

SCOREBOARD SYSTEM TECHNICAL SPECIFICATION

(Multi-Purpose Hall – With Exclusion Time Indicator)

1. Scope and General Provisions

This technical specification covers the integrated structure consisting of a scoreboard system with **Exclusion Time Indicator**, 24/14 second **Shot Clock** devices, control units, **Ball Possession Arrow Indicator**, coach **Timeout** buttons, and backboard warning lights to be used in indoor sports halls where Basketball, Volleyball, Handball, Futsal, Water Polo, and different types of hockey (field hockey, indoor hockey, hockey 5S, ice hockey, underwater hockey, rink hockey, roller inline hockey) are played.

The system shall comply with FIBA rules. **FIBA approval (Level 2)** is mandatory and shall be clearly emphasized in the technical and administrative documentation.

2. Standards, Approvals, and International Use

- **FIBA Level 2** approval is mandatory.
- The **Ball Possession Arrow Indicator** shall be **FIBA-approved**.
- The proposed brand shall document, with references, that its timing, videoboard, or scoreboard systems have been used **on site in at least five major international events** such as EuroLeague, EuroCup, AfroBasket, BAL (Basketball Africa League), and the **FIBA Basketball World Cup**.
- Products shall have **CE** and **RoHS** certificates.
- The manufacturer shall hold an **ISO 9001 Quality Management System** certificate.

3. Architecture and Communication Infrastructure

- The control console shall operate on an **embedded architecture without an operating system** (independent of Android / iOS / Windows, etc.). This design shall ensure **high responsiveness and low latency**.
- Communication infrastructure: **RF 868 MHz** wireless communication and, when required, **RS485 Half-Duplex** wired infrastructure (**single line, transmission up to 1 km**).

4. Scoreboard System Content

- **Team Name – Score – Game Time and Timeout Panel**
- **Period – Team Foul – Exclusion Time Panel**
- **24/14 Second Shot Clock Devices** (including mounting brackets above the backboard)

- **Main Console, Shot Clock Console, Game Time Console**
- **Ball Possession Arrow Indicator**
- **Coach Timeout Buttons**
- **Scoreboard Mounting Brackets** and required accessories

5. Team Name, Score, Game Clock, and Timeout Panel

5.1 Team Names

- Enterable via external keyboard or membrane keypad on the main console.
- Supports at least **12 characters; character height ≥ 16 cm**.
- LED module structure.
- **Special character support** (menus, player and team names included, without abbreviation):
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, Æ, 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, õ, ù, ú, û, ý, ž, θ

5.2 Score Indicators

- **3 digits per team; range 0–199.**
- **Digit height ≥ 30 cm.**
- Both teams' score colors shall be the same.

5.3 Game Time (Game Clock)

- **MM:SS** format, **4 digits**; **00:00–99:59**.
- Supports **count up / countdown**; **1/10 s** display in the **last 60 seconds**.
- **±0.1 s** tolerance within **100 minutes**.
- **Audible signal** at time expiry.
- **Digit height ≥ 30 cm**.

5.4 Timeout Indicators

- **3 square dots per team** (side ≥ 5 cm).
- **Timeout duration indicator: 2 digits, 0–99, digit height ≥ 20 cm;** during countdown, the timeout dots **flash**.

- Audible signal at timeout **start/end** and an **adjustable** pre-warning before timeout ends.
- **Timeout duration display on the 24 s devices** can be programmed from the console.

6. Period, Team Foul, and Exclusion Time Panel

6.1 Period/Set

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

6.2 Team Fouls

- **1 digit per team, 0–9, digit height ≥ 23 cm.**
- **Color: Red;** after the **4th foul**, displayed as a **square**.
- Automatic increment when a player foul is entered; manual correction from the console is possible.
- **Automatic reset/adjustment** according to rules at period changes.

6.3 Shot/Service Indicator

- **1 arrow per team; color: Red.**

6.4 Exclusion Times (Handball, Hockey Types, Futsal, Water Polo)

- Up to **2 players simultaneously per team:** jersey no. (**2 digits, 0–99**) + **Exclusion Time (3 digits, 0:00–9:59)**.
- **Synchronized with game time; digit height ≥ 16 cm.**
- In basketball, the **last foul** player number and foul count are flashed for **10 seconds**.

7. 24/14 Second Shot Clock Devices and Backboard Warning Lights

- **FIBA Level 2** compliant; mounted on top of the backboard.
- **Shot Clock 0–99 s; 24 s / 14 s / Start / Stop** functions; stop–resume.
- When game time falls below **24**, where required the **Shot Clock** turns off/synchronizes.

- **Audible signal** at expiry (**sound pressure ≥ 120 dBA @ 1 m**); game and shot end tones are **different**.
- Pressing **24 s** and **14 s** **simultaneously** hides the **Shot Clock**.
- **Backboard Lights: Red frame:** remains on ≥ 2 s when game time ends; **Yellow upper light:** remains on ≥ 2 s when **Shot Clock** ends.
- **Digit heights:** game time ≥ 13 cm, **Shot Clock ≥ 25 cm.**
- **Colors:** game time **Yellow**, **Shot Clock Red.**
- Program/hardware compliant with **EuroLeague** and **EuroCup** competition rules.

8. Control Units

General: Function labels on buttons shall comply with international norms; connectors shall be easy to plug/unplug.

8.1 Main Console

- Supports **Shot Clock** and game time consoles.
- Sport profiles: Basketball, Volleyball, Handball, Futsal, **3x3 Basketball**, Field Hockey, Indoor Hockey, Hockey 5S, Ice Hockey, Underwater Hockey, Rink Hockey, Roller Inline Hockey, Water Polo (**at least 13 branches**).
- Basketball modes: **FIBA, EuroLeague, 3x3, NBA**.
- Color **TFT ≥ 7"**, **≥ 800×480 px**.
- Waterproof membrane keypad adhered to aluminum front protection; long-life.
- Team/player names can be entered without a computer via external keyboard and membrane keypad.
- **Special character support** (same full scope without abbreviation):
Uppercase: Ç, Ć, 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, Θ, Β
Lowercase: ç, ģ, 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, ø
- **Wireless RF** connection; software-controllable disable.
- Language support: **Turkish, English, French, Spanish**.
- **100-step brightness** adjustment; **LED test/address test** function.
- **Game, Timeout, halftime, 24 s / 14 s** durations customizable; **early-warning** timing adjustable.
- **Automatic** period transitions; **foul and Timeout** values adjusted **per FIBA rules**.

- Team/media **Timeouts** can be preloaded and started by command.
- **Time sync difference** < **0.05 s** (console–scoreboard–24 s).
- Selective reset (game data / player data / all data).
- **Branch-based memory** (basketball, volleyball, handball, futsal, hockey types, water polo).
- Score control: **+1 / +2 / +3 / -**.
- Controls **14 players** in basketball, **16 players** in handball.
- In handball, **Exclusion Time** tracking for **up to 5 different players simultaneously**; added penalties accumulate on the same row.
- In basketball, **last foul info** flash **10 s**.
- Audible signals and **Backboard Light Strips** can be controlled independently.
- In volleyball, clock or count-up display on the main screen (can be blank).
- After power outage, **single-operation data refresh**.
- Data transmission via **RS485 Half-Duplex single line up to 1 km**.
- All updates except physical changes on the scoreboard are performed via console software.
- **Timeout** durations can be displayed on the **24 s** devices.
- Hardware supports **remote OTA** updates without opening the case.
- **Aluminum enclosure, IP54**.

8.2 Shot Clock Console

- Synchronized with the main console.
- **24 s, 14 s, Start, Stop** buttons; pressing **24 + 14** simultaneously closes the **Shot Clock**.
- When game time stops, the **Shot Clock** stops in sync; cannot be started before the match.
- **≤ 0.5 kg, ABS, IP54**.

8.3 Game Time Console

- Synchronized with the main console.

- **Start/Stop** and **manual audible signal** control.
- **≤ 0.5 kg, ABS, IP54.**

9. Ball Possession Arrow Indicator

- Right/left arrow display; **SMD LED.**
- **FIBA-approved**; width/height **≥ 11 cm**; **12 V** supply; **Red** color.
- Direction selection via switch on top; LED(s) on the rear indicate arrow direction.

10. Coach Timeout Buttons

- When pressed, **game time stops** and **Timeout** time starts counting.
- Mounted at **≥ 1 m** height; no sharp edges; **connection cable ≥ 5 m.**

11. General Technical Considerations

- All-aluminum panel; **height ≥ 190 cm, width ≥ 220 cm, thickness ≤ 8.5 cm.**
- **SMD LED, 7-segment** digit structure; a segment fault shall not extinguish the entire segment.
- **Static driving technology** for camera recordings.
- Secure mounting on a stable surface with clear visibility.
- Easy plug/unplug and moisture-resistant connectors.
- **Anti-reflective transparent** front protection (special reflect/lexan type).
- Clean internal layout with **grouped data cables**; no cut/spliced/socketless cables.
- **Short-circuit protected** driver boards; **CE-certified** power supplies.
- **LED lifetime ≥ 50,000 hours.**
- Integrated/processor brands: **ST, Toshiba, Texas, NXP, Green Micro.**
- Operating temperature: **−40 °C ... +55 °C.**
- External power and data cables to manufacturer-approved sizes/standards; wiring diagram and fuse values with manufacturer approval.
- Data and power cables protected and not visible.
- **User manual** and **warranty certificate** shall be delivered.
- **Warranty period: 2 years.**

12. Basketball Modes and Other Branches

- For basketball: **FIBA, EuroLeague, NBA, 3x3** modes.
- For water polo, futsal, and all hockey types: branch profiles and **Exclusion Time** integrations.

SUMMARY TABLE – System Overview (Highlighted Mandatory Features)

Component / Indicator	Format / Digit	Digit Height (cm)	Color (Mandatory)	Mandatory Feature / Note
Team Name	Alphanumeric (≥ 12 characters)	≥ 16	Yellow	LED module; keyboard & membrane input; full special-character support (complete list)
Score	3 digits / team (0–199)	≥ 30	White	Same color for both teams
Game Time	MM:SS (00:00–99:59), last 60 s 1/10 s	≥ 30	Yellow	± 0.1 s / 100 min tolerance; audible signal at expiry
Timeout Dots	3 square per team	side ≥ 5	Yellow	Flash during Timeout countdown
Timeout Duration	2 digits (0–99)	≥ 20	Yellow	Start/End and early-warning audible signals
Period/Set	1 digit (0–9), overtime “O”	≥ 20	White	Automatic adjustments per sport type
Team Fouls	1 digit / team (0–9)	≥ 23	Red	Square indicator after 4th foul; auto/manual control
Shot/Service Arrows	1 arrow / team	—	Red	Left/right indication
Exclusion Times	No: 2 digits (0–99) + Time: 3 digits (0:00–9:59)	≥ 16	No: Yellow / Time: Red	Up to 2 players per team at once

Component / Indicator	Format / Digit	Digit Height (cm)	Color (Mandatory)	Mandatory Feature / Note
24/14 s Device – Game Time	MM:SS (above backboard)	≥ 13	Yellow	FIBA Level 2; mounted to backboard
24/14 s Device – Shot Clock	SS (0–99)	≥ 25	Red	24/14/Start/Stop; distinct tone; hide with 24+14
Backboard Lights (Game End)	—	—	Red	Remain on ≥ 2 s
Backboard Lights (Shot End)	—	—	Yellow	Remain on ≥ 2 s
Audible Signal	—	—	—	≥ 120 dBA @ 1 m; different tones for game/Shot Clock
Console Display	Color TFT	—	—	≥ 7", ≥ 800×480 px
Language Support	—	—	—	Turkish, English, French, Spanish
Sync Accuracy	—	—	—	Console–scoreboard–24 s difference < 0.05 s
Enclosure / Protection	—	—	—	Aluminum; IP54 (consoles & main console)
Architecture	—	—	—	OS-free embedded; RF 868 MHz + RS485 (1 km)
Field Suitability	—	—	—	FIBA Level 2 approved; used in ≥ 5 major international events