



## FBXi Series

### FBXi-X256

### DESCRIPTION

The **FBXi Series** is a freely programmable range of BACnet® Controllers with native BACnet/IP communications support. The controllers are BTL listed (pending) BACnet Building Controller (B-BC) and are ideally suited for a wide range of applications for intelligent control of HVAC equipment, and electrical systems including lighting control and metering applications. The **FBXi-X256** controller supports multi-protocol communications simultaneously including BACnet/IP, BACnet MS/TP, Modbus® TCP and Modbus RTU.

Part of Cylon's **FLXeon Line** of BACnet field controllers, the **FBXi-X256** controller features support for up to sixteen FLX (Field Level eXpansion) series extension modules providing up to 256 points of control, and a dedicated input for Cylon's **CBT-STAT** or **UCU Room Display** intelligent room sensors. **FLX** I/O expansion modules are available in a variety of options to allow maximum flexibility in achieving the required point configuration.

**FLXeon's** scalable and modular architecture utilizes its embedded graphics and visualization engine **FLXvue** to get data from the #edge2cloud.

### APPLICATION

The **CBXi Series** is designed for a wide range of energy management applications for intelligent control of:

- HVAC equipment such as Central Plant, Boilers, Chillers, Cooling Towers, Pump Systems, Air Handling Units (Constant Volume, Variable Air Volume and Multi-zone), and Rooftop Units,
- Electrical systems such as lighting control, variable frequency drives and metering.

The **CBXi Series** can be used as an integration platform and natively supports the routing of either BACnet MS/TP to BACnet/IP or Modbus RTU to Modbus TCP without the need for gateways or additional hardware.

The controller accommodates available pre-engineered strategies or can be tailored to custom applications using **CXpro<sup>HD</sup>** programming software.

**BACnet/IP communications** with dual port Ethernet switch (star or daisy chain topology) and support for both DHCP and Static IP

**Network Time Protocol (NTP) support**

**Multi-protocol communications support** for BACnet MS/TP, Modbus TCP, Modbus RTU, HTTP, HTTPS and SSH

**Cylon Intelligent Room Sensor support**

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

**Compact form factor** to maximize enclosure space requirement

**Use of common FLX I/O expansion Modules throughout the CBXi Series range**

**Interchangeable with the CBX Series BACnet MS/TP controllers**

#### Accessories

Field Level eXpansion (FLX) I/O Modules (-H variants include Hand/Off/Auto Local Override Function)

**FLX-4R4(-H)** 4 UniPuts with Relay, 4 Universal Inputs

**FLX-8R8(-H)** 8 UniPuts with Relay, 8 Universal Inputs

**FLX-16DI** 16 Digital Inputs

**FLX-PS24** Power Supply Module

**FLX-RMC** Remote Module Connector

PRODUCT SELECTION CHART

		FBXi-X256	CBXi-8R8	CBXi-8R8-H	FLX-4R4	FLX-4R4-H	FLX-8R8	FLX-8R8-H	FLX-16DI
Service		Main Controller	Main Controller	Main Controller	Expansion Module	Expansion Module	Expansion Module	Expansion Module	Expansion Module
I/O Point Qty	UniPuts with Relay <sup>(1)</sup>	0	8	8	4	4	8	8	0
	Universal Inputs	0	8	8	4	4	8	8	0
	Digital Inputs	0	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			✓	✓	✓	✓	✓	✓	✓
BACnet MS/TP-to-IP Routing		✓	✓	✓					
Modbus TCP <sup>(2)</sup>		✓	✓	✓					
RS-485 Port <sup>(3)</sup>		BACnet MS/TP or Modbus RTU	BACnet MS/TP or Modbus RTU	BACnet MS/TP or Modbus RTU					
CBT-STAT Bus (UCU Room Display)		✓	✓	✓					

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

Note (2) : CBXi supports a maximum of 120 Modbus points across a maximum of 12 devices.

Note (3) : RS-485 Port 1 supports one communication protocol at a time.

When configured for BACnet MS/TP-to-IP routing, up to a maximum of 24 connected BACnet MS/TP devices are recommended.

When configured for Modbus RTU, a maximum of 120 points across a maximum of 12 devices that can be a combination of Modbus RTU or TCP may be connected.

## SPECIFICATIONS

### MECHANICAL

Size (excluding terminal plugs)	166 x 89.5 x 57 mm [6.5 x 3.55 x 2.25"]
Enclosure	Flame-Retardant ABS DIN 43880 type-2 compatible Enclosure IP 20
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 <sup>2</sup> ) Min: AWG 22 (0.355 mm <sup>2</sup> )

### 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

Supply Requirements	24 V AC/DC ±20 % 50/60 Hz
Supply	FBXi 30 VA (no FLX modules)
Rating	FBXi + 1 x FLX 42 VA FBXi + 2 x FLX 54 VA FBXi + 16 x FLX 222 VA
FLX Power Connection	Proprietary FLX bus connector carries power and communications from FBXi unit to power to up to 3 FLX modules. Using FLX-PS24 allows up to a total of 16 FLX modules.

### PROCESSOR

Type	Ti Sitara AM335X Dual-core ARM Cortex A8
Clock Speed	600 MHz
System Memory	4 GB eMMC Flash + 512 MB DDR3 DRAM
Real-Time Clock	Yes, backed for 7 days typical




### COMMUNICATIONS

Ethernet ports	Dual Switched 10/100BASE-TX (RJ45) Addressing: IPv4, IPv6 or Hostname / DHCP Client or Static IP Connection Topology: Daisy-chain BACnet/IP, BTL-BBC
Local serial port	USB Micro-B socket
USB ports	2 x Type-A USB connectors USB 2.0 5 V DC 2.5W
RS485 Port 1	Software selectable BACnet MS/TP or Modbus RTU RS485 @ 9K6, 19K2, 38K4 (default), 57K6, 76K8 or 115K2 Baud. Max cable length 1.2 km @ default ¼ unit load device. When configured as Modbus RTU a maximum of 120 points across a maximum of 12 devices that can be a combination of Modbus RTU or TCP may be connected. When configured as BACnet MS/TP a maximum of 24 devices is recommended.
Local STAT Port	RS485 with a maximum cable length 500 m Supports CBT-STAT and UCU Room Display
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

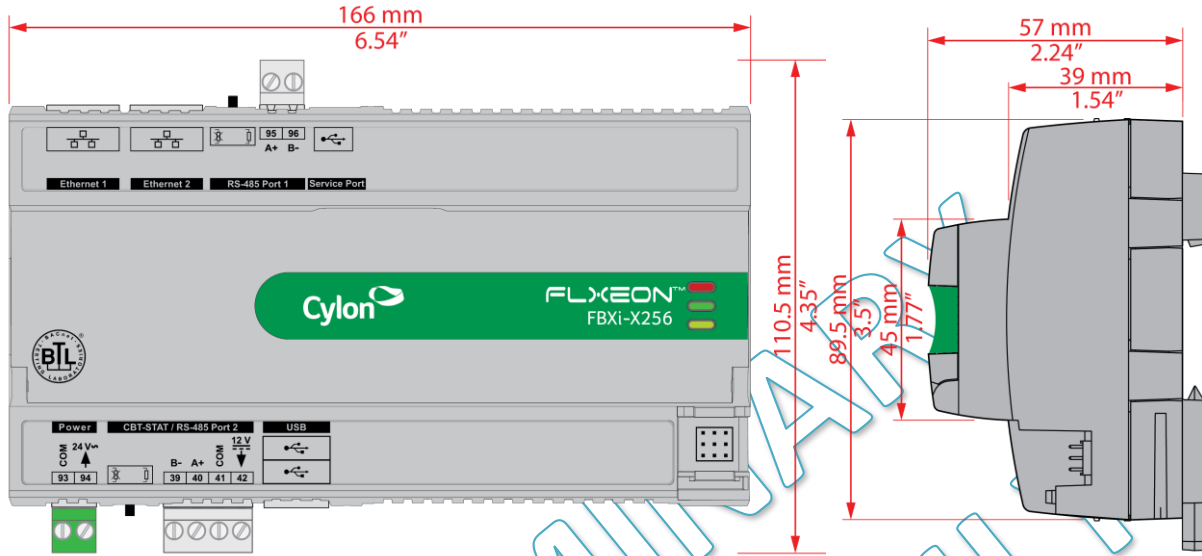
### SOFTWARE FEATURES

Maximum number of Strategy Modules	2000
Maximum number of Trendlog Modules	144
Entries per Trendlog	1024
Maximum BACnet Schedules	16
Exceptions per Schedule	5
Maximum number of Exposable BACnet Points	960
Data Security	Strategy and Set points backed up in Flash

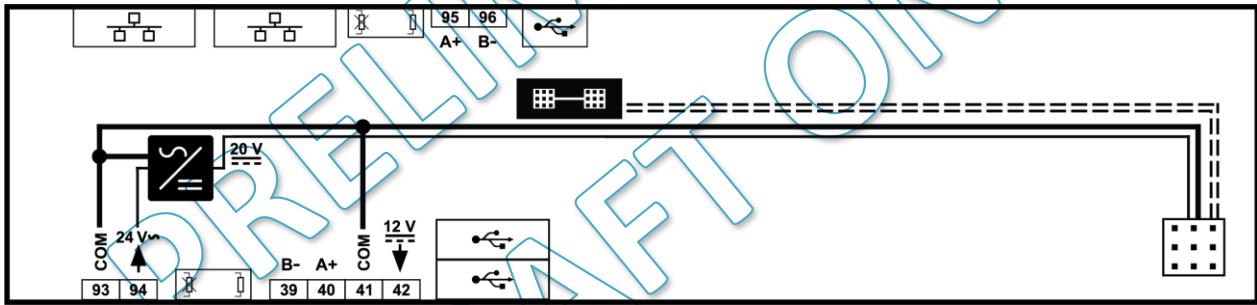
### INTERFACE

Engineering Software	CXpro <sup>HD</sup>	
Embedded Graphics and Visualisation	FLXvue	
Touchscreen	eXplore	 

### DIMENSIONS



### WIRING



# SYSTEM ARCHITECTURE

Remote Web Browser,  
Mobile Applications and Tools



Ethernet, TCP/IP, BACnet/IP, FT/Net, XML, HTTP, Modbus® TCP, Unitron/IP, FOX (INTEGRA)

