

# SMART CAN

DIGITAL SYSTEMS

## ANALOG-TO-DIGITAL CONVERSION SYSTEM

 *Cardinal*<sup>®</sup>  
[www.CardinalScale.com](http://www.CardinalScale.com)



LEGAL FOR TRADE

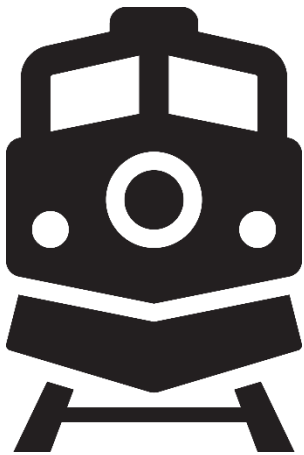


# PERFECT FOR RETROFITTING EXISTING ANALOG SCALES OR CONVERTING ANALOG LOAD CELLS TO A DIGITAL SYSTEM

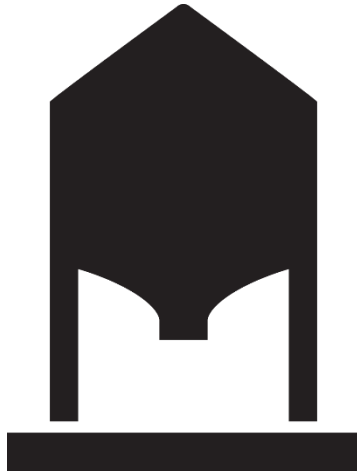
SmartCan may be used in a variety of different applications with new and existing truck scales, railroad scales, floor scales, bench scales, and batching systems.



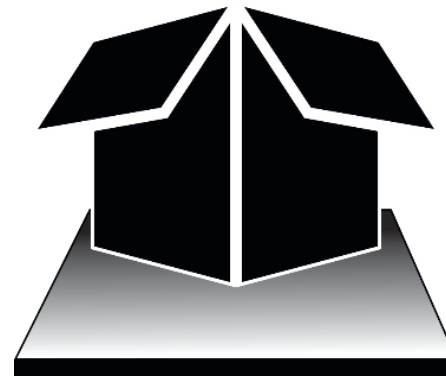
**TRUCK  
SCALES**



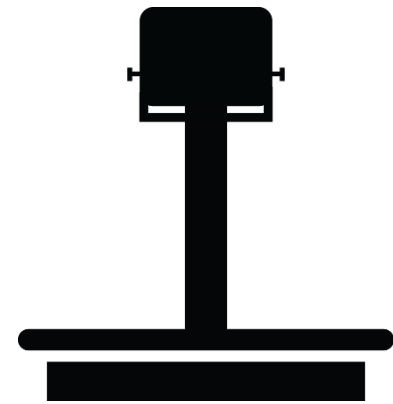
**RAILROAD  
SCALES**



**BATCHING  
SCALES**



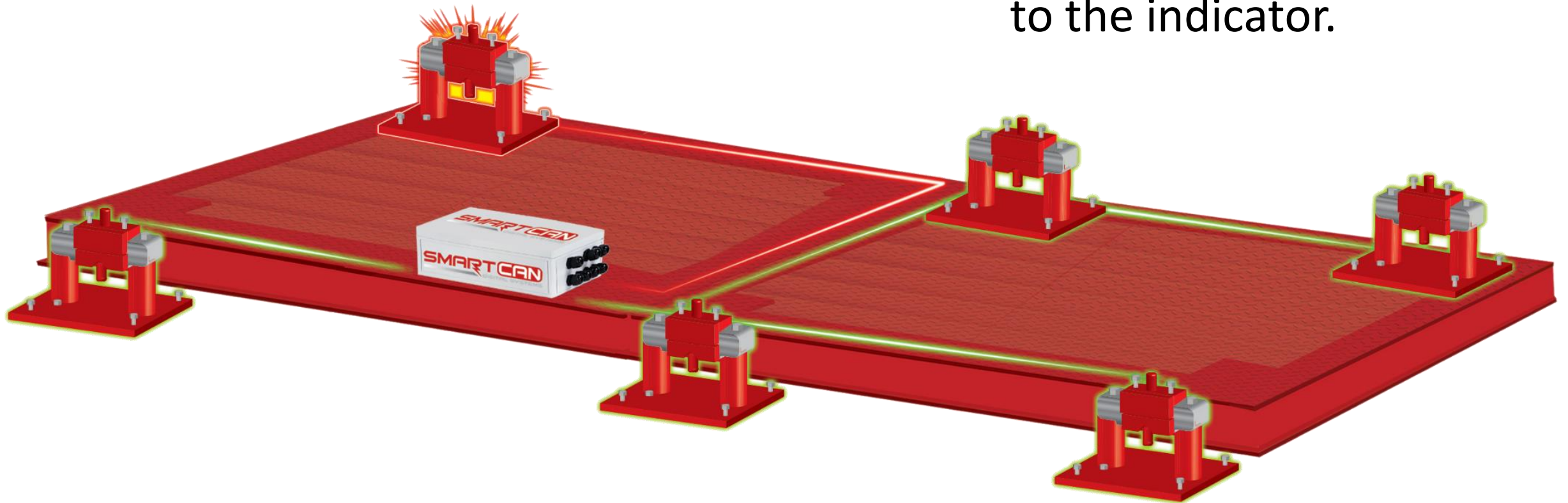
**FLOOR  
SCALES**



**BENCH  
SCALES**

# DIGITIZE YOUR SCALE WITH **SMARTCAN** DIGITAL SYSTEMS

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.

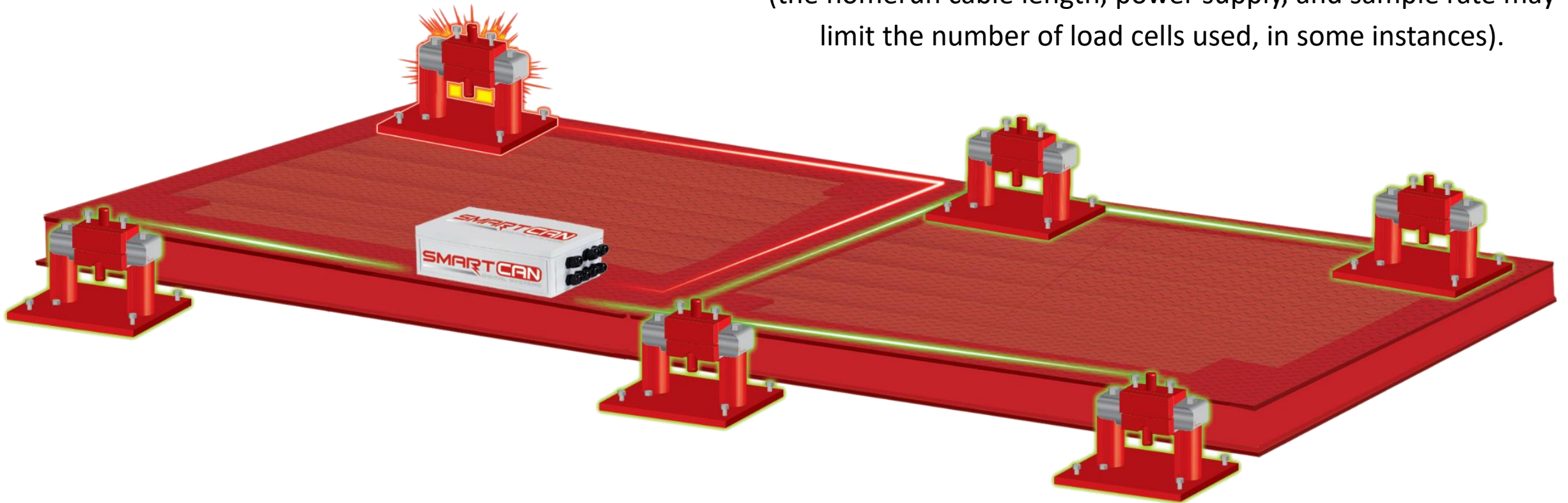




# DIGITIZE YOUR SCALE WITH **SMARTCAN** DIGITAL SYSTEMS

SmartCan is housed in a compact weatherproof IP66 / NEMA 4 enclosure and doesn't require cumbersome external power supplies, in many cases.

The indicator software permits a maximum of 32 load cells that could be used in any combination with SmartCan (the homerun cable length, power supply, and sample rate may limit the number of load cells used, in some instances).



# FAST AND POWERFUL SCALE DIAGNOSTICS



- Real-time load cell failure and fault diagnostics
- Lightning/surge protection
- Ideal for troubleshooting multi-platform truck scales
- NTEP certified



# FAST AND POWERFUL SCALE DIAGNOSTICS



- May be used with Guardian<sup>®</sup> hydraulic load cells
- Load cell troubleshooting through the Cardinal Scale 225D or 825D indicators
- Compact enclosure size only requires minimal space





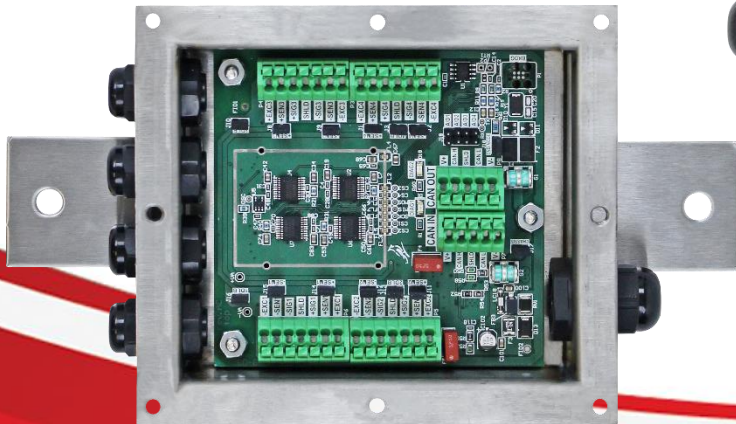
# FAST AND POWERFUL SCALE DIAGNOSTICS



- All components housed in a rugged IP66 / NEMA 4 rated enclosure
- Universal mounting brackets for easy field installation
- No power is required in most applications (SmartCan is also available with AC power)



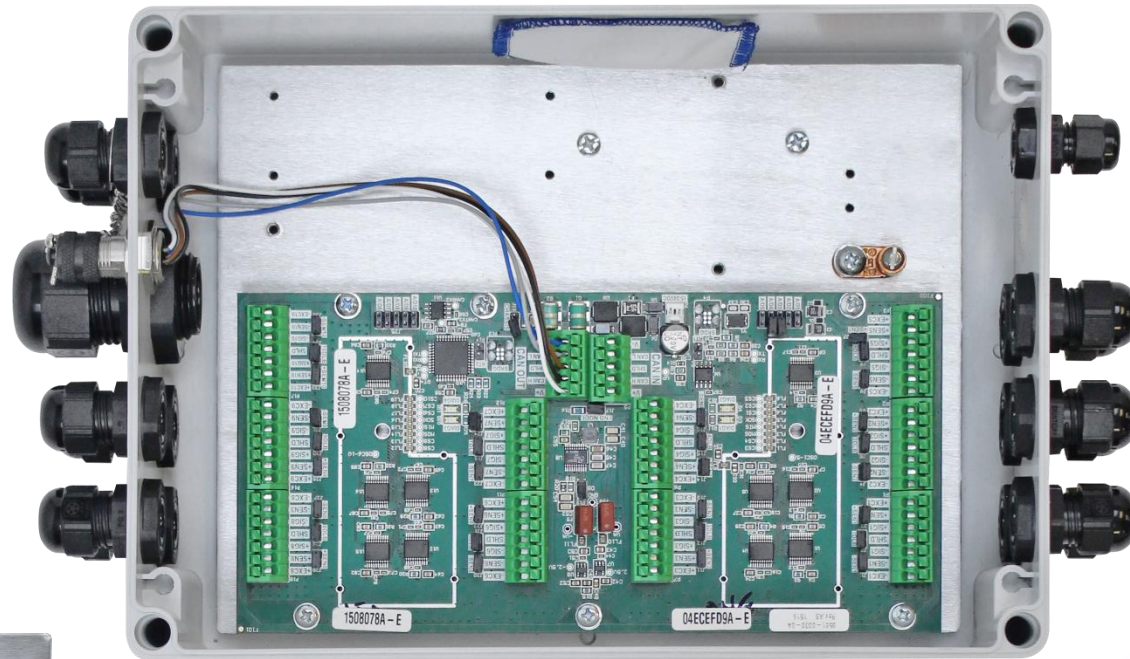
The SmartCAN system is a digitally controlled weighing and diagnostic scale environment where everything from installation to maintenance is enhanced, monitored, and simplified by state-of-the-art digital electronics including a micro-controller and flash memory.



# SMARTCAN

DIGITAL SYSTEMS

## Identify Problems In Advance



 **Cardinal®**  
Cardinal Scale Manufacturing Co.





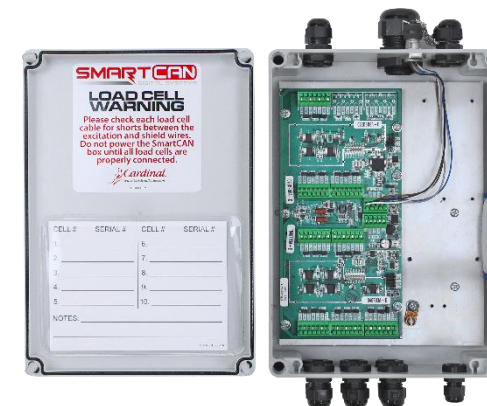
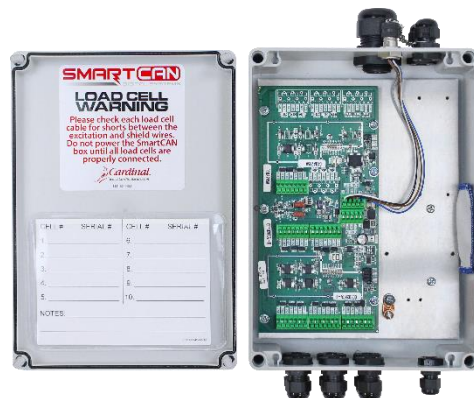
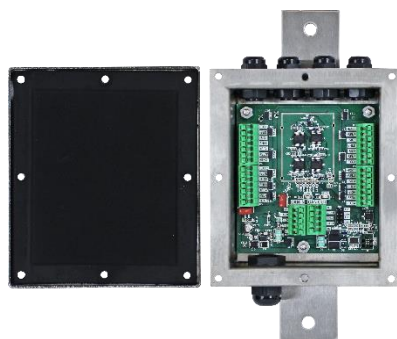
The following diagnostics data is available and will be shown to the technician on the main weight screen of the 225D or 825D indicator:

- Minimum and Maximum Load Cell Weights
- Deadload Shift (from original calibrated deadload)
- Individual Load Cell Signal in Millivolts
- DLC Controller Card Communication Error Count
- iSite Status of Last Connection



# SEVEN DIFFERENT BOXES AVAILABLE





**SMARTCAN4**  
Up to 4 Load Cells  
Stainless Steel Enclosure

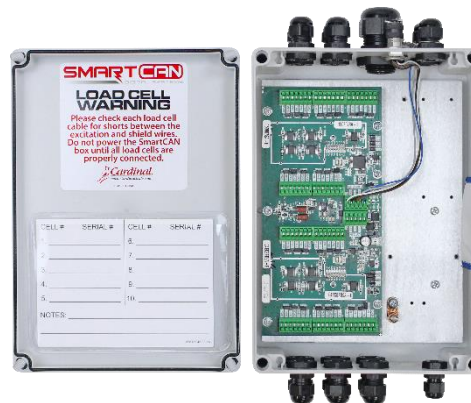
**SMARTCAN6**  
Up to 6 Load Cells  
Polycarbonate Enclosure

**SMARTCAN6-AC**  
Up to 6 Load Cells  
Polycarbonate Enclosure  
Internal AC Power Supply

**SMARTCAN8**  
Up to 8 Load Cells  
Polycarbonate Enclosure



**SMARTCAN8-AC**  
Up to 8 Load Cells  
Polycarbonate Enclosure  
Internal AC Power Supply



**SMARTCAN10**  
Up to 10 Load Cells  
Polycarbonate Enclosure



**SMARTCAN10-AC**  
Up to 10 Load Cells  
Polycarbonate Enclosure  
Internal AC Power Supply



# FAIL-SAFE MODE KEEPS YOUR SCALE RUNNING IN THE EVENT OF A FAILED CELL (COMING SOON)



Cardinal Scale's Fail-Safe feature with SmartCan allows the system to compensate for a failed load cell by mirroring the estimated value of the remaining cells to offset the failed cell. The Fail-Safe feature uses an algorithm to calculate an estimated value from the data of the remaining cells and creates a virtual load cell to replace the data from the down cell.



# ENABLES USAGE OF SMARTCAL AND DIGITAL CALIBRATION ADJUSTMENTS

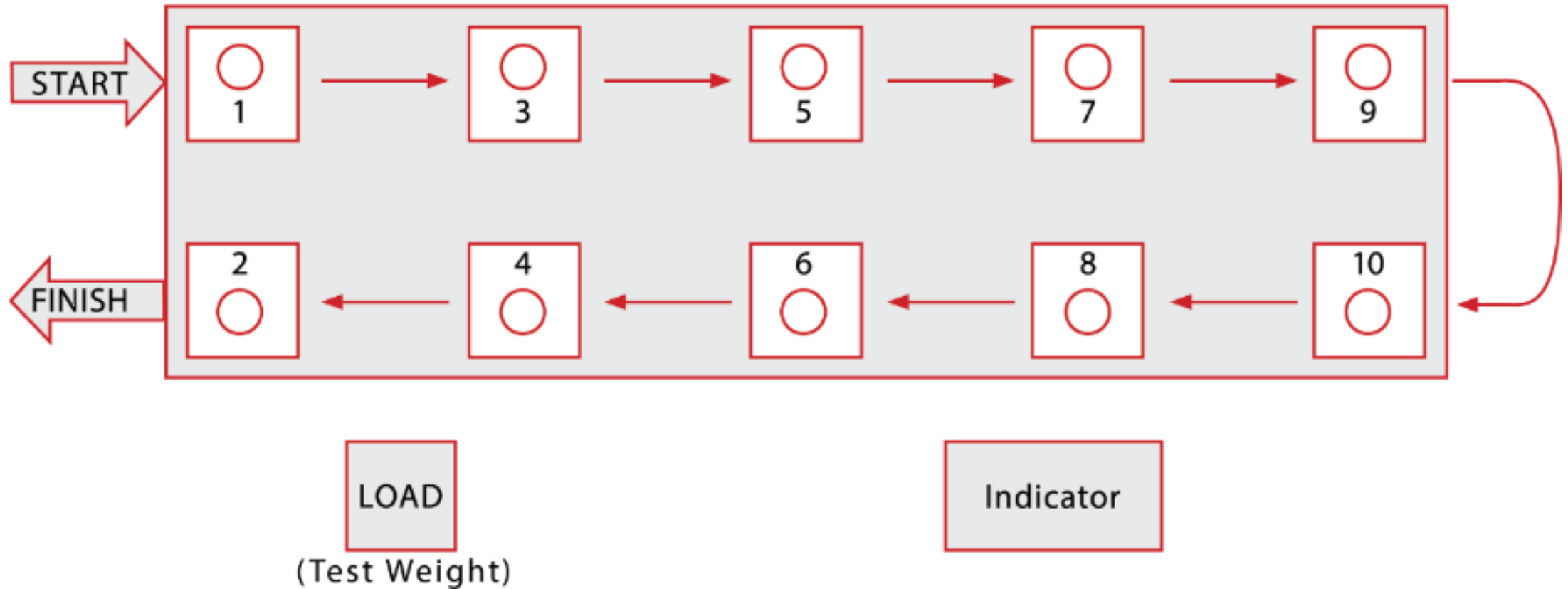


The SmartCan system uses Cardinal Scale's patented software algorithm called SmartCal<sup>®</sup> method of calibrating a scale. SmartCal<sup>®</sup> allows a quick calibration with no manual adjustments while the diagnostic software identifies real and potential system problems before they interrupt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





### SmartCal® Load Cell and Load Placement







# NEST TOOLKIT COMPATIBLE

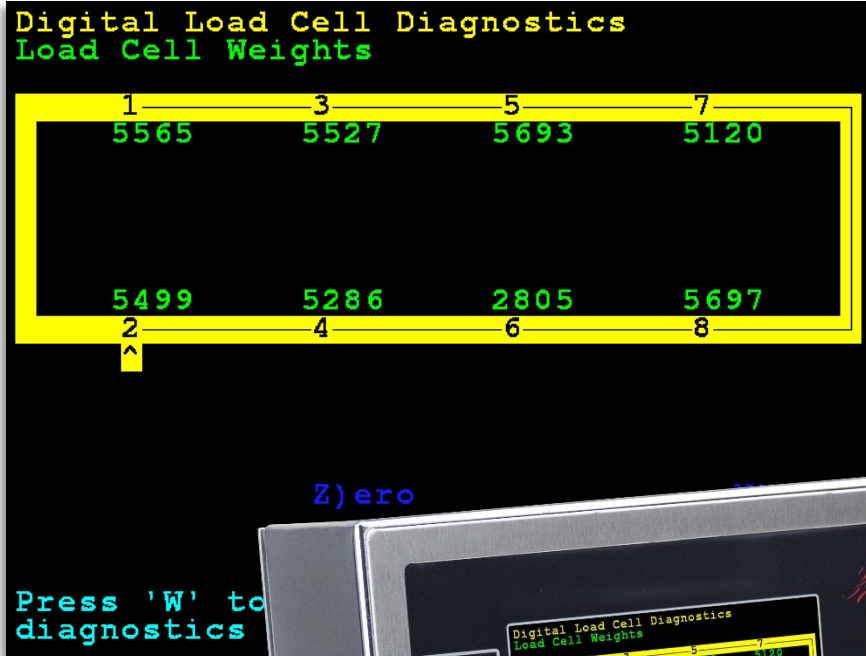


Authorized Cardinal Scale dealers may plug a NEST toolkit directly into the SmartCan box for additional onsite diagnostics. NEST allows you to view the diagnostics in your choice of millivolts or pounds. There are three display modes: signals display, minimum-maximum display, and signals minus zero reference display.



# TROUBLESHOOT THROUGH THE INDICATOR

Cardinal Scale's 825D Spectrum weight indicators easily interface with the SmartCan digital conversion system and provide onscreen diagnostics for load cell performance in real-time. The 825D makes corner and section trimming easier with its graphical, full-color display.





# TROUBLESHOOT THROUGH THE INDICATOR



Cardinal Scale's 225D Navigator weight indicators easily interface with the SmartCan digital conversion system and provide onscreen diagnostics for load cell performance in real-time.

LOAD CELL WEIGHTS			
1.	38764	5.	37876
2.	36492	6.	13649
3.	37467	7.	36746
4.	39004	8.	38904
PREVIOUS		NEXT	
		EXIT	





# REMOTE TROUBLESHOOTING AND SCALE MONITORING THROUGH ISITE CLOUD- BASED SOFTWARE

Cardinal Scale's iSite is a cloud-based remote monitoring system for load cells connected to the SmartCan conversion box. Text and/or e-mail auto alerts can be sent for errors and warning events. Through secure online dealer access, scale diagnostics may be looked up remotely to quickly identify problems before they interrupt weighing operations.





# REMOTE TROUBLESHOOTING AND SCALE MONITORING THROUGH ISITE CLOUD-BASED SOFTWARE

Cardinal DETECTO

Hello Jonathan ▾

### My Cardinal Sites

16<sup>2</sup>  
Normal Sites

60<sup>2</sup>  
Warning Count

146<sup>1</sup>  
Error Count

Site Selection | Joplin

Scale Status X Close Site

Load Cell 4

Serial #: 1CA0A640  
Cell Rev: 0.0.0

Print Filter By 12/06/2017

« December 2017 »

Su	Mo	Tu	We	Th	Fr	Sa
26	27	28	29	30	1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31	1	2	3	4	5	6

Date	Time	MilliVolts	Weight	Calibratio	Zero	Tem
12/06/17	7:18:15 PM	0.771777	-235.4	-413.1	8.3	
12/06/17	6:18:15 PM	0.772219	-235.4	-413.1	6.7	E
12/06/17	5:18:15 PM	0.773137	-232.4	-413.1	3.8	N
12/06/17	4:18:16 PM	0.772867	-236.4	-413.1	0.4	N
12/06/17	3:18:16	0.772723	-239.2	-413.1	-2.9	N

Cardinal DETECTO

Hello Jonathan ▾

### My Cardinal Sites

16<sup>2</sup>  
Normal Sites

60<sup>2</sup>  
Warning Count

146<sup>1</sup>  
Error Count

Site Selection | Joplin

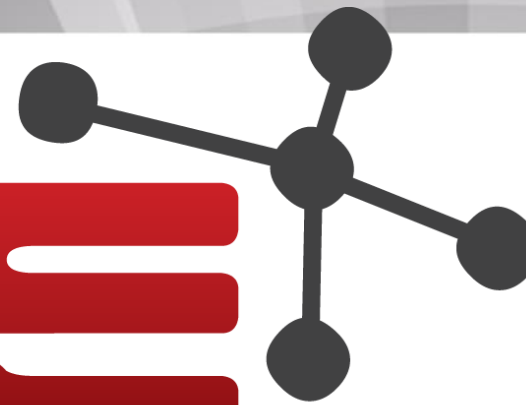
Scale Status X Close Site

Overview

Equipment

Notes

# iSITE



- Cloud-Based Remote Monitoring for Digital Systems
- Text or E-mail Auto Alerts for Errors
- Free to Authorized Cardinal Scale Dealers Using SmartCan or SmartCell® Load Cells
- Secure Online Dealer Access Interface for Scale Diagnosis
- Connect to the Cloud via Ethernet Network or Cellular Modem
- Quickly Identify Problems Before They Interrupt Weighing





## My Cardinal Sites

16<sup>2</sup>

Normal Sites

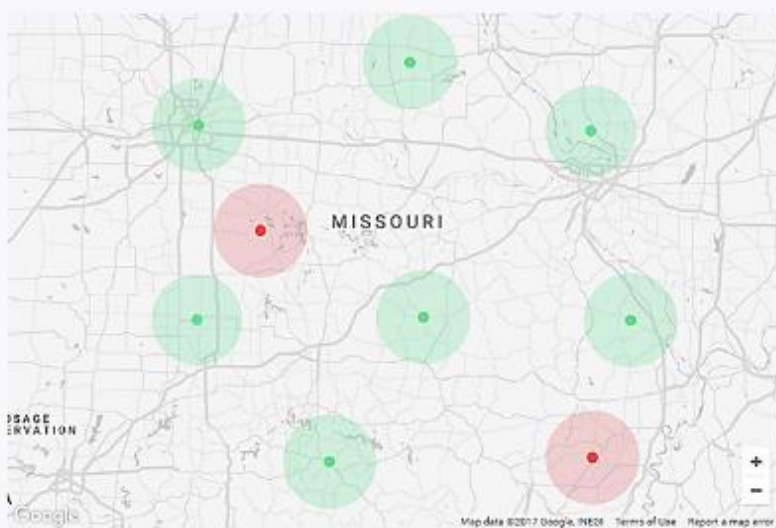
60<sup>2</sup>

Warning Count

147<sup>1</sup>

Error Count

## Site Selection



## Recent Activity

Date ▾	Message ▾
12/15/2017	Went out to the scale on Tuesday and used NEST to review load cell #3.
11/2/2017	Calibrated scale - ran NEST prior to calibration.
10/19/2017	Sent tech to job site to check home-run cable connection after lightning strike.
8/5/2017	Called customer to check in about weight readings.
4/27/2017	Replaced load cell #8.



## Geographic Look-ups

Once you log into iSite through the CardinalScale.com dealer portal, you'll have a choice of navigating to your specific digital installations via geographic look-up by map or text-based list view. The maps will automatically indicate any error or warning readings in red. Simply click on the installation site's location to go to a follow-up page for more information.

## My Cardinal Sites

 Search

16<sup>2</sup>

Normal Sites

60<sup>3</sup>

Warning Count

147<sup>1</sup>

Error Count

### Site Selection

Customer ▾	Site ▾	City ▾	State ▾	Scale ▾	Status
Ag Tech Customer	Silo 1	Atlanta	GA	Northbound Scale	<span>E</span>
Sliverbank Aggregate Customer	Rock Quarry 1	Joplin	MO	Southbound Scale	<span>N</span>
Allico Ag Industries Customer	Silo 2	Kansas City	KS	Scale #3	<span>N</span>
Worldpoint Waste Co. Customer	Transfer Station 1	Jacksonville	MS	Scale #1	<span>N</span>
Omega Quarry Customer	Rock Quarry 2	Joplin	MO	Scale #1	<span>N</span>



### Recent Activity

Date ▾	Message ▾
12/15/2017	Went out to the scale on Tuesday and used NEST to review load cell #3
11/2/2017	Calibrated scale - ran NEST prior to calibration
10/19/2017	Sent tech to job site to check homerun cable connection after lightning strike
8/5/2017	Called customer to check in about weight readings
4/27/2017	Replaced load cell #8



## Site Selection

The iSite home page within the online dealer portal lets you look up your installations based on a number of different criteria: Customer Name, Purchase Order, Site Name, City, State, Scale Name, etc. Recent Activity is also shown for any technician notes they have entered into iSite or warning readouts.

## My Cardinal Sites

16<sup>2</sup>

Normal Sites

60<sup>2</sup>

Warning Count

146<sup>1</sup>

Error Count

## Site Selection | Joplin

Overview

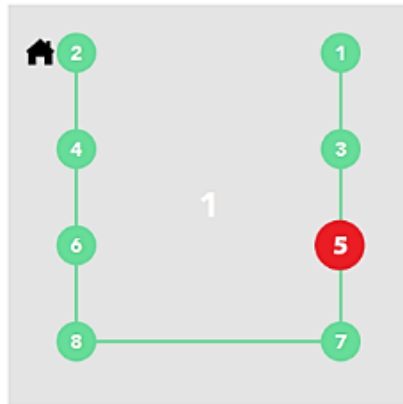
Equipment

Notes

123 Main St.  
Joplin, MO 64804

## Scale Status

X Close Site



## Vehicle Scale Diagram

Real-time digital load cell diagnostics identify problems before they cause inaccurate weighing. When you click on a particular site, a scale diagram will be shown with normally-functioning load cells displayed in green and load cells or cables with errors designated in red. The diagram lets you quickly identify where the issue is located within the scale.



## My Cardinal Sites

16<sup>2</sup>

Normal Sites

60<sup>3</sup>

Warning Count

146<sup>1</sup>

Error Count

Site Selection | Joplin

Scale Status

X Close Site

## Load Cell 4

Serial #: 1CA0A540

Cell Rev: 0.0.0



Print



Filter By

12/06/2017

Close

Date Time Millivolts Weight Calibration Zero Tare

12/06/17 7:10:15 PM 0.721777 -235.4 -413.1 8.3

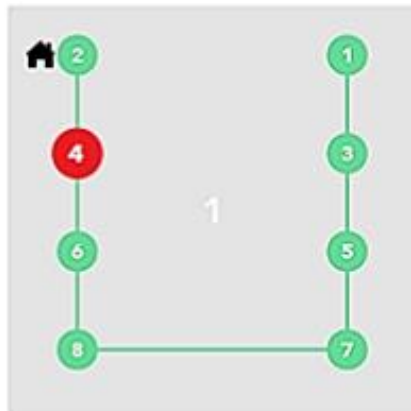
12/06/17 6:10:15 PM 0.722219 -235.4 -413.1 6.7

12/06/17 5:10:15 PM 0.723137 -232.4 -413.1 3.8

12/06/17 4:10:16 PM 0.722667 -236.4 -413.1 0.4

12/06/17 3:10:16 PM 0.722723 -239.2 -413.1 -2.9

December 2017						
Su	Mo	Tu	We	Th	Fr	Sa
26	27	28	29	30	1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31	1	2	3	4	5	6



## Specific Load Cell Data

If you click on a particular load cell, this iSite screen will display more detailed load cell diagnostic data.

# SMARTCAN DIGITAL CONVERSION BOXES GENERATE NEW COST-SAVING OPPORTUNITIES



Kyle and Julie Crane of IWCS Scale have installed many SmartCan systems



The customer, J&D Produce, who is utilizing one of the first SmartCan digital conversion systems for their multi-platform truck scale.





## SMARTCAN DIGITAL CONVERSION BOXES GENERATE NEW COST-SAVING OPPORTUNITIES

Older model alloy steel analog load cells that were difficult to diagnose by volt meters previously with the existing analog junction box.





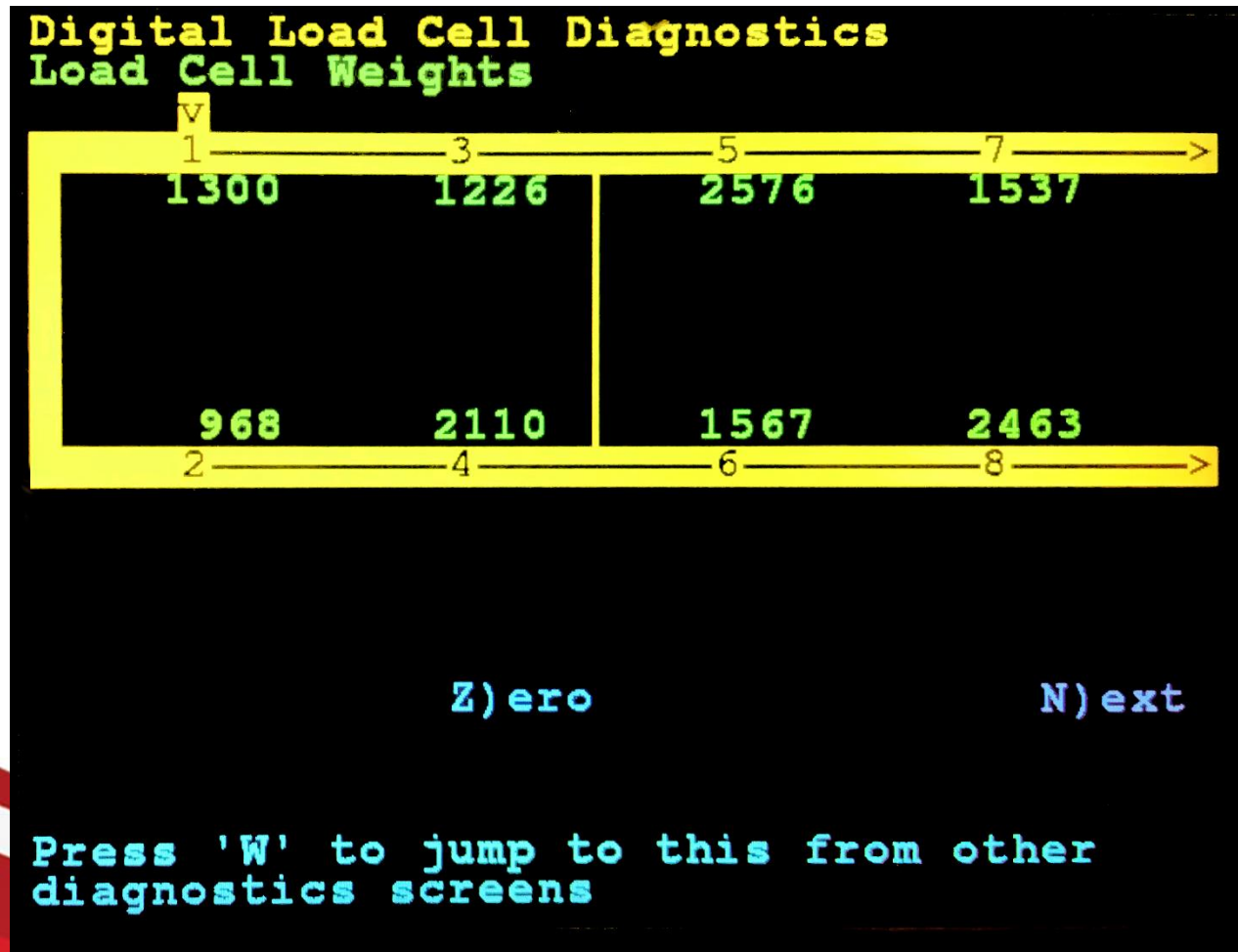
## Digitizing Analog Scales With Cardinal Scale's SmartCan

The SmartCan digital conversion box can be installed in tight spaces due to the compact enclosure size.





# SMARTCAN DIGITAL CONVERSION BOXES GENERATE NEW COST-SAVING OPPORTUNITIES



Cardinal Scale's 825D indicator displays live individual load cell weights graphically on the weighbridge diagram.

# SMARTCAN DIGITAL CONVERSION BOXES GENERATE NEW COST-SAVING OPPORTUNITIES

Digital Load Cell Diagnostics  
Load Cell IDs / Software Versions

V			
1	3	5	7
1BA7630A	1BA7630C	1BA7630E	037A541B
0.0.0	0.0.0	0.0.0	0.0.0
1BA7630B	1BA7630D	037A541A	037A541C
0.0.0	0.0.0	0.0.0	0.0.0
2	4	6	8

P)revious

N)ext

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

Cardinal Scale's 825D indicator shows the individually-assigned serial number for each analog load cell on the weighbridge diagram, so that they can be recognized independently within SmartCan digital diagnostics.





# SMART CAN

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