

Temperature and Humidity Sensor



M12FTH4Q and M12FT4Q

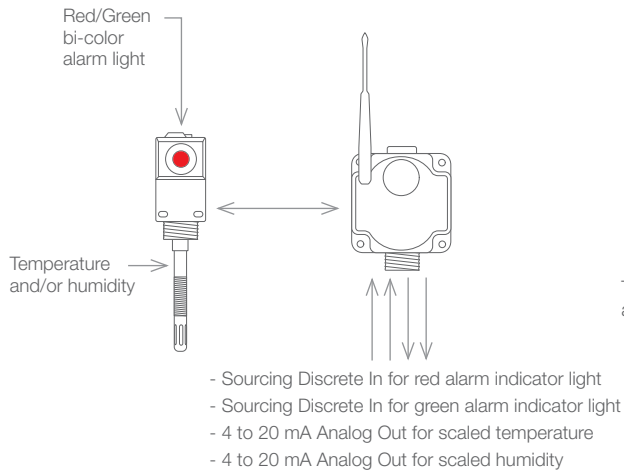


A simple way to verify conditions in locations that were once too difficult to access via traditional monitoring methods. With no software required, you can replace cables and extend the range of temperature and humidity signals with minimal effort.

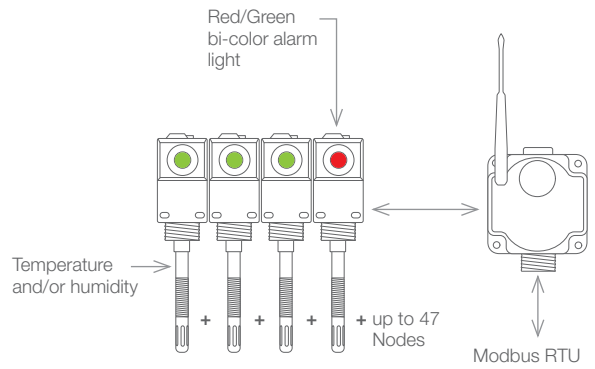
Key Features:

- Achieves temperature accuracy of ± 0.3 °C and humidity accuracy of $\pm 2\%$ relative humidity
- Temperature and relative humidity sensing elements housed in a robust metal housing
- Traceable to NIST standards
- Temperature and Humidity or Temperature-only Sensor to choose from
- Each sensor comes with a Certificate of Factory Calibration
- Reduces labor costs by obviating manual checks and reducing error

Simple Wire Replacement



Host Controlled via Modbus RTU (up to 47 Nodes)



Sensors with Serial Interface

Models	Description
M12FTH4Q	Temperature and relative humidity via a 1-wire serial interface
M12FT4Q	Temperature via a 1-wire serial interface

Nodes with Serial Interface

DX80N2Q45TH	Q45 Temperature/Humidity Node with integrated batteries	see page 16
DX80N91X1S-P6	1-wire serial Performance Node with integrated battery	see page 48
DX80N21X1S-P6		
DX80N9X6S-P6	1-wire serial Performance Node	see page 48
DX80N2X6S-P6		
DX80DR9M-H6	1-wire serial Modbus MultiHop Slave with integrated battery	see page 52
DX80DR2M-H6		

M12FTH4Q and M12FT4 Specifications

Supply Voltage	3.6 to 5.5 V dc	
Current	Default sensing: 28 μ Amps Disabled sensing: 15 μ Amps Active comms: 4.7 mA	
Mounting Threads	M12 x 1	
Indicators	Green flashing: Power ON	Red flicker: Serial Tx
Communication Hardware	Interface: 1-wire serial interface Baud rates: 9.6k, 19.2k (default), or 38.4k	Data format: 8 data bits, no parity (default), 1 stop bit (even or odd parity available)
Communication Protocol	Sure Cross [®] DX80 Sensor Node 1-wire serial Interface	
Communications Line	Level Receive ON: Greater than 2 V Level Receive OFF: Less than 0.7 V	Level Transmit ON: 2.7 to 3 V Level Transmit OFF: 0 V (pulldown resistor of 10 kOhm)
Humidity	Measuring Range: 0 to 100% relative humidity Resolution: 0.1% relative humidity Accuracy: \pm 2% relative humidity at 25 $^{\circ}$ C NOTE: Humidity measurements are only available with the M12FTH4Q model. The M12FT4Q model does not include the humidity sensor.	
Temperature	Measuring Range: -40 to $+85$ $^{\circ}$ C (-40 to $+185$ $^{\circ}$ F) ² Resolution: 0.1 $^{\circ}$ C Accuracy: \pm 0.3 $^{\circ}$ C at 25 $^{\circ}$ C	
Environmental Rating	NEMA 6, IEC IP67	
Operating Conditions	-40 to 85 $^{\circ}$ C (-40 to 185 $^{\circ}$ F)	
Shock and Vibration	IEC 68-2-6 and IEC 68-2-27 Shock: 30g, 11 millisecond half sine wave, 18 shocks Vibration: 0.5 mm p-p, 10 to 60 Hz	

Temperature and Humidity Sensor



M12FTH3Q and M12FT3Q

This temperature and humidity solution works in a variety of environments to wirelessly provide temperature and humidity measurements via Modbus RTU, RS-485.

Key Features:

- Achieves humidity accuracy of $\pm 2\%$ relative humidity and temperature accuracy of ± 0.3 °C
- Manufactured with a robust metal housing
- Traceable to NIST standards
- Functions as a Modbus slave device via RS-485

Sensors with Modbus RTU

Models	Description
M12FTH3Q	Temperature and humidity sensor with Modbus RTU, RS-485 interface
M12FT3Q	Temperature sensor with Modbus RTU, RS-485 interface

Radios with Modbus RTU (see pages 50-51)

Models	I/O	Frequency	Environmental Rating
DX80DR9M-H1	Inputs: Four discrete, two 0 – 20 mA analog, one thermistor, one counter Outputs: Two NMOS discrete Switch Power Outputs: Two Serial interface: RS-485 Wireless Q45 Serial Node for use with either M12FTH3Q or M12FT3Q	900 MHz (1 W)	IP67
DX80DR2M-H1		2.4 GHz (65 mW)	IP67
DX80DR9M-H1E		900 MHz (1 W)	IP67
DX80DR2M-H1E		2.4 GHz (65 mW)	IP65
DX80DR9M-H2	Inputs: Four discrete, two 0-20 mA analog Outputs: Four sourcing discrete, two 0-20 mA analog Serial Interface: RS-485	900 MHz (1 W)	IP67
DX80DR2M-H2		2.4 GHz (65 mW)	IP67
DX80DR9M-HB1	Inputs: Two NPN discrete, two 0-20 mA analog Outputs: Two NMOS discrete Switch Power Outputs: Two	900 MHz (1 W)	Board module
DX80DR2M-HB1		2.4 GHz (65 mW)	Board module
DX80DR9M-HB2	Inputs: Two PNP discrete, two 0-20 mA analog Outputs: Two PNP discrete, two 0-20 mA analog	900 MHz (1 W)	Board module
DX80DR2M-HB2		2.4 GHz (65 mW)	Board module
DX80SR9M-H	Serial Interface: RS-232, RS-485	900 MHz (1 W)	IP67
DX80SR2M-H		2.4 GHz (65 mW)	IP67

M12FTH3Q and M12FT3Q Sensors Specifications

Supply Voltage	12 to 24 V dc or 3.6 to 5.5 V dc low power option
Current	Default sensing: 45 μ Amps Disabled sensing: 32 μ Amps Active comms: 4 mA
Mounting Threads	M12 x 1
Indicators	Green flashing: Power ON Red flicker: Serial Tx
Communication Hardware	Interface: RS-485 serial Baud rates: 9.6k, 19.2k (default), or 38.4k Data format: 8 data bits, no parity (default), 1 stop bit (even or odd parity available)
Communication Protocol	Modbus RTU
Humidity	Measuring Range: 0 to 100% relative humidity Resolution: 0.1% relative humidity Accuracy: \pm 2% relative humidity at 25 $^{\circ}$ C NOTE: Humidity measurements are only available with the M12FTH3Q model. The M12FT3Q model does not include the humidity sensor.
Temperature	Measuring Range: -40 to $+85$ $^{\circ}$ C (-40 to $+185$ $^{\circ}$ F) ² Resolution: 0.1 $^{\circ}$ C Accuracy: \pm 0.3 $^{\circ}$ C at 25 $^{\circ}$ C
Environmental Rating	NEMA 6, IEC IP67
Operating Conditions	-40 to 85 $^{\circ}$ C (-40 to 185 $^{\circ}$ F)
Shock and Vibration	IEC 68-2-6 and IEC 68-2-27 Shock: 30g, 11 millisecond half sine wave, 18 shocks Vibration: 0.5 mm p-p, 10 to 60 Hz

Q45 Temperature and Humidity



Q45TH



The Q45TH connects directly to the M12FTH4Q & M12FT4Q sensors. With integrated lithium batteries, no software required to deploy it, and sample rates selectable using DIP switches, it is a simple solution for monitoring temp & humidity in climate controlled areas.

Key Features:

- Connects directly to the M12FTH4Q and the M12FT4Q
- Includes a red/green LED that can be used to provide local visual indication
- Set sample rates using DIP switches
- Integrated lithium batteries

Q45TH Node

Models	Description	Frequency
DX80N9Q45TH	Q45 Temperature and Humidity Node	900 MHz
DX80N2Q45TH		2.4 GHz

Temperature and Humidity Sensor

M12FTH4Q	Temperature and Humidity Sensor	see page 10
M12FT4Q	Temperature Sensor	

Q45TH Specifications

	900 MHz	2.4 GHz
Radio Range	Up to 3.2 Km (2 miles) with line of sight	Up to 1000 m (3280 ft) with line of sight
Minimum Separation Distance	4.57 m (15 ft)	0.3 m (1 ft)
Transmit Power	1W (25 dBm)	65 mW
Compliance	FCC ID UE3RM1809 - This device complies with FCC Part 15, Subpart C, 15.247 ETSI EN 300 328 V1.8.1 IC: 7044A-RM1809	FCC ID UE300DX80-2400 - This device complies with FCC Part 15, Subpart C, 15.247 ETSI EN 300 328 V1.8.1 (2012-04) IC: 7044A-DX8024
Spread Spectrum Technology	FHSS (Frequency Hopping Spread Spectrum)	
Default Sensing Interval	64 seconds	
Temperature Sensor	Measuring Range: -40 °C to +85 °C (-40 °F to +185 °F) Resolution: 0.1 °C Accuracy: ±0.3 °C	
Humidity Sensor	Measuring Range: 0% to 100% relative humidity Resolution: 0.1% relative humidity Accuracy: ±2% relative humidity at 23 °C	
Indicators	Red and green LEDs (radio function)	
Connection	One 5-pin threaded M12/Euro-style female quick-disconnect	
Construction	Molded reinforced thermoplastic polyester housing, oring-sealed transparent Lexan® cover, molded acrylic lenses, and stainless steel hardware. Q45s are designed to withstand 1200 psi washdown.	
Typical Battery Life at Default Sensing Interval	Up to 1.5 years	Up to 2 years
Environmental Rating	NEMA 6P, IEC IP67	
Operating Conditions	-40 °C to 70 °C (-40 °F to 158 °F); 90% relative humidity at 50 °C (non-condensing)	