

# Sure Cross® QM30VT2 Vibration and Temperature Sensor



## Datasheet

Continuously monitor machine health, run time, and detect unexpected machine failures such as early bearing failure, unbalance, misalignment, etc. with the Sure Cross Vibration and Temperature QM30VT2 Sensor. The QM30VT2 works in a variety of machines to identify and predict failures in rotating machinery. Paired with a Sure Cross wireless Node, the QM30VT2 becomes the ultimate predictive maintenance tool for wireless vibration and temperature monitoring.



- Detects dual-axis vibration up to 4 kHz bandwidth
- Output actionable data such as RMS Velocity, RMS High Frequency Acceleration, Peak Velocity, etc. which is pre-processed from the vibration waveforms in the sensor
- Provides high accuracy vibration and temperature measurements
- Industrial grade sensor with small form factor to fit in the tightest locations
- Manufactured with stainless steel or aluminum housing, depending on the model
- Connects to a MultiHop Modbus radio or any Modbus network for easy set up and installation, even in the hardest to reach and rugged locations
- Functions as a Modbus slave device via RS-485



### WARNING:

- **Do not use this device for personnel protection**
- Using this device for personnel protection could result in serious injury or death.
- This device does not include the self-checking redundant circuitry necessary to allow its use in personnel safety applications. A device failure or malfunction can cause either an energized (on) or de-energized (off) output condition.

For additional information, updated documentation, and a list of accessories, refer to Banner Engineering's website, [www.bannerengineering.com](http://www.bannerengineering.com).

## Models

Model	Housing Type	Connections and Cable	I/O
QM30VT2-SS-9M	316L Stainless Steel	9.1 m (30 ft) Flying Leads	Vibration and temperature via RS-485 Modbus
QM30VT2	Aluminum	2.09 m (6.85 ft) cable with a 5-pin M12/Euro-style male quick disconnect (QD)	

The Sensor Configuration Software offers an easy way to manage sensor parameters, retrieve data, and visually show sensor data from a number of different sensors. The Sensor Configuration Software runs on any Windows machine and uses an adapter cable to connect the sensor to your computer. Download the most recent version of the software from Banner Engineering's website: [www.bannerengineering.com](http://www.bannerengineering.com) and select **Software** from the **Products** drop-down list.

Configure this sensor using the [Sensor Configuration Software](#) (instruction manual p/n [170002](#)) and USB to RS-485 adapter cable model [BWA-UCT-900](#) (datasheet p/n [140377](#)). When updating the firmware, you must use one of the two USB to RS-485 adapter cables plus a splitter pigtail cable p/n 83265. .

## Installation Instructions

### Connecting the Vibration/Temperature Sensor

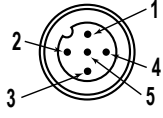
To install the sensor to a device with a 5-pin M12/Euro-style female connector:

1. Align the notch in the female connector with the key in the sensor's male connector.
2. Gently slide the sensor end into the connector.
3. Rotate the threaded nut to tighten the sensor down.

### Wiring

This sensor is designed for use as a Modbus slave. This sensor can be plugged into any Modbus RS-485 network, including compatible MultiHop Data Radios.



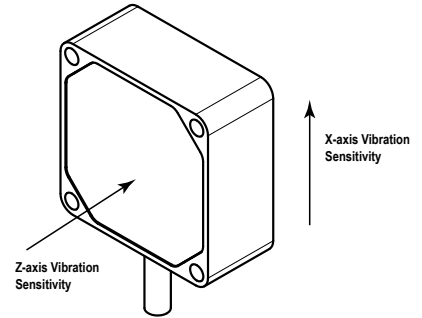
5-pin M12/Euro-style Male Connector	Pin	Wire Color	Sensor Connection
	1	brown (bn)	Power IN (+): 10 to 30 V dc
	2	white (wh)	RS485 / D1 / B / +
	3	blue (bu)	Ground (-)
	4	black (bk)	RS485 / D0 / A / -
	5	gray (gy)	Not Used (default) or Discrete NPN Select Line (optional). When updating the firmware, you must ground pin 5 by connecting it to pin 3.

## Installing the Sensor

The vibration sensors have an X and Z axis indication on the face of the sensor. The Z axis goes in a plane through the sensor while the X is parallel to the sensor.

- Install the X axis in line with the shaft of the motor or axially.
- Install the Z axis to go into or through the motor or radial.

For the best results, install the sensor as close to the motor bearing as possible. If this is not possible, install the sensor on a surface that is in rigid connection with vibration characteristics of the motor. Using a cover shroud or other flexible mounting location may result in reduced accuracy or reduced ability to detect certain vibration characteristics.



After determining the sensor direction and location, mount the sensor for the best possible vibration sensing accuracy.

Mounting Options	Applicable QM Models	Description
<b>BWA-BK-014</b>	QM30VT1, QM30VT2	Flat bracket with direct screw mount to motor and sensor
<b>BWA-BK-012</b>	QM30VT2-SS-9M	When available, directly mounting the bracket to the motor using an M4 × 0.7 bolt provides a rigid surface with the highest sensor accuracy and frequency response. This mounting option offers flexibility for future sensor and bracket movement.
<b>BWA-BK-014</b>	QM30VT1, QM30VT2	Flat bracket epoxied to motor and sensor screwed to bracket
<b>BWA-BK-012</b>	QM30VT2-SS-9M	Recommend using an epoxy designed for accelerometer mounting, such as Loctite Depend 330 and 7388 activator. Epoxying a bracket to a motor provides a permanent installation of the bracket to which the sensor can be attached. This more rigid mounting solution ensures some of the best sensor accuracy and frequency response, but is not flexible for future adjustments.
<b>BWA-BK-013</b>	QM30VT1, QM30VT2, QM30VT2-SS-9M	Flat magnet bracket Gives a solid, strong, and adjustable mount to a motor, but with a motor's curved surface it may not provide the best connection if the motor is too small for the magnet to get a full connection with the motor housing. Magnet mounts are susceptible to accidentally rotation or change in sensor location if an outside force bumps or moves the sensor. This can lead to a change in sensor information that differs from the time-trended data from the previous location.
Thermally Conductive Adhesive tape	QM30VT1, QM30VT2, QM30VT2-SS-9M	Often provides a more than sufficient mounting type but does introduce some additional flex that reduces accuracy

## Holding Registers

By default, data is sampled every five seconds. Use the Sensor Configuration Tool to adjust the sensor's sample rate if a different value is needed. Aliased register addresses are user configurable. Aliased addressed registers are sequenced to be read with one single Modbus read. Temperature values outside of the operating range of the device are forced to the maximum or minimum values.

Modbus Register Alias Address	Modbus Register Address	Description	I/O Range		Holding Register Representation	
			Min	Max	Min (dec)	Max (dec)
45201	42401	Z-Axis RMS Velocity (in/sec) <sup>1, 5</sup>	0	6.5535	0	65535