

MULTI-PURPOSE INDOOR SCOREBOARD SYSTEM TECHNICAL SPECIFICATION

(With Exclusion Indicators, Multi-Discipline Compatible)

1) Scope and Purpose

This specification defines the minimum technical requirements for the supply, installation, and commissioning of an indoor scoreboard system with **Exclusion indicators (Exclusion Time Board)** that can be used in **basketball (FIBA, 3x3, NBA, EuroLeague modes), volleyball, handball, futsal, water polo, and various hockey disciplines** (field, indoor, hockey 5S, ice, rink, roller inline, underwater). The system consists of a single main scoreboard, **24/14 second Shot Clock devices**, control units, mounting brackets, and auxiliary equipment.

2) Standards and Compliance

2.1

The system shall comply with the rules of the relevant federations: **FIBA (basketball), IHF (handball), FIVB (volleyball)**. **24/14 second Shot Clock devices** shall be **FIBA Level 2** approved.

2.2

For basketball, **FIBA, 3x3, NBA, and EuroLeague** competition modes shall be selectable via the controller.

2.3

Hardware and software shall be programmable / hardware-enabled to comply with **EuroLeague** and **EuroCup** competition rules.

2.4 International Reference Requirement

The proposed brand's timing, videoboard, or scoreboard systems shall have **actual use in at least five** major international organizations such as **EuroLeague, EuroCup, AfroBasket, BAL (Basketball Africa League), FIBA World Championship**. The relevant references shall be documented and presented (**domestic events in Türkiye excluded**).

3) System Composition

- **Score – Game Time – Timeout Panel**
- **Period – Team Foul – Exclusion Time Board**
- **24/14 Second Shot Clock Devices and Backboard Lights (red/yellow)**
- **Control Units:** Main console, Shot Clock controller, Game Time controller

- **Backboard and scoreboard mounting brackets**

4) Score, Game Time and Timeout Panel

4.1 Score Indicators

- **3 digits per team (0–199)**; digit height ≥ 30 cm; color: **white** (same for both teams).
- Unused positions shall remain **dim**.

4.2 Game Time

- **MM:SS (4 digits)**; supports up/down counting; adjustable **00:00–99:59**; tenths displayed during the **last 60 s**; tolerance ± 0.1 s per 100 minutes; audible signal at expiration.
- Digit height ≥ 30 cm, color: **yellow**.

4.3 Timeout Indicators and Duration

- **Timeout entitlements: 3 square dots per team**, each square ≥ 5 cm; color: **yellow**.
- **Timeout duration: 2 digits (0–99)**, digit height ≥ 20 cm, **yellow**; indicators **flash** during countdown; audible signal at start/end; adjustable early-end warning.
- If desired, Timeout duration display can be programmed via the controller to appear on the **24 s Shot Clock** devices.

5) Period, Team Foul and Exclusion Time Board

5.1 Period/Set

- **1 digit (0–9)**, digit height ≥ 20 cm, color: **white**; in basketball, overtime is indicated by “O”.
- On increment/decrement, game clocks/Timeout indicators are automatically adjusted per the sport.

5.2 Team Fouls

- **1 digit per team (0–9)**, digit height ≥ 23 cm, color: **red**.
- **Square indicator** after the **4th** foul, in accordance with FIBA.
- Automatic increment linked to player-foul entry; may also be adjusted independently from the main console.
- Automatic reset/adjustment at period changes per the rules.

5.3 Attack/Service Arrows

- **One Ball Possession Arrow per team; color: red.**

5.4 Exclusion Indicators (Handball, Hockey types, Futsal, Water Polo)

- **Maximum 2 players simultaneously per team; jersey number: 2 digits (0–99); Exclusion Time: 3 digits (0:00–9:59); digit height ≥ 16 cm.**
- Jersey number **yellow**, **Exclusion Time red**; synchronized with game time.
- In basketball, the last foul player's **jersey number + foul order** shall **flash for 10 s**.

6) 24/14 Second Shot Clock Devices and Backboard Lights

6.1 Compliance

FIBA Level 2 approved; **single-sided devices** shall be mounted on opposite backboards.

6.2 Function

Shot Clock **0–99 s**; start from **24 s**, stop, resume from hold; audible signal at expiration. When **game time drops below 24 s**, the Shot Clock either **turns off** or **runs in synchronization** with the game clock. When **game time stops**, the Shot Clock also stops.

6.3 Digits and Colors

Shot Clock digit ≥ 25 cm (red); game-time digit ≥ 13 cm (yellow) (same color as the main scoreboard's game time).

6.4 Backboard Lights

Backboard Lights shall comply with FIBA: **red** (at **game-time** expiration), **yellow** (at **Shot Clock** expiration); each ≥ 2 s on-time at expiration. Audible signals shall have **different tones; ≥ 120 dBA @ 1 m**.

6.5 Compatibility

Program/hardware structure shall comply with **EuroLeague/EuroCup** competition rules.

7) Control Units

7.1 Main Console (Embedded Architecture)

- a) **Architecture:** Embedded design **without operating system**; independent of Android/iOS/Windows. Provides high response speed and low latency.
- b) **Communication:** **RF 868 MHz** wireless; when required **RS485 half-duplex** wired (single line, up to **1 km**). Wireless signal can be **disabled by software**.
- c) **Input / Use:** **Membrane keypad**; by connecting an **external keyboard**, team/player (**number, foul, score**) can be entered directly.

d) **Language Support: Turkish, English, French, Spanish.** In menus and name entries, the following special characters are fully supported:

— **Uppercase:** Ç, Ğ, İ, Ö, Ş, Ü, À, Á, Â, Ã, 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, ã, æ, è, é, ê, ë, ì, í, î, ï, ñ, ò, ó, ô, õ, ù, ú, û, ý, ž, æ

e) **Display:** $\geq 7''$ color **TFT**, $\geq 800 \times 480$ pixels.

f) **Functions:** Sport selection and rule parameters; **100-level brightness**; LED/address tests; adjustment of Timeout/interval and warning times; automatic arrangement of foul/Timeout values at period transitions in accordance with **FIBA**; score control with **Score $\pm 1/\pm 2/\pm 3$** ; up to **14 players** in basketball and **16** in handball; **Exclusion Time** addition logic in handball; independent control of audible signals and **Backboard Lights**; clock/count-up display in volleyball; single-action data restore after power outage; ability to display Timeout durations on **24 s** devices.

The time difference between **controller – scoreboard – 24 s** devices shall be **< 0.05 s**.

IP54, aluminum casing, long-life waterproof printed buttons. Software updates can be performed **remotely and without opening the device**.

7.2 Shot Clock Controller

Synchronized with the main console; buttons: **24s, 14s, Start, Stop**; when **24s + 14s** are pressed simultaneously, the Shot Clock display turns off. The Shot Clock cannot be started before the contest. **ABS** housing, **IP54**, **< 0.5 kg**.

7.3 Game Time Controller

Synchronized with the main console; **start/stop** of game time and **manual audible signal** control. **ABS** housing, **IP54**, **< 0.5 kg**.

8) Control Console and Communication Architecture

- **Architecture:** Embedded, operating-system-free structure; independence from Android/iOS/Windows ensures **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 and Electronics)

- **Panel material:** Aluminum; **H ≥ 190 cm, W ≥ 220 cm, T ≤ 8.5 cm**.
- **LED/digits:** SMD, 7-segment; a single LED failure shall **not** darken an entire segment. **Static drive** (clarity for TV capture).

- **Front protection:** Anti-glare special reflective/lexan-type **non-glare plexiglass**.
- **Internal wiring:** Grouped data cables; **no cuts/splices/sockets**; driver boards with **short-circuit protection**.
- **Connectors:** Easy plug/unplug, moisture-resistant.
- **Power supplies:** CE-certified; **LED lifetime $\geq 50,000$ hours**.
- **Microelectronics:** ST, Toshiba, Texas, NXP, or **Green Micro** class.
- **Operating temperature:** **$-40\text{ }^{\circ}\text{C} \dots +55\text{ }^{\circ}\text{C}$** .
- **Cabling:** External power/data cables to manufacturer-approved sizes/standards; wiring diagram and fuse ratings manufacturer-approved; data/power lines **shielded and concealed**.

10) Installation and Accessories

24/14 s devices shall be mounted **above the backboard** (in accordance with FIBA); if mounting above the backboard is not feasible, they may be **suspended from the ceiling** to align above the backboard.

The scoreboard shall be mounted on a **secure base** visible to spectators/referees/players. **All mounting brackets** for the backboard and scoreboard shall be supplied as a complete set.

11) Certification and Warranty

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

Products shall be **CE** and **RoHS** compliant.

Warranty period: 2 years.

12) Delivery and Operational Functions (Summary)

- Single-action **data restore** after power interruption
- **Remote software update** (without opening the device)
- **100-level brightness** adjustment
- **Independent** horn / Backboard Lights control
- **Time synchronization difference $< 0.05\text{ s}$**

SUMMARY TABLE – System-Wide (Highlighted Mandatory Elements)

A) Indicators — Required Sizes and Colors

Item	Mandatory Feature
Compliance	Conformance to FIBA/IHF/FIVB rules; 24/14 s Shot Clock devices FIBA Level 2 approved
Basketball Modes	Selectable FIBA, 3x3, NBA, EuroLeague
International References	Usage in ≥ 5 major events (EuroLeague, EuroCup, AfroBasket, BAL, FIBA World Championship)
Main Panel Dimensions	H ≥ 190 cm, W ≥ 220 cm, T ≤ 8.5 cm (aluminum body)
Team Score Digits	3 digits / team (0–199), ≥ 30 cm, white
Game Time	MM:SS (4 digits), ≥ 30 cm, yellow, ± 0.1 s / 100 min, tenths in last 60 s
Timeout Indicators	3 per team, ≥ 5×5 cm squares, yellow; Timeout duration: 2 digits (0–99), ≥ 20 cm, yellow
Period/Set	1 digit (0–9), ≥ 20 cm, white; overtime “0”
Team Foul	1 digit / team (0–9), ≥ 23 cm, red; warning after 4th foul
Exclusion Indicators	2 players / team; jersey 2 digits (yellow), Exclusion Time 3 digits (red); ≥ 16 cm
24/14 s – Shot Time	0–99 s, ≥ 25 cm, red; 24/14 key combo to blank
24/14 s – Game Time	≥ 13 cm, yellow (same as main scoreboard)
Backboard Lights	Red (game-time), Yellow (Shot Clock); ≥ 2 s on-time at expirations
Audible Signal	≥ 120 dBA @ 1 m; distinct tones for game/Shot Clock
Controller Architecture	Embedded / OS-less, RF 868 MHz + RS485 (1 km); IP54, ≥ 7", ≥ 800×480
Language &	TR/EN/FR/ES; full special-character set supported (Ç, Ğ, İ, Ö, Ş, Ü, À, Á,

Item	Mandatory Feature
Characters	Â, Ä, Æ, È, É, Ê, Ë, Ì, Í, Î, Ï, Ñ, Ò, Ó, Ô, Œ, Ú, Û, Ý, Ž, Θ, Β / Ç, Ğ, ı, Ö, Ş, Ü, À, Á, Â, ã, æ, è, é, ê, ë, ì, í, î, ï, ñ, ò, ó, ô, ù, ú, û, ý, ž, ə)
Brightness / Tests	100-level brightness; LED/address tests
Time Sync	Controller – scoreboard – 24 s < 0.05 s
Front Protection	Non-glare plexiglass (reflective/lexan type)
Electronics	SMD 7-segment, static drive; LED life ≥ 50,000 h
Temperature Range	-40 °C ... +55 °C
Compliance Documents	ISO 9001 (manufacturer), CE, RoHS
Warranty	2 years