LaserLight™

LED Remote Display

Version 1.0

Installation & Operation Manual

RICE LAKE WEIGHING SYSTEMS
Industrial Solutions on a Global Scale®

ISO 9001 REGISTERED

75936

Contents

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About This Manual

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

Installation procedures are presented in the order likely to be followed by the installer: pre-installation setup, configuration, and on-site installation.

Caution *Most procedures described in this manual require work inside the remote display enclosure. These procedures are to be performed by qualified service personnel only.*

Authorized distributors and their employees can view or download this manual from the Rice Lake Weighing Systems distributor site at www.rlws.com.

1.0 Introduction

The LaserLight remote display features a super-bright, six-digit LED display and non-glare filtered lens for use in a wide variety of applications. The LaserLight remote display is designed to work with most digital weight indicators, host computers, and peripherals using 20 mA current loop, RS-232, or RS-485 communications.

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

The display has seven internal switches and three external switches to set various parameters. The external switches include two for time and date, and one for the learn sequence. The configuration menu is entered via setup and navigation switches and is displayed on the display board panel for easy configuration of the unit.

This manual provides installation and configuration instructions for the display.

Standard Features

The LaserLight remote display is available in 4" or 6" digit sizes and uses an Auto Learn function which automatically determines the data rate and format used by the attached indicator.

Additional standard features include:

- Hold displayed weight (demand input)
- Adjustable daylight/night intensity
- Mirror function
- Auto-sensing 115/230 VAC power supply

Optional Features

Optional features of the LaserLight remote display include:

- Temperature
- Time and date
- Field-installable metal visor for both 4" and 6" models
- Interchangeable mounting bracket adapter plate

1.1 LED Annunciators

The LaserLight remote display uses a set of four high-intensity LED annunciators (shown in Figure 1-1) to provide additional information about the value being displayed:

- **Gross** and **Net** annunciators are lit to show whether the displayed weight is a gross or net weight.
- **lb, kg** annunciators indicate the units associated with the displayed value and represent primary and secondary units.

Figure 1-1. LaserLight Front Panel Display

2.0 Mounting Plate Installation and Setup

The LaserLight remote display can be easily set up and configured once mounted to a wall or pole. This section describes basic installation, AC wiring, RS-232, RS-485, and 20 mA current loop connections. Once installation setup is complete, go to Section 3.0 for information on configuring the remote display.

⚠ Caution

- *Use a wrist strap to ground yourself and protect components from electrostatic discharge (ESD) when working inside the enclosure.*
- *This unit uses double pole/neutral fusing which could create an electric shock hazard. Procedures requiring work inside the remote display must be performed by qualified service personnel only.*

2.1 Unpacking and Assembly

Immediately after unpacking, visually inspect the LaserLight remote display for damage. If any parts were damaged in shipment, notify Rice Lake Weighing Systems and the shipper immediately. The shipping carton contains the remote display and this manual. The main components of the LaserLight remote display include:

Painted steel enclosure

Primary and secondary display boards

Power supply

Mounting panel for the CPU board (located on back of mounting plate)

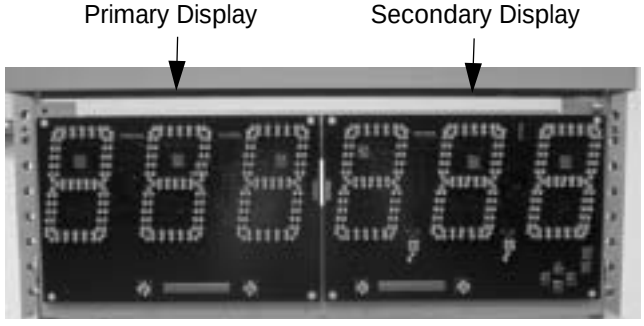

Figure 2-1. Mounting Plate Showing Primary / Secondary Display Boards

2.2 Enclosure Disassembly

For ease of installation, remove the mounting plate (which includes the primary and secondary display boards) before installing the LaserLight remote display. This protects the LEDs from unnecessary jarring and makes the enclosure lighter for installation. Use the following steps to remove the mounting plate from the enclosure.

⚠ Caution *Use caution when lowering or raising the mounting plate to ensure the LEDs do not touch the enclosure. If any of the LEDs get bent, they can be straightened back into position.*

1. Remove the captive screws located on the bottom of the enclosure. The mounting plate is located on the inside of the enclosure. It is mounted on a frame that can be held in place by tabs and two pins, when lowered, (located on the inside of the enclosure, shown in Figure 2-2).
2. Glide the mounting plate frame downward so that it hangs freely beneath the enclosure.
3. Disconnect the chassis ground wire from the top of the mounting plate mounting frame.
4. Disconnect the AC cord assembly from the power supply.
5. Using a slight diagonal twisting motion, slide the mounting plate out from the inside of the enclosure and

set it aside.

Figure 2-2. Tab Pin Assembly on Inside of Remote Display Enclosure

2.3 Wall Mounting

The LaserLight remote display can be mounted to any vertical surface or pole.

Note: *The 6" model mounting holes match the Survivor F40 series remote display. An optional mounting plate is available for 4" Laserlight models to allow placement into existing F40 series remote display mounting locations.*

Select a site and use installation screws or wall anchors to secure the remote display to a wall. If installing the remote display on a pole, an optional mounting plate is required. Once the enclosure is secured, slide the mounting plate down so that it is hanging freely from the enclosure with the tabs secured against the pins. This enables the user to continue wiring the remote display.

2.4 Wiring

The LaserLight remote display provides three cord grips located on the underside of the enclosure for cabling; one for the power cord (cord supplied), and two for serial communications and digital I/O (described in Section 2.4.2). The LaserLight remote display is pre-wired. Ribbon cables connect the CPU board to the digit display boards. An A/C power cord is also supplied. Only the serial communications cable must be connected. Use the following steps to wire the remote display.

1. If the remote display is not open, remove the captive screws located on the bottom of the remote display enclosure.
2. Lower the mounting plate from the inside of the enclosure.

Caution *Use caution when lowering or raising the mounting plate to ensure the LEDs do not touch the enclosure sides. If any of the LEDs get bent, they can be straightened back into position.*

3. Loosen the retaining screws located on the front of mounting plate (Figure 2-3). The mounting plate is hinged on a backplate frame to allow easier access to the AC wiring and the CPU board.

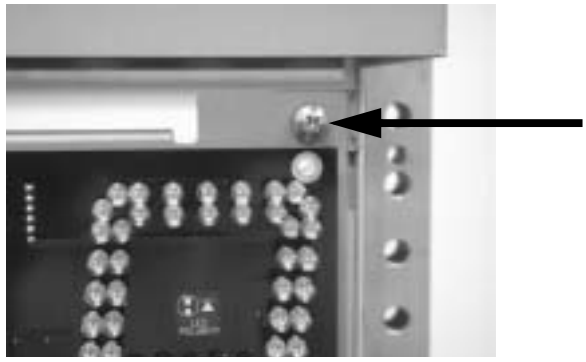

Figure 2-3. Retaining Screw Location

2.4.1 AC Wiring

The LaserLight power supply can run on either 115 or 230 VAC. The AC wiring is run through the cord grip to a 3-position AC terminal block bracket on the inside of the enclosure (shown in Figure 2-4). This bracket can be removed by loosening the two standoffs and lifting it off. It can then be lowered and pulled outside of the enclosure to ease wiring connections.

Figure 2-4. Inside Enclosure Backplate Diagram

Wiring is run from the terminal block down to the power supply on the back of the mounting plate (location shown in Figure 2-5).

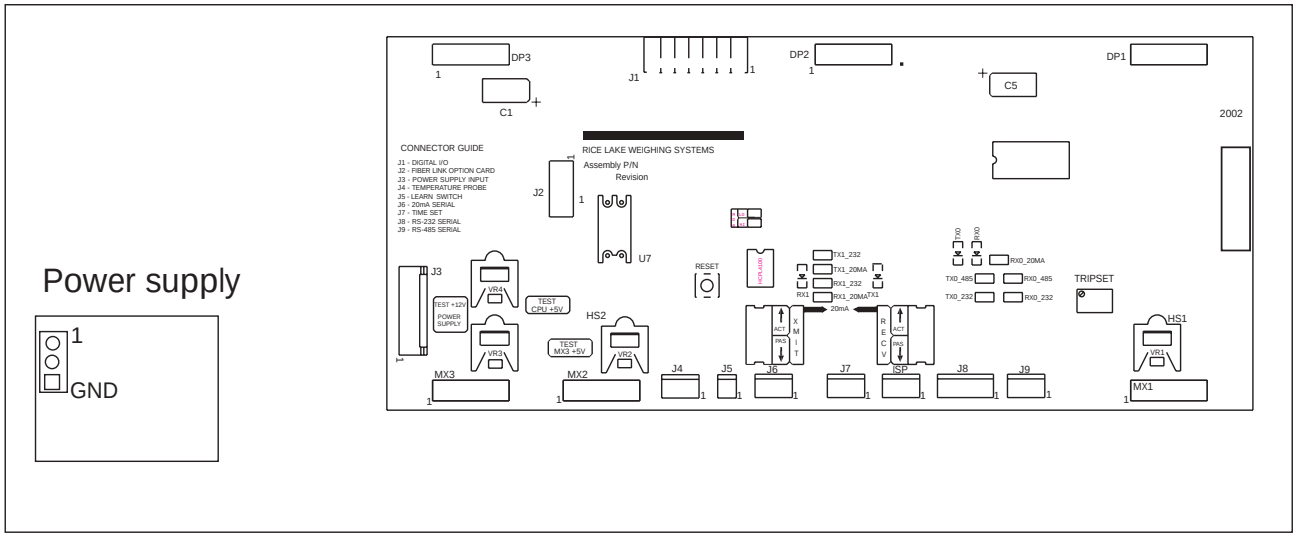

Figure 2-5. Mounting Plate Diagram with CPU Board and Power Supply Locations

Refer to the following table for AC wiring connections.

3-pin Terminal Block on Enclosure Back			To Power Supply
Pin	Wire	Color	Pin
1	Hot	Brown	1
2	Neutral	Blue	2
3	Ground	Green	Ground Tab

Table 2-1. AC Wiring Connections

Note: *Ensure that a ground wire is attached to the grounding stud located on the enclosure backplate (see Figure 2-4).*

2.4.2 Serial Wiring

Serial communications are connected to the CPU board using removable screw terminal plugs on J6, J8 and J9 (see Figure 2-7).

To connect the communications cable to the remote display, do the following:

1. If the enclosure is not open, disconnect power and open the remote display by removing the captive screws on the bottom of the enclosure and lower the mounting plate.
2. Open the captive retaining screws (Figure 2-6) and flip forward the hinged mounting plate.

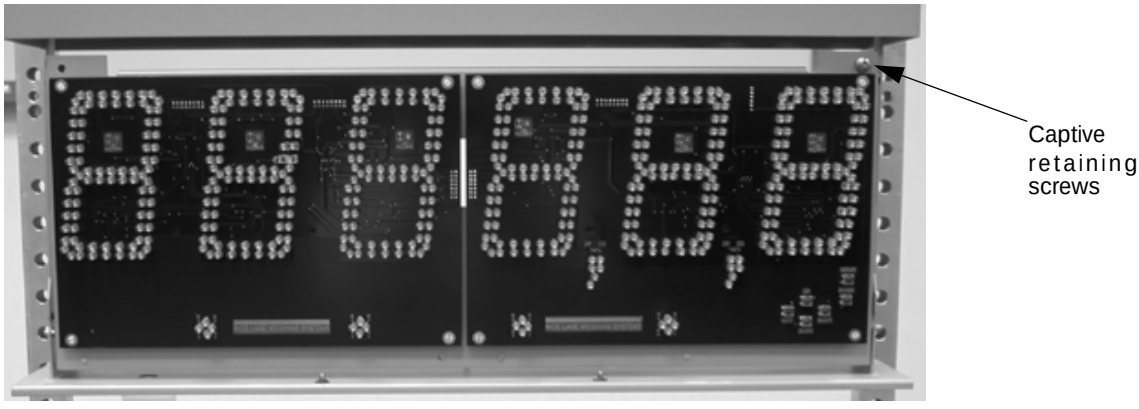

Figure 2-6. LED Primary and Secondary Display Boards

3. Loosen the serial cable cord grip and push enough communications cable into the enclosure to allow attachment to the CPU board.
4. Strip 1/4" (.65 cm) of insulation from the serial cable ends.
5. Make cable connections for RS-232, RS-485, or 20 mA current loop communications as described in Table 2-2.
6. Remove any excess cable from inside the enclosure. Tighten the serial cable cord grip.

Connector	Pin Assignment	Function	Port Position
J6	1	20 mA Rx+	Port 0
	2	20 mA Rx–	Port 0
	3	20 mA Tx+	Port 1
	4	20 mA Tx–	Port 1
J8	1	RS-232 TxD 0	Port 0
	2	RS-232 TxD 1	Port 1
	3	RS-232 RxD 0	Port 0
	4	RS-232 RxD 1	Port 1
	5	RS-232 SIG GND	
	6	RS-232 SIG GND	
J9	1	RS-485 Rx+	Port 0
	2	RS-485 Rx–	Port 0
	3	RS-485 Tx+	Port 1
	4	RS-485 Tx–	Port 1

Table 2-2. Serial Communications Wiring

Note: *Terminals J6, J8, and J9 are removable screw terminal plugs.*

Figure 2-7 shows the LaserLight remote display CPU board.

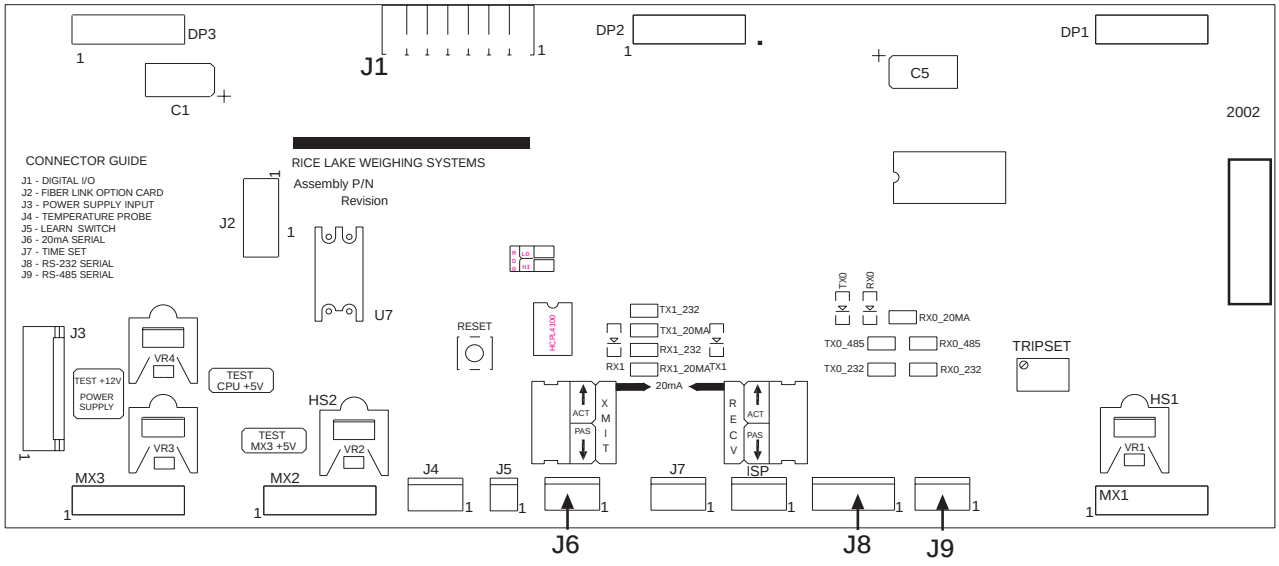

Figure 2-7. LaserLight Remote Display CPU Board

Port 0 which is connected to the indicator supports three protocols; 20 mA, RS-232, and RS-485 communications. Port 1 which is the Echo port, supports 20 mA and RS-232 communications.

2.4.3 20 mA Current Loop

The 20 mA current loop communication is provided on connector J6 of the CPU board (Figure 2-8). Plug the connector onto J6. Ensure receive jumpers are across RX0, 20 mA and select active or passive switch settings. Remove any unused jumpers.

2.4.4 RS-232

The RS-232 connection is provided on connector J8 of the CPU board. Plug the connector onto J8. Ensure the transmit and receive jumpers are across TX0 232 and RX0 232.

2.4.5 RS-485

The RS-485 connection is provided on connector J9 of the CPU board. Plug the connector onto J9. Ensure the transmit and receive jumpers are across TX0 485 and RX0 485.

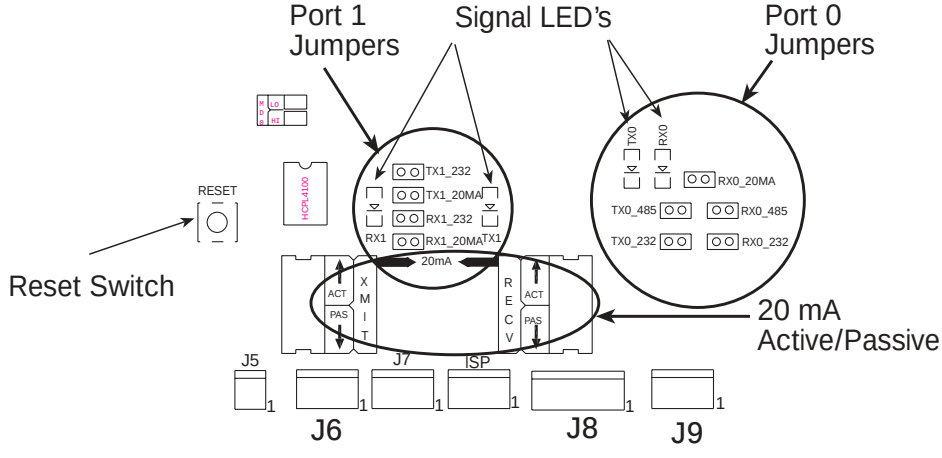

Figure 2-8. Jumper Pin Locations

2.4.6 Digital I/O

Digital inputs and outputs can be set to provide many functions. The LaserLight remote display has two inputs and two outputs available. Digital inputs can detect such things as photoeye states. Digital inputs are active (on) at 0 VDC, inactive (off) at 5 VDC. Digital outputs can be used to control such things as traffic lights.

Table 2-3 shows the pin assignments for connector J1 on the CPU board.

J1 Pin	Signal
1	GND
2	DIGIN 0
3	DIGIN 1
4	+5V
5	DIGOUT 0
6	DIGOUT 1
7	GND

Table 2-3. J1 Pin Assignments (Digital Inputs / Outputs)

2.4.7 Reset Switch

The reset switch enables a simulated power up reset. It then goes back to normal mode. The reset switch eliminates having to unplug the unit to do a reset. Refer to Figure 2-8 on page 7 for the reset switch location on the CPU board.

2.4.8 Communicating with Indicators and LEDs

Small LEDs located on the CPU board flash when serial data is received or sent. The transmit indicators flash when data is being sent out of the port. The receive indicator flashes when the data is received. A steady indicator on any receive LED reflects a connection with no streaming data. See to Figure 2-8 on page 7 for communication indicator locations on the CPU board.

2.4.9 Decimal Point Annunicator

The primary display board has decimal annunicators. These can be changed to commas by moving a jumper located on the front of the display board shown in Figure 3-2 on page 10.

Ensure that the decimal point/comma jumper is in the proper position on the display board.

3.0 Configuration

Once the LaserLight remote display is installed, it may need to be configured if your indicator requires special settings. This can be done manually and is explained in Section 3.2.

Using Auto Learn (Section 3.1) simplifies installation by automatically detecting the communications format and data rate used by the indicator and eliminates the need for configuration.

3.1 Auto Learn

The LaserLight remote display incorporates a software feature called Auto Learn. Auto Learn examines the serial data stream sent from the attached indicator and attempts to determine the data structure and format used by the indicator.

Auto Learn occurs automatically when Port 0 is not locked, there is no saved stream format, and the connecting indicator is configured to send continuous (streaming) data.

Use the following quick steps for Auto Learn.

1. Open the enclosure per disassembly instructions in Section 2.2.
2. Visually inspect that the Auto Learn switch is connected to J5 on the CPU board (see Figure 3-1 for plug-in location).
3. Power up the remote display.
4. Momentarily press the Learn switch

Note: *It is recommended to lock Port 0 (see Table 3-5), to eliminate any un-intentional changes from occurring.*

3.2 Manual Configuration

To begin configuration, ensure the remote display is powered off and open the enclosure (See Section 2.2 on page 3 for enclosure disassembly instructions), to access the CPU board (Figure 3-1) and digit display board (Figure 3-2).

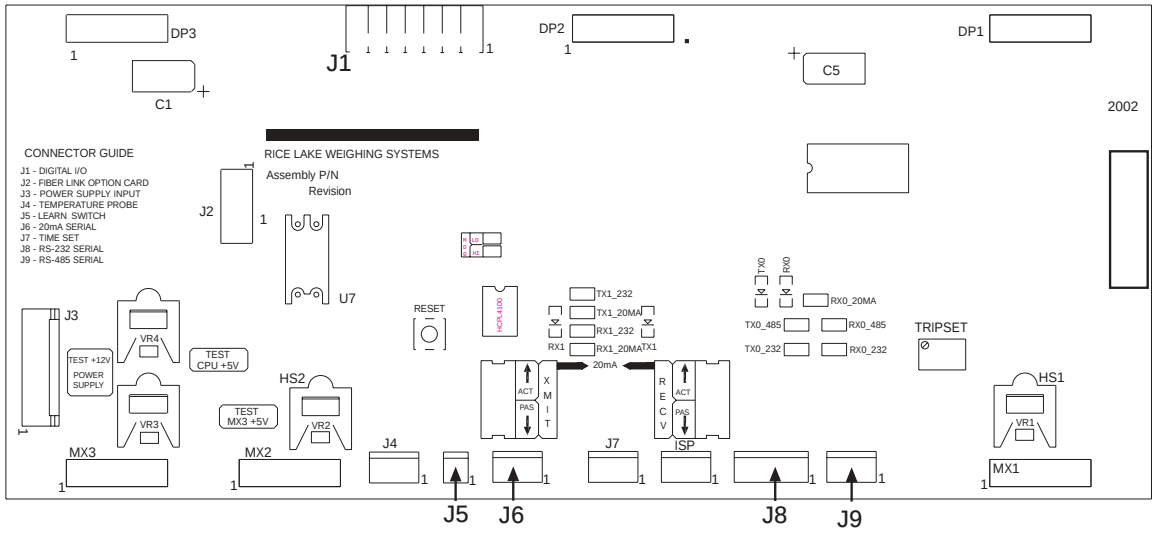

Figure 3-1. LaserLight CPU Board

The setup switch is located on the secondary display board (Figure 3-2).

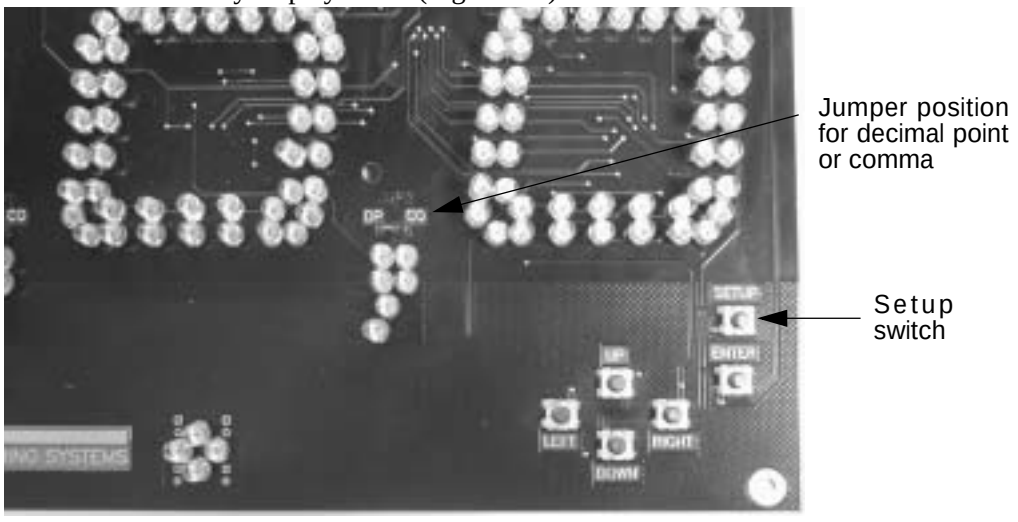

Figure 3-2. Setup Switch Location on Secondary Display Board

The display board is mounted on a hinged mounting plate to allow for easy access to the CPU board. Press the SETUP switch (shown in Figure 3-2) to access main menu configuration parameters.

Main menu parameters include:

- Configuration
- Serial communications
- Test
- Version

The LaserLight remote display can be configured and displayed using a series of menus accessed using internal switches located on the secondary display and shown in Figure 3-3.

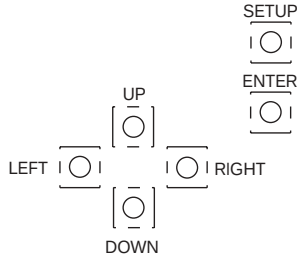

Figure 3-3. Configuration Setup Switches

Use the UP/DOWN, LEFT/RIGHT switches to navigate through menu items and the ENTER switch for setting a selection.

Note: *Use the LEFT/RIGHT switches to shift the displayed data string while in weigh mode, for multiple weights, i.e.: gross, tare, and net. An example includes: <STX> <W7> <G7> <N7> <CR> Shift right to display your net.*

Press the ENTER switch to save a parameter before moving back through the navigation menu then move up to exit the configuration mode.

Table 3-1 summarizes the functions of each of the main menus and Figure 3-4 illustrates the main menu selections.

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

Table 3-1. LaserLight Remote Display Menu Summary

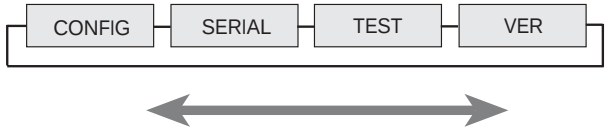

Figure 3-4. LaserLight Main Menu Options

When configuring the indicator attached to the remote display, ensure that the decimal point configuration is compatible with the remote display. The LaserLight remote display allows none, one, or two decimal places (see Figure 3-2 for jumper positions).

Figure 3-5 shows the configuration menu.

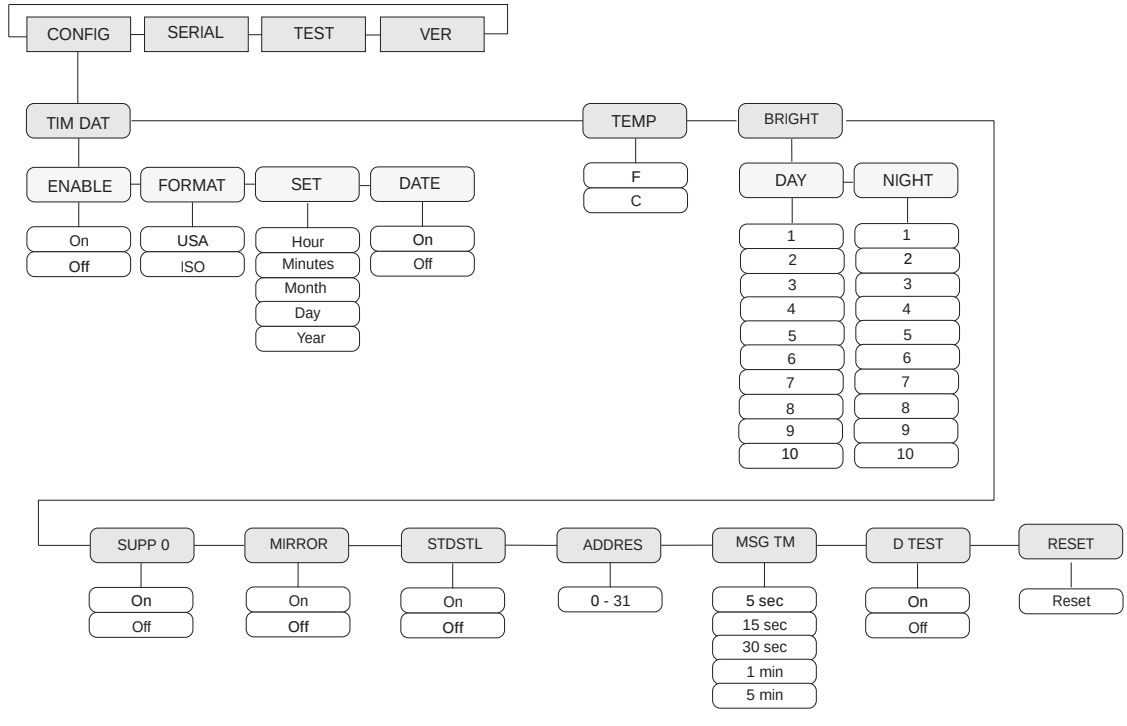

Figure 3-5. Configuration Main Menu Choices

CONFIG Menu		
Parameter	Choices	Description
Level 2 Submenus		
TIM DAT	Enabled Format Set Date	To enable time and date Displays USA or ISO time format Sets hours/minutes and month/day/year Can disable date
TEMP	F C	Select Fahrenheit or Celsius
BRIGHT	Day Night	Selects the brightness during day or nightime hours
SUPP O	On Off	Select On to enable the suppression of leading zeros in a weight.
MIRROR	On Off	Select On to display LED readout in reverse. The menu is viewed normally.
STDSTL	On Off	Select On to enable display updated weight only when the scale is not in motion.
ADDRES	0 through 31	Assign a command address by selecting a number between 0-31.
MSG TM	5, 15, 30 sec., 1, 5 minutes	Select amount of time a message stays on the remote display. Time can vary from 5 seconds to 5 minutes. If no serial command is used, then this parameter is not used.
D TEST	On Off	Set this parameter On to enable a countdown display test on start up.
RESET		Resets the remote display to default parameters

Table 3-2. Configuration Menu Summary - Level 2

Parameter	Choices	Description
Level 3 submenus (TIMDAT Parameter)		
ENABLE	On Off	Select On to enable time and date option. Note: You need an additional chip called a “snap hat.” It is recommended that you disable the time/date feature if you don’t want this addtional chip.
FORMAT	USA ISO	Displays in either USA or ISO (military time) format
SET	HH/MM MM/DD/YYYY	Sets hour/minutes and month/day/year
DATE	On Off	Select Off to disable the date feature if the date and time option is installed
Brightness (BRIGHT Parameter)		
DAY	1-10	Selects the brightness during day. Brightness is set from 1-10 or 10 to 100% of the full brightness. IntelliBright averages measured ambient light over a ten minute time span.
NIGHT	1-10	Selects the brightness during night. Brightness is set from 1-10 or 10 to 100% of the full brightness. IntelliBright averages measured ambient light over a ten minute time span.

Table 3-3. Configuration Menu Summary - Level 3

3.3 Serial Communications

The LaserLight remote display has two serial ports available:

- Port 0 - Provides communication with the indicator
- Port 1 - Provides echoing

There are 15 sub-parameters associated with Port 0 and six sub-parameters associated with Port 1 which are shown in Figure 3-6 on page 14. See Section 2.4.2 for serial wiring positions.

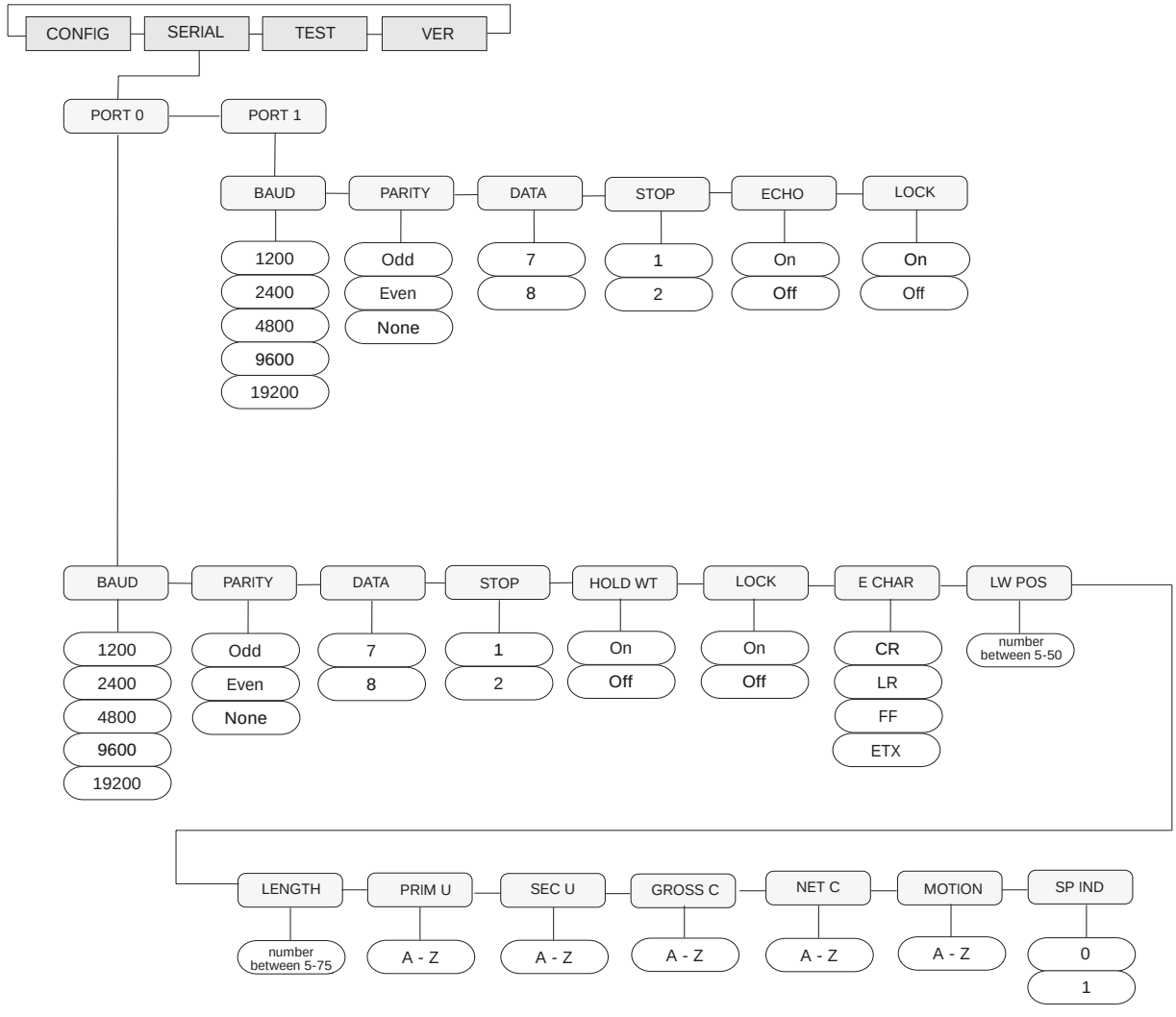

Figure 3-6. Serial Menu

Serial Menu		
Parameter	Choices	Description
Level 2 Submenus		
Port 0	BAUD PARITY DATA BITS STOP BITS	Configure Port 0. See Level 3 submenu parameter descriptions.
	HOLD WT	Keeps last weight displayed if communication is lost and prevents the remote display from going into an error condition.
	LOCK	If enabled, prevents the Auto Learn (Section 3.1) parameter from working and ensures settings remain currently set.
	E CHAR	This feature looks at the last character to determine the end of a packet.
	LW POS	Can select a number between 5 and 50. Is zero indexed and determines last weight position of the format.
	LENGTH	Can select a number between 5 and 75 and determines the length of packet in the string format.
	PRIM U	Select primary unit characters
	SEC U	Select secondary unit characters
	GROS C	Select gross character
	NET C	Select net character
	MOTION	Select motion status character
	SP IND	Select, decode status, and settings for special indicator type. 0 = none 1 = Toledo 8142 format
PORT 1	BAUD PARITY DATA BITS STOP BITS	Configure Port 1. See level 3 submenu parameter descriptions.
	ECHO	Disable this to allow echoing between remote display and other devices. Data settings should be set equal to or greater than device being echoed to.
	LOCK	If disabled, remote display uses same settings as indicator after an Auto Learn.

If selected, the appropriate annunciator is lit

Table 3-4. Serial Communication Menu Summary

Serial Menu		
Port 0 Parameter	Choices	Description
Level 3 Submenus		
BAUD	1200 2400 4800 **9600** 19200	Baud rate. Selects the transmission speed for Port 0
PARITY	ODD EVEN **NONE**	Selects the parity of data of Port 0
DATA BITS	7 **8**	Selects the number of data bits of Port 0
STOP BITS	**1** 2	Selects the number of stop bits of Port 0

Table 3-5. Port 0 Serial Menu

Serial Menu		
HOLD WT	ON OFF	Select On to enable this feature to keep the last weight displayed if communication is lost and prevents remote display from going into an error condition.
LOCK	ON OFF	Select On to make sure the current settings don't get changed and to disable Auto Learn. When off, the system enables the Auto Learn function.
E CHAR	CR LR FF ETX	When Auto Learn is enabled, this feature looks at the last character to determine the end of a packet.
LW POS	5 - 50	Select a number between 5 and 50 to determine the last weight position. If setting up Port 0 manually, the last weight position is zero indexed. Example: <STX>123456<CR> where <STX> is the start of the text character, and <CR> is a carriage return character, the "6" is in the 6th position, not the 7th.
LENGTH	5-75	Select a number between 5 and 75 to determine the length of the packet in the string format. Formats such as Toledo 8142 end in CR<AA> where <AA> is a 2-byte checksum, the checksum should not be counted when calculating the format length.
PRIM U	A - Z	Select a primary display character from A-Z. If selected, annunciator is lit
SEC U	A - Z	Select a secondary display character from A-Z. If selected, annunciator is lit
GROSS C	A - Z	Select a gross character character from A-Z. If selected, annunciator is lit
NET C	A - Z	Select a net character character from A-Z. If selected, annunciator is lit
MOTION	A - Z	Select a motion display character from A-Z. If selected, annunciator is lit
SP IND	1	Select 1 to decode the Toledo 8142 format bit-mapped status data, otherwise select 0.

Table 3-5. Port 0 Serial Menu (Continued)

Serial Menu		
Port 1 Parameter	Choices	Description
Level 3 submenus		
BAUD	1200 2400 4800 9600 19200	Baud rate. Selects the transmission speed for Port 1
PARITY	ODD EVEN NONE	Selects the parity of data transmitted from Port 1
DATA BITS	7 8	Selects the number of data bits transmitted from Port 1
STOP BITS	1 2	Selects the number of stop bits transmitted from Port 1
ECHO	ON OFF	Enable this feature to allow echoing between the remote display and other devices. If enabled and echoing, the baud settings must be set equal to or greater than the device being echoed to.
LOCK	ON OFF	If this parameter is disabled, the echo port display uses the same communications settings as the indicator port after an Auto Learn is run.

Table 3-6. Port 1 Serial Menu Parameters

3.4 Testing the Remote Display

The LaserLight remote display provides a test to check the functionality of the remote display. These tests can be accessed through the main menu (Figure 3-7).

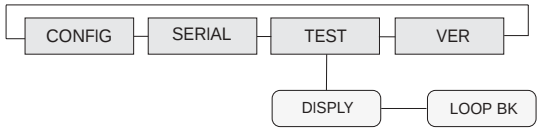

Figure 3-7. Test Menu Choices

3.4.1 Display

When this feature is enabled, all LEDs remain lit until the ENTER button is pressed (Figure 3-2 on page 10).

3.4.2 Loop Back

When enabled, this feature provides a loop-back self test for use in diagnosing serial communications errors.The loop-back self test checks the function of the remote display serial port by sending and receiving data to itself. The following table shows the required connections.

Port 0 TR	→	Port 1 RCV
Port 1 TR	→	Port 0 RCV

Table 3-7. Serial Communications Self-Test Connections

If Port 1 receives nothing from Port 0 for three seconds, the following message is displayed on the remote display:

Fail 1

If Port 0 receives nothing from Port 1 for three seconds, the following message is displayed on the remote display:

Fail 2

If communications are successful between the two, the following message is displayed:

Pass

3.5 Version

When *Version* is selected from the main menu choices (Figure 3-8), the current software version is shown on the remote display.

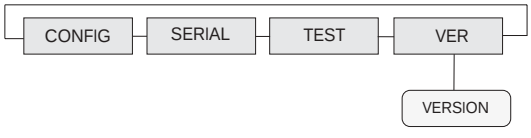

Figure 3-8. Version Menu

3.6 Demand Print Displaying

The indicator and the LaserLight remote display can be set up to do a demand print display for such applications as cattle weighing. This is useful if you want to show and keep the last weight of a cow.

Demand print display can be set up using Auto Learn when the Port 0, *Hold Weight* parameter is turned *On*, and it is set up manually by formatting the baud rate, data bits, parity, etc. of the remote display and the indicator.

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

3.7 Serial Commands

The LaserLight remote display has the ability to receive commands, display messages, set time and date, and set and get digital I/O states. When interfaced with a smart indicator like the 920i, the LaserLight can display six character alphanumeric messages on its front panel display. Commands are entered into the indicator then relayed to the remote display.

To use this feature, the command address must match the remote display address.

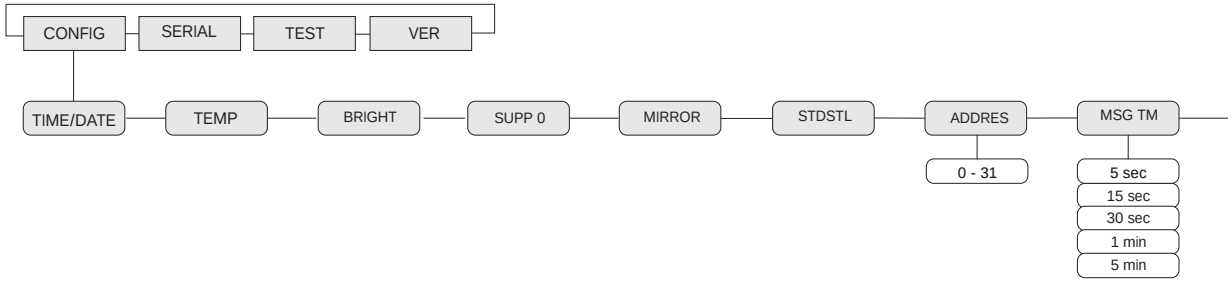

Figure 3-9. Assign Address and Message Timed

Command format:

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

Table 3-8 lists commands you can use.

Command	Description
|	Pipe character, ASCII (124)
AA	Two byte address, ASCII digits
CC	Two byte command, ASCII characters
DATA	Data depending on command
!	Exclaimation point character, ASCII (33)
DM	Data is the 6 character or less message to display. If less than 6 characters, send spaces so it equates to 6 characters. Otherwise, some data may not be overwritten. Example: |00DM STOP !
GT	Get time and date Example: |00GT!
ST	Set time and date Example: ST108:00:00 2003-01-31!
GR	Get relay state (0-3) Example: |01GR1!
SR	Set relay state (0 or 1) (0 = On, 1 = Off) Example: |01SR01!
Time and date is sent from the remote display depending on the current remote display time and date format: Time and date are sent to the remote display in ISO format. USA Format: HH:MM:SS AM/PM MMM/DD/YYYY ISO Format: HH:MM:SS YYYY-MM-DD If the real time clock is disabled in the remote display, an error message is sent back.	

Table 3-8. Messaging Formats

4.0 Options

There are several options available with the LaserLight remote display. They include:

- Time and date
- Temperature
- Field installable visor
- Mounting plate

4.1 Time and Date

The time and date option can be either factory installed or can be ordered at a later date. Figure 4-1 shows the location of the time and date option.

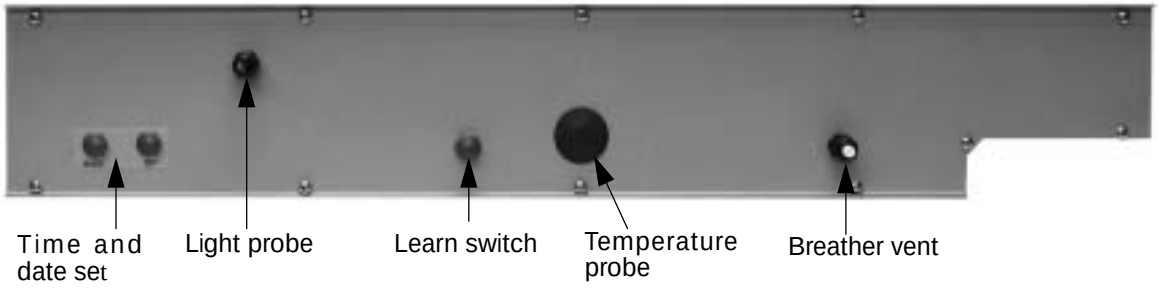

Figure 4-1. LaserLight Bottom Enclosure

If the time and date option (*PN75853*) is added after initial installation, see Section 2.0 for enclosure disassembly instructions. To install the this option, cut the adhesive labels from the option holes and install the time and date switch assembly.

Attach time and date wiring to J7.

4.2 Temperature

If the temperature option (*PN43412*) is added after initial installation, see Section 2.0 for enclosure disassembly instructions. To install the this option, remove the plug from the option hole and insert the temperature probe.

Attach temperature probe wiring to J4.

4.3 Visor Installation

An optional visor can be installed on the LaserLight remote display. Figure 4-2 shows the remote display with the optional visor installed.

Figure 4-2. LaserLight Remote Display w/ Optional Visor Installed

Set the visor (*PN 75854* - 4" model or *PN 75855* - 6" model) on top of the remote display and attach the visor using screws and plastic washers provided.

4.4 Mounting Bracket Adaptor Plate

The mounting bracket adaptor plate is available for 4" LaserLight models (*PN 75856*) to allow placement into existing F40 series remote display mounting locations. Attach the bracket adaptor plate using the screws provided.

5.0 Appendix

5.1 Error Messages

The LaserLight remote display provides several error messages. When an error occurs, the message is shown on the display.

NOTE: *Some of the actual error messages displayed by the remote display are cryptic and are represented in Table 5-1 as closely as possible with plain text.*

Table 5-1 lists error messages shown by the LaserLight remote display and their meaning.

Message	Meaning	Cause
LError	*Auto Learn error*	Auto Learn failed
WError	*Indicator code*	Write error. Could not save menu settings to the serial EEPROM
Reset	*Invalid settings*	Invalid settings upon power up. All settings reset to their default state.

Table 5-1. Error Messages

5.2 Replacement Parts

Table 5-2 lists selected replacement parts for the LaserLight remote displays.

Part Number	Description	Model
72994	Mounting plate gasket	4" model
72995	Filtering lens	4" model
74880	Primary display board, 4"	4" model
74881	Secondary display board, 4"	4" model
75854	4" Visor (optional)	4" model
75856	Mounting Plate (optional)	4" model
72996	Power supply, 12V	both models
72997	CPU board	both models
75860	Cable assembly, power supply	both models
75861	Push button switch assembly	both models
43412	Temperature probe (optional)	both models
75853	Time and date (optional)	both models
74870	Mounting plate gasket	6" model
74882	Primary display board, 6"	6" model
74883	Secondary display board, 6"	6" model
75855	6" Visor (optional)	6" model

Table 5-2. Selected Replacement Parts

5.3 ASCII Character Chart

Control	ASCII	Dec	Hex	ASCII	Dec	Hex	ASCII	Dec	Hex	ASCII	Dec	Hex
Ctrl-@	NUL	00	00	space	32	20	@	64	40	`	96	60
Ctrl-A	SOH	01	01	!	33	21	A	65	41	a	97	61
Ctrl-B	STX	02	02	“	34	22	B	66	42	b	98	62
Ctrl-C	ETX	03	03	#	35	23	C	67	43	c	99	63
Ctrl-D	EOT	04	04	$	36	24	D	68	44	d	100	64
Ctrl-E	ENQ	05	05	%	37	25	E	69	45	e	101	65
Ctrl-F	ACK	06	06	&	38	26	F	70	46	f	102	66
Ctrl-G	BEL	07	07	’	39	27	G	71	47	g	103	67
Ctrl-H	BS	08	08	(	40	28	H	72	48	h	104	68
Ctrl-I	HT	09	09	)	41	29	I	73	49	i	105	69
Ctrl-J	LF	10	0A	*	42	2A	J	74	4A	j	106	6A
Ctrl-K	VT	11	0B	+	43	2B	K	75	4B	k	107	6B
Ctrl-L	FF	12	0C	,	44	2C	L	76	4C	l	108	6C
Ctrl-M	CR	13	0D	-	45	2D	M	77	4D	m	109	6D
Ctrl-N	SO	14	0E	.	46	2E	N	78	4E	n	110	6E
Ctrl-O	SI	15	0F	/	47	2F	O	79	4F	o	111	6F
Ctrl-P	DLE	16	10	0	48	30	P	80	50	p	112	70
Ctrl-Q	DC1	17	11	1	49	31	Q	81	51	q	113	71
Ctrl-R	DC2	18	12	2	50	32	R	82	52	r	114	72
Ctrl-S	DC3	19	13	3	51	33	S	83	53	s	115	73
Ctrl-T	DC4	20	14	4	52	34	T	84	54	t	116	74
Ctrl-U	NAK	21	15	5	53	35	U	85	55	u	117	75
Ctrl-V	SYN	22	16	6	54	36	V	86	56	v	118	76
Ctrl-W	ETB	23	17	7	55	37	W	87	57	w	119	77
Ctrl-X	CAN	24	18	8	56	38	X	88	58	x	120	78
Ctrl-Y	EM	25	19	9	57	39	Y	89	59	y	121	79
Ctrl-Z	SUB	26	1A	:	58	3A	Z	90	5A	z	122	7A
Ctrl-[	ESC	27	1B	;	59	3B	[	91	5B	{	123	7B
Ctrl-\	FS	28	1C	<	60	3C	\	92	5C	|	124	7C
Ctrl-]	GS	29	1D	=	61	3D	]	93	5D	}	125	7D
Ctrl-^	RS	30	1E	>	62	3E	^	94	5E	~	126	7E
Ctrl-_	US	31	1F	?	63	3F	_	95	5F	DEL	127	7F

5.4 LaserLight Remote Enclosure Dimensions

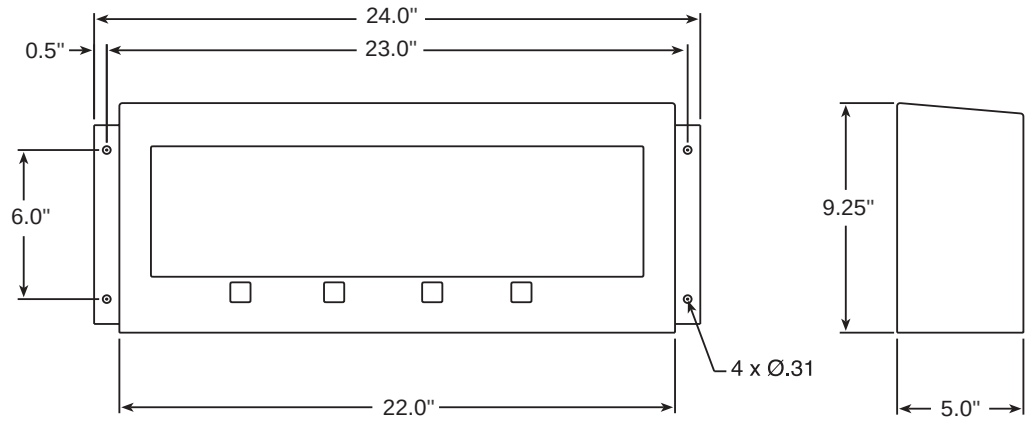

Figure 5-1. 4" Model Enclosure Dimensions

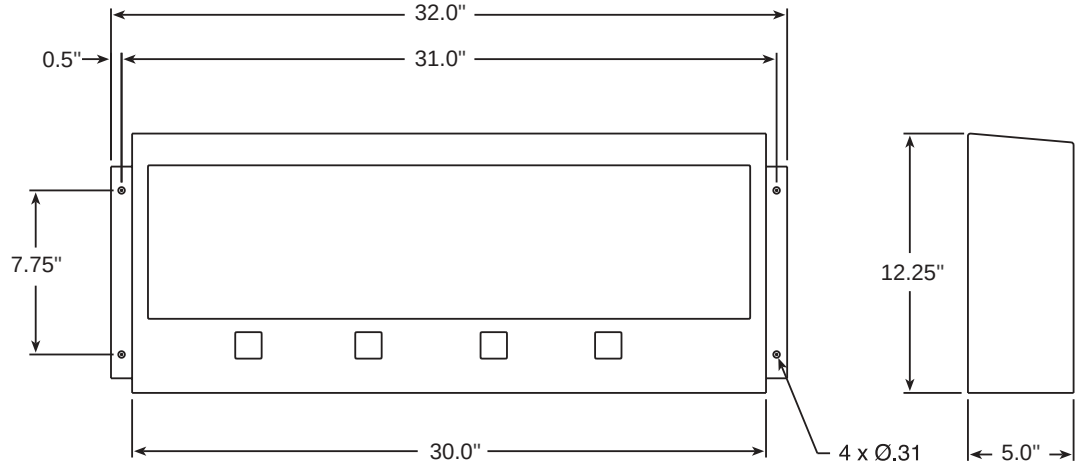

Figure 5-2. 6" Model Enclosure Dimensions

5.5 Specifications

Display
6 digit, 7 segment discrete oval precision optical performance red LED lamps
Contrast enhancement optical filtering
1- or 2-place decimal indication

Input Interface
RS-232, RS-485, 20 mA current loop (active or passive, switch selectable)

Output Interface
Independently configurable echo out port, RS-232 or 20 mA current loop (active or passive, switch selectable)

Input Data Format
Baud rate: 1200, 2400, 4800, 9600, and 19,200 self learning or software selectable

Character format: 7 or 8 data bits, even, odd, or no parity; 1 or 2 stop bits, self learning or software selectable

Update
Continuous or out-of-motion only; software selectable

Power Consumption
4" (101.6 mm): 21 watt
6" (152.4 mm): 27 watt

Time Option
Software enable/disable, 12- or 24-hour time format

Date Option
Software enable/disable, US or ISO format

Temperature Option
Software selectable F or C, temperature probe automatically detected

Rating/Material
Weather proof, painted mild steel, powder coated

Weight
4" (101.6 mm): 20 lb (9 kg)
6" (152.4 mm): 25 lb (11 kg)

Operating Temperature Range
-40°F to 120°F (-40°C to 48.8°C)

Warranty
2-year limited warranty

LaserLight Remote Display Limited Warranty

Rice Lake Weighing Systems (RLWS) warrants that all RLWS equipment and systems properly installed by a Distributor or Original Equipment Manufacturer (OEM) will operate per written specifications as confirmed by the Distributor/OEM and accepted by RLWS. All systems and components are warranted against defects in materials and workmanship for two years.

RLWS warrants that the equipment sold hereunder will conform to the current written specifications authorized by RLWS. RLWS warrants the equipment against faulty workmanship and defective materials. If any equipment fails to conform to these warranties, RLWS will, at its option, repair or replace such goods returned within the warranty period subject to the following conditions:

- Upon discovery by Buyer of such nonconformity, RLWS will be given prompt written notice with a detailed explanation of the alleged deficiencies.
- Individual electronic components returned to RLWS for warranty purposes must be packaged to prevent electrostatic discharge (ESD) damage in shipment. Packaging requirements are listed in a publication, *Protecting Your Components From Static Damage in Shipment*, available from RLWS Equipment Return Department.
- Examination of such equipment by RLWS confirms that the nonconformity actually exists, and was not caused by accident, misuse, neglect, alteration, improper installation, improper repair or improper testing; RLWS shall be the sole judge of all alleged non-conformities.
- Such equipment has not been modified, altered, or changed by any person other than RLWS or its duly authorized repair agents.
- RLWS will have a reasonable time to repair or replace the defective equipment. Buyer is responsible for shipping charges both ways.
- In no event will RLWS be responsible for travel time or on-location repairs, including assembly or disassembly of equipment, nor will RLWS be liable for the cost of any repairs made by others.

THESE WARRANTIES EXCLUDE ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING WITHOUT LIMITATION WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. NEITHER RLWS NOR DISTRIBUTOR WILL, IN ANY EVENT, BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES.

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SHOULD THE SELLER BE OTHER THAN RLWS, THE BUYER AGREES TO LOOK ONLY TO THE SELLER FOR WARRANTY CLAIMS.

NO TERMS, CONDITIONS, UNDERSTANDING, OR AGREEMENTS PURPORTING TO MODIFY THE TERMS OF THIS WARRANTY SHALL HAVE ANY LEGAL EFFECT UNLESS MADE IN WRITING AND SIGNED BY A CORPORATE OFFICER OF RLWS AND THE BUYER.

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