

TSI[®] MODEL 8650 SUREFLOW[™] CONTROLLER CIMETRICS[™] COMMUNICATIONS

APPLICATION NOTE LC-118

Cimetrics[™] communications are installed in all Model 8650 fume hood face velocity controllers. This document provides the technical information needed to communicate between the host DDC system and Model 8650 units. This document assumes the programmer is familiar with Cimetrics[™] 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 Cimetrics[™] programming in general, please contact:

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The Cimetrics[™] protocol utilizes TINY-NSP Nine Bit Serial Protocol for data transfer and error checking. Check the Cimetrics Inc. TINY-NSP User's Manual for additional information.

Blocks of data can be read from each device. Using a block format will speed up the access time for each device. The size of the blocks is limited to 15 bytes. This means the maximum message length that can be transferred is 15 bytes. The typical response time of the device is around 0.05 seconds with a maximum of 0.1 seconds.

Unique to TSI

The list of variable addresses shown below skips some numbers in the sequence due to internal Model 8650 functions. This information is not useful to the DDC system and is therefore deleted. Skipping numbers in the sequence will not cause any communication problems.

Occasionally an asterisk (*) will accompany a flow variable name. This designates that the flow station could be mounted in either supply or exhaust duct, but the variable name states it is the supply flow. If the flow station is located in the exhaust, the DDC system will need a name change to properly display on the DDC screen.

All variables are outputted in English units: feet per minute, and CFM. If the DDC system is to display different units, the DDC system needs to make the conversion.

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XRAM Variables

These variables can be read using Cimetrics command **07 Read From Slave Ext Ram**. They can be written to using Cimetrics™ command **04 Write To Slave Ext Ram**. These variables are the same “menu items” that are configured from the SureFlow™ keypad. The calibration and control items are not accessible from the DDC system. This is for safety reasons, since each room is individually setup for maximum performance. TSI offers a number of different models, so if a feature is not available on a unit, the variable is set to 0.

8650 Variable List

Variable Name	Variable Address	Input Provided to Master System	Integer DDC system receives
Face Velocity	0	Current Face Velocity	Displayed in ft/min.
Status Index	2	Status of SUREFLOW™ device	0 Normal 1 Setback 2,3 Low Alarm 4,5 High Alarm 6,7 No Flow Alarm 8,9 Sensor Error 10,11 Data Error 12,13 Emergency
Emergency Mode	4	Put unit in or out of emergency	Write only variable 0 Take unit out of emergency mode. 1 Put unit in emergency mode.
Setback Mode	6	Put unit in or out of setback	Write only variable 0 Take unit out of setback mode 1 Put unit in setback mode.
Main Setpoint	8	Main control setpoint	Displayed in ft/min
Setback Setpoint	10	Setback control setpoint	Displayed in ft/min
Low Alarm	12	Low alarm setpoint	Displayed in ft/min
High Alarm	14	High alarm setpoint	Displayed in ft/min
No Flow Alarm	16	No flow alarm setpoint	Displayed in ft/min
Averaging Index	18	Display averaging period	0 .3 sec. 1 .5 sec. 2 .75 sec. 3 1 sec. 4 2 sec. 5 3 sec. 6 5 sec. 7 10 sec. 8 20 sec. 9 40 sec.
Units	20	Units of device	0 ft/min 1 m/s
Alarm Mode	22	Alarm reset mode	0 Unlatched 1 Latched
Output Signal	24	Output mode	0 4 to 20 mA 1 0 to 10 Volt
Audible Disable	28	Permanent mute enable	0 Off 1 On
Network Protocol	30	Communications Protocol	0 Modbus 1 Cimetrics
Network Address	32	Communications Address	1 to 247
Control Action	56	Action of control signal	0 Reverse 1 Direct
Set Code Enable	58	Setpoint menu access code enable	0 Off 1 On
Conf Code Enable	60	Configure menu access code enable	0 Off 1 On
Cal Code Enable	62	Calibration menu access code enable	0 Off 1 On
Control Code Enable	64	Control menu access code enable	0 Off 1 On
Diagnostic Code Enable	66	Diagnostic menu access code enable	0 Off 1 On

EXAMPLE of 04 Write_To_Slave_Ext_Ram function format

This example changes the low alarm setpoint to 60 ft/min

QUERY		RESPONSE	
Field Name	(Hex)	Field Name	(Hex)
Target Node Address	01	Target Node Address	00
Message Length	09	Message Length	05
Eight-Bit Checksum	**	Eight-Bit Checksum	**
Source Node Address	00	Source Node Address	01
Command Opcode	04	Command Opcode	11
Data Address (Low)	0C		
Data Address (High)	00		
Data Value (High)	00		
Data Value (Low)	3C		

Example of 07 Read_From_Slave_Ext_Ram function format

This example reads the face velocity and status index.

QUERY		RESPONSE	
Field Name	(Hex)	Field Name	(Hex)
Target Node Address	01	Target Node Address	00
Message Length	08	Message Length	09
Eight-Bit Checksum	**	Eight-Bit Checksum	**
Source Node Address	00	Source Node Address	01
Command Opcode	07	Command Opcode	12
Data Address (Low)	00	Data (High Byte)	00
Data Address (High)	00	Data (Low Byte)	64 (100 ft/min)
Data Number Bytes	04	Data (High Byte)	00
		Data (Low Byte)	00 (0 Normal)



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