LaserLight3® Series

Large-Display Weight Indicator
Firmware Version 1

Technical Manual

RICE LAKE®
WEIGHING SYSTEMS

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PN 213589 Rev C

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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, 2024	Added new parameters (Display Test, Demand, Cardnal) and Traffic Light control with External Switches; firmware 1.02.00

Table i. Revision Letter History

Contents

1.0 Introduction

This manual is intended for use by service technicians responsible for installing and servicing the LaserLight3 Large-Display Weight Indicator. LaserLight3 can operate as either a remote display or an indicator. Remote display configuration is detailed in Section 5.0 on page 72. Configuration and calibration of LaserLight3 can be accomplished using the Revolution® configuration utility or the indicator front panel keys. See Section 4.0 on page 44 and Section 6.0 on page 92 for information about configuration and calibration.

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 prescites dans le Règlement sur le brouillage radioélectrique edicté 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:

- Operates as an indicator or a remote display
- Two 64 X 32 Led Displays (128 x 32 Combined)
- Color Selection (red, yellow, green, blue, magenta, cyan or white)
- Auto-Learn mode
- Hold displayed weight (demand input)
- 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

The LaserLight3 Large-Display Weight Indicator includes scale A/D circuitry and can operate as an indicator or a remote display. Operating modes are detailed in Table 1-1.

Mode	Description
Weigh Mode	While operating as an indicator, *Weigh* mode is the primary mode of the LaserLight3. The LaserLight3 displays gross or net weights as required
Remote Display Mode	While operating as a remote display, *Remote Display* mode is the primary mode of the LaserLight3. The LaserLight3 displays data that is received from an external source, such as an indicator
Menu Mode	*Menu* mode is accessible by pressing MENU on the front panel. Access to the Audit, Setpoint, Setup, Accumulator, Tare, Time, Date, MAC ID, and Version menus is available when in *Menu* mode ***NOTE: While using as remote display, menus and features not relating to displaying information from a data source or using Digital I/O is are not required in most cases.***
Setup Mode	Many of the procedures described in this manual, require the indicator to be in *Setup* mode. *Setup* mode is accessible by shorting the setup jumper or pressing MENU on the front panel when the audit jumper is in the ON position or by shorting the Setup jumper. See Section 2.8.2 on page 25 for more information.

Table 1-1. Operating Mode Descriptions

NOTE: Remote Display Mode is enabled when a RmtIn (Remote In) parameter is configured in the Comm (Communications) menu (Section 5.2.2 on page 74).

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.

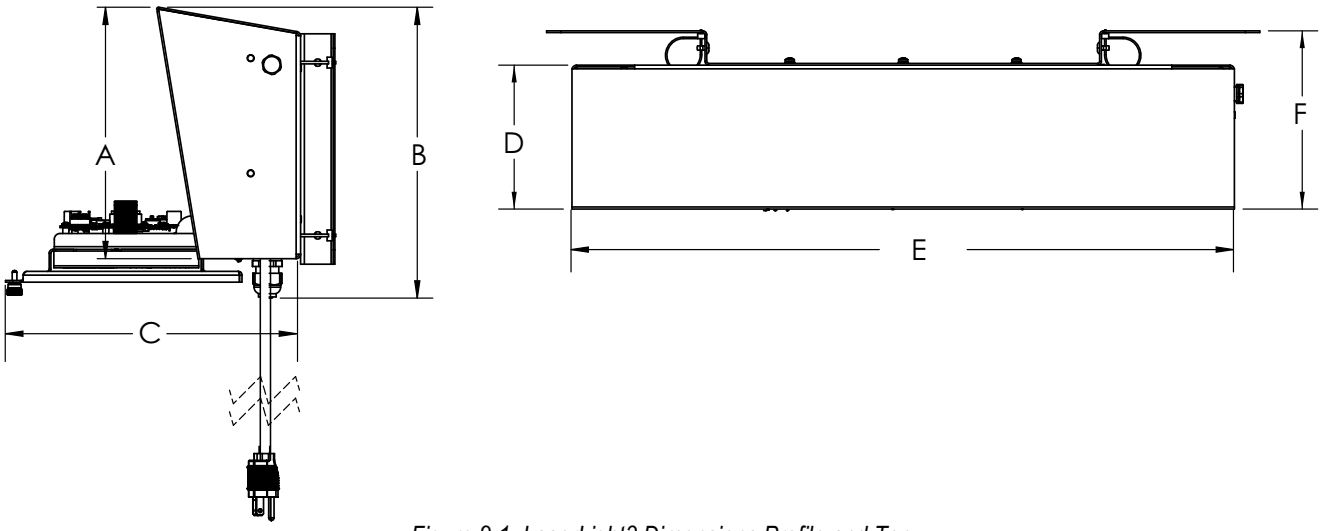


Figure 2-1. LaserLight3 Dimensions Profile and Top

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. LaseLight3 Dimensions

2.2.1 Mount Bracket Dimensions

Figure 2-2 displays LaserLight3 the mounting bracket dimensions.

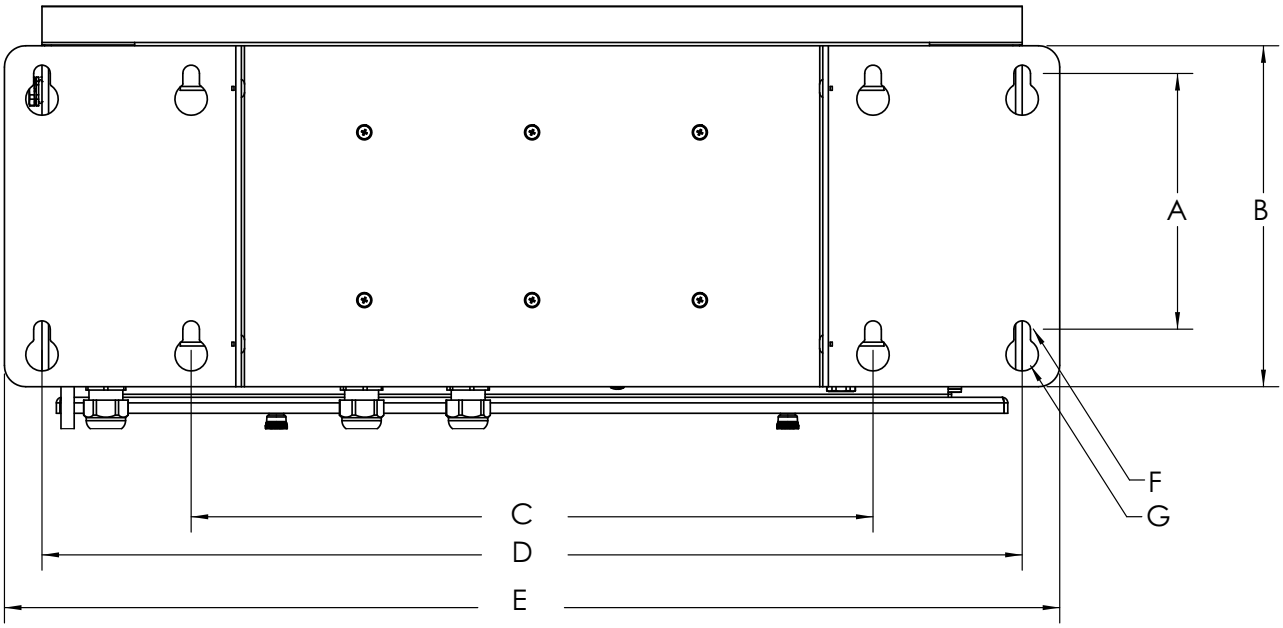


Figure 2-2. Mounting Bracket Dimensions

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

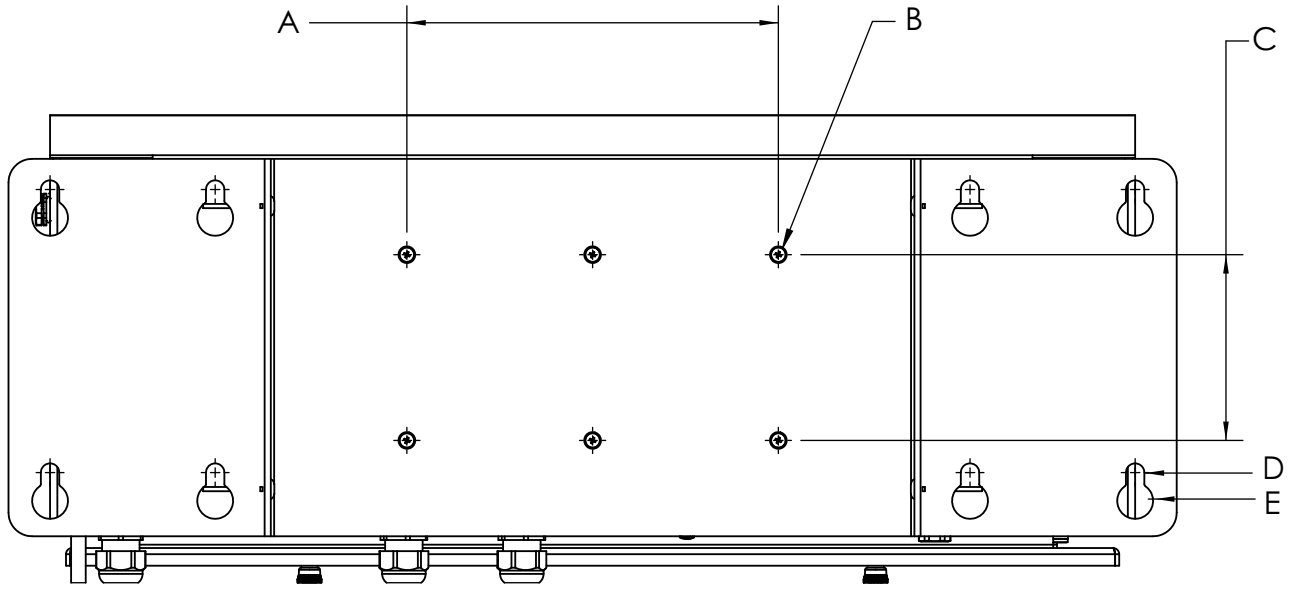


Figure 2-3. Bracket with VESA Mounting Holes Identified

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.

NOTE: Breaking the seal terminates the Legal for Trade status of the LaserLight3 Large-Display Weigh Indicator.

2. Loosen the two captive screws located on the front of the enclosure.

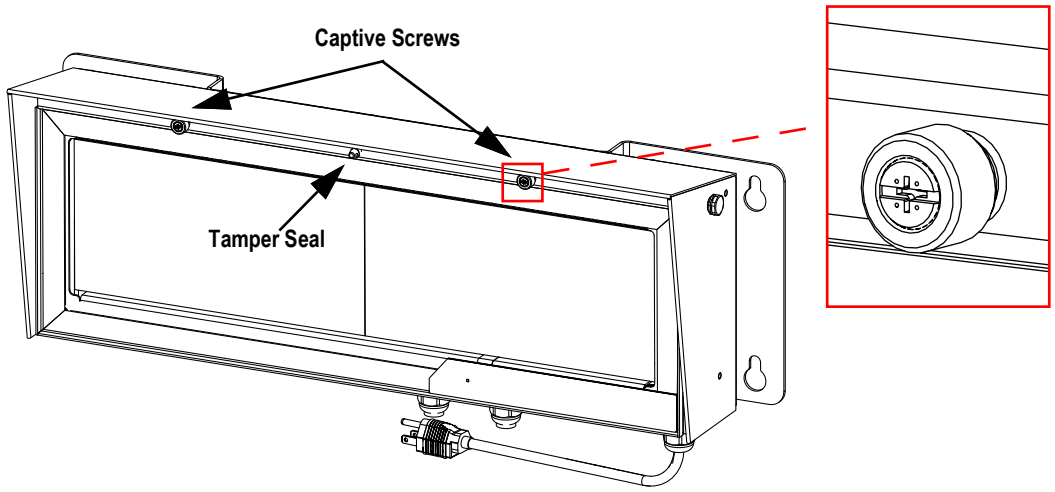


Figure 2-4. Front Door Fasteners and Wire Seal Location

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

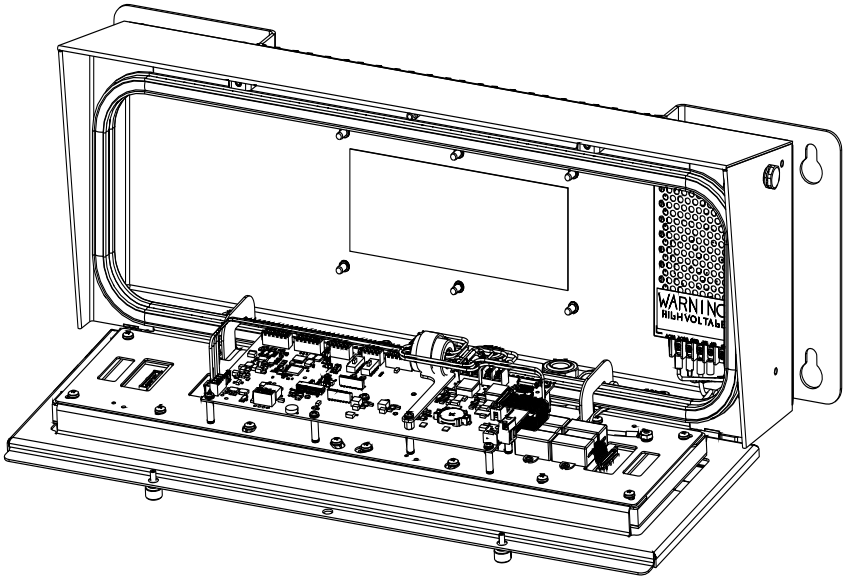


Figure 2-5. LaserLight3 Open

4. Reverse the procedure to close the enclosure.

2.5 Legal for Trade Sealing

Insert a lead wire seal through two holes on front door and through retaining bracket in enclosure. This restricts access of the setup jumpers, electronics, electrical contacts and Legal for Trade configuration parameters.

NOTE: The audit jumper (J24) must be set to off to require shorting the setup jumper (J25) to access configuration parameters. See Section 2.8.2 on page 25 for the location of the audit jumper on the CPU board.

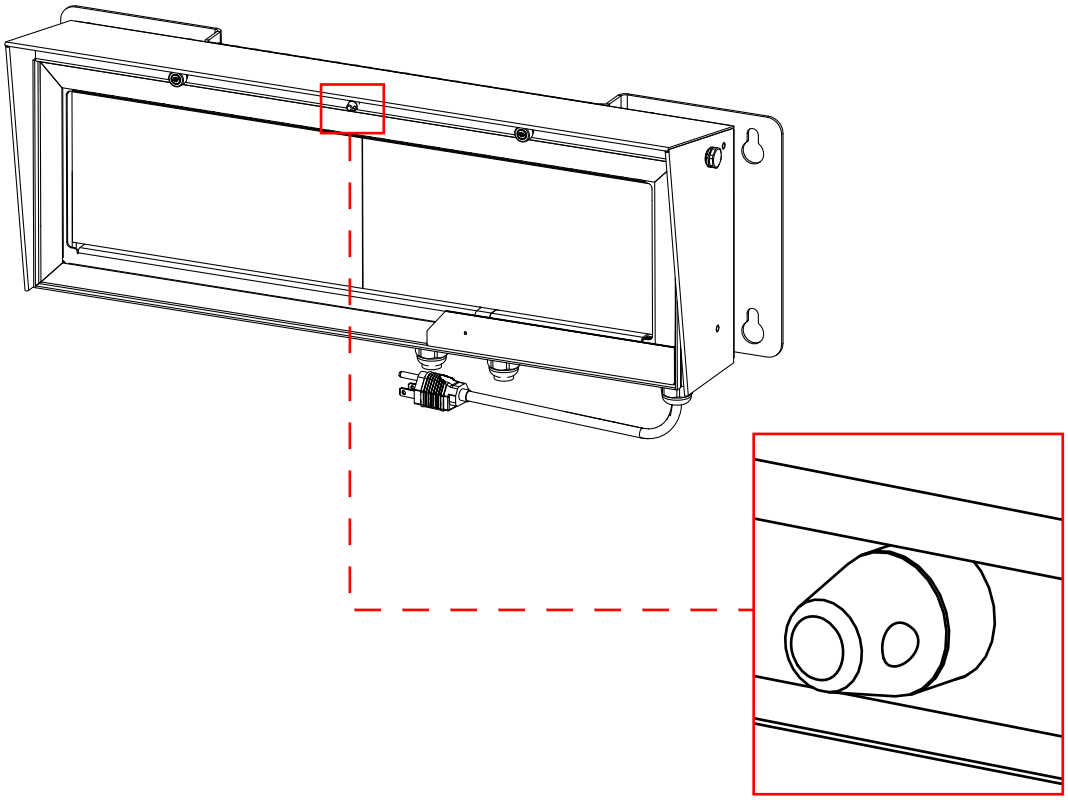


Figure 2-6. LaserLight3 Legal for Trade Sealing

1. With door closed, route sealing wire through hole in sealing post (that protrudes through door).
2. Tighten captive screws.

2.6 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. Whether the LaserLight3 operates with scale functionality or as remote displays determines the required additional cabling.

When operating with scale functionality, load cells must be wired to the CPU board (Section 2.7.3 on page 20). When operating as a remote display, a data source from an external device must connected via RS-232 (Section 2.7.4 on page 20), RS-485/422 (Section 2.7.10 on page 23), 20 mA (Section 2.7.5 on page 20), Ethernet (Section 2.7.8 on page 22) or Wi-Fi (factory installed option).

2.6.1 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).

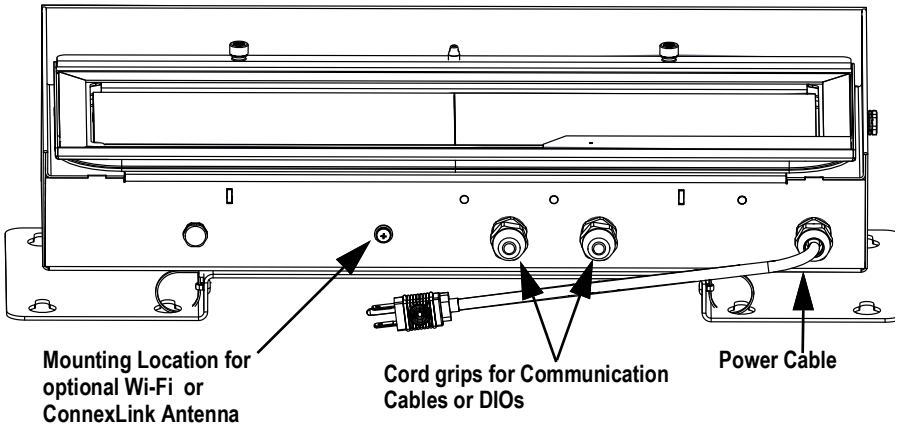


Figure 2-7. Cord Grip Layout

2.6.2 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.

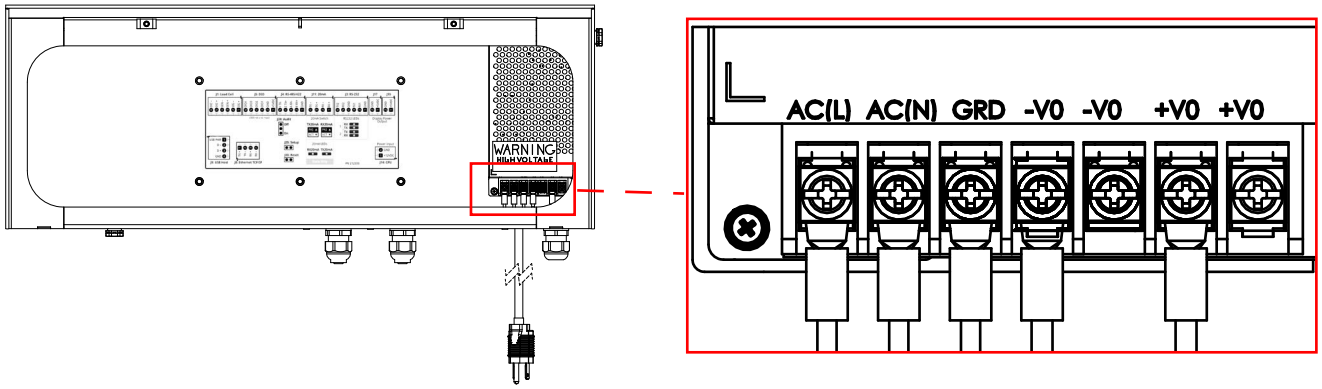


Figure 2-8. Power Supply Wiring

NOTE: The far left wire illustrated in Figure 2-8 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

2.7 CPU Board Connections

Figure 2-9 illustrates location of cable connections on the CPU board.

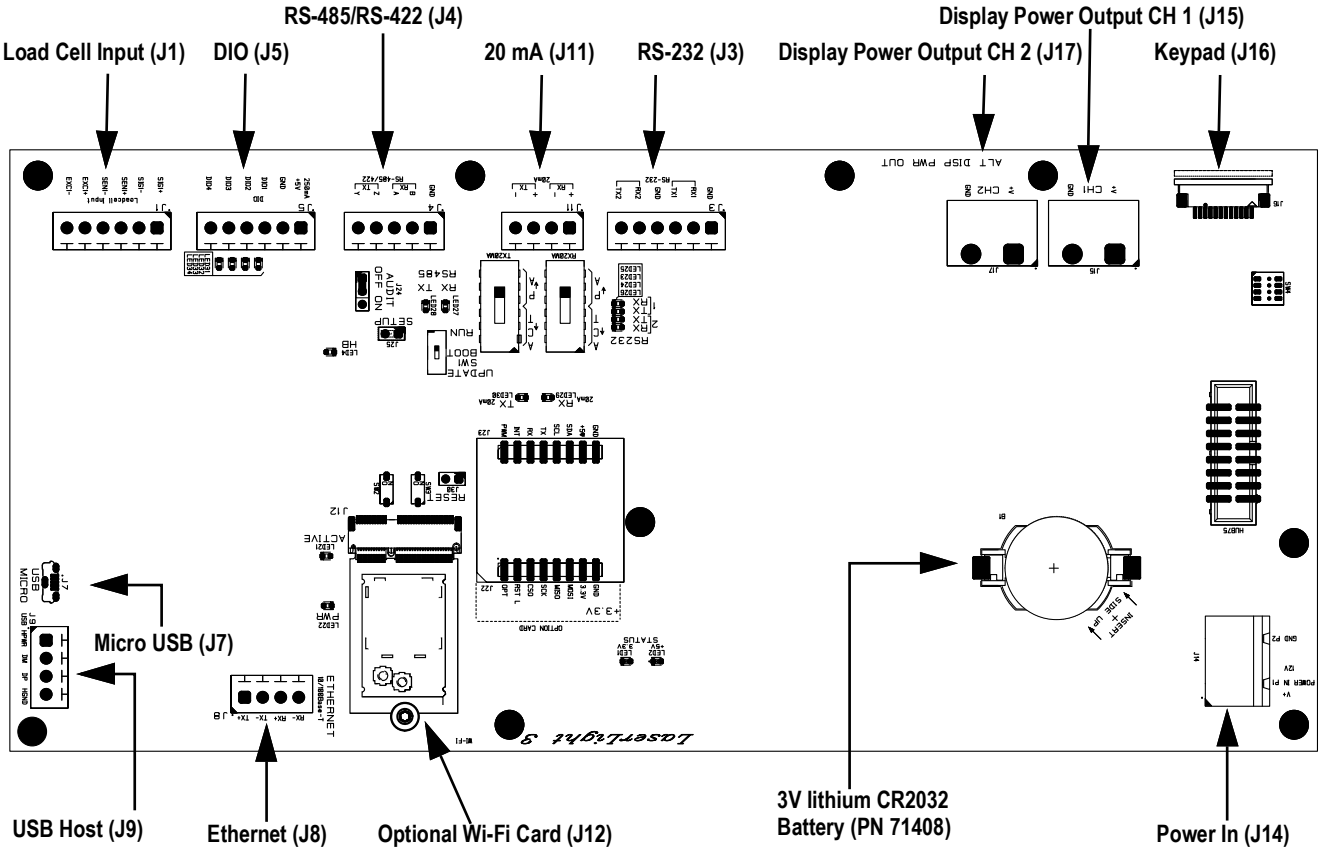
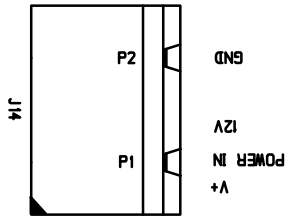


Figure 2-9. LaserLight3 CPU Board

2.7.1 CPU Board Power Input

J14 receives power from the AC power supply to power the CPU board. See Figure 2-10 for the pin assignments for the J14 connector.

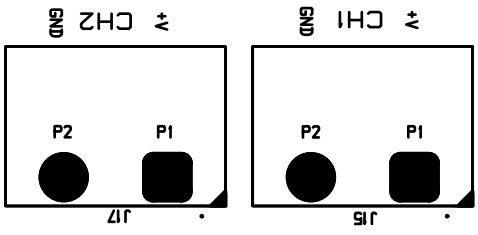


CPU Board Connector	Pin Assignment	Signal
J14	1	+ 12 VDC (10.2 to 13.8 VDC tolerance)
	2	GND

Figure 2-10. CPU Board Power In Connector (J14)

2.7.2 CPU Board Display Power Out

J15 and J17 supplies display LED boards with power. See Figure 2-11 for the pin assignments for the J15 and J17 connectors.

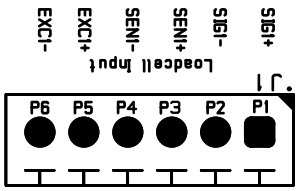


CPU Board Connector	Pin Assignment	Signal
J15 CH1 Display Power Output	1	+ 5VDC (4.85 to 5.05 VDC tolerance)
	2	GND
J17 CH 2 Display Power Output	1	+ 5VDC (4.85 to 5.05 VDC tolerance)
	2	GND

Figure 2-11. CPU Board Display Power Out Connectors (J15 and J17)

2.7.3 Load Cell Input

To attach the cable from a load cell or junction box, connect cable to the J1 connector (Section 2.8 on page 24). See Figure 2-12 for the pin assignments for the J1 connector.



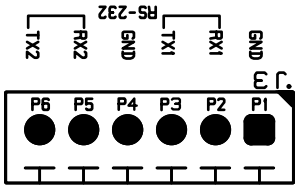
Connector	Pin	Signal
J1	1	+SIG
	2	–SIG
	3	+SENSE
	4	–SENSE
	5	+EXC
	6	–EXC

Figure 2-12. CPU Board Load Cell Connector (J1)

NOTE: For a 4-wire installation leave pins 3 and 4 empty on the connector. For a 6-wire installation set the SENSE parameter to 6-WIRE in the CONFIG menu.

2.7.4 RS-232 Serial Communications

The J3 connector (Section 2.8 on page 24) is intended to provide a connection point for the RS-232 serial communications. Two RS-232 ports are available. See Figure 2-13 for the pin assignments for the J3 connector.

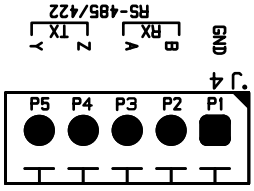


Connector	Pin	RS232-1	RS232-2
J3	1	GND	–
	2	RX1	–
	3	TX1	–
	4	–	GND
	5	–	RX2
	6	–	TX2

Figure 2-13. CPU Board RS-232 Connector (J3)

2.7.5 RS-485/422 Serial Communications

The J4 connector (Section 2.8 on page 24) 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 2-14 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 2-14. CPU Board RS-485/422 Connector (J4)

2.7.6 Digital I/O

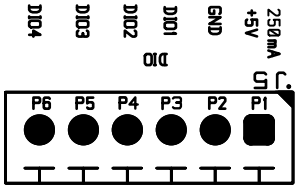
The Digital I/O port, J5 connector (Section 2.8 on page 24) can be configured as an input or an output.

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 2-15 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 2-15. CPU Board DIO Connector (J5)

2.7.7 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 2-16. Micro USB Input (J7)

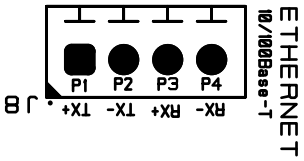
2.7.8 Ethernet TCP/IP

The LaserLight3 features Ethernet TCP/IP 10Base-T/100Base-TX communication using the J8 connector (Section 2.8 on page 24), 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 9.0 on page 100), 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 4.3.10.3 on page 67.

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 2-17 for the pin assignments for the J8 connector.



Connector	Pin	Signal
J8	1	TX+
	2	TX-
	3	RX+
	4	RX-

Figure 2-17. 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

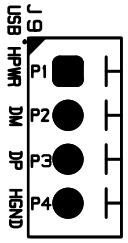
Table 2-6. Ethernet Cable Pin Assignments for T568A

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

2.7.9 USB Host

The J9 connector is intended to provide USB Host functionality. See Table 2-18 for the pin assignments for the J9 connector.

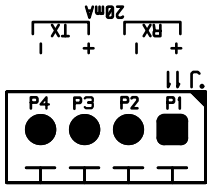


Connector	Pin	Signal
J9	1	USB PWR
	2	D-
	3	D+
	4	Ground

Figure 2-18. CPU Board USB Host Connector (J9)

2.7.10 20 mA

The J11 connector (Section 2.8 on page 24) is intended to provide a connection point for the 20 mA current loop communications. See Figure 2-19 for the pin assignments for the J11 connector.



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

Figure 2-19. CPU Board 20 mA Current Loop Connector (J11)

2.7.11 Keypad and Ambient Light Sensor

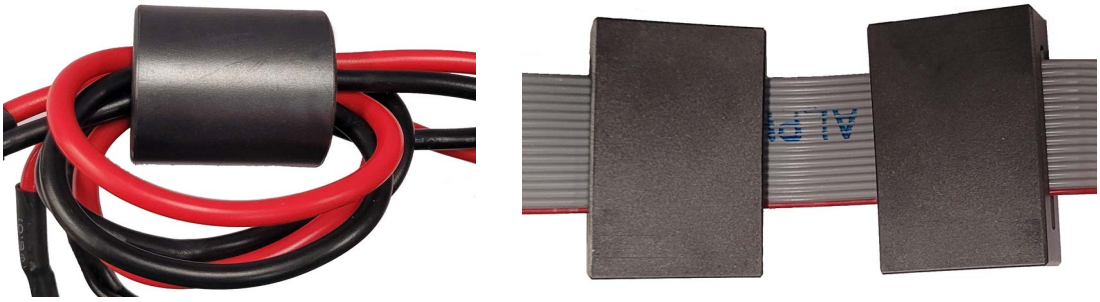
The keypad with integrated ambient light sensor connects to J16 on the CPU board. The keypad provides the functional buttons that interface with LaserLight3 (see Section 3.2 on page 32).

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 4.3.9 on page 62.

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

2.7.12 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 2-20. EMI Filters Placement for RF Interference

2.8 CPU Board Features

2.8.1 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 2-21 illustrates the locations of LEDs on the CPU board.

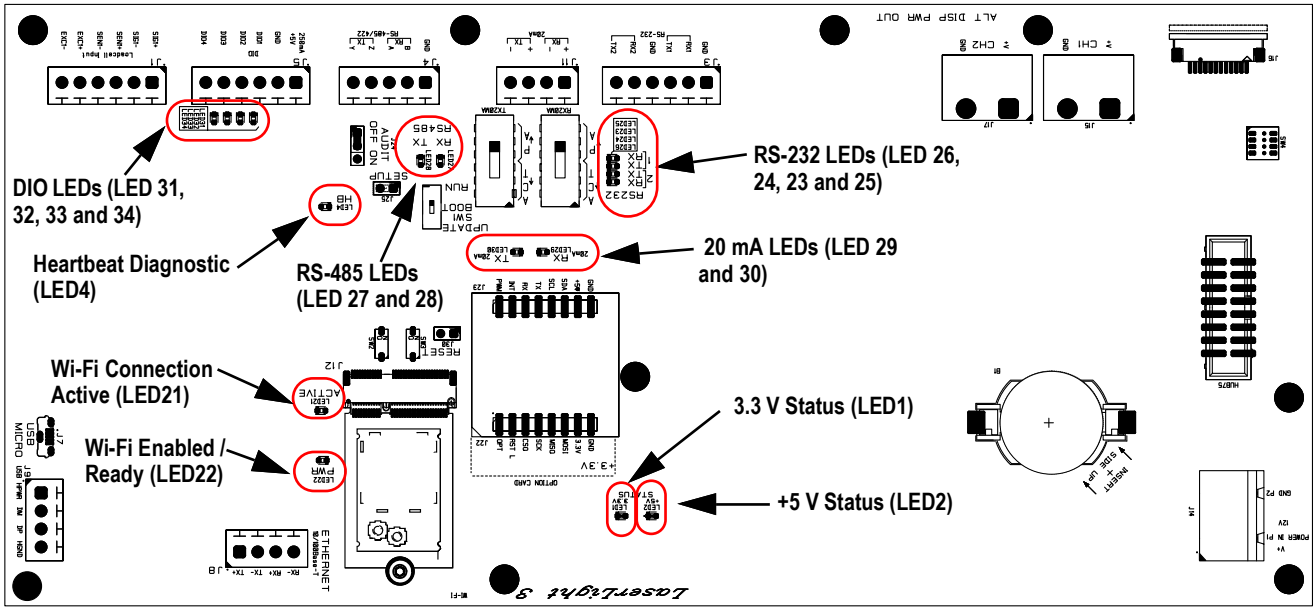


Figure 2-21. LaserLight3 CPU Board with Status LEDs Identified

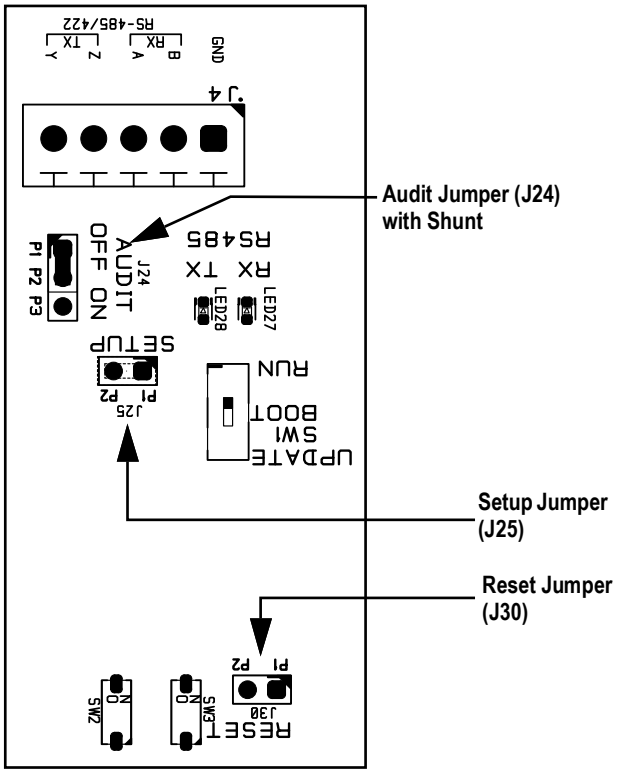
LED	Description
LED 1 +5V Status	Illuminates to indicate the +5V Power Supply is operating properly
LED 2 3.3V Status	Illuminates to indicate the +3.3V Power Supply is operating properly
LED 4 HB (Heartbeat)	Flashes when CPU board is operating properly
LED 21 ACTIVE	Flashes when Wi-Fi module is enabled 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

2.8.2 CPU Board Jumpers

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

NOTE: In certain Legal for Trade applications it is necessary to seal the LaserLight3 to restrict access to the setup jumper (Section 2.4 on page 15). Breaking of the seal terminates the Legal for Trade status of the LaserLight3.



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 2-22. 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 2-22 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 2-22 for the reset jumper location on the CPU board.

Table 2-9. Jumper Descriptions

2.8.3 CPU Board Switches

The CPU board contains several switches that are identified in Figure 2-23.

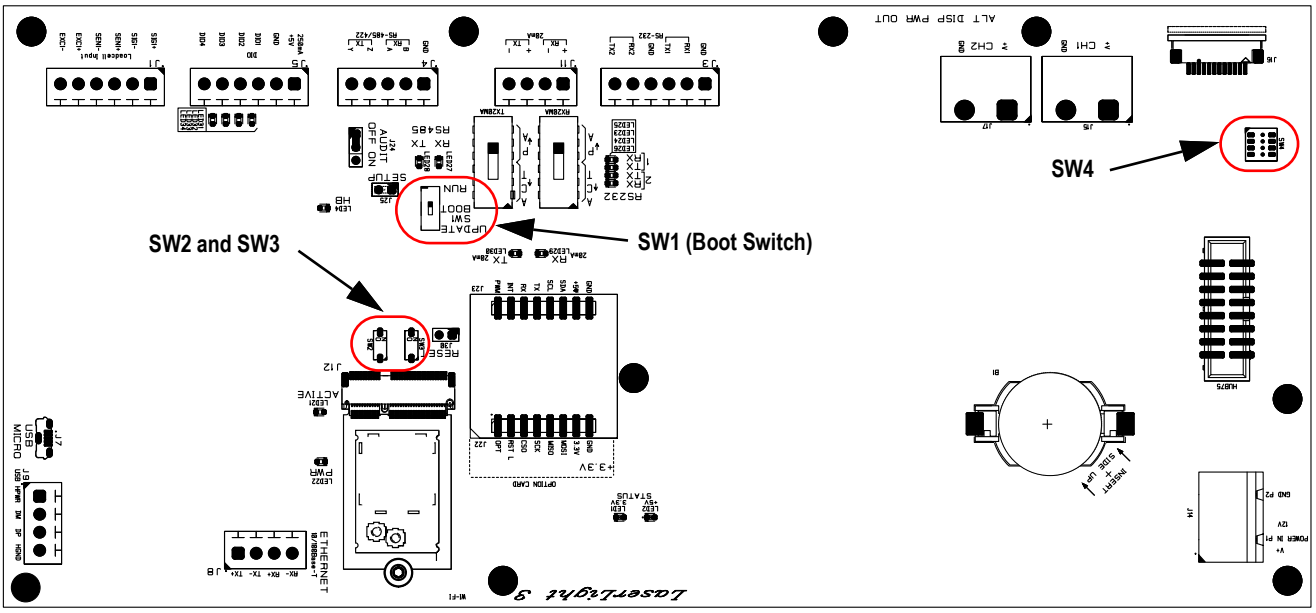


Figure 2-23. CPU Board Switches

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.
20 mA RX and TX Switches	20 mA RX and TX switches configure active or passive mode for receiving (left switch) and transmitting (right switch). The Switches have two positions up (active) and down (passive) and default positions are passive (down). The switches can be toggled at anytime without requiring a power cycle.

Table 2-10. Switch Descriptions

2.9 Parts Kit

The LaserLight3 includes a parts kit (PN 215346) 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	2
201910	Cable Tie, 8 in Nylon 6/6	4
80589	Cable Tie Mount	4

Table 2-11. LaserLight3 Assembly Parts

2.10 Replacement Parts

2.10.1 LaserLight3 Assembly Parts

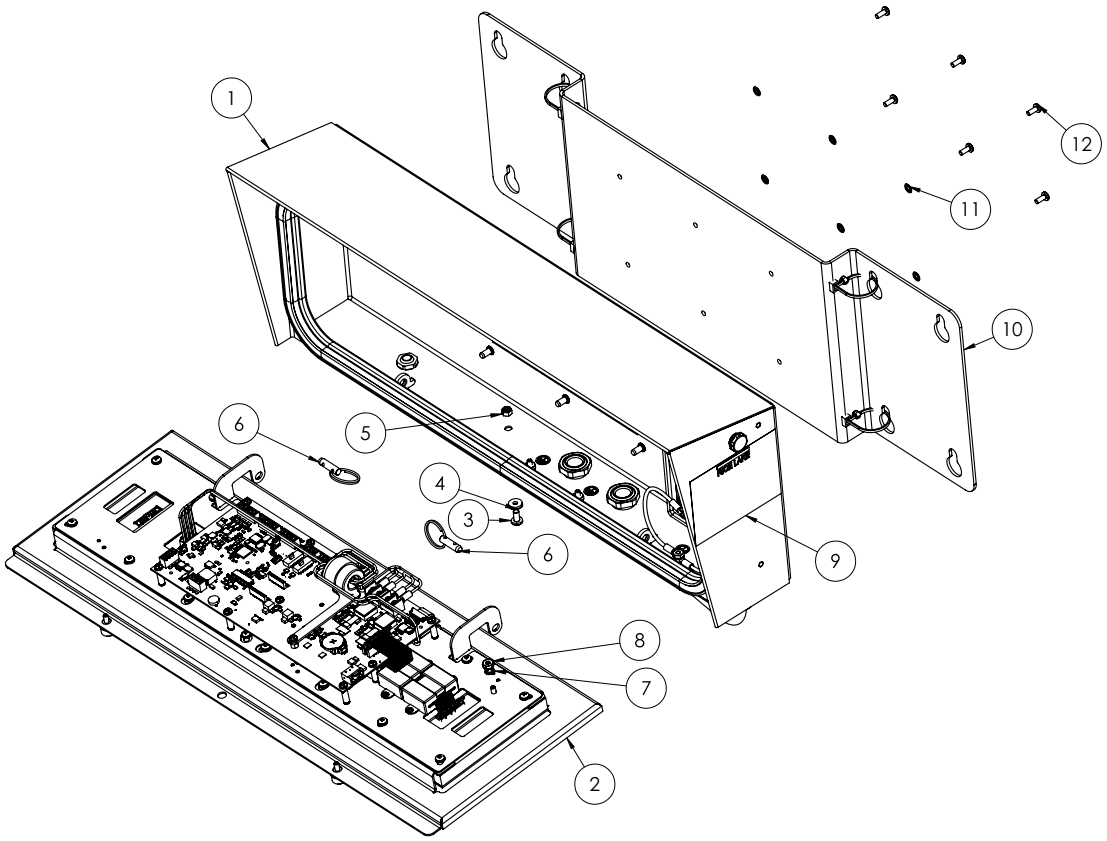


Figure 2-24. LaserLight3 Assembly Parts Illustration

Item No.	Part No.	Description	QTY
1	205781	Cabinet with Components (Section 2.10.3 on page 30)	1
2	205791	Front Door Assembly (Section 2.10.2 on page 28)	1
3	150800	Screw, M5-0.8 X 10 Pan Phillips Head	1
4	46381	Washer, Bonded Sealing #10 X .50 Od	1
5	187876	Nut, Lock M5	1
6	209194	Pin. Quick Release	2
7	15134	Washer, #8 with Internal Tooth Lock	1
8	14626	Nut, #8-32NV, Hex	6
9	165902	Serial Label	1
10	208806	Bracket, Mount	1
11	15132	Washer, #8 with Internal Tooth Lock	6
12	193230	Screw, M4X017 X 10 Phillips Pan Head	6

Table 2-12. LaserLight3 Assembly Parts

2.10.2 Front Door Assembly Parts

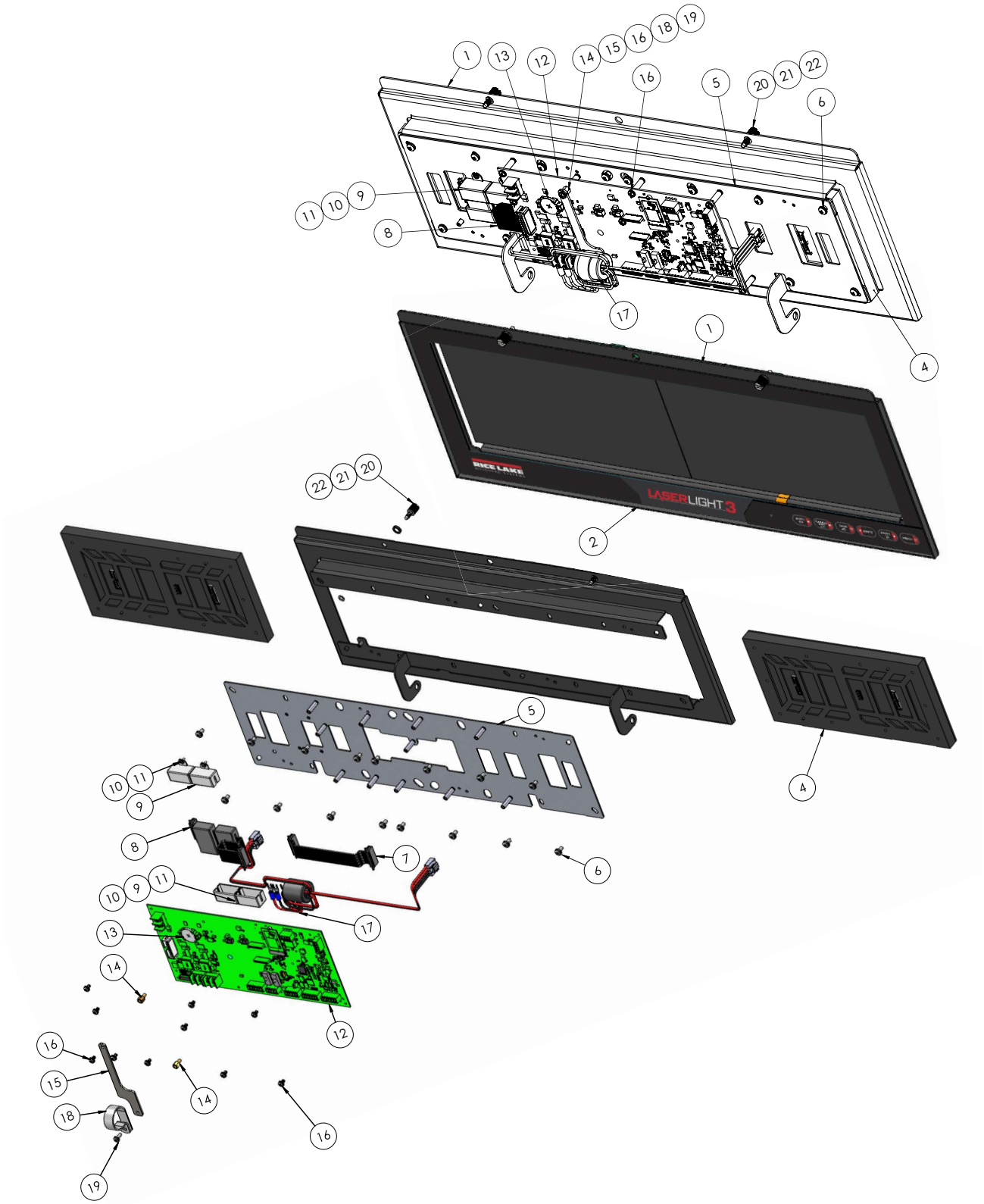


Figure 2-25. LaserLight3 Front Door Parts Illustration

Item No.	Part No.	Description	QTY
1	205792	Front Door Panel, Painted	1
2	205796	Lens Overlay Assembly	1
3	104301	3M VHB Tape, 5952 Black Double Sided Foam, 0.062 Thick X 0.75 Wide	60
4	215010	Display,32x64 Led Module P4 Pitch, Display Module, Outdoor Rated	2
5	206320	Heat Sink Assembly	1
6	214338	Machine Screw, M4-0.7x8 Phillips Pan Head, External Tooth Washer	16
7	212423	Display Communication Cable	1
8	215024	16 Conductor Data Cable with Ferrites	1
9	214876	Mount, Ferrites	4
10	206765	Washer Flat #2 Small 0.094 ID X 0.250 OD X 0.02 Thick	4
11	78628	Screw, Mach 2-56NC X 0.25 Phillips Pan Head SST	4
12	205606	CPU Board	1
13	71408	Battery, CR2032 3V	1
14	15370	Male-fem Standoff, 6-32NC x 0.25 Brass	2
15	214872	Mount, Ferrite Holder	1
16	14839	Machine Screw, 6-32nc X 1/4	10
17	212422	Power Cable Assembly with Ferrite	1
18	214914	Cable Clamp 1 In Nylon	1
19	44251	Screw, 6-32NF X 3/8 Phillips Pan Head, Internal Tooth Lock Washer	1
20	220470	Screw, Captive, Panel, 10-32 x 1/2, 18-8 SST	2
21	220471	Washer, Retaining, ID = .166, OD = .312, Thickness = .012, 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

2.10.3 Cabinet Assembly Parts

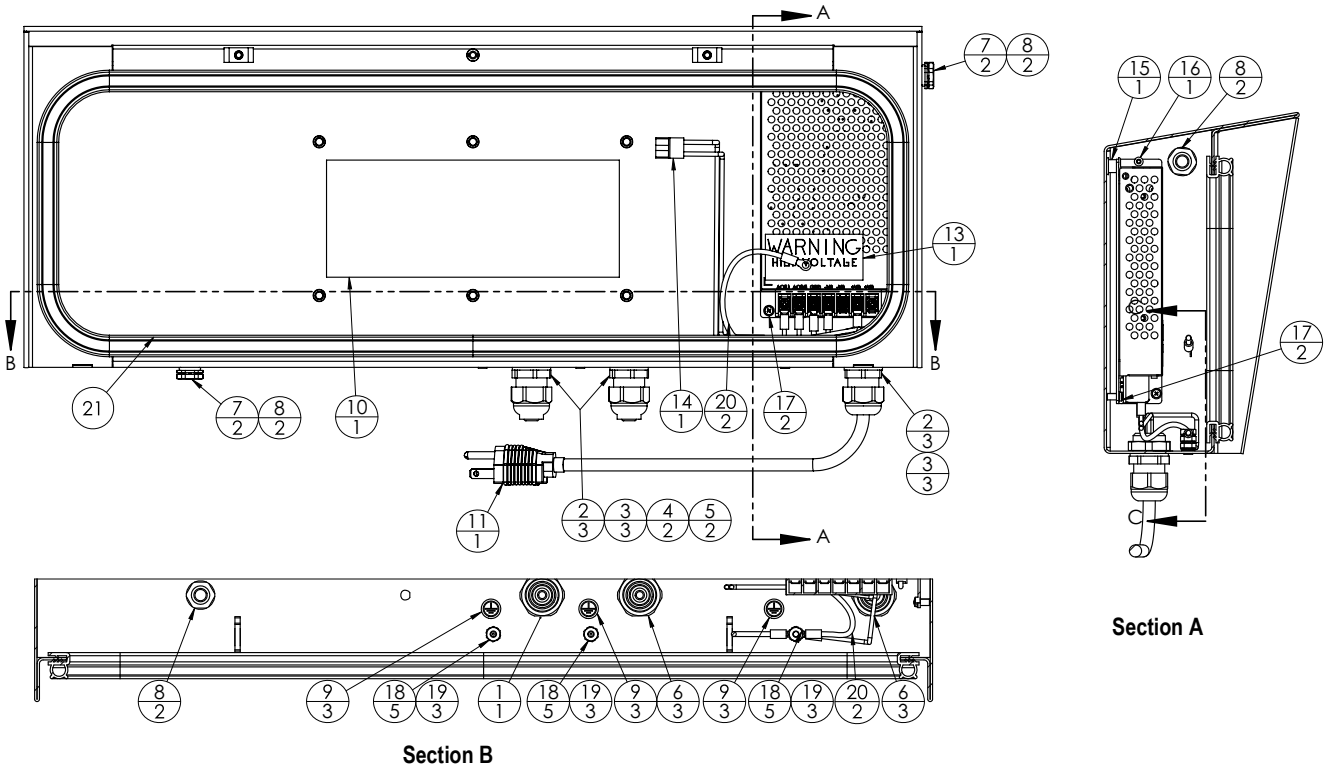


Figure 2-26. LaserLight3 Cabinet Parts Illustration

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 5.5.2 on page 88).

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. The units are changed by pressing the Units button

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.

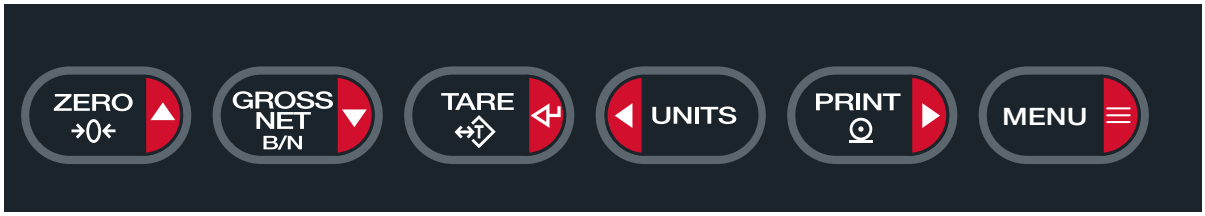


Figure 3-2. LaserLight3 Keypad

Key	Description
ZERO	Sets the current gross weight to zero, provided the amount of weight to be removed is within the specified zero range and the LaserLight3 is not in motion. The zero band by default to 1.9% of full scale, but can be configured for up to 100% of full scale. Also used as the up button to navigate menus
GROSS NET B/N	Switches the display mode from gross to net, or from net to gross. If a tare value has been entered or acquired, the net value is the gross weight minus the tare. Also used as the down button to navigate menus
TARE	Performs one of several predetermined tare functions dependent on the mode of operation selected in the TARE FN parameter. Also acts as an enter button for numeric or parameter entry
UNITS	Switches the weight display to an alternate unit. The alternate unit is defined in the ***Format*** menu, and could be kg, g, lb, oz, tn or t. Also used as the left button to navigate menus or to toggle to another digit when editing a value
PRINT	Sends on-demand print format out the configured port, provided the necessary conditions are met. RS232-1 is the default print port. Also used used as the right button to navigate menus or to toggle to another digit when editing a value
MENU	Accesses or exits *Menu* mode

Table 3-2. Key Functions

3.3 General Navigation

The front panel function buttons are also used to navigate through the menu structure.

- UNITS and PRINT move left and right (horizontally) in a menu level
- ZERO and GROSS NET B/N move up and down to different menu levels
- TARE enters a menu or parameter and selects/saves parameter settings or values
- ZERO exits a parameter and selects/saves highlighted parameter settings or values
- MENU accesses *Menu* mode, exits *Menu* mode, or leaves a parameter without making changes

3.4 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.

3.4.1 Menu with Selectable Item

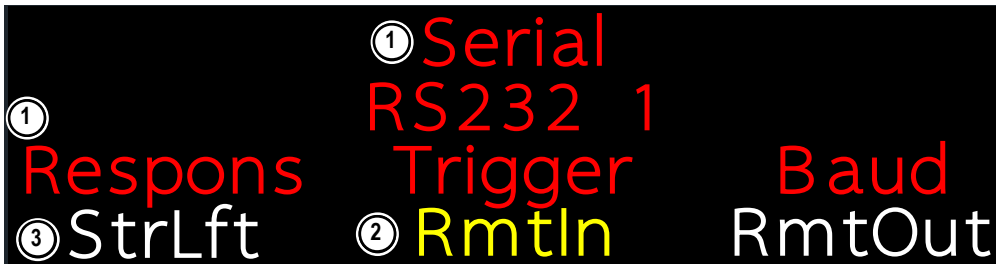


Figure 3-3. Selected Item Menu Example

Number	Element	Description
1	Red Font	Red font appears in two scenarios: • 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 UNITS and PRINT, then press TARE to confirm selection
3	White Font	Indicates parameters are available, but not currently selected
Not illustrated	Blinking Cyan Underline	Indicates text is scrollable with UNITS and PRINT buttons

Table 3-3. Menu Element Descriptions

3.4.2 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: • In center column to indicate previously selected menus and psarameters • 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

3.4.3 Menu with Text Editable Parameter

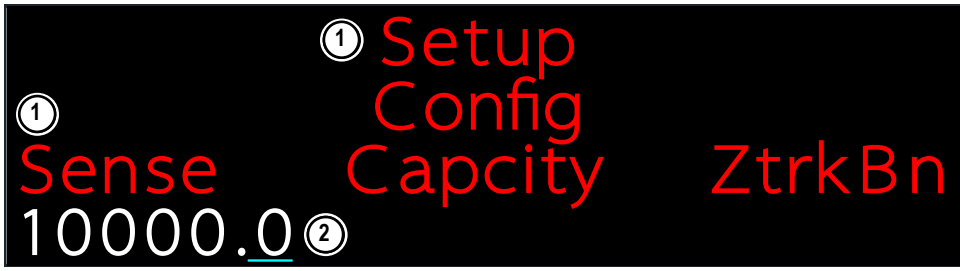


Figure 3-5. Editable Text Parameter Menu Example

Number	Element	Description
1	Red Font	Red font appears in two scenarios: • In center column to indicate previously 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 UNITS and PRINT. Press ZERO and GROSS NET B/N to change characters. Hold GROSS NET B/N to delete a character or hold ZERO to insert a 0 character. Press TARE to confirm character configuration and exit the parameter

Table 3-1. Menu Element Descriptions

3.5 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 2.8.2 on page 25).

3.5.1 Edit Time

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

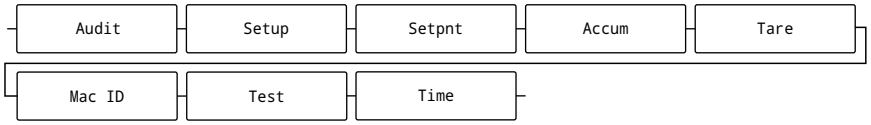


Figure 3-6. Time Parameter Menu Path

1. Navigate to **Audit** ► **...** ► **Time**.
2. Press GROSS NET B/N. The configured time displays.
3. To edit the time value:
   - Press UNITS and PRINT to select characters
   - Press ZERO and GROSS NET B/N to edit the underlined character
4. Press TARE to set the time. OK displays.
5. Press TARE then MENU 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 for time formatting options.

3.5.2 Edit Date

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

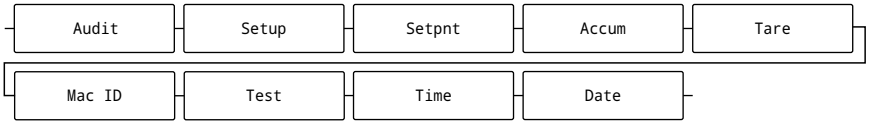


Figure 3-7. Date Parameter Menu Path

1. Navigate to **Audit ► ... ► Date**.
2. Press GROSS NET B/N to view the configured date.
3. To edit the date:
   - Press UNITS and PRINT to select characters
   - Press ZERO and GROSS NET B/N to edit the underlined character
4. Press TARE to set the date. OK displays.
5. Press TARE then MENU to exit the menu.

NOTE: Date is backed up by the internal battery and is not lost if the main power is interrupted. See for date formatting options.

3.5.3 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.

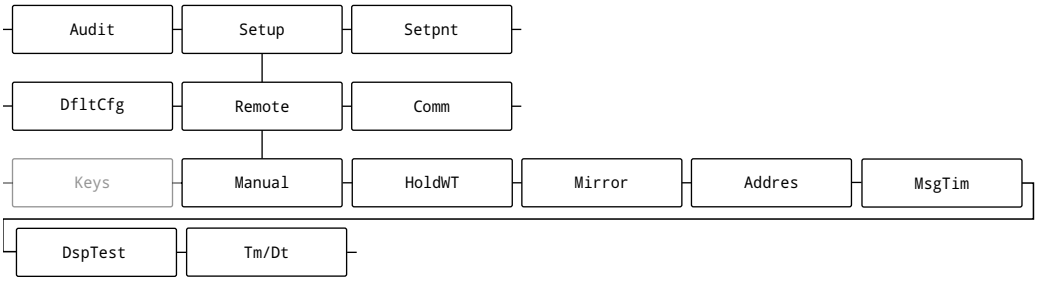


Figure 3-8. Tm/Dt File Path

1. Navigate to **Audit ► Setup ▼ Config ► ... ► Remote ▼ Manual ► ... ► Tm/Dt**.
2. Press GROSS NET B/N to view the configuration.
3. Press PRINT until **On** is selected.
4. Press TARE to accept the configuration.
5. Press MENU to exit the menu.

3.5.4 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.

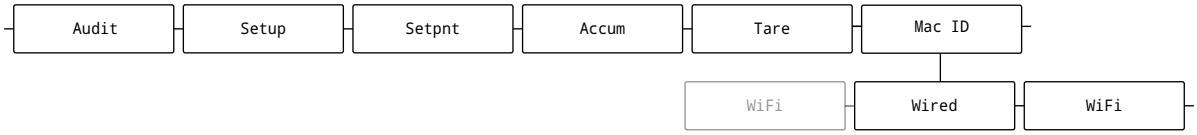


Figure 3-9. MAC ID Parameter Menu Path

1. Navigate to **Audit** ► **...** ► **Mac ID**.
2. Press GROSS NET B/N. **Wired** displays.
3. Press TARE. Ethernet MAC ID displays.
4. Press TARE. **WiFi** displays.
5. Press TARE. WiFi MAC ID displays (if installed).
6. Press MENU to exit the menu.

3.5.5 View Version

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

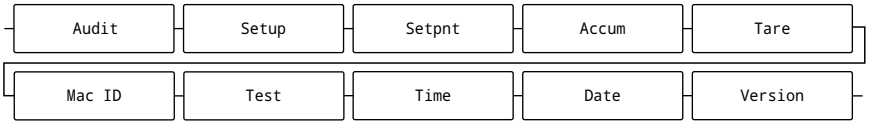


Figure 3-10. Version Parameter Menu Path

1. Navigate to **Audit** ► **...** ► **Version**.
2. Press GROSS NET B/N. The software version number displays.
3. Press MENU to exit the menu.

3.5.6 Reset Configuration

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

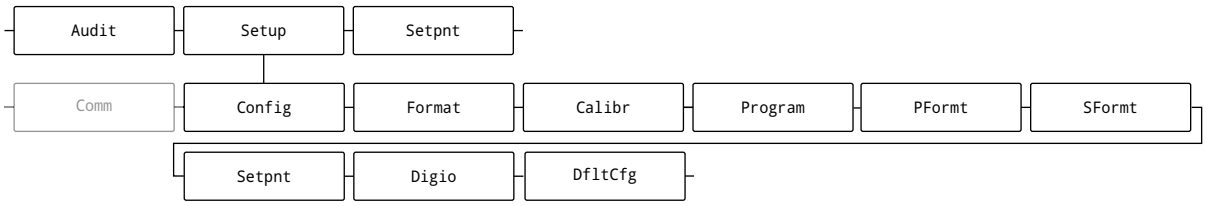


Figure 3-11. DfltCfg Parameter Menu Path

1. Navigate to **Audit** ► **Setup** ▼ **Config** ► **...** ► **DfltCfg**.
2. Press GROSS NET B/N. **No** displays.
3. Press PRINT. **Yes** displays.
4. Press GROSS NET B/N or TARE to reset the configuration setting. **OK** displays.
5. Press MENU to exit the menu.

3.5.7 Change Brightness Intensity

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

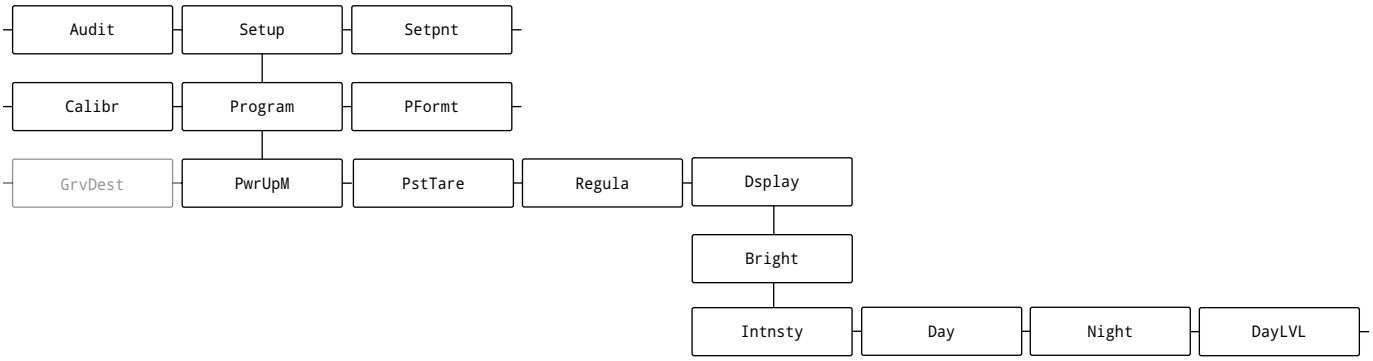


Figure 3-12. Color Parameter Menu Path

1. Navigate to **Audit** ► **Setup** ▼ **Config** ► **...** ► **Program** ▼ **PwrUpM** ► **...** ► **Dsplay** ▼ **Bright**.
2. Press GROSS NET B/N. Intnsty displays.
3. Press TARE. The currently configured parameter displays.
4. Press UNITS or PRINT 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 4.3.4 on page 50.

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

3.5.8 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 2.8.2 on page 25).

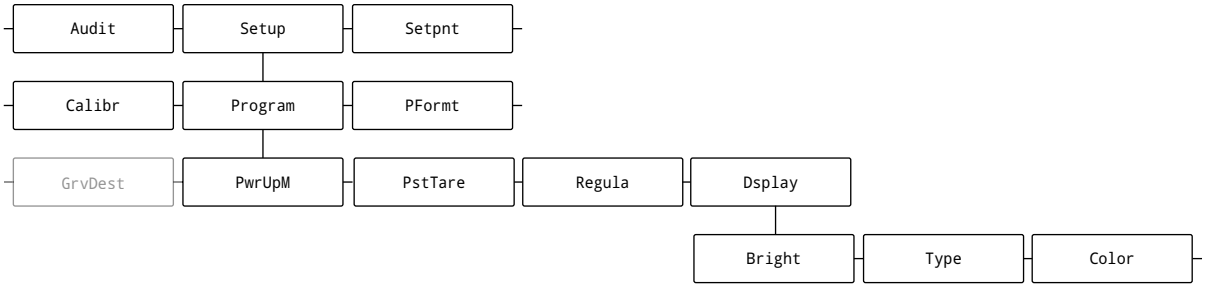


Figure 3-13. Color Parameter Menu Path

1. Navigate to **Audit ► Setup ▼ Config ► ... ► Program ▼ PwrUpM ► ... ► Dsplay ▼ Bright ► ... ► Color**.
2. Press GROSS NET B/N. The configured color displays.
3. Press UNITS or PRINT repeatedly until desired color is selected.
4. Press TARE. **Bright** displays.
5. Press MENU to exit the menu.

3.5.9 Enter New Unit ID

If more than one LaserLight3 is in use a different Unit ID may be required. Select **UID** (Unit ID) in the Program menu to assign the an identification value.

NOTE: Entering a new Unit ID requires access to Setup mode (Section 2.8.2 on page 25).

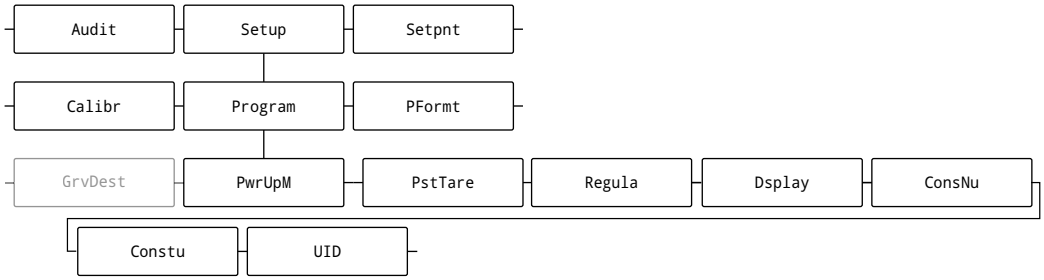


Figure 3-14. UID Parameter Menu Path

1. Navigate to **Audit ► Setup ▼ Config ► ... ► Program ▼ PwrUpM ► ... ► UID**.
2. Press GROSS NET B/N. The current unit ID value displays.
3. Edit the value using arrow keys.
4. Press TARE to accept the new value.
5. Press MENU to exit the menu.

3.6 Indicator Functions

This section provides procedures for basic indicator operations.

3.6.1 Zero Scale

1. In *Gross* mode, remove all weight from the scale and wait for the LaserLight3 to display ◺◿.
2. Press ZERO, >0< displays to indicate the LaserLight3 is zeroed.

NOTE: The LaserLight3 must be stable and within the configured zero range for it to be zeroed.

3.6.2 Print Ticket

1. Wait for ◺◿ to display.
2. Press PRINT to send data to the configured port(s). The default print destination is RS-232 Port 1.

If ◺◿ does not display and PRINT is pressed, the print action only occurs if the LaserLight3 comes out of motion within three seconds. If the LaserLight3 stays in motion for over three seconds, the PRINT press is ignored.

3.6.3 Toggle Units

Press UNITS to toggle between primary and secondary units.

3.6.4 Toggle Gross/Net Mode

NET mode is available when a tare value has been entered or acquired (Net = Gross minus Tare). If tare has not been entered or acquired, the display remains in *GROSS* mode. GR (GROSS) or NT (NET) is indicated on the right side (in Standard Display Type configurations) or along the bottom (in Legacy Display Type) of the display to indicate the current mode.

Press GROSS NET B/N to toggle the display mode between *GR (Gross)* and *NT (NET)* modes.

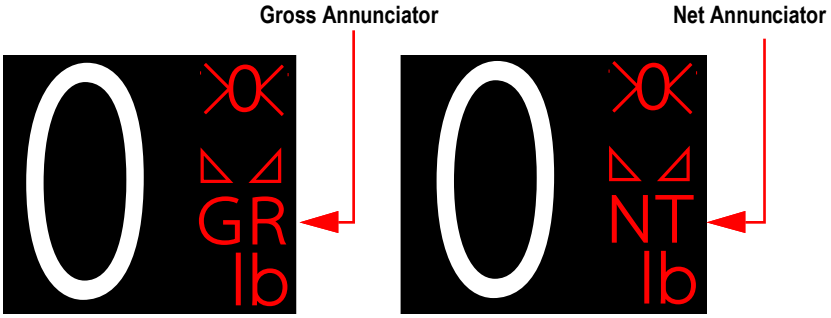


Figure 3-15. Gross and Net Annunciators

3.6.5 Acquire Tare

1. Place a container on the scale and wait for ◺◿ to display.
2. Press TARE to acquire the tare weight of the container. The net weight displays and the NT (Net) is indicated on the right side of the display.

3.6.6 Remove Stored Tare Value

1. Remove all weight from the scale and wait for ◺◿ to display. The display shows a negative net value or 0 Gross value and >0< displays.

NOTE: Press ZERO to zero the scale, if >0< is not displayed.

2. Press TARE (or ZERO in ***OIML*** mode). Tare is removed and the display changes to gross weight and Gross is indicated on the display.

3.6.7 Preset Tare (Keyed Tare)

Tare Function (Section 4.3.1 on page 46) must be set to Keyed Tare or Both for the preset tare feature to function.

1. Remove all weight from the scale and wait for ◺◿ and >0< to display.
2. With the LaserLight3 displaying zero weight, use the numeric keypad to enter the tare weight value and press TARE.
3. The display changes to net weight and NT (Net) is indicated on the display.

NOTE: Press TARE again while ◺◿ displays, or enter a keyed tare of zero to remove the preset tare value.

3.6.8 Display a Stored Tare

Select **DispTar** (Display Tare) in the Tare menu to display a stored tare.

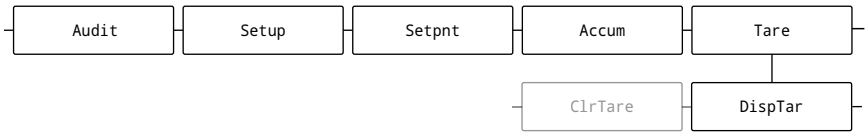


Figure 3-16. DispTar Parameter Menu Path

1. Navigate to **Audit ► ... ► Tare ▼ DispTar**.
2. Press GROSS NET B/N. The stored tare value displays.
3. Press MENU to exit the menu.

NOTE: If there is not a tare in the system, the value displayed is zero.

3.6.9 Clear a Stored Tare

Select **ClrTare** (Clear Tare) in the Tare menu to clear a stored tare without the weight being at zero.

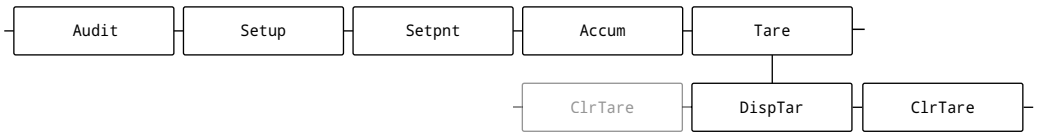


Figure 3-17. ClrTare Parameter Menu Path

1. Navigate to **Audit ► ... ► Tare ▼ DispTar ► ClrTar.**
2. Press GROSS NET B/N or TARE to clear the stored tare value. OK displays.
3. Press MENU to exit the menu.

3.6.10 View Legally Relevant Version

Select **LRV** (Legally Relevant Version) in the Audit menu to view the legally relevant version.

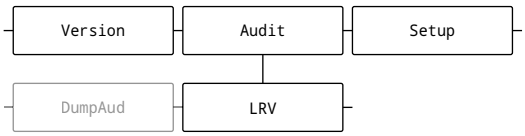


Figure 3-18. LRV Parameter Menu Path

1. Navigate to **Audit ▼ LRV.**
2. Press GROSS NET B/N. The current version number displays.
3. Press MENU to exit the menu.

3.6.11 View Audit Trail Calibration Counter

Select **Calibr** (Calibration Counter) in the Audit menu to view the audit trail calibration counter number.

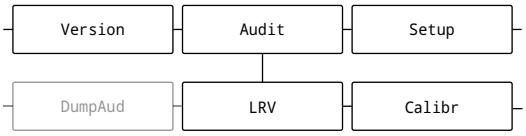


Figure 3-19. Calibr Parameter Menu Path

The audit trail calibration and configuration counters can be viewed in *Menu* mode.

1. Navigate to **Audit ▼ LRV ► Calibr**.
2. Press GROSS NET B/N. The audit trail calibration counter number displays.
3. Press MENU to exit the menu.

3.6.12 View Audit Trail Counter

Select **Config** (Configuration Counter) in the Audit menu to view the audit trail configuration counter number.

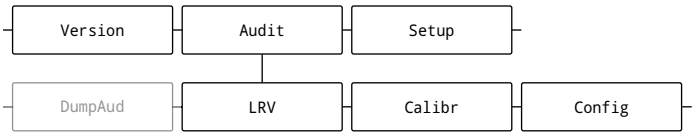


Figure 3-20. Config Parameter Menu Path

The audit trail calibration and configuration counters can be viewed in *Menu* mode.

1. Navigate to **Audit ▼ LRV ► ... ► Config**.
2. Press GROSS NET B/N. The audit trail configuration counter number displays.
3. Press MENU to exit the menu.

3.6.13 Display Accumulator

Select **DispAcm** (Display Accumulator) in the Accum menu to display the accumulator.

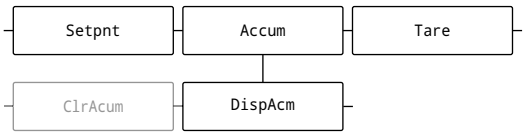


Figure 3-21. DispAcm Parameter Menu Path

1. Navigate to **Audit** ► **...** ► **Accum** ▼ **DispAcm**.
2. Press GROSS NET B/N. The accumulator value displays.
3. Press MENU to exit the menu.

3.6.14 Print Accumulator

Select **PrtAcum** (Print Accumulator) in the Accum menu to print the accumulator value.

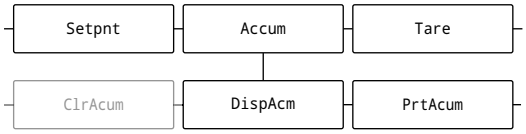


Figure 3-22. PortAcum Parameter Menu Path

1. Navigate to **Audit** ► **...** ► **Accum** ▼ **DispAcm** ► **PrtAcum**.
2. Press TARE to print the accumulator value. **OK** displays.
3. Press MENU to exit the menu.

3.6.15 Clear Accumulator

Select **ClrAcum** (Clear Accumulator) in the Accum menu to clear the accumulator value.

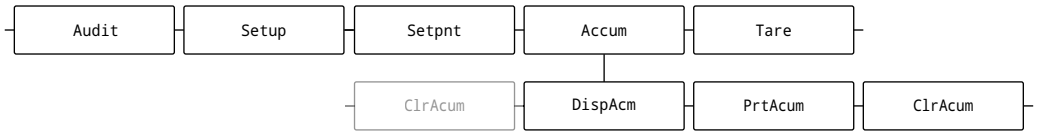


Figure 3-23. ClrAcum Parameter Menu Path

1. Navigate to **Audit** ► **...** ► **Accum** ▼ **DispAcm** ► **...** ► **ClrAcum**.
2. Press GROSS NET B/N or TARE to clear the accumulator value. **OK** displays.
3. Press MENU to exit the menu.

3.6.16 View Configured Setpoint Values

Select **Setpnt** (Setpoint) in the top-level menu to view setpoint values.

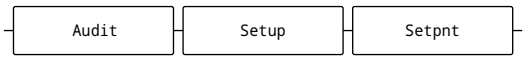


Figure 3-24. Setpnt Parameter Menu Path

1. Navigate to **Audit** ► **...** ► **Setpnt**.
2. Press GROSS NET B/N. The lowest configured setpoint number displays (e.g. **Setpnt1**).
3. Press UNITS or PRINT to navigate to the desired setpoint number (1-8).

NOTE: Only configured setpoint numbers display. See Section 4.3.7 on page 57 for the complete setpoint menu.

4. Press GROSS NET B/N. Value displays.
5. Press GROSS NET B/N again to view the current configured setpoint value.

NOTE: Displayed setpoints are editable by default, since Access defaults to On. Change Access settings if Setpoint value needs to be read only (Access = Off) or hidden (Access = Hidden).

6. Use arrow keys to edit the setpoint.
7. Press TARE to accept the new value.

Press MENU to exit the menu.

4.0 Configuration

There are two types of configuration parameters in the LaserLight3, *Setup* mode parameters (or Legal for Trade configuration) and *Menu* mode parameters (or non-legal configuration). *Setup* mode parameters are accessed by enabling the Audit Jumper or shorting the Setup jumper (Section 2.8.2 on page 25). *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 2.8.2).

4.1 Main Menu

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

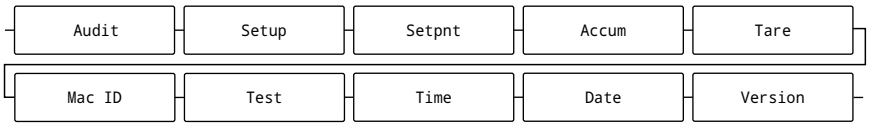


Figure 4-1. Main Menu

Menu	Description
Audit	See Section 4.2 on page 45 for menu structure and parameter descriptions of the Audit menu
Setup	See Section 4.3 on page 45 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
Setpnt (Setpoint)	Displays the setpoint value of configured setpoints; Read only unless access parameter for the setpoint is set to ON; menu is empty if no setpoints are configured; setpoints are fully configurable in the setup menu while the indicator is in *Setup* mode
Accum (Accumulator)	Displays, prints and clears accumulated weight value; see Section 4.4 on page 69
Tare	Displays and clears stored tare value; see Section 4.5 on page 69
MAC ID	Displays Ethernet and Wi-Fi (if installed) MAC ID addresses; see Section 4.6 on page 69
Test	Performs various tests; see Section 4.7 on page 69
Time	Displays the current set time; allows the time to be edited using the navigation keys; see Section 4.8 on page 71
Date	Displays the current set date; allows the date to be edited using the navigation keys; see Section 4.9 on page 71
Version	Displays the installed firmware version number (read only); see Section 4.10 on page 71

Table 4-1. Main Menu Descriptions

4.2 Audit Menu

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

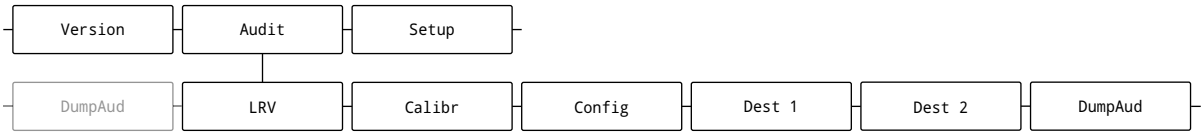


Figure 4-2. Audit Menu

Parameter	Description
LRV (Legally Relevant Version)	Legally relevant firmware version number (read only)
Calibr (Counter Calibration)	Displays total number of calibration events (read only)
Config (Configuration Counter)	Displays total number of configuration events (read only)
Dest 1 (Destination Port 1)	Destination Port 1 – Audit trail port; *Settings:* ***RS232 1*** *(default), RS232 2,* RS485, TCPC, TCPS, USB, NONE
Dest 2 (Destination Port 2)	Destination Port 2 – Audit trail port; *Settings:* ***NONE*** *(default), RS232 1,* RS232 2, RS485, TCPC, TCPS, USB
DumpAud (Dump Audit)	Sends the audit parameters to the configured audit destination ports (Section 4.3.5 on page 55)

Table 4-2. Audit Menu Descriptions

4.3 Setup Menu

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

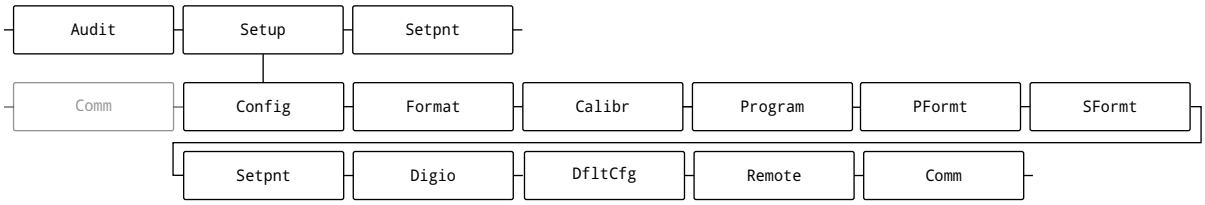


Figure 4-3. Setup Menu

Menu	Description
Config (Configuration)	See Section 4.3.1 on page 46 for menu structure and parameter descriptions of the Configuration menu
Format (Scale Format)	See Section 4.3.2 on page 48 for menu structure and parameter descriptions of the Scale Format menu
Calibr (Calibration)	See Section 4.3.3 on page 49 for menu structure and parameter descriptions of the Calibration menu
Program	See Section 4.3.4 on page 50 for menu structure and parameter descriptions of the Program menu
PFormt (Print Format)	See Section 4.3.5 on page 55 for menu structure and parameter descriptions of the Print Format menu
SFormt (Stream Format)	See Section 4.3.6 on page 56 for menu structure and parameter descriptions of the Stream Format menu
Setpnt (Setpoint)	See Section 4.3.7 on page 57 for menu structure and parameter descriptions of the Setpoint menu
Digio (Digital Inputs and Outputs)	See Section 4.3.8 on page 61 for menu structure and parameter descriptions of the Digital I/O menu
DfltCFG (Default Configuration)	See Section 3.5.6 on page 37 for instructions to reset the configuration settings
Remote	See Section 4.3.9 on page 62 for menu structure and parameter descriptions of the Remote menu
Comm (Communication)	See Section 4.3.10 on page 64 for menu structure and parameter descriptions of the Communications menu

Table 4-3. Setup Menu Descriptions

NOTE: The Setup Menu's first option changes depending on when it is accessed during a single Setup Mode session. The first instance that Setup Menu is accessed, Config displays as the first option. Subsequent times Setup Menu is accessed, without exiting Setup Mode, changes Comm to the first option and Config to the second option.

4.3.1 Configuration Menu

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

NOTE: Not used for remote display configurations.

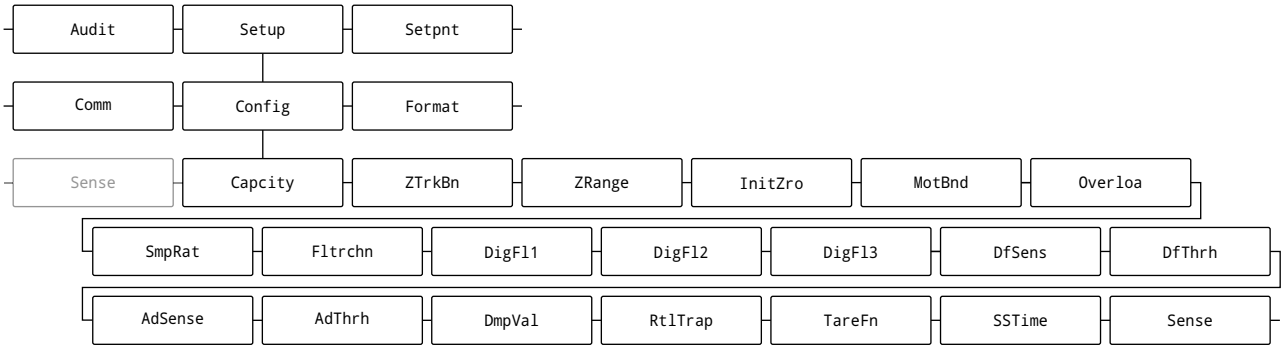


Figure 4-4. Configuration Menu

Menu	Description
Capcity (Capacity)	Maximum rated capacity of the scale; *Enter value: 0.0000001–9999999.0,* ***10000.0*** *(default)*
ZrkBn (Zero Track Band)	Automatically zeros the scale when within the range specified, as long as the input is within the Zero Range (%) and scale is at standstill; When weight is within the zero band, the center of zero annunciator displays; Max legal value depends on local regulations; Specify the zero tracking band in ± display divisions; *Enter value: 0.0–100.0,* ***0.0*** *(default)*
ZRange (Zero Range (%))	The total amount the scale can be zeroed; Zero range represents a percentage of capacity; The default value of 1.9 represents ±1.9% around the calibrated zero point, for a total range of 3.8%; A value of 0.0 prevents zeroing; Maximum legal value depends on local regulations; *Enter value: 0.0–100.0,* ***1.9*** *(default)*
InitZro (Initial Zero Range (%))	When the indicator is turned on and the weight value is between the ± percent range specified by Calibrated Zero, the indicator automatically zeros off the weight; *Enter value: 0.0–100.0,* ***0.0*** *(default)*
MotBnd (Motion Band)	Sets the level, in display divisions, at which scale motion is detected; If motion is not detected for the time defined by Standstill Time, the standstill symbol lights; Some operations, including print, tare and zero, require the scale to be at standstill; Maximum legal value varies depending on local regulations; If this parameter is set to 0, the standstill annunciator is always lit and operations requiring standstill are performed regardless of scale motion; If 0 is selected, Zero Track Band must also be set to 0; *Enter value: 0–100,* ***1*** *(default)*
Overloa (Overload)	Determines the point at which the display blanks and the overload error message displays (^^^^^^^); Maximum legal value varies depending on local regulations; *Settings: FS (Full Scale),* ***FS+2%*** *(Full Scale+2%) (default), FS+1D (Full Scale + 1D), FS+9D (Full Scale + 9D)*
SmpRat (Sample Rate)	Selects measurement rate, in samples per second, of the analog-to-digital converter; Lower sample rate values provide greater signal noise immunity; *Settings: 6.25HZ, 7.5HZ, 12.5HZ, 15HZ, 25HZ,* ***30HZ*** *(default), 50HZ, 60HZ, 100HZ, 120HZ*
FltrChn (Filter Chain Type)	Sets the filter type to be used; *Settings:* ***AvgOnly*** *(Average Only) (default)* – Digital Rolling Average Filter (*Section 7.1 on page 95*); Uses Digital Filter Stage 1-3, Digital Filter Sensitivity and Digital Filter Threshold *ADOnly (Adaptive Only)* – Adaptive Filter (*Section 7.2 on page 97*); Uses Adaptive Filter Sensitivity and Adaptive Filter Threshold *DmpOnly (Damping Only)* – Damping Filter (*Section 7.3 on page 97*); Uses Damping Value *Raw* – No filtering
DigFl1-3 (Digital Filter Stage 1-3)	Sets the digital filtering rate used to reduce the effects of environmental influences from the immediate area of the scale; Settings indicate the number of A/D conversions per update which are averaged to obtain the displayed reading; a higher number gives a more accurate display by minimizing the effect of a few noisy readings, but slows down the response time of the indicator; *Settings: 1, 2,* ***4*** *(default), 8, 16, 32, 64, 128, 256*
DfSens (Digital Filter Sensitivity)	Specifies the number of consecutive A/D readings which fall outside the Filter Threshold before filtering is suspended; *Settings:* ***2OUT*** *(default), 4OUT, 8OUT, 16OUT, 32OUT, 64OUT, 128OUT*
DfThrh (Digital Filter Threshold)	Sets a threshold value, in display divisions; when a number of consecutive A/D readings (Digital Filter Sensitivity) falls outside of this threshold value (when compared to the output of the filter), filtering is suspended and the A/D value is sent straight through the filter; Filtering is not suspended if the threshold is set to NONE; *Settings:* ***NONE*** *(default), 2D, 5D, 10D, 20D, 50D, 100D, 200D, 250D*

Table 4-4. Configuration Menu Descriptions

Menu	Description
AdSense (Adaptive Filter Sensitivity)	Controls the stability and response time of the scale; *Settings:* ***Light*** *(default)* – Fastest response to small weight changes, but less stable *Medium* – Has a quicker response time than heavy, but more stable than light *Heavy* – Results in an output which is more stable but settles slowly; small changes in weight data (a few grads) on the scale base are not seen quickly
AdThrh (Adaptive Filter Threshold)	Sets the adaptive filter weight threshold value (in display divisions); a weight change exceeding the threshold resets the filtered values; must be set above the noise disturbances in the system (if set to zero, the filter is disabled); *Enter value: 0–2000,* ***10*** *(default)*
DmpVal (Damping Value)	Sets the damping time constant (in 0.1 sec intervals); *Enter value: 1–2560,* ***10*** *(default)*
RtlTrap (RattleTrap)	Enables RattleTrap filtering; Effective at eliminating vibration effects, environmental influences and mechanical interference from nearby machinery, may increase response time over standard digital filtering; *Settings:* ***Off*** *(default), On*
TareFn (Tare Function)	Enables or disables push-button and keyed tare; *Settings:* ***Both*** *(default)* – Both push button and keyed tares are enabled *No Tare* – No tare allowed (gross mode only) *PB Tare (Push Button Tare)* – Push button tares enabled *Keyed* (Keyed Tare) – Keyed tares enabled
SSTime (Standstill Time)	Specifies the length of time the scale must be out of motion, before the scale is considered to be at standstill (in 0.1 sec intervals); *Enter value: 0–600,* ***10*** *(default)*
Sense	Specifies the type of load cell cable connected to the J1 connector (Section 2.6 on page 17); this parameter must be set correctly to match the actual load cell cable connection to ensure the load cell functions properly with the indicator; *Settings:* ***4-WIRE*** *(default), 6-WIRE*

Table 4-4. Configuration Menu Descriptions (Continued)

4.3.2 Format Menu

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

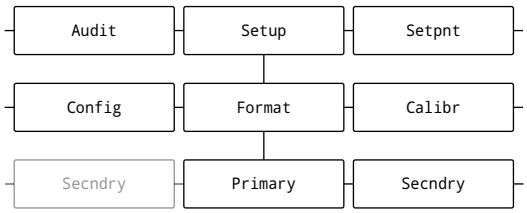


Figure 4-5. Format Menu

Parameter	Description
Primary	Scale format and units settings for the Primary format; Sub-Parameters: Format – Sets the decimal point and the display divisions for the Primary display weight format; *Settings:* ***8888881*** *(Primary default), 8888882, 8888885, 8888810, 8888820, 8888850, 8888100, 8888200, 8888500, 88.88881, 88.88882, 88.88885, 888.8881, 888.8882, 888.8885, 8888.881, 8888.882, 8888.885, 88888.81, 88888.82, 88888.85, 888888.1, 888888.2, 888888.5* For example, select *8888.885* if a count by of 0.005 is needed or select *8888820* if a count by of 20 is needed (the *8*s serve as placeholders and show a breakdown of how digits will display); Units – Sets the units type; *Settings:* ***LB*** *(Primary default), KG, OZ, TN, T, G, NONE*
Secndry (Secondary)	Scale format and units settings for the Secondary format; Sub-Parameters: Format – Sets the decimal point and the display divisions for the Secondary display weight format; *Settings: 8888881, 8888882, 8888885, 8888810, 8888820, 8888850, 8888100, 8888200, 8888500, 88.88881, 88.88882, 88.88885, 888.8881, 888.8882, 888.8885, 8888.881, 8888.882, 8888.885, 88888.81, 88888.82, 88888.85, 888888.1, 888888.2,* ***888888.5*** *(Secondary default)* For example, select *8888.885* if a count by of 0.005 is needed or select *8888820* if a count by of 20 is needed (the *8*s serve as placeholders and show a breakdown of how digits will display); Units – Sets the units type; *Settings: LB,* ***KG*** *(Secondary), OZ, TN, T, G, NONE* Enabled – Enables the front panel UNITS button to toggle between the Primary, Secondary formats; Only displays under Secondary; *Settings:* ***ON*** *(Secondary default)*

Table 4-5. Scale Format Menu Parameters

4.3.3 Calibration Menu

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

NOTE: Not used for remote display configurations.

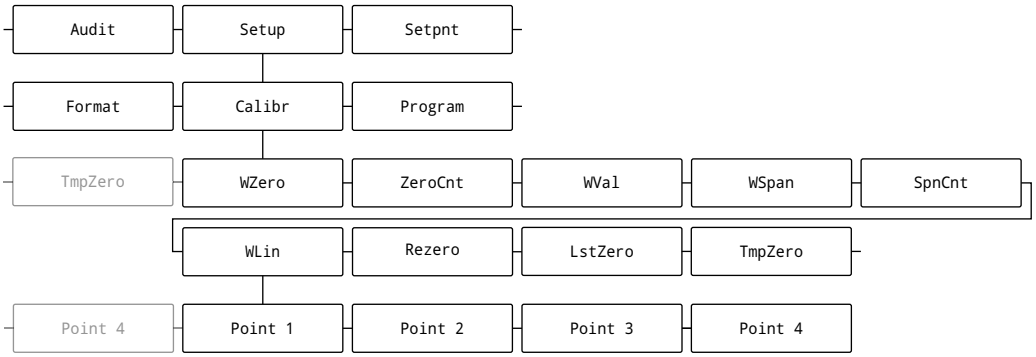


Figure 4-6. Calibration Menu

Parameter	Description
WZero (Zero Calibration)	Executes the zero calibration process (Section 6.1 on page 92)
ZeroCnt (Zero Counts)	Displays the raw count value at the zero weight; A zero calibration generates this raw count value; Manually changing this count value changes the zero weight and negates the zero calibration
WVal (Test Weight)	Sets the test weight value for the span calibration (Section 6.1 on page 92); Enter value: 0.*000001–9999999.999999,* ***10000.0*** *(default)*
WSpan (Span Calibration)	Executes the span calibration process (Section 6.1.1 on page 92)
SpnCnt (Span Counts)	Displays the raw count value at the span weight; A span calibration generates the raw count value; Manually changing this count value changes the span weight and negates the span calibration
WLin (Linear Calibration)	Linear or multi-point calibration is performed by entering up to four additional calibration points (Section 6.1.2 on page 93); Points 1-4 have the following sub-parameters: WLin V# (Linear Point # Weight) – Sets the test weight value for the linear calibration point WLin C# (Calibrate Linear Point #) – Executes the linear calibration process for the point; generates the raw count value for the test weight value for Point # WLin F# (Linear Point # Counts) – Displays the raw count value at the linear point weight; A linear calibration generates this raw count value; Manually changing this count value changes the linear point weight and negates the linear calibration for the point
Rezero	Removes an offset value from the zero and span calibrations (Section 6.2.3 on page 93)
LstZero (Last Zero)	Takes last push button zero in the system (from *Weigh* mode) and uses it as the new zero reference point, after which a new span calibration must be performed; this calibration cannot be performed when calibrating a scale for the first time (Section 6.2.1 on page 93)
TmpZero (Temp Zero)	Temporarily zeros the displayed weight of a non-empty scale, after a span calibration was performed; The difference between the temporary zero and the previously calibrated zero value is used as an offset (Section 6.2.2 on page 93)

Table 4-6. Calibration Menu Parameter

4.3.4 Program Menu

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

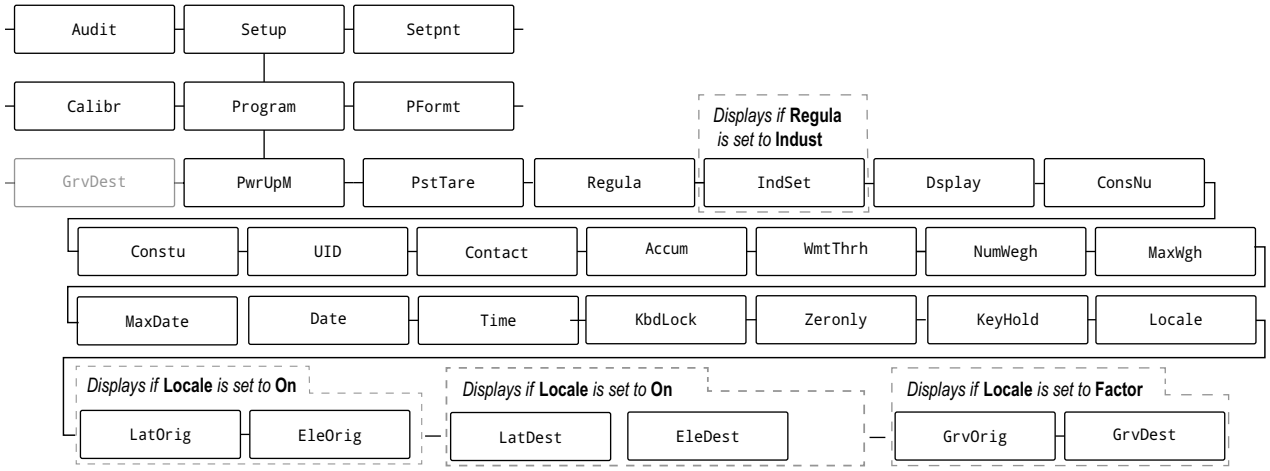


Figure 4-7. Program Menu

Parameter	Description
PwrUpM (Power Up Mode)	When the indicator is turned on, it performs a display test, then enters a warm up period; *Settings:* ***GO** (default)* – Performs display test, then enters *Weigh* mode after brief warm up period *DELAY* – Performs display test, then enters a warm up period of 30 seconds • If no motion is detected during warm up period, indicator enters *Weigh* mode when warm up period ends • If motion is detected, the 30 second timer is reset and the warm up period is repeated
PstTare (Persistent Tare)	Tare persists through a power cycle; Settings: Off (default), On
Regula (Regulatory Mode)	Specifies the regulatory agency having jurisdiction over the scale site; the value specified for this parameter affects the function of the front panel tare and zero keys; *Settings: **NTEP** (default), OIML, Canada (Measurement Canada), Indust (Industrial), None* OIML, NTEP and Measurement Canada modes allow a tare to be acquired at a weight greater than zero; None allows tares to be acquired at any weight value OIML, NTEP and Measurement Canada modes allow a tare to be cleared only if the gross weight is at no load; None allows tares to be cleared at any weight value NTEP and OIML modes allow a new tare to be acquired even if a tare is already present; In Measurement Canada mode, the previous tare must be cleared before a new tare can be acquired None, NTEP and Measurement Canada modes allow the scale to be zeroed in either gross or net mode as long as the current weight is within the specified Zero Range (%); In OIML mode, the scale must be in gross mode before it can be zeroed; pressing the ZERO key in net mode clears the tare Industrial provides a set of sub-parameters to allow customization of tare, clear and print functions in non-Legal for Trade scale installations
IndSet	Displays when Regulatory Mode parameter is set to Industrial; See Section 4.3.4.1 on page 53
Dsplay (Display Type)	Changes how information is presented on the display with three parameters. 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: *Day* – 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; *Settings: 1, 2, 3, **4** (default), 5, 6* *Night* – 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*; Settings: 1, 2, 3, **4** (default), 5, 6*

Table 4-7. Program Menu Parameters

Parameter	Description
Dsplay (Display Type) - Continued	*DayLVL* – DYLVL 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; *Settings: 1, 2, 3, **4** (default), 5, 6, 7, 8, 9, 10* *Intnsty* – 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); *Settings: 1, 2, 3, 4, 5, 6 (default), DayLVL* Type sets a predefined arrangement of information on the display; *Settings:* ***Standard*** (default) – sets display with about 5 in weight digits with annunciators stacked on the right side *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 5.5 on page 86* and *Section 5.6 on page 90*) *Cardnal* – Sets LaserLight3 as remote display and replicates Cardinal display for Message Board and Score Board formats (see Section 13.9 on page 145) Color configures the color the display uses for characters. Settings; **Red** (default), Yellow, Green, Blue, Magenta, Cyan or White
ConsNu (Consecutive Number)	Allows sequential numbering for print operations; the value is incremented following each print operation which includes <CN> in the ticket format; *Enter value: 0–9999999, **0** (default)*
Constu (Consecutive Number Start)	Specifies the initial consecutive number value used when the consecutive number is reset by sending Clear Consecutive Number digital input; *Enter value: 0–9999999, **0** (default)*
UID (Unit ID)	Specifies the unit identification with an alphanumeric value; *Enter characters: Up to 8 alphanumeric characters, **1** (default)*
Contact	Contact Information; See Section 4.3.4.2 on page 54
Accum (Accumulator)	Accumulation can be toggled On/Off; if On, accumulation occurs on print operation; if Off, an accumulation does not occur; *Settings: **Off** (default), On*
WmtThrh (Weighment Threshold)	When the weight falls below the value set, the accumulator is rearmed; *Enter value: 0.0–9999999.0, **1000.0** (default)*
NumWegh (Number of Weighments)	Displays the total number of weighments (read only)
MaxWgh (Maximum Weight)	Displays the maximum weight/weighment allowed (read only)
MaxDate (Date of Maximum Weight)	Displays the date and time the maximum weight/weighment occurred (read only)
Date	Allows setting of the date format and date separator character Format – *Settings: **MMDDYY** (default), DDMMYY, YYMMDD, YYDDMM* Date Separator – *Settings: **Slash** (default), Dash, Semi, Dot*
Time	Allows setting of the time format and the separator character Format – *Settings: **12HOUR** (default), 24HOUR* Time Separator – *Settings: **Colon** (default), Comma, Dot*
KbdLock	Keyboard lock, disables keyboard except for the menu and power key. *Settings: **Off** (default), On*
Zeronly	Disables keyboard except for the zero, menu and power keys. *Settings: **Off** (default), On*
KeyHold	Allows setting of the key hold time and interval Key Hold Time – How long a key needs to be held before a key hold action is initiated (in tenths of a second); 20 equals 2 seconds; *Enter value: 10–50, **20** (default)* Key Hold 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); *Enter value: 1–100, **2** (default)*
Locale	Enables location gravity compensation; *Settings:* ***Off** (default)* – gravity compensation disabled *On* – calculates gravity compensation using the origin and destination latitudes and elevations *Factor* – uses origin and destination gravity factors to find gravity compensation
LatOrig (Origin Latitude)	Origin latitude (to nearest degree) for gravity compensation; displays when Locale parameter is set to On; *Enter value: 0–90, **45** (default)*
EleOrig (Origin Elevation)	Origin elevation (in meters) for gravity compensation; displays when Locale parameter is set to On; *Enter value: -9999–9999, **345** (default)*

Table 4-7. Program Menu Parameters (Continued)

Parameter	Description
LatDest (Destination Latitude)	Destination latitude (to nearest degree) for gravity compensation; displays when Locale parameter is set to On; *Enter value: 0–90, **45** (default)*
EleDest (Destination Elevation)	Destination elevation (in meters) for gravity compensation; displays when Locale parameter is set to On; *Enter value: -9999–9999, **345** (default)*
GrvOrig (Origin Gravity)	Origin gravity factor (in m/s^2) for gravity compensation; displays when Locale parameter is set to Factor; *Enter value: 9.00000–9.99999, **9.80665** (default)*
GrvDest (Destination Gravity)	Destination gravity factor (in m/s^2) for gravity compensation; displays when Locale parameter is set to Factor; *Enter value: 9.00000–9.99999, **9.80665** (default)*

Table 4-7. Program Menu Parameters (Continued)

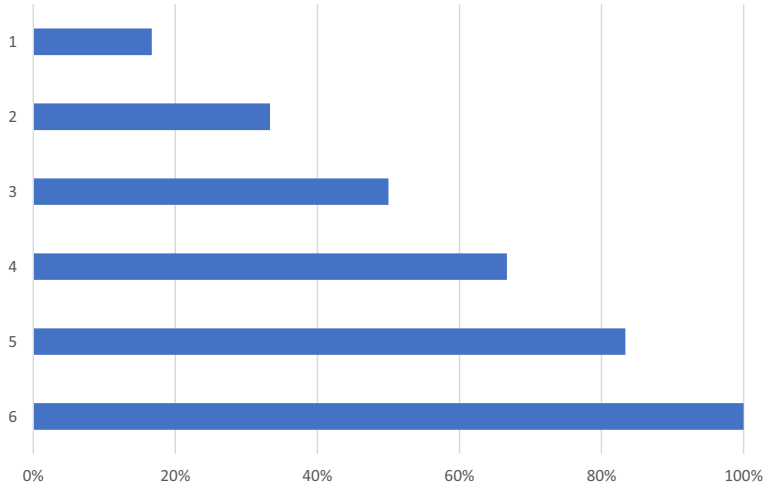


Figure 4-8. Day and Night Brightness

4.3.4.1 Industrial Settings Menu

This section provides a flow chart and descriptions for the Industrial Settings menu. The Industrial Settings menu only displays if the Regula (Regulatory Mode) parameter is set to IndSet (Industrial).

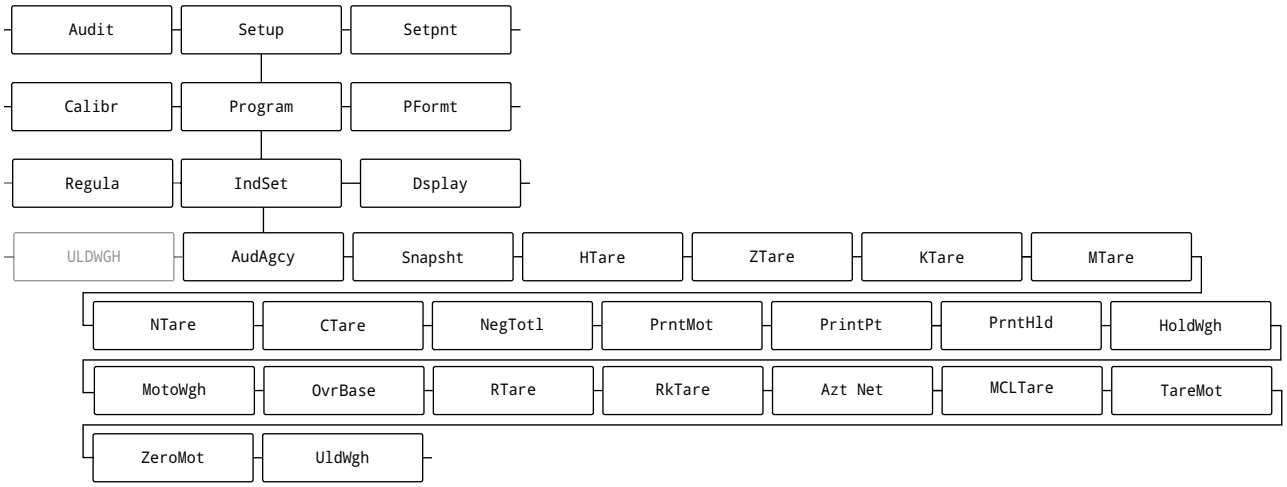


Figure 4-9. Industrial Settings Menu

Parameter	Description
AudAgcy (Audit Agency)	Audit trail display agency format; *Settings:* ***NTEP*** *(default), Measurement Canada, None, OIML*
Snapsht (Snapshot)	Display or scale weight source; *Settings:* ***DISPLAY*** *(default), SCALE*
HTare (Display Hold Tare)	Allow tare in display hold; *Settings:* ***No*** *(default), Yes*
ZTare (Remove Tare on Zero)	Remove tare on zero; *Settings:* ***No*** *(default), Yes*
KTare (Allow Keyed Tare)	Always allow keyed tare; *Settings:* ***Yes*** *(default), No*
MTare (Multiple Tare Action)	Replaces existing tare when the tare key is pressed; *Settings*: ***Replace*** *(default), Remove, Nothing*
NTare (Allow Negative Tare)	Allow negative or zero tare; *Settings:* ***No*** *(default), Yes*
CTare (Allow Clear Tare Key)	Allow clear key to clear tare or accumulator when displayed; *Settings:* ***Yes*** *(default), No*
NegTotl (Negative Total)	Allow total scale to display negative value; *Settings:* ***No*** *(default), Yes*
PrntMot (Allow Print in Motion)	Allow print while in motion; *Settings:* ***No*** *(default), Yes*
PrntPt (Add PT to Keyed Tare Print)	Add preset tare (PT) to keyed tare print; *Settings:* ***Yes*** *(default), No*
PrntHld (Print Display Hold)	Print during display hold; *Settings:* ***No*** *(default),* Yes
HoldWgh (Weighment Display Hold)	Allow weighment during display hold; *Settings:* ***NO*** *(default), Yes*
MotoWgh (Weighment in Motion)	Allow weighment in motion; *Settings:* ***No*** *(default), Yes*
OvrBase (Zero Base for Overload)	Zero base for overload calculation; *Settings*: ***Calibrated Zero*** *(default), Captured Scale Zero*
RTare (Round Button Tare)	Round pushbutton tare to the nearest display division; *Settings:* ***NO*** *(default), Yes*
RKTare (Round Keyed Tare)	Round keyed tare to the nearest display division; *Settings:* ***No*** *(default), Yes*
Azt Net (Auto-Zero Tracking on Net Zero)	Perform auto zero tracking on net zero; *Settings:* ***No*** *(default), Yes*
MCLTare (Manual Clear Tare)	Allow manual clearing of the tare value; *Settings:* ***Yes*** *(default), No*
TareMot (Tare in Motion)	Allow tare in motion; *Settings:* ***No*** *(default), Yes*
ZeroMot (Zero in Motion)	Allow scale to be zeroed while in motion; *Settings:* ***No*** *(default), Yes*
UldWgh (Underload Weight)	Underload weight value in display divisions; *Enter value: 1–9999999,* ***20*** *(default)*

Table 4-8. Industrial Settings Menu Parameters

4.3.4.2 Contact Information Menu

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

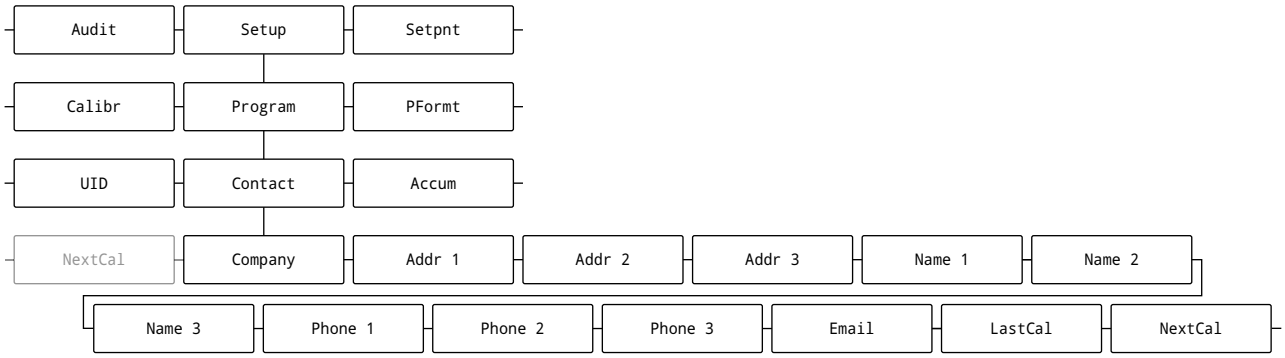


Figure 4-10. Contact Information Menu

Parameter	Description
Company	Contact company name; *Enter characters: Alphanumeric entry up to 30 characters*
Addr 1-3 (Address 1-3)	Contact company address lines; *Enter characters: Alphanumeric entry up to 20 characters (for each line)*
Name 1-3	Contact names; *Enter characters: Alphanumeric entry up to 30 characters (for each line)*
Phone 1-3	Contact phone numbers; *Enter characters: Alphanumeric entry up to 20 characters (for each line)*
Email	Contact email address; *Enter characters: Alphanumeric entry up to 40 characters*
LastCal (Last Calibration)	Last calibration date; *Enter value: 8-digit number (MMDDYYYY)*
NextCal (Next Calibration)	Next calibration date; *Enter value: 8-digit number (MMDDYYYY)*

Table 4-9. Contact Information Menu Parameters

4.3.5 Print Format Menu

This section provides a flow chart and descriptions for the PFormt (Print Format) menu.

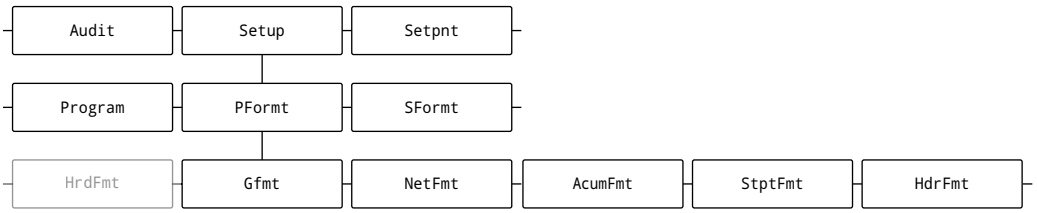


Figure 4-11. Print Format Menu

Parameter	Description
Gfmt (Gross Format)	Gross demand print format string Format – *Enter characters: Alphanumeric entry up to 1,000 characters, GROSS<G><NL2><TD><NL> (default)* Dest 1-2 (Destination Port 1-2) – Destination ports; *Settings:* ***RS-232 Port 1*** *(Port 1 default), RS-232 Port 2, 20MA, RS-485, TCP Client 1, TCP Server, USB, WiFi, None (Port 2 default)*
NetFmt (Net Format)	Net demand print format string Format – *Enter characters: Alphanumeric entry up to 1,000 characters, GROSS<G><NL>TARE<SP><T><NL>NET<SP2><N><NL2><TD><NL> (default)* Dest 1-2 (Destination Port 1-2) – Destination ports; *Settings:* ***RS-232 Port 1*** *(Port 1 default), RS-232 Port 2, RS-485, 20MA, TCP Client 1, TCP Server, USB, WiFi, None (Port 2 default)*
AcumFmt (Accumulator Format)	Accumulator print format string Format – *Enter characters: Alphanumeric entry up to 1,000 characters, ACCUM <A><NL><DA> <TI><NL> (default)* Dest 1-2 (Destination Port 1-2) – Destination ports; *Settings:* ***RS-232 Port 1*** *(Port 1 default), RS-232 Port 2, 20MA, RS-485, TCP Client 1, TCP Server, USB, WiFi, None (Port 2 default)*
StptFmt (Setpoint Format)	Setpoint print format string Format – *Enter characters: Alphanumeric entry up to 1,000 characters, <SCV><SP><SPM><NL> (default)* Dest 1-2 (Destination Port 1-2) – Destination ports; *Settings:* ***RS-232 Port 1*** *(Port 1 default), RS-232 Port 2, RS-485, 20MA, TCP Client 1, TCP Server, USB, WiFi, None (Port 2 default)*
HdrFmt (Header Format)	Ticket header format strings HdrFmt1 (Header Format 1) – Header 1 Format String; *Enter characters: Alphanumeric entry up to 1,000 characters, COMPANY NAME<NL>STREET ADDRESS<NL>CITY, ST ZIP<NL2> (default)* HdrFmt2 (Header Format 2) – Header 2 Format String; *Enter characters: Alphanumeric entry up to 1,000 characters, COMPANY NAME<NL>STREET ADDRESS<NL>CITY, ST ZIP<NL2> (default)*

Table 4-10. Print Format Menu Parameters

4.3.6 Stream Format Menu

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

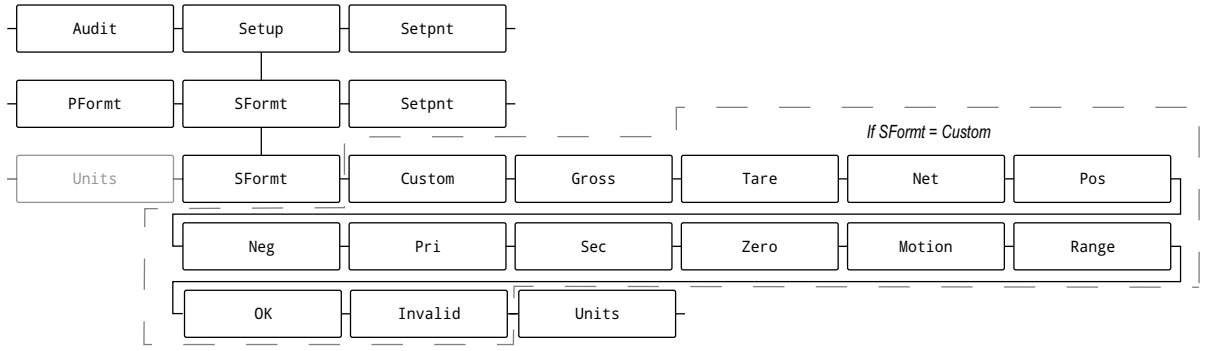


Figure 4-12. Stream Format Menu

Parameter	Description
SFormt (Stream Format)	Specifies the stream format used for streaming output of scale data or specifies the expected input for a serial scale; *Settings:* ***RLWS*** *(default)* – Rice Lake Weighing Systems stream format (Section 13.8.2 on page 141) *Cardinal* – Cardinal stream format (Section 13.8.3 on page 141) *Weigh-Tronix* – Avery Weigh-Tronix stream format (Section 13.8.4 on page 142) *Toledo* – Mettler Toledo stream format (Section 13.8.5 on page 142) *Custom* – Custom stream format
Custom	Specifies the custom stream format; only displays if SFORMT is set to CUSTOM; see Section 13.8.6 on page 143 for available stream format tokens; *Enter characters: Alphanumeric entry up to 1,000 characters*
Gross	Mode token when streaming the gross weight; *Enter characters: Alphanumeric entry up to 8 characters,* ***G*** *(default)*
Tare	Mode token when streaming the tare weight; *Enter characters: Alphanumeric entry up to 8 characters,* ***T*** *(default)*
Net	Mode token when streaming the net weight; *Enter characters: Alphanumeric entry up to 8 characters,* ***N*** *(default)*
Pos (Positive)	Polarity token when the weight is positive; *Settings:* ***Space*** *(default), None, +*
Neg (Negative)	Polarity token when the weight is negative; *Settings: Space, None,* ***–*** *(default)*
Sec (Secondary)	Units token when streaming secondary units; *Enter characters: Alphanumeric entry up to 8 characters,* ***K*** *(default)*
Pri (Primary)	Units token when streaming primary units; *Enter characters: Alphanumeric entry up to 8 characters,* ***L*** *(default)*
Zero	Status token when the weight is at center of zero; *Enter characters: Alphanumeric entry up to 2 characters,* ***Z*** *(default)*
Motion	Status token when the weight is in motion; *Enter characters: Alphanumeric entry up to 2 characters,* ***M*** *(default)*
Range (Out of Range)	Status token when the weight is out of range; *Enter characters: 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); *Enter characters: Alphanumeric entry up to 2 characters (default is a space)*
Invalid	Status token when streaming an invalid weight; *Enter characters: 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; *Settings:* ***Dynamic*** *(default), Static*

Table 4-11. Stream Format Menu Parameters

4.3.7 Setpoint Menu

The following sections provide flow charts and descriptions for the Setpoint menu.

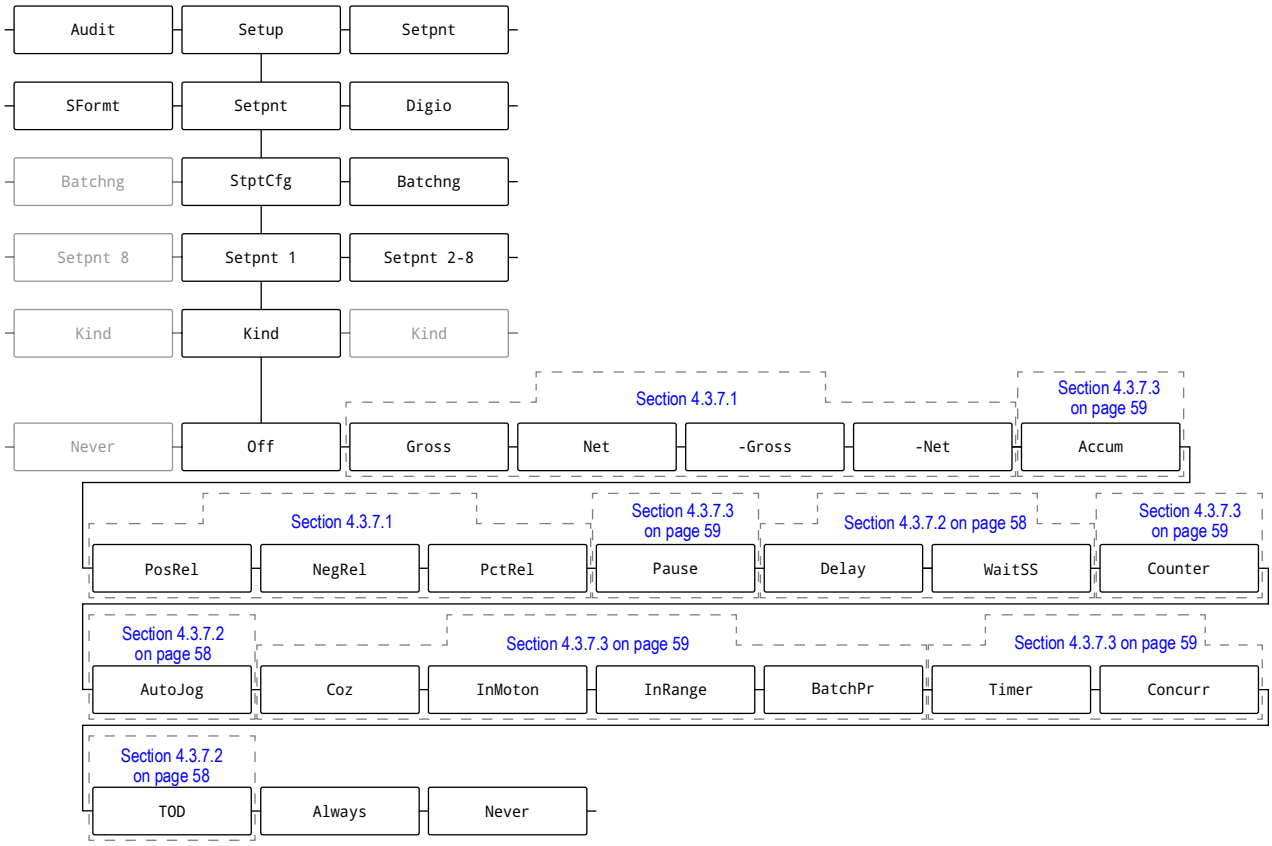


Figure 4-13. Setpoint Menu

Parameter	Description
StptCfg (Setpoint Configuration)	Access to configuration parameters and settings for up to eight setpoints; *Settings: Setpoint 1-8* *Kind* – Setpoint Kind; *Settings:* ***Off*** *(default), Gross, Net, -Gross (Negative Gross), -Net (Negative Net), Accum (Accumulate), PosRel (Positive Relative), NegRel (Negative Relative), PctRel (Percent Relative), Pause, Delay, WaitSS (Wait Standstill), Counter, AutoJog, Coz (Center of Zero), InMoton (In Motion), InRange, BatchPr (Batch in Process), Timer, Concurr (Concurrent), TOD (Time Of Day), Always, Never, Off*
Batchng (Batching)	Batch sequence runs when set to Auto or Manual; *Settings:* ***Off*** *(default)* *Auto – Allows the batch sequence to repeat automatically once it has been started* *Manual – Requires a Batch Start input/command to run the batch sequence*

Table 4-12. Setpoints Menu Parameters

4.3.7.1 If Kind = Gross, Net, Negative Gross, Negative Net, Positive Relative, Negative Relative, Percent Relative

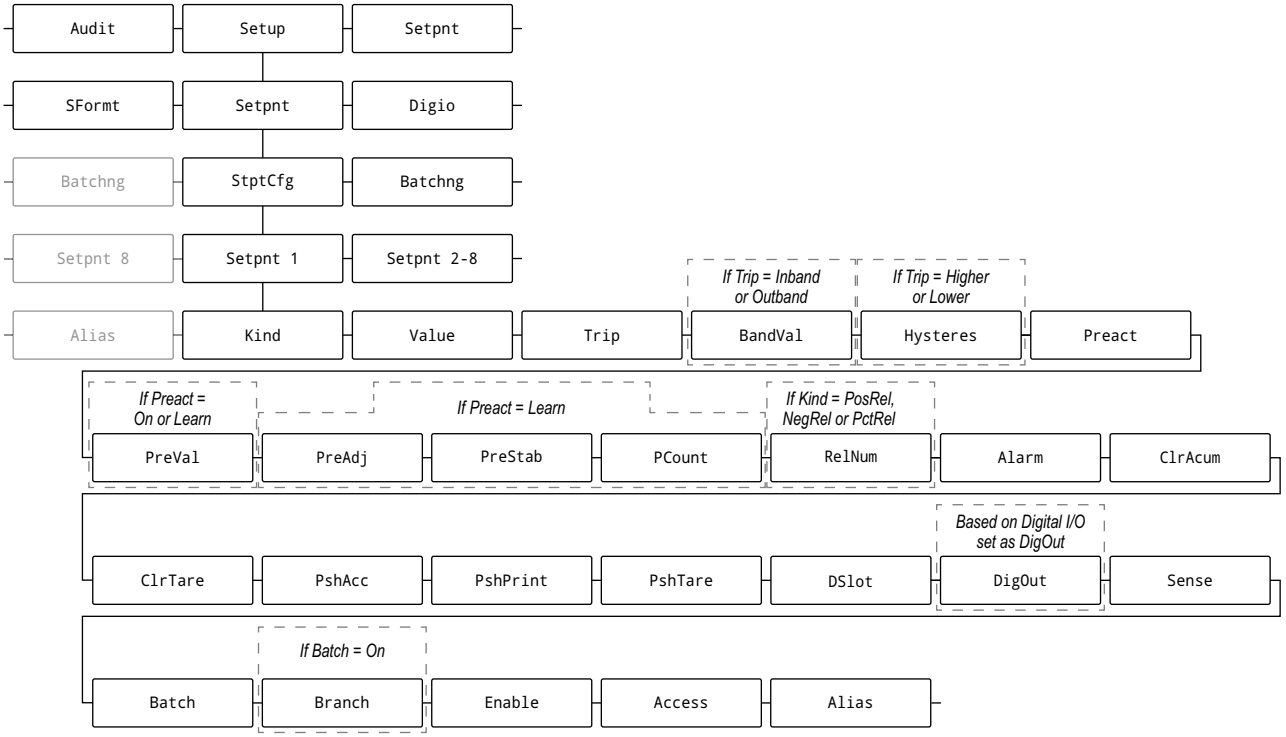


Figure 4-14. Setpoints Parameter Group A

4.3.7.2 If Kind = Accumulate, Delay, Wait Standstill, Auto-Jog, Time Of Day

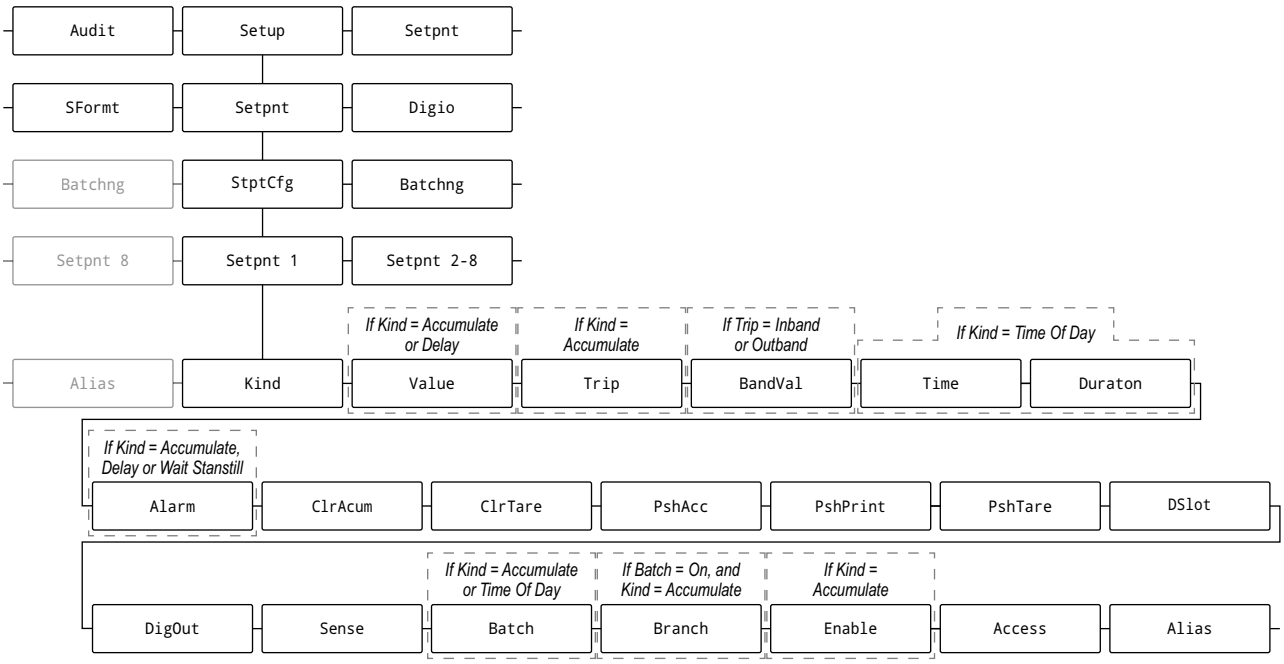


Figure 4-15. Setpoints Parameter Group B

4.3.7.3 If Kind = Pause, Counter, Center of Zero, In Motion, In Range, Batch in Process, Timer, Concurrent

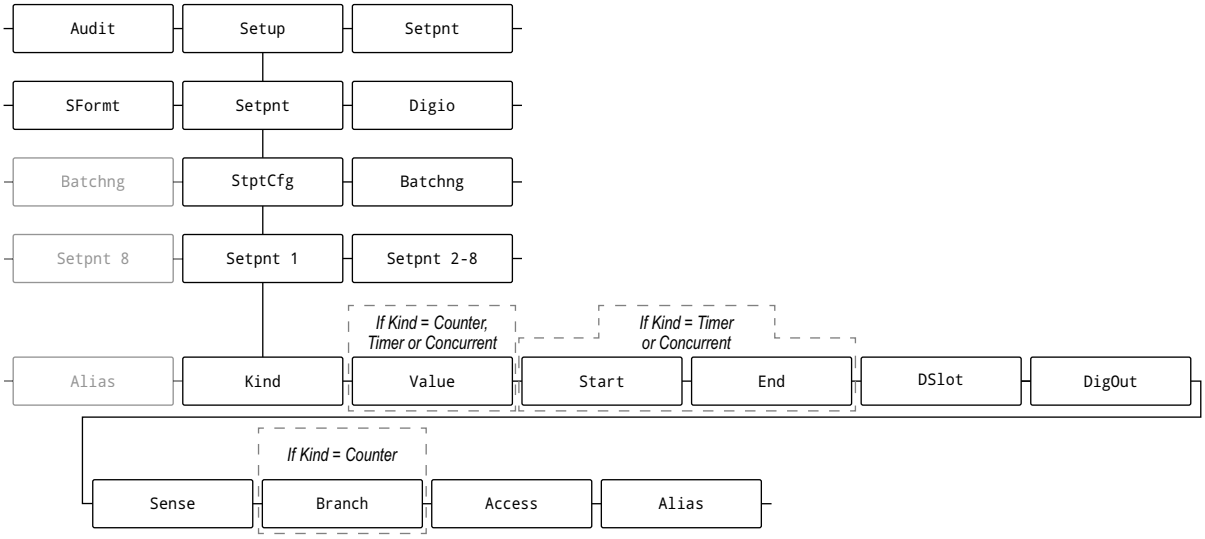


Figure 4-16. Setpoints Parameter Group C

Parameter	Description
Value	For weight-based setpoints: *Enter value: 0.0–9999999.0,* ***0.0*** *(default)* For time-based setpoints: *Enter value: 0.0–65535.0,* ***0.0*** *(default)* For Counter setpoints: *Enter value: 0.0–65535.0,* ***0.0*** *(default)*
Trip	Specifies whether the setpoint is satisfied when the weight is higher or lower than the setpoint value, within a band established around the value, or outside of the band; in a batch sequence with Trip = Higher, the associated digital output is active until the setpoint value is reached or exceeded; with Trip = Lower, the output is active until the weight goes below the setpoint value; *Settings:* ***Higher*** *(default), Lower, Inband, Outband*
BandVal (Band Value)	For setpoints with Trip = Inband or Outband, specifies a weight equal to half the band width; The band established around the setpoint value is Value ± Band Value; *Enter value: 0.0–9999999.0,* ***0.0*** *(default)*
Hysteres (Hysteresis)	Specifies a band around the setpoint value which must be exceeded before the setpoint, once off, can trip on again; *Enter value: 0.0–9999999.0,* ***0.0*** *(default)*
Preact	Allows the digital output associated with a setpoint to shut off before the setpoint is satisfied to allow for material in suspension; *Settings:* ***Off*** *(default)* *On* – Adjusts setpoint trip value up or down (depending on the Trip parameter setting) from setpoint value using a fixed value specified on the Preact Value parameter *Learn* – Can be used to automatically adjust the Preact value after each batch; it compares the actual weight at standstill to the target setpoint value and adjusts the Preact Value by the Preact Adjust (%) value times the difference after each batch
Start	Specifies starting setpoint number; do not specify number of the Timer or Concurrent setpoint itself; Timer or Concurrent setpoint begins when starting setpoint begins; *Enter value: 1–8,* ***1*** *(default)*
End	Specifies ending setpoint number; do not specify number of the Timer or Concurrent setpoint itself; Timer or Concurrent setpoint stops when ending setpoint begins; *Enter value: 1–8,* ***1*** *(default)*
Time	For Time Of Day setpoints, specifies the time at which the setpoint becomes active; the format used to enter the time (12hour or 24hour) is based on the value specified for the Time Format parameter in the Program menu (HHMM); *Enter value:* ***0000*** *(default)*
Duraton (Duration)	For Time Of Day setpoints; specifies the length of time the digital output associated with this setpoint changes state; value is entered in hours, minutes and seconds (HHMMSS); *Enter value:* ***000000*** *(default)*
PreVal (Preact Value)	Specifies the preact value for setpoints with Preact set to On or Learn; depending on the Trip setting specified for the setpoint, the setpoint trip value is adjusted up or down by the Preact Value; *Enter value: 0.0–9999999.0,* ***0.0*** *(default)*
PreAdj (Preact Adjust)	Setpoints with Preact set to Learn, specifies a decimal representation of the percentage of error correction applied (50.0 = 50%, 100.0 = 100%) each time a Preact adjustment is made; *Enter value: 0.0–100.0,* ***50.0*** *(default)*
PreStab (Preact Stability)	Setpoints with Preact set to Learn, specifies the time, in 0.1-sec intervals, to wait for standstill before adjusting the Preact value; setting this parameter to a value greater than zero disables the learn process if standstill is not achieved in the specified interval (in tenths of a second); *Enter value: 0–65535,* ***0*** *(default)*

Table 4-13. Kind Parameter Descriptions

Parameter	Description
PCount (Preact Count)	Setpoints with Preact set to Learn, specifies the number of batches after which the preact value is recalculated; the default value, 1, recalculates the preact value after every batch cycle; *Enter value: 1–65535,* ***1*** *(default)*
RelNum (Relative Setpoint Number)	For relative setpoints, specifies the number of the relative setpoint; *Enter value: 1–8,* ***1*** *(default)* Target weight for this setpoint is determined as follows: Positive Relative setpoints, the value of the relative setpoint plus the value (Value parameter) of the Positive Relative setpoint Negative Relative setpoints, the value of the relative setpoint minus the value of the Negative Relative setpoint Percent Relative setpoints, the percentage (specified on Value parameter of the Percent Relative setpoint) of the target value of the relative setpoint
Alarm	Specify On to display the word Alarm on the primary display while the setpoint is active (batch setpoints) or while the setpoint is not tripped (continuous setpoints); *Settings:* ***Off*** *(default), On*
ClrAcum (Clear Accumulator)	Specify On to clear the accumulator when the setpoint is satisfied; *Settings:* ***Off*** *(default), On*
ClrTare (Clear Tare)	Specify On to clear the tare when the setpoint is satisfied; *Settings:* ***Off*** *(default), On*
PshAcc (Push Accumulator)	Specify On to update the accumulator and perform a print operation when the setpoint is satisfied; specify On Quiet to update the accumulator without printing; *Settings:* ***Off*** *(default), On, On Quiet*
PshPrint (Push Print)	Specify On to perform a print operation when the setpoint is satisfied; specify Wait Standstill to wait for standstill after setpoint is satisfied before printing; *Settings:* ***Off*** *(default), On, Wait Standstill*
PshTare (Push Tare)	Specify On to perform an acquire tare operation when the setpoint is satisfied; *Settings:* ***Off*** *(default), On* ***NOTE: Push Tare acquires the tare regardless of the value specified for the Regulatory Mode parameter in the Program menu.***
DSlot (Digital Output Slot)	Lists all available digital I/O slots; this parameter specifies the slot number of the Digital I/O card referenced by the Digital Output setpoint; *Settings:* ***None*** *(default), 0, 1*
DigOut (Digital Output)	Lists all digital output bit numbers available for the specified Digital Output Slot; this parameter is used to specify the digital output bit associated with this setpoint; use the Digital I/O menu to assign bit function to Output; *Enter value: 1–4,* ***1*** *(default)* ***NOTE: For continuous setpoints, the digital output becomes active (low) when the condition is met; for batch setpoints, the digital output is active until the setpoint condition is met.***
Sense	Specifies whether the value of the digital output associated with this setpoint is inverted when the setpoint is satisfied; *Settings:* ***Normal*** *(default), Invert*
Batch	Specifies whether the setpoint is used as a batch (On) or continuous (Off) setpoint; *Settings:* ***Off*** *(default), On*
Branch	Specifies the setpoint number to which the batch sequence is to branch, if the current setpoint is not satisfied upon initial evaluation (0 = do not branch); *Enter value: 0–8,* ***0*** *(default)*
Enable	Specifies if setpoint parameters display in *Menu* mode; *Settings:* ***On*** *(default), Off*
Access	Specifies the access allowed to setpoint parameters in *Menu* mode; *Settings:* ***On*** *(default)* – Values can be displayed and changed *HIDE* – Values cannot be displayed or changed *OFF* – Values can be displayed but not changed
Alias	Name for the setpoint; *Enter characters: Alphanumeric entry up to 8 characters,* ***SETPT#*** *(default)*

Table 4-13. Kind Parameter Descriptions (Continued)

4.3.8 Digio (Digital I/O) Menu

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

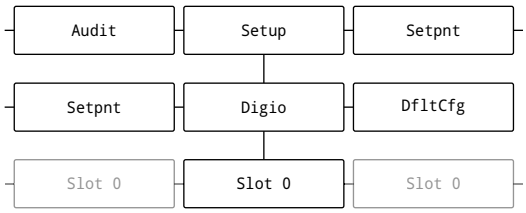


Figure 4-17. Digital I/O Menu

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 4-14. Digio Menu Parameters

4.3.9 Remote Menu

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

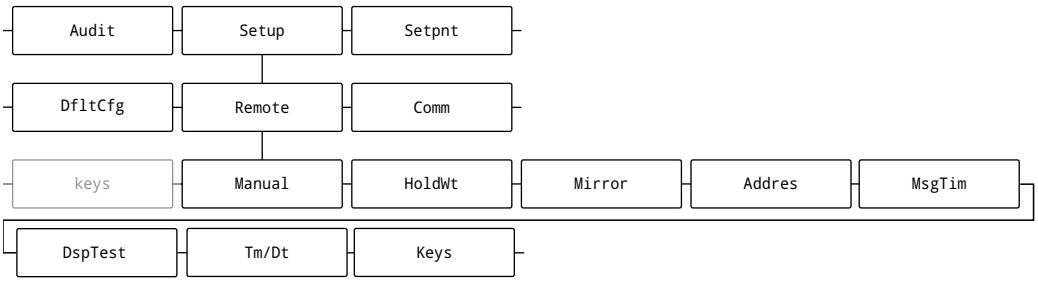


Figure 4-18. Remote Menu

Menu	Description
Manual	Advances to MnLMode (Manual Mode) (see Table 4-15 on page 62)
HoldWt (Hold Weight)	Holds last weight on display; *Settings: On, **Off** (default), Demand* *On* – Holds last weight displayed if communication is lost and prevents remote display from going into an error condition. *Off* – Hold weight function is not used. *Demand* – Holds last weight until a new weight prints.
Mirror	Select On to display LED readout in reverse; The menu is viewed normally; *Settings: On, **Off** (default), Toggle*
Addres (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 5.5.2 on page 88.***
DspTest (Startup Display Test)	Set this parameter On to view the splash screen on start up; *Settings: On, **Off** (default)*
Tm/Dt (Time/Date)	Time and date on displays when weight is zero for increments of five seconds; *Settings: On, **Off** (default)*
Keys	Contains 5 options that can be assigned strings that transmit to the host indicator via the configured RemoteIn 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. *Print* - Defines Print key string. *Settings: 0 to 20 alphanumeric characters, **KPRINT** (default)* *Units* - Defines Units key string. *Settings: 0 to 20 alphanumeric characters, **KUNITS** (default)* *Tare* - Defines Tare key string. *Settings: 0 to 20 alphanumeric characters, **KTARE** (default)* *GR/NT* - Defines Gross/Net key string. *Settings: 0 to 20 alphanumeric characters, **KGROSSNET** (default)* *Zero* - Defines Zero key string. *Settings: 0 to 20 alphanumeric characters, **KZERO** (default)*

Table 4-15. Remote Menu Descriptions

4.3.9.1 Manual Mode Menu

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

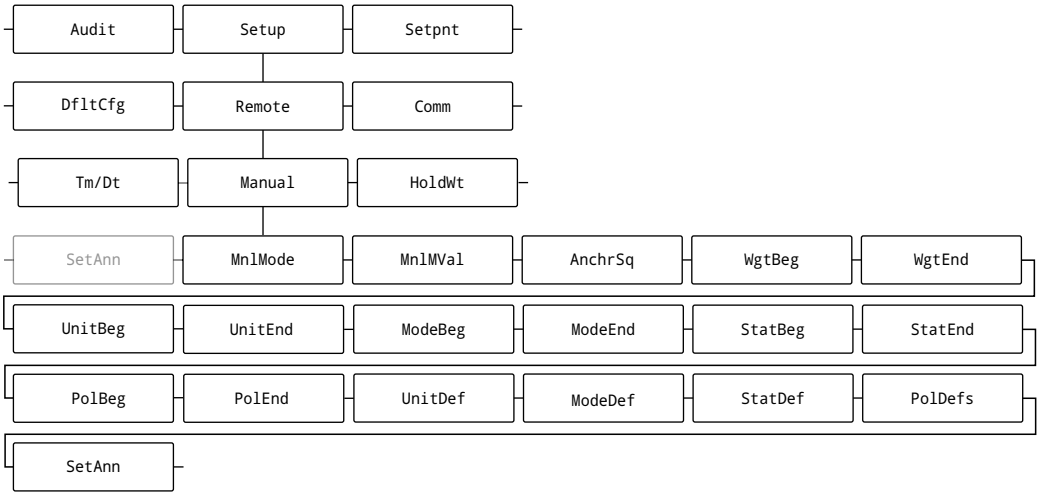


Figure 4-19. Manual Mode Menu

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 TARE ***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: *Lbs* – Defines Status name for Invalid. *Settings: Enter up to eight A-Z characters,* ***L*** *(default)* *Kg* – Defines Status name for Motion. *Settings: Enter up to eight A-Z characters,* ***K*** *(default)* *Tons* – Defines Status name for Overload. *Settings: Enter up to eight A-Z characters,* ***T*** *(default)* *ShortTon* – Defines Status name for Underload. *Settings: Enter up to eight A-Z characters,* ***t*** *(default)* *Ounces* – Defines Status name for Center of Zero. *Settings: Enter up to eight A-Z characters,* ***O*** *(default)* *Grams* – 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: *Gross* – Defines Mode name for Gross. *Settings: Enter up to eight A-Z characters,* ***G*** *(default)* *Net* – 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 4-16. Remote Menu Descriptions

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

Table 4-16. Remote Menu Descriptions (Continued)

4.3.10 Communications Menu

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

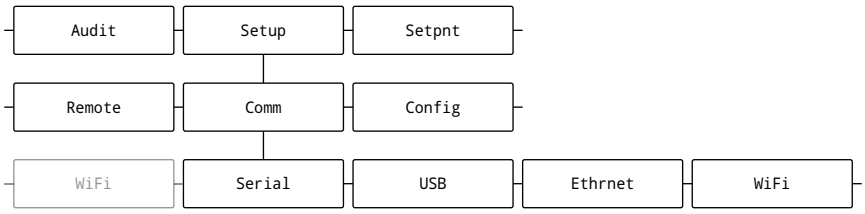


Figure 4-20. Communications Menu

Menu	Description
Serial	RS-232, RS-485/422 or 20 mA serial communications (Section 4.3.10.1 on page 65)
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 4.3.10.2 on page 66)
Ethrnet	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 4.3.10.3 on page 67)
WiFi	Supports Wi-Fi communications (Section 4.3.10.4 on page 68)

Table 4-17. Communications Menu Descriptions

4.3.10.1 Serial Menu

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

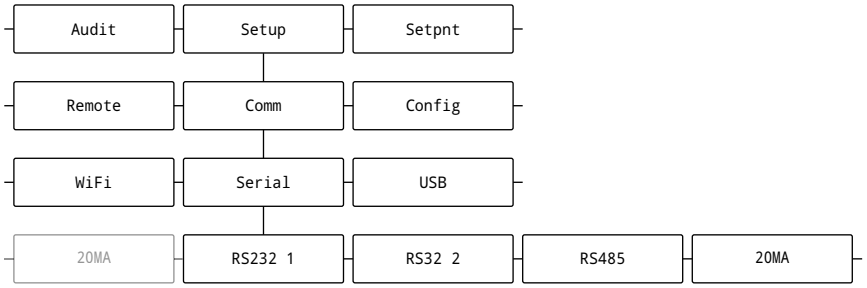


Figure 4-21. Serial Menu

Parameter	Description
RS-232 Port 1-2 RS-485/422 20 mA Current Loop	Configurable parameters for serial communications ports; Sub-Parameters: Trigger – Sets the input trigger type; *Settings:* *RmtIn (Remote In)* – Configures the port to operate as a serial input. This option is used with Remote display configurations. *RmtOut (Remote Out)* – Configures the port to operate as a serial output (similar to an echo), it bypasses processing and sends what is received on the RmtIn port out on the configured port. This is available for multiple ports simultaneously ***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).*** ***CMD*** *(Command) (default)* – Allows operation of EDP commands and printing *StrInd (Stream Industrial)* – Scale data is updated up to configured sample rate; Allows operation of EDP commands and printing *StrLft (Stream Legal for Trade)* – Scale data is updated at configured display update rate; Allows operation of EDP commands and printing Baud – Sets the transmission speed for the port; *Settings: 1200, 2400, 4800,* ***9600*** *(default), 19200, 28800, 38400, 57600, 115200, Auto* Bits – Sets number of data bits transmitted or received by the port and specifies the parity bit to odd, even or none; *Settings:* ***8NONE*** *(default), 8EVEN, 8ODD, 7EVEN, 7ODD* Stop Bits – Sets the number of stop bits transmitted or received by the port; *Settings:* ***1*** *(default), 2* LnTerm (Line Terminator) – Sets the termination character for data sent from the port; *Settings:* ***CR/LF*** *(default), CR* 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); *Enter value: 0–255,* ***0*** *(default)* Echo – Specifies if characters received by the port are echoed back to the sending unit; *Settings:* ***On*** *(default), Off* ***NOTE: When the RmtIn parameter is enabled, the Echo parameter is unavailable.*** Respnse (Response) – Specifies if the port transmits replies to serial commands; *Settings:* ***On*** *(default), Off* RS-485/422 specific parameters: Address – Specifies address used to connect to the port; Must be set to 0 for RS-422; *Enter value: 0–255,* ***0*** *(default)* Duplex – Specifies FULL (4-wire) or HALF (2-wire) duplex used to connect to the port; *Settings:* ***FULL*** *(default), HALF*

Table 4-18. Serial Menu Parameters

4.3.10.2 USB Menu

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

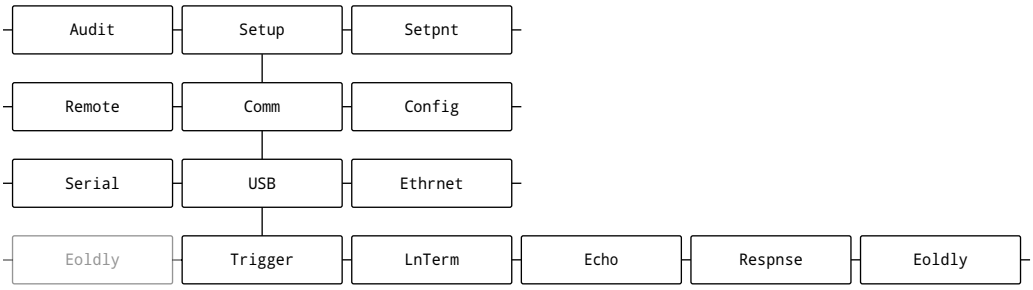


Figure 4-22. USB Menu

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

Table 4-19. USB Menu Parameters

4.3.10.3 Ethernet Menu

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

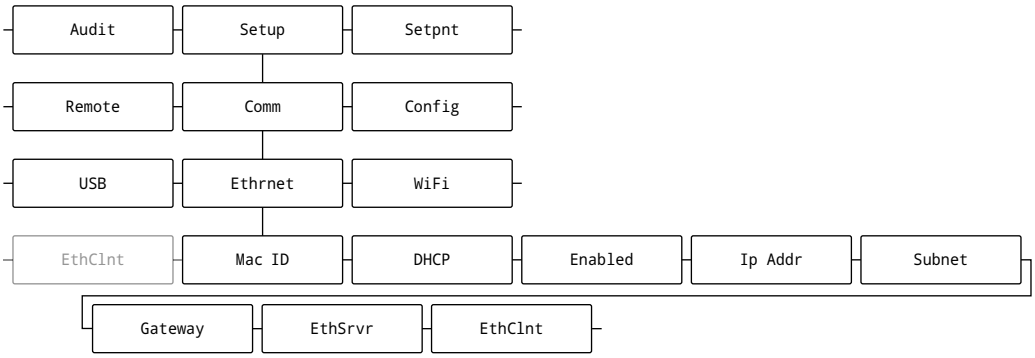


Figure 4-23. Ethernet Menu

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)* LnTerm (Line Terminator) – Sets the termination character for data sent from the port; *Settings:* ***CR/LF*** *(default), CR* Echo – Specifies if characters received by the port are echoed back to the sending unit; *Settings:* ***Off*** *(default), On* Respnse (Response) – Specifies if the port transmits replies to serial commands; *Settings:* ***On*** *(default), Off*
EthClnt (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)* IPAddre (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)* Respnse (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 4-20. Ethernet Menu Parameters

4.3.10.4 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.

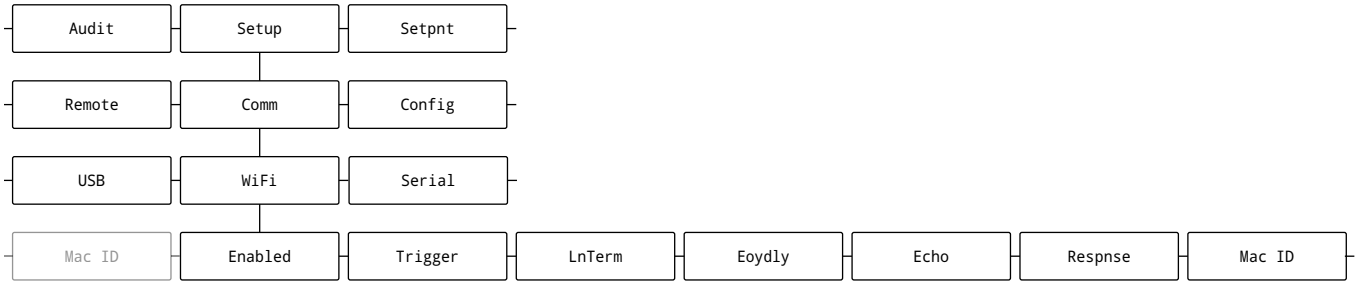


Figure 4-24. WiFi Menu

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

Table 4-21. WiFi Menu Parameters

4.4 Accumulator Menu

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

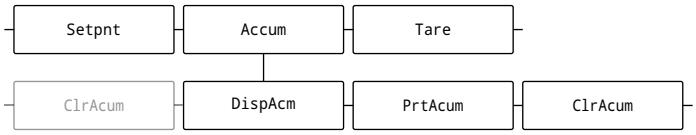


Figure 4-25. Accumulator Menu

Parameter	Description
DispAcm (Display Accumulator)	Displays the accumulator value (read only)
PrtAcum (Print Accumulator)	Prints the accumulator value to specified port, if setup
ClrAcum (Clear Accumulator)	Clears the accumulator value

Table 4-22. Accumulator Menu Parameters

4.5 Tare Menu

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

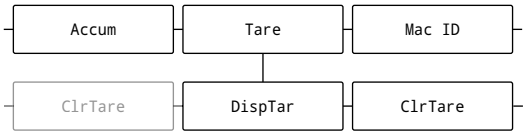


Figure 4-26. Tare Menu

Parameter	Description
DispTar (Display Tare)	Displays the current tare value (read only)
ClrTare (Clear Tare)	Clears the current tare value

Table 4-23. Tare Menu Parameters

4.6 MAC ID

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

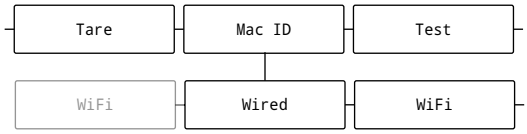


Figure 4-27. MAC ID Date Menu

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 4-24. MAC ID Menu Parameters

4.7 Test Menu

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

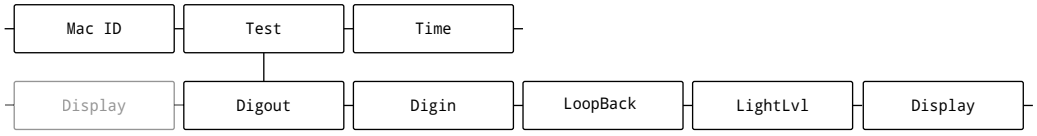


Figure 4-28. Test Menu

Parameter	Description
Digout (Digital Output)	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 ***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.*** ***NOTE: For more information, see Section 12.8.1 on page 133.***
Digin (Digital Input)	Displays a summed decimal representation of all active Digital I/O (J5 on the CPU board) input signals. The range is 0 - 15. **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 **NOTE: For more information, see Section 12.8.2 on page 133.**

Loopbck (Loop-back)	This test provides a loop-back self test for use in diagnosing serial communications errors. The loop-back self test checks the function of the serial port by sending and receiving data to itself. The following connections must have a jumper wire attached during testing:
	• RS-232 1 (J3): TX 1 → RX 1
	• RS-232 2 (J3): TX 2 → RX 2
	• RS-485 (J4):
	  • TX Z → RX B
	  • TX Y → RX A
	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
	NOTE: For more information, see Section 12.8.3 on page 134.

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 4-25. Test Menu Parameters

4.8 Time Menu

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

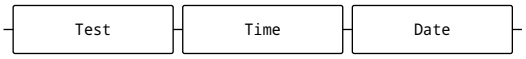


Figure 4-29. Set Time Menu

Parameter	Description
Time	Sets hour, minute and Meridian Indicator.

Table 4-26. Time Menu

4.9 Date Menu

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

Figure 4-30. Date Menu

Parameter	Description
Date	Sets date, month and year

Table 4-27. Set Date Menu Parameters

4.10 Version

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

Figure 4-31. Version Date Menu

Parameter	Description
Software Version	Displays installed software version

Table 4-28. Version Menu Parameters

5.0 Remote Display Configuration

The LaserLight3 Large-Display Weight Indicator can be configured as an indicator (with scale functionality) or a remote display. This section describes how to configure LaserLight3 as a remote display.

NOTE: Configuration occurs, after unpacking (Section 2.1), wiring is complete (Section 2.6), and Setup mode access (Section 2.8.2 on page 25) 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 5.2.2) 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 5.3 on page 76).

5.1 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 4.3.4 on page 50 for definitions).

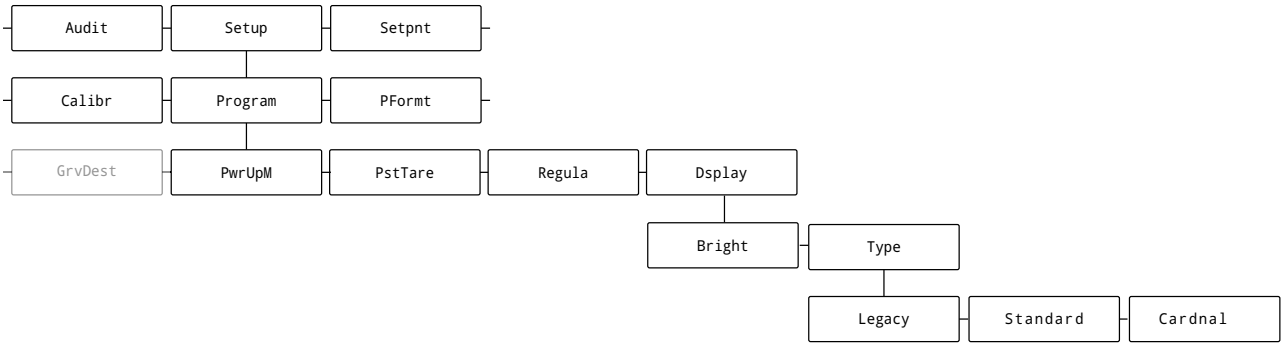


Figure 5-1. Type Parameter Menu Path

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

5.2 Automatic Configuration

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

- Automatic Baud Configuration (Section 5.2.1 on page 73)
- Auto-Learn (Section 5.2.2 on page 74)

5.2.1 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 5-2 displays the menu path to the Baud parameter.

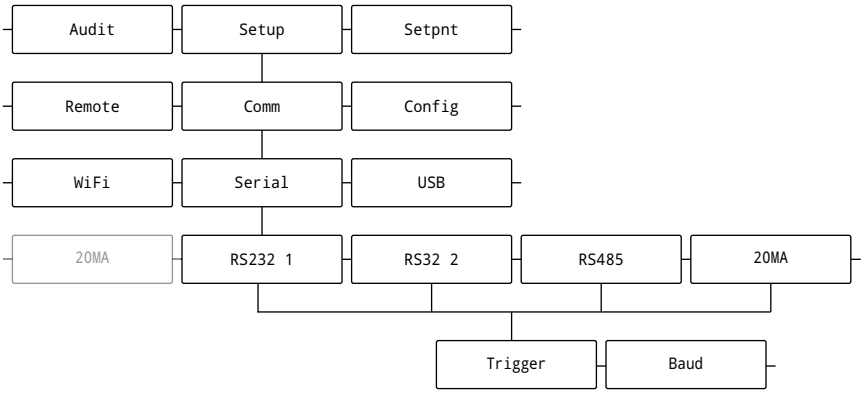


Figure 5-2. Baud Parameter Menu Path

To enable Automatic baud configuration, perform the following :

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

5.2.2 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 13.7 on page 140).

NOTE: Auto-Learn mode may be bypassed by using Manual Mode. For more information about Manual Mode see Section 5.3 on page 76.

Figure 5-3 provides a flow chart that displays each communication protocol Remote In parameter.

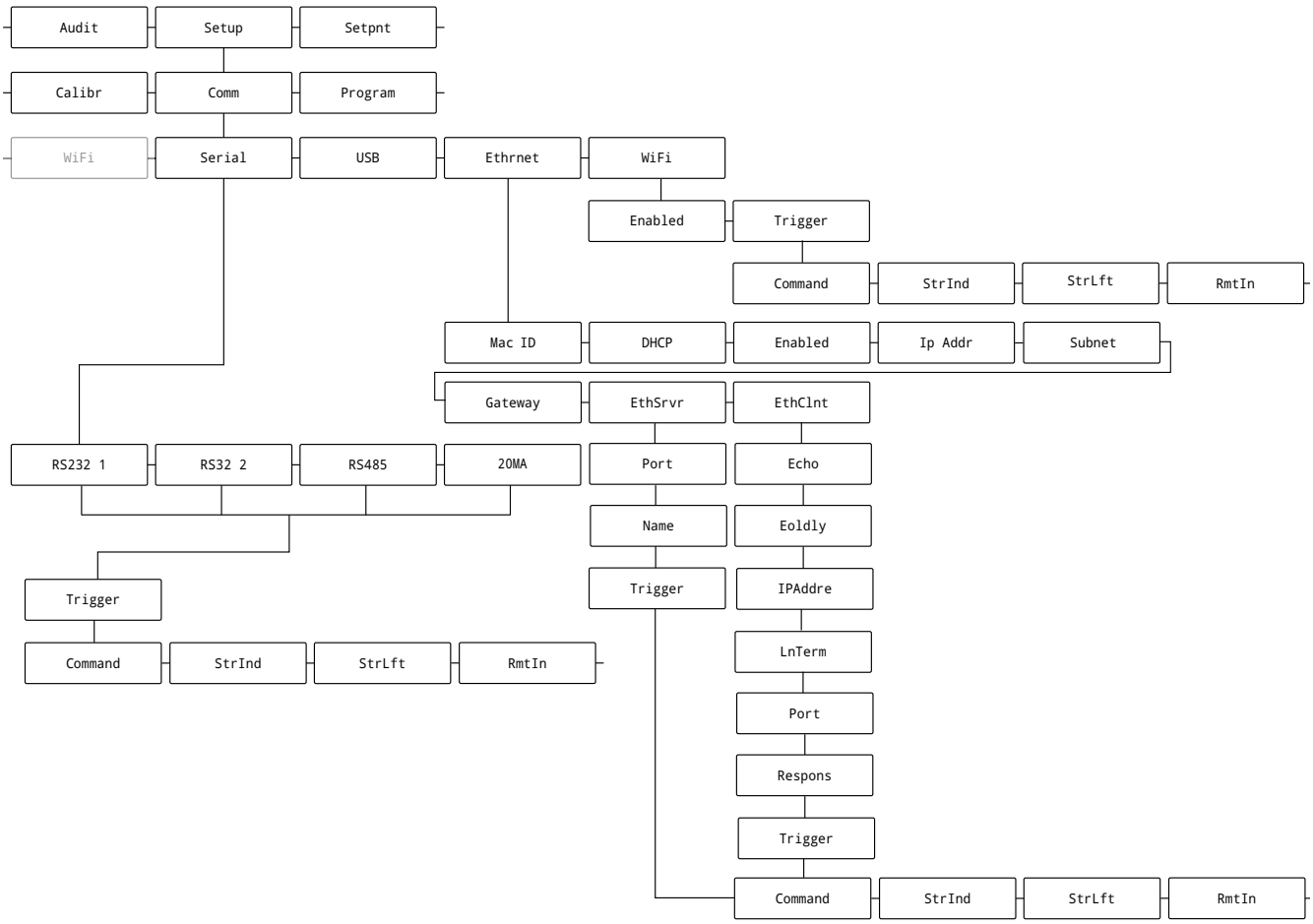


Figure 5-3. Remote In Parameters Menu Paths

If Remote In parameter is enabled, LaserLight3 attempts to learn the incoming data steam 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 13.7 on page 140).

NOTE: Access to Setup mode parameters (see Section 2.8.2 on page 25) 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 **Audit ► Setup ▼ Config ► ... ► Comm ▼ Serial ▼ Communication protocol ▼ Trigger**.
   - For Ethernet Client, navigate to **Audit ► Setup ▼ Config ► ... ► Comm ▼ Serial ► ... ► Ethernet ▼ Mac ID ► ... ► EthClnt ▼ Echo▼ ...▼ Trigger**.
   - For Ethernet Server, navigate to **Audit ► Setup ▼ Config ► ... ► Comm ▼ Serial ► ... ► Ethernet ▼ Mac ID ► ... ► EthSrvr ▼ Port ▼ ... ▼ Trigger**.
   - For Wi-Fi, navigate to **Audit ► Setup ▼ Config ► ... ► Comm ▼ Serial ► ... ► Wi-Fi ▼ Enabled ► Trigger**.

NOTE: See Section 4.3.10 on page 64 for more details about communication parameters.

2. Press TARE. The configured parameter displays.
3. Press UNITS and PRINT until **RmtIn** (Remote In) displays.
4. Press TARE to confirm the parameter configuration.
5. Press MENU to exit the menu.
6. One of the following occurs:
   - Data displays
   - NODATA display (no data is received)
   - OvrRng (Over Range) error displays

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 weighment 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 5.3.2 on page 77).

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 5.3 on page 76) must be used to configure LaserLight3.

5.3 Manual Mode

Manual Mode is used when the data stream (Section 13.7 on page 140) in not recognized by LaserLight3, or weight data can not be extracted during Auto-Learn mode.

NOTE: Always attempt Auto-Learn mode (Section 5.2.2 on page 74) 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 5.2.2 on page 74)
- Enable Manual Mode (Section 5.3.1)
- Configure Manual Mode parameters (Section 5.3.2 on page 77)
- (If needed) Configure Set Annunciator parameters (Section 5.3.2.4 on page 83)
- Validate Manual Mode configuration (Section 5.3.3 on page 85)

NOTE: Configuring parameters for Manual Mode requires access to Setup mode (Section 2.8.2 on page 25).

5.3.1 Enable Manual Mode

Figure 5-4 displays a menu path to the MnlMode (Manual Mode) parameter.

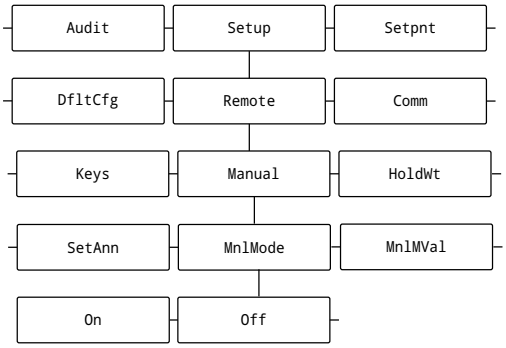


Figure 5-4. MnlMode Parameter Menu Path

1. Navigate to **Audit** ► **Setup** ▼ **Config** ► ... ► **Remote** ▼ **Manual** ▼ **MnlMode**.
2. Press GROSS NET B/N. The parameter configuration displays.
3. Press PRINT until **On** display.
4. Press TARE. **MnlMVal** displays.
5. Press MENU to exit the menu.

5.3.2 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 5.3.2.1)
- Using a text string editor to edit a text string (Section 5.3.2.2 on page 79)

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

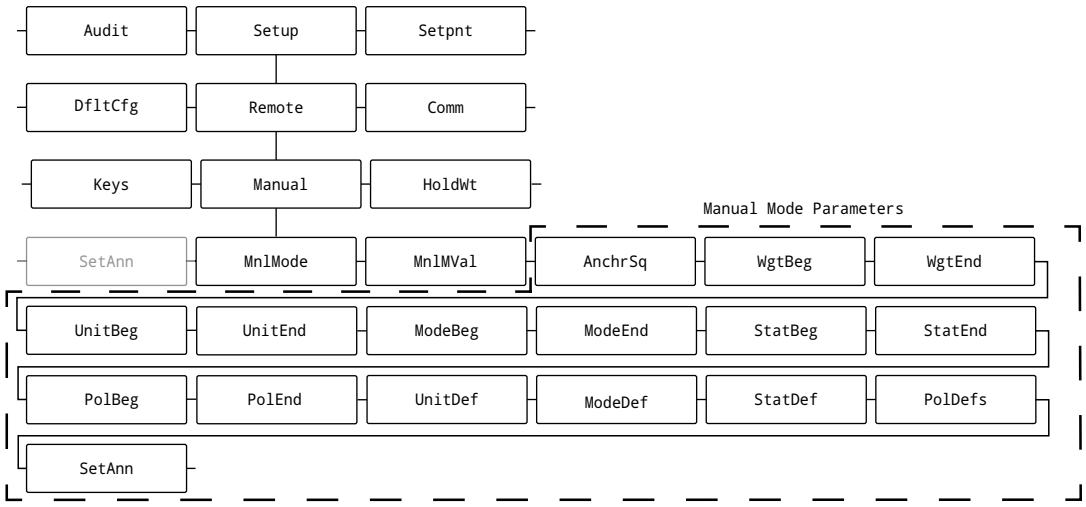


Figure 5-5. Manual Mode Parameters

5.3.2.1 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 4.3.9.1 on page 63.

Figure 5-6 displays a menu path to Manual Mode parameters that require cursor selection.

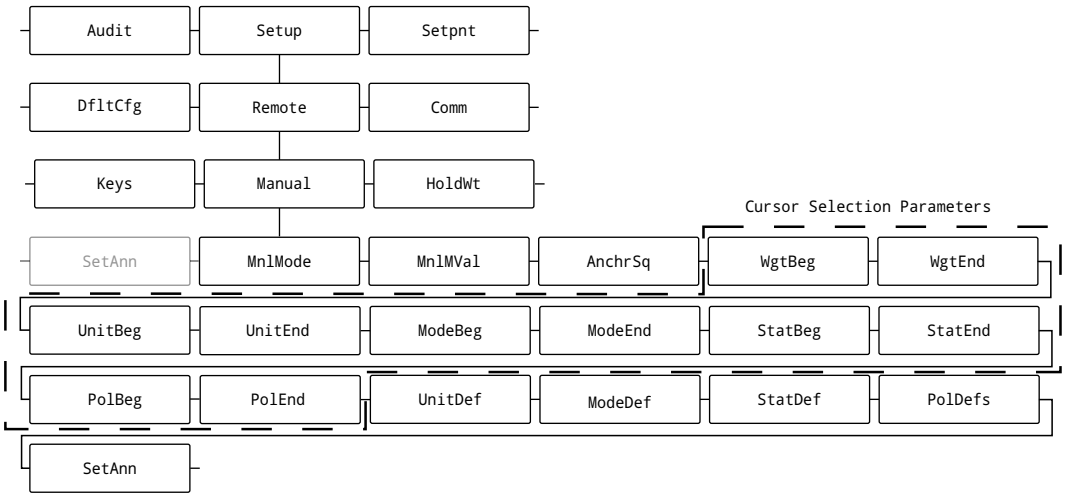


Figure 5-6. Manual Mode Cursor Selection Parameters Menu Paths

Figure 5-7 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.

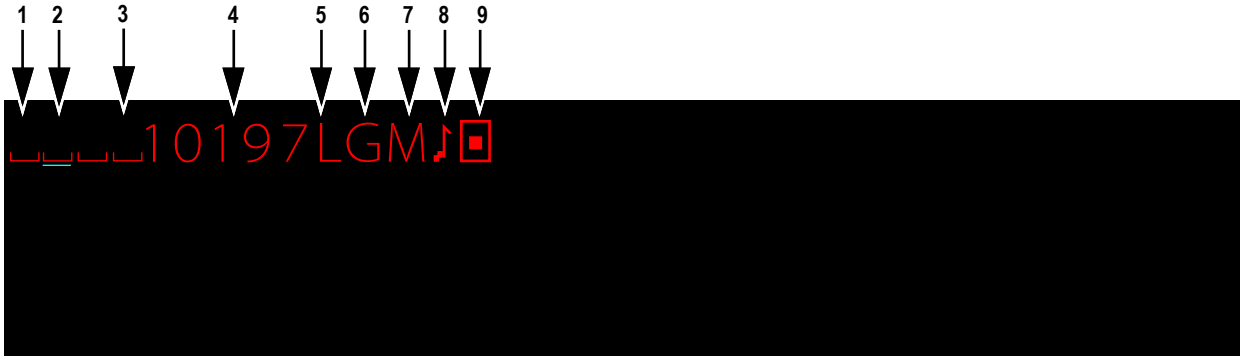


Figure 5-7. Cursor Selection Parameter Example

Data string elements are described in Table 5-1.

NOTE: For a list of possible displayed characters, see Section 13.5 on page 137.

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)	Displays when set to a remote display and indicates that 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 5-1. Data String Elements Descriptions

Configure cursor selection parameters by performing the following:

1. Navigate to **Audit ► Setup ▼ Config ► ... ► Remote ▼ Manual ▼ MnlMode ► ... ► *required parameter**. *see Figure 5-6 on page 77
2. Press TARE. LaserLight3 displays a text string with a cyan cursor.
3. Move the cyan cursor with UNITS or PRINT to the character in data string that represents selected parameter.
4. Press TARE to confirm character selection.
5. LaserLight3 returns to Manual Mode menu with next parameter (if available) displays.

5.3.2.2 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 4.3.9.1 on page 63.

Figure 5-6 displays a menu path to Manual Mode parameters that require text string configuration.

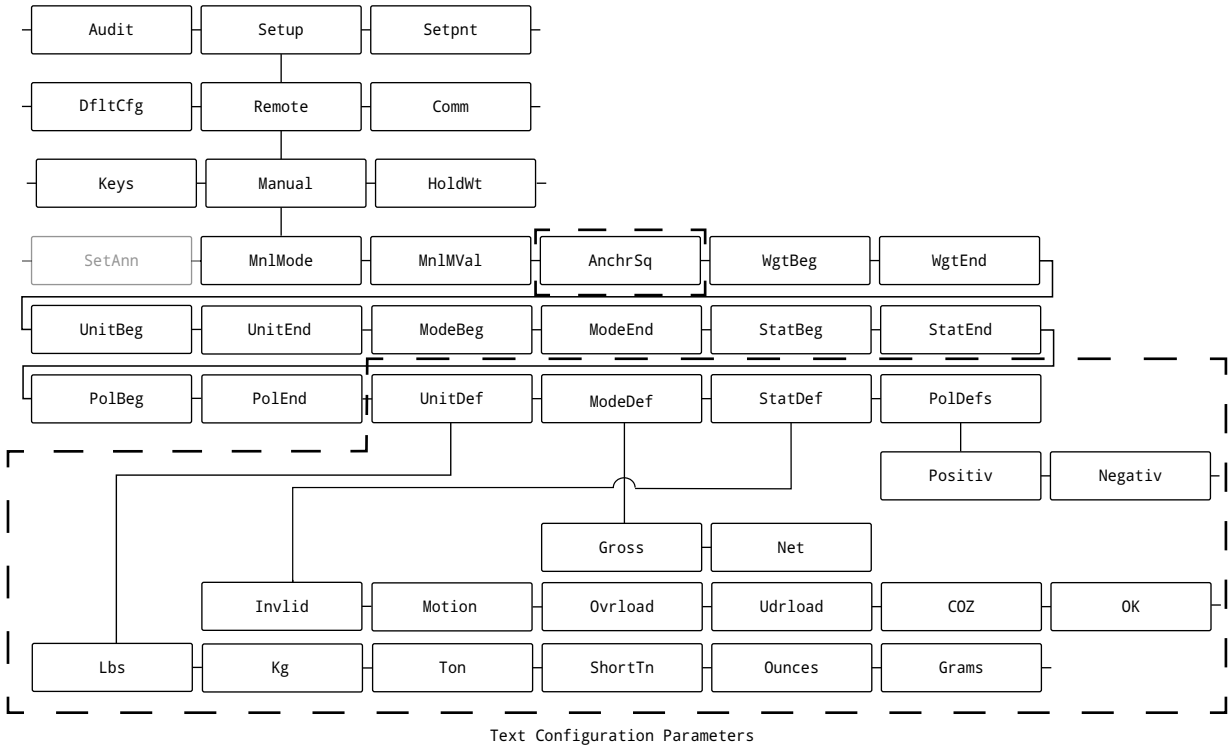


Figure 5-8. Manual Mode Text String Parameters Menu Paths

Figure 5-9 illustrates a text string parameter.

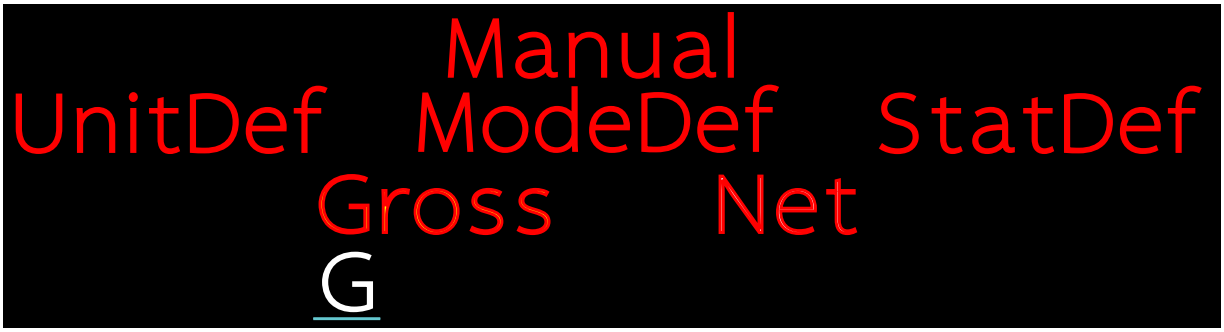


Figure 5-9. Text String Parameter Example

Table 5-2 describes text string elements are described in Figure 5-9.

Element	Description
General Screen Elements	See Section 3.4 on page 33 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 5-2. Data String Elements Descriptions

Perform the following to configure text string parameters:

1. Navigate to **Audit ► Setup ▼ Config ► ...► Remote ▼ Manual ▼ MnlMode ► ... ► *required parameter**. *see Figure 5-8 on page 79
2. Press TARE. The first parameter option displays.
3. Press TARE. The configuration for the parameter option appears.
4. Press UNITS and PRINT to select a position/character.
5. (Optional) Press TARE to insert a space/empty character.
6. Press GROSS NET B/N. The selected character enters an edit mode and an underscore (_) appears under the character.
7. Press UNITS and PRINT to change the character.
8. Press ZERO to confirm the character change and exit character edit mode.
9. Repeat steps 2 through 8 until all characters parameters are configured.
10. Press ZERO to save and exit menu.
11. Repeat steps 1 through 10 until all parameters are configured.
12. Press ZERO to save and exit menu.

NOTE: Press GROSS NET B/N twice to a delete character.

5.3.2.3 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 5.3.2.1 on page 77 and Section 5.3.2.2 on page 79.

1. Navigate to **Audit ► Setup ▼ Config ► ... ► Remote ▼ Manual ▼ MnlMode ► MnlMVal ► AnchrSq**.
2. Press TARE. 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 13.5 on page 137). 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 5-10. AnchrSq Parameter Configuration Example

4. Configure cursor selection parameters (Section 5.3.2.1 on page 77):

   4.1 Set WgtBeg as the start of the weight and WgtEnd as the end of the weight.

Figure 5-11. 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 5-12. 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 5-13. 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 5-14. 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 5-15. 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 5.3.2.2 on page 79.

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.

lb Configuration | **kg Configuration** | **Tons Configuration** | **ShortTn Configuration** | **Ounces Configuration** | **Grams Configuration**

Figure 5-16. Configured UnitDef Parameters

5.2 Set ModeDef parameters Gross and Net.

Gross Configuration | **Net Configuration**

Figure 5-17. Configured ModeDef Parameters

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

Invlid Configuration | **Motion Configuration** | **OvrLoad Configuration** | **UdrLoad Configuration** | **COZ Configuration** | **OK Configuration**

Figure 5-18. Configured StatDefs Parameters

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

Positiv Configuration | **Negativ Configuration**

Figure 5-19. Configured PolDefs Parameters

5.3.2.4 SetAnn (Set Annunciator) UnitAnn and ModeAnn Options

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

Figure 5-20 displays a menu path to SetAnn parameters.

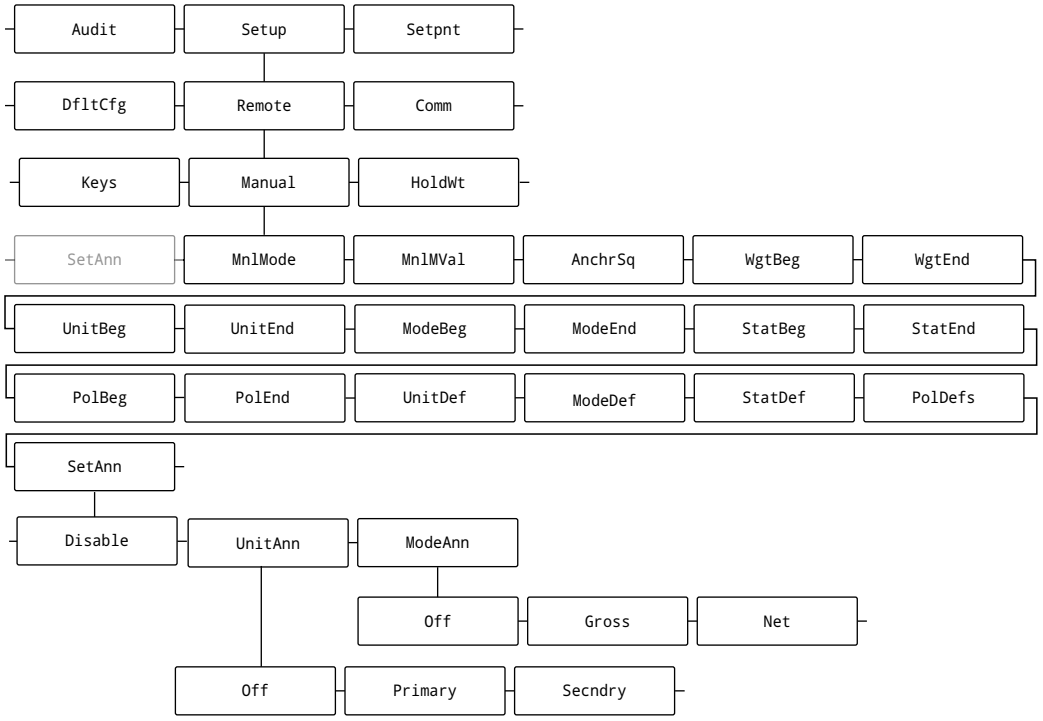


Figure 5-20. SetAnn UnitAnn and Mode Option Menu Path

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

NOTE: Primary and Secondary parameters are configured in the Format menu (Section 4.3.2 on page 48).

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

5.3.2.5 SetAnn (Set Annunciator) Disable Option

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

Figure 5-20 displays a menu path to SetAnn Disable option.

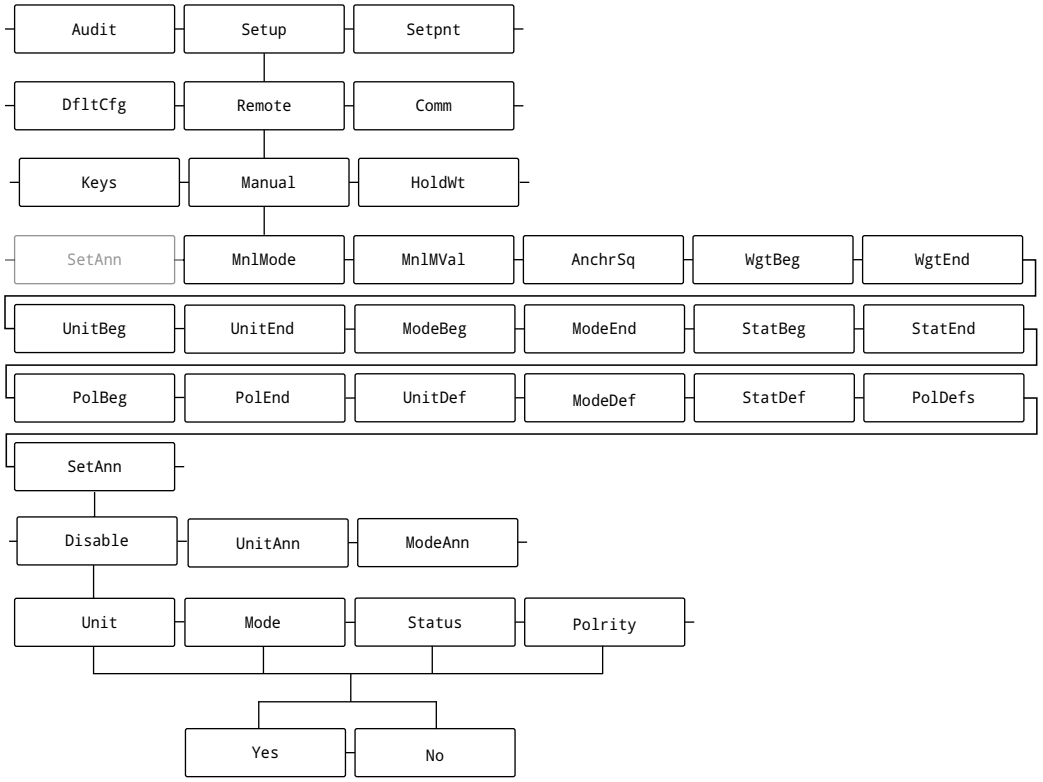


Figure 5-21. SetAnn Disable Option Menu Path

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

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

5.3.3 MnlMVal (Manual Mode Validation) Operation

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

Figure 5-22 displays a menu path to the MnlMVal (Manual Mode Validation) parameter.

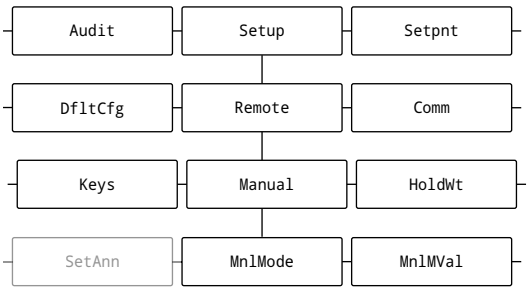


Figure 5-22. Manual Mode Validation Parameter Menu Path

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 **Audit** ► **Setup** ▼ **Config** ► ... ► **Remote** ▼ **Manual** ▼ **MnlMode** ► **MnlMVal**.
2. Press GROSS NET B/N. 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 UNITS or PRINT to scroll through the error message.
4. Review the displayed parameter's configuration, make changes and then rerun **MnlMVal**.
5. Repeat the procedure until errors are not received.
6. Press MENU to exit the menu.

5.4 Demand Print String Displaying

The indicator and LaserLight3 remote display can be configured tor 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 4.3.9 on page 62). 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.

5.5 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 4.3.9 on page 62).
- 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.

5.5.1 Remote Display Command Format:

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

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

Where:

| = Pipe character (Ox7C)

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

CC = Two byte command, ASCII characters

| = Pipe character (Ox7C)

Data = Data depending on command

! = Exclamation point character (0 x21)

NOTE: Commands, GT, ST, DI, DO, 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: • 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 5-3. Remote Display Commands

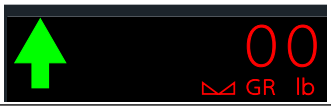
<table>
<tr><th>Command</th><th>Description</th><th>Example</th></tr>
<tr><td>DO</td><td>Set digital output levels with digital output bits. Digital output bits follow: Digital output bit 1 = 1 Digital output bit 2 = 2 Digital output bit 3 = 4 Digital output bit 4 = 8 NOTE: The value must be cumulative and converted to hex. For example, to turn on all bits the command "DOF" would be sent.</td><td>|00DOx!
Where x references the hex value 0–F</td></tr>
<tr><td>DO (with Legacy Display Mode Enabled)</td><td>Sets Legacy Mode traffic symbol:
<table>
<tr><th>Serial Command</th><th>Traffic Symbol</th><th>Traffic Symbol Example</th></tr>
<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>
</table>
NOTE: The Display Type must set as Legacy in order to display traffic symbols in this orientation (see Section 5.1 on page 72.)
NOTE: Even while Legacy mode is enabled, the DO command still controls the Digital output bits if they are set to output (see Section 4.3.8 on page 61).
NOTE: Using external switches (see Section 5.6 on page 90) and serial commands to control traffic lights may results in unpredictable displays.</td><td>00DOx!
Where x references numbers 0–3</td></tr>
<tr><td>GV</td><td>Get the version number</td><td>|00GV!</td></tr>
<tr><td colspan="3">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</td></tr>
</table>

Table 5-3. Remote Display Commands (Continued)

5.5.2 Advanced Display Message (DM) Commands

In addition to the DM command listed in Table 5-3 on page 86, there are additional DM commands with expanded capabilities available (Table 5-4).

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 5.2.2 on page 74): |00DMC|xxxxxx! Where xxxxxx is a standard EDP command (see Section 9.0 on page 100). 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><B2><FC3><BC3><FC4><BC4>|<Data1>|<Data2>|<Data3>|<Data4>! ***NOTE: Quadrant Locations follow:*** Data1 | Data2 Data3 | Data4
DMX	Clears the current message and returns to the original display: |<AA><DMX!>|

Table 5-4. 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 5-4 are described in Table 5-5.

<table>
<tr><th>Option</th><th>Description</th></tr>
<tr><td>|</td><td>Pipe characters separate parameters or data in command</td></tr>
<tr><td>!</td><td>Exclamation points indicate the end of a command</td></tr>
<tr><td><AA></td><td>NOTE: This is the same as the address configured in the remote menu (see Table 4.3.9 on page 62).
Address{00 – 99} This will always be 2 characters, for example: Address “1” will need to be “01”</td></tr>
<tr><td><DMn></td><td>Defines which display message command is used:
Command{DM1, DM2, DM4, DMQ, DMT}</td></tr>
<tr><td><Timeout></td><td>0 - 65535 milliseconds seconds; Use “0” to continue infinitely until interrupted by another message. If Scroll Count and Timeout are both used, timeout overrides.</td></tr>
<tr><td><Scroll(n)></td><td>Configured with Y or N. Text cycles from right to left continuously for the duration defined by Timeout or Scroll Count. n = line number</td></tr>
<tr><td><Slide(n)></td><td>Configured with Y or N. Text moves from right side of display and stops at the left side of the display. n = line number</td></tr>
<tr><td><Flash(n)></td><td>Configured with Y or N. Message flashes continuously for the defined timeout. n = line number.</td></tr>
<tr><td><Scroll Count></td><td>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.</td></tr>
<tr><td><FC(n)></td><td>Defines foreground color, where:
<table>
<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></td></tr>
<tr><td><BC(n)></td><td>Defines background color, where:
<table>
<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></td></tr>
<tr><td><Mode></td><td>Defines modes displayed in a message. Only G or N are accepted</td></tr>
<tr><td><Units></td><td>Defines units displayed in message. lb, kg, t, tn, oz or gr accepted</td></tr>
<tr><td><Traffic Symbol></td><td>Defines traffic symbols displayed in message. Character 0 – 7; where:
<table>
<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></td></tr>
<tr><td><Data(n)></td><td>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 5-5.</td></tr>
</table>

Table 5-5. Advanced Display Message Options

5.6 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 5.1 on page 72) 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.

5.6.1 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 5-23.

Figure 5-23. Single Switch DIO Wiring

See Table 5-6 for single switch operations details.

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

Stop and Go Switch Interactions		
SW1	**DIO2 (P4)**	**Symbol**
Open	5V (H)	
Closed	0V (L)	

Table 5-6. Single Switch Traffic Light Interaction

5.6.2 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 5-24.

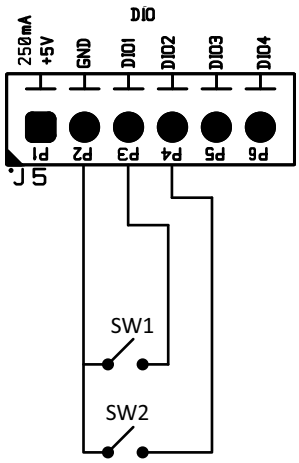


Figure 5-24. Two Switch DIO Wiring

See Table 5-7 for two switch operations details.

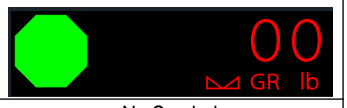
SW1	SW2	DIO1 (P3)	DIO2 (P4)	Symbol
Open	Open	5V (H)	5V (H)	
Closed	Open	0V (L)	5V (H)	
Open	Closed	5V (H)	0V (L)	
Closed	Closed	0V (L)	0V (L)	No Symbol

Table 5-7. Two Switch Traffic Light Interaction

6.0 Calibration

The LaserLight3 can be calibrated using the front panel and EDP commands. The following sections describe the procedures required for these calibration methods.

NOTE: The LaserLight3 requires a Zero Calibration and Span Calibration to be calibrated. The Linear Calibration points are optional; they must fall between zero and span, but must not duplicate zero or span.

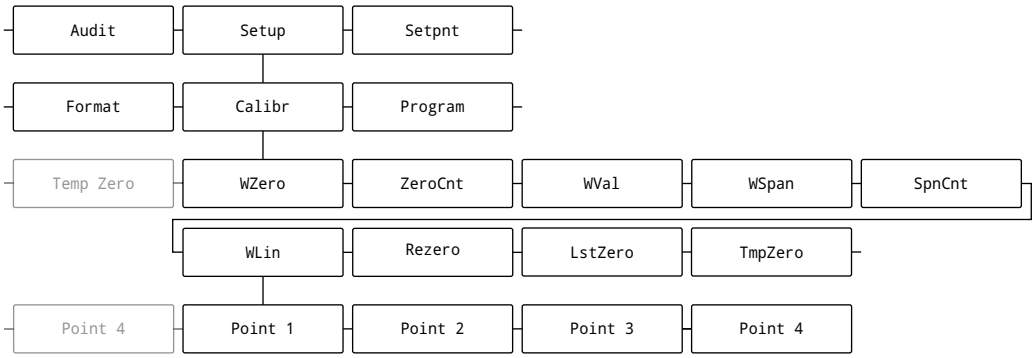


Figure 6-1. Setup – Calibration Menu

6.1 Front Panel Calibration

6.1.1 Span Calibration

Use the following procedure to perform a standard span calibration on a connected scale. Access to *Setup* mode (Section 2.8.2 on page 25) is required.

1. Navigate to **Audit ► Setup ▼ Config ► ... ► Calibr.**
2. Press GROSS NET B/N. **WZero** (zero calibration) displays.

NOTE: See Section 6.2 on page 93 if the application requires a rezero, last zero or temporary zero.

3. Ensure there is no weight on the scale.
4. Press TARE to perform a zero calibration. **OK** displays.
5. Press TARE. **ZeroCnt** (zero counts) displays. See Section 4.3.3 on page 49 for more information on zero counts.
6. Press PRINT. **WVal** (test weight value) displays.
7. Press GROSS NET B/N. The current test weight value displays.
8. Use the arrow keys to enter a new value, if necessary.
9. Press TARE to accept value. **WSpan** (span calibration) displays.
10. Place the specified amount of test weight on the scale.
11. Press TARE to perform a span calibration. **PleaseWait** displays briefly and then calibration completes.
12. Press TARE. **SpnCnt** (span counts) displays. See Section 4.3.3 on page 49 for more information on span counts.

NOTE: Span calibration is complete. To continue with a linear calibration, see Section 6.1.2 on page 93 before returning to Weigh mode.

13. Press MENU to exit the menu.

6.1.2 Linear Calibration

Linear calibration points provide increased scale accuracy by calibrating the indicator at up to four additional points between the zero and span calibrations. Access to *Setup* mode (Section 2.8.2 on page 25) is required.

1. Complete Steps 1–12 in Section 6.1.1 on page 92. Press PRINT. **WLIN** (linear calibration) displays.
2. Press GROSS NET B/N. **Point 1** displays.
3. Press GROSS NET B/N. **WLin V1** displays.
4. Press GROSS NET B/N. The current test weight value for point 1 displays.
5. Use the arrow keys to enter a new value, if necessary.
6. Press TARE to accept value. **WLin C1** displays.
7. Place the specified amount of test weight on the scale.
8. Press TARE to perform a linear point calibration. **PleaseWait** displays briefly and then calibration completes.
9. Press TARE. WLin F1 displays. See Section 4.3.3 on page 49 for more information on linear point counts.
10. Press ZERO. **Point1** displays.
11. Press PRINT. **Point2** displays.
12. Repeat previous steps for points 2-4, if necessary.

NOTE: The linear calibration for a point is saved once point is calibrated.

13. Press MENU to exit the menu.

6.2 Alternative Zero Calibrations

During a calibration, the zero value can be replaced with a temporary zero or last zero.

A rezero can be done after calibration. See below for information on alternative zeros.

6.2.1 Last Zero

This takes the last push-button zero in the system (from *Weigh* mode) and uses it as the new zero reference point, after which a new span calibration must be performed. This calibration cannot be performed when calibrating a scale for the first time.

A last zero calibration is typically used on truck scales to allow a scale verification to become a calibration without having to remove the test weights.

6.2.2 Temporary Zero

A temporary zero calibration temporarily zeros the displayed weight of a non-empty scale. After span calibration, the difference between the temporary zero and the previously calibrated zero value is used as an offset.

A temporary zero calibration is typically used on hopper scales to calibrate the span without losing the original zero calibration.

6.2.3 Rezero

A rezero calibration is needed to remove a calibration offset when hooks or chains are required to suspend the test weights.

Once a span calibration is complete, remove the hooks or chains and the test weights from the scale. With all the weight removed, a rezero calibration is used to adjust the zero and span calibration values.

6.3 EDP Command Calibration

Use the following instructions to calibrate the LaserLight3 using EDP commands. For information on the EDP commands of the LaserLight3, see Section 9.0 on page 100. Access to *Setup* mode (Section 2.8.2 on page 25) is required.

NOTE: OK must display after each step or the calibration procedure must be done again. For commands ending with #s, s is the scale number (1).

1. Put the LaserLight3 in Setup mode.
2. For a standard calibration, remove all weight from scale (except hooks or chains which are needed to attach weights).
3. Send the command **SC.WZERO#*s*** to perform a standard calibration of the zero point.
   - Send **SC.TEMPZERO#*s*** to perform a temporary zero calibration
   - Send **SC.LASTZERO#*s*** to perform a last zero calibration
4. Apply the span calibration weight to the scale.
5. Send the command **SC.WVAL#*s*=*xxxxx***, where ***xxxxx*** is the value of the span calibration weight applied to the scale.
6. Send the command **SC.WSPAN#*s*** to calibrate the span point. Continue on to Step 6 to calibrate additional linear points, or proceed to Step 10.
7. Apply weight equal to the first linear point to the scale.
8. Send the command **SC.WLIN.V*n*#*s*=*xxxxx***, where ***n*** is the linear point number (1-4) and ***xxxxx*** is the exact value of the weight applied.
9. Send the command **SC.WLIN.C*n*#*s*** to calibrate the linear point, where ***n*** is the linear point number (1-4).
10. Repeat Steps 6–8 for up to four total linear points.
11. If hooks or chains were used to attach the weights, remove all weight, including the hooks and chains, and send the command **SC.REZERO#*s*** to remove the zero offset.
12. Send the command **KSAVEEXIT** to return to *Weigh* mode.

7.0 Digital Filtering

Digital filtering is used to create a stable scale reading in challenging environments. The LaserLight3 allows selection of ***Digital Rolling Average Filtering*** (Section 7.1), ***Adaptive Filtering*** (Section 7.2 on page 97), ***Damping*** (Section 7.3 on page 97) or ***Raw*** for no filtering. See Section 4.3.1 on page 46 for configuration menu layout and the location of the Filter Chain Type parameter.

The scale's sample rate effects all types of filtering. The A/D sample rate is selected by the Sample Rate parameter. The A/D sample rate is the number of weight readings the indicator takes per second. This can be 6.25, 7.5, 12.5, 15, 25, 30, 50, 60 or 120 hertz (readings per second). Set the A/D sample rate to the lowest setting required for the application. Lower settings result in better stability.

NOTE: See Section 4.3.1 on page 46 for more details about Configuration parameters.

7.1 Digital Rolling Average Filter (Average Only)

The digital rolling average filter uses mathematical averaging with three stages. These configurable stages control the effect of a single A/D reading on the displayed weight. When an A/D reading outside of a predetermined band is encountered, the digital rolling average filter is overridden and the display jumps directly to the new value.

7.1.1 Digital Filter Stages 1-3

The filter stages can each be set to a value of 1–256. The value assigned to each stage sets the number of readings received from the preceding filter stage before averaging. Setting the filter stages to 1 effectively disables the rolling filter.

A rolling average is passed to successive filtering stages for an overall filtering effect which is effectively a weighted average of the product of the values assigned to the filter stages (*Digital Filter Stage 1 x Digital Filter Stage 2 x Digital Filter Stage 3*) within a time frame corresponding to the sum of the values (*Digital Filter Stage 1 + Digital Filter Stage 2 + Digital Filter Stage 3*).

7.1.2 Digital Filter Sensitivity and Digital Filter Threshold

The rolling averaging filter can be used by itself to eliminate vibration effects, but heavy filtering also increases settling time. The *Digital Filter Sensitivity* (DFSENS) and *Digital Filter (*DFTHRH) *Threshold* parameters can be used to temporarily override filter averaging and improve settling time.

- *Digital Filter Sensitivity* specifies the number of consecutive A/D readings which must fall outside the *Digital Filter Threshold* before filtering is suspended
- *Digital Filter Threshold* sets a threshold value, in display divisions; When the specified number of consecutive A/D readings (*Digital Filter Sensitivity*) fall outside of this threshold, filtering is suspended; Set *Digital Filter Threshold* to *NONE* to turn off the filter override

7.1.3 Digital Rolling Average Filter Procedure

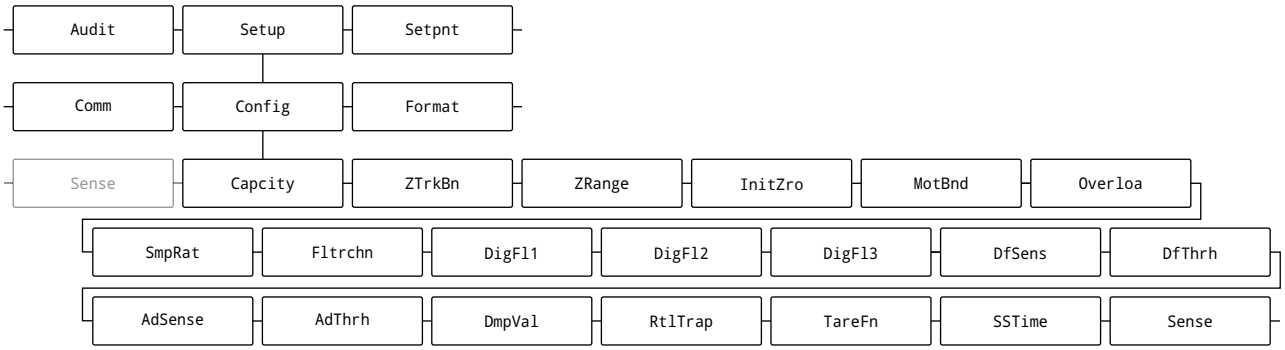


Figure 7-1. Configuration Menu

1. Navigate to **Audit** ► **Setup** ▼ **Config** ▼ **Capacity** ► **...** ► **FltrChn**.
2. Press TARE. Currently configured parameter displays.
3. Press UNITS and PRINT until **AvgOnly** (Average Only) displays.
4. Press TARE. The **DigFl1** (Digital Filter 1) displays.
5. Press TARE. The currently configured parameter displays.
6. Press PRINT repeatedly until **1** displays.
7. Press TARE. The next digital filter displays.
8. Repeat Step 5 and Step 7 for **DigFl2** and **DigFl3**.
9. Press PRINT repeatedly until **DfThrh** (Digital Filter Sensitivity) appears.
10. Press TARE. The currently configured parameter displays.
11. Press PRINT repeatedly until **None** displays.
12. Press TARE. AdSens displays.
13. Press MENU to exit the menu and return to *Weigh* mode.
14. Remove all weight from scale, then watch the indicator to determine the magnitude of vibration effects on the scale.
15. Record weight below which all but a few readings fall. This value is used to calculate the *Digital Filter Threshold* parameter in Step 17.

    Example – if a heavy-capacity scale (10,000 x 5 lb) produces vibration-related readings of up to 50 lb, with occasional spikes up to 75 lb, record 50 as the threshold weight value.
16. Repeat Step 4 through Step 8 to set the filter stage parameters (*Digital Filter Stage 1-3*) at lowest effect level that eliminates the vibration effects on the scale (leave *Digital Filter Threshold* set to *NONE*).

NOTE: If needed, the digital filter cutout sensitivity (DFSENS) and the digital filter cutout threshold (DFTHRH) can be used to reset the digital rolling average filter so the response to a rate change is faster.

17. Calculate the *Digital Filter Threshold* parameter value by converting the weight value recorded in Step 15 to display divisions (*Threshold_Weight_Value / Display_Divisions*).

    In the example in Step 15, with a threshold value of 50, and a display-division value of 5, set the Digital Filter Threshold parameter to 10 display divisions.
18. Set the *Digital Filter Sensitivity* parameter high enough to ignore transient peaks. Longer transients (typically caused by lower vibration frequencies) cause more consecutive out-of-band readings; set the *Digital Filter Sensitivity* (DFSENS) parameter higher to counter low frequency transients.

7.2 Adaptive Filter (Adaptive Only)

The adaptive filter has two settings, *Adaptive Filter Sensitivity* and *Adaptive Filter Threshold*. It maintains a running average of the A/D readings when the weight change remains less than the defined threshold value. The filter automatically applies less value to each successive A/D reading the longer the weight change is less than the threshold value. The amount of value given to the most recent A/D reading is determined by the sensitivity setting.

7.2.1 Adaptive Filter Sensitivity

Adaptive Filter Sensitivity can be set to *Heavy*, *Medium* or *Light*. A *Heavy* setting results in an output which is more stable to weight changes than the *Light* setting. A *Heavy* setting also results in small changes in weight data (a few grads) on the scale base to not be seen as quickly as with the *Light* setting.

If the difference in typical subsequent weight values on the scale are only a few display divisions, use a *Light* setting. On a truck scale where the changes in subsequent weight values are 100s of display divisions, a *Heavy* setting is more appropriate.

7.2.2 Adaptive Filter Threshold

Set the *Adaptive Filtering Threshold* for the amount of observed instability in the system. This parameter can be set in the range of 0–2000 and is entered as a weight value. When a new sampled weight value is acquired, the adaptive filter compares the new value to the previous (filtered) output value.

If the difference between the new value and the previous output value is greater than the *Adaptive Filtering Threshold* parameter the adaptive filter is reset to the new weight value.

If the difference between the new value and the previous output value is less than the *Adaptive Filtering Threshold* parameter, the two values are averaged together using a weighted average. The weighted average is based on the amount of time the system has been stable, and selected *Adaptive Filter Sensitivity* sensitivity.

With the *Adaptive Filtering Threshold* set at zero, determine the amount of instability present. Enter this amount of weight instability to set the threshold of the adaptive filter. The adaptive filter is set to *OFF*, the *Adaptive Filtering Threshold* parameter is set to zero.

7.3 Damping Filter (Damping Only)

The damping filter is a simple filter which adjusts the amount of time it takes for a change in weight to be processed through the scale. The *Damping Value* parameter is a time interval specified in tenths of a second (10 = 1 second). This *Damping Value* is used to determine the amount of time it takes for the scale to reach its final weight output. When *Damping Value* is set to ten, a transition from 0 lb to 500 lb on the scale takes one second. The closer the weight gets to its final amount, the slower the weight changes on the display.

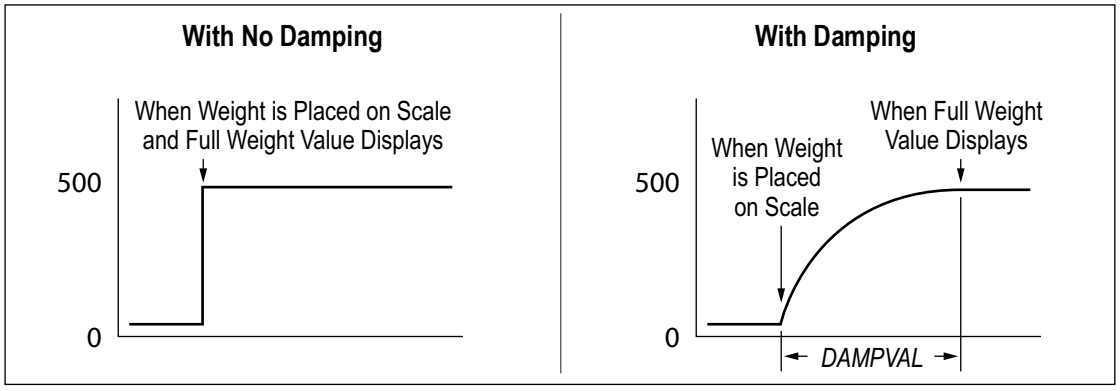


Figure 7-2. 500 lb Displayed Weight Progression

8.0 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/.

8.1 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.

8.2 Saving and Transferring Data

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

8.2.1 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.

8.2.2 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 8.2.1. Place LaserLight3 in *Setup* mode and use the PC communications software to send the saved configuration data to the LaserLight3. When transfer is complete, calibrate the LaserLight3 as described in Section 6.0 on page 92.

8.3 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 3.5.5 on page 36).
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.

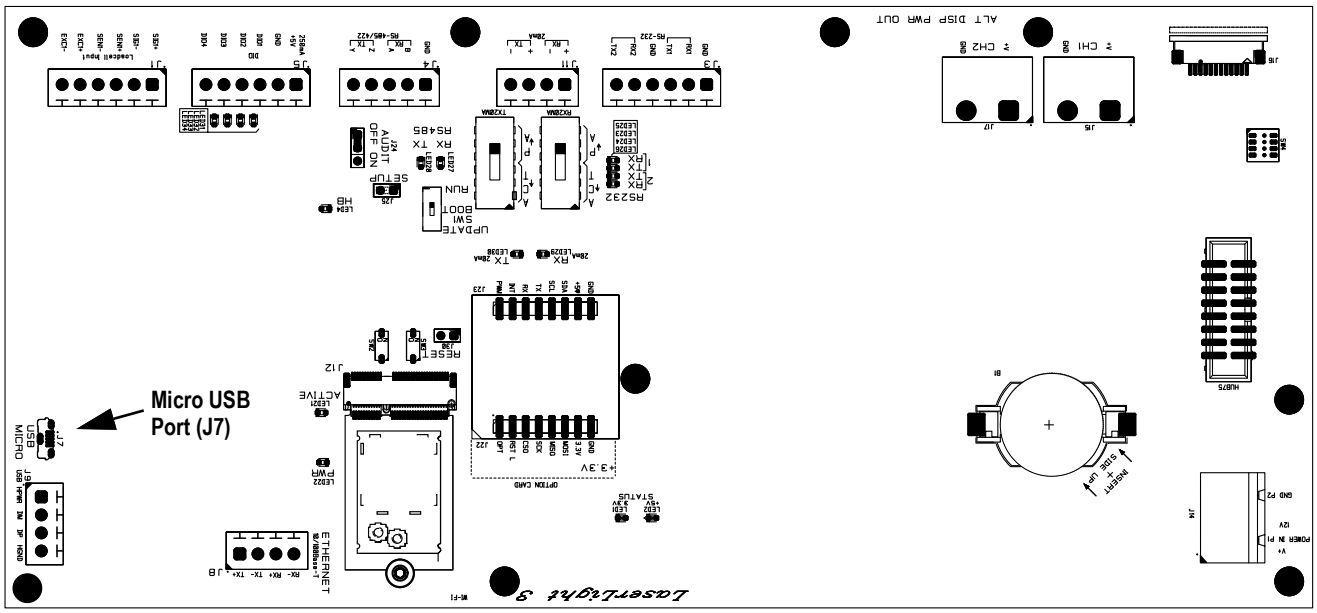


Table 8-1. CPU Board SW1 Switch and Micro USB Port

9.0 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.

9.1 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
KZERO	In *Weigh* mode, this command acts like pressing the **Zero** key
KGROSSNET	In *Weigh* mode, this command acts like pressing the **Gross/Net** key
KGROSS	Displays Gross mode (pseudo key)
KNET	Displays Net mode (pseudo key)
KTARE	In *Weigh* mode, this command acts like pressing the **Tare** key
KUNITS	In *Weigh* mode, this command acts like pressing the **Units** key
KPRIM	Displays primary units (pseudo key)
KSEC	Displays secondary units (pseudo key)
KPRINT	In *Weigh* mode, this command acts like pressing the **Print** key
KPRINTACCUM	Prints the accumulator value
KDISPACCUM	Displays the accumulator value
KDISPTARE	Displays the tare value
KCLR	In *Weigh* mode, this command acts like pressing the **Clear** key
KCLRCN	Clears consecutive number
KCLRTAR	Clears the tare from the system (pseudo key)
KLEFT	In *Setup* mode, this command moves **Left** in the menu
KRIGHT	In *Setup* mode, this command moves **Right** in the menu
KUP	In *Setup* mode, this command moves **Up** in the menu
KDOWN	In *Setup* mode, this command moves **Down** in the menu
KEXIT	In *Setup* mode, this command exits to *Weigh* mode
KSAVE	In *Setup* mode, this command saves the current configuration
KSAVEEXIT	In *Setup* mode, this command saves the current configuration and exits to *Weigh* mode
KTIME	Displays the Set System Time screen
KDATE	Displays the Set System Date screen
KTIMEDATE	Displays the Set System Time screen
KCLRACCUM	Clears the accumulator
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 (.)

Table 9-1. Key Press Commands

Command	Function
Kn	This command acts like pressing numbers 0 (zero) through 9
KLOCK=x	In *Weigh* 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 *Weigh* 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: • Input TEST.KEYPAD=ON to enter test mode • Push keys on keypad • Input TEST.KEYPAD=OFF to exit test mode ***NOTE: The LaserLight3 must be setup mode to use this function.***

Table 9-1. Key Press Commands (Continued)

9.2 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 9-2. Key Press String Transmission Commands

9.3 Reporting Commands

Reporting commands send specific information to the communications port. The commands listed in Table 9-3 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
AUDIT.CALIBRATE	Returns the number of calibrations
AUDITJUMPER	Returns the position of the audit jumper: OK (if the audit jumper is ON) or ?? (if the audit jumper is OFF)
SPDUMP	Returns a list of the setpoint parameter values
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.TEMPSENSOR	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 9-3. Reporting Commands

9.4 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 (*Setup* mode only)

Table 9-4. Reset Configuration Command

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

9.5 Scale Parameter Setting Commands

Parameter setting commands allow the current value for a configuration parameter to be displayed or changed.

Current configuration parameter settings can be displayed in Setup mode or Weigh mode using the following syntax:

command<ENTER>

Most parameter values can be changed in *Setup* mode only; setpoint parameters listed in Table 9-15 on page 111 can be changed when in normal *Weigh* mode.

NOTE: The user must stop the current batch for new values to take effect.

Use the following command syntax when changing parameter values: command=value<ENTER>, where ***value*** is either a number or a parameter value. Use no spaces before or after the equal (=) sign. If an incorrect command is typed or an invalid value is specified, the indicator returns ***??*** followed by the error message.

Example: to set the motion band parameter on Scale #1 to 5 divisions, type the following:

SC.MOTBAND#1=5<ENTER>

To return a list of the available values for parameters with specific values, enter the command and equal sign, followed by a question mark (command=?<ENTER>). The indicator must be in *Setup* mode to use this function.

After changes are made to configuration parameters using EDP commands, use the ***KSAVE*** or ***KSAVEEXIT*** commands to commit the changes to memory.

Command	Description	Values
SC.CAPACITY#n	Scale capacity	0.0000001–9999999.0, **10000.0** (default)
SC.ZTRKBND#n	Zero track band (in display divisions)	0.0–100.0, **0.0** (default)
SC.ZRANGE#*n*	Zero range (%)	0.0–100.0, **1.9** (default)
SC.MOTBAND#*n*	Motion band (in display divisions)	0–100, **1** (default)
SC.SSTIME#*n*	Standstill time (in 0.1 second intervals; 10 = 1 second)	0–600, **10** (default)
SC.SENSE#*n*	Sets the type of load cell cable connected	**4-WIRE** (default), 6-WIRE
SC.OVERLOAD#*n*	Overload	**FS+2%** (default), FS+1D, FS+9D, FS
SC.WMTTHRH#*n*	Weighment threshold	0.0–9999999.0, **1000.0** (default)
SC.NUMWEIGH#*n*	Number of weighments	0–2147483647, **0 (default)**
SC.MAX_WEIGHT#*n*	Maximum weighment	-9999999–9999999
SC.MAX_DATE#*n*	Date of maximum weighment	Up to 25 alphanumeric characters
SC.DIGFLTR1#*n* SC.DIGFLTR2#*n* SC.DIGFLTR3#*n*	Number of A/D samples averaged for the individual stages (1-3) of the three stage digital filter	1, 2, **4** (default), 8, 16, 32, 64, 128, 256
SC.DFSENS#*n*	Digital filter cutout sensitivity	**2OUT** (default), 4OUT, 8OUT, 16OUT, 32OUT, 64OUT, 128OUT
SC.DFTHRH#*n*	Digital filter cutout threshold	**NONE** (default), 2D, 5D, 10D, 20D, 50D, 100D, 200D, 250D
SC.RATLTRAP#*n*	Rattletrap filtering	**OFF** (default), ON
SC.SMPRAT#*n*	Scale A/D sample rate	6.25HZ, 7.5HZ, 12.5HZ, 15HZ, 25HZ, **30HZ** (default), 50HZ, 60HZ, 100HZ, 120HZ
SC.PWRUPMD#*n*	Power up mode	**GO** (default), DELAY
For commands ending with #*n*, n is the scale number (1)		

Table 9-5. Scale Parameter Setting Commands

Command	Description	Values
SC.TAREFN#*n*	Tare function	**BOTH** (default), KEYED, NOTARE, PBTARE
SC.PRI.FMT#*n*	Primary units format (decimal point and display divisions)	8888100, 8888200, 8888500, 8888810, 8888820, 8888850, **8888881** (default), 8888882, 8888885, 888888.1, 888888.2, 888888.5, 88888.81, 88888.82, 88888.85, 8888.881, 8888.882, 8888.885, 888.8881, 888.8882, 888.8885, 88.88881, 88.88882, 88.88885
SC.PRI.UNITS#*n*	Primary units	**LB** (default), KG, OZ, TN, T, G, NONE
SC.SEC.FMT#*n*	Secondary units format (decimal point and display divisions)	8888100, 8888200, 8888500, 8888810, 8888820, 8888850, 8888881, 8888882, 8888885, 888888.1, 888888.2, **888888.5** (default), 88888.81, 88888.82, 88888.85, 8888.881, 8888.882, 8888.885, 888.8881, 888.8882, 888.8885, 88.88881, 88.88882, 88.88885
SC.SEC.UNITS#*n*	Secondary units	LB, **KG** (default), OZ, TN, T, G, NONE
SC.SEC.ENABLED#*n*	Enable the Secondary Units	**ON** (default), OFF
SC.FILTERCHAIN#*n*	Defines what filter to use	**AVGONLY** (default), ADPONLY, DMPONLY, RAW
SC.DAMPINGVALUE#*n*	Sets the damping time constant	0–2560 (in 0.1 second intervals), **10** (default)
SC.ADTHRESHOLD#*n*	Adaptive filter weight threshold value	0–2000 (in display divisions), **10** (default)
SC.ADSENSITIVITY#*n*	Adaptive filter sensitivity	**LIGHT** (default), MEDIUM, HEAVY
SC.ACCUM#*n*	Accumulator enable	**OFF** (default), ON
SC.WZERO#*n*	Perform zero calibration	—
SC.TEMPZERO#*n*	Perform temporary zero calibration	—
SC.LASTZERO#*n*	Perform last zero calibration	—
SC.WVAL#*n*	Test weight value	0.000001–9999999.999999, **10000.0** (default)
SC.WSPAN#*n*	Perform span calibration	—
SC.WLIN.F1#*n*– SC.WLIN.F4#*n*	Actual raw count value for linear points 1–4	0–16777215, **0** (default)
SC.WLIN.V1#*n*– SC.WLIN.V4#*n*	Test weight value for linear points 1–4 (A setting of 0 indicates the linear point is not used)	0.000001–9999999.999999, **0.0** (default)
SC.WLIN.C1#*n*– SC.WLIN.C4#*n*	Perform linear calibration on points 1–4	—
SC.LC.CD#*n*	Deadload coefficient raw count value	0–16777215, **8388210** (default)
SC.LC.CW#*n*	Span coefficient raw count value	0–16777215, **9476903** (default)
SC.LC.CZ#*n*	Temporary zero raw count value	0–16777215, **8388367** (default)
SC.REZERO#*n*	Perform the Rezero calibration function	—
SC.INITIALZERO#*n*	Initial Zero range in % of full scale	0.0–100.0, **0.0** (default)
SC.RTZGRAD#*n*	Number of graduations from the zero base at which the accumulator re-arms itself	0.0–100.0, **0.4** (default)
For commands ending with #*n*, n is the scale number (1)		

Table 9-5. Scale Parameter Setting Commands (Continued)

9.6 Scale Parameter Setting Commands

Parameter setting commands allow the current value for a configuration parameter to be displayed or changed.

Current configuration parameter settings can be displayed in Setup mode or Weigh mode using the following syntax:

command<ENTER>

Most parameter values can be changed in *Setup* mode only; setpoint parameters listed in Table 9-15 on page 111 can be changed when in normal *Weigh* mode.

NOTE: The user must stop the current batch for new values to take effect.

Use the following command syntax when changing parameter values: command=value<ENTER>, where ***value*** is either a number or a parameter value. Use no spaces before or after the equal (=) sign. If an incorrect command is typed or an invalid value is specified, the indicator returns ***??*** followed by the error message.

Example: to set the motion band parameter on Scale #1 to 5 divisions, type the following:

SC.MOTBAND#1=5<ENTER>

To return a list of the available values for parameters with specific values, enter the command and equal sign, followed by a question mark (command=?<ENTER>). The indicator must be in *Setup* mode to use this function.

After changes are made to configuration parameters using EDP commands, use the ***KSAVE*** or ***KSAVEEXIT*** commands to commit the changes to memory.

Command	Description	Values
SC.CAPACITY#n	Scale capacity	0.0000001–9999999.0, **10000.0** (default)
SC.ZTRKBND#n	Zero track band (in display divisions)	0.0–100.0, **0.0** (default)
SC.ZRANGE#*n*	Zero range (%)	0.0–100.0, **1.9** (default)
SC.MOTBAND#*n*	Motion band (in display divisions)	0–100, **1** (default)
SC.SSTIME#*n*	Standstill time (in 0.1 second intervals; 10 = 1 second)	0–600, **10** (default)
SC.SENSE#*n*	Sets the type of load cell cable connected	**4-WIRE** (default), 6-WIRE
SC.OVERLOAD#*n*	Overload	**FS+2%** (default), FS+1D, FS+9D, FS
SC.WMTTHRH#*n*	Weighment threshold	0.0–9999999.0, **1000.0** (default)
SC.NUMWEIGH#*n*	Number of weighments	0–2147483647, **0 (default)**
SC.MAX_WEIGHT#*n*	Maximum weighment	-9999999–9999999
SC.MAX_DATE#*n*	Date of maximum weighment	Up to 25 alphanumeric characters
SC.DIGFLTR1#*n* SC.DIGFLTR2#*n* SC.DIGFLTR3#*n*	Number of A/D samples averaged for the individual stages (1-3) of the three stage digital filter	1, 2, **4** (default), 8, 16, 32, 64, 128, 256
SC.DFSENS#*n*	Digital filter cutout sensitivity	**2OUT** (default), 4OUT, 8OUT, 16OUT, 32OUT, 64OUT, 128OUT
SC.DFTHRH#*n*	Digital filter cutout threshold	**NONE** (default), 2D, 5D, 10D, 20D, 50D, 100D, 200D, 250D
SC.RATLTRAP#*n*	Rattletrap filtering	**OFF** (default), ON
SC.SMPRAT#*n*	Scale A/D sample rate	6.25HZ, 7.5HZ, 12.5HZ, 15HZ, 25HZ, **30HZ** (default), 50HZ, 60HZ, 100HZ, 120HZ
SC.PWRUPMD#*n*	Power up mode	**GO** (default), DELAY
SC.TAREFN#*n*	Tare function	**BOTH** (default), KEYED, NOTARE, PBTARE
SC.PRI.FMT#*n*	Primary units format (decimal point and display divisions)	8888100, 8888200, 8888500, 8888810, 8888820, 8888850, **8888881** (default), 8888882, 8888885, 888888.1, 888888.2, 888888.5, 88888.81, 88888.82, 88888.85, 8888.881, 8888.882, 8888.885, 888.8881, 888.8882, 888.8885, 88.88881, 88.88882, 88.88885
SC.PRI.UNITS#*n*	Primary units	**LB** (default), KG, OZ, TN, T, G, NONE
SC.SEC.FMT#*n*	Secondary units format (decimal point and display divisions)	8888100, 8888200, 8888500, 8888810, 8888820, 8888850, 8888881, 8888882, 8888885, 888888.1, 888888.2, **888888.5** (default), 88888.81, 88888.82, 88888.85, 8888.881, 8888.882, 8888.885, 888.8881, 888.8882, 888.8885, 88.88881, 88.88882, 88.88885
SC.SEC.UNITS#*n*	Secondary units	LB, **KG** (default), OZ, TN, T, G, NONE
SC.SEC.ENABLED#*n*	Enable the Secondary Units	**ON** (default), OFF
SC.FILTERCHAIN#*n*	Defines what filter to use	**AVGONLY** (default), ADPONLY, DMPONLY, RAW
SC.DAMPINGVALUE#*n*	Sets the damping time constant	0–2560 (in 0.1 second intervals), **10** (default)
SC.ADTHRESHOLD#*n*	Adaptive filter weight threshold value	0–2000 (in display divisions), **10** (default)
SC.ADSENSITIVITY#*n*	Adaptive filter sensitivity	**LIGHT** (default), MEDIUM, HEAVY
SC.ACCUM#*n*	Accumulator enable	**OFF** (default), ON
SC.WZERO#*n*	Perform zero calibration	—
SC.TEMPZERO#*n*	Perform temporary zero calibration	—
SC.LASTZERO#*n*	Perform last zero calibration	—
For commands ending with #*n*, n is the scale number (1)		

Table 9-6. Scale Parameter Setting Commands

Command	Description	Values
SC.WVAL#*n*	Test weight value	0.000001–9999999.999999, **10000.0** (default)
SC.WSPAN#*n*	Perform span calibration	—
SC.WLIN.F1#*n*– SC.WLIN.F4#*n*	Actual raw count value for linear points 1–4	0–16777215, **0** (default)
SC.WLIN.V1#*n*– SC.WLIN.V4#*n*	Test weight value for linear points 1–4 (A setting of 0 indicates the linear point is not used)	0.000001–9999999.999999, **0.0** (default)
SC.WLIN.C1#*n*– SC.WLIN.C4#*n*	Perform linear calibration on points 1–4	—
SC.LC.CD#*n*	Deadload coefficient raw count value	0–16777215, **8388210** (default)
SC.LC.CW#*n*	Span coefficient raw count value	0–16777215, **9476903** (default)
SC.LC.CZ#*n*	Temporary zero raw count value	0–16777215, **8388367** (default)
SC.REZERO#*n*	Perform the Rezero calibration function	—
SC.INITIALZERO#*n*	Initial Zero range in % of full scale	0.0–100.0, **0.0** (default)
SC.RTZGRAD#*n*	Number of graduations from the zero base at which the accumulator re-arms itself	0.0–100.0, **0.4** (default)
For commands ending with #*n*, n is the scale number (1)		

Table 9-6. Scale Parameter Setting Commands (Continued)

9.7 LaserLight3 Commands

The following commands can be used to configure LaserLight3 parameters.

9.7.1 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 13.5 on page 137.***
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 9-7. LaserLight3 EDP Commands

9.7.2 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 9-8. Additional LaserLight3 Commands

9.8 Serial Port Setting Commands

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

Command	Description	Values
EDP.TRIGGER#*p*	Port serial input trigger function	**CMD** (default), STRIND, STRLFT, REMOTEIN, REMOTEOUT
EDP.BAUD#*p*	Port baud rate	1200, 2400, 4800, **9600** (default), 19200, 28800, 38400, 57600, 115200, AUTO
EDP.BITS#*p*	Port data bits/parity	**8NONE** (default), 8EVEN, 8ODD, 7EVEN, 7ODD
EDP.TERMIN#*p*	Port line termination character	**CR/LF** (default), CR
EDP.STOPBITS#*p*	Port stop bits	**1** (default), 2
EDP.ECHO#*p*	Port echo	**ON** (default), OFF
EDP.RESPONSE#*p*	Port response	**ON** (default), OFF
EDP.EOLDLY#*p*	Port end-of-line delay	0–255 (0.1-second intervals), **0** (default)
EDP.ADDRESS#*p*	Port RS-485 address (port 3)	0–31, **0** (default)
EDP.DUPLEX#*p*	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 9-9. Serial Port Commands

9.8.1 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)

9.9 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 9-10. Ethernet TCP/IP and USB Commands

9.10 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 9-11. Wi-Fi Commands

9.11 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 9-12. Program Commands

9.12 Stream Setting Commands

The following commands can be used to configure stream format parameters.

Command	Description	Values
STRM.FORMAT#*n*	Stream format	**RLWS** (default), CARDNAL, WTRONIX, TOLEDO, CUSTOM
STRM.CUSTOM#*n*	Custom stream definition	Up to 1,000 alphanumeric characters
STRM.GROSS#*n*	Mode token when streaming the Gross weight	Up to 8 alphanumeric characters, **G** (default)
STRM.NET#*n*	Mode token when streaming the Net weight	Up to 8 alphanumeric characters, **N** (default)
STRM.PRI#*n*	Units token when streaming Primary units	Up to 8 alphanumeric characters, **L** (default)
STRM.SEC#*n*	Units token when streaming Secondary units	Up to 8 alphanumeric characters, **K** (default)
STRM.INVALID#*n*	Status token when streaming an Invalid weight	Up to 2 alphanumeric characters, **I** (default)
STRM.MOTION#*n*	Status token when the weight is in motion	Up to 2 alphanumeric characters, **M** (default)
STRM.POS#*n*	Polarity token when the weight is positive	**SPACE** (default), NONE, +
STRM.NEG#*n*	Polarity token when the weight is negative	SPACE, NONE, **–** (default)
STRM.OK#*n*	Status token when the weight is OK (not invalid, out of range, at zero or in-motion)	Up to 2 alphanumeric characters (default is a space)
STRM.TARE#*n*	Mode token when streaming the tare weight	Up to 8 alphanumeric characters, **T** (default)
STRM.RANGE#*n*	Status token when the weight is Out of Range	Up to 2 alphanumeric characters, **O** (default)
STRM.ZERO#*n*	Status token when the weight is at Center of Zero	Up to 2 alphanumeric characters, **Z** (default)
For commands ending with #*n*, n is the stream format number (1)		

Table 9-13. Stream Formatting Commands

9.13 Regulatory Commands

The following commands can be used to configure regulatory parameters.

Command	Description	Values
REGULAT	Regulatory mode	**NTEP** (default), CANADA, INDUST, NONE, OIML
AUDAGNCY	Audit Agency (Industrial Mode)	**NTEP** (default), CANADA, NONE, OIML
REG.SNPSHOT	Display or Scale weight source	**DISPLAY** (default), SCALE
REG.ZTARE	Remove tare on ZERO	**NO** (default), YES
REG.KTARE	Always allow keyed tare	NO, **YES** (default)
REG.MTARE	Multiple tare action	**REPLACE** (default), REMOVE, NOTHING
REG.NTARE	Allow negative tare	**NO** (default), YES
REG.CTARE	Allow Clear key to clear tare/accumulator	NO, **YES** (default)
REG.NEGTOTAL	Allow total scale to display negative value	**NO** (default), YES
REG.PRTMOT	Allow print while in motion	**NO** (default), YES
REG.PRINTPT	Add PT to keyed tare print	NO, **YES** (default)
REG.OVRBASE	Zero base for overload calculation	**CALIB** (default), SCALE
REG.AZTNET	Perform AZT on Net value	**NO** (default), YES
REG.MANUALCLEARTARE	Allows manual clearing of the tare value	NO, **YES** (default)
REG.TAREINMOTION	Allows Tare in Motion	**NO** (default), YES
REG.ZEROINMOTION	Allows scale to be zeroed while in motion	**NO** (default), YES
REG.UNDERLOAD	Underload weight value in display divisions	1–9999999, **20** (default)
REG.HLDWGH	Allow Weighment during Display Hold	**NO** (default), YES
REG.MOTWGH	Allow Weighment in Motion	**NO** (default), YES
REG.HTARE	Allow Tare during Display Hold	**NO** (default), YES
REG.PRTHLD	Allow Print during Display Hold	**NO** (default), YES
REG.RKTARE	Round Keyed Tare	**NO** (default), YES
REG.RTARE	Round Pushbutton Tare	**NO** (default), YES
NTEP defaults shown for regulatory command values		

Table 9-14. Regulatory Commands

9.14 Setpoint Commands

The following commands can be used to configure setpoint parameters.

Command	Description	Values
BATCHNG	Batching mode	**OFF** (default), AUTO, MANUAL
SP.KIND#*n*	Setpoint kind	**OFF** (default), GROSS, NET, -GROSS, -NET, ACCUM, POSREL, NEGREL, PCTREL, PAUSE, DELAY, WAITSS, COUNTER, AUTOJOG, COZ, INMOTON, INRANGE, BATCHPR, TIMER, CONCUR, TOD, ALWAYS, NEVER
SP.VALUE#*n*	Setpoint value	0.0–9999999.0, **0.0** (default)
SP.TRIP#*n*	Trip	**HIGHER** (default), LOWER, INBAND, OUTBAND
SP.BANDVAL#*n*	Band value	0.0–9999999.0, **0.0** (default)
SP.HYSTER#*n*	Hysteresis	0.0–9999999.0, **0.0** (default)
SP.PREACT#*n*	Preact type	**OFF** (default), ON, LEARN
SP.PREVAL#*n*	Preact value	0.0–9999999.0, **0.0** (default)
SP.PREADJ#*n*	Preact adjustment percentage	0.0–100.0, **50.0** (default)
SP.PRESTAB#*n*	Preact learn stability (in tenths of a second)	0–65535, **0** (default)
SP.PCOUNT#*n*	Preact learn interval	1–65535, **1** (default)
SP.BATCH#*n*	Batch step enable	**OFF** (default), ON
SP.CLRACCM#*n*	Clear accumulator enable	**OFF** (default), ON
SP.CLRTARE#*n*	Clear tare enable	**OFF** (default), ON
SP.PSHACCM#*n*	Push accumulate	**OFF** (default), ON, ONQUIET
SP.PSHPRINT#*n*	Push print	**OFF** (default), ON, WAITSS
SP.PSHTARE#*n*	Push tare	**OFF** (default), ON
SP.ALARM#*n*	Alarm enable	**OFF** (default), ON
SP.ALIAS#*n*	Setpoint name	Up to 8 alphanumeric characters, **SETPT** (default)
SP.ACCESS#*n*	Setpoint access	OFF, **ON** (default), HIDE
SP.DSLOT#*n*	Digital output slot	**NONE** (default), 0
SP.DIGOUT#*n*	Digital output	1–4, **1** (default)
SP.SENSE#*n*	Digital output sense	**NORMAL** (default), INVERT
SP.BRANCH#*n*	Branch destination (0 = do not branch)	0–8, **0** (default)
SP.RELNUM#*n*	Relative setpoint number	1–8, **1** (default)
SP.START#*n*	Starting setpoint	1–8, **1** (default)
SP.END#*n*	Ending setpoint	1–8, **1** (default)
SP.TIME#*n*	Trip time	hhmm, **0000** (default)
SP.DURATION#*n*	Trip duration	hhmmss, **000000** (default)
SP.ENABLE#*n*	Setpoint enable	OFF, **ON** (default)
For setpoint commands ending with #*n*, n is the setpoint number (1-8)		

Table 9-15. Setpoints Commands

9.15 Batching Control Commands

The commands listed in Table 9-16 provide batching control through a communications port.

Command	Description	Values
BATSTART	Batch Start	If the BATRUN digital input is active or not assigned, the BATSTART command can be used to start the batch program
BATSTOP	Batch Stop	Stops an active batch and turns off all associated digital outputs; Requires a Batch Start to resume processing
BATPAUSE	Batch Pause	Pauses an active batch and turns off all digital outputs except those associated with Concurrent and Timer setpoints; processing is suspended until the indicator receives a Batch Start signal; pressing the Batch Start digital input, BATSTART serial command resumes the batch and re-energizes all digital outputs turned off by the Batch Pause
BATRESET	Batch Reset	Stops the program and resets the batch program to the first batch step; use the BATRESET command after making changes to the batch configuration
BATSTATUS	Batch Status	Returns *XYYY* where *X* is *S* (if the batch is stopped), *P* (if the batch is paused), *R* (if the batch is running); and *YYY* is the setpoint number the batch is currently on (1-8)

Table 9-16. Batching Control Commands

9.16 Print Format Commands

The following commands can be used to configure print format parameters.

Command	Description	Values
GFMT GFMT.PORT GFMT.PORT2	Gross demand print format string	Each format can be sent out one or two ports; for the .PORT and .PORT2 commands, specify the port name as one of the following: RS232-1 (PORT default), RS232-2, 20MA, RS485, TCP1, TCPS, USB, WIFI, NONE (PORT2 default) *Example: To send the Gross format out both the RS-232 Port 2 and the TCPC Port at the same time, send:* *GFMT.PORT=RS232-2* *GFMT.PORT2=USB* See Section 10.0 on page 114 for information about demand print format strings
NFMT NFMT.PORT NFMT.PORT2	Net demand print format string	
ACCFMT ACC.PORT ACC.PORT2	Accumulator print format string	
SPFMT SPFMT.PORT SPFMT.PORT2	Setpoint print format string	
HDRFMT1 HDRFMT2	Ticket header format strings	
AUD.PORT AUD.PORT2	Audit destination print ports	

Table 9-17. Print Format Commands

9.17 Digital I/O Command

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

Command	Description	Values
DIO.*b#s*	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.*b#0*	Disables digital output for bit entered	-
DON.*b#0*	Enables digital output bit entered	-
Valid bit values (*b*) are 1-4; For commands ending with #*s*, s is the slot assigned to the digital I/O (0); Slot 0 is onboard; For commands ending with b#0, bits must be configured as a digital output for command to function properly.		

Table 9-18. Digital I/O Commands

9.18 Weigh Mode Commands

These commands function in *Weigh* mode. Non-weight-related commands work in *Setup* mode.

Command	Description	Values
P	Returns what the indicator is currently displaying	--
ZZ	Returns what the indicator is currently displaying as along with the currently displayed annunciators	See Section 13.6 on page 140
CONSNUM	Returns current consecutive number value	0–9999999, **0** (default)
UID	Sets or returns the unit ID	Up to 8 alphanumeric characters, **1** (default)
SD	Sets or returns the current system date	*MMDDYY*, *DDMMYY*, *YYMMDD*, or *YYDDMM*. Enter six-digit date using the year-month-day order specified for the DATEFMT parameter, using only the last two digits of the year; The current system date is returned by only sending *SD*
ST	Sets or returns the current system time	*HHMM* (enter using 24-hour format) The current system time is returned by only sending *ST*
STS	Sets or returns the current system time with seconds	*HHMMSS* (enter using 24-hour format) The current system time is returned by only sending *STS*
RS	Resets system	Soft reset; Used to reset the indicator without resetting the configuration to the factory defaults
SX	Starts all serial data streams	--
EX	Stops all serial data streams	--
SX#*p*	Starts serial data stream for port *p*	OK *or* ?? An EX command sent while in *Setup* mode does not take effect until the indicator is returned to *Weigh* mode
EX#*p*	Stops serial data stream for port *p*	
SF#*n*	Returns a single stream frame from scale *n* using the currently configured stream format.	--
XA#*n*	Returns the accumulator value in displayed units	nnnnnnnnn UU
XAP#*n*	Returns the accumulator value in primary units	
XAS#*n*	Returns the accumulator value in secondary units	
XG#*n*	Returns the gross weight in displayed units	nnnnnnnnn UU
XGP#*n*	Returns the gross weight in primary units	
XGS#*n*	Returns the gross weight in secondary units	
XN#*n*	Returns the net weight in displayed units	nnnnnnnnn UU
XNP#*n*	Returns the net weight in primary units	
XNS#*n*	Returns the net weight in secondary units	
XT#*n*	Returns the tare weight in displayed units	nnnnnnnnn UU
XTP#*n*	Returns the tare weight in primary units	
XTS#*n*	Returns the tare weight in secondary units	
For commands ending with #*n*, n is the scale number (1); For commands ending with #*p*, p is the port number (1-8): • 1 = RS232-1 • 2 = RS232-2 • 3 = 20mA • 4 = RS422/485 • 5 = USB • 6 = TCP Server • 7 = TCP Client • 8 = WIFI		

Table 9-19. Weigh Mode Commands

10.0 Print Formatting

The LaserLight3 provides multiple print formats, Gross, Net, Accumulator, Setpoint, Header which determine the format of the printed output when the **Print** key is pressed. If a tare has been entered or acquired, Net is used; otherwise, Gross is used.

Each print format can be customized to include up to 1,000 characters of information, such as company name and address, on printed tickets. Use the print format menu through front panel of the indicator to customize the print formats.

List of print formats and the associated EDP commands:

- Gross Format (GFMT)
- Net Format (NFMT)
- Header Format (HDRFMT1-2)
- Audit Trail Port (AUD.DEST1-2)

10.1 Print Formatting Tokens

Table 10-1 lists tokens which can be used to configure the print formats. Tokens included in the format strings must be enclosed between < and > delimiters. Characters outside of the delimiters are printed as text on the ticket. Text characters can include ASCII characters, which can be printed by the output device.

Token	Description	Supported Ticket Formats
General Weight Data Tokens		
<G*x*>	Gross weight, current scale	GFMT, NFMT, ACCFMT, SPFMT
<G*x*#*n*>	Gross weight, scale *n*	
<N*x*>	Net weight, current scale	
<N*x*#*n*>	Net weight, scale *n*	
<T*x*>	Tare weight, current scale	
<T*x*#*n*>	Tare weight, scale *n*	
<S>	Current scale number	
NOTE: For tokens with #n, n is the scale number (1). For tokens with an x, x is the character width of the weight field with padded spaces on the left. If x is not specified, 10 is the assumed default for the weight field. x can be set using one or two digits and sets the minimum number of characters in the weight field, but expands to show all characters for a value that has more characters than the minimum value set with x. *Example: To format a ticket to provide gross weight for Scale 1 with a minimum of 6 print characters, use the following token: <G6#1>* ***NOTE: Gross, net and tare weights can be printed in any configured weight unit by adding modifiers to the gross, net, and tare weight tokens: /P (primary units), /D (displayed units) or /S (secondary units). If not specified, the currently displayed unit (/D) is assumed.*** *Example: To format a ticket to provide net weight in secondary units, use the following token: <N/S>* ***Formatted weight strings default to contain a 10-digit weight field (including sign and decimal point), followed by a space and a 2-digit unit identifier. Total field length with unit identifier is 13 characters. For tokens with an x, total field length with unit identifier is x + 3.***		
Accumulator Tokens		
<A>	Accumulated weight, current scale; Prints to 15 digits	GFMT, NFMT, ACCFMT
<A#*n*>	Accumulated weight, scale *n*	
<AA>	Average accumulation, current scale	
<AA#*n*>	Average accumulation, scale *n*	
<AC>	Number of accumulations, current scale	
<AC#*n*>	Number of accumulations, scale *n*	
<AT>	Time of last accumulation, current scale	
<AT#*n*>	Time of last accumulation, scale *n*	
<AD>	Date of last accumulation, current scale	
<AD#n>	Date of last accumulation, scale *n*	
NOTE: For tokens with #n, n is the scale number (1).		
Setpoint Tokens		

Table 10-1. Print Format Tokens

Token	Description	Supported Ticket Formats
<SCV>	Setpoint captured value	SPFMT
<SN>	Setpoint number	
<SNA>	Setpoint name	
<SPM>	Setpoint mode (gross or net label)	
<SPV>	Setpoint preact value	
<STV>	Setpoint target value	
Auditing Tokens		
<CD>	Last calibration date	All
<NOC>	Number of calibrations	
<NOW>	Number of weighments since last calibration	
NOTE: Last calibration date (<CD>) and number of calibrations (<NOC>) are updated anytime a calibration is performed on any of the scales. Number of weighments (<NOW>) is incremented whenever the scale weight exceeds 10% of scale capacity. Scale must return to gross or net zero before the value can be incremented again.		
Formatting and General-Purpose Tokens		
<*nnn*>	ASCII character (*nnn* = decimal value of ASCII character); used for inserting control characters (STX, for example) in the print stream	All
<TI>	Time	
<DA>	Date	
<TD>	Time and date	
<UID>	Unit ID number (up to 8 alphanumeric characters)	
<CN>	Consecutive number (up to 7 digits)	
<H1>	Insert header format 1 (HDRFMT1)	
<H2>	Insert header format 2 (HDRFMT2)	
<CR>	Carriage return character	
<LF>	Line feed character	
<NL*nn*>	New line (*nn* = number of termination (<CR/LF> or <CR>) characters)*	
<SP*nn*>	Space (*nn* = number of spaces)*	
<SU>	Toggle weight data format (formatted/unformatted)	
NOTE: If nn is not specified, 1 is assumed. Value must be in the range 1–99.		
Header Format Tokens		
<COMP>	Company name (up to 30 characters)	All
<COAR1> <COAR2> <COAR3>	Company address, lines 1–3 (up to 30 characters)	
<CONM1> <CONM2> <CONM3>	Company contact names (up to 20 characters)	
<COPH1> <COPH2> <COPH3>	Company contact phone numbers (up to 20 characters)	
<COML>	Company contact e-mail address (up to 30 characters)	

Table 10-1. Print Format Tokens (Continued)

Format	Default Format String	When Used
GFMT	GROSS<G><NL2><TD><NL>	*Weigh* mode – no tare in system
NFMT	GROSS<G><NL>TARE<SP><T><NL>NET<SP2><N> <NL2><TD><NL>	*Weigh* mode – tare in system
ACCFMT	ACCUM <A><NL><DA> <TI><NL>	Accumulator demand print format string
SPFMT	<SCV><SP><SPM><NL>	Setpoint print operation with Push Print = ON
HDRFMT*n*	COMPANY NAME<NL>STREET ADDRESS<NL>CITY ST ZIP<NL2>	Header format strings (*n*=1-2)

Table 10-2. Default Print Formats

NOTE: The 1,000 character limit of each print format string includes the output field length of the print formatting tokens, not the token length. For example, if the indicator is configured to display a decimal point, the <G> token generates an output field of 13 characters: the 10 character weight value (including decimal point), one space, and a two-digit units identifier. For tokens with an x (e.g. <Gx> or <Gx#n>), total field length with unit identifier is x + 3.

PT (preset tare) is added to the tare weight if tare was keyed in.

10.2 Customizing Print Formats

The Gross (GFMT), Net (NFMT), Accumulator (ACCFMT), Setpoint (SPFMT), Header (HDRFMT1-2), formats can be customized using the print format menu via the front panel. See Section 4.3.5 on page 55 for the print format menu structure. To access the print format menu the indicator must be in Setup mode (Section 2.8.2 on page 25).

The print format menu via the front panel can be used to customize the print formats and to edit the print format strings with the full keyboard that appears on the display when entering a format string.

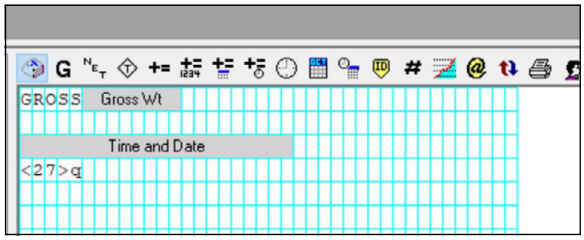
10.3 Non-Human Readable Characters

ASCII characters 0 through 31 are non-human readable characters. To include a special character in a print format, the decimal equivalent needs to be used (Section 13.5 on page 137). For example, the special character *Esc* would be <27> or 60, 50, 55, 62 (less the commas).

Examples of a print release command for a TMU295 in the GROSS format:

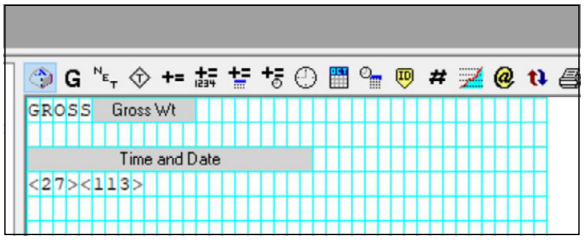
Print Format:
GROSS<G><NL2><TD><NL><27>q

In Revolution:



Print Format:
GROSS<G><NL2><TD><NL><27><113>

In Revolution:



11.0 Setpoints

The LaserLight3 indicator provides eight configurable setpoints for control of both indicator and external equipment functions. Setpoints can be configured to perform actions or functions based on specified parameter conditions. Parameters associated with various setpoint kinds can, for example, be configured to perform functions (print, tare, accumulate), to change the state of a digital output controlling indicator or external equipment functions, or to make conditional decisions.

NOTE: Weight-based setpoints are tripped by values specified in primary units only.

11.1 Continuous and Batch Setpoints

LaserLight3 setpoints can be either continuous or batch.

Continuous setpoints are free-running; the indicator constantly monitors the condition of free-running setpoints at each A/D update. The specified setpoint action or function is performed when the designated setpoint parameter conditions are met. A digital output or function assigned to a free-running setpoint continuously changes state, becoming active or inactive, as defined by the setpoint parameters.

Batch setpoints (Batch = On) which have digital outputs associated to them remain active until the setpoint condition is met. The setpoint is then latched for the remainder of the batch sequence.

To use batch setpoints, set the Batching parameter in the Setpoint menu. This parameter defines whether a batch sequence is automatic or manual. Auto sequences repeat continuously after receiving a single batch start signal, while Manual sequences only run through once for each batch start signal. The batch start signal can be initiated by a digital input (set to Batch Start), or an EDP command (BATSTART).

For a setpoint to be used as part of a batch sequence, its batch sequence (Batch) parameter must be set to On. If a setpoint is defined and enabled, but its batch sequence parameter is set to Off, the setpoint operates as a continuous setpoint even during batch sequences.

NOTE: In applications which contain both batch setpoint routines and continuous setpoints, it is good practice to keep continuous setpoints separate from the batch sequence.

Do not assign them the same digital output.

Set the Access parameter On when creating and testing batch routines. Once the batching routine is complete and ready for production, Access can be set to Off to prevent changes to the configured setpoint value, or to Hide to prevent changing or viewing the value.

Parameter	Description	Batch	Continuous
Off	Setpoint turned off/ignored		
Gross	Performs functions based on the gross weight; the target weight entered is considered a positive gross weight	X	X
Net	Performs functions based on the net weight; the target weight entered is considered a positive net weight value	X	X
Negative Gross	Performs functions based on the gross weight; the target weight entered is considered a negative gross weight	X	X
Negative Net	Performs functions based on the net weight; the target weight entered is considered a negative net weight value	X	X
Accumulate	Compares the value of the setpoint to the source scale accumulator; the accumulator setpoint is satisfied when the value of the source scale accumulator meets the value and conditions of the accumulator setpoint	X	X
Positive Relative	Performs functions based on a specified value above a referenced setpoint, using the same weight mode as the referenced setpoint	X	X
Negative Relative	Performs functions based on a specified value below a referenced setpoint, using the same weight mode as the referenced setpoint	X	X

Table 11-1. Setpoint Kinds

Parameter	Description	Batch	Continuous
Percent Relative	Performs functions based on a specified percentage of the target value of a referenced setpoint, using the same weight mode as the referenced setpoint; the actual target value of the Percent Relative setpoint is calculated as a percentage of the target value of the referenced setpoint	X	X
Pause	Pauses the batch sequence indefinitely; a Batch Start signal must be initiated to continue the batch process	X	
Delay	Delays the batch sequence for a specified time; the length of the delay (in tenths of a second) is specified on the Value parameter	X	
Wait Standstill	Suspends the batch sequence until the scale is at standstill	X	
Counter	Specifies the number of consecutive batch sequences to perform; place counter setpoints at the beginning of a batch routine	X	
Auto-Jog	Automatically checks the previous weight-based setpoint to verify the setpoint weight value is satisfied in a standstill condition • If the previous setpoint is not satisfied when at standstill, the ***Auto-Jog*** setpoint activates the digital output of the previous weight-based setpoint for a period of time, specified on the Value parameter (in tenths of a second) • The Auto-Jog process repeats until the previous weight-based setpoint is satisfied when the scale is at standstill ***NOTE: The Auto-Jog digital output is typically used to signify an Auto-Jog operation is being performed.*** ***NOTE: Auto-Jog uses the digital output of the previous weight-based setpoint, and should not be assigned to the same digital output as the related weight-based setpoint.***	X	
Center of Zero	Monitors for a gross center of zero condition • The digital output associated with this setpoint kind is activated when the referenced scale is at center of zero • No value is required for this setpoint		X
In Motion	Monitors for an in-motion condition • The digital output associated with this setpoint is activated when scale is not at standstill • No value is required for this setpoint		X
In Range	Monitors for an in-range condition • The digital output associated with this setpoint is activated when the scale is within capacity range • No value is required for this setpoint		X
Batch in Process	Batch processing signal: • The digital output associated with this setpoint is activated whenever a batch sequence is in progress • No value is required for this setpoint		X
Timer	Tracks the progress of a batch sequence based on a timer • The timer value, in tenths of a second, determines the length of time allowed between start and end setpoints • Start and End parameters are used to specify the start and end setpoints • If the End setpoint is not reached before the timer expires, the digital output associated with this setpoint is activated		X
Concurrent	Allows a digital output to remain active over a specified portion of the batch sequence • ***Type 1 (Value = 0):*** The digital output associated with this setpoint becomes active when the Start setpoint becomes the current batch step and remains active until the End setpoint becomes the current batch step • ***Type 2 (Value > 0):*** If a non-zero value is specified for the Value parameter, the value represents the timer, in tenths of a second, for this setpoint; The digital output associated with this setpoint becomes active when the Start setpoint becomes the current batch step and remains active until the timer expires		X
Time of Day	Performs functions when the internal clock time of the indicator matches the specified setpoint time	X	X
Always	This setpoint is always satisfied; It is typically used to provide an endpoint for true/false branching batch routines	X	
Never	This setpoint is never satisfied; Used to branch to a designated setpoint in true/false branching batch routines in which the batch does not continue through the normal sequence of batch setpoints	X	

Table 11-1. Setpoint Kinds (Continued)

11.2 Batch Operations

Batches are controlled by digital inputs or EDP commands.

Batch Run (or BATRUN EDP command)

If a Batch Run digital input is configured, it must be active (low) for a batch to be started, and for it to continue to run. If a batch is running and the input becomes inactive (high), it will stop the batch at the current batch setpoint and turn off all associated digital outputs.

Batch Start (or BATSTART EDP command)

If the Batch Run digital input is active (low), or is not assigned, Batch Start will start a batch, resume a paused batch or resume a stopped batch. If the Batch Run digital input is inactive (high), Batch Start will reset the current batch.

Batch Pause (or BATPAUSE EDP command)

The Batch Pause digital input will pause an active batch, turning off all associated digital outputs EXCEPT those associated with Concurrent and Timer setpoints, while the input is active (low). As soon as the Batch Pause digital input is made inactive (high), the batch will resume. BATPAUSE EDP command works the same, except the batch will not resume until a Batch Start signal is received.

Batch Stop (or BATSTOP EDP command)

Stops an active batch at the current setpoint and turns off all associated digital outputs.

Batch Reset (or BATRESET EDP command)

Stops and resets an active batch to the beginning of the process.

WARNING: To prevent personal injury and equipment damage, software-based interruptions must always be supplemented by emergency stop switches and other safety devices necessary for the application.

11.2.1 Batching Switch

The batching switch option (PN 19369) comes as a complete unit in an FRP enclosure, with legend plate, emergency stop, and a run/start/abort three-way switch.

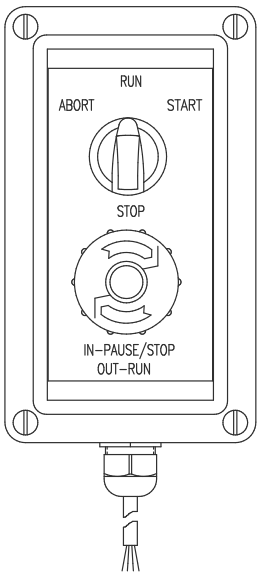


Figure 11-1. Batching Switch

Both switches are wired into the indicator's digital I/O terminal as shown in Figure 11-2 on page 120. Each switch uses a separate digital input. Digital I/O Bit 1 must be set to Batch Start and Bit 2 must be set to Batch Run.

Once cables and switches have been connected to the indicator, use the setup jumper (J25) to place the indicator in *Setup* mode. Use the Digital I/O menu (Section 4.3.8 on page 61) to configure digital input and output functions.

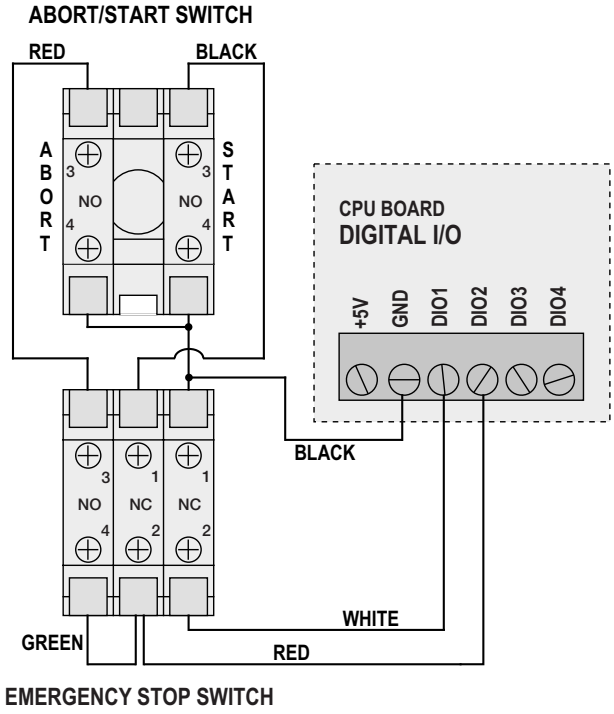


Figure 11-2. Batching Switch and Wiring Diagram Example

When configuration is complete, exit *Setup* mode. Initialize the batch by turning the three-way switch to ***ABORT***, then unlock the STOP button (the STOP button must be in the OUT position to allow the batch process to run). The batching switch is now ready to use.

WARNING: If no digital input is assigned to Batch Run, batching proceeds as if Batch Run were always on (the batch starts when the three-way switch is turned to Run, but the Stop button does not function).

To begin a batch process, turn the three-way switch to ***START*** momentarily. If the STOP button is pushed during the batch process, the process halts and the button locks in the IN position.

The ***START*** switch is ignored while the STOP button is locked in the IN position. The STOP button must be turned counterclockwise to unlock it, then released into the OUT position to enable the three-way switch.

To restart an interrupted batch from the step where it left off:

1. Unlock STOP button (OUT position).
2. Turn three-way switch to ***START***.

To restart an interrupted batch from the first batch step:

1. Turn three-way switch to ***ABORT***.
2. Unlock STOP button (OUT position).
3. Turn three-way switch to ***START***.

To abort an interrupted batch:

1. Push the STOP button.
2. Turn three-way switch to ***ABORT***.
3. Unlock STOP button (OUT position). A new batch can now be started.

NOTE: Use this procedure (or Batch Reset) to initialize the new batch routine following any change to the setpoint configuration.

11.3 Batching Examples

11.3.1 Example 1

The following example uses six setpoints to dispense material from a hopper in 100-lb batches and to automatically refill the hopper when its weight drops below 300 lb.

Bits 1 and 2 in the Digital I/O menu (Section 4.3.8 on page 61) are assigned to batch start and batch run functions: Batch Run must be on (low) before the Batch Start input starts the batch.

Slot 0, Bit 1 = Batch Start
Slot 0, Bit 2 = Batch Run
Batching = Manual

Setpoint 1 ensures the hopper has enough material to start the batch. If the hopper weight is 300 lb or higher, setpoint 1 is tripped.

Setpoint 1	Trip = Higher
Kind = Gross	Alarm = On
Value = 300	Batch = On

Setpoint 2 waits for standstill, then performs a tare to put the indicator into net mode.

Setpoint 2
Kind = Wait Standstill
Push Tare = On

Setpoint 3 is used as a reference (relative setpoint) for setpoint 4.

Setpoint 3	Trip = Higher
Kind = Net	Batch = Off
Value = 0	

Setpoint 4 is used to dispense material from the hopper. When the hopper weight falls to 100 lb less than its weight at the relative setpoint (setpoint 3), digital output 1 is set off.

Setpoint 4	Digital Output = 1
Kind = Negative Relative	Batch = On
Value = 100	Relative Setpoint Number = 3
Trip = Lower	

Setpoint 5 is used to evaluate the gross amount of material in the hopper after dispensing, and to maintain a minimum material level in the hopper. When the hopper weight falls below 300 lb, digital output 2 becomes active and the hopper is refilled to 1,000 lb.

Setpoint 5	Hysteresis = 700
Kind = Gross	Digital Output = 2
Value = 300	Batch = On
Trip = Higher	

Setpoint 6 is used to ensure the operation performed in setpoint 4 is completed within 10 seconds. The Start and End parameters identify the setpoints monitored by the Timer. If the Timer expires before Setpoint 5 starts, Digital Output 4 is turned on as an alarm to signal a process fault.

Setpoint 6	Start = 4
Kind = Timer	End = 5
Value = 100	Digital Output = 4

11.3.2 Example 2

The following example uses six setpoints to control a two-speed fill operation where both fast and slow feeds are on simultaneously.

Bits 1 and 2 in the Digital I/O menu (Section 4.3.8 on page 61) are assigned to Batch Start and Batch Run functions. Batch Run must be on (low) before the Batch Start input starts the batch.

Slot 0, Bit 1 = Batch Start
Slot 0, Bit 2 = Batch Run
Batching = Manual

Setpoint 1 ensures the scale is empty (0±2 lb).

Setpoint 1	Trip = Inband
Kind = Gross	Band Value = 2
Value = 0	Batch = On

Setpoint 2 checks for the weight of a container (>5 lb) placed on the scale.

Setpoint 2	Trip = Higher
Kind = Gross	Batch = On
Value = 5	

Setpoint 3 waits for standstill, then tares the container weight, placing the indicator in net mode.

Setpoint 3
Kind = Wait Standstill
Push Tare = On

Setpoint 4 starts the fast fill operation. When the net weight reaches 175 lb, the setpoint trips and digital output 1 is set off.

Setpoint 4	Trip = Higher
Kind = Net	Digital Output = 1
Value = 175	Batch = On

Setpoint 5 controls the slow fill operation. When the net weight reaches 200 lb, the slow fill is stopped, the indicator waits for standstill and performs a push print operation using the Setpoint Format ticket format.

Setpoint 5	Push Print = Wait Standstill
Kind = Net	Digital Output = 2
Value = 200	Batch = On
Trip = Higher	

Setpoint 6 is a continuous setpoint, used to allow the slow feed output to be on at the same time as the fast fill. The slow fill output (Digital Output 2) is turned on when Setpoint 4 (fast fill) starts and remains on until Setpoint 5 begins.

Setpoint 6	Start = 4
Kind = Concurrent	End = 5
Value = 0	Digital Output = 2

12.0 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.

12.1 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.

12.2 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; these issues cause erratic readings and shifts in weight readings
- Check all cable shields to ensure grounding is made at only the locations specified in the installation drawings

12.3 Troubleshooting Tips

Table 12-1 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 12.5 on page 126), perform another configuration reset, then reload files/configuration
^^^^^^^ or vvvvvvv	Over or under range LaserLight3 condition	For out-of -range conditions, check all LaserLight3 inputs for positive weight values. Troubleshoot load cell, then junction. Verify Sense parameter is configured correctly for the quantity of load cell wires (4- Wire is default). For more information, see Section 4.3.1 on page 46.
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
A/D LaserLight3 out of range	LaserLight3 operation Load cell connection Bad load cell or summing board in junction box	Check scale for binding, obstructions and mechanical failures Check load cell and cable connection Check LaserLight3 operation with load cell simulator Check status of sense setting
Does not display data from source	Source connection	Check source for cable connection and verify continuity of wiring

Table 12-1. Basic Troubleshooting

12.4 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 2.6 on page 17.

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 15.
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.

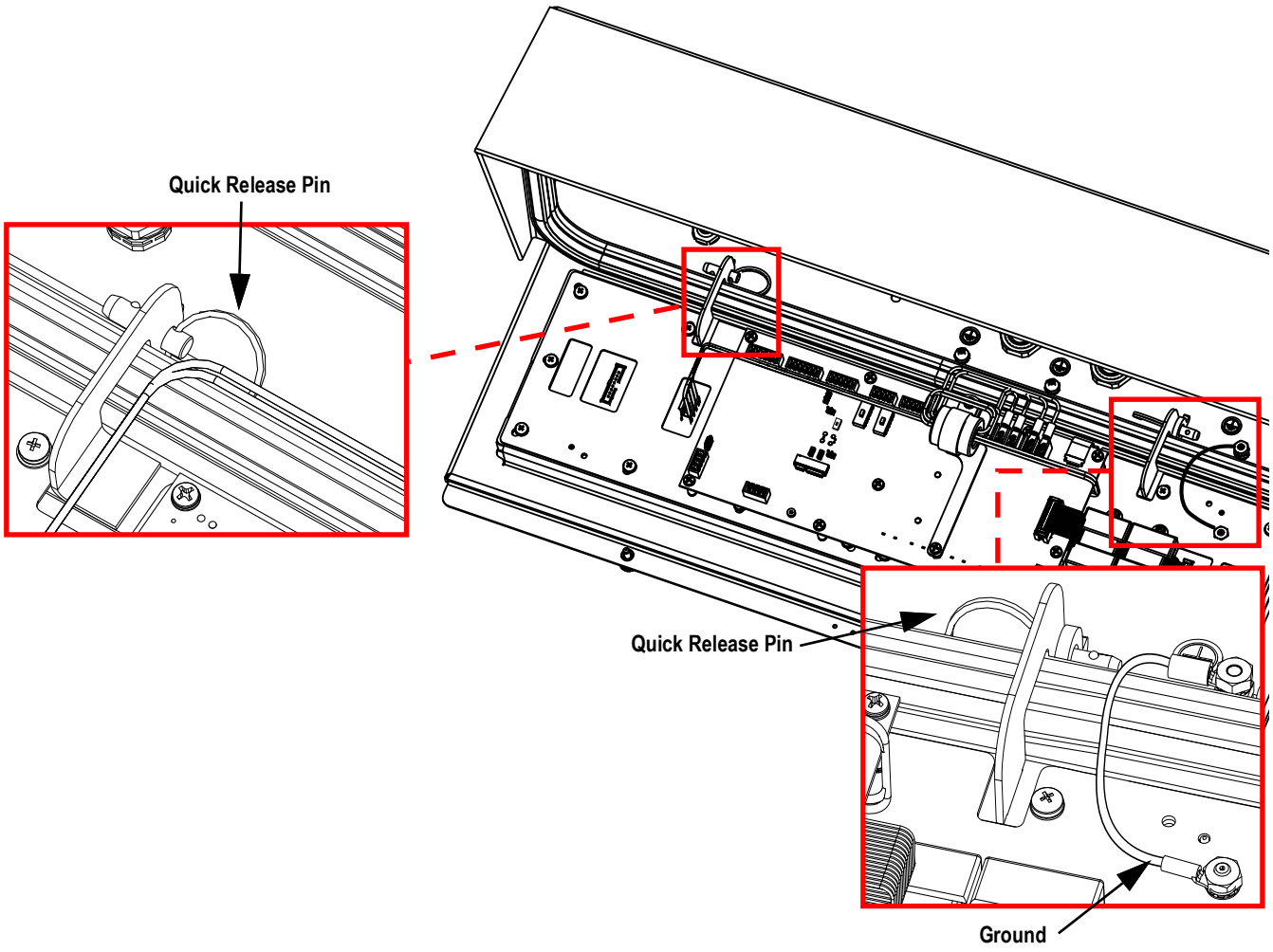


Figure 12-1. LaserLight3 Quick Release Pins

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.

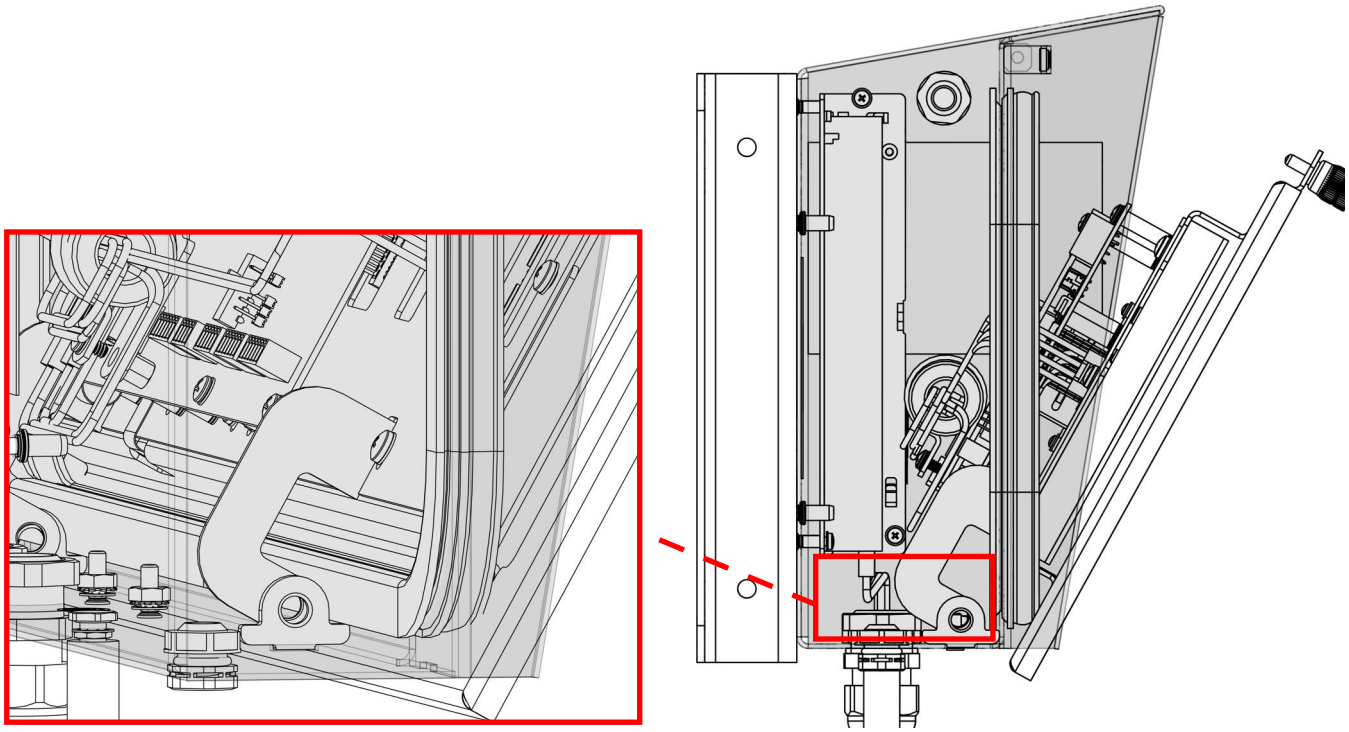


Figure 12-2. LaserLight3 Quick Release Pins

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

12.5 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 8.0 on page 98) or EDP commands (Section 9.0 on page 100) 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.

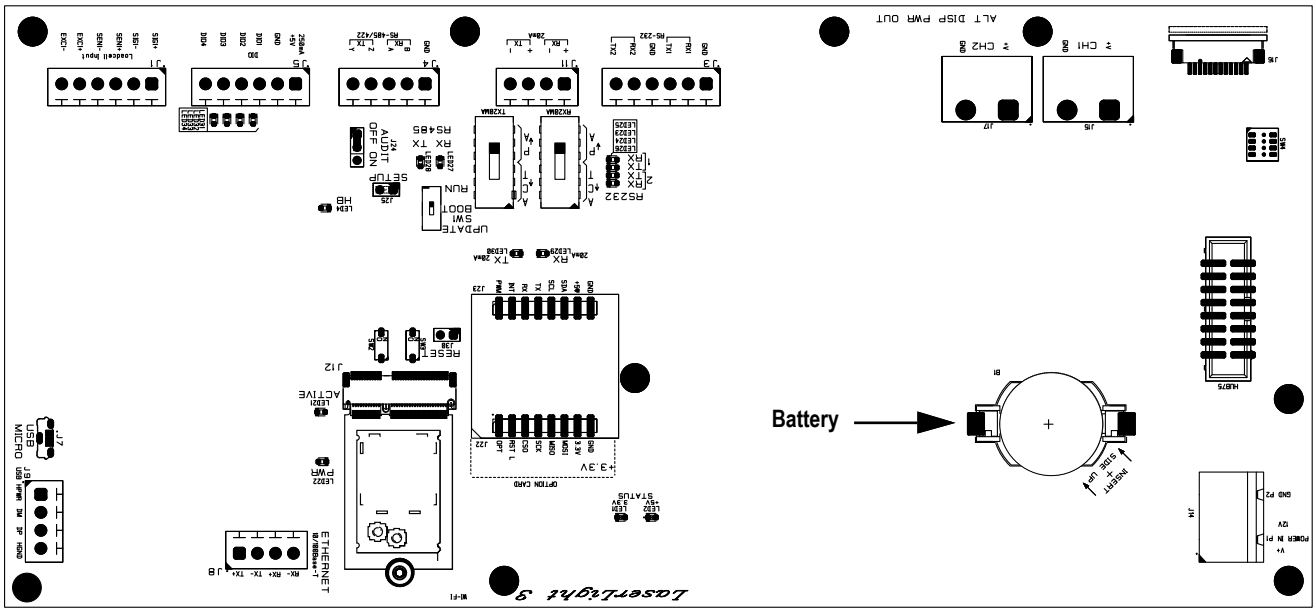


Figure 12-3. CPU Board Battery Location

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 15.
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.

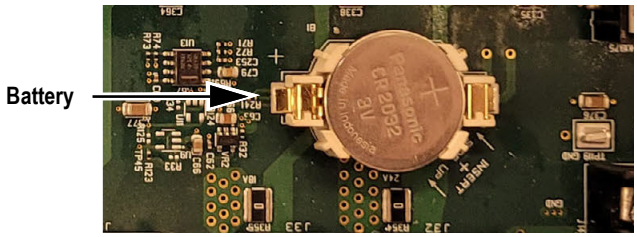


Figure 12-4. Battery Installed

6. Reset the time and date settings of the indicator (see Section 3.5.1 on page 34 and Section 3.5.2 on page 35).

12.6 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 15.
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.

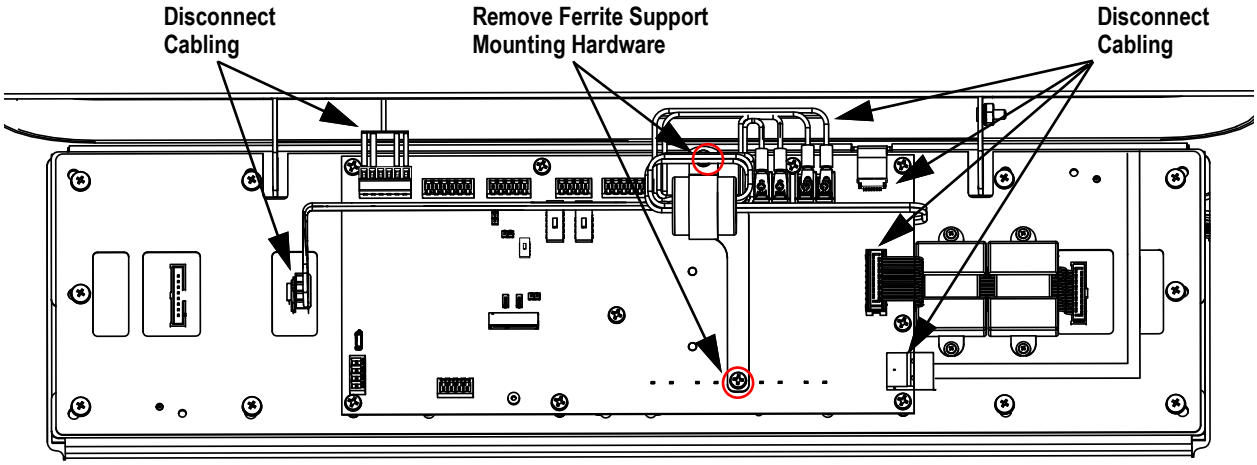


Figure 12-5. Disconnecting Components from CPU Board

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

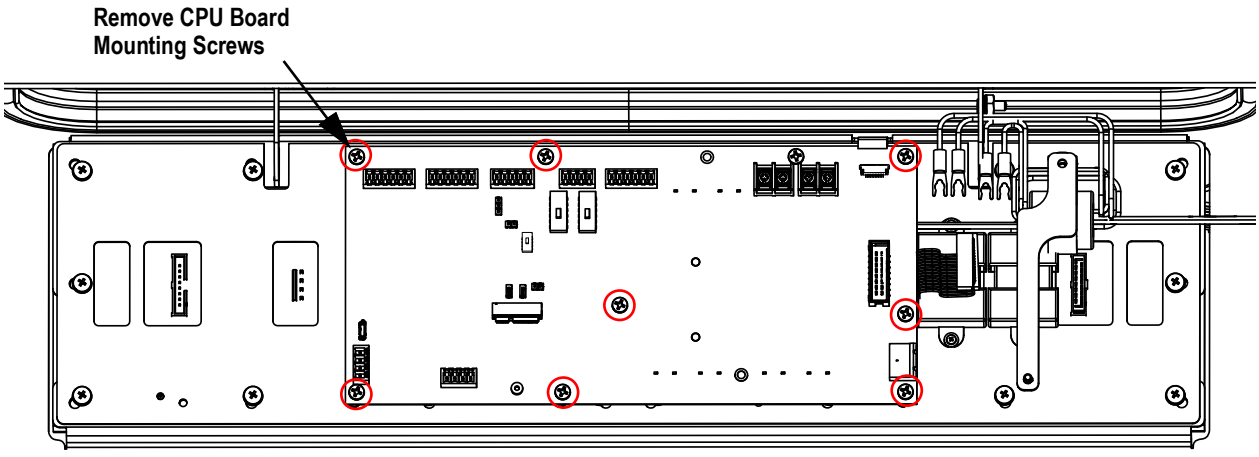


Figure 12-6. Removing CPU Board

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

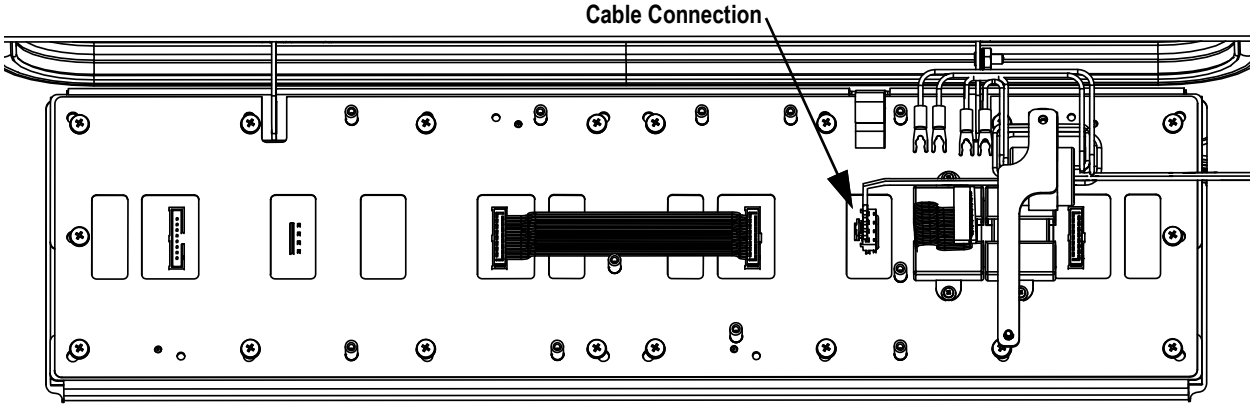


Figure 12-7. Display Power Cable Connection

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

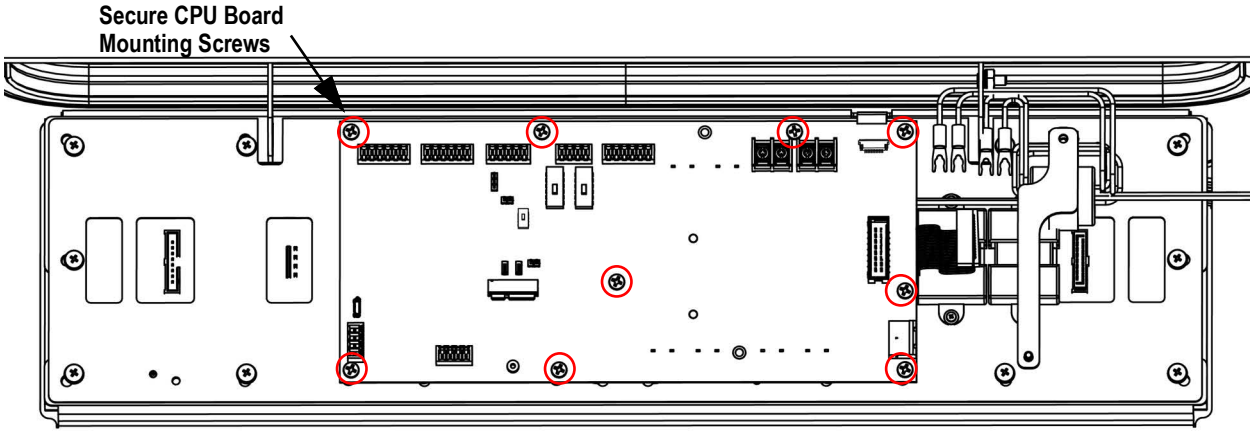


Figure 12-8. Attaching New CPU Board

11. Reattach ferrite support stand to CPU board and standoffs with previously removed hardware.
12. Reconnect cabling to CPU board. See Section 2.8 on page 24 for details about board connectors.

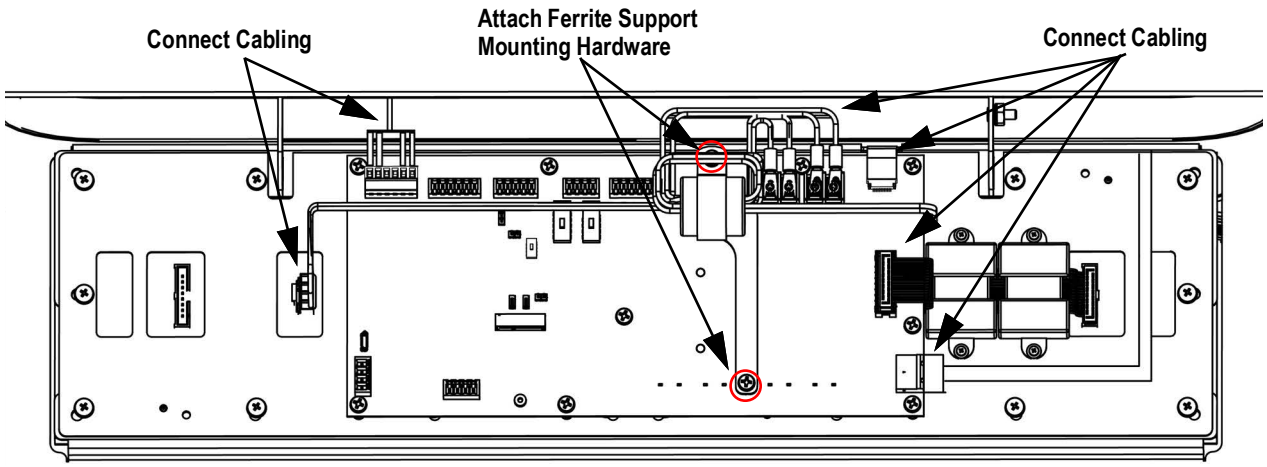


Figure 12-9. Connecting Components and Cables on CPU Board

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

12.7 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 15.
3. Remove front door as described in Section 12.4 on page 124.
4. Remove eight heat shield Phillips screws and washers on ends of heat shield.

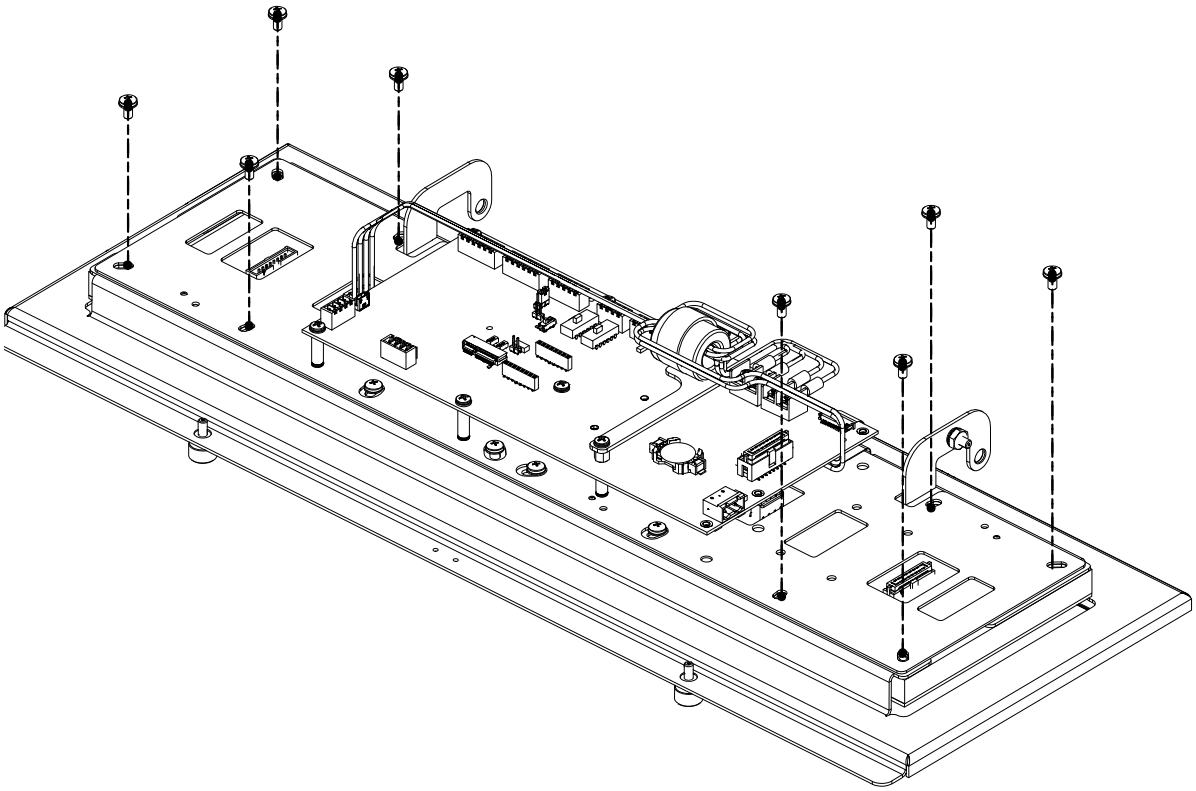


Figure 12-10. Heat shield and CPU Board Removal

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

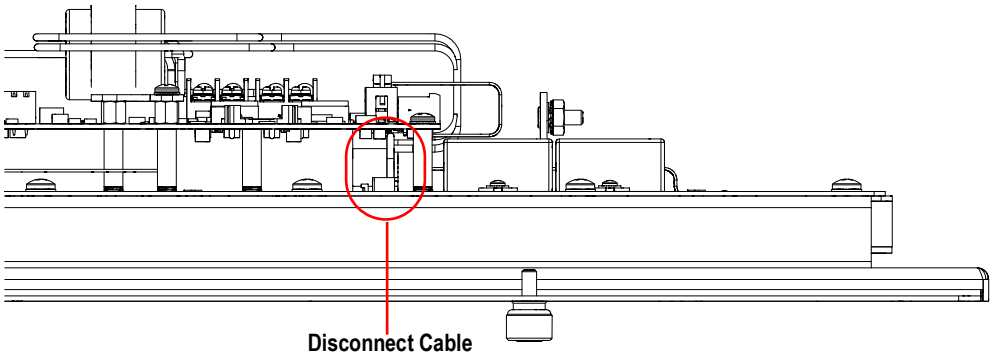


Figure 12-11. Disconnecting Cable Under Heat Shield

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

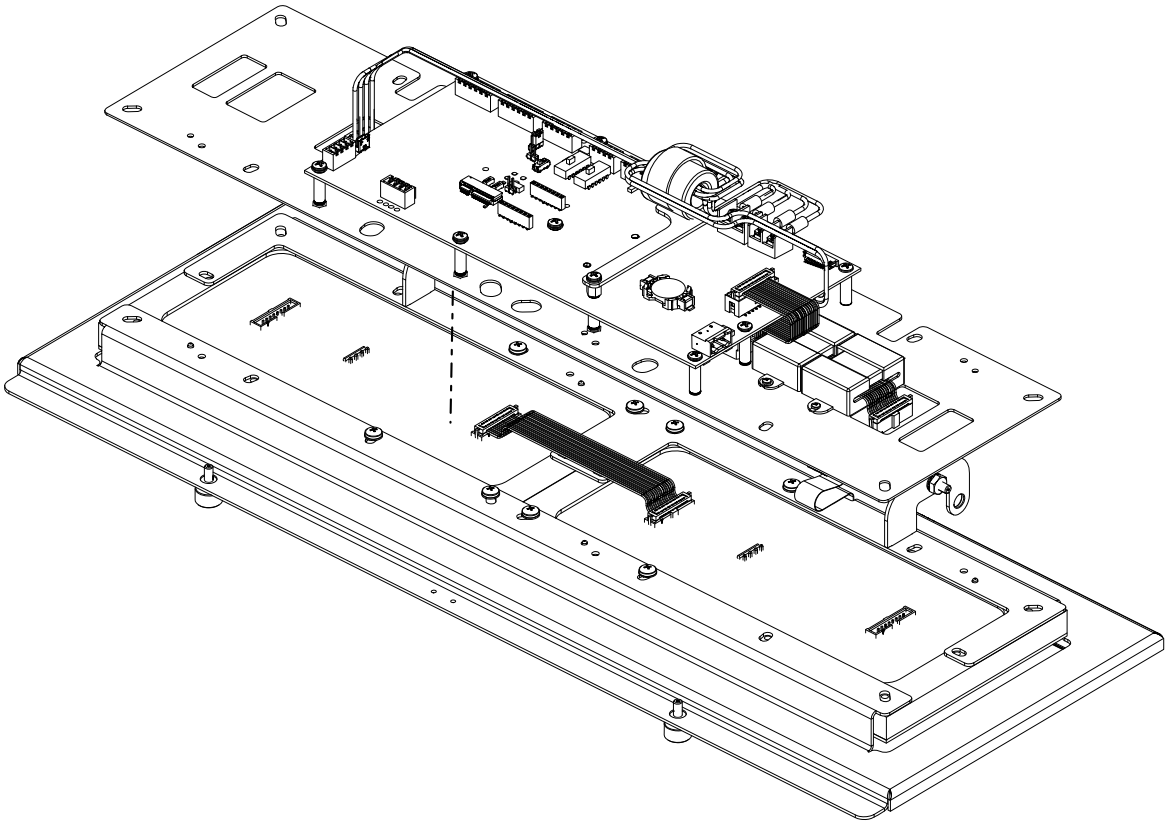


Figure 12-12. Removing Heat Shield from Door Frame

7. 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.

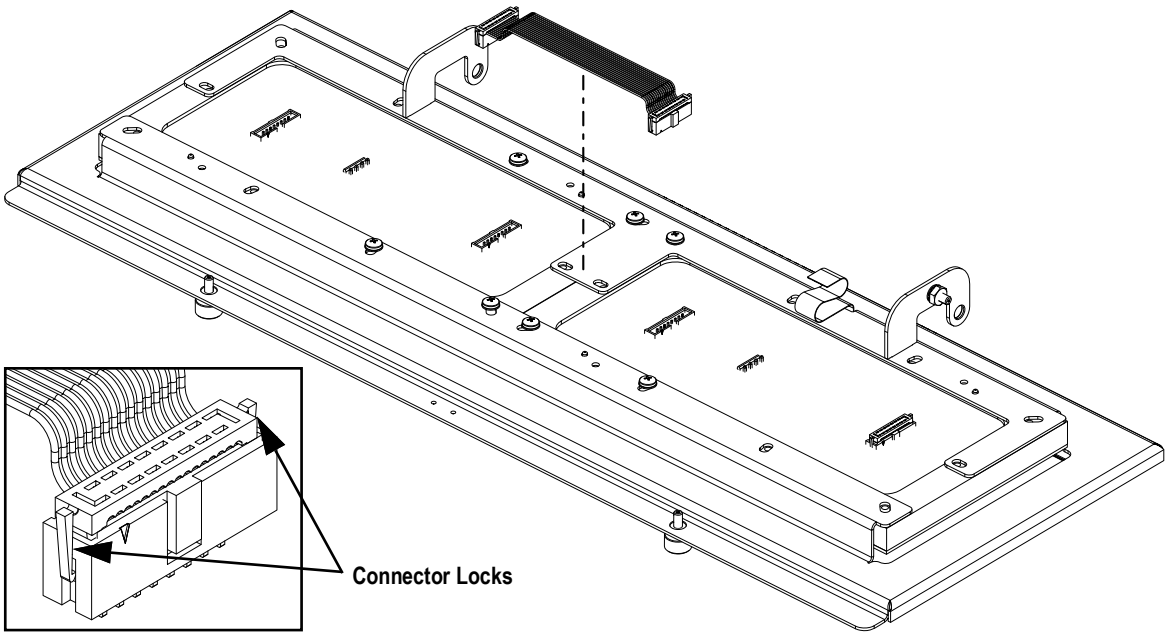


Figure 12-13. Remove Ribbon Cable from LED Displays

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

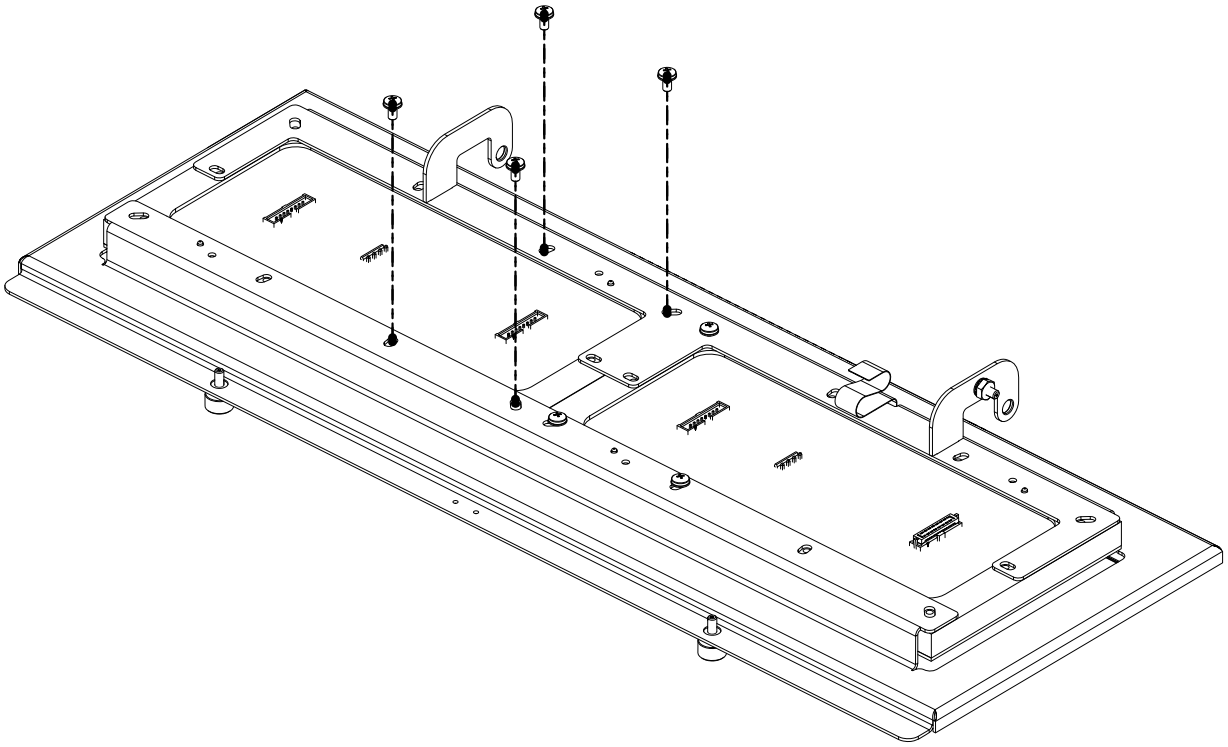


Figure 12-14. Remove Mounting Hardware from LED Displays

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

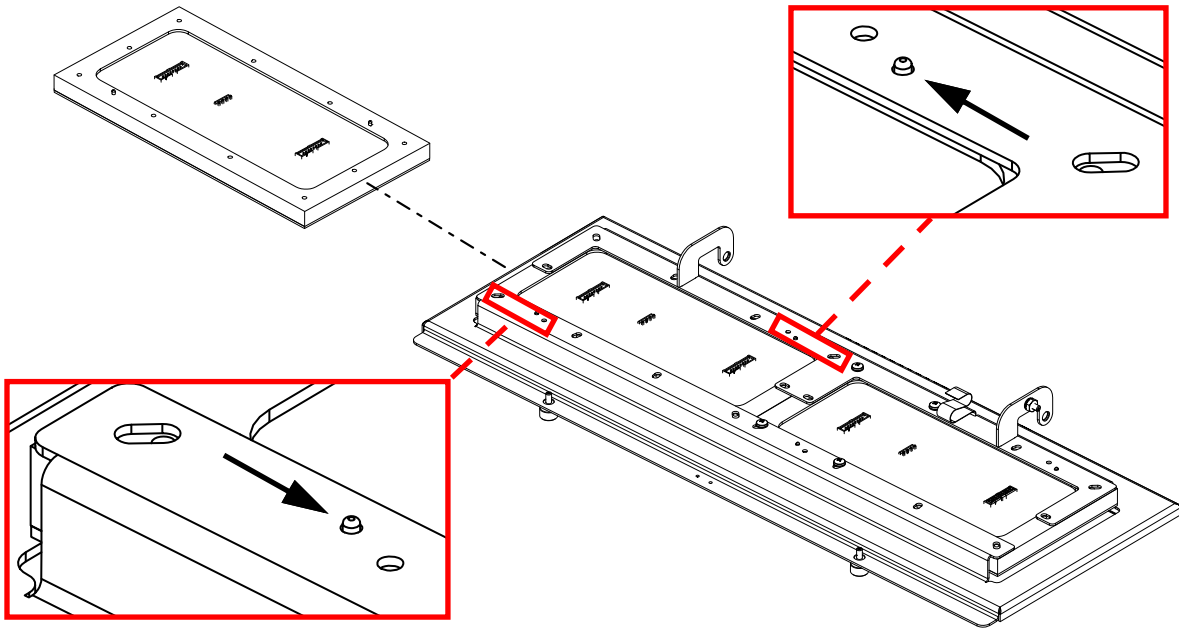


Figure 12-15. Slide Out LED Display from Door Frame

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 12.4 on page 124.

12.8 Test Functions

12.8.1 Digital Output Test

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

Figure 12-17 displays a menu path to the Digout parameter.

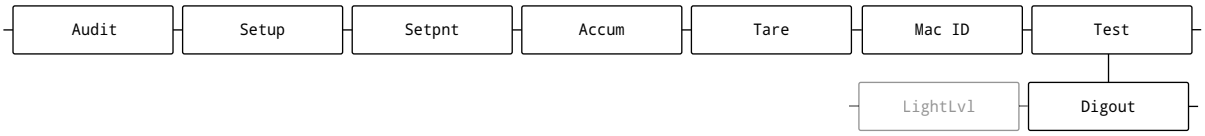


Figure 12-16. Digout parameter Menu Path

1. Navigate to **Audit ► Test ▼ Digout**.
2. Press GROSS NET B/N. Bit 1 displays.
3. Press UNITS or PRINT repeatedly until the desired Bit is selected.
4. Press TARE. 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 2.7.6 on page 21 for pin assignments and Section 4.3.7 on page 57 for digital I/O configuration description.

5. Press MENU to exit the menu.

12.8.2 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 12-17 displays a menu path to the Digin parameter.

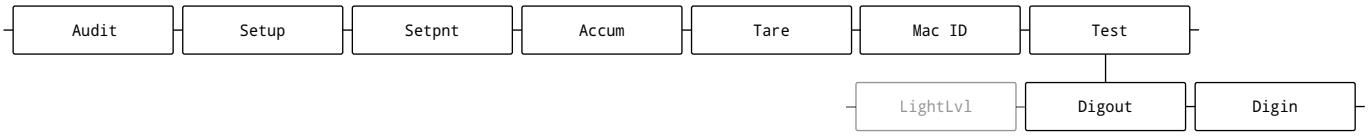


Figure 12-17. Digin parameter Menu Path

1. Navigate to **Audit ► Test ▼ Digout ► ... ► Digin**.
2. Press TARE. 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 12-2. Digin Bit Range

3. Press MENU to exit the menu.

12.8.3 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 12-3 for tests and required jumper wire connections.

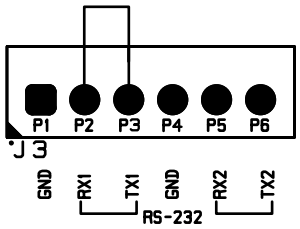
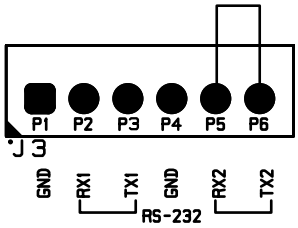
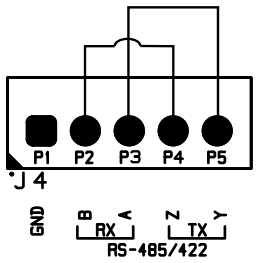
Communication Test	RS-232 1	RS-232 2	RS-485
Wire Connections	RS-232 1 TX 1 (P3) → RX 1 (P2)	RS-232 2 TX 2 (P6) → RX 2 (P5)	RS-485 TX Z (P4) → RX B (P2) RS-485 TX Y (P5) → RX A (P3)
Wire Diagram			

Table 12-3. Loop-Back Test Jumper Wire Connections

Figure 12-18 displays a menu path to the LoopBack parameter.

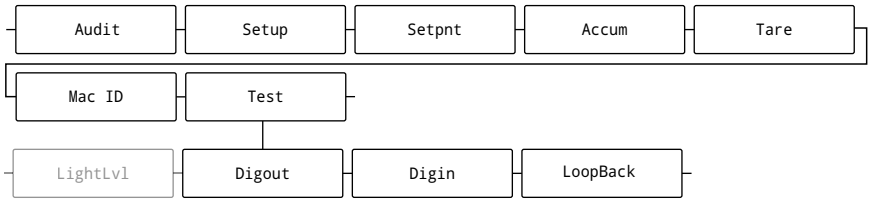


Figure 12-18. LoopBack parameter Menu Path

1. Unplug the power cord from the power outlet.
2. Open enclosure as described in Section 2.4 on page 15.
3. Install a jumper wire according to serial pin assignment (Table 12-3).
4. Close enclosure as described in Section 2.4 on page 15.
5. Plug in the power cord to the power outlet.
6. Navigate to **Audit ► Test ▼ Digout► ... ► LoopBack**.
7. Press GROSS NET B/N. RS-232 1 displays.
8. Press UNITS or PRINT repeatedly until the desired test is selected.
9. Press GROSS NET B/N. The Test begins.
10. One of the following occurs:
    - If communication is unsuccessful, ***Fail*** displays.
    - If communication is successful, ***OK*** displays.

13.0 Appendix

13.1 Error Messages

The LaserLight3 provides a number of front panel error messages to assist in problem diagnosis. Table 13-1 lists these messages and their meanings.

Error Message	Description
-------	Overflow error – Weight value too large to be displayed
^^^^^^^	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	Displays when set to a remote display and indicates that 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 13-1. LaserLight3 Error Messages

13.2 Audit Trail Support

Audit trail support provides tracking information for configuration and calibration events. To prevent potential misuse, all configuration and calibration changes are counted as change events.

Audit trail information can be printed from Revolution or by sending the DUMPAUDIT serial command. Revolution can be used to display audit trail information. The audit trail display includes the legally relevant (LR) version number (firmware version for the code which provides audit trail information), a calibration count and a configuration count.

See Section 3.6.11 on page 41 for steps to view the Audit Trail counters.

13.3 Unit Conversion Factors

The LaserLight3 has the capability to mathematically convert a weight into many different types of units and instantly display those results with a press of the Units key. Secondary Units can be configured in the Format menu (Section 4.3.2 on page 48).

NOTE: Multipliers are preconfigured within the indicator.
Ensure the unit format is set appropriately for the scale capacity in the Secondary Unit Format.

13.4 Parameter Abbreviation List

Table 13-2 lists parameter abbreviations and definitions from the menu (Section 4.0).

Abbreviation	Definition
Accum	Accumulator
AccumFmt	Accumulator Format
Addr 1-3	Address 1-3
Addres	Address
AdSense	Adaptive Filter Sensitivity
AdThrh	Adaptive Filter Threshold
AnchrSq	Anchor Sequence
AudAgcy	Audit Agency
Azt Net	Auto-Zero Tracking on Net Zero
BandVal	Band Value
Calibr	Calibration
ClrAcum	Clear Accumulator
ClrTare	Clear Tare
Comm	Communication
Config	Configuration
ConsNu	Consecutive Number
CTare	Allow Clear Tare Key
DfltCFG	Default Configuration
DfSens	Digital Filter Sensitivity
DfThrh	Digital Filter Threshold
DigFl 1-3	Digital Filter Stage 1-3
Digin	Digital Input
Digio	Digital Inputs and Outputs
DigOut	Digital Output
DispAcm	Display Accumulator
DispTar	Display Tare
DispTst	Startup Display Test
DmpVal	Damping Value
DSlot	Digital Output Slot
Dsplay	Display
DumpAud	Dump Audit
Duraton	Duration
EleOrig	Origin Elevation
Eoldly	End of Line Delay
EthClnt	Ethernet Client
EthSrvr	Ethernet Sever
FltrChn	Filter Chain Type
Format	Scale Format
Gfmt	Gross Format
GrvDest	Destination Gravity
GrvOrig	Origin Gravity
HdrFmt	Header Format
HoldWgh	Weighment Display Hold
HoldWt	Hold Weight
Htare	Display Hold Tare

Abbreviation	Definition
HttpSvr	Http Server
Hysteres	Hysteresis
IndSet	Industrial Settings
InitZro	Initial Zero Range
Ip Addr	IP Address
KTare	Allow Keyed Tare
LastCal	Last Calibration
LatOrig	Origin Latitude
LightLvL	Light Level
LnTerm	Line Termination
LRV	Legally Relevant Version
LstZero	Last Zero
MaxWgh	Maximum Weight
MCLTare	Manual Clear Tare
MnlMode	Manual Mode
MnlMVal	Manual Mode Validation
ModeBeg	Mode Start
ModeDef	Mode Definitions
ModeEnd	Mode End
MotBnd	Motion Band
MotoWgh	Weighment in Motion
MsgTim	Message Time
MTare	Multiple Tare Action
Neg	Negative
NegTotl	Negative Total
NetFmt	Net Format
NextCal	Next Calibration
NTare	Allow Negative Tare
NumWegh	Number of Weighments
OvrBase	Zero Base for Overload
PCount	Preact Count
PFormt	Print Format
PolBeg	Priority Start
PolDefs	Polarity Definitions
PolEnd	Priority End
Dest 1	Destination Port 1
Dest 2	Destination Port 2
Pos	Positive
PreAdj	Preact Adjust
PreStab	Preact Stability
PreVal	Preact Value
Pri	Primary
PrntHld	Print Display Hold
PrntMot	Allow Print in Motion
PrntPt	Add PT to Keyed Tare Print

Abbreviation	Definition
PrtAcum	Print Accumulator
PshAcc	Push Accumulator
PshPrint	Push Print
PshTare	Push Tare
PwrUpM	Power Up Mode
Range	Out of Range
Regula	Regulatory Mode
RelNum	Relative Setpoint Number
Respnse	Response
RKTare	Round Keyed Tare
RTare	Round Button Tare
RtlTrap	RattleTrap
Sec	Secondary
SetAnn	Set Annunciator
Setpnt	Set point
SFormt	Stream Format
SmpRat	Sample Rate
SnapSht	Snapshot
SpnCnt	Span Counts
SSTime	Standstill Time
StatBeg	Status Start
StatDef	Status Definitions
StatEnd	Status End
StptCfg	Setpoint Configuration
StptFmt	Setpoint Format
TareFn	Tare Function
TareMot	Tare in Motion
Theoret	Theoretical Calibration
Tm/Dt	Time/Date
TmpZero	Temp Zero
UID	Unit ID
UldWgh	Underload Weight
UnitBeg	Unit Start
UnitDef	Unit Definitions
UnitEnd	Unit End
WgtBeg	Weight Start
WgtEnd	Weight End
WLin	Linear Calibration
WmtThrh	Weighment Threshold
WSpan	Span Calibration
WVal	Test Weight
WZero	Zero Calibration
ZeroCnt	Zero Counts
ZeroMot	Zero in Motion
ZRange	Zero Range

Table 13-2. Parameter Abbreviation Definitions

13.5 Non-Printable Characters

Table 13-3 lists non-printable characters that may appear in an incoming data stream during Manual Mode configuration (Section 5.3.2 on page 77).

Character	Hex	Decimal	Abbreviation	Description
☻	01	1	SOH	Start of Heading
☺	02	2	STX	Start of Text
♥	03	3	ETX	End of Text
♦	04	4	EOT	End of Transmission
♣	05	5	ENQ	Enquiry
♠	06	6	ACK	Acknowledge
▪	07	7	BEL	Bell
◘	08	8	BS	Backspace
◻	09	9	HT	Horizontal Tab
▣	0A	10	LF	Line Feed
♂	0B	11	VT	Vertical tab
♀	0C	12	FF	Form feed
♪	0D	13	CR	Carriage Return
♫	0E	14	SO	Shift Out
☼	0F	15	SI	Shift In
►	10	16	DLE	Data Link Escape
◄	11	17	DC1	Device Control 1
↕	12	18	DC2	Device Control 2
‼	13	19	DC3	Device Control 3
¶	14	20	DC4	Device Control 4
§	15	21	NAK	Negative Acknowledge
▁	16	22	SYN	Synchronous Idle
↨	17	23	ETB	End of Transmission Block
↑	18	24	CAN	Cancel
↓	19	25	EM	End of Medium
→	1A	26	SUB	Substitute
←	1B	27	ESC	Escape
└	1C	28	FS	File Separator
╫	1D	29	GS	Group Separator
▲	1E	30	RS	Record Separator
▼	1F	31	US	Unit Separator
␣	20	32	SP	Space
!	21	33		
“	22	34		
#	23	35		
$	24	36		
%	25	37		
&	26	38		
‘	27	39		
(	28	40		
)	29	41		
*	2A	42		
+	2B	43		
,	2C	44		

Character	Hex	Decimal	Abbreviation	Description
-	2D	45		
.	2E	46		
/	2F	47		
0	30	48		
1	31	49		
2	32	50		
3	33	51		
4	34	52		
5	35	53		
6	36	54		
7	37	55		
8	38	56		
9	39	57		
:	3A	58		
;	3B	59		
<	3C	60		
=	3D	61		
>	3E	62		
?	3F	63		
@	40	64		
A	41	65		
B	42	66		
C	43	67		
D	44	68		
E	45	69		
F	46	70		
G	47	71		
H	48	72		
I	49	73		
J	4A	74		
K	4B	75		
L	4C	76		
M	4D	77		
N	4E	78		
O	4F	79		
P	50	80		
Q	51	81		
R	52	82		
S	53	83		
T	54	84		
U	55	85		
V	56	86		
W	57	87		
X	58	88		

Table 13-3. 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		
¢	9B	155		
£	9C	156		
¥	9D	157		
Pts	9E	158		
ƒ	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		
⌐	A9	169		
¬	AA	170		
½	AB	171		
¼	AC	172		
¡	AD	173		
«	AE	174		
»	AD	175		
▒	B0	176		
▒	B1	177		
▓	B2	178		
┃	B3	179		
┤	B4	180		
╡	B5	181		
╢	B6	182		
╖	B7	183		
╕	B8	184		
╣	B9	185		
╗	BA	186		

Table 13-3. 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		
ß	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 13-3. ASCII Symbols (Continued)

13.6 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 13-4).

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
4	Tare entered
8	Keyed tare entered
16	Gross
32	Net
64	Center of zero
128	Standstill

Table 13-4. Status Codes Returned on the ZZ Command

13.7 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><B><C><W06><T06><CR>
Weightronix	<TR><M><P><W6.><SP><U><CR><LF> <TR><M><SP><P><W6.><SP><U><CR><LF>

Table 13-5. Auto-Learn Supported Data String

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

13.8 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.

13.8.1 Fixed Format Options:

- Rice Lake Weighing Systems (Section 13.8.2)
- Cardinal (Section 13.8.3)
- Avery Weigh-Tronix (Section 13.8.4 on page 142)
- Mettler Toledo (Section 13.8.5 on page 142)

13.8.2 Rice Lake Weighing Systems Stream Format

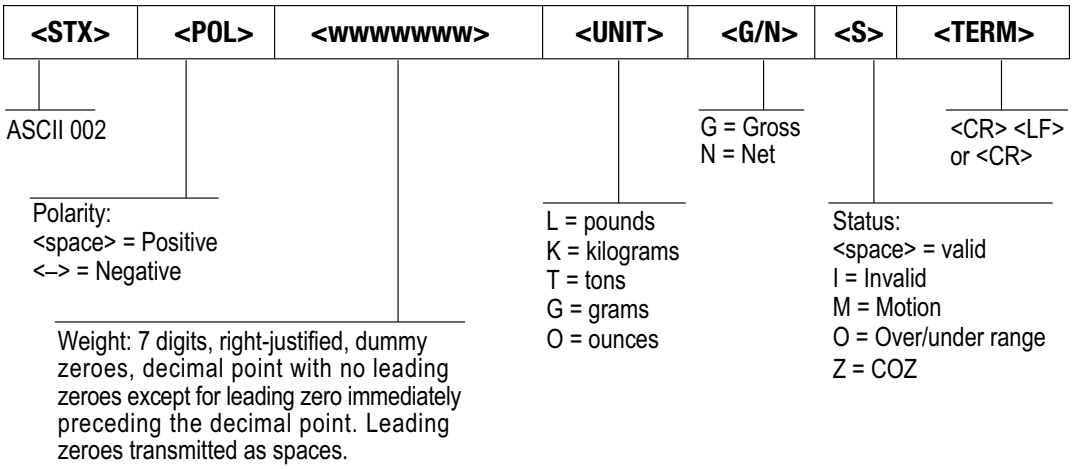


Figure 13-1. Rice Lake Weighing Systems Stream Data Format

13.8.3 Cardinal Stream Format

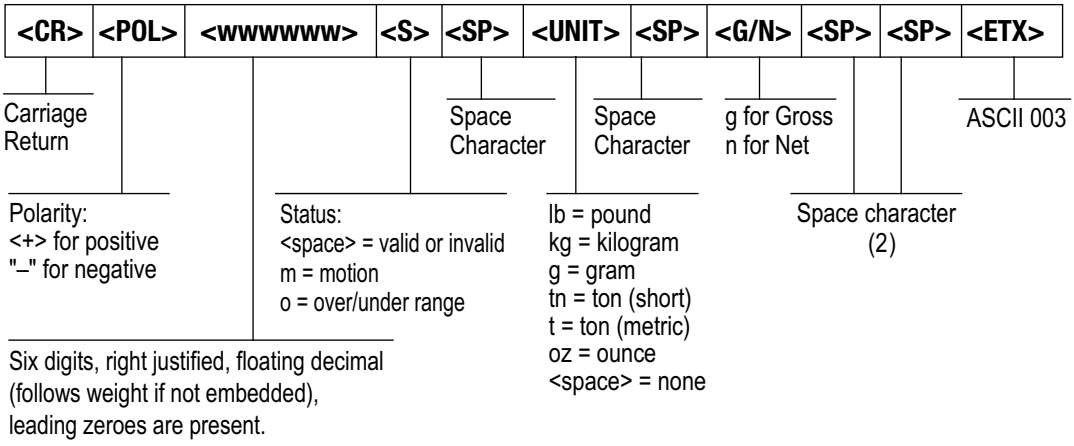


Figure 13-2. Cardinal Stream Data Format

13.8.4 Avery Weigh-Tronix Stream Format

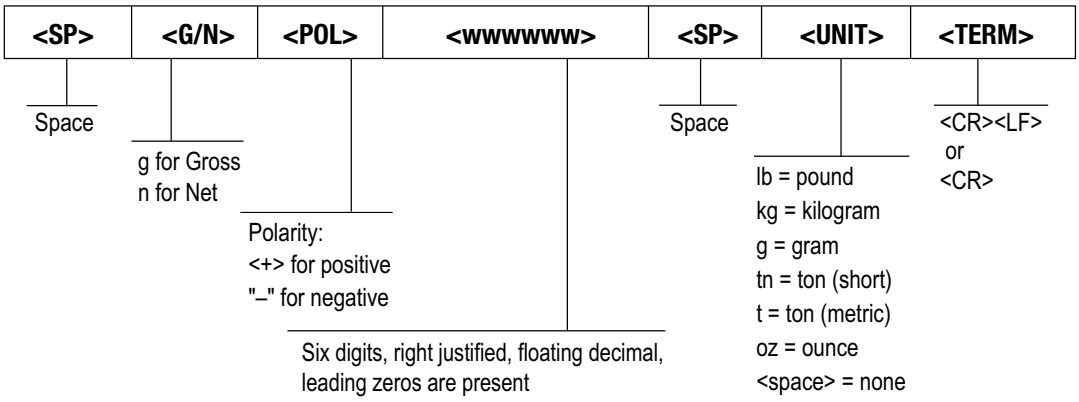


Figure 13-3. Avery Weigh-Tronix Stream Data Format

13.8.5 Mettler Toledo Stream Format

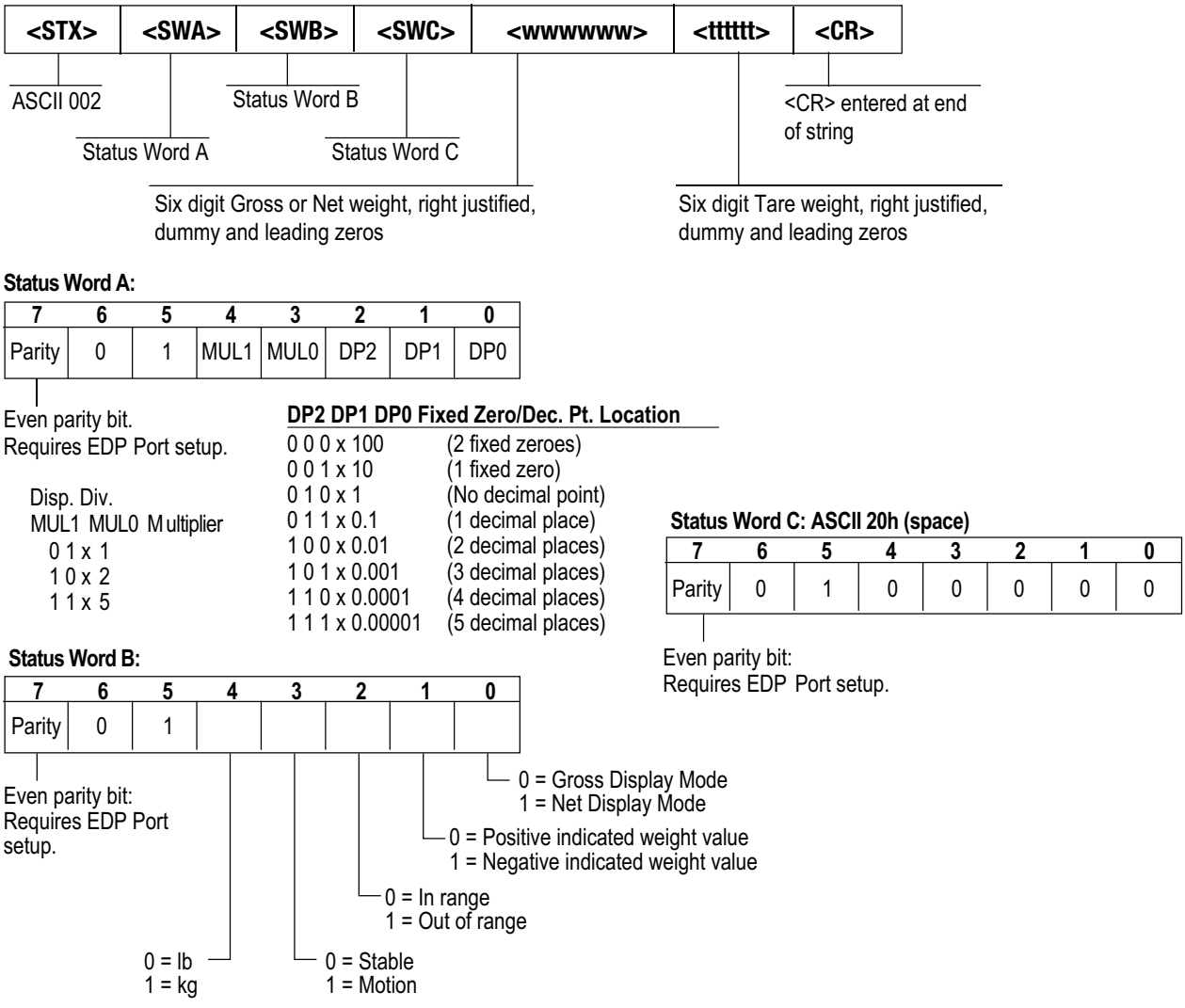


Figure 13-4. Mettler Toledo Stream Data Format

13.8.6 Custom Stream Format Tokens

The custom stream format can be configured using the stream format menu via the front panel. See Section 4.3.6 on page 56 for the stream format menu structure. The indicator must be in setup mode (Section 2.8.2 on page 25) to access the stream format menu.

13.8.6.1 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 ▼ Config ▶ ... ▶ 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 13.5 on page 137 for available characters and see Section 10.3 on page 116 for a description of Non-Human Readable 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.

13.8.6.2 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: • 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

Table 13-6. Custom Stream Format Tokens

Format Token	Defined By	Description
B3	Dynamic	=1 if MODE=NET
B4	Dynamic	=1 if COZ
B5	Dynamic	=1 if standstill
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 =001 if current DECPNT=8888880 =010 if current DECPNT=8888888 =011 if current DECPNT=888888.8 =100 if current DECPNT=88888.88 =101 if current DECPNT=8888.888 =110 if current DECPNT=888.8888 =111 if current DECPNT=88.88888
B18	Configuration	=000 if primary DECPNT=8888800 =001 if primary DECPNT=8888880 =010 if primary DECPNT=8888888 =011 if primary DECPNT=888888.8 =100 if primary DECPNT=88888.88 =101 if primary DECPNT=8888.888 =110 if primary DECPNT=888.8888 =111 if primary DECPNT=88.88888
B19	Configuration	=000 if secondary DECPNT=8888800 =001 if secondary DECPNT=8888880 =010 if secondary DECPNT=8888888 =011 if secondary DECPNT=888888.8 =100 if secondary DECPNT=88888.88 =101 if secondary DECPNT=8888.888 =110 if secondary DECPNT=888.8888 =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 13-6. Custom Stream Format Tokens (Continued)

13.9 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 CardinI (Section 5.1 on page 72)***
- ***Communication protocol with the Cardinal indicator (Section 5.2 on page 73 or Section 5.3 on page 76).***

13.9.1 Cardinal Message Board Stream Format

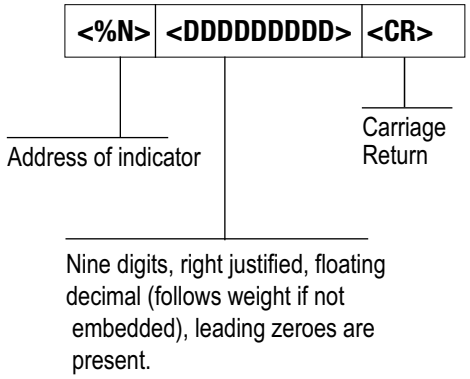


Figure 13-5. Cardinal Message Board Stream Data Format

13.9.2 Cardinal Score Board Stream Format

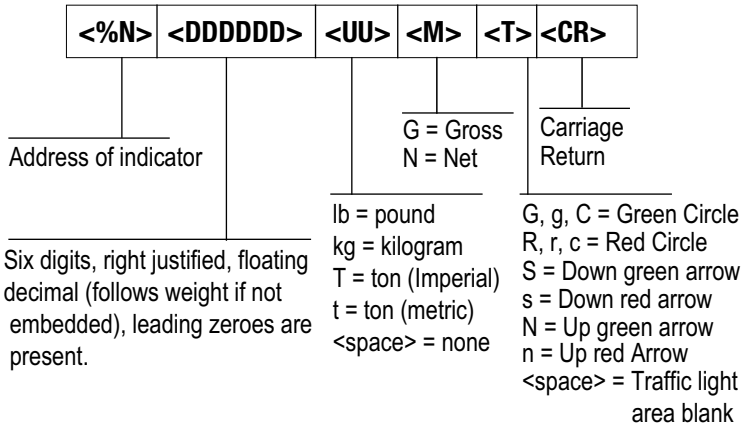


Figure 13-6. Cardinal Score Board Stream Data Format

14.0 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,

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
Integrated keypad with configurable scale commands
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

Certifications and Approvals

NTEP
CoC Number 22-096
Accuracy Class: III / IIIL; n_{max}: 10000

Measurement Canada Approved

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

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