



# iQUBE<sup>2</sup>

Intelligent Junction Box



**Communication Options:**  
 Fiber Optic Transceiver  
 RS-232/RS-485  
 Ethernet TCP/IP  
 Wireless Ethernet



**Options/ Accessories**

- 1280 indicator/controller
- 920i<sup>®</sup> indicator/controller
- VIRTUj<sup>2</sup><sup>®</sup> Windows<sup>®</sup> based indicator software
- Transient protection
- Remote AC power supply
- 9-36 VDC Converter
- Revolution<sup>®</sup> scale software

**Specifications**

<b>Enclosure:</b>	NEMA Type 4X FRP 11.3in x 9.3in x 5.4in (max 2 boards) NEMA Type 4X FRP 13.3in x 11.3in x 5.6in (max 3 boards) NEMA Type 4X stainless steel 10.3in x 8.9in x 4.3in (max 2 boards)
<b>Board Size:</b>	4 in x 5 in
<b>Voltage Input:</b>	115/230VAC power supply, 7-12VDC power supply optional 9-36 volts DC converter
<b>Load Cell Inputs:</b>	4 channels (up to 16 with secondary networked boards)
<b>Load Cell Excitation:</b>	5 VDC, 57 mA maximum per channel
<b>Analog Range:</b>	-45 mV/V to +55 mV/V
<b>Analog Signal Sensitivity:</b>	0.3 uV/grad, 1.0 uV/grad recommended
<b>Update Rate:</b>	Up to 500 per second for the 4 channel board Up to 150 per second for (4) 4 channel boards
<b>Temperature Range:</b>	14 F° to 104 F° (-10 C° to 40 C°)
<b>Ports:</b>	Port 1 and 2
<b>Band Rate:</b>	9600-460,000 7 even, odd, 8 none

**Approvals**



**Standard Features**

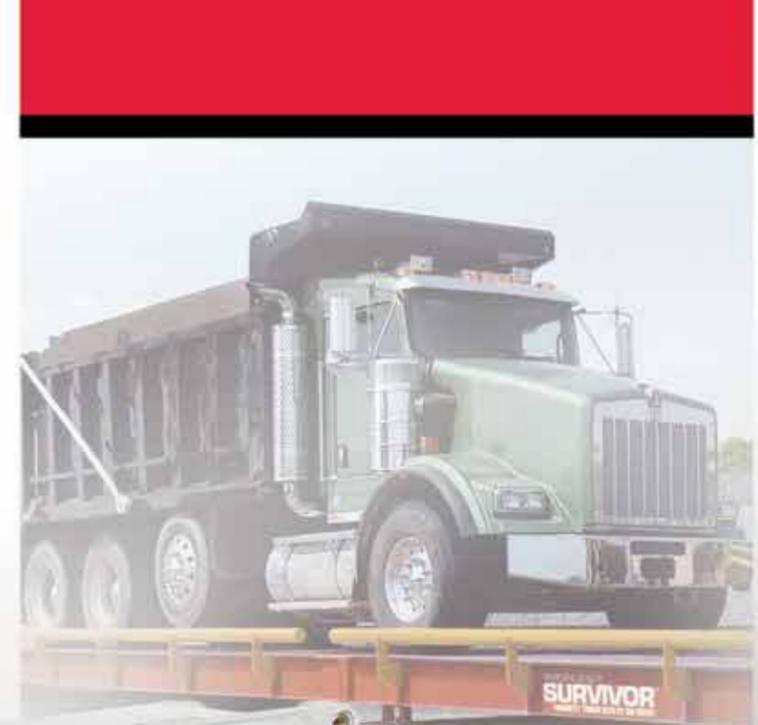
- Enclosure includes 4-channel board with or without power supply
- NEMA Type 4X fiberglass reinforced polyester or stainless steel enclosure
- Up to 16 load cells can be connected using secondary boards
- Connection can be up to 4 separate platforms with a system total, or 4 separate scale systems
- Diagnostic routines for failed cells, weighing errors and system health. Tests for zero return, cell balance (linearity), noise and drift
- Onboard status LEDs for indication of cell health, port activity, heartbeat and digital I/O
- Cell Emulator compensates for load cell failure until a repair can be made
- Cal-Match<sup>®</sup> algorithm automatically trims and calibrates the scale in one pass of test weights
- Standard communication for Port 1 RS-232/485/422. Option card slot for Fiber Optic, Ethernet TCP/IP or Ethernet TCP/IP Wireless, USB or RS-232/485/422
- Can be used as a stand alone weight-based controller with serial output
- Four digital I/O for push-button operation, host control, free running set points, or remote cell status

Your Rice Lake Weighing Systems distributor is:



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# Identifies and handles problems before they become problems.



Designed to enhance speed and performance, iQUBE<sup>2</sup> is the next generation of intelligent junction boxes. By taking standard junction box functions to a digital level, it offers more than any junction box you've ever known. iQUBE<sup>2</sup> has the unique ability to digitally monitor and communicate load cell performance, and when necessary will even compensate for a failing load cell until repairs can be made. By creating a digital signal, iQUBE<sup>2</sup> provides unparalleled speed and communication, and is far more resistant to electrostatic discharge and transient damage from lightning strikes than a traditional scale system.

iQUBE<sup>2</sup> is ideal for systems requiring single or multiple scales with multiple cells. From floor and hopper scales to large multi-deck truck scales, iQUBE<sup>2</sup> is the required solution for any mission-critical application.

## Accuracy translates to profits

Your scale controls either the quality or quantity of the product you are weighing. In other words, your scale accuracy is directly related to profits. Many factors can affect your scale accuracy, which can go unnoticed. iQUBE<sup>2</sup> monitors each load cell for weighing errors.

## Speed enhances precision

Faster data feedback improves the weight response efficiency of the HMI indicator. Whatever batching control application you are monitoring, iQUBE<sup>2</sup> gives you real-time data for precision control. Accurate targets can be achieved in fast fill applications like asphalt, grain or chemicals where both speed and accuracy are required. Even though update speed is extremely fast, the accuracy is enhanced with an adaptive digital filter.

## The benefits of iQUBE<sup>2</sup> diagnostics

iQUBE<sup>2</sup>, when used with a diagnostic screen, displays and tracks performance, weight, dead load and current values for each load cell. The diagnostics system checks A/D, excitation, communication and load cell bridges.

## iQUBE<sup>2</sup> creates a virtual load cell to keep your scale running

The iQUBE<sup>2</sup> cell emulation feature calculates what the weight should be based on known comparisons to functional load cells. For mission-critical applications, cell emulation can keep your scale weighing even through a load cell failure.

## iQUBE<sup>2</sup> features digital I/O

Each channel has a digital I/O that can be used to indicate load cell health, activate control devices or read input switch closures.

## iQUBE<sup>2</sup> diagnostics

### iQUBE<sup>2</sup> Tests for Return to Zero

If any load cell within a scale system does not return to zero, it could be an indication of scale binding or a damaged load cell. A load cell or scale that is binding could be zeroed and appear to work, but still not weigh correctly. The iQUBE<sup>2</sup> diagnostic data will troubleshoot these situations and pinpoint any problem areas.

### iQUBE<sup>2</sup> Tests for Load Cell Balance

Many factors influence scale linearity; however, when a scale is nonlinear, it usually isn't noticed until inventory shortages have already occurred. iQUBE<sup>2</sup> verifies linearity by monitoring load cell tolerances.

### iQUBE<sup>2</sup> Identifies Noise/Instability

Noise is the most common problem in a scale system, caused by deteriorating resistance to ground. Because of intermittency, it can be difficult to isolate from environmental effects like wind or vibration. One faulty load cell can cause system instability.

### iQUBE<sup>2</sup> Monitors Drift

Drift under load affects the accuracy of weighing. When a system is loaded, drift can easily be mistaken as a legitimate weight change. Drift can be caused when load cell resistance changes because of corrosion, temperature change or strain gauge damage, which produces weighing errors.

## iQUBE<sup>2</sup> extra protection

Install an optional fiber optic interface board to immunize iQUBE<sup>2</sup> from lightning damage through serial communication lines. Fiber optics is a non-conductive communication option where electrical disturbances cannot travel. Typical communication cable is a metal conductor, a pathway for electrical transients and can pick up inductive electrical pulses caused by lightning. Choose from fiberglass reinforced polyester or stainless steel case.

Truck and Track Scales



Up to Four Systems per iQUBE<sup>2</sup>

Diagnostics		DEADLOAD	CURRENT
A1-Load Cell 1		0.576	0.386
A2-Load Cell 2		0.284	0.338
A3-Load Cell 3	* ERROR *	0.286	0.507
A4-Load Cell 4	* ERROR *	0.262	0.594

System 1	2004.656
4 weighments over 1000 grads	

920i screen showing the health of load cells.

Tank and Hopper Scales



Diagnostics	
Overload (Hz)	0.00
Underload (Hz)	0.00
Cell Noise Diagnostics	Off
Peak to Peak Load Cell Noise (mV)	10.0
Cell Noise Time (Seconds)	10.0
Cell Balance Diagnostics	On
Cell Balance Range (%)	50.0
Cell Balance Threshold (%)	5.0
Cell Drift Diagnostics	Off

1280 screen showing diagnostics.



## Interface with Weight Indicators for Superior Monitoring

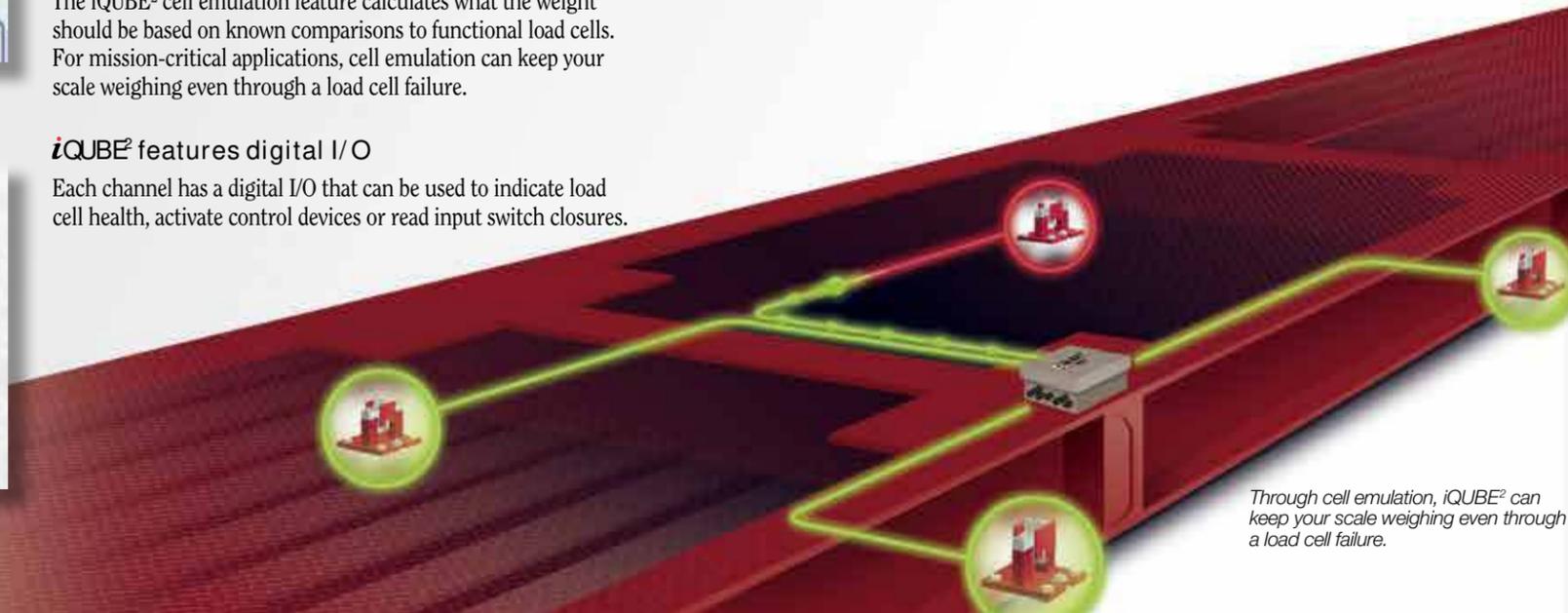
iQUBE<sup>2</sup> easily interfaces with Rice Lake's VIRTUi2<sup>®</sup> PC-based virtual indicator as well as the 920i<sup>®</sup> and 1280 Enterprise<sup>™</sup> Series programmable weight indicators.

VIRTUi2 is a PC-based, Legal for Trade application that functions as a virtual weight indicator. VIRTUi2 handles up to four scale systems and one total scale. Connect iQUBE<sup>2</sup> to VIRTUi2 through RS-232, USB or Ethernet TCP/IP to display real-time load cell performance.

The 920i programmable weight indicator offers program flexibility and higher processing performance with features that advance operations. The 920i interfaces with iQUBE<sup>2</sup>, displaying load cell performance in real-time.

The 1280 Enterprise Series programmable weight indicator supports iQUBE<sup>2</sup>, making corner and section trimming more intuitive with graphical representation. The 1280's built-in web server allows for remote trimming, summing and load cell monitoring from any networked device.

iQUBE<sup>2</sup> also features an open protocol to easily interface with other manufacturers' host instruments. Weight data is transmitted in a simple string to display load cell information and status.



Through cell emulation, iQUBE<sup>2</sup> can keep your scale weighing even through a load cell failure.