



# CARDINAL®



## 825D

**SMARTCELL®**  
DIGITAL LOAD CELLS

# Weight Indicator

## Installation and Technical Manual



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## **FCC COMPLIANCE STATEMENT**

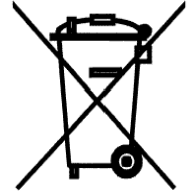
This equipment generates uses, can radiate radio frequency, and if not installed and used in accordance with the instruction manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of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



## CAUTION



**CAUTION:** RISK OF EXPLOSION IF BATTERY IS REPLACED BY AN INCORRECT TYPE. DISPOSE OF USED BATTERIES ACCORDING TO THE INSTRUCTIONS.

**ATTENTION:** RISQUE D'EXPLOSION SI LA BATTERIES EST REMPLAC'E PAR UN TYPE INCORRECT. REJETEZ LES BATTERIES UTILISE'ES SELON LES INSTRUCTIONS.

## PRECAUTIONS

Before using this indicator, read this manual and pay special attention to all "NOTIFICATION" symbols:



IMPORTANT



ELECTRICAL  
WARNING



STATIC  
SENSITIVE

# TABLE OF CONTENTS

INTRODUCTION .....	Page 1
SPECIFICATIONS .....	Page 2
HOMERUN CABLE INSTALLATION .....	Page 3
Indicator Connection .....	Page 5
Re-Installing the 825D Indicator Rear Panel .....	Page 6
825-DLC Controller Card .....	Page 7
Load Cell Connection .....	Page 9
SETUP AND CONFIGURATION .....	Page 12
Begin Setup and Configuration .....	Page 13
Login .....	Page 14
Setup Scale Number .....	Page 15
Setup DLC Card 1 .....	Page 16
Setup DLC Card 1 – Advanced Screen .....	Page 18
DLC Card 1 Cell Assignment .....	Page 21
Smart Calibration .....	Page 25
Zero Calibration .....	Page 34
Trim Cells .....	Page 37
Span Adjust .....	Page 43
DIGITAL SCALE DIAGNOSTICS .....	Page 46
On Screen Diagnostics .....	Page 46
Diagnostic Menu .....	Page 50
iSite Status of Last Connection .....	Page 65
Hardware Diagnostics .....	Page 67
DETECTING BOARD REPLACEMENTS .....	Page 68
OPTION CARD REPLACEMENT .....	Page 68
MAIN PCB REPLACEMENT .....	Page 69
825-DLC CARD REPLACEMENT .....	Page 70



# INTRODUCTION

The 825D SmartCell Weight Indicator has software specially written for communicating with digital scales. 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).

The scale must contain Cardinal Scale's SCBD SmartCell or DC Digital Load Cells to communicate with the 825D.



**825D Weight Indicator**



**825-DLC Digital Load Cell Controller**



**DC Digital Load Cell**



**SCBD Digital Load Cell**

**SMARTCELL®**  
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This manual is furnished as a guide to the setup and operation of the 825D SmartCell Weight Indicator. It has been supplied in addition to the standard 825 Weight Indicator Installation and Technical Manual, 8545-M838-O1. The standard 825 manual should be consulted for information concerning the installation, setup, and calibration of the indicator.

Please read both manuals thoroughly before attempting to install your indicator and keep them available for future reference.

# SPECIFICATIONS

Power Requirements:	100 to 240V AC (50/60 Hz) at 1A Max.
Enclosure Type:	Stainless Steel wall or desk-mount
Enclosure Size:	12"W x 9 3/4"H x 3 3/4"D (305mm W x 247mm H x 95mm D)
Weight:	16.2lbs (Includes Gimbal)
Operating Environment:	Temperature: 14 to 104 °F (-10 to +40 °C) Humidity: 90% non-condensing (maximum)
Display Size:	5.25" x 4.0" (133 mm x 102 mm)
Display Resolution:	640 x 480-pixel matrix Color Backlit LCD
Division Value:	1, 2, or 5 x 10, 1, 0.1, 0.01, 0.001 and 0.0001 commercial 0 to 99, non-commercial
Sensitivity:	
NON-COMMERCIAL	0.15 uV/e
NTEP	0.3uV/e (Class III/IIIL)
CANADA	0.3uV/e (Class III/IIHHD)
OIML	0.5 uV/e (Class III)
Scale Divisions:	
NON-COMMERCIAL	100 to 240,000
NTEP	100 to 10,000 (Class III/IIIL)
CANADA	100 to 10,000 (Class III/IIHHD)
OIML	100 to 10,000 (Class III), 1,000 (Class IIII)
Internal Resolution:	> 100,000 Counts
Tare Capacity:	Six Digits (999,999)
Sample Rate:	1 to 60 samples per second, selectable (dependent upon the number of load cells)
Auto Zero Range:	0.5 or 1 through 9 divisions
Weighing Units:	Tons, Pounds, Tonnes (Metric Tons), Kilograms, and Custom
Keypad:	Membrane type with 52 color-coded keys and using the display "touch screen", multiple programmable soft keys
Standard I/O:	2 ea bi-directional RS-232 port 1 ea bi-directional RS-232/20mA port 1 ea bi-directional RS-232/RS485 port 1 ea ICAN port 4 ea Isolated Inputs and 4 ea Isolated Outputs port 1 ea 10/100 Base-T Ethernet port 2 ea USB A Host port 1 ea USB B Device port
825-DLC Connections:	Homerun Cable - 5 position spring cage clamp (24 to 16ga wire) Ethernet Port for iSite – (1) RJ-45
Internal Connections:	36-Pin Edge Card Connector – Secured to 825 PCB by a single screw.
Homerun Cable Length:	Consult Digital Load Cell cable chart. Consult the factory for other requirements.
Number of Load Cells:	14 digital load cells with 12V power from 825D 32 digital load cells with 24V power at scale



# HOMERUN CABLE INSTALLATION

The Homerun Cable is installed between the 825D indicator and the first load cell in the loop (Start Node). Consult the chart below to determine the maximum Homerun Cable length. Note that the number of load cells in the scale determines the maximum length.

## Maximum Homerun Cable Length (Determined by Number of Load Cells in Scale)

Ft / M of 18ga Homerun Cable	NUMBER OF LOAD CELLS IN SCALE														
	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32
100 / 30	12 V	12 V	12 V	12 V	12 V	12 V	15 V	15 V	15 V	24 V	24 V	24 V	24 V	24 V	24 V
200 / 61	12 V	12 V	12 V	12 V	12 V	15 V	15 V	15 V	15 V	24 V	24 V	24 V	24 V	24 V	24 V
300 / 91	12 V	12 V	12 V	12 V	15 V	15 V	15 V	15 V	24 V	24 V	24 V	24 V	24 V	24 V	24 V
400 / 122	12 V	12 V	12 V	12 V	15 V	15 V	15 V	24 V	24 V	24 V	24 V	24 V	24 V	24 V	24 V
500 / 152	12 V	12 V	12 V	15 V	15 V	15 V	15 V	24 V	24 V	24 V	24 V	24 V	24 V	24 V	24 V
600 / 183	12 V	12 V	12 V	15 V	15 V	15 V	24 V	24 V	24 V	24 V	24 V	24 V	24 V	24 V	24 V
700 / 213	12 V	12 V	12 V	15 V	15 V	15 V	24 V	24 V	24 V	24 V	24 V	24 V	24 V	24 V	24 V
800 / 244	12 V	12 V	15 V	15 V	15 V	15 V	24 V	24 V	24 V	24 V	24 V	24 V	24 V	24 V	24 V
900 / 274	12 V	12 V	15 V	15 V	15 V	24 V	24 V	24 V	24 V	24 V	24 V	24 V	24 V	24 V	24 V
1000 / 305	12 V	12 V	15 V	15 V	15 V	24 V	24 V	24 V	24 V	24 V	24 V	24 V	24 V	24 V	24 V
1100 / 335	12 V	12 V	15 V	15 V	24 V	24 V	24 V	24 V	24 V	24 V	24 V	24 V	24 V	24 V	24 V
1200 / 366	12 V	15 V	15 V	15 V	24 V	24 V	24 V	24 V	24 V	24 V	24 V	24 V	24 V	24 V	24 V
1300 / 396	12 V	15 V	15 V	15 V	24 V	24 V	24 V	24 V	24 V	24 V	24 V	24 V	24 V	24 V	24 V
1400 / 427	12 V	15 V	15 V	15 V	24 V	24 V	24 V	24 V	24 V	24 V	24 V	24 V	24 V	24 V	24 V
1500 / 457	12 V	15 V	15 V	24 V	24 V	24 V	24 V	24 V	24 V	24 V	24 V	24 V	24 V	24 V	24 V
1600 / 488	12 V	15 V	15 V	24 V	24 V	24 V	24 V	24 V	24 V	24 V	24 V	24 V	24 V	24 V	24 V
1700 / 518	12 V	15 V	15 V	24 V	24 V	24 V	24 V	24 V	24 V	24 V	24 V	24 V	24 V	24 V	24 V
1800 / 549	12 V	15 V	15 V	24 V	24 V	24 V	24 V	24 V	24 V	24 V	24 V	24 V	24 V	24 V	24 V

Ft / M of Cable in Scale	69 / 21	123 / 37	177 / 54	231 / 70	285 / 87	339 / 103	393 / 120	447 / 136	501 / 153	555 / 169	609 / 186	663 / 202	717 / 218	771 / 235	825 / 251
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**OPTIONS (Power Required at the Scale):**

- Media box with AC power
- Glass Fiber (1 mile)
- Plastic Fiber (300 ft)
- SnapStream wireless (1 mile unobstructed line of sight – repeaters available)

### KEY

12 V — 825

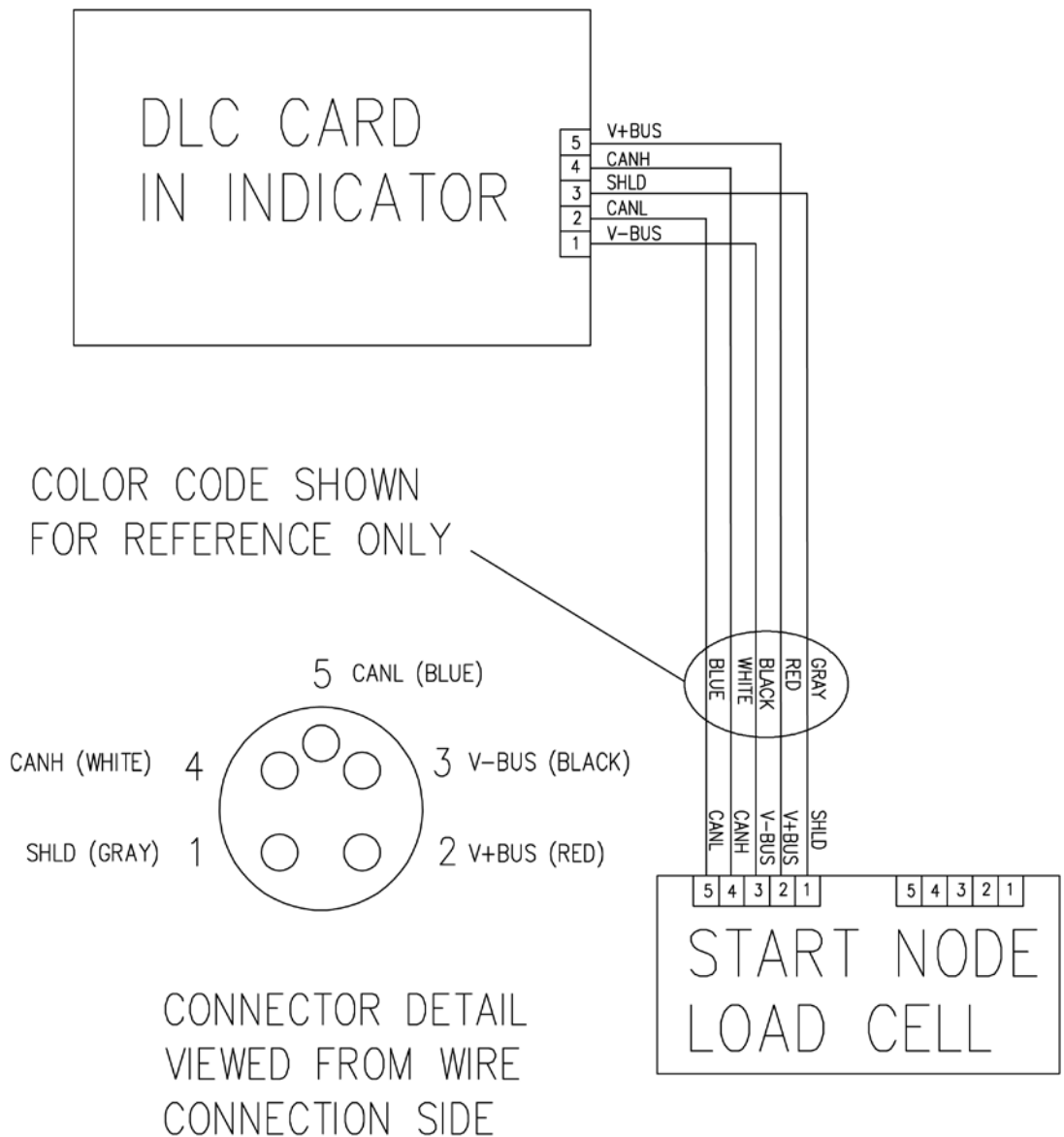
15 V — 225

24 V — Power at Scale

The Homerun Cable is made from five conductors, shielded PVC cable, and terminated in the 825D at the P1 terminal block. The load cell end is terminated with a 5-pin spring cage connector, from the Home Run Cable Connector Pack. Refer to the table below for cable and connector information.

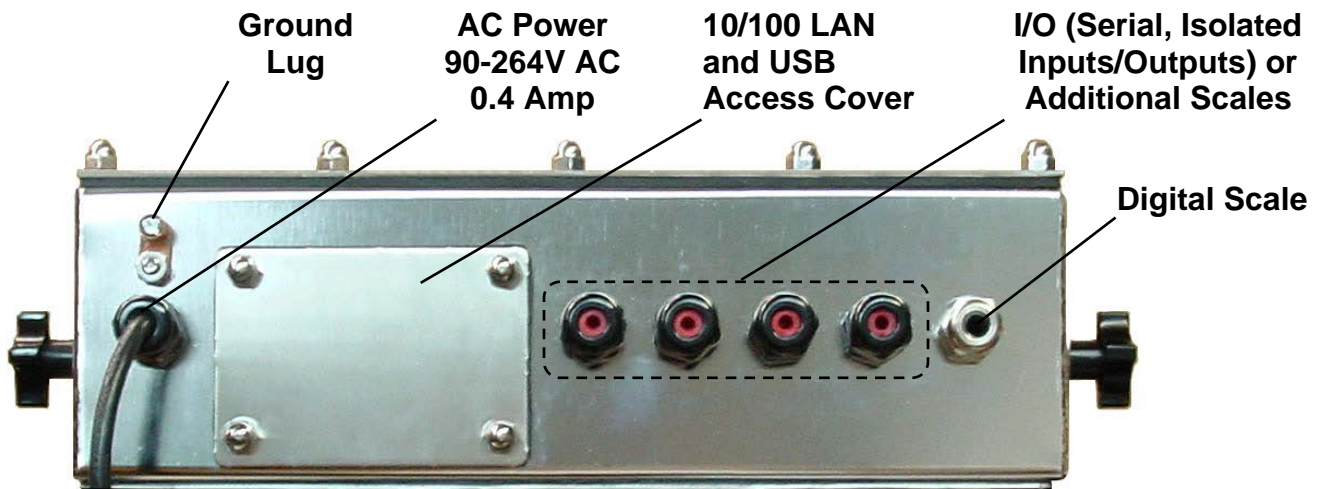
**Cable and Connector Information**

ITEM and DESCRIPTION	CARDINAL PART NO.
HOMERUN CABLE, 5 CONDUCTORS, SHIELDED PVC (CONTAINS 2 x 18AWG, 2 x 22AWG, AND 1 x 22AWG)	6980-1092
CONNECTOR PACK, HOME RUN CABLE (INCLUDES 5-PIN SPRING CAGE CONNECTOR, 6610-1258)	3502-0681-0A
RECOMMENDED HOMERUN CABLE BELDEN 5303FE, 18 AWG, 5 CONDUCTORS	SUPPLIED BY DEALER



## Indicator Connection

The homerun cable should be routed through the metallic gland connector installed in the 825D rear panel (lower right).

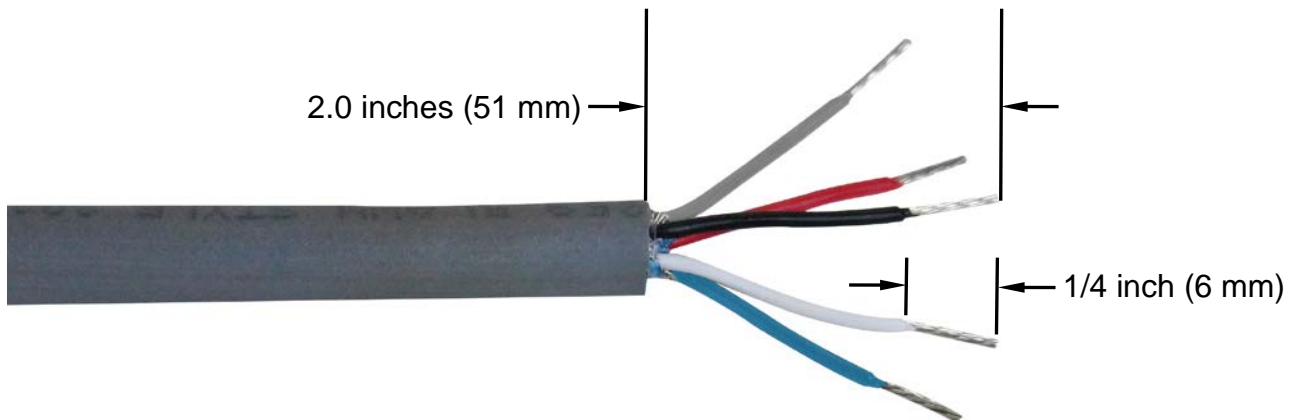


1. Remove the fourteen acorn nuts securing the rear panel assembly to the main housing.
2. Lift the rear panel from the main housing, taking care not to stretch the cable and wires between the panel and main housing. Lay the rear panel on the workbench next to the indicator.



**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.



## Indicator Connection, Cont.

4. Route the homerun cable through the nut and plastic insert and into the enclosure.
5. With the homerun cable routed into the enclosure, remove approximately 2.0 inches (51 mm) of the cables' outer jacket, exposing the internal wires.
6. Next, remove approximately 1/4 inch (6 mm) of insulation from each of the five wires.
7. Remove the screw securing the 825-DLC Controller to the 825D main PC board and then lift the 825-DLC straight up to remove it from the enclosure
8. Referring to the table below (or on the circuit board) for terminal connections, connect each wire to terminal block P1 on the 825-DLC Controller.

**825DLC Controller Card P1 Terminal Connections**

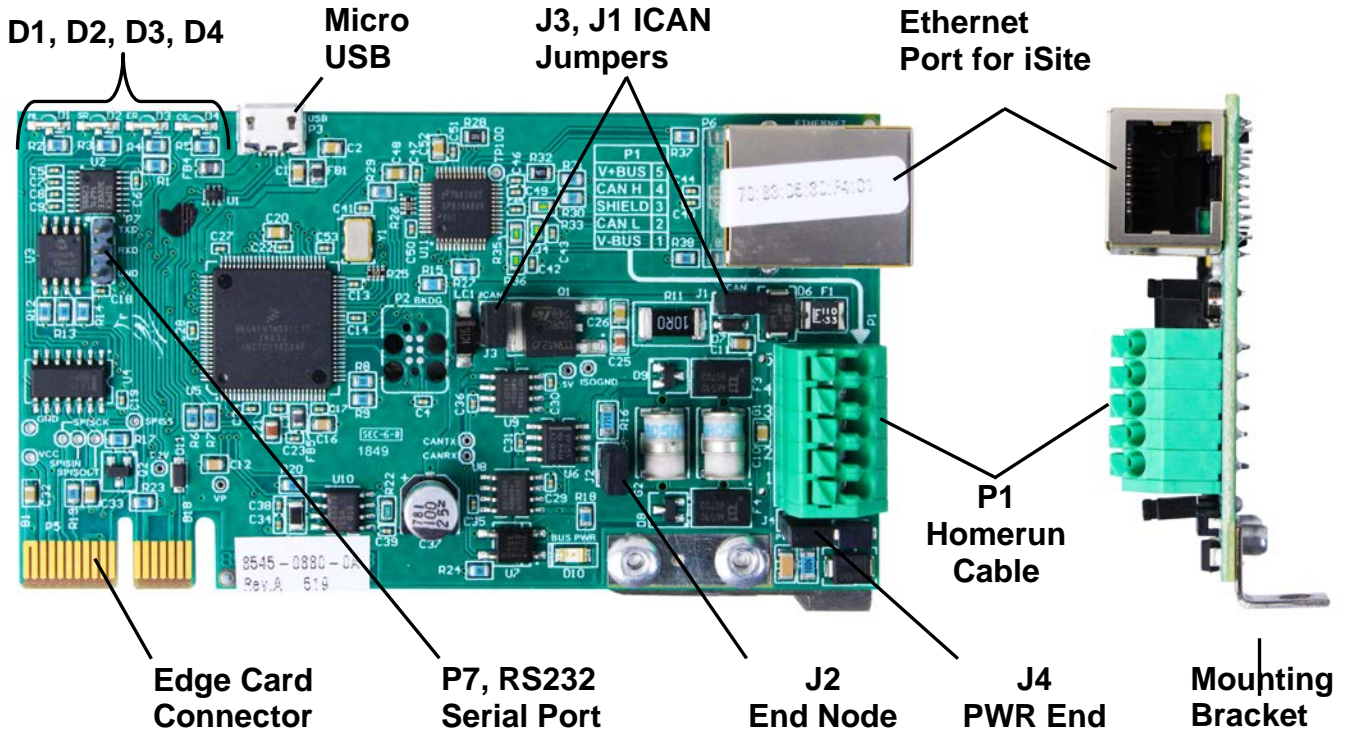
<b>Board Label</b>	<b>Homerun Cable Wire Color</b>	<b>Wire Color if using a Load Cell Cable</b>
SHLD	GRAY	BROWN
V+BUS	RED	WHITE
V-BUS	BLACK	BLUE
CAN H	WHITE	BLACK
CAN L	BLUE or LIGHT BLUE	GRAY

9. 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.
10. Repeat steps 8 and 9 until all five wires of the homerun cable are installed in the P1 terminal block on the 825DLC controller card.
11. 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.
12. Secure the 825-DLC to the main PC board with the screw removed earlier.
13. Remove the excess cable from the indicator enclosure.
14. Insert the plastic insert into the metal gland connector, and finger-tighten the metal gland connector nut and each of the black gland connectors.

## Re-Installing the 825D Rear Panel

1. After all terminations have been made, and the 825-DLC is secured to the main PC board, ensure that all excess cable has been removed 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 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).

## 825-DLC Controller Card



### J2, End Node Jumper

Jumper J2 is the CAN bus END NODE jumper and should be ON (installed).

**NOTE:** The 825D is one end of the CAN bus connections and 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 (source) 12V DC to the digital load cells in the scale. To operate from an external power source, such as the model MB-AC media box or an external 12V to 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 jumpers must be OFF (on one pin only or removed), and 12V to 24V DC must be applied to the V+BUS terminal with a ground return to the V-BUS terminal of the P1 terminal block.

### J4, PWR END

This jumper should be installed if the power to the digital load cells in the scale over the CAN bus cable (Homerun Cable) is provided by the 825D and not an external power source.

### **P1, CAN Connection to Scale (Homerun Cable)**

The P1 terminal block is used to connect the homerun cable between the 825D indicator and the first load cell in the loop (Start Node in the scale). Refer to the table below for terminal connections.

**825DLC Controller Card P1 Terminal Connections**

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

### **Micro USB**

This connector is used to perform firmware updates to the 825-DLC controller card.

### **P6, Ethernet**

This connector is used to connect the 825D to your network to send information to iSite.

### **P7, RS232 Serial Port**

The P7 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.



## Load Cell Connection

The Homerun Cable is installed between the first load cell in the loop (Start Node) and the 825D indicator. It is made from five conductors, shielded PVC cable, and terminated with the *included* 5-pin actuation lever-type connector from the Homerun Cable Connector Pack. Refer to the table below for cable and connector information.

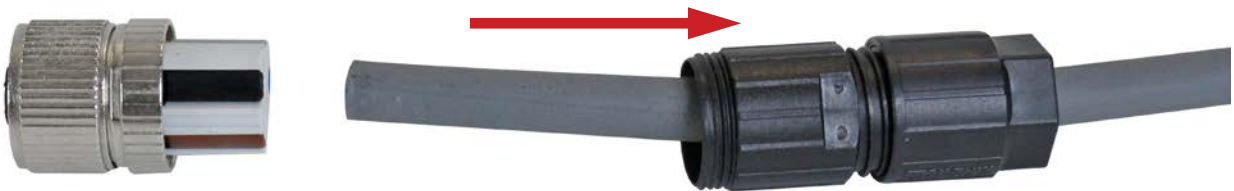
### Cable and Connector Information

ITEM and DESCRIPTION	CARDINAL PART NO.
HOMERUN CABLE, 5 CONDUCTORS, SHIELDED PVC (CONTAINS 2 x 18AWG, 2 x 22AWG, AND 1 x 22AWG)	6980-1092
BAGGED CONNECTOR AND INSTRUCTION SHEET (INCLUDES 5-PIN ACTUATION LEVER TYPE CONNECTOR, 6610-1308)	3502-0681-0A



**IMPORTANT:** Clean the load cell connectors and the homerun connector plug with electrical contact cleaner, and then apply dielectric grease to the homerun connector plug before installing it into the load cell connector.

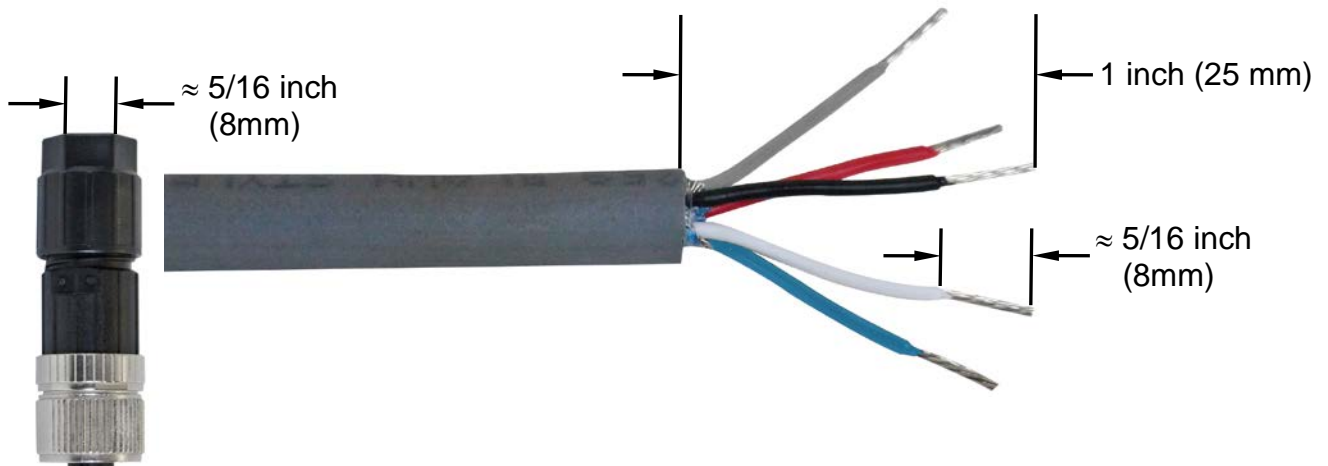
1. Dis-assemble the connector (unscrew the black plastic part of the connector from the metal part), and then slide the black plastic part onto the homerun cable.



2. With the homerun cable routed through the black plastic part of the connector, remove approximately 1 inch (25 mm) of the cable's outer jacket, exposing the internal wires.
3. Next, remove approximately 5/16 inch (8 mm) of insulation from each of the five wires.



**NOTE:** The hex part of the black plastic cable clamp is approximately 5/16 inches (8 mm) and can be used as a guide for stripping the wires.



## Load Cell Connection, Cont.

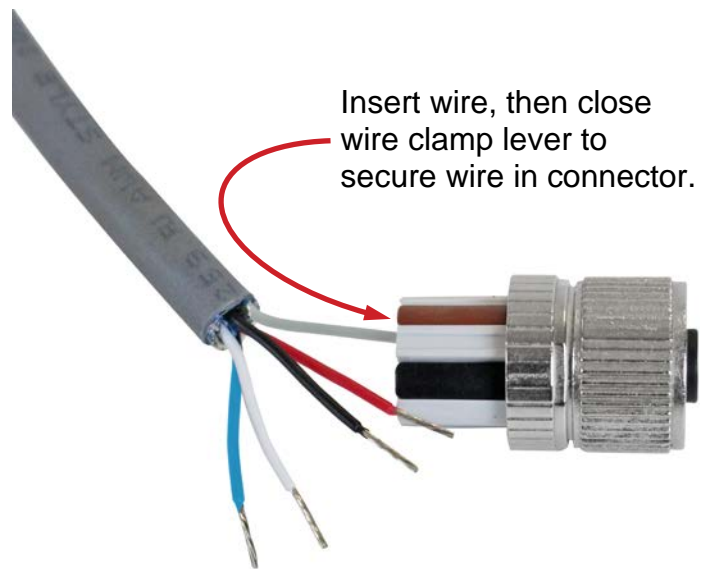
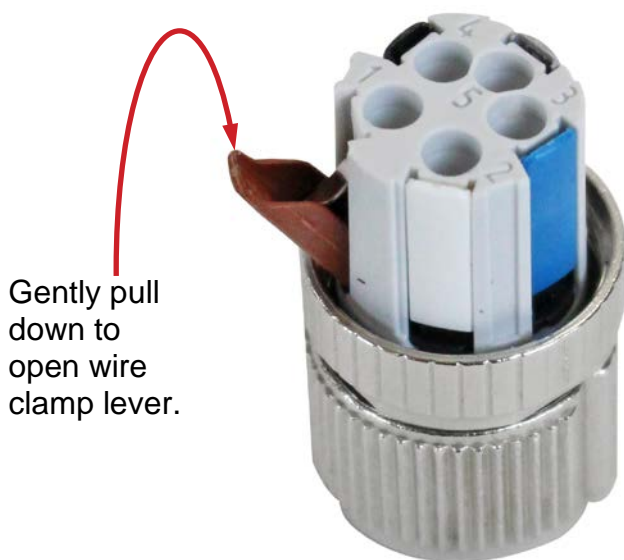


Refer to the Homerun Connector Wiring Color Code Table below when performing steps 4 through 7.

**Homerun Connector Wiring Color Code Table**

Connector Pin Number	Lever Color	Signal	Homerun Cable Wire Color	Wire Color if using a Load Cell Cable
1	BROWN	SHLD	GRAY	BROWN
2	WHITE	V+BUS	RED	WHITE
3	BLUE	V-BUS	BLACK	BLUE
4	BLACK	CAN H	WHITE	BLACK
5	GRAY	CAN L	BLUE or LIGHT BLUE	GRAY

- Looking at the end of the metal part of the connector where the wires are inserted, use your fingernail and gently pull a wire clamp lever down away from the body of the connector.
- Insert the wire into the appropriate connector opening, and then close the wire clamp lever.
- Verify that the wire is being held securely in the connector by lightly pulling on the wire.



- Repeat steps 4 through 6 until all five wires of the homerun cable are installed in the metal part of the connector.

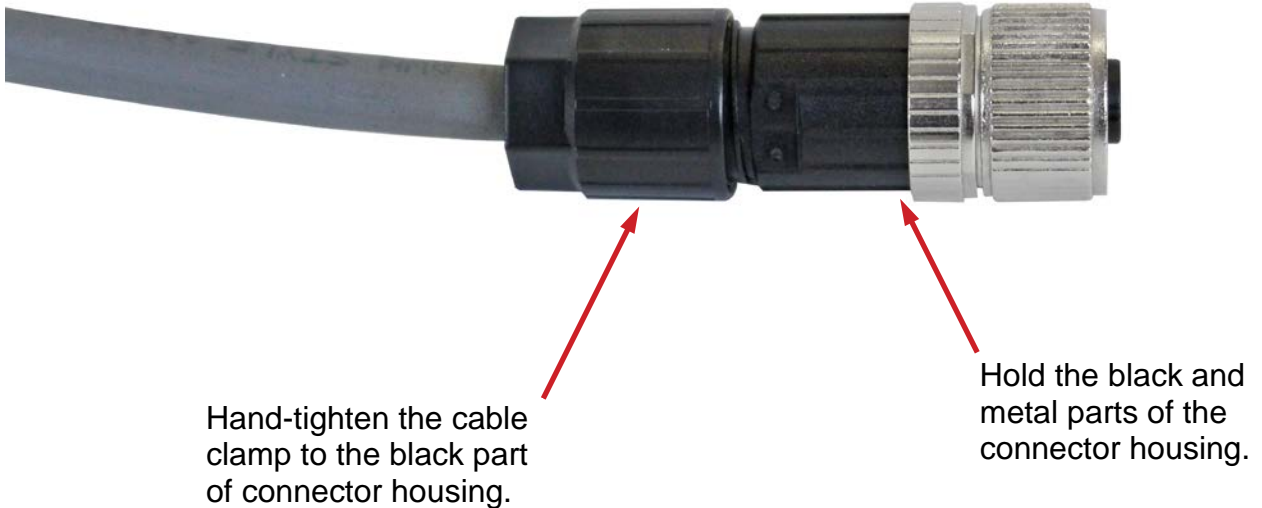


## Load Cell Connection, Cont.

8. After all connections have been made, slide the black plastic and metal connector parts together, and then screw them together by hand-tightening.



9. To complete the assembly, hold the black and metal parts of the connector housing, and then hand-tighten the cable clamp to the black plastic part of the connector housing.



**NOTE:** For reference, the image below, shows the cable clamp separated from the connector housing in order to view the cable clamp collar.

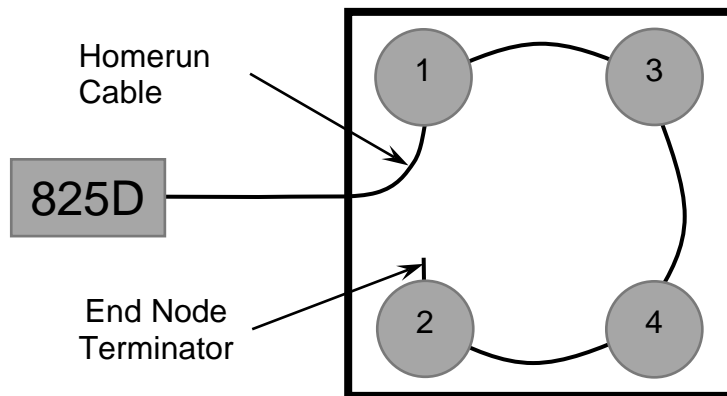


# SETUP AND CONFIGURATION

All digital scales using Cardinal Scale's SCBD SmartCell® or DC digital load cells are connected together with a daisy-chained CAN (Controller Area Network) cable. The load cell connection loop can begin at any load cell and may continue clockwise as shown or counter-clockwise if preferred. Note that in the tank/hopper example below there is not a connection between cells 1 and 2 and in the truck scale example, there is not a connection between cells 4 and 6.

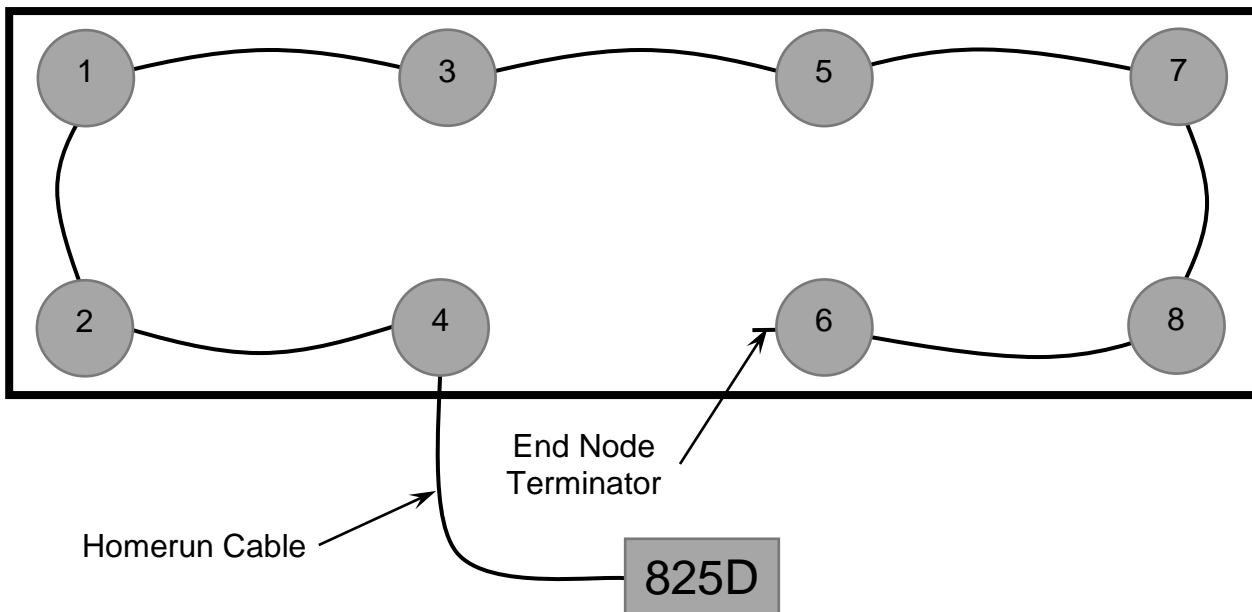
**NOTE:** Be sure to insert the end node termination plug on the load cell at end of the loop as shown in both examples.

*Example: Typical Tank/Hopper Configuration*



**NOTE:** If the loop were run in the other direction, the sequence would then be 2-4-3-1 with load cell 1 having the End Node Terminator installed on it.

*Example: Typical Truck Scale Configuration*



**NOTE:** If the loop were run in the other direction, the sequence would then be 6-8-7-5-3-1-2-4 with load cell 4 having the End Node Terminator installed on it.



## 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.

### Setup Menu

Press :

1. Date/Time

2. Communication

3. Calibration

4. Update software menu

5. Preferences

6. Diagnostics

7. Operators

MAC Address: 70:B3:D5:48:85:84

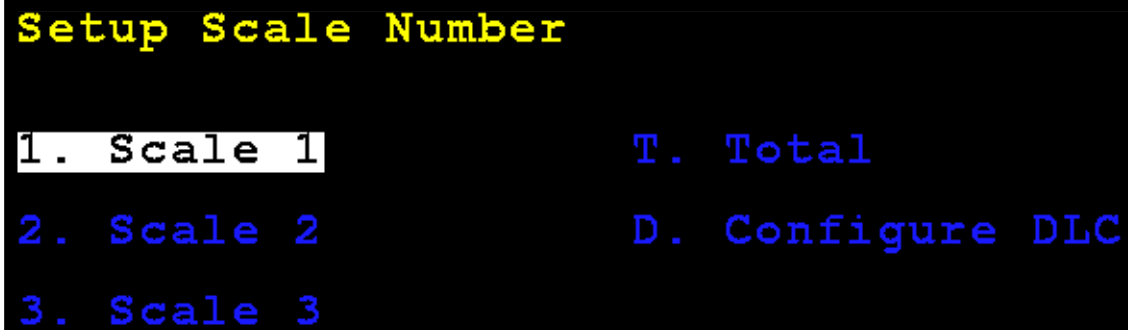
### 3. Calibration

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

### 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 Scale Number

1. Scale 1          T. Total
2. Scale 2          D. Configure DLC
3. Scale 3
```

## Setup DLC Card 1

```
Setup DLC Card 1

Scales:      3  iSITE SO:123456
Cells:       12 DHCP:      No
First Cell:  1  IP:        192.168.75.210
Last Cell:   2  Netmask:   255.255.255.0
              Gateway:    192.168.75.1
              Man DNS:    Yes
              DNS 1:      8.8.8.8
              DNS 2:      8.8.4.4
              Advanced:  No
```

**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

### Setup DLC Card 1

Server:Yes Port:10001

Ping: Yes

:www.aws.com

13.249.72.61 17ms

13.249.72.61 17ms

13.249.72.61 17ms

13.249.72.61 17ms

Press any key

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](http://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 a URL is input that does not respond, the display will show the web address and TIMEOUT indicating the URL is not responding to the ping.

```
Setup DLC Card 1

Server:Yes   Port:10001

Ping: Yes
:WWW.NOTREALSITE.COM

199.59.242.153  TIMEOUT
199.59.242.153  TIMEOUT
199.59.242.153  TIMEOUT
199.59.242.153  TIMEOUT

Press any key
```

For example, the URL used in the above screen, [WWW.NOTREALSITE.COM](http://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:

### Setup DLC Card 1

Server:Yes Port:10001

Ping: Yes

:WWW.JJSEASKCCERIOP.NET

WWW.JJSEASKCCERIOP.NET NOT FOUND

Press any key

## DLC Card 1 Cell Assignment

The left side of the column shows the existing programmed IDs and scale number assigned for each cell.

If any cells 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

Num	Cell ID	Scale	Unassigned ID
> 1	1D6BFF0F	1	
2	15D64531	1	
3	0B5B616F	1	
4	101BA5C1	1	
5	115DC621	2	
6	049AED9F	2	
7	0B2E2ECF	2	
8	0AF79DC1	2	
9	03573F3F	3	
10	043105FF	3	
11	120B5F6F	3	
12	090F1F4F	3	

Use navigation keys to move selection  
Press SPACE to configure selected item  
Press 'U' to unassign selected item

## 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 cell IDs. The up/down navigation keys may be used to select a specific cell.

### Assign Cell

Select the next cell to assign on the right column and press the **A** key to assign it to the next unassigned cell (cell ID 00000000). The ID will then appear on the assigned list on the left.

DLC CARD 1 CELL ASSIGNMENT					
Num	Cell ID	Scale		Unassigned ID	
1	1D6BFF0F	1	>	1	043105FF
2	15D64531	1		2	120B5F6F
3	0B5B616F	1		3	090F1F4F
4	101BA5C1	1			
5	115DC621	2			
6	049AED9F	2			
7	0B2E2ECF	2			
8	0AF79DC1	2			
9	03573F3F	3			
10	00000000	3			
11	00000000	3			
12	00000000	3			

Use navigation keys to move selection  
Press 'A' to assign selected item to  
first available cell number

## DLC Card 1 Cell Assignment, Cont.

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

DLC CARD 1 CELL ASSIGNMENT			
Num	Cell ID	Scale	Unassigned ID
1	1D6BFF0F	1	> 1 120B5F6F
2	15D64531	1	2 090F1F4F
3	0B5B616F	1	
4	101BA5C1	1	
5	115DC621	2	
6	049AED9F	2	
7	0B2E2ECF	2	
8	0AF79DC1	2	
9	03573F3F	3	
10	043105FF	3	
11	00000000	3	
12	00000000	3	

Use navigation keys to move selection  
Press 'A' to assign selected item to  
first available cell number

## DLC Card 1 Cell Assignment, Cont.

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.

```
DLC CARD 1 CELL ASSIGNMENT

Num      Cell ID      Scale      Unassigned ID
  1      1D6BFF0F      1          1  120B5F6F
  2      15D64531      1          2  090F1F4F
  3      0B5B616F      1
  4      101BA5C1      1
  5      115DC621      2
  6      049AED9F      2
  7      0B2E2ECF      2
  8      0AF79DC1      2
  9      03573F3F      3
 10      043105FF      3
> 11      00000000      3
 12      00000000      3

Cell ID: 120B5F6F
Scale:   3
```

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.

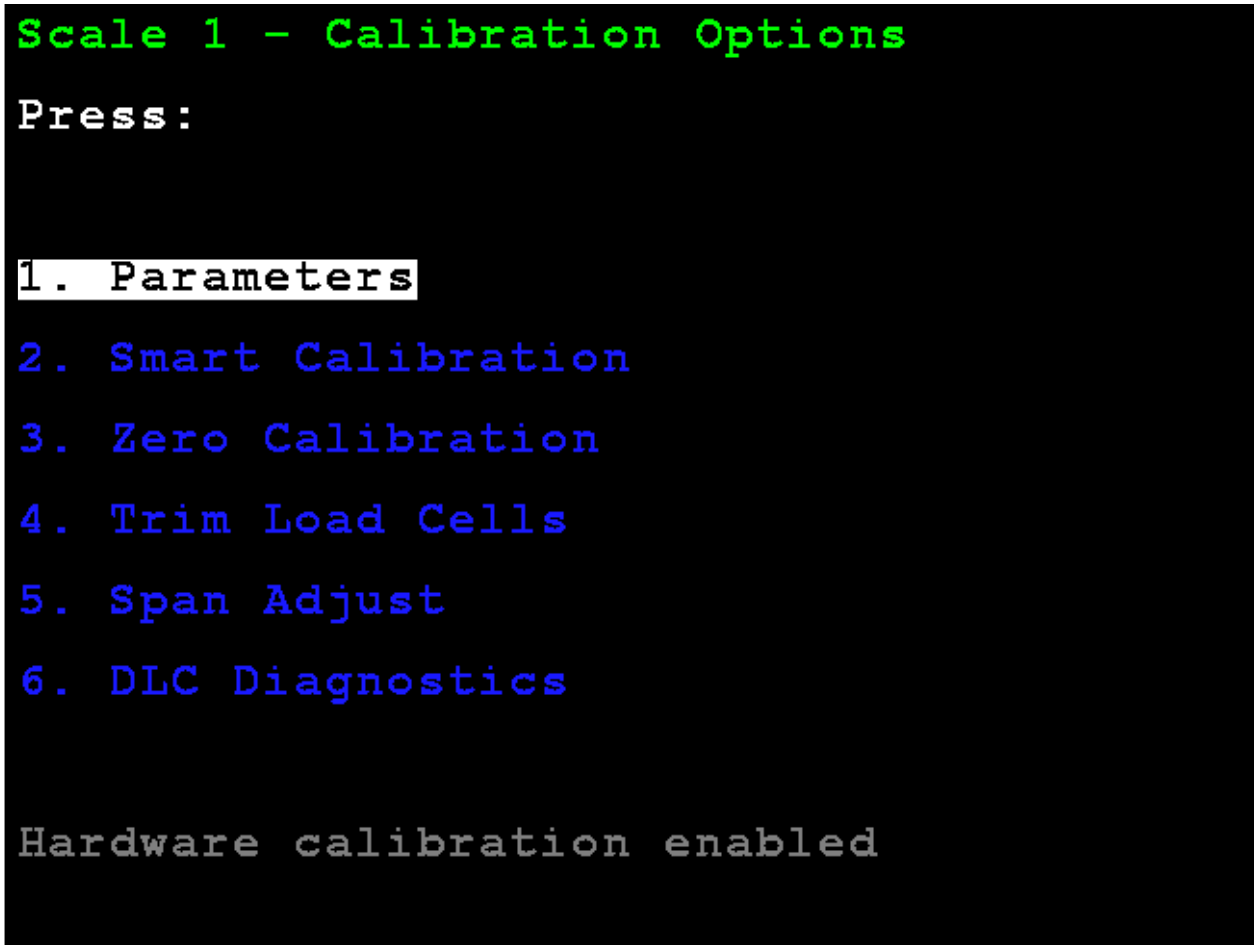
Select a scale to configure or calibrate:

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

## Smart Calibration

### 2. Smart Calibration

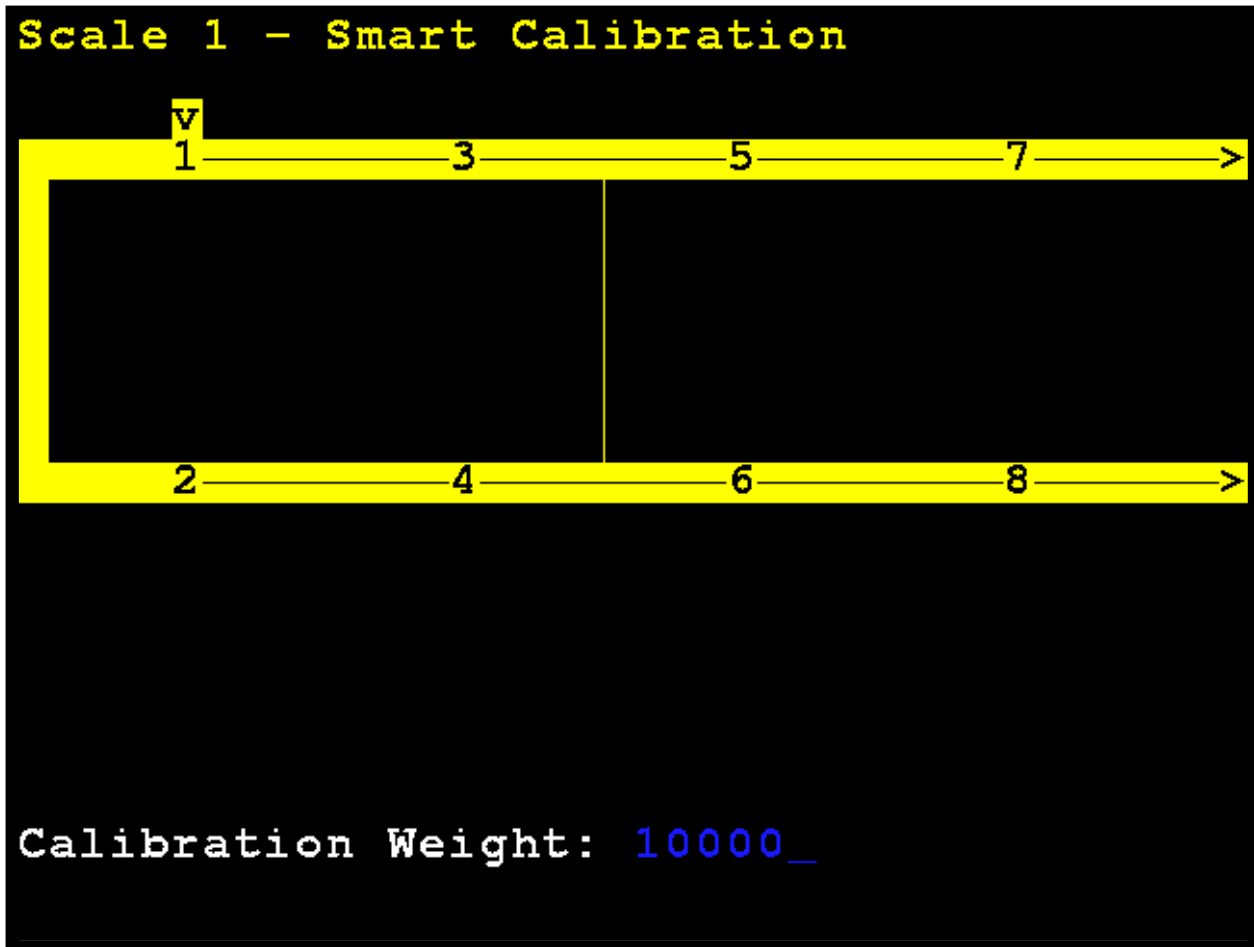
With the **Scale 1 - Calibration Options** screen displayed, press the **2** key or use the Navigation Keys to select (highlight) **2. Smart Calibration**, and then press the **ENTER** key.



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

## Smart Calibration, Cont.

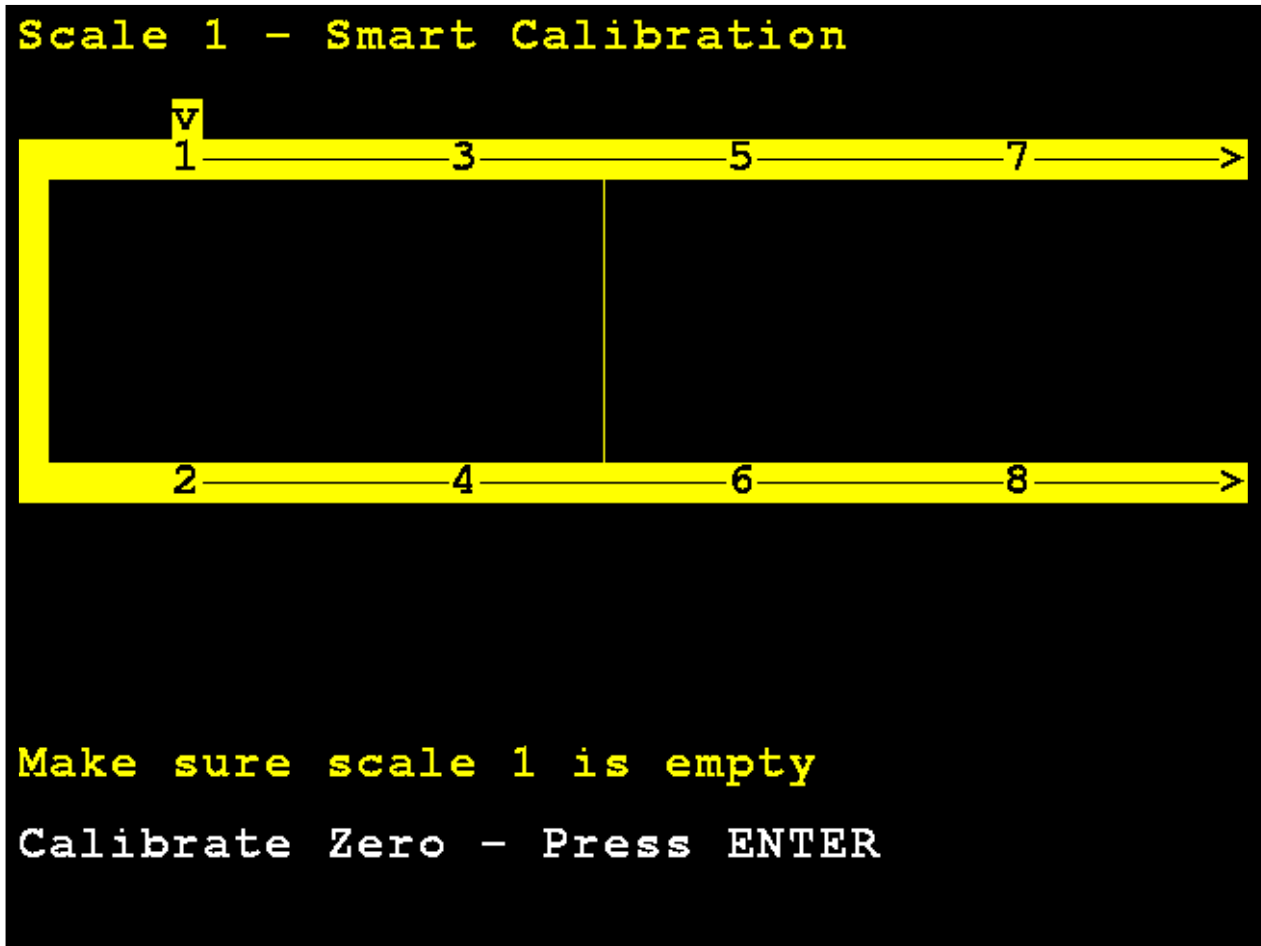
With the **Scale 1 - Smart Calibration** screen displayed, enter the weight value of the test weight to be used.





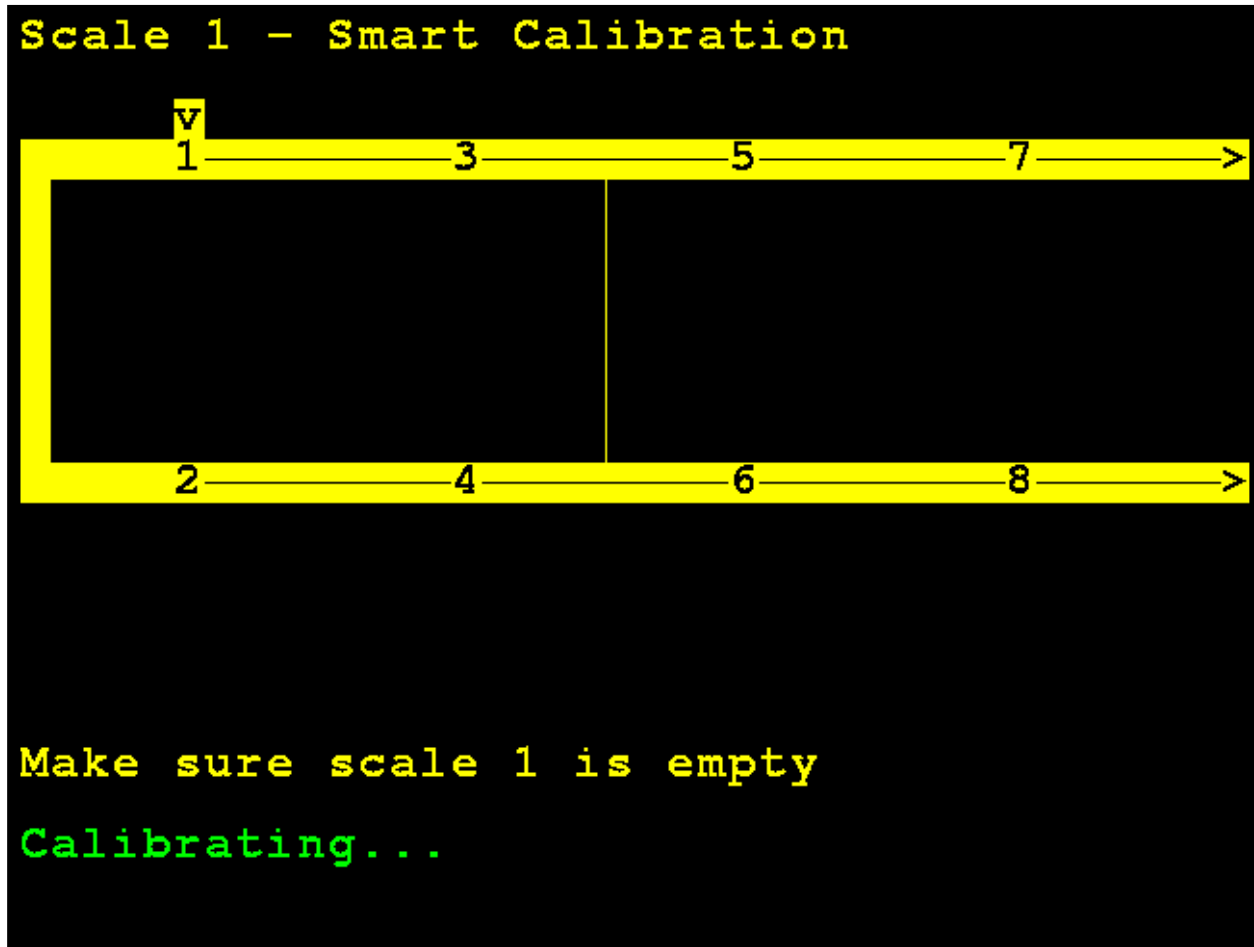
## Smart Calibration, Cont.

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



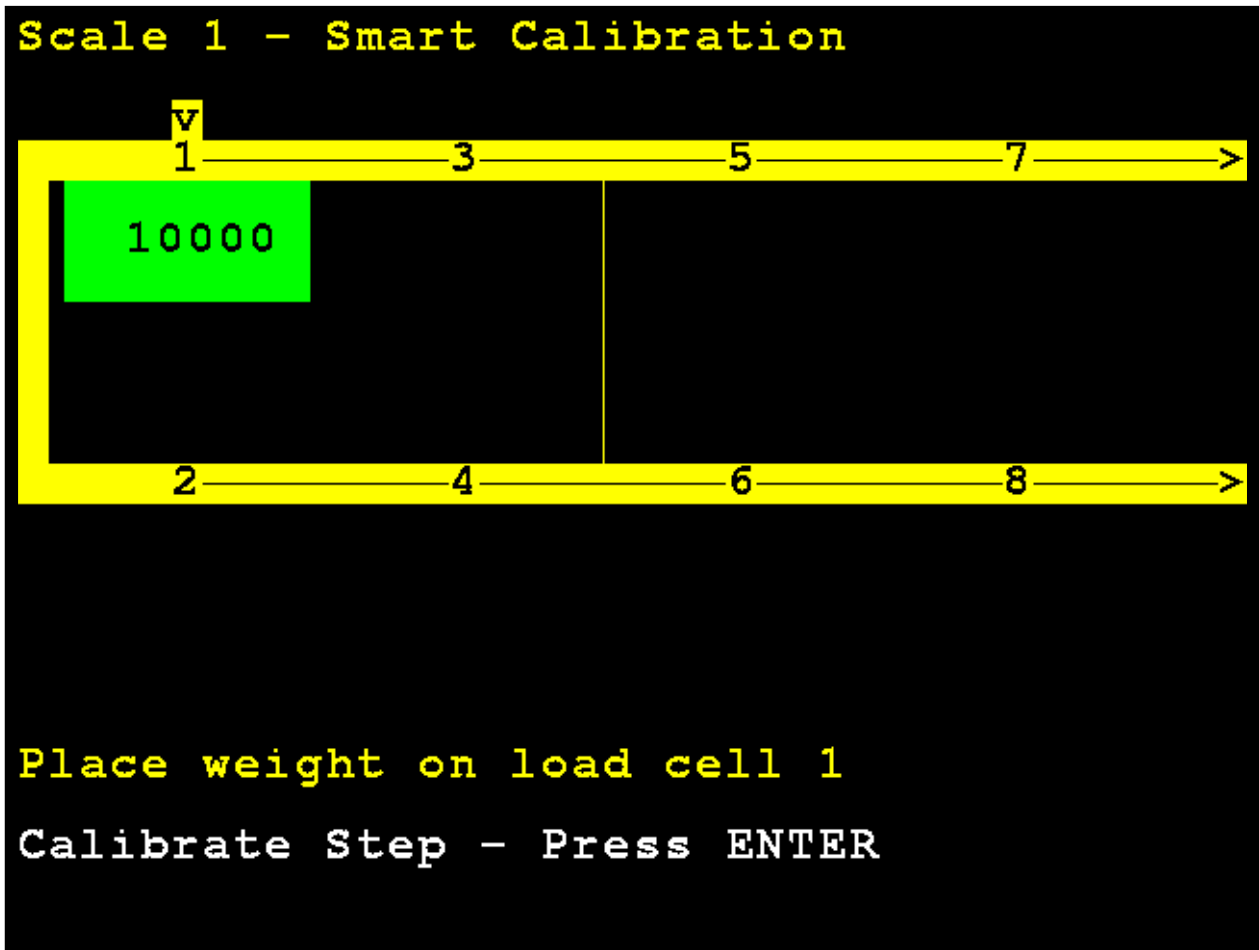
## Smart Calibration, Cont.

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



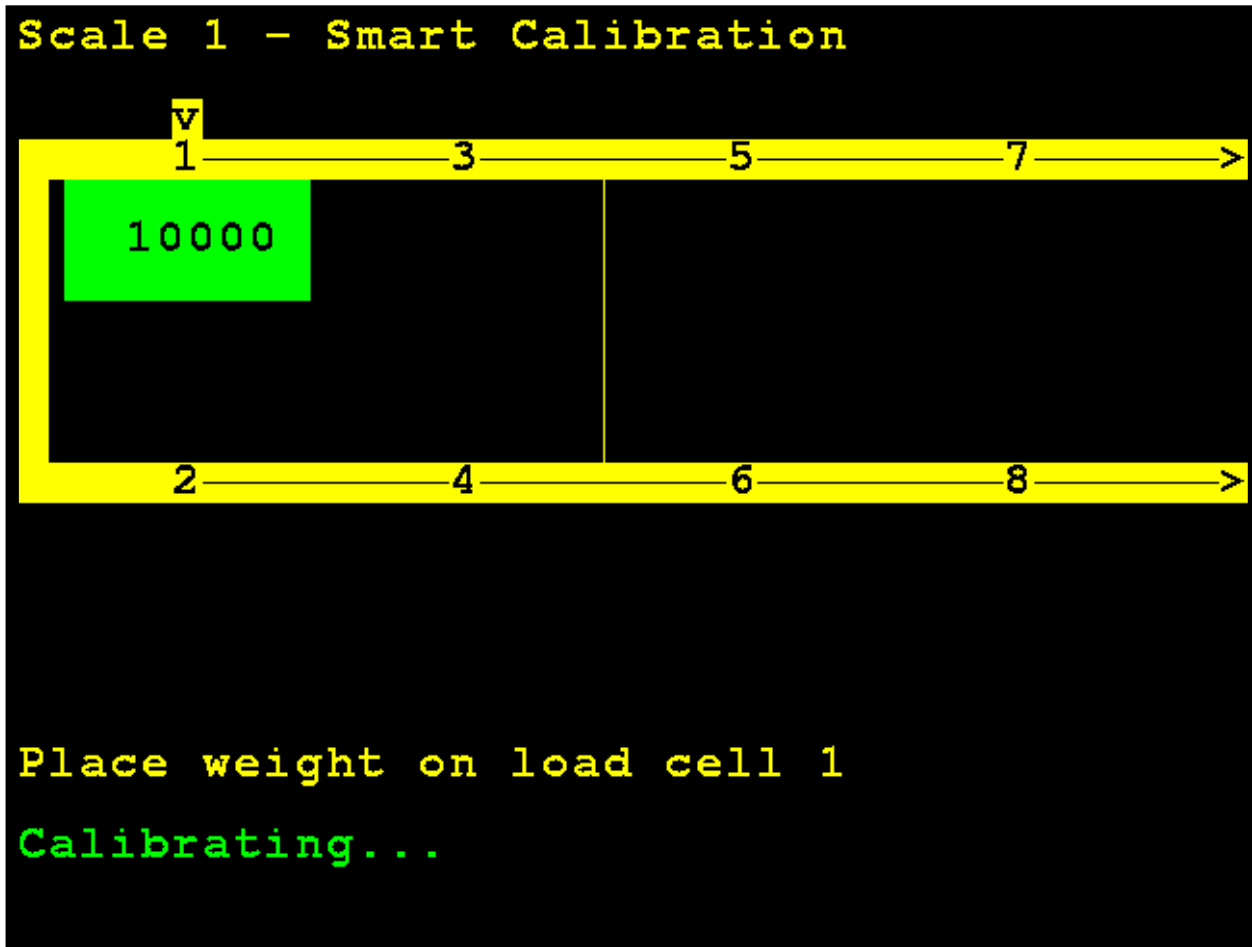
## Smart Calibration, Cont.

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



## Smart Calibration, Cont.

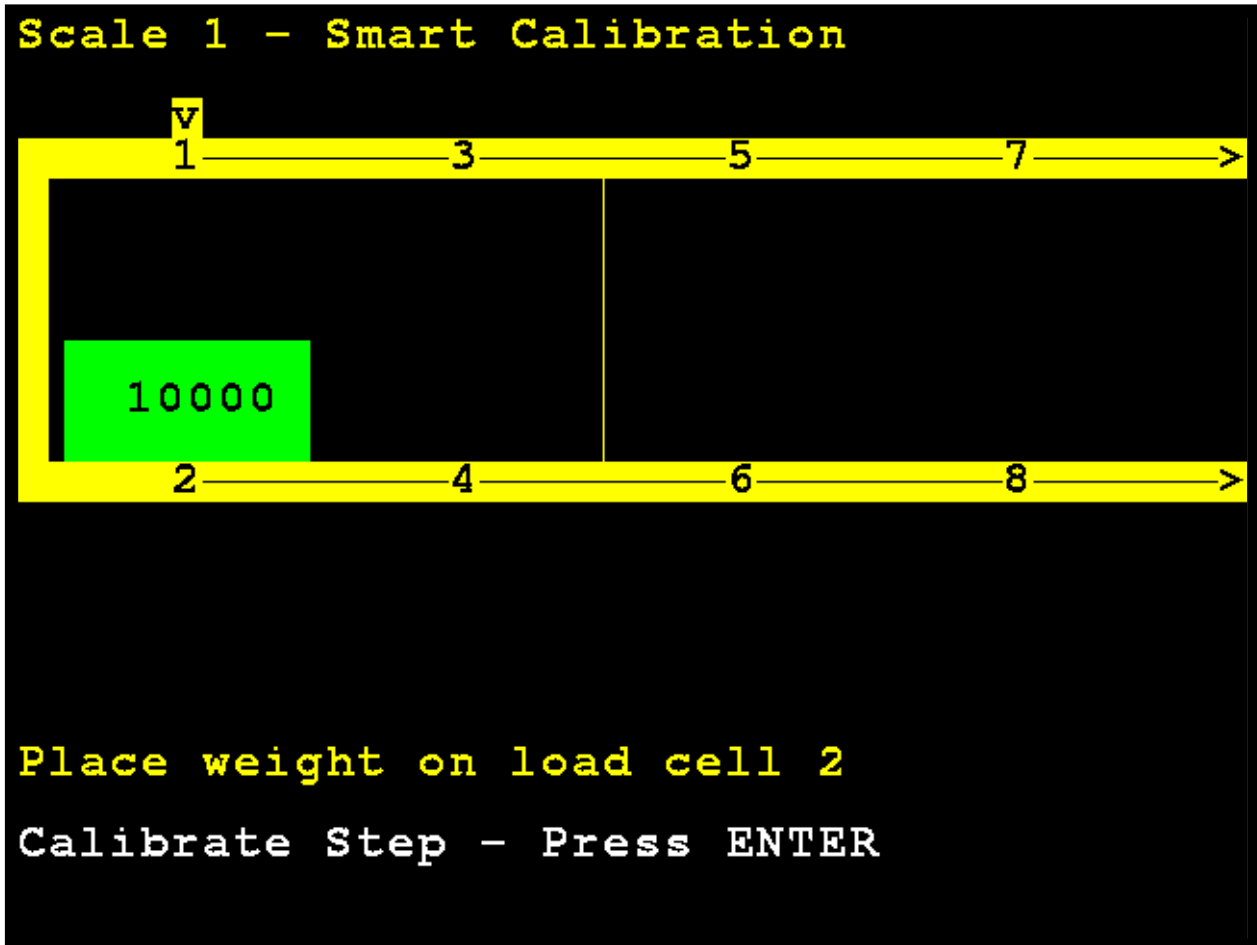
The 825D display will change to show that it is calibrating the weight on load cell 1.



## Smart Calibration, Cont.

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

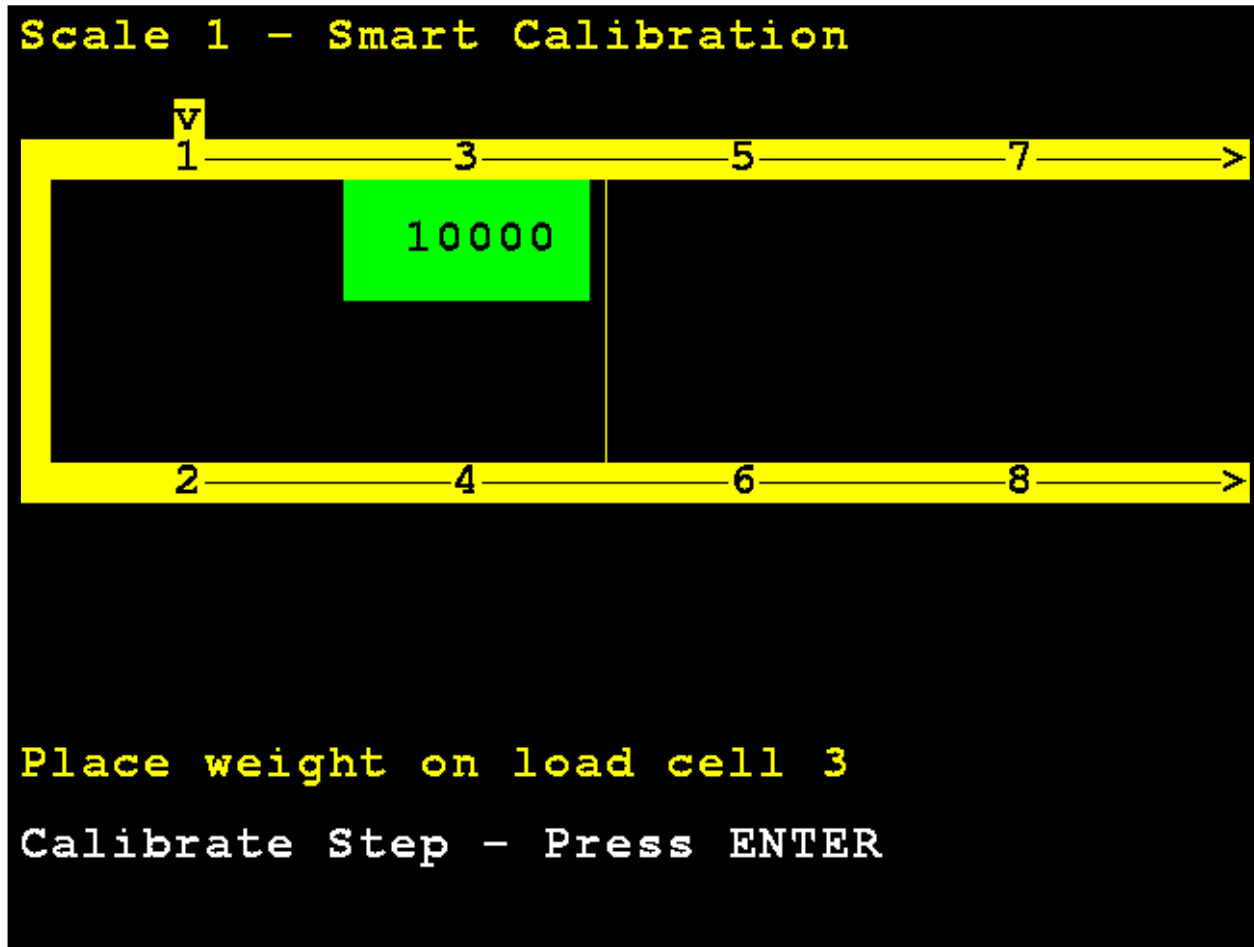
The 825D display will change to show that it is calibrating the weight on load cell 2.



## Smart Calibration, Cont.

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

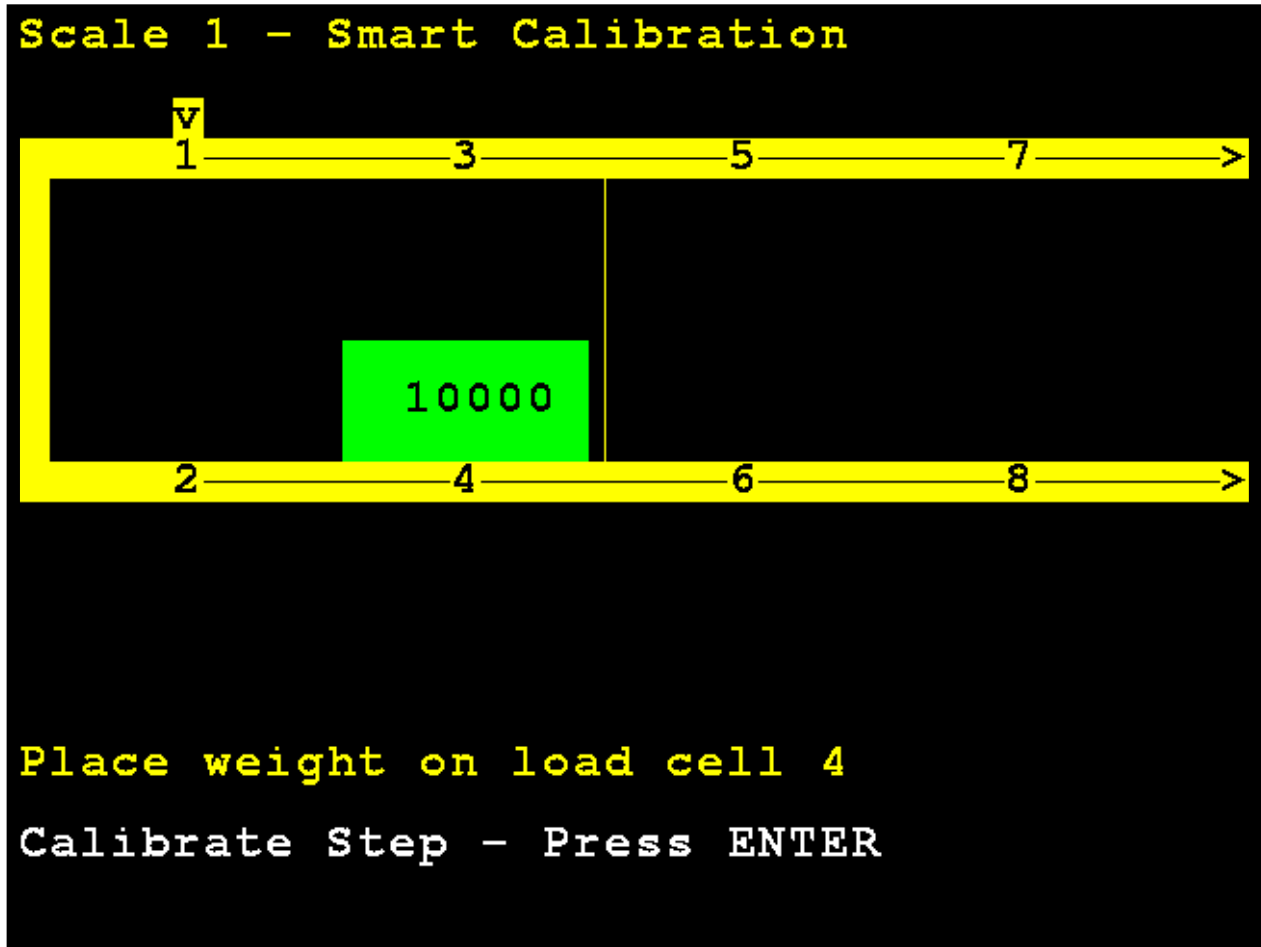
The 825D display will change to show that it is calibrating the weight on load cell 3.



## 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

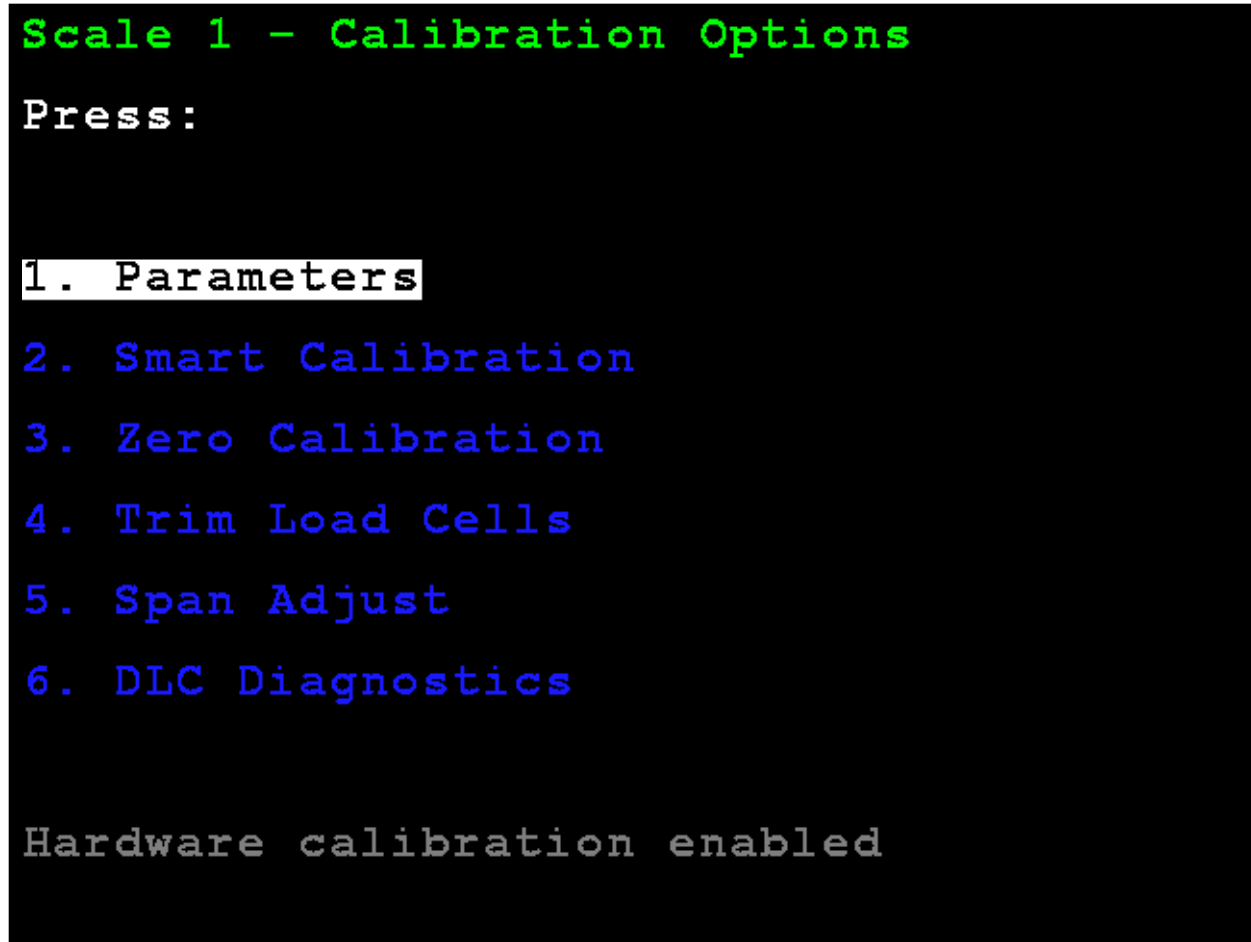
Otherwise, the calibration pattern will be sequential:

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.

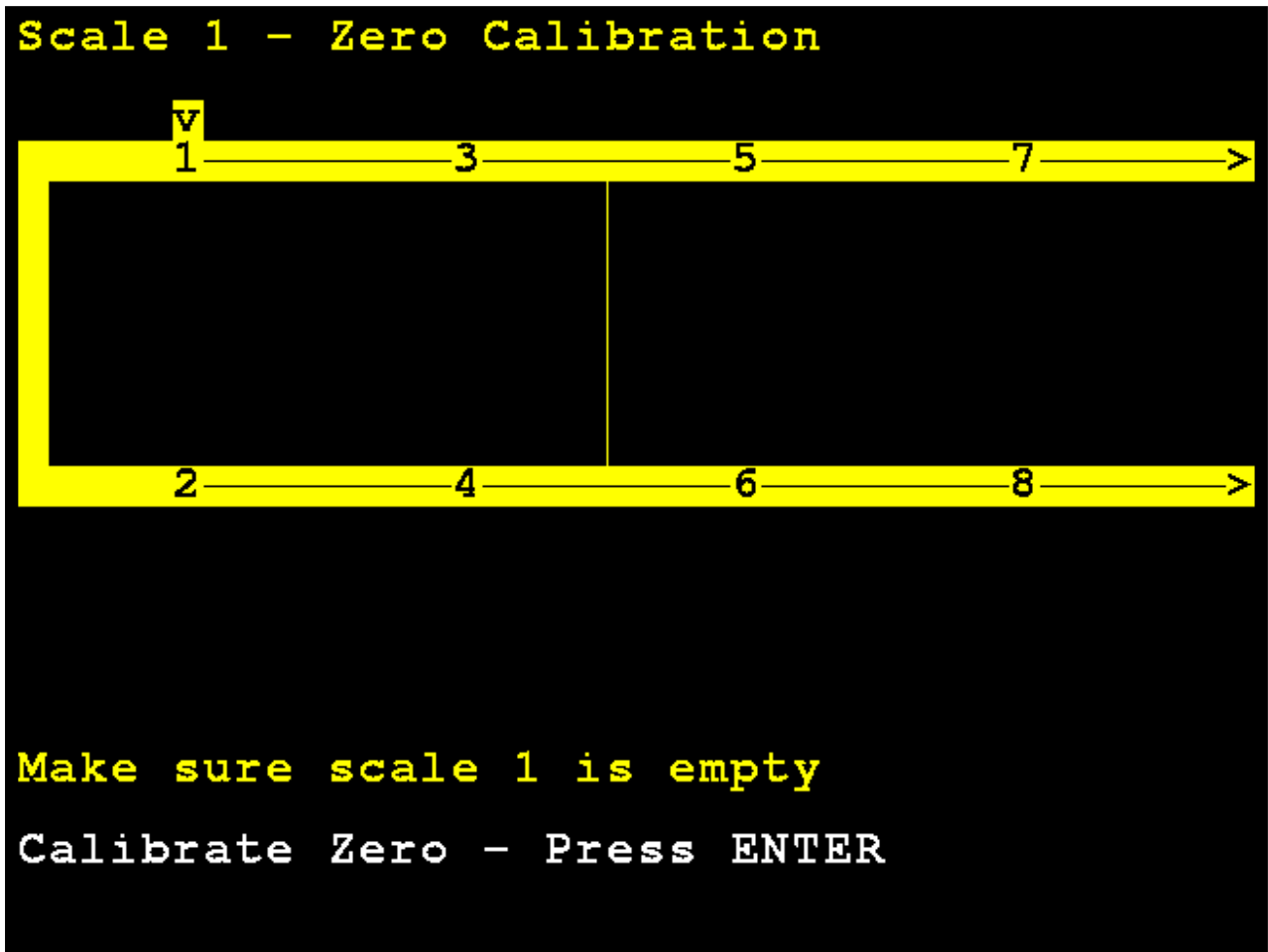


The display will change to show the **Scale 1 - Zero Calibration** screen.



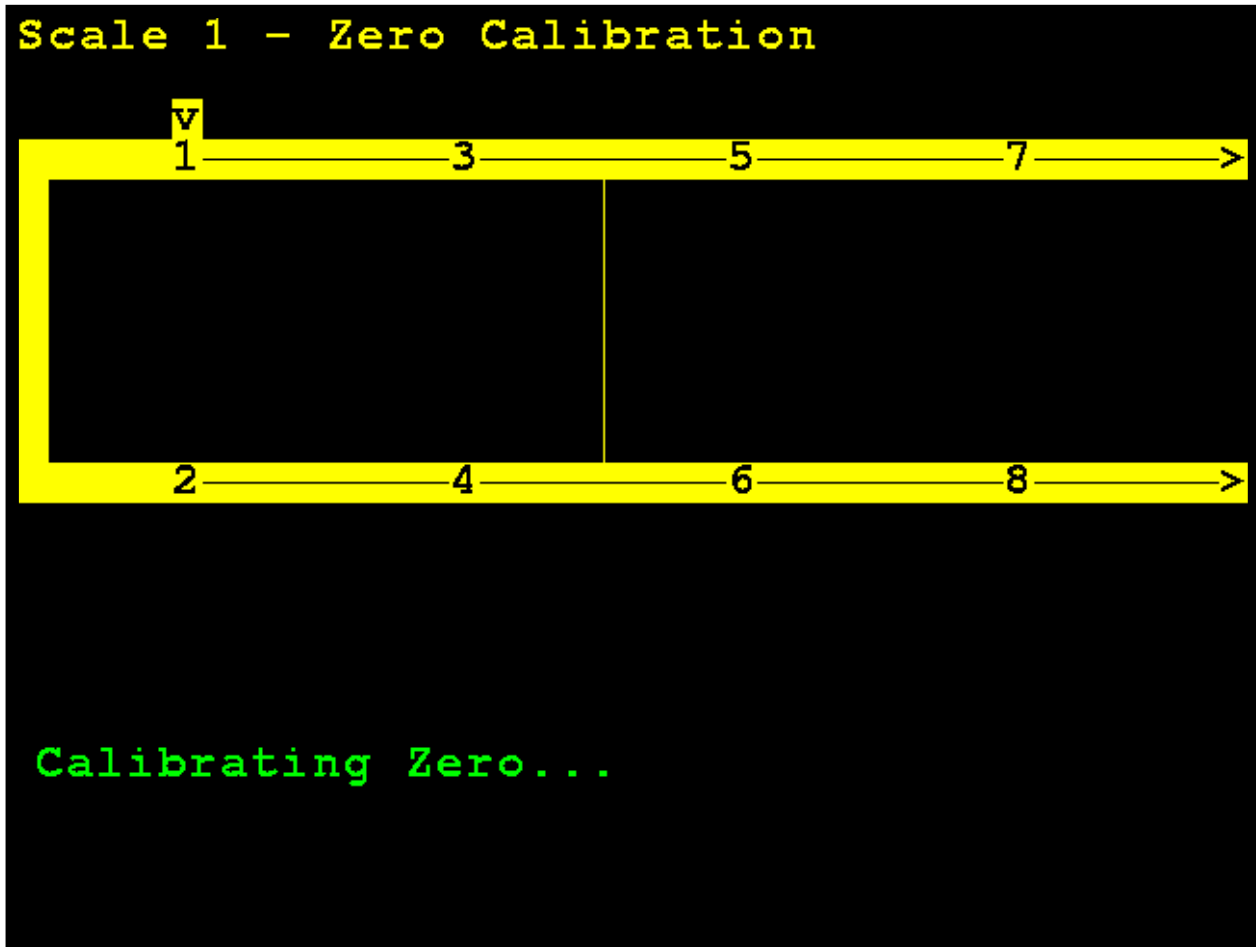
## Zero Calibration, Cont.

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.

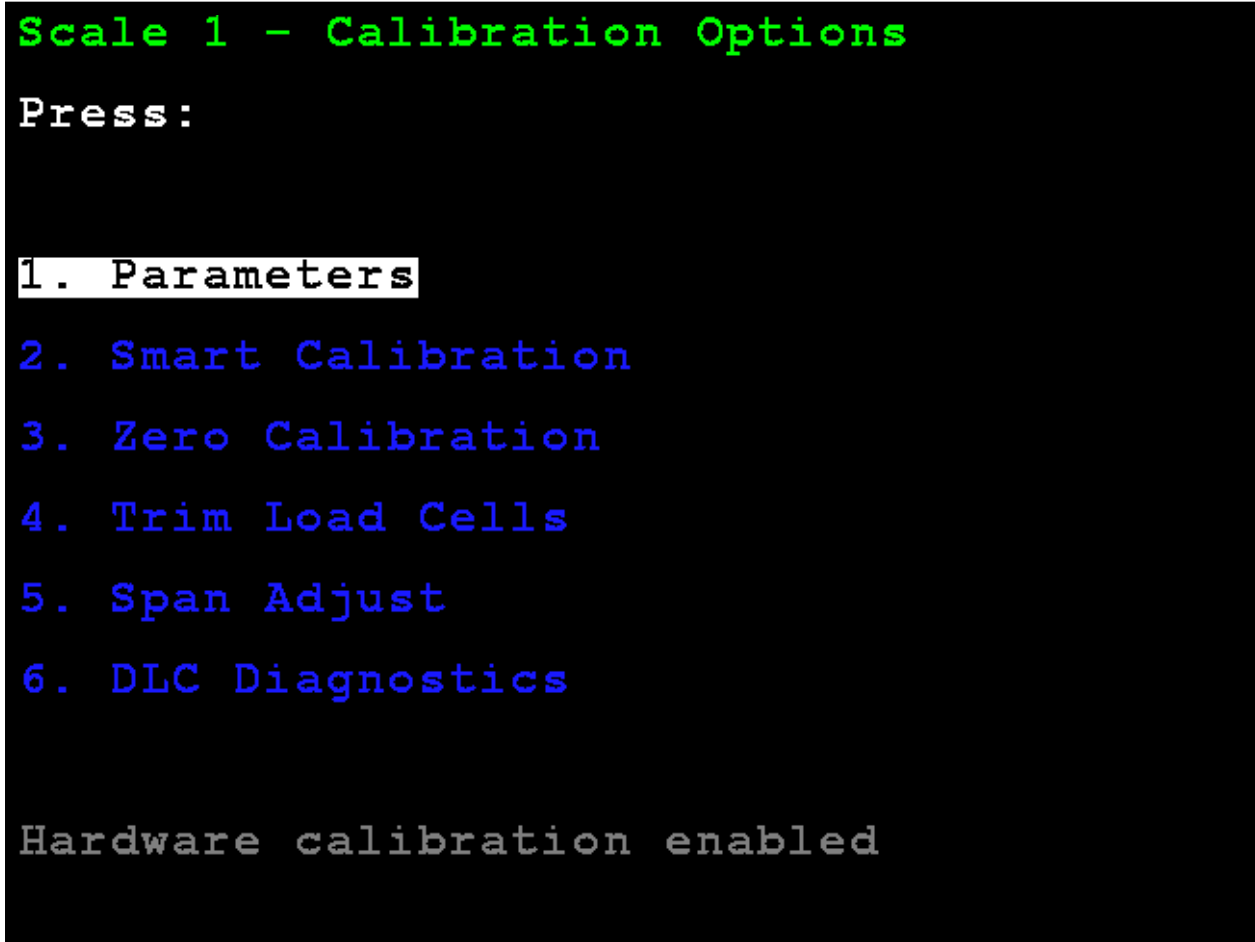
The 825D display will change to show that it is calibrating zero.



## 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.

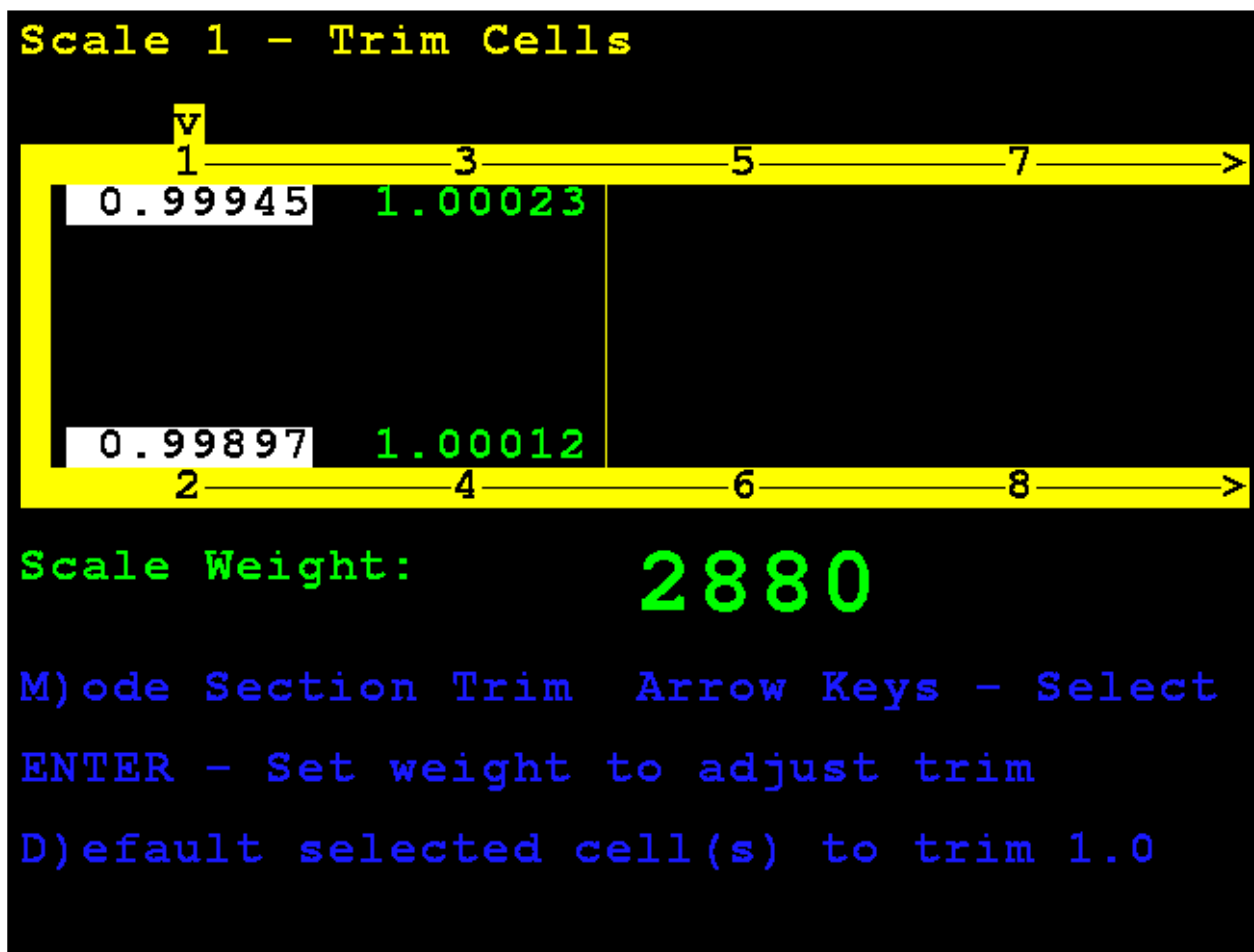
### Section Trim Mode

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.

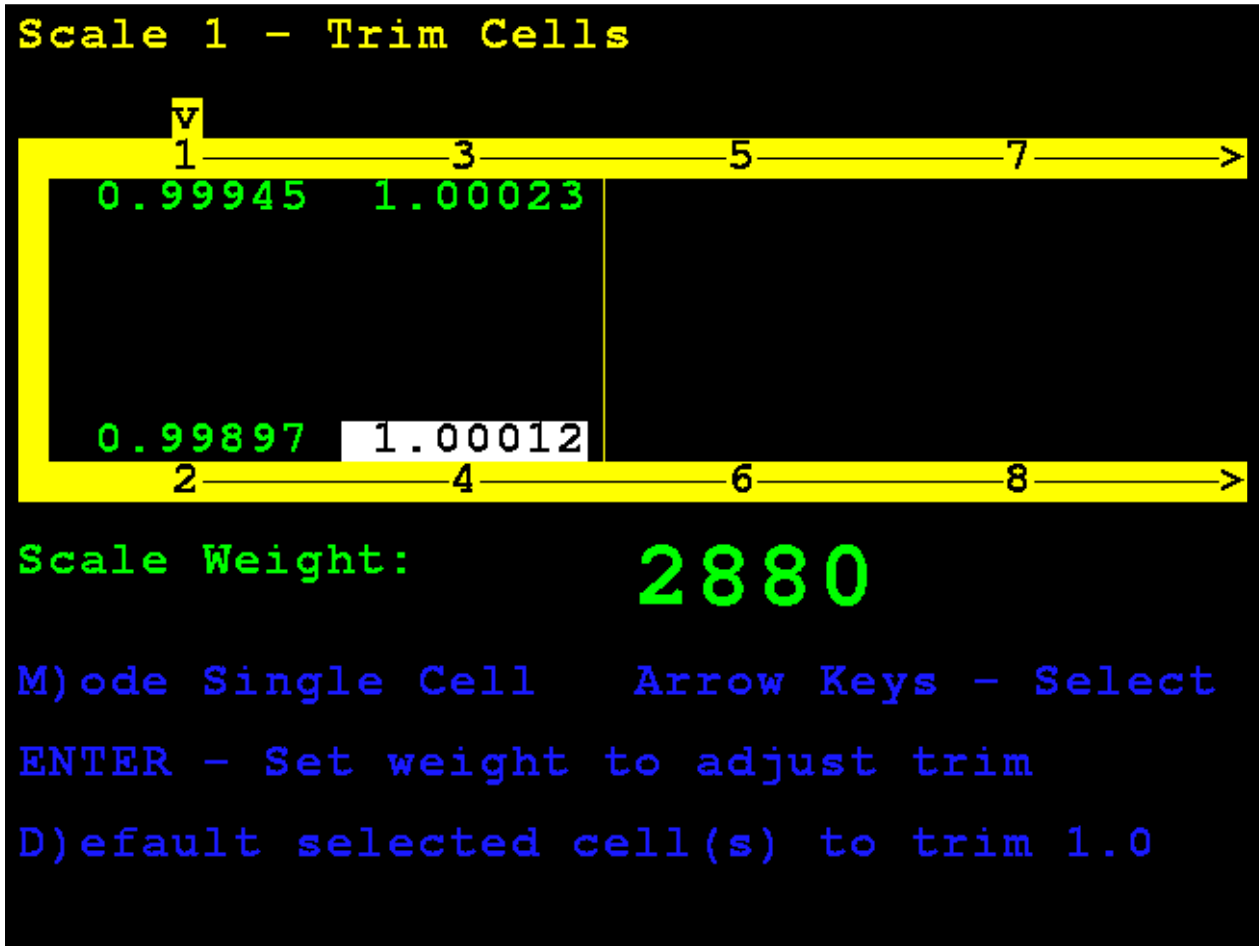


## Trim Cells, Cont.

### Single Cell Mode

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

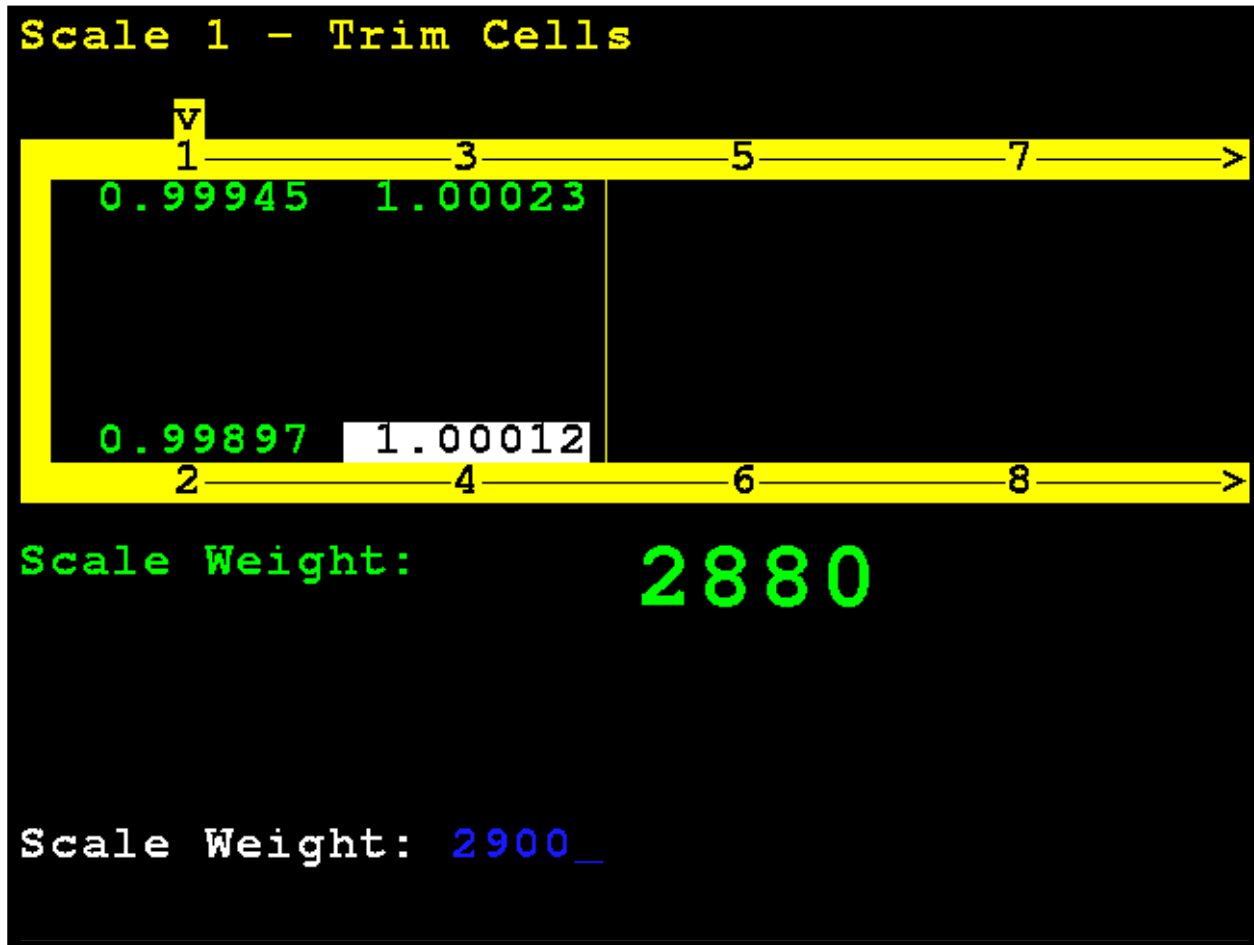
Use the Navigation Keys to select (highlight) the cell to trim.



## Trim Cells, Cont.

### Single Cell Mode, Cont.

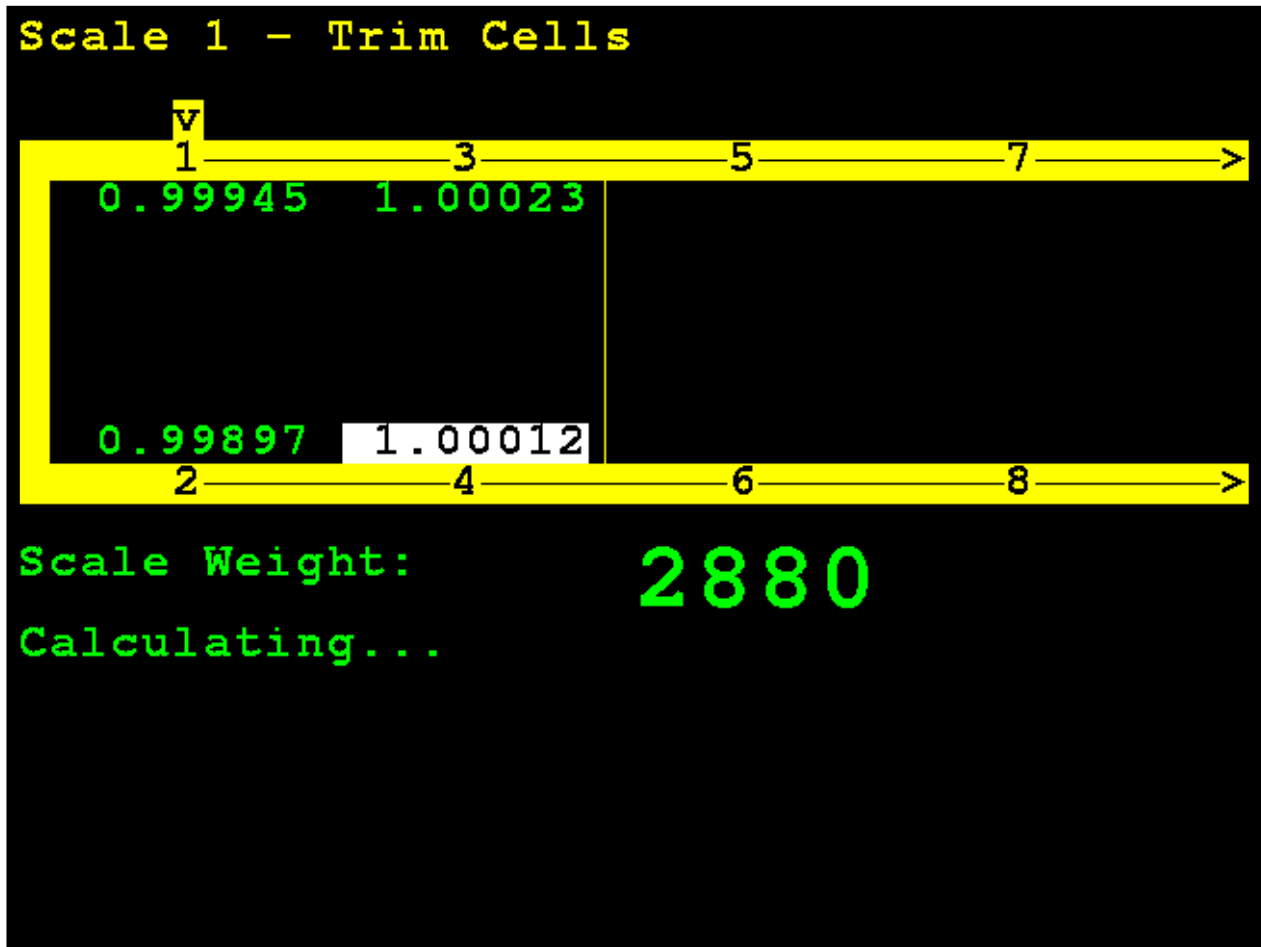
With the desired cell selected, enter the Trim Value, and press the **ENTER** key to set the weight to adjust trim.



## Trim Cells, Cont.

### Single Cell Mode, Cont.

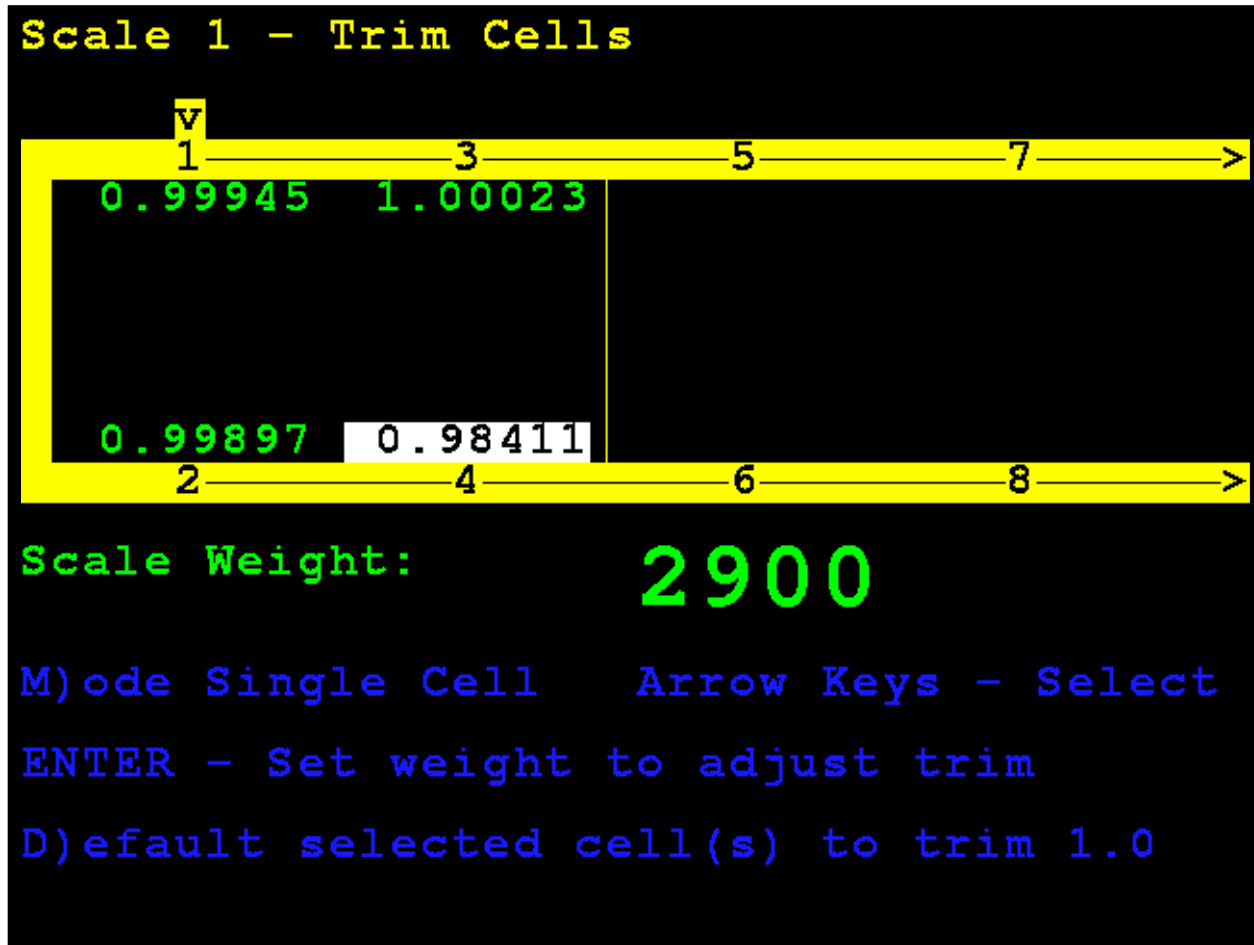
The 825D will automatically trim the cell to match the entered weight.



## 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 change 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.

## Scale 1 - Calibration Options

Press:

1. Parameters
2. Smart Calibration
3. Zero Calibration
4. Trim Load Cells
5. Span Adjust
6. DLC Diagnostics

Hardware calibration enabled

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

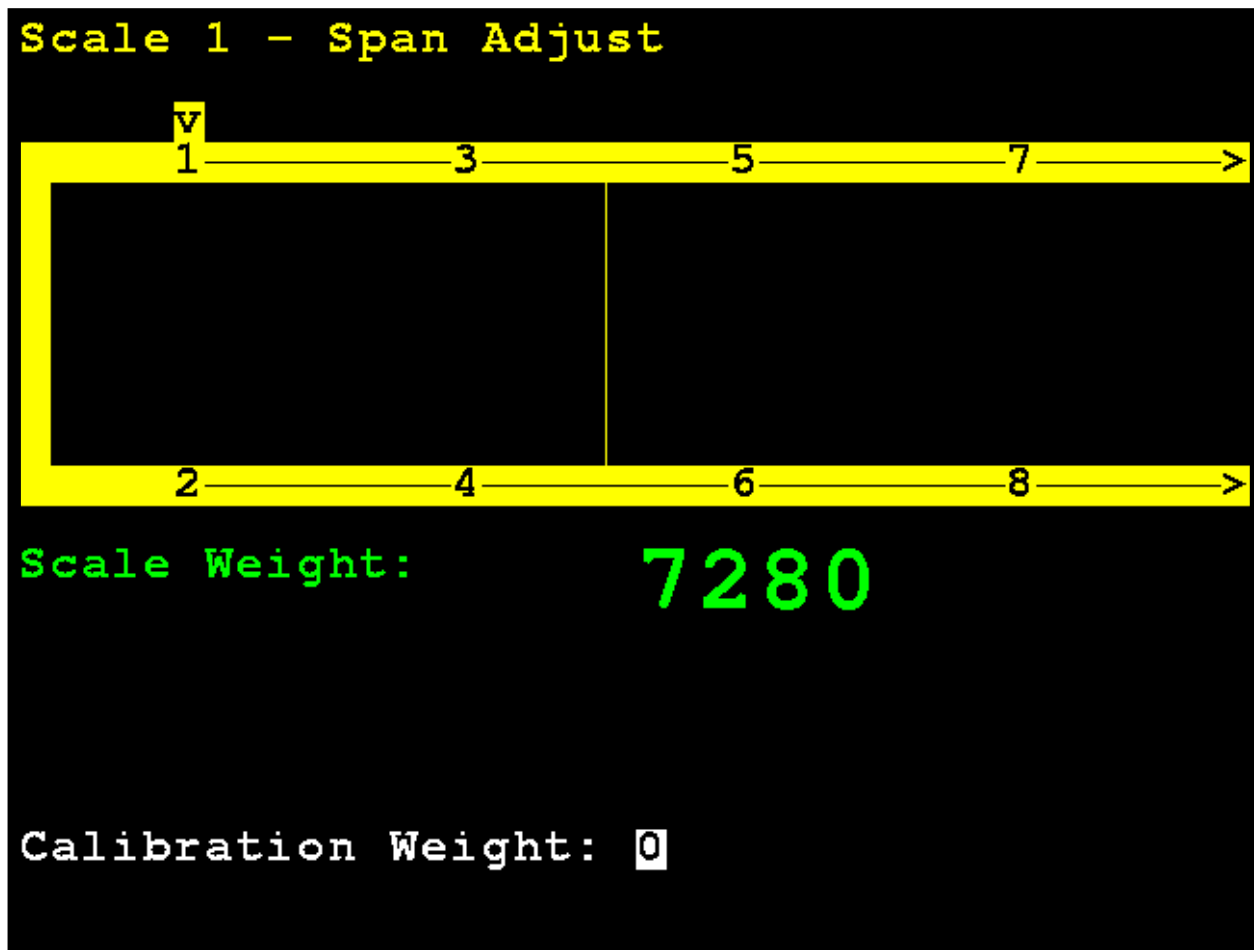
## Span Adjust

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

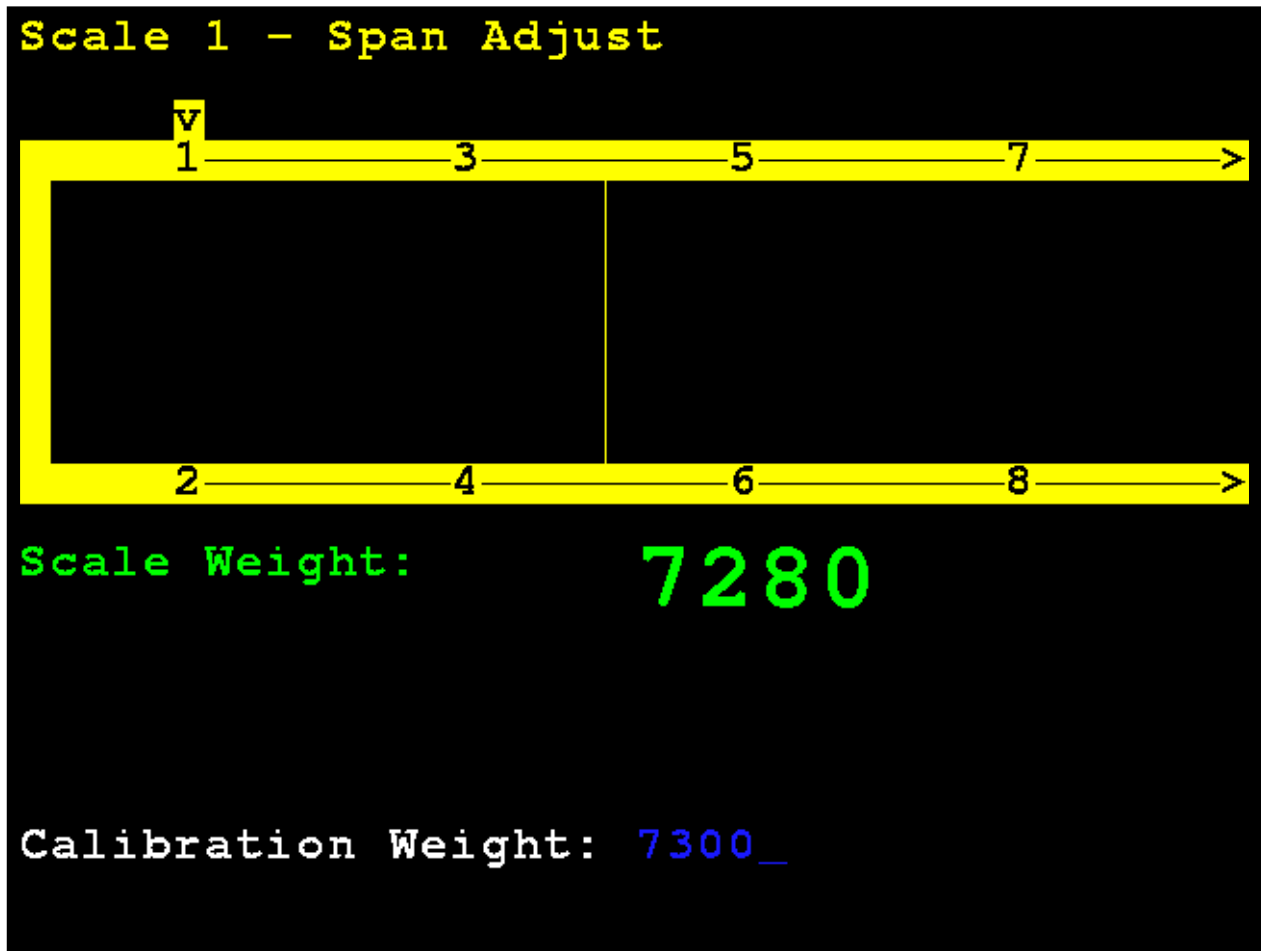
The 825D will display the current live scale weight.

Place the test weight at any location on the scale.

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



## Span Adjust



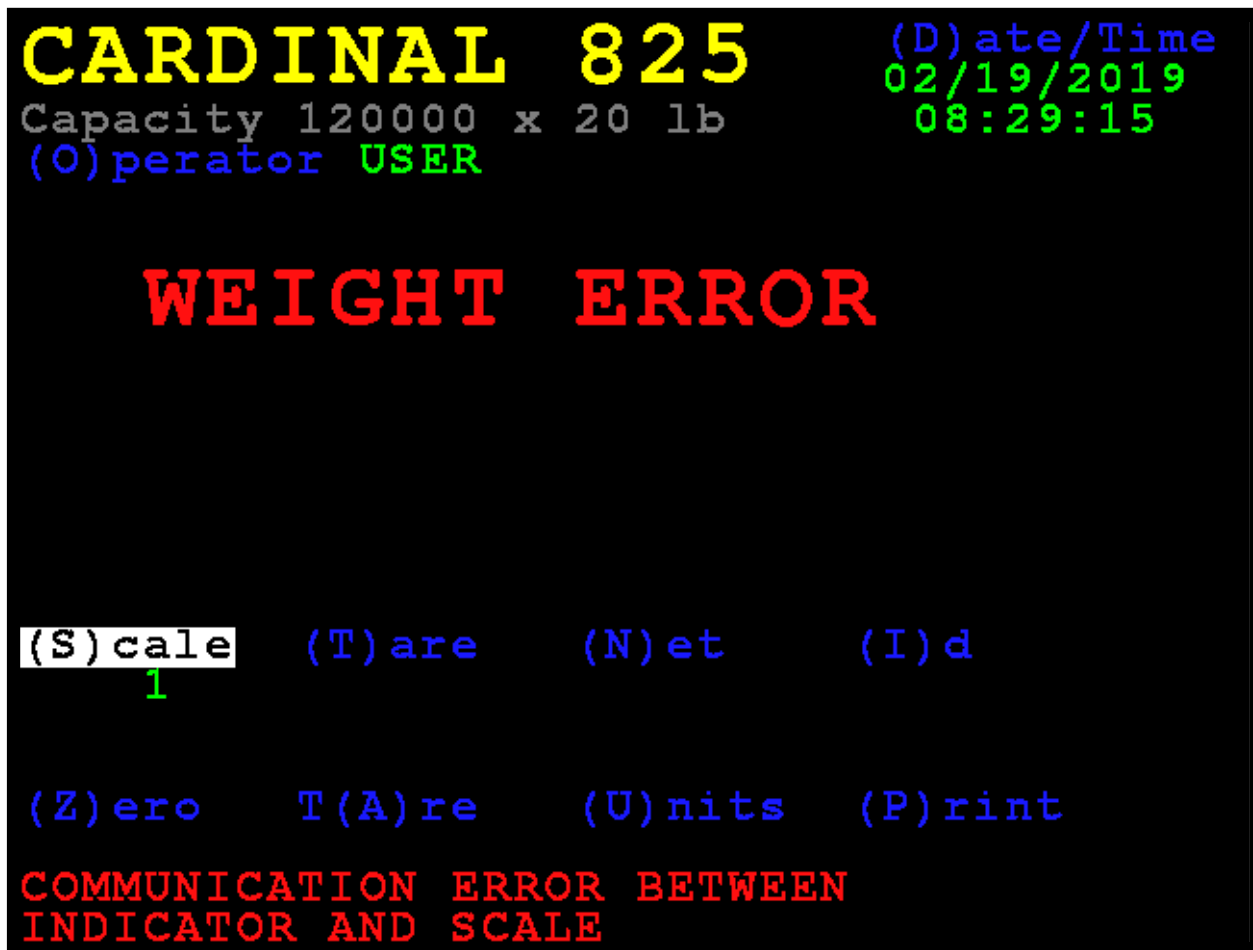
After a brief delay, the span will be adjusted (trim will be adjusted for all cells of the scale) and the 825D display will return to the **Scale 1 - Calibration Options** screen.

# DIGITAL SCALE DIAGNOSTICS

## On Screen Diagnostics

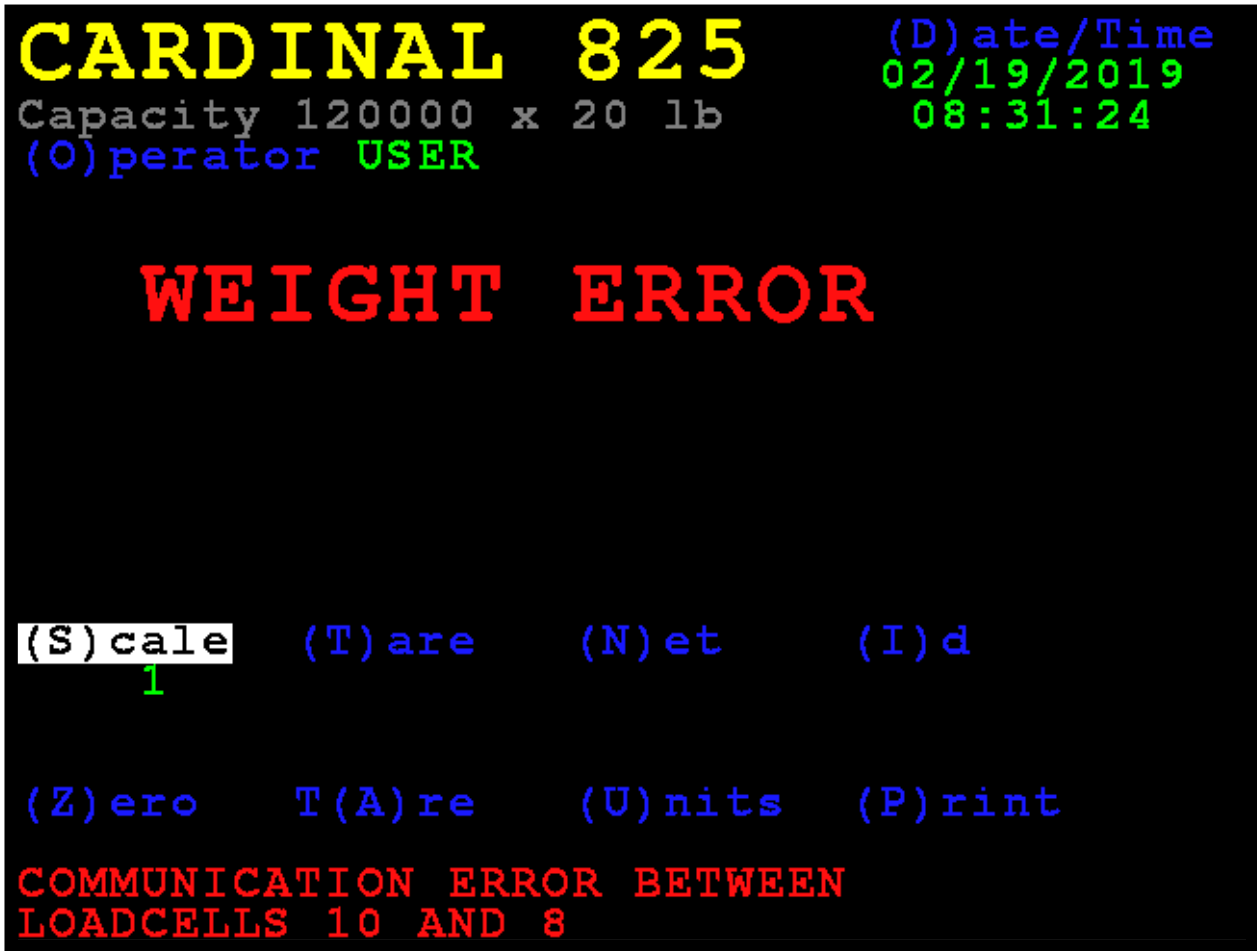
The On Screen Diagnostics messages are critical errors that alert the operator from the main screen of setup issues or hardware problems. These messages will be shown to the operator on the main weight screen in real-time when the error happens.

### COMMUNICATION ERROR BETWEEN INDICATOR AND SCALE



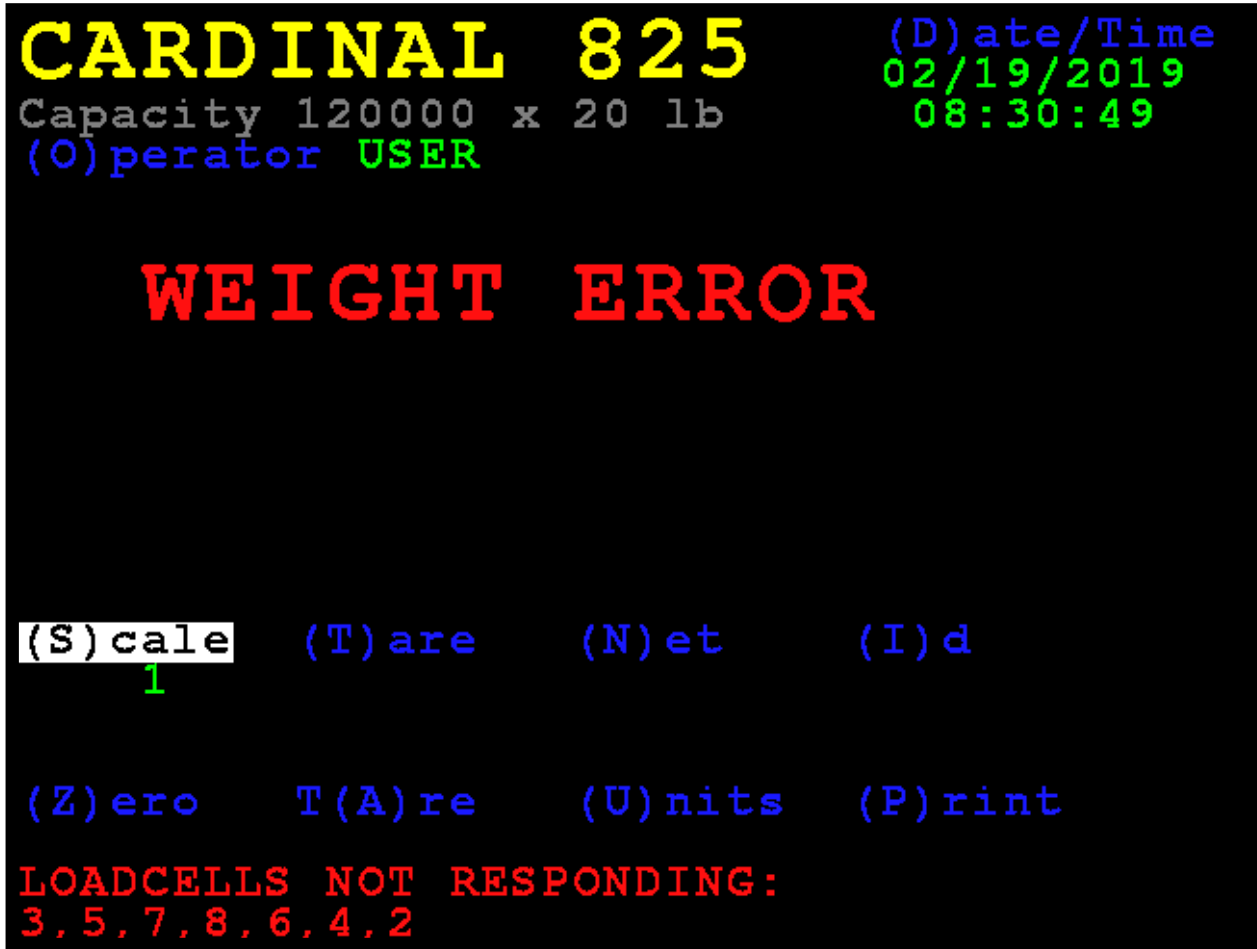
Probable Cause	Items to Check
The homerun cable is damaged or disconnected.	<ul style="list-style-type: none"> <li>• Check that cable is connected correctly.</li> <li>• Check cable for damage.</li> <li>• Use caution on the amount of insulation stripped for the connector. Center wires could short. Must be shorter than the center connector.</li> <li>• Check connector for random strands of wire.</li> <li>• Verify that connector is clear of debris.</li> </ul>

COMMUNICATION ERROR BETWEEN LOAD CELLS X AND Y



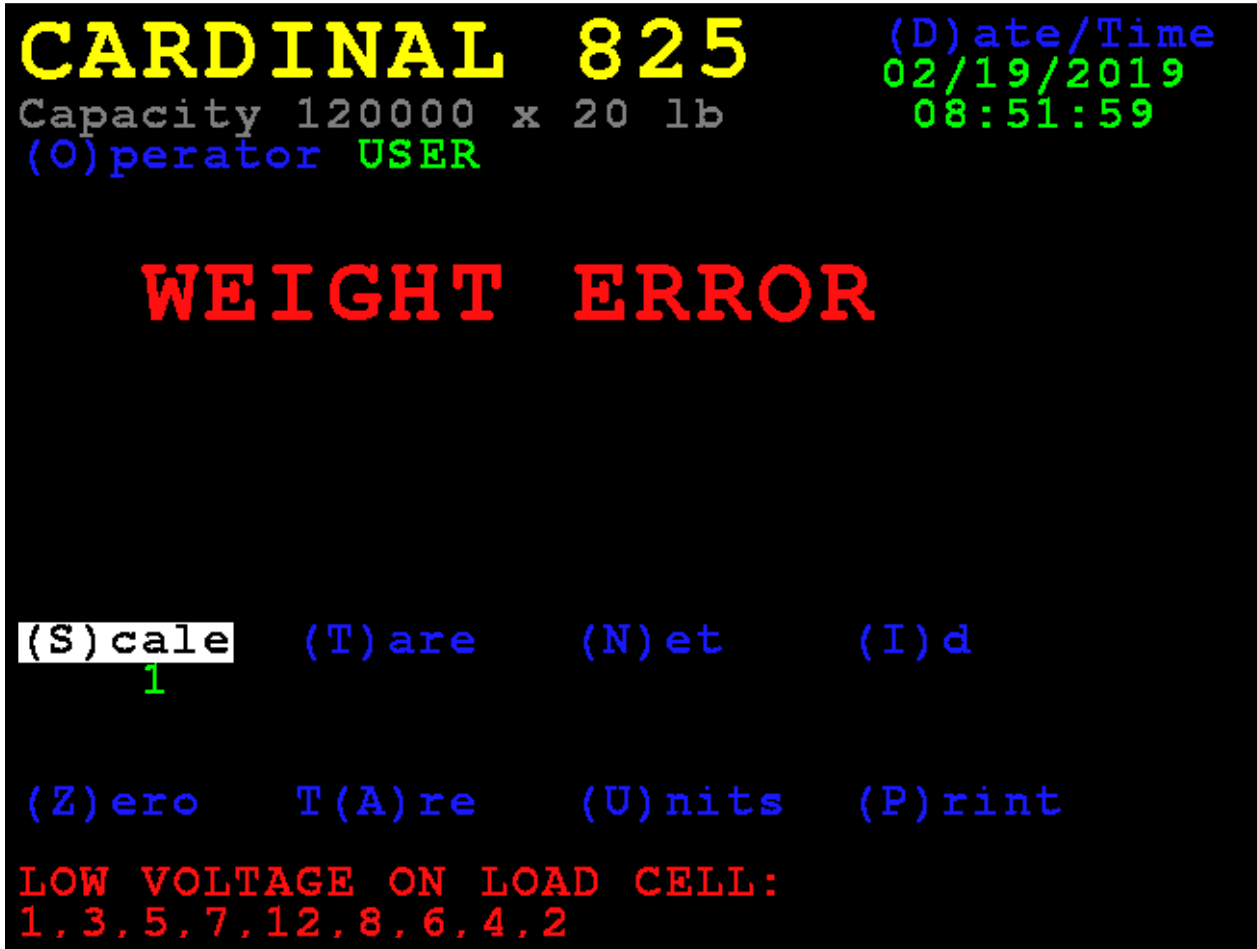
Probable Cause	Items to Check
There is a loss of communication between load cells.	<ul style="list-style-type: none"> <li>• Check that cable is connected correctly.</li> <li>• Check cable for damage.</li> <li>• Verify that connector is clear of debris.</li> <li>• Check load cell COM ports on both load cells.</li> </ul>

LOAD CELL X, Y, Z NOT RESPONDING



Probable Cause	Items to Check
The 825D cannot detect the exact communication problem with the unresponsive load cell.	<ul style="list-style-type: none"> <li>• Check that cable is connected correctly.</li> <li>• Check cable for damage.</li> <li>• Verify that connector is clear of debris.</li> <li>• Potentially dead load cell.</li> </ul>

LOW VOLTAGE DETECTED ON LOAD CELL X, Y, Z



Probable Cause	Items to Check
Low power on a load cell. Load cells at the end of the CAN daisy chain are most susceptible to low voltage errors because of voltage drop along the cable.	<ul style="list-style-type: none"> <li>• Too many load cells on the chain.</li> <li>• Check that cable is connected correctly.</li> <li>• Check cable for damage.</li> <li>• Verify that connector is clear of debris.</li> <li>• Check 825D indicator power supply.</li> </ul>

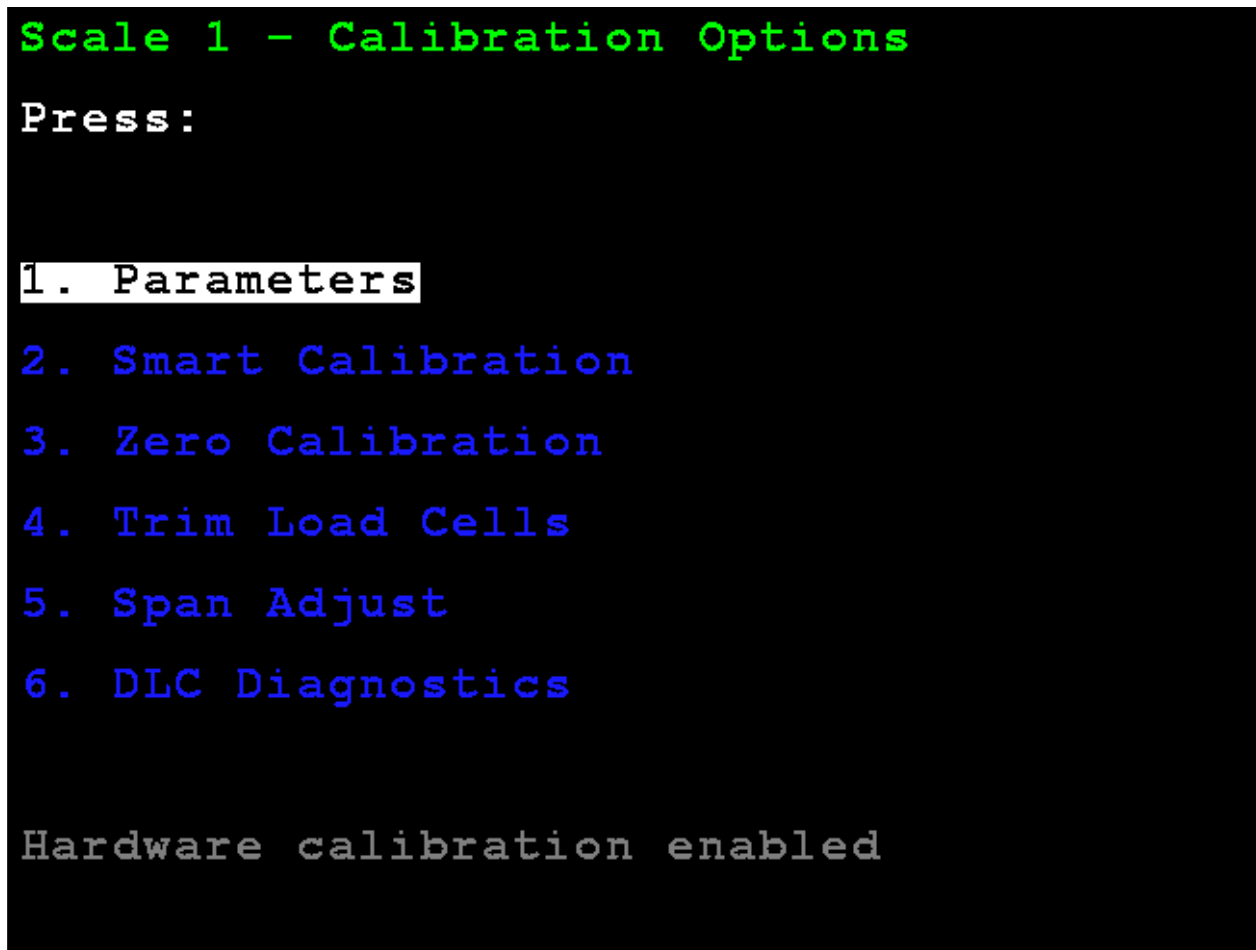
# DIGITAL SCALE DIAGNOSTICS

## Diagnostic Menu

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

### 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.







## 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.

The screenshot shows a terminal-style interface with a black background and yellow, green, and cyan text. At the top, the title 'Digital Load Cell Diagnostics' is in yellow, and the subtitle 'Maximum / Minimum Weights' is in green. Below this is a grid of data points. The grid is bounded by a yellow border with arrows at the corners. The top border has numbers 1, 3, 5, 7, and the bottom border has 2, 4, 6, 8. A small yellow box with a white 'V' is positioned above the number 1. The data is organized into two rows and two columns. The first row contains: (1,1) 46, (1,2) 25, (1,3) 0, (1,4) 1; (2,1) -0, (2,2) 0, (2,3) -0, (2,4) -0. The second row contains: (3,1) 92, (3,2) 9, (3,3) 2, (3,4) 0; (4,1) -0, (4,2) -1, (4,3) -6, (4,4) -1. Below the grid, there are three navigation options in cyan: 'P)revious', 'Z)ero', and 'N)ext'. At the bottom, a cyan instruction reads: 'Press 'X' to jump to this from other diagnostics screens'.

1	3	5	7
46	25	0	1
-0	0	-0	-0
92	9	2	0
-0	-1	-6	-1

2 4 6 8

P)revious      Z)ero      N)ext

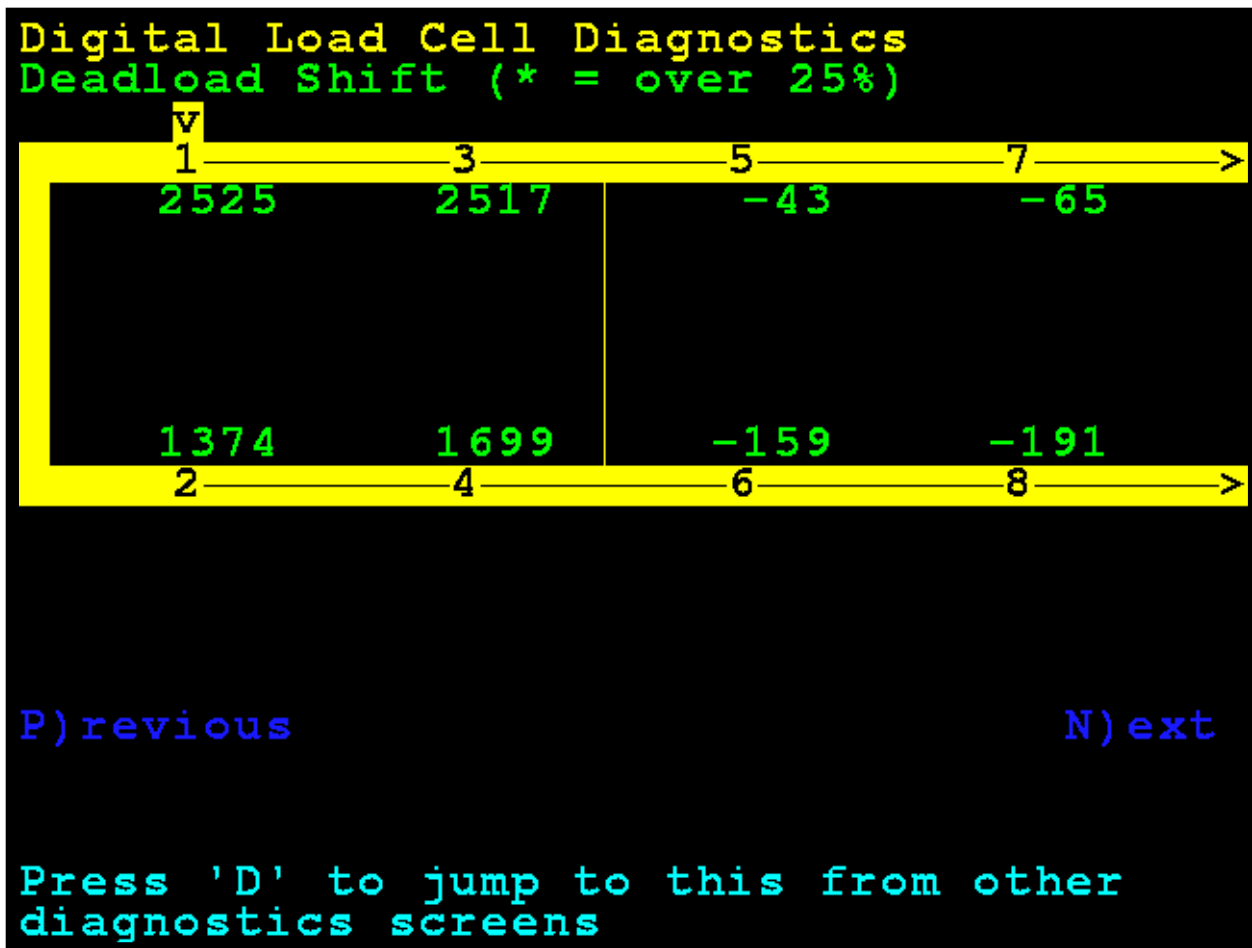
Press 'X' to jump to this from other diagnostics screens

## 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 empty for this to be valid.

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

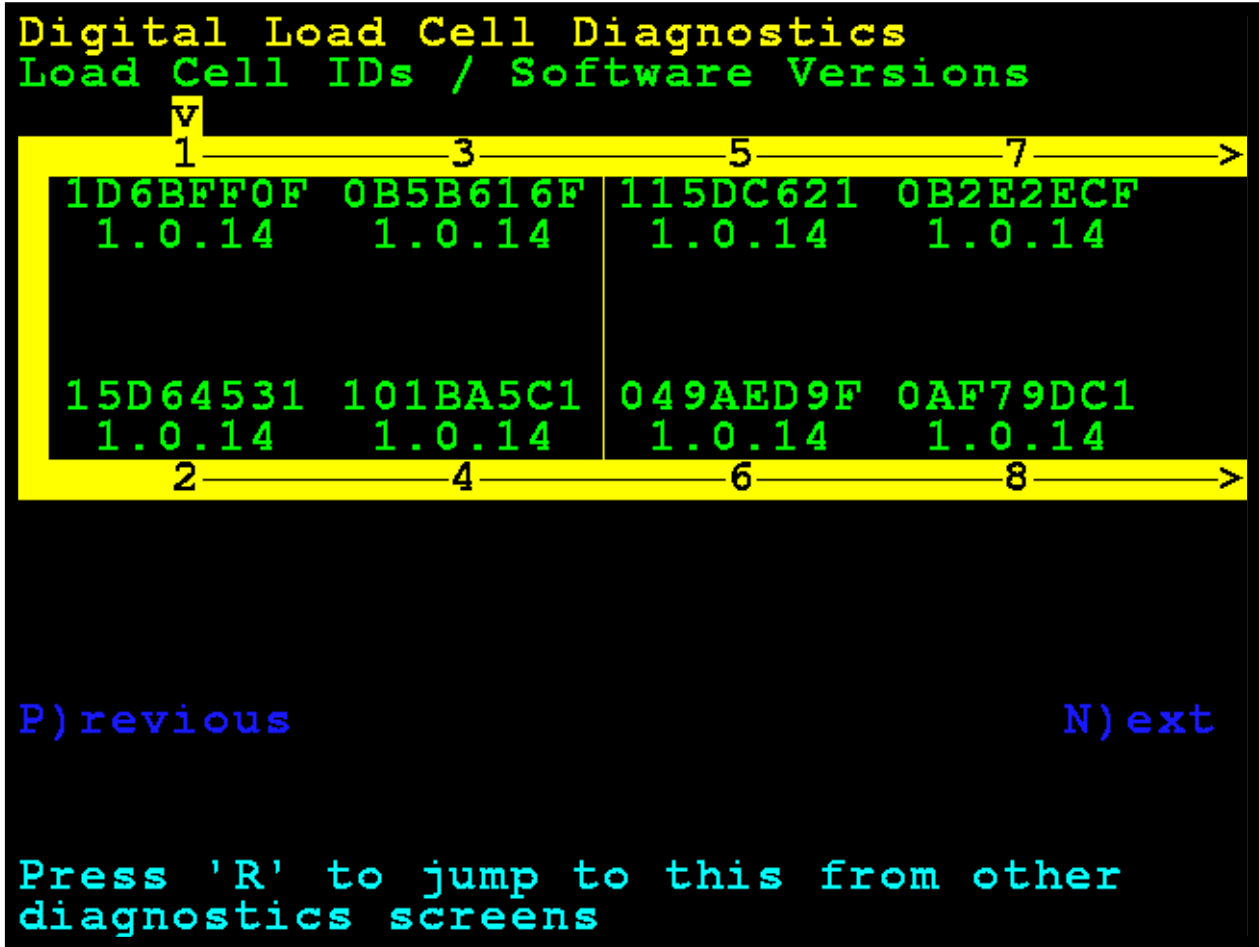
Press the **D** key to jump to the **Deadload Shift** screen from the other diagnostic screens.



## LOAD CELL IDS / SOFTWARE VERSIONS

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

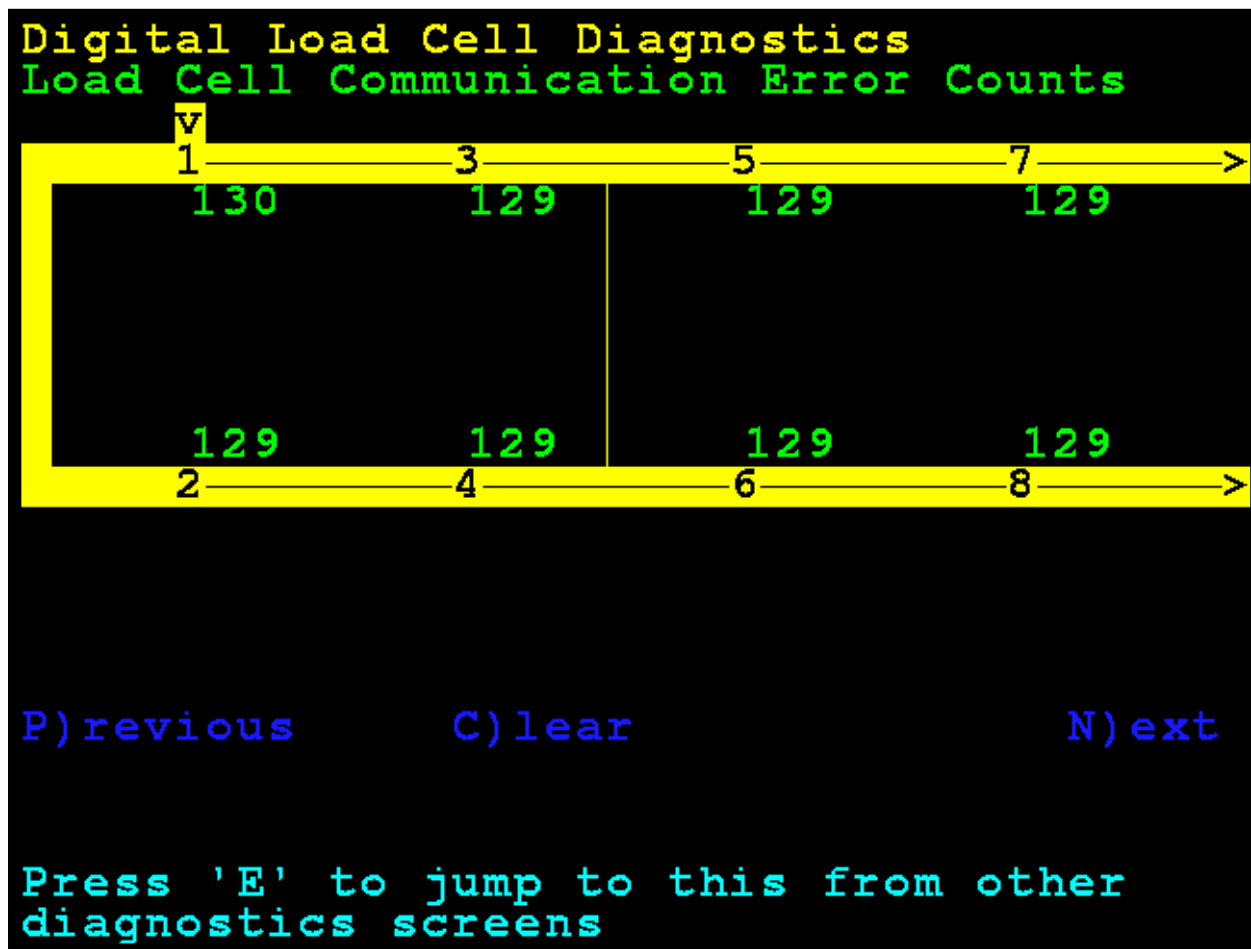
Press the R key to jump to the Load Cell IDs / Software Versions screen from the other diagnostic screens.



## LOAD CELL COMMUNICATION ERROR COUNTS

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

Press the **E** key to jump to the **Load Cell Communication Error Counts** screen from the other diagnostic screens.

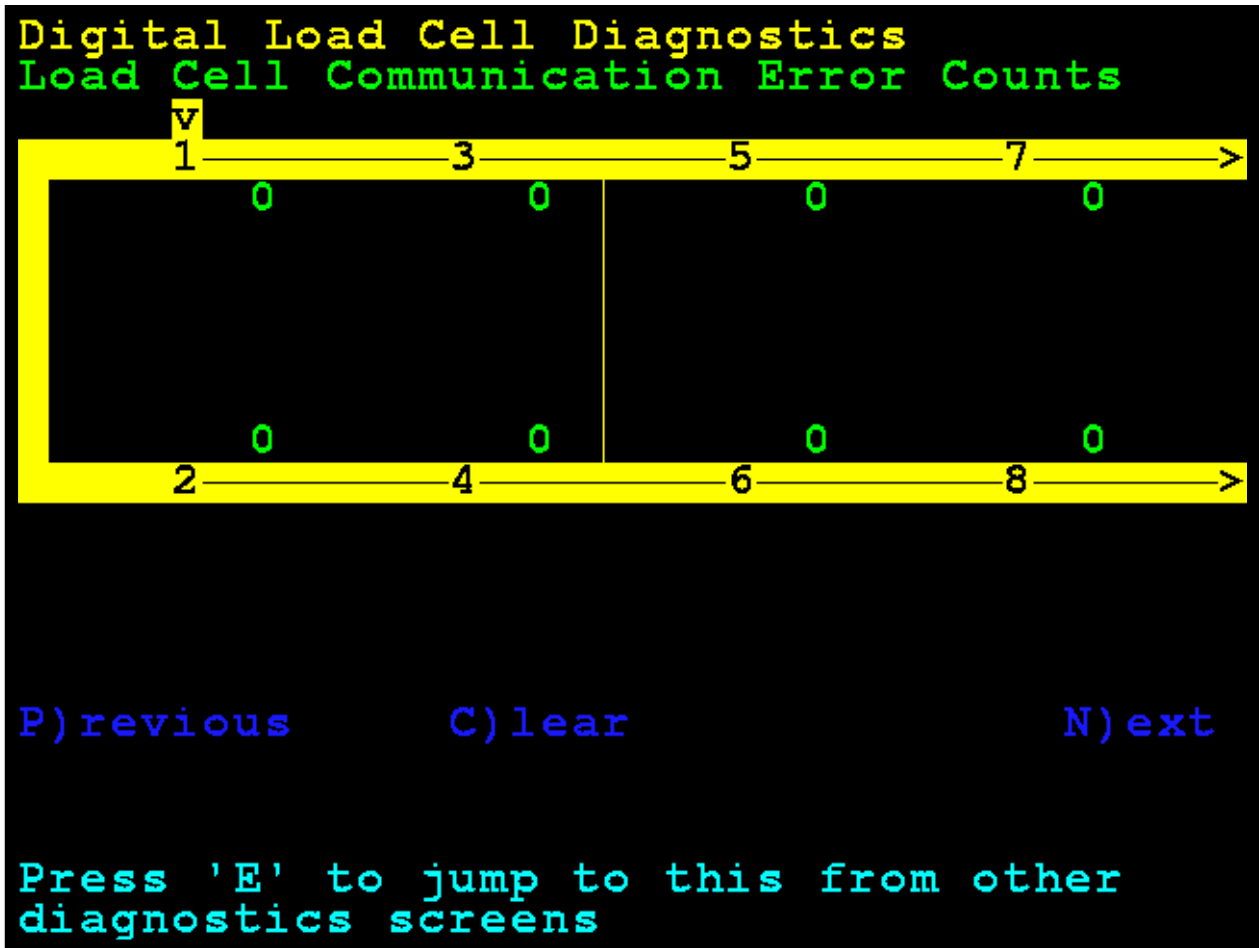


## ZERO LOAD CELL COMMUNICATION ERROR COUNTS

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

Press the **C** key to clear the Communication Error Counts.

Press the **E** key to jump to the **Load Cell Communication Error Counts** screen from the other diagnostic screens.



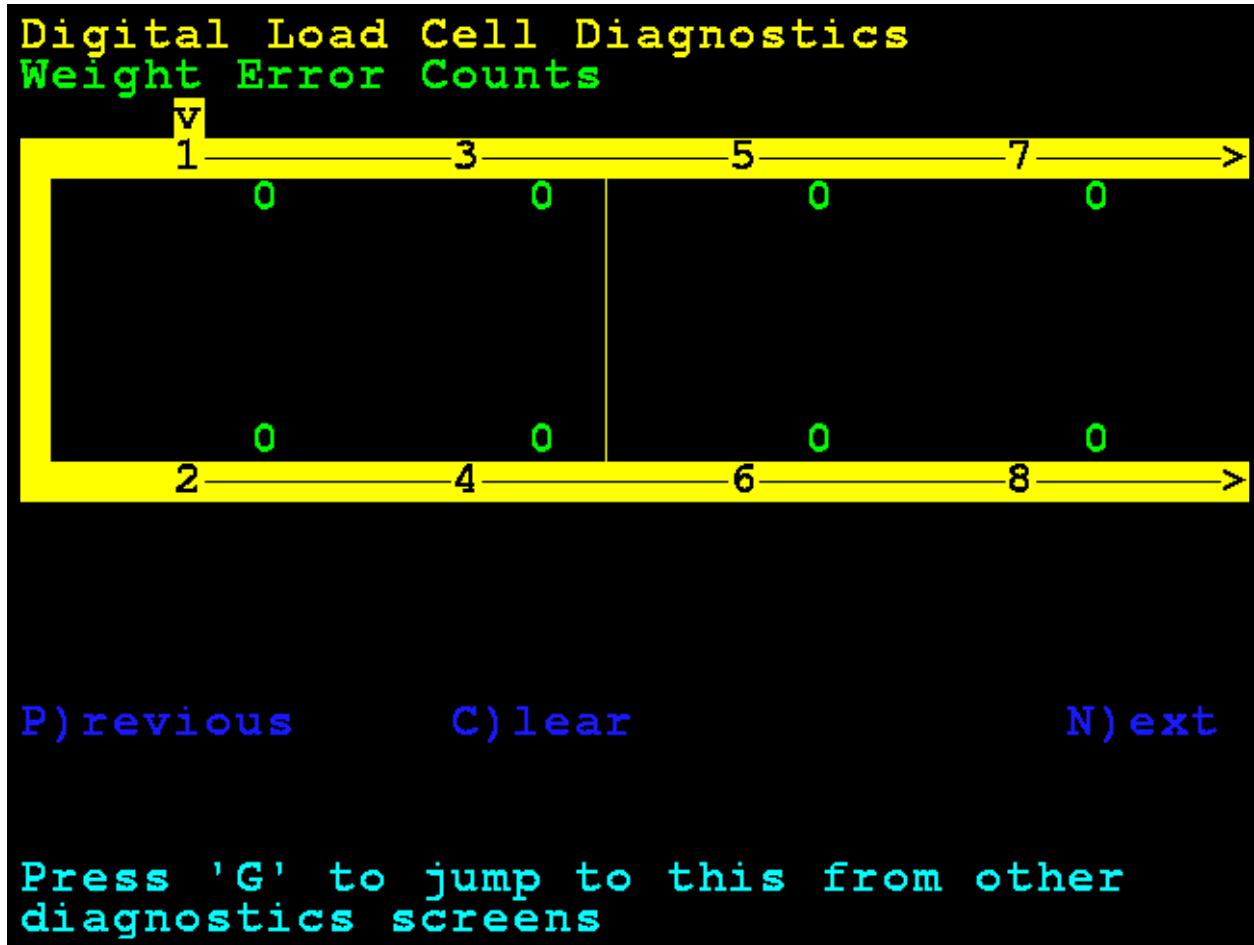
## WEIGHT ERROR COUNTS

Weight Error Counts are analog errors that would normally indicate a bad cell.

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

Press the **C** key to clear the Weight Error Counts.

Press the **G** key to jump to the **Weight Error Counts** screen from the other diagnostic screens.



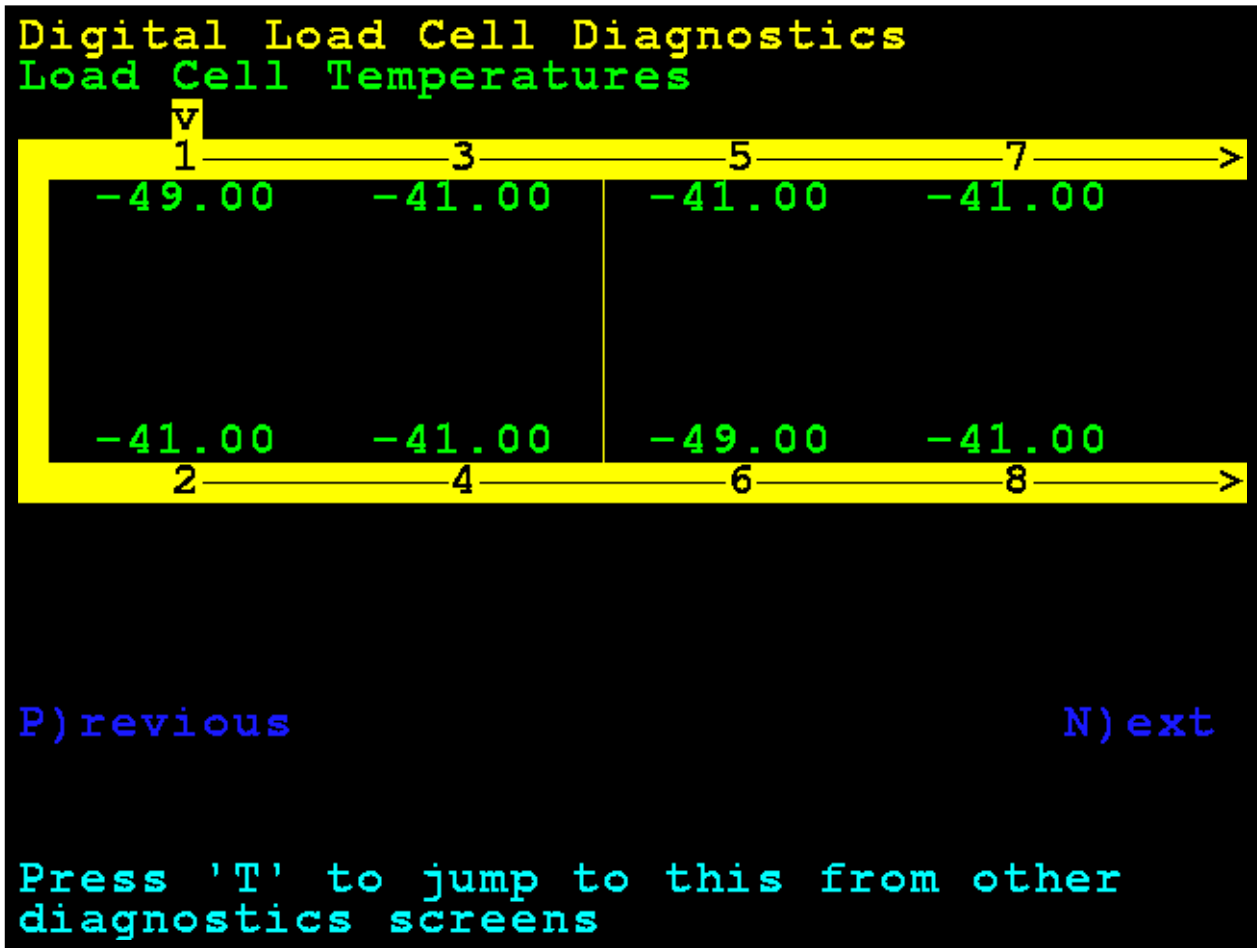


## LOAD CELL TEMPERATURES

This is the temperature of the cells in Celsius.

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

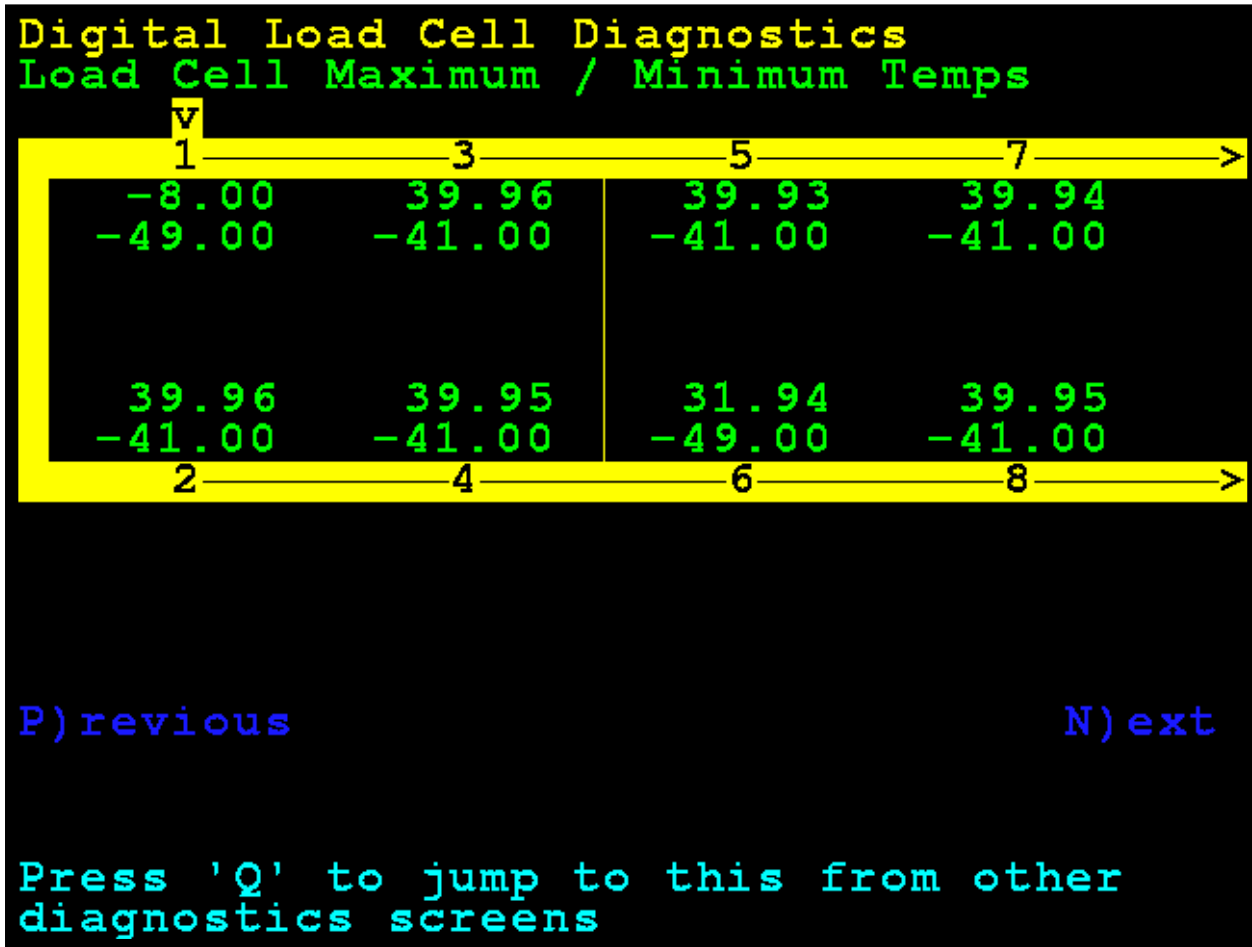
Press the **T** key to jump to the **Load Cell Temperatures** screen from the other diagnostic screens.



## LOAD CELL MINIMUM / MAXIMUM TEMPS

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

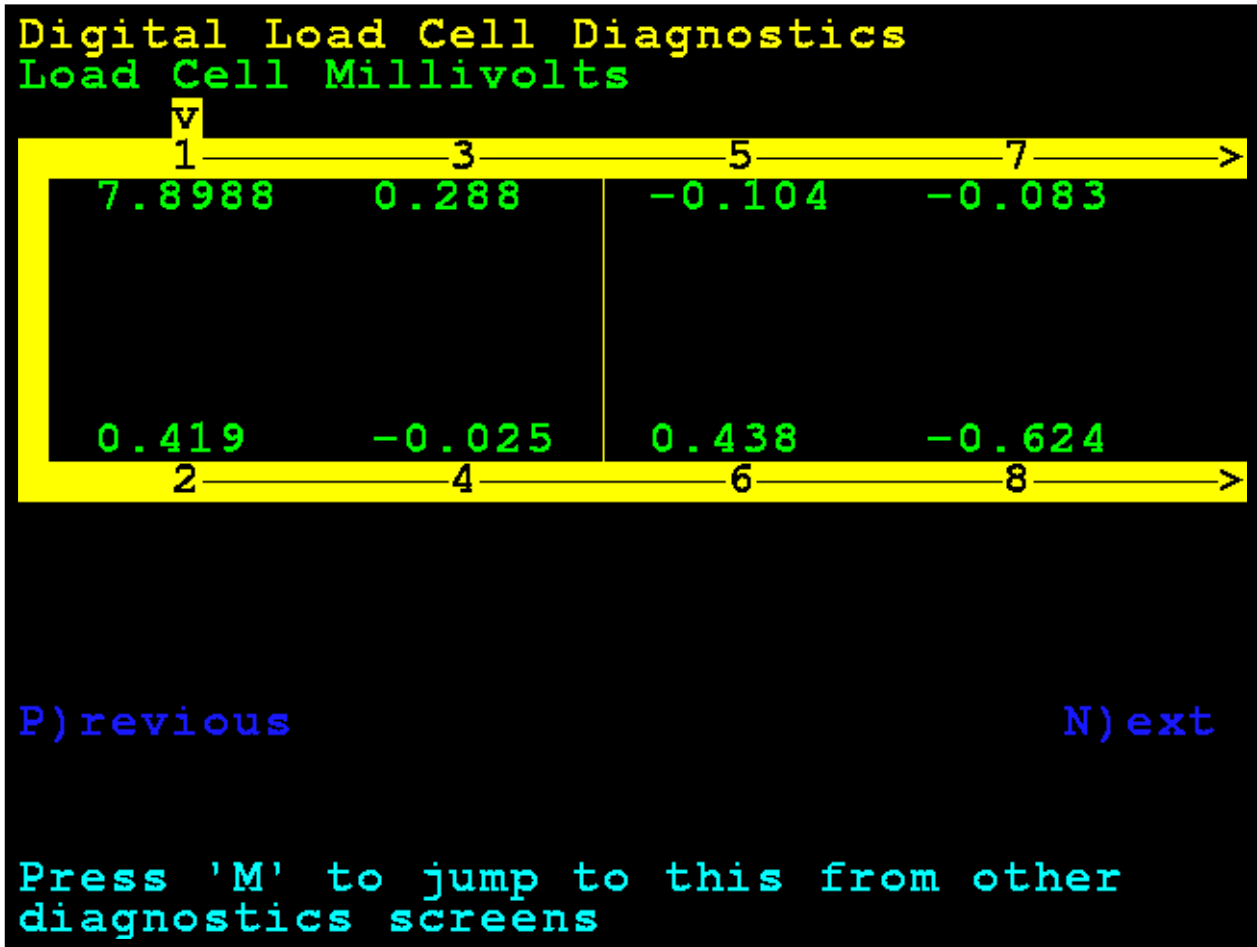
Press the **Q** key to jump to the **Load Cell Maximum / Minimum Temps** screen from the other diagnostic screens.



## LOAD CELL MILLIVOLTS

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

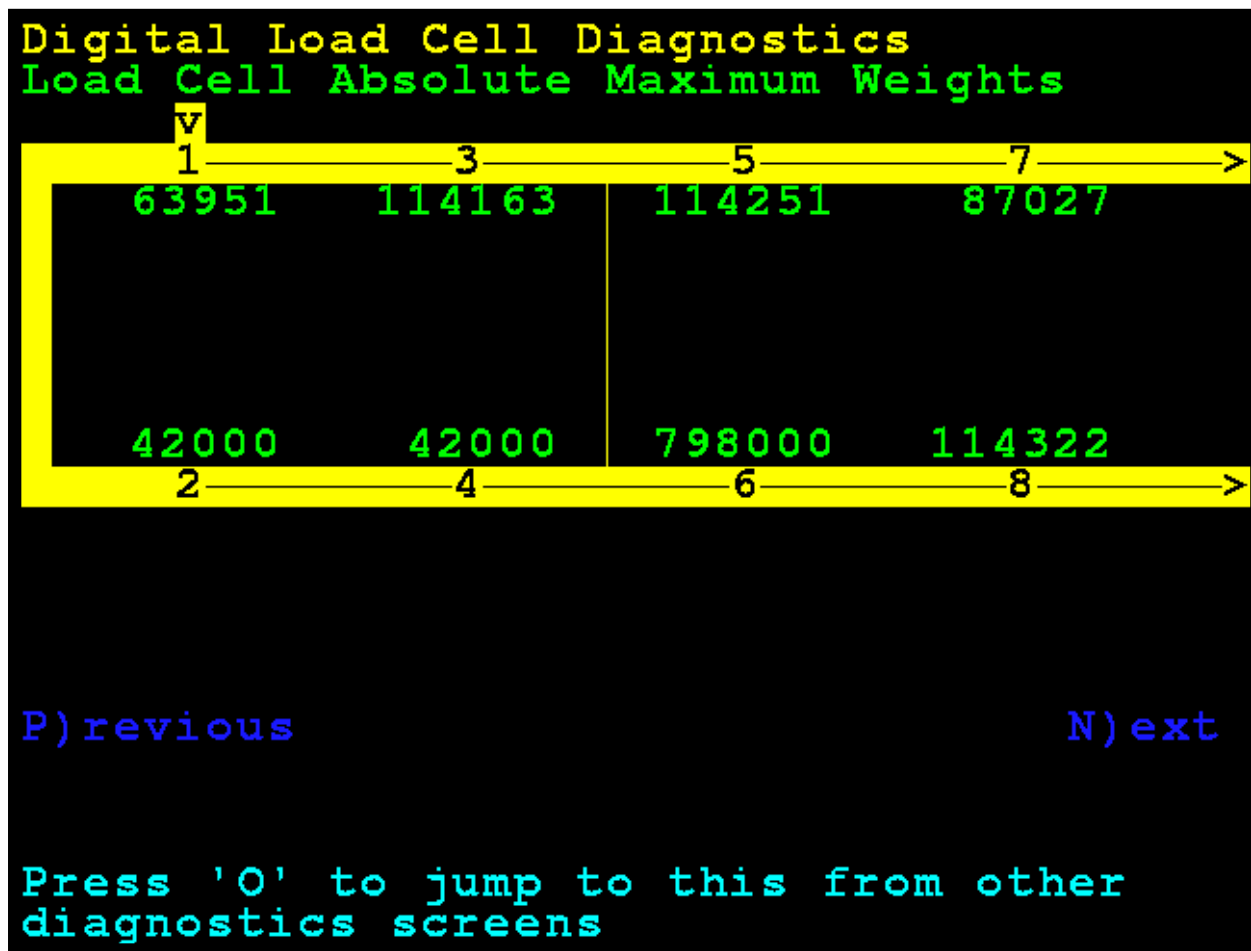
Press the **M** key to jump to the **Load Cell Millivolts** screen from the other diagnostic screens.



## LOAD CELL ABSOLUTE MAXIMUM WEIGHTS

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

Press the **O** key to jump to the **Load Cell Absolute Maximum Weights** screen from the other diagnostic screens.

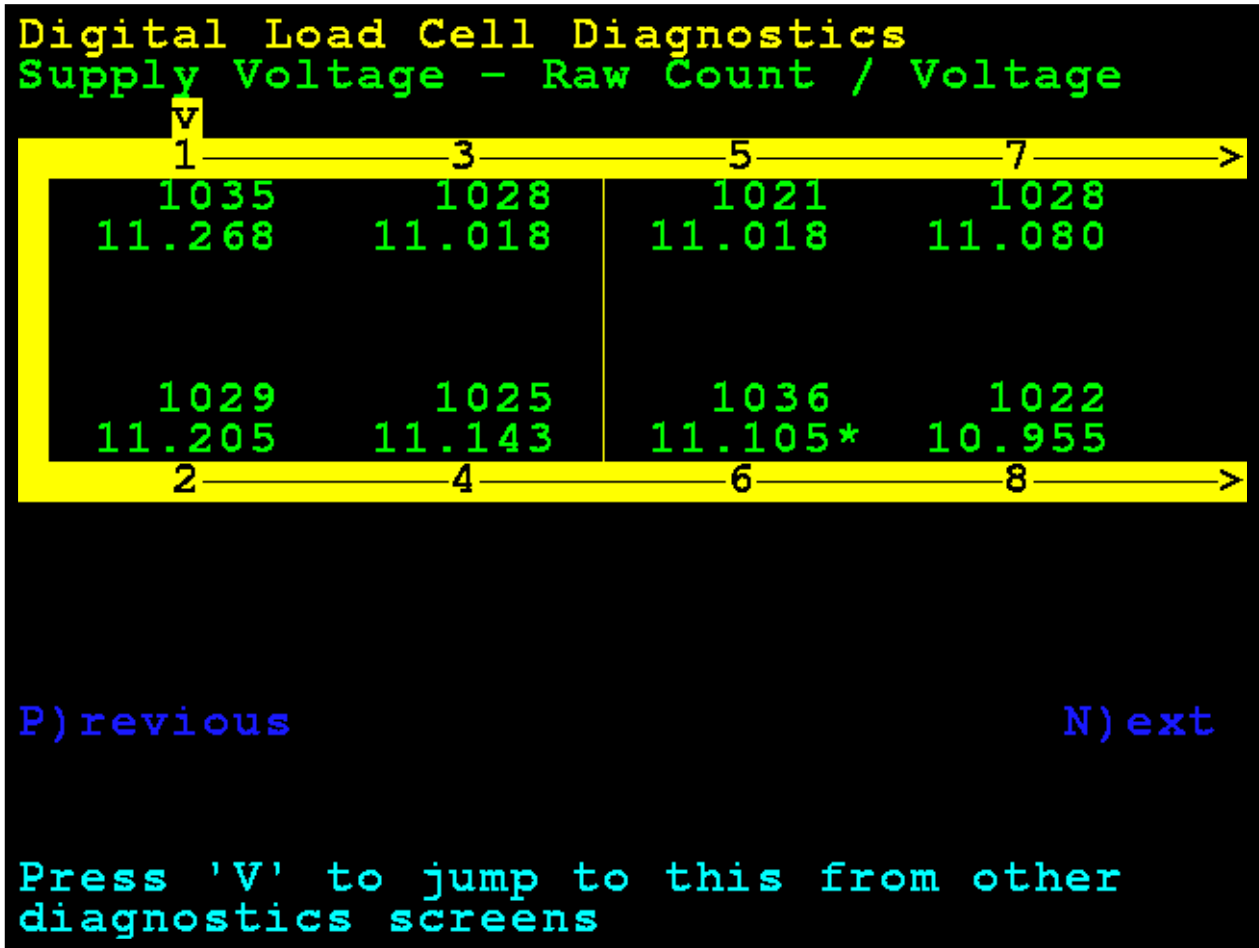


## SUPPLY VOLTAGE – RAW COUNT / VOLTAGE

**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.

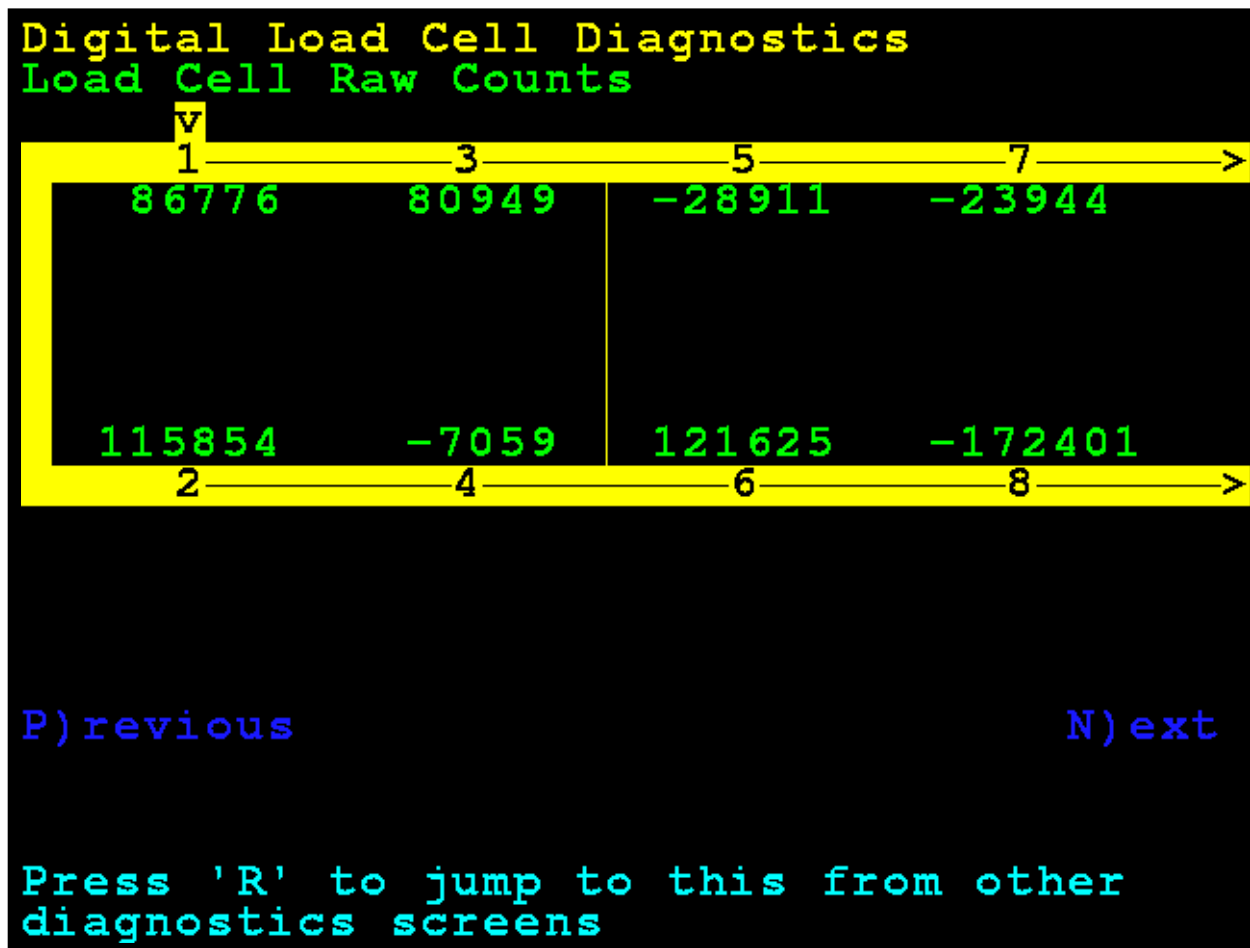
Press the **V** key to jump to the **Supply Voltage – Raw Count / Voltage** screen from the other diagnostic screens.



## LOAD CELL RAW COUNTS

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

Press the **R** key to jump to the **Load Cell Raw Counts** screen from the other diagnostic screens.



## ISITE STATUS OF LAST CONNECTION

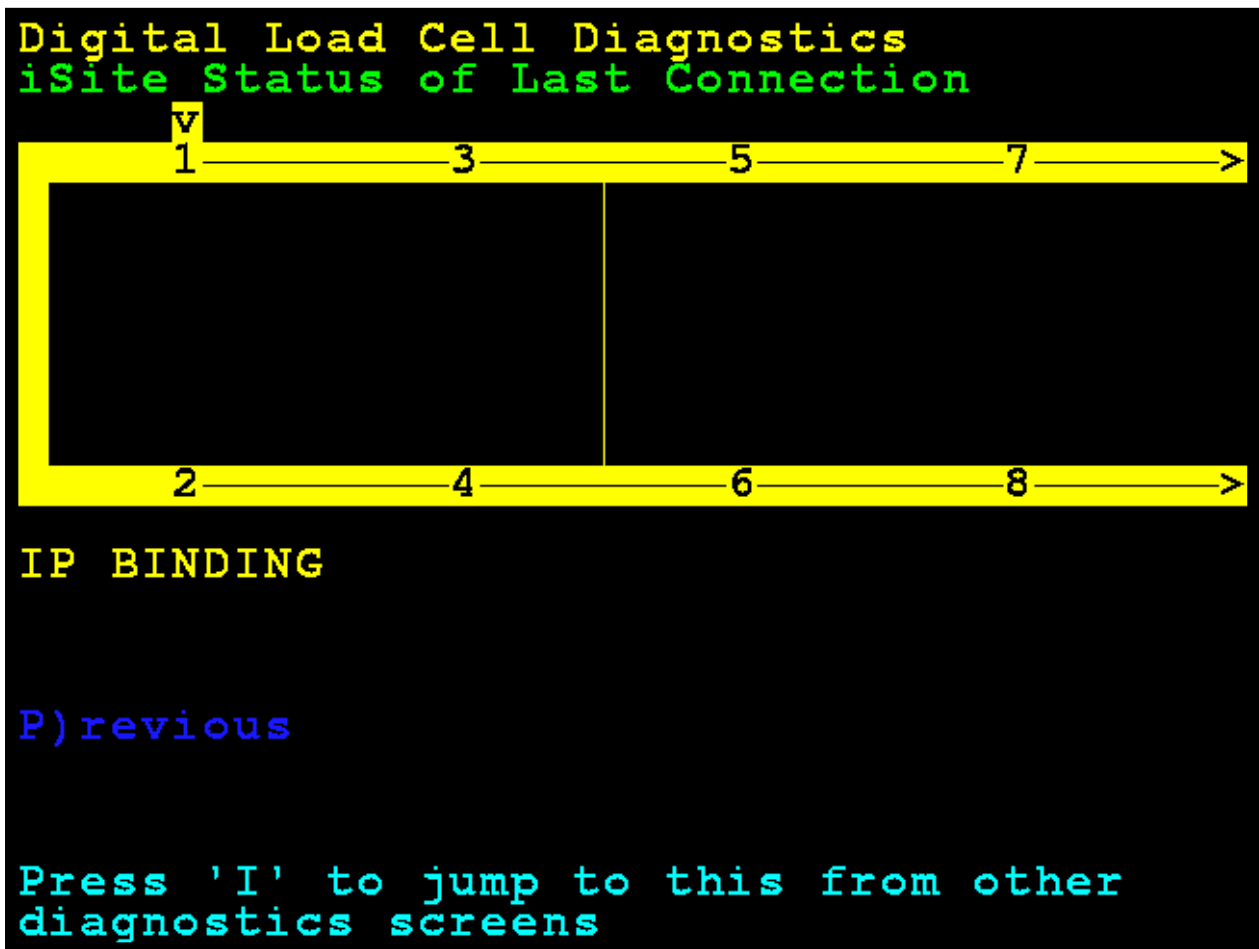
If **IP BINDING** message is displayed for a long time, it may indicate no network connection is present.

**WAITING FOR SOCKET INIT**

**PORT CONNECT FAIL**

**COMM ESTABLISHED** – successful connection

Press the **I** key to jump to the **iSite Status of Last Connection** screen from the other diagnostic screens.



## ENTER VALID SO IDENTIFIER FOR ISITE

Make sure a valid SO identifier is entered for iSite.

```
COMM ESTABLISHED  
CHECK SO# IN 825 SETUP  
Response 2019-02-18 20:12:48 GMT
```

```
P)revious
```

```
Press 'I' to jump to this from other  
diagnostics screens
```

## SUCCESSFUL COMM ESTABLISH FOR ISITE

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

```
COMM ESTABLISHED  
OKAY  
Response 2019-02-18 20:14:58 GMT
```

```
P)revious
```

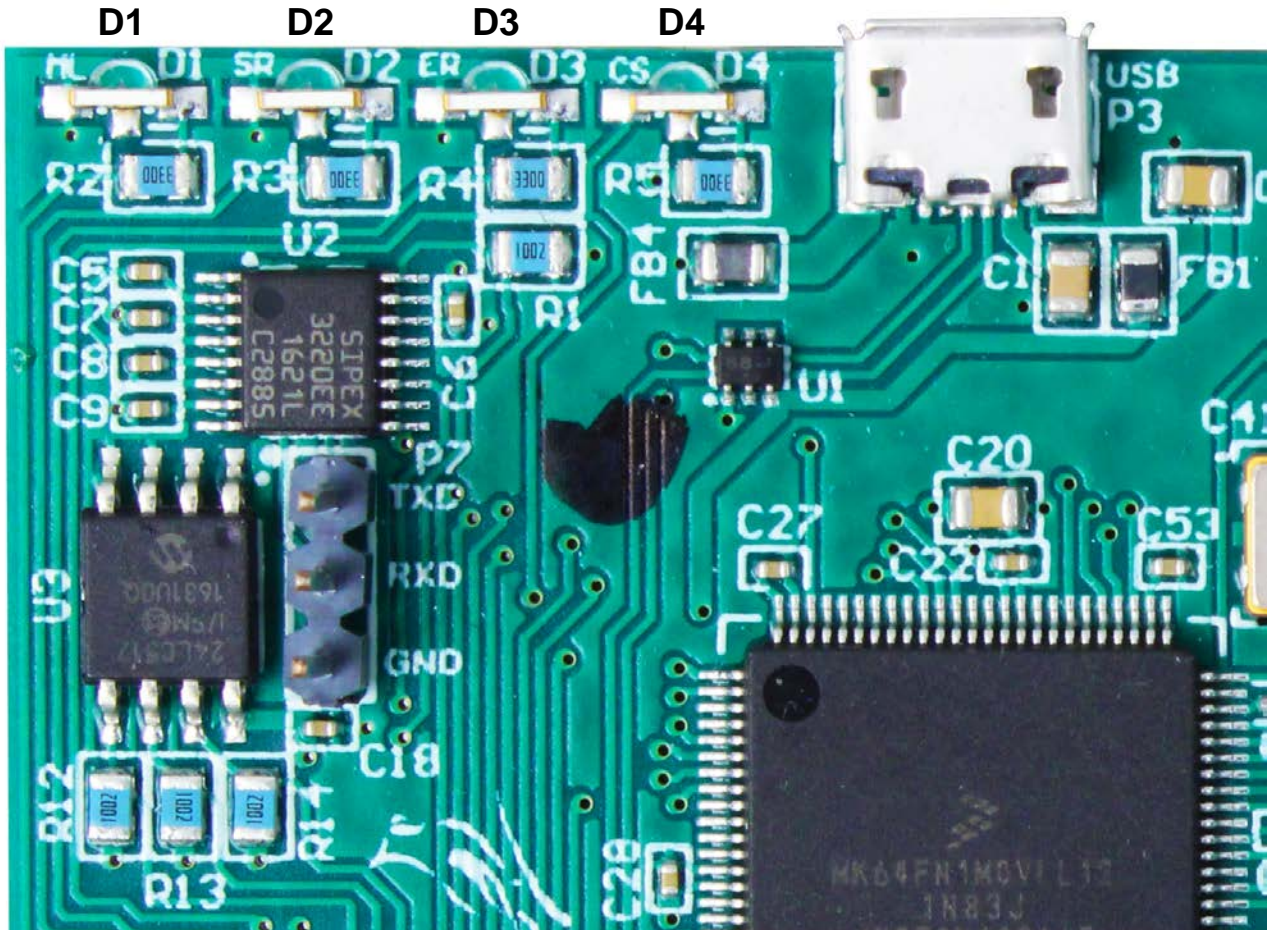
```
Press 'I' to jump to this from other  
diagnostics screens
```



# DIGITAL SCALE DIAGNOSTICS

## Hardware Diagnostics

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



- D1** – Blinking = Indicates the 825-DLC card is communicating with the 825D main board.
- D2** – Blinking = Indicates the 825-DLC card is transmitting messages to the load cells.
- D3** – Blinking = Indicates the 825-DLC card is receiving responses from all assigned load cells.
- D4** – Blinking = Indicates 825-DLC card select from the 825D main board.

## DETECTING BOARD REPLACEMENTS

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.

### OPTION CARD REPLACEMENT

If an option card is replaced, the 825D will boot up to this screen:

```
CARDINAL 825
Item          Version  01 cards  I[ ]
MnBd DLC      1.21.011 Slot Type  Version
Loader        1.10.013  1   DLC    1.00.001
OS/Std Apps   1.12.021

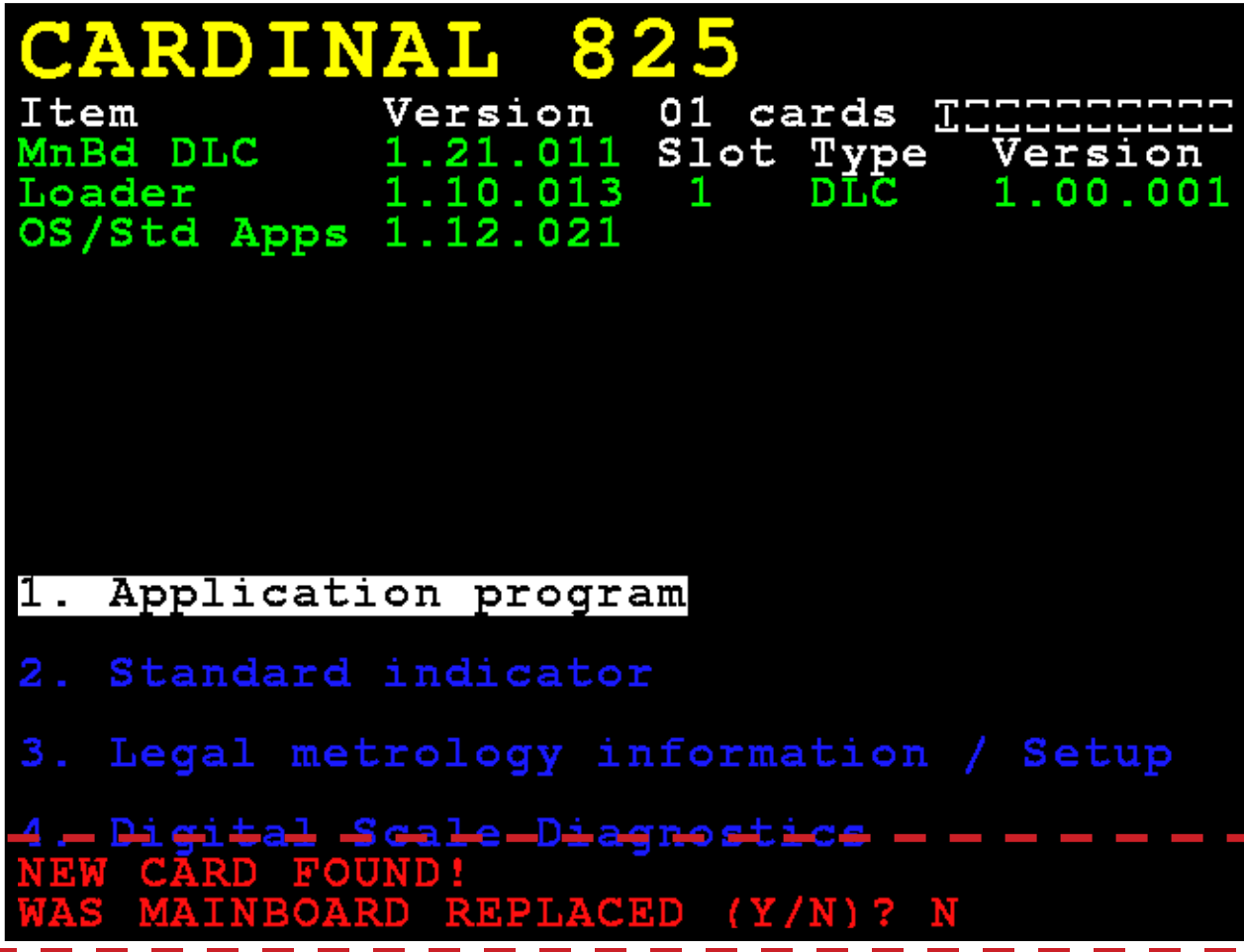
1. Application program
2. Standard indicator
3. Legal metrology information / Setup
4. Digital Scale Diagnostics
NEW CARD FOUND!
WAS DIGITAL SCALE CARD REPLACED (Y/N)? N
```

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.

## MAIN PCB 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 CARD REPLACEMENT



## CAUTION! OBSERVE THE 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:

```
CARDINAL 825
Item          Version  01 cards  I[ ]
MnBd DLC      1.21.011 Slot Type  Version
Loader        1.10.013  1   DLC    1.00.001
OS/Std Apps   1.12.021

1. Application program
2. Standard indicator
3. Legal metrology information / Setup
4. Digital Scale Diagnostics
NEW CARD FOUND!
WAS DIGITAL SCALE CARD REPLACED (Y/N)? N
```

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.

# STATEMENT OF LIMITED WARRANTY

## WARRANTY TERMS

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

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



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## APPLICABLE LIMITATIONS AND REQUIREMENTS

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

## EXCLUSIONS

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



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