

PROFESSIONAL SCOREBOARD SYSTEM TECHNICAL SPECIFICATION FOR MULTI-PURPOSE HALLS WITH EDITABLE TEAM NAMES (REVISION)

0. Scope and General Provisions

This technical specification defines the design, performance, safety, and integration requirements for the professional scoreboard system to be supplied for sports halls. The system shall be usable for Basketball (including FIBA, EuroLeague, NBA, and 3x3 modes), Volleyball, Handball, Futsal, Water Polo, and various 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 game rules of the relevant branches (e.g., IHF, FIVB).

The proposed brand's timing, videoboard, or scoreboard systems shall have been used in **at least five (5)** international major events such as **EuroLeague, EuroCup, AfroBasket, BAL (Basketball Africa League), and the World Championship**. Examples from domestic (Türkiye) events shall not be provided.

Scoreboard panels shall be mounted in accordance with the architectural and visual conditions of the venue, ensuring clear visibility for spectators, referees, and players, and installed safely on a solid base. The panel body shall be aluminum.

1. System Components

- **Team Name, Score, and Game Time Panel**
- **Period, Team Foul, and Timeout Panel**
- **Player Foul and Player Score Panels**
- **Exclusion Time Panel**
- **24–14 Second Shot Clock Devices** (including backboard mounting brackets)
- **Backboard Lights** (backboard internal warning light system)
- **Ball Possession Arrow Indicator**
- **Coach Timeout Buttons**
- **Control Units** (Main Console, Shot Clock Console, Game Time Console)
- **Scoreboard mounting brackets**

The main scoreboard panel shall be formed by combining the team name–score–game time, period–team foul–timeout, Exclusion Time, and player foul/score panels.

2. Team Name, Score, and Game Time Panel

2.1. Layout

Team names on the top left/right, team scores below them, and the centered game time indicator at the bottom.

2.2. Team Name Indicators

- Editable via **external keyboard AND the membrane keypad** on the main console.
No computer is required.
- A team name supports **at least 12 characters; character height ≥ 16 cm**.
- **Modular LED** structure. **Color: Yellow**.
- **Special character support (full list):**
Uppercase: Ç, Ğ, İ, Ö, Ş, Ü, À, Á, Â, Ä, Æ, È, É, Ê, Ë, Ì, Í, Î, Ï, Ñ, Ò, Ó, Ô, Œ, Ú, Û, Ý, Ž, Ə, 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, ə

2.3. Score Indicators

- **3 digits per team**, range **0–199**.
- **Digit height ≥ 30 cm**.
- **Color: White**.
- Unused digits remain **blank**.

2.4. Game Time Indicator

- **4 digits in MM:SS**, adjustable **00:00–99:59**.
- **Count up / countdown** selectable according to rules.
- **1/10 second** display during the **last 60 seconds**.
- **±0.1 s** tolerance within **100 minutes**.
- **Audible signal** at time expiry.
- **Digit height ≥ 30 cm**, **Color: Yellow**.

3. Period, Team Foul, and Timeout Panel

- Team fouls on the top left/right, **Period** in the center; **attack/service arrows** on the right/left of the period.
- **Timeout rights** (3 dots) on the bottom left/right and **timeout duration** in the center.

3.1. Period/Set Indicator

- **1 digit**, range **0–9**, **height ≥ 20 cm**, **Color: White**.
- In basketball, overtime is displayed with the letter **“O”**.
- On period/set increase–decrease, the clock/timeout indicators are **automatically adjusted** according to the sport type.

3.2. Team Foul Indicators

- **1 digit per team**, range **0–9**, **height ≥ 23 cm**, **Color: Red**.
- In basketball, after the **4th foul**, a **square** warning is displayed as required by the rule.
- When a player foul is entered, the team foul count increases automatically; manual change is possible from the main console.
- **Automatic reset/adjustment** at period changes.

3.3. Timeout Indicators (Rights)

- **3 square dots per team**, **side ≥ 5 cm**, **Color: Yellow**.

3.4. Timeout Duration Indicator

- **2 digits**, range **0–99**, **height ≥ 30 cm**, **Color: Yellow**.
- **Countdown**; while counting, the dot-type timeout indicators **flash**.
- **Audible signal** at start/end; **pre-end warning** time is adjustable; warnings can be disabled upon request.
- Whichever team takes a **Timeout**, that team's rights and duration indicators **operate together**.
- **Timeout** duration display on **24 s** devices can be programmed from the console.

3.5. Shot/Service Indicator (Arrows)

- **One arrow per team**, **Color: Red**.

4. Player Foul and Player Score Panels

Asymmetric appearance for two teams; **16 player rows** per team. From outside to inside: **jersey number**, **player foul**, **player score**.

4.1. Player Jersey Number

- **2 digits per player**, range **00–99**, **height ≥ 12 cm**, **Color: Yellow**.
- Jersey number is displayed in basketball and handball; if the team roster has fewer rows than available, unused rows are set completely **blank**.
- In volleyball, this field can be used as a **set indicator**.

4.2. Player Foul

- **1 digit per player**, **0–9**, **height ≥ 12 cm**, **Color: Red**.
- Max. **5** for Basketball/EuroLeague; max. **3** for Handball.
- **Blank at match start**; when a foul is given, **only the relevant player** is shown; flashes **at least 3 times** when changed.

4.3. Player Score

- **2 digits per player**, **0–99**, **height ≥ 12 cm**, **Color: White**.
- When a score is entered, the **team score increases automatically**; blank at start; flashes **at least 3 times** when changed.
- In volleyball, it may be used to display **set scores**.

5. Exclusion Time Panel

- Display of **Exclusion Times** for handball, hockey types, futsal, and water polo.
- **Up to 2 players simultaneously per team: 2-digit jersey no. + 3-digit time (0:00–9:59)**.
- **Digit height ≥ 16 cm**.
- **Colors:** jersey number **Yellow**, **Exclusion Time Red**.
- Operates **synchronized** with game time.
- In basketball, the **last foul** (relevant player jersey no. + number of fouls) is flashed for **10 s**.

6. 24–14 Second Shot Clock Devices

- **FIBA Level 2 approved**; single-sided devices per backboard are mounted on top of the backboard (suspended from the ceiling if necessary).
- While the **Shot Clock** is stopped, the **game time** shall **continue**.
- When game time falls below **24**, the **Shot Clock** either **remains off** or **synchronizes** with game time.

- **Shot Clock** range **0–99 s**; **start from 24, stop, resume from the same value.**
- **Audible signal** at expiry; **game time digits ≥ 13 cm (Yellow), Shot Clock digits ≥ 25 cm (Red).**
- **Red Backboard Lights:** remain on ≥ 2 s when **game time ends.**
- **Yellow Backboard Lights:** remain on ≥ 2 s when the **Shot Clock** ends.
- End tones for game and **Shot Clock** are **different; sound pressure ≥ 120 dBA (1 m).**
- Pressing **24s + 14s** simultaneously turns **Shot Clock digits off.**
- If game time is below **24/14** and the relevant key is used, the **Shot Clock** turns off automatically.
- Hardware/software complies with **EuroLeague** and **EuroCup** rules.

7. Control and Communication

7.1. General Architecture and Communication

- The control console shall run on an **embedded architecture without an operating system**; independent of Android / iOS / Windows. This design ensures **high responsiveness and low latency.**
- Communication: **RF 868 MHz** wireless and, when required, **RS485** wired infrastructure. **RS485 Half-Duplex single line** shall transmit game/player/team data **up to 1 km.**
- Wireless connection can be **disabled by software.**
- A **data output for broadcasters** shall be available.

7.2. Sport Modes and Languages

- The main console supports **at least 13 branches** including basketball, volleyball, handball, futsal, **3x3 basketball**, field hockey, indoor hockey, hockey 5S, ice hockey, underwater hockey, rink hockey, roller inline hockey, water polo.
- Basketball modes: **FIBA, EuroLeague, 3x3, NBA.**
- **Language support (at least 4):** Turkish, English, French, Spanish.
- **Special character support (menus/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, 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, õ, ù, ú, ý, ž, æ, ß

7.3. Main Console

- Supports **Shot Clock** and **game time** consoles; sport settings are easily selectable.
- **Color TFT $\geq 7"$, $\geq 800 \times 480$ px.**
- **Waterproof membrane keypad** adhered on aluminum front protection; long-life printed buttons.
- By connecting an external keyboard, team and player data (name, number, foul, score) can be entered **directly without a computer**.
- **100-step brightness**; functions to **switch off all indicators** and **LED/address test**.
- Game/Timeout/halftime/**Shot Clock** durations are customizable per branch rules; **pre-end timeout warning** is adjustable.
- **Automatic** period transitions; **foul** and **Timeout** values are automatically adjusted according to **FIBA rules**.
- Inter-period **Timeouts** are pre-loaded and start with **Start** upon referees leaving the court; end-of-timeout warning is adjustable.
- **Media/team Timeouts** can be pre-loaded and managed with **Start**.
- **Time difference < 0.05 s** between console–scoreboard–24s.
- **Selective reset** (game data only / player data only / all data).
- Data for basketball, volleyball, handball, futsal, hockey, water polo are stored in **branch-based memories**.
- Score control: **Score +1 / +2 / +3 / –** with single keys.
- Up to **14 players** in basketball, **16 players** in handball for display/control.
- In handball, if a new penalty is given to the same player, durations are **added and tracked on the same row**.
- In basketball, **last foul info** can be flashed for **10 s** on the **Exclusion Time Panel**.
- **Audible signals** and **Backboard Lights** can be controlled **independently** (during Timeout/manual warnings, lights may remain off while sound is given).
- In volleyball, **clock or count-up** can be displayed on the main screen and the scoreboard; may be **blanked** if required.
- **Single-operation data refresh** after power outage.
- **Remote update** (without opening the device) is supported.

- Works with **FIBA Whistle System**; **FIBA Data Protocol** can provide live data to broadcast channels.
- Enclosure: **Aluminum, IP54** protection.

7.4. Shot Clock Console

- Synchronized with the main console; **24s, 14s, Start, Stop** buttons.
- **24s + 14s** simultaneously → the **Shot Clock** device **turns off**.
- When **game time stops**, the **Shot Clock** stops in sync.
- Cannot be started **before the match**.
- **Weight ≤ 0.5 kg, ABS body, IP54.**

7.5. Game Time Console

- Synchronized with the main console; **start/stop** and **manual audible signal** control.
- **Weight ≤ 0.5 kg, ABS body, IP54.**

8. Ball Possession Arrow Indicator

- Left/right arrow indication; **SMD LED, FIBA approved.**
- **Width/Height ≥ 11 cm, 12 V** operation; **Color: Red.**
- Direction selection via switch on top; LED/LED group on the rear indicates arrow direction.

9. Coach Timeout Button

- For Timeout requests in handball and water polo.
- When pressed, **game time stops** and **Timeout** duration starts counting.
- Mounted height **≥ 1 m**; no sharp edges; **connection cable ≥ 5 m.**

10. General Technical Considerations

- **Panel body:** Aluminum; **height ≥ 250 cm, width ≥ 330 cm, thickness ≤ 8.5 cm.**
- **Indicators:** SMD LED, 7-segment; a single LED failure shall not extinguish the whole segment.
- **Static driving technology** suitable for camera recordings.
- Connectors are easy to plug/unplug and **moisture-resistant.**

- **Front protection:** anti-reflective plexiglass (special reflect/lexan type).
- **Internal wiring:** grouped data cables, clean/simple; no cut/spliced/socketless cables.
- **Short-circuit protected** driver boards.
- **CE-certified** power supplies.
- **LED lifetime $\geq 50,000$ hours.**
- Integrated/processor manufacturers: **ST, Toshiba, Texas, NXP, or Green Micro.**
- Operating temperature: **$-40...+55$ °C.**
- External power and data cables shall be to **manufacturer-approved sizes/standards**; installation diagram and fuse values shall be **manufacturer-approved.**
- Data and power cables shall be **protected** and **not visible.**
- **Broadcast data output** shall be available on the console.
- **Suspension/mounting:** for safety, **hoist/motor ≥ 500 kg capacity**, suspended from **at least one point.**
- The manufacturer shall hold **ISO 9001 Quality System Compliance** certificate.
- Products shall have **RoHS and CE** certificates.
- **User manual** and **warranty certificate** shall be delivered.
- **Warranty period: 2 years.**

11. Compliance and Past Use Requirements

- The scoreboard system and **24–14 Second Shot Clock** devices shall have **FIBA Level 2** approval.
- The proposed brand's timing, videoboard, or scoreboard systems shall have been used in **at least five** international major events such as **EuroLeague, EuroCup, AfroBasket, BAL, and the World Championship** (supporting documentation shall be provided upon request).

12. Delivery, Training, and Acceptance

- Installation, testing, and commissioning are within the contractor's scope.
- Operator training shall be provided; during acceptance tests, **all functions** shall be verified with **branch-based scenarios.**

- Delivered with a **spare parts and consumables list**.

SUMMARY TABLE – System Overview (Highlighted Mandatory Features)

Display/Indicator	Height (≥)	Color	Mandatory Feature / Note
Team name character	16 cm	Yellow	12 characters; full special-character support
Team score digit	30 cm	White	0–199
Game time digit	30 cm	Yellow	MM:SS; last 60 s with 1/10 s; ±0.1 s/100 min
Period/Set digit	20 cm	White	0–9; overtime “O”
Team foul digit	23 cm	Red	0–9; square after 4th foul
Timeout rights (square dots)	side 5 cm	Yellow	3 per team
Timeout duration digit	30 cm	Yellow	0–99; flashing display; audible warning
Shot/Service arrows	—	Red	Left/right direction
Player jersey number	12 cm	Yellow	00–99
Player foul digit	12 cm	Red	Max. 5 (Basketball/EuroLeague), max. 3 (Handball)
Player score digit	12 cm	White	0–99
Exclusion panel jersey no.	16 cm	Yellow	Up to 2 players simultaneously per team
Exclusion panel time digit	16 cm	Red	0:00–9:59; synchronized with game clock
24–14: game clock digit (backboard)	13 cm	Yellow	—
24–14: Shot Clock digit	25 cm	Red	0–99 s; 24s/14s management
Ball Possession Arrow Indicator	11 cm (min)	Red	12 V; FIBA approved

