

Installation Instruction BACnet MS/TP module For Supercal 531, Superstatic 440, Superstatic 449

This manual describes the installation procedure of the BACnet MS/TP module in the Supercal 531 integrator as standalone product or in combination with the Superstatic 440 or Superstatic 449 energy meter. The technical data and specifications of the BACnet MS/TP module are described in this document.

The optional BACnet module MS/TP comprises of an input +12 VDC for the supply of the module and also 2x3 screw terminals (positive/negative/GND terminals for the RS-485 connection).



Delivery of the module

Before installing the BACnet MS/TP module check the items delivered. Included in the delivery are the BACnet MS/TP module, a fixing clamp for strain relief and this installation instruction.

The **PICS information (Protocol Implementation Conformance Statement)** is available at the last page of this document.

These PICS data identify the particular options specified by BACnet, supported by the Supercal 531, Superstatic 440 and the Superstatic 449.

Safety instructions

Avoid electrostatic discharges during installation or handling while manipulating the BACnet module. For this purpose, before touching the integrator or the BACnet module, you are advised to touch a grounded conductor (for example a water pipe or hot water pipe) to discharge electricity.

Device Instance Number (DIN) of the BACnet MS/TP module

The **Device Instance Number (DIN)** of the BACnet MS/TP module is set with a unique ID from the embedded MCU of the BACnet module. This DIN can also be read with the Prog531 and Prog449 configuration software supplied by Sontex.

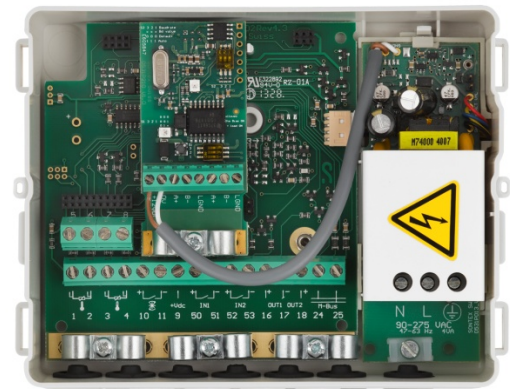
The Device ID (DIN) address can only be changed with a BACnet browser like "Boss Explorer" or "BACEye" software. For more information please refer to the application note document (Application Note BACnet_Obj_ID_Change EN - 2016.02.16.pdf) available to your local Sontex agent.

Installing the BACnet Module

The BACnet module, as all other modules to retrofit to the Supercal integrator, is mounted in one of the two module slots on the mother board of the Supercal integrator.

- Disconnect the power supply of the integrator.
- Separate the cover (MET) from the housing (MIO).
- Place the BACnet MS/TP module in one of the module slots of the integrator.
- Connect the mains power cable (external or internal) (12 VDC / 0 VDC) and the MS/TP network (A-, B+ and GND) with the BACnet module.
- Close the integrator carefully
- Reconnect the power supply cable.

The Supercal integrator will automatically detect and recognize the new module. No other action is required. The Supercal 531 / Superstatic 440 / Superstatic 449 are now ready to communicate via the BACnet MS/TP module.



Detection of the BACnet MS/TP module with the Prog531 and Prog449 software

The software Prog531 and Prog449 allows detecting the BACnet MS/TP module and to read:

- The firmware release of the BACnet MS/TP module
- The module type

Changing the settings like:

- The MAC address

Procedure to use when you will change the Mac address with Prog531 / Prog449 software:

- Detect the module with Prog531 / 449 software.
- Select a free MAC address.
- Program the MAC address with the Prog531 / 449. After programming the new address, **it's obligatory to open/separate the upper part with the lower of the integrator.** This operation will make a "reset" to the electronic board.
- Close the integrator, upper part with lower part. After that, the new address programmed will be activated.

These operations are necessary even if the BACnet module is connected on the Bus. As soon that a new MAC address is programmed with the Prog531 / 449, a "reset" hardware is necessary to activated the new address.



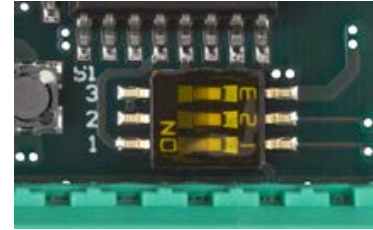
Note: The BACnet MS/TP module is compatible with Supercal / Superstatic integrators with firmware release FW 3.7 or higher (FW ≥ V3.7).

Setting of the bias resistor and the terminating resistor with the DIP switch S1

When the BACnet MS/TP module is at the end of the bus line, the terminating resistor 120 Ω of the BACnet module can be used to close the line or with an external resistor.

Settings with DIP switch S1:

Pos. 1	Pos. 2	Pos. 3	
0	0	0	Not used
0	0	1	Terminating resistor 120 Ω
1	1	0	Bias resistance (510 Ω) without termination (120 Ω)
1	1	1	Bias resistance (510 Ω) with termination (120 Ω)



0 = OFF; 1 = ON

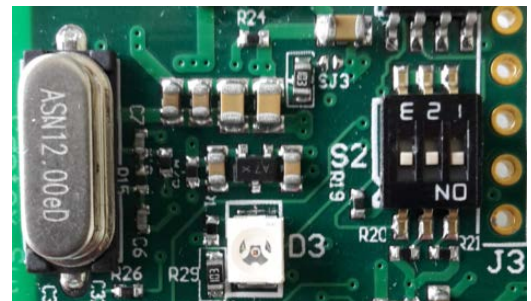
i	For DIP Switch S1, the position is defined as follows: Pos.1 Pos. 2 Pos. 3
----------	---

Setting the communication speed with the DIP switch S2:

With the DIP switch S2 the communication speed is set. If all positions are set to ON [1 1 1], the module supports a communication speed with an auto speed detection.

Settings with DIP switch S2:

Pos. 3	Pos. 2	Pos. 1	
0	0	0	9600 bit/s
0	0	1	19200 bit/s
0	1	0	38400 bit/s
0	1	1	57600 bit/s
1	0	0	76800 bit/s
1	0	1	115200 bit/s
1	1	0	MS/TP OFF
1	1	1	Auto Baud Detection (default)



0 = OFF; 1 = ON

i	For DIP Switch S2, the position is defined as follows: Pos.3 Pos. 2 Pos. 1
----------	---

MAC Address of the BACnet MS/TP module

The BACnet MS/TP module can be addressed as master/slave in the MAC Address range **0-127**.

The MAC Address **255** is used for broadcast.

The MAC Address must be unique for each device connected to the same RS-485 communication network.

By default the BACnet MS/TP module MAC Address is configured with a random value between 0-127.

Technical Data BACnet MS/TP module

General

Operating temperature 5° to 55°C
Storage temperature -10° to 55°C (dry environment)

Dimensions

Dimensions 66 x 30 mm
Mounting in one of the module slots of the Supercal 531/449 integrator

Power supply → please refer to the **Power Supply Precautions - Precautions Note** below

Internal power supply: Mains switching power supply of 531 / 449 integrator
0531A030, 230 VAC with 2 outputs
0690A013, 24 VAC with 2 outputs
External power supply: 12 VDC / 150 mA

Network transmission and technical details

Bus communication RS-485 twisted pair
RS-485 connection Plug-screw terminal for A-, B+ and GND (2x3-pin)
+ 12 VDC / 0 VDC
Bus termination Through DIP switch S1 or with an external resistor
BACnet Vendor Number Sontex ID: 717
Data Link Layer According to MS/TP Master/Slave
Data Protocol According to BACnet MS/TP Master/Slave
BACnet Device Profile B-ASC
Communication speed: 9600, 19200, 38400, 57600, 76800, 115200 bits/s or Auto Baud

Firmware compatibility

Supercal 531 / Superstatic 449 firmware release FW 3.7 or higher (FW ≥ V3.7)

Precaution

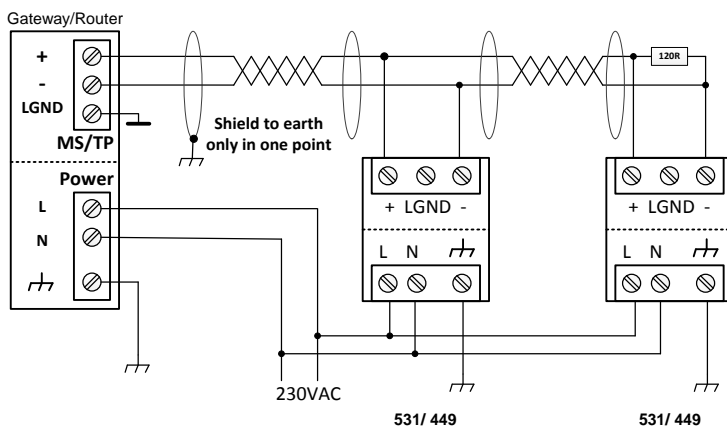
General notes: the BACnet module works with the specific characteristics described in this document. The manufacturer declines all liability if they are not respected. The manufacturer is not responsible if the BACnet module is incorrectly installed or used. The electrical connection must be established by an authorized person acting in compliance with the international and national standards in force and in conformity with local safety regulations. On the installation side, the main power supply must be protected by a 1A circuit-breaker device. The power supply cable for the Supercal 531 integrator must be installed in such a way that no hot parts (e.g. pipes, conduits at over 70°C) come into contact with the cable and no cable insulation will be damaged. The power supply connection terminals are designed for the connection of wires with a cross-section of between 0.75 mm² and 1.5 mm².

Power Supply Precautions - Precautions Note

- This main power supply 0690A013, 24 VAC with 2 outputs is built with a full-wave rectifier. Sharing AC power with half-wave rectified devices is not recommended.
- This main power supply 0531A030, 230 VAC with 2 outputs is completely electrically isolated. This power module can be used with a half-wave or a full-wave rectified device.
- With the external power supply +12VDC, it's necessary to use a completely isolated power supply.

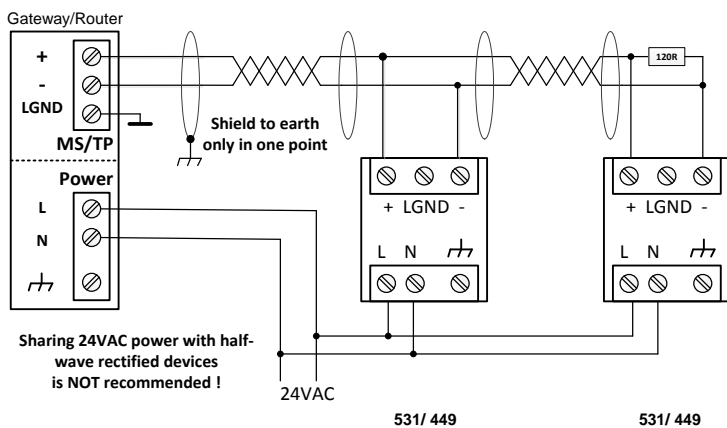
Warning: BACnet devices powered from a common AC source could be damaged if a mix of half-wave and full-wave rectified devices exist.

- Whole system is powered by 230VAC, gateway/router is built with an electrical isolation, 2-wire bus connections (230VAC_2wires):



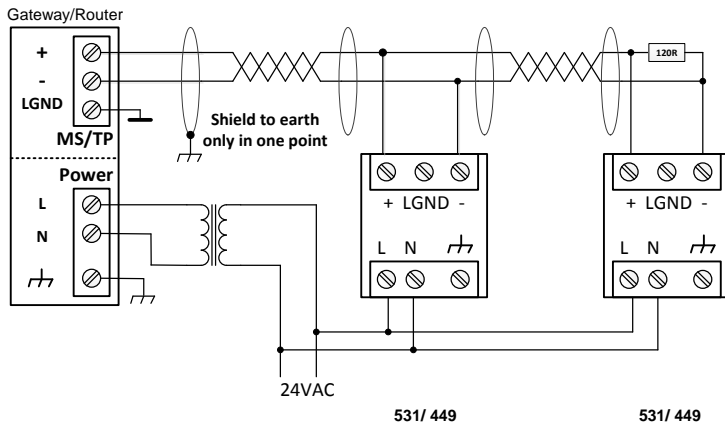
- Mains switching power supply module (Model 0531A030) used by 531 / 449 integrator.
- If gateway/router is built with an electrical isolation, there is no problem to use the main power supply module 0531A030.
- 2-wire bus connections. Connect the shield to earth at only one point.

- Whole system is powered by a 24VAC (no isolating transformer), gateway/router is built with a half-wave rectified (no electrical isolation), 2-wire bus connections :



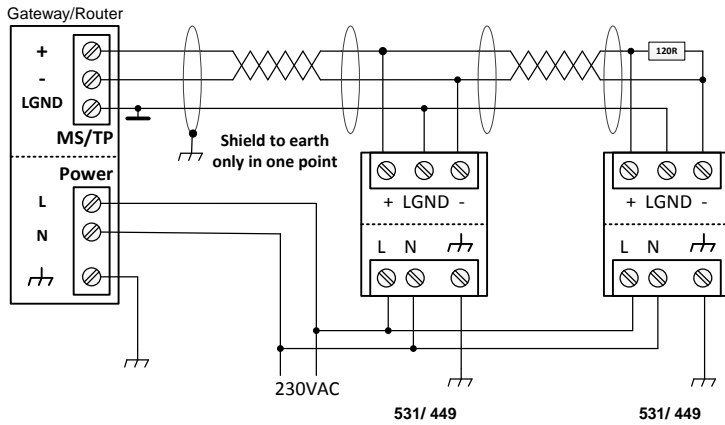
- Mains switching power supply module (Model 0690A013) used by 531 / 449 integrator.
- Does not connect the earth of the power supply module.
- 24VAC with no isolating transformer.
- If gateway/router is built with a half-wave rectified, this wiring is **NOT RECOMMENDED!**
- 2-wire bus connections. Connect the shield to earth at only one point.

- Whole system is powered by a 24VAC, gateway/router is built with an electric isolation and powered with isolating transformer, 2-wire bus connections :



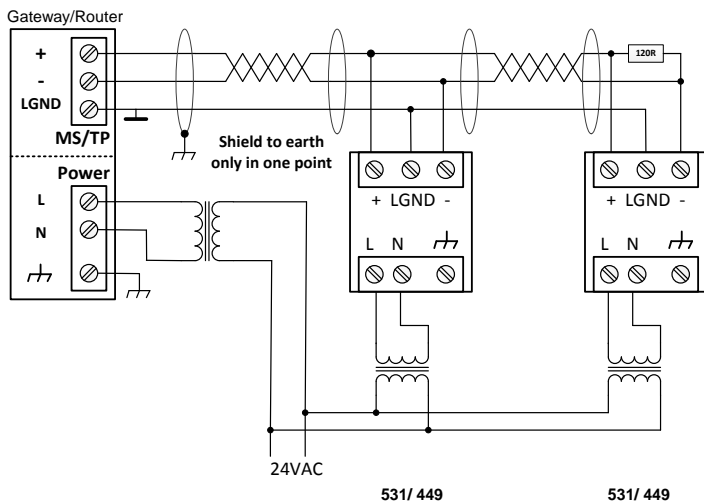
- Mains switching power supply module (Model 0690A013) used by 531 / 449 integrator.
- Does not connect the earth of the power supply module.**
- Gateway/router is powered by 24VAC with isolating transformer. Even if gateway/router is built with an electrical isolation, this wiring can be used.
- 2-wire bus connections. Connect the shield to earth at only one point.

- Whole system is powered by 230VAC, gateway/router is built with an electrical isolation, 3-wire bus connections :



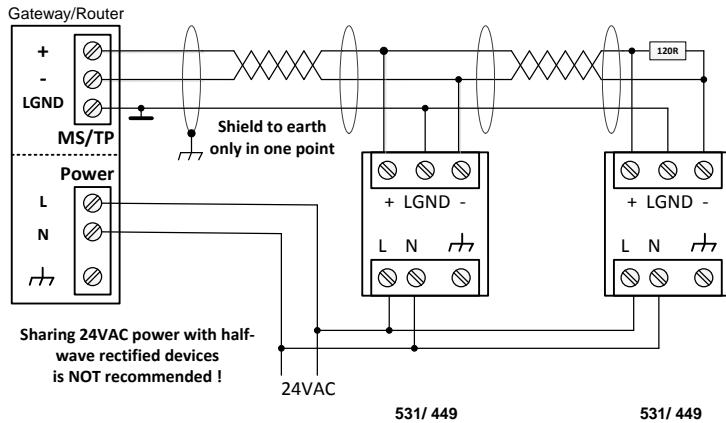
- Mains switching power supply module (Model 0531A030) used by 531 / 449 integrator.
- If gateway/router is built with an electrical isolation, there is no problem to use the main power supply module 0531A030
- 3-wire bus connections. Connect the shield to earth at only one point.

- Whole system is powered by 24VAC and full powered with isolating transformer, gateway/router is built with an electrical isolation, 3-wire bus connections :



- Mains switching power supply module (Model 0690A013) used by 531 / 449 integrator.
- Does not connect the earth of the power supply module.**
- If gateway/router is built with an electrical isolation, there is no problem to use the main power supply module 0690A013
- 3-wire bus connections. Connect the shield to earth at only one point.

- Whole system is powered by 24VAC, gateway/router is built with a half-wave rectified (no electrical isolation), 3-wire bus connections :



- Mains switching power supply module (Model 0690A013) used by 531 / 449 integrator.
- Does not connect the earth of the power supply module.**
- If gateway/router is built with a half-wave rectified, this wiring is **NOT RECOMMENDED!**
- 3-wire bus connections. Connect the shield to earth at only one point.

BACnet Protocol Implementation Conformance Statement (PICS) for Supercal 531, Superstatic 440, Superstatic 449

Date: 19.02.2015
Vendor Name: Sontex SA
Product Name: SUPERCAL 531/449
Product Model Number: Module 0531A071
Applications Software Version: since V2.42.0.10
Firmware Revision: V2.0
BACnet Protocol Revision: Rev. 12

Product Description:

The thermal energy meter SUPERCAL 531/449 can be used in various commercial building and apartments, mainly for cooling and heating applications. The system based on signal inputs of two matched temperature sensors and any of e.g. Sontex flow meters. Supercal 531/449 provide high accuracy e.g. energy, volume, power, flow, and temperature data via the local LCD display and various communication protocols, like BACnet MS/TP, LON FFT-10A and M-Bus.

BACnet Standardized Device Profile (Annex L)

- BACnet Application Specific Controller (B-ASC)

List all BACnet Interoperability Building Blocks Supported (Annex K):

Data Sharing	
BIBB	Name
DS-RP-B	Data Sharing Read-Property-B
DS-RPM-B	Data Sharing Read-Property-Multiple-B
DS-WP-B	Data Sharing Write-Property-B
DS-WPM-B	Data Sharing Write-Property-Multiple-B
DS-COV-B	Data Sharing Change-of-Value-B
DS-COVU-B	Data Sharing Change-of-Value-Unsolicited-B

Device Management	
BIBB	Name
DM-DDB-B	Device Management-Dynamic Device Binding-B
DM-DOB-B	Device Management-Dynamic Object Binding-B
DM-DCC-B	Device Management-DeviceCommunicationControl-B
DM-RD-B	Device Management-ReinitializeDevice-B

Standard Object Types Supported:

Object Name	Allowed Units
AI-0-Energy	MJ, GJ, Wh, kWh, MWh, BTU
AI-1-Volume	m ³ , USGallon
AI-2-Energy-T1	MJ, GJ, Wh, kWh, MWh, BTU
AI-3-Volume-T1	m ³ , USGallon
AI-4-Energy-T2	MJ, GJ, Wh, kWh, MWh, BTU
AI-5-Volume-T2	m ³ , USGallon
AI-6-Auxiliary-A1	No-units, MJ, GJ, Wh, kWh, MWh, BTU, m ³ , USGallon
AI-7-Auxiliary-A2	No-units, MJ, GJ, Wh, kWh, MWh, BTU, m ³ , USGallon
AI-8-High-temperature	°C
AI-9-Low-temperature	°C
AI-10-Power	W, kW
AI-11-Flow	m ³ /h
AI-12-Runnings-hours	Hours
CA-0-Set-Day1	BACnet Date year, month, day (wday = always wildcard)
AI-13-Energy-stored-ST1	MJ, GJ, Wh, kWh, MWh, BTU
AI-14-Volume-stored ST1	m ³ , USGallon
AI-15-Energy-T1-stored ST1	MJ, GJ, Wh, kWh, MWh, BTU
AI-16-Volume-T1-stored-ST1	m ³ , USGallon
AI-17-Energy-T2-stored ST1	MJ, GJ, Wh, kWh, MWh, BTU
AI-18-Volume-T2-stored-ST1	m ³ , USGallon
AI-19-Auxiliary-A1-stored-ST1	No-units, MJ, GJ, Wh, kWh, MWh, BTU, m ³ , USGallon
AI-20-Auxiliary-A2-stored-ST1	No-units, MJ, GJ, Wh, kWh, MWh, BTU, m ³ , USGallon
CA-0-Set-Day2	BACnet Date year, month, day (wday = always wildcard)
AI-21-Energy-stored-ST2	MJ, GJ, Wh, kWh, MWh, BTU
AI-22-Volume-stored ST2	m ³ , USGallon
AI-23-Energy-T1-stored ST2	MJ, GJ, Wh, kWh, MWh, BTU
AI-24-Volume-T1-stored-ST2	m ³ , USGallon
AI-25-Energy-T2-stored ST2	MJ, GJ, Wh, kWh, MWh, BTU
AI-26-Volume-T2-stored-ST2	m ³ , USGallon
AI-27-Auxiliary-A1-stored-ST2	No-units, MJ, GJ, Wh, kWh, MWh, BTU, m ³ , USGallon
AI-28-Auxiliary-A2-stored-ST2	No-units, MJ, GJ, Wh, kWh, MWh, BTU, m ³ , USGallon

Device Object Identifier:

Device Object Type Property Identifier	Property Data Type	1	2
Object_Identifier	BACnetObjectIdentifier	R	R
Object_Name	CharacterString (max. 16 characters)	R	W
Object_Type	BACnetObjectType	R	R
System_Status	BACnetDeviceStatus	R	R
Vendor_Name	CharacterString	R	R
Vendor_Identifier	Unsigned16	R	R
Model_Name	CharacterString	R	R
Firmware_Revision	CharacterString	R	R
Application_Software_Version	CharacterString	R	R
Location	CharacterString	O	-
Description	CharacterString	O	-
Protocol_Version	Unsigned	R	R
Protocol_Revision	Unsigned	R	R
Protocol_Services_Supported	BACnetServicesSupported	R	R
Protocol_Object_Types_Supported	BACnetObjectTypesSupported	R	R
Object_List	BACnetARRAY[N]of BACnetObjectIdentifier	R	R
Max_APDU_Length_Accepted	Unsigned (max. 480)	R	R
Segmentation_Supported	BACnetSegmentation	R	R
Local_Time	STX531 Time	O	W
Local_Date	STX531 Date	O	W
Daylight_Savings_Status	BOOLEAN	O	-
APDU_Timeout	Unsigned (10.000 ms)	R	R
Number_Of_APDU_Retries	Unsigned (5)	R	R
Max_Master	Unsigned (127)	O	R
Max_Info_Frames	Unsigned (1)	O	R
Device_Address_Binding	List of BACnetAddressBinding (empty)	R	R
Database_Revision	Unsigned (1)	R	R

Calendar Object Identifier:

Calendar Object Type Property Identifier	Property Data Type	1	2
Object_Identifier	BACnetObjectIdentifier (1-24)	R	R
Object_Name	CharacterString (max. 16 characters)	R	W
Object_Type	BACnetObjectType	R	R
Present_Value	BOOLEAN	R	R
Description	CharacterString (max. 16 characters)	O	W
Date_List	List of BACnetCalenderEntry	R	W
Profile_Name	CharacterString (max. 16 characters)	O	W

Analogue-Input Object Identifier:

Analogue-Input Object Type Property Identifier	Property Data Type	1	2
Object_Identifier	BACnetObjectIdentifier (1-24)	R	R
Object_Name	CharacterString (max. 16 characters)	R	W
Object_Type	BACnetObjectType	R	R
Present_Value	REAL	R	R
Description	CharacterString (max. 16 characters)	O	W
Status_Flags	BACnetStatusFlags	R	R
Event_State	BACnetEventState	R	R
Reliability	BACnetReliability	O	-
Out_Of_Service	BOOLEAN	R	W
Update_Interval	Unsigned	O	-
Units	BACnetEngineeringUnits	R	R
COV_Increment	REAL	O	-

1 = BACnet Conformance Code 135-2004
 2 = BACnet Conformance Code Stx531 BACnet

W = Writable
 O =Optional

R = Required + Readable
 - = Not supported

Data Link Layer Options:

- MS/TP master (Clause 9), baud rate(s): 9600, 19200, 38400, 57600, 76800, 115200, Auto Baud

Character Sets Supported:

- ANSI X3.4 / UTF-8*
 * Enumeration 0 = ANSI X3.4 was replaced by UTF-8, introduced in BACnet Addendum-H, approved January 2010

Technical assistance

For technical support, please contact your local Sontex representation or Sontex SA directly.

Sontex hotline: sontex@sontex.ch, +41 32 488 30 04

Detailed declarations of conformity can found on our home page: www.sontex.ch

Subject to change without notice