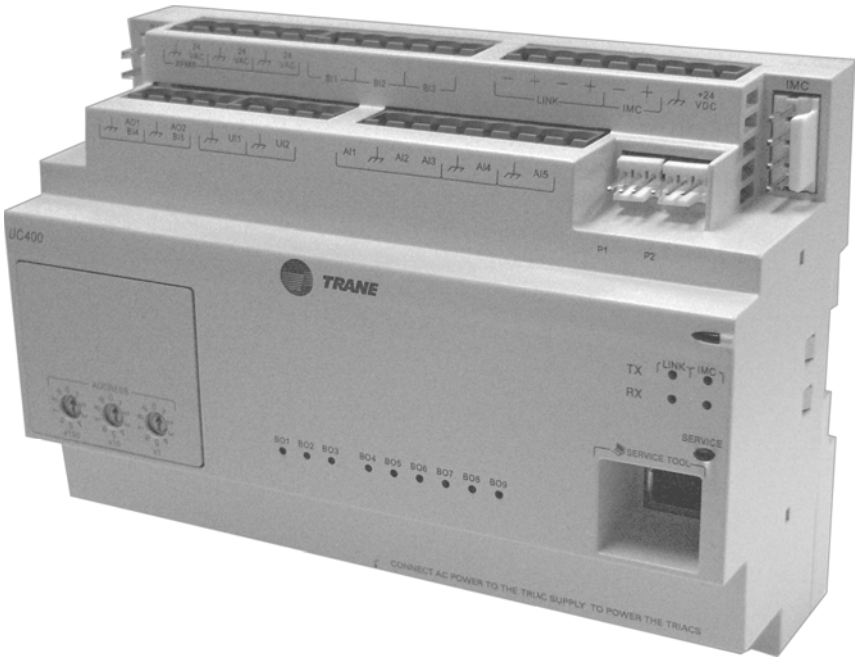
TRANE®

Integration Guide

BACnet™ Communication Interface for Chiller (BCI-C)

for RTWD/RTUD, RTHD, RTAC, and CGAM



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Warnings, cautions, and notices are provided in appropriate places throughout this document:

⚠**WARNING:** Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

⚠**CAUTION:** Indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury. It could also be used to alert against unsafe practices.

NOTICE: Indicates a situation that could result in equipment or property-damage-only accidents.

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Overview

The BACnet™ Communication Interface for Chillers (BCI-C) is comprised of a Tracer™ UC400 controller with interface software. It is a non-programmable communications module that allows heating, ventilation, and air-conditioning (HVAC) equipment to communicate on a BACnet communications network.

This guide provides:

- A brief overview of the BACnet protocol
- A explanation of the BCI-C device rotary switches and LEDs
- Data point configuration property definitions
- Tables listing object data points
- Additional resources
- A glossary of terms

Note: *Users of this guide should have basic knowledge of BACnet protocol. For more detailed information about this protocol, visit the company web site listed under "Additional Resources," p. 25.*

BACnet Protocol

The Building Automation and Control Network (BACnet and ANSI/ASHRAE Standard 135-2004) protocol is a standard that allows building automation systems or components from different manufacturers to share information and control functions. BACnet provides building owners the capability to connect various types of building control systems or subsystems together for a variety of reasons. In addition, multiple vendors can use this protocol to share information for monitoring and supervisory control between systems and devices in a multi-vendor interconnected system.

The BACnet protocol identifies standard objects (data points) called BACnet objects. Each object has a defined list of properties that provide information about that object. BACnet also defines a number of standard application services that are used to access data and manipulate these objects and provides a client/server communication between devices. For more information on BACnet protocol, refer to "Additional Resources," p. 25.

BACnet Testing Laboratory (BTL) Certification

The BCI-C supports the BACnet communication protocol and has been designed to meet the requirements of the application-specific control profile. For more details, refer to the BTL web site at www.bacnetassociation.org.

Rotary Switches and LEDs

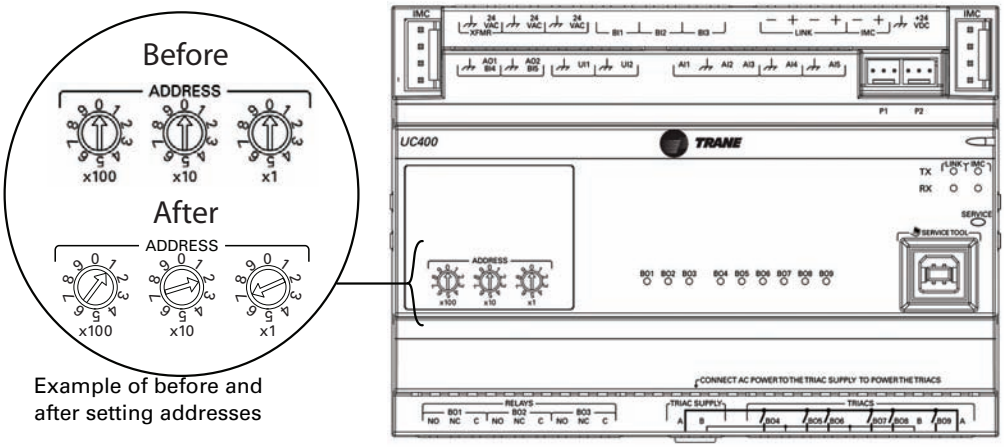
This section provides information about the BCI-C rotary switches and LED displays.

Rotary Switches

There are three rotary switches on the front of the BCI-C device that are used to define a three-digit address when the BCI-C is installed on a BACnet communications network. The three-digit address setting is the BACnet MAC address.

Note: *All devices are MSTP masters with valid MAC addresses of 001 to 127 for BACnet.*

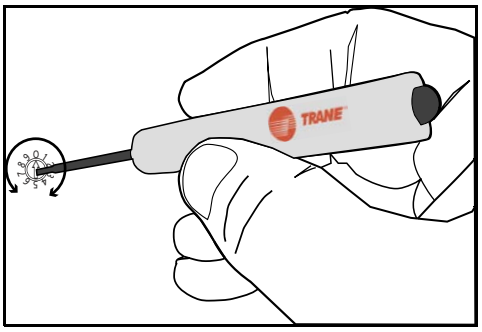
Figure 1. Setting rotary switches



Example of before and after setting addresses

Important: *Each device on the BACnet/ MSTP link must have a unique rotary switch setting, otherwise, communication problems will occur.*

Use a 1/8 inch flathead screwdriver to set rotary switches.



Note: *For details on setting the baud rate, BACnet Device ID, and units of measure, refer to the section, Configuring the BCI-C in the BACnet Communication Interface (BCI-C) Field Kit Installation Guide, RF-SVN02.*

LEDs Description, Behavior, and Troubleshooting

There are 15 LEDs on the front of the BCI-C unit. However, LEDs BO1 through BO9 are not used for the BCI-C controller. Figure 2 shows the locations of each LED. The following table provides a description of each LED activity, an indication or troubleshooting tips for each, and any notes.

Figure 2. LED locations

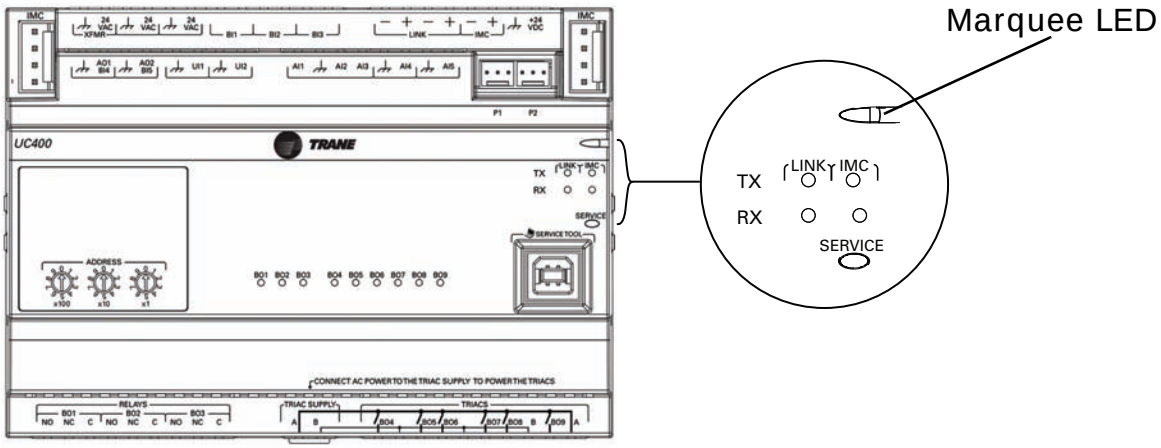


Table 1. LED Activities and Troubleshooting Tips

LED Name	Activities	Indication or Troubleshooting Tip (Denoted in Bullets)	Notes
Marquee LED	Shows solid green when the unit is **powered** and no problems exist	Indicates normal operation	
	Shows solid red when the unit is **powered**, but represents low power or a malfunction	• **If low power**; could be under voltage or the microprocessor has malfunction. • **If malfunction**; un-power and then re-power unit to bring the device back up to normal operation.	
	Shows blinking red when an **alarm** exists	Alarm; when an alarm is triggered, for example, when a point goes into fault condition because of point failure or there is an indication of a custom alarm in TGP2	
	LED not lit	Indicates power is OFF or there is a malfunction • **OFF** or **malfunction**; cycle the power.	

Table 1. LED Activities and Troubleshooting Tips

LED Name	Activities	Indication or Troubleshooting Tip (Denoted in Bullets)	Notes
Link and IMC	TX blinks green	Blinks at the data transfer rate when the unit transfers data to other devices on the link	**TX LED:** Regardless of connectivity or not, this LED will constantly blink as it continually looks for devices to communicate to. **LED not lit:** Determine if, for example, a Tracer™ SC or BACnet device is trying to talk to the controller or if it is capable of talking to the controller. Also determine if the communication status shows down all of the time.
	RX blinks yellow	Blinks at the data transfer rate when the unit receives data from other devices on the link • **ON solid yellow**; indicates there is reverse polarity	
	LED not lit	Indicates that the controller is not detecting communication • **Not lit**; cycle the power to reestablish communication	
Service	Shows solid green	Indicates someone has pressed the LED, the controller is not operating normally, or TechView is in Binding View and commanding to the BCI-C to turn On the LED	Press and hold during power up to place controller into boot code or press and hold for a count of approximately 10 seconds to clear the Device ID. ***<u>What is Boot Code</u>? When the UC400 is placed into boot code, the system will not run any applications such as trending, scheduling, and TGP2 runtime.***
	Blinks green	Indicates controllers is not accessing application software • **Restore**; using TU service tool	
	LED not lit	Indicates controller is operating normally	
Binary 01 to Binary 09			**Not Used**

BACnet Data Points and Configuration Property Definitions

The BCI-C device allows certain models of Trane chillers with CH530 controls to communicate with BACnet systems and devices using BACnet MS/TP. This section includes information about:

- BACnet protocol implementation conformance statement (PICS)
- Object types: descriptions and configuration (refer to Table 2, p. 12)
- BACnet protocol: data link layers, device address binding, networking options, and character sets
- Object data points and configurations

BACnet Protocol Implementation Conformance Statement (PICS)

Standardized Device Profile (Annex L)

Profile Description	Supported Profile
BACnet Advanced Application Controller (B-AAC)	
BACnet Application Specific Controller (B-ASC)	✓
BACnet Building Controller (B-BC)	
BACnet Operator Workstation (B-OWS)	
BACnet Smart Actuator (B-SA)	
BACnet Smart Sensor (B-SS)	

Interoperability Building Blocks (Annex K)

Data Sharing Description	Supported BIBB
Data Sharing-COV-B (DS-COV-B)	
Data Sharing-ReadProperty-A (DS-RP-A)	✓
Data Sharing-ReadProperty-B (DS-RP-B)	✓
Data Sharing-ReadPropertyMultiple-B (DS-RPM-B)	✓
Data Sharing-WriteProperty-A (DS-WP-A)	✓
Data Sharing-WriteProperty-B (DS-WP-B)	✓
Data Sharing-WritePropertyMultiple-B (DS-WPM-B)	✓
Alarm and Event Management Description	**Supported BIBB**
Alarm and Event-ACKI-B (AE-ACK-B)	✓
Alarm and Event-Alarm Summary-B (AE-ASUM-B)	✓
Alarm and Event-Enrollment Summary-B (AE-ESUM-B)	✓
Alarm and Event-Information-B (AE-INFO-B)	✓
Alarm and Event-Notification Internal-B (AE-N-I-B)	✓

Trending Description	Supported BIBB
Trending-Automated Trend Retrieval-B (T-ATR-B)	✓
Trending-viewing and Modifying Trends Internal-B (T-VMT-I-B)	✓
Device Management Description	**Supported BIBB**
Device Management-Backup and Restore-B (DM-BR-B)	✓
Device Management-Device Communication Control-B (DM-DCC-B)	✓
Device Management-Dynamic Device Binding-A (DM-DDB-A)	✓
Device Management-Dynamic Device Binding-B (DM-DDB-B)	✓
Device Management-Dynamic Object Binding-B (DM-DOB-B)	✓
Device Management-List Manipulation-B (DM-LM-B)	✓
Device Management-Object Creation and Deletion-B (DM-OCD-B)	✓
Device Management-Private Transfer-A (DM-PT-A)	✓
Device Management-Private Transfer-B (DM-PT-B)	✓
Device Management-Reinitialize Device-B (DM-RD-B)	✓
Device Management-TimeSynchronization-B (DM-TS-B)	✓

Segmentation Capability

Segmentation Description	Supported Segment
Segmented Requests/ Window Size: 1	✓
Segmented Responses/ Window Size: 1	✓

Object Types

Table 2. Descriptions and configurations

Object Type	Required Properties Read	Properties Written[a]	Optional Properties Read	Ability to Create	Ability to Delete
Analog Input	• Object_Identifier • Object_Name • Object_Type • Present_Value • Status_Flags • Event_State • Out_Of_Service • Units	• Object_Name • Description • Out_Of_Service • Present_Value • Reliability • Min_Pres_Value • Max_Pres_Value • COV_Increment • Time_Delay • Notification_Class • High_Limit • Low_Limit • Deadband • Limit_Enable • Event_Enable • Notify_Type	• Description • Reliability • Min_Pres_Value • Max_Pres_Value • COV_Increment • Time_Delay • Notification _Class • High_Limit • Low_Limit • Deadband • Limit_Enable • Event_Enable • Acked_Transitions • Notify_Type • Event_Time_Stamps	Yes	Yes, only user created objects
Analog Output	• Object_Identifier • Object_Name • Object_Type • Present_Value • Status_Flags • Event_State • Out_Of_Service • Units • Priority_Array • Relinquish_Default	• Object_Name • Description • Out_Of_Service • Present_Value • Reliability • Min_Pres_Value • Max_Pres_Value • Relinquish_Default • COV_Increment • Time_Delay • Notification_Class • High_Limit • Low_Limit • Deadband • Limit_Enable • Event_Enable • Notify_Type	• Description • Reliability • Min_Pres-Value • Max_Pres_Value • COV_Increment • Time_Delay • Notification _Class • High_Limit • Low_Limit • Deadband • Limit_Enable • Event_Enable • Acked_Transitions • Notify_Type • Event_Time_Stamps	Yes	Yes, only user created objects
Analog Value	• Object_Identifier • Object_Name • Object_Type • Present_Value • Status_Flags • Event_State • Out_Of_Service • Units	• Object_Name • Description • Out_Of_Service • Present_Value • Reliability • Relinquish_Default • COV_Increment • Time_Delay • Notification_Class • High_Limit • Low_Limit • Deadband • Limit_Enable • Event_Enable • Notify_Type	• Description • Reliability • Priority_Array • Relinquish_Default • COV_Increment • Time_Delay • Notification_Class • High_Limit • Low_Limit • Deadband • Limit_Enable • Event_Enable • Acked_Transitions • Notify_Type • Event_Time_Stamps	Yes	Yes, only user created objects
Binary Input	• Object_Identifier • Object_Name • Object_Type • Present_Value • Status_Flags • Event_State • Out_Of_Service • Polarity	• Object_Name • Description • Out_Of_Service • Inactive_Text • Active_Text • Present_Value • Reliability • Change_Of_State_Count • Elapsed_Active_Time • Time_Delay • Notification_Class • Alarm_Value • Event_Enable • Acked_Transitions • Notify_Type	• Description • Inactive_Text • Active_Text • Change_Of_State_Time • Change_Of_State_Count • Time_Of_State_Count_Reset • Elapsed_Active_Time • Time_Of_Active_Time_Reset • Time_Delay • Notification_Class • Alarm_Value • Event_Enable • Acked_Transitions • Notify_Type • Event_Time_Stamps • Reliability	Yes	Yes, only user created objects

Table 2. Descriptions and configurations (continued)

Object Type	Required Properties Read	Properties Written[a]	Optional Properties Read	Ability to Create	Ability to Delete
Binary Output	• Object_Identifier • Object_Name • Object_Type • Present_Value • Status_Flags • Event_State • Out_Of_Service • Polarity • Priority_Array • Relinquish_Default	• Object_Name • Description • Out_Of_Service • Inactive_Text • Active_Text • Present_Value • Reliability • Change_Of_State_Count • Elapsed_Active_Time • Minimum_On_Time • Minimum_Off_Time • Relinquish_Default • Time_Delay • Notification_Class • Event_Enable • Acked_Transitions • Notify_Type	• Description • Inactive_Text • Active_Text • Change_Of_State_Time • Change_Of_State_Count • Time_Of_State_Count_Reset • Elapsed_Active_Time • Time_Of_Active_Time_Reset • Minimum_On_Time • Minimum_Off_Time • Time_Delay • Notification_Class • Feedback_Value • Event_Enable • Acked_Transitions • Notify_Type • Event_Time_Stamps • Reliability	Yes	Yes, only user created objects
Binary Value	• Object_Identifier • Object_Name • Object_Type • Present_Value • Status_Flags • Event_State • Out_Of_Service • Polarity	• Object_Name • Description • Out_Of_Service • Inactive_Text • Active_Text • Present_Value • Reliability • Change_Of_State_Count • Elapsed_Active_Time • Minimum_On_Time • Minimum_Off_Time • Relinquish_Default • Time_Delay • Notification_Class • Alarm_Value • Event_Enable • Acked_Transitions • Notify_Type	• Description • Inactive_Text • Active_Text • Change_Of_State_Time • Change_Of_State_Count • Time_Of_State_Count_Reset • Elapsed_Active_Time • Time_Of_Active_Time_Reset • Priority_Array • Relinquish_Default • Minimum_On_Time • Minimum_Off_Time • Time_Delay • Notification_Class • Alarm_Value • Event_Enable • Acked_Transitions • Notify_Type • Event_Time_Stamps • Reliability	Yes	Yes, only user created objects
Device	• Object_Identifier • Object_Name • Object_Type • System_Status • Vendor_Name • Vendor_Identifier • Model_Name • Firmware_Revision • Application_Software_Version • Protocol_Version • Protocol_Revision • Protocol_Services_Supported • Protocol_Object_Types_Supported • Object_List • Max_APDU_Length_Accepted • Segmentation_Supported • APDU_Timeout • Number_Of_APDU_Retries • Device_Address_Binding • Database_Revision	• Object_Name • Location • Description • APDU_Segment_Timeout • APDU_Timeout • Number_Of_APDU_Retries • Backup_Failure_Timeout	• Location • Description • Max_Segments_Accepted • APDU_Segment_Timeout • Max_Master • Max_Info_Frames • Local_Time • Local_Date • Configuration_Files • Last_Restore_Time • Backup_Failure_Timeout • Active_COV_Subscriptions	None	None
Event Enrollment Object	• Object_Identifier • Object_Name • Object_Type • Event_Type • Notify_Type • Event_Parameters • Object_Property_Reference • Event_State • Event_Enable • Acked_Transitions • Notification_Class • Event_Time_Stamps	• Object_Name • Notify_Type • Event_Parameters • Object_Property_Reference • Event_Enable • Notification_Class	• None	Yes	Yes, only user created objects

Table 2. Descriptions and configurations (continued)

Object Type	Required Properties Read	Properties Written[a]	Optional Properties Read	Ability to Create	Ability to Delete
Multistate Input	• Object_Identifier • Object_Name • Object_Type • Present_Value • Status_Flags • Event_State • Out_Of_Service • Number_Of_States	• Object_Name • Description • State_Text • Out_Of_Service • Present_Value • Reliability • Time_Delay • Notification_Class • Alarm_Values • Fault_Values • Event_Enable • Notify_Type	• State_Text • Reliability • Time_Delay • Notification_Class • Alarm_Values • Fault_Values • Event_Enable • Acked_Transitions • Notify_Type • Event_Time_Stamps	Yes	Yes, only user created objects
Multistate Output	• Object_Identifier • Object_Name • Object_Type • Present_Value • Status_Flags • Event_State • Out_Of_Service • Number_Of_States • Priority_Array • Relinquish Default	• Object_Name • Description • State_Text • Out_Of_Service • Present_Value • Reliability • Time_Delay • Notification_Class • Event_Enable • Notify_Type	• State_Text • Reliability • Relinquish_Default • Time_Delay • Notification_Class • Feedback_Values • Event_Enable • Acked_Transitions • Notify_Type • Event_Time_Stamps	Yes	Yes, only user created objects
Multistate Value	• Object_Identifier • Object_Name • Object_Type • Present_Value • Status_Flags • Event_State • Out_Of_Service • Number_Of_States	• Object_Name • Description • State_Text • Out_Of_Service • Present_Value • Reliability • Priority_Array • Relinquish_Default • Time_Delay • Notification_Class • Alarm_Values • Fault_Values • Event_Enable • Notify_Type	• State_Text • Reliability • Relinquish_Default • Time_Delay • Notification_Class • Alarm_Values • Fault_Values • Event_Enable • Acked_Transitions • Notify_Type • Event_Time_Stamps	Yes	Yes, only user created objects
Notification Class	• Object_Identifier • Object_Name • Object_Type • Notification_Class • Priority • Ack_Required • Recipient_List	• Object_Name • Priority • Ack_Required • Recipient_List	None	Yes	Yes, only user created objects
Trend	• Object_Identifier • Object_Name • Object_Type • Log_Enable • Stop_When_Full • Buffer_Size • Log_Buffer • Record_Count • Total_Record_Count • Event_State	• Object_Name • Log_Enable • Start_Time • Stop_Time • Log_DeviceObjectProperty • Log_Interval • Stop_When_Full • Buffer_Size • Log_Buffer • Record_Count • Notification_Threshold • Notification_Class • Event_Enable • Notify_Type	• Start_Time • Stop_Time • Log_DeviceObjectProperty • Log_Interval • Stop_When_Full • Buffer_Size • Notification_Threshold • Records_Since_Notification • Last_Notify_Record • Notification_Class • Event_Enable • Acked_Transitions • Event_Time_Stamps	Yes	Yes, only user created objects

(a)Properties written for Present_Value and Reliability only if Out_of_Service is TRUE.

BACnet Protocol

Data Link Layer Options

Data Link Layer Description	Supported Option
ANSI/ATA 878.1, 2.5 Mb ARCNET (Clause 8)	
ANSI/ATA 878.1, RS-485 ARCNET (Clause 8), Baud Rate(s)	
BACnet IP, (Annex J)	
BACnet IP, (Annex J), Foreign Device	
ISO 8802-3, Ethernet (Clause 7)(10Base2, 10Base5, 10BaseT, Fiber)	
LonTalk, (Clause 11), Medium	
MS/TP Master (Clause 9), Baud Rate(s): 9600, 19200, 38400, 76800, and 115200 @1.5% Nominal Baud Rate	✓
MS/TP Slave (Clause 9), Baud Rate(s)	
Other	
Point-to-Point, EIA 232 (Clause 10), Baud Rate(s): 9600, 19200, 38400	
Point-to-Point, Modem (Clause 10), Baud Rate(s): 9600, 19200, 38400	

Device Address Binding

Device Address Binding	Supported?
Static Device Binding Supported	✓

Networking Options

Networking Descriptions	Supported Option
Annex H, BACnet Tunneling	
BACnet/IP Broadcast Management Device (BBMD)	
Does the BBMD Support Registrations by Foreign Devices?	
Router	

Character Sets

Indicates support for multiple characters sets, but does not imply that all character sets are supported simultaneously. Maximum supported string length is 64 bytes (any character set).

Character Set Descriptions	Supported
ANSI X3.4	✓
IBM/Microsoft DBCS	
ISO 10646 (UCS-4)	
ISO 10646 (UCS2)	✓
ISO 8859-1	✓
JIS C 6226	

Object and Diagnostic Data Points and Corresponding Chiller Models

For quick reference, the following tables are listed and sorted two different ways. Tables 3 through 9 are listed by input/output type and sorted by object identifier. These tables provide the user with the units type for each object type. Table 9, p. 22 is sorted by object name and provides a complete list of object names, types, values/ranges, and descriptions. Not all points are available to the user. The available data points are defined during self-configuration and are dependent on the type of equipment. Listed at the bottom of tables 3 through 8 are specific footnotes that correspond to either specific chiller models or object states that are identified by a larger dot or boldface text.

Note: *The last four columns in each table identifies which chiller model corresponds with each object name.*

Table 3. Analog Output

Object Identifier	Object Name	Description	Dimensionality	Valid Range	Reling Default	RTWD/ RTUD	RTHD	RTAC	CGAM
Analog Output 1	Chilled Water Setpoint	Desired leaving water temperature if chiller is in cooling mode.	Temperature	0°F to 75°F (-17.8°C to 23.8°C)	44°F (6.7°C)	•	•	•	•
Analog Output 2	Current Limit Setpoint	Sets the maximum capacity that the chiller can use.	Percent	0% to 120%	100%	•	•	•	
Analog Output 3	Demand Limit Setpoint	Sets the maximum capacity that the chiller can use.	Percent	0% to 120%	100%				•
Analog Output 4	Hot Water Setpoint	Desired leaving water temperature if chiller is in heating mode.	Temperature	80°F to 140°F (26.7°C to 60°C)	120°F (48.9°C)	• (a)	• (a)	• (a)	• (b)
Analog Output 5	Base Loading Setpoint	Capacity level to which the chiller should control when base loading is active.	Percent	0% to 100%	50%		•		

(a) Leaving condenser water temperature control.
(b) Hot water control with heat pumps in heating mode.

Table 4. Analog Input

Object Identifier	Object Name	Description	Dimensionality	RTWD /RTUD	RTHD	RTAC	CGAM
Analog Input, 1	Active Cool/Heat Setpoint Temperature	Active chiller water or hot water setpoint.	Temperature	•	•	•	•
Analog Input, 2	Active Current Limit Setpoint	Active capacity current limit setpoint.	Percent	•	•	•	
Analog Input, 3	Active Demand Limit Setpoint	Active demand limit setpoint.	Percent				•
Analog Input 4	Active Base Loading Setpoint	Value of base loading setpoint currently being used by the chiller.	Percent		•		
Analog Input, 5	Actual Running Capacity	Level of capacity that the chiller is currently running at.	Percent	•	•	•	•
Analog Input, 6	Evaporator Refrigerant Pressure- Ckt1	Circuit 1 evaporator refrigerant pressure.	Pressure		•	•	
Analog Input, 7	Suction Pressure- Ckt 1	Circuit 1 suction pressure.	Pressure	•			
Analog Input, 8	Suction Pressure- Ckt 1	Circuit 1 suction pressure.	Pressure				•
Analog Input, 9	Evaporator Refrigerant Pressure- Ckt 2	Circuit 2 evaporator refrigerant pressure.	Pressure		•	•	
Analog Input, 10	Suction Pressure- Ckt 2	Circuit 2 suction pressure.	Pressure	•			
Analog Input, 11	Suction Pressure- Ckt 2	Circuit 2 suction pressure.	Pressure				•
Analog Input, 12	Evaporator Saturated Refrigerant Temperature- Ckt 1	Circuit 2 evaporator refrigerant temperature.	Temperature	•	•	•	

Table 4. Analog Input (continued)

Object Identifier	Object Name	Description	Dimensionality	RTWD /RTUD	RTHD	RTAC	CGAM
Analog Input, 13	Suction Saturated Refrigerant Temperature- Ckt 1	Circuit 1 suction refrigerant temperature.	Temperature				•
Analog Input, 14	Evaporator Saturated Refrigerant Temperature- Ckt 2	Circuit 2 evaporator refrigerant temperature.	Temperature	•		•	
Analog Input, 15	Suction Saturated Refrigerant Temperature- Ckt 2	Circuit 2 suction refrigerant temperature.	Temperature				•
Analog Input, 16	Condenser Refrigerant Pressure- Ckt 1	Circuit 1 condenser refrigerant pressure.	Pressure	•	•	•	
Analog Input, 17	Discharge Pressure- Ckt 1	Circuit 1 discharge pressure.	Pressure				•
Analog Input, 18	Condenser Refrigerant Pressure- Ckt 2	Circuit 2 condenser refrigerant pressure.	Pressure	•	•	•	
Analog Input, 19	Discharge Pressure- Ckt 2	Circuit 2 discharge pressure.	Pressure				•
Analog Input, 20	Condenser Saturated Refrigerant Temperature- Ckt 1	Circuit 1 condenser refrigerant temperature.	Temperature	•	•	•	
Analog Input, 21	Discharge Saturated Refrigerant Temperature- Ckt 1	Circuit 1 discharge refrigerant temperature.	Temperature				•
Analog Input, 22	Condenser Saturated Refrigerant Temperature- Ckt 2	Circuit 2 condenser refrigerant temperature.	Temperature	•	•	•	
Analog Input, 23	Discharge Saturated Refrigerant Temperature- Ckt 2	Circuit 2 discharge refrigerant temperature.	Temperature				•
Analog Input, 24	Unit Power Consumption	The power being consumed by the chiller.	Power	● (a)	● (a)		
Analog Input, 25	Local Atmospheric Pressure	Local atmospheric pressure.	Pressure	•	•	•	•
Analog Input, 26	Starts- Compressor 1A	Number of starts for compressor 1A.		•	•	•	•
Analog Input, 27	Starts- Compressor 1B	Number of starts for compressor 1B.		•		•	•
Analog Input, 28	Starts- Compressor 2A	Number of starts for compressor 2A.		•		•	
Analog Input, 29	Starts- Compressor 2B	Number of starts for compressor 2B.		•		•	
Analog Input, 30	Starts- Compressor 1C	Number of starts for compressor 1C.					•
Analog Input, 31	Starts- Compressor 2A	Number of starts for compressor 2A.					•
Analog Input, 32	Starts- Compressor 2B	Number of starts for compressor 2B.					•
Analog Input, 33	Starts- Compressor 2C	Number of starts for compressor 2C.					•
Analog Input, 34	Run Time- Compressor 1A	Total run time of compressor 1A.	Time	•	•	•	•
Analog Input, 35	Run Time- Compressor 1B	Total run time of compressor 1B.	Time	•		•	•
Analog Input, 36	Run Time- Compressor 2A	Total run time of compressor 2A.	Time	•		•	
Analog Input, 37	Run Time- Compressor 2B	Total run time of compressor 2B.	Time	•		•	
Analog Input, 38	Run Time- Compressor 1C	Total run time of compressor 1C.	Time				•
Analog Input, 39	Run Time- Compressor 2A	Total run time of compressor 2A.	Time				•
Analog Input, 40	Run Time- Compressor 2B	Total run time of compressor 2B.	Time				•
Analog Input, 41	Run Time- Compressor 2C	Total run time of compressor 2C.	Time				•
Analog Input, 42	Airflow Percentage- Circuit 1	Approximate airflow percentage of circuit 1.	Percent	•		•	•
Analog Input, 43	Airflow Percentage- Circuit 2	Approximate airflow percentage of circuit 2.	Percent	•		•	•

Table 4. Analog Input (continued)

Object Identifier	Object Name	Description	Dimensionality	RTWD /RTUD	RTHD	RTAC	CGAM
Analog Input, 44	Evaporator Entering Water Temp	Temperature of the water entering the evaporator.	Temperature	•	•	•	•
Analog Input, 45	Evaporator Leaving Water Temp	Temperature of the water leaving the evaporator.	Temperature	•	•	•	•
Analog Input, 46	Condenser Entering Water Temp	Temperature of the water entering the condenser.	Temperature	•	•		
Analog Input, 47	Condenser Leaving Water Temp	Temperature of the water leaving the condenser.	Temperature	•	•		
Analog Input, 48	High Side Oil Pressure- Compressor 1A	Pressure of the oil at the high side of compressor 1A.	Pressure	•	•	•	
Analog Input, 49	High Side Oil Pressure- Compressor 1B	Pressure of the oil at the high side of compressor 1B.	Pressure	•		•	
Analog Input, 50	High Side Oil Pressure- Compressor 2A	Pressure of the oil at the high side of compressor 2A.	Pressure	•		•	
Analog Input, 51	High Side Oil Pressure- Compressor 2B	Pressure of the oil at the high side of compressor 2B.	Pressure	•		•	
Analog Input, 52	Oil Temp- Compressor 1A	Temperature of the oil in compressor 1A.	Temperature			•	
Analog Input, 52	Oil Temp- Compressor 1B	Temperature of the oil in compressor 1B.	Temperature			•	
Analog Input, 54	Oil Temp- Compressor 2A	Temperature of the oil in compressor 2A.	Temperature			•	
Analog Input, 55	Oil Temp- Compressor 2B	Temperature of the oil in compressor 2B.	Temperature			•	
Analog Input, 56	Refrigerant Disch Temp- Ckt 1	Temperature of the refrigerant being discharged from Ckt 1.	Temperature		•		
Analog Input, 57	Outdoor Air Temperature	Outdoor air temperature.	Temperature	•		•	•
Analog Input, 58	Condenser Control Output	Percentage of condenser water flow being requested by the chiller.	Percent	•	•		
Analog Input, 59	Phase AB Voltage- Compressor 1A	Phase AB voltage, compressor 1A.	Voltage	•	•	•	
Analog Input, 60	Phase BC Voltage- Compressor 1A	Phase BC voltage, compressor 1A.	Voltage	•	•	•	
Analog Input, 61	Phase CA Voltage- Compressor 1A	Phase CA voltage, compressor 1A.	Voltage	•	•	•	
Analo5 Input, 62	Phase AB Voltage- Compressor 1B	Phase AB voltage, compressor 1B.	Voltage	•		•	
Analog Input, 63	Phase BC Voltage- Compressor 1B	Phase BC voltage, compressor 1B.	Voltage	•		•	
Analog Input, 64	Phase CA Voltage- Compressor 1B	Phase CA voltage, compressor 1B.	Voltage	•		•	
Analog Input, 65	Phase AB Voltage- Compressor 2A	Phase AB voltage, compressor 2A.	Voltage	•		•	
Analog Input, 66	Phase BC Voltage- Compressor 2A	Phase BC voltage, compressor 2A.	Voltage	•		•	
Analog Input, 67	Phase CA Voltage- Compressor 2A	Phase CA voltage, compressor 2A.	Voltage	•		•	
Analog Input, 68	Phase AB Voltage- Compressor 2B	Phase AB voltage, compressor 2B.	Voltage	•		•	
Analog Input, 69	Phase BC Voltage- Compressor 2B	Phase BC voltage, compressor 2B.	Voltage	•		•	
Analog Input, 70	Phase CA Voltage- Compressor 2B	Phase CA voltage, compressor 2B	Voltage	•		•	
Analog Input, 71	Line 1 Current (in Amps)- Compressor 1A	Line 1 Current (in Amps)- Compressor 1A	Current	•	•	•	
Analog Input, 72	Line 2 Current (in Amps)- Compressor 1A	Line 2 Current (in Amps)- Compressor 1A	Current	•	•	•	
Analog Input, 73	Line 3 Current (in Amps)- Compressor 1A	Line 3 Current (in Amps)- Compressor 1A	Current	•	•	•	

Table 4. Analog Input (continued)

Object Identifier	Object Name	Description	Dimensionality	RTWD /RTUD	RTHD	RTAC	CGAM
Analog Input, 74	Line 1 Current (in Amps)-Compressor 1B	Line 1 Current (in Amps)-Compressor 1B	Current	•		•	
Analog Input, 75	Line 2 Current (in Amps)-Compressor 1B	Line 2 Current (in Amps)-Compressor 1B	Current	•		•	
Analog Input, 76	Line 3 Current (in Amps)-Compressor 1B	Line 3 Current (in Amps)-Compressor 1B	Current	•		•	
Analog Input, 77	Line 1 Current (in Amps)-Compressor 2A	Line 1 Current (in Amps)-Compressor 2A	Current	•		•	
Analog Input, 78	Line 2 Current (in Amps)-Compressor 2A	Line 2 Current (in Amps)-Compressor 2A	Current	•		•	
Analog Input, 79	Line 3 Current (in Amps)-Compressor 2A	Line 3 Current (in Amps)-Compressor 2A	Current	•		•	
Analog Input, 80	Line 1 Current (in Amps)-Compressor 2B	Line 1 Current (in Amps)-Compressor 2B	Current	•		•	
Analog Input, 81	Line 2 Current (in Amps)-Compressor 2B	Line 2 Current (in Amps)-Compressor 2B	Current	•		•	
Analog Input, 82	Line 3 Current (in Amps)-Compressor 2B	Line 3 Current (in Amps)-Compressor 2B	Current	•		•	
Analog Input, 83	Line 1 Current (%RLA)-Compressor 1A	Line 1 Current (%RLA)-Compressor 1A	Percent	•	•	•	
Analog Input, 84	Line 2 Current (%RLA)-Compressor 1A	Line 2 Current (%RLA)-Compressor 1A	Percent	•	•	•	
Analog Input, 85	Line 3 Current (%RLA)-Compressor 1A	Line 3 Current (%RLA)-Compressor 1A	Percent	•		•	
Analog Input, 86	Line 1 Current (%RLA)-Compressor 1B	Line 1 Current (%RLA)-Compressor 1B	Percent	•	•	•	
Analog Input, 87	Line 2 Current (%RLA)-Compressor 1B	Line 2 Current (%RLA)-Compressor 1B	Percent	•		•	
Analog Input, 88	Line 3 Current (%RLA)-Compressor 1B	Line 3 Current (%RLA)-Compressor 1B	Percent	•		•	
Analog Input, 89	Line 1 Current (%RLA)-Compressor 2A	Line 1 Current (%RLA)-Compressor 2A	Percent	•		•	
Analog Input, 90	Line 2 Current (%RLA)-Compressor 2A	Line 2 Current (%RLA)-Compressor 2A	Percent	•		•	
Analog Input, 91	Line 3 Current (%RLA)-Compressor 2A	Line 3 Current (%RLA)-Compressor 2A	Percent	•		•	
Analog Input, 92	Line 1 Current (%RLA)-Compressor 2B	Line 1 Current (%RLA)-Compressor 2B	Percent	•		•	
Analog Input, 93	Line 2 Current (%RLA)-Compressor 2B	Line 2 Current (%RLA)-Compressor 2B	Percent	•		•	
Analog Input, 94	Line 3 Current (%RLA)-Compressor 2B	Line 3 Current (%RLA)-Compressor 2B	Percent	•		•	
Analog Input, 95	Number of Circuits	Number of Circuits	None	•	•	•	•
Analog Input, 96	Number of Compressors, Ckt 1	Number of Compressors, Ckt 1	None	•	•	•	•
Analog Input, 97	Number of Compressors, Ckt 2	Number of Compressors, Ckt 2	None	•	•	•	•
Analog Input, 98	Chiller Design Capacity	Design Capacity of the Chiller	None	•	•	•	•

(a) Power meter.

Table 5. Multistate Output

Object Identifier	Object Name	Description	Relinq Default	Object States	RTWD /RTUD	RTHD	RTAC	CGAM
Multi-State Output, 1	Chiller Mode Command	Mode of operation of the chiller.	1 = Cool	1 = HVAC _Cool 2 = HVAC_Heat **3 = HVAC_Ice** (a) 4 = Not Used	•	•	•	•

(a) Chiller should be selected for ice making.

Table 6. Multistate Input

BCI-C Object Identifier	Object Name	Description	Object States	RTWD /RTUD	RTHD	RTAC	CGAM
Multi-State Input, 1	Running Mode	Indicates the primary running mode of the chiller.	1 = Chiller Off 2 = Chiller in Start Mode 3 = Chiller in Run Mode 4 = Chiller in Pre-shutdown Mode 5 = Chiller in Service Mode	•	•	•	•
Multi-State Input, 2	Operating Mode	Indicates the primary operating mode of the chiller.	1 = HVAC_Cool 2 = HVAC_Heat **3 = HVAC_Ice** (a) 4 = Not Used	•	•	•	•
Multi-State Input, 3	MP Communication Status	Communication status.	1 = R-22 2 = Communication 3 = Communication Lost 4 = Failed to Established 5 = Waiting to Establish	•	•	•	•
Multi-State Input, 4	Refrigerant Type	Refrigerant type.	1 = R-11 2 = R-12 3 = R-22 4 = R-123 5 = R-134A 6 = R407C 7 = R-410A	•	•	•	•
Multi-State Input, 5	Model Information	Indicates the model type of the chiller.	1 = RTA 2 = CVH 3 = CVG 4 = CVR 5 = CDH 6 = RTH 7 = CGW 8 = CGA 9 = CCA 10 = RTW 11 = RTX 12 = RTU 13 = CCU 14 = CXA 15 = CGC 16 = RAU	•	•	•	•
Multi-State Input, 6	Cooling Type	Cooling type of the condenser.	1 = Water Cooled 2 = Air Cooled	•	•	•	•
Multi-State Input, 7	Manufacturing Location	Location where chiller was manufactured.	1 = Field Applied 2 = La Crosse 3 = Pueblo 4 = Charmes 5 = Rushville 6 = Macon 7 = Waco 8 = Lexington 9 = Forsyth 10 = Clarksville 11 = Ft. Smith 12 = Penang 13 = Colchester 14 = Curitiba 15 = Taicang 16 = Taiwan 17 = Epinal 18 = Golbey	•	•	•	•

(a) Chiller should be selected for ice making.

Table 7. Binary Output

Object Identifier	Object Name	Description	Relinq Default	Object States	RTWD /RTUD	RTHD	RTAC	CGAM
Binary Output, 1	Chiller Auto Stop Command	Allows the chiller to run if conditions for running are met.	True	Inactive = Stop Active = Auto	•	•	•	•
Binary Output, 2	Remote Diagnostic Reset Command	Resets remotely diagnostics that can be reset.	False	Inactive = No Reset Request Active = Reset Request	•	•	•	•
Binary Output, 3	Base Loading Auto/On Request	Requests chiller to use base loading.	False	Inactive = Auto Active = On		•		
Binary Output, 4	Noise Reduction Request	Requests chiller to enter mode to reduce noise.	False	Inactive = Normal Active = Reduced Noise	•			•

Table 8. Binary Input

Object Identifier	Object Name	Description	Object States	RTWD /RTUD	RTHD	RTAC	CGAM
Binary Input, 23	Alarm Present	Indicates if an alarm is active.	Inactive = No Alarm Active = Alarm	•	•	•	•
Binary Input, 8	Base Loading Active	Indicates if the base loading control method is currently being used.	Inactive = Inactive Active = Active		•		
Binary Input, 3	Capacity Limited	Indicates if conditions may exist that prevent the chiller from reaching setpoint.	Inactive = Not Limited Active = Limited	•	•	•	•
Binary Input, 4	Chiller Running State	Indicates if the chiller is running or stopped.	Inactive = Off Active = On	•	•	•	•
Binary Input, 9	Compressor 1A Running	Indicates if compressor 1A is running.	Inactive = Off Active = Running	•	•	•	•
Binary Input, 10	Compressor 1B Running	Indicates if compressor 1B is running.	Inactive = Off Active = Running	•		•	•
Binary Input, 13	Compressor 1C Running	Indicates if compressor 1C is running.	Inactive = Off Active = Running				•
Binary Input, 11	Compressor 2A Running	Indicates if compressor 2A is running.	Inactive = Off Active = Running	•		•	
Binary Input, 14	Compressor 2A Running	Indicates if compressor 2A is running.	Inactive = Off Active = Running				•
Binary Input, 12	Compressor 2B Running	Indicates if compressor 2B is running.	Inactive = Off Active = Running	•		•	
Binary Input, 15	Compressor 2B Running	Indicates if compressor 2B is running.	Inactive = Off Active = Running				•
Binary Input, 16	Compressor 2C Running	Indicates if compressor 2C is running.	Inactive = Off Active = Running				•
Binary Input, 5	Condenser Water Flow Status	Condenser water flow status.	Inactive = No Flow Active = Flow	•	•		
Binary Input, 19	Condenser Water Pump Request	Indicates a request from the chiller to turn on the condenser water pump.	Inactive = Off Active = On	•	•		
Binary Input, 21	Defrost Mode (or in Defrost)	Indicates if one or more circuits are in a defrost mode.	Inactive = Not in Defrost Active = Defrost				• (a)
Binary Input, 22	Evaporator Water Flow Status	Indicates if water is flowing through the evaporator.	Inactive = No Flow Active = Flow	•	•	•	•
Binary Input, 17	Evaporator Water Pump Request	Indicates a request from the chiller to turn on the evaporator water pump.	Inactive = Off Active = On	•	•	•	
Binary Input, 7	Head Relief Request	Indicates if the chiller is asking an outside system to provide more heat rejection from the condenser water loop.	Inactive = Off Active = On	•	•		
Binary Input, 25	Last Diagnostic	Indicates last diagnostic for the chiller.	Inactive = Off Active = On	•	•	•	•
Binary Input, 2	Local Setpoint Control	Indicates if the chiller is being controlled by local setpoints instead of BAS setpoints.	Inactive =Remote Control Active = Local Control	•	•	•	•
Binary Input, 6	Maximum Capacity	Indicates if all available chiller capacity is being used.	Inactive = Off Active = On	•		•	•
Binary Input, 20	Noise Reduction Active	Indicates if the chiller is in a state where noise is being reduced.	Inactive = Off Active = On	•			• (a)
Binary Input, 1	Run Enabled	Indicates if the chiller is available to run or is currently running.	Inactive = Stop Active = Auto	•	•	•	•
Binary Input, 24	Shutdown Alarm Present	Indicates if a shutdown alarm is active.	Inactive = No Alarm Active = None	•	•	•	•
Binary Input, 18	Water Pump Request	Indicates a request from the chiller to turn on the water pump.	Inactive = Off Active = On				•

(a) Available only on heat pumps.

Table 9. All Object Types Sorted by Object Name (*Refer to previous tables for detailed descriptions of objects*)

Object Identifier[a]	Object Name	Description
Analog Input 4	Active Base Loading Setpoint	Value of base loading setpoint currently being used by the chiller.
Analog Input, 1	Active Cool/Heat Setpoint Temperature	Active chiller water or hot water setpoint.
Analog Input, 2	Active Current Limit Setpoint	Active capacity current limit setpoint.
Analog Input, 3	Active Demand Limit Setpoint	Active demand limit setpoint.
Analog Input, 5	Actual Running Capacity	Level of capacity that the chiller is currently running at.
Analog Input, 42	Airflow Percentage- Circuit 1	Approximate airflow percentage of circuit 1.
Analog Input, 43	Airflow Percentage- Circuit 2	Approximate airflow percentage of circuit 2.
Binary Input, 23	Alarm Present	Indicates if an alarm is active.
Binary Input, 8	Base Loading Active	Indicates if the base loading control method is currently being used.
Binary Output, 3	Base Loading Auto/On Request	Requests chiller to use base loading.
Analog Output 5	Base Loading Setpoint	Capacity level to which the chiller should control when base loading is active.
Binary Input, 3	Capacity Limited	Indicates if conditions may exist that prevent the chiller from reaching setpoint.
Analog Output 1	Chilled Water Setpoint	Desired leaving water temperature if chiller is in cooling mode.
Binary Output, 1	Chiller Auto Stop Command	Allows the chiller to run if conditions for running are met.
Binary Output, 1	Chiller Auto Stop Command	Allows the chiller to run if conditions for running are met.
Analog Input, 98	Chiller Design Capacity	Design capacity of the chiller.
Binary Input, 4	Chiller Running State	Indicates if the chiller is running or stopped.
Binary Input, 9	Compressor 1A Running	Indicates if compressor 1A is running.
Binary Input, 10	Compressor 1B Running	Indicates if compressor 1B is running.
Binary Input, 13	Compressor 1C Running	Indicates if compressor 1C is running.
Binary Input, 11	Compressor 2A Running	Indicates if compressor 2A is running.
Binary Input, 14	Compressor 2A Running	Indicates if compressor 2A is running.
Binary Input, 12	Compressor 2B Running	Indicates if compressor 2B is running.
Binary Input, 15	Compressor 2B Running	Indicates if compressor 2B is running.
Binary Input, 16	Compressor 2C Running	Indicates if compressor 2C is running.
Analog Input, 58	Condenser Control Output	Percentage of condenser water flow being requested by the chiller.
Analog Input, 46	Condenser Entering Water Temp	Temperature of the water entering the condenser.
Analog Input, 47	Condenser Leaving Water Temp	Temperature of the water leaving the condenser.
Analog Input, 16	Condenser Refrigerant Pressure- Ckt 1	Circuit 1 condenser refrigerant pressure.
Analog Input, 18	Condenser Refrigerant Pressure- Ckt 2	Circuit 2 condenser refrigerant pressure.
Analog Input, 20	Condenser Saturated Refrigerant Temperature- Ckt 1	Circuit 1 condenser refrigerant temperature.
Analog Input, 22	Condenser Saturated Refrigerant Temperature- Ckt 2	Circuit 2 condenser refrigerant temperature.
Binary Input, 5	Condenser Water Flow Status	Condenser water flow status.
Binary Input, 19	Condenser Water Pump Request	Indicates a request from the chiller to turn on the condenser water pump.
Multi-State Input, 6	Cooling Type	Cooling type of the condenser.
Analog Output 2	Current Limit Setpoint	Sets the maximum capacity that the chiller can use.
Binary Input, 21	Defrost Mode (or in Defrost)	Indicates if one or more circuits are in a defrost mode.
Analog Output 3	Demand Limit Setpoint	Sets the maximum capacity that the chiller can use.
Analog Input, 17	Discharge Pressure- Ckt 1	Circuit 1 discharge pressure.
Analog Input, 19	Discharge Pressure- Ckt 2	Circuit 2 discharge pressure.
Analog Input, 21	Discharge Saturated Refrigerant Temperature- Ckt 1	Circuit 1 discharge refrigerant temperature.
Analog Input, 23	Discharge Saturated Refrigerant Temperature- Ckt 2	Circuit 2 discharge refrigerant temperature.
Analog Input, 44	Evaporator Entering Water Temp	Temperature of the water entering the evaporator.
Analog Input, 45	Evaporator Leaving Water Temp	Temperature of the water leaving the evaporator.
Analog Input, 9	Evaporator Refrigerant Pressure- Ckt 2	Circuit 2 evaporator refrigerant pressure.

Table 9. All Object Types Sorted by Object Name (*Refer to previous tables for detailed descriptions of objects*) (continued)

Object Identifier[a]	Object Name	Description
Analog Input, 6	Evaporator Refrigerant Pressure- Ckt1	Circuit 1 evaporator refrigerant pressure.
Analog Input, 12	Evaporator Saturated Refrigerant Temperature- Ckt 1	Circuit 2 evaporator refrigerant temperature.
Analog Input, 14	Evaporator Saturated Refrigerant Temperature- Ckt 2	Circuit 2 evaporator refrigerant temperature.
Binary Input, 22	Evaporator Water Flow Status	Indicates if water is flowing through the evaporator.
Binary Input, 17	Evaporator Water Pump Request	Indicates a request from the chiller to turn on the evaporator water pump.
Binary Input, 7	Head Relief Request	Indicates if the chiller is asking an outside system to provide more heat
Analog Input, 48	High Side Oil Pressure- Compressor 1A	Pressure of the oil at the high side of compressor 1A.
Analog Input, 49	High Side Oil Pressure- Compressor 1B	Pressure of the oil at the high side of compressor 1B.
Analog Input, 50	High Side Oil Pressure- Compressor 2A	Pressure of the oil at the high side of compressor 2A.
Analog Input, 51	High Side Oil Pressure- Compressor 2B	Pressure of the oil at the high side of compressor 2B.
Analog Output 4	Hot Water Setpoint	Desired leaving water temperature if chiller is in heating mode.
Binary Input, 25	Last Diagnostic	Indicates the last diagnostic for the chiller.
Analog Input, 83	Line 1 Current (%RLA)- Compressor 1A	Line 1 Current (%RLA)- Compressor 1A
Analog Input, 86	Line 1 Current (%RLA)- Compressor 1B	Line 1 Current (%RLA)- Compressor 1B
Analog Input, 89	Line 1 Current (%RLA)- Compressor 2A	Line 1 Current (%RLA)- Compressor 2A
Analog Input, 92	Line 1 Current (%RLA)- Compressor 2B	Line 1 Current (%RLA)- Compressor 2B
Analog Input, 71	Line 1 Current (in Amps)- Compressor 1A	Line 1 Current (in Amps)- Compressor 1A
Analog Input, 74	Line 1 Current (in Amps)- Compressor 1B	Line 1 Current (in Amps)- Compressor 1B
Analog Input, 77	Line 1 Current (in Amps)- Compressor 2A	Line 1 Current (in Amps)- Compressor 2A
Analog Input, 80	Line 1 Current (in Amps)- Compressor 2B	Line 1 Current (in Amps)- Compressor 2B
Analog Input, 84	Line 2 Current (%RLA)- Compressor 1A	Line 2 Current (%RLA)- Compressor 1A
Analog Input, 87	Line 2 Current (%RLA)- Compressor 1B	Line 2 Current (%RLA)- Compressor 1B
Analog Input, 90	Line 2 Current (%RLA)- Compressor 2A	Line 2 Current (%RLA)- Compressor 2A
Analog Input, 93	Line 2 Current (%RLA)- Compressor 2B	Line 2 Current (%RLA)- Compressor 2B
Analog Input, 72	Line 2 Current (in Amps)- Compressor 1A	Line 2 Current (in Amps)- Compressor 1A
Analog Input, 75	Line 2 Current (in Amps)- Compressor 1B	Line 2 Current (in Amps)- Compressor 1B
Analog Input, 78	Line 2 Current (in Amps)- Compressor 2A	Line 2 Current (in Amps)- Compressor 2A
Analog Input, 81	Line 2 Current (in Amps)- Compressor 2B	Line 2 Current (in Amps)- Compressor 2B
Analog Input, 85	Line 3 Current (%RLA)- Compressor 1A	Line 3 Current (%RLA)- Compressor 1A
Analog Input, 88	Line 3 Current (%RLA)- Compressor 1B	Line 3 Current (%RLA)- Compressor 1B
Analog Input, 91	Line 3 Current (%RLA)- Compressor 2A	Line 3 Current (%RLA)- Compressor 2A
Analog Input, 94	Line 3 Current (%RLA)- Compressor 2B	Line 3 Current (%RLA)- Compressor 2B
Analog Input, 73	Line 3 Current (in Amps)- Compressor 1A	Line 3 Current (in Amps)- Compressor 1A
Analog Input, 76	Line 3 Current (in Amps)- Compressor 1B	Line 3 Current (in Amps)- Compressor 1B
Analog Input, 79	Line 3 Current (in Amps)- Compressor 2A	Line 3 Current (in Amps)- Compressor 2A
Analog Input, 82	Line 3 Current (in Amps)- Compressor 2B	Line 3 Current (in Amps)- Compressor 2B
Analog Input, 25	Local Atmospheric Pressure	Local atmospheric pressure.
Binary Input, 2	Local Setpoint Control	Indicates if the chiller is being controlled by local setpoints instead of BAS setpoints.
Multi-State Input, 7	Manufacturing Location	Location where chiller was manufactured.
Binary Input, 6	Maximum Capacity	Indicates if all available chiller capacity is being used.
Multi-State Input, 5	Model Information	Indicates the model type of the chiller.
Multi-State Input, 3	MP Communication Status	Communication status.
Binary Input, 20	Noise Reduction Active	Indicates if the chiller is in a state where noise is being reduced.
Binary Output, 4	Noise Reduction Request	Requests chiller to enter mode to reduce noise.
Analog Input, 95	Number of Circuits	Number of Circuits
Analog Input, 96	Number of Compressors, Ckt 1	Number of Compressors, Ckt 1

Table 9. All Object Types Sorted by Object Name (*Refer to previous tables for detailed descriptions of objects*) (continued)

Object Identifier[a]	Object Name	Description
Analog Input, 97	Number of Compressors, Ckt 2	Number of Compressors, Ckt 2
Analog Input, 52	Oil Temp- Compressor 1A	Temperature of the oil in compressor 1A.
Analog Input, 52	Oil Temp- Compressor 1B	Temperature of the oil in compressor 1B.
Analog Input, 54	Oil Temp- Compressor 2A	Temperature of the oil in compressor 2A.
Analog Input, 55	Oil Temp- Compressor 2B	Temperature of the oil in compressor 2B.
Multi-State Input, 2	Operating Mode	Indicates the primary operating mode of the chiller.
Analog Input, 57	Outdoor Air Temperature	Outdoor air temperature.
Analog Input, 59	Phase AB Voltage- Compressor 1A	Phase AB voltage, compressor 1A.
Analo5 Input, 62	Phase AB Voltage- Compressor 1B	Phase AB voltage, compressor 1B.
Analog Input, 65	Phase AB Voltage- Compressor 2A	Phase AB voltage, compressor 2A.
Analog Input, 68	Phase AB Voltage- Compressor 2B	Phase AB voltage, compressor 2B.
Analog Input, 60	Phase BC Voltage- Compressor 1A	Phase BC voltage, compressor 1A.
Analog Input, 63	Phase BC Voltage- Compressor 1B	Phase BC voltage, compressor 1B.
Analog Input, 66	Phase BC Voltage- Compressor 2A	Phase BC voltage, compressor 2A.
Analog Input, 69	Phase BC Voltage- Compressor 2B	Phase BC voltage, compressor 2B.
Analog Input, 61	Phase CA Voltage- Compressor 1A	Phase CA voltage, compressor 1A.
Analog Input, 64	Phase CA Voltage- Compressor 1B	Phase CA voltage, compressor 1B.
Analog Input, 67	Phase CA Voltage- Compressor 2A	Phase CA voltage, compressor 2A.
Analog Input, 70	Phase CA Voltage- Compressor 2B	Phase CA voltage, compressor 2B
Analog Input, 56	Refrigerant Disch Temp- Ckt 1	Temperature of the refrigerant being discharged from Ckt 1.
Multi-State Input, 4	Refrigerant Type	Refrigerant type.
Binary Output, 2	Remote Diagnostic Reset Command	Resets remotely diagnostics that can be reset.
Binary Input, 1	Run Enabled	Indicates if the chiller is available to run or is currently running.
Analog Input, 34	Run Time- Compressor 1A	Total run time of compressor 1A.
Analog Input, 35	Run Time- Compressor 1B	Total run time of compressor 1B.
Analog Input, 38	Run Time- Compressor 1C	Total run time of compressor 1C.
Analog Input, 36	Run Time- Compressor 2A	Total run time of compressor 2A.
Analog Input, 39	Run Time- Compressor 2A	Total run time of compressor 2A.
Analog Input, 37	Run Time- Compressor 2B	Total run time of compressor 2B.
Analog Input, 40	Run Time- Compressor 2B	Total run time of compressor 2B.
Analog Input, 41	Run Time- Compressor 2C	Total run time of compressor 2C.
Multi-State Input, 1	Running Mode	Indicates the primary running mode of the chiller.
Binary Input, 24	Shutdown Alarm Present	Indicates if a shutdown alarm is present.
Analog Input, 26	Starts- Compressor 1A	Number of starts for compressor 1A.
Analog Input, 27	Starts- Compressor 1B	Number of starts for compressor 1B.
Analog Input, 30	Starts- Compressor 1C	Number of starts for compressor 1C.
Analog Input, 28	Starts- Compressor 2A	Number of starts for compressor 2A.
Analog Input, 31	Starts- Compressor 2A	Number of starts for compressor 2A.
Analog Input, 29	Starts- Compressor 2B	Number of starts for compressor 2B.
Analog Input, 32	Starts- Compressor 2B	Number of starts for compressor 2B.
Analog Input, 33	Starts- Compressor 2C	Number of starts for compressor 2C.
Analog Input, 7	Suction Pressure- Ckt 1	Circuit 1 suction pressure.
Analog Input, 8	Suction Pressure- Ckt 1	Circuit 1 suction pressure.
Analog Input, 10	Suction Pressure- Ckt 2	Circuit 2 suction pressure.
Analog Input, 11	Suction Pressure- Ckt 2	Circuit 2 suction pressure.
Analog Input, 13	Suction Saturated Refrigerant Temperature- Ckt 1	Circuit 1 suction refrigerant temperature.

Table 9. All Object Types Sorted by Object Name (*Refer to previous tables for detailed descriptions of objects*) (continued)

Object Identifier[a]	Object Name	Description
Analog Input, 15	Suction Saturated Refrigerant Temperature- Ckt 2	Circuit 2 suction refrigerant temperature.
Analog Input, 24	Unit Power Consumption	The power being consumed by the chiller.
Binary Input, 18	Water Pump Request	Indicates a request from the chiller to turn on the water pump.

(a) AI=Analog Input, AO=Analog Output, AV=Analog Value, BI=Binary Input, BO=Binary Output, MI=Multistate Input, MO=Multistate Output

BCI-C Alarming

The BCI-C unit has three binary input points that are used for communicating alarms and one binary output point that is used to reset alarms remotely. Those inputs and output points are:

- **BI 23; Alarm Present**– This object indicates if any alarms are active regardless of severity. A notification will be sent to any recipients of the *Information Notification Class* object when the point transitions from *No Alarm* to *Alarm*.
- **BI 24; Shutdown Alarm Present**– This object indicates if any alarms that result in the shutdown of the chiller are active. A notification will be sent to any recipients of the *Critical Notification Class* object when the point transitions from *No Alarm* to *Alarm*.
- **BI 25; Last Diagnostic**– The active text of this object will reflect the description of the last diagnostic to occur on the chiller.
- **BO 2; Remote Diagnostic Reset Command**– This object is used to remotely reset diagnostics on the chiller. Immediately after commanding this point value to *1*, the BCI-C will send the reset command to the chiller and set this point value back to *0* and clear the priority array.

Note: *Not all diagnostics are able to be reset remotely. Some will require local reset at the chiller front panel.*

Additional Resources

Use the following documents and links as additional resources:

- *BACnet™ Communication Interface for Chillers (BCI-C) Field Kit Installation Guide* (RF-SVN02)
- Product support online:
  - www.bacnet.org
  - www.bacnetassociation.org
  - www.ashrae.org
  - Tracer TU Help online
- *Tracer™ BACnet™ Terminator Installation Instructions* (X39641151-01)
- *Tracer™ TU Service Tool Getting Started Guide* (TTU-SVN02) (X39641083)
- *Tracer™ TU Service Tool for Water-cooled CenTraVac™ Chillers with Tracer AdaptiView™ Control Programming Guide* (CTV-SVP02)

Note: *For further assistance, contact your local Trane sales office.*

Glossary

A

ASHRAE
See American Society of Heating, Refrigeration, and Air-conditioning Engineers

American Society of Heating, Refrigeration, and Air-conditioning Engineers
An international organization of 50,000 persons with chapters throughout the world. The Society is organized for the sole purpose of advancing the arts and sciences of heating, ventilation, air conditioning and refrigeration. It benefits the public with its research, standards writing, continuing education, and publications.

B

BACnet™
See Building Automation Control network

BACnet interoperability building blocks
A block of BACnet application services that tells vendors what BACnet services must be implemented to provide specific device functionality. The BIBBs are grouped together into BACnet device profiles.

BACnet object
An abstract representation of the physical point or points where data is input from or output to an I/O device. Each object may have several BACnet properties that describe the status of that object.

baud rate
The number of signaling elements that occur each second during electronic data transmission. At slow speeds, baud indicates the number of bits per second that are transmitted. For example, 500 baud means that 500 bits are transmitted each second (abbreviated 500 bps). At higher speeds, multiple bits may be encoded with each electrical change. For example, 4,800 baud may allow 9,600 bits to be sent each second. Data transmission rates at high speeds are generally expressed in bits per second (bps) rather than baud. For example, a 9,600 bps modem may operate at only 2,400 baud.

BIBB
See BACnet interoperability building blocks

Building Automation Control network (BACnet and ANSI/ASHRAE Standard 135-2004)
An interoperable protocol developed specifically for the building controls industry. The American National Standards Institute named it as a standard and Trane advocates BACnet protocol for use in system-level control devices.

device
A device is a standard BACnet object as defined by ASHRAE Standard 135-2004.The Tracer UC800 contains the BACnet object.

Device ID
The Device ID is used to uniquely identify each BACnet Device and it can be in the range of 0 to 4194302. There cannot be more than one device using the same Device ID. Each of the sample applications operate as a device and requires its own device id which defaults to zero.

I

interoperability
The ability to integrate equipment from different vendors into a comprehensive automation and control system. In addition, digital communications between products designed independently, but designed to the same communication standard.

P

protocol
A set of rules (language) that governs the exchange of data over a digital communications system.

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For more information, contact your local Trane office or e-mail us at comfort@trane.com