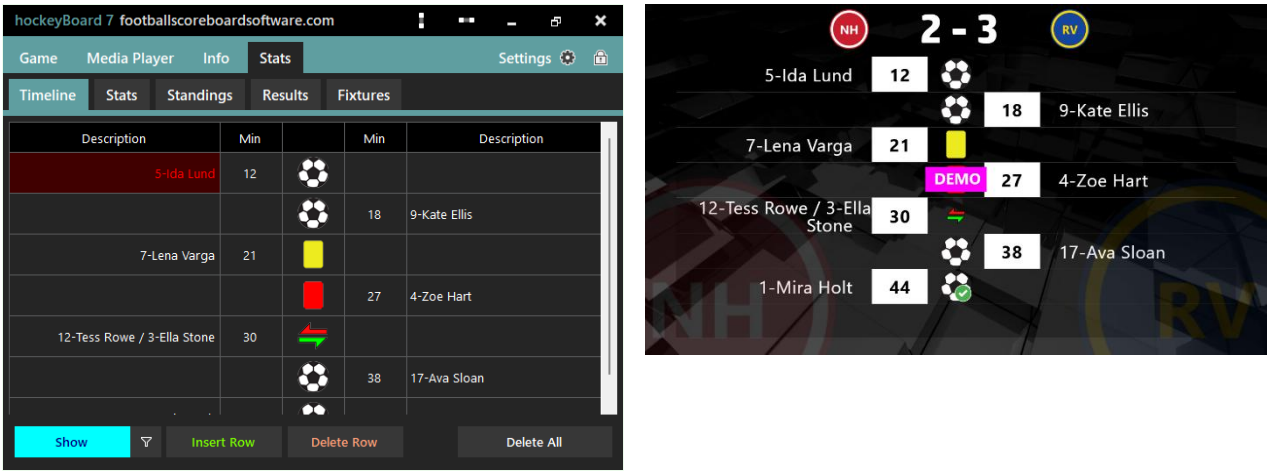


Figure 31. The match timeline and its graphic ("Match Summary").

- **Insert Row** adds an event, **Delete Row** removes the selected one, **Delete All** clears the timeline.
- Double-click a cell to change the text or the minute; click the icon cell to choose the event symbol.
- The filter button chooses which event types appear on the board.

12.2 Match Statistics

The Stats page is a table Home | Statistic | Guest. Type the names and values; **Insert Row** and **Delete Row** change the rows. In field and indoor hockey the **Penalty Corners** row is kept equal to the PC counters of the control panel.

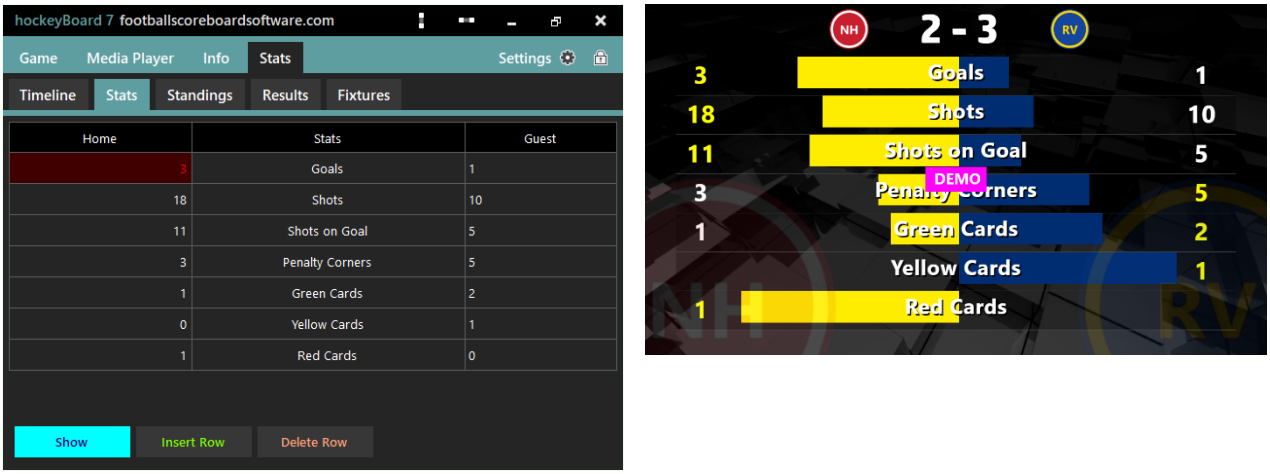


Figure 32. The match statistics and the graphic, with a bar per statistic.

12.3 Standings

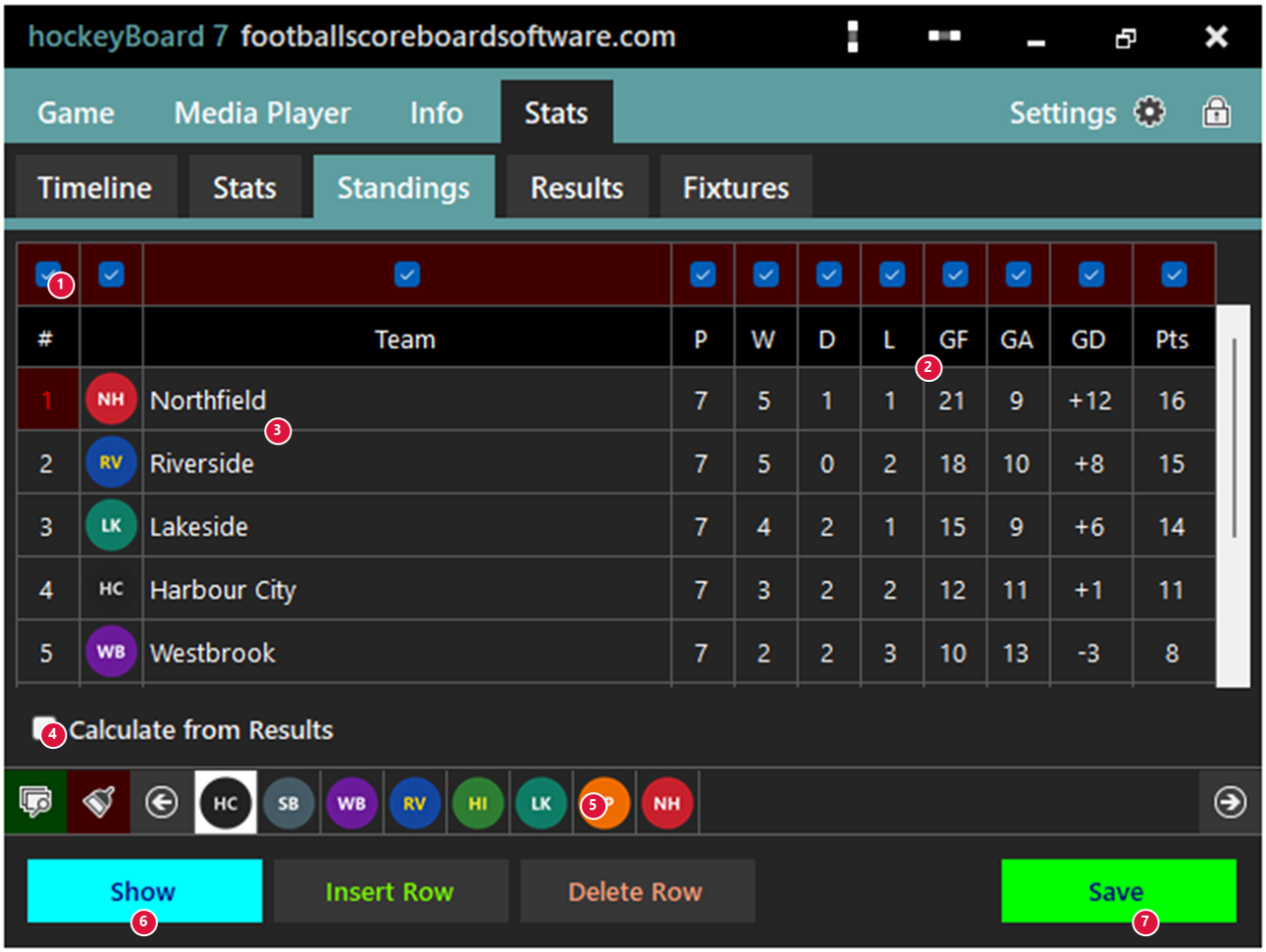


Figure 33. The standings with the board column choice (top row), the team logo bar and the calculation option.

No.	Control	What It Does
1	**Column choice**	The tick boxes above the columns choose which columns appear on the board.
2	**P, W, D, L, GF, GA, GD, Pts**	Played, won, drawn, lost, goals for, goals against, goal difference, points.
3	**Team**	The team name and logo. Drag a logo from the logo bar onto the row to set the team logo.
4	**Calculate from Results**	Calculates the table from the results (section 12.4). Off by default. While it is on, an **M** (manual) column appears: a ticked row is kept as typed.
5	**Logo bar**	The team logos; the arrows scroll, the buttons on the left add and remove logos.
6	**Show**	Shows the standings on the board.
7	**Save**	Saves the table.

Type the table by hand, or let the program calculate it from the results.

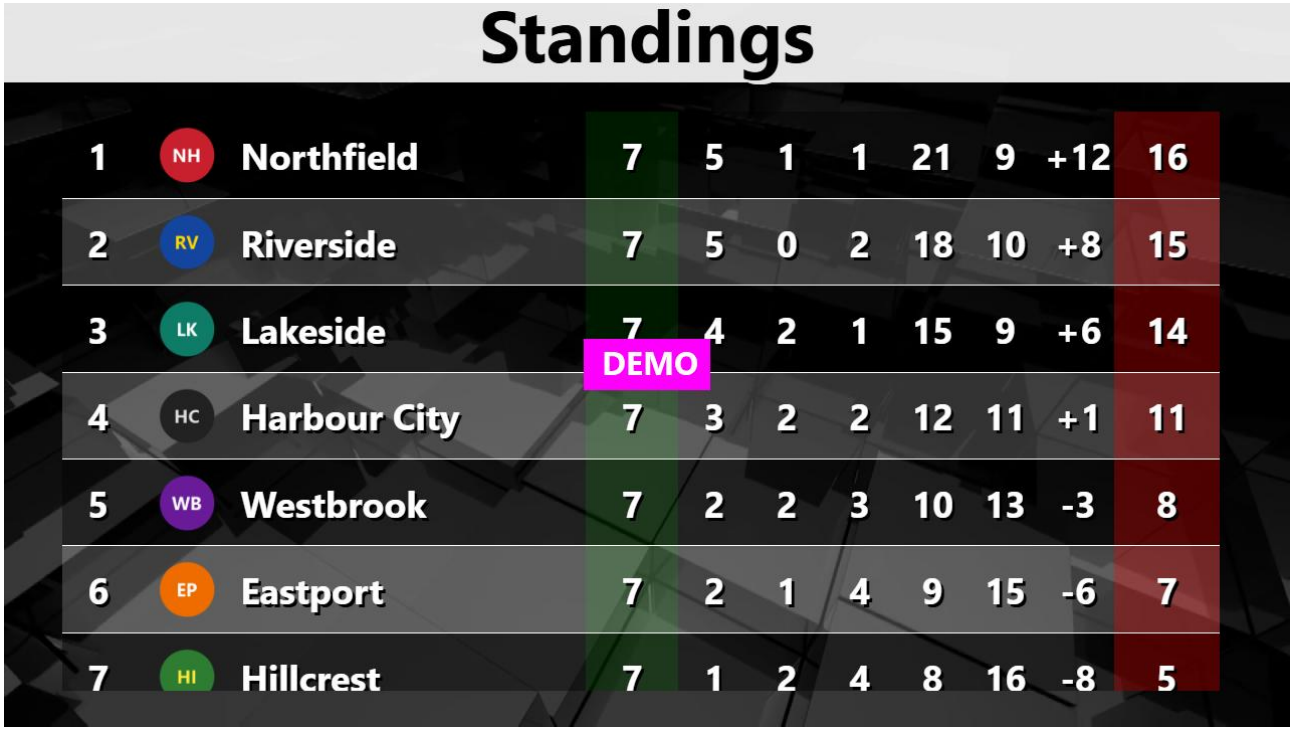


Figure 34. The standings on the board (the columns ticked in the column choice).

12.4 Calculate from Results

Tick **Calculate from Results** to calculate every row from the saved results (12.5). The program asks first, because the values of all rows without M are replaced:

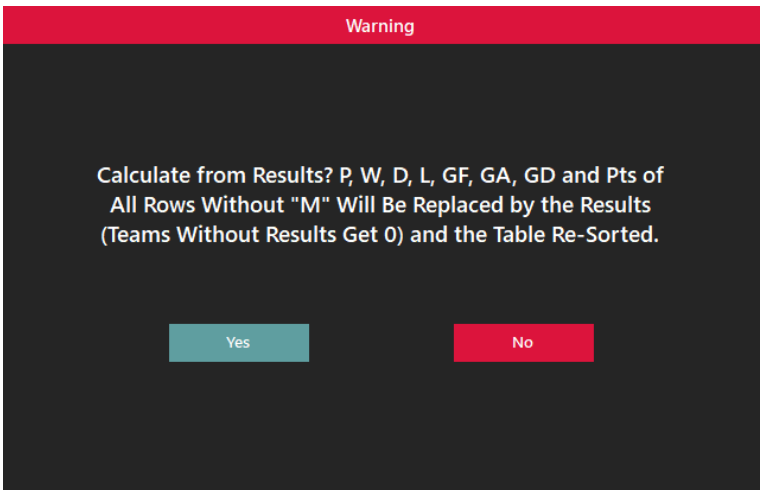


Figure 35. The question before the calculation is switched on.

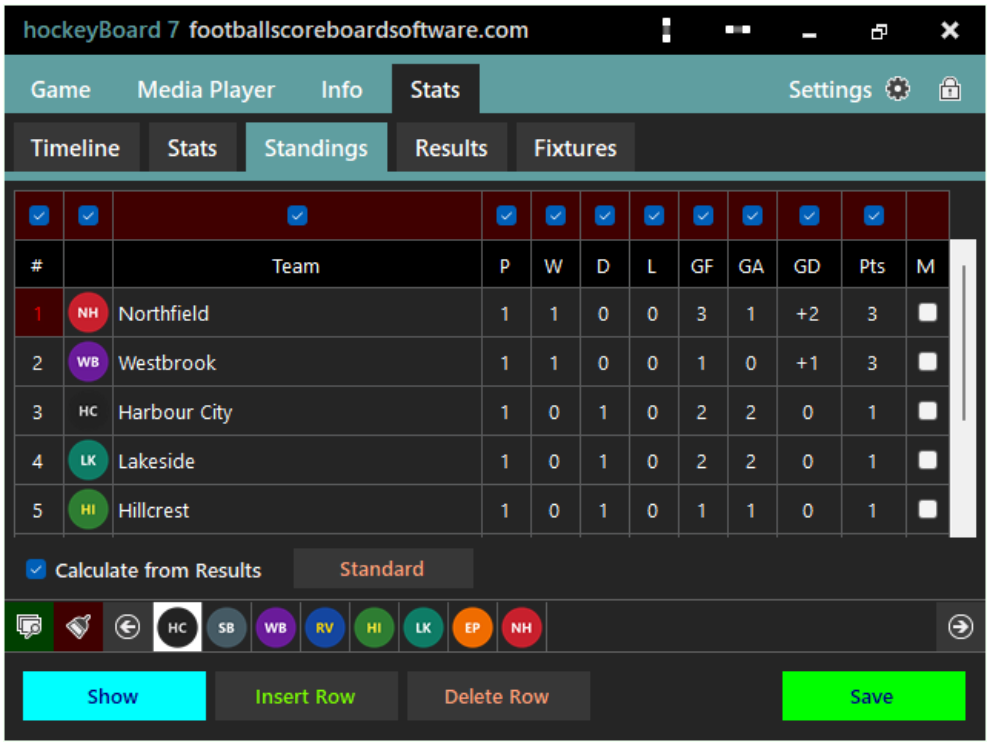


Figure 36. The standings calculated from the results, with the points scheme button.

- Every row without **M** is calculated from the results: played, won, drawn, lost, goals for and against, goal difference and points. A team without results gets 0 played and 0 points.
- Tick **M** for a row that you want to keep as typed, for example a team with points from an earlier stage. Typing a number into a row ticks M automatically.
- Teams that appear in the results but not in the table are added.
- Untick **Calculate from Results** to stop the calculation; the shown values stay as they are. The setting is off by default, also after an update, so a typed or downloaded table is never changed without your choice.

Points schemes. The button beside the option switches between:

Scheme	Win	Draw	Loss	Source
Standard	3	1	0	FIH Tournament Regulations (outdoor),

Scheme	Win	Draw	Loss	Source
				ranking in a pool
Pro League	3 in normal time; a drawn match goes to a shoot-out: winner 2, loser 1	–	0	FIH Hockey Pro League Regulations, Regulation 4.2

Ranking. The table is sorted by the FIH order: points, then matches won, goal difference, goals for, then the result between the tied teams (a mini-table if more than two teams are tied), then the team name. Only wins in normal time count as matches won.

12.5 Results and Fixtures

The Results page lists played matches: time or round (Min), home team, scores, guest team and their logos. The **SO** column marks a drawn match decided by a penalty shoot-out: **H** if the home team won the shoot-out, **G** if the guest team won it, empty otherwise. The SO column is used by the Pro League points scheme; result files of older versions without it load normally.

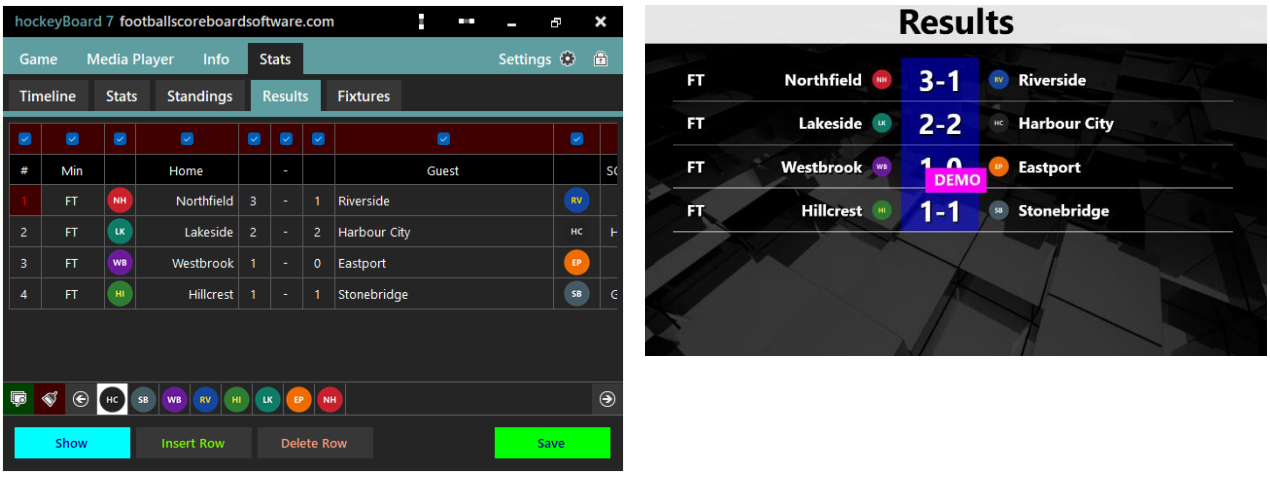


Figure 37. The results and the results graphic.

The Fixtures page has the same columns without scores, for the coming matches. Rows starting with "!" in the Min column are date lines.

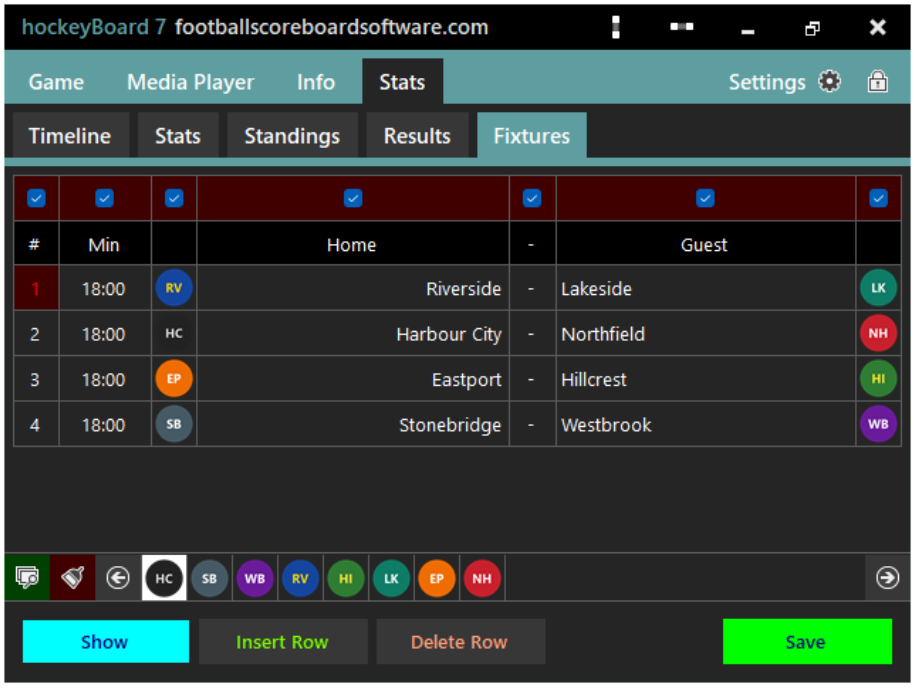


Figure 38. The fixtures page.

13. Media Player

The **Media Player** plays videos and pictures on the board, for example sponsor clips during a break.

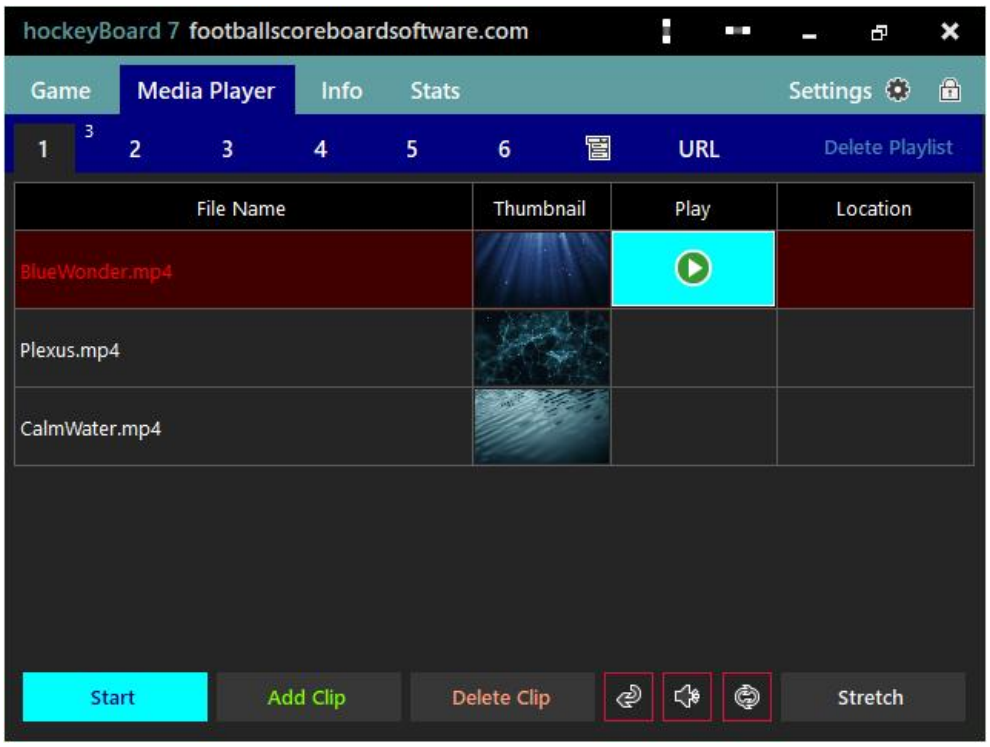


Figure 39. The media player with playlist 1.

- The buttons **1** to **6** at the top are six playlists; the small number shows how many clips a list has. **URL** holds web addresses (for example YouTube videos), **Delete Playlist** empties the selected list.
- **Add Clip** adds videos or pictures, **Delete Clip** removes the selected one. Pictures are shown for the **Image Play Duration** of the settings (default 5 seconds).
- **Start** plays the playlist from the first clip; the play button in a row plays that clip.
- The buttons beside **Delete Clip** switch repeat, sound and **Back to Game After Finish** on or off; the last button chooses how the video fills the board (Stretch, Center, Original...).
- While a clip plays, the Settings menu shows the remaining time, for example "▶ 0:24".
- Press **Game** to stop the media and show the scoreboard.

The Ad and CK display modes have their own media players for their media areas (chapter 9). From the remote control, a playlist can be started by its number (chapter 14).

14. Remote Control

The remote control is a web page for phones, tablets and computers in the same network as the scoreboard PC. It needs no app: open the address in the browser and log on with the PIN.

14.1 Network and Firewall

- The scoreboard PC and the phone or tablet must be in the same network, or port 1907 must be forwarded to the scoreboard PC by the router for access from the internet.
- Allow port 1907 in the Windows firewall: run **open_firewall_1907.bat** as administrator once (chapter 2).
- The connection is plain HTTP. Use a private network for the remote control, not a public Wi-Fi.

14.2 Switching the Remote Control On

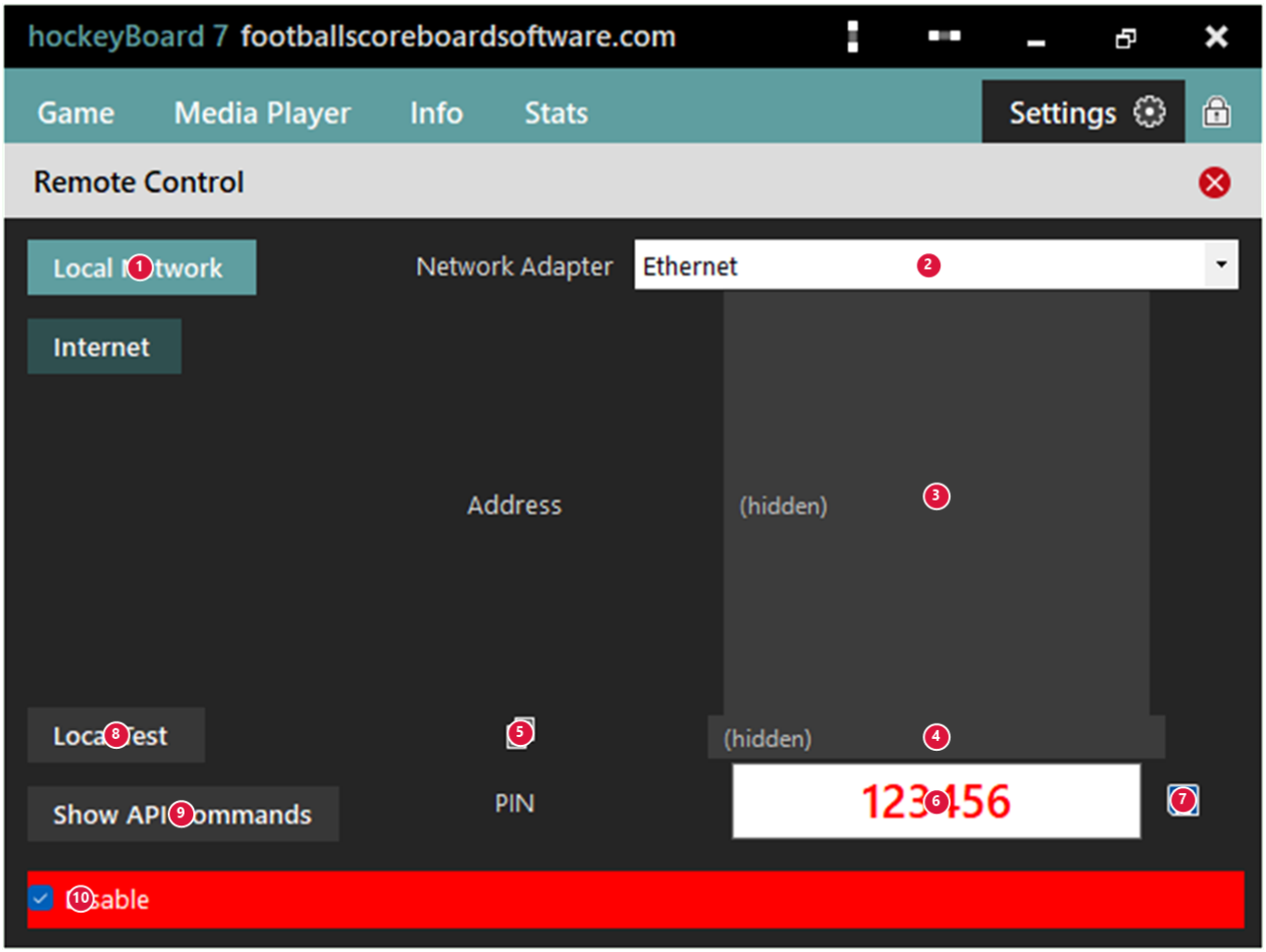


Figure 40. Settings → Remote Control. The address and its QR code are hidden in this picture.

No.	Control	What It Does
1	**Local Network**	The address for devices in the same network. **Internet** shows the address with the public IP of the router (port forwarding needed).
2	**Network Adapter**	The network card of the scoreboard PC whose address is used.
3	**QR code**	Scan it with the phone camera to open the logon page.
4	**Address**	The logon address, for example http://192.168.1.20:1907/logon.html.

No.	Control	What It Does
5	**Copy**	Copies the address.
6	**PIN**	The PIN of the remote control (digits only, up to 8).
7	**Save PIN**	Saves the PIN. All logged-on devices are logged off.
8	**Local Test**	Opens the logon page on this PC.
9	**Show API Commands**	Opens the list of the HTTP API commands (chapter 15).
10	**Disable**	Red while the remote control is switched off. Untick it to switch the remote control on.

1. Set a PIN of your own and click the save button. A new installation has the PIN 123456 until you change it. The remote control cannot start without a PIN.
2. Untick **Disable**. The remote control starts now and with every start of the program.
3. Scan the QR code or type the address on the phone.

14.3 Logging On

The logon page has a number pad. Type the PIN and press the tick. The browser then keeps a session: the PIN is not in the address and not stored on the device. The session ends after 12 hours without use, when the PIN is changed, or with **LOG OUT**.

After five wrong PINs from one device, that device is locked out for 60 seconds ("Too many wrong PINs. Try again in N s."). Wrong attempts older than 15 minutes are forgotten.

14.4 The Remote Panel

The panel follows the sport mode of the program: it shows the penalty buttons, period names and special counters of the selected sport. It refreshes about twice a second, so it always shows the state of the scoreboard. At the top are the board and period, the team names, the score, the clock and the period; at the bottom the four tabs **HOME**, **PENALTY**, **INFO** and **MEDIA**.

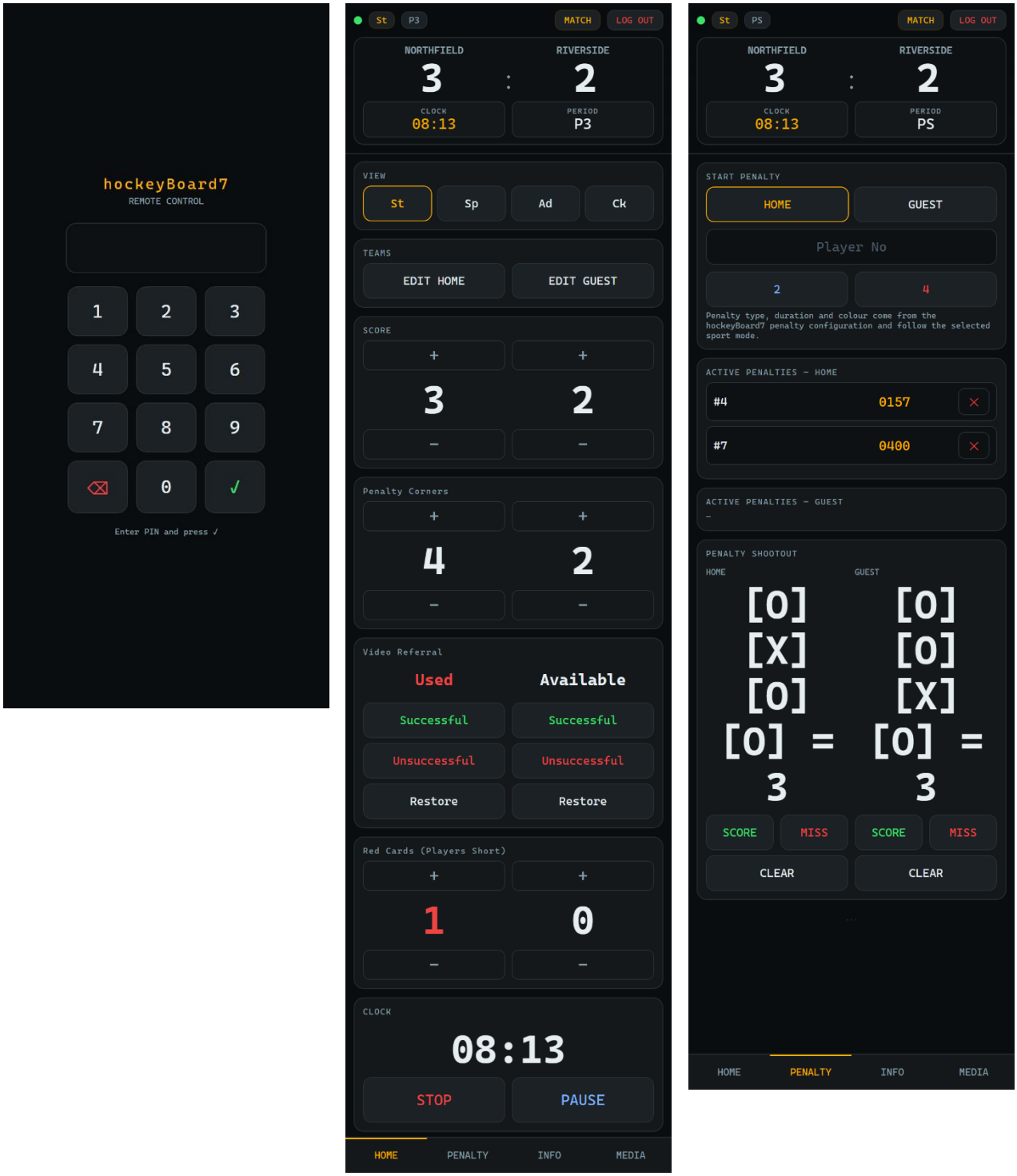


Figure 41. Logon page, the HOME tab (field hockey) and the PENALTY tab during a rink hockey shoot-out.

Tab	Cards
HOME	View (St, Sp, Ad, CK), team names, score (+/−, or tap the number to type it), team fouls (rink), penalty corners (field and indoor), video referral (field: Successful, Unsuccessful, Restore), red cards (field and indoor), attack time (rink: Reset 45, Hide), clock (tap to set, Stop, Play/Pause), periods, the two extra lines.
PENALTY	Start a penalty (home or guest, player number, the penalty buttons of the sport), the running penalties of both teams with a cancel button, the

Tab	Cards
	penalty shoot-out (Score, Miss, Clear; in the shoot-out only). In rink hockey a **Y** button records a yellow card for the player number.
INFO	Goal (goal, own goal, penalty goal), card or penalty graphic, substitution: side, player number and name, minute (filled in automatically when empty), animation, picture and timeline options, **Show on Board**.
MEDIA	A number pad for the playlist number, **START** (scoreboard media player), **START AD** (Ad media area) and **BACK TO SCOREBOARD**.



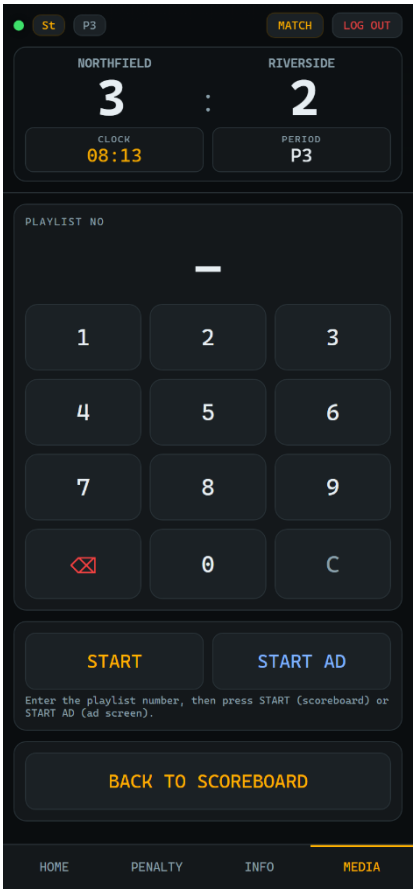


Figure 42. The INFO and MEDIA tabs.

Going back to the first period from the remote control asks for a confirmation as on the control panel. On a tablet the cards are shown in two columns.

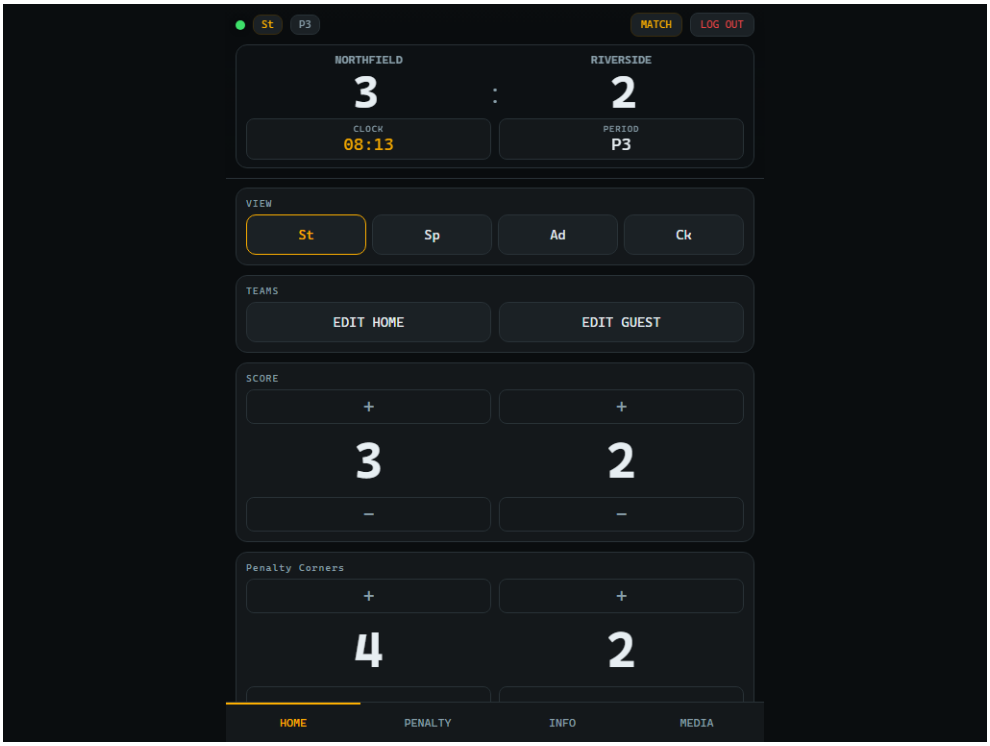


Figure 43. The remote panel on a tablet.

15. HTTP API

Other programs (a production switcher, a stream deck, a script) can control hockeyBoard 7 with simple web requests to port 1907, the port of the remote control. The remote control must be switched on and a PIN set (chapter 14). The full list of commands with examples is in **API_Commands.txt** in the program folder; **Settings** → **Remote Control** → **Show API Commands** opens it.

15.1 Request Format

```
http://<scoreboard-PC>:1907/api.html?pin=123456&cmd=<command>&value=<value>$
```

- The request ends with **$**.
- Values with special characters are URL-encoded; in team names "_" is a line break.
- Five wrong PINs lock the sending address out for 60 seconds, as on the logon page.

15.2 Reading the State

`cmd=GET` returns the state of the scoreboard as XML: display mode, sport mode, team names, scores, clock and whether it runs, period, extra lines, team fouls, red cards, penalty corners, video referrals, the running penalties of both teams, the shoot-out, timeouts, the attack time, and the penalty buttons and card types of the selected sport. A remote panel polls GET about twice a second.

15.3 Command Groups

Group	Examples
Teams and texts	set_home_team, set_guest_team, line_text_1, line_text_2
Score	set_home_score, set_home_score_up, set_home_score_down (and guest)
Clock and periods	set_chronometer (play, pause, stop or mm:ss), click (period_1 … period_4, penalty, playpause, stop)
Penalties	penalty_add (side, number, seconds), penalty_cancel
Shoot-out	shootout (side, O or X), shootout_clear
Sport counters	set_home_fault_up/down (rink team fouls), set_home_red_up/down (field and indoor red cards), set_home_pc_up/down (penalty corners), set_home_referral_lost/kept/reset (video referral)
Rink hockey	attack_reset, attack_set (ss or mm:ss), attack_hide, yellow_add (side, number)
Graphics	info_goal, info_card, info_subst
Display and media	click (St, Sp, Ad, Ck), start_playlist, start_playlist_ad_screen

Going back to the first period through the API needs the value `period_1|confirm`, because it starts a new match.

16. Keyboard Shortcuts

hockeyBoard 7 has three global keyboard shortcuts. They work even when another program has the focus, for example the production software on the same PC. Open the **Keyboard Hook Manager** with the keyboard button on the right of the control panel.

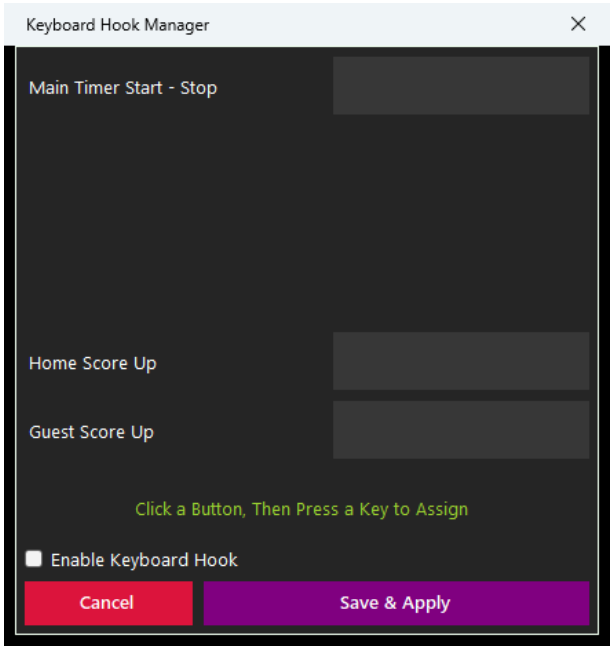


Figure 44. The Keyboard Hook Manager.

Action	Default Key
Main Timer Start - Stop (start and pause the clock)	Esc
Home Score Up	F9
Guest Score Up	F12

1. Click the button beside an action, then press the key you want.
2. Tick **Enable Keyboard Hook** and click **Save & Apply**.

- The keys are ignored while Ctrl, Shift or Alt is held, so normal shortcuts of other programs keep working.
- The keys are not taken away from other programs: a key used by hockeyBoard also reaches the program in front.
- The keyboard button of the control panel is green while the shortcuts are on and red while they are off.
- Use keys that no other program needs, for example the function keys or the numeric keypad.

17. Languages and Translations

All texts of the program and the remote control come from a language file. Open **Settings** → **Language** (or click the flag on the control panel).

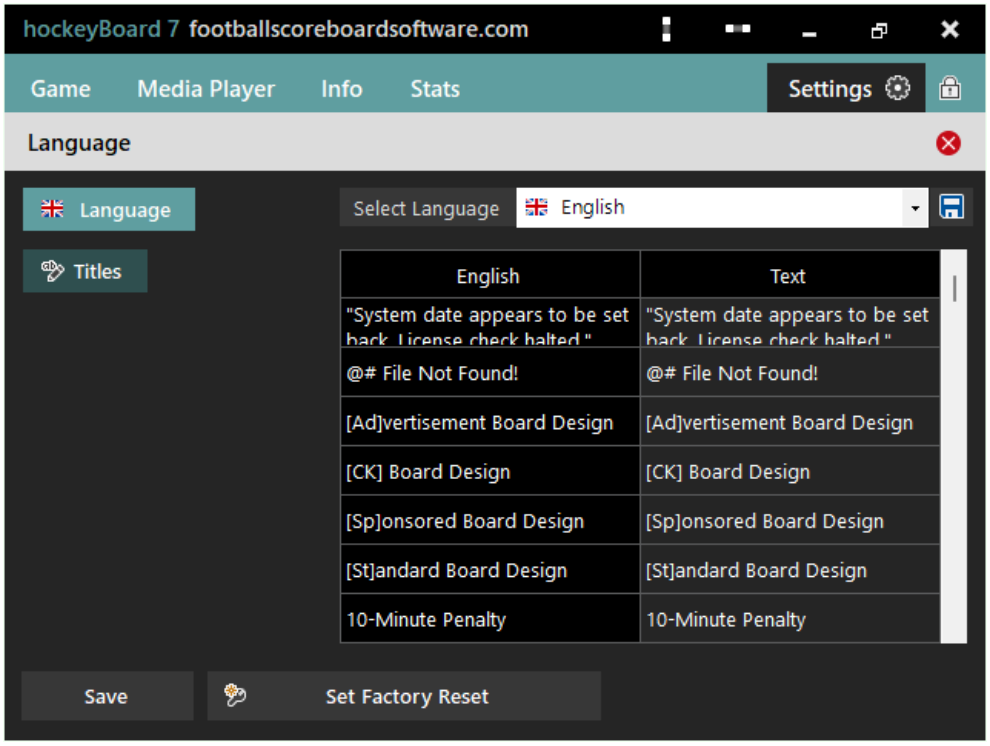


Figure 45. The Language page.

- **Select Language** switches the language of the program. The flag on the control panel shows the language in use.
- The table lists every text: the English text and the text in the selected language. Click a text to change it, for example to use your own words on the board, then click **Save**.
- **Titles** holds the titles of the board graphics (for example "Goal", "Red Card", "Substitution").
- **Set Factory Reset** puts back the original texts of the selected language.

Team names, player names and all texts you type are shown exactly as typed. Special characters of every language can be used.

18. Settings Reference

Settings has these pages: License (chapter 3), Screen Properties, the four design pages (chapter 10; only the page of the display mode in use can be opened), Remote Control (chapter 14), Language (chapter 17) and Youtube Tutorials (the video tutorials on YouTube).

18.1 Screen Properties

The values are saved as soon as you leave a cell, and the board is redrawn.

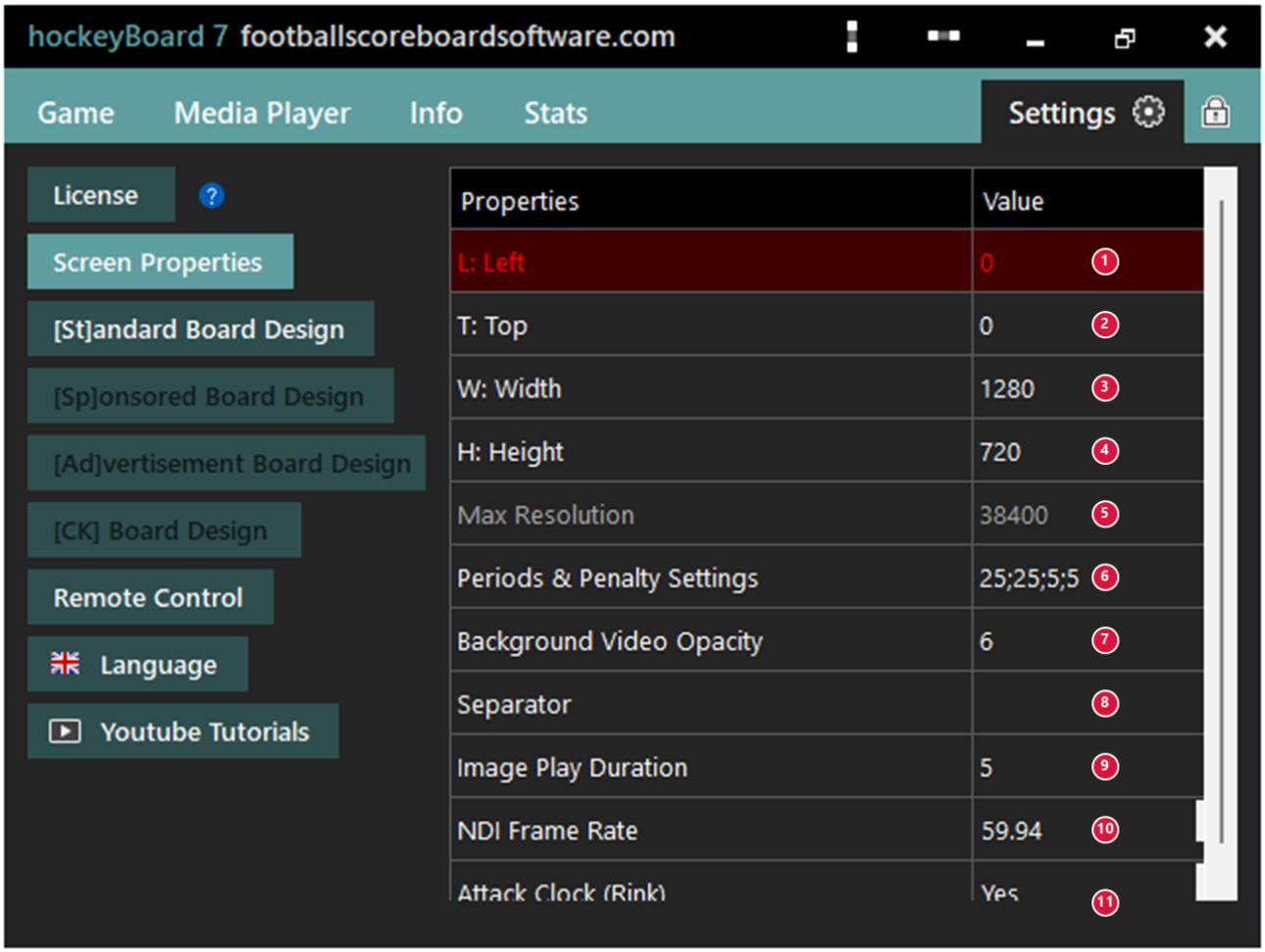


Figure 46. Screen Properties (scrolled to the last row, Attack Clock (Rink)).

No.	Setting	Meaning
1	**L: Left**	Left edge of the board window on the Windows desktop, in pixels.
2	**T: Top**	Top edge of the board window.
3	**W: Width**	Width of the board window (up to the licensed maximum).
4	**H: Height**	Height of the board window.
5	**Max Resolution**	The maximum board resolution of the licence. Read only.
6	**Periods & Penalty Settings**	The period lengths. Click the cell and the "..." button to open Period & Penalty Settings (chapter 6). The values shown are updated at the next start of the program.

No.	Setting	Meaning
7	**Background Video Opacity**	Strength of the background video, 0 (invisible) to 10 (full). Default 6.
8	**Separator**	Text between the two scores, for example "-". With a separator the board shows the score as one text ("3-2"). Empty by default.
9	**Image Play Duration**	Seconds a picture stays on the board in a playlist (1 to 120). Default 5.
10	**NDI Frame Rate**	Frame rate of the NDI output: 23.976, 25, 29.97, 30, 50, 59.94 or 60. Default 59.94 (chapter 9).
11	**Attack Clock (Rink)**	Yes: the 45-second attack clock is used in rink hockey (chapter 8). No: it is hidden. Default Yes.

18.2 Period & Penalty Settings

Periods, penalty buttons, End Penalty On Goal, Stop Chronometer on Goal, Show Milliseconds and the timeouts are set in Period & Penalty Settings; see chapter 6.

18.3 Other Settings

Setting	Where
Sound on/off	Sound button on the control panel (chapter 5).
Points scheme of the standings	Button beside Calculate from Results on the Standings page (chapter 12).
Calculate from Results	Standings page (chapter 12).
Team colours	Info page (chapter 11).
Keyboard shortcuts	Keyboard Hook Manager (chapter 16).
Remote control on/off and PIN	Settings → Remote Control (chapter 14).
Sponsors, scrolling text, banner areas, key colour	The Sp, Ad and CK menus (chapter 9).

All settings are stored in C:\hockeyBoard7\start.xml.

19. Troubleshooting and FAQ

19.1 The Program Does Not Start or Closes at Once

- **Port 1907 is in use.** When the remote control is switched on and another program already uses port 1907 (for example a second scoreboard program of the Board7 family, or a second copy of hockeyBoard), hockeyBoard 7 closes at start. Close the other program, or switch the remote control off in the other program, and start hockeyBoard again. Only one program per PC can use the remote control port.
- **WebView2 missing or damaged.** Install or repair the Microsoft Edge WebView2 Runtime and start again.
- **.NET Framework.** Install .NET Framework 4.7.2 or later.
- **Rights.** Start the program with its desktop shortcut (as administrator).

19.2 The Board Is Black or Empty

- Open **Select Design** and **Apply** a master design (chapter 10).
- Check **Settings** → **Screen Properties**: the board window may be outside the visible screens. Double-click an empty part of the control panel to bring it to 640 × 480 at the bottom right, then set the right values.
- Press **Game** to take a graphic or media off the board.

19.3 Wrong Size, Blurred Board or Wrong Fonts

- Set Windows display scaling of the board screen to 100 %; other values scale the board window.
- Use the exact resolution of the LED controller input as width and height.
- If texts appear in a different font, start the program once as administrator: it installs the fonts from common\font.

19.4 Remote Control

- **The page does not open:** both devices must be in the same network; allow port 1907 in the firewall (open_firewall_1907.bat); check the address in Settings → Remote Control, and that **Disable** is not ticked.
- **"Wrong PIN" / "Too many wrong PINs":** type the PIN of Settings → Remote Control; after five wrong attempts wait 60 seconds.
- **The page goes back to the logon:** the PIN was changed or the session ended after 12 hours; log on again.
- **"Remote Control Needs a PIN":** set a PIN and save it.

19.5 NDI

- The receiver does not see **Ho7_NDI**: both computers must be in the same network, and the firewall must allow NDI (the NDI tools or the receiving software usually add the rules).
- The NDI picture shows other windows: NDI sends the area of the board window on the screen; keep the board window visible and on top.
- Choose the NDI frame rate of your production in Screen Properties (chapter 9).

19.6 DEMO and Licence

- DEMO appears on the board and "License Required!" on the score arrows: enter a licence key (chapter 3).
- The licence was valid and is DEMO now: check the date and time of the PC; a clock set back before the last run disables the licence.
- A USB licence is not found: plug the drive in before starting the program, and keep the licence file in the root folder of the drive.

19.7 Questions

Can I change the period length during a match? In the first period, yes: change it in Period & Penalty Settings. After the first period, saving these settings asks to start a new match; to correct only the running time, pause the clock and type the time instead (chapter 5).

A penalty ended too early or too late. Can I correct it? Stop the clock, double-click the time of the penalty and type the right time (chapter 7).

Why did a goal not end the penalty? Only ice hockey ends penalties on a goal, only minor penalties, and only when the scoring team has more players on the ice (chapter 7).

Why does the second rink hockey card not count down? One period of inferiority runs per team; the second starts when the first ends (chapter 7).

Can I use the program for youth matches? Yes: change the period lengths and penalty durations in Period & Penalty Settings.

Where are my data and designs? In C:\hockeyBoard7 (chapter 2). Back up start.xml and the common folder to keep everything.

Appendix A: Rules Sources

hockeyBoard 7 follows these documents. The mode presets can be changed in Period & Penalty Settings (chapter 6). Check the edition used by your competition before an event.

Sport	What hockeyBoard Implements	Source
Ice hockey	Minor, double minor, major and misconduct penalties; up to two running penalties per team; a power-play goal ends the minor penalty with the least time remaining	IIHF Official Rule Book, Rules 16 to 20 (Rule 16.2 for the power-play goal)
Field hockey	Four quarters of 15 minutes; green card 2 minutes, yellow card at least 5 minutes, red card; penalty corners; one video referral per team (plus one for the shoot-out)	FIH Rules of Hockey, effective from 1 March 2026 (Rules 5, 13 and 14); FIH General Tournament Regulations (outdoor), Appendix 17
Indoor hockey	Four quarters of 10 minutes; green card 1 minute, yellow card at least 2 minutes, red card; penalty corners	FIH Rules of Indoor Hockey, effective from 1 December 2023 (Rules 5, 13 and 14)
Rink hockey	Two halves of 25 minutes and extra time; team fouls with direct free hits from the 10th foul; blue card 2 and red card 4 minutes of inferiority, a second period of inferiority after the first; 45 seconds attack time; card accumulation	World Skate Rink Hockey Rules of the Game, update of June 2026 (Articles 3, 4, 10, 18, 22 to 24, 31 and 32)
Standings	3/1/0 points, or Pro League 3/2/1/0 (shoot-out after a draw); ranking by points, wins, goal difference, goals for, result between the teams	FIH General Tournament Regulations (outdoor), ranking in a pool; FIH Hockey Pro League Regulations, Regulation 4.2

Appendix B: Match-Day Checklist

1. Start the program with the desktop shortcut; check the licence icon.
2. Check the sport and the period lengths in Period & Penalty Settings.
3. Check the board position and size; check the board on the LED wall or the video output.
4. Enter the team names, extra lines and logos; load the teams from the Team Database for the graphics.
5. Start a new match: go back to the first period and confirm, so penalties, fouls and timeouts are cleared. Set the scores to 0.
6. Switch the sound on and test the horn.
7. If needed: switch the remote control on, log on with the phone, start NDI and check it in the production software.
8. Check the sponsor strip, banners and playlists for the breaks.
9. During the match: Game brings the scoreboard back after every graphic.
10. After the match: update the results and the standings (chapter 12).