825-iCAN SYSTEM
Installation and Technical Manual

INTRODUCTION

Thank you for purchasing the Cardinal 825-iCAN System. The 825-iCAN system is a digitally controlled weighing and diagnostic scale environment where everything from installation to maintenance is enhanced, monitored, and simplified by state-of–the-art digital electronics including state-of–the-art ISP flash microcontrollers and advanced internationally standardized CAN serial bus.

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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 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 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.

FCC COMPLIANCE STATEMENT

This equipment generates uses and can radiate radio frequency and if not installed and used in accordance with the instruction manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC rules, which are designed 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 to take whatever measures necessary to correct the interference.

You may find the booklet "How to Identify and Resolve Radio TV Interference Problems" prepared by the Federal Communications Commission helpful. It is available from the U.S. Government Printing Office, Washington, D.C. 20402. Stock No. 001-000-00315-4.

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

TABLE OF CONTENTS

825-iCAN SYSTEM

The 825-iCAN system can be configured with 2 to 32 load cells for 1 to 10 scales with Total. The 825-iCAN system consists of one to four eight-cell ICANXG/P Junction Box Controller modules connected via the CAN serial bus to a 825CAN Interface Card in the Cardinal 825 Digital Weight Indicator. The eight-cell Module performs the analog-to-digital conversion of each of eight analog strain-gage load cells, the mathematical computation of load cell and scale data, and the transmission of data to the 825CAN Interface Card in the 825 Indicator. Additional 825-iCAN Junction Boxes may be used when there are more than eight load cells in the system. The SMARTCAL® feature allows quick calibration with no manual adjustments while the diagnostic software identifies real and potential system problems.

The 825-ICAN System indicator and ICANXG/P Junction Box Controller are housed in a IP66/NEMA 4X rated junction box enclosure with plastic or glass fiber optic cable or twisted-pair copper wire interconnection.

This manual describes the installation, setup, and calibration of the 825-iCAN System. Please make sure that you read this manual in its entirety before beginning the installation or attempting to operate the 825-iCAN System. 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 scale and/or bodily injury. Please keep this manual handy for future reference.

PRECAUTIONS

Static Electricity

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.

SPECIFICATIONS

Power Requirements ……….	115 to 230 VAC 50/60 Hz at 2 amperes per junction box
Temperature Range ….....…... (Compensated)	-13 to 104 $^\circ$F (-25 to +40 $^\circ$C)
Junction Box Connections ….	2 AC power, 8 load cell inputs, 2 fiber optic or copper wire
Junction Box Dimensions …..	17" W x 9 1/2" D x 3 3/8" H (432mm x 241mm x 88mm)
Sample Rate …………………	1 to 50 samples per second, selectable
Load Cells ……………………	Up to eight 350 ohm strain gage load cells per box
Load Cell / Scale Capacity …	Thirty-two 350 ohm load cells with up to 8 scales per box
Excitation Voltage …………..	12 VDC

Sensitivity:
   NON-COMMERCIAL …….
   NTEP ………………………
   CANADA …………………..
	
	0.15 uV/e
	0.3uV/e (Class III/IIIL)
	0.3uV/e (Class III/IIIHD)

Scale Divisions:
   NON-COMMERCIAL …….
   NTEP ………………………
   CANADA …………………..
	
	100 to 240,000
	100 to 10,000 (Class III/IIIL)
	100 to 10,000 (Class III/IIIHD)

Internal Resolution …………..	1 part in 16,777,216

Transmission Distance ……..	Up to 300 feet (30 foot minimum), plastic optical fiber
	  (1 mm diameter Duplex Zipcord Plastic Optical Fiber (POF) Cable,
	   Avago # HFBR-RUDXXX or equivalent)
	Up to 3,000 feet, glass optical fiber
	  (50/125 µm, 62.5/125 µm, 100/140 µm, or 200 µm HCS® Multimode
	   Fiber Optic Cable w/ ST connectors)
	Up to 1,000 feet, copper wire

MODEL NUMBER DESCRIPTION

The iCAN model number identifies the number of load cell inputs and type of optical fiber for which the system is configured. Refer to the diagram below to confirm that the junction box (es) you have received are appropriate for your specific application:

ICANXY
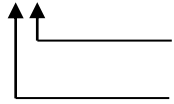
P = plastic fiber or G = glass fiber

Number of load cells in the system

ICAN MODEL	J-BOX #1 MODEL	J-BOX #2 MODEL	J-BOX #3 MODEL	TWO 8-CELL PULL BOXES 3502-D429-0A
ICAN4P	ICAN4P	N/A	N/A	N/A
ICAN6P	ICAN6P	N/A	N/A	N/A
ICAN8P	ICAN8P	N/A	N/A	1
ICAN10P	ICAN6P	ICAN4P	N/A	N/A
ICAN12P	ICAN6P	ICAN6P	N/A	N/A
ICAN14P	ICAN6P	ICAN8P	N/A	1
ICAN16P	ICAN8P	ICAN6P	N/A	2
ICAN18P	ICAN6P	ICAN6P	ICAN6P	N/A
ICAN20P	ICAN6P	ICAN6P	ICAN8P	1
ICAN4G	ICAN4G	N/A	N/A	N/A
ICAN6G	ICAN6G	N/A	N/A	N/A
ICAN8G	ICAN8G	N/A	N/A	1
ICAN10G	ICAN6G	ICAN4G	N/A	N/A
ICAN12G	ICAN6G	ICAN6G	N/A	N/A
ICAN14G	ICAN6G	ICAN8G	N/A	1
ICAN16G	ICAN8G	ICAN8G	N/A	2
ICAN18G	ICAN6G	ICAN6G	ICAN6G	N/A
ICAN20G	ICAN6G	ICAN6G	ICAN8G	1

N/A = Not Applicable

NOTES:
- Combinations of the three POF (Plastic Optic Fiber) J-BOX versions and three GOF (Glass Optic Fiber) versions will accommodate all the above configurations.
- All POF and GOF ICANXG/P Junction Box Controller boards will be the same with only one fiber optic CAN port, to be used between the 825CAN interface board and the iCAN junction box controller, and one copper wire CAN port, to be used between iCAN junction box controllers.
- The CAN bus connection between J-Box's will be a three conductor copper wire shielded cable.

INSTALLATION

Before beginning the installation of the 825-iCAN Junction Box System, make certain that you have all of the necessary material needed to perform the installation. Verify that you have received the following items before attempting the installation:

ICANXY Junction Box(es) (SEE Table on previous page)	Up to 8 cells, one ICANXY junction box (6 cells) and one 8 cell pull box for 7th and 8th cell. 10 to 16 cells, two ICANXY boxes are required. 18 to 24 cells, three ICANXY boxes are required. . Verify that all boxes are configured for the correct type of fiber (plastic or glass) and the proper number of load cells.
6610-2003 (for ICANXP)	Plastic optical fiber connector (4ea required)
6980-2004 (for ICANXP) SUPPLIED BY USER (for ICANXG)	Plastic optical fiber cable (30' min – 300' max length) This is the duplex (two fibers) fiber optic cable that attaches the first junction box to the weight-indicating instrument. Glass optical fiber cable (greater than 300' Make certain that your cable matches the type of junction box interface (plastic or glass) and is of the correct length. See Fiber Optic Cable Installation section of this manual.
6980-0093	CAN Bus Interconnection Cable This is the 3-conductor 22GA shielded cable used to connect the 825-iCAN junction boxes together (if there's more than one box).
3502-C008	Grounding kit including ground rods, interconnecting cable and clamps.
825ICANG/P 825CANP 825CANG	Weight indicating instrument with CAN interface card. **NOTE:** Your instrument may have additional option cards depending on your specific application. Plastic Optic Fiber CAN Interface Card Glass Optic Fiber CAN Interface Card
6770-9009	Polishing kit for plastic optic fiber cable
6980-1029	Pull Box to Junction Box Interconnection Cable This is the 4-conductor 20GA shielded cable used to connect the pull box (for the 7th and 8th load cell) to the 825-iCAN junction box.

INSTALLATION, CONT.

The following items may be required but are not provided by Cardinal Scale as a standard component of the 825-iCAN Junction Box System package:

- Wire and/or conduit needed to provide a source of AC power to the first 825-iCAN junction box (this is typically 18 to 20 AWG stranded wire, 3 conductor – refer to color code table below).

- Wire needed to feed AC power from the first 825-iCAN Junction Box to other 825-iCAN Junction Boxes, if a second, third or fourth junction box is required. (This is typically 18 to 20 AWG stranded wire, 3 conductor – refer to color code table below).

- Tools required for the installation.

AC WIRING COLOR CODE TABLE

Function	U.S. Code	International Code
L1 (H) - *Hot*	Black	Brown
L2 (N) - *Neutral*	White	Blue
GND - *Ground*	Green	Green/Yellow

MOUNTING THE JUNCTION BOXES

The Cardinal 825-iCAN Junction Box System may not only be used on Cardinal vehicle scales but may also be used on other brands of scales provided that they use standard analog strain gage load cells. The following instructions describe installation on Cardinal scales and for other scales.

CARDINAL PRC AND EPR SERIES VEHICLE SCALES

When the 825-iCAN Junction Box System is used with a Cardinal PRC or EPR series vehicle scale, the junction boxes are mounted in the same locations as the standard load cell junction boxes. Access to the first junction box location is gained by removing the top cover between the first and second scale modules. The cover is composed of three separate covers. Remove the two outer covers by loosening and removing the retaining bolts, lifting upward on the cover and sliding it back from the opening. Once one or both of the outer covers have been removed, the center cover can be removed. Set the covers aside in a safe place.
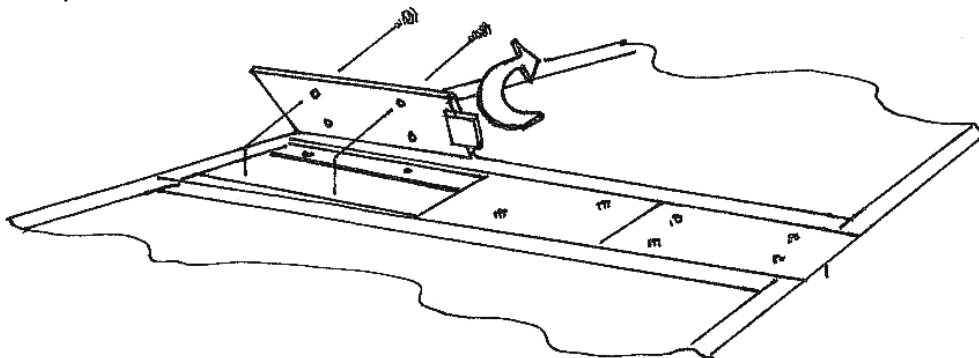
FIGURE NO. 1
REMOVAL OF COVER PLATES

INSTALLATION, CONT.

OTHER SCALE MODELS

If you are installing the 825-iCAN Junction Box System on a scale manufactured by a company other than Cardinal Scale, the installation is essentially the same as for a Cardinal model. There are, however, a few things to consider when making such an installation. First, make certain that the scale is in good mechanical condition and that all of the load cells are working properly. The 825-iCAN Junction Box System cannot compensate for existing mechanical problems in the scale. Check to make certain that the restraint system is working and properly adjusted. Also, check the scale grounding system to ensure that it is properly installed and that the connections are clean and electrically sound.

Once you have verified that the scale is in good working condition, it is time to determine where and how the junction boxes will be attached to the scale. Note that the junction box is provided with a mounting strap with a 5/16" hole at each end, which may be used to attach the junction box to the side or bottom of the scale weighbridge. Make certain that the location selected for the junction boxes does not place it a position where it may be damaged by a vehicle tire or causes a safety hazard. When selecting a position for the box, remember that a source of AC power must be provided and that suitable protection for the load cell and fiber optic cables must be provided. After selecting the mounting location for each box, place the box near that location in preparation for making the wiring interconnections. Although you can mount the boxes before making the connections, it may be easier to make the connections first then mount the box depending on the characteristics of the installation.

MOUNTING HOLE DIMENSIONS

Carefully layout the mounting hole locations, then drill and install the bolts. Attach the junction box to the scale and securely tighten the retaining bolts.
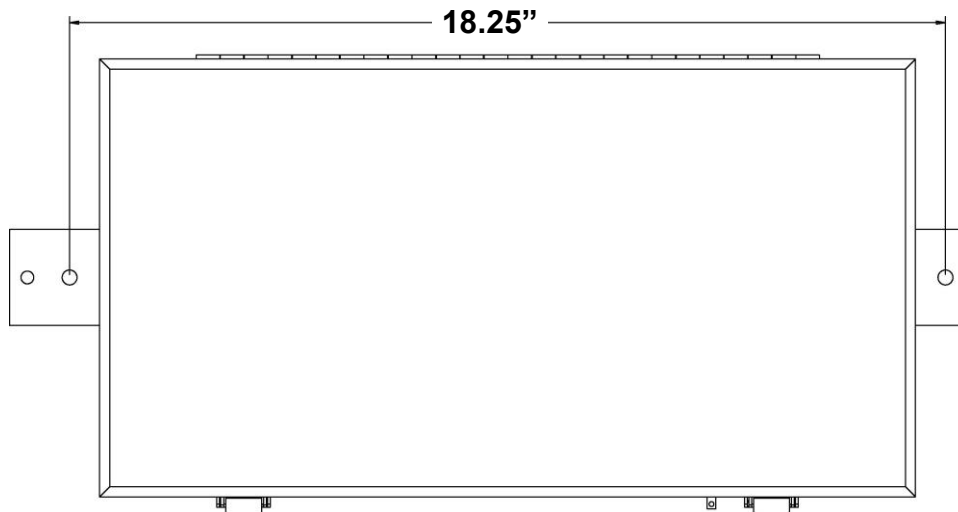
FIGURE NO. 2
MOUNTING HOLE DIMENSIONS

INSTALLATION, CONT.

CONNECTING THE JUNCTION BOXES

Although the junction boxes can be mounted to the junction box rails at this time, it will be much easier to do the wiring while the junction box is outside the scale. Determine the location for each junction box (if there's more than one) and place the junction box adjacent to the opening between the scale modules. Note that any junction box can be used in any position but that generally, the first junction box has a full complement of load cell cards.

Route the load cell cable from each load cell to the mounting location of the junction box then through the opening to the top of the scale platform. Note that the load cell cables should be routed through the protective tubing on the sides of the weighbridge. Repeat this procedure until each load cell cable has been properly routed to the junction box. Excess load cell cable should be wound up and properly secured beneath the scale platform (outside of the junction box). **NOTE:** Cardinal Scale Mfg. Co. does not recommend cutting the load cell cable.

Next, after making absolutely certain that the power has been turned off, route the power wires from the AC power source to the first junction box. If there is more than one junction box, route additional power cables between the boxes. Note that a ground fault circuit breaker (GFIC) must be installed in the AC power source.

Next, route the fiber optic cable between the first junction box and the 825 indicator. Make certain that the fiber optic cable used matches the fiber type indicated in the junction box model number. **NOTE:** You cannot use glass fiber on junction boxes configured for plastic fiber and vice versa. Refer to the following precautions for handling fiber optic cable.

- Care must be exercised when handling fiber optic cable to ensure that the cable is not damaged. Do not make sharp bends in the cable (this causes fractures in the plastic or glass core preventing the cable from transmitting data.) Do not bend the cable in anything smaller than a 1-inch radius.

- Make certain not to crush the cable. Squeezing the cable can crush the plastic or glass core also preventing the transmission of data.

- Be careful not to nick the cable jacket when pulling the cable through conduit or routing it through openings in the weighbridge.

- Keep the ends of the cable clean. Do not cut glass cored fiber optic cable. You can not re-install connectors in the field on fiber optic cables with a glass core!

INSTALLATION, CONT.

CONNECTION OF LOAD CELLS

Open the top cover on the first 825-iCAN Junction Box. Note that for each load cell a small printed circuit board is installed in the junction box. That is, if the box is configured for eight load cells, there should be a small printed circuit board in each of the junction box load cell input card guides. Refer to Figure No. 4 for the location of these cards. Verify that a card exists for each load cell to be connected to this junction box.
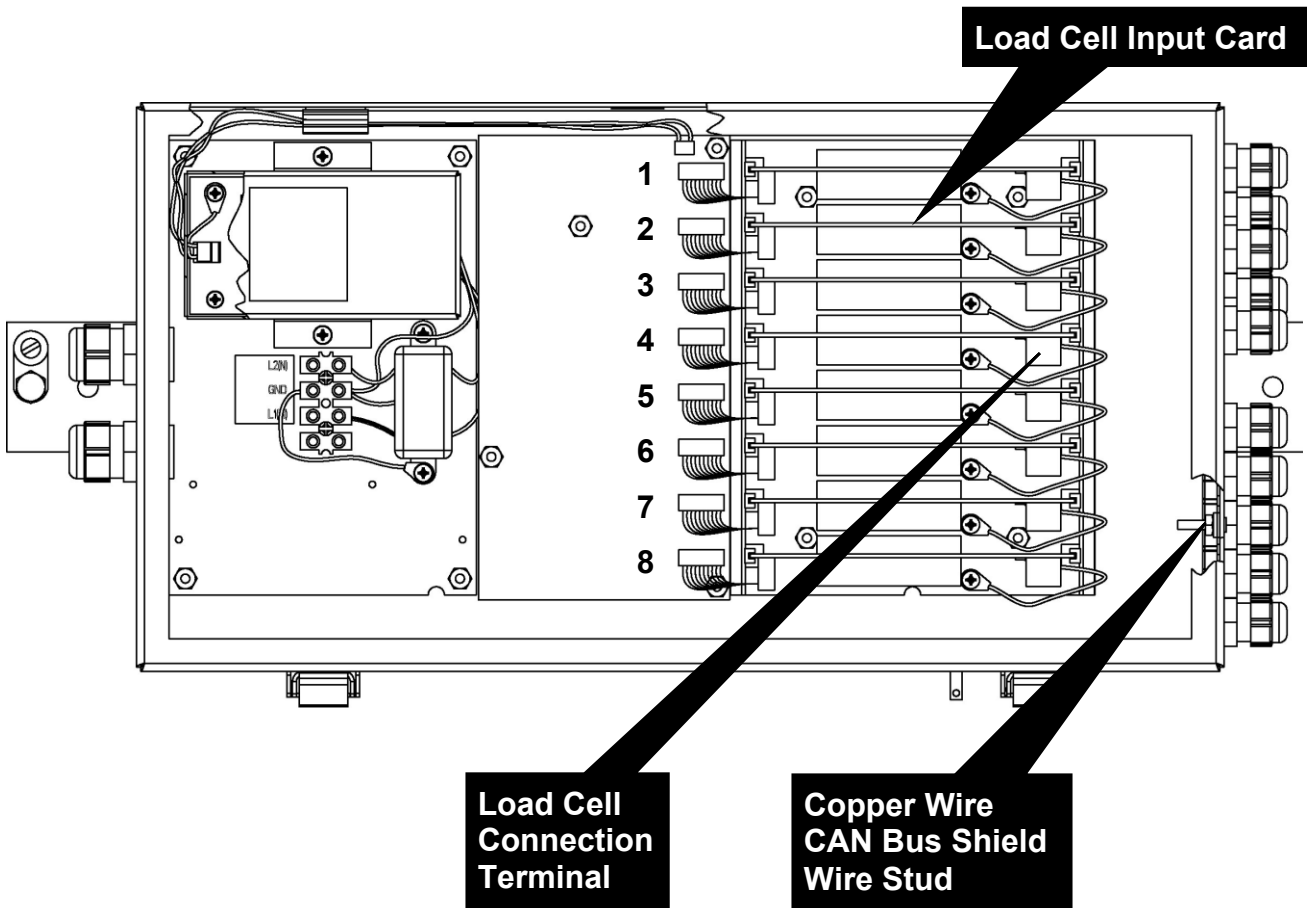

FIGURE NO. 3
LOCATION OF LOAD CELL INPUT CARDS,
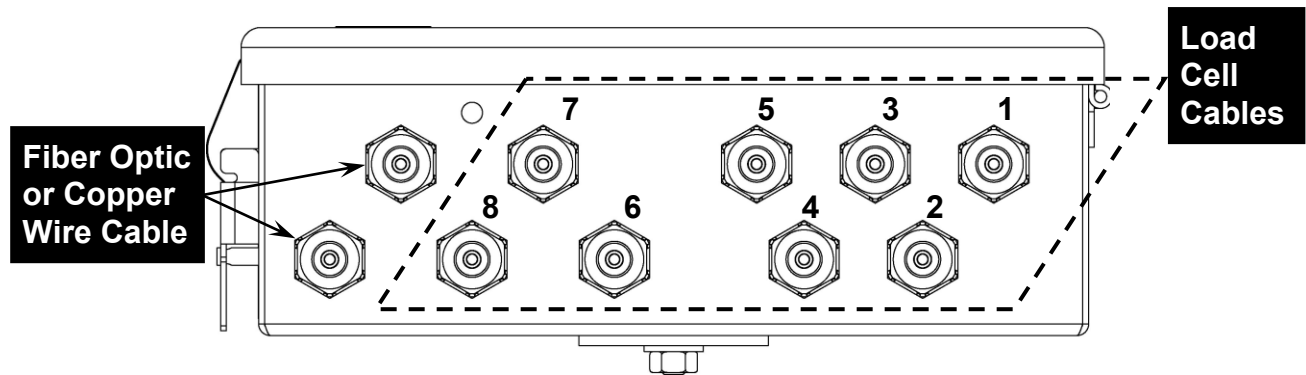**CONNECTION TERMINALS, AND**
COPPER WIRE CAN BUS SHIELD WIRE STUD

NOTE: Wiring the load cells following the layout shown in FIGURE NO. 27 (LOAD CELL AND LOAD PLACEMENT) will allow easy calibration with SmartCal®.

INSTALLATION, CONT.
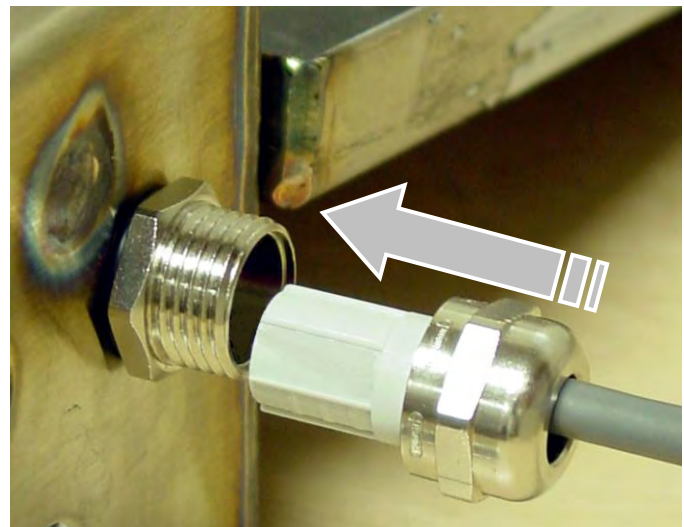
CONNECTION OF LOAD CELLS, Cont.

LOAD CELL CABLE PREPARATION

FIGURE NO. 4
**GLAND CONNECTOR LAYOUT**

Referring to Figure No. 4 for the appropriate gland connector;

1. Loosen and remove the gland connector nut for the first load cell cable.

2. Remove the plastic insert.

3. Route the cable from the first load cell through the nut and plastic insert and into the junction box.

4. With the load cell cable routed into the junction box, remove approximately 3 inches of the outer insulating jacket from the cable exposing the internal wires, then remove approximately 3/8 inch of the insulation from the end of each wire.

5. Cut the shield wire so that it extends past the outer jacket 1/2 to 3/4 inch.

FIGURE NO. 5
GLAND CONNECTOR

FIGURE NO. 6
LOAD CELL CABLE PREPARATION
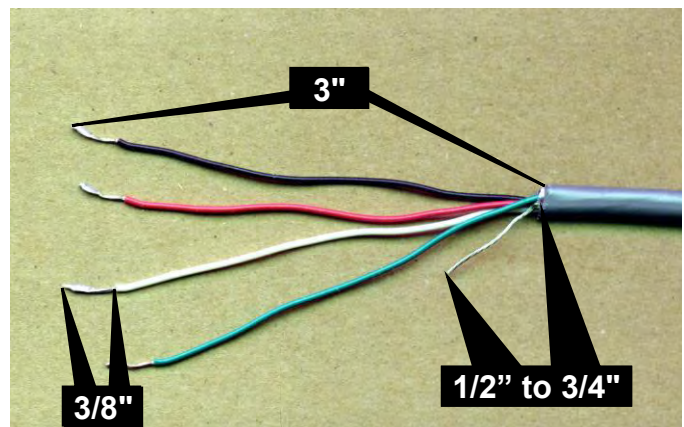
INSTALLATION, CONT.

CONNECTION OF LOAD CELLS, Cont.

REMOVABLE (SCREW) TERMINAL TYPE

1. Begin by raising the No. 1 load cell input card from the iCAN Junction Box card guide and removing the 7 connector terminal block. To remove the terminal block, hold the card in place and grasp the terminal block connector and pull straight back away from the card.

2. Loosen the screws 1, 3, 5, and 7 in the plug-in screw terminal.

3. Locate the cable from the first load cell and insert the proper wire into the first terminal then tighten the screw. Refer to the labels on the circuit board and the Load Cell Wiring Guide for terminal connections.

4. Repeat this process for each of the remaining wires until all 4 wires have been properly terminated on the plug-in screw terminals.
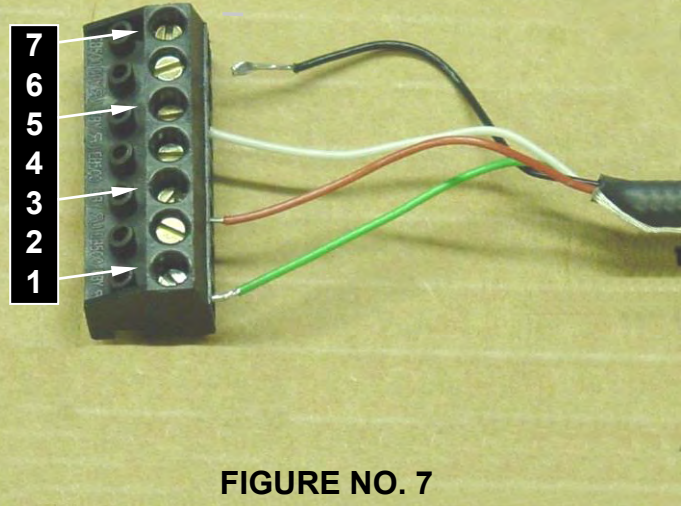
FIGURE NO. 7
TERMINATIONS OF LOAD CELL WIRES INTO PLUG-IN SCREW TERMINALS

PUSH TERMINAL TYPE

1. Begin by raising the No. 1 load cell input card from the iCAN Junction Box card guide and place it on top of the other load cell cards.

2. Locate the cable from the first load cell and insert the proper wire into the first terminal. Refer to the labels on the circuit board and the Load Cell Wiring Guide for terminal connections.

3. To terminate a wire, first press down on the release bar for the terminal, insert the wire into the terminal opening then allow the release bar to return to its original position, locking the wire in place.

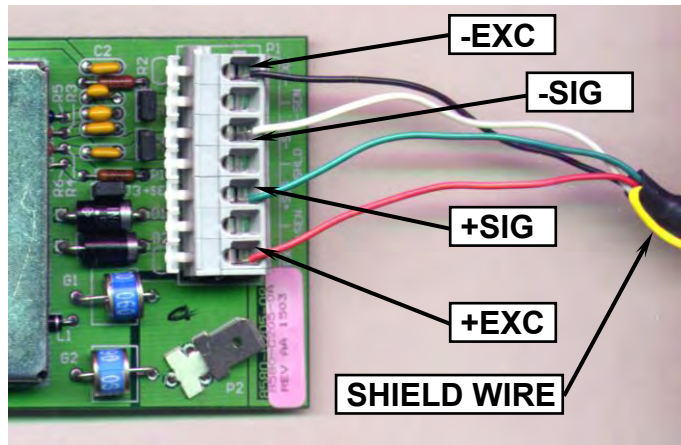4. Repeat the procedure until all of the wires are in place.

FIGURE NO. 8
TERMINATIONS OF LOAD CELL WIRES INTO PUSH TYPE TERMINALS

INSTALLATION, CONT.

CONNECTION OF LOAD CELLS, Cont.

Make sure that the correct color of wire is used for each terminal. Remember that load cells have different colors for the same function and that you must make certain that the proper wires are used. The load cells used in the Cardinal PRC and EPR Series vehicle scales are of different type and color codes. Refer to the Load Cell Wiring Guide for the proper color code.

LOAD CELL WIRING GUIDE

Terminal No.	Function	PRC Series Scales (SCA cells)	EPR Series Scales (DB cells)
1 (+EXC)	+ EXCITATION	GREEN	RED
3 (+SIG)	+ SIGNAL	RED	GREEN
5 (-SIG)	- SIGNAL	WHITE	WHITE
7 (- EXC)	- EXCITATION	BLACK	BLACK

⚠️ **For proper operation, jumpers J1 (-SENS) and J3 (+SENS) must be installed on the load cell input card and jumper J2 (DLB) must be off or on 1 pin only. Refer to Figure No. 9.**
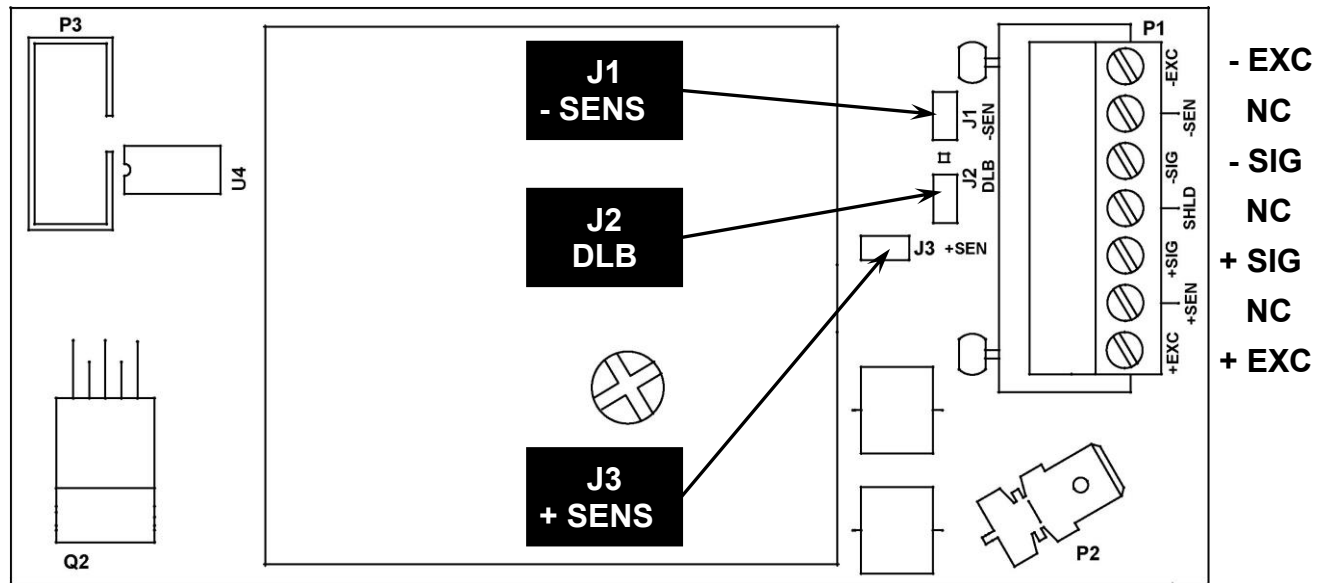
NC = no connection

FIGURE NO. 9
LOAD CELL INPUT CARD

INSTALLATION, CONT.

LOAD CELL CABLE SHIELD WIRE CONNECTION

The load cell cable shield wires must be connected to the gland connectors of the junction box for grounding and to eliminate RFI.

FIGURE NO. 10
LOAD CELL SHIELD
WIRE CONNECTION

1. After all terminations have been made, remove the excess cable from the enclosure.
2. Fold the shield wire back over the plastic insert.
3. Insert the plastic insert (with the shield wire) into the gland connector.
4. The shield wire is secured when tightening the gland connector nut.
5. Do not over-tighten these connectors but make certain they are snug.
6. **DO NOT USE TOOLS!** Finger tighten only!
7. Ensure any unused gland connectors are plugged.

INSTALLATION, CONT.

CONNECTION OF POWER

The next step in the installation of the iCAN Junction Box System is to connect the junction boxes to a source of AC power. Before beginning, make certain that the power is turned off at the distribution panel. Check to make certain that the power is off before proceeding. Note that the power cable consists of three 18 to 20 AWG stranded wires and <u>must</u> be protected by a GFIC breaker and not controlled by a switch. The power should be on continuously.

To connect each wire to the AC power terminal block, first remove approximately one half inch of insulation from each conductor. Loosen each of the three screw terminals then insert each wire into the proper terminal and securely tighten the screw. Refer to the wiring color code table below, Figure No. 11 and the labels in the junction box for the correct terminal connections.
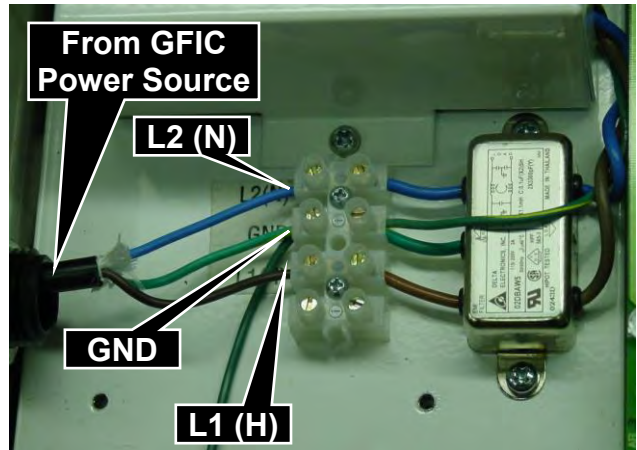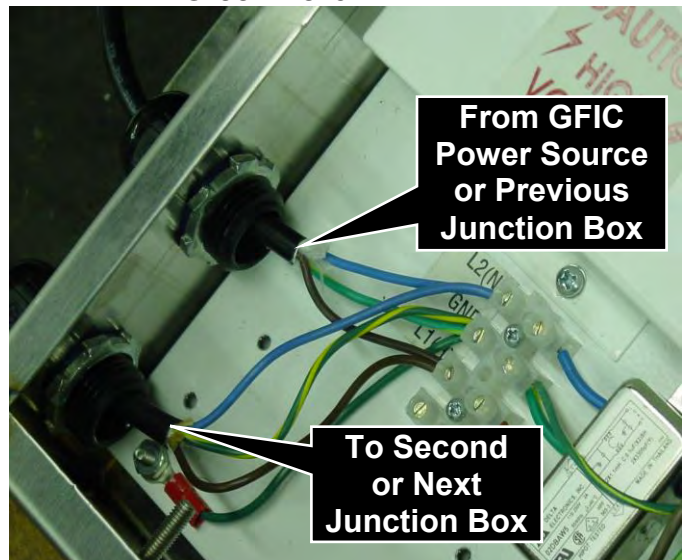

FIGURE NO. 11
AC POWER INPUT TO JUNCTION BOX

AC WIRING COLOR CODE TABLE

Function	U.S. Code	International Code
L1 (H) - *Hot*	Black	Brown
L2 (N) - *Neutral*	White	Blue
GND - *Ground*	Green	Green/Yellow

MULTIPLE JUNCTION BOXES

If your system has more than one junction box, it will be necessary to connect power to the other junction boxes. A power cable is used to connect the first junction box to the second junction box supplying it power. Another power cable is used to connect the second junction box to the third junction box board supplying it power and so on. The power cable (not supplied) consists of three 18 to 20 AWG stranded wires. Connect each wire to the AC power terminal block referring to the wiring color code table above and the labels in the junction box for the correct terminal connections.

FIGURE NO. 12
POWER INPUT BETWEEN
MULTIPLE JUNCTION BOXES

INSTALLATION, CONT.

Loosen the three screws on the screw terminal in the first junction box board. Remove approximately one half inch of insulation from each wire then insert the end of each wire into the proper terminal and tighten the screws securely.

Next, loosen the three screws on the screw terminal on the second junction box. Remove approximately one half inch of insulation from each of the three wires coming from the first junction box board then insert the ends of the wires into the proper terminal and tighten the screws securely.

Use the same procedure to connect additional junction boxes (if present).

Do not turn the power on at this time. Wait until the installation has been completed before applying power to any part of it.

TEST THE LOAD CELL CONNECTIONS

1. Apply power to the iCAN junction box. After initialization*, a scrolling message will be displayed on the iCAN Controller board (see Figure No. 37 and associated description on the following pages).

2. Press S2 to enter the TEST mode. The RUN LED (D5) will turn off and the TEST LED (D4) will turn on. The millivolt output of load cell #1 should be displayed on the six digit display indicated by the number "1" on the single digit INPUT display.

3. Place a weight on the load cell #1 and observe the increase in the millivolt reading for load cell #1.

4. To check for proper wiring and function of each load cell, continue this test for all cells by pressing S3 to step through all load cells attached to the junction box.

* The following initialization messages are displayed on the "current value" LED's on the iCAN junction box controller:

LEd UP_ EE UP_ A2d UP_ SJA UP   **NOTE:** *(These messages are displayed*
r = 1.00   *very quickly and may not be seen).*

Addr = 1 to4 ⎤
A2d = 1 to 8 ⎦—*(The number displayed depends on the scale configuration).*

Then a scrolling message " iCAn bY CArd inAL " will be displayed.

The Input LED will show " -_ (*a dash and decimal point*)".

The Run LED will be on.

The remaining LED's D2, D3, D4, D7 and D8 will be off.

INSTALLATION, CONT.

FIBER OPTIC CABLE INSTALLATION

PLASTIC FIBER

When using plastic fiber optic cable to connect the first iCAN junction box to the 825 indicator, it will be necessary to terminate the end of each cable in a special connector for attachment to the junction box and the indicator. Before installation of the connectors, however, it is first necessary to route the cable between the junction box and the indicator. Note that the cable provided is of a duplex type which means that it contains two fiber optic cores so that it can both transmit and receive data over the same cable and that one of the two conductors has a mark running the length of the cable to distinguish it from the other conductor.

PLASTIC FIBER CABLE PREPARATION

Being careful not to make sharp bends or nick the cable, route a piece of cable from the junction box to the 825.indicator You are now ready to attach a connector to the ends of each fiber optic cable. The connectors can be easily installed on cable ends with standard tools. Polishing the ends of the cable can be accomplished using the Hewlett-Packard HFBR-4593 Polishing Kit (Cardinal p/n 6770-9009) which consists of a polishing fixture, 600 grit abrasive paper and 3 um pink lapping film. The connector may be used immediately after polishing. The following materials and tools are required to terminate the plastic fiber cable:

- Wire cutters or scissors
- 16 gage wire stripper
- Plastic optical fiber (Cardinal p/n 6980-2004)
- Crimpless connectors (HP HFBR-4532) (Cardinal p/n 6610-2003)
- Hewlett-Packard polishing kit HFBR-4593 (Cardinal p/n 6770-9009)

Step 1.
The zip cord construction of the duplex fiber optic cable makes it easy to separate the cable into two conductors. The conductors should be separated a minimum of 4 inches but no more than 6 inches back from the ends to permit installation of the connectors and polishing of the conductor ends. After cutting the cable to the desired length, strip off approximately 0.3 inch of the outer jacket using the 16-gage wire stripper. Refer to Figure No. 13.

Be careful not to nick or otherwise damage the plastic core of the fiber optic cable when removing the outer insulation jacket. Damage to the plastic core can reduce the fibers ability to transmit light, leaving the system inoperable.

INSTALLATION, CONT.
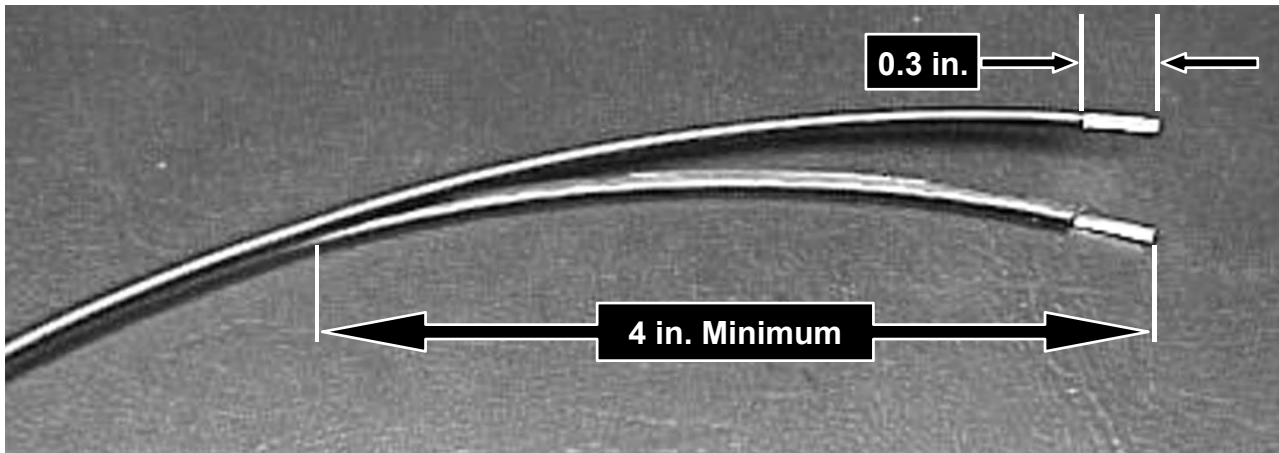
FIBER OPTIC CABLE INSTALLATION, Cont.

0.3 in.

4 in. Minimum

FIGURE NO. 13
PREPARATION OF PLASTIC FIBER OPTIC
CABLE FOR CONNECTOR INSTALLATION

Step 2.
Place a connector body on the end of the cable fiber as shown in Figure No. 14. Slide the connector down until the fiber jacket stops it. The fiber should protrude <u>no less</u> than 0.06 inch from the end of the connector. Flip the top half of the connector over and snap it into the ferrule half. Use only your fingers to do this. **Do not use pliers!** When the top half of the connector latches inside the body of the ferrule half, proper connector-to-cable attachment has been achieved. Manually press the connector halves together in the center of the assembly. The connectors are secured when the top half latches into the ferrule half.
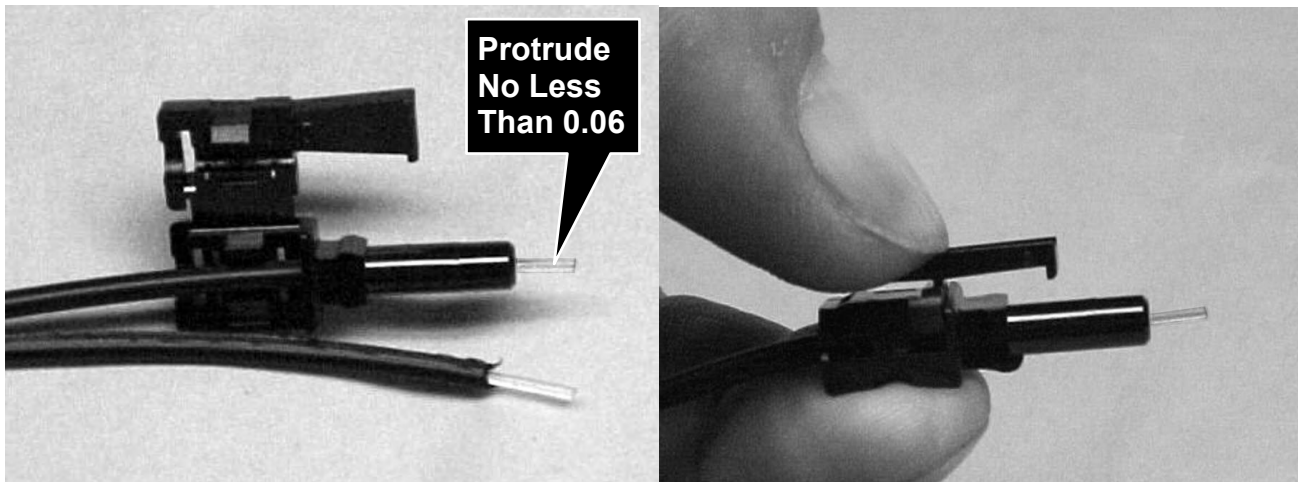

Protrude
No Less
Than 0.06

FIGURE NO. 14
CONNECTOR ATTACHMENT TO OPTICAL FIBERS

INSTALLATION, CONT.

FIBER OPTIC CABLE INSTALLATION, Cont.

Step 3.

Any fiber in excess of 0.06 inch protruding from the connector end should be cut off with the wire cutters or scissors. Insert the connector fully into the polishing fixture with the trimmed fibers protruding from the bottom of the fixture. This plastic polishing fixture can be used to polish the fibers from two connectors *(not recommended)* simultaneously, if you so choose.
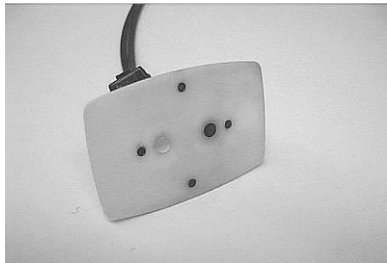
NOTE: The four dots on the bottom of the polishing fixture are wear indicators. Replace the polishing fixture when any dot is no longer visible.

FIGURE NO. 15
POLISHING FIXTURE WEAR INDICATORS

Press the polishing fixture down on the 600 grit abrasive paper. Polish the fiber ends using a figure eight pattern until the connector is flush with the bottom of the polishing fixture. Wipe the connector with a clean cloth or tissue.

Step 4.

Place the fiber end of the polishing fixture on the dull side of the 3 um pink lapping film and continue to polish the fiber ends in the same figure eight pattern for approximately 25 strokes. The fiber ends should be flat, smooth and clean.

FIGURE NO. 16
TRIMMING AND POLISHING
FIBER OPTIC CABLE END
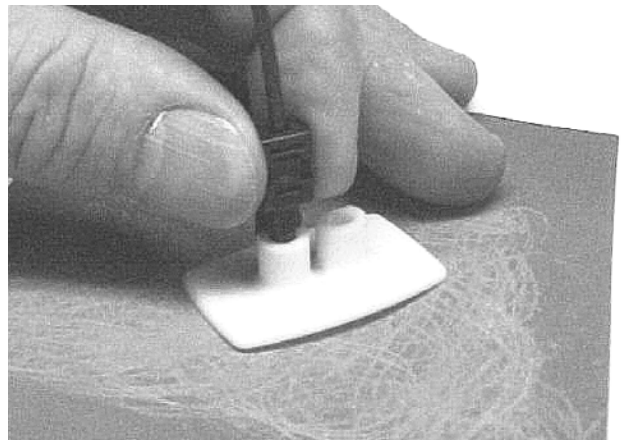
GLASS CORED FIBER

Cardinal does not recommend the field termination and preparation of glass cored fiber optic cable because of the complexity of the process and the increased risk of error. For this reason, when glass cored fiber optic cable is used, the cables will be received pre-terminated. Use the same precautions when routing glass cored fiber optic cable. That is, do not subject them to bends of less than 1-inch radius, take care not to nick the cable or its protective jacket, make sure to keep the cable ends clean and do not crush the cable. Damage to the fiber optic cable can keep the system from working.

INSTALLATION, CONT.

SINGLE JUNCTION BOX SYSTEM

1. Remove the 14 acorn nuts securing the rear panel to the main housing (see FIGURE 27).

2. Loosen and remove the gland connector nut and remove the plastic insert.

3. Note that one of the two conductors has a mark running the length of the cable to distinguish it from the other conductor.

4. Route the fiber optic cable from the junction box through the nut and plastic insert and into the enclosure.

5. Connect the fiber that is marked to the Transmitter connector on the 825CAN Interface card located on the back of the 825 main controller board. Make the connections by fully inserting the fiber connectors into the connectors on the iCAN Interface card. See FIGURE NO. 17.

6. Connect the unmarked fiber connector to the Receive connector on the 825CAN interface board.
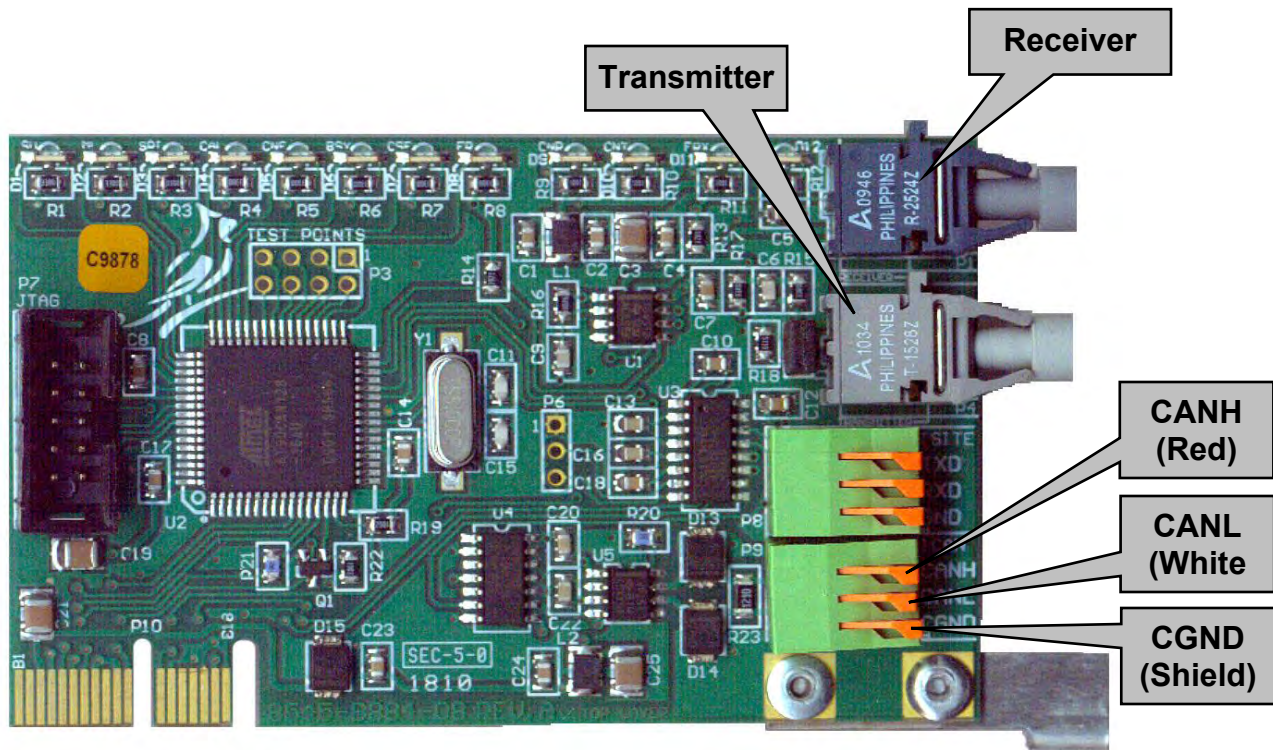
FIGURE NO. 17
825CANP CABLE
CONNECTIONS

INSTALLATION, CONT.

7. Next, at the first junction box, insert the marked (transmitter) fiber optic cable from the 825 through the gland connector then into the connector marked RX (Receive) on port 1 of the first junction box board.

8. Continue by inserting the unmarked (receiver) fiber optic from the 825 through the gland connector then into the connector marked TX (Transmit) on port 1 of the first junction box board. Make the connections by fully inserting the fiber connectors into the connectors on the board. See Figure No. 18.
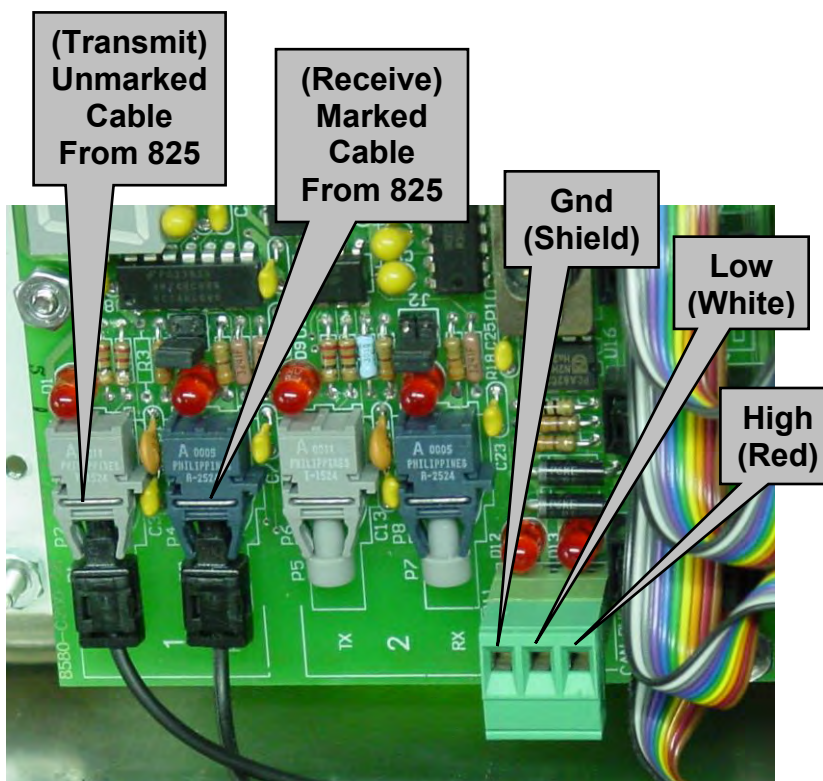
FIGURE NO. 18
JUNCTION BOX
**FIBER AND COPPER WIRE**
CABLE CONNECTIONS

9. **COPPER WIRE INTERCONNECTION**
   a. If copper wire is to be used for the CAN bus interconnection between the 825 and the junction box, connect a three conductor copper wire cable to the GND, LOW, AND HIGH terminal block connectors as shown in figures 17, 18, 21, & 22.

INSTALLATION, CONT.

MULTIPLE JUNCTION BOX SYSTEM

Continue the installation by connecting the first and second junction boxes together. Using a three conductor copper wire cable between the junction boxes, route the cable from the second junction box to the first junction box. Insert the cable through the appropriate gland connector and into the junction box.

Top of Box

Fiber Optic or Copper Wire Cable
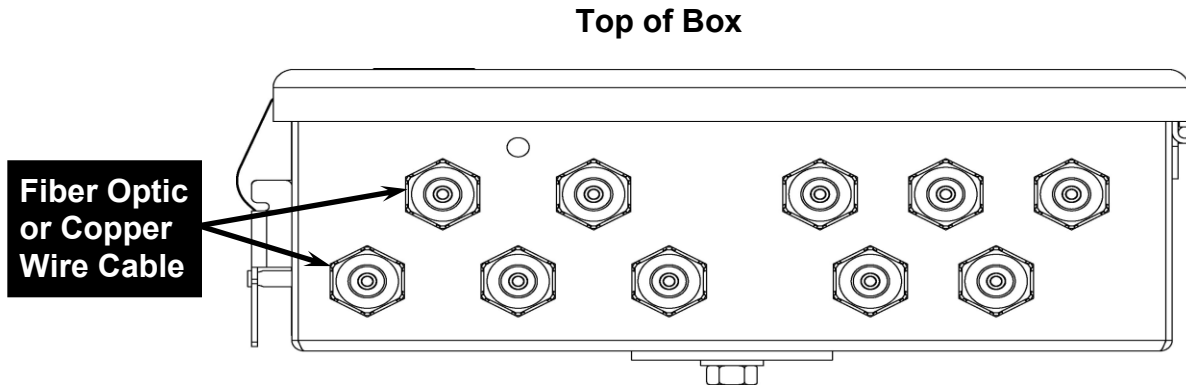
FIGURE NO. 19
GLAND CONNECTOR LAYOUT

Next remove the 3 connector terminal block from the iCAN Junction Box Controller (JBC) connector P11. To remove the terminal block, hold the card in place, grasp the connector and pull straight back away from the card. Refer to Figure No. 20.

Connector P11 Terminal Block

FIGURE NO. 20
P11 TERMINAL BLOCK LOCATION
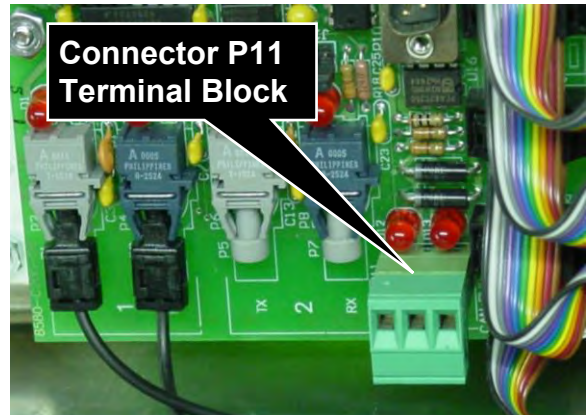
With the cable routed into the junction box, remove approximately 3 inches of the outer insulating jacket from the cable exposing the internal wires, then remove approximately 3/8 inch of the insulation from the end of each wire. Refer to Figure No. 21.

Loosen the 3 screws in the removed terminal block. Insert the colored wires and tighten the screws (FIGURE 22).

3/8"

FIGURE NO. 21
WIRE PREPARATION
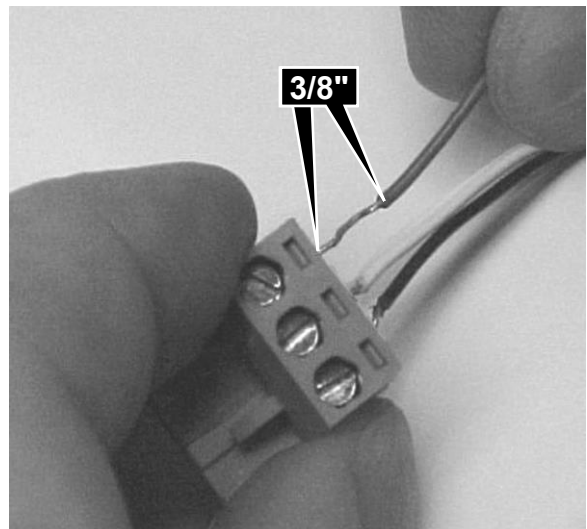
INSTALLATION, CONT.

MULTIPLE JUNCTION BOX SYSTEM, Cont.

If copper wire was used between the 825 and the first junction box, insert the wires from both cables into the terminal block.

Complete the connection by re-inserting the plug-in terminal into the connector marked P11 on the iCAN Junction Box Controller. See Figure No. 23.

Gnd (Shield)

Low (White)

High (Red)
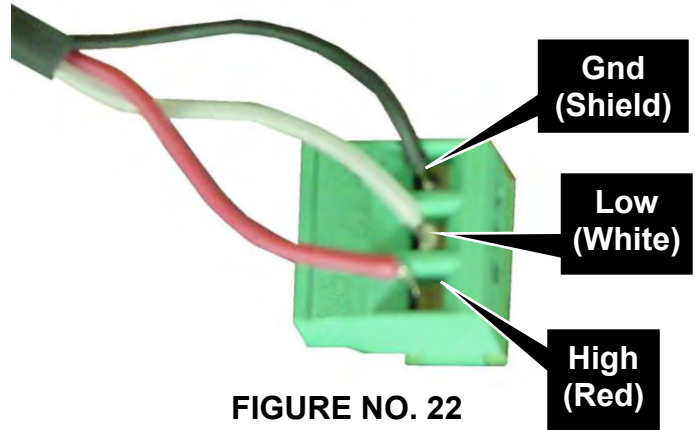
**FIGURE NO. 22
P11 PLUG-IN
TERMINAL CONNECTIONS**

From 825 Weight Indicator

To Second Junction Box
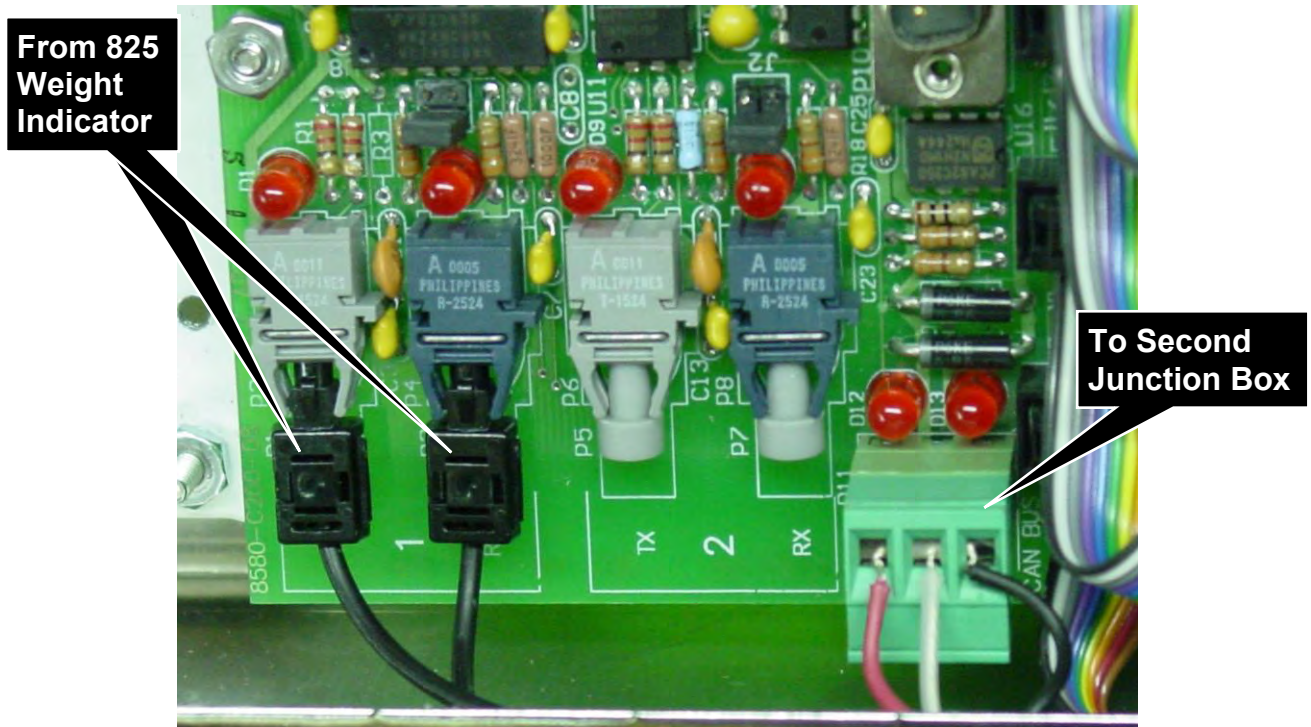
**FIGURE NO. 23
CONNECTIONS FROM 825
TO FIRST JUNCTION BOX
AND THEN TO SECOND
JUNCTION BOX**

INSTALLATION, CONT.

MULTIPLE JUNCTION BOX SYSTEM, Cont.

Proceed to making the following connections at the second junction box.

Referring to Figure No. 20, remove the three (3) connector terminal block the iCAN Junction Box Controller (JBC) connector P11. To remove the terminal block, hold the card in place and grasp the terminal block connector and pull straight back away from the card.

With the cable routed into the junction box, remove approximately 3 inches of the outer insulating jacket from the cable exposing the internal wires, then remove approximately 3/8 inch of the insulation from the end of each wire. Refer to Figure No. 21.

Loosen each of the 3 screws in the plug-in screw terminal. Insert the proper wire into the first terminal then tighten the screw. Refer to Figure No. 22.

Repeat this process for each of the remaining wires until all 3 wires have been properly terminated on the plug-in screw terminals.

Complete the connection by re-inserting the plug-in terminal into the connector marked P11 on the second iCAN Junction Box Controller (JBC). See Figure No. 24.

From First Junction Box
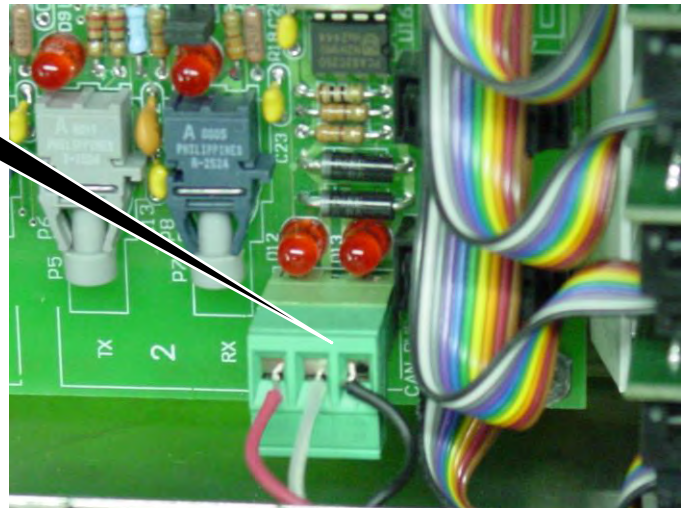
**FIGURE NO. 24
TERMINAL BLOCK
LOCATION**

INSTALLATION, CONT.

FINAL CHECKS

LOADCELL CARDS
Begin by looking at the first junction box. Count the number of load cells connected to the box then verify that a load cell input card has been installed for each load cell connected (up to a maximum of 8). *Remove any cards that do not have an associated load cell connected.*

JUMPERS (see FIGURE 25)
Make certain that jumpers J3 and J4 located within each iCAN Junction Box are properly installed. These jumpers are used to correctly configure the box based on the number of junction boxes in the system.

J3 (Junction Box Address)
Jumper J3 is the used to determine the junction box address (1 to 4). In multiple junction box installations, each box must have a unique address. **NOTE:** Always set the box address to 1 on a single junction box installation and in a multiple junction box installation, start with the first junction box set at 1.

1st box   **2nd box**   **3rd box**   **4th box**
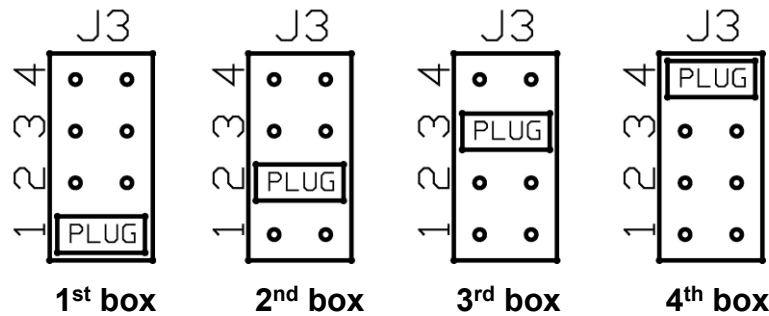
J4 (END NODE)
Jumper J4 is the CAN bus END NODE jumper. **NOTE:** Without the J4 jumper installed properly, neither the fiber optic nor the copper wire bus will operate.

- In a single junction box installation using fiber optic cable or copper wire between the junction box and the 825, J4 <u>must</u> be installed.

- In a multiple junction box installation using fiber optic cable between the first junction box and the 825, J4 <u>must</u> be installed in the *first* and *last* junction box.

- In a multiple junction box installation using copper wire between the first junction box and the 825, J4 <u>must</u> be installed in the *last* junction box only.

Refer to Figure No. 25 and the 8 AND 10 CELL INTERCONNECTION DIAGRAMS section in this manual.

INSTALLATION, CONT.

FINAL CHECKS, Cont.

FIGURE NO. 25
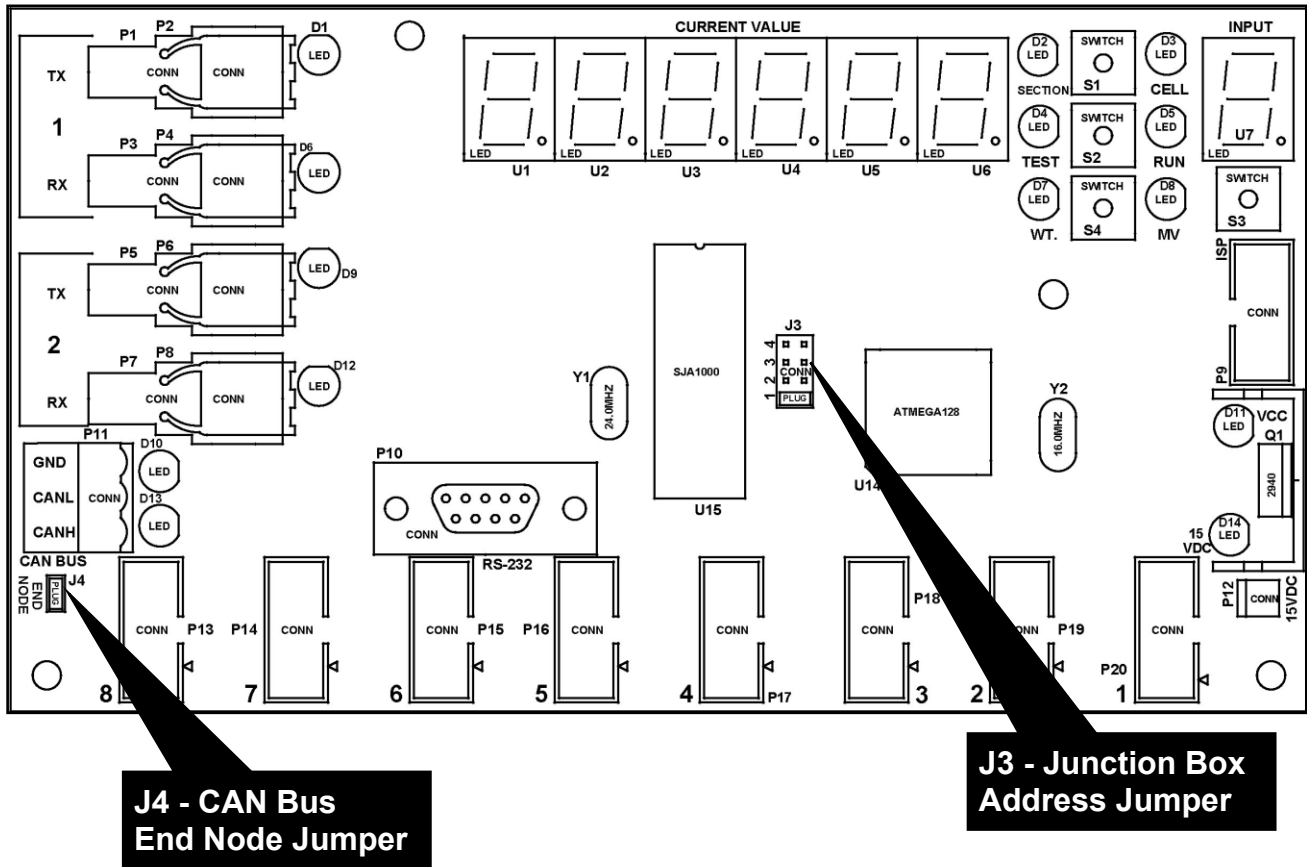**JUNCTION BOX JUMPER LOCATIONS**

⚠ **WARNING!** Failure to properly configure the jumpers will disrupt the serial communication between the junction boxes and the 825 Indicator making the system inoperative. Make <u>absolutely</u> certain the jumpers are properly configured and a load cell card has been installed for each load cell connected to the junction box before continuing with the installation.

INSTALLATION, CONT.

INSTALLATION OF 825 INDICATOR

After completion of the termination of all fiber optic cables, completion of the weight indicator installation may take place. Refer to the Model 825 Weight Indicator Installation and Technical Manual (8545-M838-O1) for additional information. In general, the weight-indicating instrument should be placed in a location that allows the operator to see the scale and is within reach of a power outlet. Connect any additional cables for peripheral devices (like a printer or remote display) to the weight indicator. Refer to the manual that accompanies the peripheral device for additional information on the proper installation connections. At this point, it is always a good idea to review the installation procedure to ensure that all proper connections have been made and that the system is ready to turn on.
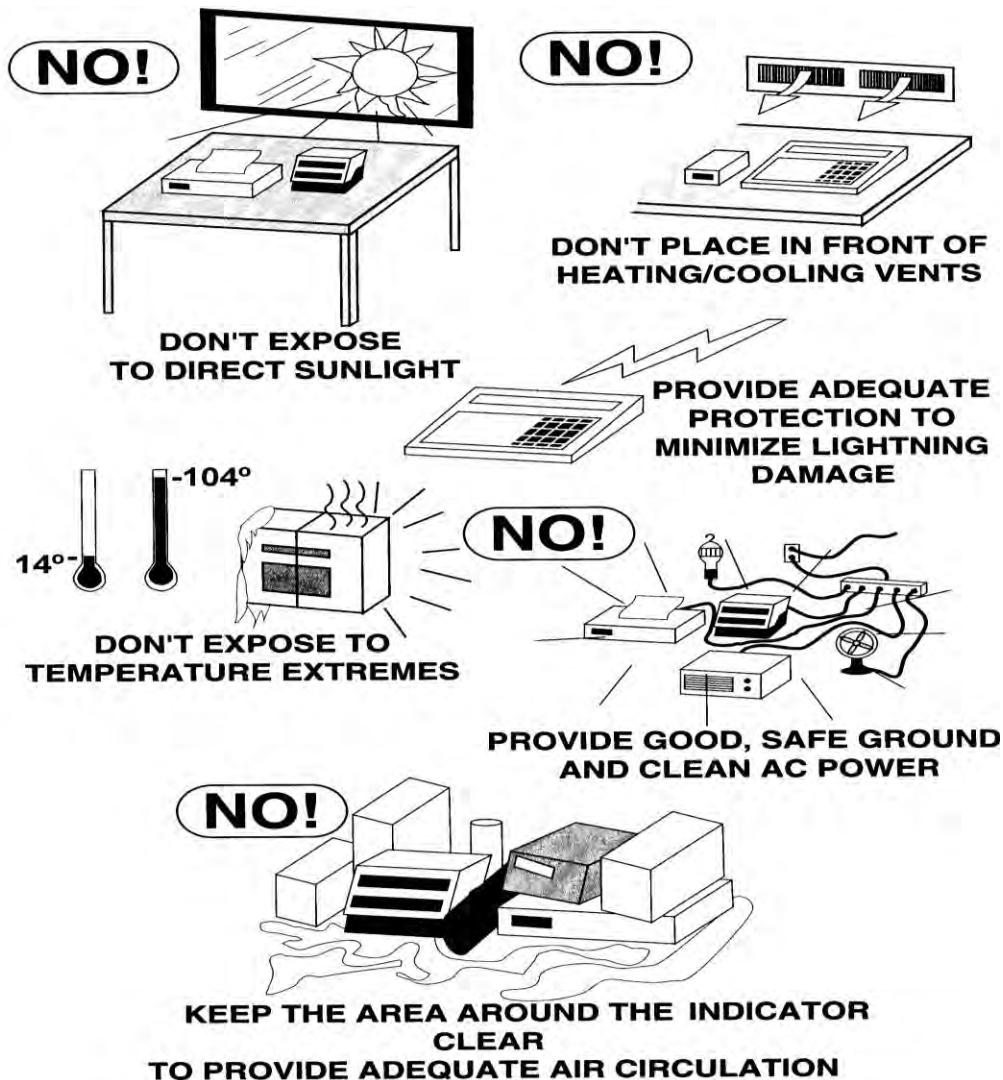
Begin by turning the GFIC powering the iCAN Junction Box(es) to the ON position. Insert the weight-indicating instrument power cord into a power outlet and turn the indicator switch to the ON position. Refer to the following section for information describing the setup and calibration of the iCAN Junction Box System.

INSTALLATION, CONT.

ELECTRICAL POWER

The 825 has been designed to operate from 100 to 240 VAC at 50/60 Hz. Note that a special order is <u>not</u> required for operation at 230/240 VAC.

CAUTION! - To avoid electrical hazard and possible damage to the indicator, DO NOT, under any circumstance, cut, remove, alter, or in any way bypass the power cord grounding prong.

- The socket-outlet supplying power to the indicator should be on a separate circuit from the distribution panel and dedicated to the exclusive use of the indicator.

- The socket-outlet shall be installed near the equipment and shall be easily accessible. Note that the power cord on the 825 serves as the power disconnect.

- The wiring should conform to national and local electrical codes and ordinances and should be approved by the local inspector to assure compliance.

- On installations requiring 230/240 VAC power, **it is the responsibility of the customer** to have a qualified electrician install the proper power cord plug 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 indicator. Many of these disturbances originate within the building itself and can seriously affect the operation of the instrument. These sources of disturbances must be identified and steps must be taken to prevent possible adverse effects on the instrument. Examples of available alternatives include isolation transformers, power regulators, uninterruptible power supplies, or simple line filters.

TRANSIENT SUPPRESSION

The following recommendations will help to reduce transients:

- Always use shielded cables to connect signal wires to the weight indicator.

- Connect the cable shield (indicator end only) to a ground point inside the indicator. Keep wires that extend beyond the shield as short as possible.

- Do not run load cell or signal cables from the weight indicator along side or parallel to wiring carrying AC power. If unavoidable, position the load cell and signal cables a minimum of 24" away from all AC wiring.

- Always use arc suppressors across all AC power relay contacts (see recommendations at http://www.paktron.com/pdf/Quencharch_QRL.pdf).

- Use zero voltage switching relays, optically isolated if possible.

INSTALLATION, CONT.

Before beginning installation of your Model 825 Weight Indicator, make certain that it has been received in good condition. Carefully remove it 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. It is the responsibility of the purchaser to file all claims for any damages or loss incurred during transit.

MOUNTING THE 825

The Model 825 Indicator is housed in a NEMA 4X/IP66 stainless steel wall or desk-mount enclosure. The 825 gimbal may be mounted on a desk, table or other smooth, flat, horizontal surface or may be mounted on a wall. Refer to Figure No. 26 for a layout of wall-mounting.

7.50"

Clearance for #10 size screw
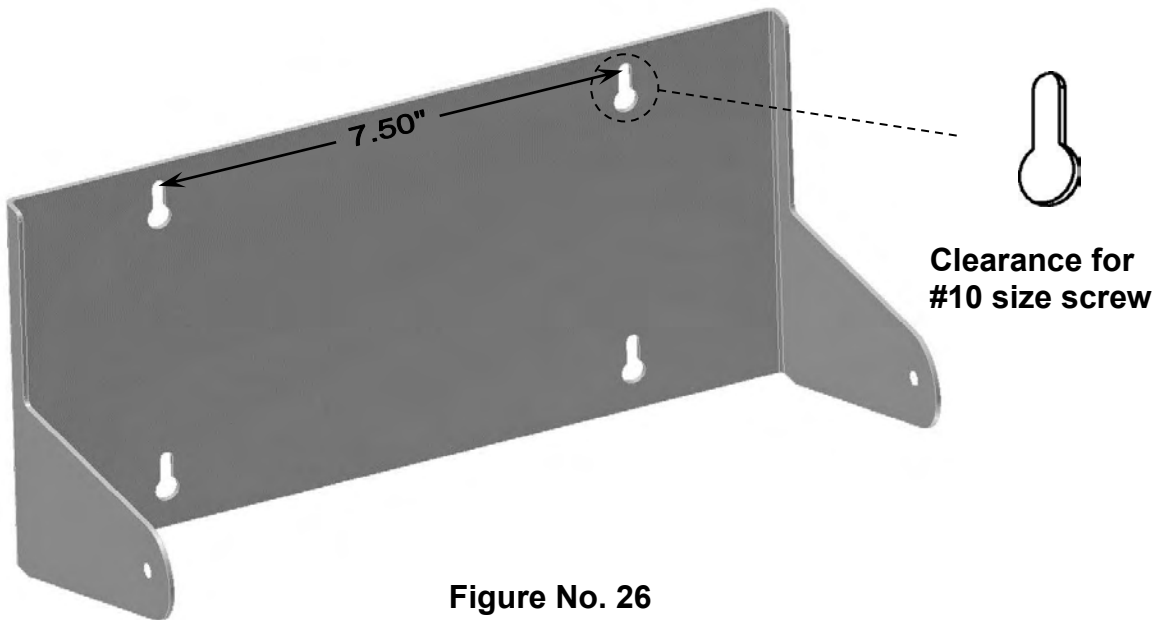
Figure No. 26

If wall mounted, make certain the mounting surface is strong enough to support the instrument. The mounting location should be where the display is easily viewed while being close enough to provide the operator easy access to the keypad. Carefully lay out the mounting hole locations, then drill and install the anchor bolts. Attach the gimbal to the wall and securely tighten the retaining bolts.

INSTALLATION, CONT.

Ground Lug **AC Power 100-240 VAC 0.4 Amp** **10/100 LAN and USB Access Cover** **I/O (Serial, Isolated Inputs/Outputs) or Additional Scales**

Scale

Figure No. 27

INSTALLATION, CONT.

ICAN I/O CABLE INSTALLATION

1. Remove the 14 acorn nuts securing the 825 rear panel to main housing.

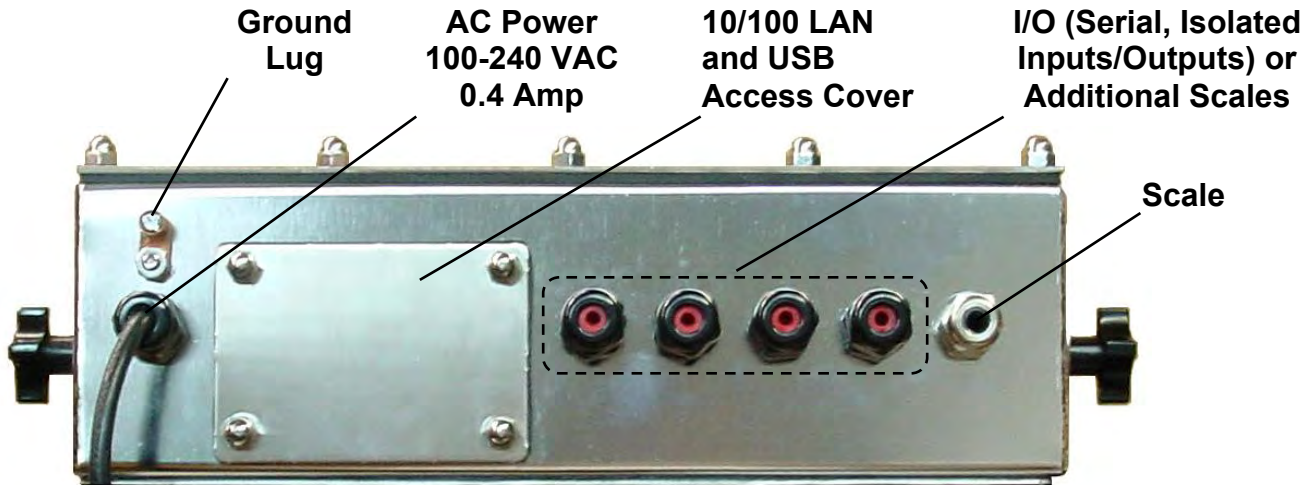**2.** Loosen the gland connectors for the iCAN cables. Refer to Figure No. 27 for the gland connector layout.

3. Slip the iCAN cables through the gland connector and into the enclosure.

4. Remove 2 inches of the outer insulation jacket of the copper wire cable.

5. Next, remove 1/4 inch of insulation from each of the wires.

6. Connect each of the wires to the iCAN I/O terminal block (P10) referring to Figure No. 17 for terminal block locations.

7. To terminate a wire, use a small flat blade screwdriver and press down on the release bar for the terminal. Insert the wire into the terminal opening. Remove the screwdriver, allowing the release bar to return to its original position, locking the wire in place. See Figure No. 17.

8. Repeat procedure until all of wires are in place.

9. Feed the fiber optic cables through the large gland connector provided and connect to the fiber optic connectors on the 825CANG/P option board, matching transmit and receive functions.

> **NOTE:** Care needs to be taken to not make sharp bends in the fiber optic cable to prevent the glass or plastic core from breaking.

RE-INSTALLING THE REAR PANEL

After all terminations have been made;

1. Remove the excess cable from the indicator enclosure and securely tighten each of the cable gland connectors.
   - Do not over-tighten these connectors but make certain they are snug.
   - **DO NOT USE TOOLS!** Finger-tighten only!
2. Ensure any unused gland connectors are plugged and replace the rear panel.
3. Secure the rear panel with the 14 acorn nuts removed earlier, following a diagonal pattern when tightening the acorn nuts.

SETUP AND CALIBRATION

The setup and calibration of the iCAN system is accomplished entirely from the keyboard on the Model 825 weight indicating instrument.

For additional information on setup and operation of the 825 Indicator, refer to the Model 825 Weight Indicator Installation and Technical Manual (8545-M838-O1).

Begin by turning the 825 weight indicating instrument OFF and ON.

```
CARDINAL 825 Loader: 1.08s
                          OS: 10.10.21
Mainboard          ver: 1.17 status: good
Option cards:      2 slots: II_____
Slot:   1 SIB      ver: 0.06 status: good
Slot:   2 DIO      ver: 0.02 status: good




Press:

1. Application program

2. Standard indicator

3. Legal metrology information / Setup
MAC Address: 00:CF:53:29:CF:01
```

If the ICAN is properly configured the "CAN" item will show with "status: good".

Press "3" to ENTER the "Setup menu".

```
Setup Menu
Press:
1. Date/Time
2. Communication
3. Calibration
4. Update software menu
5. Preferences
6. Diagnostics
7. Operators


MAC Address: 00:CF:53:29:CF:01
```

Press "3" Calibration.

```
Setup Scale Number

1. Scale 1          T. Total
                    I. Configure ICAN
```

Press "I" to "Configure ICAN".

```
ICAN Menu

Press:

1. Cell to Scale Assignments

2. Manual Commands
```

Press "1" for cell assignments.

The 825 allows up to 10 scales to be defined.

```
Cell to Scale Assignments
8 ICAN cells
Cell Box Port Scale   Cell Box Port Scale
 1    1    1     1
 2    1    2     1
 3    1    3     1
 4    1    4     1
 5    1    5     1
 6    1    6     1
 7    1    7     1
 8    1    8     1
```

The display will show all of the load cells (up to 32) and the box, port, and scale assignment for each cell.

Where **CELL** is a sequential number assigned to each load cell, **BOX** is a sequential number assigned to each iCAN junction box, **PORT** is the analog connector in the junction box to which the load cell is connected, and **SCL** is the number of the scale the load cell is assigned to. The scale assignments for up to 32 load cells will be displayed.

The iCAN system determines the weight on a given scale by summing the signal from each load cell of that scale. To do this properly, the iCAN system needs to know to which scale each load cell belongs. Using the wiring diagram for the scales and the **CELL BOX PORT SCL** information displayed, determine the cells for each scale. Then, use the following procedure to assign load cells to a scale.

Use the navigation keys to move the cursor to the fields to change and type the appropriate values to allocate the cells and specify how many scales are present.

For example, with one ICAN box with eight cells configured for two scales with four load cells each the configuration may be set as follows:

```
Cell to Scale Assignments
8 ICAN cells
Cell Box Port Scale   Cell Box Port Scale
 1    1    1      1
 2    1    2      1
 3    1    3      1
 4    1    4      1
 5    1    5      2
 6    1    6      2
 7    1    7      2
 8    1    8      2_
```

Press ENTER to accept the changes.

```
Setup Scale Number


1. Scale 1            T. Total

2. Scale 2            I. Configure ICAN
```

Press "1" to configure or calibrate scale 1.

```
Scale 1 - Calibration Options
Press:


1.  Parameters

2.  Calibrate

3.  Fine span

4.  Review

5.  ICAN Diagnostics
```

Press "5" for "ICAN Diagnostics".

```
ICAN Diagnostics - Scale 1
Cell   Weight Max-Min     mV
 1      3.11      0.00  1.2020
 2      3.12      0.00  1.2301
 3      3.45      0.00  1.3410
 4      3.23      0.00  1.5030
 5      3.23      0.00  1.4470
 6      3.54      0.00  1.2730
 7      3.43      0.00  1.1190
 8      3.82      0.00  1.3980




     200.00 G 1 SCL STAT: B8 BD STAT FF

P)rint     <-)Prev     ->)Next    R)eset
```

This display shows the updating weight for each cell. "Max – Min" shows change in weight from the time this display was entered or since the "R" reset key was pressed. The "P" key may be pressed to print the display to a serial printer attached to COM1.

Press the "<- Prev" navigation key to return to the previous display or press the "-> Next" navigation key to show the next diagnostic display.

```
ICAN Diagnostics - Scale 1
Cell   Weight      DL    Wgt-DL
 1      3.11     35.20   -32.09
 2      3.12     35.20   -32.08
 3      3.45     35.20   -31.75
 4      3.23     35.20   -31.97
 5      3.23     35.20   -31.97
 6      3.54     35.20   -31.66
 7      3.43     35.20   -31.77
 8      3.82     35.20   -31.38




     200.00 G 1 SCL STAT: B8 BD STAT FF
P)rint     <-)Prev      ->)Next     R)eset
```

This display shows the weight, dead load and weight minus dead load of each cell.

Press the "<- Prev" navigation key to return to the previous display or press the "-> Next" navigation key to show the next diagnostic display.

```
ICAN Diagnostics - Scale 1
Cell   Weight      DL    Cnt
 1      3.11     35.20    0
 2      3.12     35.20    0
 3      3.45     35.20    0
 4      3.23     35.20    0
 5      3.23     35.20    0
 6      3.54     35.20    0
 7      3.43     35.20    0
 8      3.82     35.20    0




     200.00 G 1 SCL STAT: B8 BD STAT FF
P)rint     <-)Prev      ->)Next     R)eset
```

This display shows the weight, dead load and dead load count of each cell.

Press the "<- Prev" navigation key to return to the previous display or press the "-> Next" navigation key to show the next diagnostic display.

Select "Calibrate" to calibrate an ICAN scale.

SmartCal allows calibration to be performed by placing a calibrated load over each load cell of the scale platform only <u>once</u>. In this method, the indicator will be able to derive calibration constants which will be used to convert information from each load cell into scale weight.

```
Smart Cal? (Y/N)
```

Press "N" and ENTER to calibrate using "Load" and "unload" just as with a SIB scale. Press "Y" and ENTER to perform smart calibration.

```
SMART CAL


Empty Scale
Press "Y"
```

Empty the scale and press "Y".

During SmartCal, the indicator will prompt for the test load to be applied over a particular load cell. If the scale has four or fewer load cells, the order will simply be cell 1, cell 2, and so forth up through cell 4.   If the scale has more than four load cells, the order will be the odd numbered cells first, followed by even numbered cells, in reverse order. For example, on an eight load cell scale, the order would be cell 1, cell 3, cell 5, cell 7, cell 8, cell 6, cell 4, cell 2. This order is used so that calibration can be done using a test cart with a minimal amount of maneuvering required. Refer to Figure No. 27.
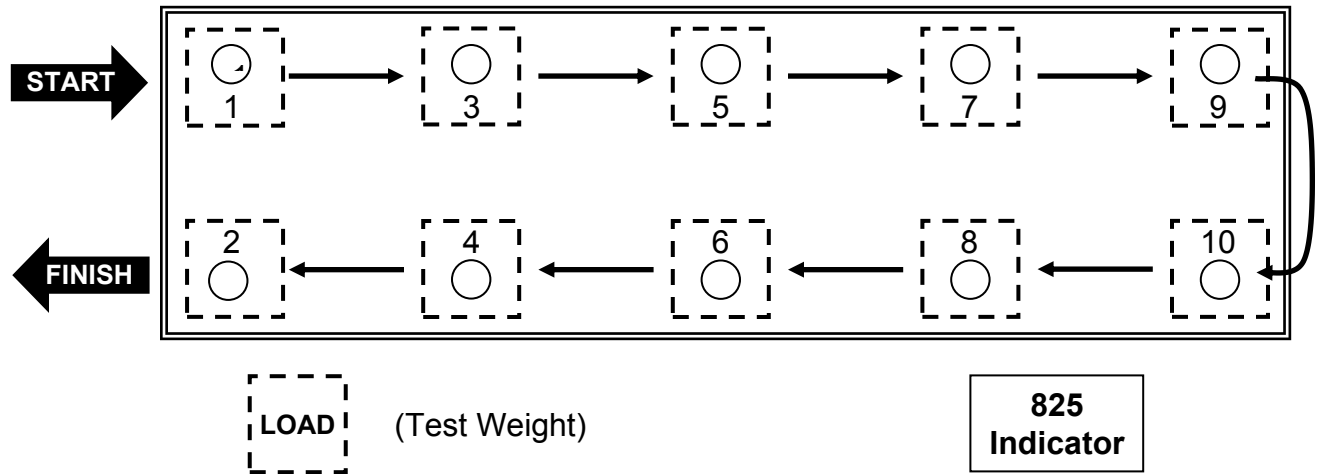
FIGURE NO. 28
LOAD CELL AND LOAD PLACEMENT

⚠ **NOTE: For optimum performance, the test weights must be concentrated over the load cell as much as is safely possible.**

After the test load has been applied to the last load cell and information gathered from the iCAN junction box, the indicator will briefly display **CALCULATING** before displaying the **FINE SPAN ADJUSTMENT** screen. A description of the Fine Span Adjustment operation follows later.

FINE SPAN

```
Scale 1 - Fine Span


           0.0 CZ



U. Up

D. Down                 L. Cells

Z. Zero

Q. Quit
```

Place a known weight on the scale. Any small error will be displayed and can be corrected as follows:

Press the **[U]** key to increase displayed weight 1 grad per press.
Press the **[D]** key to decrease the weight 1 grad per press.
Press the **[Z]** key to zero the scale.
Press the **[Q]** key to save the settings and proceed to the next step.

If it is desired to make adjustments for individual load cells, press the **[L]** key. Refer to Figure No. 29 for an example of the Cell Fine Span Adjustment display.

```
Scale 1 - Cell Fine Span
Cell   Weight      mV
 1*      3.11   1.2020
 2       3.12   1.2301
 3       3.45   1.3410
 4       3.23   1.5030
 5       3.23   1.4470
 6       3.54   1.2730
 7       3.43   1.1190
 8       3.82   1.3980







    200.00 G 1 SCL STAT: B8 BD STAT FF
Select Cell *: Up/Down Navigation Keys
Tweak: U)p D)own  Coarse: +)Up -)Down
```

The cell number showing "*" is the currently selected cell to change. Use the "Up" and "Down" navigation keys to select the cell to change. Press "U" to tweak the span up or "D" to tweak the span down. The "+" key may be press to coarse tweak the span up, or the "-" key to coarse tweak the span down.

Multiple cells may be selected to adjust at the same time. Use the Up/Down navigation keys and press **SPACE** to select or unselect each cell to be adjusted. The selected cell weights will be shown in < > angle brackets.

Each press of the **[U]** key will tweak all selected cells up.
Each press the **[D]** key will tweak all selected cells down.
Press the **SHIFT** and then the **+/-** key for coarse adjustment up of all selected cells.
Press the **+/-** key for coarse adjustment down of all selected cells.

ICAN INTERFACE CARD

The 825CAN Interface Card is the communication bridge between the iCAN Controller Board and the 825 Indicator main electronics. The 825-iCAN system can handle up to three separate scales with total and up to 32 separate load cells. All CAN bus ports are configured with separate fiber optic and copper wire transceivers.

The iCAN Interface card is located in the 825 enclosure and is plugged into the internal TWO SCALE INPUT BOARD connector P2 using a 16 pin dual in-line connector. Fiber optic and copper wire connectors are provided for communications between the iCAN Junction Box and the 825 weight indicator.

SPECIFICATIONS

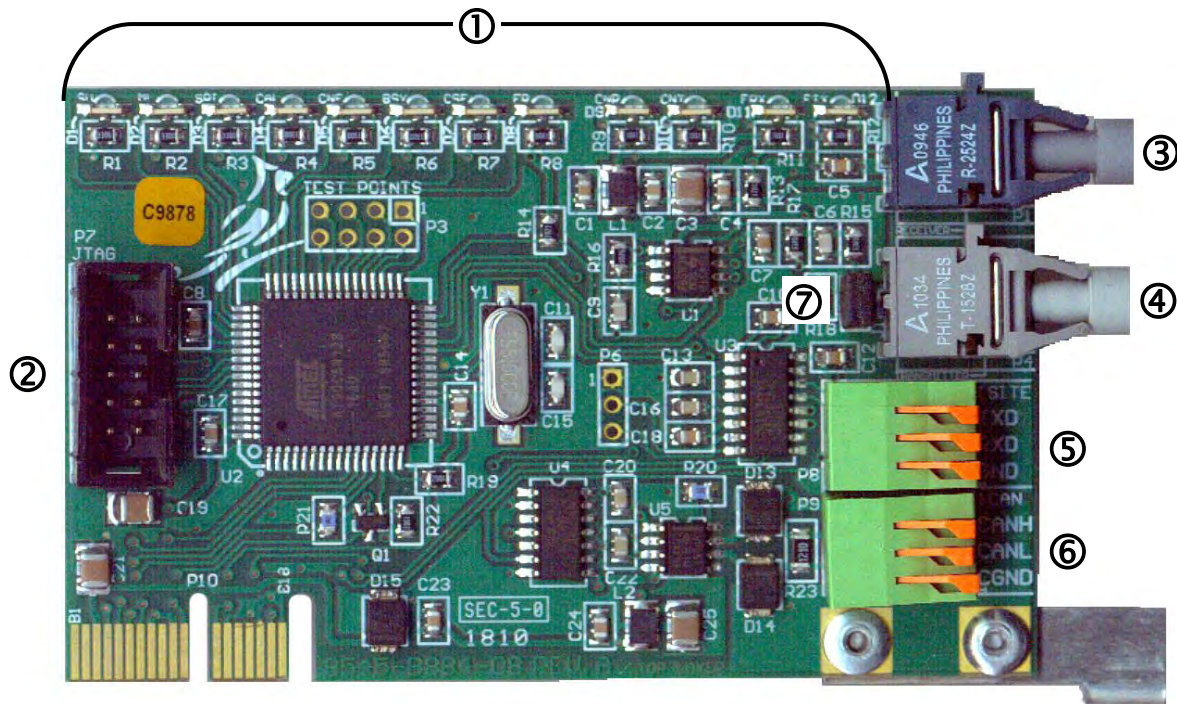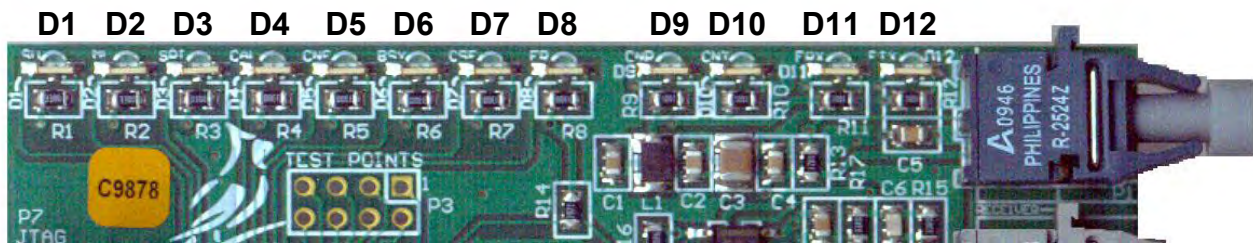| Temperature Range (Compensated):	14 to 104 $^{\circ}$F (-10 to +104 $^{\circ}$C)
Internal Connections:	1 ea Internal Bus 16 pin
External Connections:	1 ea Fiber Optic Input (Receive) 1 ea Fiber Optic Output (Transmit) 3 ea CAN Copper Wire 3 ea RS-232 Serial

FIGURE 35

1. Status LEDs
2. ISP Programming Connector
3. Fiber Optic Receiver Connector
4. Fiber Optic Transmitter Connector
5. Isite Cable Terminals
6. Can Bus Copper Wire Terminals
7. Fiber Optic Boost Jumper (Remove for short runs, Install if needed for long runs)

ICAN INTERFACE CARD, CONT.

DIAGNOSTIC LED FUNCTIONS

D1 D2 D3 D4 D5 D6 D7 D8 D9 D10 D11 D12

LED	DESCRIPTION	FUNCTION
D1	STARTUP (SU)	LED is on during card start up after the LED test
D2	MAINLINE (ML)	Flashes at approximately half the sample rate.
D3	SPI TALK (SPI)	On while SPI bus is active
D4	CAL	Not Used
D5	CAN ERROR (CNE)	LED is on while searching for junction boxes and checking for box differences
D6	BUSY (BSY)	On while card is executing a command from main board
D7	CHECKSUM ERROR (CSE)	Not Used
D8	ERROR (ER)	One or more of the following errors: 1. CAN bus error during search for junction boxes. 2. Junction boxes with same address. 3. No junction boxes found. 4. Junction box address has changed. 5. Number of cell cards in a junction box has changed. 6. The number of scales assigned to a junction box has changed. 7. The cell card data for a junction box has changed.
D9	CANR	Blinks to indicate wired CAN receiver activity.
D10	CANT	Blinks when data is transmitted via wired CAN bus.
D11	FO RXD	Blinks to indicate Fiber Optic receiver activity.
D12	FO TXD	Blinks when data is transmitted via fiber optic.

POWER-UP SEQUENCE

On power-up all twelve diagnostic LED's will light simultaneously then one at a time.

D2, D3, D6, D9, and D10 LED's, and the fiber optic D11 and D12 LED's will blink at the sample rate of the 825.

INSTALLATION OF CALIBRATION SECURITY SEAL

If your Model 825 indicator is used in a commercial application and your local metrology laws require the use of physical sealing, a lead and wire security seal can be installed to prevent the rear panel from being removed from the indicator to gain access to the calibration jumper (P6) thereby preventing unauthorized access to the calibration adjustments. Refer to the Figure No. 36 for a suggested location and details on the installation of the security seal.

> **NOTE:** In order to install the lead and wire security seal, two (2) acorn nuts on the rear panel MUST be replaced with drilled acorn nuts. They are available from the Cardinal Scale Mfg. Parts Department. The part number is 8200-B026-08 (NUT HEX #10-32 ACORN SS DRILLED).
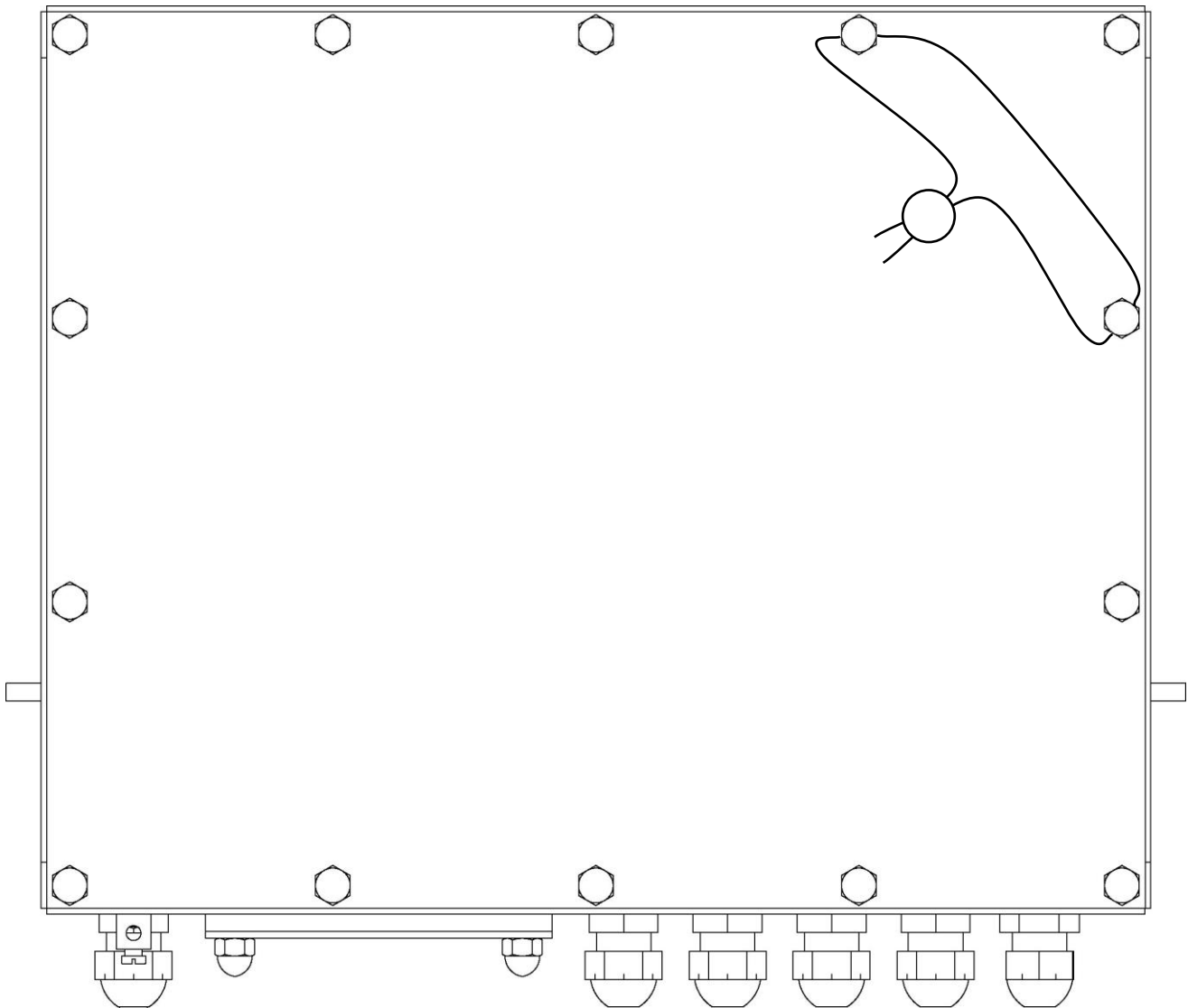
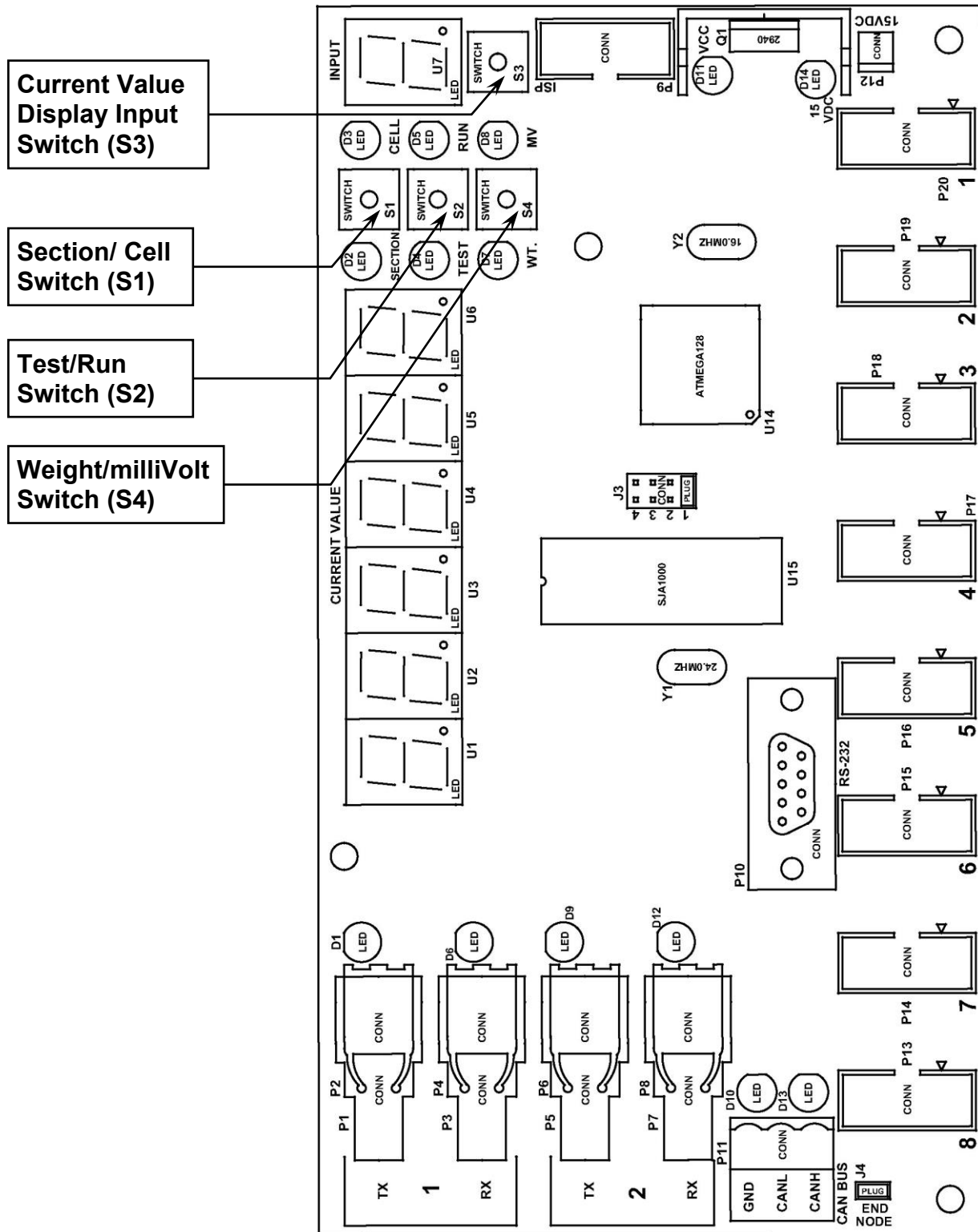**Figure No. 36**

iCAN JUNCTION BOX CONTROLLER (JBC) BOARD

Current Value Display Input Switch (S3)

Section/ Cell Switch (S1)

Test/Run Switch (S2)

Weight/milliVolt Switch (S4)

FIGURE NO. 37
iCAN JUNCTION BOX CONTROLLER (JBC)

iCAN JUNCTION BOX CONTROLLER (JBC) BOARD

STATUS LED'S AND DISPLAY (Refer to Figure No. 37)

D1 = Fiber Optic port 1 (P1) Transmit status LED.

D6 = Fiber Optic port 1 (P3) Receive status LED.

D9 = Fiber Optic port 2 (P5) Transmit status LED.

D12 = Fiber Optic port 2 (P7) Receive status LED.

Normal condition for these LED's is to blink at the sample rate.

D2 = Turned on to indicate display is showing current value of Section displayed by U7.

D3 = Turned on to indicate display is showing current value of the Cell displayed by U7.

D4 = Turned on to indicate display is showing current Test mode value of the Cell or Section displayed by U7.

D5 = Turned on to indicate display is showing current Run mode value of the Cell or Section displayed by U7.

D7 = Turned on to indicate display is showing current Weight value of the Cell or Section displayed by U7.

D8 = Turned on to indicate display is showing current milliVolt value of the Cell or Section displayed by U7.

D10 = CAN port Transmit status LED.

D13 = CAN port Receive status LED.

Normal condition for these LED's is to blink at the sample rate.

D11 = VCC status LED. Indicates 5V regulator output on JBC circuit board.

D14 = 15VDC Status LED. Indicates power to JBC circuit board.

U1 to **U6** = A 6 digit LED display (labeled CURRENT VALUE on the board) used to display error messages, informative messages and values for individual cells, sections or totals.

U7 = A 1 digit LED (labeled INPUT on the board) used to indicate Section number or Cell number to be monitored. A "-." (dash) indicates running without an error.

SWITCHES

S1 (Section/Cell Switch)
Press to toggle display between Section and Cell. Section 1 consists of cells 1 and 2. Section 2 is cells 3 & 4. Section 3 is cells 5 & 6. Section 4 is cells 7 & 8.

S2 (Test/Run Switch)
Press to toggle between Test and Run modes.

S3 (Current Value Display Input Switch)
Used to select the load cell to be monitored. Press this button to advance the cell number. After reaching the last cell the total (t in the display) of all cells in the box will be displayed. Press again to return to cell number one.

S4 (Weight/Millivolt Switch)
Press to toggle display between Weight and milliVolt. While in the mV mode iCan becomes a 6 digit volt meter displaying the cell input in 1/10 micro volt resolution. *More resolution than most hand held multi-meters.*

iCAN JUNCTION BOX CONTROLLER (JBC) BOARD

CONNECTORS (Refer To Figure No. 37)

P1/P2 = Fiber Optic port 1 transmit connector

P3/P4 = Fiber Optic port 1 receive connector

P5/P6 = Fiber Optic port 2 transmit connector

P7/P8 = Fiber Optic port 2 receive connector

P9 = ISP (In System Programming) connector

**P10** = RS232 diagnostic port.

P11 = CAN bus copper wire connector

P12 = Power (15 VDC) connector

P13 to **P20** = Analog board input connectors

JUMPERS

J3 (Junction Box Address Jumper)
J3 is the used to determine the junction box address (1 to 4). In multiple junction box installations, each box must have a unique address. **NOTE:** Always set the box address to 1 on a single junction box installation and in a multiple junction box installation, start with the first junction box set at 1.

| 1st box | 2nd box | 3rd box | 4th box |
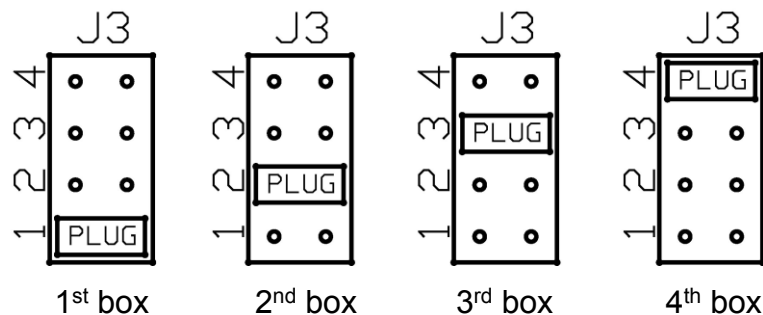
J4 (END NODE)
J4 is the CAN bus END NODE jumper. **NOTE:** Without the J4 jumper installed, neither the fiber optic or the copper wire bus will operate.

- In a single junction box installation using fiber optic cable or copper wire between the junction box and the 825, J4 <u>must</u> be installed.

- In a multiple junction box installation using fiber optic cable between the first junction box and the 825, J4 <u>must</u> be installed in the *first* and *last* junction box.

- In a multiple junction box installation using copper wire between the first junction box and the 825, J4 <u>must</u> be installed in the *last* junction box only.

iCAN JUNCTION BOX CONTROLLER MESSAGES

The following power-up and error messages are displayed on the 6 LED's on the junction box controller, <u>not</u> on the 825 weight indicator display.

The following six messages occur on power-up. Messages 1 to 4 are progress indicators and will not be seen unless an error occurs. **NOTE:** The iCAN Junction Box Controller has no calibration or setup functions, it has diagnostic capabilities only.

POWER-UP MESSAGES

MESSAGE	MEANING
LEd UP	The led driver has been initialized.
EE UP	The m128 novram has been tested and RAM variables loaded.
A2d UP	The analog boards have been initialized and interrupts enabled.
SJA UP	The Can Controller has been initialized.
r: XX.X	This message will be displayed for three seconds when power is first applied to the Junction Box Controller (JBC) board. Note that XX.X is the JBC software revision level.
A2d:X	The number of analog boards recognized as running. Displayed after *r:* XX.X for three seconds.
Addr:X	The X indicates the setting of junction box address jumper, J3.
CAn:50 or 60	If the jbox display indicates *CAn:50* or *60* at power-up, the jbox transmitter to 825CAN receiver link is broken. A coarse test for an open fiber optic cable (without copper wire connected), is to pull the cable out of the receiver connector at the junction box and 825 iCAN interface card (one at a time). - If you see a constant red light, the cable is not completely open and you should replace the 825 iCAN interface card. - If no light is present at the junction box transmitter, you should replace the junction box controller. - If you see a red light at the junction box transmitter, but not at the 825 iCAN interface card end, you should replace the cable. With the copper wire connected, the red light will blink at the sample rate.

iCAN JUNCTION BOX CONTROLLER MESSAGES

ERROR MESSAGES

CURRENT VALUE LEDS	INPUT LED	
CAn:XX		Indicates a CAN Bus interface problem. • Faulty cable or cable connection. • Faulty circuit on the 825 iCAN interface card *OR* the junction box controller board.
CALb	#	One or more ports have not been previously calibrated or the calibration data has been lost. The port number will be displayed on Input LED U7. • Re-calibrate the scale associated with the load cell.
EE Err	#	One or more load cell input cards have EE RAM failure. The card number will be displayed on Input LED U7. • Replace the load cell input card indicated by the input LED U7.
nO dAt	#	One or more load cell input cards have reported zero for sample. The card number will be displayed on Input LED U7. • Replace the load cell input card indicated by the input LED U7
nO Int	#	One or more load cell input cards have failed to take a sample in three seconds. The card number will be displayed on Input LED U7. • Replace the load cell input card indicated by the input LED U7
nO A2d	#	Either a port has an load cell input card with no scale/cell assignment or a port has a scale/cell assigned with no load cell input card. The port number will be displayed on Input LED U7. • Replace the load cell input card indicated by the input LED U7
St:X		The board has a load cell input error not defined above. • Replace the load cell input card indicated by the input LED U7

825-ICAN ERROR MESSAGES

It sometimes happens. The installation has been completed but the system just doesn't work. Before calling for assistance, there are a few things that can be done to get the system up and running. Remember that there is a logical explanation for all problems and for troubleshooting to be successful, it must be approached in a logical and rational manner. The following error messages, displayed on the 825 weight indicator display, identify possible system problems and possible solutions to those problems.

ERROR MESSAGES AT START-UP
If an ICAN Error is detected when the indicator is started or when entering the calibration menu the display will show:

> Status Error:
>
> Duplicate Address
> Cell Count
> Scale Count
> Compare Data
> Box Address
> No Boxes Found
> CAN Bus

The 825 configuration is stored in both the 825CANG/P and the ICAN junction box(s). A difference has been detected between the configuration in the 825CANG/P card and the configuration read from the ICAN junction box(s).

If the change was intentional (i.e., the system is a new installation or has been moved to a scale with a different configuration, calibration and setup is required.

The display will prompt "ICAN Action: " and allow the allow cycling through the selections using the space bar.

> No Change
> Clear NOVRAM
> Erase NOVRAM-Defaults
> Reload BOX Data

Press ENTER after selecting the action to peform. An additionally prompt to confirm will appear:

> Clear NOVRAM (Y/N)?
> Erase NOVRAM and load defaults (Y/N)?
> Reload J-Box data from ICAN card (Y/N)?

Press "Y" and ENTER to confirm the action.

825-ICAN ERROR MESSAGES, CONT.

The 825 is equipped with diagnostic software that tests various portions of the indicator's circuitry and verifies proper operation. Should a problem be detected, an error or status message will be displayed alerting the operator to that condition. The following lists these status messages and errors and their meaning.

Weight Status Messages (Displayed Concurrently With Weight)

MOTION
    The scale is in motion based on motion range parameter.

BELOW ZERO
    The gross scale weight reading is below zero.

CENTER ZERO
    The gross scale weight reading is at center of zero.

Weight Status Messages (Displayed In Place Of Weight)

OVER CAPACITY
    The scale weight is over capacity (104% of calibrated capacity).

WEIGHT ERROR
    Weight input signal is out of acceptable range. This may indicate a disconnected or failing load cell.

For other standard 825 error and status messages refer to the **TROUBLESHOOTING** section of the 825 Weight Indicator Installation and Technical Manual, 8545-M838-O1.

825 DIAGNOSTICS

Startup Screen

1. Press the **ON/OFF** key to turn on the 825.

2. The display will perform a short self-test and then change to the Startup screen. Note that when the 825 is initially started, a countdown starting at 7 seconds will appear to the right of `1. Application program`. When the countdown is complete, the application program will automatically start.

3. To allow unlimited time to review the Startup screen, press the Navigation Keys ▽ Down Arrow or △ UP Arrow to stop the countdown.

4. The following describes the Startup screen.

```
A ──────────  CARDINAL 825 Loader: 1.08s   ── B
C ──────────  Mainboard       ver: 1.17 status: good    ── D
E ──────────  Option cards:   2 slots: II▢▢▢▢▢▢▢▢   ── Slots
              Slot:   1 SIB   ver: 0.06 status: good
              Slot:   2 DIO   ver: 0.02 status: good

F ──┤



              Press:

              1. Application program

              2. Standard indicator

              3. Legal metrology information / Setup

G ──────────  MAC Address: 00:CF:53:29:CF:01
```
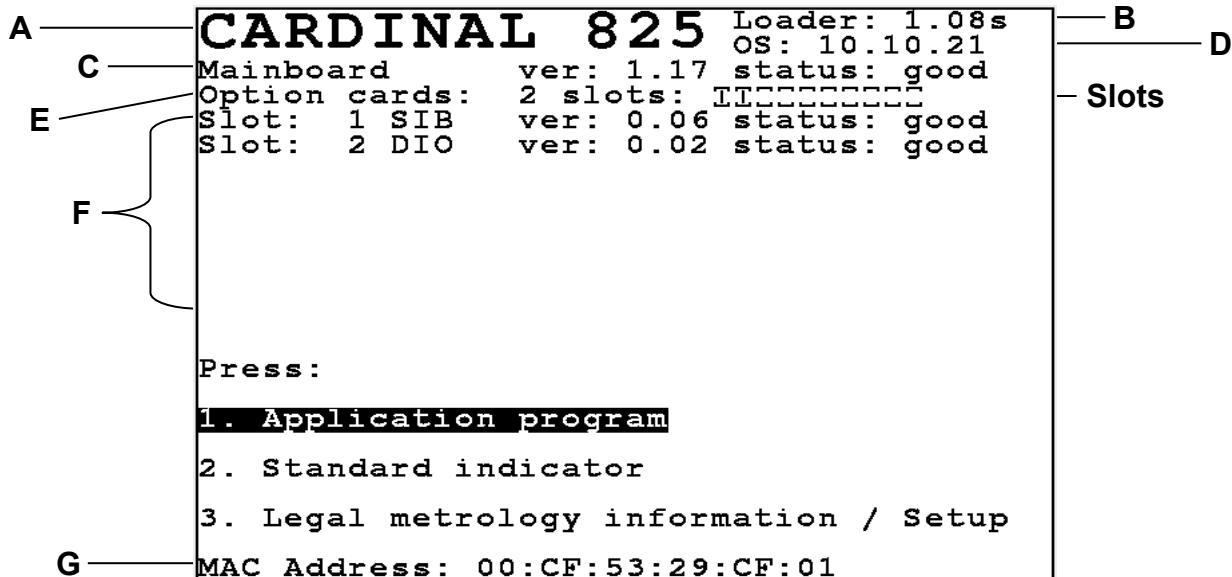
A. The top left of the diagnostic screen displays the indicator model number, Cardinal 825.

B. The top right item identifies the version of the boot loader software (e.g., Loader: 1.08s).

C. This is the main board software version and status report. The main board software performs some diagnostics upon startup, and will show `status: good` if no errors are detected. If an error is detected, a value will be displayed instead of `good`. Refer to the Troubleshooting section of this manual for more information.

D. This is the operating system version (e.g., OS: 10.10.21).

E. This line identifies how many option cards are installed into the main board and what slots they are installed in. A graphic representation of the 10 slots is shown with the filled ones indicator. From the left to right, the slots are numbered one through ten.

F. This part of the screen lists the installed option cards. Each option card is shown on one line along with the version and status of the card. The status will show `good` if no error has been detected or an error code if there is an error. Refer to the Troubleshooting section of this manual for more information.

G. This is the MAC Address of the indicator.

DIAGNOSTICS, CONT.

To Begin Diagnostics

With the Startup screen showing, press the Navigation Keys ▽ Down Arrow to "advance" to (highlight) the `Setup menu` option and then press the **ENTER** key or press the **3** key to select the `Setup menu` option. The display will change to show the `Setup Menu` screen.

> **IMPORTANT!** If the Login and Password protection feature has been enable, the `Login` screen will be displayed instead of the `Setup Menu` screen. Enter the login and then press the ▽ Down Arrow to advance to the password prompt. Enter the password and then press the **ENTER** key to proceed to the Setup Menu.

```
Setup Menu
Press:
1. Date/Time
2. Communication
3. Calibration
4. Update software menu
5. Preferences
6. Diagnostics
7. Operators


MAC Address: 00:CF:53:29:CF:01
```

Diagnostic Menu

> With the Setup Menu displayed, press the **6** key or use the Navigation Keys to select (highlight) `6. Diagnostics` and then press the **ENTER** key. The display will change to show the `Diagnostics Menu` screen.

```
Diagnostics Menu
Press:
1. Mainboard comm. test
2. Mainboard I/O test
3. SDRAM test
4. NOR Flash test




```

DIAGNOSTICS, CONT.

Mainboard comm test

With the Diagnostics Menu displayed, press the **1** key or use the Navigation Keys to select (highlight) `1. Mainboard comm. test` and then press the **ENTER** key. The display will change to show the `Mainboard comm. test` screen.

```
Mainboard comm. test
Testing     Action      Address      Errors




```

Test Mainboard I/O

With the Diagnostics Menu displayed, press the **2** key or use the Navigation Keys to select (highlight) `2. Mainboard I/O test` and then press the **ENTER** key. The display will change to show the `Test Mainboard I/O` screen.

```
Test Mainboard I/O

This test cycles digital outputs and
reads inputs. Loop-back connections
are required to prevent errors.

I/O Code From:        0

I/O Code To:         15

Card (0 mnbd):        0




Enter the starting code
out1=1,out2=2,out3=4,out4=8
example 5=out1 and 3
```

DIAGNOSTICS, CONT.

SDRAM Test

With the Diagnostics Menu displayed, press the **3** key or use the Navigation Keys to select (highlight) **3. SDRAM test** and then press the **ENTER** key. The display will change to show the **Test SDRAM** screen.

```
Test SDRAM

Address from:        40020000

Address to:          41F7FFFF

Address increment: 00000001

Starting value:      0

Value increment:     1




Enter the starting address
in hexadecimal.


```

NOR Flash Test

With the Diagnostics Menu displayed, press the **4** key or use the Navigation Keys to select (highlight) **4. NOR Flash test** and then press the **ENTER** key. The display will change to show the **Test NOR Flash** screen.

```
Test NOR Flash
This test ERASES the boot-loader
and operating sytem. This test must
be performed only at properly equipped
programming stations.


NOR test password: _






Enter the password


```

✶ ✶ ✶ WARNING! ✶ ✶ ✶

Performing the Test NOR Flash test will ERASE the boot-loader and operating system. This test must be performed only at properly equipped programming stations.

8 CELL INTERCONNECTION DIAGRAM
(USING FIBER OPTIC CABLE FROM 825 TO JUNCTION BOX)
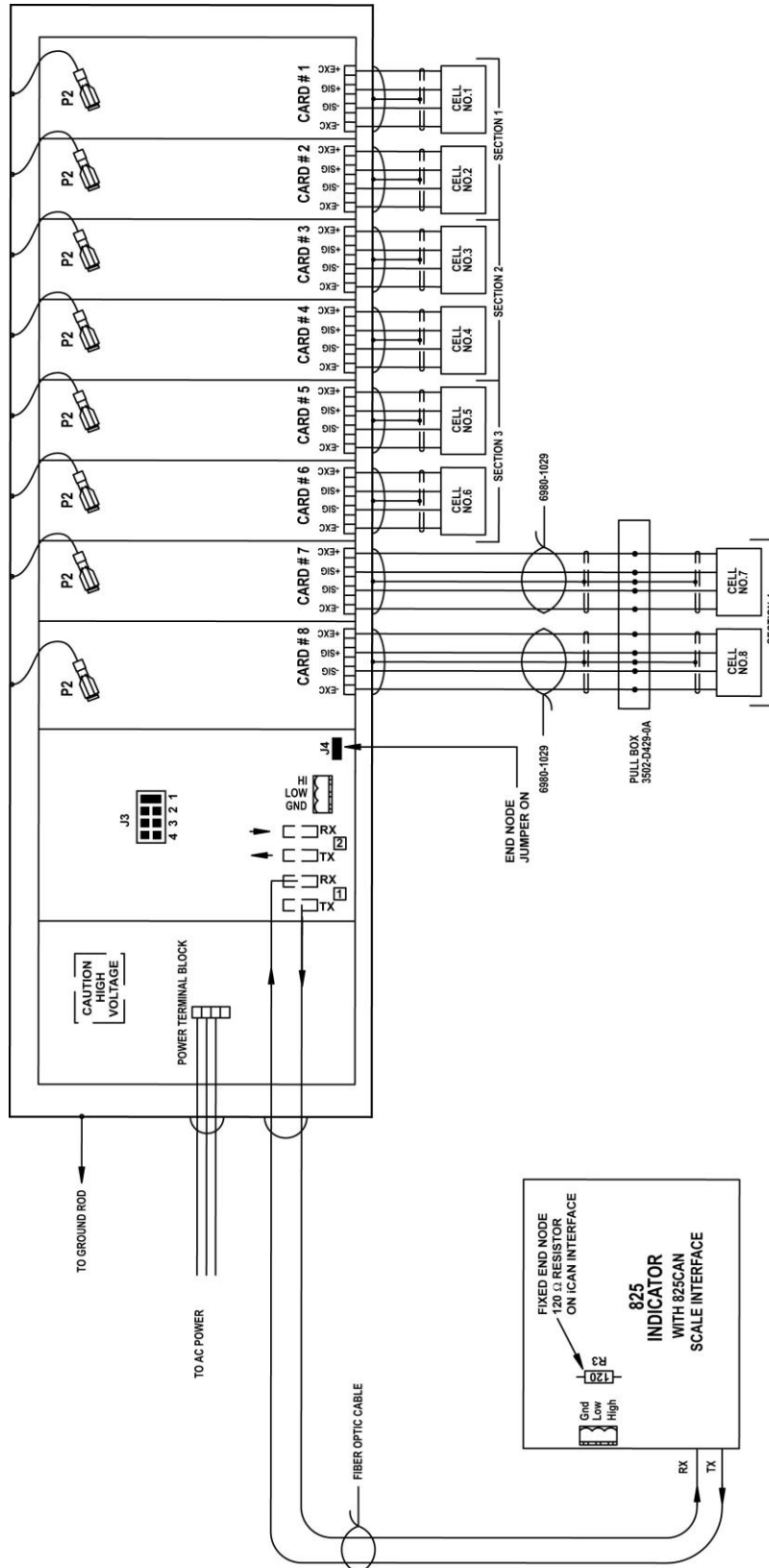
8 CELL INTERCONNECTION DIAGRAM
(USING COPPER WIRE CABLE FROM 825 TO JUNCTION BOX)
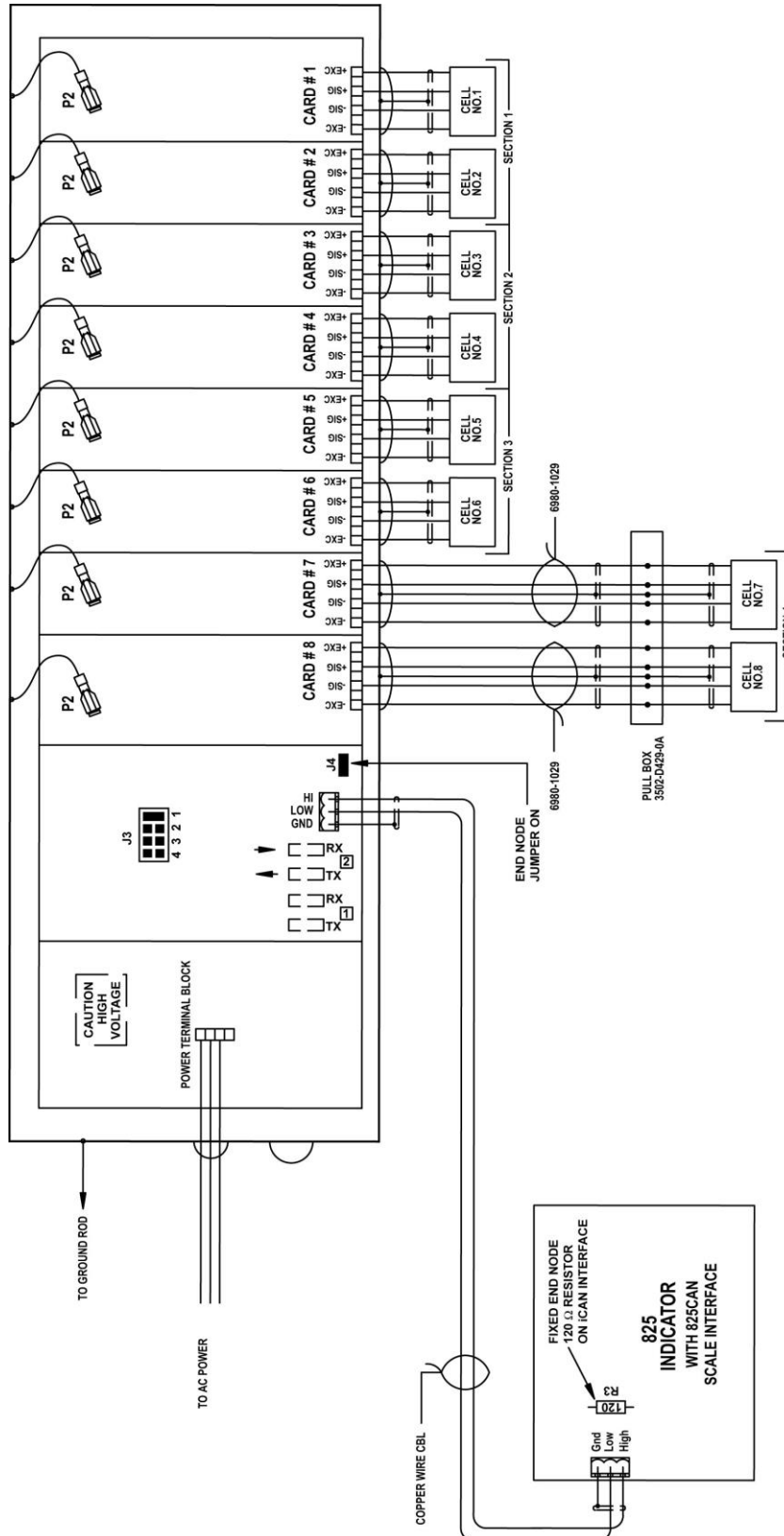
10 CELL INTERCONNECTION DIAGRAM
(USING FIBER OPTIC CABLE FROM 825 TO FIRST JUNCTION BOX)
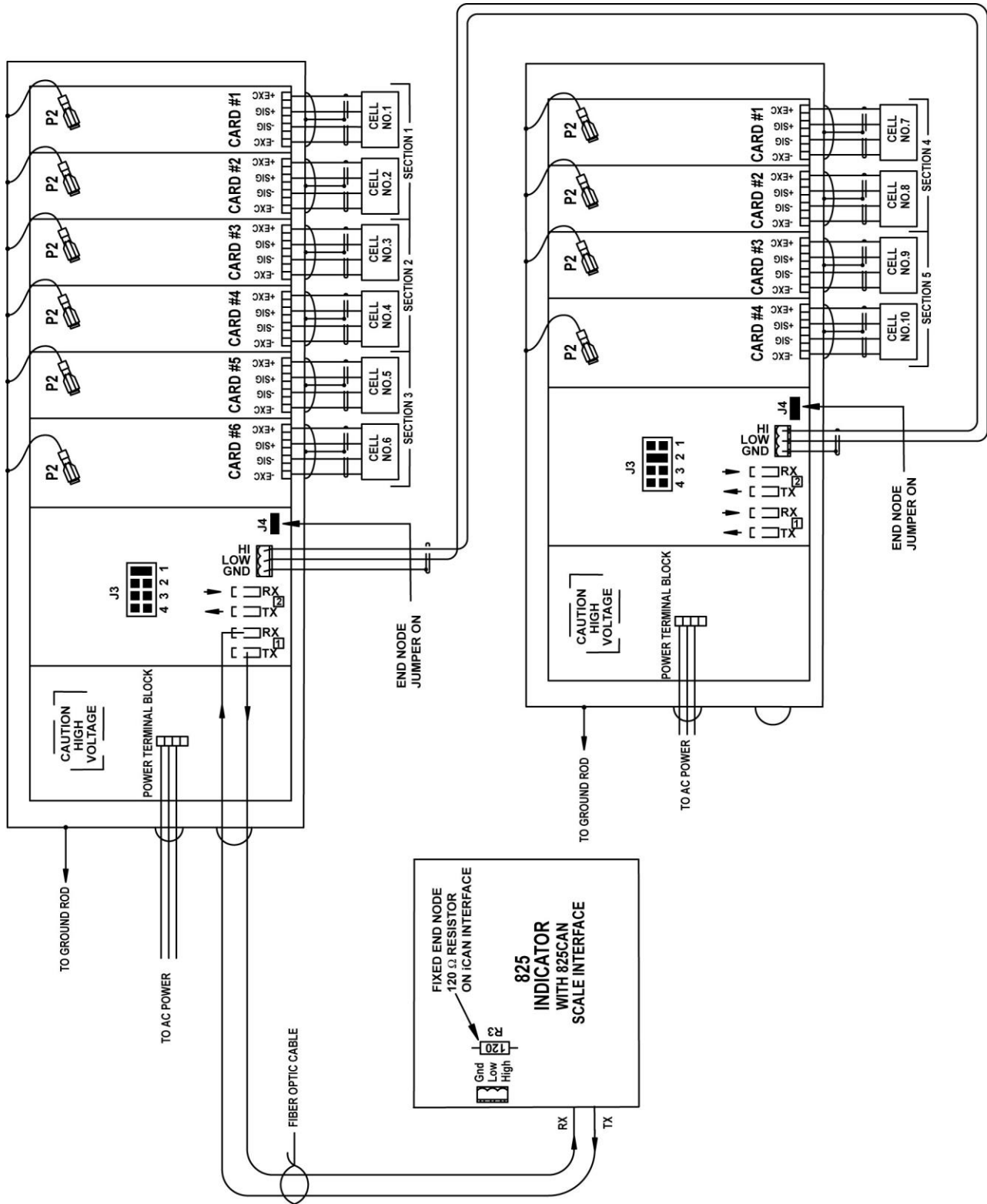
10 CELL INTERCONNECTION DIAGRAM
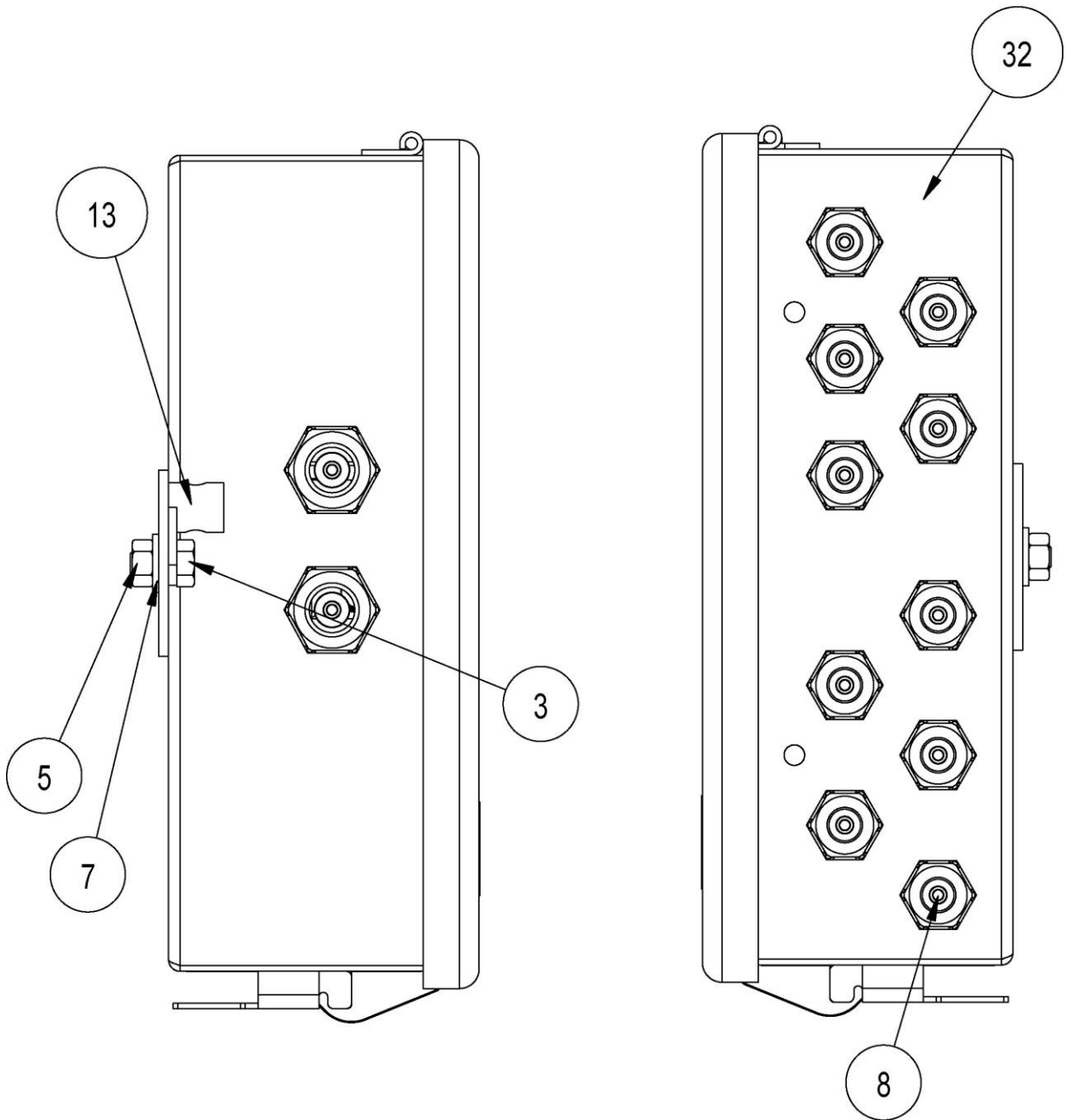## (USING COPPER WIRE CABLE FROM 825 TO FIRST JUNCTION BOX)
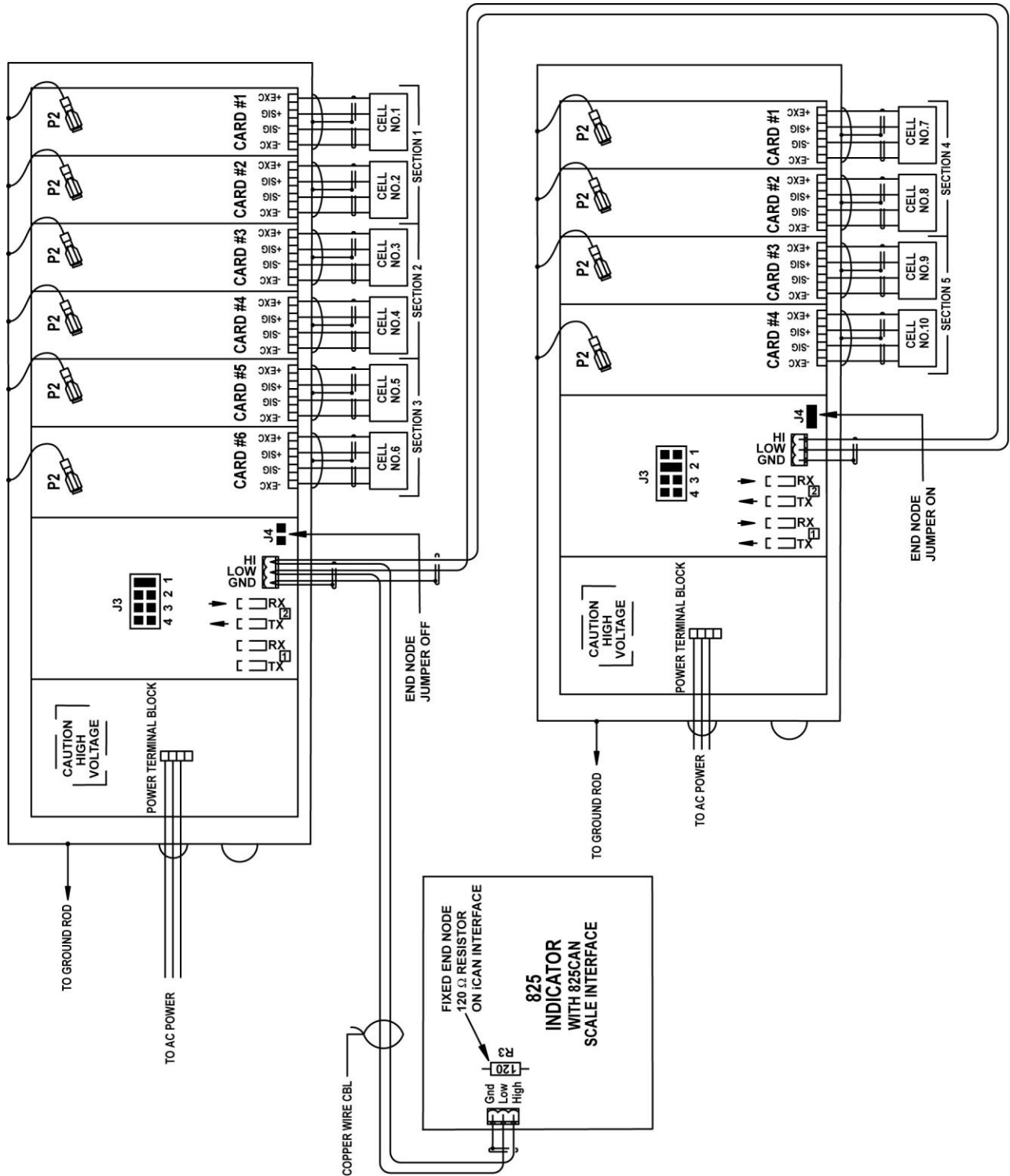
PART IDENTIFICATION
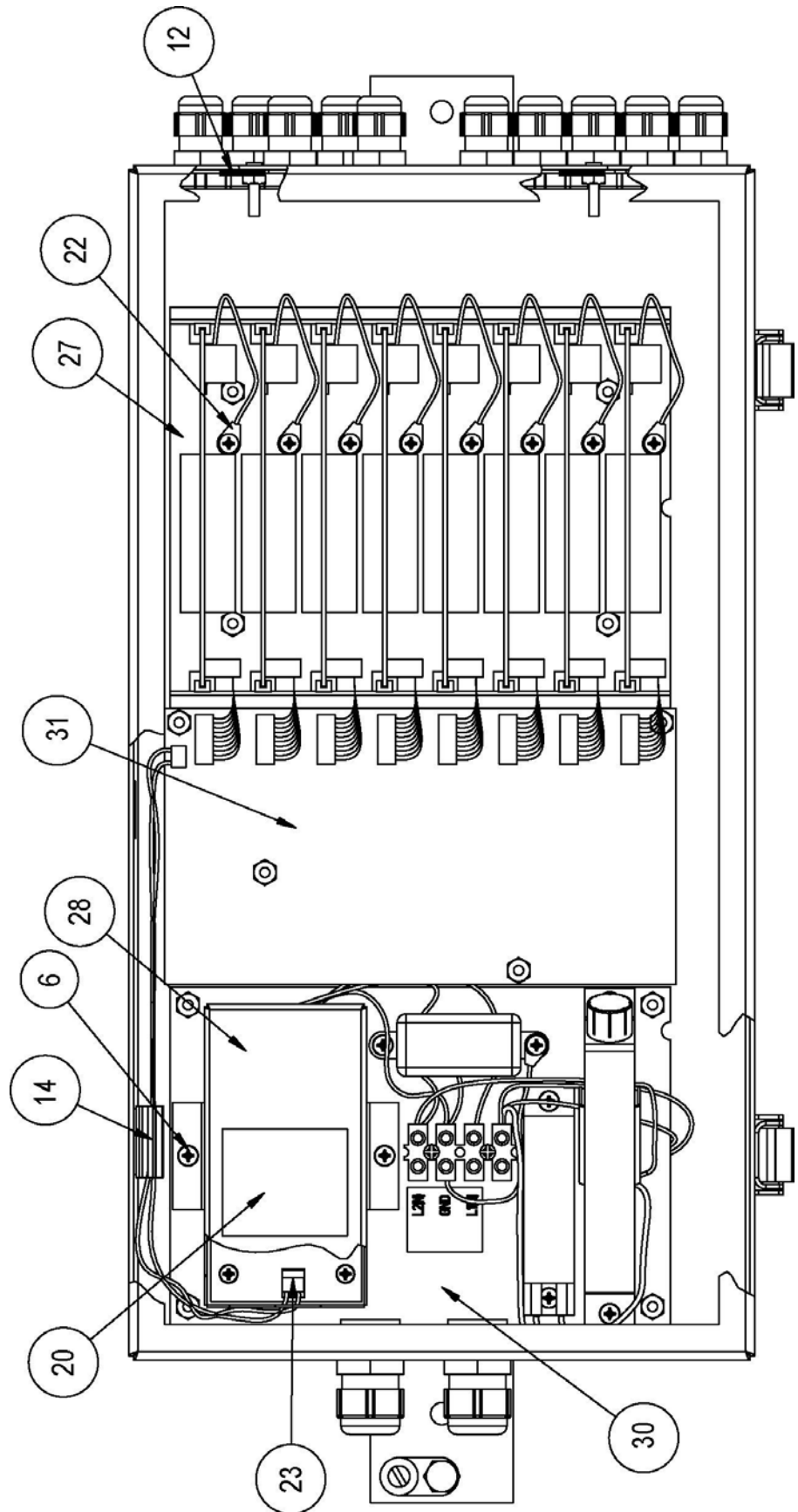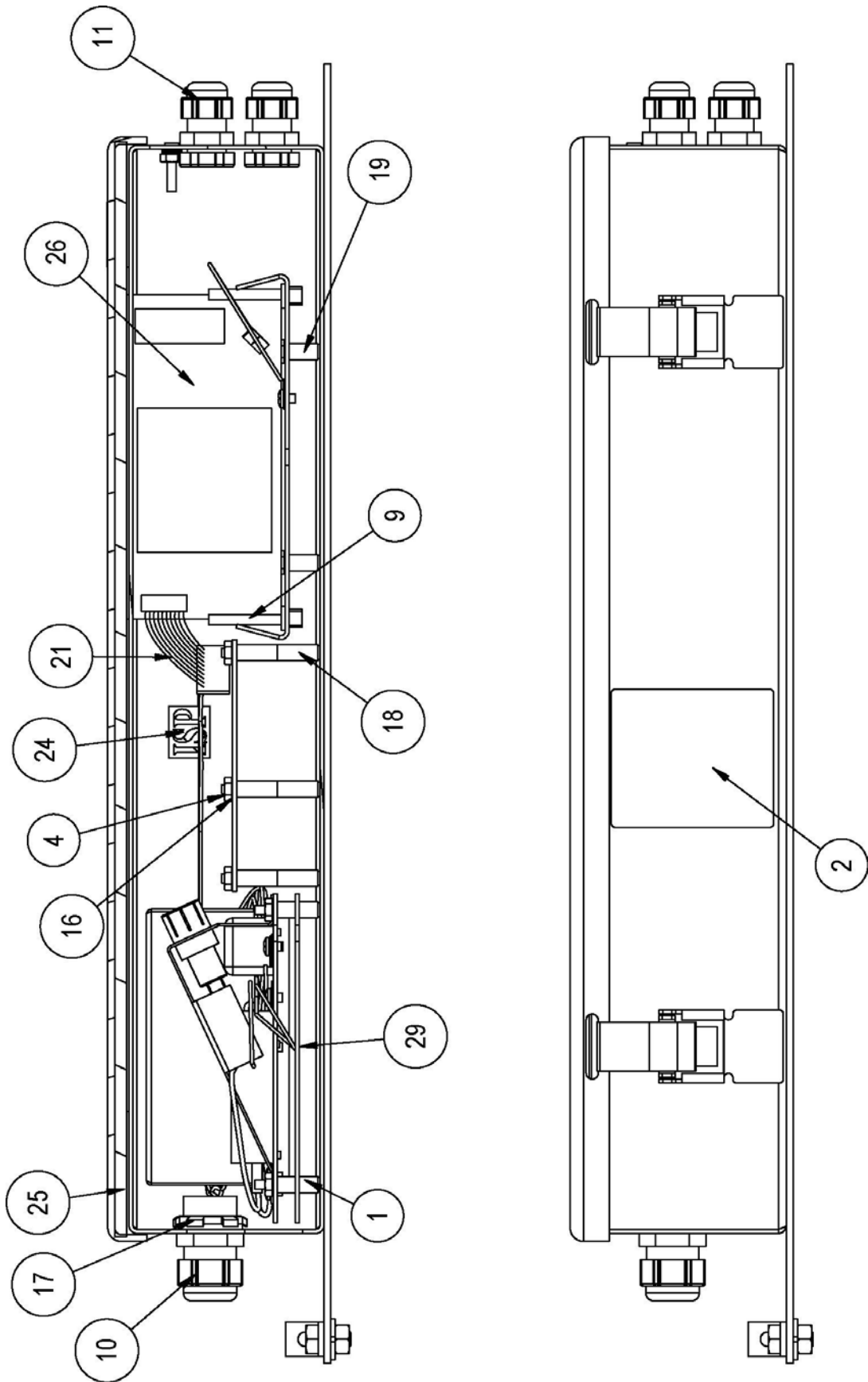
PART IDENTIFICATION, CONT.

PART IDENTIFICATION, CONT

8580-M882-O1 Rev B • 825 iCan System
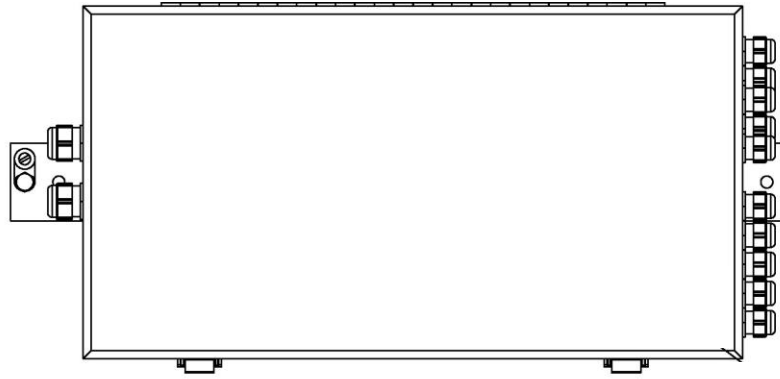
PART IDENTIFICATION, CONT.

ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
1	8	0031-B014-08	SPACER
2	1	593GR986	SERIAL TAG
3	1	6007-0016	BLT HEX HD 1/4-20 x 1/2 Z/P
4	14	6013-0039	NUT HEX #6-32
5	1	6013-0047	NUT 1/4-20 HEX SS
6	10	6021-0663	#6-32 x 3/16 PHMS
7	1	6024-0040	WASHER – LOCK 1/4 HEL SPLIT
8	12	6540-1104	PLUG, HOLE 0.173 to.240 RED POLYETH
9	16	6610-1460	CARD GUIDE 1.2 VERT. PRESS IN NYLON
10	2	6610-2081	CONN GLAND .170 to .470 GRIP .875 MTG BLK
11	10	6610-2248	CONN GLAND .187 to .312 GRIP .599 MTG BLK
12	8	6610-5005	LUG SOLDER #6 x 0.625 FLAT LOCKING
13	1	6610-5006	GROUND LUG L-70
14	1	6610-5007	CABLE CLIP
16	14	6680-0004	WASHER LOCK INT. TOOTH #6 Z/P
17	2	6680-0015	NUT CONDUIT 1/2 SEAL
18	8	6680-0080	SPACER #6 x .625 NYLON
19	4	6680-0121	SPACER (PCB) #6 x .438
20	1	8510-C346-0I	LABEL – HIGH VOLTAGE
21	8	8580-B202-0A	CABLE A/D
22	8	8580-B210-0A	WIRE: 18GA, GRN, 5.0 #8RT/TINNED
23	1	8580-B211-0A	POWER CABLE
24	1	8580-B219-08	LABEL: "ISP"
25	1	8580-B223-08	GASKET
26	8	8580-C205-0A	PCB ASSEMBLY A/D
27	1	8580-C204-08	SUB PANEL – ANALOG/ DIGITAL
28	1	8580-C208-08	POWER SUPPLY COVER
29	1	8580-C222-0A	ASSEMBLY: SUB PANEL, HEATER
30	1	8580-C224-0A	ASSEMBLY: SUB PANEL, POWER SUPPLY
31	1	8580-D200-0A	PCB ASSEMBLY: iCAN CONTROLLER
32	1	8580-D207-0A	JBOX WELDMENT

APPENDIX A
ISITE OPTION

INTRODUCTION

The iSite software and hardware facilitates electronic communications from dealer or support personnel locations to iCan scale sites. The communications can be performed via network TCP/IP connections, direct serial port connections, or dial-up modem connections.
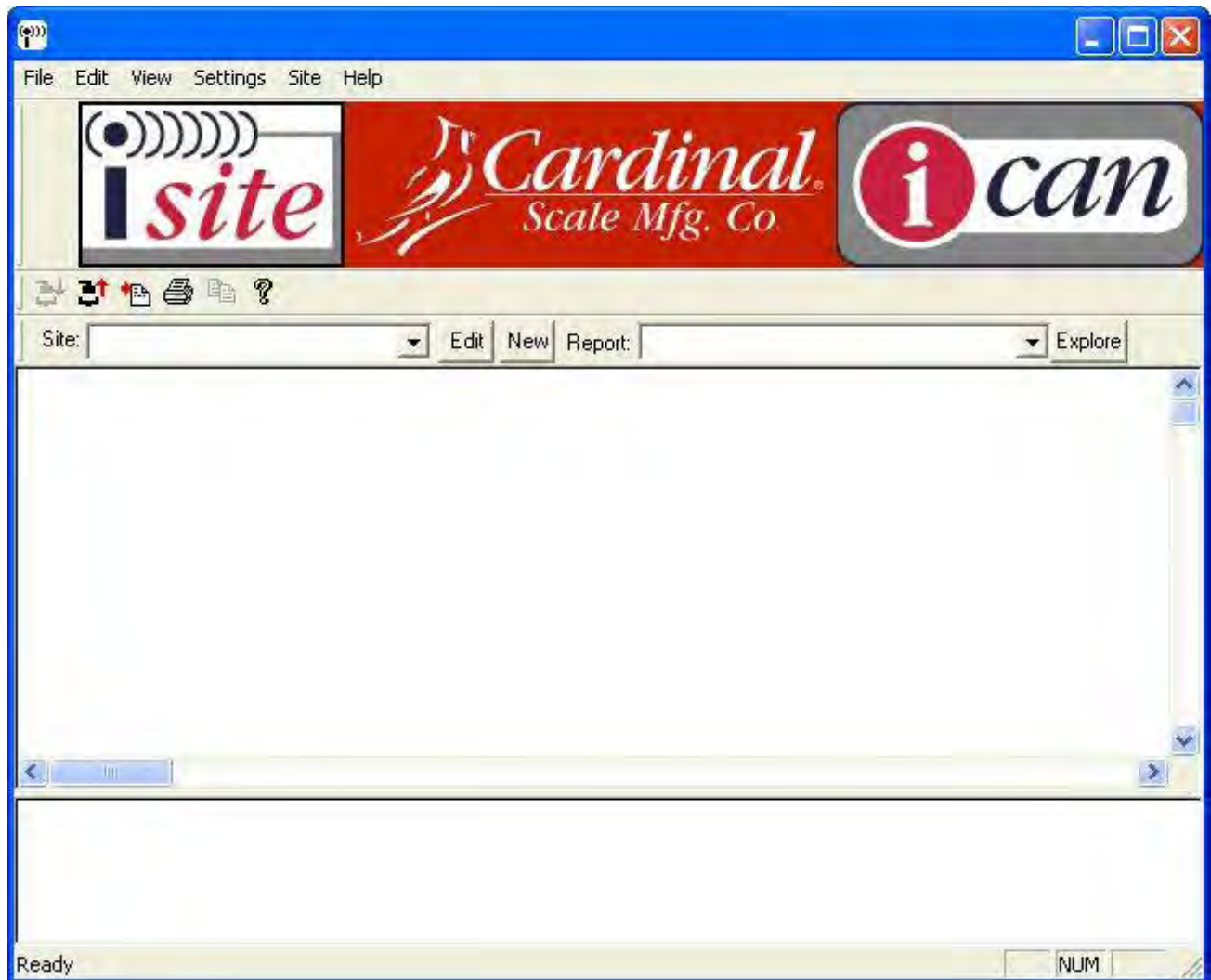

Status reports can be electronically requested from each iCan site at any time. These reports include weight information and millivolt readings for each load cell of each scale. An automatic request feature may be used to obtain new status reports from a site automatically at a specified interval, such as 40 seconds, or 20 minutes.

The iSite software automatically updates a summary report for each site as individual reports are requested. The summary report for a site provides quick comparison of load cell readings over the history of the site. The summary report may be opened with Excel to allow further analysis or graphing of the data.

APPENDIX A

ISITE SERIAL CABLE INSTALLATION

1. Remove the 14 acorn nuts securing the rear panel to the main housing (see FIGURE 27).

2. Loosen and remove one of the unused gland connector nuts and remove the plastic insert.

3. Using the serial cable provided with the iSITE kit, insert the bare wire end through the gland connector on the back of the 225 indicator.

4. Insert the cable wires into the terminal block on the 225CANG/P board as shown in the picture below.

5. Replace the rear panel and acorn nuts. Tighten the gland connector nut.
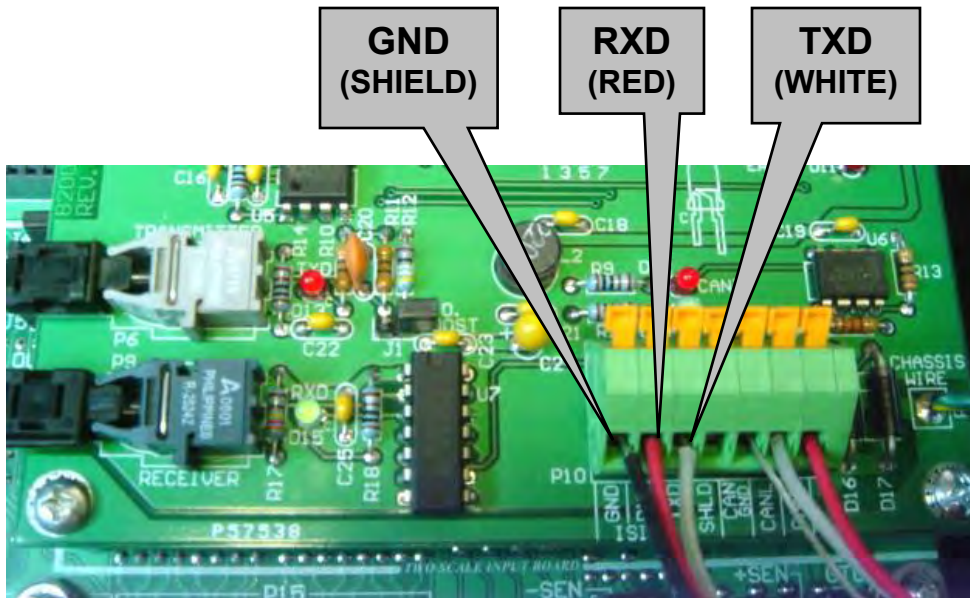
225CANG/P BOARD
iSITE
SERIAL CABLE CONNECTIONS

APPENDIX A

INSTALLATION

Insert the CD. For most systems the installation will begin automatically. Follow the onscreen prompts to perform the installation.

STARTUP

Double-click the "iSite" icon on the desktop, or click "Start" "Programs" and "iSite".

The main iSite program window will appear.
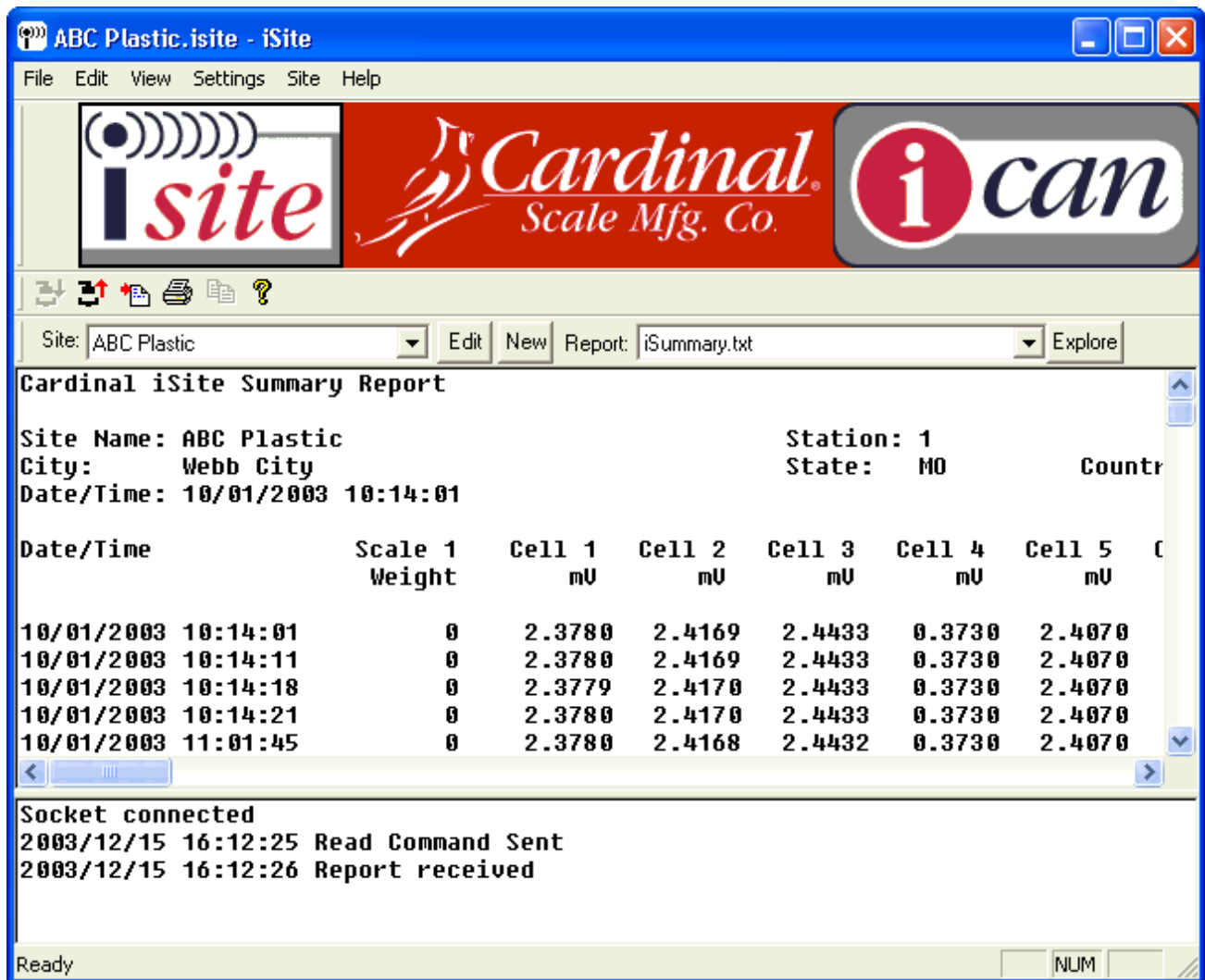
APPENDIX A

SELECTION BAR

The selection bar is used to select the desired site and report files quickly.
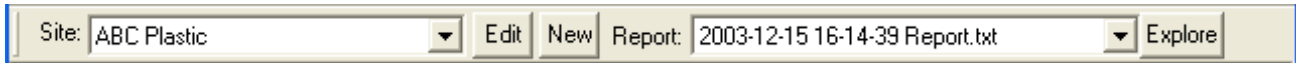
The iSite screen will initially show the most recently selected site. Click the downward arrow to the right of the "Site" prompt to show the list of sites available.
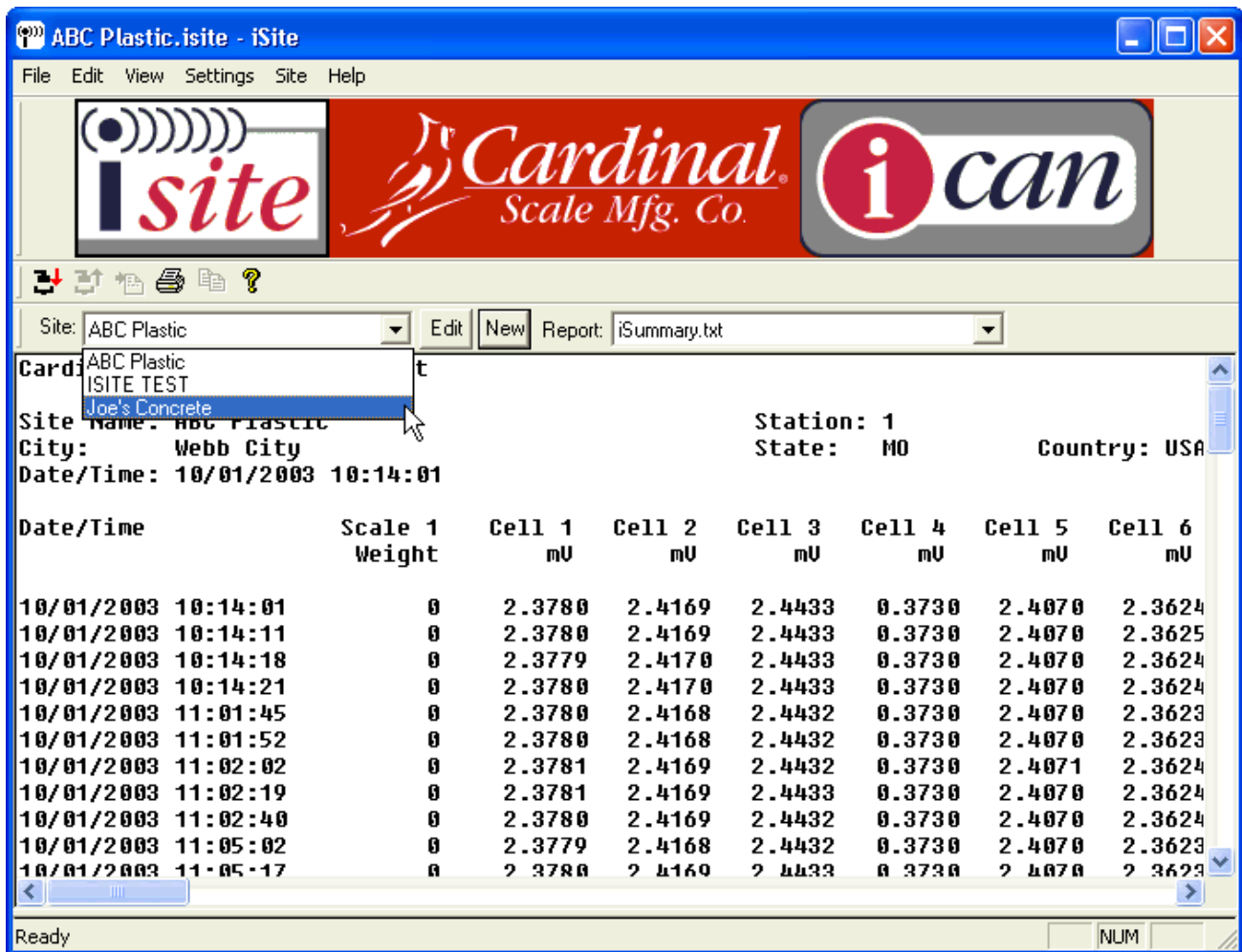
Click the desired site from the list.

Click "Edit" to edit the settings for the current site, or "New" to create a new site.

APPENDIX A

If a registration is used the site registration must be entered exactly as provided by Cardinal. For a non-registered site the "Registration" prompt should be left blank.

Click the "Connection" tab for the connection settings to the site. Set the "Device" to "TCP/IP" for a TCP/IP network connection. Provide the appropriate "IP Address" and "Port".
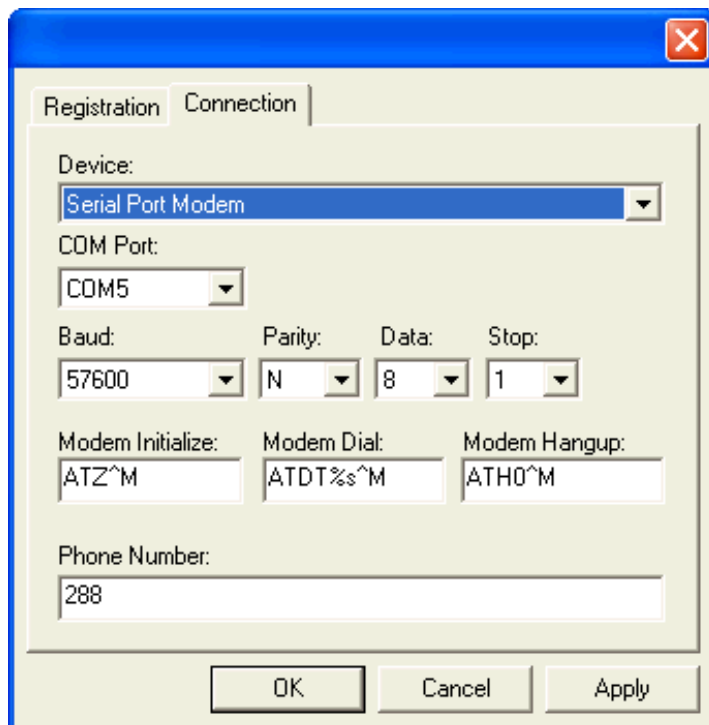
APPENDIX A

Set the "Device" to "Serial Port" for a direct serial connection.
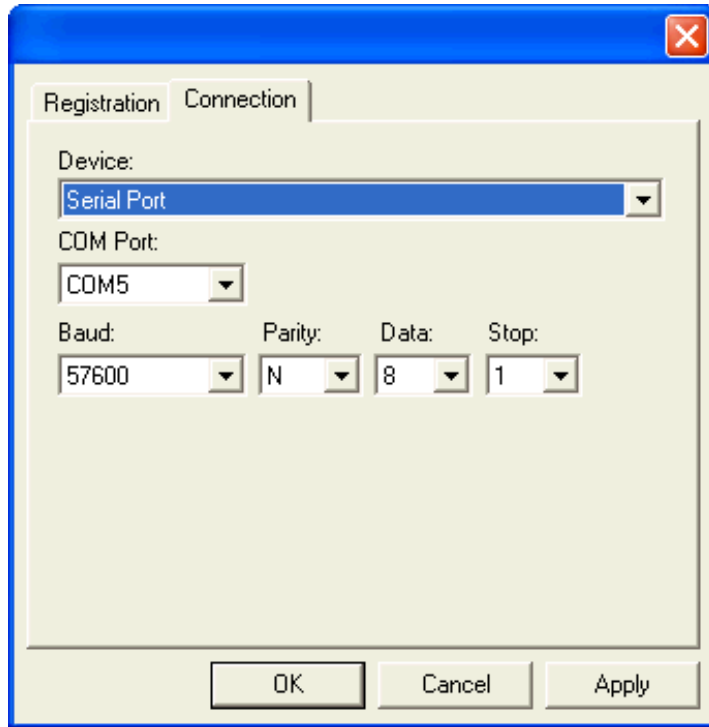
Specify the appropriate "COM Port" "Baud", "Parity", "Data", and "Stop" bits for the device.

Set the "Device" to "Serial Port Modem" to connect to the site by modem.
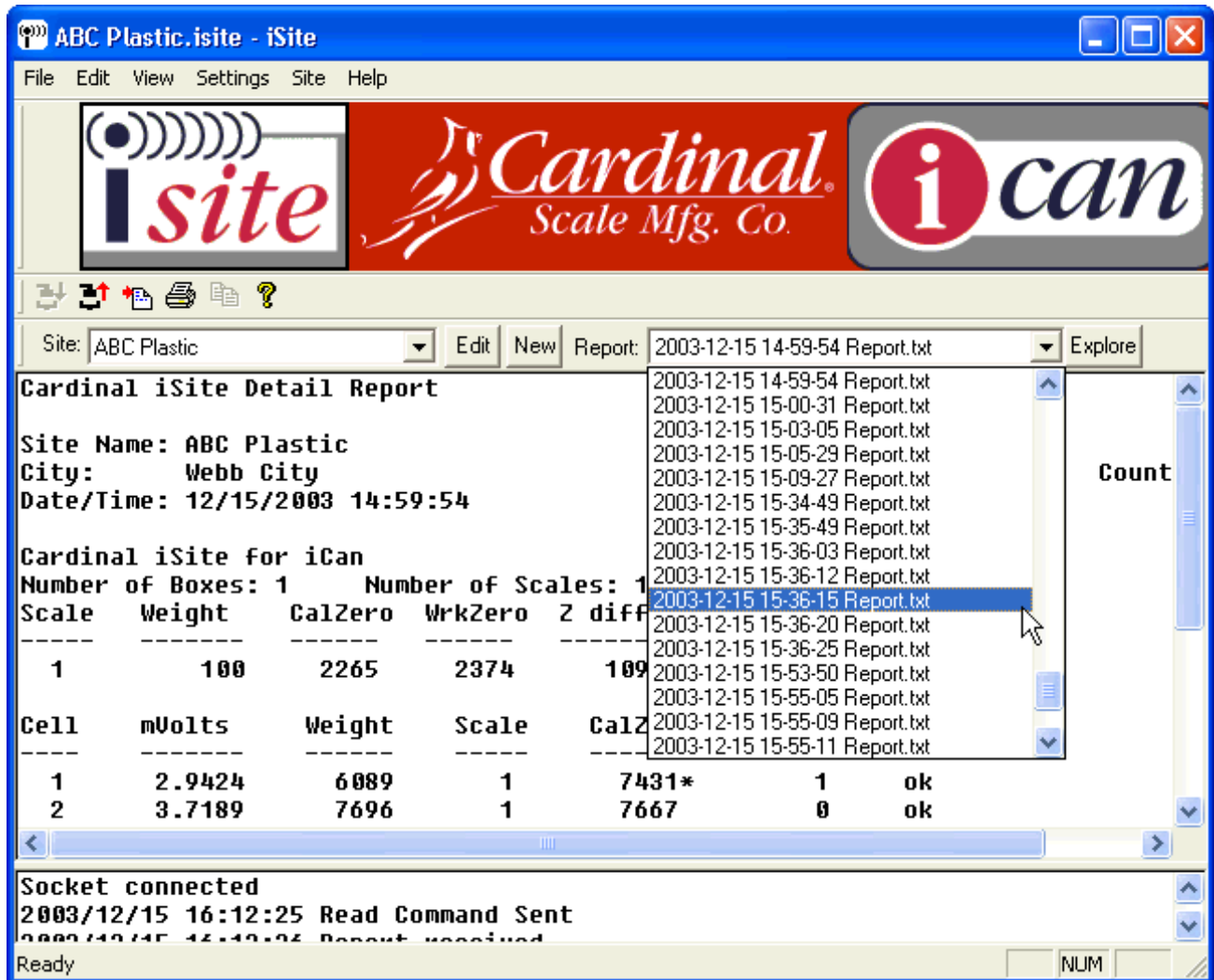
APPENDIX A

Specify the "COM Port", "Baud", "Parity", "Data", and "Stop" bits. The COM port for an internal modem can usually be determined by checking "Control Panel" "Modems", or "Control Panel", "System", "Hardware/Device Manager".

Specify the "Modem Initialize", "Modem Dial", "Modem Hangup" and "Phone Number" for the site. The "%s" in the "Modem Dial" command will be substituted with the phone number specified.

REPORT

When a site is selected the default summary report "iSummary.txt" will appear. To view other reports click the down arrow to the right of the "Report" prompt. A list of the available reports is displayed. The report file names are based on the date and time that the report was created. Click the desired report to view.

APPENDIX A

EXPLORE

As the reports are read they are created as text files in a folder
"My Documents\iSite*sitename*" (where *sitename* is the name of the site). To delete reports from a site or copy the reports to another location click the "Explore" button to open Windows explorer to the folder that corresponds to the current site.

TOOL BAR

The tool bar is used to perform common operations quickly.
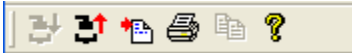
The first icon is used to connect to the currently selected site. The second icon is used to disconnect from the site. The third icon is used to read the report from the site. The fourth icon is used to print the current report. The fifth icon is used to copy any selected text to the clipboard. The final icon is used to display the "About" box.
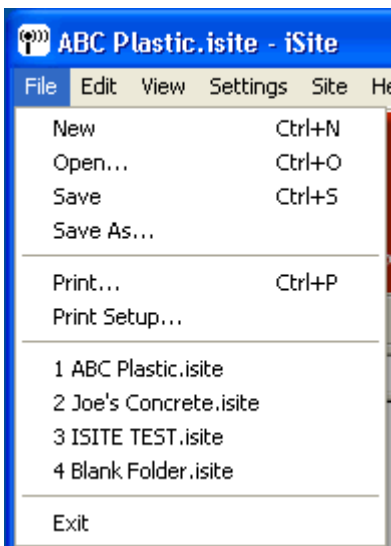
MENU BAR

The menu bar at the top of the program is used for various functions.
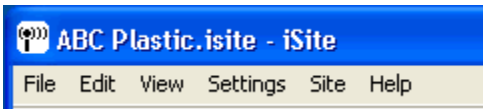
FILE

The "File" menu is used for file related activities.

New   Create a new site
Open…   Open a site
Save   Save the site information
Save As…   Save the site information as a new filename.

Print…   Print the currently shown display
Print Setup…   Specify printer options

Recent files   Recently opened site files may be selected

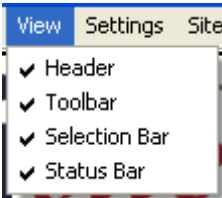**Exit**   Quit the iSite program

APPENDIX A

EDIT

The "Edit" menu is used to copy text.

Copy   When text is selected copy may be used to copy the text to the clipboard for use with other programs.

VIEW

The "View" menu is used to modify the appearance of the program.

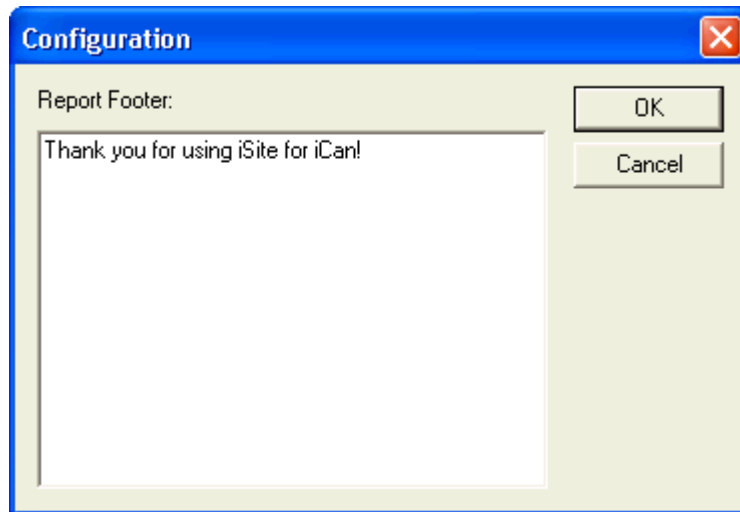The **Header**, **Toolbar**, **Selection Bar**, and **Status Bar** may be displayed or hidden.

SETTINGS

The "Settings" menu is used to specify footer text to appear at the bottom of the reports.

Report Footer…

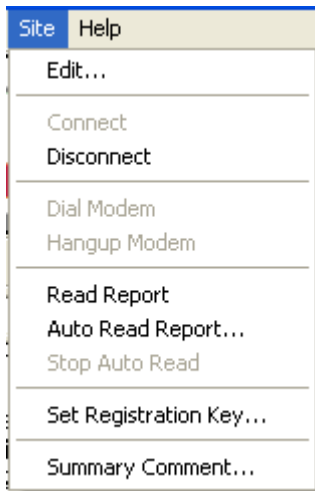Footer text may be specified to appear at the bottom of each report.

Click "OK" to save any changes to the text. Click "Cancel" to return to the main program without saving changes.

APPENDIX A

SITE

The "Site" menu is used to perform functions relating to the current site.

Edit…   Edit the site information as shown above.
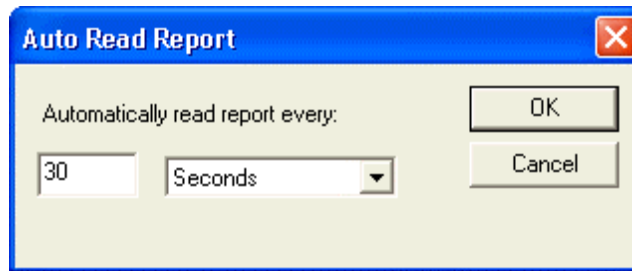
Connect   Connect to the current site.
Disconnect   Disconnect from the current site.

Dial Modem   Dial the modem to connect to a dial-up site.
Hangup Modem   Hangup the modem to a dial-up site.

**Read Report**   Read the report from the site.
Auto Read Report…   Automatically read the report at a specified interval.

Specify the time interval for auto read and click "OK" to start reading reports. Click "Cancel" to return to the main screen without starting autoread. iSite most be left open and connected for the auto read operation.

**Stop Auto Read**   Stop the auto read operation.

Set Registration Key…   Set the registration key for the first time use of the iSite hardware.
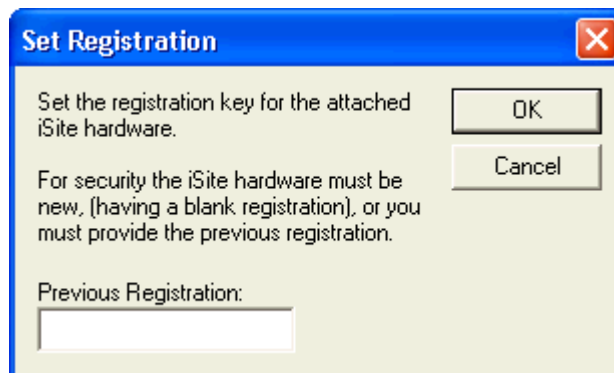
If the iSite hardware was previously programmed with a registration key the previous key must be provided. Click "OK" to set the registration key. Click "Cancel" to return to the main screen without setting the key.

APPENDIX A

Summary Comment   As reports are read from each site iSite creates a summary report showing the history of the site. Summary comments may be entered to add to this report information such as maintenance actions or calibrations performed.
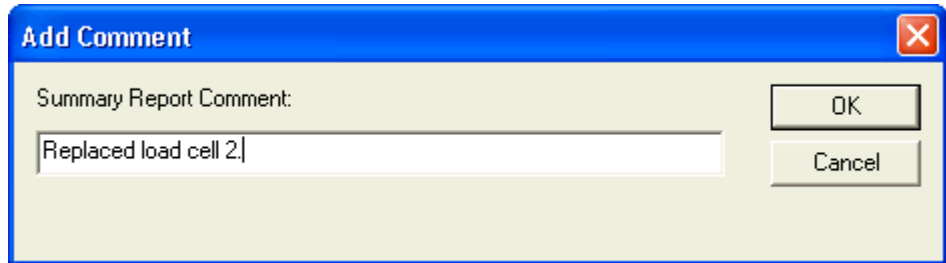
Click "OK" to add the comment to the summary report, or click "Cancel" to return to the main screen without adding a comment.

HELP

The "Help" menu is used show the about box.
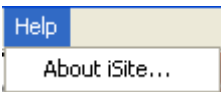
About iSite… Display the about box showing program version.

Click "OK" to return to the main program window.

APPENDIX A

EXCEL COMPATIBILITY

The site summary reports are in a tab delimited format. These reports may be opened with Excel to allow for more detailed review of the date or graphing.
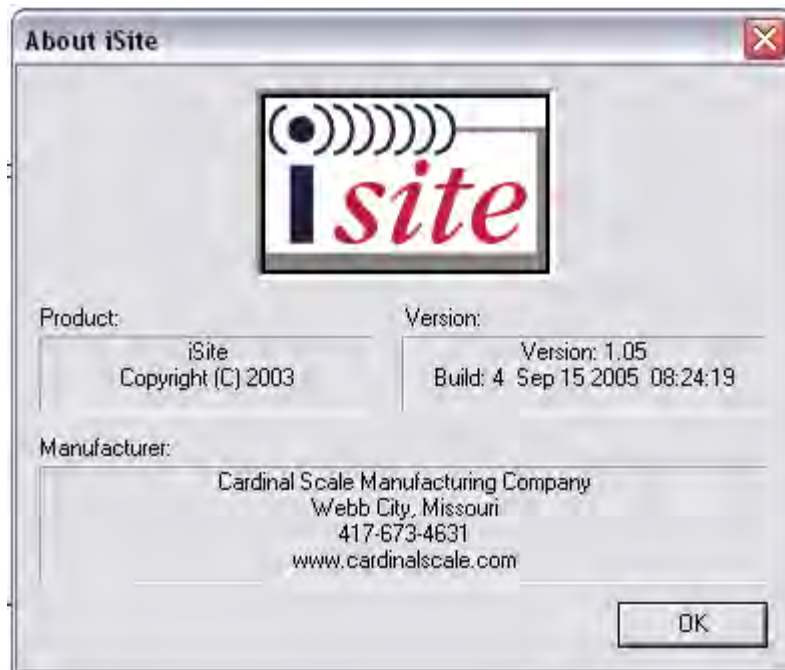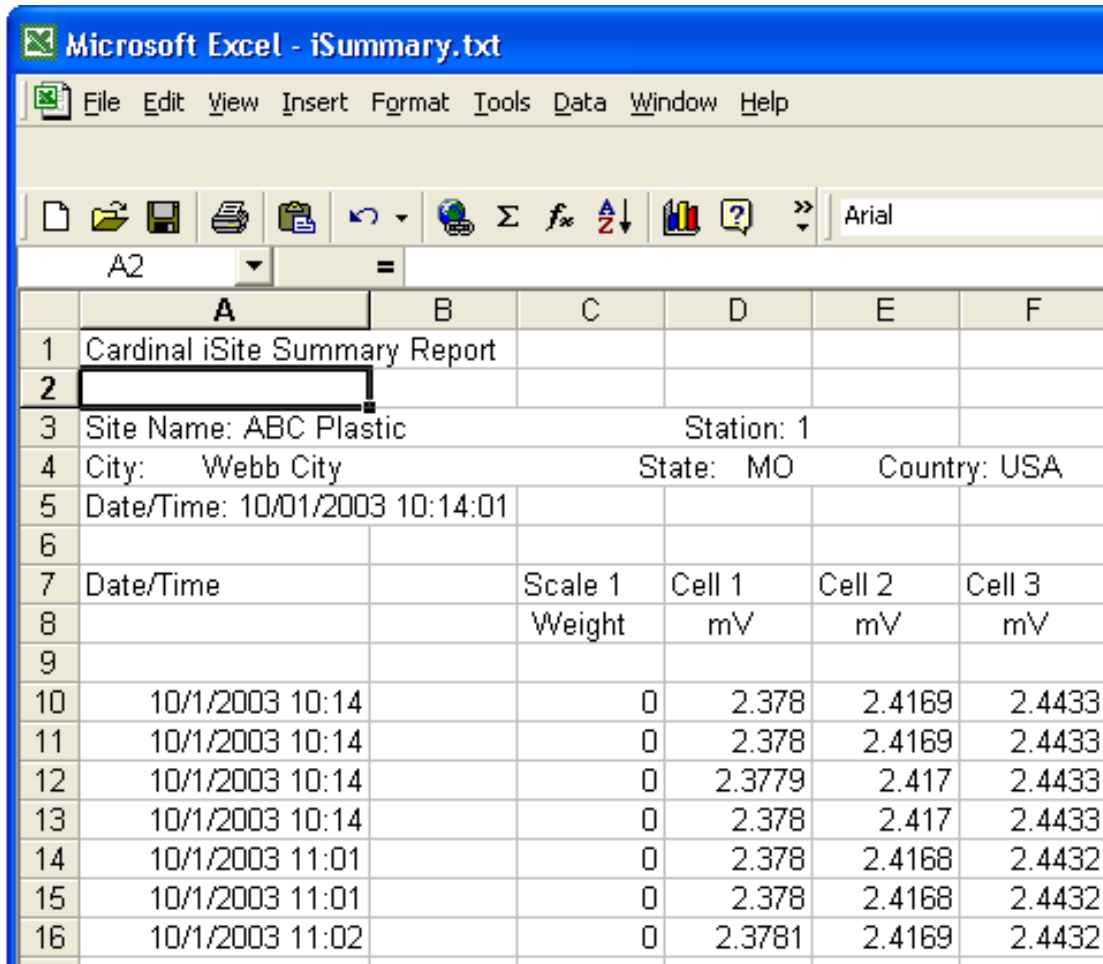
In Excel click "File", "Open" to display the file open dialog box. At the "Files of Type:" prompt select "*.txt". Browse to the "My Documents\iSite\Your site" folder. Select the "iSummary.txt" file and click open. Specify "Tab Delimited". This will insure that each load cell of each scale is given its own column in the spreadsheet.

Microsoft Excel - iSummary.txt

File Edit View Insert Format Tools Data Window Help

	A	B	C	D	E	F
1	Cardinal iSite Summary Report					
2						
3	Site Name: ABC Plastic			Station: 1		
4	City: Webb City			State: MO		Country: USA
5	Date/Time: 10/01/2003 10:14:01					
6						
7	Date/Time		Scale 1	Cell 1	Cell 2	Cell 3
8			Weight	mV	mV	mV
9						
10	10/1/2003 10:14		0	2.378	2.4169	2.4433
11	10/1/2003 10:14		0	2.378	2.4169	2.4433
12	10/1/2003 10:14		0	2.3779	2.417	2.4433
13	10/1/2003 10:14		0	2.378	2.417	2.4433
14	10/1/2003 11:01		0	2.378	2.4168	2.4432
15	10/1/2003 11:01		0	2.378	2.4168	2.4432
16	10/1/2003 11:02		0	2.3781	2.4169	2.4432

COMMAND LINE OPTION FOR TASK SCHEDULING

The iSite main program file iSite.exe supports a command line option "/AUTO" (without the quotes). This allows iSite to be specified as a scheduled task to run every week or month and automatically connect to each site, retrieve the report, and disconnect. Any sites that cannot be connected to, or the report cannot be read from, are automatically retried after all sites have be tried. When the reports from all sites have been read iSite will close automatically.

APPENDIX B

Replacing the iCAN Junction Box Controller Board (8580-D200-XA)

NOTE: By following this procedure, the ICAN junction box controller board can be replaced without the need to re-calibrate the scale. The 825 will reload the calibration data into the controller board.

CAUTION! OBSERVE THE PRECAUTIONS FOR HANDLING STATIC SENSITIVE DEVICES

1. Remove power from the junction box.

2. Disconnect the load cell input card ribbon cables, CAN bus connector, fiber optic cables, and 2-pin power cable from the controller board. Be careful to mark the fiber optic cables. Reversing them will disable the CAN bus.

3. Remove the four controller board mounting nuts and washers.

4. Replace the controller board.

5. Replace the nuts and washers.

6. Reconnect the ribbon cables, CAN bus connector, fiber optic cables, and the power connector.

7. Apply power to the junction box and observe the display for correct $Addr\varepsilon$ (address) and $A2d\varepsilon$ (number of load cell input cards, load cells) values.

8. Apply power to the 825.

9. Observe error message display with the statement:

<div align="center">

PRESS RELOAD TO RELOAD BOX DATA

</div>

10. Press the **[RELOAD]** button.

11. Observe display with the statement:

<div align="center">

RELOAD BOX DATA?

</div>

12. Press the **[YES]** key.

13. The box data should be reloaded into the controller board in the junction box.

14. When the process has finished, turn the power to the 825 off then back on.

15. Normal operation should return.

If the **SCALE 1 REQUIRES SETUP** or **CAN BUS BUSY** message appears on the 825, cycle power on the 825. Normal operation should return. For other errors call Cardinal Technical Support before proceeding (to avoid having to recalibrate the scale).

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 WORKMAN-SHIP	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

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.

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