

MERLIN NX

COMPACT VAV CONTROLLER CLMEVA423B24N



PRODUCT DATA



GENERAL

The CLMEVA423B24N controller is part of the MERLIN NX family. The MERLIN NX family of unitary controllers provide flexible, freely programmable, demand-led control that delivers tangible benefits to reduce energy spends while driving new levels of functionality and efficiency in today's buildings. These scalable and freely programmable BACnet MS/TP-based unitary controllers utilize smart engineering and commissioning tools, and Sylk™ bus technology. Multiple flexible configurations can be achieved to address specific applications with the Arena NX (Niagara) tool.

FEATURES

- Compact design for small enclosures.
- Easy to install on round ducts.
- Three 24 VAC solid state relay outputs with 1.5 A continuous and 3.5 A in-rush for 100 milliseconds per DO channel.
- Integrated DP sensor and field replaceable 5 Nm actuator with 90 sec runtime at 60 Hz (108 sec at 50 Hz).
- High-precision bi-directional DP sensor to achieve precise measurement even at low air flow.
- Supports Auto-baud rate adaption for BACnet MS/TP communication.
- Auto MAC-addressing.
- Color-coded removable terminal blocks to simplify wiring and replacement.
- Supports offline and online programming. Online programming enables quick application optimization using single tool.
- Supports concept of flexible applications.
- Bulk commissioning of similar controller applications (Master-Follower concept).
- BACnet compliant time program.
- 24 VAC power supply.
- 20 VDC at 75mA auxiliary supply for field devices.
- Sylk™ bus two-wire polarity insensitive interface connects to CentraLine Sylk™ wall modules without using I/O points.
- Real-time clock, a supercapacitor for 72 Hours data retention.
- Qualified CE, UL916
- BACnet BTL®- Listed as BACnet Advanced Application Controller (B-AAC).

SYSTEM OVERVIEW

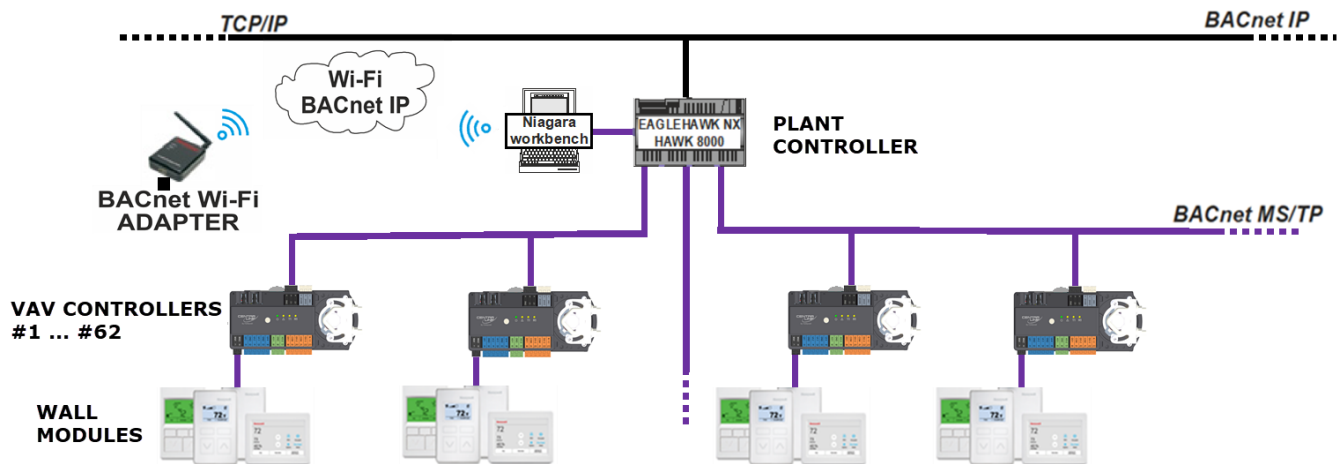


Table 1. Ordering Information

Controller Model	Description	Power supply	UIs	AOs	DOs	Total no. of I/Os	Air flow sensor	Integrated Actuator / Declutch	Remarks
CLMEVA423B24N	MERLIN NX Compact VAV with integrated actuator	24 VAC	4	2	3	9	1	Yes	72 hours data retention ^a

Table 2. Replacement Parts

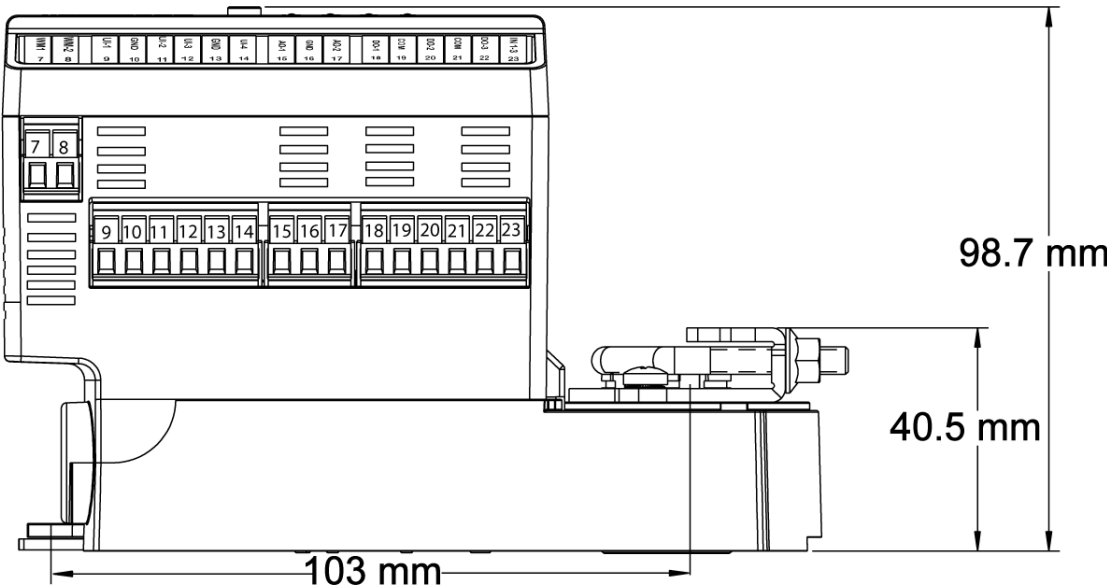
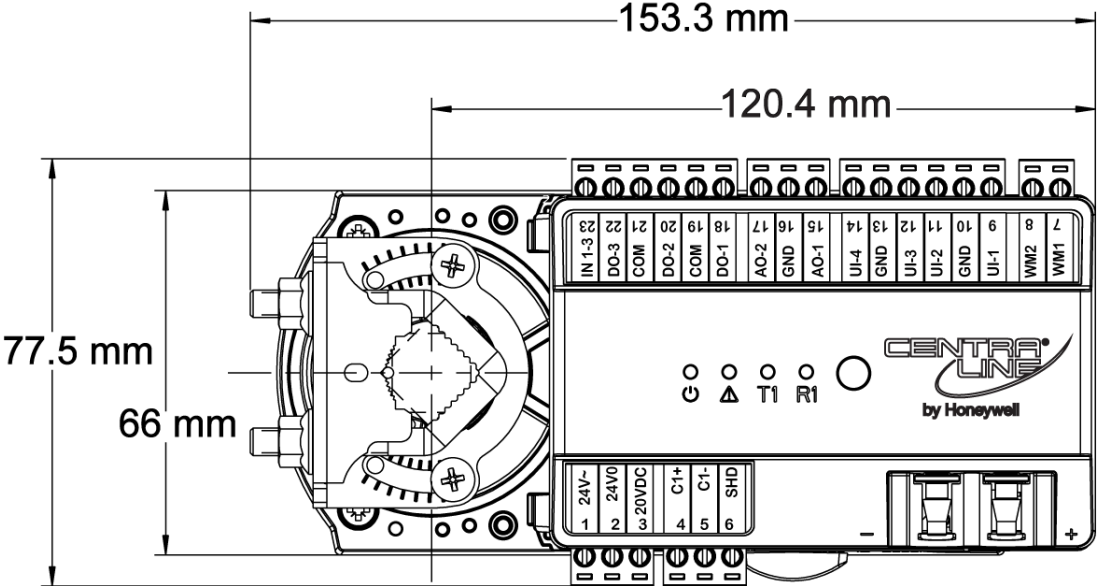
Device Model/ Part Number	Description	Power supply	UIs	AOs	DOs	Total no. of I/Os	Air flow sensor	Integrated Actuator /Declutch	Remarks
CLMEV423B24N	MERLIN NX Compact VAV controller only	24 VAC	4	2	3	9	1	No	72 hours data retention ^a
COVA	MERLIN NX Compact VAV actuator only	24 VAC	-	-	-	-	-	-	-
32351465-001	Anti-rotation bracket	-	-	-	-	-	-	-	-

^a The controller includes a supercapacitor to power the built-in real time clock for 72 hours. In case of power failure, the supercapacitor retains the time set in controller for 72 hours. After 72 hours, the time will reset to default factory time until user performs BACnet Time Sync.

Table 3. Controller Part number Description

Legend	Description
CLME	Brand Identifier
V	VAV Application
A	Actuator
4	Universal Inputs
2	Analog Outputs
3	Digital Outputs
B	BACnet MS/TP
24	24VAC power supply
N	Firmware version - Niagara

DIMENSIONS



SPECIFICATIONS

Electrical		
Power Supply	20-30 VAC, 50/60 Hz, Class 2 transformer	
Power Consumption	Controller and Actuator Load (nothing connected to IOs)	max. 9 VA
	Maximum load including external loads	max. 100 VA
Auxiliary Output	20 VDC ± 10% at 75 mA	
Real Time Clock	72-hr backup after power failure	
Indicator LEDs	Green — Power	
	Yellow — Status, BACnet MS/TP transmit and receive	
CPU	32-bit MK24FN NXP Kinetis Cortex M4	
Memory Capacity	K24 Flash	1MB
	K24 RAM	256KB
	SPI Flash	4MB
Communication		
BACnet MS/TP	Auto-baud rate adaption. Cable length 1200 m for up to 76.8 kbps. Refer also to communication section.	
Sylk™ Bus	2-wire, polarity-insensitive	
Actuator		
Torque	5 Nm	
Run Time	Floating 108 s at 50 Hz	
	Floating 90 s at 60 Hz	
Mounting Shaft	Round	8-16 mm (5/16 – 5/8 in.)
	Square	6-13 mm (15/64 – 33/64 in.)
	Shaft length ≥ 44 mm (1 47/64 in.).	
Differential Pressure Sensor (Bi-Directional)		
Range	±500 Pa (±2.0 in. H ₂ O)	
Accuracy	±3% of measured value	
Inputs and Outputs		
I/O	4 UI, 2 AO, 3 Digital Outputs	
Analog Output Resolution	16-bit digital to analog converter	
Analog Voltage Outputs	Voltage Output Range	0-10 VDC
	Output Current	10.0 mA DC
Analog Current Outputs	Current Output Range	4-20 mA DC
	Output Load Resistance	Maximum 550 Ω
Digital Outputs	Voltage Rating	20-30 VAC at 50/60 Hz
	Current Rating	1.5 A continuous and 3.5 A in-rush for 100 ms. Per DO channel.

Weight and Dimensions		
Dimensions (L X W X H)	153.3 X 77.5 X 98.7 mm.	
Weight	0.6 kg	
Mounting	Fixation with bracket and shaft	
Operating Environmental (Position Insensitive)		
Storage	-40 °C to 66 °C	
Operation	0 °C to 50 °C	
Humidity	5% to 95% RH., non-condensing	
Protection	IP20, NEMA-1	
Pollution Level	2	
Certification		
<ul style="list-style-type: none"> • UL916 certified • BTL-listed, BACnet B-AAC profile • CB Certificate • CE approved • FCC part 15B-compliant. • RoHS conformity • IC (Industrial Canada) 		
Universal Input (UI) Circuits		
Input Type	Sensor type	Operating Range
Universal Input Resolution	16-bit analog to digital converter	
Room/Zone Discharge Air Outdoor Air Temperature	20 KΩ NTC	-40 °C to 93 °C
Outdoor Air Temperature	PT1000 (IEC751 3850)	-40 °C to 93 °C
Resistive Input	Custom	100 Ω to 100 KΩ
Voltage Input	Transducer, Controller	0-10 VDC
Current Input	External 499Ω resistor required between UI and GND	0-20 mA DC
Discrete Input	Closed Contact	≤100 Ω
	Open Contact	≥100KΩ
Pulse Input ^b	Counter/Meter	• Max. frequency: 15 Hz
		• Min. pulse width: 33 ms.
^b One Universal Input (UI-1) on the CLMEVA423B24N is user selectable as a fast digital pulse meter.		

INTERFACES AND TERMINALS

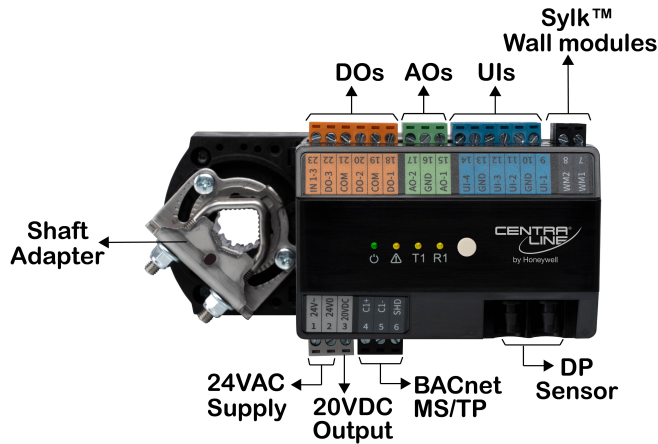


Table 4. Assigned Terminals

Terminal	Printing	Function
1	24 V~	Supply Voltage (24 V)
2	24 V0	Supply Voltage (GND), internally connected with terminal 10, 13 and 16
3	20 VDC	20 VDC power out
4,5	C1+, C1-	Removable BACnet MS/TP interface
6	SHD	Shield for external wiring support. It is not connected internally.
7,8	WM1, WM2	Removable interface for Sylk™ bus
9	UI-1	Universal Input 1
10	GND	Ground
11	UI-2	Universal Input 2
12	UI-3	Universal Input 3
13	GND	Ground
14	UI-4	Universal Input 4
15	AO-1	Analog Output 1
16	GND	Ground
17	AO-2	Analog Output 2
18	DO-1	Digital Output 1
19	COM	Supply voltage common terminal for DO. It is internally connected to terminal 21 but not to the controller's GND terminal.
20	DO-2	Digital Output 2
21	COM	Supply voltage common terminal for DO. It is internally connected to terminal 19 but not to the controller's GND terminal.
22	DO-3	Digital Output 3
23	IN 1-3	24V AC/DC input for DOs 1-3

STATUS INFORMATION

The LEDs on the top of the controller provides a visual indication of the status of the device. When the controller receives power, the LED appears in one of the following allowable states, as described below.



Table 5. Description of LED behaviors

Symbol	Color	Function
	Green	Power LED indicating firmware problems, hardware problems, etc.
	Yellow	Status LED indicating firmware problems, hardware problems, etc.
	Yellow ^c	LED indicating transmission of communication signals via the BACnet MS/TP interface.
	Yellow ^c	LED indicating reception of communication signals via the BACnet MS/TP interface.

^cIn case of no communication, LED will not glow.

Table 6. Status LED and power LED behaviors

Mode	Power LED (green)	Status LEDs (yellow)
Power failure	OFF	OFF
Device error ^d	ON	ON
Firmware Download	ON/OFF (1 Hz)	ON/OFF (1 Hz)
No application	ON/OFF (0.5 Hz)	ON/OFF (0.25 Hz)
Broken sensor	ON/OFF (0.25 Hz)	Stays ON
Short-circuiting	ON/OFF (0.5 Hz)	Stays ON
Auto-MAC	ON/OFF (1 Hz)	ON/OFF (0.5 Hz)
Unacknowledged alarm	ON/OFF (2 Hz)	ON/OFF (2 Hz)
Normal operation	ON/OFF (0.5 Hz)	Stays OFF

^dPlease return the controller for repair. The ON/OFF frequencies listed in table above can be converted from "Hz" (i.e., "ON/OFF per second") to "ON/OFF per minute" by multiplying them by 60.

WALL MODULES

A variety of wall modules can be used in conjunction with the controller to perform room temperature sensing, setpoint adjustment, fan speed manual override, and occupancy override.

Wall Modules Supported for Connection to Sylk Interface

The following wall module types are supported for connection to the controller's Sylk interface:

- CLCMTR40, CLCMTR40-H, CLCMTR40-H-CO2, and CLCMTR40-CO2
- CLCMTR42, CLCMTR42-H, CLCMTR42-H-CO2, and CLCMTR42-CO2
- CLCMTR71, CLCMTR71-H, CLCMTR75, and CLCMTR75-H
- CLCMTR120 (TR75E) and CLCMTR120-H (TR75-HE).

Wall Modules Supported for Connection to I/Os

The following wall module types are supported for connection to the controller's respective I/Os:

- CLCM1C155A and CLCM4C155A;
- CLCM1T11N, CLCM2T11N, CLCM4T111, CLCM5T111, and CLCM6T111.

COMMUNICATION

BACnet MS/TP

The controller features an RS485 interface (Terminals 4,5, and 6) suitable for BACnet MS/TP communication. The terminal block containing it is black.

Table 7. Baud rate

Baud rate	Maximum cable length
9.6, 19.2, 38.4 , 57.6, and 76.8 kbps	3600 ft (1200 m)

The controller supports auto-baud rate adaption for BACnet MS/TP communication at all of the aforementioned baud rates. For information on wire gauge, maximum permissible cable length, possible shielding and grounding requirements, and the maximum number of devices which can be connected to a bus, refer to standard EIA-485.

Each controller uses a high-quality EIA-485 transceiver and exerts 1/8 unit load on the MS/TP network.

Automatic MAC Addressing

In contrast to many other MS/TP controllers, the CLMEVA423B24N controller features automatic MAC addressing. There is no need to manually set the MAC address.

INSTALLATION

CLMEVA423B24N controllers include the direct-coupled actuator with declutch mechanism, which is shipped hard-wired to the controller. The actuator mounts directly onto the VAV box damper shaft and has up to 5 Nm torque, 90-degree stroke, and 108 second timing at 50 Hz and 90 second timing at 60 Hz. The minimum VAV damper shaft length is 44 mm. Please see MERLIN NX COMPACT VAV Controller CLMEVA423B24N - Installation Instructions (EN1Z-1061GE51) for more information.

RELATED TECHNICAL LITERATURE


Table 8. Related technical literature

Title	Reference
MERLIN NX COMPACT VAV Controller CLMEVA423B24N - Installation Instructions	31-00332 (EN1Z-1061GE51)
MERLIN NX COMPACT VAV Controller CLMEVA423B24N - Mounting Instructions	31-00331M (MU1Z-1061GE51)
MERLIN NX COMPACT VAV Controller CLMEVA423B24N - Migration Guide	EN2Z-1061GE51
Niagara IRM Engineering Tool - User Guide	EN2B-0414GE51
CLCMTR40x/TR42x - Specification Data	EN0Z-0990GE51
CLCMTR40x/TR42x - Installation Instruction	EN1Z-0990GE51

TRADEMARK INFORMATION

BACnet™ is a trademark of ASHRAE Inc.
Sylk™ is a trademark of Honeywell International Inc.

Manufactured for and on behalf of the Connected Building Division of Honeywell Products and Solutions SARL, Z.A. La Pièce, 16, 1180 Rolle, Switzerland by its Authorized Representative:

<p>Centraline Honeywell GmbH Böblinger Strasse 17 71101 Schönaich, Germany Phone+49 (0) 7031 637 01 www.centraline.com</p>	<p style="text-align: center;">Subject to change without notice 31-00330E-01 (en0z-1061ge51 R0221)</p> <div style="text-align: right;">  by Honeywell </div>
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