



Field Kit Installation Guide

BACnet™ Communication Interface for Chillers (BCI-C)
RTHD, RTWD, RTAC, CGAM/CXAM, and CGWN/CCUN

Ordering Number KT15548



⚠ SAFETY WARNING

Only qualified personnel should install and service the equipment. The installation, starting up, and servicing of heating, ventilating, and air-conditioning equipment can be hazardous and requires specific knowledge and training. Improperly installed, adjusted or altered equipment by an unqualified person could result in death or serious injury. When working on the equipment, observe all precautions in the literature and on the tags, stickers, and labels that are attached to the equipment.

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TECHNOLOGIES



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Warnings, Cautions, and Notices

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 information about:

- BACnet protocol
- Specification, requirements and dimensions
- Installing the BCI-C in the chiller control panel
- Mounting and removing/reposition the BCI-C on DIN rail
- Mounting a CGAM slant BCI-C
- Setting rotary switches for the BCI-C
- Connecting and configuring the BCI-C with Tracer TU software
- Configuring a CH530 for BACnet with TechView™ service software

Note: *The TechView functionality described in this document is the same functionality as described in the KestrelView™ documentation.*

- Additional Resources

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. 18](#).

BACnet Testing Laboratory (BTL) Certification

The BCI-I 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.

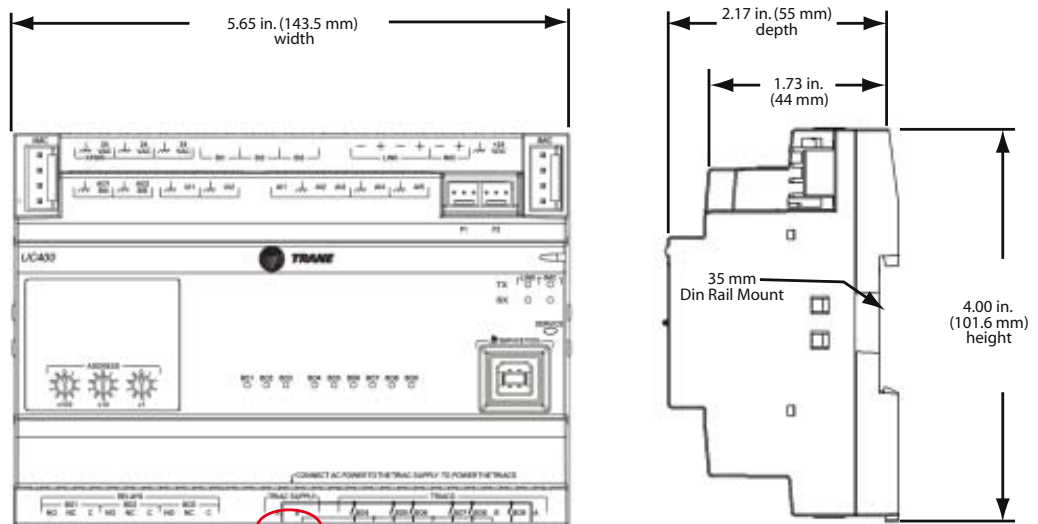
Specifications, Requirements, and Dimensions

The following table and illustration provides specifications, requirements, and dimensions of the BCI-C controller.

Specifications and Requirements

Storage	
Temperature:	-44°C to 95°C (-48°F to 203°F)
Relative humidity:	Between 5% to 95% (noncondensing)
Operating	
Temperature:	-40°C to 70°C (-40°F to 158°F)
Humidity:	Between 5% to 95% (noncondensing)
Power:	24 Vdc ±15%, maximum load 90 mA
Controller mounting weight:	Mounting surface must support: .80 lb. (.364 kg)
Environmental rating (enclosure):	NEMA 1
Altitude:	6,500 ft maximum (1,981 m)
Installation:	U.L. 840: Category 3
Pollution:	U.L. 840: Degree 2
Requirements	
Tools and software:	<ul style="list-style-type: none"> • One (1) Phillips screwdriver • One (1) 1/8 inch, flat-bladed service screwdriver • CH530 Main Processor (MP) software: RTWD/RTUD Version 6.30 or higher, RTHD Version 12.0 or higher, RTAC Version 37.0 or higher, CGAM version 2.00 or higher, CGWN/CCUN (Global Scroll) Version 9.0 or higher • TechView 13.0 SP1 or higher • Tracer TU 3.0 or higher

Controller Dimensions



Important: Slotted release clip shown— if removing or repositioning the controller, the user must remove connectors before proceeding.



Installing the BCI-C in the Chiller Control Panel

Before installing the BCI-C kit, open the box and verify that the following parts are enclosed:

- One (1) BCI-C module, X13651492010
- Two (2) mounting bracket, 520210700100
- Four (4) screws, #6-32 x 0.375 Phillips panhead, thread forming, X25330033100 (*two for each bracket*)
- One (1) DIN rail, 6 inch length, X05010049010
- Two (2) screws, #10-32 x 0.5 Phillips panhead, thread forming, X25330033410 (*for DIN rail attachment*)
- Two (2) position terminal block connectors, X19220085010
- One (1) BACnet Communication Interface for Chiller (BCI-C) Integration Guide, BAS-SVP05
- *Optional for CGAM Slant Mounting; one (1) 6-inch cable extension, CAB-00998 (Not included in the kit and must be ordered separately.)*

Note: Refer to the section, “Mounting a CGAM Slant BCI-C,” p. 12.

- One (1) copy of service literature shipped with each unit (*located in the control panel*)

Important: Visually inspect contents for obvious defects or damage. All components have been thoroughly inspected before leaving the factory. Any claims for damage incurred during shipment should be filed immediately with the carrier.

Installation

Important: Before beginning installation, it is important to read the following safety warnings. Procedures presented in this guide should be performed only by qualified HVAC technicians.

⚠ WARNING

Live Electrical Components!

During installation, testing, servicing and troubleshooting of this product, it may be necessary to work with live electrical components. Have a qualified licensed electrician or other individual who has been properly trained in handling live electrical components perform these tasks. Failure to follow all electrical safety precautions when exposed to live electrical components could result in death or serious injury.

⚠ WARNING

Hazardous Voltage!

Disconnect all electric power, including remote disconnects before servicing. Follow proper lockout/tagout procedures to ensure the power can not be inadvertently energized. Failure to disconnect power before servicing could result in death or serious injury

Note: All mounting holes for brackets and DIN rail have been predrilled.

To install the BCI-C:

1. Disconnect all power from the chiller.
2. Open the control panel and mount the brackets (520210700100) to the control panel using two (2), #6-32 x 0.375 Phillips panhead, thread forming screws (X25330033100). Use the mounting locations for the specific chiller type as shown in the following illustrations:

Installing the BCI-C in the Chiller Control Panel

- RTWD/RTUD in location 1A9

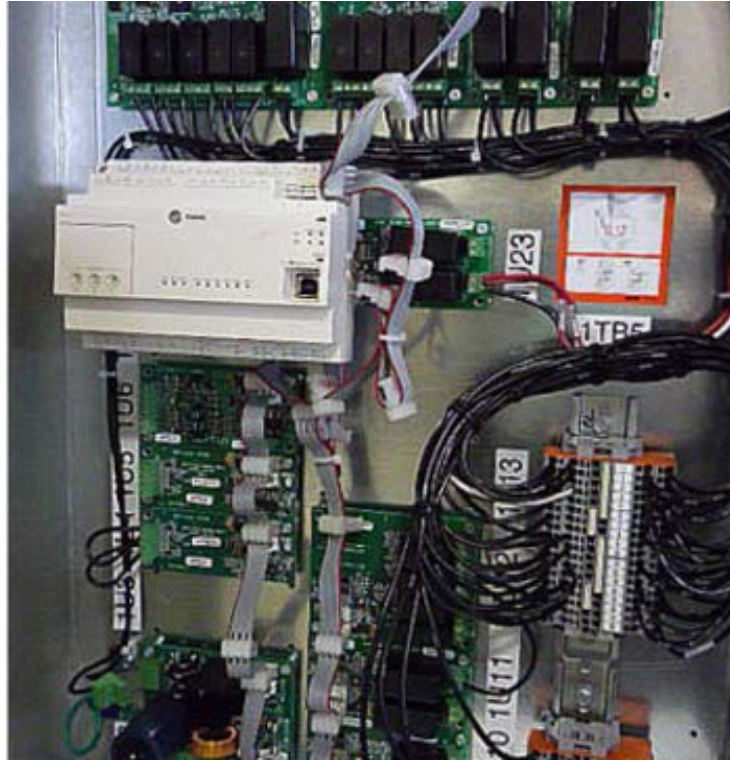


- RTHD in location 1A16



Installing the BCI-C in the Chiller Control Panel

- RTAC in location 1U8



- CGAM in location 1A15



Installing the BCI-C in the Chiller Control Panel

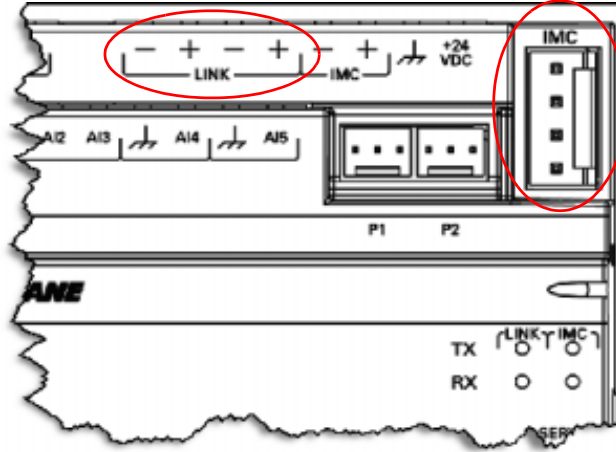
- CGWN/CCUN in location A9-2



3. Install the DIN rail on to the mounting brackets using two (2), #10-32 x 0.5 Phillips panhead, thread forming screws (X253300334104). Ensure the rail is secure before mounting controller.
4. Mount the BCI-C controller onto the DIN rail as illustrated in the section, "[Mounting or Removing/Repositioning the BCI-C,](#)" p. 11.
5. Connect the IPC3 bus to the connector port labeled *IMC* on the BCI-C controller.

Installing the BCI-C in the Chiller Control Panel

6. To complete the installation, connect the BACnet link to the terminal connector labeled *Link* on the BCI-C controller. (See the illustration below for locations of the IMC and Link connections)



Mounting or Removing/Repositioning the BCI-C

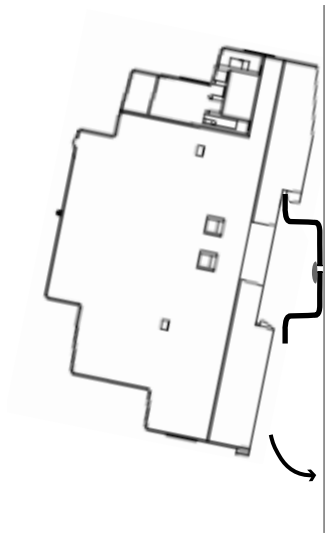
To mount or remove the controller from DIN rail, follow the illustrated instructions below.

Notice:

Avoid Equipment Damage! Do not use excessive force to install the BCI-C controller onto the DIN rail. Excessive force could result in damage to the plastic enclosure.

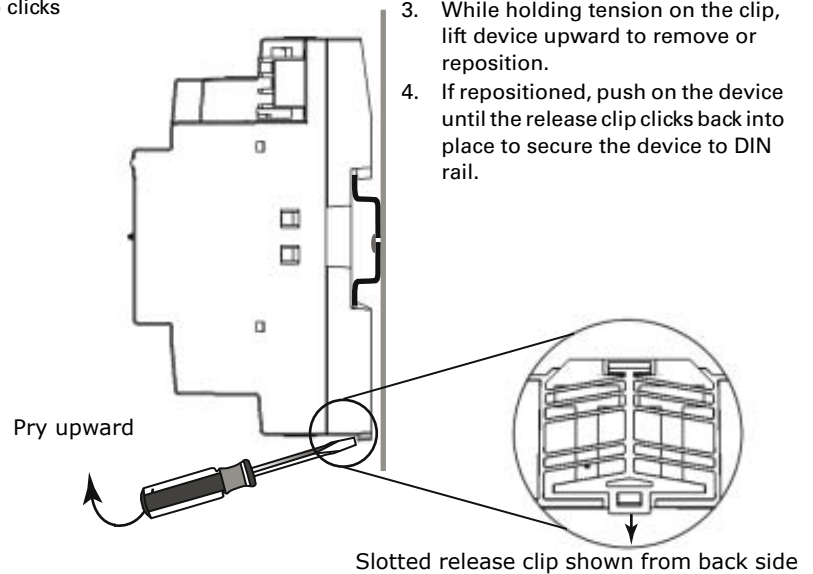
To mount device:

1. Hook device over top of DIN rail.
2. Gently push on lower half of device in the direction of arrow until the release clip clicks into place.



To remove or reposition device:

1. Disconnect all connectors before removing or repositioning.
2. Insert screwdriver into slotted release clip and gently pry upward on the clip with the screwdriver.
3. While holding tension on the clip, lift device upward to remove or reposition.
4. If repositioned, push on the device until the release clip clicks back into place to secure the device to DIN rail.



Important: Follow recommended installation procedures if using other manufacturer's DIN rails and enclosures.

Mounting a CGAM Slant BCI-C

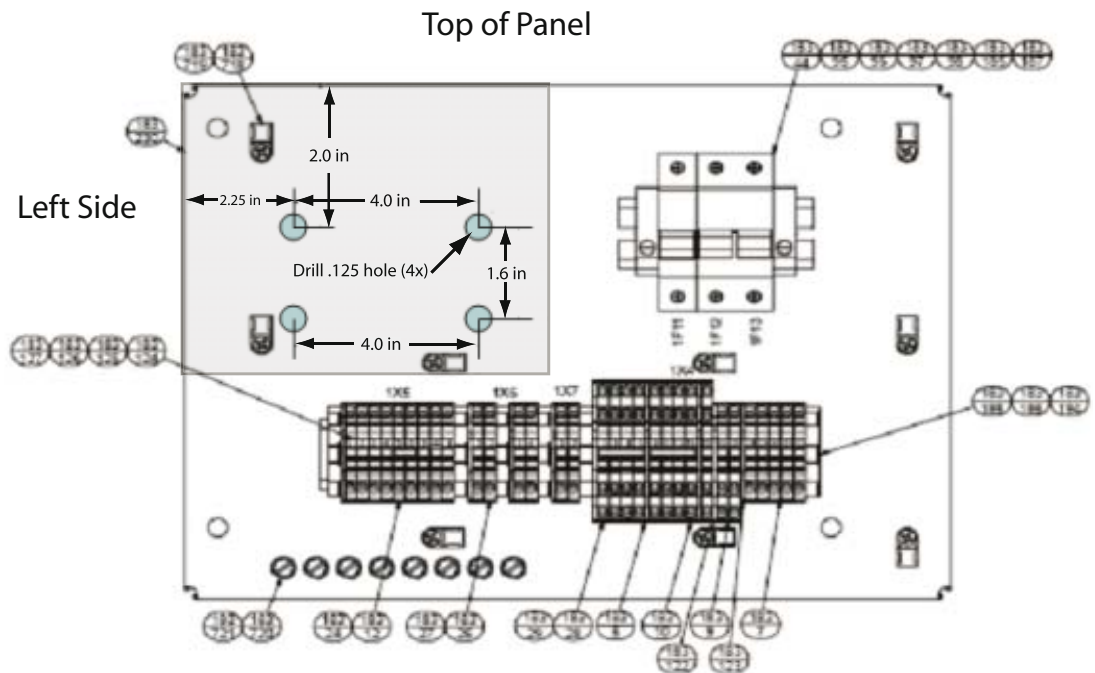
Mounting a CGAM Slant BCI-C requires modifications to the control panel. To modify and mount a CGAM Slant unit:

1. Using the illustration below and the section shaded in gray, locate and mark the first hole 2 inches down from the top of the panel and 2.25 inches in from the left side of the panel.
2. Mark the remaining three holes using the dimension pattern of 4 inches x 1.6 inches.

Note: All dimensions are centerline to centerlines.

3. Mask off all components in the control panel to protect it from metal shavings. Metal shavings on any of the circuitry could result in damage.
4. Drill out the four marked holes using a .125 inch drill bit and remove all metal shavings.
5. Install the BCI-C unit as described in [“Installing the BCI-C in the Chiller Control Panel,” p. 6.](#)

Note: Ensure that a 6-inch cable extension (CAB-00998) is used when installing.



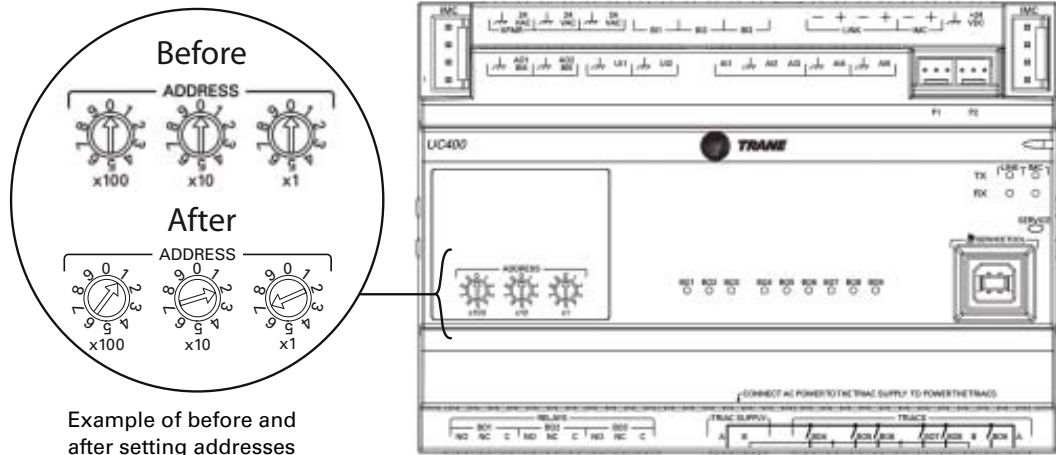
Important: Mask off the entire circuit board to protect from metal shavings during drilling.

Setting Rotary Switches on the BCI-C

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. The illustrations below show how to set addresses.

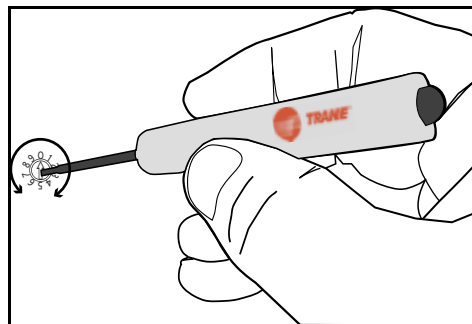
Note: All devices are MSTP masters with valid MAC addresses of 001 to 127 for BACnet.

Figure 1. Setting rotary switches



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 service screwdriver to set rotary switches.





Connecting and Configuring the BCI-C with Tracer TU Software

This section describes how to connect to the Tracer TU software and configure the BCI-C controller. Before beginning, if the TU service tool is not installed, refer to the *Tracer TU Service Tool Getting Started Guide* (TTU-SVN02). This document will provide information about features, capabilities, and requirements of TU.

Connecting to Tracer TU

To connect to Tracer TU:

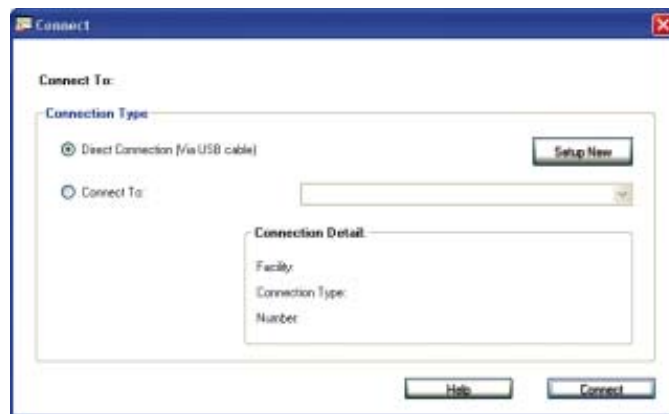
1. Connect the USB cable directly from the laptop to the UC400 or to a panel USB port connected to the controller.

Important: *If using a PC with multiple USB ports, it is conceivable to connect using the same process outlined below for the same piece of equipment. This is normal operation. Observe existing USB standards for cable length. (For more information go to informational Web sites, such as <http://www.USB.org>.)*

2. Click either the **Tracer TU** desktop icon or the **Tracer TU** program item in the Tracer TU group on the **Start** menu.

The Tracer TU splash screen appears briefly followed by the **Connect** dialog box.

Figure 2. Connect dialog box



3. Select the **Direct Connection (Via USB cable)** radio button if it is not already selected.
4. Click the **Connect** button and the **Unit Summary** page will appear after successful connection.

Connecting and Configuring the BCI-C with Tracer TU Software

Configuring the BCI-C

Configuring the BCI-C is performed by means of the TU Controller Settings Utility. Use this utility to configure date and time, units of measure, and protocol.

Important: Before beginning, the user will need the Tracer TU software, Version 3.0 or higher.

To configure the BCI-C:



1. Select the **Controller Settings Utility** tab from the vertical tab set located on the right side of the TU window.

Note: The content of this screen is based on the type of controller that is connected and the system protocol used to communicate with the controller.

2. Enter a meaningful name for the controller.
3. Click **Date and Time** to set the preferred date/time formats and then click **Save**. The BCI-C uses standard BACnet services for time synchronization. (Refer to the *BACnet Communication Interface for Chiller (BCI-C) Integration Guide, BAS-SVP05*)

Note: The actual dates and times are not saved during power loss.

4. Click the **Controller Units** expanding box label to display its contents.
5. Select the desired units of measure for data communicated across the BACnet link. The units of measure cannot be changed once the BCI-C is configured and bound to the CH530. Failure to set the units of measure will result in having to restore factory defaults, reconfigure, and rebind the BCI-C. To restore, reconfigure, and rebind the BCI-C, refer to the next section, ["Restoring to Factory Defaults to Reconfigure and Rebind the BCI-C"](#).
6. Click the **Protocol** expanding box heading to display its contents.
7. Select the desired **Baud Rate** in the drop-down list box.
8. If a software Device ID is required, check the **Use Software Device ID** box and enter the desired BACnet Device ID.
9. Click **Save**.

Restoring to Factory Defaults to Reconfigure and Rebind the BCI-C

Restoring to factory defaults and then reconfiguring and rebinding the BCI-C is necessary for two reasons:

- The chiller configuration has changed if a new option was added to the chiller
- The building automation system needs the units of measure on the BACnet link to be different than what is currently configured.

To restore to factory defaults:

1. Establish the connection between Tracer TU and the BCI-C controller.
2. Select the **Controller Settings Utility** tab from the vertical tab set located on the right side of the TU window.
3. On the controller settings page, there is a gray bar at the bottom with the **Save/Cancel** buttons. Move the mouse cursor near the left-hand edge of the gray bar, keeping the cursor inside the bar, and click on this area. A **Clear Controller** button will appear in the upper right-hand portion of the screen display.
4. Click the **Clear Controller** button and a pop-up window will appear with a message that asks for confirmation to reset the device. Click **Yes**.
5. A pop-up window will appear confirming that the controller has been reset indicating that the controller will be rebooted. Click **OK**. The BCI-C controller is restored to its *factory default* state after is reboots.
6. Follow Steps 1 through 9 in the previous section to reconfigure the BCI-C controller.



Configuring a CH530 for BACnet with TechView Software

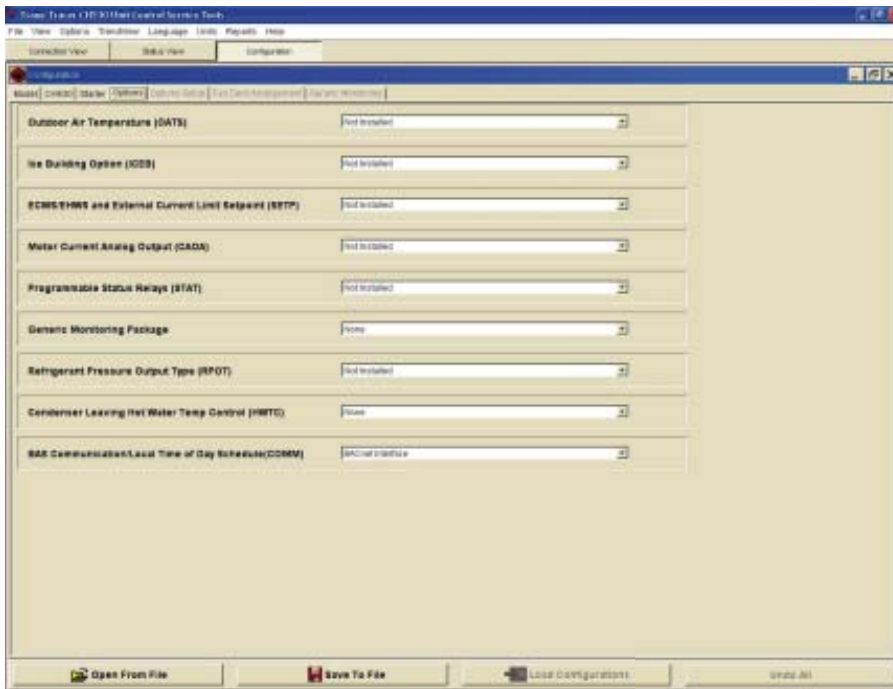
The BCI-C can be installed only in chillers that have main processor (MP) software (used with CH530 Series chillers) supporting the BACnet option. BACnet is only supported in the following MP software:

- RTWD/RTUD; MP 6.30 or higher and TechView 12.1 SP2 or higher
- RTHD; MP 12.0 or higher and TechView 12.1 SP2 or higher
- RTAC; MP 37.0 or higher and TechView 12.1 SP2 or higher
- CGAM; MP 2.00 and TechView 12.1 SP2 or higher

Note: The TechView software includes the current version of MP software for the CH530 series of products. To download the latest versions of TechView software, go to <http://www.trane.com/commercial/designanalysis/techview.aspx>.

After verifying the correct version level of software, ensure that all other LLIDs are successfully bound and communicating and then:

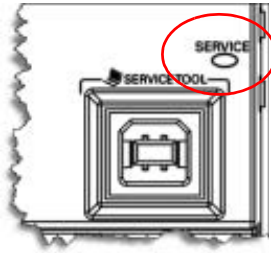
1. Restore power to the chiller and then connect the TechView to the Dynaview.
2. Verify the correct version of software.
3. Navigate to the **Configuration** view and choose the **Options** tab.
4. Select the **BACnet BCI-C Interface for the BAS** communication option.



5. Navigate to **Binding View** and locate the device in the device setup area.
6. When prompted, locate the device and then push the **Service LED** button located on the front of the device.

Configuring a CH530 for BACnet with TechView Software

Note: The service button is used for binding the BCI-C instead of a magnet.



7. Select **OK** at the prompt to initiate the binding.

Note: For more detailed information about binding or unbinding, refer to the KestrelView Online Help.



Additional Resources

Use the following documents and links as additional resources:

- *BACnet™ Communication Interface for Chiller (BCI-C) Integration Guide* (BAS-SVP05)
- *KestrelView™ Service Software, Help online*
- Product support online:
 - www.bacnet.org
 - www.bacnetassociation.org
 - www.ashrae.org
- *Tracer™ BACnet™ Terminator Installation Instructions* (X39641151-01)
- *Tracer™ TU Help online*
- *Tracer™ TU Service Tool Getting Started Guide* (TTU-SVN02) (X39641083)

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

Notes

Trane - by Trane Technologies (NYSE: TT), a global climate innovator - creates comfortable, energy efficient indoor environments for commercial and residential applications. For more information, please visit trane.eu or tranetechnologies.com.

Trane has a policy of continuous product and product data improvement and reserves the right to change design and specifications without notice.

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