

SURVIVOR[®] IQ

F-Series

Flip Digit Remote Displays

Models F15, F40, and F60

Version 1.1

Installation Manual



RICE LAKE WEIGHING SYSTEMS
Industrial Solutions on a Global Scale[®]



Contents

| | |
|---|-----------|
| About This Manual | 1 |
| 1.0 Introduction..... | 1 |
| 2.0 Pre-Installation Setup..... | 2 |
| 2.1 Indicator Connections..... | 2 |
| 2.1.1 RS-232..... | 2 |
| 2.1.2 20 mA Current Loop..... | 2 |
| 3.0 Configuration..... | 4 |
| 3.1 Indicator Configuration..... | 4 |
| 3.2 DIP Switch Configuration | 4 |
| 3.2.1 Serial Communications | 4 |
| 3.2.2 Primary and Secondary Units | 5 |
| 3.2.3 Display Type and Model | 5 |
| 3.2.4 Learn Mode (AutoLink)..... | 5 |
| 3.2.5 Display Characteristics | 6 |
| 3.2.6 Time and Temperature Options | 6 |
| 3.2.7 Suppress Leading Zeroes..... | 7 |
| 3.2.8 Loop-Back Self-Test..... | 7 |
| 3.2.9 CPU Board Part Number..... | 7 |
| 3.2.10 Indicator Type/Serial Format..... | 7 |
| 3.3 Setting the Clock (for Units with the Time Option Installed)..... | 7 |
| 4.0 On-Site Installation | 9 |
| 4.1 Sealing the Enclosure | 9 |
| 4.2 Mounting the Enclosure | 10 |
| 4.3 Connecting Cables | 10 |
| 4.4 Remote Display Self-Test..... | 10 |
| 5.0 Troubleshooting and Repair..... | 12 |
| 5.1 Error Messages | 12 |
| 5.2 Board Diagrams | 13 |
| 5.3 Loop-Back Self-Test..... | 14 |
| 5.4 Replacement Parts | 14 |
| 6.0 Specifications | 15 |
| F-Series Remote Displays Limited Warranty..... | 16 |

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, on-site installation.

This manual applies to units using Version 1.1 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 AutoLink™ learn mode 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 increased display visibility, and visor options for the F40 and F60 models.

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, then 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, then 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 self-test can be used to test the function of the remote display serial port. See Section 5.3 on page 14 for information about the loop-back self-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 2-4 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.

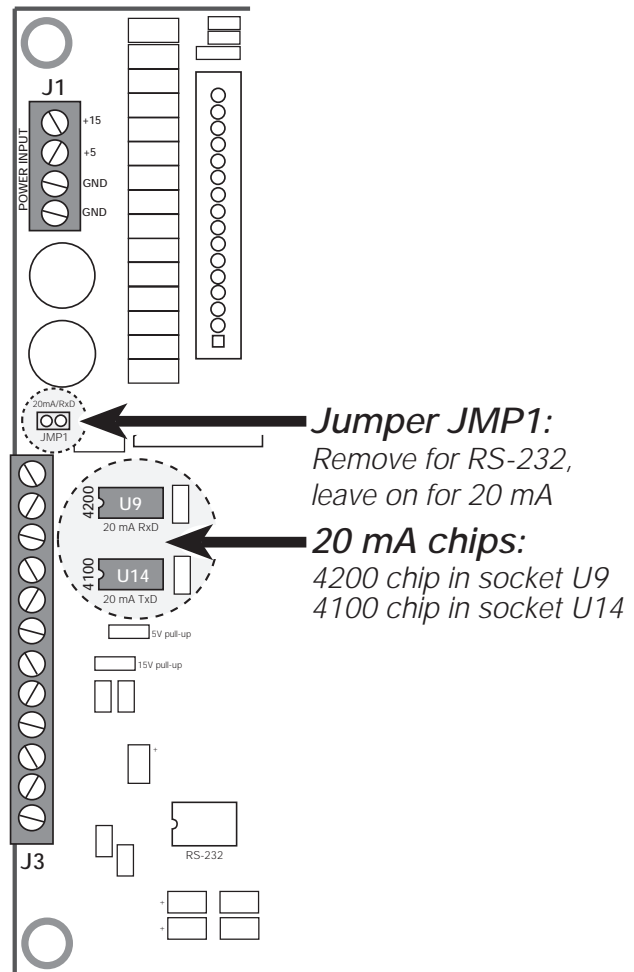


Figure 2-1. Locations of Jumper JMP1 and 20 mA Chips on Left Edge of CPU Board

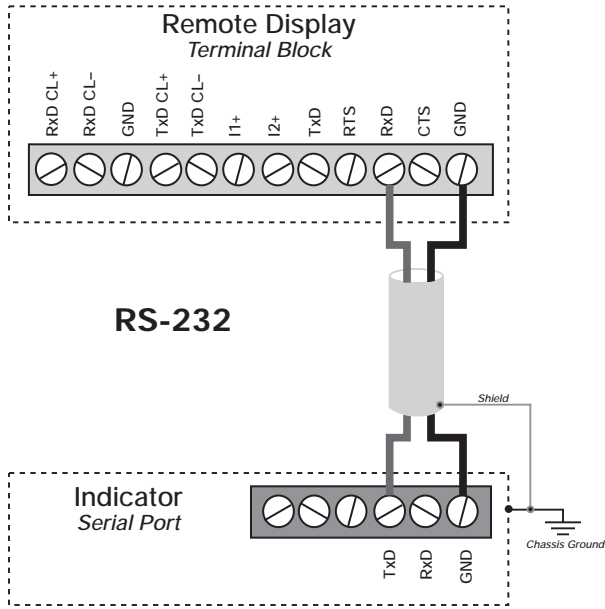


Figure 2-2. RS-232 Indicator Connections to Remote Display Terminal Block

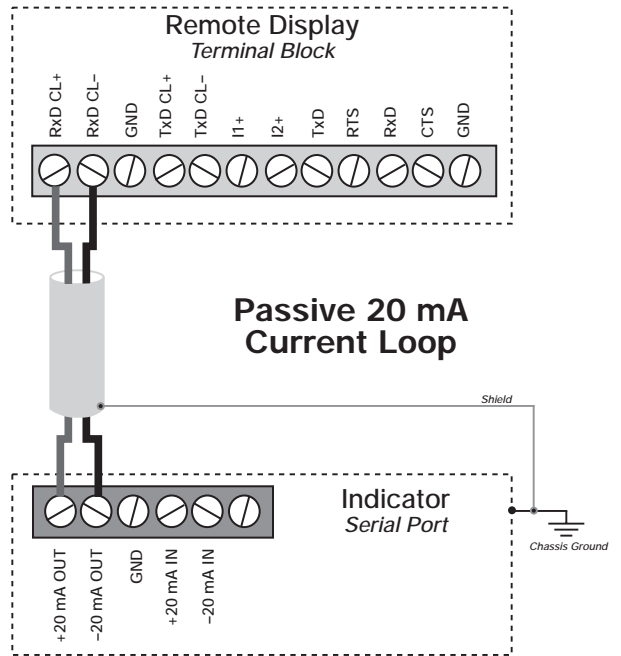


Figure 2-3. 20 mA Current Loop Connections: Passive Remote Display, Active Indicator

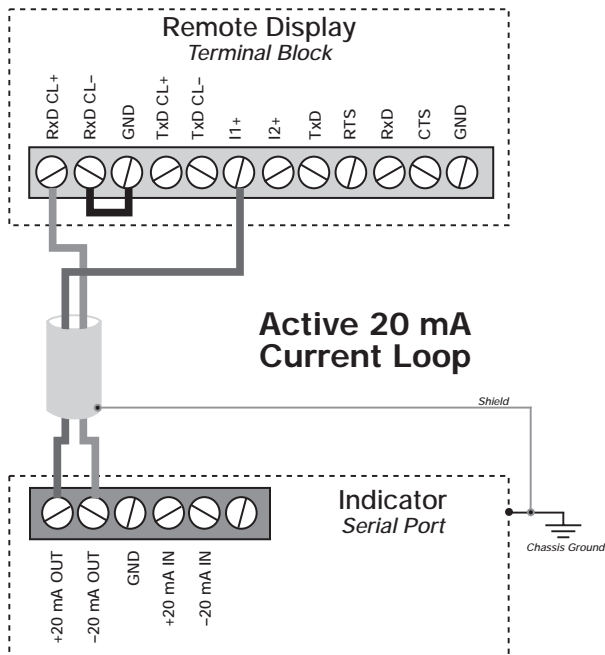


Figure 2-4. 20 mA Current Loop Connections: Active Remote Display, Passive Indicator

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.

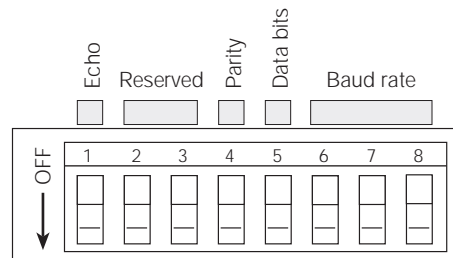
The following sections include figures and tables describing each of the DIP switch banks.

3.2.1 Serial Communications

DSW1 switches set the serial communications configuration for the remote display.

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.

The parity, data bits, and baud rate settings for the remote display must match those configured for the indicator *unless learn mode (AutoLink) is used* (see Section 3.2.4 on page 5). If learn mode is enabled, switches DSW1-4 through DSW1-8 are ignored.



DSW1

Table 3-1. DSW1 Switch Definitions

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

3.2.2 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.

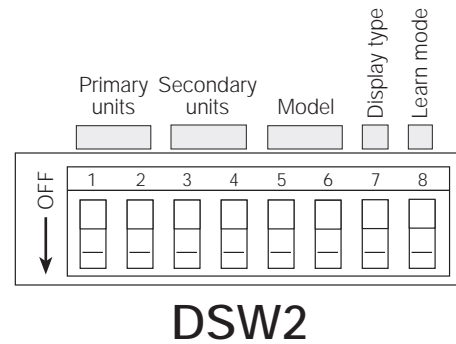


Figure 3-1. DSW2 Switch Definitions

| 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 | | |
| Learn mode (AutoLink) enable | Off | | | | | | | | OFF | |
| | On | | | | | | | | ON | |

Table 3-3. DSW2 Switch Settings

3.2.3 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.

3.2.4 Learn Mode (AutoLink)

The F-Series remote displays incorporate a software feature called *AutoLink*. The AutoLink learn mode function examines the serial data stream sent from the attached indicator and attempts to determine the data structure and format used by the indicator.

NOTE: If learn mode is enabled, switches DSW1-4 through DSW1-8 and all DSW4 switch settings are ignored.

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 self-test is complete, press the LEARN MODE switch on the underside of the display enclosure. (See page 10 for information about the self-test procedure.)
4. The display shows the message **LOAD** while it examines the serial data stream sent from the attached indicator. The **LOAD** message is shifted off the display as the data stream format is learned.
5. Next, the baud rate is shown in the format **b xxx**, where **xxx** is the learned baud rate with

the zeroes removed. For example, a baud rate of 9600 is shown as **b 96**.

- Once the display determines the data format being used, the message **LOADed** is shown.

If the display is unable to determine the data format used, an error message is shown. See Section 5.1 on page 12 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 **LEARN MODE** switch only to learn a *new* indicator format.
- Learn mode may be unable to read the serial strings sent by some indicators or particular indicator configurations. If learn mode is unable to interpret the serial string, set switch DSW2-8 off and use Table 3-5 on page 8 to set DSW4 for the attached indicator.

3.2.5 Display Characteristics

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

Set switch DSW3-2 on to enable display of input error messages. Section 5.1 on page 12 lists the F-Series input and self-test error messages.

3.2.6 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.

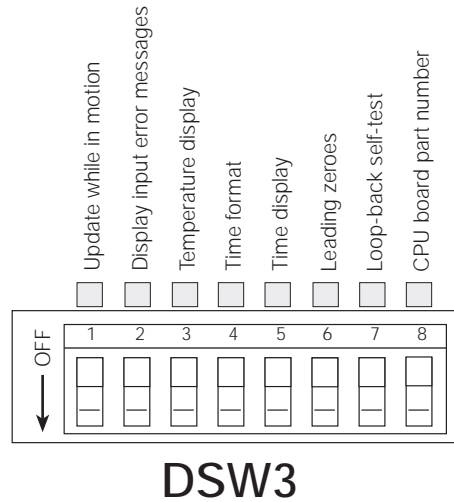


Figure 3-2. DSW3 Switch Definitions

| To Configure... | DSW3 | | | | | | | | |
|------------------------------|---------|-----|-----|-----|-----|-----|-----|-----|-----|
| Parameter | Value | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Update while in motion | No | OFF | | | | | | | |
| | Yes | ON | | | | | | | |
| Display input error messages | 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 | |
| CPU board part number | 44303 | | | | | | | | OFF |
| | 41033 | | | | | | | | ON |

Table 3-4. DSW3 Switch Settings

3.2.7 Suppress Leading Zeroes

Switch DSW3-6 enables suppression of leading zeroes in weight values of less than 1. If DSW3-6 is set on, weight values of less than 1 are shown with only one zero to the left of the decimal point. For example, a weight value received as 000.432 is shown as 0.432.

If DSW3-6 is set off, the remote display shows the zero format as sent by the indicator.

3.2.8 Loop-Back Self-Test

Switch DSW3-7 enables the loop-back self-test used to check the remote display serial port. For normal operation, set this switch off. See Section 5.3 on page 14 for information about using the loop-back self-test.

3.2.9 CPU Board Part Number

DSW3-8 specifies the part number of the CPU board installed in the remote display. Some early production units use CPU board PN 41033. The CPU board part number is printed on the CPU board, slightly above and to the right of DIP switch DSW4.

3.2.10 Indicator Type/Serial Format

Table 3-5 on page 8 shows the DSW4 switches used to identify the serial format sent by the attached indicator *unless learn mode is used* (see Section 3.2.4 on page 5). If learn mode is enabled, the DSW4 switch settings are ignored.

NOTE: Learn mode may be unable to read the serial strings sent by some indicators or particular indicator configurations. If learn mode is unable to interpret the serial string, set switch DSW2-8 off and use Table 3-5 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.

| Indicator Type / Serial Format | DSW4 | | | | | | | |
|--|------|-----|-----|-----|-----|-----|----|----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Accu-weigh SEP12K | OFF | OFF | ON | ON | ON | ON | ON | ON |
| Analogic 5316 (HB44) | ON | ON | OFF | ON | ON | ON | ON | ON |
| AnD AD4321, AD4323 | OFF | ON | OFF | ON | ON | ON | ON | ON |
| Cardinal 708 scoreboard format | OFF | OFF | OFF | OFF | OFF | ON | ON | ON |
| Cardinal 738 | OFF | ON | ON | ON | ON | ON | ON | ON |
| Cardinal 738 scoreboard format | ON | ON | ON | ON | ON | OFF | ON | ON |
| Cardinal 748 | OFF | ON | ON | OFF | ON | ON | ON | ON |
| Cardinal 778 | ON | OFF | ON | ON | ON | OFF | ON | ON |
| Condec UMC1000, UMC2000 | ON | OFF | OFF | ON | ON | ON | ON | ON |
| Doran 7000 | OFF | OFF | OFF | ON | ON | ON | ON | ON |
| Fairbanks 90-160 Series | ON | ON | ON | OFF | ON | ON | ON | ON |
| Flexweigh DWM IV | OFF | OFF | ON | OFF | ON | ON | ON | ON |
| General Freedom I, Freedom II | ON | ON | OFF | OFF | ON | ON | ON | ON |
| GSE 550 default format | OFF | OFF | OFF | ON | ON | OFF | ON | ON |
| GSE 550 displayed data format | OFF | OFF | ON | ON | ON | OFF | ON | ON |
| Hardy HI2151 WC | OFF | ON | OFF | OFF | ON | ON | ON | ON |
| IDS | ON | OFF | OFF | OFF | ON | ON | ON | ON |
| Ishida (DAP-01 format) | ON | OFF | OFF | OFF | OFF | ON | ON | ON |
| Kubota KA-10 | OFF | OFF | OFF | OFF | ON | ON | ON | ON |
| Mettler-Toledo, Fairbanks 9201 | ON | OFF | ON | OFF | ON | ON | ON | ON |
| Morrison T3500 | ON | ON | ON | ON | OFF | ON | ON | ON |
| MSI TransWeigh 6260 | OFF | ON | ON | ON | OFF | ON | ON | ON |
| Ohaus 1-10, 1-20W | ON | OFF | ON | ON | OFF | ON | ON | ON |
| Ohaus 1-5S | OFF | OFF | ON | ON | OFF | ON | ON | ON |
| Ohaus 1150 | ON | ON | OFF | ON | OFF | ON | ON | ON |
| Pennsylvania 3100 | OFF | ON | OFF | ON | OFF | ON | ON | ON |
| Pennsylvania 5600 | ON | OFF | OFF | ON | OFF | ON | ON | ON |
| Pyrel HR500K | OFF | OFF | OFF | ON | OFF | ON | ON | ON |
| Rice Lake Weighing Systems stream format | ON | ON | ON | ON | ON | ON | ON | ON |
| Streeter Amet 9000 | OFF | ON | ON | OFF | OFF | ON | ON | ON |
| Transcell (RL-100, TI-500) | ON | OFF | ON | OFF | OFF | ON | ON | ON |
| Weightronix WI-110, WI-120 | ON | OFF | ON | ON | ON | ON | ON | ON |
| Weightronix WI-125 | OFF | OFF | ON | OFF | OFF | ON | ON | ON |
| Weightronix WI-127 (default layout 6) | ON | ON | OFF | OFF | OFF | ON | ON | ON |
| Western DF1000 | OFF | ON | OFF | OFF | OFF | ON | ON | ON |

Table 3-5. DSW4 Switch Settings

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.

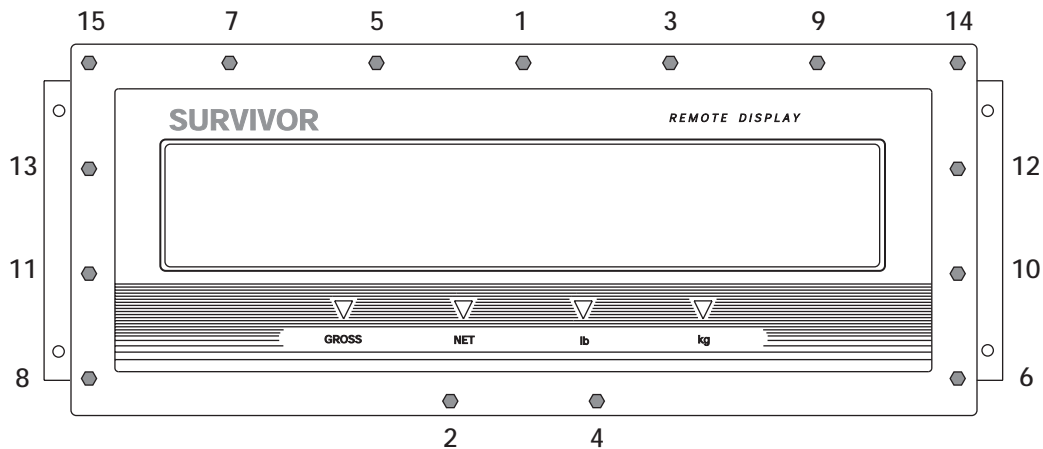


Figure 4-1. Torquing Pattern for Model F40

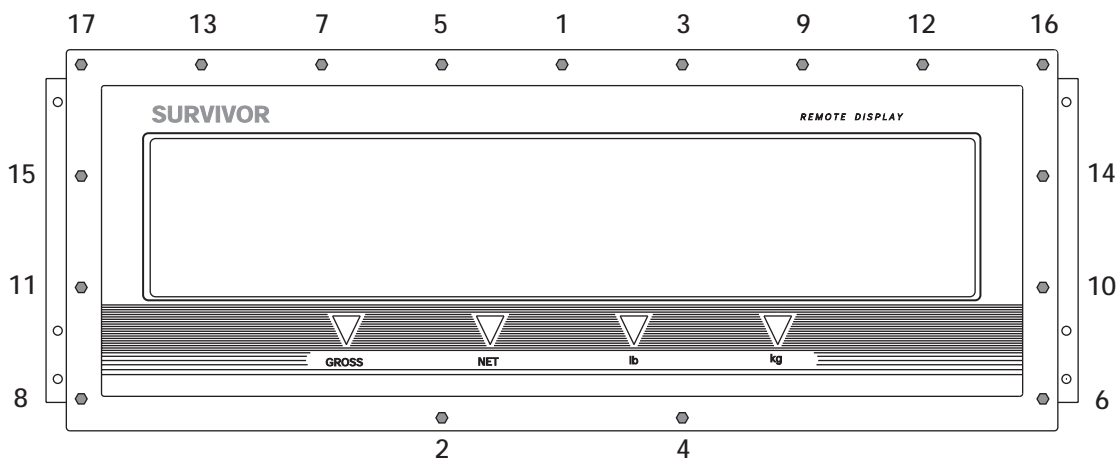


Figure 4-2. Torquing Pattern for Model F60

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 Self-Test

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

1. The remote display self-test checks the RAM and EEPROM. If an error exists, the error is shown at the end of the power-on sequence.
2. All flip digit segments are turned off, then on (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.
3. If no errors are found, the remote display shows the message **PASS**. If errors are found during the RAM and EEPROM tests, the display shows the message **FAIL R** (RAM error) or **FAIL E** (bad EEPROM or bad data in EEPROM).

If the loop-back self-test is enabled (DIP switch 3-7 set on) and the test fails, the message **FAIL S** is shown, followed by one or more of the messages listed above.

4. After showing the self-test status messages, all segments are turned off once more, then the software version number is shown.

See Section 5.0 on page 12 for more information about error messages and the loop-back self-test.

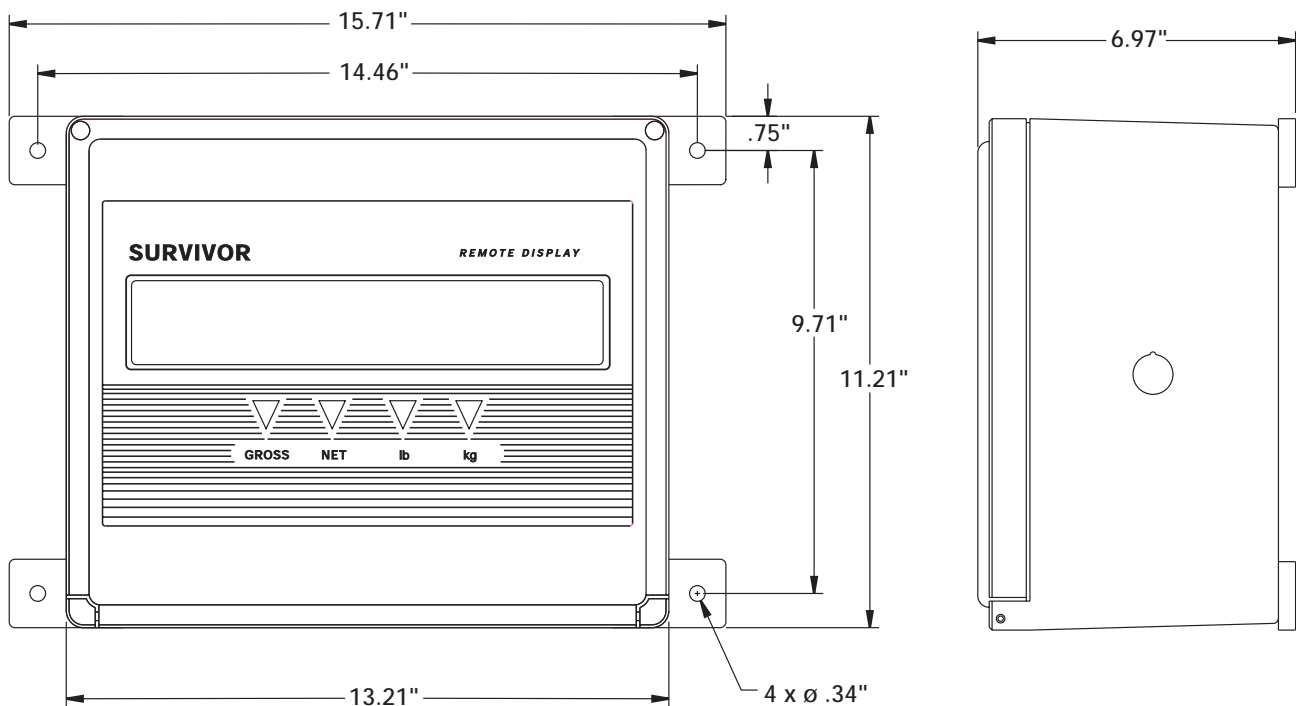


Figure 4-3. Model F15 Enclosure Dimensions

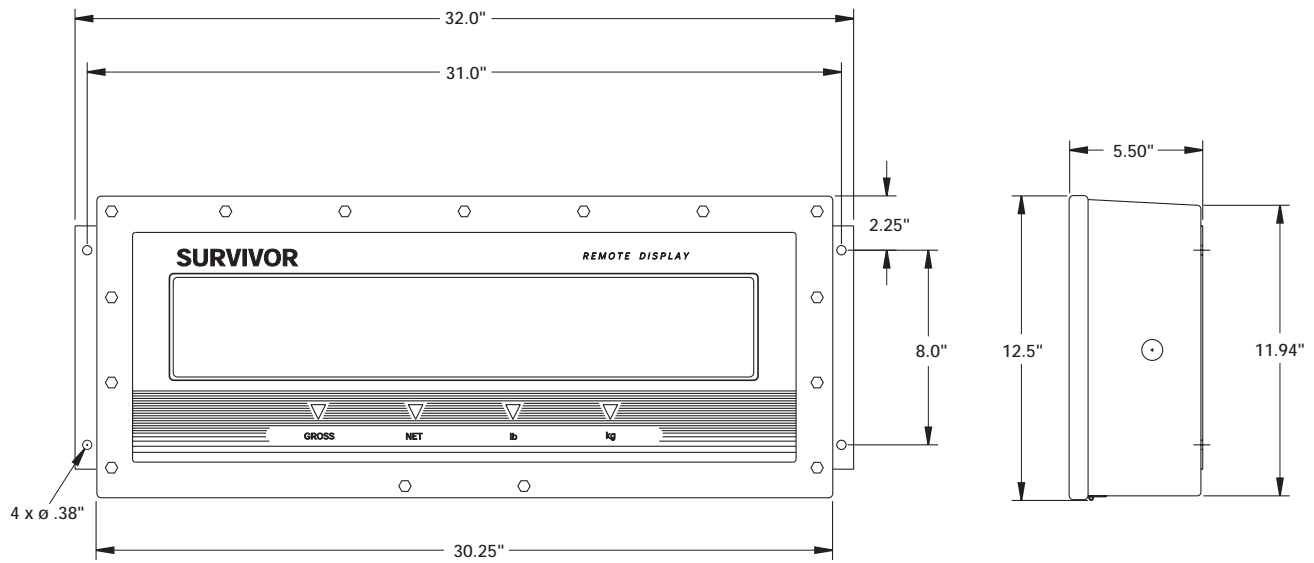


Figure 4-4. Model F40 Enclosure Dimensions

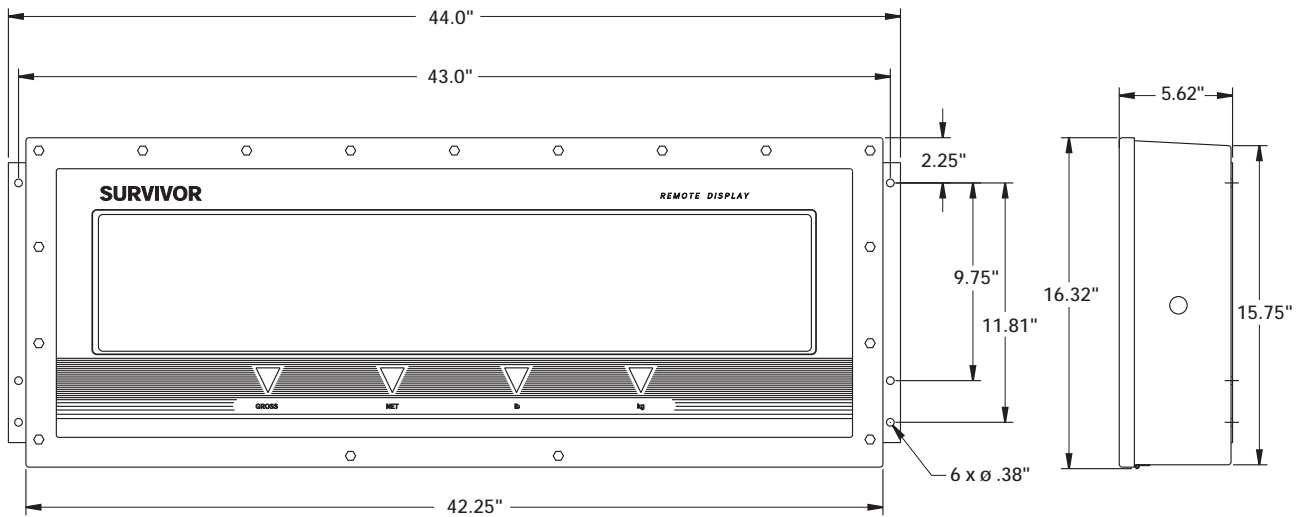


Figure 4-5. Model F60 Enclosure Dimensions

5.0 Troubleshooting and Repair

5.1 Error Messages

Table 5-1 lists error messages shown by the F-Series remote displays. The FAIL x messages indicate errors encountered during the power-on self-test sequence; input error messages are shown only if DIP switch DSW3-2 is set on.

| Message | Meaning | Cause / Correction |
|---------|--|--|
| CL r F | <i>Clock RAM failure</i> | Clock chip malfunctioning or not installed. |
| CLO St | <i>Clock stopped</i> | Clock chip malfunctioning or not installed. |
| CPU | <i>Controller error</i> | Hardware error. |
| Er Ft | <i>Error in serial string format</i> | Error in serial string format received (more than 100 characters received without a termination character). |
| Er tAr | <i>Error in tare value</i> | Positive, non-NTEP tare value received. Check scale platform. |
| FAIL E | <i>EEPROM failed self-test</i> | EEPROM portion of power-on self-test failed. |
| FAIL R | <i>RAM failed self-test</i> | RAM portion of power-on self-test failed. |
| FAIL S | <i>Loop-back self-test failed</i> | Serial port error (shown only if DSW3-7 is set on). |
| FE dIlg | <i>Too few digits in serial string</i> | Error in serial string format received. |
| IIC Pr | <i>I²C bus error</i> | EEPROM or temperature probe error. Set DSW3-3 off if temperature probe not installed. |
| Inv gn | <i>Invalid gross/net format</i> | Error in serial string format received. Remote display must be powered off, then on again to continue. |
| Inv S | <i>Invalid DIP switch setting</i> | Check switch settings at DSW4 or enable learn mode (set DSW2-8 on). Remote display must be powered off, then on again to continue. |
| nO bAU | <i>Unknown baud rate</i> | Unable to determine indicator baud rate. |
| nO CLO | <i>Clock error</i> | Clock chip malfunctioning or not installed. |
| nO Cr | <i>No <C/R> or <ETX> character</i> | No termination character received in serial string. |
| nO Lbd | <i>Unknown baud rate</i> | Unable to determine indicator baud rate (learn mode only). |
| nO rdr | <i>Error reading serial format</i> | Error in serial string format received. |
| nO SEr | <i>No serial communications</i> | Check serial connection from indicator to remote display (J10). Ensure indicator is configured for continuous (streaming) output. |
| PASS | <i>Self-test sequence passed OK</i> | No errors on power-on self-test for RAM and EEPROM functions. |
| rEv xxx | <i>Software revision number</i> | Informational message at power-on, shows software revision number (xxx). |
| t COLd | <i>Too cold!</i> | Sensed temperature is less than -99° (C or F). |
| Un Str | <i>Unknown serial format</i> | Unable to determine indicator serial string format. |
| Un Ln2 | <i>Unknown serial format</i> | Unable to determine indicator serial string format (learn mode only). |

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.

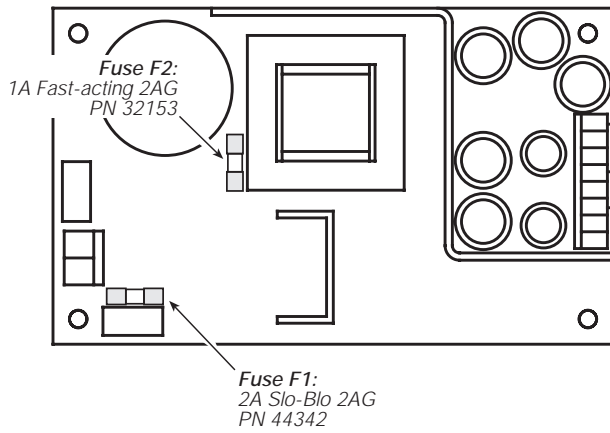


Figure 5-1. F-Series Power Supply Board, PN 43373

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.

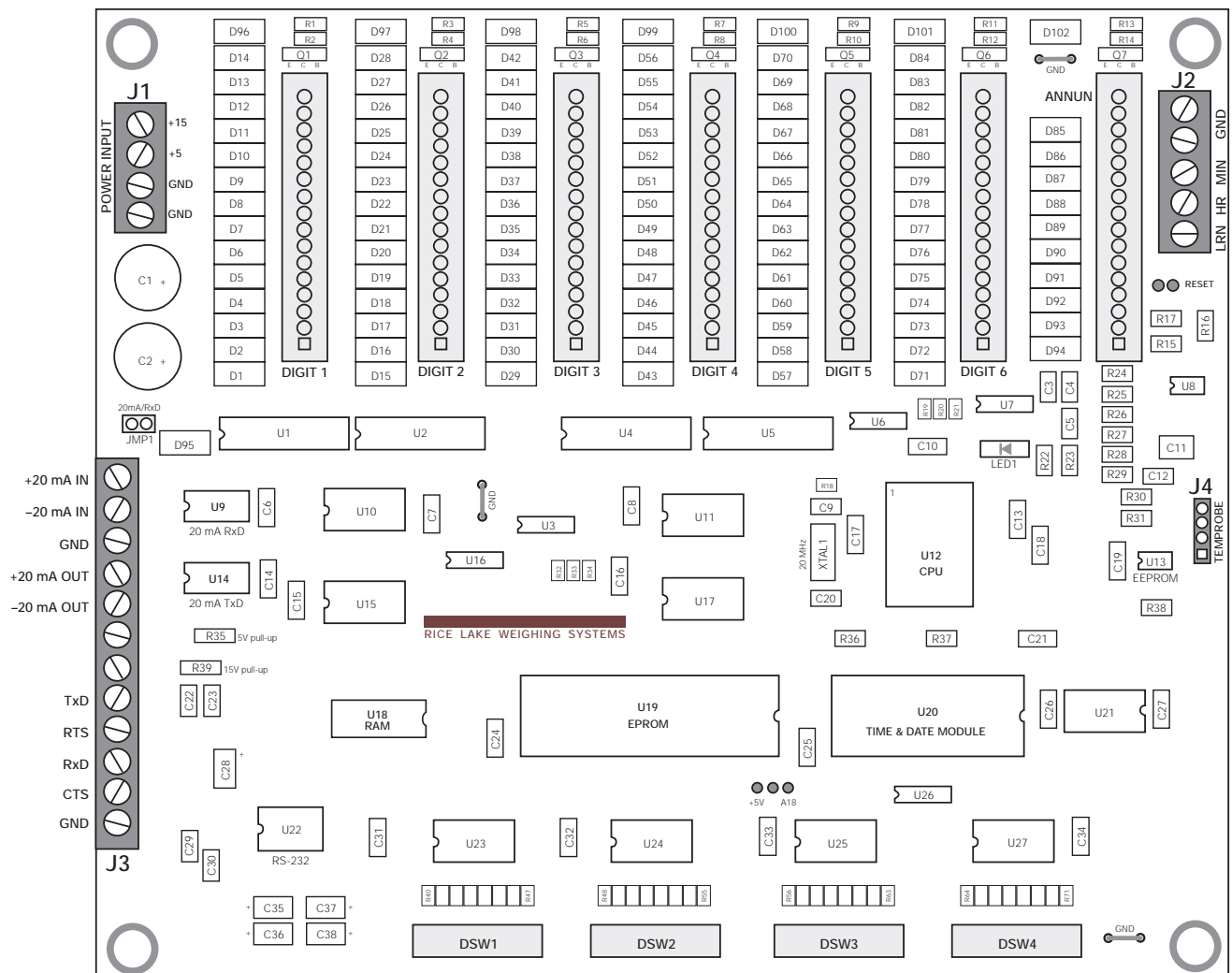


Figure 5-2. F-Series CPU Board, PN 44303

5.3 Loop-Back Self-Test

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

To perform the loop-back self-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.

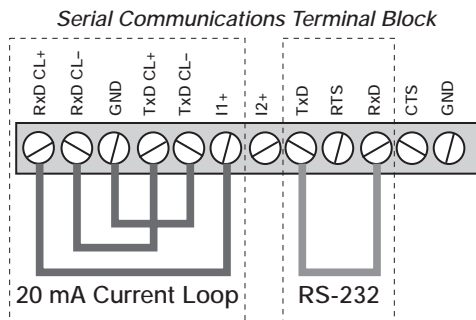


Figure 5-3. Terminal Block Connections for Loop-Back Self-Test

5. Set DIP switch DSW3-7 on to enable the loop-back self-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 self-test runs as part of the power-on self-test:
 - If all portions of the power-on self-test are good, the message **PASS** is shown.
 - If the loop-back self-test fails, the message **FAIL S** is shown, followed by one or more other messages. If the loop-back self-test fails but all other tests are good, the display will show the message **FAIL S**, then **PASS**.

If the loop-back self-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 |
| Learn mode switch assembly | F15 | 44310 |
| | F40/F60 | 42646 |
| Learn mode 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 |

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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