

The purpose of this manual is to explain how to install and maintain the Electro-Mech Model LX7406 Indoor Locker Room Clock. Operation of the clock is covered in the manual that ships with the control console for the main scoreboard display.

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BEST PRACTICES FOR PERSONAL SAFETY AND PRODUCT CARE

Thank you for choosing Electro-Mech products for your athletic facility. We hope you will be pleased with the performance and appearance of your locker room clock. The information in this document will help you maintain the equipment in its best condition.

Receiving Your Locker Room Clock

A locker room clock cabinet typically ships in a cardboard box. It is important to inspect the packaging for damage when the cabinet arrives — *before signing any paperwork telling the trucking company that you have received the clock in good condition*. If damage has occurred to the packaging, then damage may have occurred to the clock. Where you find dents, scrapes, or holes in the packaging, peel back the cardboard to expose the cabinet. Make notes on the paperwork provided by the trucking company before accepting delivery. If the damage appears to be severe, refuse the shipment. Contact Electro-Mech as soon as possible if you suspect shipping damage.

We recommend keeping the locker room clock cabinet in its packaging until the day of installation. It is important to keep the box dry while the clock is inside. Wet cardboard can adhere to the surface and damage the finish.

Conditions of Installation and Use for an Indoor Locker Room Clock

This locker room clock display is designed for installation and use in a dry environment. Do not attempt to install or operate a locker room clock outdoors or in a wet location.

An indoor locker room clock display is typically attached to a locker room wall. Accordingly, the cabinet includes keyhole slots for hanging the display on lag bolts. (This document uses the term "lag bolt" to generically represent whatever fastener is best suited for the type of structure on which the clock display will hang – bolts, hooks, nails, etc.) Whatever method you choose for hanging the display, it is important to make sure the wall and other materials can support the weight. Vibration may also be a factor in selecting mounting techniques for locker room clocks.

In its standard configuration, the locker room clock display receives power through its detachable power cord, which should plug into a 120 VAC electrical outlet. When the display is not in use, you should disconnect it from power. For this reason, we recommend installing a dedicated disconnect switch within sight of the locker room clock display. In the "off" position, the switch should isolate all load-carrying conductors (not the ground). This will help protect the locker room clock electronics from nearby lightning strikes and other power fluctuations that might otherwise travel along the power cables.

PRODUCT SPECIFICATIONS

General Description:

- Model LX7406 is an electronic scoreboard designed for permanent installation indoors. The purpose of Model LX7406 is to display timing information in the locker room during games or practice.

Standard Package Includes:

- One scoreboard cabinet
- One detachable power cable for standard configurations
 - * Note: For configurations with concealed wiring, attach power and data cables to terminal blocks inside the cabinet.
- One stereo plug tip

Cabinet Dimensions and Weight:

- 23 in (W) x 10 in (H) x 4 in (D), 12 lb

Cabinet Construction and Finish:

- The cabinet is formed from sheet aluminum and finished with black enamel paint. Optional vinyl accent striping is available in eighteen standard colors.

Overview of LED Display Circuit Boards:

- Red LEDs (light emitting diodes) mounted on PCBs (printed circuit boards) form all lighted digits. The illuminated PCBs are mounted behind the face of the scoreboard cabinet. The face allows the epoxy shells of the LEDs to protrude, maximizing viewing angle while providing impact-absorbing protection from contact with stray balls and other flying objects. The LEDs may be dimmed to reduce glare during night games. They are rated for 100,000 hours of use.

Display Features:

- 4-Digit Period Clock, 6 inches tall, shows Time in MM:SS up to 99:59, counts up or down, can show Tenths of Seconds during the final minute of a down-counting Period, can show HH:MM in Time of Day Mode

Additional Standard Scoreboard Features:

- All serviceable components accessible from the front of the cabinet
- Integrated keyhole slots for hanging the display

Optional Equipment and Features:

- Data cable for hard-wired installations
- ScoreLink RF communications system for wireless data transmission
 - * Receiver must be positioned with line of sight to transmitter
- MP-series control console
- Hard carrying case for control console and accessories

Power Requirements:

- The LX7406 locker room clock requires one circuit providing 0.3 amps, 120 VAC, 60 Hz.
- The detachable power cord shipped with standard configurations must be plugged into a standard (NEMA 5-15R) power receptacle.
- Electro-Mech recommends installing a dedicated breaker to control power to the locker room clock.

Mounting Requirements:

- Locker room clocks are designed to be mounted on a wall. The cabinet includes two keyhole slots in the back to accept lag bolts with a maximum shaft diameter of 3/8 inches.
- Lag bolts should be spaced 18 inches apart from center to center.

Safety Listing, Support, and Warranty Information:

- All LX-series scoreboard displays are ETL Listed to UL Standard 48 for Electric Signs.
- Electro-Mech offers technical support at no charge over the phone or via the Internet for the life of the product.
- The standard limited warranty covers factory labor on parts returned to Electro-Mech within five years of the scoreboard's date of invoice.
- Additional support plans are available.
- The complete standard warranty statement is included near the end of this document available.

PLANNING YOUR SCOREBOARD INSTALLATION

A good plan is important to the success of any project, and installing a locker room clock is no exception. An important first step in planning for your locker room clock is determining the optimal location. Key factors here are visibility and accessibility.

By "accessibility" we mean the ease with which you can get people, equipment, cabling, etc. to the locker room clock display during installation, as well as ease-of-access for future service. If you position a clock so that using a lift or ladder to reach it is impractical, you will almost certainly add cost to the installation and to service calls.

By "visibility" we mean the ease with which players, coaches, and/or the scoreboard operator can see the display. Most locker room clock displays are mounted on locker room walls or other structures. Because every sports facility is unique, there is no one-size-fits-all way to describe the perfect locker room clock location. We can tell you that the vertical placement of a clock should be high enough to give players and coaches a clear line of sight over the heads of others but low enough to prevent them from straining their necks. For safety, you will want to keep the bottom of the cabinet at least eight feet above the floor (to prevent people from smacking their heads against it).

For some indoor facilities, it is important to make sure people cannot – accidentally or intentionally – interfere with the locker room clock display or cables connected to it. It is advisable to keep the display away from direct exposure to showers or other sources of moisture.

If you are planning for the construction or renovation of a new facility, then you will likely have more options for locating your locker room clock. In addition, you may be able to choose helpful positions for electrical outlets, plan for conduits, and control other details that will make installation, operation, and service easier. Your scoreboard sales rep should be able to answer questions and offer advice that will help you with these plans.

If you are adding this locker room clock to an existing facility, your options may be more limited. In some cases, we can modify the clock cabinet to meet special needs. An obvious example would be accommodating power entry through the back of the cabinet rather than via the standard power cable on the side. These sorts of details must be worked out prior to the release of a scoreboard order. Your sales rep can guide you through the process.

The sections that follow in this document primarily discuss the details of the mechanical and electrical installation of a single room clock. If your project includes multiple clocks, scoreboards, or other electronic displays, please check with your scoreboard sales rep to make sure you have any project-level documentation you may need.

Before You Spend Your Time and Money...

Please keep in mind that the dimensions and other details referenced throughout this document are specific to the standard configuration of this particular locker room clock model. Before purchasing materials, running cabling, etc. you should verify with the factory that you have the right documentation for your unique project.

It is possible that a government agency, such as your local city council, will require a building permit or other documentation and approval forms related to the installation and operation of your shot clock displays. In some cases the installation plan may require a stamp from a locally licensed Professional Engineer (P.E.).

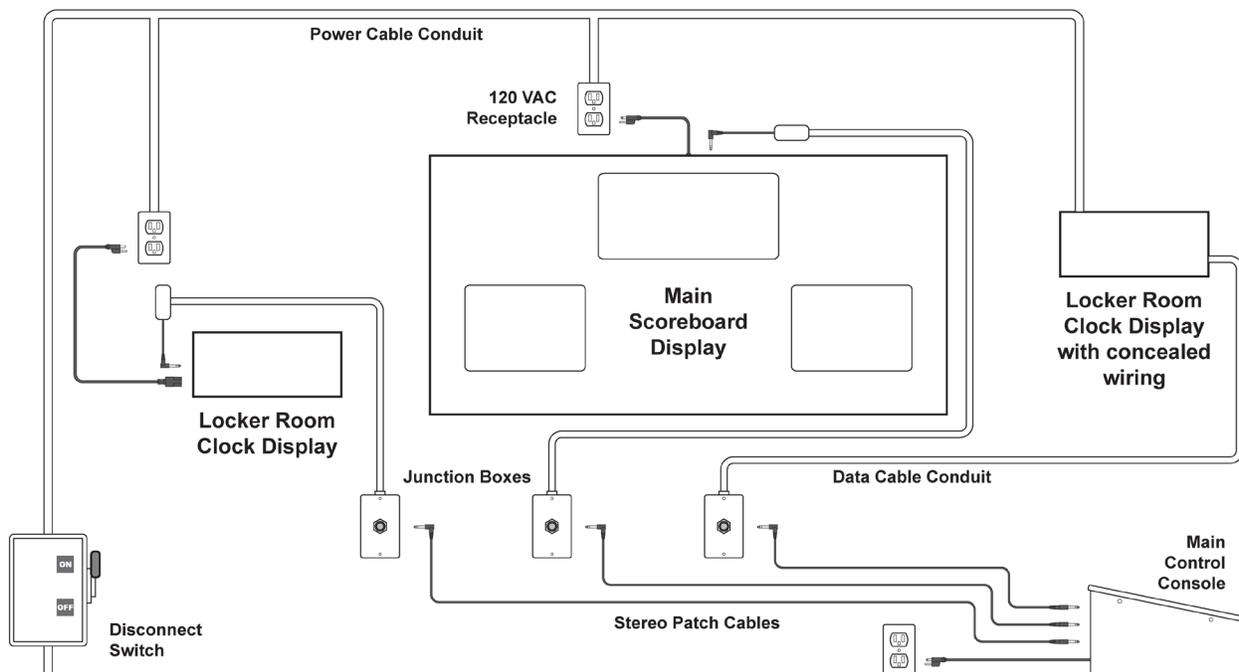
ELECTRICAL INSTALLATION

This section of the manual provides information that is important for locating power receptacles, running cable, planning for conduit, and other steps needed in preparation for bringing power and data to a locker room clock display. The final hookups for power and data will happen after the mechanical installation, but it is wise to plan for key pieces of the electrical installation prior to physically mounting the cabinet.

If your total scoreboard package includes other special accessories such as a sound system, electronic message center, or video display, there may be additional cabling and conduit needed to support this equipment. Please consult the documentation provided with these items.

The standard configuration of this locker room clock includes a power cable that can be plugged into a socket on the side of the cabinet. Input and output ports for data are located here as well. For concealed wiring configurations, power and data cables enter the cabinet via cutouts in the back. At the factory, it is possible to relocate these connection points to accommodate special needs. Let your scoreboard sales rep know about any custom requirements BEFORE we begin building your cabinets.

Overview of Electrical Connections



Power Considerations

In standard configuration, each locker room clock display requires a standard (NEMA 5-15R) AC power receptacle providing 120 VAC at 60 Hz. We recommend providing a disconnect switch to kill power to this receptacle when the clock is not in use. Here we will assume that the receptacle is available, or that power is being supplied directly via a concealed wiring configuration. A Model LX7406 locker room clock draws a maximum of 0.3 amps.

Junction Boxes and Data Cable

In the unusual situation that your locker room clock includes a ScoreLink wireless communication system, your work is done here. Skip to the next section.

A standard locker room clock usually acquires data as it is daisy-chained from the main scoreboard display. However, some situations may require one or more junction boxes,



which you should permanently mount to provide a stable point of termination for the data cables. The idea is to connect the clock to a junction box via a patch cable. So the junction box will need to be mounted near the clock (usually no more than 10 feet apart). In many gyms, junction boxes are concealed inside a larger floor box. They can be flush mounted on a wall, externally mounted on bleachers, or positioned anywhere else that is convenient. Choose a location that is protected so that the junction boxes and cables are not likely to be stepped on, tripped

over, or have liquid (or anything else) spilled on them.

It is also important to label your junction boxes. The connectors used for scoreboard data look very much like the type used in some audio systems. Plugging audio devices into a scoreboard data line can damage the scoreboard system.

Each junction box ships with a length of cable soldered to the stereo socket and tucked inside the box. There should be no need to solder cable to this socket during the installation. Instead, splice the wires from the data cable to the pigtail inside the junction box, matching colors. The wires in the pigtail are 22 AWG, and the cable should use the same size conductors. The installer must



provide wire nuts, crimp splices, or other means to connect the wires.

The splice point should stay inside the junction box. That is, you want to feed the long run of data cable into the box rather than pulling the pigtail out. Electro-Mech provides a strain relief on one side of the junction box to secure the cable. You may choose to connect conduit directly to the junction box, in which case the strain relief will not be needed. The junction box is designed to accept 3/4-inch conduit fittings.

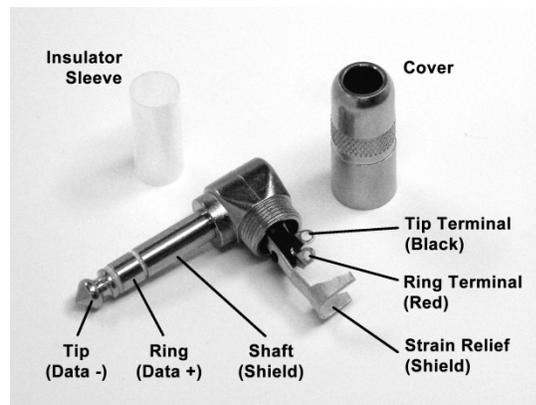
We recommend running data cable in conduit from the junction boxes to the shot clock displays — especially where the cable would otherwise be exposed. You should never run data cable in the same conduit as power cable. Having more than one run of scoreboard data cable in a single conduit is perfectly fine.

One more warning about data cable: Never split or branch the cable. The current loop signal we use to transmit data to the scoreboard and shot clock displays will behave unpredictably if it is divided between two destinations. There are other options for getting synchronized data to two locations, including daisy chaining — which will be discussed below. If your facility calls for a more complicated cabling plan, it is best to work out the details with your scoreboard sales rep prior to installation.

Stereo Plug

In standard configuration, data enters the locker room clock cabinet through a port located along the side. There are two common methods for bringing the last few feet of data cable to the clock. One method involves installing a junction box on the wall or other structure near the display. From here you can run a patch cable to the shot clock's data input port. The standard clock package does not include extra junction

boxes and patch cables for this type of cable routing. However, the materials are readily available from Electro-Mech.



The other method requires the right-angle stereo plug assembly, which Electro-Mech provides with all hard-wired indoor scoreboard packages. In the case of locker room clocks, there will be two plug assemblies to terminate the two cable runs required. The assembly consists of the main plug body, an insulating sleeve, and a cover.

Connecting data cable to the stereo plug requires soldering to two terminals. Slide the cover and sleeve over the data cable before soldering. The terminal nearer the center of the plug body connects to the tip of the socket. The black wire from the data cable should be soldered to this terminal. The terminal that extends further from the center of the plug body connects to the ring of the plug. Solder the red wire here. The strain relief tabs are connected to the shaft of the plug. When you bend the tabs around the data cable, they should be in contact with the shielding or the bare drain wire.

Slide the insulator sleeve over the terminals and screw the cover in place to complete the assembly. Now you will be ready to plug the data cable into the port at the top of the shot clock cabinet when it is installed.



MECHANICAL INSTALLATION

This section of the manual describes options for installing locker room clock cabinets. If your scoreboard project includes customizations or requires other special mounting considerations, please contact Electro-Mech to request details specific to your project. If you have unique requirements and would like to change the position or size of our mounting hardware to accommodate them, we can probably help you out. But we need to find out BEFORE we start building the cabinet. Let your scoreboard sales rep know about any special needs as early in the process as possible.

Additional Materials and Tools

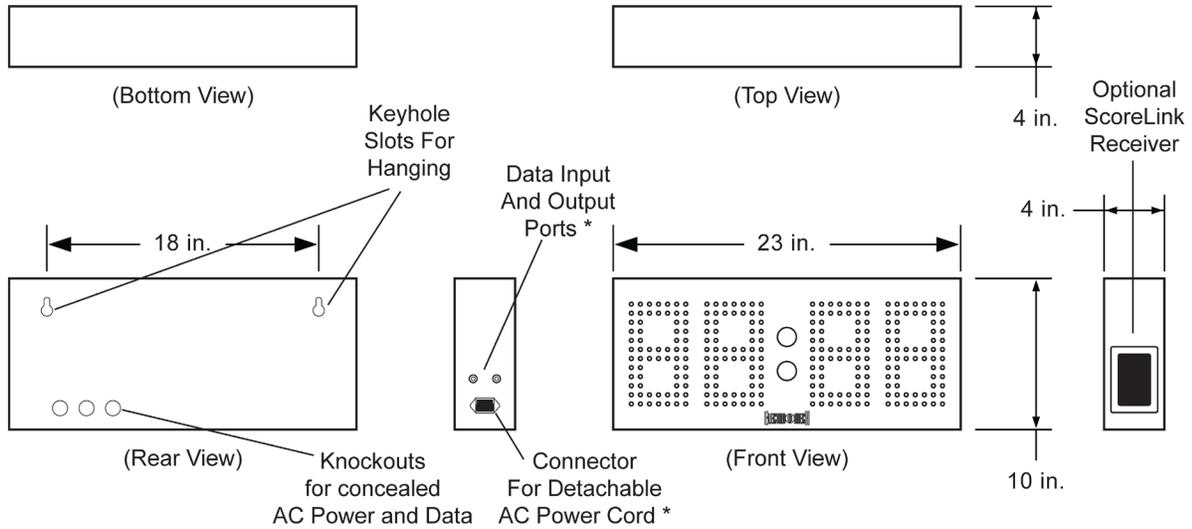
Most locker room clock displays are installed on locker room walls. Each locker room clock cabinet includes a set of keyhole mounting points in the back to facilitate this type of installation with the back of the display flat against a wall. Other techniques may be more appropriate for hanging the display on other structures. However, for the sake of clarity and brevity, we will assume a wall. We will further assume that the wall is capable of supporting the weight of the scoreboard cabinet and any accessories to be mounted with it.

The wall could be made of cinder blocks, framed with wood and covered in drywall, or constructed any number of other ways. Because different fasteners are appropriate for different walls, we cannot specify a particular type of fastener. As previously indicated, this document uses the term "lag bolt" to generically represent whatever fastener is best suited for the type of structure on which the scoreboard display will hang. To use the mounting tabs provided with the scoreboard, you will need two such lag bolts. The keyhole slots stamped into the back of the display allow for a bolt diameter of 3/8 inches or less.

In addition to the wall and the two lag bolts, this document also assumes the installer has access to tools and skills for...

- Working at the height designated for positioning of the scoreboard display
- Anchoring the lag bolts
- Lifting the scoreboard cabinet into position

Below are the standard dimensions of an LX7406 locker room clock. Lag bolts for hanging the clock should be placed 18 inches apart from center to center.



* The concealed wiring configuration of LX7406 does not include data ports or a power connector on the side.

TESTING, OPERATION, AND ONGOING CARE

After all power, data, and other connections are in place, it is time to test the locker room clock. Apply power to the locker room clock display first. Although there is no harm in powering the control console first, powering the clock first should result in the numeric displays remaining blank. Seeing any LEDs illuminated on a locker room clock display prior to the availability of data from the control console would indicate a problem inside of the locker room clock cabinet.

Next, power up the control console. For wired setups, connect any stereo patch cables to the data output ports on the back of the control console. The other ends of these patch cables are typically plugged into junction boxes, but may be plugged directly into the data input port on the side of the locker room clock.

The locker room clock display should begin showing data within a few seconds, displaying the same information as the clock on the main scoreboard display. The console buttons that control the main scoreboard clock also control the locker room clock. For more details about how the control console works, consult the documentation that ships with it.

Scheduled Testing and Maintenance

The locker room clock does not require scheduled maintenance procedures. However, it is important to check for problems prior to a game. We recommend running through the tests described above between two and four weeks prior to the start of a season (or anytime you plan to use the locker room clock after a gap of more than a month). During the season, test out the locker room clock the day before each game.

After the Game, and After the Season

Whenever you are not using your locker room clock, use the disconnect switch to cut power to the display. You should unplug the control console from its power source and from the data cables as well. It is not necessary to take steps beyond this, even if the locker room clock will not be used for several months.

MAINTENANCE

We hope your scoreboard system provides years of trouble free service. In the event of a problem, the material that follows will provide some information about contacting technical support as well as some details about the parts inside your scoreboard display.

Contacting Technical Support

Our support staff is available via phone or e-mail Monday through Friday 8:00 through 5:00 Eastern. Our web address and phone number is printed at the bottom of this page. When contacting Electro-Mech for support, it helps to have the scoreboard model (**LX7406**) handy as well as the version of the software running on your control console. If your control console includes an LCD display, you will see the software version flash briefly (for about three seconds) on the screen when you first apply power. Whether you have the LCD display or not, you should find on the bottom of the control console a product label which gives the software version.

If you are reading this manual in search of help with a different scoreboard model, for outdoor scoreboards, you can find the model number printed on a metal plate attached to the back of the scoreboard cabinet near where the power enters. For indoor scoreboards, the model number is usually printed on a label at the top center of the cabinet near the attachment point for the power cable.

If you are troubleshooting a problem, the most important information to have is an exact description of which parts of your scoreboard system are working and which parts are not working. The best person to make contact with our support team is someone who has seen the problem first hand. Better yet, give us a call when you are there at the scoreboard display and can walk through a few simple tests with one of our technicians.

Scoreboard problems are rarely so complicated that diagnosing them requires skills beyond using a screwdriver and a ladder. Similarly, replacing parts is straightforward process that does not require complex tools or special knowledge.

Parts Exchange

If, after working with our support staff, you discover that a part needs to be serviced or replaced, the next step is to send the part to Electro-Mech for repair. During the warranty period, we repair parts and return them via UPS ground service at no charge. We can ship parts via overnight service for an additional charge. For work that falls outside of the warranty terms, we can, upon request, provide an estimate of repair costs on returned parts before performing the work. The typical turnaround on repair work is less than three business days

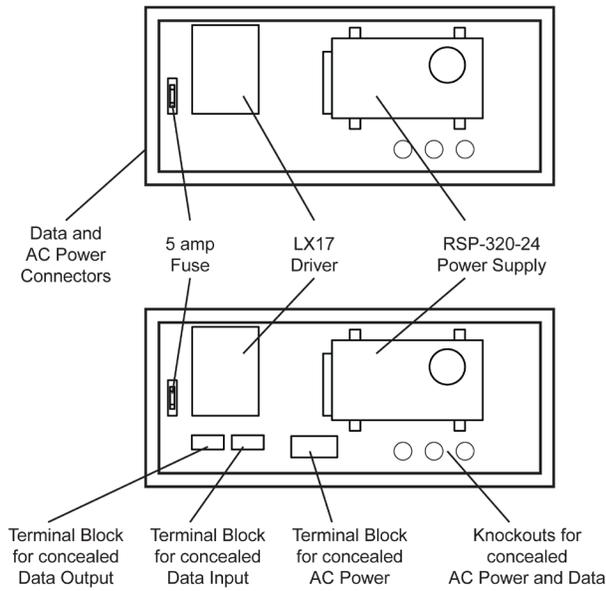
Electro-Mech maintains a supply of common parts for immediate shipment. Some customers choose to purchase new parts for immediate use and will later send old parts back to us to be repaired and returned as "backup" stock. In some cases our support plans include the option for shipping replacement parts to the customer once our service staff has identified a problem. The customer will then return the damaged part after receiving the replacement. Electro-Mech requires a valid credit card number before initiating a shipment of this type. We do not apply charges to the card unless the customer does not return parts within ten days or if the returned parts require work outside of our warranty terms.

Our shipping address:

Electro-Mech Scoreboard Co.
72 Industrial Blvd.
Wrightsville, GA 31096

Location of Serviceable Parts

All serviceable components are accessible by removing the face of the locker room clock cabinet. The next section of this document discusses removing and replacing the illuminated PCB assembly.



Standard configuration of LX7406 includes connectors on the left side for a detachable AC power cable and data cables.

Concealed wiring configuration of LX7406 includes terminal blocks for connecting the cables for AC power and data.

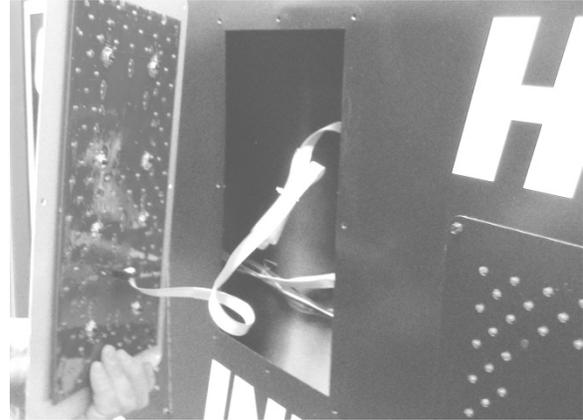
* In the unusual situation that your locker room clock includes a ScoreLink wireless data kit, the receiver unit will be accessible on the bottom right side.

Illuminated PCB Assemblies

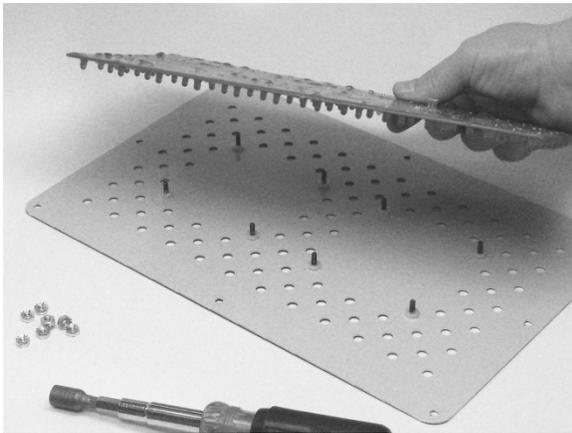
LED assemblies and circuit boards (but not individual LEDs) are field replaceable parts. Each LED is soldered to a PCB (printed circuit board) which is, in turn, attached to the metal face of the clock with machine screws. You will need a 1/4-inch nut driver to remove these screws.

Removing an LED Assembly, Step-By-Step:

- Disconnect power to the locker room clock cabinet before performing any service work.
- Remove the machine screws from the face of the display, leaving for last one of the screws along the top.
- Support the face piece with one hand as you remove the final screw.
- Rotate the face so that you can see the PCB behind it and the cable connections along the back side.
- Unplug the ribbon cables, and, if present, the power cables from the PCBs.
- Set the LED assembly aside and save the screws for later.



If your purpose in removing the LED assembly was to provide access to the components behind it, you may skip the next part about removing and replacing the LED printed circuit board.



The LED circuit board is held to the face by several nuts, which you can remove using a 3/8-inch nut driver. Be careful to keep the whole assembly right side up when you return it to the locker room clock cabinet.

Power Supplies and Fuses

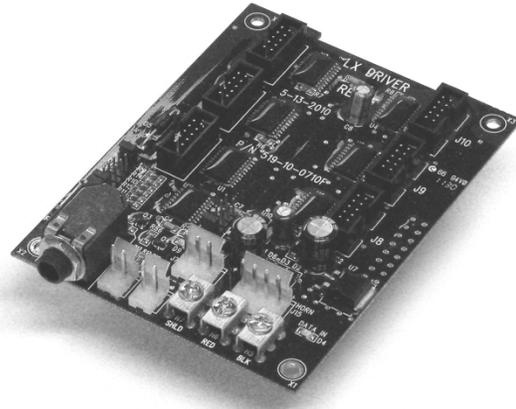
In standard configuration, the AC power socket on the side of the locker room clock serves as the point of entry for power. In the concealed wiring configuration, AC power enters through the cutouts on the back of the clock cabinet. In this case, the installer brings the power cable to a terminal block, accessible by removing the digit assembly from the front of the cabinet. From the power terminal block, or from the back of the AC socket, the line side of AC passes through a 5-amp fuse on the way to the Mean Well RSP-320-24 power supply module. This is an AG style fuse, which should only be replaced with a fuse of the same style and rating.

Power connections are made along a row of screw terminals on one side of the power supply module. The Mean Well RSP-320-24 module in the cabinet provides 18.9 VDC to the illuminated digits and driver. If you replace a power supply module, check the output voltage to make certain it is set to 18.9 VDC.



LX Driver

LX Driver circuit boards do the work of interpreting data sent from the control console to the scoreboard display. Using that information, the drivers decide which of the LEDs should be illuminated and which should not. The single LX Driver in a locker room clock decodes data representing each digit used in the scoreboard. The driver sends signals to the LED circuit boards via ribbon cables. The table below lists the names and purposes of the various connectors on the LX Driver.



LX17 Driver Functions	
Connector	Function
J2 (Data In)	N/A (or rarely from ScoreLink)
J3 (Data Out)	To Data Out Socket
J4 (Word 1 Low)	Minutes Ones
J5 (Word 1 High)	Minutes Tens
J6 (Word 2 Low)	Seconds Ones
J7 (DC Power In)	18.9 VDC
J8 (Word 3)	N/A
J9 (Word 2 High)	Seconds Tens
J10 (Word 4)	N/A
J15	N/A
H5/BLK (Data In)	From Data In Socket
H6/RED (Data In)	From Data In Socket
H7/SHLD (Data In)	From Data In Socket
Jumper Pins	X = Shunt Installed
H13 (J4/J5 Blanking)	
H16 (J4/J5 Blanking)	X
H14 (J6/J9 Blanking)	
H17 (J6/J9 Blanking)	
H15 (Not Used)	
H18 (Test Prog)	
H3 (Horn2 No Dim)	X
H11 (Horn1 No Dim)	X
H19 (Not Used)	
H1 (Memory Ret.)	
H2 (Group +1)	X
H4 (Bank +2)	
H12 (Bank +1)	X

LIMITED WARRANTY STATEMENT

**Electro-Mech Scoreboard Company
Standard Equipment Warranty and Limitation of Liability
for Scoreboards and Accessories Sold in the United States**

Warranty Coverage

Electro-Mech warrants to the original end-user that the Equipment will be free from Defects (as defined below) in materials and workmanship for a period of five years from the date of invoice. Electro-Mech's obligation under this warranty is limited to, at Electro-Mech's option, replacing or repairing any Equipment or Part thereof that is found by Electro-Mech not to conform to the Equipment's specifications. Any defective Part must be returned to Electro-Mech for repair or replacement. Equipment determined not to conform to specifications will be repaired or replaced and returned to purchaser with standard ground service transportation charges prepaid. Replacement Parts or Equipment will be new or serviceably used, comparable in function and performance to the original Parts or Equipment, and warranted for the remainder of the warranty period. Purchasing additional Parts or Equipment from Electro-Mech does not extend this warranty period.

Defects shall be defined as follows. With regard to the Equipment (excepting LEDs), a "Defect" refers to a material variance from the design specifications that prohibits the Equipment from operating for its intended use. With respect to LEDs, "Defects" are defined as LEDs that cease to emit light. The limited warranty provided by Electro-Mech does not impose any duty or liability upon Electro-Mech for partial LED degradation.

This limited warranty is not transferable.

Exclusions from Warranty Coverage

The limited warranty provided by Electro-Mech does not impose any liability upon Electro-Mech for:

- Damage caused by the unauthorized adjustment, repair, or service of the Equipment by anyone other than personnel of Electro-Mech or its authorized repair agents.
- Rental fees or other costs associated with lifts, cranes, or other tools and services used to access the Equipment.

- Damage caused by the failure to provide a continuously suitable environment, including, but not limited to (i) neglect or misuse (ii) a failure or surges of electrical power (iii) any cause other than ordinary use.
- Damage caused by vandalism, fire, flood, earthquake, water, wind, lightning, or other natural disaster, or by any other event beyond Electro-Mech's reasonable control.
- Costs associated with replacement of communication methods including but not limited to, wireless systems, copper wire, fiber optic cable, conduit, or trenching for the purpose of overcoming local site interference.
- Any statements regarding products or services made by salesmen, dealers, distributors, or agents, unless such statements are in a written document signed by an officer of Electro-Mech.

Limitation of Liability

In no event shall Electro-Mech be liable for any special, consequential, incidental, or exemplary damages arising out of or in any way connected with the Equipment or otherwise, including but not limited to damages for lost profits, cost of substitute or replacement equipment, down time, lost data, or injury to property, or any damages or sums paid by the purchaser to third parties.