

WAGO → I/O → SYSTEM 750

Library for Building Automation

**Library Description for for the
WAGO BACnet Library
BACnet_02.lib**

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Every conceivable measure has been taken to ensure the accuracy and completeness of this documentation. However, as errors can never be fully excluded, we always appreciate any information or suggestions for improving the documentation.

We wish to point out that the software and hardware names, as well as the trademarks of companies used and/or mentioned in the present manual, are generally protected by trademark or patent.

WAGO-I/O-PRO V2.3 library for building automation

List of Contents

Important Notes	5
Copyright	5
Personnel Qualification.....	5
Intended Use	5
Scope of Validity	6
Writing into the BACnet Priority Array	7
FbBACnetPriorityArray_AV	7
FbBACnetPriorityArray_BV	9
FbBACnetPriorityArray_MV	11
Reading and Writing BACnet Setpoints	13
FbBACnetInOutValue_AV.....	13
FbBACnetInOutValue_BV.....	15
FbBACnetInOutValue_MV	17
Save Setpoint Value as Retentive Value	19
FbRetainSetpoint_AV.....	19
FbRetainSetpoint_BV	21
FbRetainSetpoint_MV	23
FbRetain_LOOP	25
Access to the BACnet-native Object	26
FbBACnetNative_AI	26
FbBACnetNative_AO.....	28
FbBACnetNative_BI.....	30
FbBACnetNative_BO	32
Converting IEC/BACnet Variables	34
BACnetBinaryPV_to_BOOL	34
FuBOOL_to_BACnetBinaryPV	35
FuBACnetScale_to_DINT	36
FuBACnetScale_to_REAL.....	37
FuDINT_to_BACnetScale.....	38
FuREAL_to_BACnetScale	39
FuBACnetTimeStamp_to_DT	40
FuBACnetTimeStamp_to_SeqNumber	41
FuBACnetTimeStamp_to_TOD	42
FuDT_to_BACnetTimeStamp	43
FuSeqNumber_to_BACnetTimeStamp	44

FuTOD_to_BACnetTimeStamp	45
<u>BACnet Schedule Object</u>	46
FbBACnetSchedule.....	46
FbBACnetSchedule_small.....	50
FbBACnetScheduleTimeBeforeOperation	53
<u>BACnet Objects as an Export File</u>	55
General	55
BACNET_ANALOG_VALUE	55
BACNET_BINARY_VALUE.....	56
BACNET_LOOP	57
BACNET_MULTISTATE_VALUE.....	58
BACNET_MULTISTATE_INPUT.....	59
BACNET_MULTISTATE_OUTPUT.....	60

Important Notes

To ensure fast installation and start-up of the units, we strongly recommend that the following information and explanations are carefully read and adhered to.

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Intended Use

For each individual application, the components are supplied from the factory with a dedicated hardware and software configuration. Modifications are only admitted within the framework of the possibilities documented in this document. All other changes to the hardware and/or software and the non-conforming use of the components entail the exclusion of liability on part of WAGO Kontakttechnik GmbH & Co. KG.

Please direct any requirements pertaining to a modified and/or new hardware or software configuration directly to WAGO Kontakttechnik GmbH & Co. KG.

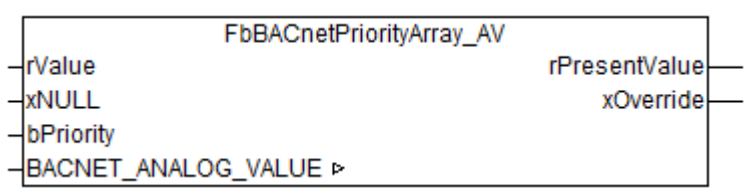
Scope of Validity

This application note is based on the stated hardware and software from the specific manufacturer, as well as the associated documentation. This application note is therefore only valid for the described installation. New hardware and software versions may need to be handled differently.

Please note the detailed description in the specific manuals.

Writing into the BACnet Priority Array

FbBACnetPriorityArray_AV

WAGO-I/O-PRO-V2.3 Library Elements		
Category:	Building Automation	
Name:	FbBACnetPriorityArray_AV	
Type:	Function <input type="checkbox"/>	Function block <input checked="" type="checkbox"/> Program <input type="checkbox"/>
Name of library:	BACnet_02.lib	
Applicable to:	See Release Note	
Library used:	BACnetAccess.lib BACnetObjects.EXP	
Input parameter:		
Data type:	Comment:	
rValue	REAL	Value entry
xNULL	BOOL	Enter NULL
bPriority	BYTE	Priority Value range = 1 – 16 Default setting = 16
Output parameter:		
Data type:	Comment:	
rPresentValue	REAL	Present value
xOverride	BOOL	TRUE-> Override value present
Input/output parameter:		
Data type:	Comment:	
BACNET_ANALOG_VALUE	BACNET_ANALOG_VALUE	Data type for the "BACnet Analog Value" object
Graphical illustration:		
		

Functional description:

The function block is used to write in a prioritized manner to the "Priority_Array" property of a BACnet Analog Value object type. In this way, it is possible to impact the same "Present_Value" property from both the BACnet network and the IEC application.

The priority specifies which party is to receive permission to write to the "Present_Value" property. The "**bPriority**" input is used to determine the write priority of the IEC application. A value of 1 denotes highest priority, and a value of 16 denotes lowest priority.

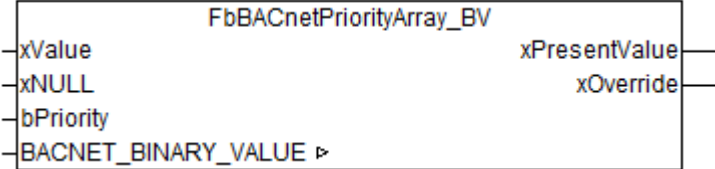
The "**rValue**" value is only written to the "**BACNET_ANALOG_VALUE**" variable when the "**xNULL**" input is not activated. If this input is activated, the "NULL" value is written in the array element (specified via "**bPriority**") of the "**BACNET_ANALOG_VALUE**" variables. The "NULL" value can be used to reset write access with a specific priority.

The "**rPresent_Value**" output indicates the present value. If a value, whose priority is higher than the priority specified at the "bPriority" input, is entered in the priority array, the "**xOverride**" output is set to TRUE.

Note:

Changing the priority "**bPriority**" after starting the IEC application is not supported and can cause an error.

FbBACnetPriorityArray_BV

WAGO-I/O-PRO-V2.3 Library Elements		
Category:	Building Automation	
Name:	FbBACnetPriorityArray_BV	
Type:	Function <input type="checkbox"/>	Function block <input checked="" type="checkbox"/> Program <input type="checkbox"/>
Name of library:	BACnet_02.lib	
Applicable to:	See Release Note	
Library used:	BACnetAccess.lib BACnetObjects.EXP	
Input parameter:		
	Data type:	Comment:
xValue	BOOL	Value entry
xNULL	BOOL	Enter NULL
bPriority	BYTE	Priority Value range = 1 – 16 Default setting = 16
Output parameter:		
	Data type:	Comment:
xPresentValue	BOOL	Present value
xOverride	BOOL	TRUE-> Override value present
Input/output parameter:		
	Data type:	Comment:
BACNET_BINARY_VALUE	BACNET_BINARY_VALUE	Data type for the "BACnet Binary Value" object
Graphical illustration:		
		

Functional description:

The function block is used to write in a prioritized manner to the "Priority_Array" property of a BACnet Binary Value object type. In this way, it is possible to impact the same "Present_Value" property from both the BACnet network and the IEC application.

The priority specifies which party is to receive permission to write to the "Present_Value" property. The "**bPriority**" input is used to determine the write priority of the IEC application. A value of 1 denotes highest priority, and a value of 16 denotes lowest priority.

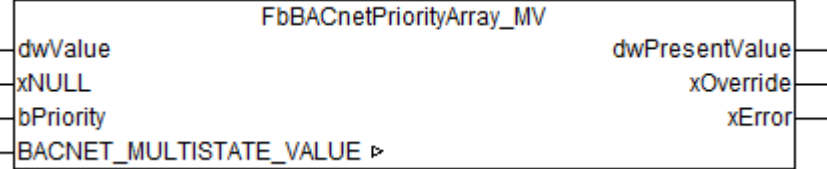
The "**xValue**" value is only written to the "**BACNET_BINARY_VALUE**" variable when the "**xNULL**" input is not activated. If this input is activated, the "NULL" value is written in the array element (specified via "**bPriority**") of the "**BACNET_BINARY_VALUE**" variables. The "NULL" value can be used to reset write access with a specific priority.

The "**xPresent_Value**" output indicates the present value. If a value, whose priority is higher than the priority specified at the "bPriority" input, is entered in the priority array, the "**xOverride**" output is set to TRUE.

Note:

Changing the priority "**bPriority**" after starting the IEC application is not supported and can cause an error.

FbBACnetPriorityArray_MV

WAGO-I/O-PRO-V2.3 Library Elements		
Category:	Building Automation	
Name:	FbBACnetPriorityArray_MV	
Type:	Function <input type="checkbox"/>	Function block <input checked="" type="checkbox"/> Program <input type="checkbox"/>
Name of library:	BACnet_02.lib	
Applicable to:	See Release Note	
Library used:	BACnetAccess.lib BACnetObjects.EXP	
Input parameter:		
Data type:	Comment:	
dwValue	DWORD	Value entry Default setting = 1 Value range = 1- "Number Of States"
xNULL	BOOL	Enter NULL
bPriority	BYTE	Priority Value range = 1 – 16 Default setting = 16
Output parameter:		
Data type:	Comment:	
dwPresentValue	DWORD	Present value
xOverride	BOOL	TRUE-> Override value present
xError	BOOL	TRUE-> The input value is greater than "Number of States"
Input/output parameter:		
Data type:	Comment:	
BACNET_MULTISTATE_VALUE	BACNET_MULTISTATE_VALUE	Data type for the "BACnet Multi-state Value" object
Graphical illustration:		
		

Functional description:

The function block is used to write in a prioritized manner to the "Priority_Array" property of a BACnet Multi-State Value object type. In this way, it is possible to impact the same "Present_Value" property from both the BACnet network and the IEC application.

The priority specifies which party is to receive permission to write to the "Present_Value" property. The "**bPriority**" input is used to determine the write priority of the IEC application. A value of 1 denotes highest priority, and a value of 16 denotes lowest priority.

The values of the priority array are entered at the "**dwValue**" input. The value must be greater than 0 and less than the BACnet Property "Number of State".

The "Number of State" property defines how many states the "Present_Value" property can accept and can only be adjusted in the BACnet configurator. Therefore, the "**dwValue**" input value cannot be greater than the "Number of States". If not, the "**xError**" output is set to TRUE.

In addition, the "**dwValue**" value is only written to the "**BACNET_MULTISTATE_VALUE**" variable when the "**xNULL**" input is not activated. If this input is activated, the "NULL" value is written in the array element (specified via "**bPriority**") of the "**BACNET_MULTI_STATE_VALUE**" variables. The "NULL" value can be used to reset write access with a specific priority.

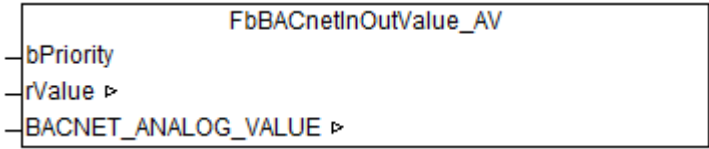
The "**dwPresent_Value**" output indicates the present value. If a value, whose priority is higher than the priority specified at the "**bPriority**" input, is entered in the priority array, the "**xOverride**" output is set to TRUE.

Note:

Changing the priority "**bPriority**" after starting the IEC application is not supported and can cause an error.

Reading and Writing BACnet Setpoints

FbBACnetInOutValue_AV

WAGO-I/O-PRO V2.3 Library Elements		
Category:	Building Automation	
Name:	FbBACnetInOutValue_AV	
Type:	Function <input type="checkbox"/>	Function block <input checked="" type="checkbox"/> Program <input type="checkbox"/>
Name of library:	BACnet_02.lib	
Applicable to:	See Release Note	
Library used:	BACnetAccess.lib BACnetObjects.EXP	
Input parameter:	Data type:	Comment:
bPriority	BYTE	Priority Value range: 1 – 16 Default setting = 16
Output parameter:	Data type:	Comment:
-	-	-
Input/Output parameters:	Data type:	Comment:
rValue	REAL	Value entry
BACNET_ANALOG_VALU E	BACNET_A NALOG_VA LUE	Input for the "BACnet Analog Value" object
Graphical illustration:		
		

Function description:

The function block is used for the reading and writing of a BACnet object's ANALOG_VALUE.

A typical application for this function block is the setting of setpoints if these should be configurable both via the BACnet network as well as via the IEC application. The setpoint is specified on the "rValue" input. The variable "rValue" is executed as IN_OUT variable and can thus also be output by the value written by the BACnet network.

The "bPriority" input is used to determine the write priority of the IEC application. A value of 1 denotes highest priority, and a value of 16 denotes lowest priority.

Note:

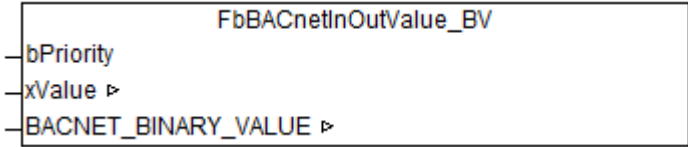
- The variable "rValue" cannot reflect the value of the "Property Present_Value".
- The variable "rValue" contains only the value of the priority array whose priority is specified by the input "bPriority".
- Changing the priority "bPriority" after starting the IEC application is not supported and can cause an error.

Present Value	25
Priority Array	Priority Value (1...16)
[1]	<null>
[2]	<null>
[3]	<null>
[4]	<null>
[5]	<null>
[6]	<null>
[7]	<null>
[8]	25
[9]	<null>
[10]	<null>
[11]	<null>
[12]	<null>
[13]	<null>
[14]	<null>
[15]	<null>
[16]	20

„rValue“ = 20
 „bPriority“ = 16



FbBACnetInOutValue_BV

WAGO-I/O-PRO V2.3 Library Elements		
Category:	Building Automation	
Name:	FbBACnetInOutValue_BV	
Type:	Function <input type="checkbox"/>	Function block <input checked="" type="checkbox"/> Program <input type="checkbox"/>
Name of library:	BACnet_02.lib	
Applicable to:	See Release Note	
Library used:	BACnetAccess.lib BACnetObjects.EXP	
Input parameter:	Data type:	Comment:
bPriority	BYTE	Priority Value range: 1 – 16 Default setting = 16
Output parameter:	Data type:	Comment:
-	-	-
Input/Output parameters:	Data type:	Comment:
xValue	BOOL	Value entry
BACNET_BINARY_VALU E	BACNET BI NARY VAL UE	Input for the "BACnet Analog Value" object
Graphical illustration:		
		

Function description:

The function block is used for the reading and writing of a BACnet object's BINARY_VALUE.

A typical application for this function block is the setting of setpoints if these should be configurable both via the BACnet network as well as via the IEC application. The setpoint is specified on the "**xValue**" input. The variable "**xValue**" is executed as IN_OUT variable and can thus also be output by the value written by the BACnet network.

The "**bPriority**" input is used to determine the write priority of the IEC application. A value of 1 denotes highest priority, and a value of 16 denotes lowest priority.

Note:

- The variable "**xValue**" cannot reflect the value of the "Property *Present_Value*".
- The variable "**xValue**" contains only the value of the priority array whose priority is specified by the input "**bPriority**".
- Changing the priority "**bPriority**" after starting the IEC application is not supported and can cause an error.

Present Value	INACTIVE (0)
Priority Array	Priority Value (1..16)
[1]	<null>
[2]	<null>
[3]	<null>
[4]	<null>
[5]	<null>
[6]	<null>
[7]	<null>
[8]	INACTIVE (0)
[9]	<null>
[10]	<null>
[11]	<null>
[12]	<null>
[13]	<null>
[14]	<null>
[15]	<null>
[16]	ACTIVE (1)

„xValue“ = TRUE

„bPriority“ = 16



FbBACnetInOutValue_MV

WAGO-I/O-PRO V2.3 Library Elements		
Category:	Building Automation	
Name:	FbBACnetInOutValue_MV	
Type:	Function <input type="checkbox"/>	Function block <input checked="" type="checkbox"/> Program <input type="checkbox"/>
Name of library:	BACnet_02.lib	
Applicable to:	See Release Note	
Library used:	BACnetAccess.lib BACnetObjects.EXP	
Input parameter:	Data type:	Comment:
bPriority	BYTE	Priority Value range: 1 – 16 Default setting = 16
Output parameter:	Data type:	Comment:
-	-	-
Input/Output parameters:	Data type:	Comment:
dwValue	DWORD	Value entry
BACNET_MULTISTATE_VALUE	BACNET_MULTISTATE_VALUE	Input for the "BACnet Multi-state Value" object
Graphical illustration:		

Function description:

The function block is used for the reading and writing of a BACnet object's MULTISTATE_VALUE.

A typical application for this function block is the setting of setpoints if these should be configurable both via the BACnet network as well as via the IEC application. The setpoint is specified on the "**dwValue**" input. The variable "**dwValue**" is executed as IN_OUT variable and can thus also be output by the value written by the BACnet network.

The "**bPriority**" input is used to determine the write priority of the IEC application. A value of 1 denotes highest priority, and a value of 16 denotes lowest priority.

Note:

- The variable "**dwValue**" cannot reflect the value of the "Property *Present_Value*".
- The variable "**dwValue**" contains only the value of the priority array whose priority is specified by the input "**bPriority**".
- Changing the priority "**bPriority**" after starting the IEC application is not supported and can cause an error.

Present Value	2
Priority Array	Priority Value (1...16)
[1]	<null>
[2]	<null>
[3]	<null>
[4]	<null>
[5]	<null>
[6]	<null>
[7]	<null>
[8]	2
[9]	<null>
[10]	<null>
[11]	<null>
[12]	<null>
[13]	<null>
[14]	<null>
[15]	<null>
[16]	5

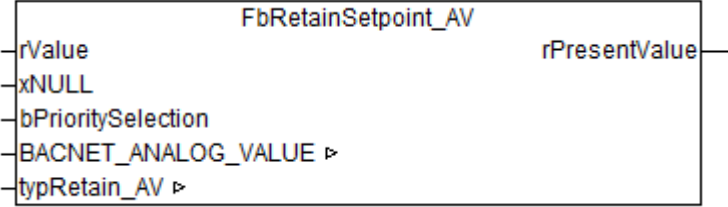
„dwValue“ = 5

„bPriority“ = 16



Save Setpoint Value as Retentive Value

FbRetainSetpoint_AV

WAGO-I/O-PRO-V2.3 Library Elements		
Category:	Building Automation	
Name:	FbRetainSetpoint_AV	
Type:	Function <input type="checkbox"/>	Function block <input checked="" type="checkbox"/> Program <input type="checkbox"/>
Name of library:	BACnet_02.lib	
Applicable to:	See Release Note	
Library used:	BACnetAccess.lib BACnetObjects.EXP	
Input parameter:		
Data type:	Comment:	
rValue	REAL	Setpoint value entry with priority 16
xNULL	BOOL	Enter NULL
bPrioritySelection	BYTE	Priority Value range = 1 – 15 Default setting = 8
Output parameter:		
Data type:	Comment:	
rPresentValue	REAL	Present value
Input/output parameter:		
Data type:	Comment:	
BACNET_ANALOG_VALUE	BACNET_ANALOG_VALUE	Data type for the "BACnet Analog Value" object
typRetain_AV	typRetain_AV	RETAIN Register
adwValuePriorityArray	ARRAY[0..1] OF DWORD	[0] = Overrange setpoint value [1] = Setpoint value with priority 16 Default setting = 2(16#00800000)
Graphical illustration:		
		

Functional description:

The function block is used to save setpoint values as retentive values without declaring the entire "*BACNET_ANALOG_VALUE*" variable as RETAIN PERSISTENT. This can contribute to a substantial reduction in usage of RETAIN memory in the controller. A typical application for this function block is the setting of setpoints and parameters via BACnet.

Two out of 16 values from the BACnet Priority Arrays can be saved. After a Reset, the priority array of the BACnet object, which is assigned on the input "*BACNET_ANALOG_VALUE*" will be initialized with the stored values.

The setpoint value entered at the "*rValue*" input is always saved as an array value with priority 16 and is one of the two values stored as retentive values. The input "*bPrioritySelection*" determined the priority of the second value from the priority array to be stored as retentive.

The setpoint value is only written to the "*BACNET_ANALOG_VALUE*" variable when the "*xNULL*" input is not activated. If the "*xNULL*" input is activated, then the "NULL" value is written. The "NULL" value can reset write access.

The variable "*typRetain_AV*" must be declared as RETAIN PERSISTENT

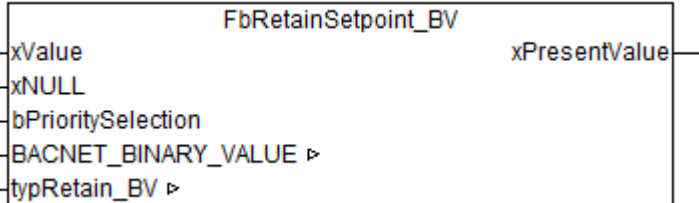
The "*rPresent_Value*" value indicates the present value.

Notes:

The BACnet value "NULL" is undefined in the IEC Application. Hence the smallest REAL number in CODESYS will be used to represent "NULL". The "NULL" will be saved in the variable "*typRetain_AV*" as 16#00800000 which corresponds to the smallest byte content of the REAL number in CODESYS (1.175494351e-38).

Changing the priority "*bPrioritySelection*" after starting the IEC application is not supported and can cause an error.

FbRetainSetpoint_BV

WAGO-I/O-PRO-V2.3 Library Elements		
Category:	Building Automation	
Name:	FbRetainSetpoint_BV	
Type:	Function <input type="checkbox"/>	Function block <input checked="" type="checkbox"/> Program <input type="checkbox"/>
Name of library:	BACnet_02.lib	
Applicable to:	See Release Note	
Library used:	BACnetAccess.lib BACnetObjects.EXP	
Input parameter:		
	Data type:	Comment:
xValue	BOOL	Setpoint value entry with priority 16
xNULL	BOOL	Enter NULL
bPrioritySelection	BYTE	Priority Value range = 1 – 15 Default setting = 8
Output parameter:		
	Data type:	Comment:
xPresentValue	BOOL	Present value
Input/output parameter:		
	Data type:	Comment:
BACNET_BINARY_VALUE	BACNET_BINARY_VALUE	Data type for the "BACnet Analog Value" object
typRetain_BV	typRetain_BV	RETAIN Register
abValuePriorityArray	ARRAY [0..1] OF BYTE	[0] = Overrange setpoint value [1] = Setpoint value with priority 16 Default setting = 2(16#FF)
Graphical illustration:		
		

Functional description:

The function block is used to save setpoint values as retentive values without declaring the entire "BACNET_BINARY_VALUE" variable as RETAIN PERSISTENT. This can contribute to a substantial reduction in usage of RETAIN memory in the controller. A typical application for this function block is the setting of setpoints and parameters via BACnet.

Two out of 16 values from the BACnet Priority Arrays can be saved. After a Reset, the priority array of the BACnet object, which is assigned on the input "BACNET_BINARY_VALUE" will be initialized with the stored values.

The setpoint value entered at the "xValue" input is always saved as an array value with priority 16 and is one of the two values stored as retentive values. The input "bPrioritySelection" determined the priority of the second value from the priority array to be stored as retentive.

The setpoint value is only written to the "BACNET_BINARY_VALUE" variable when the "xNULL" input is not activated. If the "xNULL" input is activated, then the "NULL" value is written. The "NULL" value can reset write access.

The variable "typRetain_BV" must be declared as RETAIN PERSISTENT

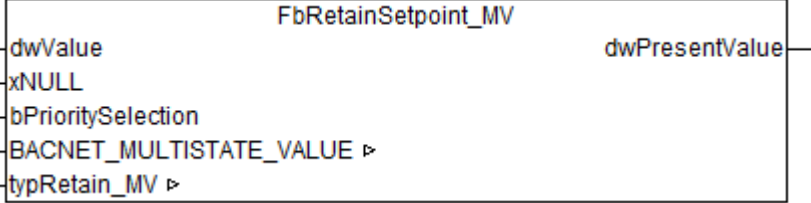
The "xPresent_Value" value indicates the present value.

Notes:

There BACnet value "NULL" is undefined in the IEC Application. Hence the value 255 will be used to represent "NULL". Hence the "NULL" will be saved in the variable "typRetain_BV" as 16#FF.

Changing the priority "bPrioritySelection" after starting the IEC application is not supported and can cause an error.

FbRetainSetpoint_MV

WAGO-I/O-PRO-V2.3 Library Elements		
Category:	Building Automation	
Name:	FbRetainSetpoint_MV	
Type:	Function <input type="checkbox"/>	Function block <input checked="" type="checkbox"/> Program <input type="checkbox"/>
Name of library:	BACnet_02.lib	
Applicable to:	See Release Note	
Library used:	BACnetAccess.lib BACnetObjects.EXP	
Input parameter:		
Data type:	Comment:	
dwValue	DWORD	Setpoint value entry with priority 16
xNULL	BOOL	Enter NULL
bPrioritySelection	BYTE	Priority Value range = 1 – 15 Default setting = 8
Output parameter:		
Data type:	Comment:	
dwPresentValue	DWORD	Present value
Input/output parameter:		
Data type:	Comment:	
BACNET_MULTISTATE_VALUE	BACNET_MULTISTATE_VALUE	Data type for the "BACnet Multi-state Value" object
typRetain_MV	typRetain_MV	RETAIN Register
adwValuePriorityArray	ARRAY[0..1] OF DWORD	[0] = Overrange setpoint value [1] = Setpoint value with priority 16 Default setting = 2(16#FFFF)
Graphical illustration:		
		

Functional description:

The function block is used to save setpoint values as retentive values without declaring the entire "*BACNET_MULTISTATE_VALUE*" variable as RETAIN PERSISTENT. This can contribute to a substantial reduction in usage of RETAIN memory in the controller. A typical application for this function block is the setting of setpoints and parameters via BACnet.

Two out of 16 values from the BACnet Priority Arrays can be saved. After a Reset, the priority array of the BACnet object, which is assigned on the input "*BACNET_MULTISTATE_VALUE*" will be initialized with the stored values.

The setpoint value entered at the "*dwValue*" input is always saved as an array value with priority 16 and is one of the two values stored as retentive values. The input "*bPrioritySelection*" determined the priority of the second value from the priority array to be stored as retentive.

The setpoint value is only written to the "*BACNET_MULTISTATE_VALUE*" variable when the "*xNULL*" input is not activated. If the "*xNULL*" input is activated, then the "NULL" value is written. The "NULL" value can reset write access.

The variable "*typRetain_MV*" must be declared as RETAIN PERSISTENT

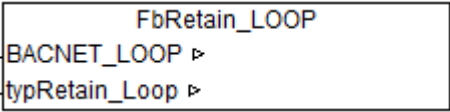
The "*dwPresent_Value*" value indicates the present value.

Notes:

There BACnet value "NULL" is undefined in the IEC Application. Hence the value 65535 will be used to represent "NULL". Hence the "NULL" will be saved in the variable "*typRetain_BV*" as 16#FFFF.

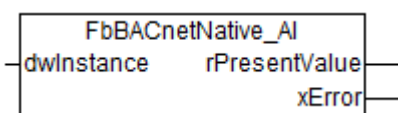
Changing the priority "*bPrioritySelection*" after starting the IEC application is not supported and can cause an error.

FbRetain_LOOP

WAGO-I/O-PRO-V2.3 Library Elements		
Category:	Building Automation	
Name:	FbRetain_LOOP	
Type:	Function <input type="checkbox"/>	Function block <input checked="" type="checkbox"/> Programm <input type="checkbox"/>
Name of library:	BACnet_02.lib	
Applicable to:	See Release Note	
Library used:	BACnetAccess.lib BACnetObjects.EXP	
Input parameter:	Data type:	Comment:
Input/output parameter:	Data type:	Comment:
BACNET_LOOP	BACNET_LOOP	Data type for the "BACnet Loop Object Type" object
typRetain_Loop	typRetain_Loop	RETAIN Register
rValuePriorityArray	ARRAY [0..5] OF REAL	[0] = Setpoint [1] = Proportional constant [2] = Integral constant [3] = Differential constant [4] = Maximum Output [5] = Minimum Output
Graphical illustration::		
		
Functional description:		
<p>The function block is used to save control parameters as retentive values without declaring the entire "BACNET_LOOP" variable as RETAIN PERSISTENT. This can contribute to a substantial reduction in usage of RETAIN memory in the controller.</p> <p>The variable "typRetain_Loop" must be declared as RETAIN PERSISTENT</p>		

Access to the BACnet-native Object

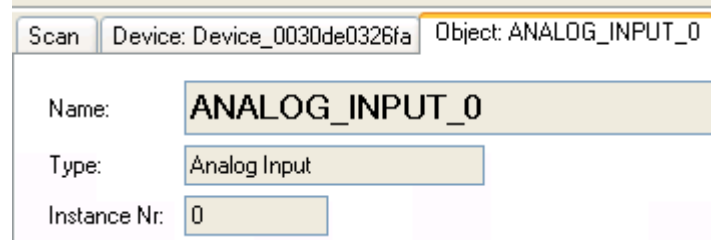
FbBACnetNative_AI

WAGO-I/O-PRO-V2.3 Library Elements		
Category:	Building Automation	
Name:	FuBACnetNative_AI	
Type:	Function <input type="checkbox"/>	Function block <input checked="" type="checkbox"/> Program <input type="checkbox"/>
Name of library:	BACnet_02.lib	
Applicable to:	See Release Note	
Library used:	BACnetAccess.lib BACnetObjects.EXP	
Input parameter:		
	Data type:	Comment:
dwInstance	DWORD	Instance number of the object
Output parameter:		
	Data type:	Comment:
rPresentValue	REAL	Present value
xError	BOOL	TRUE-> Error has occurred
Graphical illustration:		
		

Functional description:

The function block is used to read a native ANALOG_INPUT object in the IEC application.

Each BACnet device within a BACnet possess a unique instance number and can be read from the BACnet configurator (see Figure 1). This instance number of the object is entered at the "**dwlInstance**" input.



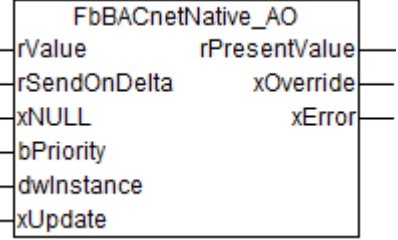
The screenshot shows a software interface for configuring a BACnet object. At the top, there are three fields: "Scan" (with a button), "Device: Device_0030de0326fa", and "Object: ANALOG_INPUT_0". Below these, there are three rows of configuration data:

Name:	ANALOG_INPUT_0
Type:	Analog Input
Instance Nr:	0

Figure 1: Instance number in the BACnet configurator

The current value is output at "**rPresentValue**". If an error occurs, the "**xError**" output is set to TRUE.

FbBACnetNative_AO

WAGO-I/O-PRO-V2.3 Library Elements		
Category:	Building Automation	
Name:	FuBACnetNative_AO	
Type:	Function <input type="checkbox"/>	Function block <input checked="" type="checkbox"/> Program <input type="checkbox"/>
Name of library:	BACnet_02.lib	
Applicable to:	See Release Note	
Library used:	BACnetAccess.lib BACnetObjects.EXP	
Input parameter:		
	Data type:	Comment:
rValue	REAL	Value entry
rSendOnDelta	REAL	Hysteresis for sending conditions Default setting = 1
xNULL	BOOL	Enter NULL
bPriority	BYTE	Priority Value range = 1 – 16 Default setting = 16
dwInstance	DWORD	Instance number of the object
xUpdate	BOOL	Update values
Output parameter:		
	Data type:	Comment:
rPresentValue	REAL	Present value
xError	BOOL	TRUE-> Error has occurred
Graphical illustration:		
		

Functional description:

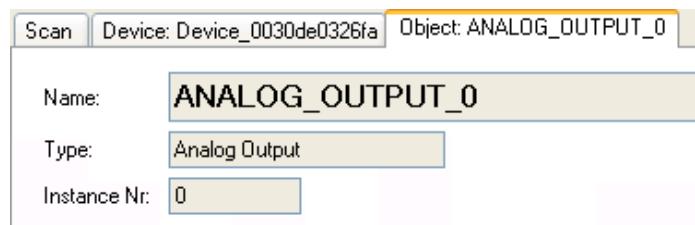
The function block is used to write in a prioritized manner to the "Priority_Array" property of a BACnet-native object. In this way, it is possible to impact the "Present_Value" property of a native analog object from both the IEC application.

The priority specifies which party is to receive permission to write to the "Present_Value" property. The "**bPriority**" input is used to determine the write priority of the IEC application. A value of 1 denotes highest priority, and a value of 16 denotes lowest priority.

The "**rValue**" value is only written when there is a value change at the "**rValue**" input and the "**xNULL**" input is not activated. If the "**xNULL**" input is activated, then only the "NULL" value is written. The "NULL" value can be used to reset write access with a specific priority. If there is a rising edge at the "**xUpdate**" input, the input values can be written again.

The "**rSendOnDelta**" parameter indicates the amount by which the input value "**rValue**" must change before a write process is activated. The writing frequency can be limited in this manner.

Each BACnet object within a BACnet network possess a unique instance number and can be read from the BACnet configurator (see Figure 2). This instance number of the object is entered at the "**dwlInstance**" input.



Scan Device: Device_0030de0326fa Object: ANALOG_OUTPUT_0

Name: ANALOG_OUTPUT_0

Type: Analog Output

Instance Nr: 0

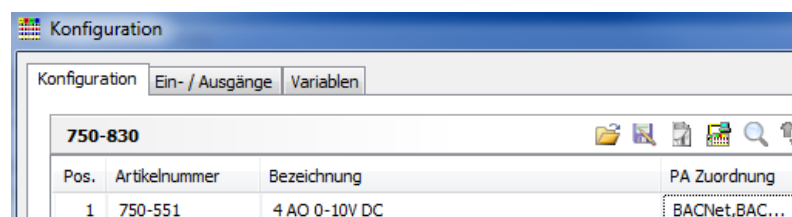
Figure 2: Instance number in the BACnet configurator

The "**rPresent_Value**" output indicates the present value. If a value, whose priority is higher than the priority specified at the "bPriority", is entered in the priority array, the "**xOverride**" output is set to TRUE. If an error occurs, the "**xError**" output is set to TRUE. The internal BACnetLibError variable of the block indicates the cause of the error.

Note:

Changing the priority "**bPriority**" after starting the IEC application is not supported and can cause an error.

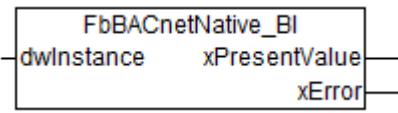
The block will only work properly if the process image (PA) assignment of the corresponding output module is configured to BACnet (see Figure 3). This is carried out in the CODESYS PLC configuration.



Pos.	Artikelnummer	Bezeichnung	PA Zuordnung
1	750-551	4 AO 0-10V DC	BACnet,BAC...

Figure 3: Example of a 4-channel analog output module

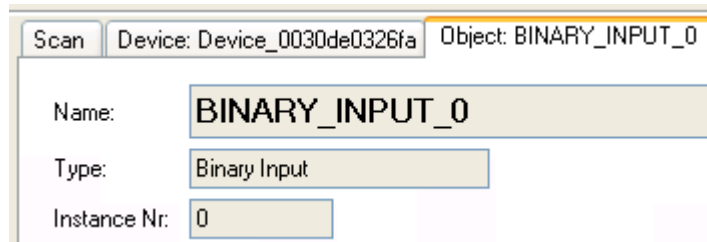
FbBACnetNative_BI

WAGO-I/O-PRO-V2.3 Library Elements		
Category:	Building Automation	
Name:	FuBACnetNative_BI	
Type:	Function <input type="checkbox"/>	Function block <input checked="" type="checkbox"/> Program <input type="checkbox"/>
Name of library:	BACnet_02.lib	
Applicable to:	See Release Note	
Library used:	BACnetAccess.lib BACnetObjects.EXP	
Input parameter:		
	Data type:	Comment:
dwInstance	DWORD	Instance number of the object
Output parameter:		
	Data type:	Comment:
xPresentValue	BOOL	Present value
xError	BOOL	TRUE-> Error has occurred.
Graphical illustration:		
		

Functional description:

The block is used to read a native BINARY_INPUT object in the IEC application.

Each BACnet object within a BACnet network possess a unique instance and can be read from the BACnet configurator. This instance number of the object is entered at the "**dwInstance**" input.



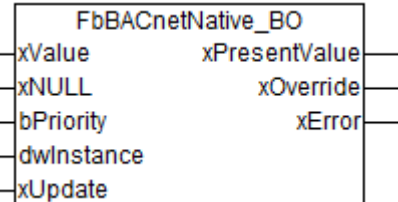
The screenshot shows a software interface for configuring a BACnet object. At the top, there are three fields: "Scan" (with a button), "Device: Device_0030de0326fa", and "Object: BINARY_INPUT_0". Below these, the configuration details are displayed:

Name:	BINARY_INPUT_0
Type:	Binary Input
Instance Nr:	0

Figure 4: Instance number in the BACnet configurator

The current value is output at "**xPresentValue**". If an error occurs, the "**xError**" output is set to TRUE.

FbBACnetNative_BO

WAGO-I/O-PRO-V2.3 Library Elements		
Category:	Building Automation	
Name:	FuBACnetNative_BO	
Type:	Function <input type="checkbox"/>	Function block <input checked="" type="checkbox"/> Program <input type="checkbox"/>
Name of library:	BACnet_02.lib	
Applicable to:	See Release Note	
Library used:	BACnetAccess.lib BACnetObjects.EXP	
Input parameter:		
	Data type:	Comment:
xValue	BOOL	Value entry
xNULL	BOOL	Enter NULL
bPriority	BYTE	Priority Value range = 1 – 16 Default setting = 16
dwInstance	DWORD	Instance number of the object
xUpdate	BOOL	Update values
Output parameter:		
	Data type:	Comment:
xPresentValue	BOOL	Present value
xError	BOOL	TRUE-> Error has occurred
Graphical illustration:		
		

Functional description:

The function block is used to write in a prioritized manner to the "Priority_Array" property of a BACnet-native object. In this way, it is possible to impact the "Present_Value" property of a native binary object from both the IEC application.

The priority specifies which party is to receive permission to write to the "Present_Value" property. The "**bPriority**" input is used to determine the write priority of the IEC application. A value of 1 denotes highest priority, and a value of 16 denotes lowest priority.

The "**xValue**" value is only written when there is a value change at the "xValue" input and the "**xNULL**" input is not activated. If the "xNULL" input is activated, then only the "NULL" value is written. The "NULL" value can be used to reset write access with a specific priority. If there is a rising edge at the "**xUpdate**" input, the input values can be written again.

Each BACnet object within a BACnet network possess a unique instance and can be read from the BACnet configurator (s. Figure 5). This instance number of the object is entered at the "**dwnInstance**" input.

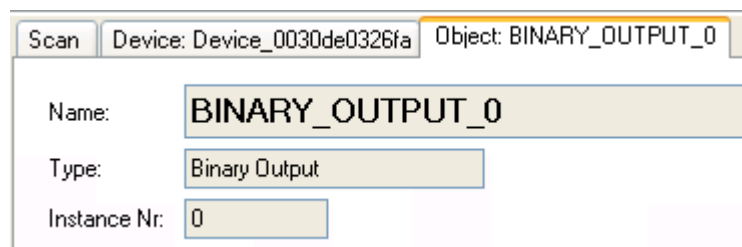


Figure 5: Instance number in the BACnet configurator

The "**xPresent Value**" output indicates the present value. If a value, whose priority is higher than the priority specified at the "bPriority" input, is entered in the priority array, the "**xOverride**" output is set to TRUE. If an error occurs, the "**xError**" output is set to TRUE. The internal BACnetLibError variable of the block indicates the cause of the error.

Note:

Changing the priority "**bPriority**" after starting the IEC application is not supported and can cause an error.

The block will only work properly if the process image (PA) assignment of the corresponding output module is configured to BACnet. This is carried out in the CODESYS PLC configuration(s. Figure 6).

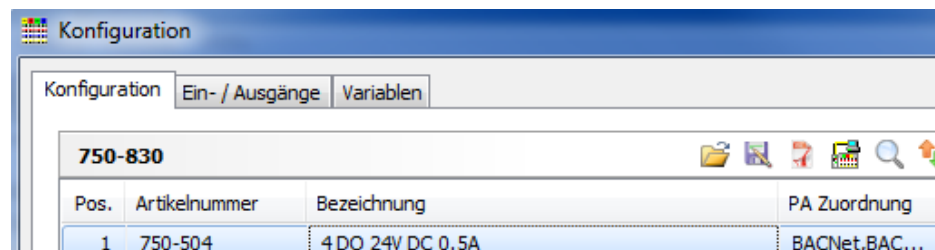
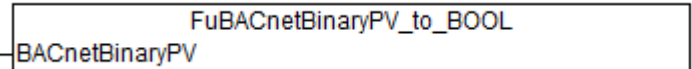


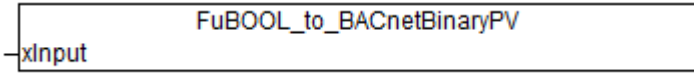
Figure 6: Example of a 4-channel binary output module

Converting IEC/BACnet Variables

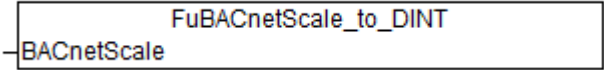
BACnetBinaryPV_to_BOOL

WAGO-I/O-PRO-V2.3 Library Elements		
Category:	Building Automation	
Name:	FuBACnetBinaryPV_to_BOOL	
Type:	Function <input checked="" type="checkbox"/>	Function block <input type="checkbox"/> Program <input type="checkbox"/>
Name of library:	BACnet_02.lib	
Applicable to:	See Release Note	
Library used:	BACnetAccess.lib BACnetObjects.EXP	
Input parameter:	Data type:	Comment:
BACnetBinaryPV	BACnetBinaryPV	
Return value	Data type:	Comment:
FuBACnetBinaryPV_to_BOOL	BOOL	
Graphical illustration:		
		
Functional description:		
The function converts the BACnetBinaryPV data type into the BOOL data type:		


FuBOOL_to_BACnetBinaryPV

WAGO-I/O-PRO-V2.3 Library Elements		
Category:	Building Automation	
Name:	FuBOOL_to_BACnetBinaryPV	
Type:	Function <input checked="" type="checkbox"/>	Function block <input type="checkbox"/> Program <input type="checkbox"/>
Name of library:	BACnet_02.lib	
Applicable to:	See Release Note	
Library used:	BACnetAccess.lib BACnetObjects.EXP	
Input parameter:	Data type:	Comment:
xInput	BOOL	
Return value	Data type:	Comment:
FuBOOL_to_BACnetBinaryPV	BACnetBinaryPV	
Graphical illustration:		
		
Functional description:		
The function converts the BOOL data type into the BACnetBinaryPV data type.		

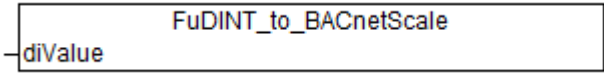
FuBACnetScale_to_DINT

WAGO-I/O-PRO-V2.3 Library Elements		
Category:	Building Automation	
Name:	FuBACnetScale_to_DINT	
Type:	Function <input checked="" type="checkbox"/>	Function block <input type="checkbox"/> Program <input type="checkbox"/>
Name of library:	BACnet_02.lib	
Applicable to:	See Release Note	
Library used:	BACnetAccess.lib BACnetObjects.EXP	
Input parameter:		
BACnetScale	Data type: BACnetScale	Comment:
Return value		
FuBACnetScale_to_DINT	Data type: DINT	Comment:
Graphical illustration:		
		
Functional description:		
The function converts the BACnetScale data type into the DINT data type.		

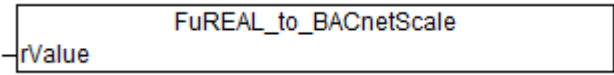
FuBACnetScale_to_REAL

WAGO-I/O-PRO-V2.3 Library Elements		
Category:	Building Automation	
Name:	FuBACnetScale_to_REAL	
Type:	Function <input checked="" type="checkbox"/>	Function block <input type="checkbox"/> Program <input type="checkbox"/>
Name of library:	BACnet_02.lib	
Applicable to:	See Release Note	
Library used:	BACnetAccess.lib BACnetObjects.EXP	
Input parameter:	Data type:	Comment:
BACnetScale	BACnetScale	
Return value	Data type:	Comment:
FuBACnetScale_to_REAL	REAL	
Graphical illustration:		
		
Functional description:		
The function converts the BACnetScale data type into the REAL data type.		

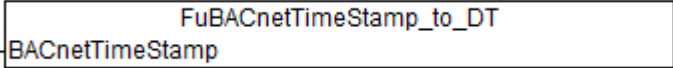
FuDINT_to_BACnetScale

WAGO-I/O-PRO-V2.3 Library Elements		
Category:	Building Automation	
Name:	FuDINT_to_BACnetScale	
Type:	Function <input checked="" type="checkbox"/>	Function block <input type="checkbox"/> Program <input type="checkbox"/>
Name of library:	BACnet_02.lib	
Applicable to:	See Release Note	
Library used:	BACnetAccess.lib BACnetObjects.EXP	
Input parameter:		
diValue	Data type: DINT	Comment:
Return value		
FuDINT_to_BACnetScale	Data type: BACnetScale	Comment:
Graphical illustration:		
		
Functional description:		
The function converts the DINT data type into the BACnetScale data type.		

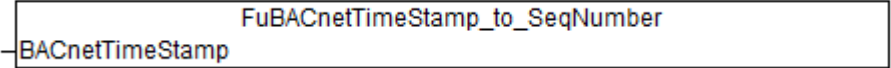
FuREAL_to_BACnetScale

WAGO-I/O-PRO-V2.3 Library Elements		
Category:	Building Automation	
Name:	FuREAL_to_BACnetScale	
Type:	Function <input checked="" type="checkbox"/>	Function block <input type="checkbox"/> Program <input type="checkbox"/>
Name of library:	BACnet_02.lib	
Applicable to:	See Release Note	
Library used:	BACnetAccess.lib BACnetObjects.EXP	
Input parameter:	Data type:	Comment:
rValue	REAL	
Return value	Data type:	Comment:
FuREAL_to_BACnetScale	BACnetScale	
Graphical illustration:		
		
Functional description:		
The function converts the REAL data type into the BACnetScale data type.		

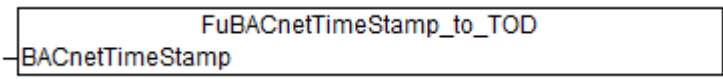
FuBACnetTimeStamp_to_DT

WAGO-I/O-PRO-V2.3 Library Elements		
Category:	Building Automation	
Name:	FuBACnetTimeStamp_to_DT	
Type:	Function <input checked="" type="checkbox"/>	Function block <input type="checkbox"/> Program <input type="checkbox"/>
Name of library:	BACnet_02.lib	
Applicable to:	See Release Note	
Library used:	BACnetAccess.lib BACnetObjects.EXP	
Input parameter:	Data type:	Comment:
BACnetTimeStamp	BACnetTime eStamp	
Return value	Data type:	Comment:
FuBACnetTimeStamp_to_ DT	DT	
Graphical illustration:		
		
Functional description:		
The function converts the BACnetTimeStamp data type into the DT data type.		

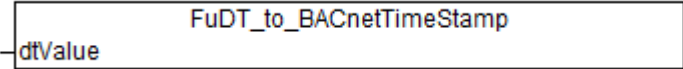
FuBACnetTimeStamp_to_SeqNumber

WAGO-I/O-PRO-V2.3 Library Elements		
Category:	Building Automation	
Name:	FuBACnetTimeStamp_to_SeqNumber	
Type:	Function <input checked="" type="checkbox"/>	Function block <input type="checkbox"/> Program <input type="checkbox"/>
Name of library:	BACnet_02.lib	
Applicable to:	See Release Note	
Library used:	BACnetAccess.lib BACnetObjects.EXP	
Input parameter:	Data type:	Comment:
BACnetTimeStamp	BACnetTimeStamp	
Return value	Data type:	Comment:
FuBACnetTimeStamp_to_SeqNumber	WORD	
Graphical illustration:		
		
Functional description:		
The function converts the BACnetTimeStamp data type into the WORD data type.		

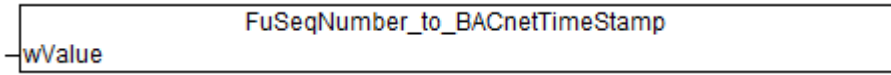
FuBACnetTimeStamp_to_TOD

WAGO-I/O-PRO-V2.3 Library Elements		
Category:	Building Automation	
Name:	FuBACnetTimeStamp_to_TOD	
Type:	Function <input checked="" type="checkbox"/>	Function block <input type="checkbox"/> Program <input type="checkbox"/>
Name of library:	BACnet_02.lib	
Applicable to:	See Release Note	
Library used:	BACnetAccess.lib BACnetObjects.EXP	
Input parameter:		
BACnetTimeStamp	Data type: BACnetTime Stamp	Comment:
Return value		
FuBACnetTimeStamp_to_TOD	Data type: TOD	Comment:
Graphical illustration:		
		
Functional description:		
The function converts the BACnetTimeStamp data type into the TOD data type.		

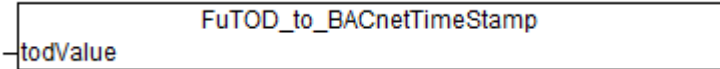
FuDT_to_BACnetTimeStamp

WAGO-I/O-PRO-V2.3 Library Elements		
Category:	Building Automation	
Name:	FuDT_to_BACnetTimeStamp	
Type:	Function <input checked="" type="checkbox"/>	Function block <input type="checkbox"/> Program <input type="checkbox"/>
Name of library:	BACnet_02.lib	
Applicable to:	See Release Note	
Library used:	BACnetAccess.lib BACnetObjects.EXP	
Input parameter:	Data type:	Comment:
dtValue	DT	
Return value	Data type:	Comment:
FuDT_to_BACnetTimeSta mp	BACnetTim eStamp	
Graphical illustration:		
		
Functional description:		
The function converts the DT data type into the BACnetTimeStamp data type.		

FuSeqNumber_to_BACnetTimeStamp

WAGO-I/O-PRO-V2.3 Library Elements		
Category:	Building Automation	
Name:	FuSeqNumber_to_BACnetTimeStamp	
Type:	Function <input checked="" type="checkbox"/>	Function block <input type="checkbox"/> Program <input type="checkbox"/>
Name of library:	BACnet_02.lib	
Applicable to:	See Release Note	
Library used:	BACnetAccess.lib BACnetObjects.EXP	
Input parameter:		
wValue	Data type: WORD	Comment:
Return value		
FuSeqNumber_to_BACnetTimeStamp	Data type: BACnetTimeStamp	Comment:
Graphical illustration:		
		
Functional description:		
The function converts the WORD data type into the BACnetTimeStamp data type.		

FuTOD_to_BACnetTimeStamp

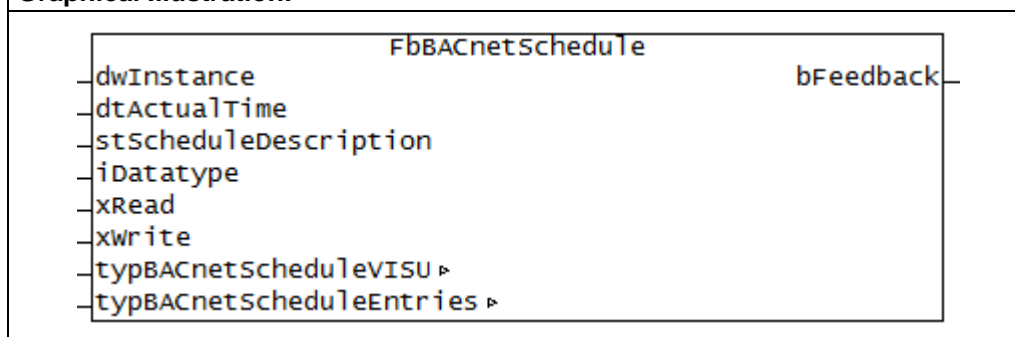
WAGO-I/O-PRO-V2.3 Library Elements		
Category:	Building Automation	
Name:	FuTOD_to_BACnetTimeStamp	
Type:	Function <input checked="" type="checkbox"/>	Function block <input type="checkbox"/> Program <input type="checkbox"/>
Name of library:	BACnet_02.lib	
Applicable to:	See Release Note	
Library used:	BACnetAccess.lib BACnetObjects.EXP	
Input parameter:	Data type:	Comment:
todValue	TOD	
Return value	Data type:	Comment:
FuTOD_to_BACnetTimeSt amp	BACnetTim eStamp	
Graphical illustration:		
		
Functional description:		
The function converts the TOD data type into the BACnetTimeStamp data type.		

BACnet Schedule Object

FbBACnetSchedule

WAGO-I/O-PRO V2.3 Library Elements		
Category:	Building technology	
Name:	FbBACnetSchedule	
Type:	Function <input type="checkbox"/>	Function block <input checked="" type="checkbox"/> Program <input type="checkbox"/>
Name of library:	BACnet_02.lib	
Applicable to:	See Release Note	
Libraries used:	BACnetAccess.lib	
Input Parameter:		
	Data Type:	Comment:
dwInstance	DWORD	BACnet Schedule instance
dtActualTime	DT	Entry for the current time
stScheduleDescription	STRING	Description text for visualization
iDatatype	INT	Date type of the BACnet Schedule 0 = NULL 1 = DINT 2 = DWORD 3 = BOOL 4 = REAL 5 = ENUM
xRead	BOOL	Reads in current switching entries
xWrite	BOOL	Writes the switching entries from the structure typBACnetScheduleEntries
Output Parameter:		
	Data Type:	Comment:
bFeedback	BYTE	Error codes: 0 = no error 1 = invalid type 2 = BACnet instance not found 3 = invalid data type 4 = invalid entry 5 = internal error 6 = PV/entries data type collision 7 = max. entries per day exceeded 8 = present value not supported 9 = time entry 24:00 not valid 10 = no entry 99 = unknown error

Input/Output Parameter:	Data Type:	Comment:
typBACnetScheduleVISU	typBACnetScheduleVISU	Placeholder structure for the visualization from the BACnet_02.exp
typBACnetScheduleEntries	typBACnetScheduleEntries	Date structure of the week time switching programs
.artodTime	ARRAY[1..7] OF ARRAY [1..bMax Entries] OF TOD	Switching time of the week entry, 1st array = day of the week 2nd array = entry of the day
.arrValue	ARRAY[1..7] OF ARRAY [1..bMax Entries] OF REAL	Value of the week entry, for iDatatype = DINT, DWORD, REAL 1st array = day of the week 2nd array = entry of the day
.arxValue	ARRAY[1..7] OF ARRAY [1..bMax Entries] OF BOOL	Status of the week entry, for iDatatype = BOOL and ENUM 1st array = day of the week 2nd array = entry of the day
.ariDatatype	ARRAY[1..7] OF ARRAY [1..bMax Entries] OF INT	Data type of the week entry, 0 = NULL 1 = DINT 2 = DWORD 3 = BOOL 4 = REAL 5 = ENUM 1st array = day of the week 2nd array = entry of the day

Graphical Illustration:

Structure of the “typBACnetScheduleEntries” Variable:	
<pre> typBACnetScheduleEntries ├── .artodTime │ ├── .artodTime[1] │ ├── .artodTime[2] │ │ ├── .artodTime[2][1] = TOD#10:10 │ │ ├── .artodTime[2][2] = TOD#04:04 │ │ ├── .artodTime[2][3] = TOD#05:05 │ │ ├── .artodTime[2][4] = TOD#18:18 │ │ ├── .artodTime[2][5] = TOD#20:20 │ │ └── .artodTime[2][6] = TOD#00:00 │ ├── .artodTime[3] │ ├── .artodTime[4] │ ├── .artodTime[5] │ ├── .artodTime[6] │ └── .artodTime[7] ├── .arrValue │ ├── .arrValue[1] │ ├── .arrValue[2] │ │ ├── .arrValue[2][1] = 1010 │ │ ├── .arrValue[2][2] = 404 │ │ ├── .arrValue[2][3] = 505 │ │ ├── .arrValue[2][4] = 0 │ │ ├── .arrValue[2][5] = 2020 │ │ └── .arrValue[2][6] = 0 │ ├── .arrValue[3] │ ├── .arrValue[4] │ ├── .arrValue[5] │ ├── .arrValue[6] │ └── .arrValue[7] ├── .arxValue │ ├── .arxValue[1] │ ├── .arxValue[2] │ │ ├── .arxValue[2][1] = FALSE │ │ ├── .arxValue[2][2] = FALSE │ │ ├── .arxValue[2][3] = FALSE │ │ ├── .arxValue[2][4] = FALSE │ │ ├── .arxValue[2][5] = FALSE │ │ └── .arxValue[2][6] = FALSE │ ├── .arxValue[3] │ ├── .arxValue[4] │ ├── .arxValue[5] │ ├── .arxValue[6] │ └── .arxValue[7] ├── .ariDatatype │ ├── .ariDatatype[1] │ ├── .ariDatatype[2] │ │ ├── .ariDatatype[2][1] = 4 │ │ ├── .ariDatatype[2][2] = 4 │ │ ├── .ariDatatype[2][3] = 4 │ │ ├── .ariDatatype[2][4] = 0 │ │ ├── .ariDatatype[2][5] = 4 │ │ └── .ariDatatype[2][6] = 0 │ ├── .ariDatatype[3] │ ├── .ariDatatype[4] │ ├── .ariDatatype[5] │ ├── .ariDatatype[6] │ └── .ariDatatype[7] </pre>	<p>Switching times [Mon ... Sun] [entry]</p> <p>Value of the entry [Mon ... Sun] [entry] for DINT, DWORD, REAL</p> <p>Status the entry [Mon ... Sun][entry] for BOOL, ENUM</p> <p>Data type of the entry [Mon ... Sun] [entry] 0 = NULL 1 = DINT 2 = DWORD 3 = BOOL 4 = REAL 5 = ENUM</p>

FbBACnetSchedule Status Indicator:

Schedule	Schedule Type	Description		
0	REAL	Schedule Description		
Actual Value	Actual Type	Status	Actual time	
0.00	Default	No error	09:55:06	

Week Time Switching Program:

	Mo	Tu	We	Th	Fr	Sa	Su
Enable		<input checked="" type="checkbox"/>					
	From	To	Value				
<input checked="" type="checkbox"/>	04:04:00	05:05:00	404.00		Default		
<input checked="" type="checkbox"/>	05:05:00	10:10:00	505.00		Default		
<input checked="" type="checkbox"/>	10:10:00	18:18:00	1010.00		Default		
<input checked="" type="checkbox"/>	18:18:00	20:20:00	0.00		Default		
<input checked="" type="checkbox"/>	20:20:00	00:00:00	2020.00		Default		
<input type="checkbox"/>							
Read				Write			

Function Description:

The **FbBACnetSchedule** is for reading and writing weekly schedule entries of a BACnet Schedule object.

The BACnet Schedule instance number to be read or written is assigned to the **“dwlInstance”** input.

The **“dtActualTime”** input is linked to the actual time. The **SysRtcGetTime** function can be used to determine the current system time. This function is found in the **SysLibRtc.lib** library.

The content of the **“stScheduleDescription”** input is passed to the visualization as description text for easier identification.

The **“iDatatype”** input must match the data type of the Schedule default property of the Schedule object.

The **“xRead”** input reads the current time switching entries and outputs them in the **“typBACnetScheduleEntries”** structure.

The entries of the **“typBACnetScheduleEntries”** structure are written to the BACnet Schedule object via the **“xWrite”** input. **“bFeedback”** outputs any error codes that arise in the process.

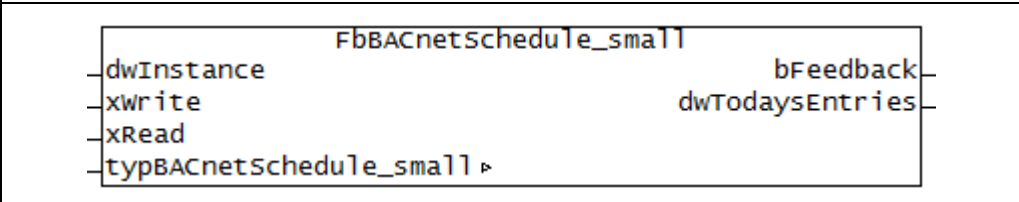
The **“typBACnetScheduleVISU”** structure serves as a placeholder structure and is the link to the visualization elements from the **“BACnet_02.exp”** library.

FbBACnetSchedule_small

WAGO-I/O-PRO V2.3 Library Elements		
Category:	Building technology	
Name:	FbBACnetSchedule_small	
Type:	Function <input type="checkbox"/>	Function block <input checked="" type="checkbox"/> Program <input type="checkbox"/>
Name of library:	BACnet_02.lib	
Applicable to:	See Release Note	
Libraries used:	BACnetAccess.lib	
Input Parameter:		
Data Type:	Comment:	
dwInstance	DWORD	BACnet Schedule instance
xWrite	BOOL	Writes the schedule entry from the "typBACnetSchedule_small" structure
xRead	BOOL	Reads the schedule entry and passes the content to "typBACnetSchedule_small"
Output Parameter:		
Data Type:	Comment:	
bFeedback	BYTE	Error codes: 0 = no error 1 = invalid type 2 = BACnet instance not found 3 = invalid data type 4 = invalid entry 5 = internal error 6 = PV/entries data type collision 7 = max. entries per day exceeded 8 = present value not supported 9 = time entry 24:00 not valid 10 = no entry 99 = unknown error
dwTodaysEntries	DWORD	Outputs the number of time switching entries of the respective day

Input/Output Parameter:	Data Type:	Comment:
typBACnetSchedule_small	typBACnetSchedule_small	Data structure of the weekly schedule entry
.wEntryNumber	WORD	Entry number
.bDayofWeek	BYTE	Day of the week
.todTime	TOD	Time switching point
rValue	REAL	Value of the entry for iDatatype = DINT, DWORD, REAL
.xValue	BOOL	Status the entry, for iDatatype = BOOL and ENUM
.bDatatype	BYTE	Data type of the entry 0 = NULL 1 = DINT 2 = DWORD 3 = BOOL 4 = REAL 5 = ENUM

Graphical Illustration:



Structure of the “typBACnetSchedule_small” Variable:

<pre> [-] typBACnetSchedule_small .wEntryNumber = 1 .bDayofweek = 1 .todTime = TOD#12:30 .rvalue = 21.5 .xvalue = FALSE .bDatatype = 4 </pre>	<p>wEntryNumber = entry bDayofWeek = day of the week todTime = switching time rValue = value of the entry DINT, DWORD, REAL xValue = status the entry BOOL, ENUM bDatatype= data type of the entry 0 = NULL 1 = DINT 2 = DWORD 3 = BOOL 4 = REAL 5 = ENUM</p>
---	--

Function Description:

The **FbBACnetSchedule_small** function block is for reading and writing a weekly schedule entry of a BACnet Schedule object.

The BACnet Schedule instance number to be read or written is assigned to the **“dwInstance”** input.

The content of the **“typBACnetSchedule_small”** structure is written to the BACnet Schedule entry via the **“xWrite”** input.

The **“xRead”** input reads in the current time switching entry and outputs it to the **“typBACnetSchedule_small”** structure.

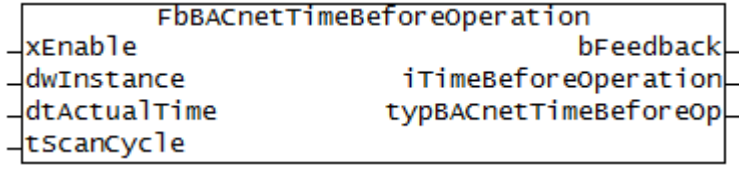
“bFeedback” outputs any error codes that arise during reading and writing.

“dwTodaysEntries” outputs the number of entries of the day of the week that was entered in the **“typBACnetSchedule_small.bDayofWeek”** structure.

FbBACnetScheduleTimeBeforeOperation

WAGO-I/O-PRO V2.3 Library Elements		
Category:	Building technology	
Name:	FbBACnetScheduleTimeBeforeOperation	
Type:	Function <input type="checkbox"/>	Function block <input checked="" type="checkbox"/> Program <input type="checkbox"/>
Name of library:	BACnet_02.lib	
Applicable to:	See Release Note	
Libraries used:	BACnetAccess.lib	
Input Parameter:		
Data Type:	Comment:	
xEnable	BOOL	Enables the block
dwInstance	DWORD	BACnet Schedule instance
dtActualTime	DT	Entry for the current time
tScanCycle	TIME	Calculation interval Default setting = 5 s
Output Parameter:		
Data Type:	Comment:	
bFeedback	BYTE	Error codes: 0 = no error 1 = invalid type 2 = BACnet instance not found 3 = invalid data type 4 = invalid entry 5 = internal error 6 = PV/entries data type collision 7 = max. entries per day exceeded 8 = present value not supported 9 = time entry 24:00 not valid 10 = no entry 99 = unknown error
iTimeBeforeOperation	INT	Indicates the time before start of operation (+); for BOOL/ENUM schedules, also with remaining operation time (-) [min]
typBACnetTimeBeforeOp	typBACnetTimeBeforeOp	Data structure of the "Time before operation" and placeholder structure for the visualization from BACnet_02.exp
.stNextType	STRING	Next data type
.todNextOperation	TOD	Time entry of the next switching point
.rNextValue	REAL	Next value
.bNextType	BYTE	Next data type
.stVISUNextVal	STRING	Next value for BOOL/ENUM
.xVISUReal	BOOL	Information for VISU element

Graphical Illustration:



Structure of the “typBACnetTimeBeforeOp” Variable:

<pre> ┌ typBACnetTimeBeforeOp │ .stNextType = 'REAL' │ .todNextOperation = TOD#14:00 │ .rNextValue = 21.5 │ .bNextType = 4 │ .stVISUNextVal = '' │ .xVISUREAL = TRUE └ </pre>	<p>stNextType = next data type, in string format todNextOperation = next switching time point rNextValue = next value bNextType = next data type stVISUNextVal = next value for BOOL/ENUM xVISUREAL = information for VISU element</p>
---	---

Status Indicator of FbBACnetTimeBeforeOperation:

Today's next operation	Next operation at	Time before operation	Next Value	Next Type
	10:10:00	207 min	21.50	REAL

Function Description:

The **FbBACnetTimeBeforeOperation** function block determines the time before the start of operation (+), or, for the BOOL/ENUM data type, the remaining operation time (-) of the time switching condition. The calculation of the time before operation always starts at 00:00.

If the function block is activated via the “**xEnable**” input, the calculation is performed in the cycle of the “**tScanCycle**” input, and the results are updated at the outputs of the block.

The BACnet Schedule instance number for which the calculation is to be performed is assigned to the “**dwInstance**” input.

The “**dtActualTime**” input is linked to the actual time. The **SysRtcGetTime** function can be used to determine the current system time. This function is found in the **SysLibRtc.lib** library.

“**bFeedback**” outputs any error codes that arise in the process.

The “**iTimeBeforeOperation**” output indicates the time before the start of operation (+) or, for the data type BOOL/ENUM, the remaining operation time (-) of the time switching conditions in **Minutes**. The calculation of the time before operation always starts at 00:00.

The “**typBACnetTimeBeforeOp**” structure contains further output variables with information about the next switching condition and serves as a placeholder structure for the visualization elements from the “**BACnet_02.exp**”.

BACnet Objects as an Export File

General

The BACnetObjects.EXP export file contains the structure of several BACnet objects to define non-native BACnet objects via the IEC application. These objects can be exported to the WAGO BACnet configurator using the SYM_XML file.

BACNET_ANALOG_VALUE

WAGO-I/O-PRO-V2.3 Library Elements	
Category:	Building Automation
Name:	BACNET_ANALOG_VALUE
Type:	Data type <input checked="" type="checkbox"/> Enumeration <input type="checkbox"/>
Name of export file:	BACnet_02.lib
Applicable to:	See Release Note
Declaration:	
<pre> TYPE BACNET_ANALOG_VALUE : STRUCT Object_Identifier :BACnetObjectIdentifier; Object_Name :STRING(50); Object_Type :BACnetObjectType; Present_Value :REAL; Priority_Array :BACnetPriorityArray; Status_Flags :BACnetStatusFlags; Out_Of_Service :BOOL; Relinquish_Default :REAL; Description :STRING(50); Event_State :BACnetEventState; Reliability :BACnetReliability; Units :BACnetEngineeringUnits; COV_Increment :REAL; Time_Delay :DWORD; Notification_Class :DWORD; High_Limit :REAL; Low_Limit :REAL; Deadband :REAL; Limit_Enable :BACnetLimitEnable; Event_Enable :BACnetEventTransitionBits; Acked_Transitions :BACnetEventTransitionBits; Notify_Type :BACnetNotifyType; Event_Time_Stamps :ARRAY [1..3] OF BACnetTimeStamp; END_STRUCT END_TYPE </pre>	

BACNET_BINARY_VALUE

WAGO-I/O-PRO-V2.3 Library Elements	
Category:	Building Automation
Name:	BACNET_BINARY_VALUE
Type:	Data type <input checked="" type="checkbox"/> Enumeration <input type="checkbox"/>
Name of export file:	BACnet_02.lib
Applicable to:	See Release Note
Declaration:	
<pre> TYPE BACNET_BINARY_VALUE : STRUCT Object_Identifier :BACnetObjectIdentifier; Object_Name :STRING(50); Object_Type :BACnetObjectType; Present_Value :REAL; Priority_Array :BACnetPriorityArray; Status_Flags :BACnetStatusFlags; Out_Of_Service :BOOL; Relinquish_Default :REAL; Description :STRING(50); Event_State :BACnetEventState; Reliability :BACnetReliability; Units :BACnetEngineeringUnits; COV_Increment :REAL; Time_Delay :DWORD; Notification_Class :DWORD; High_Limit :REAL; Low_Limit :REAL; Deadband :REAL; Limit_Enable :BACnetLimitEnable; Event_Enable :BACnetEventTransitionBits; Acked_Transitions :BACnetEventTransitionBits; Notify_Type :BACnetNotifyType; Event_Time_Stamps :ARRAY [1..3] OF BACnetTimeStamp; END_STRUCT END_TYPE </pre>	

BACNET_LOOP

WAGO-I/O-PRO-V2.3 Library Elements	
Category:	Building Automation
Name:	BACNET_LOOP
Type:	Data type <input checked="" type="checkbox"/> Enumeration <input type="checkbox"/>
Name of export file:	BACnet_02.lib
Applicable to:	See Release Note
Declaration:	
<pre> TYPE BACNET_LOOP STRUCT Object_Identifier :BACnetObjectIdentifier; Object_Name :STRING(50); Object_Type :BACnetObjectType; Proportional_Constant :REAL; Integral_Constant :REAL; Derivative_Constant :REAL; Maximum_Output :REAL; Minimum_Output :REAL; LoopAction :BACnetAction; Setpoint :REAL; Setpoint_Reference :BACnetSetpointReference; Present_Value :REAL; Status_Flags :BACnetStatusFlags; Out_Of_Service :BOOL; Priority_For_Writing :DWORD; Update_Interval :DWORD; Output_Units :BACnetEngineeringUnits; Description :STRING(50); Event_State :BACnetEventState; Reliability :BACnetReliability; COV_Increment :REAL; Bias :REAL; Manipulate_Variable_Reference :BACnetDeviceObjectPropertyReference; Controlled_Variable_Value :REAL; Controlled_Variable_Units :BACnetEngineeringUnits; Controlled_Variable_Reference :BACnetDeviceObjectPropertyReference; Proportional_Constant_Units :BACnetEngineeringUnits; Integral_Constant_Units :BACnetEngineeringUnits; Derivative_Constant_Units :BACnetEngineeringUnits; Time_Delay :DWORD; Notification_Class :DWORD; Error_Limit :REAL; Event_Enable :BACnetEventTransitionBits; Acked_Transitions :BACnetEventTransitionBits; Notify_Type :BACnetNotifyType; Event_Time_Stamps :ARRAY [1..3] OF BACnetTimeStamp; END_STRUCT END_TYPE </pre>	

BACNET_MULTISTATE_VALUE

WAGO-I/O-PRO-V2.3 Library Elements	
Category:	Building Automation
Name:	BACNET_MULTISTATE_VALUE
Type:	Data type <input checked="" type="checkbox"/> Enumeration <input type="checkbox"/>
Name of export file:	BACnet_02.lib
Applicable to:	See Release Note
Declaration:	
<pre> TYPE BACNET_MULTISTATE_VALUE : STRUCT Object_Identifier :BACnetObjectIdentifier; Object_Name :STRING(50); Object_Type :BACnetObjectType; Present_Value :DWORD; Priority_Array :BACnetPriorityArray; Number_Of_States :DWORD; Out_Of_Service :BOOL; Relinquish_Default :DWORD; Description :STRING(50); Status_Flags :BACnetStatusFlags; Event_State :BACnetEventState; Time_Delay :DWORD; Notification_Class :DWORD; Alarm_Values :ARRAY [1..24] OF DWORD; Fault_Values :ARRAY [1..24] OF DWORD; Reliability :BACnetReliability; Event_Enable :BACnetEventTransitionBits; Acked_Transitions :BACnetEventTransitionBits; Notify_Type :BACnetNotifyType; Event_Time_Stamps :ARRAY [1..3] OF BACnetTimeStamp; END_STRUCT END_TYPE </pre>	

BACNET_MULTISTATE_INPUT

WAGO-I/O-PRO-V2.3 Library Elements	
Category:	Building Automation
Name:	BACNET_MULTISTATE_INPUT
Type:	Data type <input checked="" type="checkbox"/> Enumeration <input type="checkbox"/>
Name of export file:	BACnet_02.lib
Applicable to:	See Release Note
Declaration:	
<pre> TYPE BACNET_MULTISTATE_INPUT : STRUCT Object_Identifier :BACnetObjectIdentifier; Object_Name :STRING(50); Object_Type :BACnetObjectType; Present_Value :DWORD; Number_Of_States :DWORD; Out_Of_Service :BOOL; Description :STRING(50); Status_Flags :BACnetStatusFlags; Event_State :BACnetEventState; Time_Delay :DWORD; Notification_Class :DWORD; Alarm_Values :ARRAY [1..24] OF DWORD; Fault_Values :ARRAY [1..24] OF DWORD; Reliability :BACnetReliability; Event_Enable :BACnetEventTransitionBits; Acked_Transitions :BACnetEventTransitionBits; Notify_Type :BACnetNotifyType; Event_Time_Stamps :ARRAY [1..3] OF BACnetTimeStamp; END_STRUCT END_TYPE </pre>	

BACNET_MULTISTATE_OUTPUT

WAGO-I/O-PRO-V2.3 Library Elements	
Category:	Building Automation
Name:	BACNET_MULTISTATE_OUTPUT
Type:	Data type <input checked="" type="checkbox"/> Enumeration <input type="checkbox"/>
Name of export file:	BACnet_02.lib
Applicable to:	See Release Note
Declaration:	
<pre> TYPE BACNET_MULTISTATE_OUTPUT : STRUCT Object_Identifier :BACnetObjectIdentifier; Object_Name :STRING(50); Object_Type :BACnetObjectType; Present_Value :DWORD; Priority_Array :BACnetPriorityArray; Number_Of_States :DWORD; Out_Of_Service :BOOL; Relinquish_Default :DWORD; Description :STRING(50); Status_Flags :BACnetStatusFlags; Event_State :BACnetEventState; Time_Delay :DWORD; Notification_Class :DWORD; Feedback_Value :DWORD; Alarm_Values :ARRAY [1..24] OF DWORD; Fault_Values :ARRAY [1..24] OF DWORD; Reliability :BACnetReliability; Event_Enable :BACnetEventTransitionBits; Acked_Transitions :BACnetEventTransitionBits; Notify_Type :BACnetNotifyType; Event_Time_Stamps :ARRAY [1..3] OF BACnetTimeStamp; END_STRUCT END_TYPE </pre>	



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