

# Features



The SureCross™ DX70 wireless series consists of a radio frequency network built around two devices and configured I/O.

- Wireless industrial I/O system with discrete (sourcing or sinking) inputs and outputs, analog inputs and outputs, and a link loss output that may be selected or deselected to be one of the four outputs
- DIP switches for user configuration
- 10 to 30V dc power input
- Site Survey analyzes the network's signal strength and reliability
- Frequency Hopping Spread Spectrum (FHSS) technology and Time Division Multiple Access (TDMA) control architecture combine to ensure reliable data delivery within the unlicensed Industrial, Scientific, and Medical (ISM) band
- Transceivers provide bidirectional communication between the Gateway and Node, including fully acknowledged data transmission
- Lost RF links are detected and relevant outputs set to user-defined conditions
- External or internal antenna

For additional information, the most recent version of all documentation, and a complete list of accessories, refer to Banner Engineering's website, [www.bannerengineering.com/surecross](http://www.bannerengineering.com/surecross).

# Models

When ordering the SureCross DX70 device, order the kits listed below. The kits include the Gateway, Node, mounting hardware, access hardware, antennas, and cables. Each kit's devices ship from the factory bound and with the inputs and outputs mapped as shown in the I/O mapping tables.

Kit Models	Frequency	Inputs and Outputs
DX70K9M6EM1	900 MHz	<b>Inputs:</b> Four selectable discrete, two 0-20 mA analog <b>Outputs:</b> Four sourcing discrete, two 0-20 mA analog
DX70K2M6EM1	2.4 GHz	
DX70K9M6ED1	900 MHz	<b>Inputs:</b> Eight selectable discrete on the Node, four selectable discrete on the Gateway <b>Outputs:</b> Four sourcing discrete on the Node, eight sourcing discrete on the Gateway
DX70K2M6ED1	2.4 GHz	

Internal antenna models are also available, but are not UL Listed. For more information, contact your local Banner Engineering Corp. representative.



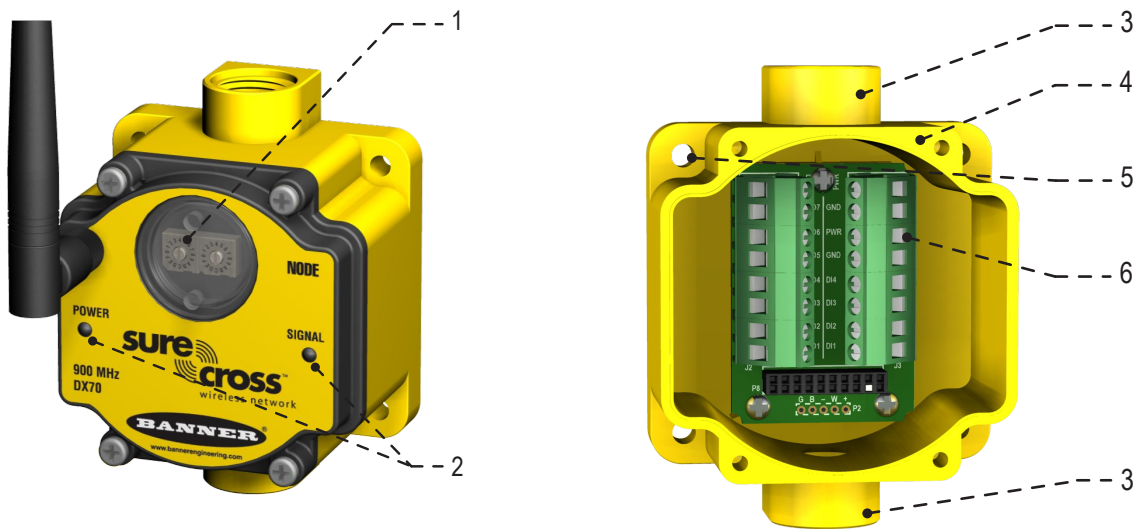
## WARNING: Not To Be Used for Personnel Protection

Never use this product as a sensing device for personnel protection. Doing so could lead to serious injury or death. This product does NOT include the self-checking redundant circuitry necessary to allow its use in personnel safety applications. A sensor failure or malfunction can cause either an energized or de-energized sensor output condition.

## Replacement DX70 Devices

Kit Models	Device	Frequency	Replacement DX70 Device
DX70K9M6EM1	Node	900 MHz ISM Band	DX70N9X6S4P4M2M2
	Gateway		DX70G9X6S4P4M2M2
DX70K2M6EM1	Node	2.4 GHz ISM Band	DX70N2X6S4P4M2M2
	Gateway		DX70G2X6S4P4M2M2
DX70K9M6ED1	Node	900 MHz ISM Band	DX70N9X6S8P4
	Gateway		DX70G9X6S4P8
DX70K2M6ED1	Node	2.4 GHz ISM Band	DX70N2X6S8P4
	Gateway		DX70G2X6S4P8

## Device Components



**1. Rotary Dials.** After the DX70 devices are bound, use the rotary dials on the Gateway to set the Network ID (NID) to a decimal value from 1 to 32.

**2. LEDs.** Power LED - Power indicator. A green LED indicates the power is on. Signal LED - Provides real-time feedback regarding RF link status and communications activity.

**3. Port, NPT Gland, or Plug.** If unused, install the provided plug into the 1/2 NPT threaded port. Use PTFE tape if an IP67 seal is required.

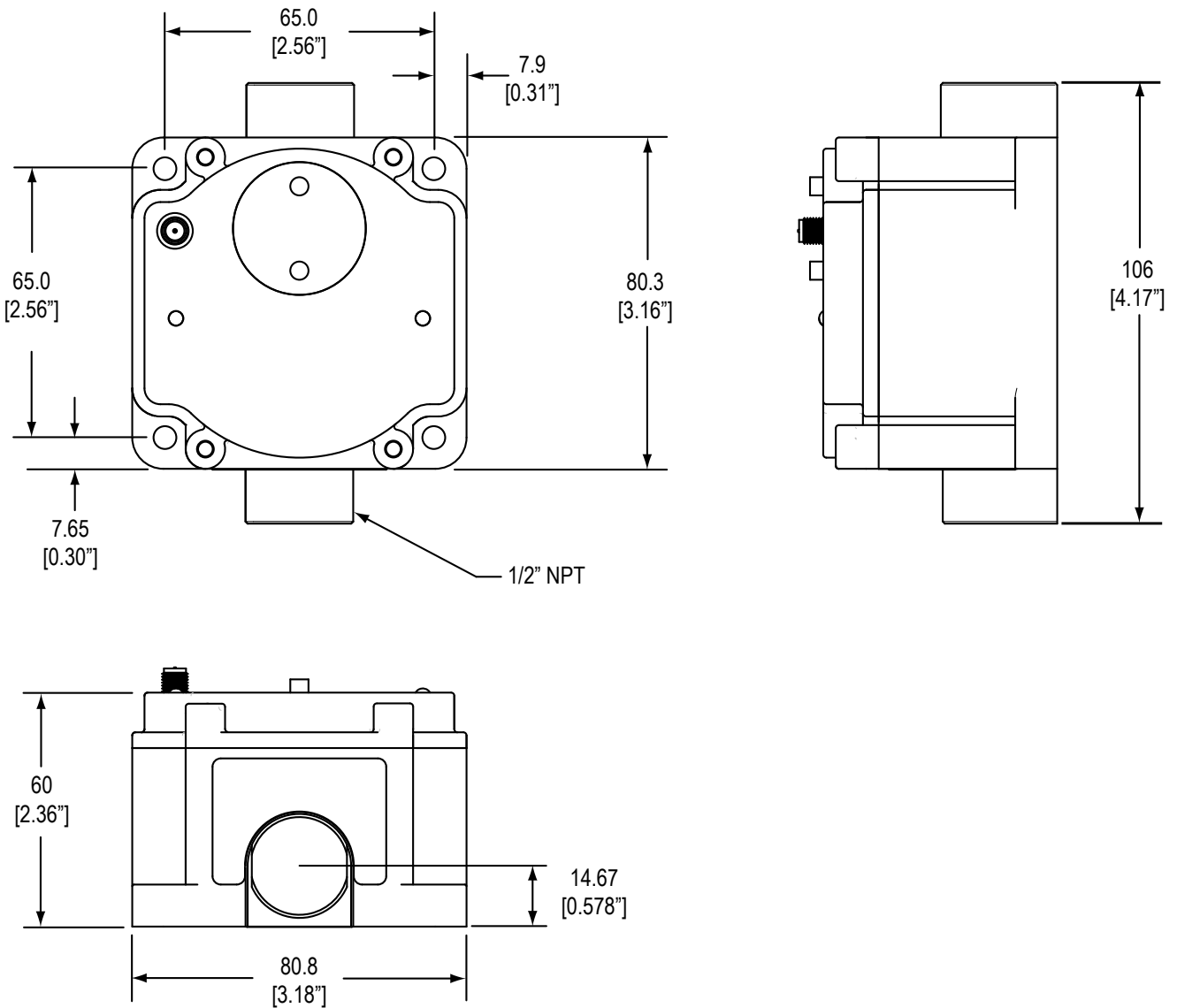
**4. Housing.** The rugged, industrial DX70 housing meets IEC IP67 standards.

**5. Mounting Hole, #10/M5 Clearance.** Mounting holes accept metric M5 or UNC/UNF #10 hardware — DIN rail mount adapter bracket available

**6. Wiring Terminal Strip.** The 16 wiring terminals accept wire sizes: AWG 12-28 or 2.5 mm<sup>2</sup>

## DX70 Dimensions

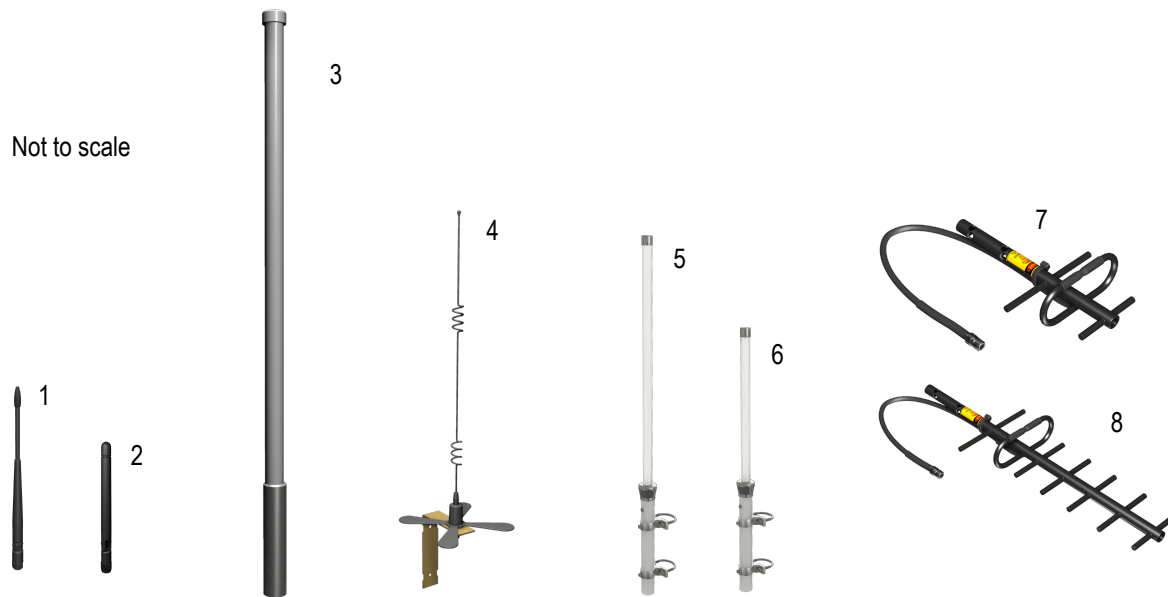
The DX70 Gateway and Node use the same housing, which is also the same in size and mounting holes as the DX80 housing.



# Accessories



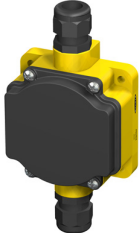
The accessories list includes FCC approved antennas, antenna cabling, surge suppressors, power supplies, replacement batteries, enclosures, cables, and other hardware.

## Antennas





Part No.	Model No.	Description
<b>Omni-Directional Antennas</b>		
1	76908	BWA-902-C 902-928 MHz, 2 dBi, RP-SMA Male (ships with 900 MHz DX80 devices)
2	77816	BWA-202-C 2.4 GHz, 2 dBi, RP-SMA Male, Rubber swivel, 3 1/4" (ships with 2.4 GHz DX80 devices)
	77817	BWA-205-C 2.4 GHz, 5 dBi, RP-SMA Male, Rubber swivel, 6 1/2"
	77818	BWA-207-C 2.4 GHz, 7 dBi, RP-SMA Male, Rubber swivel, 9 1/4"
3	77481	BWA-906-A 902-928 MHz, 6 dBd, N Female, Fiberglass, 71.5" Outdoor
4	77819	BWA-905-B 902-928 MHz, 5 dBd/7.2 dBi, N Female, with Ground Plane, 32" Indoor/Outdoor
5	81080	BWA-208-A 2.4 GHz, 8.5 dBi, N Female, 24" Indoor/Outdoor
6	81081	BWA-206-A 2.4 GHz, 6 dBi, N Female, 16" Indoor/Outdoor
<b>Directional (Yagi) Antennas</b>		
7	77479	BWA-9Y6-A 890-960 MHz, 6.5 dBd, N Female, 6.8" x 13" Outdoor
8	77480	BWA-9Y10-A 890-960 MHz, 10 dBd, N Female, 6.8" x 24" Outdoor

## Other Power Supplies

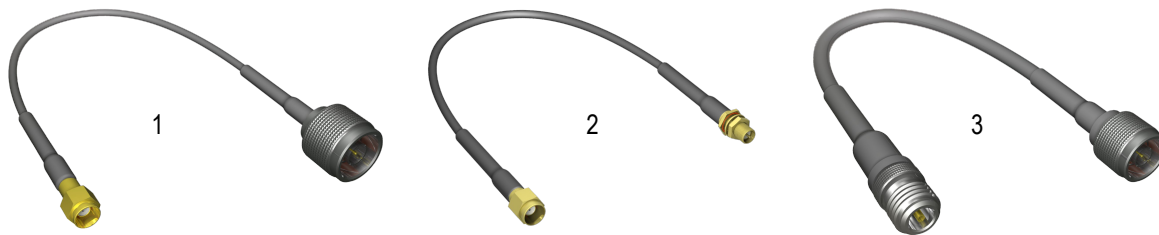
	Part No.	Model No.	Description
	65837	SPS101Q	DC Power Supply, 120 mA, 12–30V dc, 5-pin Euro-style QD
	65848	SPS101QP	DC Power Supply, 120 mA, 12–30V dc, 5-pin Euro-style QD and pigtail
	77422	PS24W	DC Power Supply, 500 mA, 24V dc, Demo kit power supply
	74321	EZAC-E-QE5	DC Power Supply, 700 mA, 24V dc, 5-pin Euro-style QD, Hard-wired AC power connection
	73466	EZAC-E-QE5-QS5	DC Power Supply, 700 mA, 24V dc, 5-pin Euro-style QD, 5-pin Mini QD AC power connection
	76809	PSDINA-24-4	DC Power Supply, 4 Amps, 24V dc, Terminal block connection, Converts 85-264V ac 50/60 Hz
	11280	PS24DX	DC Power Supply, 200 mA, 24V dc, in the DX80 low-profile housing
	11830	PS24DXSR	DC Power Supply with Solid State Relay, 200 mA, 24V dc, in the DX80 low-profile housing

## Surge Suppressors

	Part No.	Model No.	Description
	79296	BWC-LMRSFRPB	Surge Suppressor, bulkhead, RP-SMA Type
	12477	BWC-LFNBMN-DC	Surge Suppressor, bulkhead, N-Type, dc Blocking


## Cordsets and SureCross Cables

## Antenna Cables



	Part No.	Model No.	Description
1	77486	BWC-1MRSMN05	LMR200 RP-SMA to N Male, 0.5M
	77820	BWC-1MRSMN2	LMR200 RP-SMA to N Male, 2M
2	78544	BWC-1MRSFRSB0.2	RG58, RP-SMA to RP-SMAF Bulkhead, 0.2M
	78337	BWC-1MRSFRSB1	RG58, RP-SMA to RP-SMAF Bulkhead, 1M
	78338	BWC-1MRSFRSB2	RG58, RP-SMA to RP-SMAF Bulkhead, 2M
	77488	BWC-1MRSFRSB4	RG58, RP-SMA to RP-SMAF Bulkhead, 4M
3	77489	BWC-4MNFN3	LMR400 N Male to N Female, 3M
	77490	BWC-4MNFN6	LMR400 N Male to N Female, 6M
	77821	BWC-4MNFN15	LMR400 N Male to N Female, 15M
	77822	BWC-4MNFN30	LMR400 N Male to N Female, 30M

## Euro-Style Cordsets

	Part No.	Model No.	Description
	78382	BWA-QD5.5	Prewired 5-pin Euro connector, 1/2-14 NBSM
	78383	BWA-QD8.5	Prewired, 8-pin Euro connector, 1/2-14 NBSM
	78384	BWA-QD12.5	Prewired 12-pin Euro connector, 1/2-14 NBSM
	58912	FIC-M12F4	Euro-Style Field-Wireable Connector 4-pin Female Straight
	62837	DEUR-506.6C	Cordset, 5-pin Euro-style, double ended, male/female, 1.83m
	72333	DEE2R-51D	Cordset, 5-pin Euro-style, double ended, male/female, 0.3m
	72334	DEE2R-53D	Cordset, 5-pin Euro-style, double ended, male/female, 1m
	72636	DEE2R-58D	Cordset, 5-pin Euro-style, double ended, male/female, 2.4m
	71038	MQDC1-501.5	Cordset, 5-pin Euro-style, single ended, female, 0.5m
	12597	MQDMC-401	Cordset, 4-pin Euro-style, single ended, male, straight, 0.5m, longer pigtail ends for DX80...C models
1. Brown	51127	MQDC1-506	Cordset, 5-pin Euro-style, single ended, female, 1.83m
2. White	47812	MQDC1-515	Cordset, 5-pin Euro-style, single ended, female, 4.57m
3. Blue	47814	MQDC1-530	Cordset, 5-pin Euro-style, single ended, female, 9.14m
4. Black			
5. Gray			

Part No.	Model No.	Description
51128	MQDC1-506RA	Cordset, 5-pin Euro-style, single ended, female, right-angle, 1.83m
47813	MQDC1-515RA	Cordset, 5-pin Euro-style, single ended, female, right-angle, 4.57m
47815	MQDC1-530RA	Cordset, 5-pin Euro-style, single ended, female, right-angle, 9.14m

Right-angle cordsets are not compatible with the DX70 devices. When facing the Node or Gateway toward you and the quick disconnect connection is facing down, the right-angle cables exit to the right.

If using the communication lines, the cable length cannot exceed 3 meters, or 10 feet.

When using the FlexPower Node with integrated battery, use the double ended cordsets. For a FlexPower Node with external power supply, use the single ended cordset.

## Other Cables

Part No.	Model No.	Description
79985	BWA-RIBBON-001	Ribbon cable, 20-pin DBL socket
10200	BWA-HW-010	Cable, FlexPower Current Monitoring

## Enclosures and Relay Boxes



Part No.	Model No.	Description
11320	BWA-EF14128	Enclosure Fiberglass Hinged 14"x12"x8"
11321	BWA-EF1086	Enclosure Fiberglass Hinged 10"x8"x6"
11322	BWA-EF866	Enclosure Fiberglass Hinged 8"x6"x6"
11326	BWA-PA1412	Panel, 14 x 12
11327	BWA-PA108	Panel, 10 x 8
11327	BWA-PA86	Panel, 8 x 6
11329	BWA-PM12	Pole Mount, 12 inch
11340	BWA-PM8	Pole Mount, 8 inch
11341	BWA-PM6	Pole Mount, 6 inch

Part No.	Model No.	Description
11346	IB6RP	Interface Relay Box, 18-26V dc inputs, isolated relay outputs (not shown)

## Replacement Parts for DX70 Models

Part No.	Model No.	Description	Items
76907	BWA-HW-001	Mounting Hardware Kit	Screw, M5-0.8 x 25 mm, SS (4) Screw, M5-0.8 x 16mm, SS (4) Hex nut, M5-0.8mm, SS (4) Bolt, #8-32 x 3/4", SS (4)
76910	BWA-HW-003	PTFE Tape	
16328	BWA-HW-004	Replacement Seals	O-ring, rotary access cover, PG21 (2) O-ring, body gasket (2) Access cover, rotary, clear plastic (2)
79438	BWA-CG.5-10	Cable Glands, 1/2-inch NPT	10 pieces, cordgrips for cable diameters 0.17" to 0.45"
79984	BWA-HP.5-10	Dummy Hole Plugs, 1/2-inch NPT	10 pieces
77161	SMBDX80DIN	Bracket assembly, DIN rail, flat mount	

# Specifications

## Radio

### Range

900 MHz: Up to 4.8 kilometers (3 miles) \*

2.4 GHz: Up to 3.2 kilometers (2 miles) \*

### Transmit Power

900 MHz: 21 dBm conducted

2.4 GHz: 18 dBm conducted, less than or equal to 20 dBm EIRP

### 900 MHz Compliance (150 mW Radios)

FCC ID TGUDX80 - This device complies with FCC Part 15, Subpart C, 15.247

IC: 7044A-DX8009

### 2.4 GHz Compliance

FCC ID UE300DX80-2400 - This device complies with FCC Part 15, Subpart C, 15.247

ETSI/EN: In accordance with EN 300 328: V1.7.1 (2006-05)

IC: 7044A-DX8024

### Spread Spectrum Technology

FHSS (Frequency Hopping Spread Spectrum)

### Antenna Connection

Ext. Reverse Polarity SMA, 50 Ohms

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

### Link Timeout

1 or 4 seconds

\* With the standard 2 dB antenna. High-gain antennas are available, but the range depends on the environment and line of sight. To determine the range of your wireless network, perform a Site Survey.

## General

### Power\*

Requirements: +10 to 30V dc (For European applications: +10 to 24V dc,  $\pm 10\%$ ). (See UL section below for any applicable UL specifications)

Consumption: Less than 1.4 W (60 mA) at 24V dc

### Housing

Polycarbonate

Weight: 0.26 kg (0.57 lbs)

Mounting: #10 or M5 (M5 hardware included)

Max. Tightening Torque: 0.56 N·m (5 in·lbf)

### Interface

Indicators: Red/Green Power LED, Red/Yellow Signal LED

### Wiring Access

Two 1/2-inch NPT

\* For European applications, power the DX80 from a Limited Power Source as defined in EN 60950-1.

## Inputs

### Discrete Inputs

Rating: 3 mA max current at 30V dc

Sample Rate: 62.5 milliseconds

Report Rate: On change of state

### Discrete Input ON Condition

### Analog Inputs

Rating: 24 mA

Sample Rate: 62.5 milliseconds

Report Rate: 1 second or On Change of State (1% change in value)

PNP: Greater than 8V

NPN: Less than 0.7V

Accuracy: 0.1% of full scale +0.01% per °C

Resolution: 12-bit

#### Discrete Input OFF Condition

PNP: Less than 5V

NPN: Greater than 2V or open

### Outputs

#### Discrete Outputs

Update Rate: 125 milliseconds

ON Condition: Supply minus 2V

OFF Condition: Less than 2V

#### Discrete Output Rating (PNP)

100 mA max current at 30V dc

ON-State Saturation: Less than 3V at 100 mA

OFF-state Leakage: Less than 10 µA

#### Max. End-to-End Latency

300 milliseconds \*

#### Analog Outputs

Update Rate: 125 milliseconds

Accuracy: 0.1% of full scale +0.01% per °C

Resolution: 12-bit

\*From the sample point and with a good RF signal.

### Environmental

#### Environmental Conditions

Rating: IEC IP67; NEMA 6; (See UL section below for any applicable UL specifications)

Operating Temperature: -40 to +85° C

Operating Humidity: 95% max. relative (non-condensing)

Radiated Immunity: 10 V/m, 80-2700 MHz (EN61000-6-2)

#### Shock and Vibration

IEC 68-2-6 and IEC 68-2-7

Shock: 30g, 11 millisecond half sine wave, 18 shocks

Vibration: 0.5 mm p-p, 10 to 60 Hz

Operating the devices at the maximum operation conditions for extended periods can shorten the life of the device.

### Certifications

