

## BACnet Lab and Pressurized Room Controllers with Off-board Air Modules



Figure 1. Lab Controller Module.



Figure 2. Off-board Air Module 550-819B.

### Description

The BACnet Programmable Laboratory Control Modules (LCMs) and Pressurization Room Controllers (PRCs) are available on a new hardware platform. These controllers use the Off-board Air Module (OAM) to measure airflow for standard and custom pressurized room control applications. These controllers are designed to reside on any BACnet control system.

### Lab Controller Module

The LCM (Figure 1) operates as an independent, stand-alone DDC controller and can be connected on the Floor Level Network (FLN). The LCM includes the largest physical point count of any FLN device. Not all physical points are used in all applications.

### Off-board Air Module

The OAM (Figure 2) contains the air velocity sensor (a specialized differential pressure transducer), V/F conversion circuitry and solenoid for auto-zero function. Advanced digital signal processing produces a highly accurate reading of even the noisiest flow signals.

The auto-zero solenoid connects to the air velocity pressure transducer's inlet ports to enable automatic periodic re-calibration. This re-calibration ensures accurate, drift-free airflow measurement. Automatic re-calibration of the differential pressure transducers occurs upon system power-up and when airflows are stable with frequency selectable from 1 to 6 times a day.

### Features

- Communicates using BACnet MS/TP protocol for open communications on BACnet MS/TP networks.
- BTL listed as a B-ASC device.
- Programmable using PPCL.
- LCM can be factory mounted on terminal units or venturi air valves, or field mounted in panels located for easier access.
- OAM factory mounted on terminal units or venturi air valves eliminates field installation of airflow signal tubing.
- Control applications available for a variety of airflow control devices, including dampers, terminal units, fans with VFDs and venturi air valves.
- Control applications using a variety of actuation types including high-speed electronic, low-speed electronic and pneumatic (with transducers).

- Control applications that do not use a general exhaust, do not require a second OAM.
- Airflow sensor is read five times per second, independent of the output device loop time, giving the most accurate reading at all times.
- Airflow sensor is automatically recalibrated periodically to maintain highest accuracy.
- BTU Compensation temperature control application allows tighter control without over-cooling or over-heating during transients (requires discharge temperature sensor).
- Supports the use of wall switch input to change from occupied to unoccupied state.
- Optional room pressurization alarm output to notify laboratory occupants.
- Reports airflow directly in actual cfm (lps).
- Electrically Erasable Programmable Read Only Memory (EEPROM) used for storing control parameters—no battery backup or re-entry of data required.
- Quick return from power failure without operator intervention that maintains room pressure relationship.
- Maintains room pressurization during transient conditions.
- Plenum rated controller.
- User-adjustable offset for the calibration of room temperature reading when required for validation purposes (see *Application Information*).

## Room Sensor

The room sensor connection to the controller board consists of a quick-connect RJ-11 jack. This streamlines installation and reduces controller start-up time.

## Combination Temperature and Relative Humidity Models

The Series 2200 range of TEC room units includes combination temperature and humidity models. For these models, both temperature and relative humidity values are passed digitally to the TEC. This information is passed from the room unit through the RJ-11 cable to the RTS port on the TEC. See the *Series 2200 Temperature Room Units for TEC and ATEC Technical Specification Sheet* (149-820), for more information.

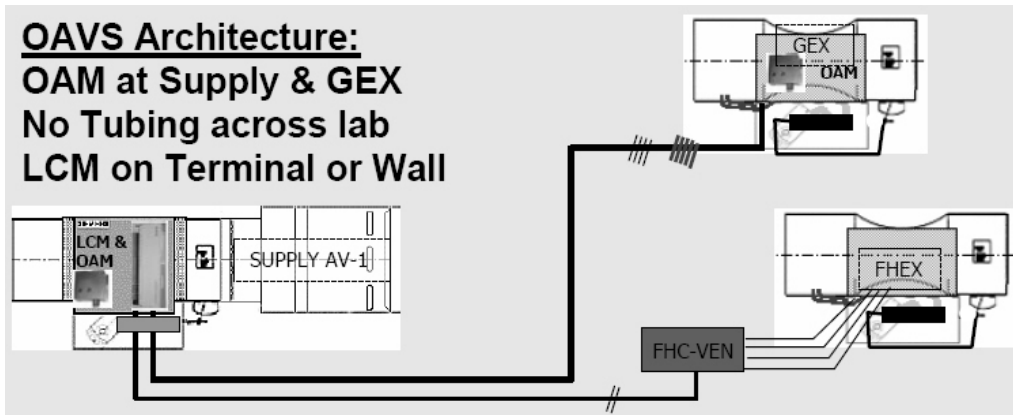
## Specifications

<b>Power Requirements</b>	
Operating Range	19.2 to 27.6 Vac 50 or 60 Hz
Power Consumption (2 OAMs)	6.9 VA (Nominal) to 6.9 VA (Peak) @ 24 Vac (plus 12 VA per DO)
<b>Inputs</b>	
Analog	1 room temperature sensor (10K thermistor) 1 setpoint (optional at RTS) 1 auxiliary temperature sensor (10k (default)/100k thermistor) 2 selectable 0-10 Vdc/4-20mA  2 air velocity sensor inputs (Only for OAM inputs)
Digital	2 dry contacts
<b>Outputs</b>	
Analog	3 0-10 Vdc
Digital	8 DO 24 Vac optically isolated solid state switches @ 0.5 amp 1 DO dedicated to AZ function
<b>Airflow Sensing</b>	
Measurement Range	0 to 5600 fpm (0 to 26 m/s)
Accuracy	3.5% maximum error from velocity pressure of 0.023"wc (5 Pa)
Controlled Temperature Accuracy	±1.5°F (0.9°C)
Dimensions	4-1/8" W x 11-1/4" L x 1-1/2" H (105 mm x 197 mm x 38 mm)
Weight	Approximately 1.65 lb (750g)
<b>Communications</b>	
Remote	9600 bps FLN Trunk, 1/8 load
Local	Portable Operator's Terminal
<b>Ambient Conditions</b>	
Storage Temperature	-40°F to 167°F (-40°C to 75°C)
Operating Temperature	32°F to 122°F (0°C to 50°C)
Humidity Range	0% to 95% (non-condensing)
<b>Agency Listings</b>	
UL Listing	UL 916, PAZX,
cUL Listed	Canadian Standards C22.2 No. 205-M1983, PAZX7
Compliance	FCC 47 CFR Part 15 European EMC Directive (CE) Australian EMC Frame (C-Tick)

# Lab Control Modules Application Information

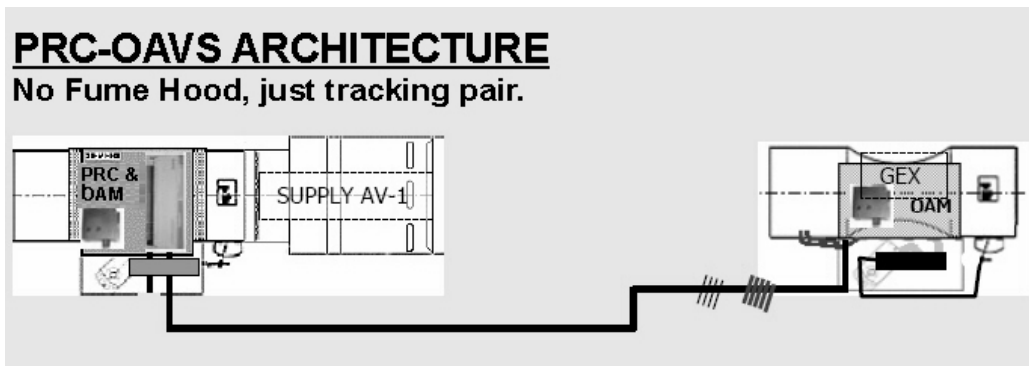
LCM P/N	Application	Airflow Control		Temperature Control		Application Notes
		Device	Output Type	Application	Output	
570-801P	6723	Damper	Low-speed 3-state	Room Temp Sensor	0-10V	Flow-Tracking, compatible with CV2 fume hood control. OCC and UOC states have separate, selectable: >Differential Flow Setpoint >VAV or CAV Temp Control Mode <b>Room Temperature Offset for single-point calibration.</b>
	BTU Comp [Discharge Temp Req'd]					
570-802P	6722	Venturi	Low-speed Modulating	Room Temp Sensor	0-10V	Flow-Tracking, compatible with CV2 fume hood control. OCC and UOC states have separate, selectable: >Differential Flow Setpoint >VAV or CAV Temp Control Mode <b>Room Temperature Offset for single-point calibration.</b>
	6728			BTU Comp [Discharge Temp Req'd]		
570-803P	6721	Damper	High-speed 3-state	Room Temp Sensor	0-10V	Flow-Tracking, compatible with VAV fume hood control. OCC and UOC states have separate, selectable: >Differential Flow Setpoint >VAV or CAV Temp Control Mode <b>Room Temperature Offset for single-point calibration.</b>
	6727			BTU Comp [Discharge Temp Req'd]		
570-804P	6720	Venturi	High-speed Modulating	Room Temp Sensor	0-10V	Flow-Tracking, compatible with VAV fume hood control. OCC and UOC states have separate, selectable: >Differential Flow Setpoint >VAV or CAV Temp Control Mode <b>Room Temperature Offset for single-point calibration.</b>
	6726			BTU Comp [Discharge Temp Req'd]		
570-805P	6724	Damper supply Venturi exhaust	Low-speed Modulating / Low-speed 3-state	Room Temp Sensor	0-10V	Flow-Tracking, compatible with CV2 fume hood control. OCC and UOC states have separate, selectable: >Differential Flow Setpoint >VAV or CAV Temp Control Mode <b>Room Temperature Offset for single-point calibration.</b>
	6730			BTU Comp [Discharge Temp Req'd]		

NOTE: Setpoint hardware adapter is required when using 10K duct sensor in place of room temperature sensor.



# Pressurized Room Controls Application Information

PRC P/N	Application	Airflow Control		Temperature Control		Application Notes
		Device	Output Type	Application	Output	
570-810P	6763	Damper	Low-speed 3-state	Room Temp or Discharge Temp Sequenced with Radiation	REHEAT 3pos /0-10V  optional RADIATION 0-10V	Flow-Tracking, NO FH FLOW INPUT. <b>Separate Heating &amp; Cooling Set Points</b> Two pressurization states. <b>Room Temperature Offset for single-point calibration.</b>
570-811P	6731	Various	Low-speed 3-state OR Modulating	Discharge Temp	REHEAT 0-10V	“Cacade” Control of Room Pressure by Resetting Flow-Tracking Differential <b>Room Temperature Offset for single-point calibration.</b>



## Ordering Information

Description	Part Number
Lab Controller Module	570-8XXP
Off-board Air Module	550-819B
Single Duct Supply Terminal	LGSn....n
Dual Duct Supply Terminal	LGDn....n
Exhaust Terminal	LGEN....n
Airflow Measurement Station	LGFn....n
Venturi Air Valve	
– Constant Volume	AVCn....n
– Variable Volume	AVVn....n
– Zero Leakage Shut-Off	AVZn....n
Venturi Air Valve Accessories	AVAn....n
Laboratory Electronic Actuator	GNP191.1P
TEC Duct Sensor Set Point Adapter Kit	540-656

Technical Specification Sheets	Part Number
Venturi Air Valves	149-425
Venturi Air Valve Accessories	149-495
Laboratory Room Single Duct Supply Air Terminal	149-319
Laboratory Exhaust Air Terminal	149-320
Laboratory Room Dual Duct Supply Air Terminal	149-338
Laboratory Airflow Station	149-317
Laboratory Electronic Actuator Submittal Sheet	155-771

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# BACnet Protocol Implementation Conformance Statement

## Products

Product	Model Number	Protocol Revision	Software Revision	Firmware Revision
Programmable BACnet LCM - OAVS Low Speed Damper and RTS or BTU	570-801P	Revision 4 (135-2004)	2.0.5.4	ZO50
Programmable BACnet LCM – OAVS with Low Speed Venturi Air Valves and RTS or BTU	570-802P	Revision 4 (135-2004)	2.0.5.10	ZN50
Programmable BACnet LCM-OAVS with High Speed Damper and RTS or BTU	570-803P	Revision 4 (135-2004)	2.0.5.6	ZL50
Programmable BACnet LCM-OAVS with High Speed Venturi Air Valves and RTS or BTU	570-804P	Revision 4 (135-2004)	2.0.5.14	ZK50
Programmable BACnet LCM-OAVS with Low Speed Damper Supply, Venturi Air Valve Exhaust and RTS or BTU	570-805P	Revision 4 (135-2004)	2.0.5.5	ZM50
Programmable BACnet PRC-OAVS with Low Speed Damper, Reheat and Radiation	570-810P	Revision 4 (135-2004)	2.0.5.3	ZG50
Programmable BACnet PRC-OAVS with Pressurization Control by Differential Flow Reset, Heating by BTU Compensation and Low Speed Actuation, Floating or Analog Output	570-811P	Revision 4 (135-2004)	2.0.5.3	ZQ50

Date Tested: July 2011 – B-ASC

## Vendor Information

<p><b>Siemens Industry, Inc.</b>          Building Technologies Division          1000 Deerfield Parkway          Buffalo Grove, IL 60089  <a href="http://www.buildingtechnologies.siemens.com/bt/us">www.buildingtechnologies.siemens.com/bt/us</a></p>
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## Product Description

<p>The controller is an integral part of Siemens controls system. The controller can operate stand-alone or can be networked to perform complex HVAC control, monitoring, and energy management functions. This controller communicates using BACnet MS/TP.</p>
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## BACnet Standardized Device Profile

Product	Device Profile	Tested
PTEC	BACnet Application Specific Controller (B-ASC)	✓

## Supported BACnet Interoperability Building Block (BIBBs)

Product	BIBB	Name	Tested
PTEC	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-DDC-B	Device Management-DeviceCommunicationControl-B	✓
	DM-RD-B	Device Management-ReinitializeDevice-B	✓
	DM-BR-B	Device Management-Backup and Restore-B	✓
	DM-OCD-B	Device Management-Object Creation and Deletion-B	✓

## Standard Object Types Supported

Product	Object Type	Creatable	Deletable
PTEC	Analog Input	No	No
	Analog Output	Yes	Yes
	Binary Input	No	No
	Binary Output	Yes	Yes
	Device	No	No
	File	Yes	Yes
	Program	Yes	Yes

## Data Link Layer Options

Product	Data Link and Options
BTEC	MS/TP master (Clause 9), baud rate(s): 9600 bps, 19200 bps, 38400 bps, 76800 bps
	MS/TP slave (Clause 9), baud rate(s): 9600 bps, 19200 bps, 38400 bps, 76800 bps

## Segmentation Capability

Product	Segmentation Type	Supported	Window Size: 32 (MS/TP product limited to 1)
BTEC	Able to transmit segmented messages	No	
	Able to receive segmented messages	No	

## Device Address Binding

Product	Static Device Binding Supported
BTEC	Yes

## Networking Options

Product	Static Device Binding Supported
BTEC	No

## Character Sets

Product	Charcter Sets Supported
BTEC	ANSI X3.4