



Tracer™ Controllers

Tracer MP580/581 Programmable Controllers



September 2001

CNT-PRC002-EN

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Contents

| | |
|-----------------------------------|-----------|
| Product overview | 4 |
| Applications | 4 |
| Product models | 4 |
| Inputs and outputs | 4 |
| Features | 6 |
| Graphical programming | 6 |
| Interoperability | 6 |
| Operator display | 6 |
| Dimensions | 8 |
| Network architecture | 10 |
| Wiring diagram | 11 |
| Enclosure interior | 12 |
| Specifications | 13 |



Product overview

The Tracer MP580 programmable controller is factory-installed on Trane Modular and T-Series Climate Changer air handlers.

The Tracer MP581 programmable controller is available for field installation for a variety of heating, ventilating, and air-conditioning (HVAC) applications.

Applications

Tracer MP580/581 controllers support a wide variety of building control applications, including:

- Air-handler control
- Support of the LonMark Space Comfort Controller (SCC) profile and the Discharge Air Controller (DAC) profile for air handlers
- Control of mechanical-room equipment, including cooling towers, pumps, boilers, and heat exchangers
- Supervisory control of an HVAC network for mid-sized buildings
- Nearly any control process needed in a commercial building

Product models

Several models of Tracer MP580/581 controllers are available. Tracer MP581 models are illustrated in Figure 1 on page 5. Operator-display touch screens are available as an option for all models.

Tracer MP580 on Trane air handlers

The Tracer MP580 controller is available packaged with Trane Modular and T-Series Climate Changer air handlers. The controller is factory wired to all sensors, actuators, valves, starters, and other items shipped with the air handler. Factory testing of connected points helps minimize field commissioning time and expense.

Frame-mounted Tracer MP581

The frame-mounted Tracer MP581 consists of a circuit board and a termination board mounted in a two-piece modular frame assembly. This modular design allows the circuit board to be programmed at a different location while installation and wiring are completed. The frame-mounted Tracer MP581 can be mounted in new equipment or an existing enclosure.

Tracer MP581 in a NEMA-1 enclosure

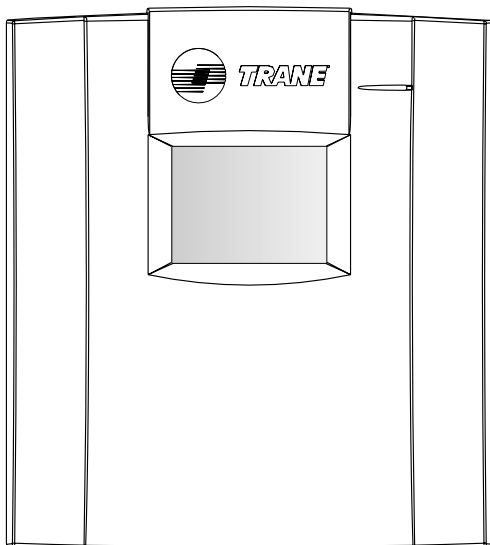
The Tracer MP581 with enclosure consists of the frame assembly mounted in an enclosure compliant with National Electrical Manufacturers Association (NEMA) type-1 standards. A line-to-low voltage transformer provides power to the electronics. The enclosure has a hinged door and plenty of room for input and output wiring. The complete assembly is UL-listed.

Inputs and outputs

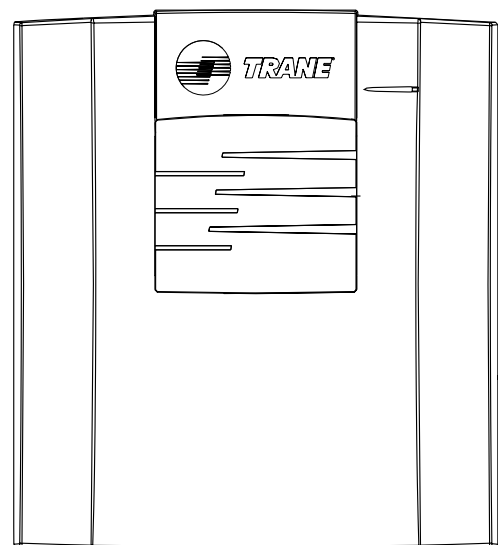
Tracer MP580/581 controllers have the following inputs and outputs (illustrated in Figure 8 on page 11):

- **12 universal inputs**
Dry contact binary (including pulse accumulation), 0–20 mA, 0–10 Vdc, linear resistance, or thermistor. Four of the twelve inputs can be used directly with resistance temperature detectors (RTDs).
- **Static pressure input**
Specialized input for a Trane differential pressure sensor (5 Vdc, 0–5 in. wc).
- **6 binary outputs**
12 VA at 24 Vac powered relay contacts.
- **6 analog outputs**
0–10 Vdc or 0–20 mA.

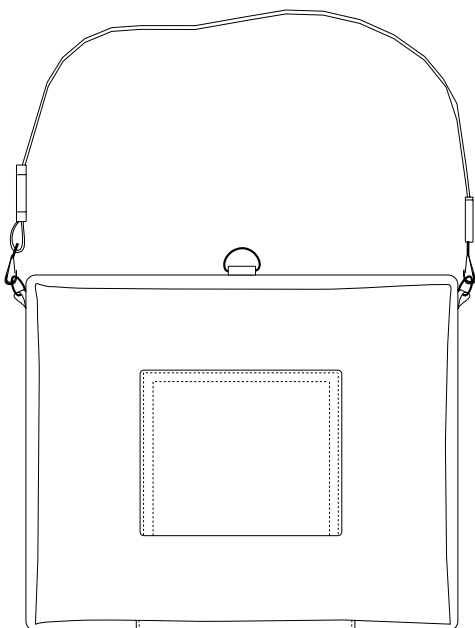
Figure 1: Tracer MP581 and operator display models



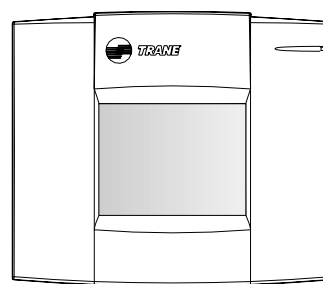
Tracer MP581 with optional operator display



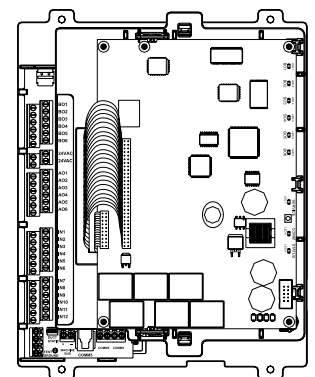
Tracer MP581 without operator display



Portable operator display



Stand-alone operator display



Frame-mounted Tracer MP581

Features

Graphical programming

The Tracer graphical programming (TGP) editor, shown in Figure 3 on page 7, eliminates the need for line-by-line programming. The TGP editor is a software component of Trane's Rover service tool. TGP has the following advantages:

- Easy to learn—programming is as easy as assembling logic blocks with a computer mouse, much like creating a flow chart.
- Powerful—the TGP editor has built-in PID functions and more than 50 logic blocks for building programs.
- Self documenting—programs can be printed and used as pictorial representations of sequences of operation (see Figure 4 on page 7).
- Programs are stored in the controller along with their graphical representation, and can be uploaded, viewed, and re-used.

Interoperability

Tracer MP580/581 controllers communicate by means of the LonTalk protocol. The controllers can be configured to conform to the LonMark Space Comfort Controller (SCC) profile or the Discharge Air Controller (DAC) profile. Tracer MP580/581 controllers can work with any control system that supports the LonTalk protocol and uses FTT10-A communications.

Operator display

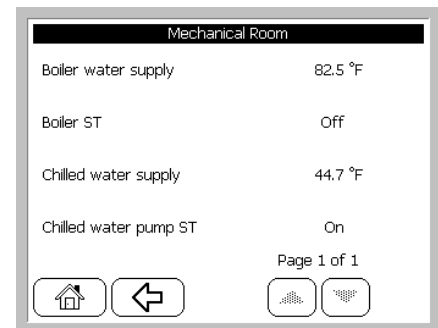
The optional operator-display touch screen is an intuitive operator interface for monitoring and changing building control functions. With the operator display you can:

- Monitor space temperature, relative humidity, and other variables
- Change setpoints and scheduled occupancy times
- Identify and troubleshoot problems
- View and reset controller alarms
- Manually override outputs

The operator display includes a 7-day time clock that gives Tracer MP580/581 controllers the ability to manage time-of-day scheduling, with two on/off times per day and up to 20 exception schedules per year.

Figure 2 shows a typical operator display screen.

Figure 2: Typical status screen



The operator display is available in the following configurations:

- Door-mounted on the Tracer MP581
- Stand-alone operator display for mounting up to 20 ft (7 m) away from a Tracer MP580 or MP581
- Portable operator display for temporary connections to the Tracer MP580/581 or Tracer AH540/541

Figure 1 on page 5 illustrates the operator displays available for the Tracer MP581.

Figure 3: TGP editor showing a supply fan program

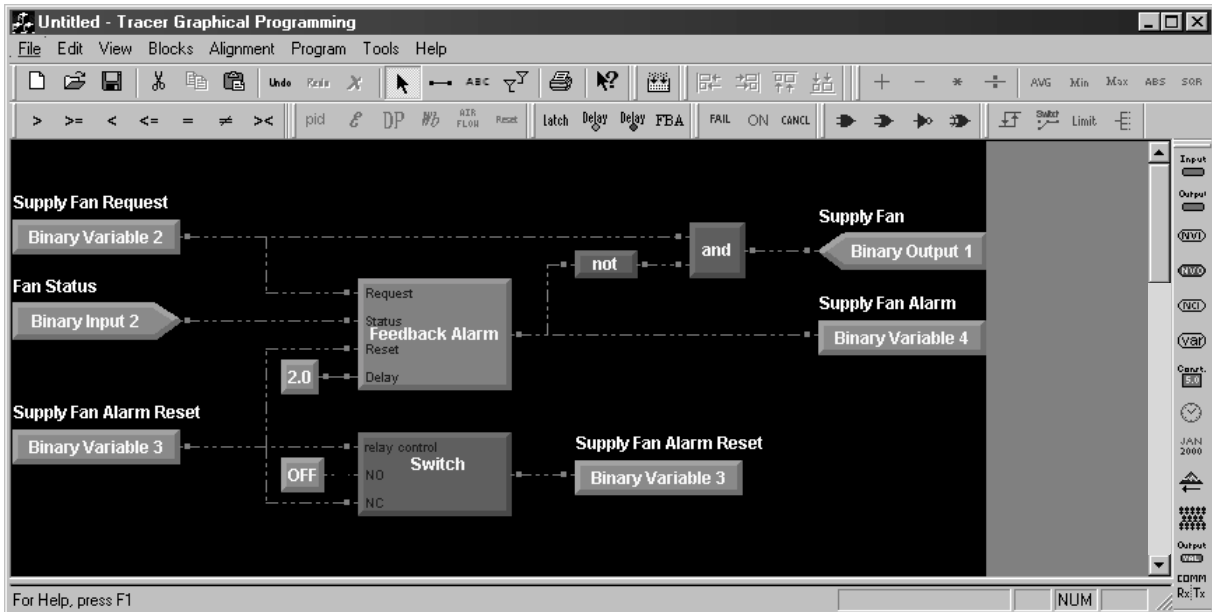
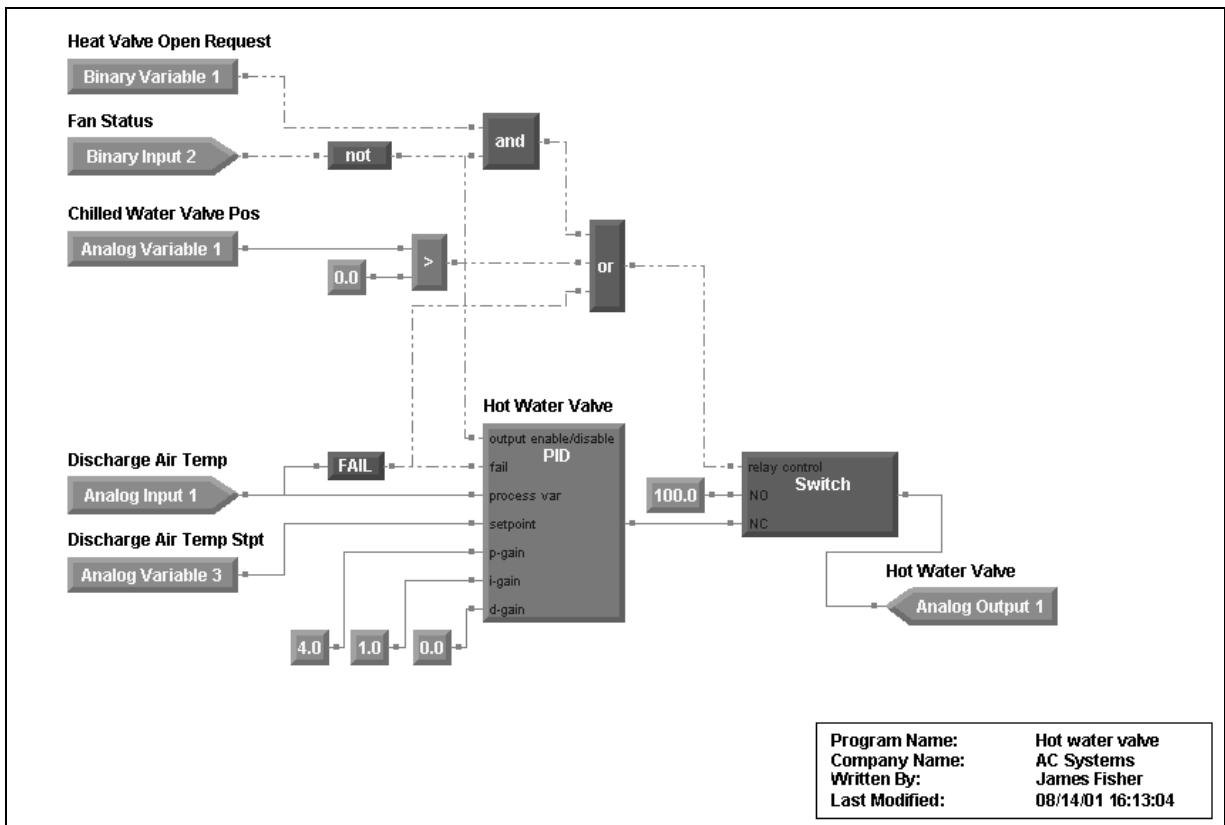


Figure 4: TGP printout of a hot water valve program



Dimensions

Figure 5 shows the dimensions of the frame-mounted Tracer MP581 controller. Figure 6 on page 9 shows the dimensions of the Tracer MP581 NEMA-1 enclosure.

Figure 5: Frame-mounted Tracer MP581 dimensions

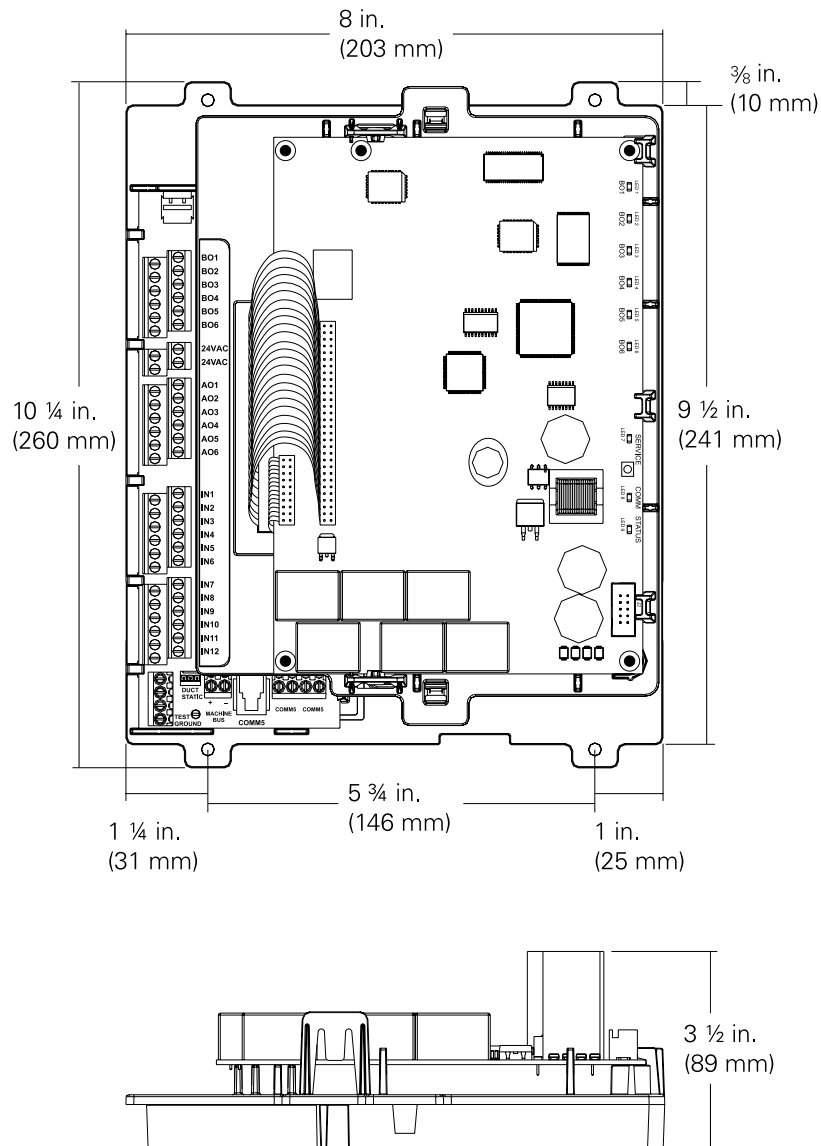
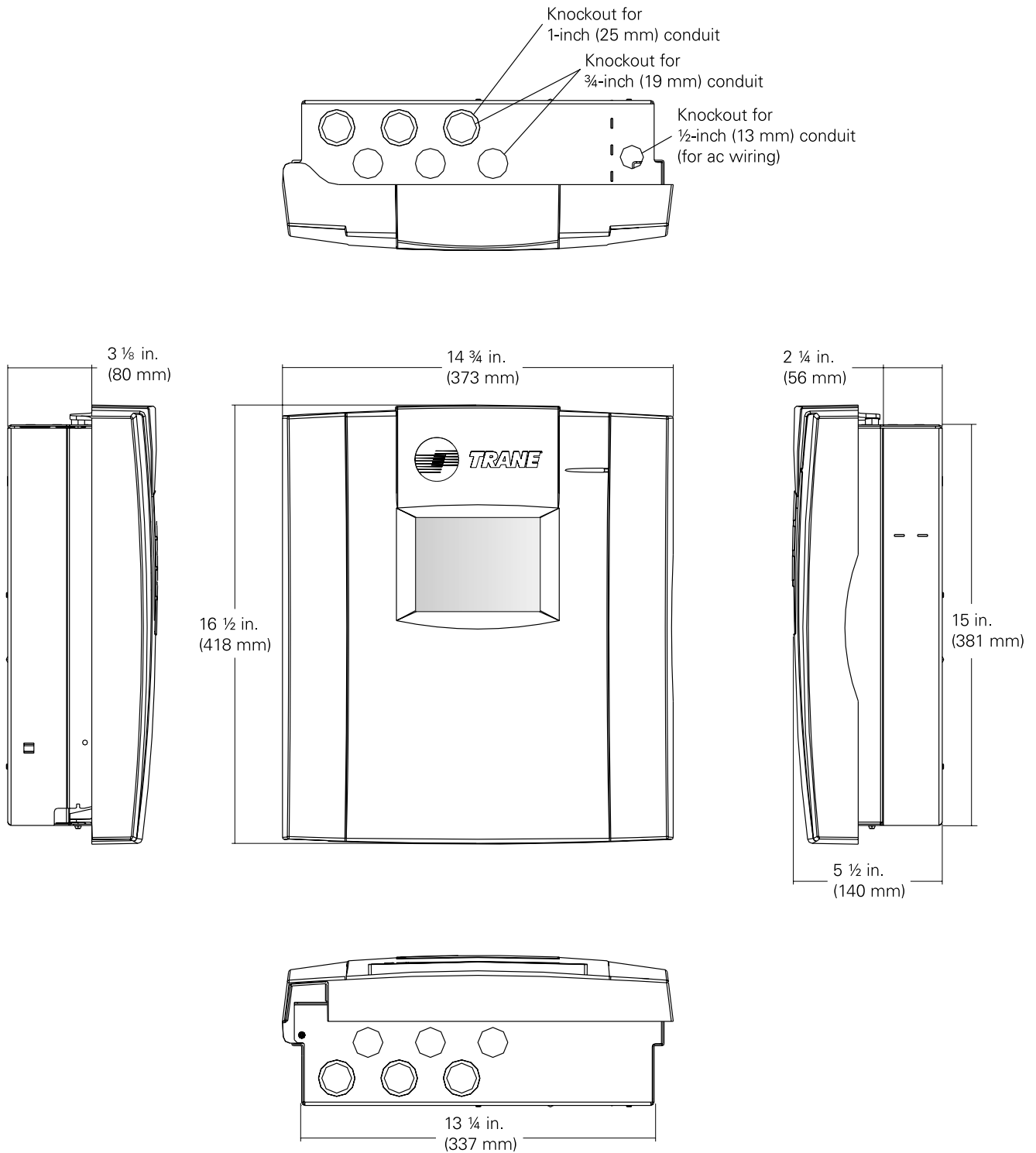


Figure 6: Tracer MP581 enclosure dimensions

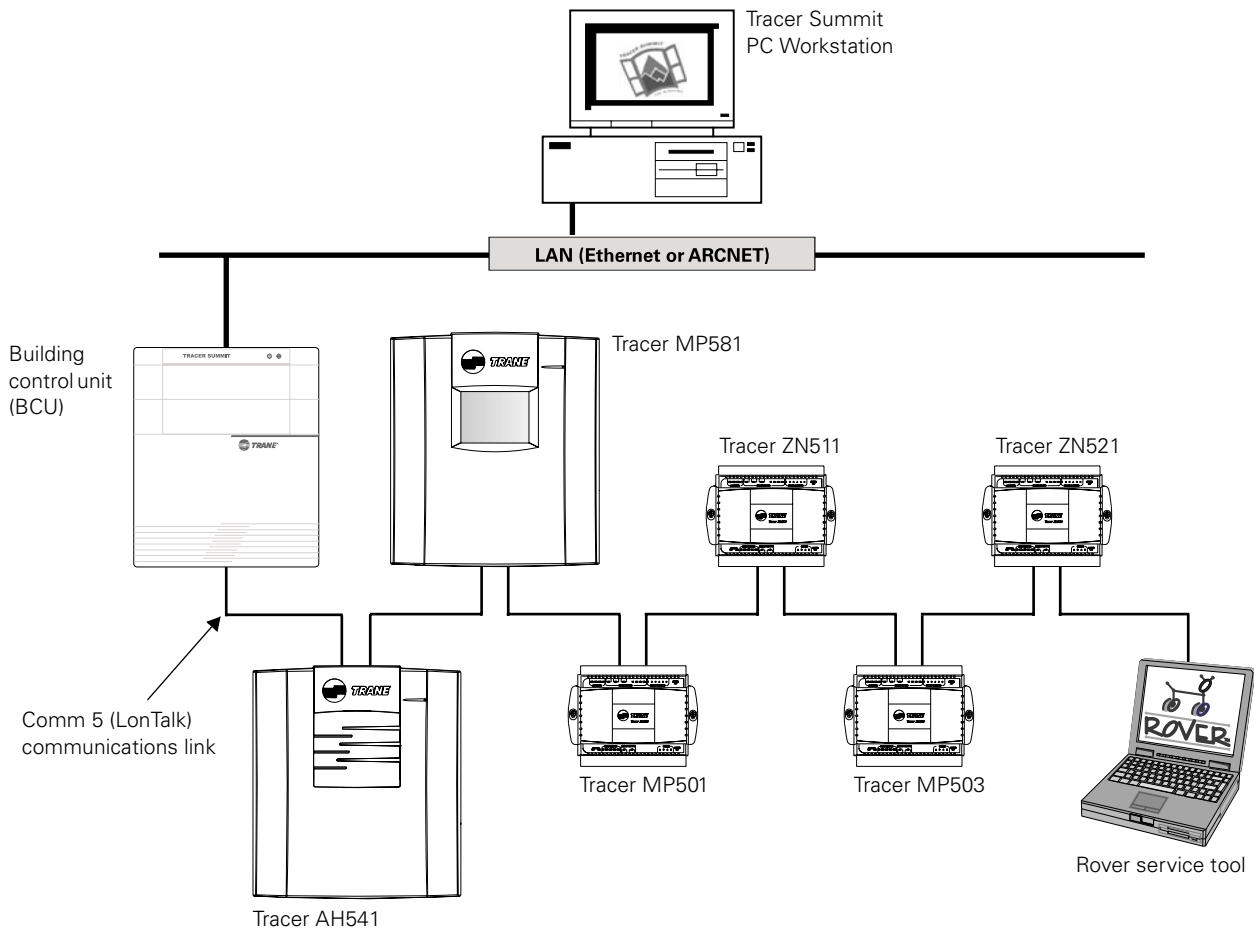


Network architecture

Tracer MP580/581 controllers can operate as stand-alone controllers, on a peer-to-peer network, or as part of a Tracer Summit building automation system (see Figure 7).

With an operator display, you can monitor information and make control changes on a peer-to-peer network.

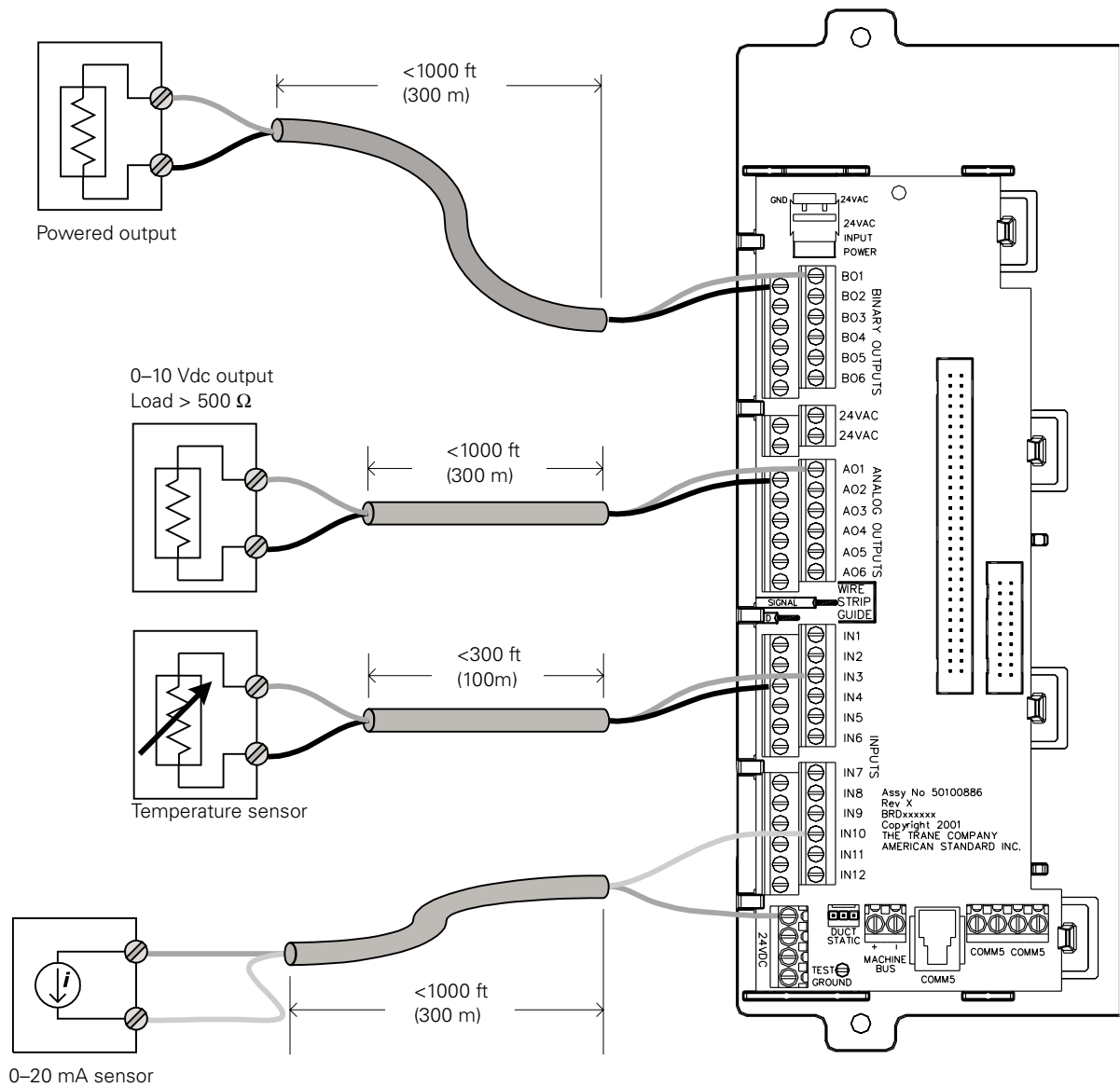
Figure 7: Tracer MP581 controller as part of a building automation system with Trane LonTalk controllers



Wiring diagram

Figure 8 shows typical input and output connections to the termination board. For details on inputs and outputs, see "Inputs and outputs" on page 4.

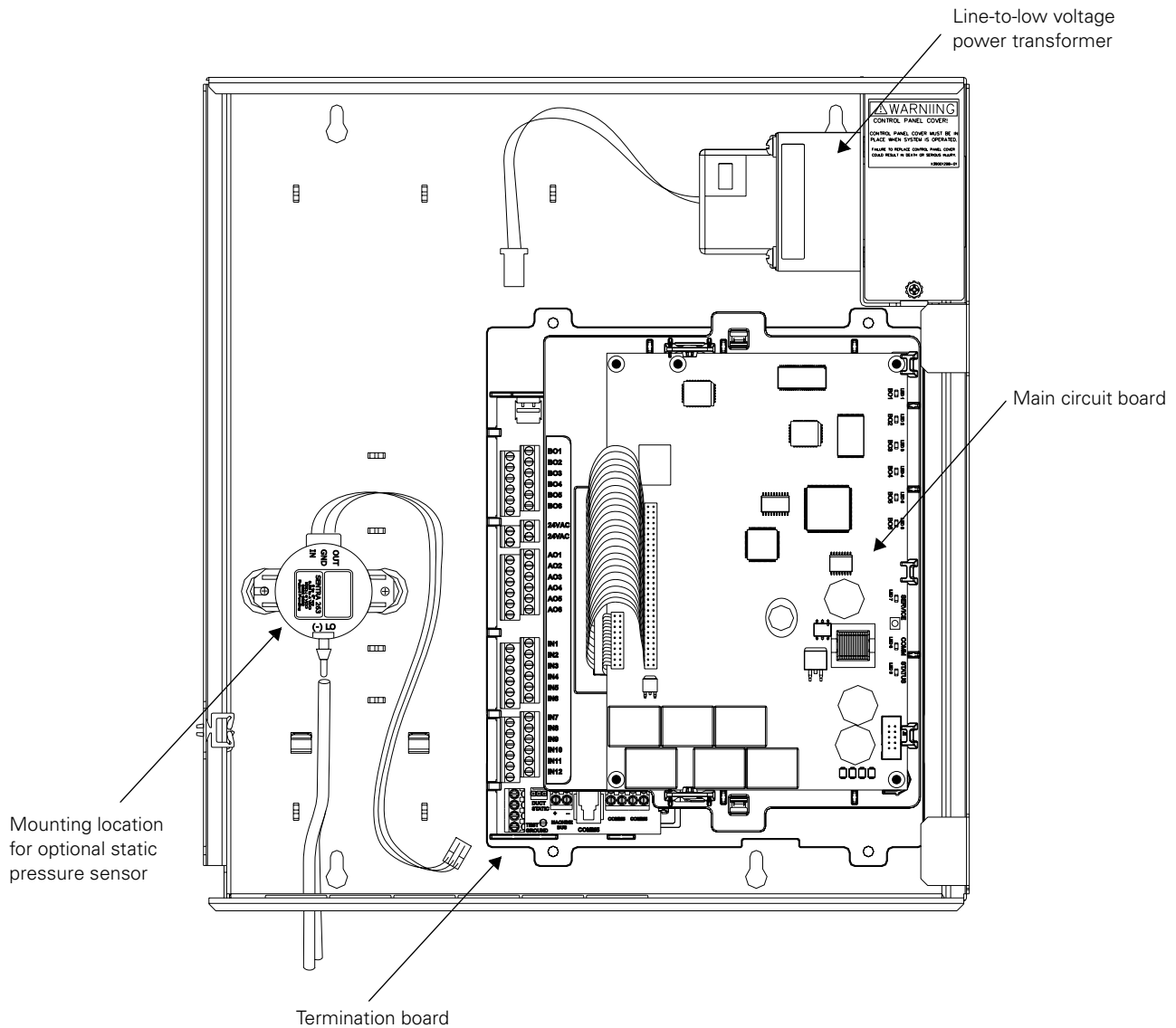
Figure 8: Wiring diagram



Enclosure interior

Figure 9 shows the interior of the Tracer MP581 NEMA-1 enclosure.

Figure 9: Tracer MP581 enclosure interior



Specifications

Power requirements

Nominal rating: 24/120/230 Vac;
50/60 Hz; 1 phase

Voltage utilization range

24 Vac (frame-mounted): 19–30 Vac

120 Vac nominal: 98–132 Vac

230 Vac nominal: 184–254 Vac

Operating environment

Temperature

Without display: From –40°F to 158°F
(–40°C to 70°C)

With display: From 32°F to 122°F
(0°C to 50°C)

Humidity: 10–90% non-condensing

Storage environment

Temperature

Without display: From –58°F to 203°F
(–50°C to 95°C)

With display: From –13°F to 149°F
(–25°C to 65°C)

Humidity: 10–90% non-condensing

Available enclosures

Tracer MP580: metal enclosure
packaged with air handler

Tracer MP581

NEMA-1 enclosure

Frame-mounted (no enclosure)

Dimensions

Tracer MP580 enclosure

15 in. × 8 ½ in. × 5 in.

(381 mm × 215 mm × 127 mm)

Tracer MP581 NEMA-1 enclosure

16 ½ in. × 14 ¾ in. × 5 ½ in.

(418 mm × 373 mm × 140 mm)

Frame-mounted Tracer MP581

10 ¼ in. × 8 in. × 3 ½ in.

(260 mm × 203 mm × 89 mm)

Minimum clearances

NEMA-1 enclosure

12 in. (30 cm) top, bottom, and right

24 in. (60 cm) left

36 in. (90 cm) front

Frame-mounted

½ in. (1.3 cm) top, right, and front

6 in. (15 cm) left (for I/O wiring)

3 in. (8 cm) bottom (for
communications wiring)

Weight

With NEMA-1 enclosure: 15 lb (7 kg)

Frame-mounted: 2 lb (1 kg)

Mounting

NEMA-1 enclosure: wall-mounted with
#10 (5 mm) screws

Frame-mounted: #8 (4 mm) screws

Analog-to-digital conversion

Resolution: 12 bits

Digital-to-digital conversion

Resolution: 12 bits

Microprocessor

Motorola MC68332 20 MHz

Memory

RAM: 512 K

ROM: 2 MB Flash

EEPROM: 256 K

Operator interface

Video graphics adapter (VGA) backlit
liquid crystal display (LCD) with touch
screen; 4.5 in. × 3.4 in. (115 mm ×
86 mm) viewable area; resolution of
320 × 240 pixels

Time clock

Included with operator display; crystal
controlled, super-capacitor backed

Battery

Not required—backed by super capacitor
for seven days under normal operating
conditions; all other programs backed by
non-volatile memory

Agency listings/compliance

CE—Immunity (directive 89/336/EEC)
EN 50090-2-2:1996

CE—Emissions (directive 89/336/EEC)
EN 50090-2-2:1996
EN 61000-3-2:1995
EN 61000-3-3:1995

UL and C-UL listed

Energy management system

UL 916

FCC approved: Part 15, Class A



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| | |
|-------------------------|--------------------------|
| Literature Order Number | CNT-PRC002-EN |
| File Number | PLES-CNT-000-PRC002-0901 |
| Supersedes | New |
| Stocking Location | La Crosse |

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