

INDOOR SCOREBOARD SYSTEM TECHNICAL SPECIFICATION

1. Scope and Purpose

This technical specification defines the minimum technical and operational requirements for the supply, installation, and operation of an indoor scoreboard system to be used in basketball, volleyball, handball, futsal, water polo, and various hockey disciplines (ice hockey, field hockey, indoor hockey, hockey 5S, underwater hockey, rink hockey, roller inline hockey). The system consists of the main scoreboard, 24/14 second devices (Shot Clock), control units, and mounting accessories.

2. System Components

- **Score/Period/Game Time/Team Foul Panel (Main Panel)**
- **24/14 Second Devices (Shot Clock)** (mounted above the backboards)
- **Control Units**
 - Main Controller
 - Shot Clock Controller
- **Backboard and Panel Mounting Hardware**

3. Functional Features

3.1 Main Panel (Score – Period – Game Time – Team Foul)

On the main panel, team scores are on the left/right, the game time is centered, and the period is below it. On the right/left of the period, there are arrows indicating the **Ball Possession Arrow** and team fouls.

a) Score Indicators

- 2 digits per team; range 0–99.
- Digit height ≥ 16 cm.
- Score digits shall be the same color for both teams.
- Unused digit positions shall remain dimmed.

b) Game Time (Match Clock)

- 4 digits in **MM:SS** format; count up / count down.
- Period length adjustable within 00:00–99:59.
- **1/10-second** display during the last 60 seconds.

- Maximum tolerance ± 0.1 s per 100 minutes.
- Audible signal at the end of the time.
- Digit height ≥ 16 cm.

c) Period/Set Indicator

- Single digit, range 0–9; ≥ 16 cm.
- In basketball, overtime is displayed with the letter “**O**”.
- Set information is displayed for volleyball.

d) Team Foul Indicators

- 1 digit per team, range 0–9; ≥ 16 cm.
- Color: **Red**.
- Automatic increment with player-foul entry; manual correction from the Main Controller.
- Automatic adjustment at period transitions according to sport type.

e) Basketball-Specific Visualization

- During the game, the last committed foul: the related player jersey number and the foul sequence may be flashed on the penalty panel for **10 s**.

3.2 24/14 Second Devices (Shot Clock)

- Mounted above the backboards (opposite ends).
- When the game time falls below **24 s**, the Shot Clock indicators either stop or run synchronized with the game time.
- Range 0–99 s; start from 24, stop/continue.
- Audible signal at the end of the Shot Clock.
- Digit height ≥ 25 cm; color: **red**.
- When **24s + 14s** buttons are pressed simultaneously, the Shot Clock is hidden/dimmed.
- When the game time falls below **24/14 s** and the relevant buttons are used, the Shot Clock automatically turns off.

3.3 Control Units

3.3.1 Main Controller

- Operates on an embedded, **operating-system-free** architecture; independent of Android / iOS / Windows. This provides high responsiveness and low latency.
- Communication via **RF 868 MHz** wireless and, when required, **RS485** wired infrastructure.
- Includes a membrane keypad; an external keyboard can be connected to enter team/player data (number, foul, score) directly.
- Language support: **Turkish, English, French, Spanish**.
- Display: Color TFT $\geq 7"$, resolution $\geq 800 \times 480$.
- Different sport settings can be configured on the controller: basketball, volleyball, handball, futsal, 3×3 basketball, field/ice/indoor hockey, hockey 5S, underwater hockey, rink hockey, roller inline hockey, water polo, etc. (support for at least **13** disciplines).
- Basketball modes: **FIBA, EuroLeague, NBA, 3×3**.
- Waterproof printed keys on the controller; aluminum front protection.
- Special-character support (for menus, player and team names):
 - **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, Ñ, 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, ù, ú, û, ý, ž, ñ
- Wireless connection can be disabled by software.
- **100-level** brightness adjustment; all indicators can be turned off/tested.
- Game/Timeout/halftime/24–14 s durations are customizable; early warning time before Timeout end is adjustable.
- Automatic transition at period end; foul and Timeout values are automatically adjusted according to **FIBA** rules.
- Team/Media Timeouts are preset and start with a **start** command.
- Time difference between controller and panel/24s devices < 0.05 s.
- Reset options: game only, player only, or all information.
- Discipline-based memory: basketball, volleyball, handball, futsal, hockey, water polo.

- Score control: **+1 / +2 / +3 / -** keys.
- Player management for up to **14** players in basketball and **16** in handball.
- Handball: tracking **5** different player Exclusion Times; if a new Exclusion Time is added to the same player, it is shown cumulatively.
- In basketball, audible signal and **Backboard Lights** are controlled independently.
- In volleyball, a clock or count-up can be shown on the main screen and scoreboard (can be turned off).
- After a power outage, controller data can be refreshed with a single operation.
- With **RS485 Half Duplex** single line, game/player/team data can be transmitted up to **1 km**.
- All software-based updates on the scoreboard are applied via the controller.
- Timeout durations can be displayed on the **24-second devices**.
- Can receive remote updates without opening the device.
- Enclosure: Aluminum; Protection class: **IP54**.

3.3.2 Shot Clock Controller

- Operates synchronized with the Main Controller.
- Buttons: **24s, 14s, Start, Stop**.
- **24s + 14s** simultaneously: Shot Clock turns off.
- When the game time stops, the Shot Clock stops in sync.
- Cannot be started before the match begins.
- Weight \leq **0.5 kg**; suitable for handheld use.
- **ABS** material, **IP54**.

4. Hardware and Structural Features (Main Panel)

- Entirely aluminum body.
- Dimensions: height \geq **80 cm**, width \geq **125 cm**, thickness \leq **8.5 cm**.
- SMD LED, 7-segment digit architecture; a segment shall not go dark due to a single LED failure.
- Static drive technology for camera recordings.

- Anti-glare plexiglass front protection of reflective/lexan type.
- Connectors are easy to plug/unplug and moisture-resistant.
- Internal layout: grouped data cables, clean/tidy internal structure; no spliced/unsocketed cabling.
- Driver boards short-circuit protected.
- Operating temperature: **-40 °C ... +55 °C**.
- External power and data cables shall be to manufacturer-approved sizes/standards.
- Wiring diagram and fuse values shall be manufacturer-approved.
- Data and power cables shall be installed protected and concealed.

5. Communication and Integration

- Supports **RF 868 MHz** wireless and **RS485** wired infrastructure.
- Transmission up to **1 km** over RS485 Half Duplex single line.
- The above-backboard 24/14 devices and the main panel operate in sync.

6. Software and Update

- All parameters and sport settings are made via the Main Controller.
- The system receives remote updates without opening the device.
- Brightness/LED test and address test functions are executed from the controller.

7. Rules and Compliance

- Full compliance with **FIBA** rules; automatic adjustment of period transitions, Timeout, and foul values.
- **FIBA approval:** 24-second devices and related indicator solutions shall be **FIBA-approved**.
- Basketball modes: **FIBA / EuroLeague / NBA / 3×3** shall be built into the controller.

8. Documentation

- The manufacturer shall possess **ISO 9001** Quality Management System certification.
- Products shall have **CE** and **RoHS** compliance.
- Component devices shall use **ST, Toshiba, Texas, NXP, Green Micro** components.

9. Use, Service, and Maintenance

- The scoreboard shall be mounted securely on a solid base, visible to spectators, referees, and players.
- Modular, orderly internal cabling and access for technical service/maintenance.
- User manual and warranty certificate shall be delivered.

10. Warranty

- The system shall have at least a **2-year** warranty.

11. Major Event Usage Requirement (Reference)

- The proposed brand's timing, videoboard, or scoreboard systems shall have been used in at least **five** top-tier events such as **EuroLeague, EuroCup, AfroBasket, BAL (Basketball Africa League)**, and the **World Championship**; official references/evidence of such use shall be submitted with the bid.

SUMMARY TABLE — System-Wide (Highlighted Mandatory Items)

Component / Indicator	Digit Height	Color	Range / Format	Mandatory Features
Score (2 digits per team)	≥ 16 cm	Same color for both teams	0–99	Unused digits dimmed; fast response; synchronization < 0.05 s
Game Time (MM:SS + 1/10 s)	≥ 16 cm	—	00:00–99:59; last 60 s shows 1/10	±0.1 s/100 min tolerance; audible signal; count up/down
Period/Set (1 digit)	≥ 16 cm	—	0–9; overtime “0”	Period/Set per discipline; automatic adjustment per FIBA rules
Team Foul (1 digit)	≥ 16 cm	Red	0–9	Automatic increment; automatic adjustment at period transition
24/14 Seconds (Shot Clock)	≥ 25 cm	Red	0–99 s	24/14 start/stop/continue; hide on 24+14 simultaneous; audible signal
Controller Display	≥ 7”	Color	≥ 800×480	Embedded OS-less architecture; membrane keys; external keyboard;

Component / Indicator	Digit Height	Color	Range / Format	Mandatory Features
	TFT			Turkish, English, French, Spanish
Communication	—	—	—	RF 868 MHz wireless + RS485 Half Duplex (1 km)
Enclosure / Front Protection	—	—	—	Aluminum body; anti-glare plexiglass; IP54 (controllers)
LED/Segment	—	—	—	SMD LED; 7-segment; static drive for cameras
Compliance	—	—	—	FIBA approval; CE & RoHS; ISO 9001
Other	—	—	—	100-level brightness; LED/address tests; Backboard Lights independent; power/temp: -40...+55 °C