



# CBT-3T6-5R

## DESCRIPTION

The **CBT-3T6-5R** is a freely programmable BACnet® Unitary Controller with native MS/TP communications support. The controller is BTL listed as a BACnet Advanced Application Controller (B-AAC) and is ideally suited for Rooftop HVAC units, Fan Coil Units, Heat Pumps, Unit Ventilators, and custom unitary equipment control.

Part of Cylon’s **CB Line** of BACnet field controllers, 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 Cylon’s **CBT-STAT** or **UCU Room Display** intelligent room sensors.

## APPLICATION

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

- Rooftop Units
- Fan Coil Units
- Heat Pumps
- Unit Ventilators
- Custom Unitary Equipment

This controller accommodates available pre-engineered strategies or can be tailored to custom applications using **CXpro<sup>HD</sup>** programming software.

### BACnet MS/TP Fieldbus

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

### 3 UniPuts with Triac

Configured as analog or digital outputs, or voltage inputs along with Triac functionality that can switch 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

### Cylon Intelligent Room Sensor support

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

### CONNECTION

**Note:** Use Copper or Copper Clad Aluminum 70 °C (158 °F) 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 <sup>2</sup> ) Min: AWG 22 (0.355 mm <sup>2</sup> )

### ENVIRONMENT

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

Ambient Temperature	0 °C ... 50 °C [32 °F ... 122 °F] ambient.
Ambient Humidity	0% ... 90% RH non-condensing
Storage Temperature	-30 °C ... +70 °C (-22 °F ... 158 °F)
EMC Immunity	EN 61326-1
EMC Emission	EN 61326-1
Approvals	BTL Listed – BACnet Advanced Application Controller (B-AAC) 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 CE Approved
Pollution Degree	Class 2 (EN 60730-1)

### ELECTRICAL

Supply Requirements	24 V AC/DC +15 % / -20 % 50/60 Hz (SELV Power Source)
Transformer Rating	10 VA typical, 31 VA max with all external loads
Rated Impulse Level	2,500 V
BACnet Loading	¼ unit load device

### PROCESSOR

Type	STM32 F103ZGT6 32bit processor
Clock Speed	8 MHz crystal, 72 MHz internal processor clock rate
System Memory (soldered to PCB not removable)	Internal Flash 1 Mbyte Internal SRAM 64 Kbyte External SRAM 1 Mbyte

### 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
Local STAT Port	RS485 with a maximum cable length 500 m Supports CBT-STAT and UCU Room Display

## INPUTS / OUTPUTS

**Note:** Shielded cable is recommended for all input connections.

### UniPuts™ with Triac



#### 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: 0 °C ... +50 °C (32 °F ... 122 °F)  
 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 [100µA]  
 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

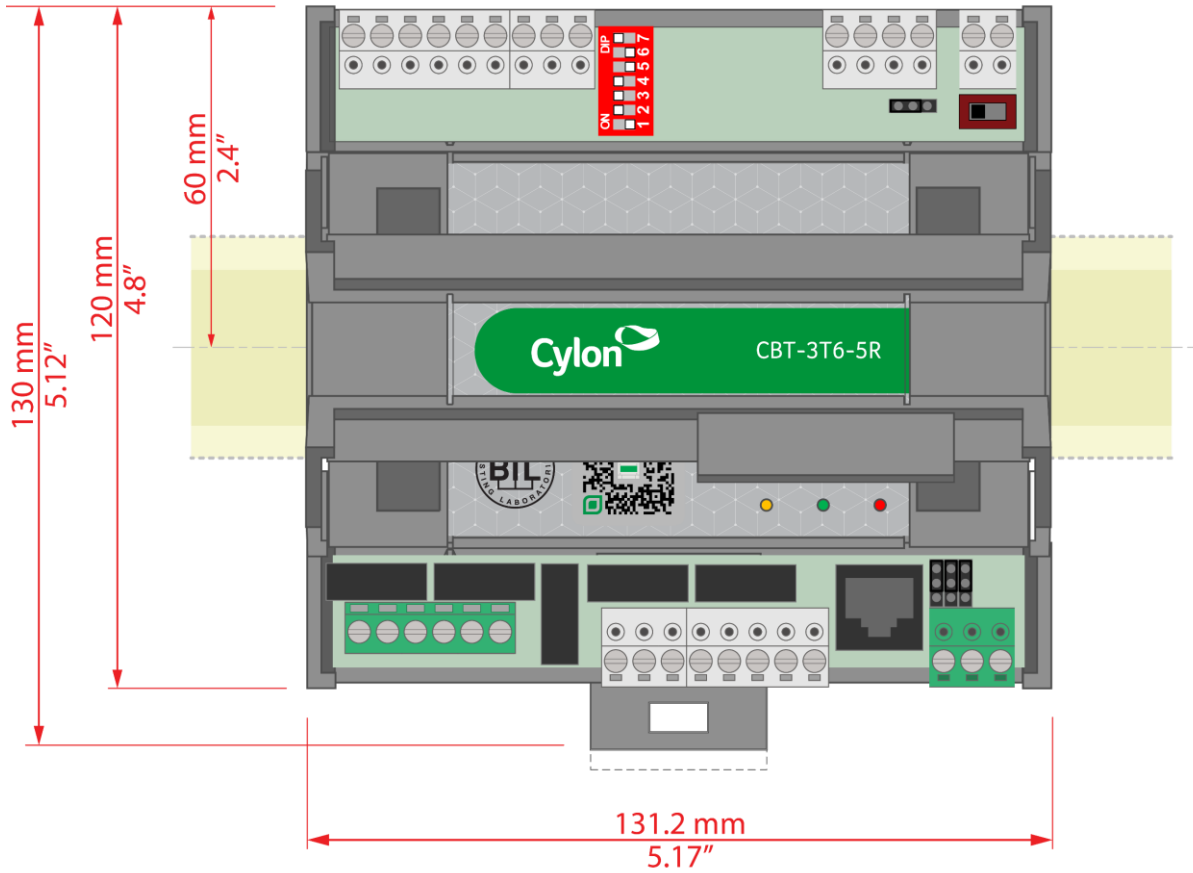
Maximum number of Strategy Blocks	500
Maximum number of Trend log Modules	6
Maximum internal Trend log capacity (standard)	1024
Data Security	Strategy and Set points backed up in Flash

## INTERFACE

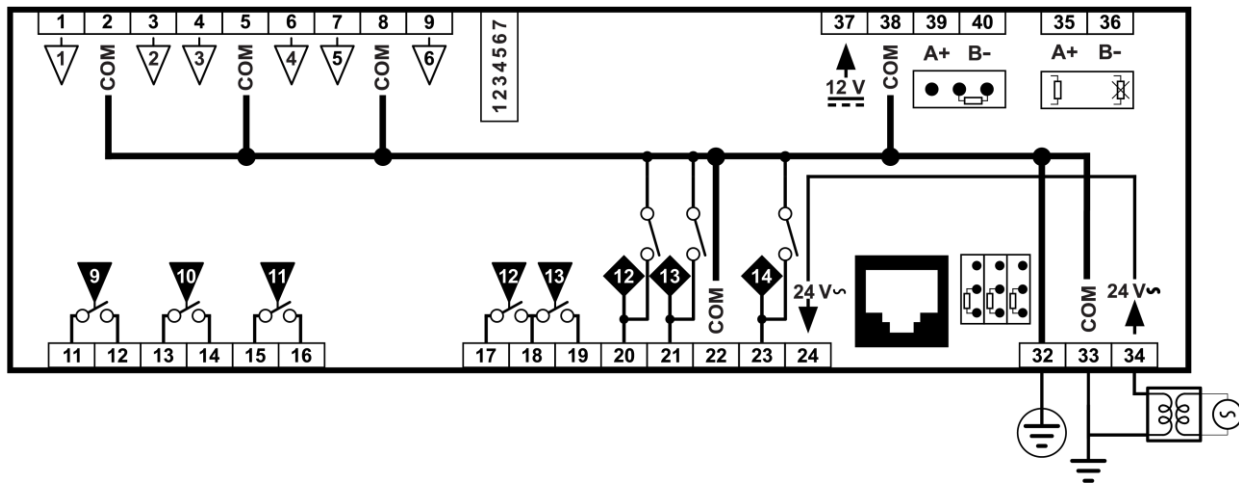
Engineering Software CXpro<sup>HD</sup>



**DIMENSIONS**



**WIRING**



# SYSTEM ARCHITECTURE

