

PROFESSIONAL SCOREBOARD SYSTEM TECHNICAL SPECIFICATION (16 Rows)

This specification defines the design, function, compliance, installation, and quality requirements of a professional scoreboard system to be used in multi-purpose sports halls. The system will be configured as an integrated solution for use in basketball, 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, floorball). The scoreboard system shall have **FIBA Level 1** approval.

1. System Components

- **Team Name Panels**
- **Score and Game Time Panel**
- **Period/Set – Team Foul – Timeout Panel** (including direction indicators and timeout duration)
- **Player Information Panels** (name – jersey number – player foul – player score)
- **Exclusion Time Panel** (handball, hockey, futsal, water polo)
- **Cube 24 / 24–14 Second (Shot Clock) Devices** (together with **Backboard Lights**)
- **Control Console (Main Controller), Shot Clock Controller, Game Time Controller**
- **Ball Possession Arrow Indicator**
- **Digital Team Foul Markers**
- **Time Keeper For Locker Rooms**
- **Coach Timeout Buttons**
- **Mounting brackets** (for backboard and main panel)

2. General Performance and Compliance

Approval and Rules: The system shall be **FIBA Level 1** approved; it shall be configurable in accordance with the rules of basketball (FIBA, EuroLeague, NBA, 3x3 modes), volleyball (set management), handball, futsal, water polo, and different hockey types.

Major Event Reference (Minimum Requirement): The proposed brand's timing, videoboard or scoreboard systems shall previously have been used in at least **five** major international events such as **EuroLeague, EuroCup, AfroBasket, BAL (Basketball Africa League), and the World Championship**.

Readability and Drive: All numeric indicators shall use static drive technology, ensuring flicker-free and sharp images in camera recordings.

Durability: LED lifetime at least **50,000 hours**; operating temperature range **-40 °C to +55 °C**.

Power and Standards: Power supplies and chargers shall be **CE-certified**; the product shall have **CE** and **RoHS** certificates.

3. Panel and Enclosure Structure

Panel height ≥ 420 cm, width ≥ 700 cm, thickness ≤ 8.5 cm. The enclosure material shall be **aluminum**. The front side shall have anti-glare transparent **plexiglass/lexan** protection. Connectors shall be moisture-resistant and easy to plug/unplug. Internal cabling shall be tidy, socketed, continuous (no cuts), and service-friendly. Driver boards shall be protected against short circuits.

Suspension and Safety: The system shall be suspended from at least **two points** using hoists/motors with a capacity of ≥ 500 kg. Data and power cables shall be routed in protective conduits and not be visible.

4. Indicator Panels

4.1. Team Name Panels

Separate panel for each team; LED module structure, **white** color. Character height ≥ 32 cm; a team name shall support at least **12 characters**. Name entry: via membrane keypad on the main console or an external keyboard **without a computer**.

Language and Character Support: In addition to the Latin alphabet, the following special characters shall be fully writable:

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

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

4.2. Score and Game Time Panel

Score: 3 digits per team, range 0–199, **white** color, **digit height ≥ 40 cm**.

Game time: MM:SS (4 digits), 1/10 s display during the last 60 s, tolerance ± 0.1 s / 100 min. **Yellow** color, **digit height ≥ 40 cm**. An audible signal shall be given at time expiration.

4.3. Period/Set – Team Foul – Timeout Panel

Period/Set: 1 digit (0–9), **white**, ≥ 30 cm. In basketball, overtime shall be indicated by the letter “O”.

Team Foul: 1 digit per team (0–9), **red**, ≥ 35 cm; after the 4th foul, when the next ball is put into play, the **square indicator** shall be activated.

Timeout Indicators: 3 square dots per team, ≥ 5 cm; timeout duration 2 digits (0–99), yellow, ≥ 30 cm; audible at start/end, and an adjustable pre-end early warning.

Attack/Service Arrows: One arrow per team, red. (This is the **Ball Possession Arrow** in basketball and the service indicator in volleyball.)

4.4. Player Information Panels (16 players/rows)

Player Names: 16 rows, yellow, ≥ 16 cm, unused roster rows dimmed. Special character support is identical to team names.

Jersey No: 2 digits per player (00–99), yellow, ≥ 16 cm.

Player Foul: 1 digit (0–9), red, ≥ 16 cm; max 5 in Basketball/EuroLeague, max 3 in handball. Flashes at least 3 times on change.

Player Score: 2 digits (0–99), white, ≥ 16 cm; flashes at least 3 times on change.

4.5. Exclusion Time Panel (Handball, Hockey, Futsal, Water Polo)

Up to 3 simultaneous player penalties per team: **Jersey No (2 digits) + Exclusion Time (MMM:SS / 0:00–9:59)**. Digit height ≥ 23 cm; jersey number yellow, Exclusion Time red. In basketball, the jersey number of the player who committed the last foul and the number of the foul shall be shown flashing for 10 s.

5. Cube 24 / 24–14 Second (Shot Clock) Devices and Backboard Lights

Per backboard, either 2×2 faces or a single 4-face configuration. **Shot Clock 0–99 s; start from 24 s, 14 s and stop/resume functions.** When **game time < 24 s**, the **Shot Clock** indicator can be synchronized/hidden.

Sound signals: Different tones for **Shot Clock** end and **game-time** end; intensity ≥ 120 dBA @ 1 m.

Digit heights: Game time ≥ 13 cm (yellow), Shot Clock ≥ 25 cm (red).

Backboard Lights: In accordance with FIBA requirements—**red backboard light** (game time end ≥ 2 s), **yellow backboard light** (Shot Clock end ≥ 2 s). When **24s and 14s** buttons are pressed simultaneously, the Shot Clock indicator shall turn **off**.

6. Controllers and Console Components

6.1. Control Console (Main Controller)

Architecture: Embedded, no operating system; independent of Android/iOS/Windows; high responsiveness and low latency.

Communication: RF 868 MHz wireless; RS485 wired if required (half-duplex, single line, up to 1 km).

Input: Membrane keypad; with an external keyboard, team/player data (name, number, foul, score) can be entered directly.

Display: Color TFT $\geq 7"$, resolution $\geq 800 \times 480$.

Language Support: Turkish, English, French, Spanish; the special character set is fully

supported in menus and name entry.

Power & Battery: **Li-ion** battery ≥ 7 hours operation; **CE-certified** adapter providing full charge in ≤ 2 hours.

Other: 100-level brightness control; ability to black out/test all indicators; rules-compliant customization of game/timeout/interval/**Shot Clock** durations; automatic foul and timeout regulation per FIBA rules at period transitions; team/media timeout counters; independent control of **Backboard Lights** and audible alerts from the main controller; controller–device time difference < 0.05 s; multiple sport profiles (basketball, volleyball, handball, futsal, 3x3 basketball, field hockey, indoor hockey, Hockey 5S, ice hockey, underwater hockey, rink hockey, roller inline hockey, floorball, water polo... at least **13** branches); compatibility with the **FIBA Whistle System** and **FIBA Data Protocol**; **IP54** enclosure; aluminum housing; software-controlled wireless disable; remote software update.

6.2. Shot Clock Controller

Synchronized with the main controller; buttons **24s**, **14s**, **Start**, **Stop**; when **24s+14s** are pressed simultaneously the Shot Clock indicator turns **off**. **ABS** housing, **IP54**, **weight** ≤ 0.5 kg.

6.3. Game Time Controller

Synchronized with the main controller; game time start/stop and manual audible alert control; **ABS**, **IP54**, ≤ 0.5 kg.

7. Auxiliary Indicators and Accessories

7.1. Ball Possession Arrow Indicator

FIBA-approved, arrow-shaped, **red**, $\geq 11 \times 11$ cm, **12 V** operation, rear-side direction LED; direction selection by switch.

7.2. Digital Team Foul Markers

Placed to the right/left of the scorer's table; synchronized with the main controller or can operate independently; **FIBA-approved**; **red**; **digit height** ≥ 25 cm, **width** ≥ 12.5 cm; aluminum housing; no sharp edges. After the **4th foul**, in the next play the screen shows a **full red** field.

7.3. Time Keeper For Locker Rooms

Synchronized with game time; **MM:SS**, **digit** ≥ 13 cm; **00:00–99:59**; **1/10 s** during the last **60 s**.

7.4. Coach Timeout Button (Handball and Water Polo)

When pressed, the game stops and the **Timeout** countdown starts; height from floor ≥ 1 m; cable ≥ 5 m; chamfered safe form.

8. Integration, Data, and Service

Broadcasters: There shall be data output on the main controller for live broadcasting.

Installation and Cabling: Manufacturer-approved cable cross-sections/schematics/fuse ratings shall be used; data and power lines shall be protected.

Service and Maintenance: Internal layout shall be socketed and service-accessible; no cuts/splices in cabling. Thanks to static drive, a single LED failure shall not darken the full segment.

9. Quality, Documents, and Warranty

Quality Management: The manufacturer shall have an **ISO 9001** quality management system.

Product Certificates: CE and RoHS.

Delivery Documents: User manual and warranty certificate.

Warranty: At least **2 years** for the system.

10. Installation and Placement

Placement shall be suitable for the hall structure. Above-backboard and/or ceiling hanging points shall comply with FIBA criteria. The Cube 24/14 and **Backboard Lights** shall be mounted on/above the backboard in accordance with the standard. The line of sight shall be optimized so that spectators, referees, and athletes can see clearly.

SUMMARY TABLE — Indicators, Colors, Sizes

Component	Display	Color	Digit/Sign Height	Range/Format	Critical Feature
Team Name	Text	White	≥ 32 cm	≥ 12 characters	Full special-character support; keyboard & membrane input
Score (Team)	3 digits	White	≥ 40 cm	0–199	Static drive, clear camera compatibility
Game Time	MM:SS (+1/10 s last 60 s)	Yellow	≥ 40 cm	00:00–99:59	±0.1 s/100 min; audible at end
Period/Set	1 digit / “0” (overtime)	White	≥ 30 cm	0–9	Automatic settings at period transitions

Component	Display	Color	Digit/Sign Height	Range/Format	Critical Feature
Team Foul	1 digit	Red	≥ 35 cm	0–9	Square indicator after 4th foul
Timeout Dots	3 squares / team	Yellow	≥ 5 cm (edge)	—	Flash synchronized with timeout
Timeout Duration	2 digits	Yellow	≥ 30 cm	0–99	Start/end alerts, pre-end warning
Player Name	Text (16 rows)	Yellow	≥ 16 cm	—	Unused rows dimmed; special-character support
Player Jersey No	2 digits	Yellow	≥ 16 cm	00–99	—
Player Foul	1 digit	Red	≥ 16 cm	0–9	BKB/EL: max 5; Handball: max 3; flash on change
Player Score	2 digits	White	≥ 16 cm	0–99	Flash on change
Exclusion Time	No + MMM:SS	Yellow/Red	≥ 23 cm	0:00–9:59	Up to 3 players per team simultaneously
Cube 24/14 – Shot Clock	Seconds	Red	≥ 25 cm	0–99 s	24/14/Stop/Start; 24+14 → off
Cube – Game	Seconds	Yellow	≥ 13 cm	—	Sync option when game < 24 s
Backboard Lights	Frame & upper	Red/Yellow	—	—	On for ≥ 2 s at ends
Ball Possession Arrow Indicator	Arrow	Red	≥ 11×11 cm	—	FIBA-approved, 12 V
Digital Team Foul Markers	1 digit	Red	≥ 25 cm	—	Full red after 4th foul in next play

Component	Display	Color	Digit/Sign Height	Range/Format	Critical Feature
Time Keeper For Locker Rooms	MM:SS (+1/10 s)	—	≥ 13 cm	00:00–99:59	Synchronized with game clock
Coach Timeout Button	—	—	—	—	Height ≥ 1 m; cable ≥ 5 m