

VTC-575

PREDICTIVE MAINTENANCE SENSORS



Technical MANUAL

*VTC-575, Wireless Vibration /
Temperature / Current Sensor*

P/N: D-103-0007

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WARRANTY

The supply of the ActiveSenz™ device(s) is(are) subject to parent company Hyper SPEARS's "Terms of Sales". These are provided through the contract. ActiveSenz™ warrants products against mechanical, electrical, physical, and workmanship defects for a period of twelve (12) months from the date of purchase.

Unpack the device(s) and inspect it for any obvious visible shipping damage. Notices of defect must be announced immediately, in writing, at the latest, within 7 days of receipt of the goods.

This warranty excludes consumable items such as electronic components, rollers, springs, or any parts subject to wear.

ActiveSenz™ will repair or replace, at its option, devices, or parts, which fail because of mechanical, electrical, physical, or workmanship defects, provided the equipment or parts were installed operated or maintained in accordance with approved practice, and used for the intended purpose. Any product which has been repaired or altered in such way, in ActiveSenz's judgment, as to affect the product adversely will not be covered under warranty.

No warranty or liability will be accepted for bodily injury or property damage resulting from one or several of the following causes:

- Misuse or abuse of the device(s).
- Improper mounting, commissioning, operation, and maintenance of the device.
- Operation of the device if any safeguards are defective or if any safety and protection precautions are not properly installed or not operative.
- Failure to comply with the notices in the Operating Instructions regarding transport, storage, mounting, commissioning, operation, maintenance, and setup of the device.
- Any unauthorized structural alteration of the device.
- Insufficient inspection of device components that are subject to wear.
- Opening the device or improper repair work.
- Disasters caused by the effects of foreign objects or by force majeure.

ActiveSenz™ reserves the right to examine the part(s) to determine if the device/part(s) is(are) covered under this warranty or to authorize scrap on site

and provide replacement device/parts without examination by ActiveSenz™ Customer Product Support.

ActiveSenz™ shall have the right to substitute replacement parts having the same form, fit, function, and specification.

All repaired or overhauled parts will be warranted to be free from defects in material and workmanship, in accordance with the above stipulations, for a period of ninety (90) days from the date of shipment.

For products not manufactured by, but sold by ActiveSenz™, warranty is limited to that extended by the original manufacturer.

Customers must notify ActiveSenz™ Customer Product Support (CPS) in writing within ten (10) working days of the failure/defect discovery with a detailed description of the problem and, if known, the cause of the problem.

ActiveSenz™ Customer Product Support
info@activesenz.com
(954) 900-2955

ActiveSenz's Customer assumes responsibility for incoming freight and custom charges unless these have been previously authorized in writing by ActiveSenz™.*

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Due to the diverse applications of the products described in this publication, those responsible for their application and use must ensure that all necessary measures are taken to meet all performance and safety requirements, including compliance with applicable laws, regulations, codes, and standards.

COMPLIANCE(S)

1.1 FCC COMPLIANCE STATEMENT

This device c

This device complies with part 15 of the FCC Rules. 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.

CAUTION: The grantee is not responsible for any changes or modifications not expressly approved by the party responsible for compliance. Such modifications could void the user's authority to operate the equipment.

NOTE: 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.

2 SAFETY

This section contains general safety instructions. Some safety instructions may not apply to the equipment in this manual. Specific warnings are included in the manual where appropriate. Follow all warnings, cautions and notes in the instructions carefully as failure to do so may result in personal injury, death, or damage to equipment.

To use this equipment safely

- Observe all safety regulations. Always remove power prior to making any wire connections and touching any parts.
- Read and become familiar with the general safety instructions provided in this section of the manual before installing, operating, maintaining, or repairing this equipment.
- Read and carefully follow the instructions given throughout this manual for performing specific tasks and working with specific equipment.
- Keep this manual within easy access of personnel installing, operating, maintaining, or repairing this equipment.
- Follow all applicable safety procedures required by your company, industry standards, and government or other regulatory agencies.
- Obtain and read Material Safety Data Sheets (MSDS) for all materials used.

2.1 SAFETY SYMBOLS

Become familiar with the safety symbols presented in this section. These symbols will alert you to safety hazards and conditions that may result in personal injury, death, or damage to equipment.

Table 2- 1 Safety Symbols

 WARNING	May result in personnel injury or death.
 CAUTION	May result in damage to equipment.
 NOTE	Informational guidance.

2.2 QUALIFIED PERSONNEL

Defined as personnel who thoroughly understand the equipment and its safe operation, maintenance, and repair. Qualified personnel are physically capable of performing the required tasks, familiar with all relevant safety rules and regulations and have been trained to safely install, operate, maintain, and repair the equipment.

2.3 INSTALLATION

Read and understand the installation section before installing the equipment.

- Failure to follow safety procedures may result in injury or death.
- Allow only qualified personnel to install the equipment.
- Use only approved equipment. Using unapproved equipment in an approved system may void agency approvals.
- Make sure all equipment is rated and approved for the environment in which you are using it.
- Follow all instructions for installing components and accessories.
- Install all electrical connections to local code.
- Use only electrical wire of sufficient gauge and insulation to handle the rated current demand. All wiring must meet local codes.
- Route electrical wiring along a protected path. Make sure they will not be damaged by moving equipment.
- Avoid dangerous environments, do not use in environments that are explosive, do not submerge in liquids.
- Carefully maintain sensors, keep dry, clean, and free from oil and grease, do not lubricate, all roller bearings sealed.

2.4 OPERATION

Only qualified personnel should operate this equipment. Read manuals before operating this equipment. A thorough understanding of system components and their operation will help you operate the system safely and efficiently.

Before using this equipment, check all safety interlocks, fire-detection systems, and protective devices such as panels and covers. Make sure all devices are fully functional. Do not operate the system if these devices are not working properly. Do not deactivate or bypass automatic safety interlocks or locked-out electrical disconnects or pneumatic valves.

- Never operate equipment with a known malfunction. Tag device(s) as “DO NOT USE”

- Do not attempt to operate or service electrical equipment if standing water is present.
- Use this equipment only in the environments for which it is rated. Do not operate this equipment in humid, flammable, or explosive environments unless it has been rated for safe operation in these environments.
- DO NOT touch exposed electrical connections on equipment while the power is ON.

2.5 EQUIPMENT MALFUNCTIONS

Do not operate a system that contains malfunctioning components. If a component malfunctions, turn the system OFF immediately.

- Disconnect and lock out electrical power.
- Allow only qualified personnel to make repairs. Repair or replace the malfunctioning component according to instructions provided in its manual.

2.6 MAINTENANCE AND REPAIR

Allow only qualified personnel to perform maintenance, troubleshooting, and repair tasks. Only properly trained personnel are permitted to provide service to this equipment.

- Follow the recommended maintenance procedures in your equipment manuals.
- Do not service or adjust any equipment unless another person trained in first aid and CPR is present.
- Use only approved ActiveSenz™ replacement parts. Using unapproved parts or making unapproved modifications to equipment may void warranty and create safety hazards.
- Do not attempt to service electrical equipment if standing water is present. Use caution when servicing electrical equipment in a high-humidity environment.
- Use tools with insulated handles when working with electrical equipment.

3 HOW IT WORKS

The 575-Series predictive monitoring system uses wireless sensor nodes to continuously collect data from designated areas or machinery assets. These sensors track parameters such as vibration, temperature, current, and conveyor belt tension, transmitting encrypted data over a closed-loop wireless network to a central base station. The base station aggregates the data and sends it to a local server or PC, where a dashboard displays real-time analysis, system health, fault alerts, and historical trends. Predictive algorithms identify patterns and anomalies that signal potential failures, enabling proactive maintenance and reducing unplanned downtime.

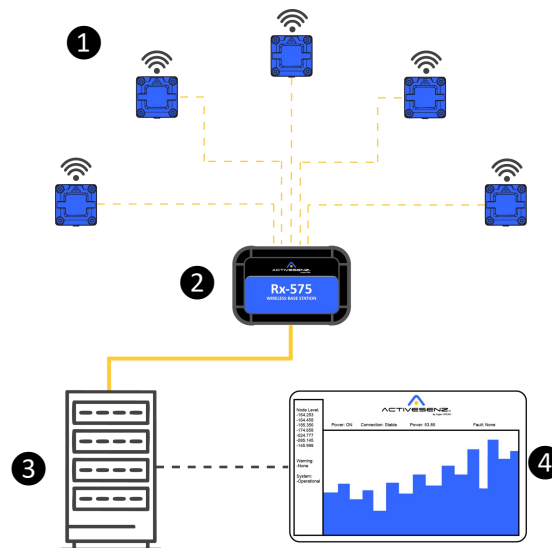


Figure 3- 1 System Overview

- ❶ Wireless Sensor(s) node
- ❷ Wireless Base Station (Rx-575).
- ❸ Company server and/or PC
- ❹ ActiveSenz IQ™ (A-IQ™)

A range of sensor types is available, offering a comprehensive solution for monitoring target assets across various conditions and operational parameters.

The following sensor options are some of the most commonly used:

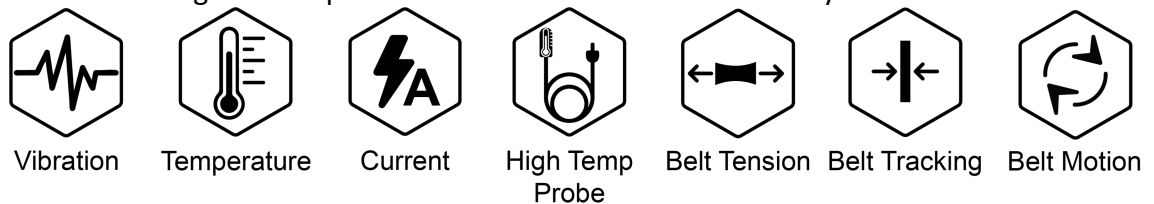


Figure 3- 2 Common Sensor(s)

4 VTC-575 [VIBRATION/TEMPERATURE/CURRENT]

The VTC-575 sensor offers a comprehensive solution for measuring, monitoring, and detecting abnormal operational conditions in industrial equipment. It features machine learning algorithms and functions as a standalone wireless sensor capable of monitoring vibration, temperature, and current. Once installed, the sensor learns the operational patterns of the target hardware and provides a predictive window for potential failures, along with real-time data. This enables users to plan maintenance procedures effectively, reducing unplanned downtime.



Figure 4- 1 VTC-575 [Vibration / Temperature Sensor]

The VTC-575 will transmit data and fault detection to a central base station (Rx-575) [sold separately] via long range wireless without the need for large external antenna. Power is via a single CR2477 coin cell, with over 6 years of operating life depending upon the data transmission rate selected by the user. An Aux port (2) allows for a (8) current sensor (CS-575) add-on to be used. Two VTC-575 sensors can be interconnected via the Aux port, allowing one sensor to act as a remote power source when installed in hard-to-reach locations.

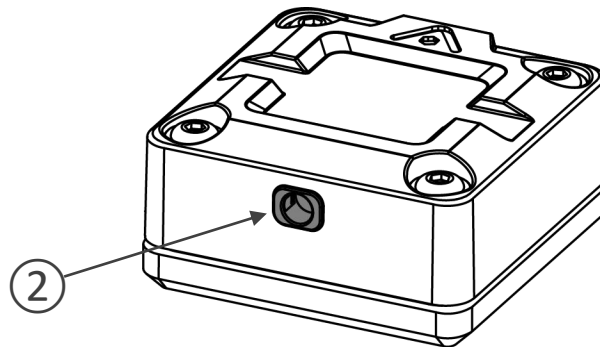


Figure 4- 2 VTC-575 Overview

4.1 SPECIFICATIONS

Power Requirements

- 1X CR2477 coin cell battery
- Operational Battery life: 6 years typical at two (2) transmitted sample per hour.
- Storage Battery life: 10 years
- Optional: Wired power via 3.5mm aux port

Measurement

- Sensitivity Range: ± 8 g (Configurable to ± 2 , ± 4 , ± 8 , ± 16 g)
- Frequency Range: DC to 10,000 Hz
- Sampling Rate: 20,000 Hz
- Temperature Range: -40C to +105C (-40F to +221F).
- Temperature Accuracy: $\pm 1.0^{\circ}\text{C}$ or $0.4\%|t|^{\circ}\text{C}$

Environment

- Commercial use
- Waterproof IP67
- Operating Temperature: -40C to +105C (-40F to +221F).
- Storage Temperature: -50C to +150C (-58F to +302F)
- Recommended ambient relative humidity (RH) up to 100%.

Features

- Closed loop Wireless Encrypted Communication for remote monitoring capabilities.
- Transmission Range: 200m (656ft) non-line of sight (*Transmission ranges vary with environmental conditions. Values indicate tested averages*)
- Ability to interface with the following add-on sensors:
 - Current/Power Sense [CS-575]
 - Remote Temperature Probe [TEMP-575]

Weight and Dimensions

- Weight: 50 g [1.8 oz]
- Dimensions: 40 x 40.7x 20.4 mm [1.6 x 1.6 x 0.8 in]

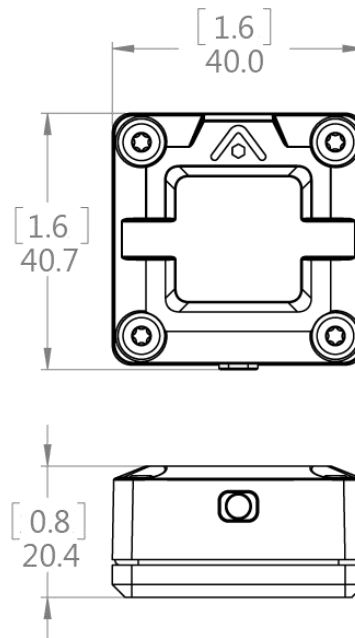


Figure 4- 3 VTC-575 Dimensions

4.2 INSTALLATION



Before working with the VTC-575 and affiliated sensor add-ons:

- *Disconnect Power: Ensure the machinery or equipment is powered down before starting the installation.*
- *Wear Protective Gear: Use safety goggles and gloves to protect yourself during the installation process.*
- *Follow Instructions: Follow all instructions and guidelines outlined in this manual.*

Tools and Materials (as required):

- VTC-575 sensor
- Adhesive (if using adhesive mount)
- Mounting bracket (if required)
- Cable ties (if required)
- M5 Screws and bolts
- Drill and drill bits
- Screwdriver
- Wrench set
- Protective gloves
- Safety goggles
- Electrical tape

Installation steps:

- 1) Identify the asset to monitor and determine the critical areas for vibration or temperature monitoring. This could include components such as motors, pumps, compressors, bearings, blowers, gearboxes, or fans. Multiple sensors can be added to an asset for comprehensive monitoring.
- 2) Select the Mounting Location:
 - 1) Accessibility: Ensure the location is accessible for maintenance and the sensor is directly on the target asset.
 - 2) Keep the vibration transmission path as short as possible by minimizing the distance between the vibration source and the sensor. The sensor should be located no further than 75cm (30 inches) from desired vibration/temperature source.
 - 3) Avoid mounting the sensor on structures prone to oscillation due to natural frequencies, such as sheet metal covers or parts made of rubber/plastic.
- 3) Mounting the Sensor
 - 1) The entire bottom surface of the sensor can detect vibrations and/or temperature.
 - 2) Ensure that at least one-third (1/3) of the sensor's bottom surface is in contact with the asset for accurate measurements. Position the sensor as close to the center of the measurement location as possible.
 - 3) Surface Preparation: Clean the mounting surface to remove any dirt, grease, or debris.
 - 4) Mounting orientation: Align the sensor to the desired orientation of measurement.

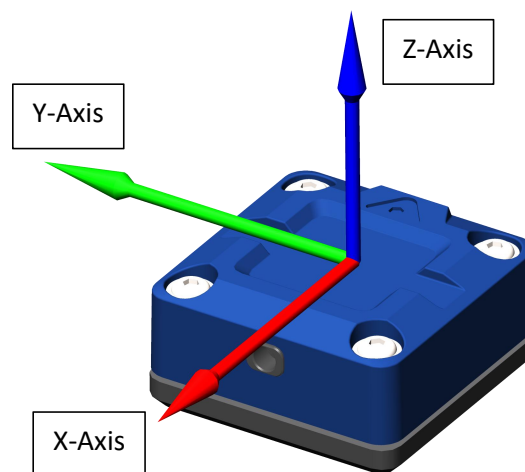


Figure 4- 4 Sensor Axis Orientation

4) Select the type of mount. The VTC-575 can be mounted in one of five (5) ways.

1) Direct adhesive bonding to the asset.

- 1) Apply an even layer of adhesive to the bottom surface of the sensor maximizing coverage.
- 2) Press the sensor firmly to the asset for the time recommended by the adhesive manufacturer.
- 3) For surfaces which are rough with large gaps of up to 5mm a gap filling such as LOCTITE® 3090 is recommended.
- 4) For smooth surfaces with roughness less than 0.1mm, an adhesive such as LOCTITE® 454 is recommended.
- 5) Allow the adhesive to cure as per manufacturer instructions.



WARNING

Always adhere to the safety and processing guidelines provided by the adhesive vendor

2) Direct base screw mount

- 1) Each sensor has four (4) M5 type threaded holes on the base, on a 23x23mm (0.9 in x 0.9in) square pattern.
- 2) These threaded holes can be used with any M5x0.8 threaded stud on the asset, or if 'clamping' through the asset is preferred.
- 3) At least one of the threaded points will be required as a mounting position, while still trying to center as much of the product flush with the target asset.

3) Stud Mounting

- 1) Stud mounting Bracket ⑦ (P/N: M-300-0003-01) provides a single M8x1.25 mm stud mount allowing for easy removal of the sensor. Recommended for use under Intrinsically Safe conditions for battery replacement.

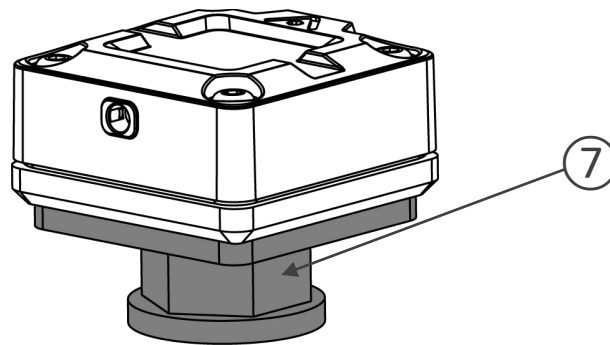
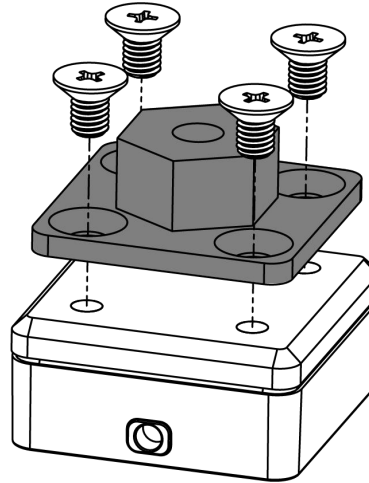
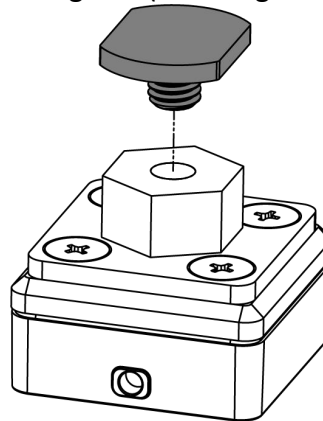


Figure 4- 5 Mounting Bracket

- 2) Attaching the sensor to the bracket using the four (4) M5 screws provided.

*Figure 4- 6 Attaching the Mounting Bracket*

- 3) Stud mounting:
1. Direct Stud mount on asset
 - a. Drill an tap an M8 x 1.25 mm hole onto the asset. Make sure there is enough space for the sensor to be threaded on.
 - b. Install an M8 x 1.25 mm stud mount cap with a recommended height of 9mm above surface. Maximum height not to exceed 10 mm.
 2. Mounting Pad (if drilling and tapping cannot be done):

*Figure 4- 7 Stud Mounting Pad*

- a. Attach mounting pad to sensor, ensuring both faces are flush and in complete contact. Use a 19 mm or $\frac{3}{4}$ in open socket wrench to assist.

- b. Stage the sensor ensuring the axis of the sensor is aligned with the asset. Mark the location of the pad.
- c. Remove the pad from the sensor and apply an even layer of adhesive to the bottom surface of the pad maximizing coverage.
- d. Press the pad firmly to the asset for the time recommended by the adhesive manufacturer.
 - i. For surfaces which are rough with large gaps of up to 5mm a gap filling such as LOCTITE® 3090 is recommended.
 - ii. For smooth surfaces with roughness less than 0.1mm, an adhesive such as LOCTITE® 454 is recommended.
- e. Allow the adhesive to cure as per manufacturer instructions.



- f. *Always adhere to the safety and processing guidelines provided by the adhesive vendor*

- 4) Thread sensor clockwise onto the stud. Ensure the sensor is tightly fastened, and the bottom face is flush with the target face to prevent any movement that could affect reading. A 19 mm or ¾ in open socket wrench can be used to tighten the sensor to the stud.

Note: Blue Loctite® or equivalent can be used on threads to prevent loosening over time.

4) Magnetic Base

- 1) The magnetic base ⑧ (P/N: X-300-0003-02) allows for quick non-permanent installations onto ferrous metallic surfaces.

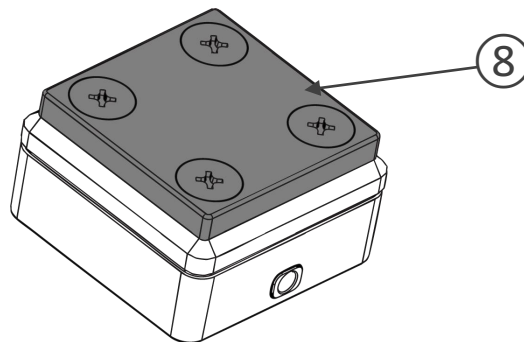


Figure 4- 8 Magnetic Base Mount

⚠ NOTE

This attachment method should be used when precision is not of the highest importance.

5) Cable Tie

- 1) The VTC-575 can be secured with a cable tie. The cover contains a guide channel to allow for cable ties up to 5mm wide to be used securely.

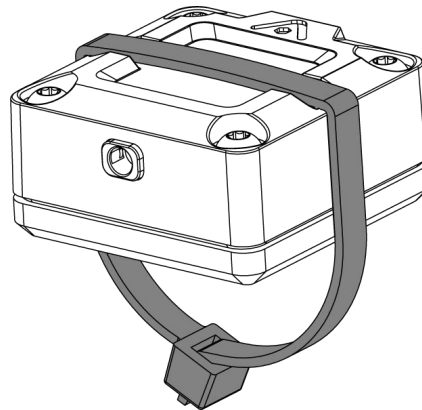


Figure 4- 9 Tie-Wrap Mount

⚠ NOTE

This attachment method should be used when precision is not of the highest importance.

5) Sensor Add-Ons:

- 1) If running a ⑨ current sensor [CS-575], or ⑩ remote temperature probe [TEMP-575], refer to section 5.

- 6) Record the sensor's serial number (S/N), installation area, alias, and component orientation on the A-IQ™ dashboard.

7) Final Inspection:

- 1) Verify Installation: Ensure all screws, bolts, and connections are secure.

4.3 OPERATION

Once the installation procedures outlined in Section 4.2 of this manual are completed, the VTC-575 data will begin capturing and transmitting data. The operation of the VTC-575 is standalone and does not require input from operators once it is successfully installed and properly calibrated. The sensor collects four (4) parameters of its target host:

- Each of the three (3) Axis (X, Y and Z) collects the following:
 - Real Time Vibration Amplitude
 - Vibration Peak to Peak Amplitude
 - Vibration Frequency domain
 - gRMS Velocity
 - Vibration Standard Deviation
 - Vibration Kurtosis
- Temperature
 - Real Time Temperature Amplitude
 - Temperature Peak to Peak
 - Temperature Standard Deviation
 - Temperature Kurtosis

All data can be viewed under the 'Sensor Parameters' tab of the A-IQ™ dashboard. The graphical display shows the gRMS (root mean square of acceleration) for each axis, providing a quick visual reference of the asset's condition. In the Sensor Detail tab, a gRMS vibration reading that encapsulates all three axes is displayed for a quick assessment of excessive vibration on the overall asset.

The VTC-575 relays information to the central wireless base station (Rx-575) via encrypted wireless signal, which allows the user to view on the dashboard (A-IQ™).

When the sensor approaches the end of battery life a red warning signal will flash on the dashboard. Battery replacement is to be conducted per section 2.4.

4.4 BATTERY REPLACEMENT

To replace the battery of the VTC-575, refer to Figure 4- 10.

- 1) Removed the four (4) screws (3) using a Torx T8.
- 2) Remove the old battery (6) and replace with a new CR2477 coin cell.
- 3) Recommended to replace the screw's O-rings (4) and main body O-ring (5). Apply silicone grease or equivalent to O-rings prior to assembly.
- 4) Re assembly unit, tighten screws (3) 1.5 in-lbs.

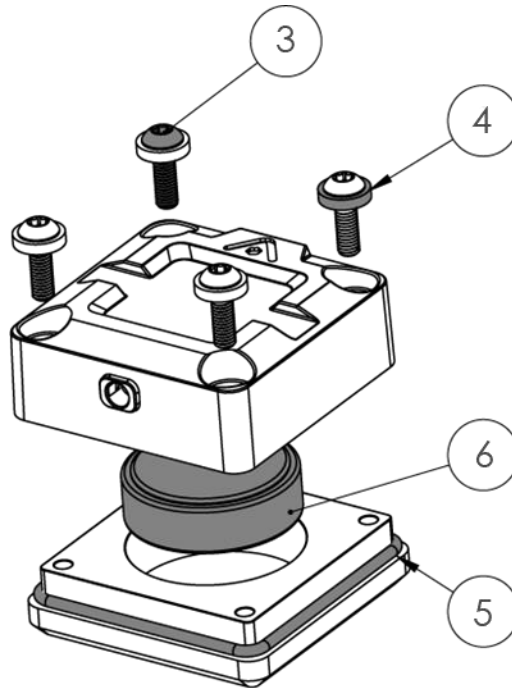


Figure 4- 10 VTC-575 Battery Replacement



Battery orientation. Positive (Text) faces down into the base.

5 ADD-ONS

The VTC-575 is designed to accept auxiliary system(s) add-ons per Table 5- 1.

Table 5- 1 Sensor Add-Ons

Item	Sensor Description	Sensor P/N	Section
⑨	Current Sensor	CS-575 [E-111-0001-XX]	5.1
⑩	Remote Temperature Probe	TEMP-575 [E-111-0004-XX]	5.2
⑪	Power Cable with 3.5 aux	Power Cable [E-109-0005-01]	5.3

5.1 CURRENT / POWER SENSOR

The CS-575 Current Sensor ⑨ provides a non-invasive solution to measuring and monitoring current. The sensor connects to the ② Aux port of the VTC-575 and is of split core design allowing for quick non-invasive installation onto any motor, VFD, or power line. Including a 6'-foot cable, routing and management is easy and convenient.

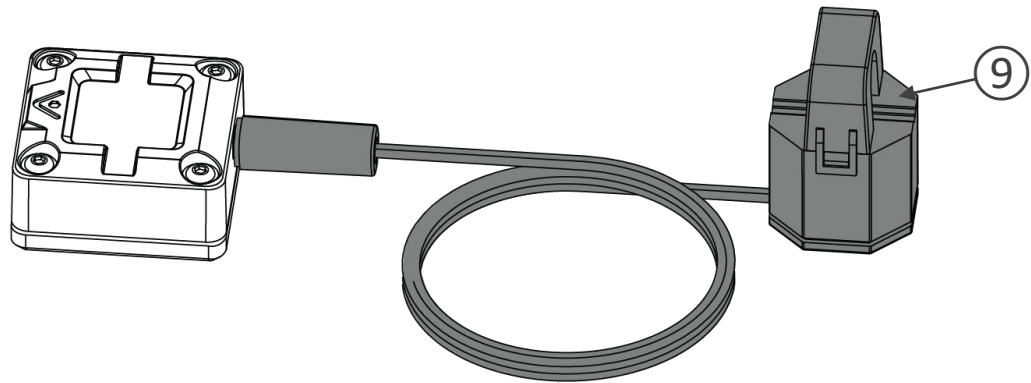


Figure 5- 1 CS-575 Add-on

5.1.1 Specifications

Power Requirements

- Provided by the VTC-575

Environment

- Commercial use
- Waterproof IP67
- Operating Temperature: -40C to +105C (-40F to +221F).
- Recommended ambient relative humidity up to 90%.

Features

- Non-Invasive Split Core
- Max Current: > 1000A, Limited by Split Core Transformer Rating

- Frequency Range: 50/60Hz

Weight and Dimensions

- Weight: 42 g [1.5 oz]
- Dimensions: 25.5 x 40 mm [1.0 x 1.57 in]
- Cable Length: 2 meters [6 feet]
- Max Cable diameter: 10.2 mm [0.40 in]

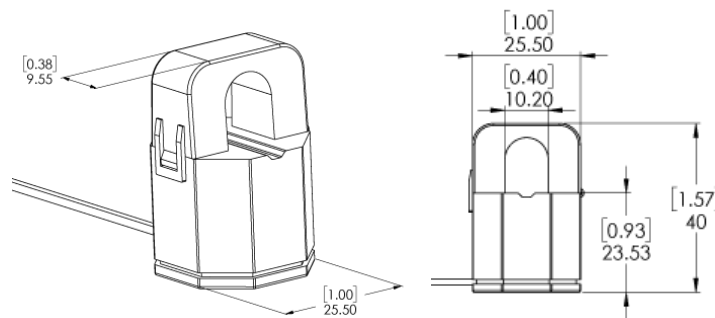


Figure 5-2 CS-575 Dimensions

5.1.2 Installation



Characteristics that exceed the electrical specifications of the CS-575 Current Sensor by more than 100% may cause permanent damage and must be avoided to ensure proper operation.

1. Ensure the CS-575 Current Sensor is properly sized to the current carrying wire being monitored.
 - a. Maximum current monitored load of is limited by size of Split Core Transformer rating.
2. Install the CS-575 Current Sensor onto the VTC-575 AUX port ②.
3. Clamp the CS-575 Current Sensor to the current carrying wire and ensure the hinge and locking snap mechanism engages.
4. Follow the operating procedures of Section 7.3.4 to calibrate the CS-575 Current Sensor to the VTC-575 as required.

5.2 TEMPERATURE PROBE

The TEMP-575 Temperature Probe enables accurate temperature monitoring in difficult-to-access or extreme environments. It connects to the ② Aux port on the VTC-575. The probe features a 6-foot stainless steel-shielded cable and is available with either an exposed or capped sensing end.

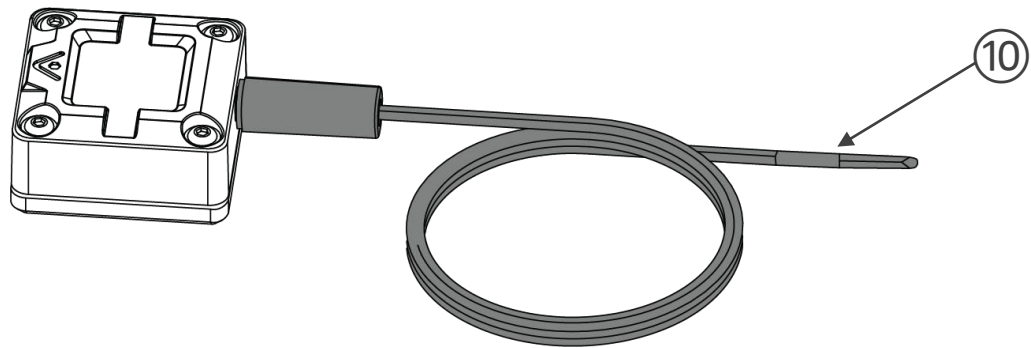


Figure 5-3 Temp Probe Add-on

5.2.1 Specifications

Power Requirements

- Provided by the VTC-575

Environment

- Commercial use
- Operating Temperature: -200C to +1260C (-328F to +2300F).
- Recommended ambient relative humidity up to 100%.

Features

- K-Type Thermocouple
- Stainless Steel Braided
- Exposed or capped sensing end

Dimensions

- Capped end: O.D: 3mm [0.118 in], Length: 17.5 mm [0.70 in]
- Cable Length: 2 meters [6 feet]

5.2.2 Installation



Characteristics that exceed the temperature specifications of the TEMP-575 Temperature Probe may cause permanent damage and must be avoided to ensure proper operation.

1. Place TEMP-575 Temperature Probe onto surface requiring monitoring.
 - a. Ensure probe end is in contact with desired surface. Bond end to surface as required with high temperature tape or epoxy.
2. Install the TEMP-575 Current Sensor onto the VTC-575 AUX port ②.
3. Follow the operating procedures of Section 7.3.4 to calibrate the CS-575 Current Sensor to the VTC-575 as required.

5.3 POWER CABLE WITH AUX PORT

The VTC-575 supports a wired power connection ⑪, eliminating the need for battery replacement. This connection also provides access to the auxiliary port, enabling compatibility with all other add-ons.

The battery inside the VTC-575 must be removed, as power will be supplied by the 5V regulator.



Figure 5- 4 Wired Power

5.3.1 Specifications

Power Requirements

- 5V Regulator

Environment

- Commercial use
- Operating Temperature: -40C to +105C (-40F to +221F).
- Recommended ambient relative humidity up to 90%.

Features

- AUX Port

5.3.2 Installation



Remove battery from the VTC-575.

1. Install the Power Cable onto the VTC-575 AUX port ②.
2. Any additional add-on can be connected to the cables AUX port, follow instructions per section 5.1.2 and 5.2.2.

6 RX-575 [WIRELESS BASE STATION]

The Rx-575 Wireless Base Station functions as the host PC gateway, facilitating encrypted and secure communication with numerous sensors, in addition to their corresponding add-on sensors. Through a USB connection, instant communication is established with any sensor within range, forming a secure closed-loop encrypted wireless system.



Figure 6- 1 RX-575 [Wireless Base Station]

6.1 SPECIFICATIONS

Power Requirements

- USB 2.0 or 3.X
- Utilizes power provided by computer's USB port.

Environment

- Indoor Commercial use
- Material: Flame-resistant ABS UL94V-0
- Protection class: IP40
- Operating Temperature: -20C to +55C (-4F to +131F).
- Storage Temperature: -40C to +65C (-40F to +150F).
- Recommended ambient relative humidity (RH) of 10% to 85%.

Features

- Closed loop wireless Long Range (AES 128-Bit Encryption)
- Dimensions: 67.3 x 124.3 x 22.5 mm [2.6 x 4.9 x 0.9 in]
- Din-Rail mountable

6.2 INSTALLATION



Before working with the RX-575 Wireless Receiver you must wear your personal protective equipment and follow the safety instructions outlined in this manual. This can include, but is not limited to, eye protection, gloves, hard hat and/or steel toed shoes.



Characteristics that exceed the electrical specifications of the RX-575 Wireless Receiver by more than 100% may cause permanent damage and must be avoided to ensure proper operation.

1. Ensure that the RX-575 is situated within 200 m (656 ft) non-line of sight (LOS) of the monitored sensors.
2. Install the RX-575 onto the computer or server using the supplied USB-A connection.
3. If required, install the appropriate 32-bit or 64-bit wireless drivers listed in Section 7.1.
4. Launch the A-IQ™ software, following the instructions in Section 7.3 and ensure data is being captured from the VTC-575 as desired.

6.3 OPERATION

Verify the correct operation of the RX-575 by following the steps outlined in Section 7.3, ensuring the appropriate display of VTC-575 data.

7 A-IQ™ [ACTIVESENZ-IQ™, PREDICTIVE SOFTWARE ANALYTICS]

The A-IQ™ Predictive Analytics Software serves as the interface between the sensor add-ons connected to the sensors and a host PC or server. This software enables users to instantly access real-time data from all connected sensors, providing a comprehensive view of connected assets in real-time. Moreover, it facilitates data import/export for in-depth analysis and streamlines the scheduling of maintenance windows.

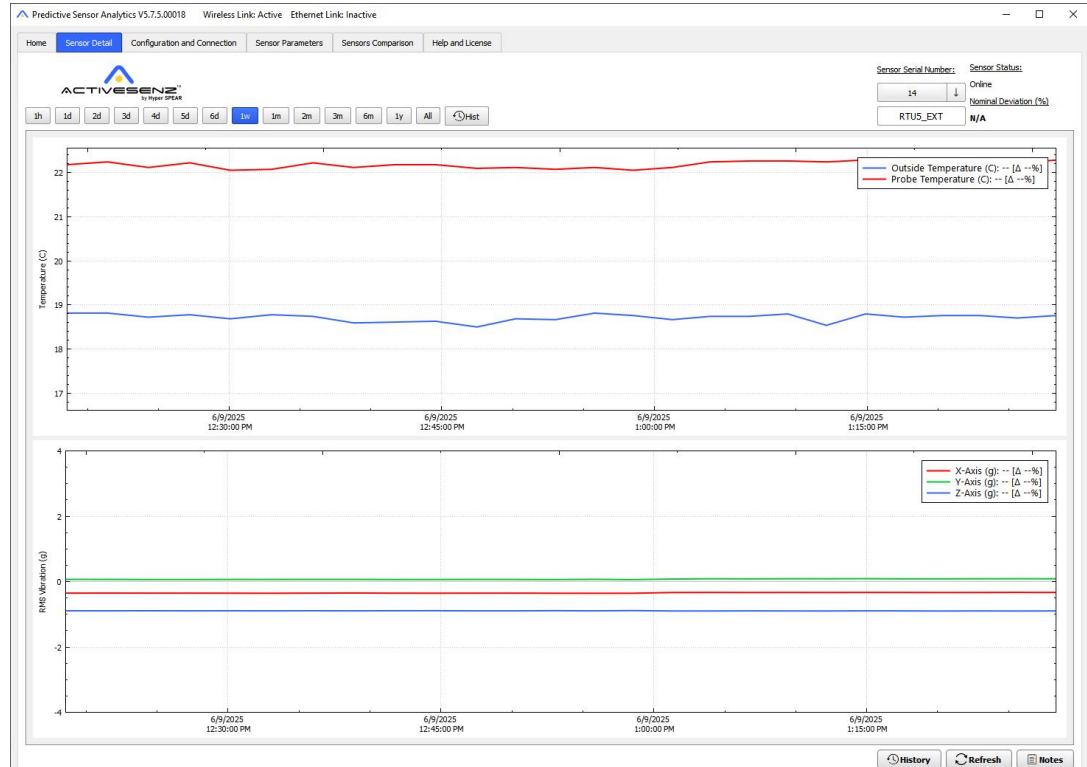


Figure 7- 1 A-IQ™ (Predictive Analytics Software UI)

7.1 SPECIFICATIONS

Operating System

- Compatible 32-bit or 64-bit versions of Windows 7, Windows 8, Windows 10 or later.

Processor (CPU)

- Intel Core i3 or equivalent AMD processor (dual-core or higher recommended but not required).

RAM (Memory)

- Minimum 4 GB RAM (8 GB or more recommended for smoother performance).

Available Hard Disk Space:

- Minimum of 1 GB of free space for installation and additional space for data storage.

Graphics Card:

- Integrated or standard graphics card capable of supporting a display resolution of 1280 x 768 pixels.

Network Connectivity:

- **Ethernet:** An onboard Ethernet port (10/100/1000 Mbps) for reliable wired connections.
- **Wireless:** Compatible wireless base station (Rx-575) with USB cable with three (3) feet or greater for positioning.

USB Ports:

- Adequate USB ports for device connections. A USB hub might be required for additional devices.

Software Pre-requisites (Provided by ActiveSenz):

- PSA575 v5.7.5.[Version Number] (32 or 64 bit)
- CP210x VCP Windows v6.7 (9/3/2020) or later

7.2 INSTALLATION AND SETUP

7.2.1 A-IQ™ Executable Installation

The A-IQ™ setup includes the executable installer 'PSA575 V5.7.5.[Version Number]'. To initiate the installation process, double-click the installation icon. Prior to installation, ensure that the target system meets the minimum requirements specified in Section 6.1.

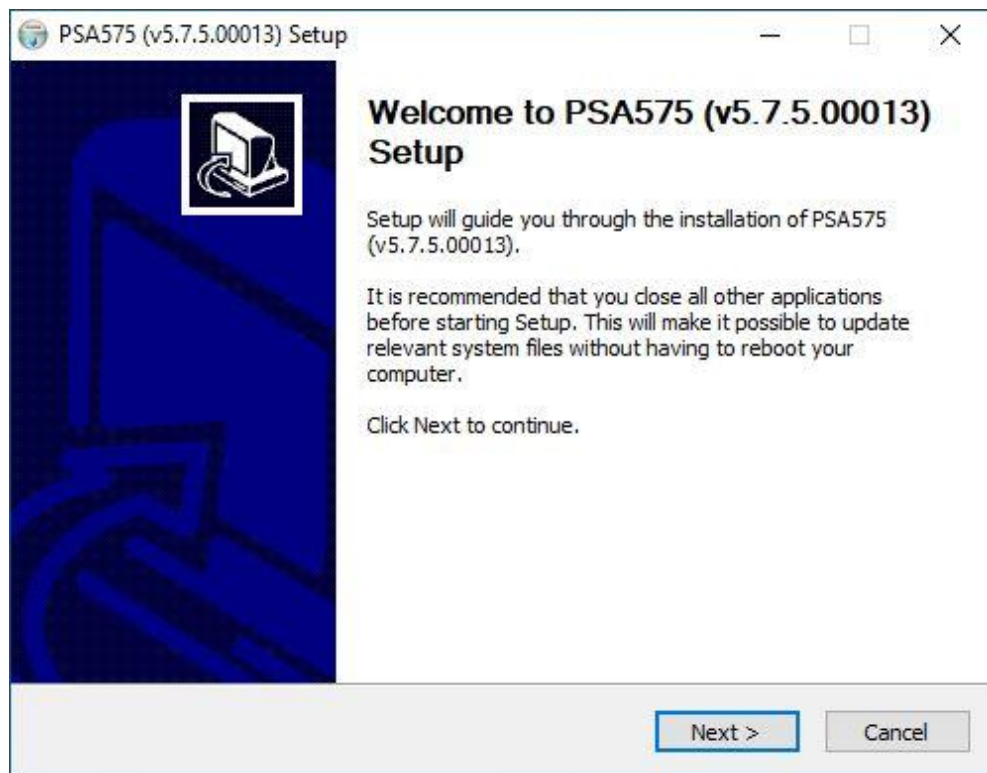
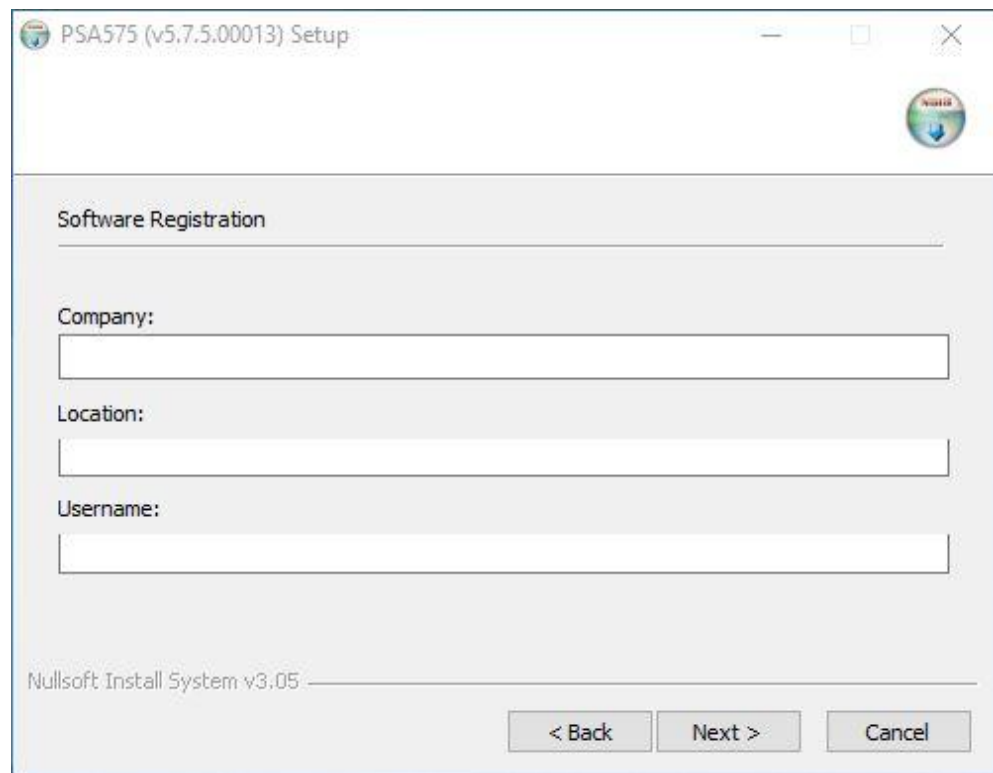


Figure 7-2 Executable Setup: Welcome Screen

Begin with the installation process by selecting 'Next' -> This action will prompt the software registration window, where users can enter information in the fields for 'Company,' 'Location,' and 'Username.' Users have the option to either fill in these fields or leave them blank based on their preference. To continue the installation, select 'Next,' which will initiate the selection of the installation location refer to Figure 7- 3 below:



PSA575 (v5.7.5.00013) Setup

Software Registration

Company:

Location:

Username:

Nullsoft Install System v3.05

< Back Next > Cancel

Figure 7- 3 Executable Setup: Registration Screen

Follow the on-screen instructions and verify that the chosen location has adequate memory, as indicated by the 'Space Required' and 'Space Available' sections in the user interface (UI). After selecting the installation location, click the 'Install' button to commence the installation of the A-IQ™ software. This installation process is self-contained and does not require any additional user input, as depicted in the Figure 7- 4 and Figure 7- 5 below.

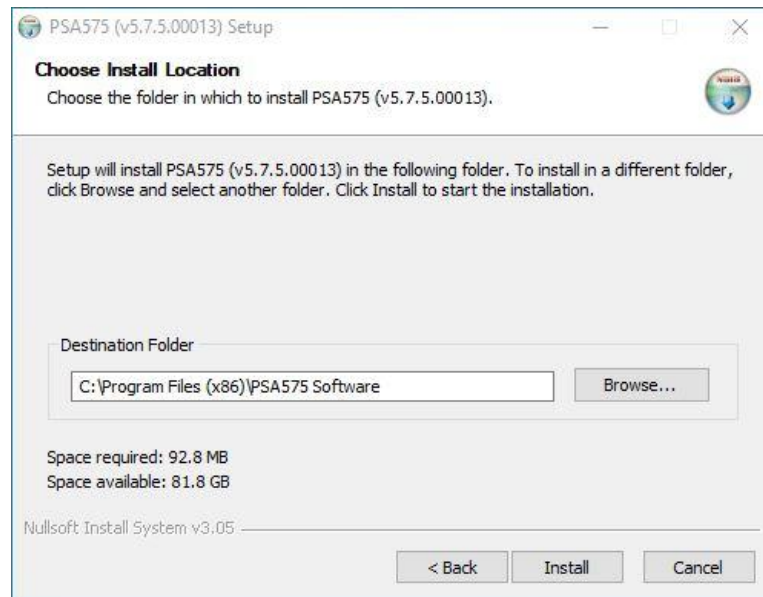


Figure 7- 4 Executable Setup: Choose Install Location

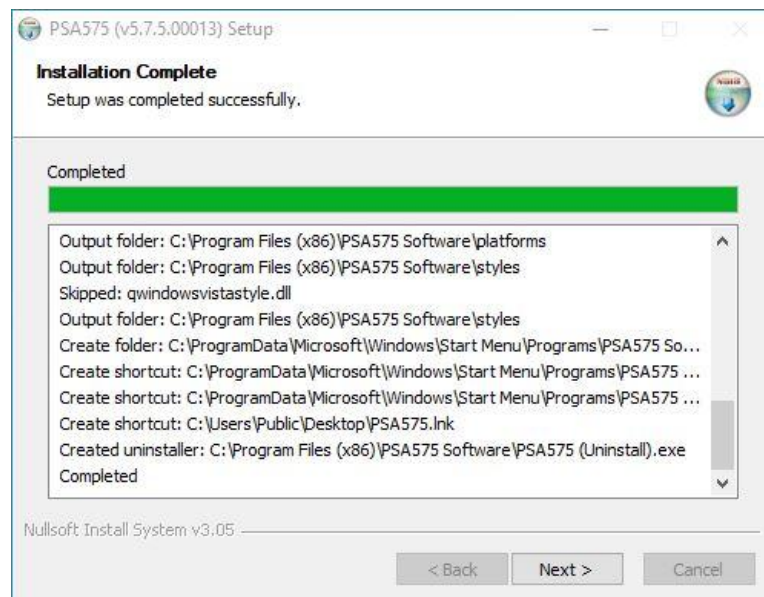


Figure 7- 5 Executable Setup: Installation Complete Screen

After completing the installation, you have the option to either close the setup or launch the A-IQ™ program. When the installation is successful, the 'Installation Complete' screen will appear as shown in Figure 7- 6 below.

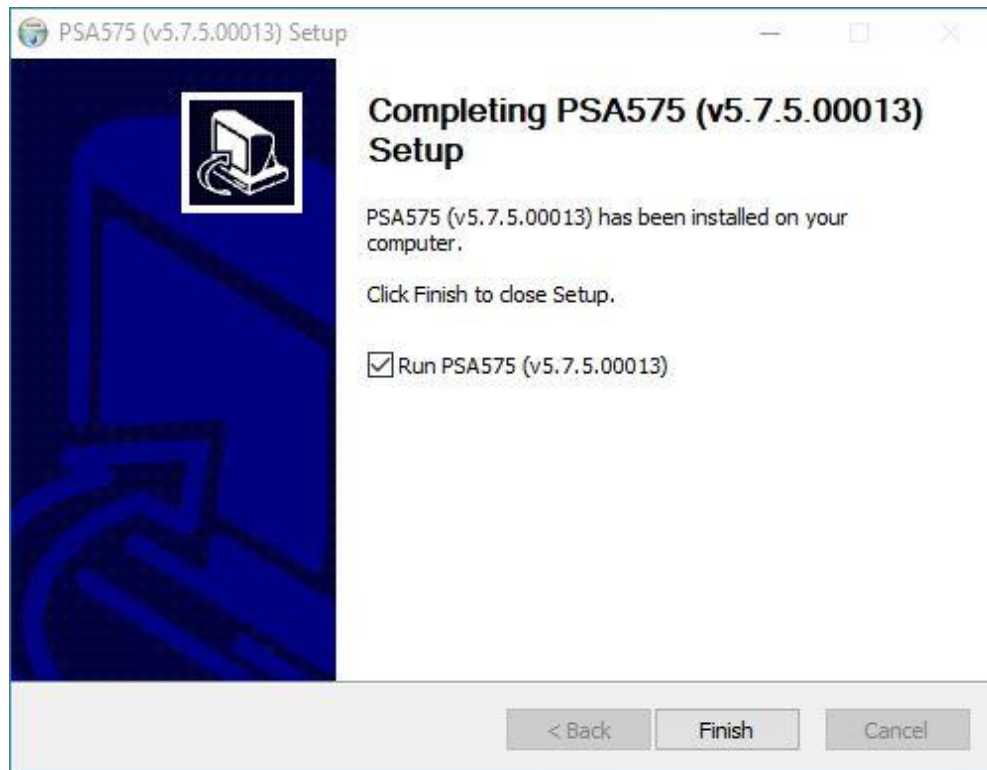


Figure 7- 6 Executable Setup: Installation Completion Screen

7.2.2 A-IQ™ Executable Uninstall

The A-IQ™ uninstallation process involves using the designated uninstaller executable, typically named 'PSA575(Uninstall)' and located in the installation path. Execute the uninstallation by double-clicking this executable. Before initiating the uninstallation, verify that the target system aligns with the minimum requirements outlined in Section 6.1.

It is crucial to note that in the event of a software update, it is imperative to uninstall the previous version of the software before installing the new version. This ensures a clean and seamless transition between software versions, preventing potential conflicts and ensuring optimal functionality of the updated A-IQ™ software. Figure 7- 7 and Figure 7- 8 for a typical uninstallation process.



Figure 7- 7 A-IQ™ Uninstall Prompt (Begin)

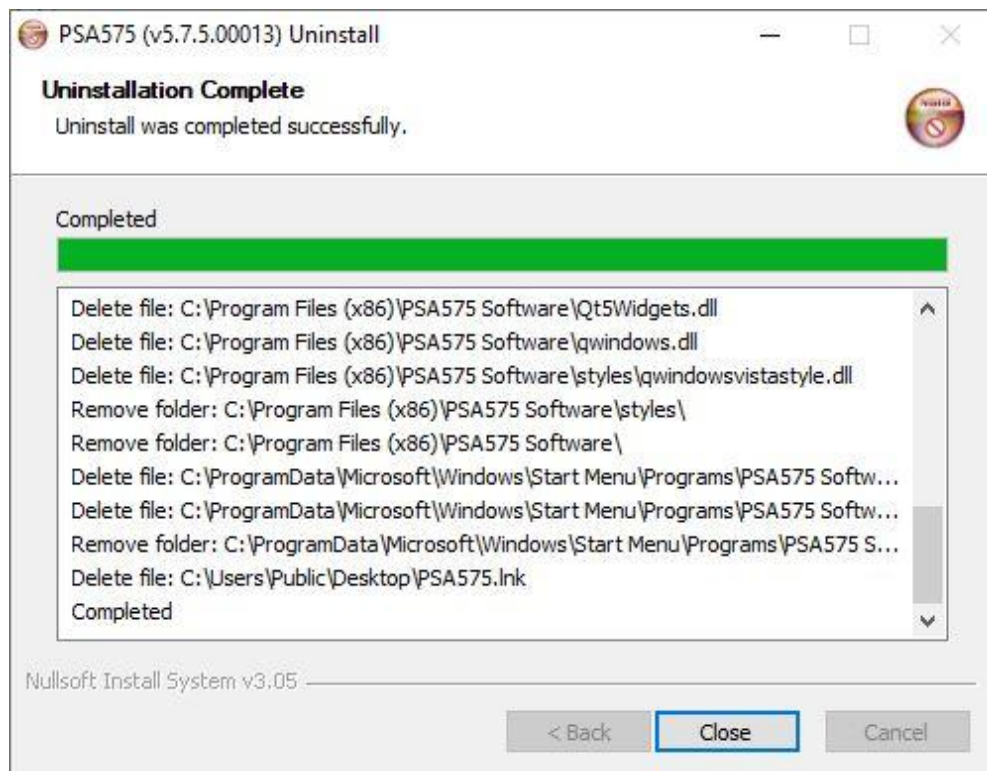


Figure 7- 8 A-IQ™ Uninstall Process (Completed Successfully)

7.2.3 A-IQ™ Network Configuration

7.2.3.1 Ethernet Configuration

The A-IQ™ software operates using Ethernet connectivity to facilitate data transfer and system communication. To ensure smooth operation, it might be necessary to adjust certain network settings. Please follow the steps below to configure your network settings for optimal use of the A-IQ™ software. The following section describes the step-by-step procedure on opening Port 575 on Windows 10. This is a general guide. The specific steps might vary based on the version and configuration of Windows 10. Always ensure you have the necessary permissions and fully understand the security implications of opening specific ports on your system.

The following steps open Port 575 using Windows Defender Firewall:

- 1) Access Windows Defender Firewall:
 - a. Go to the Control Panel on your Windows 10 system.
 - b. Select 'System and Security' and then click on 'Windows Defender Firewall.'
- 2) Open Advanced Settings:
 - a. Click on 'Advanced settings' on the left-hand side panel. This will open the Windows Defender Firewall with Advanced Security window.
- 3) Create a New Inbound Rule:
 - a. Click on 'Inbound Rules' in the left-hand pane.
 - b. Select 'New Rule' in the Actions panel on the right.
- 4) Configure the Inbound Rule:
 - a. Choose 'Port' and click 'Next.'
 - b. Select 'TCP' and specify the port number '575.' Click 'Next.'
- 5) Action for the Rule:
 - a. Choose 'Allow the connection.'
 - b. Select the profiles for which the rule should apply (usually 'Domain,' 'Private,' and 'Public').
 - c. Click 'Next.'
- 6) Name and Save the Rule:
 - a. Provide a name for the rule, for instance, 'Port 575 - A-IQ™.' Add a description if needed.
 - b. Click 'Finish' to save the rule.

This process allows incoming traffic on Port 575 for the A-IQ™ software. Please remember that adjusting firewall settings can pose security risks, and it's important to carefully consider the implications of opening specific ports. It's recommended to consult with your IT department or an expert before altering the firewall settings.



Disabling security measures can pose risks. Consult with your IT department or the software's support team for guidance on how to configure your system's firewall settings securely without compromising security.

Disabling virus protection is often needed as part of network connectivity troubleshooting. It is essential to note that temporarily disabling virus protection or altering firewall settings can expose your system to potential security threats. Only perform this action if you are certain about the safety of the software. If required, follow the specific instructions provided by your antivirus software to allow the A-IQ™ application to access the network. Be sure to re-enable your antivirus protection after the software has been configured.

7.2.3.2 Wireless Configuration

The A-IQ™ software seamlessly integrates with wireless connectivity through the Rx-575 Wireless Base Station, facilitating efficient data transfer and robust system communication. To optimize the wireless functionality of the A-IQ™ software, follow the steps below for the installation of wireless drivers on your system.

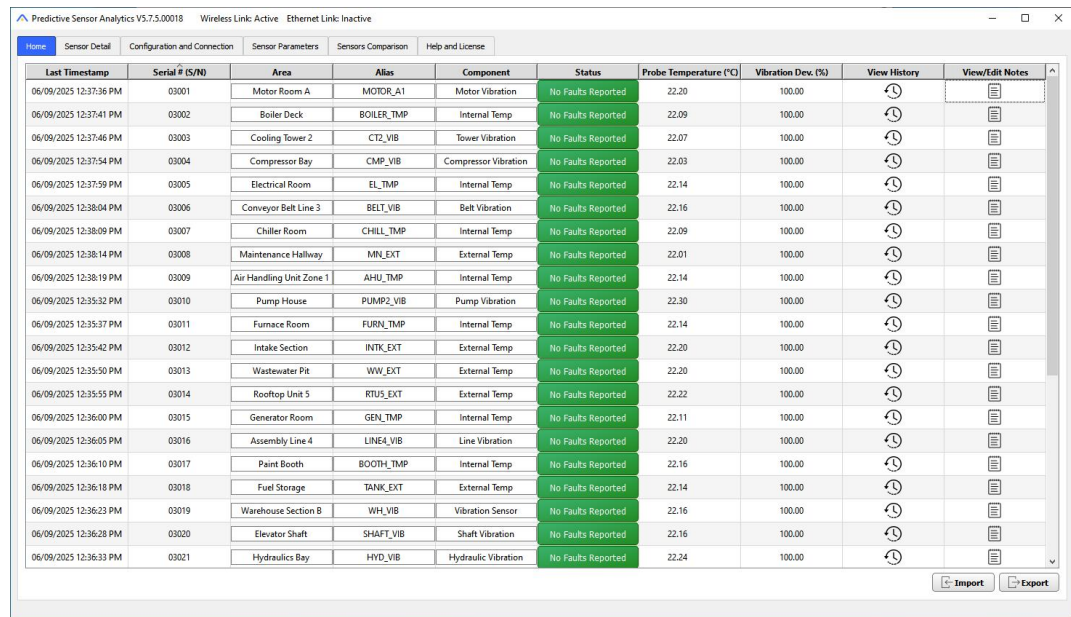
The subsequent section outlines a detailed, step-by-step procedure for installing the necessary drivers, enhancing wireless communication. Please note that this is a general guide, and specific steps may vary based on your system's configuration. Always ensure you possess the necessary permissions and adhere to the recommended procedures for driver installation. This guarantees a seamless wireless experience with the A-IQ™ software, ensuring smooth connection to all sensors.

7.3 OPERATION

7.3.1 Home Window

The 'Home' window shown in Figure 7-9 provides an overview of all sensors in operation. These sensors are automatically received by the Rx-575 Wireless Receiver and showcased in the dashboard. The dashboard exhibits crucial information including the 'Timestamp,' 'Serial Number,' an 'Area' field allowing users to designate the sensor's location, an 'Alias' field for assigning a user-defined name, a 'Component' field enabling specification of the connected component, a 'Status' field to verify the sensor's Online or Offline status.

A 'Deviation (%)' field displays the total deviation of the sensor from its baseline. This deviation is color-coded as Green, Amber, or Yellow, providing an immediate visual status indication for the monitored asset, VTC-575 variants that use an external probe for temperature monitoring or current sensing will display that respective field on the dashboard as well. To view historical data and trend analysis for a particular sensor, the icon in the 'View History' tab can be selected. Notes can also be added for individual sensors in the 'View/Edit Notes' field.



Predictive Sensor Analytics V5.7.5.00018 Wireless Link: Active Ethernet Link: Inactive

Home Sensor Detail Configuration and Connection Sensor Parameters Sensors Comparison Help and License

Last Timestamp	Serial # (S/N)	Area	Alias	Component	Status	Probe Temperature (°C)	Vibration Dev. (%)	View History	View/Edit Notes
06/09/2025 12:37:36 PM	03001	Motor Room A	MOTOR_A1	Motor Vibration	No Faults Reported	22.20	100.00		
06/09/2025 12:37:41 PM	03002	Boiler Deck	BOILER_TMP	Internal Temp	No Faults Reported	22.09	100.00		
06/09/2025 12:37:46 PM	03003	Cooling Tower 2	CT2_VIB	Tower Vibration	No Faults Reported	22.07	100.00		
06/09/2025 12:37:54 PM	03004	Compressor Bay	CMP_VIB	Compressor Vibration	No Faults Reported	22.03	100.00		
06/09/2025 12:37:59 PM	03005	Electrical Room	EL_TMP	Internal Temp	No Faults Reported	22.14	100.00		
06/09/2025 12:38:04 PM	03006	Conveyor Belt Line 3	BELT_VIB	Belt Vibration	No Faults Reported	22.16	100.00		
06/09/2025 12:38:09 PM	03007	Chiller Room	CHILL_TMP	Internal Temp	No Faults Reported	22.09	100.00		
06/09/2025 12:38:14 PM	03008	Maintenance Hallway	MNL_EXT	External Temp	No Faults Reported	22.01	100.00		
06/09/2025 12:38:19 PM	03009	Air Handling Unit Zone 1	AHU_TMP	Internal Temp	No Faults Reported	22.14	100.00		
06/09/2025 12:35:32 PM	03010	Pump House	PUMP2_VIB	Pump Vibration	No Faults Reported	22.30	100.00		
06/09/2025 12:35:37 PM	03011	Furnace Room	FURN_TMP	Internal Temp	No Faults Reported	22.14	100.00		
06/09/2025 12:35:42 PM	03012	Intake Section	INTK_EXT	External Temp	No Faults Reported	22.20	100.00		
06/09/2025 12:35:50 PM	03013	Wastewater Pit	WW_EXT	External Temp	No Faults Reported	22.20	100.00		
06/09/2025 12:35:55 PM	03014	Rooftop Unit 5	RTU5_EXT	External Temp	No Faults Reported	22.22	100.00		
06/09/2025 12:36:00 PM	03015	Generator Room	GEN_TMP	Internal Temp	No Faults Reported	22.11	100.00		
06/09/2025 12:36:05 PM	03016	Assembly Line 4	LINE4_VIB	Line Vibration	No Faults Reported	22.20	100.00		
06/09/2025 12:36:10 PM	03017	Paint Booth	BOOTH_TMP	Internal Temp	No Faults Reported	22.16	100.00		
06/09/2025 12:36:18 PM	03018	Fuel Storage	TANK_EXT	External Temp	No Faults Reported	22.14	100.00		
06/09/2025 12:36:23 PM	03019	Warehouse Section B	WH_VIB	Vibration Sensor	No Faults Reported	22.16	100.00		
06/09/2025 12:36:28 PM	03020	Elevator Shaft	SHAFT_VIB	Shaft Vibration	No Faults Reported	22.16	100.00		
06/09/2025 12:36:33 PM	03021	Hydraulics Bay	HYD_VIB	Hydraulic Vibration	No Faults Reported	22.24	100.00		

Import Export

Figure 7-9 A-IQ™ Home Page and Sensor Dashboard

In Figure 7-9 above, users can enter information into the 'Area', 'Alias', and 'Component' fields. These fields are essential for quickly identifying the sensor's location. The 'View History' icon  is clickable, triggering the trend analysis and history for the specified sensor, as described in detail in Section 7.3.3. The 'View/Edit Notes' field opens a text editor where important events, such as belt

replacements or major maintenance activities, can be recorded. The data is saved and persists even through PC shutdowns.

Exporting data from any selected sensor is simple. Right-click on the desired sensor and select 'Export Sensor Parameters', then specify the destination folder. The exported data includes a historical overview of the sensor's data, with timestamps corresponding to the selected transmission period. Post-processing can be performed on the exported data as needed. Data export can also be initiated by clicking the 'Export' icon in the lower right-hand corner of the 'Home' page. By default, data export occurs automatically and is stored approximately every 30 minutes.

7.3.2 Sensor Detail Window

The 'Sensor Detail' window shown in Figure 7-10 provides a comprehensive analysis of a selected sensor. Within the 'Sensor Serial Number' window, a dropdown list is automatically generated, encompassing all sensors received by the Rx-575 Wireless Receiver. Upon selecting a serial number, the window shows both instantaneous and historical data for the chosen sensor.

Depending on the sensor configuration, users can view instantaneous vibration and nominal vibration data for each monitored axis. The plots also display real-time asset temperature data from internal or external temperature probes connected to the sensor. Each plot shows the percent delta " Δ " deviation of the sensor readings from the nominal baseline value. The X-axis vibration is represented by the Red plot, Y-axis by the Green plot, and Z-axis by the Blue plot. The second graph shows temperature data, with the Blue plot for External Temperature and the Red plot for Probe Temperature.

Users can select the time frame for viewing the selected sensor's data, with options including:

- 1 hour (1h)
- 1 day (1d)
- 2 days (2d)
- 3 days (3d)
- 4 days (4d)
- 5 days (5d)
- 6 days (6d)
- 1 week (1w)
- 1 month (1m)
- 2 months (2m)
- 3 months (3m)

- 6 months (6m)
- 1 year (1y)
- or All time.

It must be noted that the sensor serial number selected in this window dynamically populates all corresponding parameters in the 'Sensor Parameters' window. The 'Sensor Status' field will also display faults depending on the sensor that is being monitored, this is a quick visual indication to the user of the status of sensor.

On the lower right-hand corner, the sensor's history can be launched by clicking the history icon '🕒', the plot can be refreshed by clicking the refresh icon '🔄', and the sensor notes can be viewed by clicking the notes icon '📝'.

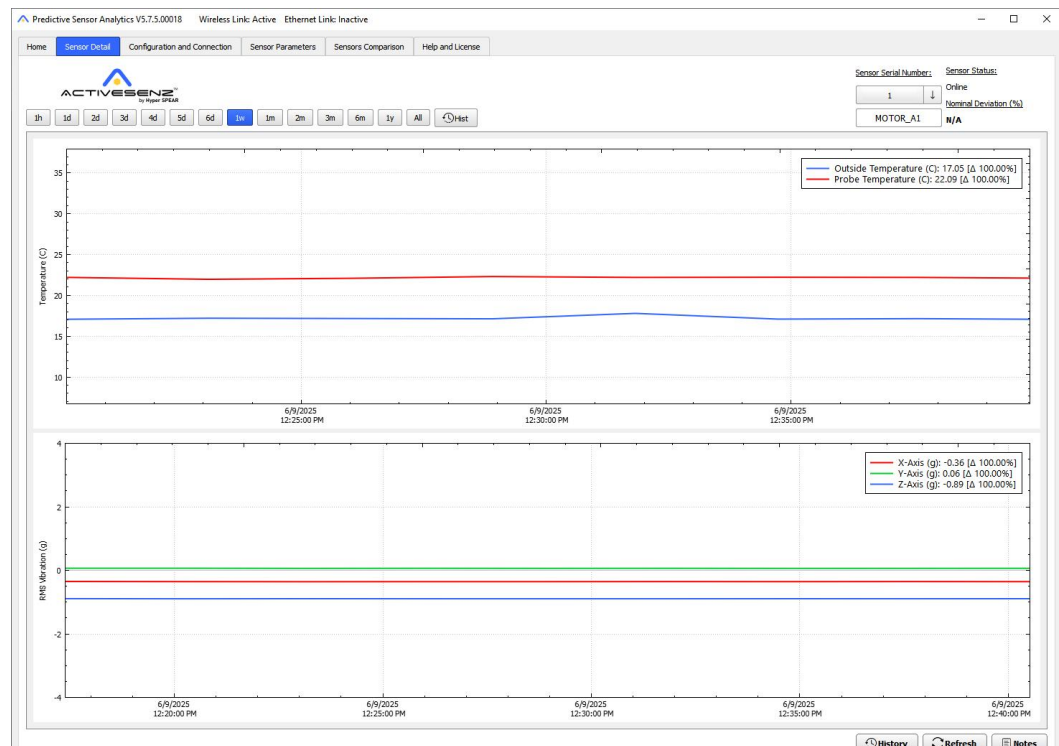


Figure 7- 10 A-IQ™ Sensor Detail Page

7.3.3 Sensor History and Analysis Window

The 'Trend Analysis' window, shown in Figure 7-11, is a powerful tool for reviewing trends, identifying major events, detecting imminent failures, and scheduling maintenance based on sensor conditions. This window provides an overview of the selected sensor in weekly, bi-weekly, or monthly intervals, with the option to further analyze data over operating years.

Each bar graph represents a specific time period. For example, in Figure 7-11 below, the bi-weekly trend analysis for the year 2025 is selected. Hovering over any of the bi-weekly bars will depict the 'Avg', 'Max', 'Min', and 'Stdev' values for the selected sensor. Additionally, the bottom axis shows the time period, average vibration or temperature for that period, and its deviation from the nominal value, color-coded based on the upper and lower limits set by the user.

A nominal operating band, shown in translucent green overlayed onto the bar graphs provides a quick visual indication of the behavior of the target asset with respect to the upper and lower limit boundaries as selected by the user.

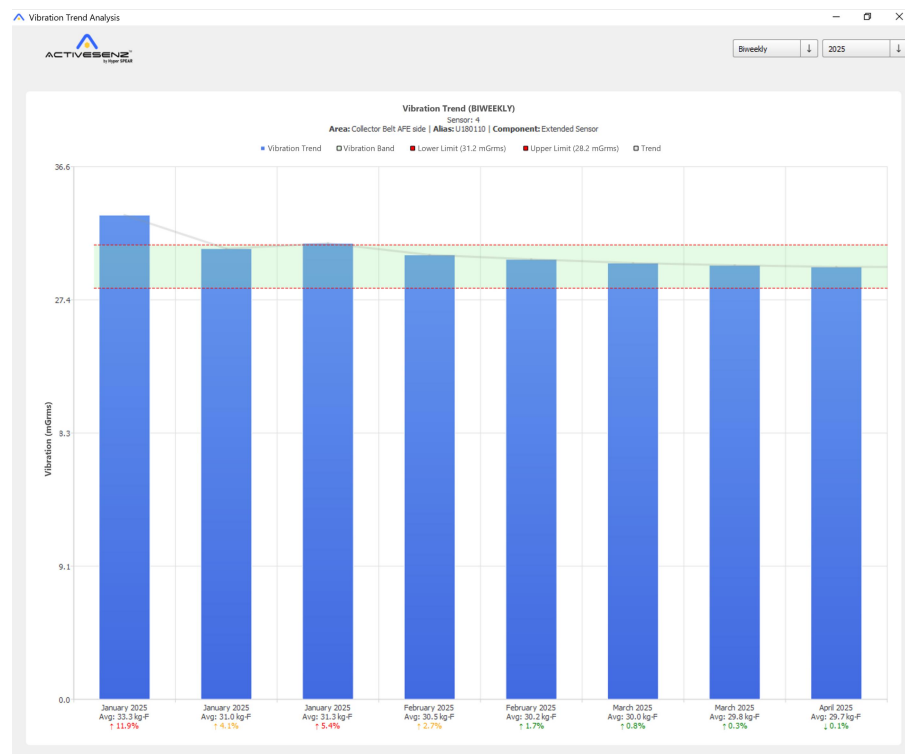


Figure 7-11 A-IQ™ Trend Analysis

The 'Trend Analysis' window can be launched from several places in the A-IQ™ software and anywhere the history icon  is located. This history icon  is located in the 'Sensor Detail' window on the bottom right corner next to the 'Refresh' icon.

7.3.4 Configuration and Connection Window

The 'Configuration and Connection Window' shown in Figure 7-12 provides users with the capability to set up various sensor parameters and configure general Wireless connectivity options as well as sensor parameters.

The first three fields in this window pertain to the Wireless Connection option of the sensor. Although the Rx-575 should automatically connect to the correct port number, users can manually select the COM port and click the connect button if needed.

- **Sensor COM Port:** Select the COM port of the Rx-575 Wireless Receiver. The COM port should automatically populate with the correct number, but if this is not the case, please select the correct COM port.
- **Sensor COM Port Connect/Disconnect:** Toggling this button will Connect or Disconnect the Rx-575 serial communication to the A-IQ™.

Predictive Sensor Analytics V5.7.5.00017 Wireless Link: Active Ethernet Link: Inactive

Home Sensor Detail Sensor Parameters Sensors Comparison Configuration and Connection Help and License

Sensor Port Number: 575

Sensor IP Address: 192.168.1.57

IP Connection Status: Offline

Ethernet Connect

Sensor COM Port: COM4

Disconnect

Sensor Serial Number: 1

Vibration Upper Limit (%): 1

Vibration Lower Limit (%): 1

Current Sensor Upper Limit (%): 5

Current Sensor Lower Limit (%): 5

Temperature Upper Limit (%): 1

Temperature Lower Limit (%): 1

Configure Sensor

Calibrate Sensor

Figure 7-12 A-IQ™ Configuration and Connection Window

The 'Configuration and Connection Window,' as illustrated in Figure 7-12, provides users the capability to establish various parameters for the selected 'Sensor Serial Number'. The dropdown list, automatically filled with all sensors received by the Rx-575, simplifies sensor selection for a seamless experience. It must be noted that if your sensor configuration does not align with any of the fields mentioned above (i.e., only a single VTC-575), the selection can be left to the default values, as demonstrated in Figure 7-12.

- **Serial Number:** Displays the serial number of the selected sensor.
- **Vibration Upper Limit (%):** Upper limit of asset vibration in percentage. Values above or below this threshold will trigger an Upper Current Threshold Fault to a PLC or ASIC interface if connected.
- **Vibration Lower Limit (%):** Lower limit of asset vibration in percentage. Values above or below this threshold will trigger a fault in the 'Home' page.
- **Current Upper Limit (%):** Upper limit of asset vibration in percentage. Values above or below this threshold will trigger a fault in the 'Home' page.
- **Current Lower Limit (%):** Lower limit of asset current in percentage. Values above or below this threshold will trigger a fault in the 'Home' page.
- **Temperature Upper Limit (%):** Upper limit of asset temperature in percentage. Values above or below this threshold will trigger a fault in the 'Home' page.
- **Temperature Lower Limit (%):** Lower limit of asset temperature in percentage. Values above or below this threshold will trigger a fault in the 'Home' page.
- **Wireless Transmission Time (s):** Time between Wireless transmission in seconds.
- **Configure Sensor IP Address:** Configure the IP address of the selected sensor.

Once the above configuration items are set, selecting the 'Configure Sensor' button saves the desired values for the connected sensor, configuring it accordingly.

The 'Calibrate Sensor' function triggers the selected sensor to re-baseline and restart its calibration process. This action recalibrates the sensor to ensure that it is providing accurate measurements based on a new reference point.

7.3.5 Sensors Parameters Window

In the 'Sensor Parameters' window shown in Figure 7-13, the selected sensor serial number populates the 'Sensor Parameters' page with additional information essential for troubleshooting and raw data visual analysis. The information is presented in as follows:

- **Sensor Serial Number:** Displays the serial number of the selected sensor.
- **Real Time Metrics:** Indicates the real time vibration data in units of g-forces for the X, Y, Z axes as well as temperature in degrees Celsius.
- **Nominal Real Time Metrics:** Shows the nominal real-time vibration data in g-forces for the X, Y, and Z axes, and temperature in degrees Celsius. The value will be calculated after the machine learning algorithm has gathered enough samples. Until then, the display will show 'Calculating'.
- **Vibration/Temperature Standard Deviation:** Represents the variability or dispersion of the vibration and temperature measurements from their mean values for the monitored asset. A higher standard deviation indicates greater fluctuation in the asset's vibration and temperature, while a lower standard deviation signifies more consistent measurements.
- **Vibration Root Mean Square (RMS):** Represents the average magnitude of vibration data for the monitored asset. It provides a single value that represents the overall level of these measurements, helping to assess the asset's operational intensity and stability. Higher RMS values can indicate greater energy or variability, which may signal potential issues or changes in the machine's condition.
- **Vibration Peak to Peak Amplitude:** Measures the difference between the highest and lowest values of vibration and temperature data for the monitored asset. It provides insight into the maximum range of fluctuations, helping to assess the extent of variation in the assets' performance. Larger Peak to Peak values can indicate significant variability or abnormal behavior, which may signal potential issues with the machine.
- **Vibration/Temperature Kurtosis:** Measures the "tailedness" or extreme values in the distribution of vibration and temperature data for the monitored asset. It indicates how much of the data deviates from a normal distribution by highlighting the presence of outliers or unusual peaks. Higher kurtosis values suggest more frequent extreme variations, which may point to potential issues or instability in the asset's performance.
- **Vibration Frequency (Hz):** Represents the fundamental frequency of vibration for the monitored asset, determined through Fast Fourier

Transform (FFT) analysis. FFT converts time-domain vibration data into frequency components, revealing the primary frequency at which the asset vibrates. This measurement helps identify the main source of vibration and can indicate potential issues by highlighting the dominant oscillation frequency.

- **First Recorded Timestamp:** Shows the timestamp of the first recorded data from the sensor.
- **Last Recorded Timestamp:** Displays the timestamp of the latest recorded data from the sensor. This information helps determine how long the sensor has been online.
- **Number of Samples:** Displays the number of samples collected for the sensor in the time that it has been monitored.
- **Rejected Samples:** Displays the number of samples rejected due to CRC errors or other anomalies.

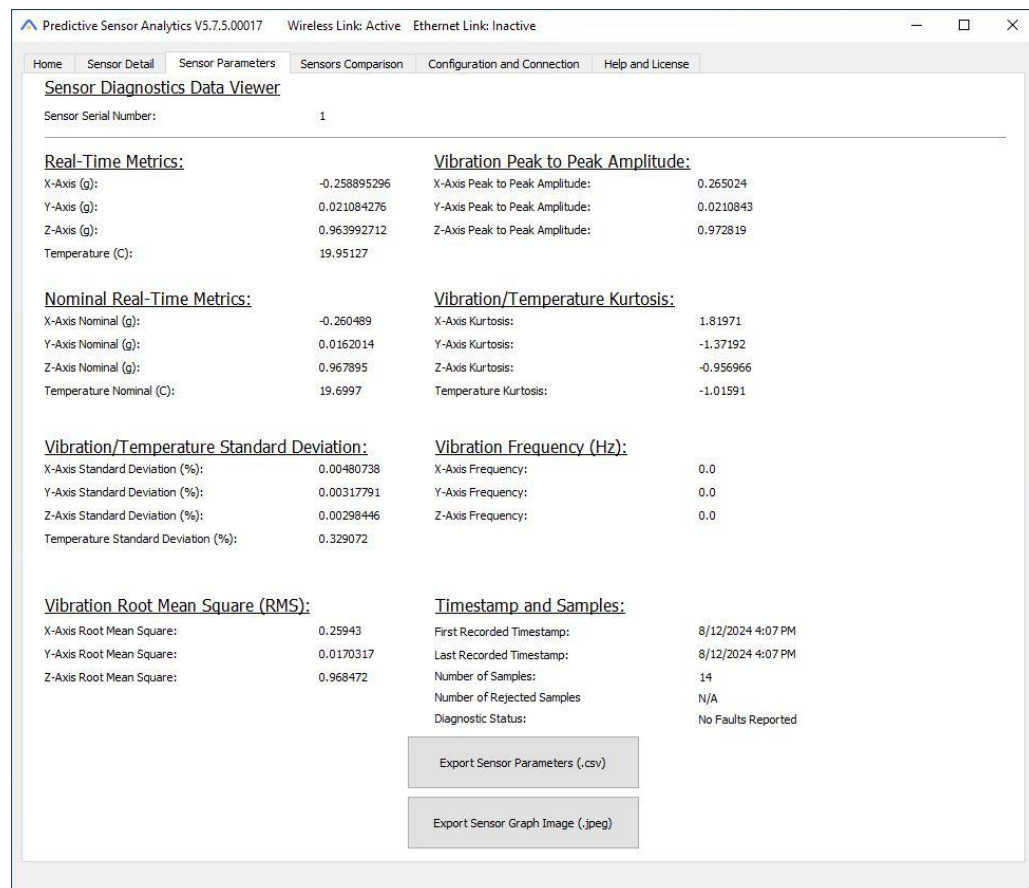


Figure 7- 13 A-IQ™ Sensor Detail Window

7.3.6 Sensors Comparison Window

The 'Sensors Comparison Window' shown in Figure 7-14 enables users to compare two or more sensors in both graphical and numerical formats. This functionality is particularly valuable when monitoring adjacent assets, such as symmetrical motors or bearings or when it is required to monitor all sensors at once in a visual format.

The dropdown list, automatically populated with all sensors received by the Rx-575, facilitates seamless sensor selection. The default option is 'None,' where no data is plotted. Users can choose any available serial number from the dropdown menu for comparison. Like the 'Sensor Detail' page, the x-axis of the plot displays timestamps of received data packets from the sensor, indicating both date and time. The y-axes (vertical) vibration data for each axes. The numerical data also indicates asset temperature.

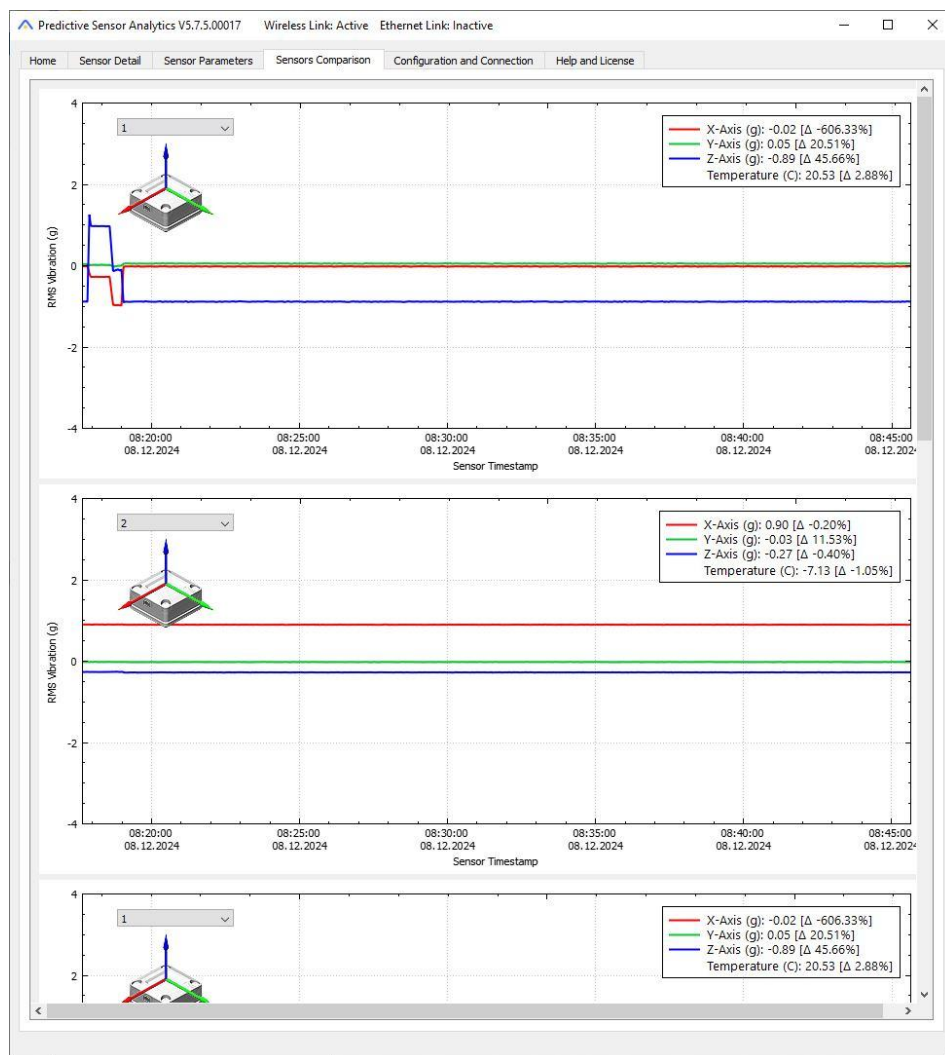


Figure 7-14 A-IQ™ Sensors Comparison Window

7.3.7 Help and License Window

The 'Help and License' window shown in Figure 7-15 offers crucial software details, including the software revision number. Users can conveniently access the current software version and copyright information within this window.

The software license is provided as a text file (e.g., license.txt) and is required for the application to operate. This file contains your unique license key and associated authorization data.

Steps to Install the License File

- 1) Obtain the License File
 - Upon purchase or renewing, a license file will be provided. If this file is lost or misplaced, request a new license file to info@activesenz.com.
- 2) Copy the License File
 - Move or copy the file into the software's directory, **C:\PSA575**. Override the existing file as necessary. The application will automatically detect and validate the file.
- 3) Verify Installation
 - If the license file is correctly placed and valid, the software will be operational and the new license expiration date will be displayed on the 'Help and License' window. If the license is missing or invalid, an error message will be displayed.

Note: Do not modify the contents of the license file. Altering the file may cause the license verification process to fail.

For any inquiries or technical support related to the A-IQ™ software, users can readily find contact information for the support team displayed in this window. This includes email and website details.

In the license information section, users can view important details about the software's license status, such as the expiration date, remaining days before expiration, and the software's serial number. This section allows users to easily monitor the validity of their software license.

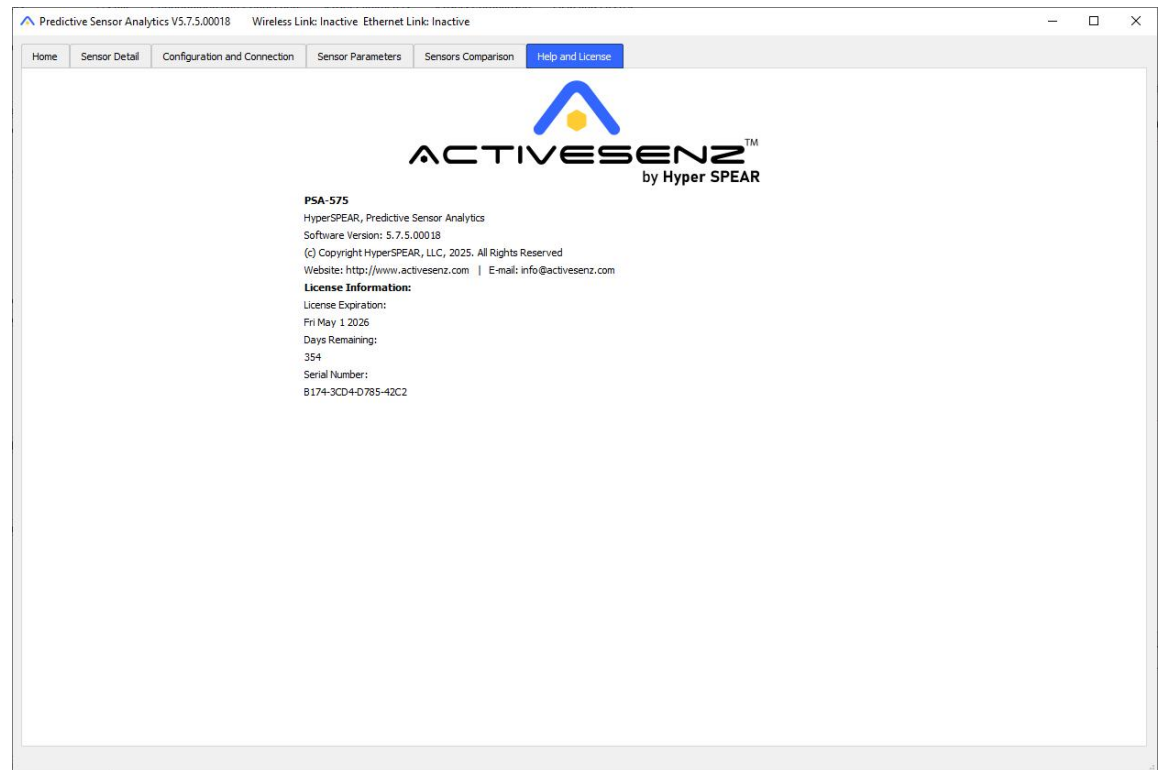


Figure 7- 15 A-IQ™ Help and License Window



Users approaching the software expiration date are encouraged to contact ActiveSenz™ in advance to renew or extend their license. To ensure uninterrupted usage and avoid any disruptions, users are advised to get in touch with the support team using the provided contact information for license renewal inquiries or assistance.

8 MAINTENANCE

This section of the manual lists the maintenance tasks required for the VTC-575 Vibration/Temperature Sensor and addons. This includes performance checks, on-site maintenance, and off-site maintenance. The performance checks and maintenance tasks in this section are required to ensure optimum equipment performance.

To keep the VTC-575 operating efficiently, follow a preventive maintenance schedule.

Table 8- 1 VTC-575 Maintenance Checks

VTC-575 (Vibration/Temperature Sensor)		
Interval	Task	Action
Monthly	Check for damage to the sensor, and or add-on connections.	Re connect lose connections, or replace sensor if damaged
	Check wireless operation.	Ensure the sensor is still transmitting wireless data.
Quarterly	Check sensor is properly bonded onto target surface.	Ensure the adhesive is present on sensor and able to bond with target surface, or that surfaces are not contaminated with oil or chemicals.
	Check mounting hardware for security and tightness.	Re connect or re secured any hardware that is not properly attached.

Table 8- 2 CS-575 Maintenance Checks

CS-575 (Current Sensor)		
Interval	Task	Action
Monthly	Check for damage to the cables of sensor, and or connections.	Re-connect lose connections, or replace sensor if cable has been damaged
Quarterly	Check sensor is properly clamped onto wire.	Ensure the hinge and locking snap mechanism is clamped to the wired being monitored.

Table 8- 3 Temp-575 Maintenance Checks

TEMP-575 (Temperature Sensor)		
Interval	Task	Action
Monthly	Check for damage to the cable of the probe, and or connections.	Re-connect lose connections, or replace probe if cable has been damaged
Quarterly	Check sensor is properly in contact with target surface.	Ensure probe is properly attached to the target surface being measured.

Table 8- 4 RX-575 Maintenance Checks

Rx-575 (Wireless Base Station)		
Interval	Task	Action
Monthly	Check for damage to the USB cables of Rx-575, and/or PC connections.	Re-connect lose connections, or replace USB cable if it has been damaged
	Check to ensure data is being received as expected by the Rx-575	Ensure the number of sensors online matches the number of sensors being monitored by the Rx-575.

Table 8- 5 A-IQ™ Maintenance Checks

A-IQ™ (Dashboard)		
Interval	Task	Action
As Required	Check sensor data is being received as expected.	Inspect timestamp of sensor(s) and ensure data is being received as expected.
Bi-Weekly	Check A-IQ™ automatic export is functioning properly.	Navigate to the C:\PSA575 folder and ensure each sensor is exporting data as expected.
Yearly	Check for software updates.	Check for software updates by contacting ActiveSenz™.

9 TROUBLE SHOOTING

 CAUTION

Static electricity can damage the sensor(s) and other electronic devices. To avoid damage, keep static-sensitive devices in their static-protective packages until you are ready to install them.

 WARNING

Before working with the sensor(s) you must wear your personal protective equipment and follow the safety instructions outlined in this manual. This can include, but is not limited to, eye protection, gloves, hard hat and/or steel toed shoes.

 WARNING

Motor control equipment and electronic controllers are connected to hazardous line voltages. When servicing drives and electronic controllers, there may be exposed components with housings or protrusions at or above line potential. Extreme care should be taken to protect against shock.

9.1 VTC-575

The VTC-575 Vibration / Temperature sensor shall be operated as described in Section 4.3 of this technical manual. When a fault occurs, the onsite inspection personnel should refer to the troubleshooting instructions provided in this section to isolate and/or correct the problem. The following items must be verified before other troubleshooting procedures are performed:

1. Ensure electrical power is being correctly supplied as described in the specifications of the VTC-575 Section 4.1.
2. If the battery has been replaced on the VTC-575, ensure the instructions of Section 4.4 are followed.
3. Visually inspect the Aux port to the VTC-575 , as well as the sensor body and overall condition to ensure there is no visible damage to the equipment.

If the preliminary troubleshooting instructions listed above do not rectify the malfunction, refer to Table 9- 1 for additional troubleshooting guidelines.

Table 9-1 VTC-575 Control Node Troubleshooting Instructions

Problem Observed	Possible Reason	Solution
The Rx-575 (Base Station) is not receiving data from the VTC-575.	Sensor has not yet transmitted.	Allow sufficient time for sensor to transmit. The default value is ten-(10) minutes between transmissions.
	VTC-575 sensor is not sufficiently close to base Rx-575 base station.	Ensure the sensor is placed sufficiently close to the base station to receive transmissions as per Section 6.2.
	VTC-575 sensor battery is too low for operation.	Replace VTC-575 battery as per Section 4.4.
Zero or Unchanging Sensor Output (Vibration or Temperature).	An internal hardware error has been occurred on the signal processing chain.	Remove and reinstall VTC-575 battery as per Section 4.4.
	The sensor has failed.	Replace VTC-575 Control Node.
Inconsistent or Erratic Readings.	Improper mounting of sensor to system being monitored.	Refer to Section 4.2 of this manual for proper sensor mounting.
	Damaged VTC-575 Control Node.	Replace VTC-575 Control Node.
Wireless connection is not working.	Rx-575 out of wireless range.	If possible, move Rx-575 close to the VTC-575 Control Node and determine if data is being received.
Unusual Vibration Frequency	This could indicate an imbalance or misalignment in the asset, resonance issues, or mechanical faults like worn bearings or loose components.	Check for and correct any mechanical imbalances or misalignments. Inspect and tighten any loose components. Perform maintenance checks on bearings and other moving parts. Refer to manufacturer specific instructions as required.
High Vibration RMS	A high RMS value may	Conduct a thorough

Value	suggest significant vibrations due to issues such as misalignment, imbalance, or a mechanical fault.	inspection of the asset's components for signs of wear or damage. Refer to manufacturer specific instructions as required.
High Peak to Peak Value	A large Peak to Peak value may indicate severe fluctuations in vibration, possibly due to mechanical imbalances, looseness, or significant operational changes.	Inspect the asset for mechanical issues such as loose parts or imbalances. Ensure all components are properly secured and aligned. Check for changes in operating conditions that might affect performance. Refer to manufacturer specific instructions as required.
High Kurtosis Value	High kurtosis values may indicate the presence of significant outliers or abnormal vibrations, such as those caused by impact or sudden changes in load.	Review the asset's operating conditions and recent changes that might contribute to unusual vibrations. Inspect for signs of impact damage or unexpected load variations. Refer to manufacturer specific instructions as required.
High Temperature and/or Temperature Spikes	Temperature spikes and high might be due to overheating, inadequate cooling, or a malfunctioning temperature control system.	Check the cooling system for proper operation and ensure adequate ventilation. Inspect the temperature control system and verify that it is functioning correctly. Refer to manufacturer specific instructions as required.

9.2 CS-575

The CS-575 Current Sensor shall be operated as described in this technical manual. When a fault occurs, the onsite inspection personnel should refer to the troubleshooting instructions provided in this section to isolate and/or correct the problem. The following items must be verified before other troubleshooting procedures are performed:

1. Ensure the CS-575 Current Sensor is properly mounted and affixed to the target asset being monitored.
2. Inspect the sensor cord set for damage such as cracks, frayed wires, or defective terminations. The cord set should not have unusual kinking or spiraling. There should be no exposed live parts, exposed metal, or splices. If any damage is found, replace the sensor.
3. Ensure the Sensor is connected to the Aux port ② of the VTC-575.
4. Ensure the VTC-575 is powered and transmitting.

If the preliminary troubleshooting instructions listed above do not rectify the malfunction, refer to Table 9-2 for additional troubleshooting guidelines.

Table 9-2 CS-575 Current Sensor Troubleshooting Instructions

Problem Observed	Possible Reason	Solution
Current sense readings are erroneous, fluctuating or zero.	Current sense not properly clamped in the closed position.	Securely clamp the sensor closed, this is required to complete the electrical path.
	Current sense clamped to improper VFD wire.	Ensure current sensor is clamped to a single U, V or W connection.
There is no change in VTC-575 Control Node current levels, even though current is known to be changing.	Sensor wiring error.	Wire the sensor to the J2 connector shown in Section 5.1.2

9.3 TEMP-575

The TEMP-575 Temperature Probe shall be operated as described in Section 4.3 of this technical manual. When a fault occurs, the onsite inspection personnel should refer to the troubleshooting instructions provided in this section to isolate and/or correct the problem. The following items must be verified before other troubleshooting procedures are performed:

1. Ensure the TEMP-575 is properly bonded and affixed to target surface as described in Section 5.2.2 of this manual.
2. Inspect the sensor cord set for damage such as cracks, frayed wires, or defective terminations. The cord set should not have unusual kinking or spiraling. There should be no exposed live parts, exposed metal, or splices. If any damage is found, replace the sensor.

If the preliminary troubleshooting instructions listed above do not rectify the malfunction, refer to Table 9-3 for additional troubleshooting guidelines.

Table 9- 3 TEMP-575 Temperature Sensor Troubleshooting Instructions

Problem Observed	Possible Reason	Solution
Temperature sense readings are erroneous, fluctuating or zero.	Temperature sensor not bonded to target surface.	Ensure target surface is clean and free from oils or chemicals, and sensor is properly bonded to it.
There is no change in Temperature levels, even though target hardware is known to be operating.	Sensor wiring error.	Perform the calibration procedure as outlined in Section 4.3.

9.4 RX-575

The RX-575 Wireless Base Station shall be operated as described in Section 6.3 of this technical manual. When a fault occurs, the onsite inspection personnel should refer to the troubleshooting instructions provided in this section to isolate and/or correct the problem. The following items must be verified before other troubleshooting procedures are performed:

1. Ensure the RX-575 is properly mounted and affixed to a suitable surface, away from high traffic areas and preferably elevated a minimum of six (6) feet off the ground.
2. Inspect the USB cable for damage such as cracks, frayed wires, or defective terminations. The cord set should not have unusual kinking or spiraling. There should be no exposed live parts, exposed metal, or splices. If any damage is found, replace the RX-575.
3. Ensure host computer or server has not entered sleep, hibernation, or any mode that removes power from the USB ports, as the RX-575 will lose power and the steps in Section 7.3.4 must be followed to re-connect the COM port.
4. Power cycle the RX-575 and perform the steps in Section 7.3.4 to re-connect the COM port.

If the preliminary troubleshooting instructions listed above do not rectify the malfunction, refer to Table 9-4 for additional troubleshooting guidelines.

Table 9-4 RX-575 Current Sensor Troubleshooting Instructions

Problem Observed	Possible Reason	Solution
Lack of data reception from sensors, even when in close proximity to the sensor.	RX-575 lost power from the host PC	Power cycle the sensor by disconnecting and reconnecting the USB cable. Perform the steps in Section 7.3.4 to re-connect the COM port.
	RX-575 internally damaged	Remove and replace the RX-575 Wireless Receiver
Sporadic data transmission not adhering to the expected time interval.	RX-575 placed too far away from VTC-575 nodes, or too many objects in the vicinity	Position the RX-575 closer to the sensors or remove the obstacles between the VTC-575 and RX-575.

9.5 A-IQ™

The A-IQ™ Predictive Sensor Analytics dashboard shall be operated as described in Section 7.3 of this technical manual. When a fault occurs, the onsite inspection personnel should refer to the troubleshooting instructions provided in this section to isolate and/or correct the problem. The following items must be verified before other troubleshooting procedures are performed:

1. Confirm the use of the correct wired or wireless configuration, and ensure no drivers have been uninstalled as outlined in Section 7.2.1.
2. Verify that the host computer or server has not entered sleep, hibernation, or any mode that cuts power from the USB ports. If so, follow the steps in Section 7.2.3 to reconnect the COM port for the RX-575.
3. Check the software license to ensure it has not expired or is about to expire, as explained in 7.3.7. If the license expires, the A-IQ™ will automatically export all collected data before it ceases to function.
4. Export all data as described in Section 7.3.3, then restart the A-IQ™ software to begin a fresh data collection session.

If the preliminary troubleshooting instructions listed above do not rectify the malfunction, refer to Table 9- 5 for additional troubleshooting guidelines.

Table 9- 5 A-IQ™ Predictive Sensor Analytics Troubleshooting Instructions

Problem Observed	Possible Reason	Solution
The A-IQ™ software is not collecting data from any sensor upon initial installation or after being operational for some time.	Firewall and Security Software	Verify that any firewall or security software is not blocking the A-IQ™ software's communication. Adjust settings as necessary, refer to Section 7.2
	Antivirus software blocking A-IQ™	Temporarily disable antivirus software to rule out any interference, refer to Section 7.2.3
	Hardware connection issues.	Ensure all hardware components, including the Rx-575 and associated sensor(s), are correctly connected to the system.

Problem Observed	Possible Reason	Solution
		Power cycle the Rx-575 by disconnecting and reconnecting the USB cable. Perform the steps in Section 7.3.4 to re-connect the COM port.
	System resource usage	Ensure that the host system has sufficient resources (CPU, memory, etc.) available for the A-IQ™ software to operate smoothly.

10 REPAIR

ActiveSenz™ does not approve repair of the sensors or components listed herein. Any damage should be dealt with appropriately per the warranty section outlined in this manual.

11 PARTS

This section of the manual contains the source data of all electrical and selected mechanical replacement parts of the 575 series of sensors.

11.1 REPLACEMENT KITS/PARTS

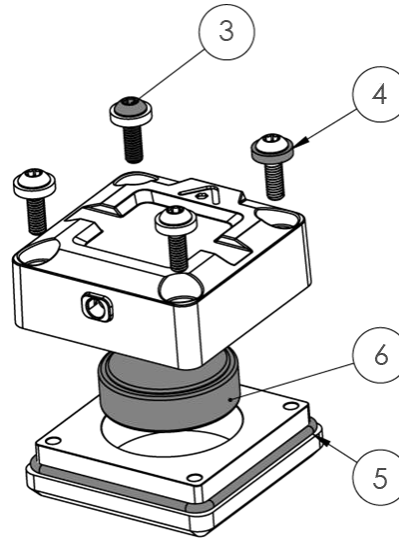


Figure 11- 1 VTC-575 Replacement Parts

Use the part numbering Table 11- 1 to order renewal parts.

Table 11- 1 Repair Kits/Parts

Used On	Part Number	Part Number	Description	Item Content
VTC-575	X-100-0015-01 (1)	X-100-0015-01	VTC-575, Vibe/Temp Sensor	Complete assembly
	M-300-0003-01 (7)	M-300-0003-01	Stud Mounting, VTC-575	Stud bracket and four (4) M5 screws
	M-300-0003-02 (8)	M-300-0003-02	Magnetic Base, VTC-575	Base with magnets and (4) M5 Screws
	E-111-0001-XX (9)	E-111-0001-XX	CS-575, Current Sensor	Complete assembly
	E-111-0004-XX (10)	E-111-0004-XX	TEMP-575, Remote Temperature Probe	Temperature Probe
	E-109-0005-01 (11)	E-109-0005-01	Power Cable with 3.5 aux	3.5mm Power cable
Rx-575	X-100-0006-20 (12)	X-100-0006-20	Wireless Base Station	Complete assembly
VTC-575	X-200-0003-01 (13)	X-200-0003-01	Kit, O-ring, VTC-575	Replacement Kit, includes: (3) [4x] Screws (4) [4x] Screw O-ring (5) [1x] Main Body O-ring