Q45VAC All-in-One Vibration and Temperature Node

Features

The Wireless Q45VAC All-in-One Sensor Node combines Banner's VT1 Vibration and Temperature Sensor with the Sure Cross® Q45VT Wireless Sensor Node. The Q45VAC is a compact, industrial, battery-powered device that wirelessly communicates with any Sure Cross Performance Gateway on a variety of machines to analyze vibration and temperature data to identify and predict failures in rotating machinery.

Benefits



- Delivers pre-processed high-accuracy vibration values for monitoring rotating equipment such as:
  - Motors
  - Pumps
  - Rotary Compressors
  - Exhaust or HVAC fan motors
  - Spindles
- Easy-to-use rugged device that can be easily mounted to equipment
- Use with the DXM Wireless Controller to track and trend vibration and temperature characteristics in real-time to predict the need for maintenance, predict potential component failure, and avoid process downtime.
- Battery-powered for “peel and stick” functionality with 2+ years of battery life
- Detects vibration characteristics on two axes (radial and axial) such as RMS Velocity, High-Frequency Acceleration, Peak Acceleration, Peak Velocity Component Frequency, etc.
- Achieves vibration accuracy of ±10% RMS velocity (in/sec)
- Eliminate control wires—The Sure Cross wireless system is a radio frequency network with integrated I/O that removes the need for power and control wires
- Reduce complexity—Machine or process reconfiguration made easier; great for retrofit applications
- Deploy easily—Simplifying installation on existing equipment enables deployment in remote and hard-to-access locations where implementing a wired solution would be difficult, impractical, or not cost-effective
- Transmit power levels of 250 mW or 1 W for 900 MHz models and 65 mW for 2.4 GHz models are user-selectable
- DIP switches for user configuration of sample time and vibration characteristics
- Frequency Hopping Spread Spectrum (FHSS) technology ensures reliable data delivery
- Transceivers provide bidirectional communication between the Gateway and Node, including fully acknowledged data transmission
- Diagnostics allow user-defined output settings in the unlikely event of a lost radio signal

Models

Active Models	Frequency	Description
DX80N2Q45VAC	2.4 GHz	One C-cell battery
DX80N9Q45VAC	900 MHz	One C-cell battery

To order the models without batteries, add an **NB** to the model number. For example, **DX80N2Q45VAC NB** .

The following models are no longer available for order but are still covered by the information in this document.

Inactive Models	Frequency	Description
DX80N2Q45VA	2.4 GHz	Two lithium AA batteries
DX80N9Q45VA	900 MHz	Two lithium AA batteries
DX80N9Q45VA-BK		Includes two lithium AA batteries and **BWA-Q45VA-FESS** and **BWA-Q45VA-CMSS** mounting brackets

Storage Mode

While in **storage mode**, the device's radio does not operate to conserve the battery. To put any device into storage mode, press and hold the binding button for five seconds. The device is in storage mode when the LEDs stop blinking. To wake the device, press and hold the binding button (inside the housing on the radio board) for five seconds.

General Operation

For the first 15 minutes after power up, the Node samples the sensor every two seconds (fast sample mode). After 15 minutes, the Node defaults to five-minute sample intervals. Activate fast sample mode by single-clicking the button (the amber LED is solid).

ISO 10816 provides guidance for evaluating vibration velocity severity motors, pumps, fans, compressors, gearboxes, blowers, dryers, presses, and other machines that operate in the 10 to 1000 Hz frequency range.

Original Instructions
20-Mar-25

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205704
p/n: 205704 Rev. M

ПРОМЭЛЕКТРОНИКА/ sales@prom-elec.com

Vibration Severity per ISO 10816

Machine			Class I Small Machines	Class II Medium Machines	Class III Large Rigid Foundation	Class IV Large Soft Foundation
Vibration Velocity Vrms	in/s	mm/s				
	0.01	0.28				
	0.02	0.45				
	0.03	0.71		good		
	0.04	1.12				
	0.07	1.80				
	0.11	2.80		satisfactory		
	0.18	4.50				
	0.28	7.10		unsatisfactory		
	0.44	11.2				
	0.70	18.0				
	1.10	28.0		unacceptable		
	1.77	45.9				

Buttons and LEDs

The following are the buttons, LEDs, and DIP switches for the Q45VAC Sensor Node.



1. Button
2. Red LED (flashing) indicates a radio link error with the Gateway
3. Green LED (flashing) indicates a good radio link with the Gateway
4. Amber LED is not used
5. DIP Switches

Configuration Instructions

DIP Switches

After making any changes to any DIP switch position, reboot the Q45VAC by triple-clicking the button, waiting a second, then double-clicking the button.

The DIP switches are in the OFF position. To turn a DIP switch on, push the switch toward the battery pack. DIP switches one through four are numbered from left to right.

DIP switch settings

Description	DIP Switches							
	1	2	3	4	5	6	7	8
Transmit power: 1 W (default setting)	OFF							
Transmit power: 250 mW (compatible with 150 mW radios)	ON							
Default I/O configuration (default setting) [1]		OFF	OFF	OFF				
I/O configuration 1		OFF	OFF	ON				
I/O configuration 2		OFF	ON	OFF				
I/O configuration 3		OFF	ON	ON				
I/O configuration 4		ON	OFF	OFF				
I/O configuration 5		ON	OFF	ON				
Not used		ON	ON	OFF				
Not used		ON	ON	ON				

Continued on page 3

[1] User configurable if switch 7 is OFF; for input serial addresses, see"Modbus Registers and IO Serial Addresses" on page 5

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Description	DIP Switches							
	1	2	3	4	5	6	7	8
Sample/report rate: User configuration (5 minutes by default; default setting)					OFF	OFF		
Sample/report rate: 150 seconds					OFF	ON		
Sample/report rate: 60 seconds					ON	OFF		
Not used					ON	ON		
English units (in/s and °F) (default setting)							OFF	
Metric units (mm/s and °C)							ON	
Not used (default setting)								OFF

I/O Configuration (set by DIP switches 2, 3, and 4)

Input Register		Default I/O	I/O Configuration 1	I/O Configuration 2	I/O Configuration 3	I/O Configuration 4	I/O Configuration 5
1	Z-Axis	RMS velocity (in/sec)	RMS velocity (in/sec)	High-frequency RMS acceleration (G)	RMS velocity (in/sec)	Full bandwidth RMS acceleration (G)	RMS velocity (in/sec)
2		High-frequency RMS acceleration (G)	Peak acceleration (G)	Peak acceleration (G)	Peak velocity component frequency (Hz)	Full bandwidth peak acceleration (G)	Full bandwidth RMS acceleration (G)
3	-	Temperature (°F)	Temperature (°F)	Temperature (°F)	Temperature (°F)	Temperature (°F)	Temperature (°F)
4	-	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
5	X-Axis	RMS velocity (in/sec)	RMS velocity (in/sec)	High-frequency RMS acceleration (G)	RMS velocity (in/sec)	Full bandwidth RMS acceleration (G)	RMS velocity (in/sec)
6		High-frequency RMS acceleration (G)	Peak acceleration (G)	Peak acceleration (G)	Peak velocity component frequency (Hz)	Full bandwidth peak acceleration (G)	Full bandwidth RMS acceleration (G)

If DIP switch 7 is on, all in/s units change to mm/s. DIP switch 7 will only switch units when using DIP switch I/O configurations, not with any user configuration.

Transmit Power. The 900 MHz radios have a high output option that will transmit at 1 W (30 dBm). The low output option transmits at 250 mW (24 dBm). The 250 mW mode reduces the radio's range but improves the battery life in short-range applications. For 2.4 GHz models, this DIP switch is disabled. The transmit power for 2.4 GHz is fixed at about 65 mW EIRP (18 dBm).

Sample and Report Rate. The sample interval, or rate, defines how often the Sure Cross device samples the input. For battery-powered applications, setting a slower rate extends the battery life. The report rate defines how often the Node communicates the I/O status to the Gateway. For battery-powered applications, setting the report rate to a slower rate extends the battery life.

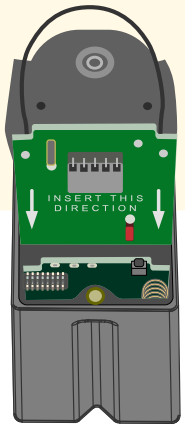
Apply Power to the Q45 C-Cell Models

Follow these instructions to install or replace the lithium C cell batteries.

CAUTION:

- **As with all batteries, these are fire, explosion, and severe burn hazards. There is a risk of explosion if the battery is replaced incorrectly.**
- Do not burn or expose them to high temperatures. Do not recharge, crush, disassemble, or expose the contents to water.
- Verify the battery's positive and negative terminals align to the positive and negative terminals of the battery holder mounted within the case.
- Properly dispose of used batteries according to local regulations by taking them to a hazardous waste collection site, an e-waste disposal center, or another facility qualified to accept lithium batteries.

Q45 battery board for C-cell batteries



1. Lift the plastic cover.
2. Slide the board containing the batteries out of the Q45 housing.
3. Remove the discharged battery and replace with a new battery.

   The replacement battery model number is **BWA-BATT-013**. For pricing and availability, contact Banner Engineering.
4. Verify the battery's positive and negative terminals align to the positive and negative terminals of the battery holder mounted within the case.
5. Slide the board containing the new batteries back into the Q45 housing.

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Bind to the Gateway and Assign the Node Address

Before beginning the binding procedure, apply power to all the devices. Separate the devices by two meters when running the binding procedure. Put only one Gateway into binding at a time to prevent binding to the wrong Gateway.

1. On the Gateway: Enter binding mode.
    - For housed DX80 Gateways, triple-click button 2 on the Gateway. Both LEDs flash red.
    - For Gateway board modules, triple-click the button. The green and red LED flashes.
2. Assign the Q45VAC a Node address using the Gateway's rotary dials. Use the left rotary dial for the left digit and the right rotary dial for the right digit. For example, to assign your Q45VAC to Node 10, set the Gateway's left dial to 1 and the right dial to 0. Valid Node addresses are 01 through 47.
3. On the Q45: Loosen the clamp plate on the top of the Q45VAC and lift the cover.
4. Enter binding mode on the Q45VAC by triple-clicking the Q45VAC's button.
   The red and green LEDs flash alternately and the sensor searches for a Gateway in binding mode. After the Q45VAC is bound, the LEDs stay solid momentarily, then they flash together four times. The Q45VAC exits binding mode.
5. Label the sensor with the Q45VAC's Node address number for future reference.
6. Repeat steps 2 through 5 for as many Q45VACs as are needed for your network.
7. On the Gateway: After binding all Q45VACs, exit binding mode.
    - For housed DX80 Gateways, double-click button 2.
    - For board-level DX80 Gateways, double-click the button.

For Gateways with single-line LCDs: After binding your Q45VAC to the Gateway, make note of the binding code displayed under the Gateway's *DVCFG menu, XADR submenu on the LCD. Knowing the binding code prevents having to re-bind all Q45VACs if your Gateway is ever replaced.

Bind to a DXM and Assign the Node Address

Before beginning the binding procedure, apply power to all the devices. Separate the radios by two meters when running the binding procedure. Put only one DXM into binding mode at a time to prevent the Q45VAC from binding to the wrong Gateway.

1. On the DXM: Use the arrow keys to select the **ISM Radio** menu on the LCD and click **ENTER**.
2. Highlight the **Binding** menu and click **ENTER**.
3. Use the arrow keys to select the Node address to bind the Q45VAC to.
4. On the Q45VAC: Loosen the top clamp plate and lift the cover.
5. Enter binding mode by triple-clicking the binding button.
   The red and green LEDs flash alternately and the sensor searches for a Gateway in binding mode. After the Node binds, the LEDs stay solid momentarily, then they flash together four times. The Node exits binding mode.
6. Label the sensor with the Node address number for future reference.
7. On the DXM: Click **BACK** to exit binding for that specific Node address.
8. Repeat steps 3 through 7 and change the Node address for as many Q45VACs as are needed for your network.
9. On the DXM: After you have finished forming your network, click **BACK** until you reach the main menu.

Configure the Q45 Using the Configuration Software

The DXM Performance Configuration Software offers an easy way to change sensor settings, show sensor data from different sensors, and retrieve data from the Gateway radio. The software runs on any Windows computer and uses an adapter cable to connect the Gateway to your computer.

Download the most recent version of the software from Banner Engineering's website: www.bannerengineering.com/wireless.

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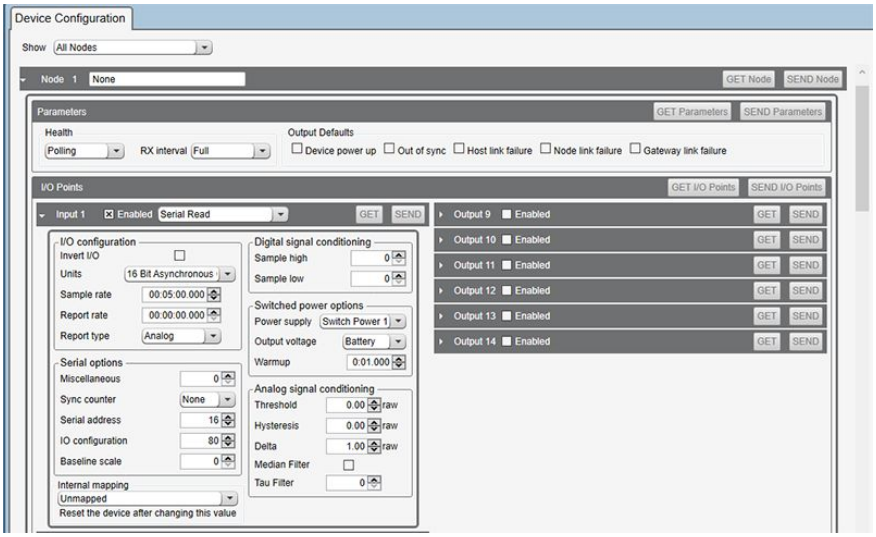

1. Go to the **Configuration › Device Configuration** screen.
2. On the top of the screen, select **Nodes Currently in the System** from the drop-down list and click **Get devices in system**.
   All Nodes bound to the Gateway connected to the computer display.
3. Click the arrow next to the Nodes to display the parameters specific to that Node.
   In this example, the parameters for Node 1 are shown.
4. Under the Node 1 I/O points section, click **GET I/O Points**.
   All I/O types for this Node are loaded onto the screen.
5. To view the parameters for an I/O point, click the arrow next to that I/O point.
   In this example, the parameters for I/O point 1 are shown.
6. To set the **Serial address**, go to the **Serial options** section of the I/O point's parameters and enter the value.
   In this example, the **Serial address** is set to 16 for output Z-Axis RMS Velocity (in/sec).
7. After making changes to the I/O point parameters, click **SEND** to send the changes to the network.
8. Repeat steps 5 and 8 for each input to manually change the configuration of the vibration parameters by changing the serial address.

For more information on using the DX80 Performance Configuration Software, refer to the instruction manual (p/n 140628).

Modbus Registers and IO Serial Addresses

I/O serial addresses

Serial Address	Output Type	I/O Range		Holding Register Representation	
		Min	Max	Min (Dec)	Max (Dec)
16	Z-Axis RMS Velocity (in/sec) [1, 5]	0	6.5535	0	65535
25	Z-Axis High-Frequency RMS Acceleration [2, 6]	0	65.535	0	65535
-	Reserved	-	-	-	-
64	X-Axis RMS Velocity (in/sec) [1, 5]	0	6.5535	0	65535
73	X-Axis High-Frequency RMS Acceleration (G) [2, 6]	0	65.535	0	65535
20	Z-Axis Peak Acceleration (G) [2, 6]	0	65.535	0	65535
68	X-Axis Peak Acceleration (G) [2, 6]	0	65.535	0	65535
18	Z-Axis Peak Velocity Component Frequency (Hz) [4, 5]	0	6553.5	0	65535
66	X-Axis Peak Velocity Component Frequency (Hz) [4, 5]	0	6553.5	0	65535
19	Z-Axis RMS Acceleration (G) [2, 5]	0	65.535	0	65535
67	X-Axis RMS Acceleration (G) [2, 5]	0	65.535	0	65535
24	Z-Axis Kurtosis [2, 6]	0	65.535	0	65535
72	X-Axis Kurtosis [2, 6]	0	65.535	0	65535
37	Z-Axis Crest Factor [2, 6]	0	65.535	0	65535
69	X-Axis Crest Factor [2, 6]	0	65.535	0	65535

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Serial Address	Output Type	I/O Range		Holding Register Representation	
		Min	Max	Min (Dec)	Max (Dec)
17	Z-Axis Peak Velocity (in/sec) [1, 5]	0	6.5535	0	65535
23	Z-Axis Peak Velocity (mm/sec) [2, 5]	0	65.535	0	65535
65	X-Axis Peak Velocity (in/sec) [1, 5]	0	6.5535	0	65535
71	X-Axis Peak Velocity (mm/sec) [2, 5]	0	65.535	0	65535
22	Z-Axis RMS Velocity (mm/sec) [2, 5]	0	65.535	0	65535
70	X-Axis RMS Velocity (mm/sec) [2, 5]	0	65.535	0	65535
27	Full Bandwidth RMS Acceleration Z-Axis (G) [2, 7]	0	65.535	0	65535
75	Full Bandwidth RMS Acceleration X-Axis (G) [2, 7]	0	65.535	0	65535
28	Full Bandwidth Peak Acceleration Z-Axis (G) [2, 7]	0	65.535	0	65535
76	Full Bandwidth Peak Acceleration X-Axis (G) [2, 7]	0	65.535	0	65535
192	Temperature (°C)[3]	–1638.4	1638.4	–32768	32767
193	Temperature (°F)[3]	–1638.4	1638.4	–32768	32767

[1] Value = Register value ÷ 10000

[2] Value = Register value ÷ 1000

[3] Value = Register value ÷ 20

[4] Value = Register value ÷ 10

[5] Measurement bandwidth = 10 Hz to 1 kHz

[6] Measurement bandwidth = 1 kHz to 4 kHz

[7] Measurement Bandwidth = 10 Hz to 4 kHz

Modbus holding registers

I/O #	Modbus Holding Register		I/O Type	I/O Range		Holding Register Representation	
	Gateway	Any Node		Min.	Max.	Min.	Max.
1	1	1 + (Node# × 16)	Sensor Input Register 1				
2	2	2 + (Node# × 16)	Sensor Input Register 2				
3	3	3 + (Node# × 16)	Sensor Input Register 3				
4	4	4 + (Node# × 16)	Sensor Input Register 4				
5	5	5 + (Node# × 16)	Sensor Input Register 5				
6	6	6 + (Node# × 16)	Sensor Input Register 6				
7	7	7 + (Node# × 16)	Reserved				
8	8	8 + (Node# × 16)	Device Message				
		...					
15	15	15 + (Node# × 16)	Control Message				
16	16	16 + (Node# × 16)	Reserved				

By default, data is supplied to the Node every five minutes, unless the Node requests the data sooner. The default configuration is shown and all optional outputs types are listed. Use the User Configuration Software to adjust the Sensor Register output type. Temperature values outside the operating range of the device are forced to the maximum or minimum values.

Installing the Q45VAC

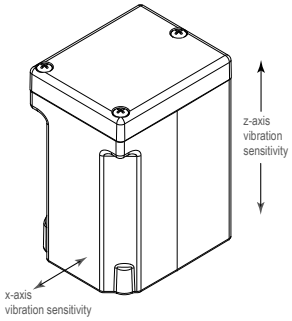
The vibration sensors have an x- and z-axis indication on the face of the sensor.

- 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.

The Q45VAC body can be affixed to the motor using Loctite 330 and 7387 Activator or similar two-part epoxy. For information about optional brackets, see .



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Specifications

Radio Range

A 2 dB antenna ships with this device.

Transmit power and range are subject to many factors, including antenna gain, installation methods, characteristics of the application, and environmental conditions.

Please refer to the following documents for installation instructions and high-gain antenna options.

Installing Your Sure Cross® Radios (151514)
Conducting a Site Survey (133602)
Sure Cross® Antenna Basics (132113)

Radio Transmit Power (900 MHz, 1 W radios)

Conducted: 30 dBm (1 W)

EIRP with the supplied antenna: < 36 dBm

Radio Transmit Power (2.4 GHz radios)

Conducted: < 18 dBm (65 mW)

EIRP with the supplied antenna: < 20 dBm (100 mW)

Antenna Minimum Separation Distance

900 MHz radios transmitting at ≥ 500 mW: 4.57 m (15 ft) with the supplied antenna

2.4 GHz radios transmitting at 65 mW: 0.3 m (1 ft) with the supplied antenna

Default Sensing Interval

5 minutes

Indicators

Red and green LEDs (radio function)

Construction

Molded reinforced thermoplastic polyester housing, oring-sealed transparent Udel (R) polysulfone cover, PTFE vent, and stainless steel hardware. Designed to withstand 1200 psi washdown.

Shock

400G

Environmental Rating

NEMA 6P, IP67

Typical Battery Life

See chart.

Vibration Sensor

Measuring Range: 0 to 46 mm/sec or 0 to 1.8 in/sec RMS

Frequency Range: 10 Hz to 4 kHz

Accuracy: ±10% at 25 °C

Sampling Frequency: 20 kHz (default)

Record Length: 8192 points (default)

Sample Duration: 0.4 s (default)

Link Timeout (Performance)

Gateway: Configurable via User Configuration Software

Node: Defined by Gateway

Spread Spectrum Technology

FHSS (Frequency Hopping Spread Spectrum)

Antenna Connection

Ext. Reverse Polarity SMA, 50 Ohms

Max Tightening Torque: 0.45 N·m (4 lbf·in)

900 MHz Compliance (RM7023 Radio Module)

Radio module is indicated by the product label marking

Contains FCC ID: UE3RM7023

Contains IC: 7044A-RM7023

2.4 GHz Compliance (SX243 Radio Module)

Radio module is indicated by the product label marking

Contains FCC ID: UE3SX243

Radio Equipment Directive (RED) 2014/53/EU

Contains IC: 7044A-SX243

Temperature Sensor

Measuring Range: –40 °C to +105 °C (–40 °F to +221 °F)

Operating Conditions

Ambient temperature: –40 °C to +70 °C (–40 °F to +158 °F)

Contact temperature: –40 °C to +105 °C (–40 °F to +221 °F)

90% at +50 °C maximum relative humidity (non-condensing)

Radiated Immunity HF: 10 V/m (EN 61000-4-3)

Certifications

CE/UKCA approval only applies to 2.4 GHz models

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Park Lane, Culliganlaan 2F bus 3
1831 Diegem, BELGIUM

Turck Banner LTD Blenheim House
Blenheim Court
Wickford, Essex SS11 8YT
GREAT BRITAIN

FCC Part 15 Class A for Intentional Radiators

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

(Part 15.21) Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

Industry Canada Statement for Intentional Radiators

This device contains licence-exempt transmitters(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:

1. This device may not cause interference.
2. This device must accept any interference, including interference that may cause undesired operation of the device.

Cet appareil contient des émetteurs/récepteurs exemptés de licence conformes à la norme Innovation, Sciences, et Développement économique Canada. L'exploitation est autorisée aux deux conditions suivantes:

1. L'appareil ne doit pas produire de brouillage.
2. L'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

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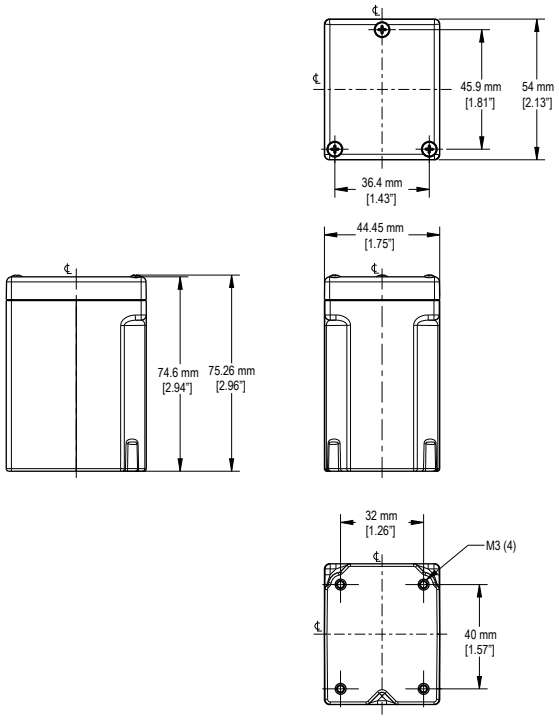
Dimensions

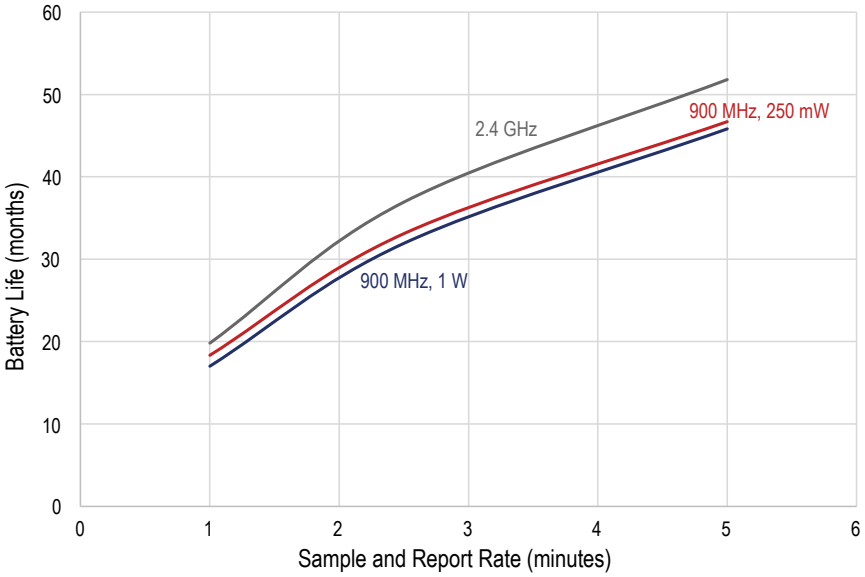
All measurements are listed in millimeters, unless noted otherwise. The measurements provided are subject to change.

Q45VAC Dimensions



Battery Life

Battery Life for the Q45VAC models



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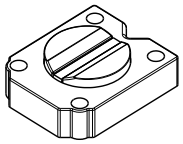
Accessories

Brackets/Installation for the Q45VAC

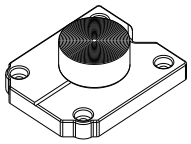
BWA-Q45VAC-CMSS

- Includes a magnetic mounting bracket and four mounting screws
- For use on flat or curved surfaces
- SmCo magnet with a 40 lb pull strength
- 44.5 mm × 54 mm; 15.6 mm thick



BWA-Q45VAC-FESS

- Includes a base plate, two screw retainers, four mounting screws, a set screw, and a mounting disc
- Mounts the device to a surface using two-part epoxy
- Alignment mark indicates the front of device
- 44.5 mm × 54 mm



Warnings (Internal Antenna Models)

Exporting Sure Cross® Radios. It is our intent to fully comply with all national and regional regulations regarding radio frequency emissions. **Customers who want to re-export this product to a country other than that to which it was sold must ensure the device is approved in the destination country.** Consult with Banner Engineering Corp. if the destination country is not on this list.

IMPORTANT: Please download the complete Wireless Q45VAC All-in-One Sensor Node technical documentation, available in multiple languages, from www.bannerengineering.com for details on the proper use, applications, Warnings, and installation instructions of this device.

IMPORTANT: Por favor descargue desde www.bannerengineering.com toda la documentación técnica de los Wireless Q45VAC All-in-One Sensor Node, disponibles en múltiples idiomas, para detalles del uso adecuado, aplicaciones, advertencias, y las instrucciones de instalación de estos dispositivos.

IMPORTANT: Veuillez télécharger la documentation technique complète des Wireless Q45VAC All-in-One Sensor Node sur notre site www.bannerengineering.com pour les détails sur leur utilisation correcte, les applications, les notes de sécurité et les instructions de montage.

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.

IMPORTANT:

- **Electrostatic discharge (ESD) sensitive device**
- ESD can damage the device. Damage from inappropriate handling is not covered by warranty.
- Use proper handling procedures to prevent ESD damage. Proper handling procedures include leaving devices in their anti-static packaging until ready for use; wearing anti-static wrist straps; and assembling units on a grounded, static-dissipative surface.

Banner Engineering Corp Limited Warranty

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Notas Adicionales

Información México: La operación de este equipo está sujeta a las siguientes dos condiciones: 1) es posible que este equipo o dispositivo no cause interferencia perjudicial y 2) este equipo debe aceptar cualquier interferencia, incluyendo la que pueda causar su operación no deseada.

Banner es una marca registrada de Banner Engineering Corp. y podrán ser utilizadas de manera indistinta para referirse al fabricante. "Este equipo ha sido diseñado para operar con las antenas tipo Omnidireccional para una ganancia máxima de antena de 6 dBd y Yagi para una ganancia máxima de antena 10 dBd que en seguida se enlistan. También se incluyen

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aquellas con aprobación ATEX tipo Omnidireccional siempre que no excedan una ganancia máxima de antena de 6dBd. El uso con este equipo de antenas no incluidas en esta lista o que tengan una ganancia mayor que 6 dBd en tipo omnidireccional y 10 dBd en tipo Yagi, quedan prohibidas. La impedancia requerida de la antena es de 50 ohms."

Mexican Importer

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