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

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).

Please visit kb.egauge.net for the most up-to-date documentation.