

THE TRIMLINE SERIES

Model TL-2400 Series Numeric Marquees

*Operation Manual
Hour Minute and Seconds Timers*



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1.0 Description

The TL-2400 series LED numeric marquees, are our most cost effective numeric marquees. TL-2400 series marquees are available with 2.3" or 4" tall LED modules. 2.3" tall LED modules provide data visibility up to 125 feet away. 4" tall LED modules provide data visibility up to 200 feet away. TL-2400 series marquees use latched LED modules instead of multiplexed LED modules resulting in a brighter and more consistent display.

Standard units are constructed using high efficiency red LED modules, however optional green or yellow LED modules are available. Optional high-brightness red LED modules are also available for applications with high ambient lighting conditions.

Single line NEMA 1 units come in an attractive black anodized aluminum extrusion with 1/8" thick, Plexiglas display lenses. Single line NEMA 1 units mount via wall mount brackets or can be hung with chain or cable.

Multi-line NEMA 1 units are assembled using a different black anodized aluminum extrusion, or are assembled using a black painted steel box as is appropriate. In both cases 1/8" thick Plexiglas display lenses are used. Mounting options include cable, chain, unistrut, or wall mount brackets as appropriate for the individual unit.

Single and multi-line NEMA 12 units are constructed from 16 gauge steel with display windows constructed from 1/4" red or smoked Plexiglas. The windows are gasketed meeting NEMA 12 specifications. NEMA 12 enclosures are designed to be hung via 5/16" eye bolts or mounted by optional wall mount brackets, and are suitable for use in most industrial and factory environments. NEMA 12 enclosures can optionally be upgraded to NEMA 4 specifications. Optional stainless steel enclosures are also available.

Single line NEMA 1 units come with an industry standard six foot three prong line cord. A five pin Brad Harrison Micro-Change connector is provided for logic wiring. The mating six foot Micro-Change cable assembly terminated with pre-stripped wires is also provided.

Multi-line NEMA 1, single line NEMA 12, and multi-line NEMA 12 units have screw terminals provided within the enclosure for connection of 120VAC power and logic wiring.

2.0 General Specifications

Physical:	NEMA 1 black anodized aluminum extrusion or 16 gauge NEMA 1 painted steel box or 16 gauge NEMA 12 painted steel box or Optional NEMA 4 painted steel box or Optional Stainless Steel box Mounting via cable, chain, wall mount brackets, or unistrut
Power:	120VAC 60Hz, ½ AMP per six digits of display
Operating Temperature:	0° F to 135° F (-17° C to +50° C)
LED Display:	2.3" Tall 7-Segment L.E.D. Modules or 4.0" Tall 7-Segment L.E.D Modules Available in Red, Yellow, Green, or High Brightness Red Rated for 100,000 Hour (11.4 Year) Lamp Life Viewable from 125 feet for 2.3" Tall L.E.D. Modules Viewable from 200 feet for 4.0" Tall L.E.D. Modules
Operation:	RUN-UP, RUN-DOWN, and RESET inputs Inputs are Optically Isolated and Passive Jumper selectable 24VDC or 120VAC logic levels standard Switch selectable HH:MM:SS, HH:MM, MM:SS format Data retention for up to one week without power.
Terminations:	Industry Standard six foot three prong line cord and Brad Harrison Micro-Change Connector or Screw Terminals suitable for 16 AWG wire

3.0 Initial Inspection

Every Trimline marquee is carefully inspected, both mechanically and electrically, before shipment. Inspect the marquee for damage, which may have occurred in transit. If there is evidence of damage or the marquee fails to operate, file a claim with the shipper and notify American LED-gible Inc.

In any case where the damage occurs in transit, American LED-gible's obligations under warranty are dependent upon the customer's immediate notification of the shipper, so that an inspection can be made and a claim filed.

Note: Save the shipping materials for inspection.

4.0 Installation and wiring

Trimline series marquees can be purchased in many different enclosures and with several options that affect installation of the unit. Please check each installation section and inspect the actual unit purchased before making provisions for mounting or wiring the unit.

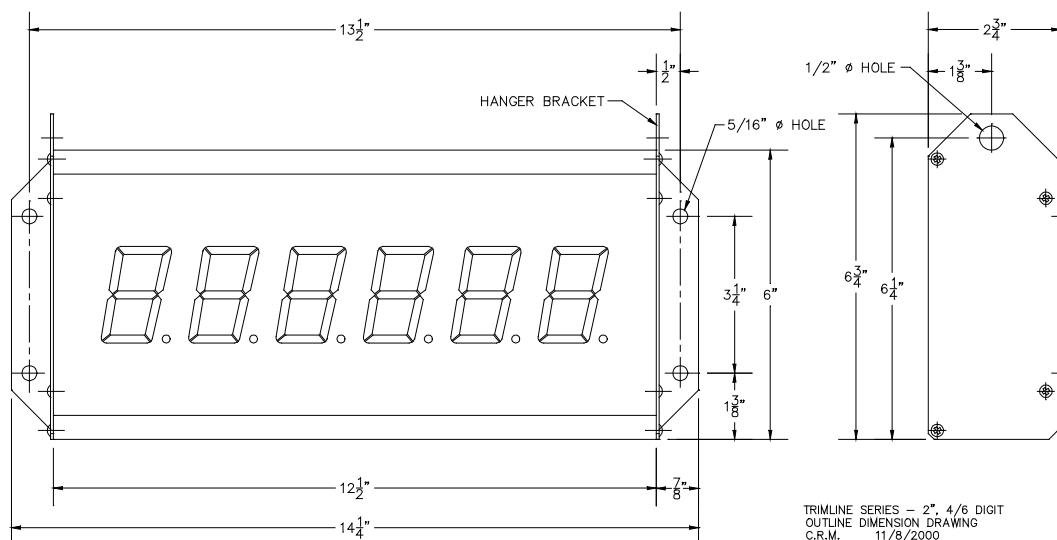
4.1 Mechanical Installation

The marquee should be suspended by cable, chain, unistrut, or mounted to the wall as appropriate for the purchased unit.

Marquees purchased with line cord and Micro-Change connector options are shipped without external connections or holes in the enclosure. An industry standard six foot, three prong line cord, and a six foot Micro-Change cable assembly is provided with the unit.

Marquees purchased without line cord and Micro-Change connector options are shipped without external connections or holes in the enclosure. The installer will have to punch holes in the enclosure as appropriate. ALI recommends running logic wiring in a separate conduit. Power and logic wiring is terminated within the unit on screw terminals appropriate for 16AWG wire.

Typical Model TL-242x-1x6



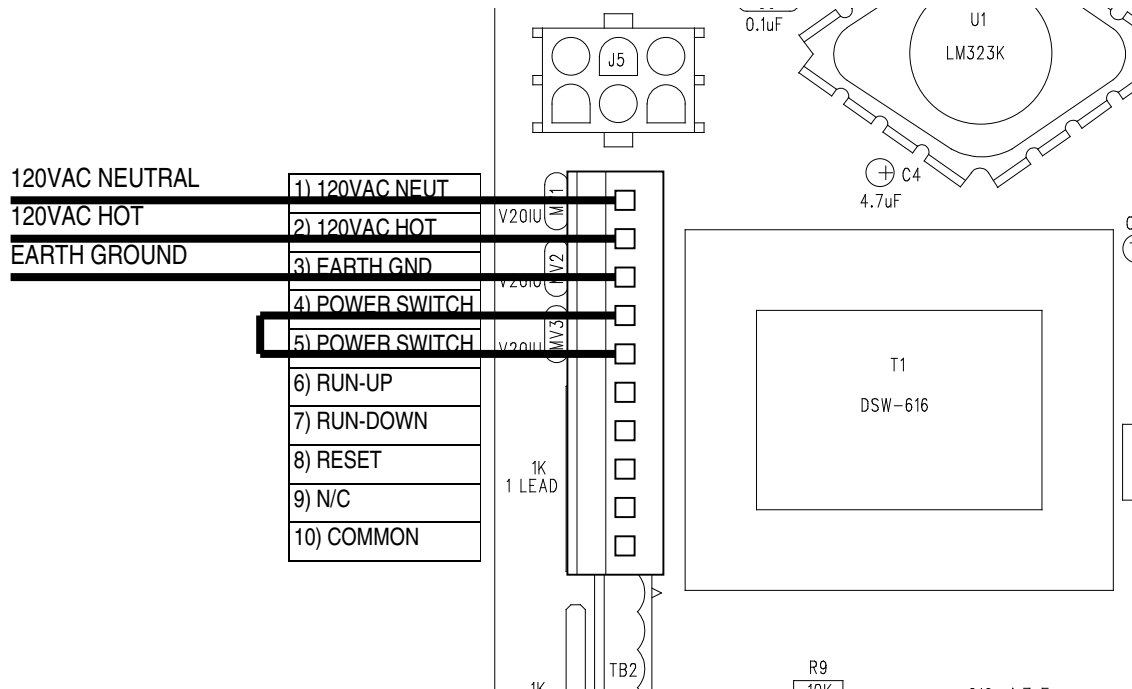
4.2 Electrical Power Installation

Bring the power and logic wiring to the marquee **separately** through conduit to avoid EMI noise problems. Power wires should be 16 AWG with 600 volt insulation rating.

Trimline units with the line cord option will simply need a standard 120VAC power receptacle located within six cable feet of the unit.

Trimline units without the line cord option provide screw terminals appropriate for 16 AWG wire within the unit. Typically the screw terminals on the Trimline marquee circuit board itself are used, however in some custom units, ALI may provide 120VAC power termination on DIN rail barriers or Cinch screw terminals as appropriate for the individual unit.

A typical Trimline 120VAC power connection label with typical 120VAC wiring illustrated is shown below.

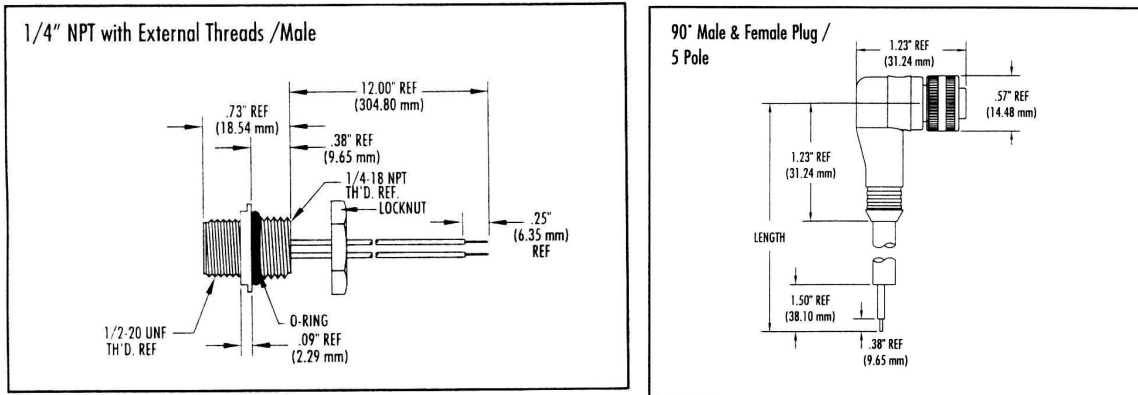


Bring 120VAC power to the unit and connect 120VAC Neutral to pin 1, 120 VAC Hot to pin 2, and Earth Ground to pin 3. A switch suitable for 120VAC power may be connected across pins 4 and 5 to control 120VAC power to the unit. Otherwise pins 4 and 5 of the power connector must be jumpered or the marquee will fail to operate.

4.3 Logic Installation

Bring the power and data communications wiring to the marquee *separately* through conduit to avoid EMI noise problems.

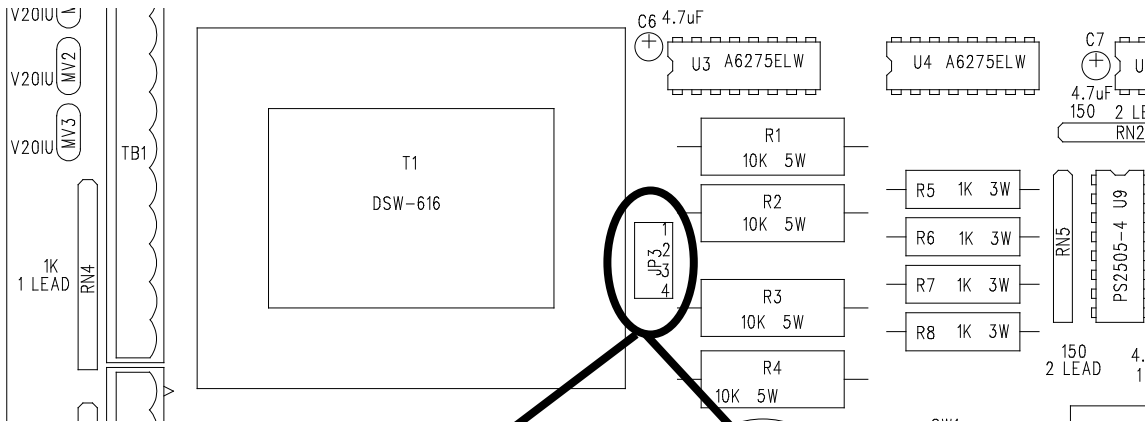
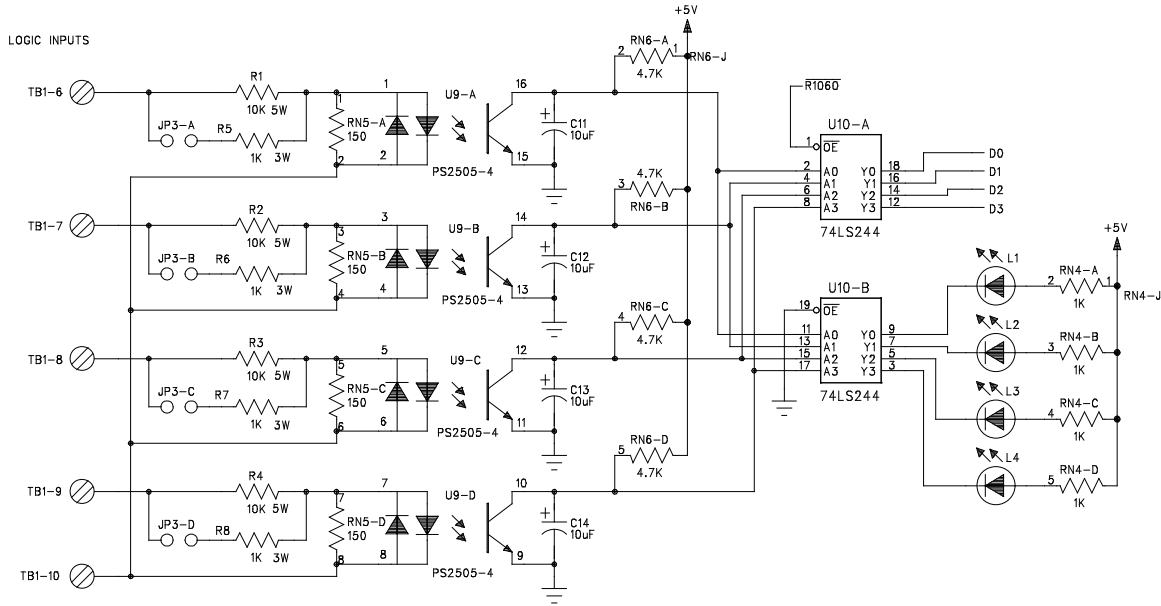
Trimline units with the Micro-Change connector option provide a Micro-Change connector diagrammed below.



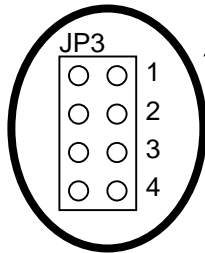
Trimline units without the Micro-Change connector option provide screw terminals appropriate for 16 AWG wire within the unit. Typically the screw terminals on the Trimline marquee circuit board itself are used, however in some custom units, ALI may provide logic termination on DIN rail barriers or Cinch screw terminals as appropriate for the individual unit.

Trimline Circuit Board Screw Terminal	Micro-Change Pin and Wire Color	Pin / Terminal Function
TB1 Terminal 6	Pin 1 Red / White	RUN-UP Logic Input
TB1 Terminal 7	Pin 5 Red / Black	RUN-DOWN Logic Input
TB1 Terminal 8	Pin 2 Red	RESET Logic Input
TB1 Terminal 9	Pin 4 Red / Yellow	Not Used
TB1 Terminal 10	Pin 3 Green	Logic Common

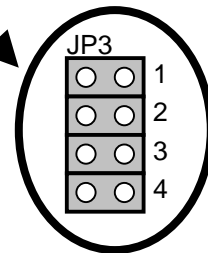
Trimline logic inputs are optically isolated and passive in nature. To assert any input, apply a voltage between Logic Common and the desired input terminal. 120VAC logic levels are selected by removing all four shorting jumpers from option header JP3. 24VDC logic levels are selected by installing all four shorting jumpers in JP3 as shown below.



**120VAC LOGIC
Jumpers Removed**



**24VDC LOGIC
Jumpers Installed**

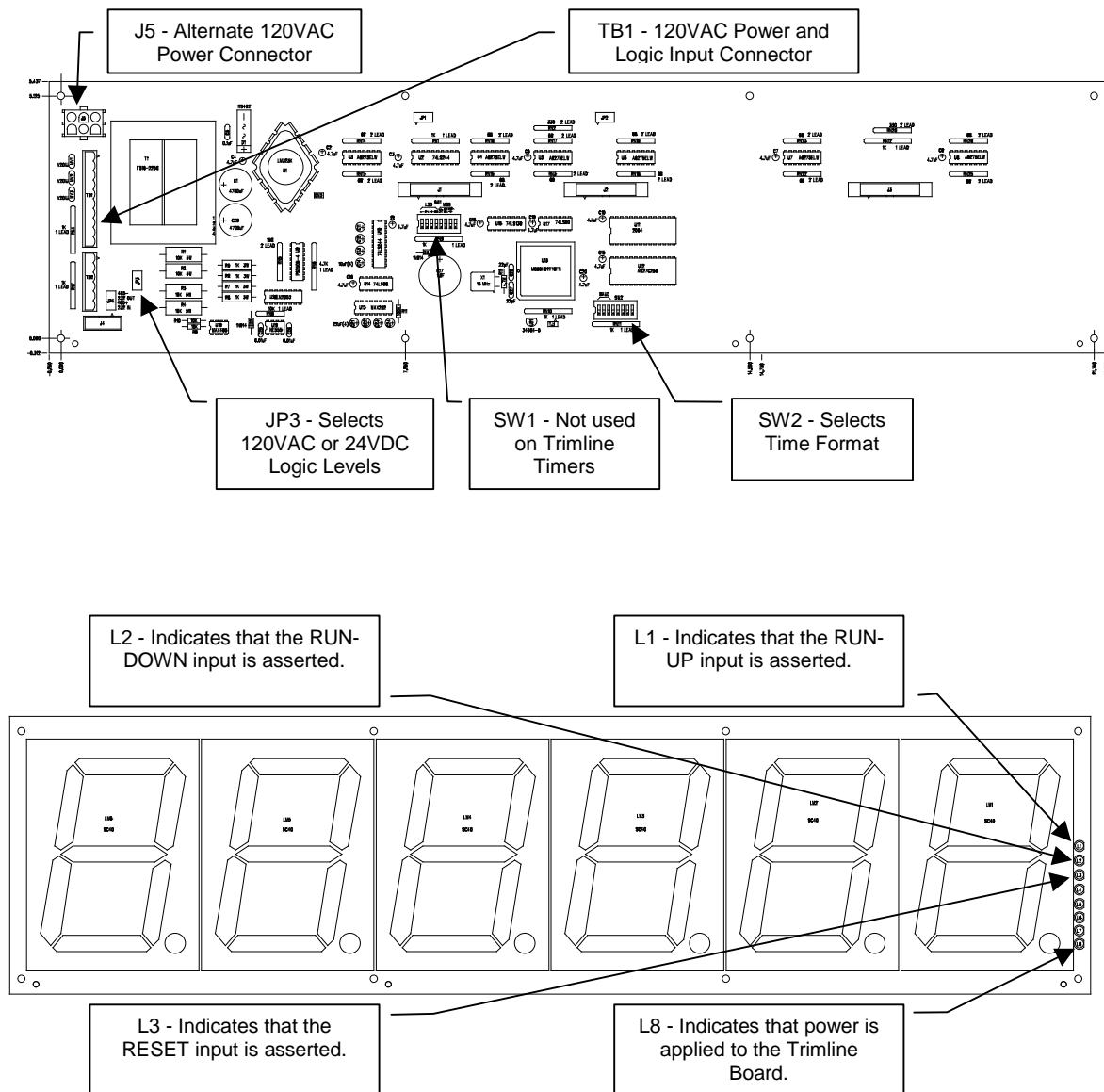


5.0 Configuration

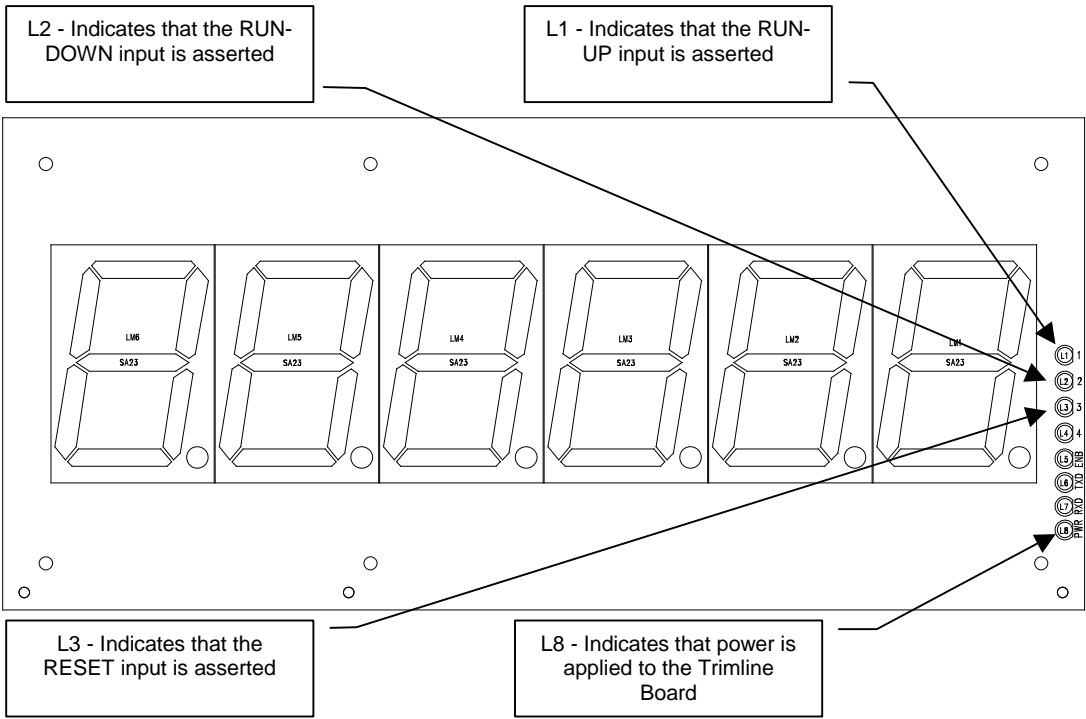
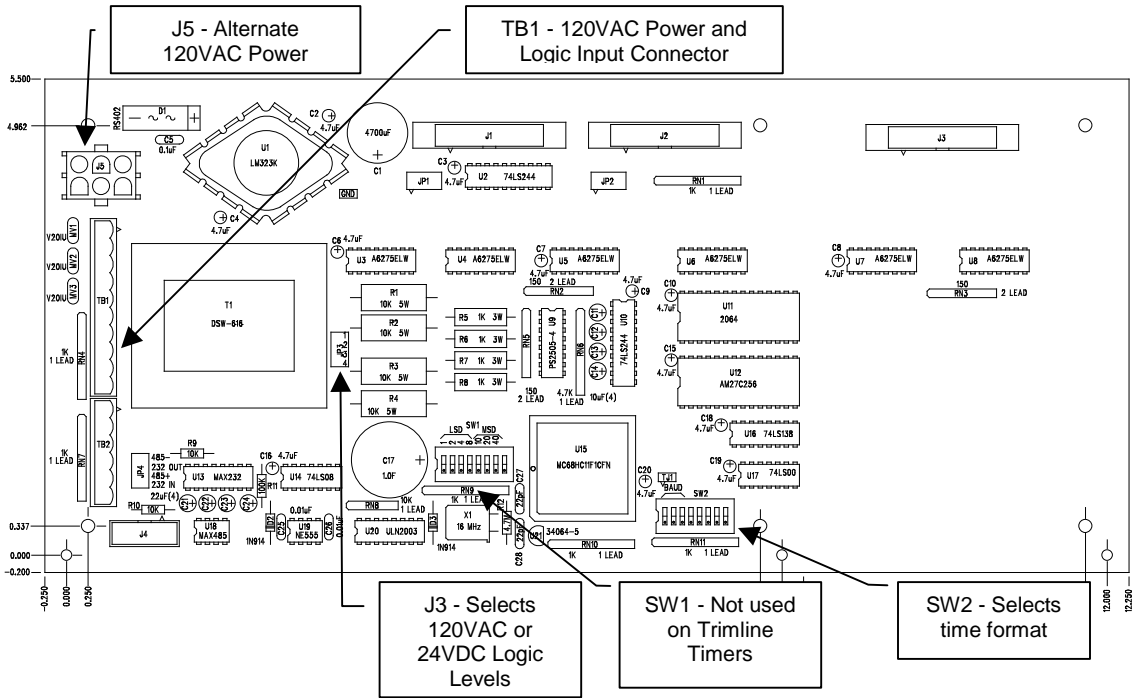
Before applying power to the marquee, take a few moments to become familiar with the Trimline circuit board. There are two versions of the board, 2.3" and 4.0"

The Trimline board has several indicator lamps that can be quite helpful when troubleshooting problems: L1 lights when the RUN-UP input is asserted; L2 lights when the RUN-DOWN input is asserted; L3 lights when the RESET input is asserted; and L8 lights when power is applied to the board.

AB-2057-400 4" Tall Trimline Circuit Board



AB-2057-200 2.3" Tall Trimline Circuit Board



5.1 Power on messages

After the electrical power has been connected in accordance with the instruction in the installation section, apply 120 VAC power to the marquee. The Trimline boards will go through a short power up sequence.

- 1) LED Segment Test - - - - -
- 2) LED Lamp Test **8.8.8.8.8.8.**

LED Segment Test:

Each LED segment will be lamp tested one at a time starting with segment A, working toward segment DP.

LED Lamp Test:

Each LED module will be lamp tested one at a time starting with the least significant digit, working toward the most significant digit.

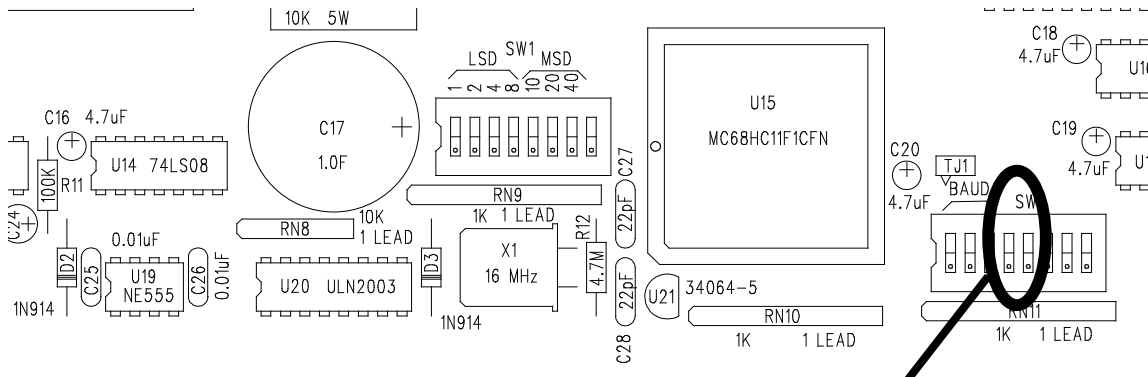
Then the Trimline boards will attempt to restore the last displayed value from Battery Backed up Ram. In the event that the Battery Backed up Ram has expired, the accumulated time value will be reset to zero.

Trimline timers can retain the accumulated time value for up to one week without power.

5.2 Configuring the Time Format

The TIME FORMAT of a Trimline board is set by switches 4 and 5 on SW2 as shown in the table below.

For example, to select MM:SS format, turn ON switch 4. Leave switch 5 in the OFF or OPEN position as shown below.



5	4	TIME FORMAT
OFF	OFF	HH:MM:SS
OFF	ON	MM:SS
ON	OFF	HH:MM
ON	ON	Not used (HH:MM:SS)

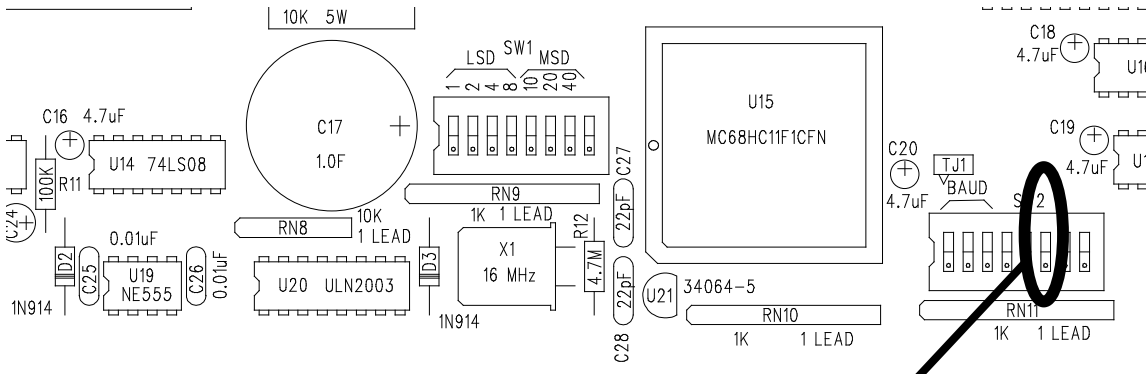
5.3 RUN-UP Auto Reset

The RUN-UP Auto Reset feature was added to the standard Trimline Timer starting with Revision B firmware. Older revisions do not support this feature. If your timer has older firmware, and you need this feature, contact American LED-gible Inc. to obtain a free replacement PROM with Revision B or higher firmware.

When the RUN-UP Auto Reset feature is enabled, the timer automatically resets to zero when the RUN-UP input is first activated. The timer then accumulates time for as long as the RUN-UP input remains activated. When the RUN-UP input is deactivated, the timer stops accumulating time and holds the displayed value. When the RUN-UP input is activated again, the timer first resets before timing up again.

When the RUN-UP Auto Reset feature is not enabled, the timer simply accumulates time while the RUN-UP input is activated, and pauses when the RUN-UP input is not activated. When the RUN-UP input is activated again, the timer continues to accumulate time instead of resetting to zero. Activate the RESET input to reset the timer to zero.

Enable RUN-UP Auto Reset by turning switch 6 on SW2 ON. Disable RUN-UP Auto Reset by turning switch 6 on SW2 OFF.



6	RUN-UP Auto Reset
OFF	DISABLED
ON	ENABLED

6.0 Operation

When 120VAC power is applied to the marquee, it will first perform power on self-tests, and then display information about the selected operating mode. See section 5.1 **Power on messages** for details on the power up sequence.

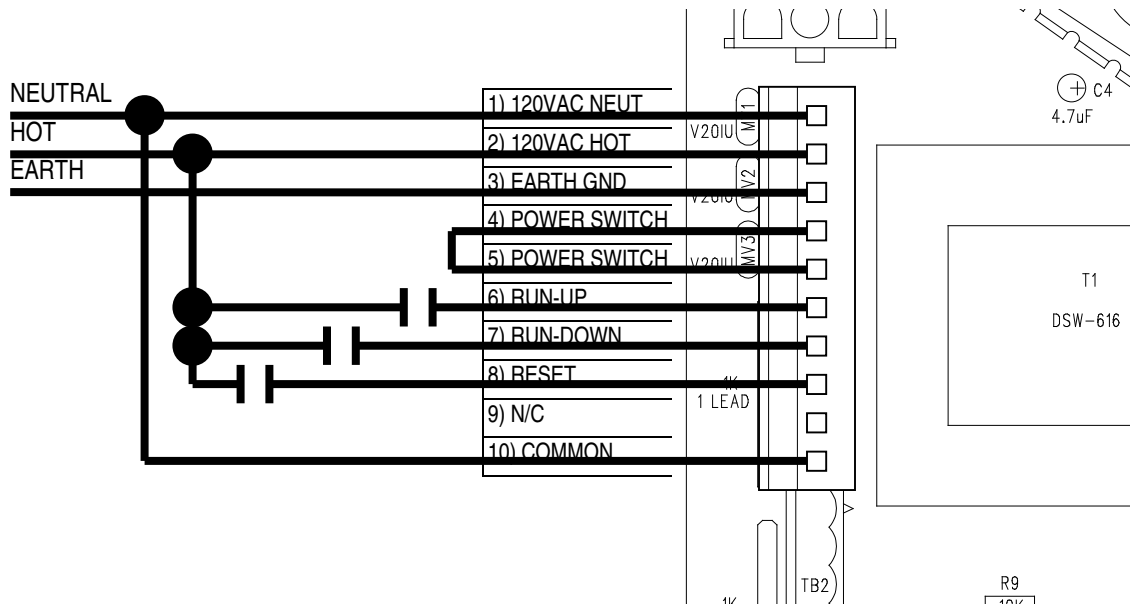
Assert the RUN-UP input by applying a voltage (120VAC or 24VDC as selected by JP3) between the LOGIC COMMON and the RUN-UP input terminal. The L1 indicator lamp will light and the timer will begin to accumulate time.

Assert the RUN-DOWN input by applying a voltage (120VAC or 24VDC as selected by JP3) between the LOGIC COMMON and the RUN-DOWN input terminal. The L2 indicator lamp will light and the timer will begin to time down from the current accumulated time value.

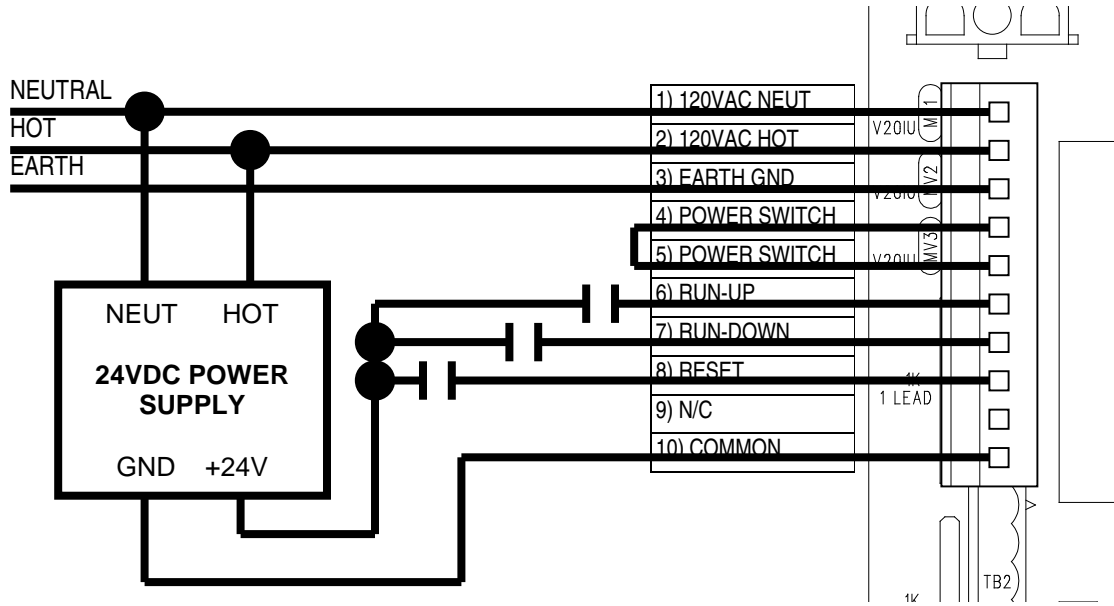
Asserting the RUN-UP and the RUN-DOWN inputs at the same time cancel each other out. The timer will neither run up or down.

Assert the RESET input by applying a voltage (120VAC or 24VDC as selected by JP3) between the LOGIC COMMON and the RESET input terminal. The L3 indicator lamp will light and the timer will reset to zero.

Typical 120VAC Logic (JP3 jumpers removed) wiring is shown below.



Typical 24VDC Logic (JP3 jumpers installed) wiring is shown below.



7.0 Problem Solving

Before contacting ALI for technical support, please review the manual sections covering installation and operation.

If the marquee does not power up, check indicator lamp L8 (POWER). This LED is connected directly to the marquee power supply. If L8 does not light the 120VAC power wiring is probably incorrect.

If the marquee powers up properly, but appears to not work properly, first check all logic wiring, JP3 jumper selections, and dip-switch settings. There are several indicator lamps on the Trimline circuit board to help troubleshoot problems.

- L1 - Lights when the RUN-UP input is asserted.
- L2 - Lights when the RUN-DOWN input is asserted.
- L3 - Lights when the RESET input is asserted.

If both the RUN-UP input and the RUN-DOWN input are asserted at the same time, they cancel each other out, and the timer will not run up or down.

While the RESET input is asserted, the timer will be held in reset, and will not respond to either the RUN-UP or the RUN-DOWN inputs.

TJ1, the self-test jumper can be installed to check the LED display. While TJ1 is jumpered, the Trimline board will execute power on self test repeatedly.

7.1 Getting Technical Support by Phone or Fax

If you need technical assistance, contact us by phone or fax and please have the following information available:

- 1) Customer Name, Address, Phone, Fax.
- 2) Model number.
- 3) Serial number.
- 4) Description of the problem.

The serial number and model number of the marquee can be located on the right hand side of the marquee. It is imprinted on a SILVER ID TAG.

<p style="text-align: center;">American LED-gible Inc. (614) 851-1100 November 2000 Model # TL-2431-116 Serial # SO-5120-001</p>

American LED-gible technical support may be reached at:

Phone: (614) 851-1100
Fax: (614) 851-1121
E-mail: ledgible@ledgible.com

8.0 Limited Warranty

We warrant to you that your AMERICAN LED-gible BRAND MARQUEE, when purchased by you, will be free from defects in material and workmanship, under normal use, for one year from date of delivery. If your LED-GIBLE BRAND MARQUEE should prove to be defective within the warranty period, we will repair it (or, if we think necessary, replace it) without charge to you.

To obtain service, please call our Customer Service Department at 1-614-851-1100 or write to:

AMERICAN LED-gible Inc.
1776 LONE EAGLE STREET
COLUMBUS, OHIO 43228

We will furnish you with shipping instructions. This warranty covers merchandise returned to American LED-gible (shipped prepaid) for repair, not in plant repairs. Should you need an in plant repair at your facility, American LED-gible will schedule a trip. Rates are per diem, plus travel expenses.

ALI shall have the right of final determination as to the existence and cause of the defect. This warranty expressly excludes any defects or damages caused by accessories, replacement parts, or repair service, other than those which have been authorized by ALI. This warranty does not cover any damage caused by accident, misuse, shipment, or other than ordinary use.

This warranty excludes all incidental or consequential damages. Some states do not allow the exclusion of, or limitation of, incidental or consequential damages, so the foregoing exclusion may not apply to you. This warranty gives you specific legal rights, and you may also have other rights, which vary from state to state. This warranty is in lieu of any other warranty, express, written, implied, or statutory, and no agreement extending or modifying it will be binding upon ALI, unless in writing and signed by duly authorized officer.

If your AMERICAN LED-gible MARQUEE is outside the warranty period, please call our Customer Service Department as above. After you return the unit to American LED-gible, we will estimate the repair charges, and contact you so a purchase order can be issued. Again, should you require in-house repair of your marquees, ALI rates are per diem, plus travel expenses. Please make sure to call, so a trip can be scheduled if this option is preferred.

LIMITATION OF LIABILITY:

If this product is not in good working order as warranted above, your sole remedy shall be repair or replacement as provided above. In no event will ALI be liable for special, indirect, or consequential damages, or any damages whatsoever resulting from loss of use, data, or profits arising out of, or in connection with this contract or the use or performance of ALI products, whether in an action of contract or tort, including negligence. ALI's liability for damage to property shall be limited to the cost of the product sold to the buyer.

9.0 Connection Labels

10) COMMON	10) COMMON	10) COMMON	10) COMMON
9) N/C	9) N/C	9) N/C	9) N/C
8) RESET	8) RESET	8) RESET	8) RESET
7) RUN-DOWN	7) RUN-DOWN	7) RUN-DOWN	7) RUN-DOWN
6) RUN-UP	6) RUN-UP	6) RUN-UP	6) RUN-UP
5) POWER SWITCH	5) POWER SWITCH	5) POWER SWITCH	5) POWER SWITCH
4) POWER SWITCH	4) POWER SWITCH	4) POWER SWITCH	4) POWER SWITCH
3) EARTH GND	3) EARTH GND	3) EARTH GND	3) EARTH GND
2) 120 VAC HOT	2) 120 VAC HOT	2) 120 VAC HOT	2) 120 VAC HOT
1) 120 VAC NEUT	1) 120 VAC NEUT	1) 120 VAC NEUT	1) 120 VAC NEUT

1) 120VAC NEUT	1) 120VAC NEUT	1) 120VAC NEUT	1) 120VAC NEUT
2) 120VAC HOT	2) 120VAC HOT	2) 120VAC HOT	2) 120VAC HOT
3) EARTH GND	3) EARTH GND	3) EARTH GND	3) EARTH GND
4) POWER SWITCH	4) POWER SWITCH	4) POWER SWITCH	4) POWER SWITCH
5) POWER SWITCH	5) POWER SWITCH	5) POWER SWITCH	5) POWER SWITCH
6) RUN-UP	6) RUN-UP	6) RUN-UP	6) RUN-UP
7) RUN-DOWN	7) RUN-DOWN	7) RUN-DOWN	7) RUN-DOWN
8) RESET	8) RESET	8) RESET	8) RESET
9) N/C	9) N/C	9) N/C	9) N/C
10) COMMON	10) COMMON	10) COMMON	10) COMMON

LB-2518-103
 TL Series Connection Labels
 Rev A, ML 11/20/00