Product Catalog

Tracer® SC System Controller

For Tracer Building Automated Systems

September 2016

BAS-PRC031T-EN

Introduction

The Tracer® SC system controller (Tracer SC) provides building automation control to coordinate unit controllers within the Tracer control architecture. A Tracer building automation system provides centralized building control through a single, integrated system. Climate, lighting, scheduling, energy consumption, and other controllable features of a facility can be programmed and managed by a Tracer building automation system for simple, consistent, and reliable operations.

The built-in functions and applications of Tracer SC include:

- Scheduling that can be configured to your building's needs and operation.
- Area control that allows you to group your building the way you use it and program multiple rooms or areas on the same schedule and update together as needed, from one user interface.
- Chiller plant control that optimizes control of the most common plant layouts.
- Variable air systems (VAS) that standardize the control of rooftop/variable-air-volume systems, including fan static pressure optimization and outside air intake.
- Overrides, reporting, data logging, and alarm logs

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Table of Contents

Product Overview 5
- Tracer® Building Automation System 6
- Tracer® SC System Architecture 6
- BAS R'newal™ Program 7
- Tracer® Communication Bridges 7
- Tracer® SC Facilities 7

The User Interface 9
- Alarms 10
- Data Logs 10
- Schedules 11
- Overrides 12
- Reports 13
- Graphical and Bindable Widgets 14
- Graphics and The Tracer® Graphics Editor 14
- The Navigation Tree 16
- User Security 17
- Remote Access to a Tracer® BAS 17

System Control 18
- Area Application 18
- Chiller Plant Control (CPC) Application 18
- Variable Air Systems (VAS) Application 18
- Trane EarthWise™ Systems 19
- Tracer® Graphical Programming (TGP2) 19

Unit control 20
- BACnet® (MS/TP) Unit Controllers Supported by Tracer® SC 20
- BACnet/IP Unit Controllers Supported by Tracer® SC 20
- AirFi™ Wireless Unit Controllers Supported by Tracer® SC 20
- LonTalk Unit Controllers Supported by Tracer® SC 20
- Trane® Legacy Unit Controllers (Comm3/4) Supported by Tracer® SC 21

Resources 22

Specifications 23

Hardware Components 26
Tracer® SC Components 26
Dimensions 27
Trane® PM014 Power Supply Module. 27
Tracer® BACnet® Terminator 28
Medium Enclosure (Optional) 28
Large Enclosure (optional) 29

Product Overview

Tracer® SC allows you to streamline facility management without reinventing the entire system. Adding Tracer SC to your system provides a flexible, cost effective solution for building automation, and managing the facility climate that can extend to lighting and energy consumption.

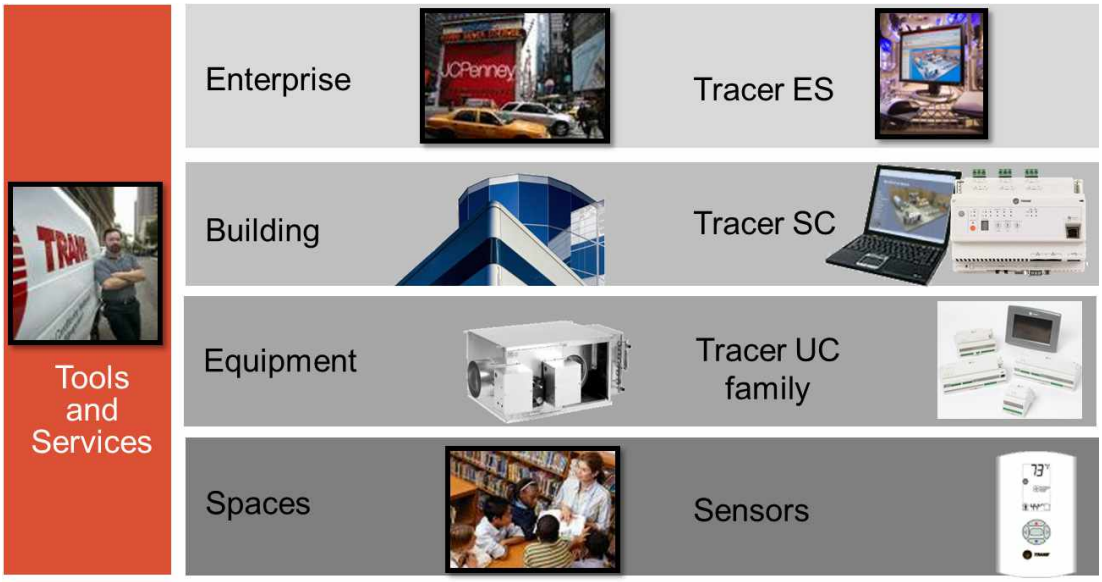
Accessible from most PCs, tablets, and smart phones, Tracer SC eliminates the need for a dedicated computer and monitor so you can manage system performance whenever and wherever it is convenient. The intuitive online tools provide improved efficiencies, increased tenant comfort and reduced energy costs, which result in operational cost-savings and a better bottom line.

	Occupant comfort and energy savings • Tracer SC includes several factory engineered HVAC applications that have been developed by HVAC system experts and tested on tens of thousands of facilities to ensure that your facility operates at its peak performance. These applications provide consistent comfort and improved indoor air quality, while reducing energy requirements. • For any building owner concerned with energy, indoor air quality, and the environment, Trane EarthWise™ Systems represent a design philosophy whose time has come. EarthWise Systems provide documented sustainability of high efficiency and low emissions over the entire lifetime of the building. • Tracer Graphical Programming (TGP2) is a powerful graphical program that can be used to customize factory applications or control non-HVAC equipment.
TRACER BAS OPERATOR SUITE GET IT ON Google play Available on the App Store	**Access your facility from anywhere** • Tracer SC is web-enabled and accessible from virtually any device with a web browser. All of the most popular device types, operating systems, and browsers are supported. • The Tracer® BAS Operator Suite is a mobile app that allows you to monitor and manage buildings from virtually anywhere, giving you greater freedom and constant peace of mind. • TraneConnect™ provides an easy, secure option for remotely connecting to a Tracer SC.
ZigBee™ BACnet TESTING LABORATORY BTL	**Support for open, standard protocols** • Open, standard protocols are the key to enabling communication among Trane and non-Trane HVAC equipment, as well as other complementary facility systems. These protocols enable communication across systems and vendors to ensure that your building operates at its best on day one and beyond. • Tracer SC natively communicates to BACnet® and LonTalk controllers and is listed as a BACnet Building Controller (B-BC) by BACnet Test Labs (BTL). • Tracer SC supports Trane®Air-Fi™ Wireless, providing standard wireless BACnet over Zigbee™ building automation between Trane BACnet controllers and zone sensors.
	Support for Trane® Air-Fi™ Wireless • Trane Air-Fi Wireless brings maximum flexibility to your building automation system. • For contractors, it significantly simplifies building controls projects by minimizing the engineering, estimating and project management tasks associated with communication link. For building owners, it provides easier and more cost-effective controls upgrades and building expansion projects. • Trane technology helps prepare your facilities for the future of building information. Trane Air-Fi Wireless runs BACnet protocol over ZigBee building automation standards. Trane Air-Fi is the first HVAC manufacturer to be Zigbee Certified.

Tracer® Building Automation System

From our industry-leading building automation systems to equipment controls and sensors, Trane offers a complete controls portfolio to enable you to operate buildings at peak energy and operational efficiency.

Trane controls are built on open, scalable platforms. They provide options to integrate with your existing equipment and controls, regardless of brand, and give you the latitude to easily expand into other systems within your building, multiple buildings and buildings you'll add in the future.



Tracer® SC System Architecture

Tracer SC is at the heart of a Tracer building automation system. Tracer SC provides a web-based front end for your facility that can be accessed with most PCs, tablets and smart phones. Tracer SC includes powerful, factory-engineered applications that are designed to provide the perfect balance of energy efficiency and user comfort. Tracer SC communicates with a variety of Trane and non-Trane controllers using open, standard protocols, including BACnet and LonTalk. A diagram depicting the high-level system architecture is shown in the following figure.

Figure 1. Tracer BAS structure (PC/Tablet/Phone with Web browser)

BACnet/IP	LonTalk	BACnet MS/TP	BACnet Zigbee	Modbus (RTU & TCP)
Non-Trane HVAC	Tracer MP Programmable Controls	Tracer UC Field Applied Controls	Tracer UC Field Applied Controls	Non-Trane HVAC
Non-Trane Lighting, Security, Fire	Tracer ZN Factory Controls	Tracer UC Factory Controls	Tracer UC Factory Controls	Tracer UC Factory Controls
Non-Trane Gateway	Non-Trane HVAC, Meter, Drive, etc.	Non-Trane HVAC, Meter, Drive, etc.		Non-Trane HVAC, Meter, Drive, etc.

BAS R'newal™ Program

BAS R'newal is a new Trane building control systems upgrade program that helps customers transition to our current Tracer SC system. The program makes it easier to upgrade existing installed Tracer systems and non-Trane systems to the latest technologies including web-access, mobile access, intuitive user interfaces, and advanced features enabled by Intelligent Services (IS). The BAS R'newal program is enabled by Tracer Communication Bridges.

Find out more about BAS R'newal at http://www.trane.com/commercial/north-america/us/en/services/upgrade-improve/r_newal_-programs.html.

Tracer® Communication Bridges

Tracer® Communications Bridges integrate legacy control products into current Tracer systems for monitoring and control purposes. See for a Tracer SC configuration that includes Tracer communication bridges.

Tracer Communications Bridges use legacy communications protocols to access points stored in previous-generation field-level controllers. The Bridges then convert the points to BACnet objects and properties, which makes them available for system use through the BACnet/IP communications protocol.

Comm2 to BACnet/IP

This bridge is used to integrate up to three UCP1-controlled chillers (CenTraVac and Series-R) into Tracer systems for monitoring and control purposes. For more information, refer to the *Comm2 to BACnet/IP Product Data Sheet, (BAS-PRC070)*.

Comm3/4 to Tracer SC (enables the BAS R'newal program)

This bridge enables Comm3 and Comm4 devices to be integrated into Tracer SC systems, similar to current generation devices. The latest features and capabilities of Tracer SC can be accessed without needing to replace the existing Comm3 and Comm4 devices. For more information, refer to the *Comm 3/4 to Tracer SC Product Data Sheet, (BAS-PRC084)*.

N2 to BACnet/IP (enables the BAS R'newal program)

This bridge integrates Johnson Controls, Inc., N2 communicating controllers into Trane Tracer control systems. The N2 Bridge converts the N2 controllers into virtual BACnet devices for easy integration into Tracer SC. For more information, refer to the *N2 to BACnet/IP Product Data Sheet, (BAS-PRC082)*.

Tracer® SC Facilities

A Tracer SC facility is defined as one Application SC and one or more associated Base SCs. A single building or site can contain more than one facility. See the following figure for an example of a Tracer SC facility configuration. The following attributes apply to Tracer SC facilities:

- Tracer SC facility is limited to one Application SC.
- Tracer SC facility has one or more Base SCs.
- Tracer SC facility can support a maximum 240 devices.
- Tracer SC facility may be limited to 120 devices depending on the communications involved (see the following table for device capability).

Table 1. Device Capability

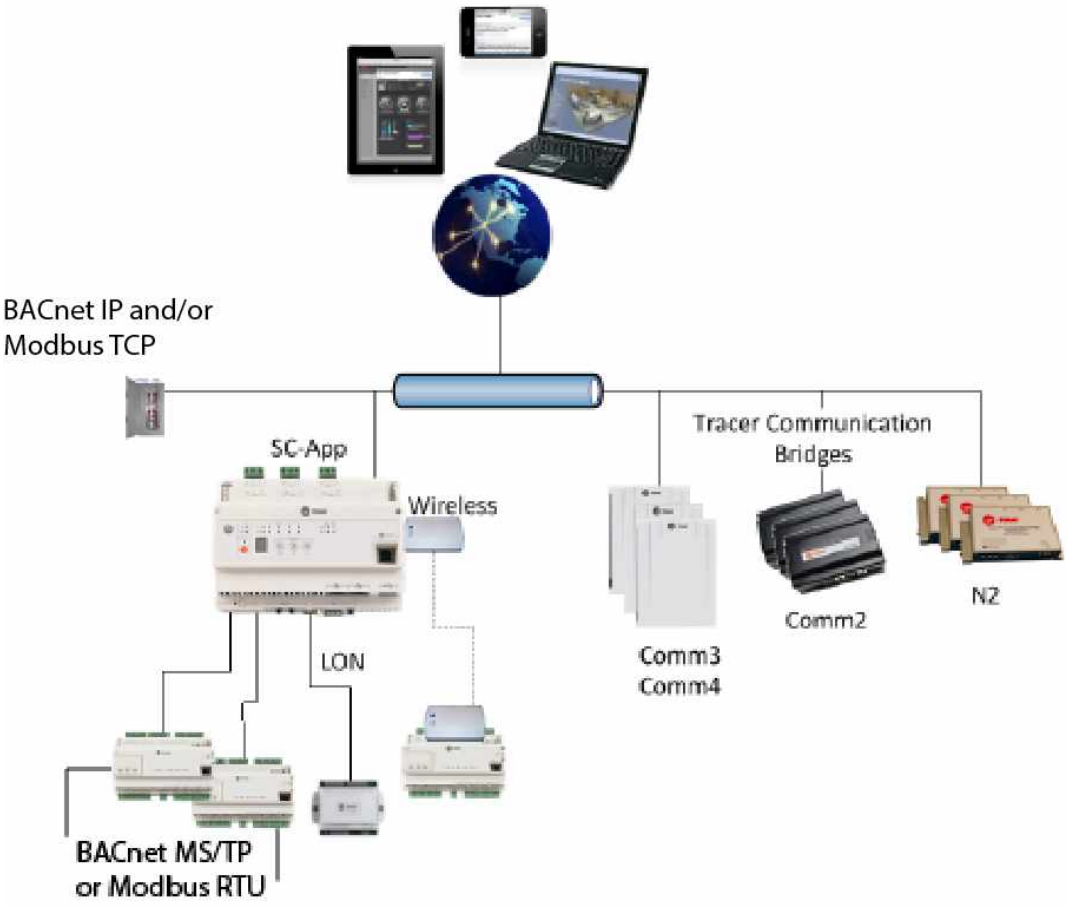
Communication Type	Single SC	Multi SC
Air-Fi™ Wireless	Up to 120 devices	Up to 240 devices
BACnet/MSTP	Up to 120 devices	Up to 240 devices
BACnet/IP	Up to 240 devices	Up to 240 devices
COMM 3/4	Up to 240 devices	Up to 240 devices
LON	Up to 120 devices	N/A

Table 1. Device Capability (continued)

Communication Type	Single SC	Multi SC
Modbus TCP	Up to 240 devices	N/A
Modbus RTU	Up to 60 devices	N/A

Note: *Trane Air-Fi™ sensor do not count against the device limits listed above. For more information, see the Air-Fi Wireless System IOM Manual, (BAS-SVX40).*

Figure 2. Example of a single Tracer SC facility configuration



The User Interface

The Tracer® SC user interface provides an easy way for users to set up, operate, and modify a building automation system. The home page contains system status information and links to navigate to all areas of the system. The navigational elements are described in the following table.

Table 2. Navigating the User Interface

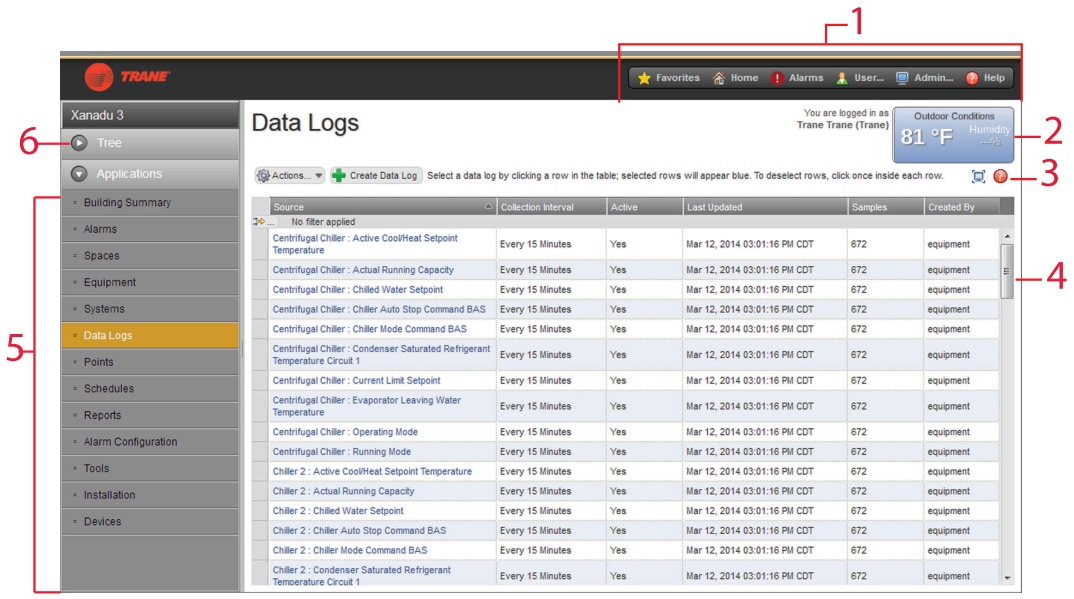
Number	Button/Menu Functions	Description
		
1	Global Navigation Bar	This is visible on every page. From left to right, the bar contains: • **Favorites** Click this button to save frequently Tracer SC UI pages. • **Home** Click this button at anytime to return to your home page. • **Alarms** Shortcut to the **Alarms** page. If a new alarm or event has been detected by the system since the **Alarms** page, the **Alarms** icon flashes. • **User...** Provides access to: – Logout – Enable/disable automatic tree opening – Preferred data view (tabular or graphical) – Table filtering – Regional preferences – Data display units – Change password • **Admin...** Provides access to roles and users. – Appears only if the user has administrative privileges. – A role is a collection of access rights to equipment, functions, and applications. Users are assigned to roles. The role assignment determines a user's access rights. – Six pre-defined user roles exist in the Tracer SC. These roles can be used as is, or as a basis to create additional roles. Roles define the extent to which a user is allowed to perform specific functions. – Each user is assigned a role. If you make a change to a role, all users assigned to that role will have their permissions changed, as prescribed by the updated role. • **Help** Opens the complete Tracer SC help system.
2	Outdoor Conditions	Shows current outdoor temperature and humidity.
3	Contextual Help	Opens a help topic that pertains only to the information on the page in view.

Table 2. Navigating the User Interface (continued)

Number	Button/Menu Functions	Description
4	Internal Scroll Bar	An internal scroll bar is available for pages that contain long lists of data and multiple sections.
5	Left Navigation Menu	Contains a list of menu items that are linked to features, applications, and equipment. Some menu items, when selected, expand to reveal a sub-menu of related items.
6	Navigation Tree	A customized view of user-selected elements in the HVAC system. You can group, order, name elements, and assign custom graphics to the tree nodes according to your preferences.

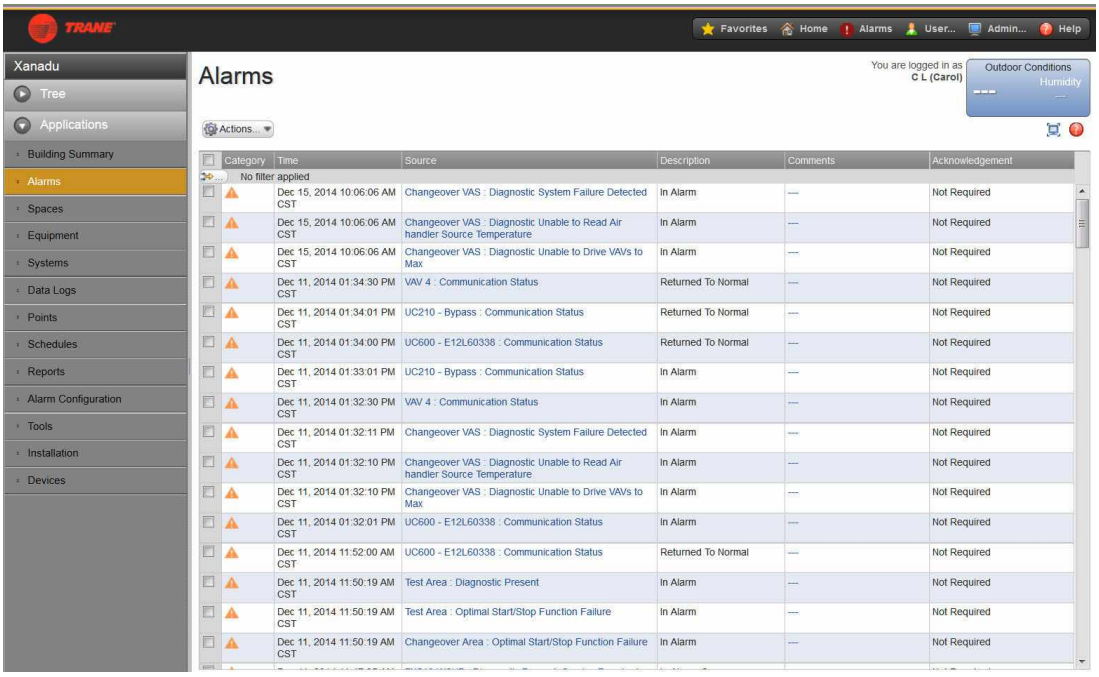
Alarms

The alarm handling capabilities of Tracer® SC allow users to receive, view, acknowledge, and make comments on building alarms and events. An event that is triggered by the detection of an abnormal or critical operating condition is generally considered to be an alarm. If a critical alarm exists, an alarm icon flashes in the global navigation bar, which remains visible in the right corner of every page of the user interface.

The Alarms page contains a list of alarms that have been detected by the system. Data displayed in the Alarm log includes when and where the event occurred and whether operator acknowledgment is required.

As of version 4.3, the Alarm log also includes the value of the data associated with the alarm.

Figure 3. Alarms log



Data Logs

Data Logging, also referred to as trending, records in real-time the value of a data point in the system and the time at which the value was recorded.

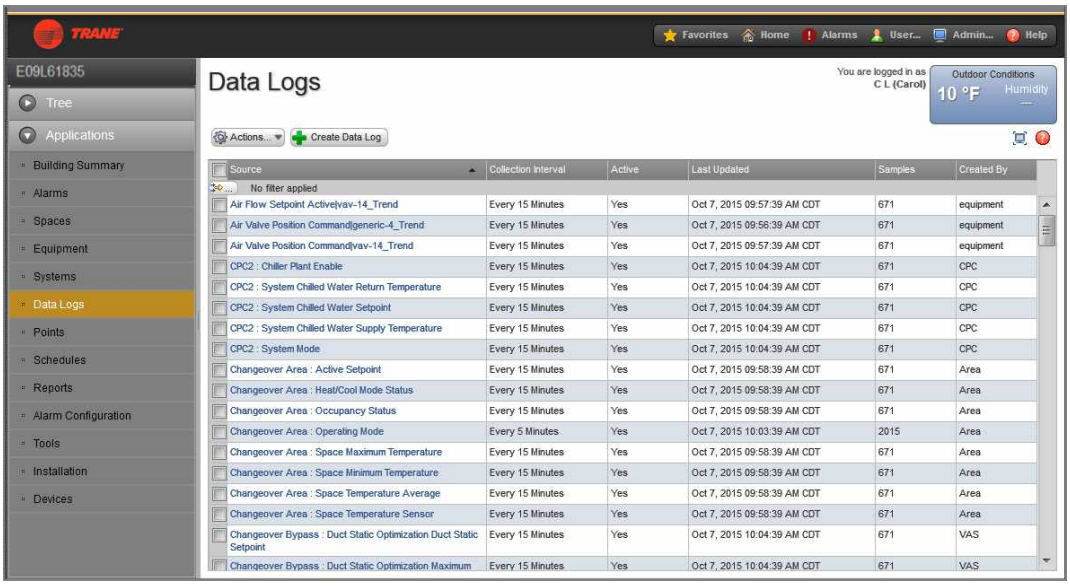
By default, Tracer® SC automatically generates system-created data logs (for equipment and standard applications) on a 15-minute interval and stores that data for seven days. Data storage

is a continuous window where only the most recent seven days of data are stored. Data older than seven days is discarded in order to make room for the newest data.

Users can also create data logs (either scheduled or triggered) by clicking the log data button on equipment and applications pages, or by using the create data log wizard.

A list of data logs can be accessed by clicking **Data Logs** from the left navigation menu. From this page you can take action on a data log, such as comparing or exporting, by selecting one or more data logs and then clicking the **Actions** button.

Figure 4. Data Logs page



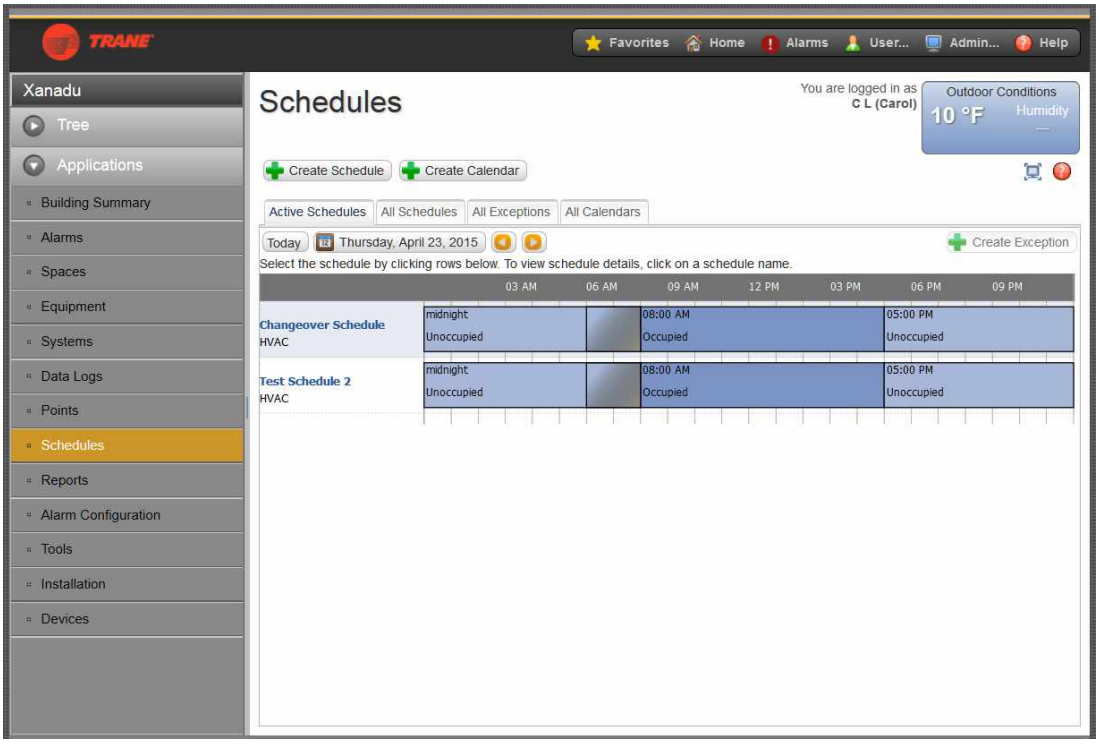
Schedules

Scheduling for Tracer® SC is based on the BACnet schedule object implementation. Scheduling is one of a facility's most important energy-saving strategies. It ensures that equipment runs only when needed. Scheduling facilitates the following tasks:

- Creating, editing, and deleting schedules
- Creating, editing, and deleting calendars and exception schedules
- Viewing all effective schedules in a facility

The Schedules page contains four tabs: Active Schedules, All Schedules, All Exceptions, and All Calendars.

Figure 5. All Schedules (Active Schedules shown)



Overrides

A typical challenge that facility managers have is maintaining the balance between automatic and manual system control. Tracer SC provides multiple methods of overriding equipment, applications, and points while also ensuring that the proper balance of automatic and manual system control is kept. These methods include:

Permanent Overrides

The most typical use of a permanent override is through applications. Tracer SC provides the ability to determine which user or application has performed an override to quickly determine who has overridden a setpoint.

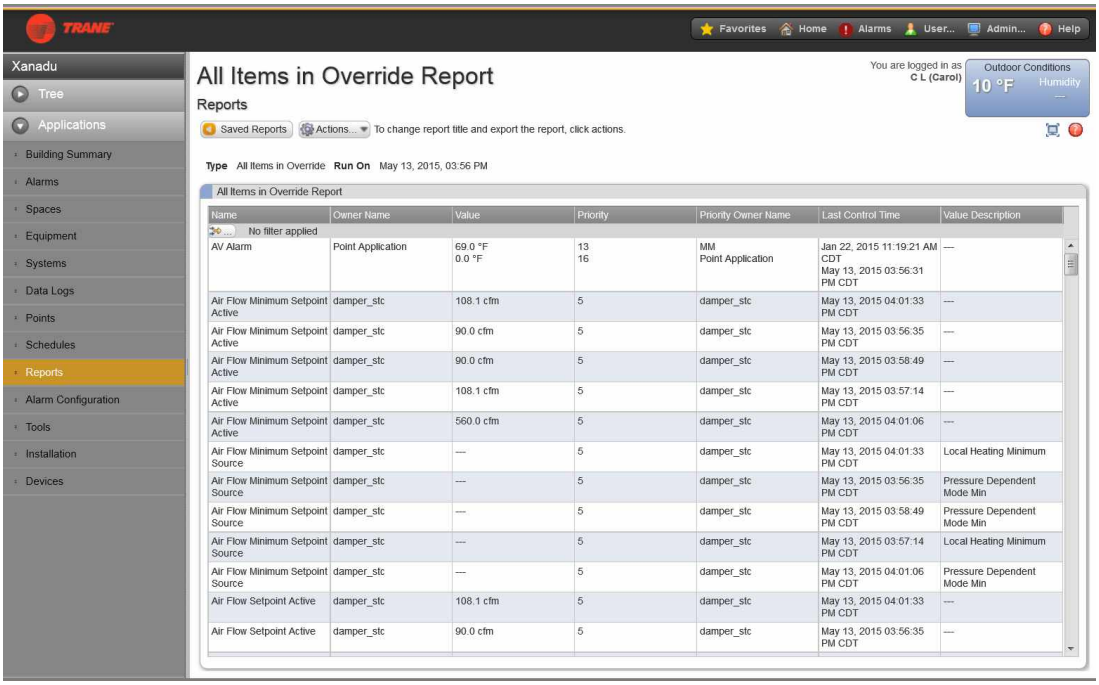
Temporary Overrides

A common challenge in facilities is inadvertent overrides. Tracer SC provides a default override option for users, which allows an override to expire after a period of time. This ensures that temporary overrides do not inadvertently become permanent overrides.

All items in Override Report

It can be difficult to track down overrides that have become permanent and are causing a facility to act differently than a facility manager expects. Tracer SC includes a standard report that allows a user to quickly identify all points within the system that have been overridden. See the following figure.

Figure 6. All items in override report



Reports

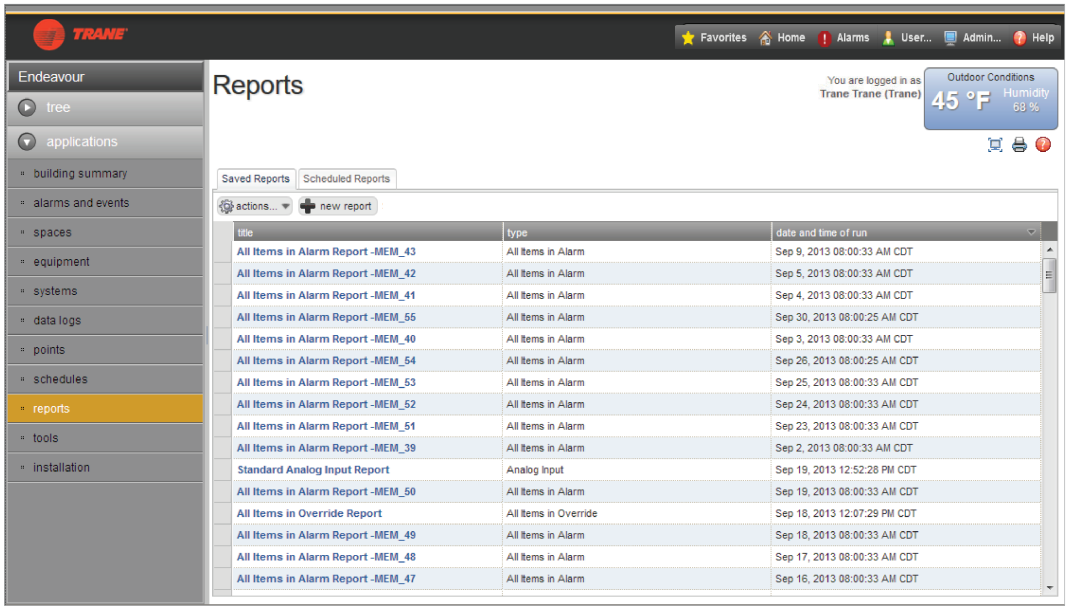
You can generate the following types of reports for Trane equipment:

- Site reports
- VAS commissioning reports
- Points reports
- Chiller reports

Report features include:

- Scheduling reports to run during specific date periods and run frequencies
- Specifying file storage options for scheduled reports
- Exporting reports to save to your PC as CSV, HTML, or PDF files
- Editing scheduled reports

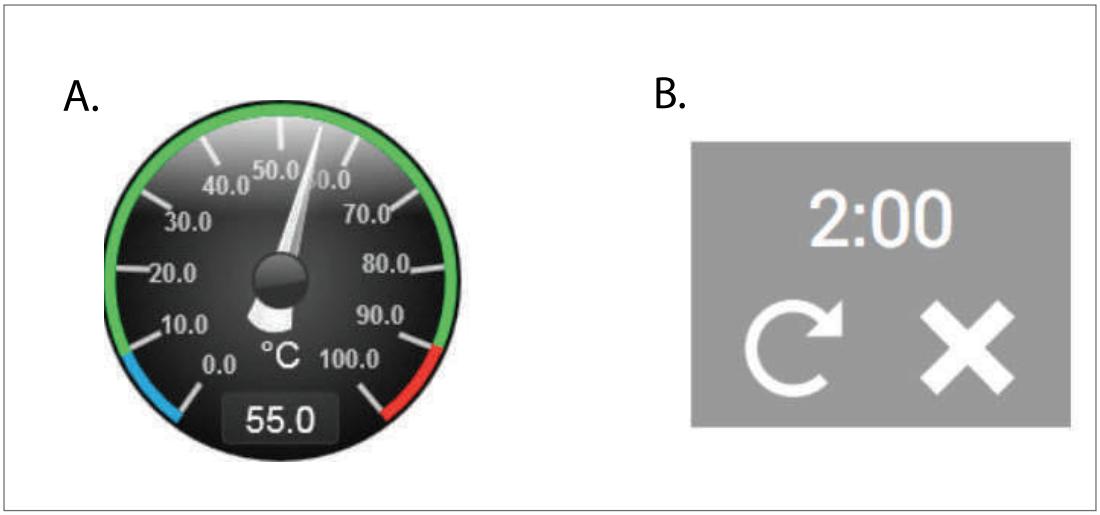
Figure 7. Reports page



Graphical and Bindable Widgets

New in Tracer® SC V4.1 is the option to incorporate graphical and bindable widgets into Tracer SC custom pages. Graphical widget components provide a visual representation of an analog process such as the current temperature or the current level of a water tank. Bindable widgets provide control and display of system controls and states in a simplified way. The following figure provides an example of each.

Figure 8. Widget examples (A. Graphical, B. Bindable)



Graphics and The Tracer® Graphics Editor

With the Tracer Graphics Editor (TGE), available through the Tracer TU service tool, users can create, edit, and publish graphics for use on Tracer SC. Graphics on the Tracer SC monitor and control building equipment and applications. They can display data related to climate, lighting, and other controllable operations. They can be used to change setpoints and to override equipment operation.

TGE can be used to align graphical elements, determine which elements appear on top, and perform cut, copy, and paste functions.

Graphics can include:

- Data from external websites — including weather data, documents and other information.
- Any data that is available in the system as a numerical or text value
- Analog values that can change colors if they deviate from a desired value
- Multiple graphic images in JPEG, GIF, and animated GIF formats
- Visual elements from the building, such as floor plans or exterior views from CAD drawings
- Digital photography in JPG and GIF formats
- Animated images to represent binary and analog values
- Target buttons that provide links to related sources
- User controls including push buttons, check boxes, drop-down list boxes, and entry fields

Graphics can be grouped in a logical way to simulate navigation through the building automation system. See the following figures for examples.

Figure 9. Home page showing graphic of building exterior (example 1)

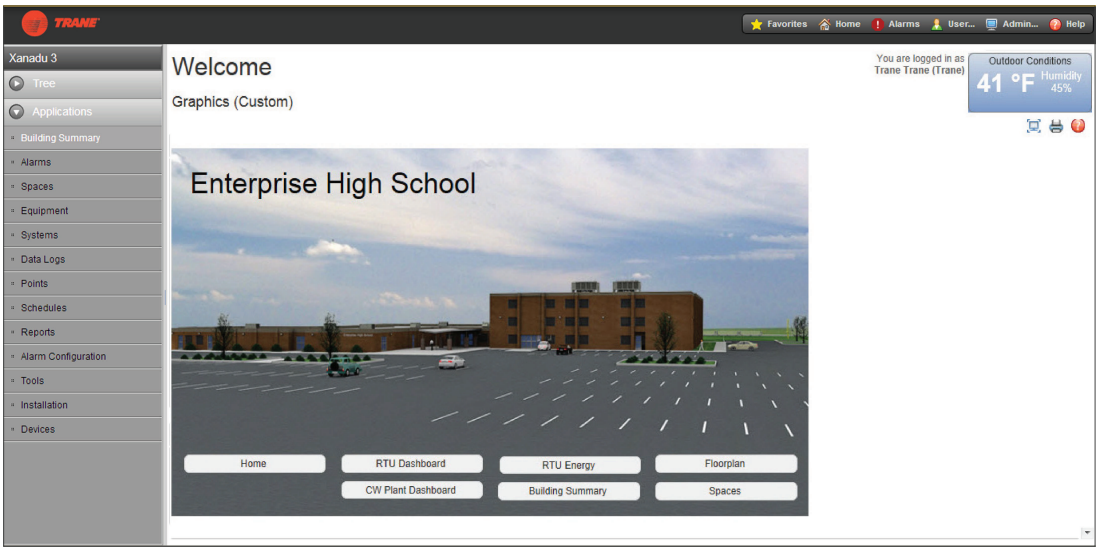


Figure 10. Home page with floor plan graphic (example 2)

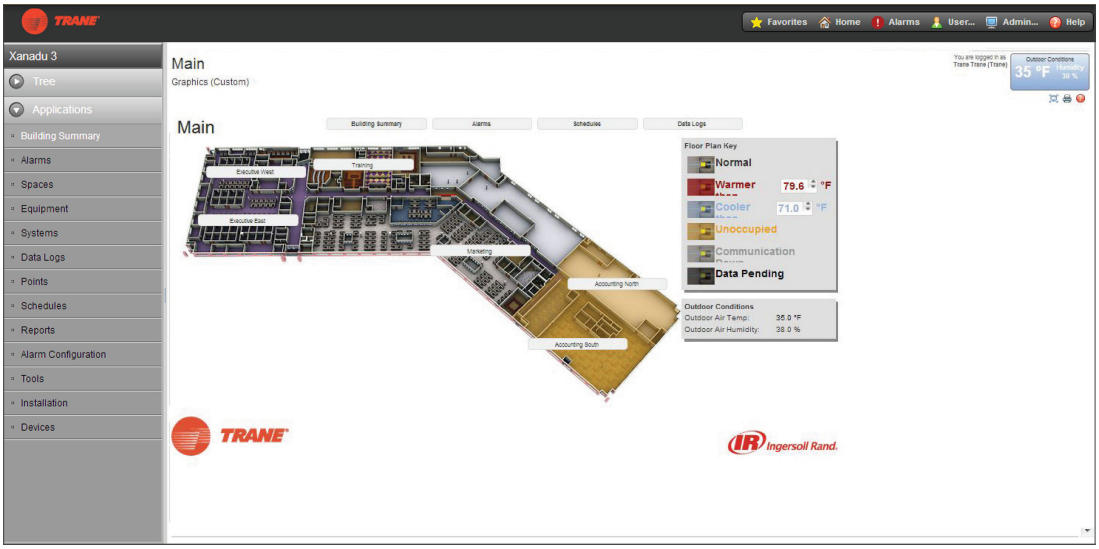
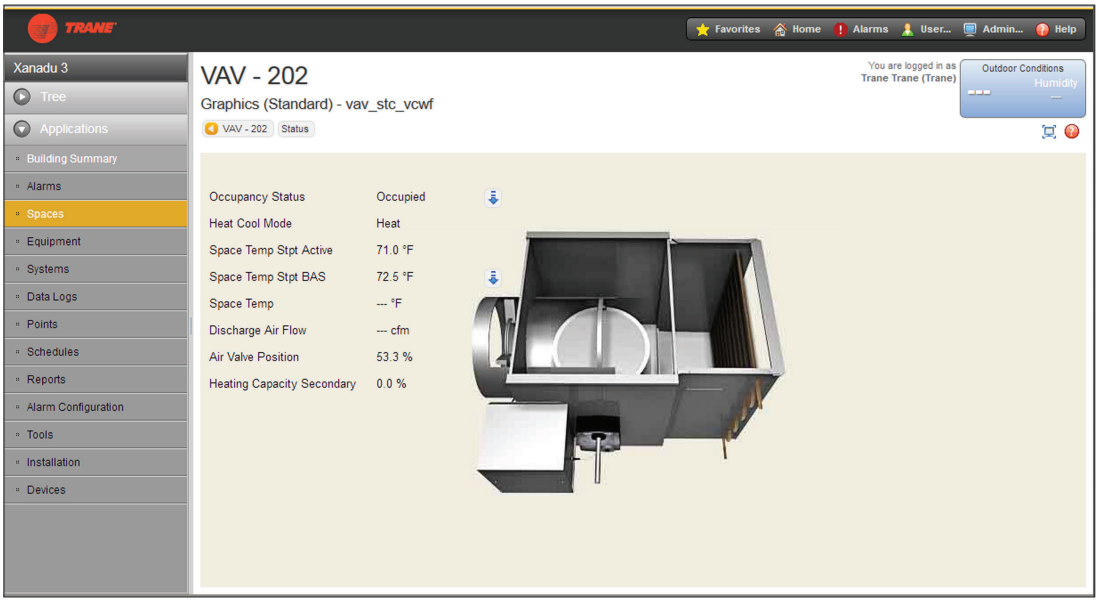


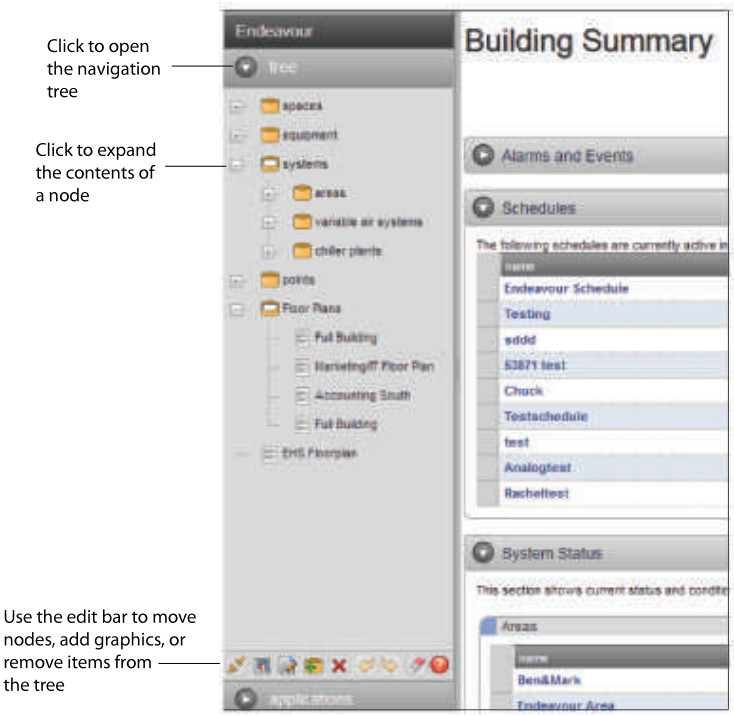
Figure 11. Equipment status graphic (example 3)



The Navigation Tree

The navigation tree contains the logically ordered and grouped content of all the elements of your HVAC system. The navigation tree populates automatically when spaces, systems, points, and equipment are installed. A navigation tree provides an alternate way to navigate through the user interface. The navigation tree consists of nodes, display text, and icons. You build the tree by choosing display text for nodes, arranging the nodes, and assigning associated graphics. The graphics represent equipment and areas of the facility.

Figure 12. Using the Tracer SC navigation tree



User Security

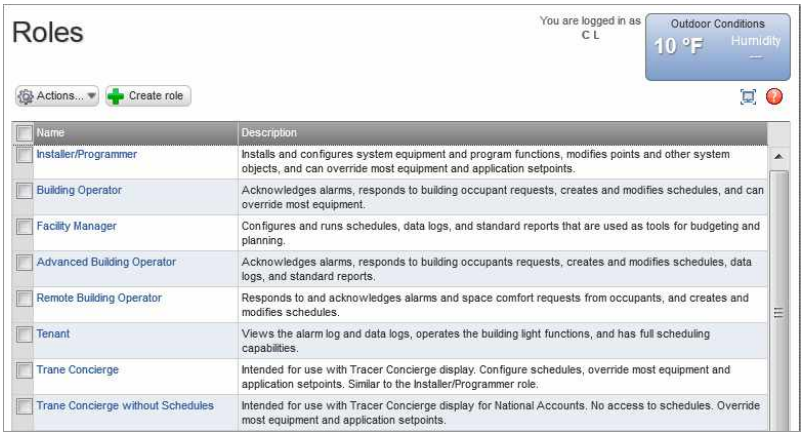
A sophisticated password system protects a Tracer system from unauthorized access. Password strength criteria is editable and can be tailored to meet security requirements.

Figure 13. Password requirements

Operators are assigned a role, which defines their access rights.

- Operators have access only to those features that are defined in their roles.
- Several predefined roles can be selected from the Tracer SC interface and roles can also be customized.
- An operator with administrative-level security can manage users and roles and has the ability to reset passwords.

Figure 14. Tracer SC user roles



Remote Access to a Tracer® BAS

Trane recommends using TraneConnect,™ a pre-engineered, secure IT technology, for remote access. For more information about TraneConnect, refer to the *TraneConnect How-to Guide, (BAS-SVU22)*. For customers who want remote access to the BAS equipment when it is not behind their own corporate firewall, the cellular router solution has VPN capability. These VPN accounts must be activated at the time the cellular router is ordered. For more information on the cellular router solution, including ordering information and remote access, refer to the *Tracer Cellular Router Installation, Operation, and Maintenance Guide, (BAS-SVX067)*.

System Control

Tracer® SC includes a powerful system control engine. Every Tracer SC ships with several factory engineered HVAC applications, support for Trane Earthwise™ Systems, and a powerful custom graphical programming language.

Area Application

Area is an application that resides on the Tracer® SC. The primary function of Area is to coordinate the start and stop of equipment based on a schedule stored in the Tracer SC. An Area may consist of a single room, a group of rooms, a large open warehouse, a manufacturing space, or any grouping defined by a system user. Area allows such functions as synchronizing member setpoints and controlling a large number of devices to be performed as one efficient operation.

Area can be configured to use multiple algorithms, along with area temperatures and humidity inputs, to make an economizing decision.

Area also supports:

- Optimal start/stop
- Humidity pulldown
- Night purge
- Unoccupied heating/cooling setpoints
- Unoccupied humidify/dehumidify
- Timed override functions

Additionally, the Area application allows users to efficiently perform a single operation, such as changing a setpoint, creating a schedule, performing an override, and apply it to all members of the area. For more information, see the *Air Systems for Tracer SC Applications Guide, (BAS-APG007)*.

Chiller Plant Control (CPC) Application

The Chiller Plant Control (CPC) application coordinates chillers and provides system chilled water control.

The CPC application allows you to configure a chiller plant for optimal efficiency and reliability, and provides a means for you to monitor and control the daily operation. Depending upon the many possible chiller plant configurations and design differences, the CPC application can:

- Provide overall chiller plant status information and alarms to local and remote Tracer® SC users.
- Enable or disable chiller plants.
- Start, stop, and monitor the status of system chilled water pumps.
- Calculate individual chilled water setpoints for individual chillers in series chiller plants
- Request when chillers are added or subtracted according to building load requirements and user-specified add and subtract logic
- Rotate chillers according to user-defined intervals
- Remove chillers from the rotation in the event

For more information, see the *Chiller Plant Application Guide, (BAS-APG012)*.

Variable Air Systems (VAS) Application

The variable air system (VAS) coordinates the control of air handlers, rooftop units, and variable air volume terminal units. The Tracer® SC VAS includes valuable tools to help manage tasks that were previously problematic and time consuming, such as:

- Determining Heat/Cool mode for changeover systems
- Coordinating AHU and VAV box operation

- Commissioning VAV boxes
- Scheduling common spaces
- Optimizing ventilation
- Optimizing duct static pressure

For more information, see the *Air Systems for Tracer SC Application Guide, (BAS-APG007).*

Trane EarthWise™ Systems

For any building owner concerned with energy, indoor air quality, and the environment, Trane's EarthWise Systems represent a design philosophy whose time has come. EarthWise and EarthWise Elite Systems, by definition, provide documented sustainability of high efficiency and low emissions over the entire lifetime of the building.

Trane EarthWise Systems include:

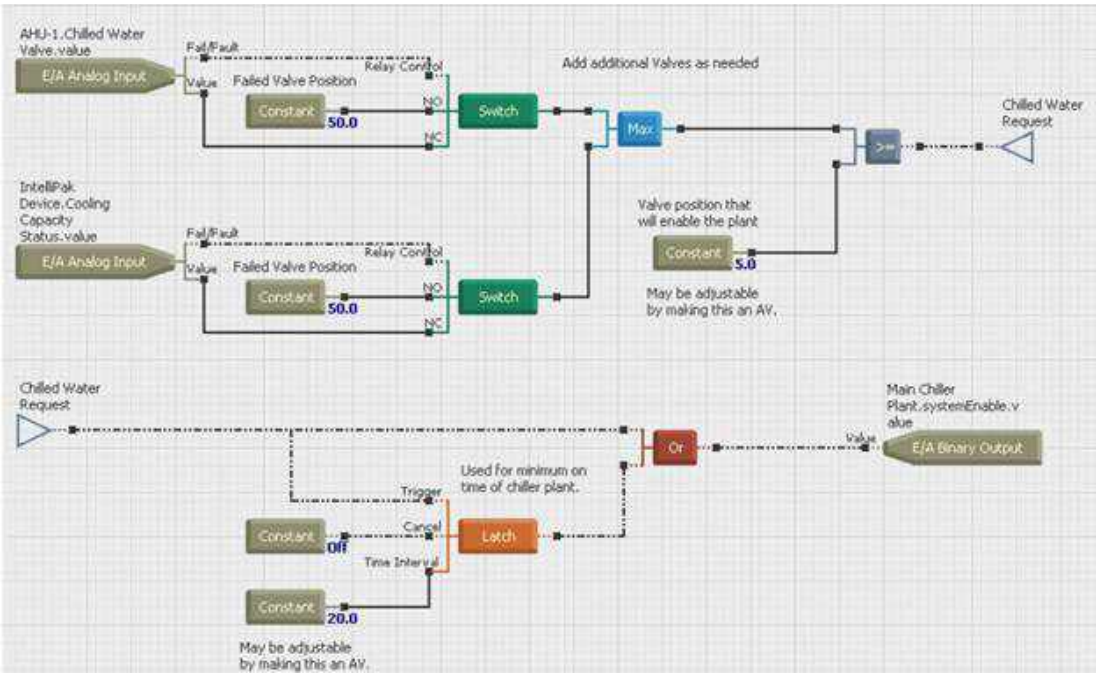
- Low Flow, Low Temperature CentraVac™ Chilled Water Systems
- Ice Enhanced, Air-Cooled Chiller Plant
- Intelligent Variable Air System for chilled-water applications
- Intelligent Variable Air System for IntelliPak™ rooftop applications
- Central Geothermal Systems

Find out more about EarthWise at http://www.trane.com/commercial/north-america/us/en/products-systems/earthwise-systems.html

Tracer® Graphical Programming (TGP2)

Tracer Graphical Programming (TGP2) is a powerful graphical program that allows you to customize Tracer system applications. TGP2 routines are typically used for sequencing equipment, calculating setpoints and values, and performing shutdown sequences. See the following figure for an example.

Figure 15. TGP2 example



Unit control

Unit controllers provide all necessary unit control functions. They operate associated unitary equipment, while ensuring that all built-in safety features are enabled and that diagnostics are issued. Each controller is designed to operate in stand-alone mode. Therefore, if system control fails, unit operation can continue. Unit controllers installed on a Tracer SC can be a combination of the following BACnet, LonTalk, Air-Fi wireless, and legacy unit controllers:

BACnet® (MS/TP) Unit Controllers Supported by Tracer® SC

- Tracer UC210 unit controller for variable-air-volume (VAV) equipment
- Tracer UC400 unit controller for variable-air-volume (VAV) equipment
- Tracer UC400 unit controller for programmable equipment
- Tracer UC800/AdaptiView unit controller for CenTraVac chillers
- BCI-I: BACnet communications interface for IntelliPak system
- BCI-C: BACnet communications interface for chillers
- BCI-R: BACnet communications interface for ReliaTel
- Non-Trane BACnet (MS/TP) devices

BACnet/IP Unit Controllers Supported by Tracer® SC

- Tracer UC600 Programmable controller
- Non-Trane BACnet/IP devices

AirFi™ Wireless Unit Controllers Supported by Tracer® SC

- Tracer UC210 unit controller for variable-air-volume (VAV) equipment
- Tracer UC400 unit controller for variable-air-volume (VAV) equipment
- Tracer UC400 unit controller for programmable equipment
- Tracer UC600 unit controller for Air Handler (AHU) equipment
- Tracer UC600 unit controller for programmable equipment

LonTalk Unit Controllers Supported by Tracer® SC

- Tracer AH540/541 air-handler controllers
- Tracer MP501 multi-purpose controller
- Tracer MP503 input/output module
- Tracer MP580/581 programmable controller
- Tracer VV550/551 VAV controller
- Tracer ZN510/511 zone controller
- Tracer ZN517 unit controller
- Tracer ZN520/521 zone controller
- Tracer ZN523 zone controller
- Tracer ZN524 water-source heat pump unit controller
- Tracer ZN525 zone controller
- Tracer CH530 chiller controller
- Tracer CH532 chiller controller
- LCI-C: LonTalk communications interface for chillers
- LCI-I: LonTalk communications interface for IntelliPak systems
- LCI-R: LonTalk communications interface for ReliaTel systems

- Non-Trane LonTalk devices using SCC, DAC, and chiller profiles, devices that support LonTalk standard network generic variables, and devices with Standard Network Variable Types (SNVTs)

Trane® Legacy Unit Controllers (Comm3/4) Supported by Tracer® SC

Note: *The following devices are supported through the use of Legacy Comm Bridge.*

- Variable Air Volume (VAV I, II, III, IV)
- IntelliPak
- Voyager
- Commercial Self-Contained (CSC)
- Thermostat Control Module (TCM)
- Programmable Control Module (PCM)
- Universal Programmable Control Module (UPCM)
- Terminal Unit Controller (TUC)
- Centrifugal Chillers (UCP2)
- Helical Rotary Chillers (UCP2)
- CGX Chillers
- Series-R Chillers (RTA/RTW)

Resources

The following is a list of related Tracer® SC documentation and training resources.

- **Tracer SC System Controller Installation and Setup Guide (BAS-SVX31)**

  Describes detailed configuration for network settings, Ethernet network wiring, and IT security.

- **Tracer SC System Controller Installation Sheet (X39641154-01)**

  For mounting the enclosure and providing AC power.

- **Tracer SC online help**

  An online help system is included with the Tracer SC user interface. Global help has a table of contents and is searchable. Contextual help is specific to the information on each page.

- **Tracer BAS Operator Suite (Mobile App) Getting Started Guide (BAS-SVU23)**

  Describes how to obtain, download, install, and set up the mobile app.

- **BACnet® MS/TP Wiring Best Practices and Troubleshooting (BAS-SVX051)**

  Provides best practices, procedures, and troubleshooting for wiring BACnet unit controllers to a Tracer SC system controller.

- **Tracer SC Air Systems Application Guide (BAS-APG007)**

  Describes variable-air-volume strategies for variable air systems. It also include constant-volume applications and area application strategies for Tracer SC.

- **Tracer Graphical Programming (TGP2) Applications Guide (BAS-APG008)**

  Describes how to use the TGP2 editor and typical implementation strategies and best practices for using TGP2.

- **Tracer TU Service Tool Getting Started Guide (TTU-SVN01)**

  This document describes how to use the Tracer TU service tool to

  – Transfer programs to the Tracer SC

  – Start the Tracer Graphical Programming (TGP2) Editor and the Tracer Graphics Editor from within Tracer TU

  – Backing up and restoring firmware and TGP2 programs

- **Trane College of Building Automation**

  The Trane College of Building Automation (TCBA) offers a comprehensive portfolio of technical courses to help you effectively monitor and coordinate your HVAC equipment and systems.

  http://www.trane.com/Commercial/DNA/view.aspx?i=586

Specifications

This section contains specifications for Tracer® SC system controllers and for Tracer building automation systems.

Table 3. Tracer SC specifications

Client Software Requirements	PC or Mac	Microsoft Windows 7: • Internet Explorer™— version 11.0 or higher • Mozilla Firefox®— latest version • Google Chrome™— latest version • Microsoft Edge™ — latest version Microsoft Windows 8.1: (no support) Microsoft Windows 10: • Internet Explorer™— no support • Mozilla Firefox®— latest version • Google Chrome™— latest version • Microsoft Edge™ — latest version Mac® OS 10.9/10.10: • Mozilla Firefox — latest version • Google Chrome — latest version • Safari® — latest version • Microsoft Edge™ — no support
	Tablet/Phone	iOS (iPad®/iPhone®) 8, 9: • Safari — latest version • Mozilla FireFox — no support • Google Chrome — no support Android — 4.4, 5.0, 5.1: • Google Chrome — version 45 or higher • Mozilla FireFox — no support
	Concurrent Users	• Five
	Supported Languages	Up to four languages are supported per Tracer SC. • English • Chinese (Simplified/Traditional) • French • French Canadian • Portuguese (Brazil) • German • Indonesian • Japanese • Korean • Spanish (Latin America) • Thai • Polish • Arabic

Table 3. Tracer SC specifications (continued)

Tracer SC system controller	Power requirements	From PM014 Power Supply: 24 Vdc @ 0.3A; 14VA max (PM014 input VA)
	Operating environment	• Temperature: From –40°F to 122°F (–40°C to 50°C) • Relative humidity: From 10% to 90%, non-condensing
	Storage environment	• Temperature: From –40°F to 158°F (–40°C to 70°C) • Relative humidity: From 5% to 95%, non-condensing
	Agency Listings	UL: • UL-864/UUKL listed (when installed and programmed in accordance with the Engineered Smoke Control System Application Guide, BAS-APG019-EN) • UL-916-PAZX – energy management • CUL-C22.2-signal devices – Canada FCC: • FCC part 15, Class A CE CE: • The European Union (EU) Declaration of Conformity is available from your local Trane® office. ISO: • 9001:2008
	Processor	PowerPC405 Core
	Memory	• FLASH 400 MB • SDRAM 256 MB
	Battery	• No battery required. The clock is maintained for a minimum of three days by the super capacitor. All other programs are backed up by nonvolatile memory.
Protocol Communications	BACnet	Tracer building automation systems communicates with BACnet devices that support: • Communications based on the BACnet ASHRAE/ANSI 2012 standard • ENV-1805-1/ENV-13321-1 • 10BASE-T/100BASE-TX dedicated Ethernet (ISO/IEC 8802-3) or Transmission Control Protocol/Internet Protocol (TCP/IP) compatible network Tracer SC is listed by BACnet Test Labs (BTL) as a BACnet Building Controller (B-BC). Listing information can be found at: http://www.bacnetinternational.net
	LonTalk	Tracer building automation systems communicates with LonTalk devices that support: • Communications based on the EIA-709.1 (LonTalk) standard • LonTalk standard network variable types (SNVTs) • FTT-10A or FT-X1 transceivers • Twisted-pair physical media (Level 4 wiring)

Table 3. Tracer SC specifications (continued)

	Modbus	TBD
	Device Limits	Tracer SC facility (combination of all protocols) • Up to 240 devices BACnet (per link/Per facility) • Tracer UC200 Series - 60/240 • Tracer UC400 Series - 60/240 • Tracer UC600 Series- 10/20 • Tracer UC800 Series - 60/240 • BCI Series - 60/240 • Trane Communicating Thermostats - 60/120 • Non-Trane BACnet - 32/240 LonTalk (Per link/Per facility) • AH Series - 120/120 • CH Series - 120/120 • VV Series - 120/120 • ZN Series - 120/120 • MP503 - 120/120 • MP580 - 20/20 • Trane Communicating Thermostats - 120/120 • Non-Trane LON - 120/120 Modbus (Per link/Per facility) • Modbus TCP – 240/NA • Modbus RTU – 60/NA Air-Fi Wireless (Per network/Per facility) • WCI - 30/240
Medium Enclosure (optional)	NEMA Type	NEMA-1
	Weight	14 lb. (6.5 kg)
	Mounting	Wall-mounted with #10 (5 mm) screws and #10 wall anchors. Mounting surface must be able to support 60 lb. (28 kg)
Large Enclosure (optional)	NEMA Type	NEMA-1
	Weight	50 lb (23.0 kg)
	Mounting	Wall-mounted with #10 (5 mm) screws and #10 wall anchors. Mounting surface must be able to support 120 lb. (56 kg)

Hardware Components

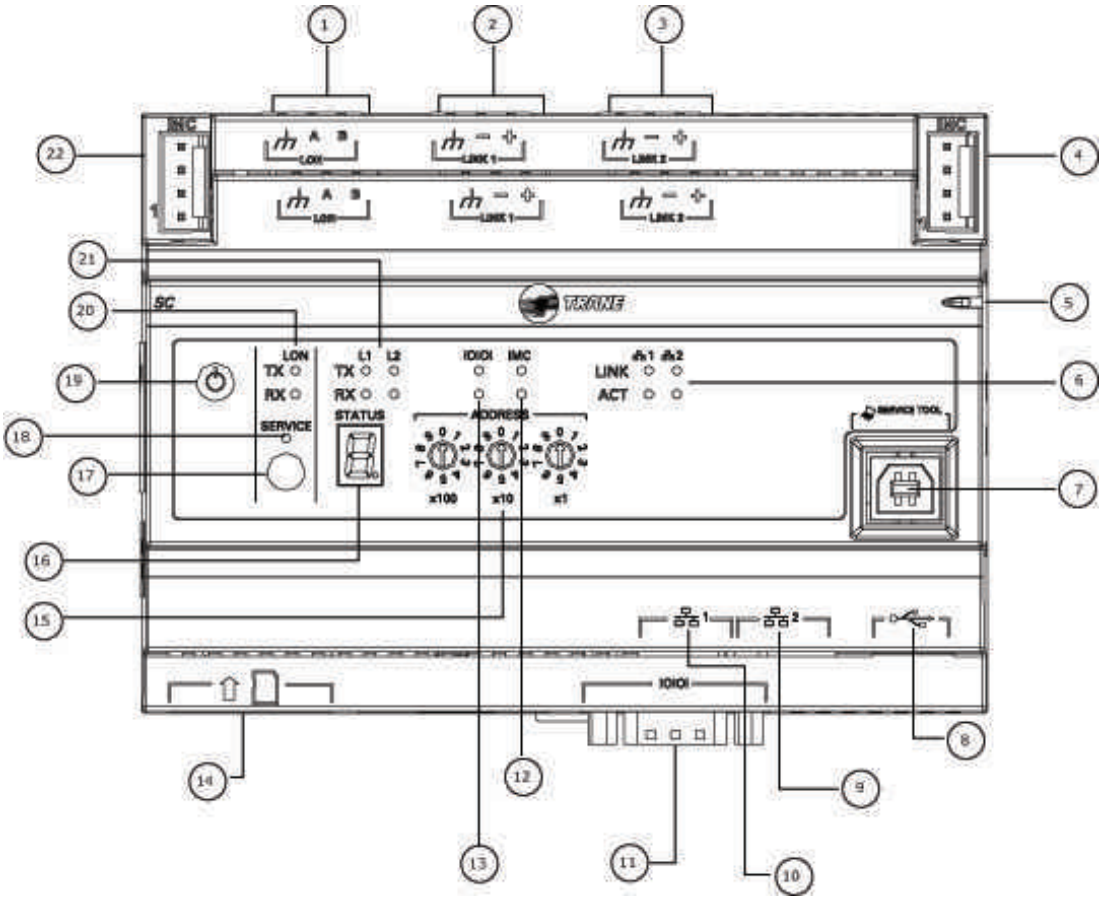
The Tracer® SC system controller and additional hardware options are described in this section.

- Tracer SC system controller components
- Trane PM014 power supply module
- Tracer BACnet terminator
- Medium enclosure
- Large enclosure

Tracer® SC Components

The Tracer SC system controller is equipped with the components shown in the following figure. The table that follows provides descriptions.

Figure 16. Tracer SC Components

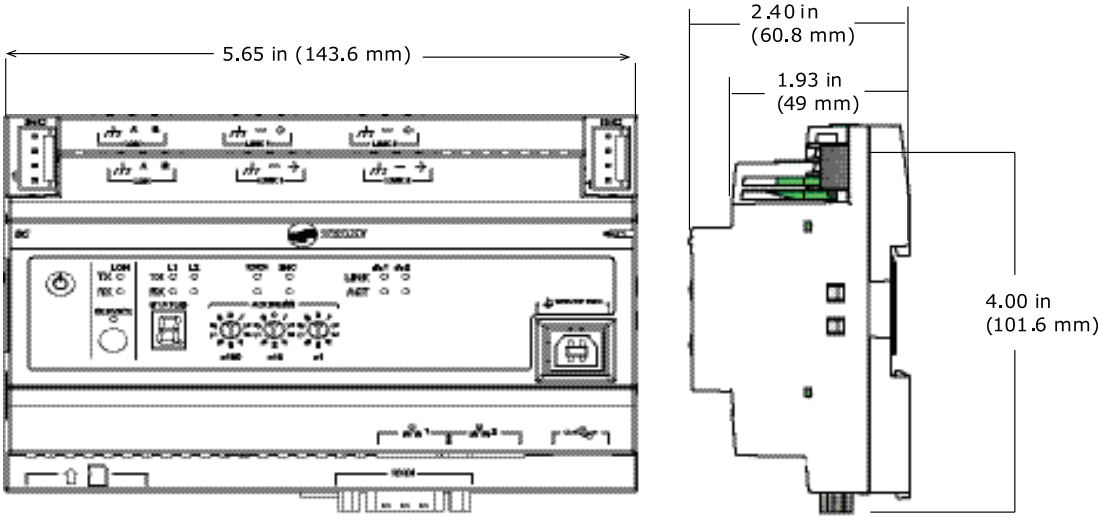


Callout Number in Figure	Tracer SC Components Description
1	LonTalk LINK
2	BACnet MS/TP or Modbus RTU LINK 1
3	BACnet MS/TP or Modbus RTU LINK 2
4, 22	IMC Connections
5	Status LED

Callout Number in Figure	Tracer SC Components Description
6	Ethernet LEDs
7	USB service tool port
8	USB host (future)
9	Ethernet network connection 2 (supports TCP/IP, recommended for direct connection to PC)
10	Ethernet network connection 1 (supports Modbus TCP, BACnet and TCP/TP; recommended for building network connections)
11	EIA-232 serial connection
12	IMC LEDs
13	EIA-232 LEDs
14	SD card port (future)
15	Rotary switches
16	7-segment display
17	LonTalk service pin
18	LonTalk service LED
19	Power button
20	LonTalk LEDs
21	BACnet LEDs

Dimensions

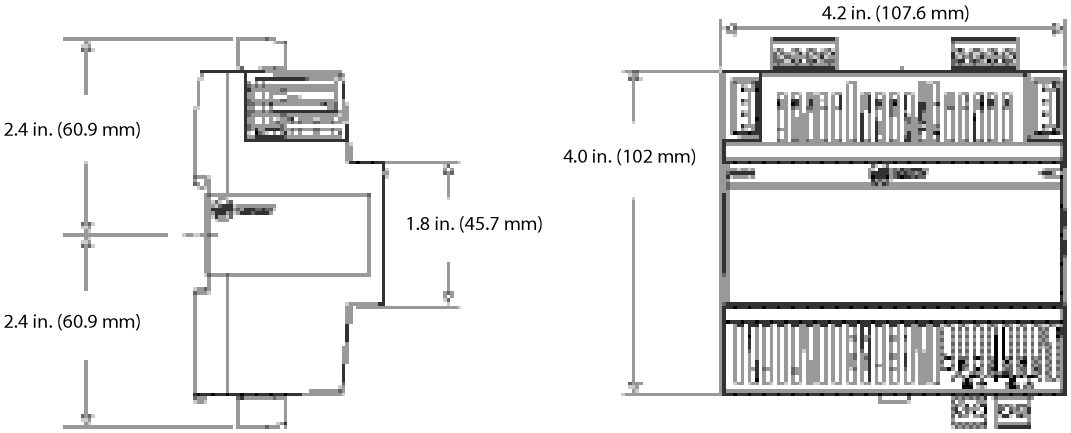
Figure 17. Tracer SC system controller dimensions



Trane® PM014 Power Supply Module

The PM014 power supply module provides 24 Vdc for Trane inter-module communication (IMC) buses. IMC buses are used in components of Trane building automation systems, including the Tracer® SC system controller. Refer to the *Power Supply Module Installation, Operation, and Troubleshooting Guide, (BAS-SVX33)*.

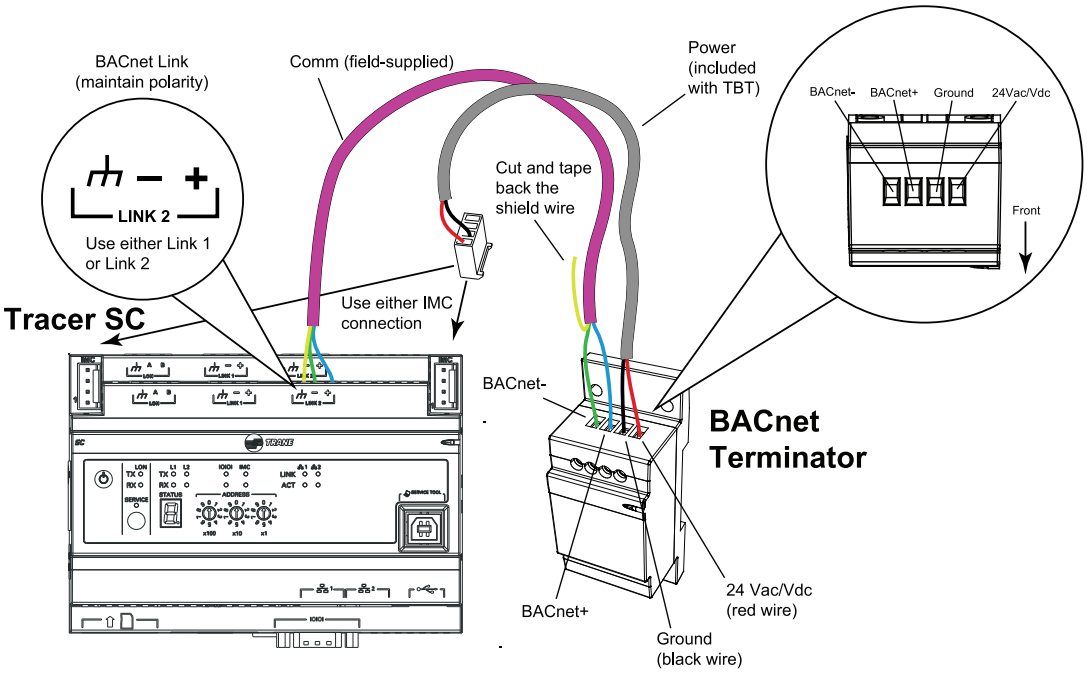
Figure 18. PM014 power supply module (dimensions)



Tracer® BACnet® Terminator

A Tracer BACnet terminator (order no. X13651524-01) is placed at the end of each communication link in order to decrease communication signal degradation. Refer to the *BACnet Wiring Best Practices and Troubleshooting Guide, (BAS-SVX51)*.

Figure 19. BACnet terminator (wiring)

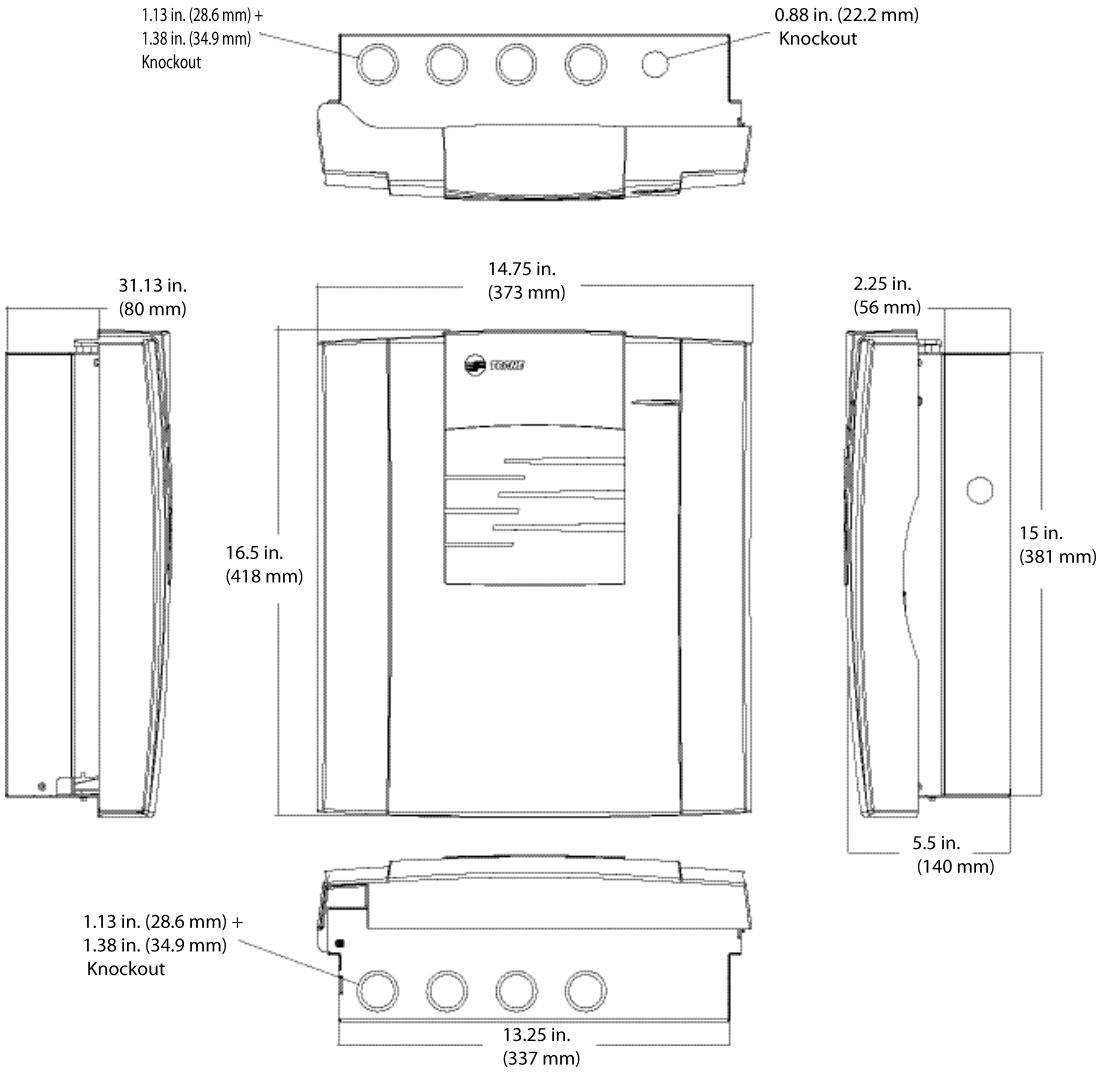


Medium Enclosure (Optional)

The medium enclosure for Tracer® DIN-mounted controllers is available in the following:

- VAC (*order number: X13651559010*)
- VAC (*order number: X13651560010*)

Figure 20. Medium enclosure (dimensions)

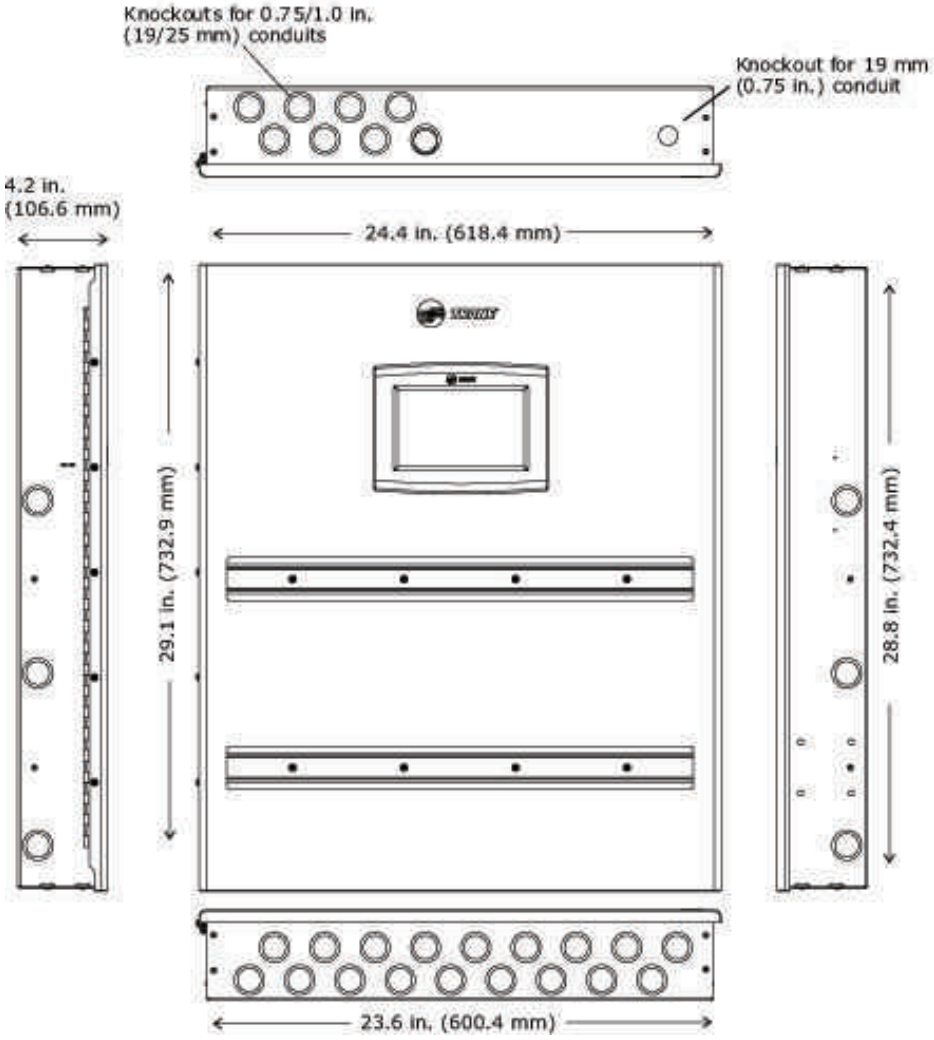


Large Enclosure (optional)

The large enclosure for Tracer® DIN-mounted controllers is available in the following:

- 120 VAC
  - solid door *(order number: X1365155201)*
  - display-capable door *(order number: X1365155301)*
- 230 VAC Dual Transformer
  - solid door *(order number: X1365155401)*
  - display-capable door *(order number: X1365155501)*

Figure 21. Large enclosure (dimensions)



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