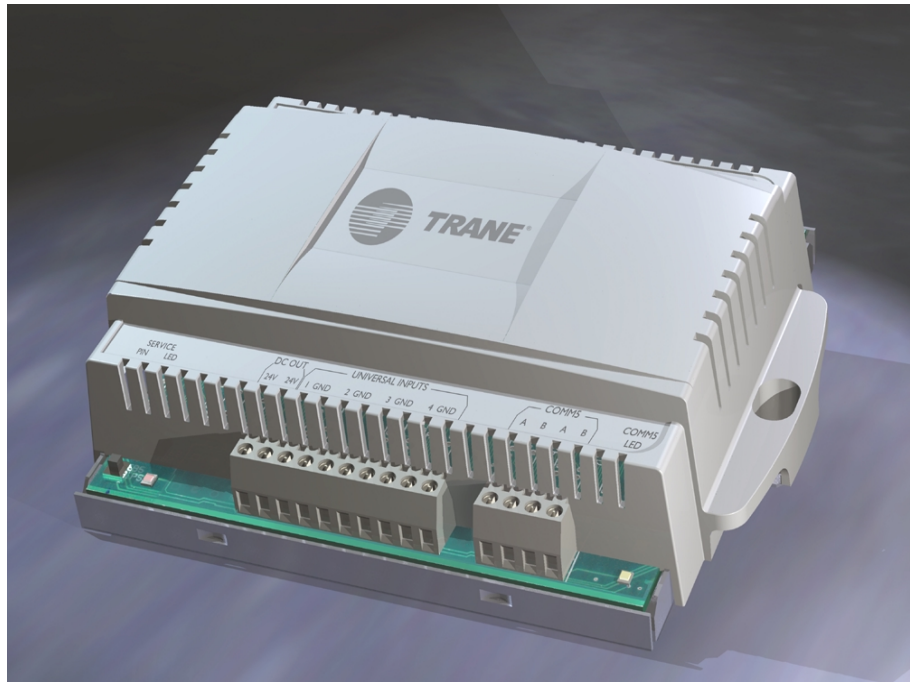# Tracer Controllers

Tracer MP503 Input/Output Module

Introduction

The Tracer MP503 input/output (I/O) module is a configurable, multi-purpose device used to provide data monitoring and binary control as part of a building automation system (BAS).

Communication between the module and a BAS occurs over a LonTalk communication link.

The Tracer MP503 I/O module is in a compact enclosure. It can monitor a wide variety of sensed conditions and provide equipment start/stop, or other switched states, based on communicated commands from a peer device or higher level BAS.

The Tracer MP503 I/O module includes four universal inputs and four binary outputs.

Universal inputs

Each of the four universal inputs can be configured for use with any of the following:

- Trane 10 kΩ thermistor temperature sensor
- 0–20 mA or 0–10 Vdc sensor
- Binary (dry-contact) device

Binary outputs

Each of the four binary outputs can be controlled independently, as commanded from a peer control device or higher level BAS.

Features

Application flexibility

Tracer MP503 I/O modules may be located anywhere in a building, wherever up to four monitoring and/or four binary control points are needed. By connecting the Tracer MP503 to a LonTalk network, input data can be sent from and commands can be sent to the Tracer MP503.

The Tracer MP503 I/O module can be used in a wide variety of monitoring and control applications. Typical applications include monitoring of the following:

- Room, duct, or water temperatures
- Relative humidity in rooms or duct-work
- Pressure sensing, including duct static pressure and hydronic differential pressures
- Status of fan or pump operation

The outputs can be used for on/off functions including:

- Fan control
- Pump control
- Lighting control
- Staging of heating or cooling equipment

Easy installation

The Tracer MP503 is suitable for indoor mounting in a variety of locations. Screw terminals that are clearly labeled ensure that wires are connected quickly and accurately. A compact enclosure design simplifies installation in small spaces.

Configurable inputs

Each of the four universal inputs can be easily configured using the Trane Tracker (BMTK) light-commercial system controller or the Rover service software tool. Each input is individually selectable for input signal type, and the value of the input signal is then transmitted to any other peer device on the LonTalk network or BAS.

Internal 24 Vdc sensor power supply

The Tracer MP503 has a built-in 80 mA, 24 Vdc power supply capable of powering 4–20 mA transmitting sensors. This capability eliminates the need for auxiliary power supplies. Any of the four inputs can be used with 4–20 mA sensors.

12-bit analog-to-digital (A/D) conversion

The four universal inputs of the Tracer MP503 provide very precise sensing of measured variables through the use of high-resolution analog-to-digital converters.

Output status LEDs

Light-emitting diodes (LEDs) located on the Tracer MP503 board indicate the status of each of the four binary outputs. An LED lights up whenever its respective binary output is energized. With a glance at these visual indicators, you can tell if the associated controlled device is on or off.

Output default options

Each of the four binary outputs has a default state provided to ensure fail-safe operation of controlled equipment in the event of a system-level communications loss. The output can be configured to default to off or on, or can maintain its current state.
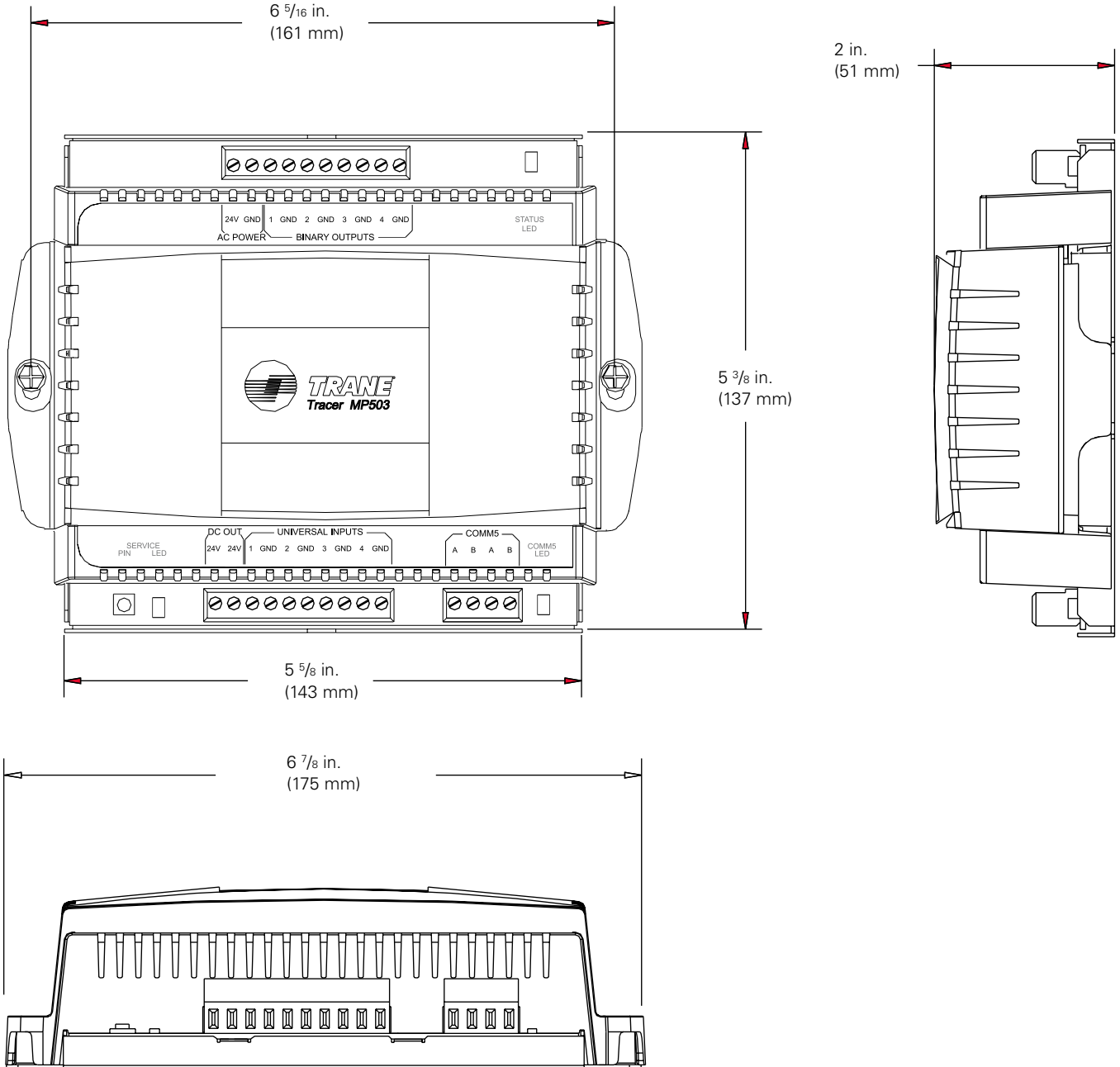
Wide ambient operating temperature

The Tracer MP503 has an extended operating temperature range from –40°F to 158°F (from –40°C to 70°C). Because of this extended range, the module can be placed in locations not suitable for other building control modules. If the module is used outdoors, it should be placed in a suitable NEMA-4 enclosure (not included), for weather protection.

Interoperability

The Tracer MP503 I/O module communicates using the LonTalk FTT-10A communication protocol. The Trane implementation of this protocol is also referred to as Comm5. Comm5 allows the controllers to operate in peer-to-peer configuration and to communicate with other compatible building control systems. The module supports LonMark standard network variable types (SNVTs), allowing the module to be used with the Trane Tracer Summit and Tracker (BMTK) building control systems, as well as other building control systems that support the LonTalk protocol.

Dimensions

Figure 1: Tracer MP503 dimensions

6 5/16 in.
(161 mm)

2 in.
(51 mm)

24V GND 1 GND 2 GND 3 GND 4 GND

STATUS
LED

AC POWER   BINARY OUTPUTS

Tracer MP503

SERVICE
PIN   LED

DC OUT   UNIVERSAL INPUTS

24V 24V 1 GND 2 GND 3 GND 4 GND

COMM5

A B A B   COMM5
LED

5 3/8 in.
(137 mm)

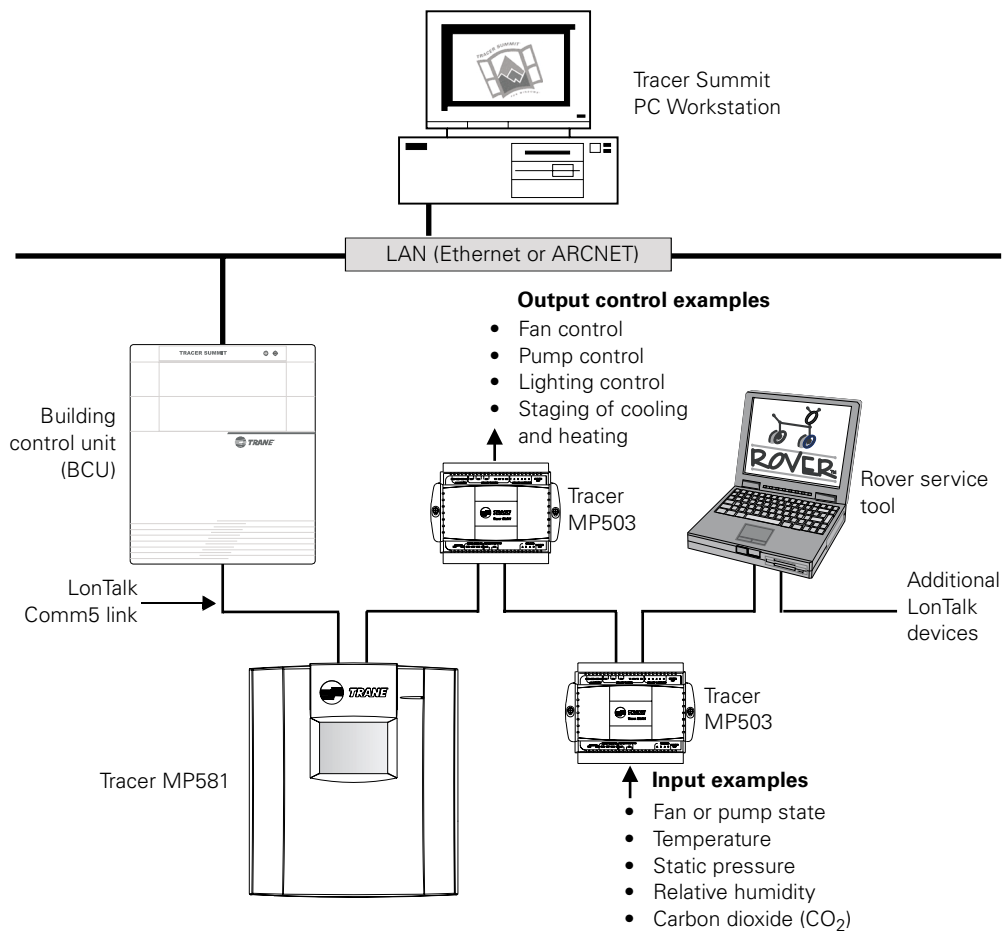5 5/8 in.
(143 mm)

6 7/8 in.
(175 mm)

Network architecture

The Tracer MP503 can operate on a Tracer Summit building automation system (see Figure 2), a Tracker (BMTK) system, or as part of a peer-to-peer network.
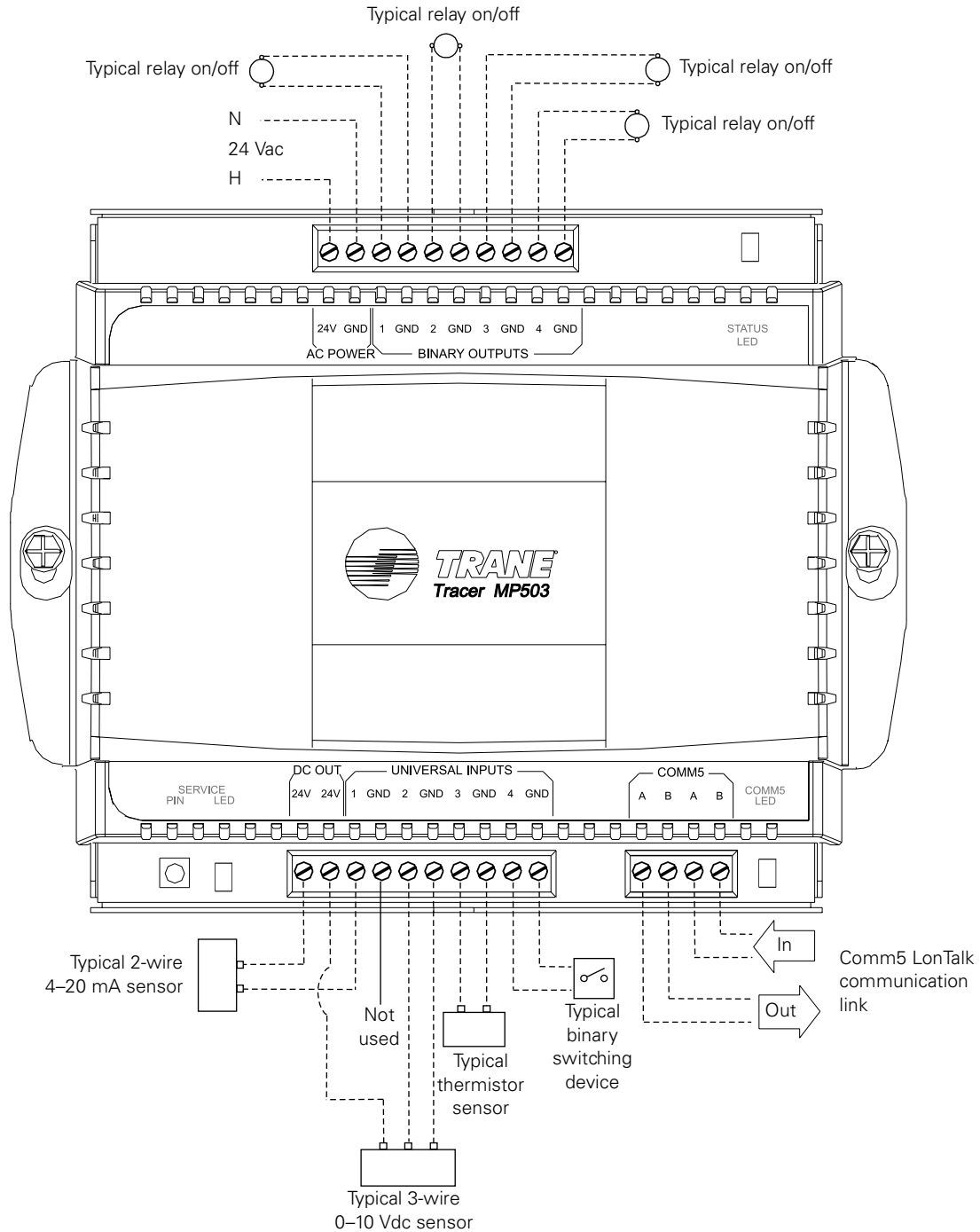
The Tracer MP503 can be configured using the Rover service tool for Tracer controllers or other PC-based service tools compliant with the EIA/CEA-860 standard. This tool can be connected at any accessible location on the LonTalk Comm5 communication link.

Figure 2: Tracer MP503 I/O modules as part of a building automation system

Tracer Summit
PC Workstation

LAN (Ethernet or ARCNET)

Output control examples
- Fan control
- Pump control
- Lighting control
- Staging of cooling and heating

Building control unit (BCU)

Tracer MP503

Rover service tool

LonTalk Comm5 link

Additional LonTalk devices

Tracer MP581

Tracer MP503

Input examples
- Fan or pump state
- Temperature
- Static pressure
- Relative humidity
- Carbon dioxide (CO_2)

Wiring diagram

Figure 3: Tracer MP503 I/O module general wiring diagram

Specifications

Power
Supply: 20–30 Vac (24 Vac nominal) at 50/60 Hz

Consumption: 10 VA plus 12 VA (maximum) per binary output

Dimensions
6 $\frac{7}{8}$ in. long × 5 $\frac{3}{8}$ in. wide × 2 in. high

(175 mm × 137 mm × 51 mm)

Operating environment
Temperature: from –40°F to 158°F (from –40°C to 70°C)

Relative humidity: 5–95% non-condensing

Storage environment
Temperature: from –40°F to 185°F (from –40°C to 85°C)

Relative humidity: 5–95% non-condensing

Analog to digital conversion
12-bit resolution

Power supply for inputs
24 Vdc, 80 mA

Outputs
24 Vac powered relays (12 VA maximum)

Agency listings/compliance
CE—Immunity:

EMC Directive 89/336/EEC

EN 50090-2-2:1996

EN 50082-1:1997

EN 50082-2:1995

EN 61326-1:1997

CE—Emissions:

EN 50090-2-2:1996 (CISPR 22) Class B

EN 50081-1:1992 (CSPR 22) Class B

EN 55022:1998 (CISPR 22) Class B

EN 61326-1:1997 (CISPR 11) Class B

UL and C-UL listed:

Energy Management Equipment—PAZX (UL 916)

UL 94-5V (UL flammability rating for plenum use)

FCC Part 15, Subpart B, Class B

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