SURVIVOR® IQ F-Series

Flip Digit Remote Displays

Models F15, F40, and F60

Version 2.0

Installation Manual

RICE LAKE WEIGHING SYSTEMS

Industrial Solutions on a Global Scale®

ISO 9001 REGISTERED

43545

Contents

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About This Manual

This manual is intended for use by service technicians responsible for installing and servicing the F-Series flip digit remote displays. Installation procedures are presented in the order likely to be followed by the installer: pre-installation setup, configuration, and on-site installation.

This manual applies to units using Version 2.0 of the F-Series remote display software.

Warning *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 F-Series flip digit remote displays provide high-visibility, six-digit display capability for use in a wide variety of applications. This manual provides installation and configuration instructions for the F15 (1.5-inch), F40 (4-inch) and F60 (6-inch) flip digit remote displays.

The F-Series remote displays are designed to work with most digital weight indicators using 20 mA current loop or RS-232 communications. The Auto-Link™ function allows the F-Series displays to automatically determine the data rate and format sent by the attached indicator.

Optional features include time and temperature display, fluorescent backlighting for dark or night visibility, and visor options for the F40 and F60 models.

NOTE: Night time viewing distance is decreased from glare caused by the back light.

Optional Features

Table 1-1 lists the optional features available for the F-Series remote displays. Units can be ordered from the factory with these options already installed, or the options can be separately ordered and installed into existing F-Series displays.

Option	Model	PN
Time	All	43522
Temperature	All	43412
Visor	F40	41248
	F60	41247
Backlighting	F15 (115 VAC)	43599
	F40 (115/230 VAC)	40881
	F60 (115/230 VAC)	43520

Table 1-1. Options for F-Series Remote Displays

2.0 Pre-Installation Setup

The F-Series remote displays should be set up, configured, and tested before delivery to the installation site.

This section describes RS-232 and 20 mA current loop indicator connections. Once pre-installation setup is complete, go to Section 3.0 for information about configuring the remote display.

⚠Caution *Use a wrist strap to ground yourself and protect components from electrostatic discharge (ESD) when handling chips and working inside the remote display enclosure.*

2.1 Indicator Connections

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

1. Disconnect power and open the remote display enclosure.
2. For Models F40 and F60, turn the retaining screws and lower the hinged flip digit mounting panel. For the Model F15, remove the two screws from the hinged flip digit mounting panel. Lower the panel.
3. Loosen the serial cable cord grip and push only enough communications cable into the enclosure to allow attachment at the terminal block.
4. Strip 1/4 inch (.65 cm) of insulation from the serial cable ends.
5. Make cable connections for RS-232 or 20 mA current loop communications as described in Sections 2.1.1 or 2.1.2, below.
6. For RS-232 connections, remove jumper JMP1 on the CPU board (see Figure 2-1).
7. Remove any excess cable from inside the enclosure. Tighten the serial cable cord grip.

The DIP switches on the remote display CPU board should be set and the remote display configuration verified before sealing the display enclosure. DIP switch configuration is described in Section 3.0.

A loop-back test can be used to test the function of the remote display serial port. See Section 5.3 on page 16 for information about the loop-back system test.

2.1.1 RS-232

Figure 2-2 on page 3 shows the connections required for RS-232 communications to the remote display. See the manual for your indicator to determine the indicator pin assignments for RS-232 communications.

2.1.2 20 mA Current Loop

Figures 2-3 and 2-5 show the connections required for passive or active 20 mA current loop communications to the remote display. See the manual for your indicator to determine the indicator pin assignments for 20 mA communications.

NOTE: The F-Series remote displays are passive receive and echo (transmit). Additional jumpers must be added if it is to be active.

2.1.3 Echo

Figure 2-6 through 2-10 show connections required for echo to additional peripheral devices.

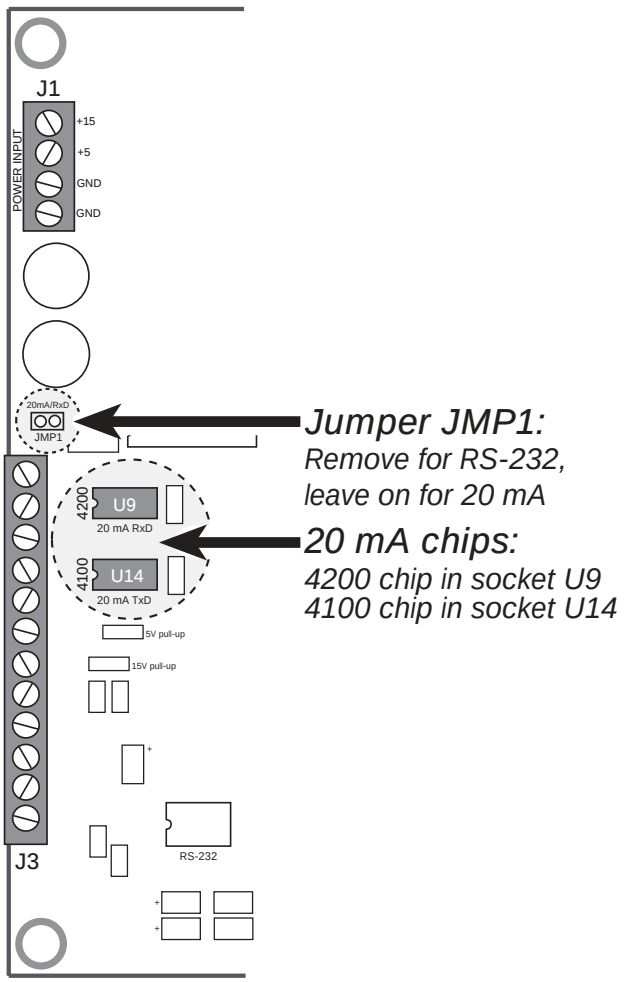


Figure 2-1. Locations of Jumper JMP1 and 20 mA Chips on Left Edge of CPU Board

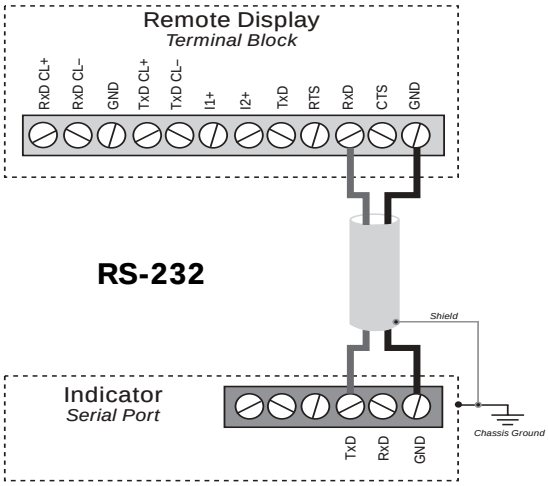


Figure 2-2. RS-232 Indicator Connections to Remote Display Terminal Block

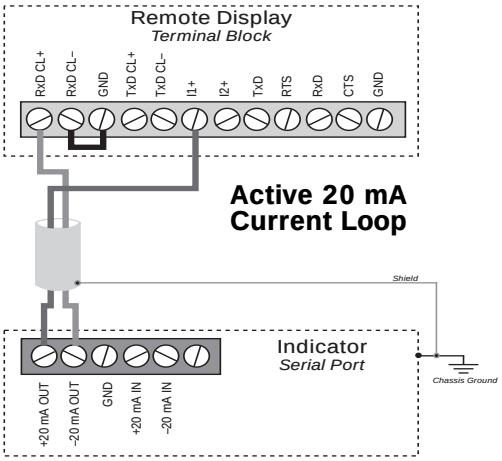


Figure 2-3. 20 mA Current Loop Connections: Active Remote Display, Passive Indicator

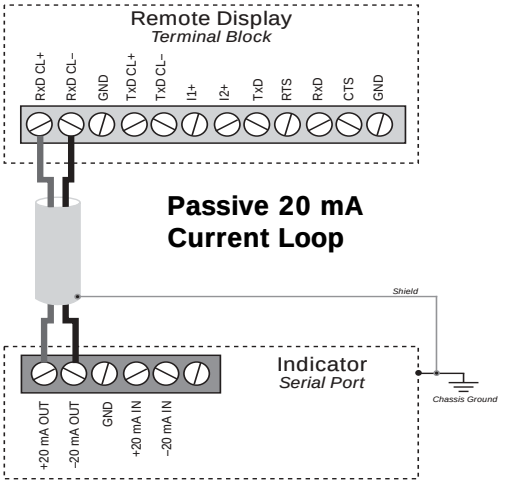


Figure 2-4. 20mA Current Loop Connections: Passive Remote Display, Active Indicator

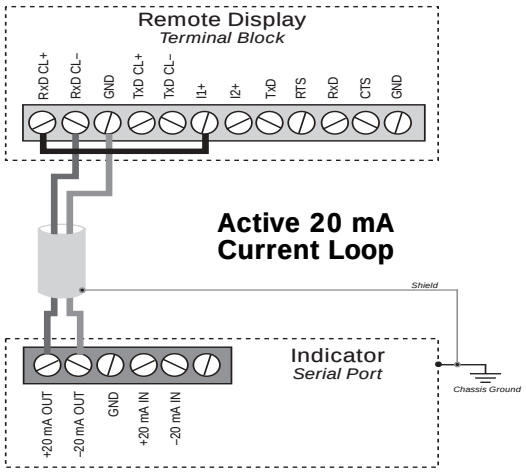


Figure 2-5. 20 mA Current Loop Connections: Active Remote Display, Passive Indicator

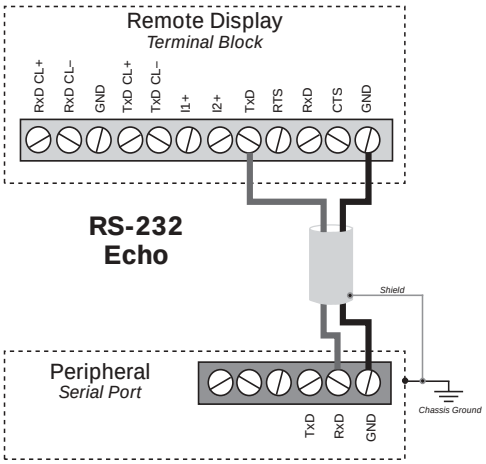


Figure 2-6. RS-232 Indicator Connections to Remote Display Terminal Block

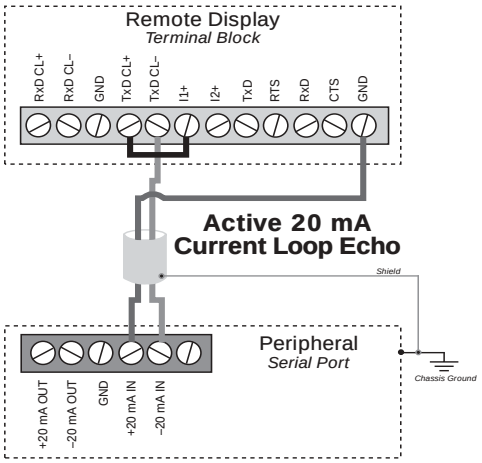


Figure 2-8. 20mA Current Loop Connections: Passive Remote Display, Active Indicator

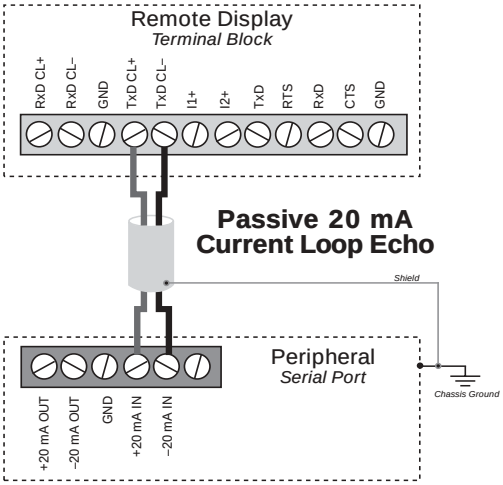


Figure 2-7. 20 mA Current Loop Connections: Passive Remote Display, Active Indicator

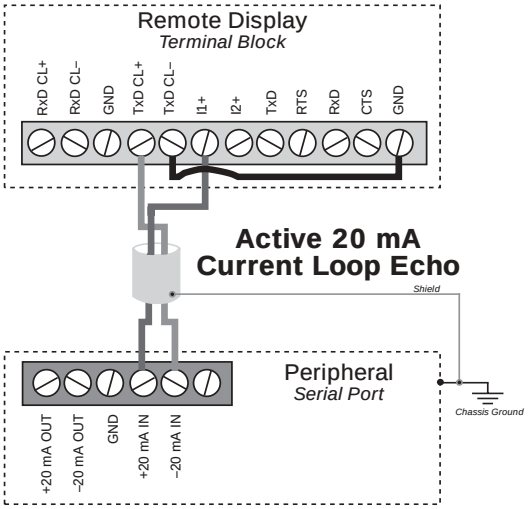
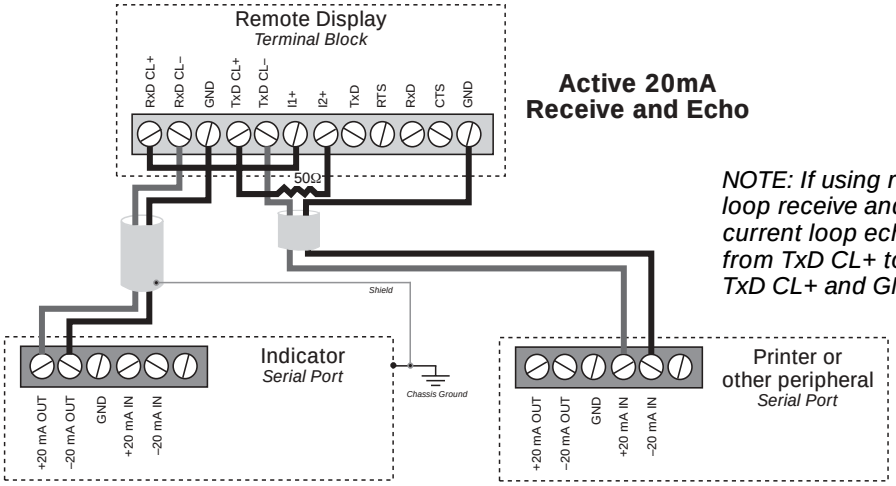


Figure 2-9. 20 mA Current Loop Connections: Active Remote Display, Passive Indicator



NOTE: If using remote display as an active current loop receive and you want to use it as an active current loop echo, put in an additional resistor from TxD CL+ to I2+. Also, use TxD CL- as TxD CL+ and GND as TxD CL- for echo.

Figure 2-10. 20 mA Current Loop Connections: Active Remote Display, Echo (Transmit)

3.0 Configuration

The remote display and indicator should be connected, configured, and tested before delivery to the installation site. To begin configuration, ensure the remote display is powered off and open the enclosure to access the CPU board.

3.1 Indicator Configuration

When configuring the indicator attached to the remote display, ensure that the decimal point configuration is compatible with the remote display. Because the F-Series remote displays use a fixed decimal point between the third and fourth digits, weight data sent from the indicator must be configured to show either no decimal point (000000) or decimal thousandths (000.000).

NOTE: The indicator must be configured to send continuous (streaming) data to the remote display.

3.2 DIP Switch Configuration

The F-Series remote displays are configured using four banks of eight DIP switches located along the front edge of the CPU board. DIP switch settings are read only when the remote display is powered on; to change a switch setting, the unit must be powered off, then on again, for the change to take effect.

The following sections include figures and tables describing each of the DIP switch banks.

3.2.1 Echo

Switch DSW1-1 allows data sent to the remote display to be echoed back to the indicator or relayed to another device, such as a printer or second remote display.

3.2.2 Display Test

By setting switch DSW1-2 on, the display may be put in Display Test Mode. In display test mode, the following are displayed:

- The baud rate, parity, and bit settings
- The code for the configured indicator
- The numbers 0-9, blanks, and the letters A-Z

The display will continue to loop displaying this information until the switch is turned off.

3.2.3 Serial Communications

DSW1-4 through DSW1-8 switches set the serial communications configuration for the remote display.

The parity, data bits, and baud rate settings for the remote display must match those configured for the indicator *unless Auto-Link is used* (see Section 3.2.6 on page 7). If Auto-Link is enabled, switches DSW1-4 through DSW1-8 are defaults.

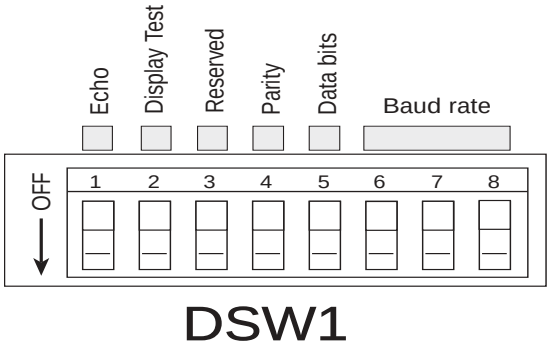


Figure 3-1. DSW1 Switch Definitions

To Configure...	DSW1								
Parameter	Value	1	2	3	4	5	6	7	8
Echo	Off	OFF							
	On	ON							
Display Test	Off		OFF						
	On		ON						
Parity	Even				OFF				
	Odd				ON				
Data bits	7					OFF			
	8					ON			

Table 3-1. DSW1 Switch Settings

To Configure...	DSW1								
Parameter	Value	1	2	3	4	5	6	7	8
Baud rate	300						OFF	OFF	OFF
	600						ON	OFF	OFF
	1200						OFF	ON	OFF
	2400						ON	ON	OFF
	4800						OFF	OFF	ON
	9600						ON	OFF	ON
	19200						OFF	ON	ON

Table 3-1. DSW1 Switch Settings (Continued)

3.2.4 Primary and Secondary Units

Switches DSW2-1 through DSW2-4 set the primary and secondary annunciators for the remote display. Using these switches, the lb and kg annunciators can be assigned to designate pounds, kilograms, tons, or metric tons (megagrams). Decals included with the remote display can be used to change annunciator labeling to show tons (T), metric tons (t), or megagrams (Mg).

Actual function of the lb and kg annunciators depends on the units information included in the indicator serial stream.

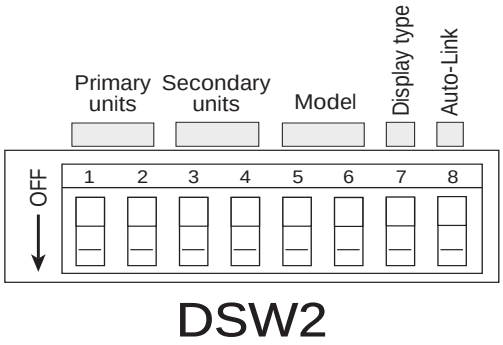


Figure 3-2. DSW2 Switch Definitions

To Configure…	DSW2								
Parameter	Value	1	2	3	4	5	6	7	8
Primary units	Pounds	OFF	OFF						
	Kilograms	OFF	ON						
	Metric tons	ON	OFF						
	Tons	ON	ON						
Secondary units	Pounds			OFF	OFF				
	Kilograms			OFF	ON				
	Metric tons			ON	OFF				
	Tons			ON	ON				
Model	F15					OFF	OFF		
	F40					OFF	ON		
	F60					ON	OFF		
Display type	Flip digit							OFF	
	LCD							ON	
Auto-Link Enable	Off								OFF
	On								ON

Table 3-2. DSW2 Switch Settings

3.2.5 Display Type and Model

Switches DSW2-5 through DSW2-7 set the display type and model. DSW2-7 must be off for all F-Series remote displays.

3.2.6 Auto-Link

The F-Series remote displays incorporate a software feature called *Auto-Link*. The Auto-Link function examines the serial data stream sent from the attached indicator and attempts to determine the communication settings and format used by the indicator.

NOTE: If Auto-Link is enabled, switches DSW1-4 through DSW1-8 and all DSW4 switch settings are defaulted.

Use the following procedure to learn the indicator serial data stream:

1. Set DIP switch DSW2-8 on.
2. With wiring and configuration complete for both the indicator and the remote display, power on the indicator, then the remote display.
3. When the power-up display is complete and the indicator is streaming weight data in normal mode, press the Auto-link switch on the underside of the display enclosure. (See page 12 for information about the system test procedure.)
4. The display informs you that it is performing the Auto-Link function.
5. Next, the baud rate, parity, data bits, and stop bits settings are displayed.
6. Once the display determines the data format being used, the remote display will begin displaying the indicator data.

If the display is unable to determine the data format used, an error message is shown. See Section 5.1 on page 14 for information about F-Series error messages.

NOTES:

- The learned indicator data stream format stays in the remote display memory even if the unit is powered off. Press the AUTO-LINK switch only to learn a *new* indicator format.
- Auto-Link may be unable to read the serial strings sent by some indicators or particular indicator configurations. If Auto-Link is unable to interpret the serial string, set switch DSW2-8 off and use Table 3-4 on page 9 to set DSW4 for the attached indicator.

3.2.7 Display Characteristics

Set switch DSW3-1 on to allow the remote display to update weight data without waiting for scale standstill.

3.2.8 Time and Temperature Options

Switches DSW3-3 through DSW3-5 control the display of time and temperature information for units with these options installed. If these options are not installed, set switches DSW3-3 and DSW3-5 off.

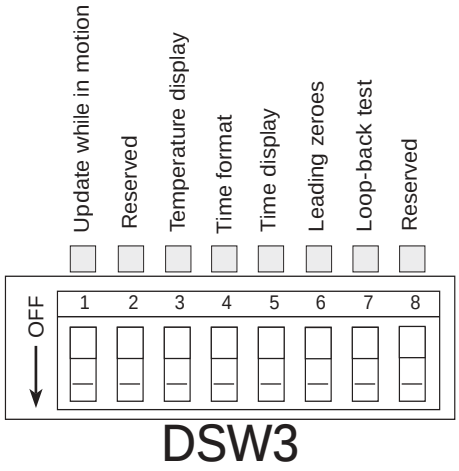


Figure 3-3. DSW3 Switch Definitions

To Configure…		DSW3							
Parameter	Value	1	2	3	4	5	6	7	8
Update while in motion	No	OFF							
	Yes	ON							
Reserved	No		OFF						
	Yes		ON						
Temperature display	Off			OFF					
	On			ON					
Time format	24 hour				OFF				
	12 hour				ON				
Time display	Off					OFF			
	On					ON			
Suppress leading zeroes	Off						OFF		
	On						ON		
Loop-back self-test	Off							OFF	
	On							ON	

Table 3-3. DSW3 Switch Settings

3.2.9 Suppress Leading Zeros

Switch DSW3-6 enables suppression of leading zeroes. If this feature is used, leading zeroes are always suppressed on the remote display. THE EXCEPTION is when a decimal value between 1.000 and -1.000 is displayed. In this case, the display will add a single zero before the decimal point.

If this feature is not used, leading zeroes sent from the indicator will also be displayed.

3.2.10 Loop-Back Test

Switch DSW3-7 enables the loop-back system test used to check the remote display serial port. For normal operation, set this switch off. See Section 5.3 on page 16 for information about using the loop-back system test.

3.2.11 Indicator Type/Serial Format

Table 3-4 on page 9 shows the DSW4 switches used to identify the serial format sent by the attached indicator *unless Auto-Link is used* (see Section 3.2.6 on page 7). If Auto-Link is enabled, the DSW4 switch settings are ignored.

NOTE: Auto-Link may be unable to read the serial strings sent by some indicators or particular indicator configurations. If Auto-Link is unable to interpret the serial string, set switch DSW2-8 off and use Table 3-4 to set DSW4 for the attached indicator.

3.3 Setting the Clock (for Units with the Time Option Installed)

Once remote display configuration is complete and the unit powered on, set the clock by doing the following:

1. Turn the clock switch to the HRS SET position to set the hour. Hours digits count up once per second while the switch is held in the HRS SET position. Release the switch when the current hour is displayed.
2. Turn the clock switch to the MIN SET position to set the minute. Minutes digits count up once per second while the switch is held in the MIN SET position. Release the switch when the current minute is displayed.

The clock chip contains its own battery which maintains the current time when the remote display is powered off.

The current time is displayed when the weight reading received by the remote display is zero. If the temperature option is also installed and enabled, the time and temperature displays alternate. The zero weight is also displayed periodically with the time and temperature options.

Indicator Type / Serial Format	DSW4								Code
	1	2	3	4	5	6	7	8	
Accu-weigh SEP12K	OFF	OFF	ON	ON	ON	ON	ON	ON	10
Analogic 5316 (HB44, EDP Output)	ON	ON	OFF	ON	ON	ON	ON	ON	20
Analogic 5316 (HB44, Version 13.0.9)	OFF	ON	OFF	ON	ON	OFF	ON	ON	21
AND (AD4321, AD4323)	OFF	ON	OFF	ON	ON	ON	ON	ON	30
Cardinal 708 (Scoreboard Format)	OFF	OFF	OFF	OFF	OFF	ON	ON	ON	40
Cardinal 738	OFF	ON	ON	ON	ON	ON	ON	ON	41
Cardinal 738 (Scoreboard Format)	ON	ON	ON	ON	ON	OFF	ON	ON	42
Cardinal 748	OFF	ON	ON	OFF	ON	ON	ON	ON	43
Cardinal 778	ON	OFF	ON	ON	ON	OFF	ON	ON	44
Condec (UMC1000, UMC 2000)	ON	OFF	OFF	ON	ON	ON	ON	ON	50
Doran 7000	OFF	OFF	OFF	ON	ON	ON	ON	ON	60
Fairbanks (90-160 Series, RS232)	ON	ON	ON	OFF	ON	ON	ON	ON	70
Fairbanks (90-160 Series, 20 ma)	ON	ON	ON	OFF	OFF	ON	ON	ON	71
Flexweigh (DWM IV)	OFF	OFF	ON	OFF	ON	ON	ON	ON	80
General Freedom (I, II)	ON	ON	OFF	OFF	ON	ON	ON	ON	90
GSE (550, Default Format)	OFF	OFF	ON	ON	ON	OFF	ON	ON	100
GSE (550 Displayed Data Format)	ON	ON	OFF	ON	ON	OFF	ON	ON	101
Hardy (HI2151 WC)	OFF	ON	OFF	OFF	ON	ON	ON	ON	110
IDS	ON	OFF	OFF	OFF	ON	ON	ON	ON	120
Ishida (DAP-01)	ON	OFF	OFF	OFF	OFF	ON	ON	ON	130
Ohaus (1-10, 1-20W)	ON	OFF	ON	ON	OFF	ON	ON	ON	140
Ohaus (1-5S)	OFF	OFF	ON	ON	OFF	ON	ON	ON	141
Ohaus (1150)	ON	ON	OFF	ON	OFF	ON	ON	ON	142
Rice Lake Weighing Systems	ON	ON	ON	ON	ON	ON	ON	ON	150
RLWS IQ810 4 Scale (1st Scale)	ON	OFF	OFF	ON	ON	OFF	ON	ON	151
RLWS IQ810 4 Scale (2nd Scale)	OFF	OFF	OFF	ON	ON	OFF	ON	ON	152
RLWS IQ810 4 Scale (3rd Scale)	ON	ON	ON	OFF	ON	OFF	ON	ON	153
RLWS IQ810 4 Scale (4th Scale)	OFF	ON	ON	OFF	ON	OFF	ON	ON	154
RLWS IQ810 4 Scale Allen/Bradley Continuous	ON	OFF	ON	OFF	ON	OFF	ON	ON	155
RLWS IQ810 Master/Slave Format	OFF	OFF	ON	OFF	ON	OFF	ON	ON	156
Toledo	ON	OFF	ON	OFF	ON	ON	ON	ON	170

Table 3-4. DSW4 Switch Settings

Transcell (RL 100 (RLWS), RL 101 (RLWS), TI-500, TI-500E (All are for the Transcell Technology)	ON	OFF	ON	OFF	OFF	ON	ON	ON	180
Weightronix (WI-110, WI-120)	ON	OFF	ON	ON	ON	ON	ON	ON	190
Weightronix (WI-125)	OFF	OFF	ON	OFF	OFF	ON	ON	ON	191
Weightronix (WI-127, default, layout 6)	ON	ON	OFF	OFF	OFF	ON	ON	ON	192
Western (DF 1000)	OFF	ON	OFF	OFF	OFF	ON	ON	ON	200

Table 3-4. DSW4 Switch Settings (Continued)

NOTE: After Auto-Link is performed, the baud rate and communication port settings (parity, data bits, and stop bits) are displayed. The code from table 3-5 is also displayed so you can compare it to make sure Auto-Link performed correctly.

4.0 On-Site Installation

This section describes procedures for sealing the enclosure and dimensions for mounting the F-Series remote displays. Ensure that the remote display has been tested and works with the indicator before sealing and mounting the enclosure.

4.1 Sealing the Enclosure

Once pre-installation setup and configuration are complete and the remote display has been tested with the indicator, close and secure the enclosure cover.

For Model F15 remote displays, close the cover and turn the screws to secure the enclosure.

For Models F40 and F60, securing the cover requires 15 (F40) or 17 (F60) bolts, all torqued to 20 in-lbs. Use the torquing patterns shown in Figures 4-1 and 4-2 to prevent distorting the cover gasket.

NOTE: When sealing the F40 and F60 enclosure covers, you must make at least two passes through the torquing pattern shown to ensure all bolts maintain the 20 in-lb. torque value.

Visor Option (Models F40 and F60)

To install the optional visor, place the rubber washers over each of the 5 (F40) or 7 (F60) holes along the top of the enclosure cover. Place the visor on top of the washers, aligning the holes in the visor with those in the enclosure cover. Insert the sealing washers and bolts and torque to 20 in-lbs.

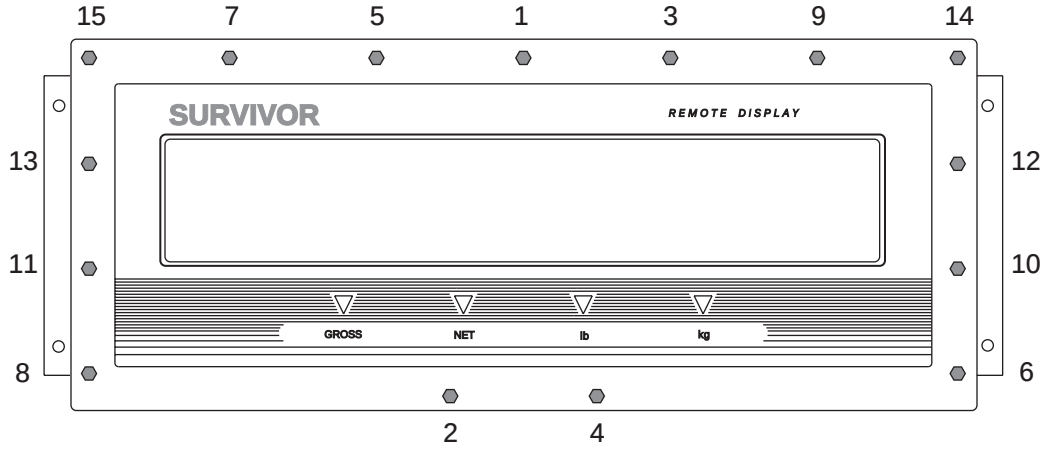


Figure 4-1. Torquing Pattern for Model F40

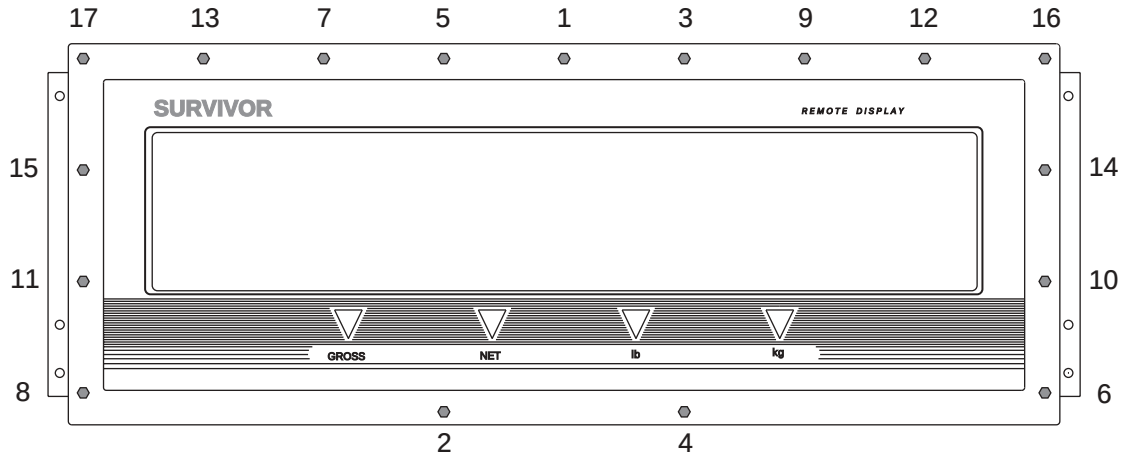


Figure 4-2. Torquing Pattern for Model F60

4.2 Mounting the Enclosure

Figures 4-3 through 4-5 show the enclosure dimensions, mounting hole diameters, and distances on center between mounting holes for each of the F-Series models.

NOTE: The F-Series remote displays must be mounted in a near-upright (90°) position to function properly. Flip digit performance diminishes as the mounting angle is increased (or decreased) from the optimal 90° position. At too great an angle, the effect of gravity on the flip digit mechanism causes the digits and annunciators to stick.

4.3 Connecting Cables

Once the remote display is securely mounted, connect the serial communications cable to the indicator as described in the indicator manual. Last, connect the remote display power cable to the AC power supply.

4.4 Remote Display System Test

When the remote display is powered on, the unit goes through the following system test procedure:

1. All flip digit segments are turned on for 3 seconds (all 8's displayed, decimal point and annunciators set on), then off again. Watch the display to determine whether any flip digit segments or annunciators are stuck on or off.
2. The remote display system test checks the RAM, EEPROM, and clock. If an error exists, the error is displayed.
3. The software version number is shown for 3 seconds and the system begins processing indicator data.
4. If the loop-back system test is enabled (DIP switch 3-7 set on), the system displays LBT OK if the test is wired and working correctly. It will display LBT ER if there is an error. The message is updated continually so troubleshooting can be done while the system is working. When you are finished with the loop-back test, turn the system off, wire the indicator, turn off the DSW3-7, and cycle power on the remote display.

See Section 5.0 on page 14 for more information about error messages and the loop-back test.

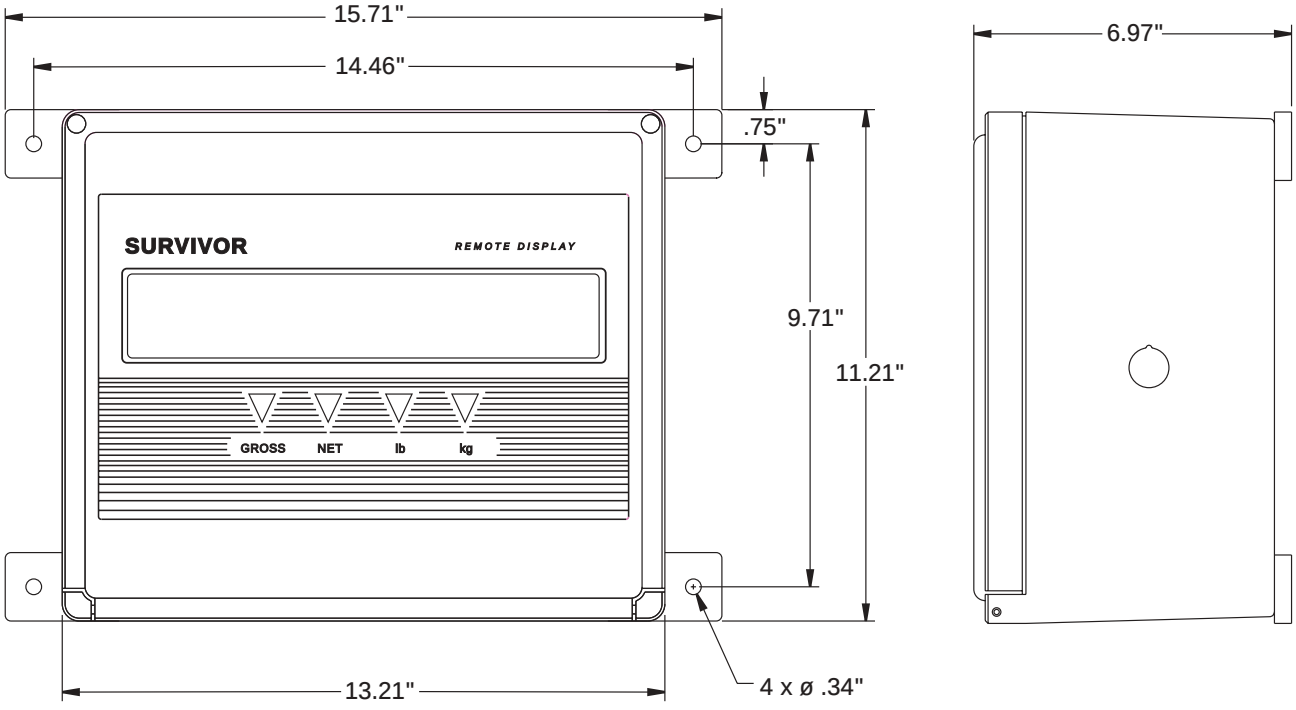


Figure 4-3. Model F15 Enclosure Dimensions

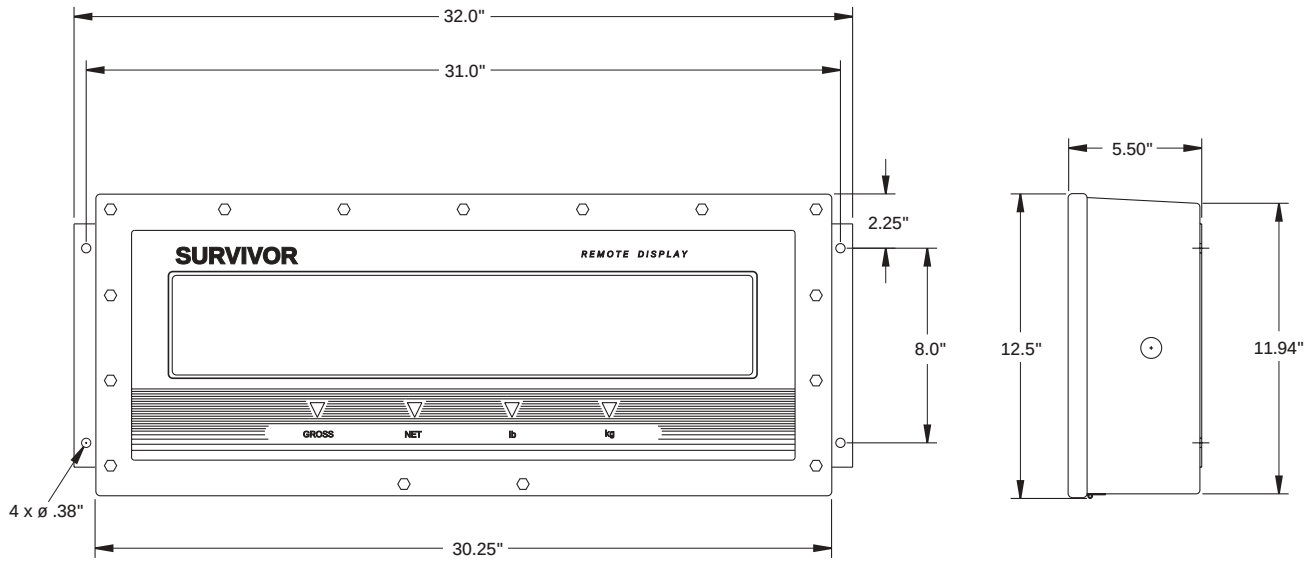


Figure 4-4. Model F40 Enclosure Dimensions

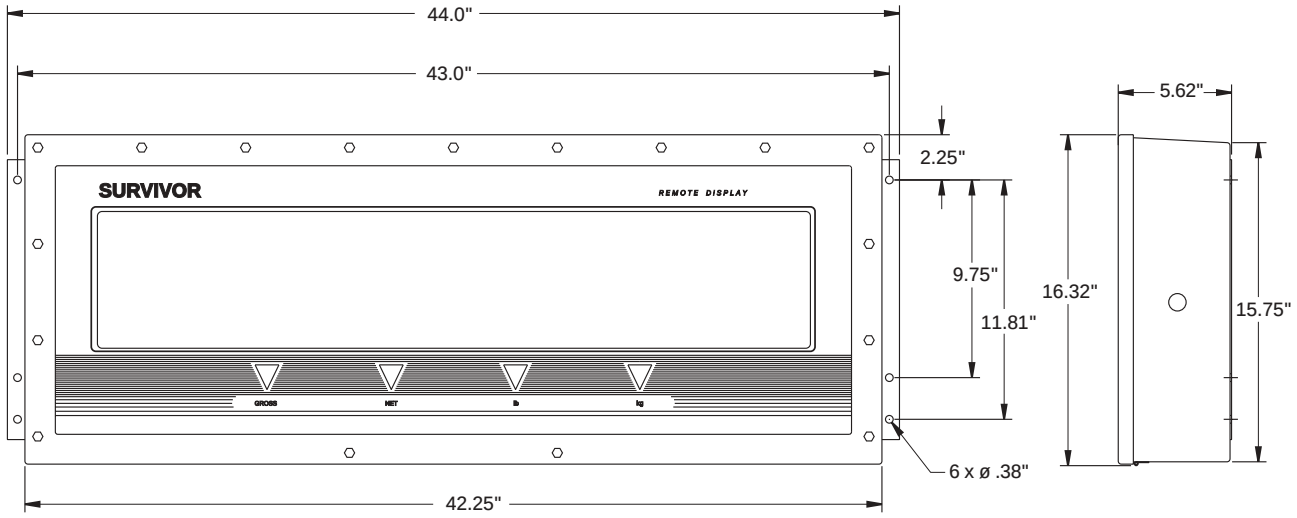


Figure 4-5. Model F60 Enclosure Dimensions

5.0 Troubleshooting and Repair

NOTE: Some of the actual error messages displayed by the F-Series remote displays are cryptic and are represented in the following table as closely as possible with plain text.

5.1 Error Messages

Table 5-1 lists error messages shown by the F-Series remote displays.

Message	Meaning	Cause / Correction
CLK ER	*Clock error*	Clock malfunctioning or not installed. To disable the clock interface, set DSW3 switch 5 off.
DEFnnn	*Indicator code*	During AutoLink learn the indicator detection has failed and nnn is the indicator code for the default indicator as defined by the setting of DSW4.
FMT ER	*Received Data Format Error*	The data received from the indicator either did not contain the expected delimiter character or the record was not the correct length. Possible reasons include incorrect settings of DSW4 for indicator type, DSW1 for parity, data bits or baud rates, or in AutoLink mode, the communications protocol has not been determined.
IIC ER	*IIC bus error*	Error reading/writing to temperature probe or EEPROM. If the temperature probe is not installed, make sure DSW3 switch 3 is off.
IND IV	*Indicator invalid*	The indicator has specified it is in an invalid state.
IND SM	*Setup mode*	Indicator is in setup mode.
INDnnn	*Indicator code*	During AutoLink learn, nnn is the indicator code for the detected indicator data format.
IO ER	*Serial I/O error*	An error has been detected receiving data on the serial port. Possible reasons include incorrect settings of DSW1 for parity, data bits or baud rates, or in AutoLink mode, the communications protocol has not been determined.
LBT ER	*Loopback error*	During operation of the loopback self test, the received data was not the same as the transmitted data.
LBT OK	*Loopback test OK*	The loopback self test was successful.
LFM ER	*Indicator detection failed*	Indicator string unrecognized during AutoLink learn. Make sure indicator is transmitting a valid weight value.
LRN ER	*Baud rate detection failed*	Baud rate not recognized during AutoLink learn. Valid baud rates are 300, 600, 1200, 2400, 4800, 9600, and 19200. Valid parity/data bits are 7 ODD, 7 EVEN, or 8 NONE.
NO SIG	*No serial input signal*	No input data has been detected on the serial input port. Check the connections at the display and at the indicator. Ensure that the indicator is configured for continuous output on the correct port. Make sure jumper JMP1 has been removed if you are using the RS232 interface instead of the 20ma current loop.
PAR ER	*Serial I/O parity error*	A parity error has been detected receiving data on the serial port. Possible reasons include incorrect settings of DSW1 for parity, data bits or baud rates, or in AutoLink mode, the communications protocol has not been determined.
RAM ER	*RAM self test failed*	RAM power up self test failed.
RNG ER	*Range error*	Either the indicator is out of range or the data cannot be displayed in six characters.
ROM ER	*AutoLink data error*	The data used in AutoLink mode is invalid. Make sure the indicator is connected and transmitting a valid weight and press the LEARN button on the bottom of the enclosure to re-learn the data.
UNK FM	*Unknown format*	Either DSW4 is set incorrectly or the unit is in AutoLink mode and the communications protocol has not been determined.
Vn.nnnn	*Software version*	During power up, indicates the installed version of the software.

Table 5-1. Error Messages

5.2 Board Diagrams

Figure 5-1 shows the location of the fuses on the power supply board used by all F-Series models.

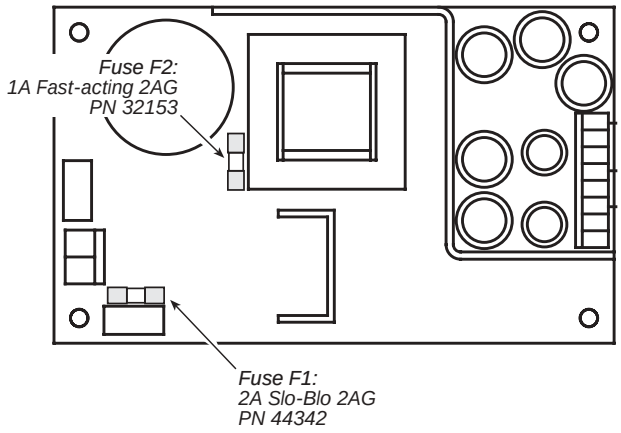


Figure 5-1. F-Series Power Supply Board, PN 43373

Figure 5-2 shows the CPU board used by all F-Series models.

NOTE: Some early production units use CPU board PN 41033. These boards are functionally equivalent to PN 44303.

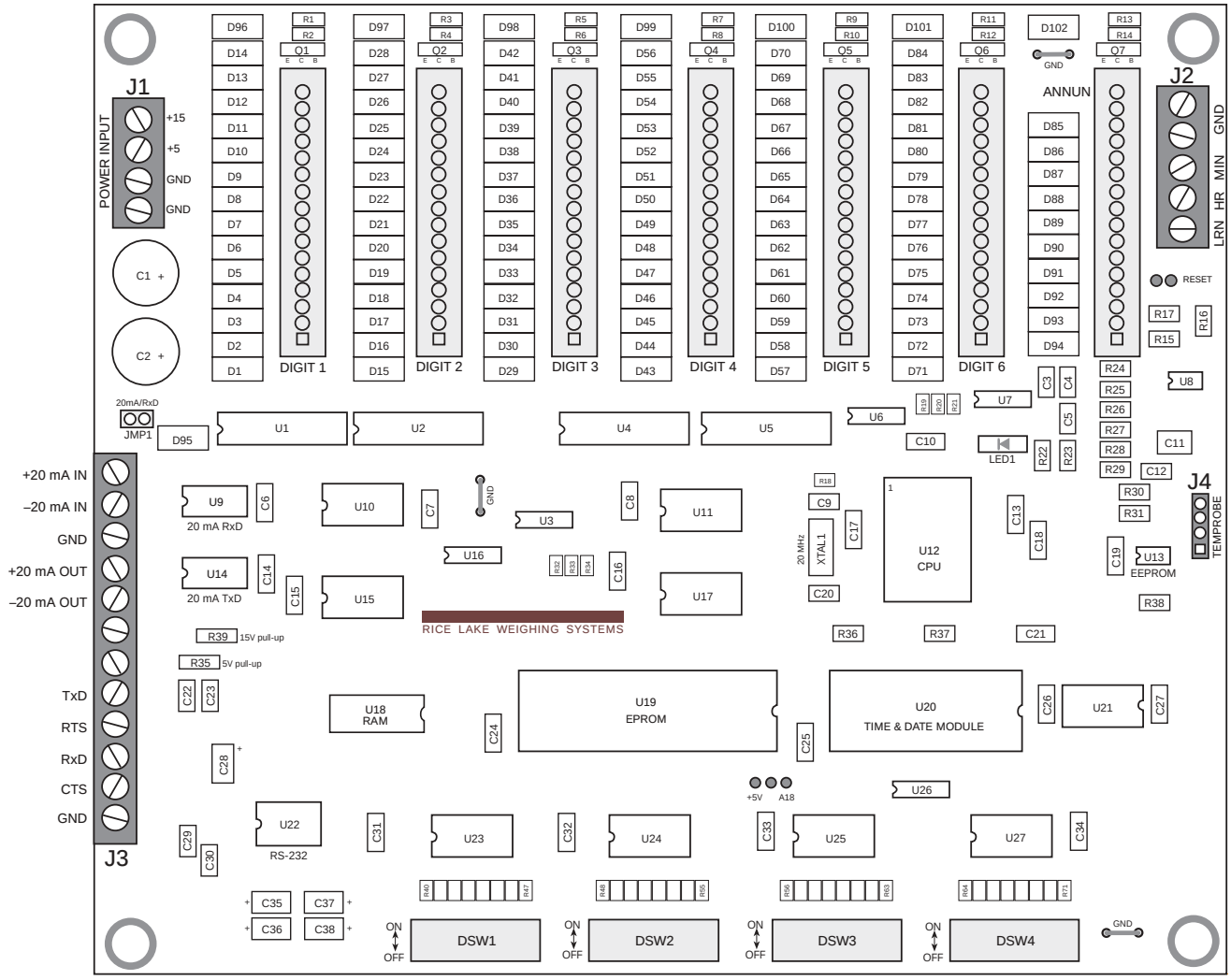


Figure 5-2. F-Series CPU Board, PN 44303

5.3 Loop-Back Test

The F-Series remote displays provide a loop-back test for use in diagnosing serial communications errors. When enabled, the loop-back test checks the function of the remote display serial port by sending and receiving data to itself.

To perform the test, do the following:

1. Disconnect power to the remote display.
2. Open the remote display enclosure cover and the flip digit mounting panel to access the serial communications terminal block.
3. Disconnect any indicator wiring.
4. Connect jumpers to the terminal block as shown in Figure 5-3. Wire the terminal block only for the type of communications you are using (RS-232 or 20 mA), not both.

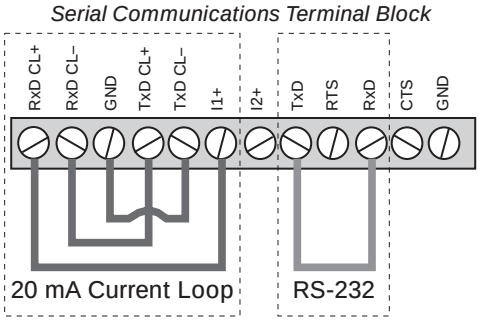


Figure 5-3. J-3: Terminal Block Connections for Loop-Back Self-Test

5. Set DIP switch DSW3-7 on to enable the loop-back test.
6. Return the flip digit mounting panel to operating position, close the cover, and set the remote display upright.
7. Connect power to the remote display. The loop-back test runs as part of the power-on system test:
   - If all portions of the power-on self-test are good, the message LBT OK is shown.
   - If the loop-back test fails, the message LBT ER is shown.

If the loop-back test fails, the serial port is not functional. Be sure to check the following when troubleshooting the serial port:

- For 20 mA communications, ensure that 20 mA chips are installed correctly and the jumper at JMP1 is on. See Figure 2-1 on page 2 for component locations.
- For RS-232 communications, ensure that jumper JMP1 is off.
- Check continuity of wires between connector J3 on the CPU board and the serial communications terminal block.

5.4 Replacement Parts

Table 5-2 lists selected replacement parts for the F-Series remote displays. Part numbers for F-Series optional features are listed in Section 1.0.

NOTE: Some early production units use CPU board PN 41033. These boards are compatible with and, if necessary, should be replaced with the listed CPU board, PN 44303.

Description	Model	PN
CPU board	All	44303
EPROM	All	43619
Power supply board	All	43373
Power cord assembly (115 VAC)	F15/F40	15436
	F60	44006
Auto-link switch assembly	F15	44310
	F40/F60	42646
Auto-link switch cover	All	15895
Breather vent	F40/F60	42865
Display board assembly (digits and annunciators)	F15	42370
Digit (4”) assembly (single digit)	F40	21087
Annunciators/decimal point board	F40	41238
Digit (6”) assembly (single digit)	F60	21088
Annunciator board (single annunciator)	F60	44004
Decimal point board	F60	41327
Cover gasket	F40	45258
	F60	45448
Cover sealing washers	F40/F60	44676
Overlay	F15	42935
	F40	40878
	F60	41361
Ballast	F15	44309
	F40/F60	43537
Bulb Flourescent	F15	43606
	F40	43535
	F60	43536

Table 5-2. Selected Replacement Parts

6.0 Specifications

Power

Line Voltages 115 or 230 VAC (+10% / –15%)
Frequency 50 or 60 Hz
Power Consumption (115 VAC models)
Base model (no options installed):
Model F15: 18 W / 150 mA
Model F40: 52 W / 450 mA
Model F60: 75 W / 650 mA
With backlighting option installed:
Model F15: 52 W / 450 mA
Model F40: 75 W / 650 mA
Model F60: 115 W / 1 A

Digital Specifications

Microcomputer AMD 80C188ES microcontroller

Serial Communications

Type 20 mA current loop (active or passive) and RS-232 standard
Data Stream 7 or 8 data bits; 1 start bit; 1 or 2 stop bits; even, odd, or no parity
Data Rate 19200, 9600, 4800, 2400, 1200, 600, 300 bps.

Display

Digits 6, with fixed decimal between digits 3 and 4
Annunciators Gross, Net, Lb, Kg

Optional Features

Time (12/24 hour selectable)
Temperature (displays °C and °F)
Backlighting
Visor (F40 and F60 only)

Environmental

Operating Temperature -10°C to +40°C
Storage Temperature -10°C to +50°C
Humidity Can be used in washdown environment

Enclosure

All-steel NEMA 4 (Models F40 and F60) or FRP (F15)
Overall Dimensions
Model F15 15.71" W x 11.21" H x 6.97" D
39.90 cm W x 28.47 cm H x 17.70 cm D
Model F40 32.0" W x 12.5” H x 5.50" D
81.28 cm W x 31.75 cm H x 13.97 cm D
Model F60 44.0" W x 16.32" H x 5.62" D
111.76 cm W x 41.45 cm H x 14.27 cm D

Weight

Model F15 14.5 lb (6.6 Kg)
Model F40 44.1 lb (20.0 Kg)
Model F60 69.4 lb (31.5 Kg)

F-Series Remote Displays 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 one year.

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.

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

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