Contents

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Introduction

The Z3 family of wireless devices encompasses many different technologies and capabilities because it provides advantages that are highly application specific. In trying to choose from the myriad capabilities, it is generally best to start by thinking about what you want to monitor, about how critical that monitoring is, and about which communications strategy best fits your application. Decisions also need to be made about output choices such as audible alarms, etc.

In respect to sensor families, there are some “universal” input devices that can accept any of the Rees Scientific standard sensors including temperature sensors and thousands of different types of sensors using the standard 4-20 mA interface. Because the 4-20 mA interface involves using a separate transmitter and a separate power supply, greater elegance and economy can be achieved by dedicated sensor modules such as the THL family that monitors temperature and humidity, the DP family that monitors differential pressure, and In-Box temperature sensor family that rests inside the refrigerator, and the RTD family that measures temperature between -200 and +100 C with 0.7 degree resolution and high accuracy.

In addition to these families, there is the MPX family which monitors and buffers data from a 16 input wired MPX panel. These are often used to upgrade legacy installations that are wired, and can also be used in new applications where a wired approach can be more reliable than any wireless solution.

COMMUNICATIONS TECHNOLOGY CHOICES

Once you have decided on the module families to be used, you will need to pick a technology to bring the data back to the central monitoring system’s Centron node. Each technology has its own advantages, and the technologies can all be mixed in a single system.

First, there is the Zigbee technology. Zigbee is very similar to Wi-Fi but is a light weight, more battery friendly technology that was designed specifically for sensor type, relatively low-speed communications. It has the advantage that it will have its own independent battery-backed-up infrastructure that will not be affected by any Wi-Fi network issues. One principal advantage is that most modules can run on battery for approximately a year and a half. The modules that are plugged in to AC power serve as routers for the rest. Zigbee networks are organized around “Coordinators” which are connected to the Centron via USB or Ethernet. The indoor range of Zigbee is very similar to Wi-Fi.

The second technology choice is Wi-Fi. This has the advantage of using existing infrastructure, and can allow you to move equipment to entirely new locations without adding any support infrastructure. While the sensors themselves are a little more expensive than their Zigbee counterparts, the lack of additional infrastructure can make up the difference. It can be terrific when one or two sensors need to be placed far away from the base.

The third technology choice is Ethernet. This has the advantage of being a wired technology with all the reliability that wired implies.

ACCESSORY CHOICES

The last item to be selected is what accessories you want to specify for your modules. Most modules can be supplied with an audible alarm that can signal a problem in a given area. The alarm signaling in this case will signal that one of a group of alarms has been triggered.

Most modules can alternatively be supplied with an output relay. This relay can be used for a variety of complex control functions such as temperature controls, or it can trigger an external alarm based on a group of system alarms.

Most modules can alternatively be supplied with a connection to an Output-8 panel that can control a whole bank of different control points based upon logic programmed into the Centron system.

There are also modules with visual displays that can show exactly what the module is reading. The "universal" input type can also be provided with a local audio-visual alert and a local alert silence button. The local alert is designed to remind people to close the freezer door and allow its temperature to recover before a real alarm is triggered.

Z3 Zigbee Technology

Utilizing Spread Spectrum technology at the transmitter level, Rees Scientific's Z3 Wireless Monitoring System offers collision avoidance, receiver energy detection, link quality indication, clear channel assessment, acknowledgement and security.

A major advantage of the Z3 Zigbee technology is its low power needs, allowing a battery to last for approximately 1.5 years. The Z3 modules use an advanced Zigbee protocol that is optimized for efficient communications. They have greater stability of Mesh wireless infrastructure and reduce/eliminate battery alarms. The Z3 wireless system offers increased number of modules per network device and encrypted communication.

Some of the Zigbee modules, when powered by the buildings AC power, serve as both transmitters and as routers allowing you to extend the Zigbee infrastructure hop by hop. Each module can buffer up to 7 days' worth of data. Modules can support the entire range of Rees Scientific sensors. All communications are Spread Spectrum for vastly enhanced communication reliability over older single channel 418 MHz transmission. Zigbee communication is 128-bit AES encrypted.

5 GHz Wi-Fi Technology

Rees Scientific's new 5GHz Wi-Fi transmitters offer the same great reliability, security, & flexibility you've come to expect from the company you trust. Designed to reduce the overall installation footprint, the Wi-Fi transmitters utilize your existing infrastructure to minimize site impact and get you up and running fast.

Each module can buffer up to 7 days of data. Modules can support the entire range of Rees Scientific sensors.

5GHz Wi-Fi modules will run for approximately 1.5 years on battery, and offer Enterprise Wi-Fi (PEAP MSCHAPv2) security as an option. They are also available with IPv6 capability.

LCD Displays

LCD display with alert and inhibit alarm button

LCD expansion modules

View sensor conditions of your unit right from the LCD display module. Many module families support the LCD displays. The displays can support one or two sensors and they can come equipped with a local audio and visual alert that can be silenced from the module with a push of a button. NOTE: the alert is designed to remind the user to close the refrigerator door. It is NOT documented and silencing it does NOT inhibit the Centron system alarm. If the out-of-range condition persists, a documented Centron system alarm will occur along with all of the usual alarm and dial-out options. This is done this way because a silence button provides no indication of who pressed it and inhibiting a real alarm with such a button would be a violation of GxP and any other quality assurance based accountability requirement.

If the audio-visual alert is used, the module will need to be plugged in. This is ideal for health clinics, hospital pharmacies and many other healthcare facilities that house critical commodities in their refrigerators. It works with ReesCloud and on-premises installations.

Zigbee modules without the alert can run on battery.

*Note: Expansion modules come equipped with a 10ft wire between wireless/WiFi module and display.

Communications Options

- WiFi
- Zigbee

NOTE: Requires Presidio Software 3.0 build 1020 or greater.

Universal Transmitter Family

The universal modules are most often used to monitor temperatures ranging between -196 and + 105 Degrees C. This is done best using the TPT series of sensors (please refer to the Sensor portion of the catalog). These modules can also connect to any of the thousands of 4-20 mA sensor modules, many of which are listed in the sensors portion of the catalog. These modules buffer 7 days of data at 5 minute intervals. These work with ReesCloud and on-premises installations.

Communications Options

- 5G WiFi
- Zigbee
- Network Connected

Accessories Options - See Lighting Control and Output section of the catalog

- Local LCD Display with audio-visual alert and silence button (NOTE: Alert is not a system alarm. It is a local alert designed to remind the user to close the freezer door.) Zigbee version can be operated on battery. WiFi version requires power.
- Local Alarm (NOTE: This provides an output annunciator that signals when programmed to do so. It is usually used as an alarm annunciator for a group of inputs such as a lab area or freezer farm.) Modules with Local Alarm require AC Power.
- Output Relay – This can be used to control lights, fans, thermostats, pumps, etc., or to provide output to other alarm systems. Modules with Output Relay require AC Power.
- Output 8 Interface Cable – This is an add-on for a module that should be specified in addition to the module itself. It connects the module to an Output-8 board which then allows the Centron system full programmable control of up to 8 different devices (See Output section of the catalog.). Not supported with display, local alarm, or relay containing modules. AC Power required.

Z3 Zigbee- US Parts		**24VDC Sensor Version***
1 input with Zigbee Radio	Z3-U-1	Z3-U-1-24
2 inputs with Zigbee Radio	Z3-U-2	Z3-U-2-24
Non US Parts		
1 input with Zigbee Radio	Z3-U-1-EV	Z3-U-1-24-EV
2 inputs with Zigbee Radio	Z3-U-2-EV	Z3-U-2-24-EV

5G Wi-Fi – US Parts		**24VDC Sensor Version ***
1 input with Wi-Fi	5GWIFI-U1	5GWIFI-U1-24
2 inputs with Wi-Fi	5GWIFI-U2	5GWIFI-U2-24
Non US Parts		
1 input with Wi-Fi	5GWIFI-U1-EV	TBD
2 inputs with Wi-Fi	5GWIFI-U2-EV	TBD

	US Part
Ethernet	
1 input Ethernet Connected	Z3-DIRECT-U1
2 inputs Ethernet Connected	Z3- DIRECT-U2
4 inputs Ethernet Connected	Z3- DIRECT-U4
Output-Relay for Z3-Direct Modules	Z3-DIRECT-ORLY
Remote Audio Visual Alarm for Z3-Direct Modules	Z3-DIRECT-RAVA

***24VDC Sensor Version includes 24VDC power for powered sensors and utilizes a single wall power supply.**

Universal Transmitter Family
Expansion Modules

Expansion Modules with LCD and Z3 Wireless

Expansion Modules with Output Relay and Z3 Wireless

Expansion Modules with Audio Visual Alarm Z3 Wireless

Accessories Options - See Lighting Control and Output section of the catalog

- Local LCD Display with audio-visual alert and silence button (NOTE: Alert is not a system alarm. It is a local alert designed to remind the user to close the freezer door.) Zigbee version can be operated on battery. WiFi version requires power.
- Local Alarm (NOTE: This provides an output annunciator that signals when programmed to do so. It is usually used as an alarm annunciator for a group of inputs such as a lab area or freezer farm.) Modules with Local Alarm require AC Power.
- Output Relay – This can be used to control lights, fans, thermostats, pumps, etc., or to provide output to other alarm systems. Modules with Output Relay require AC Power.
- Output 8 Interface Cable – This is an add-on for a module that should be specified in addition to the module itself. It connects the module to an Output-8 board which then allows the Centron system full programmable control of up to 8 different devices (See Output section of the catalog.). Not supported with display, local alarm, or relay containing modules. AC Power required.

Z3 Zigbee and WiFi- US Parts	
LCD Remote Display Expansion Module	Z3-EM-LCD-RD
Output Relay Expansion Module	Z3-EM-OUT-RLY
Remote Audio Visual Alarm Expansion Module	Z3-EM-R-AVA

Universal Transmitter Family
LCD Display Cover Option

LCD display cover for Z3 modules. LCD displays sensors current reading as well as alarm status. Local audio and visual pre-alarm alert with ability to silence locally. This option will help you comply with current CDC Vaccine Storage requirements.

- For New Modules only.
- Recommend AC power for display to be backlit and local alarm function.
- Will operate with battery for approximately 6 months with unlit display.
- Requires Centron Presidio Version 3.0 software, Build 1020 and up, or DIACAP.

Accessories Options - See Lighting Control and Output section of the catalog

- Local LCD Display with audio-visual alert and silence button (NOTE: Alert is not a system alarm. It is a local alert designed to remind the user to close the freezer door.) Zigbee version can be operated on battery. WiFi version requires power.
- Local Alarm (NOTE: This provides an output annunciator that signals when programmed to do so. It is usually used as an alarm annunciator for a group of inputs such as a lab area or freezer farm.) Modules with Local Alarm require AC Power.
- Output Relay – This can be used to control lights, fans, thermostats, pumps, etc., or to provide output to other alarm systems. Modules with Output Relay require AC Power.
- Output 8 Interface Cable – This is an add-on for a module that should be specified in addition to the module itself. It connects the module to an Output-8 board which then allows the Centron system full programmable control of up to 8 different devices (See Output section of the catalog.). Not supported with display, local alarm, or relay containing modules. AC Power required.

Z3 Zigbee and WiFi- US Parts	
LCD display cover for Z3 modules	Z3-LCD-CVR
Remote Audio Visual Alarm Cover for Z3	Z3-R-AVA-CVR
Audio Visual Alarm Cover for Z3	Z3-AVA-CVR
Output relay cover for Z3	Z3-RELAY-CVR

Accessories

5 Volt DC, regulated wall transformer to power TA16,	Z3-0-5-TRANS
24 Volt DC wall transformer to power 4-20mA	Z3-4-20TRANS
Replacement 3.6 Volt Battery(1/2 AA)	Z3-BATT
Output 8 Interface Cable	Z3-OUTPUT-CBL
Enterprise Security Add On	Z3-WF-ENT
IPv6 add on for any Z3-WiFi module	Z3-WF-IPV6

Z3 RTD Temperature Sensor Family

Rees Scientific Z3 Universal wireless transmitter for 1 input uses an advanced protocol stack that has been optimized for extremely efficient communications. These transmitters come with PT-100 platinum RTD sensors. They read from -200 to +100 degrees C with typical accuracy over span of 0.4 degrees and a resolution of 0.07 degrees. Transmitters buffer 7 days of readings history recorded at 5 minute intervals. Battery life is approximately 1.5 years. Certified version reads from -200 to +100 degrees C. with a resolution of 0.07 degrees and is calibrated to 0.1 degrees C accuracy at -196, --50, 0, and 50 degrees C. Certificate is provided. Additional 0.1 degree accuracy calibration point(s) for Z3-RTD-CERT modules available for an extra charge. For each point purchased, up to 16 additional sensors will be calibrated at the specified temperature. NOTE: temperatures in Celsius must be multiples of 10 degrees and must be between -70 C and +100 C.

Type	US Part #
	Z3 Wireless
Single Input RTD Module	Z3-RTD-STD-1
Dual Input RTD Module	Z3-RTD-STD-2
Single Input Certified RTD Module	Z3-RTD-CERT-2
Dual Input Certified RTD Module	Z3-RTD-CERT-2
Additional Calibration Point for certified Modules	Z3-RTD-CALPT

*Note: For Remote Display Expansion Modules and Display Covers, please see page 8 and 9.

CO2 and Temperature - Z3 Zigbee/WiFi Incubator Sensor

These sensor modules are specifically designed to work in the 5% CO2, high humidity, 37 degree tissue culture incubator environment. These transmitters come with temperature compensated NDIR CO2 sensors and provide the maximum accuracy available in modern CO2 sensing technology. They also include an accurate temperature sensor to provide a complete, incubator monitoring solution. They are available in either Z3 Zigbee or Z3 WiFi modules.

Type	US Part #
Zigbee CO2 Temperature Module	.Z3-T-CO2
Zigbee CO2 Temperature Module with Certificate	.Z3-T-CO2-CERT
5GHz WiFi CO2 Temperature Module	5GWF-T-CO2
5GHz WiFi CO2 Temperature Module with Certificate	5GWF-T-CO2-C

Note 1: All measurements are at STP unless otherwise stated.
Note 2: Set the pressure calibration constant for maximum accuracy at altitudes over 1000 feet.

Temperature/Humidity/Light Transmitter Family

Rees Scientific Temperature, Humidity, and Light transmitter. More limited versions are available for ambient temperature only, and for ambient temperature and humidity but no light. These sensors are widely used in animal facilities, as well as in room monitoring. The remote-probe versions can be used in stability chambers and the like. These modules buffer 7 days of data at 5 minute intervals. It works with ReesCloud and on-premises installations.

Communications Options

- WiFi
- 5G WiFi
- Zigbee
- Network Connected

Accessories Options - See Lighting Control and Output section

- Local LCD Display (Zigbee version can be operated on battery)
- Local Alarm NOTE: This provides an output annunciator that signals when programmed to do so. It is usually used as an alarm annunciator for a group of inputs such as a lab area or freezer farm. Modules with Local Alarm require AC Power.
- Output Relay – This can be used to control lights, fans, thermostats, pumps, etc., or to provide output to other alarm systems. Modules with Output Relay require AC power.
- Output 8 Interface Cable – This is an add-on for a module that should be specified in addition to the module itself. It connects the module to an Output-8 board which then allows the Centron system full programmable control of up to 8 different devices (See Output section of the catalog.). Not supported with display, local alarm, or relay containing modules. AC Power required.

	US Part Module Only	Non-US Part Module Only
Z3		
Zigbee		
Temperature Only	Z3-T	Z3-T-EV
Temperature and Humidity	Z3-T/H	Z3-T/H-EV
Temp, Humidity & Light	Z3-T/H/L	Z3-T/H/L-EV
Temp & Humidity with Remote Probe	Z3-T/H-REM	Z3-T/H-REM-EV
Temperature only with Certificate	Z3-T-CERT	Z3-T-CERT-EV
Temperature & Humidity with Certificate	Z3-T/H-CERT	Z3-T/H-CERT-EV
5GWiFi		
Temperature Only	5GWIFI-T	5GWIFI-T-EV
Temperature and Humidity	5GWIFI-T/H	5GWIFI-T/H-EV
Temp, Humidity & Light	5GWIFI-T/H/L	5GWF-T/H/L-EV
Temp & Humidity with Remote Probe	5GWF-T/H-REM	
Temperature only with Certificate	5GWF-T-CERT	5GWF-T-CERT-EV

Temperature & Humidity with Certificate	5GWF-T/H-CERT	

*Note: For Remote Display Expansion Modules and Display Covers, please see page 8 and 9.

Accessories

5 Volt DC, regulated wall transformer to power TA16,	Z3-0-5-TRANS
24 Volt DC wall transformer to power 4-20mA	Z3-4-20TRANS
Replacement 3.6 Volt Battery(1/2 AA)	Z3-BATT
Output 8 Interface Cable	Z3-OUTPUT-CBL

Differential Pressure Transmitter Family

The differential pressure sensor is used to measure the difference in pressure between two points. Able to be tucked away in the smallest of spaces, integrating a battery backup, and requiring no wires to be pulled for communicating back to a panel, the DP can be used in situations that were previously impossible. Specific applications are: measuring the pressure difference across an air handler for efficiency, ensuring positive air pressure between a room and hallway, or guaranteeing that a laboratory hood system is working correctly. Buffers 7 days of data at 5 minute intervals. Works with ReesCloud and on-premises installations.

Communications Options

- WiFi
- Zigbee

Accessories Options - See Lighting Control and Output section

- Local LCD Display (Zigbee version can be operated on battery)
- Local Alarm NOTE: This provides an output annunciator that signals when programmed to do so. It us usually used as an alarm annunciator for a group of inputs such as a lab area or freezer farm. Modules with Local Alarm require AC Power.
- Output Relay – This can be used to control lights, fans, thermostats, pumps, etc., or to provide output to other alarm systems. Modules with Output Relay require AC power.
- Output 8 Interface Cable – This is an add-on for a module that should be specified in addition to the module itself. It connects the module to an Output-8 board which then allows the Centron system full programmable control of up to 8 different devices (See Output section of the catalog.). Not supported with display, local alarm, or relay containing modules. AC Power required.

	US Part Module Only	Non US Part Module Only
Zigbee		
Differential Pressure	Z3-DP	Z3-DP-EV

*Note: For Remote Display Expansion Modules and Display Covers, please see page 8 and 9.
*Note : Local Alarm not recommended.
*Note: For optimal performance, we recommend Z3 Zigbee DP be plugged into power.

Accessories

5 Volt DC, regulated wall transformer to power TA16,	Z3-0-5-TRANS
24 Volt DC wall transformer to power 4-20mA	Z3-4-20TRANS
Replacement 3.6 Volt Battery(1/2 AA)	Z3-BATT
Output 8 Interface Cable	Z3-OUTPUT-CBL

In Box Temperature Sensor Family

For use inside standard refrigerator and freezers for monitoring temperature range of -30 to 60° C. Each module can buffer up to 7 days' worth of data at a logging rate of every 5 minutes. Works with ReesCloud and on-premises installations.

Communications Options

- Zigbee

Accessories Options

- None

Type	Part #
Z3	
Wireless Ambient Temp Transmitter inside Refrigerators and Freezers	Z3-T-REF/FRZ
Replacement 3.6 Volt Battery	Z3-BATT

Wired System MPX Interface Family

This module connects a 16 input wired MPX panel into the Centron System. It provides 7 day buffering at 15 minute intervals for all of the 16 wired inputs. Use it to provide a fully wired alternative with the Ethernet connected version. Upgrade older systems to have buffered remote panels and/or failover node capability.

Communications Options

- Zigbee
- Ethernet

Accessories Options - See Lighting Control and Outputs

- Local Alarm NOTE: This provides an output annunciator that signals when programmed to do so. It us usually used as an alarm annunciator for a group of inputs such as a lab area or freezer farm. Modules with Local Alarm require AC Power.
- Output Relay – This can be used to control lights, fans, thermostats, pumps, etc., or to provide output to other alarm systems. Modules with Output Relay require AC power.
- Output 8 Interface Cable – This is an add-on for a module that should be specified in addition to the module itself. It connects the module to an Output-8 board which then allows the Centron system full programmable control of up to 8 different devices (See Output section of the catalog.). Not supported with display, local alarm, or relay containing modules. AC Power required.

	US Part Module Only	Non-US Part Module Only
Z3 Zigbee		
MPX Interface Module	Z3-MPX	Z3-MPX-EV
Ethernet		
MPX Interface w/Ethernet (240/110 VAC)	Z3-MPX-NET	Z3-MPX-NET

Accessories

5 Volt DC, regulated wall transformer to power TA16,	Z3-0-5-TRANS
24 Volt DC wall transformer to power 4-20mA	Z3-4-20TRANS
Replacement 3.6 Volt Battery(1/2 AA)	Z3-BATT
Output 8 Interface Cable	Z3-OUTPUT-CBL

Zigbee Infrastructure & intermediator Devices

Zigbee USB Coordinator

The Wireless USB Coordinator serves as an end-point for the wireless network. It organizes the Zigbee network and provides two way communications between up to 35 modules and the Centron node.

Communications Options

- Zigbee

Type	Part #
Z3	
Zigbee Wireless USB Coordinator	Z3-CRD

Zigbee Infrastructure & intermediate Devices

Z.3 Net Zigbee Coordinator

A 4 hour battery backed up network device that will connect transmitters at remote sites back to a central node over the organization's existing TCP/IP network. Requires an IP address.

Easily monitor sensors on the other side of your facility, across campus, or across country. Works with ReesCloud and on-Premises installations. Zigbee communication is AES encrypted.

Communications Options

- WiFi
- Zigbee

Connection

- Requires 120 VAC or 230 VAC power
- Maximum wireless transmission receiver range indoors 300ft
- Ethernet connection required

Type	US Part #	Non-US Part #
Z3		
Zigbee Net Wireless Coordinator	Z3-NET	Z3-NET-EV

Zigbee Infrastructure & intermediate Devices

Z.3 Net POE (Power over Ethernet)

Z3 Net POE is a network ready device, which connects transmitters to a central node over the existing TCP/IP Network. Monitor sensors on the other side of your facility, across campus, or across country. No power is required. POE battery back-up is provided by the existing network infrastructure. The maximum number of modules that it supports is 35. (Note: Use up to 20 Z3-NET devices and 1 Z3-CRD per Centron Node with Build 1019 or higher). Zigbee communication is AES encrypted.

Connection

- Requires CentronSQL software Build1019 or higher
- Maximum wireless transmission receiver range indoors 300ft
- Requires a POE network switch or jack

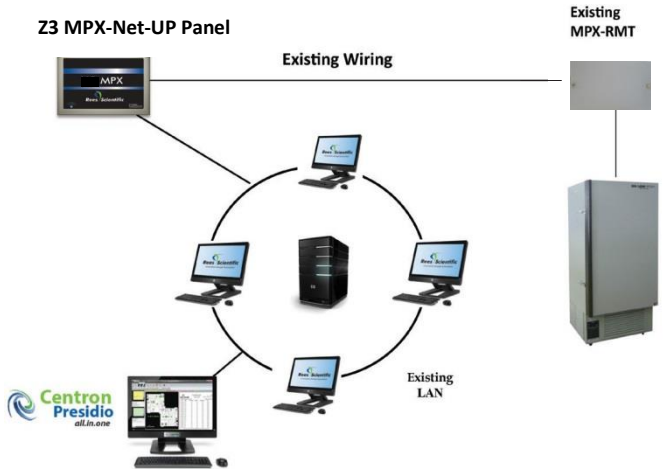
Type	Part #
Z3	
Z3 NET Power over Ethernet	Z3-NET-POE

Zigbee Infrastructure & intermediator Devices

Z3-MPX Transmitter Family

Z3 MPX Net Up & Z3 MPX USB

The MPX-NET-UP and MPX-USB-UP provide data buffering and backup for up to 8 existing MPX panels. Once attached, the buffered panels communicate through a single network or USB connection. This allows for easy communication to both virtualized and non-virtualized Centrons. Ideal for use with upgrading existing hardwired systems to the new Presidio and Enterprise systems.



Communications Options

- Ethernet (1 Ethernet Connection)
- USB

Connection

- 1 Requires Ethernet or USB Connection
- Connected to MPX panels via 3 conductor shielded 22AWG wiring

Type	Part #
Z3	
Network Connected MPX Interface Panel for up to 8 MPX panels. Requires use of MPX-BOARD modules as needed.	Z3-MPX-NET-UP
USB Connected MPX Interface Panel for up to 8 MPX panels. Requires use of MPX-BOARD modules as needed.	Z3-MPX-USB-UP
MPX board module (one needed for each MPX panel.)	Z3-MPX-BOARD

Specifications

Universal Transmitter - Zigbee

- Transmitters buffer 7 days of readings history recorded at 5 minute intervals.
- Most sensors in a typical install will be battery powered.
- Transmitters accept any type of Rees Scientific or industry standard input and provide 12 bit analog to digital conversion accuracy.
- **Z3**: 1 input and 2 input transmitters available.
- Batteries are monitored in battery-powered units. Low batteries cause low battery alarms, which can dial out.
- AC power loss in routers will cause a power loss alarm which can dial out.
- Can be added to existing systems. A single system can contain wired sensors, Wireless Version 1 sensors, and V2 wireless sensors.
- Dimensions (enclosure) **Z3:** 2.54 W X 2.54 H X 1 D (inches) **24 VDC enclosure**: 6 W X 3.5 H X 1.5 D (inches)
- FCC Certified- FCC ID **Z3**: MCQ-S2CTH*
- Transmit Power: V2 3 dBm, Z3 8 dBm
- Z3 units are capable of connecting to an output, output board, and local alarms.
- Thermistor (TPT series) sensor wire length should be limited to 30 feet.
- Battery Back Up Duration
    - For modules running solely on battery, battery lasts approximately 1.5 year for **Z3**.
    - Modules connected to AC power will perform as routers for other modules.
    - In a power outage, AC connected modules will continue as routers for 4 hours, then demote to run efficiently on battery power.
    - Batteries last approximately 100 hours in the high-draw state that happens during the first 4 hours of a power outage. Thus, these modules are good for about twenty- five power outages with duration of 4 hours or more.
- 6-7.5 VDC can be supplied using 120 VAC or 230 VAC power supply. Powered units become routers.
- Each router can service up to 20 battery powered children.
- Maximum wireless transmission receiver range indoors about 50-75 feet with standard radios.

Universal Transmitter – 5GHz WiFi

Standard: Standard: 5GHz / 2.4 GHz IEEE 802.11 ab/g/n.
• 5G WiFi – Security: WPA-PSK, WPA2-PSK, WPA2-Enterprise (PEAP MSCHAPv2), WPA3-Personal.
• Transmit Power: 5GHz:15dBm, 2.4GHz:16dBm
• Dimensions (enclosure) 3.295 W X 3.295 H X 1.25 D (inches)
• WPA2/WPA-PSK username/password character limit: 63 characters
• WPA2-Enterprise username/password character limit: 32 characters
• WPA2-Enterprise Compatible Cipher Suites
- SL_SEC_MASK_SSL_RSA_WITH_RC4_128_SHA
- SL_SEC_MASK_SSL_RSA_WITH_RC4_128_MD5
- SL_SEC_MASK_TLS_RSA_WITH_AES_256_CBC_SHA
- SL_SEC_MASK_TLS_DHE_RSA_WITH_AES_256_CBC_SHA
- SL_SEC_MASK_TLS_ECDHE_RSA_WITH_AES_256_CBC_SHA
- SL_SEC_MASK_TLS_ECDHE_RSA_WITH_RC4_128_SHA
- SL_SEC_MASK_TLS_RSA_WITH_AES_128_CBC_SHA256
- SL_SEC_MASK_TLS_RSA_WITH_AES_256_CBC_SHA256
- SL_SEC_MASK_TLS_ECDHE_RSA_WITH_AES_128_CBC_SHA256
- SL_SEC_MASK_TLS_ECDHE_ECDSA_WITH_AES_128_CBC_SHA256
- SL_SEC_MASK_TLS_ECDHE_ECDSA_WITH_AES_128_CBC_SHA
- SL_SEC_MASK_TLS_ECDHE_ECDSA_WITH_AES_256_CBC_SHA
- SL_SEC_MASK_TLS_RSA_WITH_AES_128_GCM_SHA256
- SL_SEC_MASK_TLS_RSA_WITH_AES_256_GCM_SHA384
- SL_SEC_MASK_TLS_DHE_RSA_WITH_AES_128_GCM_SHA256
- SL_SEC_MASK_TLS_DHE_RSA_WITH_AES_256_GCM_SHA384
- SL_SEC_MASK_TLS_ECDHE_RSA_WITH_AES_128_GCM_SHA256
- SL_SEC_MASK_TLS_ECDHE_RSA_WITH_AES_256_GCM_SHA384

All specifications are subject to change without notice.

- SL_SEC_MASK_TLS_ECDHE_ECDSA_WITH_AES_128_GCM_SHA256
- SL_SEC_MASK_TLS_ECDHE_ECDSA_WITH_AES_256_GCM_SHA384
- SL_SEC_MASK_TLS_ECDHE_ECDSA_WITH_CHACHA20_POLY1305_SHA256
- SL_SEC_MASK_TLS_ECDHE_RSA_WITH_CHACHA20_POLY1305_SHA256
- SL_SEC_MASK_TLS_DHE_RSA_WITH_CHACHA20_POLY1305_SHA256

• FIPS 140-2 Level 1 validated IC
• Thermistor (TPT series) sensor wire length should be limited to 30 feet.
• Line Power maybe needed - 6VDC supplied by 120 VAC or 230 VAC power supply included w/5G WiFi.
• Connects to existing WiFi.
• Maximum wireless transmission receiver range indoors 200 feet.

RTD Transmitter – Z3 Zigbee

- Transmitters buffer 7 days of readings history recorded at 5 minute intervals.
- Most sensors in a typical install will be battery powered.
- Transmitters come with PT-100 RTD sensors and provide 12 bit analog to digital conversion accuracy.
- Range -200 Deg. C. to +100 Deg. C.
- **Certified version** is calibrated to +/- 0.1 Deg. C. accuracy at -196, -50, 0, and 50 degrees (line powered).
- **Non-certified version** is calibrated using an RTD simulator to be 0.1 degree accurate at 0 degrees C. The untrimmed probe accuracy is ±(0.30 + 0.005* t) where t is the absolute value of the temperature in degrees C. Sensor can be field calibrated to be accurate at any set point.
- 1 input and 2 input transmitters available.
- Batteries are monitored in battery-powered units. Low batteries cause low battery alarms, which can dial out.
- AC power loss in routers will cause a power loss alarm which can dial out.
- Can be added to existing systems. A single system can contain wired sensors, Wireless Version 1 sensors, V2 and Z3 wireless sensors.
- Dimensions (enclosure) Z3: 2.54 W X 2.54 H X 1 D (inches)
- FCC Certified- FCC ID Z3: MCQ-S2CTH*
- Transmit Power: V2 3 dBm, Z3 8 dBm
- Battery Back Up Duration
- For modules running solely on battery, battery lasts approximately 1.5 year for Z3.
- Modules connected to AC power will perform as routers for other modules.
- In a power outage, AC connected modules will continue as routers for 4 hours, then demote to run efficiently on battery power.
- Batteries last approximately 100 hours in the high-draw state that happens during the first 4 hours of a power outage. Thus, these modules are good for about twenty-five power outages with duration of 4 hours or more.
- 6-7.5 VDC can be supplied using 120 VAC or 230 VAC power supply. Powered units become routers.
- Each router can service up to 20 battery powered children.
- Maximum wireless transmission receiver range indoors approximately 50-75 with standard radios.

CO2 and Temperature – Z3 Zigbee/WiFi Incubator Sensor

- Start-up time @ 25°C: < 10s
- Operating Conditions: -40°C to 60°C (Standard)
  0 to 100% RH, non-condensing
- Recommended Storage: -40°C to 70°C

CO2 Measurement

- Sensing Method: Non-dispersive infrared (NDIR) absorption
  Patented Gold-plated optics
  Patented Solid-state source and detector
- Measurement Range: 0-20%
- Accuracy at 25°C
  at 5 %CO2: ±0.1 %CO2
  0-8 %CO2: ±0.2 %CO2

All specifications are subject to change without notice.

8-20 %CO2: ±0.4 %CO2

- Pressure Dependence at 5 %CO2, 700 ... 1100 hPa: ±0.05 %CO2.
- Operating Pressure Range: 500-1100hPa
- Response Time: <1 mins

Temperature Measurement

- Temperature Range: -15 to +60 C, +5 to
- Resolution over Range: +/- 0.1 Deg. C
- Accuracy: 0.2 degrees C from 0-70

Universal Transmitter - Ethernet

Same as specifications for Zigbee version except for:

- Dimensions (enclosure) 4.625 W X 4.625 H X 2 3/8 D (inches)
- Battery backed up with a rechargeable gel cell system that lasts approximately 4 hours.
- Requires 1 Ethernet connection and IP address.

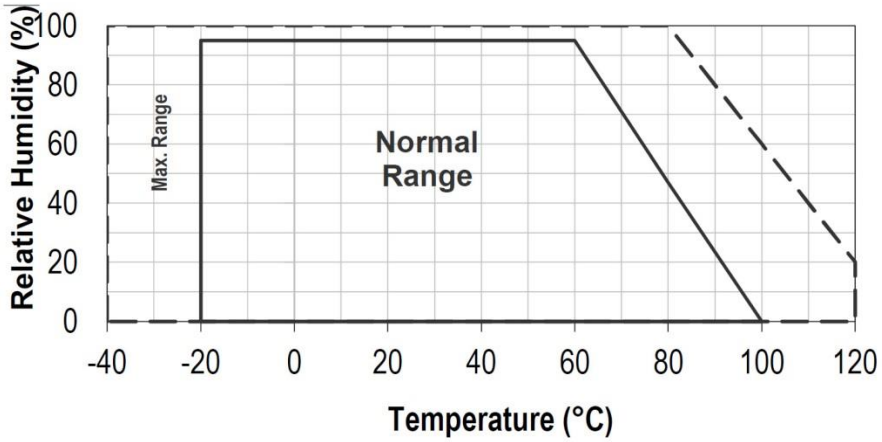
Temperature, Humidity and Light Transmitter - Zigbee

- Measures Ambient Temperature and Relative Humidity
- Also available with Integrated Light Sensor
- All communications are Spread Spectrum for vastly enhanced communication reliability over older single channel 418 MHz transmission.
- Buffers 7 days of readings history recorded at 5 minute intervals.
- Most sensors in a typical install will be battery powered. Not plugged in batteries last approximately
- 1 year. Plugged in battery runs 4 hours as router. Router mode ~100 hours (twenty-five four + hour power outages).
- 6-7.5 VDC can be supplied using 120 VAC or 230 VAC power supply. Powered units become routers.
- Each router can service up to 20 battery powered children.
- Batteries are monitored in battery-powered units. Low batteries cause low battery alarms, which can
- dial out.
- AC power loss in routers will cause a power loss alarm which can dial out.
- Can be added to existing systems. A single system can contain wired sensors, Wireless Version 1 sensors, V2, and Z3 wireless sensors.
- Dimensions (enclosure) **Z3:** 2.54 W X 2.54 H X 1 D (inches)
- FCC Certified- FCC ID **Z3**: MCQ-S2CTH*
- Module Operating Temperature: -20° to 60° C
- Remote Sensor Operating Temperature: -40 to +100 degrees C
- Humidity: 0% to 100% RH non-condensing
- Built-in probe humidity accuracy Typ: 3% RH 20-90% RH, 5% 0-100% RH
- Remote probe humidity accuracy 1.8% 10-90%RH, 4% 0-100% RH,
- Temperature accuracy: Typ: 0.4 Deg. C., resolution 0.1 Deg. C.
- Transmit Power: Z3 8 dBm
- Maximum wireless transmission receiver range indoors 50-75 with standard radios.

Operation Conditions

Sensor works stable within recommended normal range. Long term exposures to conditions outside normal range, especially at humidity >80%RH, may temporarily offset the RH signal (+3 %RH after 60h). After return to normal range it will slowly return towards calibration state by itself. Prolonged exposure to extreme conditions may accelerate aging.

All specifications are subject to change without notice.



All specifications are subject to change without notice.

Temperature, Humidity and Light Transmitter – Z3 WiFi

Specifications are the same as Zigbee units with the following differences:

- Standard: IEEE 802.11b/g/n
- Z3 WiFi – Security: WPA-PSK, WPA2-PSK, WPA2-Enterprise (PEAP MSCHAPv2)
- Transmit Power: 15dBm
- WPA2/WPA-PSK username/password character limit: 63 characters
- WPA2-Enterprise username/password character limit: 32 characters
- WPA2-Enterprise Compatible Cypher Suites
  - TLS_RSA_WITH_AES_128_CBC_SHA256 (Module firmware 5x40 and higher)
  - TLS_RSA_WITH_AES_256_CBC_SHA256 (Module firmware 5x40 and higher)
  - TLS_RSA_WITH_AES_128_CBC_SHA
  - TLS_RSA_WITH_3DES_EDE_CBC_SHA
  - TLS_RSA_WITH_RC4_128_SHA
  - TLS_RSA_WITH_RC4_128_MD5
  - TLS_RSA_WITH_AES_256_CBC_SHA
- Support 802.11g/n OFDM with BPSK, QPSK, 16-QAM and 64-QAM; 802.11b with BPSK, QPSK and CCK
- Z3-Wifi – Battery lasts for approximately 1.5 years. Usually run on battery. Low battery causes an alarm which can dial out.
- Line Power may be needed - 6VDC supplied by 120 VAC or 230 VAC power supply included w/ V2 WiFi.
- Connects to existing WiFi
- Maximum wireless transmission receiver range indoors approximately 50-75.

Differential Pressure Transmitter - Zigbee

- Pressure Range: -2.0 to 2.0 inches Water Column
- Media Compatibility: Air and non-conductive, non-corrosive gases.
- Materials: PBT, glass, silicon, gold, FR4, silicone, epoxy, copper alloy, lead-free solder.
- Pressure Connection: Barbed fitting for 3/16" ID tubing
- Accuracy: 3% of Reading
- Repeatability: 0.5% of Reading
- Operating Temperature: -20°C to 60°C (-4°F to 140°F)
- Transmit Power: V2 3 dBm, Z3 8 dBm
- Maximum wireless transmission receiver range indoors 50-75 with standard radios.
- Weight: 0.40 lb (180 g)
- Buffers 7 days of data at 5 minute intervals.
- Capable of connecting to an output, output board, and local alarms.
- Battery backed up. Replaceable battery lasts about 250 hours of total power outage.
- 6 VDC supplied using 120 VAC or 230 VAC power supply included. Powered units are routers.
- AC power loss will cause a power loss alarm which can dial out.

In Box Temperature Sensor

- Measures Ambient Temperature inside refrigerators and freezers.
- Buffers 7 days of readings history recorded at 5 minute intervals.
- Batteries are monitored in battery-powered units. Low batteries cause low battery alarms, which can dial out.
- Can be added to existing systems. A single system can contain wired sensors, Wireless Version 1
- sensors, V2 wireless and Z3 sensors.
- Dimensions (enclosure) **Z3:** 2.54 W X 2.54 H X 1 D (inches)
- FCC Certified- FCC ID **Z3**: MCQ-S2CTH*
- Operating Temperature: -30° to 60° C

MPX Interface Module – Zigbee

- Connects to a Rees Scientific MPX panel to provide communications and buffering.
- Buffers 7 days of readings history recorded at 15 minute intervals.
- Require 6VDC supplied by 120 VAC or 230 VAC power supply included.
- AC power is monitored and can cause a power alarm which can dial out.
- Battery backed up by standard V2 battery and MPX panel rechargeable gel cell system.

All specifications are subject to change without notice.

- Dimensions (enclosure) 3.295 W X 3.295 H X 1.25 D (inches)
- FCC Certified- FCC ID **Z3**: MCQ-S2CTH*
- Presidio V3.0 or above software.

MPX Interface Module – Ethernet

Same as specifications for Zigbee version except for:

- Dimensions (enclosure) 4.625 W X 4.625 H X 2 3/8 D (inches)
- Battery backed up with a rechargeable gel cell system that lasts approximately 4 hours.
- Requires 1 Ethernet connection and IP address.

Output Relay Containing Modules

- SPDT output
- Max. contact voltage: 125 VAC, 60 VDC
- Rated load: 0.5 A at 125 VAC; 1A at 24 VDC
- For switching larger loads, use with RELAY-PWR : Max switching capacity: 62.50 VA, 30W
- Relay drops out if AC power to the module is lost

Local Alarm Containing Modules

- Sounds triple beep every 5 seconds when in alarm.
- Can be programmed to signal that at least one sensor in an input group or department is in alarm.
- Requires AC power, will not make sound when module is running on battery.

Zigbee Coordinator – USB

- Connects Directly to Rees Scientific Centron, Satellite or Virtual Node via USB port.
- Communicates bi-directionally with V2 or Z3 modules.
- Organizes the Zigbee network, assigning routers, etc.
- Receives power from Node.
- Transmit Power: +8 dBm
- FCC Certified- FCC ID **Z3**: MCQ-S2CTH*

Zigbee Coordinator - Ethernet

- Communicates bi-directionally with Z3 modules.
- Organizes the Zigbee network, assigning routers, etc.
- 4 hour rechargeable gel cell battery backup
- LED indicator light
- Connects directly to TCP/IP network
- Dimensions (enclosure) Z3: 5.75 W X 4.75 H X 2.5 D (inches)
- FCC Certified- FCC ID Z3: MCQ-S2CTH*
- Transmit Power: +8dBm

Z3 Net POE

- Communicates bi-directionally with Z3 modules.
- Organizes the Zigbee network, assigning routers, etc.
- LED indicator light
- Connects directly to TCP/IP network
- Dimensions (enclosure) Z3: 6 W X 3.5 H X 1.5 D (inches)
- FCC Certified- FCC ID Z3: MCQ-S2CTH*
- Transmit Power: +8dBm
- 802.3af PoE compliant

Z3 MPX NET UP / Z3 MPX USB UP

- Designed for in-wall installation with studs on 16” centers or surface mounting for Z3

All specifications are subject to change without notice.

- Able to accommodate up to 8 existing MPX panels. (Expansion boards sold separately Part# V2-MPX-BOARD or Part # Z3-MPX-BOARD)
- Battery backed up to collect readings for up to 24 hours
- Buffers MPX panel input data for 7 days at 15 minute intervals.
- Network Type: 10/100 for network type
- USB connection for USB type.
- Dimensions 15”x12.75”x3.4”
- Presidio V3.0 or above software.
- 120VAC @ 0.8 Amps max.

All specifications are subject to change without notice.