Product Data

Symbio™ 500 Programmable Controller

Data Sheet

Ordering Numbers:	Description:
BMSY500AAA0100011	Symbio™ 500 Programmable Controller
BMSY500UAA0100011	Symbio™ 500 Programmable Controller, made in USA
BMSY500ABA0100011	Symbio™ 500 with RTU or HP program

⚠ 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.

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Trademarks

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

Overview

The Symbio™ 500 unit controller is a multi-purpose, programmable, wireless sensor support device. This field-or factory-installed device is designed to control the following equipment:

- Dual duct variable air volume (VAV) units requiring wired BACnet®/IP communications.
- Small air handlers.
- Built-up equipment requiring BACnet/IP communications or a display.

Features and Benefits

Feature	Benefit
BACnet® MS/TP	An open standard building automation communications protocol which enables connections to other BAS systems and controllers.
Wireless BACnet Communication using Trane Air-Fi®	Provides wireless communication between Trane BACnet® unit and system controllers and zone sensors. This allows faster, easier, lower-risk installation and life-cycle savings due to future space re-configuration, upgrades, and expansions.
Configurable and Fully Programmable	• Factory programs available through quick configuration for lowest setup time. • Field programmable for flexibility to meet unique sequence or hardware needs.
23 On-Board Input/Output (I/O) Points	Meets most terminal unit needs with extra built-in I/O available to network or additional programming on controller. Analog inputs have RTD and additional thermistor type support. See “Device Connections,” p. 4.
Expandable to 133 Points	Available expansion modules enable flexibility to meet unique equipment needs by adding 110 additional points (133 total).
Data Logging	Easier investigation of equipment, zone, or building problems.
Factory and Field Mounting Options	Options to best meet job schedule and bidding process.
Removable Connectors, DIN Rail Mounting, Multiple Service Tool Connections	Ease of installation and service.
Built in Web interface	USB port to enable user interface (UI) for installation, integration, and serviceability.
Ethernet compatible	Ethernet ports for when wired BACnet/IP is specified or used to support the TD7 display. The Symbio™ 500 controller can support one or the other.
Optional display	Optional TD7 display is available and can be used when BACnet/IP is not being used. See the notes on Ethernet Compatible above.
Built-in scheduling	Scheduling is accessed through the Web UI. This is used primarily when the SC+ controller has yet to be installed.
Trane Wi-Fi Module support	Easy and secure connection to Trane Connect.

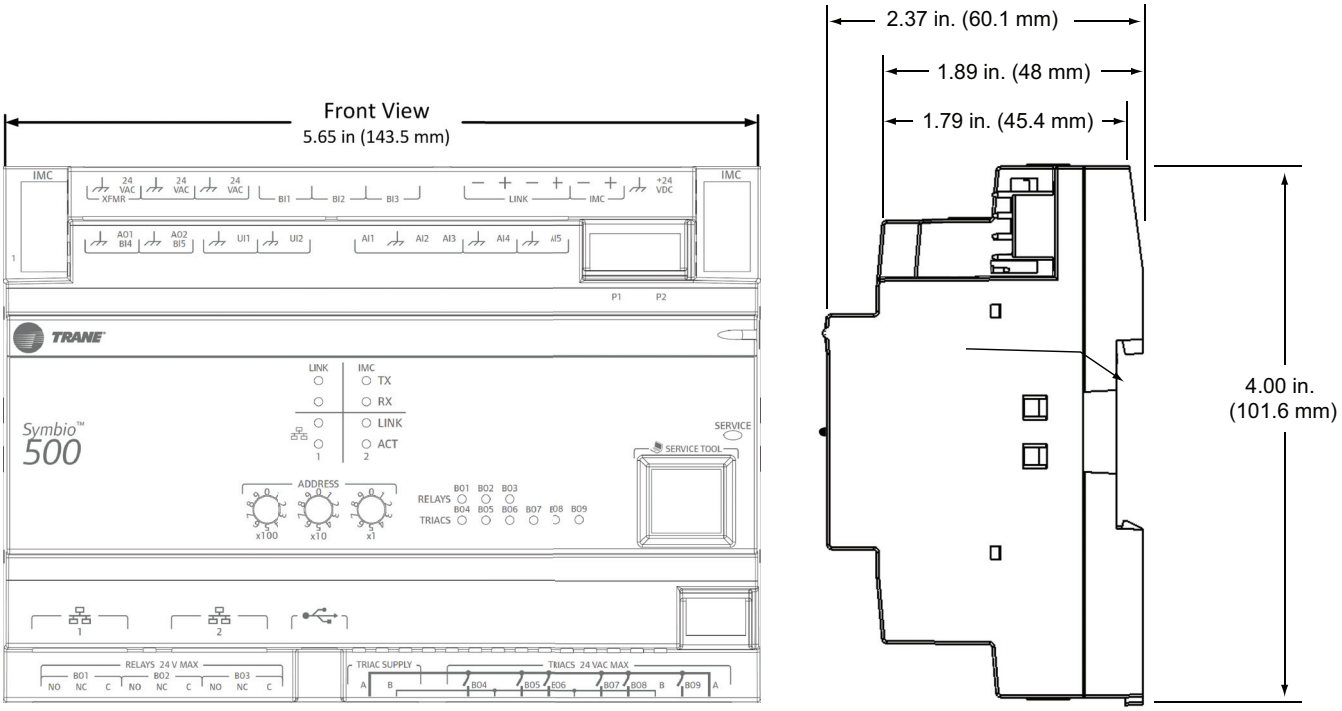
Note: Symbio™ 500 does not support LonTalk®.

Controller Specifications and Agency Compliance

Storage	
Temperature:	-67°F to 203°F (-55°C to 95°C)
Relative Humidity:	Between 5% to 95% (non-condensing)
Operating	
Temperature:	-40°F to 158°F (-40°C to 70°C)
Humidity:	Between 5% to 95% (non-condensing)
Power:	20.4 to 27.6 Vac (24 Vac, ±15% nominal) 50 to 60 Hz 24 VA
Mounting Weight of Controller:	Mounting surface must support 0.80 lb. (0.364 kg)
Environmental Rating (Enclosure):	NEMA 1
Plenum rating:	Not plenum rated. The Symbio™ 500 must be mounted withing a rated enclosure when installed in a plenum.

Wiring/Transformer
16 AWG (recommended) copper wire
• UL Listed, Class 2 power transformer 20.4 to 27.6 Vac (24 Vac, ±15% nominal) • The transformer must be sized to provide adequate power to the controller and outputs. For more information on transformer sizing, see *Symbio™ 500 Programmable Controller Installation, Operation, and Maintenance* (BAS-SVX090*-EN).
Agency Compliance
• UL60730-1 PAZX (Open Energy Management Equipment • UL94-5V Flammability • CE Marked. The European Union (EU) Declaration of Conformity is available from your local Trane® office. • UKCA Marked • FCC Part 15, Subpart B, Class B Limit • VCCI-CISPR 32:2016: Class B Limit • AS/NZS CISPR 32:2015: Class B Limit • CAN ICES-003(B)/NMB-003(B) • The Symbio™ 500 is BTL certified as a B-BC profile device. A complete list of Trane certified devices is available at www.bacnetinternational.org.

Controller Dimensions



Note: *DIN Standard 43 880, Built-in Equipment for Electrical Installation. Overall Dimensions and Related Mounting Dimensions.*

Device Connections

Input/Output type	Qty	Types	Range	Notes
Analog Input (AI1 to AI5))	5	Thermistor	10kΩ – Type II, 10kΩ – Type III, 2252Ω – Type II, 20kΩ – Type IV, 100 kΩ	These inputs can be configured for timed override capability. Supports *, ** for Trane Zone Sensors.
		RTD	Balco™ (Ni-Fe) 1kΩ, 385 (Pt) 1kΩ, 375 (Pt) 1kΩ, 672 (Ni) 1kΩ,	
		Setpoint (Thumbwheel)	189Ω to 889Ω	
		Resistive	100 kΩ to 100 kΩ	Typically used for fan speed switch.
Universal input (UI1 and UI2)	2	Linear Current	0 to 20 mA	These inputs may be configured to be thermistor or resistive inputs, 0 to 10 Vdc inputs, or 0 to 20 mA inputs.
		Linear Voltage	0 to 10 Vdc	
		Thermistor	10kΩ – Type II, 10kΩ – Type III, 2252Ω – Type II, 20kΩ – Type IV, 100 kΩ	
		RTD	Balco™ (Ni-Fe) 1kΩ, 385 (Pt) 1kΩ, 375 (Pt) 1kΩ, 672 (Ni) 1kΩ,	
		Setpoint (Thumbwheel)	189 W to 889 W	
		Resistive	100 kΩ to 100 kΩ	
		Binary	Dry contact	Low impedance relay contact.
		Pulse Accumulator	Solid state open collector	Minimum dwell time is 25 milliseconds **ON** and 25 milliseconds **OFF**.
Binary input (BI1 to BI3)	3		24 Vac detect	The controller provides the 24Vac that is required to drive the binary inputs when using the recommended connections.
Binary Outputs (BO1 to BO3)	3	Form C Relay	0.5A @ 24 Vac pilot duty	Ranges given are per contact. Power needs to be wired to the binary output. All outputs are isolated from each other and from ground or power.
Binary Outputs (BO4 to BO9)	6	Triac	0.5A @ 24 Vac resistive and pilot duty	Ranges given are per contact and power comes from the TRIAC SUPPLY circuit. Use for modulating TRIACs. User determines whether closing high side (providing voltage to the grounded load) or low side (providing ground to the power load). **Note:** Class 1 voltages shall not be used on Symbio™ 500 controllers.
Analog Output / Binary Input (AO1/BI4 and AO2/BI5)	2	Linear Current	0 to 20 mA	Each termination must be configured as either an analog output or binary input.
		Linear Voltage	0 to 10 Vdc	
		Binary Input	Dry contact	
		Pulse Width Modulation	80 Hz signal @ 15 Vdc	
Pressure Inputs (PI1 and PI2)	2		0 to 5 In H_2O	Pressure inputs supplied with 5 volts (designed for Kavlico™ pressure transducers).
Point total	**23**			

Expansion Modules

In addition to the 23 on-board points, additional points can be created by using XM30, XM32, XM70, or XM90 expansion modules. Symbio™ 500 supports a maximum of 133 points.

The Symbio 500 module can power up to a maximum of two XM30 or XM32 modules from the DC power on the IMC link.

For more information on Expansion Module, wiring refer to *Tracer XM30, XM32, XM70, and XM90 Expansion Modules Installation, Operation, and Maintenance* (BAS-SVX46*-EN).

Additional Ordering Options

- Symbio™ 500 Controller (made in U.S.A. version) *(Ordering Number: BMSY500UAA0100011)*
- Symbio 500 Controller Pre-programmed for RTU or Heat Pump *(Ordering Number: BMSY500ABA0100011)*
- Tracer® XM30 Expansion Module *(Ordering Number: X13651537010)*
- Tracer XM32 Expansion Module *(Ordering Number: X13651563010)*
- Tracer XM70 Expansion Module *(Ordering Number: X13651568010)*
- Tracer XM70 Expansion Module (Made in the U.S.A version) *(Ordering Number: X13651597010)*
- Tracer XM90 Expansion Module *(Ordering Number: X1365167301)*
- Tracer® BACnet® Term (2 pack) *(Ordering Number: X1365152401)*
- Tracer Small 10-inch DIN Rail Enclosure *(Ordering Number: X19091354010)*
- Tracer 10-inch Enclosure with Solid Metal Door, 120 Vac *(Ordering Number: X19091354010)*
- Tracer 13-inch Enclosure with Solid Plastic Door, 120 Vac *(Ordering Number: X13651559010)*
- Tracer 13-inch Enclosure with Solid Plastic Door, 230 Vac *(Ordering Number: X13651560010)*
- Tracer 16-inch Enclosure with Solid Metal Door, 120 Vac *(Ordering Number: X13651618010)*
- Tracer 16-inch Enclosure with Metal Window Door, 120 Vac *(Ordering Number X13651619010)*
- Tracer 24-inch Enclosure with Metal Window Door, 120 Vac *(Ordering Number: X13651552010)*
- Tracer 24-inch Enclosure with Metal Window Door and Display Mount, 120 Vac *(Ordering Number: X13651553010)*
- Air-Fi® Interface (WCI) - Indoor *(Ordering Number: X13790901030)*
- Air-Fi Interface (WCI) - Outdoor *(Ordering Number: X13790941030)*
- Air-Fi Interface (WCI) - Indoor BAA *(Ordering Number: X13790963030)*
- Tracer TD7 Operator Display *(Ordering Number: X13651571010)*
- Tracer TD7 Sealed Ethernet cable (for wet environments) *(Ordering Number: X19070632020)*
- Tracer TD7 Display Portable Carry Case *(Ordering Number: X18210613010)*
- Tracer TD7 Mounting Bracket (flat surface, fixed position) *(Ordering Number: X05010511010)*
- Wi-Fi Field Installed Kit, 1 m cable, 70°C *(Ordering Number: X13651743001)*
- Wi-Fi Field Installed Kit, 2.9 m cable, 70°C *(Ordering Number: X13651743002)*

Notes

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 or tranetechnologies.com.

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