

MULTI-PURPOSE HALL SCOREBOARD SYSTEM

TECHNICAL SPECIFICATION (FIBA Level 2 Compliant)

0. Purpose and Scope

This technical specification defines the technical requirements for the supply and installation of a scoreboard system to be used in multi-purpose sports halls, supporting Basketball (including FIBA, NBA, EuroLeague, and 3x3 modes), Volleyball, Handball, Futsal, Water Polo, and different types of hockey (field hockey, indoor hockey, hockey 5S, ice hockey, underwater hockey, rink hockey, roller inline hockey).

The system shall have FIBA Level 2 approval and comply with the relevant rule sets of the respective sports.

1. Standards, Approvals, and International Usage Requirement

1.1. FIBA Approval: The main scoreboard unit and 24/14 second **Shot Clock** devices shall comply with FIBA Level 2 requirements. The **Ball Possession Arrow Indicator** (next attack/possession) shall also be FIBA approved.

1.2. Sport Rules: The system shall be configurable to operate in accordance with the rule sets of basketball, volleyball, and handball.

1.3. Usage Reference Requirement: The proposed brand shall provide official references/evidence showing that its timing, videoboard, or scoreboard systems have been used in at least five top-level international events such as EuroLeague, EuroCup, AfroBasket, BAL (Basketball Africa League), and the FIBA World Championship.

2. System Components (Minimum)

- Team Name, Score, and Game Time Panel
- Period, Team Foul, and **Timeout** Panel
- 24–14 Second **Shot Clock** Devices (for opposite backboards)
- Control Units: Main Console, **Shot Clock** Console, Game Time Console
- **Ball Possession Arrow Indicator** (possession)
- Backboard Light Strips (**Backboard Lights**)
- Mounting brackets for 24–14 second devices
- Scoreboard mounting brackets

3. Architecture, Communication, and Language/Character Support

3.1. Control Console Architecture and OS Independence

- The control console shall operate on an embedded architecture without an operating system; independent of Android / iOS / Windows.
- This design shall ensure high responsiveness and low latency.
- The console shall include a membrane keypad.
- By connecting an external keyboard, team and player data (number, foul, score) shall be entered directly.

3.2. Communication Infrastructure

- RF 868 MHz wireless communication support shall be provided; shall also operate with RS485 wired infrastructure when required.
- RS485 Half Duplex shall transmit game/player/team data at least 1 km over a single line.

3.3. Language and Special Character Support

Languages supported: Turkish, English, French, Spanish.

Menus and name entries shall fully support the following special characters (without abbreviation):

Uppercase: Ç, Ğ, İ, Ö, Ş, Ü, À, Á, Â, Ä, Æ, È, É, Ê, Ë, Ì, Í, Î, Ï, Ñ, Ò, Ó, Ô, Õ, Æ, Ú, Û, Ý, Ž, Æ, ß

Lowercase: ç, ğ, ı, ö, ş, ü, à, á, â, ä, æ, è, é, ê, ë, ì, í, î, ï, ñ, ò, ó, ô, õ, ù, ú, û, ý, ž, æ

4. Display Panels and Device Features

4.1. Team Name, Score, and Game Time Panel

Layout: Team names on the upper left/right; team scores below; centered game time at the bottom.

a) Team Name Indicators

- Input via external keyboard or membrane keypad on the main console.
- Supports at least 12 characters; character height ≥ 16 cm.
- LED module structure.
- Full support for special character list in item 3.3.

b) Score Indicators

- 3 digits per team, range 0–199.
- Digit height ≥ 30 cm; unused digits remain blank.

c) Game Time Indicator (Main Scoreboard)

- MM:SS, 4 digits; adjustable 00:00–99:59.
- Supports count up / countdown; displays tenths during last 60 seconds.
- ± 0.1 s tolerance per 100 minutes; audible signal at expiry.
- Digit height ≥ 30 cm.

4.2. Period, Team Foul, and Timeout Panel

a) Period/Set

- Single digit, 0–9; digit height ≥ 20 cm.
- Displays set in volleyball, period in basketball; overtime displayed as “O”.
- With period/set increment, game clock and timeout indicators adjust automatically per rule.

b) Team Foul

- 1 digit per team, 0–9; digit height ≥ 23 cm.
- In basketball, after the 4th foul, displayed as a square per rule.
- When a foul is entered for a player, the team foul count increases automatically; manual adjustment possible from the console.
- Auto reset/adjustment during period changes. Color: Red.

c) Timeout Indicators

- 3 square dots per team; side ≥ 5 cm.

d) Timeout Duration

- 2 digits, 0–99; digit height ≥ 30 cm.
- Operates as countdown; dots flash during counting.
- Audible signal at start/end; adjustable early-warning before expiry (can be disabled).
- When a team calls a timeout, its timeout dots and duration activate.
- Timeout display on 24 s devices supported if desired.

e) Shot Clock / Service Indicators (Arrows)

- 1 arrow per team; color: Red.

4.3. 24–14 Second Shot Clock Devices

- Designed per FIBA Level 2 standards; mounted on backboard top.
- Shot Clock 0–99 s; reset at 24 s and 14 s; stop–resume at same value.
- When game time <24 s, Shot Clock stops or syncs.
- Different sound tones for Shot Clock and game time end; ≥ 120 dBA (1 m).
- Digit heights: Game time ≥ 13 cm, Shot Clock ≥ 25 cm.
- Colors: Game time Yellow, Shot Clock Red.
- **Backboard Lights:** Red **Backboard Lights** at game time end; yellow **Backboard Lights** at Shot Clock end; both remain lit ≥ 2 s.
- Pressing 24s+14s simultaneously hides the Shot Clock (digits off).
- When game time <24/14 s and relevant keys used, Shot Clock display turns off automatically.
- Devices have hardware/software compliant with EuroLeague and EuroCup competition rules.

5. Control Units

5.1. Main Console

- Supports Shot Clock and game time consoles; easy setup for different sports.
- Supports at least 13 branches: Basketball, Volleyball, Handball, Futsal, 3x3 Basketball, Field Hockey, Indoor Hockey, Hockey 5S, Ice Hockey, Underwater Hockey, Rink Hockey, Roller Inline Hockey, Water Polo.
- Supports FIBA, EuroLeague, 3x3, and NBA modes.
- Color TFT display $\geq 7"$, $\geq 800 \times 480$ px; aluminum front protection; waterproof printed buttons and membrane keypad.
- Team/player names entered via external keyboard and membrane without computer.
- Language/character support (see 3.3).
- Wireless RF connection; signals can be disabled via software.
- 100-step brightness adjustment on scoreboard; functions to switch off/test all indicators.

- Game, timeout, halftime; in basketball, 24 s and 14 s customizable per rules.
- Timeout early-warning adjustable; period transitions auto/optional.
- Foul/timeout values automatically adjusted per rules at period transitions.
- Inter-period timeouts can be given automatically; triggered by referee/player actions.
- Difference between console time and field displays <0.05 s.
- Single operation reset: only game, only player, or all data.
- Sport-specific memory for player/team/time data.
- Fast scoring input: Score +1/+2/+3 and Score –.
- Controls 14 players in basketball, 16 in handball.
- In Handball, simultaneous **Exclusion Time** tracking for 5 players; additional penalties added to the same row.
- In Basketball, last foul info (jersey no. and number of fouls) can be shown flashing for 10 s.
- Audible signals and **Backboard Light Strips** controllable independently.
- In Volleyball, main screen clock/count-up display (can be blanked).
- After power loss, all data on console can be refreshed in one operation.
- All updates except physical changes on scoreboard done via console software.
- Timeout display on 24 s devices can be enabled from main console.
- System hardware supports remote OTA updates without opening device.
- Case: Aluminum, IP54.

5.2. Shot Clock Console

- Synced with main console; 24s, 14s, Start, Stop buttons.
- 24s+14s simultaneously → Shot Clock closes.
- When game stops, Shot Clock stops in sync; cannot start before match.
- ≤0.5 kg, ABS case, IP54.

5.3. Game Time Console

- Synced with main console; start/stop of game time and manual audible signal control.
- ≤0.5 kg, ABS case, IP54.

6. Ball Possession Arrow Indicator (Possession)

- Right/left arrow display; SMD LED; FIBA approved.
- Width and height ≥11 cm; 12 V supply; color: Red.
- Direction determined by switch on top; LED group on back side shows arrow direction.

7. General Technical Considerations

- Panels entirely aluminum; height ≥190 cm, width ≥220 cm, thickness ≤8.5 cm.
- SMD LED, 7-segment layout; single/multiple LED failures do not extinguish entire segment.
- Static driving technology ensures clarity for camera recordings.
- Mounted on stable ground in visible area for spectators/referees/players, with safety measures.
- Easy plug/unplug, moisture-resistant connectors.
- Transparent plexiglass (reflect/lexan type) on front to reduce reflections.
- Internal wiring with grouped data cables; no cut/spliced/socketless wiring.
- Short-circuit protected driver boards.
- CE certified power supplies; products RoHS and CE certified.
- LED lifetime ≥50,000 hours.
- Integrated/processor manufacturers: ST, Toshiba, Texas, NXP, Green Micro.
- Operating temperature: -40 °C ... +55 °C.
- External power/data cables shall comply with manufacturer-approved standards.
- Wiring diagram and fuse values provided with manufacturer approval.
- Data and power cables protected, not visible.
- ISO 9001 Quality System Compliance certificate required.
- User manual and warranty certificate delivered.

- System warranty: minimum 2 years.

SUMMARY TABLE – System Overview (Highlighted Mandatory Features)

Component / Indicator	Digit/Module Height	Display Range	Color (if mandatory)
Team Name	≥16 cm (character)	Text (≥12 characters)	—
Score (per team)	≥30 cm (digit)	0–199	—
Game Time (Main Scoreboard)	≥30 cm (digit)	00:00–99:59, last 60 s: 1/10	—
Period/Set	≥20 cm (digit)	0–9, overtime “O”	—
Team Foul	≥23 cm (digit)	0–9, square after 4th foul	Red
Timeout Indicator (dots)	Square, side ≥5 cm	3 per team	—
Timeout Duration	≥30 cm (digit)	0–99 (countdown)	—
Shot Clock / Service Arrows	—	Direction indicator	Red
24–14 Device – Game Time	≥13 cm (digit)	Synchronized display	Yellow
24–14 Device – Shot Clock	≥25 cm (digit)	0–99; 24 s/14 s	Red
Backboard Lights (Game End)	—	Remain on ≥2 s	Red
Backboard Lights (Shot End)	—	Remain on ≥2 s	Yellow
FIBA Approval	—	Level 2 (main system and 24/14)	Mandatory
Modes (Basketball)	—	FIBA, NBA, EuroLeague, 3x3	Mandatory

Component / Indicator	Digit/Module Height	Display Range	Color (if mandatory)
Communication	—	RF 868 MHz wireless; RS485 wired	Mandatory
Console Architecture	—	Embedded, OS-free, low latency	Mandatory
Language/Characters	—	TR/EN/FR/ES + full char list	Mandatory
Audible Signals	—	Different tones for game/shot; ≥120 dBA	Mandatory
International Usage	—	At least 5 major events incl. EuroLeague, EuroCup, AfroBasket, Mandatory BAL, FIBA World Championship	