TECHNICAL SPECIFICATION FOR MULTI-PURPOSE INDOOR PROFESSIONAL SCOREBOARD SYSTEM

(With Exclusion Indicators, Multi-Sport Compatible)

1) SCOPE AND FIELD OF APPLICATION

This specification covers the minimum technical requirements for the supply, installation, commissioning, and operation of a multi-purpose professional scoreboard system to be used in indoor sports halls for **Basketball**, **Volleyball**, **Handball**, **Hockey** (field hockey, indoor hockey, hockey 5S, ice hockey, underwater hockey, rink hockey, roller inline hockey) and **Futsal**. **Water polo** and other disciplines that use **Exclusion Time** are also within scope.

2) COMPLIANCE WITH STANDARDS AND CERTIFICATION

- The system shall comply with the international rules of the relevant sport (FIBA for Basketball, IHF for Handball, FIVB for Volleyball).

- For Basketball, **FIBA, NBA, EuroLeague, and 3x3** competition modes shall be supported. Shot Clock/game clock rules for **3x3** shall operate according to the relevant levels.

- **24–14 second Shot Clock devices** shall be **FIBA Level 2** approved and shall operate in synchronization with **Backboard Lights** in FIBA-standard **red/yellow**.

- The proposed brand's timing, videoboard, or scoreboard systems shall be supplied from a manufacturer/solution provider with actual usage experience in **at least five** major international events such as **EuroLeague, EuroCup, AfroBasket, BAL (Basketball Africa League), World Championship**; this shall be documented with official references at the time of bid (domestic events in Türkiye are excluded).

3) SYSTEM CONTENT (COMPONENTS)

- **Score and Game Time Panel**

- **Period, Team Foul, and Timeout Panel**

- **Player Foul and Player Score Panels** (for both teams)

- **Exclusion Time Board** (for water polo, handball, futsal, and hockey branches)

- **24–14 Second Shot Clock Devices** and **Backboard Lights** above the hoops in red/yellow

- **Control Units** (Main Console, Shot Clock Controller, Game Time Controller)

- **Backboard-top mounting kits for 24–14 s devices**

- **Scoreboard mounting brackets**

4) SCORE AND GAME TIME PANEL

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

a) Score Indicators

- 3 digits per team, range **0–199**.

- Digit height **≥ 30 cm**.

- Unused positions shall remain **dim**.

b) Game Time Indicator

- **MM:SS**, total **4 digits**.

- Supports **count up/down**; period time adjustable within **00:00–99:59**.

- **Tenths** displayed during the **last 60 seconds**.

- Maximum tolerance **±0.1 s per 100 minutes**.

- Audible signal at expiration.

- Digit height **≥ 30 cm**.

5) PERIOD, TEAM FOUL, AND TIMEOUT PANEL

Layout: At the top, team fouls (left/right) and the period in the center; **Ball Possession Arrows** on the right/left of the period to show attack/service. At the bottom, **three Timeout dots per team** and **Timeout duration** in the center.

a) Period/Set Indicator

- Single digit, **0–9**; period for basketball, set for volleyball.

- Overtime in basketball shall be indicated by **"O"** in accordance with FIBA.

- Digit height **≥ 20 cm**.

b) Team Foul Indicators

- **1 digit per team (0–9)**.

- Digit height **≥ 23 cm**.

- In basketball, the start of time after the **4th team foul** shall be indicated by a **square** on the display.

- Automatic increment with player-foul entry; manual correction possible from the main console.

- Automatic reset/adjustment at period changes (according to sport type).

- **Color: Red (mandatory).**

c) Timeout Rights Indicator

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

d) Timeout Duration Indicator

- **2 digits**, range **0–99**; countdown.

- Digit height **≥ 30 cm**.

- Audible tone at the start/end of the Timeout; adjustable pre-end warning.

- Timeout duration display can be programmed from the controller to appear on **24–14 s** devices.

e) Attack/Service Indicator

- **One arrow per team** (left/right) for attack in basketball and serving team in volleyball (**Ball Possession Arrow**).

6) PLAYER FOUL AND PLAYER SCORE PANELS

Asymmetric layout for both teams: from outside to inside **jersey number (2 digits)**, **player fouls (1 digit)**, **player score (2 digits)**. Display up to **16 players**.

a) Player Jersey Number

- **0–99** (including **00**); digit height **≥ 12 cm**.

- Jersey number for basketball/handball; may be used for set display in volleyball.

- If rosters are smaller, unused rows can be set to dim.

b) Player Foul

- **0–9**; digit height **≥ 12 cm**.

- For Basketball and EuroLeague matches maximum **5**; for Handball maximum **3** indicators.

- Dim at match start; only the relevant player appears when a foul is entered; flash **at least 3 times** on change.

c) Player Score

- **0–99**; digit height ≥ **12 cm**.

- Dim at match start; when a score is entered, the relevant player appears; flash **at least 3 times** on change.

- On entry of player score, the **team score increases automatically**.

7) EXCLUSION TIME BOARD

- For **Handball, Hockey, Futsal, and Water Polo**; up to **2 players simultaneously per team**: **2-digit jersey number + 3-digit Exclusion Time**.

- Exclusion Time shall run **synchronized** with the game time.

- Jersey number **0–99**, Exclusion Time **0:00–9:59**; digit height ≥ **16 cm**.

- In Basketball, information about the most recent foul (jersey number and which foul) can be displayed with a **10-second flash**.

8) 24–14 SECOND SHOT CLOCK DEVICES AND BACKBOARD LIGHTS

- One **single-sided** unit per hoop, mounted opposite each other; **FIBA Level 2** approved.

- Shot Clock range **0–99 s**; start from **24 s**, stop, resume from hold.

- When the game time drops below **24 s**, the Shot Clock display operates **in sync** or **turns off**.

- Audible tone at expiration; **distinct tones** for game time and Shot Clock.

- Game-time digit height ≥ **13 cm**, Shot Clock digit height ≥ **25 cm**.

- **Colors (mandatory):** game time **yellow**, Shot Clock **red**.

- **Backboard Lights** above the hoop: red (game-time expiration) and yellow (Shot Clock expiration) shall remain on for **at least 2 s**.

- When **24s and 14s** buttons are pressed simultaneously, the Shot Clock display shall **turn off**.

- Programmatic/hardware structure in compliance with **EuroLeague** and **EuroCup** competition rules.

9) CONTROL UNITS

9.1 Main Console

- Operates on **embedded architecture without an operating system**; independent of Android/iOS/Windows. This structure provides **high response speed** and **low latency**.

- Supports at least **13 disciplines** 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**.

- Color **TFT display ≥ 7"**, resolution **≥ 800×480 px**.

- Long-life waterproof **membrane keypad**; with **external keyboard**, team/player names (number, foul, score) can be entered directly.

- Language support: **Turkish, English, French, Spanish**.

- **Special-character support** (for menus and name entry): **Uppercase:** Ç, Ğ, İ, Ö, Ş, Ü, À, Á, Â, Ä, Æ, È, É, Ê, Ë, Ì, Í, Î, Ï, Ň, 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, ň, ò, ó, ô, ù, ú, û, ý, ž, ə

- Wireless **RF (868 MHz)** connectivity; can be **software-disabled** if required.

- **100-level** brightness.

- Ability to **blank** all indicators, LED/address test functions.

- Game, Timeout, interval, **24/14 s** times can be customized according to discipline rules; **automatic adjustments** at period transitions.

- Automatic/hold and **pre-warning tones** for team/media Timeouts and intervals.

- The time difference between the main console and the scoreboard/24s shall be **< 0.05 s**.

- Reset: **game data**, **player data**, or **all data** with a single action.

- Separate memories shall store team/player/time information for each discipline.

- Score control: **Score +1 / +2 / +3 / −**; control up to **14** players in basketball and **16** in handball.

- In Handball, tracking up to **5** different player **Exclusion Time** entries; when a new Exclusion is added to the same player, it is displayed cumulatively on the same row.

- In Basketball, the last foul's jersey number and which foul it is can be flashed for **10 s**.

- Independent control of audible signals and **Backboard Lights** (Backboard Lights can remain disabled during Timeout/manual horn).

- In Volleyball, clock/count-up display on the main screen and scoreboard.

- After a power outage, **all data on the console** can be **restored with a single action**.

- Transmission of game/player/team information up to **1 km** over **RS485 Half Duplex** single line.

- **Remote software updates** capability; scoreboard can be updated by software **without requiring physical changes**.

- Housing: **Aluminum**; protection class **IP54**.

9.2 Shot Clock Controller

- Operates synchronized with the main console.

- Buttons: **24s, 14s, Start, Stop**; pressing **24s + 14s** simultaneously turns off the Shot Clock display.

- When the game time stops, the Shot Clock stops in sync; it **cannot be started before** the competition.

- Weight **≤ 0.5 kg**; **ABS** material; **IP54**.

9.3 Game Time Controller

- Synchronized with the main console; **start/stop** the game time and **manually trigger** the audible signal.

- Weight **≤ 0.5 kg**; **ABS** material; **IP54**.

10) COMMUNICATION AND INTEGRATION

- Communication via **RF 868 MHz** wireless and, when required, **RS485** wired infrastructure.

- The console shall include a **data output for broadcasters**.

- For ease of on-site installation/service, the system can be **updated remotely** and allows **address/LED tests** via software.

11) GENERAL TECHNICAL MATTERS

- **Panel body** shall be **aluminum**; **Height ≥ 250 cm, Width ≥ 330 cm, Thickness ≤ 8.5 cm**.

- Indicators shall be **SMD LED, 7-segment**; failure of one/few LEDs shall **not** turn off an entire segment.

- **Static drive technology** for TV camera clarity.

- Installation on a **secure base** visible to spectators/referees/players; connectors shall be easy to plug/unplug and **moisture-resistant**.

- **Front protection**: non-glare plexi (reflective/lexan-type) preventing light reflections.

- **Internal wiring**: organized with grouped data cables; **no sockets/splices/cuts**; driver boards with **short-circuit protection**.

- **Power supplies**: **CE-certified**.

- **LED lifetime ≥ 50,000 hours**.

- Integrated circuit/processor brands: **ST, Toshiba, Texas, NXP, Green Micro**.

- **Operating temperature: −40…+55 °C** (entire system).

- External power and data cables shall be to manufacturer-approved sizes/standards.

- Wiring diagram and fuse ratings shall be submitted for manufacturer approval.

- Data and power cables shall be **shielded and concealed** (as approved by the manufacturer).

- Documents: **CE, RoHS**; **user manual** and **warranty certificate** shall be delivered.

- The system shall carry a **minimum 2-year warranty**.

- The manufacturer shall hold an **ISO 9001 Quality Management System** certificate.

12) DELIVERY, INSTALLATION, AND TEST

- Supplied with mounting brackets (for the scoreboard and backboard-top devices); installation, commissioning, and discipline-based functional tests shall be performed under the supervision of the manufacturer/supplier.

- **Backboard Lights**, audible signaling systems, **24–14 s synchronization**, and **timing tolerances** shall be verified in on-site tests.

SUMMARY TABLE – System-Wide (Highlighted Mandatory Elements)

Item	Mandatory Feature

Item	Mandatory Feature
Sport Support	Basketball (FIBA/NBA/EuroLeague/3x3), Volleyball, Handball, Futsal, Hockey (field, indoor, 5S, ice, underwater, rink, roller inline), Water polo
Certification/Compliance	Compliance with FIBA/IHF/FIVB rules; **24–14 s Shot Clock** devices **FIBA Level 2** approved
Tournament Experience	Proven use in **≥ 5** major international events (EuroLeague, EuroCup, AfroBasket, BAL, World Championship) — to be documented
Console Architecture	Embedded, **OS-less** (independent of Android/iOS/Windows); **membrane keypad**; direct entry of names/number/foul/score via **external keyboard**
Communication	**RF 868 MHz** wireless; **RS485 Half Duplex**, transmission up to **1 km**
Language & Characters	TR/EN/FR/ES; special characters **Ç, Ğ, İ, Ö, Ş, Ü, À, Á, Â, Ä, Æ, È, É, Ê, Ë, Ì, Í, Î, Ï, Ň, Ò, Ó, Ô, Œ, Ú, Û, Ý, Ž, Ə, ß / ç, ğ, ı, ö, ş, ü, à, á, â, ä, æ, è, é, ê, ë, ì, í, î, ï, ň, ò, ó, ô, ù, ú, û, ý, ž, ə** fully supported
Game Time (Main Panel)	**MM:SS**, **1/10 s** in last 60 s, tolerance **±0.1 s/100 min**; digits **≥ 30 cm**
Team Score	**0–199**; **3 digits per team**; digits **≥ 30 cm**
Period/Set	Single digit **0–9**; basketball overtime **"O"**; digit **≥ 20 cm**
Team Fouls	**1 digit per team (0–9)**, **red**, digit **≥ 23 cm**; **square** after 4th foul
Timeout Duration	**2 digits, 0–99**, countdown; digit **≥ 30 cm**; adjustable pre-warning
Player Info	Jersey **2 digits**, foul **1 digit**, score **2 digits**; digits **≥ 12 cm**; **≥ 3** flashes on change
Exclusion Times	Up to **2 players per team**; jersey **2 digits**, **Exclusion Time 3 digits (0:00–9:59)**; digits **≥ 16 cm**
24–14 s	Offense **0–99 s**; **24/14** start; when game **< 24 s** sync/off;

Item	Mandatory Feature
	offense **red**, game **yellow**; digit heights **≥ 25 cm / ≥ 13 cm**
Backboard Lights	**Red** (game-time end) & **Yellow** (Shot Clock end); on **≥ 2 s**
Sync/Tolerance	Console–scoreboard–24s time difference **< 0.05 s**
Body/Front Protection	**Aluminum** panel; **non-glare plexi** front protection
Panel Dimensions	**Height ≥ 250 cm, Width ≥ 330 cm, Thickness ≤ 8.5 cm**
LED/Electronics	**SMD LED, 7-segment**; LED life **≥ 50,000 h**; short-circuit-protected drivers
Environmental	Operating temperature **−40…+55 °C**
Documents/Warranty	**CE, RoHS**, user manual; **≥ 2-year** warranty; manufacturer **ISO 9001**