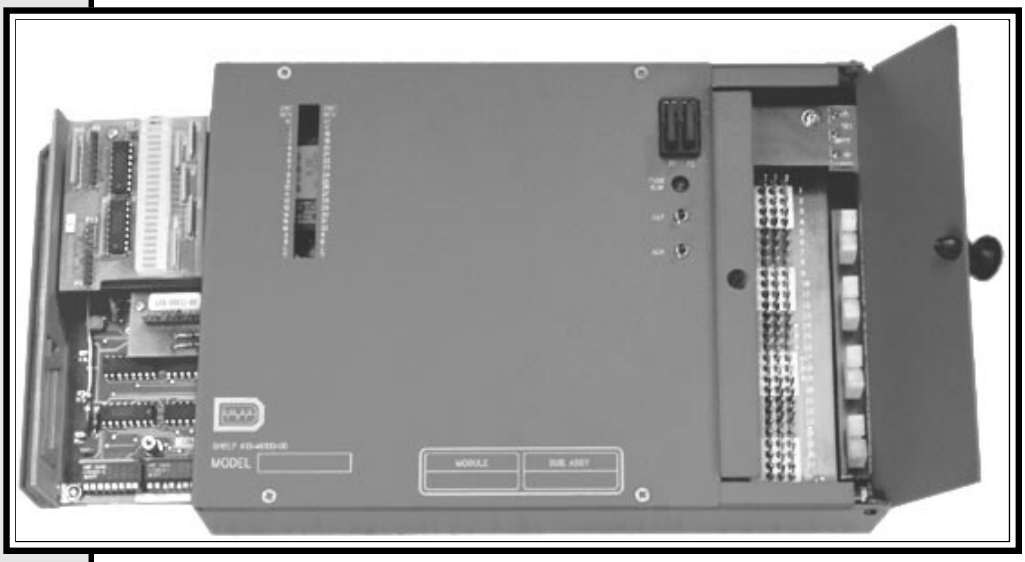
46100
WALL-MOUNT SHELF
w/ 46012 MULTIPLE ALARM TRANSMITTER



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About this Practice:

This practice has been reissued to:

- Add a note on using the dial-up system over a PBX system.

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

UPDATED

Issue date: March 2000

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.

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
A13-46100-00	Wall-Mount MAT Shelf
A15-46100-10	Wall-Mount MAT Shelf equipped with 46012 Wall-Mount MAT; TTL interface
A15-46100-11	Wall-Mount MAT Shelf equipped with 46012 Wall-Mount MAT; 202 Tone interface
A15-46100-12	Wall-Mount MAT Shelf equipped with 46012 Wall-Mount MAT; RS-232 interface
A15-46100-13	Wall-Mount MAT Shelf equipped with 46012 Wall-Mount MAT; RS-422/485 interface
A15-46100-14	Wall-Mount MAT Shelf equipped with 46012 Wall-Mount MAT; 49212 Dial-up subassembly
A11-46012-03	32-point Wall-Mount MAT
A25-00704-01	AC to DC Power Supply, Wall Mount; 3 Screw Terminals
A25-00704-02	AC to DC Power Supply, Wall Mount; 6 Foot, 2-Conductor Cable

GENERAL DESCRIPTION

The 46100 Wall-Mount Shelf is part of Dantel's 460 Alarm and Control System. It holds one 46012 Multiple Alarm Transmitter (MAT). For the purpose of this practice, the housing in which the MAT is used will be referred to as the 46100. The MAT will be referred to as the 46012.

46100

On the front panel (refer to the cover photo) of the shelf are the following:

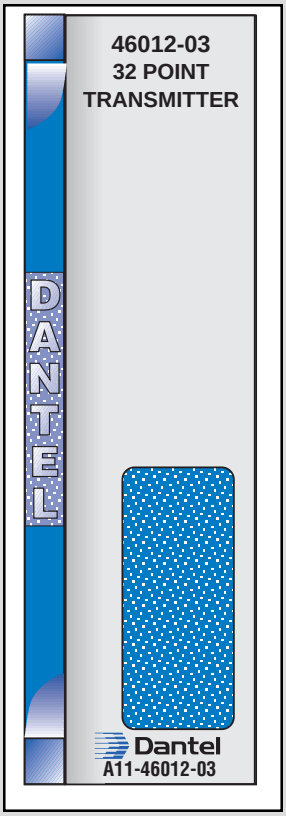
- A window to view the LED display on the MAT module that is installed in the shelf.
- A reset (RST) button to return the alarm inputs on the MAT to the non-alarm state.
- An acknowledge (ACK) button to acknowledge the alarms on the MAT.
- Two half-ampere fuses and a red LED that lights if either fuse blows.

The bottom card guide of the shelf provides electrostatic discharge (ESD) grounding for the MAT. There is also a jack for grounding of personnel who work with the shelf.

There are 84 wire-wrap pins, a six-pin RJ-11C connector, and a three-slot connector for wiring equipment and power to the shelf.

GENERAL DESCRIPTION

46012



The 46012 Multiple Alarm Transmitter (MAT) is part of Dantel's 460 Alarm and Control System. Features include:

- Reports the alarm status for 32 independent discrete alarm inputs.
- Reports the alarms in either DCM or TBOS format, depending on how the module's switches are set.
- Reports alarms locally through four relays to audible or visual devices. If you do not use the relays to report alarms, you can use the relays as controls.
- Provides alarm acknowledgment.

The 46012 MAT has a regulated power supply that uses -21 to -56 VDC input power.

The module has 23 LEDs visable through a window in the shelf. The top two are green and are labeled XMT DATA and RCV DATA. They light when the MAT is sending or receiving data.

The third LED is yellow and is labeled A1. It indicates whether the next group of 16 red LEDs are showing alarms for points 1-16 or for points 17-32.

Below the 16 alarm LEDs are four more red LEDs labeled A-D. These indicate the level of alarms.

CIRCUIT DESCRIPTION

Features of the 46012 circuitry include optically isolated inputs, microprocessor, communications port, LED display, multi-level output bus, reset and acknowledge circuitry, battery-backed ram, regulated power supply, and watchdog circuit. The functional schematic is shown in Fig. 1. Alarm input 1-32 pin assignments are shown in Table A at the end of this section.

Optically Isolated Inputs

The 32 alarm status points inputs of the MAT are optically isolated from the internal circuitry. Alarms are activated by ground inputs.

Normally, when current flows through an optical coupler, the MAT reports an alarm and the front panel LED will light. The condition for an alarm may be reversed with switch settings so that the absence of current flow will indicate an alarm.

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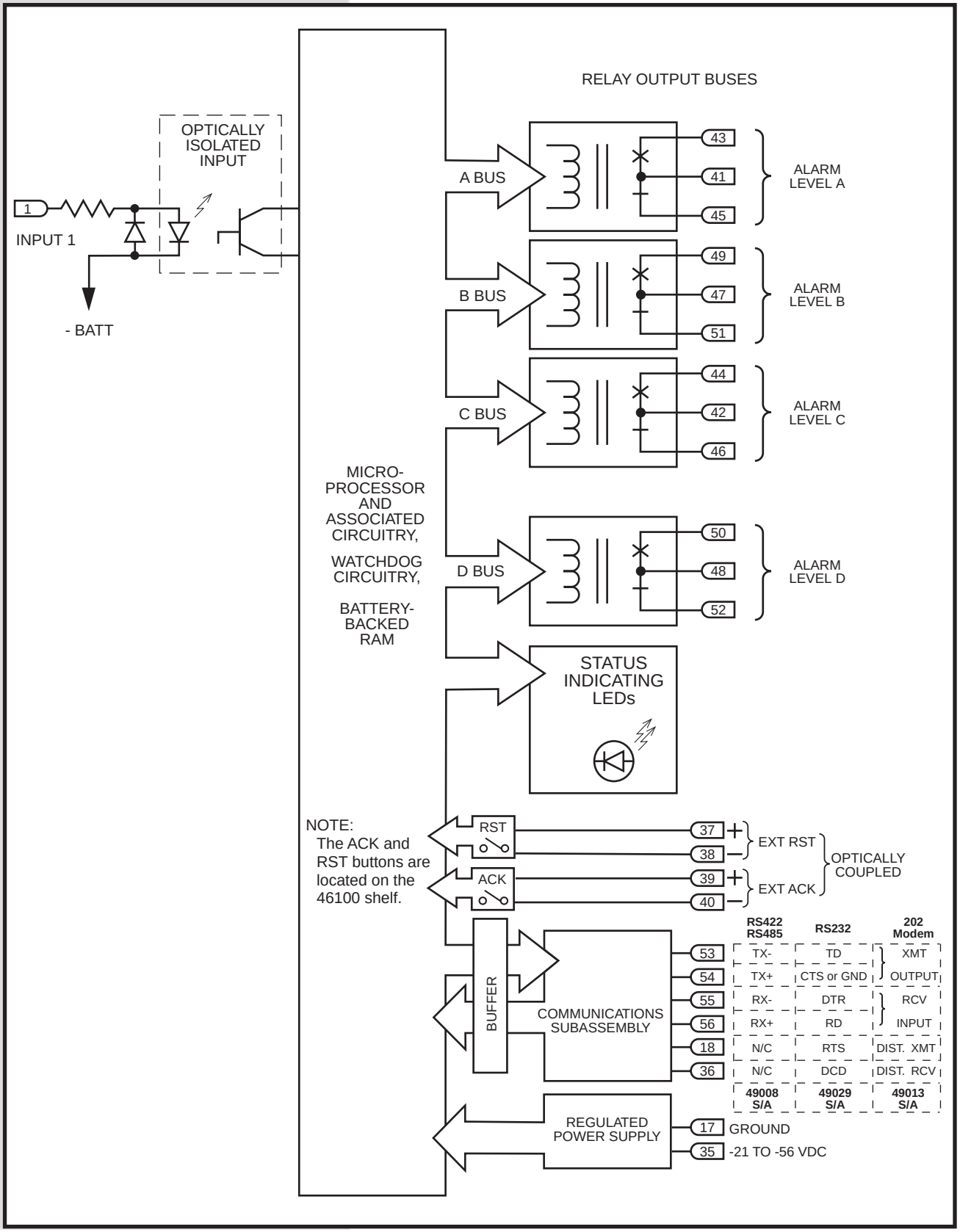
CIRCUIT DESCRIPTION

FIG. 1 - FUNCTIONAL SCHEMATIC; 46012 MAT



When the MAT is configured to report alarms to a MAP using DCM protocol, the inputs also can be optioned to have a latching capability. This prevents alarms from being cleared before the MAT is polled. A optional delayed input feature defeats momentary false alarms. When configured to report alarms to a MAP using TBOS format, the inputs are latched and delayed automatically.

Microprocessor

The microprocessor monitors the optically isolated inputs and compares the status of each alarm point to the previous status. An alarm output occurs when the status changes. The output is sent to the appropriate alarm level relay output, the LED display, and, when requested, through a buffer to the communications port.

Communications Port

Data input/output is through a communications subassembly that provides an interface, such as TTL, RS-232, RS-422, or 202 Tone, to other parts of the alarm system. All communication lines are buffered to prevent interference with other modules in case of power failure to the MAT.

LED Display

The alarm LEDs are turned on when an alarm status point shows current activity in the optical coupler (or the lack of current, if so configured). The first 16 LEDs of the display report the status of the alarm points. The bottom four indicate the level of the alarms.

When the A1 LED is on, the status of alarm points 1-16 are shown by the LEDs. When the A1 LED is off, the status of points 17-32 are shown. The A1 LED cycles on and off every six seconds. Once on, the alarm status LEDs are latched on until the alarm clears or is acknowledged, depending on how S3-1, S3-2, S4-3, and S5-1 are set. Refer to the ***Installation*** section for details on these switches.

Multi-Level Output Buses

Each of the 32 alarm points can, if configured, drive one of four form-C relays. The relay contacts may be used to provide an audible or visual indication of alarm status, or to provide a corrective action, such as enabling a backup circuit.

The multiple levels must be downloaded through the communications port and will be stored in a battery-backed RAM. If no value is loaded into RAM (by the MAP) the default level is D. This means that every alarm triggered will also activate alarm relay level D. If alarm levels other than D are desired, refer to the MAP firmware manual specific to the MAP being used.

CONTINUED . . .

Reset and Acknowledge Circuitry

Alarms can be reset and acknowledged with two momentary push buttons on the front of the 46100. Also, there are optically isolated inputs for external control. These operate the same as with the push buttons.

Battery-Backed RAM

A battery is installed on the memory board subassembly. In case of power failure, downloaded alarm levels will not be lost.

Regulated Power Supply

The regulated power supply uses -21 to -56 VDC input power to provide ±12 VDC and +5 VDC to the module's circuit board and subassemblies.

Watchdog Circuit

The watchdog circuit monitors the strobe activity of the microprocessor and the +5 VDC. The circuit will reset the microprocessor whenever the voltage drops 10% or no strobe is sensed for 600 milliseconds.

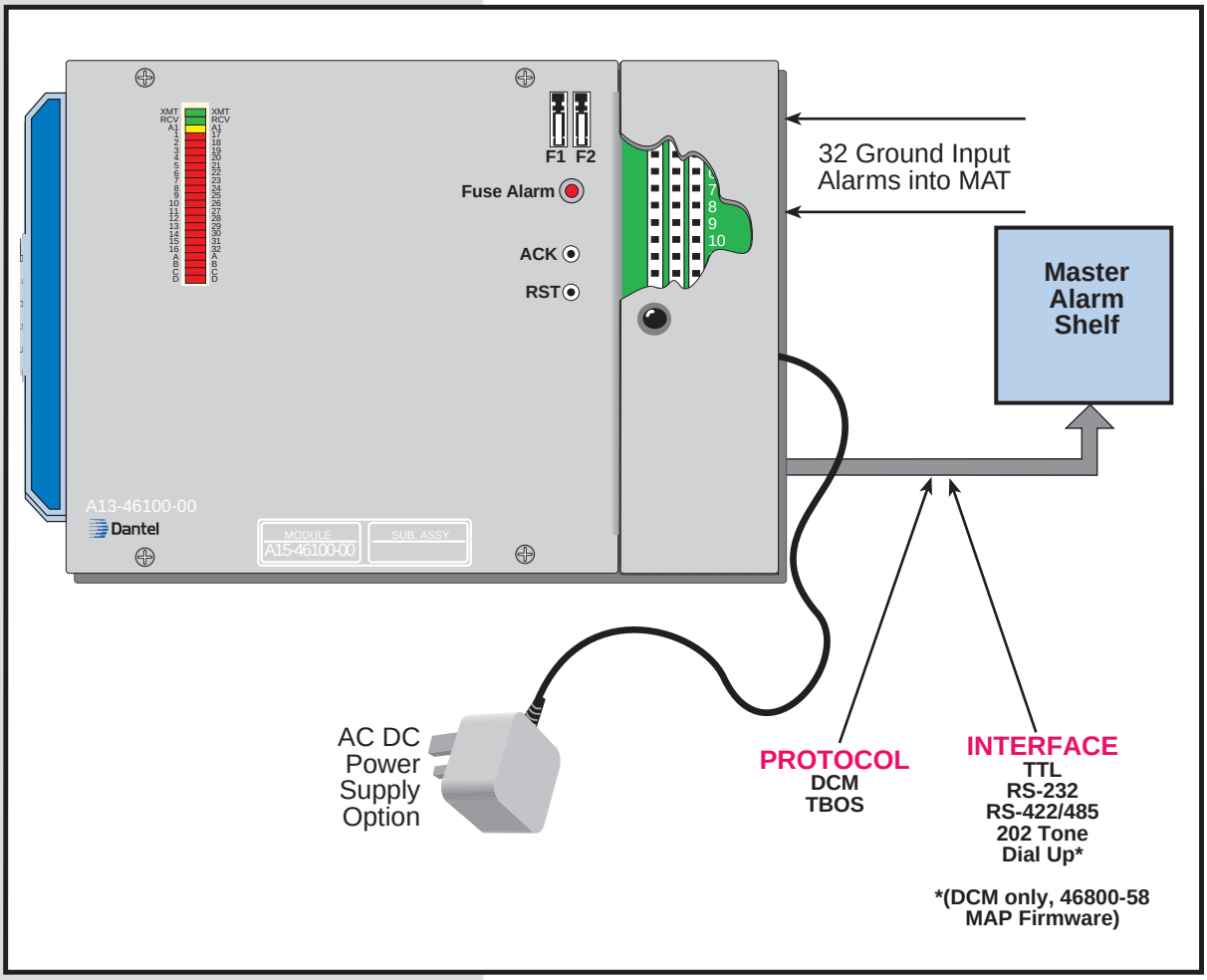
TABLE A - PIN ASSIGNMENTS FOR INPUTS 1-32

ALARM INPUT NUMBER	EDGE CONNECTOR PIN NUMBER		ALARM INPUT NUMBER	EDGE CONNECTOR PIN NUMBER
1	1		17	2
2	3		18	4
3	5		19	6
4	7		20	8
5	9		21	10
6	11		22	12
7	13		23	14
8	15		24	16
9	19		25	20
10	21		26	22
11	23		27	24
12	25		28	26
13	27		29	28
14	29		30	30
15	31		31	32
16	33		32	34

APPLICATION INFORMATION

Fig. 2 shows a 46100 Wall Mount MAT application. 32 ground input alarms connect to the 46100 Wall Mount MAT. The MAT connects to the Multiple Alarm Processor (MAP), which polls the MAT using DCM or TBOS protocol.

FIG. 2 - EXAMPLE APPLICATION; 46100 WALL-MOUNT MAT



NOTE:

PBX applications utilizing the 46100 Wall-Mount Shelf have been successfully tested and deployed.

Dantel's **Customer Support Services Group** is available by phone to assist in the planning, installation, and turn-up of this product.

This free service is available by calling 800.432.6835 and asking for Customer Support Services.

NEW NOTE

INSTALLATION

Installation consists of mounting the shelf, configuring the 46012 MAT, wiring the shelf, installing the MAT, and a check-out procedure.

MOUNT THE SHELF.

1. If a module is installed in the shelf, remove the module.
2. Open the door on the right side of the shelf.
3. Remove the four Phillips screws and take off the front cover of the shelf.
4. The back of the shelf has three holes for mounting the shelf either vertically or horizontally. Hold the shelf against the wall and mark the three points for drilling holes in the wall.
5. Drill three holes in the wall for the mounting hardware (not supplied).
6. Install the mounting hardware in the wall, but do not tighten all the way.
7. Install the shelf on the hardware with the narrow parts of the keyhole slots on the shelf pointed upward. Push the shelf downward onto the mounting hardware.
8. Tighten the hardware. Do not replace the front cover yet.

CONFIGURE THE MAT

The 46012 MAT can operate in one of several modes if it is reporting alarms in the DCM format. Study Table B carefully and make the proper switch settings for the mode of operation you choose. When reporting alarms in the TBOS format, the MAT operates in the "Alarm with Levels" mode only.

1. Set switches.

Refer to Fig. 3 for the switch locations. Set the switches as described in Tables B, C, and D if the alarms report in DCM format. Addressing for the MAT is in multiples of two. When the MAT is addressed, the MAT responds to that address and the next consecutive address; for example, if the MAT address is set for 1, the MAT responds to addresses 1 and 2. The first address is alarm points 1-16 and the second address is points 17-32.

If the control points are enabled with S3-3 & S3-4, the MAT will also respond as a CPM with the address set by S5-2 through S5-8.

Set the switches as described in Table E if the alarms report in TBOS format. Refer to Fig. 3 or the drawing with Table D for the switch locations.

NOTE: *Leave the A-B strap in the A position.*

CONTINUED . . .

2. Mount a subassembly, if necessary.

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

1. If there is a hole plug in the front panel of the MAT, remove the plug.
2. Remove the three screws from the subassembly standoffs (refer to Fig. 3).
3. Take the subassembly off the board.
4. 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.
5. Replace the three screws in the standoffs.
6. Refer to the subassembly manual for strapping information.

FIG. 3 - 46012 SWITCH AND SUBASSEMBLY LOCATIONS

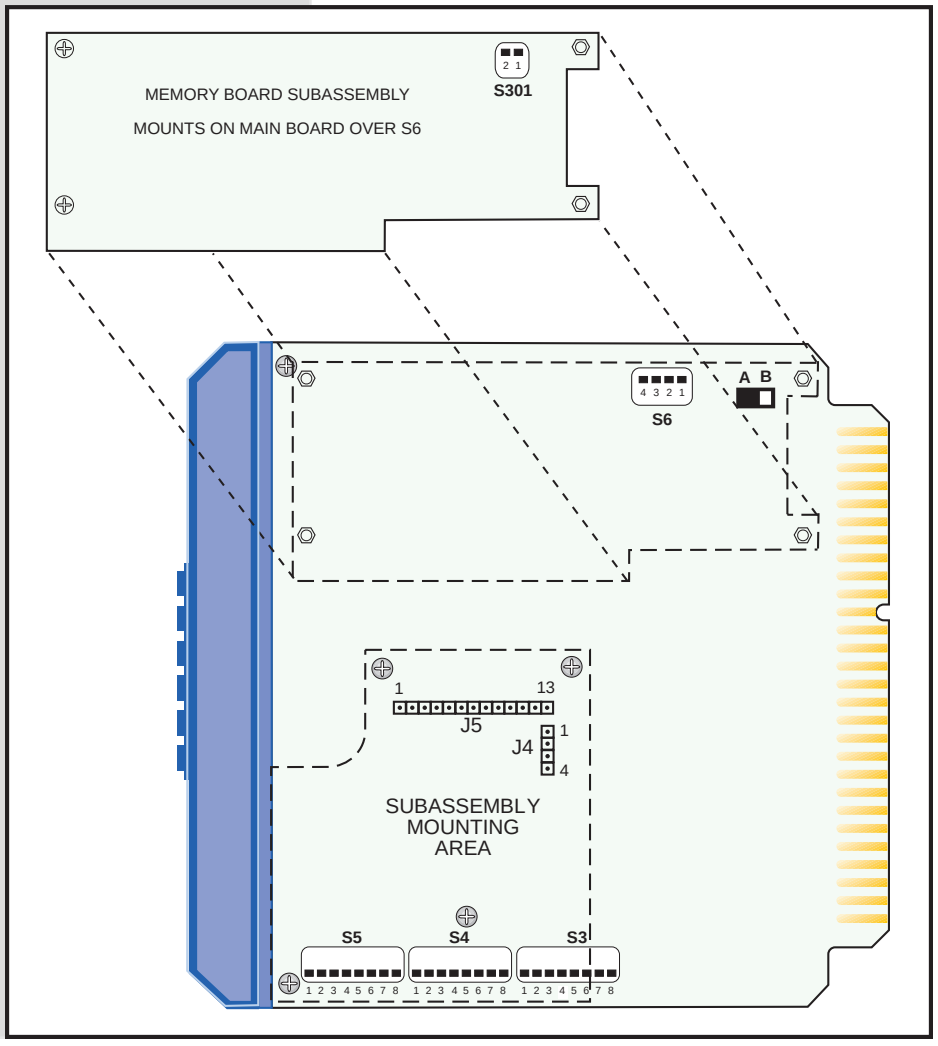


TABLE B - MODES OF OPERATION (DCM MODE)

OPTION	SWITCH NUMBER	SETTING
MODES		
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 serves no function. The output level relays are non-functional.	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 again. Both LEDs go OFF.	S3-1 S3-2 S4-3 S5-1	OFF ON OFF OFF
Annunciator 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 stops flashing and stays on solid. 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 level LED go ON. Press the ACK button. The level LED goes OFF. When the alarm goes away, the alarm LED goes OFF.	S3-1 S3-2 S4-3 S5-1	ON OFF OFF OFF
Transmit Continuous. Only for MAT/CPM mode applications. Serial data is transmitted continuously. No polling is required for data transmission.	S3-6	ON
Reversed Inputs Reverses the normal alarm status current from: Current Flow or TTL High = Alarm Status to No current Flow or TTL Low = Alarm Status	 S4-1 S4-2	 See Table C for all possible combinations
Latching Inputs Holds an 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 (about 1/2 second) to the alarm detection function. Brief signals caused by non-alarm conditions are not reported as alarms.	S4-4	ON
LATCH RELEASE		
AUTO-LATCH		
Applies automatic reset to all latching inputs. The inputs are released as soon as the MAT transmits its status. The RST button is inoperative.	S5-1 S4-3	ON ON
MANUAL RELEASE		
After an alarm is reported, the RST button must be pressed to return the alarm to normal.	S5-1 S4-3	OFF ON
Address Sets the address of the MAT.	S5-2 thru S5-8	See Table D

TABLE C - SWITCH SETTINGS (DCM MODE)

OPTION	SWITCH SETTINGS							
SWITCH 3	**S3-1**	**S3-2**	**S3-3**	**S3-4**	**S3-5**	**S3-6**	**S3-7**	**S3-8**
Normal Display	OFF	OFF						
Latching Display	OFF	ON						
Annunciator Display	ON	ON						
Alarm with Levels Display	ON	OFF						
On-board Relays								
Relays used to operate control points 1-4			ON	ON				
Relays A - C used operate control points 1-3								
and Relay D reports alarm levels			ON	OFF				
All relays report alarm levels			OFF	OFF				
Not Used					OFF		OFF	OFF
Transmit Continuous								
MAT/CPM Mode Only						ON		
Normal Applications						OFF		
SWITCH 4	**S4-1**	**S4-2**	**S4-3**	**S4-4**	**S4-5**	**S4-6**	**S4-7**	**S4-8**
Input Reversal								
Normal (current flow = alarm)	OFF	OFF						
Points 1-4 and 17-20 Reversed (no								
current flow generates alarm)	OFF	ON						
Points 1-8 and 17-24 Reversed	ON	OFF						
All Points Reversed	ON	ON						
Latching Input			ON					
Delayed Input (500 ms)				ON				
Data Rate								
50 Baud					OFF	OFF	OFF	ON
75 Baud					OFF	OFF	ON	OFF
110 Baud					OFF	OFF	ON	ON
135 Baud					OFF	ON	OFF	OFF
150 Baud					OFF	ON	OFF	ON
300 Baud					OFF	ON	ON	OFF
600 Baud					OFF	ON	ON	ON
1200 Baud					ON	OFF	OFF	OFF
1800 Baud					ON	OFF	OFF	ON
2400 Baud					ON	OFF	ON	OFF
3600 Baud					ON	OFF	ON	ON
4800 Baud					ON	ON	OFF	OFF
7200 Baud					ON	ON	OFF	ON
9600 Baud					ON	ON	ON	OFF
SWITCH 5	**S5-1**	**S5-2**	**S5-3**	**S5-4**	**S5-5**	**S5-6**	**S5-7**	**S5-8**
Latch Release (S4-3 ON)								
Automatic Release On Poll	ON							
Manual Release (RST button)	OFF							
Address (* See Table D)		*	*	*	*	*	*	*
SWITCH 6	**S6-1**	**S6-2**	**S6-3**	**S6-4**				
Not Used	OFF	OFF	OFF	OFF				
SWITCH 301	**S301-1**		**S301-2**					
DCM Protocol	ON		OFF					

Data rate must be set for 9600 baud when MAT is equipped with 49212 Dial-up subassembly.

TABLE D - ADDRESS SELECTION (DCM); S5-2 THROUGH S5-8

1	14	27	40	53	66	79	92	105	118
2	15	28	41	54	67	80	93	106	119
3	16	29	42	55	68	81	94	107	120
4	17	30	43	56	69	82	95	108	121
5	18	31	44	57	70	83	96	109	122
6	19	32	45	58	71	84	97	110	123
7	20	33	46	59	72	85	98	111	124
8	21	34	47	60	73	86	99	112	125
9	22	35	48	61	74	87	100	113	126
10	23	36	49	62	75	88	101	114	127
11	24	37	50	63	76	89	102	115	128
12	25	38	51	64	77	90	103	116	
13	26	39	52	65	78	91	104	117	

OFF ↓ ON

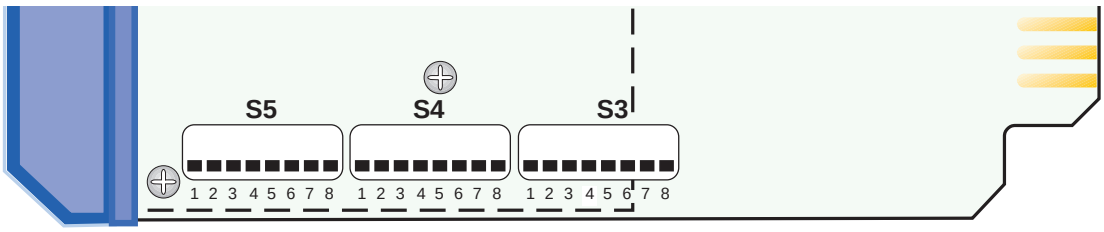


TABLE E - SWITCH SETTINGS (TBOS MODE)

OPTION	SWITCH SETTINGS							
SWITCH 3	**S3-1**	**S3-2**	**S3-3**	**S3-4**	**S3-5**	**S3-6**	**S3-7**	**S3-8**
Required Settings	ON	OFF			OFF	OFF	OFF	OFF
On-board Relays								
All relays used to operate controls points 1-4			ON	ON				
Relays A - C operate control points 1-3 and Relay D reports alarm levels.			ON	OFF				
All relays report alarm levels			OFF	OFF				
SWITCH 4	**S4-1**	**S4-2**	**S4-3**	**S4-4**	**S4-5**	**S4-6**	**S4-7**	**S4-8**
Input Reversal								
Normal (current flow = alarm)	OFF	OFF						
Points 1-4 and 17-20 Reversed (no current flow generates alarm)	OFF	ON						
Points 1-8 and 17-24 Reversed	ON	OFF						
All Points Reversed	ON	ON						
Latching Input			ON					
Delayed Input								
40 ms				OFF				
500 ms				ON				
Data Rate								
50 Baud					OFF	OFF	OFF	ON
75 Baud					OFF	OFF	ON	OFF
110 Baud					OFF	OFF	ON	ON
135 Baud					OFF	ON	OFF	OFF
150 Baud					OFF	ON	OFF	ON
300 Baud					OFF	ON	ON	OFF
600 Baud					OFF	ON	ON	ON
1200 Baud					ON	OFF	OFF	OFF
1800 Baud					ON	OFF	OFF	ON
2400 Baud					ON	OFF	ON	OFF
3600 Baud					ON	OFF	ON	ON
4800 Baud					ON	ON	OFF	OFF
7200 Baud					ON	ON	OFF	ON
9600 Baud					ON	ON	ON	OFF

CONTINUED . . .

TABLE E (CONTINUED)- SWITCH SETTINGS (TBOS MODE)

OPTION	SWITCH SETTINGS							
SWITCH 5	**S5-1**	**S5-2**	**S5-3**	**S5-4**	**S5-5**	**S5-6**	**S5-7**	**S5-8**
Latch Release (S4-3 ON) Automatic Release On Poll Manual Release (RST button)	 ON OFF							
Not Used		OFF	OFF	OFF				
TBOS Display *								
Disp. 1 Char. 1-4					OFF	OFF	OFF	OFF
Disp. 1 Char. 5-8					OFF	OFF	OFF	ON
Disp. 2 Char. 1-4					OFF	OFF	ON	OFF
Disp. 2 Char. 5-8					OFF	OFF	ON	ON
Disp. 3 Char. 1-4					OFF	ON	OFF	OFF
Disp. 3 Char. 5-8					OFF	ON	OFF	ON
Disp. 4 Char. 1-4					OFF	ON	ON	OFF
Disp. 4 Char. 5-8					OFF	ON	ON	ON
Disp. 5 Char. 1-4					ON	OFF	OFF	OFF
Disp. 5 Char. 5-8					ON	OFF	OFF	ON
Disp. 6 Char. 1-4					ON	OFF	ON	OFF
Disp. 6 Char. 5-8					ON	OFF	ON	ON
Disp. 7 Char. 1-4					ON	ON	OFF	OFF
Disp. 7 Char. 5-8					ON	ON	OFF	ON
Disp. 8 Char. 1-4					ON	ON	ON	OFF
Disp. 8 Char. 5-8					ON	ON	ON	ON
SWITCH 6	**S6-1**	**S6-2**	**S6-3**	**S6-4**				
TBOS Function	OFF * ON *	OFF	OFF	OFF				
SWITCH 301	**S301-1**	**S301-2**						
TBOS Protocol	ON	ON						

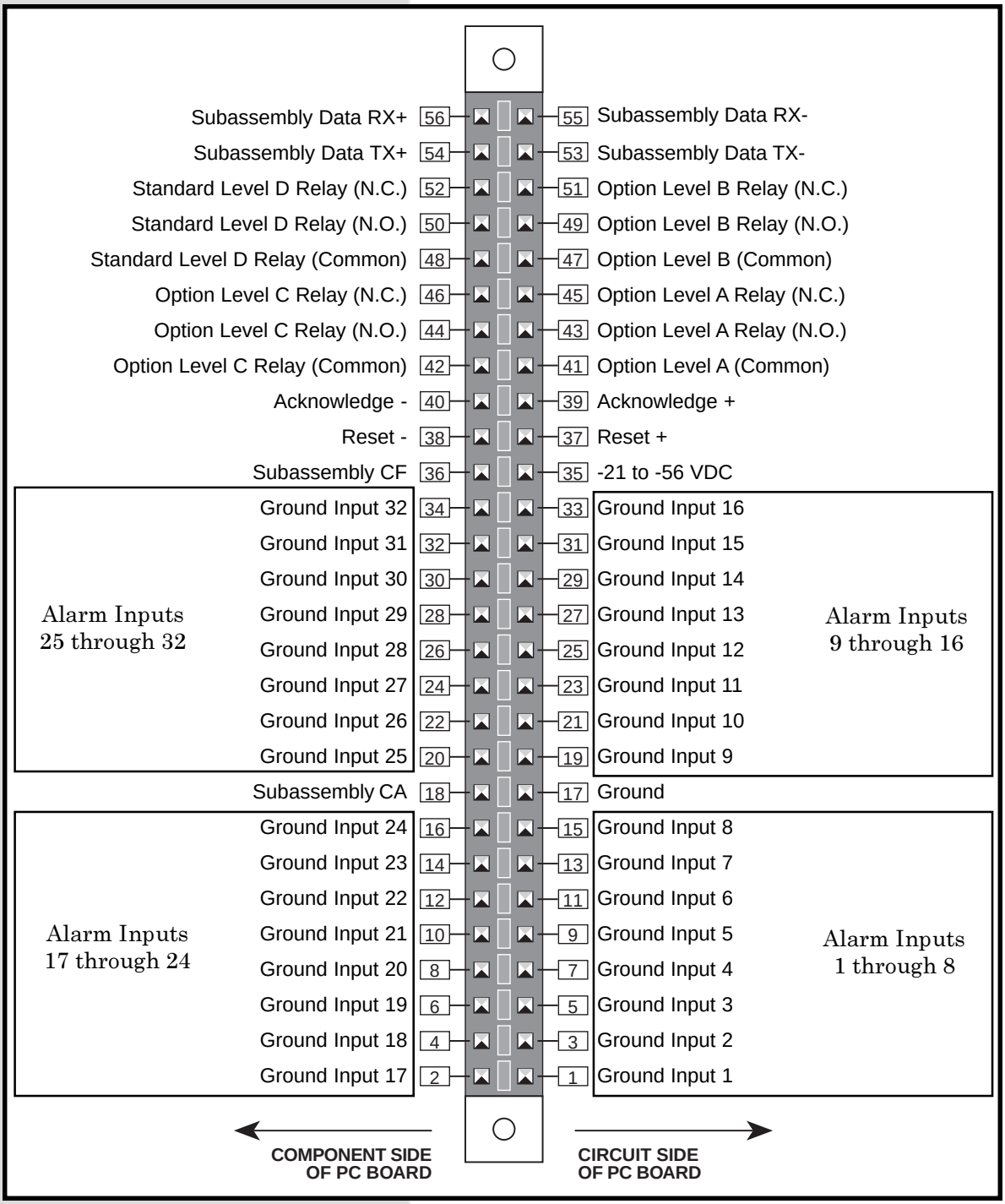
**** NOTE:*** *A TBOS display consists of eight characters (64 points). A MAT can handle four characters (32 points).*

*1. If S6-1 is **OFF**, the MAT will respond only to the four characters (32 points) selected by switches S5-5 through S5-8.*

*2. If S6-1 is **ON**, the MAT will respond to the four characters selected by S5-5 through S5-8; It will also respond to the other four characters of the same display, reporting no alarms.*

***THEREFORE**: Set S6-1 **OFF** if two MATs are being used for a display. Set S6-1 **ON** if only one MAT is being used.*

FIG. 4 - MULTIPLE ALARM TRANSMITTER PIN DESIGNATIONS



NOTE: *Edge connector pins **18, 36** and **53-56** vary in function depending on which communications subassembly has been installed. Refer to Fig. **1** in **Circuit Description** section.*

WIRE THE SHELF.

1. Open the door on the right side of the front panel to expose the wire-wrap pins.

WARNING: *Pins C17-C24 have negative battery on them. For safety, these pins should be covered with protective insulation.*

2. Refer to Fig. 5 for a wiring chart. The chart also is located on the inside of the door.

NOTE:
Remove the door to make wiring easier. Pry out the two rivets that hold it on. When you finish wiring the shelf, replace the door and rivets.

- Wire the 32 status (alarm) inputs. The inputs accept grounds from the equipment generating the alarms. If a ground return is needed, use pins C1-C16 (refer to Fig. 6).
- Wire the relay outputs. If you are going to use the relays to report alarms, wire the relays to audible or visual alarm reporting devices. If you are going to use the relays as controls, wire the relays to the equipment to be operated.
- Check the MAT to see if it is equipped with a 49008 RS-422 interface, a 49013 202 modem interface, or a 49029 RS-232 interface. Wire the communications port according to the type of subassembly, using either the wire-wrap pins or the RJ-11C connector. Refer to Figs 7 and 8.
- Wire the miscellaneous connections:

  Pins C17-C24 have negative battery on them. They are not used with the 46012 MAT.

  For remote operation of the reset and acknowledge functions wire switches to pins A19 (reset) and A20 (acknowledge). The inputs must be grounds.

3. Close the cover.
4. Wire power to the three-pin connector on the rear of the shelf:

NOTE:
An optional AC to DC Power Supply is available. This unit plugs into any 110 VAC wall outlet and provides 24 VDC ±5% and 200 mA maximum current. Refer to the ***Ordering Information*** section

- Remove the connector from the plug in the shelf.
- Refer to Fig. 9 and wire the connector as shown. When you insert a wire into the connector, tighten it with the screw below the wire.
- Insert the connector into the shelf plug.

FIG. 5 - WIRING CHART

A15-46100-1X WALL MNTD MAT							
STATUS INPUTS							
INPUTS	A ROW	B ROW	C (RETURN)	INPUTS	A ROW	B ROW	C (RETURN)
1	1		1	17		1	1
2	2		2	18		2	2
3	3		3	19		3	3
4	4		4	20		4	4
5	5		5	21		5	5
6	6		6	22		6	6
7	7		7	23		7	7
8	8		8	24		8	8
9	9		9	25		9	9
10	10		10	26		10	10
11	11		11	27		11	11
12	12		12	28		12	12
13	13		13	29		13	13
14	14		14	30		14	14
15	15		15	31		15	15
16	16		16	32		16	16

CONTROL OUTPUTS					
RELAY	A ROW	TYPE	RELAY	B ROW	TYPE
A	21	COM	C	21	COM
A	22	NO	C	22	NO
A	23	NC	C	23	NC
B	24	COM	D	24	COM
B	25	NO	D	25	NO
B	26	NC	D	26	NC

B12-49008 & A12-49013 SUB ASSY			
RS-422 & MODEM	PINS		RJ-11C
TRANSMIT-	A	27	4
TRANSMIT+	B	27	3
RECEIVE-	A	28	5
RECEIVE+	B	28	2

A12-49029 SUB ASSY			
RS-232	PINS		RJ-11C
TRANS. DATA	A	27	4
RCV DATA	B	28	2
RTS	C	27	6
CTS	B	27	3
DTR	A	28	5
RLSD (DCD)	C	28	*
GROUND	C	16	1

MISC. CONNECTIONS		
C	17-24	PROGRAM BAT.
A	19	GROUND RESET
A	20	GROUND ACK.

* USING RJ-11C, DCD ON 49029 MUST BE STRAPPED ON

• Screw the connector to the shelf.

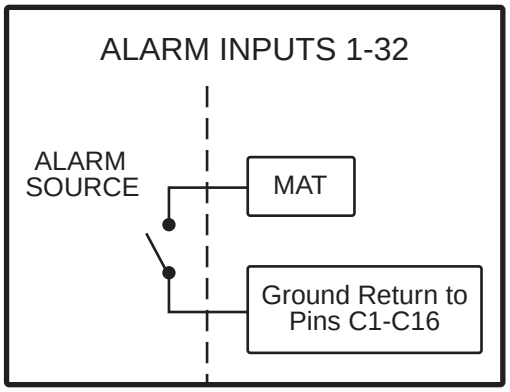


FIG. 6 - TYPICAL ALARM CIRCUIT

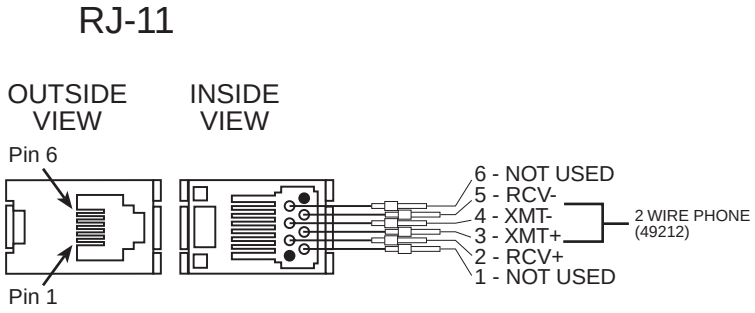


FIG. 7 - RJ-11C CONNECTOR; RS-422 OR MODEM (202 OR DIAL-UP)

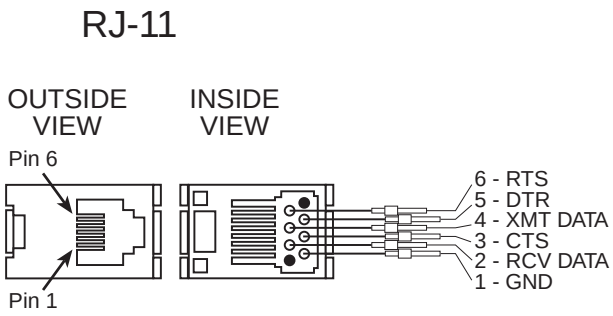
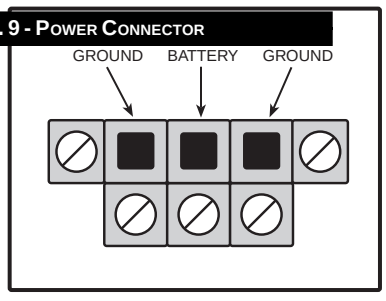


FIG. 8 - RJ-11C CONNECTOR; RS-232

FIG. 9 - POWER CONNECTOR



INSTALL THE MODULE.

1. Insert the module into the shelf and push it into the 56-pin edge connector.
2. Verify that the LED display on the module appears in the window of the shelf.

Download the alarm levels to the MAT.

1. Set the default level for alarms to D:
   - Verify that the power to the shelf is off.
   - Press and hold the RST button.
   - Turn on power.
   - Release the RST button after three seconds.
2. Download the alarm levels (A-D) from the 46020 Multiple Alarm Processor (MAP).

   For MAPs that require a T/Shell software program to configure (such as those with 46640-01 or 46641-00 firmware), refer to the ***Data Port Definition*** section of the ***MAP System Definition*** chapter of the software manual to set the levels. Refer to the ***Transfer*** chapter to download the settings.

   For MAPs that do *not* require a T/Shell software program to configure (such as those with 46600-35 or 46600-38 firmware), refer to the OPTION/PUT/SHOW command in the ***Printer Syntax*** chapter of the firmware manual.

   A battery on the memory board subassembly prevents the alarm levels from being lost if there is a power failure.

CHECKOUT PROCEDURE

PROCEDURE	RESULT
Turn on power to the shelf and begin polling the MAT.	The RCV DATA LED blinks in response to all polling, but the XMT DATA LED flashes only when its two addresses are polled.
Press the ACK and RST buttons * at the same time and hold them for a few seconds.	All LEDs except the A1 ON, XMT DATA, and RCV DATA light up and remain on until the buttons are released.
Generate alarms on each of the MAT's inputs. Acknowledge * the alarms. Reset the inputs to the non-alarm state.	The alarm and level LEDs operate according to the mode of operation chosen. The A1 ON LED turns on and off at six second intervals. When the A1 LED is on, alarms 1-16 appear on the alarm LEDs. When the A1 ON LED is off, alarms 17-32 appear. The correct information also is sent to the alarm center.
If relays on the MAT are configured to operate controls, test their operation.	The level LEDs and relays operate.

* The ACK and RST buttons are located on the 46100 Wall-Mount shelf. The operation of the buttons depend on the settings of switch SW1 on the 46100 shelf.

OPERATION

This section describes the operation of both the 46100 shelf and the 46012 MAT.

46100 SHELF

- Before working with the shelf, ground yourself to the ESD jack.
- Refer to the 46012 MAT manual for operation of the RST and ACK buttons.
- If you need to replace a fuse, they are GMT-type fuses, rated at a half ampere.

Fuse F1 protects power to pins C17-C24 of the wire-wrap terminal block on the shelf (program battery).

Fuse F2 protects power to the MAT.

46012 MAT

Once the 46009 has been installed, observe the LED display. When the A1 ON LED is on, alarms 1-16 appear on the alarm LEDs. When the A1 ON LED is off, alarms 17-32 appear.

Reset and acknowledge alarms according to the mode chosen by pressing the RST and ACK buttons.

CONTROL POINT OPERATION

When the on-board relays have been configured to act as control points (just as a Control Point Module), all commands are issued or passed through the Multiple Alarm Processor (MAP). To issue a command from the MAP, the following commands are available:

NOTE:
Only control points 1-3 or 1-4 are available for these commands.

DCM Mode (S301-2 OFF)

- DLON (direct latch on)
- DLOF (direct latch off)
- DMON (direct momentary on)
- SLON (select latch on)
- SLOF (select latch off)
- SMON (select momentary on)
- EXE (execute)

TBOS Mode (S301-2 ON)

- OPR (operate)
- RLS (release)
- MOM (momentary)

TECHNICAL SPECIFICATIONS

DESCRIPTION	VALUE
Input Voltage Range	-21 to -56 VDC
Input Current (±20%)	
@ -24VDC (idle)	24 mA
@ -24VDC (max)	155 mA
@ -48VDC (idle)	52 mA
@ -48VDC (max)	120 mA
Heat Dissipation @ -48VDC	19.6 Btu/Hr
Alarm, Acknowledge, Reset Inputs	
Voltage Range	-21 to -56 VDC
Current Range	600uA to 2.0 mA
Resistance	33K ohms + 1 diode (0.6 volt)
TTL Levels	
Logic 0	0 to 1.0 VDC
Logic 1	2.6 to 5.25 VDC
Alarm Bus Output	
Contact Type	Single Form-C Dry Contact
Contacts Ratings	Max. 1 Amp @ 24 VDC Max. 0.5 Amp @ 125 VAC
Data Rates (selectable)	50 through 9600 baud
Weight	2 lbs.
Physical Dimensions	9.9W" x 6.5"H x 2.3"D
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

Dantel

P.O. Box 55013 • Fresno, CA 93747-5013 Phone (559) 292-1111 Fax (559) 292-9355 http://www.dantel.com