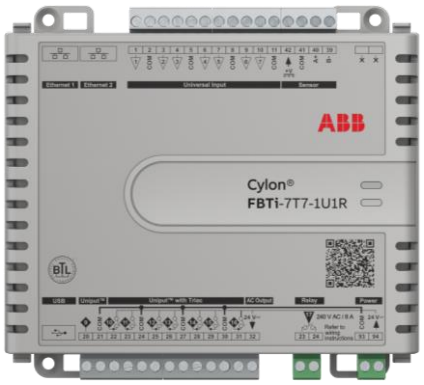
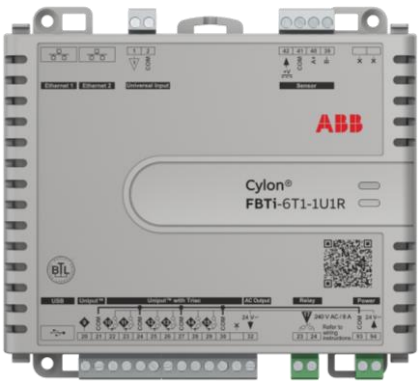
TECHNICAL DATA SHEET
DS0137 rev 30

Cylon® FBTi-Series





DESCRIPTION

The **FBTi Series** is a family of BACnet® Unitary Controller with native BACnet/IP communications support. BTL listed as BACnet Building Controller (B-BC), they perfectly complement the **FBVi** (IP VAV controller) in the IP terminal unit controller range. Utilizing the patented UniPut technology, it provides reliable and cost effective control solutions for Fan Coil Units, Chilled Ceilings, Heat Pumps and Roof Top Units.

Dual IP ports with failsafe switchover connects the FBTi to any open BACnet network and also provides seamless integration to the ABB Cylon system.

APPLICATION

The **FBTi Series** consists of 2 different input / output point versions. The 9 point version supports most Fan Coil Unit and Chilled Ceiling applications, while the 16 point version is optimized for higher end Fan Coil Unit, Heat Pump and Roof Top Units. Leveraging the ABB Cylon FusionAir sensor series, the **FBTi** can execute IAQ applications such as Demand Control Ventilation and optimize energy usage in the controlled terminal equipment. The **FBTi** is fully supported by the CXpro^{HD} programming software.

FBTi-7T7-1U1R	16 point IP Terminal Unit Controller
FBTi-6T1-1U1R	9 point IP Terminal Unit Controller

The **FBTi-7T7-1U1R** features 7 UniPuts™ with Triac, and 7 Universal Inputs. **FBTi-6T1-1U1R** features 6 UniPuts™ with Triac, and 1 Universal Input. Both feature 1 UniPut™ without Triac, a 240 V AC relay and a dedicated port for **ABB Cylon® FusionAir** sensors.

Dual IP ports
Failsafe switchover of IP communications in event of power interruption

Reference Applications
Available ASHRAE 36 applications support FCU and RTU applications for download

FusionAir Sensor Port
Enables IAQ applications using CO_2 and VOC sensors in FusionAir

Touch Free User Mobile App

Data Security
Strategy and setpoints backed up in Flash

UniPut™
ABB's patented technology that can be configured as analog / digital outputs or voltage inputs automatically by the downloaded strategy

UniPut™ with Triac
24 V AC @ 500 mA (powered)

Universal Inputs
Configurable as analog (voltage or current) or digital inputs. Automatically configured by the downloaded strategy

Relay Digital Output
Switch high inrush loads up to 240 V AC, 8 Amps

Up to 750 Strategy Blocks

Up to 15 Trendlogs

1024 entries per Trendlog

SPECIFICATIONS

COMMUNICATIONS

Ethernet ports	Dual Switched 10/100BASE-TX (RJ45) Addressing: IP address or Hostname / DHCP Client or Static IP Connection Topology: Daisy-chain, supports Spanning Tree BACnet/IP
USB port	Type-A USB connector USB 2.0 5 V DC 2.5 W
Sensor/RS485 Port 2	Software selectable Modbus RTU or FusionAir sensor bus. RS485 @ 9K6,19K2, 38K4(default), 57K6, 76K8 or 115k2 Baud. Max cable length 1.2 km @ default ¼ unit load device. RS485 sensor bus with a maximum cable length 500 m. Supports ABB Cylon® room sensors.
Modbus	Max. 320 Modbus points which can be a combination of Modbus RTU or TCP. Notes: Acts only as a Modbus Client for Modbus TCP communications, Acts only as a Modbus Master for Modbus RTU communications. Routing of Modbus RTU to Modbus TCP via strategies in CXpro[HD]
BACnet	Profile: BACnet Building Controller (B-BC), AMEV AS-A Listing: BTL B-BC

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 ±20 % max. 10 VA, Class-2 50/60 Hz
Cylon® room sensor Power Supply	12 V DC … 13.5 V DC / 200 mA output
Over-current protection	Internal re-settable fuse

SOFTWARE FEATURES

Maximum number of Strategy Modules	FBTi-7T7-1U1R	750
	FBTi-6T1-1U1R	500
Maximum number of Trendlog Modules		15
Entries per Trendlog		1024
Maximum BACnet Schedules		10
Maximum number of Exposable BACnet Points	FBTi-7T7-1U1R	500
	FBTi-6T1-1U1R	250

SECURITY

Data Security	Strategy and Set points backed up in Flash
Transport Layer Security	Support for TLS 1.33
Upgrade Security	Upgrade software bundles are signed

INPUTS / OUTPUTS

Note: Shielded cable is recommended for all input connections.

UniPut™

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

UniPuts with Triac

When configured as **Input** or **Output (UniPut)**:

As above

When configured as **Digital Triac Output**:

Triac @ 500 mA maximum. Switch live only.

Note: 500 mA shared by Triacs 1…4, and another 500 mA shared by Triacs 5…7

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

Relay Digital Output

Relay Contacts with ability to switch up to 240 V AC

Maximum Load: 240 V AC / 8 A max

24 V AC output terminal	Total current drawn from 24 V AC terminals is limited to 0.9 A

PROCESSOR

Type	TI Sitara AM335X 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

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)

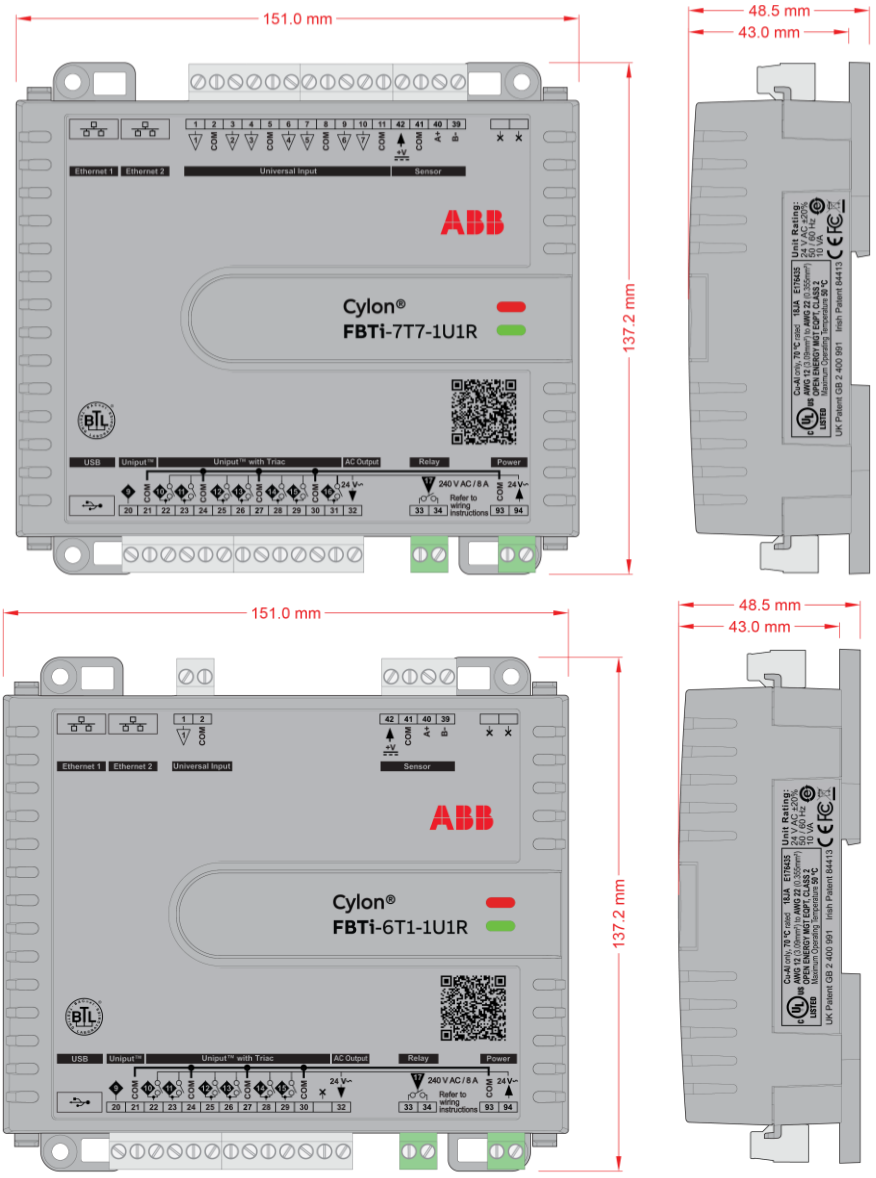
MECHANICAL

Size (Excluding terminal plugs)	5.9 x 5.4 x 1.7 ” [151 x 137 x 48.5 mm]
Enclosure	Injection molded flame retardant ABS
Mounting	The housing base is designed for snap-mounting on DIN rails or Direct Mounting **Note**: - The controller should not be freely accessible after mounting - Unit must be oriented such that powered relay terminals are at the bottom of unit

INTERFACE

Engineering Software	CXpro[HD]
Commissioning	Aero[bt]
Touchscreen	eXplore
Supervision	FusionAir

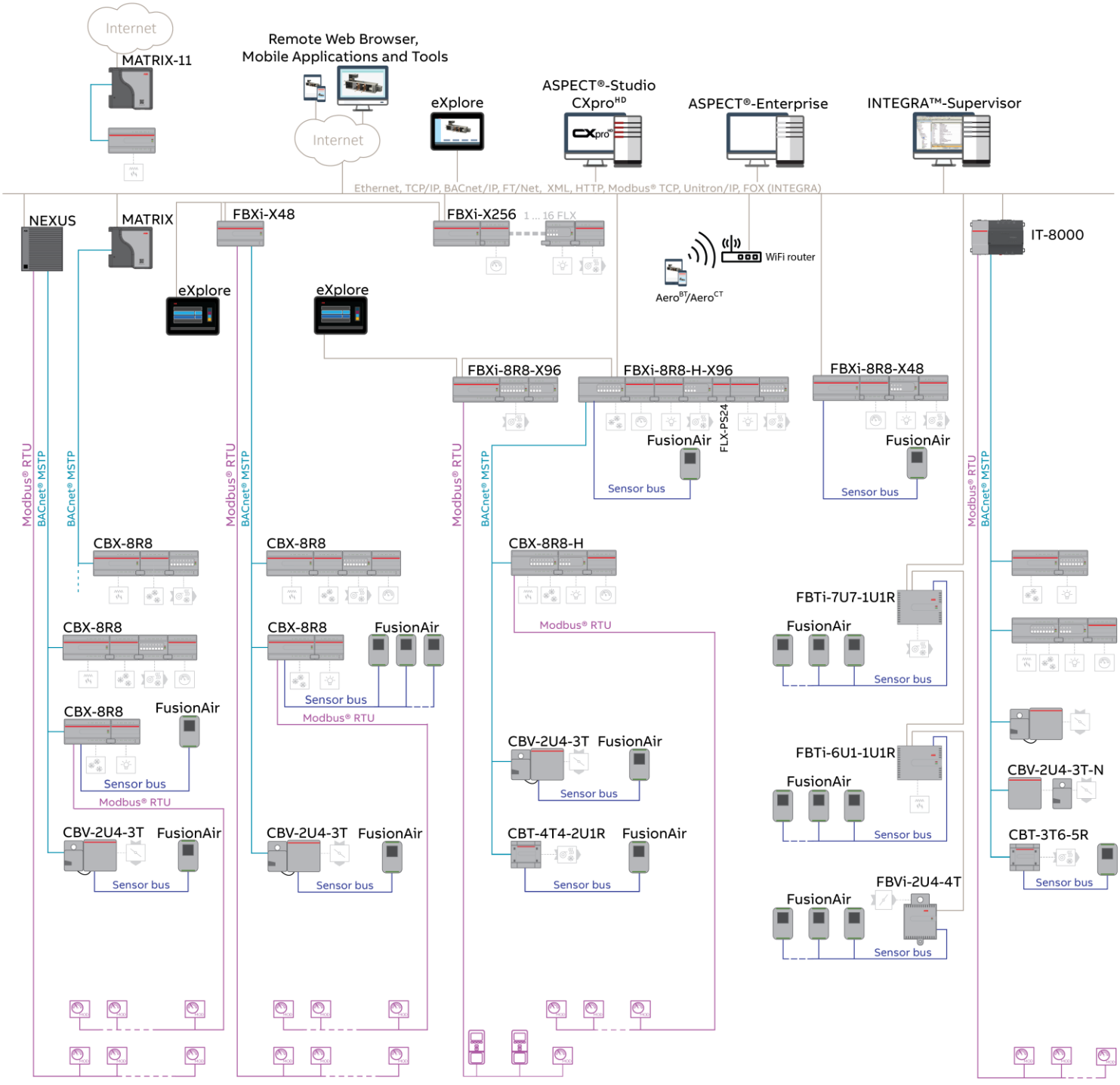
DIMENSIONS



ORDERING INFORMATION

Order Code	Product Name	Description
ABB2CQG201022R1011	FBTi-7T7-1U1R	FBTi-7T7-1U1R IP B-BC:16 I/O Unitary
ABB2CQG201023R1011	FBTi-6T1-1U1R	FBTi-6T1-1U1R IP B-BC:9 I/O Unitary
ABB2CQG201024R1011	FBTi-6T1-1U1R-FCDI	FBTi-6T1-1U1R-FCDI IP B-BC:9 I/O Unitary
ABB2CQG201026R1011	FBTi-6T1-1U1R-FCDS	FBTi-6T1-1U1R-FCDS IP B-BC:9 I/O Unitary
ABB2CQG201027R1011	FBTi-6T1-1U1R-FCAS	FBTi-6T1-1U1R-FCAS IP B-BC:9 I/O Unitary
ABB2CQG201025R1011	FBTi-6T1-1U1R-FCAI	FBTi-6T1-1U1R-FCAI IP B-BC:9 I/O Unitary

SYSTEM ARCHITECTURE



FBXi / CBXi-8R8 / CBX-8R8

CBXi-8R8-H / CBX-8R8-H

CBV-2U4-3T

FLX-8R8 / FLX-4R4 / FLX-16DI

FLX-8R8 -H

FLX-4R4-H

FLX-PS24

CBT-4T4-2U1R

FBVi-2U4-4T

NEXUS Series

MATRIX Series

INTEGRA Series

eXplore

FusionAir Smart Sensor

CBT-STAT

UCU Room Display

DS0137 rev 30