

Building Controller with BACnet Interface

PICS

Protocol Implementation
Conformance Statement

BACnet/IP

BACnet MS/TP

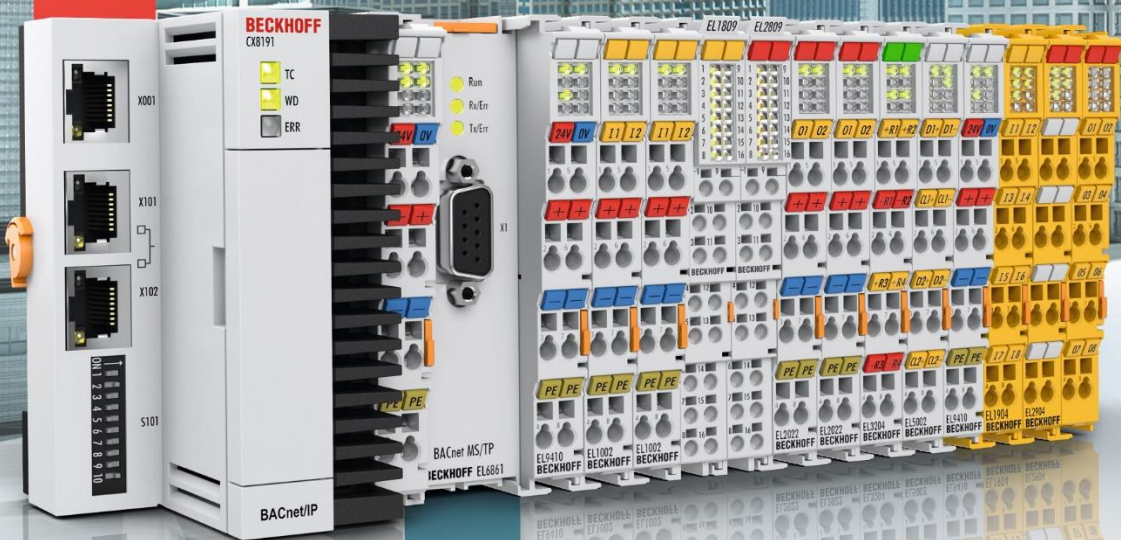


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1 Foreword

1.1 Notes on the documentation

1.1.1 Liability conditions

This documentation has been prepared with care. The products described are, however, constantly under development. For this reason, the documentation may not always have been fully checked for consistency with the performance data, standards or other characteristics described. If it should contain technical or editorial errors, we reserve the right to make changes at any time and without notice. No claims for the modification of products that have already been supplied may be made on the basis of the data, diagrams and descriptions in this documentation.

1.1.2 Delivery conditions

In addition, the general delivery conditions of the company Beckhoff Automation GmbH & Co. KG apply.

1.1.3 Brands

Beckhoff®, TwinCAT®, EtherCAT®, Safety over EtherCAT®, TwinSAFE® and XFC® are registered and licensed brand names of Beckhoff Automation GmbH. The use by third parties of other brand names or trademarks contained in this documentation may lead to an infringement of the rights of the respective trademark owner.

BACnet® is a registered trademark of ASHRAE.

1.1.4 Patents

The EtherCAT technology is patent protected, in particular by the following patent applications and patents: DE10304637, DE102004044764, DE102005009224, and DE102007017835 with the corresponding applications and registrations in various other countries.

1.1.5 Copyright

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1.2 Safety instructions

This description is only intended for the use of trained specialists in control and automation technology who are familiar with the applicable national standards. It is essential that the following notes and explanations are followed when installing and commissioning these components. The responsible staff must ensure that the application or use of the products described satisfy all the requirements for safety, including all the relevant laws, regulations, guidelines and standards.

1.2.1 Description of safety symbols

The following safety symbols are used in this documentation. They are intended to alert the reader to the associated safety instructions.

 DANGER	<p>Serious risk of injury!</p> <p>Failure to follow the safety instructions associated with this symbol directly endangers the life and health of persons.</p>
 WARNING	<p>Risk of injury!</p> <p>Failure to follow the safety instructions associated with this symbol endangers the life and health of persons.</p>
 CAUTION	<p>Personal injuries!</p> <p>Failure to follow the safety instructions associated with this symbol can lead to injuries to persons.</p>
 Warning	<p>Damage to the environment or devices</p> <p>Failure to follow the instructions associated with this symbol can lead to damage to the environment or equipment.</p>
 Note	<p>Tip or pointer</p> <p>This symbol indicates information that contributes to better understanding.</p>

2 BACnet Protocol Implementation Conformance Statement

Date:	14.05.2024
Vendor Name:	Beckhoff Automation GmbH (Vendor-ID: 415)
Product Name:	TwinCAT BACnet
Product Model Number*:	CX8191 CX9020 CX51xx CX52xx C60xx CP66xx CP67xx CP22xx CP27xx
Application Software Version:	4.0.4 (0)**
Firmware Revision:	4.0.4 (0)**
BACnet Protocol Revision	14

* See document "BECKHOFF Automation BACnet Model-Number overview" for detailed information about CPU-options, operating-systems and display sizes.

** The number in brackets represents firmware changes which do not affect the TwinCAT BACnet implementation or the functionality described in this document.

Product Description

TwinCAT BACnet is a real-time software implementation of BACnet, running on Windows operating systems, including Windows 10, Windows 7 and Windows CE. TwinCAT BACnet can be executed on X86/X64 and ARM systems. Using the Beckhoff modular IO-System various hardware devices can be coupled to other BACnet devices.

BACnet Standardized Device Profile (Annex L)

- BACnet Operator Workstation (B-OWS)
- BACnet Advanced Operator Workstation (B-AWS)
- BACnet Operator Display (B-OD)
- BACnet Building Controller (B-BC)
- BACnet Advanced Application Controller (B-AAC)
- BACnet Application Specific Controller (B-ASC)
- BACnet Smart Sensor (B-SS)
- BACnet Smart Actuator (B-SA)

3 BACnet Interoperability Building Blocks

Data-Sharing BIBBs

<input checked="" type="checkbox"/>	Data Sharing ReadProperty-A	(DS-RP-A)
<input checked="" type="checkbox"/>	Data Sharing ReadProperty-B	(DS-RP-B)
<input checked="" type="checkbox"/>	Data Sharing ReadPropertyMultiple-A	(DS-RPM-A)
<input checked="" type="checkbox"/>	Data Sharing ReadPropertyMultiple-B	(DS-RPM-B)
<input checked="" type="checkbox"/>	Data Sharing WriteProperty-A	(DS-WP-A)
<input checked="" type="checkbox"/>	Data Sharing WriteProperty-B	(DS-WP-B)
<input checked="" type="checkbox"/>	Data Sharing WritePropertyMultiple-B	(DS-WPM-B)
<input checked="" type="checkbox"/>	Data Sharing Change Of Value-A	(DS-COV-A)
<input checked="" type="checkbox"/>	Data Sharing Change Of Value-B	(DS-COV-B)
<input checked="" type="checkbox"/>	Data Sharing Change Of Value Property-A	(DS-COVP-A)
<input checked="" type="checkbox"/>	Data Sharing Change Of Value Property-B	(DS-COVP-B)
<input checked="" type="checkbox"/>	Data Sharing Change Of Value-Unsubscribed-A	(DS-COVU-A)
<input checked="" type="checkbox"/>	Data Sharing Change Of Value-Unsubscribed-B	(DS-COVU-B)

Alarm and Event BIBBs

<input checked="" type="checkbox"/>	Alarm and Event Management-Notification-Internal-B	(AE-N-I-B)
<input checked="" type="checkbox"/>	Alarm and Event Management-Notification-External-B	(AE-N-E-B)
<input checked="" type="checkbox"/>	Alarm and Event Management-Acknowledge-B	(AE-ACK-B)
<input checked="" type="checkbox"/>	Alarm and Event Management-Information-B	(AE-INFO-B)
<input checked="" type="checkbox"/>	Alarm and Event Management-Alarm Summary-B	(AE-ASUM-B)
<input checked="" type="checkbox"/>	Alarm and Event Management-Enrollment Summary-B	(AE-ESUM-B)
<input checked="" type="checkbox"/>	Alarm and Event Management-Event Log-Internal-B	(AE-EL-I-B)
<input checked="" type="checkbox"/>	Alarm and Event Management-Event Log-External-B	(AE-EL-E-B)
<input checked="" type="checkbox"/>	Alarm and Event Management-Configurable Recipient Lists-B	(AE-CRL-B)

Scheduling BIBBs

<input checked="" type="checkbox"/>	Scheduling-Internal-B	(SCHED-I-B)
<input checked="" type="checkbox"/>	Scheduling-External-B	(SCHED-E-B)

Trending BIBBs

<input checked="" type="checkbox"/>	Trending-Viewing and Modifying Trends-Internal-B	(T-VMT-I-B)
<input checked="" type="checkbox"/>	Trending-Viewing and Modifying Trends-External-B	(T-VMT-E-B)
<input checked="" type="checkbox"/>	Trending-Automated Trend Retrieval-B	(T-ATR-B)
<input checked="" type="checkbox"/>	Trending-Viewing and Modifying Multiple Values-Internal-B	(T-VMMV-I-B)
<input checked="" type="checkbox"/>	Trending-Automated Multiple Value Retrieval-B	(T-AMVR-B)

Device Management BIBBs

<input checked="" type="checkbox"/>	Device Management-Dynamic Device Binding-A	(DM-DDB-A)
<input checked="" type="checkbox"/>	Device Management-Dynamic Device Binding-B	(DM-DDB-B)
<input checked="" type="checkbox"/>	Device Management-Dynamic Object Binding-B	(DM-DOB-B)
<input checked="" type="checkbox"/>	Device Management-DeviceCommunicationControl-B	(DM-DCC-B)
<input checked="" type="checkbox"/>	Device Management-TimeSynchronization-A	(DM-TS-A)
<input checked="" type="checkbox"/>	Device Management-TimeSynchronization-B	(DM-TS-B)
<input checked="" type="checkbox"/>	Device Management-UTCTimeSynchronization-A	(DM-UTC-A)
<input checked="" type="checkbox"/>	Device Management-UTCTimeSynchronization-B	(DM-UTC-B)
<input checked="" type="checkbox"/>	Device Management-Automatic Time Synchronization-A	(DM-ATS-A)
<input checked="" type="checkbox"/>	Device Management-ReinitializeDevice-B	(DM-RD-B)
<input checked="" type="checkbox"/>	Device Management-Backup and Restore-B	(DM-BR-B)
<input checked="" type="checkbox"/>	Device Management-Restart-B	(DM-R-B)
<input checked="" type="checkbox"/>	Device Management-List Manipulation-B	(DM-LM-B)
<input checked="" type="checkbox"/>	Device Management-Object Creation and Deletion-B	(DM-OCD-B)

Network Management BIBBs

<input checked="" type="checkbox"/>	Network Management-Router Configuration-B	(NM-RC-B)
<input checked="" type="checkbox"/>	Network Management-BBMD Configuration-B	(NM-BBMD-C-B)
<input checked="" type="checkbox"/>	Network Management – Foreign Device Registration – A	(NM-FDR-A)

Gateway BIBBs

- Gateway – Embedded Objects – B (GW-EO-B)

Total number of BIBBs supported: 47

Segmentation Capability

- Able to transmit segmented messages Window Size 16
- Able to receive segmented messages Window Size 16

4 Standard Object Types Supported

Object Type	Dynamically Creatable	Dynamically Deletable
Accumulator	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Analog Input	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Analog Output	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Analog Value	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Averaging	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Binary Input	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Binary Output	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Binary Value	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Calendar	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Command	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Device	<input type="checkbox"/>	<input type="checkbox"/>
Event Enrollment	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
File	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Group	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Loop	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Multi-state Input	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Multi-state Output	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Multi-state Value	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Notification Class	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Schedule	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Structured View	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Program	<input type="checkbox"/>	<input type="checkbox"/>
Pulse Converter	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Trend Log	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Trend Log Multiple	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Event Log	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Bitstring Value	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
CharacterString Value	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Date Pattern Value	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Date Value	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
DateTime Pattern Value	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
DateTime Value	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Integer Value	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Large Analog Value	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
OctetString Value	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Positive Integer Value	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Time Pattern Value	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Time Value	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Total number of object types supported: 38

4.1 List of Proprietary Properties

Generally TwinCAT BACnet implements the open BACnet communication using standard objects and properties. The following proprietary properties may be used to retrieve additional information.

Name	Identifier	Data type	Meaning
Scale_Offset	512	REAL	Specifies the scale offset for the conversion from raw value provided by the terminal (normally 0-32.767) and the converted value in BACnet engineering units. This property is used together with the standard property <i>Resolution</i> .
Io_Bus_Nr	513	Unsigned	Bus number of the Beckhoff terminal structure.
Io_Module_Nr	514	Unsigned	Module number of the Beckhoff terminal.
Io_Channel_Nr	515	Unsigned	Channel number within the referenced terminal.
Persist_Data	516	Enumerated	Displays the current state of the persistent data handling and allows for commanding the BACnet supplement to write the persistent data to the storage medium (flash / hard drive). 0 = Disabled 1 = Initialize 2 = No Change 3 = Ready 4 = Write 5 = Writing
Active_Priority	517	Unsigned	Highest BACnet priority currently active for this object (1=Highest priority, 16= Lowest Priority, 17= Relinquish_Default)
LastConfirmedServiceAccess	518	Character String	IP address of the BACnet station which issued the last confirmed service access to TwinCAT BACnet.
Data_Request_Mode	519	Enumerated	Data retrieval mode to gather the data from the Event Enrollment object. 0 = COV 1 = Read Property 2 = Read Property Multiple
Data_Polling_Interval	520	Unsigned	Polling Interval in milliseconds if Data_Request_Mode = Read Property or Read Property Multiple.
EnrollmentCovResubscriptionInterval	521	Unsigned	Cov Resubscription Interval in seconds if Data_Request_Mode = COV.
File_Name	522	Character String	Name of the file referenced by the file object.
Process_Id	523	Unsigned	Process-ID used to reference the Event Log object in TwinCAT. Default = 20000
PLC_SymbolName	524	Character String	Symbolname of the function block connected to the BACnet object in the PLC runtime.

UseUnconfirmedCoV	525	Boolean	This flag determines if the Trendlog objects uses the confirmed or unconfirmed Change of Value service.
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4.2 Property Range Restrictions

General implementation details on the property list:

- All properties are listed with their data types and conformance code as specified in the BACnet standard.
- Read/Write access is identified by “R” for read-only properties, “W” represents writable properties.
- If not otherwise specified, all properties support the required ranges defined in the BACnet standard.
- All CharacterString properties support up to 255 characters.

4.3 Object Types

A detailed description of all supported properties is shown in the following tables.

Column CC = BACnet Conformance Code

Column WA = WriteAccess

Conformance Code

Properties marked with “R” are read-only and may be read from the device using standard BACnet services.

Properties marked with “O” are optional properties specified in the BACnet standard.

Properties marked with “W” may be configured to be writable by standard BACnet services.

4.3.1 Accumulator

Property	Data type	CC	WA
Object_Identifier	BACnetObjectIdentifier	R	R
Object_Name	CharacterString	R	W
Object_Type	BACnetObjectType	R	R
Present_Value	Unsigned	R	W
Description	CharacterString	O	W
Device_Type	CharacterString	O	W
Status_Flags	BACnetStatusFlags	R	R
Event_State	BACnetEventState	R	R
Reliability	BACnetReliability	O	R
Out_Of_Service	BOOLEAN	R	W
Scale	BACnetScale	R	R
Units	BACnetEngineeringUnits	R	W
Prescale	BACnetPrescale	O	W
Max_Pres_Value	Unsigned	R	W
Value_Change_Time	BACnetDateTime	O	R
Value_Before_Change	Unsigned	O	R
Value_Set	Unsigned	O	W
Pulse_Rate	Unsigned	O	R
High_Limit	Unsigned	O	W
Low_Limit	Unsigned	O	W
Limit_Monitoring_Interval	Unsigned	O	W
Notification_Class	Unsigned	O	W
Time_Delay	Unsigned	O	W
Limit_Enable	BACnetLimitEnable	O	W
Event_Enable	BACnetEventTransitionBits	O	W
Acked_Transitions	BACnetEventTransitionBits	O	R
Notify_Type	BACnetNotifyType	O	W
Event_Time_Stamps	BACnetARRAY[3] of BACnetTimeStamp	O	R
Event_Message_Texts	BACnetARRAY[3] of CharacterString	O	R
Event_Message_Texts_Config	BACnetARRAY[3] of CharacterString	O	W
Event_Detection_Enable	BOOLEAN	O	W
Event_Algorithm_Inhibit_Ref	BACnetObjectPropertyReference	O	R
Event_Algorithm_Inhibit	BOOLEAN	O	W
Time_Delay_Normal	Unsigned	O	W
Reliability_Evaluation_Inhibit	BOOLEAN	O	W
Property_List	BACnetARRAY[N] of BACnetPropertyIdentifier	R	R
Profile_Name	CharacterString	O	R
PLC_SymbolName (524)	CharacterString	O	R

4.3.2 Analog Input

Property	Data type	CC	WA
Object_Identifier	BACnetObjectIdentifier	R	R
Object_Name	CharacterString	R	W
Object_Type	BACnetObjectType	R	R
Present_Value	REAL	R	R
Description	CharacterString	O	W
Device_Type	CharacterString	O	W
Status_Flags	BACnetStatusFlags	R	R
Event_State	BACnetEventState	R	R
Reliability	BACnetReliability	O	R
Out_Of_Service	BOOLEAN	R	W
Update_Interval	Unsigned	O	R
Units	BACnetEngineeringUnits	R	W
Min_Pres_Value	REAL	O	W
Max_Pres_Value	REAL	O	W
Resolution	REAL	O	W
COV_Increment	REAL	O	W
Time_Delay	Unsigned	O	W
Notification_Class	Unsigned	O	W
High_Limit	REAL	O	W
Low_Limit	REAL	O	W
Deadband	REAL	O	W
Limit_Enable	BACnetLimitEnable	O	W
Event_Enable	BACnetEventTransitionBits	O	W
Acked_Transitions	BACnetEventTransitionBits	O	R
Notify_Type	BACnetNotifyType	O	W
Event_Time_Stamps	BACnetARRAY[3] of BACnetTimeStamp	O	R
Event_Message_Texts	BACnetARRAY[3] of CharacterString	O	R
Event_Message_Texts_Config	BACnetARRAY[3] of CharacterString	O	W
Event_Detection_Enable	BOOLEAN	O	W
Event_Algorithm_Inhibit_Ref	BACnetObjectPropertyReference	O	R
Event_Algorithm_Inhibit	BOOLEAN	O	W
Time_Delay_Normal	Unsigned	O	W
Reliability_Evaluation_Inhibit	BOOLEAN	O	W
Property_List	BACnetARRAY[N] of BACnetPropertyIdentifier	R	R
Profile_Name	CharacterString	O	R
Scale_Offset (512)	REAL	O	R
Io_Bus_Nr (513)	Unsigned (0 .. 255)	O	R
Io_Module_Nr (514)	Unsigned (1 .. 65535)	O	R
Io_Channel_Nr (515)	Unsigned (1 .. 65535)	O	R
PLC_SymbolName (524)	CharacterString	O	R

4.3.3 Analog Output

Property	Data type	CC	WA
Object_Identifier	BACnetObjectIdentifier	R	R
Object_Name	CharacterString	R	W
Object_Type	BACnetObjectType	R	R
Present_Value	REAL	W	W
Description	CharacterString	O	W
Device_Type	CharacterString	O	W
Status_Flags	BACnetStatusFlags	R	R
Event_State	BACnetEventState	R	R
Reliability	BACnetReliability	O	R
Out_Of_Service	BOOLEAN	R	W
Units	BACnetEngineeringUnits	R	W
Min_Pres_Value	REAL	O	W
Max_Pres_Value	REAL	O	W
Resolution	REAL	O	W
Priority_Array	BACnetPriorityArray	R	R
Relinquish_Default	REAL	R	W
COV_Increment	REAL	O	W
Time_Delay	Unsigned	O	W
Notification_Class	Unsigned	O	W
High_Limit	REAL	O	W
Low_Limit	REAL	O	W
Deadband	REAL	O	W
Limit_Enable	BACnetLimitEnable	O	W
Event_Enable	BACnetEventTransitionBits	O	W
Acked_Transitions	BACnetEventTransitionBits	O	R
Notify_Type	BACnetNotifyType	O	W
Event_Time_Stamps	BACnetARRAY[3] of BACnetTimeStamp	O	R
Event_Message_Texts	BACnetARRAY[3] of CharacterString	O	R
Event_Message_Texts_Config	BACnetARRAY[3] of CharacterString	O	W
Event_Detection_Enable	BOOLEAN	O	W
Event_Algorithm_Inhibit_Ref	BACnetObjectPropertyReference	O	R
Event_Algorithm_Inhibit	BOOLEAN	O	W
Time_Delay_Normal	Unsigned	O	W
Reliability_Evaluation_Inhibit	BOOLEAN	O	W
Property_List	BACnetARRAY[N] of BACnetPropertyIdentifier	R	R
Profile_Name	CharacterString	O	R
Scale_Offset (512)	REAL	O	R
Io_Bus_Nr (513)	Unsigned (0 .. 255)	O	R
Io_Module_Nr (514)	Unsigned (1 .. 65535)	O	R
Io_Channel_Nr (515)	Unsigned (1 .. 65535)	O	R
Active_Priority (517)	Unsigned (1 .. 17)	O	R
PLC_SymbolName (524)	CharacterString	O	R

4.3.4 Analog Value

Property	Data type	CC	WA
Object_Identifier	BACnetObjectIdentifier	R	R
Object_Name	CharacterString	R	W
Object_Type	BACnetObjectType	R	R
Present_Value	REAL	R	W
Description	CharacterString	O	W
Status_Flags	BACnetStatusFlags	R	R
Event_State	BACnetEventState	R	R
Reliability	BACnetReliability	O	R
Out_Of_Service	BOOLEAN	R	W
Units	BACnetEngineeringUnits	R	W
Priority_Array	BACnetPriorityArray	O	R
Relinquish_Default	REAL	O	W
COV_Increment	REAL	O	W
Time_Delay	Unsigned	O	W
Notification_Class	Unsigned	O	W
High_Limit	REAL	O	W
Low_Limit	REAL	O	W
Deadband	REAL	O	W
Limit_Enable	BACnetLimitEnable	O	W
Event_Enable	BACnetEventTransitionBits	O	W
Acked_Transitions	BACnetEventTransitionBits	O	R
Notify_Type	BACnetNotifyType	O	W
Event_Time_Stamps	BACnetARRAY[3] of BACnetTimeStamp	O	R
Event_Message_Texts	BACnetARRAY[3] of CharacterString	O	R
Event_Message_Texts_Config	BACnetARRAY[3] of CharacterString	O	W
Event_Detection_Enable	BOOLEAN	O	W
Event_Algorithm_Inhibit_Ref	BACnetObjectPropertyReference	O	R
Event_Algorithm_Inhibit	BOOLEAN	O	W
Time_Delay_Normal	Unsigned	O	W
Reliability_Evaluation_Inhibit	BOOLEAN	O	W
Property_List	BACnetARRAY[N] of BACnetPropertyIdentifier	R	R
Profile_Name	CharacterString	O	R
Active_Priority (517)	Unsigned (1 .. 17)	O	R
PLC_SymbolName (524)	CharacterString	O	R

4.3.5 Averaging

Property	Data type	CC	WA
Object_Identifier	BACnetObjectIdentifier	R	R
Object_Name	CharacterString	R	W
Object_Type	BACnetObjectType	R	R
Minimum_Value	REAL	R	R
Minimum_Value_Timestamp	BACnetDateTime	O	R
Average_Value	REAL	R	R
Variance_Value	REAL	O	R
Maximum_Value	REAL	R	R
Maximum_Value_Timestamp	BACnetDateTime	O	R
Description	CharacterString	O	W
Attempted_Samples	Unsigned	R	W
Valid_Samples	Unsigned	R	R
Object_Property_Reference	BACnetDeviceObject PropertyReference	R	W
Window_Interval	Unsigned	R	W
Window_Samples	Unsigned	R	W
Property_List	BACnetARRAY[N] of BACnetPropertyIdentifier	R	R
Profile_Name	CharacterString	O	R
PLC_SymbolName (524)	CharacterString	O	R

4.3.6 Binary Input

Property	Data type	CC	WA
Object_Identifier	BACnetObjectIdentifier	R	R
Object_Name	CharacterString	R	W
Object_Type	BACnetObjectType	R	R
Present_Value	BACnetBinaryPV	R	R
Description	CharacterString	O	W
Device_Type	CharacterString	O	W
Status_Flags	BACnetStatusFlags	R	R
Event_State	BACnetEventState	R	R
Reliability	BACnetReliability	O	R
Out_Of_Service	BOOLEAN	R	W
Polarity	BACnetPolarity	R	W
Inactive_Text	CharacterString	O	W
Active_Text	CharacterString	O	W
Change_Of_State_Time	BACnetDateTime	O	R
Change_Of_State_Count	Unsigned	O	W
Time_Of_State_Count_Reset	BACnetDateTime	O	R
Elapsed_Active_Time	Unsigned32	O	W
Time_Of_Active_Time_Reset	BACnetDateTime	O	R
Time_Delay	Unsigned	O	W
Notification_Class	Unsigned	O	W
Alarm_Value	BACnetBinaryPV	O	W
Event_Enable	BACnetEventTransitionBits	O	W
Acked_Transitions	BACnetEventTransitionBits	O	R
Notify_Type	BACnetNotifyType	O	W
Event_Time_Stamps	BACnetARRAY[3] of BACnetTimeStamp	O	R
Event_Message_Texts	BACnetARRAY[3] of CharacterString	O	R
Event_Message_Texts_Config	BACnetARRAY[3] of CharacterString	O	W
Event_Detection_Enable	BOOLEAN	O	W
Event_Algorithm_Inhibit_Ref	BACnetObjectPropertyReference	O	R
Event_Algorithm_Inhibit	BOOLEAN	O	W
Time_Delay_Normal	Unsigned	O	W
Reliability_Evaluation_Inhibit	BOOLEAN	O	W
Property_List	BACnetARRAY[N] of BACnetPropertyIdentifier	R	R
Profile_Name	CharacterString	O	R
Io_Bus_Nr (513)	Unsigned (0 .. 255)	O	R
Io_Module_Nr (514)	Unsigned (1 .. 65535)	O	R
Io_Channel_Nr (515)	Unsigned (1 .. 65535)	O	R
PLC_SymbolName (524)	CharacterString	O	R

4.3.7 Binary Output

Property	Data type	CC	WA
Object_Identifier	BACnetObjectIdentifier	R	R
Object_Name	CharacterString	R	W
Object_Type	BACnetObjectType	R	R
Present_Value	BACnetBinaryPV	W	W
Description	CharacterString	O	W
Device_Type	CharacterString	O	W
Status_Flags	BACnetStatusFlags	R	R
Event_State	BACnetEventState	R	R
Reliability	BACnetReliability	O	R
Out_Of_Service	BOOLEAN	R	W
Polarity	BACnetPolarity	R	W
Inactive_Text	CharacterString	O	W
Active_Text	CharacterString	O	W
Change_Of_State_Time	BACnetDateTime	O	R
Change_Of_State_Count	Unsigned	O	W
Time_Of_State_Count_Reset	BACnetDateTime	O	R
Elapsed_Active_Time	Unsigned32	O	W
Time_Of_Active_Time_Reset	BACnetDateTime	O	R
Minimum_Off_Time	Unsigned32	O	W
Minimum_On_Time	Unsigned32	O	W
Priority_Array	BACnetPriorityArray	R	R
Relinquish_Default	BACnetBinaryPV	R	W
Time_Delay	Unsigned	O	W
Notification_Class	Unsigned	O	W
Feedback_Value	BACnetBinaryPV	O	W
Event_Enable	BACnetEventTransitionBits	O	W
Acked_Transitions	BACnetEventTransitionBits	O	R
Notify_Type	BACnetNotifyType	O	W
Event_Time_Stamps	BACnetARRAY[3] of BACnetTimeStamp	O	R
Event_Message_Texts	BACnetARRAY[3] of CharacterString	O	R
Event_Message_Texts_Config	BACnetARRAY[3] of CharacterString	O	W
Event_Detection_Enable	BOOLEAN	O	W
Event_Algorithm_Inhibit_Ref	BACnetObjectPropertyReference	O	R
Event_Algorithm_Inhibit	BOOLEAN	O	W
Time_Delay_Normal	Unsigned	O	W
Reliability_Evaluation_Inhibit	BOOLEAN	O	W
Property_List	BACnetARRAY[N] of BACnetPropertyIdentifier	R	R
Profile_Name	CharacterString	O	R

Binary Output (continued)

Property	Data type	CC	WA
Io_Bus_Nr (513)	Unsigned (0 .. 255)	O	R
Io_Module_Nr (514)	Unsigned (1 .. 65535)	O	R
Io_Channel_Nr (515)	Unsigned (1 .. 65535)	O	R
Active_Priority (517)	Unsigned (1 .. 17)	O	R
PLC_SymbolName (524)	CharacterString	O	R

4.3.8 Binary Value

Property	Data type	CC	WA
Object_Identifier	BACnetObjectIdentifier	R	R
Object_Name	CharacterString	R	W
Object_Type	BACnetObjectType	R	R
Present_Value	BACnetBinaryPV	R	W
Description	CharacterString	O	W
Status_Flags	BACnetStatusFlags	R	R
Event_State	BACnetEventState	R	R
Reliability	BACnetReliability	O	R
Out_Of_Service	BOOLEAN	R	W
Inactive_Text	CharacterString	O	W
Active_Text	CharacterString	O	W
Change_Of_State_Time	BACnetDateTime	O	R
Change_Of_State_Count	Unsigned32	O	W
Time_Of_State_Count_Reset	BACnetDateTime	O	R
Elapsed_Active_Time	Unsigned32	O	W
Time_Of_Active_Time_Reset	BACnetDateTime	O	R
Minimum_Off_Time	Unsigned32	O	W
Minimum_On_Time	Unsigned32	O	W
Priority_Array	BACnetPriorityArray	O	R
Relinquish_Default	BACnetBinaryPV	O	W
Time_Delay	Unsigned	O	W
Notification_Class	Unsigned	O	W
Alarm_Value	BACnetBinaryPV	O	W
Event_Enable	BACnetEventTransitionBits	O	W
Acked_Transitions	BACnetEventTransitionBits	O	R
Notify_Type	BACnetNotifyType	O	W
Event_Time_Stamps	BACnetARRAY[3] of BACnetTimeStamp	O	R
Event_Message_Texts	BACnetARRAY[3] of CharacterString	O	R
Event_Message_Texts_Config	BACnetARRAY[3] of CharacterString	O	W
Event_Detection_Enable	BOOLEAN	O	W
Event_Algorithm_Inhibit_Ref	BACnetObjectPropertyReference	O	R
Event_Algorithm_Inhibit	BOOLEAN	O	W
Time_Delay_Normal	Unsigned	O	W
Reliability_Evaluation_Inhibit	BOOLEAN	O	W
Property_List	BACnetARRAY[N] of BACnetPropertyIdentifier	R	R
Profile_Name	CharacterString	O	R
Active_Priority (517)	Unsigned (1 .. 17)	O	R
PLC_SymbolName (524)	CharacterString	O	R

4.3.9 Calendar

Property	Data type	CC	WA
Object_Identifier	BACnetObjectIdentifier	R	R
Object_Name	CharacterString	R	W
Object_Type	BACnetObjectType	R	R
Description	CharacterString	O	W
Present_Value	BOOLEAN	R	R
Date_List	List of BACnetCalendarEntry	R	W
Property_List	BACnetARRAY[N] of BACnetPropertyIdentifier	R	R
Profile_Name	CharacterString	O	R
PLC_SymbolName (524)	CharacterString	O	R

4.3.10 Command

Property	Data type	CC	WA
Object_Identifier	BACnetObjectIdentifier	R	R
Object_Name	CharacterString	R	W
Object_Type	BACnetObjectType	R	R
Description	Description	O	W
Present_Value	Present_Value	W	W
In_Process	In_Process	R	R
All_Writes_Successful	All_Writes_Successful	R	R
Action	Action	R	W
Action_Text	Action_Text	O	W
Property_List	BACnetARRAY[N] of BACnetPropertyIdentifier	R	R
Profile_Name	Profile_Name	O	R
PLC_SymbolName (524)	CharacterString	O	R

4.3.11 Device

Property	Data type	CC	WA
Object_Identifier	BACnetObjectIdentifier	R	R
Object_Name	CharacterString	R	W
Object_Type	BACnetObjectType	R	R
System_Status	BACnetDeviceStatus	R	R
Vendor_Name	CharacterString	R	R
Vendor_Identifier	Unsigned16	R	R
Model_Name	CharacterString	R	R
Firmware_Revision	CharacterString	R	R
Application_Software_Version	CharacterString	R	R
Location	CharacterString	O	W
Description	CharacterString	O	W
Protocol_Version	Unsigned	R	R
Protocol_Revision	Unsigned	R	R
Protocol_Services_Supported	BACnetServicesSupported	R	R
Protocol_Object_Types_Supported	BACnetObjectTypesSupported	R	R
Object_List	BACnetARRAY[N] of BACnetObjectIdentifier	R	R
Structured_Object_List	BACnetARRAY[N] of BACnetObjectIdentifier	O	R
Max_APDU_Length_Accepted	Unsigned	R	R
Segmentation_Supported	BACnetSegmentation	R	R
Max_Segments_Accepted	Unsigned	O	R
Local_Time	Time	O	R
Local_Date	Date	O	R
UTC_Offset	INTEGER	O	W
Daylight_Savings_Status	BOOLEAN	O	W
APDU_Segment_Timeout	Unsigned	O	W
APDU_Timeout	Unsigned	R	W
Number_Of_APDU_Retries	Unsigned	R	W
Time_Synchronization_Recipients	List of BACnetRecipient	O	W
Max_Master	Unsigned(1..127)	O	R*
Max_Info_Frames	Unsigned	O	R*
Device_Address_Binding	List of BACnetAddressBinding	R	R
Database_Revision	Unsigned	R	R
Configuration_Files	BACnetARRAY[N] of BACnetObjectIdentifier	O	R
Last_Restore_Time	BACnetTimeStamp	O	R
Backup_Failure_Timeout	Unsigned16	O	W
Backup_Preparation_Time	Unsigned16	O	R
Restore_Preparation_Time	Unsigned16	O	R
Restore_Completion_Time	Unsigned16	O	R
Backup_And_Restore_State	BACnetBackupState	O	R
Active_COV_Subscriptions	List of BACnetCOVSubscription	O	R
Last_Restart_Reason	BACnetRestartReason	O	R

Property	Data type	CC	WA
Time_Of_Device_Restart	BACnetTimeStamp	O	R
Restart_Notification_Recipients	List of BACnetRecipient	O	W

Device (continued)

Property	Data type	CC	WA
UTC_Time_Synchronization_Recipients	List of BACnetRecipient	O	W
Time_Synchronization_Interval	Unsigned	O	W
Align_Intervals	BOOLEAN	O	W
Interval_Offset	Unsigned	O	W
Property_List	BACnetARRAY[N] of BACnetPropertyIdentifier	R	R
Profile_Name	CharacterString	O	
Persist_Data (516)	Enumerated	O	W
LastConfirmedServiceAccess (518)	CharacterString	O	R
PLC_SymbolName (524)	CharacterString	O	R

*Max_Master / Max_Info_Frames are present if MS/TP terminal EL6861 is connected.

4.3.12 Event Enrollment

Property	Data type	CC	WA
Object_Identifier	BACnetObjectIdentifier	R	R
Object_Name	CharacterString	R	W
Object_Type	BACnetObjectType	R	R
Description	CharacterString	O	W
Event_Type	BACnetEventType	R	W
Notify_Type	BACnetNotifyType	R	W
Event_Parameters	BACnetEventParameter	R	W
Object_Property_Reference	BACnetDeviceObjectPropertyReference	R	W
Event_State	BACnetEventState	R	R
Event_Enable	BACnetEventTransitionBits	R	W
Acked_Transitions	BACnetEventTransitionBits	R	R
Notification_Class	Unsigned	R	W
Event_Time_Stamps	BACnetARRAY[3] of BACnetTimeStamp	R	R
Event_Message_Texts	BACnetARRAY[3] of CharacterString	O	R
Event_Message_Texts_Config	BACnetARRAY[3] of CharacterString	O	W
Event_Detection_Enable	BOOLEAN	R	W
Event_Algorithm_Inhibit_Ref	BACnetObjectPropertyReference	O	R
Event_Algorithm_Inhibit	BOOLEAN	O	W
Time_Delay_Normal	Unsigned	O	W
Status_Flags	BACnetStatusFlags	R	R
Reliability	BACnetReliability	R	R
Reliability_Evaluation_Inhibit	BOOLEAN	O	W
Property_List	BACnetARRAY[N] of BACnetPropertyIdentifier	R	R
Profile_Name	CharacterString	O	R
Data_Request_Mode (519)	Enumerated	O	W
Data_Polling_Interval (520)	Unsigned	O	W
Enrollment_Cov_Resubscription_Interval (521)	Unsigned	O	W
PLC_SymbolName (524)	CharacterString	O	R

4.3.13 File

Property	Data type	CC	WA
Object_Identifier	BACnetObjectIdentifier	R	R
Object_Name	CharacterString	R	W
Object_Type	BACnetObjectType	R	R
Description	CharacterString	O	W
File_Type	CharacterString	R	R
File_Size	Unsigned	R	W
Modification_Date	BACnetDateTime	R	R
Archive	BOOLEAN	W	W
Read_Only	BOOLEAN	R	W
File_Access_Method	BACnetFileAccessMethod	R	R
Property_List	BACnetARRAY[N] of BACnetPropertyIdentifier	R	R
Profile_Name	CharacterString	O	R
File_Name (522)	CharacterString	O	W
PLC_SymbolName (524)	CharacterString	O	R

4.3.14 Group

Property	Data type	CC	WA
Object_Identifier	BACnetObjectIdentifier	R	R
Object_Name	CharacterString	R	W
Object_Type	BACnetObjectType	R	R
Description	CharacterString	O	W
List_Of_Group_Members	List of ReadAccessSpecification	R	W
Present_Value	List of ReadAccessResult	R	R
Property_List	BACnetARRAY[N] of BACnetPropertyIdentifier	R	R
Profile_Name	CharacterString	O	R
PLC_SymbolName (524)	CharacterString	O	R

4.3.15 Loop

Property	Data type	CC	WA
Object_Identifier	BACnetObjectIdentifier	R	R
Object_Name	CharacterString	R	W
Object_Type	BACnetObjectType	R	R
Present_Value	REAL	R	W
Description	CharacterString	O	W
Status_Flags	BACnetStatusFlags	R	R
Event_State	BACnetEventState	R	R
Reliability	BACnetReliability	O	R
Out_Of_Service	BOOLEAN	R	W
Update_Interval	Unsigned	O	R
Output_Units	BACnetEngineeringUnits	R	W
Manipulated_Variable_Reference	BACnetObjectPropertyReference	R	W
Controlled_Variable_Reference	BACnetObjectPropertyReference	R	W
Controlled_Variable_Value	REAL	R	R
Controlled_Variable_Units	BACnetEngineeringUnits	R	W
Setpoint_Reference	BACnetSetpointReference	R	W
Setpoint	REAL	R	W
Action	BACnetAction	R	W
Proportional_Constant	REAL	O	W
Proportional_Constant_Units	BACnetEngineeringUnits	O	W
Integral_Constant	REAL	O	W
Integral_Constant_Units	BACnetEngineeringUnits	O	W
Derivative_Constant	REAL	O	W
Derivative_Constant_Units	BACnetEngineeringUnits	O	W
Bias	REAL	O	W
Maximum_Output	REAL	O	W
Minimum_Output	REAL	O	W
Priority_For_Writing	Unsigned	R	W
COV_Increment	REAL	O	W
Time_Delay	Unsigned	O	W
Notification_Class	Unsigned	O	W
Error_Limit	REAL	O	W
Deadband	REAL	O	W
Event_Enable	BACnetEventTransitionBits	O	W
Acked_Transitions	BACnetEventTransitionBits	O	R
Notify_Type	BACnetNotifyType	O	W
Event_Time_Stamps	BACnetARRAY[3] of BACnetTimeStamp	O	R
Event_Message_Texts	BACnetARRAY[3] of CharacterString	O	R
Event_Message_Texts_Config	BACnetARRAY[3] of CharacterString	O	W
Event_Detection_Enable	BOOLEAN	O	W
Event_Algorithm_Inhibit_Ref	BACnetObjectPropertyReference	O	R
Event_Algorithm_Inhibit	BOOLEAN	O	W

Loop (continued)

Property	Data type	CC	WA
Time_Delay_Normal	Unsigned	O	W
Reliability_Evaluation_Inhibit	BOOLEAN	O	W
Property_List	BACnetARRAY[N] of BACnetPropertyIdentifier	R	R
Profile_Name	CharacterString	O	R
PLC_SymbolName (524)	CharacterString	O	R

4.3.16 Multi-state Input

Property	Data type	CC	WA
Object_Identifier	BACnetObjectIdentifier	R	R
Object_Name	CharacterString	R	W
Object_Type	BACnetObjectType	R	R
Present_Value	Unsigned	R	R
Description	CharacterString	O	W
Device_Type	CharacterString	O	R
Status_Flags	BACnetStatusFlags	R	R
Event_State	BACnetEventState	R	R
Reliability	BACnetReliability	O	R
Out_Of_Service	BOOLEAN	R	W
Number_Of_States	Unsigned (1..1000)	R	W
State_Text	BACnetARRAY[N]of CharacterString	O	W
Time_Delay	Unsigned	O	W
Notification_Class	Unsigned	O	W
Alarm_Values	List of Unsigned	O	W
Fault_Values	List of Unsigned	O	W
Event_Enable	BACnetEventTransitionBits	O	W
Acked_Transitions	BACnetEventTransitionBits	O	R
Notify_Type	BACnetNotifyType	O	W
Event_Time_Stamps	BACnetARRAY[3] of BACnetTimeStamp	O	R
Event_Message_Texts	BACnetARRAY[3] of CharacterString	O	R
Event_Message_Texts_Config	BACnetARRAY[3] of CharacterString	O	W
Event_Detection_Enable	BOOLEAN	O	W
Event_Algorithm_Inhibit_Ref	BACnetObjectPropertyReference	O	R
Event_Algorithm_Inhibit	BOOLEAN	O	W
Time_Delay_Normal	Unsigned	O	W
Reliability_Evaluation_Inhibit	BOOLEAN	O	W
Property_List	BACnetARRAY[N] of BACnetPropertyIdentifier	R	R
Profile_Name	CharacterString	O	R
Io_Bus_Nr (513)	Unsigned (0 .. 255)	O	R
Io_Module_Nr (514)	Unsigned (1 .. 65535)	O	R
Io_Channel_Nr (515)	Unsigned (1 .. 65535)	O	R
PLC_SymbolName (524)	CharacterString	O	R

4.3.17 Multi-state Output

Property	Data type	CC	WA
Object_Identifier	BACnetObjectIdentifier	R	R
Object_Name	CharacterString	R	W
Object_Type	BACnetObjectType	R	R
Present_Value	Unsigned	W	W
Description	CharacterString	O	W
Device_Type	CharacterString	O	R
Status_Flags	BACnetStatusFlags	R	R
Event_State	BACnetEventState	R	R
Reliability	BACnetReliability	O	R
Out_Of_Service	BOOLEAN	R	W
Number_Of_States	Unsigned (1..1000)	R	W
State_Text	BACnetARRAY[N]of CharacterString	O	W
Priority_Array	BACnetPriorityArray	R	R
Relinquish_Default	Unsigned	R	W
Time_Delay	Unsigned	O	W
Notification_Class	Unsigned	O	W
Feedback_Value	Unsigned	O	W
Event_Enable	BACnetEventTransitionBits	O	W
Acked_Transitions	BACnetEventTransitionBits	O	R
Notify_Type	BACnetNotifyType	O	W
Event_Time_Stamps	BACnetARRAY[3] of BACnetTimeStamp	O	R
Event_Message_Texts	BACnetARRAY[3] of CharacterString	O	R
Event_Message_Texts_Config	BACnetARRAY[3] of CharacterString	O	W
Event_Detection_Enable	BOOLEAN	O	W
Event_Algorithm_Inhibit_Ref	BACnetObjectPropertyReference	O	R
Event_Algorithm_Inhibit	BOOLEAN	O	W
Time_Delay_Normal	Unsigned	O	W
Reliability_Evaluation_Inhibit	BOOLEAN	O	W
Property_List	BACnetARRAY[N] of BACnetPropertyIdentifier	R	R
Profile_Name	CharacterString	O	R
Io_Bus_Nr (513)	Unsigned (0 .. 255)	O	R
Io_Module_Nr (514)	Unsigned (1 .. 65535)	O	R
Io_Channel_Nr (515)	Unsigned (1 .. 65535)	O	R
Active_Priority (517)	Unsigned (1 .. 17)	O	R
PLC_SymbolName (524)	CharacterString	O	R

4.3.18 Multi-state Value

Property	Data type	CC	WA
Object_Identifier	BACnetObjectIdentifier	R	R
Object_Name	CharacterString	R	W
Object_Type	BACnetObjectType	R	R
Present_Value	Unsigned	R	W
Description	CharacterString	O	W
Status_Flags	BACnetStatusFlags	R	R
Event_State	BACnetEventState	R	R
Reliability	BACnetReliability	O	R
Out_Of_Service	BOOLEAN	R	W
Number_Of_States	Unsigned (1..1000)	R	W
State_Text	BACnetARRAY[N] of CharacterString	O	W
Priority_Array	BACnetPriorityArray	O	R
Relinquish_Default	Unsigned	O	W
Time_Delay	Unsigned	O	W
Notification_Class	Unsigned	O	W
Alarm_Values	List of Unsigned	O	W
Fault_Values	List of Unsigned	O	W
Event_Enable	BACnetEventTransitionBits	O	W
Acked_Transitions	BACnetEventTransitionBits	O	R
Notify_Type	BACnetNotifyType	O	W
Event_Time_Stamps	BACnetARRAY[3] of BACnetTimeStamp	O	R
Event_Message_Texts	BACnetARRAY[3] of CharacterString	O	R
Event_Message_Texts_Config	BACnetARRAY[3] of CharacterString	O	W
Event_Detection_Enable	BOOLEAN	O	W
Event_Algorithm_Inhibit_Ref	BACnetObjectPropertyReference	O	W
Event_Algorithm_Inhibit	BOOLEAN	O	W
Time_Delay_Normal	Unsigned	O	W
Reliability_Evaluation_Inhibit	BOOLEAN	O	W
Property_List	BACnetARRAY[N] of BACnetPropertyIdentifier	R	R
Profile_Name	CharacterString	O	R
Active_Priority (517)	Unsigned (1 .. 17)	O	R
PLC_SymbolName (524)	CharacterString	O	R

4.3.19 Notification Class

Property	Data type	CC	WA
Object_Identifier	BACnetObjectIdentifier	R	R
Object_Name	CharacterString	R	W
Object_Type	BACnetObjectType	R	R
Description	CharacterString	O	W
Notification_Class	Unsigned	R	R
Priority	BACnetARRAY[3] of Unsigned	R	W
Ack_Required	BACnetEventTransitionBits	R	W
Recipient_List	List of BACnetDestination	R	W
Property_List	BACnetARRAY[N] of BACnetPropertyIdentifier	R	R
Profile_Name	CharacterString	O	R
PLC_SymbolName (524)	CharacterString	O	R

4.3.20 Program

Property	Data type	CC	WA
Object_Identifier	BACnetObjectIdentifier	R	R
Object_Name	CharacterString	R	W
Object_Type	BACnetObjectType	R	R
Program_State	BACnetProgramState	R	R
Program_Change	BACnetProgramRequest	W	W
Reason_For_Halt	BACnetProgramError	O	R
Description_Of_Halt	CharacterString	O	W
Program_Location	CharacterString	O	W
Description	CharacterString	O	W
Instance_Of	CharacterString	O	W
Status_Flags	BACnetStatusFlags	R	R
Reliability	BACnetReliability	O	R
Out_Of_Service	BOOLEAN	R	W
Property_List	BACnetARRAY[N] of BACnetPropertyIdentifier	R	R
Profile_Name	CharacterString	O	R
PLC_SymbolName (524)	CharacterString	O	R

4.3.21 Pulse Converter

Property	Data type	CC	WA
Object_Identifier	BACnetObjectIdentifier	R	R
Object_Name	CharacterString	R	W
Object_Type	BACnetObjectType	R	R
Description	CharacterString	O	W
Present_Value	REAL	R	R
Input_Reference	BACnetObjectPropertyReference	O	W
Status_Flags	BACnetStatusFlags	R	R
Event_State	BACnetEventState	R	R
Reliability	BACnetReliability	O	R
Out_Of_Service	BOOLEAN	R	W
Units	BACnetEngineeringUnits	R	W
Scale_Factor	REAL	R	W
Adjust_Value	REAL	W	W
Count	Unsigned	R	R
Update_Time	BACnetDateTime	R	R
Count_Change_Time	BACnetDateTime	R	R
Count_Before_Change	Unsigned	R	W
COV_Increment	REAL	O	W
COV_Period	Unsigned	O	W
Notification_Class	Unsigned	O	W
Time_Delay	Unsigned	O	W
High_Limit	REAL	O	W
Low_Limit	REAL	O	W
Deadband	REAL	O	W
Limit_Enable	BACnetLimitEnable	O	W
Event_Enable	BACnetEventTransitionBits	O	W
Acked_Transitions	BACnetEventTransitionBits	O	R
Notify_Type	BACnetNotifyType	O	W
Event_Time_Stamps	BACnetARRAY[3] of BACnetTimeStamp	O	R
Event_Message_Texts	BACnetARRAY[3] of CharacterString	O	R
Event_Message_Texts_Config	BACnetARRAY[3] of CharacterString	O	W
Event_Detection_Enable	BOOLEAN	O	W
Event_Algorithm_Inhibit_Ref	BACnetObjectPropertyReference	O	R
Event_Algorithm_Inhibit	BOOLEAN	O	W
Time_Delay_Normal	Unsigned	O	W
Reliability_Evaluation_Inhibit	BOOLEAN	O	W
Property_List	BACnetARRAY[N] of BACnetPropertyIdentifier	R	R
Profile_Name	CharacterString	O	R
PLC_SymbolName (524)	CharacterString	O	R

4.3.22

4.3.22 Schedule

Property	Data type	CC	WA
Object_Identifier	BACnetObjectIdentifier	R	R
Object_Name	CharacterString	R	W
Object_Type	BACnetObjectType	R	R
Present_Value	Any	R	R
Description	CharacterString	O	W
Effective_Period	BACnetDateRange	R	W
Weekly_Schedule	BACnetARRAY[7] of BACnetDailySchedule	O	W
Exception_Schedule	BACnetARRAY[N] of BACnetSpecialEvent	O	W
Schedule_Default	Any	R	W
List_Of_Object_Property_References	List of BACnetDeviceObject PropertyReference	R	W
Priority_For_Writing	Unsigned(1..16)	R	W
Status_Flags	BACnetStatusFlags	R	R
Reliability	BACnetReliability	R	R
Out_Of_Service	BOOLEAN	R	W
Property_List	BACnetARRAY[N] of BACnetPropertyIdentifier	R	R
Profile_Name	CharacterString	O	R
PLC_SymbolName (524)	CharacterString	O	R

4.3.23 Structured View

Property	Data type	CC	WA
Object_Identifier	BACnetObjectIdentifier	R	R
Object_Name	CharacterString	R	W
Object_Type	BACnetObjectType	R	R
Description	CharacterString	O	W
Node_Type	BACnetNodeType	R	W
Node_Subtype	CharacterString	O	W
Subordinate_List	BACnetARRAY[N] of BACnetDeviceObjectReference	R	R
Subordinate_Annotations	BACnetARRAY[N] of CharacterString	O	W
Property_List	BACnetARRAY[N] of BACnetPropertyIdentifier	R	R
Profile_Name	CharacterString	O	R
PLC_SymbolName (524)	CharacterString	O	R

4.3.24 Trend Log

Property	Data type	CC	WA
Object_Identifier	BACnetObjectIdentifier	R	R
Object_Name	CharacterString	R	W
Object_Type	BACnetObjectType	R	R
Description	CharacterString	O	W
Enable*	BOOLEAN	W	W
Start_Time	BACnetDateTime	O	W
Stop_Time	BACnetDateTime	O	W
Log_DeviceObjectProperty	BACnetDeviceObject PropertyReference	O	W
Log_Interval	Unsigned	O	W
COV_Resubscription_Interval	Unsigned	O	W
Client_COV_Increment	BACnetClientCOV	O	W
Stop_When_Full	BOOLEAN	R	W
Buffer_Size	Unsigned32	R	R
Log_Buffer	List of BACnetLogRecord	R	R
Record_Count	Unsigned32	W	W
Total_Record_Count	Unsigned32	R	R
Logging_Type	BACnetLoggingType	R	W
Align_Intervals	BOOLEAN	O	W
Interval_Offset	Unsigned	O	W
Trigger	BOOLEAN	O	W
Status_Flags	BACnetStatusFlags	R	R
Reliability	BACnetReliability	O	R
Notification_Threshold	Unsigned32	O	W
Records_Since_Notification	Unsigned32	O	R
Last_Notify_Record	Unsigned32	O	R
Event_State	BACnetEventState	R	R
Notification_Class	Unsigned	O	W
Event_Enable	BACnetEventTransitionBits	O	W
Acked_Transitions	BACnetEventTransitionBits	O	R
Notify_Type	BACnetNotifyType	O	W
Event_Time_Stamps	BACnetARRAY[3] of BACnetTimeStamp	O	R
Event_Message_Texts	BACnetARRAY[3] of CharacterString	O	R
Event_Message_Texts_Config	BACnetARRAY[3] of CharacterString	O	W
Event_Detection_Enable	BOOLEAN	O	W
Event_Algorithm_Inhibit_Ref	BACnetObjectPropertyReference	O	R
Event_Algorithm_Inhibit	BOOLEAN	O	W
Reliability_Evaluation_Inhibit	BOOLEAN	O	W

*Formerly aka "Log_Enable"

Trend Log (continued)

Property	Data type	CC	WA
Property_List	BACnetARRAY[N] of BACnetPropertyIdentifier	R	R
Profile_Name	CharacterString	O	R
PLC_SymbolName (524)	CharacterString	O	R
UseUnconfirmedCoV (525)	BOOLEAN	O	W

4.3.25 Trend Log Multiple

Property	Data type	CC	WA
Object_Identifier	BACnetObjectIdentifier	R	R
Object_Name	CharacterString	R	W
Object_Type	BACnetObjectType	R	R
Description	CharacterString	O	W
Status_Flags	BACnetStatusFlags	R	R
Event_State	BACnetEventState	R	R
Reliability	BACnetReliability	O	R
Enable	BOOLEAN	W	W
Start_Time	BACnetDateTime	O	W
Stop_Time	BACnetDateTime	O	W
Log_DeviceObjectProperty	BACnetArray[N] of BACnetDeviceObject PropertyReference	R	W
Logging_Type	BACnetLoggingType	R	W
Log_Interval	Unsigned	R	W
Align_Intervals	BOOLEAN	O	W
Interval_Offset	Unsigned	O	W
Trigger	BOOLEAN	O	W
Stop_When_Full	BOOLEAN	R	W
Buffer_Size	Unsigned32	R	R
Log_Buffer	List of BACnetLogMultipleRecord	R	R
Record_Count	Unsigned32	W	W
Total_Record_Count	Unsigned32	R	R
Notification_Threshold	Unsigned32	O	W
Records_Since_Notification	Unsigned32	O	R
Last_Notify_Record	Unsigned32	O	R
Notification_Class	Unsigned	O	W
Event_Enable	BACnetEventTransitionBits	O	W
Acked_Transitions	BACnetEventTransitionBits	O	R
Notify_Type	BACnetNotifyType	O	W
Event_Time_Stamps	BACnetARRAY[3] of BACnetTimeStamp	O	R
Event_Message_Texts	BACnetARRAY[3] of CharacterString	O	R
Event_Message_Texts_Config	BACnetARRAY[3] of CharacterString	O	W
Event_Detection_Enable	BOOLEAN	O	W
Event_Algorithm_Inhibit_Ref	BACnetObjectPropertyReference	O	R
Event_Algorithm_Inhibit	BOOLEAN	O	W
Reliability_Evaluation_Inhibit	BOOLEAN	O	W
Property_List	BACnetARRAY[N] of BACnetPropertyIdentifier	R	R
Profile_Name	CharacterString	O	R
PLC_SymbolName (524)	CharacterString	O	R

4.3.26 Event Log

Property	Data type	CC	WA
Object_Identifier	BACnetObjectIdentifier	R	R
Object_Name	CharacterString	R	W
Object_Type	BACnetObjectType	R	R
Description	CharacterString	O	W
Status_Flags	BACnetStatusFlags	R	R
Event_State	BACnetEventState	R	R
Reliability	BACnetReliability	O	R
Enable	BOOLEAN	W	W
Start_Time	BACnetDateTime	O	W
Stop_Time	BACnetDateTime	O	W
Stop_When_Full	BOOLEAN	R	W
Buffer_Size	Unsigned32	R	R
Log_Buffer	List of BACnetEventLogRecord	R	R
Record_Count	Unsigned32	W	W
Total_Record_Count	Unsigned32	R	R
Notification_Threshold	Unsigned32	O	W
Records_Since_Notification	Unsigned32	O	R
Last_Notify_Record	Unsigned32	O	R
Notification_Class	Unsigned	O	W
Event_Enable	BACnetEventTransitionBits	O	W
Acked_Transitions	BACnetEventTransitionBits	O	R
Notify_Type	BACnetNotifyType	O	W
Event_Time_Stamps	BACnetARRAY[3] of BACnetTimeStamp	O	R
Event_Message_Texts	BACnetARRAY[3] of CharacterString	O	R
Event_Message_Texts_Config	BACnetARRAY[3] of CharacterString	O	W
Event_Detection_Enable	BOOLEAN	O	W
Event_Algorithm_Inhibit_Ref	BACnetObjectPropertyReference	O	R
Event_Algorithm_Inhibit	BOOLEAN	O	W
Reliability_Evaluation_Inhibit	BOOLEAN	O	W
Property_List	BACnetARRAY[N] of BACnetPropertyIdentifier	R	R
Profile_Name	CharacterString	O	R
Process_Id (523)	Unsigned	O	W
PLC_SymbolName (524)	CharacterString	O	R

4.3.27 Bitstring Value

Property	Data type	CC	WA
Object_Identifier	BACnetObjectIdentifier	R	R
Object_Name	CharacterString	R	W
Object_Type	BACnetObjectType	R	R
Description	CharacterString	O	W
Present_Value	BIT STRING	R	W
Status_Flags	BACnetStatusFlags	R	R
Bit_Text	BACnetARRAY[N] of CharacterString	O	W
Property_List	BACnetARRAY[N] of BACnetPropertyIdentifier	R	R
Profile_Name	CharacterString	O	R
PLC_SymbolName (524)	CharacterString	O	R

4.3.28 CharacterString Value

Property	Data type	CC	WA
Object_Identifier	BACnetObjectIdentifier	R	R
Object_Name	CharacterString	R	W
Object_Type	BACnetObjectType	R	R
Description	CharacterString	O	W
Present_Value	CharacterString	R	W
Status_Flags	BACnetStatusFlags	R	R
Property_List	BACnetARRAY[N] of BACnetPropertyIdentifier	R	R
Profile_Name	CharacterString	O	R
PLC_SymbolName (524)	CharacterString	O	R

4.3.29 DatePattern Value

Property	Data type	CC	WA
Object_Identifier	BACnetObjectIdentifier	R	R
Object_Name	CharacterString	R	W
Object_Type	BACnetObjectType	R	R
Description	CharacterString	O	W
Present_Value	Date	R	W
Status_Flags	BACnetStatusFlags	R	R
Property_List	BACnetARRAY[N] of BACnetPropertyIdentifier	R	R
Profile_Name	CharacterString	O	R
PLC_SymbolName (524)	CharacterString	O	R

4.3.30 Date Value

Property	Data type	CC	WA
Object_Identifier	BACnetObjectIdentifier	R	R
Object_Name	CharacterString	R	W
Object_Type	BACnetObjectType	R	R
Description	CharacterString	O	W
Present_Value	Date	R	W
Status_Flags	BACnetStatusFlags	R	R
Property_List	BACnetARRAY[N] of BACnetPropertyIdentifier	R	R
Profile_Name	CharacterString	O	R
PLC_SymbolName (524)	CharacterString	O	R

4.3.31 DateTimePattern Value

Property	Data type	CC	WA
Object_Identifier	BACnetObjectIdentifier	R	R
Object_Name	CharacterString	R	W
Object_Type	BACnetObjectType	R	R
Description	CharacterString	O	W
Present_Value	BACnetDateTime	R	W
Status_Flags	BACnetStatusFlags	R	R
Property_List	BACnetARRAY[N] of BACnetPropertyIdentifier	R	R
Profile_Name	CharacterString	O	R
PLC_SymbolName (524)	CharacterString	O	R

4.3.32 DateTime Value

Property	Data type	CC	WA
Object_Identifier	BACnetObjectIdentifier	R	R
Object_Name	CharacterString	R	W
Object_Type	BACnetObjectType	R	R
Description	CharacterString	O	W
Present_Value	BACnetDateTime	R	W
Status_Flags	BACnetStatusFlags	R	R
Property_List	BACnetARRAY[N] of BACnetPropertyIdentifier	R	R
Profile_Name	CharacterString	O	R
PLC_SymbolName (524)	CharacterString	O	R

4.3.33 Integer Value

Property	Data type	CC	WA
Object_Identifier	BACnetObjectIdentifier	R	R
Object_Name	CharacterString	R	W
Object_Type	BACnetObjectType	R	R
Description	CharacterString	O	W
Present_Value	INTEGER	R	W
Status_Flags	BACnetStatusFlags	R	R
Units	BACnetEngineeringUnits	R	W
Property_List	BACnetARRAY[N] of BACnetPropertyIdentifier	R	R
Profile_Name	CharacterString	O	R
PLC_SymbolName (524)	CharacterString	O	R

4.3.34 Large Analog Value

Property	Data type	CC	WA
Object_Identifier	BACnetObjectIdentifier	R	R
Object_Name	CharacterString	R	W
Object_Type	BACnetObjectType	R	R
Description	CharacterString	O	W
Present_Value	Double	R	W
Status_Flags	BACnetStatusFlags	R	R
Units	BACnetEngineeringUnits	R	W
Property_List	BACnetARRAY[N] of BACnetPropertyIdentifier	R	R
Profile_Name	CharacterString	O	R
PLC_SymbolName (524)	CharacterString	O	R

4.3.35 OctetString Value

Property	Data type	CC	WA
Object_Identifier	BACnetObjectIdentifier	R	R
Object_Name	CharacterString	R	W
Object_Type	BACnetObjectType	R	R
Description	CharacterString	O	W
Present_Value	OCTET STRING	R	W
Status_Flags	BACnetStatusFlags	R	R
Property_List	BACnetARRAY[N] of BACnetPropertyIdentifier	R	R
Profile_Name	CharacterString	O	R
PLC_SymbolName (524)	CharacterString	O	R

4.3.36 Positive Integer Value

Property	Data type	CC	WA
Object_Identifier	BACnetObjectIdentifier	R	R
Object_Name	CharacterString	R	W
Object_Type	BACnetObjectType	R	R
Description	CharacterString	O	W
Present_Value	Unsigned	R	W
Status_Flags	BACnetStatusFlags	R	R
Units	BACnetEngineeringUnits	R	W
Property_List	BACnetARRAY[N] of BACnetPropertyIdentifier	R	R
Profile_Name	CharacterString	O	R
PLC_SymbolName (524)	CharacterString	O	R

4.3.37 Time Pattern Value

Property	Data type	CC	WA
Object_Identifier	BACnetObjectIdentifier	R	R
Object_Name	CharacterString	R	W
Object_Type	BACnetObjectType	R	R
Description	CharacterString	O	W
Present_Value	Time	R	W
Status_Flags	BACnetStatusFlags	R	R
Property_List	BACnetARRAY[N] of BACnetPropertyIdentifier	R	R
Profile_Name	CharacterString	O	R
PLC_SymbolName (524)	CharacterString	O	R

4.3.38 Time Value

Property	Data type	CC	WA
Object_Identifier	BACnetObjectIdentifier	R	R
Object_Name	CharacterString	R	W
Object_Type	BACnetObjectType	R	R
Description	CharacterString	O	W
Present_Value	Time	R	W
Status_Flags	BACnetStatusFlags	R	R
Property_List	BACnetARRAY[N] of BACnetPropertyIdentifier	R	R
Profile_Name	CharacterString	O	R
PLC_SymbolName (524)	CharacterString	O	R

4.4 Data Link Layer Options

- BACnet IP, (Annex J)
- BACnet IP, (Annex J), Foreign Device
- ISO 8802-3, Ethernet (Clause 7)
- ATA 878.1, 2.5 Mb. ARCNET (Clause 8)
- ATA 878.1, EIA-485 ARCNET (Clause 8), baud rate(s) _____
- MS/TP master (Clause 9), baud rate(s):
Terminal EL6861: 9600, 19200, 38400, 57600, 76800, 115200
- 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: _____
- BACnet/ZigBee (ANNEX O)
- Other: _____

Device Address Binding

Is static device binding supported? (This is currently necessary for two-way communication with MS/TP slaves and certain other devices.) Yes No

Networking Options

- Router, Clause 6 - List all routing configurations, e.g., ARCNET-Ethernet, Ethernet-MS/TP, etc.
BACnet/IP – BACnet MS/TP
- Annex H, BACnet Tunneling Router over IP
- BACnet/IP Broadcast Management Device (BBMD)
 - Does the BBMD support registrations by Foreign Devices? Yes No
 - Does the BBMD support network address translation? Yes No

Network Security Options

- Non-secure Device - is capable of operating without BACnet Network Security
- Secure Device - is capable of using BACnet Network Security (NS-SD BIBB)
 - Multiple Application-Specific Keys
 - Supports encryption (NS-ED BIBB)
 - Key Server (NS-KS BIBB)

Character Sets Supported

Indicating support for multiple character sets does not imply that they can all be supported simultaneously.

- | | | |
|---|--|--|
| <input checked="" type="checkbox"/> ISO 10646 (UTF-8) | <input checked="" type="checkbox"/> IBM™/Microsoft™ DBCS | <input checked="" type="checkbox"/> ISO 8859-1 |
| <input checked="" type="checkbox"/> ISO 10646 (UCS-2) | <input checked="" type="checkbox"/> ISO 10646 (UCS-4) | <input checked="" type="checkbox"/> JIS X 0208 |

If this product is a communication gateway, describe the types of non-BACnet equipment/networks(s) that the gateway supports:

Using the Beckhoff modular IO-System various hardware devices can be coupled to other BACnet devices.

5 Appendix

5.1 Support and Service

Beckhoff and their partners around the world offer comprehensive support and service, making available fast and competent assistance with all questions related to Beckhoff products and system solutions.

5.2 Beckhoff's branch offices and representatives

Please contact your Beckhoff branch office or representative for local support and service on Beckhoff products!

The addresses of Beckhoff's branch offices and representatives round the world can be found on her internet pages: <http://www.beckhoff.com>

You will also find further documentation for Beckhoff components there.

5.3 Beckhoff company headquarters

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33415 Verl
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Web: www.beckhoff.com

Beckhoff Support

Support offers you comprehensive technical assistance, helping you not only with the application of individual Beckhoff products, but also with other, wide-ranging services:

- world-wide support
- design, programming and commissioning of complex automation systems
- and extensive training program for Beckhoff system components

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E-mail: support@beckhoff.com

Beckhoff Service

The Beckhoff Service Center supports you in all matters of after-sales service:

- on-site service
- repair service
- spare parts service
- hotline service

Hotline: + 49 (0) 5246/963-460
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