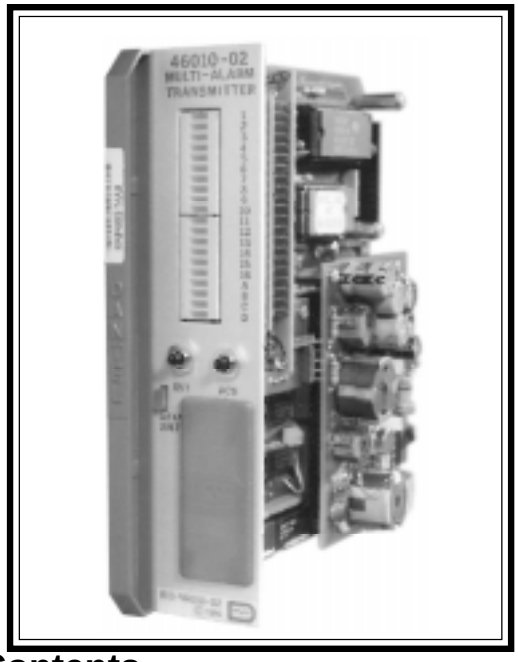
46010

MULTIPLE ALARM TRANSMITTER (MAT)



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CAUTION

- Install or remove modules from the shelf only when the power is off. If you install a module in the shelf with the power on, the internal circuitry may suffer damage and the product warranty will be void.
- Remove and install circuit boards only in a static-safe environment (use antistatic wrist straps, smocks, footwear, etc.).
- Keep circuit boards in their antistatic bags when they are not in use.
- Do not ship or store circuit boards near strong electrostatic, electromagnetic, magnetic, or radioactive fields.
- For more complete information on electrostatic discharge safety precautions, refer to Bellcore™ Technical Reference # TR-NWT-000870.

About this Practice:

This practice has been reissued to:

- Move the ***Application Information*** section forward and renumber all Figs. appropriately.

Reissued Practices: Updated and new content can be identified by a banner in the right margin.

UPDATED

Issue date: July 1998

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ORDERING INFORMATION

NOTE: This section lists the different options available for this product. To order any of the available options, contact Dantel Inside Sales through our toll-free number, **1-800-432-6835.**

OPTION NUMBER	FEATURES
B11-46010-00	Multiple Alarm Transmitter; no display; one alarm relay output
B11-46010-02	Multiple Alarm Transmitter; one alarm relay output
B11-46010-03	Multiple Alarm Transmitter; four alarm relay outputs
B11-46010-12	Multiple Alarm Transmitter; one alarm relay output; TTL alarm inputs
B11-46010-13	Multiple Alarm Transmitter; four alarm relay outputs; TTL alarm inputs
A17-46010-02	Special Application MAT utilizing no parity

GENERAL DESCRIPTION

The 46010 Multiple Alarm Transmitter (MAT) is part of Dantel's 460 Alarm and Control System. It does the following:

- Reports the alarm status for 16 independent discrete alarm inputs.
- Reports the alarms to a 46020 Multiple Alarm Processor (MAP), which sends data to an alarm center.
- Reports alarms locally through 1-4 relays to audible or visual devices.
- Provides alarm acknowledgment.

The 46010 MAT has a regulated power supply that uses -21 to -56 VDC input power. It is available in five different options:

OPTION NUMBER	FEATURES
*-00	A basic unit with no LED display and a one-alarm relay output.
-02	An LED display and a single-level relay output bus.
-03	An LED display and four alarm-level relay output buses.
-12	An LED display and a single-level relay output bus and TTL alarm inputs.
-13	An LED display, four alarm-level relay output buses, and TTL alarm inputs.

NOTE: *In these instructions, any mention of LED displays (other than DATA XMT) refers only to the -02, -03, -12, and -13 options. The -00 option does not have these LEDs.*

GENERAL DESCRIPTION

On all options:

A green LED on the front panel (labeled DATA XMT) lights up to show that the unit is sending data.

On options -02, -03, -12, -13:

There are 20 red LEDs on the upper half of the front panel, arranged in a vertical row. The first 16 are numbered 1-16 starting at the top, and the last four are numbered A-D. The first 16 LEDs show the alarm status of each point. The last four (A-D) show the level of alarm. These LEDs operate in different modes, depending on how you set the switches S3-1, S3-2, S4-3, and S5-1. Table A explains how to set these switches for the type of operation you want.

If a second alarm occurs at the same level as an existing alarm, the level LED pulses once. The output relays follow the level LEDs.

A17-46010-02 Special Application MAT

The A17-46010-02 MAT communicates using no parity, 1 stop bit and 8 data bits. (The standard 46010 MAT communicates using even parity, 1 stop bit and 8 data bits.)

APPLICATION INFORMATION

Multiple Alarm Transmitter applications include interrogated alarm status reporting, and alarm and control. All sixteen alarm inputs are bipolar. Two connections are made for each input. You can bus all negative or positive (ground) input leads together.

The 46010 MAT accepts plug-in subassemblies. These subassemblies provide additional functions, and you can order subassemblies factory installed or you can install them in the field. You can only mount one subassembly at a time. Fig. 1 shows the maximum allowable cable lengths for data transmission.

Fig. 2 shows an interrogated alarm application. The processing center interrogates (polls for data) multiple MATs with a 46022-20 Multiple Alarm Combiner (MAC) equipped with a data communications subassembly. The MATs and the MAC are in the same shelf and exchange data via TTL. You can set the polling address for each MAT with on-board switches.

NOTE: *Two MATs cannot share the same address. If they do, the combined output is garbled.*

APPLICATION INFORMATION

FIG. 1 - MAXIMUM RECOMMENDED CABLE LENGTHS

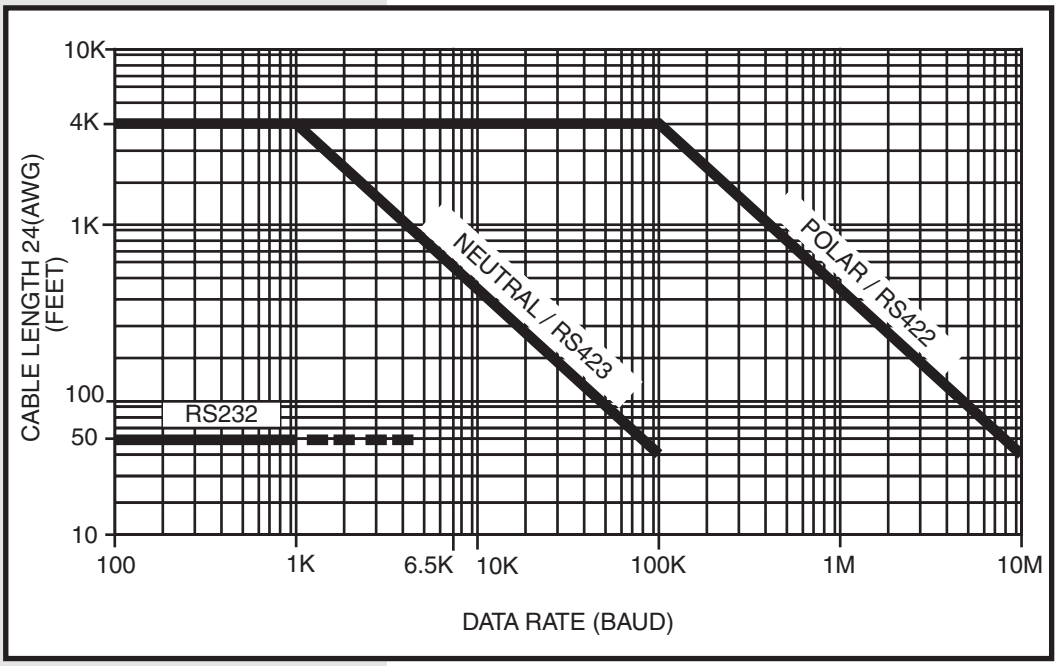
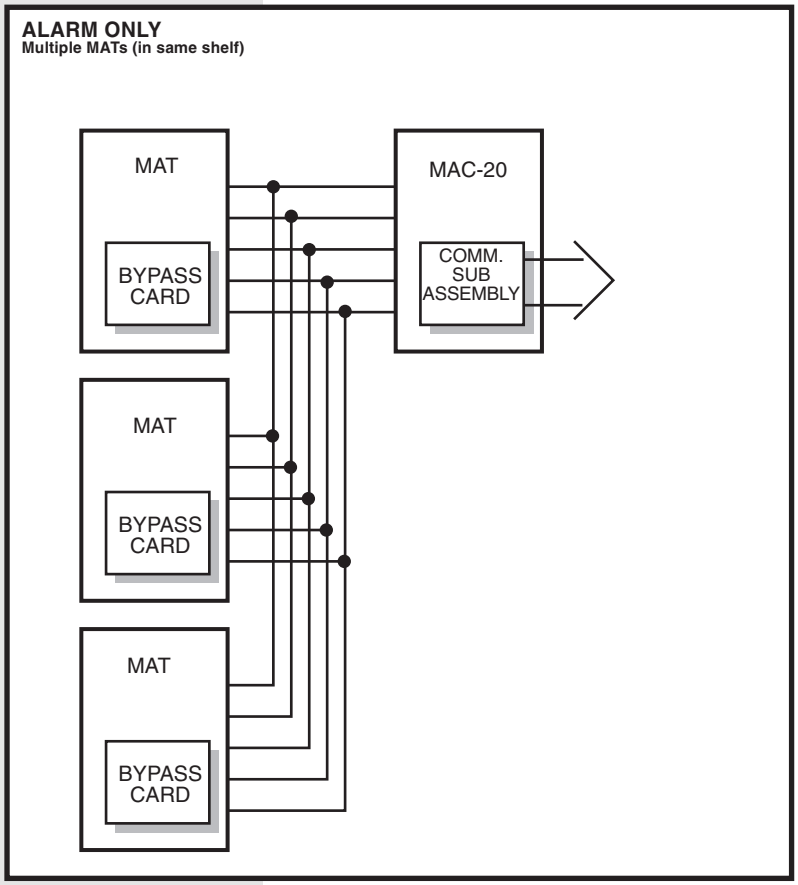


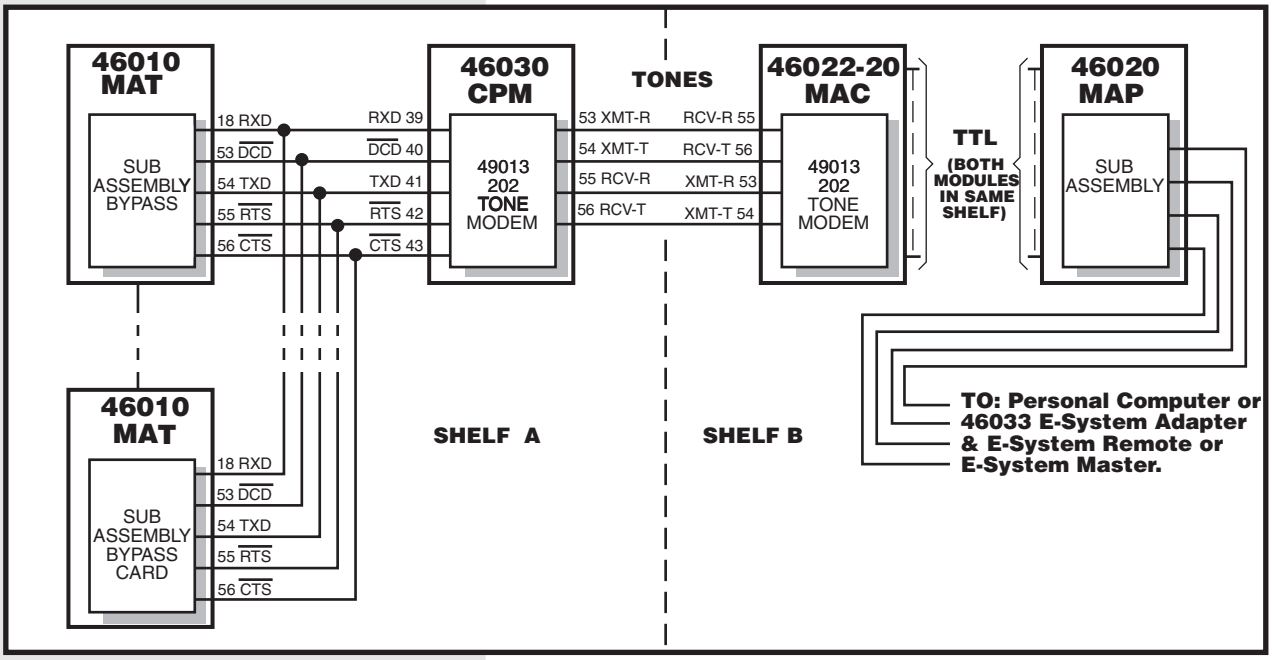
FIG. 2 - EXAMPLE APPLICATION; MULTIPLE MATS IN SAME SHELF (ALARM ONLY)



APPLICATION INFORMATION

Fig. 3 shows an alarm and control application. A MAT is connected to a 46030 Control Point Module (CPM). This provides alarm status reporting and remote control points at the same location and within the same shelf. A common data communications subassembly on the CPM sends data to and from the MAC and 46020 Multiple Alarm Processor (MAP).

FIG. 3 - EXAMPLE APPLICATION; DUAL SHELF APPLICATION



MATs and CPMs use Dantel DCM protocol to communicate with other system components. You can download alarm level assignments from the MAC and MAP no matter what the switch settings are. Refer to the MAP Firmware manual for information.

You can configure Dantel 460 Alarm Control Systems with custom software for special applications. Contact a Dantel Custom Service Engineer for more information.

FIG. 4 - EXAMPLE APPLICATION; MAT/CPM MODE

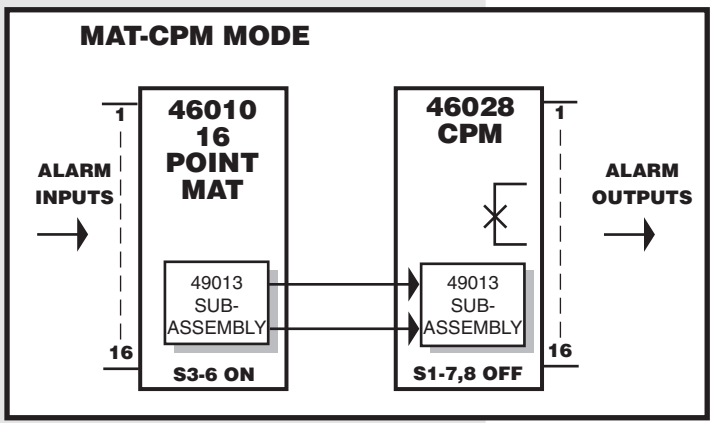


Fig. 4 shows a MAT/CPM mode application. Useful for transmitting alarm points from a remote location back to a central alarm center:

- ♦ Data transmission is one direction only
- ♦ Any communications subassembly may be used, but must match at both ends.
- ♦ The MAT and CPM must have the same address.
- ♦ Only one MAT may be used.

CONTINUED . . .

APPLICATION INFORMATION

♦ The MAT is locked into transmit mode and is never polled.

• The CPM is locked into receive mode and constantly monitors the MAT's transmission. Any alarm point (1-16) triggered on the MAT is duplicated by the CPM's relay output (1-16).

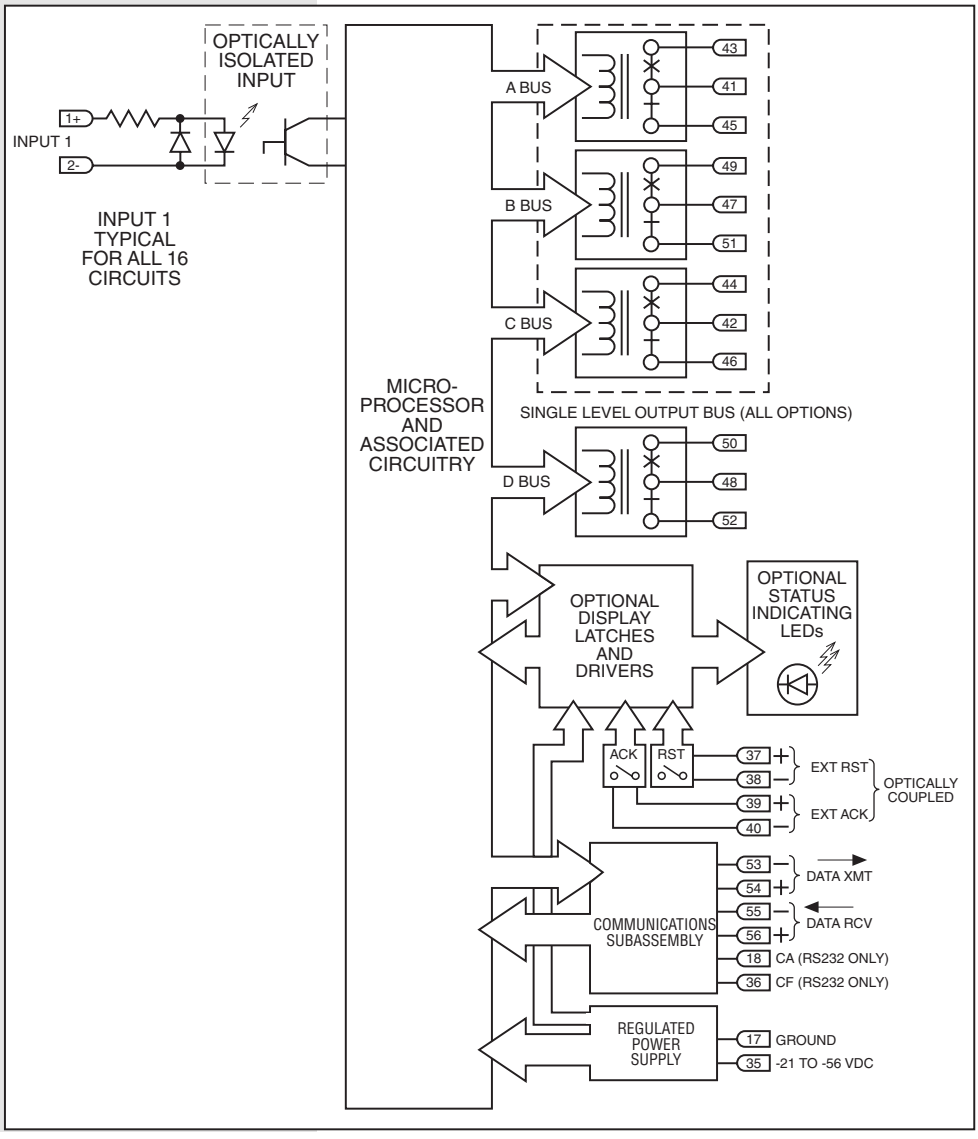
• Point 16 of the CPM can be used to monitor the MAT and energize (or release) if the MAT fails.

• The CPM outputs can then be used to drive another MAT in that same office.

CIRCUIT DESCRIPTION

Fig. 5 shows the 46010 MAT Functional Schematic.

FIG. 5 - FUNCTIONAL SCHEMATIC, 46010 MAT



INSTALLATION

The 46010 MAT can operate in a number of different modes, depending on your needs. Study the tables carefully and make the proper switch settings for the mode of operation you choose.

1. Set switches.

Set the switches described in Tables A, B, C, and D, and Fig. 6 for the type of operation you want.

2. Mount a subassembly, if necessary.

The module comes equipped with a subassembly. To install a different subassembly, follow these steps:

- If there is a hole plug in the front panel of the MAT, remove the plug.
- Remove the three screws from the subassembly standoffs (see Fig. 6).
- Take the subassembly off the board.
- Place the new subassembly on the board.
- Insert P4 into J4 and P5 into J5.
- Make sure each connector pin goes straight into the socket.
- Make sure the subassembly fits closely on the standoffs.
- The panel should be straight in the opening.

3. Install the module in the proper slot of the equipment shelf.

Wire as necessary. Refer to Fig. 7.

TABLE A - MODES OF OPERATION

OPTION	SWITCH NUMBER	SETTING
NORMAL MODE		
When an alarm occurs, that alarm's LED goes on but the level LED does not. When the alarm goes away, the alarm LED goes off. The ACK button does not function. The output relays remain inoperative.	S3-1 S3-2 S4-3 S5-1	OFF OFF OFF OFF
LATCHING MODE		
When an alarm occurs, both the alarm LED and the level LED go on. Press the ACK button. The level LED goes off. When the alarm goes away, the level LED goes back on. Press the ACK button. Both LEDs go off.	S3-1 S3-2 S4-3 S5-1	OFF ON OFF OFF
ANNUCIATOR MODE		
When an alarm occurs, the alarm LED flashes. The level LED goes on. Press the ACK button. The level LED goes off and the alarm LED does not flash but stays on. When the alarm goes away, the level LED goes back on and the alarm LED flashes again. Press the ACK button. Both LEDs go off.	S3-1 S3-2 S4-3 S5-1	ON ON OFF OFF
ALARM WITH LEVELS MODE		
When an alarm occurs, that alarm's LED and the level LED go on. Press the ACK button. The level LED goes off. When the alarm goes away, both LEDs go off.	S3-1 S3-2 S4-3 S5-1	ON OFF OFF OFF
TRANSMIT RESPOND DELAY (46010-12/13 OPTIONS ONLY)		
When ON, the MAT's response to its poll is delayed by 1/25 second (40mS).	S3-3	ON
TRANSMIT CONTINUOUS		
ONLY FOR MAT/CPM MODE APPLICATIONS. Serial data is transmitted continuously. No external command is required to start data transmission.	S3-6	ON
REVERSED INPUTS		
Reverses the normal alarm status current from (A) Current Flow (TTL High) = Alarm Status, to (B) No Current Flow (TTL Low) = Alarm Status. The number of inputs reversable are 4, 8, 16, or none.	S4-1 S4-2	Refer to Table B
LATCHING INPUTS		
Holds and alarm point in the alarm status, even if the alarm is very brief. Reports the alarm data during the next transmission cycle. To restore the alarm point to normal, press the RST button.	S4-3	ON
DELAYED INPUTS		
Adds a short delay (1/2 second) to the alarm detection function. Brief signals caused by non-alarm conditions are not reported as alarms.	S4-4	ON
AUTO LATCH RELEASE		
Applies automatic reset to all latching inputs. The inputs are released as soon as the MAT transmits its status. The RST button is inactive.	S5-1 S4-3	ON ON
MANUAL RELEASE		
After an alarm is reported, the RST button must be pressed to return the alarm point to normal.	S5-1 S4-3	OFF ON
ADDRESS		
Sets the address of the MAT.	S5-2 thru S5-8	Refer to Table C.

TABLE B - SWITCH SETTINGS

OPTION	SWITCH SETTINGS							
	S3-1	**S3-2**	**S3-3**	**S3-4**	**S3-5**	**S3-6**	**S3-7**	**S3-8**
Display Function Normal Latching Annunciator Alarm with Levels	OFF OFF ON ON	OFF ON ON OFF						
Transmit Respond Delay (-1X only)			ON					
Not Used				OFF	OFF		OFF	OFF
Transmit Continuous MAT/CPM Mode Only All other applications						ON OFF		
	S4-1	**S4-2**	**S4-3**	**S4-4**	**S4-5**	**S4-6**	**S4-7**	**S4-8**
Input Reversal Normal (current flow generates an alarm) Points 1-4 Reversed (no current flow generates an alarm) Points 1-8 All Points Reversed	OFF OFF ON ON	OFF ON OFF ON						
Latching Input			ON					
Delayed Input (500 m.s.)				ON				
Data Rate 50 Baud 75 Baud 110 Baud 135 Baud 150 Baud 300 Baud 600 Baud 1200 Baud 1800 Baud 2400 Baud 3600 Baud 4800 Baud 7200 Baud 9600 Baud					OFF OFF OFF OFF OFF OFF OFF ON ON ON ON ON ON ON	OFF OFF OFF ON ON ON ON OFF OFF OFF OFF ON ON ON	OFF ON ON OFF OFF ON ON OFF OFF ON ON OFF OFF OFF	ON OFF ON OFF ON OFF ON OFF ON OFF ON OFF OFF ON
	S5-1	**S5-2**	**S5-3**	**S5-4**	**S5-5**	**S5-6**	**S5-7**	**S5-8**
Latch Release (When S4-3 is ON) Automatic Release (On Poll) Manual Release (Use RST button)	ON OFF							
Address	See Table C							

TABLE C - ADDRESS SELECTION (S5-8 IS NOT PART OF THE ADDRESSING)

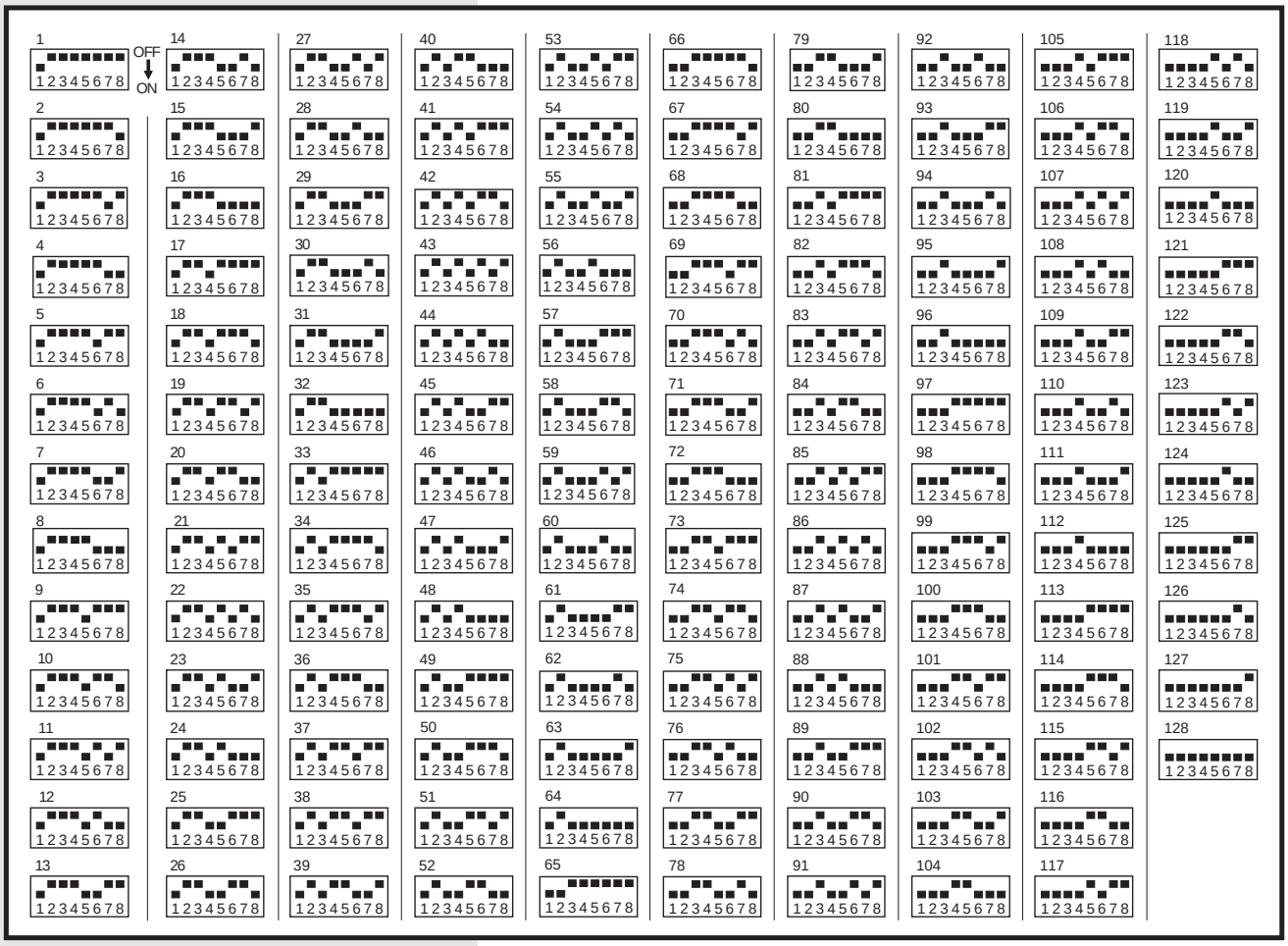

OFF
ON
1 2 3 4 5 6 7 8
1 2 3 4 5 6 7 8
1 2 3 4 5 6 7 8

TABLE D - ALARM LEVEL SELECTION (POINTS 1-8)

ALARM INPUT NUMBER	ALARM LEVEL	SWITCH NUMBER & SETTING	
1		**S101-1**	**S103-1**
	A	ON	ON
	B	ON	OFF
	C	OFF	ON
	D	OFF	OFF
2		**S101-2**	**S103-2**
	A	ON	ON
	B	ON	OFF
	C	OFF	ON
	D	OFF	OFF
3		**S101-3**	**S103-3**
	A	ON	ON
	B	ON	OFF
	C	OFF	ON
	D	OFF	OFF
4		**S101-4**	**S103-4**
	A	ON	ON
	B	ON	OFF
	C	OFF	ON
	D	OFF	OFF
5		**S101-5**	**S103-5**
	A	ON	ON
	B	ON	OFF
	C	OFF	ON
	D	OFF	OFF
6		**S101-6**	**S103-6**
	A	ON	ON
	B	ON	OFF
	C	OFF	ON
	D	OFF	OFF
7		**S101-7**	**S103-7**
	A	ON	ON
	B	ON	OFF
	C	OFF	ON
	D	OFF	OFF
8		**S101-8**	**S103-8**
	A	ON	ON
	B	ON	OFF
	C	OFF	ON
	D	OFF	OFF

TABLE D - ALARM LEVEL SELECTION (POINTS 9-16)

ALARM INPUT NUMBER	ALARM LEVEL	SWITCH NUMBER & SETTING	
9		**S102-1**	**S104-1**
	A	ON	ON
	B	ON	OFF
	C	OFF	ON
	D	OFF	OFF
10		**S102-2**	**S104-2**
	A	ON	ON
	B	ON	OFF
	C	OFF	ON
	D	OFF	OFF
11		**S102-3**	**S104-3**
	A	ON	ON
	B	ON	OFF
	C	OFF	ON
	D	OFF	OFF
12		**S102-4**	**S104-4**
	A	ON	ON
	B	ON	OFF
	C	OFF	ON
	D	OFF	OFF
13		**S102-5**	**S104-5**
	A	ON	ON
	B	ON	OFF
	C	OFF	ON
	D	OFF	OFF
14		**S102-6**	**S104-6**
	A	ON	ON
	B	ON	OFF
	C	OFF	ON
	D	OFF	OFF
15		**S102-7**	**S104-7**
	A	ON	ON
	B	ON	OFF
	C	OFF	ON
	D	OFF	OFF
16		**S102-8**	**S104-8**
	A	ON	ON
	B	ON	OFF
	C	OFF	ON
	D	OFF	OFF

FIG. 6 - SWITCH LOCATIONS, 46010

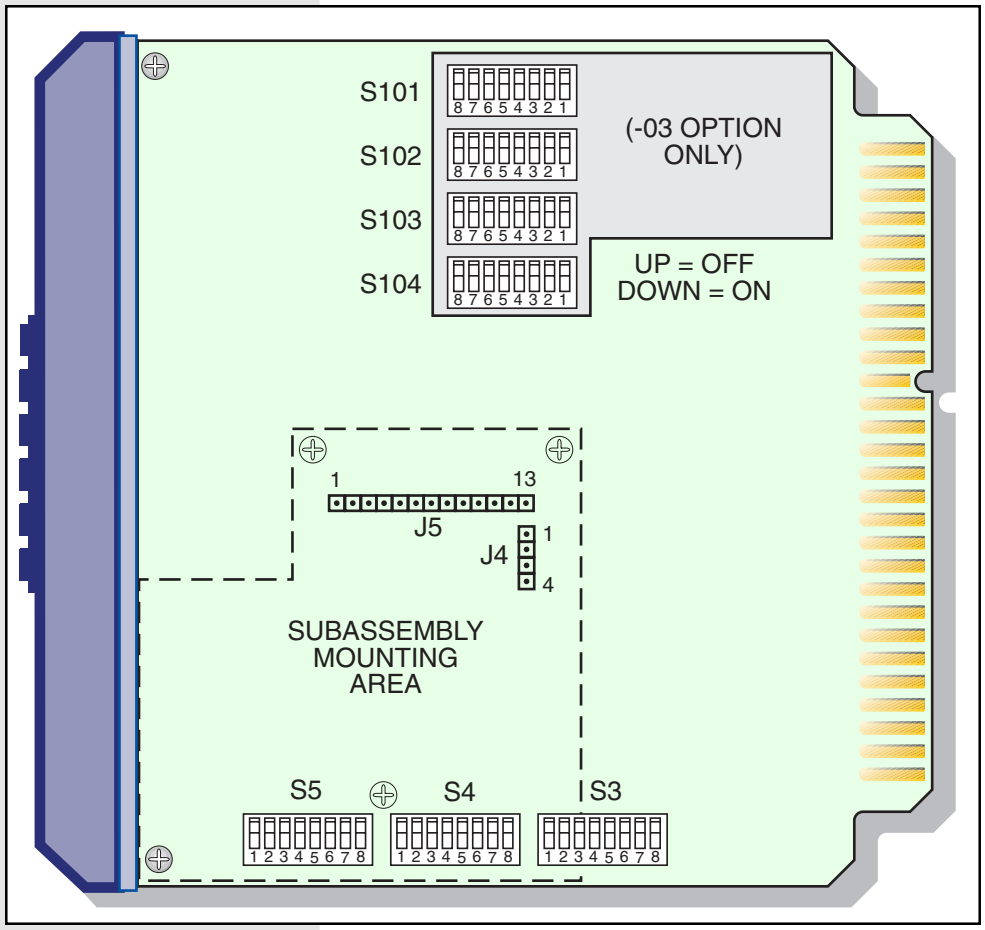
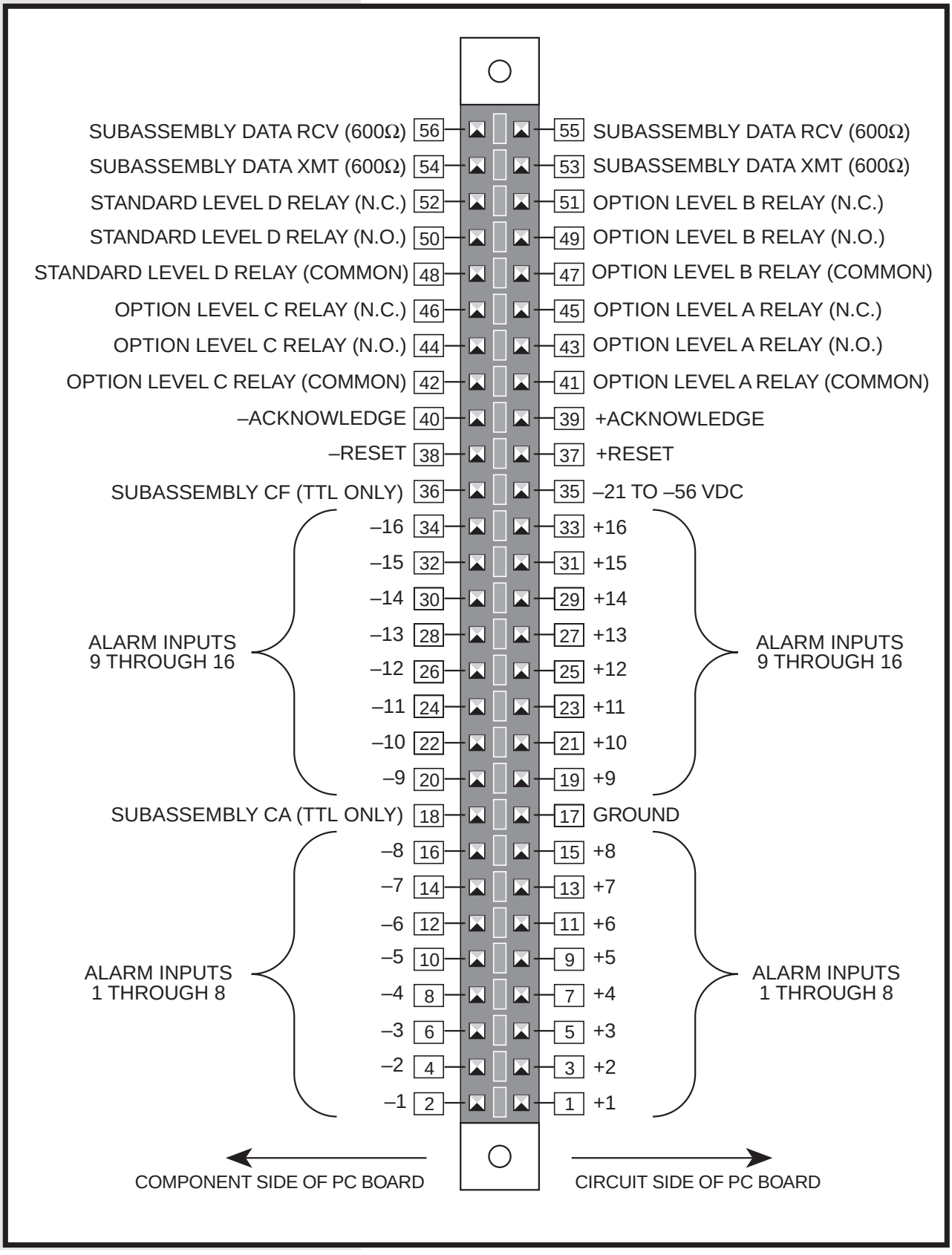


FIG. 7 - PIN DESIGNATIONS, 46010



CHECKOUT

Verify the 46010 MAT is functioning properly by following these steps:

1. Operate each of the devices connected to each of the MAT's alarm points one at a time.
2. Look at the front panel LEDs and the computer (or dumb teminal) that is being used with the system. The lighted LEDs and the messages on the computer screen should be correct for each device.

Table E describes some other ways to test the performance of the 46010 MAT.

TABLE E - CHECKOUT PROCEDURES, 46010 MAT

PROCEDURE	RESULT
1. Turn on power to the shelf.	When the MATs address is polled, the green LED labeled DATA XMT flashes. This indicates that the MAT is sending data to the processing center.
2. Press the ACK and RST buttons at the same time. Hold them for a few seconds.	All LEDs except the DATA XMT light up and remain on until the buttons are released.

OPERATION

Once the 46010 MAT is installed, simply observe the front panel and press the RST and ACK buttons to reset and acknowledge alarms according to the mode you have chosen. (Refer to Tables A and B, in the ***Installation*** section for switch settings.)

TECHNICAL SPECIFICATIONS

DESCRIPTION	VALUE
Input Voltage	-21 to -56 VDC
Input Current (Maximum; @ -56VDC)	
-00 Option	35 mA
-02 & -12 Options	75 mA
-03 & -13 Options	105 mA
Heat Dissipation (maximum; @ -56VDC)	
-00 Option	6.7 Btu/Hr
-02 & -12 Options	14.3 Btu/Hr
-03 & -13 Options	20.0 Btu/Hr
Alarm Inputs	
-00 thru -03 Options	
Voltage Range	-21 to -56 VDC
Current Range	600uA to 2.0 mA
Resistance	33K Ohms + 1 diode (0.6 volts)
-12 & -13 Options (TTL)	0 to 0.9 VDC = Low Level
	2.6 to 5.25 VDC = High Level
Outputs (Alarm Level Relays)	
Contact Type	Single Form-C Dry Contact
Contact Ratings (maximum)	1 Amp @ 28 VDC; 0.5 Amp @ 120 VAC
Data Port (with Bypass Card - no subassembly)	Standard TTL
Data Rates	50 through 9600 baud
Weight (excluding subassemblies)	
-00 Option	10 ounces
-02 & -12 Options	12 ounces
-03 & -13 Options	14 ounces
Physical Dimensions	1.4"W x 6"D x 5.6"H
Operating Temperature Range	0° to 55° C.

NOTES

WARRANTY

LIMITED WARRANTY

The Seller warrants that the standard hardware products sold will be free from defects in material and workmanship and perform to the Seller's applicable published specifications for a period of 18 months for hardware, and 3 months for software, from the date of the original invoice. The liability of the Seller hereunder shall be limited to replacing or repairing, at its option, any defective products which are returned F.O.B. to the Seller's plant, (or, at the Seller's option, refunding the purchase price of such products). In no case are products to be returned without first obtaining permission and a customer return authorization number from the Seller. In no event shall the Seller be liable for any consequential or incidental damages.

Equipment or parts which have been subject to abuse, misuse, accident, alteration, neglect, unauthorized repair or installation are not covered by warranty. The Seller shall make the final determination as to the existence and cause of any alleged defect. No warranty is made with respect to custom equipment or products produced to the Buyer's specifications except as specifically stated in writing by the Seller in the contract for such custom equipment.

This warranty is the only warranty made by the Seller with respect to the goods delivered hereunder, and may be modified or amended only by a written instrument signed by a duly authorized officer of the Seller and accepted by the Buyer.

Warranty and remedies on products not manufactured by the Seller are in accordance with warranty of the respective manufacturer. THE SELLER MAKES NO OTHER WARRANTY OF ANY KIND WHATSOEVER, EXPRESSED OR IMPLIED; AND ALL IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE WHICH EXCEEDS THE AFORESAID OBLIGATIONS IS HEREBY DISCLAIMED BY THE SELLER.

IN CASE OF DIFFICULTY

If you experience difficulty with this equipment, check the following, as appropriate:

1. **Switch settings**
2. **Signal levels**
3. **Software configuration**
4. **Connections between Dantel's equipment and your equipment.**

If there is still a problem, substitute equipment that is known to be good. For additional assistance, call Dantel's Technical Field Service Department weekdays, 6 A.M. to 5 P.M. pacific time:

1-800-4DANTEL (1-800-432-6835).

If a thorough checkout shows a piece of equipment has malfunctioned, you may return it to the factory. For repairs and emergency replacements, obtain a Return Material Authorization (RMA) number from the Customer Service Representative at **1-800-4DANTEL** (1-800-432-6835).

To ensure expedient processing of your order, provide a purchase order number and shipping and billing information when requesting an RMA number. Also, when the units are returned to Dantel, include a description of the failure symptoms for each unit returned. Send defective equipment to:

Dantel, Inc. • 2991 North Argyle Avenue • Fresno, California 93727-1388