LaserLight2® Series

4-inch, 6-inch and Stop/Go Remote Displays
Version 3

Technical Manual

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W E I G H I N G   S Y S T E M S

Revision History

This section tracks and describes manual revisions for awareness of major updates.

Revision	Date	Description
H	January 29, 2025	Established revision history; updated non-UL power supply info and warning/note icons

Table i. Revision Letter History

Contents

Rice Lake continually offers web-based video training on a growing selection of product-related topics at no cost. Visit www.ricelake.com/webinars

1.0   Introduction

This manual is intended for use by service technicians responsible for installing and servicing the LaserLight2 LED remote display.

🛈 *IMPORTANT: Information contained within this manual is exclusively for units with CPU board, PN 169279 (blue in color).*

LaserLight2 Technical Manual revision B or earlier contains information based on software Version 2 with CPU board, PN 166274 (green in color).

Manuals and additional resources are available from the Rice Lake Weighing Systems website at **www.ricelake.com**
Warranty information can be found on the website at **www.ricelake.com/warranties**

1.1   Safety

Safety Definitions:

⚠ *DANGER: Indicates an imminently hazardous situation that, if not avoided, will result in death or serious injury. Includes hazards that are exposed when guards are removed.*

⚠ *WARNING: Indicates a potentially hazardous situation that, if not avoided, could result in serious injury or death. Includes hazards that are exposed when guards are removed.*

⚠ *CAUTION: Indicates a potentially hazardous situation that, if not avoided, could result in minor or moderate injury.*

🛈 *IMPORTANT: Indicates information about procedures that, if not observed, could result in damage to equipment or corruption to and loss of data.*

General Safety

Do not operate or work on this equipment unless this manual has been read and all instructions are understood. Failure to follow the instructions or heed the warnings could result in injury or death. Contact any Rice Lake Weighing Systems dealer for replacement manuals.

⚠ *WARNING*

Failure to heed could result in serious injury or death.

Some procedures described in this manual require work inside the indicator enclosure. These procedures are to be performed by qualified service personnel only.

Do not allow minors (children) or inexperienced persons to operate the LaserLight2.

Do not place fingers into slots or possible pinch points.

Do not use any load-bearing component that is worn beyond 5% of the original dimension.

Do not use this product if any of the components are cracked.

Do not exceed the rated load limit of the unit.

Do not make alterations or modifications to the unit.

Do not remove or obscure warning label (Figure 1-1).

Before opening the unit, ensure the power cord is disconnected from the outlet.

🛈 *IMPORTANT: Test the operation of the ground fault circuit interrupter each time the sign is plugged in (UL version only).*
To test the GFCI, plug in the LaserLight2 and press the TEST button. The LaserLight2 immediately powers off.
If it does not, either the GFCI is mis-wired, there is a wiring problem in the same circuit, or the GFCI has malfunctioned and must be replaced. Press the RESET button to restore power to the LaserLight2 or the circuit.

Figure 1-1. Safety Label PN 16861

1.2   Overview

The LaserLight2 remote display features an ultra-bright LED display with a non-glare filtered lens for use in a wide variety of applications. The LaserLight2 Series is available with a 6-digit display. It is designed to work with most digital weight indicators, host computers, and peripherals using 20 mA current loop, RS-232 or RS-422 full and half duplex communications.

The unique IntelliBright™ feature uses a photo sensor to read ambient light and automatically adjusts the LaserLight2 display between day and night settings.

The LaserLight2 enclosure provides easy access to internal components. The front panel swings open for convenient setup and service. The enclosure has an external keypad which makes navigating configuration options convenient using the arrows, **Enter**, **Setup**, **Mode**, **Set**, and **Learn** keys.

1.2.1   Standard Features

The LaserLight2 display is available in 4" or 6" digit size. The LaserLight 4-SG display is a 4" digit size housed in the larger enclosure (13" x 31"), with a 6" Stop/Go light. Both styles use an *Auto-Learn* function which automatically determines the data format used by the attached indicator.

Additional standard features include:

- Six high-intensity red digits (double-row discrete LED)
- Auto learn mode of communication protocols
- Hold displayed weight (demand input)
- Software selectable standstill mode for no updates while in motion
- Durable weather tight IP66 enclosure
- Adjustable day/night intensity
- Software selectable time and date when the displayed weight is at zero and below
- Non-glare contrast filtered lens
- Mirror (reverse image) feature
- RS-232, 20 mA, and RS-422 communications
- Auto sensing 115/230 VAC power supply
- PEMs for VESA flat-wall mount or side-mounting flange
- Polyethylene breather vent inhibits internal moisture buildup
- Red, green, and arrow lights in Stop/Go version

1.2.2   Optional Features

Optional features of the LaserLight2 remote display include:

- Pole mount kit
- ConnexLink radio interface
- Visor kit
- VESA flat wall mount kit
- Offset kit (used with pole mount)

1.3   Keypad

The keypad, located on the bottom of the unit, allows for easy setup of the remote control.

Figure 1-2. LaserLight2 Keypad

Key	Description
▲ ◄ ► ▼	Used to navigate the configuration menu choices while in setup mode; The **UP** arrow exits the setup mode; The arrow keys can also be used to set time and date after the **SET** key has been pressed
ENTER	Used to select a setting
SETUP	Used to enter the setup mode
MODE	Used to increment a value for time and date after the **SET** key has been pressed; The time and date value can be entered with the navigation keys
SET	Used to set time and date; press **SET** to toggle to the next value of the time or date format; Press **SET** one final time to exit the time and date setup
LEARN	Used to manually learn the incoming format; Use the navigation keys to move the displayed value to the correct position (Section 3.1 on page 25)

Table 1-1. Key Functions

1.4   Annunciators

The LaserLight2 remote display uses a set of four high-intensity LED annunciators to provide additional information about the value displayed. The serial default values for the annunciators are *G & N* and *L & K*. Parameters for alternative values can be set under the serial menu, port 0.

The Stop/Go version of the LaserLight2 also has arrow and round light annunciators to indicate the different states of the digital outputs.

Figure 1-3. Front Panel Display (Stop/Go Model)

LED	Description
GR	Gross – Indicates the displayed weight is gross weight
NT	Net – Indicates the displayed weight is net weight
lb	Pounds – Indicates units associated with the displayed value, represents primary and secondary units
kg	Kilograms – Indicates units associated with the displayed value, represents primary and secondary units
--	Red stop light, green go light, and green arrow – Indicates the traffic light state on the display; This feature applies to only the LaserLight 4-SG (Section 3.9 on page 37)

Table 1-2. Annunciators

2.0   Installation and Setup

This section provides an overview of LaserLight2 Series installation, AC wiring, RS-232, RS-422, and 20 mA current loop connections. See for information on configuring the remote display.

⚠️ *WARNING: The LaserLight2 has no on/off switch. Before opening the unit, ensure the power cord is disconnected from the power outlet.*

Use a wrist strap for grounding to protect components from electrostatic discharge (ESD) when working inside the enclosure.

2.1   Unpacking

Immediately after unpacking, visually inspect the LaserLight2 for damage. If parts were damaged in shipment, notify Rice Lake Weighing Systems and the shipper immediately.

The shipping carton contains the LaserLight2 as well as the following components:

- Weathertight, IP66 rated enclosure with a blue CPU board and either mounting flanges or a VESA mount
- Installation manual

ⓘ *IMPORTANT: Remove the protective plastic on the lens of the LaserLight2 as the protective plastic obscures the display and over time becomes difficult to remove.*

2.2   Wall Mounting

The LaserLight2 remote display can be mounted to a vertical surface or pole using 1/4" hardware or a VESA mounting bracket for increased versatility.

2.2.1   Flange Mounting Brackets

The flange tab mounting comes in both 4" or 6" brackets.

Select a site and secure the remote display to a wall using included hardware and the mounting holes on the flange tabs.
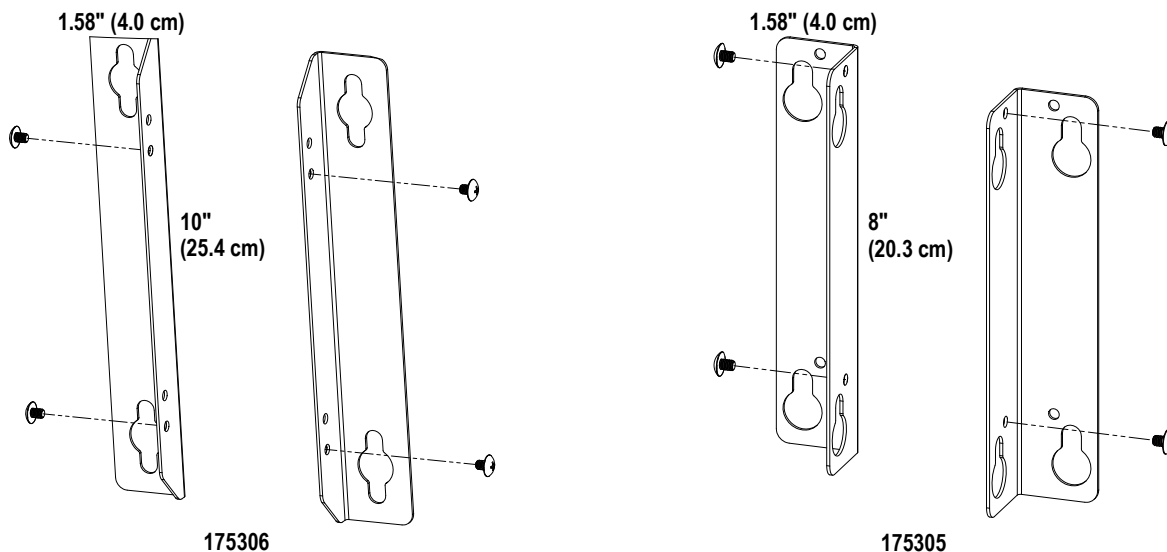
Figure 2-1. Side Mount Flange Brackets for 6" and 4" Models

An optional pole mounting kit is required when installing the remote display on a pole. The optional pole mounting kit fits 4" - 6" poles .

2.2.2 VESA Mounting Bracket

The VESA mount allows for a wide variety of mounting options to be compatible with the LaserLight2.
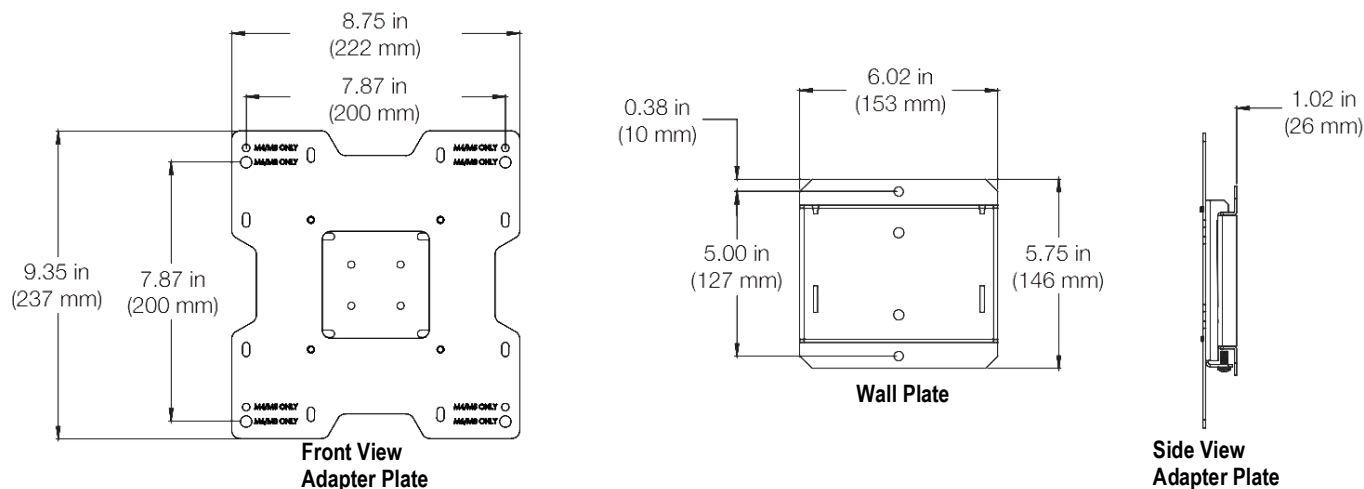
Figure 2-2. VESA Mounting Bracket

The four mounting PEMs on the LaserLight2 are threaded, see Figure 2-13 on page 24 and Table 2-11 on page 24 for applicable mounting bracket part numbers.

2.3 Wiring

The LaserLight2 remote display provides three cord grips located on the underside of the enclosure; one for the supplied A/C power cord and two for serial communications. The LaserLight2 remote display comes pre-wired. Ribbon cables connect the CPU board to the digit display boards. Only the serial communications cable must be connected.

⚠️ *WARNING: The LaserLight2 remote display has no on/off switch. Before opening the unit, ensure the power cord is disconnected from the power outlet.*

To open and wire the remote display in Section 2.3.1 on page 13:

1. If the remote display is not open, loosen the captive screws located on the front of the remote display enclosure.
2. Pull the hinged display outward to open the enclosure.
3. Once the appropriate wiring is complete, close the hinged display and tighten to 16-20 in-lb.

2.3.1 AC Wiring

The LaserLight2 power supply can run on either 115 or 230 VAC. The AC wiring is run through the cord grip to a 3-position AC terminal block bracket located on the inside of the enclosure.
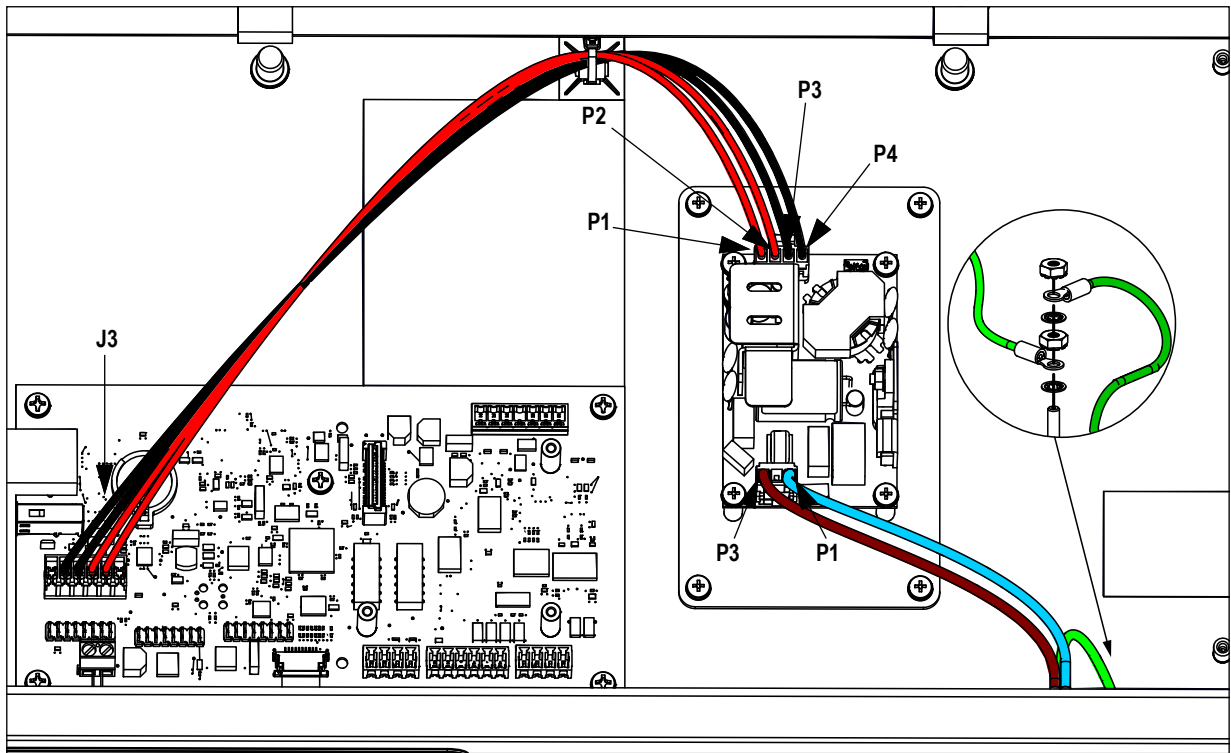
Figure 2-3. Power Supply Location and Wiring (non-UL Version Model)

Refer to Table 2-1 and Table 2-2 for wiring connections in the non-UL Version Model.

AC Input from Power Cord		
Pin	**Wire**	**Color**
1	Neutral (N)	Blue or White
To Ground Stud	Ground (⏚)	Green or Green/Yellow
3	Live (L)	Brown or Black

Table 2-1. AC Input Wiring Connections

DC Output to J3		
Pin	**Wire**	**Color**
1	Positive DC Output (+V)	Red
2	Positive DC Output (+V)	Red
3	Negative DC Output (-V)	Black
4	Negative DC Output (-V)	Black

Table 2-2. DC Output Wiring Connections
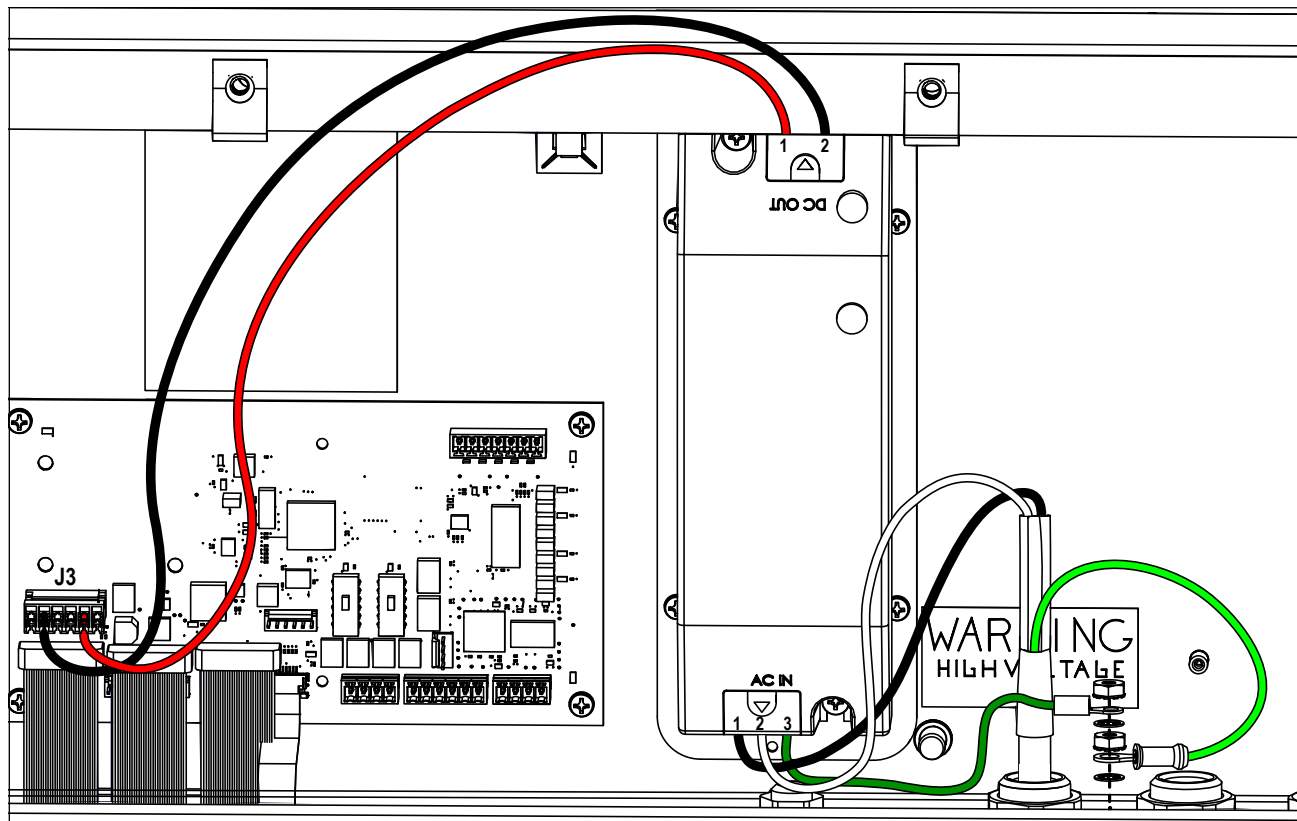
Figure 2-4. Power Supply Location and Wiring (UL Version Model)

Refer to Table 2-3 and Table 2-4 for wiring connections in the UL Version Model.

AC Input from Power Cord		
Pin	**Wire**	**Color**
1	Live (L)	Brown or Black
2	Neutral (N)	Blue or White
3	Ground (⏚)	Green or Green/Yellow

Table 2-3. AC Input Wiring Connections

DC Output to J3		
Pin	**Wire**	**Color**
1	Positive DC Output (+V)	Red
2	Negative DC Output (-V)	Black

Table 2-4. DC Output Wiring Connections

2.3.2 Serial Wiring

Serial communications are connected to the CPU board using removable screw terminal plugs on J6, J8 and J9 (Figure 2-6 on page 17).

To connect the communications cable to remote display:

1. Disconnect power then open the remote display by removing the captive screws on the front of the enclosure and swinging the hinged front cover forward.
2. Loosen the serial cable cord grip and push enough of the communications cable into the enclosure to allow for attachment to the CPU board.
3. Strip 1/4" (0.65 cm) of insulation from the serial cable ends.
4. Make cable connections for RS-232, RS-422, or 20 mA current loop communications as described in Table 2-5 on page 16.
5. Remove excess cable from inside the enclosure. Tighten the serial cable cord grip.
6. Close the hinged front cover and tighten to 16-20 in/lb.

2.3.3 RF interference

An EMI filter can be installed on the serial interface cable to eliminate RF interference.

1. Run the serial wires through the EMI filter provided in the parts kit (Table 2-6 on page 19).
2. Loop the serial wires around the EMI filter.
3. Use the provided plastic cable tie to secure the looped wires to the ferrite and the serial cable; this prevents the ferrite from coming in contact with the CPU board.

Figure 2-5. Cylindrical Ferrite Placement for RF Interference

CPU Board Connector	Pin Assignment	Function	CPU Board Silk Naming	Port Position
J1 Digital Input/Output	1	Ground	GROUND	–
	2	Digital Input 0	DIGIN 0	–
	3	Digital Input 1	DIGIN 1	–
	4	+5 V	+5 C	–
	5	Digital Output 0	DIGOUT0 CTRL	–
	6	Digital Output 1	DIGOUT1 CTRL	–
	7	Ground	GROUND	–
J6 20 mA	1	Tx-	MATX-	Port 0
	2	Tx+	MATX+	Port 0
	3	Rx-	MARX-	Port 0
	4	Rx+	MARX+	Port 0
J8 RS-232	1	SIG GND	GNDIS01	Port 0/1
	2	SIG GND	GNDIS01	Port 0/1
	3	RxD 1	RIN2	Port 1
	4	RxD 0	RIN1	Port 0
	5	TxD 1	TOUT2	Port 1
	6	TxD 0	TOUT1	Port 0
J9 RS-422	1	Tx- (Z)	RS485-Z	Port 0
	2	Tx+ (Y)	RS485-Y	Port 0
	3	Rx- (B)	RS485-B	Port 0
	4	Rx+ (A)	RS485-A	Port 0

Table 2-5. Serial Communications Wiring

NOTE: Terminals J1, J6, J8, and J9 are removable screw terminal plugs.

Port 0 is used for input only and port 1 is used to drive additional LaserLight2 Remote Displays (Table 2-5).

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2.4   Battery Replacement

The lithium battery (PN 69291) on the CPU board maintains the real-time clock.

To replace the battery:

1. Ensure unit is unplugged from power source.

2. Open unit and place the tip of a finger in the notched area near the battery retaining spring and slide the battery out of position on the CPU board.

3. Replace with new battery. Ensure the positive side is up and slide the battery under the retaining ring then close the unit.

⚠️ *WARNING: Risk of explosion if battery is replaced by an incorrect type. Dispose of used batteries according to state and local regulations.*

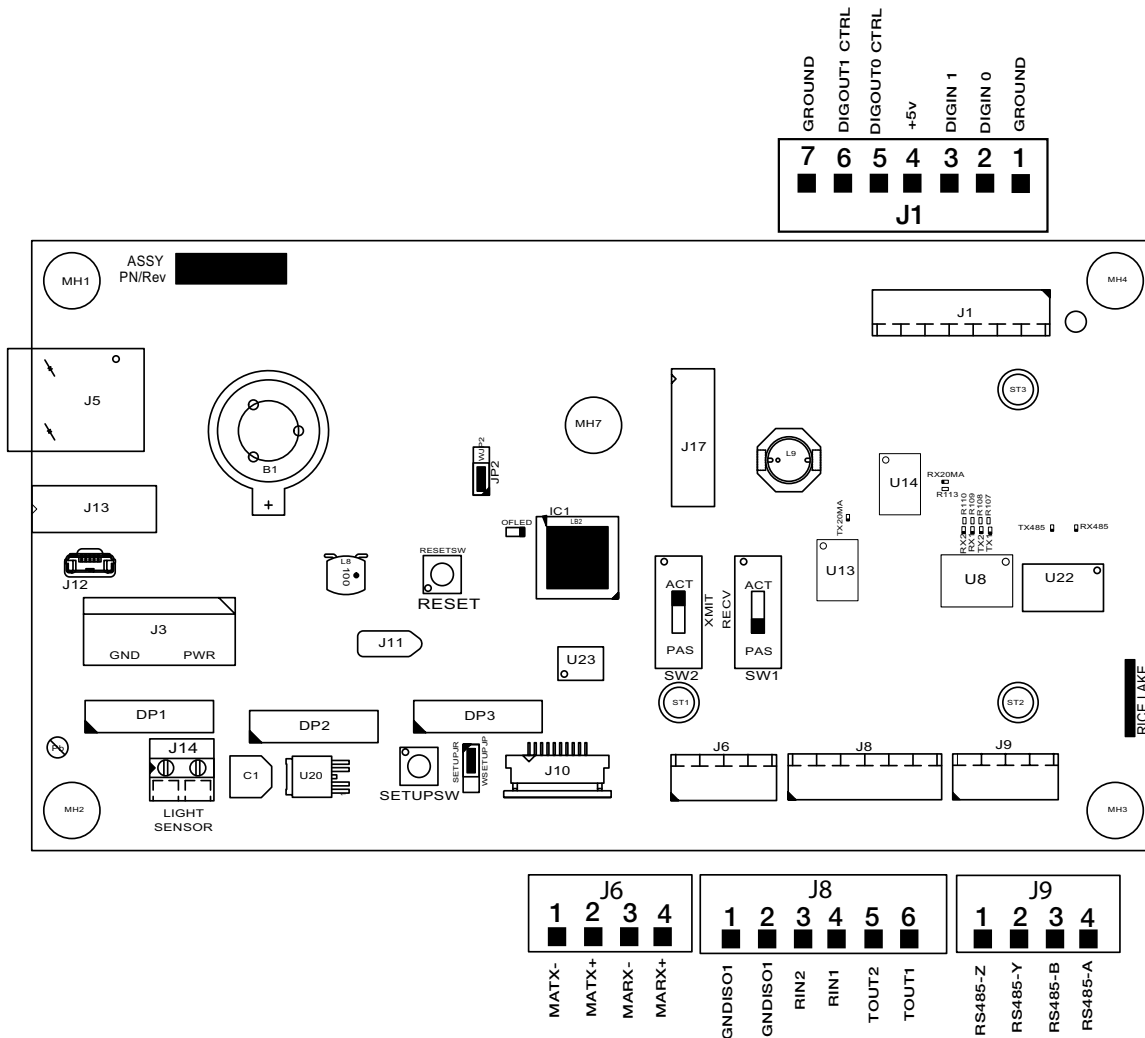## 2.5   LaserLight2 CPU Board (PN 169279)

Figure 2-6. LaserLight2 Remote Display CPU Board

Port 0, which is connected to the indicator, supports three configurations; 20 mA, RS-232, and RS-422 communications.

Port 1, which is the Echo port, does not support 20 mA but does support RS-232 communications.

2.5.1   20 mA Current Loop

The 20 mA current loop communication is provided on connector J6 of the CPU board (Figure 2-6 on page 17 and Table 2-5 on page 16).

Make sure to select active or passive switch settings.

2.5.2   RS-232

The RS-232 connection is provided on connector J8 of the CPU board (Figure 2-6 on page 17 and Table 2-5 on page 16).

2.5.3   RS-422

The RS-422 connection is provided on connector J9 of the CPU board (Figure 2-6 on page 17 and Table 2-5 on page 16).

2.5.4   Reset Switch

The reset switch enables a simulated power up reset, eliminating the need to unplug the unit to perform a reset. The unit then goes back to normal operation mode, see Figure 2-6 on page 17 for the reset switch location on the CPU board.

2.5.5   Communicating with Indicators and LEDs

There are eight small LEDs for RS-232, RS-422, and 20 mA located on the CPU board (above U8 on the CPU board in Figure 2-6 on page 17) which flash when serial data is received or sent. The transmit indicators flash when data is sent out of the port, while the receive indicator flashes when data is received. A steady indicator on a receive LED reflects a connection with no streaming data.

2.5.6   Ambient Light Sensor (PN 177369)

Ambient light sensors are used to detect light or brightness in a manner similar to the human eye. The ambient light sensor is connected to J14 on the CPU board and adjusts the brightness on the LaserLight2 in daytime or nighttime conditions.

A third setting (DYLVL) is the ambient brightness threshold, at which the display changes from night to day mode and vice versa. Settings range between 1 and 10 with 1 requiring less intense light to change to day mode and 10 requiring more intense light to change from night to day mode.

NOTE: The LaserLight2 defaults to the Night setting if the sensor is absent.

Do not cut the light sensor pins to the same length, as the long pin is used to identify orientation.

To install a light sensor, ensure the pins (long and short) are inserted correctly into the J14 connector. The short pin side has a flat side to the sensor and must be oriented on the right side of J14.
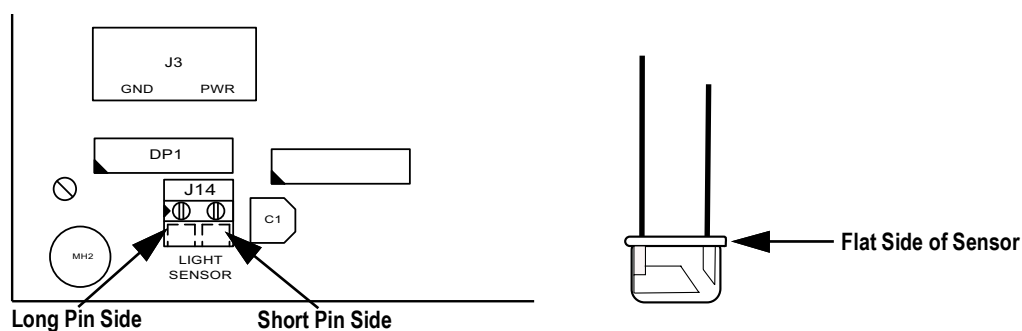
Figure 2-7. Light Sensor Pin Orientation

Insert into the terminal block and bend pins slightly to ensure the pins are located by the hole in the bottom of the enclosure.

2.5.7 Decimal Point

Ensure the decimal point configuration is compatible with the remote display when configuring the indicator attached to the LaserLight2. The primary display board has decimal LED's. These can be changed to commas by moving jumpers JMP1 and JMP2 (located on the back of the display board) to the right.

Ensure the decimal point/comma jumper is in the proper position on the display board.
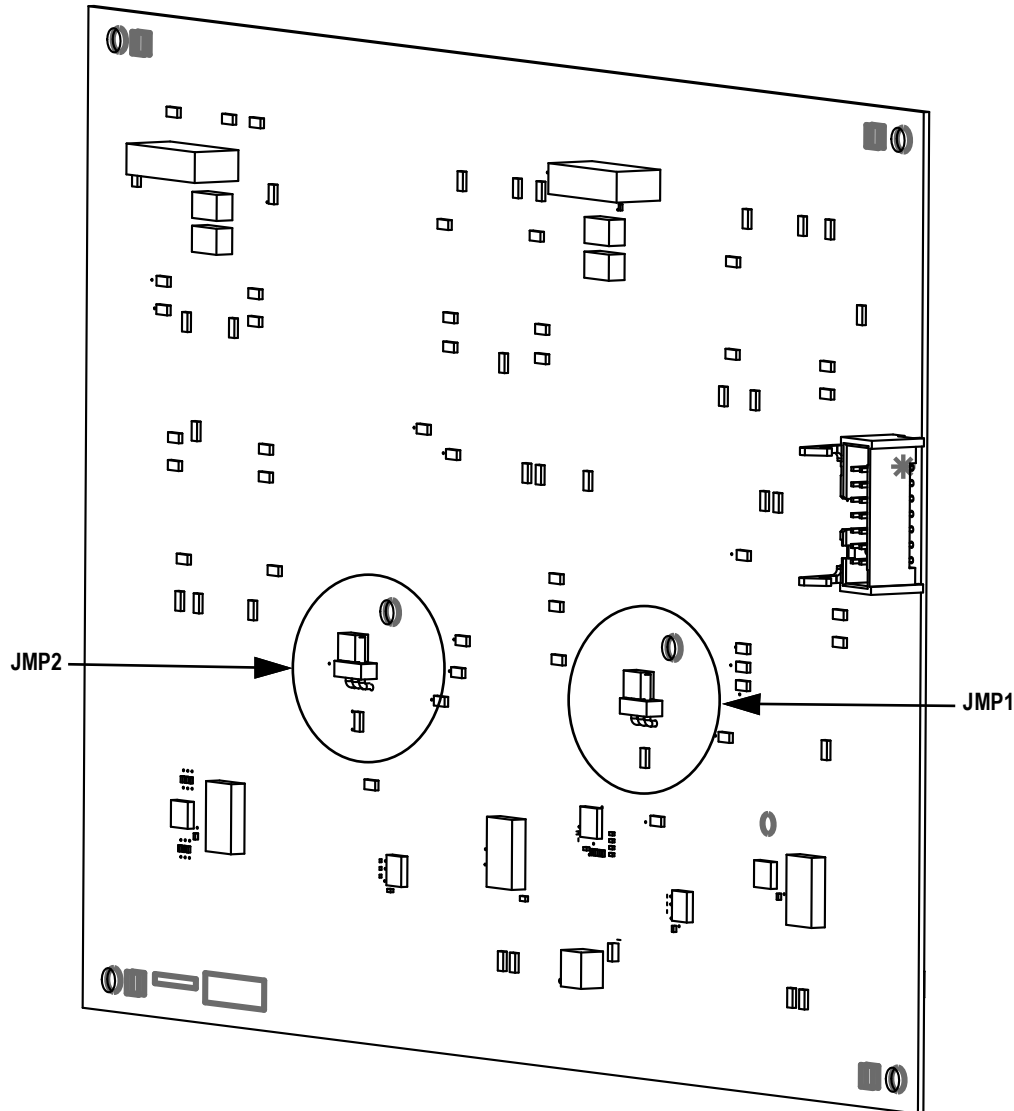
Figure 2-8. Display Board Jumper Location

2.6 Parts Kit, PN 92056 – All Models

See Table 2-6 for the common LaserLight2 parts kit.

Part No.	Description	Qty.
15631	Cable Tie, 3" Nylon	2
66730	Filter, Cylindrical EMI	1
76513	Conn, 4 Position Screw Terminal	2
76514	Conn, 6 Position Screw Terminal	1

Table 2-6. LaserLight2 Parts Kit

2.7   Replacement Parts

See the following information for the LaserLight2 parts illustration and parts kit:

Figure 2-9. LaserLight2 Parts Illustration

Item No.	Part No.	Description	4" Model	6" Model	4" Stop/Go Model	Qty.
1	173599	Front Panel Assembly (Figure 2-11 on page 22)	–	–	–	1
2	173146	Cabinet Assembly (Figure 2-10 on page 21)	–	–	–	1
3	174488	Power Kit (Figure 2-11 on page 22)	–	–	–	1
4	169391	Cable, Ribbon 16" long	–	–	x	2
5	76224	Cable, Ribbon 8"	–	x	–	2
6	76225	Cable, Ribbon 14"	x	x	–	2
7	104284	Cable, Ribbon 23" Long	–	–	x	1
	104283	Cable, CPU to Traffic	–	–	x	1
8	173144	Washer, Black Nylon	x	x	x	2
9	178043	U-Nut, 1/4-20 Tapped Barrel Free Spin	x	x	x	2

Table 2-7. LaserLight2 Parts
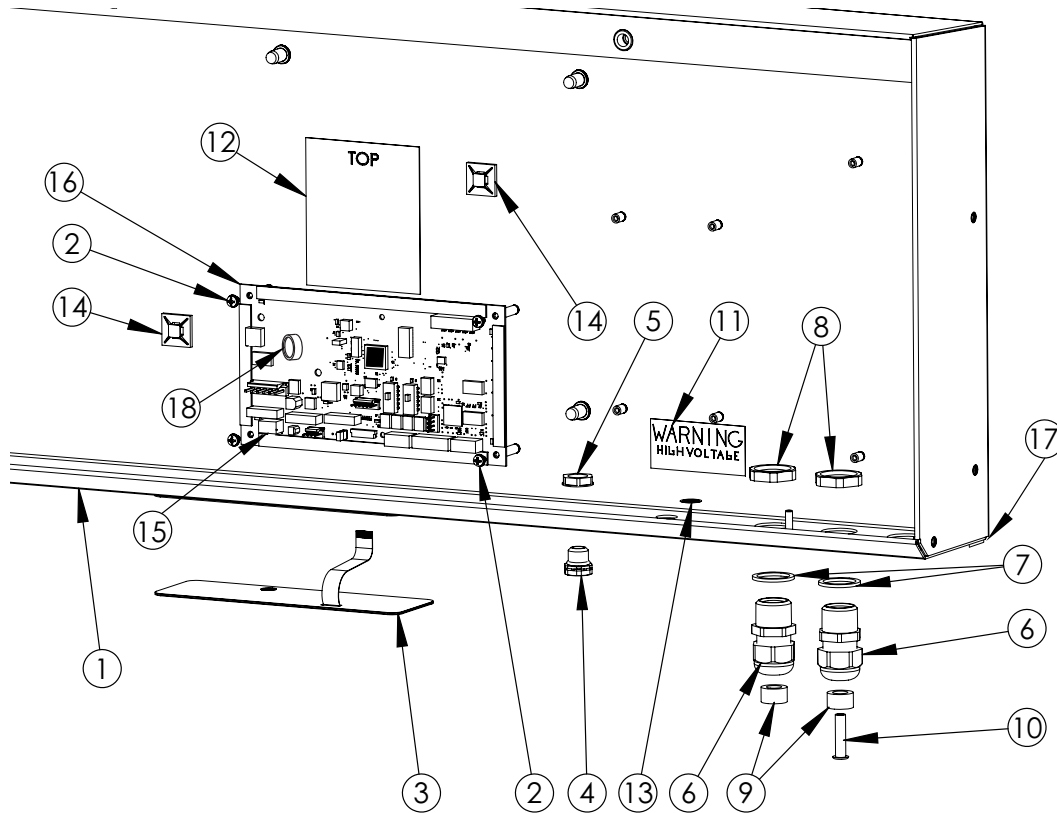
Figure 2-10. Cabinet Parts Illustration

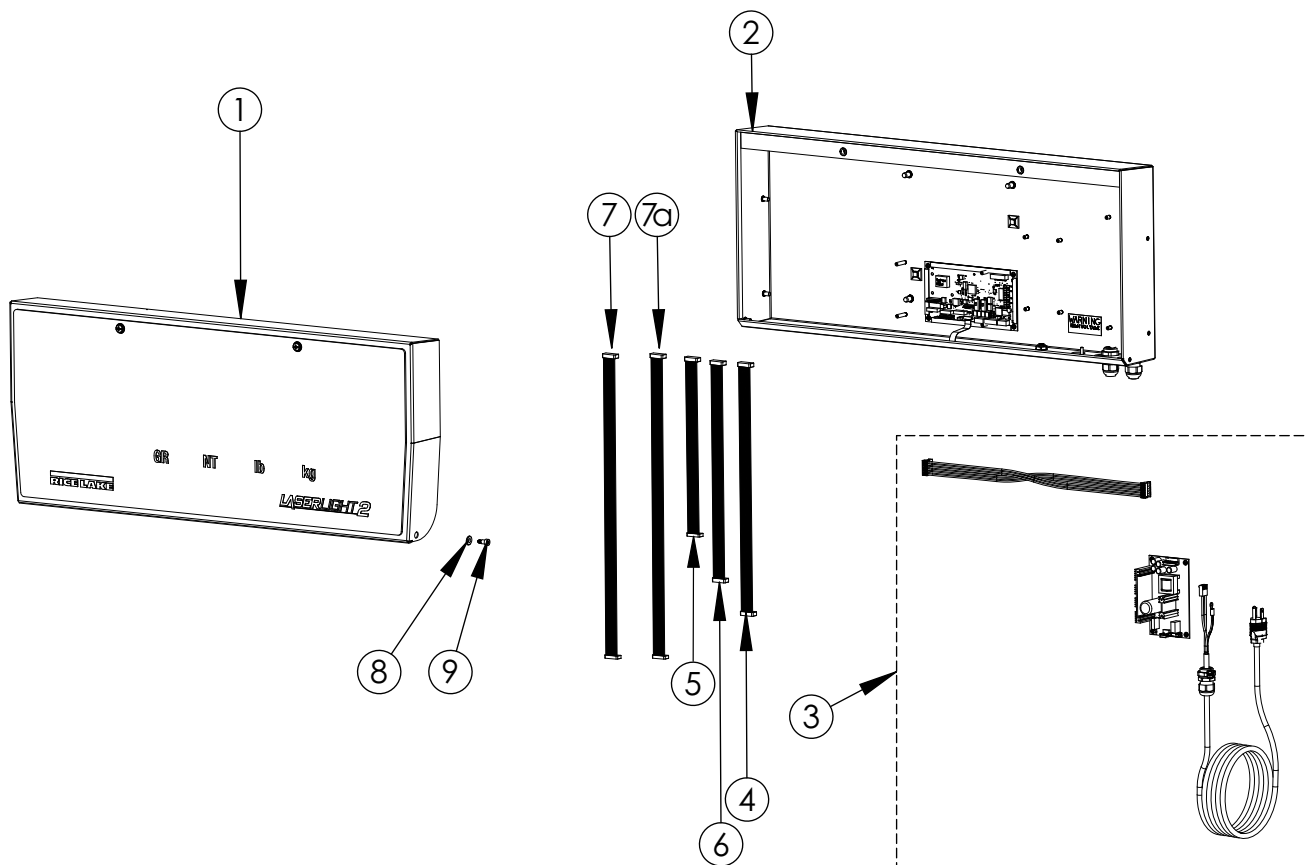| Item No.	Part No.	Description	4" Model	6" Model	4" Stop/Go Model	Qty.
–	181411	Cabinet	–	x	x	1
–	173597	Cabinet	x	–	–	1
1	181411	Rear Panel Assembly	–	x	x	1
	181408	Rear Panel Assembly	x	–	–	1
2	14839	Screw, Mach 6-32NC x 1/4	x	x	x	5
3	166345	Overlay, LaserLight2	x	x	x	1
4	88733	Vent, Breather Sealed	x	x	x	1
5	88734	Nut, Breather Vent	x	x	x	1
6	15628	Cord Grip, 1/2 NPT Black	x	x	x	2
7	30376	Seal Ring, Nylon 1/2 NPT	x	x	x	2
8	15630	Locknut, 1/2 NPT Black	x	x	x	2
9	15665	Gland, Reducing 1/2 NPT	x	x	x	2
10	19538	Post Plug, Slotted Black	x	x	x	1
11	16861	Label, Warning High	x	x	x	1
12	177093	Label, Serial Comm Pin Out	x	x	x	1
13	16892	Label, Ground Protective	x	x	x	1
14	15650	Mount, Cable Tie 3/4"	x	x	x	2
15	177369	Ambient Light Sensor	x	x	x	1
16	178869	Board, CPU - Blue Board	x	x	x	1
17	26408	Bumper, Self Adhesive 3/4 Rubber	x	x	x	2
18	69291	Battery, 3 V Coin Lithium	x	x	x	1

Table 2-8. Cabinet Parts List
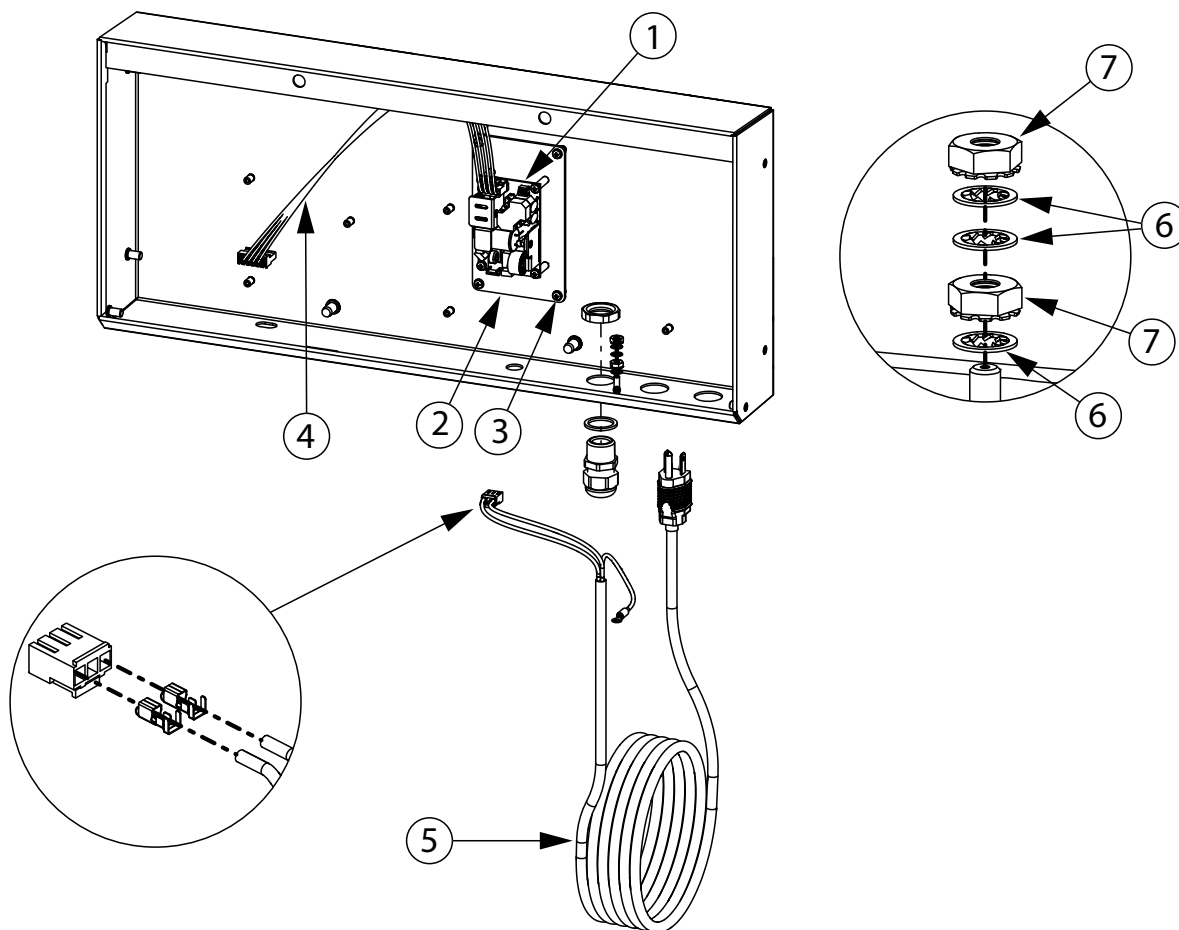
Figure 2-11. Power Kit Parts Illustration

Item No.	Part No.	Description	Qty.
1	208511	Power Supply, 12 VDC	1
2	214447	Bracket Assembly Adaptor	1
3	14839	Screw, Mach 6-32NC x 1/4	8
4	214445	Cable Assembly, Power Supply	1
5	214444	Power Cord Assembly Remote	1
6	15134	Washer, Lock No. 8 Type A	3
7	14626	Nut, Kep 8-32NC Hex	2

*Table 2-9. Power Kit Parts List*

Figure 2-12. Front Panel Parts Illustrations

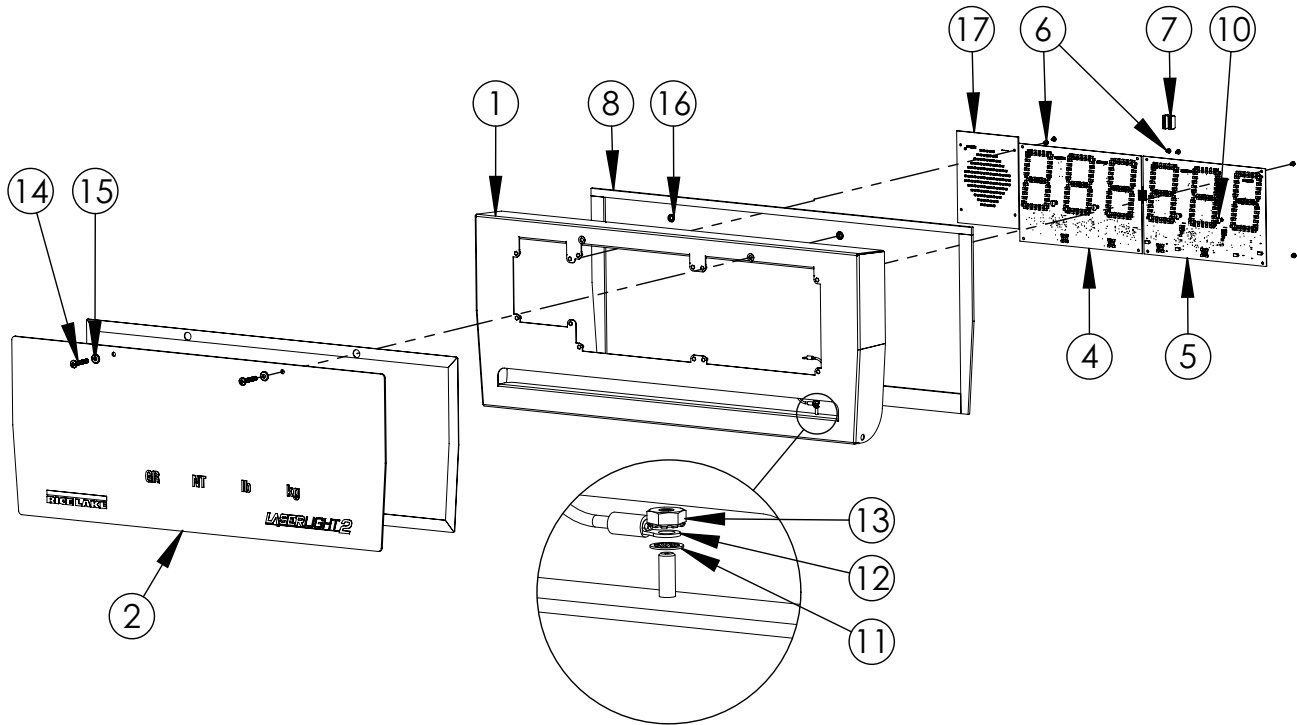| Item No.	Part No.	Description	4" Model	6" Model	4" Stop/Go Model	Qty.
1	181412	Front Cabinet	–	–	x	1
	181410	Front Cabinet	–	x	–	1
	181409	Front Cabinet	x	–	–	1
2	173824	Lens, Display	–	–	x	1
	169715	Lens, Display	–	x	–	1
	167134	Lens, Display	x	–	–	1
4	167401	Board, Display Primary	x	–	x	1
	168033	Board, Display Primary	–	x	–	1
5	167402	Board, Display Secondary	x	–	x	1
	168034	Board, Display Secondary	–	x	–	1
6	14839	Screw, Mach 6-32NC x 1/4	x	x	–	8
		Screw, Mach 6-32NC x 1/4	x	–	x	12
7	76226	Cable, Ribbon 5" Long	x	x	–	1
8	170174	Gasket	–	x	x	1
	167238	Gasket	x	–	–	1
10	175212	Standoff, Plastic Press-in	x	x	x	4
11	15134	Washer, Lock No. 8 Type A	x	x	x	1
12	15601	Ground Wire, 6" with No. 8	x	x	x	1
13	14626	Nut, Kep 8-32NC Hex	x	x	x	1
14	175781	Machine Screw, 1/4-20 x 1-1/2	x	x	x	2
15	182246	Fasteners, 1/4"	x	x	x	1
	182281	Washer Shell, 1/4"	x	x	x	1
16	166653	Retainer, Pushnut Bolt 1/4	x	x	x	2
17	103651	Board Assembly, LED Traffic	–	–	x	1

Table 2-10. Front Panel Parts List
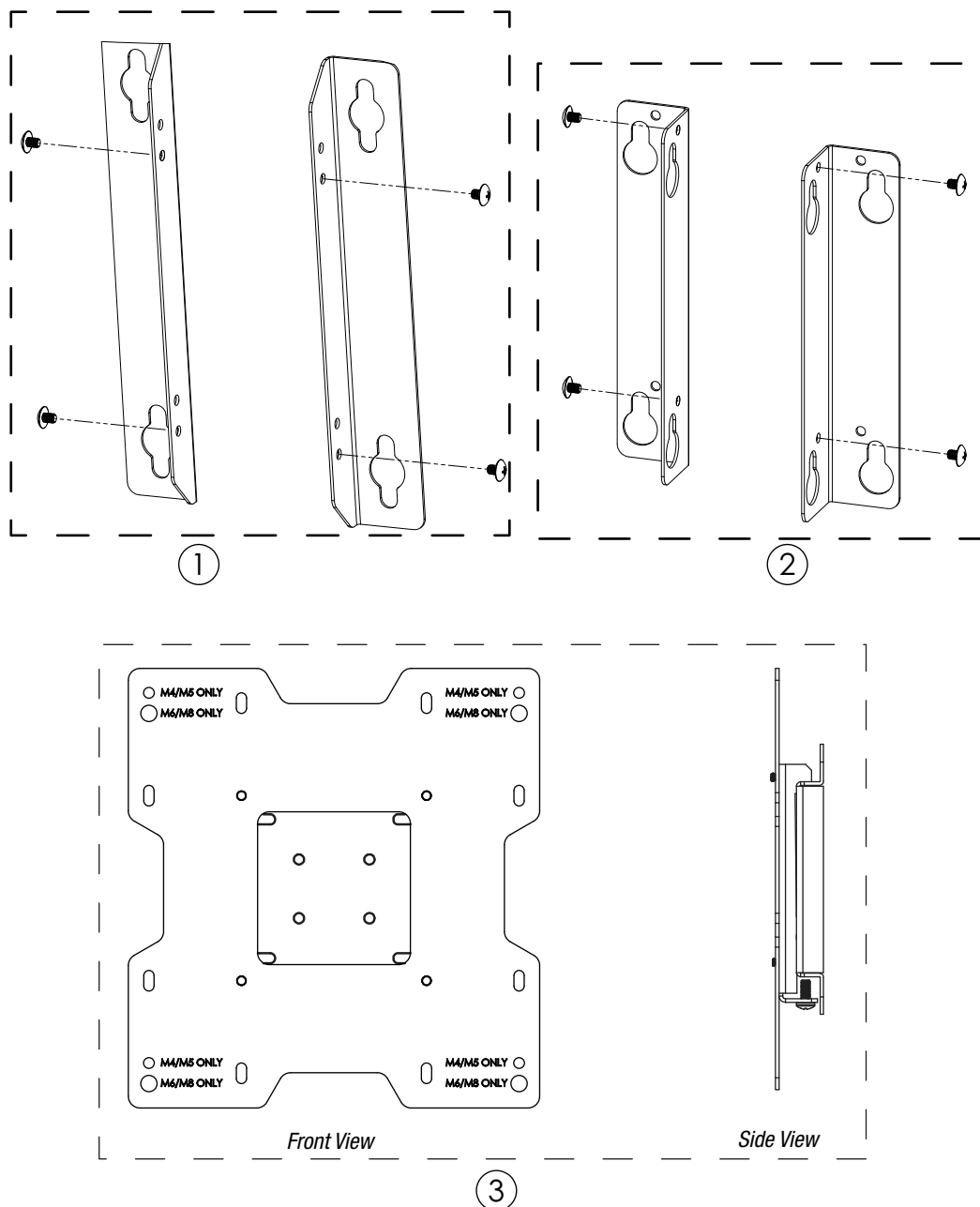
Figure 2-13. Mounting Options Parts Illustrations

Item No.	Part No.	Description	4" Model	6" Model	4" Stop/Go Model	Qty.
1	175306	Option Kit	–	x	x	1
	154183	Screw, Phillip Truss Head	–			4
	183467	Bracket, Right/Left Mount	–			2
2	175305	Option Kit	x	–		1
	154183	Screw, Phillip Truss Head		–		4
	183432	Bracket, Right/Left Mount		–		2
3	175213	Vesa Mount, Low Profile	–	–		1

Table 2-11. Mounting Options Parts List

3.0   Configuration

This section provides an overview of LaserLight2 Series configuration instructions.

Configuration can be simplified or eliminated with the Auto-Learn feature.

3.1   Auto-Learn

Auto-Learn examines the serial data stream sent from the attached indicator and determines the data settings and format used by the indicator. Auto-Learn is capable of recognizing several common data formats used in the weighing industry.

> NOTE: *For Auto-Learn to work, the data must be sent using one of the supported baud rates in the exact format of one of the predefined stream data formats. If the format does not exactly match one of the predefined formats then the Catch All mode must be used (Section 3.2 on page 27).*

Auto-Learn is enabled or disabled based on the setting of the Port 0 Lock parameter. If Port 0 Lock is OFF, the LaserLight2 attempts to learn the incoming data every time it is powered up and each time the data stream is paused and restarted. If Port 0 Lock is ON, no Auto-Learn takes place. By default, Port 0 Lock is set to OFF. If Auto-Learn does not start on its own, it can be initiated using the following steps.

1. Press **LEARN** . The LaserLight2 cycles through baud rates looking for the one being used. If it can identify the baud rate and read the format, it displays the weight. If it does not find a baud rate, it displays *LError* and reverts to using the last learned baud and stream data format.

2. Once the Auto-Learn sequence is correct, lock the Port 0 configuration menu to save the Auto-Learn settings (Figure 3-6 on page 32).

> NOTE: *If DSPERR displays after the Auto-Learn process then the value being sent is beyond the capabilities of the display.*

> *Example: Too many digits, or too many digits including a minus sign.*

Currently Supported Stream Data Formats as of Firmware Version 3.04:

Rice Lake / Condec: <STX><P><W7.><U><M><S><CR><LF>

<STX>	Start of text character (ASCII 2)
<P>	Space for positive, - for negative
<W7.>	7-digit weight, floating decimal, leading spaces
<U>	Units, upper case: L or K
<M>	Mode, upper case: G or N
<S>	Status, upper case: <SP> =OK, M=Motion, O=Overload, Z=Zero, I=Invalid
<CR><LF>	Carriage return and line feed

Toledo: <STX><A><B><C><W06><T06><CR>

<STX>	Start of text character (ASCII 2)
<A><B><C>	Status bytes (polarity, mode, decimal location, and others)
<W06>	6-digit weight (gross or net), leading zeros, no decimal
<T06>	6-digit tare, leading zeros, no decimal
<CR>	Carriage return and line feed

AWTX: <T><M><P><W06.><SP><UU><CR><LF>

<T>	Tare register, space, or single digit number
<M>	Mode, upper case: G, T, or N
<P>	+ for positive, - for negative
<W06.>	6-digit weight, floating decimal, leading zeros
<SP>	Space (ASCII 32)
<UU>	2-character units, lower case: lb or kg
<CR><LF>	Carriage return and line feed

Cardinal (SB-200):   <CR><P><W06..><S><SP><UU><SP><M><SP><SP><ETX>

<CR>	Carriage return
<P>	Space for positive, - for negative
<W06..>	6-digit weight, leading zeros, always decimal
<S>	Status: Space=OK, m=motion, o=overload
<SP>	Space (ASCII 32)
<UU>	2-character units, lower case: lb or kg
<M>	Mode, lower case: g or n
<ETX>	End-of-text character (ASCII 3)

Dini: <SS>,<MM>,<P><W7.>,<UU><CR><LF>

<SS>	2-character status: ST=stable, US=unstable, UL/OL=under/overload
<MM>	2-character mode, upper case: GS=gross, NT=net
<P>	Space for positive, - for negative
<W7.>	7-digit weight, floating decimal, leading spaces
<UU>	2-character units, lower case – lb or kg
<CR><LF>	Carriage return and line feed

Hardy: ><CR><LF><SP>GROSS<SP><-W7.><SP><UU><SP><CR><LF>

<SP>NET<SP><SP><SP><-W7.><SP><UU><SP><CR><LF>

<SP>TARE<SP><SP><-W7.><SP><UU><SP><CR><LF><CR><LF>

<-W7.>	7-digit weight, floating decimal, - for negative in first position
<CR><LF>	Carriage return and line feed

NOTE: The full 65-character format must be used, but only the gross weight is displayed. For Hardy only, a stream of at least 5 full frames per second is required for Auto-Learn to work.

GSE: <W-8.><SP><UUUUU><SP><MMMMM><CR><LF>

<W-8.>	8-digit weight, floating decimal and negative sign
<SP>	Space (ASCII 32)
<UUUUU>	5-character units, lower case: lb<SP><SP><SP> or kg<SP><SP><SP>
<MMMMM>	5-character mode, upper case: GROSS, NET<SP><SP>, TARE<SP>
<CR><LF>	Carriage return and line feed

Fairbanks: (20mA)   <STX><SS><W-7.><ETX>

<STX>	Start of text character (ASCII 2)
<SS>	2-digit type: 40=Gross lb, 41=Net lb, 42=Gross kg, 43=Net kg
<-W7.>	7-digit weight, floating decimal and negative sign, leading spaces
<ETX>	End-of-text character (ASCII 3)

MSI: <W-7.><SP><UU><SP><MM><CR><LF>

<W-7.>	7-digit weight, floating decimal and negative sign
<SP>	Space (ASCII 32)
<UU>	2-character units, upper case – LB or KG
<MM>	2-character mode, upper case – GR or NT
<CR><LF>	Carriage return and line feed

3.2   Catch-All Mode

The Catch-All mode attempts to identify only numeric data in the stream format. No unit or mode annunciators are identified.

The display annunciators can be set manually with the parameter ***SETANN*** in the serial menu for Port 0 (Figure 3-6 on page 32).

- Manually configure the serial port settings then lock Port 0
- Set the special indicator type to 1 in the Port 0 menu
- The data stream must contain a standard end token character for data packets (<cr>, <lf> <ff>, <ETX> and others) as it only finds the last data number sent in the packet

  Examples: Valid - 1234<cr>5678<cr> displays 1234 then 5678

  Valid - 1234 5678<cr> displays only 5678

If the least significant digit of the displayed weight is not in the right most character position, the value can be shifted left or right using (◀) (▶) to shift the display.

  Example: 12345678<cr> displays 345678, but can be positioned to display 123456 or other sets of six digits.

3.3   Setting Time and Date

📝 **NOTE: Time and Date are standard and factory installed on the 4", 6", and 4" SG models.**

The Time and Date (when enabled in the configuration menu) is displayed in three-second cycles (along with weight) when the displayed weight is zero or below.

To set time and date:

1. Go to **CONFIG** and enable Time and Date under **Enable** (Figure 3-3 on page 29).

2. Press **SET** to enter the time in hours.

3. Press **MODE** to increment or decrement the hours.

4. Press **SET** to set the hours and move to minutes.

5. Press **MODE** to increment or decrement minutes.

6. Press **SET** to set the minutes and move to the month.

7. Repeat steps to set the month, day, and year.

3.4   Manual Configuration

To begin configuration:

1.   Open the enclosure, see Section 2.3 on page 12 for enclosure disassembly instructions.

2.   Press SETUP on front panel overlay to access main menu configuration parameters.

Main menu parameters include:

- Configuration
- Serial communications
- Test
- Version

The LaserLight2 remote display can be configured using a series of menus accessed using the keys in Figure 3-1.

3.   Use ◀ ▲ ▼ ▶ to navigate through menu items and ENTER to set a selection.

3.4.1   When External Keypad is Disabled

There may be instances where the external keypad needs to be disabled.

To disable external keypad:

1.   Open the enclosure, see Section 2.3 on page 12 for enclosure disassembly instructions.

2.   Move the setup jumper (circled in Figure 3-1) to pin positions 2 and 3.

3.   Press SETUPSW (located on the CPU board) to enter into configuration mode.

Once the external keypad is disabled, proceed to configuration.
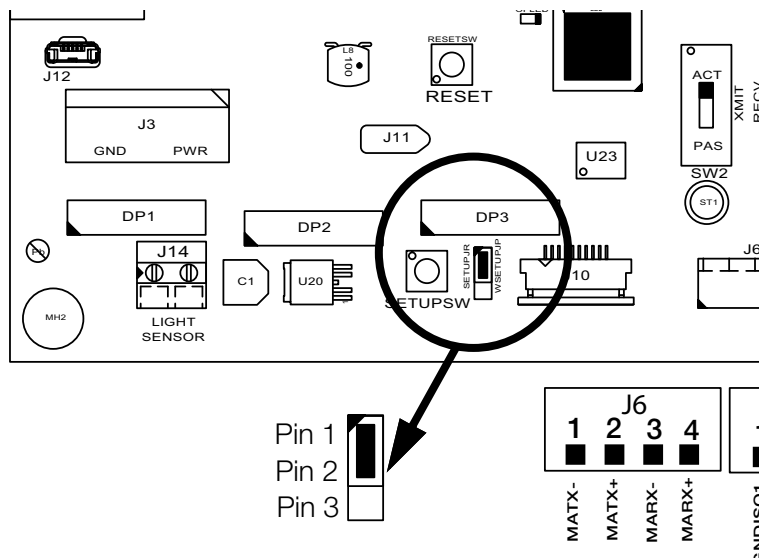
Figure 3-1. LaserLight2 Setup Switch Location on the CPU Board

3.4.2   Menu Navigation Using Keypad
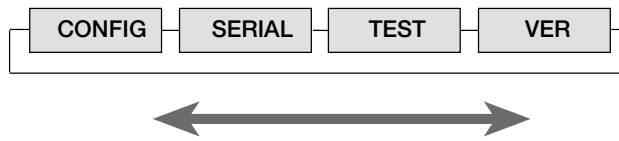
Figure 3-2. LaserLight2 Main Menu Options

Table 3-1 summarizes the functions of each of the main menus.

Display Menu	Menu Function
CONFIG	Configures time and date (option), display brightness, mirroring, and other parameters associated with configuring the remote display
SERIAL	Configures serial ports
TEST	System hardware tests
VER	Displays installed software version number

Table 3-1. Main Menu Functions
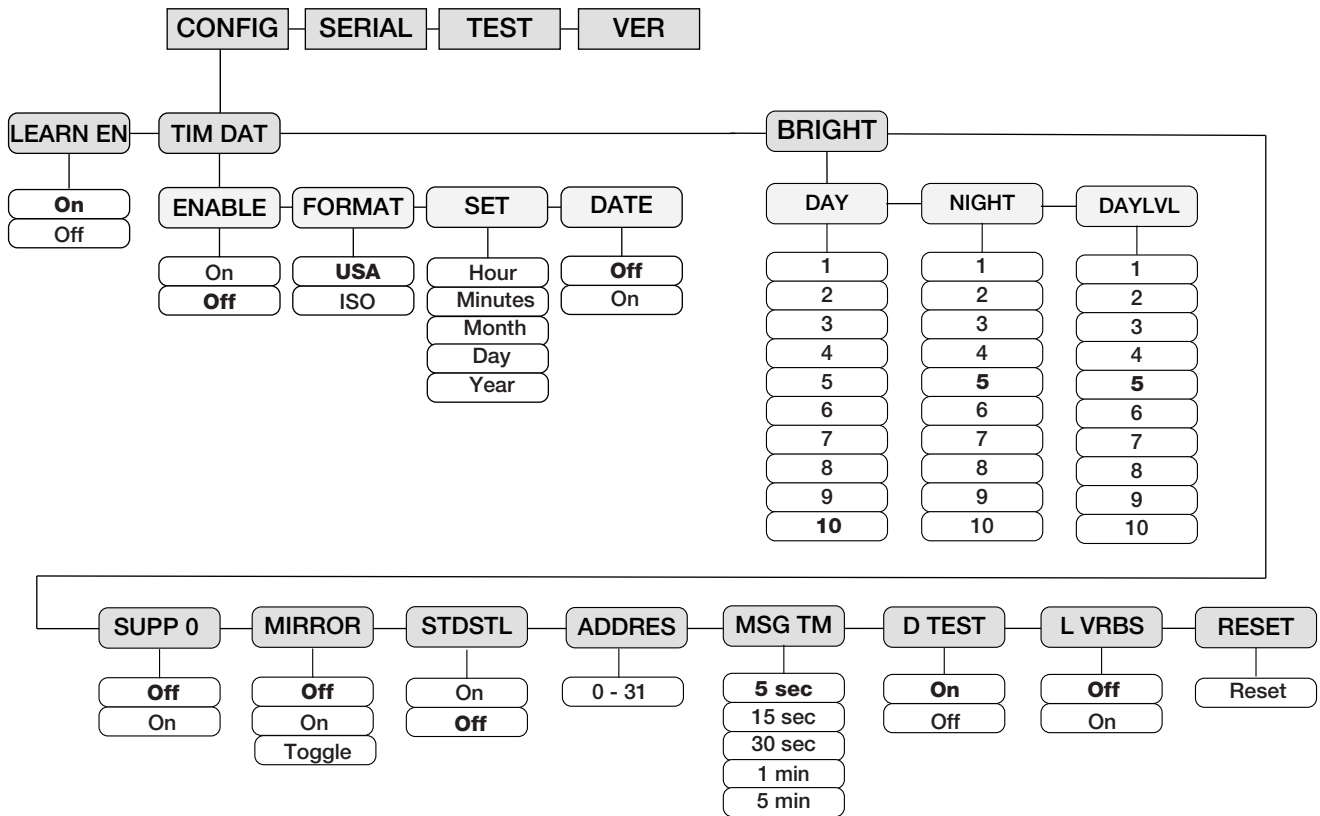
Figure 3-3. Configuration Main Menu Choices

Parameter	Settings	Description
Level 2 Submenus		
TIMDAT	Enabled	Enable time and date
	Format	Displays USA or ISO time format
	Set	Sets hours/minutes and month/day/year
	Date	Disable date
BRIGHT	Day	Selects brightness during day or nighttime hours
	Night	If the ambient light sensor is not installed in the unit, the default settings are automatically set to night mode
	DayLvl	and are not adjustable
SUPP O	On	Select On to enable the suppression of leading zeros in a weight
	Off	
MIRROR	On	Select On to display LED readout in reverse; The menu is viewed normally
	Off	
	Toggle	Toggles between normal and mirrored image (if enabled) in 5-second intervals
STDSTL	On	Select On to enable display updated weight only when scale is not in motion
	Off	
ADDRES	0–31	Assign a command address by selecting a number from 0–31
MSG TM	5-seconds	Select amount of time a message stays on the remote display; Time can vary from 5-seconds to 5-minutes; If no serial
	15-seconds	command is used then this parameter is not used (7 segment DM command only)
	30-seconds	
	1-minute	
	5-minutes	
D TEST	On	Set this parameter On to test display on start up
	Off	
L VRBS	Off	Learn Verbose; displays the baud rates as it cycles through them during the auto-learn process; Acts as a diagnostic tool
	On	
RESET	--	Reset remote display to default parameters
LEARN EN	On	Learn must be ON for streamed data; With Learn off, unit operates for demand messages and commands only and does not
	Off	display streamed weight data; Messages can display and commands acted on while remote display receives streamed data

Table 3-2. Level 2 Configuration Parameters

Parameter	Settings	Description
Level 3 Submenus		
ENABLE	On	Select On to enable time and date option; Time and date display if display is at zero or below
	Off	
FORMAT	USA	Display either USA or ISO (military time) format
	ISO	
SET	HH/MM	Set hour/minutes and month/day/year
	MM/DD/YYYY	
DATE	On	Off disables date display when date and time option is installed, date is always displayed
	Off	
Brightness (BRIGHT Parameter) If the ambient light sensor is not installed in the unit the default settings are automatically set to night mode; All lighting selections are environmentally dependent and may require some trial and error to achieve optimal brightness setting		
DAY	1–10	Select brightness during day; Brightness is set from 1–10 (10–100%) of full brightness; IntelliBright averages measured ambient light over a 5-second time span; Day values = % of maximum brightness in the following chart, see Figure 3-4 for day brightness information
NIGHT	1-5-10	Select brightness during night; Brightness is set from 1–10 (10–100%) of full brightness; IntelliBright averages measured ambient light over a 5-second time span; Night values = % of maximum brightness in the following chart, see Figure 3-5 for night brightness information
DAYLVL	1-3-10	DYLVL is the ambient brightness threshold at which the display changes from night to day mode and vice versa; Settings range between 1 and 10 with 1 requiring less intense light to change to day mode and 10 requiring more intense light to change from night to day mode; Select the daylight level at which the display switches to DAY brightness mode; This may require some trial and error, due to the unique lighting conditions of the environment

Table 3-3. Time and Date Brightness Parameters
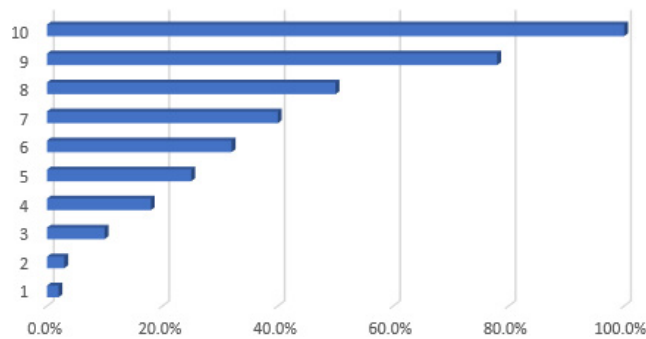
Figure 3-4. Percent of Full Day Brightness
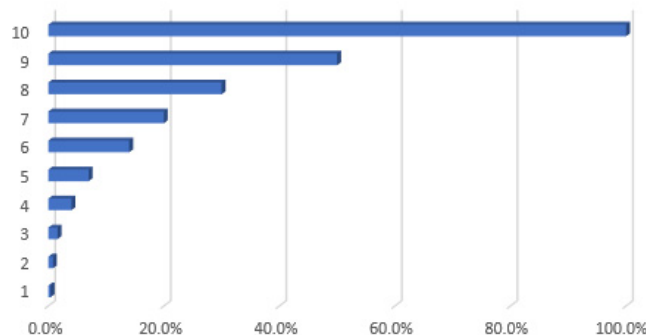

Figure 3-5. Percent of Full Night Brightness

3.5 Serial Communications

The LaserLight2 remote display has two serial ports available:

- Port 0 - Communicates with indicator and can receive data if daisy-chained from a second LaserLight2
- Port 1 - Provides echoing of indicator data

See Section 2.5.2 on page 18 for serial wiring positions.
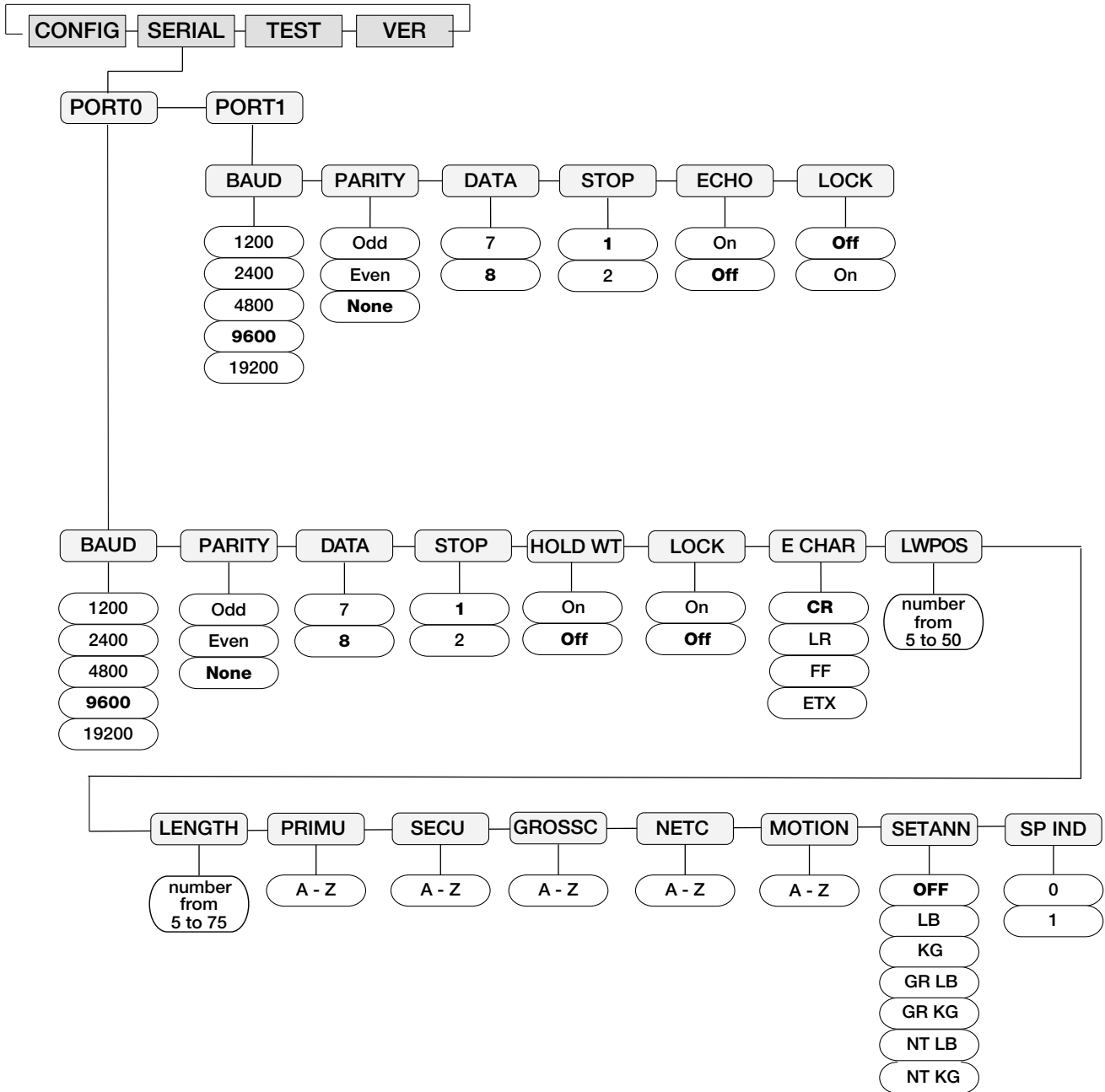
Figure 3-6. Serial Menu

Parameter	Settings	Description
Level 2 Submenus		
Port 0	BAUD	Configure Port 0 – See level 3 submenu parameter descriptions (Table 3-5 on page 34)
	PARITY	
	DATA	
	STOP	
	HOLD WT	Holds last weight displayed if communication is lost and prevents remote display from going into an error condition
	LOCK	If enabled, prevents the Auto-Learn parameter from working and ensures settings remain as currently set, unless manually adjusted (Section 3.1 on page 25)
	E CHAR	Determines the end character of a packet when Auto Learn is enabled
	LW POS	Determines the last weight position of the format; Select a number from 5–50
	LENGTH	Determines the length of packet in the string format; Select a number from 5–75
	PRIM U	Select primary unit characters*
	SEC U	Select secondary unit characters*
	GROS C	Select gross character*
	NET C	Select net character*
	MOTION	Select motion status character*
	SETANN	Select which annunciators are enabled manually*
	SP IND (special indicators)	Select, decode status, and settings for special indicator type 0 = automatic learning 1 = catch-all, semi-automatic learning ***NOTE: Only available if the parameter, Special Indicators is set to Mode 1 (Catch-all).***
PORT 1	BAUD	Configure Port 1 – See level 3 submenu parameter descriptions (Table 3-5 on page 34)
	PARITY	
	DATA BITS	
	STOP BITS	
	ECHO	Allows echoing between remote display and other devices; Data settings are recommended to be set equal to or greater than device being echoed to
	LOCK	Select On to ensure current settings are not changed; If Auto-Learn is not locked, it mirrors port 0 serial settings
NOTE: *If selected, the appropriate annunciator is lit.		

Table 3-4. Level 2 Parameters

Port 0 Parameter	Settings	Description
Level 3 Submenus		
BAUD	1200	Select transmission speed
	2400	
	4800	
	9600	
	19200	
PARITY	ODD	Select data parity
	EVEN	
	NONE	
DATA	7	Select number of data bits
	8	
STOP	**1**	Select number of stop bits
	2	
HOLD WT	ON	To prevent display from going into an error condition, select On to hold last weight displayed
	OFF	
LOCK	ON	On ensures current port settings are not changed and prevents Auto-Learn function; Off enables Auto-Learn function for port settings
	OFF	
E CHAR	**CR**	Determines the end character of a packet when Auto Learn is enabled
	LR	
	FF	
	ETX	
LW POS	5–50	Select a number from 5–50 to determine the last weight position; If Port 0 is set up manually, the last weight position is zero indexed *Example: <STX>123456<CR> where <STX> is the start of the text character, and <CR> is a carriage return character, the 6 is in the 6th position, not the 7th.*
LENGTH	5–75	Select a number from 5–75 to determine the length of the packet in the string format; Formats such as Toledo end in CR<AA> where <AA> is a 2-byte checksum, the checksum must not be counted when calculating the format length
PRIM U	A–Z	A primary display character from A–Z; Annunciator is illuminated when selected
SECD U		A secondary display character from A–Z; Annunciator is illuminated when selected
GROS C		A gross character from A–Z; Annunciator is illuminated when selected
NET C		A net character from A–Z; Annunciator is illuminated when selected
MOTION		A motion display character from A–Z; Annunciator is illuminated when selected
SETANN	**OFF**	All annunciators are off
	LB	Sets only the lb annunciator on
	KG	Sets only the kg annunciator on
	GR LB	Sets only the GR and lb annunciators on
	GR KG	Sets only the GR and kg annunciators on
	NT LB	Sets only the NT and lb annunciators on
	NT KG	Sets only the NT and kg annunciators on **NOTE: Only available in Special Indicator mode 1 (Catch-All).**
SP IND (special indicators)	0	Off (Select when not using a special indicator)
	1	Catch-All mode; requires manually setting the baud rate, bits, and parity then setting the lock parameter to ON

Table 3-5. Port 0, Level 3 Parameters

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Port 1 Parameter	Settings	Description
Level 3 Submenus		
BAUD	1200	Select transmission speed for Port 1
	2400	
	4800	
	9600	
	19200	
PARITY	ODD	Select data parity transmitted from Port 1
	EVEN	
	NONE	
DATA BITS	7	Select number of data bits transmitted from Port 1
	8	
STOP BITS	**1**	Select number of stop bits transmitted from Port 1
	2	
ECHO	ON	Allow echoing between remote display and other devices; If parameter is ON, the baud setting must be set to equal or greater than the device being echoed to
	OFF	
LOCK	**OFF**	When set to OFF, the echo port display uses same communications settings as the indicator after an Auto Learn is run
	ON	

Table 3-6. Port 1, Level 3 Parameters

3.6   Testing the Remote Display

The LaserLight2 remote display provides tests to check the hardware of the remote display. The tests can be accessed through the main menu.
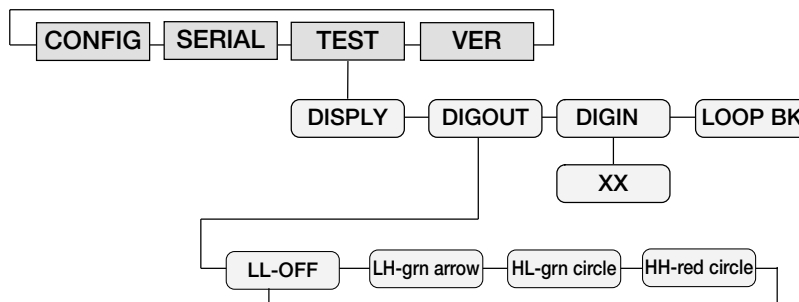

Figure 3-7. Test Menu Choices

3.6.1   Display

In the display test, all LEDs are illuminated and remain lit until ENTER is pressed.

3.6.2 Digital Outputs

This test provides a way to view the different states of digital outputs or stop/go option, if installed. Use the left and right arrows to increment/decrement and display each of the states, which are digital values of the two ports. On/Off terminology includes:

- Low (L) = ON = 0 V
- High (H) = OFF = +5 V

Digital Out 1 J1 - 6	Digital Out 0 J1 - 5	Stop/Go Signal
L	L	Off
L	H	Green Arrow On
H	L	Green Circle On
H	H	Red Stop

Table 3-7. Digital Output States

See Figure 2-6 on page 17 for plug positions.

1. Press the **Right Arrow** key again to display LL and the stop/go option displays no light.

2. Press the **Right Arrow** key again to display LH and the stop/go option displays a green arrow.

3. Press the **Right Arrow** key again to display HL and the stop/go option displays a green circle.

4. Press the **Right Arrow** key again to display HH and the stop/go option displays a red circle.

3.6.3 Digital Inputs

The digital input test displays current values read from the digital inputs.

3.6.4 Loop-back

This test provides a loop-back self test for use in diagnosing serial communications errors. The loop-back self test checks the function of the remote display serial port by sending and receiving data to itself. See Figure 3-8 for required connections.

Port 0 TR ⟶ Port 1 RCV

Port 1 TR ⟵ Port 0 RCV

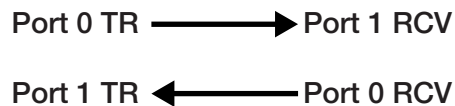*Figure 3-8. Loop-back*

If Port 1 receives nothing from Port 0 for three seconds, *Fail 1* displays.

If Port 0 receives nothing from Port 1 for three seconds, *Fail 2* displays.

If communications are successful between the two, *Pass* displays.

3.7 Version

The current software version displays on remote display.

CONFIG — SERIAL — TEST — VER

VERSION

Figure 3-9. Version Menu

3.8 Demand Print Displaying

The indicator and LaserLight2 remote display can be set up to demand print display.

Demand print display is set up using Auto Learn when the Port 0 **Hold Weight** parameter is turned on. It can also be set up manually by configuring the Port 0 parameters of the remote display and indicator.

Using Auto-Learn, ensure **HOLD WT** is on and continuously push the print button on the indicator to attempt a demand print display.

3.9 Serial Commands

The LaserLight2 has the ability to receive commands, display messages, or use a digital I/O (2 inputs and 2 outputs). When interfaced to an indicator which has a configurable serial string, the print ticket format can be configured, allowing the user to press **Print** on the indicator and send a message which temporarily interrupts the streamed weight display. The length of time the message displays is defined by the **MSG TM** (message time) parameter in the **CONFIG** menu (Figure 3-3 on page 29).

If the LaserLight2 remote display is interfaced with a programmable smart indicator, a user program can be written allowing the user to send messages utilizing softkeys or events. The user can send one message to temporarily override the streamed weight display (Learn Enable is ON); or send multiple messages to be displayed one at a time, replacing the weight display (Learn Enable is OFF and no streamed weight data is available).

The remote display accepts serial commands to return the current time and date or to set the time and date to a new setting. This information can be used in conjunction with user programs in the indicator and remote display to ensure both have the same time and date settings.
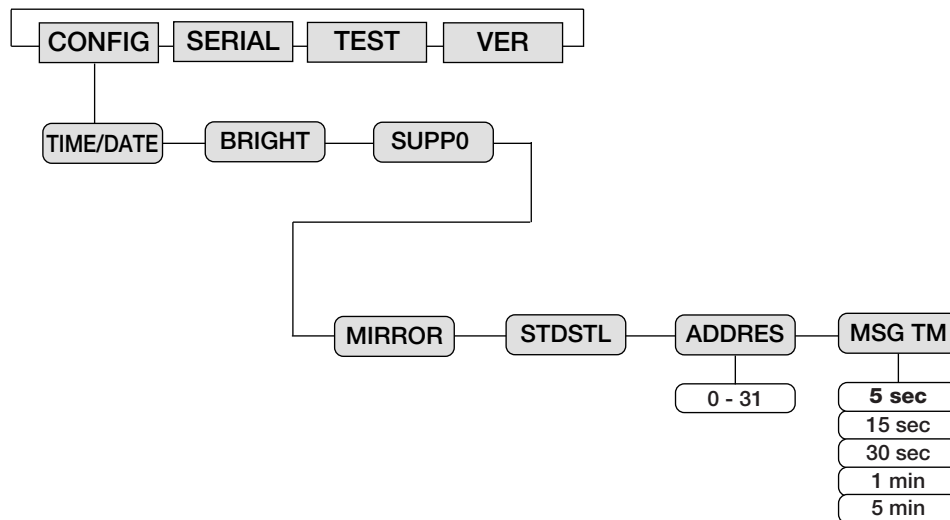

Figure 3-10. Assign Address and Message Timed

3.9.1   Remote Display Command Format:

The following is an example format string if using a display message on a 4", 6", and Stop/Go remote.

|<AA><CC>|<Data>!

Where:

| = Pipe character (Ox7C)

AA = Two byte address, ASCII digits (0-31)

CC = Two byte command, ASCII characters

| = Pipe character (Ox7C)

Data = Data depending on command

! = Exclamation point character (0 x21)

> **Note** *Commands, GT, ST, DI, DO, GR, SR, GV, DC, and the feedback results are not displayed on remote display.*
>
> *Display message commands must not be sent faster than once every second.*

Command	Description	Examples
DM	Display message <Data> is a six character message	|00DM|HELLO ! Alternative command |00DM HELLO !
GT	Get time and date; Information gathered is sent back to the indicator; Ensure both remote display and indicator match	|00GT!
ST	Set time and date *NOTE: Two spaces are required between time and date entries.* *Time must be entered in a 24-hour format.*	|00ST08:00:00 2003-01-31! |00ST15:00:00 2003-01-31! To obtain a P.M. time of 3:00P.M.
DI	Read digital input levels (returns "0"=LL, "1"=LH, "2"=HL, "3"=HH), see Section 3.9.2 on page 39 for further examples	|00DI!
DO	Set digital output levels ("DO0"=LL, "DO1"=LH, "DO2"=HL, "DO3"=HH), see Section 3.9.2 on page 39 for further examples	|00DOx! Where x references numbers 0–3
GV	Get the version number	|00GV!
DC	Dump configuration parameters (for testing purposes only)	|00DC!

Time and date are sent from remote display in the current time format of remote display;
Time and date are sent to remote display in ISO format;
  USA Format: HH:MM:SS AM/PM MMM/DD/YYYY
  ISO Format: HH:MM:SS YYYY-MM-DD
If the real time clock is disabled in the remote display, an error message is sent back		

Table 3-8. Remote Display Commands

3.9.2   Set or Get the Digital I/O

Dry Contact Wiring

The Dig 0 and Dig 1 pins on the traffic light board (pin 2 and pin 3 on connector J1 respectively) have pull up resistors which allow operation of the traffic light can be controlled by switching Dig 0 or Dig 1 (or both) to ground.

> *NOTE: Pressing the reset button on the LaserLight2 CPU board sets the D0 and D1 pins on the LaserLight2 CPU (pins 5 and 6 on J1) to a high pulled up state, which is the default state of the traffic light to be a stop light (red).*

Single Switch Wiring

The user must select two of the four possible states if they want a single switch used for controlling the traffic light.

Two Switch Wiring

It is possible to obtain a variety of combinations of the four possible states using two switches to control the traffic light.
- Both switches with contacts closed give the OFF condition
- Both switches with contacts open give the STOP condition
- One switch open and the other closed gives either the Go or Arrow condition

Signal	Digital 1 Signal J1- 6	Digital 0 Signal J1 - 5
Stop	Open (H)	Open (H)
Arrow	Open (H)	Closed (L)
Go	Closed (L)	Open (H)
Off	Closed (L)	Closed (L)

Table 3-9. Traffic Option Wiring

Connect Digital 1 Example

1. Disconnect wire connecting D1 (pin 6 on J1) of CPU to Digital 1 (pin 3 on J1) of the traffic light pcb at the CPU connector.
2. Solder the wire going to Digital 1 on traffic light board to the wire which goes to the switch.
3. Place wires back into the connector on the CPU board (pin 6 on J1).
4. Connect other end of the switch wire to one pole of the switch.
5. Connect the remaining switch pole to the digital ground of the indicator. If a common ground between the indicator and the LaserLight2 does not exist (fiber optic communication is used), an additional wire is needed for connecting the switch to the ground on the LaserLight2 CPU board.

> *NOTE: This connection does not harm the CPU board since digital outputs on CPU board are designed to be pulled low. The digital outputs are set to High (OFF) on reset.*

To use the two Digital Inputs and Digital Outputs, use J1 to connect and use the following message command formats to set or get the Digital I/O (Figure 2-6 on page 17).

Traffic Light State	Dry Contact	Serial Commands
Stop	Dig0 and Dig1 open circuit	|00DO3!
Green Circle	Dig0 open circuit; Dig1 pulled low	|00DO2!
Green Arrow	Dig0 pulled low; Dig1 open circuit	|00DO1!
Off	Dig0 and Dig1 pulled low	|00DO0!

Table 3-10. Serial Commands (Basic Configuration)

Digital Input and Output Examples

Get Digital input levels (all digin)
    |00DI!
        Response: 0 = LL, 1 = LH 2 = HL, 3 = HH
Set Digital output levels to HH (all digout = +5V)
    |00DO0! = LL
    |00DO1! = LH
    |00DO2! = HL
    |00DO3! = HH
        Response: OK = success (states: DO0=DO1=+5V) or ?? = error

3.10   Updating the LaserLight2 Firmware

To update the LaserLight2 firmware:

1. Go to the Rice Lake website **www.ricelake.com** and search for the LaserLight2.

    • Select LaserLight2

    • Select Resources/Downloads

    • Select Firmware and Download

2. Unzip the file and drag the .bin file to a known location on the PC.

3. Power off the LaserLight2.

4. Connect a Micro USB type B connector to the LaserLight2 CPU board and the PC.
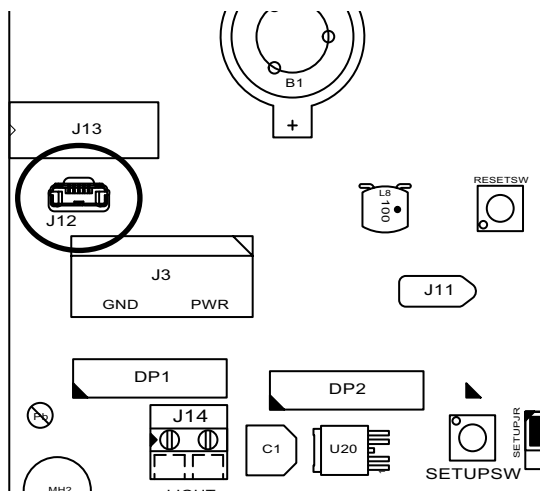

Figure 3-11. USB Type B Location on CPU Board

5. Power on the LaserLight2.

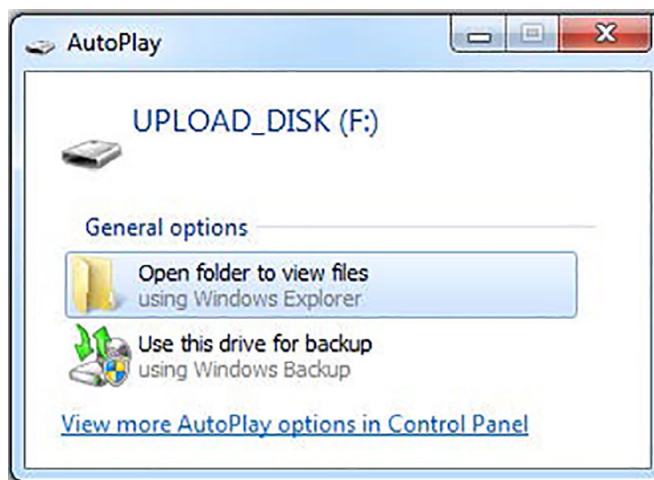6. The PC recognizes it as a mass storage device.

Figure 3-12. Open Folder

7. Open the folder.

8. Drag and drop the.bin file into the folder. The folder closes.

9. Disconnect the USB type B connector from the LaserLight2.

10. Power cycle the LaserLight2.

4.0   Options

This section provides an overview of LaserLight2 Series options.

Options available for the LaserLight2 display:

- Fiber-optic interface
- Radio interface
- Visor kit
- Pole mount kit

4.1   Fiber-Optic Interface

The fiber optic interface (PN 77788) allows for an optically-isolated connection between two devices. It eliminates electrical disturbance transferred on the communication line between devices. It also resolves potential differences due to a difference in grounding between the devices. The fiber optic cable can be run up to 300'.

Refer to PN 175664 for installation instructions of the fiber optic interface.

4.2   Radio Interface

A ConnexLink Wireless Radio (PN 175052) system is available for the 4" and 6" LaserLight2 remote displays and allows for communication between the remote display and an indicator with the matching radio installed. Refer to the ConnexLink Wireless Radio System Installation Instructions (PN 180704).

4.3   Visor Installation Kit

An optional visor can be installed on the LaserLight2. See Figure 4-1 for the remote display with the optional visor installed.


Figure 4-1. LaserLight2 Remote Display With Optional Visor Installed

Set the visor (PN 181224 - 4" model) or (PN 181801 - 6" model and 4" Stop/Go) on top of the remote display and attach the visor using screws and plastic washers provided.

4.4   Pole Mount Kit

The LaserLight2 remote display can be mounted horizontally on a pole using the 2-6" Diameter Pole Mounting Kit (PN 177865). Alternatively, the LaserLight2 can use the Flange Pole Mount Assembly (PN 75856 or PN 77775).
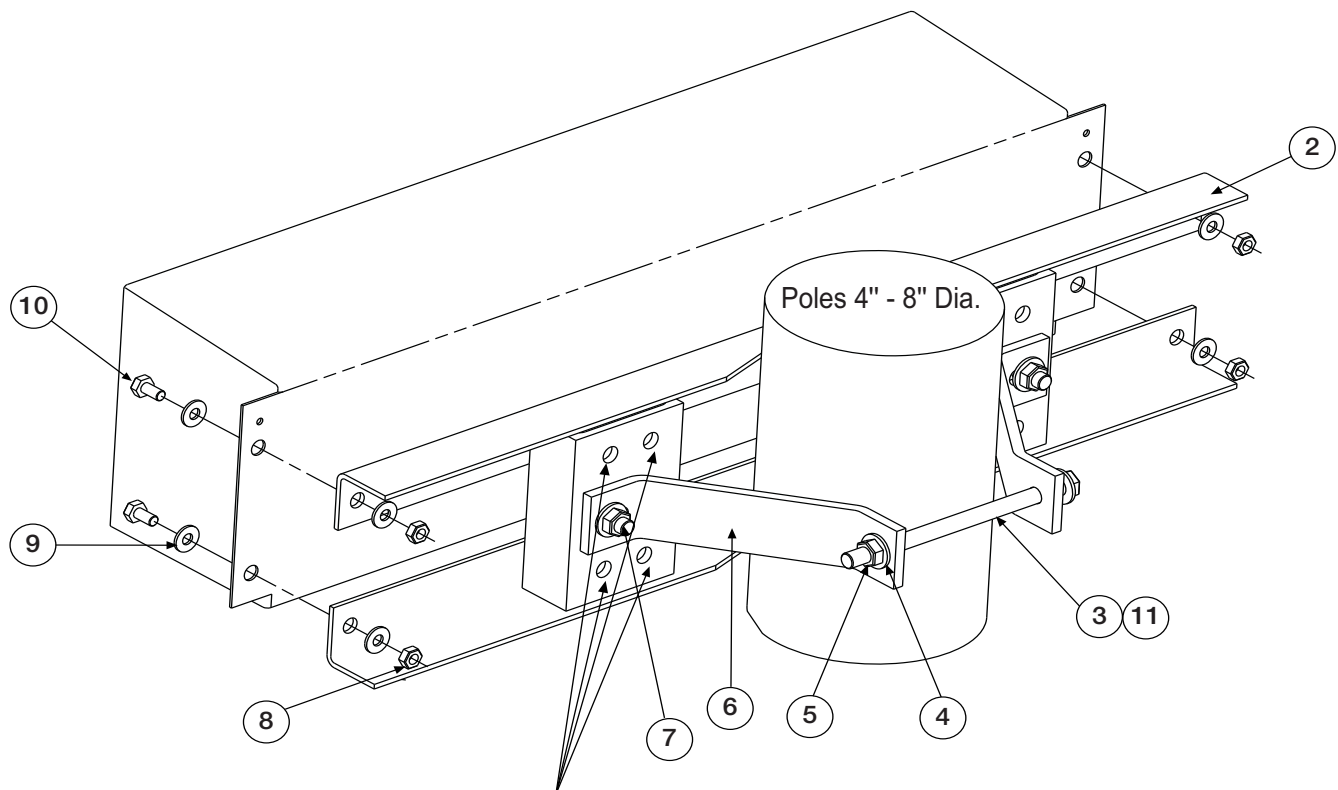
Holes for two brackets on each side of pole for 6" LaserLight remote display

Figure 4-2. LaserLight Pole Mount Assembly

Item No.	Part No.	Description
2	77000	Weldment, Pole Mounting (4" Model - 1)
	76998	Weldment, Pole Mounting (6" Model - 1)
8	14635	Nut, Lock 1/4-20NC Hex (4)
3	14747	Bolt, 3/8-16NCx2-3/4 Hex (4" Model - 1) (6" Model - 2)
10	14955	Screw, Cap 1/4-20NCx1/2 (4)
7	15019	Screw, Cap 3/8-16NCx1 HEX (4" Model - 2) (6" Model - 4)
9	15145	Washer, Plain 3/8 Type A (8)
4	21938	Washer, Plain Type A (4" Model - 4) (6" Model - 8)
5	22072	Nut, Lock 3/8-16NC Hex (4" Model - 3) (6" Model - 6)
6	76999	Bracket, Clinching Pole (4" Model -2) (6" Model - 4)
11	77001	Screw, Mach 3/8-16NC (4" Model - 3) (6" Model - 6)

Table 4-1. Parts Kit Contents

To install the pole mount option:

1. Attach the two clinching pole brackets to the pole using the enclosed 3/8" carriage bolts (grade 5), washers, and lock nuts from the parts kit.
2. Tighten the clinching pole brackets together using the enclosed 3/8" carriage bolts (grade 6), washers, and lock nuts. Tighten as necessary.
3. Align the back of the LaserLight2 remote display to the vesa mounting bracket, ensuring the holes line up.
4. Attach the mounting bracket to the remote display using the enclosed M6 cap screws, washers and nuts. Use a torque spec of 20-30 in/lb.
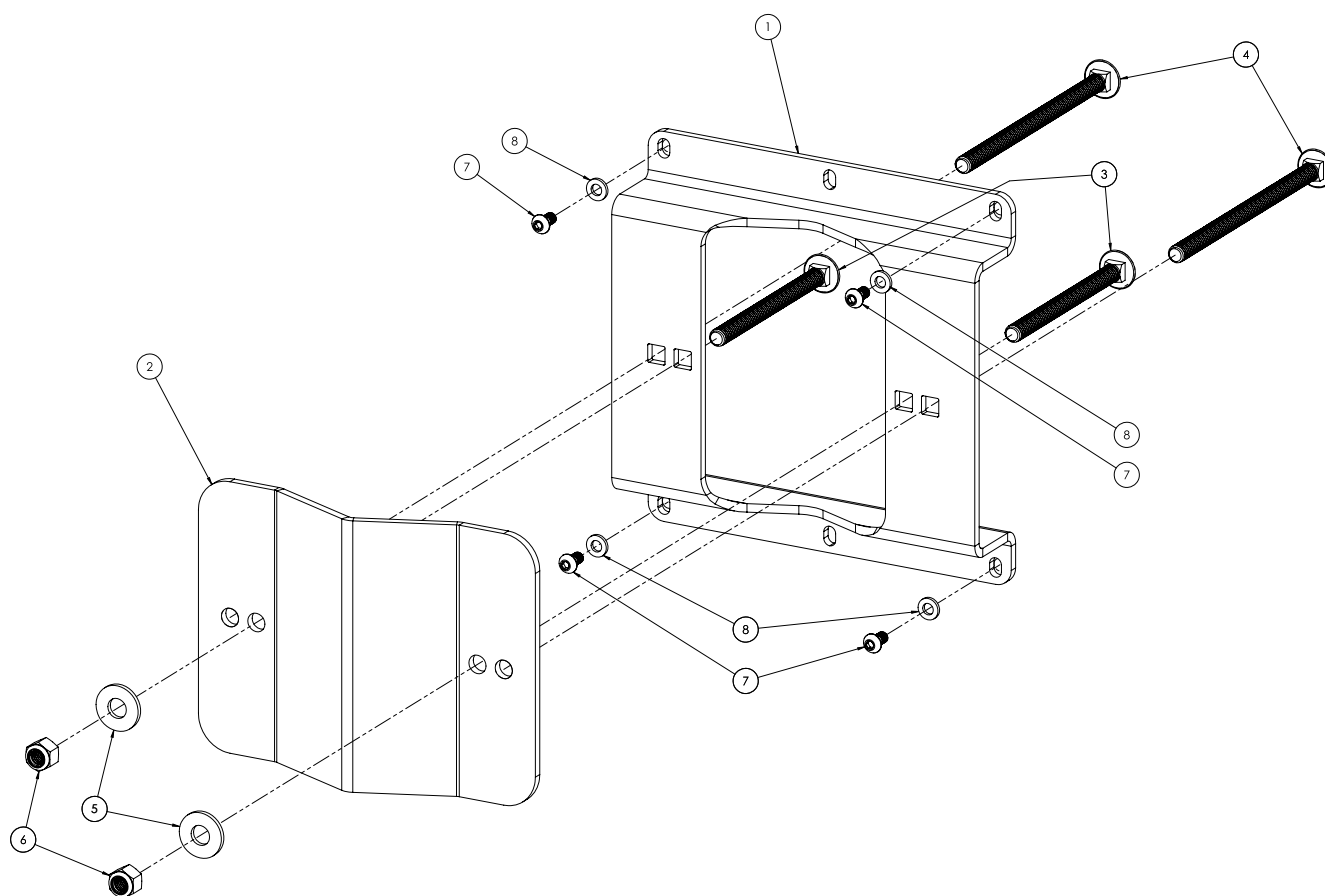

Figure 4-3. LaserLight2 Mount Assembly

Item No.	Part No.	Description	Qty.
1	177866	Pole Mount Bracket	1
2	177867	Pole Clamp Bracket	1
3	177871	Bolt, 3/8-16 x 4-1/2 Grade 5 Full Thread	2
4	177872	Bolt, 3/8-16 x 4-1/2 Grade 6 Full Thread	2
5	21938	Washer, Plain 3/8 Type A	2
6	22072	Lock Nut, 3/8-16 Hex	2
7	130869	Metric M6 x 1 x 12 Button Head Cap Screw	4
8	167958	M6 Metric Flat Washer	4

Table 4-2. Pole Mount Parts Kit

4.5   Offset Plate

The LaserLight2 can be offset mounted using the optional offset mounting bracket (PN 178790) mounted to the pole mount kit. The offset plate allows the left or right offset of the LaserLight2 to mount the pole (flange mounted). The flange mount requires the Vesa style pole mount (Figure 4-3 on page 43).
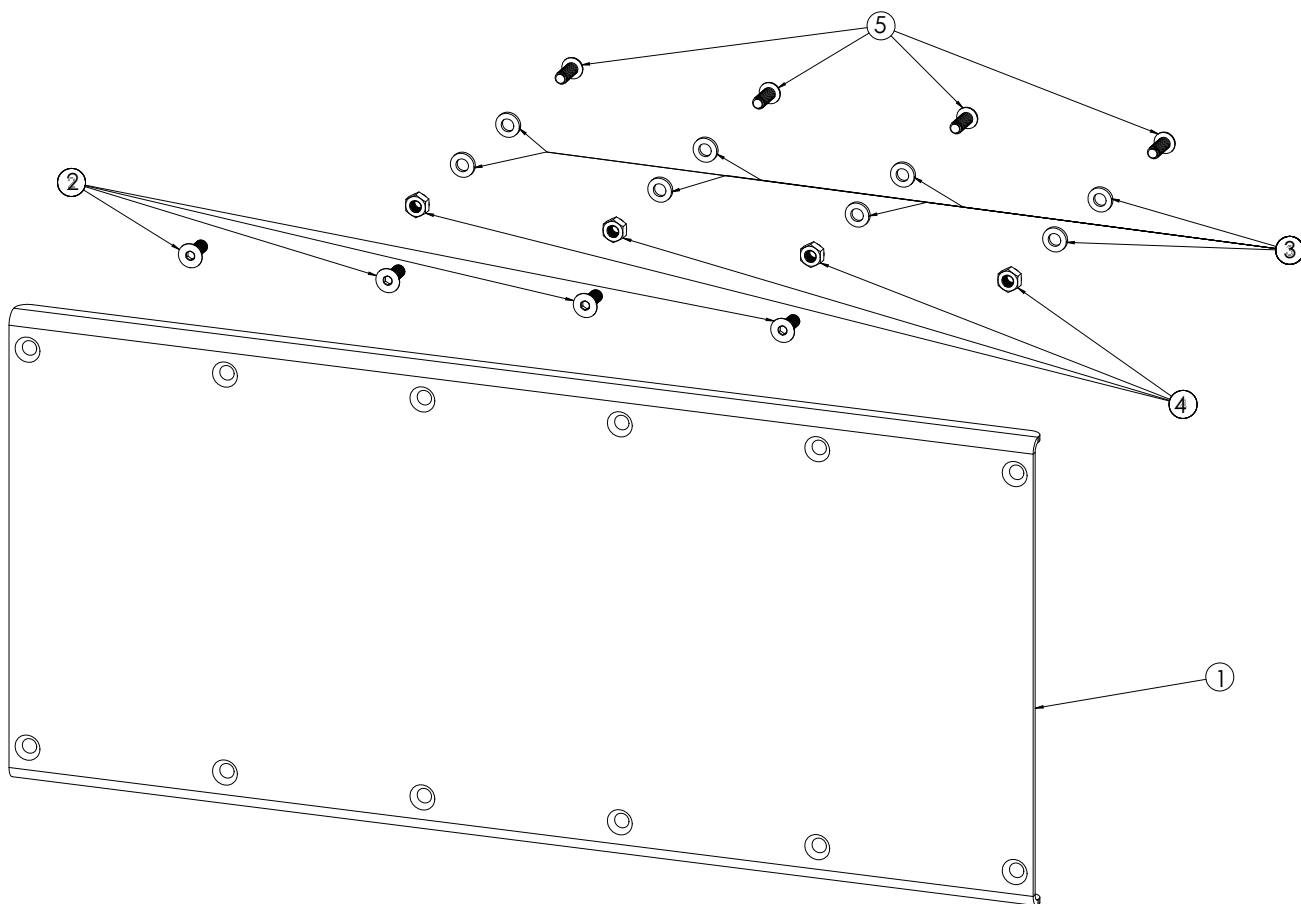
Figure 4-4. Offset Mounting Bracket Kit

Item No.	Part No.	Description	Qty.
1	177868	Plate, Offset Pole Mounting	1
2	167299	Screw, M6-1.0 x 16 mm Flat Head	4
3	167958	Flat washer, M6, Stainless Steel	8
4	175921	Nut, M6 x 16 mm	4
5	178804	Screw, Button Head M6 x 16 mm	4

Table 4-3. Offset Mounting Bracket Parts Kit

5.0   Maintenance

This section provides an overview of LaserLight2 Series maintenance instructions.

5.1   Error Messages

The LaserLight2 displays an error message when an error occurs. Table 5-1 lists the error messages and causes.

Message	Description	Cause
LError	Auto Learn Error	Auto Learn failed
HError	Indicator Code	Write error; Could not save menu settings to the serial EEPROM
rESEt	Invalid Settings	Invalid settings upon power up; All settings reset to their default state
rError	Range Error	When the Rice Lake format goes over or under range
dSPErr	Display Error	Data cannot be accurately displayed
-- --	Invalid Data	Data is being received but is not valid

Table 5-1. Error Messages

5.2   Enclosure Dimensions

See the following information for the 22" unit (4" model enclosure) and the 31" unit (6" and Stop/Go model enclosures) dimensions.
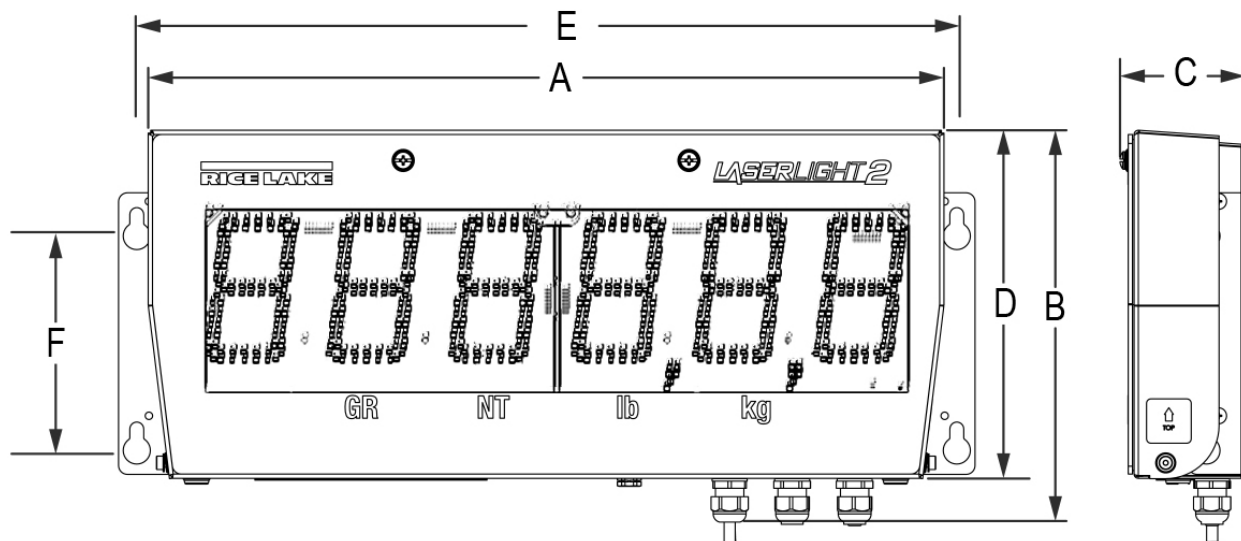

Figure 5-1. Model Enclosure Dimensions (4" Model Enclosure Shown)

Key	4" Model Enclosure Dimensions	6" and Stop/Go Model Enclosure Dimensions
A	22.28" (56.5 cm)	30.63" (78.0 cm)
B	10.96" (28.0 cm)	13.94" (35.5 cm)
C	3.28" (8.50 cm)	3.73" (9.50 cm)
D	9.80" (25.0 cm)	12.77" (32.5 cm)
E	23.00" (58.4 cm)	31.00" (78.7 cm)
F	6.00" (15.2 cm)	7.75" (19.69 cm)

Table 5-2. LaserLight2 Series Model Dimensions

6.0   Specifications

Power

Power Consumption
4"	21 W
6"	27 W

Operator Interface

Display	6-digit, 7-segment discrete oval red LED lamps, dual width
	Contrast enhanced optical filtering lens
	1- or 2-place decimal or comma indication
	4 annunciators for GR, NT, lb, kg
	4" red, green ball/arrow in Stop/Go model

Maximum Viewing Distance

4" Model Enclosure	250' (75 m)
6" Model Enclosure	300' (100 m)

Serial Communications

Input Interface	RS-232, RS-485 or 20 mA current loop (active or passive, switch selectable)
Output Interface	Independently configurable echo port, RS-232 or 20 mA current loop (active or passive, switch selectable)
RS-232	Full and Half Duplex
RS-485	Full and Half Duplex
Baud Rate	1200, 2400, 4800, 9600, and 19200 self-learning or software selectable
Character Format	7 or 8 data bits; even, odd, or no parity; 1 or 2 stop bits, self-learning or software selectable
Update	Continuous or out-of-motion only; software selectable
Time	Software enable/disable, 12- or 24-hour format
Date	Software enable/disable, US or ISO format

Environmental

Operating Temperature	-40°F–120°F (-40°C–49°C)

Enclosure

Enclosure Dimensions
4" Model Enclosure (L x H)	22.28" x 9.8"
6" Model Enclosure (L x H)	30.63" x 12.77'
Stop/Go (L x H)	30.63" x 12.77"
	(Flanges add 2.00" width)

Weight

4"Model Enclosure	20 lb (9 kg)
6" Model Enclosure	25 lb (11 kg)
Rating	IP66
Material	Weather tight, powder coated steel or stainless steel

Warranty

Two-year limited warranty

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