INTEGRA METERING

CALEC® ST III

Protocol description BACnet® MS/TP



ASHRAE BACnet™

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1. General information

1.1. Content

This communication description includes only specific information about CALEC® ST III with the BACnet® MS/TP module. Further information is available in the technical documentation of CALEC® ST III.

You will find **further documentation** on our websites.

CALEC® ST III Standard & Smart: Energy Calculator

CALEC® ST III Advanced: Energy Calculator

General information about BACnet® can be found at www.bacnet.org.

1.2. Definition

BACnet® is a globally accepted, open standard (ISO Standard 16484-5) in building automation. BACnet® assures the inter-operability between devices of different manufacturers. CALEC® ST III with BACnet® MS/TP interface allows an integration in BACnet® networks without using gateways. The physics of RS485 interface is used for transmission.

1.3. Registered trademark and brand names

BACnet®, as well as the **BACnet® logo** are registered trademarks of ASHRAE (American Society of Heating, Refrigerating and Air-Conditioning Engineers) in Atlanta, GA (USA).

1.4. Certification according to BACnet® standard

CALEC® ST III with the BACnet® MS/TP module is certified according to the BACnet Revision 18.

2. Hardware

2.1. Communication interface

INTEGRA METERING AG uses a communication interface defined by BACnet® technology with twisted-pair wiring (2-core).

CALEC® ST III: Overview of supported functions			
Function	**Parameter**	**Value description**	**More information**
Manufacturer ID	431	-	This identification is valid for INTEGRA METERING AG
Data protocol	BACnet® MS/TP	-	-
BACnet device profile	B-ASC	-	-
MAC address	0...127 master and slave 0...254 slave	Factory setting: the last 2 digits of the device serial no. Master/slave setting: Changeable via CALEC® ST III operating menu. Factory setting: master	See: Chapter 3.4 Master/slave mode
Baud rate	9600, 19200, 38400, 57600, 76800, 115200	Automatic adjustment	See: Chapter 3.2 BACnet Baud rate
Device instance number	-	The last 5 digits of the device serial no.	See: Chapter 3.5 Device instance number (DIN)
BACnet connection type	-	RS-485	-

2.2. Line termination

A termination resistor must be connected to both ends of the segment. The technical BACnet® MS/TP specifications recommend a 120 Ohm resistor. If CALEC® ST III is at the end of a segment, the internal termination resistor can be activated.

Operating menu: BAcnEt ↵ ↓ TRm ↵

3. Commissioning

3.1. Commissioning of CALEC® ST III with the BACnet® MS/TP interface

After connecting the RS-485 cable with the terminals, the following steps need to be performed:

- A11 (+) and B11 (-) for Modul #1
- A21 (+) and B21 (-) for Modul #2 (Depends were the module is plugged in).

Step-by-step instructions		
Step	**Action**	**Description**
1	Configuration of CALEC® ST III for use of application	The respective information can be found in the operating instructions of CALEC® ST III.

Step-by-step instructions		
Step	**Action**	**Description**
2	Configuration of CALEC® ST III for BACnet® use	According to this description: The relevant bus number for the configuration results from the assembly of the BACnet® interface in socket # 1 or socket # 2 for all CALEC® ST III Standard, Smart, Advanced and socket #3, # 4 ,# 5 ,#6 for CALECT® ST III Advanced.

3.2. BACnet® Baud rate

The baud rate adjustment of CALEC® ST III will be set automatically after connecting the BTU meter to the network. Supported baud rates are 9600, 19200, 38400, 57600, 76800 and 115200. If the Baud rate is changed at the master system during operation, CALEC® ST III needs to be restarted.

3.3. BACnet® MAC address

The BACnet® MS/TP MAC address can be changed in the operating menu of CALEC® ST III. The applicable range of the BACnet® MS/TP MAC address lies between 0 and 254 (for master functionality between 0 and 127, for the slave functionality between 0 and 254). The differentiation between master and slave address range is defined via the operating menu in the menu Mod of CALEC® ST III.

Operating menu: BAcnEt Adr

3.4. Master/slave mode

By means of the BACnet® MS/TP mode selection the mode behaviour of CALEC® ST III can be selected as master or slave. After 30 seconds the change is active.

Operating menu: BAcnEt Mod

3.5. Device instance number (DIN)

The device instance number can be changed in the operating menu of CALEC® ST III. The last 5 digits of the serial number (CALEC® ST III) are the factory setting for the DIN.

Operating menu: BAcnEt DIN

3.6. Device object name

The parameter „object-name“ can be overwritten (standard: “**CALEC ST III BACnet**”)

3.7. Location

The parameter “location” can be overwritten (standard: “**No Location set**”)

3.8. Description

The parameter "description" can be overwritten (standard: "**CALEC BTU METER**")

4. CALEC® ST III BACnet® services and objects

For detailed information on Device Objects, Analog Input Objects, the Extended AI Block, Binary Output Objects, Network Port Objects, and the CALEC STIII Object Availability List, please refer to the **PICS document (BACnet Protocol Implementation Conformance Statement)**.



You will find **further documentation** on our websites.

CALEC® ST III Standard & Smart: Energy Calculator

CALEC® ST III Advanced: Energy Calculator

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5. Alarm

CALEC® ST III status messages are linked with the BACnet® objects. INTEGRA METERING AG differs between the following types of status messages:

Device status "error"

All important device errors such as "system error" need to be verified including their error codes.

Measurement value status "alarm":

Specific messages such as "dt alarm" have to be verified (further information can be found in the section "Error messages, alarms" in the operating instructions of CALEC® ST III).

6. PICS document

The PICS document of CALEC® ST III can be found at our websites or on the BACnet website.



You will find **further documentation** on our websites.

CALEC® ST III Standard & Smart: Energy Calculator

CALEC® ST III Advanced: Energy Calculator

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7. Troubleshooting

Communication errors			
No.	**Error / malfunction**	**Possible reason**	**Correction**
1	CALEC® ST III is not communicating in the BACnet® MS/TP network	Wiring of the network Terminating resistors Configuratin of CALEC® ST III Configuration of BMS	Check if the BACnet MS/TP® devices are correctly connected. Check, if the termination and bus topology are correct. Check, if the BACnet® MAC address and the device instance number are correctly configured and unique within the network
2	After changing the Baud rate on the master system, CALEC CALEC® ST III is not communicating via BACnet® MS/TP anymore	CALEC® ST III is unable to automatically recognise the set Baud rate	Restart CALEC® ST III by switching the power supply off and on again. CALEC® ST III runs through an initialisation process and takes over the new Baud rate. The adapted Baud rate is displayed in “Device Object” in the “Proprietary Property 10000”

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