CARDINAL®

SmartCAN4 SmartCAN10

SMARTCAN DIGITAL SYSTEMS

# SmartCAN SYSTEM

## Installation and Technical Manual

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## PRECAUTIONS

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

**IMPORTANT**

**ELECTRICAL WARNING**

**STATIC SENSITVE**

# COPYRIGHT



# DISCLAIMER

While every precaution has been taken in the preparation of this manual, the Seller assumes no responsibility for errors or omissions. Neither is any liability assumed for damages resulting from the use of the information contained herein. All instructions and diagrams have been checked for accuracy and ease of application; however, success and safety in working with tools depend largely 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 in the procedures do so entirely at their own risk.

# FCC COMPLIANCE STATEMENT

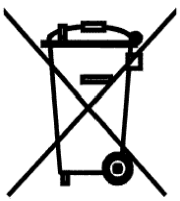
This equipment generates uses, can radiate radio frequency, and if not installed and used in accordance with the instruction manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of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

# PROPER DISPOSAL

When this device reaches the end of its useful life, it must be properly disposed of. It must not be disposed of as unsorted municipal waste. Within the European Union, this device should be returned to the distributor from where it was purchased for proper disposal. This is in accordance with EU Directive 2002/96/EC. Within North America, the device should be disposed of in accordance with the local laws regarding the disposal of waste electrical and electronic equipment.

It is everyone’s responsibility to help maintain the environment and to reduce the effects of hazardous substances contained in electrical and electronic equipment on human health. Please do your part by making certain that this device is properly disposed of. The symbol shown to the right indicates that this device must not be disposed of in unsorted municipal waste programs.



# STATIC ELECTRICITY PRECAUTION

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

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.

**ATTENTION:** 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.

# INTRODUCTION

Thank you for purchasing the Cardinal SmartCAN System. The SmartCAN 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 a micro-controller and flash memory.

The SmartCAN System utilizes the advanced internationally standardized CAN (Controller Area Network) serial bus system to digitize the analog output signals from two or more independent load cells and send the data to the indicator. The weight data from the SmartCAN System is sent via copper wiring to the indicator for viewing and further system processing by the operator. Note that no data is sent back from the indicator to the SmartCAN System.

The SmartCAN system uses Cardinal's patented software algorithm called SmartCal® method of calibrating a scale. SmartCal® allows a quick calibration with no manual adjustments while the diagnostic software identifies real and potential system problems before they interrupt your weighing operations.

The SmartCAN system consists of one 4-cell, 6-cell, 8-cell, or 10-cell SmartCAN Junction Box with one load cell input and A to D converter for each load cell connected to it. Using a CAN interface cable (Homerun Cable), the SmartCAN System connects to a Cardinal 225D Digital Weight Indicator or a Cardinal 825D Digital Weight Indicator. SmartCAN uses a dedicated 24-bit analog-to-digital converter to perform the analog-to-digital conversion of each of the analog strain-gage load cells, the mathematical computation of load cell and scale data, and the transmission of data to the DLC card in the 225D or 825D indicator.


***NOTE:*** *Unless otherwise noted, SmartCAN6, SmartCAN8, and SmartCAN10 refer to both the non-powered models, as well as the self-powered (-AC models).*

This manual describes the installation, setup, and calibration of the SmartCAN System. Please make sure that you read this manual in its entirety before beginning the installation or attempting to operate the SmartCAN 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 available for future reference.

# INTRODUCTION, CONT.

## SmartCAN System Model Numbers

The SmartCAN System model number identifies the number of load cell inputs and any additional options depending upon the configuration. Refer to the illustrations below to confirm that the junction box(es) you have received are appropriate for your specific application:

The model number of the SmartCAN System is:

**SMARTCANXX-YY**

where:

**XX** is the maximum number of load cells the system can accommodate.

**-YY** is additional options (currently “AC” for the self-powered models.

| Non-Powered Models * | |
|---|---|
| **Model Number** | **Description** |
| SMARTCAN4 | 4-cell capacity |
| SMARTCAN6 | 6-cell capacity |
| SMARTCAN8 | 8-cell capacity |
| SMARTCAN10 | 10-cell capacity |

| Self-Powered Models ** | |
|---|---|
| **Model Number** | **Description** |
| SMARTCAN6-AC | 6-cell capacity |
| SMARTCAN8-AC | 8-cell capacity |
| SMARTCAN10-AC | 10-cell capacity |

* A SmartCAN System with a CAN interface cable (Homerun Cable) “***less***” than 200 Ft (61 M) in length can use the SmartCAN4 through the SmartCAN10 models.

** A SmartCAN System with a Homerun Cable “***greater***” than 200 Ft (61 M) in length requires using the appropriate SmartCANXX-AC model.

**Non-Powered**
**SmartCAN10 Shown**


**Self-Powered**
**SmartCAN10-AC Shown**

# INTRODUCTION, CONT.

## SmartCAN System Enclosures

The SmartCAN System is housed in either a stainless-steel or polycarbonate IP66, NEMA 4 rated enclosure designed for mounting to a flat surface on the scale. The SmartCAN System enclosures may be sealed physically via a lead wire setup or self-destructive stickers.

**SmartCAN4**

**SmartCAN6**

**SmartCAN8**

**SmartCAN10**

**SmartCAN6-AC**

**SmartCAN8-AC**

**SmartCAN10-AC**

# INTRODUCTION, CONT.

## SmartCAN System Enclosures, Cont.

### SmartCAN4

The SmartCAN4 junction box is an IP66, NEMA 4 rated stainless-steel enclosure that is 5.6” L x 4.9” W x 1.3” H (143mm L x 124mm W x 33mm H) and has a gasketed top cover to prevent the entry of moisture into the box. The top is secured in place with eight screw fasteners.

The SmartCAN4 can be mounted in the same location as a standard load cell junction box using its 2-hole mounting tab.

The SmartCAN4 junction box has four gland connectors for load cell cables on one side. On the other side, it has two gland connectors for the CAN IN/CAN OUT cables and one 225NEST connector.

### SmartCAN6, SmartCAN8, and SmartCAN10

The SmartCAN6, SmartCAN8, and SmartCAN10 non-powered and self-powered (-AC models) junction boxes are an IP66, NEMA 4 rated polycarbonate enclosure that is 10” L x 7.1” W x 3.5” H (254mm L x 180mm W x 90mm H) and have a gasketed top cover to prevent the entry of moisture into the box. The top is secured in place with four screw fasteners.

The SmartCAN6, SmartCAN8, and SmartCAN10 junction boxes are equipped with two mounting brackets and eight self-tapping screws that allow them to be mounted in the same location as a standard load cell junction box.


**SmartCAN4 Mounting Tabs**


**SmartCAN Mounting Hardware (SmartCAN8-AC Shown)**

**SmartCAN6**
The SmartCAN6 junction box has six gland connectors for load cell cables and one gland connector for a ground wire on the left side. On the right side, it has two gland connectors for the CAN IN/CAN OUT cables, one 225NEST connector, and one large gland connector for a multi-cell/interconnect cable. *Note that the SmartCAN6-AC has an additional large gland on the left side for the AC power cord.*

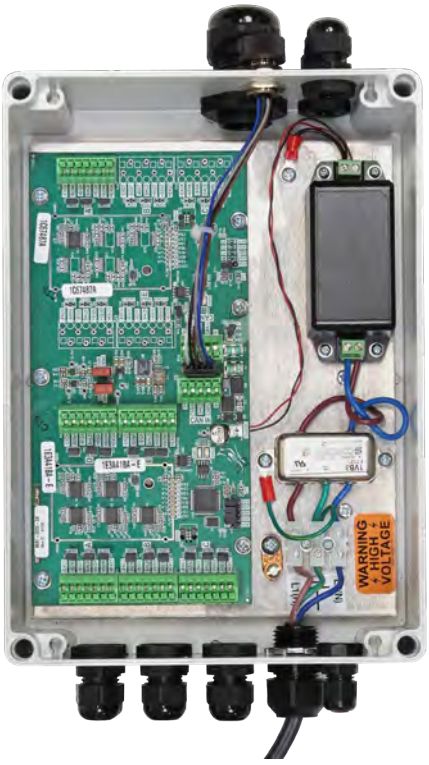
**SmartCAN8**
The SmartCAN8 junction box has six gland connectors for cables from load cells 1 through 6, and one gland connector for a ground wire on the left side. On the right side, it has two gland connectors for cables from load cells 7 and 8, two gland connectors for the CAN IN/CAN OUT cables, one 225NEST connector, and one large gland connector for a multi-cell/interconnect cable. *Note that the SmartCAN8-AC has an additional large gland on the left side for the AC power cord.*

**SmartCAN10**
The SmartCAN10 junction box has six gland connectors for cables from load cells 1 through 6, and one gland connector for a ground wire on the left side. On the right side, it has four gland connectors for cables from load cells 7 through 10, two gland connectors for the CAN IN/CAN OUT cables, one 225NEST connector, and one large gland connector for a multi-cell/interconnect cable. *Note that the SmartCAN10-AC has an additional large gland on the left side for the AC power cord.*

## SmartCAN System Enclosures, Internal View


**SmartCAN4**

**SmartCAN6-AC**




**SmartCAN6-AC**

## SmartCAN System Enclosures, Internal View, Cont.

**SmartCAN8**


**SmartCAN8-AC**

**SmartCAN10**


**SmartCAN10-AC**

# SPECIFICATIONS

| | |
|---|---|
| Accuracy class: | III and IIIL |
| Weighing range: | Single-interval |
| Maximum Number of Verification Scale Intervals: | 10,000 (CLASS III), 10,000 (CLASS IIIL) |
| Internal Resolution: | 1 part in 16,777,216 |
| Minimum Input-Voltage per Verification Scale Intervals: | 0.5 uV |
| Excitation Voltage: | 10 VDC |
| Maximum Analog Range: | 1 to 30 mV |
| Minimum Input-Impedance: | 350 ohms |
| Maximum Input-Impedance: | 1100 ohms |
| Maximum Number of Load[1] Cells Supported: | Multiple 4-cell, 6-cell, 8-cell, or 10-cell enclosures can be daisy-chained together for a total of 32 load cells |
| Power Requirements:<br>SmartCAN 4<br>SmartCAN6, 8, 10<br>SmartCAN6, 8, 10-AC | <br><br>15 VDC from the 225D or 12V DC from the 825D<br>15 VDC from the 225D or 12V DC from the 825D[2]<br>100 to 240V AC (50/60 Hz) @ 0.1A |
| Operating Environment: | Temperature: 14 to 104 ºF (-10 to +40 ºC)<br>Humidity: 90% non-condensing (maximum) |
| Junction Box Construction:<br>SmartCAN 4<br>SmartCAN6, 8, 10<br>SmartCAN6-AC, 8-AC, 10-AC | <br><br>IP66 / NEMA 4 rated Stainless Steel Enclosure<br>IP66 / NEMA 4 rated Polycarbonate Enclosure |
| Junction Box Dimensions:<br>SmartCAN 4<br><br>SmartCAN6, 8, 10<br>SmartCAN6-AC, 8-AC, 10-AC | <br>8.5” L x 4.7” W x 1.3” H (216mm L x 119mm W x 33mm H)<br>(*Dimensions include the mounting strap*)<br>10” L x 9.8” W x 4.0” H (254mm L x 249mm W x 102mm H)<br>(*Dimensions include the mounting brackets*) |

**1** The maximum number of load cells supported is dependent upon load cell impedance, length of Homerun cable, whether a 225D or an 825D is used, indicator sample rate, and which SmartCAN enclosure is used, a non-powered model or a self-powered (-AC) model.

**2** Power to the SmartCAN6, SmartCAN8, or SmartCAN10 can be supplied from the 225D or 825D if the CAN interface cable (Homerun Cable) is “***less***” than 200 Ft (61 M) long.

If the CAN interface cable (Homerun Cable) is “***greater***” than 200 Ft (61 M), power must be supplied from an external 24V DC @ 1.3A power supply provided by the customer.

# SPECIFICATIONS, CONT.

## Internal Junction Box Connections

| | |
|---|---|
| SmartCAN4 | (2) 5-position spring cage clamps (24 to 16ga wire) for Homerun Cable (CAN IN/CAN OUT)<br>(4) 7-position spring cage clamps for Load Cell Cables<br>(1) 5-position pre-wired to external NEST connector |
| SmartCAN6<br>SmartCAN6-AC | (2) 5-position spring cage clamps (24 to 16ga wire) for Homerun Cable (CAN IN/CAN OUT)<br>(6) 7-position spring cage clamps for Load Cell Cables<br>(1) 5-position pre-wired to external NEST connector<br>(1) 2-pin for power (15 to 24 VDC) |
| SmartCAN8<br>SmartCAN8-AC | (2) 5-position spring cage clamps (24 to 16ga wire) for Homerun Cable (CAN IN/CAN OUT)<br>(8) 7-position spring cage clamps for Load Cell Cables<br>(1) 5-position pre-wired to external NEST connector<br>(1) 2-pin for power (15 to 24 VDC) |
| SmartCAN10<br>SmartCAN10-AC | (2) 5-position spring cage clamps (24 to 16ga wire) for Homerun Cable (CAN IN/CAN OUT)<br>(10) 7-position spring cage clamps for Load Cell Cables<br>(1) 5-position pre-wired to external NEST connector<br>(1) 2-pin for power (15 to 24 VDC) |

## Homerun Cable Length

| | | |
|---|---|---|
| SmartCAN4 (225D or 825D) | 1800 Ft (549 M) maximum | ***Consult factory for other requirements*** |
| SmartCAN6 (225D)<br>SmartCAN8 (225D)<br>SmartCAN10 (225D) | 1800 Ft (549 M) maximum<br>1800 Ft (549 M) maximum<br>1400 Ft (427 M) maximum | |
| SmartCAN6 (825D)<br>SmartCAN8 (825D)<br>SmartCAN10 (825D) | 1100 Ft (335 M) maximum<br>700 Ft (213 M) maximum<br>400 Ft (122 M) maximum | |
| SmartCAN6-AC<br>SmartCAN8-AC<br>SmartCAN10-AC | 1800 Ft (549 M) maximum | |

# SPECIFICATIONS, CONT.

## Maximum Number of Load Cells Supported

Cardinal Scale's SmartCan Digital Conversion System can be configured with multiple 4-cell, 6-cell, 8-cell, or 10-cell enclosures daisy-chained together for a total of 32 load cells in a single system. However, the number of load cells supported in a system can vary due to several factors. The maximum number of load cells supported is dependent upon the load cell impedance, the length of the Homerun cable, whether the indicator is a 225D or an 825D, the sample rate of the indicator, and whether the SmartCAN enclosure used is a non-powered model or a self-powered (-AC) model. Note that if an external 24V DC @ 1.3A power supply (provided by the customer) is used with a non-powered model, it would support the same maximum number of load cells as its comparable self-powered (-AC) model.

**NOTE:** The following tables are based on using 350 ohm or 720 ohm load cells and 500 feet of 18 gauge Homerun cable.

### 225D Weight Indicator

**(*Using 350 Ohm Load Cells with 500 feet of 18-gauge Homerun Cable*)**

| SmartCAN Model | MAXIMUM NUMBER OF LOAD CELLS | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 22 | 24 | 26 | 28 | 30 | 32 |
| SmartCAN4 | Y | N | N | N | N | N | N | N | N | N | N | N | N | N | N |
| SmartCAN6 | Y | Y | N | N | N | N | N | N | N | N | N | N | N | N | N |
| SmartCAN8 | Y | Y | Y | N | N | N | N | N | N | N | N | N | N | N | N |
| SmartCAN10 | Y | Y | Y | Y | N | N | N | N | N | N | N | N | N | N | N |
| SmartCAN6-AC | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| SmartCAN8-AC | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| SmartCAN10-AC | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |

### 225D Weight Indicator

**(*Using 720 Ohm Load Cells with 500 feet of 18-gauge Homerun Cable*)**

| SmartCAN Model | MAXIMUM NUMBER OF LOAD CELLS | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 22 | 24 | 26 | 28 | 30 | 32 |
| SmartCAN4 | Y | Y | N | N | N | N | N | N | N | N | N | N | N | N | N |
| SmartCAN6 | Y | Y | Y | N | N | N | N | N | N | N | N | N | N | N | N |
| SmartCAN8 | Y | Y | Y | Y | N | N | N | N | N | N | N | N | N | N | N |
| SmartCAN10 | Y | Y | Y | Y | Y | N | N | N | N | N | N | N | N | N | N |
| SmartCAN6-AC | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| SmartCAN8-AC | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| SmartCAN10-AC | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |

# SPECIFICATIONS, CONT.

## 825D Weight Indicator

(*Using 350 Ohm Load Cells with 500 feet of 18-gauge Homerun Cable*)

| SmartCAN Model | MAXIMUM NUMBER OF LOAD CELLS | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 22 | 24 | 26 | 28 | 30 | 32 |
| SmartCAN4 | Y | N | N | N | N | N | N | N | N | N | N | N | N | N | N |
| SmartCAN6 | Y | N | N | N | N | N | N | N | N | N | N | N | N | N | N |
| SmartCAN8 | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N |
| SmartCAN10 | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N |
| SmartCAN6-AC | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| SmartCAN8-AC | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| SmartCAN10-AC | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |

## 825D Weight Indicator

(*Using 720 Ohm Load Cells with 500 feet of 18-gauge Homerun Cable*)

| SmartCAN Model | MAXIMUM NUMBER OF LOAD CELLS | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 22 | 24 | 26 | 28 | 30 | 32 |
| SmartCAN4 | Y | Y | N | N | N | N | N | N | N | N | N | N | N | N | N |
| SmartCAN6 | Y | Y | Y | N | N | N | N | N | N | N | N | N | N | N | N |
| SmartCAN8 | Y | Y | Y | Y | N | N | N | N | N | N | N | N | N | N | N |
| SmartCAN10 | Y | Y | Y | Y | Y | N | N | N | N | N | N | N | N | N | N |
| SmartCAN6-AC | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| SmartCAN8-AC | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| SmartCAN10-AC | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |

# INSTALLATION

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

| | |
|---|---|
| SMARTCANXX (-YY) Junction Box(es) | SMARTCAN4 (supports up to 4 cells, powered by indicator)<br>SMARTCAN6 (supports up to 6 cells, powered by indicator or customer supplied 24V DC @ 1.3A power supply)<br>SMARTCAN8 (supports up to 8 cells, powered by indicator or customer supplied 24V DC @ 1.3A power supply)<br>SMARTCAN10 (supports up to 10 cells, powered by indicator or customer supplied 24V DC @ 1.3A power supply)<br>SMARTCAN6-AC (supports up to 6 cells, powered by internal 24V DC @ 1.3A power supply)<br>SMARTCAN8-AC (supports up to 8 cells, powered by internal 24V DC @ 1.3A power supply)<br>SMARTCAN10-AC (supports up to 10 cells, powered by internal 24V DC @ 1.3A power supply) |
| 3502-C008 | Grounding Instructions Drawing |
| 225D or 825D | Weight Indicator with DLC (Digital Load Cell Controller) card.<br><br>**NOTE:** Your indicator may have additional option cards depending on your specific application. |

The following items may be required but are not provided by Cardinal Scale as a standard component of the SmartCAN System package:

- Wire and/or conduit needed to provide a source of AC power to the SmartCAN6-AC, SmartCAN8-AC, or SmartCAN10-AC junction box (this is typically 18 to 20 AWG stranded wire, 3 conductor – refer to color code table below).

**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 |

- Purchased Homerun Cable, 5 Conductors, Shielded PVC (Contains 2 x 18AWG, 2 x 22AWG, and 1 x 22AWG), Cardinal Part No.6980-1092
- Tools required for the installation.

## SmartCAN Junction Box Mounting Dimensions

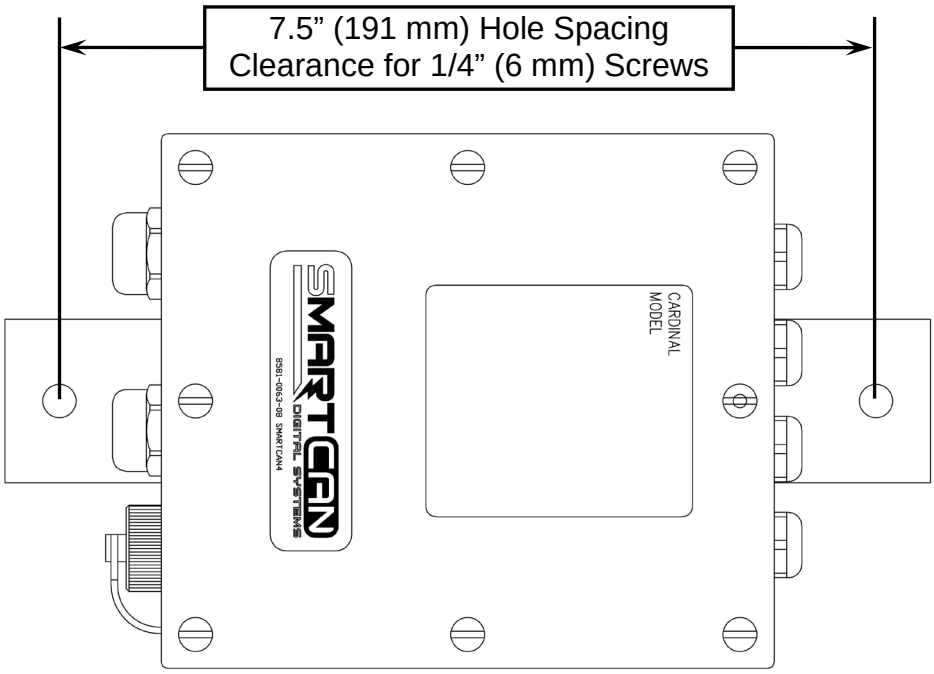



**Figure No. 1 – SmartCAN4 Mounting Dimensions**

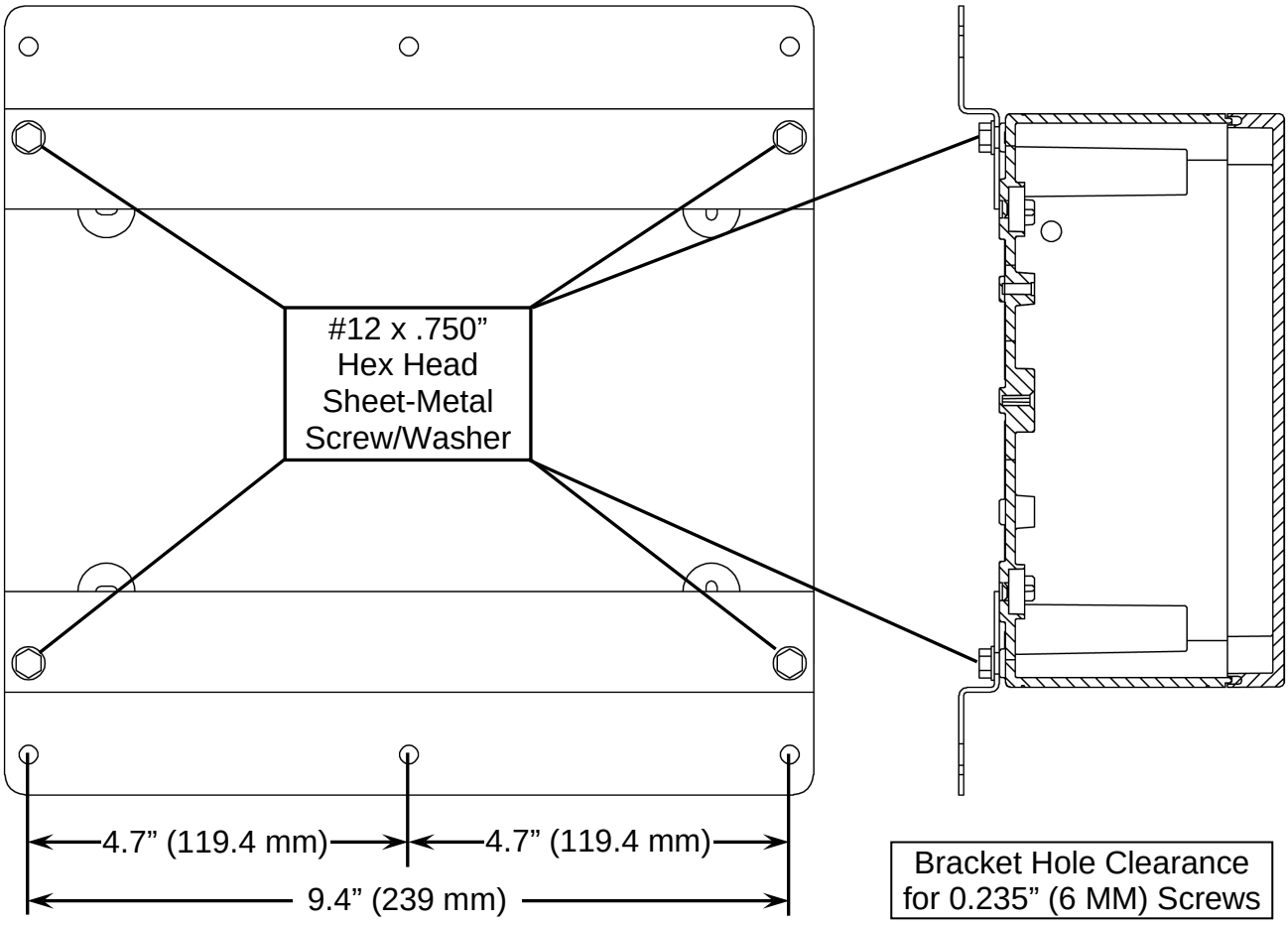



**Figure No. 2 – SmartCAN6, SmartCAN8, and SmartCAN10 Mounting Dimensions**

## Mounting SmartCAN Junction Boxes

Cardinal's SmartCAN junction boxes can be used on Cardinal scales, as well as other brands of scales, provided they use standard analog strain gauge load cells. The following instructions describe installation on Cardinal scales and for other scales.

### Mounting SmartCAN4 on Cardinal Scales

When the SmartCAN4 junction box is used with a Cardinal PRC or EPR series scale, it is mounted in the same location as the standard load cell junction box using its two mounting tabs. Access to the 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. Referring to Figure No. 3, 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 outer covers have been removed, the center cover can be removed. Set the covers aside in a safe place.

### Mounting SmartCAN6, SmartCAN8, and SmartCAN10 on Cardinal Scales

The SmartCAN6, SmartCAN8, and SmartCAN10 junction boxes are equipped with two mounting brackets and four self-tapping screws (see Figure No. 2) to allow the box to be mounted on a Cardinal PRC or EPR series scale in the same location as the standard load cell junction box, or in any location on the scale that does not place it a position where it may be damaged by a vehicle tire or cause a safety hazard.

If mounting SmartCAN6, SmartCAN8, or SmartCAN10 junction box in the standard junction box location, access is gained by removing the top cover between the first and second scale modules. The cover is composed of three separate covers. Referring to Figure No. 3, 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 outer covers have been removed, the center cover can be removed. Set the covers aside in a safe place.

If mounting elsewhere on the scale, after selecting the mounting location for the box, ensure the location is clean and free of debris. Place the box near the location in preparation for making the wiring interconnections. Although you can mount the box before making the connections, it may be easier to make the connections first, then mount the box depending on the characteristics of the installation.

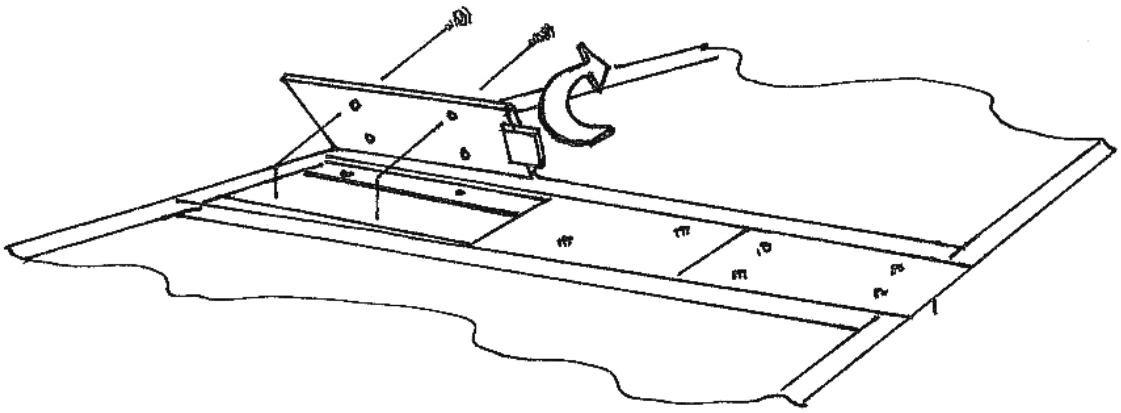


**Figure No. 3 – Removal of Cover Plates on Cardinal PRC and EPR**

### Mounting SmartCAN4 on Scales from Others

If you are installing the SmartCAN4 junction box on a scale manufactured by a company other than Cardinal Scale, the installation is essentially the same as for a Cardinal scale. 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 the load cells are working properly. The SmartCAN4 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 correctly 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 SmartCAN4 junction box will be attached to the scale. Make certain that the location selected for the SmartCAN4 junction box does not place it in a position where it may be damaged by a vehicle tire or cause a safety hazard. After selecting the mounting location, place the box near that location in preparation for making the wiring interconnections. Although you can mount the box 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 SmartCAN6, SmartCAN8, and SmartCAN10 on Scales from Others

If you are installing the SmartCAN6, SmartCAN8, or SmartCAN10 junction box on a scale manufactured by a company other than Cardinal Scale, the installation is essentially the same as for a Cardinal scale. 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 the load cells are working properly. The SmartCAN6, SmartCAN8, or SmartCAN10 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 correctly installed and that the connections are clean and electrically sound.

The SmartCAN6, SmartCAN8, and SmartCAN10 junction boxes are equipped with two mounting brackets and four self-tapping screws (see Figure No. 2) to allow the box to be mounted on a scale. Mount the box in a location that does not place it in a position where it may be damaged by a vehicle tire or cause a safety hazard. After selecting the mounting location for the box, ensure the location is clean and free of debris. Place the box near the location in preparation for making the wiring interconnections. Although you can mount the box before making the connections, it may be easier to make the connections first, then mount the box depending on the characteristics of the installation.

## Connecting the Junction Boxes

Although the junction boxes can be mounted to the scale 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 is 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 cells.

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 or extending the load cell cable.**

# SMARTCAN JUNCTION BOX CONNECTIONS

## SmartCAN4 Interconnection

**NOTES:**

1. The scale-to-scale house (Homerun) cable is to be furnished by others or ordered from Cardinal Scale.
2. Refer to Drawing No. 3502-C008 for Grounding Instructions.
3. Cardinal Scale Mfg. Co. recommends that the customer install a protective conduit/cover for the load cell cables whenever the condition is present that can result in damage or abrasion to the load cell cables.
4. When installing cables into junction box terminals, twist the stranded wire to prevent stray conductors from shorting to adjacent terminals.
5. On item #1 (4-Cell SmartCAN Junction Box), insert two sense jumpers for 4-wire load cells that do not have voltage sensing wired in. Add the DLB jumper for load cells that require Dead Load Boost.
6. On multi-platform scales or systems with more than four load cells, multiple boxes may be wired together using "CAN IN" / "CAN OUT" terminals.

   **IMPORTANT!** End node jumper J18 must be installed in a single box installation and it must be installed if this is the last box in a multi-box installation.
7. Load Cell Disable Jumpers: place a jumper on the A/D channel that does not have a load cell connection.

**LOAD CELL WIRING COLOR CODE TABLE**

| Load Cell Type | –SIG | +SIG | –EXC | +EXC |
|---|---|---|---|---|
| DB-75000S | WHITE | GREEN | BLACK | RED |
| CBC50K | WHITE | GREEN | BLACK | RED |
| SB-xxxxS | WHITE | RED | BLACK | GREEN |
| xxK-SCA (50, 100, 120) | WHITE | RED | BLACK | GREEN |
| 200K-SCA | RED | WHITE | BLACK | GREEN |

**NOTE:** The Four Cell SmartCAN Wiring Diagram, 3502-0691-02 is included with the SmartCAN4. It will be folded and placed inside the junction box.

## SmartCAN4 Interconnection, Cont.

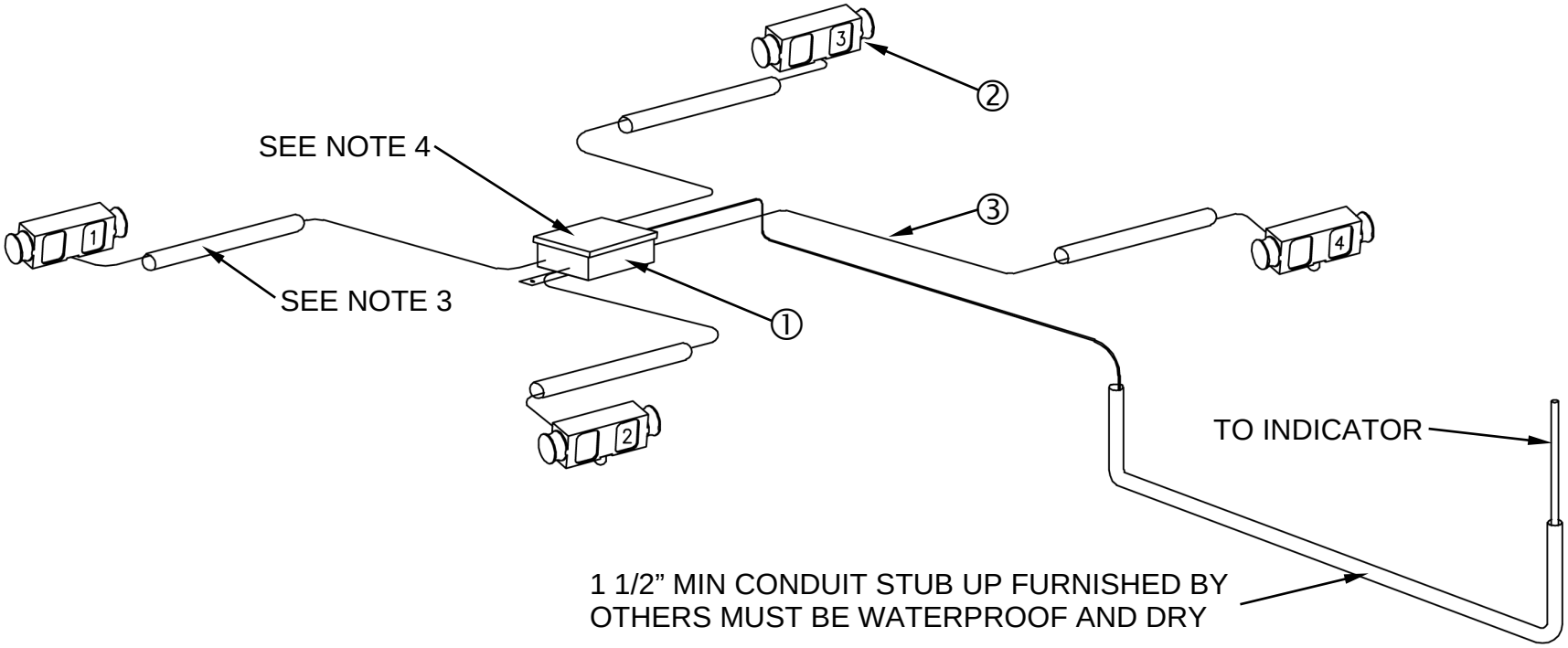



**Figure No. 4 – SmartCAN4 Load Cell Interconnect Diagram**

| Item | Qty | Part Number | Description |
|---|---|---|---|
| 1 | 1 | 8581-0037-0A | 4-CELL SMARTCAN JUNCTION BOX |
| 2 | (REF) | LOAD CELL | SEE CHART ON NEXT PAGE FOR COLOR CODE |
| 3 | (REF) | 6980-1092 | HOMERUN CABLE, 5 CONDUCTORS, SHIELDED PVC (SEE NOTE 1)<br>(CONTAINS 2 x 18AWG, 2 x 22AWG, AND 1 x 22AWG) |

## SmartCAN4 Interconnection, Cont.

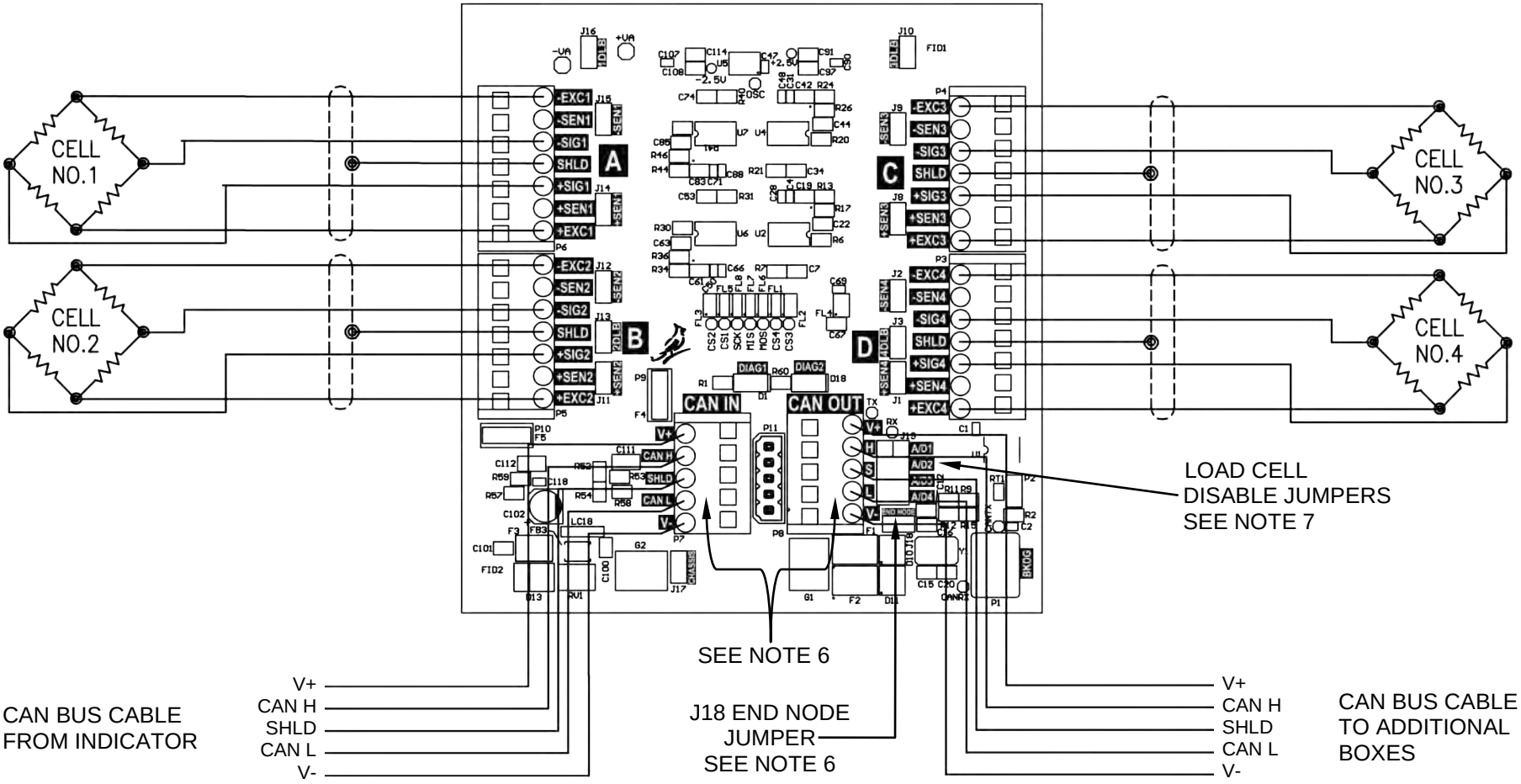



**Figure No. 5 – SmartCAN4 Main Board Interconnect Diagram**

## SmartCAN4 Interconnection, Cont.

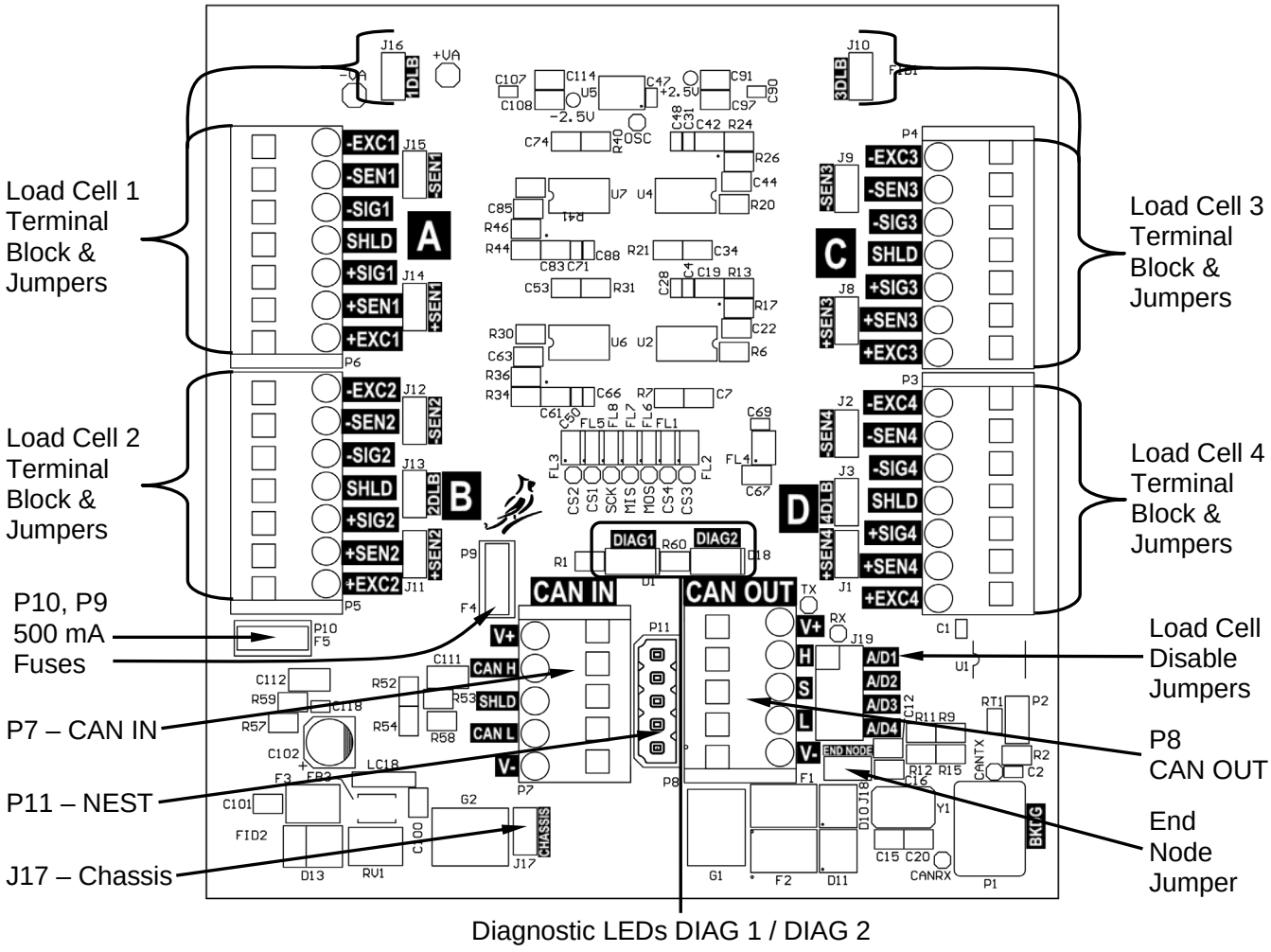



**Figure No. 6 – SmartCAN4 Main Board**

### SmartCAN4 Main Board Jumpers

| Sense | DLB (Dead Load Boost) | Load Cell Disable |
|---|---|---|
| Load Cell 1 = J14 and J15 | Load Cell 1 = J16 | Load Cell 1 = J19 A/D1 |
| Load Cell 2 = J11 and J12 | Load Cell 2 = J13 | Load Cell 2 = J19 A/D2 |
| Load Cell 3 = J8 and J9 | Load Cell 3 = J10 | Load Cell 3 = J19 A/D3 |
| Load Cell 4 = J1 and J2 | Load Cell 4 = J3 | Load Cell 4 = J19 A/D4 |

| | | |
|---|---|---|
| **END NODE – J18** | **ON** – Install this jumper for a Single Box or the Last Box in a Multi-Box Installation. | **OFF** – Remove this jumper for the Middle Box in a Multi-Box Installation. |

| | | |
|---|---|---|
| **CHASSIS – J17**<br>This jumper connects the CAN bus SHLD wire to the chassis ground. | **ON** – Install this jumper if an external power supply is connected to the board. | **OFF** – Removed this jumper if power is from the indicator. |

## SmartCAN4 Interconnection, Cont.

### SmartCAN4 Main Board Fuses

The SmartCAN4 mainboard has two replaceable fuses for the power (**V+**, **V-**) to the load cells.

| LOCATION | FUSE | PART NUMBER | DESCRIPTION |
|---|---|---|---|
| P9 | F4 | 6910-0024 | 500mA 65V, Fast Acting, TE5 |
| P10 | F5 | 6910-0024 | 500mA 65V, Fast Acting, TE5 |

### SmartCAN4 Main Board LEDs

The SmartCAN4 mainboard has two diagnostic LEDs for the connection to the load cells.

| LED | MEANING | STATUS |
|---|---|---|
| DIAG1 | Indicates data received on the CAN bus. | Red, blinking rapidly |
| DIAG2 | Indicates power is on and the main loop is running. | Green, blinking slowly |

### SmartCAN4 Gland Connector Layout

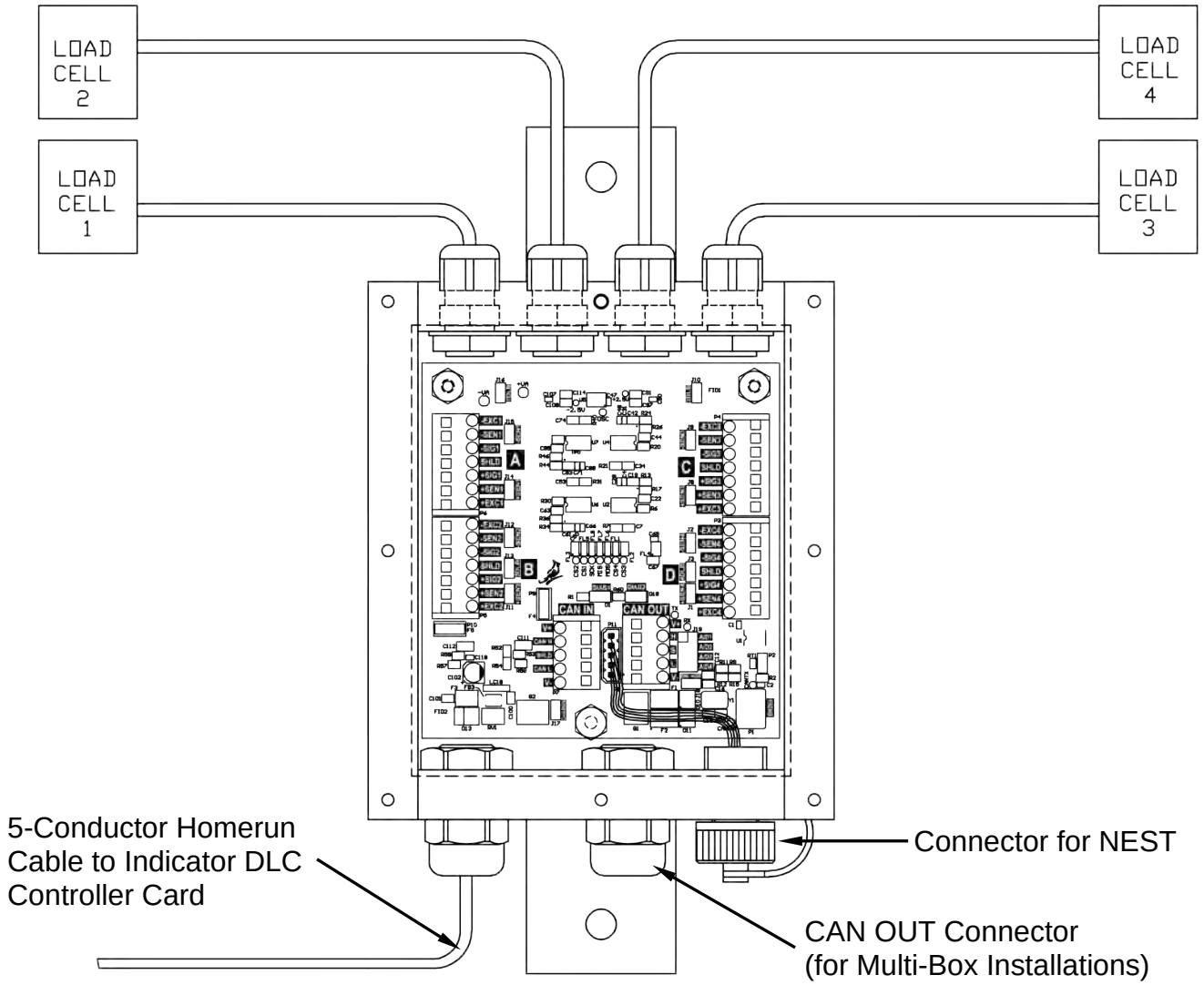



**Figure No. 7 – SmartCAN4 Gland Connector Layout**

## SmartCAN4 Interconnection, Cont.

### Connecting the Load Cell Cables

1. Remove the eight screws securing the top cover and gasket to the junction box body, then remove the top cover and gasket and set them aside.
2. Loosen the gland connector for the load cell cable. Refer to Figure No. 6 for the gland connector layout.
3. Slip the load cell cable through the gland connector and into the enclosure.
4. Remove 2.0 inches (51 mm) of the outer insulation jacket, and then remove 1/4 inch (6 mm) of insulation from each of the wires.
5. Next, locate the first load cell input terminal on the SmartCAN4 mainboard.
6. 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 Color Code Table for terminal connections.

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. For example, the load cells used in the Cardinal PRC and EPR Series vehicle scales are of a different type and have different color codes. Refer to the Load Cell Wiring Color Code table.

**LOAD CELL WIRING COLOR CODE TABLE**

| Load Cell Type | –SIG | +SIG | –EXC | +EXC |
|---|---|---|---|---|
| DB-75000S | WHITE | GREEN | BLACK | RED |
| CBC50K | WHITE | GREEN | BLACK | RED |
| SB-xxxxS | WHITE | RED | BLACK | GREEN |
| xxK-SCA (50, 100, 120) | WHITE | RED | BLACK | GREEN |
| 200K-SCA | RED | WHITE | BLACK | GREEN |

7. 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.
8. Repeat the procedure until all the wires are in place.
9. Repeat steps 2 through 8 for the remaining load cells.

**WARNING! Make sure all load cells are properly connected (refer to the Load Cell Wiring Color Code table) and have been checked for shorts between the excitation and shield wire, before powering on the SmartCAN box.**

## SmartCAN4 Interconnection, Cont.

### Connecting the Homerun Cable

The CAN interface cable (Homerun Cable) is installed between the SmartCAN4 junction box and the 225D or 825D indicator. The Homerun Cable is made from five conductors, shielded PVC cable, and terminated at the P5 terminal block on the 225D, and at the P1 terminal block on the 825D.

On the junction box end of the Homerun Cable, the cable is terminated at the P7 terminal block on the SmartCAN 4 mainboard. Refer to the table below for cable information.

| CARDINAL PART NO. | ITEM and DESCRIPTION |
|---|---|
| 6980-1092 | HOMERUN CABLE, 5 CONDUCTORS, SHIELDED PVC<br>(CONTAINS 2 x 18AWG, 2 x 22AWG, AND 1 x 22AWG) |

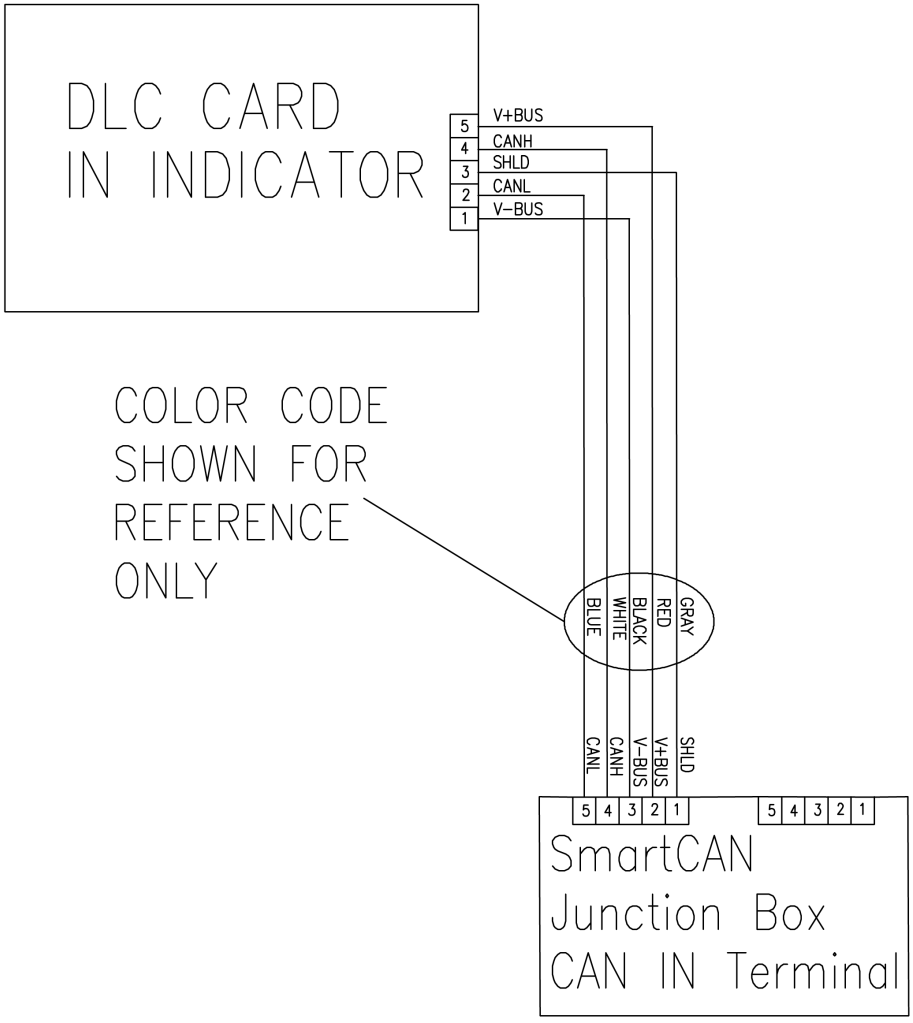



**Figure No. 8 – Indicator to SmartCAN4 Junction Box Connection**

## SmartCAN4 Interconnection, Cont.

### Connecting the Homerun Cable, Cont.

1. With the top cover and gasket to the junction box body removed, loosen the gland connector for the Homerun cable. Refer to Figure No. 6 for the gland connector layout.
2. Slip the Homerun cable through the gland connector and into the enclosure.
3. With the homerun cable routed into the enclosure, remove approximately 2.0 inches (51 mm) of the cables' outer jacket, exposing the internal wires.
4. Next, remove approximately 1/4 inch (6 mm) of insulation from each of the five wires.
5. Referring to the table below (or on the circuit board) for terminal connections, connect each wire to CAN IN terminal block P7 on the SmartCAN4 mainboard.

**Terminal Block P7**

| Board Label | Homerun Cable Wire Color | Wire Color if using a Load Cell Cable |
|---|---|---|
| SHLD | GRAY | BROWN |
| V+BUS | RED | WHITE |
| V-BUS | BLACK | BLUE |
| CAN H | WHITE | BLACK |
| CAN L | BLUE or LIGHT BLUE | GRAY |

6. 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 opening, and then remove the screwdriver. The release bar will return to its original position, locking the wire in place.
7. Repeat the procedure until all five wires are in place.

## Re-Installing the SmartCAN4 Top Cover

**IMPORTANT: The surface of the junction box and top cover that contacts the gasket must be clean and free of debris. Make sure the gasket is clean and properly aligned with the holes in the junction box before securing the top cover to the junction box.**

1. After all terminations have been made, remove the excess cable from the enclosure.
2. Using a wrench, tighten the *load cell cable* gland connectors to 15 in-lb (1.7 Nm).
3. Using a wrench, tighten the *Homerun cable* gland connector to 33 in-lb (3.7 Nm).
4. Secure the top cover to the junction box body with the 8 screws removed earlier.
5. Follow a diagonal pattern when tightening the screws.

# SMARTCAN JUNCTION BOX CONNECTIONS, CONT.

## SmartCAN6, SmartCAN8, and SmartCAN10 Interconnection

## NOTES:

1. The scale-to-scale house (Homerun) cable is to be furnished by others or ordered from Cardinal Scale.
1. Refer to Drawing No. 3502-C008 for Grounding Instructions.
2. Cardinal Scale Mfg. Co. recommends that the customer install a protective conduit/cover for the load cell cables whenever the condition is present that can result in damage or abrasion to the load cell cables.
3. When installing cables into junction box terminals, twist the stranded wire to prevent stray conductors from shorting to adjacent terminals.
4. On item #1, insert two sense jumpers for four-wire load cells that do not have voltage sensing wired in. Add the DLB jumper for load cells that require Dead Load Boost.
5. On multi-platform scales or systems with more than 10 load cells, multiple boxes may be wired together using "CAN IN" / "CAN OUT" terminals.

   **IMPORTANT!** End node jumper J17 must be installed in a single box installation and it must be installed if this is the last box in a multi-box installation.
6. Load Cell Disable Jumpers: place a jumper on the A/D channel that does not have a load cell connection.

**LOAD CELL WIRING COLOR CODE**

| Load Cell Type | –SIG | +SIG | –EXC | +EXC |
|---|---|---|---|---|
| DB-75000S | WHITE | GREEN | BLACK | RED |
| CBC50K | WHITE | GREEN | BLACK | RED |
| SB-xxxxS | WHITE | RED | BLACK | GREEN |
| xxK-SCA (50, 100, 120) | WHITE | RED | BLACK | GREEN |
| 200K-SCA | RED | WHITE | BLACK | GREEN |

## SmartCAN6, SmartCAN8, and SmartCAN10 Interconnection, Cont.

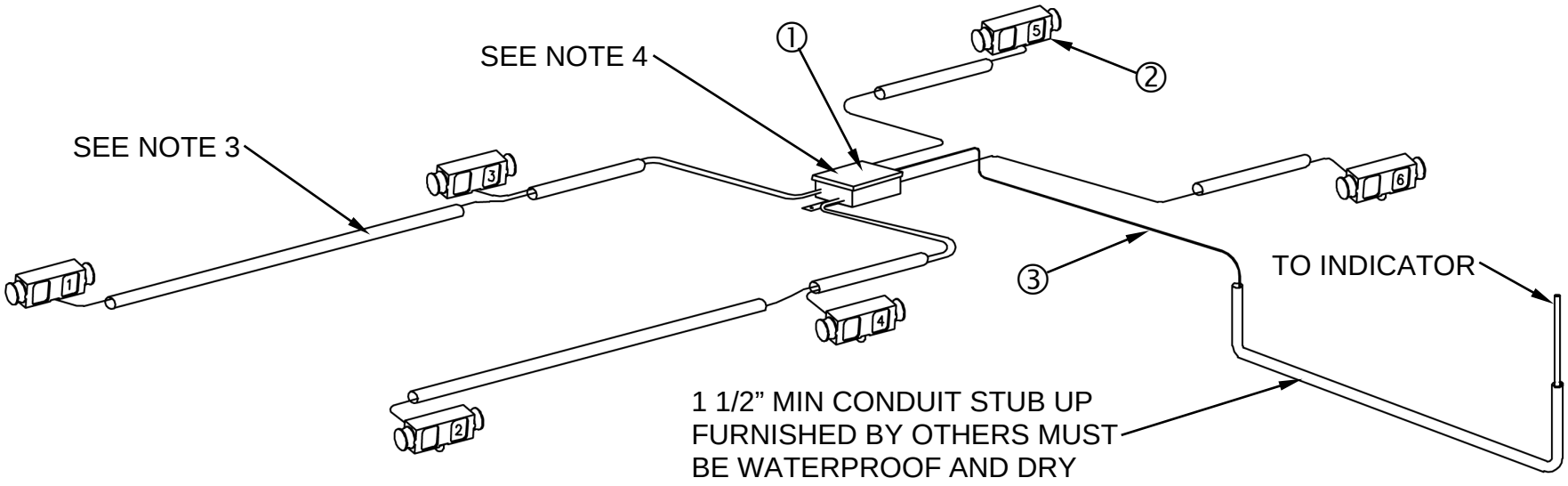



**Figure No. 9 – SmartCAN6 Load Cell Interconnect Diagram**

| Item | Qty | Part Number | Description |
|---|---|---|---|
| 1 | 1 | 8581-0048-0A | 6-CELL SMARTCAN JUNCTION BOX |
| 2 | (REF) | LOAD CELL | SEE CHART ON “NOTES:” PAGE FOR COLOR CODE |
| 3 | (REF) | 6980-1092 | HOMERUN CABLE, 5 CONDUCTORS, SHIELDED PVC (SEE NOTE 1)<br>(CONTAINS 2 x 18AWG, 2 x 22AWG, AND 1 x 22AWG) |

## SmartCAN6, SmartCAN8, and SmartCAN10 Interconnection, Cont.

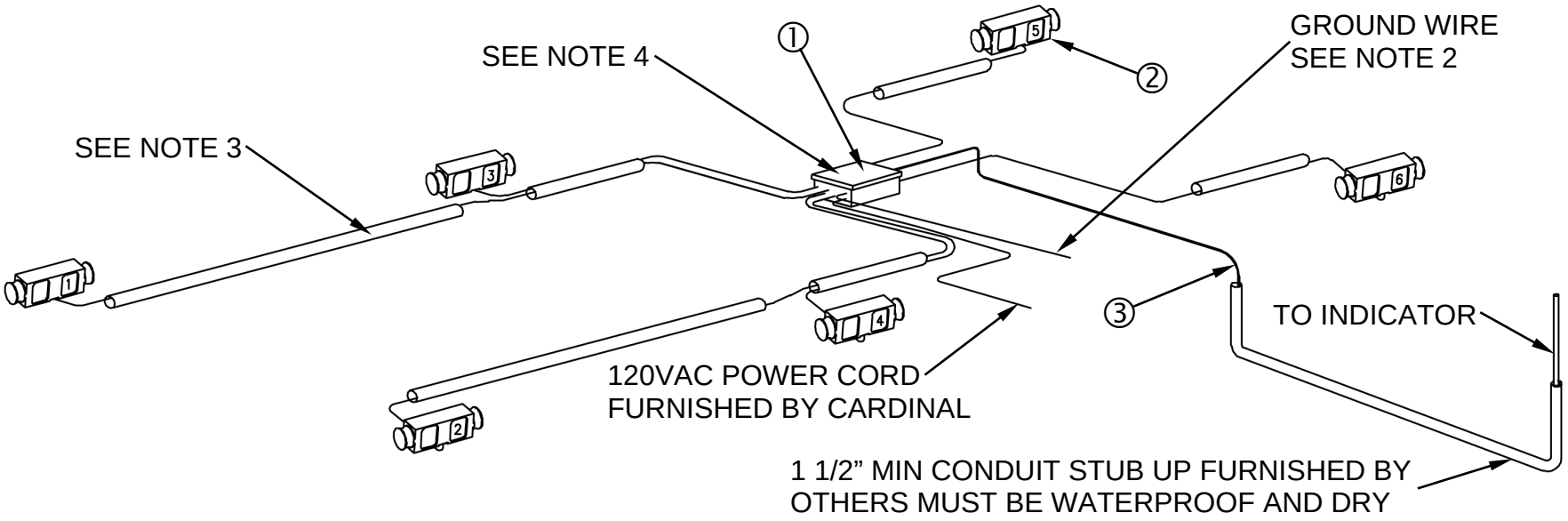



**Figure No. 10 – SmartCAN6-AC Load Cell Interconnect Diagram**

| Item | Qty | Part Number | Description |
|---|---|---|---|
| 1 | 1 | 8581-0048-1A | 6-CELL SMARTCAN JUNCTION BOX WITH AC |
| 2 | (REF) | LOAD CELL | SEE CHART ON “NOTES:” PAGE FOR COLOR CODE |
| 3 | (REF) | 6980-1092 | HOMERUN CABLE, 5 CONDUCTORS, SHIELDED PVC (SEE NOTE 1)<br>(CONTAINS 2 x 18AWG, 2 x 22AWG, AND 1 x 22AWG) |

## SmartCAN6, SmartCAN8, and SmartCAN10 Interconnection, Cont.

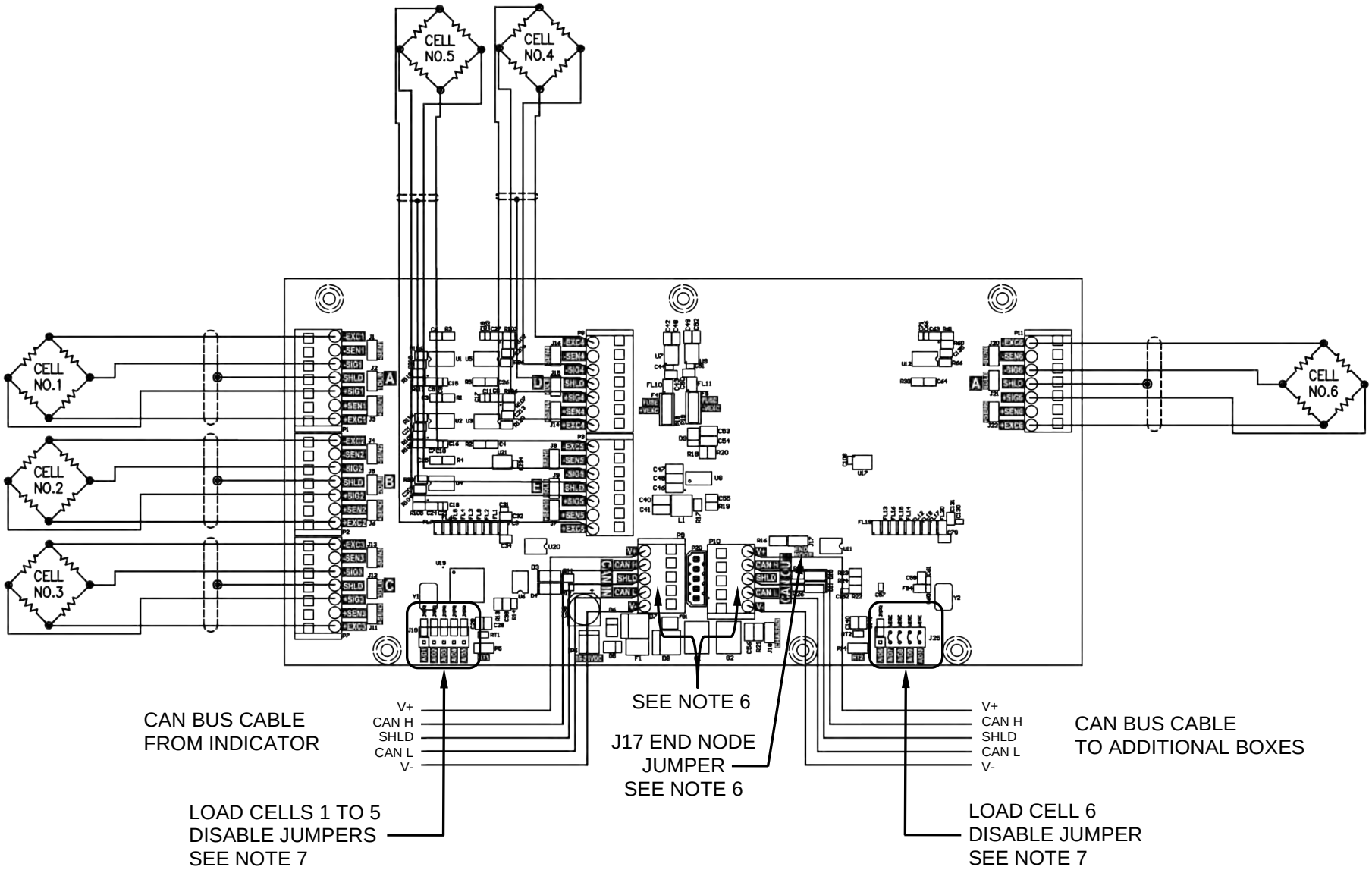



**Figure No. 11 – SmartCAN6 / SmartCAN6-AC Main Board Interconnect Diagram**

## SmartCAN6, SmartCAN8, and SmartCAN10 Interconnection, Cont.

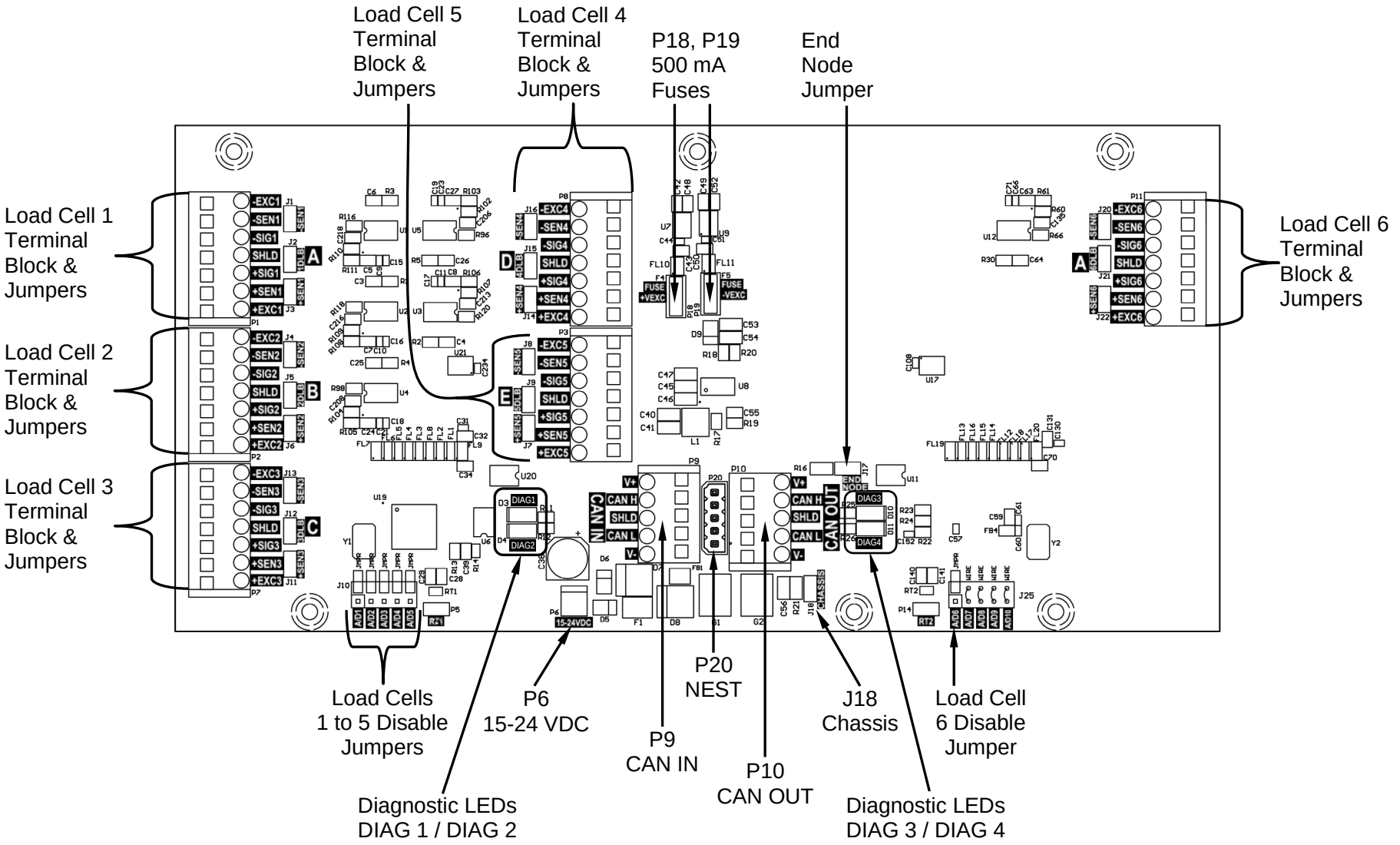



**Figure No. 12 – SmartCAN6 / SmartCAN6-AC Main Board**

## SmartCAN6, SmartCAN8, and SmartCAN10 Interconnection, Cont.

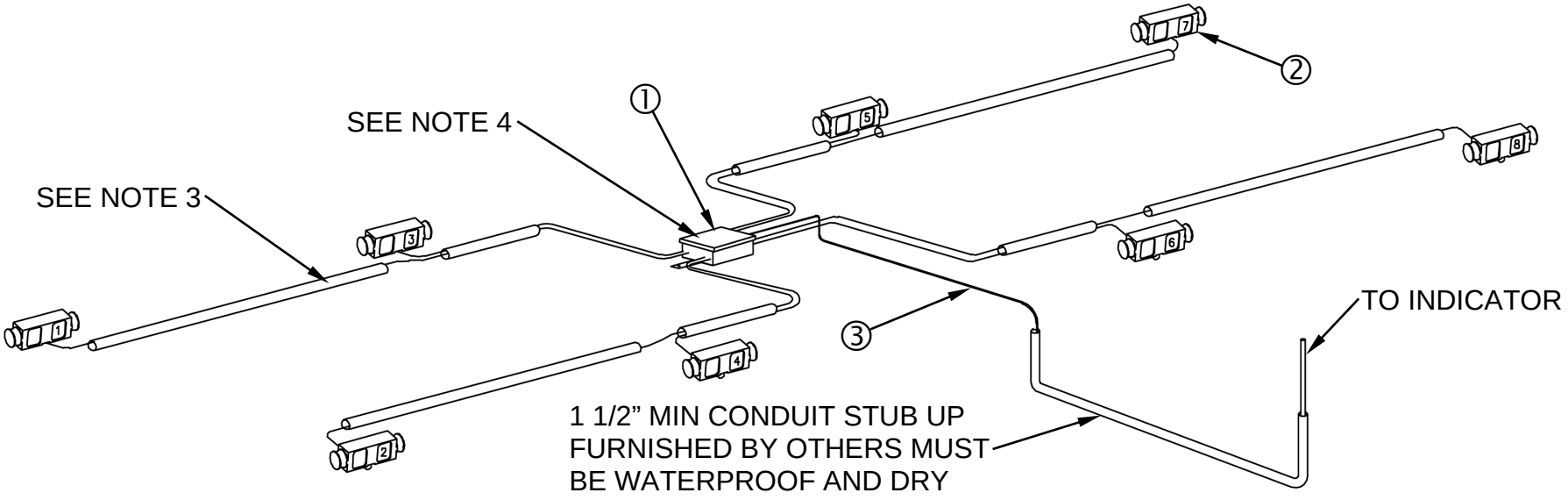



**Figure No. 13 – SmartCAN8 Load Cell Interconnect Diagram**

| Item | Qty | Part Number | Description |
|---|---|---|---|
| 1 | 1 | 8581-0047-0A | 8-CELL SMARTCAN JUNCTION BOX |
| 2 | (REF) | LOAD CELL | SEE CHART ON “NOTES:” PAGE FOR COLOR CODE |
| 3 | (REF) | 6980-1092 | HOMERUN CABLE, 5 CONDUCTORS, SHIELDED PVC (SEE NOTE 1)<br>(CONTAINS 2 x 18AWG, 2 x 22AWG, AND 1 x 22AWG) |

## SmartCAN6, SmartCAN8, and SmartCAN10 Interconnection, Cont.

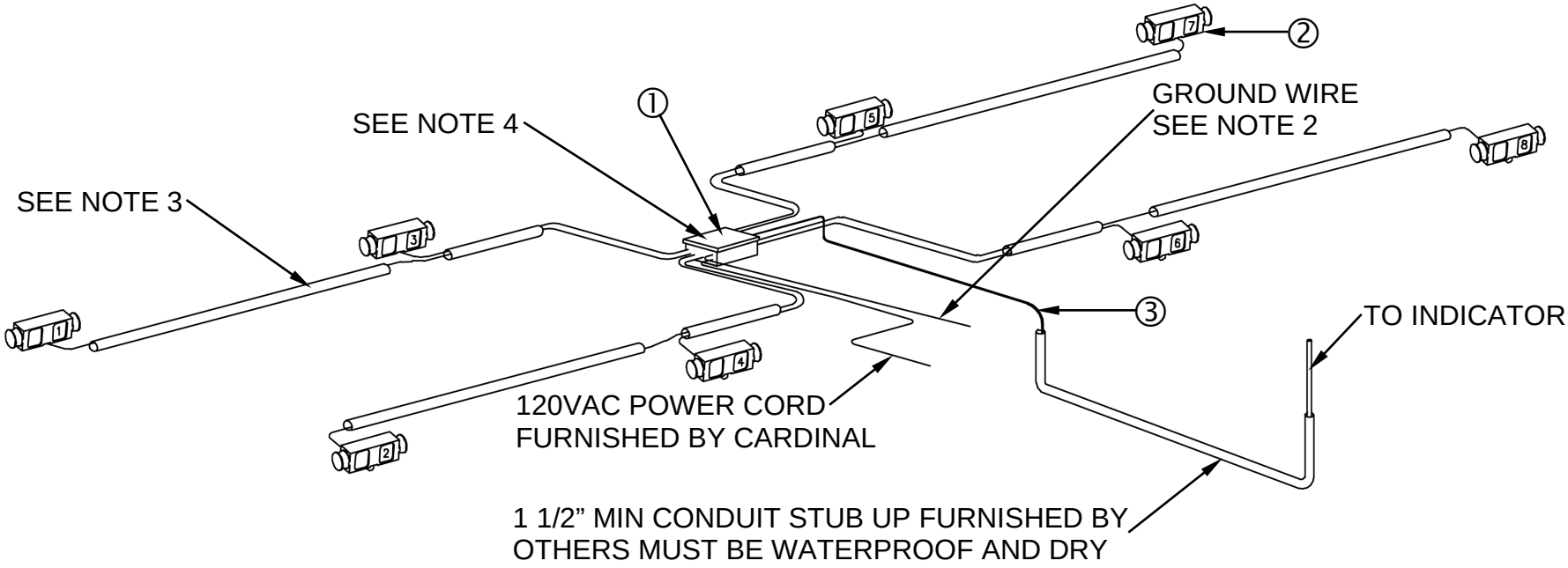



**Figure No. 14 – SmartCAN8-AC Load Cell Interconnect Diagram**

| Item | Qty | Part Number | Description |
|---|---|---|---|
| 1 | 1 | 8581-0047-1A | 8-CELL SMARTCAN JUNCTION BOX WITH AC |
| 2 | (REF) | LOAD CELL | SEE CHART ON “NOTES:” PAGE FOR COLOR CODE |
| 3 | (REF) | 6980-1092 | HOMERUN CABLE, 5 CONDUCTORS, SHIELDED PVC (SEE NOTE 1)<br>(CONTAINS 2 x 18AWG, 2 x 22AWG, AND 1 x 22AWG) |

## SmartCAN6, SmartCAN8, and SmartCAN10 Interconnection, Cont.

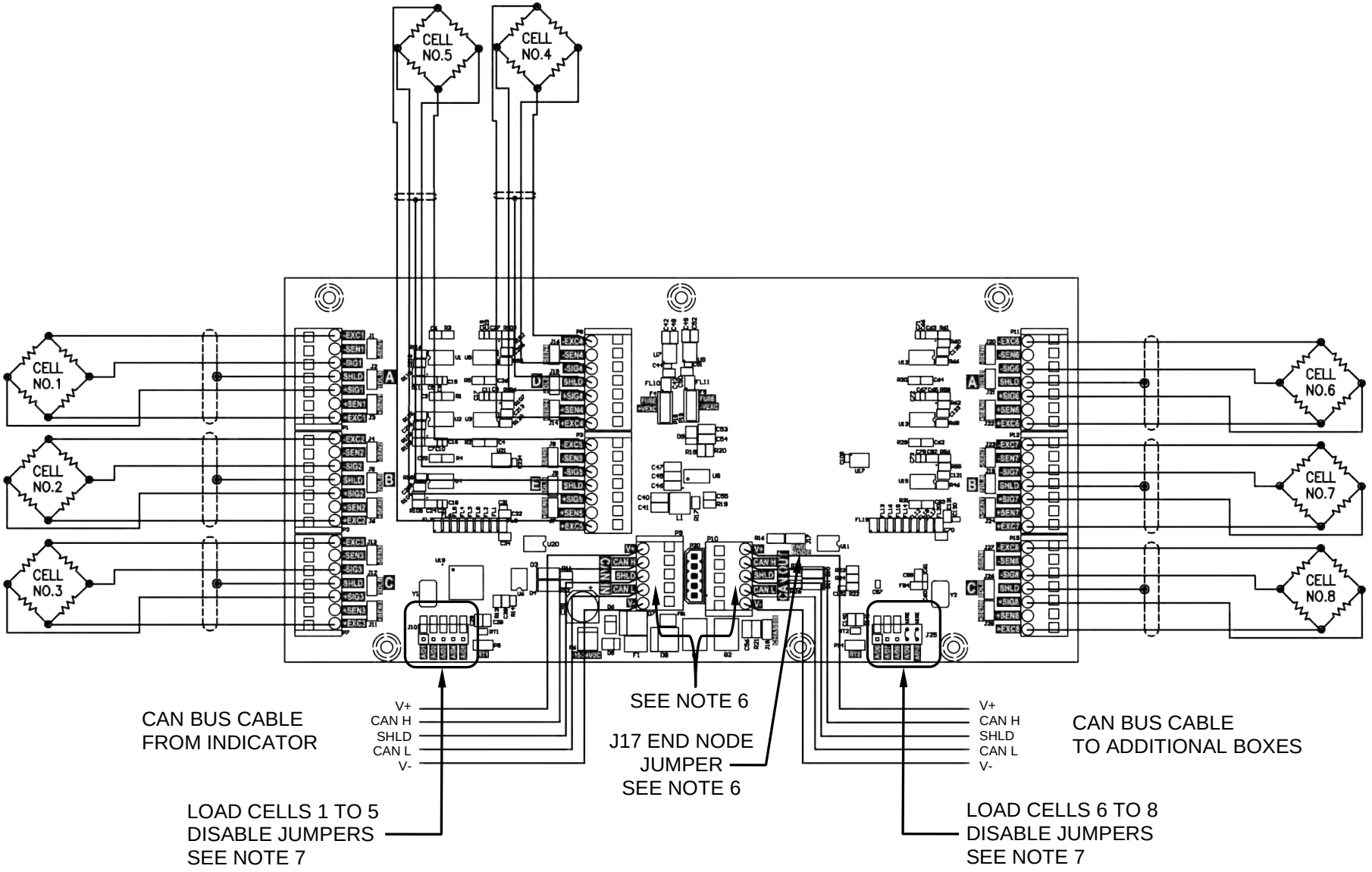



**Figure No. 15 – SmartCAN8 / SmartCAN8-AC Main Board Interconnect Diagram**

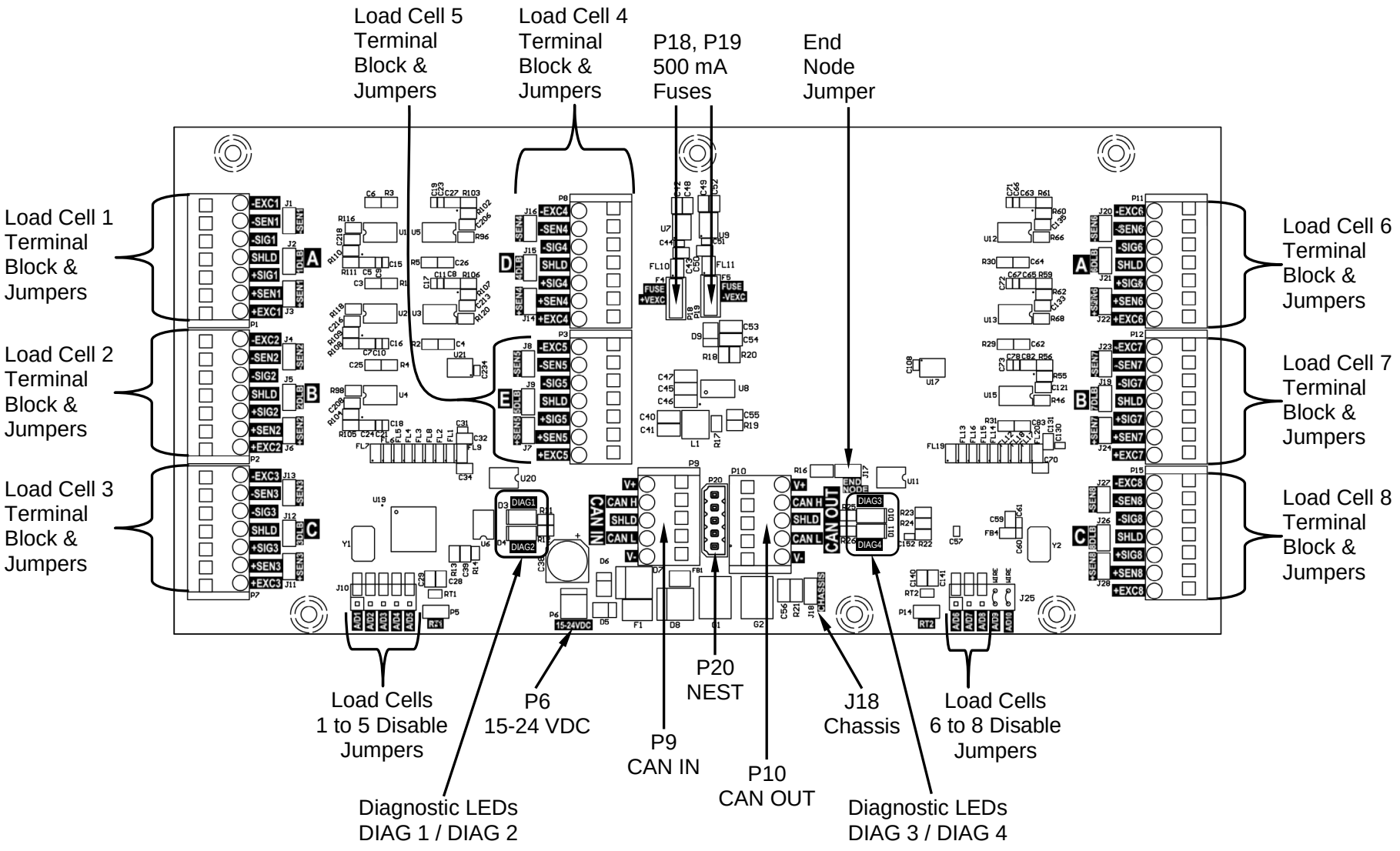



**Figure No. 16 – SmartCAN8 / SmartCAN8-AC Main Board**

## SmartCAN6, SmartCAN8, and SmartCAN10 Interconnection, Cont.

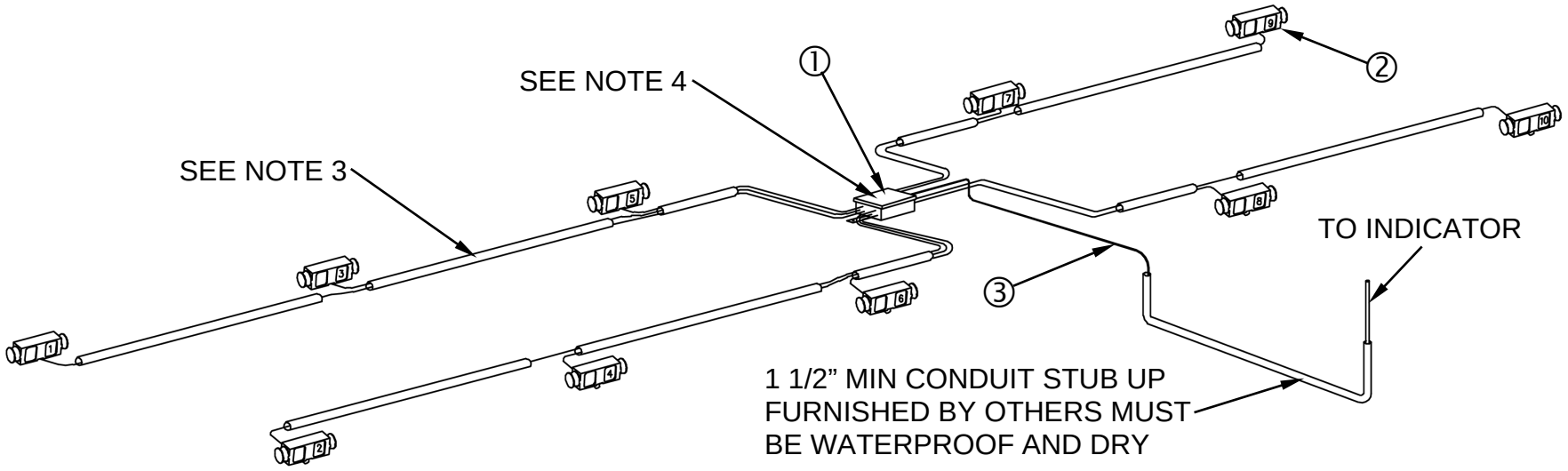



**Figure No. 17 – SmartCAN10 Load Cell Interconnect Diagram**

| Item | Qty | Part Number | Description |
|---|---|---|---|
| 1 | 1 | 8581-0036-0A | 10-CELL SMARTCAN JUNCTION BOX |
| 2 | (REF) | LOAD CELL | SEE CHART ON “NOTES:” PAGE FOR COLOR CODE |
| 3 | (REF) | 6980-1092 | HOMERUN CABLE, 5 CONDUCTORS, SHIELDED PVC (SEE NOTE 1)<br>(CONTAINS 2 x 18AWG, 2 x 22AWG, AND 1 x 22AWG) |

## SmartCAN6, SmartCAN8, and SmartCAN10 Interconnection, Cont.

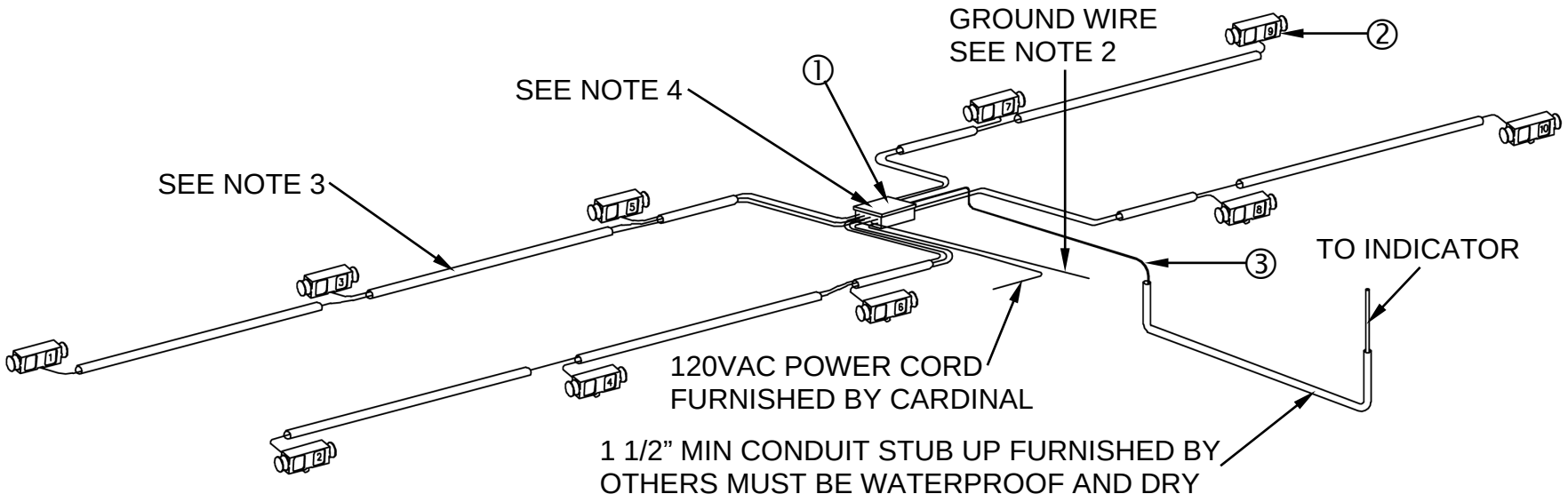



**Figure No. 18 – SmartCAN10-AC Load Cell Interconnect Diagram**

| Item | Qty | Part Number | Description |
|---|---|---|---|
| 1 | 1 | 8581-0036-0A | 10-CELL SMARTCAN JUNCTION BOX |
| 2 | (REF) | LOAD CELL | SEE CHART ON “NOTES:” PAGE FOR COLOR CODE— |
| 3 | (REF) | 6980-1092 | HOMERUN CABLE, 5 CONDUCTORS, SHIELDED PVC (SEE NOTE 1)<br>(CONTAINS 2 x 18AWG, 2 x 22AWG, AND 1 x 22AWG) |

## SmartCAN6, SmartCAN8, and SmartCAN10 Interconnection, Cont.

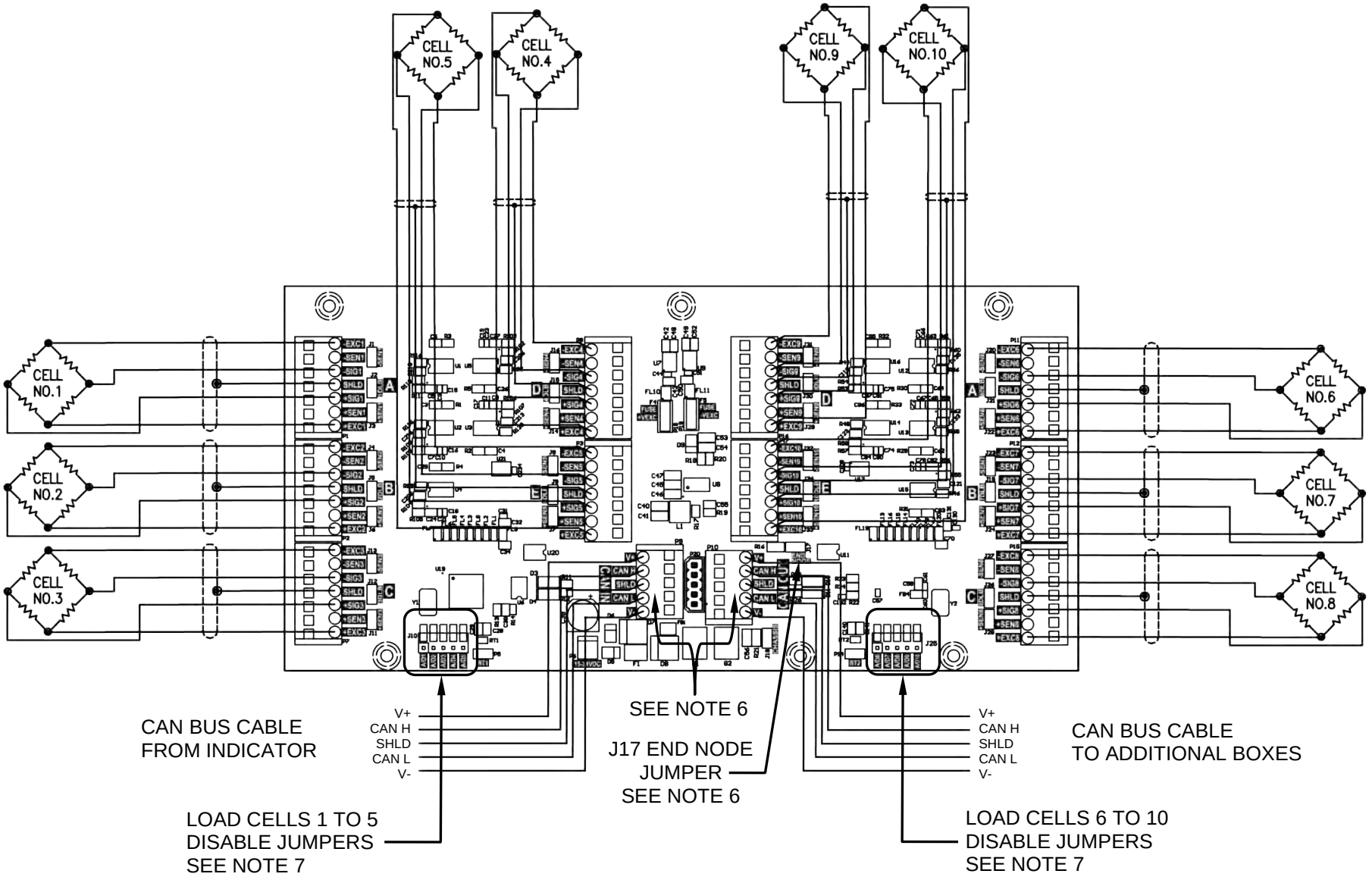



**Figure No. 19 – SmartCAN10 / SmartCAN10-AC Main Board Interconnect Diagram**

## SmartCAN6, SmartCAN8, and SmartCAN10 Interconnection, Cont.

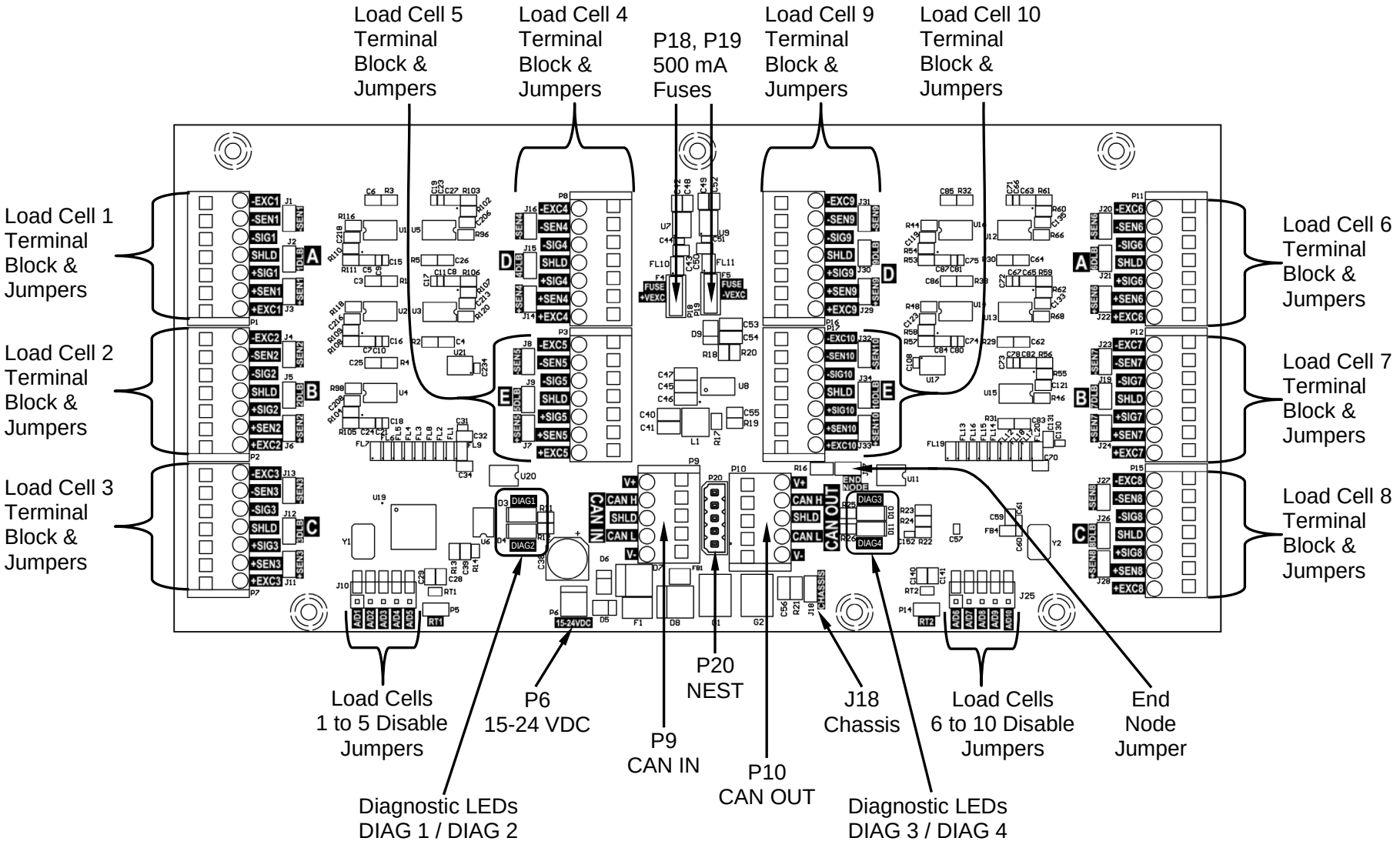



**Figure No. 20 – SmartCAN10 / SmartCAN10-AC Main Board**

## SmartCAN6, SmartCAN8, and SmartCAN10 Interconnection, Cont.

### SmartCAN6 Main Board Jumpers

| Sense | DLB (Dead Load Boost) | Load Cell Disable |
|---|---|---|
| Load Cell 1 = J1 and J3 | Load Cell 1 = J2 | Load Cell 1 = J10 A/D1 |
| Load Cell 2 = J4 and J6 | Load Cell 2 = J5 | Load Cell 2 = J10 A/D2 |
| Load Cell 3 = J11 and J13 | Load Cell 3 = J12 | Load Cell 3 = J10 A/D3 |
| Load Cell 4 = J14 and J16 | Load Cell 4 = J15 | Load Cell 4 = J10 A/D4 |
| Load Cell 5 = J7 and J8 | Load Cell 5 = J9 | Load Cell 5 = J10 A/D5 |
| Load Cell 6 = J20 and J22 | Load Cell 6 = J21 | Load Cell 6 = J25 A/D6 |

### SmartCAN8 Main Board Jumpers

**NOTE: The SmartCAN 8 uses the same jumpers as the SmartCAN6, plus the following additional jumpers.**

| | | |
|---|---|---|
| Load Cell 7 = J23 and J24 | Load Cell 7 = J19 | Load Cell 7 = J25 A/D7 |
| Load Cell 8 = J27 and J28 | Load Cell 8 = J26 | Load Cell 8 = J25 A/D8 |

### SmartCAN10 Main Board Jumpers

**NOTE: The SmartCAN 10 uses the same jumpers as the SmartCAN6 and SmartCAN8, plus the following additional jumpers.**

| | | |
|---|---|---|
| Load Cell 9 = J29 and J31 | Load Cell 9 = J30 | Load Cell 9 = J25 A/D9 |
| Load Cell 10 = J32 and J33 | Load Cell 10 = J34 | Load Cell 10 = J25 A/D10 |

### Jumpers Common to SmartCAN6, SmartCAN8, and SmartCAN10

| | | |
|---|---|---|
| **END NODE – J17** | **ON** – Install this jumper for a Single Box or the Last Box in a Multi-Box Installation. | **OFF** – Remove this jumper for the Middle Box in a Multi-Box Installation. |

| | | |
|---|---|---|
| **CHASSIS – J18**<br>This jumper connects the CAN bus SHLD wire to the chassis ground. | **ON** – Install this jumper if an external power supply is connected to the board. | **OFF** – Removed this jumper if power is from the indicator. |

## SmartCAN6, SmartCAN8, and SmartCAN10 Interconnection, Cont.

### SmartCAN6, SmartCAN8, and SmartCAN10 Main Board Fuses

The mainboard of the SmartCAN6, SmartCAN8, and SmartCAN10 has two replaceable fuses for the power (**V+**, **V-**) to the load cells.

| LOCATION | FUSE | PART NUMBER | DESCRIPTION |
|---|---|---|---|
| P18 | F4 | 6910-0024 | 500mA 65V, Fast Acting, TE5 |
| P19 | F5 | 6910-0024 | 500mA 65V, Fast Acting, TE5 |

### SmartCAN6, SmartCAN8, and SmartCAN10 Main Board LEDs

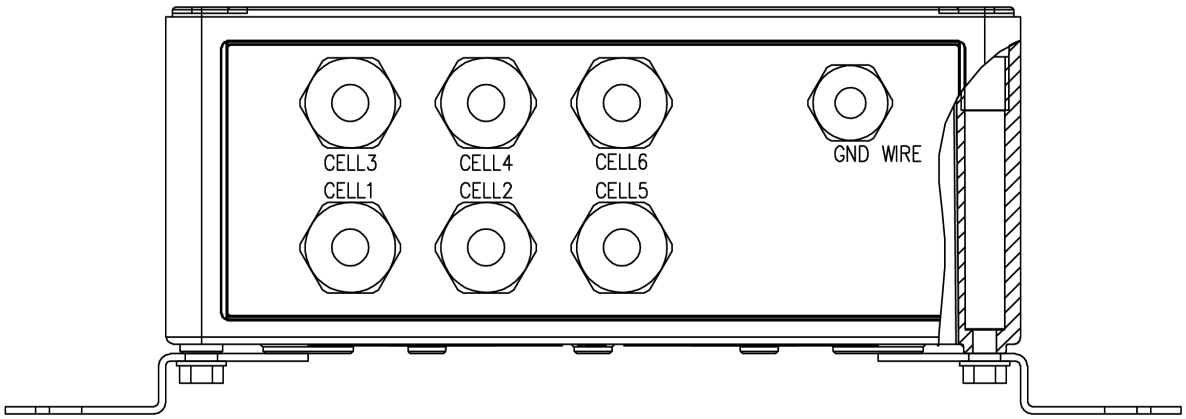
The mainboard of the SmartCAN6, SmartCAN8, and SmartCAN10 have four diagnostic LEDs for the connection to the load cells. DIAG1 and DIAG2 are for load cells 1 to 5 and DIAG3 and DIAG4 are for load cells 6 to 10.

| LED | Meaning | Status |
|---|---|---|
| DIAG1/DIAG3 | Indicates data received on the CAN bus. | Red, blinking rapidly |
| DIAG2/DIAG4 | Indicates power is on and the main loop is running. | Green, blinking slowly |

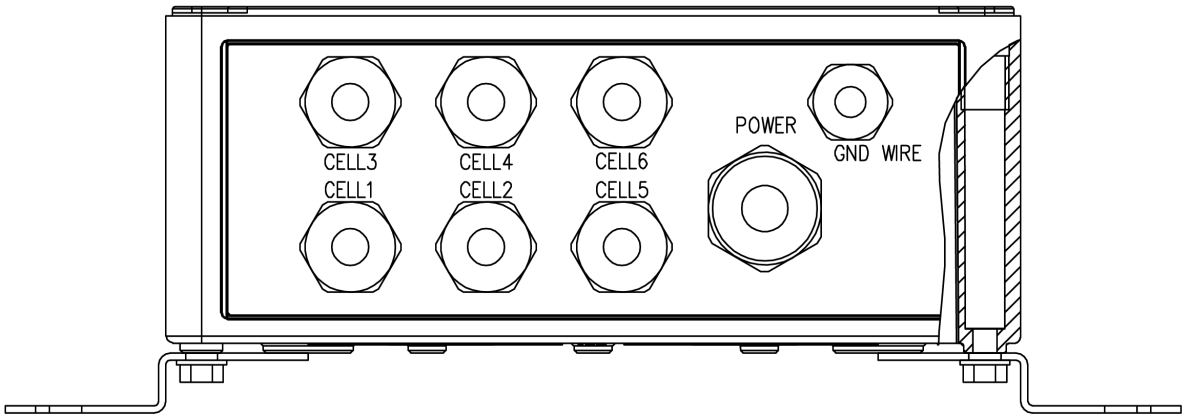
## SmartCAN6, SmartCAN8, and SmartCAN10 Interconnection, Cont.

### Gland Connector Layout – SmartCAN6

**SmartCAN6 Left End View**




**SmartCAN6-AC Left End View**




**SmartCAN6/SmartCAN6-AC Right End View**

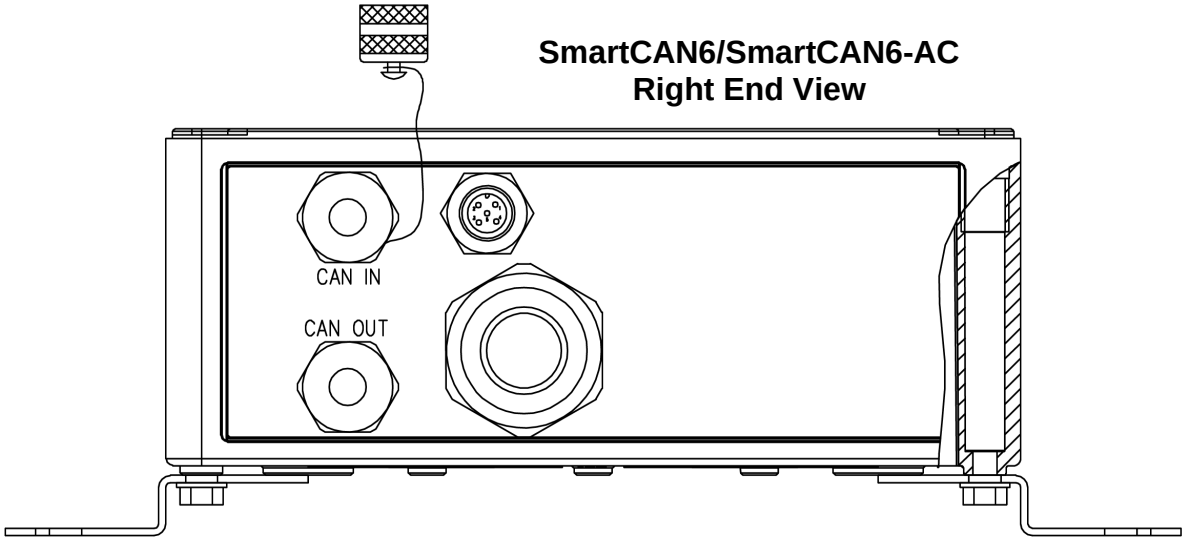
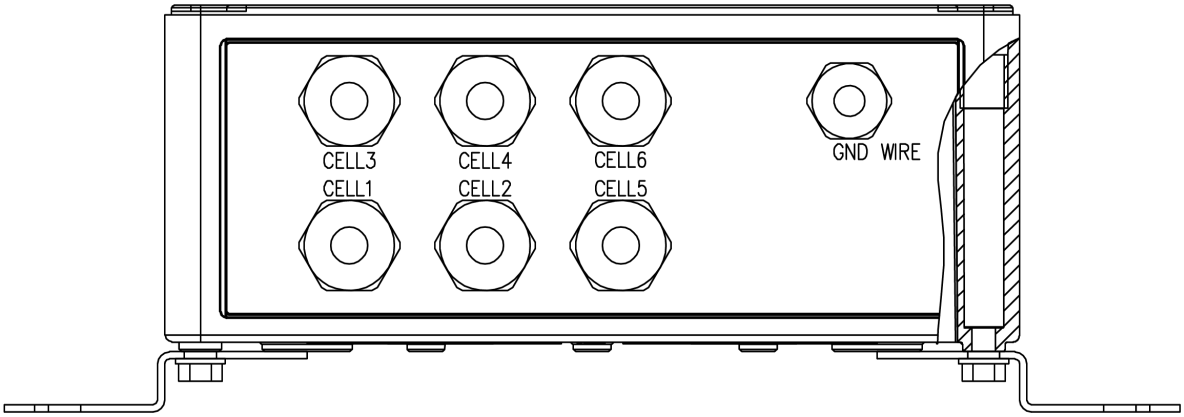



**Figure No. 21 – SmartCAN6 Gland Connector Layout**

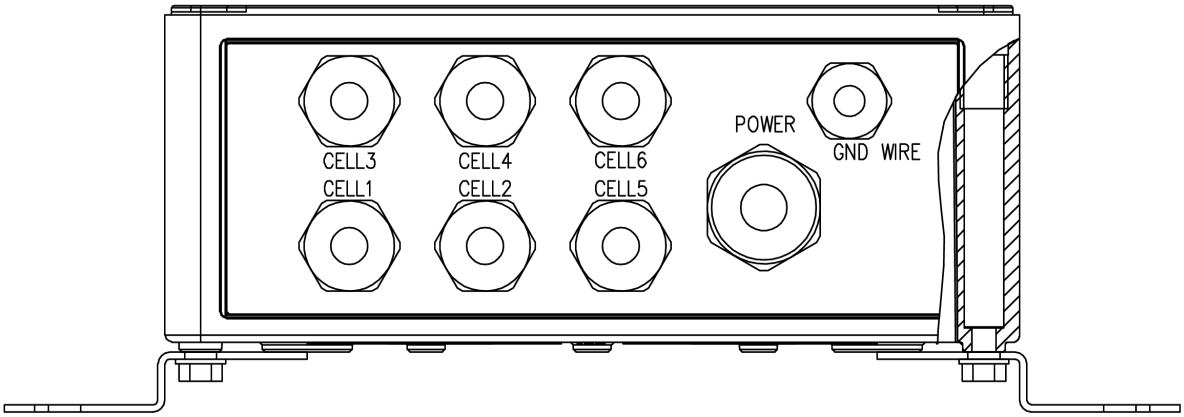
## SmartCAN6, SmartCAN8, and SmartCAN10 Interconnection, Cont.

### Gland Connector Layout – SmartCAN8

**SmartCAN8 Left End View**




**SmartCAN8-AC Left End View**




**SmartCAN8/SmartCAN8-AC Right End View**

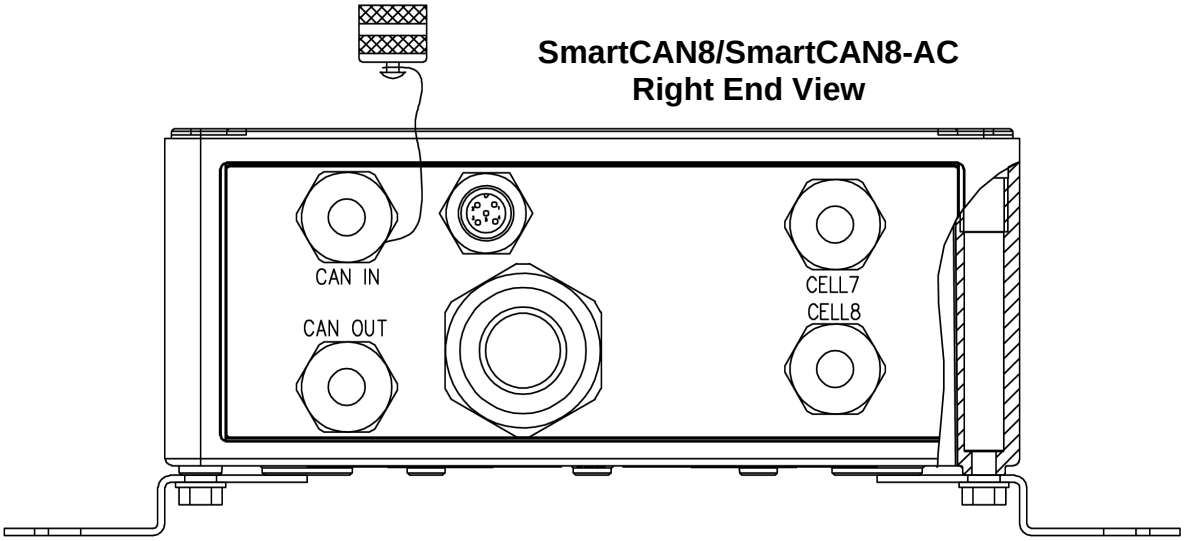
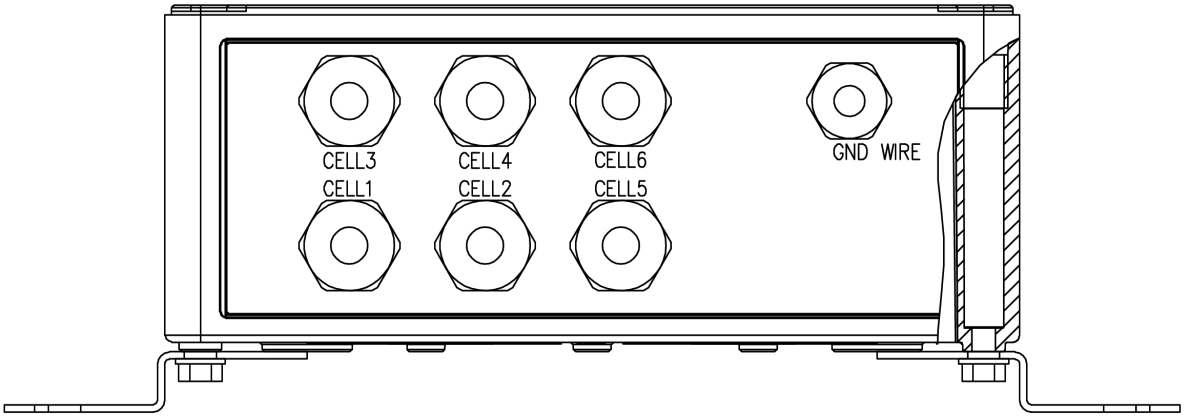



**Figure No. 22 – SmartCAN8 Gland Connector Layout**

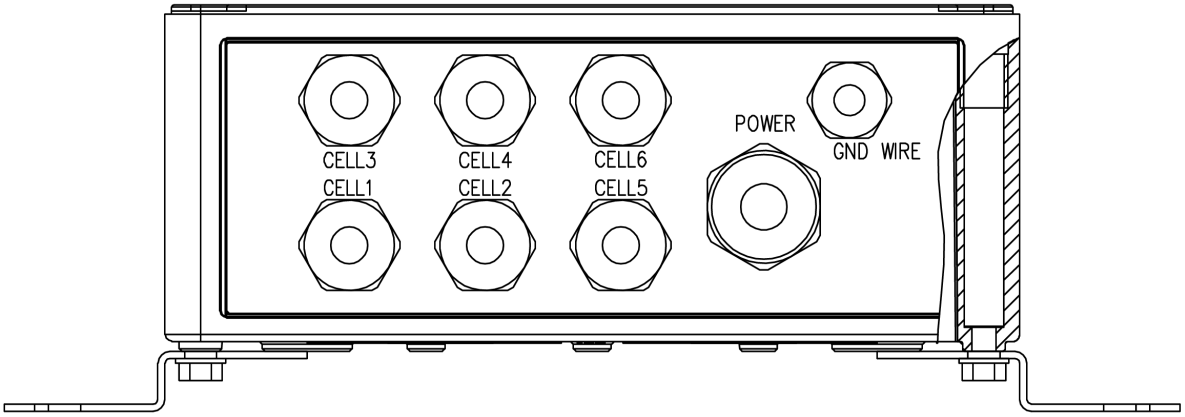
## SmartCAN6, SmartCAN8, and SmartCAN10 Interconnection, Cont.

### Gland Connector Layout – SmartCAN10

**SmartCAN10 Left End View**




**SmartCAN10-AC Left End View**




**SmartCAN10/SmartCAN10-AC Right End View**

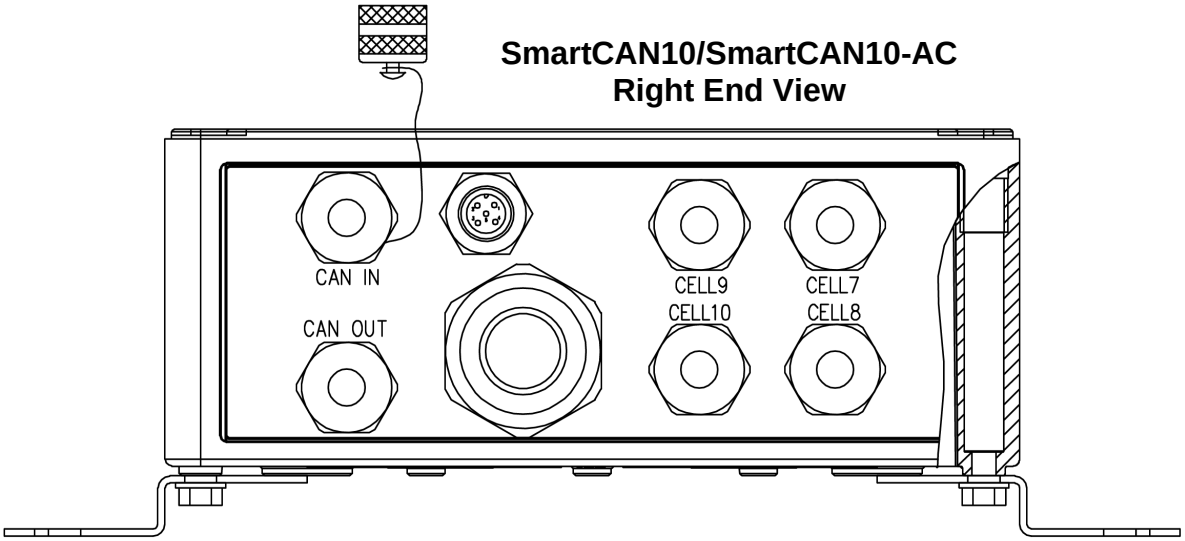



**Figure No. 23 – SmartCAN10 Gland Connector Layout**

## SmartCAN6, SmartCAN8, and SmartCAN10 Interconnection, Cont.

### Connecting the Load Cell Cables

1. Loosen the four screws securing the top cover and gasket to the junction box body, then remove the top cover and gasket and set them aside
2. Loosen the gland connector for the load cell cable. Refer to Figures No. 20, 21, or 22 for the gland connector layout.
3. Slip the load cell cable through the gland connector and into the enclosure.
4. Remove 2.0 inches (51 mm) of the outer insulation jacket, and then remove 1/4 inch (6 mm) of insulation from each of the wires.
5. Next, locate the first load cell input terminal on the mainboard.
6. 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 Color Code Table for terminal connections.
7. 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.
8. Repeat the procedure until all the wires are in place.
9. Repeat steps 2 through 8 for the remaining load cells.

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. For example, the load cells used in the Cardinal PRC and EPR Series vehicle scales are of a different type and have different color codes. Refer to the Load Cell Wiring Color Code table.

**LOAD CELL WIRING COLOR CODE**

| Load Cell Type | –SIG | +SIG | –EXC | +EXC |
|---|---|---|---|---|
| DB-75000S | WHITE | GREEN | BLACK | RED |
| CBC50K | WHITE | GREEN | BLACK | RED |
| SB-xxxxS | WHITE | RED | BLACK | GREEN |
| xxK-SCA (50, 100, 120) | WHITE | RED | BLACK | GREEN |
| 200K-SCA | RED | WHITE | BLACK | GREEN |

**WARNING! Make sure all load cells are properly connected (refer to the Load Cell Wiring Color Code table) and have been checked for shorts between the excitation and shield wire, before powering on the SmartCAN box.**

## SmartCAN6, SmartCAN8, and SmartCAN10 Interconnection, Cont.

### Connecting the Homerun Cable

The CAN interface cable (Homerun Cable) is installed between the SmartCAN6, SmartCAN8, or SmartCAN10 junction box and the 225D or 825D indicator. The Homerun Cable is made from five conductors, shielded PVC cable, and terminated at the P5 terminal block on the 225D, and at the P1 terminal block on the 825D.

On the junction box end of the Homerun Cable, the cable is terminated at the P9 terminal block on the mainboard. Refer to the table below for cable information.

| CARDINAL PART NO. | ITEM and DESCRIPTION |
|---|---|
| 6980-1092 | HOMERUN CABLE, 5 CONDUCTORS, SHIELDED PVC<br>(CONTAINS 2 x 18AWG, 2 x 22AWG, AND 1 x 22AWG) |

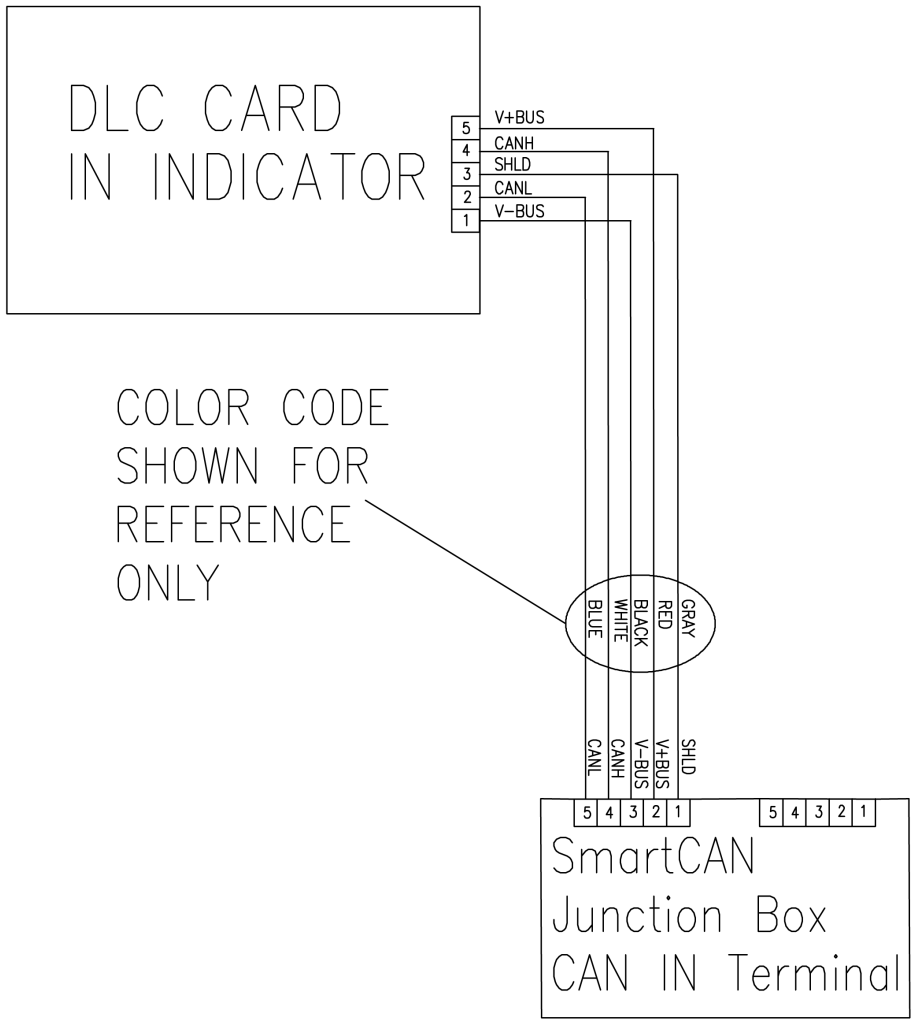



**Figure No. 24 – Indicator to SMARTCAN Junction Box Connection**

## SmartCAN6, SmartCAN8, and SmartCAN10 Interconnection, Cont.

### Connecting the Homerun Cable, Cont.

1. With the top cover and gasket to the junction box body removed, loosen the gland connector for the Homerun cable. Refer to Figures No. 20, 21, or 22 for the gland connector layout.
2. Slip the Homerun cable through the gland connector and into the enclosure.
3. With the homerun cable routed into the enclosure, remove approximately 2.0 inches (51 mm) of the cables' outer jacket, exposing the internal wires.
4. Next, remove approximately 1/4 inch (6 mm) of insulation from each of the five wires.
5. Referring to the table below (or on the circuit board) for terminal connections, connect each wire to the CAN IN terminal block P9 on the mainboard.

**Terminal Block P9**

| Board Label | Homerun Cable Wire Color | Wire Color if using a Load Cell Cable |
|---|---|---|
| SHLD | GRAY | BROWN |
| V+BUS | RED | WHITE |
| V-BUS | BLACK | BLUE |
| CAN H | WHITE | BLACK |
| CAN L | BLUE or LIGHT BLUE | GRAY |

6. 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 opening, and then remove the screwdriver. The release bar will return to its original position, locking the wire in place.
7. Repeat the procedure until all five wires are in place.

## Re-Installing the SmartCAN6, SmartCAN8, and SmartCAN10 Top Cover

**IMPORTANT: The recess in the junction box and top cover that contacts the gasket must be clean and free of debris. Make sure the gasket is clean and properly aligned in the junction box recess before securing the top cover to the junction box.**

1. After all terminations have been made, remove the excess cable from the enclosure.
2. Using a wrench, tighten the *load cell cable* gland connectors to 15 in-lb (1.7 Nm).
3. Using a wrench, tighten the *Homerun cable* gland connector to 33 in-lb (3.7 Nm).
4. Secure the top cover to the junction box body with the four screws loosened earlier.
5. Follow a diagonal pattern when tightening the screws.

# POWERING THE SMARTCAN SYSTEM

## SmartCAN4

Power to the SmartCAN4 is supplied from the 225D or 825D indicator. The input voltage can range from 12 to 24V DC. **NOTE:** The 225D supplies 15V DC and the 825D supplies 12V DC.

## SmartCAN6, SmartCAN8, and SmartCAN10

The 15V DC from the 225D can power the SmartCAN6, SmartCAN8, and SmartCAN10 if the CAN interface cable (Homerun Cable) is less than 200 Ft (61 M) long.

If the CAN interface cable (Homerun Cable) is longer than 200 Ft (61 M), power must be supplied from an external power supply provided by the customer. The voltage from the external power supply should be 24V DC @ 1.3A. It connects to P6 on the mainboard.

**IMPORTANT!** The 12V DC from the 825D **cannot** power the SmartCAN6, SmartCAN8, and SmartCAN10 regardless of the length of the CAN interface cable (Homerun Cable) and therefore requires an external power supply provided by the customer. The voltage from the external power supply should be 24V DC @ 1.3A. It connects to P6 on the mainboard.

## SmartCAN6-AC, SmartCAN8-AC, and SmartCAN10-AC

For some system configurations, a powered model is offered. The SmartCAN6-AC, SmartCAN8-AC, and SmartCAN10-AC contain an internal power supply that can be powered at the scale by 100-260V AC @ 50/60 Hz.

**CAUTION: The power supply of the SmartCAN6-AC, SmartCAN8-AC, and SmartCAN10-AC produces 24V DC and CANNOT connect directly to the 225DLC or 825-DLC V+BUS without removing the ICAN jumpers on the 225DLC and 825-DLC Controller Card.**

**On the 225DLC Controller Card, the ICAN jumpers J2 and J3 MUST be removed.**

**On the 825DLC Controller Card, the ICAN jumpers J1 and J3 MUST be removed.**

## SmartCAN6-AC, SmartCAN8-AC, and SmartCAN10-AC Power Connection

**IMPORTANT!** Before beginning, make certain that the power is turned off at the distribution panel, and then route the power wires from the AC power source to the SmartCAN10-AC junction box. Note that the power cable consists of three 18 to 20 AWG stranded wires and must 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 1/4 inch (6 mm) 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, and the labels in the junction box for the correct terminal connections.

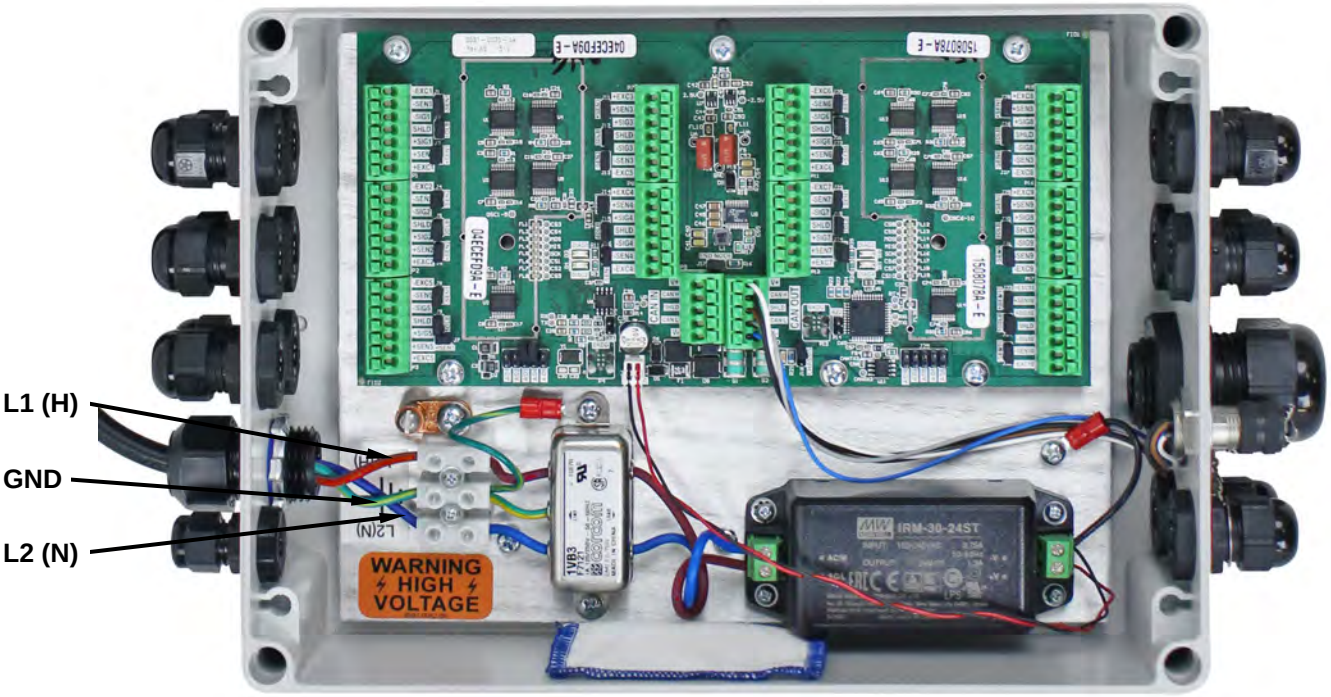



**Figure No. 25 – AC Power Input to SmartCANXX-AC (SmartCAN10-AC Shown)**

**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 |

# GROUNDING INSTRUCTIONS

## Grounding Specifications – 3502-0671-GS

**1.** The ground rod shall be copper plated 0.5 in (1.27 cm) minimum diameter, with clean exterior surfaces, and shall not be covered with paint, enamel, or other materials, which are poor conductors.

**2.** The ground rod shall be embedded below permanent moisture level at least 8 ft (2.44 m) where practicable. Where rock bottom is encountered, at depth of less than 4 ft (1.22 m), the ground rod shall be buried in a horizontal trench.

**3.** Connect the weighbridge to the ground rod with a minimum 1.5 in (38 mm) flat braided cable or ground wire. Clamp the flat braided cable (or ground wire) to the ground stud on the most centered scale section. After installation of the flat braided cable (or ground wire), check for continuity between the conductive scale components and the ground rod.

**4.** Connect the scale grounding stud to the grounding lug on the indicator, using the supplied 10 GA-(6.0 sq mm) stranded insulated wire.

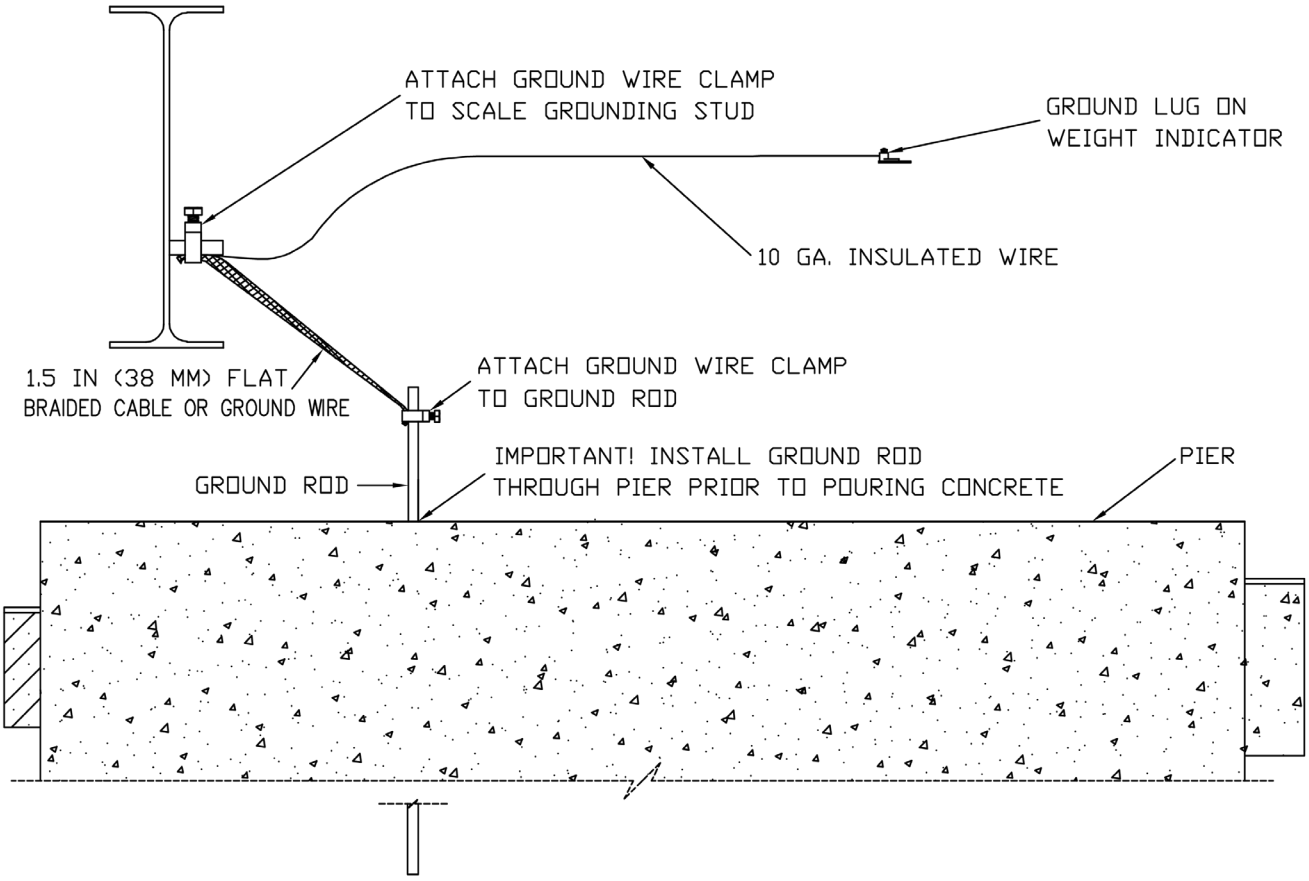
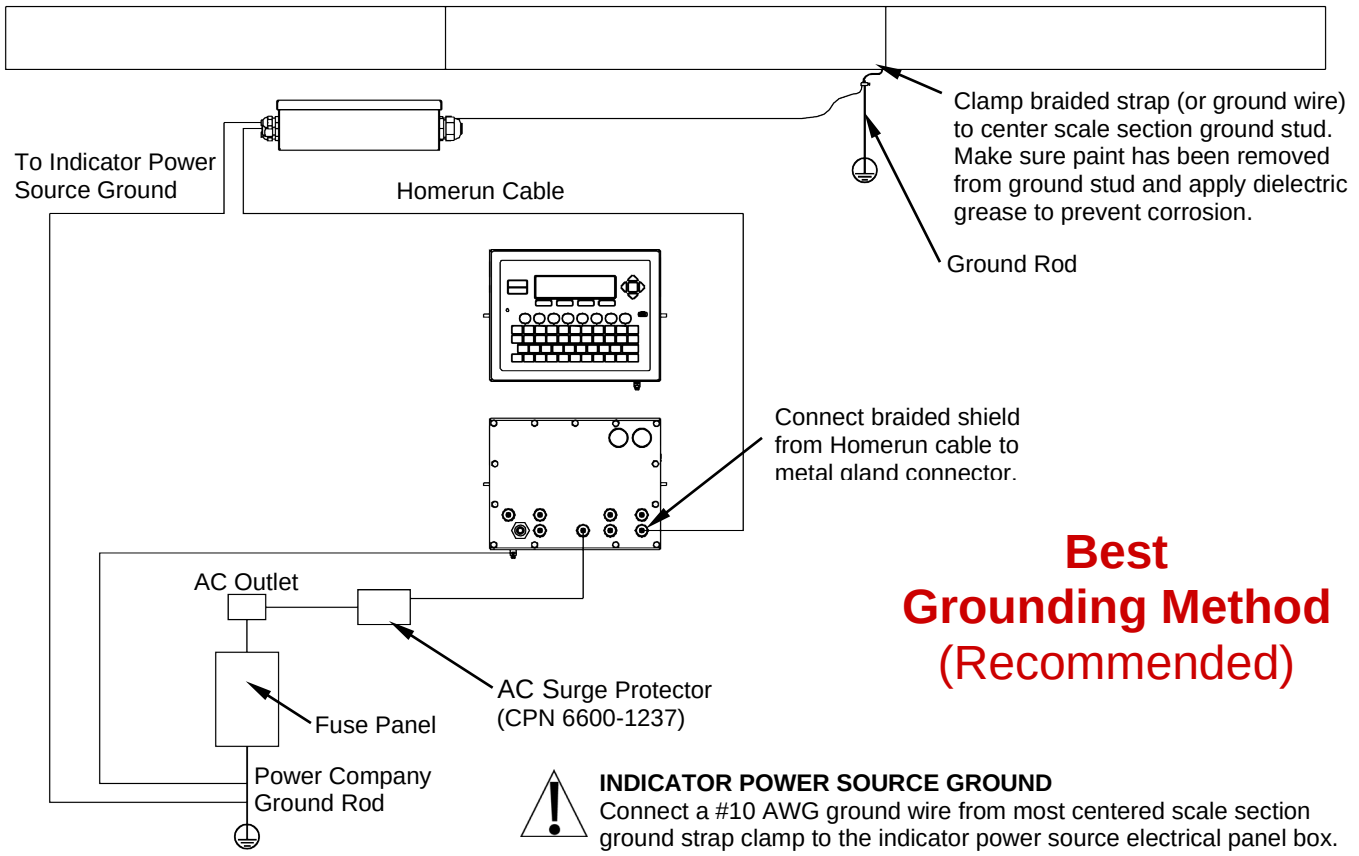



**Diagram of Scale and Indicator Grounding per 3520-0671-GS**
**(New Scale Installation Shown)**

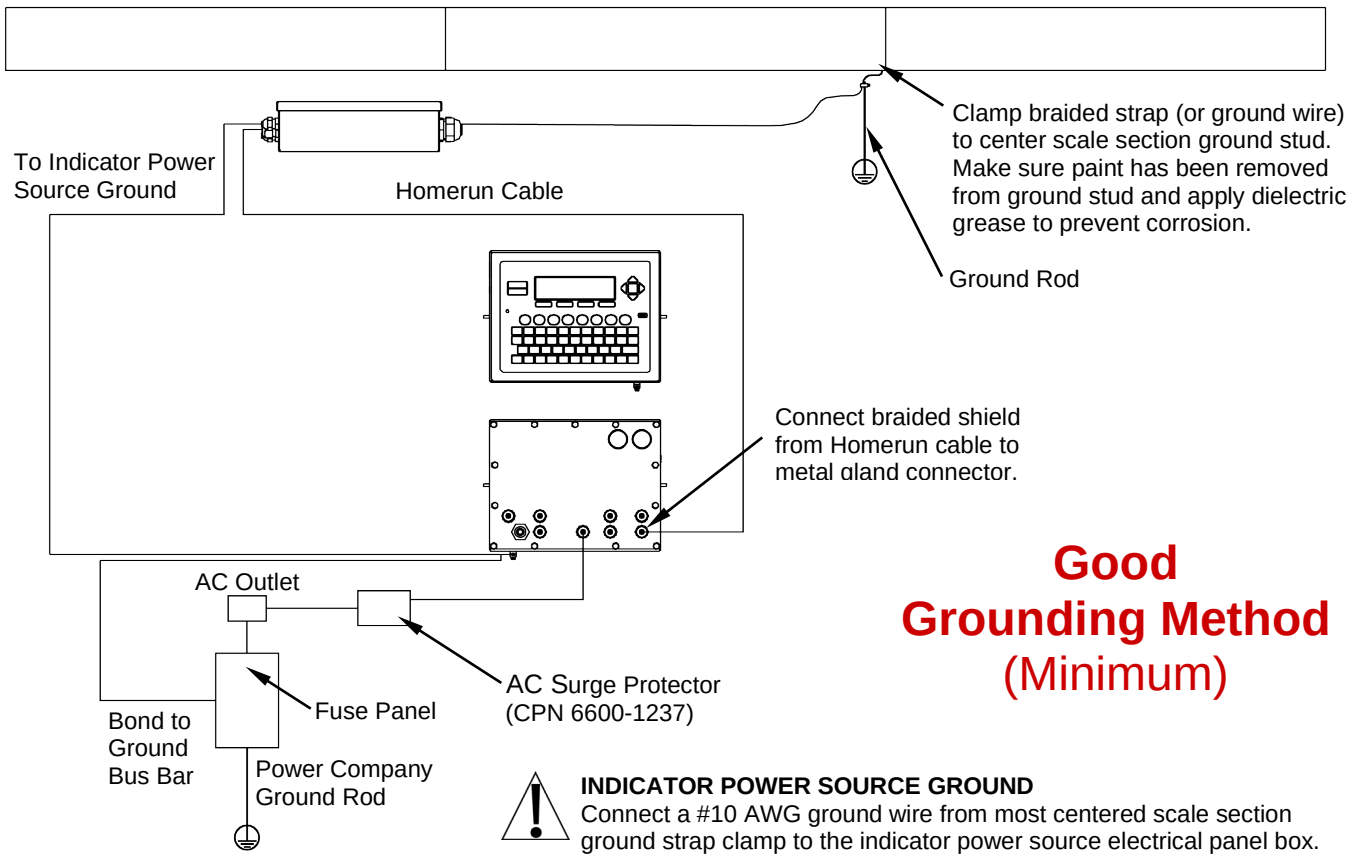
**IMPORTANT! The ground rod should be driven in the ground (through the area for the pier) prior to pouring the concrete. Leave approximately 6 in (15.2 cm) of the ground rod exposed above the pier.**

## Truck Scale Grounding Specifications – 3502-0720-GS




**Best Grounding Method** (Recommended)

**INDICATOR POWER SOURCE GROUND**
Connect a #10 AWG ground wire from most centered scale section ground strap clamp to the indicator power source electrical panel box.




**Good Grounding Method** (Minimum)

**INDICATOR POWER SOURCE GROUND**
Connect a #10 AWG ground wire from most centered scale section ground strap clamp to the indicator power source electrical panel box.

## Grounding Instructions for SmartCAN Systems

Cardinal Scale Mfg. Co. recommends the following grounding procedures for installations of the SmartCAN Systems. This grounding scheme is valid for various soil types and should help minimize downtime and repair costs caused by lightning damage.

**SUPPLIED GROUNDING COMPONENTS**

| Description | Qty. | Part No. |
|---|---|---|
| Ground Rod .625" Diameter X 10 Feet. | 1 | 6980-0054 |
| Ground Cable, 1 1/2” Flat Braid #3 AWG | 1 | 6980-0036 |
| Wire #10 AWG Stranded, Green | 1 | 6980-0035 |
| Grounding Clamp | 2 | 6610-5023 |
| Dielectric Grease (*available from Cardinal Parts Department at 800-641-2045 or parts@cardet.com*) | 1 | 6050-3056 |

## Site Requirements

**1.** For a new installation, the ground rod should be driven in the ground (*through the area for the pier*) prior to pouring the concrete. Leave approximately 6 in (15.2 cm) of the ground rod exposed above the pier.

**2.** On an existing scale site, the ground rod should be driven into the ground with approximately 6 in (15.2 cm) of the ground rod exposed.

**3.** It is recommended that metal conduits be used with separate conduit runs for the AC power lines and the data lines.

**4.** To prevent electrical induction into the data lines during a lightning strike, the scale ground wire should be routed in a separate conduit away from the data lines.

**5.** Make sure the AC outlet the indicator is wired correctly. Use an AC outlet circuit tester to check for proper Line, Neutral, and Earth ground wiring.

**6.** A surge protector (CPN 6600-1237) is **required** between the AC power source and the indicator.

## Indicator and Scale Lightning Protection Connections

Follow these steps to ensure the indicator ground and the scale weighbridge ground are at the same potential which is necessary for good lightning protection:

**1.** Make sure the flat braided cable (or ground wire) and grounding clamp are connected to the ground stud on the most centered scale section of the truck scale. Make sure the paint has been removed from the ground stud and apply dielectric grease to prevent corrosion.

(*Dielectric Grease, CPN # 6050-3056 is available from Cardinal Parts Department at 800-641-2045 or parts@cardet.com*).

**2.** Connect the other end of the flat braided wire (or ground wire) near the top of the ground rod so the clamps will not corrode due to ground moisture. Make sure the flat braided wire (or ground wire) has at least a *1 ft (31 cm) loop* to ensure the weight operation is not affected.

**3.** Connect a #10 AWG or larger copper ground wire from the ground rod clamp to the indicator power source ground (the indicator power source ground is the electrical panel box that provides power to the indicator).

**NOTE:** If connecting to the electrical panel box is impractical, connect the #10 AWG wire to the indicator power outlet ground.

**4.** Connect a # 10 AWG ground wire from the indicator's copper ground lug, at the bottom of the 225D enclosure (or back of the 825D enclosure), to the indicator power source ground. *Connect the indicator ground wire at the same point as the scale ground wire*.

**5.** The truck scale must be inspected periodically to ensure that all connections are tight and that there is no corrosion to the braided cable (or ground wires) or wire clamps. Use an "Earth Ground Resistance Tester" to measure the ground connection. A connection that measures higher than 1 ohm of resistance should be cleaned or replaced.

## Scale Ground Stud to Ground Rod Connections

**1.** Clamp the flat braid cable (or ground wire) to the ground stud on the most centered scale section. Make sure the paint has been removed from the ground stud and apply dielectric grease to prevent corrosion.

**2.** Clamp the other end of the flat braided cable (or ground wire) to the ground rod to connect the weighbridge ground stud to the ground rod. Connect the flat braided cable (or ground wire) near the top of the ground rod so the clamp will not corrode due to ground moisture.

**NOTE:** Make sure the flat braided cable (or ground wire) has at least a *1 ft (31 cm) loop* to ensure the weight operation is not affected.

**3.** After the installation of the flat braided cable (or ground wire) has been completed, check for continuity between the conductive scale components (weighbridge) and the ground rod.

# 225D HOMERUN CABLE INSTALLATION

## 225D Indicator Connection

To suppress noise, the homerun cable should be routed through the metallic gland connector installed in the lower right of the 225D rear panel and the cable shield from the cable connected to the metal gland connector for grounding. Refer to the image below for the gland connector layout.

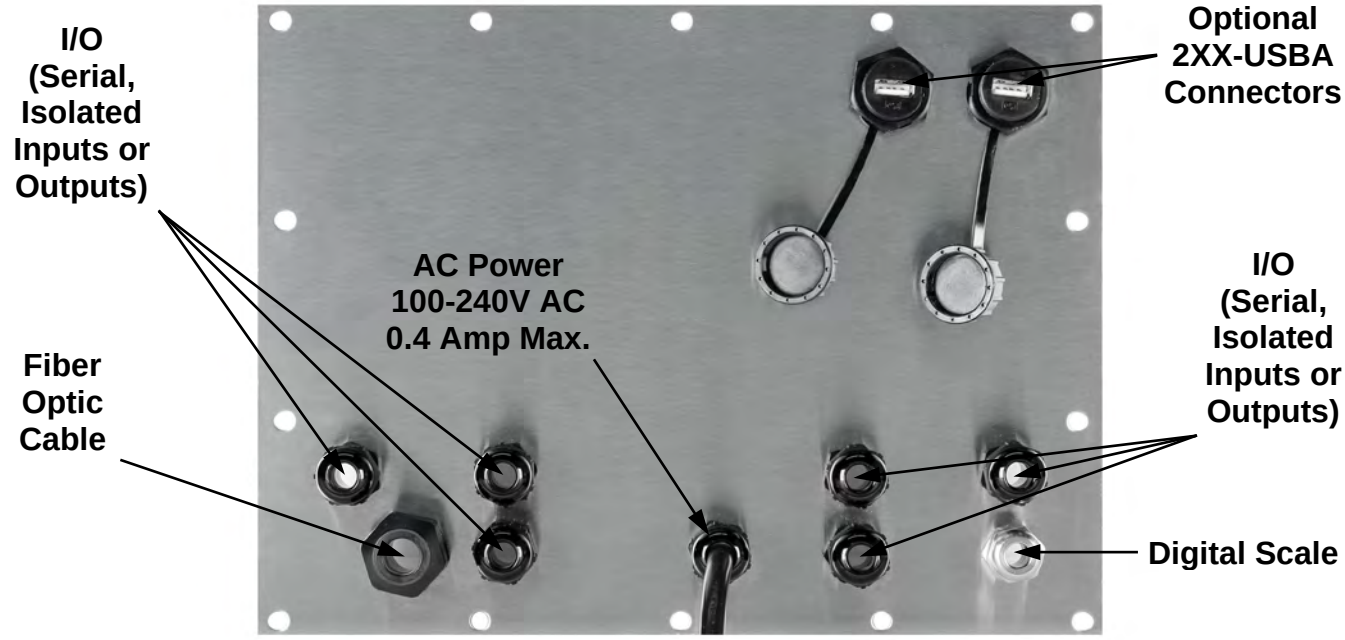



**Figure No. 27 – 225D Rear Panel Gland Locations**

**ATTENTION!**
OBSERVE PRECAUTIONS FOR HANDLING ELECTROSTATIC SENSITIVE DEVICES

1. Remove the fourteen acorn nuts securing the rear panel assembly to the main housing.
2. Lift the rear panel from the main housing, taking care not to stretch the cable and wires between the panel and main housing. Lay the panel on the workbench next to the indicator.

**IMPORTANT:** You may need to loosen the gland connectors for the I/O cables to allow enough slack in the cable and wires to avoid stretching them.

3. Loosen and remove the metal gland connector nut, and then remove the plastic insert.
4. Slip the homerun cable through the nut and plastic insert.

## 225D Indicator Connection, Cont.

5. Remove approximately 6 in (15 cm) of the homerun cable outer jacket, exposing the cable shield and internal wires.
6. Cut the cable shield so it extends past the outer jacket approximately 3/4 in (19 mm).
7. Next, remove approximately 1/4 in (6 mm) of insulation from each of the five internal wires.
8. Slide the plastic insert up the cable and then fold the cable shield back over the plastic insert.
9. Insert the internal wires and the plastic insert (with the cable shield folded over it) into the metal gland connector on the 225D rear panel.
10. Slide the metal gland connector nut up the cable and install it on the threads of the gland connector. Note that the cable shield will be secured to the connector when tightening the gland connector nut.
11. Make sure the metal gland connector nut is tight, but do not over-tighten it.
12. Referring to the table below (or the circuit board) for terminal connections, connect each wire to the P5 terminal block on the 225DLC controller card.

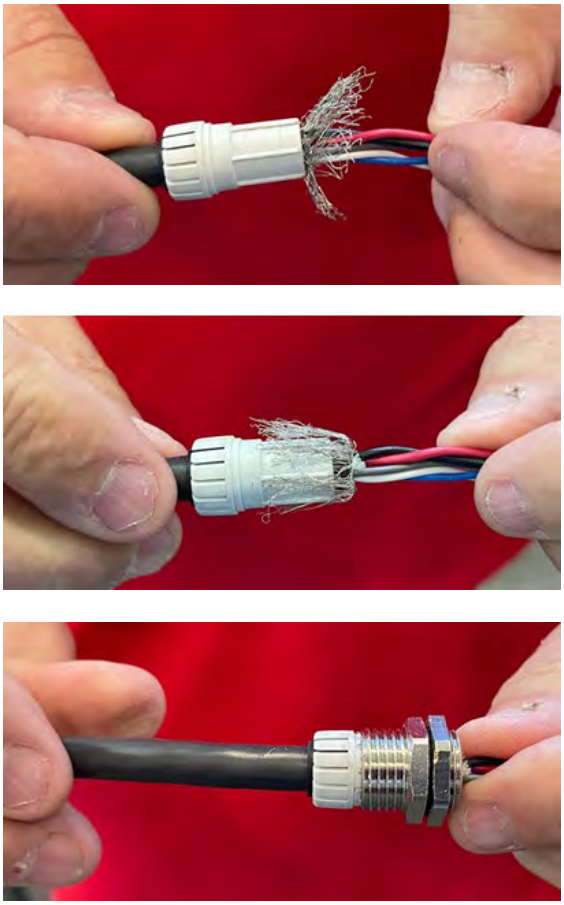


**Figure No. 28**
**Homerun Cable Preparation**

**225DLC Controller Card P5 Terminal Connections**

| Board Label | Homerun Cable Wire Color | Wire Color if using a Load Cell Cable |
|---|---|---|
| SHLD | GRAY | BROWN |
| V+BUS | RED | WHITE |
| V-BUS | BLACK | BLUE |
| CAN H | WHITE | BLACK |
| CAN L | BLUE or LIGHT BLUE | GRAY |

13. Using a small flat blade screwdriver press down on the release bar for the terminal, insert the wire into the opening, and then remove the screwdriver. The release bar will return to its original position, locking the wire in place.

14. Repeat steps 11 and 12 until all five wires of the homerun cable are installed in the P5 terminal block on the 225DLC controller card.

15. After all terminations have been made, remove the excess cable from the indicator enclosure.

16. Insert the plastic insert into the metal gland connector, and finger-tighten the metal gland connector nut and each of the black gland connectors.

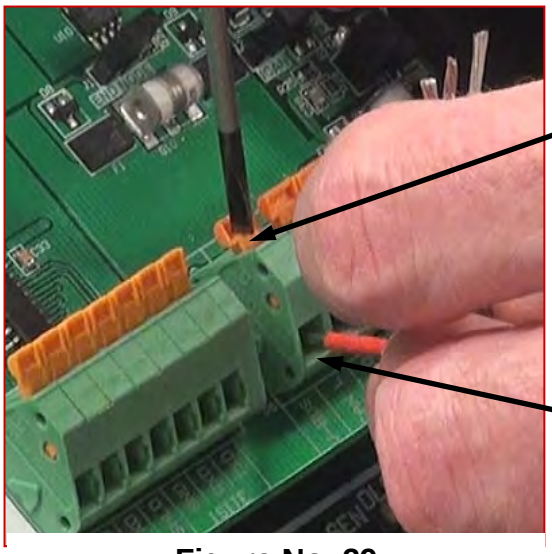



**Figure No. 29**
**Inserting Homerun Cable Wires**

## 225DLC Controller Card

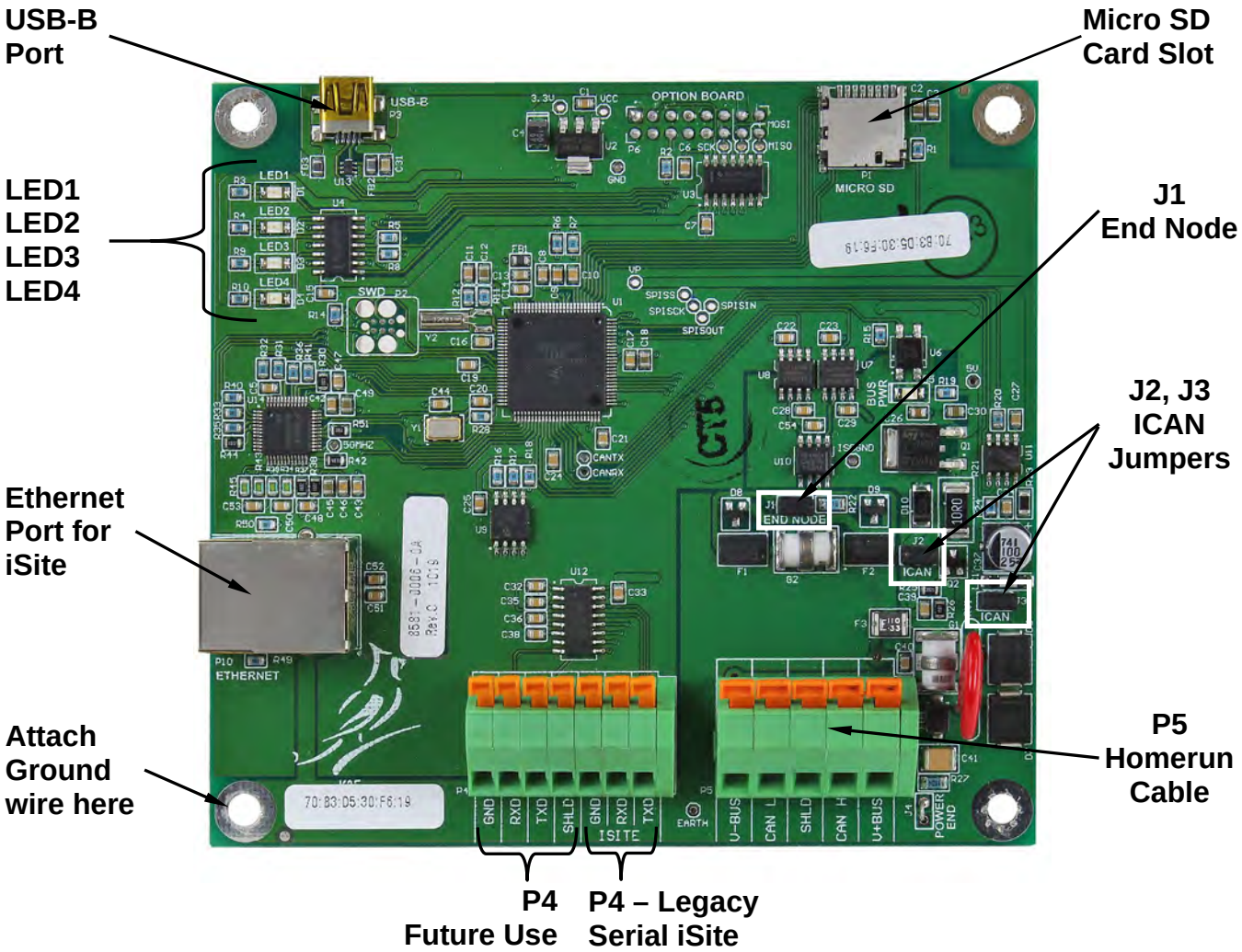



**Figure No. 30 – 225DLC Controller Card**

## 225DLC Controller Card, Cont.

**USB-B**
This port is used to perform software updates to the 225DLC controller card.

**Micro SD Card Slot**
The Micro SD card slot is not used at this time.

**LED 1-4**
The LEDs are used for diagnostic purposes. For a complete explanation of their function, refer to the 225D DIGITAL SCALE DIAGNOSTICS, Hardware Diagnostics section of this manual.

**Ethernet Port**
This port is used to connect the 225D to your network to send information to the cloud for iSite.

**J1, End Node Jumper**
Jumper J1 is the CAN bus END NODE jumper. **NOTE:** The J1 jumper must be installed for the 225D communications to the scale to operate.

**J2, J3 ICAN Jumpers**
When ON (installed), these jumpers allow the 225D indicator to supply power to the SmartCAN System junction box. To operate a SmartCAN System junction box *with an external power supply*, such as the model MB-AC media box or an external 24V DC power supply provided by the customer, the jumpers must be **OFF** (on one pin only or removed).

**IMPORTANT!** To operate from an external power source, the J2, J3 jumpers must be OFF (*on one pin only or removed*), and 24V DC must be applied to the V+BUS terminal with a ground return to the V-BUS terminal of the P5 terminal block.

**IMPORTANT!** The SmartCAN6-AC, SmartCAN8-AC, and SmartCAN10-AC (*are self-powered*), and require the J2, J3 jumpers to be **OFF** (*removed or on one pin only*).

**P5, Homerun Cable**
The P5 terminal block is used to connect the homerun cable between the 225D indicator and the first SmartCAN junction box.

**Homerun Cable Connection to P5 Terminal Block**

| Board Label | Homerun Cable Wire Color | Wire Color if using a Load Cell Cable |
|---|---|---|
| SHLD | GRAY | BROWN |
| V+BUS | RED | WHITE |
| V-BUS | BLACK | BLUE |
| CAN H | WHITE | BLACK |
| CAN L | BLUE or LIGHT BLUE | GRAY |

**P4, Legacy Serial iSite**
This portion of the P4 terminal is used to connect to Legacy iCan, and for future connections.

**P4, Future Use**
This portion of the P4 terminal is not used at this time. It is reserved for a future serial connection.

## Re-Installing the 225D Indicator Rear Panel

1. After all terminations have been made, remove the excess cable from the indicator enclosure, and finger-tighten each of the cable gland connectors.
2. Ensure any unused gland connectors are plugged, and then replace the rear panel.
3. Secure the rear panel with the fourteen acorn nuts removed earlier, following a diagonal pattern when tightening the acorn nuts.
4. Using a wrench, tighten the plastic gland connectors to 15 in-lb (1.7 Nm).
5. Using a wrench, tighten the metal gland connector to 33 in-lb (3.7 Nm).

# SMARTCAN REFERENCE CARD

To aid in keeping track of the Cell Input IDs and the load cells with their location on the scale, the SmartCAN6/8/10 enclosures have a plastic envelope attached to the lid with (2) removable cards inside, to record the section Cell Input IDs and the load cell input letter for each load cell with its associated physical location on the scale.

Recording the section Cell Input IDs and cell input letter for each load cell associated with their location on the scale on one of the cards offers an easy reference to the numbers when entering the cell to scale assignments of the Addressing Cells setup screen on the 225D.

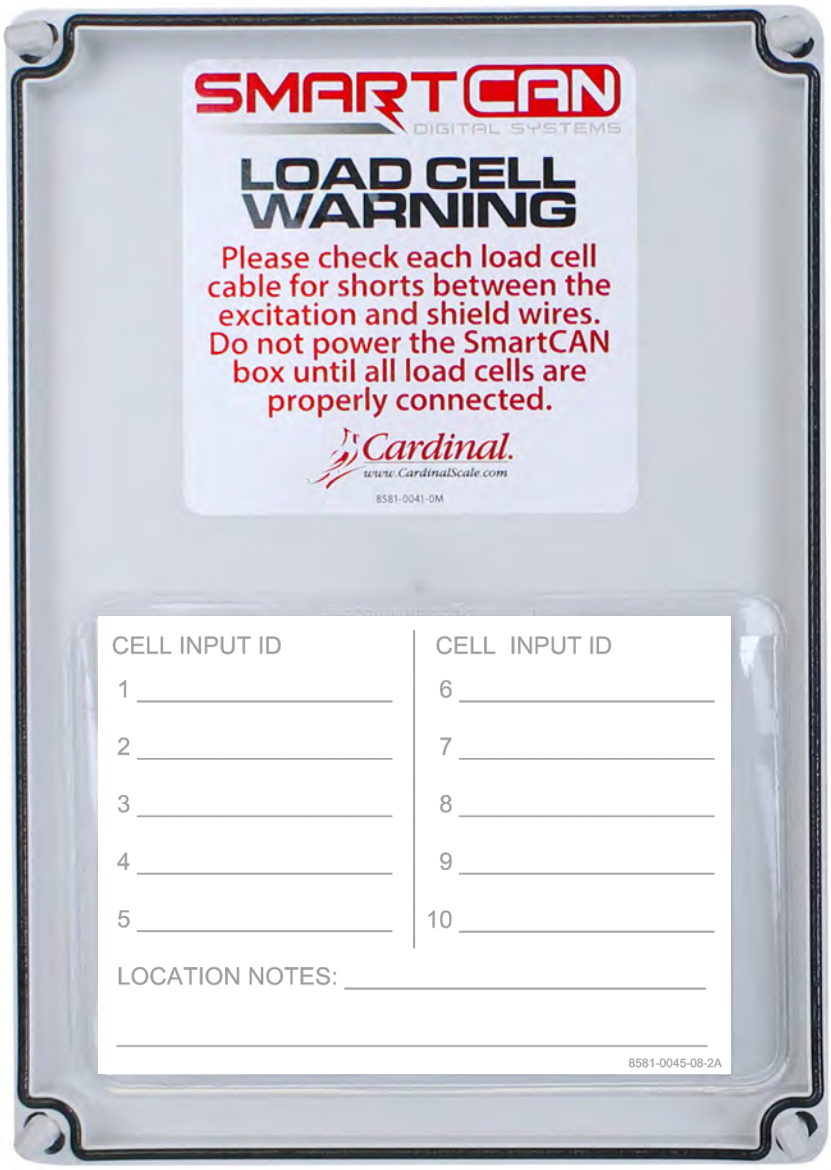



**Figure No. 31**
**Load Cell Warning Label and SmartCAN Reference Card**

# 225D SETUP AND CALIBRATION

## The 225D Weight Indicator

The 225D SmartCell Weight Indicator has software specially written for communicating with digital scales and the SmartCAN systems. It provides in-depth diagnostics, easy maintenance, and a simplified calibration.

The 225D consists of two main components: a 225 indicator with special digital scale software, and a 225DLC Digital Load Cell Controller (installed in the indicator option card slot).


**Figure No. 32**
**225D Weight Indicator**

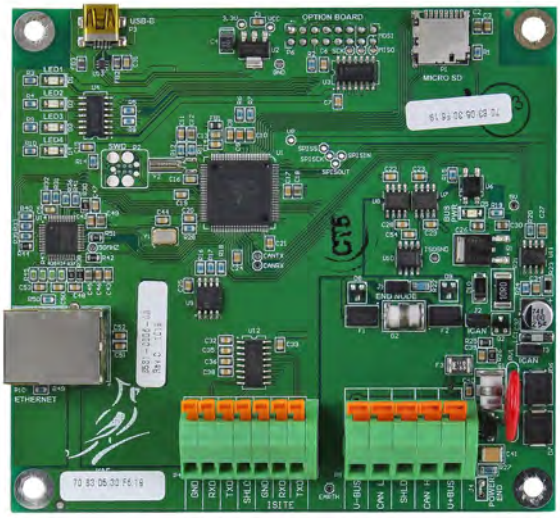



**Figure No. 33**
**225DLC Digital Load Cell Controller**

This section of the SmartCAN System manual is furnished as a guide to the setup and calibration of the 225D SmartCell Weight Indicator when used with a SmartCAN System junction box. It should be used in addition to the standard 225 Weight Indicator Installation and Technical Manual, 8200-M698-O1. The standard 225 manual should be consulted for additional information concerning installation, setup, and calibration. Please keep both manuals available for future reference.

## Addressing Cells

**NOTE: The numbers in the example are unique to the controller board shown and will not work in any other SmartCAN.**

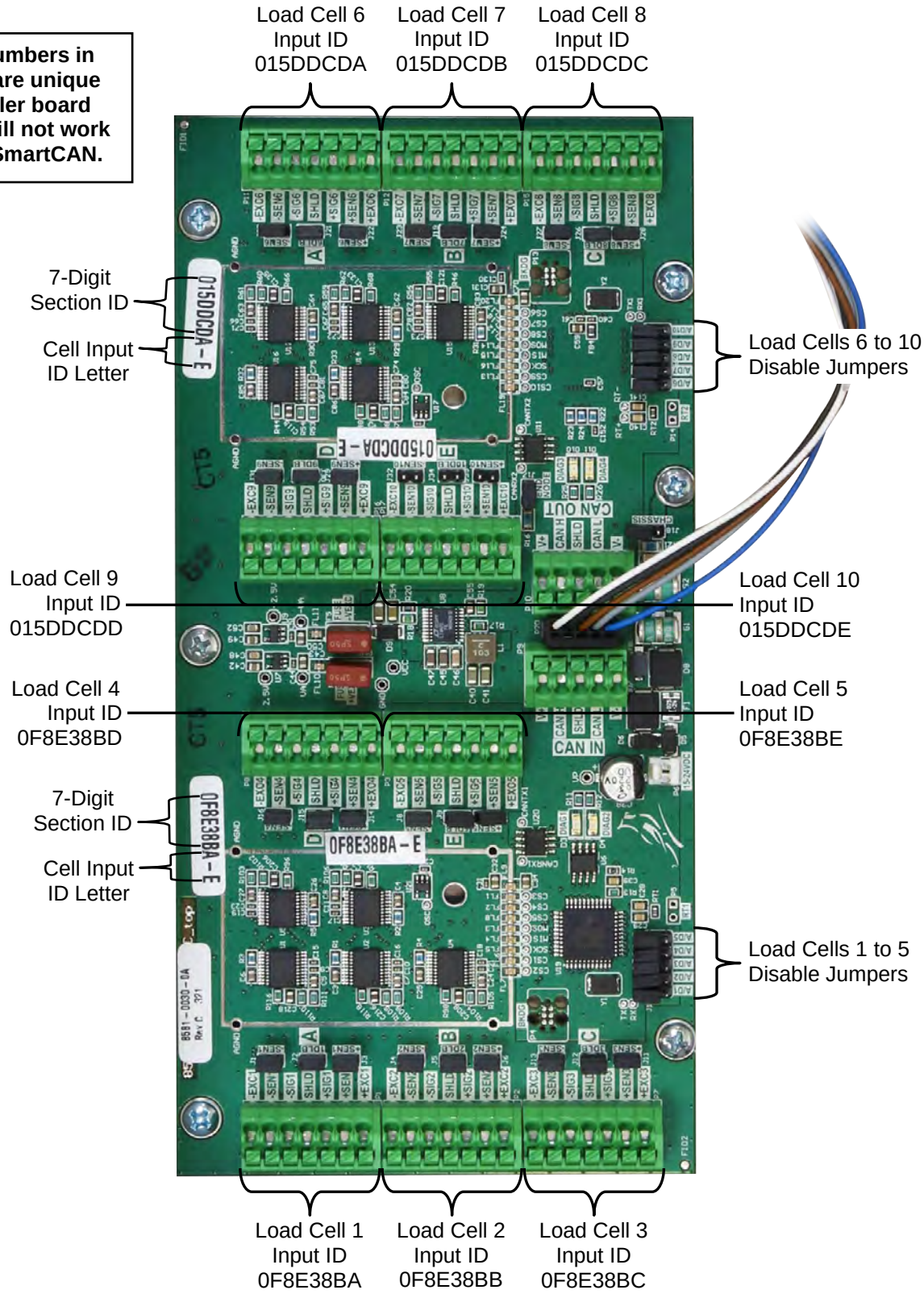


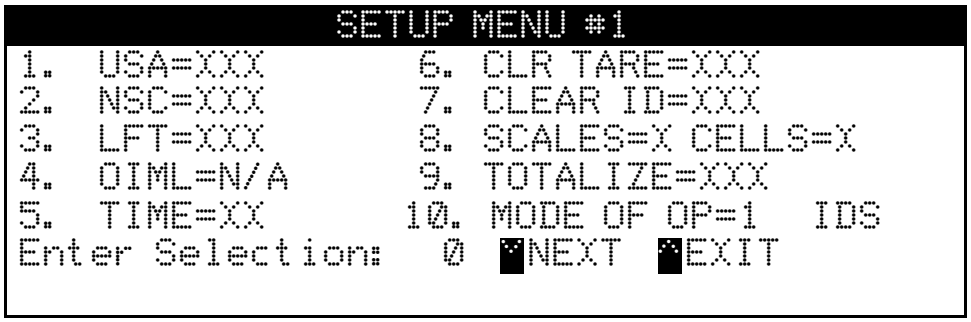

**Figure No. 34 – Example of SmartCAN Controller Cell Input IDs**

The SmartCAN6/8/10 controller has a Cell Input ID label on the PC board for each of the two sections of the controller. This label has a seven-digit hexadecimal number followed by the letters A to B, C, D, or E which is used to identify the load cell inputs for that section. When entering the cell to scale assignments, you would enter the *first seven digits* of the label as the section ID, followed by the letter A – E for each input a load cell is connected to.

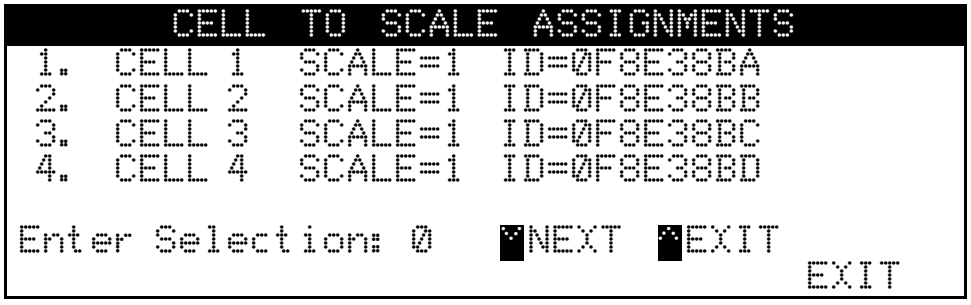
For example, referring to Figure No. 34, the Cell Input ID labels for the SmartCAN10 controller shown are: 0F8E38BA-E for one section (where 0F8E38B is the seven-digit section ID and A-E is for the first 5 load cell inputs) and 015DDCDA-E for the other section (where 015DDCD is the seven-digit section ID and A-E is for the other 5 load cell inputs).

Therefore, when entering the cell to scale assignments, the first five Cell Input IDs you enter would be: 0F8E38BA, 0F8E38BB, 0F8E38BC, 0F8E38BD, and 0F8E38BE. The second five Cell Input IDs would be 015DDCDA, 015DDCDB, 015DDCDC, 015DDCDD, and 015DDCDE.

1. Enter the SETUP menu by pressing **SHIFT**+**RED_KEY**.
2. Press **ENTER**.
3. Press **1. ENTER CALIBRATION AND SETUP**.
4. Press **ENTER**.
5. Press **8** and **ENTER** to set the number of scales and cells.



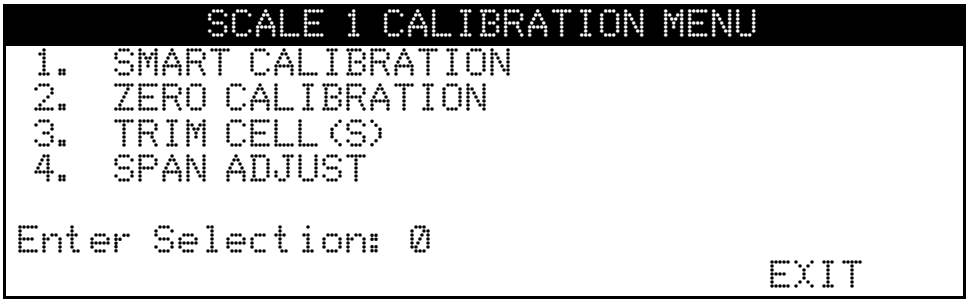

6. Enter the number of scales and press **ENTER**.
7. Enter the number of cells and press **ENTER**. The addressing menu will appear.




8. Press a cell number, and then **ENTER** to be prompted for the associated scale number followed by the Cell Input ID.
9. Referring to the SMARTCAN REFERENCE CARD in the enclosure lid, enter the Cell Input ID number for CELL 1, and then press **ENTER**.
10. Repeat step 9 until the Cell Input ID numbers for all load cells have been entered.

## Navigating to the DLC Calibration Menu

1. Enter SETUP by pressing **SHIFT**+**RED_KEY**.
2. Press **ENTER**.
3. Press **DOWN** to get to SETUP MENU #2.
4. Select **SETUP SCALE #X** where ‘X’ is the scale number.
5. Press **DOWN** to get to SCALE X SETUP MENU #2.
6. Enter **10** and press **ENTER** to open the DLC calibration menu.



**SMART CALIBRATION**

Smart Calibration is not necessary to make weight, but it is helpful for trimming all load cells automatically.

1. Press **1** and **ENTER**. The 225D will prompt for “CAL WT = 0”.
2. Enter the weight of the test weight.
3. The 225D will display…
   VERIFY SCALE IS EMPTY
   PRESS ENTER TO CONTINUE
4. With an empty scale, press **ENTER**. This will capture the calibrated dead load weight of the scale.
5. The 225D will display…
   PLACE WEIGHT ON CELL X
   PRESS ENTER TO CONTINUE
6. Center the weight over scale X and press **ENTER** to take a weight sample.
7. Repeat steps 5 and 6 for each cell in the order prompted by the 225D. (This is the same order as other Cardinal scales, for example, 1, 3, 5, 7, 9, 10, 8, 6, 4, 2). Refer to the diagram below.

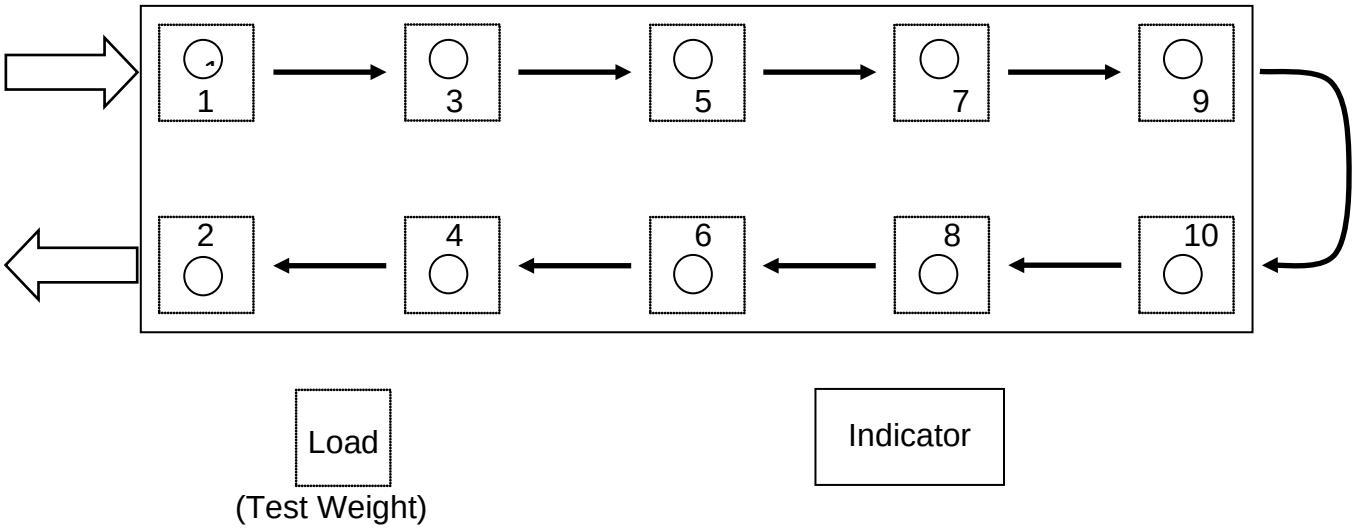



**Figure No. 35 – Example of SMART CALIBRATION**

**ZERO CALIBRATION**

Zero Calibration does not affect the trimming of the cells or affect span. It simply sets the dead load weight of the scale.

1. Press **2** and **ENTER**.
2. The 225D will display
   VERIFY SCALE IS EMPTY
   PRESS ENTER TO CONTINUE
3. Ensure the scale is empty and press **ENTER**. The scale will record dead load weight.

**TRIM CELLS**

Individual cells or pairs of cells may be trimmed. This requires a test load weight.

1. Press **3** and **ENTER**.
2. The 225D will prompt for “Cell Number(s): “.
3. To trim a single cell, enter the cell number, and press **ENTER**. To trim a pair of cells, enter both cells in the form “X + Y”, and press **ENTER**. For example, to trim the pair of cells 5 and 6, enter “**5**+**6**”, and press **ENTER**.
4. For information only, the 225D will display the cell trim “CELL # TRIM X.XXXXXXX”. It will also display the total “SCALE WT = XXXXXX” in hi-resolution mode.
5. Place a test weight over the cell(s) to be adjusted.
6. Press the **SET_WT** soft key.
7. The 225D will prompt “ENTER NEW WEIGHT =.
8. Enter the actual correct weight of the test weight and press **ENTER**.
9. The indicator will automatically trim the cell to match the entered test weight.
10. Press the **PREVIOUS** and **NEXT** soft keys to navigate to other cells without exiting the trim menu.

**SPAN ADJUST**

Span adjust allows the user to tweak the span of the entire scale at once.

1. Press **4** and **ENTER**.
2. The 225D will display the current live scale weight “SCALE WT = XXXXX.X” in high-resolution mode.
3. Place the test weight at any location on the scale.
4. Press **SET_WT** soft key. The 225D will prompt “ENTER NEW WEIGHT = “.
5. Enter the value of the test weight and press **ENTER**.
6. The 225D will adjust the span to the target weight.

# 225D DIGITAL SCALE DIAGNOSTICS

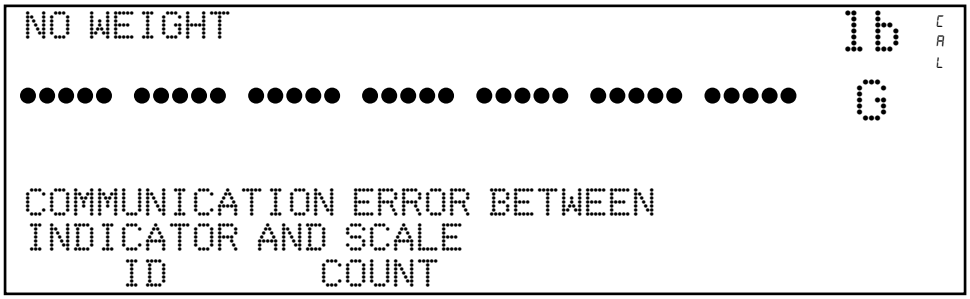
There are four main components to Digital Scale Diagnostics:

- On Screen Diagnostics – Critical errors that alert the operator from the main screen of setup issues or hardware problems.
- Diagnostic Menu – A set of diagnostic tools that give a technician more information about each load cell connection.
- Hardware Diagnostics – LEDs on the DLC controller alert technicians of communications status.
- iSite – A web-based repository for historical load cell connection data that will be tracked for slow degradation of load cell connection integrity (for example a single load cell connection that is drifting away from zero). iSite will also receive all the hardware errors found by the 225D SmartCell Weight Indicator.

## On Screen Diagnostics

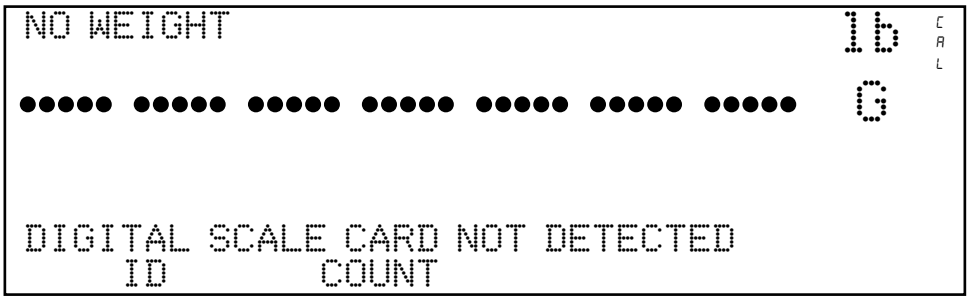
The On Screen Diagnostics messages are critical errors that alert the operator from the main screen of setup issues or hardware problems. These messages will be shown to the operator on the main weight screen in real-time when the error happens.

### COMMUNICATION ERROR BETWEEN INDICATOR AND SCALE




| Probable Cause | Items to Check |
|---|---|
| The homerun cable is damaged or disconnected. | • Check that cable is connected correctly.<br>• Check cable for damage.<br>• Use caution on the amount of insulation stripped for the connector. Center wires could short. Must be shorter than the center connector.<br>• Check connector for random strands of wire.<br>• Verify that connector is clear of debris. |

**DIGITAL SCALE BOARD NOT DETECTED**



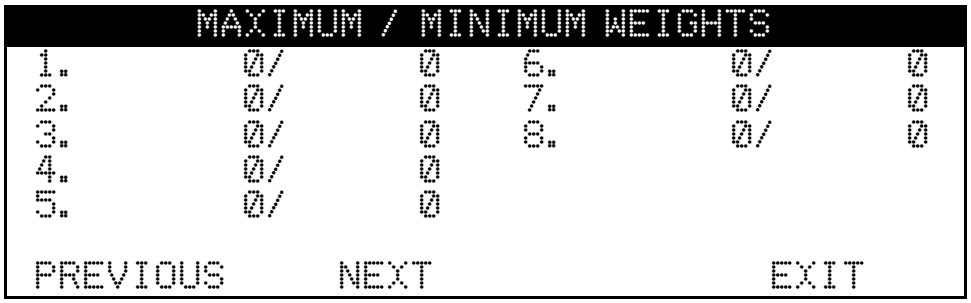

| Probable Cause | Items to Check |
|---|---|
| The 225D cannot communicate with the option card or the option card is not responding. | • Check that the card is seated properly and fastened correctly.<br>• Check that card is seated on the correct row of pins.<br>• Potential of a failed card if occurs after installation and in-service. |

## Diagnostic Menu

The Diagnostic Menu is a set of diagnostic tools that give a technician more information about each load cell connection. To enter the diagnostic menu press **SHIFT** + **CELL_DIAG** soft key.

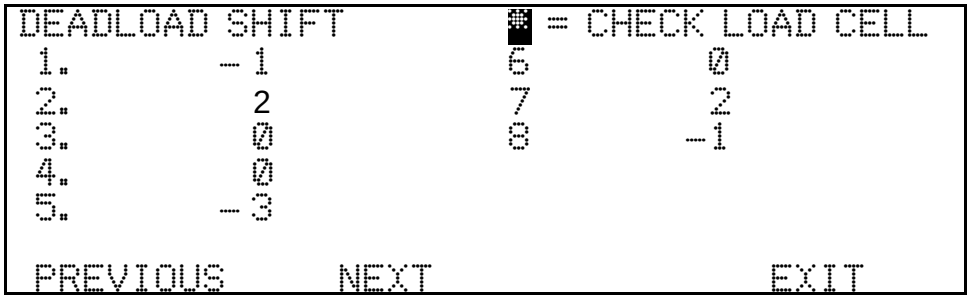
**LIVE LOAD CELL WEIGHTS (*This can be zeroed as needed.*)**


**MINIMUM AND MAXIMUM WEIGHTS (*This can be zeroed as needed.*)**



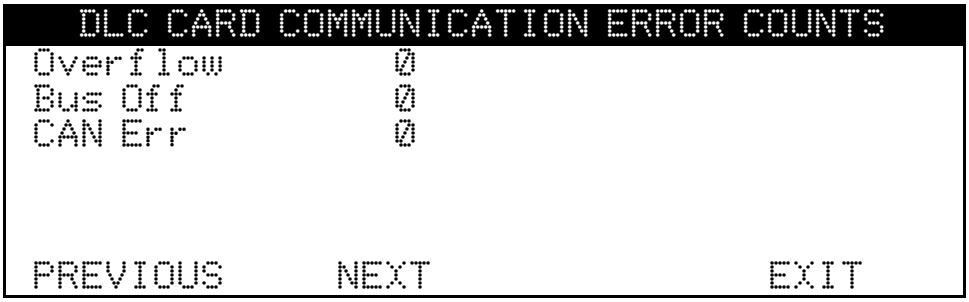

**Zeroing the LIVE LOAD CELL WEIGHTS and MINIMUM AND MAXIMUM WEIGHTS screens is only temporary while in diagnostics. It does not affect the scale weight working zero. If you exit diagnostics and return, the weights will have returned to the previous values.**

**DEADLOAD SHIFT**



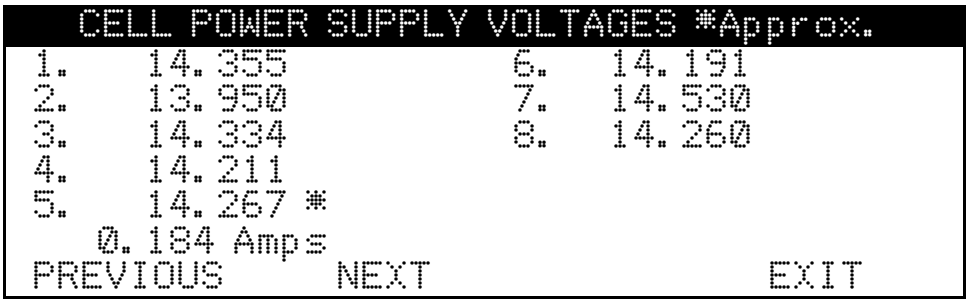

This shows the live shift from the original calibrated deadload. An asterisk (∗) indicates that the deadload shift has been exceeded. The scale must be empty for this to be valid.

## DLC CARD COMMUNICATION ERROR COUNTS




| | |
|---|---|
| Overflow | This is the count of any missed messages from the DLC card buffer that were not kept up with. This should not happen unless too many cells are connected with too high of a sample rate. |
| Bus Off | This does not happen if you completely disconnect the home run cable but does count up if V+ or V- is disconnected. |
| CAN Err | This counts for any of the following errors: |

## CELL POWER SUPPLY VOLTAGES

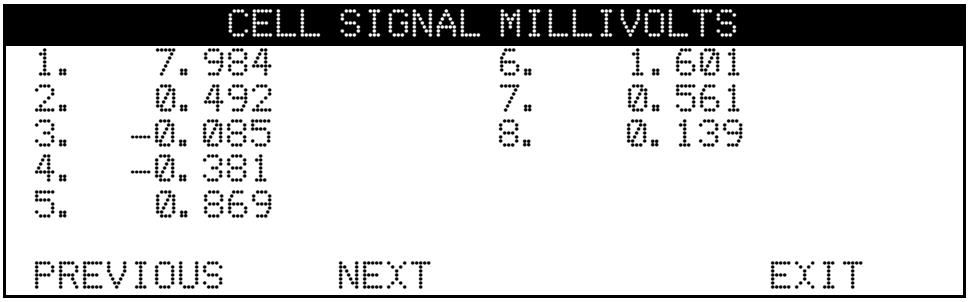



**NOTES:**

- The ∗ on cell number 5 indicates the cell voltage measurement was not calibrated but is an approximate value based on the raw counts.

- The 0.184 Amps in this example shows the approximate current draw from the DLC for all of the cells. Unless an external power is being used, the more cells that are connected, the larger this number will be.

**CELL SIGNAL MILLIVOLTS**

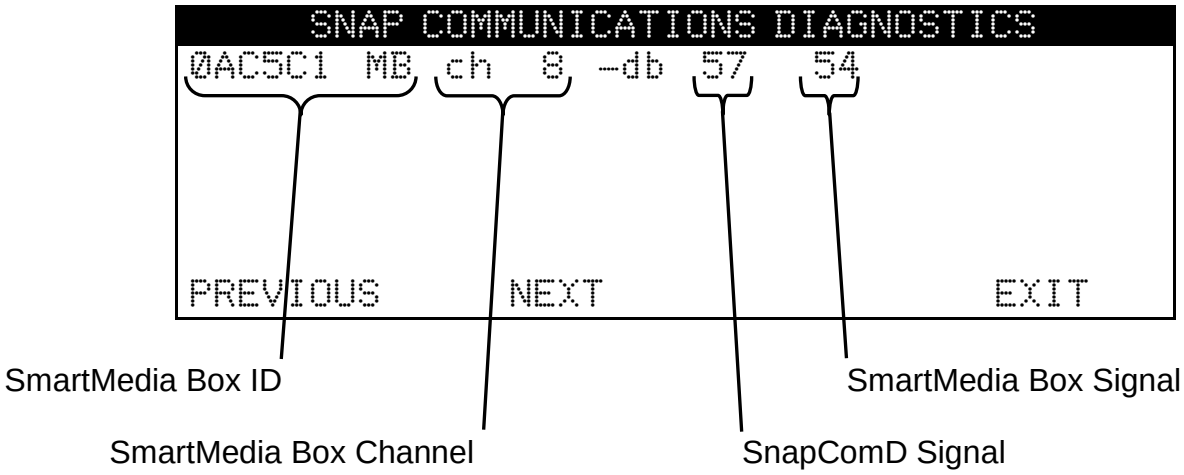



**SNAP COMMUNICATIONS DIAGNOSTICS**

When the SNAP SmartMedia Box communications is enabled, an additional page of the Digital Scale Diagnostics is available.

This will scan and list the IDs of any SmartMedia boxes that it finds on the same channel that the indicator is set to.

This screen shows the ID of the SmartMedia Box, the channel that is being used, and the signal strength detected at the SnapComD and SmartMedia Box.




**NOTE:** The –db numbers are the signal strength detected at the SnapComD and SmartMedia Box. Lower numbers indicate better signal strength.

## Hardware Diagnostics

The 225DLC (Digital Load cell Controller) option card has four LEDs for diagnostic purposes.

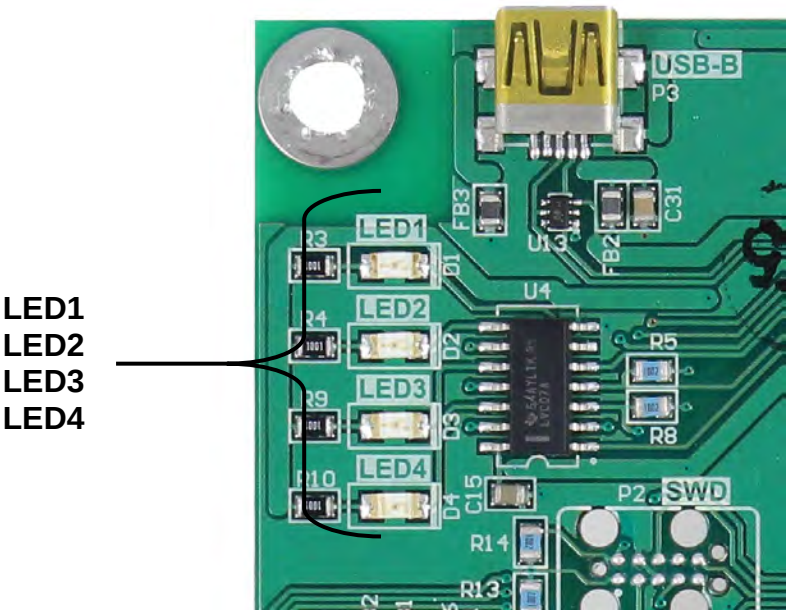



**Figure No. 36 – 225DLC Diagnostics LEDs**

LED1 (RED) – MAIN BOARD TX/RX: Toggles each time the DLC controller and the 225D Mainboard exchange messages.

LED2 (RED) – TX TO LOAD CELL: Toggles each time a message is sent from the DLC controller to the SmartCAN controller.

LED3 (RED) – RX FROM LOAD CELL: Toggles each time the controller receives a response from the SmartCAN controller.

LED4 (GREEN) – MODE: Indicates the mode of the DLC Controller

INIT MODE – Blinks once per second. If the 225D drops into INIT MODE, it is because setup is required, or it cannot find the SmartCAN controller.

NORMAL MODE – solid ON

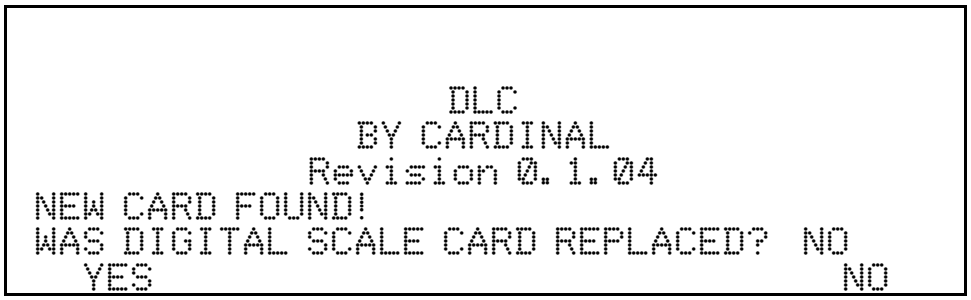
DIAGNOSTIC MODE – Blinks twice per second. This should happen when the operator enters the diagnostics menus.

# DETECTING 225D BOARD REPLACEMENTS

The 225D will detect when a DLC controller or 225D mainboard has been replaced using checksums and unique board identification numbers. Based on several parameters, it can detect whether the option card was replaced, or the mainboard was replaced, and then reconfigure the NEW card to the existing scale.

## 225DLC Digital Controller Card Replacement

If the 225DLC option card is replaced, the 225D will boot up to this screen:

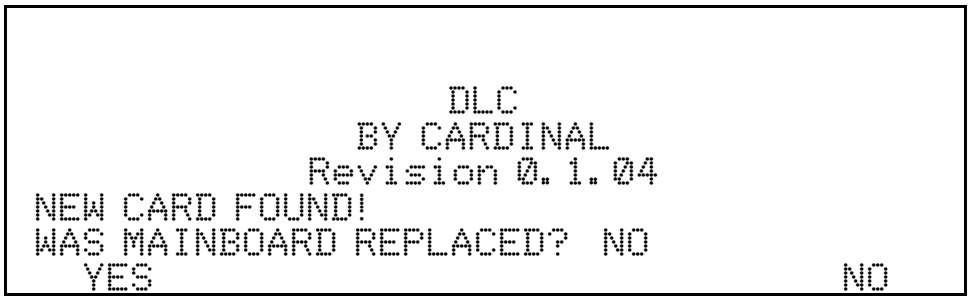



The 225D will check whether the option card has been replaced, in order to reconfigure the new option card to the existing scale.

If the operator selects YES, then the 225D mainboard will upload the scale configuration to the controller, and the 225D will immediately be able to make weight again.

## 225D Main Board Replacement

If a 225D main board is replaced, the 225D will boot up to this screen:




The system will also check whether the 225D's main board has been replaced, so the scale configuration can be downloaded from the controller to the main board.

If the operator selects YES, then the scale configuration will be downloaded from the controller to the mainboard. Scale configuration includes the number of load cells, all load cell IDs, and individual load cell trim. The 225D indicator parameters will need to be entered manually (Interval, Decimal Point Position, Zero Tracking, Filtering, Print Settings, and Serial Settings).

**NOTE: A dead load calibration will need to be performed (does not require test weights).**

# 225DLC DIGITAL CONTROLLER CARD REPLACEMENT

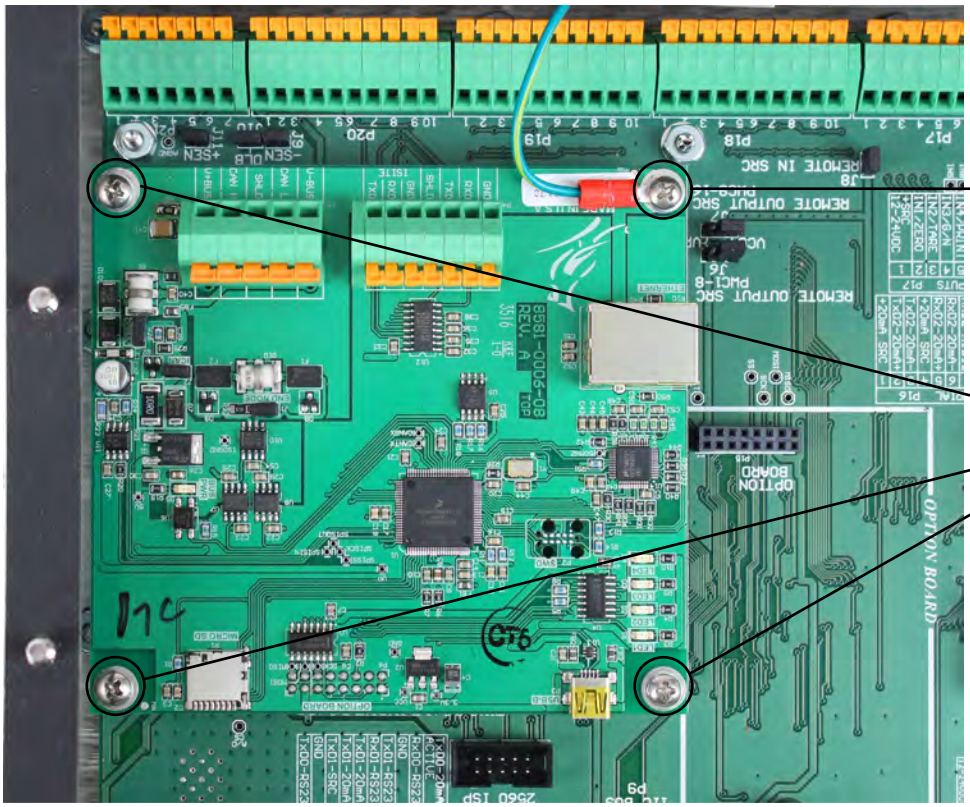



**Figure No. 37 – Remove Screws and Washers Securing 225DLC to 225D**

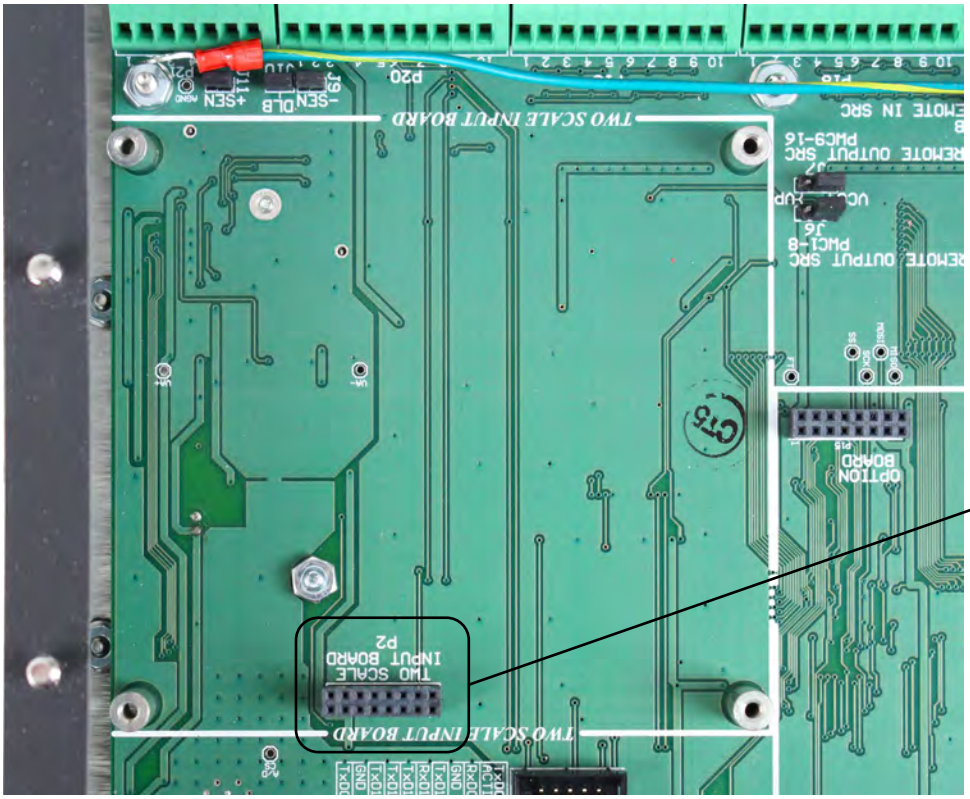
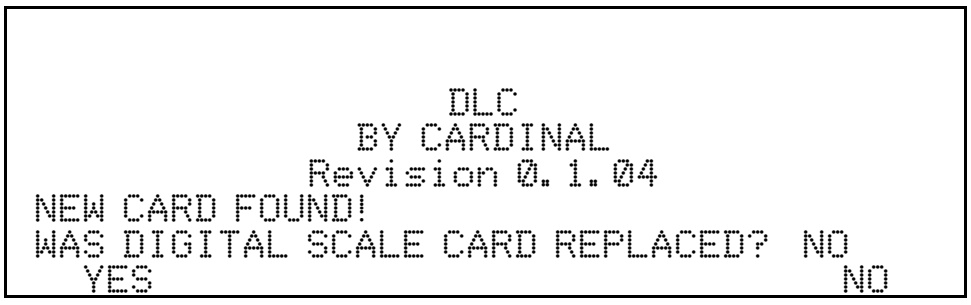



**Figure No. 38 – Align Pins on 225DLC with Connector P2 on 225D**

**CAUTION! OBSERVE PRECAUTIONS FOR HANDLING STATIC SENSITIVE DEVICES**

1. Remove the 225D power cord from the wall outlet.
2. Remove the fourteen acorn nuts securing the rear panel to the main housing.
3. Lift the rear panel from the main housing, taking care not to stretch the cable and wires between the panel and main housing. Lay the rear panel on the workbench/table next to the indicator. **NOTE:** You may need to loosen the gland connectors to allow enough slack in the cable and wires to avoid stretching them.
4. Disconnect the Homerun cable wires from the 225DLC card.
5. Remove the four screws and washers securing the 225DLC card to the 225D main board. Note that the ground wire for the card is secured by one of these screws.
6. Gently rock the 225DLC card from side to side while pulling up to remove it.
7. To install the new 225DLC card, carefully align the dual row of pins on the top of the 225DLC card (on the trace side of the card) with connector P2 on the main board and apply even downward pressure to the edge of the 225DLC card.
8. Align the holes in the 225DLC with the threaded mounting spacers on the main board.
9. Secure the 225DLC card to the main board, using the four screws and washers removed earlier. Note that one screw and washer should be inserted through the ground wire ring terminal, before using it to secure the card to the main board.
10. Reconnect the Homerun cable wires.
11. Ensure that no cables or wires are exposed between the main housing and the rear panel, and then place the rear panel onto the main housing and secure it using the fourteen acorn nuts removed in step 2.
12. Re-insert the 225D power cord into the wall outlet.
13. Press the **ON/OFF** key on the 225D keypad to turn on the indicator.
14. The 225D will boot up to this screen:




15. The 225D will check whether the option card has been replaced, in order to reconfigure the new option card to the existing scale.
16. If the operator selects YES, then the 225D main board will upload the scale configuration to the controller, and the 225D will immediately be able to make weight again.

# 825D HOMERUN CABLE INSTALLATION

## 825D Indicator Connection

To suppress noise, the homerun cable should be routed through the metallic gland connector installed in the bottom (right) of the 825D enclosure and the cable shield from the cable connected to the metal gland connector for grounding. Refer to the image below for the gland connector layout.

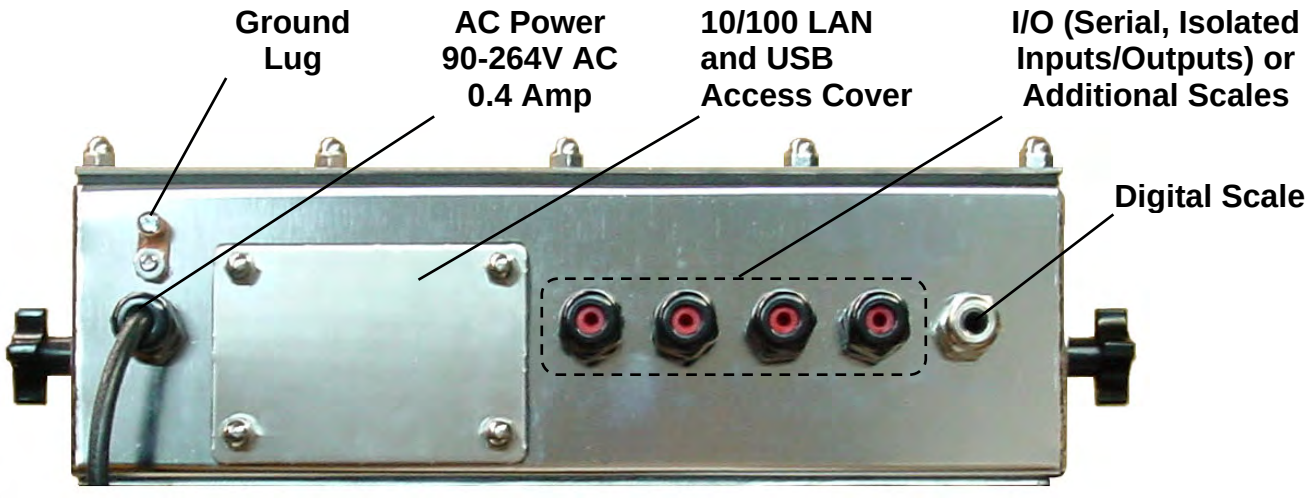



**Figure No. 39 – 825D Gland Locations**

**ATTENTION!**
OBSERVE PRECAUTIONS FOR HANDLING ELECTROSTATIC SENSITIVE DEVICES

1. Remove the fourteen acorn nuts securing the rear panel assembly to the main housing.
2. Lift the rear panel from the main housing and place it on the workbench next to the 825D, taking care not to stretch the cable and wires between the rear panel and main housing.

**IMPORTANT:** You may need to loosen the gland connectors for the I/O cables to allow enough slack in the cable and wires to avoid stretching them.

3. Loosen and remove the metal gland connector nut, and then remove the plastic insert.
4. Slip the homerun cable through the nut and plastic insert.

## 825D Indicator Connection, Cont.

5. Remove approximately 6 in (15 cm) of the homerun cable outer jacket, exposing the cable shield and internal wires.
6. Cut the cable shield so it extends past the outer jacket approximately 3/4 in (19 mm).
7. Next, remove approximately 1/4 in (6 mm) of insulation from each of the five internal wires.
8. Slide the plastic insert up the cable and then fold the cable shield back over the plastic insert.
9. Insert the internal wires and the plastic insert (with the cable shield folded over it) into the metal gland connector on the bottom of the 825D.
10. Slide the metal gland connector nut up the cable and install it on the threads of the gland connector. Note that the cable shield will be secured to the connector when tightening the gland connector nut.
11. Remove the screw securing the 825-DLC card to the 825D main PC board and then lift the card straight up to remove it from the enclosure
12. Referring to the table below (or the circuit board) for terminal connections, connect each wire of the homerun cable to terminal block P1 on the 825-DLC controller card.

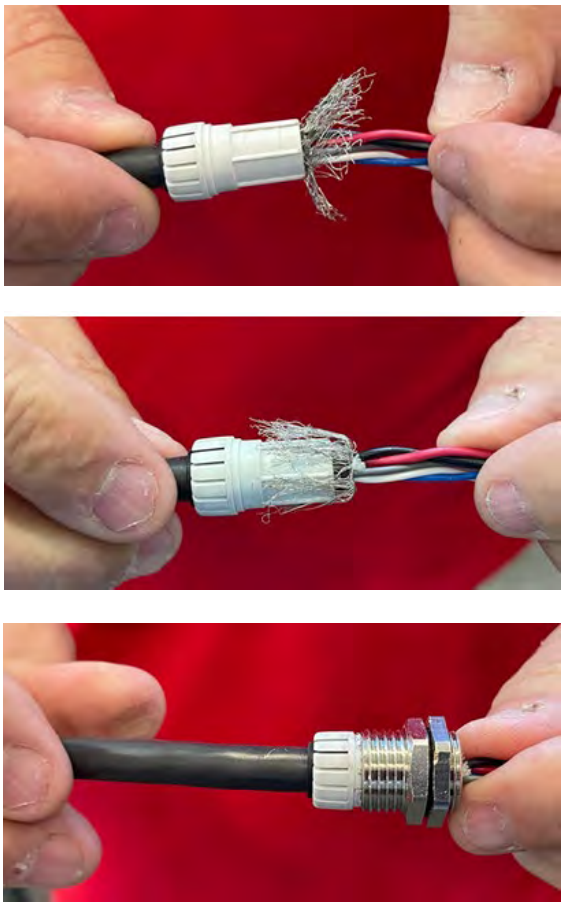


**Figure No. 40**
**Homerun Cable Preparation**

**825DLC Controller Card P1 Terminal Connections**

| Board Label | Homerun Cable Wire Color | Wire Color if using a Load Cell Cable |
|---|---|---|
| SHLD | GRAY | BROWN |
| V+BUS | RED | WHITE |
| V-BUS | BLACK | BLUE |
| CAN H | WHITE | BLACK |
| CAN L | BLUE or LIGHT BLUE | GRAY |

13. Using a small flat blade screwdriver press down on the release bar for the terminal, insert the wire into the opening, and then remove the screwdriver. The release bar will return to its original position, locking the wire in place.
14. Repeat steps 12 and 13 until all five wires of the homerun cable are installed in the P1 terminal block on the 825DLC controller card.
15. After all terminations have been made, reinstall the 825-DLC into the enclosure, taking care not to strike the board against the side of the 825D enclosure.
16. Secure the 825-DLC to the main PC board with the screw removed earlier.

## 825-DLC Controller

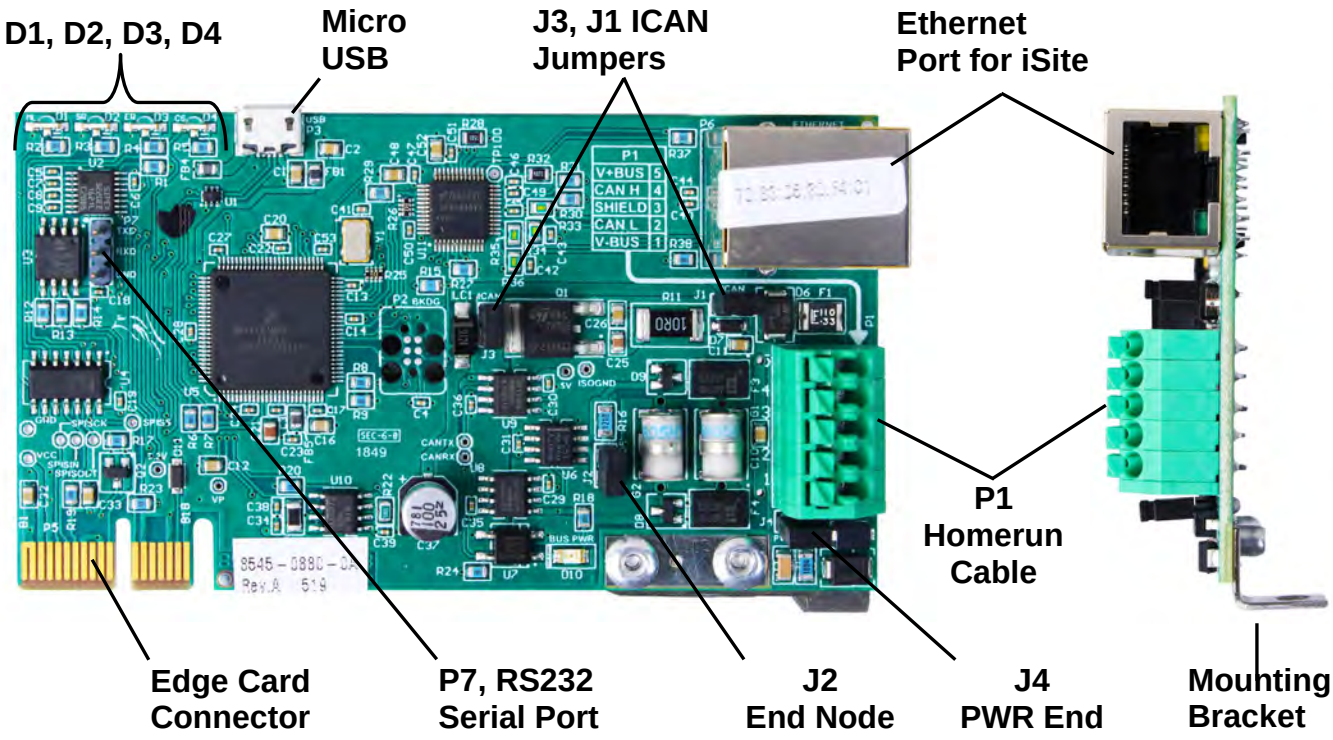



**Figure No. 41 – 825DLC Controller Card**

### J2, End Node Jumper

Jumper J2 is the CAN bus END NODE jumper. **NOTE:** The J2 jumper must be installed for the 825D communications to the scale to operate.

### J1, J3 ICAN Jumpers

When ON (installed), these jumpers allow the 825D indicator to supply power to the SmartCAN System junction box. To operate a SmartCAN System junction box *with an external power supply*, such as the model MB-AC media box or an external 24V DC power supply provided by the customer, the jumpers must be **OFF** (on one pin only or removed).

**IMPORTANT!** To operate from an external power supply, the J1, J3 jumpers must be **OFF** (*on one pin only or removed*), and 24V DC must be applied to the V+BUS terminal with a ground return to the V-BUS terminal of the P1 terminal block.

**IMPORTANT!** The SmartCAN6-AC, SmartCAN8-AC, and SmartCAN10-AC (*are self-powered*), and require the J1, J3 jumpers to be **OFF** (*removed or on one pin only*).

### J4, PWR END

This jumper should be installed if the power to the SmartCAN System junction box is provided by the 825D power supply and not an external power source.

### P1, Homerun Cable

The P1 terminal block is used to connect the homerun cable between the 825D indicator and the first SmartCAN junction box.

## 825-DLC Controller, Cont.

**Micro USB**
This connector is used to perform software updates to the 825-DLC controller card.

**P6, Ethernet Port**
This port is used to connect the 825D to your network to send information to the cloud for iSite.

**P7, RS232 Serial Port**
The P7, RS232 Serial port pins are used to connect to Legacy iCAN, and for future connections.

**LED 1-4**
The LEDs are used for diagnostic purposes. For a complete explanation of their function, refer to the DIGITAL SCALE DIAGNOSTICS, Hardware Diagnostics section of this manual.

## Re-Installing the 825D Rear Panel

1. After all terminations have been made, and the 825-DLC is secured to the main PC board, remove the excess cable from any other cables from the indicator enclosure, and finger-tighten each of the cable gland connectors.
2. Ensure any unused gland connectors are plugged and replace the rear panel.
3. Secure the rear panel with the fourteen acorn nuts removed earlier, following a diagonal pattern when tightening the acorn nuts.
4. Using a torque wrench, tighten the plastic gland connectors to 15 in-lb (1.7 Nm).
5. Using a torque wrench, tighten the metal gland connector to 33 in-lb (3.7 Nm).

# SMARTCAN REFERENCE CARD

To aid in keeping track of the Cell Input IDs and the load cells with their location on the scale, the SmartCAN6/8/10 enclosures have a plastic envelope attached to the lid with (2) removable cards inside, to record the section Cell Input IDs and the load cell input letter for each load cell with its associated physical location on the scale.

Recording the section Cell Input IDs and cell input letter for each load cell associated with their location on the scale on one of the cards offers an easy reference to the numbers when entering the cell to scale assignments of the Addressing Cells setup screen on the 825D.

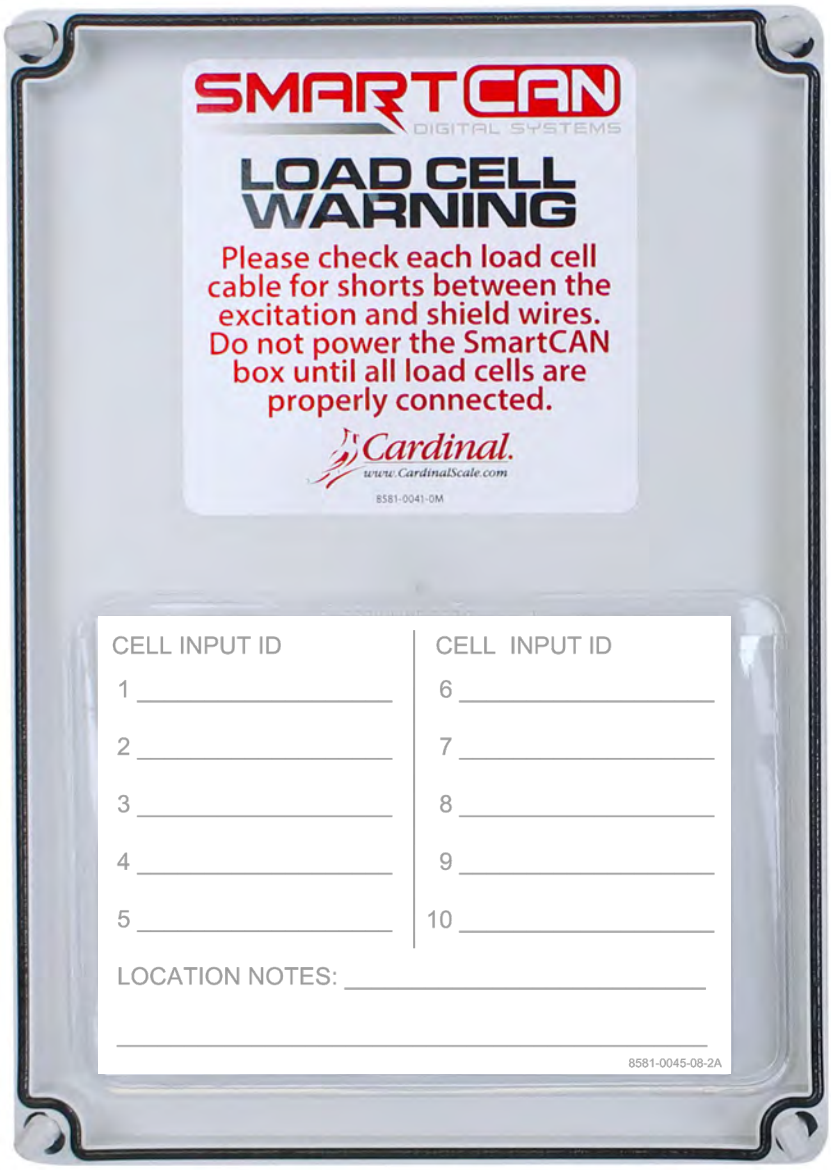



**Figure No. 42**
**Load Cell Warning Label and SmartCAN Reference Card**

# 825D SETUP AND CALIBRATION

## The 825D Weight Indicator

The 825D SmartCell Weight Indicator has software specially written for communicating with digital scales and the SmartCAN systems. It provides in-depth diagnostics, easy maintenance, and a simplified calibration.

The 825D consists of two main components: an 825 indicator with digital scale software, and an 825-DLC controller (installed in the indicator option card slot).


**Figure No. 43**
**825D Weight Indicator**

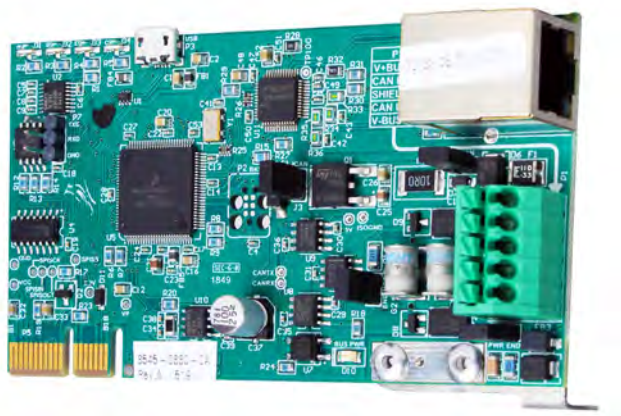
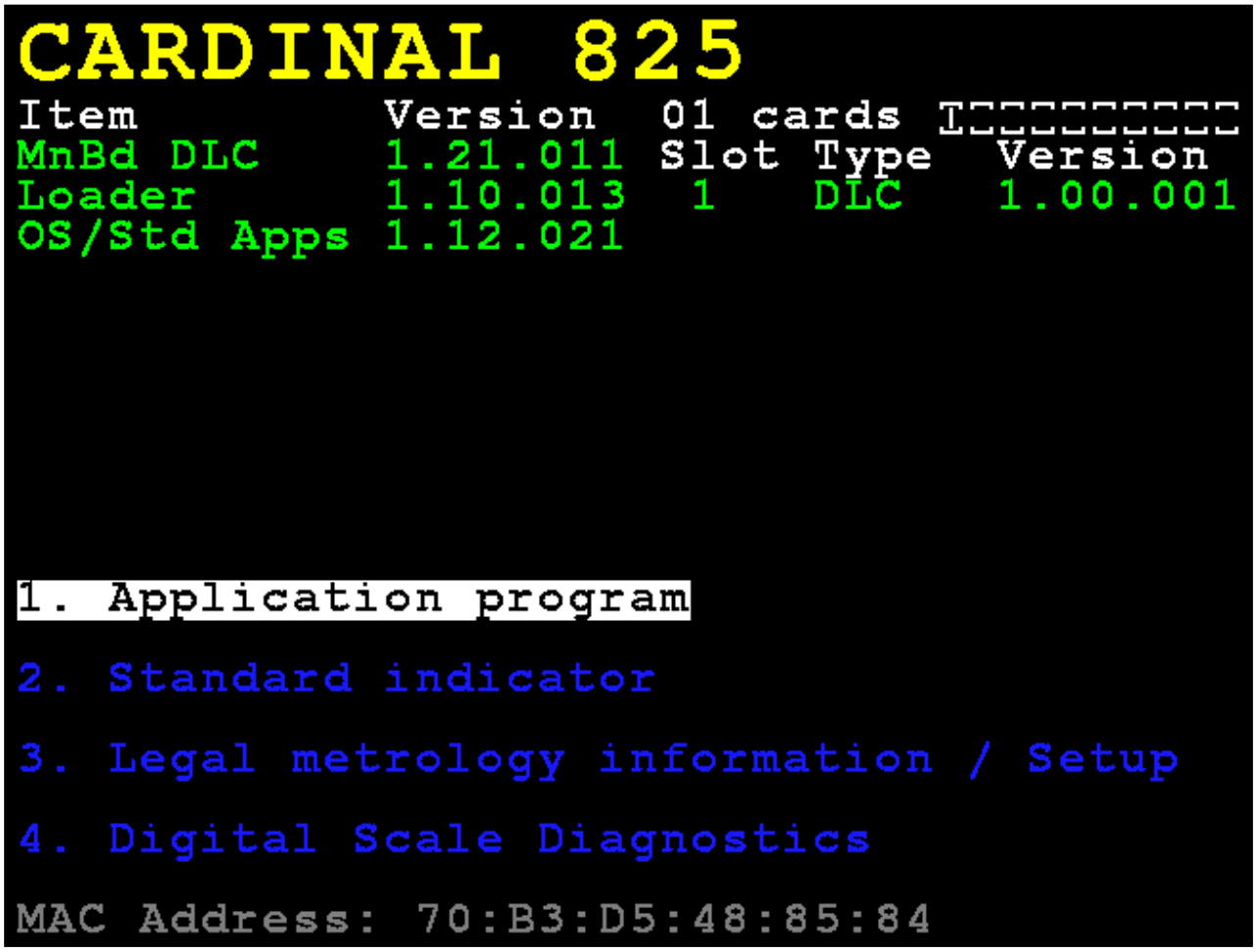


**Figure No. 44**
**825-DLC Digital Load Cell Controller**

This section of the SmartCAN System manual is furnished as a guide to the setup and calibration of the 825D SmartCell Weight Indicator when used with a SmartCAN System junction box. It should be used in addition to the standard 825 Weight Indicator Installation and Technical Manual, 8545-M838-O1. The standard 825 manual should be consulted for additional information concerning installation, setup, and calibration. Please keep both manuals available for future reference.

## To Begin Setup and Configuration

1. Press the **ON/OFF** key to turn on the 825D. The display will perform a short self-test and then change to the Startup screen showing the software versions and status of the main board and option cards.




**IMPORTANT!** The **MnBd DLC** shown under **Item**, indicates the main board is loaded with the DLC version of the software.

The **Slot Type** is showing that Slot 1 of the 825D is occupied by a DLC card version “1.00.001”.

**NOTE:** Currently, the 825D only supports a single DLC card operation.

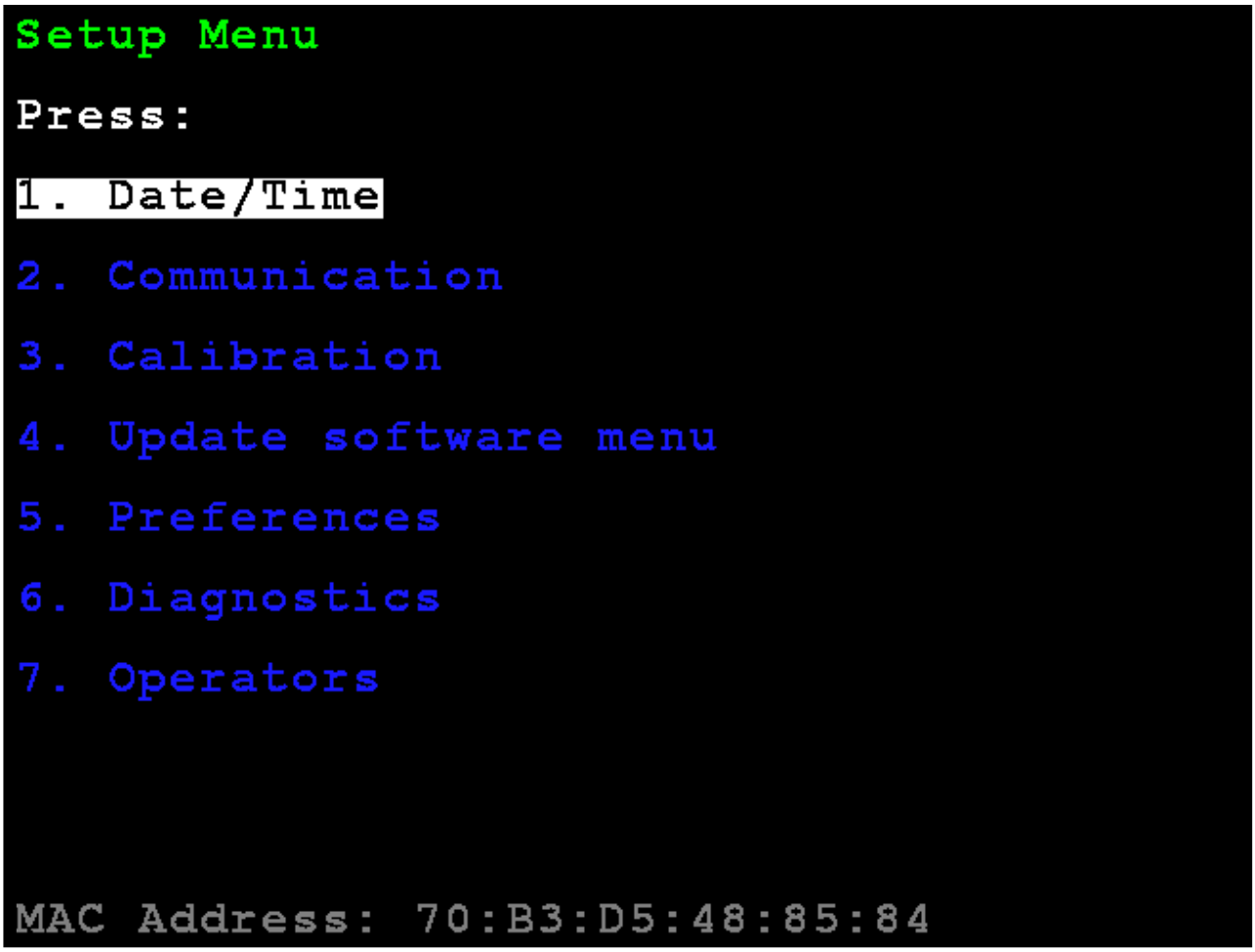
2. To configure the DLC operation use the Navigation Keys to select (highlight) the **3. Legal metrology information / Setup** option and then press the **ENTER** key.
3. Press the Navigation Keys to select (highlight) the **3.Setup menu** option, and then press the **ENTER** key.
4. The display will change to show the login and password prompt screen.

## Login

1. With the **Login** screen and prompt displayed, use the alphanumeric keys to enter the login, and then press the ▽ Down Arrow to advance to the password prompt.
2. Enter the password using the alphanumeric keys, and then press the **ENTER** key to proceed with Setup and Configuration.

**NOTE:** The 825D will arrive from the factory with the calibration access locked by the "login" and "password" prompts protection. The factory default login and password are "ADMIN" and "81440".

3. The display will change to show the **Setup Menu** screen.



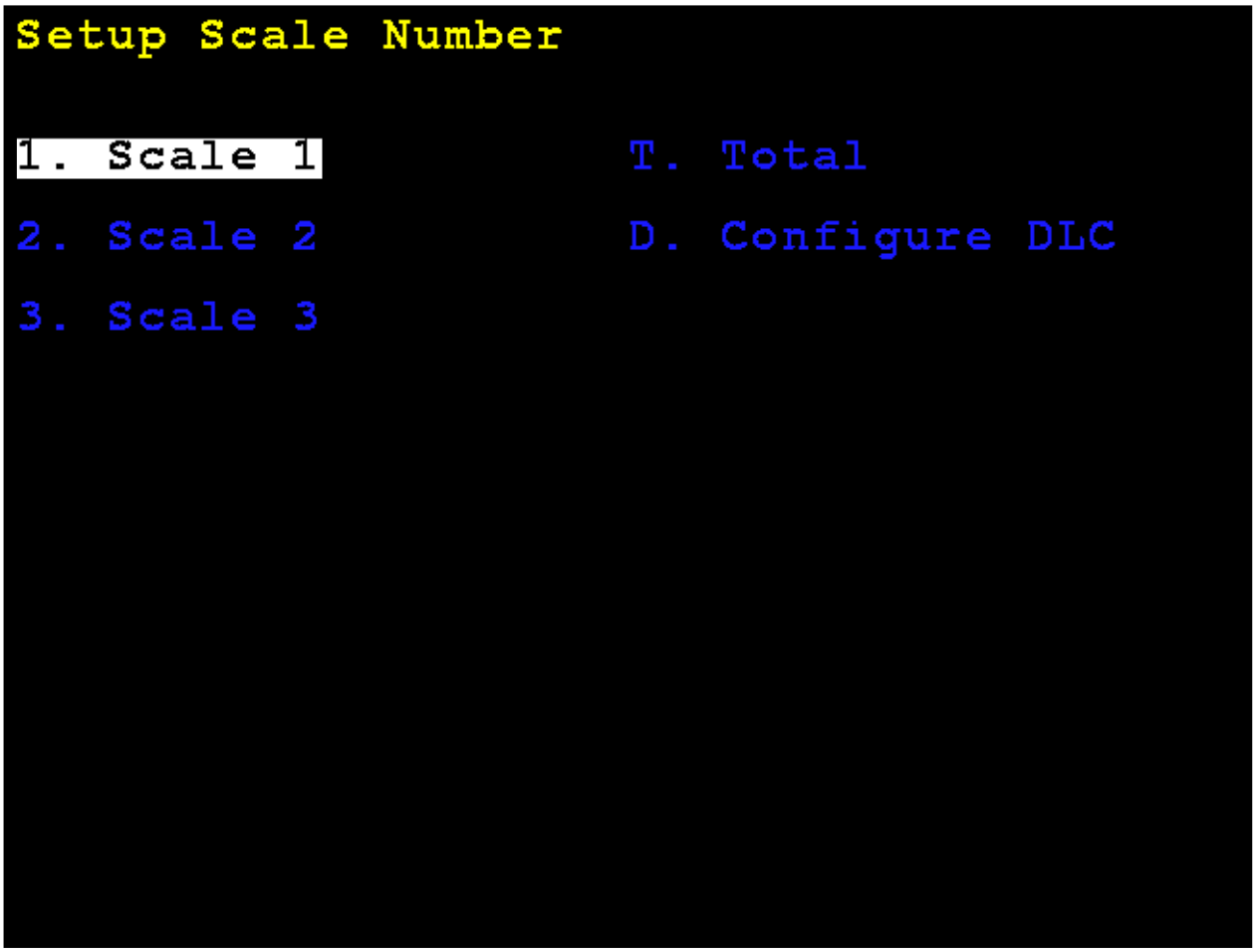

## Select Calibration

### 3. Calibration

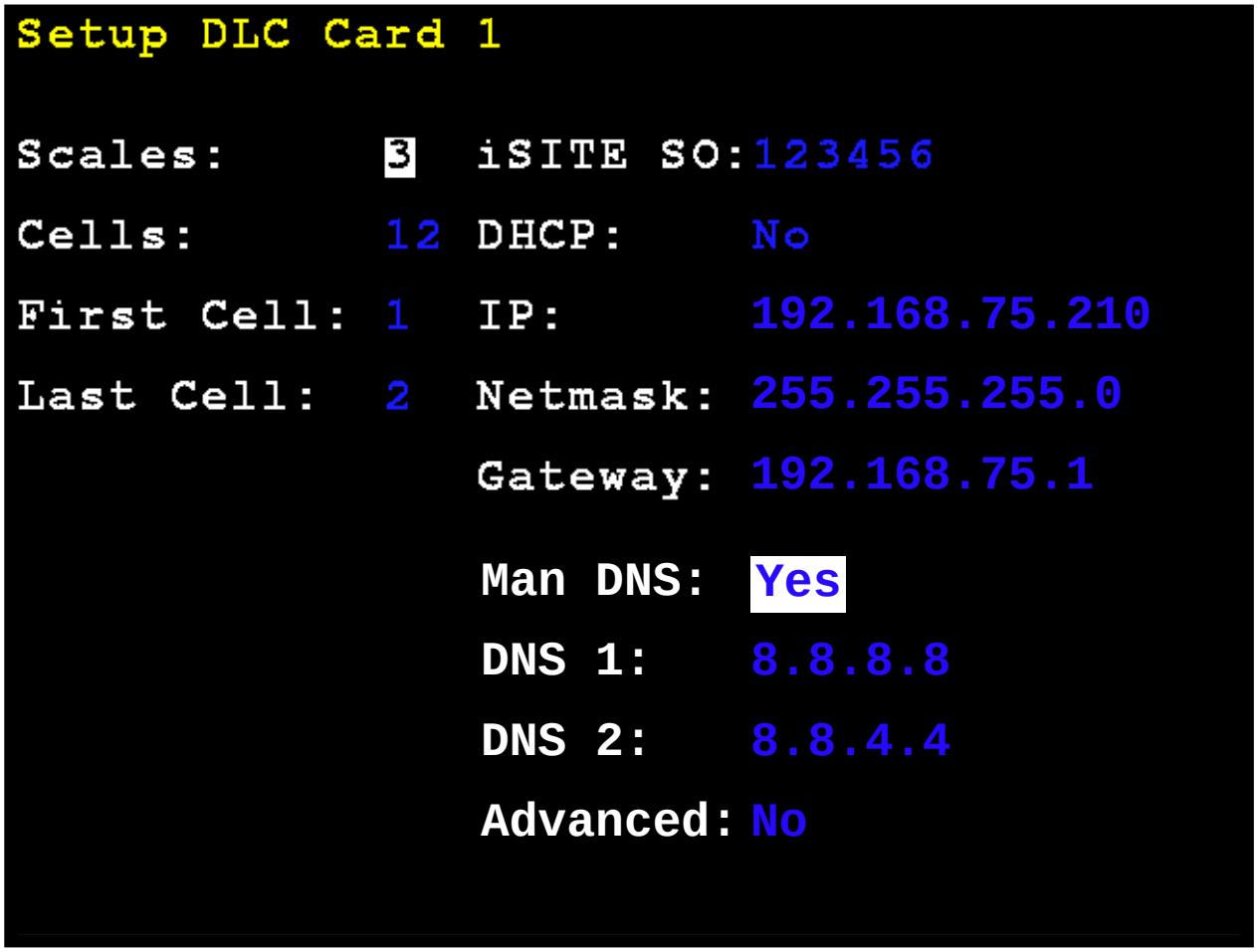
With the Setup Menu displayed, press the **3** key, or use the Navigation Keys to select (highlight) **3. Calibration**, and then press the **ENTER** key. The display will change to show the **Setup Scale Number** screen.

### Setup Scale Number

With the Setup Scale Number screen displayed, press the **D** key, or use the Navigation Keys to select (highlight) **D. Configure DLC**, and then press the **ENTER** key. The display will change to show the **Setup DLC Card 1** screen.



### Setup DLC Card 1




**Scales:** – Set the number of scales.

**Cells:** – Set the total number of cells.

**First Cell:** – Set the cell number that is connected to the 825D indicator.

**Last Cell:** – Set the cell number of the end of the chain of load cells.

**iSITE SO:** – Set Sales Order or another identifier for communications link to iSite cloud.

**DHCP:** – Set to **Yes** for automatic configuration of the DLC card Ethernet parameters from a DHCP server.

Set to **No** for manual configuration.

## Setup DLC Card 1, Cont.

If **DHCP:** = **No**, the following prompts will be visible:

**IP:** – Set the IP address.

**Netmask:** – Set the netmask.

**Gateway:** – Set the network gateway setting.

**Man DNS:** – Set the domain server addresses.

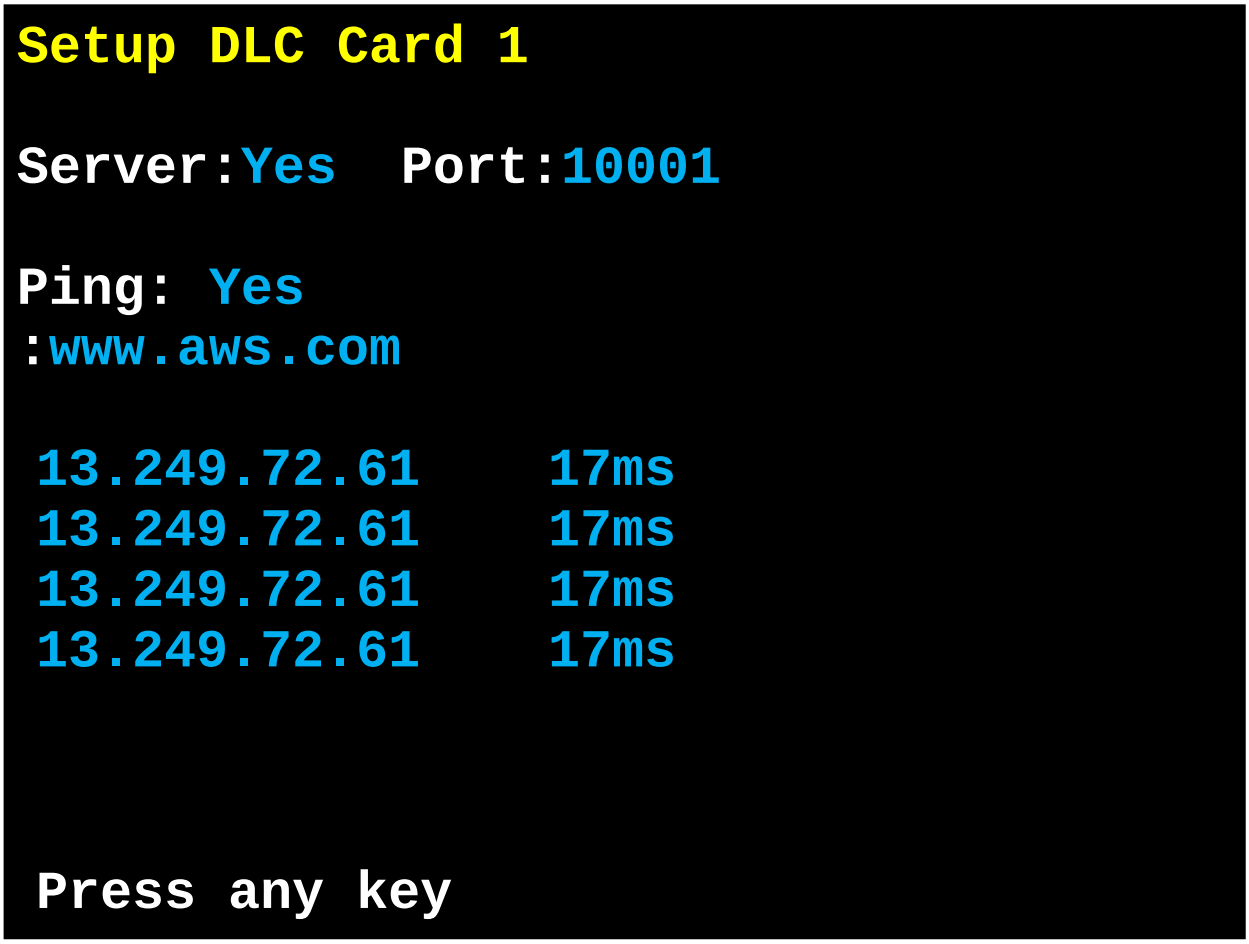
**DNS1:** – Shown if **Man DNS:** set to Yes. Input first DNS IP address.

**DNS2:** – Shown if **Man DNS:** set to Yes. Input second DNS IP address.

**Advanced:** – Set to **No** by default. Press **ENTER** to save any changes. The display will change to show the **DLC CARD 1 CELL ASSIGNMENT** screen.

Set to **Yes** and then press **ENTER** to save any changes. The display will change to show the **Setup DLC Card 1** Advanced screen.

### Setup DLC Card 1 – Advanced Screen




The **Server** prompt should normally be set to **No**.

Set to **Yes** to perform diagnostic server function (similar to old-style iSite).

If **Server** is set to **Yes**, the **Port** prompt will be shown to set the port.

If **Ping** is set to **Yes**, an input line will be shown.

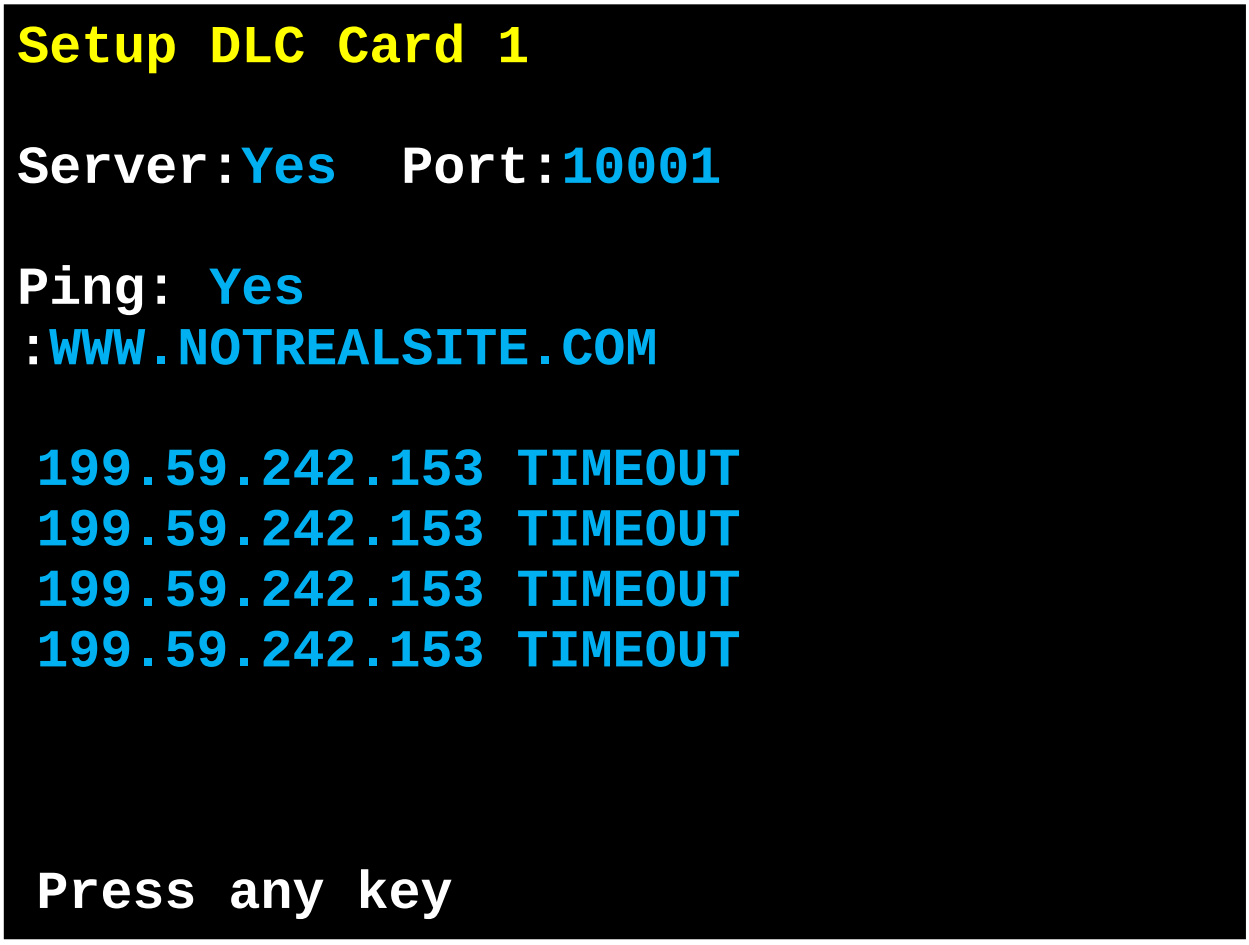
**NOTE:** The input line is the colon (**:**) displayed below **Ping:**. Also, **Ping** will default to www.aws.com but may be changed to other URLs.

Press **ENTER** to perform the ping function.

Over several seconds the ping will occur and display the results of the resolved IP address, along with the response time in milliseconds.

### Setup DLC Card 1 – Advanced Screen, Cont.

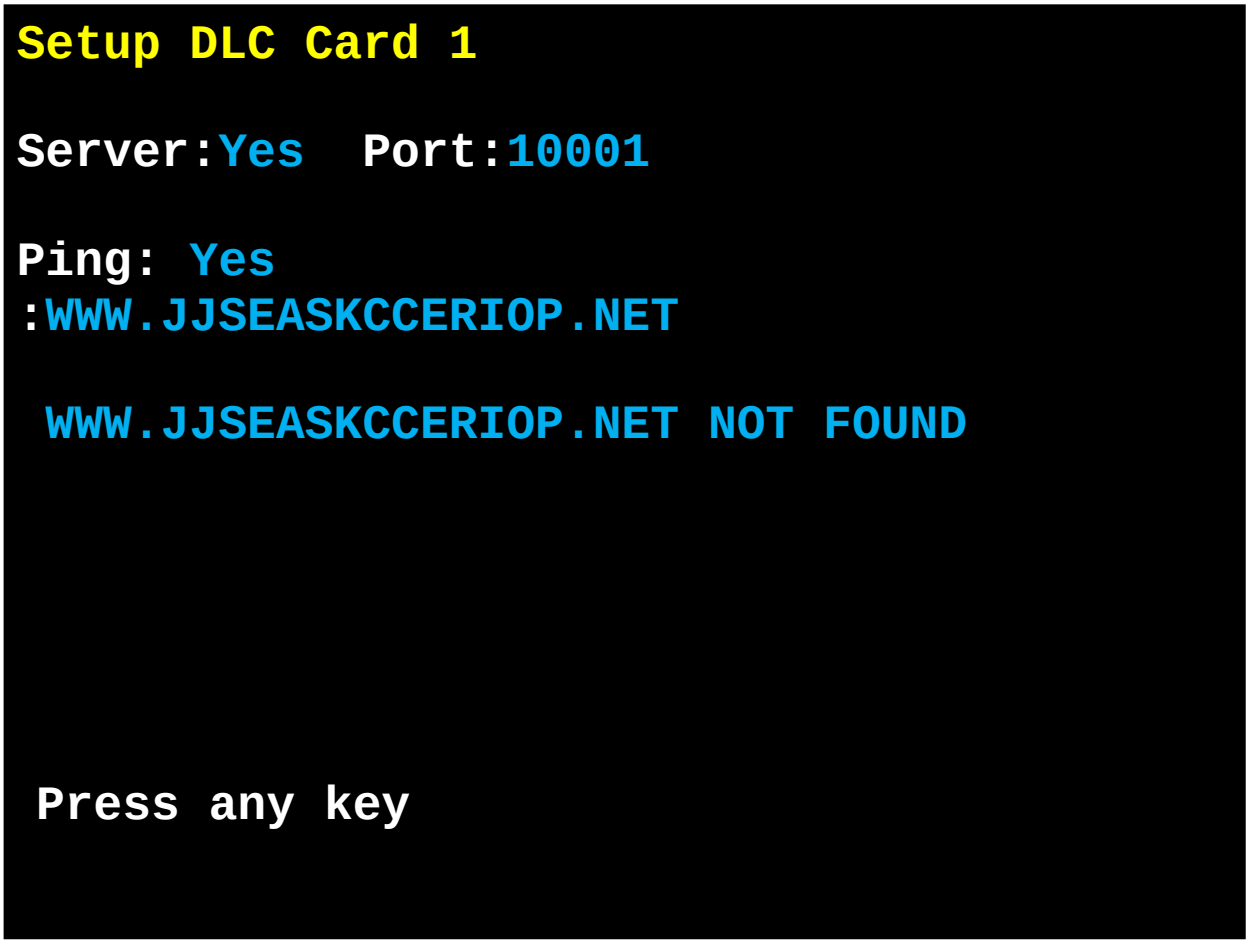
If the URL that is input that does not respond, the display will show the web address and TIMEOUT indicating the URL is not responding to the ping.




For example, the URL used in the above screen, WWW.NOTREALSITE.COM has a DNS record but shows TIMEOUT because it is not responding to the ping.

### Setup DLC Card 1 – Advanced Screen, Cont.

If the name cannot be resolved to an IP address via DNS the display will show:



## DLC Card 1 Cell Assignment

**NOTE: The numbers in the example are unique to the controller board shown and will not work in any other SmartCAN.**

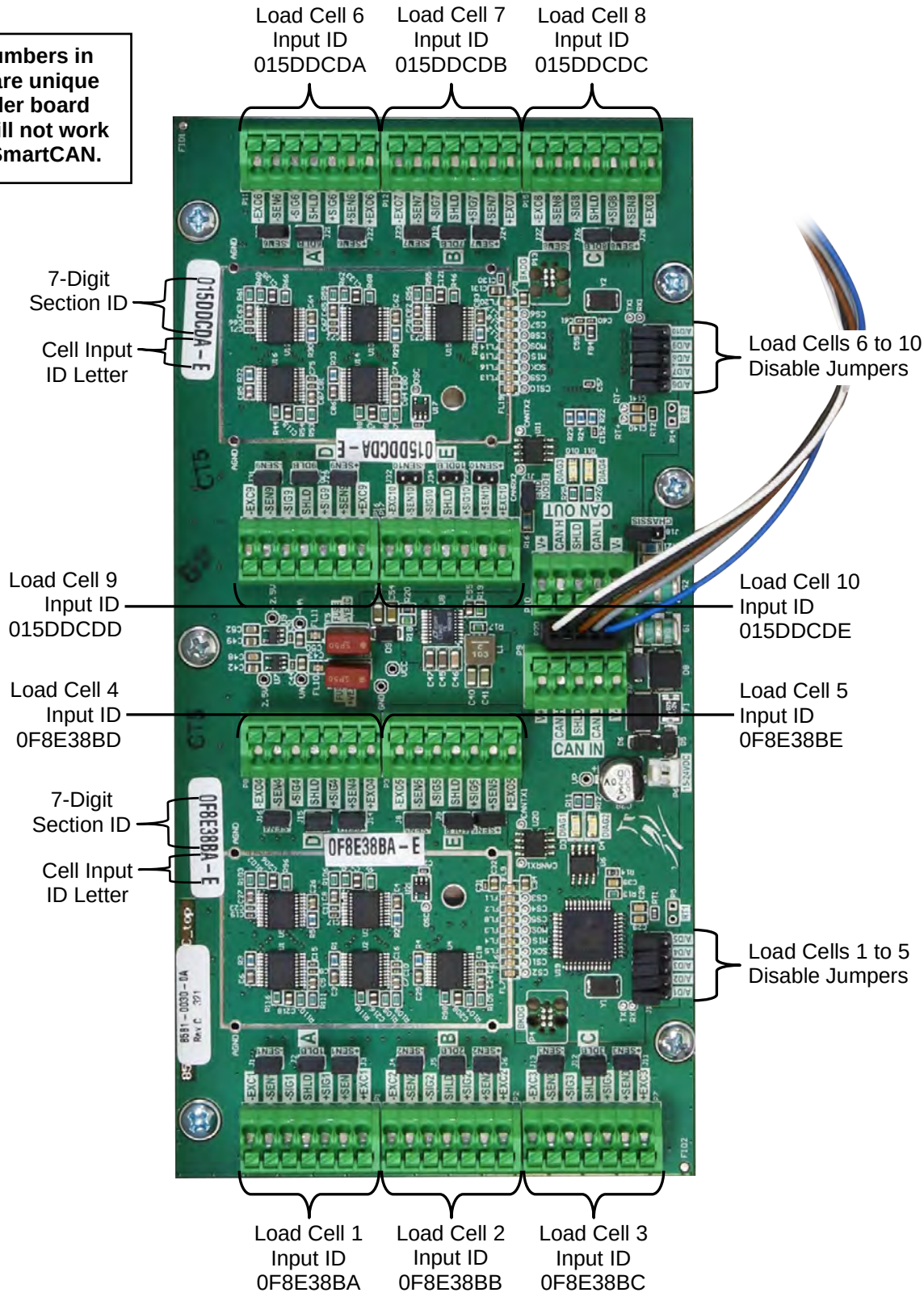


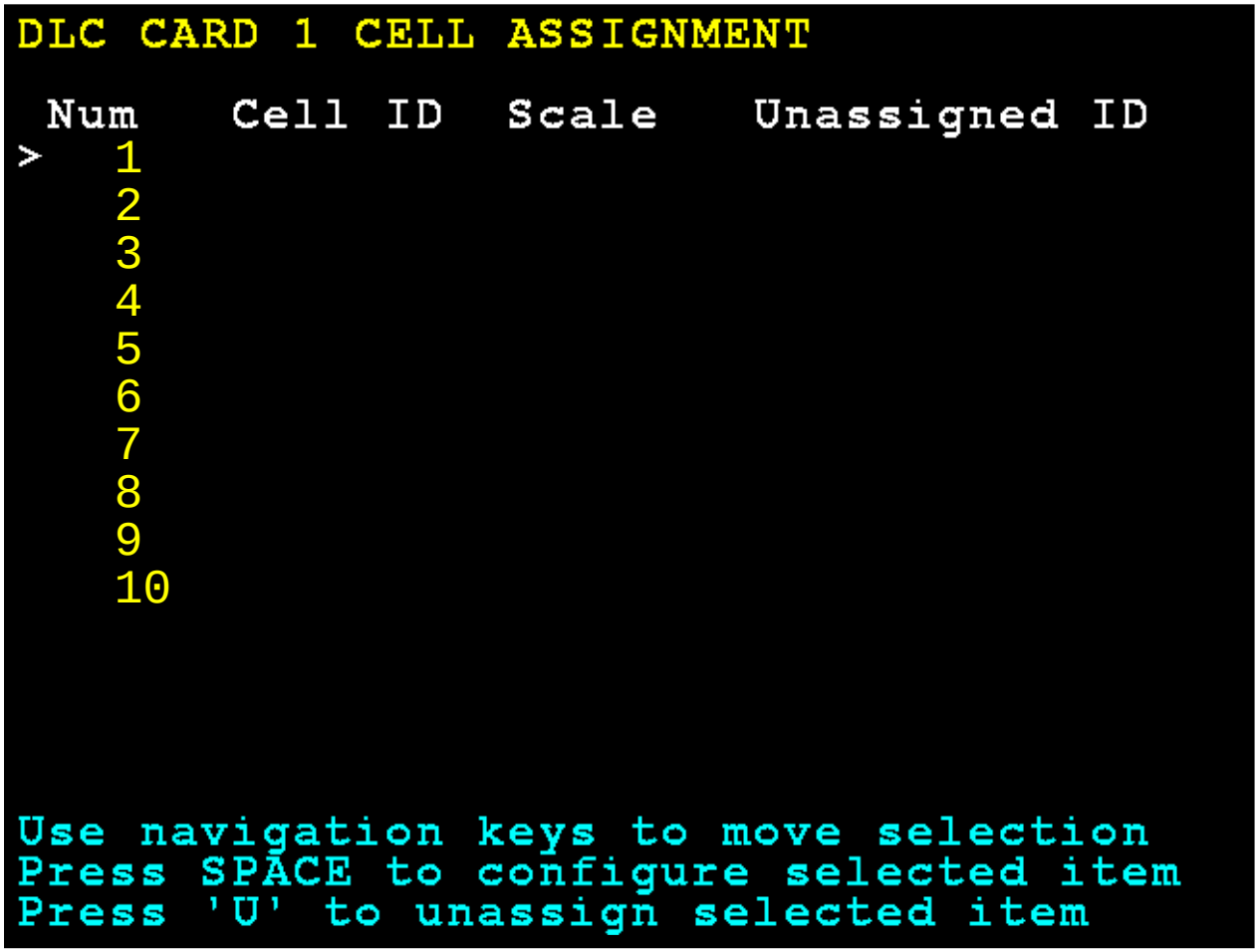

**Figure No. 45 – SmartCAN Controller Cell Input IDs**

The SmartCAN6/8/10 controller has a Cell Input ID label on the PC board for each of the two sections of the controller. This label has a seven-digit hexadecimal number followed by the letters A to B, C, D, or E which is used to identify the load cell inputs for that section. When entering the cell to scale assignments, you would enter the *first seven digits* of the label as the section ID, followed by the letter A – E for each input a load cell is connected to.

For example, referring to Figure No. 45, the Cell Input ID labels for the SmartCAN10 controller shown are: 0F8E38BA-E for one section (where 0F8E38B is the seven-digit section ID and A-E is for the first 5 load cell inputs) and 015DDCDA-E for the other section (where 015DDCD is the seven-digit section ID and A-E is for the other 5 load cell inputs).

Therefore, when entering the cell to scale assignments, the first five Cell Input IDs you enter would be: 0F8E38BA, 0F8E38BB, 0F8E38BC, 0F8E38BD, and 0F8E38BE. The second five Cell Input IDs would be 015DDCDA, 015DDCDB, 015DDCDC, 015DDCDD, and 015DDCDE.

The left side of the column shows the existing programmed IDs and the scale number assigned for each load cell connection.
.
If any load cell connections are detected on the bus that are not assigned, they will show on the right column under the **Unassigned ID** heading.

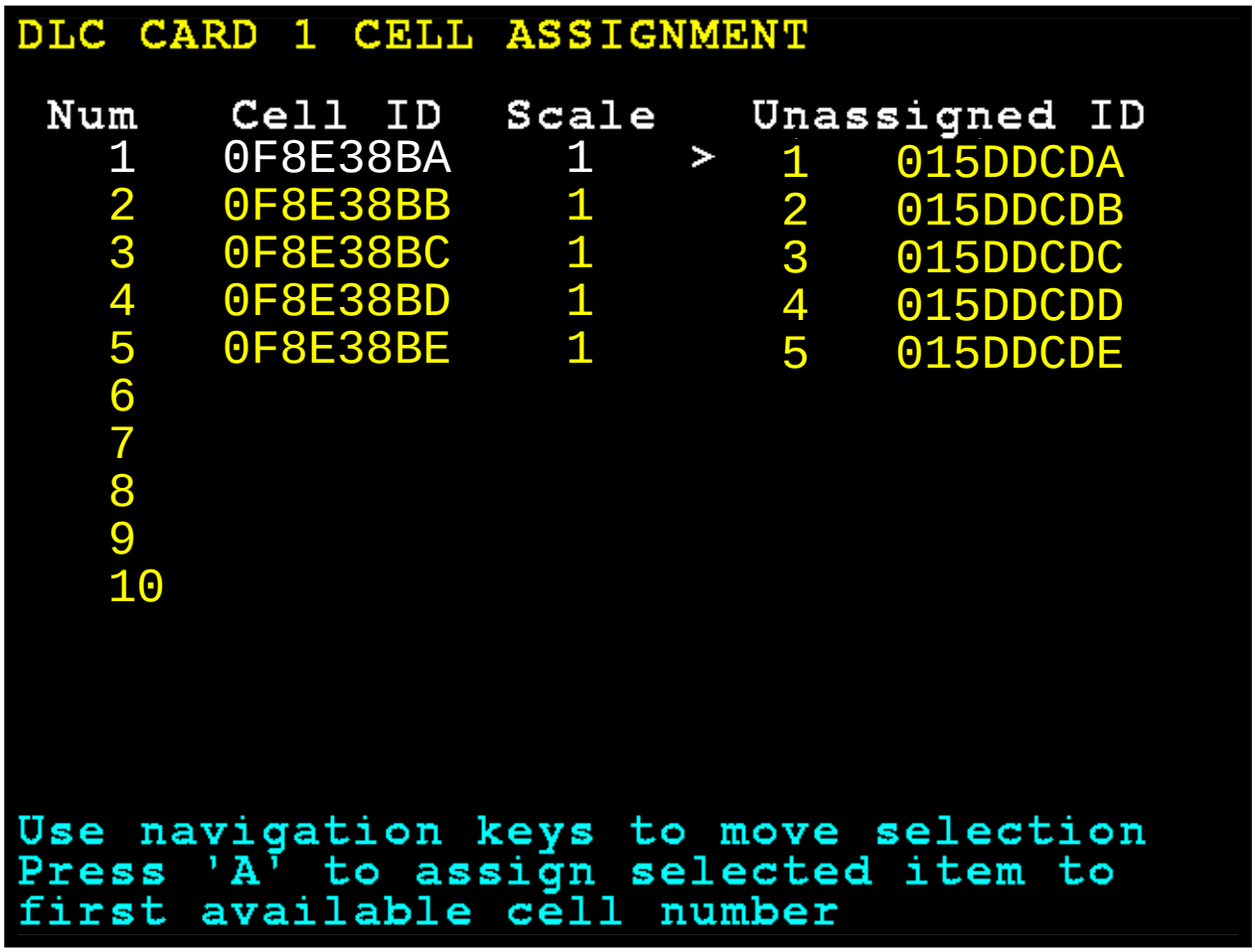


## DLC Card 1 Cell Assignment, Cont.

The right navigation key may be used to select the unassigned column. The left navigation key may be used to select the existing IDs of the load cell connections. The up/down navigation keys may be used to select a specific load cell connection.

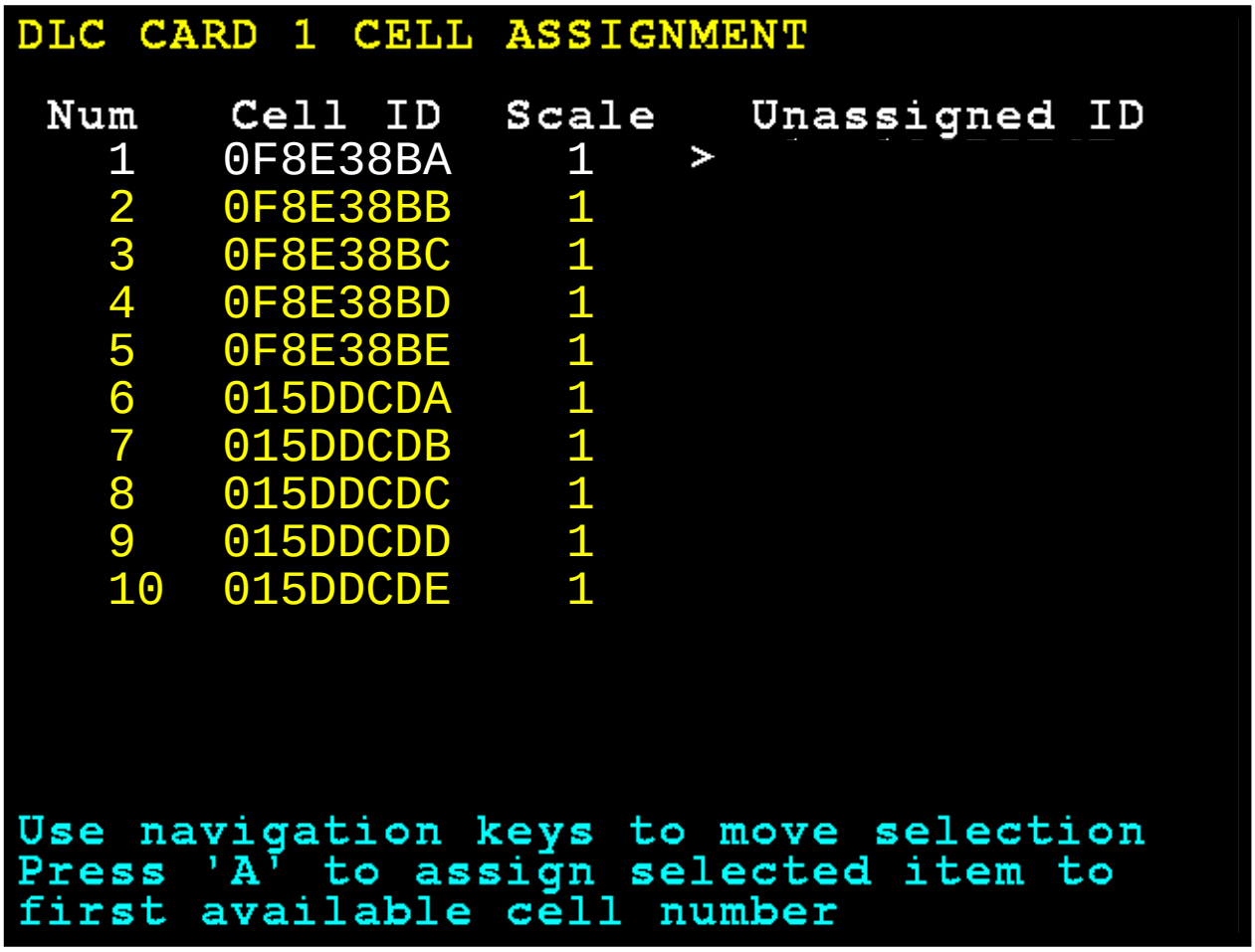
### Assign Load Cell Connection

Select the next load cell connection to assign on the right column and press the **A** key to assign it to the next unassigned Cell ID (cell ID 015DDCDA). The ID will then appear on the assigned list on the left.



## DLC Card 1 Cell Assignment, Cont.

Load cell connection IDs may also be entered manually and the scale to associate with the load cell connection by selecting an item in the left column pressing the **SPACE** key.




Type the **`Cell ID`** if it is to be changed, press the down navigation key to select the **`Scale:`** prompt, and then enter the scale number.

When finished press and release the **SHIFT** key, then press the **ESC/←—** key.

The display will return to the Setup Scale Number screen.

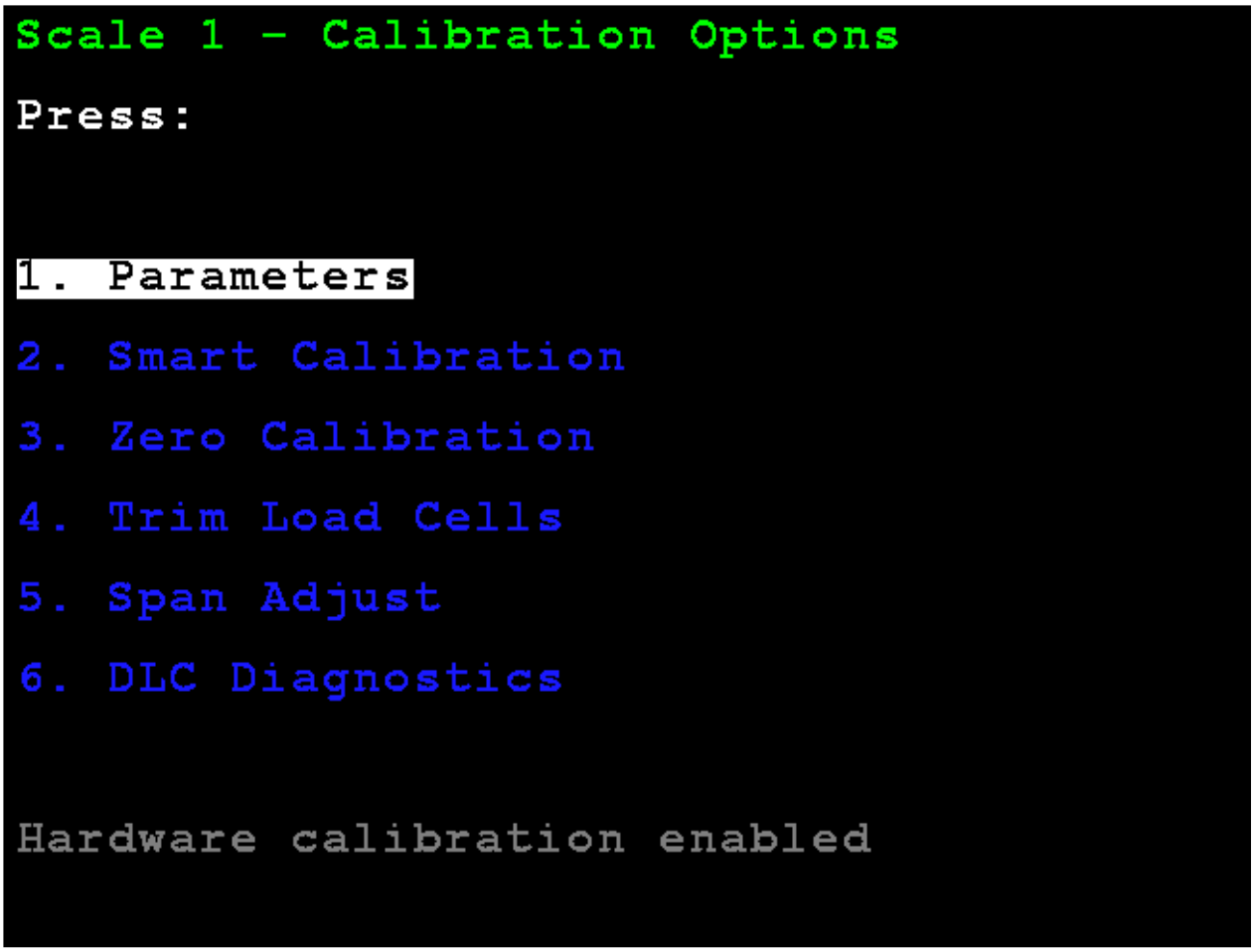
**NOTE:** If the DLC configuration changes have changed the number of scales the 825D, power should be turned off, and after a brief delay turn the power back on.

Select a scale to configure or calibrate:

The display will change to show the **`Scale 1 – Calibration Options`** screen.

### 2. Smart Calibration

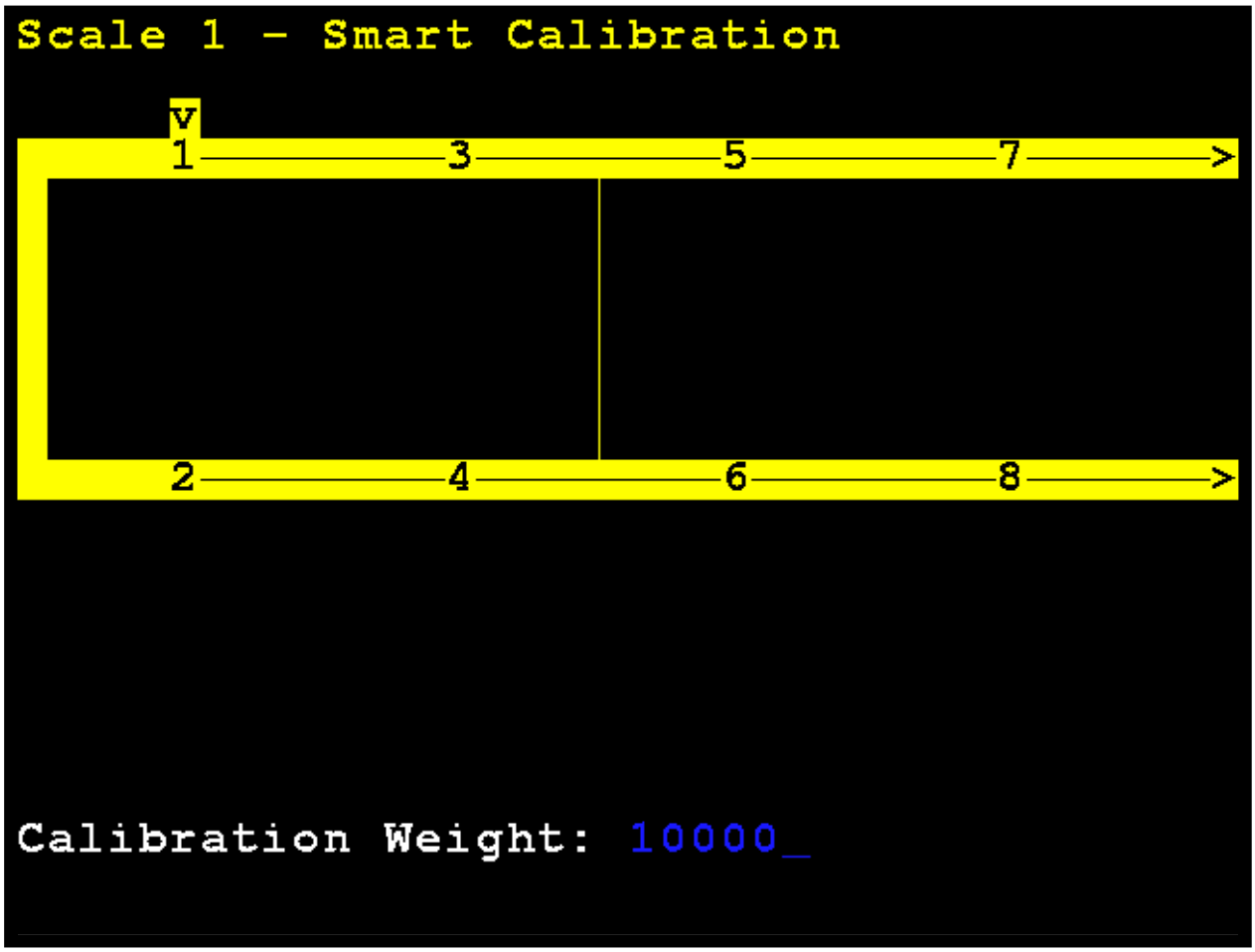
With the **Scale 1 – Calibration Options** screen displayed, press the **2** key, or use the Navigation Keys to select (highlight) **2. Smart Calibration**, and then press the **ENTER** key.




The display will change to show the **Scale 1 – Smart Calibration** screen.

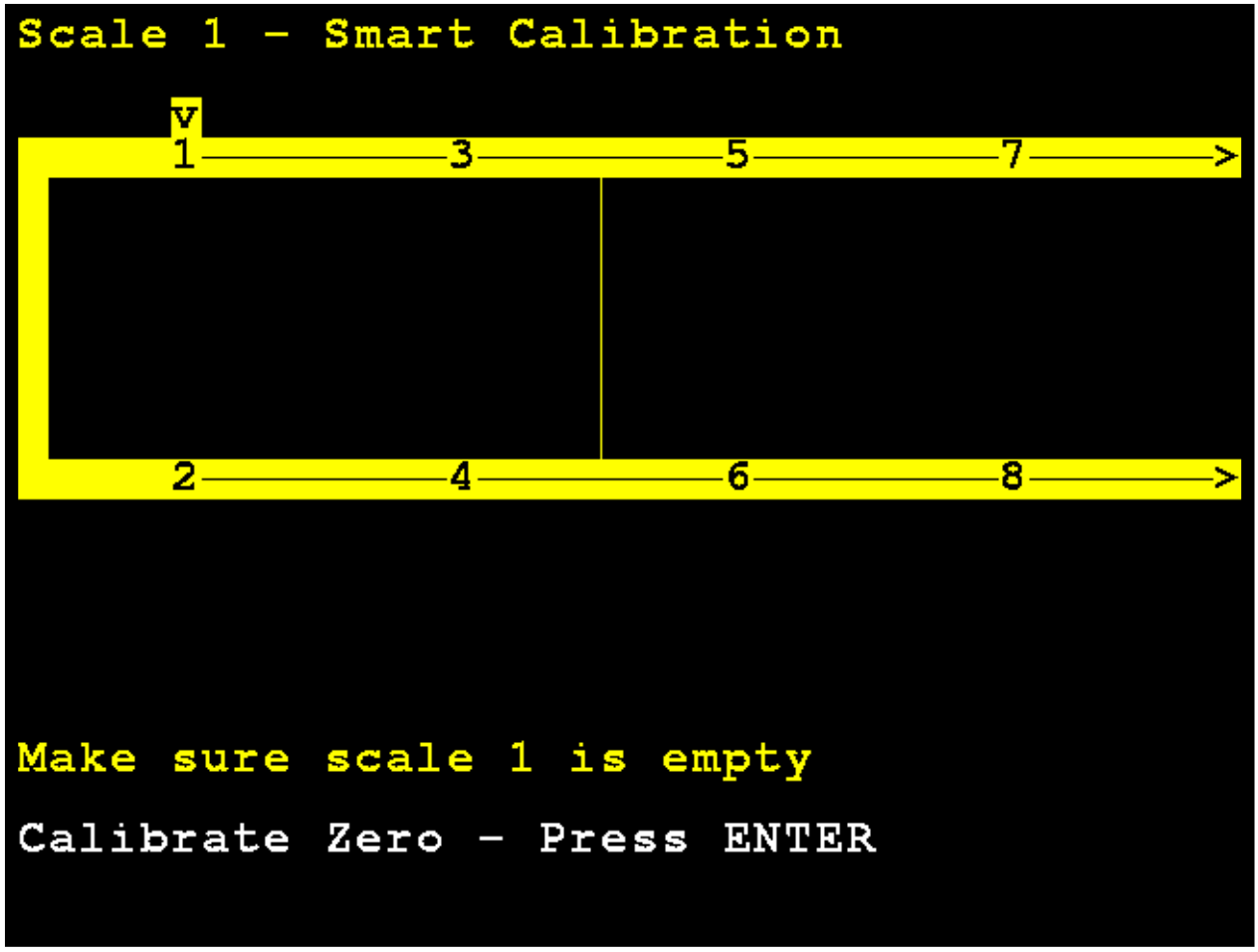
## Smart Calibration, Cont.

With the **`Scale 1 – Smart Calibration`** screen displayed, enter the weight value of the test weight to be used.



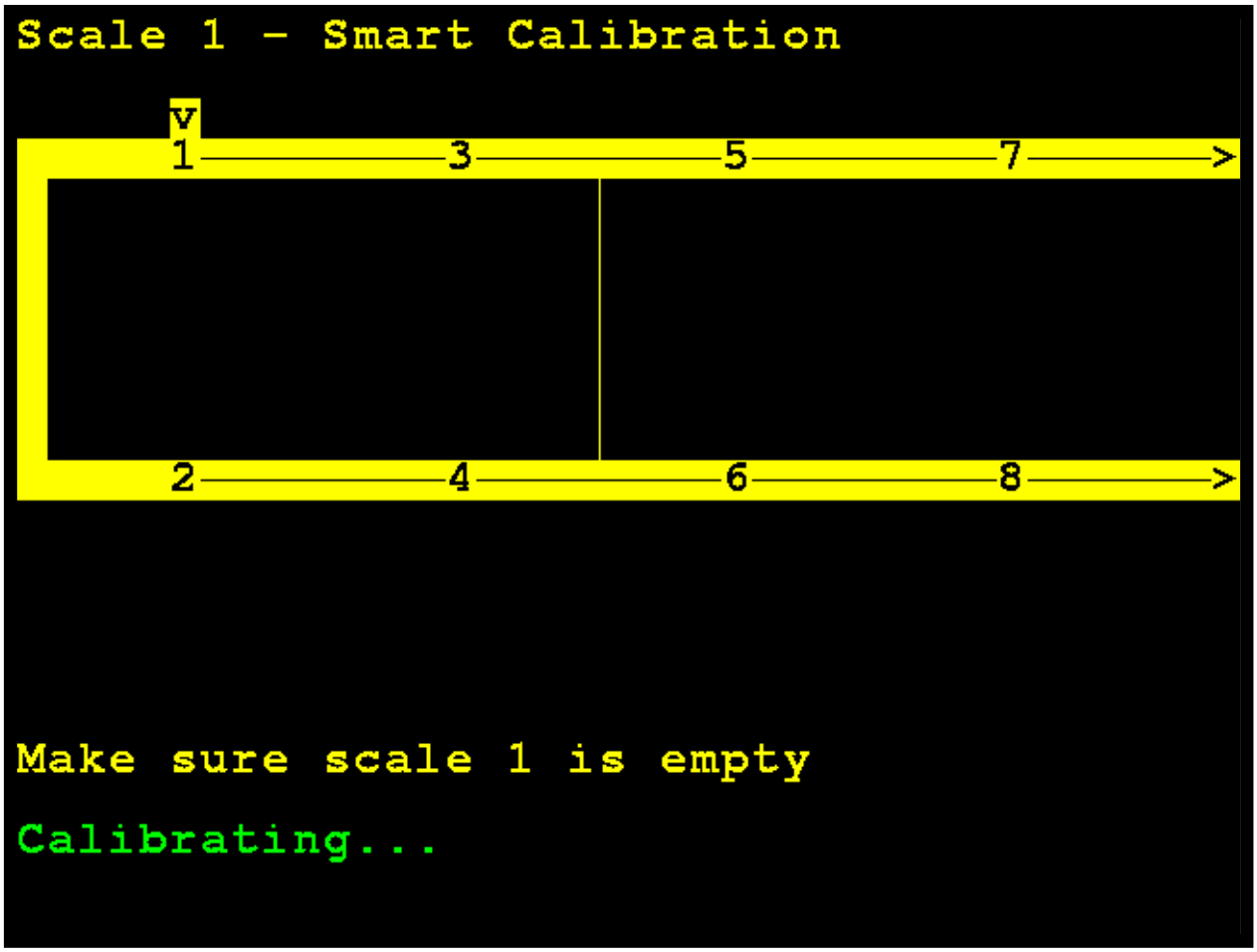
## Smart Calibration, Cont.

With an empty scale, press **ENTER**. This will capture the calibrated dead load weight of the scale.



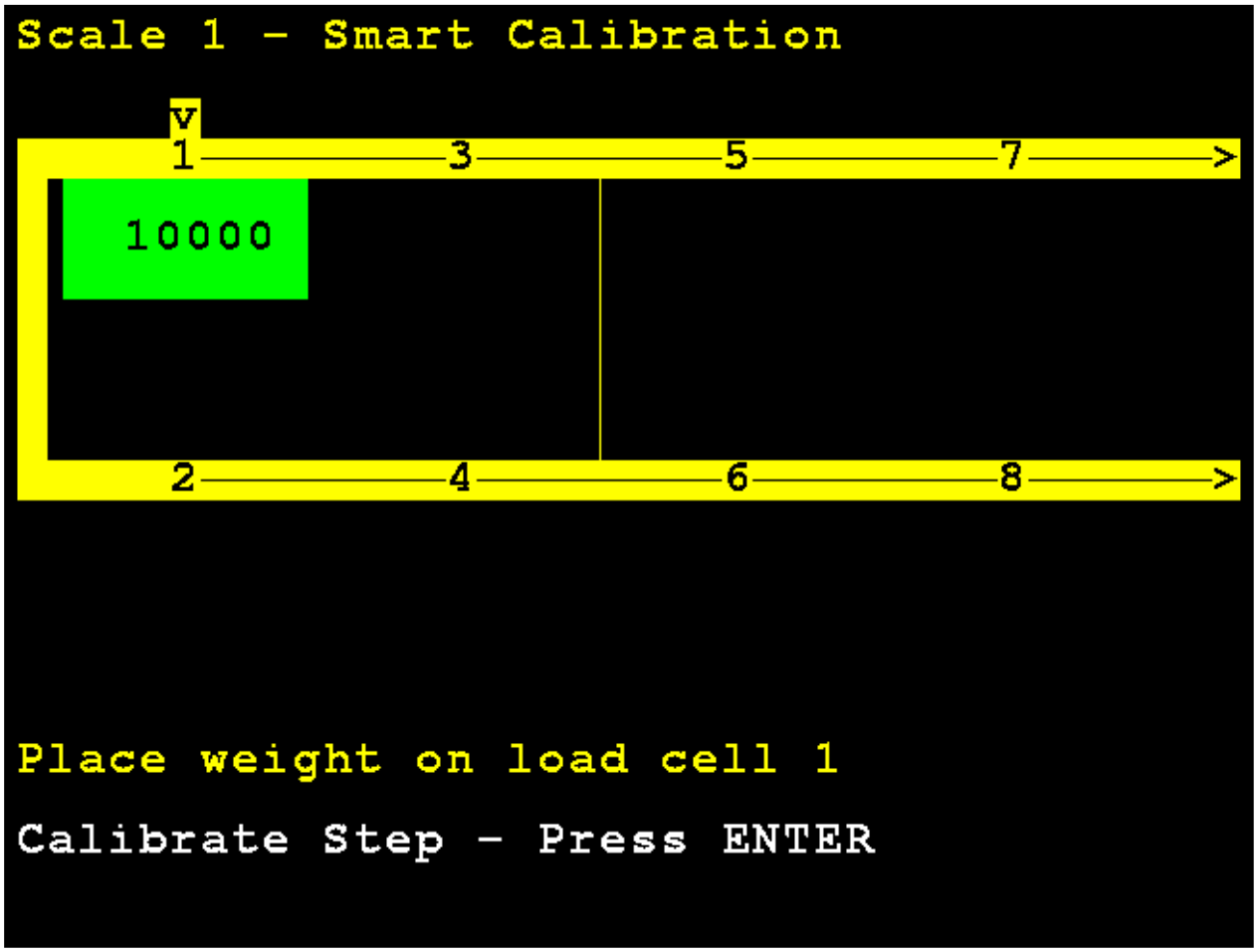
## Smart Calibration, Cont.

The 825D display will change to show that it is calibrating.



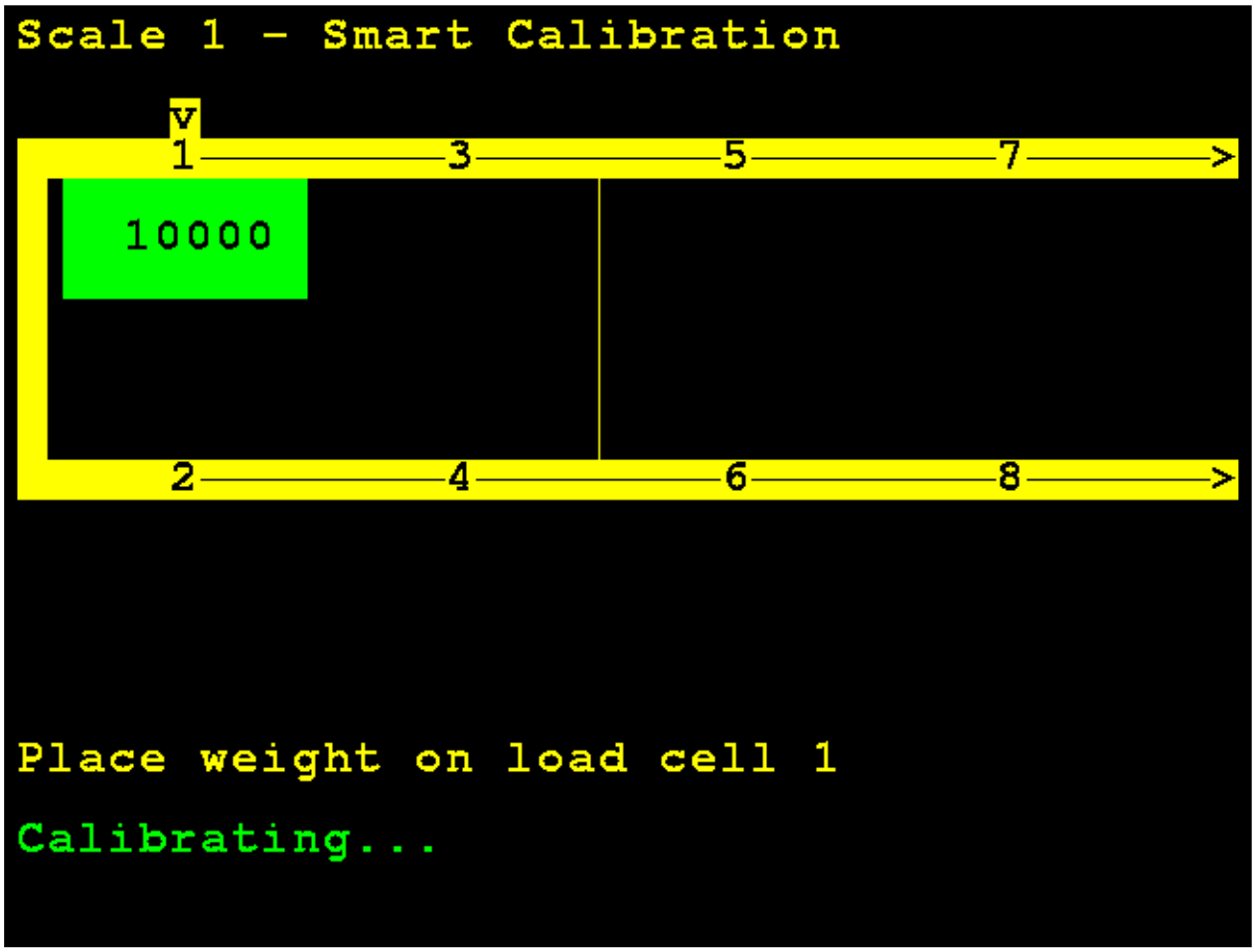
## Smart Calibration, Cont.

Center the weight over load cell 1, and press **ENTER**.



## Smart Calibration, Cont.

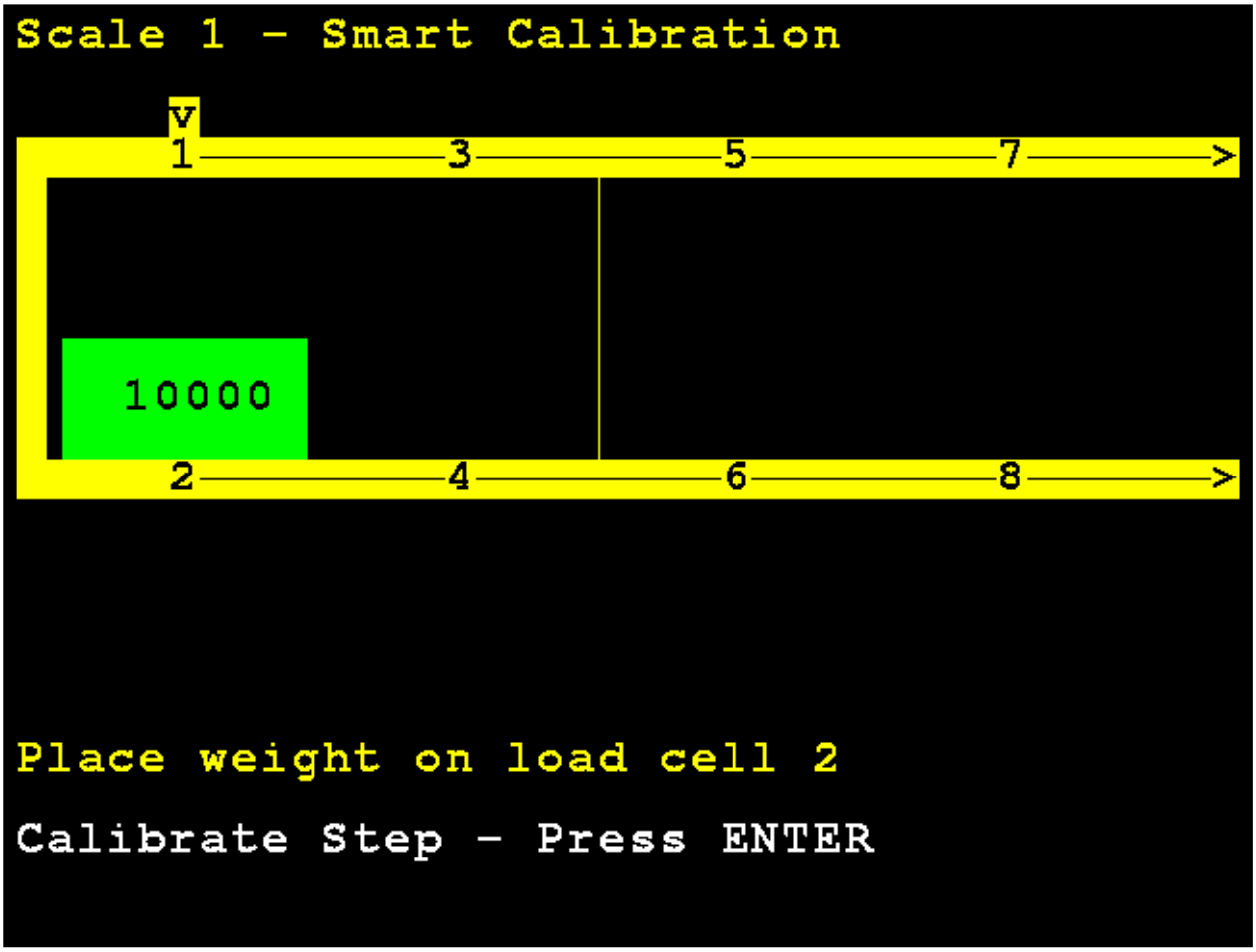
The 825D display will change to show that it is calibrating the weight on load cell 1.



## Smart Calibration, Cont.

Move the test weight and center it over load cell 2, and press **ENTER**.

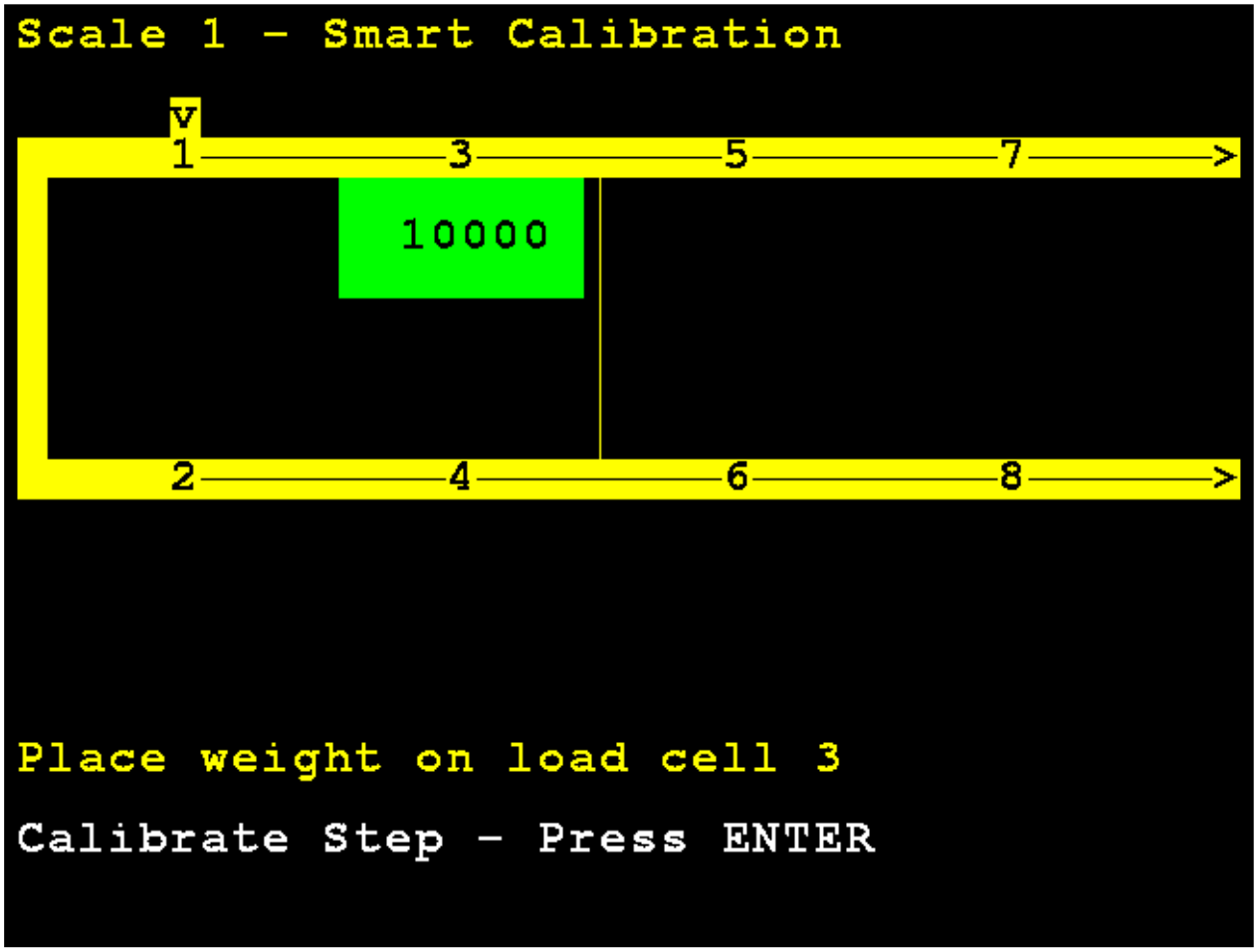
The 825D display will change to show that it is calibrating the weight on load cell 2.



## Smart Calibration, Cont.

Move the test weight and center it over load cell 3, and press **ENTER**.

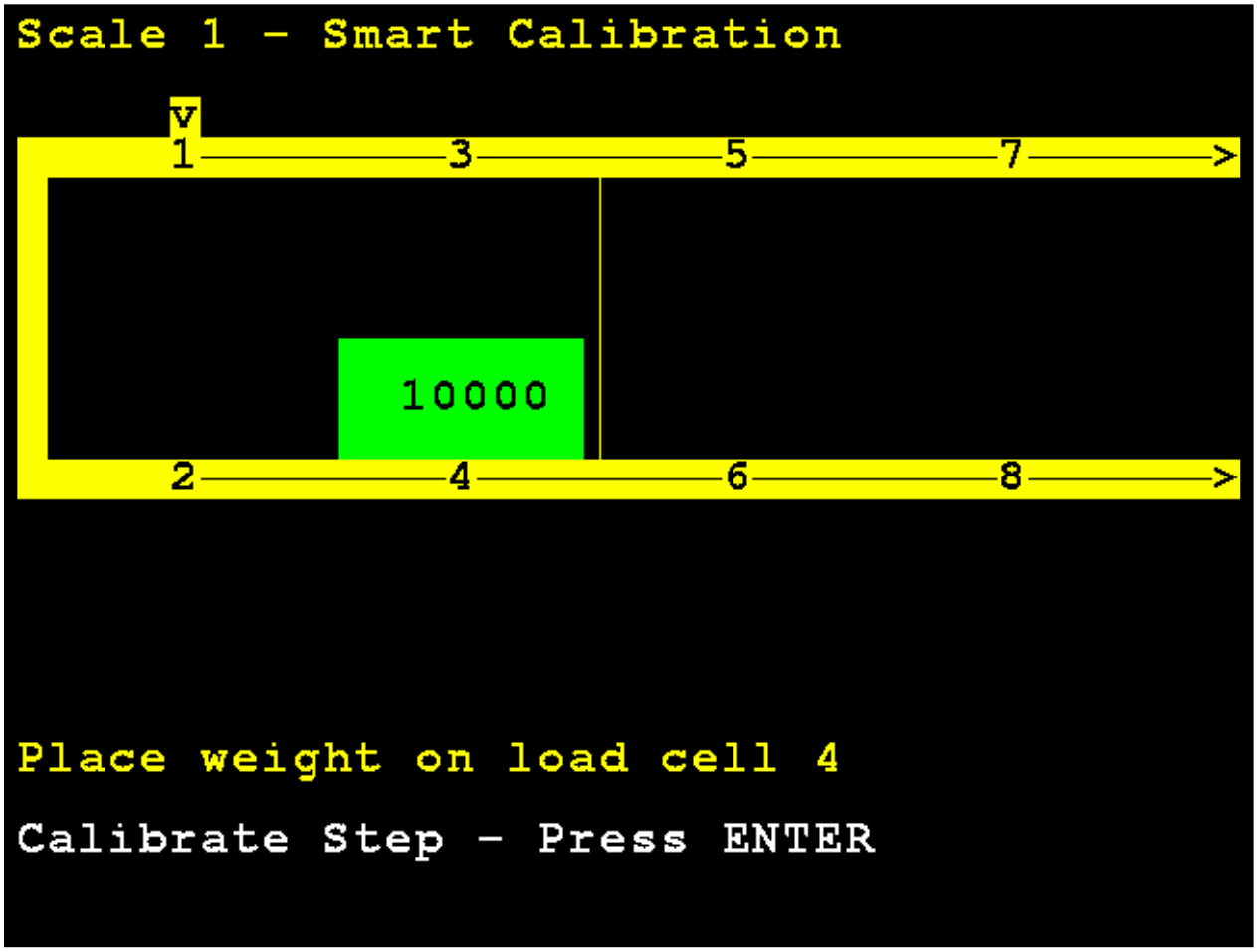
The 825D display will change to show that it is calibrating the weight on load cell 3.



## Smart Calibration, Cont.

Move the test weight and center it over load cell 4, and press **ENTER**.

The 825D display will change to show that it is calibrating the weight on the load cell.




If more than four cells and the number of cells is even a number (such as for an eight-cell scale), the calibration pattern will be the odd number cells, then the even number cells *in reverse* to facilitate easy weight cart movement:

1, 3, 5, 7, 8, 6, 4, 2

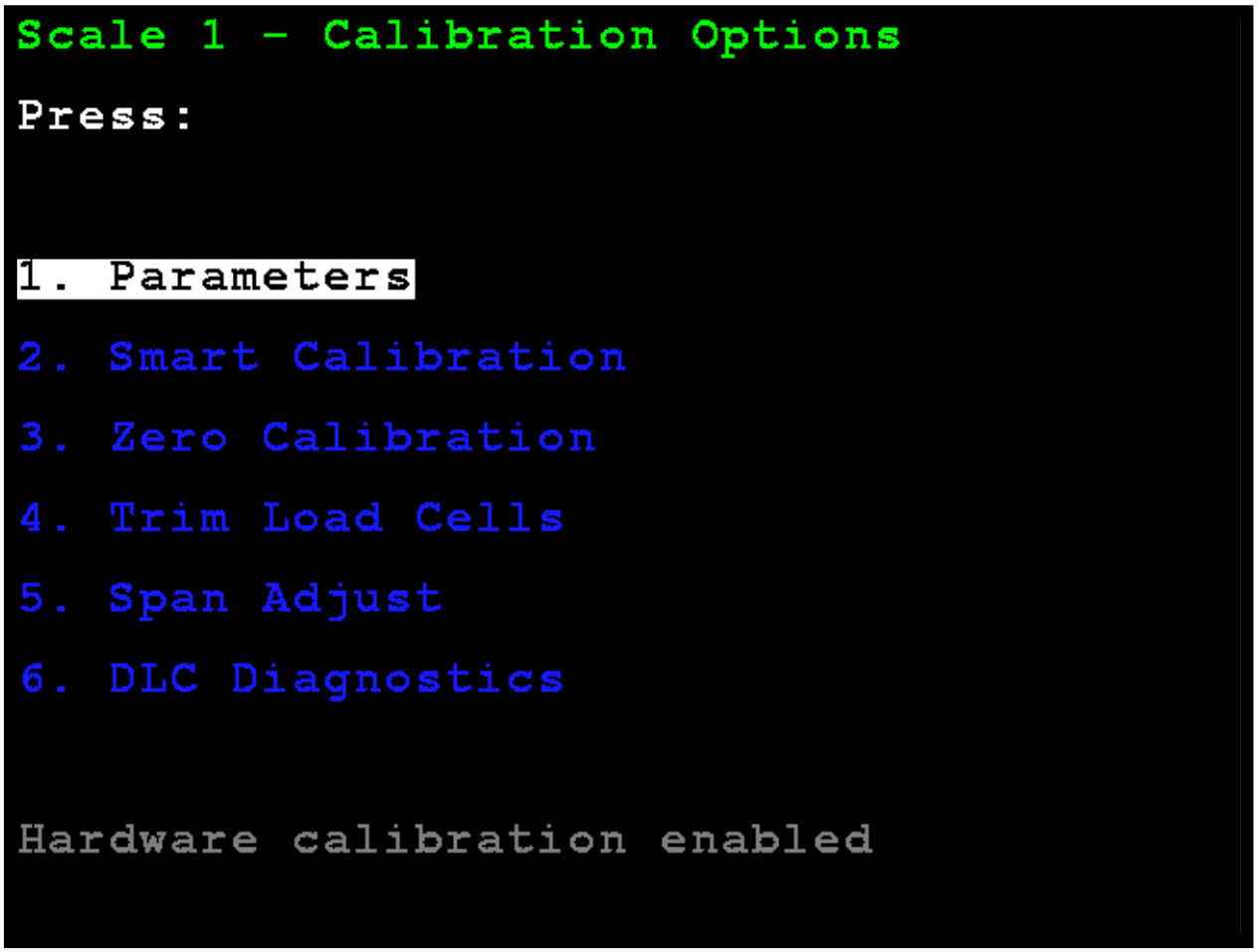
Otherwise, the calibration pattern will be sequential:

1, 2, 3, 4, 5, 6, 7, 8

## Zero Calibration

### 3. Zero Calibration

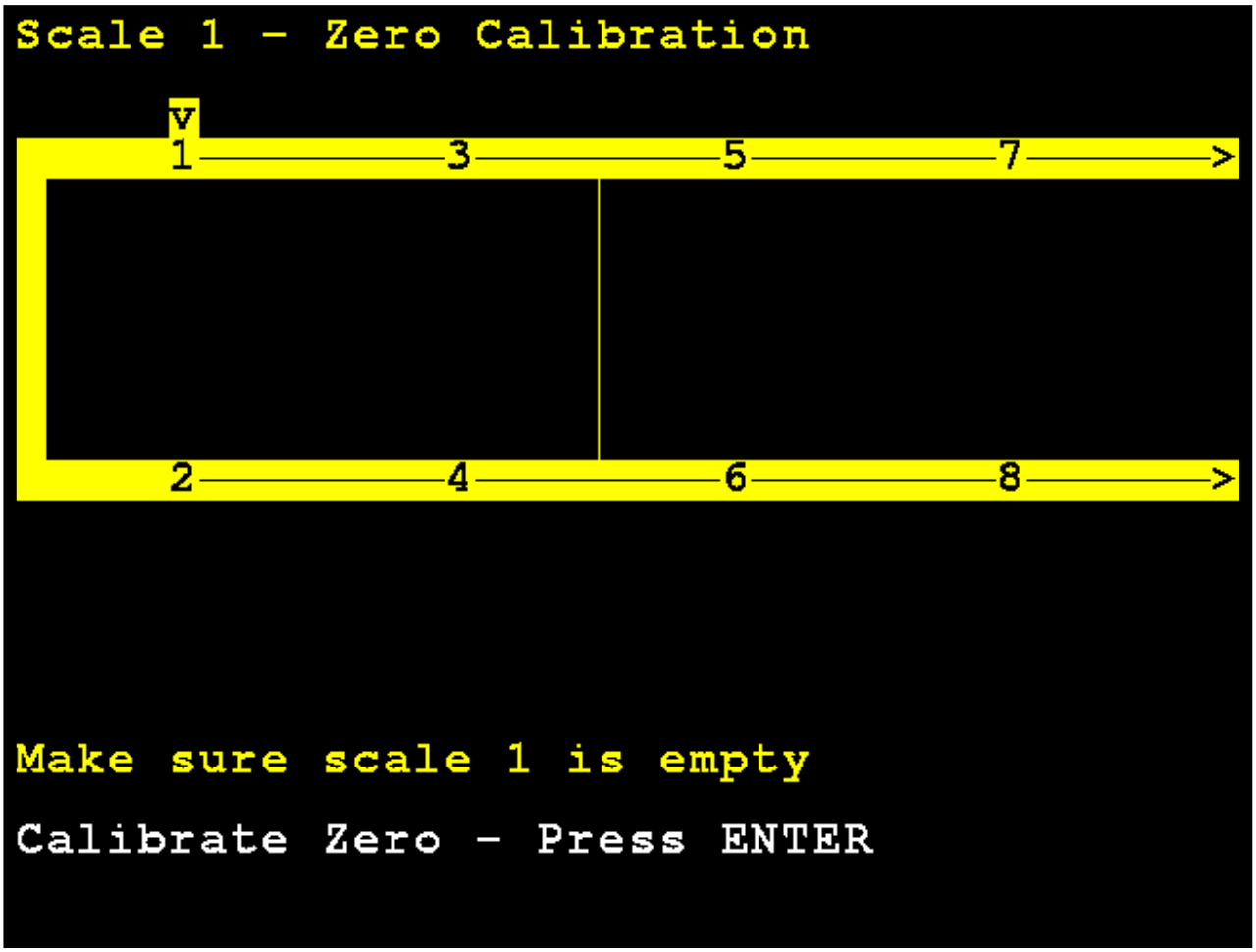
With the **Scale 1 – Calibration Options** screen displayed, press the **3** key, or use the Navigation Keys to select (highlight) **3. Zero Calibration**, and then press the **ENTER** key.




The display will change to show the **Scale 1 – Zero Calibration** screen.

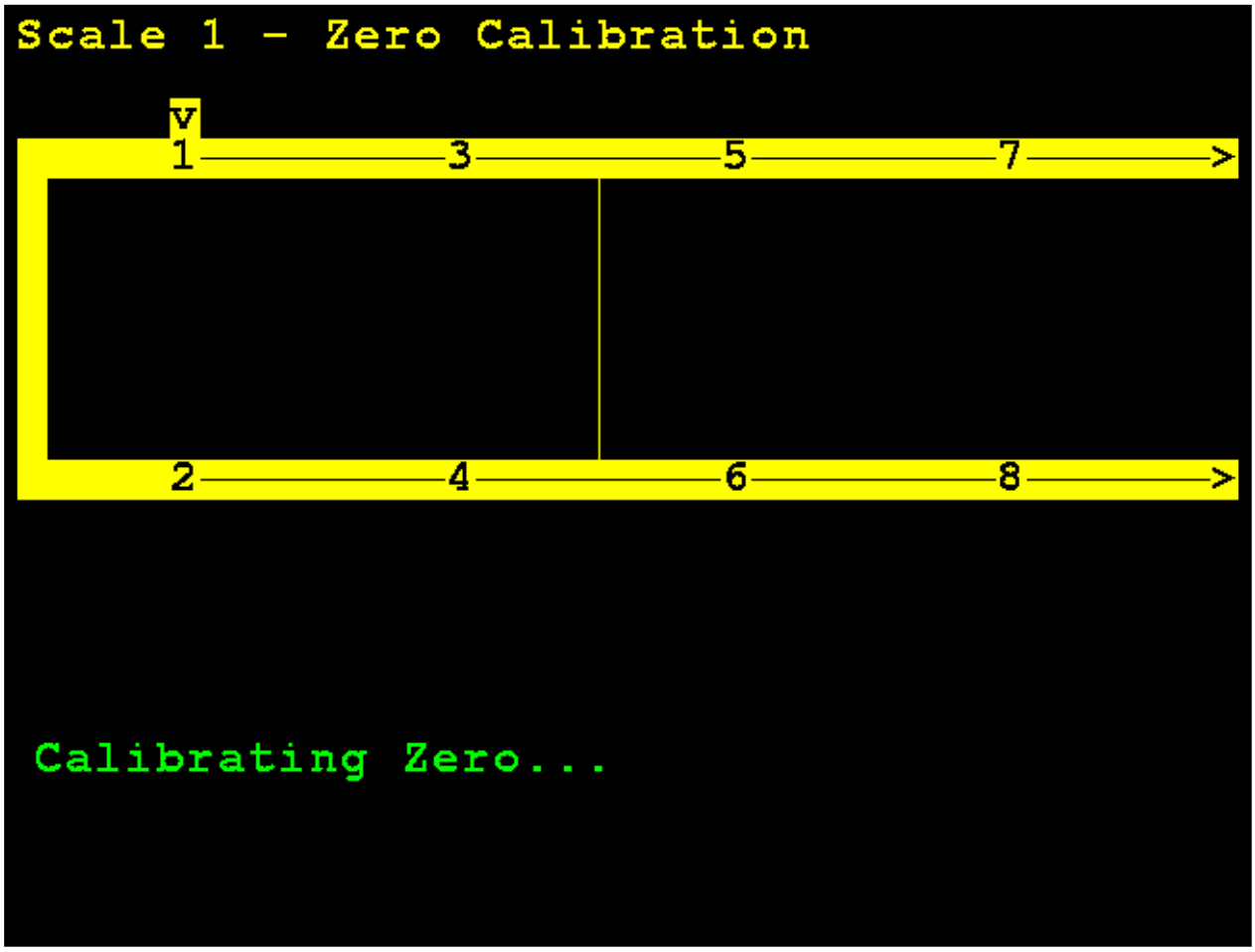
## Zero Calibration, Cont.

With an empty scale, press **ENTER**. Zero Calibration does not affect the trimming of the cells or affect span; it simply sets the dead load weight of the scale.



## Zero Calibration, Cont.

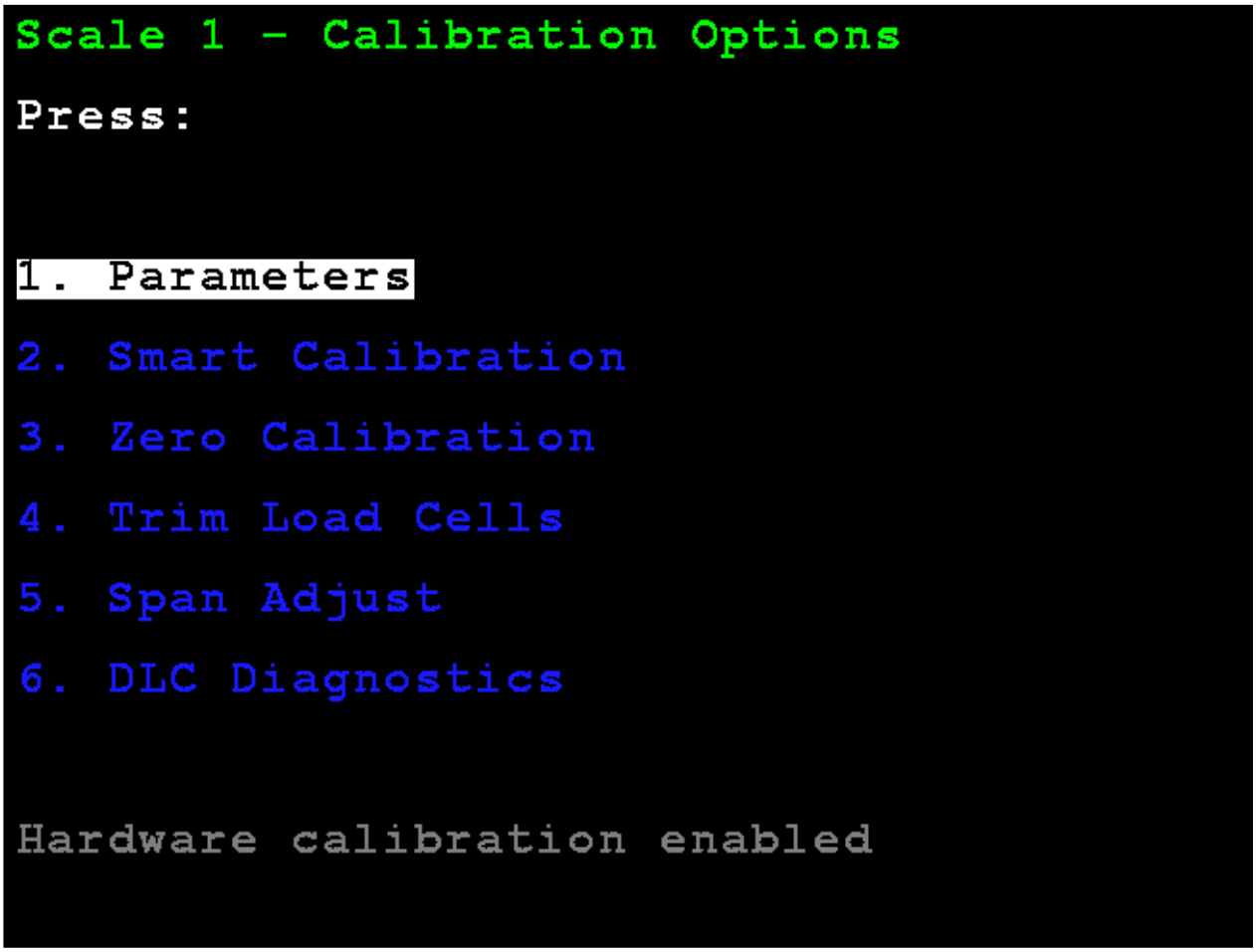
The 825D display will change to show that it is calibrating zero.



## Trim Cells

### 4. Trim Load Cells

With the **Scale 1 – Calibration Options** screen displayed, press the **3** key, or use the Navigation Keys to select (highlight) **4. Trim Load Cells**, and then press the **ENTER** key.




The display will change to show the **Scale 1 – Trim Cells** screen.

## Trim Cells, Cont.

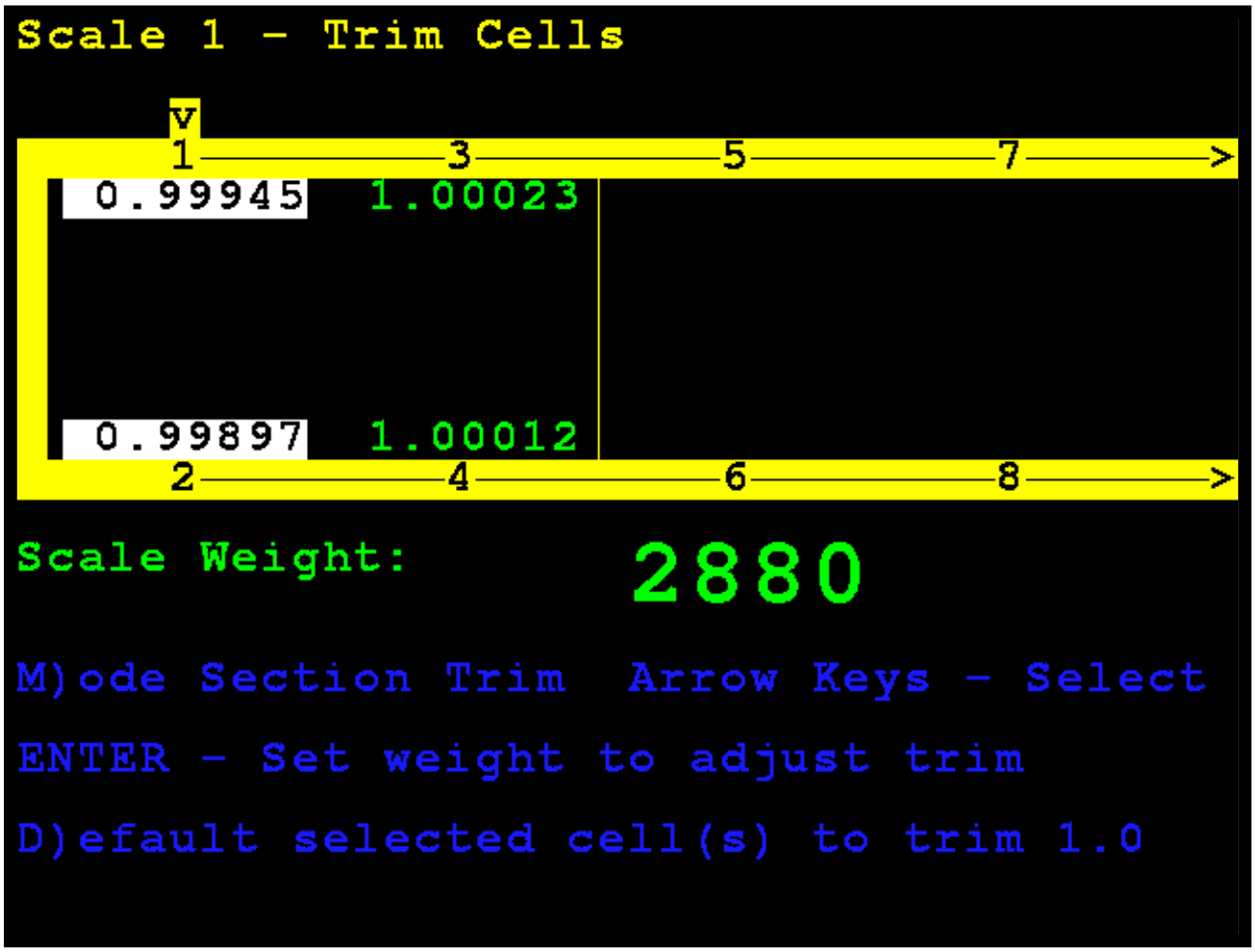
### Section Trim Mode

Individual cells or a section (pairs of cells) may be trimmed. This requires a test load weight.

**M)ode** – Press the **M** key to toggle between Section or Single Cell trim. *Default is Section*.

Use the Navigation Keys to select (highlight) the section to trim.

With the desired section selected, enter the Trim Value, and press the **ENTER** key to set the weight to adjust trim.

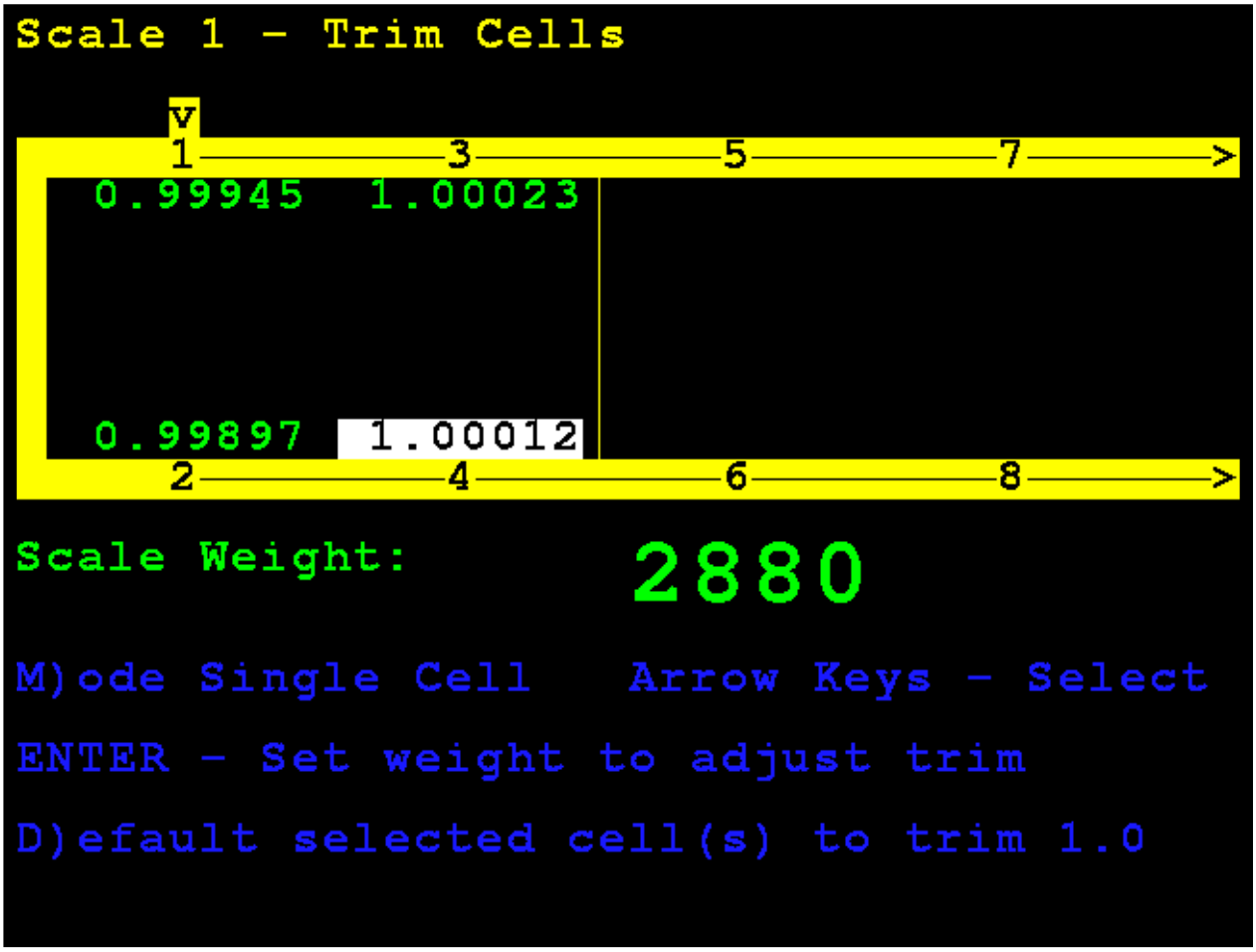


## Trim Cells, Cont.

### Single Cell Mode

Press the **M** key to select Single Cell trim.

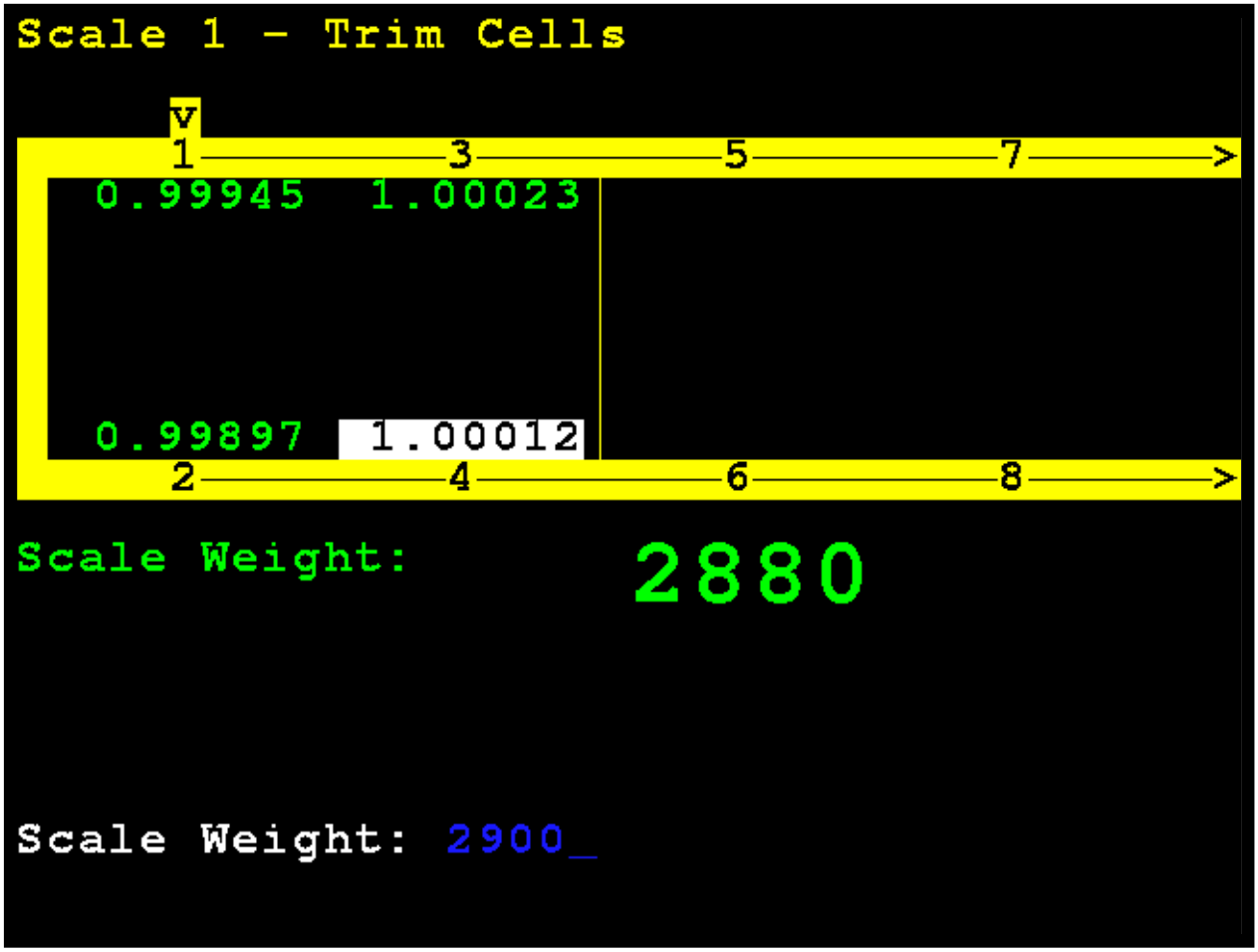
Use the Navigation Keys to select (highlight) the cell to trim.



## Trim Cells, Cont.

### Single Cell Mode, Cont.

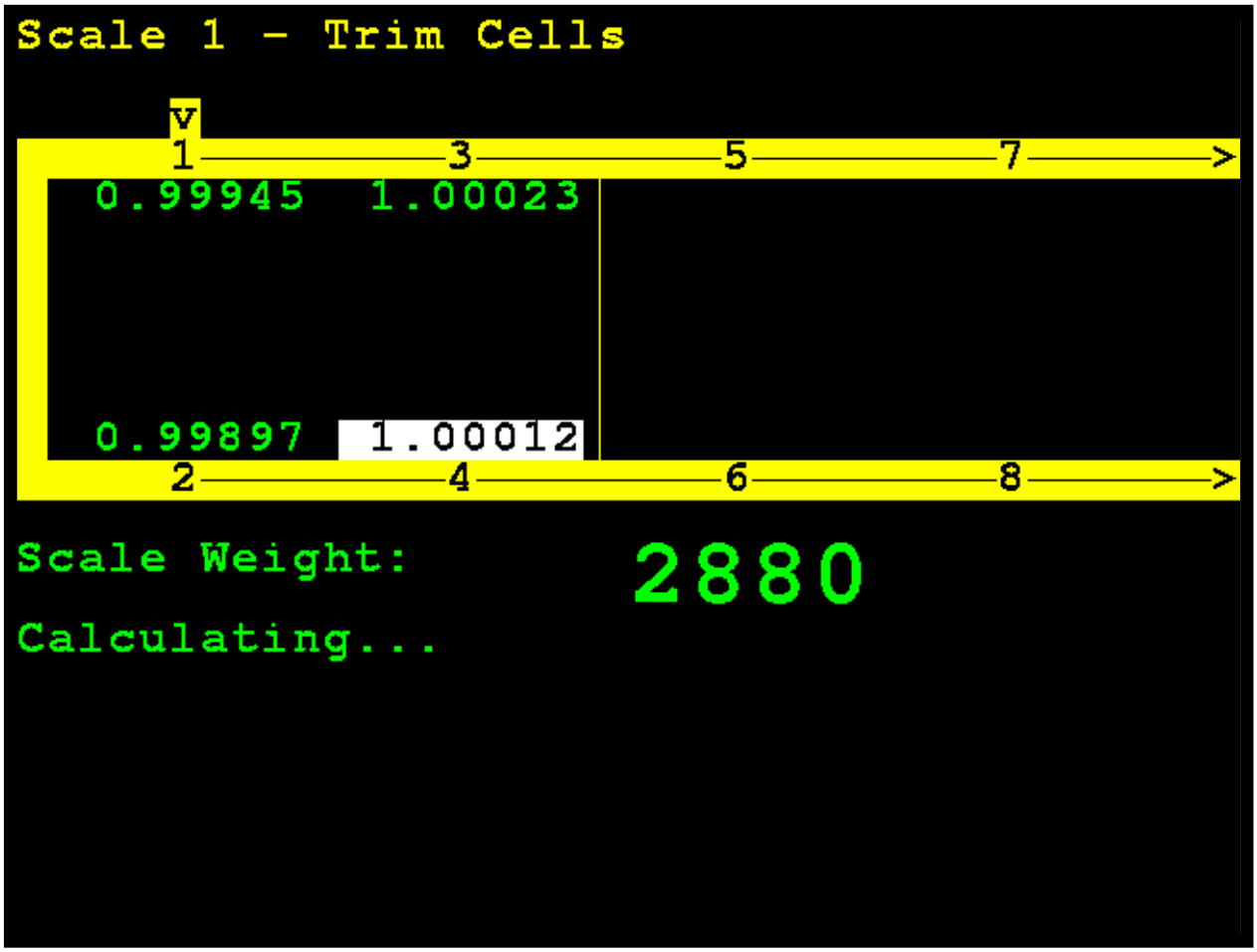
With the desired cell selected, enter the Trim Value, and press the **ENTER** key to set the weight to adjust trim.



## Trim Cells, Cont.

### Single Cell Mode, Cont.

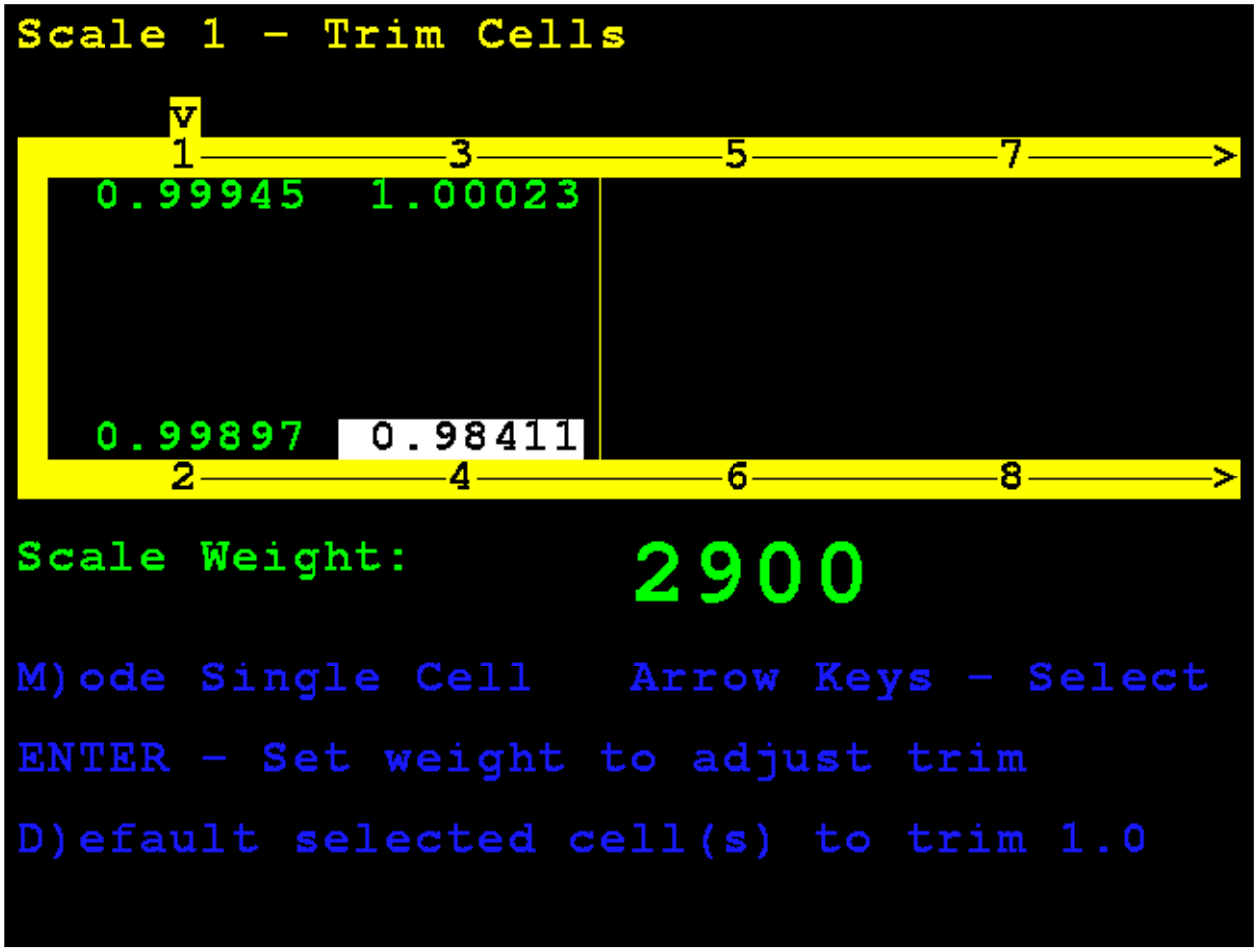
The 825D will automatically trim the cell to match the entered weight.



## Trim Cells, Cont.

### Single Cell Mode, Cont.

**NOTE:** If in the Single Cell mode, manually enter a trim value by pressing the **FUNCT** key, then press the (•) period key. This can be used to enter a slight adjustment, such as changing 0.98411 to 0.98421.

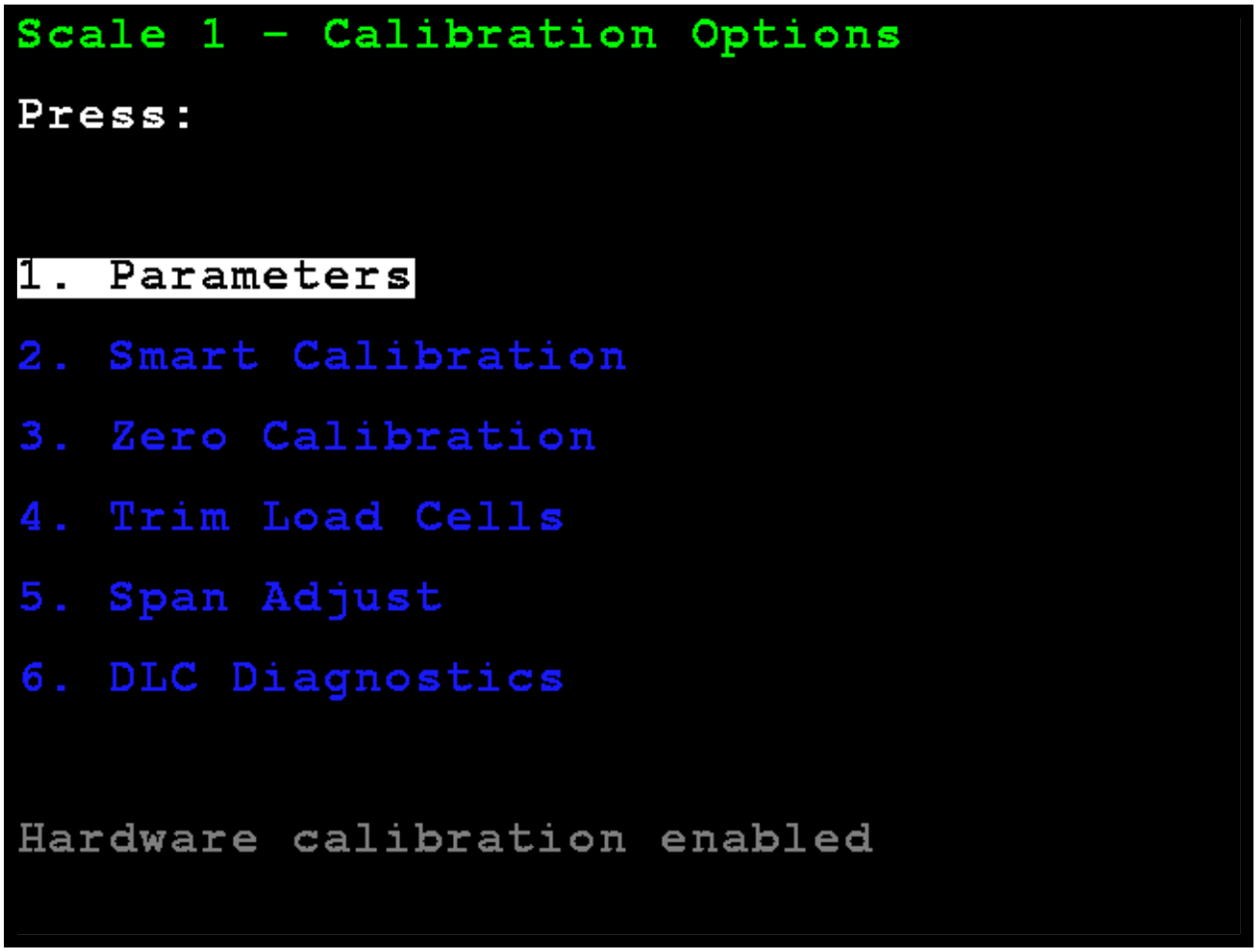



When finished, press, and release the **SHIFT** key, then press the **ESC/←—** key to exit.

## Span Adjust

### 5. Span Adjust

With the **Scale 1 – Calibration Options** screen displayed, press the **3** key, or use the Navigation Keys to select (highlight) **5. Span Adjust**, and then press the **ENTER** key.




The display will change to show the **Scale 1 – Span Adjust** screen.

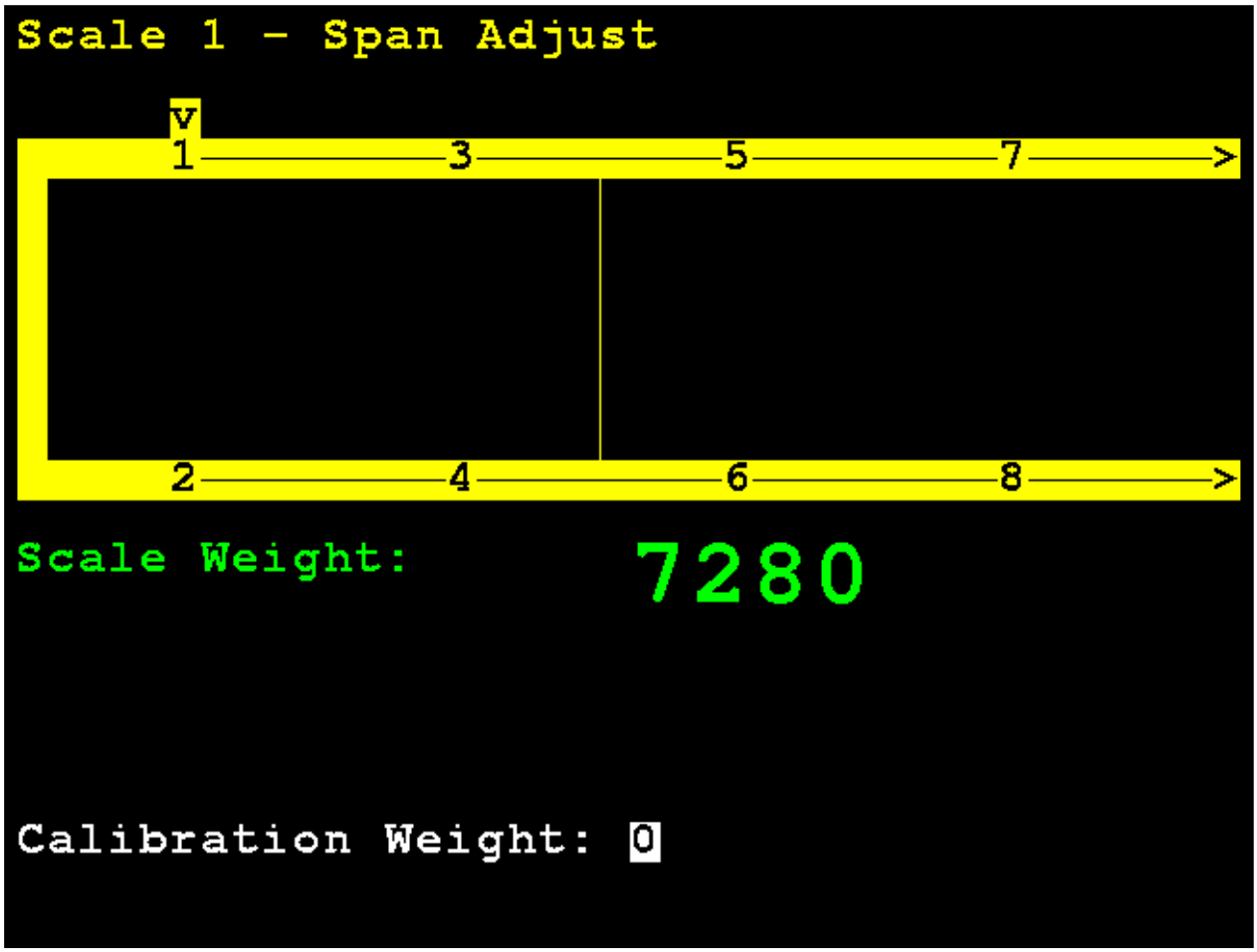
## Span Adjust

Span adjust allows you to tweak the span of the entire scale at once.

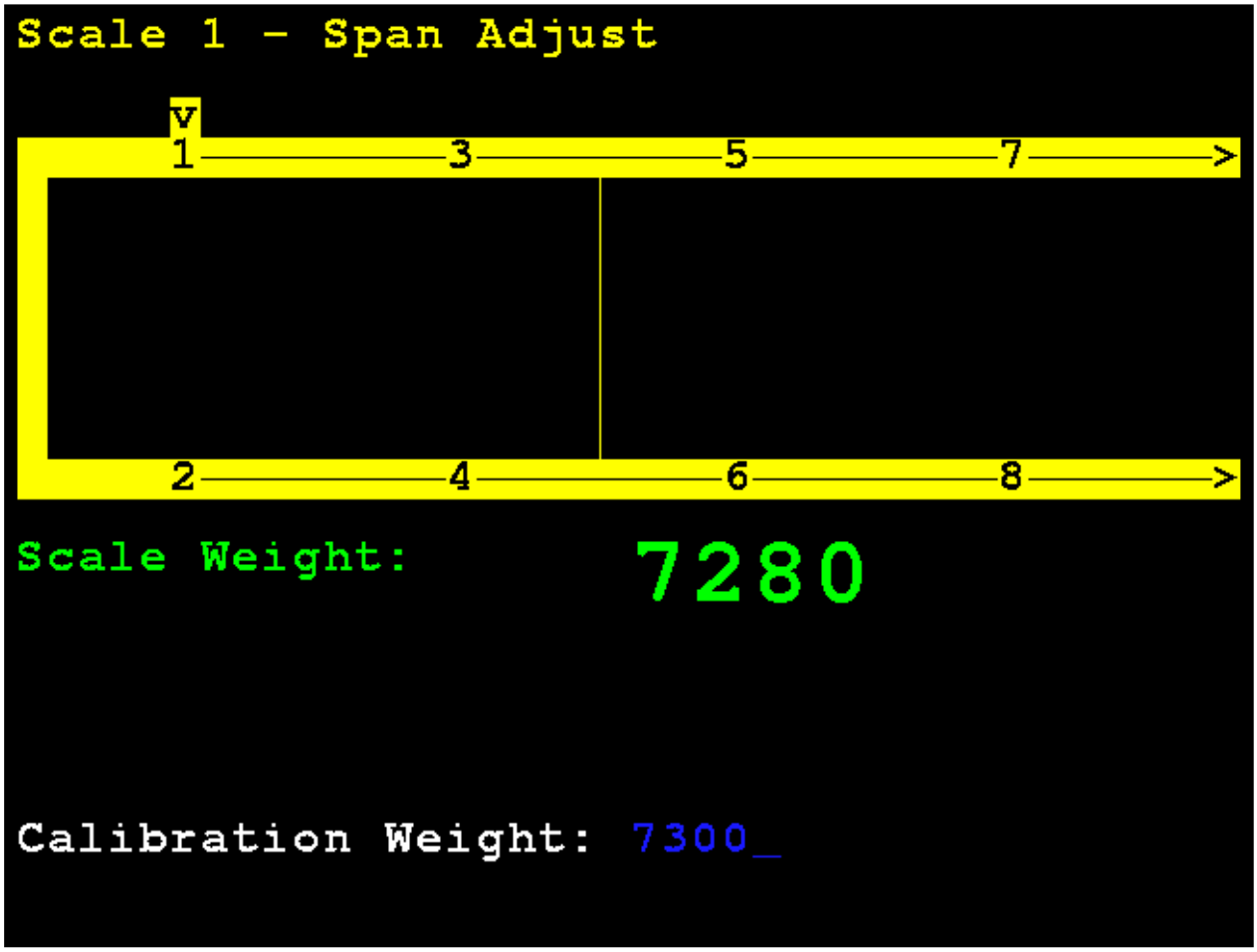
The 825D will display the current live scale weight.

Place the test weight at any location on the scale.

Enter the value of the test weight and press the **ENTER** key.



## Span Adjust



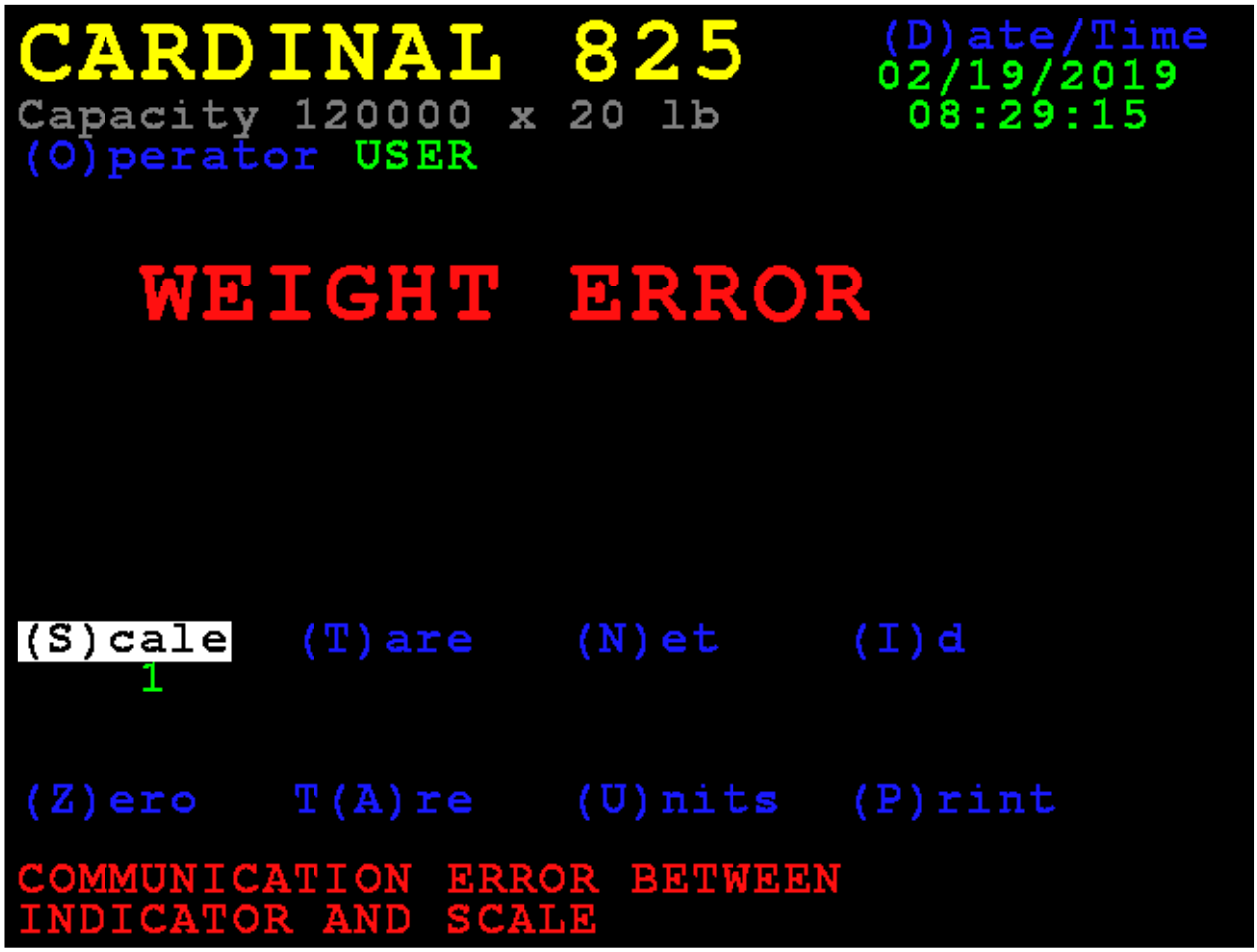

After a brief delay, the span will be adjusted (trim will be adjusted for all cells of the scale) and the 825D display will return to the **`Scale 1 - Calibration Options`** screen.

# 825D DIGITAL SCALE DIAGNOSTICS

## On Screen Diagnostics

The On Screen Diagnostics messages are critical errors that alert the operator from the main screen of setup issues or hardware problems. These messages will be shown to the operator on the main weight screen in real-time when the error happens.

### COMMUNICATION ERROR BETWEEN INDICATOR AND SCALE



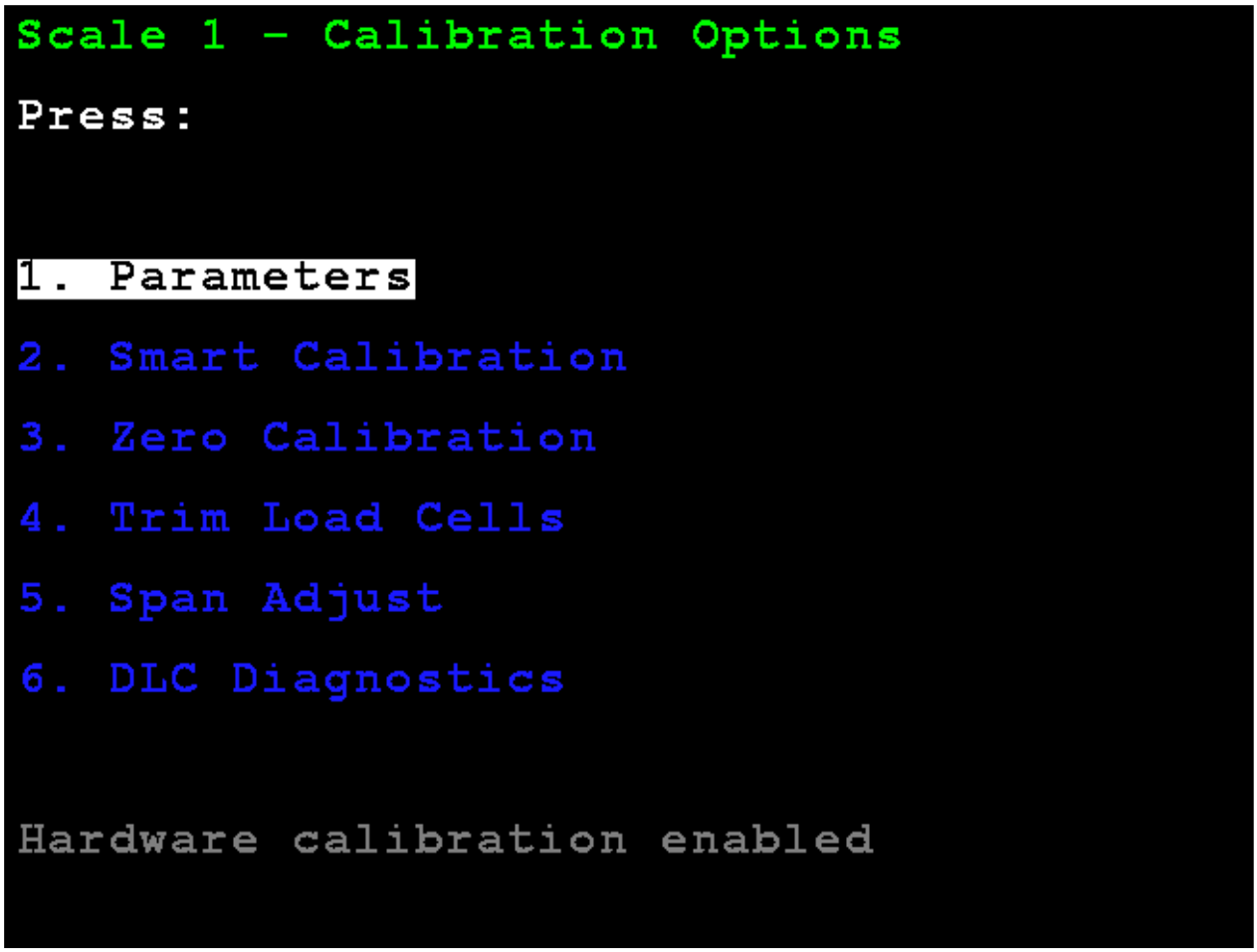

| Probable Cause | Items to Check |
|---|---|
| The homerun cable is damaged or disconnected. | • Check that cable is connected correctly.<br>• Check cable for damage.<br>• Use caution on the amount of insulation stripped for the connector. Center wires must be shorter than the center connector to avoid a short.<br>• Check connector for random strands of wire.<br>• Verify that connector is clear of debris. |

## Diagnostic Menu

The Diagnostic Menu is a set of diagnostic tools that give a technician more information about each load cell connection.

### 6. DLC Diagnostics

With the **Scale 1 – Calibration Options** screen displayed, press the **3** key, or use the Navigation Keys to select (highlight) **6. DLC Diagnostics**, and then press the **ENTER** key.

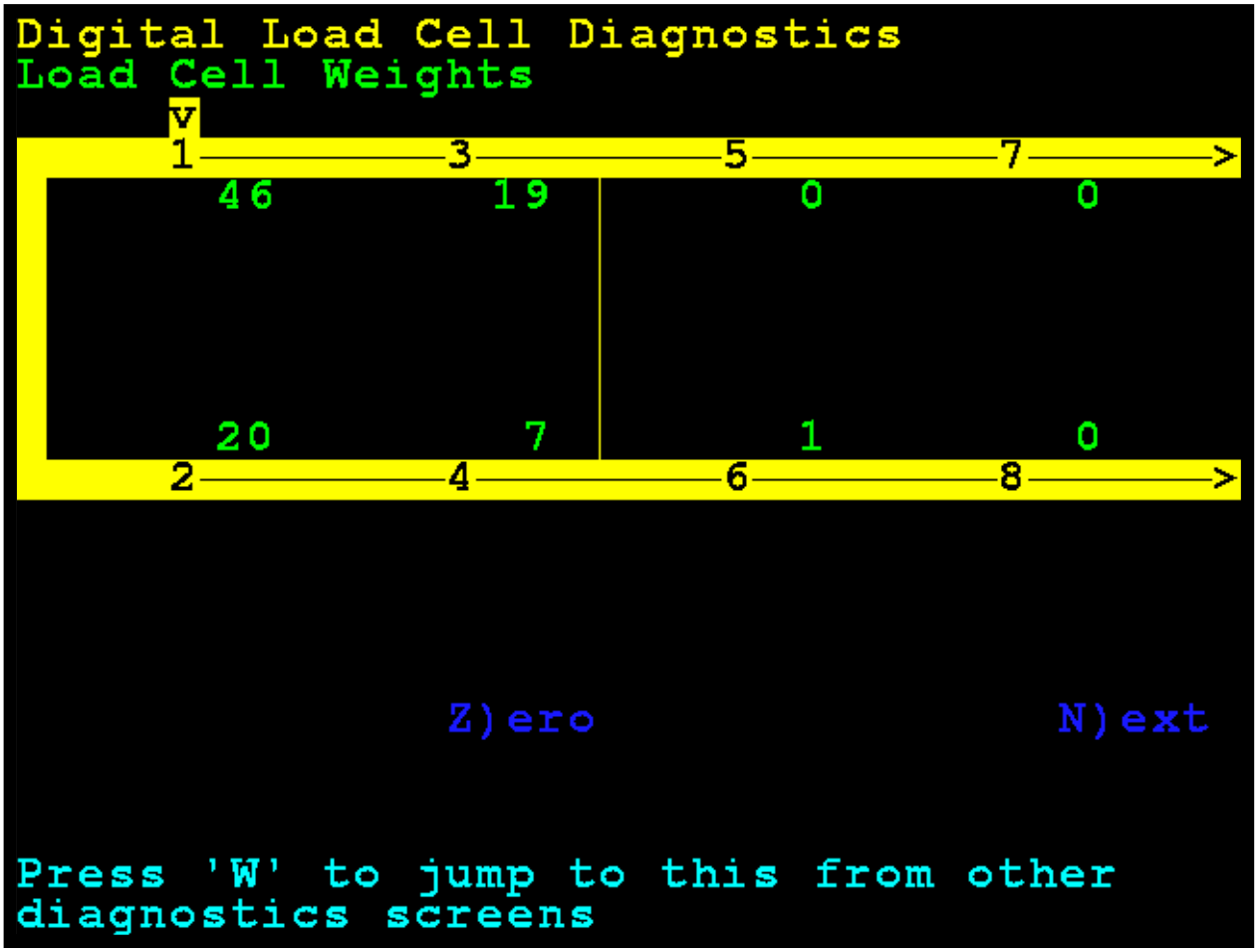



The display will change to show the **Digital Load Cell Diagnostics** screen.

**LIVE LOAD CELL WEIGHTS**

Use the Navigation Keys to scroll the display to show all cells.

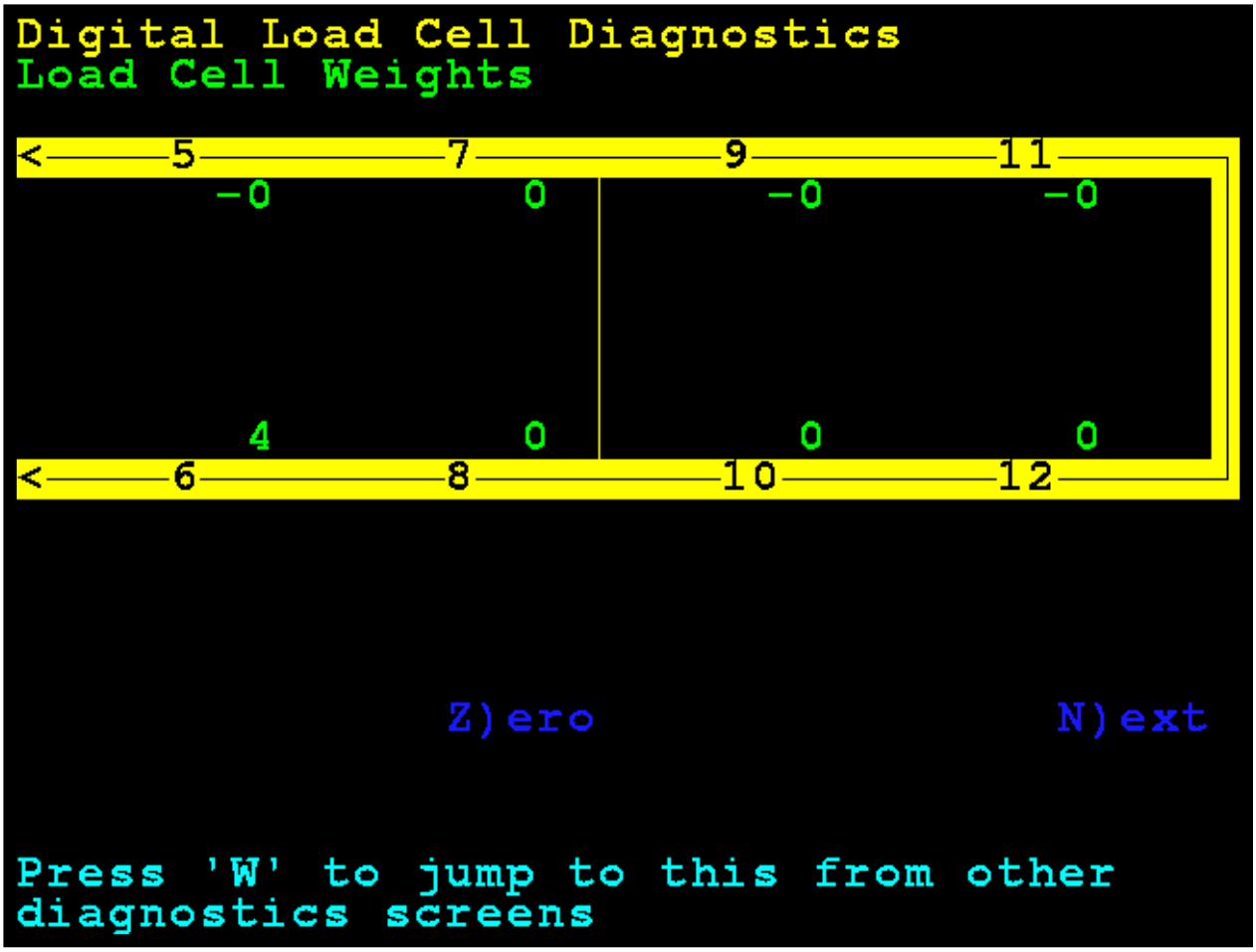
Press the **W** key to jump to the **`Load Cell Weights`** screen from the other diagnostic screens.



**ZERO LIVE LOAD CELL WEIGHTS**

The **Z** key (for Zero) may be used to zero the diagnostics display while in the diagnostics screen. It does not affect scale zero.
Use the Navigation Keys to scroll the display to show all cells.

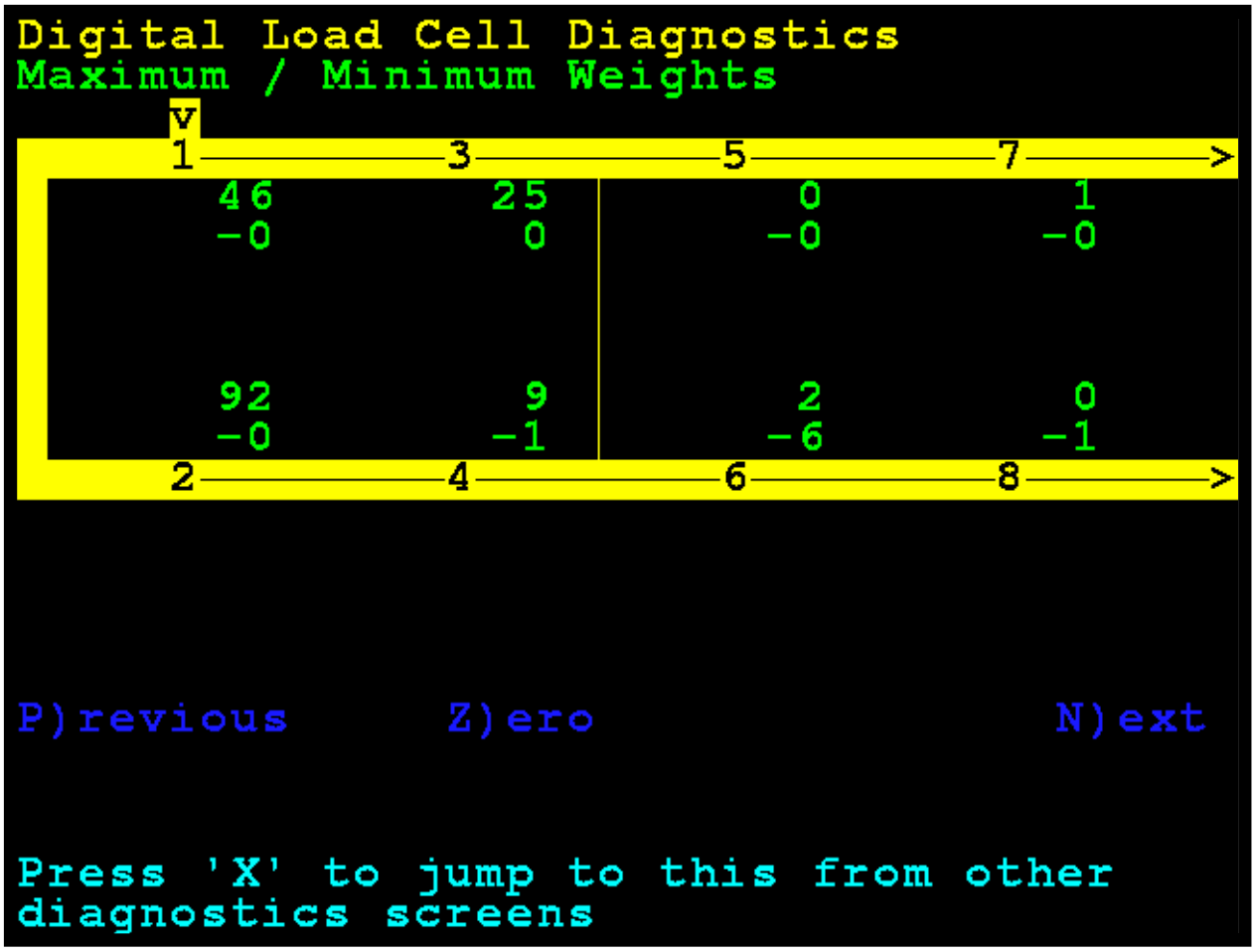
Press the **W** key to jump to the **`Load Cell Weights`** screen from the other diagnostic screens.



**MINIMUM AND MAXIMUM WEIGHTS**

Use the Navigation Keys to scroll the display to show all cells.

Press the **X** key to jump to the **Maximum / Minimum Weights** screen from the other diagnostic screens.

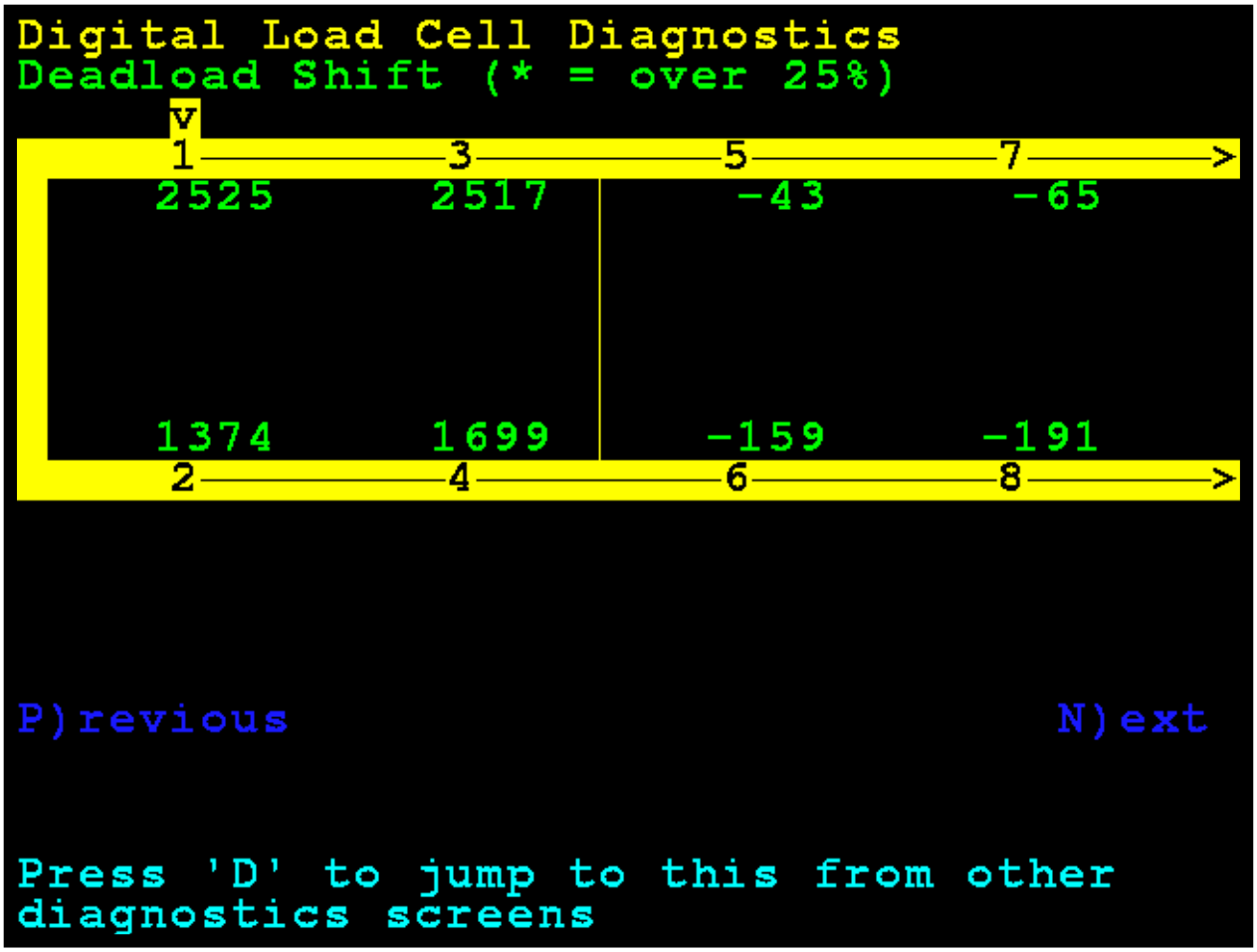


**DEADLOAD SHIFT**

This shows the live shift from the original calibrated deadload. An asterisk (∗) indicates that the deadload shift has been exceeded. The scale must be empty for this to be valid.

Use the Navigation Keys to scroll the display to show all cells.

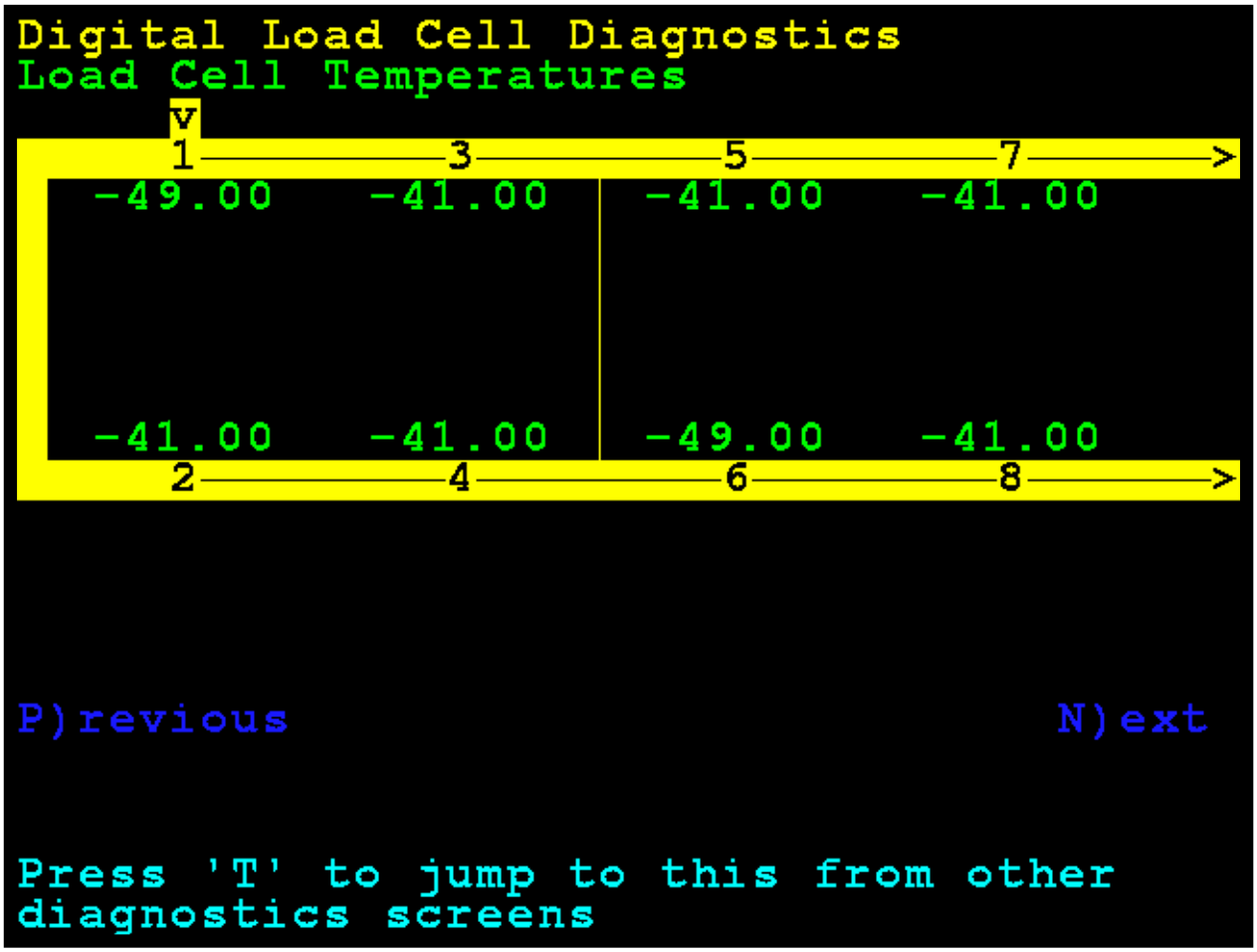
Press the **D** key to jump to the **`Deadload Shift`** screen from the other diagnostic screens.



**LOAD CELL TEMPERATURES**

This is the temperature of the SmartCAN Junction Box in Celsius.

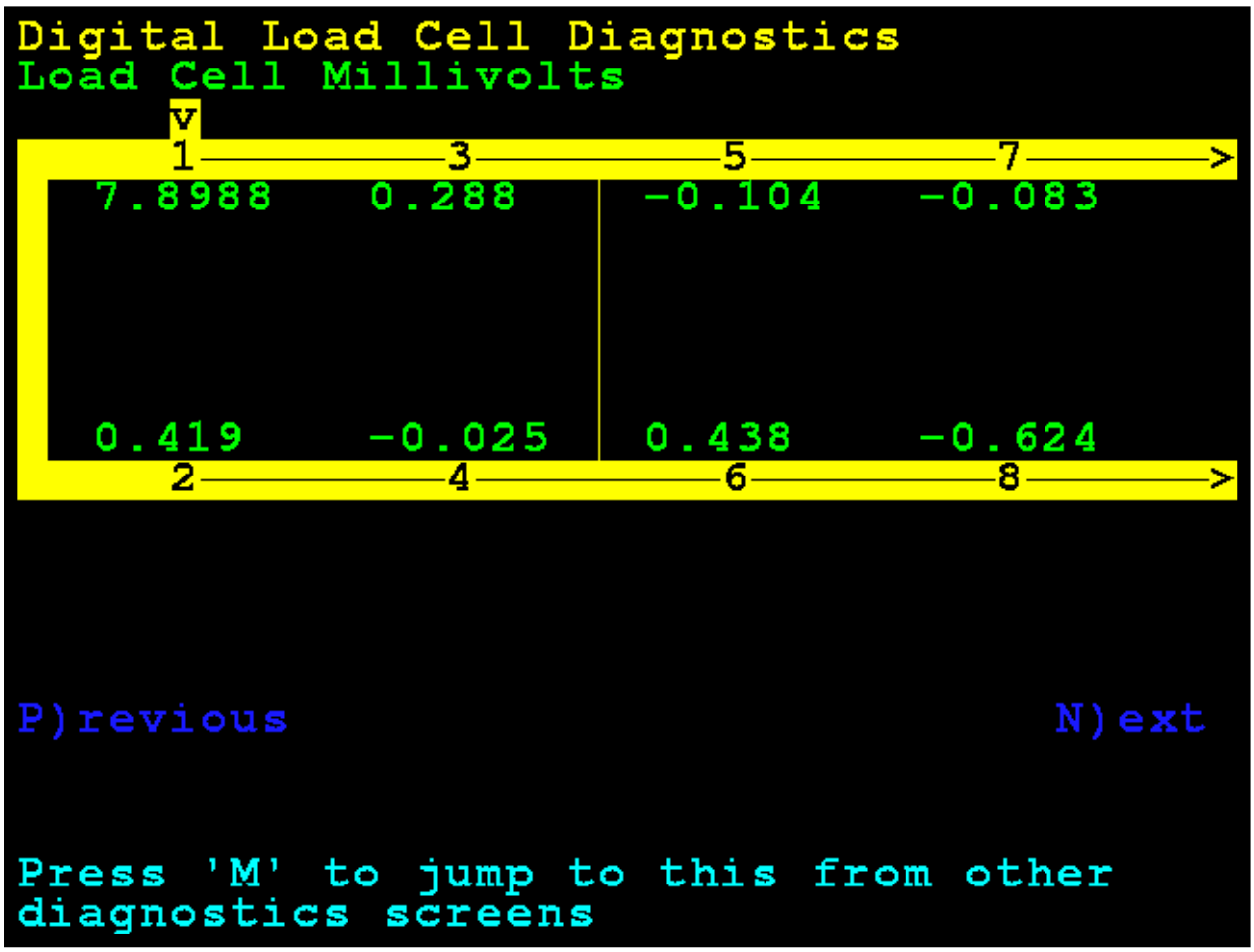
Press the **T** key to jump to the **`Load Cell Temperatures`** screen from the other diagnostic screens.



**LOAD CELL MILLIVOLTS**

Use the Navigation Keys to scroll the display to show all cells.

Press the **M** key to jump to the **`Load Cell Millivolts`** screen from the other diagnostic screens.

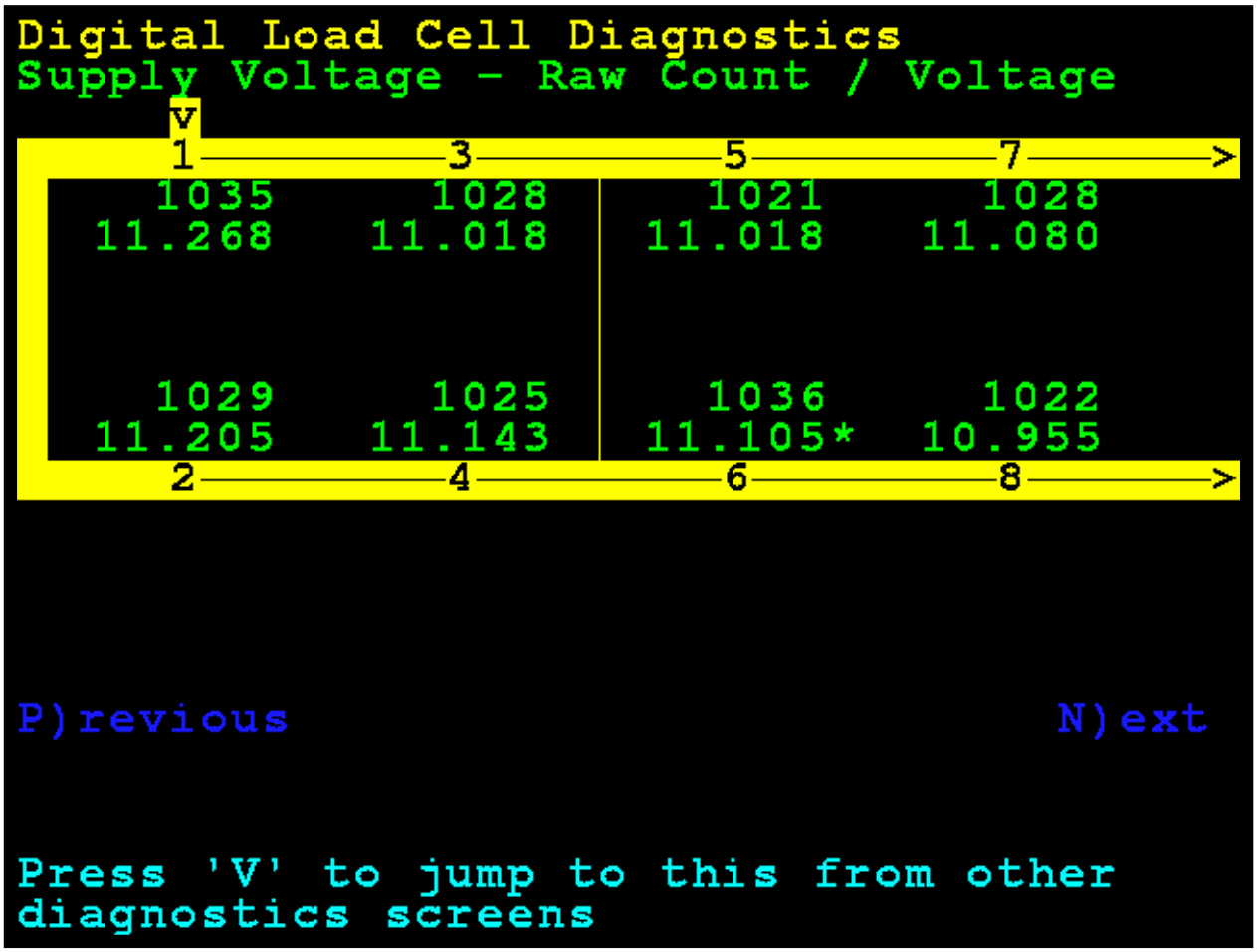


**SUPPLY VOLTAGE – RAW COUNT / VOLTAGE**

**NOTE:** An asterisk (∗) indicates voltage determination is approximated based on the raw count value.

Use the Navigation Keys to scroll the display to show all cells.

Press the **V** key to jump to the **Supply Voltage – Raw Count / Voltage** screen from the other diagnostic screens.



## Hardware Diagnostics

The 825-DLC (Digital Load cell Controller) option card has four LEDs for diagnostic purposes.

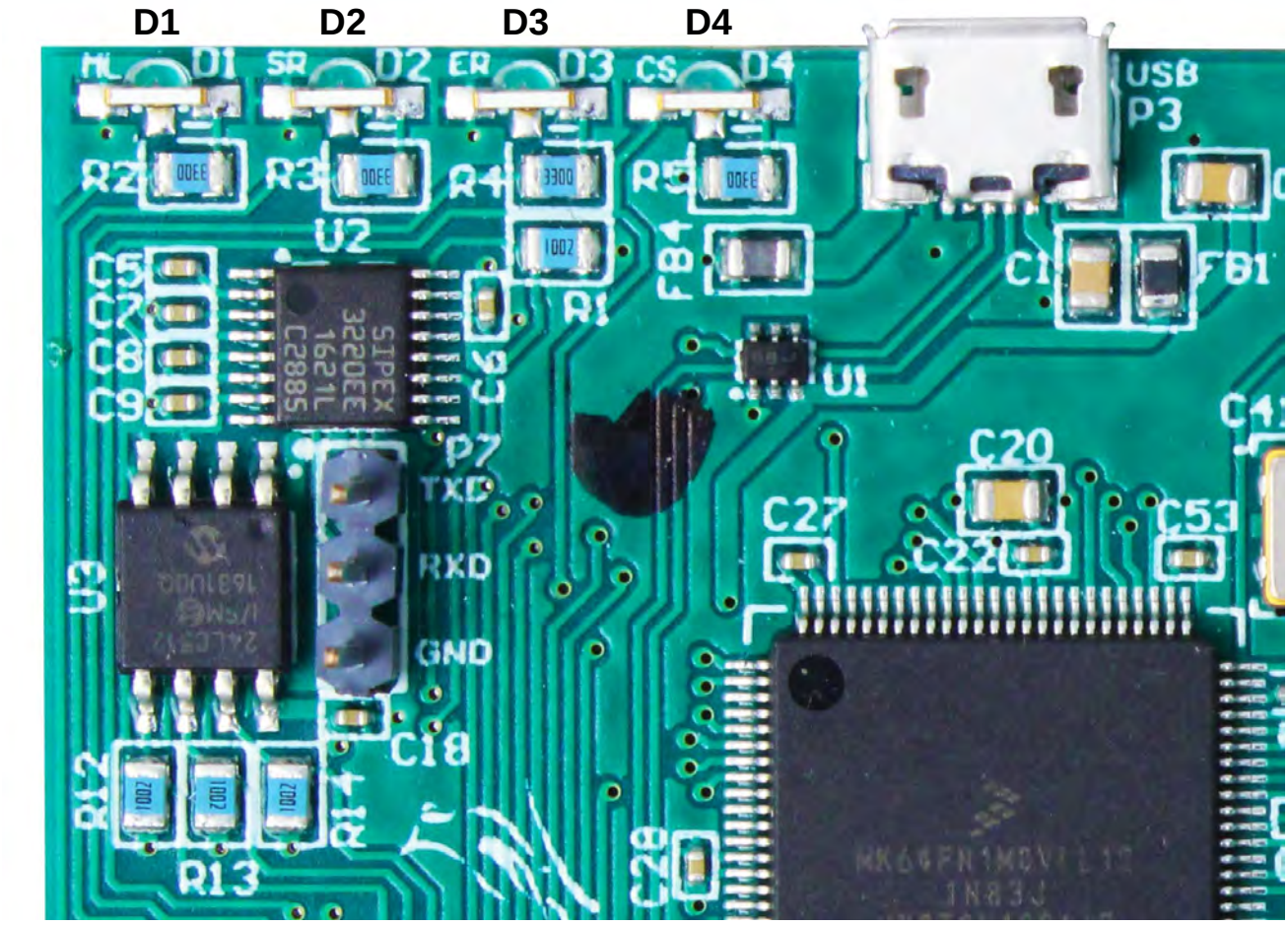



**Figure No. 46 – 825-DLC Diagnostics LEDs**

**D1** – Blinking = Indicates the 825-DLC card is communicating with the 825D main board.

**D2** – Blinking = Indicates the 825-DLC card is transmitting messages is to the SmartCAN controller.

**D3** – Blinking = Indicates the 825-DLC card is receiving responses from the SmartCAN controller.

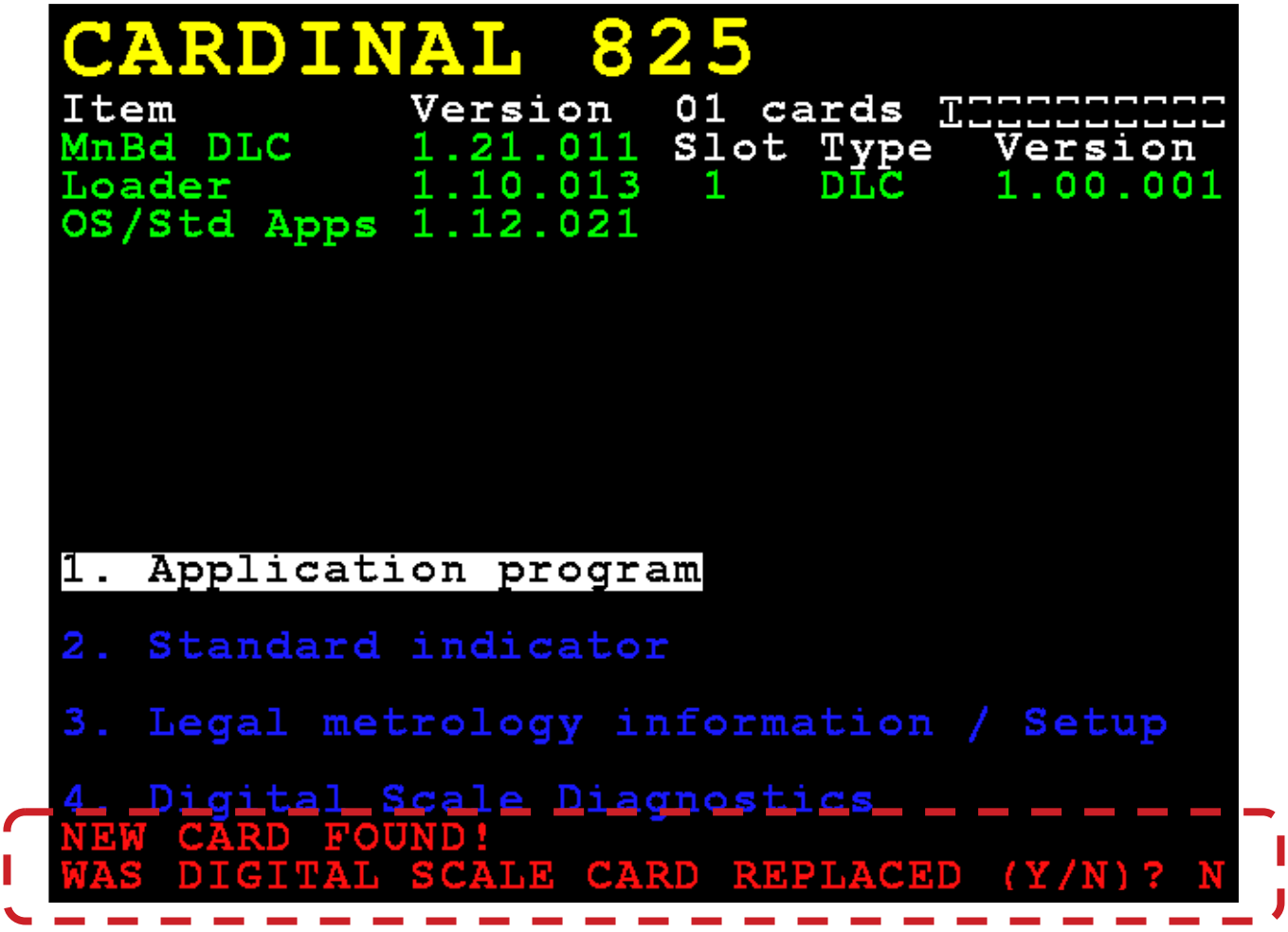
**D4** – Blinking = Indicates 825-DLC card selected from the 825D main board.

# DETECTING 825D BOARD REPLACEMENT

The 825D will detect when a DLC controller or 825D mainboard has been replaced using checksums and unique board identification numbers. Based on several parameters, it can detect whether the option card was replaced, or the mainboard was replaced and then reconfigure the NEW card to the existing scale.

## 825-DLC Digital Controller Card Replacement

If the 825-DLC card is replaced, the 825D will boot up to this screen:

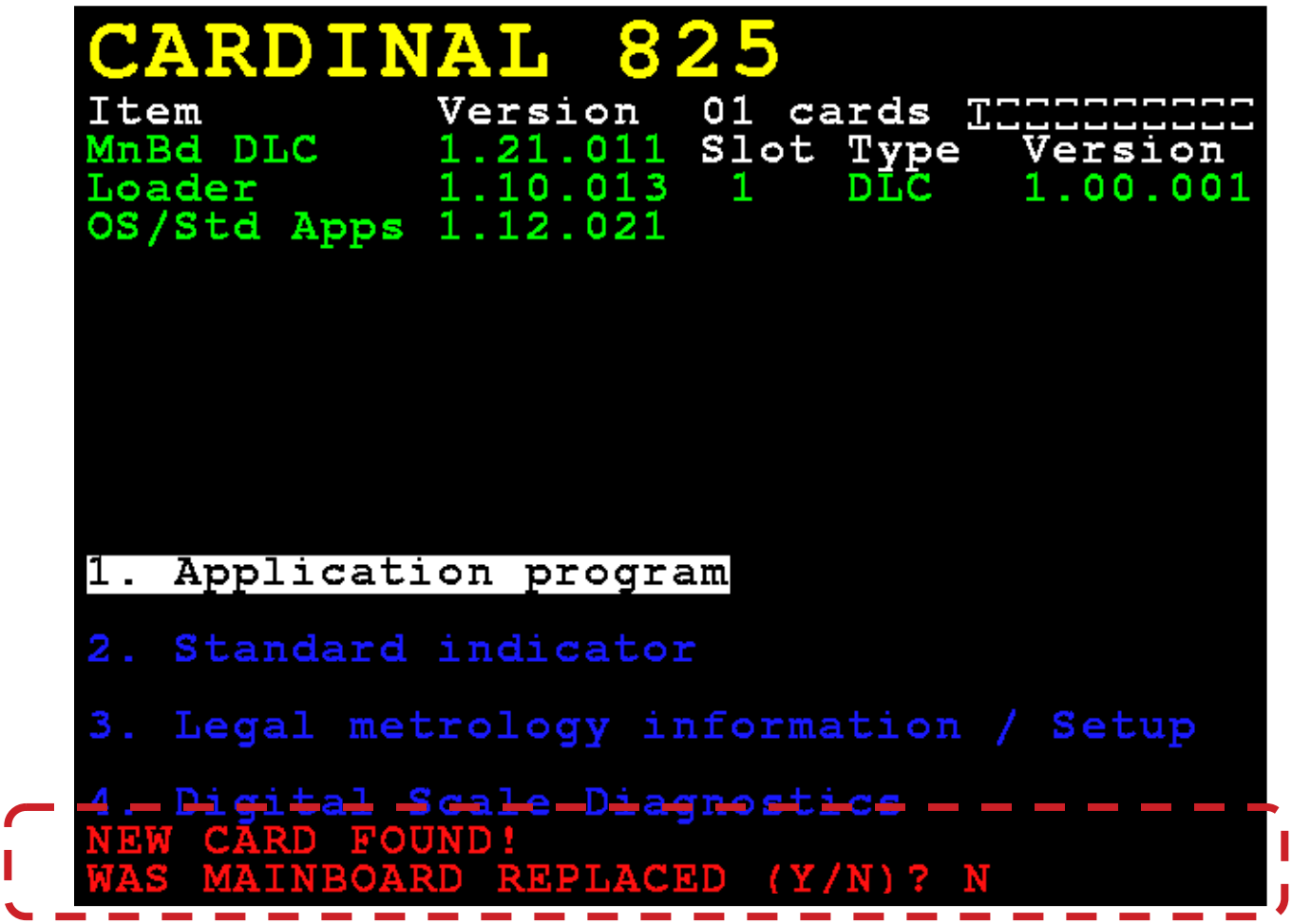



The 825D will check whether the option card has been replaced, in order to reconfigure the new option card to the existing scale.

If the operator selects YES, then the 825D mainboard will upload the scale configuration to the controller, and the 825D will immediately be able to make weight again.

## 825D Main Board Replacement

If an 825D main board is replaced, the 825D will boot up to this screen:




The system will also check whether the 825D's main board has been replaced, so the scale configuration can be downloaded from the controller to the main board.

If the operator selects YES, then the scale configuration will be downloaded from the controller to the mainboard. Scale configuration includes the number of load cells, all load cell IDs, and individual load cell trim. The 825D indicator parameters will need to be entered manually (Interval, Decimal Point Position, Zero Tracking, Filtering, Print Settings, and Serial Settings).

**NOTE:** A dead load calibration will need to be performed (does not require test weights).

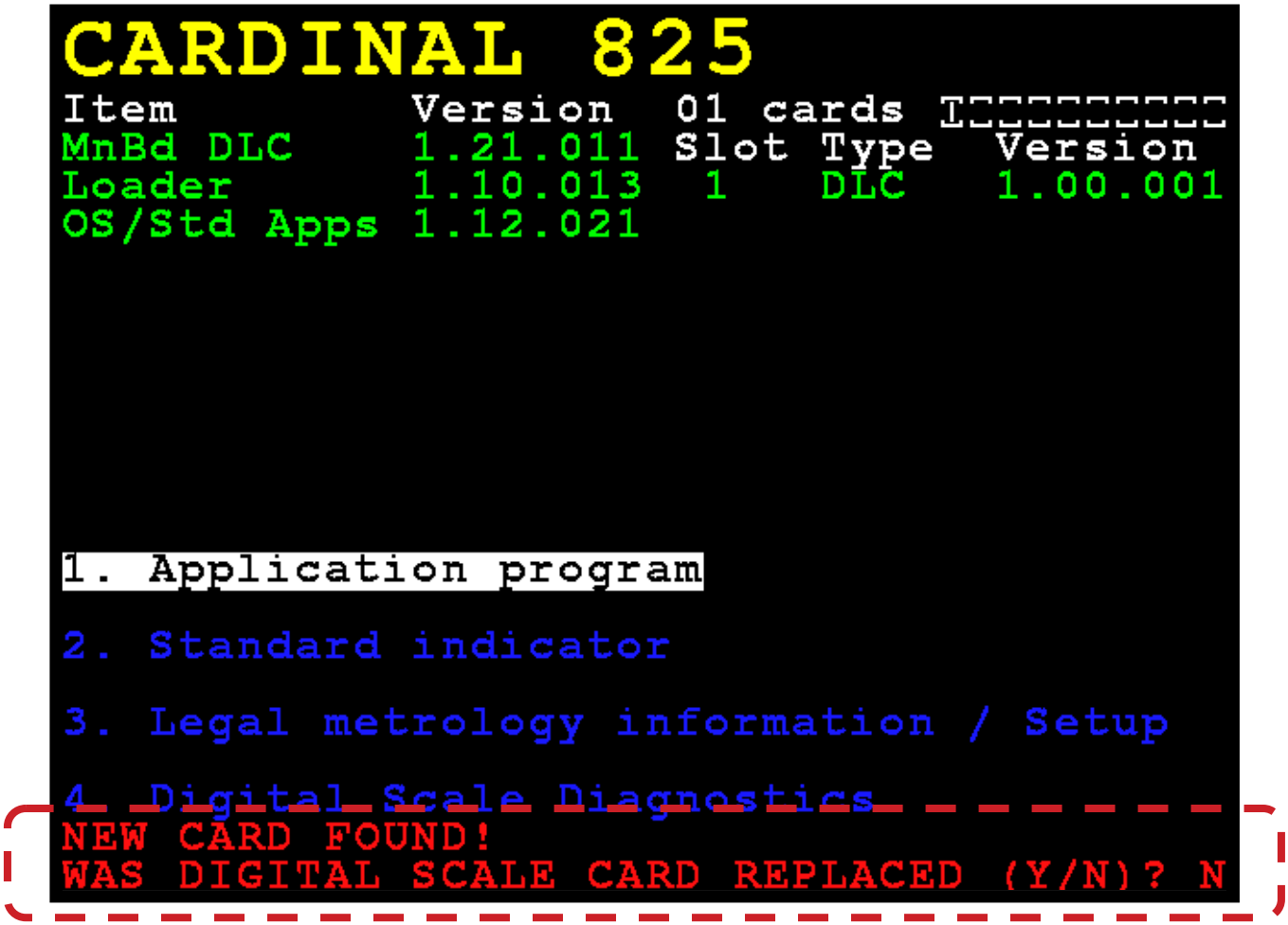
# 825-DLC DIGITAL CONTROLLER CARD REPLACEMENT

**CAUTION! OBSERVE PRECAUTIONS FOR HANDLING STATIC SENSITIVE DEVICES**

1. Remove the 825D power cord from the wall outlet.
2. Remove the fourteen acorn nuts securing the rear panel to the main housing.
3. Lift the rear panel from the main housing, taking care not to stretch the cables and wires between the panel and main housing. Lay the rear panel on the workbench/table next to the indicator.

   **NOTE:** You may need to loosen the gland connectors to allow enough slack in the cable and wires to avoid stretching them.
4. Remove the screw securing the 825-DLC card to the main PC board and then lift the 825-DLC straight up to remove it from the enclosure.
5. Disconnect the Homerun cable wires (and any other wires or cables) from the 825-DLC card.
6. On the new 825-DLC card, connect the Homerun cable wires (and any other wires or cables).
7. To install the new 825-DLC card, carefully align the card edge connector with the PCI Express Bus (PCIe) slot and apply even downward pressure to the edge of the 825-DLC card.
8. Secure the 825-DLC card to the main board with the screw removed earlier.
9. Ensure that no cables or wires are exposed between the main housing and the rear panel, and then place the rear panel onto the main housing and secure it using the fourteen acorn nuts removed in step 2.
10. Re-insert the 825D power cord into the wall outlet.
11. Press the **ON/OFF** key on the 825D keypad to turn it on.

**12.** The 825D will boot up to this screen:




**13.** The 825D will check whether the option card has been replaced, in order to reconfigure the new option card to the existing scale.

**14.** If the operator selects **Y**, then the 825D main board will upload the scale configuration to the new 825-DLC card, and the 825D will immediately be able to make weight again.

# iSITE CONFIGURATION

## 225D iSite Configuration

The 225D will periodically send indicator, scale, and cell data to the Cardinal iSite Webserver for diagnostic logging. The server will use this information to determine if there are problems with the scale(s) that need to be addressed.

To access the ISITE IP CONFIG menu:

1. Press **SHIFT** + **RED_KEY** to enter SETUP/REVIEW.
2. Press **ENTER** once and **DOWN** twice to navigate to SETUP MENU #3.
3. Select **#9. ISITE IP CONFIG**

The SO# of the scale is used to match up the scale to the correct iSite dealer account. In many cases, DHCP may be used which makes setup quite simple:

1. SO# = XXXXXX
2. DHCP = YES

If a static IP address is required (such as to address firewall issues) then set DHCP = NO and prompting will appear to manually set addresses:

1. SO# = XXXXXX
2. DHCP = NO
3. IP = XXX.XXX.XXX.XXX
4. SUBNET = XXX.XXX.XXX.XXX
5. GATEWAY = XXX.XXX.XXX.XXX

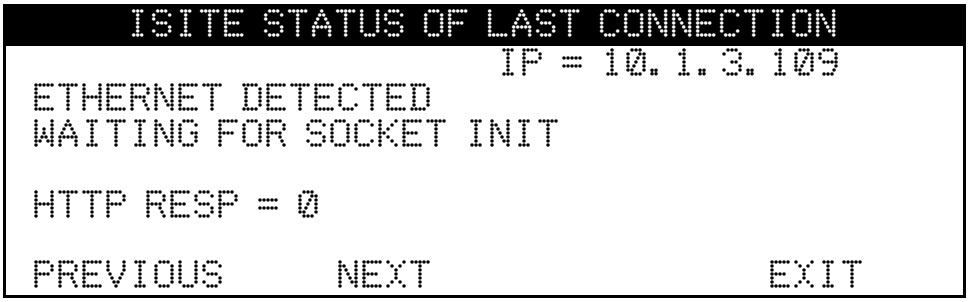
To confirm that iSite is working or to diagnose any errors in the connection there is an iSite status page in the diagnostics menu. Some of the information is quite technical but is present in case of a more complicated problem.

**TO CHECK THE STATUS OF THE LAST ISITE CONNECTION**

1. From the main weight screen go to the diagnostics menu by pressing **SHIFT** + **CELL_DIAG**.
2. Navigate with the **PREVIOUS/NEXT** soft keys to the page titled “ISITE STATUS OF LAST CONNECTION”.

## 225D iSite Configuration, Cont.

### TO CHECK THE STATUS OF THE LAST ISITE CONNECTION, CONT.




**3.** The following information is available:

A. IP address (if available).

B. Ethernet cable state – “ETHERNET DETECTED” or “ETHERNET NOT DETECTED”

C. The status of the connection. The following statuses should occur in order while making a connection after bootup:

   a. WAITING FOR SOCKET INIT

   b. IP BINDING

   c. DNS RESOLVING SERVER IP

   d. COMM ESTABLISHED – OR—PORT CONNECT FAIL

D. Once there is a connection to the webserver, the previous HTTP response will be displayed.

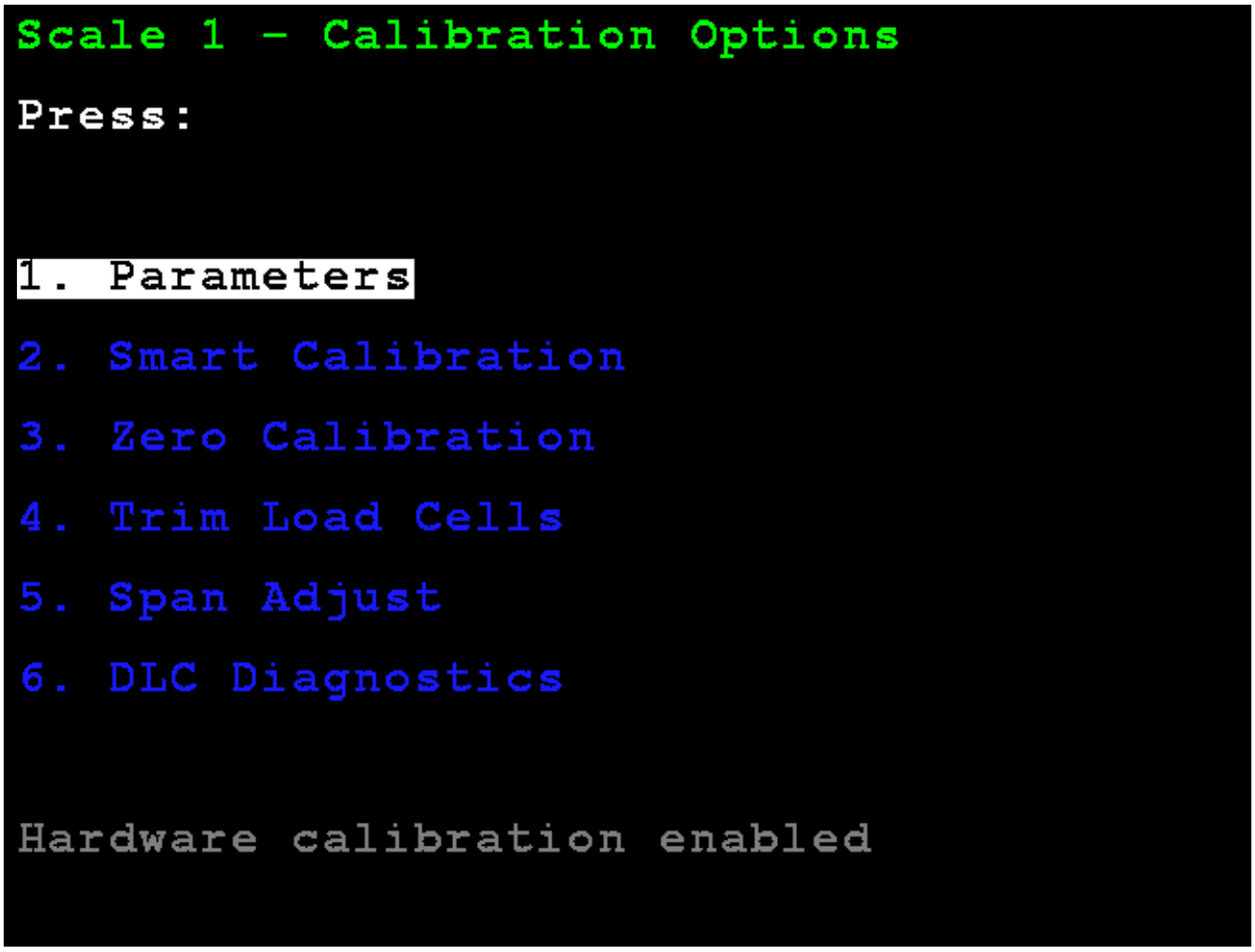
   a. A good response is “HTTP RESP = 200 OKAY”

   b. Any other response means there is a problem. Many issues are causing the SO# to not be entered in the indicator, “HTTP RESP = 404 CHECK SO# IN 225 SETUP”.

## 825D iSite Configuration

The 825D will periodically send indicator, scale, and cell data to the Cardinal iSite Webserver for diagnostic logging. The server will use this information to determine if there are problems with the scale(s) that need to be addressed.

With the **`Scale 1 – Calibration Options`** screen displayed, press the **6** key, or use the Navigation Keys to select (highlight) **`6. DLC Diagnostics`**, and then press the **ENTER** key.




The display will change to the **`Digital Load Cell Diagnostics Load Cell Weights`** screen.

Press the **I** key to jump to the **`iSite Status of Last Connection`** screen.

## 825D iSite Configuration, Cont.

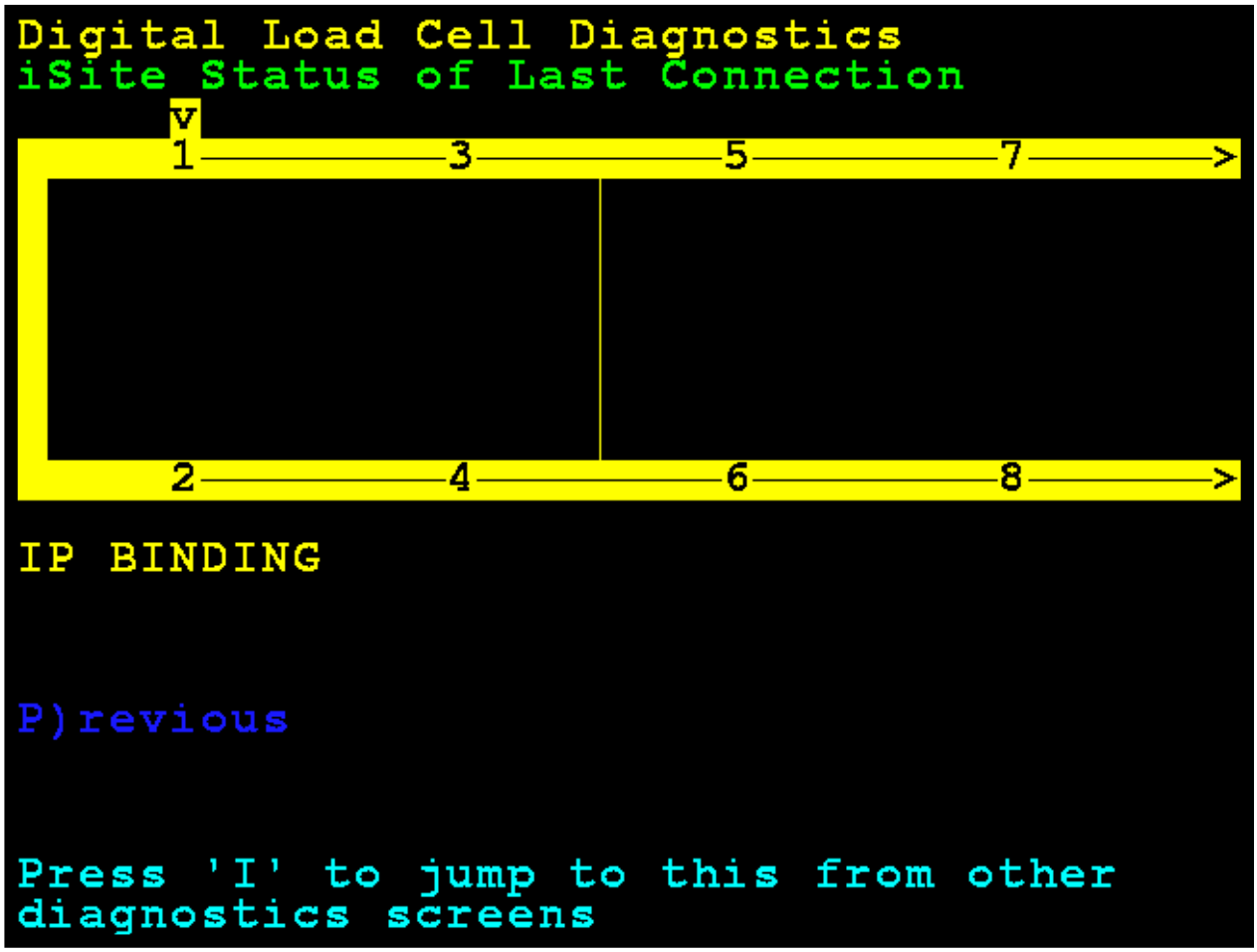
### ISITE STATUS OF LAST CONNECTION

If **IP BINDING** message is displayed for a long time, it may indicate no network connection is present.

**WAITING FOR SOCKET INIT**

**PORT CONNECT FAIL**

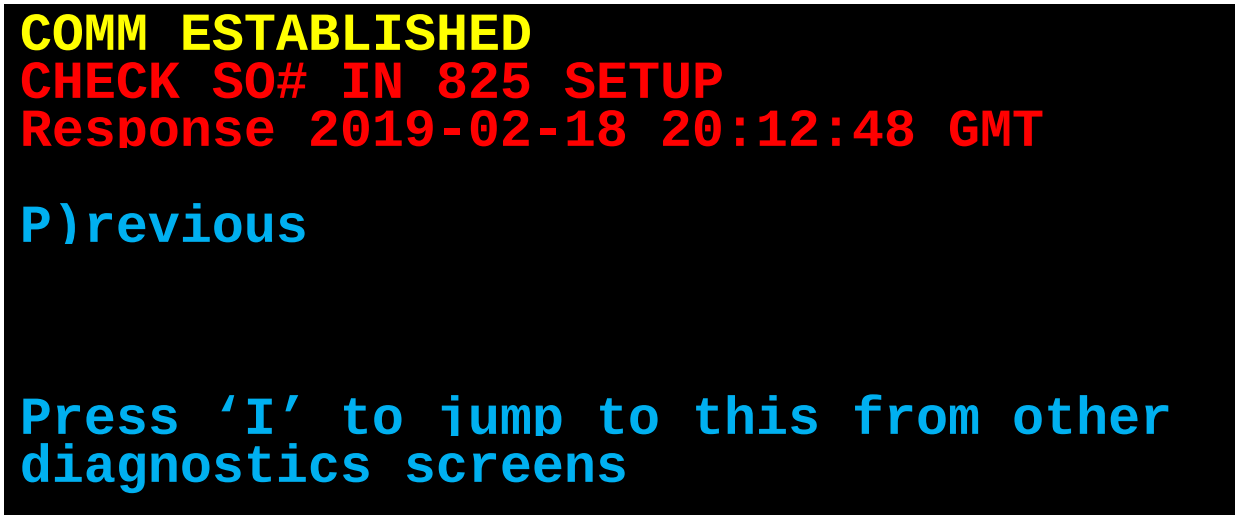
**COMM ESTABLISHED** – successful connection



## 825D iSite Configuration, Cont.

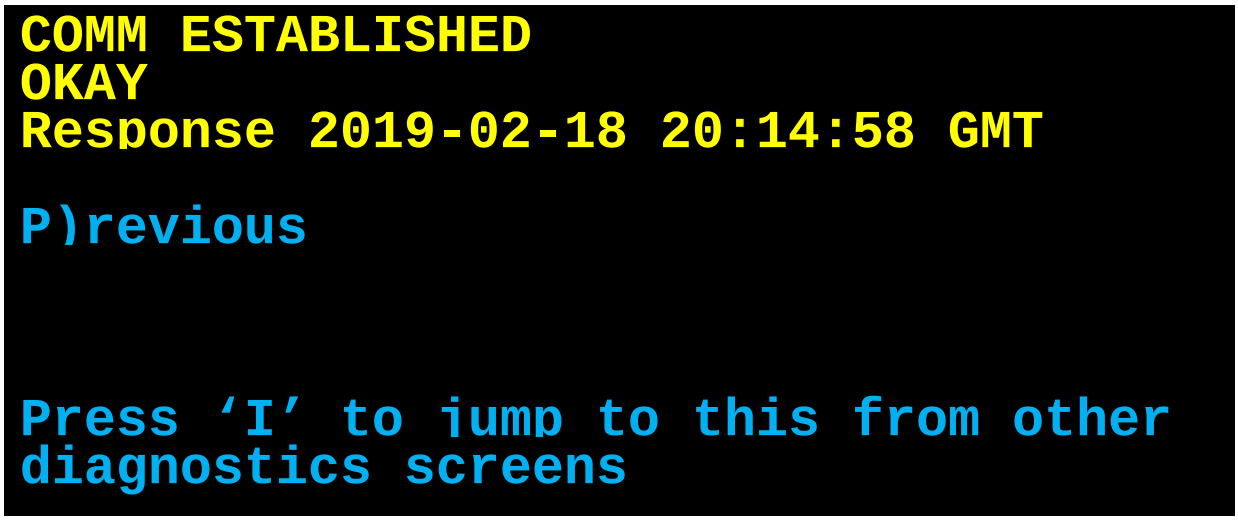
### ENTER VALID SO IDENTIFIER FOR ISITE

Make sure a valid SO identifier is entered for iSite.

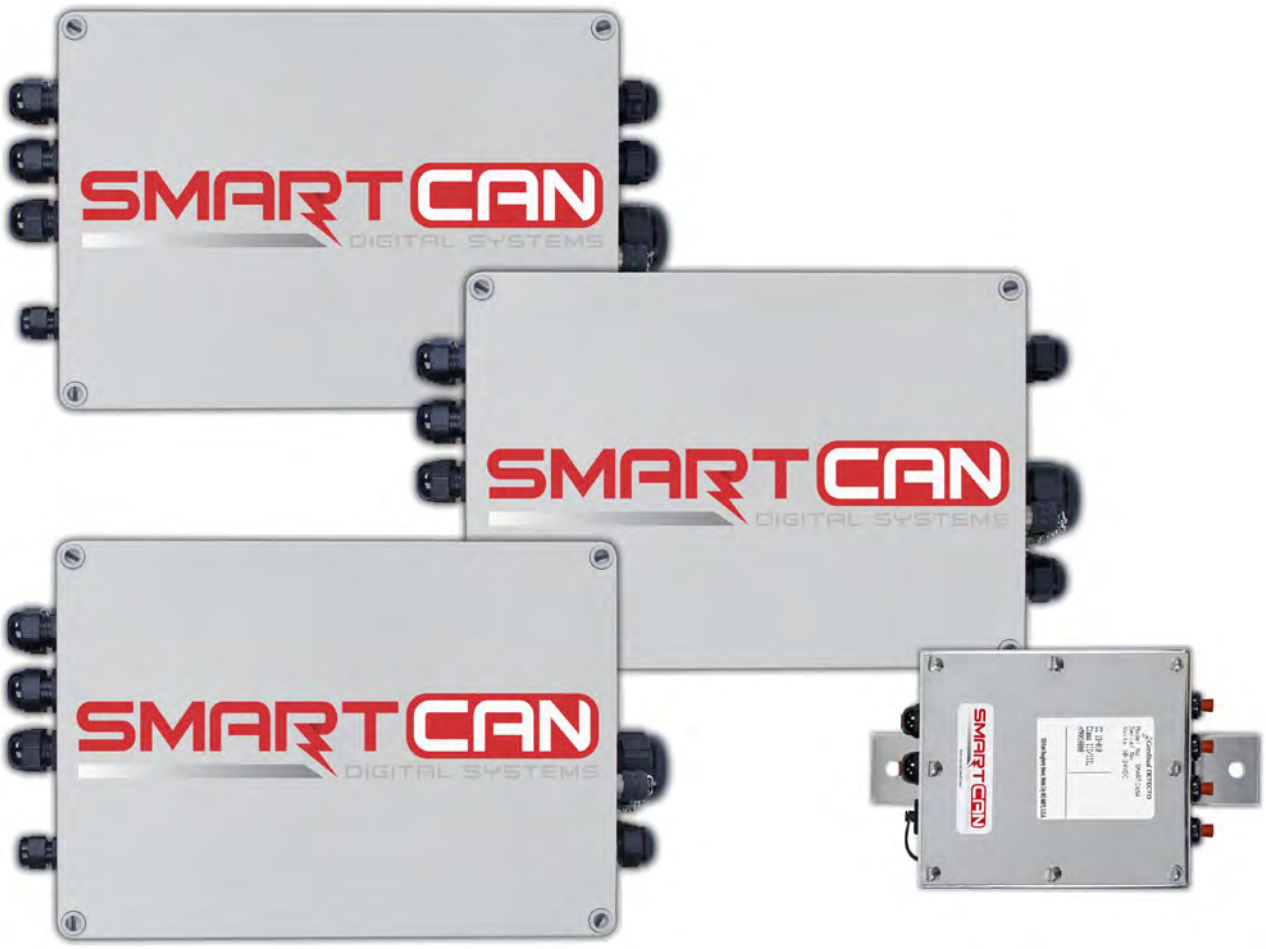



### SUCCESSFUL COMM ESTABLISH FOR ISITE

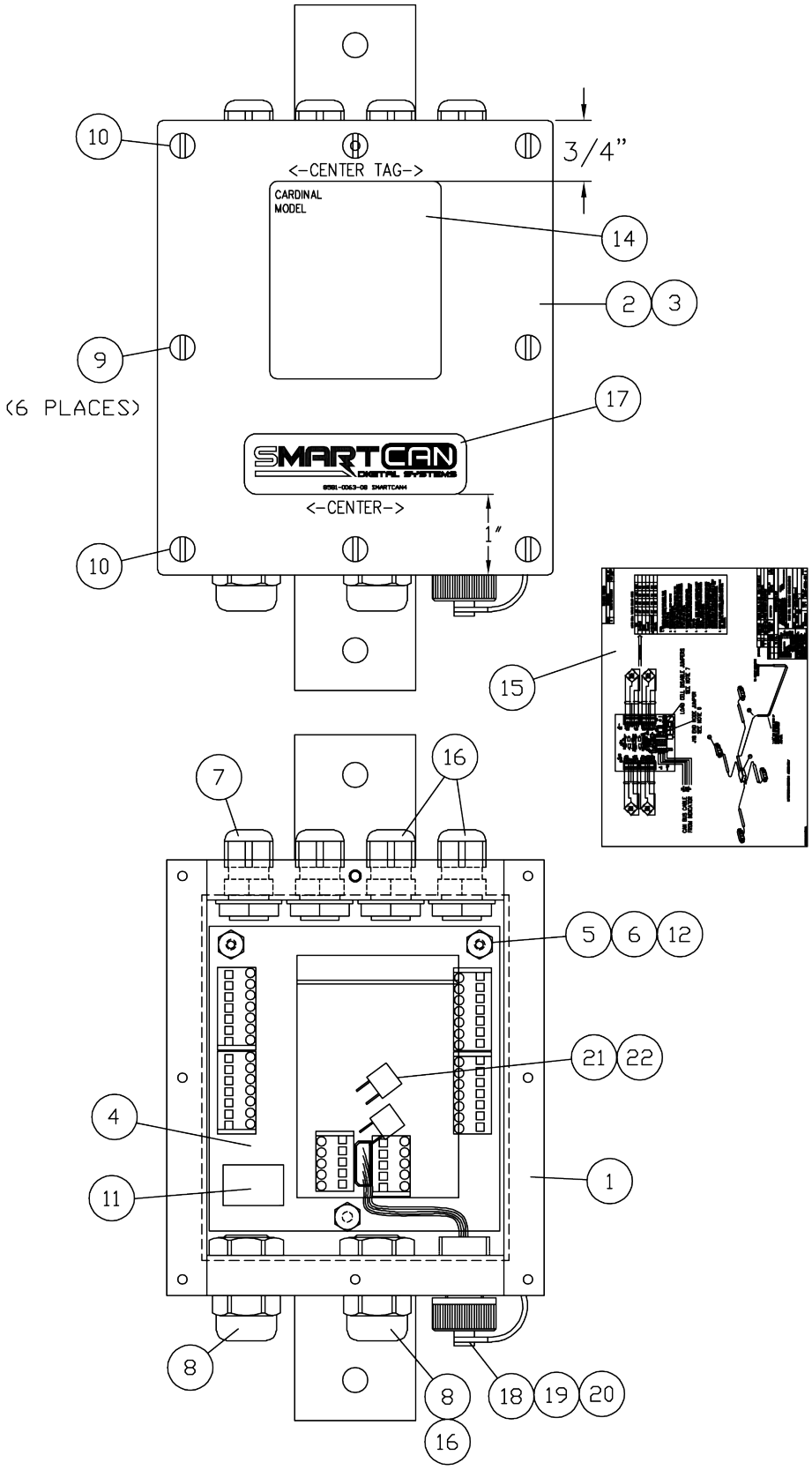
The 825D screen will display **OKAY** when a successful comm has been established.



# PARTS IDENTIFICATION



# SmartCAN4 Final Assembly



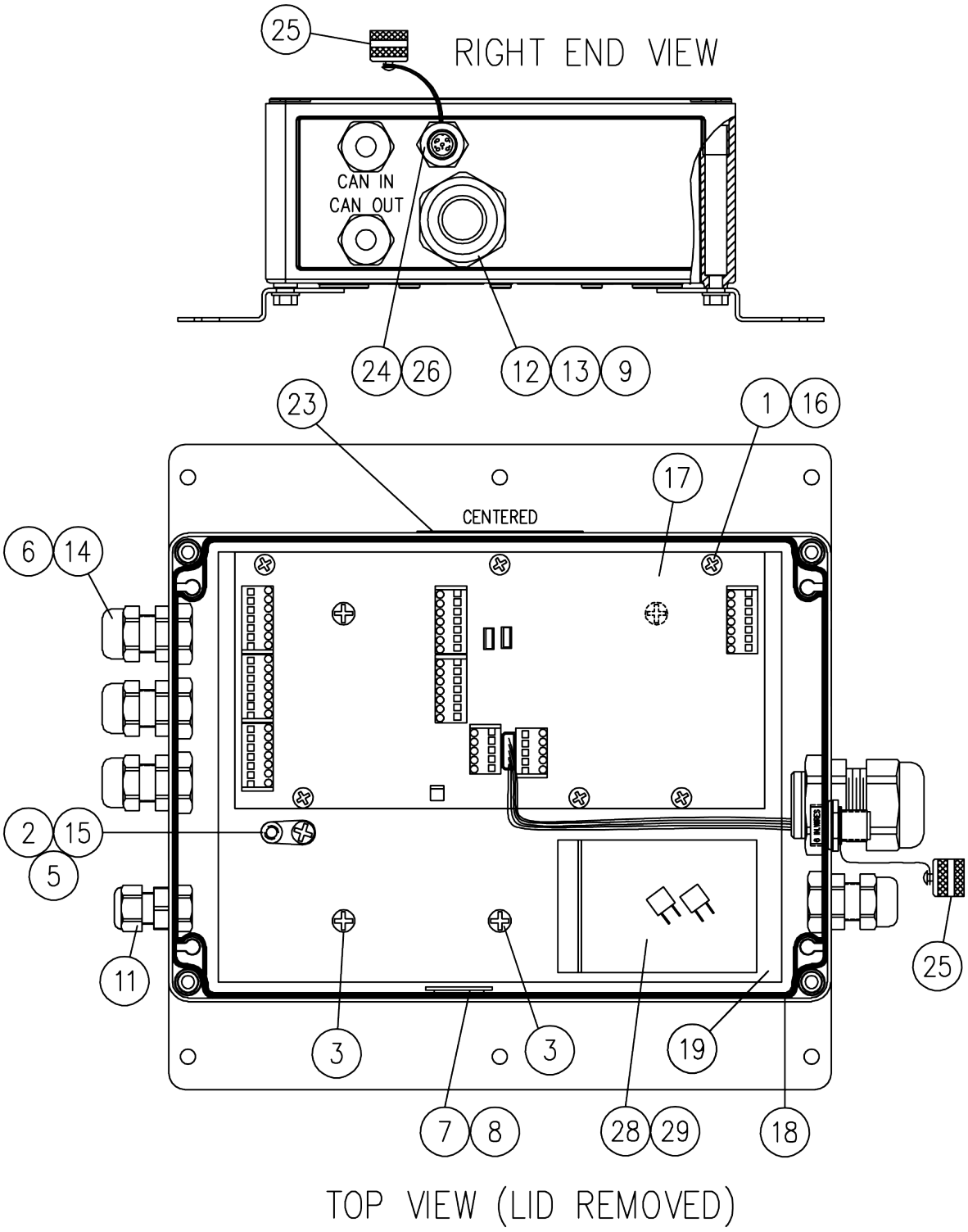
## SmartCAN4 Final Assembly

| ITEM | QTY | PART NUMBER | DESCRIPTION |
|---|---|---|---|
| 1 | 1 | 8581-0035-0A | STAINLESS STEEL ENCLOSURE |
| 2 | 1 | 3502-C401-08 | STAINLESS STEEL COVER |
| 3 | 1 | 3502-B403-08 | GASKET |
| 4 | 1 | 8581-0029-0A | PC BOARD ASSEMBLY – SMARTCAN 4 CELLS |
| 5 | 3 | 6680-0093 | ALUMINUM SPACER #6 X .25" |
| 6 | 3 | 6013-0039 | HEX NUT 6-32 |
| 7 | 4 | 6610-1150 | GLAND CONNECTOR SMALL – SEE NOTE 2 |
| 8 | 1 | 6610-2248 | GLAND CONNECTOR LARGE – SEE NOTE 1 |
| 9 | 6 | 6021-1013 | SCW RHMS S.S. 10-32 X 3/8" |
| 10 | 2 | 6021-1108 | SCW FIL HMS S.S. 10-32 X 3/8" |
| 11 | 1 | 6560-0034 | DESICCANT CAPSULE |
| 12 | 3 | 6680-0004 | LOCK WASHER #6 INT. TOOTH |
| 14 | 1 | 593GR986 | SERIAL TAG |
| 15 | 1 | 3502-0691-02 | WIRING DIAGRAM – SEE NOTE 3 |
| 16 | 2 | 6540-1104 | HOLE PLUG |
| 17 | 1 | 8581-0063-08 | LABEL, SMARTCAN LOGO |
| 18 | 1 | 8581-0073-0A | CABLE, SMARTCAN TO NEST |
| 19 | 1 | 6610-1310 | PROTECTION CAP |
| 20 | 1 | 6610-1312 | NUT, M16 |
| 21 | 2 | 6910-0024 | FUSE, 500mA 65V, FAST ACTING TE5 |
| 22 | 1 | 6050-0085 | BAG, PLASTIC 2 X 3, 2 MIL RECLOSABLE |

**NOTES:**

1. TORQUE GLAND CONNECTOR ITEM 8 TO 33 in-lb (3.7 Nm).
2. TORQUE GLAND CONNECTOR ITEM 7 TO 15 in-lb (1.7 Nm).
3. FOUR CELL SMARTCAN WIRING DIAGRAM ITEM 15 IS FOLDED AND PLACED INSIDE THE JUNCTION BOX.

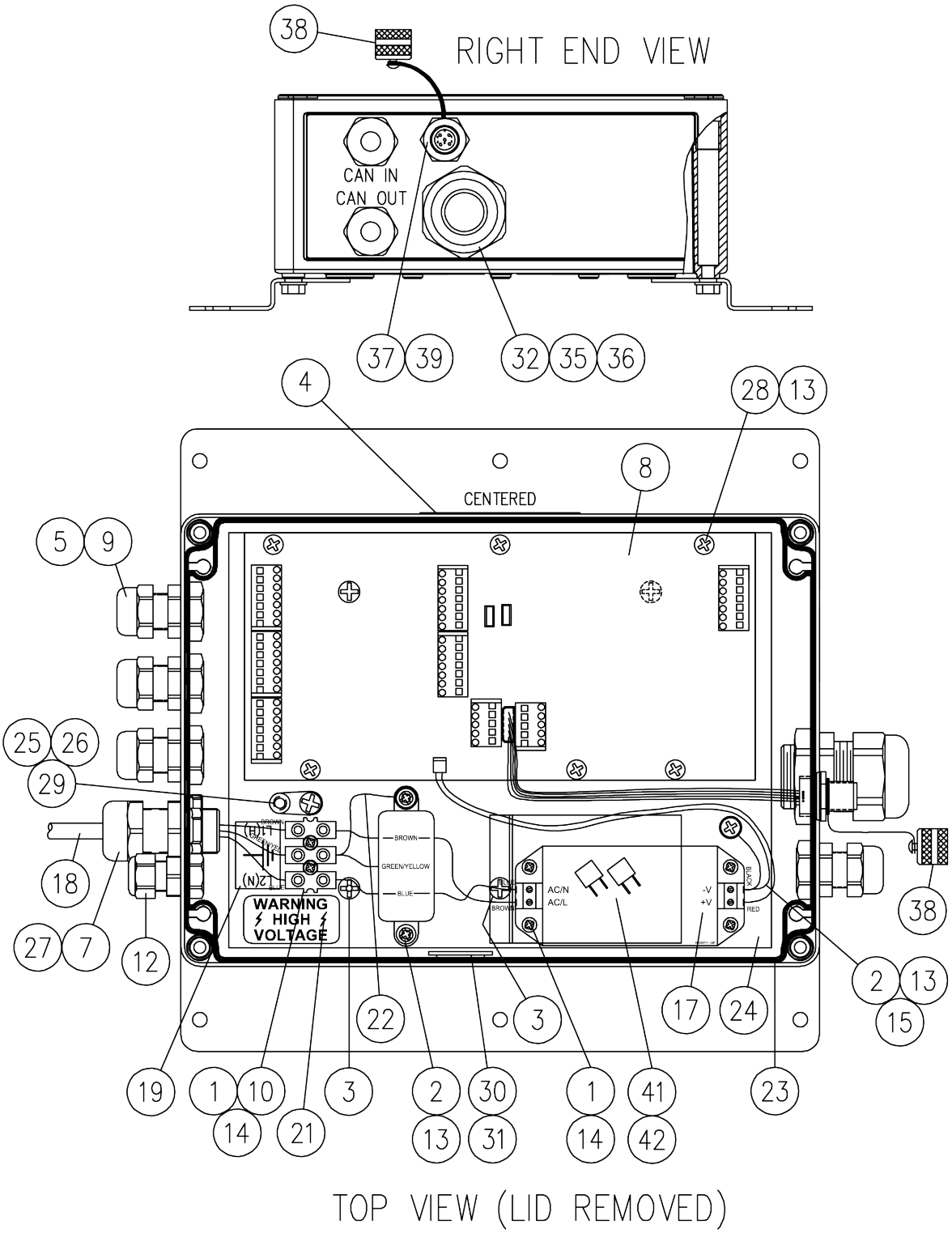
## SmartCAN6 Final Assembly



## SmartCAN6 Final Assembly

| ITEM | QTY | PART NUMBER | DESCRIPTION |
|---|---|---|---|
| 1 | 6 | 6021-0695 | SCW PHMS 6-32 X .500 |
| 2 | 1 | 6021-1020 | SCW RHMS 10-32 X .375 |
| 3 | 4 | 6021-1292 | SCW PH THREAD CUTTING 3.9mm X 9mm |
| 5 | 1 | 6024-1010 | WASHER LOCK INT TOOTH #10 TYPE |
| 6 | 8 | 6540-1104 | HOLE PLUG .343 X .187 X 1 |
| 7 | .75" | 6560-0025 | TAPE DBL SIDED 0.75" WIDE 45 MIL THICK |
| 8 | 1 | 6560-0064 | DESICCANT, 1" X 1" BAG, FOR VOL. UP TO 1 CU.FT. |
| 9 | 1 | 6560-0310 | RUBBER PLUG 7/16 X 11/16 X 1" LG, SILICON |
| 10 | 1 | 6600-3007 | ENVELOPE, PRESS-ON VINYL 4" X 6" |
| 11 | 1 | 6610-1150 | CONN GLAND .090 - .265, BLACK |
| 12 | 1 | 6610-1267 | CONN GLAND .354 - .630 GRIP 1.05 MTG. 3/4" NPT BLK |
| 13 | 1 | 6610-1227 | CONN GLAND LOCKNUT 3/4" NPT NYLON |
| 14 | 8 | 6610-2248 | CONN GLAND .187 - .312 GRIP |
| 15 | 1 | 6610-5002 | GROUND LUG L-35 |
| 16 | 6 | 6680-0004 | WASHER INT LOCK #6 |
| 17 | 1 | 8581-0030-2A | PCB ASSY, CONTROLLER |
| 18 | 1 | 8581-0033-08 | ENCLOSURE, MODIFIED SMARTCAN 6 CELLS |
| 19 | 1 | 8581-0034-08 | SUB PANEL |
| 20 | 1 | 8581-0041-08 | LABEL, SMARTCAN LOAD CELL WARNING |
| 22 | 2 | 8581-0045-08 | CARD, LOAD CELL ID |
| 23 | 1 | 593GR986 | SERIAL TAG |
| 24 | 1 | 8581-0073-0A | CABLE: SMARTCAN TO NEST |
| 25 | 1 | 6610-1310 | PROTECTION CAP FOR M12 MALE CONNECTOR |
| 26 | 1 | 6610-1312 | NUT, M16 FOR CIRCUILAR M12 CONNECTOR |
| 27 | 1 | 8581-0062-08 | LABEL, SMARTCAN LOGO |
| 28 | 2 | 6910-0024 | FUSE 500mA 65V FAST ACTING TE5 |
| 29 | 1 | 6050-0085 | BAG: PLASTIC 2 X 3 – 2 MIL, RECLOSABLE |

## SmartCAN6-AC Final Assembly

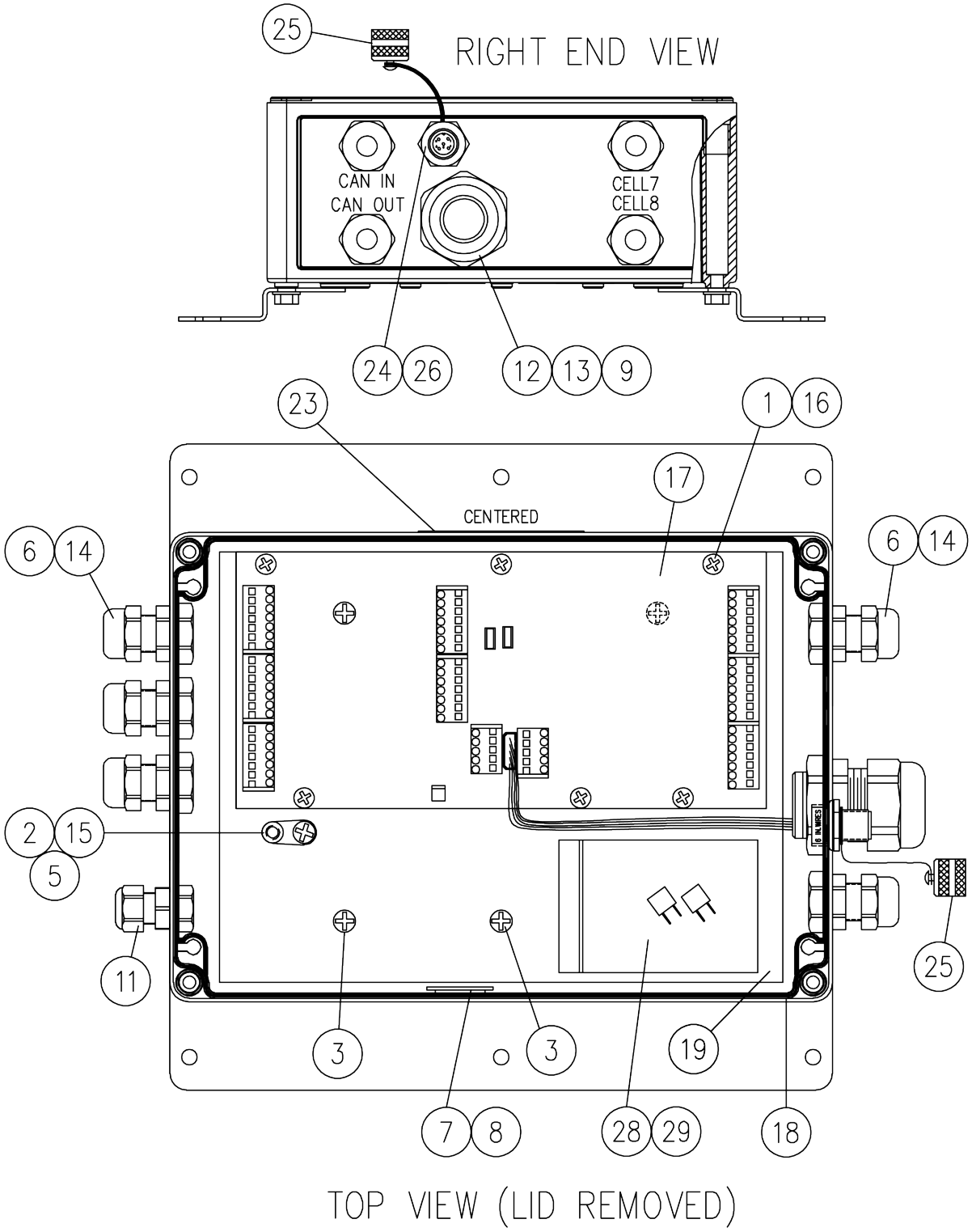



| ITEM | QTY | PART NUMBER | DESCRIPTION |
|---|---|---|---|
| 1 | 6 | 6021-0426 | SCW RHMS 4-40 X .500 |
| 2 | 3 | 6021-0654 | SCW PHMS 6-32 X .250 |
| 3 | 4 | 6021-1292 | SCW PH THREAD CUTTING 3.9mm X 9mm |

## SmartCAN6-AC Final Assembly

| ITEM | QTY | PART NUMBER | DESCRIPTION |
|---|---|---|---|
| 4 | 1 | 593GR986 | SERIAL TAG |
| 5 | 8 | 6540-1104 | HOLE PLUG .343 X .187 X 1 |
| 7 | 1 | 6610-2081 | CONN GLAND .170 - .470 GRIP |
| 8 | 1 | 8581-0030-2A | PCB ASSY, CONTROLLER |
| 9 | 8 | 6610-2248 | CONN GLAND .187 - .312 GRIP |
| 10 | 1 | 8200-B392-0A | CABLE: AC POWER W/FILTER |
| 11 | 1 | 8581-0041-08 | LABEL, SMARTCAN LOAD CELL WARNING |
| 12 | 1 | 6610-1150 | CONN GLAND .090 - .265, BLACK |
| 13 | 9 | 6680-0004 | WASHER INT LOCK #6 |
| 14 | 6 | 6680-0026 | WASHER INT LOCK #4 |
| 15 | 1 | 8581-0055-0A | CABLE, POWER SUPPLY OUTPUT, SMARTCAN |
| 17 | 1 | 6800-1024 | POWER SUPPLY 24V DC / 1.3A |
| 18 | 1 | 6980-1030 | POWER CORD 6.3ft |
| 19 | 1 | 8200-B104-08 | LABEL, TERM. BLOCK |
| 21 | 1 | 8581-0042-08 | "WARNING HIGH VOLTAGE" SMALL LABEL |
| 22 | 1 | 8526-B166-0A | GROUND WIRE |
| 23 | 1 | 8581-0033-58 | ENCLOSURE, MODIFIED SMARTCAN 6 CELLS W/AC |
| 24 | 1 | 8581-0034-08 | SUB PANEL |
| 25 | 1 | 6024-1010 | WASHER LOCK INT TOOTH #10 TYPE |
| 26 | 1 | 6021-1020 | SCW RHMS 10-32 X .375 |
| 27 | 1 | 6680-0015 | NUT CONDUIT 1/2 SEAL |
| 28 | 6 | 6021-0695 | SCW PHMS 6-32 X .500 |
| 29 | 1 | 6610-5002 | GROUND LUG L-35 |
| 30 | .75" | 6560-0025 | TAPE DBL SIDED 0.75" WIDE 45 MIL THICK |
| 31 | 1 | 6560-0064 | DESICCANT, 1" X 1" BAG, FOR VOL. UP TO 1 CU.FT. |
| 32 | 1 | 6560-0310 | RUBBER PLUG 7/16 X 11 /16 X 1" LG, SILICON |
| 33 | 1 | 6600-3007 | ENVELOPE, PRESS-ON VINYL 4"X6" |
| 34 | 2 | 8581-0045-08 | CARD, LOAD CELL ID |
| 35 | 1 | 6610-1267 | CONN GLAND .354 - .630 GRIP 1.05 MTG. 3/4" NPT BLK |
| 36 | 1 | 6610-1227 | CONN GLAND LOCKNUT 3/4" NPT NYLON |
| 37 | 1 | 8581-0073-0A | CABLE: SMARTCAN TO NEST |
| 38 | 1 | 6610-1310 | PROTECTION CAP FOR M12 MALE CONNECTOR |
| 39 | 1 | 6610-1312 | NUT, M16 FOR CIRCUILAR M12 CONNECTOR |
| 40 | 1 | 8581-0062-08 | LABEL, SMARTCAN LOGO |
| 41 | 2 | 6910-0024 | FUSE 500mA 65V FAST ACTING TE5 |
| 42 | 1 | 6050-0085 | BAG: PLASTIC 2 X 3 - 2 MIL, RECLOSABLE |

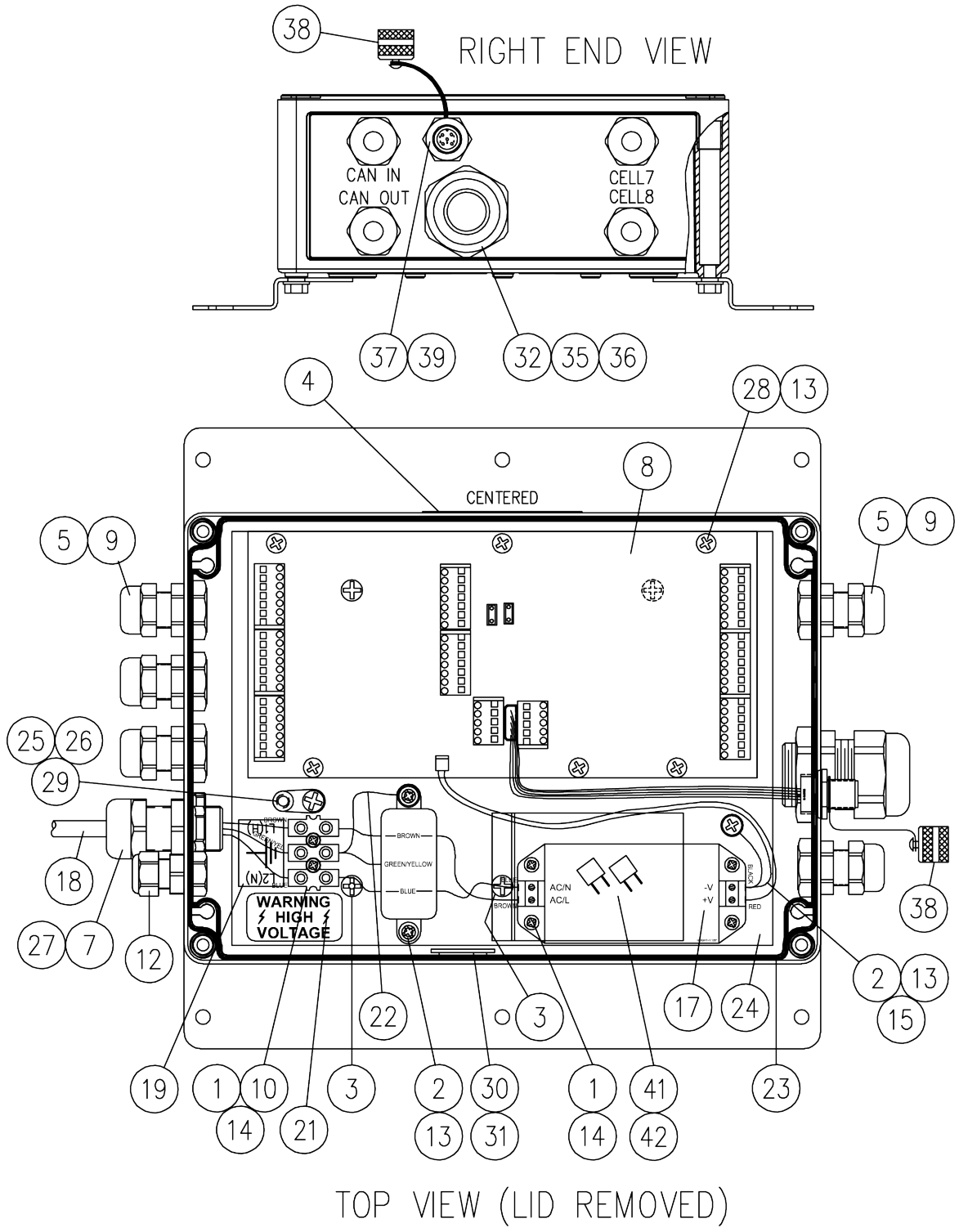
## SmartCAN8 Final Assembly



## SmartCAN8 Final Assembly

| ITEM | QTY | PART NUMBER | DESCRIPTION |
|---|---|---|---|
| 1 | 6 | 6021-0695 | SCW PHMS 6-32 X .500 |
| 2 | 1 | 6021-1020 | SCW RHMS 10-32 X .375 |
| 3 | 4 | 6021-1292 | SCW PH THREAD CUTTING 3.9mm X 9mm |
| 5 | 1 | 6024-1010 | WASHER LOCK INT TOOTH #10 TYPE |
| 6 | 10 | 6540-1104 | HOLE PLUG .343 X .187 X 1 |
| 7 | . 75" | 6560-0025 | TAPE DBL SIDED 0.75" WIDE 45 MIL THICK |
| 8 | 1 | 6560-0064 | DESICCANT, 1" X 1" BAG, FOR VOL. UP TO 1 CU.FT. |
| 9 | 1 | 6560-0310 | RUBBER PLUG 7/16 X 11 /16 X 1" LG, SILICON |
| 10 | 1 | 6600-3007 | ENVELOPE, PRESS-ON VINYL 4"X6" |
| 11 | 1 | 6610-1150 | CONN GLAND .090 - .265, BLACK |
| 12 | 1 | 6610-1267 | CONN GLAND .354 - .630 GRIP 1.05 MTG. 3/4" NPT BLK |
| 13 | 1 | 6610-1227 | CONN GLAND LOCKNUT 3/4"NPT NYLON |
| 14 | 10 | 6610-2248 | CONN GLAND .187 - .312 GRIP |
| 15 | 1 | 6610-5002 | GROUND LUG L-35 |
| 16 | 6 | 6680-0004 | WASHER INT LOCK #6 |
| 17 | 1 | 8581-0030-1A | PCB ASSY, CONTROLLER |
| 18 | 1 | 8581-0033-18 | ENCLOSURE, MODIFIED SMARTCAN 8 CELLS |
| 19 | 1 | 8581-0034-08 | SUB PANEL |
| 20 | 1 | 8581-0041-08 | LABEL, SMARTCAN LOAD CELL WARNING |
| 22 | 2 | 8581-0045-08 | CARD, LOAD CELL ID |
| 23 | 1 | 593GR986 | SERIAL TAG |
| 24 | 1 | 8581-0073-0A | CABLE: SMARTCAN TO NEST |
| 25 | 1 | 6610-1310 | PROTECTION CAP FOR M12 MALE CONNECTOR |
| 26 | 1 | 6610-1312 | NUT, M16 FOR CIRCULAR M12 CONNECTOR |
| 27 | 1 | 8581-0062-08 | LABEL, SMARTCAN LOGO |
| 28 | 2 | 6910-0024 | FUSE 500mA 65V FAST ACTING TE5 |
| 29 | 1 | 6050-0085 | BAG: PLASTIC 2 X 3 - 2 MIL, RECLOSABLE |

## SmartCAN8-AC Final Assembly

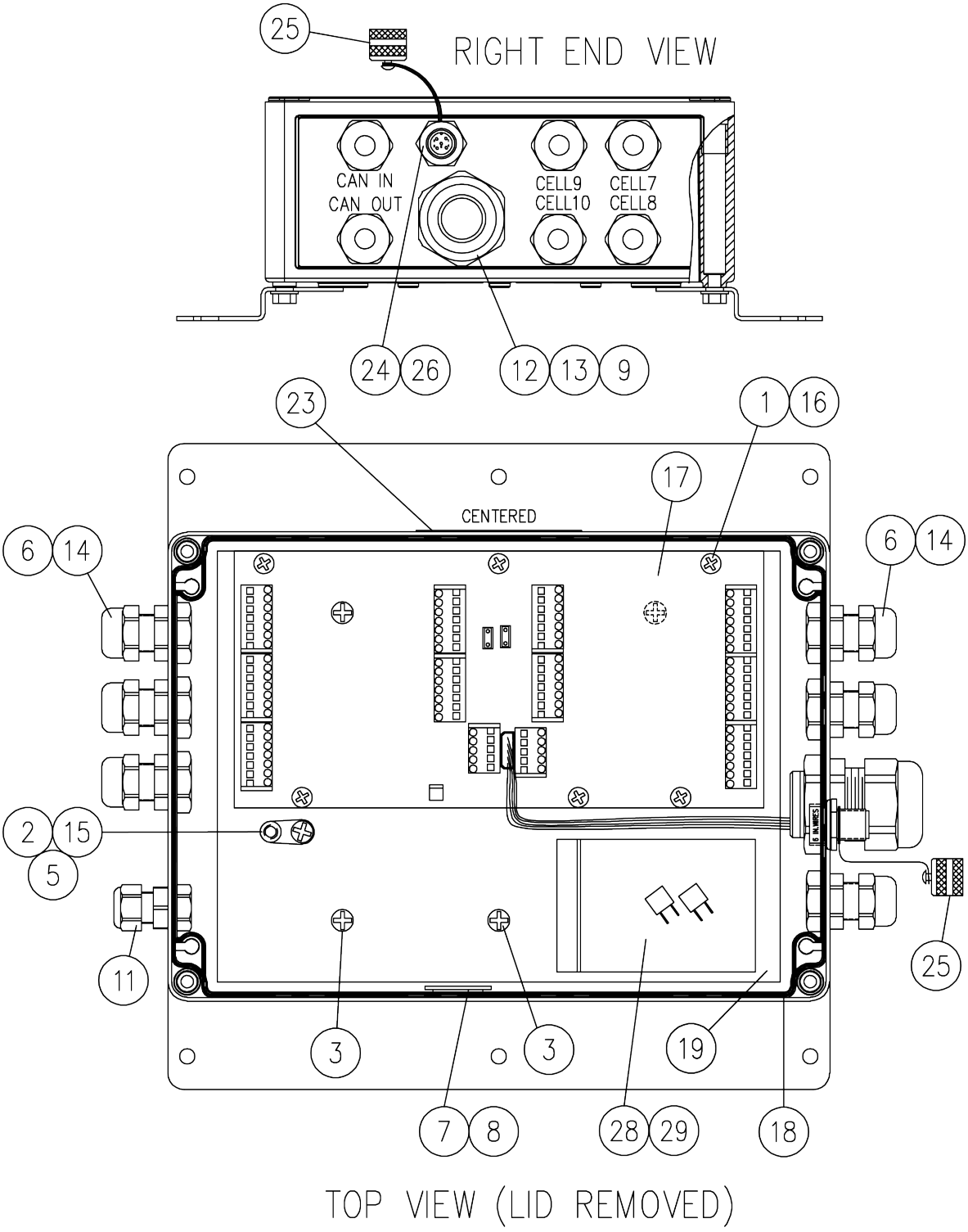



| ITEM | QTY | PART NUMBER | DESCRIPTION |
|---|---|---|---|
| 1 | 6 | 6021-0426 | SCW RHMS 4-40 X .500 |
| 2 | 3 | 6021-0654 | SCW PHMS 6-32 X .250 |
| 3 | 4 | 6021-1292 | SCW PH THREAD CUTTING 3.9mm X 9mm |

## SmartCAN8-AC Final Assembly

| ITEM | QTY | PART NUMBER | DESCRIPTION |
|---|---|---|---|
| 4 | 1 | 593GR986 | SERIAL TAG |
| 5 | 10 | 6540-1104 | HOLE PLUG .343 X .187 X 1 |
| 7 | 1 | 6610-2081 | CONN GLAND .170 - .470 GRIP |
| 8 | 1 | 8581-0030-1A | PCB ASSY, CONTROLLER |
| 9 | 10 | 6610-2248 | CONN GLAND .187 - .312 GRIP |
| 10 | 1 | 8200-B392-0A | CABLE: AC POWER W/FILTER |
| 11 | 1 | 8581-0041-08 | LABEL, SMARTCAN LOAD CELL WARNING |
| 12 | 1 | 6610-1150 | CONN GLAND .090 - .265, BLACK |
| 13 | 9 | 6680-0004 | WASHER INT LOCK #6 |
| 14 | 6 | 6680-0026 | WASHER INT LOCK #4 |
| 15 | 1 | 8581-0055-0A | CABLE, POWER SUPPLY OUTPUT, SMARTCAN |
| 17 | 1 | 6800-1024 | POWER SUPPLY 24V DC / 1.3A |
| 18 | 1 | 6980-1030 | POWER CORD 6.3ft |
| 19 | 1 | 8200-B104-08 | LABEL, TERM. BLOCK |
| 21 | 1 | 8581-0042-08 | "WARNING HIGH VOLTAGE" SMALL LABEL |
| 22 | 1 | 8526-B166-0A | GROUND WIRE |
| 23 | 1 | 8581-0033-28 | ENCLOSURE, MODIFIED SMARTCAN 8 CELL W/AC |
| 24 | 1 | 8581-0034-08 | SUB PANEL |
| 25 | 1 | 6024-1010 | WASHER LOCK INT TOOTH #10 TYPE |
| 26 | 1 | 6021-1020 | SCW RHMS 10-32 X .375 |
| 27 | 1 | 6680-0015 | NUT CONDUIT 1/2 SEAL |
| 28 | 6 | 6021-0695 | SCW PHMS 6-32 X .500 |
| 29 | 1 | 6610-5002 | GROUND LUG L-35 |
| 30 | .75" | 6560-0025 | TAPE DBL SIDED 0.75" WIDE 45 MIL THICK |
| 31 | 1 | 6560-0064 | DESICCANT, 1" X 1" BAG, FOR VOL. UP TO 1 CU.FT. |
| 32 | 1 | 6560-0310 | RUBBER PLUG 7/16 X 11 /16 X 1" LG, SILICON |
| 33 | 1 | 6600-3007 | ENVELOPE, PRESS-ON VINYL 4"X6" |
| 34 | 2 | 8581-0045-08 | CARD, LOAD CELL ID |
| 35 | 1 | 6610-1267 | CONN GLAND .354 - .630 GRIP 1.05 MTG. 3/4" NPT BLK |
| 36 | 1 | 6610-1227 | CONN GLAND LOCKNUT 3/4" NPT NYLON |
| 37 | 1 | 8581-0073-0A | CABLE: SMARTCAN TO NEST |
| 38 | 1 | 6610-1310 | PROTECTION CAP FOR M12 MALE CONNECTOR |
| 39 | 1 | 6610-1312 | NUT, M16 FOR CIRCUILAR M12 CONNECTOR |
| 40 | 1 | 8581-0062-08 | LABEL, SMARTCAN LOGO |
| 41 | 2 | 6910-0024 | FUSE 500mA 65V FAST ACTING TE5 |
| 42 | 1 | 6050-0085 | BAG: PLASTIC 2 X 3 - 2 MIL, RECLOSABLE |

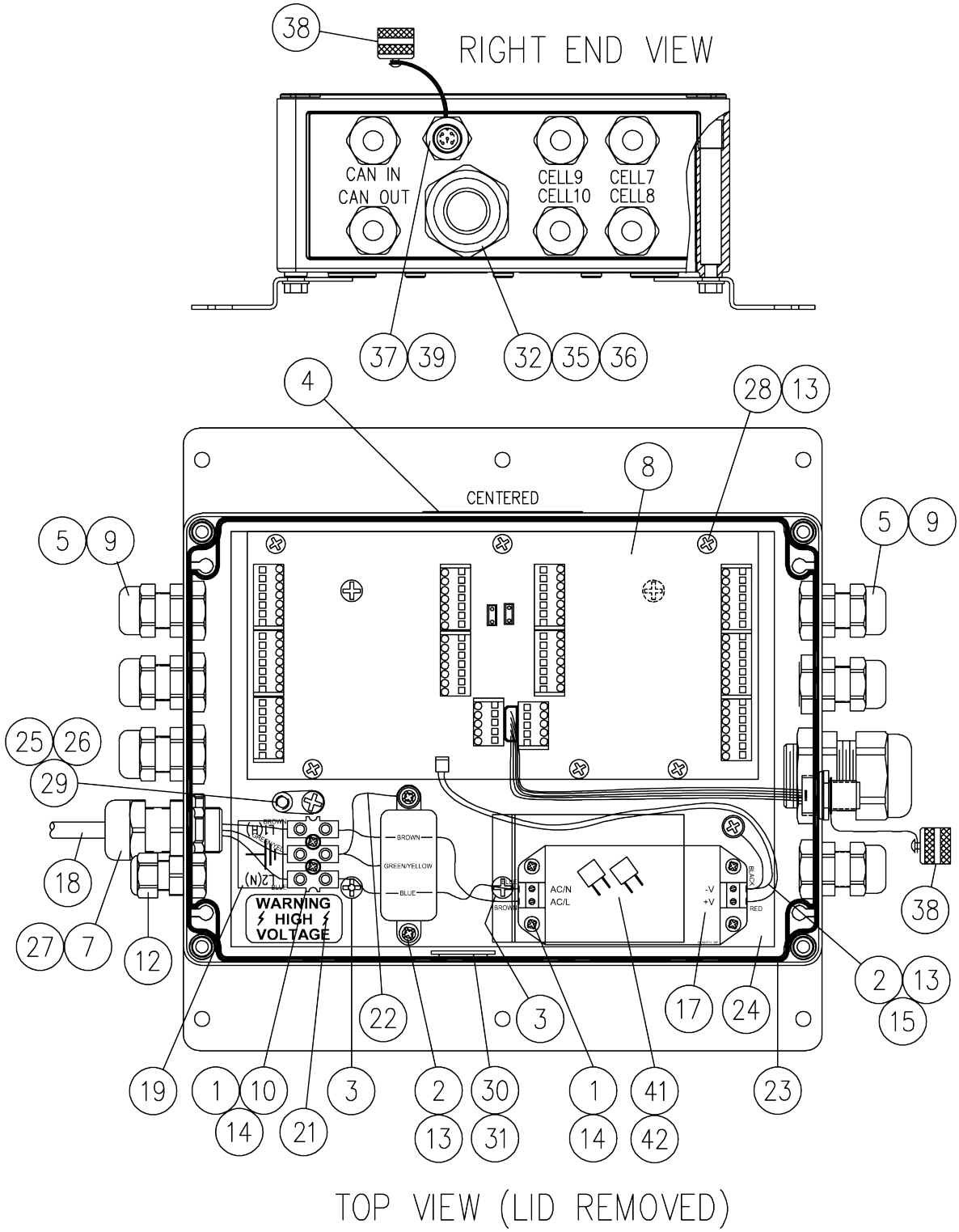
## SmartCAN10 Final Assembly



## SmartCAN10 Final Assembly

| ITEM | QTY | PART NUMBER | DESCRIPTION |
|---|---|---|---|
| 1 | 6 | 6021-0695 | SCW PHMS 6-32 X .500 |
| 2 | 1 | 6021-1020 | SCW RHMS 10-32 X .375 |
| 3 | 4 | 6021-1292 | SCW PH THREAD CUTTING 3.9mm X 9mm |
| 5 | 1 | 6024-1010 | WASHER LOCK INT TOOTH #10 TYPE |
| 6 | 12 | 6540-1104 | HOLE PLUG .343 X .187 X 1 |
| 7 | .75" | 6560-0025 | TAPE DBL SIDED 0.75" WIDE 45 MIL THICK |
| 8 | 1 | 6560-0064 | DESICCANT, 1" X 1"BAG, FOR VOL. UP TO 1 CU.FT. |
| 9 | 1 | 6560-0310 | RUBBER PLUG 7/16 X 11 /16 X 1" LG, SILICON |
| 10 | 1 | 6600-3007 | ENVELOPE, PRESS-ON VINYL 4" X 6" |
| 11 | 1 | 6610-1150 | CONN GLAND .090 - .265, BLACK |
| 12 | 1 | 6610-1267 | CONN GLAND .354 - .630 GRIP 1.05 MTG. 3/4" NPT BLK |
| 13 | 1 | 6610-1227 | CONN GLAND LOCKNUT 3/4" NPT NYLON |
| 14 | 12 | 6610-2248 | CONN GLAND .187 - .312 GRIP |
| 15 | 1 | 6610-5002 | GROUND LUG L-35 |
| 16 | 6 | 6680-0004 | WASHER INT LOCK #6 |
| 17 | 1 | 8581-0030-0A | PCB ASSY, CONTROLLER |
| 18 | 1 | 8581-0033-38 | ENCLOSURE, MODIFIED SMARTCAN 10 CELLS |
| 19 | 1 | 8581-0034-08 | SUB PANEL |
| 20 | 1 | 8581-0041-08 | LABEL, SMARTCAN LOAD CELL WARNING |
| 22 | 2 | 8581-0045-08 | CARD, LOAD CELL ID |
| 23 | 1 | 593GR986 | SERIAL TAG |
| 24 | 1 | 8581-0073-0A | CABLE: SMARTCAN TO NEST |
| 25 | 1 | 6610-1310 | PROTECTION CAP FOR M12 MALE CONNECTOR |
| 26 | 1 | 6610-1312 | NUT, M16 FOR CIRCUILAR M12 CONNECTOR |
| 27 | 1 | 8581-0062-08 | LABEL, SMARTCAN LOGO |
| 28 | 2 | 6910-0024 | FUSE 500mA 65V FAST ACTING TE5 |
| 29 | 1 | 6050-0085 | BAG: PLASTIC 2 X 3 - 2 MIL, RECLOSABLE |

## SmartCAN10-AC Final Assembly

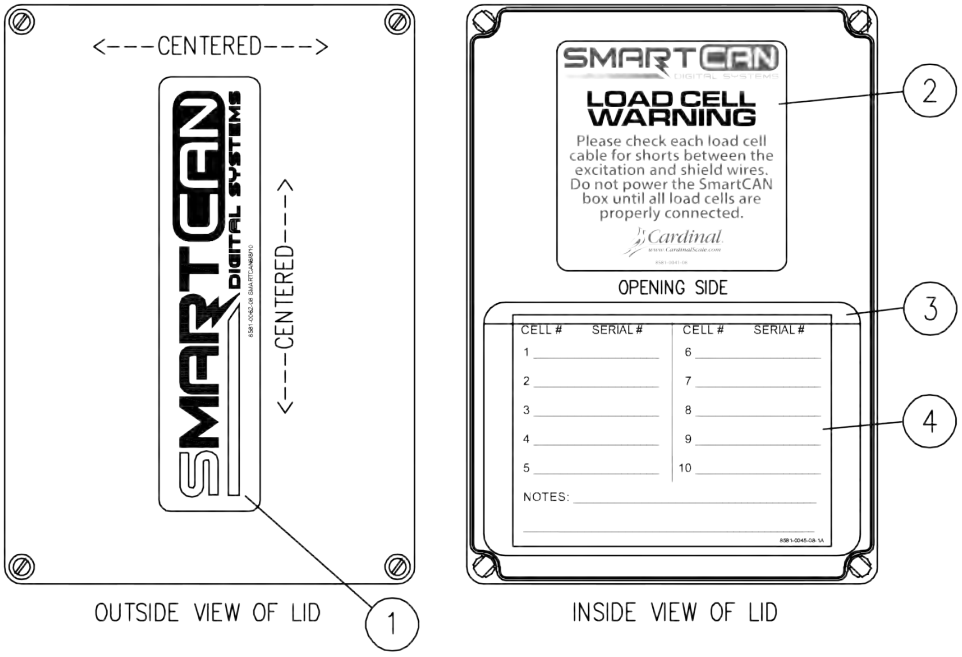


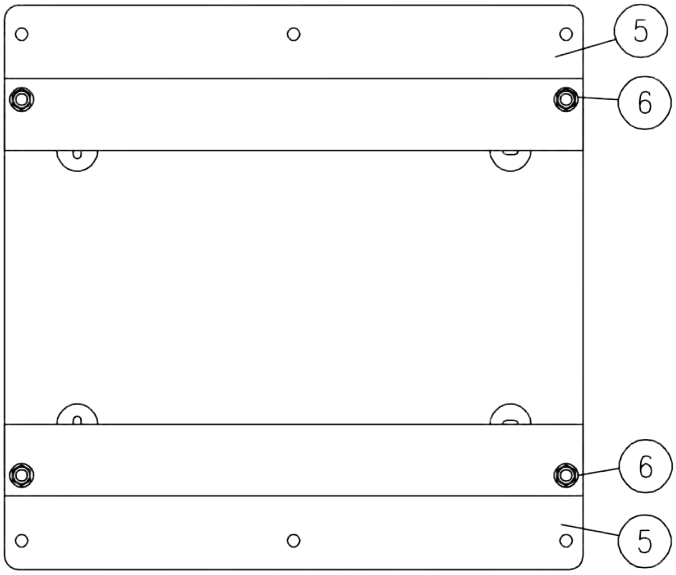

| ITEM | QTY | PART NUMBER | DESCRIPTION |
|---|---|---|---|
| 1 | 6 | 6021-0426 | SCW RHMS 4-40 X .500 |
| 2 | 3 | 6021-0654 | SCW PHMS 6-32 X .250 |
| 3 | 4 | 6021-1292 | SCW PH THREAD CUTTING 3.9mm X 9mm |

## SmartCAN10-AC Final Assembly

| ITEM | QTY | PART NUMBER | DESCRIPTION |
|---|---|---|---|
| 4 | 1 | 593GR986 | SERIAL TAG |
| 5 | 12 | 6540-1104 | HOLE PLUG .343 X .187 X 1 |
| 7 | 1 | 6610-2081 | CONN GLAND .170 - .470 GRIP |
| 8 | 1 | 8581-0030-0A | PCB ASSY, CONTROLLER |
| 9 | 12 | 6610-2248 | CONN GLAND .187 - .312 GRIP |
| 10 | 1 | 8200-8392-0A | CABLE: AC POWER W/FILTER |
| 11 | 1 | 8581-0041-08 | LABEL, SMARTCAN LOAD CELL WARNING |
| 12 | 1 | 6610-1150 | CONN GLAND .090 - .265, BLACK |
| 13 | 9 | 6680-0004 | WASHER INT LOCK #6 |
| 14 | 6 | 6680-0026 | WASHER INT LOCK #4 |
| 15 | 1 | 8581-0055-0A | CABLE, POWER SUPPLY OUTPUT, SMARTCAN |
| 17 | 1 | 6800-1024 | POWER SUPPLY 24V DC / 1.3A |
| 18 | 1 | 6980-1030 | POWER CORD 6.3ft |
| 19 | 1 | 8200-8104-08 | LABEL, TERM. BLOCK |
| 21 | 1 | 8581-0042-08 | "WARNING HIGH VOLTAGE" SMALL LABEL |
| 22 | 1 | 8526-8166-0A | GROUND WIRE |
| 23 | 1 | 8581-0033-48 | ENCLOSURE, MODIFIED SMARTCAN 10 CELL w/AC |
| 24 | 1 | 8581-0034-08 | SUB PANEL |
| 25 | 1 | 6024-1010 | WASHER LOCK INT TOOTH #10 TYPE |
| 26 | 1 | 6021-1020 | SCW RHMS 10-32 X .375 |
| 27 | 1 | 6680-0015 | NUT CONDUIT 1/2 SEAL |
| 28 | 6 | 6021-0695 | SCW PHMS 6-32 X .500 |
| 29 | 1 | 6610-5002 | GROUND LUG L-35 |
| 30 | .75" | 6560-0025 | TAPE DBL SIDED 0.75" WIDE 45 MIL THICK |
| 31 | 1 | 6560-0064 | DESICCANT, 1" X 1" BAG, FOR VOL. UP TO 1 CU.FT. |
| 32 | 1 | 6560-0310 | RUBBER PLUG 7/16 X 11 /16 X 1" LG, SILICON |
| 33 | 1 | 6600-3007 | ENVELOPE, PRESS-ON VINYL 4" X 6" |
| 34 | 2 | 8581-0045-08 | CARD, LOAD CELL ID |
| 35 | 1 | 6610-1267 | CONN GLAND .354 -.630 GRIP 1.05 MTG. 3/4" NPT BLK |
| 36 | 1 | 6610-1227 | CONN GLAND LOCKNUT 3/4" NPT NYLON |
| 37 | 1 | 8581-0073-0A | CABLE: SMARTCAN TO NEST |
| 38 | 1 | 6610-1310 | PROTECTION CAP FOR M12 MALE CONNECTOR |
| 39 | 1 | 6610-1312 | NUT, M16 FOR CIRCUILAR M12 CONNECTOR |
| 40 | 1 | 8581-0062-08 | LABEL, SMARTCAN LOGO |
| 41 | 2 | 6910-0024 | FUSE 500mA 65V FAST ACTING TES |
| 42 | 1 | 6050-0085 | BAG: PLASTIC 2 X 3 - 2 MIL, RECLOSABLE |

## SmartCAN6/-AC, SmartCAN8/-AC, and SmartCAN10/-AC
## Enclosure Lid and Mounting




BOTTOM VIEW

| ITEM | QTY | PART NUMBER | DESCRIPTION |
|---|---|---|---|
| 1 | 1 | 8581-0062-08 | LABEL, SMARTCAN LOGO |
| 2 | 1 | 8581-0041-08 | LABEL, SMARTCAN LOAD CELL WARNING |
| 3 | 1 | 6600-3007 | ENVELOPE, PRESS-ON VINYL 4" X 6" |
| 4 | 2 | 8581-0045-08 | CARD, SMARTCAN REFERENCE |
| 5 | * | 6021-1416 | SCW HEX/WASHER SHEET-METAL #12 X .750 |
| 6 | * | 8581-0044-08 | SMARTCAN MOUNTING BRACKET |

* FOR REFERENCE ONLY

# 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<br>---<br>1 YEAR PARTS | YES | YES | YES | YES | NO | 1, 2, 3, 5, 6<br>A, B, C, D |
| **LOAD CELLS** (Excluding Hydraulic) | 1 YEAR | YES | YES | YES | YES | NO | 1, 2, 3, 5, 6<br>A, B, C, D |
| **HYDRAULIC LOAD CELLS** (When purchased with Guardian Vehicle Scale) | LIFETIME | YES | YES | YES | YES | 90 DAYS | 1, 5, 6, 8<br>A, B, C, D |
| **HYDRAULIC LOAD CELLS** (When purchased separately) | 10 YEARS | YES | YES | YES | YES | NO | 1, 5, 6, 8, 9<br>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<br>A, B, C, D, E |
| **LSC SCALE** (Deck and Below) | 3 YEARS | YES | YES | YES | YES | 90 DAYS | 1, 2, 3, 5, 6, 11<br>A, B, C, D |
| **GUARDIAN FLOOR SCALES** | 10 YEARS | YES | YES | YES | YES | NO | 1, 2, 3, 5, 6, 9, 10<br>A, B, C, D |
| **ALL OTHER CARDINAL PRODUCTS** | 1 YEAR | YES | YES | YES | YES | NO | 1, 2, 5, 6<br>A, B, C, D, E |
| **REPLACEMENT PARTS** | 90 DAYS | YES | YES | YES | YES | NO | 1, 2, 4, 5, 6<br>A, B, C, D |
| **SWIM AND 760 SERIES VEHICLE SCALES** | 1 YEAR | YES | YES | YES | YES | 90 DAYS | 1, 2, 5, 6<br>A, B, C, D |
| **SOFTWARE** | 90 DAYS | YES | N/A | N/A | N/A | NO | 1, 6<br>B, C, D |
| **CONVEYOR BELT SCALES** (including Belt-Way) | 1 YEAR | YES | YES | YES | YES | NO | 1, 2, 3, 5, 6<br>A, B, C, D, E, F |

CARDINAL®

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E-mail: cardinal@cardet.com
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Webb City, MO 64870

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

## APPLICABLE LIMITATIONS AND REQUIREMENTS

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

## EXCLUSIONS

A.) This warranty does not include replacement of consumable or expendable parts. The warranty does not apply to any item that has been damaged due to unusual wear, abuse, improper line voltage, overloading, theft, fire, water, prolonged storage or exposure while in purchaser's possession or acts of God unless otherwise stated herein.

B.) This warranty does not apply to peripheral equipment not manufactured by Cardinal. This equipment will normally be covered by the equipment manufacturer's warranty.

C.) This warranty sets forth the extent of our liability for breach of any warranty or deficiency in connection with the sale or use of our product. Cardinal will not be liable for consequential damages of any nature, including but not limited to loss of profit, delays or expenses, whether based on tort or contract. Cardinal reserves the right to incorporate improvements in material and design without notice and is not obligated to incorporate said improvements in equipment previously manufactured.

D.) This warranty is in lieu of all other warranties expressed or implied including any warranty that extends beyond the description of the product including any warranty of merchantability or fitness for a particular purpose. This warranty covers only those Cardinal products installed in the forty-eight contiguous United States and Canada.

E.) This warranty does not cover paint coatings due to the variety of environmental conditions.

F.) Do not cut load cell cables on load cells returned for credit or warranty replacement. Cutting the cable will void the warranty.

G.) Software is warranted only for performance of the functions listed in the software manual and/or the Cardinal proposal.

H.) The software warranty does not cover hardware. Warranties on hardware are provided from the hardware vendor only.

I.) The software warranty does not cover interfacing issues to non-Cardinal supplied hardware.

J.) The software warranty does not include automatic software upgrades unless purchased separately.

CARDINAL®

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E-mail: cardinal@cardet.com
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Webb City, MO 64870

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*Ph: 417-673-4631 or 1-800-641-2008*
*Fax: 417-673-2153*
*www.cardinalscale.com*

*Technical Support: 1-866-254-8261*
*E-mail: tech@cardet.com*

Printed in USA

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