

TECHNICAL DATA SHEET

DS0129 rev 14

Field Level eXpansion (FLX) modules



DESCRIPTION

Field Level eXpansion (FLX) modules provide I/O expansion to the CBXi and CBX Series of BACnet® field controllers. FLX expansion modules are available in a variety of models to allow maximum flexibility in achieving the required point configuration to meet the most complex applications.

Part of Cylon's CB Line and CBX System, FLX modules feature models with UniPuts™ with Relay, Universal Inputs as well as Digital Inputs.

APPLICATION

Use the FLX I/O expansion modules with the CBX, CBXi and FBXi Series of BACnet controllers to extend their capacity to meet input and output point requirements for Air Handling Units, Boiler Rooms, Plants and Lighting Control applications.

FLX-4R4

4 UniPuts + Relays

Hardware connections that can be used as inputs, outputs or relays (software selectable)

4 Universal Inputs (supports a variety of thermistors and RTDs that range from 0 to 450 kΩ)

FLX-8R8

8 UniPuts + Relays

Hardware connections that can be used as inputs, outputs or relays (software selectable)

8 Universal Inputs (supports a variety of thermistors and RTDs that range from 0 to 450 kΩ)

FLX-16DI

16 Digital Inputs

FLX-4R4-H, FLX-8R8-H

Additionally includes Hand/Off/Auto Local Override Function

LED status on all I/O channels provides indication of fault or override status

Compact form factor to maximize enclosure space

Easy module expansion using simple bus connectors

Accessories

FLX-PS24 Power Supply Module

FLX-RMC Remote Module Connector

PRODUCT SELECTION CHART

		FLX-4R4	FLX-4R4-S	FLX-4R4-H	FLX-8R8	FLX-8R8-S	FLX-8R8-H	FLX-16DI
Service		Expansion Module	Expansion Module	Expansion Module	Expansion Module	Expansion Module	Expansion Module	Expansion Module
I/O Point Qty	UniPuts with Relay ⁽¹⁾	4	4	4	8	8	8	0
	Universal Inputs	4	4	4	8	8	8	0
	Digital Inputs	0	0	0	0	0	0	16
Input Options	Voltage 0 ... 10 V @ 40 kΩ	✓	✓	✓	✓	✓	✓	
	Resistance 0 ... 450 kΩ	✓	✓	✓	✓	✓	✓	
	Temperature -40 °C ... +110 °C (-40 °F ... +230 °F)	✓	✓	✓	✓	✓	✓	
	Current 0 ... 20 mA @ 390 Ω	✓	✓	✓	✓	✓	✓	
	Digital Volt-Free contact	✓	✓	✓	✓	✓	✓	✓
	Digital 24 V AC detect	UniPuts only	UniPuts only	UniPuts only	UniPuts only	UniPuts only	UniPuts only	
	Pulse counting	✓	✓	✓	✓	✓	✓	✓
Output Options	Analog 0 ... 10 V	✓	✓	✓	✓	✓	✓	
	Digital 0 ... 10 V	✓	✓	✓	✓	✓	✓	
	Relay Contacts 24 V AC	✓	✓	✓	✓	✓	✓	
HOA Switch & Pot.				✓			✓	
18 V Aux Power		✓	✓	✓	✓	✓	✓	✓
UL 864 UUKL compliant			✓			✓		

Note (1) : UniPuts are software configurable for point types AI, DI, AO or DO-R.

SPECIFICATIONS

MECHANICAL

Size (excluding terminal plugs)	FLX-4R4 FLX-4R4-H FLX-8R8 FLX-8R8-H FLX-16DI	104 x 89.5 x 57 mm [4.1 x 3.55 x 2.25"]
Enclosure	Flame-Retardant ABS DIN 43880 type-2 compatible	
Mounting	DIN rail	

CONNECTION

Note: Use Copper or Copper Clad Aluminum 70 °C (158 °F) conductors only.

Terminals	PCB mounted plug terminal connections
Conductor Area	Max: AWG 12 (3.31 mm ²) Min: AWG 22 (0.355 mm ²)
Maximum No. of FLX Modules per controller	CBXi Series : 5 (requires a FLX-PS24) CBX Series : 3

ENVIRONMENT

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

Ambient Temperature	-25 °C ... 50 °C (-13 °F ... 122 °F)
Ambient Humidity	0% ... 90% RH non-condensing
Storage Temperature	-30 °C ... +70 °C (-22 °F ... 158 °F)
EMC Immunity	EN 61326-1: 2013
EMC Emission	EN 61326-1: 2013 EN 61000-3-2: 2014 EN 61000-3-3: 2013
Approvals	UL Listed (CDN & US) UL916 Energy Management Equipment – File No. E176435
Safety	CE Approved

ELECTRICAL

FLX Power Connection	Proprietary FLX bus connector carries power and comms from a CBX-8R8(-H) or CBXi-8R8(-H) unit. A CBX or CBXi unit can supply power to up to 3 FLX modules.
Unit Rating	24 V AC ±20% 50 / 60Hz 16 VA
Auxiliary Power	18 V DC / 60 mA output

COMMUNICATIONS

FLX bus	115.2K Baud Max bus length (including extension cables): 30 m / 100 ft. using 18 AWG conductors 15 m / 50 ft. using 22 AWG conductors
FLX bus Connection	FLX bus connector carries inter-module communications and module power

INPUTS / OUTPUTS

Note: Shielded cable is recommended for all input connections.

UniPuts with Relay



When configured as Input:

Analog Input	Range: 0 ... 10 V @ 40 kΩ Accuracy: ±0.5% full scale [50mV]
Resistance measurement	Range: 0 ... 450 kΩ Accuracy: ±0.5% of measured resistance
Temperature measurement	Range: -40 °C ... +110 °C (-40 °F ... +230 °F) Accuracy: 10k NTC sensors (e.g. 10k Type 2 (10K3A1) or 10k Type 3 (10K4A1): ±0.3 °C, -40 to 90 °C (-40°F to 194°F); ±0.4 °C > 90 °C (194°F)
Current input	Range: 0 ... 20 mA @ 390 Ω

Note: Current Input requires user-supplied external 390 Ω resistance.

Accuracy: depends on user supplied external resistor

Digital Volt-Free contact, 2 mA contact-wetting current
Digital 24 V AC detect
Pulse counting up to 20 Hz, 25 ms - 25 ms

When configured as Output:

Analog Output 0 ... 10 V @ 20 mA max load, 12-bit resolution
Digital Output 0 ... 10 V @ 20 mA max load
Relay Contacts with ability to switch up to 24 V AC
Maximum Load: 24 V AC, 2 (1) A resistive (inductive) for all relay contacts

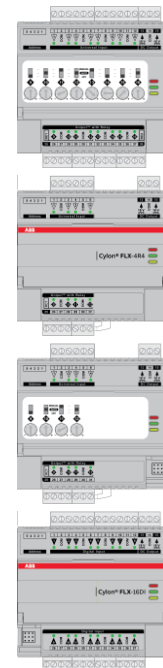
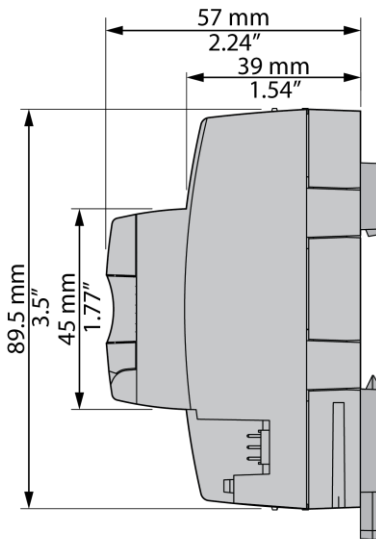
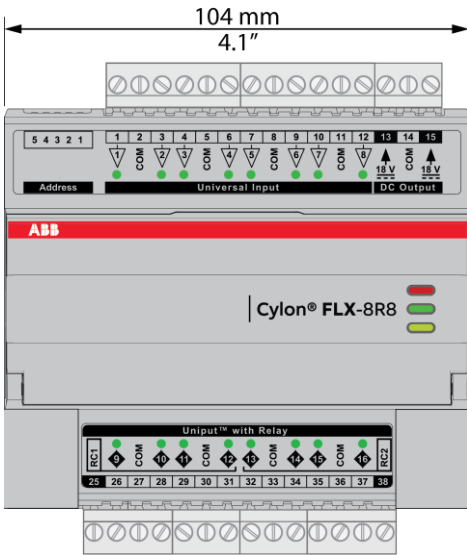
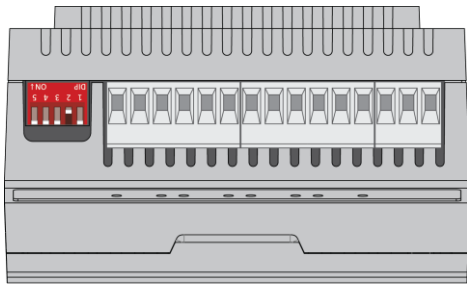
Universal Inputs



Analog Input	Range: 0 ... 10 V @ 130 kΩ Accuracy: ±0.5% full scale [50mV]
Resistance measurement	Range: 0 ... 450 kΩ Accuracy: ±0.5% of measured resistance
Temperature measurement	Range: -40 °C ... +110 °C (-40 °F ... +230 °F) Accuracy: 10k NTC sensors (e.g. 10k Type 2 (10K3A1) or 10k Type 3 (10K4A1): ±0.3 °C, -40 to 90 °C (-40°F to 194°F); ±0.4 °C > 90 °C (194°F)
Current input	Range: 0 ... 20 mA @ 390 Ω Accuracy: ±0.5% full scale [100µA]
Digital Volt-Free contact, 2 mA contact-wetting current	Pulse counting up to 20 Hz, 25 ms – 25 ms
Digital Inputs	Digital Volt-Free contact, 2 mA contact-wetting current Pulse counting up to 20 Hz, 25 ms – 25 ms

- Notes:**
- 1) All inputs and outputs are protected against short circuit, as well as over-voltage up to 24 V AC.
 - 2) Inputs use on-board 16-bit analog to digital convertor.
 - 3) 18 V DC supply, max 60 mA per FLX unit, is available for powering sensors.

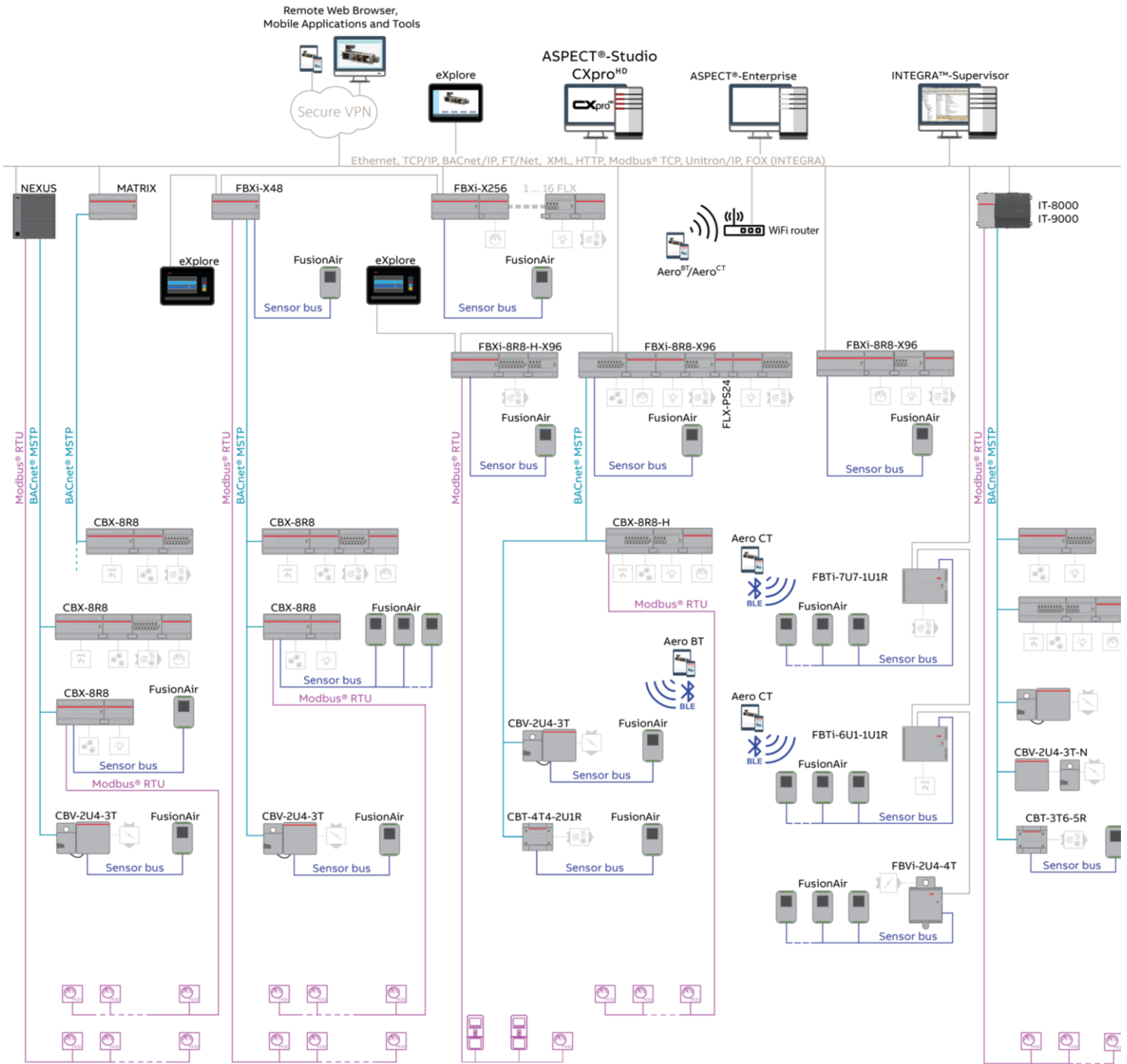
DIMENSIONS



ORDERING INFORMATION

Order Code	Product Name	Description
ABB2CQG200703R1021	FLX-16DI	FLX-16DI I/O module for FBXi, CBXi, CBX
ABB2CQG200704R1021	FLX-4R4	FLX-4R4 I/O module for FBXi, CBXi, CBX
ABB2CQG200705R1021	FLX-4R4-H	FLX-4R4-H I/O module for FBXi, CBXi, CBX
ABB2CQG200707R1021	FLX-8R8-H	FLX-8R8-H I/O module for FBXi, CBXi, CBX
ABB2CQG200706R1021	FLX-8R8	FLX-8R8 I/O module for FBXi, CBXi, CBX
ABB2CQG200709R1011	FLX-4R4-S	FLX-4R4-S I/O module for FBXi-8R8-X96-S (UUKL)
		Note: This variant complies with UL 864 UUKL and must be installed in accordance with Design Guide MAN0156
ABB2CQG200710R1011	FLX-8R8-S	FLX-8R8-S I/O module for FBXi-8R8-X96-S (UUKL)
		Note: This variant complies with UL 864 UUKL and must be installed in accordance with Design Guide MAN0156

SYSTEM ARCHITECTURE



FBXi / CBXi-8R8 / CBX-8R8	FLX-8R8 -H	FBVi-2U4-4T	INTEGRA Series	FusionAir Smart Sensor
CBXi-8R8-H / CBX-8R8-H	FLX-4R4-H	NEXUS Series	eXplore	CBT-STAT
CBV-2U4-3T	FLX-PS24	MATRIX-2 Series		UCU Room Display
FLX-8R8 / FLX-4R4 / FLX-16DI	CBT-4T4-2U1R			