

MULTI-PURPOSE INDOOR SCOREBOARD SYSTEM

TECHNICAL SPECIFICATION

1) Scope and Purpose

This specification defines the minimum technical requirements concerning the supply, installation, and operation of scoreboards and associated equipment to be used in indoor sports halls for **Basketball (including FIBA, NBA, EuroLeague, 3x3), Volleyball, Handball, Futsal**, and different hockey disciplines (**field, indoor, hockey 5s, ice, rink, roller inline, underwater**). The system shall cover **game clocks, Shot Clocks, period/set, team fouls, and Timeout indicators**.

2) Standards and Compliance Conditions

- **FIBA Approval:** 24/14-second devices and backboard perimeter lights shall be **FIBA Level-2** approved.
- **Rules Compliance:** The system shall be configurable in accordance with **FIBA, IHF (Handball), and FIVB (Volleyball)** rules of play.
- **Basketball Modes:** Selectable **FIBA – EuroLeague – NBA – 3x3** modes.
- **Major Event References:** The proposed brand's timing, videoboard, or scoreboard systems shall have usage references (to be documented) from **at least five** international organizations such as **EuroLeague, EuroCup, AfroBasket, BAL (Basketball Africa League)**, and the **FIBA Basketball World Cup**.

3) System Components

- **Score and Game Time Panel**
- **Period / Team Foul / Timeout Panel**
- **24/14 Second (Shot Clock) Devices** (with backboard-top mounting kits)
- **Control Units** (Main console, Shot Clock controller, Game Time controller)
- **Scoreboard Mounting Hardware**

4) Score and Game Time Panel

Layout: Team scores on upper left/right; game time centered at the bottom.

a) Score Indicators

- **3 digits per team, range 0–199.**
- **Digit height ≥ 30 cm.**

- Color: **White**.
- Unused positions shall remain **dim (blank)**.

b) Game Time Indicator

- **4 digits in MM:SS format**; adjustable **00:00–99:59**.
- Count up/down selectable per game rules.
- **Tenths** displayed during the **last 60 s**.
- **±0.1 s** maximum tolerance within **100 minutes**.
- Audible signal at expiration.
- Digit height ≥ 30 cm, color: **Yellow**.

5) Period / Team Foul / Timeout Panel

Top: team fouls (left/right), period centered; **Ball Possession Arrows** on both sides of the period.

Bottom: **three Timeout dots per team** and **Timeout duration** in the center.

a) Period / Set

- **1 digit, 0–9**.
- Digit ≥ 20 cm, color: **White**.
- In basketball, overtime is indicated by **“O”**.
- On period/set changes, relevant clocks auto-adjust to the game.

b) Team Foul

- **1 digit per team, 0–9**.
- Digit ≥ 23 cm, color: **Red**.
- In basketball, **square indicator** after the **4th** foul per FIBA.
- On entry of a player foul, team foul increments automatically; manual correction via main console is possible.
- Auto reset/adjust on period change.

c) Timeout Indicators (Entitlements)

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

d) Timeout Duration Indicator

- **2 digits, 0–99**; countdown.
- Digit ≥ 30 cm, color: **Yellow**.
- Audible signal at start/end; an additional early warning before the end (can be disabled).
- During Timeout countdown, the dot indicators shall **flash**.
- If desired, Timeout duration can be programmed to be shown on **24s Shot Clock** devices.

e) Attack / Service Arrows

- **1 arrow per team**, color: **Red**.
- Shows attacking direction in basketball and the serving team in volleyball. (**Ball Possession Arrow**)

6) 24/14 Second (Shot Clock) Devices

- **FIBA Level-2** approved; single-sided devices mounted above each backboard.
- When game time drops below **24 s**, the Shot Clock shall **either stop** or **run in sync** with the game clock.
- Range **0–99 s**; **24/14** start, stop, and resume from hold.
- Audible at expiration; **distinct tones** for Shot Clock and game time.
- **Game time digit ≥ 13 cm (Yellow); Shot Clock digit ≥ 25 cm (Red)**.
- **Backboard Lights**: Red perimeter ≥ 2 s at **game time** expiry; Yellow top ≥ 2 s at **Shot Clock** expiry.
- Sound level ≥ 120 dBA (**1 m**).
- Pressing **24s + 14s** together blanks the Shot Clock display.
- If the game time is below **24/14 s** and the relevant key is pressed, the Shot Clock digits **turn off automatically**.
- Program/hardware architecture shall comply with **EuroLeague/EuroCup** competition rules.

7) Control Units

General: Buttons shall be labeled according to international conventions. All connectors shall be high-quality and easy to plug/unplug.

a) Main Console

- Supports Shot Clock and game time controllers.
- **Disciplines:** At least **13** including Basketball (**FIBA, EuroLeague, 3x3, NBA**), Volleyball, Handball, Futsal, Field/Indoor/Hockey 5s/Ice/Underwater/Rink/Roller Inline hockey, Water Polo, etc.
- **Display:** Color TFT $\geq 7"$, $\geq 800 \times 480$ resolution.
- **Keypad:** Long-life waterproof printed buttons; aluminum front.
- **Data entry:** Team/player names and data via membrane keypad and external keyboard **without a PC**.
- **Language support: Turkish, English, French, Spanish.**
Special character support (menus, names):
Uppercase: Ç, Ğ, İ, Ö, Ş, Ü, À, Á, Â, Ã, Ä, È, É, Ê, Ë, Ì, Í, Î, Ï, Ñ, Ò, Ó, Ô, Œ, Ú, Û, Ý, Ž, Θ, Β
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
- **Wireless link:** RF-enabled; can be disabled via software.
- **Brightness:** **100-step** light adjustment on the scoreboard.
- **Test/Reset:** Ability to **blank** all indicators; LED/address tests.
- **Time settings:** Game, Timeout, interval, **24/14 s** customizable per rules.
- **Timeout warning:** Adjustable pre-end warning.
- **Period transitions:** Automatic option; foul and Timeout values auto-arranged per FIBA.
- **Team/media Timeouts:** Start timing aligned to substitution/bench procedures.
- **Time sync:** Difference between main console, scoreboard, and 24s devices **< 0.05 s**.
- **Reset modes:** Single-action reset of **game only / player only / all** information.
- **Memory:** Separate memories for Basketball, Volleyball, Handball, Futsal, Hockey, Water Polo.
- **Score control:** **+1 / +2 / +3 / -** keys.
- **Player counts:** Basketball ≤ 14 ; Handball exclusion timing tracked for ≤ 5 players per team.

- **Handball exclusion addition:** New exclusion adds on top of current time, shown on the same row.
- **Basketball notifications:** Last foul jersey number and foul order can be flashed **10 s**.
- **Backboard Lights / horn independence:** Horn can operate without triggering lights (e.g., during Timeout/manual horn).
- **Volleyball timing:** Clock or count-up on main screen/board (dimnable if needed).
- **Recovery after outage:** Single-action data restore after a power cut.
- **RS485 (Half Duplex):** Single line up to **1 km**.
- **Updates:** Remote software updates **without opening the device**.
- **Enclosure / Protection:** **Aluminum** housing; **IP54**.

b) Shot Clock Controller

- Operates synchronized with the main console.
- Buttons: **24s, 14s, Start, Stop** (pressing **24s + 14s** together → Shot Clock blank).
- If the game clock stops, the Shot Clock stops in sync; cannot be started **before** the game.
- **≤ 0.5 kg, ABS, IP54.**

c) Game Time Controller

- Operates synchronized with the main console.
- **Start/Stop** of game time and **manual horn** control.
- **≤ 0.5 kg, ABS, IP54.**

8) Control Console and Communication Architecture

- **Architecture:** Embedded, **operating-system-free**; independent of Android/iOS/Windows, enabling **high response** and **low latency**.
- **Wireless:** **RF 868 MHz**.
- **Wired:** **RS485 Half Duplex**, single line, up to **1 km**.
- **Input:** Team/player data entered directly via **membrane keypad** and **external keyboard**.

- **Languages:** TR-EN-FR-ES (with full special-character support).

9) General Technical Matters

- **Panel body:** All **aluminum**.
- **Dimensions:** Height ≥ 190 cm, Width ≥ 220 cm, Thickness ≤ 8.5 cm.
- **LED/Digits:** **SMD, 7-segment**; single/multiple LED failure shall **not** black out an entire segment.
- **Camera compatibility:** Static-drive technique on all numeric indicators.
- **Mounting:** On a safe, solid base visible to spectators/referees/players.
- **Connectors:** Easy plug-unplug, moisture-resistant.
- **Front protection:** Anti-glare reflective/lexan-type transparent **plexiglass**.
- **Internal wiring:** Clean/simple with grouped data cables; cables **continuous, spliceless, socketed**.
- **Protection:** Short-circuit protection on driver boards.
- **Power supplies:** **CE-certified**.
- **LED lifetime:** $\geq 50,000$ hours.
- **Component brands:** **ST, Toshiba, Texas, NXP, or Green Micro**.
- **Operating temperature:** $-40...+55$ °C.
- **Cables/diagrams:** Energy and data cables manufacturer-approved; wiring diagram and fuse ratings manufacturer-approved; cables **shielded and concealed**.

10) Installation and Accessories

- **24/14s** devices shall be mounted **above the backboard** per FIBA; if not feasible, suspended from the ceiling to align above the backboard.
- **Backboard Lights:** Red **perimeter** and Yellow **top** lights shall remain on ≥ 2 s at their respective end-of-period events.

11) Certification, Documentation and Warranty

- **Product:** CE and RoHS certified.
- **Manufacturer:** ISO 9001 Quality Management System certified.
- **Delivery Documents:** User manual and warranty certificate.

- **Warranty: 2 years.**

12) Delivery and Operational Functions (Summary)

- Single-action **data restore after outage**.
- **Remote software update** (without opening the device).
- **100-step brightness** adjustment.
- **Independent control** of horn / Backboard Lights.
- **Time synchronization difference < 0.05 s.**