

INDOOR SPORTS SCOREBOARD AND TIMING SYSTEM

TECHNICAL SPECIFICATION

1. Scope and Purpose

This technical specification defines the minimum technical and functional requirements for the procurement, installation, and commissioning of the scoreboard and timing system to be used in indoor sports halls. The system shall be used for Basketball (5x5, 3x3, FIBA, NBA, Euroleague modes), Volleyball, Handball, Futsal, Water Polo, and Hockey types (Field Hockey, Indoor Hockey, Hockey 5S, Ice Hockey, Underwater Hockey, Rink Hockey, Roller Inline Hockey).

2. Standards and Approvals

- **FIBA Level 2 approval is mandatory.**
- Basketball **24/14 Shot Clock** devices and **Backboard Lights** shall fully comply with FIBA conditions.
- Compliance with the relevant rules for Volleyball and Handball (FIVB, IHF) shall be ensured.
- CE and RoHS conformity is required at the product level.
- The manufacturer shall hold an ISO 9001 Quality Management System.

3. Major Event Usage Requirement

The proposed brand shall certify that its timing, videoboard, or scoreboard systems have been used in at least **five major international events**. Examples within the reference scope include Euroleague, EuroCup, AfroBasket, BAL (Basketball Africa League), and the World Championship. Documents shall be submitted in the bid file.

4. System Components

1. **Main Scoreboard Panel:** Team names, scores, game time, period/set, team timeouts, team fouls, Ball Possession/Service indicators.
2. **24/14 Shot Clock Devices:** Single-faced devices mounted to opposing backboards, displaying game and Shot Clock countdowns.
3. **Control Units:**
 - a) Main control console
 - b) Shot Clock control
 - c) Game Time control

4. **Backboard Lights System:** Red/yellow Backboard Lights compliant with FIBA conditions.
5. **Mounting Brackets:** For the scoreboard and 24/14 Shot Clock devices.

5. Main Scoreboard Panel – Technical Features

5.1 General Layout

Team names at left and right, scores beneath; centered game time in the lower section; Timeout indicators on the right/left of game time; period/set at the bottom; Ball Possession/Service arrows on the right/left of the period; team fouls for both teams shall also be displayed.

5.2 Team Name Indicators

- Can be entered without a computer via an external keyboard or the membrane keypad on the main console.
- Supports at least **8 characters**; character height $\geq$ **16 cm**.
- LED module structure.
- Full support for the Latin alphabet and special characters:
 - **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, Ù, Ú, 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, ù, ú, û, ý, ž, æ

5.3 Score Indicators

- **3 digits per team**, range **0–199**.
- Digit height $\geq$ **25 cm**.
- **Color:** Same color for both teams (color selection fixed).

5.4 Game Time Indicator

- **MM:SS** format, **4 digits**; supports count up/down.
- Adjustable range **00:00–99:59**.
- **1/10 second display** during the last **60 seconds**.
- Maximum tolerance **±0.1 s per 100 minutes**.

- Audible warning at expiration.
- Digit height ≥ 25 cm.

5.5 Period / Set Indicator

- **Single digit**, range **0–9**, height ≥ 20 cm.
- In basketball, overtime shall be shown with “**0**”.
- When the period/set value changes, the game clock and Timeout indicators shall be automatically adjusted according to the type of sport.

5.6 Team Foul Indicators

- **1 digit per team**, range **0–9**, height ≥ 23 cm.
- **Color: Red (mandatory)**.
- In basketball, after the **4th foul**, a **square** symbol shall appear on the indicator.
- Automatic increase linked to player-foul entries; manual correction from the main console is possible.
- Automatic reset/adjustment at period changes.

5.7 Timeout Indicator

- **3 square dots per team**, minimum **5 cm** side length.

5.8 Ball Possession / Service Indicators

- **1 arrow per team**.

6. 24/14 Shot Clock Devices

- Designed per **FIBA Level 2** standards, single-faced devices (one per side) mounted to backboards.
- When game time stops, the Shot Clock shall stop in sync; **24/14 start/stop/resume** functions.
- Shot Clock range **0–99 s**; audible warning at **0**.
- When game time is below **24/14 s**, if the related Shot Clock buttons are pressed, Shot Clock digits shall automatically turn off.

- When **24s** and **14s** buttons are pressed simultaneously, the Shot Clock indicator turns off.
 - **Digit heights:** Game time ≥ 13 cm, Shot Clock ≥ 25 cm.
 - **Colors (mandatory):** Game time **Yellow**, Shot Clock **Red**.
 - **Backboard Lights (FIBA conditions):**
 - Red lights surrounding the backboard remain on for at least **2 s** when **game time** expires.
 - Yellow lights at the **top** of the backboard remain on for at least **2 s** when the **Shot Clock** expires.
 - Sound pressure level ≥ 120 dBA (**1 m**).
 - Mounting: Onto the backboard; if not possible, suspended from the ceiling aligned above the backboard.
 - League rules compliance: Programmable hardware/software compliant with **Euroleague** and **EuroCup** competition rules.
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7. Control Units

7.1 Main Control Console (OS-less Embedded Architecture)

- Operates on an embedded architecture **without an operating system**; independent of Android / iOS / Windows. Provides high responsiveness and low latency.
- **Communication:** RF **868 MHz** wireless; RS485 wired infrastructure when required. RF can be disabled by software.
- **Display:** Color **TFT $\geq 7"$** , resolution $\geq 800 \times 480$.
- **Keypad:** Printed, waterproof membrane keys; front face protected with aluminum.
- **Input:** Team/player names can be entered without a computer via external keyboard and membrane keypad.
- **Languages:** Turkish, English, French, Spanish.
- **Character set:** Full support of special characters in menus and name entry:
 - **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, Ù, Ú, 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, ò, ù, ú, û, ý, ž, æ

- **Sport profiles:** At least 13 branches including Basketball, Volleyball, Handball, Futsal, Field Hockey, Indoor Hockey, Hockey 5S, Ice Hockey, Underwater Hockey, Rink Hockey, Roller Inline Hockey, Water Polo, etc.
- **Basketball modes:** FIBA, Euroleague, 3x3, NBA.
- **Brightness:** 100-level light adjustment on the scoreboard.
- **Synchronization:** Time difference among main console–scoreboard–24/14 < **0.05 s**.
- **Time/Timeout management:** Game, Timeout, halftime, and 24/14 durations can be customized per rules; Timeout-end warnings adjustable. At period transitions, fouls and Timeout values are automatically adjusted per FIBA; inter-period Timeouts can be given automatically and started in accordance with referee/field flow.
- **Score management:** Single-press **Score +1/+2/+3** and **–**; player data for up to **14** in basketball, **16** in handball; up to **5** separate **Exclusion Time** tracks in handball, cumulative on the same row if an additional penalty is given to the same player.
- **Basketball last-foul info:** On the **Exclusion Time Indicator** panel, jersey number and foul count can flash for **10 s**.
- **Sound–Backboard Lights independence:** In Timeout/manual audible warnings, sound can be heard **without** triggering the Backboard Lights.
- **Clock/time mode:** In volleyball, clock or count-up can be shown on the main screen and scoreboard.
- **Recovery after outage:** After power loss, all data on the console can be transferred to the scoreboard with a single action.
- **Communication:** **RS485 Half Duplex** single line; game/player/team data up to **1 km**.
- **Update and test:** Updates that do not require physical changes on the scoreboard are performed via console software; the system can receive remote updates **without opening the device**; “turn-off/test all indicators” function is available.
- **Enclosure / Protection:** Aluminum housing, **IP54** protection.

7.2 Shot Clock Control

- Synchronized with the main console; **24s, 14s, Start, Stop** buttons.
- When **24s+14s** are pressed simultaneously, the Shot Clock indicator turns off.
- Stops in sync when game time stops; cannot be started before the match.

- **Weight** ≤ 0.5 kg, handheld; **ABS** body, **IP54**.

7.3 Game Time Control

- Synchronized with the main console; start/stop of game time and manual audible warning control.
 - **Weight** ≤ 0.5 kg; **ABS** body; **IP54**.
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8. Physical and Hardware Requirements (Scoreboard Panel)

- **Body:** Entirely aluminum.
 - **Dimensions:** Height ≥ 120 cm, width ≥ 200 cm, thickness ≤ 8.5 cm.
 - **Display technology:** **SMD LED**, 7-segment digit structure; **static drive** technology (clarity for camera recordings).
 - **LED lifetime:** ≥ 50,000 hours.
 - **Segment tolerance:** In case of one/several LED failures, the whole segment shall **not** go dark.
 - **Front protection:** Anti-glare transparent plexiglass of reflective/lexan type.
 - **Mounting:** On a solid base visible to spectators, referees, and players, with safety-oriented installation.
 - **Cabling:** Connectors easy to plug/unplug, moisture-resistant; grouped data cables, neat/clean internal layout; no cut/spliced/unsocketed cables; routed in protective conduits with no visible exposed cables.
 - **Electrical:** Driver boards protected against short circuit; power supplies **CE-certified**; operating range **−40...+55 °C**.
 - **Wiring/approval:** External power and data cables and the installation diagram/fuse ratings shall be manufacturer-approved.
 - **Certification/Delivery:** User manual and warranty certificate shall be provided.
 - **Warranty:** 2 years.
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9. Installation and Accessories

- Mounting brackets shall be provided for the scoreboard and 24/14 Shot Clock devices (over-backboard or ceiling-suspension solutions).

- Necessary connectors and accessories for wired/wireless communication shall be included.

10. Software/Operation and Maintenance

- Remote updates shall be possible; updates shall be received **without opening the device**.
 - Indicators shall be testable; addressing and LED test functions shall be accessible from the main console.
 - Player/team/time profiles per sport branch can be stored in separate memories.
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SUMMARY TABLE – System Overview (Highlighted Mandatory Items)

Component / Indicator	Digit/Field Structure	Mandatory Size (min.)	Mandatory Color / Light	Other Mandatory Aspects
Team Name	Text, ≥ 8 characters	≥ 16 cm (character)	—	Full special-character support
Score (per team)	3 digits, 0–199	≥ 25 cm	Same color (both teams)	—
Game Time (scoreboard)	MM:SS, 4 digits, ±0.1 s/100 min	≥ 25 cm	—	1/10 s in last 60 s; audible at end
Period/Set	1 digit, 0–9; overtime “O”	≥ 20 cm	—	Auto adjustments (by sport type)
Team Fouls	1 digit (per team), 0–9	≥ 23 cm	Red	Square after 4th foul; auto/manual update
Timeout Indicator	3 squares (per team)	≥ 5 cm (side)	—	—
Ball Possession/Service Arrows	Arrow (per team)	—	—	—

Component / Indicator	Digit/Field Structure	Mandatory Size (min.)	Mandatory Color / Light	Other Mandatory Aspects
Shot Clock – Attack Time	Countdown, 0–99 s	≥ 25 cm	Red	24/14/Start/Stop; 24+14 ⇒ indicator off
Shot Clock – Game Time	Countdown	≥ 13 cm	Yellow	Synchronized with scoreboard clock
Backboard Lights (Game)	Perimeter light	—	Red	≥ 2 s on at game-time expiration
Backboard Lights (Shot Clock)	Upper light	—	Yellow	≥ 2 s on at Shot Clock expiration
Audible Signal	Siren	—	—	≥ 120 dBA (1 m)
Communication	RF + RS485	—	—	RF 868 MHz, RS485 Half Duplex, ~1 km
Console – Display	Color TFT	≥ 7", ≥ 800×480	—	—
Console – Protection	Enclosure/IP	—	—	Aluminum, IP54
Operating Temperature	System-wide	—	—	–40...+55 °C
Compliance / Approval	Standards	—	—	FIBA L2, CE, RoHS, ISO 9001
Basketball Modes	Game profiles	—	—	FIBA, Euroleague, 3x3, NBA
Major Event Usage	Reference requirement	—	—	≥ 5 major events (e.g., Euroleague, EuroCup, AfroBasket, BAL, World Championship)