

FOOTBALL SCOREBOARD SYSTEM FOR AMATEUR FIELDS

TECHNICAL SPECIFICATION

1. Purpose and Scope

This technical specification defines the components, technical criteria, installation, and acceptance conditions for the football scoreboard system to be supplied for use on amateur fields. The system consists of the Game Time & Score Panel, the Control Unit, and the Mounting Bracket.

2. System Components

- **Game Time & Score Panel:** The main display presenting the game time and both teams' scores.
- **Control Unit:** The control panel used to manage game time and scores.
- **Mounting Bracket:** Mechanical hardware that ensures the scoreboard is securely fixed.

3. Game Time & Score Panel

3.1 Game Time Indicator

1. **Format:** Displayed in MM:SS format as 5 characters: 2 digits for minutes, a ":" separator, and 2 digits for seconds.
2. **Range:** Shall be settable between 00:00 and 99:59.
3. **Counting Modes:** Shall support count-up and count-down operation in accordance with the rules of the game.
4. **Time Accuracy:** Shall achieve a tolerance of ± 0.1 seconds per 100 minutes.
5. **End-of-Time Alert:** An audible alert shall sound when time expires.
6. **Additional Display:** The time indicator shall be capable of showing the current time of day.
7. **Digit Height:** At least 30 cm.
8. **Color:** Time digits shall be single-color (red preferred).

3.2 Score Indicators

1. **Digits per Team:** Each team shall have a 2-digit score display.
2. **Range:** Shall display values from 0 to 99.

3. **Color:** Score digits for both teams shall be the same color (red preferred).
4. **Digit Height:** At least 30 cm.

4. Control Unit

1. **Function:** Game time and team scores are set and managed via the controller.
2. **Sport Profiles:** Profiles for football and five-a-side (mini) football shall be available.
3. **Keypad:** Printed, water-resistant, long-life membrane keypad.
4. **Markings:** Buttons shall feature symbols/labels indicating their functions, compliant with international norms.
5. **Score Control:** Team scores are adjusted with “Score +” and “Score –” keys.
6. **Time Setting:** After pressing **Set Period Time**, hour/time setting shall be possible via **Score +/-**.
7. **Automatic Pausing:** Using the time setting, the device can automatically stop at the 45th and 90th minutes; it shall also be configurable to stop at other times.
8. **Connectivity:** Wireless (RF) connection support is required.
9. **Reset:** It shall be possible to reset all match information with a single action.
10. **Updates:** All updates not requiring physical changes to the scoreboard shall be applicable via the controller software.
11. **Enclosure:** The controller housing shall be made of ABS plastic.
12. **IP Protection:** The control unit shall meet IP54 protection.
13. **Power and Battery:**
 - Li-ion battery shall be used.
 - A charge-level indicator shall be present on the controller.
 - Operating voltage: 8.4 V.
 - Charging time: full charge shall be achieved within 1–1.5 hours.
 - Standby time: shall hold charge for at least 3 days after full charge.

5. Mechanical and Structural Characteristics

1. **Body Material:** The panel shall be manufactured entirely from aluminum.
2. **Dimensions:** Panel height ≥ 95 cm, width ≥ 195 cm, thickness ≤ 12 cm.

3. **Front Protection:** The front surface shall have an anti-glare Lexan-type protective cover to reduce light reflections.
4. **LED and Drive:**
 - SMD LEDs and 7-segment structure shall be used in the indicators.
 - Static drive technology shall be used for image clarity in video recording.
5. **Segment Continuity:** In the event one or more LEDs fail, the corresponding segment shall not extinguish entirely.
6. **Portability:** The scoreboard shall support portable use.
7. **Installation:**
 - Shall be securely mounted in a position clearly visible to spectators, referees, and players.
 - Mounting hardware shall be supplied with the product.

6. Electrical and Cabling

1. **Power Supplies:** Power supplies used shall be CE-certified.
2. **Driver Boards:** Shall be protected against short circuits.
3. **Connectors:** Shall be easy to plug/unplug and resistant to moisture.
4. **Wiring:**
 - For ease of service and maintenance, wiring inside the unit shall use grouped data bundles in an orderly arrangement.
 - To ensure safety and fast service, cables shall not be cut/spliced; connectors shall be used.
 - Data and power cables shall be shielded and routed so as not to be exposed.
 - External power and data cables shall meet cross-section and standards approved by the manufacturer.
 - Wiring diagram and fuse ratings shall be submitted for manufacturer approval.

7. Environmental Conditions and Durability

1. **Operating Temperature:** Shall operate continuously between -40°C and $+55^{\circ}\text{C}$.
2. **LED Lifetime:** LEDs used shall have a service life of at least 50,000 hours.

8. Material and Component Qualifications

- Integrated circuits/microcontrollers used shall be from ST, Toshiba, Texas Instruments, NXP, or Green Micro brands (or shall deliver performance in this class).

9. Compliance, Documentation, and Warranty

1. **Product Compliance:** The product shall have CE and RoHS conformity certificates.
2. **Manufacturing Quality Management:** The manufacturer shall hold an ISO 9001 Quality Management System certificate.
3. **Delivery Documents:** User manual and warranty certificate shall be delivered.
4. **Warranty:** The system shall have a minimum warranty of 2 years.

SUMMARY TABLE – System-Wide (Key Mandatory Items)

Category	Mandatory Feature
Time Display	MM:SS (5 characters), 00:00–99:59 range, count-up/count-down, audible alert at time end
Time Accuracy	±0.1 s / 100 min tolerance
Visibility	Time and score digit height ≥ 30 cm
Score Indicator	Two digits per team, 0–99 range, same color
Optical Quality	Static drive technology, anti-glare Lexan front protection
Durability	–40 °C ... +55 °C operating range, LED lifetime ≥ 50,000 hours
Controller	RF wireless control, IP54, ABS housing, Li-ion battery, full charge in 1–1.5 h, ≥ 3 days standby
Functions	Auto stop at 45 and 90 minutes + configurable stop times, one-touch full reset
Safety/Electrical	Short-circuit-protected driver boards, CE-certified power supplies
Mechanical	Aluminum body, portable use, tidy connectorized internal wiring
Compliance	Product with CE and RoHS certificates; manufacturer ISO 9001-certified

Category	Mandatory Feature
Installation	Safe installation with good visibility; mounting hardware included