Third party Environmental Sensors

Information on third party environmental sensors

- Comet T4411 Temperature Sensor (Modbus RTU)
- ACI TSense Environmental Sensor
- IMT Weather Station (Si-RS485TC-2T-v-MB)

Comet T4411 Temperature Sensor (Modbus RTU)

Overview

> This product is not fully supported by eGauge Systems. Information here is provided as-is.

The T4411 Temperature Sensor from Comet can be used to read temperature in outdoor installations or where a sensor meeting IP65 requirements must be used. The T4411 uses an RS485 interface, and as such requires either a BF430 serial to Ethernet adapter (when using the EG30xx or EG4xxx model lines) or an eGauge serial to USB adapter (EG4xxx with USB ports only). Both pieces of hardware can be purchased directly through eGauge Systems. Steps highlighted in green apply only to the BF430, while steps highlighted in blue apply only to the USB485 adapter. Any other steps are required regardless of which adapter type or eGauge model is used.

The information below is intended to provide an overview of the correct wiring, communication settings, and eGauge configuration. Additional steps may be required if the BF430 is not purchased directly through eGauge. eGauge systems can only provide limited support for the T4411 and BF430. Advanced questions may need to be addressed directly to Comet (for the T4411) or Chiyu (if using a BF430).

While these instructions are for the Comet T4411, most other Comet sensors should work with the eGauge. However, there may be differences in configuration, installation, required input power, etc. eGauge Systems cannot guarantee that every Comet sensor will work as expected. Please contact eGauge support if using a different sensor at support@egauge.net.

Installation and wiring

Serial to Ethernet adapter (BF430) - EG30xx and EG4xxx

The BF430 can power the T4411 directly using the included 12V 1A power supply. No additional power supply is needed in this configuration. Connect the BF430 to power using the supplied DC adapter.

Connect the wiring between the T4411 and BF430 as follows:

T4411	BF430
B (-)	485-
A (+)	485+
GND	9~30V-
U+	9~30V+

Make sure the toggle switch on the BF430 is set to "485".

The BF430 needs to be connected via Ethernet to the same network used by the eGauge. We recommend connecting the eGauge to the network via Ethernet as well - PLC or WiFi can cause issues with latency.

Serial to USB adapter (USB485) - EG4xxx with USB port only

With a serial to USB adapter (USB485), the T4411 will require an external power supply (check the T4411 documentation for acceptable voltage ranges; as of the time this article was written 9-30VDC is the standard). The 12Vdc power supply sold by eGauge systems will work in most cases. Connect the USB485 to the eGauge using the provided USB cable (untested cables may cause problems or may not work at all).

Connect the wiring between the T4411 and USB485 as follows:

| T4411	USB485
B (-)	D-
A (+)	D+
GND	⏚ terminal (ground)

The T4411 will need an external power supply with this configuration. The 12Vdc power supply sold by eGauge Systems will work, or a suitable power supply rated to provide 9-30VDC can be used. Connect the power supply as follows:

T4411	9-30VDC Power Supply
GND	negative side of power supply
U+	positive side of power supply

Make sure the termination switch on the USB485 is set to "ON"

Connect the USB485 to the USB port on the eGauge. Make a note of whether USB1 or USB2 is used.
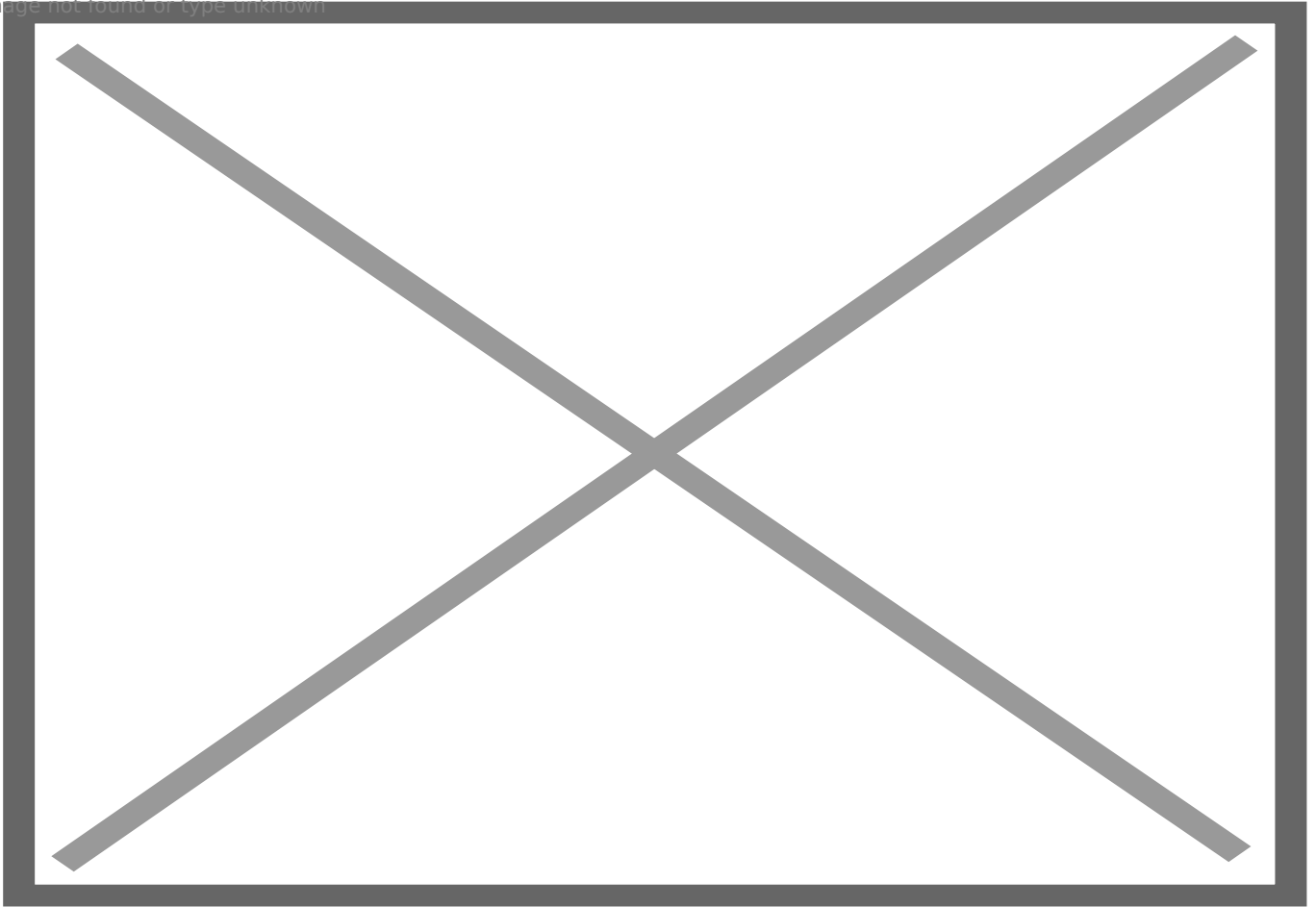
Sample wiring for the Comet T4411. T4411 shown with faceplate removed.

Third party device configuration

Verify T4411 settings

The Comet sensor default serial settings are as follows:

Baud: 9600
Data Bits: 8
Parity: None
Stop Bits: 2
Modbus ID/slave address: 1

These settings can be changed using the free TSensor software available through Comet. **eGauge Systems does not support or distribute this software**. For assistance with the TSensor software, contact Comet directly. If using multiple Modbus devices on a single RS485 chain, each

device must have a unique Modbus slave address.

Verify BF430 settings

The settings provided on the BF430 should be fine if purchased through eGauge. If configuring manually or if in doubt about the settings, connect the BF430 to the local network and use a computer to access the BF430 configuration page. The default credentials are user: **admin** pass: **admin**. Make sure the physical toggle switch on the BF430 is set to "485".

Click "Serial Type" from the menu on the left.

Make sure the following settings are in place:

Serial Type = RS485
Baud Rate = 9600 (selected in the dropdown, leave the user defined baudrate as "0")
Data Bits = 8
Parity Check = None
Stop Bits = 1
Flow Control = None
All other settings should be "0"

Verify USB485 Settings

The USB485 is not user-configurable, and has no settings to adjust. However, the termination switch should be set to "ON".

eGauge configuration

Create a Modbus map (Firmware 4.1 or later)

For instructions on creating an inline definition, see this section. Note that inline definitions are no longer recommended for use from firmware 4.1 onward.

Open the eGauge UI using the web browser of your choice. Navigate to **Settings -> Installation**. Under Remote Devices click "Modbus Map" - a new page will load.

Click the

≡+ icon in the top right corner of the page to create a new map. Name the map appropriately (in this example, we'll use T4411 as the map name - shorter is generally better).

Next, click the options button. Add the following options:

"Default unit number" should be set to 1 (assuming the default Modbus ID is set on the Comet sensor)
"Default serial-port parameters" should be set to 9600/8n1 (assuming default serial settings are set on the Comet sensor)

Option	Value	≡+
Default unit number	1	✕
Default serial-port parameters	9600/8n1	✕

Click "Save" in the bottom right corner of the page.

Next, click the "Add Register" button. Enter the following settings (note that "Scale" and "Offset" should be blank):

Add Modbus register

Address *
48

Register name *
TempF

Type *
u16 ▼

Kind *
analog ▼

Scale

Offset

Recorded unit *
record with 3 digits ▼

☐ read-only input register

Cancel   OK

Click OK, then click Save in the bottom right corner of the page. The final result should look like this:

For more information on the Modbus Map tool, see [this article.](#)

Add remote device

Navigate to **Settings -> Installation**. Under "Remote Devices", click "Add Device". Give the device a suitable name (this is arbitrary), then select "Serial" for the protocol (older meters may use "RS485" instead). In the device address field, enter:

BF430

modbus://T4411@MAC (where MAC is the MAC address of the BF430 adapter)

USB485

modbus://T4411@USBx (where x is either 1 or 2 depending on which USB port is in use)

After adding the appropriate address, click the grey "?" to the right of the remote device address. After a few seconds, this should turn into a green check mark.

Add registers

Before starting, make sure to fetch available registers by clicking the grey "?" to the right of the remote device address.

Under Registers (X of Y in use):

1. Click "Add Register".
2. Name the register as appropriate.
3. Using the dropdown menu, change the "P" to the remote device name.
4. A second dropdown menu will appear. Select the register of interest (for example, Humidity).
5. Repeat as necessary to add a register for each data point of interest.
6. Click "Save" at the bottom of the page to save settings. The eGauge will reboot.

Verify readings

Verify that the values on the main graph of the eGauge match those shown on the front of the T4411 (the external display on the T4411 can be used for this purpose). Note that a second or two of transmission delay may occur - this is normal.

After rebooting, the eGauge may take up to five minutes to start reading data from the T4411 (particularly if a BF430 is used).

(Deprecated) Add remote device using inline definitions

Once finished adding an inline definition, continue from the "Add remote device" section

When using a BF430

Device name = whatever is appropriate

Protocol = RS485 (firmware 4.0 and newer, select "Serial")

Device address = `modbus://tempF=48,u16.1@`**`<MAC>`** where **<MAC>** is the MAC Address of the BF430, for example `modbus://tempF=48,u16.1@`**`000ee3056940`**

Note that the T4411 (and all Comet sensors) have several Modbus registers in addition to temperature (and/or humidity and pressure, depending on model). These registers are not listed in this example for the sake of simplicity. For a full list of registers for a given device, contact Comet or visit https://www.cometsystem.com. By default, the T4411 provides temperature readings in F (this may not be true for meters purchased outside of the US). This can be changed using the TSensor software.

Click the grey "?" mark next to the remote device address and wait for a green check to appear. A red "X" typically indicates a configuration or wiring issue.

Click "Save" at the bottom of the page to save settings. The eGauge will reboot.

When using a USB485

Device name = whatever is appropriate

Protocol = RS485 (firmware 4.0 and newer, select "Serial")

Device address = `modbus://tempF=48,u16.1@USBX:9600/8n2` where **X** is the number of the USB port, for example `modbus://tempF=48,u16.1@USB1:9600/8n2`

Note that the T4411 (and all Comet sensors) have several Modbus registers in addition to temperature (and/or humidity and pressure, depending on model). These registers are not listed in this example for the sake of simplicity. For a full list of registers for a given device, contact Comet or visit https://www.cometsystem.com. By default, the T4411 provides temperature readings in F (this may not be true for meters purchased outside of the US). This can be changed using the TSensor software.

Click the grey "?" mark next to the remote device address and wait for a green check to appear. A red "X" typically indicates a configuration or wiring issue.

Click "Save" at the bottom of the page to save settings. The eGauge will reboot.

ACI TSense Environmental Sensor

> This product is not fully supported by eGauge Systems. Information here is provided as-is.

The TSense Environmental Sensor from ACI can be used to read CO2 concentrations, relative humidity, and temperature. The TSense uses an RS485 interface, and as such requires either a BF430 serial to Ethernet adapter (when using the EG30xx or EG4xxx model lines) or an eGauge serial to USB adapter (EG4xxx with USB ports only). Both pieces of hardware can be purchased directly through eGauge Systems. Steps highlighted in green apply only to the BF430, while steps highlighted in blue apply only to the USB485 adapter. Any other steps are required regardless of which adapter type or eGauge model is used.

The information below is intended to provide an overview of the correct wiring, communication settings, and eGauge configuration. Additional steps may be required if the BF430 is not purchased directly through eGauge. eGauge systems can only provide limited support for the TSense and BF430. Advanced questions may need to be addressed directly to ACI (for the TSense) or Chiyu (if using a BF430).

Installation and wiring

Serial to Ethernet adapter (BF430) - EG30xx and EG4xxx

The BF430 can power the T-Sense directly using the included 12V 1A power supply. No additional power supply is needed in this configuration. Connect the BF430 to power using the supplied DC adapter.

Connect the wiring between the T-Sense and BF430 as follows:

TSense	BF430
485_B	485-
485_A	485+
Agnd	9~30V-
G+_Pin1	9~30V+

Make sure the toggle switch on the BF430 is set to "485".

The BF430 needs to be connected via Ethernet to the same network used by the eGauge. We recommend connecting the eGauge to the network via Ethernet as well - PLC or WiFi can cause issues with latency.

Serial to USB adapter (USB485) - EG4xxx with USB port only

With a serial to USB adapter (USB485), the T-Sense will require an external power supply (check the T-Sense documentation for acceptable voltage ranges; as of the time this article was written 12V-24VDC works fine). Connect the USB485 to the eGauge using the provided USB to micro USB cable (untested cables may cause problems or may not work at all).

Connect the wiring between the T-Sense and USB485 as follows:

TSense	USB485
485_B	D-
485_A	D+
485_Gnd	terminal (ground)

The TSense will need an external power supply with this configuration. The power supply sold by eGauge Systems will work, or a suitable power supply rated to provide 12-24VDC can be used. Connect the power supply as follows:

TSense	12-24VDC Power Supply
Agnd	negative side of power supply
G+_Pin1	positive side of power supply

Make sure the termination switch on the USB485 is set to "ON"

Connect the USB485 to the USB port on the eGauge. Make a note of whether USB1 or USB2 is used.

Third party device configuration

Verify TSense settings

Verify the serial address settings and baud rate using the touchscreen on the front of the unit. There are two PIN numbers, PIN1 (1111) and PIN2 (2001). Depending on whether the hardware has been accessed in the past, there may not be a prompt for PIN1. If the PIN numbers have been changed, contact ACI for additional support.

Tap on the "SenseAir" logo -> enter PIN1 -> Settings -> enter PIN2 -> Meter -> RS485

Ensure the following settings are in place:

Protocol = Auto

Address = 10

Baudrate = 9600

Parity,Stopbits = None,1

Verify BF430 settings

The settings provided on the BF430 should be fine if purchased through eGauge. If configuring manually or if in doubt about the settings, connect the BF430 to the local network and use a computer to access the BF430 configuration page. The default credentials are user: **admin** pass: **admin**. Make sure the physical toggle switch on the BF430 is set to "485".

Click "Serial Type" from the menu on the left.

Ensure the following settings are in place:

Serial Type = RS485

Baud Rate = 9600 (selected in the dropdown, leave the user defined baudrate as "0")

Data Bits = 8

Parity Check = None

Stop Bits = 1

Flow Control = None

All other settings should be "0"

The USB485 is not user-configurable, and has no settings to adjust. However, the termination switch should be set to "ON".

eGauge Configuration

Add remote device

Open the eGauge UI using the web browser of your choice. Navigate to **Settings -> Installation**. Under Remote Devices click "Add Device"

When using a BF430

Device name = whatever is appropriate

Protocol = RS485 (firmware 4.0 and newer, select "Serial")

Device address = modbus://tsense.10@**<MAC>** where **<MAC>** is the MAC Address of the BF430, for example modbus://tsense.10@000ee3056940

Click the grey "?" mark next to the remote device address and wait for a green check to appear. A red "X" typically indicates a configuration or wiring issue.

Click "Save" at the bottom of the page to save settings. The eGauge will reboot.

Device name = whatever is appropriate

Protocol = RS485 (firmware 4.0 and newer, select "Serial")

Device address = modbus://tsense.10@USB**X**:9600/8n1 where **X** is the number of the USB port, for example modbus://tsense.10@USB1:9600/8n1

Click the grey "?" mark next to the remote device address and wait for a green check to appear. A red "X" typically indicates a configuration or wiring issue.

Click "Save" at the bottom of the page to save settings. The eGauge will reboot.

Add registers

Before starting, make sure to fetch available registers by clicking the grey "?" to the right of the remote device address.

Under Registers (X of Y in use):

Click "Add Register"

Name the register as appropriate

Using the dropdown menu, change the "P" to the remote device name

A second dropdown menu will appear. Select the register of interest (for example, Humidity)

Repeat as necessary to add a register for each data point of interest

Click "Save" at the bottom of the page to save settings. The eGauge will reboot.

Verify readings

Verify that the values on the main graph of the eGauge match those shown on the front of the TSense. Note that a second or two of transmission delay may occur - this is normal.

After rebooting, the eGauge may take up to five minutes to start reading data from the TSense (particularly if a BF430 is used).

IMT Weather Station (Si-RS485TC-2T-v-MB)

Overview

The IMT Weather Station model Si-RS485TC-2T-v-MB (referred to as the IMT sensor for the remainder of this article) is a high accuracy irradiance and cell temperature sensor. Optional attachments can be connected to monitor windspeed and ambient temperature. The IMT sensor is resold (not manufactured) and supported by eGauge Systems for use in applications where measuring irradiance may prove useful. The most common application would be to estimate solar production for an array of a given size using the irradiance and temperature data from the IMT sensor.

The IMT sensor communicates via Modbus RTU (RS485). A RS485 to USB adapter is required for use with the EG4xxx meter line, and a serial to Ethernet adapter is required for use with EG30xx meters. Instructions for using both adapters are included in this document.

> If using multiple IMT weather stations on the same serial bus, the Modbus address must be changed. See the manufacturer's information at https://www.imt-solar.com/downloads/ under "Software Si-Series" for more information.

> If splicing into a "wall wart" style DC power supply wires, verify the polarity of the DC output is correct with a voltmeter. Typically, **the wire with a white stripe or dash** is the **positive** line.

OEM Data Sheets

Visit https://www.imt-solar.com/ . Additional or newer version documents may be found in the "Downloads" section.

- Irradiance Sensor Main Unit Reference Guide (required for accessories)
- Irradiance Sensor Main Unit Data Sheet
- Wind Speed Sensor Data Sheet

- [Ambient Temperature Sensor Data Sheet](#)

Hardware Included

- IMT Weather Station (Si-RS485TC-2T-v-MB)
- Barrel connector to screw terminal block set
- 12Vdc power supply (120V American outlet wall-wart style)

Installation and Wiring

For best results, the IMT sensor must be installed in the same plane as the solar array. The sensor window should be clean and clear of any obstructions. Follow the mounting instructions included with the IMT sensor, and contact IMT directly with any questions regarding unique installation environments.

The IMT sensor has four wires and a heavier gauge wire shield connector. Depending on the application, the wire shield may or may not be used, and it is not shown in the following diagrams. If required, the wire shield should be connected to **earth ground**, not the RS485 ground or signal ground. Note that proper wiring is *essential*. Failure to wire the IMT sensor correctly will prevent the sensor from functioning and may cause damage.
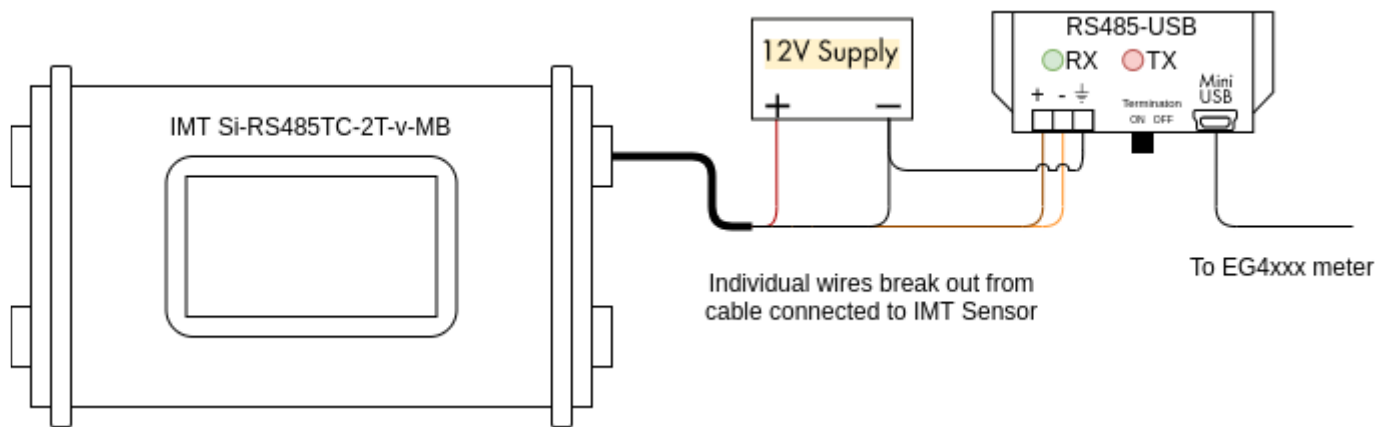

Wiring for EG4xxx with RS485-USB adapter

The following diagram shows the IMT sensor connected to a 12Vdc power supply and RS485-USB adapter. The eGauge is not shown.

> If splicing into a "wall wart" style DC power supply wires, verify the polarity of the DC output is correct with a voltmeter. Typically, **the wire with a white stripe or dash** is the **positive** line.

The wire assignments are as follows:

Black: Negative side of 12Vdc power supply
Red: Positive side of 12Vdc power supply
Orange: D- terminal on RS485-USB adapter
Brown: D+ terminal on RS485-USB adapter

> The larger, thick black wire is a grounded shield and must not be connected to the eGauge, power supply or USB485 converter. Only connect this wire if you know what you are doing as improper grounding conditions can cause damage or communication issues.

Additionally, it is necessary to connect the ground (⏚) terminal on the RS485-USB adapter to the negative terminal of the 12Vdc power supply.

A barrel connector with terminal blocks is included with the IMT sensor. Use the female side to quickly connect the IMT sensor to the 12Vdc power supply without splicing any wires. The male side can be discarded or saved for use in another project.
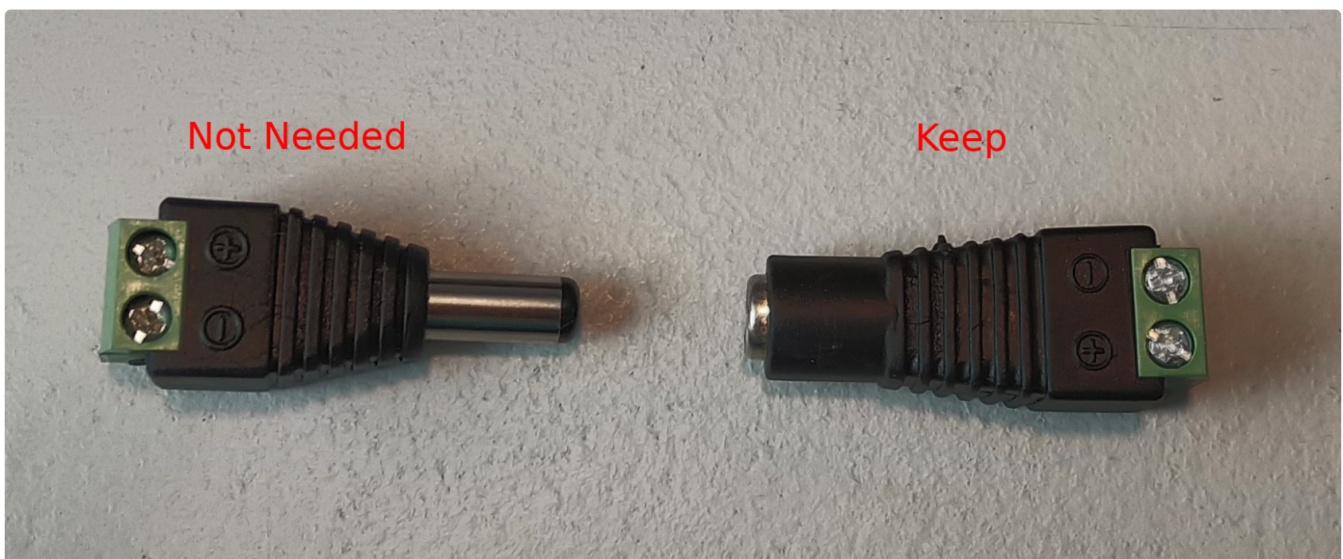
Use the included USB cable to connect the RS485-USB adapter to the eGauge, and make a note of which port is used (USB1 or USB2). Also ensure the termination switch on the RS485-USB adapter is set to "ON".

Wiring for EG30xx using BF430 serial to Ethernet adapter

The following diagram shows the IMT sensor connected to a BF430 serial to Ethernet adapter. The eGauge is not shown.
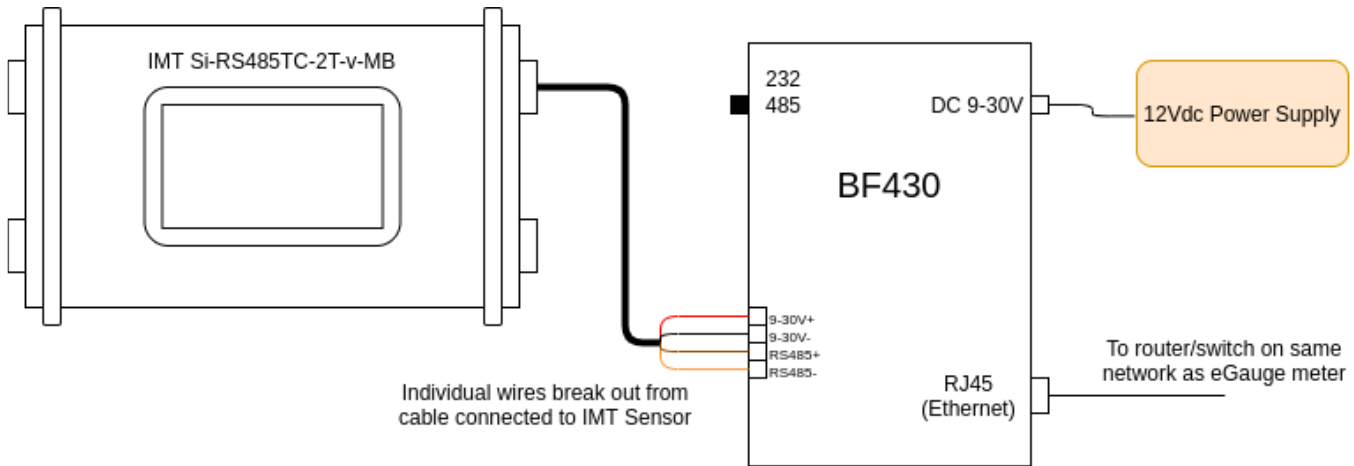
The wire assignments are as follows:

Black: 9-30V-
Red: 9-30V+
Orange: RS485- terminal on BF430 adapter
Brown: RS485+ terminal on BF430 adapter

A note on power: The BF430 obtains power through a 9-30Vdc power supply, and can optionally share that power source with a connected device. As such, all four wires on the IMT sensor are connected to the BF430. However, note that the 12Vdc power supply provided by eGauge (or a similar 12Vdc power supply) should be used, as 9Vdc is too low for the IMT sensor.

A barrel connector with terminal blocks is included with the IMT sensor, but it is not needed for this application. Discard this piece, or save it for another project.

Connect the BF430 to the same local area network as the eGauge, and ensure the external switch is set to "485".

Configuration

As a supported device, the IMT sensor has a predefined map built into the eGauge meter. This makes addressing and configuration very simple when using a RS485-USB adapter. Configuration with a BF430 is significantly more complex.

> Valid credentials are required for the eGauge meter in order to make changes. See this article for more information.

Configuration for EG4xxx using RS485-USB adapter

The RS485-USB adapter does not require any configuration on the adapter side. However, it's important to note which USB port is in use by the adapter. It's also necessary to ensure the termination switch is set to "on" when used with the IMT sensor.

1. Navigate to **Settings -> Installation**.
2. Under the "Remote Devices" section, click "Add Device" to add a new remote device.
3. Enter a suitable device name. This field is arbitrary, but should make sense to the end user.
4. Click the "Edit" button, and set the protocol to "Serial"
5. Enter the device address. This will be `modbus://imt_si.1@USBX` where X is the USB port (1 or 2).

Device name:		Protocol:	Device address:		
IMT Si-RS485TC-2T-v-MB	x =	Serial ∨	modbus://imt_si.1@USB1	? ⓘ	Edit
Add Device					

6. Click the grey "?" next to the device address field. After a few seconds, this should turn into a green check mark.
7. To save these settings, click the "Save" button at the bottom of the page.

> If a red X appears instead of a green check mark, ensure the wiring is correct, the USB port is identified correctly, the address is entered correctly, and that the IMT sensor has power.

Assuming a green check mark is displayed, the next step is to configure the eGauge to store data from the IMT sensor. To do this, at least one register will need to be created.

1. Ensure a green check mark is shown next to the remote device address. If a grey "?" is shown, click it and wait for it to turn into a green check mark.
2. On the Installation page, navigate to the "Registers" section and click "Add Register".
3. Enter a suitable register name. This field is arbitrary, but should make sense to the end user.
4. The default register type will be set to "P". Click the dropdown menu and select the remote device name for the IMT sensor.
5. A second dropdown menu will appear. Select the remote register to record.

Name:		Recorded value/formula:	
Cell Temperature	✕ =	IMT Si-RS485TC-2T-v-MB ⌄	Temp_Cell ⌄
Irradiance	✕ =	IMT Si-RS485TC-2T-v-MB ⌄	Irradiance ⌄

Add Register

6. Repeat steps 2-5 for each remote register.
7. To save these settings, click the "Save" button at the bottom of the page. The meter will reboot.
8. Once the meter reboots, the RX and TX LEDs on the RS485-USB adapter should be blinking.

> The IMT sensor has add-on hardware to measure ambient temperature and windspeed. These registers will be listed even if that hardware is not connected, but they will return invalid values if selected

Configuration for EG30xx with BF430 serial to Ethernet adapter

The BF430 requires additional configuration through its internal web interface. A computer with an Ethernet port and an Ethernet cable are required for configuration. The two primary areas of concern are applying the correct serial settings (listed below) and setting the BF430 to use either a dynamic IP address (obtained with DHCP) or a static IP address. Refer to the BF430 manual for additional information.

> Support for the BF430 is limited. Using a RS485 to USB adapter is *strongly* recommended.

1. Ensure the BF430 is configured to use the following serial settings for RS485 communication: 9600 baud, 8 data bits, no parity, 1 stop bit.
2. Ensure the BF430 is set to obtain an IP address via DHCP or use an appropriate static IP address depending on the network requirements (generally, DHCP is preferred).

Once the BF430 has been configured and wired:

1. Navigate to **Settings -> Installation**.
2. Under the "Remote Devices" section, click "Add Deice" to add a new remote device.
3. Enter a suitable device name. This field is arbitrary, but should make sense to the end user.
4. Click the "Edit" button, and set the protocol to "Serial"
5. Enter the device address. This will be `modbus://imt_si.1@MAC` where MAC is the MAC address of the BF430. If the BF-430 has been configured with a *static IP*, the IP may be used instead.

Device name:		Protocol:	Device address:		
IMT Si-RS485TC-2T-v-MB	☒ =	Serial ⌄	modbus://imt_si.1@2f57ba0013f2	? ⓘ	Done
Add Device					

6. Click the grey "?" next to the device address field. After a few seconds, this should turn into a green check mark.
7. To save these settings, click the "Save" button at the bottom of the page.

> If a red X appears instead of a green check mark, ensure the wiring is correct, the USB port is identified correctly, the address is entered correctly, and that the IMT sensor has power.

Assuming a green check mark is displayed, the next step is to configure the eGauge to store data from the IMT sensor. To do this, at least one register will need to be created.

1. Ensure a green check mark is shown next to the remote device address. If a grey "?" is shown, click it and wait for it to turn into a green check mark.
2. On the Installation page, navigate to the "Registers" section and click "Add Register".
3. Enter a suitable register name. This field is arbitrary, but should make sense to the end user.
4. The default register type will be set to "P". Click the dropdown menu and select the remote device name for the IMT sensor.
5. A second dropdown menu will appear. Select the remote register to record.

Name:		Recorded value/formula:	
Cell Temperature	☒ =	IMT Si-RS485TC-2T-v-MB ⌄	Temp_Cell ⌄
Irradiance	☒ =	IMT Si-RS485TC-2T-v-MB ⌄	Irradiance ⌄
Add Register			

6. Repeat steps 2-5 for each remote register.
7. To save these settings, click the "Save" button at the bottom of the page. The meter will reboot.
8. Once the meter reboots, the RX and TX LEDs on the BF430 adapter should be blinking.

Viewing Data

The data recorded from the IMT sensor can be viewed like any other data point recorded by the meter. To see this data, navigate to the main graph page and select the appropriate register(s) from the list under the main graph. In the following example, the graph is set to display irradiance data (with temperature and windspeed data as options under the main graph.
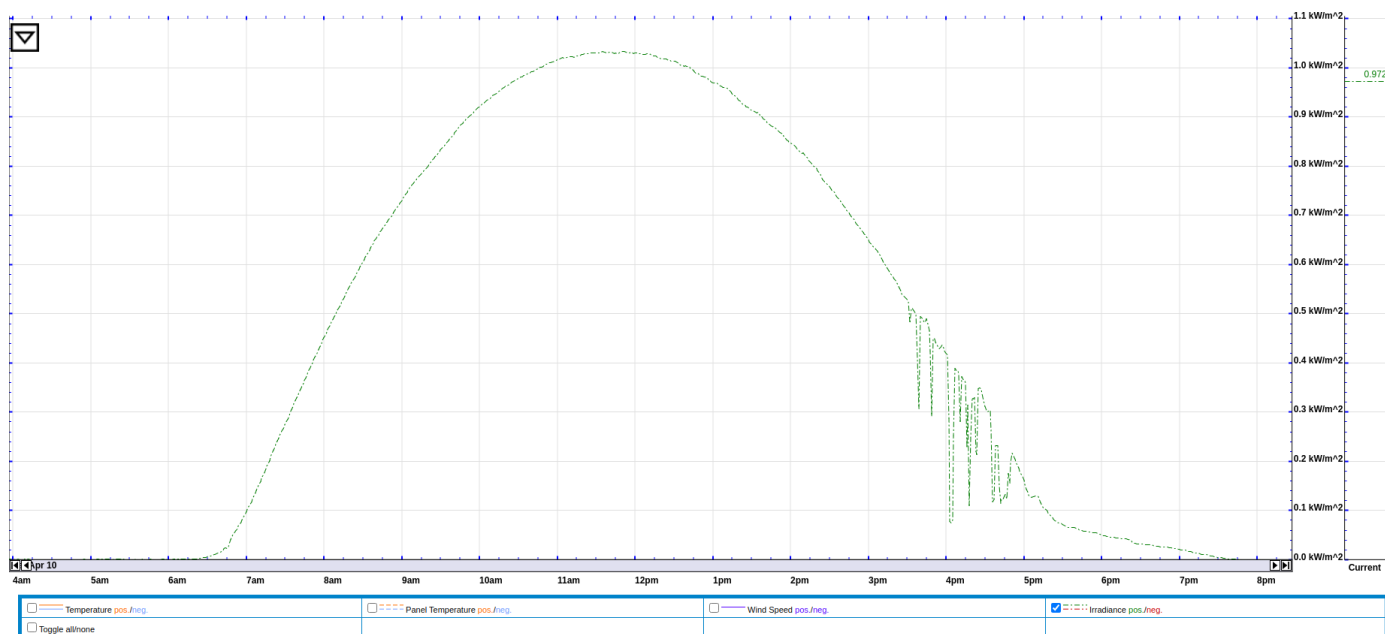
Data from the IMT sensor can also be used in formula registers to calculate the estimated solar production at a site. The formula for this calculation requires real time irradiance and temperature data (obtained from the IMT sensor), the array's rating in watts, and the panel temperature coefficient (usually a small negative number). The following example shows this formula based on a 10kW array and a temperature coefficient of -.12%.

The formula field contains: P_PV($"Irradiance",$"Cell Temperature",10000,-.12)

Additional Sensors

The IMT sensor supports two additional sensors: a wind speed sensor and an ambient temperature sensor. These sensors connect directly to the IMT sensor body. To connect these sensors, remove the appropriate threaded cap from the sensor body (the wind speed sensor uses the two pin connector, and the ambient temperature sensor uses the three pin connector). In the image below,

one cap has been removed (left).

When using an add-on sensor, the configuration is exactly the same *except* additional registers will need to be created to record data from the add-on sensors.

> Do not connect anything besides official IMT add-on sensors to these ports. Doing so will cause damage and void the warranty on the IMT sensor.

Suggested Reading

- RS485-USB adapter
- General information on connecting remote devices via RS485-USB adapter
- RS485-Ethernet adapter (BF430)
- Remote devices and third party devices