

# VIRTUlink™

SCALE MONITORING AND DIAGNOSTICS SYSTEM



**RICE LAKE®**  
WEIGHING SYSTEMS

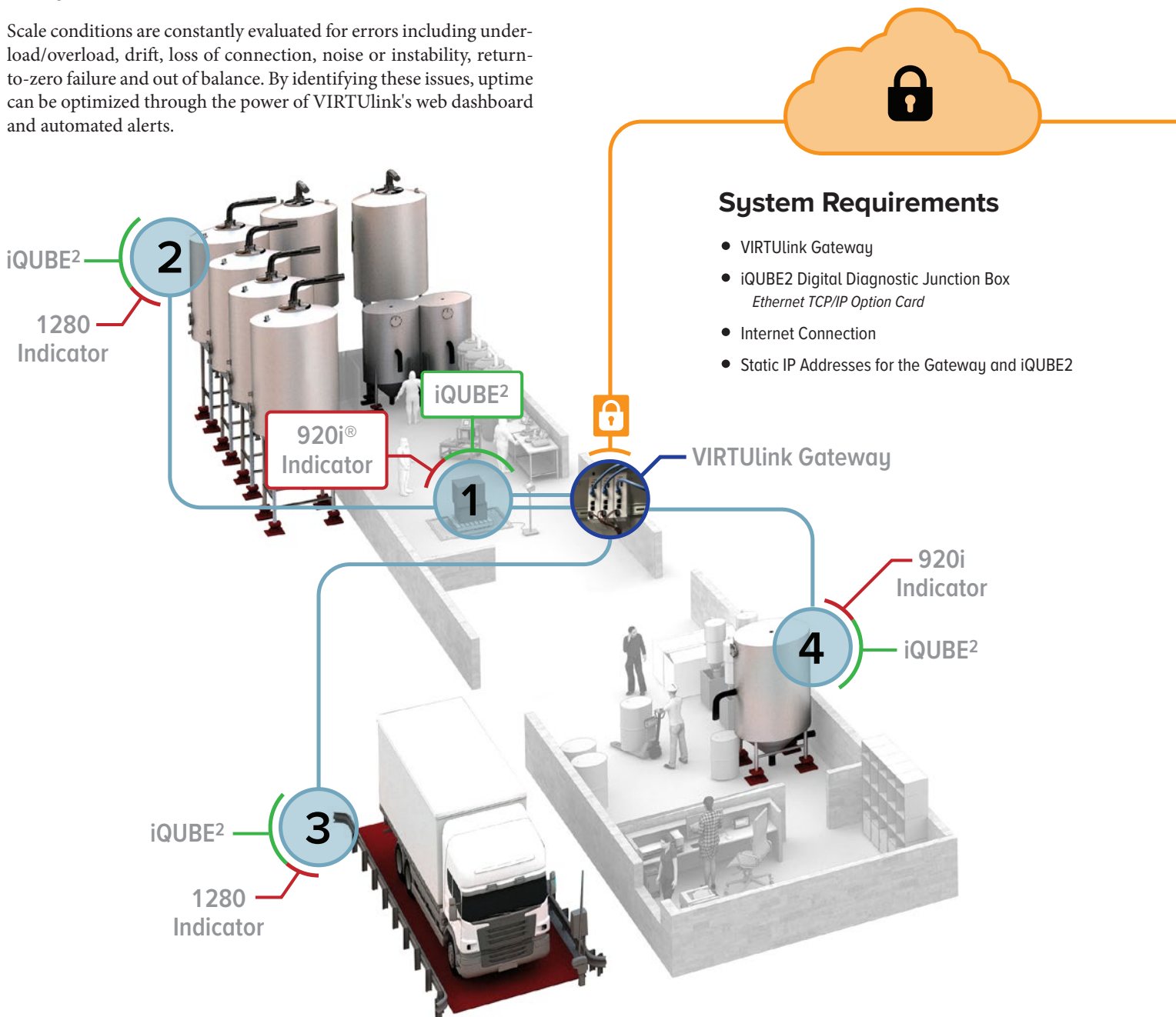
800-472-6703  
[www.ricelake.com](http://www.ricelake.com)

# Optimize Uptime with Data Insight

Essential for critical applications where scale downtime results in lost profit, decreased product quality, unnecessary waste or opportunity cost, VIRTUlink intelligently monitors and analyzes weighing systems across entire processes. From shipping and receiving to inventory, safety and quality control, VIRTUlink helps ensure your business keeps moving forward.

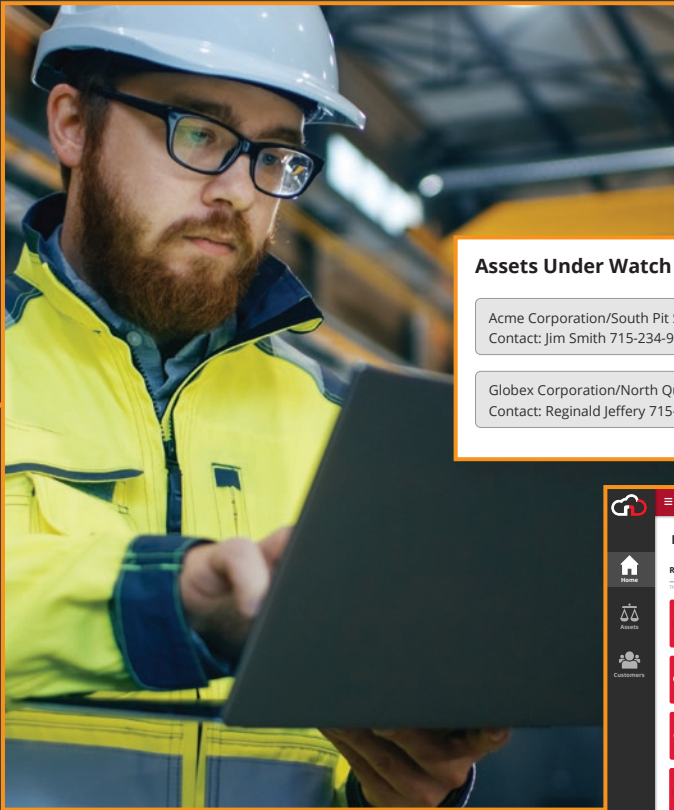
Scale conditions are constantly evaluated for errors including under-load/overload, drift, loss of connection, noise or instability, return-to-zero failure and out of balance. By identifying these issues, uptime can be optimized through the power of VIRTUlink's web dashboard and automated alerts.

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.



# VIRTUlink Web Dashboard

- 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
- Review technician notes
- Maintenance visits become more focused
- Hosted on secure data centers for optimal uptime



**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

Thomas Johnson

Acme Corporation  
South Pit Scale - Truck Scale  
All Machine Road South 202000040, NY 14819

CELL #1 CELL #2 CELL #3 CELL #4 CELL #5 CELL #6 CELL #7 CELL #8  
CELL #9 CELL #10 CELL #11 CELL #12 CELL #13 CELL #14 CELL #15 CELL #16

Service Notes

CREATED BY JF Deane CELL CALL 14

CREATED BY JF Deane CELL CALL 15

Thomas Johnson

Home

Recent Alerts

Zero Reference - Acme Corporation/South Pit Scale - Truck Scale  
Found mechanical bind on scale south corner. Removed debris and confirmed all calls.

Cell Connection - Acme Corporation/South Pit Scale - Truck Scale  
Load cell #15 is disconnected, reconnected and put back in service.

Emulation Mode Load Cells - Acme Corporation/South Pit Scale - Truck Scale  
Load Cell is damaged. Putting it in emulation mode until repaired. Repair scheduled.

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Emulation Mode Load Cells

CELL #15 SIM Acme Corporation/South Pit Scale  
EMULATION MODE Jim Smith 715-234-9171

1

## SHIPPING AND RECEIVING

Floor Scale, iQUBE2 and 920i Indicator

For warehouses with real-time inventory data and/or product traceability, monitoring floor scale health ensures this busy environment keeps running smoothly.

2

## RECIPE BATCHING

Weigh Modules, iQUBE2 and 1280 Indicator

Automated product manufacturing through weight-based batching increases efficiency and maintains product consistency. With VIRTUlink continually monitoring this process, valuable insights into operations are available 24/7/365. The system's configurable, automated alerts help ensure potential issues are identified and can be corrected before resulting in errors and waste.

3

## INCOMING/OUTGOING TRANSACTIONS

Truck Scale, iQUBE2 and 1280 Indicator

A truck scale often operates as a company's cash register. As products enter or leave the facility, invoices are created based on recorded weight. VIRTUlink can immediately notify operators and key personnel of potential issues.

4

## QUALITY CONTROL

Weigh Modules, iQUBE2 and 920i Indicator

Inconsistent quality can result in lost business, decreased safety and diminished confidence. VIRTUlink serves as a constant and efficient tool to maintain quality through the highest standards of accuracy, without sacrificing speed.

# 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 iQUBE<sup>2</sup> 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.

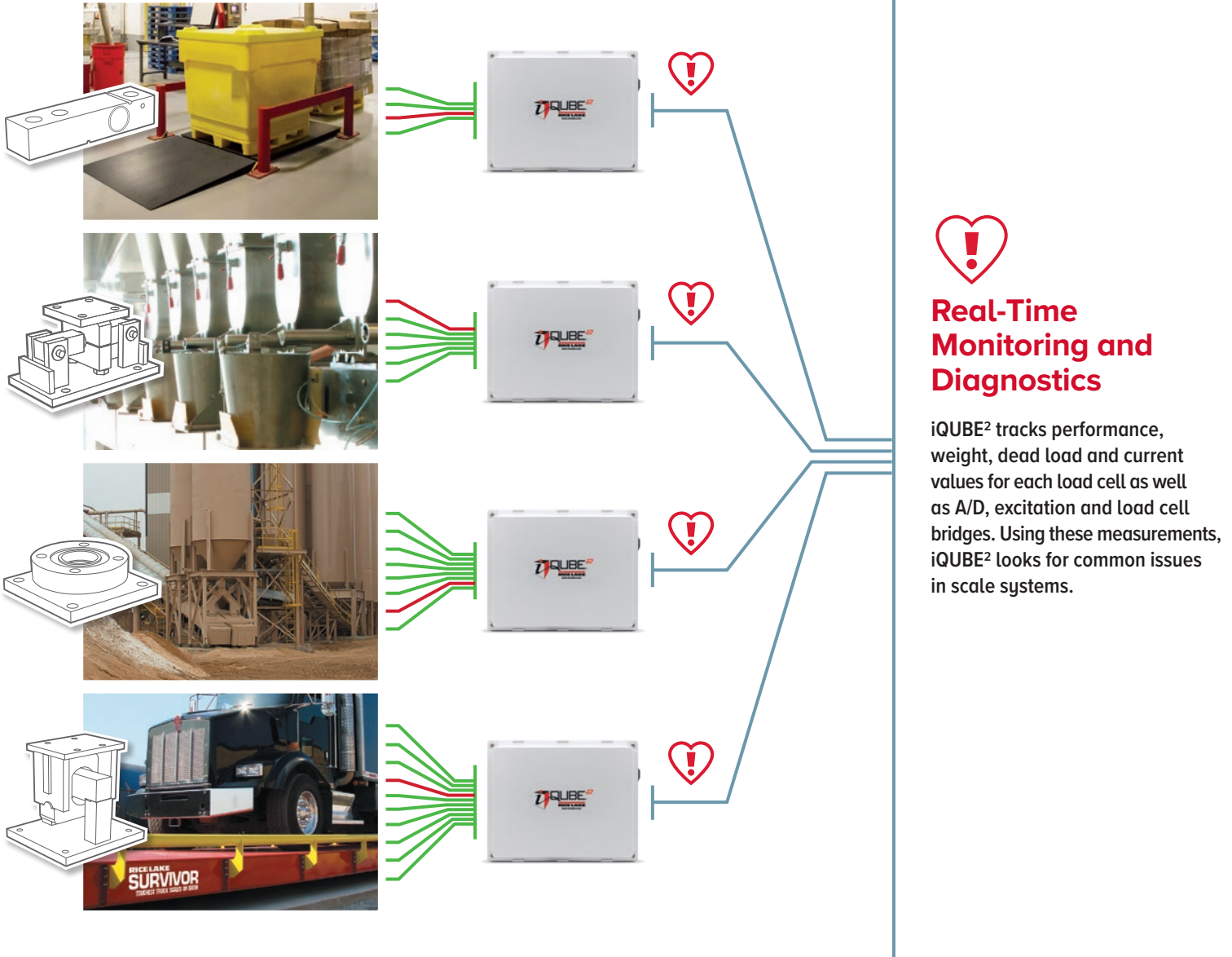
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Christy Pinkerton, project engineer, TriRx Pharmaceutical Services, LLC.



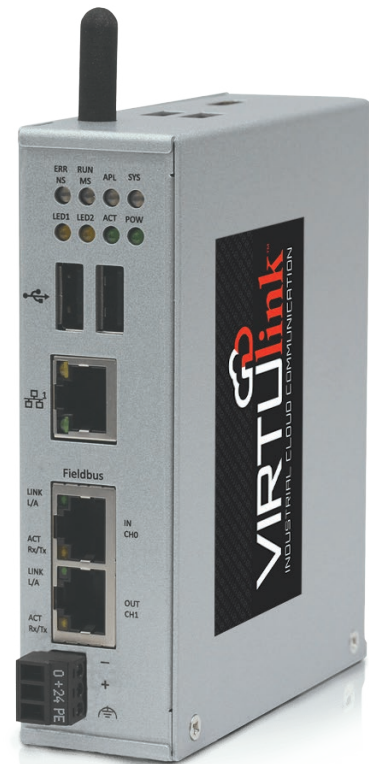
# System Components

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™ and 920i® to display weight data. 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 and scale health
- Connect up to four iQUBE<sup>2</sup> digital junction boxes per gateway, accommodating up to 16 scales
- Expandable with support for multiple data points from indicators, junction boxes, sensors, web relays and IP cameras



### 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.

### 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.

### Load Cell Emulation

When a weighing problem is catastrophic and your scale operation is mission critical, continue using your scale by enabling the iQUBE<sup>2</sup>'s load cell emulation. It can keep your scale operational by comparing load cells with intelligently calculated values.

### 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.

### 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.

### 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. iQUBE<sup>2</sup> verifies linearity by monitoring load cell tolerances.

### 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.

## User Interfaces



### 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.

## Other Components

VIRTUlink™ integrates with several IoT peripherals, including:

### IP Camera

*Access images over the network on demand.*



### Cellular Modem

*Bring reliable, wireless data to equipment without access to a standard LAN connection.*

## Secure Integration

### Network Security

*Physical separation of external and LAN network avoids mutual attacks.*

*Signed software protects against manipulation and secures device integrity.*

*Data is encrypted with the latest state of technology against eavesdropping and data theft.*



## SPECIFICATIONS

### CONNECTIVITY FROM iQUBE<sup>2</sup> TO IoT GATEWAY

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

### GATEWAY HARDWARE/COMMUNICATION

<b>MEMORY:</b>	Integrated memory 1 GB DDR3 RAM, SD card 32 GB MLC NAND, Micro SD card
<b>INTERFACES:</b>	Bluetooth®, Core Specification 4.2, Bluetooth Low Energy (BLE) support Wi-Fi: 1 x Wi-Fi, 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
<b>DISPLAY CONNECTOR:</b>	1 x HDMI, software activatable
<b>IT INTERFACE:</b>	1 x 10/100 Mbit, Microchip LAN9514 1 x RJ45 socket LAN connector

### REQUIRED ACCESSIBLE PORTS:

<b>REQUIRED ACCESSIBLE PORTS:</b>	http (80) https (443) MQTT (1883) MQTT over SSL (8883) AMOP (5672) AMOPS (5671)
<b>DISPLAY:</b>	8 LEDs (2 programmable)
<b>REAL-TIME CLOCK:</b>	Capacitor buffered, maximum 7 days backup, maintenance free
<b>ENVIRONMENT:</b>	IP20 degree of protection
<b>AMBIENT TEMPERATURE:</b>	Operation: -20°C-+60°C; Storage: -40°C-+85°C
<b>HUMIDITY RANGE:</b>	10 % -95 % (95 % at 40°C) relative humidity (non-condensing)
<b>USE:</b>	Indoor use
<b>DIMENSIONS:</b>	5.5 in x 1.38 in x 1.13 in 140 mm x 35 mm x 105 mm
<b>WEIGHT:</b>	0.89 lb (400 g)
<b>METAL HOUSING:</b>	DIN top hat rail mount
<b>APPROVALS:</b>	UL – Nr. E221530 Vol D1 FCC – ID 2ANEG0001 IC – 24152-0001 KCC – No. R-C-HKR-ETP51EN-RE UL Japan – No. 007-AH0211 RoHS
<b>CONFORMANCE WITH EMC DIRECTIVES:</b>	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