SIEMENS

BACnet PTEC Controller

Extended I/O, Application 6696

Application Note

140-1148
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Building Technologies

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Overview

NOTE:
For information on applications with Firmware Revision B*x*40 or earlier, see InfoLink and/or Asset Portal for documentation.

Application 6696 runs on TEC Part Number 550-491PA and expands its IO capability.

Its purpose is to allow point extension in the PTEC.

BACnet

The controller communicates using BACnet MS/TP protocol for open communications on BACnet MS/TP networks.

Product	Supported BIBBs	BIBB Name
BTEC/PTEC	DS-RP-B B	Data Sharing-Read Property-B
	DS-RPM-B	Data Sharing-Read Property Multiple-B
	DS-WP-B	Data Sharing-Write Property-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
	DM-RD-B	Device Management-Reinitialize Device-B
	DM-BR-B	Device Management-Backup and Restore-B
	DM-OCD-B	Device Management-Object Creation and Deletion-B

Room Temperature and CTL TEMP

ROOM TEMP is the temperature that is being sensed by the room temperature sensor (RTS).

CTL TEMP is the room temperature that is used for control purposes. In other words, what the application is trying to do is to maintain CTL TEMP at the control setpoint (per added PPCL).

When CTL TEMP is not overridden, CTL TEMP and ROOM TEMP are related by the following equation:

If CTL TEMP is not overridden, then:

- The current value of ROOM TEMP (normal or overridden) will be used to determine the value of CTL TEMP. Where CTL TEMP = ROOM TEMP + RMTMP OFFSET.
- If ROOM TEMP has a status of Failed the last known good value of ROOM TEMP will be used to determine the value of CTL TEMP.

If CTL TEMP is overridden then:

- CTL TEMP equals its overridden value and ROOM TEMP has no effect on the value of CTL TEMP.

Using the Controller as a Point Extension Device

The controller is used only as a point extension device, with no embedded control application in effect. A control program can be added to the PTEC using PPCL. Alternatively, points may be unbundled at the field panel. The applications and PPCL in the field panel can also be used for monitoring and control.

NOTE:
Application 6696 allows the inputs at AI 3, AI 4, and AI 5, which are normally analog, to be used as spare DIs if desired (DI 3, DI 4, and DI 5).

Room Unit Operation

Sensor Select

SENSOR SEL is a configurable, enumerated point (values are additive). This point tells the controller what type of room unit is being used and how to handle loss of data. It also provides the ability to enable the optional RH, and CO2 sensors and which thermistor type is connected.

Room Temperature, Setpoint, RH and CO2

- When the digital room unit (Series 2200/2300) is used, SENSOR SEL selects the source temperature and setpoint and enables a loss of communications indication:
  - Temperature/Setpoint enable and supervision for fail communications (temperature) with a value of 1.
  - Relative humidity enable and supervision for fail communications with a value of 2.
  - CO2 enable and supervision for fail communications with a value of 4.
- When the analog room unit (Series 1000/2000) is used, default temperature sensing (0) from an analog room unit is enabled (relative humidity and CO2 sensing are not available and should not be selected).

Thermistor Inputs

- Default for either input is 10K.
- To enable 100K thermistor on input, see the following table for additive values of 8 or 16.

Other Inputs (only available on Digital Room Unit)

- Use the following table to select and enable communications supervision of room temperature/setpoint dial, relative humidity or CO2 for additive values of 1, 2 and 4.

SENSOR SEL Value * (additive)	Description (include values to enable feature)
1	Select Digital Room Unit (for temperature sensing and setpoint dial)
2	Relative Humidity (RH) sensing
4	CO_2 sensing
8	If short board: 100K Ω thermistor on AI 3 (else input is 10K Ω) If long board: 100K Ω thermistor on AI 5 (else input is 10K Ω)
16	Long board only: 100K Ω thermistor on AI 4 (else input is 10K Ω)

Room CO2

RM CO2 displays the CO_2 value in units of parts-per-million (PPM). RM CO2 (from the digital 2200/2300 room units) can be used with PPCL in the PTEC controller or unbundled for control or monitoring purposes.

Room RH

RM RH displays the relative humidity value in percent. RM RH can be used for PPCL in the PTEC or unbundled for control or monitoring purposes.

PPCL STATUS

PPCL STATUS displays LOADED or EMPTY.

- LOADED = PPCL programming is present in the controller. A new application number must be assigned (12000 through 12999).
- EMPTY = NO PPCL programming is present.

The maximum number of PPCL dynamic points is 15.

Wiring Diagram

⚠ CAUTION

The controller's DOs control 24 Vac loads only. The maximum rating is 12 VA for each DO. An external interposing relay is required for any of the following:

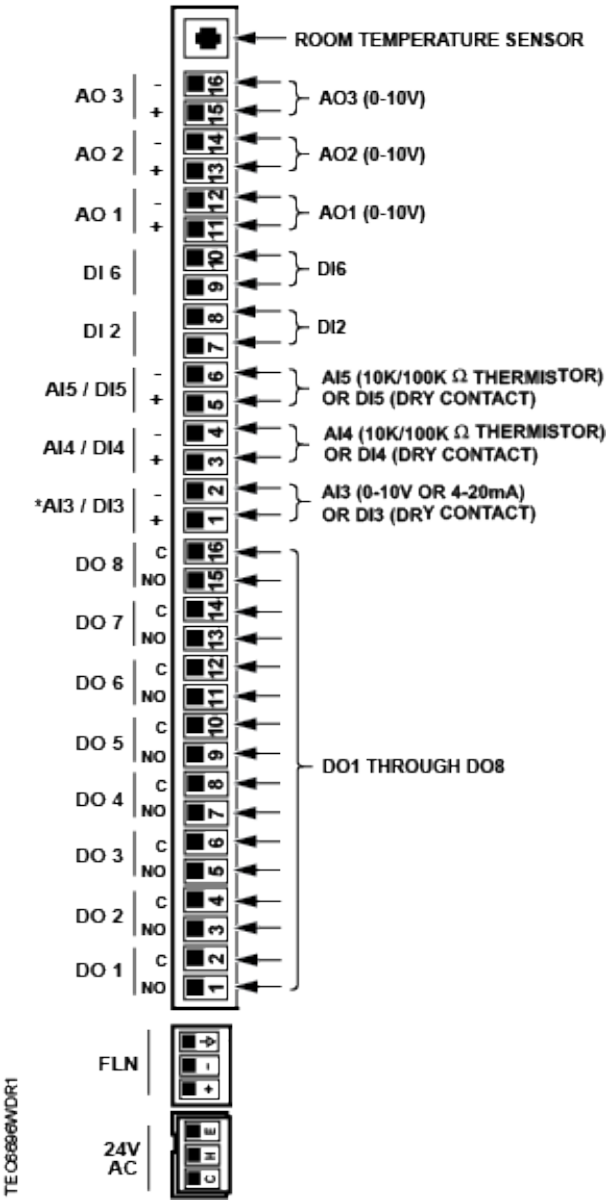
• VA requirements higher than the maximum

• 110 or 220 Vac requirements

• DC power requirements

• Separate transformers used to power the load
(for example part number 540-147, Terminal Equipment Controller Relay Module)

NOTE:
Thermistor inputs are 10K (default) or 100K software selectable (AUX TEMP AI X).



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*A voltage/current switch for AI 3 is located under the controller's cover on the circuit board (behind AI 3). It must be set either to voltage or current position according to function.

NOTE: If the voltage/current switch is set to current and a 4 to 20 mA sensor is connected to AI 3, then special wiring requirements must be followed. See *Wiring for AI 3 with a 4 to 40 mA Sensor* drawing.

Application 6696 Point Database

Object Type[1]	Object Instance (Point Number)	Object Name (Descriptor)	Factory Default (SI Units)[2]	Engr Units (SI Units)	Range	Active Text	Inactive Text
AO	1	CTLR ADDRESS	255	--	0-255	--	--
AO	2	APPLICATION	6696	--	0-32767	--	--
AO	3	RMTMP OFFSET	0.0 (0.0)	DEG F (DEG C)	-31.75-32	--	--
AI	{04}	ROOM TEMP	74.0 (23.45)	DEG F (DEG C)	48-111.75	--	--
AI	{13}	RM STPT DIAL	74.0 (23.45)	DEG F (DEG C)	48-111.75	--	--
AI	{15}	AI 5	74.0 (23.496)	DEG F (DEG C)	37.5-165	--	--
AI	{17}	AI 3	0	PCT	0-102	--	--
AI	{18}	AI 4	74.0 (23.496)	DEG F (DEG C)	37.5-165	--	--
BI	{19}	DI OVRD SW	OFF	--	Binary	ON	OFF
BO	{21}	NGT OVRD	NIGHT	--	Binary	NIGHT	DAY
BI	{22}	DI 2	OFF	--	Binary	ON	OFF
BI	{23}	DI 3	OFF	--	Binary	ON	OFF
BI	{24}	DI 4	OFF	--	Binary	ON	OFF
BI	{25}	DI 5	OFF	--	Binary	ON	OFF
BI	{26}	DI 6	OFF	--	Binary	ON	OFF
BO	{29}	DAY.NGT	DAY	--	Binary	NIGHT	DAY
AO	40	DO DIR.REV	0	--	0-255	--	--
BO	{41}	DO 1	OFF	--	Binary	ON	OFF
BO	{42}	DO 2	OFF	--	Binary	ON	OFF
BO	{43}	DO 3	OFF	--	Binary	ON	OFF
BO	{44}	DO 4	OFF	--	Binary	ON	OFF
BO	{45}	DO 5	OFF	--	Binary	ON	OFF
BO	{46}	DO 6	OFF	--	Binary	ON	OFF
BO	{47}	DO 7	OFF	--	Binary	ON	OFF
BO	{48}	DO 8	OFF	--	Binary	ON	OFF
AO	{49}	AOV1	0	VOLTS	0-10.23	--	--
AO	{50}	AOV2	0	VOLTS	0-10.23	--	--
AO	{51}	AOV3	0	VOLTS	0-10.23	--	--
AO	52	MTR SETUP	0	--	0-255	--	--
AO	{53}	MTR1 COMD	0	PCT	0-102	--	--

Object Type[1]	Object Instance (Point Number)	Object Name (Descriptor)	Factory Default (SI Units)[2]	Engr Units (SI Units)	Range	Active Text	Inactive Text
AO	{54}	MTR1 POS	0	PCT	0-102	--	--
AO	55	MTR1 TIMING	130	SEC	0-511	--	--
AO	56	MTR1 ROT ANG	90	--	0-255	--	--
AO	{57}	MTR2 COMD	0	PCT	0-102	--	--
AO	{58}	MTR2 POS	0	PCT	0-102	--	--
AO	59	MTR2 TIMING	130	SEC	0-511	--	--
AO	60	MTR2 ROT ANG	90	--	0-255	--	--
AO	{61}	MTR3 COMD	0	PCT	0-102	--	--
AO	{62}	MTR3 POS	0	PCT	0-102	--	--
AO	63	MTR3 TIMING	130	SEC	0-511	--	--
AO	64	MTR3 ROT ANG	90	--	0-255	--	--
AO	{78}	CTL TEMP	74.0 (23.45)	DEG F (DEG C)	48-111.75	--	--
AO	96	CAL TIMER	12	HRS	0-255	--	--
AO	{99}	ERROR STATUS	0	--	0-255	--	--
AO	124	SENSOR SEL	0	--	0-255	--	--
AI	{125}	RM CO2	1000	PPM	0-8191	--	--
AI	{126}	RM RH	50	PCT	0-102	--	--
BO	{127}	PPCL STATE	EMPTY	--	Binary	LOADED	EMPTY

1) Object Types are; Analog Input (AI), Analog Output (AO), Binary Input (BI) and Binary Output (BO).

2) A single value in a column means that the value is the same in English units and in SI units.

3) Point numbers that appear in brackets { } may be unbundled at the field panel.

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1000 Deerfield Pkwy
Buffalo Grove IL 60089
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