LED

Sign Module

Assembly Manual

6/14/2002 3:10 PM
# Table of Contents

Table of Contents .................................................................................................................. 2

Overview .................................................................................................................................. 3

LED Module Mounting ........................................................................................................... 4

LED Power Wiring .................................................................................................................. 5

Incoming A/C Wiring ............................................................................................................... 6

- 300 Watt Switching Power Supply ....................................................................................... 6
- 8 Line Sign Controller ........................................................................................................... 6
  - 120 VAC 60Hz Wiring ....................................................................................................... 6
  - 240 VAC 60Hz Wiring ...................................................................................................... 6

Data Cable Wiring .................................................................................................................... 7

- LED Starter Board Connection ........................................................................................... 8
  - Single Sided ....................................................................................................................... 8
  - Double Sided .................................................................................................................... 8
- Controller Connection ......................................................................................................... 8
Overview

Using our off the shelf LED modules, you can custom build your changeable animated sign into the walls of your building, on a bus, on an airship or in or on virtually any other structure you can imagine. The LED message center modules are made up of a matrix of LED's, allowing both text and graphics to be displayed. Wiring of power and the data connections is simple and straight forward. When the modules are mounted, they are grounded by two of the mounting screws. The power is distributed by attaching a buss bar metal strip, with holes in each end, horizontally between each module to the Power Screw terminal. Data reaches the sign via a 16 conductor ribbon cable connected to the starter board for each row of modules. To complete the data termination of each row of modules, a terminator board is installed on the right-hand end of each row of modules. Each side of a double sided sign is connected in parallel via ribbon cables with a connector in the middle for connection to the controller, and on each end for each side’s starter board.

That's it! We've made it as simple as possible.

Inside of a double sided 128 x 32 resolution sign
LED Module Mounting

The LED modules are normally mounted to a stamped out piece of metal. Patterns for stamping the panel out are available on our website. The panels can be mounted fixed, hinged, or removable, for easy maintenance or repair.

1. Start with the starter boards. Though they look just like the terminator boards, they can be identified by the black 16 pin connector mounted on the back of each board. Mount them along the left-hand edge of your sign, using the two mounting holes in each board, with the black 16 pin connector to the back left-hand edge. The connector will have to be accessible from the back, to connect ribbon cables to the sign controller. Make sure they fit tightly against one another vertically, and are in a straight inline. This is the basis for your entire sign.

2. Next, start installing LED modules, one column at a time. Make sure all four pins of each interconnection connector(seven per board), mate with the sockets of the previous(left-hand) board. Mount each LED module with the center three holes for now. The left-hand center, and middle center hole, are the power supply ground connection for the LED Module, so make sure both of these screws on every LED module are grounded. Make sure the +5VDC power supply connection is accessible from the back to connect to the positive of the +5VDC power supply. Again, make sure the boards are tight against one another, and are horizontally straight.

3. Repeat Step #2, until all LED modules are installed.

4. Finish/terminate each row of your sign with an LED terminator board. The terminator does not have the 16 pin black connector, and has 5 sets of four gold pins on the right-hand edge of each board. Mount them using the middle two mounting holes.

5. Finish securing the boards. Loosen and adjust each LED module, until all of the boards are in a nice straight row, and are aligned vertically as well. Now complete the mounting by installing an additional six screws, in each LED module, and an additional two screws in each LED Starter and Terminator.

6. Make sure there are no metal clippings, or anything else conductive laying in or on the boards!
LED Power Wiring

Be sure to use at least 10 gauge 50V UL listed wiring.

1. If the panel that you are mounting the LED boards to is not metal, make sure the left-hand and center, middle, screw of each LED module is grounded to the negative of +5VDC power supply. If the panel you are mounting to is metal, make sure the panel is connected to ground (negative of the +5VDC power supply).

2. From the back, or inside of the sign panel, install one end of a power bus bar to the left-hand most LED module of each row, using an 8-32 x ½” screw. On the next column of LED modules, lift the non-connected end of the previous columns bus bar up to this columns +5VDC connection. Place a star washer on an 8-32 x ½” screw, place it through a new power bus bar, install a second star washer after the power bus bar, then place it through the existing power bus bar from the previous column, then into the +5VC connection of the LED module. Wait until all power bus bars have been installed before tightening the 8-32 screws.

3. Install a wire (10 gauge) from the +5VDC terminal of the power supply to the end of each row of the power bus bars. The 300 watt power supplies have three positive (+5VDC) & three negative (ground) screw terminals. Be sure to distribute your connections on all three sets of screws. I.E. two rows of the sign on each screw, etc..
Incoming A/C Wiring

**300 Watt Switching Power Supply**

The 300 Watt switching power supply will operate on 90-260VAC 50 or 60 Hz. Be sure to route the A/C wiring away from the +5VDC, Negative(Ground), and Ribbon cables.

1. Connect the incoming A/C to Pins 1 & 2 of the 300 Watt power supply. Make sure at least one leg of the incoming A/C is fused!
2. Connect the A/C ground to the chassis ground(Pin #3) of the power supply, and connect a small wire from the chassis ground(Pin #3) to the negative(ground – Pin 4, 5, or 6) of the power supplies output.

**8 Line Sign Controller**

The sign controller has to be wired for 120 or 240 VAC operation. There are five ¼” faston terminals, P1 – P5, located on the edge of the board.

**120 VAC 60Hz Wiring**

Connect the HOT leg(wire) to P1 & P3.
Connect the Neutral leg(wire) to P2 & P4.
Connect the Ground leg(wire) to P5.

**240 VAC 60Hz Wiring**

Connect the L1 leg(wire) to P1.
Connect the L2 leg(wire) to P4.
Install a jumper wire from P2 to P3
Connect the Ground leg(wire) to P5.
Data Cable Wiring

The data is sent to the LED modules from the sign controller via 16 conductor ribbon cable.

The connectors that go on the ribbon cable are just crimped on. The name of the connector is IDC, Insulation Displacement Connector. It is very critical that they are crimped on properly! When crimping them on the cable, they can be on either side of the wire, but must have the arrow on the side of the connector pointing towards the red wire of the ribbon cable. Installing the connectors on the ends of the ribbon cable is pretty straight forward. To install the connectors in the middle of the ribbon cable requires removing the snap in crimp piece, placing the cable in the connector, then re-installing the crimp piece, then crimping. Or the connector can be slid down the cable before installing the connectors on both ends.

After the connector is crimped on the ribbon cable, fold the ribbon cable back over the top of the connector, and install the strain relief. The strain relief prevents the wire from being pulled out of the connector, and also allows it to be locked in the mating connector on the board.
**LED Starter Board Connection**

**Single Sided**
Install a crimp on connector on the end of a piece of ribbon cable. Make sure it is oriented so that when plugged into the starter, it comes out towards the controller in the sign. Route the cable over to the controller leaving slack to allow the sign LED panel to open or close if mounted on a hinge. Make sure to route away from high voltage A/C wiring. Cut the ribbon cable with a pair of scissors about an inch longer than you need. You need the extra inch, because after the connector is crimped on, you have to fold it over to install the strain relief. Install the crimp on connector, facing up, but with the arrow facing the red line, so that once the strain relief is installed, it will be facing down, and should align with the controller connector.

**Double Sided**
Install a crimp on connector on the end of a piece of ribbon cable. Make sure it is oriented so that when plugged into the starter, it comes out towards the controller in the sign. Route the cable over to the controller leaving slack to allow the sign LED panel to open or close if mounted on a hinge. Make sure to route away from high voltage A/C wiring. Slide a crimp on connector on the cable, until it lines up with the proper row connector on the controller. Crimp the connector on, then without folding over the cable, install the strain relief so it will lock into the board connector. Finish routing the cable to the other end of the sign for connection to the starter boards on the other side of the sign. Cut the ribbon cable with a pair of scissors about an inch longer than you need. You need the extra inch, because after the connector is crimped on, you have to fold it over to install the strain relief. Install the crimp on connector, facing up, but with the arrow facing the red line, so that once the strain relief is installed, it will be facing down, and should align with the starter board connector.

**Controller Connection**
The connectors on the sign controller for the ribbon cables are marked R1A, R1B, R2A, R2B, R3A, R3B, R4A, R4B. The number after the “R”, is the sign row number(1 thru 4). The “A” or the “B” indicates which channel. On four line signs, only the “A” outputs are used. On terminal mode four line signs with the clock option, R4B is used to drive the clock.