BAS Integration Manual

BACnet Snow/Ice Sensor Interface 681

Introduction

The BACnet Snow/Ice Sensor Interface 681 communicates with a Building Automation System (BAS) using BACnet® MSTP.

This manual provides information about control parameters that can be accessed by building automation or management systems that use BACnet.

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BACnet Protocol Implementation Conformance Statement (PICS)

Vendor Name: tekmar Control Systems Ltd.

Vendor ID: 585

Product Name: BACnet Snow/Ice Sensor Interface 681

Product Model Number: 681

Application Software Version: J1297 Firmware Revision: 0.0.2 BACnet Protocol Revision: 14

Product Description:

The 681 is a interface that automatically measures the presence of snow or ice and interfaces with a Building Automation System through BACnet to operate an automatic snow melting system.

BACNET STANDARDIZED DEVICE PROFILE
BACnet Application Specific Controller (B-ASC)

SUPPORTED BIBBS (ANNEX K)	NAME
DS-RP-B	Data Sharing-ReadProperty-B
DS-RPM-B	Data Sharing-ReadPropertyMultiple-B
DS-WP-B	Data Sharing-WriteProperty-B
DM-DDB-B	Device Management-Dynamic Device Binding-B
DM-DOB-B	Device Management-Dynamic Object Binding-B
DM-DCC-B	Device Management-Device Communication Control-B

*Device Communication Control password is tekmar1151.

SEGMENTATION CAPABILITY	SUPPORTED	WINDOW SIZE
Able to transmit segmented messages	No	
Able to receive segmented messages	No	

STANDARD OBJECT TYPES SUPPORTED	CREATABLE	DELETABLE
Analog Input	No	No
Analog Value	No	No
Binary Input	No	No
Binary Value	No	No
Device	No	No

DATA LINK LAYER	SUPPORTED
BACnet MSTP	Yes

DEVICE ADDRESS BINDING	SUPPORTED
Static Device Address Binding	No

NETWORK SECURITY OPTIONS	
Non-secure Device	-

CHARACTER SET	SUPPORTED
ANSI X3.4	Yes

DATA LINK LAYER OPTION	SUPPORTED
BACnet MSTP	Yes

SPECIAL FUNCTIONALITY	SUPPORTED
Maximum Address Size in Octets	Yes

DEVICE ADDRESS BINDING OPTION	SUPPORTED
Device Address Binding	No

BACnet MSTP Connection

SERVICE NAME	INITIATE	EXECUTE
ReadProperty	-	Yes
ReadPropertyMultiple	-	Yes
DeviceCommunicationControl	-	Yes
Who-Is	-	Yes
I-Am	Yes	-
Who-Has	-	Yes
I-Have	Yes	-

BACnet-MSTP Connection

Use the 681 terminal block to connect a shielded twisted pair wire from the BACnet RS485 connection point. Wire the A, B & G conductors from the BACnet point to the 681 A, B & Ref terminals.

• Gnd should not be connected to the ground screws in the 681.

STATUS FLAG	
In Alarm Flag	F
Fault Flag	F
Overridden Flag	F
Out of Service Flag	F/T

RELIABILITY	
No Fault	0
No Sensor	1
Open Loop	4
Shorted Loop	5

BACnet Analog Parameters

Analog Input Object = AI Analog Value Object = AV Read = R Read/Write = R/W

OBJECT ID	NAME	DATA TYPE	READ/ WRITE	STATUS FLAG	EVENT STATE	RELIABILITY	OUT OF SERVICE	UNITS	RANGE/ VALUE
Analog Input Objects									
1	Outdoor Air Temperature	AI	R	FFF(F/T)	Normal	0, 1, 4, 5	False or True	°F (64)	-76 to 266°F
2	Slab Temperature	AI	R	FFF(F/T)	Normal	0, 1	False or True	°F (64)	-
3	Slab Target Temperature	AI	R	FFF(F/T)	Normal	0	False or True	°F (64)	-
4	Error Code	AI	R	FFF(F/T)	Normal	0	False or True	No Units (95)	See Error Codes list
Analog Value Objects									
1	BAS Outdoor Air Temperature	AV	R/W	FFF(F/T)	Normal	-	False or True	°F (64)	-76 to 266°F
2	Melt Setpoint	AV	R/W	FFF(F/T)	Normal	-	False or true	°F (64)	32 to 95°F
3	Snow/Ice Sensitivity	AV	R/W	FFF(F/T)	Normal	-	-	No Units (95)	0 = Auto, 1 = Min, 2 = -2, 3 = -1, 4 = Mid, 5 = +1, 6 = +2, 7 = Max
4	Warm Weather Shut Down	AV	R/W	FFF(F/T)	Normal	-	False or True	°F (64)	32 to 95°F
5	Cold Weather Cut Off	AV	R/W	FFF(F/T)	Normal	-	False or True	°F (64)	-30 to 50°F

BACnet Binary Parameters

Binary Input Object = BI Binary Value Object = BV Read = R Write = W

OBJECT ID	NAME	DATA TYPE	READ / WRITE	STATUS FLAG	EVENT STATE	OUT OF SERVICE	PRESENT VALUE
Binary Input Objects							
1	Snow Detected	BI	R/W	FFF/(F/T)	Normal	False or True	0 = False 1 = True
2	Cold Weather Cut Off	BI	R/W	FFF(F/T)	Normal	False or True	0 = False 1 = True
3	Warm Weather Shut Down	BI	R/W	FFF(F/T)	Normal	False or True	0 = False 1 = True
4	Melt Pending Detected	BI	R/W	FFF(F/T)	Normal	False or True	0 = False 1 = True
5	Wet Detected	BI	R/W	FFF(F/T)	Normal	False or True	0 = False 1 = True
6	Sensor Mode	BI	R/W	FFF(F/T)	Normal	False or True	0 = 090 Sensor Configured 1 = 095 Sensor Configured

BACnet Binary Parameters (continued)

OBJECT ID	NAME	DATA TYPE	READ / WRITE	STATUS FLAG	EVENT STATE	OUT OF SERVICE	PRESENT VALUE
BACnet Binary Parameters (continued)							
Binary Value Objects							
1	Outdoor Sensor Enable	BV	R/W	FFF(F/T)	Normal	False or True	0 = Interface measures outdoor 1 = BAS sends outdoor temperature
2	Warm Weather Shut Down Type	BV	R/W	FFF(F/T)	Normal	False or True	0 = Auto, 1 = Setting
3	Cold Weather Cut Off Type	BV	R/W	FFF(F/T)	Normal	False or True	0 = Auto, 1 = Setting
4	Reset Snow Detection Request	BV	R/W	FFF(F/T)	Normal	False or True	0 = Do nothing, 1 = Reset Snow Detection

Refer to the *Installation & Operation Manual 681_D* for additional information.

BACnet MSTP Troubleshooting

If there is no communication, check the following:

- Check that the polarity on the BACnet MSTP A & B terminals is correct.
- Check that BACnet MSTP Ref terminal is securely connected.
- Check that the baud rate is the same on both devices.

BACnet MSTP Specification

Communication Protocol	MSTP over RS-485
Physical Layer	TIA-485 two-wire plus signal ground
Baud Rate	9600, 19200, 38400, 57600, 76800, 115200 (default: 76800 bps)
Recommended Cable	18 AWG Shielded Twisted pair (STP)
Maximum Cable Length	9600 bps: 1200 meters (4000 feet) 19200 bps: 1200 meters (4000 feet) 38400 bps: 1200 meters (4000 feet) 57600 bps: 1200 meters (4000 feet) 76800 bps: 1200 meters (4000 feet) 115200 bps: 1000 meters (3280 feet)
Parity	Even (1 stop bit)
Addressing	0 to 127 (default: 60)

Error Codes

CODE	DESCRIPTION
1	Setpoint Menu Save Error
2	Sensors Menu Save Error
3	BAS Menu Save Error
4	Outdoor Sensor Error
5	Slab Sensor Error
6	Snow Sensor Yellow Wire Error
7	Snow Sensor Blue Wire Error
8	Snow Sensor Brown Wire Error
9	Snow Sensor Error
10	Snow/Ice Sensor

Detailed information on how to correct the error is included in the *Installation & Operation Manual 681_D* available at watts.com/tekmar

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