

CBT14

The Cylon Auto-Matrix CBT14 BACnet Unitary Controller is a BACnet Advanced Application Controller ideally suited for rooftop HVAC units, small air handling units, heat pumps, fan coil units and custom unitary equipment control. The CBT14 provides 6 universal inputs, 5 relay outputs, 3 UniPuts™ with Triac (configurable as inputs OR outputs), and a dedicated input for the Cylon Auto-Matrix 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. CBT14 controllers ship 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 the Engineering Center programming software.



FEATURES

Primary Communications Port is BACnet MS/TP 6 Universal Inputs

Configured as analog or digital inputs with pulse counting on the 6th input.

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.

5 Relay Digital Outputs

3 outputs can switch up to 240 V AC.

2 outputs can switch up to 24 V AC.

- Up to 500 strategy blocks for custom programming
- Up to 6 trend logs
- 1024 entries per trend log
- Data Security

Strategy and set points backed up in non-volatile Flash memory

BENEFITS

Unique Flexibility with UniPuts™

The CBT range of terminal unit controllers offers UniPuts™ - a revolutionary answer to flexible point configuration allowing points on the controller to be configured as an input or an output, maximizing flexibility relative to programming changes as well as point capacity on the controller and utilizing less space in the enclosure.

Cost-effective, Low Entry Point for Building Control

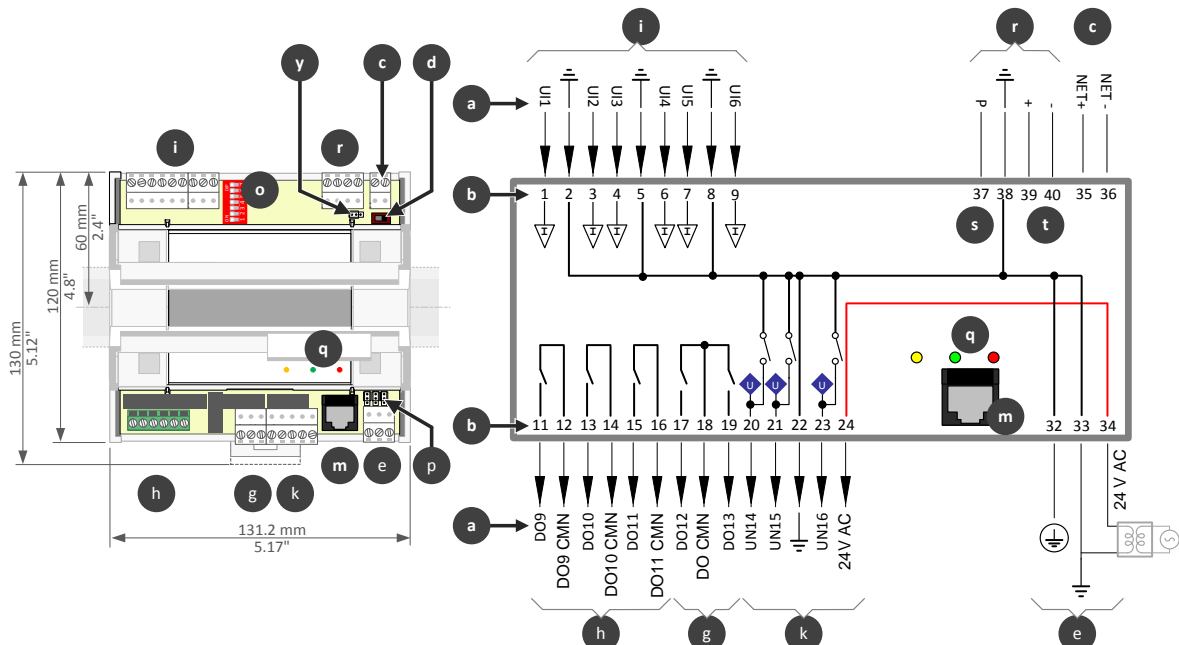
The CBT range of terminal equipment controllers offers reduced costs in terms of implementation, training, rollout, and maintenance. Modular, extendible packages along with low installation costs mean a low entry point for building control. The pre-loaded Rooftop and Heat-Pump strategies can decrease your project engineering and installation time.

These strategies link to pre-configured graphics in the Cylon Auto-Matrix award-winning Aspect™ API, further reducing your development and deployment time.

Highly Programmable & Extendable via Web-enabled HVAC Technology

The CBT range of terminal equipment controllers is built on an advanced web-based 32-bit architecture. It is shipped pre-loaded with one of a number of powerful and flexible strategies, but the CBT range of terminal equipment controllers are also fully programmable to meet your most demanding building automation needs. It has built-in diagnostics, along with data logging and strategy storage with the flexibility of being stand-alone or network enabled.

DATASHEET



Common

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 to manually set the MSTP address of the BACnet port between address 1 and 127. Setting the switch to all zeros will allow the unit to use the production-set address or the BACnet-set address.

p UniPut™ current sink enable jumpers



Sink disabled Sink enabled

q Indicator LEDs (Extra LED on optional network comm port)

Red LED
 Continuous: Optional battery is healthy.
 Flash once a second: Indicates no battery/battery is low.
Note: battery is present only on custom versions.

Green LED
 Continuous: Strategy servicing and no network comm.
 Flash rapidly (every 100 ms): Strategy not servicing.
 Flash once a second: Network comm, and Strategy servicing.
Note: when Service Port is in use, the Green LED blinks off as Service Port comm data is received.

Yellow LED
 Off: Normal operation.
 On: One or more hardware points overridden by BACnet priority array setting

Cycle left to right (Yellow - Green - Red):
 Controller is in terminal mode.

Cycle right to left (Red - Green - Yellow):
 Upgrade in progress while Controller is in terminal mode
Note: The strategy is not serviced while in upgrade mode.

Cycle green to yellow
 Global communication/setup problem

Green and yellow flash simultaneously
 Global communication/setup problem and Priority Array is set above 16 by external BACnet Client, or by the CEC.

r Room Display / CBT-STAT Port

s Room Display / CBT-STAT Power supply

t Room Display / CBT-STAT RS485 connection

y Room Display / CBT-STAT Terminator



OFF (Not Terminated) ON (Terminated)

SPECIFICATIONS

MECHANICAL

Size	130 x 131.2 x 45 mm (5.12 x 5.17 x 1.78")
Enclosure	Injection molded ABS
Construction	Integrated Electronic Controller
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

ENVIRONMENT

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

Ambient Temperature	0° - 50°C (32°-122°F) 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)

WIRING

Note: Use Copper or Copper-coated Aluminum conductors only.

Termination	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)

ELECTRICAL


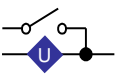

Supply Requirements	24 V AC +15% / -20% 50/60 Hz (SELV Power Source)
Transformer Rating	up to 10 VA
Rated Impulse Level	2,500 V

PROCESSOR

Type	STM32F103ZET6 32bit processor
Clock Speed	8 MHz crystal, 72 MHz internal processor clock rate
System Memory (soldered to PCB not removable)	1024kByte flash, 64kByte SRAM internal to processor 1MByte external SRAM

INPUTS/OUTPUTS

Note: Screened cable is recommended for all input connections.

<p>6 Universal Inputs</p> 	<p>Active voltage input 0-10 V @ 130 K. 12 bit resolution. Passive Input for a large range of temperature sensors. 12 bit resolution. 10K3A1 (10K Type 3 thermistor) 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. Temperature input range: 0 °C to 50 °C (32 °F to 122 °F) Active current input 0-20 mA @ 390 Ω (screened cable). Digital Volt Free Contact (Dry Contact). Note: Only Universal Input 6 supports pulse counting at below 20Hz and a minimum pulse width of 25mseconds.</p>
<p>3 UniPuts™ with Triac</p> 	<p>(Software selectable interfaces) Active Input 0 – 10 V @ 40 KΩ with 12 bit resolution. Digital Volt-Free contact @ 25 mA not continuous. Active Output 0 - 10 V @ 10 mA max load with 12 bit resolution. Active Output 1 - 10 V for sinking 1 mA max load with 12 bit resolution. 24 V AC Triac @ 500 mA maximum. Switch neutral only.</p>
<p>5 Relay Digital Outputs</p> 	<p>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.</p>
<p>24 V AC output terminal</p>	<p>Total current drawn from 24 V AC terminals is limited to 0.9 A.</p>

COMMUNICATIONS

<p>Local RS232 port</p>	<p>Right angle entry RJ-45 @ 9600 Baud Max cable length 4m</p>
<p>BACnet MS/TP port</p>	<p>RS485 @ 9K6,19K2, 38K4 or 76K8 Baud (defaults to 38K4) Max cable length 1.2 km</p>
<p>CBT-Stat Port</p>	<p>RS485 with a maximum cable length 500m.</p>

INTERFACE

<p>Engineering Software</p>	<p>Engineering Center (EC) NetLink (portable operator interface tool)</p>
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SOFTWARE FEATURES

<p>Maximum number of Strategy Blocks</p>	<p>500</p>
<p>Maximum number of Trend log Modules</p>	<p>6</p>
<p>Maximum internal Trend log capacity (standard)</p>	<p>1024</p>
<p>Data Security</p>	<p>Strategy and Set points backed up in Flash</p>
<p>Maximum Controllers per BACnet MS/TP bus</p>	<p>99* <i>* It is recommended for typical conditions that the number of controllers on a unitary BACnet MS/TP bus be limited to 32. MSTP devices with a fractional (¼ or smaller) unit load will be required in order to extend a single BACnet MS/TP bus trunk beyond 32 devices. Both CBM and CBT controllers are ¼ unit load devices. Please refer to MAN0106 for recommendations on configuring a specific network for optimal coms speed.</i></p>



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