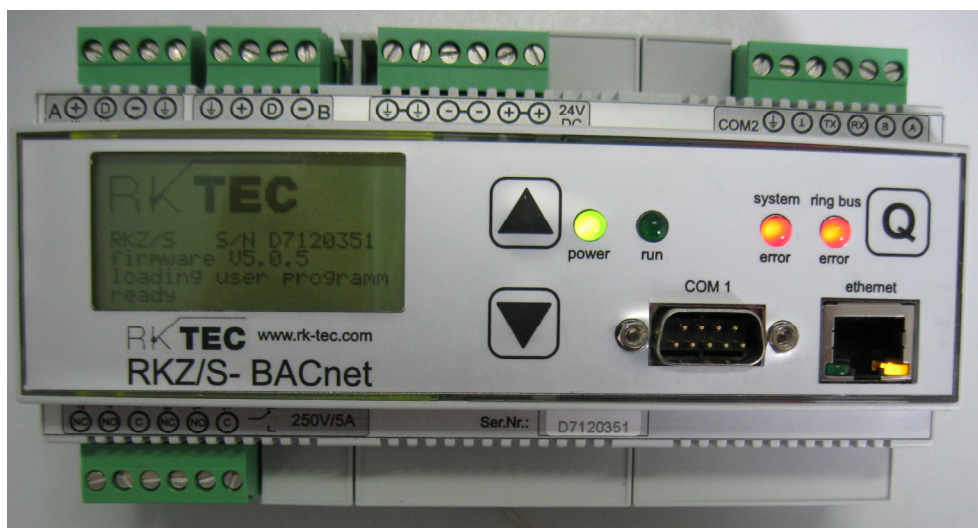


BACnet Protocol Implementation Conformance Statement

for the



RKZ/S-BACnet controller

Version 1.14, Stand: 26.06.2018

contents:

1	General.....	4
2	BACnet PICS.....	5
3	Supported Services and Objects	8
3.1	Standard Services supported	8
3.2	BACnet objects supported.....	8
3.3	Device object type.....	9
3.4	Binary Input object type.....	10
3.5	Binary Output object type.....	10
3.6	Binary Value object type	11
3.7	Notification Class object type.....	12
4	Device Management functions	13
4.1	DM-DDB-A Dynamic Device Binding A.....	13
4.2	DM-DDB-B Dynamic Device Binding B	13
4.3	DM-DOB-B Dynamic Object Binding B.....	13
4.4	DM-TS-B Device Management Time Synchronisation B.....	13
4.5	DM-UTC-B Device Management UTC Time Synchronisation B.....	14
4.6	DM-RD-B Device Management Reinitialize Device B.....	14
4.7	DM-R-B Device Management Restart Device B	14
4.8	DM-LM-B Device Management List Manipulation B.....	14
5	Object Access services	15
5.1	DS-RP-B Data sharing ReadProperty B.....	15
5.2	DS-RPM-B Data sharing ReadPropertyMultiple B	15
5.3	DS-WP-B Data sharing WriteProperty B.....	15
5.4	DS-WPM-B Data sharing WritePropertyMultiple B	16
5.5	DS-COV-B Data sharing ChangeOfValue B.....	16

6	Alarm and Event services.....	18
6.1	Alarming for RKC/M fieldbus modules.....	20
6.2	AE-N-I-B Alarm and event, notification internal B.....	22
6.3	AE-ASUM-B Alarm and event, alarm summary B	22
6.4	AE-ESUM-B Alarm and event, enrollment summary B	22
6.5	AE-INFO-B Alarm and event, get event information B.....	23
7	Multiple BACnet/IP subnets	24
8	Manufacturer	26

1 General

Das RKS1000 System dient zur Steuerung von motorbetriebenen Brandschutz- und Entrauchungsklappen in Lüftungs- und Klimaanlage. Als zentrale Steuereinheit fungiert die RKZ/S-BACnet Zentrale, welche die digitalen Ein- bzw. Ausgänge von bis zu 1000 Feldbusmodulen organisiert. Neben der zyklischen Abfrage des Ringbussystemes und der Neuberechnung logischer Verknüpfungsregeln, beinhaltet die RKZ/S-BACnet Zentrale auch das Kommunikations-Gateway zu einer übergeordneten GLT.

Hierzu verfügt die RKZ/S-BACnet Zentrale über eine galvanisch entkoppelte serielle RS232 / RS485 Schnittstelle. Über diese Schnittstelle kann mit Hilfe des MODBUS-RTU oder des 3964R-Übertragungsprotokolls ein Datenaustausch aktueller Eingangs- bzw. Ausgangsinformationen erfolgen.

Eine komfortablere Kopplung ist mit Hilfe des integrierten BACnet/IP Protokolls möglich. Über die 10/100Mbit Ethernet-Schnittstelle kann die RKZ/S-BACnet Zentrale direkt in Ihre Netzwerktopologie eingebunden werden. Der laufende BACnet Server stellt für jedes Feldbusmodul die geeigneten binären Objektdaten zur Verfügung. Da Diese entsprechend des physikalisch vorhandenen Bussystems automatisch erzeugt werden, sind nur geringe Konfigurationsarbeiten nötig um eine Weiterleitung der Zustandsinformationen zu realisieren.

Folgende Parameter werden standardmäßig eingestellt:

BACnet Device instance: 1234 (has to be changed if you run more than 1 RKZ/S in your LAN)
BACnet UDP port : BAC0h (47808 dec.)
BACnet Vendor ID : 256 (registered manufacturer @ ASHRAE)

2 BACnet PICS

ANNEX A - PROTOCOL IMPLEMENTATION CONFORMANCE STATEMENT (NORMATIVE)

(This annex is part of this Standard and is required for its use.)

BACnet Protocol Implementation Conformance Statement

Date: 29.04.2015
Vendor Name: RK-Tec GmbH
Product Name: RKZ/S-BACnet controller
Product Model Number: V4.2
Applications Software Version: --- **Firmware Revision:** V5.0.60 **BACnet Protocol Revision:** 135-2008

Product Description:

The RKZ/S-BACnet controller is the central processing controller for a RKS100 ring bus system. It communicates with up to 1000 RKC field bus modules using fail-save methods. This digital control is used for monitoring and controlling fire protection and smoke exhaust systems.

Our registered BACnet vendor Identification is "256".

BACnet Standardized Device Profile (Annex L):

- BACnet Operator Workstation (B-OWS)
- 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)

BACnet Interoperability Building Blocks supported (Annex K):

BACnet Interoperability Building Block	Supported
Data Sharing	
Data Sharing-ReadProperty-A (DS-RP-A), Client	<input type="checkbox"/>
Data Sharing-ReadProperty-B (DS-RP-B), Server	<input checked="" type="checkbox"/>
Data Sharing-ReadPropertyMultiple-A (DS-RPM-A)	<input type="checkbox"/>
Data Sharing-ReadPropertyMultiple-B (DS-RPM-B)	<input checked="" type="checkbox"/>
Data Sharing-ReadPropertyConditional-A (DS-RPC-A)	<input type="checkbox"/>
Data Sharing-ReadPropertyConditional-B (DS-RPC-B)	<input type="checkbox"/>
Data Sharing-WriteProperty-A (DS-WP-A)	<input type="checkbox"/>
Data Sharing-WriteProperty-B (DS-WP-B)	<input checked="" type="checkbox"/>
Data Sharing-WritePropertyMultiple-A (DS-WPM-A)	<input type="checkbox"/>
Data Sharing-WritePropertyMultiple-B (DS-WPM-B)	<input checked="" type="checkbox"/>
Data Sharing-COV-A (DS-COV-A)	<input type="checkbox"/>
Data Sharing-COV-B (DS-COV-B)	<input checked="" type="checkbox"/>
Data Sharing-COVP-A (DS-COVP-A)	<input type="checkbox"/>
Data Sharing-COVP-B (DS-COVP-B)	<input type="checkbox"/>
Data Sharing-COV-Unsolicited-A (DS-COVU-A)	<input type="checkbox"/>
Data Sharing-COV-Unsolicited-B (DS-COVU-B)	<input type="checkbox"/>
Alarm and Event Management	
Alarm and Event -Notification-A (AE-N-A), Client	<input type="checkbox"/>
Alarm and Event -Notification Internal-B (AE-N-I-B)	<input checked="" type="checkbox"/>
Alarm and Event -ACK-A (AE-ACK-A)	<input type="checkbox"/>

BACnet Interoperability Building Block	Supported
Alarm and Event –ACK-B (AE-ACK-B)	<input checked="" type="checkbox"/>
Alarm and Event –Alarm Summary-A (AE-ASUM-A)	<input type="checkbox"/>
Alarm and Event –Alarm Summary-B (AE-ASUM-B)	<input checked="" type="checkbox"/>
Alarm and Event –Enrollment Summary-A (AE-ESUM-A)	<input type="checkbox"/>
Alarm and Event –Enrollment Summary-B (AE-ESUM-B)	<input checked="" type="checkbox"/>
Alarm and Event –Information-A (AE-INFO-A)	<input type="checkbox"/>
Alarm and Event –Information-B (AE-INFO-B)	<input checked="" type="checkbox"/>
Alarm and Event –Live safety-A (AE-LS-A)	<input type="checkbox"/>
Alarm and Event –Live safety-B (AE-LS-B)	<input type="checkbox"/>
Scheduling	
Scheduling-A (SCHED-A)	<input type="checkbox"/>
Scheduling-Internal-B (SCHED-I-B)	<input type="checkbox"/>
Scheduling-External-B (SCHED-E-B)	<input type="checkbox"/>
Trending	
Trending-Viewing and Modifying Trends-A (T-VMT-A)	<input type="checkbox"/>
Trending-Viewing and Modifying Trends-Internal-B (T-VMT-I-B)	<input type="checkbox"/>
Trending-Viewing and Modifying Trends-External-B (T-VMT-E-B)	<input type="checkbox"/>
Networking Management	
Network Management-Connection Establishment-A (NM-CE-A)	<input type="checkbox"/>
Network Management-Connection Establishment-B (NM-CE-B)	<input type="checkbox"/>
Network Management-Router Configuration-A (NM-RC-A)	<input type="checkbox"/>
Network Management-Router Configuration-B (NM-RC-B)	<input type="checkbox"/>
Device Management	
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-A (DM-DOB-A)	<input checked="" type="checkbox"/>
Device Management-Dynamic Object Binding-B (DM-DOB-B)	<input checked="" type="checkbox"/>
Device Management-DeviceCommunicationControl-A (DM-DCC-A)	<input type="checkbox"/>
Device Management-DeviceCommunicationControl-B (DM-DCC-B)	<input type="checkbox"/>
Device Management-Private Transfer-A (DM-PT-A)	<input type="checkbox"/>
Device Management-Private Transfer-B (DM-PT-B)	<input type="checkbox"/>
Device Management-Text Message-A (DM-TM-A)	<input type="checkbox"/>
Device Management-Text Message-B (DM-TM-B)	<input type="checkbox"/>
Device Management-TimeSynchronisation-A (DM-TS-A)	<input type="checkbox"/>
Device Management-TimeSynchronisation-B (DM-TS-B)	<input checked="" type="checkbox"/>
Device Management-UTC TimeSynchronisation-A (DM-UTC-A)	<input type="checkbox"/>
Device Management-UTC TimeSynchronisation-B (DM-UTC-B)	<input checked="" type="checkbox"/>
Device Management-ReinitializeDevice-A (DM-RD-A)	<input type="checkbox"/>
Device Management-ReinitializeDevice-B (DM-RD-B)	<input checked="" type="checkbox"/>
Device Management-Restart-A (DM-R-A)	<input type="checkbox"/>
Device Management-Restart-B (DM-R-B)	<input checked="" type="checkbox"/>
Device Management-Backup and Restore-A (DM-BR-A)	<input type="checkbox"/>
Device Management-Backup and Restore-B (DM-BR-B)	<input type="checkbox"/>
Device Management-List Manipulation-A (DM-LM-A)	<input type="checkbox"/>
Device Management-List Manipulation-B (DM-LM-B)	<input checked="" type="checkbox"/>
Device Management-Object Creation and Deletion-A (DM- OCD-A)	<input type="checkbox"/>
Device Management-Object Creation and Deletion-B (DM-OCD-B)	<input type="checkbox"/>
Device Management-Virtual Terminal-A (DM-VT-A)	<input type="checkbox"/>
Device Management-Virtual Terminal-B (DM-VT-B)	<input type="checkbox"/>

Segmentation Capability:

- Segmented requests supported Window Size _____
 Segmented responses supported Window Size _____
(Segmented responses is supported only for the Object-List with up to 1476 octets and a window size = 1)

Data Link Layer Options:

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

Device Address Binding:

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

Networking Options:

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

Character Sets Supported:

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

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

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

Not applicable.

3 Supported Services and Objects

3.1 Standard Services supported

BACnet standard service supported	initiate	execute
AcknowledgeAlarm	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
ConfirmedCOVNotification	<input checked="" type="checkbox"/>	<input type="checkbox"/>
UnconfirmedCOVNotification	<input checked="" type="checkbox"/>	<input type="checkbox"/>
ConfirmedEventNotification	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
UnconfirmedEventNotification	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
ReadProperty	<input type="checkbox"/>	<input checked="" type="checkbox"/>
ReadPropertyMultiple	<input type="checkbox"/>	<input checked="" type="checkbox"/>
WriteProperty	<input type="checkbox"/>	<input checked="" type="checkbox"/>
WritePropertyMultiple	<input type="checkbox"/>	<input checked="" type="checkbox"/>
AddListElement	<input type="checkbox"/>	<input checked="" type="checkbox"/>
RemoveListElement	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Reinitialize Device	<input type="checkbox"/>	<input checked="" type="checkbox"/>
TimeSynchronisation	<input type="checkbox"/>	<input checked="" type="checkbox"/>
UTCTimeSynchronisation	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Who Is	<input checked="" type="checkbox"/>	<input type="checkbox"/>
I-Am	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Who Has	<input type="checkbox"/>	<input checked="" type="checkbox"/>
I-Have	<input type="checkbox"/>	<input checked="" type="checkbox"/>
GetAlarmSummary	<input type="checkbox"/>	<input checked="" type="checkbox"/>
GetEnrollmentSummary	<input type="checkbox"/>	<input checked="" type="checkbox"/>
GetEventInformation	<input type="checkbox"/>	<input checked="" type="checkbox"/>
SubscribeCOV	<input type="checkbox"/>	<input checked="" type="checkbox"/>

3.2 BACnet objects supported

BACnet standard object type	Supported	Dynamically Creatable
Binary Input	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Binary Output	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Binary Value	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Calendar	<input type="checkbox"/>	<input type="checkbox"/>
Device	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Schedule	<input type="checkbox"/>	<input type="checkbox"/>
Notification_Class	<input checked="" type="checkbox"/>	<input type="checkbox"/>

3.3 Device object type

The device object will be automatically generated and supports following properties

object property	supported	writeable	property range
Object_Identifier ^{R)}	<input checked="" type="checkbox"/>	<input type="checkbox"/>	adjustable Device instance, default = 1234
Object_Name ^{R)}	<input checked="" type="checkbox"/>	<input type="checkbox"/>	max. 60 chars (RK-Soft)
Object_Type ^{R)}	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
System_Status ^{R)}	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Vendor_Name ^{R)}	<input checked="" type="checkbox"/>	<input type="checkbox"/>	„RK-Tec GmbH & Co. KG“
Vendor_Identifier ^{R)}	<input checked="" type="checkbox"/>	<input type="checkbox"/>	256
Model_Name ^{R)}	<input checked="" type="checkbox"/>	<input type="checkbox"/>	"RKZ/S-BACnet controller"
Firmware_Revision ^{R)}	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Application_Software_Version ^{R)}	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Description ^{O)}	<input checked="" type="checkbox"/>	<input type="checkbox"/>	max. 60 chars (RK-Soft)
Location ^{O)}	<input checked="" type="checkbox"/>	<input type="checkbox"/>	max. 60 chars (RK-Soft)
Protocol_Version ^{R)}	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Protocol_Revision ^{R)}	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Protocol_Conformance_Class ^{O)}	<input type="checkbox"/>	<input type="checkbox"/>	
Protocol_Services_Supported ^{R)}	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Protocol_Object_Types_Supported ^{R)}	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Object_List ^{R)}	<input checked="" type="checkbox"/>	<input type="checkbox"/>	(segmentation supported)
Max_APDU_Length_Accepted ^{R)}	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Segmentation_Supported ^{R)}	<input checked="" type="checkbox"/>	<input type="checkbox"/>	No segmentation
Max_Segments_Accepted ^{O)}	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Local_Time ^{O)}	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Local_Date ^{O)}	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
UTC_Offset ^{O)}	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	+/- 780
APDU_Segment_Timeout ^{O)}	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
APDU_Timeout ^{R)}	<input checked="" type="checkbox"/>	<input type="checkbox"/>	2000
Number_Of_APDU_Retries ^{R)}	<input checked="" type="checkbox"/>	<input type="checkbox"/>	0
Max_Master ^{O)}	<input checked="" type="checkbox"/>	<input type="checkbox"/>	127
Max_Info_Frames ^{O)}	<input checked="" type="checkbox"/>	<input type="checkbox"/>	1
Device_Address_Binding ^{R)}	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Database_Revision ^{R)}	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Daylight_Savings_Status ^{O)}	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Time_of_Device_Restart ^{O)}	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Profile_Name ^{O)}	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Last_Restart_Reason ^{O)}	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Restart_Notification_Recipients ^{O)}	<input checked="" type="checkbox"/>	<input type="checkbox"/>	max. 16 entries

^{R)} These properties are required for B-AAC conformance, ^{O)} optional properties

3.4 Binary Input object type

object property	supported	writable	property range
Object_Identifier ^{R)}	<input checked="" type="checkbox"/>	<input type="checkbox"/>	automatically generated
Object_Name ^{R)}	<input checked="" type="checkbox"/>	<input type="checkbox"/>	max. 50 chars (RK-Soft)
Object_Type ^{R)}	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Present_Value ^{R)}	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Writable if OUT_OF_SERVICE
Description ^{O)}	<input checked="" type="checkbox"/>	<input type="checkbox"/>	max. 50 chars (RK-Soft)
Device_type ^{O)}	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	max. 24 chars
Status_Flags ^{R)}	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Event_State ^{R)}	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Out_Of_Service ^{R)}	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Reliability ^{O)}	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Polarity ^{R)}	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Inactive_Text ^{O)}	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	max. 24 chars
Active_Text ^{O)}	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	max. 24 chars
Change-Of-State-Count ^{O)}	<input checked="" type="checkbox"/>	<input type="checkbox"/>	(cleared on power on)
Change-Of-State-Time ^{O)}	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Time-Of-State-Count-Reset ^{O)}	<input checked="" type="checkbox"/>	<input type="checkbox"/>	(set on power on)
Time_Delay ^{O)}	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0 - 255
Notification_Class ^{O)}	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0 - 63
Alarm_Value ^{O)}	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Event_Enable ^{O)}	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Acked_Transitions ^{O)}	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Notify_Type ^{O)}	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	BacnetNotifyType
Profile_Name ^{O)}	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Event_Time_Stamps ^{O)}	<input checked="" type="checkbox"/>	<input type="checkbox"/>	BacnetTimeStamps[3]

^{R)} These properties are required for B-AAC conformance, ^{O)} optional properties

3.5 Binary Output object type

object property	supported	writable	property range
Object_Identifier ^{R)}	<input checked="" type="checkbox"/>	<input type="checkbox"/>	automatically generated
Object_Name ^{R)}	<input checked="" type="checkbox"/>	<input type="checkbox"/>	max. 50 chars (RK-Soft)
Object_Type ^{R)}	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Present_Value ^{R)}	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Description ^{O)}	<input checked="" type="checkbox"/>	<input type="checkbox"/>	max. 50 chars (RK-Soft)
Device_type ^{O)}	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	max. 24 chars
Status_Flags ^{R)}	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Event_State ^{R)}	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Out_Of_Service ^{R)}	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Reliability ^{O)}	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Polarity ^{R)}	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Inactive_Text ^{O)}	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	max. 24 chars
Active_Text ^{O)}	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	max. 24 chars
Change-Of-State-Count ^{O)}	<input checked="" type="checkbox"/>	<input type="checkbox"/>	(cleared on power on)

RKS 1000

object property	supported	writable	property range
Change-Of-State-Time ⁰⁾	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Time-Of-State-Count-Reset ⁰⁾	<input checked="" type="checkbox"/>	<input type="checkbox"/>	(set on power on)
Priority_Array ⁰⁾	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Relinquish_Default ⁰⁾	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Time_Delay ⁰⁾	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0 - 255
Notification_Class ⁰⁾	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0 - 63
Feedback_Value ⁰⁾	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Event_Enable ⁰⁾	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Acked_Transitions ⁰⁾	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Notify_Type ⁰⁾	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	BacnetNotifyType
Profile_Name ⁰⁾	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Event_Time_Stamps ⁰⁾	<input checked="" type="checkbox"/>	<input type="checkbox"/>	BacnetTimeStamps[3]

R) These properties are required for B-AAC conformance, ⁰⁾ optional properties

3.6 Binary Value object type

object property	supported	writable	property range
Object_Identifier ^{R)}	<input checked="" type="checkbox"/>	<input type="checkbox"/>	automatically generated
Object_Name ^{R)}	<input checked="" type="checkbox"/>	<input type="checkbox"/>	max. 50 chars (RK-Soft)
Object_Type ^{R)}	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Present_Value ^{R)}	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Description ⁰⁾	<input checked="" type="checkbox"/>	<input type="checkbox"/>	max. 50 chars (RK-Soft)
Device_type ⁰⁾	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	max. 24 chars
Status_Flags ^{R)}	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Event_State ^{R)}	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Out_Of_Service ^{R)}	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Reliability ⁰⁾	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Inactive_Text ⁰⁾	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	max. 24 chars
Active_Text ⁰⁾	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	max. 24 chars
Change-Of-State-Count ⁰⁾	<input checked="" type="checkbox"/>	<input type="checkbox"/>	(cleared on power on)
Change-Of-State-Time ⁰⁾	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Time-Of-State-Count-Reset ⁰⁾	<input checked="" type="checkbox"/>	<input type="checkbox"/>	(set on power on)
Priority_Array ⁰⁾	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Relinquish_Default ⁰⁾	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Time_Delay ⁰⁾	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0 - 255
Notification_Class ⁰⁾	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0 - 63
Alarm_Value ⁰⁾	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Event_Enable ⁰⁾	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Acked_Transitions ⁰⁾	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Notify_Type ⁰⁾	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	BacnetNotifyType
Profile_Name ⁰⁾	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Event_Time_Stamps ⁰⁾	<input checked="" type="checkbox"/>	<input type="checkbox"/>	BacnetTimeStamps[3]

R) These properties are required for B-AAC conformance, ⁰⁾ optional properties

3.7 Notification Class object type

object property	supported	writeable	property range
Object_Identifier ^{R)}	<input checked="" type="checkbox"/>	<input type="checkbox"/>	automatically generated
Object_Name ^{R)}	<input checked="" type="checkbox"/>	<input type="checkbox"/>	max. 50 chars (RK-Soft)
Object_Type ^{R)}	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Description ^{O)}	<input checked="" type="checkbox"/>	<input type="checkbox"/>	max. 50 chars (RK-Soft)
Notification_Class ^{R)}	<input checked="" type="checkbox"/>	<input type="checkbox"/>	fix 1-10
Priority ^{R)}	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	unsigned char array[3]
Ack_Required ^{R)}	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Event transition bits
Profile_Name ^{O)}	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Recipient_List ^{R)}	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	List of BACnetDestinations

Can be written using
theWriteProperty or
AddListElement function

4 Device Management functions

4.1 DM-DDB-A Dynamic Device Binding A

The A device seeks information about device attributes of other devices and interprets device announcements. The BACnet client device (A) initiates the “Who Is” function and the RKZ/S-BACnet controller (B device) sends the general device information with an “I am” responds.

BACnet service	initiate	execute
Who Is	<input checked="" type="checkbox"/>	<input type="checkbox"/>
I-Am	<input type="checkbox"/>	<input checked="" type="checkbox"/>

4.2 DM-DDB-B Dynamic Device Binding B

The B device (RKZ/S-BACnet) provides information about its device attributes and responds to requests to identify itself. The “Who Is” service initiated by the BACnet client (A), will be responded with the RKZ/S’s device information.

BACnet service	initiate	execute
Who Is	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
I-Am	<input checked="" type="checkbox"/>	<input type="checkbox"/>

4.3 DM-DOB-B Dynamic Object Binding B

The A device (BACnet client) seeks address information about objects and the B device (RKZ/S-BACnet) provides this information if the requested object exists in this device.

BACnet service	initiate	execute
Who Has	<input type="checkbox"/>	<input checked="" type="checkbox"/>
I-Have	<input checked="" type="checkbox"/>	<input type="checkbox"/>

4.4 DM-TS-B Device Management Time Synchronisation B

The TimeSynchronisation is an unconfirmed service request transmitted from the BACnet client and executed by our BACnet server. The transmitted time stamp will be decoded and set to our internal RTC to synchronize system times.

4.5 DM-UTC-B Device Management UTC Time Synchronisation B

The TimeSynchronisation is a UNCONFIRMED service request transmitted from the BACnet client and executed by our BACnet server. The transmitted time stamp will be decoded and set to our internal RTC to synchronize system times.

The day-light saving status and the UFC_offset (in minutes) are used to recalculate the devices actual time. The default settings for the UFC_Offset are set to European standard “+60” minutes (+1 h Brussels).

You may use the terminal command “clock daylight” to set the daylight saving parameter using the serial interface protocol.

4.6 DM-RD-B Device Management Reinitialize Device B

If needed, a BACnet client is able to restart the RKZ/S-BACnet controller sending the confirmed DM-RD-B request. The RKZ/S controller will only restart if you set the status value to “1 – warm start”.

4.7 DM-R-B Device Management Restart Device B

The RKZ/S-BACnet controller sends an UnConfirmedCOV notification as a broadcast message to all BACnet devices every time it restarts.

4.8 DM-LM-B Device Management List Manipulation B

The RKZ/S-BACnet controller response to requests to add or remove list elements. Some properties consists of list of various data values. In our case, this function is used to add a recipient to the recipient_list property of a notification class object.

BACnet service	initiate	execute
AddListElement	<input type="checkbox"/>	<input checked="" type="checkbox"/>
RemoveListElement	<input type="checkbox"/>	<input checked="" type="checkbox"/>

5 Object Access services

5.1 DS-RP-B Data sharing ReadProperty B

The ReadProperty service is used by a client BACnet-user to request the value of one property of one BACnet Object. This service allows read access to any property of any object, whether a BACnet-defined object or not.

Service arguments	Description
Object identifier	type of BACnetObjectIdentifier, object whoses property is to be read
Property identifier	type of BACnetPropertyIdentifier, shall provide the means of uniquely identifying the property to be read and returned by this service
Property array index	If the property is a datatype array, this OPTIONAL parameter of type unsigned shall indicate the array index of the element of the property referenced by this service. If the property array index is omitted, this shall mean that the entire array shall be referenced.

5.2 DS-RPM-B Data sharing ReadPropertyMultiple B

The ReadPropertyMultiple service is used by a client BACnet-user to request the value of multiple properties of one or more BACnet Object. This service allows read access to any property of any object, whether a BACnet-defined object or not.

5.3 DS-WP-B Data sharing WriteProperty B

The WriteProperty service is used by a client BACnet-user to set the value of one property of a BACnet Object. This service allows write access to any property of any object. Note that most properties are write-protected.

Service arguments	Description
Object identifier	type of BACnetObjectIdentifier, object whoses property will be changed
Property identifier	type of BACnetPropertyIdentifier, shall provide the means of uniquely identifying the property which will be written
Property array index	If the property is a datatype array, this OPTIONAL parameter of type unsigned shall indicate the array index of the element of the property referenced by this service. If the property array index is omitted, this shall mean that the entire array shall be referenced.
Property value	The property value is coded between the opening and the closing tag with variable data length

RKS 1000

Note:

If you like to overwrite an output value, you have to write these changes with a priority lower than “9”. The output value calculated by the internal user code will be handled with priority level “9”.

5.4 DS-WPM-B Data sharing WritePropertyMultiple B

The WritePropertyMultiple service is used by a client BACnet-user to set the value of one or more properties of a BACnet Object. This service allows write access to any property of any object. Note that some properties are write-protected.

Service arguments	Description
Object identifier	type of BACnetObjectIdentifier, object whoses property will be changed
Property identifier	type of BACnetPropertyIdentifier, shall provide the means of uniquely identifying the property which will be written
Property array index	If the property is a datatype array, this OPTIONAL parameter of type unsigned shall indicate the array index of the element of the property referenced by this service. If the property array index is omitted, this shall mean that the entire array shall be referenced.
Property value	The property value is coded between the opening and the closing tag with variable data length

5.5 DS-COV-B Data sharing ChangeOfValue B

The RKZ/S-BACnet controller provides Change-Of-Value notification messages on all binary input and output signal changes. A broadcast COV message will be generated, if no specific COV subscription exists for the affected object. You can select whether you like to get an unconfirmed or confirmed COV broadcast notification using the protocol command “bacnet cov”. After setting the factory default parameters ConfirmedCOV notification is selected.

BACnet service	initiate	execute
Subscribe COV	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Unconfirmed COV notification	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Confirmed COV notification	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Note:

A COV notification message will be send to all BACnet devices as a broadcast message only if no COV subscription can be found for the affected object.

You can deactivate the broadcast COV notifications with the command “bacnet cov 0”

The functionality to subscribe a COV message is supported for objects but not for properties. The SubscribeCOV service is used by a COV client to subscribe for the receipt of notifications of occurring value changes.

Up to 2000 COV subscriptions can be handled, with full support of limited or indefinite lifetime.

The parameter “lifetime” conveys to the desired lifetime of the subscription in seconds. A value of zero indicates an indefinite lifetime without automatic cancellation. An existing subscription will be cancelled, if both parameters “lifetime” and “Issue ConfirmedNotification” are absent

Limits:

- max. 2.000 active COV subscriptions
- max. lifetime value 4294967295 seconds (32 bit)

The boolean parameter “Issue Confirmed Notification” defines the message type of this subscription. Usually a confirmedCOV notification is suggested.

An existing subscription can be overwritten with new parameters, if processID and objectID can be found in the subscription list according to the requesting device.

6 Alarm and Event services

The RKZ/S-BACnet controller supports intrinsic reporting for all bacnet objects. Each BACnet object is able to generate an alarm or event notification to single or various destinations. An “active” alarm on any object occurs, if the present value is equal to the alarm value.

If any alarm occurs for any BACnet object, the objects “notification_class” property selects the notification class which should handle the distribution of the event message. The notifications class is a set of parameters which defines the terms how a notification should be distributed to various recipients. It describes, in its “recipient_list” which BACnet device should receive this notification message.

For simple installations only a single notification class might be sufficient. The RKZ/S-BACnet controller supports up to 10 notification classes and uses the first 4 for different types of fieldbus modules.

Nr.	notification class name	description
1	Fire_and_smoke_exhaust_flaps	standard notification class for objects corresponding to field bus modules type RKC/M, RKC/MFW or RKC/M2 modules. These modules handles the motorized flaps with the special alarm generation functionality.
2	RKC_TABEIN_field_bus_modules	standard notification class for objects corresponding to field bus modules type RKC/TABEIN and RKC/TABAUS.
3	RKC_E4_field_bus_modules	standard notification class for objects corresponding to field bus modules type RKC/E4. These are typically used for un-motorized flaps.
4	internal_flags	standard notification class for objects corresponding to internal flags.
5	General_purpose_event_1	not used
6	General_purpose_event_2	not used
7	General_purpose_event_3	not used
8	General_purpose_event_4	not used
9	General_purpose_event_5	not used
10	General_purpose_event_6	not used

The standard parameters for all notification classes are:

- priority for TO-OFFNORMAL event : 130
- priority for TO-FAULT event : 140
- priority for TO-NORMAL event : 150
- acknowledge required for TO-OFFNORMAL and TO-FAULT events,
- no acknowledge required for the TO-NORMAL events

The notification class –1- is used to define the parameters for sending alarm notifications for RKC/M fieldbus modules, which controls the motorized fire and smoke flaps. We decide to include special conventions to handle the alarming of the motorized flaps. You will find a description of these rules in a separate chapter.

The alarm generation follows the BACnet standard definition for all field bus modules other than the RKC/M, RKC/MFW or RKC/M2. The objects “alarm value” property controls the alarm notification. Changes of this property will be saved inside the RKZ/S-BACnet controller and restored after a power-on reset.

Module type	description
RKC/E4 4 digital binary inputs, potential free	4 binary input objects will be generated for E1... E4, input should be connected closed-circuit signal, normal state E1 = 1 input closed, present value = 1, alarm value = 0
RKC/TABEIN 24 digital binary inputs, 24V logic	24 binary input objects will be generated for E1 ... E24, input should be connected closed-circuit signal, normal state E1 = 1 input closed, present value = 1, alarm value = 0
RKC/A2 2 digital binary inputs, potential free 2 digital binary relay outputs	2 binary input objects will be generated for E1 & E2, 2 binary output objects will be generated for A1 & A2, input should be connected closed-circuit signal, normal state E1 = 1 input closed, present value = 1, alarm value = 0 outputs should be connected as a closed-circuit signal, normal state A1 = 1 relay contact closed, present value = 1, alarm value = 0

The binary input object of a RKC/E4 field bus module generates an alarm notification, when the Present value (PV) changes to FALSE because alarm value is set to FALSE. You can invert this handling by setting the alarm value to TRUE.

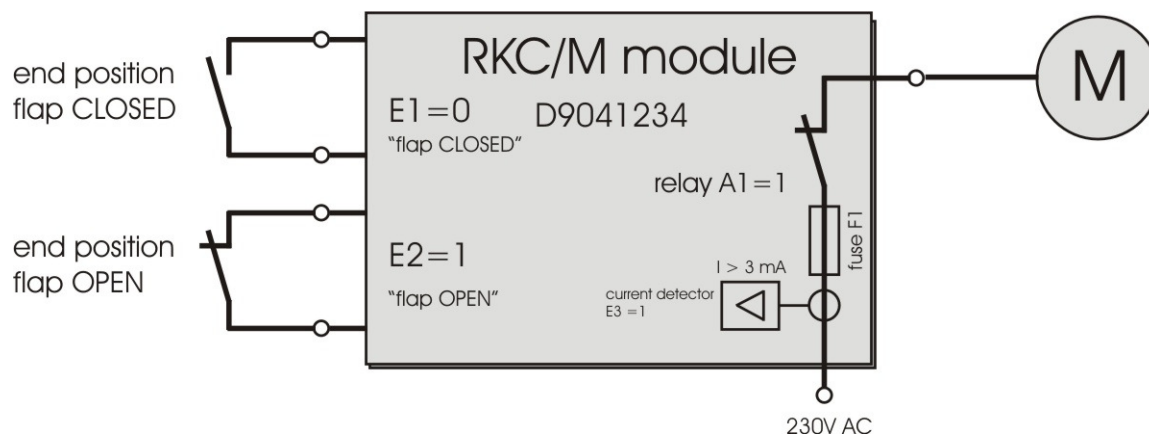
notes:

If there are no recipients defined by the notification classes, all known devices will receive an event notification. This “alarm broadcast” function can be activated using the command “bacnet alarm-bc 0”.

RKS 1000

6.1 Alarming for RKC/M fieldbus modules

The RKC/M field bus module is used to control a motorized flap. The following scheme shows the recommended standard wire plan.



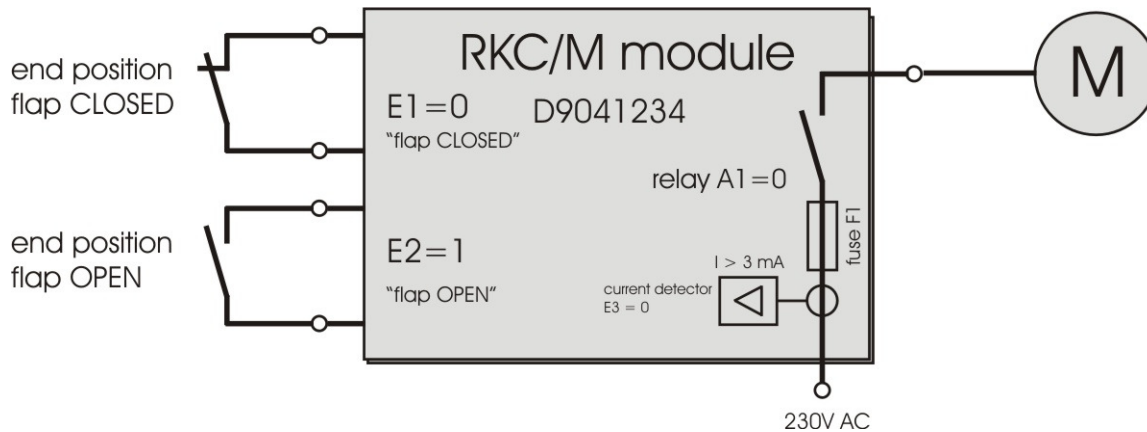
The flaps motor coil get it's supplying voltage by setting the output A1 to TRUE. The binary input signals E1 and E2 should be connected to the flaps end point switches. The binary input E1 indicates the critical state of a closed flap and the binary input E2 indicates the normal state of an open flap.

Operation Mode	description
flap motor ON, normal operation mode	relay output A1 = 1 binary input E1 = 0 PV=0 AV=1 binary input E2 = 1 PV=1 AV=0 binary input E3 = 1 PV=1 AV=0 (Event_Enable bits deactivated)
flap motor OFF,	relay output A1 = 0 binary input E1 = 1 PV=1 AV=0 binary input E2 = 0 PV=0 AV=1 binary input E3 = 0 PV=0 AV=0 (Event_Enable bits deactivated)

In this normal operation state with powered flap motor (A1 = 1) only the digital input E2 should indicate an open flap. The present value of E2 must be TRUE and the alarm value should be FALSE. Now, an alarm would be generated if the end position switches changes their state indicating a CLOSED flap. This might happen on a defective fuse F1, a missing power supply or an interrupted wire at the motor coil. The current indicator is drawn on the binary input E3, but this signal won't generate alarm notifications, due to the deactivated "Event_Enable" bits.

RKS 1000

In the case, that you like to close the flaps due to a controlled shut-down of your ventilation system, the relay output A1 must be driven to FALSE.



After turning off the motor voltage, a correct working flap should indicate a CLOSED flap on input E1. In this case, no alarm notification should be generated! The RKZ/S-BACnet controller changes the alarm values for the binary inputs E1 and E2 (end position switches) in subject to the output value A1.

The alarm value of the binary inputs for the end position switches of motorized flaps depends on the corresponding output state!

If you don't like to use this this specific alarming for motorized flaps, deactivate it by sending the command "bacnet alarming 0". Then you will find the BACnet conform handling which doesn't invert the alarm values.

RKS 1000

6.2 AE-N-I-B Alarm and event, notification internal B

The RKZ/S-BACnet controller generates alarm and event notifications. You can select whether you like to get an unconfirmed or confirmed EVENT notification using the protocol command “bacnet event”. The alarm generation can be completely deactivated using the protocol command “bacnet event 0”

BACnet service	initiate	execute
UnconfirmedEventNotification	<input checked="" type="checkbox"/>	<input type="checkbox"/>
ConfirmedEventNotification	<input checked="" type="checkbox"/>	<input type="checkbox"/>

After setting the factory default parameters “ConfirmedEvent” notification is selected.

Note:

The alarm notification will be send to all BACnet devices as a broadcast message, if no Recipient_List is defined within the notification class object 1.

6.3 AE-ASUM-B Alarm and event, alarm summary B

The RKZ/S-BACnet controller provides a summary of all “active” alarms. This function is only suitable on small installations, due to the fact, that a big list of alarms can’t be transmitted.

BACnet service	initiate	execute
GetAlarmSummary	<input type="checkbox"/>	<input checked="" type="checkbox"/>

6.4 AE-ESUM-B Alarm and event, enrollment summary B

This function provides a more sophisticated approach for the summary of alarms, with various kinds of filters. This service may be used to obtain summaries of objects with any EventType, Event State and gives additional selection functions using the acknowledgment and priority.

BACnet service	initiate	execute
GetEnrollmentSummary	<input type="checkbox"/>	<input checked="" type="checkbox"/>

6.5 AE-INFO-B Alarm and event, get event information B

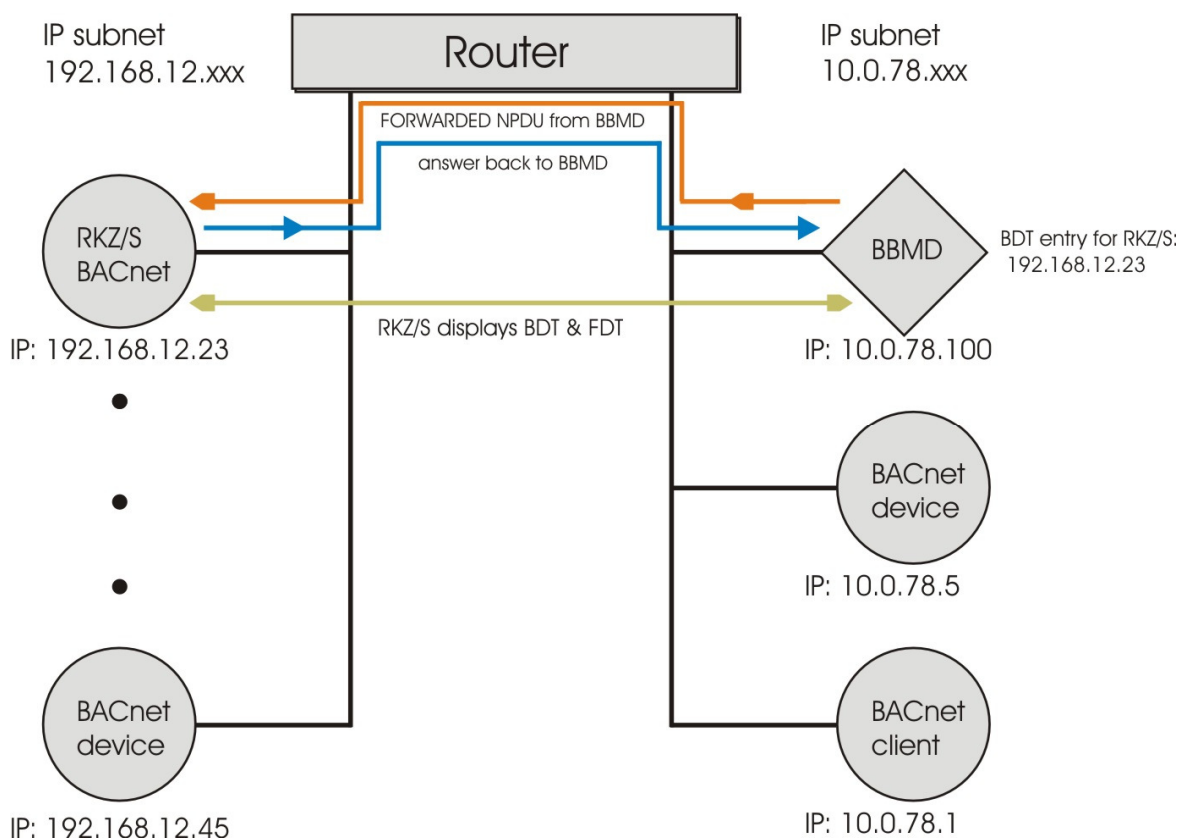
This function provides a summary of all “active event states” alarms, which means that either the objects `EVENT_STATE` isn't `NORMAL` or the `ACKED_TRANSITIONS` property has one of the 3 bits (`TO-OFFNORMAL`, `TO-FAULT`, `TO-NORMAL`) set to `FALSE`.

BACnet service	initiate	execute
GetEventInformation	<input type="checkbox"/>	<input checked="" type="checkbox"/>

The `GetEventInformation` service is suitable to read a very big event summary list. The functions argument “Last Received Object Identifier” makes it possible to transmit a big event summary into several pieces.

7 Multiple BACnet/IP subnets

On standard installations, all BACnet devices will have an IP address within one Class C subnet. In the case, that you like to place the RKZ/S-BACnet controller in the different IP address range the supported BBMD operations will be required.



The RKZ/S-BACnet controller supports the handling of forwarded NPDU's. If you like to place a BACnet device in a different IP range, you need to have a BACnet broadcast managing device (BBMD). Normally all BACnet/IP data packages will be sent to an IP address using the specific BACnet port (default: 47808). There should be only one BBMD in each IP subnet (f.e. 10.0.78.xxx) to manage the handling of "foreign" devices and BACnet devices in different IP areas. The BBMD shall possess a table called the broadcast distribution table (BDT). The configurable BDT must contain an entry for the RKZ/S-BACnet device with the devices IP address (192.168.12.23) and the port number (47808).

Any request to a BACnet device in a different IP area will be transmitted through the BBMD. If for example, the BACnet client (10.0.78.1) wants to read a property from the RKZ/S-BACnet controller (192.168.12.23), the BBMD (10.0.78.100) directs the ReadProperty request as a "forwarded" NPDU to the RKZ/S-BACnet controller (192.168.12.23).

The RKZ/S-BACnet controller 192.168.12.23 answers as a "forwarded" NPDU to the BBMD (10.0.78.100) containing the IP address of the original requester 10.0.78.1. The BBMD sends the answer to the requesting device (10.0.78.1) in the same IP area.

The RKZ/S-BACnet controller can also work as a “foreign” device. A “foreign” device is a BACnet device that has an IP subnet address different from those comprising the BACnet/IP network that the device seeks to join.

You can set the status of the RKZ/S-BACnet device to “foreign” device by sending the terminal command “bacnet foreign 1”. In this case, the RKZ/S-BACnet controller will automatically try to register in the BBMD’s foreign device table (FDT).

Note:

With default parameter settings, the RKZ/S-BACnet controller will work as a normal BACnet server which should be placed in a single BACnet/IP network. The possibility to use it as a “foreign” device has been included only for the sake of completeness.

Actually, only installations with the BACnet clients working as a “foreign” device are known.

8 Manufacturer

RK-Tec Rauchklappen-Steuerungssysteme GmbH&Co.KG

Robert-Perthel-Strasse 19
D-50739 Köln

Telefon +49 (0) 221-579 5603 0
Fax +49 (0) 221-579 5603 10

E-Mail: info@rk-tec.com
Internet www.rk-tec.com

Sitz Köln, HRA 14029 Ust-IdNr.: DE193830797
Geschäftsführer : Reiner Dünwald

Wir haben alles daran gesetzt, dass der Inhalt dieser Unterlage korrekt und auf dem neusten Stand ist. RK-Tec behält sich im Rahmen seiner Politik zur Anpassung an den technischen Fortschritt das Recht vor, jederzeit die Spezifikationen der Komponenten ohne vorherige Ankündigung zu ändern. Für Falschinterpretationen, auch durch drucktechnische Fehler, keine Gewähr.