

SIEMENS



BACnet PTEC Controller

VAV with CO2 Monitoring Slave Mode, Application 6698

Application Note

Table of Contents

Overview 4

BACnet 4

Hardware Inputs 5

Hardware Outputs..... 5

Using Auxiliary Points 5

Using the Controller as a Point Extension Device 5

Room Unit Operation 6

 Sensor Select 6

 Room CO2..... 7

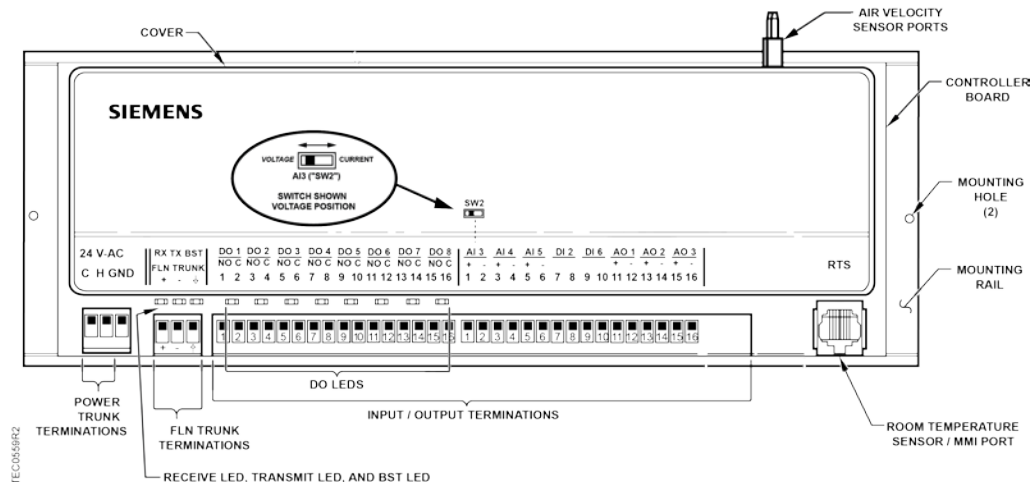
 Room RH..... 7

CO2 Configuration 7

PPCL STATUS 8

Application 6698 Point Database 9

Overview



Generic Controller I/O Layout. See *Wiring Diagram* for application specific details.

Application 6698 is the slave mode application for the Siemens BACnet PTEC VAV with CO2 Monitoring & Floating or AOV Heating Controller (550-499PA). Slave mode is the default application that displays when power is first applied to the controller. Slave mode provides no control. Instead, it allows the operator to perform equipment checkout before a control application is put into effect and to set some basic controller parameters (CTRLR ADDRESS, APPLICATION, etc.).

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

Hardware Inputs

Analog

Air velocity sensor
Room temperature sensor
Room temperature setpoint dial
Room unit with humidity and CO2 (optional)
Auxiliary temperature sensor
Spare temperature sensor
CO2 sensor (optional) or spare Analog Input (AI 3)

Digital

Night/Unoccupied mode override
Wall switch (DI 2)
Digital Input (DI 6)

Hardware Outputs

Analog

AOV 1 - spare
AOV 2 - spare
AOV 3 - spare

Digital

1 to 3 floating control actuators
OR
Spare DOs

Using Auxiliary Points

It is possible to have extra points available in addition to the ones used by the current application that is running in the controller. These extra points will be controlled by PPCL in the PTEC controller or by the field panel.

Using the Controller as a Point Extension Device

If the controller is used only as a point extension device, with no existing control application is in effect, its application must be set to slave mode and the points can be controlled by PPCL in the PTEC or can be unbundled at the field panel. All of these points must be controlled from the field panel or with PPCL in the PTEC controller in order to be used. See the *Point Database* for more information.

For other combinations of DOs and motors, see the *Start-up Procedures* for complete motor enable/reverse procedures.



NOTE:

If using either a motor or DOs as auxiliary points, be sure to set MTR SETUP to the correct value. If using a pair of DOs to control a motor, the DOs cannot be unbundled or commanded separately.

Motor Enable/Reverse Values for MTR SETUP. (For Floating-Type Dampers Only).		
Motor 1 Not Used	Motor 1 Enabled	Motor 1 Enabled and Reversed
0	1	3

Example

If using DO 1 and DO 2 as the physical terminations for a direct acting motor, follow these steps:

1. Set MTR SETUP to 1 to enable the motor.
2. MTR1 COMD (DMPR COMD) can be controlled by PPCL in the PTEC or at the field panel.

Floating Control Actuation Auto-correct

In addition to the existing options for floating control actuator full stroke actions, all floating control actuators are provided with additional logic to fully drive open or closed when commanded to 100% or 0%.

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 CO2 value in units of parts-per-million (PPM). For AI 3, the sensor input (0-100%) is scaled using CO2 SCALE. RM CO2 from the 2200/2300 digital room units or AI3 can be used with PPCL in the PTEC controller or unbundled for 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.

CO2 Configuration

CO2 CONFIG is a configurable point to indicate the source for a CO2 sensor. These applications can utilize either a room unit module with CO2 (as configured in SENSOR SEL) or an external CO2 sensor connected to AI3 as enable by CO2 CONFIG.

CO2 CONFIG	Description
0	Not used
1	CO2 (to be enabled using SENSOR SEL)
3	CO ₂ sensing using AI 3 as scaled by CO2 SCALE

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.

Application 6698 Point Database

Object Type ¹	Object Instance (Point Number)	Object Name (Descriptor)	Factory Default (SI Units) ²	Eng Units (SI Units)	Range	Active Text	Inactive Text
AO	1	CTLR ADDRESS	255	--	0-255	--	--
AO	2	APPLICATION	6698	--	0-32767	--	--
AI	{03}	RM CO2	1000	PPM	0-8191	--	--
AI	{04}	ROOM TEMP	74.0 (23.44888)	DEG F (DEG C)	48-111.75	--	--
AO	10	CO2 SCALE	5000	PPM	0-8191	--	--
AI	{13}	RM STPT DIAL	74.0 (23.44888)	DEG F (DEG C)	48-111.75	--	--
AI	{15}	AI 3	100	PCT	0-102	--	--
BO	18	WALL SWITCH	NO	--	Binary	YES	NO
BI	{19}	DI OVRD SW	OFF	--	Binary	ON	OFF
BI	{24}	DI 2	OFF	--	Binary	ON	OFF
BI	{25}	DI 3	OFF	--	Binary	ON	OFF
BI	{26}	DI 4	OFF	--	Binary	ON	OFF
BI	{27}	DI 5	OFF	--	Binary	ON	OFF
BI	{28}	DI 6	OFF	--	Binary	ON	OFF
BO	{29}	DAY.NGT	DAY	--	Binary	NIGHT	DAY
AI	{35}	AIR VOLUME	0 (0.0)	CFM (LPS)	0-131068	--	--
AO	36	FLOW COEFF	1	--	0-2.55	--	--
AO	{37}	MTR3 COMD	0	PCT	0-102	--	--
AO	{38}	AOV2	0	VOLTS	0-10.23	--	--
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
AI	{47}	AUX TEMP AI4	74.0 (23.495556)	DEG F (DEG C)	37.5-165	--	--
AO	{48}	MTR1 COMD	0	PCT	0-102	--	--
AO	{49}	MTR1 POS	0	PCT	0-102	--	--
AO	51	MTR1 TIMING	95	SEC	0-511	--	--
AO	{52}	MTR2 COMD	0	PCT	0-102	--	--

Object Type ¹	Object Instance (Point Number)	Object Name (Descriptor)	Factory Default (SI Units) ²	Eng Units (SI Units)	Range	Active Text	Inactive Text
AO	{54}	AOV3	0	VOLTS	0-10.23	--	--
AO	56	DPR1 ROT ANG	90	--	0-255	--	--
AO	58	MTR SETUP	0	--	0-255	--	--
AO	59	DO DIR. REV	0	--	0-255	--	--
AO	{60}	AOV1	0	VOLTS	0-10.23	--	--
AO	66	TEMP OFFSET	0.0 (0.0)	DEG F (DEG C)	-31.75-32	--	--
AO	{78}	CTL TEMP	74.0 (23.44888)	DEG F (DEG C)	48-111.75	--	--
BO	{81}	DO 7	OFF	--	Binary	ON	OFF
AI	{82}	AUX TEMP AI5	74.0 (23.495556)	DEG F (DEG C)	37.5-165	--	--
BO	87	CAL MODULE	NO	--	Binary	YES	NO
BO	{89}	DO 8	OFF	--	Binary	ON	OFF
BO	{94}	CAL AIR	NO	--	Binary	YES	NO
AO	95	CAL SETUP	4	--	0-255	--	--
AO	96	CAL TIMER	12	HRS	0-255	--	--
AO	97	DUCT AREA	1.0 (0.09292)	SQ. FT (SQ M)	0-6.375	--	--
AO	{99}	ERROR STATUS	0	--	0-255	--	--
AO	{101}	MTR2 POS	0	PCT	0-102	--	--
AO	102	MTR2 TIMING	130	SEC	0-511	--	--
AO	103	MTR2 ROT ANG	90	--	0-255	--	--
AO	{104}	MTR3 POS	0	PCT	0-102	--	--
AO	105	MTR3 TIMING	130	SEC	0-511	--	--
AO	106	MTR3 ROT ANG	90	--	0-255	--	--
AO	113	CO2 CONFIG	3	--	0-255	--	--
BO	{124}	PPCL STATE	EMPTY	--	Binary	LOADED	EMPTY
AO	126	SENSOR SEL	0	--	0-255	--	--
AI	{127}	RM RH	50	PCT	0-102	--	--

- 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.

Issued by
Siemens Industry, Inc.
Building Technologies Division
1000 Deerfield Pkwy
Buffalo Grove IL 60089
Tel. +1 847-215-1000

© 2014 Copyright Siemens Industry, Inc.
Technical specifications and availability subject to change without notice.