

Model FHC50 Fume Hood Controller

Model FHM10 Fume Hood Monitor

N2 Communications

Johnson Controls N2 communications are installed in the Model FHM10 fume hood monitor and Model FHC50 fume hood controller. This document provides the technical information needed to communicate between the host DDC system and the Model FHM10 or Model FHC50 units. This document assumes the programmer is familiar with N2 protocol. Further technical assistance is available from TSI if your question is related to TSI interfacing to a DDC system. If you need further information regarding Modbus[®] programming in general, please contact Johnson Controls, Inc.

Description of Variables

NPT - Network Point Type

Variables are defined as analog inputs, binary inputs, and analog outputs. Analog inputs are current control parameters and items that the controller is measuring. Binary inputs represent controller states. Analog outputs are the programmable setpoints for the Fume Hood Controller. These setpoints can be changed through the keypad or by over-writing the current setpoint.

NPA - Network Point Address

Address of the desired point.

Change of Status (COS) - Face Velocity Analog Input

The FHC50 has the ability to change control setpoints locally. The alarm setpoints need to be based on the controllers control setpoint (AI #2). The unit can be changed from Normal Mode to Setback Mode. For example the setpoint could go from 100 ft/min to 60 ft/min when the Setback key is pressed. If the COS alarm setpoints are not changed to accommodate you could get low alarm or low warning messages when the unit is working correctly. If these alarm points are set outside of the setback and main velocity setpoint values, incorrect alarm messages can be prevented.

Override Analog Input Command

The Damper Position Analog Input value can be set using the override command. This value will be reset to the correct item when the Override is released. There is not a time-out on the override command.

Other Analog Input values cannot be Overridden.

Override Binary Input Command

Overriding a 1 to the Setback or Emergency binary inputs enables the respective mode. To return the controller to normal mode from setback mode, press the Setback key on the controller, toggle the setback contact input, or release the override. To release controller from emergency state, override a 0 to the Emergency input, toggle the emergency contact input, or press either the emergency or reset key. Releasing the override will return the controller to the state it was in previous to the emergency, either Normal or Setback.

The alarm, data error, and sensor error variables can be overridden, but this will not affect the controller. Overriding the low alarm variable will result in a change of status, but will not put the controller into low alarm mode. The local alarm modes can only be controlled locally. Only override these variables for diagnostic purposes, and release them for normal operation.

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Binary Inputs, Sensor Error and Data Error

Sensor Error and Data Error binary inputs are used to indicate if something has gone wrong with the controller. The Sensor Error is set when the sensor on the controller has a malfunction. This indicates that service should be done on the controller. Data Error indicates when some of the data stored on the device has been corrupted. The calibration and setpoint values should be checked on the controller.

Override Analog Output Command

The analog output variables can be overridden to change their values. The overridden value will be checked for validity. If invalid, the override command will be ignored, and the value will not change. The override flag will not be set when the value is ignored. The override command will be cleared when the variable is reset in the menus. The variable will not reset with the release command.

Supported Commands

Command	Response
Request Device ID	Returns 0x10
Synchronize Time Command	Acknowledged. There is no internal clock to synchronize.
Poll without/With Ack Message	Any change of status is returned
Read Analog Input Command	Variable value
Read Binary Input Command	Variable value
Read Analog Output Command	Variable Value
Write Analog Input	Acknowledge
Write Binary Input	Acknowledge
Write Analog Output	Acknowledge
Override Analog Input Command	Acknowledge
Override Binary Input Command	Acknowledge
Override Analog Output Command	Acknowledge
Override Release Request	Acknowledge
Identify Device Type Command	Returns 0x10H

Note: Poll Without/With Ack Message will need to be sent twice in order to receive all of the possible change of status variables.

NPT	NPA	Feature	Unit
AI	1	Face Velocity	fpm, m/s
AI	2*	Current Face Velocity Setpoint	fpm, m/s
AI	3	Flow Rate	cfm or L/s
AI	4*	Current Flow Rate Setpoint	cfm or L/s
AI	5*	Sash Position Percent	%
AI	6*	Sash Open Area	ft ² or m ²
AI	7*	Damper or Valve Position	%
AO	1*	Normal Face Velocity Setpoint	fpm, m/s
AO	2*	Setback Face Velocity Setpoint	fpm, m/s
AO	3*	Min. Damper Position	%
AO	4*	Max. Damper Position	%
AO	5*	Normal Flow Setpoint	cfm or L/s
AO	6*	Setback Flow Setpoint	cfm or L/s
AO	7*	Minimum Flow Setpoint	cfm or L/s
AO	8*	Maximum Flow Setpoint	cfm or L/s
AO	9	Normal Low Face Velocity Alarm Setpoint	fpm, m/s
AO	10	Normal High Face Velocity Alarm Setpoint	fpm, m/s
AO	11	Normal Low Flow Alarm Setpoint	cfm or L/s

NPT	NPA	Feature	Unit
AO	12	Normal High Flow Alarm Setpoint	cfm or L/s
AO	13	Setback Low Face Velocity Alarm Setpoint	fpm, m/s
AO	14	Setback High Face Velocity Alarm Setpoint	fpm, m/s
AO	15	Setback Low Flow Alarm Setpoint	cfm or L/s
AO	16	Setback High Flow Alarm Setpoint	cfm or L/s
AO	17*	Setback Damper Position Setpoint	%
AO	18	High Sash Position Alarm Setpoint	%
AO	19	Units Value	0: English Units (FPM, CFM) 1: Metric Units (m/s, m ³ /h) 2: Metric Units (m/s, l/s)
BI	1	Low Velocity Alarm Status	0: Inactive 1: Active
BI	2	High Velocity Alarm Status	0: Inactive 1: Active
BI	3	Low Flow Alarm Status	0: Inactive 1: Active
BI	4	High Flow Alarm Status	0: Inactive 1: Active
BI	5	High Sash Position Alarm Status	0: Inactive 1: Active
BI	6	Velocity Sensor Error Status	0: Inactive 1: Active
BI	7	Data Error Status	0: Inactive 1: Active
BI	8	Setback Status	0: Inactive 1: Active
BI	9	Emergency Status	0: Inactive 1: Active

*Feature only available on Model FHC50 fume hood controller.

Specifications subject to change without notice.

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