

Unlocking Semi-Autonomous Plants

World's most user-validated Prescriptive AI



Product Name: **vEdge 3XTURPM**

Product Version: **vEdge 4.x (4.6)**

The "**vEdge 3XTURPM**" is mounted on asset surface for data acquisition.

KEY FEATURES

- Includes Ultrasound Sensor for high frequency acoustic signal detection
- Includes Magnetic Flux Sensor for motor RPM measurement
- Rotating equipment Fault Detection and Alerts
- Real-Time data capture
- FFT for Spectral Analysis of Rotating equipment
- Visual feedback through LEDs and color codes
- Detection of Bearing fault based on bearing type selected from the list
- Polarity reversal and Overload power supply protection
- Easy 1-minute installation through Mobile Application
- Fixed and variable rotation speed input option available for better analysis
- Availability of Automatic and Manual rollback feature for firmware upgrade OTA (Over the Air) by wireless technology

EQUIPMENT & ENVIRONMENTAL SUITABILITY

Equipment with transient load patterns, operating between Revolution Per Minute (RPM) of 20 RPM to 5000 RPM such as

- Blowers
- Compressors
- Mills
- Pumps
- Gearboxes

ASSET FAILURE MODES COVERED

- Unbalance
- Angular Misalignment
- Gear Defects
- *Bearing Defects
- Parallel Misalignment
- Structural Looseness
- Rotating Looseness
- Structural Looseness
- Gear Defects
- Pump Flow Issues

*Early-stage lubrication breakdown, pitting, or brinelling in bearings, Inner/Outer race fault.




| Vibration Sensing & Processing | |
|--|--|
| Parameter Monitored | Triaxial Vibration, asset temperature, Ultrasonic, Magnetic Flux |
| Vibration Sensor | MEMS based Triaxial accelerometer |
| Asset RPM that can be analyzed | 20 RPM to 5000 RPM |
| Frequency range / Bandwidth of accelerometer with vibration pad mounting | Up to 2.5 kHz for X, Y & Z axis |
| Configuration Range (in PlantOS Platform) | <ul style="list-style-type: none"> Fmax: 325 Hz to 2.5 kHz Fmin: 0.2 Hz to 10Hz LOR: 100 to 12800 (LOR = Lines of Resolution) |
| g-range with vibration pad mounting | Up to ± 16 G The vibration pad is affixed to the equipment as specified in the <i>User Guide: Prescriptive Maintenance (Sense & Ingest Module)</i> . Apply tightening torque as per the User Guide. When mounted with the vibration pad, the device supports measurements up to 16 g |
| Vibration Sampling Rate | Configurable up to 6.6 kHz |
| Resolution of accelerometer | 16 bit |
| Derived values | <ul style="list-style-type: none"> 3-axis acceleration RMS and velocity RMS 3-axis acceleration and velocity FFT 3-axis spectral features as per configuration |
| FFT frequency resolution (delta-f) | Configurable up to 0.025 Hz (depends on Fmax and LOR settings) |
| Ultrasonic Sensing & Processing | |
| Sensor Type | Silicon MEMS |
| Frequency Range | 50Hz to 80kHz |
| Directivity | Omnidirectional |
| Derived Values | RMS, Crest Factor, Spectrum |
| Magnetic Flux Sensor: Motor RPM Measurement | |
| Sensor Type | Ratiometric Hall Sensor |
| Sensitivity | 200 mV/mT |
| Derived Value | Drive end Motor RPM |
| RPM Range of Magnetic flux sensor | 20 RPM to 5000 RPM |
| Accuracy | $\pm 2\%$ |
| Mounting Position | <p>Motor Drive End for *RPM measurement.</p> <p>*RPM measurement only applicable for AC induction and Synchronous Motors</p> <p>Note:</p> <p>vEdge 3XTURPM must mount on the motor housing—not on the shaft—when measuring motor RPM</p> |
| Temperature | |
| Temperature sensor | Semiconductor based sensor |
| Contact temperature range (with vibration pad mounting) | -20°C to 85° C |
| Wireless Interfaces | |
| Wi-Fi Features | <ul style="list-style-type: none"> MAC address displayed in Android/iOS app for MAC filtering in the Company network Static & Dynamic IP support |
| BLE features | <ul style="list-style-type: none"> Low power 5 m open-air range Connect the vEdge 3XTURPM to the Android device (Operating System version 9 and above) or iOS device (Operating System version 12 and above) to: <ul style="list-style-type: none"> Configure the vEdge 3XTURPM Visualize real-time data |
| Wi-Fi Protocol | IEEE 802.11 b/g/n support |
| Frequency Range | 2.4 GHz |
| Antenna | Integrated with vEdge 3XTURPM |
| Security | WPA / WPA2 - PSK based authentication |

| | |
|---|---|
| Encryption | TKIP/AES |
| Communication Protocol | MQTT, HTTP / MQTTS, HTTPS (TCP/IPv4), As per configuration |
| Data Transactions | |
| Transfer to server interface | Wi-Fi |
| Transfer interval | <ul style="list-style-type: none"> Real-time transfer every 2 Second, 7 Second, 12 Second, 25 Second, 35 second, and 55 second (depending on Fmax and LOR selection chosen in the configuration) FFT data transfer every 30 minutes under the described bandwidth and RSSI specifications |
| Local Viewing | <ul style="list-style-type: none"> Mobile Android Application iOS Application |
| Minimum Requirements for Android and iOS Application | <p>Android device (operating system version 9 and above) or iOS device (operating system version 12 and above) to:</p> <ul style="list-style-type: none"> Configure vEdge 3XTURPM Visualize real-time data Screen Size (for Android device): Supports screen size of 6" and above |
| OTA | Over-The-Air - remote firmware upgrade |
| Configuration | <ul style="list-style-type: none"> Remotely on the dashboard Locally through the android device or iOS device meeting minimum requirements |
| RSSI level between Access point and the vEdge 3XTURPM | -60 dBm minimum |
| Throughput / Bandwidth from the vEdge 3XTURPM to server | Minimum 50 Kbps upload and download speed per vEdge 3XTURPM |
| Recommended Access Point/Wi-Fi Router | <p>Access point make and configuration:</p> <ul style="list-style-type: none"> Make: Teltonika Model: Teltonika: RUT200/RUT240/ RUT241 /RUT360/ RUT361/RUTX50/RUTX12/RUTX10 Antennas: 2.4 GHz Gain: 5 dBi Radios: 2.4 GHz of IEEE 802.11 b/g/n <ul style="list-style-type: none"> Make: Silbo Antennas: 2 x SMA for LTE, 2 x SMA for Wi-Fi antenna connectors Gain: Mobile antenna @ 5dBi and for Wi-Fi antenna: 5 dBi Max RF Power: 23 dBm@LTE, 20 dBm@ Wi-Fi |
| Electrical | |
| Power supply | External power supply 24 VDC@200 mA DC. |
| Power Supply Protection | Polarity reversal protection, Overload protection |
| Connector | 4-pin M8 connector [V+, 0, (A)DATA+, (B) DATA-] |
| Cable | <ul style="list-style-type: none"> 28 AWG 2-core shielded 5 m cable with the open leads of 25 mm- standard cable for SMPS Connection. Cable with inbuilt, moulded surge protection. Cable has heat shrink of 20mm. <ul style="list-style-type: none"> 28 AWG 4-core shielded 5 m cable with open leads of 25 mm- optional cable for MODBUS Connection Cable with inbuilt, moulded surge protection. Cable has heat shrink of 20mm Note: 4 core cable is applicable only for Modbus communication users |
| Cable Material | PVC |
| Cable temperature range | 0° C to 90° C |
| Local Communications | |
| Protocol (Functionality) | Modbus RTU (Slave) |
| Physical standard | RS 485, 2 Wire |
| Supported Baud | 4800 bps to 115200 bps (excluding 57,600 bps) |
| Parity | None, even |

| | |
|--|---|
| Data bits | 8 bits |
| Stop bits | 1 |
| General | |
| Enclosure | Aluminium base with Polycarbonate cover |
| LEDs | 4 RGB LEDs, one on each corner of the enclosure, rated up to 85° C |
| Axis orientation | Y-axis along with the power cord |
| Size | Approx. 51.9 (L) mm x 32.6 (W) mm x 24.8 (H) mm without connector. Approx. 61.6 (L) mm x 32.6 (W) mm x 24.8 (H) mm with connector. |
| Weight | 80 g |
| Resistance to impact requirement as per IEC 60079-0 Section 26.4.2 | Resistance to the impact of 1 kg mass dropped from 0.7m height |
| Drop test requirement as per IEC 60079-0 Section 26.4.3 | Resistance to drop from a height of 1meter |
| Mounting | Recommended mounting procedure: Using Vibration Pad Recommended Glue: <ul style="list-style-type: none"> For installation using a vibration pad, Bondtite structural adhesive is recommended. If the asset surface or ambient temperature exceeds 70°C, it is advised to use LOCTITE AA 326 adhesive in conjunction with LOCTITE SF 7075 activator. [Note]: vEdge 3XTURPM should be firmly fixed to a flat surface (spot face surface may be needed to be produced and cable anchored to the sensor body) |
| Mounting accessories | Vibration pad (28 mm x 8 mm, SS304) |
| Operating ambient temperature | 0° C to 85° C |
| Storage temperature | -20°C to 85°C |
| Relative humidity at storage conditions tested as per MIL-STD-810H, Method 507.6-7 Aggravated Temperature Humidity Cycle | 0 to 100% RH (Non-Condensation) |
| Network Security | |
| Wi-Fi Network access | Pre-shared key (PSK), Open, Hidden Network (Hidden SSID) |
| Encryption | AES 256 |
| Cryptographic Algorithm | SHA-256 |
| Whitelisting | IP (Source IP and Destination IP), Port (for Secure: 8883, 443, 8000; for Unsecure— only for testing: 1883, 80), URL or MAC Address (depending on the network) |
| vEdge 3XTURPM Authentication | Certificate-based authentication (as per configuration) |
| Restricted Network Access | Only Whitelisted URL IPs are allowed |
| MAC Security | MAC-based Authentication |
| Bluetooth | |
| Version | Bluetooth 4.2 (Low Energy) Concurrent Central & Peripheral (S132) |
| Frequency Range | 2.4 GHz |
| Encryption | AES-128 (between the vEdge 3XTURPM and the Mobile Application) |
| Range (Open Air) | 5 meters |
| Certifications | |
| Sealing | IP68 (Waterproof and Dustproof) |
| Packaging | |
| Packaging box dimensions | 150 mm x 75 mm x 75 mm (Length x Width x Height) |
| Material of Package | Cardboard, Expanded Polyethylene foam sheet |
| Weight of complete package | 470 g |
| Contents of the package | Two vEdge 3XTURPM, 2 cables |
| Appearance and color | Appearance as shown in Appendix A . |

Appendix A

Packaging Box

| Component | Appearance |
|---|---|
| Packaging Box – Inner contents |  <p data-bbox="722 667 1066 689">Inner View of the Packaging Box</p> |
| Packaging Box – Top Foam material |  <p data-bbox="722 987 1497 1043">Top foam material of the Packaging Box (the picture shows two pieces placed one over the other)</p> |
| Packaging Box – Device Locating Foam material |  <p data-bbox="722 1323 1465 1379">vEdge 3XTURPM locating foam material of Packaging Box (the picture shows two pieces placed one over the other)</p> |