

MULTI-DISCIPLINE INDOOR SCOREBOARD SYSTEM – TECHNICAL SPECIFICATION

1. SCOPE AND PURPOSE

This technical specification defines the mandatory technical criteria for the supply, installation, commissioning, and operation of the scoreboard and related sub-systems (game time/Shot Clock, control units, mounting brackets, etc.) to be used in indoor sports halls with multi-sport support. The system supports multiple sports, primarily Basketball, Volleyball, Handball, Hockey (ice hockey, indoor hockey, field hockey, rink hockey, roller inline hockey, underwater hockey), Futsal, and Water Polo.

2. COMPLIANCE, APPROVALS, AND REFERENCES

2.1 Regulatory Compliance: Products shall comply with CE and RoHS directives.

2.2 Quality Management: The manufacturer shall hold ISO 9001 Quality Management System certification.

2.3 Game Rules Compliance and FIBA Approval: The system shall be fully compliant with FIBA game rules for basketball and shall be FIBA-approved. Basketball modes shall include FIBA, NBA, EuroLeague, and 3x3.

2.4 Use in Major Events: The proposed brand's timing, videoboard, or scoreboard systems must have been actually used in at least five top-tier events such as EuroLeague, EuroCup, AfroBasket, BAL (Basketball Africa League), and the World Championship, and such use shall be verified with documentation during procurement.

3. SYSTEM COMPONENTS AND DELIVERY SCOPE

- Score, Period/Set, and Game Time Panel (main scoreboard)
- 24/14 Second (Shot Clock) Devices (one per basket, above opposing backboards)
- Control Units: Main controller + Shot Clock controller
- Mounting Brackets: Above-backboard Shot Clock bracket, scoreboard mounting brackets
- User Manual and Warranty Certificate (Turkish, English, French, Spanish)

4. OVERALL SYSTEM ARCHITECTURE AND COMMUNICATION

4.1 Control Console Architecture: The control console shall operate on an embedded architecture without an operating system; it shall be independent of Android, iOS, and Windows. This architecture provides high responsiveness and low latency.

4.2 Communication Infrastructure: Primary communication shall be RF 868 MHz wireless; when required, RS485 wired (Half Duplex, single line). Over RS485, game, player, and team data shall be transmitted up to 1 km.

4.3 Console Hardware: The console shall include a membrane keypad; an external keyboard can be connected so team and player data (number, foul, score) can be entered

directly.

4.4 Language Support: Full interface and character support shall be provided in English, French, Turkish, and Spanish.

4.5 Special Character Support: In addition to the Latin alphabet, the following special characters shall be fully supported in menus and team/player 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, 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. MAIN SCOREBOARD (SCORE, PERIOD/SET, GAME TIME)

5.1 Visual Layout: The game time shall be centered; below it the period/set; team scores shall be positioned to the right and left of the period area.

5.2 Score Indicators

- 2 digits per team (range 0–99).
- Digit height ≥ 16 cm.
- Color: White (same color for both teams).
- Unused digit positions shall remain dimmed.

5.3 Game Time Indicator

- 4 digits (MM:SS); supports count up/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 time expiration.
- Digit height ≥ 16 cm.
- Color: Yellow.

5.4 Period/Set Indicator

- Single digit, range 0–9.
- In basketball, the overtime period is shown with the letter “O”.
- Digit height ≥ 16 cm.
- Color: Yellow.

- Displays the set being played in volleyball and the period being played in basketball.

5.5 Panel Structure and Materials

- The panel body shall be aluminum.
- $H \geq 60$ cm, $W \geq 120$ cm, thickness ≤ 8.5 cm.
- Anti-glare transparent front protection (reflective/lexan type), static drive technology suitable for camera recordings.
- SMD LED, 7-segment digit structure; in partial LED failure, the entire segment shall not go dark.
- Panels shall have passed resistance testing against ball impact.

6. 24/14 SECOND (SHOT CLOCK) DEVICES

- To be mounted on opposing baskets; if mounting above the backboard is not possible, they can be suspended from the ceiling positioned above the backboard.
- Shall display values in the 0–99 s range; supports 24 s and 14 s start, stop, and resume from where it left off.
- Audible signal at the end of the Shot Clock.
- When game time falls below 24 s, Shot Clock indicators shall be either off or run synchronized with the game time.
- On the controller, when the **24s + 14s** buttons are pressed simultaneously, the Shot Clock shall turn off.
- When the game time stops, the Shot Clock stops in sync; the Shot Clock cannot be started before the match begins.
- Digit height ≥ 25 cm; color: **Red**.

7. CONTROL UNITS

7.1 Main Controller

- **Multi-sport profiles:** Basketball, Volleyball, Handball, Futsal, 3x3 Basketball, Field Hockey, Indoor Hockey, Hockey 5S, Ice Hockey, Underwater Hockey, Rink Hockey, Roller Inline Hockey, Water Polo, etc., at least 13 disciplines.
- **Basketball modes:** FIBA, EuroLeague, 3x3, NBA.
- **Display:** Color TFT, ≥ 7 inches, $\geq 800 \times 480$ pixels.
- **Keypad:** Waterproof printed buttons; aluminum front protection.

- **Input:** Team/player names can be entered without a PC via external keyboard and membrane keypad.
- **Wireless:** RF connection support; can be disabled by software when required.
- **Brightness:** 100-level light adjustment on the scoreboard.
- **Testing:** All indicators can be turned off/tested from the controller (LED and address tests).
- **Time Parameters:** Game, Timeout, halftime; 24 s/14 s customizable in basketball.
- **Warning Signal Timing:** Adjustable early warnings for Timeouts and intermissions.
- **Period Transitions:** Automatic transition option; foul and Timeout values automatically adjusted according to FIBA rules.
- **Timeouts Between Periods:** Held ready before referees leave the court; start with a start command.
- **Team/Media Timeouts:** Start based on a start command when players are at the bench.
- **Time Synchronization:** Difference between controller, scoreboard, and Shot Clock shall be < 0.05 s.
- **Reset:** Single-action reset of game, player, or all information.
- **Memory:** Basketball, Volleyball, Handball, Futsal, Hockey, and Water Polo data stored in separate memories.
- **Score Entry:** Score +1/+2/+3 and Score -; tracking up to 14 players in basketball and 16 in handball.
- **Handball Penalty Tracking:** Simultaneous Exclusion Time for up to 5 players per team; in repeat penalties, the time is added and shown on the same line.
- **Basketball Foul Indicator:** The last foul committed—player jersey number and which foul it is—flashes for 10 s.
- **Audible Signal & Backboard Lights:** Independent control (audible signal may be given without activating Backboard Lights for Timeout/manual alerts).
- **Volleyball Time Display:** Clock/count-up can be displayed on the main screen and scoreboard; can be kept dimmed if needed.
- **After Power Loss:** All data on the controller can be refreshed in a single operation.

- **Software Updates:** All updates that do not require physical changes on the scoreboard are performed via controller software; the system can receive updates remotely without opening the enclosure.
- **Enclosure and Protection:** Aluminum housing; IP54 protection class.

7.2 Shot Clock Controller

- Operates synchronized with the main controller.
- **Buttons:** 24s, 14s, Start, Stop; when **24s+14s** are pressed together, the Shot Clock turns off.
- When the game time stops, the Shot Clock stops; cannot be started before the match begins.
- Mass < 0.5 kg; handheld use.
- Material ABS; IP54 protection class.

8. INSTALLATION, MOUNTING, AND SAFETY

- The scoreboard shall be mounted safely on a solid base, easily visible to spectators/referees/players.
- Connectors shall be easy to plug/unplug and moisture-resistant.
- Data and power cables shall be protected and not visible; wiring diagram and fuse values shall be submitted for manufacturer approval.
- In the internal installation, a tidy internal layout with grouped data cables; no cut/spliced/unsocketed cables.
- Driver boards shall be protected against short circuits.
- Power supplies used shall be CE-certified.

9. ENVIRONMENTAL CONDITIONS AND DURABILITY

- Operational temperature: -40 °C ... +55 °C.
- LED lifetime: ≥ 50,000 hours.
- All numeric indicators shall use static drive technology for clarity in camera recordings.

10. SUPPORTED SPORTS AND GAME MODES

- **Disciplines:** Basketball, 3x3 Basketball, Volleyball, Handball, Futsal, Hockey 5S, Indoor Hockey, Field Hockey, Ice Hockey, Rink Hockey, Roller Inline Hockey, Underwater Hockey, Water Polo.
- **Basketball Modes:** FIBA, EuroLeague, NBA, 3x3 (compliant with official game rules).

11. SUPPLY, DOCUMENTS, AND WARRANTY

- User Manual and Warranty Certificate shall be delivered.
- Warranty period: 2 years.
- Integrated circuit/processor manufacturers used in the circuitry shall be ST, Toshiba, Texas, NXP, or Green Micro.

SUMMARY TABLE — System-Wide (Highlighted Mandatory Items)

Component / Area	Mandatory Feature
Score Indicator	0–99, 2 digits per team; ≥ 16 cm; white; same color; dim unused digit
Game Time	4 digits (MM:SS); last 60 s shows 1/10 s; ± 0.1 s/100 min; ≥ 16 cm; yellow; audible at end
Period/Set	1 digit (0–9), “O” for overtime in basketball; ≥ 16 cm; yellow
24/14 Shot Clock	0–99 s; 24/14/Start/Stop; synchronized with game; ≥ 25 cm; red; audible at end
Panel Dimensions	Aluminum body; $H \geq 60$ cm, $W \geq 120$ cm, $t \leq 8.5$ cm; anti-glare front; SMD 7-segment
Communication	RF 868 MHz wireless; RS485 Half Duplex single line, 1 km
Controller Display	Color TFT $\geq 7"$, $\geq 800 \times 480$
Time Sync	Difference between controller–scoreboard–Shot Clock < 0.05 s
Brightness	100-level adjustment
Language & Characters	English, French, Turkish, Spanish; full support for the special character list

Component / Area Mandatory Feature

Basketball Modes	FIBA, EuroLeague, NBA, 3x3
Sport Coverage	Basketball, 3x3, Volleyball, Handball, Futsal, Hockey types, Water Polo
Durability	–40...+55 °C; LED lifetime ≥ 50,000 hours; ball-impact resistance
Updates	Remote software update without opening the enclosure
Safety/Electrical	CE-certified power supplies; driver boards short-circuit protected; shielded cabling
Event Reference	Actual use in at least 5 events such as EuroLeague, EuroCup, AfroBasket, BAL, World Championship
Warranty	2 years