

BACnet: Reading and writing a Calendar object



The BACnet server from the FAQ *BACnet: Cyclic Reading of a Property* is used as the server here.

Requirements for the BACnet server

- If you have followed the steps in the above linked FAQ exactly, then
 - add a BACnet object of type BACnet Calendar to the BACnet Server in the device tree
 - delete the existing BACnet Analog Value
- Adapt the "PLC_PRG" as follows:

Declaration

```
VAR
    xAddCalendar          : BOOL;
    // API does not check dayOfWeek!!! == >> DAY_OF_WEEK_UNSPECIFIED
    bacDate               : CmpBACnet.IEC_BACNET_DATE := (year := 2020,
month := 2, dayOfMonth := 7, dayOfWeek := CmpBACnet.IEC_BACNET_DAY_OF_WEEK.DAY_OF_WEEK_FRIDAY);
    bacDate2              : CmpBACnet.IEC_BACNET_DATE := (year := 2020, month := 2,
dayOfMonth := 14, dayOfWeek := CmpBACnet.IEC_BACNET_DAY_OF_WEEK.DAY_OF_WEEK_UNSPECIFIED);
    bacDateStartRange     : CmpBACnet.IEC_BACNET_DATE := (year := 2020, month := 2,
dayOfMonth := 17, dayOfWeek := CmpBACnet.IEC_BACNET_DAY_OF_WEEK.DAY_OF_WEEK_UNSPECIFIED);
    bacDateEndRange       : CmpBACnet.IEC_BACNET_DATE := (year := 2020, month := 3,
dayOfMonth := 25, dayOfWeek := CmpBACnet.IEC_BACNET_DAY_OF_WEEK.DAY_OF_WEEK_UNSPECIFIED);

    udiCnt                : UDINT;
    xMatchCurDay         : BOOL;
END_VAR
```

Implementation

```
BACnet_Calendar.GetEntryCount(count => udiCnt);
xMatchCurDay := BACnet_Calendar.PresentValue;
IF xAddCalendar THEN
    xAddCalendar := FALSE;
    BACnet_Calendar.AddBACnetDate(bacDat := bacDate);
    BACnet_Calendar.AddBACnetDate(bacDat := bacDate2);
    BACnet_Calendar.AddBACnetDateRange(bacStartDat := bacDateStartRange, bacEndDat :=
bacDateEndRange);
END_IF
```

- Download the project to the controller and set the *xAddCalendar* variable to *TRUE*.
If successful, the entry count for the BACnet Calendar will increase by three.

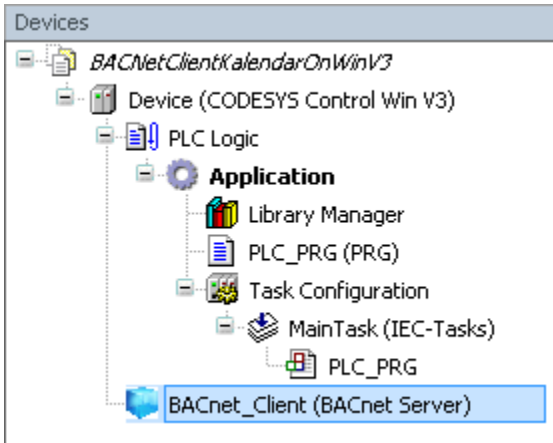
The screenshot shows the SIMATIC Manager interface. On the left, the 'Devices' tree shows the 'BACnet_Calendar (BACnet Calendar)' object under the 'BACnet_Server (BACnet Server)'.

On the right, the 'PLC_PRG' window shows the variable declaration for the 'Device.Application.PLC_PRG' program. The variables are listed in a table:

Expression	Type	Value
xAddSchedule	BOOL	FALSE
bacDate	CmpBACnet.IEC_BA...	
bacDate2	CmpBACnet.IEC_BA...	
bacDateStartRange	CmpBACnet.IEC_BA...	
bacDateEndRange	CmpBACnet.IEC_BA...	
udiCnt	UDINT	3
xMatchCurDay	BOOL	TRUE

Requirements for the BACnet client

- Create a "Standard project" and select *CODESYS Control Win V3* as the device.
- Define the target system by means of the network scan (see BACnet server).
- Insert a "BACnet Server" object and rename it to "BACnet_Client"



- Open the *Library Manager* and add the following libraries
CmpBACnet

Name	Namespace	Effective version
3SLicense = 3SLicense, 3.5.14.0 (3S - Smart Software Solutions GmbH)	_3S_LICENSE	3.5.14.0
BACnet = BACnet, 1.5.0.0 (3S - Smart Software Solutions GmbH)	BACnet	1.5.0.0
BreakpointLogging = Breakpoint Logging Functions, 3.5.5.0 (3S - Smart Software Solutions GmbH)	BPLog	3.5.5.0
CAA Device Diagnosis = CAA Device Diagnosis, 3.5.15.0 (CAA Technical Workgroup)	DED	3.5.15.0
CmpBACnet = CmpBACnet, 3.5.15.30 (3S - Smart Software Solutions GmbH)	CmpBACnet	3.5.15.30
IoStandard = IoStandard, 3.5.15.0 (System)	IoStandard	3.5.15.0
Standard = Standard, 3.5.15.0 (System)	Standard	3.5.15.0

- Adapt the "PLC_PRG" as follows:

Declaration

```
VAR CONSTANT
    c_udiMaxEntries      : UDINT := 10;
    c_sDelimiter         : String := '.';
END_VAR
VAR
    fbReadProperty       : BACnet.BACnetClientReadProperty;
    xReadExecute         : BOOL;

    xInitDone            : BOOL := FALSE;
    bacCalendarContents  : CmpBACnet.IEC_BACNET_PROPERTY_CONTENTS;
    udiIndex             : UDINT;

    asEntries            : ARRAY [0..c_udiMaxEntries] OF STRING;

    pbyRawBuffer         : POINTER TO BYTE;
    pCalendarEntry       : POINTER TO CmpBACnet.IEC_BACNET_CALENDAR_ENTRY;
    dat                  : CmpBACnet.IEC_BACNET_DATE;
    // Value is used if type is set to "date range"
    dateRange            : CmpBACnet.IEC_BACNET_DATE_RANGE;
    // Value is used if type is set to "week-n-day"
    weekNDay            : CmpBACnet.IEC_BACNET_WEEK_AND_DAY;

    sHelp               : STRING;
END_VAR
```

Implemen
tation

```

IF NOT xInitDone THEN
    fbReadProperty.RegisterToServer(BACnet_Client);
    fbReadProperty(dwTargetDeviceNumber := 718,
                   objType := BACnet.CmpBACnet.IEC_BACNET_OBJECT_TYPE.
OBJ_CALENDAR, objInst := 1,
                   propID := BACnet.CmpBACnet.IEC_BACNET_PROPERTY_ID.
PROP_DATELIST,
                   udiTimeOut := 5000000);
    xInitDone := TRUE;
ELSE
    fbReadProperty(xExecute := xReadExecute);
    IF fbReadProperty.xDone THEN
        xReadExecute := FALSE;
        bacCalendarContents := fbReadProperty.result;

        IF bacCalendarContents.tag = CmpBACnet.IEC_BACNET_DATA_TYPE.
DATA_TYPE_CALENDAR_ENTRY THEN
            pCalenderEntry := bacCalendarContents.buffer.pBuffer;
            FOR udiIndex := 0 TO bacCalendarContents.nElements -1 DO
                CASE pCalenderEntry[udiIndex].tag OF
                    CmpBACnet.IEC_BACNET_CALENDAR_ENTRY_TYPE.
CALENDAR_ENTRY_DATE:
                        sHelp := CONCAT(BYTE_TO_STRING(pCalenderEntry
[udiIndex].entry.dat.dayOfMonth), '.');
                        sHelp := CONCAT(sHelp, TO_STRING(pCalenderEntry
[udiIndex].entry.dat.month));
                        sHelp := CONCAT(sHelp, '.');
                        sHelp := CONCAT(sHelp, WORD_TO_STRING
(pCalenderEntry[udiIndex].entry.dat.year));
                        asEntries[udiIndex] := sHelp;
                        CmpBACnet.IEC_BACNET_CALENDAR_ENTRY_TYPE.
CALENDAR_ENTRY_DATE_RANGE:
                        sHelp := CONCAT(BYTE_TO_STRING(pCalenderEntry
[udiIndex].entry.dateRange.startDate.dayOfMonth), '.');
                        sHelp := CONCAT(sHelp, TO_STRING(pCalenderEntry
[udiIndex].entry.dateRange.startDate.month));
                        sHelp := CONCAT(sHelp, '.');
                        sHelp := CONCAT(sHelp, WORD_TO_STRING
(pCalenderEntry[udiIndex].entry.dateRange.startDate.year));
                        sHelp := CONCAT(sHelp, ' ... ');
                        sHelp := CONCAT(sHelp, BYTE_TO_STRING
(pCalenderEntry[udiIndex].entry.dateRange.endDate.dayOfMonth));
                        sHelp := CONCAT(sHelp, '.');
                        sHelp := CONCAT(sHelp, TO_STRING(pCalenderEntry
[udiIndex].entry.dateRange.endDate.month));
                        sHelp := CONCAT(sHelp, '.');
                        sHelp := CONCAT(sHelp, WORD_TO_STRING
(pCalenderEntry[udiIndex].entry.dateRange.endDate.year));
                        asEntries[udiIndex] := sHelp;
                        CmpBACnet.IEC_BACNET_CALENDAR_ENTRY_TYPE.
CALENDAR_ENTRY_WEEK_AND_DAY:
                                // Do Something
                                ELSE
                                    // Should never used == >> Implement ErrorHandling
                                END_CASE
                                IF pCalenderEntry[udiIndex].tag = CmpBACnet.
IEC_BACNET_CALENDAR_ENTRY_TYPE.CALENDAR_ENTRY_DATE THEN
                                    dat := pCalenderEntry[udiIndex].entry.dat;
                                END_IF
                                IF pCalenderEntry[udiIndex].tag = CmpBACnet.
IEC_BACNET_CALENDAR_ENTRY_TYPE.CALENDAR_ENTRY_DATE_RANGE THEN
                                    dateRange := pCalenderEntry[udiIndex].entry.dateRange;
                                END_IF
                                END_FOR
                                END_IF
                                END_IF
                                END_IF
END_IF

```

- Download the project to the controller and set the *xReadExecute* auf den Wert *TRUE*.
If successful, the values are transmitted from the server to the client.

