

LaserLight3[®] Series

*Remote Display
Firmware Version 1*

Technical Manual



© Rice Lake Weighing Systems. All rights reserved.

Rice Lake Weighing Systems® is a registered trademark of
Rice Lake Weighing Systems.

All other brand or product names within this publication are trademarks or
registered trademarks of their respective companies.

All information contained within this publication is, to the best of our knowledge, complete and
accurate at the time of publication. Rice Lake Weighing Systems reserves the right to make
changes to the technology, features, specifications and design of the equipment without notice.

The most current version of this publication, software, firmware and all other product
updates can be found on our website:

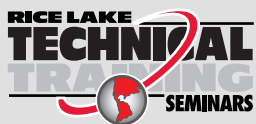
www.ricelake.com

Revision History

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

Revision	Date	Description
A	December 8, 2022	Initial manual release with the launch of the product; firmware V1.00.00
B	March 1, 2023	Updated various hardware drawings; Updated various software components; firmware 1.01.00
C	March 29, 2029	Added new parameters (Display Test, Demand, Cardinal) and Traffic Light control with External Switches; firmware 1.02.00

Table i. Revision Letter History



Technical training seminars are available through Rice Lake Weighing Systems. Course descriptions and dates can be viewed at www.ricelake.com/training or obtained by calling 715-234-9171 and asking for the training department.

Contents

1.0	Introduction	7
1.1	Safety	7
1.2	FCC Compliance	8
1.3	Overview	8
1.3.1	Standard Features	8
1.4	Operating Modes	9
1.5	LaserLight3 Options	9
2.0	Installation	10
2.1	Unpacking	10
2.2	Product Dimensions	10
2.2.1	Mount Bracket Dimensions	11
2.3	Wall Mounting	12
2.4	Opening the Enclosure	13
2.5	Cable Connections	14
2.5.1	Cord Grips	14
2.5.2	Power Supply Wiring	15
2.6	CPU Board Connections	16
2.6.1	CPU Board Power Input	16
2.6.2	CPU Board Display Power Out	16
2.6.3	RS-232 Serial Communications	17
2.6.4	RS-485/422 Serial Communications	17
2.6.5	Digital I/O	18
2.6.6	Micro USB Device Communications	18
2.6.7	Ethernet TCP/IP	19
2.6.8	20 mA	20
2.6.9	Keypad and Ambient Light Sensor	20
2.6.10	RF Interference	20
2.7	CPU Board Features	21
2.7.1	Status LEDs	21
2.7.2	CPU Board Jumpers	22
2.7.3	CPU Board Switches	23
2.8	Parts Kit	23
2.9	Replacement Parts	24
2.9.1	LaserLight3 Assembly Parts	24
2.9.2	Front Door Assembly Parts	25
2.9.3	Cabinet Assembly Parts	27
3.0	Operation	28
3.1	Front Panel Display	28
3.2	Keypad	29
3.3	Menu Element Overview	30
3.3.1	Menu with Selectable Item	30
3.3.2	Menu and Read Only Message	30
3.3.3	Menu and Text Editable Parameter	31
3.4	Frequently Used Software Functions	31
3.4.1	Edit Time	31
3.4.2	Edit Date	32



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

3.4.3	Displaying Time and Date	32
3.4.4	View Ethernet and Wi-Fi Media Access Control (MAC) IDs	33
3.4.5	View Version	33
3.4.6	Reset Configuration	34
3.4.7	Change Brightness Intensity	34
3.4.8	Change Display Color	35
4.0	Remote Display Configuration	36
4.1	Configure Display Type	36
4.2	Automatic Configuration	37
4.2.1	Automatic Baud Configuration	37
4.2.2	Auto-Learn and Data String Recognition	38
4.3	Manual Mode	40
4.3.1	Enable Manual Mode	40
4.3.2	Configuring Manual Mode Parameters	41
4.3.3	MniMVal (Manual Mode Validation) Operation	49
4.4	Demand Print String Displaying	50
4.5	Serial Commands	50
4.5.1	Remote Display Command Format	50
4.5.2	Advanced Display Message (DM) Commands	52
4.6	Control Traffic Lights with External Switches (Digital Inputs)	54
4.6.1	Single Switch Wiring	54
4.6.2	Two Switch Wiring	55
5.0	Configuration	56
5.1	Main Menu	56
5.2	Setup Menu	57
5.2.1	Communications Menu	57
5.2.2	Format Menu	62
5.2.3	Program Menu	63
5.2.4	Stream Format Menu	65
5.2.5	Digio (Digital I/O) Menu	66
5.2.6	Remote Menu	67
5.3	MAC ID	69
5.4	Test Menu	70
5.5	Time Menu	71
5.6	Date Menu	71
5.7	Version	71
6.0	Revolution	72
6.1	Connecting to LaserLight3	72
6.2	Saving and Transferring Data	72
6.2.1	Saving LaserLight3 Data to a PC	72
6.2.2	Downloading Configuration Data from PC to LaserLight3	72
6.3	Updating Firmware	73
7.0	EDP Commands	74
7.1	Key Press Commands	74
7.2	Key Press String Transmission Commands	75
7.3	Reporting Commands	75
7.4	Reset Configuration Command	75



Technical training seminars are available through Rice Lake Weighing Systems. Course descriptions and dates can be viewed at www.ricelake.com/training or obtained by calling 715-234-9171 and asking for the training department.

7.5	LaserLight3 Commands	76
7.5.1	Learn or Manual Mode commands	76
7.5.2	Additional LaserLight3 commands	77
7.6	Serial Port Setting Commands	77
7.6.1	Serial Ports	77
7.7	Ethernet and USB Setting Commands	78
7.8	Wi-Fi Setting Commands	78
7.9	Program Commands	79
7.10	Digital I/O Command	79
8.0	Maintenance	80
8.1	Maintenance Checkpoints	80
8.2	Field Wiring	80
8.3	Troubleshooting Tips	80
8.4	Removing Front Door	81
8.5	Battery Replacement	83
8.6	CPU Board Replacement	84
8.7	LED Display Replacement	86
8.8	Test Functions	90
8.8.1	Digital Output Test	90
8.8.2	Digital Input Test	90
8.8.3	Loop-back Test	91
9.0	Appendix	92
9.1	Error Messages	92
9.2	Parameter Abbreviation List	93
9.3	Non-Printable Characters	94
9.4	ZZ EDP Command	97
9.5	Auto-Learn Supported Data Formats	97
9.6	Continuous Data (Stream) Output Formats	98
9.6.1	Fixed Format Options:	98
9.6.2	Rice Lake Weighing Systems Stream Format	98
9.6.3	Cardinal Stream Format	98
9.6.4	Avery Weigh-Tronix Stream Format	99
9.6.5	Mettler Toledo Stream Format	99
9.6.6	Custom Stream Format Tokens	100
9.7	Cardinal Display Type Format	102
9.7.1	Cardinal Message Board Stream Format	102
9.7.2	Cardinal Score Board Stream Format	102
10.0	Specifications	103



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 LaserLight3 Remote Display. Remote display configuration is detailed in [Section 4.0 on page 36](#). Configuration of LaserLight3 can be accomplished using the Revolution® configuration utility or the front panel keys. See [Section 5.0 on page 56](#) for information about configuration.



Manuals and additional resources are available from Rice Lake Weighing Systems at www.ricelake.com/manuals

Warranty information can be found 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.

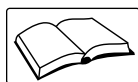


CAUTION: Indicates a potentially hazardous situation that, if not avoided, could result in minor or moderate injury.



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 LaserLight3.

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 make alterations or modifications to the unit.

Do not remove or obstruct view of warning label (Figure 1-1).

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



Figure 1-1. Safety Label (PN 16861)

1.2 FCC Compliance

United States

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Canada

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la Class A prescrites dans le Règlement sur le brouillage radioélectrique édicté par le ministère des Communications du Canada.

1.3 Overview

The LaserLight3 operates with most digital weight indicators, host computers, and peripherals via 20 mA current loop, RS-232, RS-422 full and half duplex, Ethernet (wired TCP/IP), Wi-Fi or Radio connections. It displays a 5 in weight, 4 in weight with traffic symbols, 2-line message, or quarantine messages with color selections. The LaserLight3 includes a photo sensor that monitors ambient light and automatically adjusts the LaserLight3 display between day and night settings.

The LaserLight3 enclosure provides easy access to internal components, the front door swings down for setup and service. A keypad is installed on the front door which makes navigating and configuring options convenient.

1.3.1 Standard Features

Standard features include:

- Two 64 X 32 Led Displays (128 x 32 Combined)
- Color Selection (red, yellow, green, blue, magenta, cyan or white)
- Auto-Learn mode
- IP66 enclosure
- Hinged front door
- Keypad
- Adjustable day and night brightness intensity
- Software selectable time and date (when the displayed weight is at zero)
- Non-glare contrast filtered lens
- Mirror (reverse image) feature
- RS-232, RS-422, 20 mA, and Ethernet (wired TCP/IP) communications
- Auto sensing 115/240 VAC power supply
- VESA flat-wall mount or side-mounting flange
- Gore-Tex® breather vent inhibits internal moisture buildup

1.4 Operating Modes

Modes available to the LaserLight3 remote display are detailed in [Table 1-1](#).


Mode	Description
Remote Display Mode	<i>Remote Display</i> mode is the primary mode of the device. The LaserLight3 displays data that is received from an external source, such as an indicator
Menu Mode	<i>Menu</i> mode is accessible by pressing  on the front panel. Access to the Audit, Setpoint, Accumulator, Tare, Time, Date, MAC ID, and Version menus is available when in <i>Menu</i> mode
Setup Mode	Many of the procedures described in this manual, require the indicator to be in <i>Setup</i> mode. See Section 2.7.2 on page 22 for the procedure to enter <i>Setup</i> mode and the parameters available

Table 1-1. Operating Mode Descriptions

1.5 LaserLight3 Options

Options for the LaserLight3 include:

- Flange Pole mount kit (see PN 75856)
- VESA Pole mount kits (see PN 212745)
- Sunshade Visor kit (see PN 214693)
- Wi-Fi (factory installed, PN 209118)
- ConnexLink (see PN 212753)

2.0 Installation

This section provides an overview of LaserLight3 Series installation, AC wiring, CPU board connections, replacement parts.



WARNING: The LaserLight3 has no on/off switch. Before opening the unit, ensure the power cord is disconnected from the power outlet.

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

2.1 Unpacking

Immediately after unpacking, visually inspect the LaserLight3 for damage. If parts were damaged in shipment, notify Rice Lake Weighing Systems and the shipper immediately.

The shipping carton contains the following components:

- LaserLight3
- Mounting bracket or pole mount
- Documentation

2.2 Product Dimensions

Figure 2-1 displays exterior LaserLight3 dimensions.

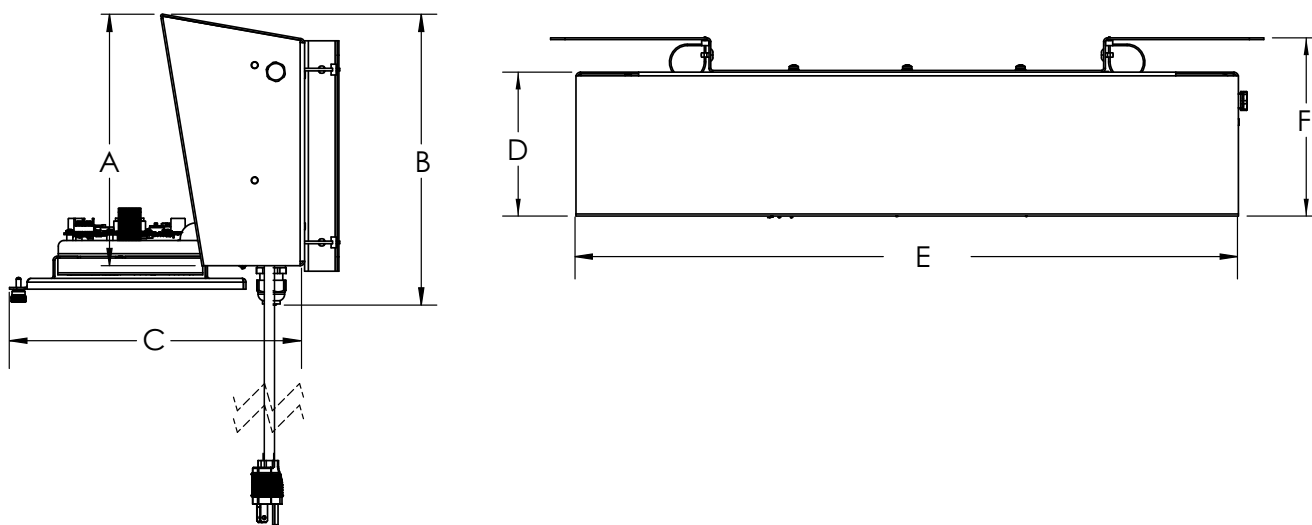


Figure 2-1. LaserLight3 Dimensions Profile and Top

Item	Inches	Millimeters
A	8.73	222
B	10.10	257
C	10.34	262
D	5.00	127
E	23.00	584
F	6.35	162

Table 2-1. LaserLight3 Dimensions

2.2.1 Mount Bracket Dimensions

Figure 2-2 displays LaserLight3 the mounting bracket dimensions.

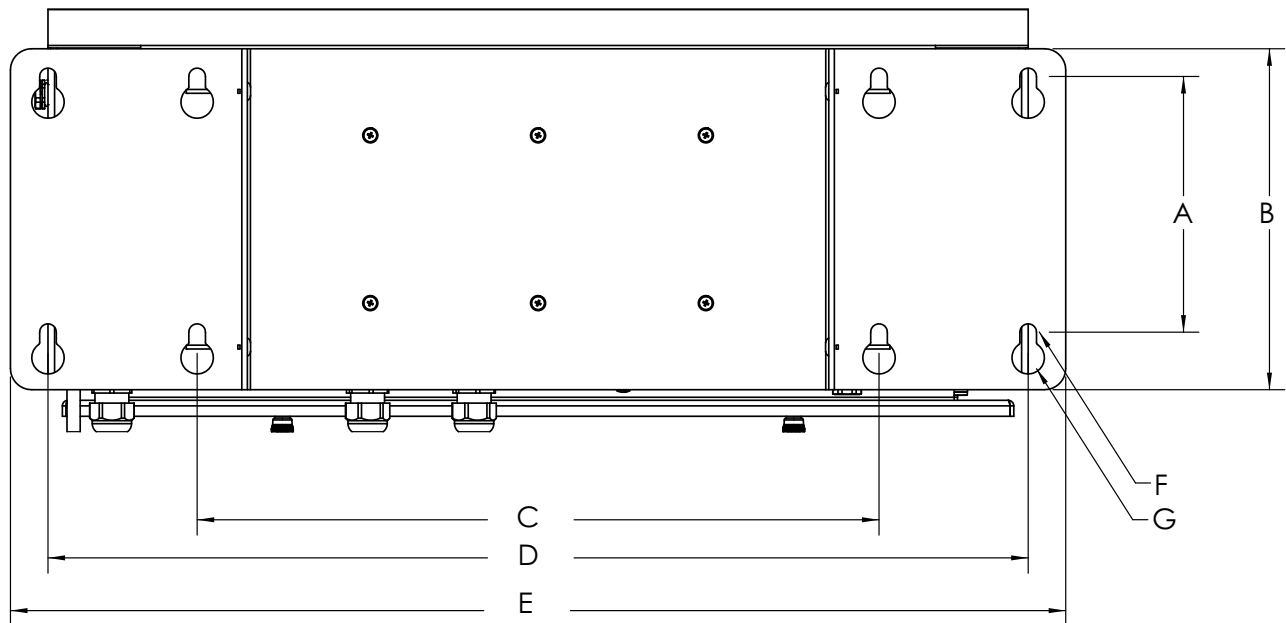


Figure 2-2. Mounting Bracket Dimensions

Item	Inches	Millimeters
A	6.00	152
B	8.00	203
C	16.00	406
D	23.00	584
E	25.00	635
F	0.39	10
G	0.76	19

Table 2-2. LaseLight3 Dimensions

2.3 Wall Mounting

LaserLight3 can be mounted to a flat surface in two ways:

- Using 0.39 in (10 mm) - 0.76 in (19 mm) keyholes
- Using 100 x 100 or 200 x 200 VESA mounting holes

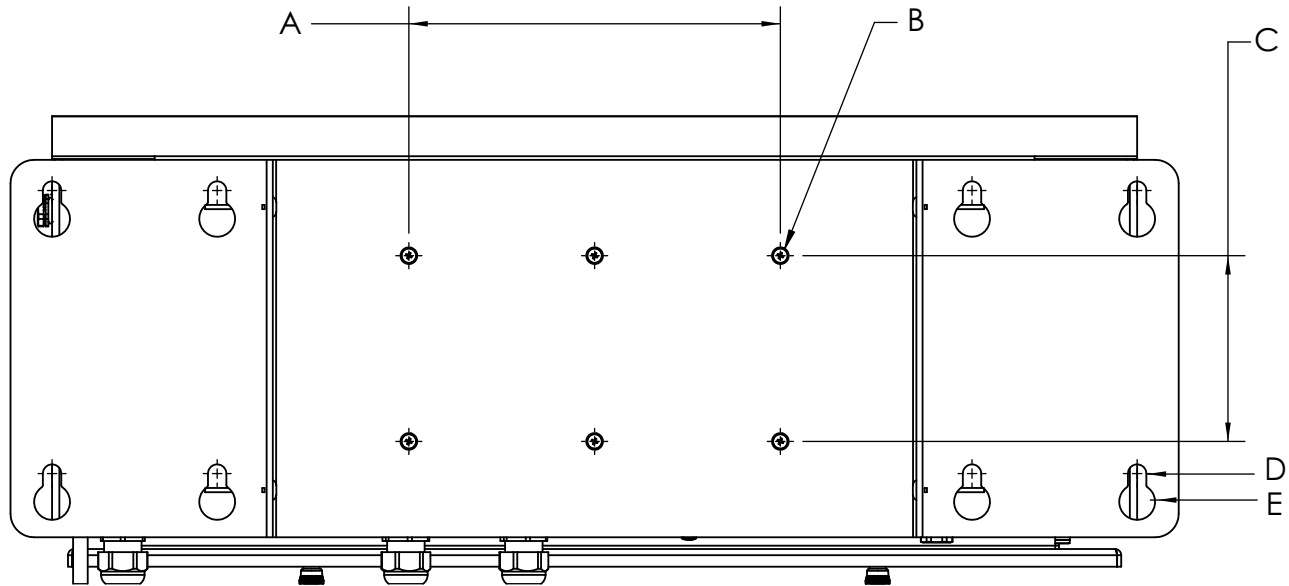


Figure 2-3. Bracket with VESA Mounting Holes Identified

Item	Description	Inches	Millimeters
A	VESA 200 Mount Standard	7.87	200
B	VESA Mount Holes (M4 0.07 X 10mm)	0.19	5
C	VESA 100 Mount Standard	3.94	100
D	Upper Keyhole Mount	0.39	10
E	Lower Keyhole Mount	0.75	19

Table 2-3. Mounting Dimensions



NOTE: An optional pole mounting kit is required when installing the remote display on a pole.

2.4 Opening the Enclosure

Perform the following to open the enclosure.



WARNING: The LaserLight3 has no on/off switch. Before opening the unit, ensure the power cord is disconnected from the power outlet.

1. If necessary, remove tamper proof seal.
2. Loosen the two captive screws located on the front of the enclosure.

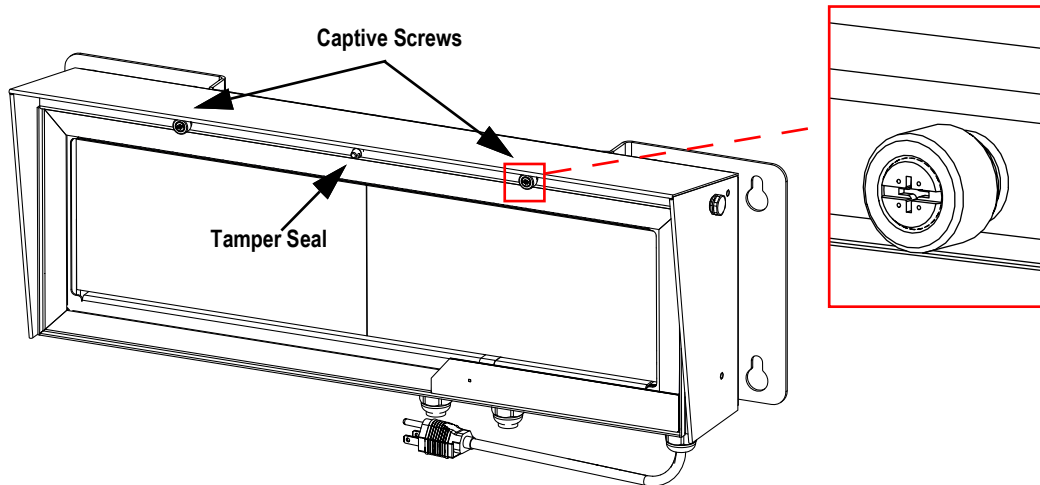


Figure 2-4. Front Door Fasteners and Wire Seal Location

3. Pull the hinged display outward to open the enclosure.

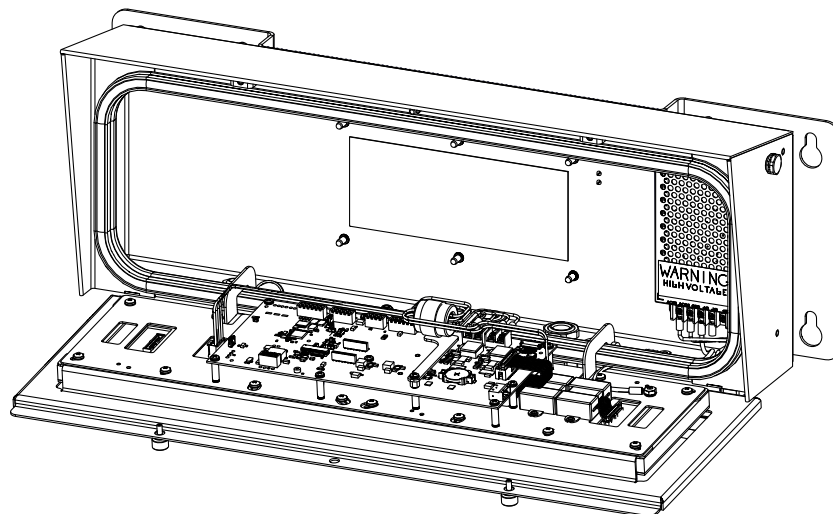


Figure 2-5. LaserLight3 Open

4. Reverse the procedure to close the enclosure.

2.5 Cable Connections

The LaserLight3 arrives pre-wired with connections from the CPU board to the display boards, CPU board to keypad, CPU board to power supply and power cord to power supply.

A data source from an external device must be received by the Remote Display via RS-232 (Section 2.6.3 on page 17), RS-485/422 (Section 2.6.8 on page 20), 20 mA (Section 2.6.4 on page 17), Ethernet (Section 2.6.7 on page 19) or Wi-Fi (factory installed option).

2.5.1 Cord Grips

The LaserLight3 remote display provides three cord grips located on the underside of the enclosure; one for the supplied A/C power cord and two for load cell or communication cables. Cable plugs are included in the parts kit and must be installed in open cord grips to prevent moisture from entering the enclosure. See the following sections to install cables as required for the application.



IMPORTANT: Ensure stripped portion of cables are entirely inside cord grips. Properly seal cord grips to prevent moisture damage inside of the enclosure. Cable plugs must be installed in unused cord grips. Cord grips have a clamping range of 0.197-0.472 in (5.0-12.0 mm).

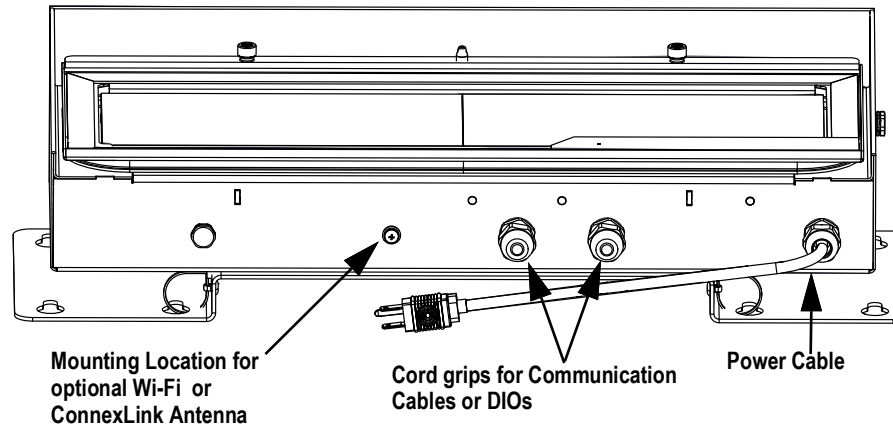


Figure 2-6. Cord Grip Layout

2.5.2 Power Supply Wiring

The LaserLight3 AC power supply is mounted inside the enclosure and supplies power to the CPU board. AC wiring runs through a cord grip to the power supply.

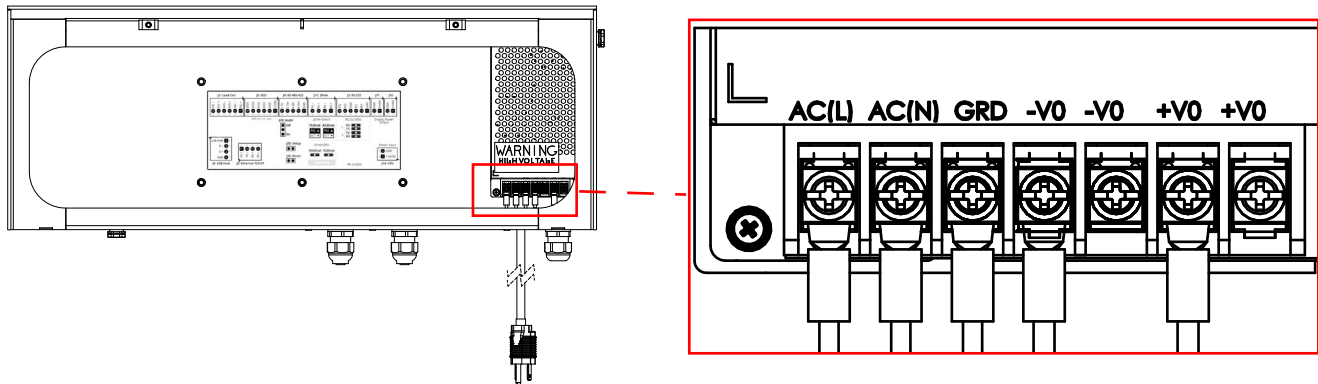


Figure 2-7. Power Supply Wiring



NOTE: The far left wire illustrated in [Figure 2-7](#) is a ground attached to power supply mounting plate and enclosure.

Refer to [Table 2-4](#) for power supply input wiring connections.

Power Supply Label	Wire	Color	Voltage Input
AC (L)	Line	Brown or Black	115 or 240 VAC at 50/60 Hz.
AC (N)	Neutral	Blue or White	0
GRD	Ground	Green/Yellow	0

Table 2-4. Power Supply Input Connections

Refer to [Table 2-4](#) for power supply output connections.

Power Supply Label	Wire	Color	Voltage Output	CPU Board Connector
-V0	Ground	Black	0	J14 P2
-V0	-	-	-	-
+V0	Line	Red	12 VDC (10.2 to 13.8 VDC tolerance)	J14 P1
+V0	-	-	-	-

Table 2-5. Power Supply Power Output Connections

2.6 CPU Board Connections

Figure 2-8 illustrates location of cable connections on the CPU board.

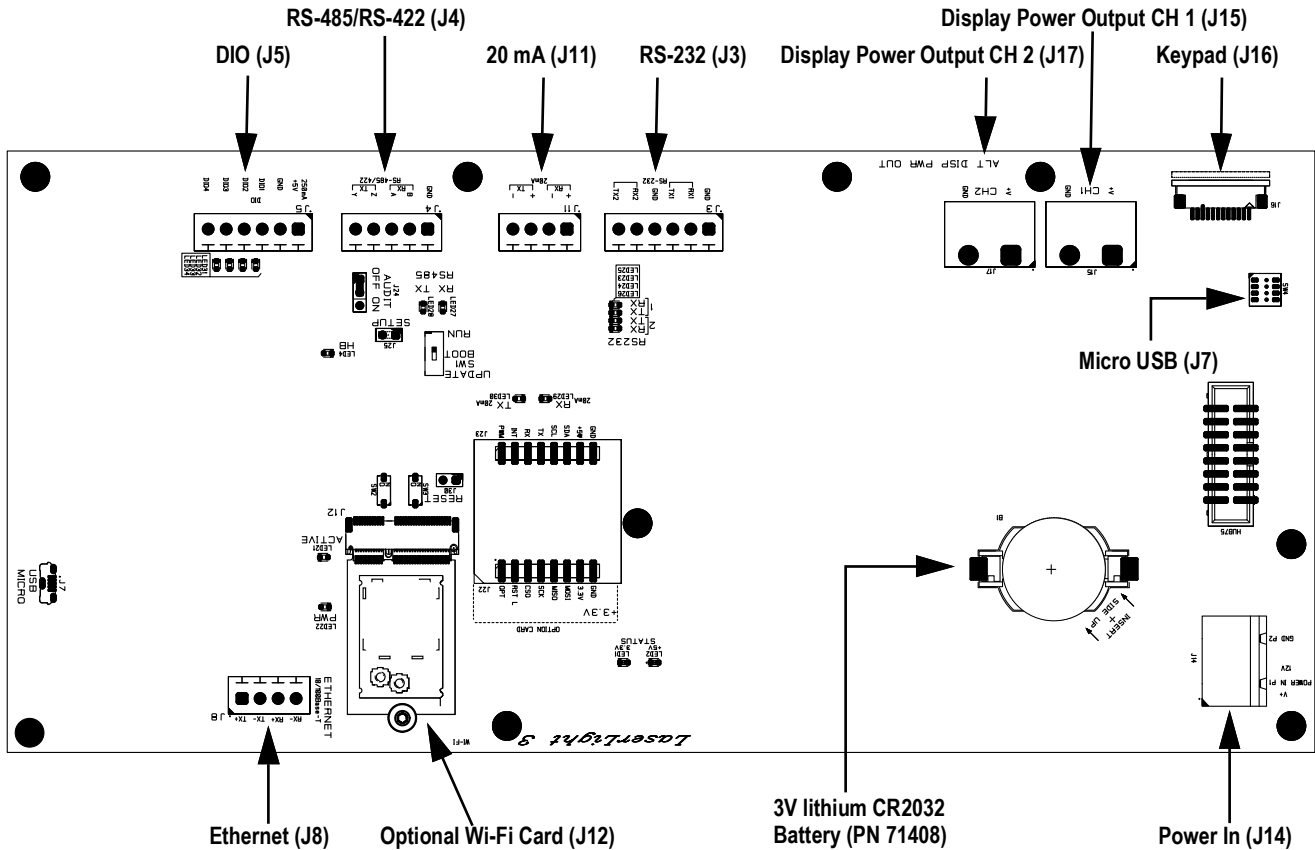
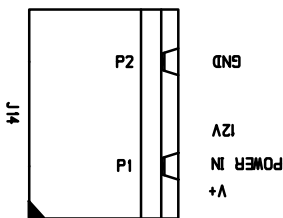


Figure 2-8. LaserLight3 CPU Board

2.6.1 CPU Board Power Input

J14 receives power from the AC power supply to power the CPU board. See Figure 2-9 for the pin assignments for the J14 connector.

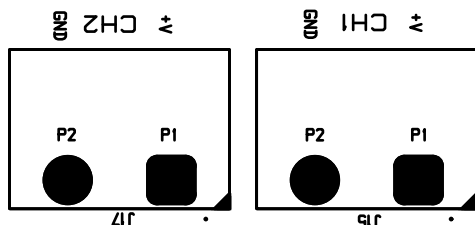


CPU Board Connector	Pin Assignment	Signal
J14	1	+ 12 VDC (10.2 to 13.8 VDC tolerance)
	2	GND

Figure 2-9. CPU Board Power In Connector (J14)

2.6.2 CPU Board Display Power Out

J15 and J17 supplies display LED boards with power. See Figure 2-10 for the pin assignments for the J15 and J17 connectors.

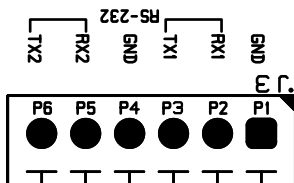


CPU Board Connector	Pin Assignment	Signal
J15 CH1 Display Power Output	1	+ 5VDC (4.85 to 5.05 VDC tolerance)
	2	GND
J17 CH 2 Display Power Output	1	+ 5VDC (4.85 to 5.05 VDC tolerance)
	2	GND

Figure 2-10. CPU Board Display Power Out Connectors (J15 and J17)

2.6.3 RS-232 Serial Communications

The J3 connector (Section 2.7 on page 21) is intended to provide a connection point for the RS-232 serial communications. Two RS-232 ports are available. See Figure 2-11 for the pin assignments for the J3 connector.

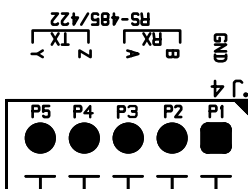


Connector	Pin	RS232-1	RS232-2
J3	1	GND	-
	2	RX1	-
	3	TX1	-
	4	-	GND
	5	-	RX2
	6	-	TX2

Figure 2-11. CPU Board RS-232 Connector (J3)

2.6.4 RS-485/422 Serial Communications

The J4 connector (Section 2.7 on page 21) is intended to provide a connection point for the RS-485/422 serial communications. Both full duplex (four-wire) and half duplex (two-wire) are supported through the J4 connector. See Figure 2-12 for the pin assignments for the J4 connector.



Connector	Pin	4-Wire (Full Duplex)	2-Wire (Half Duplex)
J4	1	GND	GND
	2	RX- (B)	-
	3	RX+ (A)	-
	4	TX- (Z)	TX/RX-
	5	TX+ (Y)	TX/RX+

Figure 2-12. CPU Board RS-485/422 Connector (J4)

2.6.5 Digital I/O

The Digital I/O port, J5 connector (Section 2.7 on page 21) can be configured as an input or an output.

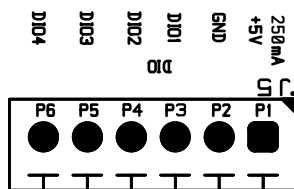
Digital inputs can be set to provide many functions, including most keypad functions except MENU. Digital inputs are active low (0 VDC) and inactive high (5 VDC). Use the Digital I/O menu to configure the digital inputs.

Digital outputs are used to control relays which drive other equipment. Outputs are designed to sink, rather than source current. Each output is an open collector circuit, capable of sinking 24 mA (max) when active. Digital outputs are active when low or at 0 VDC, with reference to the 5 VDC supply.

Use the Digital I/O menu to set the function of the Digital I/O pins to OUTPUT and then use the Setpoints menu to configure the digital outputs. See Figure 2-13 for the pin assignments for the J5 connector.



NOTE: An output is wired to ground (P2) and the first available DIO pin, while an input is wired to +5VDC (P1) and first available DIO pin.



Connector	Pin	Signal
J5	1	+5 VDC, 250 mA max
	2	GND
	3	DIO1
	4	DIO2
	5	DIO3
	6	DIO4

Figure 2-13. CPU Board DIO Connector (J5)

2.6.6 Micro USB Device Communications

The Micro USB port, J7 connector, is intended to be connected to a PC only. It appears as a Virtual COM Port and is assigned a "COMx" designation. Applications communicate through the port like a standard RS-232 communications port.

With the PC and LaserLight3 powered on, connect a USB cable from the PC to the micro USB connector (J7) on the LaserLight3. A new COM Port designation is assigned for each physical USB port the LaserLight3 is connected to on the PC.



WARNING: Use a grounding wrist strap to protect components from electrostatic discharge (ESD) when working inside the enclosure or on the front door.

For example, if the PC has four physical COM Ports with two are in use, they most likely are designated COM1 and COM2. When connecting the LaserLight3 to a USB port on the PC, it is assigned the next available port designation, or in this case, COM3. When plugging into the same physical USB port on the PC, the port designation is again COM3. If plugging into another physical USB port on the PC, it is assigned the next available designation, in this case COM4.

Use Windows® Device Manager to determine the COM Port designation which was assigned to the USB port, or open the application to be used with the LaserLight3, such as Revolution, to see which ports are available.

Configuration of the Micro USB port is done in the USB sub-menu under Communication in *Setup mode*. If Remote In is set, other features (such as sending EDP commands) are disabled.

The port can be configured as either a demand port for EDP commands and printing, or as a data streaming port (Remote In parameter).



NOTE: This port is not a host port and is not intended to be connected to other devices such as keyboards, memory sticks or printers.



NOTE: If a computer application has an open communications connection through the Micro USB device port and the physical cable connection is interrupted, a soft reset (short J30 momentarily) must be performed on the LaserLight3 or the power must be cycled to the LaserLight3; the connection in the computer application must be disconnected and then reconnected before it continues to communicate with the LaserLight3.

For the Micro USB device port, it does not matter what the settings are for Baud, Data Bits, Parity and Stop Bits in the computer software. The port communicates in the same way regardless of these settings.



Figure 2-14. Micro USB Input (J7)

2.6.7 Ethernet TCP/IP

The LaserLight3 features Ethernet TCP/IP 10Base-T/100Base-TX communication using the J8 connector (Section 2.7 on page 21), and can support two simultaneous connections, one as a server, the other as a client.

Through an Ethernet network, software applications can communicate with the LaserLight3 using the EDP command set (Section 7.0 on page 74), or data can be streamed continuously from the LaserLight3, or printed on demand.

The Ethernet port supports both DHCP and manual configuration of settings such as the IP and netmask. In addition, the TCP Port number, and the Default Gateway can be configured using the Ethernet sub-menu of the Ports setup menu. For more information on configuring the Ethernet port see Section 5.2.1.3 on page 60.

Physical connection to the LaserLight3 Ethernet port can be made directly from a PC to the LaserLight3 (AdHoc Network), or through a network router or switch. The port supports auto-sensing MDI/MDIX cable configuration, allowing either straight-through or crossover cables to be used. See Figure 2-15 for the pin assignments for the J8 connector.



Figure 2-15. CPU Board Ethernet Connector (J8)

See Table 2-6 and Table 2-7 for the pin assignments when connecting a RJ45 Ethernet cable to the J8 connector. There are two Ethernet wire standards (T568A and T568B). If the type of cable is unknown, use the wiring option in Table 2-6. The auto-sensing feature of the Ethernet port allows either of the wiring options to function. Trim unused wires.

RJ45 Cable Pin	Wire Color (T568A)	Wire Diagram (T568A)	10Base-T Signal 100Base-TX Signal	J8 Connector Pin
1	White/Green		Transmit+	1
2	Green		Transmit-	2
3	White/Orange		Receive+	3
4	Blue		Unused	NA
5	White/Blue		Unused	NA
6	Orange		Receive-	4
7	White/Brown		Unused	NA
8	Brown		Unused	NA

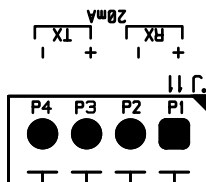
Table 2-6. Ethernet Cable Pin Assignments for T568A

RJ45 Pin #	Wire Color (T568B)	Wire Diagram (T568B)	10Base-T Signal 100Base-TX Signal	J8 Pin #
1	White/Orange		Transmit+	1
2	Orange		Transmit-	2
3	White/Green		Receive+	3
4	Blue		Unused	NA
5	White/Blue		Unused	NA
6	Green		Receive-	4
7	White/Brown		Unused	NA
8	Brown		Unused	NA

Table 2-7. Ethernet Cable Pin Assignments for T568B

2.6.8 20 mA

The J11 connector (Section 2.7 on page 21) is intended to provide a connection point for the 20 mA current loop passive communications. See Figure 2-16 for the pin assignments for the J11 connector.



Connector	Pin	Signal
J11	1	RX+
	2	RX-
	3	TX+
	4	TX-

Figure 2-16. CPU Board 20 mA Current Loop Connector (J11)

2.6.9 Keypad and Ambient Light Sensor

The keypad with integrated ambient light sensor connects to J16 on the CPU board. The keypad provides the functional buttons that interface with LaserLight3 (see Section 3.2 on page 29).

The ambient light sensor adjusts the brightness of the display in relation to configured Bright parameters. For more information about ambient light sensor parameters, see Section 5.2.6 on page 67.



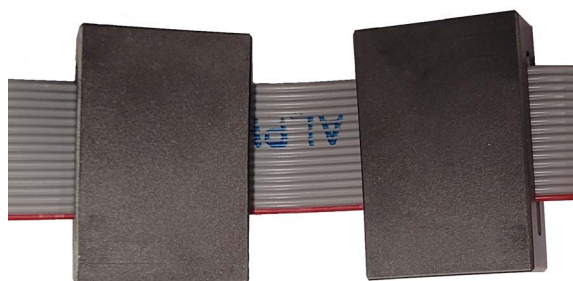
NOTE: The LaserLight3 defaults to the Night setting if the sensor is faulty or absent.

2.6.10 RF Interference

A cylindrical EMI filter is pre-installed on LED power cables (J15 and J17) and two rectangular EMI filters are pre-installed on the LED data cable (HUB75) to eliminate RF interference.



Power Cables with EMI Filter



Data Cable with EMI Filters

Figure 2-17. EMI Filters Placement for RF Interference

2.7 CPU Board Features

2.7.1 Status LEDs

There are several small LEDs located on the CPU board that indicate status for a specific connector or component. Typically, LEDs are located adjacent to their relevant connectors or components. Figure 2-18 illustrates the locations of LEDs on the CPU board.

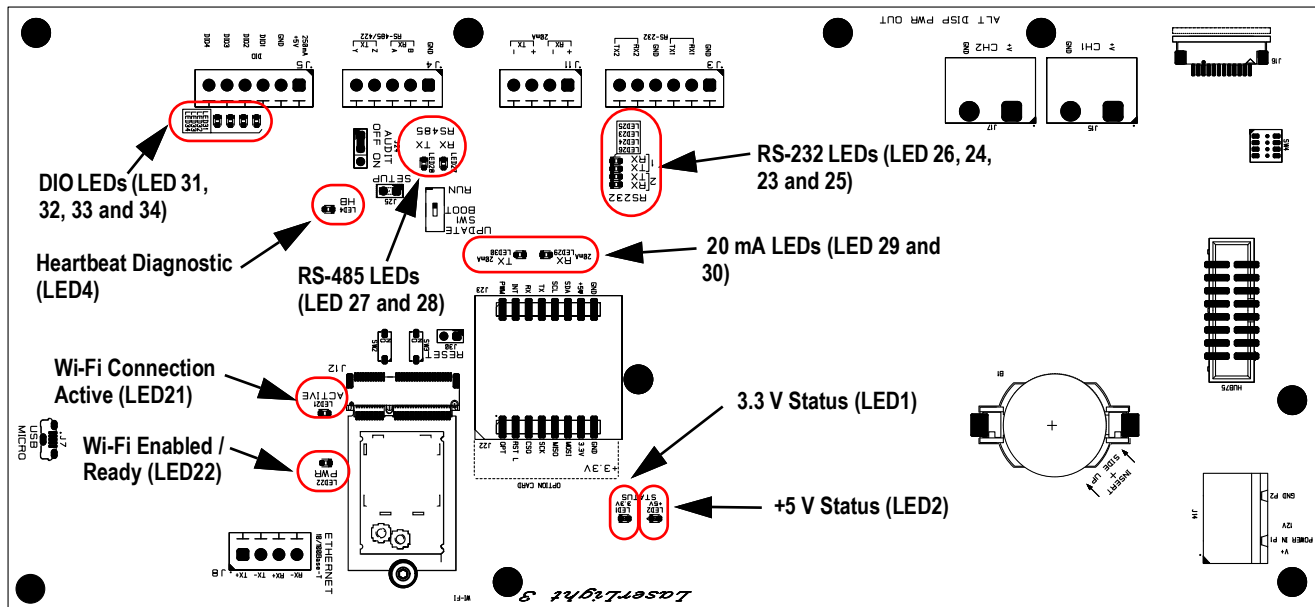


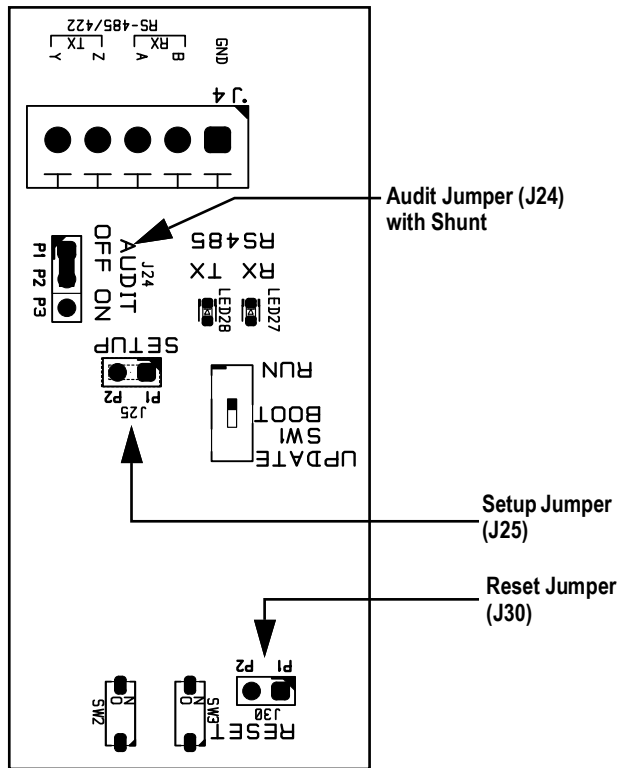
Figure 2-18. LaserLight3 CPU Board with Status LEDs Identified

LED	Description
LED 1 +5V Status	Illuminates to indicate the +5V Power Supply is operating properly
LED 2 3.3V Status	Illuminates to indicate the +3.3V Power Supply is operating properly
LED 4 HB (Heartbeat)	Flashes when CPU board is operating properly
LED 21 ACTIVE	Flashes when Wi-Fi module is enabled and ready
LED 22 PWR	Illuminates when Wi-Fi module receives power
LED 23 TX RS-232 Port 1	Flashes when data is transmitted by RS-232 Port 1
LED 24 TX RS-232 Port 2	Flashes when data is transmitted by RS-232 Port 2
LED 25 RX RS-232 Port 1	Flashes when data is received by RS-232 Port 1
LED 26 RX RS-232 Port 2	Flashes when data is received by RS-232 Port 2
LED 27 RX RS-485/422	Flashes when data is received by RS-485/422
LED 28 TX RS-485/422	Flashes when data is transmitted by RS-485/422
LED 29 20 mA RX	Flashes when data is received by 20 mA
LED 30 20 mA TX	Flashes when data is transmitted by 20 mA
LED 31 DIO 1	Illuminates when DIO 1 (DIO P3) is active (pulled low)
LED 32 DIO 2	Illuminates when DIO 2 (DIO P4) is active (pulled low)
LED 33 DIO 3	Illuminates when DIO 3 (DIO P5) is active (pulled low)
LED 34 DIO 4	Illuminates when DIO 4 (DIO P6) is active (pulled low)

Table 2-8. Status LED Descriptions

2.7.2 CPU Board Jumpers

The CPU board provides three jumpers (J24 Audit, J25 Setup and J30 Reset) located near RS-485/RS-422 (J4).



CPU Board Jumper	Function	Application
J24	Audit Trail Off	Install shunt on pins 1 and 2
	Audit Trail On (LFT)	Install shunt on pins 2 and 3
J25	Setup	Short pins 1 and 2 momentarily
J30	Reset	Short pins 1 and 2 momentarily

Figure 2-19. CPU Board Jumpers

Jumper	Description
Audit Jumper (J24)	The audit jumper (J24) turns Setup mode access ON (shunt on pins 2 and 3) and OFF (shunt on pins 1 and 2). Access to Setup mode is allowed without shorting the setup jumper when the audit jumper is in the ON position. Access to Setup mode requires shorting jumper J25 with a metallic object when the audit jumper is in the OFF position. See Figure 2-19 for the location of the audit jumper on the CPU board.
Setup Jumper (J25)	In order to configure the LaserLight3, it must be placed in Setup mode with the setup jumper or with the audit jumper. The setup jumper is activated by opening the enclosure and momentarily shorting the pins on J25.
Reset Jumper (J30)	The reset jumper (J30) 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 2-19 for the reset jumper location on the CPU board.

Table 2-9. Jumper Descriptions

2.7.3 CPU Board Switches

The CPU board contains several switches that are identified in Figure 2-20.

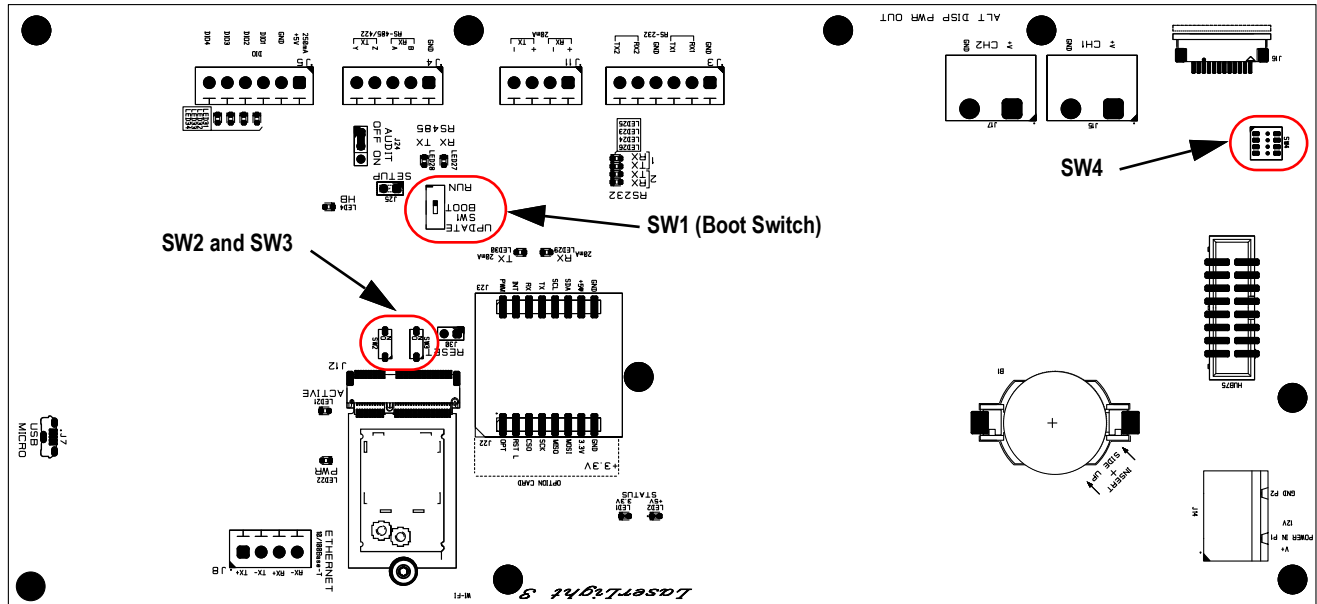


Figure 2-20. CPU Board Switches

Switches	Description
SW1 (Boot Switch)	SW1 is located near the Setup jumper (J25) and controls the operating state of the CPU board. SW1 has two positions: Update (top) and RUN (bottom/default)
SW2 and SW3	SW2 and SW3 are located adjacent to the Reset Jumper (J30) and not intended for use. These switches are sealed with a film and should remain in their default Off positions
SW4	SW4 switch bank is located in the bottom left corner near the Hub75 connector. These switches are sealed with a film and should remain in their default off positions: 1, 2, 3 and 4

Table 2-10. Switch Descriptions

2.8 Parts Kit

The LaserLight3 includes a parts kit (PN 214885) that provides wire connectors and cable ties.

Part No.	Description	QTY
153878	Connector, 4 Position Screw Terminal	1
153882	Connector, 5 Position Screw Terminal	1
153883	Connector, 6 Position Screw Terminal	1
201910	Cable Tie, 8 in Nylon 6/6	4
80589	Cable Tie Mount	4

Table 2-11. LaserLight3 Assembly Parts

2.9 Replacement Parts

2.9.1 LaserLight3 Assembly Parts

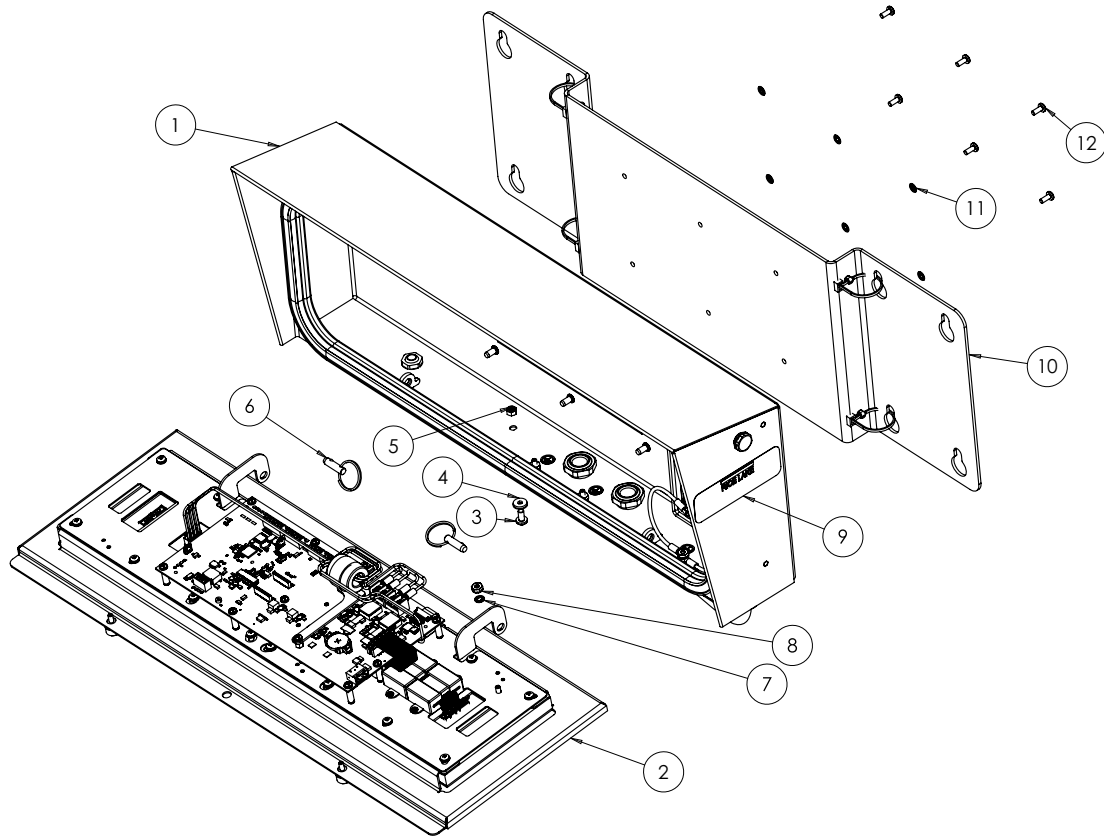


Figure 2-21. LaserLight3 Assembly Parts Illustration

Item No.	Part No.	Description	QTY
1	205781	Cabinet with Components (Section 2.9.3 on page 27)	1
2	214908	Front Door Assembly (Section 2.9.2 on page 25)	1
3	215788	Seal, Bulb	1
4	46381	Washer, Bonded Sealing #10 x .05 OD	1
5	187876	Nut, Lock M5	1
6	209194	Pin, Quick Release Ring Grip	6
7	15134	Washer, Lock #8 with Internal Tooth Lock	1
8	14626	Nut, #8-32NC	1
9	52342	Serial Label	1
10	2058806	Bracket, Mount	1
11	15132	Washer, #8 with Internal Tooth Lock	1
12	193230	Screw, Machine M4x0.7 X 10 Phillips Pan Head	6

Table 2-12. LaserLight3 Parts

2.9.2 Front Door Assembly Parts

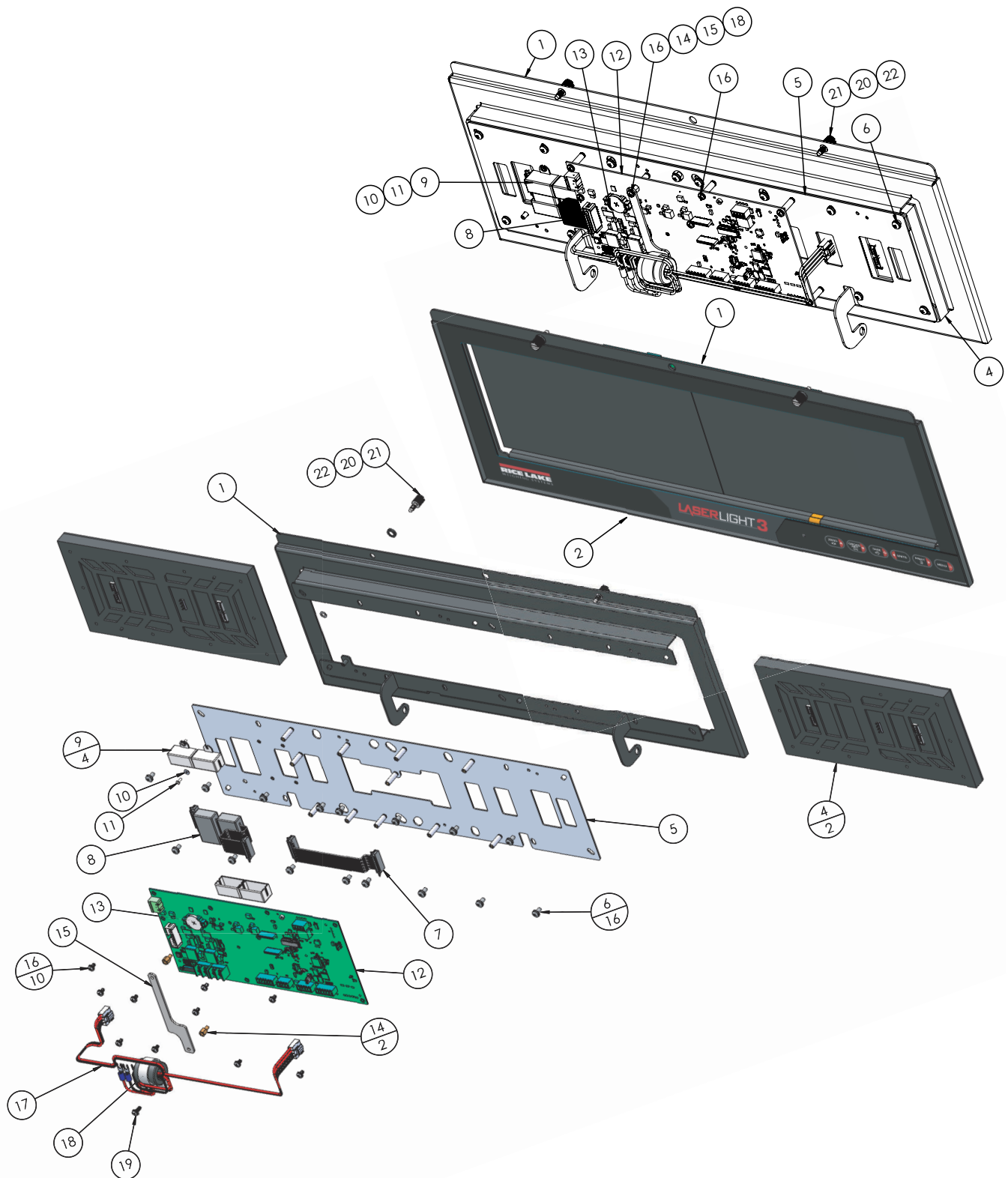


Figure 2-22. LaserLight3 Front Door Parts Illustration

Item No.	Part No.	Description	QTY
1	205792	Front Door Panel, Painted	1
2	205796	Lens Overlay Assembly	1
3	104301	Tape, 3M VHB, Black Double Sided, 0.62 Thick X 0.75 Wide	60
4	215010	Display, 32x64 Led Module P4 Pitch, Display Module, Outdoor Rated	2
5	206320	LL3 Door Heatsink Assembly	1
6	214338	Screw M4 0.7 X 8 Phillips Pan Head, External Washer	16
7	212423	LaserLight3 Display Cable	1
8	215024	16 Conductor Data Cable with Ferrites	1
9	214876	Mount, Ferrite	4
10	206765	Washer, Flat #2 0.94ID X 0.25 OD X 0.2 Thick	4
11	78628	Screw 2-56NC X 0.25 Phillips Pan Head SST	4
12	212207	CPU Board	1
13	71408	Battery, CR2032 3V	1
14	15370	Male-Female Standoff, 6-32NC X 0.25 Brass	2
15	214872	Mount, Ferrite Holder	1
16	14839	Screw, 6-32NC X 1/4 SEMS	10
17	212422	Power Cable with Ferrite	1
18	214914	Nylon Cable Clamp	1
19	44251	Screw, 6-32NC X 3/8 Phillips Pan Head, Internal Lock Washer	1
20	220471	Washer, Retaining, ID = 0.166, OD = 0.312, Thickness = 0.012, SST	2
21	220470	Screw, Captive, Panel, 10-32 x 1/2, 18-8 SST	2
22	223088	Washer cup, No 82 Quarter Turn, 0.420 in OD 0.38 in ID 0.080 in Deep 0.02 in Thick Nylon, black	2

Table 2-13. LaserLight3 Front Door Parts

2.9.3 Cabinet Assembly Parts

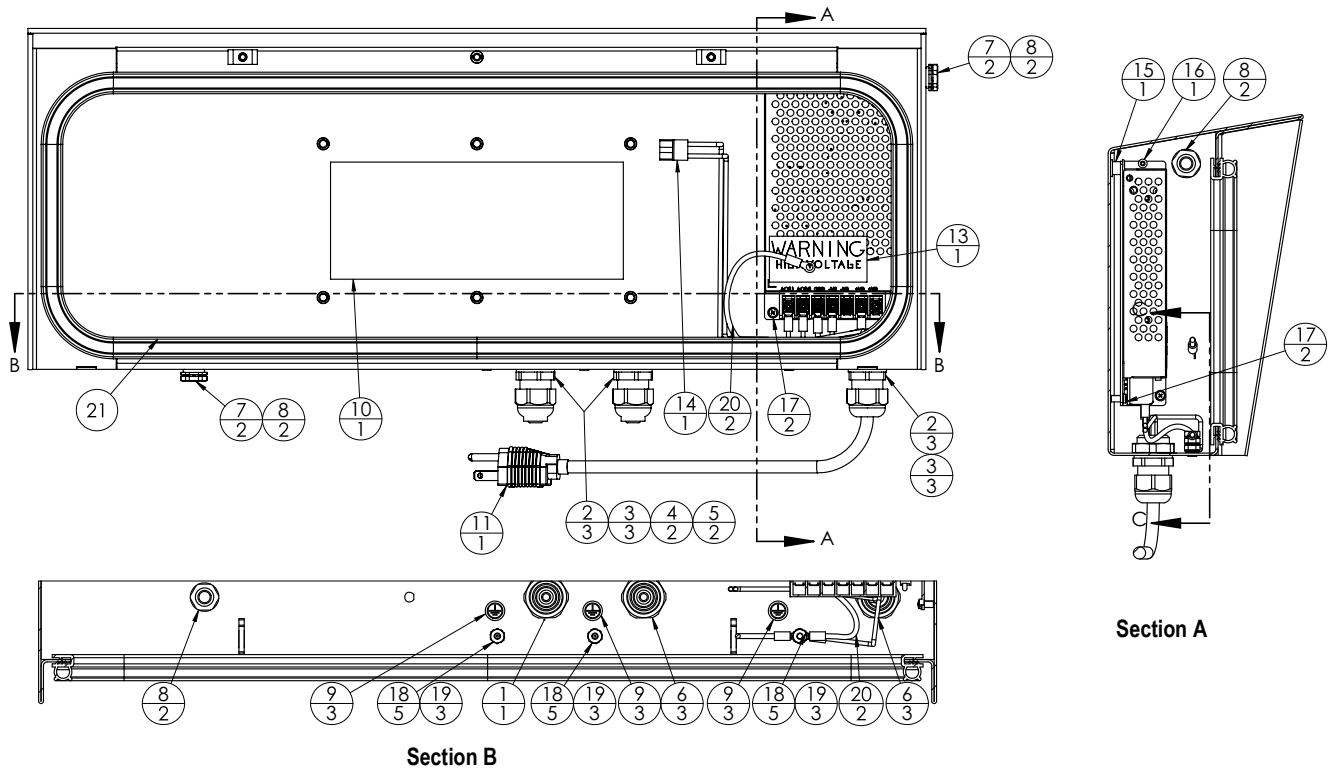


Figure 2-23. LaserLight3 Cabinet Parts Illustration

Item No.	Part No.	Description	QTY
1	205782	Cabinet, Painted	1
2	15628	Cord Grip, 1/2-NPT	3
3	30376	Seal Ring, 1/2-NPT Nylon	3
4	15665	Gland, Reducing 1/2-NPT	2
5	19538	Cord Grip Post, Slotted Black Seal 1/4 x 1	2
6	15630	Lock Nut, 1/2-NPT Plastic	3
7	88733	Vent, Breather Sealed Gore-Tex® Membrane	2
8	88734	Nut, Breather Vent M12 x 1 Thread	2
9	16892	Label, Ground Protective Earth	3
10	212330	Label, Serial Comm Pin Out	1
11	212318	Power Cord Assembly	1
12	206521	Power Supply, 12V 150W, 12.5A, AC Input, 100-240 VAC	1
13	16861	Warning Label, High Voltage	1
14	209464	Cable Assembly, Power	1
15	15418	Grommet, Rubber 3/16 ID X 7/16 OD	1
16	214933	Screw,Cap M3-0.5x10 Phillips Button Head	1
17	194487	Screw, Machine M3-0.5x6 Phillips Pan Head	2
18	14626	NUT, KEP #8-32NC HEX Ext. Tooth Lockwasher	5
19	15134	Washer, Lock No 8 Type A Internal Tooth	3
20	15601	Wire, Ground 6 in	2
21	215788	Seal, Bulb, 55 5/8 inches	1

Table 2-14. LaserLight3 Cabinet Parts

3.0 Operation

The front panel consists of two combined LED displays and a keypad.

3.1 Front Panel Display

The LaserLight3 provides status information about the weight value displayed. The LaserLight3 also has arrows and traffic lights that can be displayed with serial commands ([Section 4.5.2 on page 52](#)).



Figure 3-1. Front Panel Display

Item	Description
Traffic Symbols	Red stop light, red x, green go light, and green up arrow, green left arrow, green right arrow
Weight Value	Displays weighment data
>0< →0←	The center of zero annunciator indicates that the current gross weight reading is within ± 0.25 display divisions of the acquired zero, or is within the center of zero band. A display division is the resolution of the displayed weight value, or the smallest incremental increase or decrease which can be displayed or printed
⏏	The standstill annunciator indicates the weight is at standstill or within the specified motion band. Some operations, including zero, tare and print, can only be done when the standstill annunciator is displayed
GR NT	Displays which weight display mode is active, GR (Gross) or NT (Net)
lb kg oz g tn T G	The current unit displays at the right side of the numeric weight area and specifies which unit of measure is being used. Indicates units associated with the displayed value, represents primary and secondary units such as lb, kg, g, oz, tn and T

Table 3-1. Front Panel Descriptions



NOTE: The layout of annunciators and size of weight digits vary depending on which Type option is configured in the Display menu: Legacy provides about 3.75 inch weight digits with annunciators along the bottom while Standard provides about 5 inch weight digits with annunciators along the right side.

3.2 Keypad

The keypad, located on the bottom right corner of the unit, allows for easy setup and operation of LaserLight3. The keypad includes six function keys.



Figure 3-2. LaserLight3 Keypad







Key	Description
	Used as the up button to navigate menus
	Used as the down button to navigate menus
	Acts as an enter button for numeric or parameter entry
	Used as the left button to navigate menus or to toggle to another digit when editing a value
	Used used as the right button to navigate menus or to toggle to another digit when editing a value
	Accesses or exits <i>Menu</i> mode

Table 3-2. Key Functions

3.3 Menu Element Overview

LaserLight3 can display up to four lines, preceding and following menus/parameters and parameter configurations. A color scheme indicates the type element in the menu. Figure 3-3 through Figure 3-5 displays illustrations with several menus selected and a parameter configured.

3.3.1 Menu with Selectable Item



Figure 3-3. Selected Item Menu Example






Number	Element	Description
1	Red Font	Red font appears in two scenarios: <ul style="list-style-type: none"> • In center column to indicate previously selected menus and parameters • On left or right sides to indicate previously available menus, options, or parameters
2	Yellow Font	Indicates selected menu or parameter. Select a menu item with  and  , then press  to confirm selection
3	White Font	Indicates parameters are available, but not currently selected
Not illustrated	Blinking Cyan Underline	Indicates text is scrollable with  and  buttons

Table 3-3. Menu Element Descriptions

3.3.2 Menu and Read Only Message



Figure 3-4. Read Only Message Menu Example

Number	Element	Description
1	Red Font	Red font appears in two scenarios: <ul style="list-style-type: none"> • In center column to indicate previously selected menus and psparameters • On left or right sides to indicate previously available menus, options, or parameters
2	White Font	Indicates a read only message NOTE: Read only messages, typically display as a result of selecting an information parameter.

Table 4. Menu Element Descriptions

3.3.3 Menu and Text Editable Parameter



Figure 3-5. Text Editable Menu Example

Number	Element	Description
1	Red Font	Red font appears in two scenarios: <ul style="list-style-type: none"> In center column to indicate selected menus and parameters On left or right sides to indicate previously available menus, options, or parameters
2	White font with blinking cyan underline	Indicates a text configured parameter. Move character selection (cyan underline) with and . Press and to change characters. Hold to delete a character or hold to insert a 0 character. Press to confirm character configuration and return to the previous menu

Figure 3-6. Menu Element Descriptions

3.4 Frequently Used Software Functions

This section provides procedures for frequently used LaserLight3 functions.



NOTE: Parameters that are part of the Setup Menu require access to Setup mode ([Section 2.7.2 on page 22](#)).

3.4.1 Edit Time

Select **Time** in the top-level menu to edit the time.



Figure 3-7. Time Parameter Menu Path

- Navigate to **Setup** ► ... ► **Time**.
- Press . The configured time displays.
- To edit the time value:
 - Press and to select characters
 - Press and to edit the underlined character
- Press to set the time. OK displays.
- Press then to exit the menu.



NOTE: Time is backed up by the internal coin cell battery and is not lost if the main power is interrupted. See [Section 5.2.3 on page 63](#) for time formatting options.

3.4.2 Edit Date

Select **Date** in the top-level menu to edit the date.

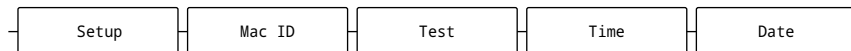


Figure 3-8. Date Parameter Menu Path

1. Navigate to **Setup ▶ ... ▶ Date**.
2. Press to view the configured date.
3. To edit the date:
 - Press and to select characters
 - Press and to edit the underlined character
4. Press to set the date. OK displays.
5. Press then to exit the menu.



NOTE: Date is backed up by the internal battery and is not lost if the main power is interrupted. See [Section 5.2.3 on page 63](#) for date formatting options.

3.4.3 Displaying Time and Date

To display time and date when weight is zero in increments of five seconds, select **Tm/Dt** from the Remote menu.

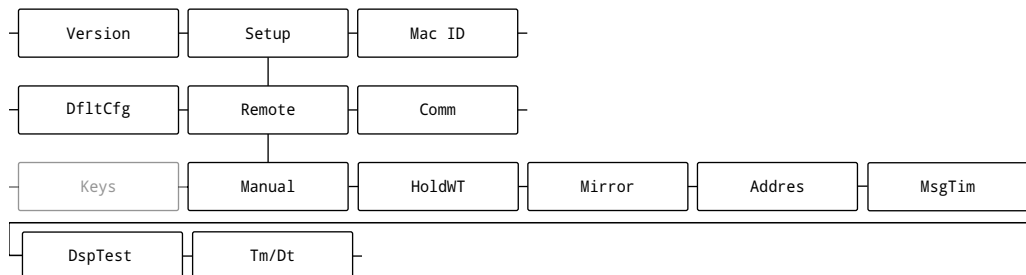


Figure 3-9. Tm/Dt File Path

1. Navigate to **Setup ▼ Comm ▶ ... ▶ Remote ▼ Manual ▶ ... ▶ Tm/Dt**.
2. Press to view the configuration.
3. Press until **On** is selected.
4. Press to accept the configuration.
5. Press to exit the menu.

3.4.4 View Ethernet and Wi-Fi Media Access Control (MAC) IDs

Select **MAC ID** in the top-level menu to view the Ethernet and Wi-Fi MAC IDs. MAC addresses display in the following format: 88:88:88:88:88:88.

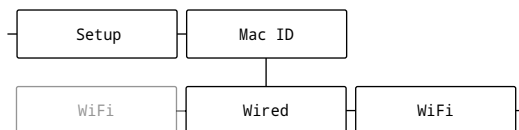







Figure 3-10. MAC ID Parameter Menu Path



1. Navigate to **Setup ► Mac ID**.
2. Press . **Wired** displays.
3. Press . Ethernet MAC ID displays.
4. Press . **WiFi** displays.
5. Press . WiFi MAC ID displays (if installed).
6. Press  to exit the menu.

3.4.5 View Version

Select **Version** in the top-level menu to view the current firmware version.



Figure 3-11. Version Parameter Menu Path

1. Navigate to **Setup ► ... ► Version**.
2. Press . The software version number displays.
3. Press  to exit the menu.

3.4.6 Reset Configuration

Select **DfltCfg** in the Setup menu to reset the LaserLight3 configuration.

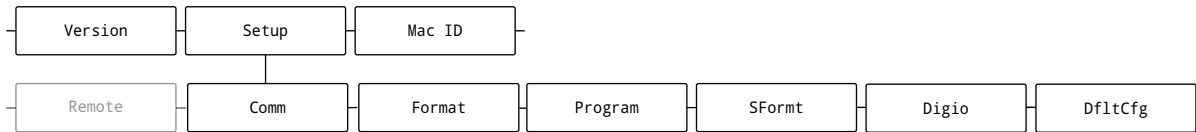


Figure 3-12. DfltCfg Parameter Menu Path

1. Navigate to **Setup ▼ Comm ▶ ... ▶ DfltCfg**.
2. Press . **No** displays.
3. Press . **Yes** displays.
4. Press or to reset the configuration setting. **OK** displays.
5. Press to exit the menu.

3.4.7 Change Brightness Intensity

To change brightness, adjust the **Intnsty** (Intensity) parameter in the Dsplay (Display) Menu.

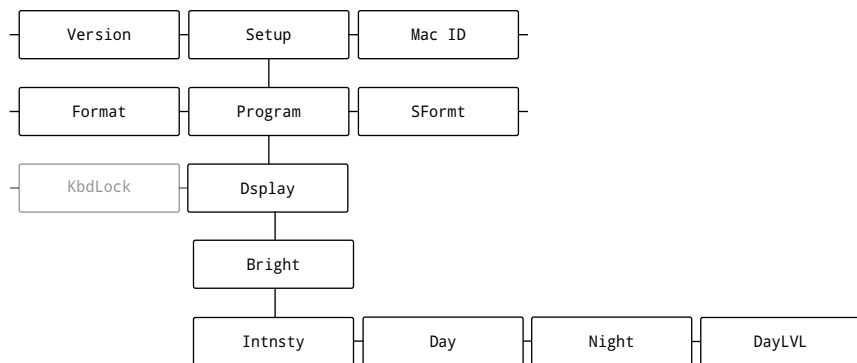


Figure 3-13. Color Parameter Menu Path

1. Navigate to **Setup ▼ Comm ▶ ... ▶ Program ▼ PwrUpM ▶ ... ▶ Dsplay ▼ Bright**.
2. Press . **Intnsty** displays.
3. Press . The currently configured parameter displays.
4. Press or repeatedly until the desired brightness value is selected.



NOTE: *Brightness is set from 1–6 (16.67–100% screen brightness) or as DayLVL (uses Day, Night and DayLVL parameters to automatically adjust brightness for day and night). For additional information about brightness, see Section 5.2.3 on page 63.*

5. Press . **Day** displays.
6. Press to exit the menu and load the new brightness setting.

3.4.8 Change Display Color

The LaserLight3 display can illuminate as red (default), yellow, green, blue, magenta, cyan or white. Select the desired color in the Color parameter.



NOTE: Changing the display color requires access to Setup mode ([Section 2.7.2 on page 22](#)).

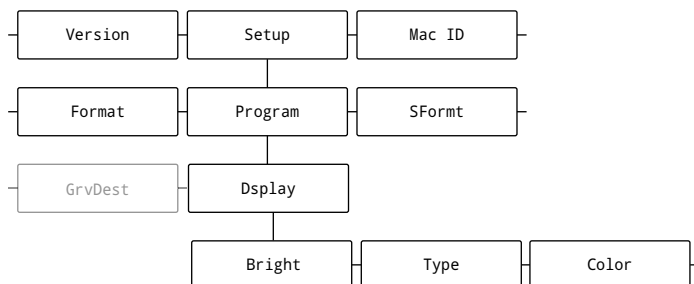







Figure 3-14. Color Parameter Menu Path

1. Navigate to **Setup ▼ Comm ▶ ... ▶ Program ▼ PwrUpM ▶ ... ▶ Dsplay ▼ Bright ▶ ... ▶ Color**.
2. Press . The configured color displays.
3. Press  or  repeatedly until desired color is selected.
4. Press . **Bright** displays.
5. Press  to exit the menu.

4.0 Remote Display Configuration

This section describes how to configure LaserLight3 as a remote display.



NOTE: Configuration occurs, after unpacking (Section 2.1), wiring is complete (Section 2.5), and Setup mode access (Section 2.7.2 on page 22) is configured.

When configuring the LaserLight3 as a remote display, set the Display Type parameter then define Auto-Learn or Manual Mode. Auto-Learn mode (Section 4.2.2) attempts to parse weighment data from the connected indicator. In the event a parsed data format is unknown, Auto-Learn mode activates and attempts to rectify weighment data. If it is unable to parse the weighment data, Manual Mode must be used to configure how data is displayed (Section 4.3 on page 40).

4.1 Configure Display Type

When configuring the display, the Dsplay (Display) Type parameter must be set. Set the parameter as Legacy (annunciators along the bottom, allows specific serial commands and external switches), Standard (annunciators along the right side) or Cardnal (replicates score board or message board displays) (see Section 5.2.3 on page 63 for definitions).

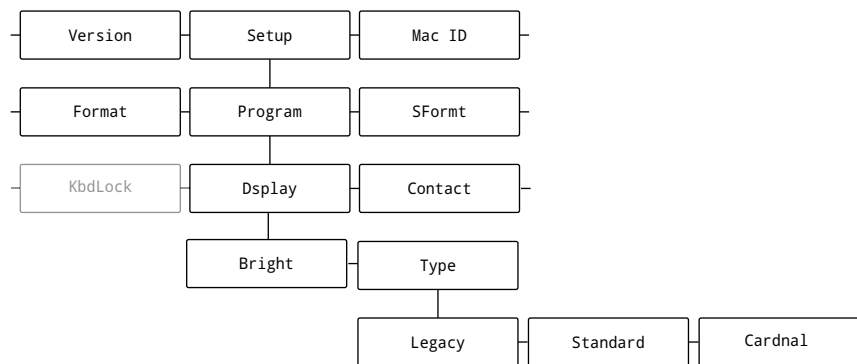







Figure 4-1. Type Parameter Menu Path

1. Navigate to **Setup ▼ Comm ► Program ▼ PwrUpM ► ... ► Dsplay ▼ Type**.
2. Press . The Type configuration displays.
3. Press  or  repeatedly until the desired Type is selected (Standard, Legacy, or Cardnal).
4. Press  to confirm the Type configuration.
5. Press  to exit the menu.

4.2 Automatic Configuration

LaserLight3 provides three functions that attempt to automatically set remote display parameters:

- Automatic Baud Configuration ([Section 4.2.1 on page 37](#))
- Auto-Learn ([Section 4.2.2 on page 38](#))

4.2.1 Automatic Baud Configuration

The automatic baud configuration feature automatically sets the serial communication protocol (RS-232, RS-485/422 and 20 mA current loop) parameters. Automatic baud configuration searches for serial communication settings (baud rate, bits and stop bits) until it finds and sets parameters that establish a serial connection.



NOTE: Prior to activating automatic baud configuration, current **Baud**, **Bits**, and **Stop Bits** parameter values can be recorded from the **Serial** menu to later verify and compare value changes.

Figure 4-2 displays the menu path to the Baud parameter.

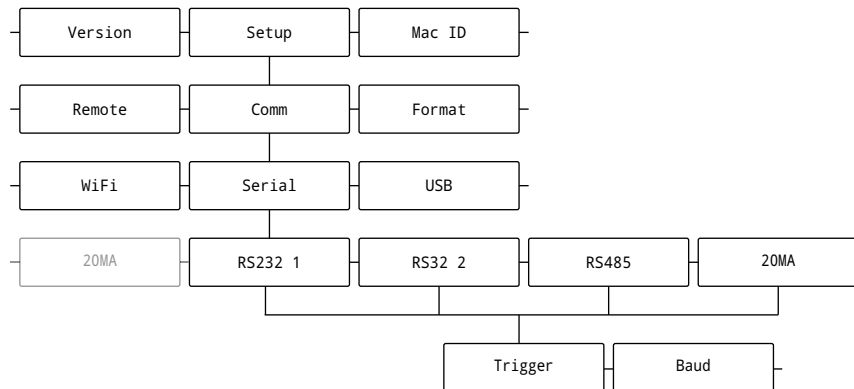


Figure 4-2. Baud Parameter Menu Path

To enable Automatic baud configuration, perform the following :

1. Navigate to **Setup ▼ Comm ▼ Serial ▼ Communication Protocol* ▼ Trigger ► Baud.**
* **RS232 1, RS232 2, RS485 or 20MA**
2. Press . The configured parameter displays.
3. Press or repeatedly until **Auto** is selected.
4. Press to confirm the parameter configuration.
5. Press to exit the menu.
6. The automatic baud configuration function executes.

4.2.2 Auto-Learn and Data String Recognition

Auto-Learn examines the data stream sent from the connected indicator and determines the data settings and format used by the indicator. Auto-Learn is capable of recognizing several common data string formats used in the weighing industry. Auto-Learn is enabled when the Trigger parameter for a communication protocol (RS-232, RS-485/422, 20 mA current loop, Ethernet or Wi-Fi) is configured as RmtIn (Remote In).



NOTE: Only configure one communication protocol as RmtIn (Remote In). If more than one communication protocol is configured as RmtIn (Remote In), LaserLight3 uses the first communication protocol configured with RmtIn (Remote In) that occurs in the system menu:

- RS232-1
- RS232-2
- 20mA
- RS485/422
- Ethernet Server
- Ethernet Client
- WiFi

For example, if RS232-2 and WiFi were set as Remote In, RS232-2 would be used as it appears before WiFi in the list above.



NOTE: For Auto-Learn to function properly, data must be sent using one of the predefined stream data formats (Section 9.5 on page 97).



NOTE: Auto-Learn mode may be bypassed by using Manual Mode. For more information about Manual Mode see Section 4.3 on page 40.

Figure 4-3 provides a flow chart that displays each communication protocol Remote In parameter.

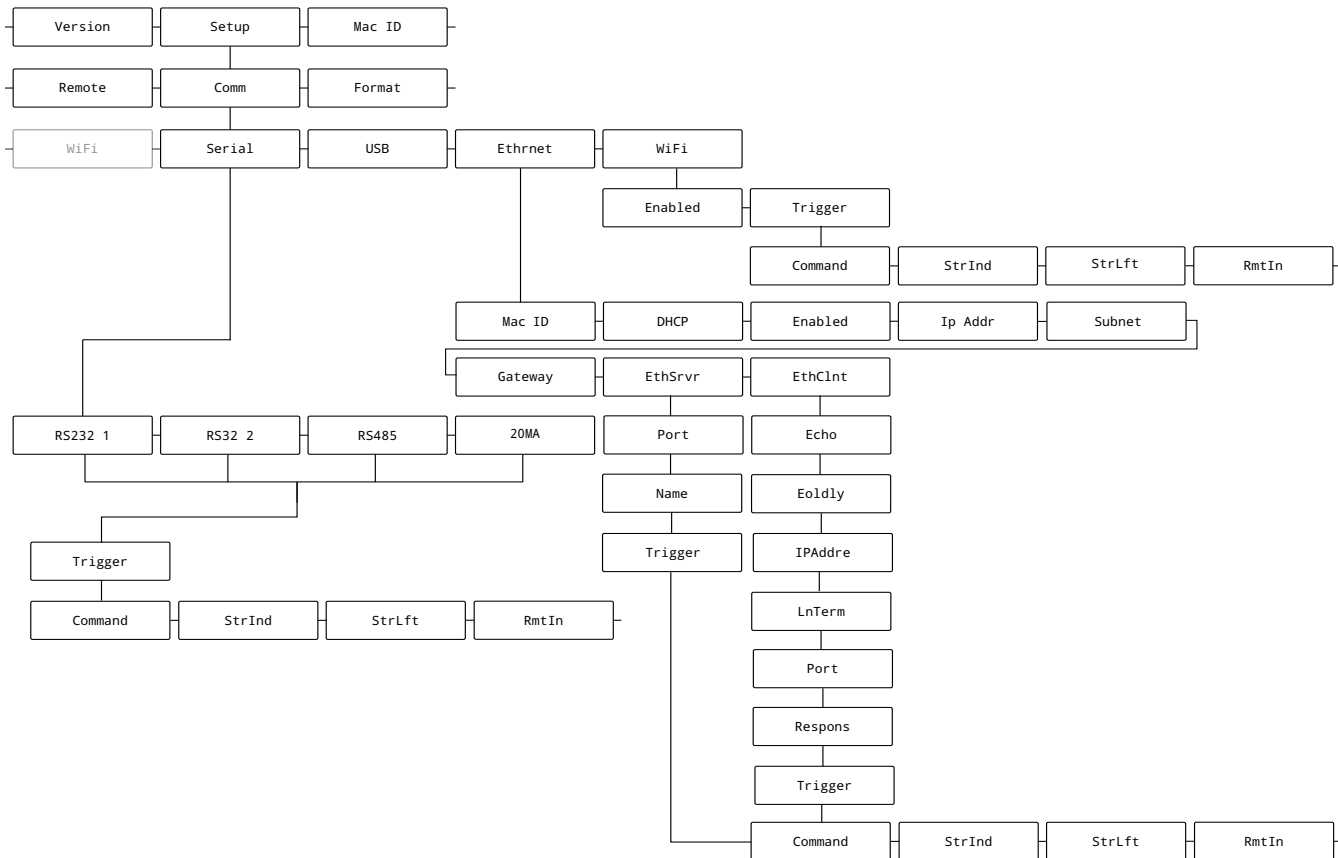


Figure 4-3. Remote In Parameters Menu Paths

If Remote In parameter is enabled, LaserLight3 attempts to learn the incoming data stream when it is powered on, when the data stream starts or when the data stream is paused and restarted. In order for the Auto-Learn to function, the incoming data stream must be supported ([Section 9.5 on page 97](#)).








NOTE: Access to Setup mode parameters (see [Section 2.7.2 on page 22](#)) are required to access the Remote In parameter.

1. Enable Remote In parameter for the required communication protocol:
 - For RS-232, RS-485/422 or 20 mA current loop, navigate to **Setup ▼ Comm ▼ Serial ▼ Communication protocol ▼ Trigger**.
 - For Ethernet Client, navigate to **Setup ▼ Comm ▼ Serial ▶ ... ▶ Ethernet ▼ Mac ID ▶ ... ▶ EthCInt ▼ Echo ▼ ... ▼ Trigger**.
 - For Ethernet Server, navigate to **Setup ▼ Comm ▼ Serial ▶ ... ▶ Ethernet ▼ Mac ID ▶ ... ▶ EthSrvr ▼ Port ▼ ... ▼ Trigger**.
 - For Wi-Fi, navigate to **Setup ▼ Comm ▼ Serial ▶ ... ▶ Wi-Fi ▼ Enabled ▶ Trigger**.



NOTE: See [Section 5.2.1 on page 57](#) for more details about communication parameters.

2. Press . The configured parameter displays.
3. Press  and  until RmtIn (Remote In) displays.
4. Press  to confirm the parameter configuration.
5. Press  to exit the menu.
6. One of the following occurs:
 - Data displays
 - NODATA display (no data is received)
 - OvrRng (Over Range) error displays
 - Dashes (no port is configured as a remote input)



NOTE: If NODATA appears, this represents that data is not received from the indicator and to verify connection from the indicator to LaserLight3.

If OvrRng (over range) displays after the Auto-Learn process parses data, then the weight value sent is beyond the capabilities of the display (six characters). Setting WgtBeg (Weight Begin) and WgtEnd (Weight End) parameters in Manual Mode frequently resolves character quantity issues (see [Section 4.3.2 on page 41](#)).



NOTE: If LaserLight3 does not match a data format, it automatically attempts to parse the weight, units, mode, status and weight data out of frame. At a minimum weight, unit and mode data are required. If a valid weight cannot be found, Manual Mode ([Section 4.3 on page 40](#)) must be used to configure LaserLight3.

4.3 Manual Mode

Manual Mode is used when the data stream (Section 9.5 on page 97) is not recognized by LaserLight3, or weight data can not be extracted during Auto-Learn mode.



NOTE: Always attempt Auto-Learn mode (Section 4.2.2 on page 38) before configuring the LaserLight3 in Manual Mode.

Perform Manual Mode configuration in the following order:

- Set communication protocol trigger to Remote In (detailed in Auto-Learn configuration, Section 4.2.2 on page 38)
- Enable Manual Mode (Section 4.3.1)
- Configure Manual Mode parameters (Section 4.3.2 on page 41)
- (If needed) Configure Set Annunciator parameters (Section 4.3.2.4 on page 47)
- Validate Manual Mode configuration (Section 4.3.3 on page 49)



NOTE: Configuring parameters for Manual Mode requires access to Setup mode (Section 2.7.2 on page 22).

4.3.1 Enable Manual Mode

Figure 4-4 displays a menu path to the MnlMode (Manual Mode) parameter.

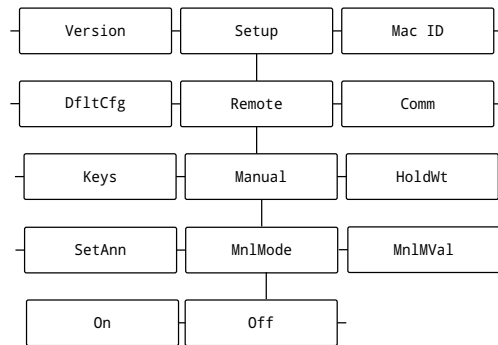


Figure 4-4. MnlMode Parameter Menu Path

1. Navigate to **Setup ▼ Comm ► ... ► Remote ▼ Manual ▼ MnlMode**.
2. Press . The parameter configuration displays.
3. Press until **On** display.
4. Press . **MnlMVal** displays.
5. Press to exit the menu.

4.3.2 Configuring Manual Mode Parameters

After Manual Mode is enabled, many parameters must be configured. Manual Mode parameter configuration differs from most other parameters found on LaserLight3. Instead of selecting from a list of predefined values, most Manual Mode parameters are configured by:

- Selecting characters from a parsed data string (Section 4.3.2.1)
- Using a text string editor to edit a text string (Section 4.3.2.2 on page 43)

Figure 4-5 displays a menu path to the Manual Mode parameters.

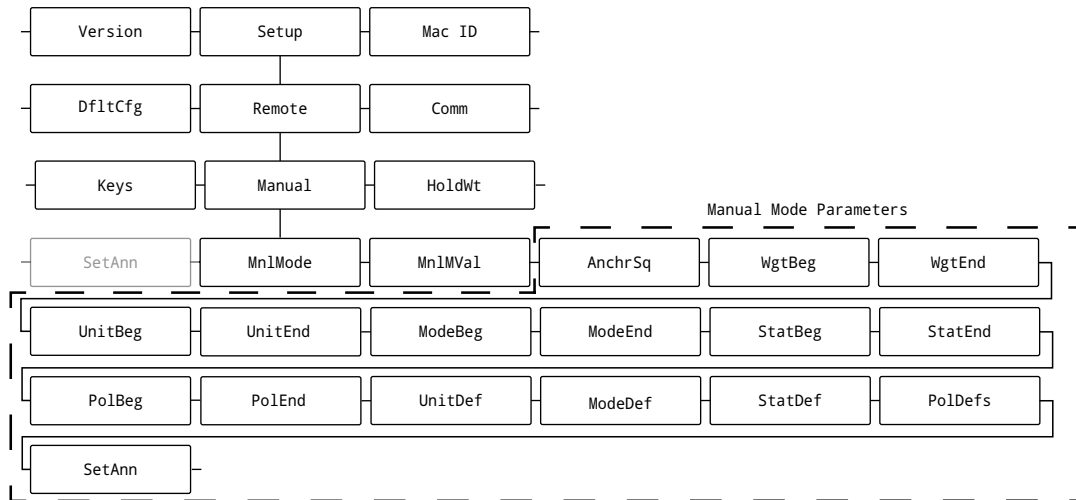


Figure 4-5. Manual Mode Parameters

4.3.2.1 Character Selection Parameter Overview

During Manual Mode configuration, specific data string characters must be selected while setting the following parameters:

- WgtBeg (Weight Begin)
- WgtEnd (Weight End)
- UnitBeg (Unit Begin)
- UnitEnd (Unit End)
- ModeBeg (Mode Start)
- ModeEnd (Mode End)
- StatBeg (Status Begin)
- StatEnd (Status End)
- PolEnd (Polarity End)
- PolBeg (Polarity Start)



NOTE: For parameter definitions, see Section 5.2.6.1 on page 68.

Figure 4-6 displays a menu path to Manual Mode parameters that require cursor selection.

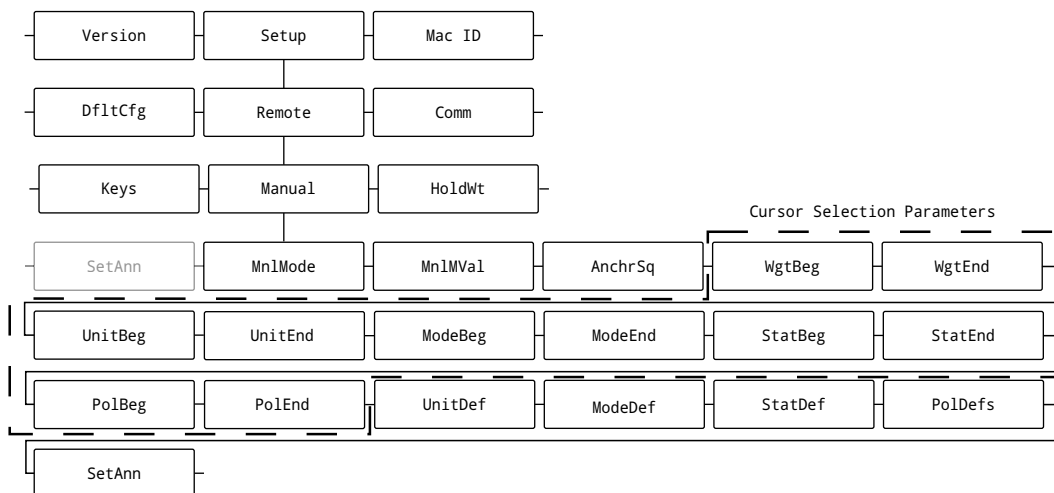


Figure 4-6. Manual Mode Cursor Selection Parameters Menu Paths

Figure 4-7 illustrates a data string example. LaserLight3 captures and displays one frame based on the AnchrSq (Anchor Sequence) parameter configuration. Data strings vary depending on the format of data transmitted by the indicator.

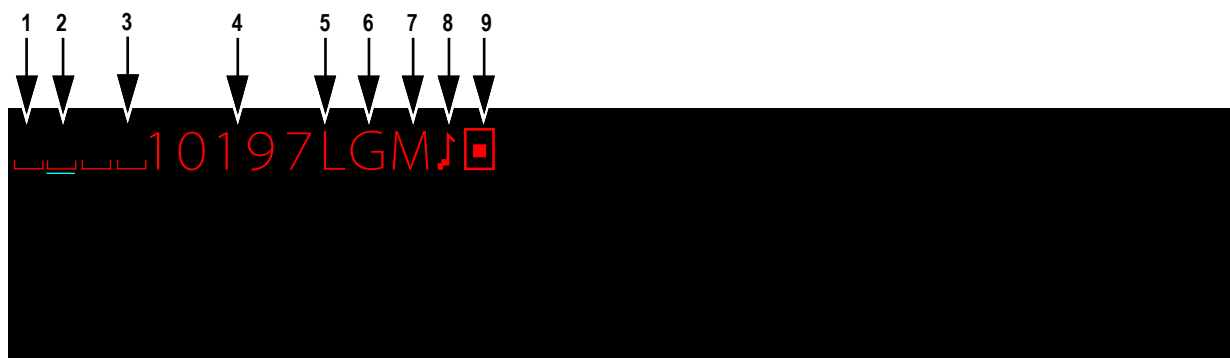


Figure 4-7. Cursor Selection Parameter Example

Data string elements are described in Table 4-1.



NOTE: For a list of possible displayed characters, see Section 9.3 on page 94.

Item	Element	Description
1		The first character in this example is a positive polarity character. In some data strings a space or a positive symbol (+) may occur for positive polarity. The character could also appear as a negative (-) character if the scale or simulator causes a negative weight measurement
2	—	A cyan underline that acts a cursor and used to select characters for configuration
3		A symbol indicating a space
4	10197	The current weight measurement NOTE: In this example the weight has 6 digits, but only 5 are shown. The leading blank character is the sixth digit. If the quantity of digits in a data string are unknown, a simulator or loading the scale to near capacity can populate all weight digits.
5	L	The unit of measure. The units may appear abbreviated, in this case L is short for lb NOTE: If there is only one character for the unit Lb (L) the same character is selected for both the UnitBeg (Unit Begin) and UnitEnd (Unit End) parameters.
6	G	The configured weigh mode, Gross (G) or Net (N)
7	M	The status of the scale (Center of Zero, Invalid, Motion, OK, Overload or Underload). The units may appear abbreviated, in this case M is short for Motion. Also, if there no status affecting the scale, the digit may be blank NOTE: If there is no status affecting the scale, the digit for status may be blank. If the status character location is unknown, a simulator can be used to input a status and cause the character to populate on screen.
8	␣	The symbol indicating a carriage return (CR)
9	␣	The symbol indicating a line feed (LF)
10	NODATA (Not Displayed)	Display when a data stream is not currently received by the LaserLight3. Ensure Indicator is transmitting a data stream to LaserLight3, LaserLight3 is set to RmtIn (Remote In), and wiring is correct/undamaged.

Table 4-1. Data String Elements Descriptions

Configure cursor selection parameters by performing the following:

1. Navigate to **Setup ▼ Comm ► ... ► Remote ▼ Manual ▼ MnlMode ► ... ► *required parameter.**
*see Figure 4-6 on page 41
2. Press . LaserLight3 displays a text string with a cyan cursor.
3. Move the cyan cursor with or to the character in data string that represents selected parameter.
4. Press to confirm character selection.
5. LaserLight3 returns to Manual Mode menu with next parameter (if available) displays.

4.3.2.2 Text String Parameter Configuration Overview

Text string parameters are configured by using a text string editor to change character value. The following parameters are configured with a text string editor:

- AnchrSq (Anchor Sequence)
- ModeDef (Mode Definition)
- PolDefs (Polarity Definition)
- UnitDef (Unit Definition)
- StatDef (Status Definition)

 **NOTE:** For parameter definitions, see [Section 5.2.6.1 on page 68](#).

Figure 4-6 displays a menu path to Manual Mode parameters that require text string configuration.

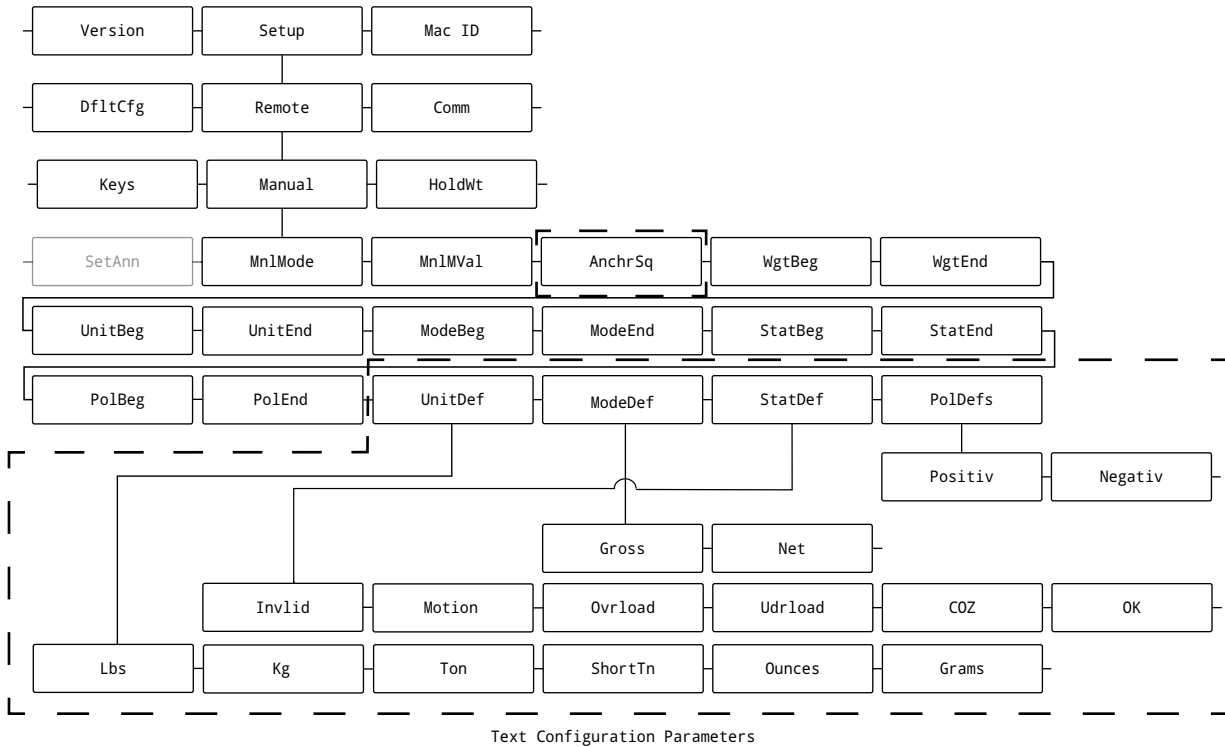


Figure 4-8. Manual Mode Text String Parameters Menu Paths

Figure 4-9 illustrates a text string parameter.

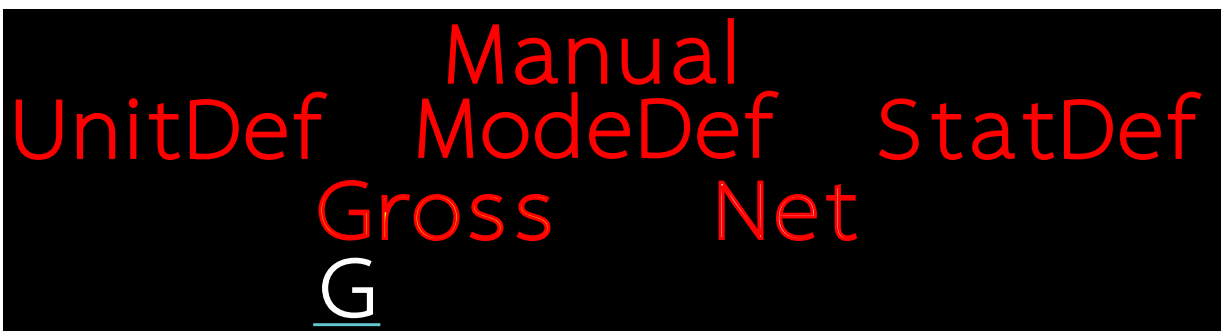













Figure 4-9. Text String Parameter Example

Table 4-2 describes text string elements are described in Figure 4-9.

Element	Description
General Screen Elements	See Section 3.3 on page 30 for more information.
G	A single character text string. In this example only one character comprises the text string.
Underscore (_)	Appears under a character when string editor is active.

Table 4-2. Data String Elements Descriptions

Perform the following to configure text string parameters:


1. Navigate to **Setup ▼ Comm ► ... ► Remote ▼ Manual ▼ MnlMode ► ... ► *required parameter.**
*see [Figure 4-8 on page 43](#)
2. Press . The first parameter option displays.
3. Press . The configuration for the parameter option appears.
4. Press  and  to select a position/character.
5. (Optional) Press  to insert a space/empty character.
6. Press . The selected character enters an edit mode and an underscore (_) appears under the character.
7. Press  and  to change the character.
8. Press  to confirm the character change and exit character edit mode.
9. Repeat steps 2 through 8 until all characters parameters are configured.
10. Press  to save and exit menu.
11. Repeat steps 1 through 10 until all parameters are configured.
12. Press  to save and exit menu.



NOTE: Press  twice to a delete character.

4.3.2.3 MnlMode (Manual Mode) Parameter Configuration

Cursor selection and text string parameters are contained in Manual Mode configuration. This section provides a general guide of how to configure Manual Mode parameters. For information about hows to configure each parameter and menu paths, see [Section 4.3.2.1 on page 41](#) and [Section 4.3.2.2 on page 43](#).

1. Navigate to **Setup ▼ Comm ► ...► Remote ▼ Manual ▼ MnlMode ► MnlMVal ► AnchrSq**.
2. Press . The AnchrSq (Anchor Sequence) parameter configuration displays.
3. Configure AnchrSq parameter.



NOTE: The AnchrSq is a text string parameter that defines the repeating anchor point in a text string. This point can be any repeating characters at front or end of the text string. The repeating character must reoccur in the same position across all received data strings. In addition, there are additional constraints that must be adhered to when configuring this parameter:

- Non-printable characters must be entered in hex code and placed inside "<>" brackets (see [Section 9.3 on page 94](#)). The exceptions are carriage return <CR> and line feed <LF>.
- Several data strings end with termination type characters: <CR>, <LF>, <CR><LF>, <02> (STX) or <03> (ETX)



Figure 4-10. AnchrSq Parameter Configuration Example

4. Configure cursor selection parameters ([Section 4.3.2.1 on page 41](#)):
 - 4.1 Set WgtBeg as the start of the weight and WgtEnd as the end of the weight.



Figure 4-11. WgtBeg and WgtEnd Configuration



NOTE: In this example the weight has 6 digits, but only 5 are shown. The leading blank character is the sixth digit. If the quantity of digits in a data string are unknown, a simulator or loading the scale to near capacity can populate all weight digits.

- 4.2 Set UnitBeg as the start of the unit and UnitEnd as the end of the unit.



Figure 4-12. UnitBeg and Unitnd Configuration



NOTE: In this example there is only one character for the unit, Lb (L), therefore the same character is selected for both the UnitBeg and UnitEnd parameters.

- 4.3 Set MdeStr as the start of the mode and MdeEnd as the end of the mode.



Figure 4-13. MdeStr and MdeEnd Configuration



NOTE: In this example there is only one character for the Mode (M), Gross (G), therefore the same character is selected for both the ModeBeg and ModeEnd parameters.

- 4.4 Set StatBeg as the start of the status and StatEnd as the end of the status.



Figure 4-14. Status Configuration



NOTE: If there is no status displayed, the character for status may be blank. If the status character location is unknown, a simulator can be used to input a status and cause the character to populate.

4.5 Set PolBeg as the start of the polarity and PolEnd as the end of the polarity.



Figure 4-15. Polarity Configuration

NOTE: The character for positive polarity may be a blank character as some data streams do not define positive polarity with a positive (+) symbol. If polarity character location is unknown, a simulator can be used to apply a negative weight value to the scale and populate the negative (-) character onscreen.

In this example there is only one character for Polarity, therefore the same character is selected for both the PolBeg and PolEnd parameters.

5. Configure UnitDef (Unit Definition), ModeDef (Mode Definition), StatDef (Status Definition), PolDefs (Polarity Definition) sub-parameters as described in Section 4.3.2.2 on page 43.

NOTE: By default each UnitDef, ModeDef, StatDef, and PolDefs parameter are configured with one character in their parameters. Each parameter must contain the same quantity of characters. If more characters are required, ensure the same quantity is used across the parameter group. If required, use leading spaces to increase character quantity (for example, _G).

5.1 Set UnitDef sub-parameters lb, kg, Tons, ShortTn, ounces, grams.

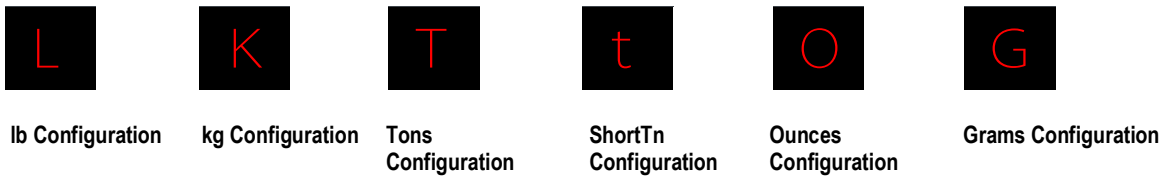


Figure 4-16. Configured UnitDef Parameters

5.2 Set ModeDef parameters Gross and Net.

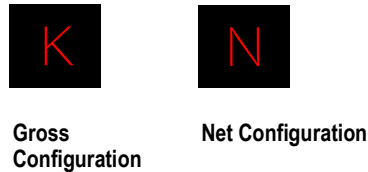


Figure 4-17. Configured ModeDef Parameters

5.3 Set StatDefs parameters Invlid (Invalid), Motion, OvrLoad (Over Load), UdrLoad (Under Load), COZ (Center of Zero) and OK.

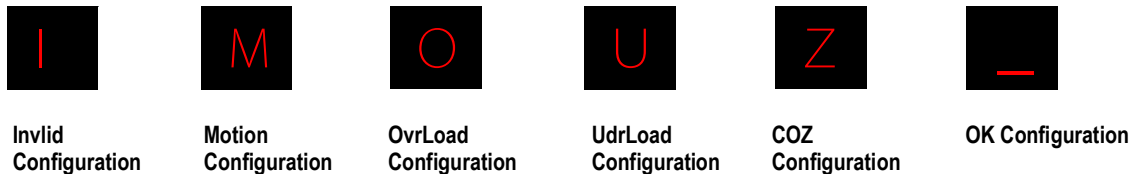


Figure 4-18. Configured StatDefs Parameters

5.4 Configure PolDefs parameters Positiv (Positive) and Negativ (Negative)

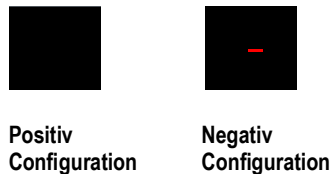


Figure 4-19. Configured PolDefs Parameters

4.3.2.4 SetAnn (Set Annunciator) UnitAnn and ModeAnn Options

SetAnn UnitAnn and Mode options lock a selected mode (Gross or Net) or unit annunciators in place on screen.

Figure 4-20 displays a menu path to SetAnn parameters.

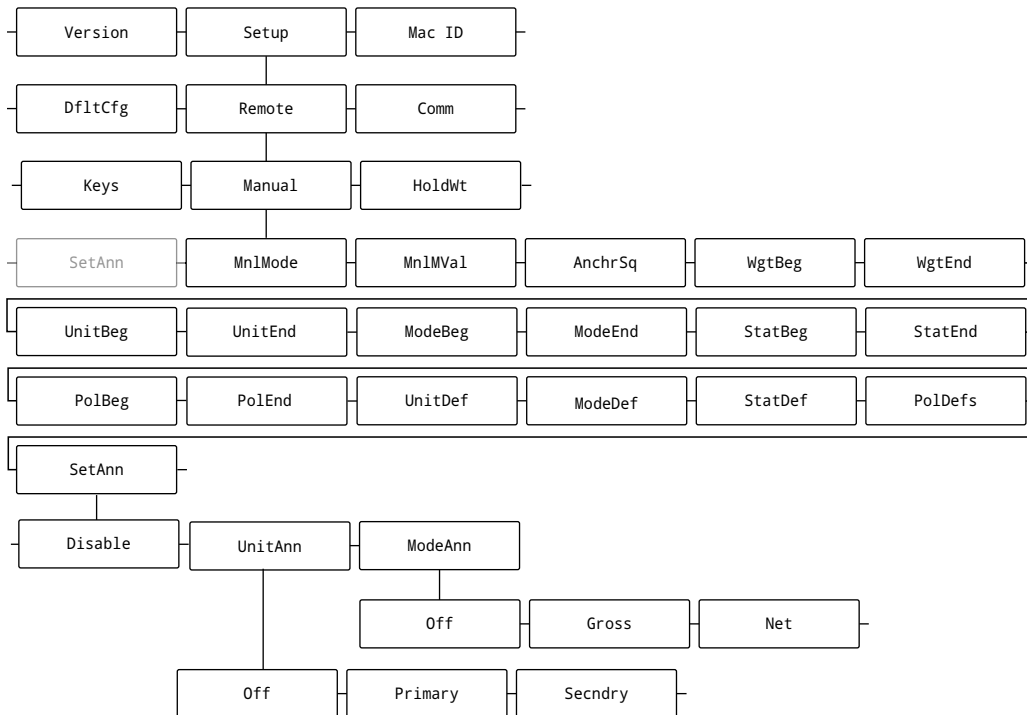


Figure 4-20. SetAnn UnitAnn and Mode Option Menu Path

1. Navigate to **Setup ▼ Comm ► ... ► Remote ▼ Manual ▼ MnlMode ► ... ► SetAnn**.
2. Press . **Disable** displays.
3. Press . **UnitAnn** (Unit Annunciator) displays.
4. Press . **Off** displays.
5. Press or to select **Primary** or **Secondary**.



NOTE: Primary and Secondary parameters are configured in the Format menu ([Section 5.2.2 on page 62](#)).

6. Press . **ModeAnn** (Mode Annunciator) displays.
7. Press . **Off** displays.
8. Press or to select **Gross** or **Net**.
9. Press . **UnitAnn** displays.
10. Press to exit the menu.

4.3.2.5 SetAnn (Set Annunciator) Disable Option

SetAnn Disable option disables specific annunciators (Unit, Mode, Status or Polarity).

Figure 4-20 displays a menu path to SetAnn Disable option.

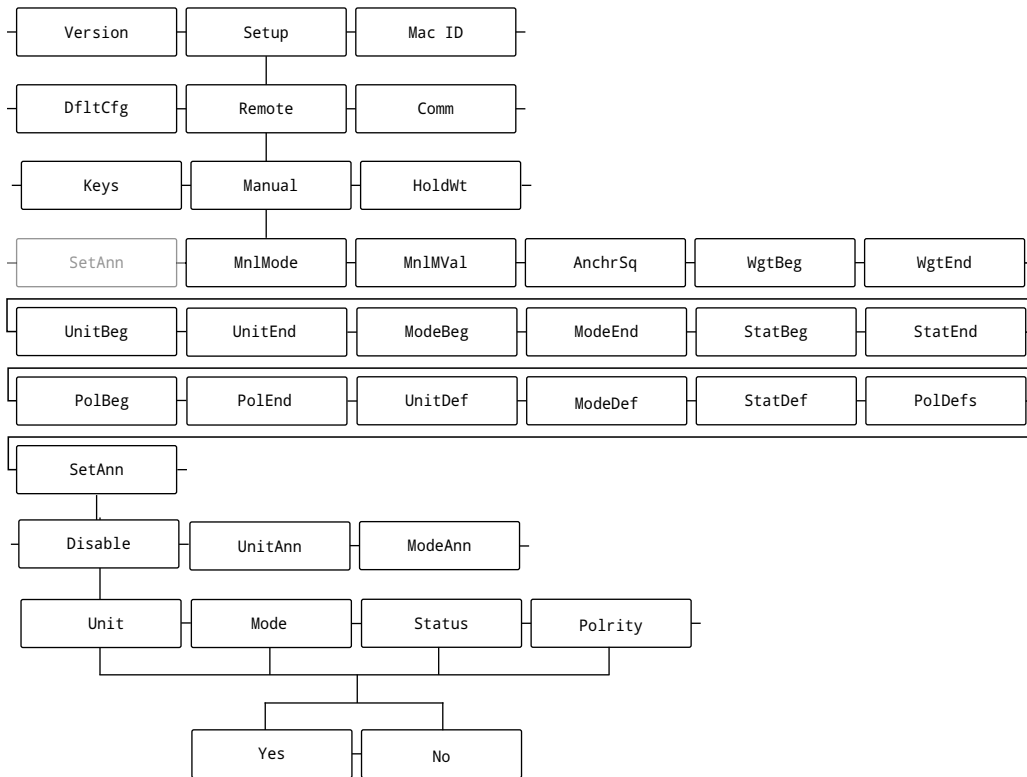









Figure 4-21. SetAnn Disable Option Menu Path

1. Navigate to **Setup ▼ Comm ► ... ► Remote ▼ Manual ▼ MnlMode ► ... ► SetAnn**.
2. Press . **Disable** displays.
3. Press . **Unit** displays.
4. Press . **Yes** displays.
5. Press  or  to select **Yes** or **No**.
6. Press . **Mode** displays.
7. If needed, repeat steps 4 through 6 for remaining options.
8. Press  to exit the menu.



NOTE: *Unit, Mode and Status options apply to Automatic Configuration and Manual Mode. Polrity only applies to Manual Mode.*

4.3.3 MnIMVal (Manual Mode Validation) Operation

After Manual Mode is configured, the built-in validation tool should be used to ensure the configuration is correct.

Figure 4-22 displays a menu path to the MnIMVal (Manual Mode Validation) parameter.

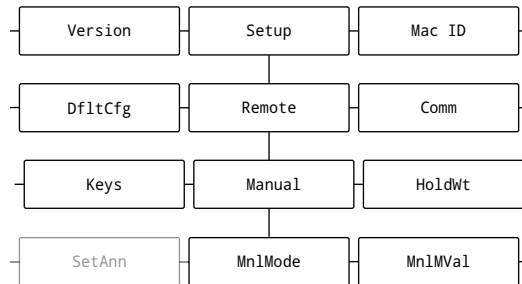






Figure 4-22. Manual Mode Validation Parameter Menu Path



NOTE: The Validation tool shows one error at time or none at all. Be prepared to run the Validation tool several times until the all Manual Mode parameters are validated.

1. Navigate to **Setup ▼ Comm ► ... ► Remote ▼ Manual ▼ MnIMode ► MnIMVal**.
2. Press . One of the following occurs:
 - OK displays, indicating errors were not detected in configuration
 - A parameter error displays
3. If an error is received, press  or  to scroll through the error message.
4. Review the displayed parameter's configuration, make changes and then rerun **MnIMVal**.
5. Repeat the procedure until errors are not received.
6. Press  to exit the menu.

4.4 Demand Print String Displaying

The indicator and LaserLight3 remote display can be configured to display a demand print string. Demand print display is set up using Auto-Learn when the **HoldWt** (Hold Weight) parameter is turned on (see [Section 5.2.6 on page 67](#)). It can also be set up manually by configuring the parameters of the remote display and indicator. Using Auto-Learn, ensure **HoldWt** is on and continuously push the print button on the indicator to acquire a demand print display.

4.5 Serial Commands

The LaserLight3 has the ability to receive commands, display messages, or use digital I/O. Commonly used serial command scenarios, include:

- 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 ([Section 5.2.6 on page 67](#)).
- If the LaserLight3 remote display is interfaced with a programmable smart indicator, a user program can be written allowing the user to send messages. The user can send one message to temporarily override the streamed weight display.
- 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.

4.5.1 Remote Display Command Format:

The following is an example of serial command format or message formatting commands:

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

Where:

| = Pipe character (0x7C)

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

CC = Two byte command, ASCII characters

| = Pipe character (0x7C)

Data = Data depending on command

! = Exclamation point character (0 x21)



NOTE: Commands, GT, ST, DI, DO, GV, and the feedback results are not displayed on remote display. Display message commands must not be sent faster than once every second.

Command	Description	Example
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 and returns a hex representation of 0 - F (0 - 15) of all active digital inputs bits. Digital Input bits follow: <ul style="list-style-type: none"> • Digital input bit 1 = 1 • Digital input bit 2 = 2 • Digital input bit 3 = 4 • Digital input bit 4 = 8 NOTE: The returned value must be converted from hex to decimal. For example, all bits turned on would be a hex value of F (15 in decimal).	00DI!

Table 4-3. Remote Display Commands

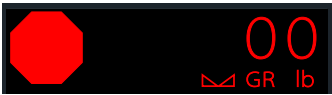
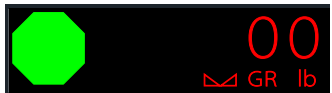

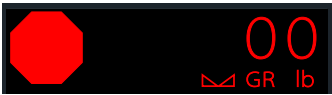
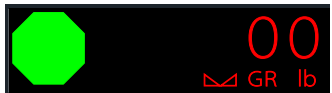

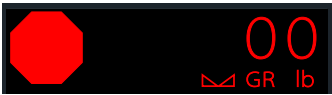
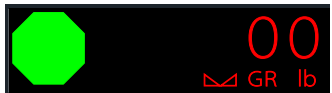

Command	Description	Example															
DO	<p>Set digital output levels with digital output bits. Digital output bits follow:</p> <ul style="list-style-type: none"> • Digital output bit 1 = 1 • Digital output bit 2 = 2 • Digital output bit 3 = 4 • Digital output bit 4 = 8 <p>NOTE: The value must be cumulative and converted to hex. For example, to turn on all bits the command "DOF" would be sent.</p>	00DOx! Where x references the hex value 0–F															
DO (with Legacy Display Mode Enabled)	<p>Sets Legacy Mode traffic symbol:</p> <table border="1"> <thead> <tr> <th>Serial Command</th> <th>Traffic Symbol</th> <th>Traffic Symbol Example</th> </tr> </thead> <tbody> <tr> <td> 00DO3!</td> <td>Stop</td> <td></td> </tr> <tr> <td> 00DO2!</td> <td>Green Circle</td> <td></td> </tr> <tr> <td> 00DO1!</td> <td>Green Arrow</td> <td></td> </tr> <tr> <td> 00DO0!</td> <td>Off</td> <td>-</td> </tr> </tbody> </table> <p>NOTE: The Display Type must set as Legacy in order to display traffic symbols in this orientation (see Section 4.1 on page 36.)</p> <p>NOTE: Even while Legacy mode is enabled, the DO command still controls the Digital output bits if they are set to output (see Section 5.2.5 on page 66).</p> <p>NOTE: Using external switches (see Section 4.6 on page 54) and serial commands to control traffic lights may results in unpredictable displays.</p>	Serial Command	Traffic Symbol	Traffic Symbol Example	00DO3!	Stop		00DO2!	Green Circle		00DO1!	Green Arrow		00DO0!	Off	-	00DOx! Where x references numbers 0–3
Serial Command	Traffic Symbol	Traffic Symbol Example															
00DO3!	Stop																
00DO2!	Green Circle																
00DO1!	Green Arrow																
00DO0!	Off	-															
GV	Get the version number	00GV!															
<p>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</p>																	

Table 4-3. Remote Display Commands (Continued)

4.5.2 Advanced Display Message (DM) Commands

In addition to the DM command listed in [Table 4-3 on page 50](#), there are additional DM commands with expanded capabilities available ([Table 4-4](#)).

Display Message	Description				
DMC	A remote display function where an EDP command is performed on the LaserLight3 and the result is returned to the host through the configured RemoteIn port (Section 4.2.2 on page 38): 00DMC xxxxx! Where xxxxxx is a standard EDP command (see Section 7.0 on page 74). For example, to view the LaserLight3 firmware version on the host, send " 00DMC VERSION!".				
DM1	One Line Message: <AA><DM1> <Timeout> <Flash1> <Slide1> <Scroll1> <Scroll Count> <FC1><BC1> <Data>!				
DM1	One Line Message with Annunciators: <AA><DM1> <Timeout> <Flash1> <Slide1> <Scroll1> <Scroll Count> <FC1><BC1> Mode Units <Data>!				
DMT	One Line Message for Traffic Symbols: <AA><DMT> <Timeout> <Flash1> <Slide1> <Scroll1> <Scroll Count> <FC1><BC1> Mode Units <Traffic symbol> <Data>!				
DM2	Two Line Message: <AA><DM2> <Timeout> <Flash1><Flash2> <Slide1><Slide2> <Scroll1><Scroll2> <Scroll Count> <FC1><BC1><FC2><BC2> <Data1> <Data2>!				
DM4	Four Line Message: <AA><DM4> <Timeout> <Flash1><Flash2><Flash3><Flash4> <Slide1><Slide2><Slide3><Slide4> <Scroll1><Scroll2><Scroll3><Scroll4> <Scroll Count> <FC1><BC1><FC2><BC2><FC3><BC3><FC4><BC4> <Data1> <Data2> <Data3> <Data4>! NOTE: Multi-line messages start with Data1 at the top.				
DMM	Sets the display to immediately show a mirror image: 00DMM!				
DMN	Sets the display to immediately show a normal image: 00DMN!				
DMQ	4 Quadrant Message: <AA><DMQ> <Timeout> <Flash1><Flash2><Flash3><Flash4> <Slide1><Slide2><Slide3><Slide4> <Scroll1><Scroll2><Scroll3><Scroll4> <Scroll Count> <FC1><BC1><FC2><BC2><FC3><BC3><FC4><BC4> <Data1> <Data2> <Data3> <Data4>! NOTE: Quadrant Locations follow: <table border="1" style="margin-left: 20px;"> <tr> <td>Data1</td> <td>Data2</td> </tr> <tr> <td>Data3</td> <td>Data4</td> </tr> </table>	Data1	Data2	Data3	Data4
Data1	Data2				
Data3	Data4				
DMX	Clears the current message and returns to the original display: <AA><DMX!>				

Table 4-4. Advanced Display Message Commands



NOTE: The total character quantity allowed in messages is limited depending on the selected command. Adding multiple-digit timeouts or scrolls limits it even further. For example:

- **DM1** - 99 available characters. 95 characters if both the timeout and scroll count are 3-digits long
- **DM1 (with mode and units)** - 96 available characters. 92 characters if both the timeout and scroll count are 3-digits long
- **DM2** - 93 available characters. 89 characters if both the timeout and scroll count are 3-digits long
- **DMT** - 95 available characters. 91 characters if both the timeout and scroll count are 3-digits long
- **DM4/DMQ** - 81 available characters. 77 characters if both the timeout and scroll count are 3-digits long

For example, in **DM2** listed above one line could have 92 characters while a second line could have 1 (without timeout or scroll count)

Advanced Display Message Options listed [Table 4-4](#) are described in [Table 4-5](#).

Option	Description								
	Pipe characters separate parameters or data in command								
!	Exclamation points indicate the end of a command								
<AA>	NOTE: This is the same as the address configured in the remote menu (see Table 5.2.6 on page 67). Address{00 – 99} This will always be 2 characters, for example: Address “1” will need to be “01”								
<DMn>	Defines which display message command is used: Command{DM1, DM2, DM4, DMQ, DMT}								
<Timeout>	0 - 65535 milliseconds seconds; Use “0” to continue infinitely until interrupted by another message. If Scroll Count and Timeout are both used, timeout overrides.								
<Scroll(n)>	Configured with Y or N. Text cycles from right to left continuously for the duration defined by Timeout or Scroll Count. n = line number								
<Slide(n)>	Configured with Y or N. Text moves from right side of display and stops at the left side of the display. n = line number								
<Flash(n)>	Configured with Y or N. Message flashes continuously for the defined timeout. n = line number.								
<Scroll Count>	0 – 999; defines the number of times the message scrolls across the display. Use “0” to scroll infinitely until interrupted by another message. If Scroll Count and Timeout are both used, Timeout overrides.								
<FC(n)>	Defines foreground color, where: <table border="1" data-bbox="344 722 665 856"> <tr> <td>Space = Black</td> <td>B = Blue</td> </tr> <tr> <td>R = Red</td> <td>M = Magenta</td> </tr> <tr> <td>Y = Yellow</td> <td>C = Cyan</td> </tr> <tr> <td>G = Green</td> <td>W = White</td> </tr> </table>	Space = Black	B = Blue	R = Red	M = Magenta	Y = Yellow	C = Cyan	G = Green	W = White
Space = Black	B = Blue								
R = Red	M = Magenta								
Y = Yellow	C = Cyan								
G = Green	W = White								
<BC(n)>	Defines background color, where: <table border="1" data-bbox="344 926 665 1060"> <tr> <td>Space = Black</td> <td>B = Blue</td> </tr> <tr> <td>R = Red</td> <td>M = Magenta</td> </tr> <tr> <td>Y = Yellow</td> <td>C = Cyan</td> </tr> <tr> <td>G = Green</td> <td>W = White</td> </tr> </table>	Space = Black	B = Blue	R = Red	M = Magenta	Y = Yellow	C = Cyan	G = Green	W = White
Space = Black	B = Blue								
R = Red	M = Magenta								
Y = Yellow	C = Cyan								
G = Green	W = White								
<Mode>	Defines modes displayed in a message. Only G or N are accepted								
<Units>	Defines units displayed in message. lb, kg, t, tn, oz or gr accepted								
<Traffic Symbol>	Defines traffic symbols displayed in message. Character 0 – 7; where: <table border="1" data-bbox="344 1194 724 1329"> <tr> <td>0 = Red Stop Light</td> <td>4 = Arrow Right</td> </tr> <tr> <td>1 = Green Go light</td> <td>5 = Arrow Down</td> </tr> <tr> <td>2 = Red X</td> <td>6 = Arrow Left</td> </tr> <tr> <td>3 = Arrow Up</td> <td>7 = No Icon</td> </tr> </table>	0 = Red Stop Light	4 = Arrow Right	1 = Green Go light	5 = Arrow Down	2 = Red X	6 = Arrow Left	3 = Arrow Up	7 = No Icon
0 = Red Stop Light	4 = Arrow Right								
1 = Green Go light	5 = Arrow Down								
2 = Red X	6 = Arrow Left								
3 = Arrow Up	7 = No Icon								
<Data(n)>	User configurable message with a variable character quantity depending on commands. (n) = line number NOTE: This parameter must be adhere to the total character limit described for commands listed in Table 4-5.								

Table 4-5. Advanced Display Message Options

4.6 Control Traffic Lights with External Switches (Digital Inputs)

Traffic lights may be controlled with switches connected to digital inputs. This sections describes wiring connections needed to connect external switches to the LaserLight3.



IMPORTANT: Legacy mode ([Section 4.1 on page 36](#)) must be enabled in order for traffic lights to function with external switches.



NOTE: Only Ground, DIO1 and DIO2 are used to connect to switches. Using external switches and serial commands to control traffic lights may results in unpredictable displays.

4.6.1 Single Switch Wiring

A single switch may be wired as either stop and green arrow lighting or stop and go lighting. Wire switch as indicated in [Figure 4-23](#).



Figure 4-23. Single Switch DIO Wiring

See [Table 4-6](#) for single switch operations details.


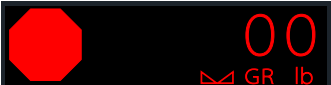

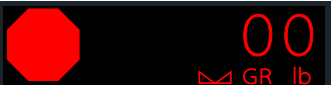



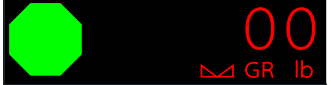
Stop and Green Arrow Switch Interactions			Stop and Go Switch Interactions		
SW1	DIO1 (P3)	Symbol	SW1	DIO2 (P4)	Symbol
Open	5V (H)	 	Open	5V (H)	 
Closed	0V (L)	 	Closed	0V (L)	 

Table 4-6. Single Switch Traffic Light Interaction

4.6.2 Two Switch Wiring

It is possible to obtain a variety of combinations of the four possible states using two switches to control the traffic symbols:

- Both switches with contacts open cause the stop condition
- Both switches with contacts closed cause the off condition
- One switch open and the other closed causes either the go or arrow condition

Wire switch as indicated in [Figure 4-24](#).

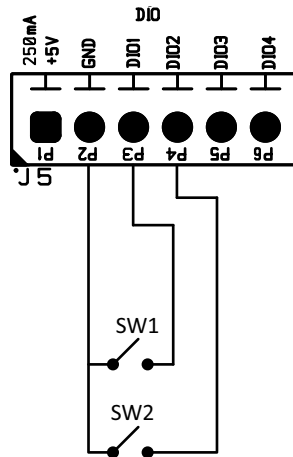


Figure 4-24. Two Switch DIO Wiring

See [Table 4-7](#) for two switch operations details.




SW1	SW2	DIO1 (P3)	DIO2 (P4)	Symbol
Open	Open	5V (H)	5V (H)	 00 GR lb
Closed	Open	0V (L)	5V (H)	 00 GR lb
Open	Closed	5V (H)	0V (L)	 00 GR lb
Closed	Closed	0V (L)	0V (L)	No Symbol

Table 4-7. Two Switch Traffic Light Interaction

5.0 Configuration

There are two types of configuration parameters in the LaserLight3, *Setup* mode parameters and *Menu* mode parameters. *Setup* mode parameters are accessed by enabling the Audit Jumper or shorting the Setup jumper ([Section 2.7.2 on page 22](#)). *Menu* mode parameters are accessed by pressing the Menu button and do not require shorting the setup jumper.

The following sections provide graphic representations of the LaserLight3 menu structures. Most menu diagrams are accompanied by a table which describes all parameters and parameter values associated with the menu. The factory default setting appears at the top of each column in bold type.

The Audit, Calibration, Setpoints, Accumulator, Tare, Test, Time, Date, MAC ID and Version menus can be accessed by pressing the Menu button. The Audit, Tare, MAC ID and Version menus are read only and accessible in the top-level menu.



NOTE: The Menu mode Setpoints menu displays the setpoint value of configured setpoints and is accessible with the Menu button. Complete configuration of setpoints is available in Setup mode within the Setup menu. All weight related parameters must be configured prior to calibrating the unit.



IMPORTANT: In order to configure the LaserLight3, it must be placed in Setup mode by shorting the setup jumper or enabling the audit jumper ([Section 2.7.2](#)).

5.1 Main Menu

This section provides a flow chart and descriptions for the LaserLight3 top-level Main menu.



Figure 5-1. Main Menu

Menu	Description
Setup	See Section 5.2 on page 57 for menu structure and parameter descriptions of the Setup menu; only accessible when in Setup mode by shorting the setup jumper or if the audit jumper is in the ON position
MAC ID	Displays Ethernet and Wi-Fi (if installed) MAC ID addresses; see Section 5.3 on page 69
Test	Performs various tests; see Section 5.4 on page 70
Time	Displays the current set time; allows the time to be edited using the navigation keys; see Section 5.5 on page 71
Date	Displays the current set date; allows the date to be edited using the navigation keys; see Section 5.6 on page 71
Version	Displays the installed firmware version number (read only); see Section 5.7 on page 71

Table 5-1. Main Menu Descriptions

5.2 Setup Menu

This section provides a flow chart and descriptions for the Setup menu.

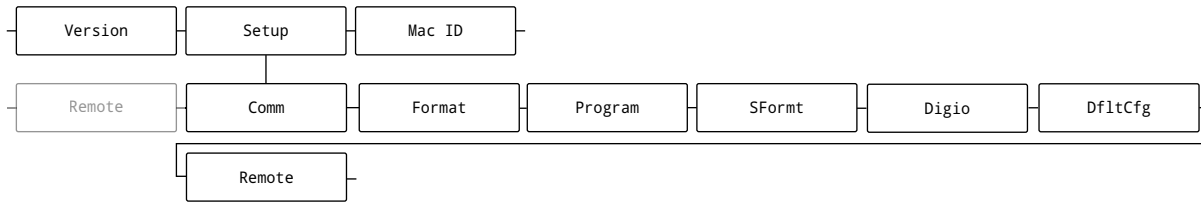


Figure 5-2. Setup Menu

Menu	Description
Comm (Communication)	See Section 5.2.1 on page 57 for menu structure and parameter descriptions of the Communications menu
Format	See Section 5.2.2 on page 62 for menu structure and parameter descriptions of the Format menu
Program	See Section 5.2.3 on page 63 for menu structure and parameter descriptions of the Program menu
SFormat (Stream Format)	See Section 5.2.4 on page 65 for menu structure and parameter descriptions of the Stream Format menu
Digio (Digital Inputs and Outputs)	See Section 5.2.5 on page 66 for menu structure and parameter descriptions of the Digital I/O menu
DfltCFG (Default Configuration)	See Section 3.4.6 on page 34 for instructions to reset the configuration settings
Remote	See Section 5.2.6 on page 67 for menu structure and parameter descriptions of the Remote menu

Table 5-2. Setup Menu Descriptions

5.2.1 Communications Menu

This section provides a flow chart and descriptions for the Communications menu.

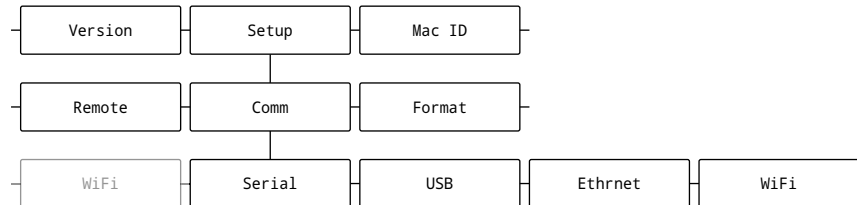


Figure 5-3. Communications Menu

Menu	Description
Serial	RS-232, RS-485/422 or 20 mA serial communications (Section 5.2.1.1 on page 58)
USB	Intended to be connected to a PC only; appears as a Virtual COM Port and is assigned a "COMx" designation; Applications communicate through the port like a standard RS-232 communications port (Section 5.2.1.2 on page 59)
Ethnet	Features Ethernet TCP/IP 10Base-T/100Base-TX communication and can support two simultaneous connections, one as a server, the other as a client (Section 5.2.1.3 on page 60)
WiFi	Supports Wi-Fi communications (Section 5.2.1.4 on page 61)

Table 5-3. Communications Menu Descriptions

5.2.1.1 Serial Menu

This section provides a flow chart and descriptions for the Serial menu.

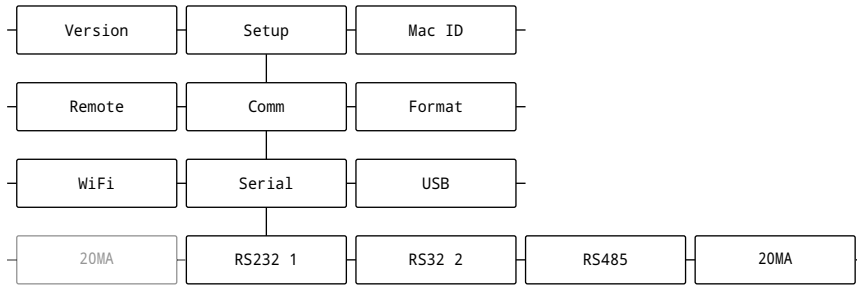


Figure 5-4. Serial Menu

Parameter	Description
RS-232 Port 1-2 RS-485/422 20 mA Current Loop	<p>Configurable parameters for serial communications ports; Sub-Parameters:</p> <p>Trigger – Sets the input trigger type; <i>Settings:</i></p> <p><i>RmtIn (Remote In)</i> – Configures the port to operate as a serial input. This configuration is used with Remote display configurations</p> <p><i>RmtOut (Remote Out)</i> – Configures the port to operate as a serial output</p> <p>NOTE: For the RS-485/422 port when Stream Industrial, Stream Legal for Trade, RmtIn and RmtOut is configured and only RS422 streams data (RS-485 port does not stream data).</p> <p>CMD (Command) (default) – Allows operation of EDP commands and printing</p> <p><i>StrInd (Stream Industrial)</i> – Scale data is updated up to configured sample rate; Allows operation of EDP commands and printing</p> <p><i>StrLft (Stream Legal for Trade)</i> – Scale data is updated at configured display update rate; Allows operation of EDP commands and printing</p> <p>Baud – Sets the transmission speed for the port; <i>Settings: 1200, 2400, 4800, 9600 (default), 19200, 28800, 38400, 57600, 115200, Auto</i></p> <p>Bits – Sets number of data bits transmitted or received by the port and specifies the parity bit to odd, even or none; <i>Settings: 8NONE (default), 8EVEN, 8ODD, 7EVEN, 7ODD</i></p> <p>Stop Bits – Sets the number of stop bits transmitted or received by the port; <i>Settings: 1 (default), 2</i></p> <p>LnTerm (Line Terminator) – Sets the termination character for data sent from the port; <i>Settings: CR/LF (default), CR</i></p> <p>Eoldly (End of Line Delay) – Sets the delay period from when a formatted line is terminated to the beginning of the next formatted serial output (0.1-second intervals); <i>Enter value: 0–255, 0 (default)</i></p> <p>Echo – Specifies if characters received by the port are echoed back to the sending unit; <i>Settings: On (default), Off</i></p> <p>NOTE: When the RmtIn parameter is enabled, the Echo parameter is unavailable.</p> <p>Respse (Response) – Specifies if the port transmits replies to serial commands; <i>Settings: On (default), Off</i></p> <p>RS-485/422 specific parameters</p> <p>Address – Specifies address used to connect to the port; Must be set to 0 for RS-422; <i>Enter value: 0–255, 0 (default)</i></p> <p>Duplex – Specifies FULL (4-wire) or HALF (2-wire) duplex used to connect to the port; <i>Settings: FULL (default), HALF</i></p>

Table 5-4. Serial Menu Parameters

5.2.1.2 USB Menu

This section provides a flow chart and descriptions for the USB menu.

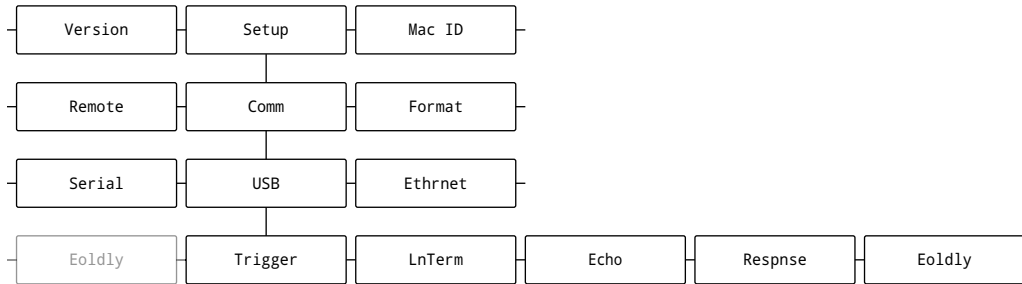


Figure 5-5. USB Menu

Parameter	Description
Trigger	Sets the input trigger type; <i>Settings:</i> Command (default) – Sets input trigger to command; allows operation of EDP commands and can print <i>Stream Industrial</i> – Scale data is updated up to configured sample rate; allows operation of EDP commands and printing <i>Stream Legal For Trade</i> – Scale data is updated at configured display update rate; allows operation of EDP commands and printing <i>RmtIn (Remote In)</i> – Configures the port to operate as a serial input. This configuration is used with Remote display configurations <i>RmtOut (Remote Out)</i> – Configures the port to operate as a serial output
LnTerm (Line Termination)	Sets the termination character for data sent from the port; <i>Settings: CR/LF (default), CR</i>
Echo	Specifies if characters received by the port are echoed back to the sending unit; <i>Settings: On (default), Off</i>
Response (Response)	Specifies if the port transmits replies to serial commands; <i>Settings: On (default), Off</i>
Eoldly (End of Line Delay)	End of line delay sets the delay period from when a formatted line is terminated to the beginning of the next formatted serial output (0.1-second intervals); <i>Enter value: 0–255, 0 (default)</i>

Table 5-5. USB Menu Parameters

5.2.1.3 Ethernet Menu

This section provides a flow chart and descriptions for the Ethernet (Ethernet) menu.

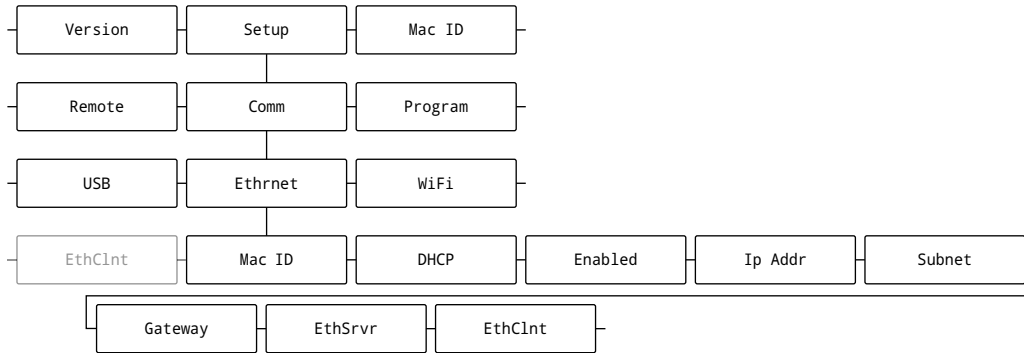


Figure 5-6. Ethernet Menu

Parameter	Description
Mac ID	Displays the Ethernet MAC address (read only): 00:00:00:00:00:00
DHCP	Dynamic Host Configuration Protocol (static allocation of IP address when OFF); Settings: On (default), Off
Enabled	Enables Ethernet communications; Settings: Off (default), On
Ip Addr (IP Address)	IP Address; Enter value: 0.0.0.0 (default)
Subnet	Subnet Mask; Enter value: 255.255.255.0 (default)
Gateway	Default Gateway; Enter value: 0.0.0.0 (default)
EthSrvr (Ethernet Sever)	Allows the LaserLight3 to receive external EDP commands; Sub-parameters: Port – Specifies IP Address port to open to establish communications; Enter value: 1025–65535, 10001 (default) Name – Host name for Ethernet Server; Enter characters: Alphanumeric entry up to 30 characters, 0 (default) Trigger – Sets the input trigger type; Settings: CMD (Command) (default), StrInd (Stream Industrial), StrLft (Stream Legal For Trade), RmtIn (Remote In), RmtOut (Remote Out) Echo – Specifies if characters received by the port are echoed back to the sending unit; Settings: Off (default), On LnTerm (Line Terminator) – Sets the termination character for data sent from the port; Settings: CR/LF (default), CR Response (Response) – Specifies if the port transmits replies to serial commands; Settings: On (default), Off
EthCInt (Ethernet Client)	Allows the LaserLight3 to send EDP commands to external devices; Sub-parameters: Echo – Specifies if characters received by the port are echoed back to the sending unit; Settings: On (default), Off Eoldy (End of Line Delay) – Sets the delay period from when a formatted line is terminated to the beginning of the next formatted serial output (0.1-second intervals); Enter value: 0–255, 0 (default) IPAddr (Remote IP Address) – Sets the remote IP Address; Enter value: 0.0.0.0 (default) LnTerm (Line Terminator) – Sets the termination character for data sent from the port; Settings: CR/LF (default), CR Port (Remote Port) – Specifies IP Address port to look for to establish communications; Enter value: 1025–65535, 10001 (default) Response (Response) – Specifies if the port transmits replies to serial commands; Settings: On (default), Off Trigger – Sets the input trigger type; Settings: Command (default), Stream Industrial, Stream Legal For Trade, Remote In, Remote Out DiscTim (Disconnect Time) – Sets the disconnect timeout (in seconds); Enter value: 0–60, 0 (default)

Table 5-6. Ethernet Menu Parameters

5.2.1.4 WiFi Menu

This section provides a flow chart and descriptions for the WiFi menu.



NOTE: *Wi-Fi is an factory installed LaserLight3 option and is not included with all systems.*

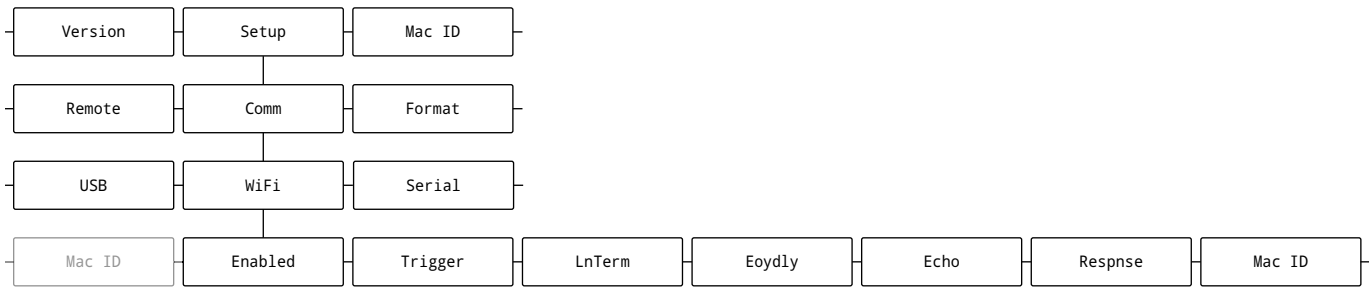


Figure 5-7. WiFi Menu

Parameter	Description
Enabled	Enables the wireless module and specifies WiFi communication; <i>Settings: OFF (default), WiFi</i>
Trigger	Sets the input trigger type; <i>Settings: Settings: Command (default), Stream Industrial, Stream Legal For Trade, RmtIn, RmtOut</i> CMD (Command) (default) – Sets the input trigger to command; allows operation of EDP commands and can print <i>StrInd (Stream Industrial)</i> – Scale data is updated up to configured sample rate; allows operation of EDP commands and printing <i>StrLft (Stream Legal for Trade)</i> – Scale data is updated at configured display update rate; allows operation of EDP commands and printing <i>RmtIn (Remote In)</i> – Configures the port to operate as a serial input. This configuration is used with Remote display configurations <i>RmtOut (Remote Out)</i> – Configures the port to operate as a serial output
LnTerm (Line Termination)	Sets the termination character for data sent from the port; <i>Settings: CR/LF (default), CR</i>
Eoydly (End of Line Delay)	End of Line Delay sets the delay period from when a formatted line is terminated to the beginning of the next formatted serial output (0.1-second intervals); <i>Enter value: 0–255, 0 (default)</i>
Echo	Specifies if characters received by the port are echoed back to the sending unit; <i>Settings: On (default), Off</i>
Response (Response)	Specifies if the port transmits replies to serial commands; <i>Settings: On (default), Off</i>
Mac ID	Displays read only Wi-Fi MAC address (if installed): <i>00:00:00:00:00:00 or blank (if not equipped)</i>

Table 5-7. WiFi Menu Parameters

5.2.2 Format Menu

This section provides a flow chart and descriptions for the Format menu.

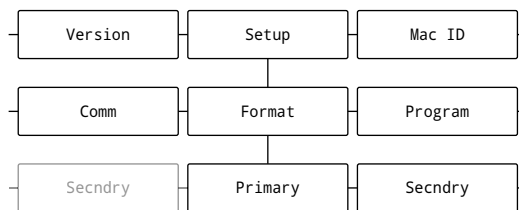


Figure 5-8. Format Menu

Parameter	Description
Primary	Scale format and units settings for the Primary format; Sub-Parameters: Units – Sets the units type; Settings: lb (Primary default), kg, oz, tb, T, G, NONE
Secndry (Secondary)	Scale format and units settings for the Secondary format; Sub-Parameters: Units – Sets the units type; Settings: kg (Secondary), oz, tn, T, G, NONE, lb

Table 5-8. Scale Format Menu Parameters

5.2.3 Program Menu

This section provides a flow chart and descriptions for the Program menu.

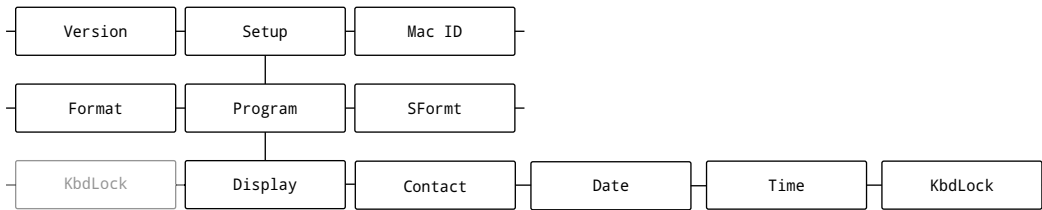


Figure 5-9. Program Menu

Parameter	Description
Dsplay (Display Type)	<p>Changes how information is presented on the display with three parameters.</p> <p>Bright configures the intensity of brightness displayed. Ambient light sensor detects light or brightness similar to a human eye. These parameters configure how the ambient light sensor adjusts the brightness on the LaserLight3:</p> <p><i>Day</i> – Select brightness during day; Brightness is set from 1–6 (16.67–100%) of full brightness; light sensor averages measured ambient light continuously over a 5-second time span; Day values = % of maximum brightness; <i>Settings: 1, 2, 3, 4 (default), 5, 6</i></p> <p><i>Night</i> – Select brightness during night; Brightness is set from 1–6 (16.67–100%) of full brightness; light sensor averages measured ambient light continuously over a 5-second time span; Night values = % of maximum brightness; <i>Settings: 1, 2, 3, 4 (default), 5, 6</i></p> <p><i>DayLVL</i> – DYLV is The ambient brightness threshold at which the display changes from night to day mode and vice versa; Settings range between 1 through 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; <i>Settings: 1, 2, 3, 4 (default), 5, 6, 7, 8, 9, 10</i></p> <p><i>Intnsty</i> – Brightness is set from 1–6 (16.67–100%) of full brightness or as DayLVL (uses Day, Night and DayLVL parameters to automatically adjust brightness for day and night); <i>Settings: 1, 2, 3, 4, 5, 6 (default), DayLVL</i></p> <p>Type sets a predefined arrangement of information on the display; <i>Settings:</i></p> <p>Standard (default) – sets display with about 5 in weight digits with annunciators stacked on the right side</p> <p>Legacy – sets display with about 3.75 in weight digits with annunciators along the bottom. This configuration also provides functionality for serial commands or digital inputs to function with traffic symbols (see Section 4.5 on page 50 and Section 4.6 on page 54)</p> <p>Cardnal – Replicates Cardinal indicator display for message board and score board modes. These modes typically include a stop and go function that is controlled from the Cardinal indicator (see Section 9.7 on page 102)</p> <p>Color configures the color the display uses for characters. Settings; Red (default), Yellow, Green, Blue, Magenta, Cyan or White</p>
Contact	Contact Information; See Section 5.2.3.1 on page 64
Date	<p>Allows setting of the date format and date separator character</p> <p>Format – <i>Settings: MMDDYY (default), DDMMYY, YYMMDD, YYDDMM</i></p> <p>Date Separator – <i>Settings: Slash (default), Dash, Semi, Dot</i></p>
Time	<p>Allows setting of the time format and the separator character</p> <p>Format – <i>Settings: 12HOUR (default), 24HOUR</i></p> <p>Time Separator – <i>Settings: Colon (default), Comma, Dot</i></p>
KbdLock	Keyboard lock, disables keyboard except for the menu and power key. <i>Settings: Off (default), On</i>

Table 5-9. Program Menu Parameters

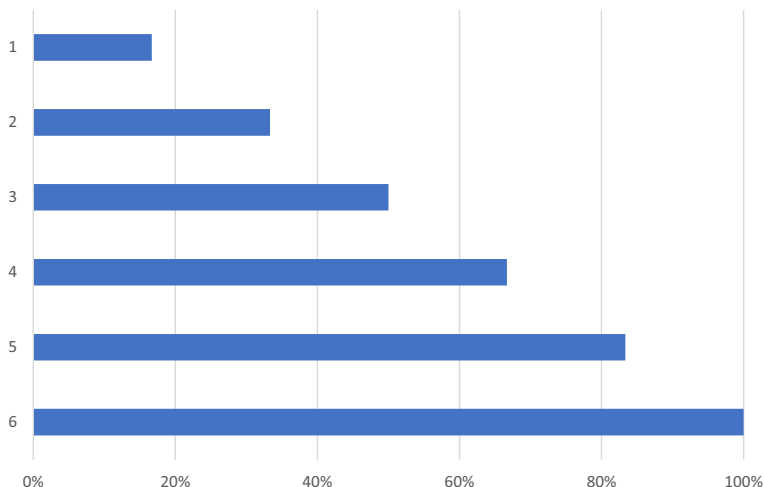


Figure 5-10. Day and Night Brightness

5.2.3.1 Contact Information Menu

This section provides a flow chart and descriptions for the Contact Information menu.

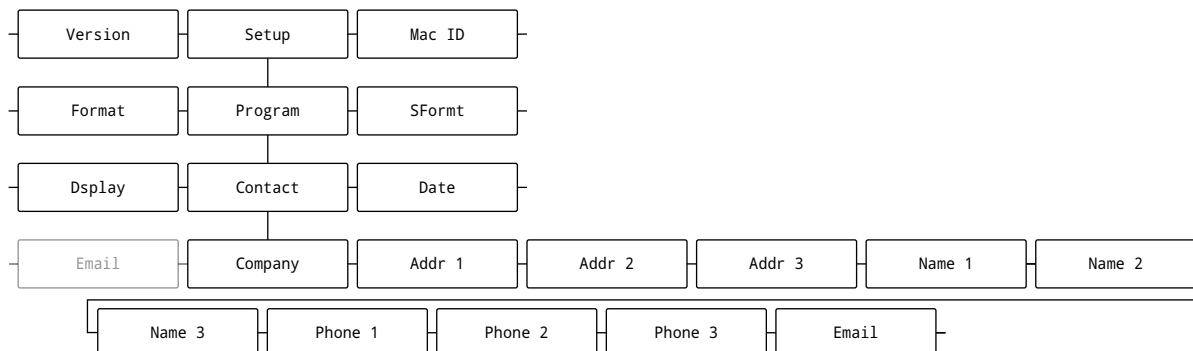


Figure 5-11. Contact Information Menu

Parameter	Description
Company	Contact company name; <i>Enter characters: Alphanumeric entry up to 30 characters</i>
Addr 1-3 (Address 1-3)	Contact company address lines; <i>Enter characters: Alphanumeric entry up to 20 characters (for each line)</i>
Name 1-3	Contact names; <i>Enter characters: Alphanumeric entry up to 30 characters (for each line)</i>
Phone 1-3	Contact phone numbers; <i>Enter characters: Alphanumeric entry up to 20 characters (for each line)</i>
Email	Contact email address; <i>Enter characters: Alphanumeric entry up to 40 characters</i>

Table 5-10. Contact Information Menu Parameters

5.2.4 Stream Format Menu

This section provides a flow chart and descriptions for the Stream Format menu.

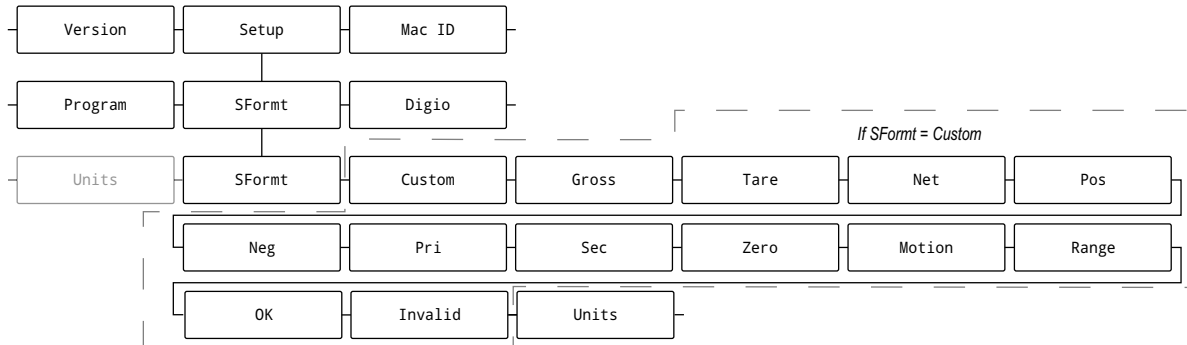


Figure 5-12. Stream Format Menu

Parameter	Description
SFormat (Stream Format)	Specifies the stream format used for streaming output of scale data or specifies the expected input for a serial scale; <i>Settings:</i> RLWS (default) – Rice Lake Weighing Systems stream format (Section 9.6.2 on page 98) Cardinal – Cardinal stream format (Section 9.6.3 on page 98) Weigh-Tronix – Avery Weigh-Tronix stream format (Section 9.6.4 on page 99) Toledo – Mettler Toledo stream format (Section 9.6.5 on page 99) Custom – Custom stream format
Custom	Specifies the custom stream format; only displays if SFORMAT is set to CUSTOM; see Section 9.6.6 on page 100 for available stream format tokens; <i>Enter characters:</i> Alphanumeric entry up to 1,000 characters
Gross	Mode token when streaming the gross weight; <i>Enter characters:</i> Alphanumeric entry up to 8 characters, G (default)
Tare	Mode token when streaming the tare weight; <i>Enter characters:</i> Alphanumeric entry up to 8 characters, T (default)
Net	Mode token when streaming the net weight; <i>Enter characters:</i> Alphanumeric entry up to 8 characters, N (default)
Pos (Positive)	Polarity token when the weight is positive; <i>Settings:</i> Space (default), None, +
Neg (Negative)	Polarity token when the weight is negative; <i>Settings:</i> Space, None, – (default)
Sec (Secondary)	Units token when streaming secondary units; <i>Enter characters:</i> Alphanumeric entry up to 8 characters, K (default)
Pri (Primary)	Units token when streaming primary units; <i>Enter characters:</i> Alphanumeric entry up to 8 characters, L (default)
Zero	Status token when the weight is at center of zero; <i>Enter characters:</i> Alphanumeric entry up to 2 characters, Z (default)
Motion	Status token when the weight is in motion; <i>Enter characters:</i> Alphanumeric entry up to 2 characters, M (default)
Range (Out of Range)	Status token when the weight is out of range; <i>Enter characters:</i> Alphanumeric entry up to 2 characters, O (default)
OK	Status token when the weight is OK (not invalid, out-of-range, at zero or in-motion); <i>Enter characters:</i> Alphanumeric entry up to 2 characters (default is a space)
Invalid	Status token when streaming an invalid weight; <i>Enter characters:</i> Alphanumeric entry up to 2 characters, I (default)
Units	Units – Specifies whether the streaming unit tokens remain static or dynamically updated with the configured units; Static uses set Primary/Secondary unit tokens and Dynamic defaults to configured units of the scale; <i>Settings:</i> Dynamic (default), Static

Table 5-11. Stream Format Menu Parameters

5.2.5 Digio (Digital I/O) Menu

This section provides a flow chart and descriptions for the Digio menu.

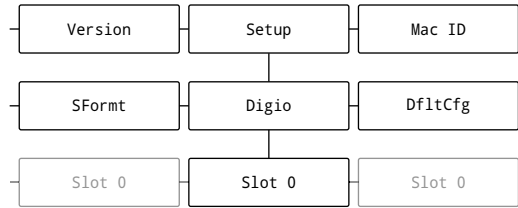


Figure 5-13. Digital I/O Menu

Parameter	Description
Bit 1-4	Digital I/O Bit 1-4 – Specifies the mode and function of the digital I/O pins; Settings: Off (default), Print, Zero, Tare, Units, Primary, Secndry, Clear, DspAcc (Display Accumulator), DspTare (Display Tare), ClrAcc (Clear Accumulator), ClrTare (Clear Tare), NT/GRS (Net/Gross), Gross, Net, ClrCN (Clear Consecutive Number), KbdLock (Keyboard Lock), BatRun (Batch Run), BatStry (Batch Start), BatPaus (Batch Pause), BatRest (Batch Reset), BatStop (Batch Stop), Output, Input

Table 5-12. Digio Menu Parameters

5.2.6 Remote Menu

This section provides a flow chart and descriptions for the Remote menu.

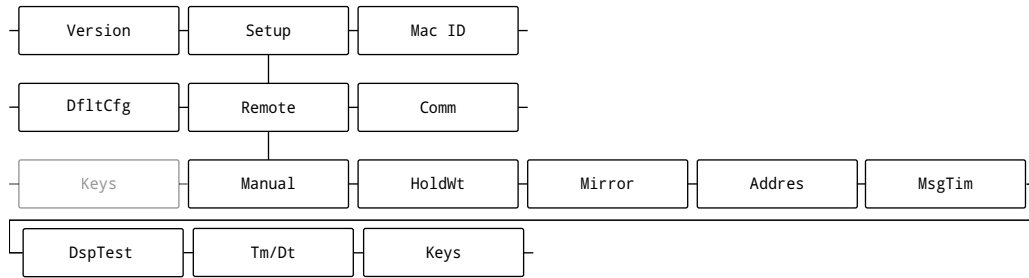


Figure 5-14. Remote Menu

Menu	Description
Manual	Advances to MnLMode (Manual Mode) (see Table 5-13 on page 67)
HoldWt (Hold Weight)	Holds last weight on display; <i>Settings: On, Off (default), Demand</i> <i>On</i> – Holds last weight displayed if communication is lost and prevents remote display from going into an error condition. <i>Off</i> – Hold weight function is not used. <i>Demand</i> – Holds last weight until a new weight prints.
Mirror	Select On to display LED readout in reverse; The menu is viewed normally; <i>Settings: On, Off (default), Toggle</i>
Address (Address)	Assign a command address by selecting a number from 0–ff (255), 0 (default)
MsgTim (Message Time)	Input the amount of time a message displays on the remote display; Time can display from 1-seconds to 65535-seconds (default 5 seconds); If 0 is entered the message displays indefinitely NOTE: For information about clearing or sending messages with DM commands, see Section 4.5.2 on page 52.
DspTest (Startup Display Test)	Set this parameter On to view the splash screen on start up; <i>Settings: On, Off (default)</i>
Tm/Dt (Time/Date)	Time and date on displays when weight is zero for increments of five seconds; <i>Settings: On, Off (default)</i>
Keys	Contains 5 options that can be assigned strings that transmit to the host indicator via the configured Remoteln port when the corresponding front panel key is pressed. The strings are typically edited if the serial commands for these functions on the host are different. If the parameter is configured without values (not including spaces), the key does not transmit strings to the host indicator. <i>Print</i> - Defines Print key string. <i>Settings: 0 to 20 alphanumeric characters, KPRINT (default)</i> <i>Units</i> - Defines Units key string. <i>Settings: 0 to 20 alphanumeric characters, KUNITS (default)</i> <i>Tare</i> - Defines Tare key string. <i>Settings: 0 to 20 alphanumeric characters, KTARE (default)</i> <i>GR/NT</i> - Defines Gross/Net key string. <i>Settings: 0 to 20 alphanumeric characters, KGROSSNET (default)</i> <i>Zero</i> - Defines Zero key string. <i>Settings: 0 to 20 alphanumeric characters, KZERO (default)</i>

Table 5-13. Remote Menu Descriptions

5.2.6.1 Manual Mode Menu

This section provides a flow chart and descriptions for the Manual Mode menu.

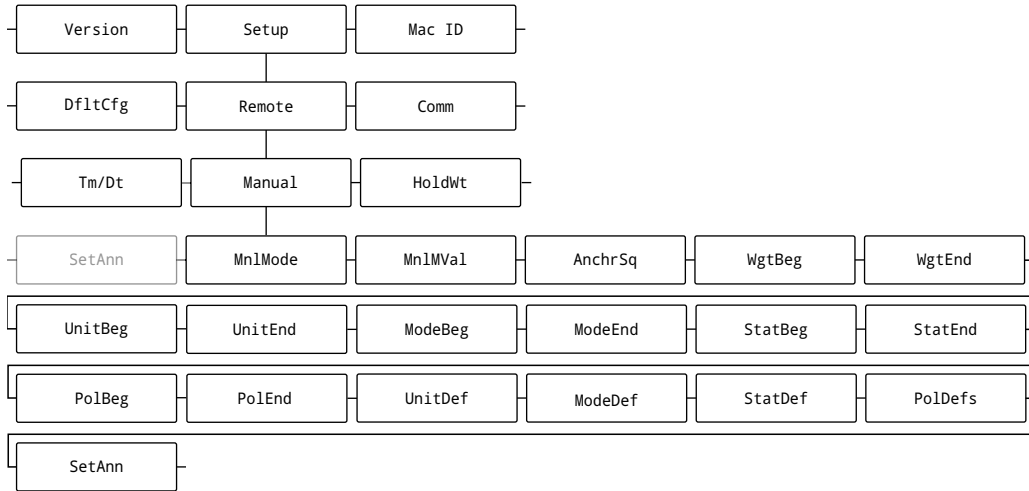



Figure 5-15. Manual Mode Menu

NOTE: Manual Mode parameter configuration behaves differently when compared to other parameters. Many of these parameters will bring up the entire raw format display including control characters. A cursor accompanies the raw format, the arrows keys moves the cursor and pushing  sets the configuration at the cursor's position.

Menu	Description
MnlMode (Manual Mode)	Enables or disables Manual Mode parameters; Settings: On, Off (default)
MnlMVal (Manual Mode Validation)	Display one parameter at a time that causes a Manual Mode issue
AnchrSq (Anchor Sequence)	The beginning or end character in a stream, used to determine boundaries of incoming text frame
WgtBeg (Weight Start)	Select start of weight string with cursor
WgtEnd (Weight End)	Select end of weight string with cursor
UnitBeg (Unit Start)	Select the first character of the unit string (for example: lb, kg, oz, g, T and tn)
UnitEnd (Unit End)	Select the last character of the unit string (for example: lb, kg, oz, g, T and tn)
ModeBeg (Mode Start)	Select the first character of the Mode string (for example: gross or net)
ModeEnd (Mode End)	Select the character of the Mode string (for example: gross or net)
StatBeg (Status Start)	Select the first character of the status string (for example: center of zero, invalid, motion, OK, overload or underload)
StatEnd (Status End)	Select the last character of the status string (for example: center of zero, invalid, motion, OK, overload or underload)
PolBeg (Priority Start)	Select the first character of the of the polarity string (for example: space, + or -)
PolEnd (Priority End)	Select the last character of the of the polarity string (for example: space, + or -)
UnitDef (Unit Definitions)	Define the name for each unit: <i>Lbs</i> – Defines Status name for Invalid. Settings: Enter up to eight A-Z characters, L (default) <i>Kg</i> – Defines Status name for Motion. Settings: Enter up to eight A-Z characters, K (default) <i>Tons</i> – Defines Status name for Overload. Settings: Enter up to eight A-Z characters, T (default) <i>ShortTon</i> – Defines Status name for Underload. Settings: Enter up to eight A-Z characters, t (default) <i>Ounces</i> – Defines Status name for Center of Zero. Settings: Enter up to eight A-Z characters, O (default) <i>Grams</i> – Defines Status name for OK. Settings: Enter up to eight A-Z characters, G (default) NOTE: Each unit must have the same quantity of characters. Use leading space to increase character count if needed.
ModeDef (Mode Definitions)	Defines the name for each mode: <i>Gross</i> – Defines Mode name for Gross. Settings: Enter up to eight A-Z characters, G (default) <i>Net</i> – Defines Mode name for Net. Settings: Enter up to eight A-Z characters, N (default) NOTE: Each unit must have the same quantity of characters. Use leading space to increase character count if needed.

Table 5-14. Remote Menu Descriptions

Menu	Description
StatDef (Status Definitions)	<p>Define the name for each status:</p> <p><i>Invlid</i> (Invalid) – Defines Status name for Invalid. Settings: Enter up to eight A-Z characters, I (default)</p> <p><i>Motion</i> – Defines Status name for Motion. Settings: Enter up to eight A-Z characters, M (default)</p> <p><i>OvrLoad</i> (Overload) – Defines Status name for Overload. Settings: Enter up to eight A-Z characters, O (default)</p> <p><i>UdrLoad</i> (Underload) – Defines Status name for Underload. Settings: Enter up to eight A-Z characters, U (default)</p> <p><i>COZ</i> (Center of Zero) – Defines Status name for Center of Zero. Settings: Enter up to eight A-Z characters, Z (default)</p> <p><i>OK</i> – Defines Status name for OK. Settings: Enter up to eight A-Z characters, (space) (default)</p> <p>NOTE: Each unit must have the same quantity of characters. Use leading space to increase character count if needed.</p>
PolDefs (Polarity Definitions)	<p>Define the name for each status (8 alpha character limit). Each unit must have the same quantity of characters. Use leading space to increase character count if needed. Default Settings: space (positive) and - (negative)</p> <p>es the name for each mode:</p> <p><i>Negativ</i> (Negative) – Defines Mode name for Gross. Settings: Enter up to eight A-Z characters, - (default)</p> <p><i>Positiv</i> (Positive) – Defines Mode name for Net. Settings: Enter up to eight A-Z characters, (Space) (default)</p> <p>NOTE: Each unit must have the same quantity of characters. Use leading space to increase character count if needed.</p>
SetAnn (Set Annunciator)	<p>Disable or select which unit/mode annunciators are enabled manually. If disabled, the appropriate annunciator does not display. If selected, the appropriate annunciator displays.</p> <p><i>Disable</i> – Disables annunciator for Unit, Mode, Status or Polrity. Settings: Yes, No (default)</p> <p>NOTE: Unit, Mode, Status are applicable to Manual and Auto Learn Modes, while Polrity is only applicable to manual mode.</p> <p><i>UnitAnn</i> (Unit Annunciator) – Defines Status name for Invalid. Settings: Primary, Secondary, Off (default)</p> <p><i>ModeAnn</i> (Mode Annunciator) – Defines illuminated mode annunciator. Settings: Gross, Net, Off (default)</p>

Table 5-14. Remote Menu Descriptions (Continued)

Figure 5-16.

5.3 MAC ID

This section provides a flow chart and descriptions for the MAC ID menu.

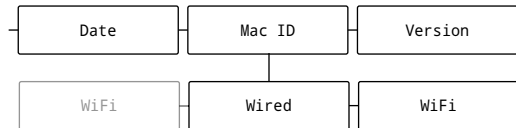


Figure 5-17. MAC ID Date Menu

Parameter	Description
Wired	Views read only Ethernet MAC Address: 00:00:00:00:00:00
WiFi	Views read only WiFi MAC Address (if installed): 00:00:00:00:00:00 or blank (if not equipped)

Table 5-15. MAC ID Menu Parameters

Figure 5-18.

5.4 Test Menu

This section provides a flow chart and descriptions for the Test menu.

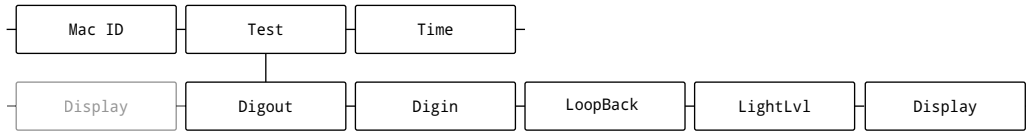


Figure 5-19. Test Menu

Parameter	Description																							
Digout (Digital Output)	<p>Provides a way to test states of digital outputs. Use the left and right arrows to select bit 1 - 4. The bit activates for three seconds, displays "OK" and then becomes inactive</p> <p>NOTE: Digital output bits must be configured as an output to be tested. Displays "Bit not configured" if a digital output bit is not assigned.</p> <p>NOTE: For more information, see Section 8.8.1 on page 90.</p>																							
Digin (Digital Input)	<p>Displays a summed decimal representation of all active Digital I/O (J5 on the CPU board) input signals. The range is 0 - 15.</p> <table border="1"> <thead> <tr> <th>Connector</th> <th>Pin</th> <th>Signal</th> <th>Input Bit</th> </tr> </thead> <tbody> <tr> <td rowspan="6">J5</td> <td>1</td> <td>+5 VDC, 250 mA max</td> <td>-</td> </tr> <tr> <td>2</td> <td>GND</td> <td>-</td> </tr> <tr> <td>3</td> <td>DIO1</td> <td>1</td> </tr> <tr> <td>4</td> <td>DIO2</td> <td>2</td> </tr> <tr> <td>5</td> <td>DIO3</td> <td>4</td> </tr> <tr> <td>6</td> <td>DIO4</td> <td>8</td> </tr> </tbody> </table> <p>NOTE: For more information, see Section 8.8.2 on page 90.</p>	Connector	Pin	Signal	Input Bit	J5	1	+5 VDC, 250 mA max	-	2	GND	-	3	DIO1	1	4	DIO2	2	5	DIO3	4	6	DIO4	8
Connector	Pin	Signal	Input Bit																					
J5	1	+5 VDC, 250 mA max	-																					
	2	GND	-																					
	3	DIO1	1																					
	4	DIO2	2																					
	5	DIO3	4																					
	6	DIO4	8																					
Loopbck (Loop-back)	<p>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 serial port by sending and receiving data to itself. The following connections must have a jumper wire attached during testing:</p> <ul style="list-style-type: none"> RS-232 1 (J3): TX 1 → RX 1 RS-232 2 (J3): TX 2 → RX 2 RS-485 (J4): <ul style="list-style-type: none"> TX Z → RX B TX Y → RX A <p>If the data is sent and received as expected, the test is successful and Pass displays. If the data is not sent or received, the test is unsuccessful and displays Fail</p> <p>NOTE: For more information, see Section 8.8.3 on page 91.</p>																							
LightLvl (Light Level)	Displays raw data received from the light sensor.																							
Display	Tests display with user selected color (None, Red, Green, Blue, White). Press any key will return to test menu.																							

Table 5-16. Test Menu Parameters

5.5 Time Menu

This section provides a flow chart and descriptions for the Time menu.



Figure 5-20. Set Time Menu

Parameter	Description
Time	Sets hour, minute and Meridian Indicator.

Table 5-17. Time Menu

5.6 Date Menu

This section provides a flow chart and descriptions for the Date menu.

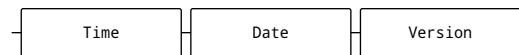


Figure 5-21. Date Menu

Parameter	Description
Date	Sets date, month and year

Table 5-18. Set Date Menu Parameters

5.7 Version

This section provides a flow chart and descriptions for the Version menu.

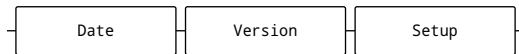


Figure 5-22. Version Date Menu

Parameter	Description
Software Version	Displays installed software version

Table 5-19. Version Menu Parameters

6.0 Revolution

The Revolution utility provides a suite of functions used to support configuration, calibration, customization and backup of the LaserLight3 software. Calibration values and scale configuration can both be saved and restored to the LaserLight3 using Revolution.



NOTE: For system requirements and software download visit the Revolution product page on: <https://www.ricelake.com/products/revolution-scale-software/>.

6.1 Connecting to LaserLight3

Connect the PC serial port to a LaserLight3 comm port, then click **Connect** in the toolbar. Revolution attempts to establish communications to the LaserLight3. If communication settings need to be adjusted, select **Options...** from the Tools menu in Revolution.

Downloading to the LaserLight3

The **Send Configuration to Device** function in the Revolution Communications menu allows a Revolution configuration file (with or without scale calibration data) or ticket formats to be sent/downloaded to a connected LaserLight3 in *Setup* mode.

The **Send Section to Device** function in the Communications menu allows the download of only the currently displayed object, such as a scale configuration.

Because less data is transferred using the **Send Section to Device**, it is typically faster than a full configuration download, but there is an increased possibility the download fails due to dependencies on other objects. If the download fails, try performing a complete download using the **Send Configuration to Device** function.

Uploading Configuration to Revolution

The **Get Configuration from Device** function in the Revolution Communications menu allows the existing configuration of a connected LaserLight3 to be saved to a file on the PC. Once saved, the configuration file provides a backup which can be quickly restored to the LaserLight3 if needed. Alternatively, the file can be edited within Revolution and sent back to the LaserLight3.

6.2 Saving and Transferring Data



NOTE: Revolution has a module to save and transfer data. It is the preferred method over using ProComm or similar.

6.2.1 Saving LaserLight3 Data to a PC

Configuration data can be saved to a computer connected to the selected port. The PC must be running a communications program such as PROCOMMPLUS®.

When configuring the LaserLight3, ensure the values set for the baud and bits parameters on the serial menu match the baud rate, bits and parity settings configured for the serial port on the PC.

To save all configuration data, first put the communications program into data capture mode, then place the LaserLight3 in *Setup* mode and send the DUMPALL command to the LaserLight3. The LaserLight3 responds by sending all configuration parameters to the PC as ASCII-formatted text.


6.2.2 Downloading Configuration Data from PC to LaserLight3

Configuration data saved on a PC or disc can be downloaded from the PC to an LaserLight3. This procedure is useful when a number of LaserLight3s with similar configurations are set up or when an LaserLight3 is replaced.

To download configuration data, connect the PC to the selected port as described in [Section 6.2.1](#). Place LaserLight3 in *Setup* mode and use the PC communications software to send the saved configuration data to the LaserLight3.

6.3 Updating Firmware

Revolution is used to update the firmware of the LaserLight3.

 **NOTE:** Updating the firmware defaults the configuration settings.

To initiate a firmware update:

1. Check current LaserLight3 firmware version ([Section 3.4.5 on page 33](#)).
2. Navigate to <https://www.ricelake.com/firmware> and determine if newer firmware exists.
 - If no new firmware version exists, end procedure
 - If newer firmware version exists, continue procedure
3. Download latest LaserLight3 firmware.
4. Connect computer running Revolution to the CPU board's Micro USB port (J7) with a micro USB cable (up to 10 feet long).
5. In Revolution, open the LaserLight3 module. The LaserLight3 Information page displays.
6. Select **Update Firmware** and follow steps on-screen.

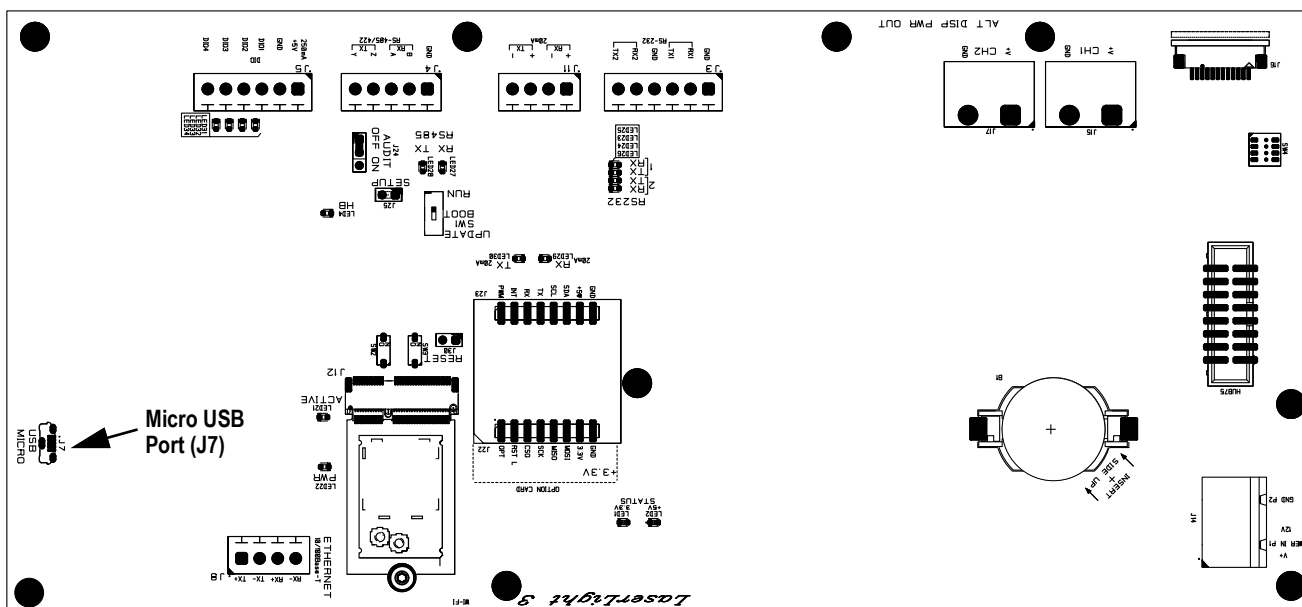


Table 6-1. CPU Board SW1 Switch and Micro USB Port

7.0 EDP Commands

The LaserLight3 indicator can be controlled by a personal computer connected to one of the indicator communication ports. Control is provided by a set of commands which can simulate front panel key press functions, return and change setup parameters, and perform reporting functions. The commands provide the capability to print configuration data or to save data to an attached personal computer. This section describes the EDP command set and procedures for saving and transferring data using the communication ports. The EDP command set is divided into several groups.

When the indicator processes a command, it either responds with a value (for reporting commands, or when querying parameter settings), or with the message **OK**. The **OK** response verifies the command was received and has been executed. If the command is unrecognized, the indicator responds with **?? invalid command**. If the command cannot be executed in the current mode, the indicator responds with **?? invalid mode**. If the command is recognized, but the value is out of range or an invalid type, the indicator responds with **??** followed by the type and the range.

7.1 Key Press Commands

Key press serial commands simulate pressing keys on the front panel of the indicator. These commands can be used in both setup and *Weigh* mode. Several of the commands serve as pseudo keys, providing functions which are not represented by a key on the front panel.

For example, to enter a 15 lb tare weight using serial commands:

1. Type **K1** and press **Enter** (or **Return**).
2. Type **K5** and press **Enter**.
3. Type **KTARE** and press **Enter**.

Command	Function
KLEFT	In <i>Setup</i> mode, this command moves Left in the menu
KRIGHT	In <i>Setup</i> mode, this command moves Right in the menu
KUP	In <i>Setup</i> mode, this command moves Up in the menu
KDOWN	In <i>Setup</i> mode, this command moves Down in the menu
KEXIT	In <i>Setup</i> mode, this command exits to <i>Weigh</i> mode
KSAVE	In <i>Setup</i> mode, this command saves the current configuration
KSAVEEXIT	In <i>Setup</i> mode, this command saves the current configuration and exits to <i>Weigh</i> mode
KTIME	Displays the Set System Time screen
KDATE	Displays the Set System Date screen
KTIMEDATE	Displays the Set System Time screen
KENTER	This command acts like pressing the Enter key
KMENU	This command acts like pressing the Menu key
KDOT	This command acts like pressing the decimal point (.)
Kn	This command acts like pressing numbers 0 (zero) through 9
KLOCK=x	In <i>Weigh</i> mode, this command locks specified front panel key; x = KPRINT, KUNITS, KTARE, KGROSSNET, KZERO, (example: to lock the Zero key, enter KLOCK=KZERO)
KUNLOCK=x	In <i>Weigh</i> mode, this command unlocks specified front panel key; x = KPRINT, KUNITS, KTARE, KGROSSNET, KZERO, (example: to unlock the Print key, enter KUNLOCK=KPRINT)
TEST.KEYPAD	Allows testing of the keys on the keypad. To Test keys: <ul style="list-style-type: none"> • Input TEST.KEYPAD=ON to enter test mode • Push keys on keypad • Input TEST.KEYPAD=OFF to exit test mode <p>NOTE: The LaserLight3 must be setup mode to use this function.</p>

Table 7-1. Key Press Commands

7.2 Key Press String Transmission Commands

Sends up to a 20 alphanumeric character string to host indicator through the REMOTEIN port as if the correlating face button is pressed (Gross/Net, Print, Tare, Units and Zero).

Command	Function
REMOTEKEY.GROSSNET	0 to 20 alphanumeric characters, REMOTEKEY.GROSSNET= KGROSSNET (Default value)
REMOTEKEY.PRINT	0 to 20 alphanumeric characters, REMOTEKEY.PRINT= KPRINT (Default value)
REMOTEKEY.TARE	0 to 20 alphanumeric characters, REMOTEKEY.TARE= KTARE (Default value)
REMOTEKEY.UNITS	0 to 20 alphanumeric characters, REMOTEKEY.UNITS= KUNITS (Default value)
REMOTEKEY.ZERO	0 to 20 alphanumeric characters, REMOTEKEY.ZERO= KZERO (Default value)

Table 7-2. Key Press String Transmission Commands

7.3 Reporting Commands

Reporting commands send specific information to the communications port. The commands listed in [Table 7-3](#) can be used in either Setup mode, Weigh mode or Remote Display mode.

Command	Function
DUMPALL	Returns a list of all parameter values
DUMPAUDIT	Returns the Audit Trail information
KDUMPAUDIT	Returns the Audit Trail information on the same port which the EDP command was sent
AUDIT.LRVERSION	Returns the legally relevant firmware version
AUDIT.CONFIG	Returns the number of times configuration has changed
AUDITJUMPER	Returns the position of the audit jumper: OK (if the audit jumper is ON) or ?? (if the audit jumper is OFF)
VERSION	Returns the installed firmware version
BUILD	Returns the firmware version and build number
HARDWARE	Returns the option card installed
HWSUPPORT	Returns the CPU board part number
RTCBATTERYSTATUS	Returns the status of the real time clock battery: GOOD or BAD
TEST.TEMPSSENSOR	Enter command to view CPU board temperature in Celsius
REMOTE.FORMAT	Returns a string representing the learned format when in Remote Display mode. For example, RLWS for Rice Lake Weighing Systems format.

Table 7-3. Reporting Commands

7.4 Reset Configuration Command

The following command can be used to reset the configuration parameters of the LaserLight3.

Command	Function
RESETCONFIGURATION	Restores all configuration parameters to default values (<i>Setup</i> mode only)

Table 7-4. Reset Configuration Command



NOTE: All scale calibration settings are lost when the **RESETCONFIGURATION** command is run.

7.5 LaserLight3 Commands

The following commands can be used to configure LaserLight3 parameters.

7.5.1 Learn or Manual Mode commands

Command	Description	Values
MANUALMODE.VALIDATE	Used to validate Manual Mode configuration when configured through EDP commands.	No parameters, action only.
MANUALMODE	Used to enable Manual Mode.	On, Off (default)
MANUAL.ANCHOR	The beginning or end character in a stream, used to determine boundaries of incoming frame.	0 – 32 (decimal); <STX> (default), <CR> , <LF> , or <ETX> NOTE: For more abbreviations, see Section 9.3 on page 94.
MANUAL.GROSSCHAR	The first character representing Gross Mode	0-Z characters up to 1 character, G (default)
LEARN.HOLDWT	Holds last weight on the display when there is an interruption in communications	On, Off (default)
MANUAL.MODEEND	The index of the last character representing Mode	0 – 100; 0 (default)
MANUAL.MODESTART	The index of the first character representing Mode	0 – 100; 0 (default)
MANUAL.NETCHAR	The first character representing Net Mode	0-Z characters up to 1 character, N (default)
MANUAL.POLSTART	The index of the first character representing Polarity	0 – 100; 0 (default)
MANUAL.POLEND	The index of the last character representing Polarity	0 – 100; 0 (default)
MANUAL.STATUSEND	The index of the last character representing Status	0 – 100; 0 (default)
MANUAL.STATUSSTART	The index of the first character representing Status	0 – 100; 0 (default)
MANUAL.UNITEND	The index of the last character representing Unit	0 – 100; 0 (default)
MANUAL.UNITSTART	The index of the first character representing Unit	0 – 100; 0 (default)
MANUAL.WEIGHTEND	The index of the last character representing Weight	0 – 100; 0 (default)
MANUAL.WEIGHTSTART	The index of the first character representing Weight	0 – 100; 0 (default)
MODEDEF.GROSS	Expected Gross character in the incoming stream.	A – Z up to 8 characters; G (default)
MODEDEF.NET	Expected Net character in the incoming stream.	A – Z up to 8 characters; N (default)
POLARITYDEF.POSITIVE	Expected character(s) representing positive Polarity	A – Z up to 8 characters; <space> (default)
POLARITYDEF.NEGATIVE	Expected character(s) representing negative Polarity	A – Z up to 8 characters; - (default)
STATUSDEF.INVALID	Expected character(s) representing Invalid status	A – Z up to 8 characters; I (default)
STATUSDEF.MOTION	Expected character(s) representing Motion status	A – Z up to 8 characters; M (default)
STATUSDEF.OVERLOAD	Expected character(s) representing Overload status	A – Z up to 8 characters; O (default)
STATUSDEF.UNDERLOAD	Expected character(s) representing Underload status	A – Z up to 8 characters; U (default)
STATUSDEF.COZ	Expected character(s) representing Center of Zero status	A – Z up to 8 characters; Z (default)
STATUSDEF.OK	Expected character(s) representing OK status	A – Z up to 8 characters; <Space> (default)
UNITDEF.G	Expected Gram unit character(s) in the incoming stream.	A – Z up to 8 characters; G (default)
UNITDEF.KG	Expected Kilogram unit character(s) in the incoming stream.	A – Z up to 8 characters; K (default)
UNITDEF.LB	Expected Pound unit character(s) in the incoming stream.	A – Z up to 8 characters; L (default)
UNITDEF.OZ	Expected Ounce unit character(s) in the incoming stream.	A – Z up to 8 characters; O (default)
UNITDEF.T	Expected Metric Ton unit character(s) in the incoming stream.	A – Z up to 8 characters; T (default)
UNITDEF.TN	Expected Ton unit character(s) in the incoming stream.	A – Z up to 8 characters; t (default)

Table 7-5. LaserLight3 EDP Commands

7.5.2 Additional LaserLight3 commands

Command	Description	Values
ADDRESS	Command address of LaserLight3	0-31; 0 (default)
BRIGHT.DAY	Display brightness during the day	1-6; 4 (default)
BRIGHT.NIGHT	Display brightness during the night	1-6; 4 (default)
BRIGHT.DAYLVL	Ambient brightness threshold at which the display changes from night to day and vice versa	0-10; 4 (default)
BRIGHT.INTENSITY	Display brightness from 1-6 (16.67-100%) of full brightness or as DayLVL	1, 2, 3, 4, 5, 6, DAYLVL; 6 (default)
DISPLAY.COLOR	Color of text on the display.	Red, Yellow, Green, Blue, Magenta, Cyan, White; Red (default)
DISPLAY.TYPE	Determine how the display will be situated	Legacy; Standard (default)
MIRROR	Select On to display LED readout in reverse; The menu is viewed normally	ON, Off (default), Toggle
MSGTIME	The amount of time (in seconds) a message stays on the remote display	0 - 65535 ; 5 (default)
SETANN.UNIT	Manually set Unit annunciator	OFF (default), Primary, Secondary
SETANN.MODE	Manually set Mode annunciator	OFF (default), Gross, Net
STARTUPDTEST	Turn Startup Display Test on or off	ON, OFF (default)
TIMEDATE	Display the Time and Date when at a zero weight	ON, OFF (default)

Table 7-6. Additional LaserLight3 Commands

7.6 Serial Port Setting Commands

The following commands can be used to configure serial port parameters.

Command	Description	Values
EDP.TRIGGER# <i>p</i>	Port serial input trigger function	CMD (default), STRIND, STRLFT, REMOTEIN, REMOTEOUT
EDP.BAUD# <i>p</i>	Port baud rate	1200, 2400, 4800, 9600 (default), 19200, 28800, 38400, 57600, 115200, AUTO
EDP.BITS# <i>p</i>	Port data bits/parity	8NONE (default), 8EVEN, 8ODD, 7EVEN, 7ODD
EDP.TERMIN# <i>p</i>	Port line termination character	CR/LF (default), CR
EDP.STOPBITS# <i>p</i>	Port stop bits	1 (default), 2
EDP.ECHO# <i>p</i>	Port echo	ON (default), OFF
EDP.RESPONSE# <i>p</i>	Port response	ON (default), OFF
EDP.EOLDLY# <i>p</i>	Port end-of-line delay	0-255 (0.1-second intervals), 0 (default)
EDP.ADDRESS# <i>p</i>	Port RS-485 address (port 3)	0-31, 0 (default)
EDP.DUPLEX# <i>p</i>	Port duplex setting for RS-485 ports (port 3)	FULL (default), HALF

For commands ending with #*p*, *p* is the port number (1-4)

Table 7-7. Serial Port Commands

7.6.1 Serial Ports

- Ports 1 and 2 are the two RS-232 ports (J3)
- Port 3 is the RS-485/422 port (J4)
- Port 4 is 20ma (J11)

7.7 Ethernet and USB Setting Commands

The following commands can be used to configure Ethernet and USB parameters.

Command	Description	Values
WIRED.MACID	Ethernet hardware MAC ID (read only)	xx:xx:xx:xx:xx:xx
WIRED.DHCP	Enable Ethernet DHCP	ON (default), OFF
WIRED.ENABLED	Enable wired Ethernet adapter	ON, OFF (default)
WIRED.IPADDR	Ethernet IP address	Valid IP xxx.xxx.xxx.xxx*, 0.0.0.0 (default)
WIRED.SUBNET	Ethernet subnet mask	Valid IP xxx.xxx.xxx.xxx*, 255.255.255.0 (default)
WIRED.GATEWAY	Ethernet gateway	Valid IP xxx.xxx.xxx.xxx*, 0.0.0.0 (default)
TCPC1.ECHO	TCP Client 1 echo	ON (default), OFF
TCPC1.EOLDLY	TCP Client 1 end-of-line delay	0–255 (in 0.1 sec intervals), 0 (default)
TCPC1.IPADDR	TCP Client 1 remote server IP	Valid IP xxx.xxx.xxx.xxx*, 0.0.0.0 (default)
TCPC1.LINETERM	TCP Client 1 line termination	CR/LF (default), CR
TCPC1.PORT	TCP Client 1 remote server port	1025–65535, 10001 (default)
TCPC1.RESPONSE	TCP Client 1 response	ON (default), OFF
TCPC1.TRIGGER	TCP Client 1 input trigger type	CMD (default), STRIND, STRLFT, REMOTEIN, REMOTEOUT
TCPC1.DISCTIME	TCP Client 1 disconnect time (in seconds)	0–60 (0 = do not disconnect), 0 (default)
TCPS.PORT	TCP Server port number	1025–65535, 10001 (default)
TCPS.HOSTNAME	TCP Server host name	Up to 30 alphanumeric characters, 0 (default)
TCPS.TRIGGER	TCP Server input trigger type	CMD (default), STRIND, STRLFT, REMOTEIN, REMOTEOUT
TCPS.ECHO	TCP Server echo	ON (default), OFF
TCPS.LINETERM	TCP Server line termination	CR/LF (default), CR
TCPS.RESPONSE	TCP Server response	ON (default), OFF
USB.TRIGGER	USB input trigger type	CMD (default), STRIND, STRLFT, REMOTEIN, REMOTEOUT
USB.LINETERM	USB line terminator	CR/LF (default), CR
USB.ECHO	USB echo	ON (default), OFF
USB.RESPONSE	USB response	ON (default), OFF
USB.EOLDLY	USB end of line delay	0–255, 0 (default)

* A valid IP consists of four numbers, in the range of 0 to 255, separated by a decimal point (127.0.0.1 and 192.165.0.230 are valid IP addresses)

Table 7-8. Ethernet TCP/IP and USB Commands

7.8 Wi-Fi Setting Commands

The following commands can be used to configure Wi-Fi parameters.

Command	Description	Values
WIFI.ENABLED	Enables the wireless module and sets Wi-Fi	OFF (default), ON
WIFI.TRIGGER	Wi-Fi input trigger type	CMD (default), STRIND, STRLFT, REMOTEIN, REMOTEOUT
WIFI.TERMIN	Wi-Fi line terminator	CR/LF (default), CR
WIFI.ECHO	Wi-Fi echo	ON (default), OFF
WIFI.RESPONSE	Wi-Fi response	ON (default), OFF
WIFI.EOLDLY	Wi-Fi end of line delay	0–255 (in 0.1 second intervals), 0 (default)
WIFI.MACID	Returns MAC address of the Wi-Fi radio (read only)	xx:xx:xx:xx:xx:xx

Table 7-9. Wi-Fi Commands

7.9 Program Commands

The following commands can be used to configure feature parameters.

Command	Description	Values
DATEFMT	Date format	MMDDYY (default), DDMMYY, YYMMDD, YYDDMM
DATESEP	Date separator	SLASH (default), DASH, SEMI, DOT
TIMEFMT	Time format	12HOUR (default), 24HOUR
TIMESEP	Time separator	COLON (default), COMMA, DOT
CONSNUM	Consecutive numbering	0–9999999, 0 (default)
CONSTUP	Consecutive number start-up value	0–9999999, 0 (default)
UID	ID of the LaserLight3	Up to 8 alphanumeric characters, 1 (default)
KYBDLK	Keyboard lock, disables keyboard except for the menu key	OFF (default), ON
ZERONLY	Disables keyboard except for the zero and menu keys	OFF (default), ON
CONTACT.COMPANY	Contact company name	Up to 30 alphanumeric characters
CONTACT.ADDR1-3	Contact company address	Up to 20 alphanumeric characters (for each line)
CONTACT.NAME1-3	Contact names	Up to 30 alphanumeric characters (for each line)
CONTACT.PHONE1-3	Contact phone numbers	Up to 20 alphanumeric characters (for each line)
CONTACT.EMAIL	Contact email address	Up to 40 alphanumeric characters
CONTACT.LASTCAL	Last calibration date	Date MMDDYYYY as an 8-digit number
CONTACT.NEXTCAL	Next calibration date	Date MMDDYYYY as an 8-digit number
KHOLDTIME	Key hold time (in tenths of a second); 20 equals 2 seconds	10–50, 20 (default)
KHOLDINTERVAL	Key hold time interval; the amount of time between increments during a key hold (in twentieths of a second); 2 equals a tenth of a second (10 increments per second during a key hold)	1–100, 2 (default)
LOCALE	Enable gravity compensation	OFF (default), ON, FACTOR
LAT.LOC	Origin latitude (to nearest degree) for gravity compensation	0–90, 45 (default)
ELEV.LOC	Origin elevation (in meters) for gravity compensation	-9999–9999, 345 (default)
DEST.LAT.LOC	Destination latitude (in degrees) for gravity compensation	0–90, 45 (default)
DEST.ELEV.LOC	Destination elevation (in meters) for gravity compensation	-9999–9999, 345 (default)
GRAV.LOC	Origin gravity factor (in m/s ²) for gravity compensation	9.00000–9.99999, 9.80665 (default)
DEST.GRAV.LOC	Destination gravity factor (in m/s ²) for gravity compensation	9.00000–9.99999, 9.80665 (default)
PERSISTENTTARE	Determines if a tare remains through a power cycle	OFF (default), ON

Table 7-10. Program Commands

7.10 Digital I/O Command

The following commands can be used to configure digital I/O parameters.

Command	Description	Values
DIO. <i>b#s</i>	Sets DIO type	OFF (default), OUTPUT, PRIM, PRINT, SEC, TARE, UNITS, ZERO, BATRUN, BATSTART, BATPAUSE, BATRESET, BATSTOP, CLEAR, CLRACC, CLRCN, CLRTAR, DSPACC, DSPTAR, GROSS, KBDLOC, NET, NT/GRS, INPUT
DIN#0	Returns a bit-weighted integer number (0-15) based on the state of the DIO pins; the command looks at the raw state of pins (input or output); if all are inactive, it returns 0; if all are active, it returns 15	-
DOFF. <i>b#0</i>	Disables digital output for bit entered	-
DON. <i>b#0</i>	Enables digital output bit entered	-
Valid bit values (<i>b</i>) are 1-4; For commands ending with <i>#s</i> , <i>s</i> is the slot assigned to the digital I/O (0); Slot 0 is onboard; For commands ending with <i>b#0</i> , bits must be configured as a digital output for command to function properly.		

Table 7-11. Digital I/O Commands

8.0 Maintenance

The maintenance information in this manual is designed to cover aspects of maintaining and troubleshooting the LaserLight3 indicator. Contact the local Rice Lake Weighing Systems dealer if a problem requires technical assistance.



NOTE: Have serial number available when calling for assistance.

8.1 Maintenance Checkpoints

The LaserLight3 must be checked frequently to determine when a calibration is required. It is recommended a zero calibration be checked every other day and a calibration checked every week for several months after installation. Observe the results and change the period between calibration checks, depending upon the accuracy desired.



NOTE: Establish a routine inspection procedure. Report changes in the LaserLight3 function to the individual or department responsible for the LaserLight3 performance.

8.2 Field Wiring

If a problem with the wiring is suspected, check the electrical portion of the LaserLight3.

- Check for proper connections between the components of the system
- Check wiring meets all specifications in the installation drawings
- Check all wiring and connections for continuity, shorts and grounds using an ohmmeter with the LaserLight3 off
- Check for loose connections, poor solder joints, shorted or broken wires and unspecified grounds in wiring
- Check all cable shields to ensure grounding is made at only the locations specified in the installation drawings

8.3 Troubleshooting Tips

Table 8-1 lists general troubleshooting tips for hardware and firmware error conditions.


Symptom	Possible Cause	Remedy
LaserLight3 does not power up	Bad power supply	Check power supply; Check presence of AC power – breaker tripped or unit unplugged; Power supply outputs low or no voltage – replace if bad
Battery-backed corrupt error message at startup	Bad CR2032 coin cell battery (on CPU board)	Perform configuration reset then check for low battery warning on display; If battery is 2.7V or less, replace battery (see Section 8.5 on page 83), perform another configuration reset, then reload files/configuration
Cannot enter Setup mode	Bad or missing shunt	Test shunt for continuity or replace shunt on jumper (J25)
Serial port not responding to a command	Configuration error	Ensure port INPUT parameter is set to CMD for command input
Does not display data from source	Source connection	Check source for cable connection and verify continuity of wiring

Table 8-1. Basic Troubleshooting

8.4 Removing Front Door

The LaserLight3 front door can be detached when service is required. Perform the following to remove the front door.

 **NOTE:** The following procedure involves disconnecting wiring, for more information about wiring see [Section 2.5 on page 14](#).

 **WARNING:** The LaserLight3 has no on/off switch. Before opening the unit, ensure the power cord is disconnected from the power outlet.

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

1. Unplug the power cord from the power outlet.
2. Open enclosure as described in [Section 2.4 on page 13](#).
3. Disconnect power wiring from CPU board on J14.
4. Remove green ground wire from front door closest mounted ferrites.
5. Disconnect wiring to external components from CPU board. For example, communication cables (J3, J11, J4 or J8), load cell cables (J1) and DIG I/O (J5).
6. (Optional) If installed, disconnect Wi-Fi antenna cable from Wi-Fi module.
7. While supporting front door from underneath, pull quick release pins by rings away from hinges.

 **NOTE:** If pins are difficult to remove, lift door slightly to relieve weight of front door from hinge.

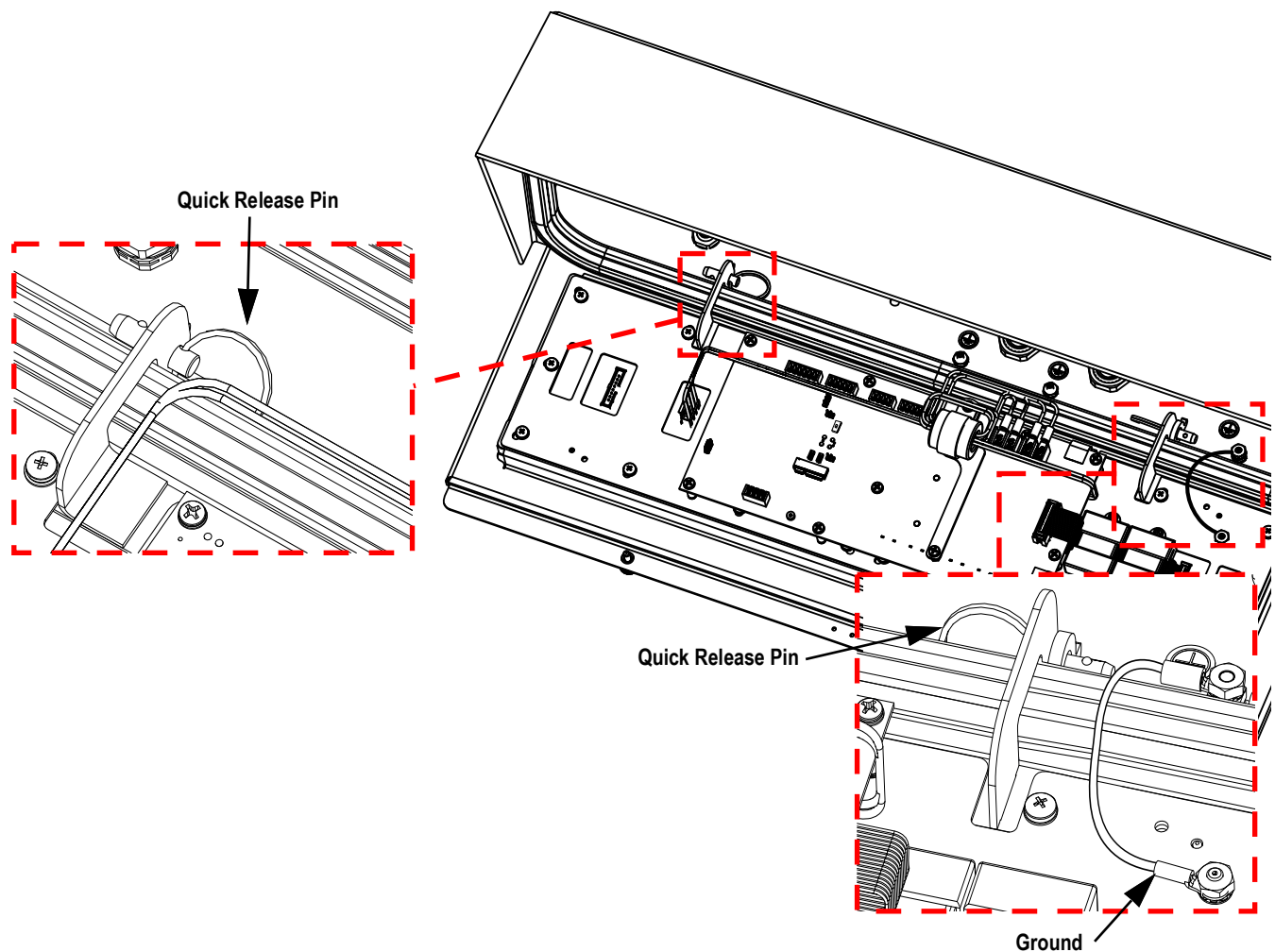


Figure 8-1. LaserLight3 Quick Release Pins

8. Position door approximately 30 degrees from vertical, then lift vertically to remove from enclosure.



NOTE: Positioning the door approximately 30 degrees from vertical, allows the door hinge to pass over the enclosure seal.

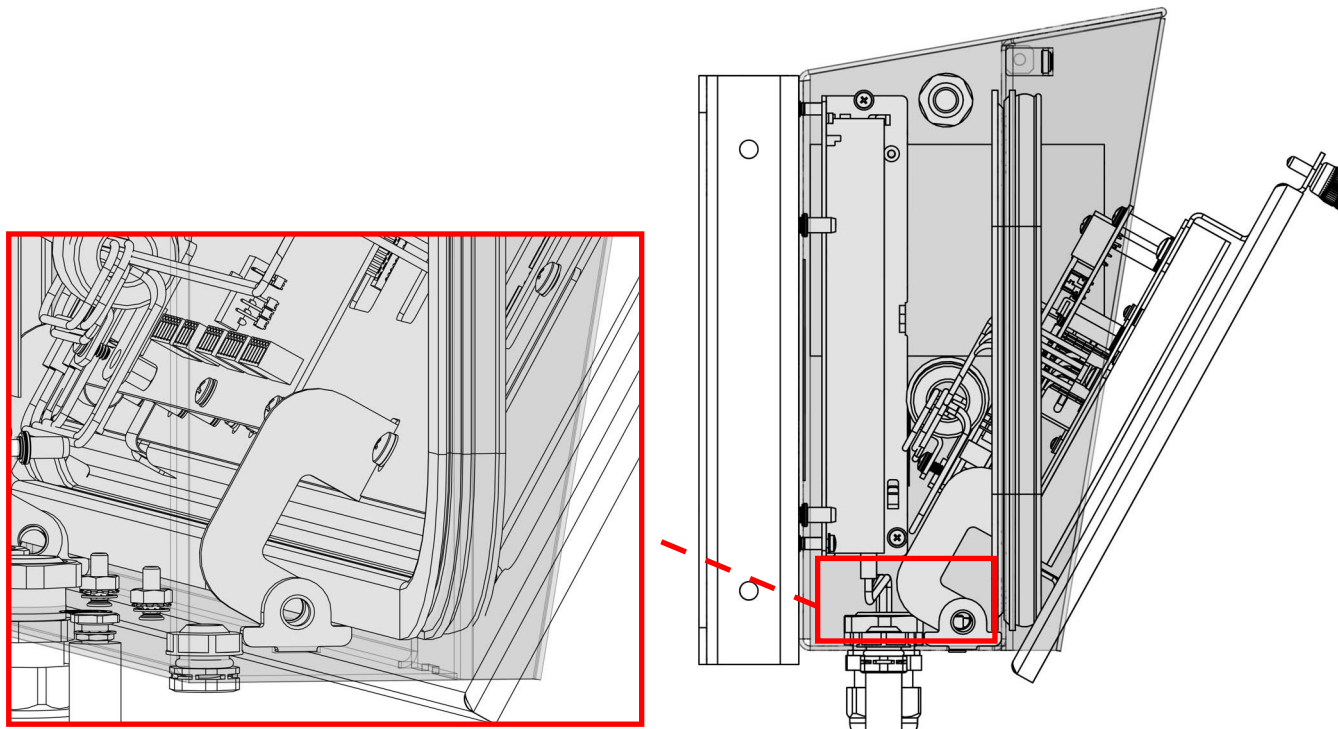


Figure 8-2. LaserLight3 Quick Release Pins

9. Place front door in ESD safe work area and perform required maintenance.
10. Reverse procedure to reinstall front door.

8.5 Battery Replacement

The battery life varies depending on use. It is recommended to replace the battery every three years, or sooner, if left powered off for extended periods of time to prevent data loss in the event of a power failure. Use the Revolution configuration utility ([Section 6.0 on page 72](#)) to store a copy of the LaserLight3 configuration on a PC before attempting battery replacement. The LaserLight3 configuration can be restored from the PC if data is lost.



NOTE: When LaserLight3 is opened, the CPU board is presented with the text oriented upside down. This section reflects the orientation of the CPU board when viewed in an open LaserLight3 enclosure.



WARNING: Risk of explosion if battery is replaced with an incorrect type. Dispose of used batteries according to federal, state and local regulations.



IMPORTANT: Use anti-static protection for grounding and to protect components from electrostatic discharge (ESD) when working inside the LaserLight3 enclosure. Procedures requiring work inside the LaserLight3 must be performed by qualified service personnel only.

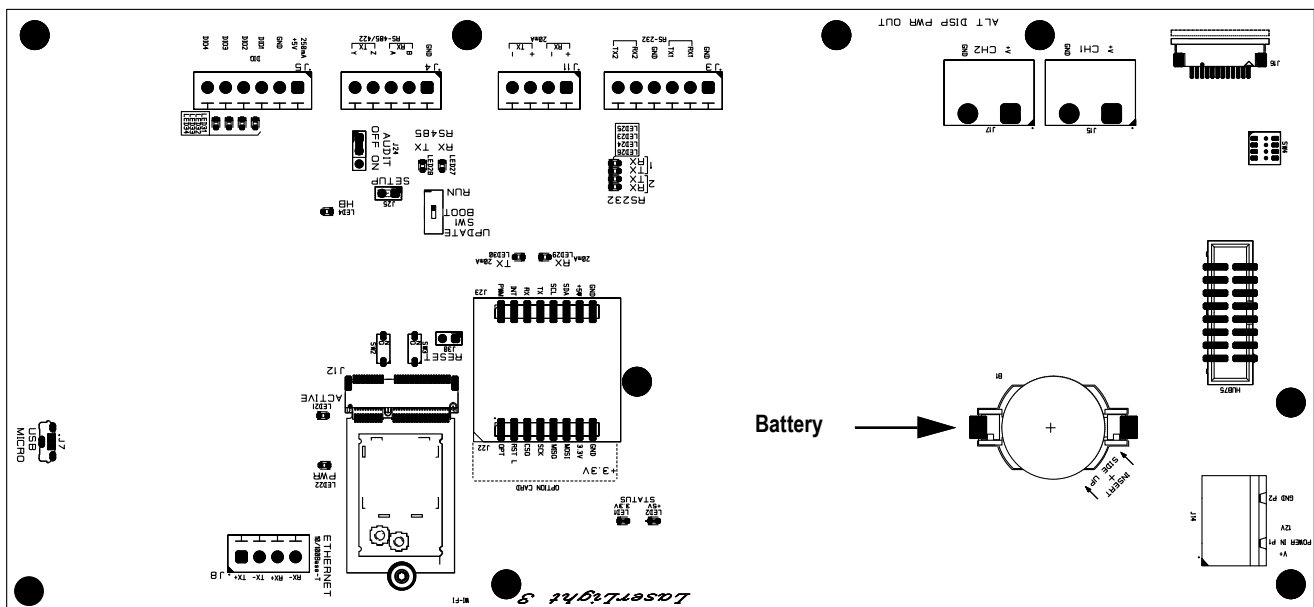


Figure 8-3. CPU Board Battery Location

Perform the following to replace the 3V lithium CR2032 battery (PN 71408):

1. Disconnect power to the indicator.
2. Open enclosure as described in [Section 2.4 on page 13](#).
3. Place the tip of a non-conductive flat head screw driver between negative contact and battery.
4. Twist screw driver to release battery from holder.
5. Press new replacement battery straight into the battery holder with the positive side up.

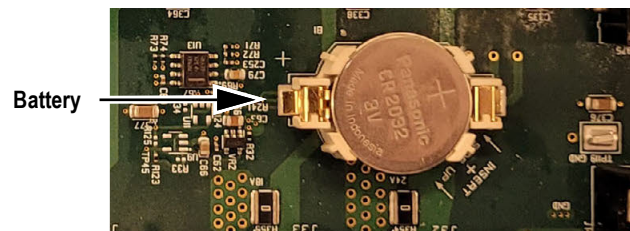


Figure 8-4. Battery Installed

6. Reset the time and date settings of the indicator (see [Section 3.4.1 on page 31](#) and [Section 3.4.2 on page 32](#)).

8.6 CPU Board Replacement



NOTE: CPU Board replacement should only be performed by a service technician.



IMPORTANT: Use anti-static protection for grounding and to protect components from electrostatic discharge (ESD) when working inside the LaserLight3 enclosure. Procedures requiring work inside the LaserLight3 must be performed by qualified service personnel only.

1. Disconnect power to LaserLight3.
2. Open enclosure as described in [Section 2.4 on page 13](#).
3. Label connections for re-installation to new CPU board.
4. Disconnect all cabling from CPU board.
5. Remove ferrite support mounting screws, washers and standoffs.
6. Set display ferrite support stand/display power cable to side.



NOTE: The following image displays a basic example of the CPU board installed in the LaserLight3. Depending on configuration, additional components and cabling may present.

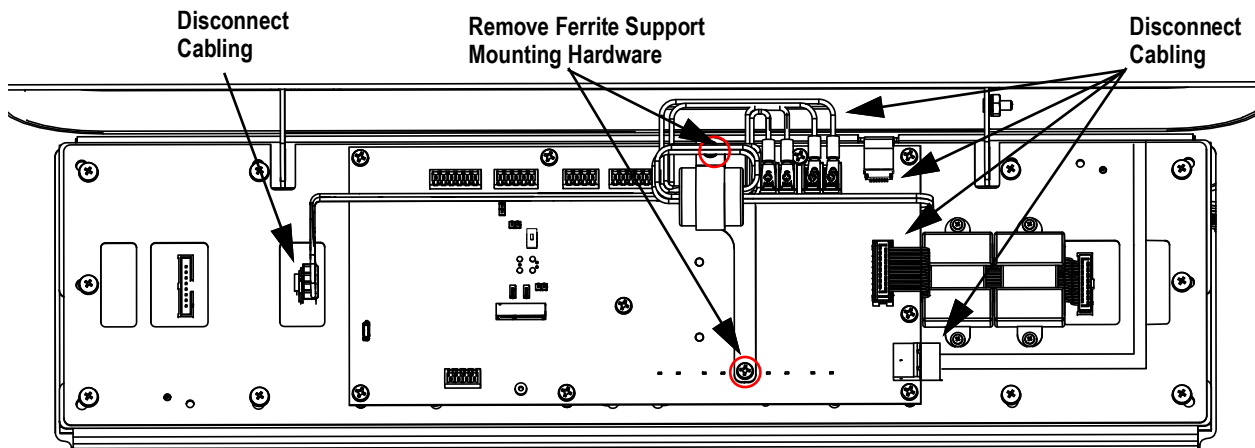


Figure 8-5. Disconnecting Components from CPU Board

7. Remove all CPU board mounting screws and washers.
8. Remove CPU board.

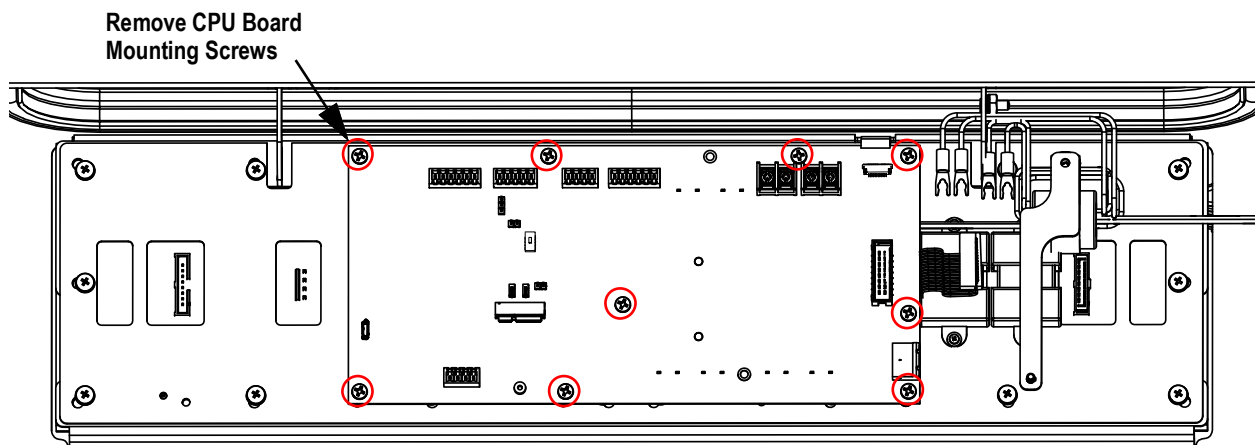


Figure 8-6. Removing CPU Board

- Ensure display power cable is connected to display power input (adjacent to large ribbon cable with ferrites), and then set to the side.

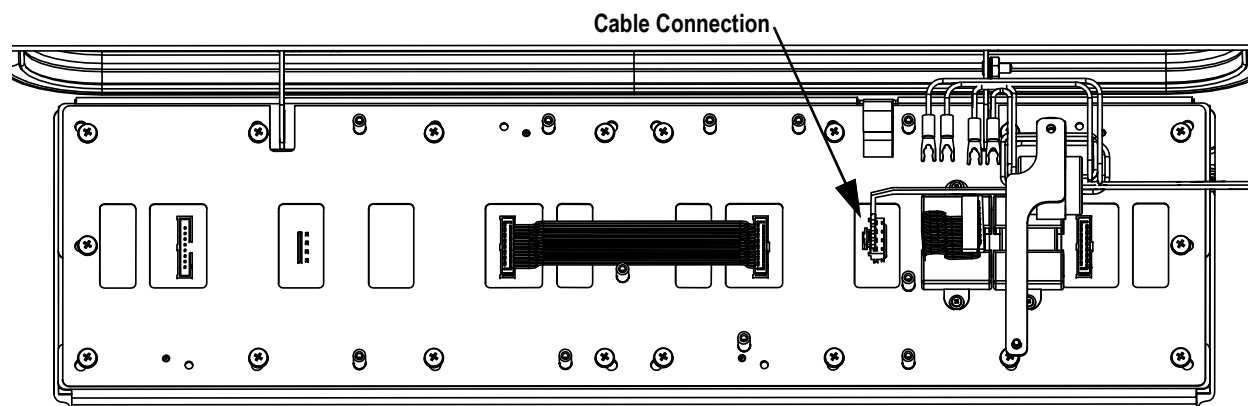


Figure 8-7. Display Power Cable Connection

- Position new replacement CPU board on standoffs in enclosure and secure with previously removed hardware.

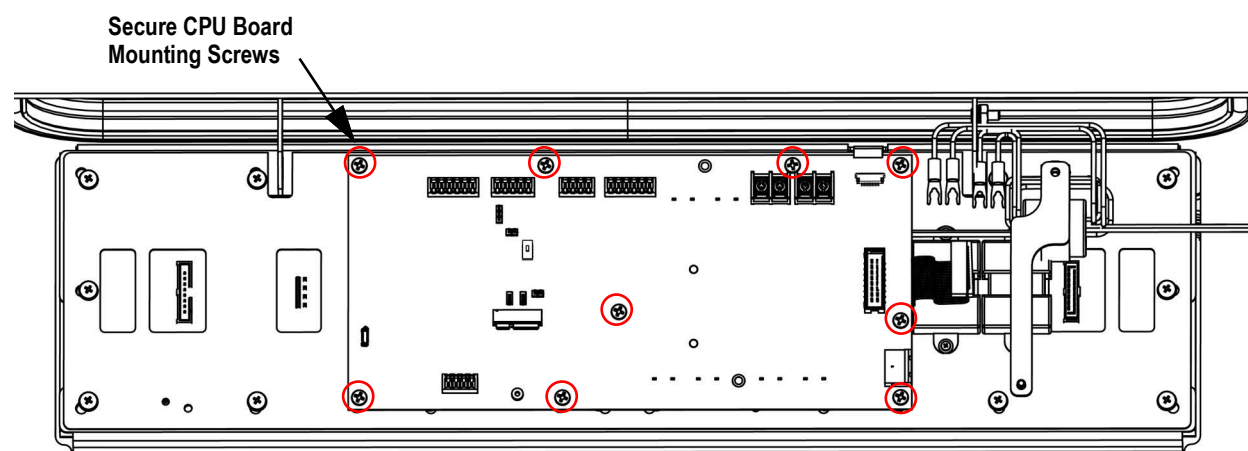


Figure 8-8. Attaching New CPU Board

- Reattach ferrite support stand to CPU board and standoffs with previously removed hardware.
- Reconnect cabling to CPU board. See [Section 2.7 on page 21](#) for details about board connectors.

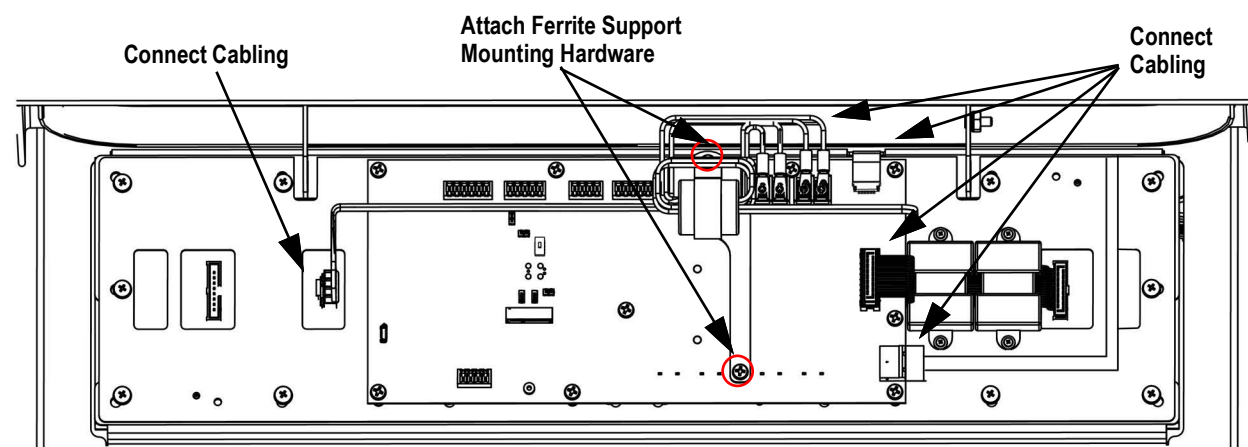


Figure 8-9. Connecting Components and Cables on CPU Board



IMPORTANT: Verify LaserLight3 connections are properly installed and perform complete function test before returning the LaserLight3 to service.

8.7 LED Display Replacement

Two LED display panels comprise the LaserLight3 display. Depending on the scenario, either one or both LED display panels may be replaced.



NOTE: CPU Board replacement should only be performed by a service technician.



IMPORTANT: Use anti-static protection for grounding and to protect components from electrostatic discharge (ESD) when working with LaserLight3 components.

1. Disconnect power to LaserLight3.
2. Open LaserLight3 as described in [Section 2.4 on page 13](#).
3. Remove front door as described in [Section 8.4 on page 81](#).
4. Remove eight heat shield Phillips screws and washers on ends of heat shield.

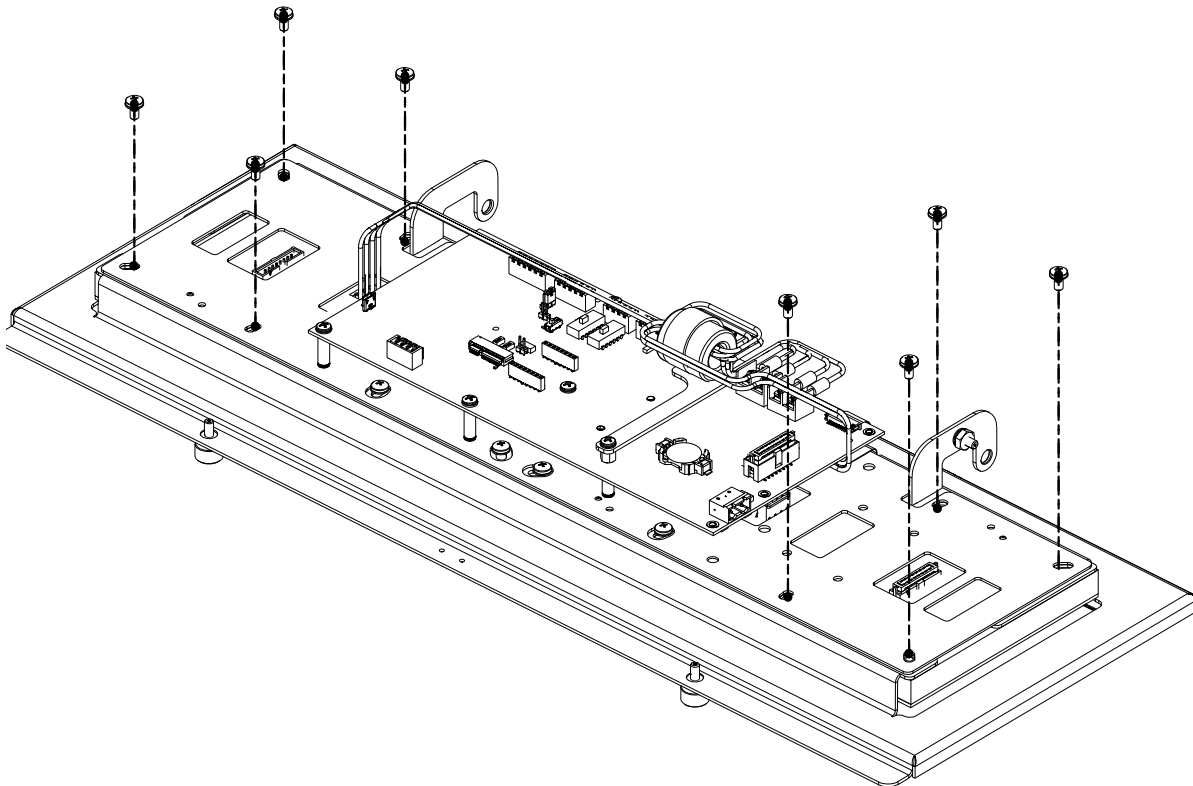


Figure 8-10. Heat shield and CPU Board Removal

5. Lift the heat shield slightly and then unplug 4-pin cable connected to LED display (approximately under CPU board HUB 75 connector).

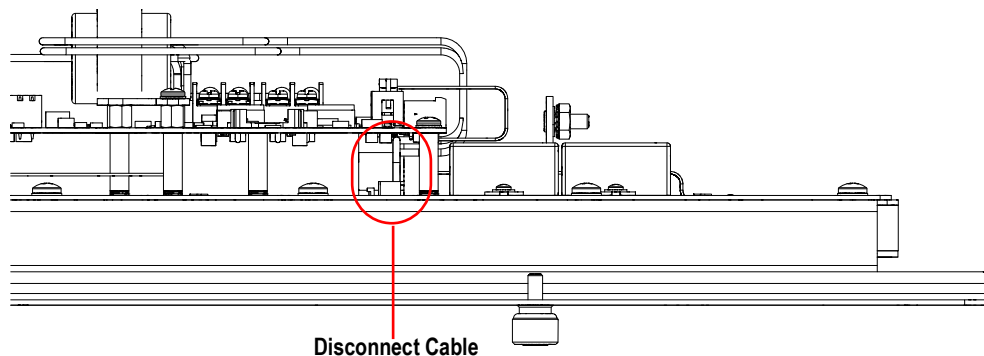


Figure 8-11. Disconnecting Cable Under Heat Shield

- Lift heat shield and PCB away from door frame and set aside.

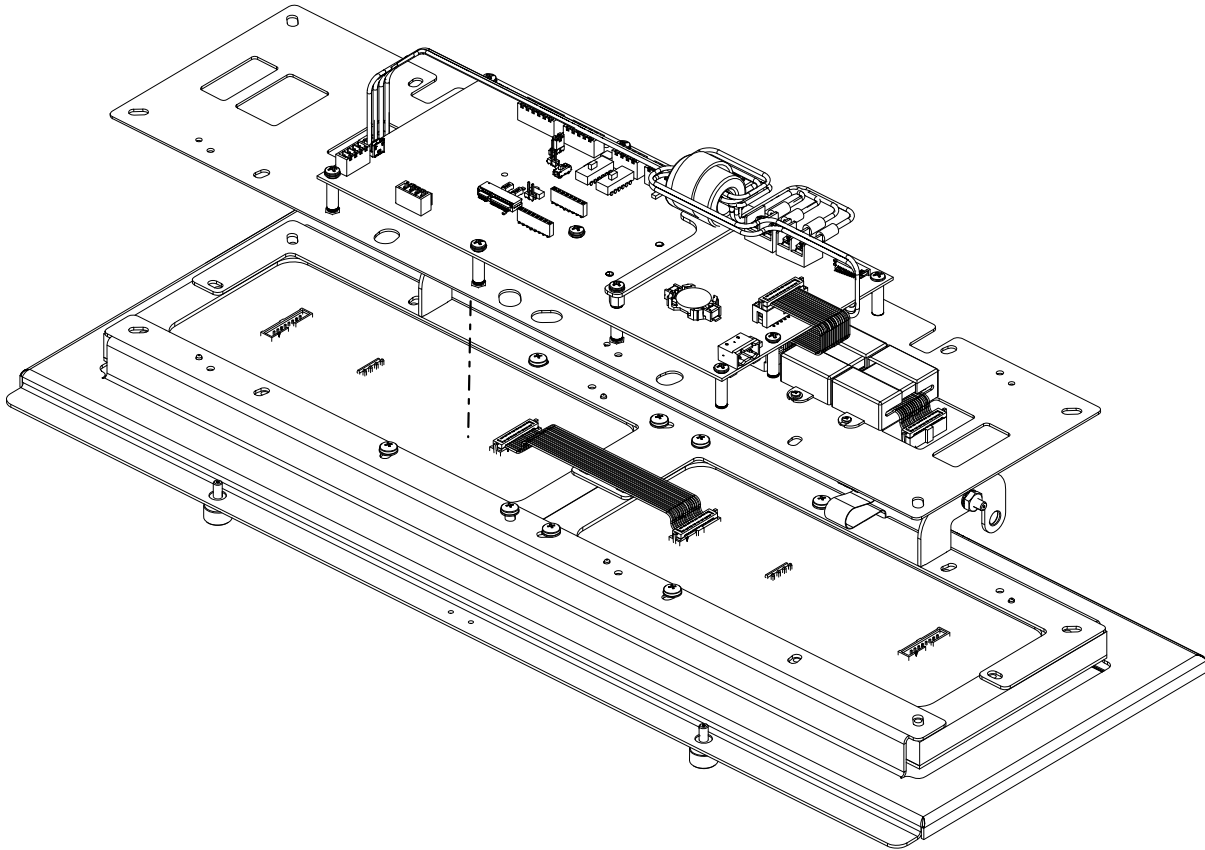


Figure 8-12. Removing Heat Shield from Door Frame

- Remove ribbon cable attached to the two LED displays.



NOTE: The ribbon cable has a locking feature that must be carefully unlocked to allow removal.

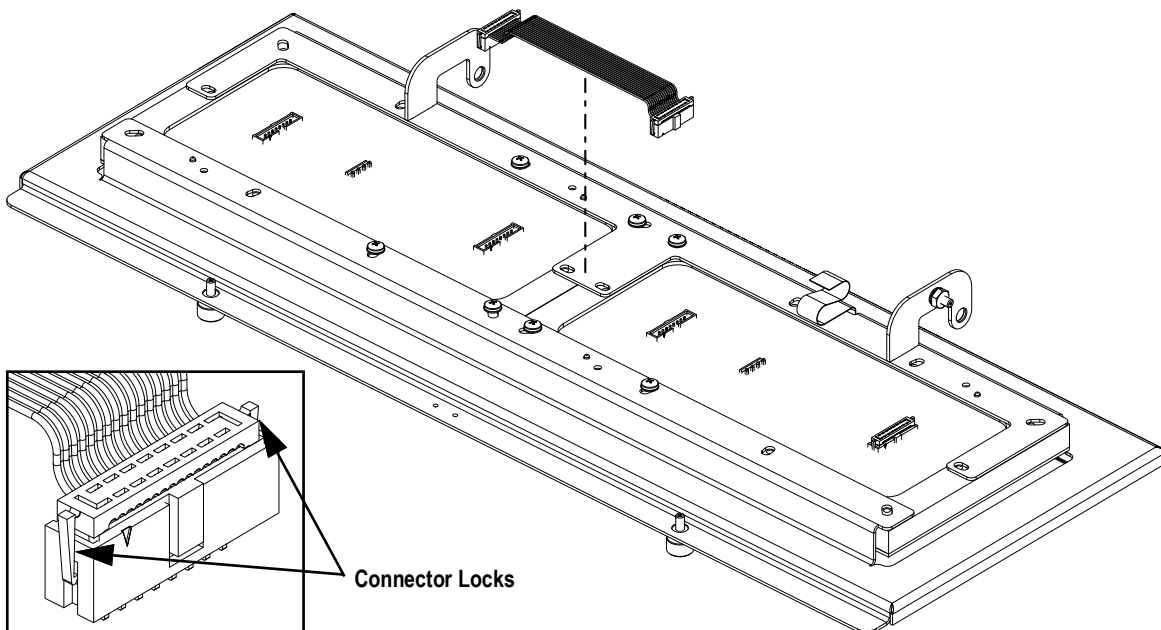


Figure 8-13. Remove Ribbon Cable from LED Displays

8. Remove four Philips mounting screws and washers (previously underneath heat shield) for only the LED display that will be replaced.

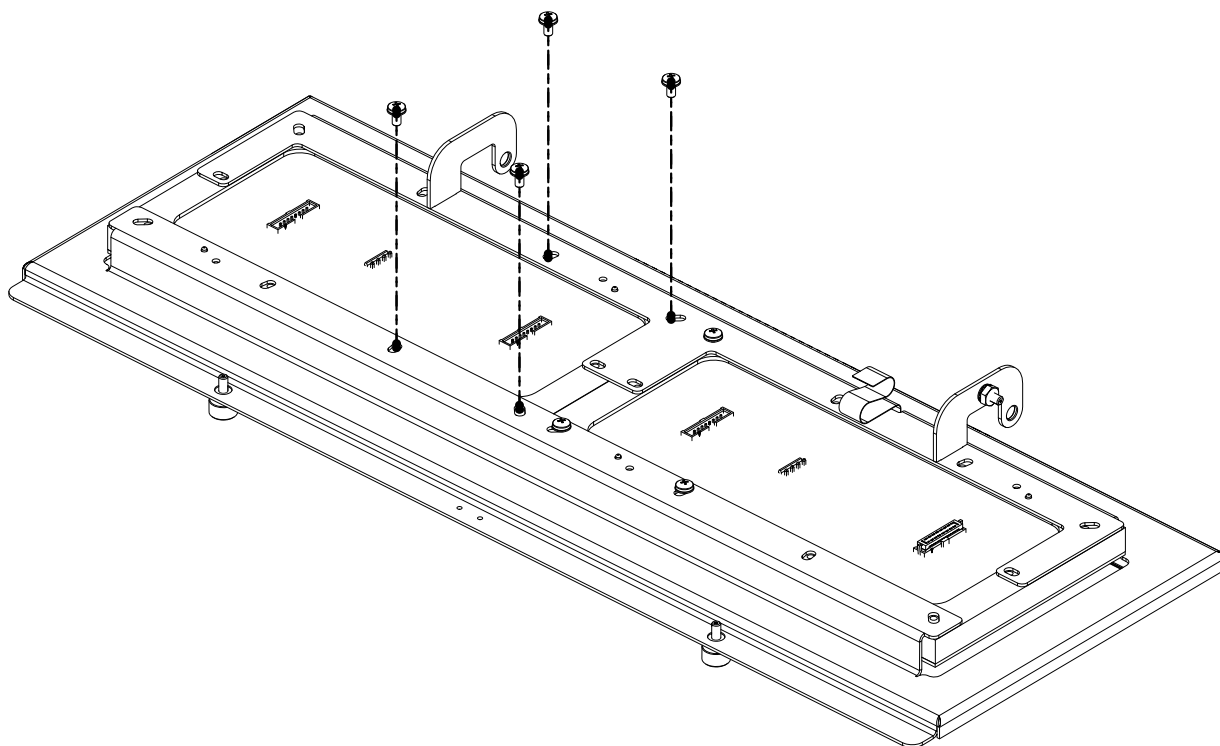


Figure 8-14. Remove Mounting Hardware from LED Displays

9. Note orientation of connectors on LED display.
10. Press the two locating pins down, then slide out LED display from door frame.

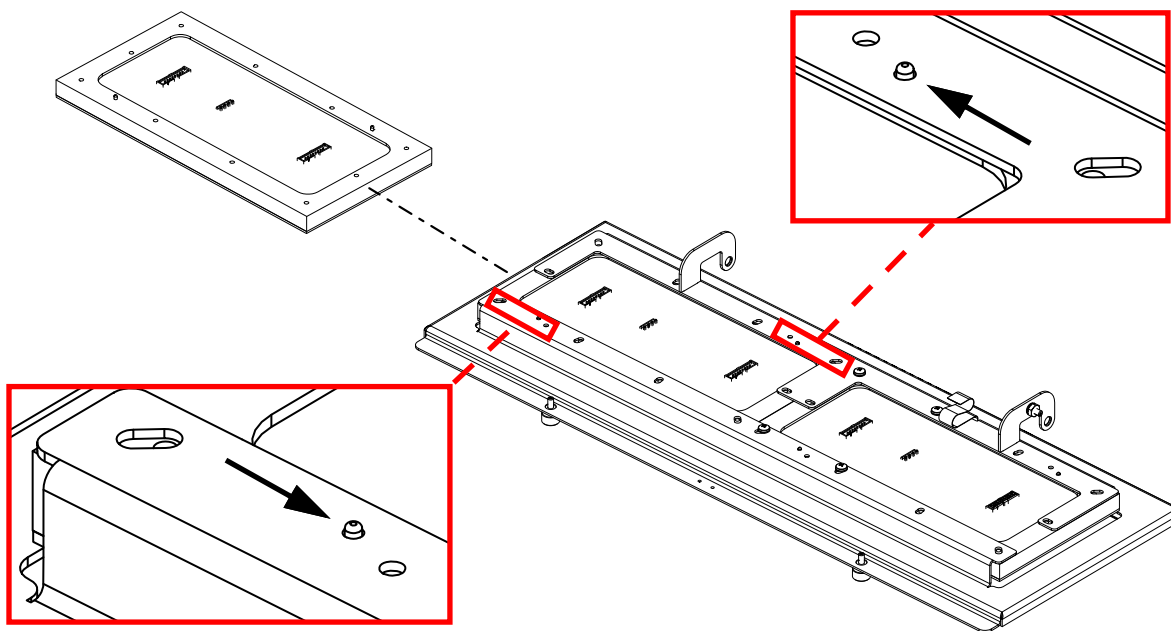


Figure 8-15. Slide Out LED Display from Door Frame

11. Slide new LED display into door frame while maintaining same connector orientation as previous LED display.



NOTE: *The display provides orientation arrows. Ensure they point toward the captive screws.*

12. Ensure two locating pins engage in door frame.
13. Attach LED display with four Philips mounting screws and washers (removed in [Step 8](#)).
14. If needed, repeat [Step 8](#) through [Step 13](#) to replace remaining LED display.
15. Reattach and lock ribbon cable to the two LED displays (removed in [Step 7](#)).
16. Connect 4-pin cable to LED display that is covered by the heat shield (removed in [Step 6](#)).
17. Reattach heat shield with CPU board to door frame with eight Philips screws and washers (removed in [Step 4](#)).
18. Reconnect CPU board cabling.
19. Reattach front door as described in [Section 8.4 on page 81](#).

8.8 Test Functions

8.8.1 Digital Output Test

The Digital Output Test displays if a digital output is operational.

Figure 8-17 displays a menu path to the Digout parameter.

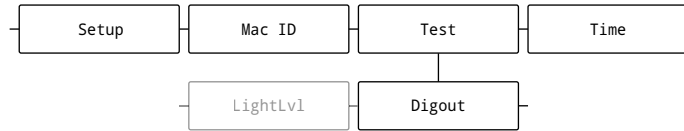


Figure 8-16. Digout parameter Menu Path

1. Navigate to **Setup ▶ Test ▼ Digout**.
2. Press . Bit 1 displays.
3. Press or repeatedly until the desired Bit is selected.
4. Press . The bit activates for three seconds, displays OK and then becomes inactive.



NOTE: Digital output bits must be configured as an output to be tested. “Bit not configured” displays if the test is activated for a digital output bit that is not assigned. See [Section 2.6.5 on page 18](#) for pin assignments and [Section 5.2.5 on page 66](#) for digital I/O configuration description.

5. Press to exit the menu.

8.8.2 Digital Input Test

Perform the following to test Digital Inputs:

The Digital Input Test Displays a summed decimal representation of all active Digital I/O (J5 on the CPU board) input signals.

Figure 8-17 displays a menu path to the Digin parameter.

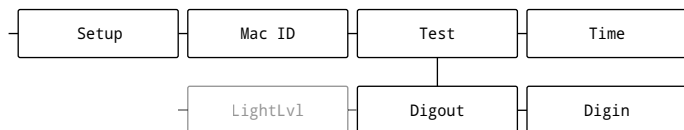


Figure 8-17. Digin parameter Menu Path

1. Navigate to **Setup ▶ Test ▼ Digout ▶ ... ▶ Digin**.
2. Press . The summed values read from the digital input bits displays.



NOTE: The summed data range is 0 - 15. Each input bit provides a specific value:

Connector	Pin	Signal	Input Bit
J5	1	+5 VDC, 250 mA max	-
	2	GND	-
	3	DIO1	1
	4	DIO2	2
	5	DIO3	4
	6	DIO4	8

Table 8-2. Digin Bit Range

3. Press to exit the menu.

8.8.3 Loop-back Test

This test provides a loop-back self test for use in diagnosing CPU board serial communications errors. The loop-back self test checks the function of the LaserLight3 by connecting a jumper wire to specific serial port pins and sending and receiving data to itself. If the data is sent and received as expected, the test is successful and Pass displays. If the data is not sent or received, the test is unsuccessful and displays Fail. There are three tests depend on serial port, see [Table 8-3](#) for tests and required jumper wire connections.

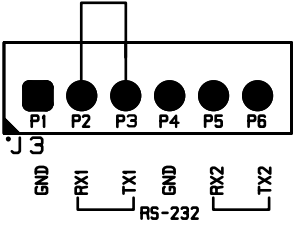
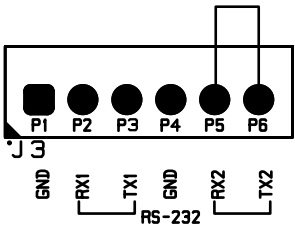
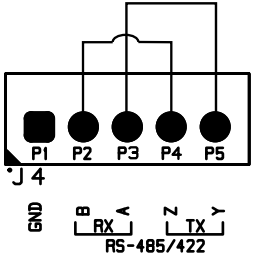
Communication Test	RS-232 1	RS-232 2	RS-485
Wire Connections	RS-232 1 TX 1 (P3) → RX 1 (P2)	RS-232 2 TX 2 (P6) → RX 2 (P5)	RS-485 TX Z (P4) → RX B (P2) RS-485 TX Y (P5) → RX A (P3)
Wire Diagram			

Table 8-3. Loop-Back Test Jumper Wire Connections

Figure 8-18 displays a menu path to the LoopBack parameter.

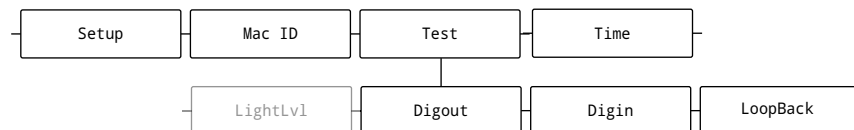






Figure 8-18. LoopBack parameter Menu Path

1. Unplug the power cord from the power outlet.
2. Open enclosure as described in [Section 2.4 on page 13](#).
3. Install a jumper wire according to serial pin assignment ([Table 8-3](#)).
4. Close enclosure as described in [Section 2.4 on page 13](#).
5. Plug in the power cord to the power outlet.
6. Navigate to **Setup** ► **Test** ▼ **Digout** ► ... ► **LoopBack**.
7. Press . RS-232 1 displays.
8. Press  or  repeatedly until the desired test is selected.
9. Press . The Test begins.
10. One of the following occurs:
 - If communication is unsuccessful, **Fail** displays.
 - If communication is successful, **OK** displays.

9.0 Appendix

9.1 Error Messages

The LaserLight3 provides a number of front panel error messages to assist in problem diagnosis. [Table 9-1](#) lists these messages and their meanings.

Error Message	Description
-----	Overflow error – Weight value too large to be displayed
AAAAAAAA	Gross > overload limit – Gross value exceeds overload limit; Check configuration or signal input level; Overload can be caused by input signal > 45 mV or common mode voltage > 950 mV
VVVVVVV	Gross < underload limit – Gross value exceeds underload limit
Battery low	Displays every 30-seconds when CR2032 battery is 2.7V or less
Waiting for 30 seconds of standstill	Displays when power up delay is active
Not allowed in motion	Displays when attempting to perform a function while weight is in motion, if in motion is not allowed for that function
Tare in motion not allowed	Displays when attempting to perform a tare while weight is in motion, if in-motion tares are not allowed
Tare not allowed	Displays when attempting to perform a tare, if a tare is not allowed
Negative tare not allowed	Displays when attempting to perform a negative tare, if a negative tare is not allowed
Keyed tare not allowed	Displays when attempting to perform a keyed tare, if a keyed tare is not allowed
Tare exceeding capacity not allowed	Displays when attempting to perform a tare larger than capacity, if it is not allowed
Multiple tares not allowed	Displays when attempting to perform a tare if a tare is already in the system, if tare is not configured to replace or remove
Must be in first interval to tare	Interval is currently within the second or third interval; Perform tare while in the first interval only
Keyed tare value must be in first interval	Keyed tare value is within the second or third interval; Keyed tare value must be within the first interval only
Initial zero failed	Displays when an attempt to perform an initial zero fails, only possible at startup
Please wait	Displays when calibrating
Alarm	Displays when a configured setpoint's ALARM action occurs
NODATA	Display when a data stream is not currently received by the LaserLight3. Ensure Indicator is transmitting a data stream to LaserLight3, LaserLight3 is set to RmtIn (Remote In), and wiring is correct/undamaged.

Table 9-1. LaserLight3 Error Messages

9.2 Parameter Abbreviation List

Table 9-2 lists parameter abbreviations and definitions from the menu (Section 5.0).

Abbreviation	Definition	Abbreviation	Definition	Abbreviation	Definition
Accum	Accumulator	HttpSvr	Http Server	PrtAccum	Print Accumulator
AccumFmt	Accumulator Format	Hysteres	Hysteresis	PshAcc	Push Accumulator
Addr 1-3	Address 1-3	IndSet	Industrial Settings	PshPrint	Push Print
Address	Address	InitZro	Initial Zero Range	PshTare	Push Tare
AdSense	Adaptive Filter Sensitivity	Ip Addr	IP Address	PwrUpM	Power Up Mode
AdThrh	Adaptive Filter Threshold	KTare	Allow Keyed Tare	Range	Out of Range
AnchrSq	Anchor Sequence	LastCal	Last Calibration	Regula	Regulatory Mode
AudAgcy	Audit Agency	LatOrig	Origin Latitude	RelNum	Relative Setpoint Number
Azt Net	Auto-Zero Tracking on Net Zero	LightLvL	Light Level	Response	Response
BandVal	Band Value	LnTerm	Line Termination	RKTare	Round Keyed Tare
Calibr	Calibration	LRV	Legally Relevant Version	RTare	Round Button Tare
ClrAccum	Clear Accumulator	LstZero	Last Zero	RtlTrap	RattleTrap
ClrTare	Clear Tare	MaxWgh	Maximum Weight	Sec	Secondary
Comm	Communication	MCLTare	Manual Clear Tare	SetAnn	Set Annunciator
Config	Configuration	MnlMode	Manual Mode	Setpnt	Set point
ConsNu	Consecutive Number	MnlMVal	Manual Mode Validation	SFmt	Stream Format
CTare	Allow Clear Tare Key	ModeBeg	Mode Start	SmpRat	Sample Rate
DfltCFG	Default Configuration	ModeDef	Mode Definitions	SnapSht	Snapshot
DfSens	Digital Filter Sensitivity	ModeEnd	Mode End	SpnCnt	Span Counts
DfThrh	Digital Filter Threshold	MotBnd	Motion Band	SSTime	Standstill Time
DigFl 1-3	Digital Filter Stage 1-3	MotoWgh	Weighment in Motion	StatBeg	Status Start
Digin	Digital Input	MsgTim	Message Time	StatDef	Status Definitions
Digio	Digital Inputs and Outputs	MTare	Multiple Tare Action	StatEnd	Status End
DigOut	Digital Output	Neg	Negative	StptCfg	Setpoint Configuration
DispAcm	Display Accumulator	NegTotl	Negative Total	StptFmt	Setpoint Format
DispTar	Display Tare	NetFmt	Net Format	TareFn	Tare Function
DispTst	Startup Display Test	NextCal	Next Calibration	TareMot	Tare in Motion
DmpVal	Damping Value	NTare	Allow Negative Tare	Theoret	Theoretical Calibration
DSlot	Digital Output Slot	NumWegh	Number of Weighments	Tm/Dt	Time/Date
Dsplay	Display	OvrBase	Zero Base for Overload	TmpZero	Temp Zero
DumpAud	Dump Audit	PCount	Preact Count	UID	Unit ID
Duraton	Duration	PFmt	Print Format	UldWgh	Underload Weight
EleOrig	Origin Elevation	PolBeg	Priority Start	UnitBeg	Unit Start
Eoldly	End of Line Delay	PolDef	Polarity Definitions	UnitDef	Unit Definitions
EthClnt	Ethernet Client	PolEnd	Priority End	UnitEnd	Unit End
EthSvr	Ethernet Sever	Dest 1	Destination Port 1	WgtBeg	Weight Start
FiltrChn	Filter Chain Type	Dest 2	Destination Port 2	WgtEnd	Weight End
Format	Scale Format	Pos	Positive	WLin	Linear Calibration
Gfmt	Gross Format	PreAdj	Preact Adjust	WmtThrh	Weighment Threshold
GrvDest	Destination Gravity	PreStab	Preact Stability	Wspan	Span Calibration
GrvOrig	Origin Gravity	PreVal	Preact Value	WVal	Test Weight
HdrFmt	Header Format	Pri	Primary	WZero	Zero Calibration
HoldWgh	Weighment Display Hold	PrntHld	Print Display Hold	ZeroCnt	Zero Counts
HoldWt	Hold Weight	PrntMot	Allow Print in Motion	ZeroMot	Zero in Motion
Htare	Display Hold Tare	PrntPt	Add PT to Keyed Tare Print	ZRange	Zero Range

Table 9-2. Parameter Abbreviation Definitions

9.3 Non-Printable Characters

Table 9-3 lists non-printable characters that may appear in an incoming data stream during Manual Mode configuration (Section 4.3.2 on page 41).

Character	Hex	Decimal	Abbreviation	Description	Character	Hex	Decimal	Abbreviation	Description
☉	01	1	SOH	Start of Heading	-	2D	45		
☺	02	2	STX	Start of Text	.	2E	46		
♥	03	3	ETX	End of Text	/	2F	47		
♦	04	4	EOT	End of Transmission	0	30	48		
♣	05	5	ENQ	Enquiry	1	31	49		
♠	06	6	ACK	Acknowledge	2	32	50		
·	07	7	BEL	Bell	3	33	51		
▣	08	8	BS	Backspace	4	34	52		
□	09	9	HT	Horizontal Tab	5	35	53		
▣	0A	10	LF	Line Feed	6	36	54		
♂	0B	11	VT	Vertical tab	7	37	55		
♀	0C	12	FF	Form feed	8	38	56		
♪	0D	13	CR	Carriage Return	9	39	57		
♪	0E	14	SO	Shift Out	:	3A	58		
☀	0F	15	SI	Shift In	;	3B	59		
▶	10	16	DLE	Data Link Escape	<	3C	60		
◀	11	17	DC1	Device Control 1	=	3D	61		
↕	12	18	DC2	Device Control 2	>	3E	62		
!!!	13	19	DC3	Device Control 3	?	3F	63		
¶	14	20	DC4	Device Control 4	@	40	64		
§	15	21	NAK	Negative Acknowledge	A	41	65		
_	16	22	SYN	Synchronous Idle	B	42	66		
↕	17	23	ETB	End of Transmission Block	C	43	67		
↑	18	24	CAN	Cancel	D	44	68		
↓	19	25	EM	End of Medium	E	45	69		
→	1A	26	SUB	Substitute	F	46	70		
←	1B	27	ESC	Escape	G	47	71		
ℒ	1C	28	FS	File Separator	H	48	72		
‖	1D	29	GS	Group Separator	I	49	73		
▲	1E	30	RS	Record Separator	J	4A	74		
▼	1F	31	US	Unit Separator	K	4B	75		
␣	20	32	SP	Space	L	4C	76		
!	21	33			M	4D	77		
"	22	34			N	4E	78		
#	23	35			O	4F	79		
\$	24	36			P	50	80		
%	25	37			Q	51	81		
&	26	38			R	52	82		
'	27	39			S	53	83		
(28	40			T	54	84		
)	29	41			U	55	85		
*	2A	42			V	56	86		
+	2B	43			W	57	87		
,	2C	44			X	58	88		

Table 9-3. ASCII Symbols

Character	Hex	Decimal	Abbreviation	Description
Y	59	89		
Z	5A	90		
[5B	91		
\	5C	92		
]	5D	93		
^	5E	94		
_	5F	95		
`	60	96		
a	61	97		
b	62	98		
c	63	99		
d	64	100		
e	65	101		
f	66	102		
g	67	103		
h	68	104		
i	69	105		
j	6A	106		
k	6B	107		
l	6C	108		
m	6D	109		
n	6E	110		
o	6F	111		
p	70	112		
q	71	113		
r	72	114		
s	73	115		
t	74	116		
u	75	117		
v	76	118		
w	77	119		
x	78	120		
y	79	121		
z	7A	122		
{	7B	123		
	7C	124		
}	7D	125		
”	7E	126		
△	7F	127	DEL	Delete
Ç	80	128		
ü	81	129		
é	82	130		
â	83	131		
ä	84	132		
à	85	133		
å	86	134		
ç	87	135		
ê	88	136		
ë	89	137		

Character	Hex	Decimal	Abbreviation	Description
è	8A	138		
ï	8B	139		
î	8C	140		
ì	8D	141		
Ä	8E	142		
Å	8F	143		
É	90	144		
æ	91	145		
Æ	92	146		
ô	93	147		
ö	94	148		
ò	95	149		
û	96	150		
ù	97	151		
ÿ	98	152		
Ö	99	153		
Ü	9A	154		
ç	9B	155		
£	9C	156		
¥	9D	157		
Pts	9E	158		
f	9F	159		
á	A0	160		
í	A1	161		
ó	A2	162		
ú	A3	163		
ñ	A4	164		
Ñ	A5	165		
ª	A6	166		
º	A7	167		
¿	A8	168		
ƒ	A9	169		
¬	AA	170		
½	AB	171		
¼	AC	172		
ì	AD	173		
«	AE	174		
»	AD	175		
☐	B0	176		
☐	B1	177		
☐	B2	178		
	B3	179		
†	B4	180		
‡	B5	181		
‡	B6	182		
π	B7	183		
¶	B8	184		
‡	B9	185		
	BA	186		

Table 9-3. ASCII Symbols (Continued)

Character	Hex	Decimal	Abbreviation	Description
⌈	BB	187		
⌋	BC	188		
⌌	BD	189		
⌍	BE	190		
⌎	BF	191		
⌏	C0	192		
⌐	C1	193		
⌑	C2	194		
⌒	C3	195		
⌓	C4	196		
⌔	C5	197		
⌕	C6	198		
⌖	C7	199		
⌗	C8	200		
⌘	C9	201		
⌙	CA	202		
⌚	CB	203		
⌛	CC	204		
⌜	CD	205		
⌝	CE	206		
⌞	CF	207		
⏟	D0	208		
⠏	D1	209		
⠑	D2	210		
⠒	D3	211		
⠓	D4	212		
⠔	D5	213		
⠕	D6	214		
⠖	D7	215		
⠗	D8	216		
⠘	D9	217		
⠙	DA	218		
■	DB	219		
■	DC	220		
■	DD	221		

Character	Hex	Decimal	Abbreviation	Description
■	DE	222		
■	DF	223		
α	E0	224		
β	E1	225		
Γ	E2	226		
π	E3	227		
ε	E4	228		
σ	E5	229		
μ	E6	230		
τ	E7	231		
φ	E8	232		
θ	E9	233		
Ω	EA	234		
δ	EB	235		
∞	EC	236		
φ	ED	237		
ε	EE	238		
∩	EF	239		
≡	F0	240		
±	F1	241		
≥	F2	242		
≤	F3	243		
∫	F4	244		
∫	F5	245		
÷	F6	246		
≈	F7	247		
°	F8	248		
·	F9	249		
·	FA	250		
√	FB	251		
ⁿ	FC	252		
²	FD	253		
■	FE	254		
□	FF	255		

Table 9-3. ASCII Symbols (Continued)

9.4 ZZ EDP Command

The ZZ EDP command can be used to remotely query the value currently displayed on the display, along with the units, and a number representing the current state of the annunciators. The number represents the LED annunciators currently lit (Table 9-4).

Example: If the ZZ command returns 2500 LB 145; the weight on display is 2500 pounds, and the gross, standstill, and lb annunciators are lit. The number 145 represents the sum of the values for the gross mode annunciator (16), the standstill annunciator (128), and the lb annunciator (1).

Decimal Value	Annunciator
1	lb/primary units
2	kg/secondary units
16	Gross
32	Net
64	Center of zero
128	Standstill

Table 9-4. Status Codes Returned on the ZZ Command

9.5 Auto-Learn Supported Data Formats

Vender or Product	Data Format
Accuweigh	<STX><P><W6.><U><M><S><CR><LF>
Analogic	<STX><SP><W6.><CR><LF>
A&D	<S><,><M><,><P><W7.><U><CR><LF>
Avery Weigh-Tronix	<T><M><P><W06.><SP><UU><CR><LF>
Cardinal	<CR><P><W06..><S><SP><UU><SP><M><SP><SP><ETX> <CR><P><W6.><S><SP><U><SP><M><SP2><ETX> <CR><P><W7.><S><SP><U><SP><M><SP2><ETX> <CR><P><W6.><S><SP><U><SP><S2><SP2><ETX>
Dini Argeo	<SS>,<MM>,<P><W7.>,<UU><CR><LF>
Fairbanks	<STX><SS><W-7.><ETX> <STX><M><P><W6.><ETX>
GSE Scale Systems	<STX><W8><SP><UNIT><SP><MODE><CR><LF>
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> 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.
Ishida	<P><W7.><U><S1><S2><CR><LF>
Measurement Systems International	<W-7.><SP><UU><SP><MM><CR><LF>
Rice Lake / Condec	<STX><P><W7.><U><M><S><CR><LF>
SCT 20	<W6><CR><LF>
SCT 2200 Standard	<ID><S1><,><M><,><W8.><,><U><CR><LF>
SCT 2200 Extended	<ID><SC><,><S1><,><NW10><,><TT><,><TW10><,><P10><,><UU><,><CR><LF>
Toledo	<STX><A><C><W06><T06><CR>
Weightronix	<TR><M><P><W6.><SP><U><CR><LF> <TR><M><SP><P><W6.><SP><U><CR><LF>

Table 9-5. Auto-Learn Supported Data String



NOTE: Functions with devices that do not require a checksum in the data string.

9.6 Continuous Data (Stream) Output Formats

When the trigger setting for a port is set to STRIND or STRLFT, data is continuously streamed from the appropriate port in one of the four fixed format options or a custom format option.

9.6.1 Fixed Format Options:

- Rice Lake Weighing Systems ([Section 9.6.2](#))
- Cardinal ([Section 9.6.3](#))
- Avery Weigh-Tronix ([Section 9.6.4 on page 99](#))
- Mettler Toledo ([Section 9.6.5 on page 99](#))

9.6.2 Rice Lake Weighing Systems Stream Format

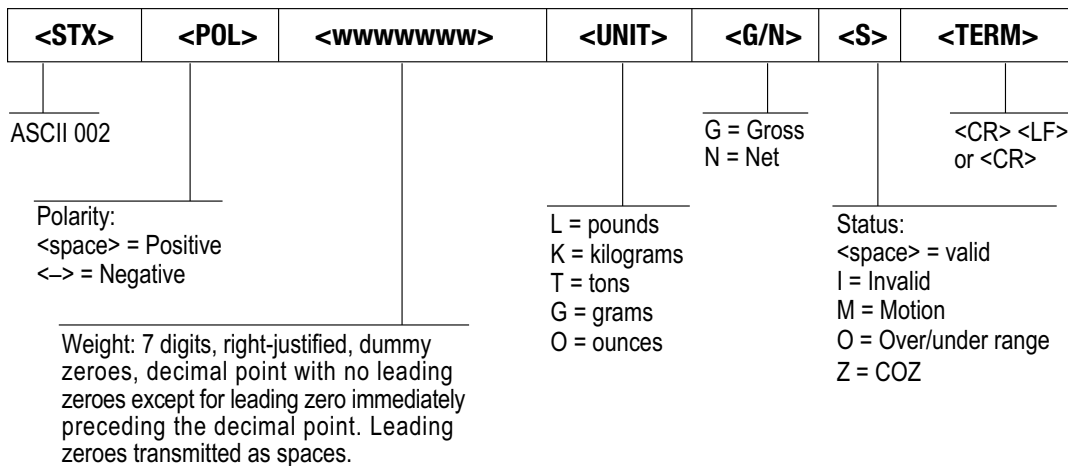


Figure 9-1. Rice Lake Weighing Systems Stream Data Format

9.6.3 Cardinal Stream Format

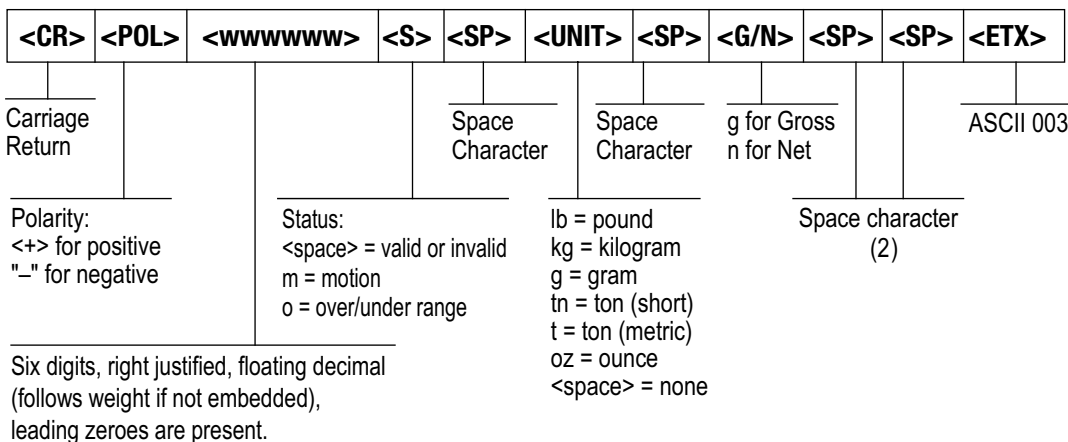


Figure 9-2. Cardinal Stream Data Format

9.6.4 Avery Weigh-Tronix Stream Format

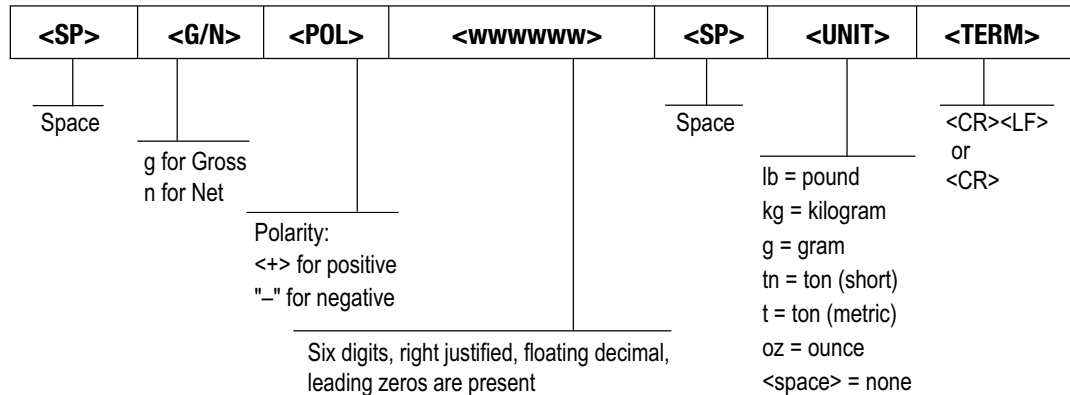
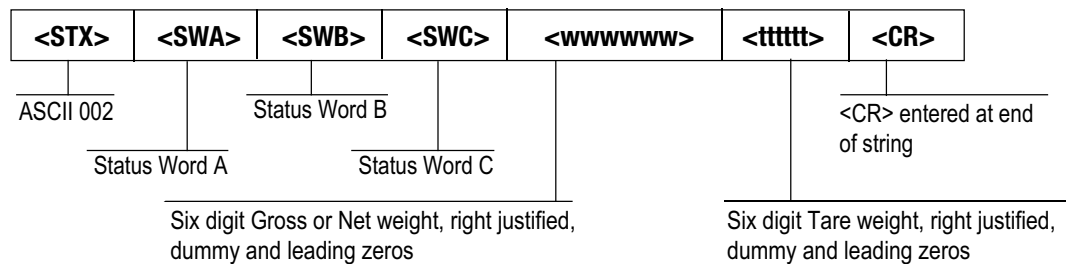


Figure 9-3. Avery Weigh-Tronix Stream Data Format

9.6.5 Mettler Toledo Stream Format



Status Word A:

7	6	5	4	3	2	1	0
Parity	0	1	MUL1	MUL0	DP2	DP1	DP0

Even parity bit.
Requires EDP Port setup.

Disp. Div.
MUL1 MUL0 Multiplier
0 1 x 1
1 0 x 2
1 1 x 5

DP2 DP1 DP0 Fixed Zero/Dec. Pt. Location

0 0 0 x 100 (2 fixed zeroes)
0 0 1 x 10 (1 fixed zero)
0 1 0 x 1 (No decimal point)
0 1 1 x 0.1 (1 decimal place)
1 0 0 x 0.01 (2 decimal places)
1 0 1 x 0.001 (3 decimal places)
1 1 0 x 0.0001 (4 decimal places)
1 1 1 x 0.00001 (5 decimal places)

Status Word C: ASCII 20h (space)

7	6	5	4	3	2	1	0
Parity	0	1	0	0	0	0	0

Even parity bit:
Requires EDP Port setup.

Status Word B:

7	6	5	4	3	2	1	0
Parity	0	1					

Even parity bit:
Requires EDP Port
setup.

0 = lb
1 = kg

0 = Stable
1 = Motion

0 = In range
1 = Out of range

0 = Positive indicated weight value
1 = Negative indicated weight value

0 = Gross Display Mode
1 = Net Display Mode

Figure 9-4. Mettler Toledo Stream Data Format

9.6.6 Custom Stream Format Tokens

The custom stream format can be configured using the stream format menu via the front panel. See [Section 5.2.4 on page 65](#) for the stream format menu structure. The indicator must be in setup mode ([Section 2.7.2 on page 22](#)) to access the stream format menu.

9.6.6.1 Using the Front Panel

Use the stream format menu to customize the custom stream format by changing the ASCII characters in the format string.

Setup ▼ Format ► ... ► SFormt ▼ SFormt ► Custom ◀ Custom ▼ to format string entry



NOTE: The LaserLight3 can send or receive ASCII characters; the character printed depends on the particular ASCII character set implemented for the receiving device. Some characters cannot be displayed on the LaserLight3 front panel, see the ASCII character chart in [Section 9.3 on page 94](#) for available characters.

For example, enter the following string of format tokens to recreate the standard RLWS stream format as a custom stream format: <2><P><W7.><U><M><S><CR><LF>

- <2> Sends ASCII character 2, or STX.
- <P> Sends the Polarity character.
- <W7.> Sends 7 weight digits, no leading zeros, with a floating decimal point as needed.
- <U> Sends the Units.
- <M> Sends the Mode.
- <S> Sends the Status.
- <CR> Sends a Carriage Return.
- <LF> Sends a Line Feed.

9.6.6.2 Custom Stream Format Tokens

Format Token	Defined By	Description
<P[G N T]>	STRM.POS#n STRM.NEG#n	Polarity – specifies positive or negative polarity for the current or specified (Gross/Net/Tare) weight on the source scale. Possible values are SPACE, NONE, + (for STR.POS#n) or – (for STR.NEG#n)
<U[P S]>	STRM.PRI#n STRM.SEC#n	Units – specifies primary or secondary units for the current or specified weight on the source scale
<M[G N T]>	STRM.GROSS#n STRM.NET#n STRM.TARE#n	Mode – specifies gross, net or tare weight for the current or specified weight on the source scale
<S>	STRM.MOTION#n STRM.RANGE#n STRM.OK#n STRM.INVALID#n STRM.ZERO#n	Status for the source scale – default values and meanings for each status: <ul style="list-style-type: none"> • STR.MOTION#n M In motion • STR.RANGE#n O Out of range • STR.OK#n <space> OK • STR.INVALID#n I Invalid • STR.ZERO#n Z COZ
<UID>	UID	Unit ID number – specifies the unit identification number as an alphanumeric value up to 8 characters long
<###>	--	To send an ASCII character; ### is a number 0 to 255; for example: <2> sends the ASCII character 2, Start of Text (STX) and the token <13> sends a Carriage Return
XXXX	--	To send literal characters; XXXX represents literal characters to include in the string by not including < >; for example: SCALE<W7.><U><CR><LF> will stream “ SCALE 1234 L ” with a weight of 1234 pounds
<B [-]n,...>	See descriptions below	Bit fields. Comma-separated sequence of bit field specifiers; must be exactly 8-bits; minus sign ([–]) inverts the bit
B0	--	Always 0
B1	--	Always 1
B2	Configuration	=1 if even parity
B3	Dynamic	=1 if MODE=NET
B4	Dynamic	=1 if COZ
B5	Dynamic	=1 if standstill

Table 9-6. Custom Stream Format Tokens

Format Token	Defined By	Description
B6	Dynamic	=1 if gross negative
B7	Dynamic	=1 if out of range
B8	Dynamic	=1 if secondary
B9	Dynamic	=1 if tare in system
B10	Dynamic	=1 if tare is keyed
B11	Dynamic	=00 if MODE=GROSS =01 if MODE=NET =10 if MODE=TARE =11 (not used)
B12	Dynamic	=00 if UNITS=PRIMARY =01 if UNITS=SECONDARY =11 (not used)
B13	Configuration	=00 (not used) =01 if current DSPDIV=1 =10 if current DSPDIV=2 =11 if current DSPDIV=5
B14	Configuration	=00 (not used) =01 if primary DSPDIV=1 =10 if primary DSPDIV=2 =11 if primary DSPDIV=5
B15	Configuration	=00 (not used) =01 if secondary DSPDIV=1 =10 if secondary DSPDIV=2 =11 if secondary DSPDIV=5
B17	Configuration	=000 if current DECPNT=8888800 =100 if current DECPNT=88888.88 =001 if current DECPNT=8888880 =101 if current DECPNT=8888.888 =010 if current DECPNT=8888888 =110 if current DECPNT=888.8888 =011 if current DECPNT=888888.8 =111 if current DECPNT=88.88888
B18	Configuration	=000 if primary DECPNT=8888800 =100 if primary DECPNT=88888.88 =001 if primary DECPNT=8888880 =101 if primary DECPNT=8888.888 =010 if primary DECPNT=8888888 =110 if primary DECPNT=888.8888 =011 if primary DECPNT=888888.8 =111 if primary DECPNT=88.88888
B19	Configuration	=000 if secondary DECPNT=8888800 =100 if secondary DECPNT=88888.88 =001 if secondary DECPNT=8888880 =101 if secondary DECPNT=8888.888 =010 if secondary DECPNT=8888888 =110 if secondary DECPNT=888.8888 =011 if secondary DECPNT=888888.8 =111 if secondary DECPNT=88.88888
<wspec [-][0] digit [.][digit]>	Scale weight	Weight for the source scale. wspec is defined as follows: wspec indicates whether the weight is the current displayed weight (W, w), gross (G, g), net (N, n) or tare (T, t) weight; upper-case letters specify right-justified weights, lower-case are left-justified Optional /P, /S or /T suffixes can be added before the ending delimiter (>) to specify weight display in primary (/P) or secondary (/S) units [-] Enter a minus sign (-) to include sign for negative values [0] Enter a zero (0) to display leading zeros digit[.][digit] The first digit indicates the field width in characters; the decimal point only indicates a floating decimal; a decimal point with a following digit indicates fixed decimal with n digits to the right of the decimal; two consecutive decimals send the decimal point even if it falls at the end of the transmitted weight field
<CR>	--	Carriage return
<LF>	--	Line feed

Table 9-6. Custom Stream Format Tokens (Continued)

9.7 Cardinal Display Type Format

When LaserLight3 is configured correctly and receives an appropriate signal from a Cardinal indicator, the LaserLight3 replicates either Message Board or a Score Board stop and go formats with data from the Cardinal indicator.



NOTE: In order to view Cardinal Message Board or a Score Board stop and go formats, The LaserLight3 must be configured with:

- Remote display configuration
- Display Type set as Cardinl (Section 4.1 on page 36)
- Communication protocol with the Cardinal indicator (Section 4.2 on page 37 or Section 4.3 on page 40).

9.7.1 Cardinal Message Board Stream Format

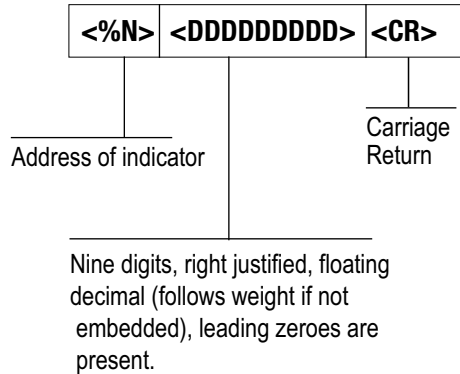


Figure 9-5. Cardinal Message Board Stream Data Format

9.7.2 Cardinal Score Board Stream Format

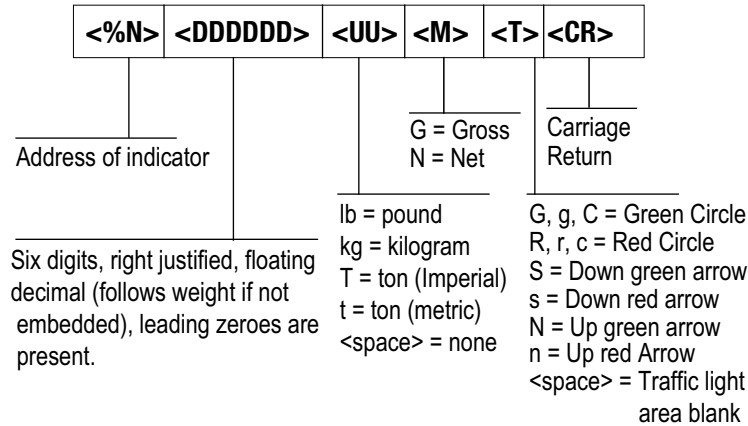


Figure 9-6. Cardinal Score Board Stream Data Format

10.0 Specifications

Power

AC voltages 100-240 VAC; 50-60 Hz
120 Watt (120 VAC)

Output Interface

Ethernet TCP/IP, Independently configurable echo port

Input Data Format

7 or 8 data bits; even, odd or no parity; 1 or 2 stop bits
Baud Rate: 1200, 2400, 4800, 9600, 19200, 38400, 57600 and 115200
self-learning or configurable

Update

Continuous or out-of-motion modes
Message interrupt mode

Digital I/O

Four I/O Read or Set
5V Logic

Communication Ports

Ethernet TCP/IP, RS-232, RS-485, 20 mA passive loop,

Optional

ConnexLink™ wireless radio
WLAN interface 801.11 a/b

Character Format

Selectable foreground/background color
7-color: red, blue, green, yellow, magenta, cyan, white

Maximum Viewing Distance

4-inch character: 100 ft (30 m)
5-inch character: 150 ft (46 m)

Viewing Angle

160 degrees

Display

Bright, outdoor color LED Lamps
128 x 32-pixel, 4 mm pitch
Decimal or comma indication
Weight display with Units and Mode

Keys/Buttons

Zero, Gross/Net, Tare, Units, Print, Menu

Time

Software enable, 12- or 24-hour format

Date

Software enable, US or ISO format

Dimensions

(L x H x W): 25.0 in x 10.0 in x 6.0 in

Temperature Range

Operating: -40°F to 120°F (-40°C to 49°C)

Rating/Material

IP66
Mild steel, powder-coated

Weight

Without wall mount: 14.19 lb (7.81 kg)
With wall mount: 20.48 lb (10.66 kg)
With sunshade: 29.79 lb (14.88 kg)

Warranty

Two-year limited warranty
CoC Number 22-096
Accuracy Class: III/IIIL; n_{max} : 10000

Approval AM-6210C
Accuracy Class: III/IIILD; n_{max} : 10000



© Rice Lake Weighing Systems Specifications subject to change without notice.

230 W. Coleman St. • Rice Lake, WI 54868 • USA

U.S. 800-472-6703 • Canada/Mexico 800-321-6703 • International 715-234-9171 • Europe +31 (0)26 472 1319