CALEC® STIII – BACnet® MS/TP

BACnet Protocol Implementation Conformance Statement

ANNEX A - PROTOCOL IMPLEMENTATION CONFORMANCE STATEMENT (NORMATIVE)

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METERING

CALEC® STIII with BACnet® MS/TP for cooling and heating applications

Date: September 10th, 2019
Vendor Name: INTEGRA METERING AG (Vendor ID 431)
Product Name: CALEC STIII BACnet MS/TP
Product Model Number: CALEC STIII
Application Software Version: V2.01.01
Firmware Revision: V2.00.05
BACnet Protocol Revision: 14

Product Description:

The BTU meter CALEC® STIII can be use in various commercial buildings and apartments, mainly for cooling and heating applications.
The system based on signal inputs of two matched temperature sensors and any of e.g. INTEGRA METERING flow meters. CALEC® STIII provides high accuracy e.g. energy, flow, volume, power, mass and temperature data via the local display and various communication protocols, like BACnet MS/TP, Modbus RTU, LON FTT-10A, M-Bus, N2Open and KNX TP1.
Via two auxiliary inputs additional impulses meter (water or oil) can be connected directly to BACnet MS/TP network.

BACnet Standardized Device Profile (Annex L):

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

BACnet Interoperability Building Blocks (BIBB) Supported (Annex K):

Data sharing services	
Name	**BIBB**
Data Sharing - ReadProperty - B	DS-RP-B
Data Sharing - ReadPropertyMultiple - B	DS-RPM-B
Data Sharing - WriteProperty - B	DS-WP-B
Data Sharing – WritePropertyMultiple - B	DS-WPM-B
Data Sharing - COV - B	DS-COV-B

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Device management services	
Name	**BIBB**
Device Management - Dynamic Device Binding - B	DM-DDB-B
Device Management - Dynamic Object Binding - B	DM-DOB-B
Device Management - DeviceCommunicationControl - B	DM-DCC-B
Device Management - TimeSynchronization - B	DM-TS-B
Device Management - UTCTimeSynchronization - B	DM-UTC-B
Device Management - ReinitializeDevice - B	DM-RD-B

Segmentation Capability:

Segmentation is not supported

☐ Able to transmit segmented messages   Window Size   _____
☐ Able to receive segmented messages   Window Size   _____

Standard Object Types Supported:

☑ **Device related parameters are supported in the Device Object**
☑ **All measurement values are mapped to Analog Input (AI) objects**
☑ **All switching signals are mapped to Binary Output (BO) objects**

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Complete object list for CALEC® STIII BACnet MS/TP		Available in version						
Objekt-Name	**Object Type**	**Volume**	**Mass**	**Flow**	**BDE**	**TGR**	**BDV**	**DTF**
Calec STIII BACnet	Device	X	X	X	X	X	X	X
AI-0-Energy	Analog Input	X	X		X	X	X	X
AI-1-Energy-BDE	Analog Input				X	X	X	X
AI-2-Volume	Analog Input	X			X	X	X	X
AI-3-Volume-BDE	Analog Input				X		X	X
AI-4-Mass	Analog Input		X					
AI-5-Auxiliary Counter 1	Analog Input			X				
AI-6-Auxiliary Counter 2	Analog Input	X	X	X	X	X	X	X
AI-7-Auxiliary Counter 3	Analog Input	X	X	X	X	X		
AI-8-Power	Analog Input	X	X		X	X	X	X
AI-9-Volume Flow	Analog Input	X		X	X	X	X	X
AI-10-Mass Flow	Analog Input		X					
AI-11-Temperature warm	Analog Input	X	X		X	X	X	X
AI-12-Temperature cold	Analog Input	X	X		X	X	X	X
AI-13-Temperature difference	Analog Input	X	X		X	X	X	X
AI-14-Density	Analog Input	X	X		X	X	X	X
AI-15-Energy-TGR	Analog Input					X		
BO-0	Binary Output	X	X	X	X	X	X	X
BO-1	Binary Output	X	X	X	X	X	X	X

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Detailed Object information

Device Object			
Property Identifier	**Property Datatype**	**Confor-mance Code**	**Value CALEC® STIII BACnet MS/TP**
object-identifier	BACnetObjectIdentifier	R	(device, 1111111)
object-name	CharacterString	W	"Calec STIII BACnet"
object-type	BACnetObjectType	R	device
system-status	BACnetDeviceStatus	R	OPERATIONAL
vendor-name	CharacterStirng	R	"Aquametro AG"
vendor-identifier	Unsigned16	R	431
model-name	CharacterString	R	"CALEC STIII MS/TP"
firmware-revision	CharacterSring	R	"V2.00.02"
application-software-version	CharacterString	R	"V2.01.01"
location	CharacterString	W	"No Location set"
description	CharacterString	W	"CALEC BTU METER"
protocol-version	Unsigned	R	1
protocol-revision	Unsigned	R	14
protocol-services-supported	BACnetServicesSupported	R	{F,F,F,F,T,F,F,F,F,F,F,T,F,T,T,T,T,F,F,T, F,F,F,F,F,F,F,F,F,F,T,T,T,F,T,F,F,F,F} 0,1,2,3,4,5,6,7,8,9,0,1,2,3,4,5,6,7,8,9, 0,1,2,3,4,5,6,7,8,9,0,1,2,3,4,5,6,7,8,9,0 confirmedCOVNotification (1) subscribeCOV (5) readProperty (12) readPropertyMultiple (14) writeProperty (15) writePropertyMultiple (16) deviceCommunicationControl (17) reinitializeDevice (20) I am (26) I have (27) unconfirmedCOVNotification (28) timeSynchronisation (32) who has (33) who is (34) utc time synchronisation (36)
protocol-object-types-supported	BACnetObjectTypesSupported	R	{T,F,F,F,T,F,F,F,T,F,F,F,F,F,F,F,F,F,F,F, F,F,F,F,F,F,F,F,F,F,F,F,F,F,F,F,F,F,F,F,F, F,F,F,F,F,F,F,F,F,F,F,F,F,F} 0,1,2,3,4,5,6,7,8,9,0,1,2,3,4,5,6,7,8,9, 0,1,2,3,4,5,6,7,8,9,0,1,2,3,4,5,6,7,8,9, 0,1,2,3,4,5,6,7,8,9,0,1,2,3,4 Analog_Input Binary_Output Device

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Device Object			
Property Identifier	**Property Datatype**	**Confor-mance Code**	**Value CALEC® STIII BACnet MS/TP**
object-list	BACnetArray[N] of Object Identifier	R	(device, 1111111), (analog-input, 0), (analog-input, 1), (analog-input, 2), (analog-input, 3), (analog-input, 4), (analog-input, 5), (analog-input, 6), (analog-input, 7), (analog-input, 8), (analog-input, 9), (analog-input, 10), (analog-input, 11), (analog-input, 12), (analog-input, 13), (analog-input, 14), (analog-input, 15), (binary-output,0), (binary-output,1)
max-APDU-length-accepted	Unsigned	R	480
segmentation-supported	BACnetSegmentaion	R	no-segmentation
local-time	Time	O	?
local-date	Date	O	?
utc-offset		W	0 <minimum: -780; maximum: 780>
daylight-savings-status	Unsigned	W	?
apdu-timeout	Unsigned	W	10000 <minimum: 100; maximum: 25500>
number-of-APDU-retries	Unsigned	W	5 <minimum: 0; maximum: 10>
max-master	Unsigned	W	127 <minimum: 1; maximum: 127>
max-info-frames	Unsigned	W	1 <minimum: 1; maximum: 127>
device-address-binding	List of BACnet-AddressBinding	R	( )
database-revision	Unsigned	R	?
active-cov-subscriptions	List of BACnetCOV-Subscrition	R	( )
proprietary-baudrate-10000	Unsigned	R	? <minimum: 9600; maximum: 115200; increment: 1>
proprietary: proprietary-10000	Unsigned	R	? <minimum: 9600; maximum: 115200; increment: 1>

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Analog Input Object			
Property Identifier	**Property Datatype**	**Confor-mance Code**	**Value CALEC® STIII BACnet MS/TP**
object-identifier	BACnetObjectIdentifier	R	(analog-input, 0-15)
object-name	CharacterString	W	"AI-x-abcdefgh" ⇨ see "description"
object-type	BACnetObjectType	R	analog-input
present-value	REAL	R	? Writable when "out-of-service" is TRUE
description	CharacterStirng	O	One of: "Energy" „Energy-BDE" „Volume" „Volume-BDE" „Mass" „Auxiliary Counter 1" „Auxiliary Counter 2" „Auxiliary Counter 3" „Power" „Volume Flow" „Mass Flow" „Temperature warm" „Temperature cold" „Temperature difference" "Density" "Energy-TGR"
status-flags	BACnetStatusFlags	R	IN_ALARM, FAULT, OVERRIDDEN, OUT OF SERVICE
event-state	BACnetEventState	R	normal (0), fault (1), offnormal (2), high-limit (3), low-limit (4)
reliability	BACnetReliability	O	NO_FAULT_DETECTED, NO_SENSOR, OVER_RANGE, UNDER_RANGE, OPEN_LOOP, SHORTED_LOOP, COMMUNICATION_FAILURE, UNRELIABLE_OTHER
out-of-service	BOOLEAN	W	TRUE, FALSE
update-interval	Unsigned	W	200
units	BACnetEngineering-Units	W	Unit list ⇨ see "Extended AI-Block description (units)"
cov-increment	REAL	W	1.0

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Extended AI-Block description (units)		
Object Name	**Unit**	**Allowed values**
AI-0-Energy	kilowatt-hours	joules, kilojoules, kilojoules-per-kilogram, megajoules, watt-hours, kilowatt-hours, megawatt-hours, btus, kilo-btus, mega-btus, therms, ton-hours
AI-1-Energy-BDE	kilowatt-hours	joules, kilojoules, kilojoules-per-kilogram, megajoules, watt-hours, kilowatt-hours, megawatt-hours, btus, kilo-btus, mega-btus, therms, ton-hours
AI-2-Volume	cubic-meters	cubic-feet, cubic-meters, imperial-gallons, liters, us-gallons
AI-3-Volume-BDE	cubic-meters	cubic-feet, cubic-meters, imperial-gallons, liters, us-gallons
AI-4-Mass	tons	kilograms, pounds-mass, tons
AI-5-Auxiliary Counter 1	cubic-meters	joules, kilojoules, kilojoules-per-kilogram, megajoules, watt-hours, kilowatt-hours, megawatt-hours, btus, kilo-btus, mega-btus, therms, ton-hours, cubic-feet, cubic-meters, imperial-gallons, liters, us-gallons, kilograms, pounds-mass, tons, no-units
AI-6-Auxiliary Counter 2	cubic-meters	joules, kilojoules, kilojoules-per-kilogram, megajoules, watt-hours, kilowatt-hours, megawatt-hours, btus, kilo-btus, mega-btus, therms, ton-hours, cubic-feet, cubic-meters, imperial-gallons, liters, us-gallons, kilograms, pounds-mass, tons, no-units
AI-7-Auxiliary Counter 3	cubic-meters	joules, kilojoules, kilojoules-per-kilogram, megajoules, watt-hours, kilowatt-hours, megawatt-hours, btus, kilo-btus, mega-btus, therms, ton-hours, cubic-feet, cubic-meters, imperial-gallons, liters, us-gallons, kilograms, pounds-mass, tons, no-units
AI-8-Power	kilowatts	milliwatts, watts, kilowatts, megawatts, btus-per-hour, kilo-btus-per-hour, horsepower, tons-refrigeration
AI-9-Volume Flow	cubic-meters-per-hour	cubic-feet-per-second, cubic-feet-per-minute, cubic-meters-per-second, cubic-meters-per-minute, cubic-meters-per-hour, imperial-gallons-per-minute, liters-per-second, liters-per-minute, liters-per-hour, us-gallons-per-minute
AI-10-Mass Flow	tons-per-hour	grams-per-second, grams-per-minute, kilograms-per-second, kilograms-per-minute, kilograms-per-hour, pounds-mass-per-second, pounds-mass-per-minute, pound-mass-per-hour, tons-per-hour
AI-11-Temperature warm	degrees-celsius	degrees-Celsius, degrees-Kelvin, degrees-Fahrenheit
AI-12-Temperature cold	degrees-celsius	degrees-Celsius, degrees-Kelvin, degrees-Fahrenheit
AI-13-Temperature difference	degrees-Kelvin	degrees-Kelvin
AI-14-Density	kilograms-per-cubic-meter	kilograms-per-cubic-meter
AI-15-Energy-TGR	kilowatt-hours	joules, kilojoules, kilojoules-per-kilogram, megajoules, watt-hours, kilowatt-hours, megawatt-hours, btus, kilo-btus, mega-btus, therms, ton-hours

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Binary Output Object			
Property Identifier	**Property Datatype**	**Confor-mance Code**	**Value CALEC® STIII BACnet MS/TP**
object-identifier	BACnetObjectIdentifier	R	(binary-output, 0-1)
object-name	CharacterString	W	?
object-type	BACnetObjectType	R	binary-output
present-value	BACnetBinaryPV	W	?
description	CharacterStirng	W	One of: Relay 1 Relay 2
status-flags	BACnetStatusFlags	R	IN_ALARM, FAULT, OVERRIDDEN, OUT OF SERVICE
event-state	BACnetEventState	R	normal (0), fault (1), offnormal (2), high-limit (3), low-limit (4)
out-of-service	BOOLEAN	W	FALSE, TRUE
polarity	BACnetPolarity	W	?
priority-array	BACnetPriorityArray	R	{NULL, NULL, NULL, NULL, NULL, NULL, NULL, NULL, NULL, NULL, NULL, NULL, NULL, NULL, NULL, NULL}
relinquish-default	BACnetBinaryPV	W	INACTIVE

Data Link Layer Options:

☐ BACnet IP, (Annex J)
☐ BACnet IP, (Annex J), Foreign Device
☐ ISO 8802-3, Ethernet (Clause 7)
☐ ANSI/ATA 878.1, 2.5 Mb. ARCNET (Clause 8)
☐ ANSI/ATA 878.1, RS-485 ARCNET (Clause 8), baud rate(s)
☑ **MS/TP master (Clause 9), baud rate(s): 9600, 19200, 38400, 57600, 76800, 115200**
☑ **MS/TP slave (Clause 9), baud rate(s): 9600, 19200, 38400, 57600, 76800, 115200**
☐ Point-To-Point, EIA 232 (Clause 10), baud rate(s):
☐ Point-To-Point, modem, (Clause 10), baud rate(s):
☐ LonTalk, (Clause 11), medium:
☐ BACnet/ZigBee (ANNEX O)
☐ Other:

Device Address Binding:

Is static device binding supported? ☐ Yes   ☑ **No**

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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**
Does the BBMD support network address translation?	☐ Yes	☑ **No**

Network Security Options:

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

Character Sets Supported:

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

☑ **ISO 10646 (UTF-8)**	☐ IBM™/Microsoft™ DBCS	☐ ISO 8859-1
☐ ISO 10646 (UCS-2)	☐ ISO 10646 (UCS-4)	☐ JIS X 0208