

# FOOTBALL SCOREBOARD SYSTEM WITH EDITABLE TEAM NAMES

## TECHNICAL SPECIFICATION

### 0. Purpose and Scope

This technical specification defines the components, functional requirements, and technical criteria of a graphics-based football scoreboard system with editable team names for use in stadiums and similar outdoor facilities. The system consists of the Graphical Match Display Screen, the Control Unit, and the Scoreboard Mechanical Platform.

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### 1. System Components

- Graphical Match Display Screen
  - Control Unit
  - Scoreboard Mechanical Platform
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### 2. Graphical Match Display Screen

#### 2.1 General Layout

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

#### 2.2 Match Time Indicator

- **Time display:** Minutes always 2 digits, seconds 2 digits, with a “:” separator (format MM:SS, total 5 characters).
- **Time direction:** Count-up or count-down supported in accordance with the Laws of the Game.
- **Range:** Settable within 00:00 – 99:59.
- **Accuracy:** Maximum tolerance  $\pm 0.1$  s within 100 minutes.
- **Visibility:** Time digit height at least 48 cm.

#### 2.3 Team Name Indicators

- Team names are entered via an external keyboard connected to the controller or via the membrane keypad on the controller (no computer required).

- A team name supports up to 12 characters depending on character width; character height  $\geq 42$  cm.
- **Character set:** In addition to the Latin alphabet, the following special characters are supported:
  - **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, ß
  - **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

## 2.4 Score Indicators

- Two digits per team; range 0–99.
  - Score digit height  $\geq 42$  cm.
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## 3. Control Unit

### 3.1 Display and Interface

- Color TFT screen:  $\geq 4.3$  inches,  $\geq 480 \times 272$  px resolution.
- Front panel: long-life printed waterproof membrane keypad on an aluminum guard.
- Button labels: functions indicated with wording compliant with international norms.

### 3.2 Match Controls

- **Score control:** Single-step via **Score + / –** keys.
- **Time direction:** Selectable count-up/count-down.
- **Period cumulative:** Time may run cumulatively across periods.
- **Half start:** If the first half exceeds 45 minutes, when it is ended the second half starts at 45:00 (auto-configurable).
- **Auto stop:** Automatic stops at 45 and 90 minutes; additional stop points can be defined as required.
- **Pause/restart:** When play is stopped, restart from any desired time via manual setting on the controller.
- **Period management:** Period indicator and total number of periods are configurable.

### 3.3 Displays and Messages

- **Animations:** Yellow card, red card, and goal animations.
- **Messages:** Text message display on the scoreboard.
- **Lineups:** Pre-match player and referee information displayable as animations.
- **Input:** Team/player names enterable via external keyboard or membrane keypad (no PC required).
- **Languages:** At least Turkish, English, and French.

### 3.4 Power and Connectivity

- **Battery:** Li-ion,  $\geq 10$  hours operation; charge level visible on the main screen.
- **Charging:** Full charge within  $\leq 2$  hours via CE-certified adapter.
- **Wireless:** RF connection supported; may be software-disabled from the controller if desired.

### 3.5 Maintenance, Test, and Durability

- **Brightness:** Scoreboard brightness adjustable in 100 steps from the controller.
- **LED test:** LED modules testable remotely.
- **Reset:** One-touch full reset of all match information.
- **Updates:** All software updates on the scoreboard performed via the controller; the system supports remote updates without opening the enclosure.
- **Connectors:** Easy to plug/unplug and compliant with quality standards.
- **Enclosure:** Aluminum; IP54 protection class.

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## 4. Scoreboard Mechanical Platform

### 4.1 Load-Bearing Structure and Installation

- The scoreboard platform is installed on four metal legs in a suitable area.
- Leg height  $\geq 2450$  mm; profile cross-section  $\geq 80 \times 80$  mm with 5 mm wall thickness.
- Legs are anchored to the ground at two points using anchor hardware; rebar dowels are provided and concrete backfill is applied.
- A protective roof is provided against natural elements.

- Leg color is determined by the contracting authority; finished with electrostatic powder coating.

## **4.2 Structural Resistance**

- The screen frame is statically rated for wind speeds of 90 km/h.
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## **5. General Technical Provisions**

### **5.1 Materials and Dimensions**

- Panel body manufactured from aluminum or sheet steel.
- Scoreboard panels: height 48 cm, width 128 cm; panel thickness  $\leq 15$  cm.
- Overall scoreboard dimensions: height  $\geq 144$  cm, width  $\geq 384$  cm.

### **5.2 Display and LED Modules**

- The display is graphics-based; formed by arranging 16×32 cm LED modules.
- LED modules suitable for outdoor use.
- Pixel pitch: 10 mm.
- One red LED per pixel.
- **Lifetime:** LEDs with  $\geq 50,000$  hours service life.

### **5.3 Environmental Conditions**

- Operating temperature:  $-40\text{ }^{\circ}\text{C} \dots +55\text{ }^{\circ}\text{C}$ .
- Relative humidity: 0–95 % operating range.
- Protection class: Scoreboard IP65.

### **5.4 Electrical and Power**

- Operating voltage: 200–240 V, 50/60 Hz.
- Maximum power consumption: 4.6 kW.
- Power supplies: CE-certified.
- Connectors resistant to moisture and easy to plug/unplug.

### **5.5 Cabling and Service**

- Internal layout arranged neatly using grouped data cable bundles.
- For service and safety, internal cables shall not be cut/spliced/connector-less.
- Data and power cables are shielded and routed out of sight; implementation drawings are submitted by the contractor for approval.

## 5.6 Electronics and Protection

- Driver boards protected against short circuits.
- Integrated circuits/microcontrollers used: ST, Toshiba, Texas (Texas Instruments), NXP, or Green Micro.

## 5.7 Software, Documentation, and Warranty

- The software used shall be developed by the LED display contractor; references to prior implementations are submitted to the authority.
- Product certificates: RoHS and CE.
- Quality management: Manufacturer shall hold ISO 9001 Quality System Conformity Certificate.
- User manual and warranty certificate are delivered.
- Warranty period: 2 years.

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## SUMMARY TABLE – System-Wide (Key Mandatory Items)

| Item              | Mandatory Feature                                                                                                       |
|-------------------|-------------------------------------------------------------------------------------------------------------------------|
| Time Display      | Format MM:SS (5 characters), minutes 2 digits, seconds 2 digits; adjustable 00:00–99:59; accuracy $\pm 0.1$ s / 100 min |
| Digit Sizes       | Time digit $\geq 48$ cm; score and team-name digits/characters $\geq 42$ cm                                             |
| Score & Name      | Score 0–99 (2 digits); team name $\leq 12$ characters; extended character-set support                                   |
| Controller Screen | Color TFT $\geq 4.3''$ , $\geq 480 \times 272$ px                                                                       |
| Language Support  | At least Turkish, English, French                                                                                       |
| Match Control     | Count-up/count-down; cumulative periods; second half starts at 45:00; auto stops at 45/90 minutes                       |

| <b>Item</b>              | <b>Mandatory Feature</b>                                                                     |
|--------------------------|----------------------------------------------------------------------------------------------|
| Displays                 | Yellow/Red card and Goal animations; message display; animated player/referee lists          |
| Input Methods            | Name entry without PC via external keyboard and membrane keypad                              |
| Brightness & Test        | 100-step brightness; LED test; one-touch full reset                                          |
| Updates                  | Remote software update without opening the enclosure, via the controller                     |
| Power & Battery          | Li-ion $\geq 10$ hours; CE adapter full charge $\leq 2$ hours                                |
| Connectivity             | RF wireless; software disable                                                                |
| Protection Class         | Scoreboard IP65, controller IP54                                                             |
| Mechanical Structure     | 4-leg platform; leg $\geq 2450$ mm, 80×80×5 mm profile; 90 km/h wind rating; protective roof |
| Electrical               | 200–240 V, 50/60 Hz; max 4.6 kW; CE-certified power supplies                                 |
| Documentation & Warranty | RoHS, CE, ISO 9001; 2-year warranty; delivery of user manual and warranty certificate        |