

MULTIPURPOSE HALL SCOREBOARD SYSTEM

TECHNICAL SPECIFICATION

1. Purpose and Scope

This technical specification applies to the supply and installation of a professional scoreboard system to be used in multipurpose sports halls for Basketball (FIBA, EuroLeague, NBA, 3x3), Volleyball, Handball, Futsal, Water Polo, and hockey branches (field hockey, indoor hockey, hockey 5S, ice hockey, underwater hockey, rink hockey, roller inline hockey). The system operates with placement and installation suitable to the hall structure.

2. Compliance and Approvals

- The main scoreboard system and 24/14 second shot clock devices shall have **FIBA Level 1 approval**.
 - The system shall comply with the game rules of the relevant branches (FIBA, IHF, FIVB, etc.).
 - The proposed brand's timing, videoboard, or scoreboard systems shall have references of actual use in at least five international organizations such as **EuroLeague, EuroCup, AfroBasket, BAL (Basketball Africa League), FIBA World Championship**.
 - Shall be compatible with the **FIBA Whistle System**.
 - Shall provide data output suitable for live broadcasts via the **FIBA Data Protocol**.
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3. System Architecture and Communication

- The control console shall operate on an **embedded architecture without an operating system**; independent of general-purpose systems such as Android / iOS / Windows. This structure ensures high response speed and low latency.
- **RF 868 MHz wireless communication** and **RS485 wired infrastructure** shall be supported.
- The console shall have a **membrane keypad**; team and player data (number, foul, score) can also be entered directly via an external keyboard.
- Console languages supported: **Turkish, English, French, Spanish**.

- Special character support (team/player names and menus):
 - 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, Ñ, Ò, Ó, Ô, Õ, Æ, Ú, Û, Ý, Ž, Ñ
 - 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, ñ
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4. System Components

- Team Name Panels
 - Score and Game Time Panel
 - Period, Team Foul, and Timeout Panel
 - Player Information Panels
 - Cube 24 / 24-14 Second Shot Clock Devices (above basket, 2×2 sides or single 4 sides)
 - Control Units (Main Console, Shot Clock Console, Game Time Console)
 - **Ball Possession Arrow Indicator**
 - **Digital Team Foul Markers**
 - **Time Keeper For Locker Rooms**
 - **Backboard Light Strips** for basketball (red/time and yellow/24-14)
 - Mounting accessories for backboard and scoreboard
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5. Display Panels and Detailed Technical Features

5.1 Team Name Panels

- Separate panels for each team.
- Input: membrane keypad on main console and/or external keyboard.
- At least 12 characters supported depending on character width; character height ≥ 32 cm.
- LED module structure. Color: White.
- Full special character set supported (see Article 3).

5.2 Score and Game Time Panel

- **Score Displays:**
 - 3 digits per team, range 0–199.
 - Digit height ≥ 40 cm, color: White; unused digits remain off.
- **Game Time Display:**
 - Format MM:SS (4 digits), count up/down.
 - Setting range 00:00–99:59; last 60 s with 1/10 s display.
 - Time tolerance: ± 0.1 s per 100 minutes.
 - Audible signal at end; digit height ≥ 40 cm, color: Yellow.

5.3 Period, Team Foul, and Timeout Panel

- **Period/Set:** 1 digit, 0–9; ≥ 30 cm, color White.
 - In basketball, overtime shown as “O”. Auto-adjusted per sport rules.
- **Team Foul:** 1 digit per team, 0–9; ≥ 35 cm, color Red.
 - In basketball, after 4th foul and time start, square indication appears.
 - Auto increment with player foul entries; auto reset at period change per rule.
- **Timeout Rights (Point Indicators):** 3 square indicators per team; side ≥ 5 cm, color Yellow.
- **Timeout Duration:** 2 digits, 0–99; ≥ 30 cm, color Yellow.
 - Flashing during countdown; start/end and early warning sounds adjustable.
 - Optionally displayed on 24s devices.
- **Attack/Service Direction:** Red arrow for each team.

5.4 Player Information Panels

- 12 player rows per team; outer to inner order: Name – Jersey No – Player Foul – Player Score.
- Names: up to 16 characters, ≥ 16 cm, Yellow; missing rows off. Full character set supported.
- Jersey No: 2 digits, 00–99, ≥ 16 cm, Yellow; may be used for set in volleyball.

- Player Foul: 1 digit, 0–9, ≥ 16 cm, Red; basketball/EuroLeague max 5, handball max 3; flashes at least 3 times on change.
- Player Score: 2 digits, 0–99, ≥ 16 cm, White; flashes at least 3 times on change.

5.5 Cube 24 / 24-14 Second Shot Clock Devices (Above Basket)

- **FIBA Level 1 approved**; for one basket, 2×2 sides or 1×4 sides.
 - Shot clock: 0–99 s, 24/14 start, stop, resume.
 - When game time falls below 24, shot clock can turn off / work in sync.
 - Digit heights: Game time ≥ 13 cm, shot clock ≥ 25 cm.
 - Colors: Game time Yellow, shot clock Red (game time color same as main panel).
 - **Backboard Lights**: Red (game time end, ≥ 2 s lit), Yellow (24/14 end, ≥ 2 s lit).
 - Sound signals: different tones for shot clock and game; intensity ≥ 120 dBA (1 m).
 - When 24s + 14s pressed together, shot clock digits turn off.
 - Hardware/software compliant with EuroLeague/EuroCup rules.
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6. Control Units

6.1 Main Console

- Supports shot clock and game time consoles; easy sport settings.
- Supported sports: Basketball (FIBA, EuroLeague, NBA, 3x3), Volleyball, Handball, Futsal, Field Hockey, Indoor Hockey, Hockey 5S, Ice Hockey, Underwater Hockey, Rink Hockey, Roller Inline Hockey, Floorball, Water Polo (min. 13 branches).
- Display: Color TFT, $\geq 7''$, $\geq 800 \times 480$.
- Keypad: waterproof printed membrane with buttons, front aluminum protection.
- Input: external keyboard + membrane; full character set for team/player names and menus.
- Power: Li-ion battery ≥ 7 h, CE certified charger, ≤ 2 h full charge; level displayed.
- Communication: RF 868 MHz wireless; signal can be software disabled. RS485 supported.
- Languages: TR/EN/FR/ES.

- Light level: 100 steps. Full blackout & address/LED test.
- Times: Game, timeout, halftime, and 24/14 customizable; early warning adjustable.
- Period transition: automatic; fouls and timeouts auto-adjusted per FIBA.
- Score control: +1/+2/+3/-; track up to 14 players in basketball, 16 in handball.
- Handball penalties: up to 5 simultaneous per team; 2nd penalty shown for same player.
- Event indicators: basketball last foul flashing 10 s on penalty panel (jersey no + foul count).
- Sound/backboard lights: independent control (manual sound without lights during timeout).
- Volleyball: time/forward count on main and scoreboard; time section can be off.
- Power loss: console data recoverable in one step.
- Software updates: remote, without opening device.
- Case/IP: aluminum body, IP54.

6.2 Shot Clock Console

- Works in sync with main console.
- Buttons: 24s, 14s, Start, Stop (24+14 together = shot clock off).
- Stops with game time; cannot start before match.
- Weight < 0.5 kg, ABS case, IP54.

6.3 Game Time Console

- Works in sync with main console.
- Start/stop game time, manual sound control.
- Weight < 0.5 kg, ABS case, IP54.

7. Auxiliary Indicators

7.1 Ball Possession Arrow Indicator

- Arrow left/right shape; SMD LED, color Red.

- FIBA approved; width and height ≥ 11 cm; 12 V; rear arrow LED; direction via switch.

7.2 Digital Team Foul Markers

- Placed right/left of scorer's table; sync or independent from main console.
- FIBA approved; color Red; digit height ≥ 25 cm, width 12.5 cm.
- Aluminum case; no sharp edges.
- After 4th foul and game start, full red area display.

7.3 Time Keeper For Locker Rooms

- Synchronized with main game time; digit height ≥ 13 cm.
- MM:SS (4 digits), 00:00–99:59; last 60 s with 1/10 s display.

8. General Technical Conditions

- Full aluminum panel body.
- Dimensions: height ≥ 325 cm, width ≥ 675 cm, thickness ≤ 8.5 cm.
- Indicators SMD LED, 7-segment; partial LED fault does not turn off entire segment.
- Static drive technology for TV broadcast capture.
- Mounted at safe view height, on solid ground with manufacturer approval.
- Connectors easy plug/unplug, moisture resistant.
- Front protection: anti-reflective transparent (reflex/lexan type) plexiglass.
- Internal wiring: grouped data cables, neat; no cut/splice/unsocketed wiring.
- Driver boards short-circuit protected.
- Power supplies CE certified; LED lifespan $\geq 50,000$ h.
- Integrated/processor brand: ST, Toshiba, Texas, NXP, or Green Micro.
- Operating temperature: -40 °C ... $+55$ °C.
- External energy/data cables per manufacturer-approved norms.
- Manufacturer-approved wiring diagram and fuse ratings.

- Data/power cables shielded, hidden routing.
- Data output for broadcasters on console.
- Scoreboards hung from ≥ 2 points, ≥ 500 kg hoist/motor capacity.
- Manufacturer: ISO 9001 certified.
- Product: RoHS and CE certified.
- User manual and warranty document provided; warranty: 2 years.

9. Installation and Placement

- 24/14 second shot clock devices installed above basket per FIBA; if impossible, suspended from ceiling above basket.
 - Scoreboard positioned considering hall architecture and sight lines for optimum visibility.
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10. Summary Table

Display / Section	Digit / Character Height (min)	Color	Note
Team Name	32 cm	White	LED module, special character support
Score (3 digits per team)	40 cm	White	0–199, unused off
Game Time (MM:SS, 4 digits)	40 cm	Yellow	Last 60s 1/10s; ± 0.1 s/100 min
Period/Set (1 digit)	30 cm	White	“O” for overtime in basketball
Team Foul (1 digit)	35 cm	Red	Square after 4th foul
Timeout Rights (3 point markers)	5 cm side	Yellow	With flash
Timeout Duration (2 digits)	30 cm	Yellow	0–99, early warning

Display / Section	Digit / Character Height (min)	Color	Note
Player Names	16 cm	Yellow	12 players per side
Player Jersey No (2 digits)	16 cm	Yellow	00–99
Player Foul (1 digit)	16 cm	Red	BB max 5, HB max 3
Player Score (2 digits)	16 cm	White	0–99
24/14s – Game Time	13 cm	Yellow	Same as main panel
24/14s – Shot Clock	25 cm	Red	0–99 s
Digital Team Foul Markers	25 cm (digit)	Red	Width 12.5 cm
Ball Possession Arrow Indicator	—	Red	WxH ≥ 11 cm