



CBT-3T6-5R

DESCRIPTION

The CBT-3T6-5R BACnet Unitary Controller is a BTL Listed BACnet Advanced Application Controller (B-AAC) ideally suited for rooftop HVAC units, small air handling units, heat pumps, fan coil units and custom unitary equipment control.

The CBT-3T6-5R provides 3 UniPuts™ with Triac (configurable as inputs or outputs), 6 Universal Inputs, 5 Digital (Relay) outputs, and a dedicated input for the Cylon CBT-STAT intelligent room display.

The product is shipped with a unique MSTP address based on its serial number, but the address may also be set manually using a seven-way DIP switch.

APPLICATION

The CBT-3T6-5R is suitable for controlling a variety of small to medium sized HVAC equipment such as:

- Rooftop Units
- Heat Pumps
- Fan Coil Units
- Unit Ventilators
- Chilled Ceilings
- Small to medium Air Handling Units

This controller ships with a variety of powerful and flexible pre-configured strategies, which can be quickly configured to control almost any Rooftop or Heat Pump application. It also accommodates custom programming using CXpro^{HD} programming software.

BACnet MS/TP Fieldbus

Supports the following configurable BACnet objects: AI/BI/AO/BO/AV/BV, Trend Logs, and Schedules

3 UniPuts™ with Triac

Configured as analog / digital outputs or voltage inputs along with Triac functionality that can switch the low side of a 24 V AC load.

6 Universal Inputs

Can be configured as analog or digital inputs with pulse counting on the 6th input.

5 Digital (Relay) Outputs

3 outputs can switch up to 240 V AC.
2 outputs can switch up to 24 V AC.

Up to 500 Strategy Blocks

Up to 6 Trendlogs

1024 entries per Trendlog

Data Security

Strategy and setpoints backed up in Flash

No Hardware I/O Jumpers

Hardware points are automatically configured by the downloaded strategy

SPECIFICATIONS

MECHANICAL

Size	5.12 x 5.17 x 1.78" (excluding terminal plugs) (130 x 131.2 x 45 mm)
Enclosure	Injection molded ABS
Mounting	DIN rail <ul style="list-style-type: none"> - The housing base is designed for snap-mounting on DIN rails - The controller should not be freely accessible after mounting - Unit must be oriented such that powered relay terminals are at the bottom of unit

CONNECTION

Note: Use Copper or Copper Clad Aluminum 70 °C conductors only.

Terminals	I/O & RS485 Comm Network: Grey Pluggable PCB mounted screw terminal connections. 24 V AC Power: Green Pluggable PCB mounted screw terminal connections. 240 V AC Relay: Green PCB mounted screw terminal connections. These may not be pluggable.
Conductor Area	Max: AWG 12 (3.09 mm ²) Min: AWG 22 (0.355 mm ²)

ENVIRONMENT

Note: This equipment is intended for field installation within an enclosure.

Ambient Temperature	32 °F ... 122 °F [0 °C ... 50 °C] ambient.
Ambient Humidity	0% ... 90% RH non-condensing
EMC Immunity	EN 61326-1
EMC Emission	EN 61326-1
Approvals	UL Listed (CDN & US) UL916 Energy Management Equipment - File No. E176435
Safety	EN 60730-1:2011 Automatic Action type i.e. Type 1.B.Y
Pollution Degree	Class 2 (EN 60730-1)

ELECTRICAL

Supply Requirements	24 V AC +15 % / -20 % 50/60 Hz (SELV Power Source)
Transformer Rating	Up to 10 VA
Rated Impulse Level	2,500 V
BACnet Loading	¼ unit load device

PROCESSOR

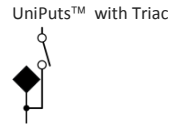
Type	STM32 F103ZET6 32bit processor
Clock Speed	8 MHz crystal, 72 MHz internal processor clock rate
System Memory	1024kByte flash, 64kByte SRAM internal to processor (soldered to PCB not removable)

COMMUNICATIONS

Local serial port	Right angle entry RJ-45 @ 9600 Baud Max cable length 4 m
BACnet MS/TP port	RS485 @ 9K6, 19K2, 38K4 or 76K8 Baud (defaults to 38K4) Max cable length 1.2 km
CBT-STAT Port	RS485 with a maximum cable length 500 m

INPUTS / OUTPUTS

Note: Shielded cable is recommended for all input connections.



When configured as **Input:**

Analog Input
 Range: 0 ... 10 V @ 40 kΩ
 Resolution: 12 bit
 Digital Volt-Free contact, @ 25 mA not continuous

When configured as **Output:**

Analog Output 0 ... 10 V, 10 mA, 12-bit resolution
 Active Output 1 ... 10 V for sinking 1 mA max load with 12 bit resolution.
 Digital Output 0 ... 10 V, 10 mA
 24 V AC Triac @ 500 mA maximum. Switch neutral only.

Universal Inputs



Analog Input

Range: 0 ... 10 V @ 130 kΩ
 Resolution: 12 bit

Temperature measurement

Range: 32 °F to 122 °F (0 °C ... +50 °C)
 Resolution: 12 bit

Passive Input for a large range of temperature sensors. 10K3A1 sensors are recommended.

Note: It is not recommended using Sensors with a heating dissipation constant (K factor) < 2 as this will lead to an offset error.

Current input

Range: 0 ... 20 mA @ 390 Ω
 Accuracy: ±0.5% full scale [100 µA]

Digital Volt-Free contact, Dry Contact

Note: Only Universal Input 6 supports pulse counting at below 20 Hz and a minimum pulse width of 25 milliseconds.

Relay Digital Outputs



Points 9, 10 & 11 are relay contacts with ability to switch 240 V AC (USA: Pilot Duty 120V AC, 72 VA). Points 12 & 13 are relay contacts with ability to switch up to 24 V AC.

Maximum Load: 250 V AC, 2 (1) A resistive (inductive) for all relay contacts.

Relay contacts switch single-phase only.

24 V AC output terminals

Total current drawn from 24 V AC terminals is limited to 0.9 A.

SOFTWARE FEATURES

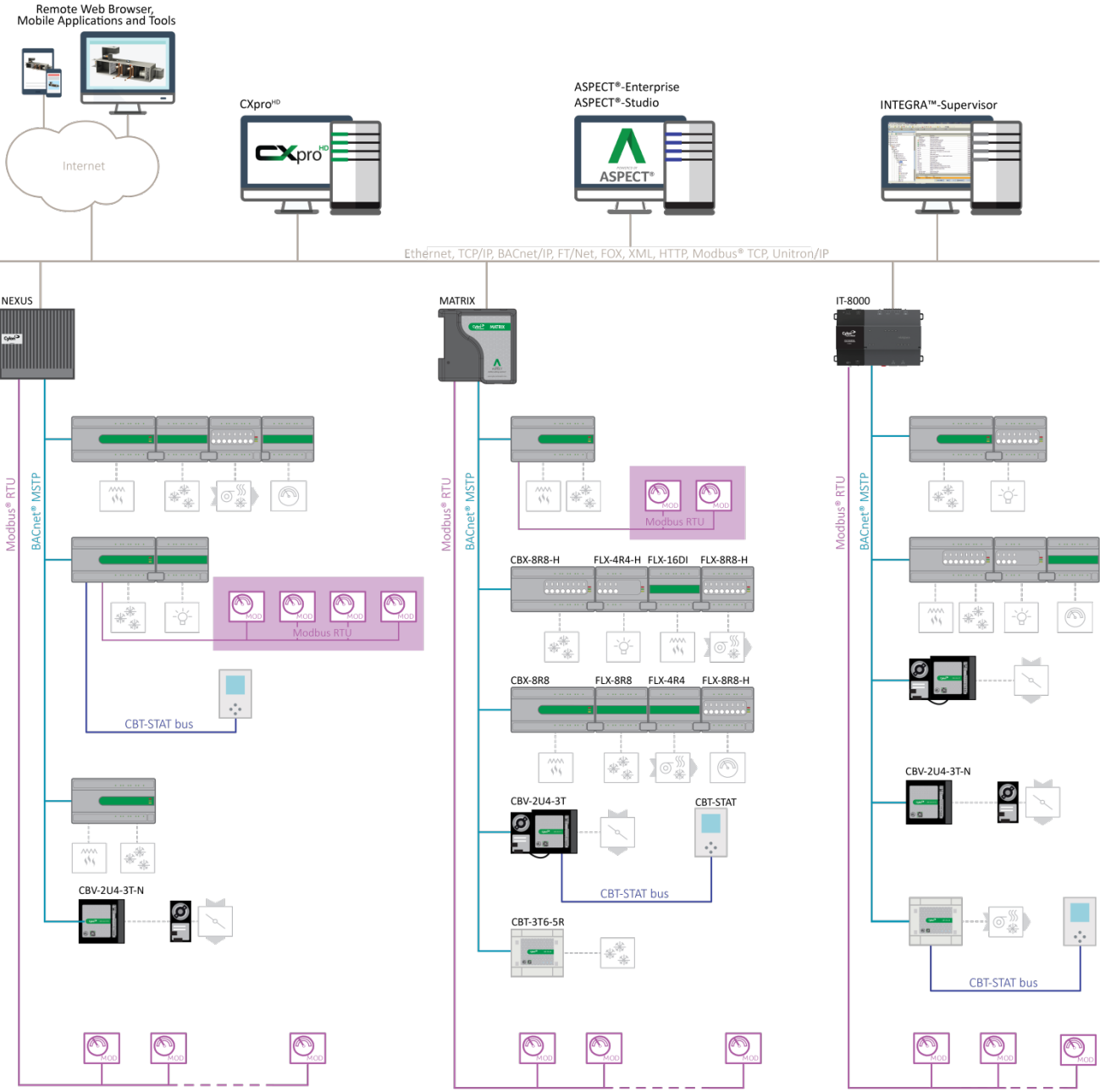
Maximum number of Strategy Blocks	500
Maximum number of Trend log Modules	6
Maximum internal Trend log capacity (standard)	1024
Data Security	Strategy and Set points backed up in Flash

INTERFACE

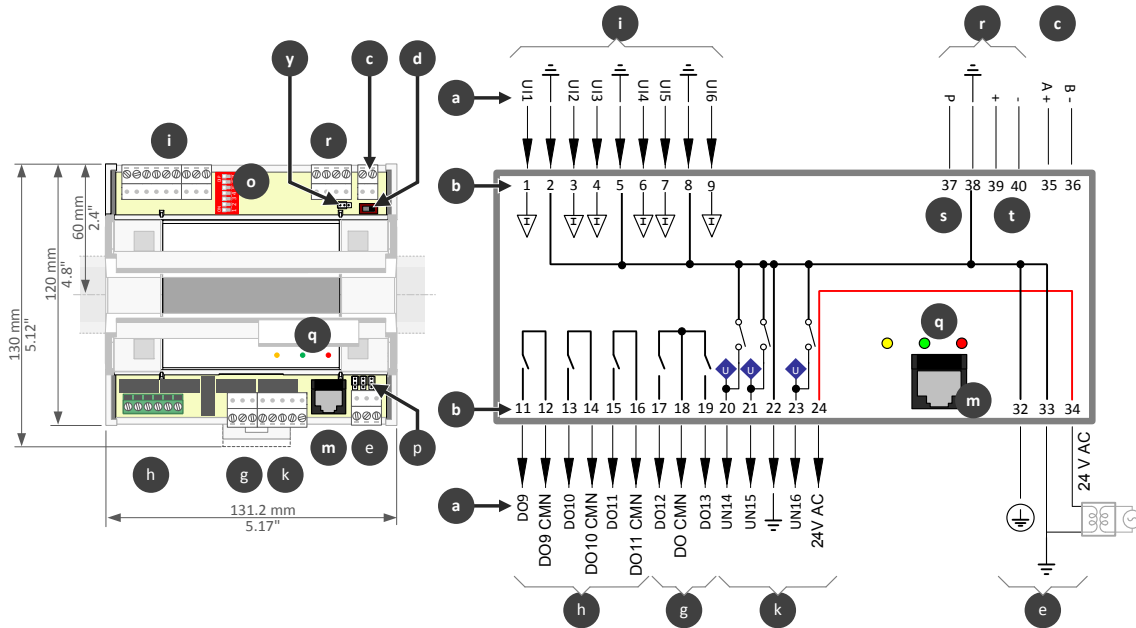
Engineering Software



SYSTEM ARCHITECTURE



DIMENSIONS AND WIRING



- a** Point Numbers
- b** Terminal Numbers
- c** BACnet MS/TP port
Important: In order for the BACnet MS/TP bus to operate reliably, the common power connection (terminal 33 ---) must be connected to ground. It is recommended that this is done at the 24 V AC transformer.
- d** BACnet MS/TP Terminator
 - OFF (BACnet MS/TP bus not terminated at this controller)
 - ON (BACnet MS/TP bus terminated at this controller)
- e** Power 24 V AC
Important: The common power connection (terminal 33 ---) must be connected to ground. It is recommended that this is done at the 24 V AC transformer.
NOTE: THIS UNIT MUST BE GROUNDED
- g** Relay digital outputs (24 V AC)
- h** Relay digital outputs 240 V AC, 2 (1) A (USA: Pilot Duty 120 V AC, 72 VA)
NOTE: DISCONNECT SUPPLY TO POWERED RELAYS AND 24 V AC TO UNIT BEFORE WIRING.
- i** Universal Input (UI6 capable of pulse counting)
- k** UniPuts™ + Triac
- m** Service Port (RJ-45) for both temporary and permanent connection.
Note: Service Port must not be connected until after the device is powered on.
- o** 7-way DIP switch. Setting this to an address between 1 and 127 and cycling the power will force the controller to update its MAC address to match the DIP settings.
Note: Failure to subsequently return the switch to all zeros will render the unit unable to be configured electronically or remotely.

