

SIEMENS



BACnet PTEC Controller

Dual Duct 2 AVS - Slave Mode Controller, Application 6693

Application Note

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Diagram of the Siemens 6ES7 307-1EA00-0AB0 power supply unit. The diagram shows the front panel with various ports and labels. At the top, there are two 'AIR VELOCITY SENSOR PORTS'. On the left, a 'COVER' is indicated. The main panel features a 'SIEMENS' logo and a 'VOLTAGE' / 'CURRENT' selector switch. Below this, there are two rows of terminals: '24 V AC' and 'C H GND' on the left, and 'RTS' on the right. The terminals are labeled with various codes like 'RX TX BST', 'DO 1', 'DO 2', etc., and numbers 1 through 16. A 'DO LEDS' section is highlighted with a bracket. On the right side, there are 'MOUNTING HOLE (2)' and a 'MOUNTING RAIL'. At the bottom, there are 'POWER TRUNK TERMINATIONS', 'FLN TRUNK TERMINATIONS', 'RECEIVE LED, TRANSMIT LED, and BST LED', and 'INPUT / OUTPUT TERMINATIONS'. A 'ROOM TEMPERATURE SENSOR / MMI PORT' is located at the bottom right. The diagram is labeled 'FIGURE 1' and 'FIGURE 2'.

Application 6693 is the slave mode application for the Siemens BACnet PTEC Dual Duct 2 AVS Controller (550-497PA). 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 (CTLR ADDRESS, APPLICATION, etc.).

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
Auxiliary temperature sensor
Spare Analog Input (AI 3/AI 4)

Digital

Night mode override
Wall switch (DI 2)
Spare digital input (DI 6)

Hardware Outputs

Analog

Analog output (three) 0-10Vdc

Digital

Floating control actuator 1 (DO 1/DO 2)
Floating control actuator 2 (DO 3/DO 4)
Floating control actuator (DO 5/DO 6)
Digital Output (DO 1 through DO 8)

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 need to 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.

All DOs may be used as separate DOs. The first six may also be used in pairs, (DO 1 and DO 2), (DO 3 and DO 4), and (DO 5 and DO 6), to control a motor as shown in the example. DO 7 and DO 8 cannot be used in pairs.

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			
	MTR SETUP Value ^{a)}		
	Disabled	Enabled	Enabled and Reversed
Motor 1	0	1	3
Motor 2	0	4	12
Motor 3	0	16	48

^{a)} The values in this table are additive and must be added per the requirements of the job.

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 for 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 (from the room unit) for fail communications with a value of 2.

- CO2 enable and supervision (from the room unit) 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 input is 10K.
- To enable 100K thermistor on input, see the following table for additive values of 8.

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 and 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). 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.

Application 6693 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	6693	--	0-32767	--	--
AI	{04}	ROOM TEMP	74.0 (23.44888)	DEG F (DEG C)	48-111.75	--	--
AI	{13}	RM STPT DIAL	74.0 (23.44888)	DEG F (DEG C)	48-111.75	--	--
AI	{15}	AUX TEMP AI5	74.0 (23.495556)	DEG F (DEG C)	37.5-165	--	--
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
BO	{29}	DAY.NGT	DAY	--	Binary	NIGHT	DAY
AI	{30}	AIR VOLUME 2	0 (0.0)	CFM (LPS)	0-131068	--	--
AI	{35}	AIR VOLUME 1	0 (0.0)	CFM (LPS)	0-131068	--	--
AO	36	FLOW COEFF 1	1	--	0-2.55	--	--
AO	{37}	MTR3 COMD	0	PCT	0-102	--	--
AO	{38}	MTR3 POS	0	PCT	0-102	--	--
AO	39	MTR3 TIMING	130	SEC	0-511	--	--
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
AO	{48}	MTR1 COMD	0	PCT	0-102	--	--
AO	{49}	MTR1 POS	0	PCT	0-102	--	--
BO	{50}	DO 8	OFF	--	Binary	ON	OFF
AO	51	MTR1 TIMING	95	SEC	0-511	--	--
AO	{52}	MTR2 COMD	0	PCT	0-102	--	--
AO	{53}	MTR2 POS	0	PCT	0-102	--	--
AO	54	FLOW COEFF 2	1	--	0-2.55	--	--
AO	55	MTR2 TIMING	95	SEC	0-511	--	--

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	56	DPR1 ROT ANG	90	--	0-255	--	--
AO	57	DPR2 ROT ANG	90	--	0-255	--	--
AO	58	MTR SETUP	0	--	0-255	--	--
AO	59	DO DIR. REV	0	--	0-255	--	--
AO	60	DUCT AREA 2	1.0 (0.09292)	SQ. FT (SQ M)	0-6.375	--	--
BO	87	CAL MODULE	NO	--	Binary	YES	NO
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	1.0 (0.09292)	SQ. FT (SQ M)	0-6.375	--	--
AO	{99}	ERROR STATUS	0	--	0-255	--	--
AO	{102}	AOV 1	0	VOLTS	0-10.23	--	--
AO	{103}	AOV 2	0	VOLTS	0-10.23	--	--
AO	{104}	AOV 3	0	VOLTS	0-10.23	--	--
AI	{105}	AI 3	0	PCT	0-102	--	--
AI	{106}	AI 4	0	PCT	0-102	--	--
AO	{107}	RMTMP OFFSET	0.0 (0.0)	DEG F (DEG C)	-31.75-32	--	--
BI	{108}	DI 4	OFF	--	Binary	ON	OFF
BI	{109}	DI 5	OFF	--	Binary	ON	OFF
BI	{110}	DI 6	OFF	--	Binary	ON	OFF
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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Siemens Industry, Inc.
Building Technologies Division
1000 Deerfield Pkwy
Buffalo Grove IL 60089
Tel. +1 847-215-1000

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