

FOOTBALL SCOREBOARD SYSTEM WITH EDITABLE TEAM NAMES

TECHNICAL SPECIFICATION

Scope and Purpose

This specification defines the principles for the design, manufacturing, installation, operation, and acceptance of a football scoreboard system with editable team names to be used in stadiums and outdoor sports fields.

1. System Components

- Graphical Match Display Screen
 - Control Unit
 - Scoreboard Platform (support legs, anchors, roof and protective elements)
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2. Graphical Match Display Screen

2.1 General Layout

- The game time is centered on the screen; team names and scores are displayed beneath it.

2.2 Match Time Indicator

- **Format:** mm:ss (minutes 2 digits, seconds 2 digits, ":" separator). Total of 5 characters.
- **Operation:** Count-up or count-down in accordance with the rules of the game.
- **Range:** Settable within 00:00–99:59.
- **Accuracy:** Maximum tolerance ± 0.1 s over a 100-minute period.
- **Visuals:** Digit height ≥ 32 cm.

2.3 Team Name Indicators

- **Input methods:**
 - By connecting an external keyboard to the control unit, or
 - Via the membrane keypad on the controller without requiring a computer.

- ## 2.4 Score Indicators

- ### 3. Control Unit

- Color TFT screen of at least 4.3", resolution $\geq 480 \times 272$ px.
- Front face: long-life, printed, waterproof membrane keypad; button functions marked in accordance with international norms.
- Aluminum front guard and housing.
- IP54 protection class.

- Selectable count-up/count-down.
- Cumulative time management (total time accounting across periods).
- Automatic stop settings at 45:00 and 90:00; the second-half start value can be auto-set to 45:00.
- After any stoppage, time may be set to the desired value from the controller and restarted.
- Number of periods configurable as a parameter; period indicator can be displayed on screen.

- Single-step score increase/decrease via **Score +** / **Score -** keys.

- RF wireless connection supported; wireless signals may be disabled by software from the controller when required.
- Language support: Turkish, English, French (at least 3 languages).
- 100-level brightness adjustment (scoreboard screen).
- LED module test function; one-touch reset of match information.
- Software updates can be performed remotely without opening the enclosure.
- Connection connectors meet quality standards and are easy to plug/unplug.

3.4 Power and Energy

- ≥ 10 hours of operation with Li-ion battery; battery level viewable on the main screen.
 - CE-certified charger providing full charge in ≤ 2 hours.
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4. Scoreboard Platform (Mechanics and Installation)

4.1 Support Structure

- The scoreboard platform is mounted in a suitable area on two metal legs.
- Leg height ≥ 2450 mm; profile $\geq 60 \times 60$ mm with 3 mm wall thickness.
- Legs are anchored to the ground at two points; required rebar dowels are provided and concrete backfill is applied.

4.2 Environmental Protection

- Appropriate roof and protective elements against rain/snow/hail/dust/sun.
 - Leg color designated by the client; coated with electrostatic powder paint.
 - Screen frame has static strength suitable for 90 km/h wind speed.
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5. Display Screen – Structure and LED Modules

- Panel material: Aluminum or sheet steel.
- Panel dimensions: height 48 cm, width 128 cm.
- Panel thickness: ≤ 15 cm.

- Net scoreboard dimensions: height $\geq$ 95 cm, width $\geq$ 250 cm.
 - The display is graphics-based and composed of 16×32 cm LED modules.
 - LED modules are suitable for outdoor use.
 - Pixel pitch: 10 mm. One red LED per pixel.
 - LED lifetime: $\geq$ 50,000 hours.
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6. Electrical, Environmental, and Safety

- Operational temperature: $-40\dots+55$ °C.
 - Relative humidity: 0–95 % operating range.
 - Maximum power consumption: 2.1 kW.
 - Supply voltage: 200–240 V AC, 50/60 Hz.
 - Connectors: easy to plug/unplug, moisture-resistant.
 - Internal wiring: neat and orderly with grouped data cables; internal scoreboard wiring implemented uncut, without splices, using connectorized solutions.
 - Driver boards short-circuit protected.
 - Integrated circuit and processor brands: ST, Toshiba, Texas, NXP, or Green Micro.
 - External power and data cables to sizes and standards approved by the manufacturer.
 - Wiring diagram and fuse ratings approved by the manufacturer.
 - Data and power cables are shielded and routed out of sight (submitted for manufacturer approval).
 - **Installation:** Performed on a solid base, in compliance with safety rules, at a location easily visible to spectators, referees, and players.
 - Scoreboard protection class: IP65.
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7. Software and Functionality

- The scoreboard screen software shall be developed by the contractor; references to previous implementations shall be provided upon request.

- All updates that do not require physical changes to the scoreboard shall be applied via the controller software.
 - During the match, yellow card, red card, and goal animations can be displayed.
 - Before the match, player and referee information entered on the controller can be shown on screen as animations.
 - Team/player names can be entered without a computer via a keyboard connected to the controller or via the membrane keypad.
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8. Compliance, Documentation, and Warranty

- CE and RoHS compliance.
 - The manufacturer holds an ISO 9001 Quality Management System certificate.
 - User manual and warranty certificate delivered.
 - Warranty period: 2 years.
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9. Delivery, Testing, and Acceptance Principles

- After installation is completed:
 - The time indicator is tested in mm:ss format; count-up/count-down, automatic stops at 45:00/90:00, and the second-half auto-start at 45:00 are verified.
 - Brightness is tested for linear/repeatable control across 100 levels.
 - RF communication, LED test function, score increment/decrement, and team name/character-set display tests are performed.
 - Power consumption, voltage/handling ratings, IP protection, and temperature/humidity operating ranges are verified.
 - Short-circuit protection and internal wiring layout tests are carried out.
 - All tests are recorded with an acceptance report.
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SUMMARY TABLE – System-Wide (Key Mandatory Items)

Title	Mandatory Feature
Time Format	mm:ss, 5 characters (minutes 2 digits, seconds 2 digits, “:”)
Time Range & Accuracy	00:00–99:59, ±0.1 s over 100 minutes
Match Flow	Auto stop at 45:00 and 90:00; second-half start at 45:00
Display Digit Sizes	Time digit ≥ 32 cm, score digit ≥ 28 cm
Team Names	At least 12 characters, extended Latin support, height ≥ 28 cm
Score Indicator	Two digits per team (00–99)
Brightness Control	100 levels, adjusted remotely
Controller Screen	≥ 4.3", ≥ 480×272 px color TFT
Power & Battery	Li-ion ≥ 10 h operation; ≤ 2 h full charge (CE charger)
Communication	RF wireless; software disable
Updates	Remote, without opening the device
Environmental Endurance	–40...+55 °C, 0–95 % RH
Protection Classes	Scoreboard IP65, controller IP54
Power & Supply	Max 2.1 kW, 200–240 V AC, 50/60 Hz
LEDs & Modules	P10 (10 mm), 1 red LED per pixel, ≥ 50,000 h
Mechanics	Panel 48×128 cm, thickness ≤ 15 cm; scoreboard ≥ 95×250 cm
Support Structure	Legs ≥ 60×60×3 mm, height ≥ 2450 mm; anchoring and concrete backfill
Certification	CE, RoHS, ISO 9001
Warranty	2 years