Model LX2330 Product Guide
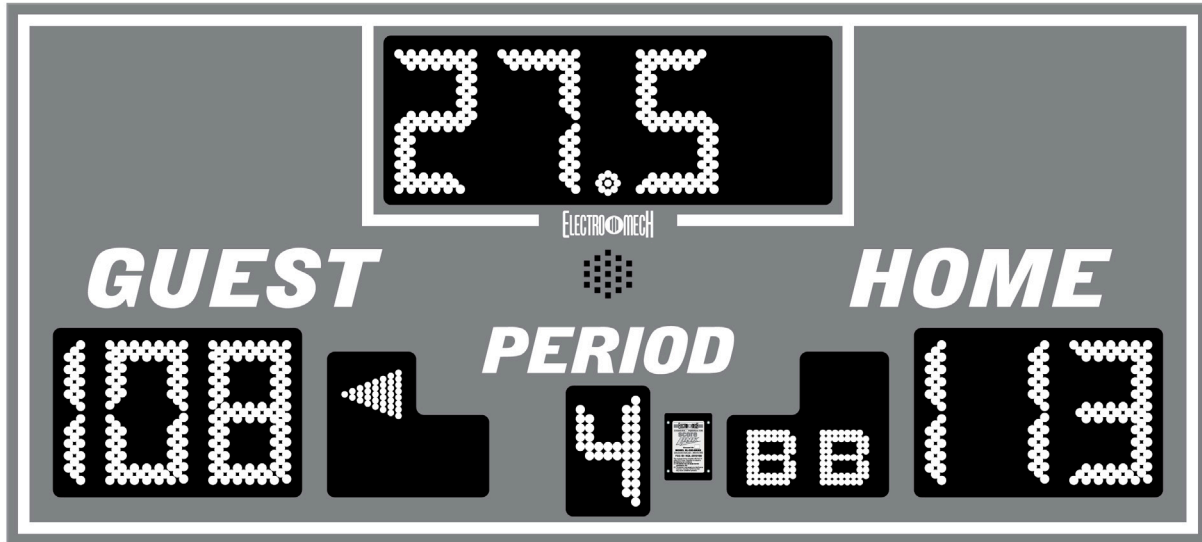
Indoor Basketball Scoreboard

ELECTRO-MECH
SCOREBOARD COMPANY

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Scoreboard Specifications

Model: LX2330

Packing List: Scoreboard cabinet, control console, junction box, stereo patch cable, and right-angled male stereo connector

Dimensions: 78 inches W x 35 inches H x 6 inches D

Weight: 70 lbs.

Standard Power Requirements: 120 VAC, 0.9 Amps, 60 Hz

Displays:
- **Four-Digit Clock**: 9-inch tall Red LED digits for Minutes and Seconds. In final minute, Minutes become seconds and Seconds become tenths of seconds.
- **Score:** 9-inch tall Amber LED digits with a max score of 199 for Home/Guest
- **Period:** 6-inch tall Green LED digit with a max count of 4
- **Possession Indicators:** 3-inch tall Red triangle LED clusters for Home/Guest
- **Bonus Indicators:** 3-inch tall letter B's made with green LEDs for Home/Guest

Location of Serviceable Components: Behind the Clock display

Accessories: A 4-1/4 in. x 2-1/4 in. x 2 in. junction box with a 1/4 in. stereo jack mounted on the face plate is attached to the data cable at the point of operation. A 10-ft. stereo patch cable connects the control console to the junction box.

Scoreboard Installation

One of the items listed below must be purchased in order to complete the installation:
- Data Cable (length not to exceed 1000 feet)
- ScoreLink RF System

Items not provided by Electro-Mech that are necessary for installation:
- Two grounded NEMA 5-15R 120 VAC receptacle (standard 3-prong outlet) - one at the scoreboard, the other for the control console at the scorekeeper's table
- Lag bolts or other hardware to fasten the scoreboard cabinet to a wall
- Dedicated circuit breaker to turn the scoreboard(s) on and off.

Electro-Mech performs installations in some areas. In other areas, we can help you contact an independent installer. In either case, we will make every effort to answer your installation questions. Qualified personnel should perform the scoreboard installation. Consult national and local codes before beginning installation.
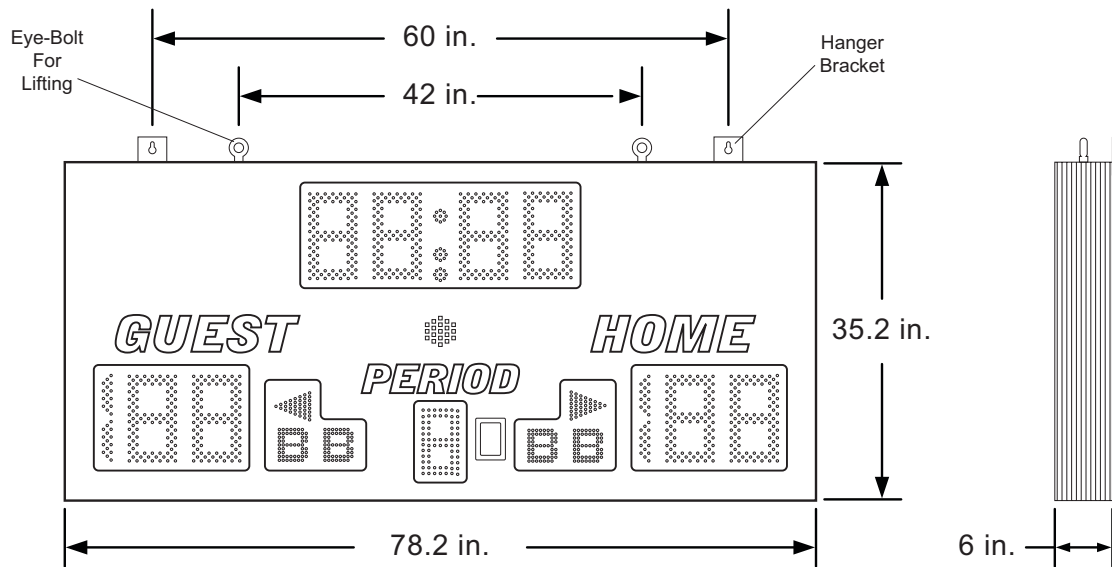
Mechanical Installation

Electro-Mech indoor scoreboards were designed to be mounted on the wall of your gym or other indoor athletic complex. However, where you can/should mount the scoreboard is dependant on your building's construction and design. We strongly recommend only qualified personnel perform the installation to ensure the scoreboard is mounted in a secure location.

The scoreboard was designed to be hung using the two flat brackets bolted to the back of the cabinet along the top of the frame. The hanging brackets are rotated down for shipping. You may have to loosen the bolt holding the brackets to spin them up into position so that the keyhole slots are visible. Before hanging the scoreboard, tighten the bolts that hold the hanging brackets.

The keyhole slots in the brackets accept bolts with up to a 3/8-inch diameter. The bolt head can be up to 1-1/4 inches in diameter and still pass through the larger part of the keyhole slot. The diagrams on the following pages show the center-to-center measurements for these keyhole slots for some typical configurations of this scoreboard model. If your scoreboard has been customized in any way, make certain you have measurements specific to your project before assuming the standard measurements will work. The surest bet is, of course, to measure the actual product when it arrives. Or, if you have the equipment to suspend the scoreboard in place while you install lag bolts, your scoreboard itself can serve as a template.

The scoreboard may be lifted by the two eye-bolts provided along the top of the cabinet. The eye-bolts can also be used as the attachment points for permanent mounting cables, if you prefer to suspend the scoreboard from the ceiling rather than hang it on the wall. If you have no need of the eye-bolts after installation, you may remove them.
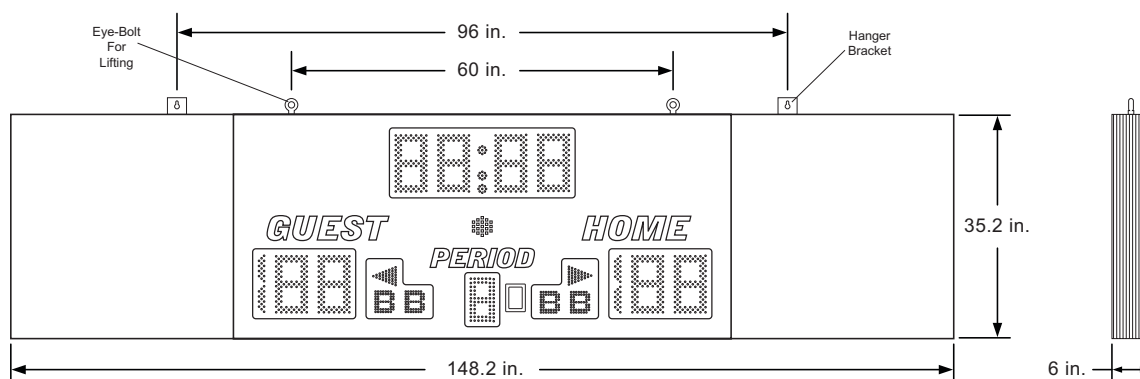
Mechanical Dimensions for Standard Scoreboard

Mechanical Dimensions for Scoreboard with One Side ID Panel
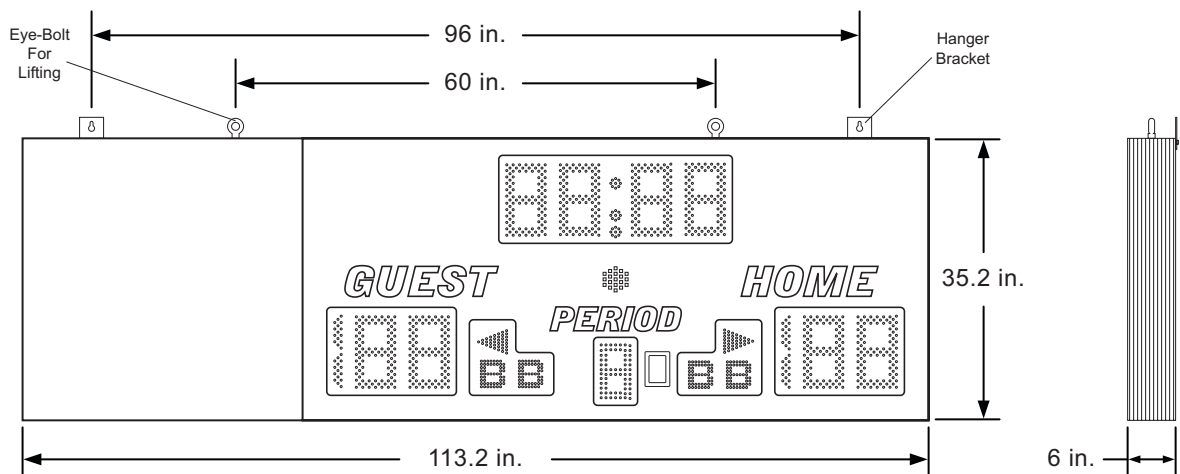
Mechanical Dimensions for Scoreboard with Two Side ID Panels

Electrical Installation

We recommend a qualified electrician perform the needed electrical connections to ensure proper operation of the scoreboard. These connections include installing power receptacles, a local disconnect, additional displays (such as shot clocks, goal lights, etc.), and the data cable or Score-Link RF communication system.

Power Connection

The scoreboard requires 120 VAC service at the scoreboard to operate. Maximum power consumption of LX2330: 120 Watts. On the top of the scoreboard is an attached six foot power cord. Plug the power cord into a grounded NEMA 5-15R receptacle (standard 3-prong outlet). The receptacle should be controlled by a separate circuit breaker so that the scoreboard can be turned on and off without affecting other electrical devices in the facility. **THERE IS NO BUILT-IN ON/OFF SWITCH**. If the scoreboard has power, it's on. If not, it's off. The illustration below shows all of the connection points for the scoreboard; they are located on the top of the cabinet.

Top View of Scoreboard
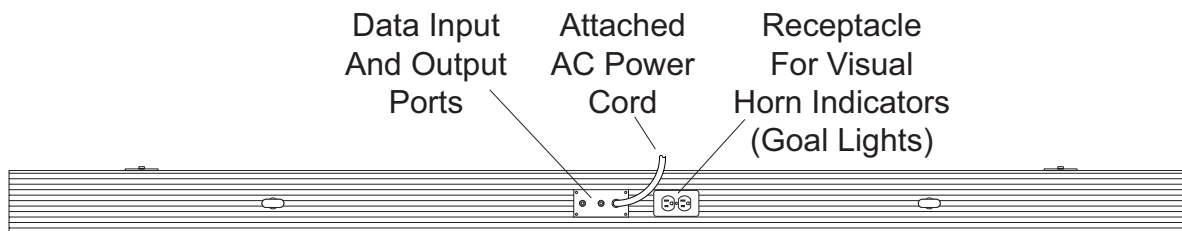
ScoreLink

The ScoreLink RF Modem is designed to elminate the need for a control cable between the score-board(s) and control console. If you have purchased this accessory, disregard the section of this manual titled Data Cable Installation. Also, if you ordered an embedded ScoreLink receiver when you ordered your scoreboard, it will be shipped pre-installed from the factory. See your ScoreLink manual included with this accessory.

Data Cable Installation

The data cable connects the scoreboard to the control console or, more often, to a junction box that the control console plugs into. This junction box includes a 1/4-in. stereo jack mounted on the face plate and is attached to the data cable at the point of operation of the scoreboard. The junction box should be securely mounted within ten feet of the rear of the control console. To solder the control cable to the 1/4-in. stereo jack, see the illustration on the following page showing the data cable wire connection points on the rear of the jack.

<p align="center">Stereo Jack Wiring Illustration</p>
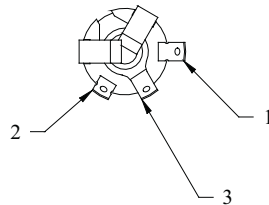
PIN 1 - BLACK WIRE
PIN 2 - RED WIRE
PIN 3 - SHIELD WIRE

A 1/4-in. right-angle stereo plug is provided to attach to the scoreboard end of the data cable. It mates with the 1/4-in. stereo jack mounted on top of the scoreboard. You will need to solder the right-angled, 1/4-in. stereo plug to the cable according the illustration below. Unscrew the stereo plug cover from the plug body to expose the contact pins.

Right-Angle Stereo Plug Wiring Illustration
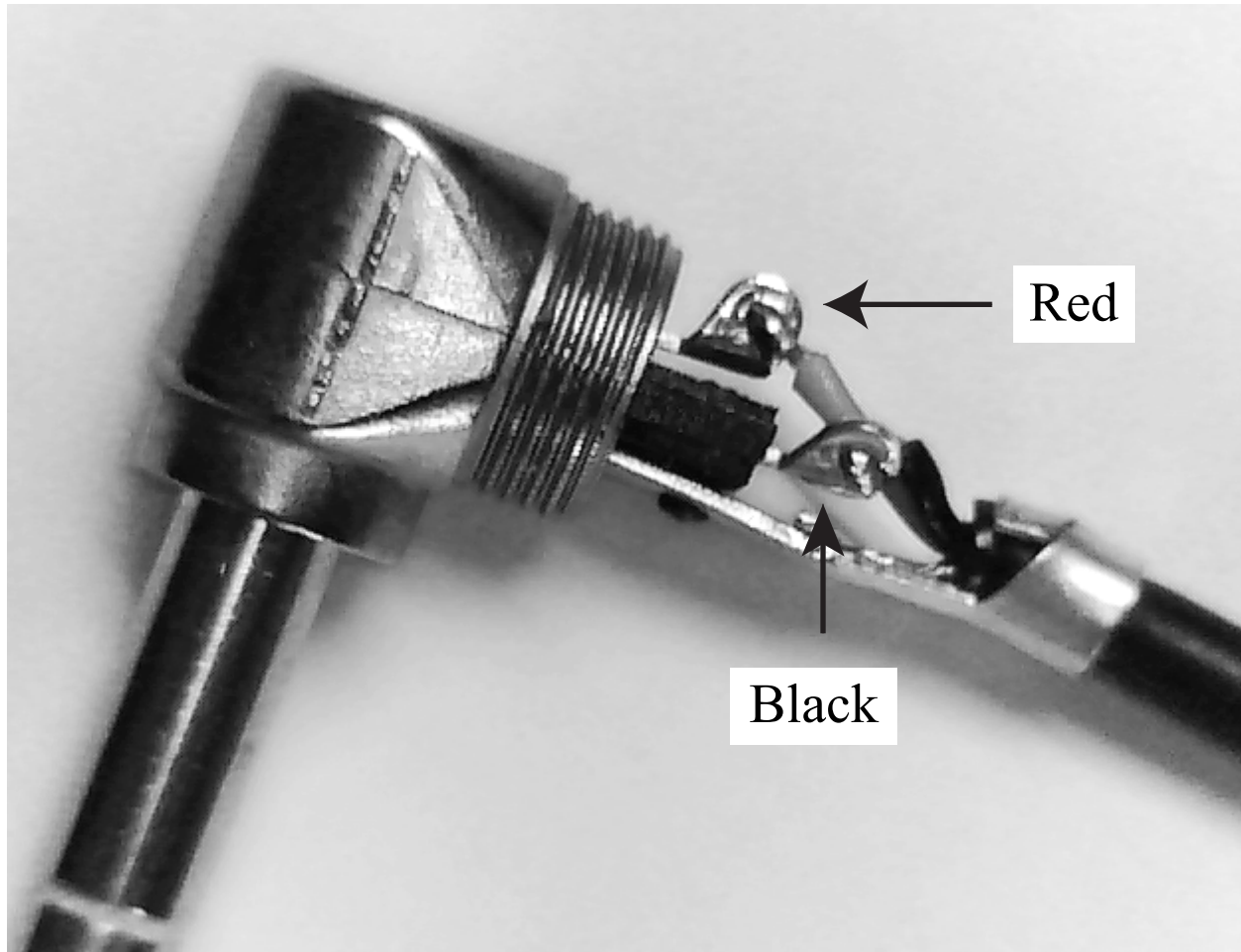
Control Console Connections
The 10-ft. stereo patch cable has two molded 1/4-in. stereo plugs attached to it. The following steps describe how to connect the control console:
1. Plug one end of the stereo patch cable into the 1/4-in. stereo jack on the junction box or the external ScoreLink transmitter, if purchased.
2. Plug the other end into one of the 1/4-in. stereo jacks mounted on the control console back plate.
3. Plug the control console power cord into a grounded NEMA 5-15R 120 VAC receptacle (standard 3-prong outlet).

Control Console Safety Warning
The console is equipped with a 3-wire grounding type plug, having a third (grounding) pin. The plug will only fit into this type of power outlet. Do not defeat the purpose of the grounding pin by removing it to fit in a two pin outlet. Rather, call an electrician to replace your obsolete outlet.

Installing Multiple Scoreboards

Basketball facilities often require multiple scoring displays along with shot clocks and locker room clocks. There are limitless ways to configure multiple displays to allow a variety of options for synchronization or separate operation. This document will provide guidance for a few basic setups. Consult your scoreboard sales representative during the planning phase of your project, if your needs are more complicated.

Each scoreboard in your facility must be tied back to a control console -- either directly with data cable, indirectly through daisy chaining, or wirelessly using the ScoreLink RF system. Each control console supports four output paths. Each output path can be wired directly to ONLY ONE scoreboard, which can, in turn, be wired to a limitless number of additional displays via daisy chaining. Or an output path can be routed to a ScoreLink transmitter, which can broadcast to a limitless number of displays outfitted with ScoreLink receivers set to the same channel.

It is important to understand that, because our wired communication system uses a current loop signal, you must never split a run of cable so that one output path is directly linked to two devices. Split signals may work intermittently, but are unreliable.
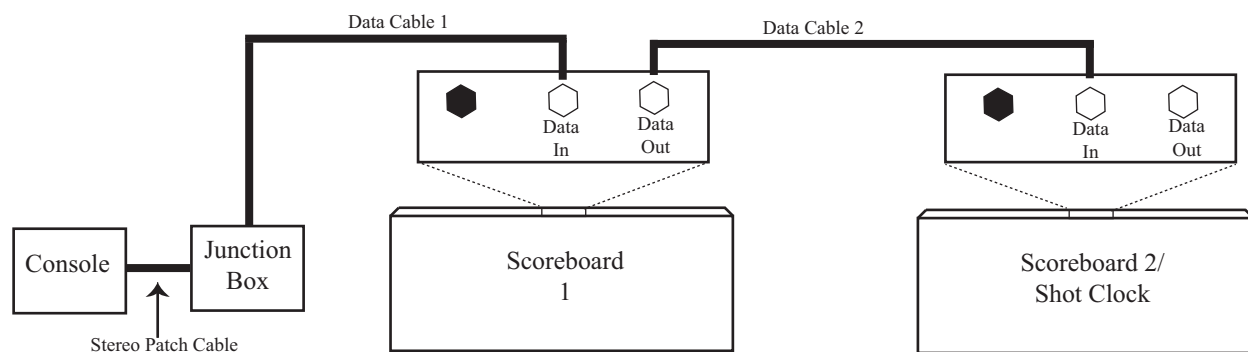
An Example Using Daisy Chaining
If two displays are always operated in synchronization, you may daisy chain them together. You would install a single junction box for data cable at your scorer's table. In this setup, Data Cable 1 would run from this junction box to the Data Input jack on the first scoreboard. Data Cable 2 would then run from the Data Output jack on the first scoreboard to the Data Input jack on the second scoreboard.

To operate the scoreboards, plug the stereo patch cable from one of the output jacks on the back of the control console into the junction box. Data will flow from the console, through the first scoreboard, to the second one.

In the example on the following page, Data Cable 1 could be replaced by a ScoreLink transmitter/receiver pair. The second scoreboard could still be supplied data via Data Cable 2, which would eliminate the need to purchase a second ScoreLink receiver.
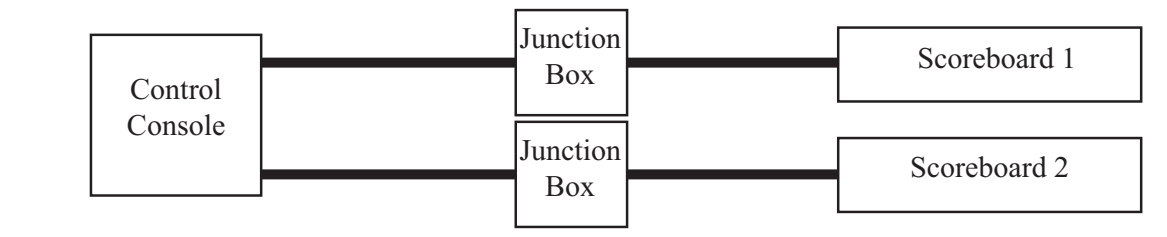
Daisy Chaining Example

Data Cable 1 Data Cable 2

Data In Data Out Data In Data Out

Console Junction Box Scoreboard 1 Scoreboard 2/ Shot Clock
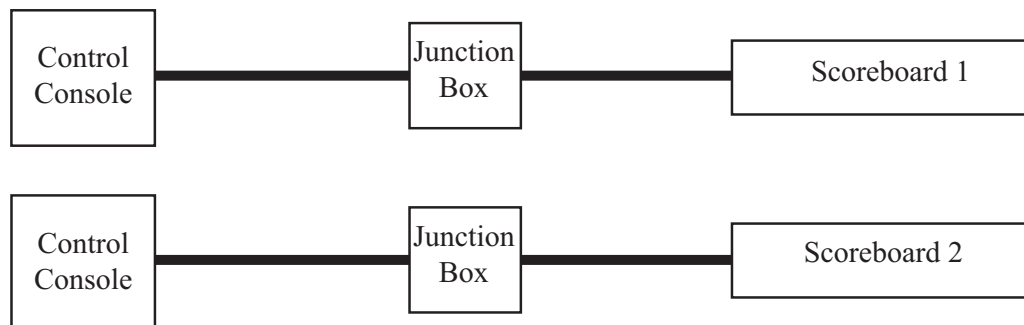
Stereo Patch Cable

An Example Using Two Output Paths
The most versatile method of routing data cable for two scoreboards is to have two separate runs of cable. The first data cable would run from a junction box at the scorer's table to the Data Input jack on the first scoreboard. The second data cable would fun from a second junction box at the scorer's table to the Data Input jack on the second scoreboard. To synchronize the two score-boards, use two stereo patch cables to plug two outputs on the back of one control console into the two junction boxes. To operate the scoreboards separately, plug one control console into the first junction box and plug a second control console into the second junction box. See picture below.
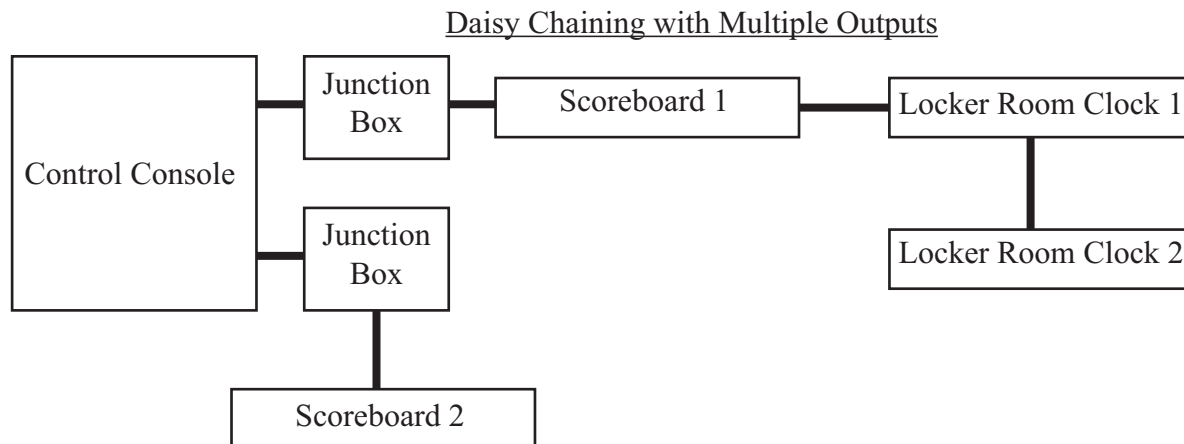
Synchronized Scoreboards with Two Output Paths

Control Console Junction Box Scoreboard 1

Junction Box Scoreboard 2

Independent Multiple Scoreboards

Control Console Junction Box Scoreboard 1

Control Console Junction Box Scoreboard 2

An Example Using Multiple Output Paths AND Daisy Chaining
Consider the setup described above. Now, let's add a pair of locker room clocks. You could install two additional runs of cable from the control console to these locker room clock displays. Or it may be convenient to tie them to one of the main scoreboards via daisy chaining. In this case, run a cable from the Data Output jack of the first scoreboard to the Data Input jack of the first locker room clock. Then run a cable from the Data Output jack of that locker room clock to the Data Input jack of the second locker room clock. Now both locker room clocks are tied to the first scoreboard. Any control console plugged into the first junction box will control the first scoreboard and the two locker room clocks. See illustration below.

Daisy Chaining with Multiple Outputs

```
┌─────────────┐   ┌──────────┐   ┌─────────────┐   ┌──────────────────────┐
│             ├───┤ Junction ├───┤ Scoreboard 1├───┤ Locker Room Clock 1  │
│             │   │   Box    │   │             │   │                      │
│  Control    │   └──────────┘   └─────────────┘   └──────────┬───────────┘
│  Console    │   ┌──────────┐                                │
│             ├───┤ Junction │                     ┌──────────┴───────────┐
│             │   │   Box    │                     │ Locker Room Clock 2  │
└─────────────┘   └─────┬────┘                     └──────────────────────┘
                        │
                  ┌─────┴─────────┐
                  │  Scoreboard 2 │
                  └───────────────┘
```
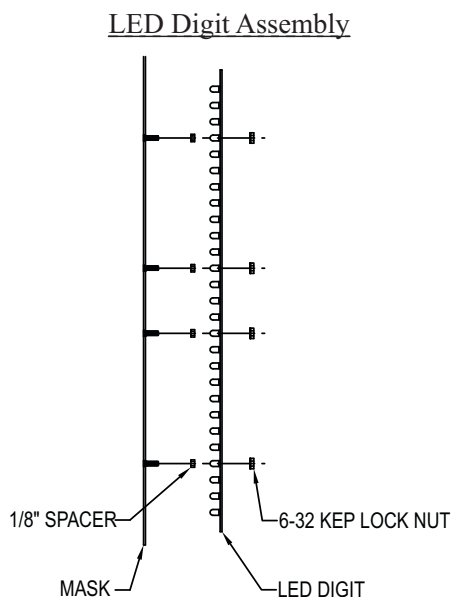
Servicing the Scoreboard

While your scoreboard was designed for years of trouble-free operation, some problems may occasionally occur. Electro-Mech offers onsite service in some areas. In other areas, we can help you contact an independent service technician. In either case, we will make every effort to answer your questions. Our trained personnel are ready to provide technical support from Monday to Friday during the hours of 8 AM to 5 PM Eastern Time. Our convenient toll free number is listed on the cover page of this product guide. Be sure to know your scoreboard model number when calling. Most scoreboard replacement parts are available for immediate shipment. Damaged parts can usually be repaired at a significant cost savings.

If the scoreboard turns on LEDs, but does not operate normally, make note of which functions are affected. If some LEDs either never turn on or always stay on, make note of their specific locations on the scoreboard.

LED Digit And Indicator Replacement

The LEDs that form digits and indicators are soldered on circuit boards mounted behind metal masks. Do not attempt to replace individual LEDs. In case of a malfunction, the entire LED circuit board must be removed. To avoid damage to electrical components, always turn off the power to the scoreboard when removing or replacing LED digits and indicators. The illustration below shows the components of a typical LED digit assembly.

LED Digit Assembly

1/8" SPACER   6-32 KEP LOCK NUT

MASK   LED DIGIT

The following steps describe how to replace a defective LED digit or indicator:

1. Remove the machine screws that fasten the mask to the face of the scoreboard. **Caution: Support the mask with your hand before removing the last screw. The ribbon cable that connects to the rear of the circuit board is not designed to support the weight of the assembly.**

2. Disconnect the ribbon cable from the rear of the circuit board. For assemblies with more than one LED display PCB, it will be necessary to disconnect the ribbon cables from each circuit board. The cables are labeled to indicate the proper circuit board connection. **Caution: Do not let the cable hang outside of the scoreboard. It is easily cut by sharp metal edges. Damage to the ribbon cable may create short circuit paths that will damage the other components.**

3. Place the assembly on a flat surface and remove the 6-32 kep lock nuts that hold the defective circuit board in place.

4. Remove the circuit board from the assembly.

5. Align the mounting holes in the replacement LED digit circuit board with the threaded studs on the mask and install it on the mask using the 6-32 kep lock nuts.

6. Plug the ribbon cable onto the header on the back of the circuit board. Refer to the illustration below in order to plug the ribbon cable IDC connector onto the circuit board in the proper orientation.

7. Plutheg the ribbon cable onto the header on the back of the circuit board. Refer to the illustration below in order to plug the ribbon cable IDC connector onto the circuit board in the proper orientation.
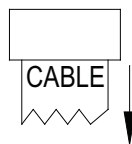
LED DIGIT HEADER   RIBBON CABLE
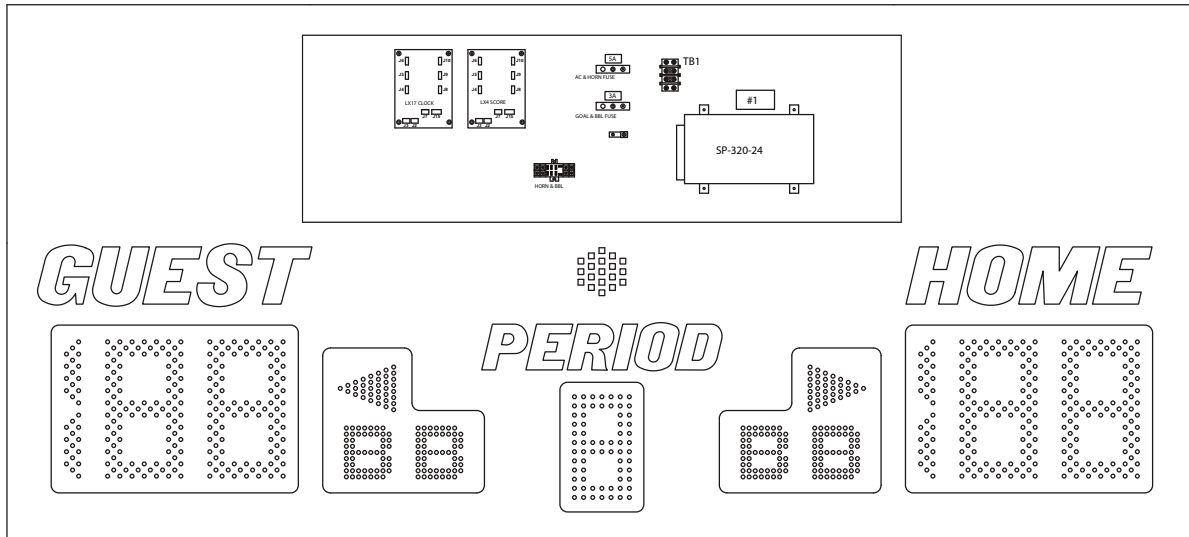   IDC SOCKET
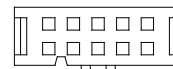
CABLE

CENTER KEY

CENTER KEY ON RIBBON CABLE IDC SOCKET
MUST POINT IN THE SAME DIRECTION AS THE
ARROW ON THE REAR OF THE LED DIGIT.

8. Reinstall the assembly using the machine screws.

Serviceable Component Location

All power and driver logic components are accessible through the front of the scoreboard cabinet. Use a 1/4-inch nut driver to remove the sheet metal screws holding the Clock display in place to reveal the chassis. Always disconnect power before removing this panel and making repairs.

Components Identified

Model LX2330 contains the components shown below. Wiring removed for clarity.
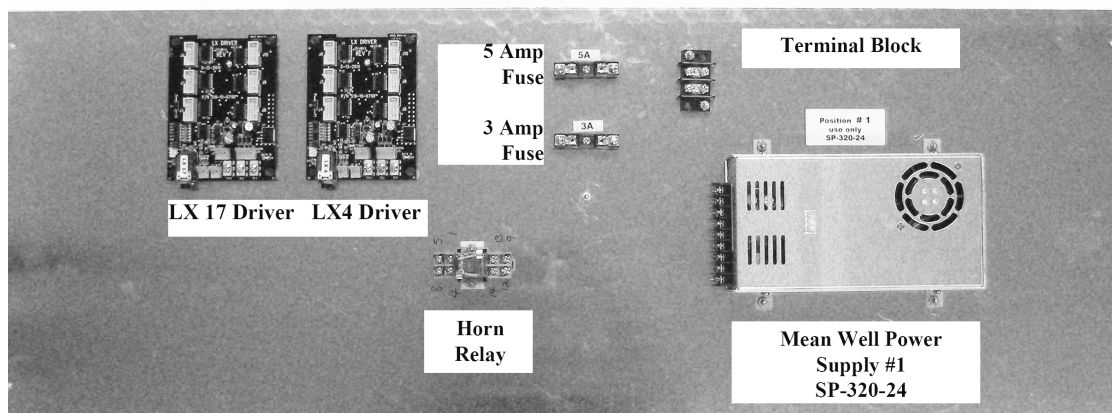
LX Driver PCB Replacement

Electrical connections to the LX Driver are made with ribbon cable polarized IDC sockets and locking ramp crimp terminal housings that mate with jacks on the PCB. Four machine screws are used to secure a Driver PCB inside the scoreboard.

1. Unplug the electrical connections from the PCB. Do not cut the plastic tie wraps around the ribbon cables.
2. Remove the four screws.
3. Remove the PCB from the scoreboard.
4. Insert the replacement PCB in the scoreboard.
5. Secure the PCB with the four screws.
6. Insert the plugs into the jacks on the module.

To avoid damage to the PCB, always turn off the power to the scoreboard when removing or replacing it.

LX Driver Line Drawing
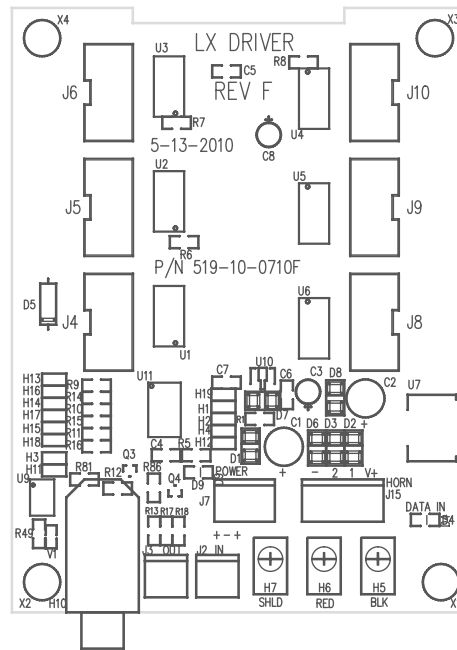
PCB Jack	LX17	LX4
J2	ScoreLink Data Input (if used)	Not used on this scoreboard
J3	Output Data	Output Data
J4	Minutes units digit	Home Score units digit
J5	Minute tens digit	Home Score tens/hundreds digit
J6	Seconds units digit	Guest Score units digit
J7	DC Power Input	DC Power Input
J8	Period units digit	Home Possession/Bonus indicators
J9	Seconds tens digit	Guest Score tens/hundreds digit
J10	Colon/Decimal display	Guest Possession/Bonus indicators
J15	Horn	Not used on this scoreboard
SHLD, RED, BLK	Input Data	Input Data

Power Supply Module Replacement

The Model LX2330 uses a Mean Well SP-320-24 power supply module. Replacement modules are available from Electro-Mech or through distributors of Mean Well power supplies. The SP-320-24 power supply must be set to provide 18.9 VDC output, which is how it is configured when shipped from Electro-Mech. Connections are made to a set of screw terminals along the side of the power supply as illustrated on the next page, along with a table listing the terminals and their corresponding functions. **To avoid damage to the power supply module, always turn off the power to the scoreboard when removing or replacing it.**

A fuse holder is mounted near the middle of the chassis near the Power Supply and connected in-line with the incoming 120 VAC line side of the power coming in from the Main Power terminal block. Scoreboards without ETNs use a 5 amp fuse. Below this main power fuse is a 3 amp, 250 volt, 3AG style fuse that protects the Goal Light (or Visual Horn) circuit. These fuses should only be replaced with fuses of the same type and rating.
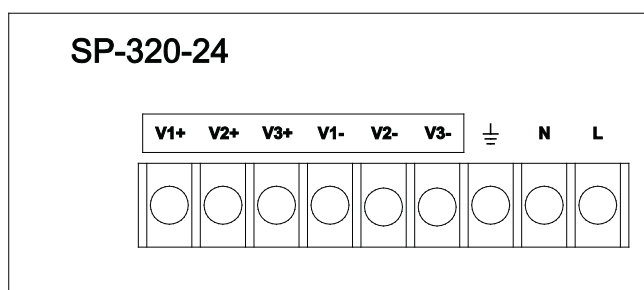
Mean Well #1 Power Supply Terminals	Function
Line (L)	Main AC Power
Neutral (N)	
Ground	
V1 Positive (V1+)	LX17 Driver
V1 Negative (V1-)	
V2 Positive (V2+)	LX4 Driver
V2 Negative (V2-)	
V3 Positive (V3+)	ScoreLink RF System (if used)
V3 Negative (V3-)	

<u>Warranty</u>

Electro-Mech Scoreboard Co. Five-Year Limited Warranty

The electrical components of all Electro-Mech scoreboards are guaranteed for a period of five (5) years from the date of invoice against defects in workmanship or material and will be replaced or repaired without cost to the owner, provided the equipment or parts are returned postage-paid to the factory in Wrightsville, GA. Shipping back to the owner will be via UPS ground service except when air or special method of return is specified by the owner, in which case shipping will be freight collect.

This warranty does not include labor charges incurred in the removal of component parts, service calls, or damages resulting from improper installation, improper operation, or problems caused by any repair, alteration or modification of the scoreboard not performed by Electro-Mech.

Equipment which is subjected to accident, neglect, abuse, misuse, or natural disasters, including but not limited to fire, wind, lightning, or flood, is not covered by this guarantee.