



Energy and Environmental Data Radios



2016 8-Series Catalog



**Unwire
Your World**

866-417-5008

503-352-0654

www.environmentaldata radios.com
www.miratron.com



Welcome to the 2016 Miratron Data Radios catalog. Whether you're a long-time customer or currently considering us as a future part of your supply chain team, we're committed to delivering a great customer experience and high quality products.

The items represented in this catalog are just part of our radio portfolio, as we proudly offer many more online at **www.miratron.com**. From automation and data acquisition to intrinsically safe radio controls. We've got solutions to meet or exceed the needs of your wireless applications.

Our sales office is located in Portland, Oregon. Staffed with a knowledgeable team, ready to take on your most demanding applications. You can contact us via our toll free number **1.866.417.5008** or our local number **1.503.352.0654**.

Every customer we encounter is unique and each application can require a personal touch. We look forward to working with you to create a solution that exceeds your expectations. Thank you for giving us an opportunity to serve you.



Energy and Environmental data radios

Wireless Solutions for Building Automation and Energy Service Projects



FEATURES

- Long range reliability
Up to 3-mile range outdoor line-of-sight. Proven frequency hopping technology.
- Battery, solar, or externally powered
Long life battery with optional solar charging.
- Waterproof and rugged
Withstands harsh outdoor environments.
- BACnet MS/TP or Modbus RTU
Easy integration with BAS panels, DAQ's and PLC's.
- Universal inputs
Field selectable inputs: vdc, mA, or thermistor.

OPTIONS

- Sensors
Integrated high-accuracy, low power RH/T sensor probe with sintered metal filter and solar shield.
- Antennas
Long range directional and broad coverage omni models available.
- Mounting Brackets
Pole mount hardware kits available.

SERIAL OUTPUT RECEIVER

- Serial I/O options
RS-485 serial available in BacNET MS/TP or Modbus RTU
- Compact package
Small size fits easily in control panels.
- External antenna
Remote mounted antenna options for broad, omni-directional coverage or targeted, long-range performance.

Add and remotely configure transmitters easily via USB connection on receiver, or over Ethernet.



R8 Programmer

Setup:
1) Select TCP/IP or RTU Modbus Mode
2) Set Modbus ID
3) Enter IP address (for TCP) or Serial Port and Baudrate (for RTU)
4) (optional) "Save Settings" to remember the above settings for next time.

You should now be able to READ/WRITE the pointmap and LOAD/SAVE to a .csv file.

Notes:
MAC Address changes will read back as updated immediately. For all other settings to read back the new values you have to wait for a radio transaction to occur.
This will take about as much time as the "Radio Ping" setting is set to.

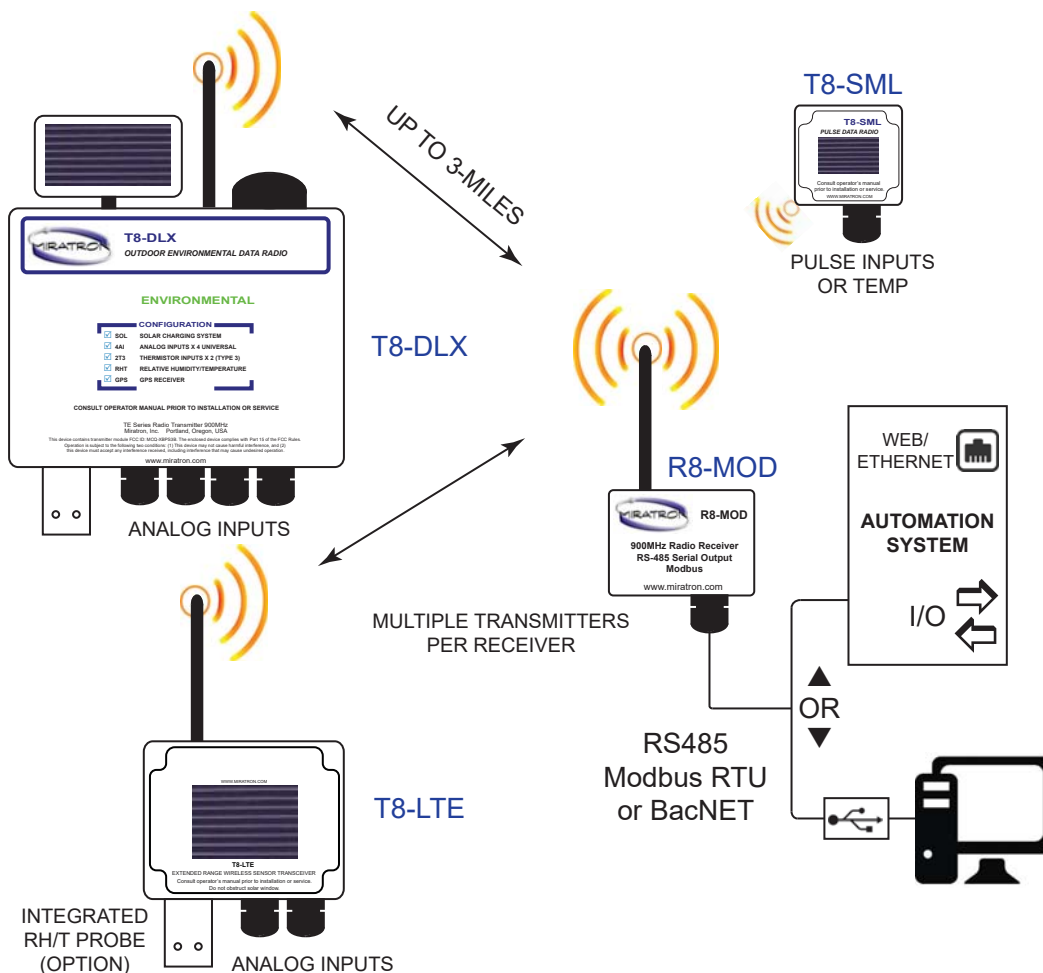
MAC Address	Radio Ping	Thermistor A	Warm-up	A Sample	GPS Ping	T1 Low	T1 High	T2 Low	T2 High	Last Packet	Tx Value
TX0: 0013A20400000000	60	2	0	60	0	0	0	0	0	0	A204007295 0.00
TX1: 0013A20400000000	60	2	0	60	0	0	0	0	0	0	A204007295 0.00
TX2: 0000000000000000	0	0	0	0	0	0	0	0	0	0	A204007295 0.00
TX3: 0000000000000000	0	0	0	0	0	0	0	0	0	0	A204007295 0.00
TX4: 0000000000000000	0	0	0	0	0	0	0	0	0	0	A204007295 0.00
TX5: 0000000000000000	0	0	0	0	0	0	0	0	0	0	A204007295 0.00
TX6: 0000000000000000	0	0	0	0	0	0	0	0	0	0	A204007295 0.00
TX7: 0000000000000000	0	0	0	0	0	0	0	0	0	0	A204007295 0.00
TX8: 0000000000000000	0	0	0	0	0	0	0	0	0	0	A204007295 0.00
TX9: 0000000000000000	0	0	0	0	0	0	0	0	0	0	A204007295 0.00

At last! Yes Seconds "2" or "T" Seconds Seconds Deg C Deg C Deg C Deg C Seconds Value

FEATURE COMPARISON

FEATURE	DLX for Weather Stations	LTE for Analog Sensors	SML for Pulse Meters
Radio	900MHz extended range up to 3 miles, or 2.4GHz standard range up to 1000 feet		
Enclosure	Coated steel, NEMA 4, w/padlock hasp	NEMA 4 Polycarbonate	NEMA 4 Polycarbonate
Analog Inputs	4 x Switch selectable 0-5v/0-10v/4-20mA	2 switch selectable inputs	None
Thermistor Inputs	2 x Dedicated thermistor inputs	Thermistor, voltage, or current (mA)	Built-in probe or thermistor input
Pulse Counting Inputs	No	No	1 or 2
OA RH/T Probe option	Yes	Yes	No
Soil Tension	1 x Dedicated vacuum sensor input	Use with analog input	No
GPS option	Yes	No	No
Power options	Solar, Battery, or externally powered.		
Battery Type	High Capacity LiFePO4	2 x "AA" alkaline	2 x "AAA" alkaline

SYSTEM TOPOLOGY





T8-DLX Environmental data radio

Universal environmental data radio transceiver station



FEATURES

- **Internally powered**
High capacity rechargeable battery with solar charger.
- **Sensor options**
Available with integrated relative humidity and temperature sensor, vacuum gauge for soil tension measurement, and GPS receiver. External soil temperature probe and wind speed anemometer also available.
- **Configurable inputs**
Four general purpose analog inputs switch selectable for 0-5v, 0-10v, or 4-20mA instruments. Two dedicated temperature inputs for 10k ohm thermistors.
- **Long-Range communication**
High power 900MHz radio link with directional antenna for reliable line of sight communication to 3 miles.
- **Rugged**
Coated, impact resistant, vented steel enclosure with weather tight gasket and cable seals stands up to harsh environments.

OPERATION

Inputs

Configured with up to 4 analog inputs from sensors, plus 2 dedicated thermistor temperature inputs. Optional built-in RH/T sensor, soil tension vacuum gauge input, and GPS receiver. Ideal for remote monitoring of ambient temperature and humidity, soil tension and temperature, wind speed/direction, and other environmental or industrial instrumentation.

Power

Internal high-capacity battery powers transmitter and external sensors. User selectable power management allows sensors to be automatically powered on only when needed. Data transmission rate is also selectable to optimize battery life and performance.

Radio

High-power 900MHz radio transmitter and directional antenna provides long-range reliable data link. Compatible with Miratron RE series receivers equipped with 0-5v, 0-10v, and/or 4-20mA output modules. Serial output versions also available including Modbus RTU and BACnet MS/TP for easy integration with building management systems or PLC's.

ORDERING INFORMATION

BASE MODEL WITH INTEGRATED OPTIONS

PART #	DESCRIPTION
TE8-DLX	Base transceiver, 900MHz radio (Add options below)
-SOL	Solar panel, integrated with automatic charger
-RHT	Integrated relative humidity/temperature sensor
-GPS	Integrated GPS receiver

Ordering examples:

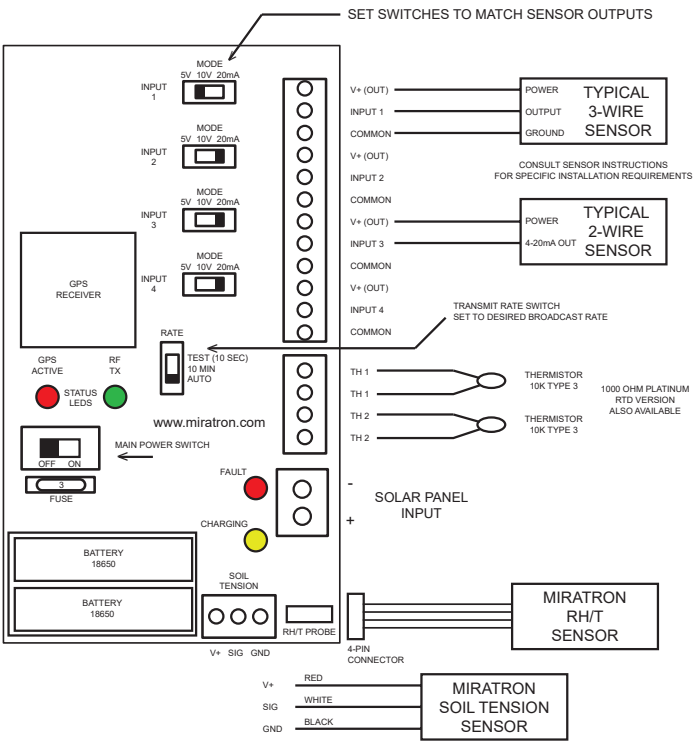
TE8-SOL-RHT-GPS (Transmitter with all options)

TE8-SOL-RHT (Transmitter with solar panel and RH/T sensor)

ACCESSORIES - ORDER SEPARATELY

PART #	DESCRIPTION
T8-VAC	Sensor kit for soil tensiometer
T8-IMM	Temperature sensing immersion probe
T8-ANE	Pulse to analog converter for cup anemometer
T8-PMK-DLX	Pole mounting kit.
ANT-YAG-900	Directional long-range Yagi antenna kit w/mounting.
ANT-OMN-900	Omni-directional long-range whip antenna kit w/mounting.

WIRING/CONFIGURATION



Consult installation manual prior to installation or service.

SPECIFICATIONS

Power	Power Supply	Internal (2 x 18650) rechargeable battery with solar charger
Inputs		4 x general purpose analog signal input 2 x temperature input, 10k-ohm thermistor, type 3 1x Serial interface for Miratron integrated RH/T sensor probe option 1 x Serial interface for Miratron integrated GPS receiver option 1 x Vacuum sensor input factory scaled for soil tensiometer
Configuration/Setup	Power	On/Off switch and 3-amp replaceable fuse
	Transmit rate	Switch selectable, 10 sec or 10 min fixed or programmable automatic interval
	Analog input	4 x Switch selectable 0-5v, 0-10v, or 4-20mA
	Status	Internal status, charging LEDs
Radio	Frequency	902-928MHz, Unlicensed ISM band, FHSS direct FM
	Range	Up to 3 miles outdoor line-of-sight with optional directional antenna
Enclosure		Coated steel, NEMA 4, 12" x 9" x 4-1/2", panel or pole mount

Consult factory for sensor option specifications.



T8-LTE Energy and Environmental data radio

Long-range, wireless sensor transceiver for outdoor use



FEATURES

- **Internally powered**
High capacity battery with solar charging option. Long life and low maintenance. Built-in 12vdc power supply operates external sensors for a truly wireless solution.
- **Configurable input options**
Two general purpose inputs switch selectable for 10k type 2 or 3 thermistor, 0-5v/0-10vdc, or 4-20mA instruments.
- **Sensor options**
Available with integrated outside air relative humidity and temperature sensor. Can be used in addition to other analog or thermistor inputs.
- **Long-Range communication**
High power 900MHz radio link with directional antenna for reliable line of sight communication to 3 miles. Standard range 2.4GHz version also available.
- **Rugged**
Impact resistant polycarbonate enclosure with weather tight gasket and cable seals stands up to harsh environments.

OPERATION

Inputs

Switch selectable universal inputs accommodate thermistors, voltage, or milliamp output devices. Optional built-in outside air RH/T sensor probe with stainless media filter and solar shield. Ideal for remote monitoring of ambient temperature and humidity, fluid levels, pressures, soil tension, surface or immersion temperatures, gas sensors, and other environmental or industrial sensor data.

Power

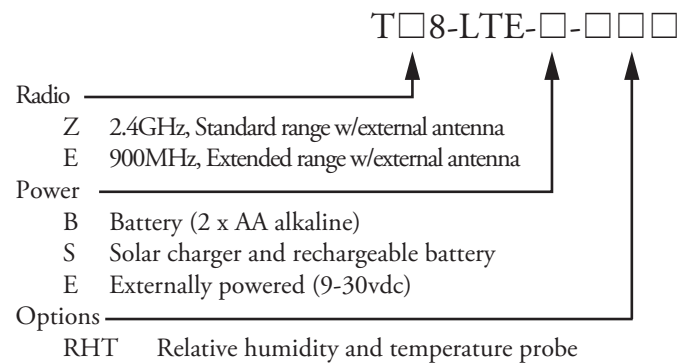
Internal high-capacity battery powers transmitter and external sensors. Solar charging and external powered versions also available. User selectable power management allows sensors to be automatically powered on only when needed. Data transmission rate is also selectable to optimize battery life and performance.

Radio

High-power 900MHz radio transmitter and directional antenna provides long-range reliable data link. Compatible with Miratron R8 series serial output receivers. Modbus RTU and BACnet MS/TP versions available for easy integration with building automation systems or PLC's.

ORDERING INFORMATION

BASE MODEL WITH INTEGRATED OPTIONS



Ordering example:
TE8-LTE-S-RHT (Extended range, solar power, and RH/T probe.)

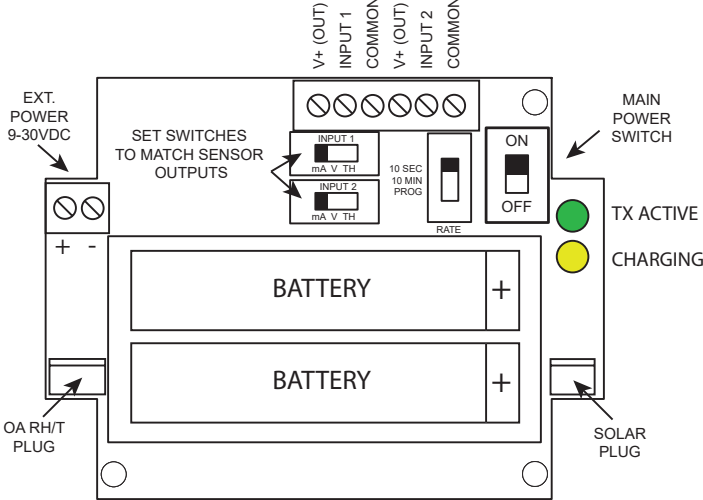
ACCESSORIES - ORDER SEPARATELY

PART #	DESCRIPTION
T8-VAC	Vacuum sensor kit for soil tensiometer
T8-IMM	Temperature sensing immersion probe w/armored cable
T8-ANE	Pulse to analog converter for cup anemometer
T8-PMK-LTE	Pole mounting kit w/tilt adjustment for solar alignment.
ANT-YAG-900	Directional long-range Yagi antenna kit w/mounting.
ANT-OMN-900	Omni-directional long-range whip antenna kit w/mounting.

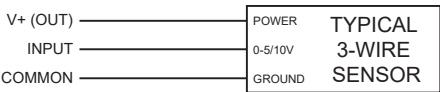
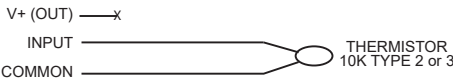
SPECIFICATIONS

Power	Solar charger (-S)	Internal (26650 LiFePO ₄) rechargeable battery with solar charging
	Battery only (-B)	Internal replaceable (2 x AA) alkaline battery
	External (-E)	9-30vdc, 100mA
Inputs	TH (thermistor setting)	Resistive input for 10k-ohm type 2 or 3 thermistor (jumper selectable)
	V (voltage setting)	0-10vdc input range
	mA (current setting)	0-20mA input range (for use with 4-20mA devices)
	-RHT option	Serial interface for Miratron integrated RH/T sensor probe option
Configuration/Setup	Power	On/Off switch
	Transmit rate	Switch selectable, 10 sec or 10 min fixed or programmable automatic interval
	Input selector switch	2 x Switch selectable thermistor, voltage or current input
	Indicators	Internal transmit and charging status LEDs
Radio	Standard Range	2.4GHz, Unlicensed ISM band, 1000 feet line-of-sight outdoor range
	Extended Range	902-928MHz, Unlicensed ISM band, Up to 3 miles outdoor line-of-sight with optional directional antenna
Enclosure	UV stable polycarbonate, NEMA 4X, 5-3/4" x 3-1/2" x 2-1/4", with molded-in mounting brackets	

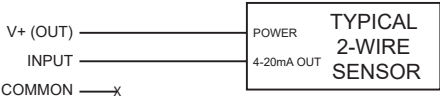
WIRING/CONFIGURATION



EXTERNAL SENSOR WIRING:



CONSULT SENSOR INSTRUCTIONS FOR SPECIFIC INSTALLATION REQUIREMENTS



Consult installation manual prior to installation or service.



T8-SML Energy data radio

Compact wireless pulse / temperature transceiver for outdoor use



FEATURES

- **Internally powered**
Battery powered with optional solar charger. Long life and low maintenance. Externally powered version available.
- **Configurable input options**
Models available with integral temperature sensing, externally wired thermistor, or dry contact/switch pulse counting.
- **Long-Range communication**
Long-range 2.4GHz radio link for reliable operation to 1,500 feet. High power 900MHz model available for reliable line-of-sight communication up to 3 miles with directional antenna.
- **Rugged**
Impact resistant polycarbonate enclosure with weather tight gasket and cable seals stands up to harsh environments.

OPERATION

Inputs

Configurable with temperature sensing and/or pulse counting inputs from utility meters.

Power

Internal replaceable batteries with optional solar charger. User selectable data transmission rate to optimize battery life and performance.

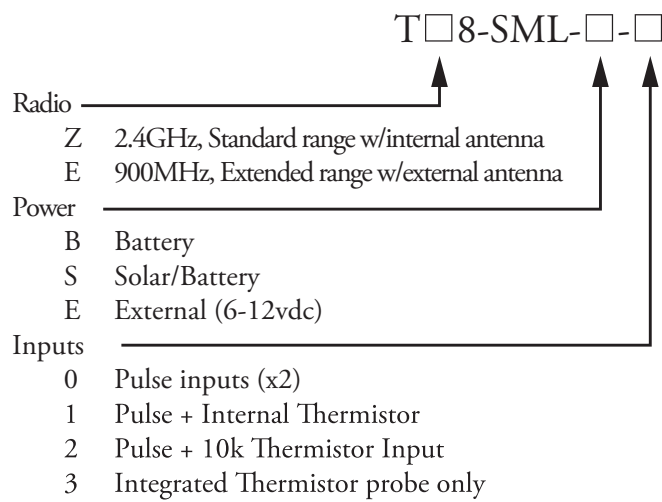
Radio

Long range 2.4GHz or high-power 900MHz radio transmitter and antenna options provide best range and battery life for a wide variety of applications. Compatible with Miratron RZ (2.4GHz) or RE (900MHz) series receivers equipped with 0-5v, 0-10v, and/or 4-20mA output modules. Serial output versions also available, including Modbus RTU and BACnet MS/TP for easy integration with building automation systems or PLC's.

Data Storage

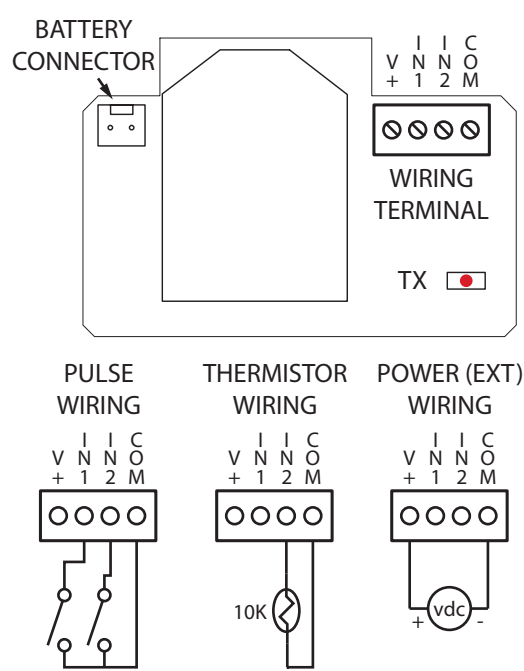
Transmitter stores pulse count totals until successful transmission to receiver is verified. Receiver stores data in non-volatile memory.

ORDERING INFORMATION



Part number examples:
TZ8-SML-S-0: Standard range, solar powered, w/ 2 pulse inputs.
TE8-SML-B-3: Extended range, battery power, w/temp probe.

WIRING/CONFIGURATION



Consult installation manual prior to installation or service.

SPECIFICATIONS

Power	Power Supply	Internal (2 x AAA) alkaline battery. (NiMH type with solar charging option) External option: 6 to 12vdc input, 10mA min. (terminal block)
Inputs	Temperature probe	Integrated stainless steel sensing probe
	Thermistor	Thermistor input for external 10k type 2 or type 3
	Pulse	Dry contact or solid-state switch closure counting (Non-volatile storage)
Configuration/Setup	Transmit rate	Programmable interval (Factory set, or configurable from serial receiver)
	Indicators	Internal transmit and charging status LEDs
Radio	Frequency	2.4GHz (TZ8) or 902-928MHz (TE8), Unlicensed ISM band, direct FM
	Range (TZ8)	1,000 ft. line of sight
	Range (TE8)	1 mile outdoor line-of-sight. 3 miles with optional directional antenna
Enclosure		UV stable polycarbonate, NEMA 4X, 3.7" x 2.35" x 1.5", with molded-in mounting brackets



R8 Series Data Output Receiver

Compact radio receiver with data output - Modbus, BACnet, CAN, or Profinet



FEATURES

- **Compact Size**
Easily integrated in tight control panels. Fits in 3" x 3" area.
- **Long-Range communication**
Long-range 2.4GHz radio link for reliable outdoor line-of-sight operation to 1,000 feet. High power 900MHz model available for reliable line-of-sight communication up to 3 miles with directional antenna.
- **Easy Integration**
Popular output types for compatibility with BAS systems, PLC's and DAQ's, automotive and hydraulic CAN controllers, and industrial automation systems.
- **Flexible antenna options**
RZ8 standard range and RE8 extended range models include RP-SMA connected rubber duck. Optional external wire whip for extended range. Yagi available for improved performance.

MODELS

R8-MOD (Modbus RTU) and R8-BAC (Bacnet MS/TP) models are ideal for data aggregation. Integrates easily into BAS systems or PLC's. Compatible with T8 series transmitters for pulse meter monitoring, sensor data acquisition, and weather station applications. USB port and application software provided for easy setup and configuration. Each receiver can store data from multiple transmitters.

R8-CAN version ideal for integration with CAN based controllers for vehicle and machine control. CAN messages can be factory customized for specific applications. Compatible with popular Miratron transmitter styles and CAN I/O modules.

R8-PRO (Profinet) version for industrial networking and automation. Factory configurable for specific customer applications. Compatible with popular Miratron transmitter styles.

ORDERING INFORMATION

		R	□	8	-	□	□	□
Radio								
Z	2.4GHz, Standard range w/external antenna							
E	900MHz, Extended range w/external antenna							
Protocol								
MOD	Modbus RTU							
BAC	BACnet MS/TP							
CAN	CANbus							
PRO	Profinet							

Consult factory for custom pointmap options.

SPECIFICATIONS

Power Output	Power Supply	5 to 24 VDC, 200mA max.
	-MOD	Modbus RTU Serial, 9600 baud 8N1
	-BAC	BACnet MS/TP, consult factory for specifications
	-CAN	Factory configurable CAN messages
	-PRO	Profinet compatible
Radio	Frequency	2.4GHz (RZ8) or 902-928MHz (RE8), Unlicensed ISM band, direct FM
	Range (RZ8)	1,000 ft. line of sight
	Range (RE8)	1 mile outdoor line-of-sight. 3 miles with optional directional antenna
Enclosure		Thermoplastic, 3" w x 2.75" h x 1" d, with molded-in mounting brackets



T8 Sensors and accessories

Add-on options for T8-DLX and T8-LTE environmental data radios

HUMIDITY

Outside air Relative Humidity and Temperature probe with solar shield - factory installed



-RHT
FACTORY INSTALLED
(ORDER WITH T8)

Fully calibrated. Excellent long-term stability. Recovers from 100% saturation.

SPECIFICATIONS:	
RANGE	0 to 100%RH, -40 to 120°C
RH ACCURACY	+/- 2%RH over 20-80%RH range
TEMP ACCURACY	+/- 0.3°C over 0-60°C range
OUTPUT	I ² C for use with T8 transceiver models only

TEMPERATURE

Stainless steel, potted immersion probe with armored cable



T8-IMM

Stainless steel probe. Encapsulated sensor. Armored cable. Weatherproof.

SPECIFICATIONS:	
THERMISTOR	10k type 3 standard - other types available
ACCURACY	+/- 0.2°C
PROBE	12 inches x 1/4" diam. Customization available.
CABLE	10 feet, 2-conductor, armored cable.

SOIL TENSION

Vacuum sensor kit for use with popular soil tensiometers



T8-VAC

Easy retrofit to popular soil tensiometer tubes. Factory calibrated. Armored cable.

SPECIFICATIONS:	
RANGE	0-100kPa vacuum
OUTPUT	1-5 vdc (12vdc power supply)
FITTING	1/4" MNPT, brass.
CABLE	10 feet, 2-conductor, armored cable.

WIND SPEED

Pulse to analog adapter kit for use with popular rotary cup anemometers



T8-ANE

Compact, weatherproof enclosure. Simple installation. Pre-configured conversion.

SPECIFICATIONS:	
RANGE	0.45 to 60 meters/second
OUTPUT	0-5 vdc (5-12vdc power supply)
CONVERSION	Internal: M/sec = (frequency x 0.79984) + 0.45
COMPATIBILITY	For use with Met One™ 014MINI cup anemometer

FLUID LEVEL

Pressure transducer for liquid level measurement



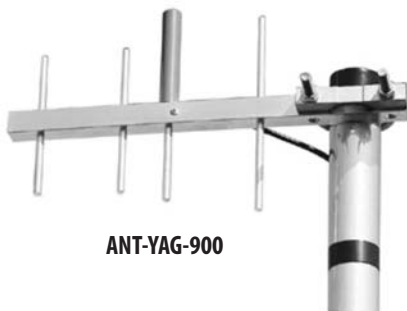
T8-LVL-[PSI]

Rugged stainless construction. Submersible. Compatible with various liquids.

SPECIFICATIONS:	
RANGE	Ranges available from 1 to 100 psi (2 to 230 feet)
ACCURACY	+/-0.25% BFSI
SEALING	IP68 - Submersible. 1/2" NPT conduit fitting at cable.
OUTPUT	1 to 5vdc (10 to 28vdc power)

ANTENNAS

Directional and Omni-directional options for improved performance



ANT-YAG-900

SPECIFICATIONS:	
TYPE	Directional Yagi, 4-element
GAIN	6 dB
CONNECTION	N female with 3 ft. N to SMA adapter cable
MOUNTING	Includes U-bolt for pole mounting up to 2-1/8" pipe



ANT-OMN-900

SPECIFICATIONS:	
TYPE	Omni-directional wire whip
GAIN	3 dB
CONNECTION	17 ft. coax with SMA connector
MOUNTING	NMO. Includes angle bracket for surface mounting

MOUNTING BRACKETS

Kits for pole installation

T8-PMK-LTE



T8-PMK-DLX



ORDERING INFORMATION

PART #	DESCRIPTION
T8-VAC	Vacuum sensor kit for soil tensiometer
T8-IMM	Temperature sensing immersion probe w/armored cable
T8-ANE	Pulse to analog converter for cup anemometer
T8-LVL-[PSI]	Pressure transducer for liquid level measurement

PART #	DESCRIPTION
T8-PMK-LTE	Pole mounting kit for LTE model.
T8-PMK-DLX	Pole mounting kit for DLX model.
ANT-YAG-900	Directional long-range Yagi antenna kit w/mounting.
ANT-OMN-900	Omni-directional long-range whip antenna kit w/mounting.



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