PXC Compact Series for BACnet Networks
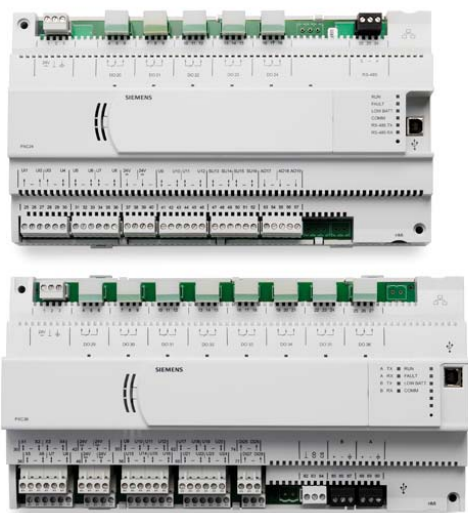

Figure 1. PXC Compact Series Controllers (PXC-24 and PXC-36 shown).

Description

The PXC Compact Series (Programmable Controller–Compact) for BACnet networks is a high-performance Direct Digital Control (DDC) supervisory equipment controller, which is an integral part of the APOGEE Automation System. It is classified as a BACnet Building Controller (B-BC) and supports BACnet/IP and BACnet MS/TP protocols.

The PXC Compact Series offers integrated I/O based on state-of-the-art TX-I/O™ Technology, which provides superior flexibility of point and signal types, and makes it an optimal solution for Air Handling Unit (AHU) control. The PXC Compact operates stand-alone or networked to perform complex control, monitoring, and energy management functions without relying on a higher-level processor.

The PXC Compact Series communicates with other field panels or workstations on a peer-to-peer Automation Level Network (ALN) and supports the following communication options:

- Native BACnet/IP communications over 10/100 MB Ethernet networks
- Native BACnet MS/TP on RS-485

The PXC Compact is available with 16, 24, or 36 point terminations. Selected models in the Compact Series provide the following options:

- Support for FLN devices.
- An extended temperature range for the control of rooftop devices.
- Support for Island Bus, which uses TX-I/O modules to expand the number of point terminations.

Features

- BACnet Testing Laboratories (BTL) certified Classified as BACnet Building Controllers (B-BC) using the BACnet/IP protocol and/or BACnet MS/TP.
- DIN rail mounted device with removable terminal blocks simplifies installation and servicing.
- Proven program sequences to match equipment control applications.
- Built-in energy management applications and DDC programs for complete facility management.
- Comprehensive alarm management, historical data trend collection, operator control, and monitoring functions.
- Sophisticated Adaptive Control, a closed loop control algorithm that auto-adjusts to compensate for load/seasonal changes.
- Message control for terminals, printers, pagers, and workstations.

- Highly configurable I/O using Siemens state-of-the-art TX-I/O™ Technology.
- HMI RS-232 port, which provides laptop connectivity for local operation and engineering.
- Extended battery backup of Real Time Clock.
- Persistent database backup and restore within controller.
- Optional HOA (Hand/Off/Auto) module for swappable and configurable HOA capability.
- Optional extended temperature range for rooftop installation.
- Optional support for P1 or MS/TP FLN devices.
- Optional P1 Wireless FLN support.

The Compact Series

In addition to building and system management functions, the Compact Series includes several styles of controllers that flexibly meet application needs.

PXC-16

The PXC-16 provides control of 16 points, including 8 software-configurable universal points.

Point count includes: 3 Universal Input (UI), 5 Universal I/O (U), 2 Digital Input (DI), 3 Analog Output (AOV), and 3 Digital Output (DO).

PXC-24

The PXC-24 provides control of 24 points, including 16 software-configurable universal points.

Point count includes: 3 Universal Input (UI), 9 Universal I/O (U), 4 Super Universal I/O (X), 3 Analog Output (AOV), 5 Digital Output (DO).

PXC-36

The PXC-36 provides control of 36 local points, including 24 software-configurable universal points.

Point count includes: 18 Universal I/O (U), 6 Super Universal I/O (X), 4 Digital Input (DI), and 8 Digital Output (DO).

The PXC-36 offers the flexibility of expanding the total point count through a self-forming island bus. With the addition of a TX-I/O Power Supply, up to four TX-I/O modules can be supported. For more information, see *TX-I/O Product Range Technical Specification Sheet* (149-476).

Available Options

The following options are available to match the application:

FLN Support

- The PXC-16 and PXC-24 "F" models with an FLN license support up to 32 P1 or MS/TP FLN devices.
- The PXC-36 with an FLN license supports up to 96 P1 or MS/TP FLN devices.
- A Wireless FLN may also be used to replace the traditional P1 FLN cabling with wireless communication links that form a wireless mesh network. Additional hardware is required to implement the Wireless FLN.

For more information about FLN support, contact your local Siemens Industry representative.

Extended Temperature Operation

The "R" models of the PXC Compact Series support extended temperature operation, allowing for rooftop installations.

Hardware

The PXC Compact Series consists of the following major components:

- Input/Output Points
- Power Supply
- Controller Processor

Input/Output Points

- The PXC Compact input/output points perform A/D or D/A conversion, signal processing, point command output, and communication with the controller processor. The terminal blocks are removable for easy termination of field wiring.
- The Universal and Super Universal points leverage TX-I/O™ Technology from Siemens Industry to configure an extensive variety of point types.
- Universal Input (UI) and Universal Input/Output (U) points are software-selectable to be:
  - 0-10V input
  - 4-20 mA input
  - Digital Input
  - Pulse Accumulator inputs
  - 1K Ni RTD @ 32°F (Siemens, Johnson Controls, DIN Standard)
  - 1K Pt RTD (375 or 385 alpha) @ 32°F

- 10K NTC Thermistor (Type 2 and Type 3) @ 77°F
- 100K NTC Thermistor (Type 2) @ 77°F
- 0-10V Analog Output (Universal Input/Output (U) points only)

- Super Universal (X) points (PXC-24 and PXC-36 only) are software-selectable to be:
  - 0-10V input
  - 4-20 mA input
  - Digital Input
  - Pulse Accumulator inputs
  - 1K Ni RTD @ 32°F (Siemens, Johnson Controls, DIN Standard)
  - 1K Pt RTD (375 or 385 alpha) @ 32°F
  - 10K NTC Thermistor (Type 2 and Type 3) @ 77°F
  - 100K NTC Thermistor (Type 2) @ 77°F
  - 0-10V Analog Output
  - 4-20 mA Analog Output
  - Digital Output (using external relay)

- Dedicated Digital Input (DI) points (PXC-16 and PXC-36 only) are dry contact status sensing.

- Digital Output (DO) points are 110/220V 4 Amp (resistive) Form C relays; LEDs indicate the status of each point.

- All PXC Compact Series models support 0-10 Vdc Analog Output (AO) circuits.

- On PXC-24 and PXC-36 models, the Super Universal circuits may be defined as 4-20 mA current AO.

Power Supply

- The 24 volt DC power supply provides regulated power to the input/output points and active sensors. The power supply is internal to the PXC Compact housing, eliminating the need for external power supply and simplifying installation and troubleshooting.

- The power supply works with the processor to ensure smooth power up and power down sequences for the equipment controlled by the I/O points, even through brownout conditions.

Controller Processor

- The PXC Compact Series includes a microprocessor-based multi-tasking platform for program execution and communications with the I/O points and with other PXC Compacts and field panels over the ALN.

- A Human Machine Interface (HMI) port, with a quick-connect phone jack (RJ-45), uses RS-232 protocol to support operator devices (such as a local user interface or simple CRT terminal), and a phone modem for dial-in service capability.

- A USB Device port supports a generic serial interface for an HMI or Tool connection. The USB Device port does not support firmware flash upgrades.

- The program and database information stored in the PXC Compact RAM memory is battery-backed. This eliminates the need for time-consuming program and database re-entry in the event of an extended power failure.

- The firmware, including the operating system, is stored in non-volatile flash ROM memory. Flash ROM is easily upgradeable at the job site. This provides for ease of upgrade as new firmware updates are made available.

- Brownout protection and power recovery circuitry protect the controller board from power fluctuations.

- LEDs provide instant visual indication of overall operation, network communication, and low battery warning.

Programmable Control with Application Flexibility

The PXC Compact Series of high performance controllers provides complete flexibility, which allows the owner to customize each controller with the exact program for the application.

The control program for each PXC Compact is customized to exactly match the application. Proven Powers Process Control Language (PPCL), a text-based programming structure like BASIC, provides direct digital control and energy management sequences to precisely control equipment and optimize energy usage.

Global Information Access

The HMI port supports operator devices, such as a local user interface or simple CRT terminal, and a phone modem for dial-in service capability. Devices connected to the operator terminal port gain global information access.

Multiple Operator Access

Multiple operators can access the network simultaneously. Multiple operator access ensures that alarms are reported to an alarm printer while an operator accesses information from a local terminal. When using the BACnet/IP ALN option, multiple operators may also access the controller through concurrent Telnet sessions and/or local operator terminal ports.

Menu Prompted, English Language Operator Interface

The PXC Compact field panel includes a simple, yet powerful, menu-driven English Language Operator Interface that provides, among other things:

- Point monitoring and display
- Point commanding
- Historical trend collection and display for multiple points
- Event scheduling
- Program editing and modification via Powers Process Control Language (PPCL)
- Alarm reporting and acknowledgment
- Continual display of dynamic information

Built-in Direct Digital Control Routines

The PXC Compact provides stand-alone Direct Digital Control (DDC) to deliver precise HVAC control and comprehensive information about system operation. The controller receives information from sensors in the building, processes the information, and directly controls the equipment. The following functions are available:

- Adaptive Control, an auto-adjusting closed loop control algorithm, which provides more efficient, adaptive, robust, fast, and stable control than the traditional PID control algorithm. It is superior in terms of response time and holding steady state, and at minimizing error, oscillations, and actuator repositioning.
- Closed Loop Proportional, Integral and Derivative (PID) control.
- Logical sequencing.
- Alarm detection and reporting.
- Reset schedules.

Built-in Energy Management Applications

The following applications are programmed in the PXC Compact Series and require simple parameter input for implementation:

- Automatic Daylight Saving Time switchover
- Calendar-based scheduling
- Duty cycling
- Economizer control
- Equipment scheduling, optimization and sequencing
- Event scheduling
- Holiday scheduling
- Night setback control
- Peak Demand Limiting (PDL)
- Start-Stop Time Optimization (SSTO)
- Temperature-compensated duty cycling
- Temporary schedule override

Specifications

Dimensions (L × W × D)

PXC-16 and PXC-24

10.7" × 5.9" × 2.45" (272 mm × 150 mm × 62 mm)

PXC-36

11.5" × 5.9" × 3.0" (293 mm × 150 mm × 77 mm)

Processor, Battery, and Memory

Processor and Clock Speed

PXC-16 and PXC-24: Freescale MPC852T, 100 MHz
PXC-36: Freescale MPC885, 133 MHz

Memory

PXC-16 and PXC-24: 24 MB (16 MB SDRAM, 8 MB Flash ROM)
PXC-36: 80 MB (64 MB SDRAM, 16 MB Flash ROM)

Battery backup of Synchronous Dynamic (SD) RAM (field replaceable)

Non-rooftop Models: 60 days (accumulated),
AA (LR6) 1.5 Volt Alkaline (non-rechargeable)
Rooftop (Extended Temperature) Models: 90 days (accumulated),
AA (LR6) 3.6 Volt Lithium (non-rechargeable)

Battery backup of Real Time Clock

Non-rooftop Models: 10 years
Rooftop (Extended Temperature) Models: 18 months

Communication

A/D Resolution (analog in)

16 bits

D/A Resolution (analog out)

10 bits

BACnet/IP Automation Level Network (ALN)

10Base-T or 100Base-TX compliant

BACnet MS/TP Automation Level Network (ALN)

RS-485, 9600 bps to 115.2 Kbps

BACnet MS/TP Field Level Network (FLN) *on selected models, license required*

RS-485, 9600 bps to 76.8 Kbps

P1 Field Level Network (FLN) *on selected models, license required*

RS-485, 4800 bps to 38.4 Kbps

Human-Machine Interface (HMI)

RS-232 compliant, 1200 bps to 115.2 Kbps

USB Device port (for non-smoke control applications only)

Standard 1.1 and 2.0 USB device port, Type B female connector.

USB Host port *on selected models* (for ancillary smoke control applications only)

Standard 1.1 and 2.0 USB host port, Type A female connector.

Electrical

Power Requirements

24 Vac ±20% input @ 50/60 Hz

Power Consumption (Maximum)

PXC-16: 18 VA @ 24 Vac
PXC-24: 20 VA @ 24 Vac
PXC-36: 35 VA @ 24 Vac

AC Power and Digital Outputs	NEC Class 1 Power Limited
Communication and all other I/O	NEC Class 2
Digital Input	Contact Closure Sensing Dry Contact/Potential Free inputs only Does not support counter inputs
Digital Output	Class 1 Relay
Analog Output	0 to 10 Vdc
Universal Input (UI) and Universal Input/Output (U)	**Analog Input** Voltage (0-10 Vdc) Current (4-20 mA) 1K Ni RTD @ 32°F 1K Pt RTD (375 or 385 alpha) @ 32°F 10K NTC Type 2 or Type 3 Thermistor @ 77°F 100K NTC Type 2 Thermistor @ 77°F **Digital Input** Pulse Accumulator Contact Closure Sensing Dry Contact/Potential Free inputs only Supports counter inputs up to 20 Hz **Analog Output (Universal Input/Output (U) points only)** Voltage (0-10 Vdc)
Super Universal (X)	**Analog Input** Voltage (0-10 Vdc) Current (4-20 mA) 1K Ni RTD @ 32°F 1K Pt RTD (375 or 385 alpha) @ 32°F 10K NTC Type 2 or Type 3 Thermistor @ 77°F 100K NTC Type 2 Thermistor @ 77°F **Digital Input** Pulse Accumulator Contact Closure Sensing Dry Contact/Potential Free inputs only Supports counter inputs up to 20 Hz **Analog Output** Voltage (0-10 Vdc) Current (4-20 mA) **Digital Output (requires an external relay)** 0 to 24 Vdc, 22 mA max.

Operating Environment

Ambient operating temperature	32°F to 122°F (0°C to 50°C)
Ambient operating temperature with rooftop (extended temperature) option	-40°F to 158°F (-40°C to 70°C)
Relative Humidity	*PXC-16 and PXC-24:* 5% to 95%, non-condensing *PXC-36:* 5% to 93%, non-condensing

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Mounting Surface

PXC-16 and PXC-24: Direct equipment mount, building wall, or structural member
PXC-36: Building wall or a secure structure

Agency Listings

UL

UL864 UUKL (except rooftop models)
UL864 UUKL7 (except rooftop models)
CAN/ULC-S527-M8 (except rooftop models)
UL916 PAZX (all models)
UL916 PAZX7 (all models)

Agency Compliance

FCC Compliance
Australian EMC Framework
European EMC Directive (CE)
European Low Voltage Directive (LVD)
BACnet Testing Laboratories (BTL) Certified

Ordering Information

PXC Compact Series

Part Number	Description
PXC16.2-E.A	PXC Compact, 16 point, BACnet/IP ALN
PXC16.2-M.A	PXC Compact, 16 point, MS/TP ALN
PXC16.2-EF.A	PXC Compact, 16 point, BACnet/IP ALN. P1 or MS/TP FLN option.
PXC24.2-E.A	PXC Compact, 24 point, BACnet/IP ALN
PXC24.2-M.A	PXC Compact, 24 point, MS/TP ALN
PXC24.2-ER.A	PXC Compact, 24 point, MS/TP ALN, rooftop
PXC24.2-MR.A	PXC Compact, 24 point, MS/TP ALN, rooftop
PXC24.2-EF.A	PXC Compact, 24 point, BACnet/IP ALN. P1 or MS/TP FLN option.
PXC24.2-ERF.A	PXC Compact, 24 point, BACnet/IP ALN, rooftop. P1 or MS/TP FLN option.
PXC36-E.A	PXC Compact, 36 point, BACnet/IP or MS/TP ALN.
PXC36-EF.A	PXC Compact, 36 point, BACnet/IP or MS/TP ALN, Island Bus, P1 or MS/TP FLN.

Available Licenses

Product Number	Description
LSM-FLN	License to enable FLN support on PXC-16 or PXC-24 "F" models
LSM-FLN36.A	License to enable FLN support on model PXC36-E.A
LSM-IB36.A	License to enable the Island Bus on model PXC36-E.A
LSM-36.A	License to enable both FLN and Island Bus support on model PXC36-E.A

Accessories

Product Number	Description
PXA8-M	8-switch HOA (UL864)
PXA16-M	16-switch HOA (UL864)
PXA16-MR	16-switch HOA (extended temp, UL 916) with HMI cable
PXA-HMI.CABLEP5	Serial cable required for HOA connection to non-rooftop variants of the 16-point and 24-point Compact Series (pack of 5)
TXA1.LLT-P100	Labels for HOA and TX-I/O Modules, pack of 100, letter format

Service Boxes and Enclosures

Product Number	Description
PXA-SB115V192VA	PX Series Service Box —115V, 24 Vac, 50/60 Hz, 192 VA
PXA-SB115V384VA	PX Series Service Box— 115V, 24 Vac, 50/60 Hz, 384 VA
PXA-SB230V192VA	PX Series Service Box— 230V, 24 Vac, 50/60 Hz, 192 VA
PXA-SB230V384VA	PX Series Service Box —230V, 24 Vac, 50/60 Hz, 384 VA
PXA-ENC18	18" Enclosure (Utility Cabinet) (UL Listed NEMA Type 1 Enclosure)
PXA-ENC19	19" Enclosure (UL Listed NEMA Type 1 Enclosure)
PXA-ENC34	34" Enclosure (UL Listed NEMA Type 1 Enclosure)

Documentation

Product Number	Description
553-104	PXC Compact Series Owner's Manual
125-1896	Powers Process Control Language (PPCL) User's Manual

Your feedback is important to us. If you have comments about this document, please send them to sbt_technical.editor.us.sbt@siemens.com.

BACnet Protocol Implementation Conformance Statement

Products

Product	Model Number	Protocol Revision	Software Revision	Firmware Revision
BACnet PXC Compact Series	PXC16.2-E.A PXC16.2-EF.A PXC16.2-M.A PXC24.2-E.A PXC24.2-EF.A PXC24.2-ER.A PXC24.2-ERF.A PXC24.2-M.A PXC24.2-MR.A PXC36-E.A PXC36-EF.A	135-2004	N/A	3.2

Vendor Information

Siemens Industry, Inc.
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Buffalo Grove, IL 60089

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Product Description

An integral member of the APOGEE product family, the PXC Compact for BACnet Networks is a high performance, modular Direct Digital Control (DDC) supervisory equipment and primary building controller. The PXC Compact operates stand-alone or networked to perform complex control, monitoring and energy management functions without relying on a higher-level processor. The PXC Compact communicates on a 10/100 MB Ethernet BACnet/IP or BACnet MS/TP network and optionally supervises BACnet MS/TP devices.

BACnet Standardized Device Profile (Annex L)

Supported	Device Profile
	BACnet Operator Workstation (B-OWS)
•	BACnet Building Controller (B-BC)
	BACnet Advanced Application Controller (B-AAC)
	BACnet Application Specific Controller (B-ASC)
	BACnet Smart Actuator (B-SA)
	BACnet Smart Sensor (B-SS)

Supported BACnet Interoperability Building Blocks (BIBBs)

BIBB	Name	Initiate	Execute
Data Sharing			
DS-RP-A	Data Sharing-ReadProperty-A	•	
DS-RP-B	Data Sharing-ReadProperty-B		•
DS-RPM-A	Data Sharing-ReadPropertyMultiple-A	•	
DS-RPM-B	Data Sharing-ReadPropertyMultiple-B		•
DS-WP-A	Data Sharing-WriteProperty-A	•	
DS-WP-B	Data Sharing-WriteProperty-B		•
DS-WPM-B	Data Sharing-WritePropertyMultiple-B		•
DS-COV-A	Data Sharing-COV-A	•	
DS-COV-B	Data Sharing-COV-B		•
DS-COVU-A	Data Sharing-COV-Unsolicited-A	•	
DS-COVU-B	Data Sharing-COV-Unsolicited-B		•
Scheduling			
SCHED-I-B	Scheduling-Internal-B		•
SCHED-E-B	Scheduling-External-B		•
Alarm and Event Management			
AE-N-A	Alarm and Event-Notification-A	•	
AE-N-I-B	Alarm and Event-Notification Internal-B		•
AE-N-E-B	Alarm and Event-Notification External-B		•
AE-ACK-A	Alarm and Event-ACK-A	•	
AE-ACK-B	Alarm and Event- ACK-B		•
AE-ASUM-B	Alarm and Event-Alarm Summary-B		•
AE-ESUM-A	Alarm and Event-Enrollment Summary-A	•	
AE-ESUM-B	Alarm and Event-Enrollment Summary-B		•
AE-INFO-A	Alarm and Event-Information-A	•	
AE-INFO-B	Alarm and Event-Information-B		•
Trending			
T-VMT-A	Trending-Viewing and Modifying Trends-A	•	
T-VMT-I-B	Trending-Viewing and Modifying Trends-Internal-B		•
T-VMT-E-B	Trending-Viewing and Modifying Trends-External-B		•
T-ATR-B	Trending-Automated Trend Retrieval-B		•
Network Management			
NM-CE-A	Network Management-Connection Establishment-A	•	

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BIBB	Name	Initiate	Execute
Device Management			
DM-DDB-A	Device Management-Dynamic Device Binding-A	•	
DM-DDB-B	Device Management-Dynamic Device Binding-B		•
DM-DOB-A	Device Management-Dynamic Object Binding-A	•	
DM-DOB-B	Device Management-Dynamic Object Binding-B		•
DM-DCC-B	Device Management-DeviceCommunicationControl-B		•
DM-PT-A	Device Management-Private Transfer-A	•	
DM-PT-B	Device Management-Private Transfer-B		•
DM-TM-A	Device Management-Text Message-A	•	
DM-TM-B	Device Management-Text Message-B		•
DM-TS-B	Device Management-TimeSynchronization-B		•
DM-RD-B	Device Management-ReinitializeDevice-B		•
DM-BR-B	Device Management-Backup and Restore-B		•
DM-LM-B	Device Management-List Manipulation-B		•
DM-OCD-B	Device Management-Object Creation and Deletion-B		•

Standard Object Types Supported

Name	Creatable	Deletable
Analog Input		
Analog Output		
Analog Value		
Binary Input		
Binary Output		
Binary Value		
Calendar	•	•
Command	•	•
Device		
Event Enrollment	•	•
File		
Multi-state Output		
Multi-state Value		
Notification Class	•	•
Schedule	•	•
Trend Log		

Object Attributes

O indicates that the property is optional, per the BACnet standard.

R indicates that the property is required to be present and readable using BACnet services.

Yes indicates that the property is required to be present, readable, and writable using BACnet services.

Analog Input Object Type			
Property_Identifier	**Supported**	**Writable**	**Required \ Optional**
Object_Identifier	Yes		R
Object_Name	Yes		R
Object_Type	Yes		R
Present_Value	Yes	Yes	R
Description	Yes	Yes	O
Device_Type	Yes		O
Status_Flags	Yes		R
Event_State	Yes		R
Reliability	Yes		O
Out_Of_Service	Yes	Yes	R
Units	Yes	Yes	R
Resolution	Yes		O
COV_Increment	Yes	Yes	O
Time_Delay	Yes - Alarm		O
Notification Class	Yes - Alarm	Yes	O
High_Limit	Yes - Alarm	Yes	O
Low_Limit	Yes - Alarm	Yes	O
Deadband	Yes - Alarm		O
Limit_Enable	Yes - Alarm		O
Event_Enable	Yes - Alarm	Yes	O
Acked_Transitions	Yes - Alarm		O
Notify_Type	Yes - Alarm		O
Event_Time_Stamps	Yes - Alarm		O
Analog Output Object Type			
Property_Identifier	**Supported**	**Writable**	**Required \ Optional**
Object_Identifier	Yes		R
Object_Name	Yes		R
Object_Type	Yes		R
Present_Value	Yes	Yes	W
Description	Yes	Yes	O
Device_Type	Yes		O
Status_Flags	Yes		R
Event_State	Yes		R
Reliability	Yes		O
Out_Of_Service	Yes		R
Units	Yes		R

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Property_Identifier	Supported	Writable	Required \ Optional
Min_Pres_Value	No		O
Max_Pres_Value	No		O
Resolution	Yes		O
Priority_Array	Yes		R
Relinquish_default	Yes		R
COV_Increment	Yes	Yes	O
Time_Delay	Yes - Alarm		O
Notification Class	Yes - Alarm	Yes	O
High_Limit	Yes - Alarm	Yes	O
Low_Limit	Yes - Alarm	Yes	O
Deadband	Yes - Alarm		O
Limit_Enable	Yes - Alarm		O
Event_Enable	Yes - Alarm	Yes	O
Acked_Transitions	Yes - Alarm		O
Notify_Type	Yes - Alarm		O
Event_Time_Stamps	Yes - Alarm		O

Analog Value Object Type			
Property_Identifier	**Supported**	**Writable**	**Required \ Optional**
Object_Identifier	Yes		R
Object_Name	Yes		R
Object_Type	Yes		R
Present_Value	Yes	Yes	R
Description	Yes	Yes	O
Status_Flags	Yes		R
Event_State	Yes		R
Reliability	Yes		O
Out_Of_Service	Yes		R
Units	Yes		R
Priority_Array	Yes		O
Relinquish_default	Yes		O
COV_Increment	Yes	Yes	O
Time_Delay	Yes - Alarm		O
Notification Class	Yes - Alarm	Yes	O
High_Limit	Yes - Alarm	Yes	O
Low_Limit	Yes - Alarm	Yes	O
Deadband	Yes - Alarm		O
Limit_Enable	Yes - Alarm		O
Event_Enable	Yes - Alarm	Yes	O
Acked_Transitions	Yes - Alarm		O
Notify_Type	Yes - Alarm		O
Event_Time_Stamps	Yes - Alarm		O

Binary Input Object Type

Property_Identifier	Supported	Writable	Required \ Optional
Object_Identifier	Yes		R
Object_Name	Yes		R
Object_Type	Yes		R
Present_Value	Yes	Yes	R
Description	Yes	Yes	O
Device_Type	Yes		O
Status_Flags	Yes		R
Event_State	Yes		R
Reliability	Yes		O
Out_Of_Service	Yes	Yes	R
Polarity	Yes		R
Inactive_Text	Yes		O
Active_Text	Yes		O
Elapsed_Active_Time	Yes	Yes	O
Time_Of_Active_Time_Reset	Yes		O
Time_Delay	Yes - Alarm		O
Notification Class	Yes - Alarm	Yes	O
Alarm_Value	Yes - Alarm		O
Event_Enable	Yes - Alarm	Yes	O
Acked_Transitions	Yes - Alarm		O
Notify_Type	Yes - Alarm		O
Event_Time_Stamps	Yes - Alarm		O

Binary Output Object Type

Property_Identifier	Supported	Writable	Required \ Optional
Object_Identifier	Yes		R
Object_Name	Yes		R
Object_Type	Yes		R
Present_Value	Yes	Yes	W
Description	Yes	Yes	O
Device_Type	Yes		O
Status_Flags	Yes		R
Event_State	Yes		R
Reliability	Yes		O
Out_Of_Service	Yes		R
Polarity	Yes		R
Inactive_Text	Yes		O
Active_Text	Yes		O
Elapsed_Active_Time	Yes	Yes	O
Time_Of_Active_Time_Reset	Yes		O
Priority_Array	Yes		R
Relinquish_default	Yes		R

Time_Delay	Yes - Alarm		O
Notification Class	Yes - Alarm	Yes	O
Feedback_Value	Yes - Alarm		O
Event_Enable	Yes - Alarm	Yes	O
Acked_Transitions	Yes - Alarm		O
Notify_Type	Yes - Alarm		O
Event_Time_Stamps	Yes - Alarm		O

Binary Value Object Type

Property_Identifier	Supported	Writable	Required \ Optional
Object_Identifier	Yes		R
Object_Name	Yes		R
Object_Type	Yes		R
Present_Value	Yes	Yes	R
Description	Yes	Yes	O
Status_Flags	Yes		R
Event_State	Yes		R
Reliability	Yes		O
Out_Of_Service	Yes		R
Inactive_Text	Yes		O
Active_Text	Yes		O
Elapsed_Active_Time	Yes	Yes	O
Time_Of_Active_Time_Reset	Yes		O
Priority_Array	Yes		O
Relinquish_default	Yes		O
Time_Delay	Yes - Alarm		O
Notification Class	Yes - Alarm	Yes	O
Alarm_Value	Yes - Alarm		O
Event_Enable	Yes - Alarm	Yes	O
Acked_Transitions	Yes - Alarm		O
Notify_Type	Yes - Alarm		O
Event_Time_Stamps	Yes - Alarm		O

Calendar Object Type

Property_Identifier	Supported	Writable	Required \ Optional
Object_Identifier	Yes		R
Object_Name	Yes		R
Object_Type	Yes		R
Description	Yes	Yes	O
Present_Value	Yes		R
Date_List	Yes	Yes	R

Command Object Type			
Property_Identifier	Supported	Writable	Required \ Optional
Object_Identifier	Yes		R
Object_Name	Yes		R
Object_Type	Yes		R
Description	Yes	Yes	O
Present_Value	Yes	Yes	W
In_Process	Yes		R
All_Writes_Successful	Yes		R
Action	Yes	Yes	R
Action _Text	Yes	Yes	O

Device Object Type			
Property_Identifier	Supported	Writable	Required \ Optional
Object_Identifier	Yes		R
Object_Name	Yes		R
Object_Type	Yes		R
System_Status	Yes		R
Vendor_Name	Yes		R
Vendor_Identifier	Yes		R
Model_Name	Yes		R
Firmware_Revision	Yes		R
Application_Software_Version	Yes		R
Location	Yes		O
Description	Yes		O
Protocol_Version	Yes		R
Protocol_Revision	Yes		R
Protocol_Services_Supported	Yes		R
Protocol_Object_Types_Supported	Yes		R
Object_List	Yes		R
Max_APDU_Lenght_Accepted	Yes		R
Segmentation_Supported	Yes		R
Max_Segments_Supported	Yes		O
Local_Time	Yes		O
Local_Date	Yes		O
Daylight_Savings_Status	Yes		O
APDU_Segment_Timeout	Yes		O
APDU_Timeout	Yes		R
Number_Of_APDU_Retries	Yes		R
Device_Address_Binding	Yes		R
Database_Revision	Yes		R
Configuration_Files	Yes		O
Last_Restore_Time	Yes		O
Backup_Failure_Timeout	Yes	Yes	O
Active_COV_Subscriptions	Yes		O

Event Enrollment Object Type

Property_Identifier	Supported	Writable	Required \ Optional
Object_Identifier	Yes		R
Object_Name	Yes		R
Object_Type	Yes		R
Description	Yes	Yes	O
Event_Type	Yes		R
Notify_Type	Yes	Yes	R
Event_Parameters	Yes	Yes	R
Object_Property_Ref	Yes		R
Event_State	Yes		R
Event_Enable	Yes	Yes	R
Acked_Transitions	Yes		R
Notification Class	Yes	Yes	R
Event_Time_Stamps	Yes		R

File Object Type

Property_Identifier	Supported	Writable	Required \ Optional
Object_Identifier	Yes		R
Object_Name	Yes		R
Object_Type	Yes		R
Description	Yes		O
File_Type	Yes		R
File_Size	Yes	Yes	R
Modification_Date	Yes		R
Archive	Yes	Yes	W
Read_only	Yes		R
File_Access_Method	Yes		R

Multi-state Output Object Type

Property_Identifier	Supported	Writable	Required \ Optional
Object_Identifier	Yes		R
Object_Name	Yes		R
Object_Type	Yes		R
Present_Value	Yes	Yes	W
Description	Yes	Yes	O
Device_Type	Yes		O
Status_Flags	Yes		R
Event_State	Yes		R
Reliability	Yes		O
Out_Of_Service	Yes	Yes	R
Number_Of_States	Yes		R
State_Text	Yes		O

Priority_Array	Yes		R
Relinquish_default	Yes		R
Time_Delay	Yes - Alarm		O
Notification Class	Yes - Alarm	Yes	O
Feedback_Value	Yes - Alarm		O
Event_Enable	Yes - Alarm	Yes	O
Acked_Transitions	Yes - Alarm		O
Notify_Type	Yes - Alarm		O
Event_Time_Stamps	Yes - Alarm		O

Multi-state Value Object Type

Property_Identifier	Supported	Writable	Required \ Optional
Object_Identifier	Yes		R
Object_Name	Yes		R
Object_Type	Yes		R
Present_Value	Yes	Yes	R
Description	Yes	Yes	O
Status_Flags	Yes		R
Event_State	Yes		R
Reliability	Yes		O
Out_Of_Service	Yes	Yes	R
Number_Of_States	Yes		R
State_Text	Yes		O
Priority_Array	Yes		O
Relinquish_default	Yes		O
Time_Delay	Yes - Alarm		O
Notification Class	Yes - Alarm	Yes	O
Alarm_Values	Yes - Alarm		O
Fault_Values	Yes - Alarm		O
Event_Enable	Yes - Alarm	Yes	O
Acked_Transitions	Yes - Alarm		O
Notify_Type	Yes - Alarm		O
Event_Time_Stamps	Yes - Alarm		O

Notification Class Object Type

Property_Identifier	Supported	Writable	Required \ Optional
Object_Identifier	Yes		R
Object_Name	Yes		R
Object_Type	Yes		R
Description	Yes	Yes	O
Notification_Class	Yes		R
Priority	Yes	Yes	R
Ack_Required	Yes	Yes	R
Recipient_List	Yes	Yes	R

Schedule Object Type			
Property_Identifier	**Supported**	**Writable**	**Required \ Optional**
Object_Identifier	Yes		R
Object_Name	Yes		R
Object_Type	Yes		R
Present_Value	Yes	Yes	R
Description	Yes	Yes	O
Effective_Period	Yes	Yes	R
Weekly_Schedule	Yes	Yes	O
Exception_Schedule	Yes	Yes	O
Schedule_Default	Yes	Yes	R
List_Of_Object_Property_References	Yes	Yes	R
Priority_For_Writing	Yes	Yes	R
Status_Flags	Yes		R
Reliability	Yes		R
Out_Of_Service	Yes	Yes	R
Trend Log Object Type			
Property_Identifier	**Supported**	**Writable**	**Required \ Optional**
Object_Identifier	Yes		R
Object_Name	Yes		R
Object_Type	Yes		R
Description	Yes	Yes	O
Log_Enable	Yes	Yes	W
Start_Time	Yes	Yes	O
Stop_Time	Yes	Yes	O
Log_DeviceObjectProperty	Yes		O
Log_Interval	Yes		O
Client_COV_Interval	Yes		O
Stop_When_Full	Yes	Yes	R
Buffer_Size	Yes		R
Log_Buffer	Yes		R
Record_Count	Yes	Yes	W
Total_Record_Count	Yes		R
Notification_Threshold	Yes - Alarm	Yes	O
Records_Since_Notification	Yes - Alarm		O
Last_Notify_Record	Yes - Alarm		O
Event_State	Yes - Alarm		R
Notification_Class	Yes - Alarm	Yes	O
Event_Enable	Yes - Alarm		O
Acked_Transitions	Yes - Alarm		O
Notify_Type	Yes - Alarm		O
Event_Time_Stamps	Yes - Alarm		O

Data Link Layer Options

•	BACnet IP, (Annex J)	
•	BACnet IP, (Annex J), Foreign Device	
	ISO 8802-3, Ethernet (Clause 7)	
	ANSI/ATA 878.1, 2.5 Mb. ARCNET (Clause 8)	
	ANSI/ATA 878.1, RS-485 ARCNET (Clause 8), baud rate(s) _____	
•	MS/TP master (Clause 9), baud rate(s): 9600 bps, 19200 bps, 38400 bps, 76800 bps	
	MS/TP slave (Clause 9), baud rate(s): _____	
	Point-To-Point, EIA 232 (Clause 10), baud rate(s): _____	
	Point-To-Point, modem, (Clause 10), baud rate(s): _____	
	LonTalk, (Clause 11), medium: _____	
	Other: _____	

Segmentation Capability

Able to transmit segmented messages	Yes	Window Size: 32
Able to receive segmented messages	Yes	Window Size: 32

Device Address Binding

Is Static Device Binding supported?	Yes

Networking Options

•	Router, Clause 6 BACnet/IP (Annex J) to BACnet MS/TP
	Annex H.3, BACnet Tunneling Router over UDP/IP
•	BACnet/IP Broadcast Management Device (BBMD)
Yes	Does the BBMD support registrations by Foreign Devices?

Character Sets

•	ANSI X3.4
	ISO 10646 (UCS-2)
	IBM™/Microsoft™ DBCS
	ISO 10646 (ICS-4)
	ISO 8859-1
	JIS C 6226