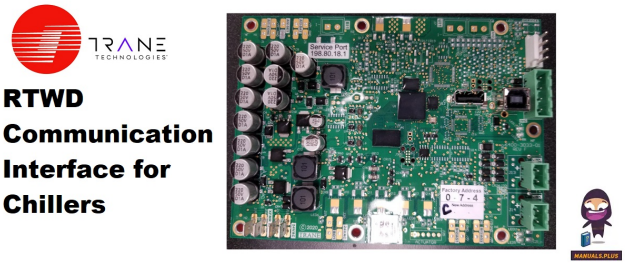
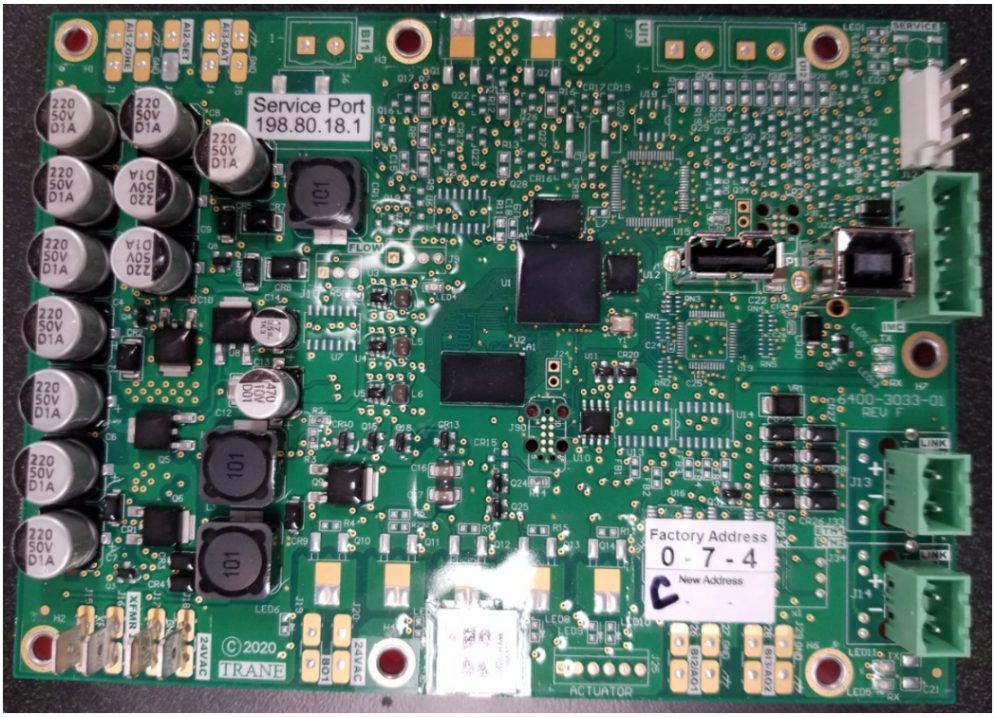


TRANE TECHNOLOGIES RTWD Communication Interface for Chillers Instruction Manual

Contents

TRANE TECHNOLOGIES RTWD Communication Interface for Chillers



Specifications:

- **Field Kit Order Number:** KIT19852
- **Service Port:** 198.80.18.1
- **Models:** RTWD, RTAC, CGAM
- **Copyright:** Trane

Product Information

The product is designed for heating, ventilating, and air-conditioning purposes. It is essential that only qualified personnel handle the installation, starting up, and servicing of the equipment to prevent any hazardous situations.

Installation Instructions:

1. Read the manual thoroughly before operating or servicing the unit.
2. Ensure all warnings, cautions, and notices are strictly followed.
3. Proper field wiring and grounding are required by qualified personnel.
4. Wear appropriate Personal Protective Equipment (PPE) as instructed.
5. Follow Environmental Health and Safety (EHS) policies.

Product Usage:

1. Only qualified personnel should handle the installation, startup, and servicing of the equipment.
2. Observe all safety precautions mentioned in the literature and on equipment tags, stickers, and labels.
3. Ensure proper field wiring and grounding following NEC and local electrical codes.
4. Always wear the appropriate Personal Protective Equipment (PPE) as per the manual instructions.
5. Follow Environmental Health and Safety (EHS) policies to prevent any hazardous situations.

FAQ:

- **Q: Who should handle the installation and servicing of the equipment?**
  A: Only qualified personnel should handle the installation, startup, and servicing of the equipment to ensure safety.
- **Q: What should be worn during the job?**
  A: Proper Personal Protective Equipment (PPE) as per the manual instructions should be worn to prevent potential hazards.

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 require 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.

Introduction

Read this manual thoroughly before operating or servicing this unit.

Warnings, Cautions, and Notices
Safety advisories appear throughout this manual as required. Your safety and the proper operation of this machine depend upon the strict observance of these precautions.

The three types of advisories are defined as follows:

- **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.

Important Environmental Concerns
Scientific research has shown that certain man-made chemicals can affect the earth’s naturally occurring stratospheric ozone layer when released into the atmosphere. In particular, several of the identified chemicals that may affect the ozone layer are refrigerants that contain Chlorine, Fluorine, and Carbon (CFCs) and those containing Hydrogen, Chlorine, Fluorine, and Carbon (HCFCs). Not all refrigerants containing these compounds have the same potential impact on the environment. Trane advocates the responsible handling of all refrigerants.

Important Responsible Refrigerant Practices
Trane believes that responsible refrigerant practices are important to the environment, our customers, and the air conditioning industry. All technicians who handle refrigerants must be certified according to local rules. For the USA, the Federal Clean Air Act (Section 608) sets forth the requirements for handling, reclaiming, recovering, and recycling certain refrigerants and the equipment that is used in these service procedures. In addition, some states or municipalities may have additional requirements that must also be adhered to for responsible management of refrigerants. Know the applicable laws and follow them.

WARNING

Proper Field Wiring and Grounding Required!
Failure to follow the code could result in death or serious injury. All field wiring MUST be performed by qualified personnel. Improperly installed and grounded field wiring poses FIRE and ELECTROCUTION hazards. To avoid these hazards, you MUST follow requirements for field wiring installation and grounding as described in NEC and your local/state/national electrical codes.

WARNING

Personal Protective Equipment (PPE) Required!
Failure to wear proper PPE for the job being undertaken could result in death or serious injury. Technicians, to protect themselves from potential electrical, mechanical, and chemical hazards, MUST follow precautions in this manual and on the tags, stickers, and labels, as well as the instructions below:

- Before installing/servicing this unit, technicians MUST put on all PPE required for the work being undertaken (Examples; cut-resistant gloves/sleeves, butyl gloves, safety glasses, hard hat/bump cap, fall protection, electrical PPE, and arc flash clothing). ALWAYS refer to appropriate Safety Data Sheets (SDS) and OSHA guidelines for proper PPE.
- When working with or around hazardous chemicals, ALWAYS refer to the appropriate SDS and OSHA/GHS (Global Harmonized System of Classification and Labelling of Chemicals) guidelines for information on allowable personal exposure levels, proper respiratory protection, and handling instructions.
- If there is a risk of energized electrical contact, arc, or flash, technicians MUST put on all PPE by OSHA, NFPA 70E, or other country-specific requirements for arc flash protection, before servicing the unit. NEVER PERFORM ANY SWITCHING, DISCONNECTING, OR VOLTAGE TESTING WITHOUT PROPER ELECTRICAL PPE AND ARC FLASH CLOTHING. ENSURE ELECTRICAL METERS AND EQUIPMENT ARE PROPERLY RATED FOR THE INTENDED VOLTAGE.

WARNING

Follow EHS Policies!
Failure to follow the instructions below could result in death or serious injury.

- All Trane personnel must follow the company's Environmental, Health, and Safety (EHS) policies when performing work such as hot work, electrical, fall protection, lockout/tagout, refrigerant handling, etc. Where local regulations are more stringent than these policies, those regulations supersede these policies.
- Non-Trane personnel should always follow local regulations.

Overview

The BACnet® Communication Interface for Chillers (BCI2-C) is comprised of a Trane 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 BCI2-C in the chiller control panel
- Mounting and removing/repositioning the BCI2-C
- Mounting a CGAM slant BCI2-C
- Setting rotary switches for the BCI2-C
- Connecting and configuring the BCI2-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 as described in the KestrelView™ documentation.
- Additional Resources

Parts List

Before installing the BCI2-C kit, open the box and ensure the following parts are enclosed:

Table 1. Parts list

Part Number	Description
X13651793001	BCI2-C; Module
X19060374040	4 COND, 20 AWG, Wire Harness
573178900001	BCI2-C Module Mounting; Bracket
23092075	CGAM – W Frame Units – Schematic
23115511	CGAM – V Frame Units – Schematic
23115510	CGAM Slant Frame Units – Schematic
23092097	RTAC – 2 Compressor Units Schematic
23094621	RTAC – 3 Compressor Units, X-Line Schematic
23094622	RTAC – 3 Compressor, Units Y-Delta Schematic
23094623	RTAC – 4 Compressor Units X-Line Schematic
23094624	RTAC – 4 Compressor Y-Delta Schematic
23097584	RTWD/RTUD 60-250 TON WATER COOLED CHILLER Schematic
23097585	RTWD/RTUD 60-250 TON WATER COOLED CHILLER Schematic

Note:
One copy of service literature shipped with each unit (located in the control panel).

Table 2. Field provided parts

Part Number	Description
X25330033100	#6-32 Phillips Panhead 0.375 inch, Thread Rolling Zinc Plate Screw
X25020783130	# 6-32 TORX Panhead 0.75 inch, Thread Rolling Zinc Plate Screw

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.

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 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 some standard application services that are used to access data manipulate these objects and provide client/server communication between devices. For more information on BACnet protocol, see “Additional Resources,”.

BACnet Testing Laboratory (BTL) Certification
The BCI2-I supports the BACnet communication protocol and has been designed to meet the requirements of the BACnet Building Controller (B-BC) profile. For more details, refer to the BTL website at **www.bacnetinternational.org**.

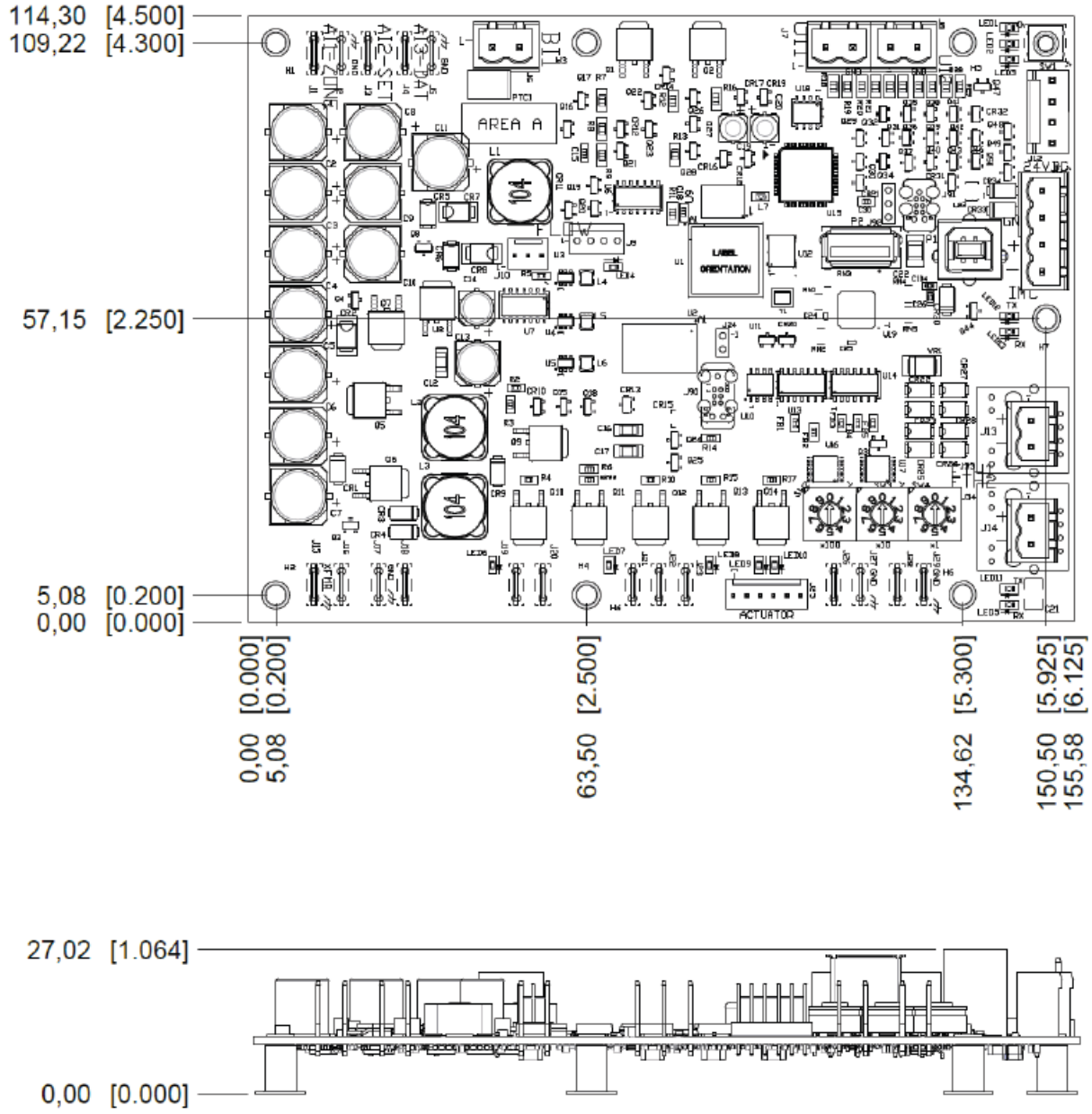
Specifications, Requirements, and Dimensions

The following table and illustration provide specifications, requirements, and dimensions of the BCI2-C controller.

Storage	
Temperature	-44°C to 95°C (-48°F to 203°F)
Relative humidity	Between 5% to 95% (non-condensing)
Operating	
Temperature	-40°C to 70°C (-40°F to 158°F)
Humidity	Between 5% to 95% (non-condensing)
Power	24 Vdc ±15%, maximum load 90 mA
Altitude	6,500 ft. maximum (1,981 m)
Installation	U.L. 840: Category 3
Pollution	U.L. 840: Degree 2
Requirements	
Tools and software	• One Phillips screwdriver • One 1/8-inch, flat-bladed service screwdriver • CH530 Main Processor (MP) software: RTWD Version 6.30 or higher, RT AC Version 37.0 or higher, CGAM version 2.00 or higher • TechView 13.0 SP1 or higher • Tracer TU 11.6 or higher

Figure 1. Controller dimension

Figure 1. Controller dimension



Installation

Installing BCl2-C in the Chiller Control Panel

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!

- Failure to follow all electrical safety precautions when exposed to live electrical components could result in death or serious injury.
- When it is 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.

WARNING

Hazardous Voltage!
Failure to disconnect power before servicing could result in death or serious injury. Disconnect all electric power, including remote disconnects before servicing. Follow proper lockout/tagout procedures to ensure the power can not be inadvertently energized. Verify that no power is present with a voltmeter.

Note:
All mounting holes for brackets and DIN rail have been pre-drilled.

To Install the BCI2-C

1. Disconnect all power from the chiller.
2. Open the control panel and mount the brackets (573178900001) to the control panel using two, #6-32 x 0.375 Phillips pan head, thread forming screws (X25330033100). Use the mounting locations for the specific chiller type as shown in the following illustrations:

Figure 2. RTWD/RTUD

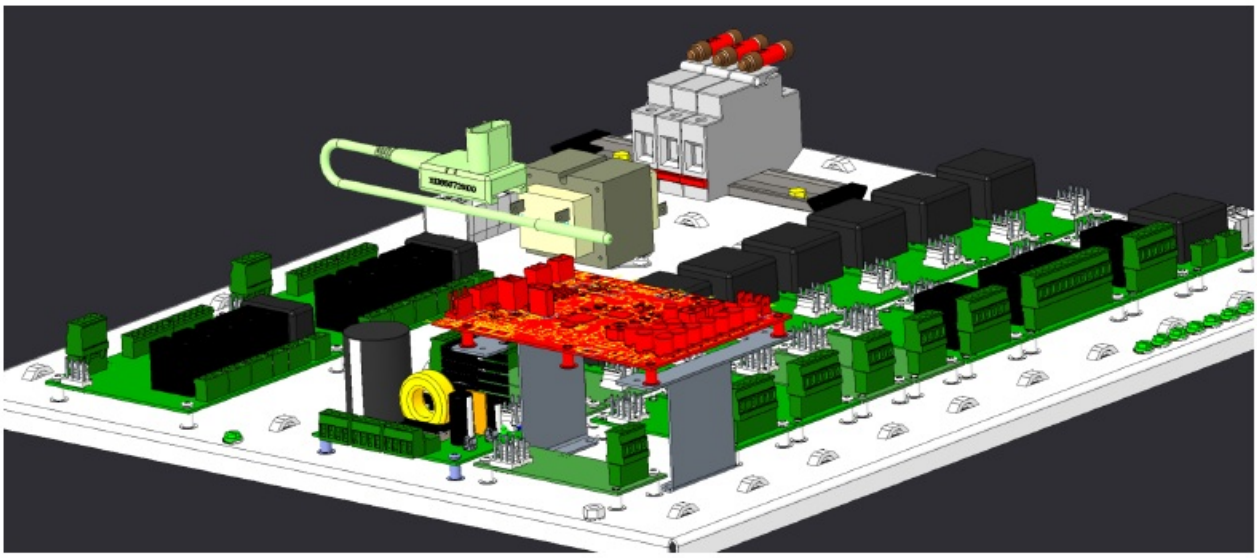


Figure 3. RTAC

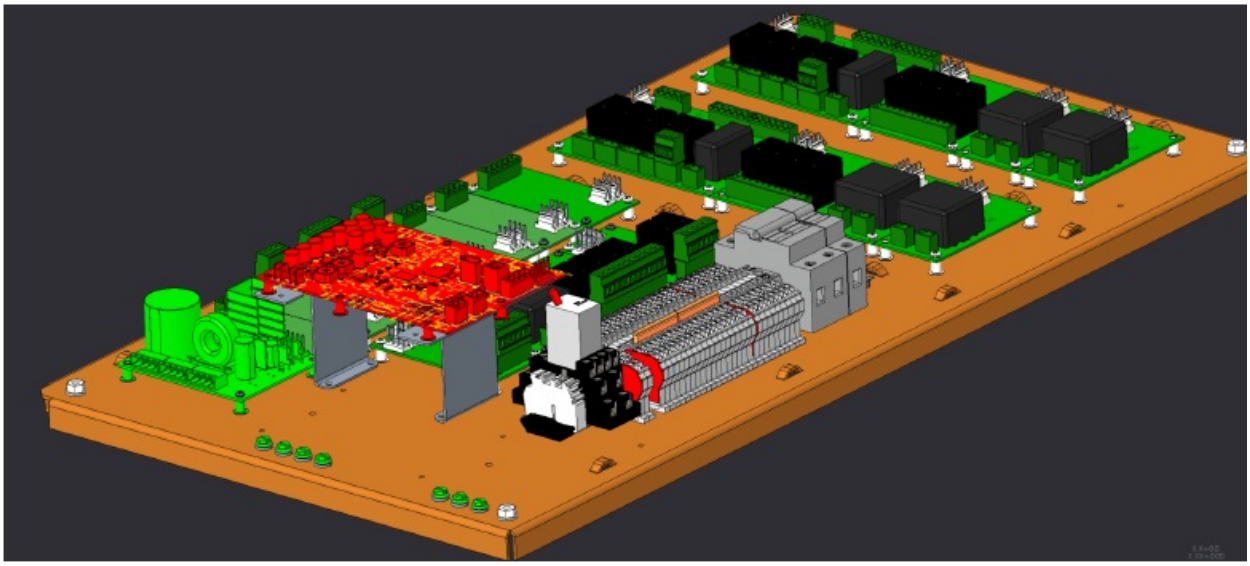


Figure 4. CGAM

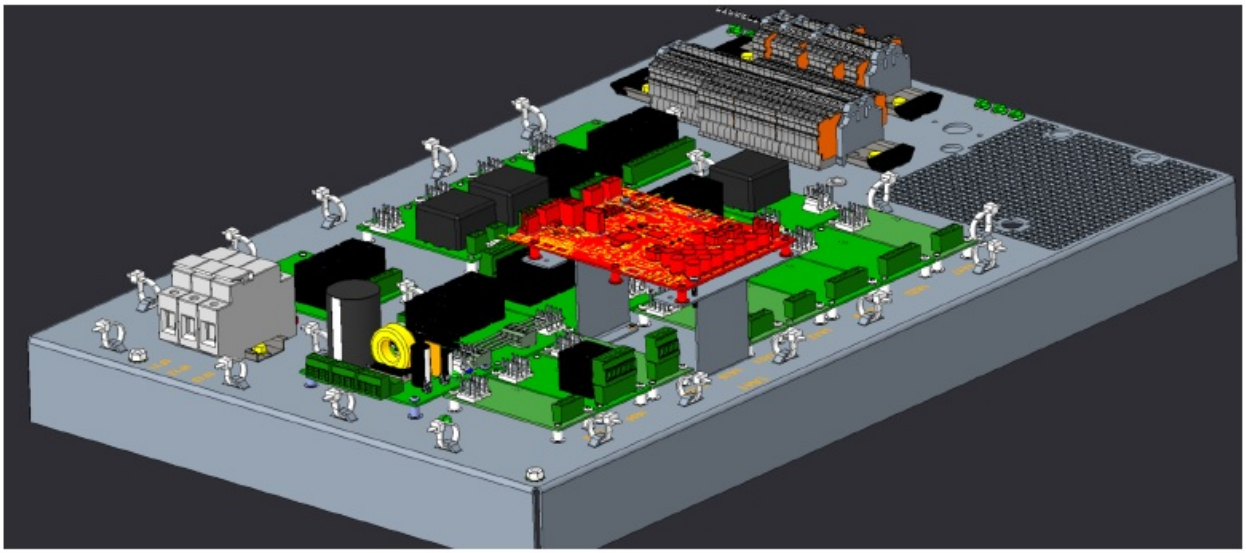
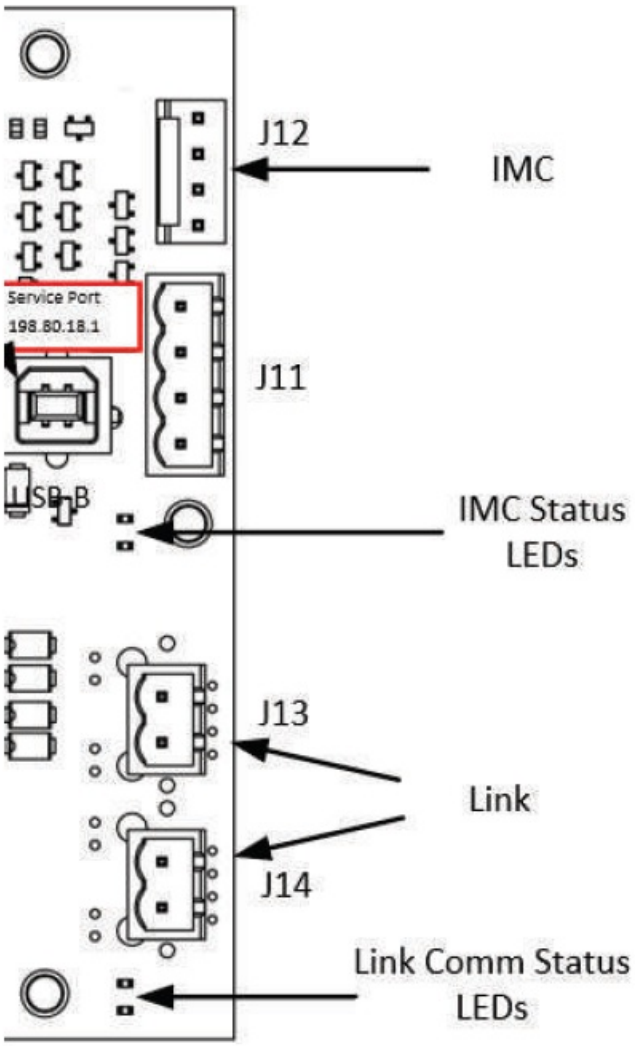
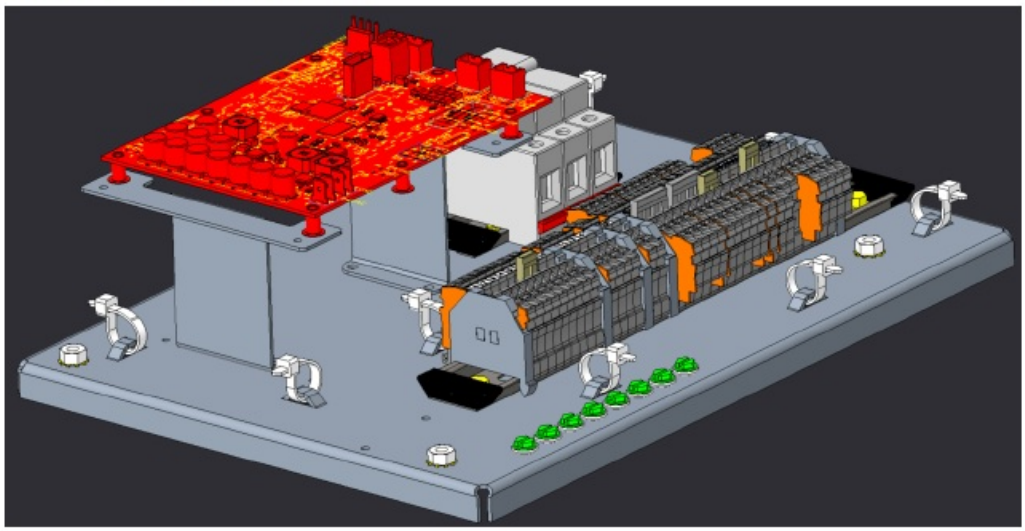


Figure 5. BCI2-C link IMC



Mounting a CGAM Slant BCI2-C

Figure 6. CGAM slant



Setting Rotary Dial Address Using Embedded BCI2 Software Tool

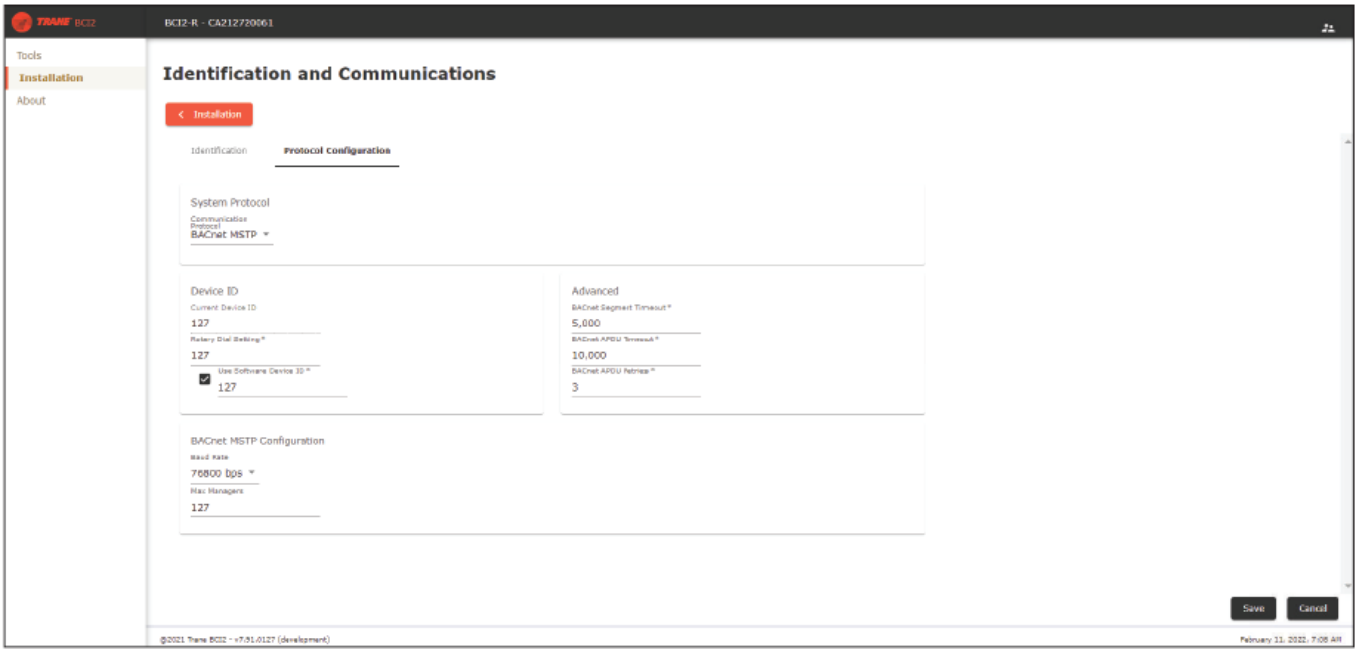
Previous versions of BCI-C had rotary dials to set the controller address. The BCI2-C controller does not have

rotary dials to set the address. A default address is set at the factory and recorded on a label applied to the circuit board. The address can be changed using the embedded BCI2 Service Tool. Follow these instructions to change the address of the controller:

1. Use a USB-A to USB-B cable. Plug the USB-B end into the service port on the BCI2. Plug the USB-A end into a laptop.
2. Open a browser on the laptop.
3. Enter 198.80.18.1
4. The BCI2 Service Tool will be served up from the BCI2 controller.
5. Navigate to Installation > Identification and Communication > Protocol Configuration > Edit.
6. Set the rotary dial setting (address) by clicking the line and typing in the new address.
7. If the Device ID needs to be changed, check the box next to Use software device ID and enter the desired device ID.

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

Figure 7. Setting rotary dial address



Connecting and Configuring the BCI2-C with Tracer TU Software

This section describes how to connect to the Tracer TU software and configure the BCI2-C controller. Before beginning, if the TU service tool is not installed, see Tracer TU Service Tool Getting Started Guide (TTU-SVN02*-EN). This document will provide information about the features, capabilities, and requirements of TU.

Connecting to Tracer TU

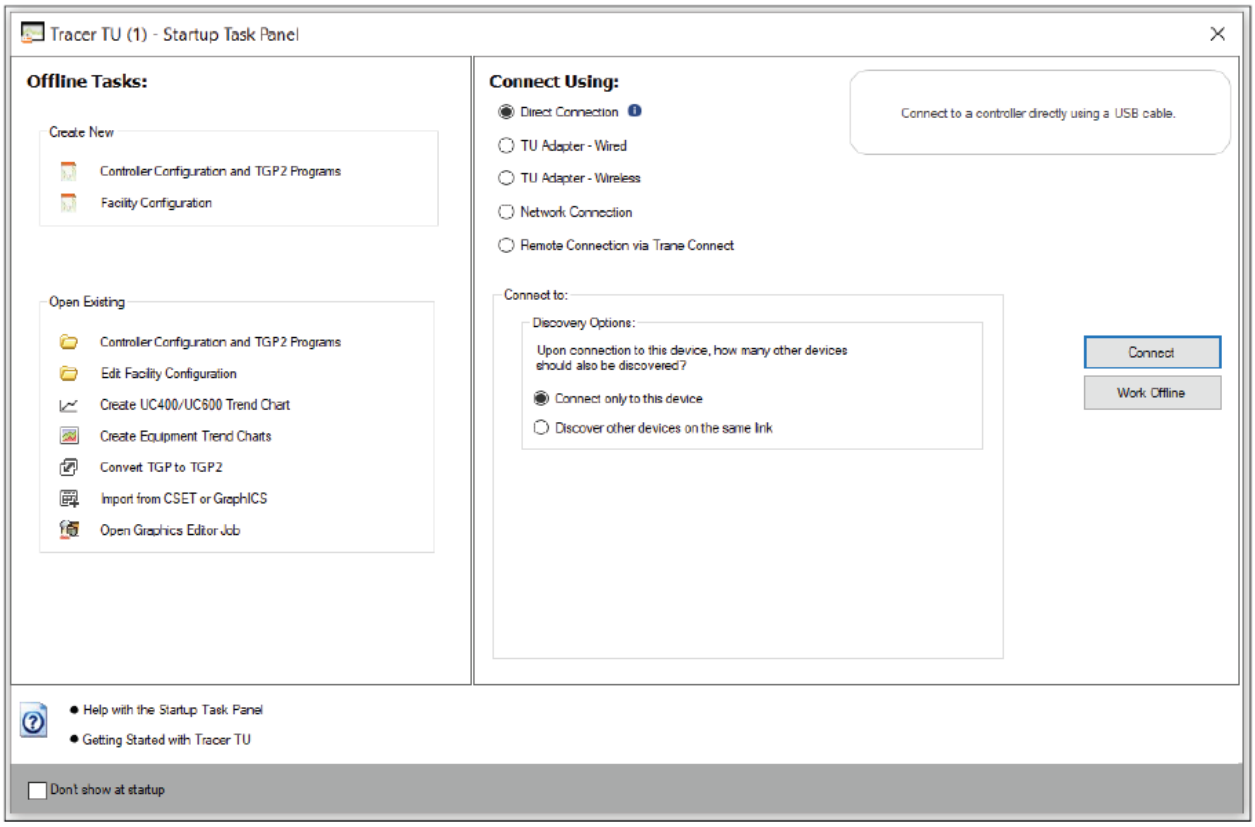
To Connect to Tracer TU

1. Connect the USB cable directly from the laptop to the BCI2-C controller 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 websites, 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 Startup Task Panel.

Figure 8. Startup task panel



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 displays after successful connection.

Configuring the BCI2-C

Configuring the BCI2-C is performed using the TU Controller Settings tab. 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 11.6 or higher.

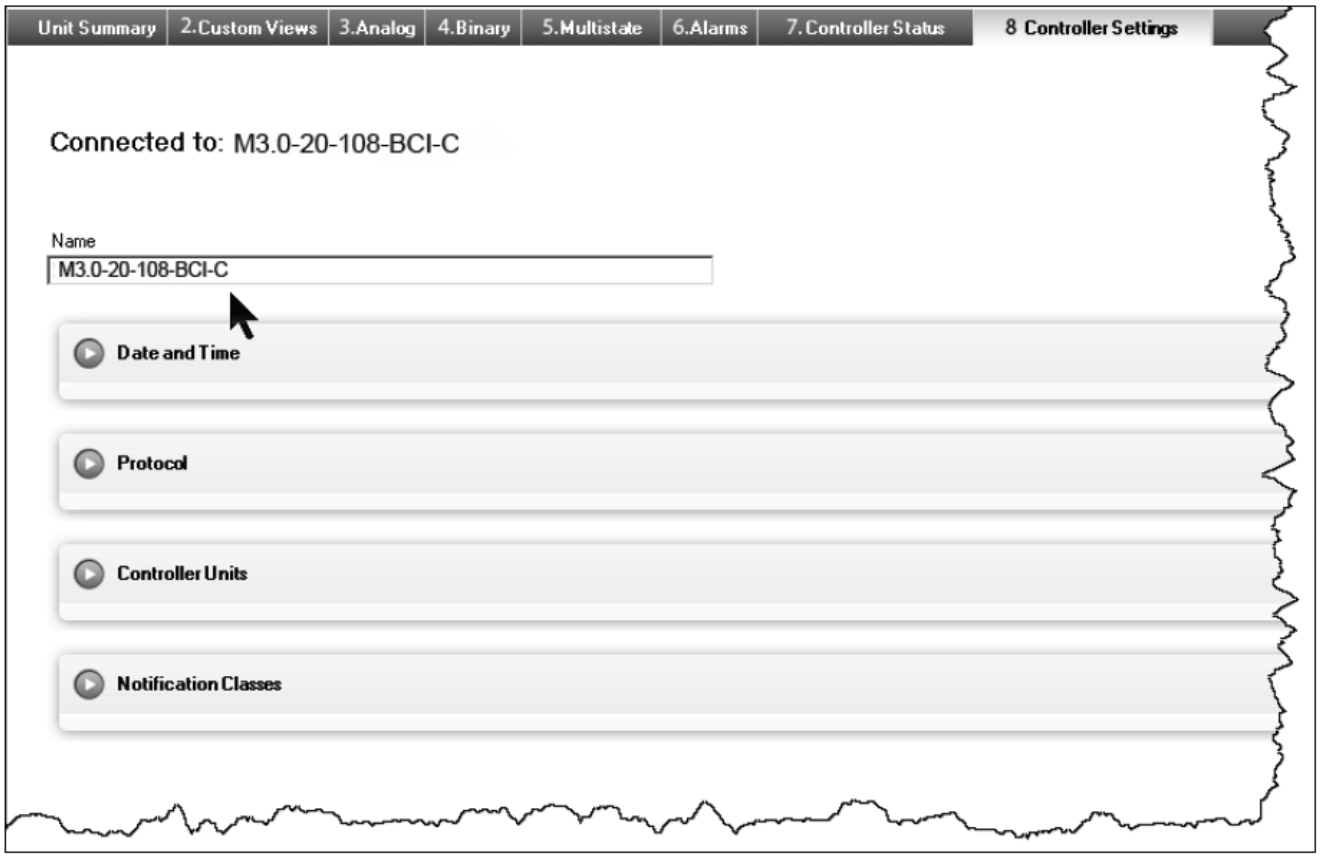
To Configure the BCI2-C

1. Select the Controller Settings tab from the horizontal tab set in 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.

Figure 9. Controller settings screen



2. Enter a meaningful name for the controller as shown above.
3. Click Date and Time to set the preferred date/time formats and then click Save. The BCI2-C uses standard BACnet services for time synchronization. (See BACnet® Communication Interface for Chiller (BCI2-C) For RTWD, RTAC, and CGAM Integration Guide (BAS-SVP055*-EN).

Figure 10. Date and time screen

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

4. Click the Protocol and select the desired Baud Rate in the drop-down list box.
5. Click the Controller Units and select the desired units of measure for data communicated across the BACnet link. The units of measure cannot be changed once the BCI2- C is configured and bound to the CH530.
   Important: Failure to set the units of measure will result in having to restore factory defaults, reconfigure, and rebind the BCI2-C. To restore, reconfigure, and rebind the BCI2-C, refer to the next section, “Clearing the Controller to Reconfigure and Rebind the BCI2- C,”.
6. If a software Device ID is required, check the Use Software Device ID box and enter the desired BACnet Device ID.
7. Click Save.

Clearing the Controller to Reconfigure and Rebind the BCI2-C

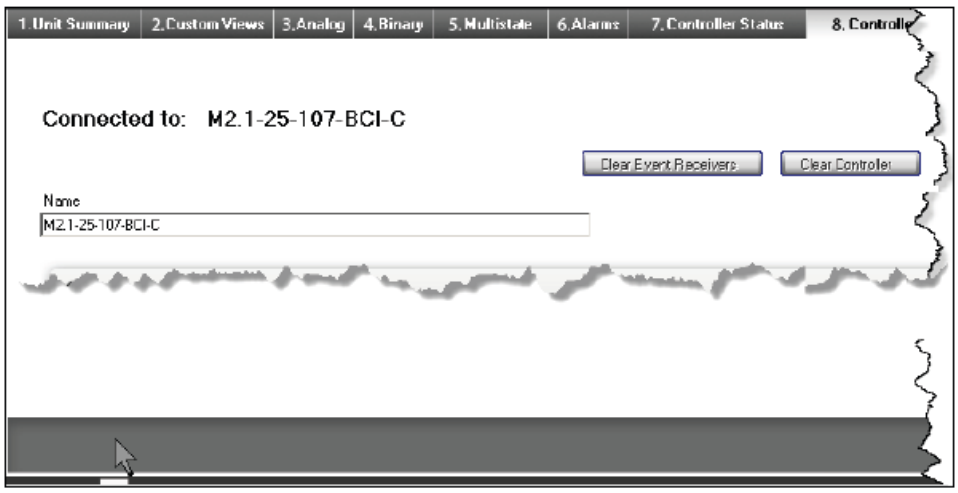
Clearing the controller and then reconfiguring and rebinding the BCI2-C is necessary for two reasons:

- The chiller configuration changes if a new option is 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 clear the controller:

1. Establish the connection between Tracer TU and the BCI2- C controller.
2. Select the Controller Settings tab from the vertical tab set located on the right side of the TU window.
3. On the controller settings page, there is a clear controller button displayed in the upper right-hand portion of the screen display.

Figure 11. Clear controller button



4. Click the Clear Controller button and a pop-up window will display with a message that asks for confirmation to reset the device. Click Yes.
5. A pop-up window displays confirming that the controller has been reset indicating that the controller will be rebooted. Click OK. The BCI2-C controller is restored to its factory default state after is reboots.
6. Follow Step 1 through Step 7 in the “Configuring the BCI2-C,” section to reconfigure the BCI2-C controller.
7. Go to “Connecting and Configuring the BCI2-C with Tracer TU Software,” for binding if needed.

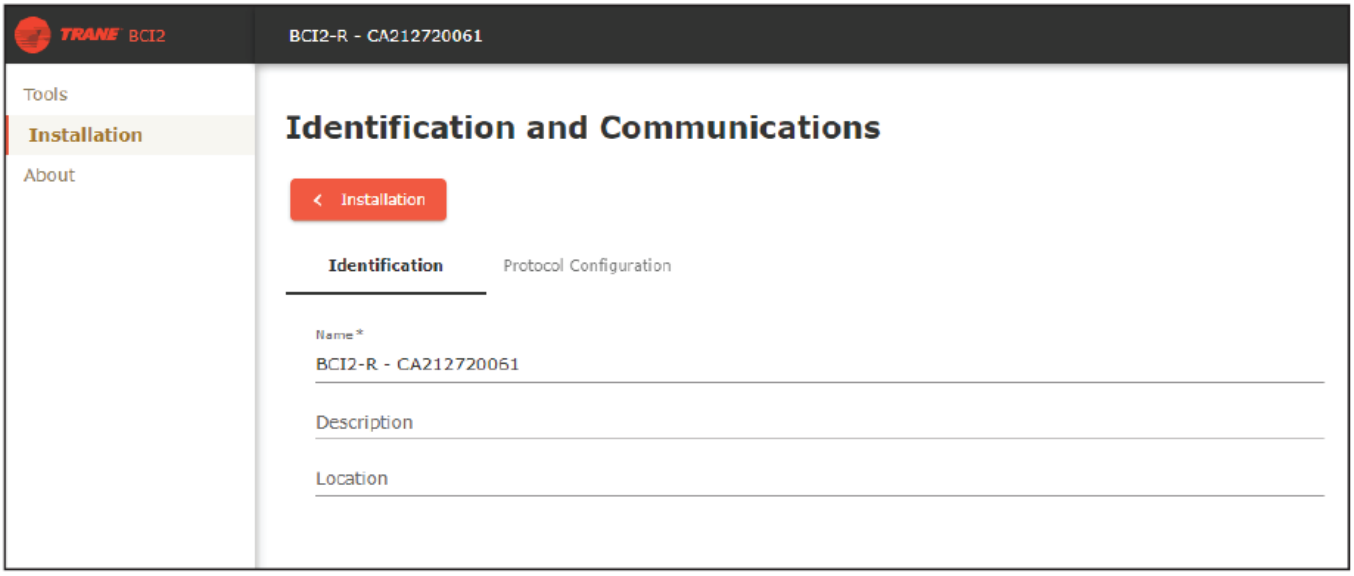
Connecting and Configuring the BCI2-C with the BCI2 Service Tool

This section describes how to configure the BCI2-C controller using the embedded BCI2 Service Tool.

1. Use a USB-A to USB-B cable. Plug the USB-B end into the Service Port on the BCI2. Plug the USB-A end into a laptop.
2. Open a browser on the laptop.
3. Enter 198.80.18.1
4. The BCI2 Service Tool will be served up from the BCI2 controller.

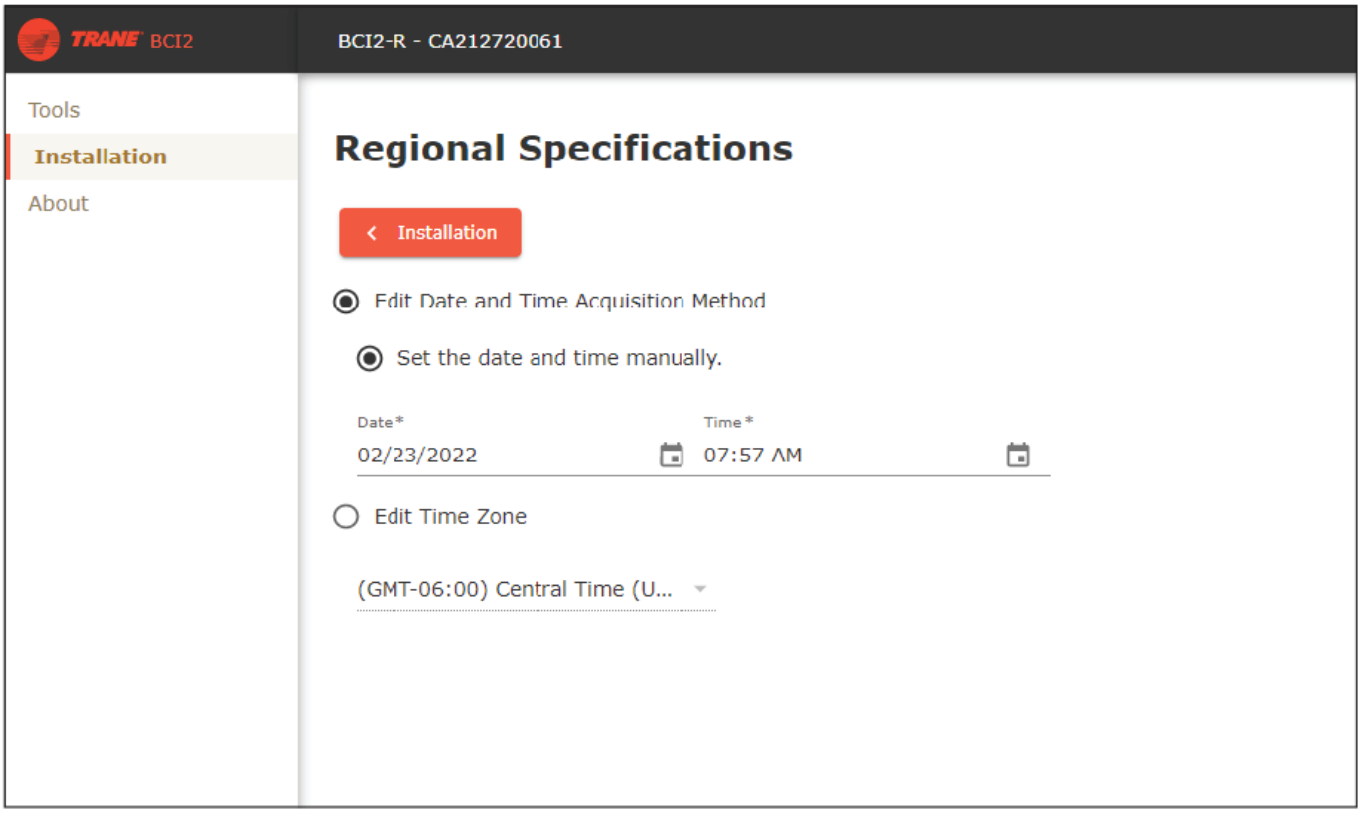
To enter a name, navigate to Installation > Identification and Communication > Identification > Edit. Enter a name, description, and location, and then click Save.

Figure 12. Identification and communications



To set the time and date, navigate to Installation > Regional Specifications > Edit. Enter the date and time, and then click Save.

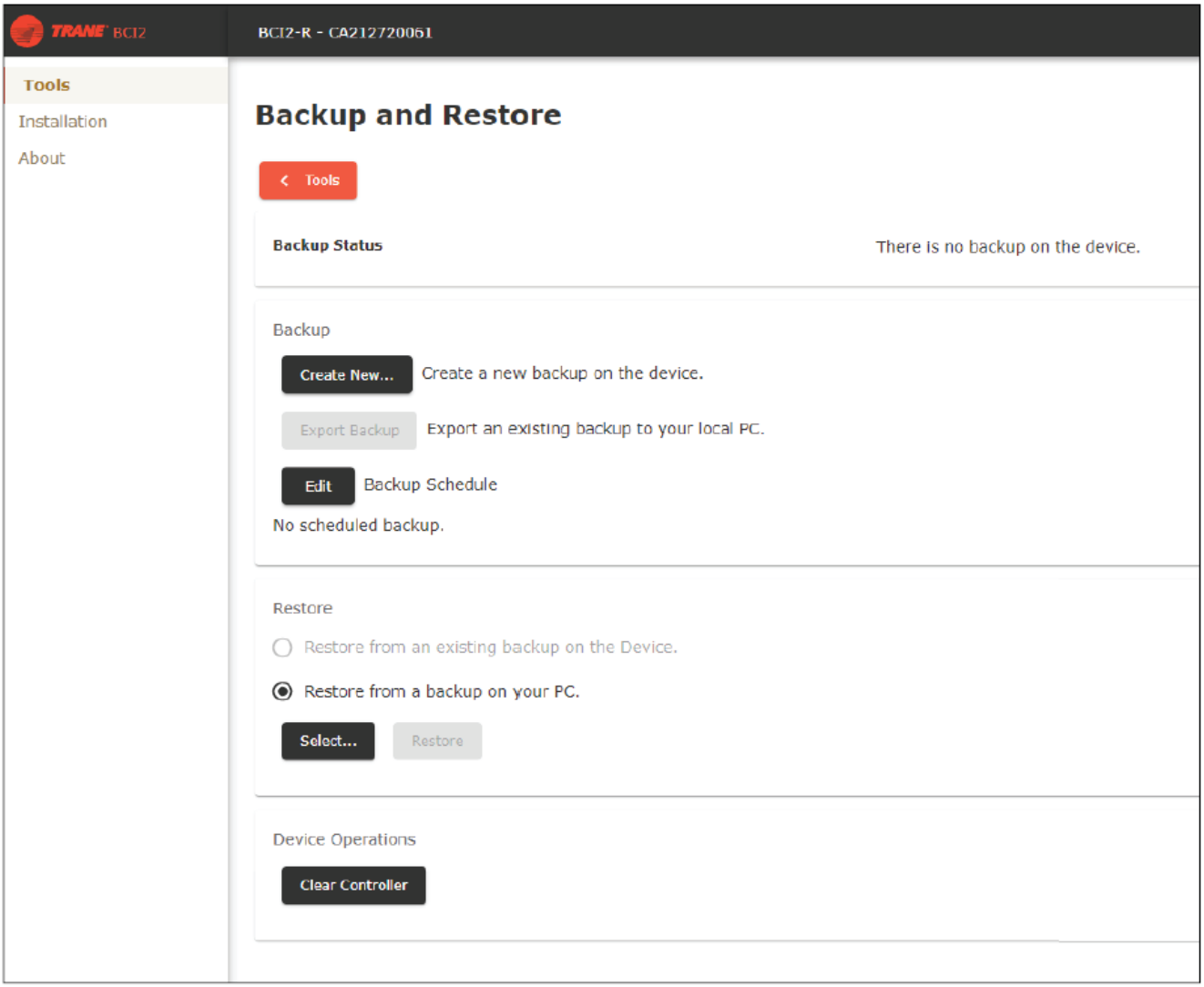
Figure 13. Regional specifications



- To clear the BCI-2 controller, navigate to Tools > Backup and Restore > Clear Controller. When prompted, click Continue.
- The BCI2-R is cleared and ready to accept a new configuration.

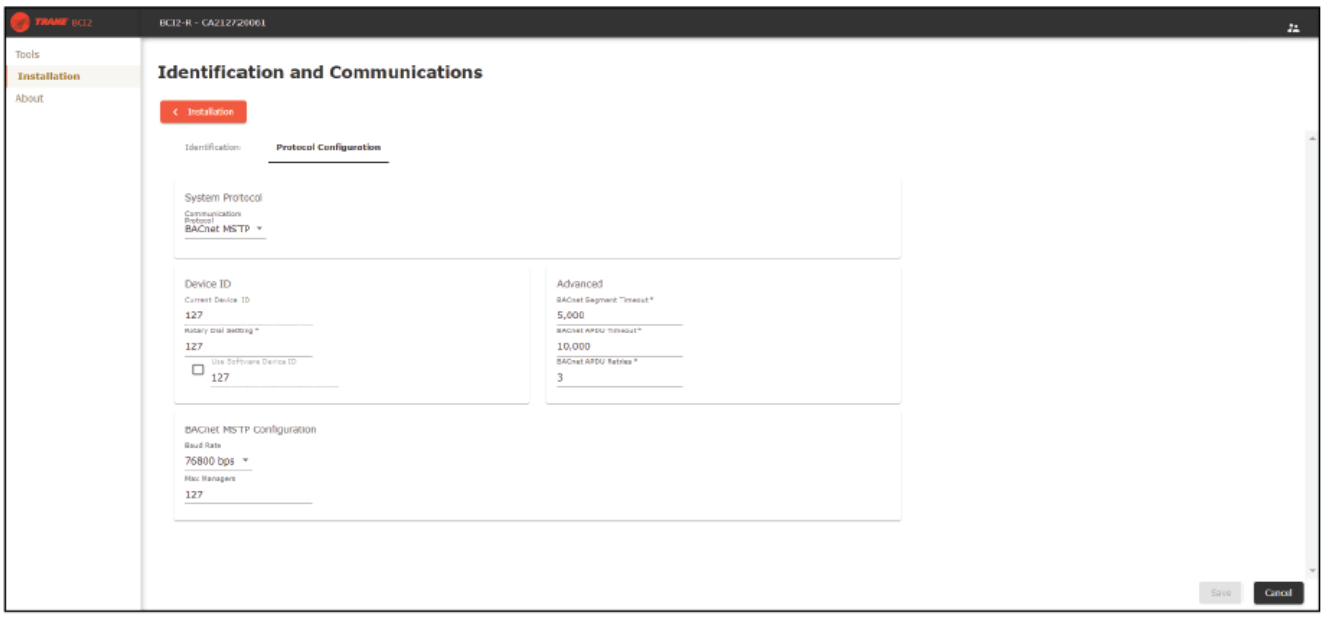
The BCI2-R is cleared and ready to accept a new configuration.

Figure 14. Backup and restore



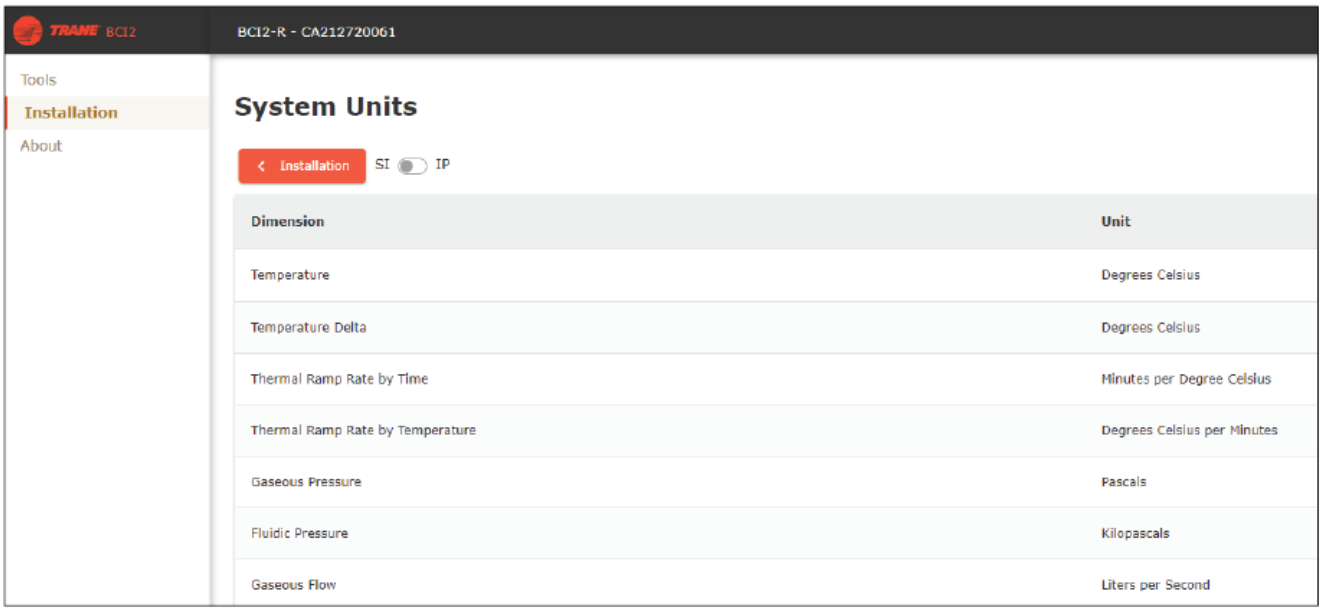
- To configure Baud Rate, Rotary address, and Device ID, navigate to Installation > Identification and Communication > Protocol Configuration > Edit.

Figure 15. Protocol configuration



- To change system units navigate to Installation > System Units.

Figure 16. System units



Configuring a CH530 for BACnet with TechView Software

The BCI2-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:

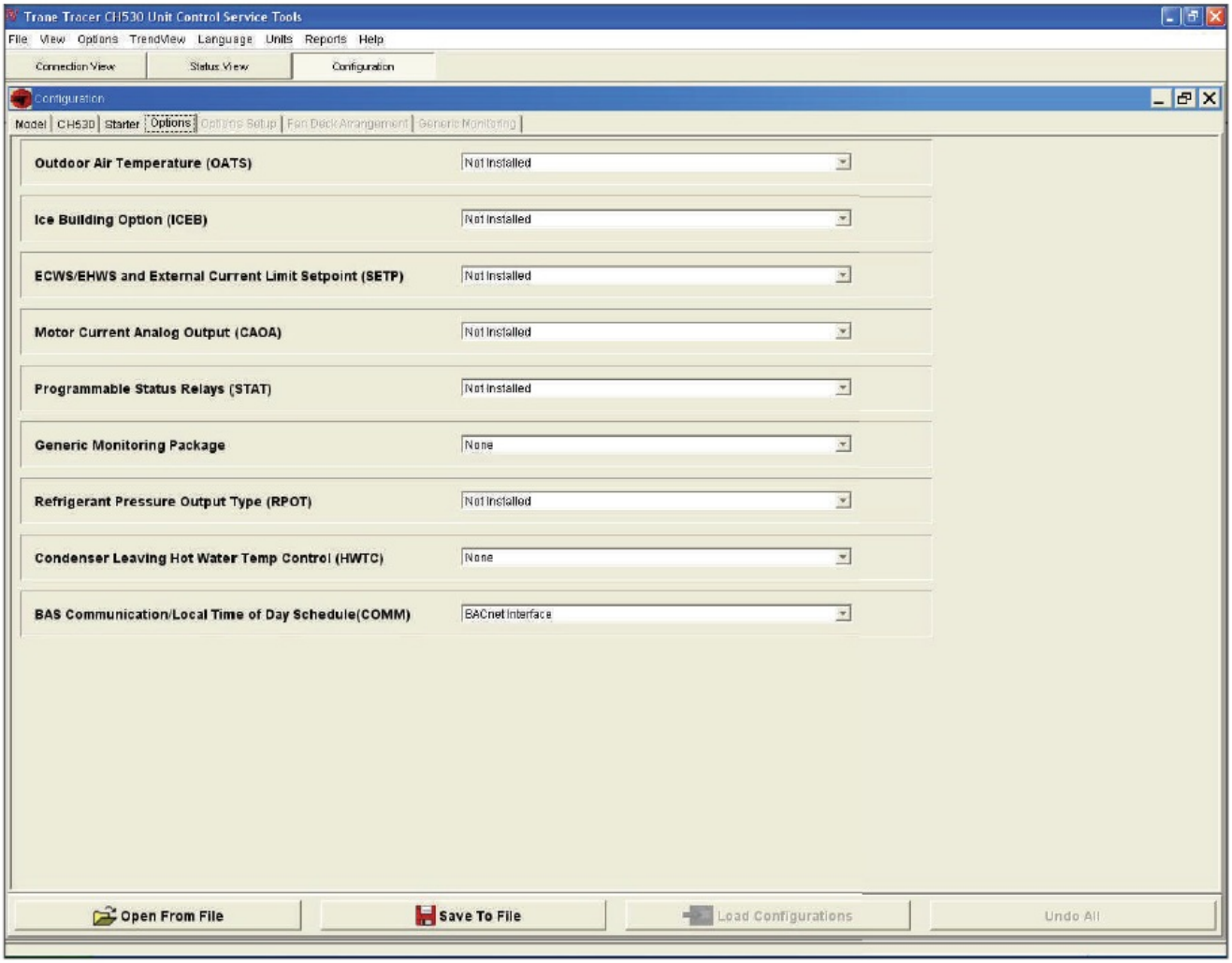
- RTWD; MP 6.30 or higher and TechView 12.1 SP2 or higher
- RTAC; MP 37.0 or higher and TechView 12.1 SP2 or higher
- CGAM; MP 2.00 and TechView 12.1 SP2 or higher

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:

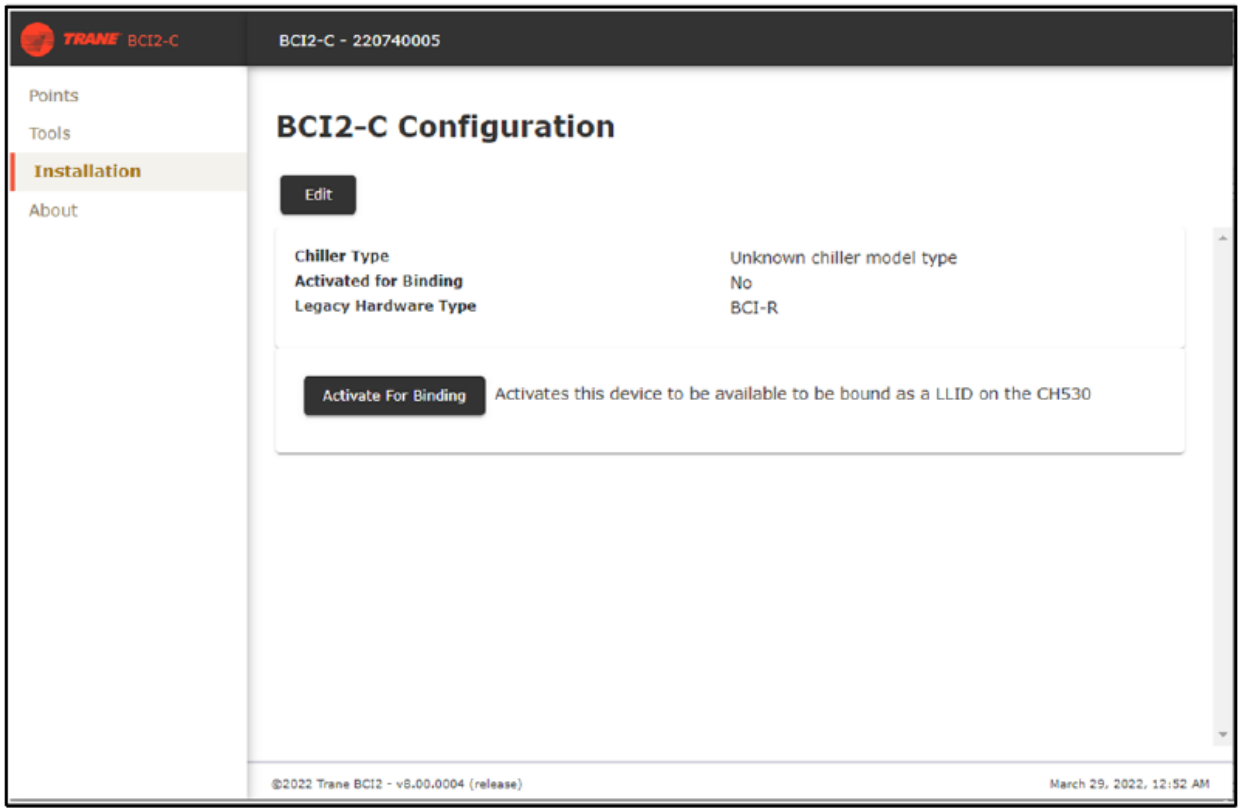
1. Restore power to the chiller and then connect the TechView to the Dynaview.
2. Verify the correct version of the software.
3. Navigate to the Configuration view and choose the Options tab.
4. Select BACnet Interface for the BAS communication option.

Figure 17. Trane Tracer CH530 unit control service tools



5. Navigate to Binding View and locate the device in the device setup area.
6. When prompted, use the BCI2 Service Tool to activate the BCI2-C for binding. Navigate to Installation > BCI2-C Configuration > Activate for **Binding.**

Figure 18. Activate binding



Note: The Activate for Binding button is used for binding the BCI2-C instead of a Service Button or a magnet, as has been the case in the past.

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

- BACnet® Communication Interface for Chiller (BCI2-C) For RTWD, RTAC, and CGAM Integration Guide (BAS-SVP055*-EN)
- KestrelView® Service Software, Help online
- Tracer® BACnet® Terminator Installation Instructions (BAS-SVN214*-EN)
- Tracer® TU Help Online
- Tracer TU Service Tool User Guide (BAS-SVU046*-EN)

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

Trane – by Trane Technologies (NYSE: TT), a global innovator – creates comfortable, energy-efficient indoor environments for commercial and residential applications. For more information, please visit trane.com or tranetechnologies.com. Trane has a policy of continuous product and product data improvements and reserves the right to change design and specifications without notice. We are committed to using environmentally conscious print practices.

Documents / Resources

	**TRANE TECHNOLOGIES RTWD Communication Interface for Chillers** [pdf] Instruction Manual RTWD, RTAC, CGAM, RTWD Communication Interface for Chillers, RTWD, Communication Interface for Chillers, Interface for Chillers, for Chillers, Chillers

References

- Trane Heating & Air Conditioning
- BACnet International – BACnet Community Information, Promotion and Education
- Trane Heating & Air Conditioning
- User Manual