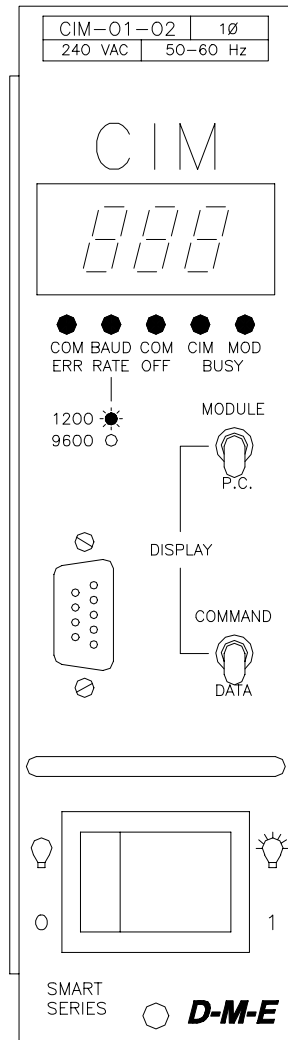


CIM-01-01 & CIM-01-02



Computer Interface Module

User's Manual

D-M-E Company

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WARRANTY

D-M-E Company warrants that this product will be free from defects in materials and workmanship for a period of one (1) year from the date of shipment. If any such product proves defective during this warranty period, D-M-E Company, at its option, either will repair the defective product without charge for parts and labor, or will provide a replacement in exchange for the defective product.

This warranty shall not apply to any defect, failure or damage caused by improper use or improper or inadequate maintenance and care. D-M-E Company shall not be obligated to furnish service under this warranty a) to repair damage resulting from attempts by personnel other than D-M-E Company representatives to repair or service the product; b) to repair damage resulting from improper use or connection to incompatible equipment; or c) to service a product that has been modified or integrated with other products when the effect of such modification or integration increases the time or difficulty of servicing the product.

SAFETY

D-M-E Company products have been designed to be safe and simple to operate. As with any electronic equipment, you must observe standard safety procedures to protect both yourself and the equipment.

To Prevent Injuries:

- To avoid electrical shock or fire hazard, do not apply voltage to a terminal that exceeds the range specified for that terminal.
- To avoid mechanical injury, electrical shock or fire hazard, do not operate this product with covers or panels removed.
- To avoid electrical shock or fire hazard, do not operate this product when wet.
- To avoid injury or fire hazard, do not operate this product in an explosive atmosphere.

To Prevent Product Damage:

- Do not operate this product from a power source that applies more than the voltages specified.

Computer Interface Module

CIM-01-01 & CIM-01-02

GENERAL DESCRIPTION

The CIM Computer Interface Module represents an impressive breakthrough in automated process management and information gathering. Used in conjunction with D-M-E CSS modules and main frames with communications capability, the CIM module was developed to connect a D-M-E Temperature Control System to a molding machine. The CIM module provides a method to collect vital information that was once difficult to obtain and analyze. Equally important is the CIM's ability to control settings directly from a molding machine. This all adds up to greater control and accuracy as management can virtually control all temperature related operations from one remote location host system. The CIM module and the CSS module are part of a temperature control system specifically designed for runnerless injection molding of plastic parts.

MONITORS AND TRACKS OPERATING CONDITIONS

In conjunction with all the above functions, the CIM interface module also permits selection or monitoring of the following conditions: Over and under temperature; open, shorted or reversed thermocouple; Smart Start Mode; manual mode; power to load and ground fault.

FEATURES

- SPI 3.01 Compatible - will connect and operate from machine control consoles equipped with SPI 3.01 Standard Communications Protocol (DEV. ID 26).
- Industry Standard Interfaces: EIA232, EIA485 multi-drop, EIA422.
- Simple to use---requires no special training.

- 63 zone communications capability.
- Compatible with both Smart Series and G-Series communications style (MFCP) Main Frames. *

* For use with CSS modules only.

NOTE: Non-communications style Main Frames (MFP type frames) must be upgraded to communications style (MFCP type frames) with an easy-to-install Communications Interface Kit (CIK) available from D-M-E. Contact D-M-E for details.

COMPATIBLE INTERFACES (SWITCH SELECTABLE ON MODULE)

- RS232 (EIA232) DUPLEX
50 ft. max.
- RS485 (EIA485) DIFFERENTIAL
4000 ft. max. multi-drop
- RS422 (EIA422) DIFFERENTIAL
4000 ft. max.

NOTE: Cables for RS232 interface are available from D-M-E. See D-M-E catalog for more information.

INSTALLATION

CIM module is connected to a molding machine using an interface cable. The CIM module simply slides into any unused zone position in the mainframe to provide communications to all zones. The system is immediately operational after connecting the molding machine to the CIM Module. The CIM requires a molding machine with a serial EIA232, EIA485, or EIA422 port & SPI compatible software.

D-M-E CIM COMMUNICATION SPECIFICATIONS

- **Maximum Number of Zones:** 63 Zones per machine.
- **Maximum Number of Mainframes per Machine:** 8, using one CIM module for each mainframe group.
- **Baud Rate:** 9600 or 1200 baud.
- **Molding Machine Requirements:** SPI 3.01 runnerless temp control software compatible. Contact your molding machine manufacturer. (The host molding machine must be outfitted with on EIA 232, 422 or 485 communications. EIA-485 is the preferred method and it is what SPI specifications require).

FRONT PANEL CONTROLS AND INDICATORS (SEE FIGURE 1)

1. **IDENTIFICATION LABEL:** Provides model number and power ratings for quick reference.
2. **DIGITAL LED DISPLAY:** Multi-function display indicates the transmitted data or commands.
3. **STATUS INDICATORS:** LED's illuminate to show status of communications and baud rate selection.
4. **MODULE / P.C. SWITCH:** Selects the display mode of module or peripheral commands / data.
5. **COMMUNICATIONS CONNECTOR:** DB-9 style communications connector. A duplicate of this connector is included at rear of module for those who prefer to route the computer interface wiring internally.
6. **COMMAND / DATA SWITCH:** Selects the display mode of commands or data.
7. **HANDLE:** Assists in insertion or removal of module from main frame.
8. **POWER ON/OFF SWITCH:** Controls AC power to the module.
9. **PUSH-PULL FASTENER:** Quickly locks modules into main frame. No tools required.

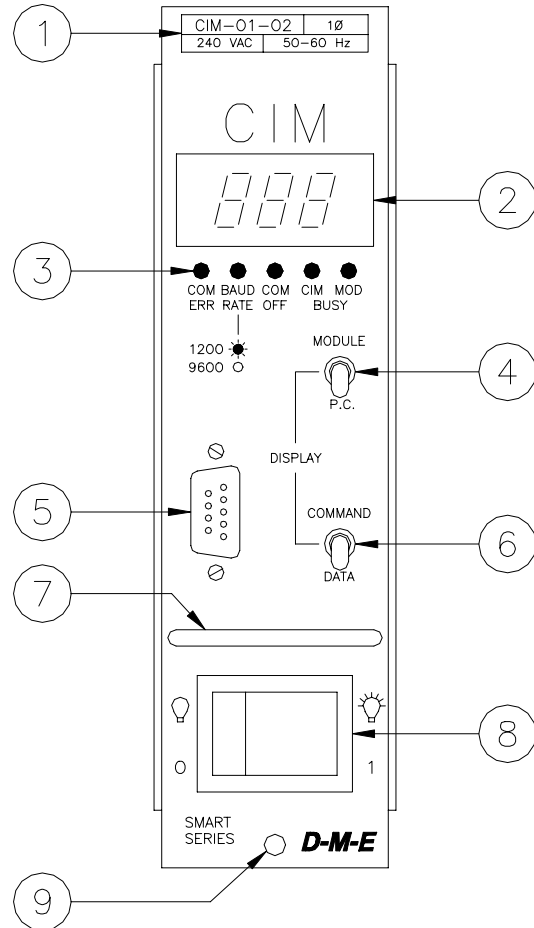


Figure 1 - CIM Front Panel Controls

CABLES

Standard 10 and 50 foot cables for RS232 interface are available. Cables for RS485 and RS422 are available on special order.

ELECTRICAL POWER SPECIFICATIONS

Input Voltage: 240/120 VAC +10% -20%, 240 VAC Standard, 120 VAC Available

Frequency: 50/60 Hz

DC Power Supplies: Internally generated, regulated and compensated

Module power usage: Less than 5 watts

Dimensions: 2" W x 7" H x 7-1/2" D (5.08 x 17.78 x 19.05 cm)

NOTE: Modules are only compatible with main frames wired with communications kit.

ELECTRICAL CONNECTIONS

When connecting the CIM module to a molding machine, the following communications protocol must be followed: The CIM module is supplied with a nine pin DB-9 D-subminiature connector mounted to the faceplate and another mounted to the backside of the side panel near the rear of the module. The two connectors are wired the same so that either one may be used. Mating connectors, male DB-9-P plugs, can be purchased at any electronics supply or computer store. The wire type required is as follows: 24 AWG shielded twisted-pair cable with a shunt capacitance of less than 52.5 pF/M. A standard "off-the-shelf" cable that meets this specification is the Belden part number 9730. Custom cables can be ordered as specials through D-M-E.

NOTE: A rotary switch has been provided on the component side of the circuit board near the rear of the module. This switch, used as the "machine selector", must remain in the "1" position unless you are using RS-485 wiring for multiple mainframes. In this case, the switch must be set to indicate "1" for the first mainframe, "2" for the second mainframe,up to "8" for the eighth mainframe. This is used to identify the different mainframe systems to the molding machine.

(SPI 3.01 Interface)

Typical Wiring RS-485 (EIA-485) 1200 meters (4000 feet) or less. See Figure 2. [DB-9]

CIM Pin No.		HOST Pin No.
1	COMMON	1
	SHIELD	3
4	XMIT(+)	4
5	XMIT(-)	5
8	RECV(+)	8
9	RECV(-)	9

(Typical RS-485)

NOTE: The shield is connected to only one end of the cable assembly. Do not connect the shield to the CIM unit end of the cable.

A termination plug is supplied with the CIM for older versions of SPI protocol. Remove this plug from the rear of the module for any molding machine made after 1991.

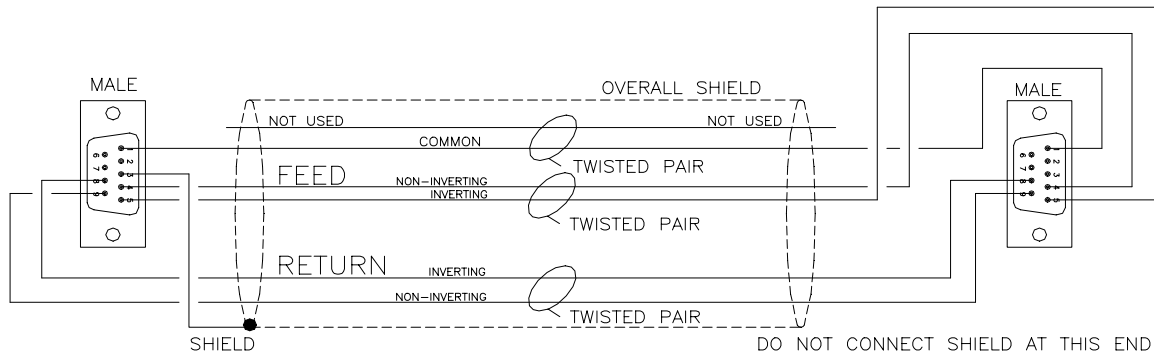


Figure 2 - RS-485 Communications Cable - Schematic

Note: When using multiple CIM modules and mainframes with a single molding machine, the CIM modules must be wired in a daisy chain configuration. Consult D-M-E Electronic Engineering Department for more information.

Typical Wiring RS-422 (EIA-422) 1200 meters (4000 feet) or less. [DB-9]

CIM Pin No.		Host Pin No.
4	XMIT(+)	4
5	XMIT(-)	5
8	RECV(+)	8
9	RECV(-)	9
	SHIELD	CHASSIS

(Typical RS-422)

NOTE: The shield is connected to only one end of the cable assembly. Do not connect the shield to the CIM unit end of the cable.

Typical Wiring RS-232 (EIA-232) 15 meters (50 feet) or less. [DB-9]

CIM Pin No.		Host Pin No.
2	RECV	2
3	XMIT	3
1	COMMON	5
	SHIELD	CHASSIS

(Typical RS-232)

NOTE: The shield is connected to only one end of the cable assembly. Do not connect the shield to the CIM unit end of the cable.

BAUD RATE SELECTOR SWITCH

The CIM module can be operated at 1200 or 9600 BAUD, no parity, 8 data bits. The Baud Rate is selected by the printed circuit board mounted slide switch, SW5 position 4. Set the switch to the "ON" position for 1200 Baud, "OFF" for 9600 Baud. (See Figure 4).

SWITCH SETTINGS

Communications switches must be set to the correct positions for proper communications to the Host computer. These switches are shown in detail in an enlarged view on the component layout page (see figure 4).

SW4 selects the correct "Mainframe" number. This switch, used as the "mainframe selector", must remain in the "1" position unless you are using RS-485 wiring

for multiple mainframes. In this case, the switch must be set to indicate "1" for the first mainframe, "2" for the second mainframe,up to "8" for the eighth mainframe.

SW5 and SW6 are used concurrently to select the Communications Protocol settings.

SW5 - 1 selects single or double command hits. Double is selected for most situations and assures communications establishment. Single should only be selected when operating the unit at 50 Hertz.

SW5 - 2 & 3 are not used.

SW5 - 4 selects the communications Baud Rate of 1200 or 9600 Baud.

SW5 - 5 & 6 selects RS485/422 or RS232 protocol. (To be used with SW6)

SW6 - A, CENTER, & B selects between RS422, RS485, or RS232 protocols respectively.

For RS232 protocol settings:

SW5 - 5	OFF
SW5 - 6	ON
SW6	B

For RS422 protocol settings:

SW5 - 5	ON
SW5 - 6	OFF
SW6	A

For RS485 protocol settings:

SW5 - 5	ON
SW5 - 6	OFF
SW6	CENTER

TROUBLESHOOTING

CABLES

Cables must be wired correctly to match the communications configuration in order to function properly. Each connection must be made with the highest quality termination available. If you are using a crimp tool and crimp tight connectors, the crimp must be as specified by the connector manufacturer. Also, if solder cup connectors are used, solder joints must be checked to ensure that

they are not cold soldered joints, or have frayed wires. All cables should be checked with an ohm meter to ensure that all termination's have a resistance of less than 2 ohms. Also, check for crossed (short circuited) wires.

CONTROLLER MODULES

Controller modules can cause problems with communications and yet still work well at controlling temperature. This is due to a separate set of electronic components used on the controller for communications. Sometimes a controller can cause communications problems with neighboring modules. This problem can be best detected by testing communications with only using one module inserted into the main frame along with a CIM module. If the problem can be narrowed down to a particular module, that module will need to be repaired. However, if all modules exhibit the same problem, it is probably not a controller problem.

MAIN FRAME ENCLOSURES

Most common of all problems with the main frame enclosures is that the modules are not inserted all the way into the slot. This is critical due to the number of connections made at the communications strip which is located in the rear connector panel of the main frame. Many times the push latch has been damaged and one of its segments has been bent against the faceplate. This restricts the module from being inserted fully into the main frame. Replace the damaged latch to make a positive connection.

Another common problem is an unaddressed or an incorrectly addressed communications strip in the mainframe, or no communications strip installed at all. Refer to the D-M-E Technical Manual for the Smart Series Temperature Controls System, to determine if the communications strip is present and addressed properly. Also, see figure 3 to determine proper addressing.

SUPPORTED COMMANDS

A list of all the supported commands and expected responses is listed in figure 5.

COMMUNICATIONS PROBLEMS

Although it is rare that the CIM may be causing a problem with communications, this is typically due to setup switches not positioned correctly. (See figure 4.)

Figure 5 shows a chart of the commands and data that can be expected to be displayed when the system is operating properly. This can be used to debug or troubleshoot any communications problems.

RETURN POLICY

The D-M-E CIM-01-01 & CIM-01-02 modules are warranted for 1 year parts and labor, excluding fuses.

Contact D-M-E Customer Service for return authorization for repairs or warranties. Replacement parts are also available through the Customer Service Department.

D-M-E CUSTOMER SERVICE

US, West Coast: 1-213-263-9261
Elsewhere in US: 1-800-626-6653
Canada: 1-416-677-6370

SERVICE CENTER USA

D-M-E WORLD HEADQUARTERS
29111 STEPHENSON HIGHWAY
MADISON HEIGHTS, MICHIGAN 48071
TELEFAX: (810)398-6174

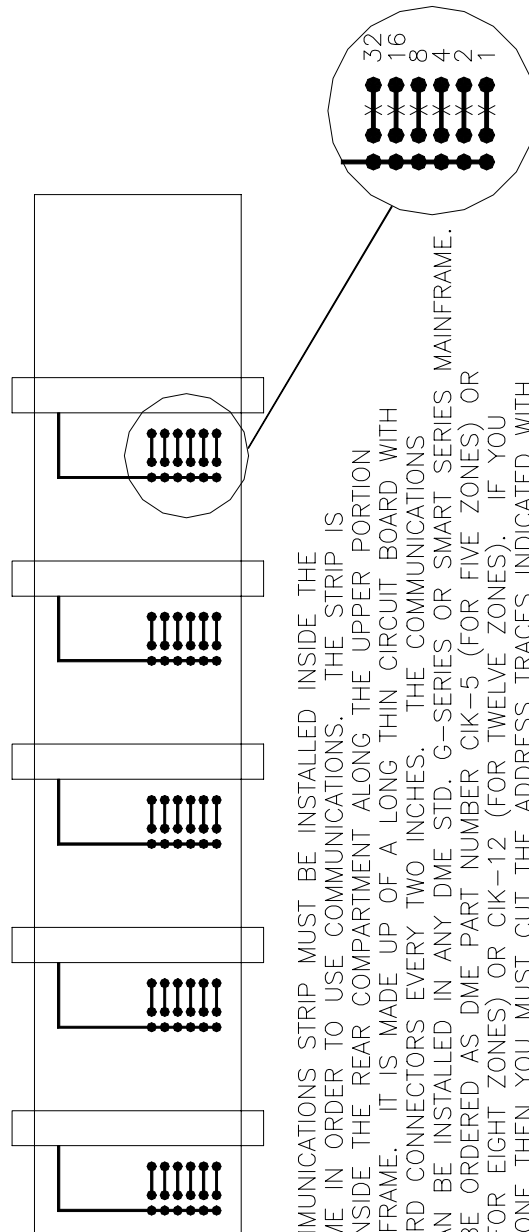
REPLACEMENT PARTS LIST

To meet D-M-E engineering specifications, use only DME replacement parts.

S1	Power Switch	RPM0008
F1 & F2	Fuses, 1 Amp	ABC1
T1	Transformer	RPM0009
Handle	Handle	RPM0027
Micro	CIM Micro/software	CIM0001

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ZONE NO.	CUT TRACES INDICATED BY AN X					
	32	16	8	4	2	1
1						
2					X	X
3					X	X
4				X	X	X
5				X	X	X
6				X	X	X
7				X	X	X
8			X	X	X	X
9			X	X	X	X
10			X	X	X	X
11			X	X	X	X
12			X	X	X	X
13			X	X	X	X
14			X	X	X	X
15			X	X	X	X
16		X	X	X	X	X
17		X	X	X	X	X
18		X	X	X	X	X
19		X	X	X	X	X
20		X	X	X	X	X
21		X	X	X	X	X
22		X	X	X	X	X
23		X	X	X	X	X
24		X	X	X	X	X
25		X	X	X	X	X
26		X	X	X	X	X
27		X	X	X	X	X
28		X	X	X	X	X
29		X	X	X	X	X
30		X	X	X	X	X
31		X	X	X	X	X
32	X	X	X	X	X	X
33	X	X	X	X	X	X
34	X	X	X	X	X	X
35	X	X	X	X	X	X
36	X	X	X	X	X	X
37	X	X	X	X	X	X
38	X	X	X	X	X	X
39	X	X	X	X	X	X
40	X	X	X	X	X	X
41	X	X	X	X	X	X
42	X	X	X	X	X	X
43	X	X	X	X	X	X
44	X	X	X	X	X	X
45	X	X	X	X	X	X
46	X	X	X	X	X	X
47	X	X	X	X	X	X



THE COMMUNICATIONS STRIP MUST BE INSTALLED INSIDE THE MAINFRAME IN ORDER TO USE COMMUNICATIONS. THE STRIP IS FOUND INSIDE THE REAR COMPARTMENT ALONG THE UPPER PORTION OF THE FRAME. IT IS MADE UP OF A LONG THIN CIRCUIT BOARD WITH EDGE CARD CONNECTORS EVERY TWO INCHES. THE COMMUNICATIONS STRIP CAN BE INSTALLED IN ANY DME STD. G-SERIES OR SMART SERIES MAINFRAME. IT CAN BE ORDERED AS DME PART NUMBER CIK-5 (FOR FIVE ZONES) OR CIK-8 (FOR EIGHT ZONES) OR CIK-12 (FOR TWELVE ZONES). IF YOU INSTALL ONE THEN YOU MUST CUT THE ADDRESS TRACES INDICATED WITH A SHARP KNIFE - BE CAREFUL NOT TO CUT SURROUNDING TRACES ON THE CIRCUIT BOARD.

Figure 3 - Communications Strip - Jumper Addressing

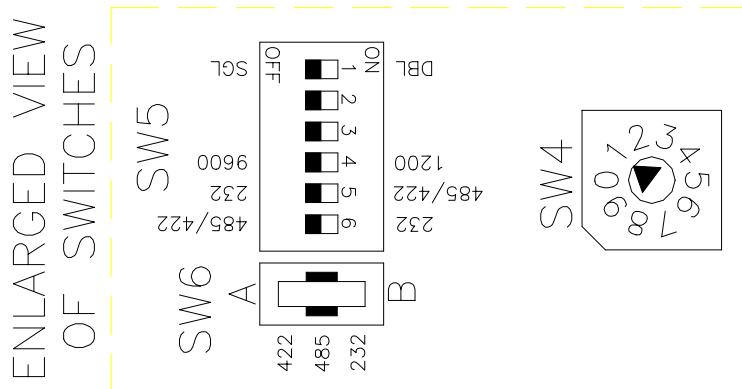
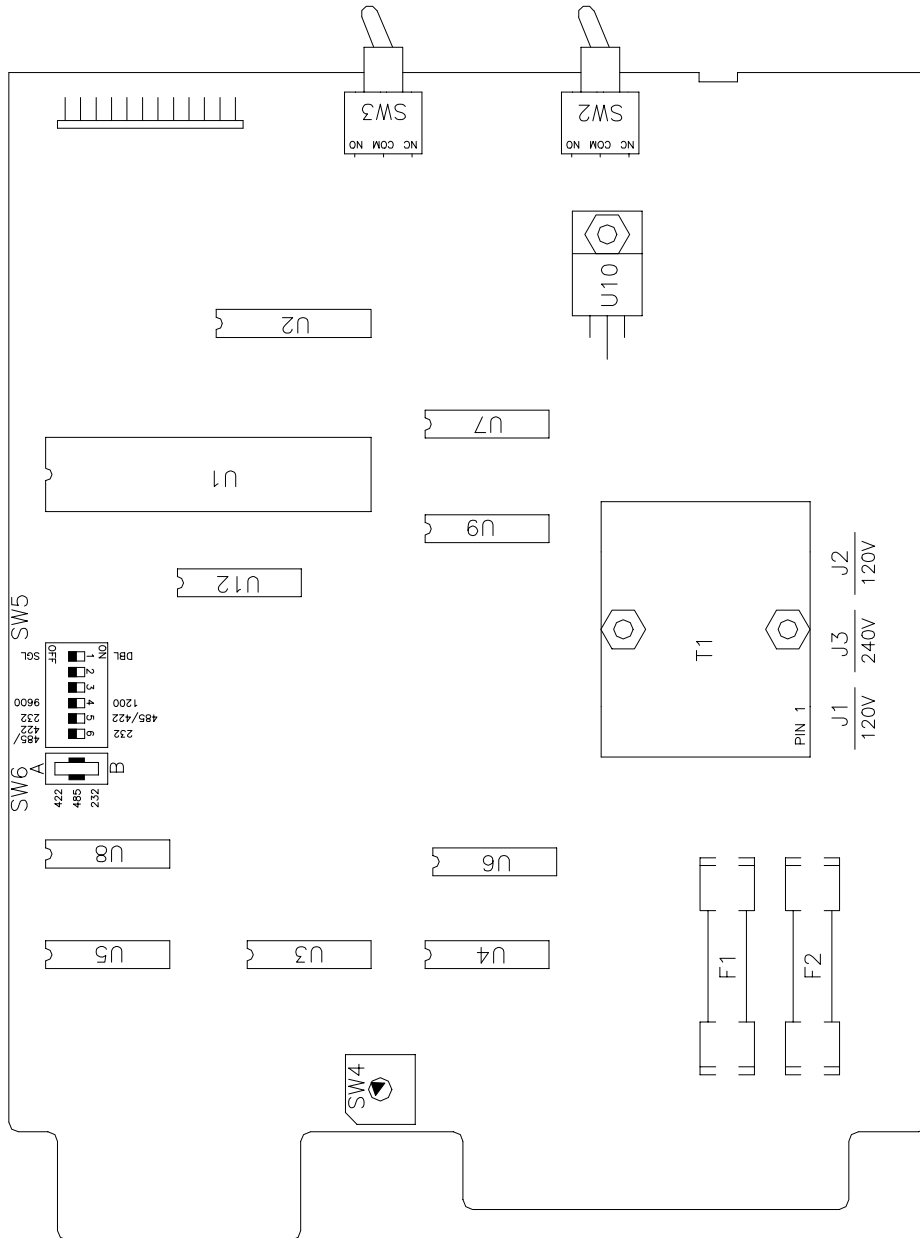


Figure 4 - CIM Component Layout / Switch Settings

COMMAND	DESCRIPTION	MODULE COMMAND	MODULE DATA	PC COMMAND	PC DATA
7.1	Echo Select	---	---	21	63
7.1	Echo Poll	---	---	20	63
7.2	Version Poll	---	---	22	Version
7.3	Process Setpoint 1 Select	1	Setpoint	21	Setpoint
7.3	Process Setpoint 1 Poll	7	Setpoint	20	Setpoint
7.4	Process Value Poll	4	Temperature	22	Temperature
7.6	Alarm Active Status Poll	C	Varies 0=No Alarm	2E	0 or 1
7.13	Load Current Value Poll	b	Value X 10	40	Value X 10
7.15	Controller Status Poll	5, C	Varies	44	Varies
7.29	Manual Percent Output Select	8	Setpoint	6b	Setpoint
7.29	Manual Percent Output Poll	6	Setpoint	6A	Setpoint
7.30	Open/Closed Loop Control Select	9	0/1	8F	0=Open, 1=Closed
7.30	Open/Closed Loop Control Poll	5	Varies	8E	0=Open 1=Closed
7.31	Soft Start Sequence Select	A or 3	0=Off, 1=On	97	0,1
7.31	Soft Start Sequence Poll	5	0, 1	96	0,1
7.32	Process Temp. Deviation Poll	0	Temperature	AA	Temperature
Others	Unsupported Commands	---	---	(SPI #)	---
7.33	Blanket Poll	4,7,C	Varies	E0	Varies
	Reserved	2			
	Reserved	d			
	Reserved	E			
	Reserved	F			

Figure 5 - SPI Protocol Commands and Expected Responses