



ViewPoint Essentials Sensor User Manual

Document No. DS-VP-ESS-S-MNL

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Rev. DRAFT



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1.0 Introduction

The ViewPoint Essentials wireless sensor is an integral part of the ViewPoint continuous monitoring (“CM”) system which is an end-to-end enterprise asset monitoring system that is designed to continuously monitor vital assets and notify individuals when an alarm condition exists. The sensors have the following features:

- Battery powered
- 1 analog input: Thermistor temperature probe
- 1 digital input: Humidity/Temperature
- 1 dry contact / binary input
- Expanded local data storage of 2,500-time stamped records (2 analog and 1 discreet input)
- Removable probe for convenient Probe Exchange options

There are three families of the ViewPoint (VP) sensors: VPx Generation 5, VPx Professional Generation 6 and VP Essentials.

VP Essentials sensors operate in the 902 to 928 MHz frequency range and requires a ViewPoint Access Point to be able to forward data to the ViewPoint application.

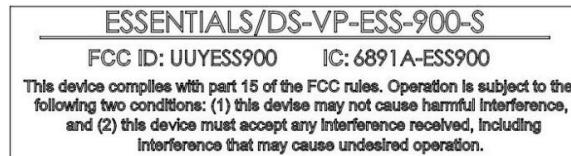
The VP Essentials 900 MHz sensors also support a legacy radio network protocol called Check Point G4 and can be used in the same system as Check Point G4 sensors. For more information on how to configure this mode, see the VPx Configuration Utility User Manual. The main part of the user guide assumes the use of the ViewPoint Radio Network.

2.0 Regulatory Compliance

2.1 United States FCC

This device complies with Part 15 of the FCC Rules. Sensor operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Ex.



2-1 VP Essentials Product Label

Warning: This unit is not explosion proof and is not rated for intrinsically safe installations.

WARNING

This equipment has been tested and found to comply with the limits for a class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- * Reorient or relocate the receiving antenna.
- * Increase the separation between the equipment and receiver.
- * Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- * Consult the dealer or an experienced radio/TV technician for help.

In order to maintain compliance with FCC regulations, shielded cables must be used with this equipment. Operation with non-approved equipment or unshielded cables is likely to result in interference to radio and TV reception. The user is cautioned that changes and modifications made to the equipment without the approval of manufacturer could void the user's authority to operate this equipment.

RF Exposure Notice: To satisfy RF exposure requirements, this device and its antennas must operate with a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

2.2 Industry Canada

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions: (1) This device may not cause interference. (2) This device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes: (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

3.0 Reference Documents

Document	Document Number
VPx Configuration Utility User Manual	DS-VPX-VP-S-UTIL-MNL
ViewPoint User Manual	DV1561
ViewPoint System Configuration & Best Practices Guide	DV3403
VPx Access Point Setup Instructions	DV3405
Continuous Monitoring Probe Accuracy Data Sheet & Calibration Policy	D1701

Table 3-1 Reference Documents

4.0 VP Essentials Sensor Models

VP Essentials Sensor Model	Part Number
VP Essentials 900MHz Temperature Sensor 10K Thermistor input	DS-VP-ESS-900-S-TEMP
VP Essentials 900MHz Humidity Sensor I2C Humidity/Temperature input	DS-VP-ESS-900-S-HUMI

Tables 4-1 VP Essentials Sensor Models

5.0 Needed Infrastructure

The VP Essentials sensors are a component in the larger ViewPoint application, and they need particular hardware to function in the ViewPoint application.

VP Essentials Sensors

Model	Part Number
View Point 900MHz Access Point	CM-000250

*Note: "G4 Compatibility Mode" requires 45010-V4 G4 900MHz Access Point

Sensor Support

Model	Part Number
ViewPoint Essentials USB Configuration Cable	166552
-or-	
ViewPoint (G3-G4-VPx Pro) 3-Pin Programming Cable	166563
VPx Configuration Utility	SW-00056

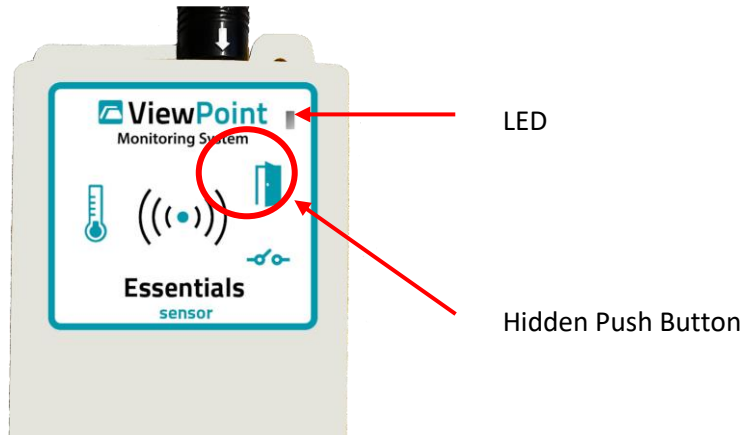
Software Application Options

Model
ViewPoint Professional Edition (VP Pro)
ViewPoint Cloud Edition (VPC)

Tables 5-1 Needed Infrastructure

6.0 Features

6.1 User Interface



6-1 VP Essentials Sensor – Illustrating Position of Push Button and LED

The hidden push button is located underneath the door icon image. Push the door icon image to engage the push button. As you push that area you should feel the button indent and hear a click.

Use the push button and LED to query the sensor about various states of operation and to change the operating mode of the sensor.

Query Sensor

Action or State	Button	LED
Normal run mode. (Sensor is linked to the Access Point)	No button pressed.	Not lite.
Normal run mode query. (Sensor is linked to the Access Point)	One button press (held less than 3 seconds)	The LED is turned on for 10 seconds.
Firmware Fault Condition or Unprogrammed/Configuration Error	No button pressed	Two quick blinks every second.
Indication of Radio Broken Link State	One button press (held less than 3 seconds)	LED is lite while button pressed and when button is released. LED is turned off and then a quick blink after one second.
Indication of Deep Sleep State	One button press (held less than 3 seconds)	LED is lite while button pressed and when button is released. LED is turned off and then two quick blinks after one second.

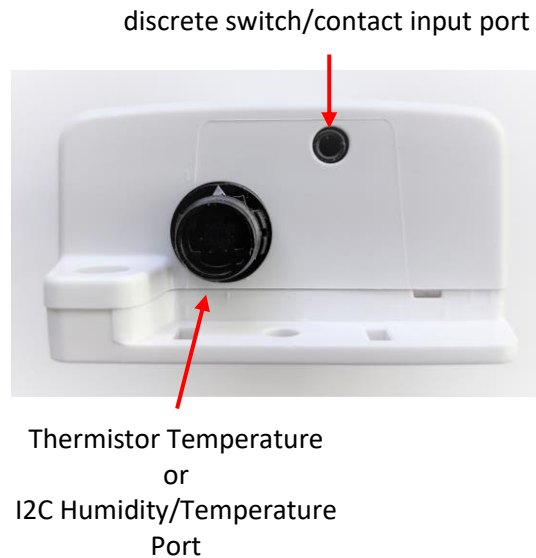
Tables 6-2 Sensor Query Actions

Changing Operating Mode

Action or State	Button	LED
Fast transmit mode – transmit once a minute for 15 minutes. (Sensor must be linked to the Access Point)	Two button presses within one second.	The LED is turned on for 10 seconds.
Reset Radio Link State (when sensor radio is in the Broken link state)	Two button presses within one second.	Quick blink for once a second at first until Link table built. Then the sensor will blink the LED 4 times in a second and then leave the LED on for 10 seconds at which point the sensor is linked with the Access Point.
Waking from Deep Sleep state.	Three button presses within five seconds during Deep Sleep.	The LED is turned on for 3 seconds. The sensor does a blink off the LED and leaves on for half a second. The sensor then turns off the LED for 1 second and then does two blinks a half second apart.
Firmware Reset of Sensor	Hold button for greater than 7 seconds but less than 11 seconds.	While the button is pressed, the goes through 2 sequences of the LED on for 3 seconds and off for 1 second. Afterwards the sensor will perform 2 quick blinks for the LED.
Place Sensor in Deep Sleep	Hold button for greater than 11 seconds.	While the button is pressed, the goes through 3 sequences of the LED on for 3 seconds and off for 1 second. Afterwards the sensor will perform 2 quick blinks for the LED.

Tables 6-2 Changing Sensor Operating Mode

6.2 Inputs



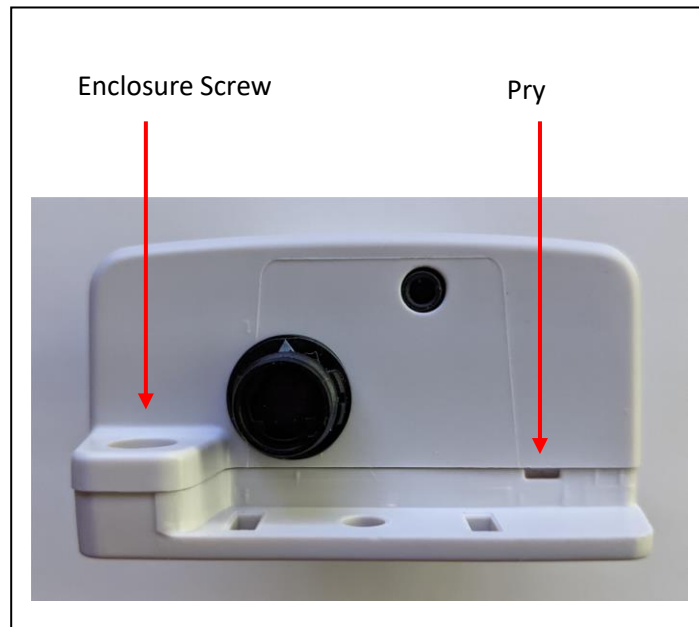
6-2 VP Essentials Sensor Top Side View Showing Ports

The VP Essentials Sensor has 2 I/O ports that can accept Thermistor temperature probe or one I2C input for a Humidity/Temperature probe and a discrete switch/contact input. The discrete switch/contact input can be used at the same time as either the Thermistor temperature probe or Humidity/Temperature probe. Either Thermistor temperature probe or Humidity/Temperature probe can be used (configured) but both cannot be used at the same time.

Note: The discrete switch/contact input port is also used as the configuration port where 166552 ViewPoint Essentials USB Configuration Cable plugs into the same port.

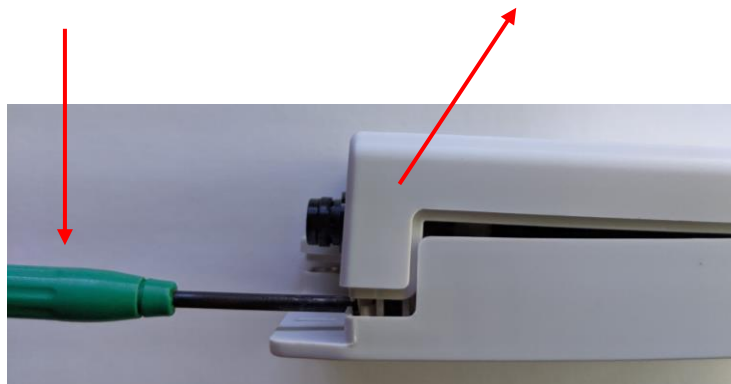
7.0 Installing and Configuring

7.1 Opening Enclosure



7-1 VP Essentials Sensor – Opening Enclosure

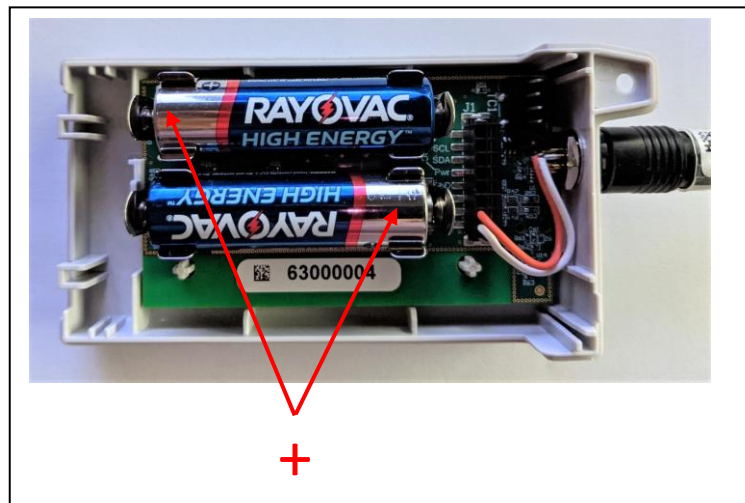
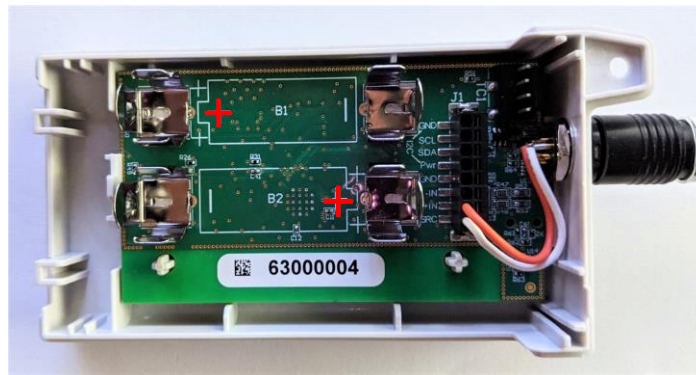
To remove the top enclosure, remove the enclosure screw using a small Philips screwdriver. Take a small flat head screwdriver and insert it in the pry slot. Pry the top and bottom enclosures apart and then remove the top part of the enclosure.



7-1-1 VP Essentials Sensor – Opening Enclosure

To put the sensor back together, place the bottom of top enclosure and line up with the bottom portion of the top enclosure. Rotate the top enclosure (hinged at the bottom of the bottom enclosure) until the top “snaps” into the bottom enclosure. Insert the screw to secure the top and the bottom together.

7.2 Inserting Batteries



7-1 VP Essentials Sensor – Batteries

Insert 2 1.5-volt Alkaline batteries (MesaLabs PN TWA53-A) in the sensor battery connectors. Note the direction and polarity of the batteries compared to the battery connector polarity. Replace both batteries with new batteries. Do not mix new and used batteries.

The sensor will detect the new batteries and automatically set the battery meter for the new batteries.

7.3 Physically Installing

Please consult the document "DV3403 ViewPoint System Configuration & Best Practices Guide" for guidance about placement of the sensors with relation to ViewPoint 900 MHz Access Points. Double sticky tape, sticky backed Velcro, zip tie and screw are options for mounting the VP Essentials sensor.



7-3 VP Essentials Sensor – Mounting Holes

Connect the probes. ***Note:** Route wires/cables away from the sensor to avoid RF interference issues.

7.4 Startup

The sensor comes from the factory in a deep sleep state. To wake up the sensor, press the button 3 times within 5 seconds. The LED does a quick flash. Refer to the section 6.1 User Interface for information about locating the push button.

7.5 Configuring

7.5.1 Connect Configuration Cable (Phono Stereo Connector)



7-5-1 VP Essentials Sensor Top Side View Showing Configuration Port and Cable

Insert the USB connector of the 166552 VP Essentials Configuration Cable to the USB port of the computer. Connect the 166552-phonon connector to the sensor's configuration port. (Note, the same port is used for the digital input and may have 43006 Door Access/Motion Cable attached. Remove this cable first before connecting the 166552 Configuration cable.)

7.5.2 3-Pin Configuration Cable (option)



7-5-2 VP Essentials Sensor Top Side View Showing Configuration Port and Cable

An alternative means of configuring the sensor is to insert the USB connector of the 166564 VP (G3-G4-VPx Pro) 3-Pin Programming Cable to the USB port of the computer. The enclosure will need to be opened to connect the cable. To open the enclosure, follow the instructions in section 7.1 *Opening Enclosure*. Locate the 4-pin connector in the upper right corner of the sensor labeled TC1. Connect the 4-pin cable connector to the connector at TC1. Note: the cable connector is polarized and can only fit in one direction. Be careful not to fit the cable connector off by one pin.

7.5.3 VPx Configuration Utility

Both the VPx Configuration Utility and ViewPoint Programming/VPx Configuration Cable must be used to configure the VP Essentials sensor. Refer to the VPx Configuration Utility Manual (DS-VPX-VP-S-UTIL-MNL) for detailed instructions of how to configure the sensor.

7.6 Shipping

If the sensor is going to be shipped, place the sensor into deep sleep mode. Use the VPx Configuration Utility to set the sensor to deep sleep mode. Refer to the VPx Configuration Utility Manual for instructions.

7.7 Log Term Storage

If the sensor is not going to be used for a large period of time, remove the batteries before long-term storage.

8.0 Sensor Modes

8.1 Fast Transmit Mode

When the sensor is placed in Fast Transmit Mode, it will transmit more frequently for 15 minutes. After 15 minutes the sensor will go back to its normal logging mode. To place the sensor in Fast Transmit Mode, press the push button twice within one second. The sensor will turn on the LED for 10 seconds. After the 15 minutes expires, the sensor will transmit at its normal configured cadence. If the push button is pressed twice within one second while in fast transmit mode, the sensor will continue with fast transmit mode for another 15 minutes. For more information about location of the push button and LED, see section 6.1 User Interface.

9.0 New Battery

***Note:** The units require two (2) AA 1.5v Alkaline batteries MesaLabs PN TWA53-A.

Following the instructions in section 7.1 Open Enclosure and open the enclosure.

Following the instructions in section 7.2 Inserting Batteries. Note the direction and polarity of the batteries compared to the battery connector polarity. Replace both batteries with new batteries. Do not mix new and used batteries.

Following the instructions in section 7.1 Open Enclosure and assemble the enclosure.

The sensor will detect the new batteries and automatically set the battery meter for the new batteries.

10.0 Specs

All specs below are estimated ranges for the described inputs. Please refer to the probe specification documentation for the exact application ranges and tolerances.

Input Range

Sensor Thermistor Input

Range: -50°C to 125°C

Air Temperature Probe– (P/N 72107)

3" Stainless Steel Temperature Probe- (P/N 72105-12)

Range: 4°C to +37°C

Tolerance: $\pm 0.5^{\circ}\text{C}$ @ -25°C to +45°C ($\pm 1.0^{\circ}\text{C}$ @ -90°C to -26°C and +46°C to +140°C)

Temperature and Humidity Probe – (P/N 72112)

Range: +10°C to 40°C and 10% RH to 90% RH

Accuracy: $\pm 0.4^{\circ}\text{C}$ and $\pm 3\%$ RH

Operating Environment

15 °C to 40 °C and 0-90% RH non-condensing

Storage Capacity

2,500 logged packets (2 analog and 1 discreet input) (with a transmit time of 5 minutes the sensor will hold 8.6 days. For 15 minutes the sensor will hold 26 days).

Battery

2 1.5V AA Cell (Alkaline or Lithium)

Battery Life

Varies with Transmit Interval

5 minutes 1 year

15 minutes 2 year

Radio

900 MHz (902-928 MHz) frequency hopping with 4 channels

Other

NIST or ISO/IEC ILAC-MRA 17025:2005 Certificate of Calibration: Self-service, probe swap or on-site calibration options

11.0 Probe List

11.1 DS-VP-ESS-900-S-TEMP - VP Essentials 900MHz Temperature Sensor

Probe / Input	Part Number
Air Temperature Probe	72107
3" Stainless Steel Temperature Probe -30°C to +60°C	72105-12
Door Switch, Motion, Alarm Contact	43006

Table 11-1 Probe / Input Part Numbers

11.2 DS-VP-ESS-900-S-HUMI - VP Essentials 900MHz Humidity Sensor

Probe / Input	Part Number
Temp/Humidity (Snap)	72112
Door Switch, Motion, Alarm Contact	43006

Table 11-2 Probe / Input Part Numbers

12.0 Accessory List

Accessory Type	Part Number
Battery 1.5V AA Alkaline	TWA53-A
Cable, Snap Extension, 25', 22AWG	63001
Cable, Snap Extension, 75', 22AWG	63000
Single Bottle with PGX	TWA200A

Table 12-1 Accessory Type Part Numbers

13.0 CheckPoint G4 Compatibility

VP Essentials 900 MHz sensors can be configured to communicate with the CheckPoint G4 radio network protocol. VP Essentials 900 MHz sensors, when configured correctly, can be used as a compatible alternative for CheckPoint G4 sensors and must use a CheckPoint G4 Access Point.

Model	Part Number
G4 900MHz Access Point	45010-V4

Table 15-1 VPx Pro G4 Compatibility Mode Required Hardware

G4 and G5 protocols are not directly compatible with each other. Any related system hardware components must run exclusively on the same protocol.

Both G4 and G5 protocols are supported by ViewPoint. G4 protocol does not support over-the-air (OTA) updates (transmit intervals, alarm points and firmware upgrade). The G4 protocol is also limited to the standard temperature and humidity measurements in the original application ranges supported by the G4 hardware. For any other measurement type, the G5 protocol must be used.

***Note:** Maximum possible temperature measurement range of the G4 compatibility mode is limited to -50°C to 125 °C. For any measurements taken outside of this range, the G5 protocol must be used.

***Note:** Local alarms at the sensor must be set at the sensor. Alarms are not configured over-the-air (OTA) from ViewPoint to the sensor.

***Note:** Measurement accuracy and precision while operating in G4 mode shall be evaluated to the original G4 probe specification. See the document D1701 Probe Accuracy Data Sheet & Calibration Policy for G4 probe specifications.

14.0 Troubleshooting

Issue	Action
No LED response	1) Check batteries a. Check if batteries are aligned in the right direction. b. VP Essentials uses 2 1.5V AA Batteries. c. Check the battery chemistry and voltage. d. Only use new batteries. 2) Is the sensor in deep sleep? Do a quick press of the button. If in deep sleep, LED is lite while button pressed and when button is released. LED is turned off and then two quick blinks after one second.
ViewPoint not receiving packets from the 900 MHz sensor	1) Check the Access Point a. Powered on? b. Is the Service Link Status LED on solid green? c. Are there other sensors associated with this Access Point that are also offline? d. Is antenna attached to the Access Point and oriented correctly? 2) Does Sensor respond to Normal Run Query push button? a. Check batteries 3) Check for broken link indicator at sensor using the push button a. Did the sensor recently get moved? b. Did the RF environment recently change? Changes to the building? Lab equipment changed or moved? c. Check if a possible interference source is nearby like electric motors, microwave ovens, and other electronics. d. Check if electrical cables are draped over the unit. e. Consider reorienting the sensor. f. Consider moving the sensor closer to the Access Point.

	g. In ViewPoint, find the RSSI value. Move the sensor and then wait 24 hours to reevaluate the RSSI. h. For 900 MHz, if the sensor is within range of multiple ViewPoint Access Points, consider manually setting a "Preferred Link SN".
ViewPoint receiving data from the sensor intermittently (large "Updated" times in ViewPoint).	1) Check the Access Point a. (For 900 MHz sensors only) Is the Service Link Status LED on solid green? b. Are there other sensors associated with this Access Point having similar issues? c. Is antenna attached to the Access Point and oriented correctly. 2) Check batteries. 4) Check for broken link indicator at sensor using the push button. a. Did the sensor get moved? b. Did the RF environment recently change? Changes to the building? Lab equipment changed or moved? c. Check if interference source nearby like electric motors, microwave ovens, and other electronics. d. Check if electrical cables are draped over the unit. e. Consider reorienting the sensor. f. Consider moving the sensor closer to the Access Point. g. In ViewPoint, find the RSSI value. Move the sensor and then wait 24 hours to reevaluate the RSSI. h. For 900 MHz, if the sensor is within range of multiple ViewPoint Access Points, consider manually setting a "Preferred Link SN".
Sensor does two quick blinks of the LED every second.	1) The sensor may have a faulty configuration or firmware may be corrupted. Contact Mesalabs Support.

ViewPoint indicate the sensor has a disconnected probe.	Probe Disconnected 1) For thermistor temperature probes, check that all wires are connected. 2) Check probe is connected. Reconnect probe. 3) Replace probe 4) Check the configured alarm limits. 5) Check if the probe is being used at extreme temperatures.
Incorrect readings are delivered to ViewPoint.	1) Check that the probe is connected to the input 2) Check that the probe is wired correctly and there are no damaged wires. 3) If the probe wiring was extended, verify that the length of the extension does not exceed recommended maximum length. 4) Verify that the probe wiring is not near anything that could cause interference (ex. Electric motors or microwave oven).
Battery Life is not as expected	1) Sensor battery life is dependent on what type of probe is connected, how often the sensor is configured to transmit, and how often it is left to persist in an alarm state. 2) Addressing alarms in a timely manner will help to preserve battery life. 3) Only replace with new batteries of the same capacity.

15.0 Revisions

REV	DESCRIPTION	DATE
A	Initial Release	8/15/2022