AMERICAN AUTO-MATRIX®
A Cylon Energy Inc. Company

CBM Range

BACnet® Plant Controller

CBM08 / CBM12 / CBM16
CBM24 / CBM24k / CBM24LC

The CBM (BACnet Main Plant) range of controllers are ideally suitable for main plant control, including AHUs, Boilers, Rooftop Units, Lighting, etc.

BENEFITS

Unique Flexibility with UniPuts™

The CBM range has all the benefits of the Cylon BACnet range which uniquely presents UniPuts™ - a revolutionary answer to flexible point configuration, offering maximized utilization of controller capacity along with flexibility in strategy changes. Built on a modern web-based architecture, it has a wide application scope with the flexibility of being stand-alone or network enabled.

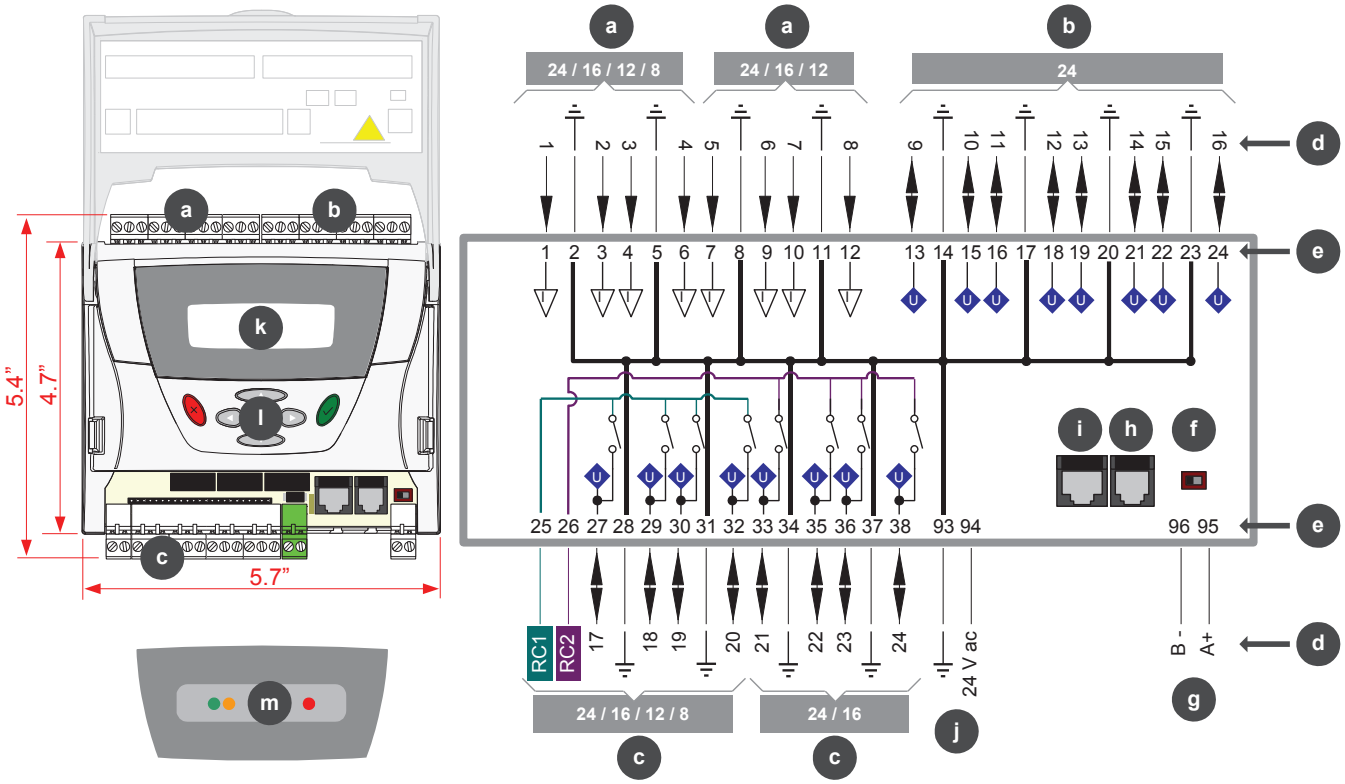
Cost-effective, Low Entry Point for Building Control

The CBM range 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.

Highly Programmable & Extendable via Web-enabled HVAC Technology

The CBM range offers an advanced web-based 32-bit architecture, with advanced programmability. built-in diagnostics, along with expanded data logging and strategy storage, is further enhanced by UniPuts, offering up to 8 Universal inputs, up to 8 UniPuts (AI/DI/AO/DO) and up to 8 UniPuts with relays.

	CBM08	CBM12	CBM16	CBM24	CBM24k	CBM24LC
UniPuts				8	8	8
UniPuts + Relays Hardware connections that can be used as inputs, outputs, or relays (software selectable)	4	4	8	8	8	8
Universal Inputs Hardware connections that can be used as analog or digital inputs (software selectable)	4	8	8	8	8	8
Controllers per Fieldbus (up to)	32	32	16	16	16	16
Strategy Blocks	1024	1024	1024	1024	1024	400
Flash-upgradeable Firmware						
Time-stamped data logs for increased flexibility and longer monitoring times						
32 data logs with up to 1024 entries per catalog						
Powerful diagnostics with rapid error-free commissioning technologies						



		CAUTION - DANGER OF EXPLOSION IF BATTERY IS INCORRECTLY REPLACED. REPLACE ONLY WITH THE SAME OR EQUIVALENTTYPE RECOMMENDED BY THE MANUFACTURER. DISPOSE OF USED BATTERIES ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS.
	a	**Universal Input**
	b	**UniPut**
	c	**UniPut + Relay** When these outputs are configured as 'relay' they use either terminal 25 RC1 or terminal 26 RC2 as their common point. Otherwise, they use 28, 31, 34, or 37 (⏚) as their common point
RC1 RC2		**Relay Common**
⏚		**Common**
	d	**Point Numbers**
	e	**Terminal Numbers**
	f	**Fieldbus Terminator**
		OFF (fieldbus not terminated at this controller)
		ON (fieldbus terminated at this controller)
	g	**Fieldbus Port**
	h	**External Keypad Port**
	i	**Service Port** Note: Service Port must not be connected until after the device is powered on.
	j	**Power 24 V AC**

KEYPAD VARIANTS

k	**Text Display (LCD)**
l	**Internal Keypad** Pressing △ and 🍃 together toggles the display between configuration and program modes Pressing ▽ and 🍃 changes the contrast of LCD display

NON-KEYPAD VARIANTS

m	**Indicator LEDs**
	Red LED Continuous : Optional battery is healthy Flash once/second : No battery / battery low *bettery is present only on custom versions*
	Green LED Continuous : Strategy servicing and no comms Flash rapidly (every 100ms) : Strategy not servicing Flash once/second : MS/TP comms & strategy servicing *when service port is in use, the green LED blinks off as service port communication is received*
	Orange LED Off : Normal operation On : Priority Array set above 16, for one or more hard-ware points, by external BACnet client or by the CEC
	Cycle left to right (green-orange-red) : terminal mode
	Cycle right to left (red-orange-green) : upgrade in prog-ress while in terminal mode *strategy not serviced while in terminal mode*
	Cycle green to orange : global comms/setup problem
	Green and orange flash simultaneously : global comms/ setup problem and priority array set above 16 by external BACnet client, or the CEC.

SPECIFICATIONS

MECHANICAL

Size (excluding terminal plugs)	5.7 x 4.7 x 2.6″ (144 x 118 x 65 mm)
Enclosure / Mounting	Injection-molded ABS / DIN Rail

ENVIRONMENT *Intended for field installation within another enclosure*

Temperature / Humidity	32˚ - 122˚ F (0˚ - 50˚ C) / 0 - 90 % Relative Humidity non-condensing
EMC Immunity	EN 50082-1
EMC Emission	EN 55011 Class B

WIRING *Use Copper or Copper-clad Aluminum conductors only*

Termination	PCB-mounted plug terminal connections
Conductor Area	Max : AWG 12 (3.09 mm^2) Min : AWG 22 (0.355 mm^2)

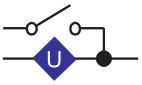
ELECTRICAL

Supply Requirements	24 VAC +/- 20% 50/60 Hz
Transformer Rating	With UCKRA420 : 25 VA without UCKRA420 : 20 VA
Power / Fuse Rating	10 Watts maximum / 1A resettable

PROCESSOR

Type	Hitachi (Renesas) SuperH SH17034 32-bit RISC @ 20 Mhz
Operating System Memory	512k flash
User-Programmable Memory	System Memory 768kb flash & 128kb RAM (battery backup for two years)
Real-time Clock	Battery backup for two years

INPUTS/OUTPUTS *Screened cable is recommended for all input connections*

	CBM24 CBM24K CBM24LC	CBM16	CBM12	CBM08	
Universal Inputs 	8 (pts 1-8)	8 (pts 1-8)	8 (pts 1-8)	4 (pts 1-4)	**Software Selectable Interfaces** • Active Input 0 – 10 V @ 182 KΩ. 10-bit resolution • Passive Input for a large range of temp sensors, 10K3A1 sensors recommended. 10-bit resolution • Active Current Input 0 – 20 mA @ 390 Ohms. 10 bit-resolution • Digital Volt-Free contact @ 1 mA continuous • Pulse Counting up to 20 Hz, minimum pulse width 25 mS • Potentiometer input (0 KΩ -10 KΩ, 1 KΩ - 11 KΩ etc)
UniPuts 	8 (pts 9-16)	0	0	0	**Software Selectable Interfaces** • Active Input 0 – 10 V @ 40 KΩ. 10-bit resolution • Active Output 0 – 10 V @ 20 mA max load • Digital Volt-Free contact @ 25 mA continuous • 24 VAC detect
UniPuts + Relays 	8 (pts 17-24)	8 (pts 17-24)	4 (pts 17-20)	4 (pts 17-20)	**Software Selectable Interfaces** • Active Input 0 – 10 V @ 40 KΩ. 9-bit resolution • Active Output 0 – 10 V @ 20 mA max load • Digital Volt-Free contact @ 25 mA continuous • N.O. 24 VAC relay contacts, 2 A continuous / 15 A inrush • 24 VAC detect

COMMUNICATIONS

RS-232 Service Port	@ 1.2k, 2.4k, 9.6k 19.2k, or 38.4k Baud (defaults to 38.4k) [cable: CC20/CAB]
BACnet MS/TP Fieldbus Port	RS-485 @ 9.6k, 19.2k, 38.4k, or 76.8k Baud (defaults to 38.4k)
Keypad Port	@ 9.6k Baud, RJ-11 socket
Modem	Modem connection supported through RS-232 service port [cable: CC20/CAB]

INTERFACE

Software	Cylon Engineering Center / BACnet Operator Workstation
Optional Internal Keypad	CBM24K model - LCD 4x20 characters, 6 buttons. Compatible with UCKRA420
Remote Keypad	UCKRA420 Serial Text Keypad connected via RJ-11 port. Maximum cable length 50 m

SOFTWARE FEATURES

Configuration Mode	Accessible via Internal or External Keypad/display device
Firmware Upgrading via Service Port	

	CBM08, CBM12, CBM16, CBM24, CBM24k	CBM24LC
Maximum Number of Analog Points	1024	1024
Maximum Number of Digital Points	1024	1024
Maximum Number of Strategy Blocks	1024	400
Maximum Controllers per Fieldbus	99*	99*
	It is recommended for typical conditions that the number of main plant controllers on a main plant fieldbus be limited to 16. MS/TP devices with a fractional (1/4 or smaller) unit load will be required in order to extend a single fieldbus trunk beyond 32 devices. Both CBM and CBT controllers are 1/4 load devices. Please refer to MAN0106 for recommendation on configuring a specific network for optimal communication speeds.	
Maximum Time Schedules	10	10
Maximum Time Schedules Weekly Events	24	24
Maximum Time Schedules Exceptions	5	5
Maximum Time Schedules Exception Events	10	10

APPROVALS

UL Listed (CDN & US)

UL916 Energy Management Equipment

File Number E176435

AMERICAN AUTO-MATRIX
A Cylon Energy Inc. Company

American Auto-Matrix
One Technology Lane
Export, PA 15632
(724) 733-2000

aam@aamatrix.com
www.aamatrix.com

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