

TC Compact Series Unitary Equipment Controller



Figure 1. TC Compact Series Controllers (TC-24).

Description

The TC Compact Series Unitary Equipment Controller (Programmable Controller–Compact) for BACnet networks is a high-performance Direct Digital Control (DDC) equipment controller, which is an integral part of the TALON Automation System. The controllers are classified as a BACnet Advanced Application Controller (B-AAC) with support for BACnet MS/TP protocol.

The TC 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 TC Compact operates stand-alone or networked to perform complex control, monitoring,

and energy management functions without relying on a higher-level processor.

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

- Native BACnet MS/TP on RS-485

Features

- BACnet Testing Laboratories (BTL) certified Classified as BACnet Advanced Application Controllers (B-AAC) using the BACnet MS/TP protocol for specific models.
- Message control for terminals, printers, pagers, and workstations.
- HMI RS-232 port, which provides laptop connectivity for local operation and engineering.
- Extended battery backup of Real Time Clock.
- Auto Save and persistent database backup and restore within the controller.
- PXM10T and PXM10S support: Optional LCD Local user interface with HOA (Hand-off-auto)

capability and point commanding and monitoring features.

Compact Series Unitary Equipment Controller

The TC-24 Unitary Equipment Controller provides control for 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).

The TC Unitary Equipment Controller (UEC) is an MS/TP device, that can be configured as a programmable, stand-alone device or the UEC can operate as a networked device on the BACnet MS/TP ALN (Automation Level Network) or FLN (Field Level Network) device.

Hardware

The TC Compact Series consists of the following major components:

- Input/Output Points
- Power Supply
- Controller Processor

Input/Output Points

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

- All TC Compact Series models support 0-10 Vdc Analog Output circuits.
- The Super Universal points may be defined as either 0-10 Vdc or 4-20 mA Analog Output circuits.

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 TC 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 TC Compact Series includes a microprocessor-based multi-tasking platform for program execution and communications with the I/O points and with other TC Compacts and field panels.
- 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 Human Machine Interface (HMI) port, with a quick-connect Ethernet port for program and database editing tools.
- 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 TC 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, which includes the operating system, is stored in non-volatile flash ROM memory; this enables firmware upgrades in the field.
- 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 TC 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 TC 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. 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. Multiple operators may also access the controller through concurrent Telnet sessions and/or local operator terminal ports.

Menu Prompted, English Language Operator Interface

The TC Compact 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 TC Compact provides stand-alone Direct Digital Control (DDC) to deliver precise HVAC control and comprehensive information about system operation. It receives information from sensors in the building, processes the information, and directly controls the

equipment. The following functions are available in the TC Compact:

- 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 TC Compact Series and require simple parameter input for implementation:

- Automatic Daylight Saving Time switchover
- Duty cycling
- Economizer control
- Event scheduling
- Holiday scheduling
- Night setback control
- Peak Demand Limiting (PDL)
- Temperature-compensated duty cycling
- Temporary schedule override

BACnet UEC Specifications

Dimensions (L × W × D)

TC Unitary Equipment Controller, 24 point, BACnet MS/TP 10.7" × 5.9" × 2.45"
(272 mm × 150 mm × 62 mm)

Processor, Battery, and Memory

Processor and Clock Speed Freescale MPC852T, 100 MHz

Memory 24 MB (16 MB SDRAM, 8 MB Flash ROM)

Battery backup of SDRAM (field replaceable) AA (LR6) 1.5 Volt Alkaline (non-rechargeable)
60 days (accumulated)

Battery backup of Real Time Clock 10 years (32°F to 122°F (0°C to 50°C))
Coin cell (BR2032) 3 Volt lithium

Communication

A/D Resolution (analog in) 16 bits

D/A Resolution (analog out) 10 bits

BACnet MS/TP Automation Level Network (ALN) 9600 bps to 115.2 Kbps, up to 10 nodes per MS/TP ALN

BACnet MS/TP Field Level Network (FLN) 9600 bps to 115.2 Kbps

Human-Machine Interface (HMI) RS-232 compliant, 1200 bps to 115.2 Kbps

Human-Machine Interface (HMI) Ethernet, 10/100 MB

USB Device port (for non-smoke control applications only) Standard 1.1 and 2.0 USB device port, Type B female connector

Electrical

Power Requirements		24 Vac \pm 20% input @ 50/60 Hz
Power Consumption (Maximum)		20 VA @ 24 Vac
A/D Resolution (analog in)		16 bits
D/A Resolution (analog out)		10 bits
AC Power and Digital Outputs		NEC Class 1 Power Limited
Communication and all other I/O		NEC Class 2
Digital Output		Class 1 Relay, Form C (NO and NC contacts)
Analog Outputs		Voltage (0-10 Vdc)
Universal Inputs (UI) and	Analog Inputs	Digital Inputs
Universal Inputs/Outputs (U)	Voltage (0-10 Vdc)	Pulse Accumulator
	Current (4-20 mA)	Contact Closure Sensing
	1K Ni RTD @ 32°F (Siemens, JCI, DIN Ni 1K)	Dry Contact/Potential Free inputs only
	1K Pt RTD (375 or 385 alpha) @ 32°F	Digital Input (10 ms settling time)
	10K NTC Type 2 or Type 3 Thermistor	Supports counter inputs up to 20 Hz,
	100K NTC Type 2 Thermistor	minimum pulse duration 20 ms (open or closed)
	Analog Outputs	
	0 to 10 Vdc @ 1 mA max	

Electrical

Super Universal (X)

Analog Inputs

Digital Inputs

Voltage (0-10 Vdc)

Pulse Accumulator

Current (4-20 mA)

Contact Closure Sensing

1K Ni RTD @ 32°F (Siemens, JCI, DIN Ni 1K)

Dry Contact/Potential Free inputs only

1K Pt RTD (375 or 385 alpha) @ 32°F

Digital Input (10 ms settling time)

10K NTC Type 2 or Type 3 Thermistor

Supports counter inputs up to 20 Hz,

100K NTC Type 2 Thermistor

minimum pulse duration 20 ms (open or closed)

Analog Outputs

0 to 10 Vdc @ 1 mA max

Digital Output

0 to 20 mA @ 650 Ω max.

0 to 24 Vdc, 22 mA max.

(using external relay)

Operating Environment

Ambient operating temperature

32°F to 122°F (0°C to 50°C)

Relative Humidity

95%, non-condensing

Mounting Surface

Direct equipment mount, building wall, or structural member

CE Compliance

Must be installed inside a metal enclosure rated at IP20 minimum

Agency Listings

UL

UL916 PAZX (all models)

UL916 PAZX7 (all models)

Agency Compliance

FCC Compliance CFR47 Part 15, Subpart B, Class B

Australian EMC Framework

European EMC Directive (CE)

European Low Voltage Directive (LVD)

BACnet Testing Laboratories (BTL) Certified

Ordering Information

TC Compact Series

Part Number	Description
TC24.2-UCM.T	TC Unitary Equipment Controller, 24 point, BACnet MS/TP

Optional License(s)

Product Number	Description
LSM-24.T	License to upgrade the UEC to a TC Compact

Accessories

Product Number	Description
PXM10S	Controller mounted Operator Display module with point monitor and optional blue backlight
PXM10T	Controller mounted Operator Display module
PXA-HMI.CABLEP5	Serial cable required for PXM10T/S connection to non-rooftop variants of the 16-point and 24-point Compact Series (pack of 5)

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
588-682	TC Compact Series Owner's Manual
588-583	TALON Powers Process Control Language (PPCL) User's Manual

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Document No. 149-837T
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Page 9 of 28

BACnet Protocol Implementation Conformance Statement

Products

Product	Model Number	Protocol Revision	Software Revision	Firmware Revision
TC-24 Unitary Equipment Controller	TC24.2-UCM.T	135-2004	N/A	3.2.2

Vendor Information

Siemens Industry, Inc.
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 1000 Deerfield Parkway
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www.buildingtechnologies.siemens.com/bt/us

Product Description

An integral member of the TALON product family, the TC Compact Unitary Equipment Controller for BACnet Networks is a high performance, Direct Digital Control (DDC) unitary equipment controller. The TC Compact operates stand-alone or networked to perform complex control, monitoring and energy management functions without relying on a higher-level processor. The TC Compact communicates on a BACnet MS/TP.

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)

Supported	Device Profile
	BACnet Smart Sensor (B-SS)

Supported BACnet Interoperability Building Block (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		•

Alarm and Event Management			
AE-N-A	Alarm and Event-Notification-A	•	
AE-N-I-B	Alarm and Event-Notification Internal-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		•

Alarm and Event Management			
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-ATR-B	Trending-Automated Trend Retrieval-B		•

Network Management			
NM-CE-A	Network Management-Connection Establishment-A	•	

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-DDC-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		•

Device Management			
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
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
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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)
	Does the BBMD support registrations by Foreign Devices?

Character Sets

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