Installing the Tracer™ MP503 Input/Output Module

Ordering number: 4950 0490, 4950 0590

Product overview

The Tracer MP503 input/output (I/O) module is a field-installed device used to monitor inputs and control binary outputs. The I/O module has four universal inputs that can be configured as binary, thermistor, 0–20 mA, or 0–10 Vdc. It also has four binary outputs.

The Tracer MP503 is available in two different versions: frame-mount (4950 0490) and metal enclosure (4950 0590) (see Figure 1 and Figure 2 on page 2).

The frame-mount package contains:

- A Tracer MP503 circuit board fastened to a metal back plate
- A removable molded resin cover

The metal-enclosure package contains:

- A Tracer MP503 circuit board fastened to the back plate of the metal enclosure
- A removable metal cover

Shipment

Visually inspect all parts for obvious defects or damage. All components are thoroughly inspected before leaving the factory. Any claims for damage incurred in shipping should be filed with the carrier.

Storage environment

The storage environment must meet the following requirements:

- Temperature: -40°F to 185°F (-40°C to 85°C)
- Relative humidity: 5–95%, noncondensing

Operating environment

Make sure that the operating environment conforms to the specifications listed in Table 1. Dimensions and clearances are illustrated in Figure 1 and Figure 2 on page 2.

Table 1. Operating environment specifications

Temperature	From -40°F to 158°F (-40°C to 70°C)
Humidity	5–95%, noncondensing
Power	20–30 Vac (24 Vac nominal), 50–60 Hz 10 VA per I/O module plus a maximum of 12 VA per binary output used
Mounting weight (frame-mount)	Mounting surface must be able to support 4 lb (2 kg)
Mounting weight (metal enclosure)	Mounting surface must be able to support 16 lb (7.5 kg)
Altitude	6,500 ft (2,000 m) maximum
Installation	Category 3
Pollution	Degree 2

Location

Trane recommends locating the Tracer MP503 I/O module:

- In an indoor environment for protection from the elements
- Where public access is restricted to minimize the possibility of tampering or vandalism
- Near the controlled equipment to reduce wiring costs
- Where it is easily accessible for service personnel

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Figure 1. Dimensions and clearances for the frame-mount I/O module

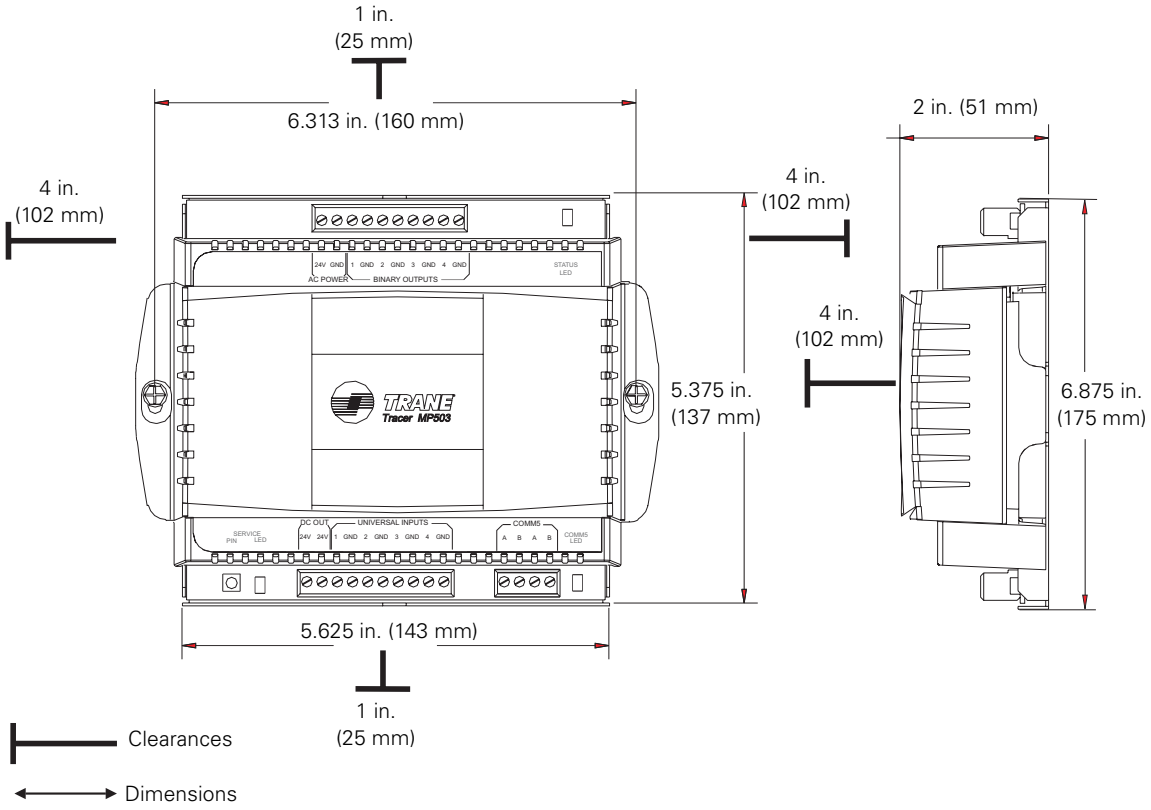
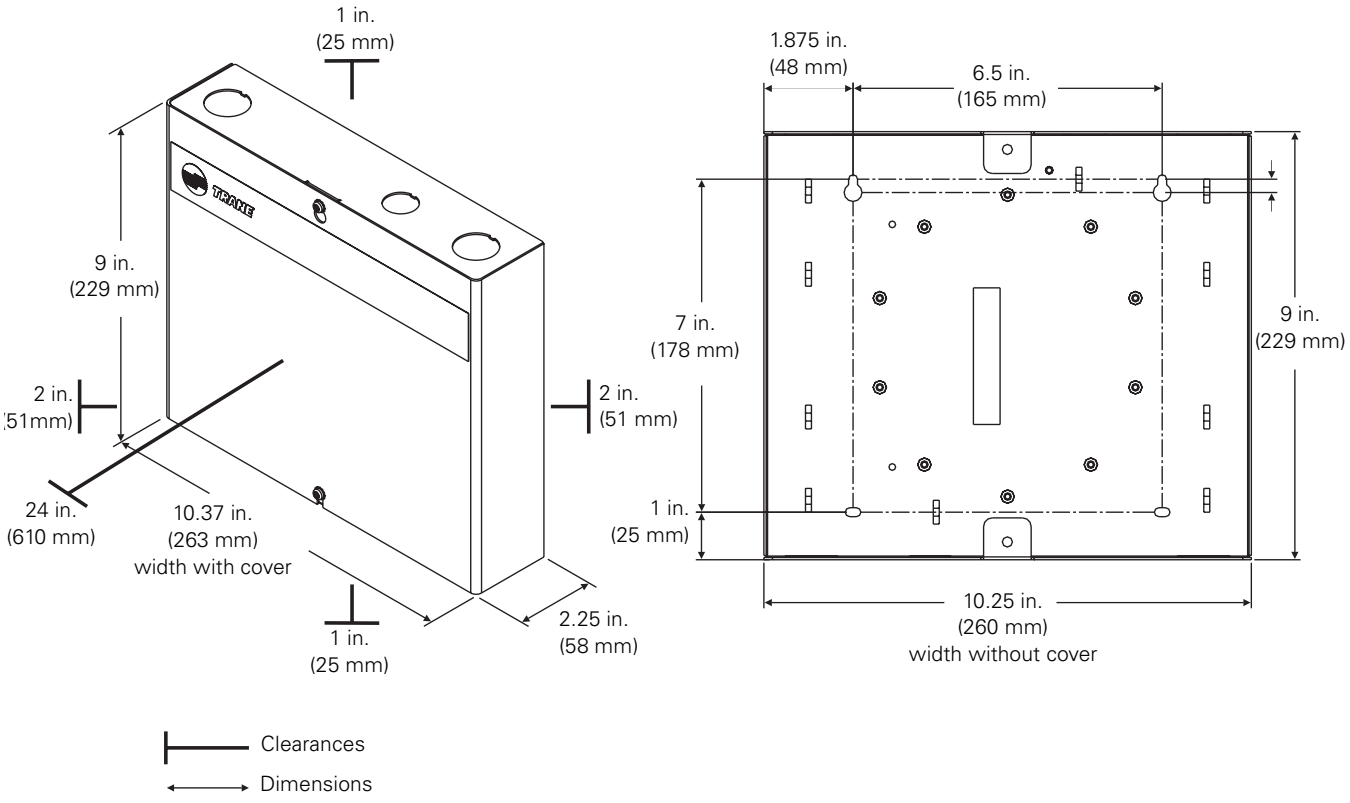


Figure 2. Dimensions and clearances for the metal-enclosure version I/O module



Mounting the frame-mount I/O module

IMPORTANT

Mount the Tracer MP503 with the cover on to avoid damaging the circuit board during installation.

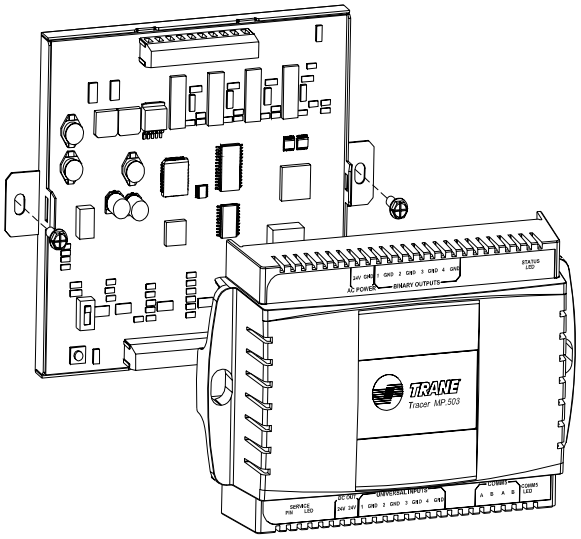
To mount the frame-mount I/O module:

1. Using the module as a template, mark the location of the two mounting holes on the mounting surface (Figure 3).
2. Set the module aside and drill holes for the screws at the marked locations.

   Drill holes for #10 (5 mm) screws or #10 wall anchors. Use wall anchors if the mounting surface is dry wall or masonry.
3. Insert wall anchors if needed.
4. Secure the module to the mounting surface with #10 (5 mm) screws (not included).

Attach the frame-mount module securely so that it can withstand the vibrations of associated heating, ventilating, and air-conditioning (HVAC) equipment.

Figure 3. Mounting the Tracer MP503



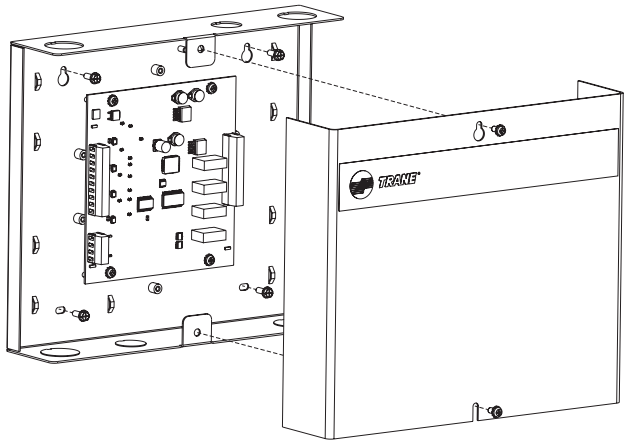
Mounting the metal-enclosure I/O module

To mount the metal-enclosure I/O module:

1. Remove the two cover screws and then the cover.
2. Using the enclosure as a template, mark the location of the four mounting holes on the mounting surface (Figure 4).
3. Set the enclosure aside and drill holes for the screws at the marked locations.

   Drill holes for #10 (5 mm) screws or #10 wall anchors. Use wall anchors if the mounting surface is dry wall or masonry.
4. Insert wall anchors if needed.
5. Secure the enclosure to the mounting surface with #10 (5 mm) screws (not included).

Figure 4. Mounting the metal-enclosure Tracer MP503



Agency listings/compliance

CE marked

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

AC-power wiring

See Figure 5 or Figure 6 for the location of the AC-power connections.

IMPORTANT

Make sure that the 24 Vac power supplies are consistently grounded. Do not share 24 Vac between I/O modules.

The recommended wire for AC-power is 16 AWG copper wire. All wiring must comply with National Electrical Code® and local codes.

Use a UL-listed Class 2 power transformer supplying a nominal 24 Vac (20–30 Vac). The transformer must be sized to provide adequate power to the Tracer MP503 (10 VA) and outputs (a maximum of 12 VA per binary output).

⚠WARNING

Hazardous voltage!

Disconnect all electric power, including remote disconnects before servicing. Follow proper lockout/tagout procedures to ensure the power cannot be inadvertently energized. Failure to disconnect power before servicing could result in death or serious injury.

⚠CAUTION

Personal injury and equipment damage!

After installation, make sure that the 24 Vac transformer is grounded through the board. Failure to do so may result in personal injury and/or damage to equipment.

CAUTION

Equipment damage!

Complete input/output wiring before applying power to the controller. Failure to do so may cause damage to the controller or power transformer due to inadvertent connections to power circuits.

CAUTION

Equipment damage!

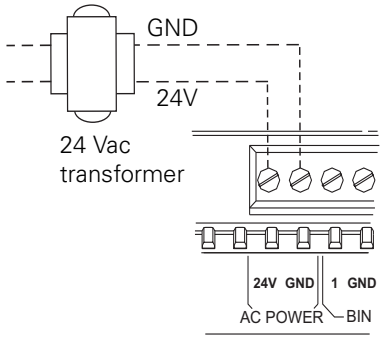
Do not share 24 Vac between controllers. Sharing 24 Vac power may cause controller damage.

Wiring AC-power to the frame-mount I/O module

Please read the preceding warning and cautions. To connect AC-power to the frame-mount I/O module:

1. Connect one secondary wire from the 24 Vac transformer to the GND terminal shown in Figure 5.
2. Connect the other secondary wire to the 24V terminal.

Figure 5. AC-power wiring for frame-mount

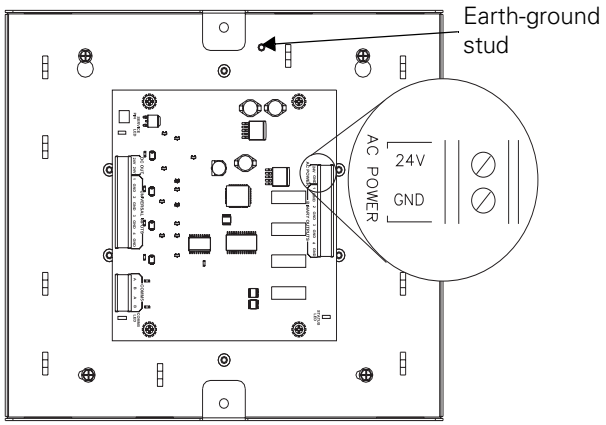


Wiring AC-power to the metal-enclosure I/O module

Please read the preceding warnings and cautions. To connect AC-power wiring to the enclosure:

1. Remove the cover of the enclosure.
2. Remove the knockout for the 0.5 in. (13 mm) conduit from the enclosure and attach the conduit.
3. Feed the power wire into the enclosure.
4. When mounting on dry wall or other non-conductive surface, connect an earth ground to the earth-ground stud on the enclosure (Figure 6).
5. Connect one secondary wire from the 24 Vac transformer to the GND terminal.
6. Connect the other secondary wire to the 24V terminal.
7. Replace the cover of the enclosure.

Figure 6. AC-power wiring for metal enclosure



Communication-link wiring

The Tracer MP503 communicates with the building automation system (BAS) and with other controllers by means of a LonTalk® (formerly called Comm5) communication link. For instructions on LonTalk® communication wiring and addressing, follow the *Tracer Summit Hardware and Software Installation* guide (BMTW-SVN01E), the *Tracker Building Automation System Hardware Installation* guide (BMTK-SVN01D), or another BAS installation manual.

Input/output terminal wiring

All input/output terminal wiring for the Tracer MP503 must meet the following requirements:

- All wiring must be in accordance with the National Electrical Code and local codes.
- Use only 18–22 AWG, stranded, tinned-copper, shielded, twisted-pair wire.
- Binary output wiring must not exceed 1000 ft (300 m).
- Binary input and 4–20 mA input wiring must not exceed 1000 ft (300 m).
- Thermistor input and 0–10 Vdc input wiring must not exceed 300 ft (100 m).
- Do not run input/output wires in the same wire bundle with any AC-power wires.

The Tracer MP503 has four binary outputs and four universal inputs.

24 Vdc outputs

The Tracer MP503 provides power for mA and Vdc sensors. The DC OUT 24V outputs are current-limited to 80mA (see Figure 7 on page 6). If sensors draw more than 80mA, the output of the circuit drops from 24V to 0V. Periodically, the circuit is turned On to test the current draw and if the draw is less than 80mA, the 24V DC OUT output returns to 24Vdc.

Binary outputs

The binary outputs are form A (SPST) relay outputs. These relays are not dry contacts; they switch 24 Vac. A pilot relay is required for any application requiring dry contacts. Relays connected to the binary outputs on the I/O module (see Figure 7 on page 6) cannot exceed 12 VA or 0.5 A current draw at 24 Vac.

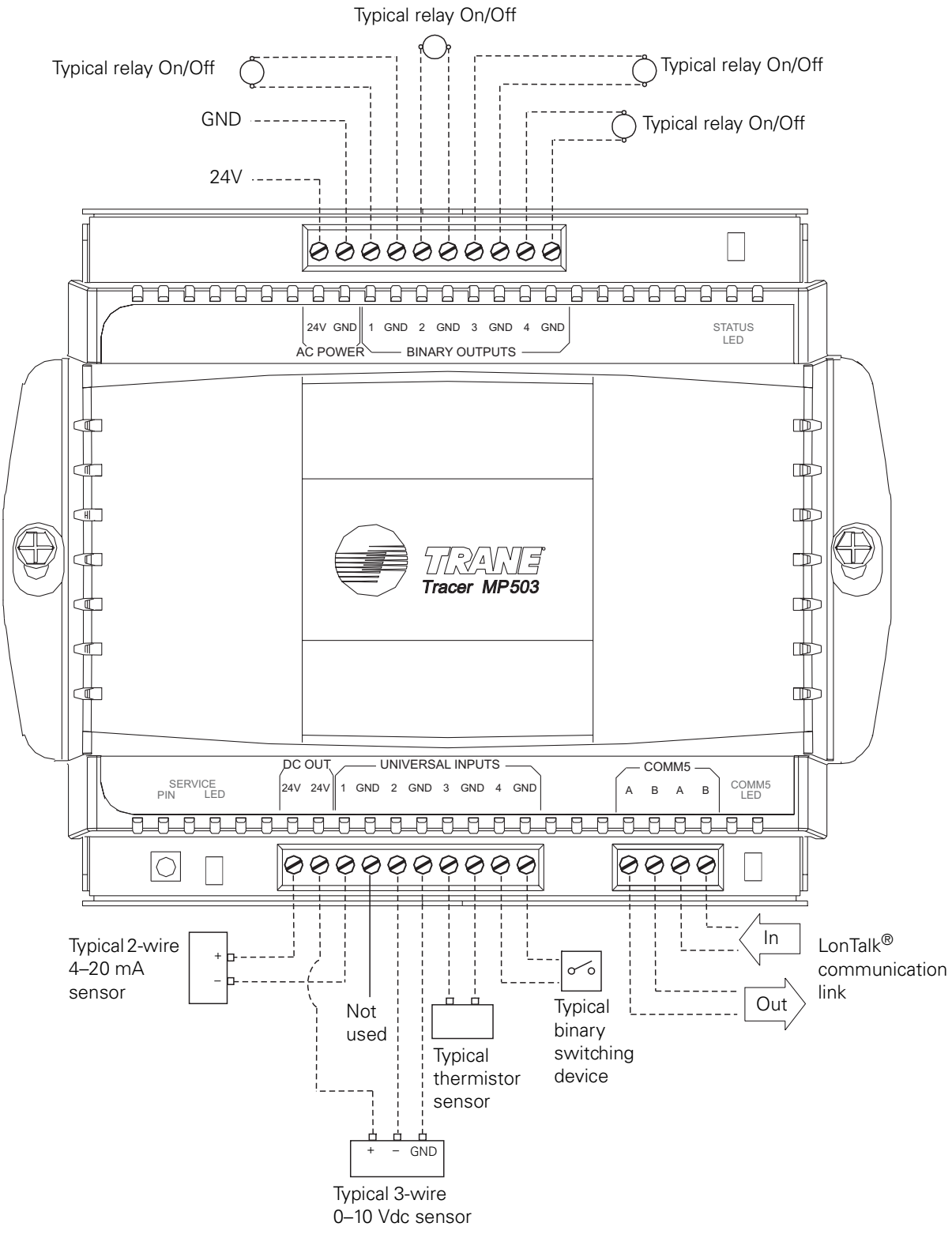
Universal inputs

Each of the four universal inputs may be configured as:

- Binary
- Thermistor
- 0–20 mA
- 0–10 Vdc

You can configure each input using the device plug-in and a service tool, such as the Rover™ service tool. The inputs are software configurable only; there are no jumpers to set on the circuit board. The inputs are factory-configured to be thermistors. Figure 7 on page 6 shows some common sensor types wired to the Tracer MP503.

Figure 7. Input/output terminal wiring diagram for the Tracer MP503



Declaration of Conformity

Manufacturer's Name: Trane
Manufacturer's Address: 4833 White Bear Parkway
St. Paul MN 55110
USA

The manufacturer hereby declares that the product

Product Name: Tracer MP503
Model Number: MP503 (4950 0490 and 4950 0590)

Conforms to the following standards or other normative documents:

Electromagnetic Emission:
(by Council Directive 89/336/EEC)

EN50081-1:1992, EN50090-2-2:1996, and EN61326-1:1997

Radiated EN55022:1994	Class A limit: 4950 0590 Class B limit: 4950 0490
Conducted EN55022:1994	Class B limit

Electromagnetic Immunity:
(by Council Directive 89/336/EEC)

EN50082-2:1995, EN50090-2-2:1996, and EN61326-1:1997

IEC 1000-4-2:1995 EN61000-4-2	±4.0 kV by Contact
IEC 1000-4-3:1995 EN61000-4-3:1996 Amendment A1:1998	10.0 V/m 80 to 1000 MHz
IEC 1000-4-4:1995 EN61000-4-4	±2.0 kV Signal Lines ±2.0 kV AC Power Lines
IEC 1000-4-5:1995 EN61000-4-5	
IEC 1000-4-6:1996 EN61000-4-6	10 V 0.15 to 80 MHz
IEC 1000-4-8:1993 EN61000-4-8	30 A/m
IEC 1000-4-11:1994 EN61000-4-11	

When and Where Issued

Electromagnetic Emission	05/09/2001
Electromagnetic Immunity	07/06/2001

Craig Kasl
Design/Compliance Engineer

Mark of Compliance

CE

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This document validates CE conformity of the Tracer MP503 controller.