iQUBE²
RICE LAKE
Configurations

1 iQUBE², 1 Scale

1 iQUBE², 4 Scales

4 iQUBE²s, 4 Scales

Multiple iQUBE²s, 1 Scale

## What is the difference between *i*QUBE² and an Analog Junction Box?

iQUBE² has an A/D for each load cell providing a digital value from each channel, making the output of each load cell visible. In an analog summing box, the load cells are summed as one analog signal – just like having one big load cell. For trouble shooting a multi-cell system, a summed analog signal makes it difficult to determine the source of the problem. Also signal strength is substantially stronger with iQUBE² since the output is for each load cell, instead of a summed total load cell output. For example, a truck scale with (8) 75,000 load cells produces 1 uV/grad in an analog system (with 10 volts excitation), but iQUBE² produces 4 uV/grad (with only 5 volts of excitation).

What is the difference between *i*QUBE and *i*QUBE²?

iQUBE² is the fastest smart junction box on the market. A/D sample rate has increased and multiple scales are supported.

It can be interfaced to almost any serial host using the open protocol. iQUBE² can even be used without a display if no operator interface is required.

Channel	Hz
4	200
8	150
12	100
16	60
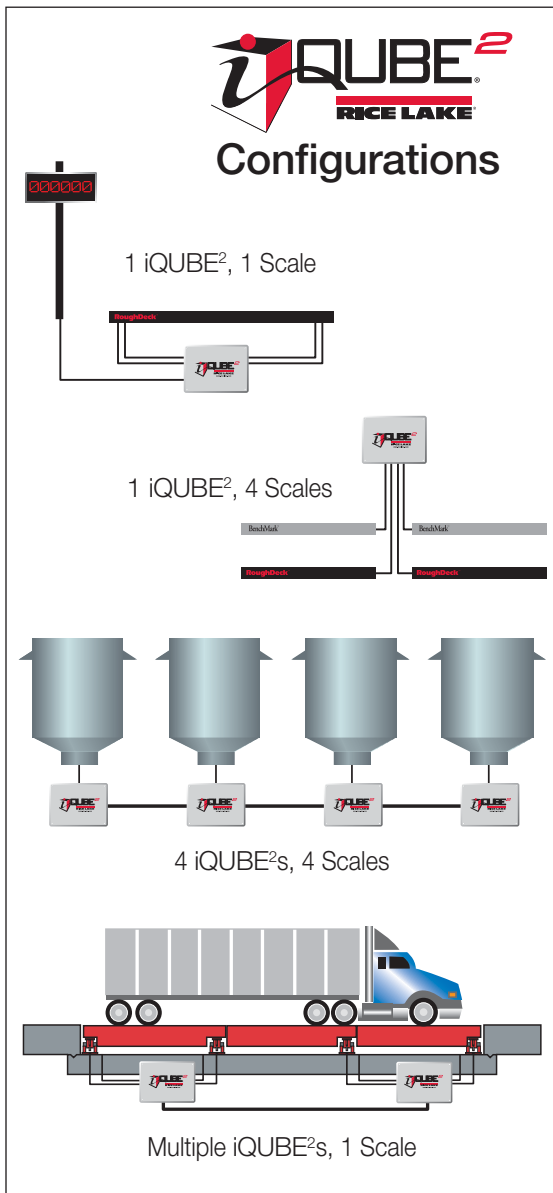
Why is speed important?

A/D speed is required when filling at a fast flow rate. The faster the A/D speed, the more precise the data. This translates to lbs per A/D cycle (lb/sec ÷ Hz = lb per A/D cycle).

How does load cell emulation work?

Cell emulation is an algorithm that calculates the output of a faulty load cell. The degree of accuracy of both emulators is dependent on good installation practices where all cells are carrying loads in a plumb and level condition and there is broad distribution of weight. The emulators will work flawlessly where there is no mechanical error, but not where weight can be concentrated on the emulated cell. The emulated load cell is based on a comparison to other functional load cells. In a vehicle scale, the emulated load cell is factored by applying the ratio of a good section to the known weight on the remaining good cell mate. In a tank/hopper scale, the emulated load cell is based on a snap shot obtained (ratio of all cells) when the scale was functional and factoring the known weight of good cells to this relationship. For scales that can be point loaded (off center loaded), like a floor scale, cell emulation is not possible.

How do scale diagnostics function?

The scale diagnostic tests are set to detect if the scale is not performing as expected. These diagnostic tests can be vital since most weighing errors go undetected until the scale is tested with certified test weights. The tests are based on setting tolerances and making comparisons to other load cells referred to as cellmates. There are four weighing tests (return to zero, cell balance or linearity, instability and drift). These tests only detect that a cell did not fall within the determined tolerance. There are also system and channel tests to detect any electrical failure whether system operation/communication issues, cell failure or cable damage.

How many cells, platforms or systems can be interfaced?

Each board has four channels. Up to four of these boards can be connected to sum 16 load cells. An iQUBE² system can consist of a primary board and up to three secondary boards. These can be configured as one scale or any combination of four scales plus a total.

What are the advantages of using a fiber optic interface?

Although lightning damage can still happen when employing fiber optic isolation, it is the best method to increase immunity to lightning. There are two main reasons: first, fiber optic cable is non-conductive so there is no possible circuit for current flow between the indicator and the scale, even in the case of a direct strike. Second, fiber cable is immune to electrical noise, where as a copper load cell cable interface is basically an antenna that can pick up inductive pulses and couple these as current flow into sensitive electronic devices.

What comes in an *i*QUBE²?

Each board has diagnostic LEDs for displaying load cell health, communication port activity, processor heartbeat, and digital I/O functionality. The boards can be run with a DC power source (7.5 – 12 VDC), or with an internal/external mounted AC power supply.

There are three enclosure types: A (4) channel FRP box, a (4 or 8) channel FRP box, or a (4) channel stainless steel box. An additional board can be added to the enclosures.

Why a 920*i*?

The industrial enclosure is attractive enough for an office but rugged enough for the most demanding NEMA 4X applications. It can display up to four legal-for-trade scales at one time. It displays real-time diagnostics and is programmable for customizing process control or data collection.

Through iRite, a user program can be written to customize the scale operation for the application requirements. The 920i is expandable through two on board option slots, to add A/D channels, Serial Ports, Pulse Input, Analog Input and Output, Thermocouples, Memory and a number of field bus protocols.

Why Virtu*i*²?

There is no need for a separate scale indicator if a PC already exists. Weight data can be transferred from one Windows® application to another.

What about relay control?

Each board has associated Digital I/O, which can be used to show cell health or the primary I/O can operate as unlatched setpoints or digital inputs.
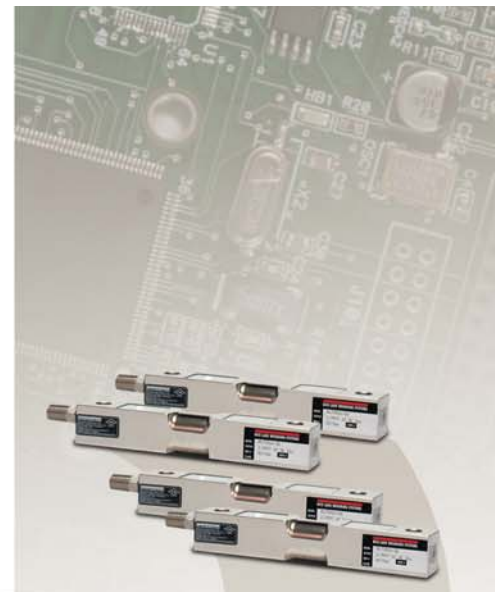
What is the open protocol?

Standard communication with iQUBE² is through RS-232 or RS-485. The interface protocol string is easy to parse and will interface to most devices.

<STX><Polarity><Weight><Units><Mode><Status><ETX>

What option cards are available?

Fiber Optic Interface card

Ethernet TCP/IP card

Ethernet Wireless TCP/IP

USB Interface

RS-232/485 card

Serial Option card

Fiber Optic Transceiver
RS-232/RS-485
Ethernet TCP/IP
Ethernet TCP/IP wireless