MODEL FHC50 FUME HOOD CONTROLLER MODEL FHM10 FUME HOOD MONITOR

BACnet® MS/TP COMMUNICATIONS

Date: April 7, 2010 Vendor Name: TSI Inc. Product Name: Fume Hood Controller Product Model Number: FHC50-BAC / FHM10-BAC Applications Software Version: 1.0 Firmware Revision: 1.0 BACnet Protocol Revision: 2

Product Description:

TSI's Fume Hood Monitor continuously measures average fume hood face velocity, while TSI's Fume Hood Controller provides a closed-loop VAV control system for proper lab hood containment. The controller assures safety by responding quickly during sash movement, or to disturbances within the sash plane, to maintain a constant face velocity and contain hazardous chemicals. The controller provides opportunities for energy savings, lower fan brake horsepower, smaller chillers and lower duct work cost by reducing the volume of air exhausted from a hood when the sash is not fully open. This model controller is capable of acting as a stand-alone device or as part of a building automation system via BACnet[®] MS/TP protocol.

BACnet Standardized Device Profile (Annex L):

BACnet Operator Workstation (B-OWS)
 BACnet Building Controller (B-BC)
 BACnet Advanced Application Controller (B-AAC)
 BACnet Application Specific Controller (B-ASC)
 BACnet Smart Sensor (B-SS)
 BACnet Smart Actuator (B-SA)

List all BACnet Interoperability Building Blocks Supported (Annex K):

DS-RP-B	DM-DDB-B
DS-WP-B	DM-DOB-B
DS-RPM-B	DM-DCC-B

Segmentation Capability:

Segmented requests not supported Segmented responses not supported



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Standard Object Types Supported:

	Dynamically Createable	Dynamically Deletable	Optional Properties Supported	Writable Properties (Data Type)
Analog Input	No	No		
Analog Value	No	No		Present_Value
				(Real)
Binary Input	No	No	Active_Text, Inactive_Text	
Binary Value	No	No	Active_Text, Inactive_Text	Present_Value
				(Enumerated)
Multi-state Input	No	No	State_Text	
Multi-state Value	No	No	State_Text	Present_Value (Unsigned
				Int)
Device Object	No	No		Object Name
				(Char String)
				Max Master (Unsigned
				Int)

Data Link Layer Options:

- □ BACnet IP, (Annex J)
- BACnet IP, (Annex J), Foreign Device
- □ ISO 8802-3, Ethernet (Clause 7)
- ANSI/ATA 878.1, 2.5 Mb. ARCNET (Clause 8)
- ANSI/ATA 878.1, RS-485 ARCNET (Clause 8), baud rate(s)
- ☑ MS/TP master (Clause 9), baud rate(s): 76.8k 38.4k, 19.2k, 9600 bps
- □ MS/TP slave (Clause 9), baud rate(s):
- □ Point-To-Point, EIA 232 (Clause 10), baud rate(s):
- □ Point-To-Point, modem, (Clause 10), baud rate(s):
- □ LonTalk, (Clause 11), medium:
- \Box Other:

Device Address Binding:

Is static device binding supported? (This is currently necessary for two-way communication with MS/TP slaves and certain other devices.) \Box Yes \boxtimes No

Networking Options:

Router, Clause 6 - List all routing configurations, e.g., ARCNET-Ethernet, Ethernet-MS/TP, etc.
 Annex H, BACnet Tunneling Router over IP
 BACnet/IP Broadcast Management Device (BBMD)

Character Sets Supported:

Indicating support for multiple character sets does not imply that they can all be supported simultaneously.

🗹 ANSI X3.4	\Box IBM TM /Microsoft TM DBCS	🗖 ISO 8859-1
□ ISO 10646 (UCS-2)	□ ISO 10646 (UCS-4)	🗖 JIS C 6226

If this product is a communication gateway, describe the types of non-BACnet[™] equipment/networks(s) that the gateway supports:

Not Applicable

BACnet[®] MS/TP Object Set

Feature	Object Type	Device Instance	Unit	Range	Read / Write	Notes
Face Velocity	Analog Input	1	fpm	0 to 1000	R	
	maiog mput	1	m/s	0 to 5.08	IX .	
	2	cfm	0 to 10000			
Flow Rate	Analog Input	Z		0 to 16990	К	
Damper or Valve Position	Analog Input	3	%	0 to 100	R	FHC50 only
Sash Position Percent	Analog Input	4	%	0 to 100	R	FHC50 only
Sash Open Area	Analog Input	5	ft ² m ²	0 to 1000 0 to 93	R	FHC50 only
MAC Address**	Analog Value	1	-	1 to 127	R/W	Communications will be lost until
MAC ID** (1 st 4 digits)	Analog Value	2	N/A	1 to 4,194	R/W	front-end updated with new MAC Address
Normal Face	A	2	fpm	0, 60 to 1000		
Velocity Setpoint	Analog value	3	m/s	0, 0.03 to 5.08	K/W	FHC50 only
Setback Face			fpm	0, 60 to 1000		
Velocity Setpoint	Analog Value	4	m/s	0, 0.03 to 5.08	R/W	FHC50 only
Normal Low Face			fpm	0. 5 to 980		
Velocity Alarm Setpoint	Analog Value	5	m/s	0, 0.03 to 4.98	R/W	
Normal High Face			fpm	0, 80 to 1000		
Velocity Alarm Setpoint	Analog Value	6	m/s	0, 0.42 to 5.08	R/W	
Setback Low Face		_	fpm	0, 5 to 980	5 (7.1	
Velocity Alarm Setpoint	Analog Value	7	m/s	0, 0.03 to 4.98	R/W	
Setback High Face		0	fpm	0, 80 to 1000	D /141	
Setpoint	Allalog value	8	m/s	0, 0.42 to 5.08	R/W	
Normal Flow	A	0	cfm	0 to 10000	R/W	FHC50 only
Setpoint	Analog value	9		0 to 16990		
			cfm	0 to 10000		
Setback Flow	Analog Value	10	m ³ /h	0 to 16990	R/W	FHC50 only
Setpoint	U	-	l/s	0 to 4719	,	-
Normal Low Flow			cfm	0 to 10000		
Alarm Setpoint	Analog Value	11	m ³ /h	0 to 16990	R/W	
1			l/s	0 to 4719		
Normal High Flow	Applog Value	12	cim m ³ /h	0 to 10000	р/\//	
Alarm Setpoint Analog value	Allalog value	12		0 to 4719	N/ W	
			cfm	0 to 10000		
Setback Low Flow	Analog Value	13	m³/h	0 to 16990	R/W	
Alarm Setpoint			l/s	0 to 4719	,	
Setback High Flow		nalog Value 14	cfm	0 to 10000		
Alarm Setpoint	Analog Value		<u>m³/h</u> l/s	0 to 16990 0 to 4719	R/W	
Min. Damper Position	Analog Value	15	%	0 to 100	R/W	FHC50 only
Max. Damper Position	Analog Value	16	%	0 to 100	R/W	FHC50 only

Feature	Object Type	Device Instance	Unit	Range	Read / Write	Notes
Minimum Flow	Analog Value	17	cfm	0 to 10000	R/W	FHC50 only
Setpoint			m ³ /h	0 to 16990		
			l/s	0 to 4719		
Maximum Flow Setpoint	Analog Value	18	cfm	0 to 10000	R/W	FHC50 only
			M³/h	0 to 16990		
			l/s	0 to 4719		
Setback Damper Position Setpoint	Analog Value	19	%	0 to 100	R/W	FHC50 only
High Sash Position Alarm Setpoint	Analog Value	20	%	0, 10 to 105	R/W	
MAC ID** (Last 3 digits)	Analog Value	21	N/A	1 to 999	R/W	Communications will be lost until front-end updated with new MAC Address
Low Velocity Alarm Status	Binary Input	1	0: Inactive 1: Active	0;1	R	
High Velocity Alarm Status	Binary Input	2	0: Inactive 1: Active	0;1	R	
Low Flow Alarm Status	Binary Input	3	0: Inactive 1: Active	0;1	R	
High Flow Alarm Status	Binary Input	4	0: Inactive 1: Active	0;1	R	
High Sash Position Alarm Status	Binary Input	5	0: Inactive 1: Active	0;1	R	
Velocity Sensor Error Status	Binary Input	6	0: Inactive 1: Active	0;1	R	
Data Error Status	Binary Input	7	0: Inactive 1: Active	0;1	R	
Setback Status	Binary Input	8	0: Inactive 1: Active	0;1	R	
Emergency Status	Binary Input	9	0: Inactive 1: Active	0;1	R	
Auto Baud	Multi-State	1	0: No Action 1 Set Auto Baud	0;1	R/W	Controller will reset variable to 0 after setting baud rate.
Emergency Mode	Multi-State	2	1: Exit Emergency Mode 2: Enter Emergency Mode 3: Normal	1; 2; 3	R/W	
Setback Mode	Multi-State	3	1: Exit Setback Mode 2: Enter Setback Mode 3: Normal	1; 2; 3	R/W	
Units Value	Multi-State	4	1: fpm and cfm 2: m/s and m ³ /h 3: m/s & l/s	1; 2; 3	R/W	

* The units are based on the value of the Units Value object. When the Units Value is set to 1 the units are in English form. When the Units Value is set to

2 or 3 the units are based on the value of the ones value object. When the ones value is set of 1 the units are in English is the default value.
** The device index is the 1st 4 digits of the MAC ID (AV 2) multiplied by 1000 plus the Last 3 Digits of the MAC ID (AV 21). For example, if the device index is 4,194,302 then the 1st 4 digits of the MAC ID (AV 2) will be 4,194 and the Last 3 Digits of the MAC ID (AV 21) will be 302.

Specifications subject to change without notice.



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