

LaserLT-60 and LaserLT-100

Remote Displays
Firmware Version: 8.02

Technical Manual



LaserLT-60



LaserLT-100

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1.0 Introduction

The purpose of this manual is to help the technician understand the LaserLT-60 and LaserLT-100 Remote Display's functioning modes, key functions, display indications, setup and configuration.



Note *The LaserLT-60 and LaserLT-100 require firmware version 8.02 to operate as a remote display. Firmware can be downloaded from the product page at www.ricelake.com and a replacement board (PN 206795) is also available with the remote display firmware version 8.02 already installed.*



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

Warranty information can be found on the website at www.ricelake.com/warranties

1.1 Safety

Safety Signal 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.



Failure to heed could result in serious injury or death.

Electric shock hazard!

There are no user serviceable parts. Refer to qualified service personnel for service.

The unit has no power switch, to completely remove power from the unit, disconnect the power source.

For pluggable equipment the socket outlet must be installed near the equipment and must be easily accessible.

Always disconnect from main power before performing any work on the device.

Do not allow minors (children) or inexperienced persons to operate this unit.

Do not operate without all shields and guards in place.

Do not use for purposes other than weighing applications.

Do not place fingers into slots or possible pinch points.

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 obscure warning labels.

Do not use near water, avoid contact with excessive moisture.

1.2 Product Dimensions

Product	Dimensions	
LaserLT-60		
LaserLT-100		
Standard Mounting Bracket for LaserLT-60 and LaserLT-100		
Optional Side Mount Bracket for LaserLT-100		

Table 1-1. Product Dimensions

1.3 Product Displays

The front panel of the LaserLT-60 Remote Display has a six digit display that is 2.4" high, six LED annunciators and five function keys.

The front panel of the LaserLT-100 Remote Display has a six digit display that is 3.9" high, six LED annunciators and five function keys.

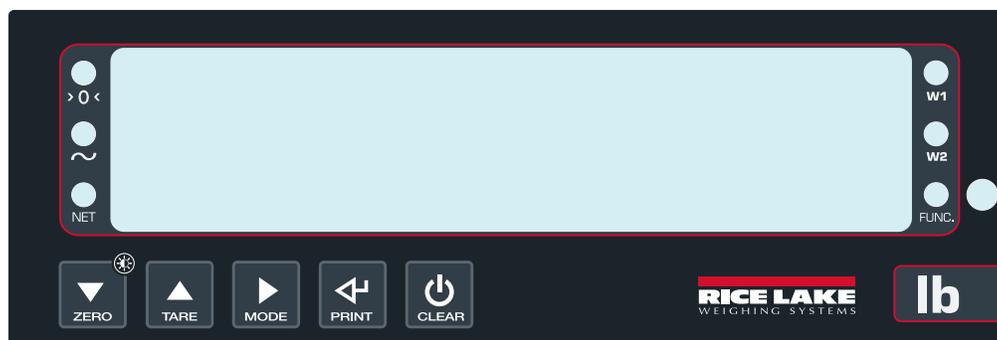


Figure 1-1. LaserLT-60 Remote Display Front Panel

The following table describes the function keys:

Key	Description
	Steps forward, or moves right in the menu or increments an entry value; Used to adjust the display intensity; When is pressed by default KZERO<CR> is transmitted; To modify display intensity press and hold until <i>Lint 01</i> displays then press again to increment the display intensity from <i>Lint 01 - Lint 05</i> (<i>Lint 01 - Lint 05</i>)
	Steps backward in the menu or decrements, decreases, an entry value; When is pressed by default KTARE<CR> is transmitted
	Returns to the default level of the menu or scrolls in entry mode; When is pressed by default KGROSSNET<CR> is transmitted
	Enter a parameter step or confirm entry of a value; When is pressed by default KPRINT<CR> is transmitted
	Press to turn on the unit; Hold until <i>OFF</i> displays to put the unit into standby mode (<i>'</i> displays to indicate unit is in standby); Exits a parameter step when pressed in a menu

Table 1-2. Front Panel Key Descriptions

The following table describes the function LEDs:

Annunciator	Description
>0<	Illuminates when the weighing system is within $\pm 1/4$ division of zero
~	Illuminates when the weight is unstable
Net	Illuminates when a tare is established, measuring for net weight
W1	Indicates the activation of the first output (Sp1) or Primary (unit 1) if set
W2	Indicates the activation of the second output (Sp2) or Secondary (unit 2) if set
Func	Illuminates: <ul style="list-style-type: none"> When the specification function of the instrument is active (set in <i>Function</i> \rightarrow <i>Func</i> parameter) When a key is pressed Turns off: <ul style="list-style-type: none"> When the specification function of the instrument is disabled with an active function Blinking indicates instrument function is active for five seconds

Table 1-3. LED Annunciator Descriptions



Net, W1 and W2 require setting values in *RDU*. The labeled default unit of measurement is pound. A kilogram sticker label is provided with the unit to indicate a change in units of measurement. Stickers for unit of measurement are provided to replace W1 and W2 function LED labels.

2.0 Installation

This section provides an overview of LaserLT-60 and LaserLT-100 installation.

Install the instrument on a stable, vibration free, flat surface. Disconnect from power source to completely power off the instrument. The back mounting bracket is for vertical mounting. An optional side mount for horizontal surfaces is available for the LaserLT-100.

IMPORTANT Remove protective film from the overlay as it may become difficult to remove if exposed to heat or sunlight.

2.1 Grounding the System

For proper grounding and optimal functioning of the system, it is necessary to create a single point ground in proximity of the instrument on which to connect the ground of the instrument, an interface cable and shields. Connect the ground point of the remote display directly to the ground bar of the electric panel or to a grounding rod.

2.2 Wiring Schematic

For proper device wiring, refer to the schematic below:

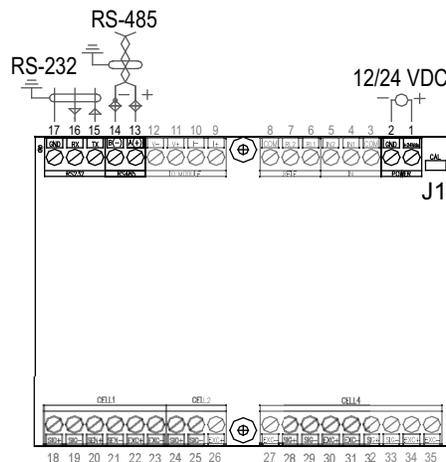


Figure 2-1. Wiring Schematic



Note Pins 3 – 12 and 18 – 35 are not used for remote display models.

Connector	Pin	Function
12/24 VDC	1	+24 VDC
	2	GND
RS-485 Serial Port	13	(A) 485 + Line
	14	(B) 485 - Line
RS-232 Serial Port	15	(TX) Transmit
	16	(RX) Receive
	17	GND

Table 2-1. Remote Display Connections

2.3 Power Supply

The instrument is supplied with an AC power cord, connected to an internal AC/DC power adapter. To power the instrument with 12 VDC or 24 VDC, connect the power supply cable directly to the terminal strip on the CPU board, see J1 in Figure 2-1. This input is for static DC, not for an automotive source.

The maximum power of the outputs 48 VAC 0.15A max (or 60 VDC 0.15 A max), the maximum voltage applicable to the inputs is between 12 VDC and 24 VDC with current from minimum 5 mA to maximum 20 mA.

3.0 Configuration

This section provides an overview of LaserLT-60 and LaserLT-100 configuration.

3.1 Quick Setup Menu

Press  when the firmware version is displayed during power on to enter the *SEtUP* (**Quick Setup**) menu.

The **Quick Setup** menu contains options for remote display configuration.

Navigate configuration parameters by using the function keys, see [Table 1-2 on page 3](#) for navigation assistance.

Use  and  to move across the menu and use  to move to the next level.

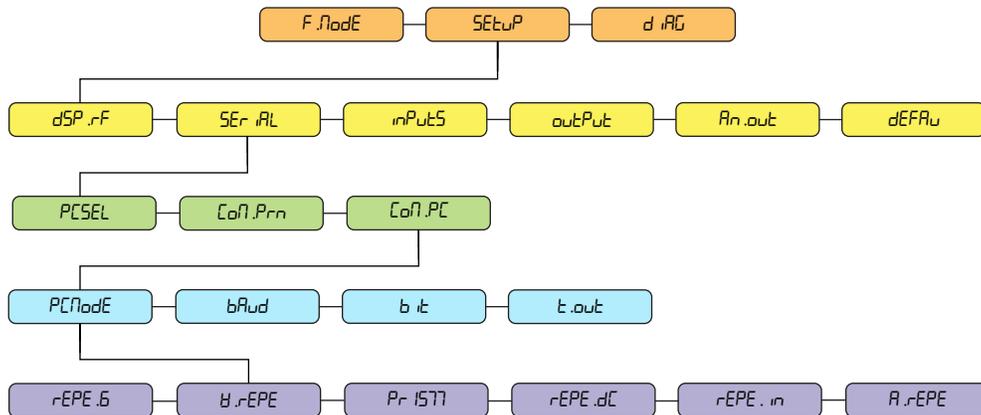


Figure 3-1. Setup Navigation

Menu	Parameter	Description
SEtUP (Setup)	dSP.rF	Display Radio Frequency – Display refresh; Settings: none, 1hz, 2.5hz, 5hz, 10hz., 20hz
	SEr.iRL	Serial – Access to serial port parameters
	inPut5	Inputs – Settings: inP.D1, inP.D2
	outPut	Output – Settings: out.D1, out.D2
	An.out	Annunciator Output – Settings: CAPAc, ModE, AdnAH, Ad2Er, Adn.in, S.in
	dEFRAU	Default – Resets each parameter to the default setting
SEr.iRL (Serial)	PCSEL	PC Select – PC serial selection; Settings: 485, 232
	CoM.Prn	Communication Print – Printer Serial
	CoM.PC	Communication PC – Port configuration for incoming data
CoM.PC (Communication PC)	PCModE	PC Mode – Port setting for baud rate, bits, and time out
	bAud	Baud – Common baud rate selection; Settings: 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200
	b.it	Bit – Set parity, word, and stop bit; Settings: n-8-1, E-7-2, E-7-1, n-7-2, n-8-2
	Add.En	Add.En – Settings: YES, no
PCModE (PC Mode)	rEPE.6	REPE.6 – Reception of the SCT 2200 string
	U.rEPE	U.REPE.6 – Configurable mode that allows identification and location of data in the string; Default configuration for the Rice Lake continuous format by default (Section 3.3 on page 7)
	Pr.1577	PR 1577 – Reception of the Pr.1577 string
	rEPE.dC	REPE.DC – Used when the indicator is connected to digital load cells while connected to the same network
	rEPE.in	REPE.In – Auto lean mode that allows reading of the received string automatically without setting any parameters
	A.rEPE	Auto.REPE – Alpha numeric mode that allows ASCII text to be displayed when a string is six characters followed by <CR>

Table 3-1. Setup Parameter Definitions

3.2 RS-485/422 and RS-232 Access

Access to RS-485/422 and RS-232 allow for hardware to connect to the LaserLT-60 and LaserLT-100 Remote Displays through the specific port selected. Software selection determines the communication carrier used. RS-232 is the default carrier. To select RS-485/422 or RS-232 from the setup menu, see [Section 3.1 on page 5](#), navigate to *PC SEL* (PC Select):

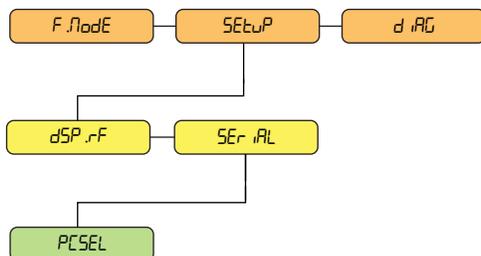


Figure 3-2. Navigation to RS-485/422 and RS-232

Menu	Parameter	Description
SETUP (Setup)	dSP.rF	Display Radio Frequency – Display refresh; Settings: norm, 1hz, 2.5hz, 5hz, 10hz., 20hz
	SERIAL	Serial – Access to serial port parameters
SERIAL (Serial)	PCSEL	PC Select – PC serial selection; Settings: 485, 232

Table 3-2. RS-485/422 and RS-232 Parameter Definitions

3.3 Manual Configuration Using W.rEPE

W.rEPE is a configurable mode that allows identification and location of data within the string. The W.rEPE parameter is selected, it allows for the manual configuration of parameters to parse string data. The manual configuration is defaulted to read the Rice Lake continuous format. The Rice Lake continuous format is defined as:

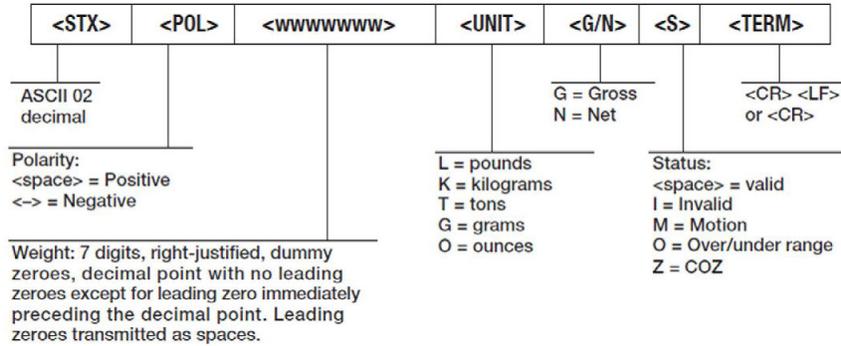


Figure 3-3. STR-1 Rice Lake Stream Data Format

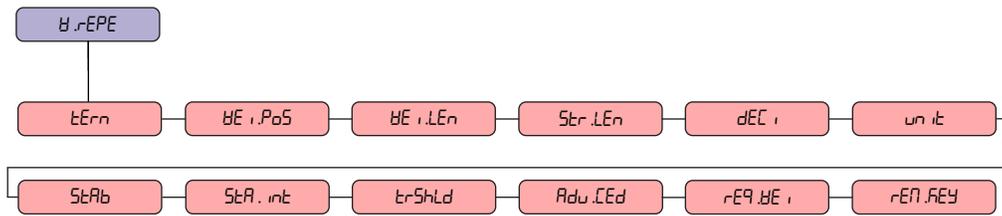


Figure 3-4. String Configuration Parameters

Parameter	Description
tErn	Terminator – Identifies the string terminator at the end of the string in ASCII code; Default value is 10 = LF
WE .Po5	Weigh Position – Identifies the 1st character position of the weight in the string; 1st string character has index zero; Default value is 01, see Figure 3-5 on page 8
WE .LEn	Weigh Length – Identifies number of characters of the weight data string; Default value is 08 (polarity and seven weight digits)
Str .LEn	String Length – Identifies the length of the string transmitted from the indicator; Enter a value from 0–39; Default value is 13
dEC .	Decimal –Enter a number of scale decimals from 0–5 for F, HED; Default value is Str-ERN
unit	Unit –Identifies unit of measure; available units are G, Lb, t, KG; Default unit of measure is Lb but not available for incoming data
StAb	Stability – Identifies number of readings used to compare for stability; Default value is 3
StA .int	Stability Intensity – Identifies weight difference for the stability sample between reading to identify motion; Default value is 2
trShLd	Threshold – Identifies minimum and maximum capacity for display blanking
Adv .CEd	Advanced – See Section 3.3.2 on page 8 for advanced settings information
rEQ WE .	Not applicable
rEN .KEY	Remember Key – Settings: rZERo, rTARE, rMODE, rPr int; Allows for the command to be sent to the indicator when the relative function key is pressed; Up to 12 characters can be defined for the string if the first character is ASCII 0 the remote key is disabled; Function key defaults are: <ul style="list-style-type: none"> ZERO = KZERO<CR> TARE = KTARE<CR> MODE = KGROSSNET<CR> PRINT = KPRINT<CR>

Table 3-3. String Configuration Parameter Definitions



The following parameters must be set when working in W.rEPE:

- * WE .Po5
- * WE .LEn
- * Adv .CEd

3.3.1 String Example

The weight value of the first character position is defined within the parameter of weight position, or `Wei.Pos`, in the string transmitted by indicator. A possible polarity sign is also part of the weight value. The unit can parse a string up to 39 characters. For example, if the received string is `bpwwwwwwLGS+CR+LF`:

Received String	b	p	w	w	w	w	w	w	w	L	G	S	CR	LF
String Position	00	01	02	03	04	05	06	07	08	09	10	11	12	13

Figure 3-5. Rice Lake Continuous Data Format Example

3.3.2 Advanced Parsing Parameters

Advanced Parsing Parameters utilize logical operators and bit masking to set the individual bits of the string to read the sign, stability, zero and over/under load and units.

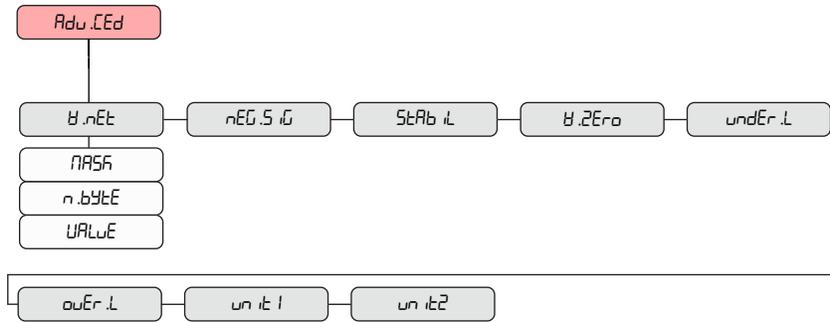


Figure 3-6. Advanced Configuration Parameters

Parameter	Description
<code>Wei.Net</code>	Weight Net – Bit and character that indicates if the weight is net
<code>Neg.Sig</code>	Negative Sign – Bit and character that indicates if the weight is positive or negative
<code>Stab.L</code>	Stability – Bit and character that indicates if the weight is stable
<code>Wei.Zero</code>	Weight Zero – If the value is not set (MASK = 0) the scale is considered to be in the zero range when the weight is equal to 0
<code>Under.L</code>	Weight Under Load – Bit and character that indicates if the weight is under load
<code>Over.L</code>	Over Load – Bit and character that indicates if the weight is over load
<code>Unit 1</code>	Unit 1 – Lights W1; If 076 lights unit 1, the unit of measure is L, or pounds; Unit of measurement stickers are provided to replace W1 function LED labels
<code>Unit 2</code>	Unit 2 – Lights W2; If 075 lights unit 2, the unit of measure is K, or kilograms; Unit of measurement stickers are provided to replace W2 function LED labels

Table 3-4. Advanced Parsing Parameter Settings

Each of the Advanced parameters are defined by setting the following parameters:

Parameter	Description
<code>Mask</code>	Mask – Byte where will extract the data, relative to step indicated in <code>Adv.CEd</code> (from 0–255); Character is logical <code>Adv.CEd</code> with this mask, the result is compared with Value; Parameter is not managed if the value is set to 0
<code>N.Byte</code>	Index Byte – Indicates the character where the data will be extracted; Character index in the string
<code>Unit</code>	Value – Character value that defines what was selected in <code>Adv.CEd</code> step; If the character of the string is a letter it is necessary to insert the relative ASCII code value <code>Und.Dur</code> if the <code>Tr.LD</code> is set and the <code>Tr.H</code> parameters will be ignored

Table 3-5. Advanced Parsing Parameter Settings

Example: If the string sent by the scale indicator has the form: `WWWWWWF<CR><LF>`

Where `WWWWWW` is the weight, `F` some flags.

`Wei.Pos` will be 0. `Wei.Len` 6.

If check bit 2 of flag character `F` is desired and this bit is about negative weight, then set in `Adv.CEd / Neg.Sig`:

- Mask = 4 (if check bit 2 is desired, binary mask is 00000100, decimal = 4)
- N.Byte = 6
- Value = 4

When character 6 of the string `AND` (logical AND) Mask = 4 weight is considered negative.

Check Multiple Bits

Sum the mask decimals of all bits to be checked to check multiple bits.

Example: Check bits 7 (decimal 64) and 6 (decimal 128) the mask will be 192 (binary 11000000).

Sum all mask decimals to check a whole character.

Example: If the stability condition is a character 'S' in a certain position, the mask will be 255 (11111111 binary) and value will be 83 (ASCII code of character S). When character and 255 (character remains unchanged) is equal to ASCII of S (83) the weight is considered stable.

An example for standard string parameters of the Rice Lake continuous format:

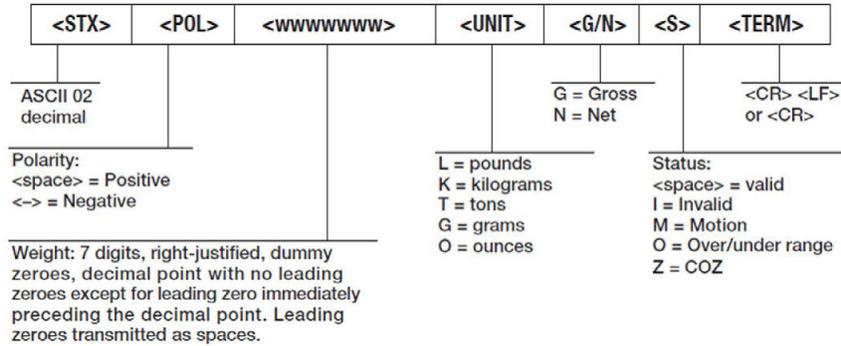


Figure 3-7. STR-1 Rice Lake Stream Data Format

```

<STX><POL><wwwwwww>
F.Mode>> Func = rEPE
SEtUP >> SEr iAL >> PL SEL = 232 or 485 (depending on the connection)
Cof.PC >> Baud = 9600
    bit = n-8-1
    t.out = 01.5
    PL.Mode = WrEPE
    tErn = 010
    HE i.PoS = 01
    HE i.LEn = 08
    Str.LEn = 13
    dEC i = set in function of the scale
    dEC i = StrERn
    uP = set in function of the scale
    StAb = 03
    StA. int = 02
    trShld >> tr.Lo = -99999; tr.h i = 99999
    AdU.CEd >> H.nEt >> nASh = 255
    n.bytE = 10
    UALwE = 078
    nEG.S in >> nASh = 000
    n.bytE = 00
    UALwE = 000
    StAb iL >> nASh = 000
    n.bytE = 00
    UALwE = 000
    H.ZErO >> nASh = 255
    n.bytE = 11
    UALwE = 090
    und.L >> nASh = 255
    n.bytE = 11
    UALwE = 079
    oUr L >> nASh = 255
    n.bytE = 11
    UALwE = 078
    un it 1 >> nASh = 255
    n.bytE = 09
    UALwE = 076
    un it 2 >> nASh = 255
    n.bytE = 09
    UALwE = 075
    
```

3.4 Semi Auto Learn Using rEPE.in

rEPE.in is a semi-automatic mode to establish the start and end positions of the weight value. rEPE.in has no parameters and does not read annunciators for units, mode, or status. This parameter is in the PCNode.

The polarity sign is to be included as part of the start position. The total weight length can be more than six characters. If a negative value is present, the negative sign will be placed in the character to the left of the displayed value, as long as the value is not more than five digits.

If the weight value includes leading zeros they will be displayed. Navigate parameters for the configuration of the weight indicator by using the display keys, see Table 1-2 on page 3 for navigation assistance:

1. CON.A i displays, press .
 2. The detected baud rate and the milliseconds to read the string displays, press .
 3. UEr iFY and the first recognized character displays, navigate parameter using the five function keys, press .
 4. SETP displays, press .
 5. BA it ...StArt displays, wait for the process to finish.
 6. The start of the string will display, navigate parameter using the five function keys, press .
 7. End displays the end of the string, navigate parameter using the five function keys, press .
- Baud, bits, address (for RS-485) and timeout can be configured or the learn mode can be saved.

3.5 Function Mode Menu

The F.Mode (Function Mode) menu changes parameter functions of the device:

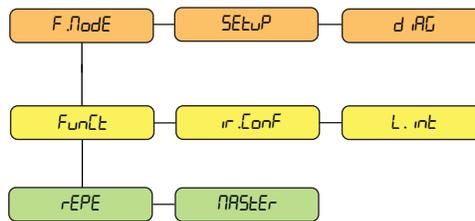


Figure 3-8. Function Mode Navigation

Menu	Parameter	Description
F.Mode (Function Mode)	FunCt	Function – Access to function parameter; Not applicable
	ir.ConF	Not applicable
	L.int	Light Intensity – Display back light intensity selection that defaults on power on; Settings: L.int00, L.int01, L.int02, L.int03, L.int04, L.int05
FunCt (Function)	rEPE	REPE – Single scale repeater; Reception of the RS-485 address, see PCSEL in Table 3-2 on page 6
	PAStEr	Not applicable

Table 3-6. Function Mode Parameter Definitions

4.0 Troubleshooting

This section provides an overview of LaserLT-60 and LaserLT-100 troubleshooting.

4.1 Diagnostics Menu

The *d iRG* (**Diagnostics**) menu provides device information:

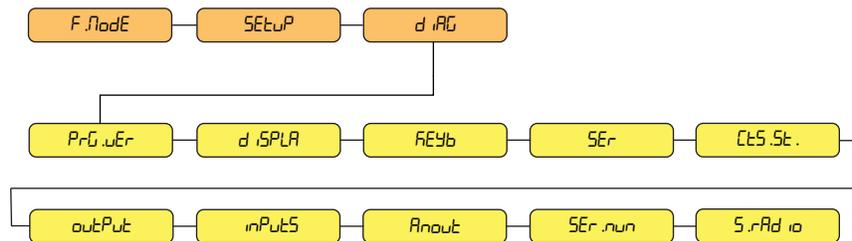


Figure 4-1. Diagnostics Navigation

Menu	Parameter	Definition
<i>d iRG</i> (Diagnostics)	<i>PrG.vEr</i>	Program Version – Firmware version
	<i>d iSPtR</i>	Display test – <i>B.B.B.B.B.B.</i> displays
	<i>FEYb</i>	Function key test – <i>0000</i> displays; Navigate with the front panel keys to display related codes to confirm the key is working; Press any key two times to exit
	<i>SEr</i>	Serial – RS-232 serial port test
	<i>Con 1-2</i>	Not applicable
	<i>CtS.St.</i>	Not applicable
	<i>outPut</i>	Output Test – Test of the outputs; Settings: <i>rELD 1</i> , <i>rELD 2</i>
	<i>inPutS</i>	Inputs Test – Test of the inputs; Settings: <i>in. 1-0</i> , <i>in. 2-0</i>
	<i>Anout</i>	Not applicable
	<i>SEr.nun</i>	Serial Number – The serial number of the unit, scrolls
	<i>S.rAd io</i>	Not applicable

Table 4-1. Diagnostics Parameter Definitions

5.0 Specifications

Display

6-digit, 7-segment discrete oval red LED lamps, single width
2.4" (60 mm) or 4" (100 mm) digit
Decimal/comma indication in any position
Annunciators for NT, Stability, COZ

Operator Interface

Display	LaserLT-60 – 2.4" high (60 mm) LaserLT-100 – 3.9" high (100 mm)
Keypad	Five function keys
LED	Six status instrument LEDs

Rating/Material

304 stainless steel, IP68

Weight

10 lb

Communication

Digital Inputs/Outputs	
Two inputs	Opto isolated 12–24 VDC
Two outputs	150 mA, 48 VAC/150 mA, 60 VDC
Serial ports	1 RS-485 bidirectional port, configurable 1 RS-232 bidirectional port, configurable

Input Data Format

Baud Rate: 1200 to 115.2 K software selectable.
Even parity 7 data bits, or no parity 8 data bits

Update

Software selectable 1-20/sec

Environmental

Operating Temperature	
Legal	14°F–104°F (-10°C–40°C)
Industrial	-40°F–120°F (-40°C–49°C)
Storage Temperature	-22°F–179°F (-30°C–80°C)
Humidity	85% (non-condensing)

Power

Input	120/240 12–24 VDC
Power Consumption	160 mA max

Warranty

One-year limited warranty

Certifications and Approvals



FCC Compliance

United States

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

Canada

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

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



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