

Modbus Serial 245

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Overview

This document guides you through use of the Modbus serial devices with Tipify™.

Connectors

The 245 provides an RS-485 port via the three pin connector shown below. Wire should be 28 - 14 AWG.



Connectors from the Left

- 4 pin Pulse Inputs (1+,COM,2+,COM) left to right.
- USB
- Ethernet 2 LAN
- Ethernet 1 WAN
- 3 pin RS485 – s1 - The RS-485 on 240 is pinned (+,COM,-) left to right.
- RS232 – s0
- Power

LEDs

The LEDs provide indication of some of the 240's hardware features including the RS-485 used for Modbus Serial.

Note: Your label may show 3G or 4G depending on when it was manufactured. Behavior is the same.



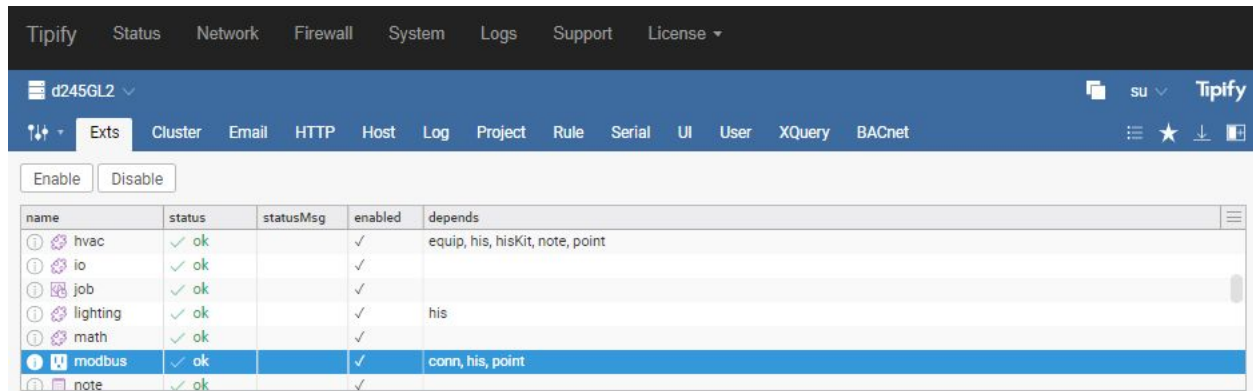
These include:

- First 4 - cell signal growing from left to right
- 3G Status - status light driven by modem (off=modem off, on solid=provisioning, blinking=normal)
- 3G Mode - supposed to be (on=modem is uplink, off=otherwise)
- GPS Status - related to GPS operation
- RS-485 - lights up on transmit or receive on RS-485 port
- HBEAT - defined as follows
 - on=system boot in progress
 - off= system shutting down
 - 50% duty blink=normal operation
 - 10% duty blink=JVM has exited or not running
 - single blink=no ppp established
 - double blink=ppp established
- SYS PWR - lights up when all power supplies are operating within correct voltage tolerance

Note: HBEAT - Heartbeat is currently on solid when running r3.

Enable the Modbus Extension

Select your project and go to Settings. Enable the Modbus extension by selecting it and pressing Enable if it is not already enabled (status Green ok).



Add Register Maps

The Connectors app is used to add Register Maps for Modbus. You must set up a map for each type of Modbus device.

See <https://skyfoundry.com/doc/ext-modbus/doc#regMap> for more information.

Note: If you change a Register Map after the Connector has been pinged, it is cached and you will need to Disable and Enable your connector to force a reload. If you make changes to the actual tag names, you will need to delete your points and re-add them.

Register Maps

Select Connectors and then press Register Maps to access your Register Maps.

The screenshot displays the Tipify web interface for configuring Modbus connectors. The top navigation bar includes 'Tipify', 'Status', 'Network', 'Firewall', 'System', 'Logs', 'Support', and 'License'. The breadcrumb trail indicates the current location: 'test245GL2 > Connectors'. The sidebar on the left lists various device categories: BACNET, HAYSTACK, 245GL, 245GL3, 245GM2, MODBUS, PULSE, and TUNING. The main content area shows a table of connectors. The 'VerisE50C2' connector is selected, showing its URI as 'data/modbus/VerisE50C2.csv'. Below this, a table lists the register maps for this connector, including fields like 'ping', 'command', 'systemType', 'ctRatio', 'ptRatio', 'systemVoltage', 'maximumSysPower', 'phaseLossVoltageThreshold', 'phaseLossImbalanceThreshold', and 'pulseRatio'.

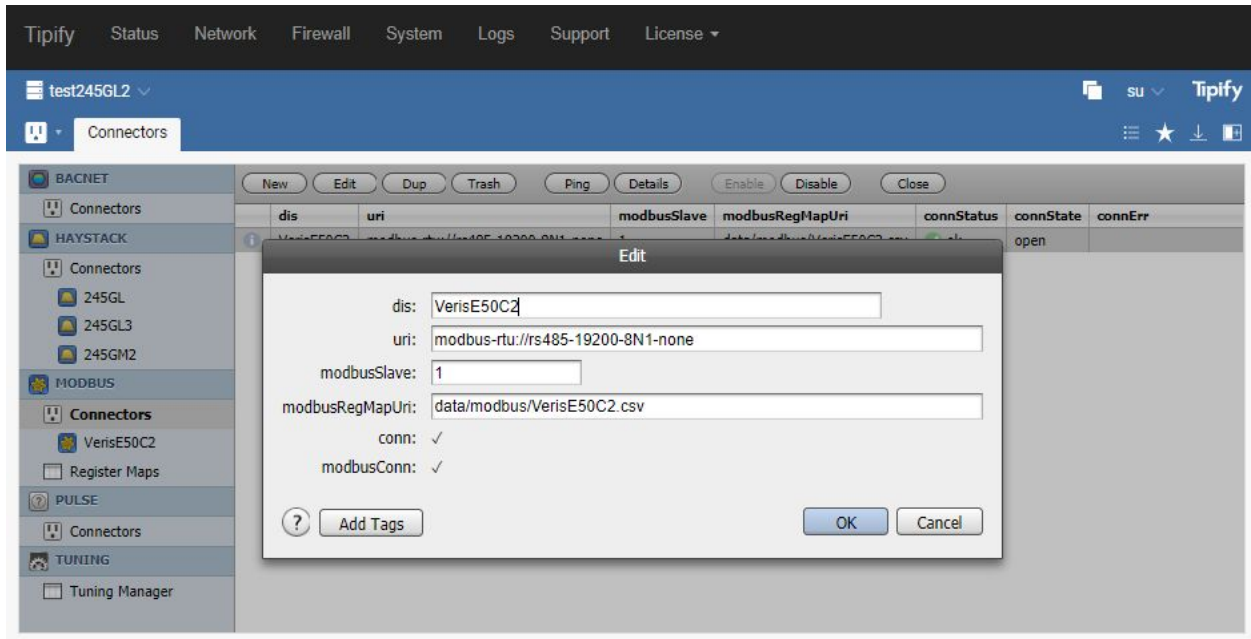
name	addr	data	rw	scale	dis	unit	tags
ping	40025	u2	r		ping		
command	40129	u2	rw		Command		
systemType	40130	u2	r		System Type		
ctRatio	40131	u2	r		CT Ratio		
ctRatio2	40132	u2	r		Ct Ratio 2		
ptRatio	40133	u2	r		PT Ratio		
systemVoltage	40134	u2	r		System Voltage	V	
maximumSysPower	40135	u2	r		Maximum System Power	kW	
phaseLossVoltageThreshold	40142	u2	r		Phase Loss Voltage Threshold	%	
phaseLossImbalanceThreshold	40143	u2	r		Phase Loss Imbalance Threshold	%	
pulseRatio	40144	u2	r		Pulse Ratio		

Press New Map to create a new register map. Enter a name for your map and press OK. If you want to paste a complete map, press the Edit Source on the right and paste the complete map. You will then see the columns in the map.

In addition to the name, address, data type and read/write entries, the Register Map can automatically add scale, display name, units and tags to your point as shown in the example above.

Add Modbus Connectors

Set up a connector for each Modbus device. Use Connectors app to add Connectors for each Modbus device. Select Modbus Connectors and press New in the top menu to add your connector.



dis - Display Name – This is the name used to reference your device.

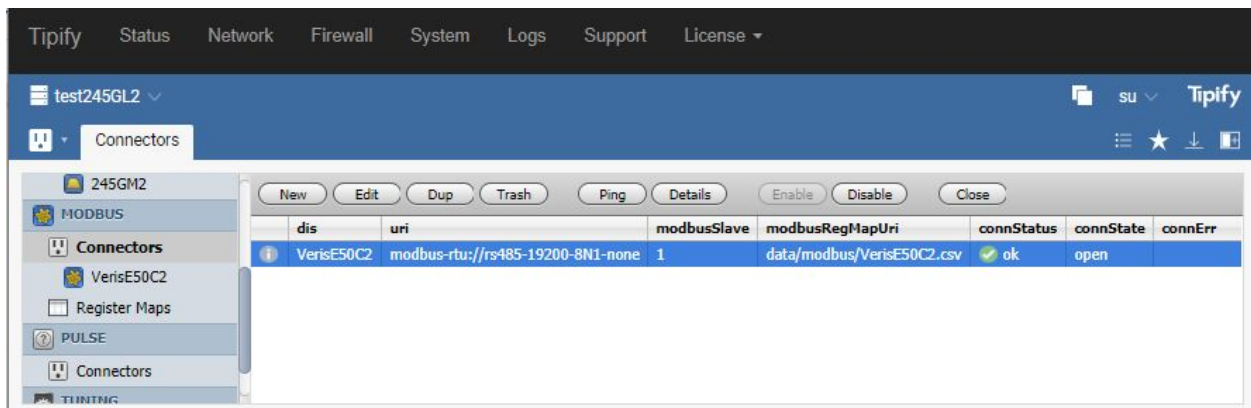
uri – This selects which type of Modbus connectivity. Use “modbus-rtu://s1” for serial Modbus.
 modbus-rtu://{serial-port}-{baud}-{data|parity|stop}-{flow}

E.g. `modbus-rtu://rs485-9600-8N1-none` (none for no flow control, this only ever needs to be used for rs232 modbus)

modbusSlave - Modbus Slave – This is the Modbus address of the device like 3.

modbusRegMapUri - Modbus Register Map URI – This is a reference to the Register Map you created for this type of device. Don't forget to enter “data/modbus/” before and “.csv” after the name you used when entering the Register Map like “data/modbus/veris.csv”.

Press OK to create your connector.

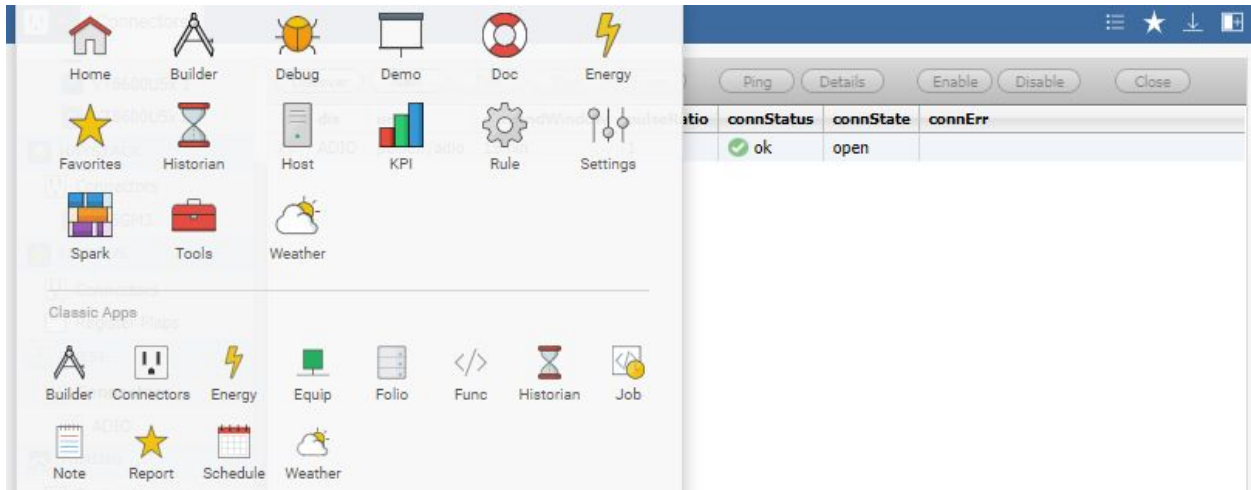


Check Connector

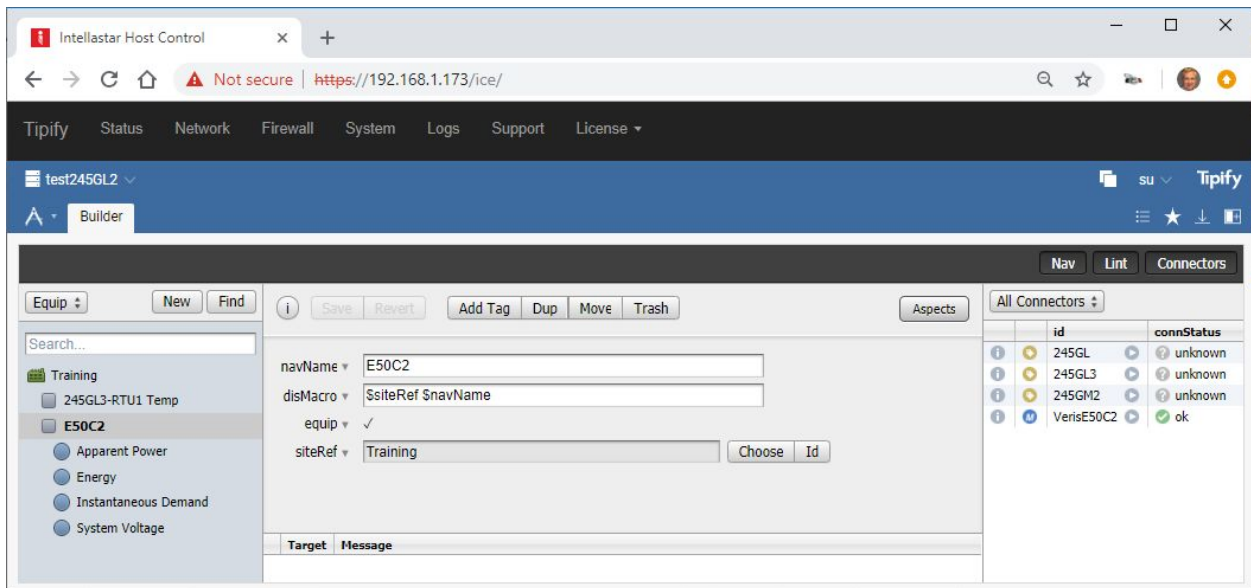
Select your connector and press Ping to check it.


Create Points

Use Builder to add points from the Pulse Connector you added. Select Classic Builder at the bottom.

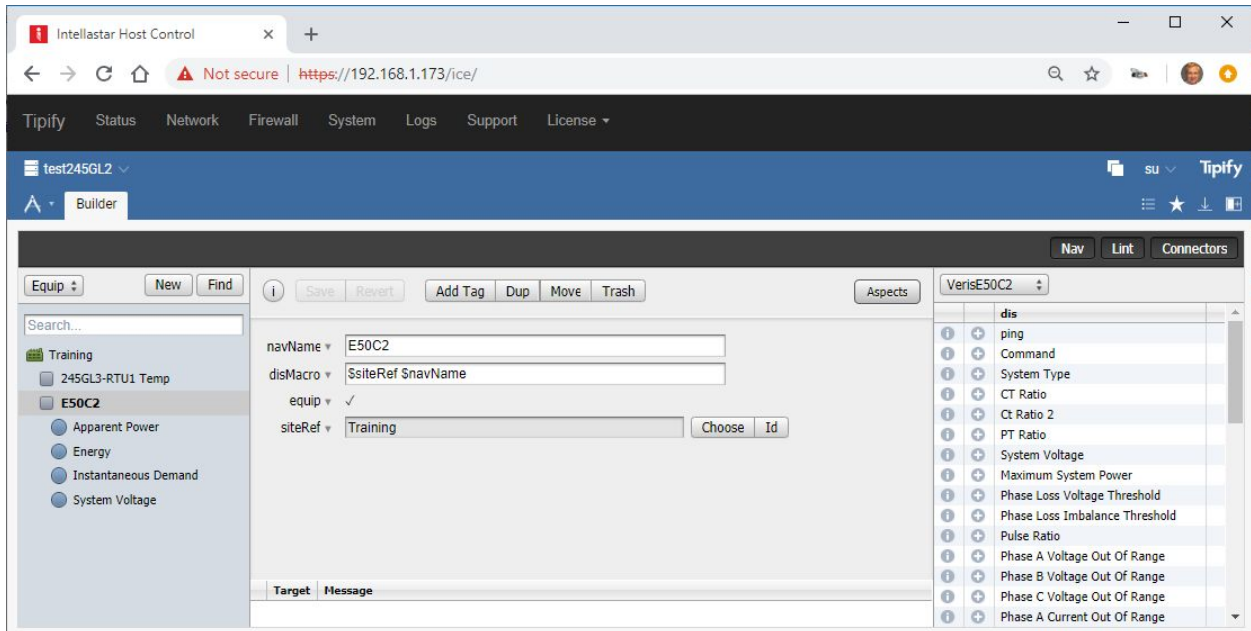


Press Connectors in the upper right to see the connectors in the right column.

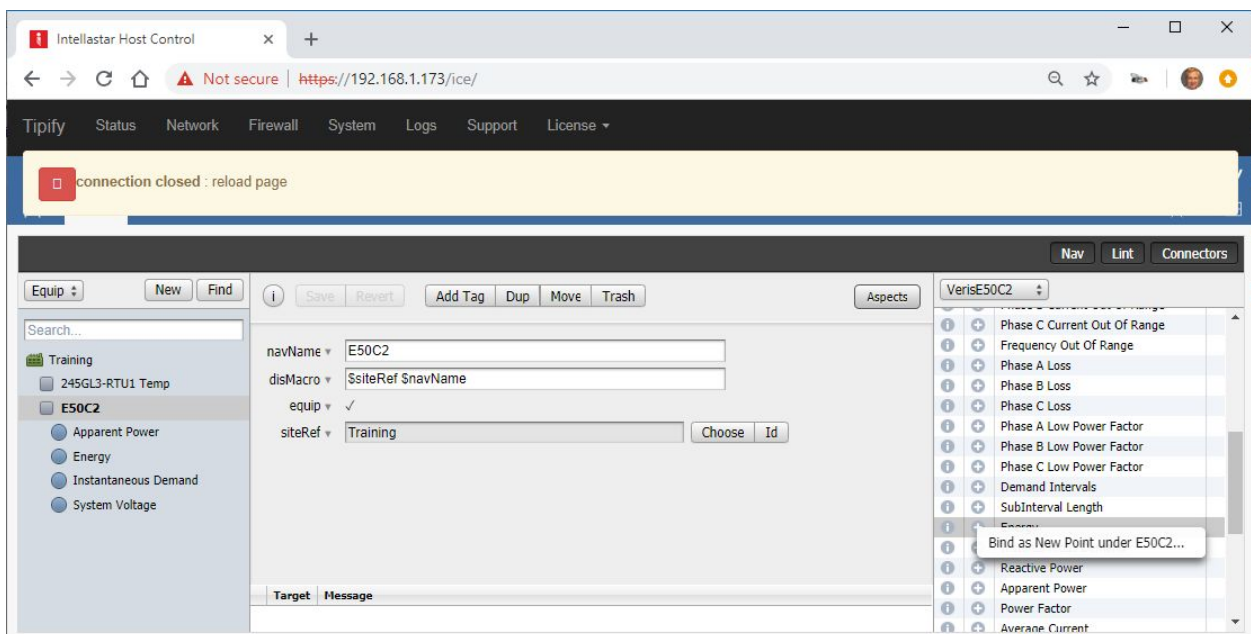


The Right Arrow () lets you see what is in your connector.

Preliminary



Select an Equip in the Nav Tree where you want to add points for this connector. You can add New Equip in a New Site to provide a place for the points if you have not already created them. Press the Plus (+) sign beside a point to add it.



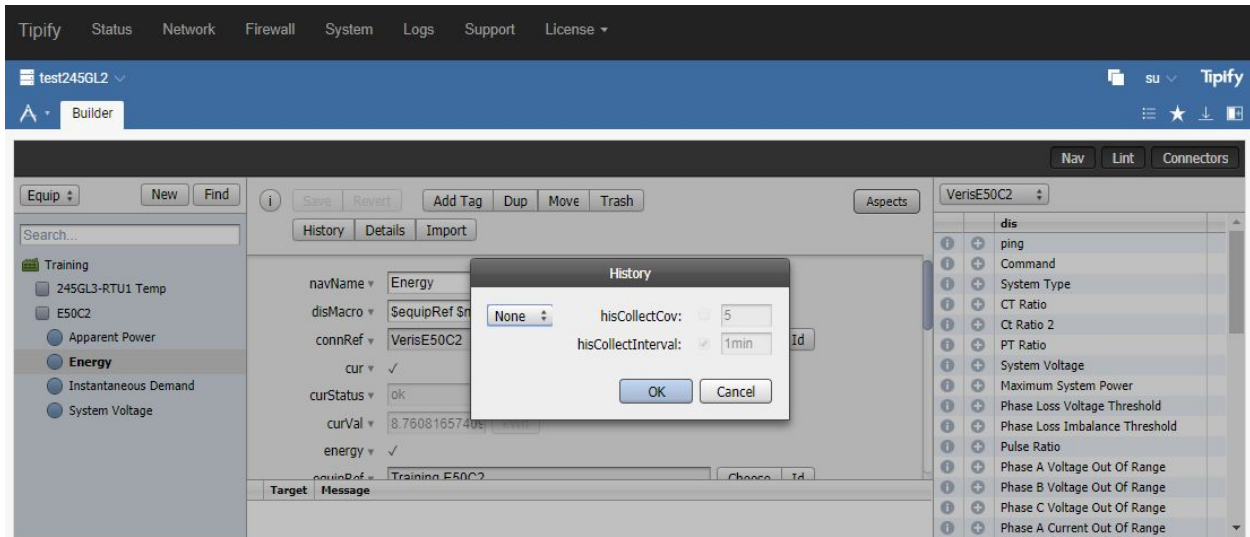
Select Bind... to add the point.

Press OK to add your point.

Continue adding all the points you need from this connector.

Adding History

You also probably want to press the History button and change the drop down to Collected.



Scale the Points

You can scale the points using the Register Map or Point Conversions, but Register Maps are much more efficient if they can perform your scaling.

See the reference docs at <http://licensing.intellastar.com/doc/ext-modbus/doc#scale> for more information on scaling in the register maps.

Register Map Conversions

You can scale using the scale column of your register map as in the example below.

Point Conversions

One simple example is to scale an input with the curConvert property. Add a property of type string named curConvert with a tag value of “* 100” (without quotes). This will multiply the value by 100.

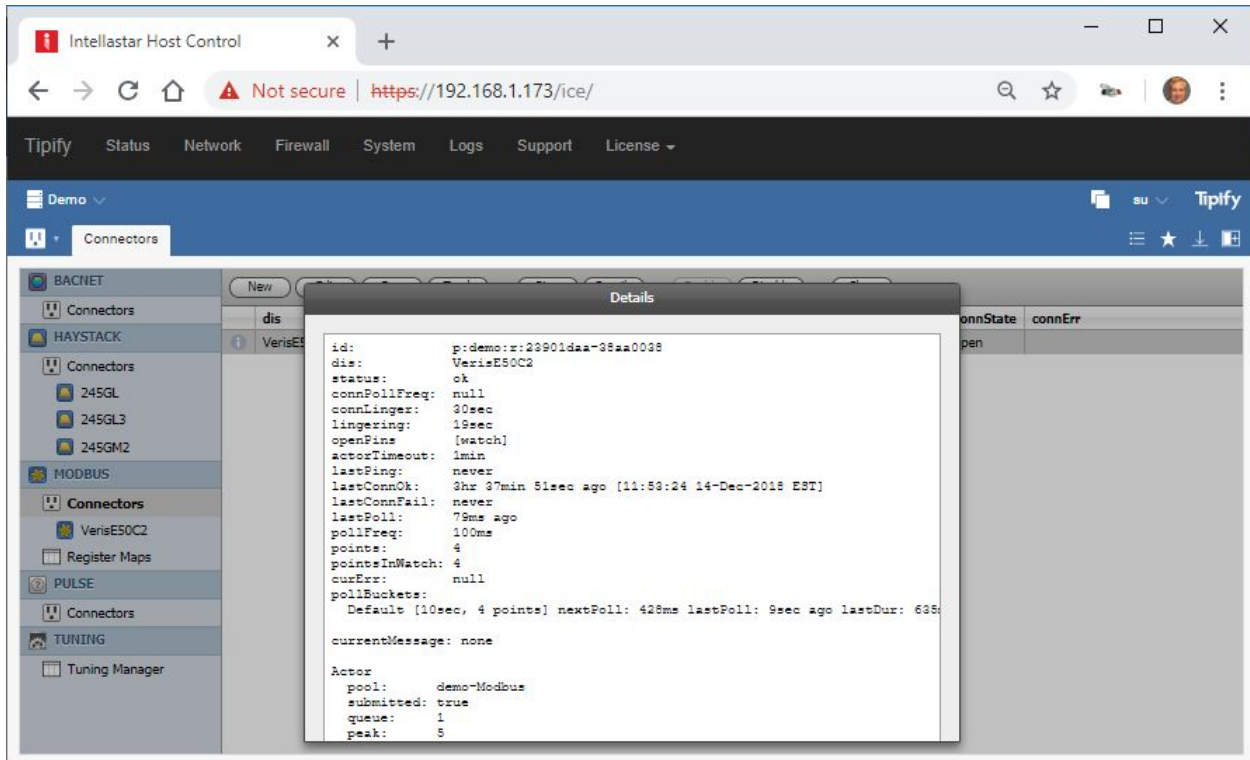
See the point extension reference at <http://licensing.intellastar.com/doc/ext-point/doc#overview> . And specifically the Point Conversion Reference at <http://licensing.intellastar.com/doc/ext-point/doc#convert> .

Debugging Your Connector

If you have problems with your connector, there are a few places to get diagnostic information.

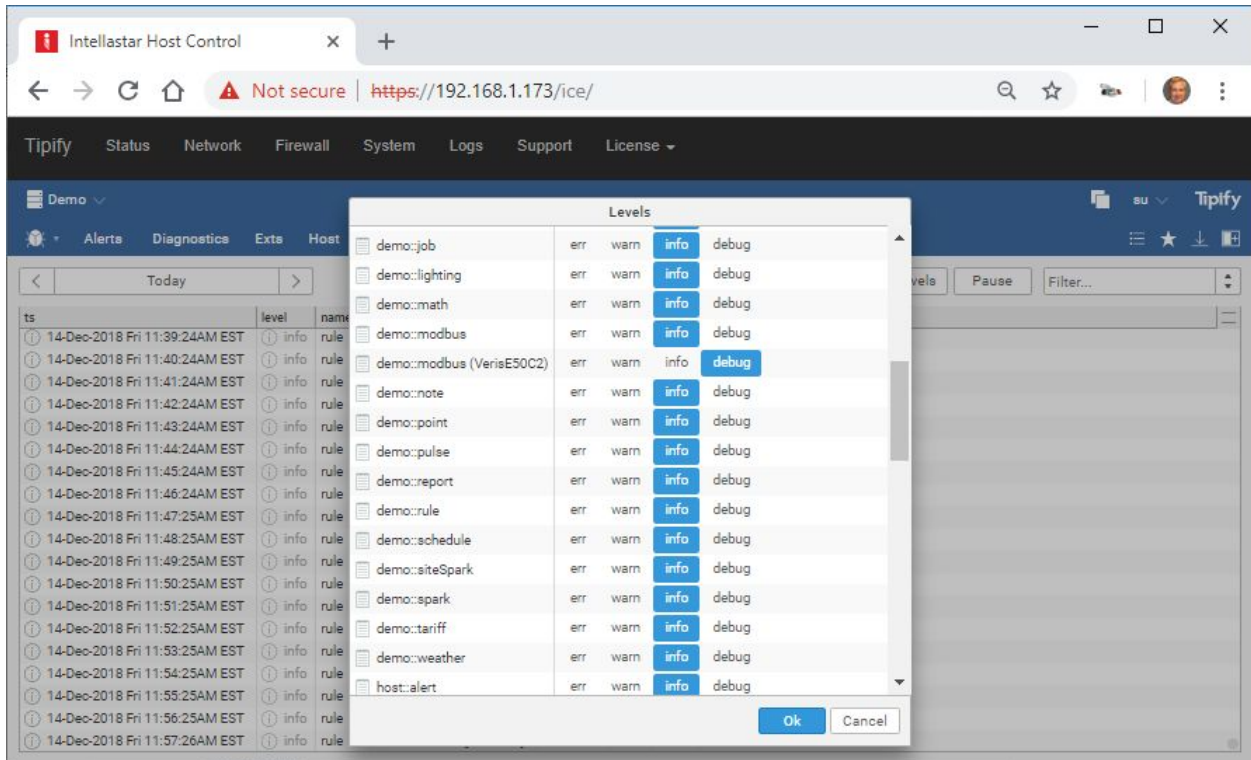
Connectors app

In the Connectors app, you can select your connector and press Details to see more information about how your connector is performing.



Debug app

The Log tab of the Debug app provides adjustable levels of diagnostic information.



Reference

The reference information is on your device or server via the Doc app or searchable online at <https://skyfoundry.com/doc/>.

Scroll down to Extensions and select from these:

conn – Connector Extension Framework

equip – Equipment Extension

his – Historian Extension

point – Point Extension