FOOTBALL SCOREBOARD SYSTEM FOR AMATEUR FIELDS – TECHNICAL SPECIFICATION

1. Scope and Purpose

This technical specification defines the scope, minimum technical requirements, and acceptance criteria for the scoreboard system to be used on amateur football fields. The system includes the game time and score displays, the control unit, and the necessary mounting hardware.

2. System Components

- **Game Time & Score Panel**
- **Control Unit**
- **Scoreboard Mounting Hardware**

3. Functional Requirements

3.1 Game Time Indicator

a) Display Format

- The time indicator shall be in MM:SS format: two digits for minutes, the ":" separator, and two digits for seconds; 5 characters in total.
- Minutes shall always be displayed with 2 digits; seconds shall be 2 digits.
- The display range shall cover 00:00 – 99:59.

b) Time Operation

- Time shall operate in count-up or count-down modes in accordance with the rules of the game.
- Maximum tolerance deviation over 100 minutes shall be ±0.1 seconds.
- An audible alert shall be given when time expires.
- A clock-of-day mode (HH:MM) shall be available.

c) Visual Characteristics

- Time digits shall be red.
- Time digit height shall be at least 40 cm.
- Indicators shall use SMD LEDs with 7-segment construction.

- All numeric indicators shall use static-drive technology for clarity in camera recordings.

3.2 Score Indicators

- Each team shall have a two-digit score display.
- Display range shall be 00 – 99.
- Score digits shall be the same color across both teams and shall be red.
- Digit height shall be at least 40 cm.
- In case one or more LEDs fail, the corresponding segment shall not fully extinguish; readability shall be maintained.

3.3 Control Unit

- Profiles for association football and five-a-side (mini-football) shall be provided.
- A water-resistant printed, long-life membrane keypad shall be used.
- Button labels indicating functions shall comply with international norms.
- Team scores shall be adjusted with “+” and “–” keys.
- Time and period settings shall be adjustable via the period/time setting key.
- With time settings, the device shall support automatic stops at the 45th and 90th minutes; additional stop times shall be configurable as required.
- Wireless (RF) connectivity shall be supported.
- A single-action reset function shall clear all match information.
- The controller shall operate with a Li-ion battery and include a charge-level indicator.
- A charger providing full charge within 1–1.5 hours shall be supplied.
- After full charge, the controller shall retain its charge for at least 3 days.
- The scoreboard time counter shall continue running even if the controller is turned off.
- All updates that do not require physical changes to the scoreboard shall be performed via the controller software.
- The controller housing shall be made of ABS plastic.

- Protection class shall be IP54.
- Controller operating voltage shall be 8.4 V.

4. Mechanical and Structural Requirements

- The panel body shall be manufactured entirely from aluminum.
- Panel dimensions: height ≥ 110 cm, width ≥ 230 cm.
- Panel thickness shall be ≤ 12 cm.
- The front face of the panel shall include a Lexan-type anti-glare protective cover to prevent reflections.
- The scoreboard shall be mounted on a solid base with due regard to safety, in a position clearly visible to spectators, referees, and players.
- The scoreboard shall also support portable use.
- Connectors shall be easy to plug/unplug and resistant to moisture.

5. Electrical/Electronic Requirements and Safety

- Driver boards shall be protected against short circuits.
- Power supplies shall be CE-certified.
- LED lifetime shall be ≥ 50,000 hours.
- Integrated circuits and microcontrollers used in the circuits shall be of the ST, Toshiba, Texas Instruments, NXP, or Green Micro class.
- Data and power cables shall be shielded and installed so as not to be exposed.
- External power and data cables shall be to sizes and standards approved by the manufacturer.
- Wiring diagrams and fuse ratings shall be subject to manufacturer approval.

6. Environmental Conditions

- The operational working temperature of the entire system shall be −40 °C to +55 °C.
- Connectors and external surfaces shall be resistant to moisture and environmental factors suitable for field conditions.

7. Software and Updates

- The base scoreboard software shall cover time modes (count-up/count-down, clock mode), automatic stop points, and score increment/decrement functions.
- Software updates shall be applicable in the field via the controller (without any physical hardware intervention).

8. Installation, Mounting, and Service

- Mounting hardware shall be supplied.
- Installation shall be carried out in accordance with manufacturer-approved mechanical and electrical instructions.
- For technical service and maintenance, the internal layout shall be neat and orderly with grouped data cable bundles.
- No cut, spliced, or connector-less cable practices shall be present.

9. Certification, Documentation, and Warranty

- The product shall have CE and RoHS conformity certificates.
- The manufacturer shall hold an ISO 9001 Quality Management System certificate.
- The user manual and warranty certificate shall be delivered.
- The system shall be covered by a warranty of at least 2 years.

SUMMARY TABLE – System-Wide (Key Mandatory Items)

Criterion	**Mandatory Feature**
Time Format	MM:SS; minutes 2 digits, ":" separator, seconds 2 digits (5 characters total)
Time Range & Accuracy	00:00–99:59, ±0.1 s/100 min tolerance
Auto Stop	Automatic stops at 45 and 90 minutes; additional target times configurable
Digit Construction & Size	7-segment SMD LED; digit height ≥ 40 cm; red color
Broadcast-Friendly Image	Static-drive (clarity in camera recordings)

Criterion	Mandatory Feature
Fault Tolerance	A single LED failure does not extinguish the whole segment; readability preserved
Controller Robustness	IP54, ABS housing, water-resistant membrane keypad
Power & Battery	Li-ion; full charge in 1–1.5 h; ≥ 3 days on full charge
Continuity	Scoreboard time counters run even when controller is off
Connectivity	Wireless (RF); installation-ready, moisture-resistant connectors
Mechanics	Aluminum body; anti-glare Lexan on front face
Dimensions	Height ≥ 110 cm, width ≥ 230 cm, thickness ≤ 12 cm
Environmental Resistance	−40 °C…+55 °C operating range
Compliance & Warranty	CE & RoHS; manufacturer ISO 9001; ≥ 2 years warranty