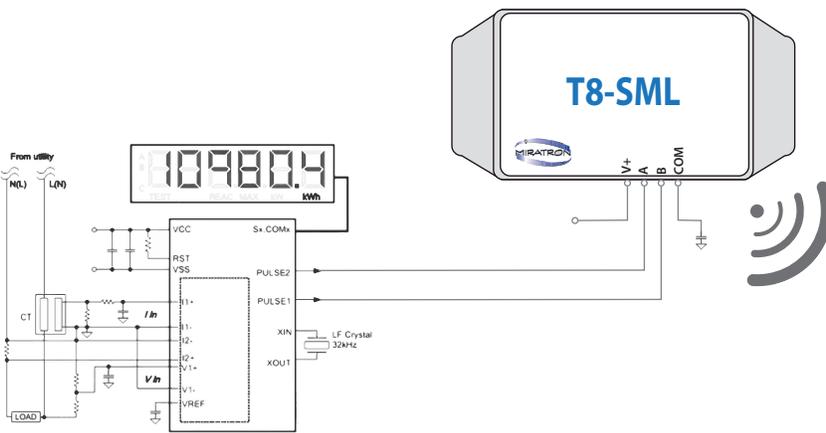
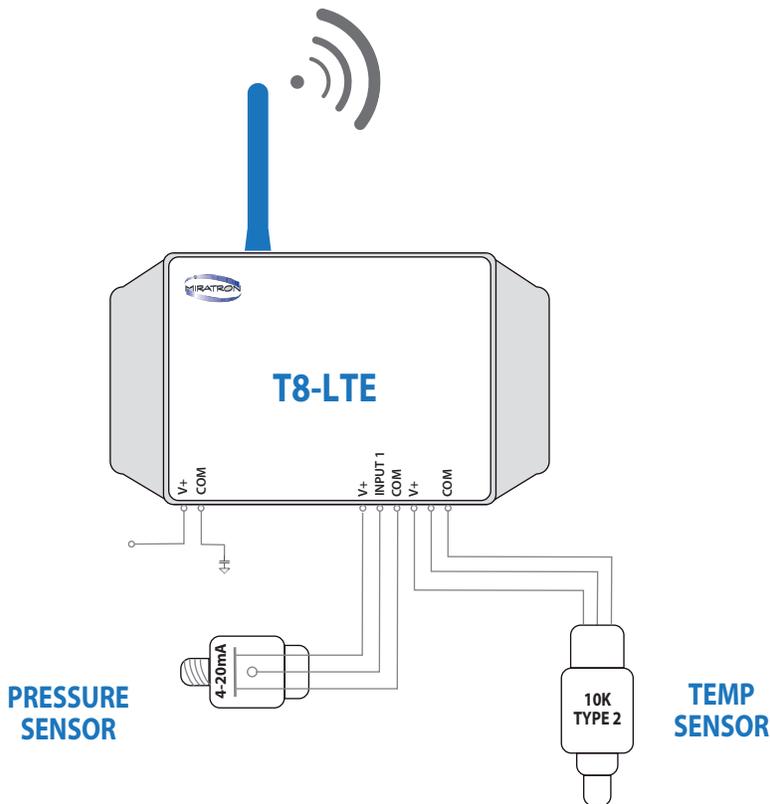


Installation Guide

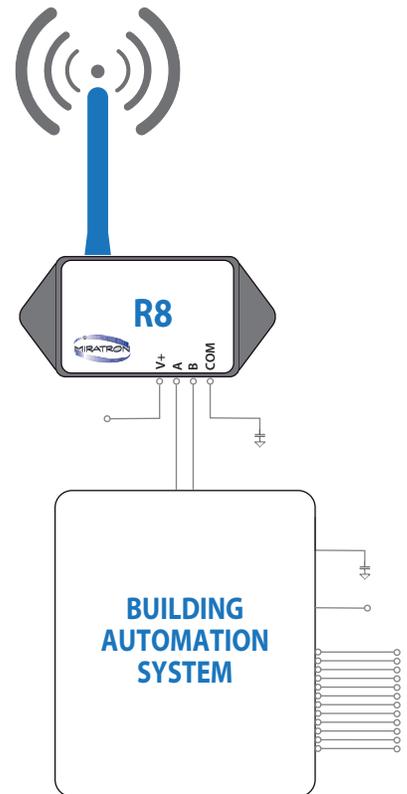


ENERGY METER



PRESSURE SENSOR

TEMP SENSOR



BUILDING AUTOMATION SYSTEM

Thank You!

Thank you for purchasing this hand crafted Miratron product! We have created this guide to help you get your 8 Series Energy Data Radio System or component up and running as quickly and seamlessly as possible. We have broken down the process into 3 basic sections--unpacking, software installation, system configuration and pairing.

Review the Table of Contents and go straight to the applicable section or follow the simple step-by-step process. Useful information about the products such as status LED definitions are detailed in the appendix. If at any time you need assistance please contact the Miratron service department at 1-866-417-5008.

For more information about this and additional Miratron products and services, please visit www.miratron.com or give us a call at 1-866-417-5008.

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T8/R8 Installation Overview



- 1 Unpack your T8/R8 system and verify you have all of the system components.



- 2 Download the R8 Setup Utility and install on your Windows computer.



- 3 Pair your new T8/R8 together and configure the system to work with your BAS.

Unpacking

When unpacking the 8 Series package, verify that for each system you have the following items:

QTY. (1) T8 Module



*T8-SML Model Shown
As Reference*

QTY. (1) R8 Module



QTY. (2) Antennas



Additional items *not included* that you will need to setup the system:

A usb to usb mini cable.

A laptop or computer running the Windows operating system.

A copy of the R8 Setup Utility, which is available from the following link:

<http://www.environmentaldata radios.com/downloads>

Software Installation

R8 Setup Utility

1. Download the setup utility from: <http://www.environmentaldata radios.com/downloads>
2. Save the zipped file to a convenient location.
3. Unzip the file and save the R8 Setup Utility folder to your desktop.
4. Open the folder and double click the R8_Setup_UTILITY file. Once open the application will appear as represented on the next page in Image 1. A black scripting screen will also open. This screen can be used for troubleshooting and logging information about any errors that may occur during the process. **Close the application before plugging in the R8 hardware. Failure to do so can cause COM errors.**

****Note**** Depending on the security setting of your operating system, you may get warnings that the software is potentially dangerous because the software is unsigned. Please ignore these warnings and continue with installation. On Windows 10 computers you may get a warning that says that the app is unrecognized. Click on the "More Info" link and then the "Run Anyway" button.

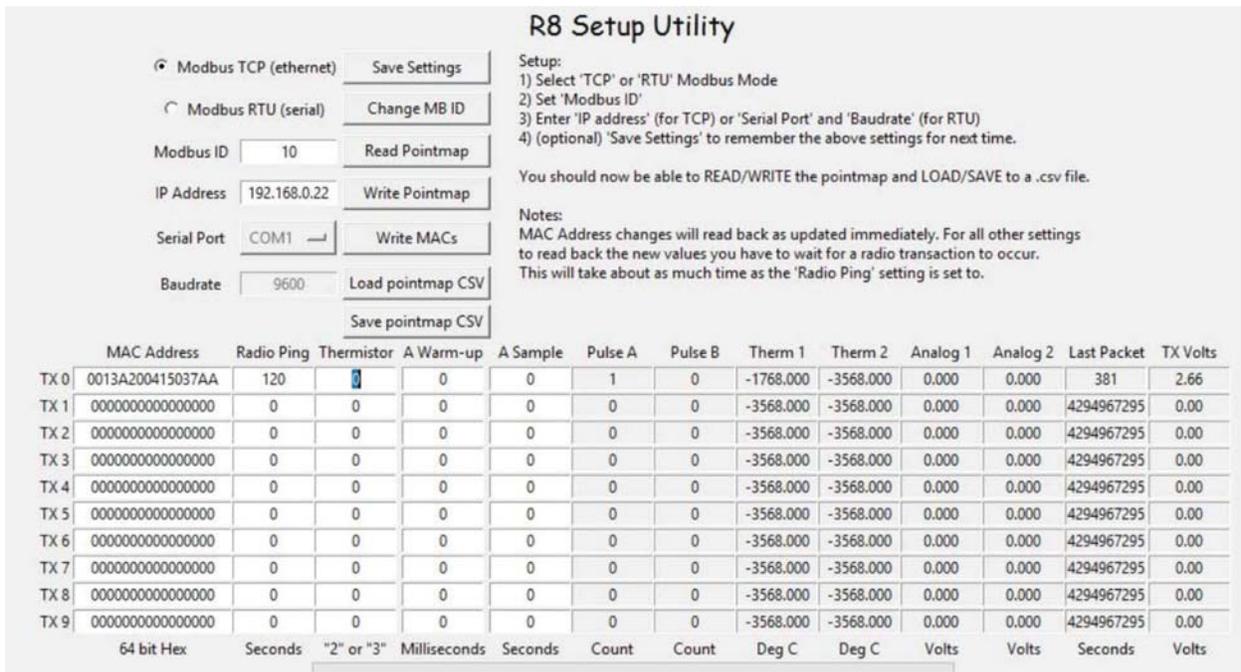


Image 1

The setup utility can be used to pair transmitters and receivers and configure operational parameters.

Pairing and Configuration

- Using a micro USB cable connect the R8 receiver to a computer. The red LED on the R8 will blink at a rate of twice per second.

****Note**** If the computer is connected to a PLC network, disable the connection until the pairing and configuration process is complete.

- Double click the file named R8_Setup_Utility.exe.
- In the "Baudrate" box set the receiver Baudrate to match your control system network. The default setting is 9600 BAUD.
- In the "Serial Port" box select a communication serial port. The default is COM1 but you may need to select a different port such as COM3.

****Note**** If the "Serial Port" box is not editable (grayed out), installing a 3rd party software driver will typically resolve the issue.

- Use the following link to download a virtual com port driver (VCP).
<http://www.ftdichip.com/Drivers/VCP.htm>
- Download and run the VCP that matches the PC OS type listed in the comments column of the table. Be sure to select the correct version for your Windows system (32 or 64 bit. If this does not resolve the issue, please contact Miratron technical support at 1-866-417-5008.

5. To ensure that the receiver is communicating with the computer, click the “Read Point Map” button. The MAC addresses of any paired transmitters, among other values, will be displayed for all transmitters associated with the connected receiver. Empty MAC address boxes will contain 0000000000000000 (see Image 1 for reference).

****Note**** If the MAC address fields remain blank, you are not connected to the R8. The MAC address fields should not be blank if the computer is communicating with the R8. Try changing the serial port to a different COM address. Double check your cables and ensure the R8 is plugged in and the red light is flashing before opening the program.

6. Open the transmitter lid by removing the 4 screws located on the faceplate. Locate the MAC address printed on a sticker attached to the radio module inside the housing. The MAC address is a 16-character address comprised of numbers and letters (see Image 2 for reference). Enter the MAC address without colons or spaces in any of the available “MAC Address” boxes of the tool. Click the “Write MACs” button to load the transmitter address into the receiver’s memory.



Image 2

7. Apply power to the transmitter by plugging in the battery lid, solar lid or power connection. The status LED located on the main board inside the housing will illuminate for approximately one second and then blink quickly one time. The LED will remain unlit until the transmitter pings the receiver which will vary depending on what the ping rate of the system is set to. The factory default is set to 600 seconds.

****Note**** If it doesn’t complete the blink sequence, ensure you are using fresh batteries, or the solar lid is fully charged or you have a proper 5-24V supply powering the transmitter. De-energize the unit for approximately one minute and try powering it up again.

8. To verify that the devices have been properly paired, enter 10 in the “Radio Ping” box then click the “Write Pointmap” button. Then press the “Read Pointmap” button. If the transmitter and receiver are paired, the “Last Packet” value will be less than 4,294,967,295, and the voltage of the transmitter will be greater than zero. After a few seconds the status LED on the transmitter will blink every 10 seconds to indicate it is pinging the receiver.
9. Once you have verified that the transmitter and receiver are communicating, change the radio ping rate from the 10 second test rate. The recommended setting is 600 seconds (10 minutes) or higher or as low as the minimum recommended setting of 60 seconds. The faster the transmitter pings the receiver the faster the batteries will be depleted. Enter the value in seconds into the “Radio Ping” field and click the “Write Pointmap” button.
10. Please note that any configuration changes that have been made will not take effect until the next radio transmission. Any sensor data in the Thermistor or Analog fields will not update until the next radio transmission. For example, if the ping rate is 600 seconds the first transmission will occur approximately 10 minutes after the pairing procedure is complete, confirmed by a last packet timer value less than (<) 4,294,967,295.

Troubleshooting

Cannot Install R8 Setup Utility Software

Depending on the security setting of your operating system, you may get warnings that the software is potentially dangerous because the software is unsigned. Please ignore these warnings and continue with installation. On Windows 10 computers you may get a warning that says that the app is unrecognized. Click on the “More Info” link and then the “Run Anyway” button.

The R8 Receiver is not communicating with the computer

Try changing the serial port to a different COM address. Double check your cables and ensure the R8 is plugged in and the red light is flashing before opening the program. If you are unable to select a COM port you can try installing a third party virtual com port driver such as the one in the link below.

<http://www.ftdichip.com/Drivers/VCP.htm>

The T8 Transmitter is not responsive

Ensure that the power source is properly connected to the device. Make any required adjustments. If this does not resolve the issue, try rebooting the processor. To reboot the processor, locate the 5-pin header positioned at the bottom of the circuit board (see image 3). Short the two pins at the far-right end of the header. If this operation was successful, the Status LED will blink once for approximately 1 second followed by a quick blink.



Image 3

The Ping Rate Change did not take effect

Configuration changes that have been made will not take effect until the next radio transmission. For example if the ping rate is 600 seconds, the first transmission will occur approximately 10 minutes after the pairing procedure is complete, confirmed by a last packet timer value less than 4,294,967,295.

Appendix

Operational Characteristics:

1. Transmitter Status LED

A single long (1 second) followed by a short blink indicates the transmitter has been properly powered up and is now ready to be configured or deployed. After the system has been configured, the LED will blink on every radio transmission (ping).

2. Receiver Status LED

When the receiver is powered up the receiver status LED blinks constantly at a rate of 2 Hz. This indicates that the processor is running properly. It does not provide information regarding radio or network communications.

3. Optional Solar Lid LED

The LED on the Solar Lid, located to the right of the Solar Panel will be dimly illuminated when the lid has adequate light and is charging the battery.

R8 Setup Utility Fields:

1. Last Packet Timer

The last packet timer is the number of seconds since the R8 receiver last communicated with a specific T8 transmitter. The base value stored in the RX is 4,294,297,295. A read request that reports this value indicates that the R8 has not yet synced up with that particular T8. A last packet timer value that is less than 4,294,297,295 indicates that the T8 has been properly paired to an R8 receiver.

2. Radio Ping

The radio ping rate defines the communication interval from a specific T8 transmitter to an R8 receiver. If the ping rate is set at 300 seconds, the T8 transmitter will send an update to the R8 every 5 minutes. In that exchange the T8 will receive any updates since the last transmission. For example, if the ping rate was changed to 120 seconds (2 minutes) the T8 will receive and incorporate that configuration change.

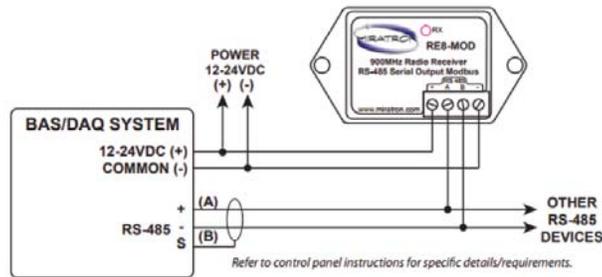
Reading and Writing Values to 8 Series Energy Data Radios

R8 / T8 parameters		
R8	T8-SML	T8-LTE
Modbus Baudrate	Ping Rate	Ping Rate
Modbus ID	Thermistor Type	Warm Up Time
Modbus Parity		Sample Rate
Modbus Stopbits		Thermistor Type
		T1 Low
		T1 High
		T2 Low
		T2 High
		T1 Slew
		T2 Slew

Values can be written to and read from R8 receivers dynamically; however, transmitter configuration changes and read requests are reflective of the most current transmission. T8 configuration changes and reported values are updated at each ping rate interval.

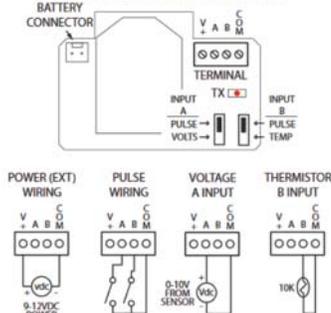
R8 / T8 Wiring Reference

RECEIVER WIRING/CONFIGURATION



R8

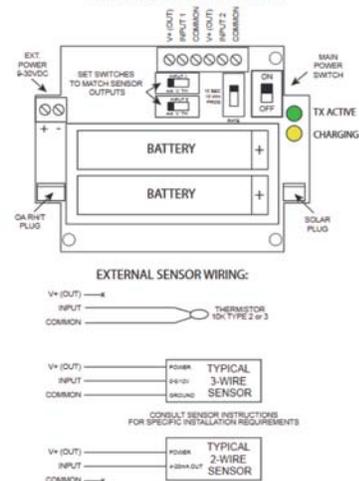
WIRING/CONFIGURATION



Note: V+ (external) power input may be safely connected on all versions including battery and solar models.

T8-SML

WIRING/CONFIGURATION



T8-LTE

R8-MOD POINTMAP
MODBUS SERIAL RECEIVER

RS485 RTU SERIAL, 9600 BAUD 8N1

CONFIGURATION	Read/Write	Name	Units	Type	Notes	DLX	LTE	SML
Address	[3,4]x001	MAC A		HEX16	Radio Address	✓	✓	✓
	[3,4]x002	MAC B		HEX16		✓	✓	✓
	[3,4]x003	MAC C		HEX16		✓	✓	✓
	[3,4]x004	MAC D		HEX16		✓	✓	✓
Rates	[3,4]x005	Radio Ping Rate	Seconds	UINT16	Broadcast interval	✓	✓	✓
	[3,4]x006	Warm Up Time	Seconds	UINT16	For 12v power	✓	✓	
	[3,4]x007	Sample Rate	Seconds	UINT16	For sensors	✓	✓	
	[3,4]x008	GPS Ping Rate	Seconds	UINT16	0xFFFF = Disable	✓	✓	
Thermistor	[3,4]x009	Thermistor Type		UINT16	Note 1	✓	✓	✓
	[3,4]x010	T1 Low Set Point	deg C	INT16	Note 2 0x7FFF = Disable	✓	✓	
Temp Set Points	[3,4]x011	T1 High Set Point	deg C	INT16		✓	✓	
	[3,4]x012	T2 Low Set Point	deg C	INT16		✓	✓	
	[3,4]x013	T2 High Set Point	deg C	INT16		✓	✓	
Pulse Counts	[3,4]x014	Pulse Count A		UNT32	Default = Disabled Factory Option			✓
	[3,4]x016	Pulse Count B		UNT32				✓
Modbus ID #	[3,4]9999	Modbus ID#		UINT16	Default = 10			✓

(x = transmitter #)

DIAGNOSTIC	Read Only	Name	Units	Type	Notes	DLX	LTE	SML
Raw Voltages	3x020	Thermistor 1	mV	UINT16	Analog 0	✓	✓	✓
	3x021	Thermistor 2	mV	UINT16	Analog 1	✓	✓	✓
	3x022	Input 1	mV	UINT16	Analog 2	✓	✓	
	3x023	Input 2	mV	UINT16	Analog 3	✓	✓	
	3x024	Input 3	mV	UINT16	Analog 4	✓	✓	
	3x025	Input 4	mV	UINT16	Analog 5	✓	✓	
	3x026	Vacuum	mV	UINT16	Analog 6	✓	✓	
	3x027	Battery	mV	UINT16	Analog 7	✓	✓	✓

(x = transmitter #)

DATA	Read Only	Name	Units	Type	Notes	DLX	LTE	SML
Scaled Data	3x030, 3x031	Battery	Volts	FLOAT32	Note 3	✓	✓	✓
	3x032, 3x033	Last Packet Timer	Seconds	UINT32		✓	✓	✓
	3x034, 3x035	Pulse Count A		UINT32		✓	✓	✓
	3x036, 3x037	Pulse Count B		UINT32		✓	✓	✓
	3x038, 3x039	Thermistor 1	deg F	FLOAT32		✓	✓	✓
	3x040, 3x041	Thermistor 2	deg F	FLOAT32		✓	✓	✓
	3x042, 3x043	Analog 1	Volts or mA	FLOAT32		✓	✓	✓
	3x044, 3x045	Analog 2	Volts or mA	FLOAT32		✓	✓	✓
	3x046, 3x047	Analog 3	Volts or mA	FLOAT32		✓	✓	✓
	3x048, 3x049	Analog 4	Volts or mA	FLOAT32		✓	✓	✓
	3x050, 3x051	O/A RH%	%RH	FLOAT32		✓	✓	✓
	3x052, 3x053	O/A TEMP	deg F	FLOAT32		✓	✓	✓

(x = transmitter #)

GPS OPTION	Read Only	Name	Units	Type	Notes	DLX	LTE	SML
GPS Data	3x060, 3x061	GPS Latitude		FLOAT32	Note 4	✓	✓	✓
	3x062, 3x063	GPS Longitude		FLOAT32		✓	✓	✓
	3x064	North/South		UINT16 (1 CHAR)		✓	✓	✓
	3x065	East/West		UINT16 (1 CHAR)		✓	✓	✓

(x = transmitter #)

OTHER	Read Only	Name
Reserved	3x100-3x999	Expansion/Legacy

NOTE 1: Thermistor Type. 2 = 10k TYPE 2, 3 = 10k TYPE 3. Consult factory for other options.

NOTE 2: If Thermistor 1 or Thermistor 2 readings are in programmed range, ping rate is automatically overridden to 10 seconds in auto mode.

NOTE 3: Not Reported Yet = -3568 deg F, Open Circuit / No Sensor = -1768 deg F

NOTE 4: N = 78 (0x4E), S = 83 (0x53), E = 69 (0x45), W = 87 (0x57), No Fix = 45 (0x2D)

Supported Modbus Function Codes

FC03 = Read 16 bit Output Holding Registers (4xxxx table)

FC04 = Read 16 bit Input Registers (3xxxx table)

FC06 = Write Single 16 bit Holding Register (4xxxx table)

Multiple Transmitters

Up to 10 transmitters are supported per receiver device.

30001 - 30999 = Transmitter 0 Registers Block 0

31001 - 31999 = Transmitter 1 Registers Block 1

32001 - 32999 = Transmitter 2 Registers Block 2

39001 - 39998 = Transmitter 9 Registers Block 9



866-417-5008

503-352-0654

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