



CARDINAL.®



RD2
Remote Display
Installation and Technical Manual

TABLE OF CONTENTS

INTRODUCTION	Page 1
SPECIFICATIONS	Page 1
SPECIAL FEATURES	Page 1
INDICATOR COMPATIBILITY	Page 1
AUTO-FORMAT FEATURE	Page 2
MULTIPLE DISPLAYS	Page 2
SITE PREPARATION	Page 2
INSTALLATION	Page 3
Unpacking	Page 3
Mounting	Page 3
SERIAL CABLE INSTALLATION	Page 4
RS-232	Page 4
20 mA Current Loop	Page 4
Current Cardinal Indicators	Page 5
RS-232 Only Connections	Page 5
20 mA Current Loop Connections	Page 5
Retired Cardinal Indicators	Page 7
RS-232 Only Connections	Page 7
20 mA Current Loop Connections	Page 7
DISPLAY BOARD	Page 9
Switches	Page 9
Connectors	Page 9
Jumpers	Page 9
SETUP AND CONFIGURATION	Page 10
DISPLAY BRIGHTNESS	Page 11
RE-INSTALLING THE REAR PANEL	Page 11
ANNUNICATOR DISPLAY	Page 12
SINGLE AND MULTIPLE DISPLAY CONNECTIONS	Page 13
ERROR AND STATUS DISPLAYS	Page 14
PART IDENTIFICATION	Page 15

SERIAL NUMBER _____
DATE OF PURCHASE _____
PURCHASED FROM _____

RETAIN THIS INFORMATION FOR FUTURE USE

PRECAUTIONS

Before using this instrument, read this manual and pay special attention to all "WARNING" symbols:



IMPORTANT



ELECTRICAL
WARNING



STATIC
SENSITVE

STATIC ELECTRICITY PRECAUTION



CAUTION! This device contains static-sensitive circuit cards and components. Improper handling of these devices or printed circuit cards can result in damage to or destruction of the component or card. Such actual and/or consequential damage **is not** covered under warranty and is the responsibility of the device owner. Electronic components must be handled only by qualified electronic technicians who follow the guidelines listed below.



WARNING! ALWAYS use a properly grounded wrist strap when handling, removing, or installing electronic circuit cards or components. Make certain that the wrist strap ground lead is securely attached to an adequate ground. If you are uncertain of the quality of the ground, you should consult a licensed electrician.



ALWAYS handle printed circuit card assemblies by the outermost edges. **NEVER** touch the components, component leads, or connectors. **ALWAYS** observe warning labels on static protective bags and packaging and never remove the card or component from the packaging until ready for use. **ALWAYS** store and transport electronic printed circuit cards and components in anti-static protective bags or packaging.

FCC COMPLIANCE STATEMENT

This equipment generates, uses, and can radiate radio frequency, and if not installed and used in accordance with the instruction manual, it may cause interference to radio communications. It has been designed within limits for a Class A computing device pursuant to Subpart J of Part 15 of the FCC rules to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area may cause interference, in which case the user will be responsible for taking whatever measures are necessary to correct the interference.

The booklet *How to Identify and Resolve Radio-TV Interference Problems* (Second Edition, September 1982), prepared by the Federal Communications Commission, may be helpful. It can be ordered from the U.S. Government Publishing Office, Superintendent of Documents, P.O. Box 37082, Washington, DC 20013-7082. The stock number is 004-000-00345-4.

COPYRIGHT

All rights reserved. Reproduction or use, without expressed written permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein.

DISCLAIMER

While every precaution has been taken in the preparation of this manual, the Seller assumes no responsibility for errors or omissions. Neither is any liability assumed for damages resulting from the use of the information contained herein. All instructions and diagrams have been checked for accuracy and ease of application; however, success and safety in working with tools depend to a great extent upon the individual's accuracy, skill, and caution. For this reason, the Seller is not able to guarantee the result of any procedure contained herein. Nor can they assume responsibility for any damage to property or injury to persons occasioned from the procedures. Persons engaging the procedures do so entirely at their own risk.

INTRODUCTION

Thank you for your purchase of our Cardinal RD2 Remote Display. It was built with Cardinal quality and reliability at our factory in Webb City, Missouri. This manual will guide you through the installation and operation of your display. Please read it thoroughly before attempting to install your display. Also, make certain that you pay attention to the warnings that appear in this manual. Failure to read and follow these instructions and warnings may result in damage to the display and/or bodily injury. Please keep this manual available for future reference.

SPECIFICATIONS

Character Height:	2.25 inch (57 mm)
Viewing Range:	150 Feet
Viewing Angle:	Viewable in direct sunlight with an angle of +/- 70 degrees
Number of Characters:	Six-digit, seven-segment, 2.5" high (display) Three-digit, sixteen-segment, 0.8" high (annunciators)
Display Type:	Programmable High Intensity Red LED
Annunciators:	lb, kg, T, t, G, N
Enclosure Type:	Stainless Steel
Dimensions:	16.4" W x 3.4" D x 7.0" H (417 mm x 86 mm x 178 mm)
Weight:	16 lbs / 7.3 kg
Data Input:	RS-232 and 20 mA Current Loop
Power Requirements:	94 to 264 VAC, 47/63 Hz Universal Input
Power Fuse:	2A (located on power supply)
Operating Temperature:	-10 to 120 °F (-23 to 49 °C)

SPECIAL FEATURES

- Auto-format feature (automatically selects input protocol).
- Auto-baud detection.
- Alpha descriptors for units (no more stats lamps required).
- 10 Levels of brightness.

INDICATOR COMPATIBILITY

Utilizing the Auto-format feature, the RD2 display can be driven by the following Cardinal weight indicators and most other weight indicators from other manufacturers. Should configuration be required, Cardinal provides the Smart Configuration software for serial updating of the display.

Current Indicators

185/185B (*RS-232 Only*), 190/190A/190DC (*with 190-RS232 Option*), 200 Panel Mount 205, 210, 210-FE, 212X, 212GX, and Legacy 225/225D (*all with onboard USB*)
195A/195D and 225 Gen2 (225A-D, 225A-S, 225D-D, and 225D-S)
825 Gen2 (825A-D, 825A-S, 825A-NS, 825D-D, 825D-S, and 825D-NS)

Retired Indicators

180/180EU and 204/204S (*RS-232 Only*), 220, and 225 (*without onboard USB*)
205, 210/215, 210-F, 212/21X, and 212G/212GX (*all without onboard USB*)
777 Series, 778 Series, 788 Series (*with the 778C Option Card Installed*), and 825 Gen1

AUTO-FORMAT FEATURE

The RD2 serial interface can auto-format most serial protocols (automatically selects input protocol). The interface auto-detects baud rates between 2400 and 38400 baud with the following settings:

Baud rate: 2400 to 38400
Data bits: 7 or 8
Character format: All standard ASCII characters

MULTIPLE DISPLAYS

The RD2 display has been designed to echo received characters (from a single weight indicator) to other RD2 displays, allowing the same weight data to be shown on multiple displays. Typical applications might consist of back-to-back displays or displays placed at each end of the scale.

SITE PREPARATION

Electrical Power

The RD2 display has been designed to operate from 94 to 264 VAC at 47/63 Hz. Note that a special order is not required for operation at 230 VAC.



WARNING! To avoid electrical hazards and possible damage to the display, DO NOT, under any circumstances, cut, remove, alter, or in any way bypass the power cord-grounding prong.

- The power for the display should be on a separate circuit from the distribution panel. This circuit should be dedicated to the exclusive use of the display.
- The wiring should conform to national and local electrical codes and ordinances and should be approved by the local inspector to ensure compliance.
- For permanently connected equipment, a readily accessible disconnect device must be provided external to the equipment.
- For pluggable equipment, the socket-outlet shall be installed near the equipment and shall be easily accessible.
- **It is the responsibility of the customer** to have a qualified electrician install the proper service disconnect that conforms to national electrical codes and local codes, and ordinances.

Electrical Noise Interference

To prevent electrical noise interference, make certain all other wall outlets for use with air conditioning and heating equipment, lighting, or other equipment with heavily inductive loads, such as welders, motors, and solenoids, are on circuits separate from the display. Many of these disturbances originate within the building itself and can seriously affect the operation of the display. These sources of disturbances must be identified, and steps must be taken to prevent possible adverse effects on the display. Examples of available alternatives include isolation transformers, power regulators, uninterruptible power supplies, or simple line filters.

INSTALLATION

Unpacking

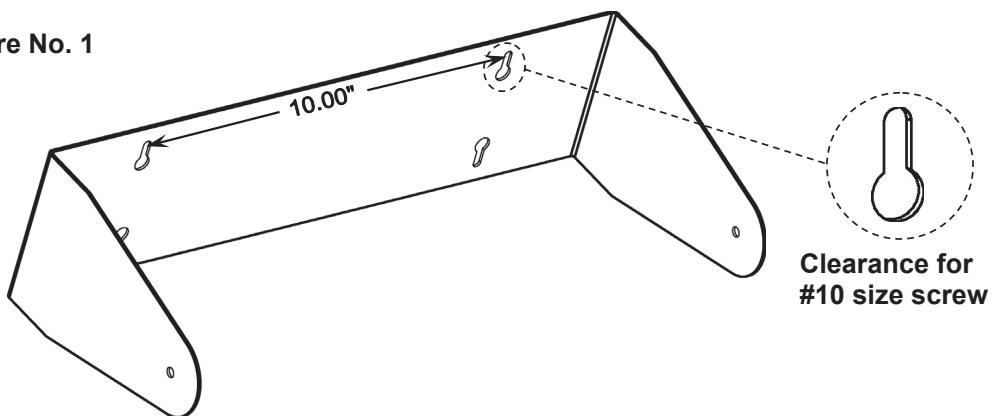
Before beginning installation of your RD2 display, make certain it has been received in good condition. Carefully remove the display from the shipping carton and inspect it for any evidence of damage (such as exterior dents or scratches) that may have taken place during shipment. Keep the carton and packing material for return shipment if it should become necessary.

NOTE: It is the responsibility of the purchaser to file all claims for any damages or loss incurred during transit.

Mounting

The RD2 display is housed in a stainless steel wall or desk-mount enclosure. The gimbal may be mounted on a desktop or other smooth, flat, horizontal surface or may be mounted on a wall. Refer to Figure No. 1 for a layout of wall-mounting bolts.

Figure No. 1



If wall-mounted, make certain the mounting surface is strong enough to support the display. The mounting location should be where the display is easily viewed. Carefully lay out the mounting hole locations and then drill and install the anchor bolts. Attach the gimbal to the wall and securely tighten the retaining bolts.

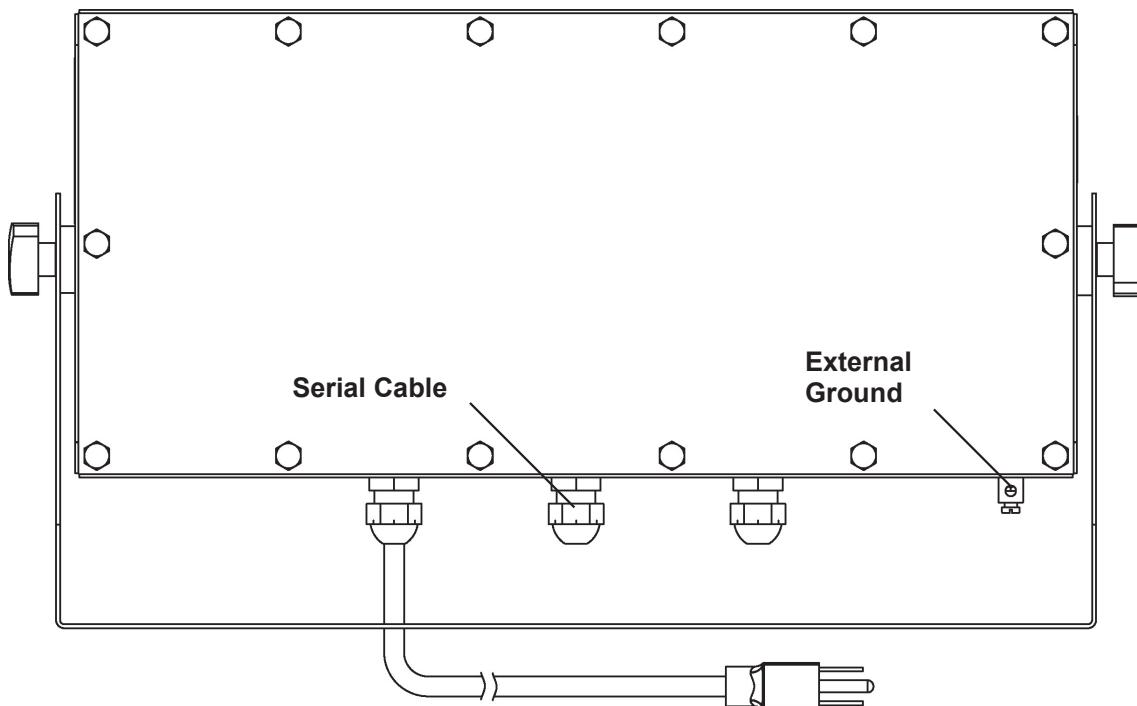


Figure No. 2

SERIAL CABLE INSTALLATION

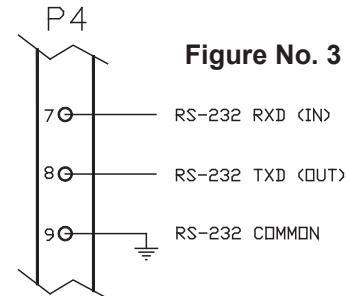


CAUTION! This device contains static sensitive components. Improper handling can result in damage to or destruction of the components or board. Such actual and/or consequential damage IS NOT covered under warranty.

1. Referring to Figure No. 2 on the previous page, remove the 14 acorn nuts securing the rear panel to the main housing.
2. Choose a gland connector for the serial cable and then loosen it.
3. Slip the single cable through the gland connector and into the enclosure.
4. Remove approximately 3" of the outer insulation jacket from the cable, then remove 1/2" of insulation from each of the wires.

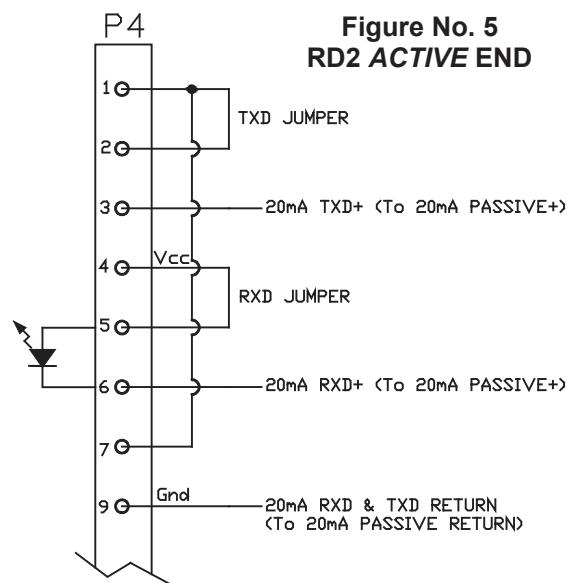
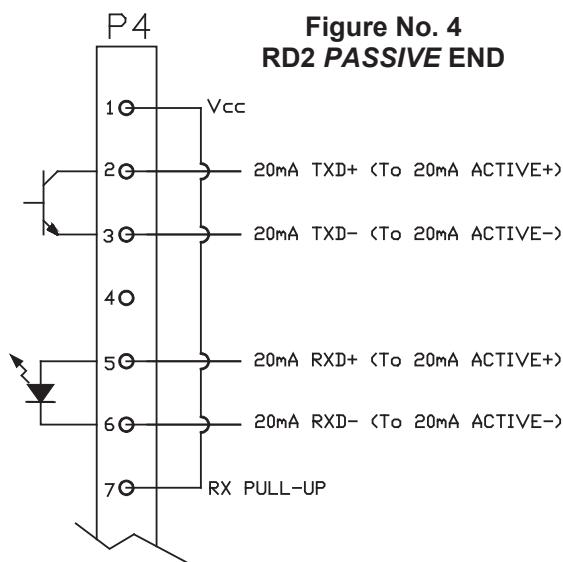
RS-232

1. Refer to Figure No. 6 for the location of the terminal block.
2. For RS-232 connections, refer to Figure No. 3 (or the circuit board) for the terminal connections and connect each wire to the terminal block.
3. To connect each wire to the terminal block, first loosen each of the screw terminals, then insert the wire under the terminal washer. Tighten the screw to secure the wire in place.



20 mA Current Loop

1. Refer to Figure No. 6 for the location of the terminal block.
2. For *PASS/IVE* connections, refer to Figure No. 4, the table below, or the circuit board for the terminal connections and connect each wire to the terminal block.
3. For *ACTIVE* connections, refer to Figure No. 5, the table below, or the circuit board for the terminal connections and connect each wire to the terminal block.
4. To connect each wire to the terminal block, first loosen each of the screw terminals, then insert the wire under the terminal washer. Tighten the screw to secure the wire in place.



IMPORTANT! A jumper must be installed between P4 terminals 1 and 7 to enable 20 mA current loop operation.

SERIAL CABLE INSTALLATION, CONT.

Current Cardinal Indicators

RS-232 Only Connections

185/185B (RS-232 Only)

RS-232 ONLY	RD2
P6, TX	P4, 7
P6, GND	P4, 9

20 mA Current Loop Connections

190/190A/190DC (with 190-RS232 Option)

CARD (PASSIVE)	RD2
P4,6	P4, 6
P4,7	P4, 9
n/c	JUMPER P4, 4 to 5
n/c	JUMPER P4, 1 to 7

195A/195D, 225 Gen2 (225A-D, 225A-S, 225D-D, and 225D-S)

PORT 1 (ACTIVE)	RD2
P22, 3	P4, 5
P22, 4	P4, 6
JUMPER P22, 5 to P22, 8	n/c
n/c	JUMPER P4, 1 to 7

PORT 1 (PASSIVE)	RD2
P22, 4	P4, 6
P22, 5	P4, 9
n/c	JUMPER P4, 4 to 5
n/c	JUMPER P4, 1 to 7

200 Panel Mount

PORT 1	RD2
P3, 3	P4, 5
P3, 4	P4, 6
n/c	JUMPER P4, 1 to 7

PORT 2	RD2
P3, 6	P4, 5
P3, 7	P4, 6
n/c	JUMPER P4, 1 to 7

205, 210, 210-FE, 212X, 212GX (with onboard USB)

PORT 0 (ACTIVE)	RD2
P13,5	P4, 5
P13,6	P4, 6
JUMPER P13,7 to P13,10	n/c
n/c	JUMPER P4, 1 to 7

PORT 0 (PASSIVE)	RD2
P13,6	P4, 6
P13,7	P4, 9
n/c	JUMPER P4, 4 to 5
n/c	JUMPER P4, 1 to 7

SERIAL CABLE INSTALLATION, CONT.

Current Cardinal Indicators, Cont.

20 mA Current Loop Connections, Cont.

205, 210, 210-FE, 212X, 212GX (with onboard USB), Cont.

PORT 1 (ACTIVE)	RD2
P13,5	P4, 5
P13,8	P4, 6
JUMPER P13,9 to P13,13	n/c
n/c	JUMPER P4, 1 to 7

PORT 1 (PASSIVE)	RD2
P13,8	P4, 6
P13,9	P4, 9
n/c	JUMPER P4, 4 to 5
n/c	JUMPER P4, 1 to 7

Legacy 225/225D (with onboard USB)

PORT 0 (ACTIVE)	RD2
P20,10	P4, 5
P20,8	P4, 6
n/c	JUMPER P4, 1 to 7

PORT 1 (ACTIVE)	RD2
P20, 3	P4, 5
P20, 4	P4, 6
JUMPER P20, 5 to P20, 8	n/c
n/c	JUMPER P4, 1 to 7

PORT 2 (ACTIVE)	RD2
P16, 1	P4, 5
P16, 2	P4, 6
JUMPER P16, 3 to P16, 9	n/c
n/c	JUMPER P4, 1 to 7

PORT 2 (PASSIVE)	RD2
P16, 2	P4, 6
P16, 3	P4, 9
n/c	JUMPER P4, 4 to 5
n/c	JUMPER P4, 1 to 7

825 Gen2 (825A-D, 825A-S, 825A-NS, 825D-D, 825D-S, and 825D-NS)

PORT 2 (ACTIVE)	RD2
P21, 2	P4, 5
P21, 5	P4, 6
J3 INSTALLED J7 SHUNT ON 20 mA	n/c
n/c	JUMPER P4, 1 to 7

PORT 2 (PASSIVE)	RD2
P21, 1	P4, 6
P21, 2	P4, 9
J3 REMOVED J7 SHUNT ON 20 mA	JUMPER P4, 4 to 5
n/c	JUMPER P4, 1 to 7

SERIAL CABLE INSTALLATION, CONT.

Retired Cardinal Indicators

RS-232 Only Connections

180/180EU (RS-232 Only)

RS-232 ONLY	RD2
Serial Port Pin 3	P4, 7
Serial Port Pin 5	P4, 9

204/204S (RS-232 Only)

RS-232 ONLY	RD2
Serial Port Pin 3	P4, 7
Serial Port Pin 5	P4, 9

20 mA Current Loop Connections

205, 210/215, 210-F, 212/212X, 212G/212GX, (without USB)

PORT 1	RD2
P11, 3	P4, 5
P11, 4	P4, 6
n/c	JUMPER P4, 1 to 7

PORT 2	RD2
P11, 6	P4, 5
P11, 7	P4, 6
n/c	JUMPER P4, 1 to 7

220

220 PORT 1 (ACTIVE)	SB600
P10, 1	P6, CLRX+
P10, 2	P6, CLRX-
JUMPER P10, 3 to P10, 10	n/c

220 PORT 1 (PASSIVE)	SB600
P10, 2	P6, CLRX-
P10, 3	P6, GND
n/c	JUMPER CS2 to CLRX+

220 PORT 2	SB600
P10, 11	P6, CLRX+
P10, 10	P6, CLRX-

225 (without USB)

PORT 1 (ACTIVE)	RD2
P14, 3	P4, 5
P14, 4	P4, 6
JUMPER P14, 5 to P14, 8	n/c
n/c	JUMPER P4, 1 to 7

PORT 1 (PASSIVE)	RD2
P14, 4	P4, 6
P14, 5	P4, 9
n/c	JUMPER P4, 4 to 5
n/c	JUMPER P4, 1 to 7

PORT 2 (ACTIVE)	RD2
P18, 1	P4, 5
P18, 2	P4, 6
JUMPER P18, 3 to P18, 9	n/c
n/c	JUMPER P4, 1 to 7

PORT 2 (PASSIVE)	RD2
P18, 2	P4, 6
P18, 3	P4, 9
n/c	JUMPER P4, 4 to 5
n/c	JUMPER P4, 1 to 7

PORT 3 (ACTIVE)	RD2
P18, 12	P4, 5
P18, 13	P4, 6
n/c	JUMPER P4, 1 to 7

SERIAL CABLE INSTALLATION, CONT.

Retired Cardinal Indicators, Cont.

20 mA Current Loop Connections, Cont.

825 Gen1

PORT 2 (ACTIVE)	RD2
P21, 2	P4, 5
P21, 5	P4, 6
J3 INSTALLED J7 SHUNT ON 20 mA	n/c
n/c	JUMPER P4, 1 to 7

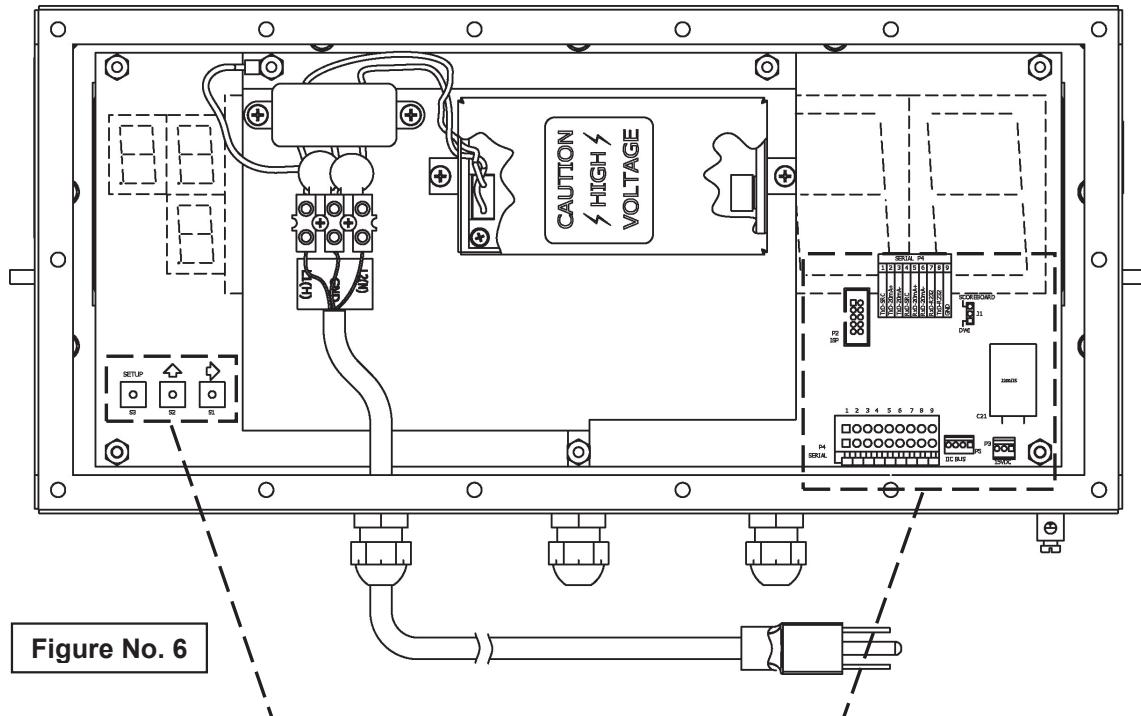
PORT 2 (PASSIVE)	RD2
P21, 1	P4, 6
P21, 2	P4, 9
J3 REMOVED J7 SHUNT ON 20 mA	JUMPER P4, 4 to 5
n/c	JUMPER P4, 1 to 7

777 Series, 778 Series, 788 Series (with 778C Option Card Installed)

778C (PASSIVE)	RD2
COMA, 11	P4, 6
COMA, 23	P4, 9
n/c	JUMPER P4, 4 to 5
n/c	JUMPER P4, 1 to 7

778C (ACTIVE)	RD2
COMA, 10	P4, 5
COMA, 11	P4, 6
JUMPER COMA, 23 to COMA, 24	n/c
n/c	JUMPER P4, 1 to 7

DISPLAY BOARD



SWITCHES

S3 = (SETUP). Press to begin Setup mode. While in setup, press to advance to the next setup option.

S2 = (Up Arrow ↑). This switch has a dual purpose. If pressed while in setup, it will increment the current value by 1. In normal operation, it is used to increase display brightness.

S1 = (Right Arrow ⇒). This switch also has a dual purpose. If pressed while in setup, it will step back to the previous option. In normal operation, it is used to decrease display brightness.

CONNECTORS

P2 = ISP (In System Programming) connector

P3 = 15VDC Power connector

P4 = SERIAL 9 terminal connector for serial cable connections.

P5 = IIC Bus (For Factory Use Only)

JUMPERS

J1 = Operation mode selection jumper. (Jumper must be on pins 2 and 3 for scoreboard)

SETUP AND CONFIGURATION

The RD2 display has been pre-configured at the factory and should not require configuration for use in most applications. In the event that the factory settings do not meet the requirements of your application, the following describes the steps to configure the display.

The setup mode switch is located on the back of the display board. You may gain access to it by removing the 14 acorn nuts securing the rear panel to the main housing. Refer to Figure No. 7 for the location of the **SETUP** switch.

- When a prompt is displayed, press the **SETUP** switch to retain the current value and proceed to the next prompt.
- To change a setting, press the **Up Arrow**  switch to scroll through and select a new value.
- Press the **Right Arrow**  switch to "backup" to the previous prompt.

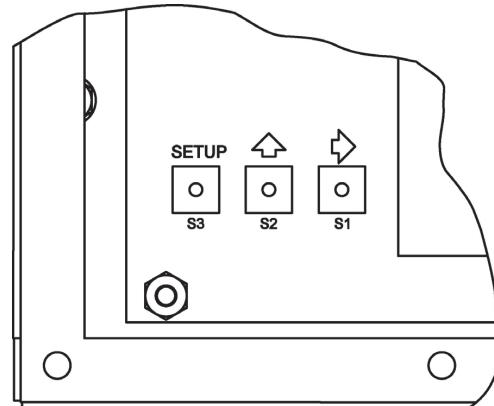


Figure No. 7

Enter Setup Mode

1. With the rear panel removed and the display ON, press and release the **SETUP** switch.
2. The display will change to show **SETUP**.
3. Press the **SETUP** switch again.
4. The display will change to show **EYPE =** and the current value.

EYPE = (Serial Format)

This option allows you to manually select a serial format and override the Auto-format feature by setting **EYPE =** to a number listed below. Note that the factory's default value is 0 (Auto-format is enabled).

If the value displayed is acceptable, press the **SETUP** switch again. Otherwise, press the **Up Arrow**  switch to scroll through and select a new value and then press the **SETUP** switch to save it and proceed to the next prompt. Values from 0 to 8 may be selected.

0 = Auto-format	5 = ANDFV
1 = SMA	6 = WI110
2 = Cardinal SB400	7 = Toledo Short
3 = Numbers	8 = Toledo Long
4 = Rice Lake IQ355	

BRUD = (Serial Port Baud Rate)

This option allows you to manually select a baud rate and override the Auto-baud feature by setting **BRUD =** to a number listed below. Note that the factory default value is 0 (Auto-baud is enabled).

If the value displayed is acceptable, press the **SETUP** switch again. Otherwise, press the **Up Arrow**  switch to scroll through and select a new value and then press the **SETUP** switch to save it and proceed to the next prompt. Values from 0 to 5 may be selected.

0 = Auto-baud	1 = 2400	2 = 4800
3 = 9600	4 = 19,200	5 = 38,400

SETUP AND CONFIGURATION, CONT.

dRtR: (Serial Port Data Bits)

This option allows you to manually select 7 or 8 data bits for the serial port data format. Note that if Auto-format is enabled (*lYPE* = 0), the *dRtR:* setting is ignored.

If the value displayed is acceptable, press the **SETUP** switch again. Otherwise, press the **Up Arrow** \uparrow switch to toggle to the other value and then press the **SETUP** switch to save it.

0 = 7 Data bits

1 = 8 Data bits

DISPLAY BRIGHTNESS

The RD2 Remote Display has an extra-bright 2 1/4" LED display. Ten levels of brightness can be set using the **Up Arrow** \uparrow and **Right Arrow** \Rightarrow switches on the display board.

To Increase Brightness:

1. Press the **Up Arrow** \uparrow switch.
2. Continue pressing the **Up Arrow** \uparrow switch to increase the brightness to the desired level.

To Reduce Brightness:

1. Press the **Right Arrow** \Rightarrow switch.
2. Continue pressing the **Right Arrow** \Rightarrow switch until the brightness has been reduced to the desired level.

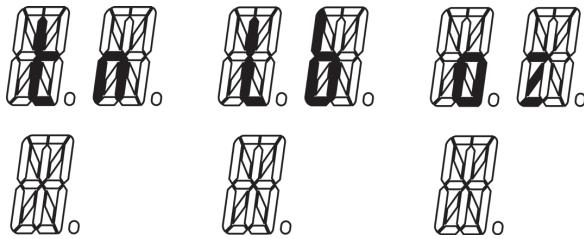
RE-INSTALLING THE REAR PANEL

After all terminations have been made, changes to setup have been completed, and the display brightness has been set to the desired level, it is time to reinstall the rear panel.

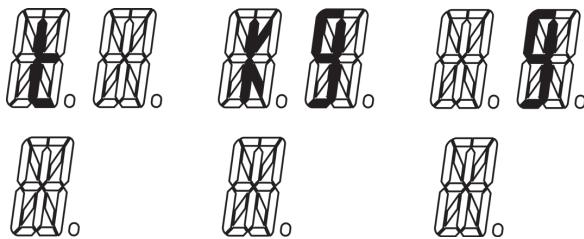
1. Gently pull any excess cable (AC power and serial) from the enclosure.
2. Securely tighten the cable gland connectors.
 - ! Do not over-tighten the connectors, but make certain they are snug.
 - ! **DO NOT USE TOOLS!** Finger-tighten only!
 - ! Ensure that any unused gland connectors are plugged.
3. Make certain no cables or wires are exposed between the main housing and the rear panel.
4. Place the rear panel onto the main housing.
5. Secure with the 14 acorn nuts removed earlier.
6. Follow a diagonal pattern when tightening the acorn nuts.

ANNUNCIATOR DISPLAY

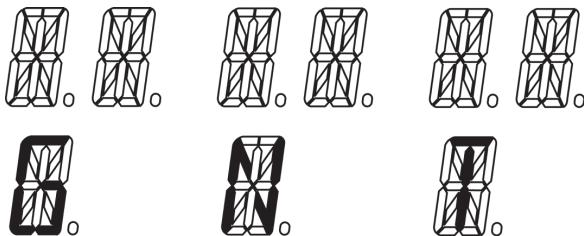
The annunciator display is a three (3) character 16-segment display to the right of the weight display. It is used to indicate that the display is in the mode corresponding to the character(s) displayed or that the status indicated by the character(s) displayed is active.



- **t** is turned on to show that the displayed weight unit is tons. It is displayed in the two upper characters of the annunciator display.
- **L** is turned on to show that the displayed weight unit is pounds. It is displayed in the two upper characters of the annunciator display.
- **oz** is turned on to show that the displayed weight unit is ounces. It is displayed in the two upper characters of the annunciator display.



- **t** is used to indicate that the displayed unit of weight measurement is tonnes (metric tons). It is displayed in the two upper characters of the annunciator display.
- **kg** is used to indicate that the displayed unit of weight measurement is kilograms. It is displayed in the two upper characters of the annunciator display.
- **g** is used to indicate that the displayed unit of weight measurement is grams. It is displayed in the two upper characters of the annunciator display.



- **G** is turned on to show that Gross weight is displayed. Gross weight will be displayed when no tare weight is stored. It is displayed in the lower character of the annunciator display.
- **N** is turned on to show that the displayed weight is the Net weight (gross weight less tare weight). It is displayed in the lower character of the annunciator display.
- **T** is turned on to show that the displayed weight is the Tare weight. It is displayed in the lower character of the annunciator display.

SINGLE AND MULTIPLE DISPLAY CONNECTIONS

The RD2 can display received characters from a single weight indicator. With multiple displays, the received characters can be echoed from one RD2 to other RD2 displays, allowing the same weight data to be shown on two or more displays. Typical applications of multiple displays might consist of back-to-back displays or displays placed at each end of the scale.

The figures below are typical installations consisting of a single indicator to a single display (Figure No. 8), a single indicator to two displays (Figure No. 9), and a single indicator with two or more displays (Figure No. 10).

Figure No. 8 – ONE RD2

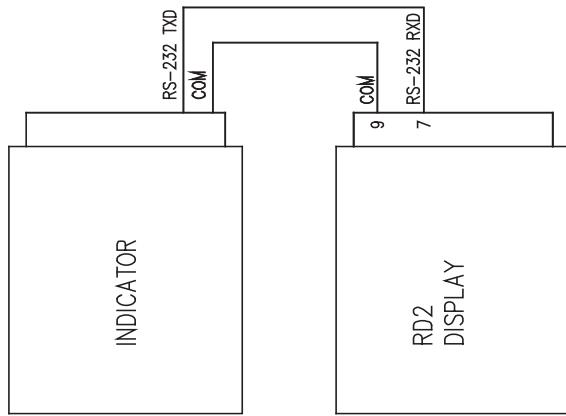


Figure No. 9 – TWO RD2

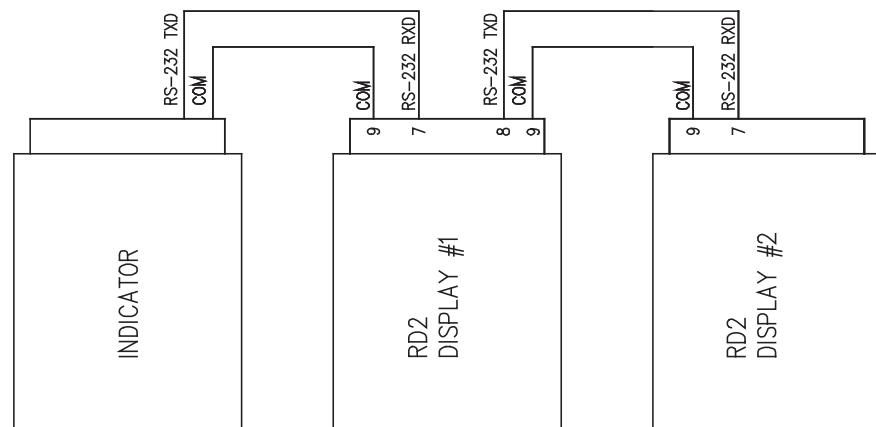
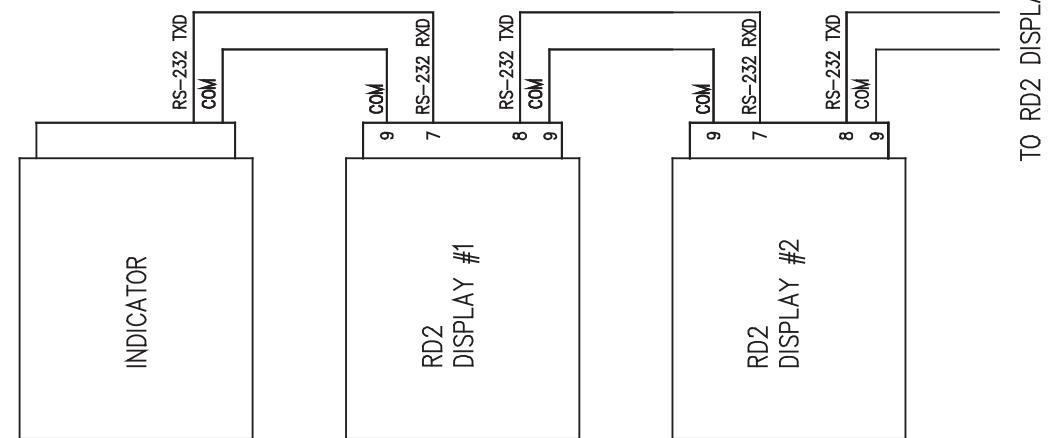


Figure No. 10 – MULTIPLE RD2



ERROR AND STATUS DISPLAYS

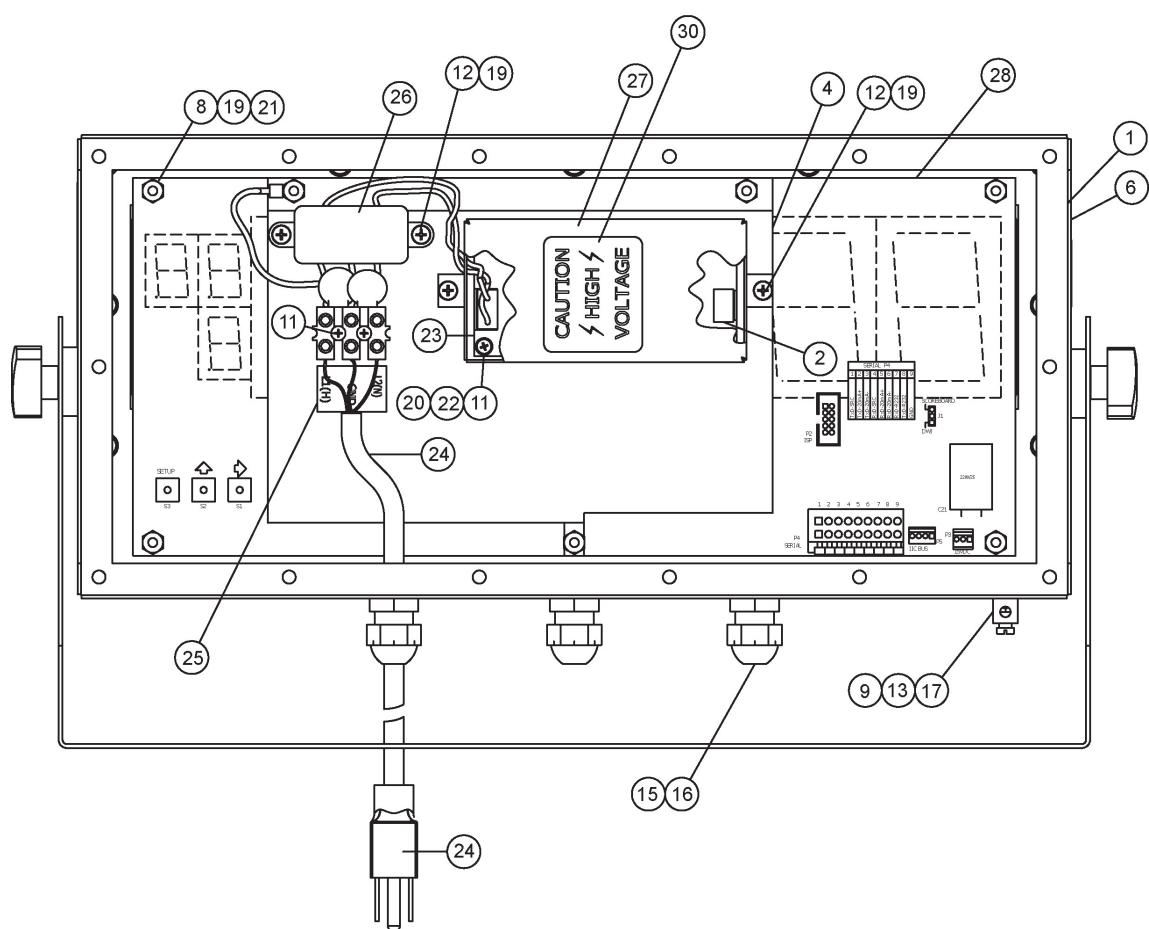
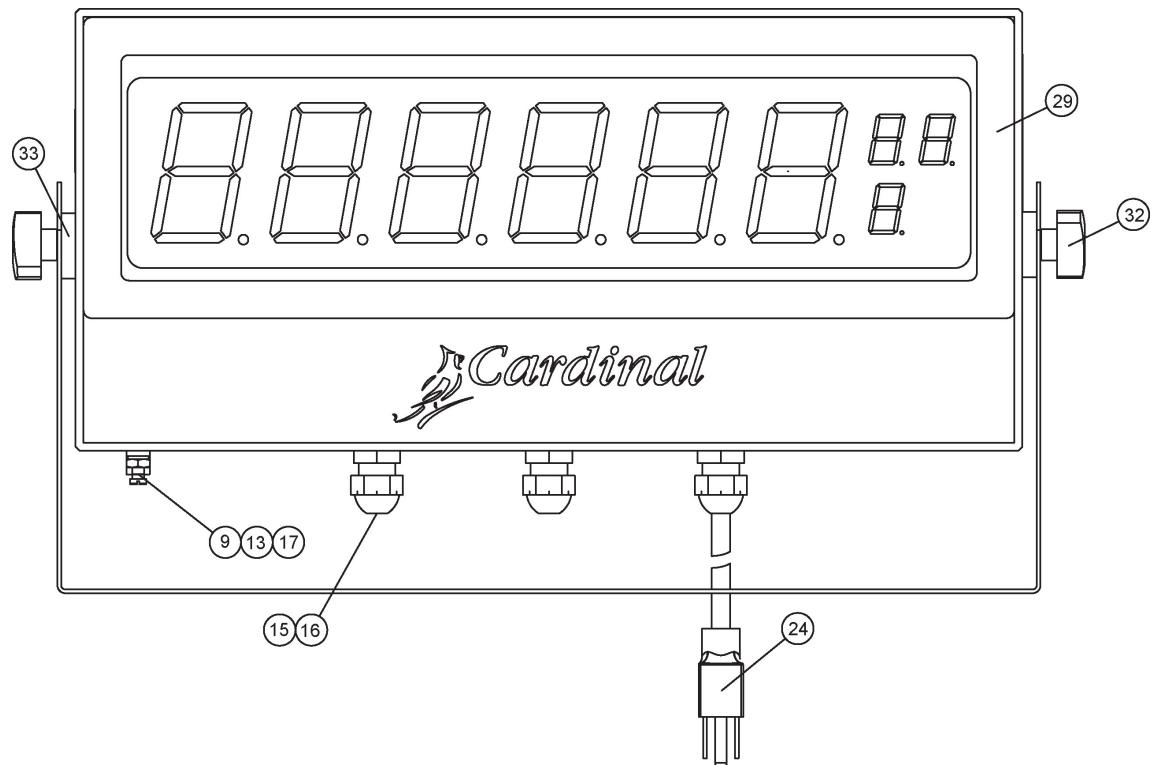
The RD2 Remote Display is equipped with software that tests various portions of its circuitry and verifies proper operation. Should a problem be detected, a message will be displayed. The following lists the messages displayed and their meaning:

Display	Meaning
<i>-----Ab</i>	This will be displayed for a maximum of 4 seconds when the display is configured for Auto-baud detection. Note that while detecting the baud rate, the intensity of the digits will increase to full brightness.
<i>Error 1</i> <i>Error 2</i>	Auto-baud feature could not detect the baud rate of the indicator. Verify the baud rate of the indicator serial port is set for 2400 to 38400 baud and try again. If the error continues, manually set the baud rate of the display and indicator.
<i>AutoFormat</i>	This will be displayed for a maximum of 3 seconds when the display is configured for Auto-format.
<i>Error 3</i>	Auto-format feature was unable to automatically select a serial input protocol. Verify the indicator serial output is one of the eight serial formats listed in Setup and Configuration and try again. If the error continues, manually set the serial format of the display and indicator.
<i>noDataA</i>	<p>On some indicators, the serial output will stop when displaying an error code or when in an "input" mode. When the serial input to the display stops for any reason, after 3 seconds, this message will be displayed.</p> <p>Correct the error condition on the indicator. Cancel or complete the input operation on the indicator.</p> <p>This message could also indicate that the serial connection between the indicator and the display has been lost.</p> <p>Check for a broken, loose, or disconnected serial cable between the indicator and the display.</p>

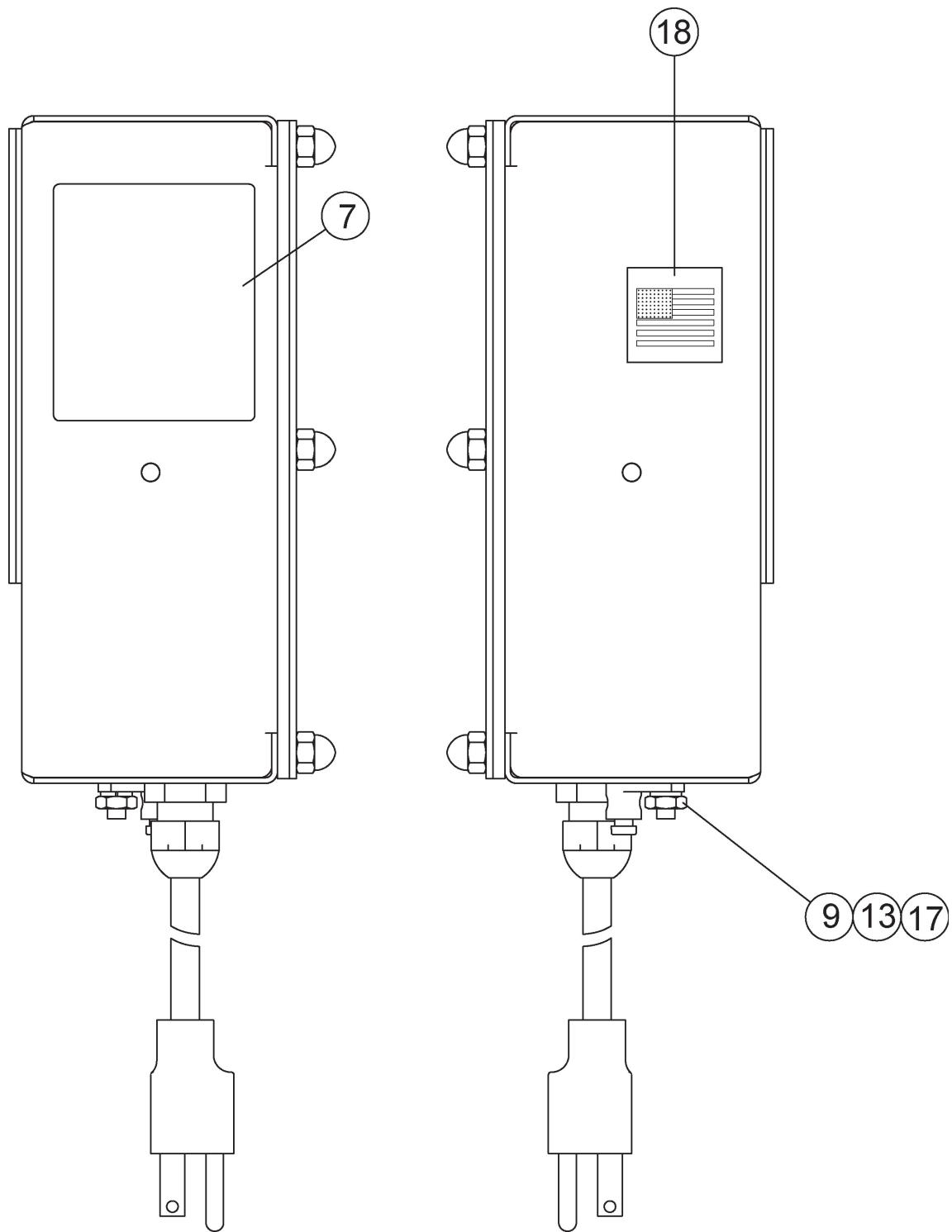
PART IDENTIFICATION

ITEM #	QTY.	PART NUMBER	DESCRIPTION
1	1	3601-B507-08	GASKET, RD2
2	1	3601-B508-0A	CABLE: RD2 POWER SUPPLY OUTPUT
3	1	3601-C502-08	REAR PANEL
4	1	3601-C503-08	POWER MOUNT BRACKET
5	1	3601-C505-0A	BEZEL WELDMENT, RD2
6	1	3601-D501-0A	WELDMENT: ENCLOSURE FRONT
7	1	593GR986	SERIAL TAG ASSY
8	19	6013-0039	NUT #6-32 HEX
9	1	6013-0297	NUT #10-32 HEX
10	14	6013-0433	NUT #10-32 HEX ACORN LOCK SS
11	6	6021-0426	SCW ROUND-HEAD MACHINE-SCW 04-40 X.500
12	4	6021-0663	SCW PAN-HEAD.. MACHINE-SCW 06-32 X.187
13	1	6024-0037	WASHER LOCK HELICAL SP #10 REG SS
14	12	6024-1078	WASHER FLAT #6 NEOPRENE BACKING SS
15	2	6540-1104	PLUG, HOLE 0.173"-0.240" RED POLYETH.
16	3	6610-2248	CONN GLAND, .187-.312 GRIP .599 MTG BLK
17	1	6610-5002	GROUND LUG L-35
18	1	6650-0087	LABEL, MADE IN USA (WITH FLAG) 1" X 1"
19	11	6680-0004	WASHER LOCK INT TOOTH #6 TYPE A Z-PL
20	4	6680-0026	WASHER LOCK INT TOOTH #4 TYPE A Z-PL
21	7	6680-0121	SPACER #6 X .437 NYLON
22	4	6680-0138	SPACER #6 X .187 NYLON
23	1	6800-1051	POWER SUPPLY 15V/4A OPEN FRAME 90-264VAC
24	1	6980-1030	POWER CORD 18/3 SVT CEE 6.3 FT
25	1	8200-B104-08	LABEL: 205/210 TERMINAL BLOCK
26	1	8200-B237-0A	CABLE: AC POWER W/FILTER 205/210 DWI
27	1	8200-C363-08	POWER SUPPLY COVER
28	1	8200-D278-0A	PCB ASSY: DISPLAY BOARD, 210-FE
29	1	8200-D286-08	OVERLAY: 210-FE
30	1	8510-C346-OI	LABEL CAUTION HIGH VOLTAGE
31	1	8200-C298-08	GIMBAL, 210-FE
32	2	6540-1053	ENCLOSURE KNOB
33	2	3601-B510-08	GIMBAL SPACER
34	4	6540-1004	RUBBER FOOT (NOT SHOWN)

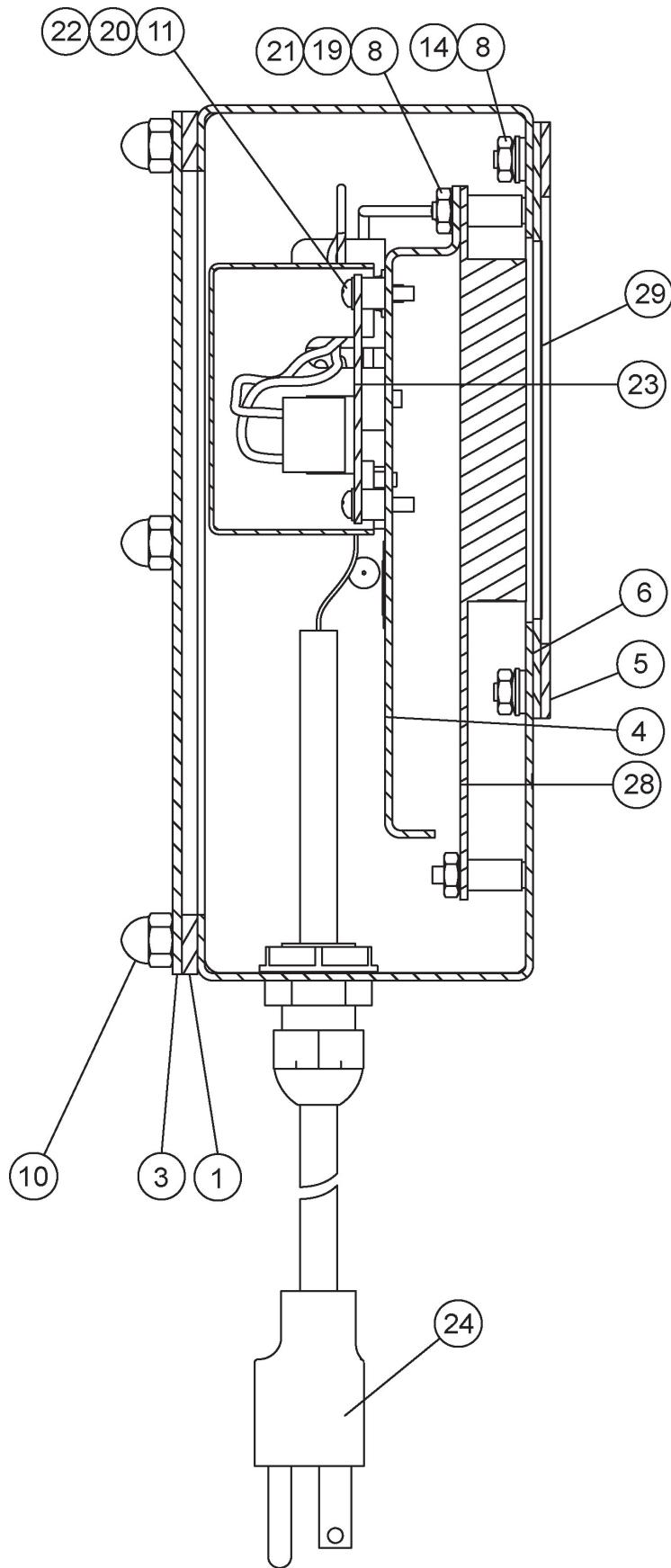
PART IDENTIFICATION, CONT.



PART IDENTIFICATION, CONT.



PART IDENTIFICATION, CONT.



STATEMENT OF LIMITED WARRANTY

WARRANTY TERMS

Cardinal Scale Manufacturing Company warrants the equipment we manufacture against defects in material and workmanship. The length and terms and conditions of these warranties vary with the type of product and are summarized below:

PRODUCT TYPE	TERM	MATERIAL AND WORKMANSHIP	LIGHTNING DAMAGE See note 9	WATER DAMAGE See note 7	CORROSION See note 4	ON-SITE LABOR	LIMITATIONS AND REQUIREMENTS
WEIGHT INDICATORS	90 DAY REPLACEMENT ----- 1 YEAR PARTS	YES	YES	YES	YES	NO	1, 2, 3, 5, 6 A, B, C, D
LOAD CELLS (Excluding Hydraulic)	1 YEAR	YES	YES	YES	YES	NO	1, 2, 3, 5, 6 A, B, C, D
HYDRAULIC LOAD CELLS (When purchased with Guardian Vehicle Scale)	LIFETIME	YES	YES	YES	YES	90 DAYS	1, 5, 6, 8 A, B, C, D
HYDRAULIC LOAD CELLS (When purchased separately)	10 YEARS	YES	YES	YES	YES	NO	1, 5, 6, 8, 9 A, B, C, D
VEHICLE SCALE (Deck and Below Excl. PSC Series)	5 YEARS	YES	YES	YES	YES	90 DAYS	1, 2, 3, 5, 6 A, B, C, D, E
LSC SCALE (Deck and Below)	3 YEARS	YES	YES	YES	YES	90 DAYS	1, 2, 3, 5, 6, 11 A, B, C, D
GUARDIAN FLOOR SCALES	10 YEARS	YES	YES	YES	YES	NO	1, 2, 3, 5, 6, 9, 10 A, B, C, D
ALL OTHER CARDINAL PRODUCTS	1 YEAR	YES	YES	YES	YES	NO	1, 2, 5, 6 A, B, C, D, E
REPLACEMENT PARTS	90 DAYS	YES	YES	YES	YES	NO	1, 2, 4, 5, 6 A, B, C, D
SWIM AND 760 SERIES VEHICLE SCALES	1 YEAR	YES	YES	YES	YES	90 DAYS	1, 2, 5, 6 A, B, C, D
SOFTWARE	90 DAYS	YES	N/A	N/A	N/A	NO	1, 6 B, C, D
CONVEYOR BELT SCALES (including Belt-Way)	1 YEAR	YES	YES	YES	YES	NO	1, 2, 3, 5, 6 A, B, C, D, E, F



CARDINAL[®]

Ph. (800) 441-4237

E-mail: cardinal@cardet.com

102 E. Daugherty
Webb City, MO 64870

04/24
Printed in USA
315-WARRANTY-CAR-M

APPLICABLE LIMITATIONS AND REQUIREMENTS

1. This warranty applies only to the original purchaser. The warranty does not apply to equipment that has been tampered with, defaced, damaged, or had repairs or modifications not authorized by Cardinal or has had the serial number altered, defaced or removed.
2. This warranty is not applicable to equipment that has not been grounded in accordance with Cardinal's recommendations.
3. This equipment must be installed and continuously maintained by an authorized Cardinal / Belt-Way dealer.
4. Applies only to components constructed from stainless steel.
5. This warranty does not apply to equipment damaged in transit. Claims for such damage must be made with the responsible freight carrier in accordance with freight carrier regulations.
6. Warranty term begins with date of shipment from Cardinal.
7. Only if device is rated NEMA 4 or better or IP equivalent.
8. Lifetime warranty applies to damages resulting from water, lightning, and voltage transients and applies only to the hydraulic load cell structure itself (does not include pressure transducers, rubber seals, o-rings, and associated wiring).
9. 10-Year prorated warranty on hydraulic load cells.
10. 1-Year warranty for scale structure.
11. PSC models' warranty coverage applies only to agricultural installations on farms up to 3,000 acres (LSC models not limited in this manner).
12. Load cell kits MUST be installed in accordance with Cardinal Scale instructions. Failure to follow these instructions will void the warranty.

EXCLUSIONS

- A.) This warranty does not include replacement of consumable or expendable parts. The warranty does not apply to any item that has been damaged due to unusual wear, abuse, improper line voltage, overloading, theft, fire, water, prolonged storage or exposure while in purchaser's possession or acts of God unless otherwise stated herein.
- B.) This warranty does not apply to peripheral equipment not manufactured by Cardinal. This equipment will normally be covered by the equipment manufacturer's warranty.
- C.) This warranty sets forth the extent of our liability for breach of any warranty or deficiency in connection with the sale or use of our product. Cardinal will not be liable for consequential damages of any nature, including but not limited to loss of profit, delays or expenses, whether based on tort or contract. Cardinal reserves the right to incorporate improvements in material and design without notice and is not obligated to incorporate said improvements in equipment previously manufactured.
- D.) This warranty is in lieu of all other warranties expressed or implied including any warranty that extends beyond the description of the product including any warranty of merchantability or fitness for a particular purpose. This warranty covers only those Cardinal products installed in the forty-eight contiguous United States and Canada.
- E.) This warranty does not cover paint coatings due to the variety of environmental conditions.
- F.) Do not cut load cell cables on load cells returned for credit or warranty replacement. Cutting the cable will void the warranty.
- G.) Software is warranted only for performance of the functions listed in the software manual and/or the Cardinal proposal.
- H.) The software warranty does not cover hardware. Warranties on hardware are provided from the hardware vendor only.
- I.) The software warranty does not cover interfacing issues to non-Cardinal supplied hardware.
- J.) The software warranty does not include automatic software upgrades unless purchased separately.



Ph. (800) 441-4237
E-mail: cardinal@cardet.com
102 E. Daugherty
Webb City, MO 64870

04/24
Printed in USA
315-WARRANTY-CAR-M

Cardinal Scale Mfg. Co.

102 E. Daugherty, Webb City, MO 64870 USA

Ph: 417-673-4631 or 1-800-641-2008

Fax: 417-673-2153

www.cardinalscale.com

Technical Support: 1-866-254-8261

E-mail: tech@cardet.com

Printed in USA

3601-M511-O1 Rev D 12/25