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.
**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.
## FEATURE COMPARISON

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

## SYSTEM TOPOLOGY

![System Topology Diagram](image-url)
**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

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

Ordering examples:
TE8-SOL-RHT-GPS (Transmitter with all options)
TE8-SOL-RHT (Transmitter with solar panel and RH/T sensor)

ACCESSORIES - ORDER SEPARATELY

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

Consult installation manual prior to installation or service.

SPECIFICATIONS

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 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”x9” x 4-1/2”, panel or pole mount

Consult factory for sensor option specifications.
**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

Radio
Z 2.4GHz, Standard range w/external antenna
E 900MHz, Extended range w/external antenna

Power
B Battery (2 x AA alkaline)
S Solar charger and rechargeable battery
E Externally powered (9-30vdc)

Options
RHT Relative humidity and temperature probe

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

ACCESSORIES - ORDER SEPARATELY

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<tr>
<td>T8-IMM</td>
<td>Temperature sensing immersion probe w/armored cable</td>
</tr>
<tr>
<td>T8-ANE</td>
<td>Pulse to analog converter for cup anemometer</td>
</tr>
<tr>
<td>T8-PMK-LTE</td>
<td>Pole mounting kit w/tilt adjustment for solar alignment.</td>
</tr>
<tr>
<td>ANT-YAG-900</td>
<td>Directional long-range Yagi antenna kit w/mounting.</td>
</tr>
<tr>
<td>ANT-OMN-900</td>
<td>Omni-directional long-range whip antenna kit w/mounting.</td>
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</table>

SPECIFICATIONS

Power
Solar charger (-S) Internal (26650 LiFEPO₄) 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 for10k-ohm type 2 or 3 thermistor (jumper selectable)
V (voltage setting) 0-10vdc input range
mA (current setting) 0-10vdc 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

Consult installation manual prior to installation or service.
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

T□8-SML-□-□

Radio

Z  2.4GHz, Standard range w/internal antenna
E  900MHz, Extended range w/external antenna

Power

B  Battery
S  Solar/Battery
E  External (6-12vdc)

Inputs

0  Pulse inputs (x2)
1  Pulse + Internal Thermistor
2  Pulse + 10k Thermistor Input
3  Integrated Thermistor probe only

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.

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

WIRING/CONFIGURATION

Consult installation manual prior to installation or service.
Compact radio receiver with data output - Modbus, BACnet, CAN, or Profinet

FEATURER

■ 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

<table>
<thead>
<tr>
<th>Radio</th>
<th>Protocol</th>
<th>Power Supply</th>
<th>Output</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>R8</td>
<td>Z MOD</td>
<td>5 to 24 VDC, 200mA max. Modbus RTU Serial, 9600 baud 8N1</td>
<td>MOD Modbus RTU</td>
<td>Modbus RTU Serial, 9600 baud 8N1</td>
</tr>
<tr>
<td></td>
<td>E BAC</td>
<td></td>
<td>BAC BACnet MS/TP</td>
<td>BACnet MS/TP, consult factory for specifications</td>
</tr>
<tr>
<td></td>
<td>CAN</td>
<td></td>
<td>CAN CANbus</td>
<td>Factory configurable CAN messages</td>
</tr>
<tr>
<td></td>
<td>PRO</td>
<td></td>
<td>PRO Profinet</td>
<td>Profinet compatible</td>
</tr>
</tbody>
</table>

Consult factory for custom pointmap options.

SPECIFICATIONS

- MOD
- BAC
- CAN
- PRO

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*

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

**SPECIFICATIONS:**

<table>
<thead>
<tr>
<th>RANGE</th>
<th>0 to 100%RH, -40 to 120°C</th>
</tr>
</thead>
<tbody>
<tr>
<td>RH ACCURACY</td>
<td>+/-2%RH over 20-80%RH range</td>
</tr>
<tr>
<td>TEMP ACCURACY</td>
<td>+/-0.3°C over 0-60°C range</td>
</tr>
<tr>
<td>OUTPUT</td>
<td>1°C for use with T8 transceiver models only</td>
</tr>
</tbody>
</table>

**TEMPERATURE**

*Stainless steel, potted immersion probe with armored cable*


**SPECIFICATIONS:**

<table>
<thead>
<tr>
<th>THERMISTOR</th>
<th>10k type 3 standard - other types available</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACCURACY</td>
<td>+/-0.2°C</td>
</tr>
<tr>
<td>PROBE</td>
<td>12 inches x 1/4” diam. Customization available.</td>
</tr>
<tr>
<td>CABLE</td>
<td>10 feet, 2-conductor, armored cable.</td>
</tr>
</tbody>
</table>

**SOIL TENSION**

*Vacuum sensor kit for use with popular soil tensiometers*

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

**SPECIFICATIONS:**

<table>
<thead>
<tr>
<th>RANGE</th>
<th>0-100kPa vacuum</th>
</tr>
</thead>
<tbody>
<tr>
<td>OUTPUT</td>
<td>1-5 vdc (12vdc power supply)</td>
</tr>
<tr>
<td>FITTING</td>
<td>1/4” MNPT, brass.</td>
</tr>
<tr>
<td>CABLE</td>
<td>10 feet, 2-conductor, armored cable.</td>
</tr>
</tbody>
</table>

**WIND SPEED**

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

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

**SPECIFICATIONS:**

<table>
<thead>
<tr>
<th>RANGE</th>
<th>0.45 to 60 meters/second</th>
</tr>
</thead>
<tbody>
<tr>
<td>OUTPUT</td>
<td>0-5 vdc (5-12vdc power supply)</td>
</tr>
<tr>
<td>CONVERSION</td>
<td>Internal: M/sec = (frequency x 0.79984)+0.45</td>
</tr>
<tr>
<td>COMPATIBILITY</td>
<td>For use with Met One™ 014MINI cup anemometer</td>
</tr>
</tbody>
</table>
FLUID LEVEL
Pressure transducer for liquid level measurement

Rugged stainless construction. Submersible. Compatible with various liquids.

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<td>Temperature sensing immersion probe w/armed cable</td>
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<td>T8-ANE</td>
<td>Pulse to analog converter for cup anemometer</td>
</tr>
<tr>
<td>T8-LVL-[PSI]</td>
<td>Pressure transducer for liquid level measurement</td>
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ANTENNAS
Directional and Omni-directional options for improved performance

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</tr>
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<tbody>
<tr>
<td>T8-PMK-LTE</td>
<td>Pole mounting kit for LTE model.</td>
</tr>
<tr>
<td>T8-PMK-DLX</td>
<td>Pole mounting kit for DLX model.</td>
</tr>
<tr>
<td>ANT-YAG-900</td>
<td>Directional long-range Yagi antenna kit w/mounting.</td>
</tr>
<tr>
<td>ANT-OMN-900</td>
<td>Omni-directional long-range whip antenna kit w/mounting.</td>
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MOUNTING BRACKETS
Kits for pole installation

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Data Radios

866-417-5008
503-352-0654
www.environmentaldataradions.com
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