iQUBE²®

Intelligent Junction Box

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

Options/Accessories

- 920i® indicator/controller
- VIRTUi²® Windows® based indicator software
- Transient protection
- Remote AC power supply
- 9-36 VDC Converter
- Revolution® scale software

Specifications

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

Approvals

NTEP
CC# 03-302A1

Measurement Canada Approved
AM-5561

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Standard Features

- Enclosure includes 4-channel board with or without power supply.
- NEMA 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® 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.

iQUBE²

INTELLIGENT JUNCTION BOX

WARNING! HIGH VOLTAGE

RICE LAKE
WEIGHING SYSTEMS

RICE LAKE®
WEIGHING SYSTEMS
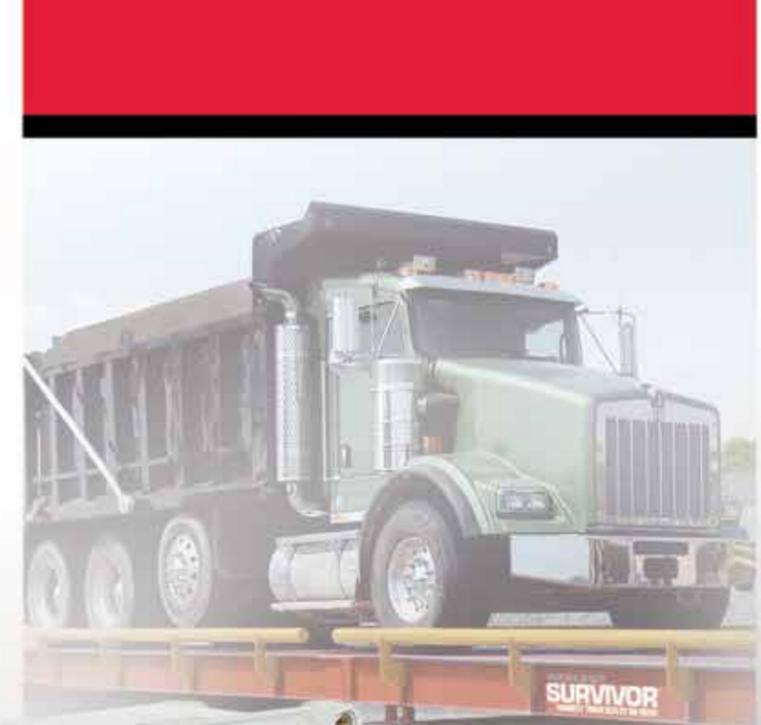
800-472-6703
www.ricelake.com

Identifies and handles problems before they become problems.

Truck and Track Scales

Up to four systems per *i*QUBE²

Tank and Hopper Scales

Designed to enhance speed and performance, iQUBE²® is the next generation of intelligent junction boxes. By taking standard j-box functions to a digital level, it offers more than any junction box you've ever known. iQUBE² 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, iQUBE² provides unparalleled speed and communication, and is far more resistant to electrostatic discharge and transient damage from lightning strikes than a traditional scale system.

iQUBE² is ideal for systems requiring single or multiple scales with multiple cells. From floor and hopper scales to large multi-deck truck scales, iQUBE² 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. iQUBE² 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, iQUBE² 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 *i*QUBE² diagnostics

iQUBE², when used with a diagnostic screen, displays and tracks cell performance, weight, dead load and current values for each load cell. The diagnostics system checks A/D, excitation, communication and load cell bridges.

920i screen showing the health of load cells.

*i*QUBE² Diagnostics

iQUBE² 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 cell or scale that is binding could be zeroed and appear to work, but still not weigh correctly. The iQUBE² diagnostic data will troubleshoot these situations and pinpoint any problem areas.

iQUBE² Tests for Cell Balance

Many factors influence scale linearity; however, when a scale is nonlinear, it usually isn't noticed until inventory shortages have already occurred. iQUBE² verifies linearity by monitoring load cell tolerances.

iQUBE²® 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.

iQUBE² Monitors Drift

Drift under load affects the accuracy of weighment. 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.

*i*QUBE² creates a virtual load cell to keep your scale running

The iQUBE² 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.

*i*QUBE² 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.

*i*QUBE² extra protection

Install an optional fiber optic interface board to immunize the iQUBE² 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.)

*i*QUBE² enclosures

Choose from fiberglass reinforced polyester or stainless steel case.

Through cell emulation, iQUBE² can keep your scale weighing even through a load cell failure.

Rice Lake Hosts and Open Protocol

Rice Lake HMI Indicator/Controllers

VIRTUi²® is a Windows® based application that displays a virtual indicator, handles up to four scales, plus a total, and is connected to iQUBE² through RS-232, USB or Ethernet TCP/IP. VIRTUi² replaces the need for a separate indicator, and is the way to go if the application also requires a local PC.

VIRTUi² is a Legal-for-Trade PC-based weight indicator that displays gross or net weight, with primary weighing functions to zero, tare or print the weight and can transfer weight data into other Windows applications. The diagnostic screen shows real-time load cell performance. If a cell failure or weighing error is detected, it sends an email and logs the error to an error report. The scale is configured and calibrated through a setup application, which can be protected through administration rights.

920i® HMI is a programmable, expandable, and cost-effective industrial weight controller with an attractive streamlined enclosure and large display screen to view real-time diagnostics. Load cell performance is conveniently displayed, and service personnel are immediately notified via email when weighing errors occur. 920i® can be configured directly through the front panel or by using the iRev™ configuration utility. Its selection of features excel in batching and data collection.

Expand the 920i with option cards including analog output, analog input, thermocouple, serial communication, pulse input, digital I/O, additional memory and protocol cards for EtherNet/IP®, DeviceNet®, ControlNet®, Remote I/O and Profibus®.

iQUBE² features an open protocol to easily interface with other hosts. Weight is transmitted in a simple string and cell status can be queried for more detailed information on each load cell.

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