

VIRTUlink™

SCALE MONITORING AND DIAGNOSTICS SYSTEM



RICE LAKE®
WEIGHING SYSTEMS

800-472-6703
www.ricelake.com



Monitor and Analyze Scale Data

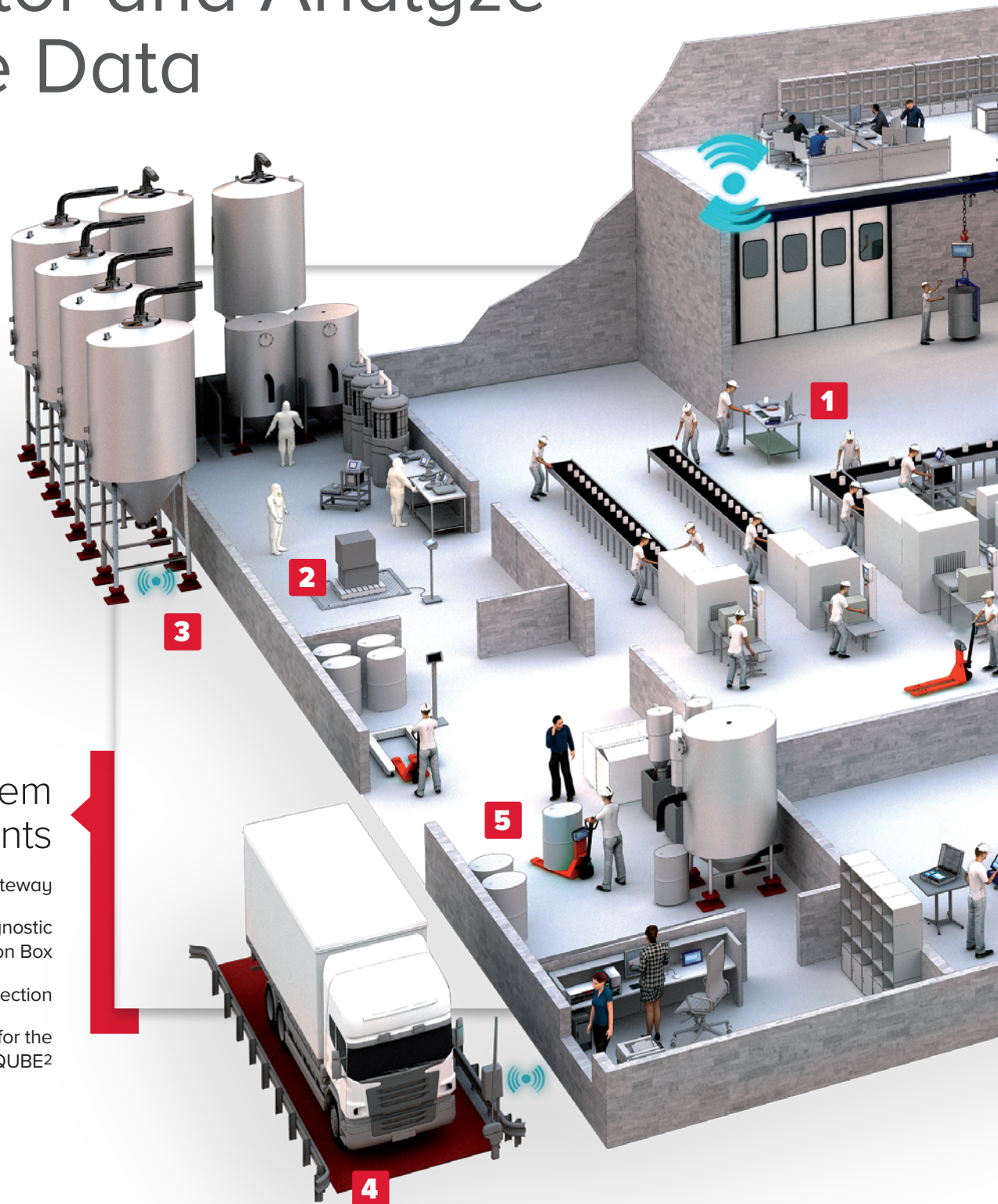
System Requirements

VIRTUlink Gateway

iQUBE2® Digital Diagnostic Junction Box

Internet Connection

Static IP Addresses for the Gateway and iQUBE2



Rice Lake's VIRTULink™ IoT System connects weighing equipment to the cloud, enabling data from networked devices to be utilized for a wide variety of business and operational decisions. By combining the iQUBE² digital junction box with the latest cloud technology, VIRTULink provides access to diagnostics and can automate service alerts.

VIRTULink supports long-term efficiency, and is expandable with support for multiple datapoints from weight indicators, junction boxes, auxiliary equipment, sensors and web relays, and IP cameras.

VIRTULink-enabled systems can automatically report scale status and individual load cell information. iQUBE²'s unique load cell emulation feature allows it to compensate for a failing load cell until a repair can be made. With an unmatched reaction time, accuracy is brought to new levels.



Scale Systems

1 Process Weighing
Bench Scales

2 Material Handling
Floor Scales

3 Batching/Dosing
Load Cells and Weigh Modules

4 Shipping and Receiving
Vehicle Scales

5 Warehouse Inventory and Logistics
Forklift and Pallet Jack Scales

6 Overhead Safety
Crane Scales

Rice Lake's VIRTUlink™ Optimizes Uptime for TriRX Pharmaceutical Services

In the pharmaceutical industry, reputation and integrity are critical, and patient safety is at the forefront of every facet of the business. From research and development to manufacturing and packaging, the highest standards of accuracy and quality must be maintained.

When TriRX Pharmaceutical Services was searching for a new technology to improve their production environment and overall responsive capabilities, they implemented Rice Lake's VIRTUlink IoT gateway system and web application into their everyday processes.

"A quality scale system is essential for the effectiveness of our products and most importantly, the safety for our customers," explains Christy Pinkerton, TriRX project engineer. "Our industry is regulated by the FDA and DEA, so any opportunity to improve our processes and strengthen our authenticity is always welcomed. We saw an opportunity to leverage VIRTUlink on our 1,000-, 2,000- and 5,000-gallon tanks to see how our load cells were performing in real-time. It turned out to be a game-changer that helped all groups involved."

If any of the load cells begins to fail, it may produce an out-of-tolerance result for the finished product. This can negatively impact the pharmaceutical's overall effectiveness and result in lost business or diminished confidence in the company as a whole.

VIRTUlink constantly monitors the health and performance of connected equipment. By connecting to Rice Lake's iQUBE² digital junction box, the VIRTUlink IoT gateway enables remote diagnostics, automated maintenance alerts and advanced analytics.

"VIRTUlink has been very beneficial," continues Pinkerton. "It has proven itself numerous times, including an event where one port would not register any readings. We determined the ground wires were missing and possibly the GFCI outlet nearby had shorted out. Once remedied, the port was back online and we received an automated notification."

Another occasion involved one of the tank scales providing erratic readings. By remotely checking the alert logs, operators determined the errors occurred during the same time the team was cleaning the tank. They determined only one load cell was having the issue and suspected a nick in the cable which was allowing water ingress. After identifying the damage and replacing the cable, the issue was resolved. "We are very impressed with how quickly the system alerts us there is a problem," Pinkerton concludes. "Our group knew there was an issue before the production group caught it."

As a quickly growing company, TriRX relies on the best equipment to maintain reliability in the demanding and highly regulated pharmaceutical field. With Rice Lake's VIRTUlink as a constant and efficient tool, TriRX looks forward to many years of future success in serving customers and patients.

"We saw an opportunity to leverage VIRTUlink on our 1,000-, 2,000- and 5,000-gallon tanks to see how our load cells were performing in real-time. It turned out to be a game-changer that helped all groups involved."

Christy Pinkerton, project engineer, TriRX Pharmaceutical Services, LLC.



System Components

VIRTUlink™ is compatible with any application using analog load cells, and can be easily added to installations already using an iQUBE2® digital junction box. Select from Rice Lake's 1280 Enterprise™, 920i® or VIRTUi® to display weight data, connect to peripherals or even control an advanced process with setpoints. VIRTUlink operates independently from the weight indicator and interfaces directly with iQUBE2 to connect scale diagnostics to the power of the cloud.

VIRTUlink Gateway Device

- Sends raw and analyzed values from the scale to the cloud
- Supports long-term efficiency by providing scale and throughput records
- Expandable with support for multiple data points from indicators, junction boxes, auxiliary equipment, sensors, web relays and IP cameras



iQUBE2 Diagnostic Junction Box

VIRTUlink's IoT gateway connects the power of iQUBE2 to the cloud. This enables the digital junction box's real-time diagnostics and process data to be accessible through a convenient, secure web dashboard. iQUBE2 and VIRTUlink partner together to monitor scale health around the clock. If an issue is detected, VIRTUlink can display an alert and automatically send an email to designated users. By automating alerts and logging diagnostics, iQUBE2 and VIRTUlink proactively improve any application's uptime and efficiency.

iQUBE2 monitors common scale conditions to evaluate system health



Load Cell Emulation

When a weighing problem is catastrophic and your scale operation is mission critical, continue using your scale by enabling the iQUBE2's load cell emulation. It can keep your scale operational by comparing load cells with intelligently calculated values.

Return to Zero Failure

Scale accuracy is dependent on a scale returning to zero when unloaded. If zero consistently needs to be reacquired by pressing the Zero key, the ability to accurately weigh is suspect. This may be an indication of load cell damage or scale movement being restricted due to debris or other factors, resulting in binding.

Underload/Overload

Underloads and overloads occur when a load cell's reading is out of normal operating range. Consistent underloads or overloads can be a symptom of a failing load cell or mechanical issues such as binding.

Loss of Connection

An electrically damaged strain gauge circuit is not unlike a cut load cell cable, both of which will greatly impact the weighment or cause an out-of-range condition.

Out of Balance

When a scale's load cells are nonlinear, it typically is not noticed because all the outputs are summed together. When compared to an adjacent load cell, the output response in a section will be similar if the load cells are equally loaded. iQUBE2 verifies linearity by monitoring load cell tolerances.

Drift

Drift can manifest itself by gradually changing weight or by sudden weight changes. It can be caused when load cell resistance changes because of corrosion, temperature change or strain gauge damage—producing weighing errors.

Noise or Instability

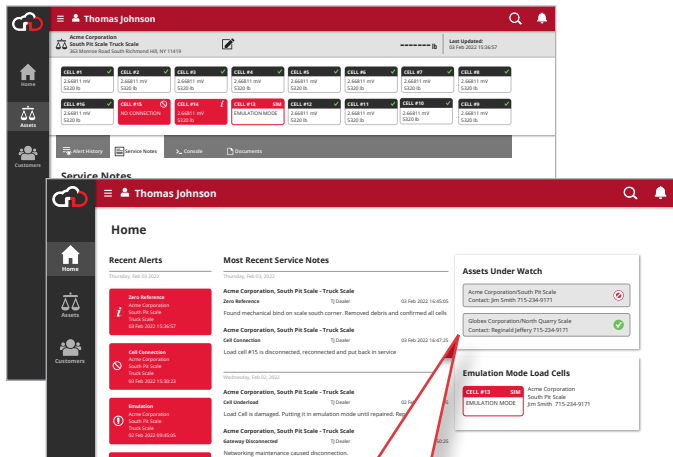
Noise is the most common problem in a scale system, but it can be difficult to isolate from environmental factors unless you can see each output individually. One faulty load cell will cause system instability.

User Interfaces



VIRTUlink Web Dashboard

- Online portal to monitor equipment and review data in real time
- Receive alerts when a problem is detected
- Configure the home screen to display critical assets
- Remotely identify service needs and schedule regular maintenance alerts based on number of weighments or time intervals
- Review technician notes and dispatch customer support faster, with relevant information at your fingertips
- Hosted on secure data centers for optimal uptime and ultimate data protection



Assets Under Watch

Acme Corporation/South Pit Scale
Contact: Jim Smith 715-234-9171



Globex Corporation/North Quarry Scale
Contact: Reginald Jeffery 715-234-9171



Scale Display Options Compatible with iQUBE²

VIRTUI

VIRTUI provides the functionality of a basic weight indicator on a PC. For simple installations not requiring process control, this Windows®-based solution is ideal.



1280 Programmable Weight Indicator

Offering process control options and a highly customizable color touchscreen interface, the 1280 is capable of sophisticated batching and complex event-based programs.



920i Programmable Weight Indicator

The 920i has been tested and trusted by the weighing industry for years. Utilized by a wide range of industrial applications, the 920i offers a customizable LCD graphical display and custom program options.



Stream Data Directly to a LaserLT

For applications that simply require weight monitoring, a weight indicator may not be necessary. Streaming data directly to a remote LaserLT remote display provides visible weight data from a distance in any environment.



Other Components

VIRTUlink™ integrates with several IoT peripherals, including:

IP Camera

Monitor visuals during weighments.



Weather Station

For outdoor applications where weather data is essential, incorporate wind speed and other conditions into your process.

Industrial Sensors

Additional data such as temperature and speed can be utilized for complex process control and high-level information.

Secure Data Storage

Network Security

Physical separation of external and LAN network avoids mutual attacks.

Signed software protects against manipulation and secures device integrity.

Data encryption according the latest state of technology against electronic eavesdropping and data theft.



SPECIFICATIONS

CONNECTIVITY FROM iQUBE² TO IoT GATEWAY

STANDARD COMMUNICATION:	Ethernet TCP/IP
POWER CONNECTOR:	3-pin terminal block (3.5 mm)
POWER SUPPLY:	24 V DC ± 6 V DC
CONFORMITY WITH UL:	Use Class 2 power source, Over-voltage Category II
CURRENT (AT 24 V DC):	170 mA (typical) max. 400 mA
POWER CONSUMPTION:	Min. 4.2 W; Max. 9 W
OPERATING SYSTEM:	Security-hardened Linux
CPU PROCESSORS	Broadcom BCM2837, 1.2 GHz, 64 bit, 4 cores

GATEWAY HARDWARE/COMMUNICATION

MEMORY:	Integrated memory 1 GB DDR3 RAM, SD card 32 GB MLC NAND, Micro SD card
INTERFACES:	Bluetooth®, Core Specification 4.2, Bluetooth Low Energy (BLE) support Wi-Fi: 1 x WiFi, single band 2.4 GHz IEEE 802.11b/g/n (BCM43438), fixed antenna USB: 4 x USB 2.0, max. 500 mA max. 1 A overall USBs, Type A
DISPLAY CONNECTOR:	1 x HDMI, software activatable
IT INTERFACE:	1 x 10/100 Mbit, Microchip LAN9514 1 x RJ45 socket LAN connector

REQUIRED ACCESSIBLE PORTS:	http (80) https (443) MQTT (1883) MQTT over SSL (8883) AMQP (5672) AMQPS (5671)
-----------------------------------	--

DISPLAY:	8 LEDs (2 programmable)
REAL-TIME CLOCK:	Capacitor buffered, maximum 7 days backup, maintenance free
ENVIRONMENT:	IP20 degree of protection
AMBIENT TEMPERATURE:	Operation: -20°C-+60°C; Storage: -40°C-+85°C
HUMIDITY RANGE:	10 % -95 % (95 % at 40°C) relative humidity (non-condensing)
USE:	Indoor use
DIMENSIONS:	5.5 in x 1.38 in x 1.13 in 140 mm x 35 mm x 105 mm
WEIGHT:	0.89 lb (400 g)
METAL HOUSING:	DIN top hat rail mount
APPROVALS:	UL – Nr. E221530 Vol D1 FCC – ID ZANEG0001 IC – 24152-0001 KCC – No. R-C-HKR-ETP51EN-RE UL Japan – No. 007-AH0211 RoHS

CONFORMANCE WITH EMC DIRECTIVES:	CE Emission EN 55011:2009 Immunity IEC 61000-6-2/3, EN 61131-2 Electrostatic discharge (ESD) (air and contact discharge method) EN 61000-4-2 Fast transient interferences (Burst) EN 61000-4-4 Surge voltage EN 61000-4-5
---	--