



## Installation Guide

# BACnet<sup>®</sup> Communication Interface for IntelliPak (BCI-I)

for CSC Ordering Number: C175218460010



Used with: S\_WF 20–110 Ton  
S\_WG 20–35 Ton

### **⚠ 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.



# Introduction

Read this manual thoroughly before operating or servicing this unit.

## Warnings, Cautions, and Notices

Safety advisories appear throughout this manual as required. Your personal 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 to 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 to 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 of 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 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, in order 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 Labeling 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 in accordance with OSHA, NFPA 70E, or other country-specific requirements for arc flash protection, **PRIOR** to 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 INTENDED VOLTAGE.**

**⚠ WARNING****Follow EHS Policies!**

Failure to follow 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.

## Copyright

This document and the information in it are the property of Trane, and may not be used or reproduced in whole or in part without written permission. Trane reserves the right to revise this publication at any time, and to make changes to its content without obligation to notify any person of such revision or change.

## Trademarks

All trademarks referenced in this document are the trademarks of their respective owners.

## Revision History

Removed IPAK model information in the document.



# Table of Contents

Overview .....	4
BACnet® Protocol .....	5
BACnet Testing Laboratory (BTL) Certification	5
Field Kit Parts, Tools and Requirements, and Specifications .....	6
Field Kit Parts .....	6
Tools and Requirements .....	6
Specifications and Dimensions .....	6
Backward Compatibility .....	7
Mounting and Installing CSC Modules .....	8
Mounting .....	8
CSC (S*WF, S*RF) Module Installation .....	8
CSC (S*WG, S*RG) Module Installation ...	10
Mounting or Removing/Repositioning the BCI-I Controller .....	12
Generic BCI Wiring Diagram .....	13
Wire Harness Installation for CSC .....	14
Wiring Harness Installation for CSC (S*WF, S*RF) .....	15
Wiring Harness Installation for CSC (S*WG, S*RG) .....	17
Additional Resources .....	18



## Overview

This installation document contains information about the BACnet® Communication Interface for Commercial Self-Contained (CSC) controllers. This controller allows CSC units the capability to:

- Communicate on an open standard, interoperable protocols used in Building Automation and Control Networks (BACnet).
- Provide customers the flexibility to choose the best possible vendor for their building subsystems.
- Easily incorporate Trane products into legacy systems in existing buildings.

**Important:** *This controller is intended to be installed by a qualified system integration technician who is properly trained and experienced in BACnet.*

The BCI-I controller is available as a factory-installed option or field-installed kit. The features and functions described in this manual apply to either option. The following sections describe:

- A brief overview of the BACnet protocol.
- Field kit inspection, tool requirements, and specifications.
- Backward compatibility.
- Module mounting and installation.
- Wiring harness installation.



# BACnet<sup>®</sup> 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. 19.](#)

## 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](http://www.bacnetassociation.org).



# Field Kit Parts, Tools and Requirements, and Specifications

## Field Kit Parts

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

Qty	Description
1	Green ground wire
1	2-wire harness
1	4-wire harness
2	#6, Type A washers
1	BCI-I Integration Guide, ACC-SVP01*-EN
2	DIN rail end stops

Qty	Description
6	#6-32 x 3/8-in long mounting screws
2	#10-32 x 3/8-in DIN rail mounting screws
1	Sheet metal mounting bracket
1	7.5-in DIN rail

**Important:** Contact the Trane Parts Center nearest your area should there be any damaged or missing components.

**Note:** One copy of the appropriate service literature ships inside the control panel of each unit.

## Tools and Requirements

- 11/64 inch drill bit
- Drill
- Phillips #1 screwdriver
- 5/16 inch hex-socket screwdriver
- Small flat-bladed screwdriver
- For reconfiguration instructions, refer to the latest edition of the programming and troubleshooting guides for constant volume units or variable air volume units.

## Specifications and Dimensions

### Dimensions

Height: 4.00 inches (101.6 mm)

Width: 5.65 inches (143.6 mm)

Depth: 2.17 inches (55 mm)

### Storage Environment

-44°C to 95°C (-48°F to 203°F)

5% to 95% relative humidity non-condensing

### Operating Environment

-40° to 70°C (-40° to 158°F)

5% to 95% relative humidity non-condensing

### Power requirements

50 or 60 HZ

24 Vac ±15% nominal, 6 VA, Class 2 (Maximum VA = 12VA)

24 Vdc ±15% nominal, maximum load 90 mA

### Mounting Weight of Controller

Mounting surface must support 0.80 lb. (0.364 kg)

### UL Approval

UL unlisted component

### Environmental Rating of Enclosure

NEMA 1

### Altitude

6,500 ft maximum (1,981 m)

### Installation

UL 840: Category 3

### Pollution

UL 840: Degree 2



## Backward Compatibility

CSC units manufactured after October 2009 are shipped with the correct software versions. For CSC units manufactured before 2009, the HI will report the wrong device/COMM protocol on the **Revision Report** screen on the configuration menu. The units will report COMM5 instead of BACnet® on the BAS communications **Software Revision Number** screen.





# Mounting and Installing CSC Modules

## ⚠ 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.

## Mounting

Use the model number on the unit nameplate and the model number description in the unit IOM (or the wiring diagrams located on the control panel door) to determine unit size.

## CSC (S\*WF, S\*RF) Module Installation

1. Disconnect all power from the CSC unit.

**Note:** Units without a Ventilation Override Module (VOM) (1U37), go to [Step 5](#).

2. Swing out the Human Interface (HI) to get access to the VOM module.
3. Disconnect the wire harnesses from the VOM by unplugging the connectors. Remove the two screws securing the VOM to the mounting panel.
4. Reinstall the VOM in the lower right module position on the mounting panel. Reinstall the two screws to secure the VOM to the panel and reinstall the wiring harness connectors to the VOM.
5. Position the DIN rail from the kit approximately as shown on the panel. Position the rail as close to the horseshoe shaped module mounting feature as possible.

**Note:** Abut the DIN rail up to the horseshoe mounting feature or the BCI-I module will not fit on to the panel.

6. Using the DIN rail, mark positions for two screw holes and then drill the marked holes using a 11/64 inch drill bit.
7. Mount the DIN rail using two #10-32 x 3/8 inch screws from the kit.
8. Using two DIN rail end stops from the kit, install the BCI-I module onto the DIN rail.

**Tip:** For ease of installation, install the bottom end stop first followed by the BCI-I module, and then the upper end stop.

(Refer to the "[Mounting or Removing/Repositioning the BCI-I Controller](#)," p. 13).

## Mounting and Installing CSC Modules

Figure 1. S\*\*F VOM module relocation

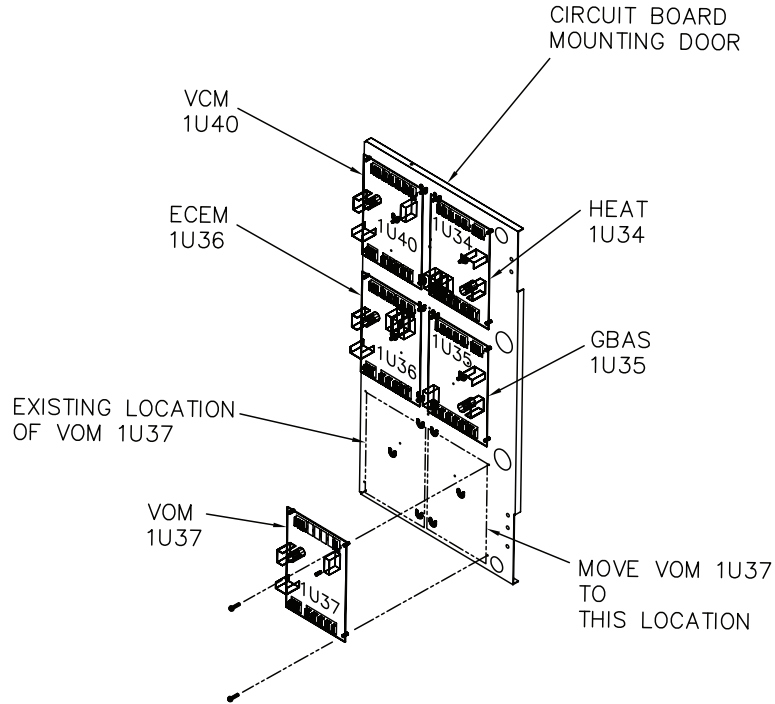
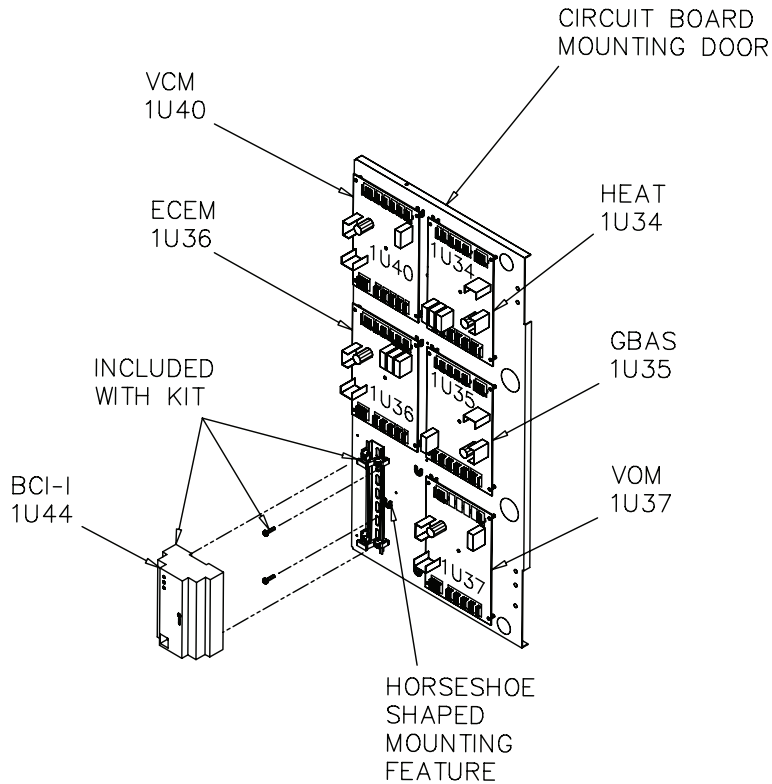


Figure 2. S\*\*F BCI-I module installation



### CSC (S\*WG, S\*RG) Module Installation

1. Disconnect all power from the CSC unit.
 

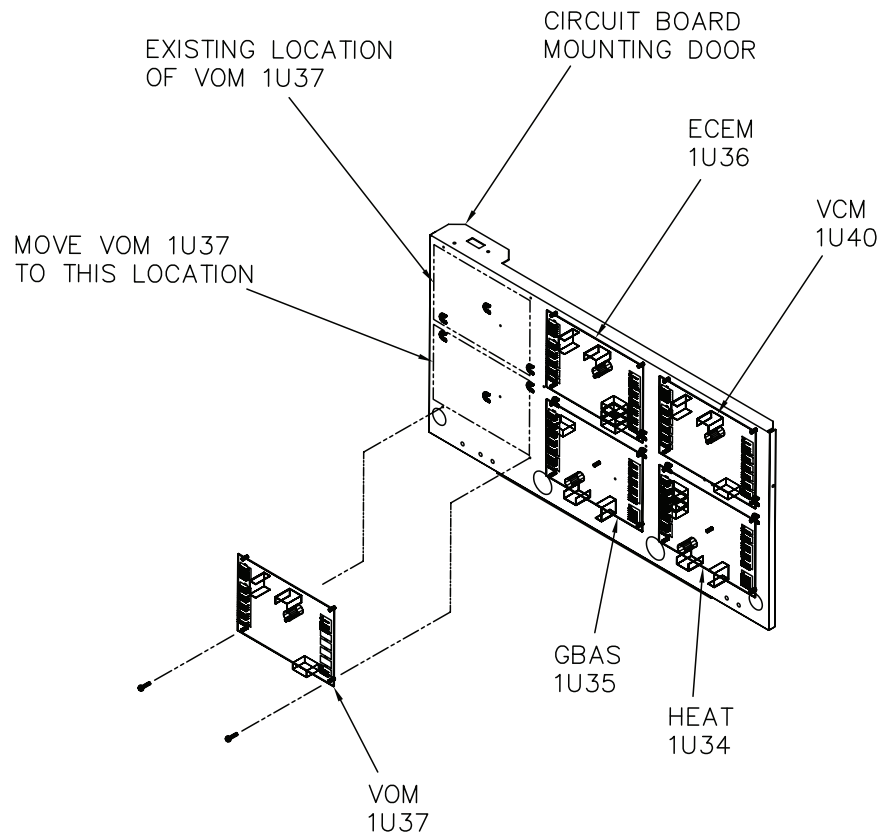
**Note:** Units without a Ventilation Override Module (VOM) (1U37), go to [Step 4](#).
2. Disconnect the wire harnesses from the VOM by unplugging the connectors. Remove the two screws securing the VOM to the mounting panel.
3. Reinstall the VOM in the lower left module position on the mounting panel. Reinstall the two screws to secure the VOM to the panel and reinstall the wiring harness connectors on the VOM.

4. Position the DIN rail from the kit approximately as shown on the panel. Position the rail as close to the horseshoe-shaped module mounting feature as possible.

**Note:** Abut the DIN rail up to the horseshoe mounting feature or the BCI-I module will not fit on to the panel.

5. Using the DIN rail, mark positions for two screw holes and then drill the marked holes using a 11/64 inch drill bit.
6. Mount the DIN rail using two #10-32 screws from the kit.
7. Using two (2) DIN rail end stops from the kit, install the BCI-I module on to the DIN rail. (Refer to the section, [“Mounting or Removing/Repositioning the BCI-I Controller,”](#) p. 13.).

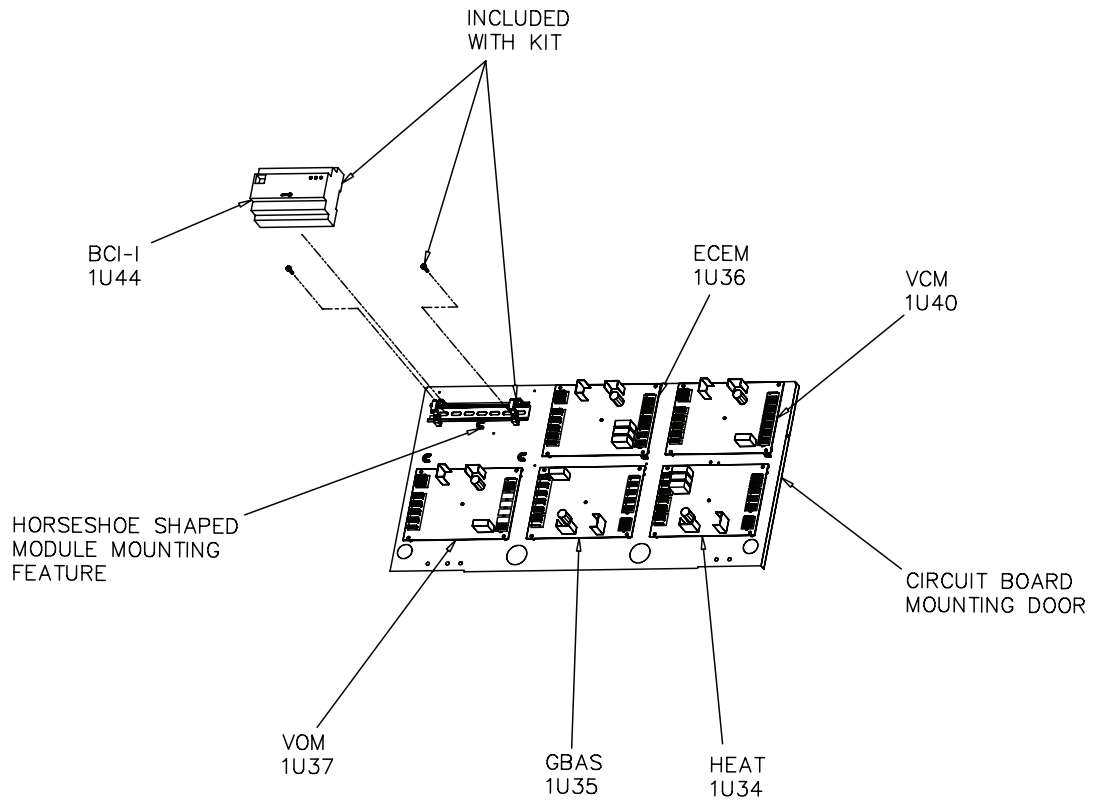
**Figure 3. S\*\*G VOM module relocation**



## Mounting and Installing CSC Modules

---

Figure 4. S\*\*G BCI-I module installation



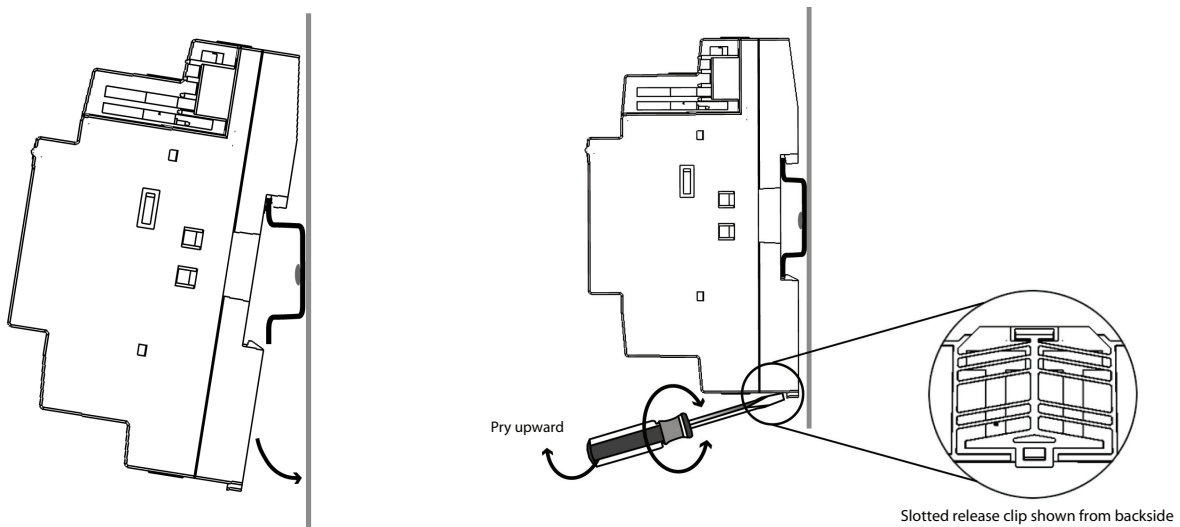


# Mounting or Removing/Repositioning the BCI-I Controller

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

**NOTICE**  
**Enclosure Damage!**  
Failure to follow instructions below could result in damage to the plastic enclosure.  
Do not use excessive force to install the controller on the DIN rail. If using another manufacturer's DIN rail, follow their recommended installation.

Figure 1. DIN rail mounting/removal



## 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.

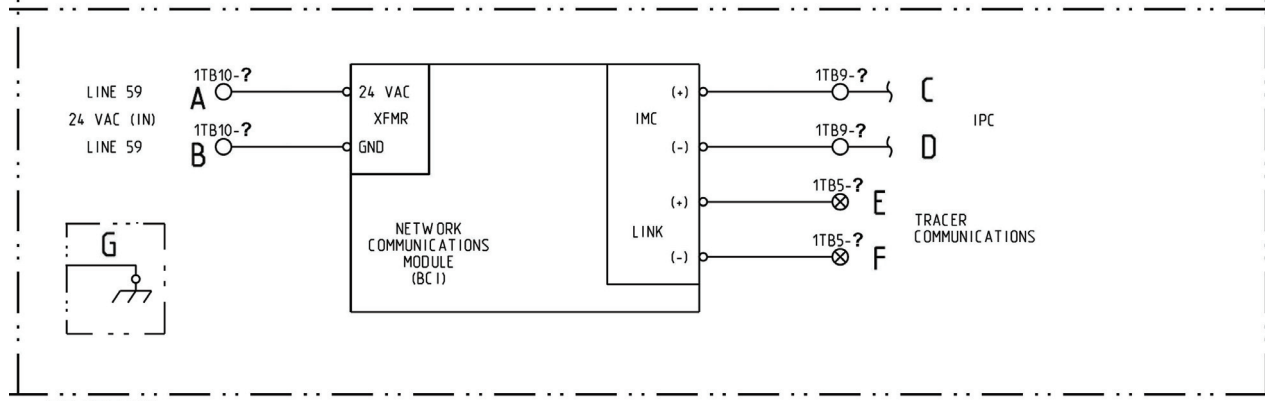
## To remove or reposition device:

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.

# Generic BCI Wiring Diagram

The figure and table below provide a generic BCI wiring diagram reference. Use letters A-F shown in the figure below to determine connection information according to product line.

**Figure 1.**



**Table 1.**

Item	KIT Wire Name	Commercial Self-Contained	
		Terminal Block	Standard Wire Name
A	24VAC+	1TB4-9	41AB
B	24V-CG	1TB4-19	254E
C	IMC+	1TB12-A	283N
D	IMC-	1TB12-C	284N
E	LINK+	1TB8-53	281B
F	LINK-	1TB8-4	282B
G	GND	**	**

**Note:** \*\*Self-Contained units already have the 24 Vac secondary grounded. No additional ground wire is required.



# Wire Harness Installation for CSC

It is recommended to read the following warnings and notice before proceeding with the wire harness installation for the IntelliPak I and II and CSC.

**⚠ WARNING**

**Proper Field Wiring and Grounding Required!**

Failure to follow 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.

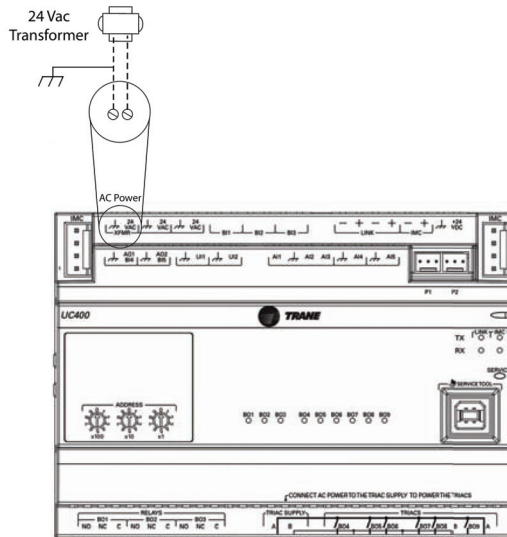
**NOTICE**

**Equipment Damage!**

To prevent damage to other control modules, ensure the correct transformer is grounded. The user must connect the chassis ground to the 24 Vac transformer used by BCI-I.

**Important:** On units equipped with older/non-standard variable frequency drives (VFD), excessive electrical noise may cause data loss. If the BCI drops data, move the green ground wire (GND) closer to the BCI-I by moving the GND wire fork terminal to a nearby fastener such as one of the BCI-I DIN rail mounting screws. Next, cut off the 1/4 inch spade connector and excess GND wire length not needed to reach the BCI-I. Finally, strip and insert the GND wire into the 24 Vac terminal connector corresponding with a BCI-I chassis ground symbol (next to wire 24 Vac+).

Figure 1. Connecting 24 Vac transformer and ground





### Wiring Harness Installation for CSC (S\*WF, S\*RF)

1. Remove the 2-wire and 4-wire harnesses from the kit.
2. Connect each plug to its appropriate receptacle on the BCI-I Module so that the wire numbers match the legends on the BCI. For example, wire LINK+ to LINK+ on the module or wire the 24VAC+ to 24VAC on the module.
3. Using the IPC harness, connect wire IMC+ to 1TB12-A. Connect wire IMC- to 1TB12-C. (Refer to [Figure 2, p. 17](#) for SXXF terminal block locations in the control panel.)

**Note:** *Verify that the wires on 1TB12-A are labeled with wire number 283 and the wires on 1TB12-C are labeled with wire number 284.*

4. Using the 24 Vac wires, connect wire 24VAC+ to 1TB4-9. Connect wire 24V-CG to 1TB4-19.
5. Using COMM Link wires, connect wire LINK+ to 1TB8-53. Connect wire LINK- to 1TB8-54.
6. The green wire marked GND in the harness is not required to be connected.
7. Secure the harness wires within the control panel to the existing wire bundles. Coil and secure any excess wire.

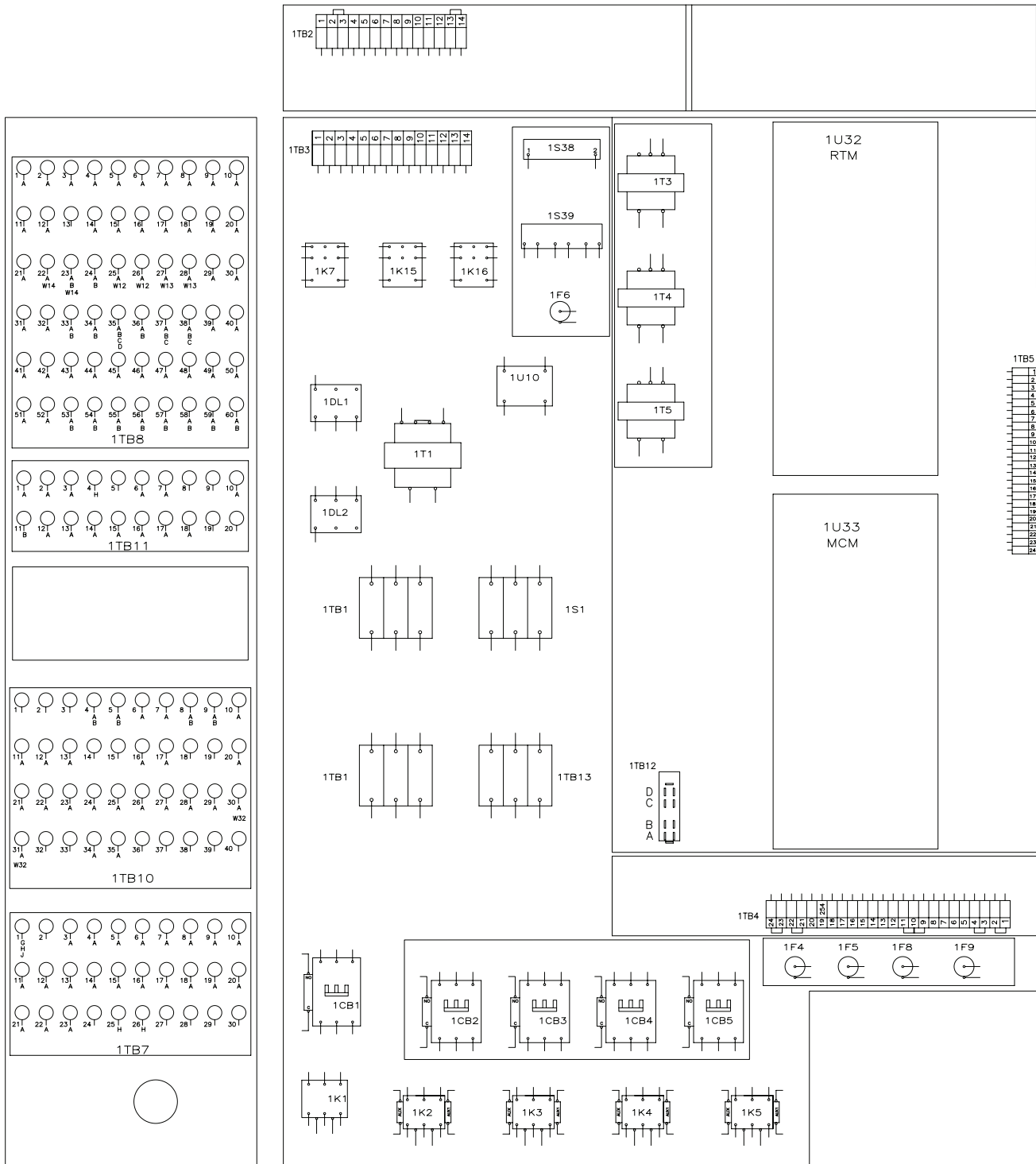
**Note:** *For the BCI-I external connections, refer the Field Connection Wiring Diagram for the CSC unit. For detailed information about BACnet<sup>®</sup> termination for BACnet links, refer to the Unit Controller Wiring for the Tracer SC<sup>™</sup> System Controller Wiring Guide, BAS-SVN03\*-EN.*

8. Restore power to the unit.

**Important:** *Before operating the unit, the operating parameters must be re-programmed to include the BCI-I Module. (For reconfiguration instructions, refer to the latest edition of the programming and troubleshooting guides for constant volume units or variable air volume units.)*



Figure 2. S\*\*F Terminal Block Locations







## Additional Resources

Use the following documents and links as additional resources:

- *BACnet® Communication Interface (BCI-I) Integration Guide (ACC-SVP01\*-EN).*
- *Unit Controller Wiring for the Tracer SC™ System Controller Wiring Guide (BAS-SVN03\*-EN).*

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.com](http://trane.com) or [tranetechnologies.com](http://tranetechnologies.com).

Trane has a policy of continuous product and product data improvement and reserves the right to change design and specifications without notice. We are committed to using environmentally conscious print practices.