

ETH-1000 Chillgard RT Quick Start Guide for BACnet/IP

This document provides a brief overview of the connections and settings that must be used to connect a preconfigured ETH-1000 gateway to a MSA Chillgard RT Refrigerant Monitor. This document also contains the BACnet object mapping for the application and some troubleshooting tips. For more information, please refer to the ETH-1000 User's Manual available at <http://www.iccdesigns.com/products/millennium/eth-1000.html>.

Wiring

Wiring the Gateway to the Chillgard RT

The Chillgard RT can be used to power the gateway from its 12V supply by connecting J14 terminals 1 (+12V) and 3 (GND) to the gateway's terminal block at terminals TB:5 (POWER) and TB:6 (GND) as shown in Figure 1. For RS-485 communications, connect J15 terminals A (+) and B (-) on the Chillgard RT to the gateway's terminal block at terminals TB:1 (A) and TB:2 (B) as shown in Figure 1. Additionally, a jumper wire must be placed on the gateway's terminal block between terminals TB:1 (A) and TB:3 (Y). Another jumper wire must be placed between terminals TB:2 (B) and TB:4 (Z). as shown in Figure 1.

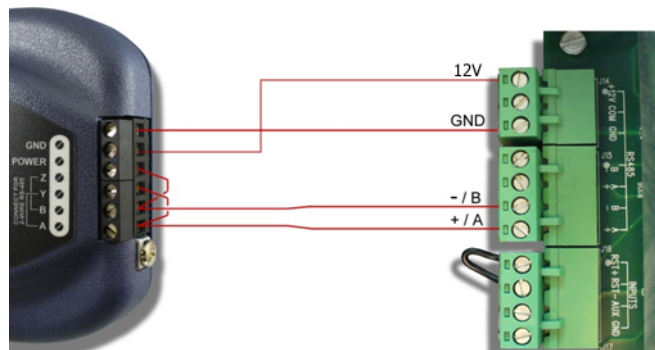


Figure 1: Gateway and Chillgard RT Connections

Customizing the ETH-1000's Configuration

The ETH-1000 can be configured via USB using the ICC Configuration Studio. Certain network settings and BACnet settings may need to be modified to match a specific network configuration. To modify the gateway's configuration, open the ICC Configuration Studio and connect the gateway via the included USB cable. The software will automatically recognize the connected device and upload the current configuration file stored on the gateway. The configuration must be downloaded back to the gateway after making any changes. The latest ICC Configuration Studio is available at <http://www.iccdesigns.com/icc-configuration-studio.html>.

Ethernet Network Settings

The network settings may need to be modified to be compatible with your network. These settings can be modified in the ICC Configuration Studio by selecting "Ethernet" in the Project Pane and changing the settings in the Settings Pane as shown in Figure 2.

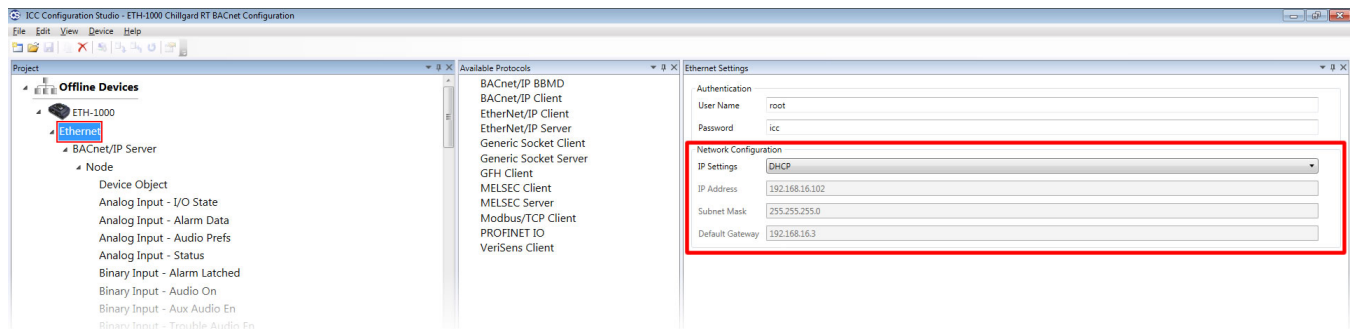


Figure 2: Network Settings

BACnet Communications Settings

The UDP Port, Device Name, and Device Instance may need to be modified to be compatible with your network. These settings can be modified in the ICC Configuration Studio by selecting the corresponding items in the Project Pane and changing the settings in the Settings Pane. The UDP Port can be changed by selecting "BACnet/IP Server" and entering the desired UDP port number in the UDP Port field as shown in Figure 3. The Device Name and Instance can be changed by selecting "Device Object" and entering a value in the Device Name and Instance Number fields as shown in Figure 4. The default settings for the gateway are shown in Table 1.

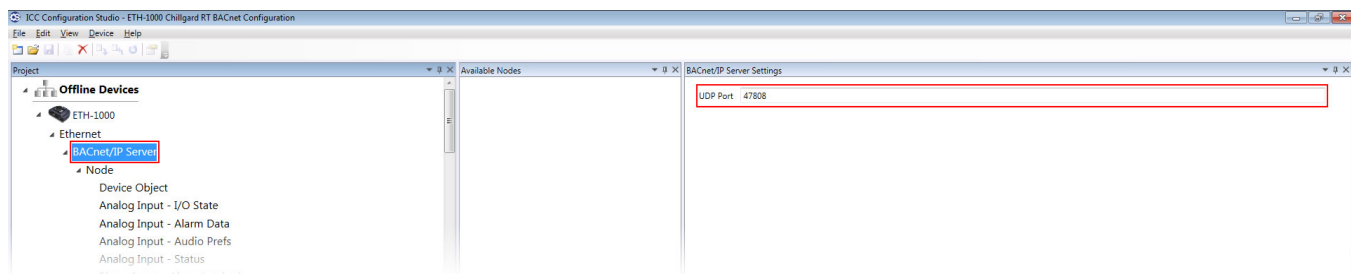


Figure 3: BACnet/IP UDP Port

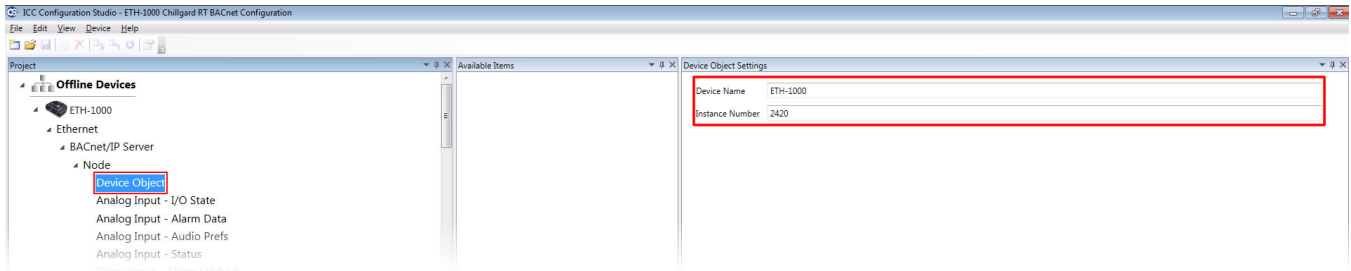


Figure 4: BACnet Device Settings

Table 1: Default BACnet Settings

Setting	Default Value
UDP Port	47808 (0xBAC0)
Device Name	ETH-1000
Device Instance	2420

BACnet Object Mapping

Table 2 provides a listing of the BACnet objects supported by the configuration preloaded on the ETH-1000 gateway.

Table 2: BACnet Object Mapping

Instance ID	Object Name	Description	Units	Multiplier	Definition Of Encoded Data
AI1	S1 Gas Number	Gas Number for Sensor 1	No Units (95)	1.000000	0 to 44 (Refer to manual for definition)
AI2	S1 Concentration	Gas Concentration for Sensor 1	PPM (96)	1.000000	-20 to 1050
AI3	S1 Alarm State	Alarm State for Sensor 1	No Units (95)	1.000000	0 - None Bit 0 – Caution Bit 1 – Warning Bit 2 – Alarm
AI11	S2 Gas Number	Gas Number for Sensor 2	No Units (95)	1.000000	0 to 44 (Refer to manual for definition)
AI12	S2 Concentration	Gas Concentration for Sensor 2	PPM (96)	1.000000	-20 to 1050
AI13	S2 Alarm State	Alarm State for Sensor 2	No Units (95)	1.000000	0 - None Bit 0 – Caution Bit 1 – Warning Bit 2 – Alarm
AI21	S3 Gas Number	Gas Number for Sensor 3	No Units (95)	1.000000	0 to 44 (Refer to manual for definition)
AI22	S3 Concentration	Gas Concentration for Sensor 3	PPM (96)	1.000000	-20 to 1050
AI23	S3 Alarm State	Alarm State for Sensor 3	No Units (95)	1.000000	0 - None Bit 0 – Caution Bit 1 – Warning Bit 2 – Alarm
AI31	S4 Gas Number	Gas Number for Sensor 4	No Units (95)	1.000000	0 to 44 (Refer to manual for definition)
AI32	S4 Concentration	Gas Concentration for Sensor 4	PPM (96)	1.000000	-20 to 1050
AI33	S4 Alarm State	Alarm State for Sensor 4	No Units (95)	1.000000	0 - None Bit 0 – Caution Bit 1 – Warning Bit 2 – Alarm
AI41	S5 Gas Number	Gas Number for Sensor 5	No Units (95)	1.000000	0 to 44 (Refer to manual for definition)
AI42	S5 Concentration	Gas Concentration for Sensor 5	PPM (96)	1.000000	-20 to 1050
AI43	S5 Alarm State	Alarm State for Sensor 5	No Units (95)	1.000000	0 - None Bit 0 – Caution Bit 1 – Warning Bit 2 – Alarm
AI51	S6 Gas Number	Gas Number for Sensor 6	No Units (95)	1.000000	0 to 44 (Refer to manual for definition)
AI52	S6 Concentration	Gas Concentration for Sensor 6	PPM (96)	1.000000	-20 to 1050

Instance ID	Object Name	Description	Units	Multiplier	Definition Of Encoded Data
AI53	S6 Alarm State	Alarm State for Sensor 6	No Units (95)	1.000000	0 - None Bit 0 – Caution Bit 1 – Warning Bit 2 – Alarm
AI61	S7 Gas Number	Gas Number for Sensor 7	No Units (95)	1.000000	0 to 44 (Refer to manual for definition)
AI62	S7 Concentration	Gas Concentration for Sensor 7	PPM (96)	1.000000	-20 to 1050
AI63	S7 Alarm State	Alarm State for Sensor 7	No Units (95)	1.000000	0 - None Bit 0 – Caution Bit 1 – Warning Bit 2 – Alarm
AI71	S8 Gas Number	Gas Number for Sensor 8	No Units (95)	1.000000	0 to 44 (Refer to manual for definition)
AI72	S8 Concentration	Gas Concentration for Sensor 8	PPM (96)	1.000000	-20 to 1050
AI73	S8 Alarm State	Alarm State for Sensor 8	No Units (95)	1.000000	0 - None Bit 0 – Caution Bit 1 – Warning Bit 2 – Alarm
AI100	I/O State	I/O State for Monitor Module	No Units (95)	1.000000	0 – Warmup 1 – Ready 2 – Trouble 3 – Cal/Setup
AI101	Alarm Data	Alarm Information for Monitor Module	No Units (95)	1.000000	Bit 6 – Audio On Bit 7 – Alarm Latched
AI102	Audio Prefs	Audio and Latching Preferences	No Units (95)	1.000000	Bit 0 – Latching Caution Relay Bit 1 – Latching Warning Relay Bit 2 – Latching Alarm Relay Bit 3 – Audio Triggers on Caution Bit 4 – Audio Triggers on Warning Bit 5 – Audio Triggers on Alarm Bit 6 – Audio Triggers on Trouble Bit 7 – Audio Triggers on Auxiliary
AI103	Status	Communication and Sample Information for Monitor Module	No Units (95)	1.000000	Bit 0 – Sample 1 Valid Bit 1 – Sample 2 Valid Bit 2 – Sample 3 Valid Bit 3 – Sample 4 Valid Bit 4 – Sample 5 Valid Bit 5 – Sample 6 Valid Bit 6 – Sample 7 Valid Bit 7 – Sample 8 Valid Bit 8 – Communication Error

Instance ID	Object Name	Description	Active/Inactive Text	Notes
BI0	S1 Valid	Sample 1 Concentration Valid	Valid/Invalid	Concentrations are only valid when displayed on display screen.
BI1	S1 Caution	Sample 1 Caution State	On/Off	
BI2	S1 Warning	Sample 1 Warning State	On/Off	
BI3	S1 Alarm	Sample 1 Alarm State	On/Off	
BI10	S2 Valid	Sample 2 Concentration Valid	Valid/Invalid	Concentrations are only valid when displayed on display screen.
BI11	S2 Caution	Sample 2 Caution State	On/Off	
BI12	S2 Warning	Sample 2 Warning State	On/Off	
BI13	S2 Alarm	Sample 2 Alarm State	On/Off	
BI20	S3 Valid	Sample 3 Concentration Valid	Valid/Invalid	Concentrations are only valid when displayed on display screen.
BI21	S3 Caution	Sample 3 Caution State	On/Off	
BI22	S3 Warning	Sample 3 Warning State	On/Off	
BI23	S3 Alarm	Sample 3 Alarm State	On/Off	
BI30	S4 Valid	Sample 4 Concentration Valid	Valid/Invalid	Concentrations are only valid when displayed on display screen.
BI31	S4 Caution	Sample 4 Caution State	On/Off	
BI32	S4 Warning	Sample 4 Warning State	On/Off	
BI33	S4 Alarm	Sample 4 Alarm State	On/Off	
BI40	S5 Valid	Sample 5 Concentration Valid	Valid/Invalid	Concentrations are only valid when displayed on display screen.
BI41	S5 Caution	Sample 5 Caution State	On/Off	
BI42	S5 Warning	Sample 5 Warning State	On/Off	
BI43	S5 Alarm	Sample 5 Alarm State	On/Off	
BI50	S6 Valid	Sample 6 Concentration Valid	Valid/Invalid	Concentrations are only valid when displayed on display screen.
BI51	S6 Caution	Sample 6 Caution State	On/Off	
BI52	S6 Warning	Sample 6 Warning State	On/Off	
BI53	S6 Alarm	Sample 6 Alarm State	On/Off	
BI60	S7 Valid	Sample 7 Concentration Valid	Valid/Invalid	Concentrations are only valid when displayed on display screen.
BI61	S7 Caution	Sample 7 Caution State	On/Off	
BI62	S7 Warning	Sample 7 Warning State	On/Off	
BI63	S7 Alarm	Sample 7 Alarm State	On/Off	
BI70	S8 Valid	Sample 8 Concentration Valid	Valid/Invalid	Concentrations are only valid when displayed on display screen.
BI71	S8 Caution	Sample 8 Caution State	On/Off	
BI72	S8 Warning	Sample 8 Warning State	On/Off	
BI73	S8 Alarm	Sample 8 Alarm State	On/Off	
BI100	Alarm Latched	Alarm Latched Status	Alarm/No Alarm	
BI101	Audio On	Audio Alarm Status	On/Off	
BI102	Aux Audio En	Audio Triggers on Auxiliary	Enabled/Disabled	
BI103	Trouble Audio En	Audio Triggers on Trouble	Enabled/Disabled	
BI104	Alarm Audio En	Audio Triggers on Alarm	Enabled/Disabled	

Instance ID	Object Name	Description	Active/Inactive Text	Notes
BI105	Warning Audio En	Audio Triggers on Warning	Enabled/Disabled	
BI106	Caution Audio En	Audio Triggers on Caution	Enabled/Disabled	
BI107	Alarm Latching	Latching Alarm Relay	Enabled/Disabled	
BI108	Warning Latching	Latching Warning Relay	Enabled/Disabled	
BI109	Caution Latching	Latching Caution Relay	Enabled/Disabled	
BI110	Com Error	Module Communications Error	Com Lost/Com Ok	

Troubleshooting

This section details some troubleshooting tips to follow if any issues are encountered when installing the gateway and Chillgard RT onto a BACnet/IP network.

1. Power
 - a. Confirm that the gateway is receiving power from the 12V supply on the Chillgard RT. The MS (Module Status) LED should light green when the gateway is powered.
2. Wiring
 - a. Confirm the wiring matches the connections shown in Figure 1.
3. Configuration
 - a. Confirm that the gateway is configured with the appropriate network parameters (UDP port, device instance, etc) using the ICC Configuration Studio as described in the Customizing the ETH-1000's Configuration section.
4. Gateway LEDs
 - a. The MS (Module Status) LED should light green when the gateway is powered and should flash green when the gateway is connected via USB.
 - i. If this is not observed, check the gateway's power.
 - b. The RS-485 RX LED should flash red. The TX LED will always be off.
 - i. If this is not observed, check the wiring between the gateway and the Chillgard RT.
 - ii. Check the gateway's configuration using the ICC Configuration Studio and confirm that the RS-485 port is configured for Chillgard Monitor.
5. Chillgard RT Data Confirmation
 - a. View the gateway's internal database via the Database pane in ICC Configuration Studio and select the 16-bit Unsigned data type from the dropdown. There should be some highlighted cells which do not show a value of 0.
6. BACnet Data Confirmation
 - a. View the gateway's internal database via the Database pane in ICC Configuration Studio and select the 16-bit Unsigned data type from the dropdown. The data shown in the highlighted cells should match the data read on the BACnet system. The specific BACnet object mapped at an address is shown when the mouse is hovered over a cell in the Database Pane.