



CBT-4T4-4T

DESCRIPTION

The **CBT-4T4-4T** BACnet Unitary Controller is a BTL Listed BACnet Advanced Application Controller ideally suited for the control of Fan Coil Units, Unit Ventilators, Unit Heaters, Chilled Ceilings/Beams and custom unitary equipment.

The **CBT-4T4-4T** provides 4 UniPuts™ (configurable as inputs OR outputs), 4 Universal Inputs and 4 Digital (Triac) Outputs. The product is shipped with a unique MSTP address based on its serial number.

APPLICATION

CBT-4T4-4T controllers ship with a variety of powerful and flexible pre-configured strategies, which can be quickly configured to control almost any Fan Coil or other terminal unit 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

4 UniPuts™ with Triac

Can be configured as analog / digital outputs or voltage inputs.

4 Universal Inputs

Can be configured as analog or digital inputs

4 Digital (Triac) Outputs

Can switch up to 24 V AC (switches GND)

Up to 255 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	5.7 x 5.12 x 1.78" [145 x 130 x 45 mm] (excluding terminal plugs)
Enclosure	Flame retardant ABS
Mounting	DIN rail

CONNECTION

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

Terminals	PCB mounted plug terminal connections
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 55024, 2010
EMC Emission	EN 55022, 2010 Class A
Approvals	UL Listed (CDN & US) UL916 Energy Management Equipment - File No. E176435 BTL Listed – BACnet Advanced Application Controller (B-AAC) CE Approved

ELECTRICAL

Supply Requirements	24 V AC +15 % / –20 % 50/60 Hz
Transformer Rating	Up to 55 VA (up to 12 VA internal power plus up to 43 VA supplied to Triac loads)
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 (soldered to PCB not removable)	512k flash, 64k SRAM internal to processor 1024k SRAM external

COMMUNICATIONS

Local serial port	RS232 TTL port @ 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

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, 20 mA, 12-bit resolution
Digital Output 0 ... 10 V, 20 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 [100µA]

Digital Volt-Free contact, Dry Contact

Digital (Triac) Outputs



24 V AC Triac @ 500 mA maximum. Switch neutral 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	255
Maximum number of Trend log Modules	6
Maximum internal Trend log capacity (standard)	1024
Data Security	Strategy and Set points backed up in Flash

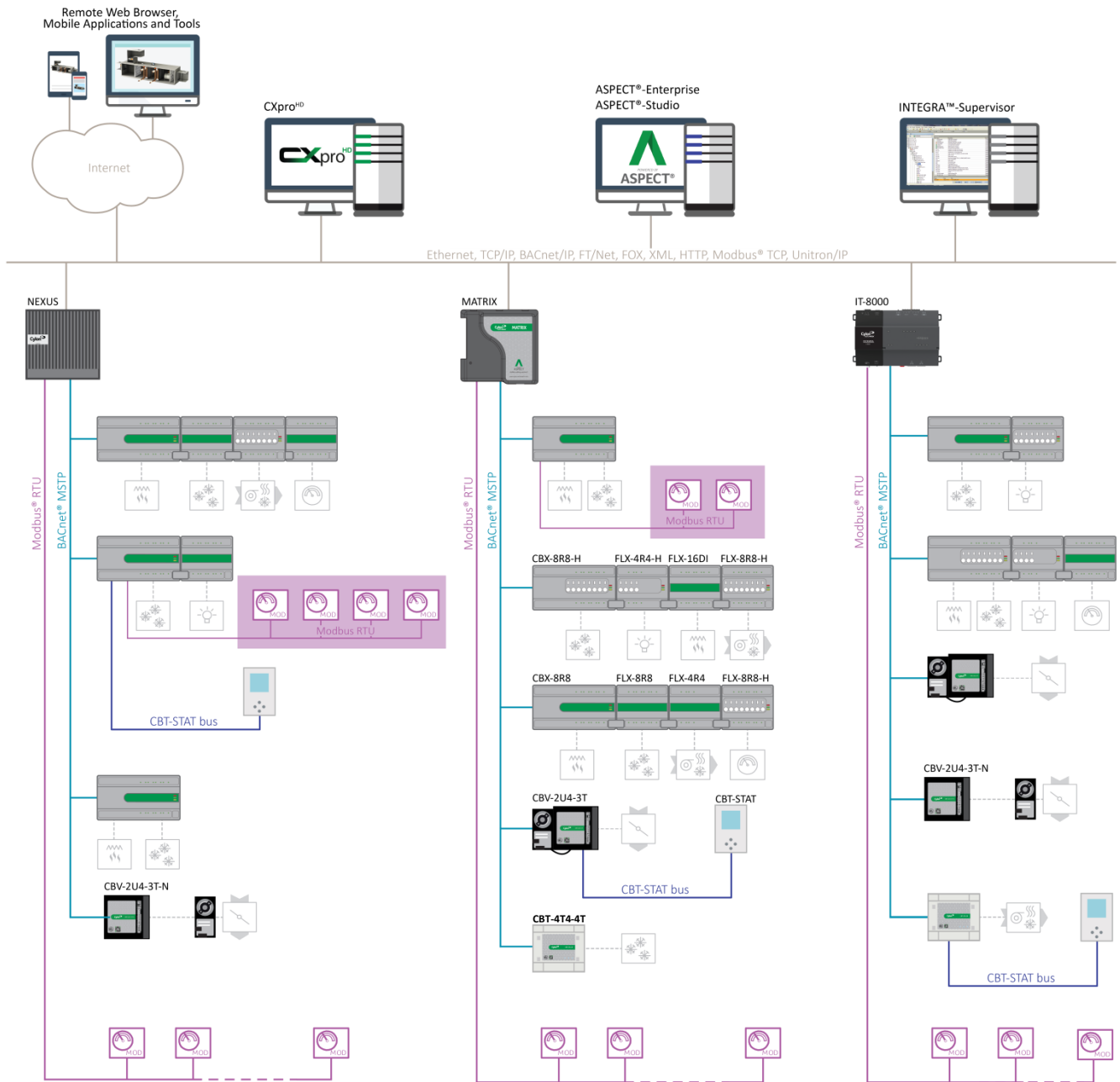
INTERFACE

Engineering Software

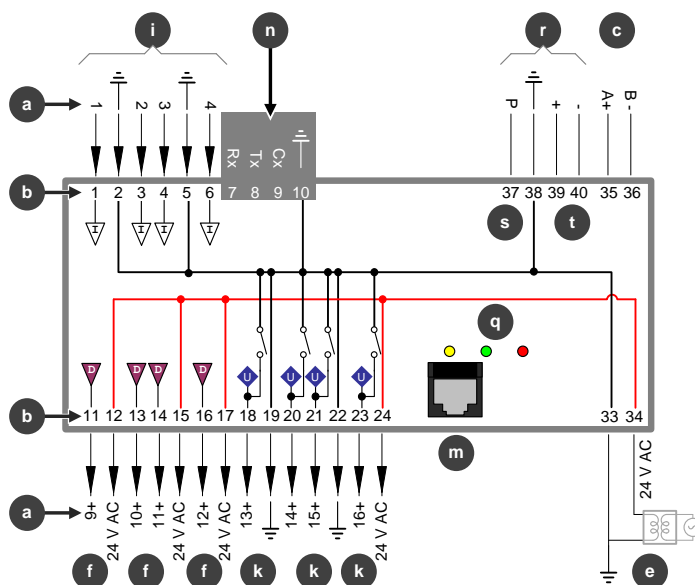
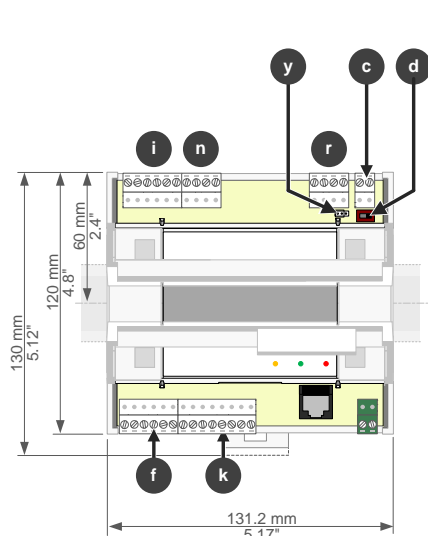
CXpro^{HD}



SYSTEM ARCHITECTURE



DIMENSIONS AND WIRING



Note: Terminals 12, 15, 17, 24, and 34 are connected internally. When a controller is powered, 24 V AC is available for low current devices at terminals 12, 15, 17, and 24. The total combined current must be less than 0.9 A.

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 $\frac{\square}{\text{---}}$) must be connected to Earth. Cylon recommend 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 $\frac{\square}{\text{---}}$) must be connected to Earth. Cylon recommend that this is done at the 24 V AC transformer.

f Digital Outputs

i Universal Input

j UniPut™

k UniPuts™ + Triac

l Airflow Sensor


m Service Port (RJ-45)


Note: Service Port must not be connected until after the device is powered on.


n Service Port (screw terminal)


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
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
















Indicator LEDs

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.*



CAUTION - DANGER OF EXPLOSION IF BATTERY IS INCORRECTLY REPLACED. REPLACE ONLY WITH THE SAME OR EQUIVALENT TYPE RECOMMENDED BY THE MANUFACTURER. DISPOSE OF USED BATTERIES ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS.

Green LED

Continuous: Strategy servicing and no comms.

Flash rapidly (every 100 ms): Strategy not servicing.

Flash once a second: MSTP comms, and Strategy servicing.

Note: *When Service Port is in use, the Green LED blinks off as Service Port comms are received.*

Yellow LED

Off: Normal operation.

On: Priority Array set above 16, for one or more Hardware Points, by external BACnet Client, or by the Cylon Engineering Center.

Cycle left-to-right

Controller is in terminal mode.

Cycle right-to-left

Upgrade in progress while Controller is in terminal mode.

Note: *The strategy is not serviced while in upgrade mode.*

Cycle green to yellow

Globals communication/setup problem

Green and yellow flash simultaneously

Globals communication/setup problem **and** Hardware Point Priority Array is set above 16 by external BACnet Client, or by the Cylon Engineering Centre.

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
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Keypad Port


Room Display / CBT-STAT Power supply

Room Display / CBT-STAT RS485

Room Display / CBT-STAT Terminator



OFF (Not Terminated)



ON (Terminated)