46017

SUMMARY AUDIBLE ALARM MODULE (SAAM)

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46017-00
SUMMARY
AUDIBLE ALARM
        EXIST
[||||||||]
        NEW
[||||||||]
                        ON
  ○      ▯      [▤]
 ACK   ACO
      GROUP 1
        EXIST
[||||||||]
        NEW
[||||||||]
                        ON
  ○      ▯      [▤]
 ACK   ACO
      GROUP 2
                        ON
  ○      ▯      [▤]
 ACK   ACO

     (   ⊚   )

  ⮞ Dantel
A11-46017-00 REV__
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Table of Contents

About this Practice:

This practice has been reissued to:
• Move the Applications Information section forward.

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

Issue date: March 1998

UPDATED

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.**

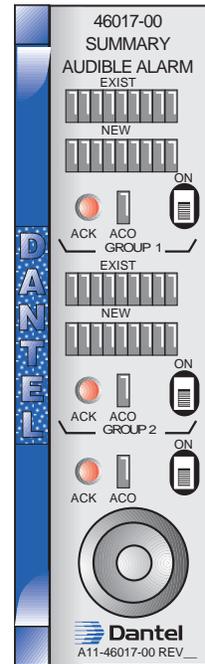| OPTION NUMBER	FEATURES
A11-46017-01	Summary Audible Alarm Module (SAAM)
A11-46017-11	Summary Audible Alarm Module (SAAM)

GENERAL DESCRIPTION

The 46017 Summary Audible Alarm Module (SAAM) provides a highly recognizable two-level audio alarm indicator and alarm status display to alert service personnel of an alarm. The module is part of Dantel's 460 Alarm and Control System.

The 46017 SAAM indicates alarms audibly and visually, remotely or locally. It accepts 16 external alarms, summed in two groups of eight. Each group of eight alarms reports with a different tone rate, allowing priority alarms to be grouped together and audibly recognized.

The 46017 SAAM also provides relays to control external audio and visual alarm indicating devices.

A timer can be set to acknowledge all alarms automatically.

There are two options of the module:

46017-01 - The first four inputs of each group are TTL as well as optically coupled (OC) inputs. The second four inputs of each alarm group are OC only.

46017-11 - The same as the 46017-01 except that inputs 5 through 8 of Alarm Group 1 and inputs 13 through 16 of Alarm Group 2 are TTL inputs instead of OC inputs.

The 46017 SAAM is a plug-in printed circuit module that fits into any Dantel 400-type or similar equipment housing. It operates on -21 to -56 VDC input power.

The front panel includes:

♦ Two status-indicating LEDs for each alarm input

♦ A Sonalert audible alarm with Alarm Cut-Off (ACO) switch and LED

♦ Alarm acknowledge buttons for each alarm group

♦ Alarm Cut-Off (ACO) switches

♦ LEDs for external alarm indicating devices for each alarm group

♦ An external Alarm Acknowledge button

CIRCUIT DESCRIPTION

A functional schematic for the 46017 Summary Audible Alarm Module is shown in Fig. 1. Here is a brief description of each of the functional parts of the circuit:

Input Latching Circuits

There are 16 alarm input circuits. Each one has an input latching circuit that remains inactive with a high state present until an alarm is indicated (when an input goes to ground). When an alarm occurs, even momentarily, the input latch circuit holds (latches) its output to the alarm summing logic.

When an alarm comes in, two front panel LEDs light. The LED labeled EXIST follows the input signal, but the NEW LED is held by the latch circuit until someone acknowledges the alarm.

When alarms are acknowledged, the NEW LEDs go out. There are four ways to acknowledge alarms:

- ♦ Push the front panel acknowledge (ACK) buttons in factory-wired applications. Pins 27 and 41 for Alarm Group 1, and pins 15 and 28 for Alarm Group 2 are normally wired together at the factory to enable the buttons to operate.

- ♦ Connect pin 41 for Alarm Group 1 and pin 15 for Alarm Group 2 to a remote ground source.

- ♦ Connect pin 29 of the EXT ACK to ground. Connect pin 31 to pins 41 and 15 of 46017 modules. Pressing the EXT ACK button will acknowledge alarms on the 46017 SAAM and all modules to which the switch is wired.

- ♦ Set the DIP switches to acknowledge alarms automatically after a certain time-out period (refer to Table A).

Alarm OR'd Logic

There are two groups of eight inputs combined by the alarm logic circuit (called alarm OR'd logic). One or more inputs results in an output to the relay select and driver circuits.

If an alarm signal is present at the alarm OR'd logic and another alarm signal from the ***same group*** comes in, its front panel LED lights to indicate the additional alarm. The audio alarm tone rate does not change. However, if the first alarm is from Group 1 and the second is from Group 2, the Group 2 alarm takes precedence over the Group 1 alarm. In that case, the audio alarm rate changes and the device generates a different tone.

Relay Select and Driver Circuit

The alarm signal from each group's OR'd logic goes to the relay select and driver circuit to activate relays. Each relay coil operates two sets of form-C contacts. Refer to Table A.

The NEW relays deactivate when you acknowledge an alarm. The EXIST relays follow the alarm input. If alarms still exist when they are acknowledged, the NEW relays deactivate but the EXIST relays do not.

TABLE A - RELAY COILS

RELAY COILS
K1 AND K2
Activated by Alarm Group 1.
K3 AND K4
Activated by Alarm Group 2.
K1 AND K3
Activated by a new alarm.
K2 AND K4
Activated by an existing alarm.

CIRCUIT DESCRIPTION

Fig. 1 - Functional Schematic, 46017

Fig. 1 - Functional Schematic, 46017
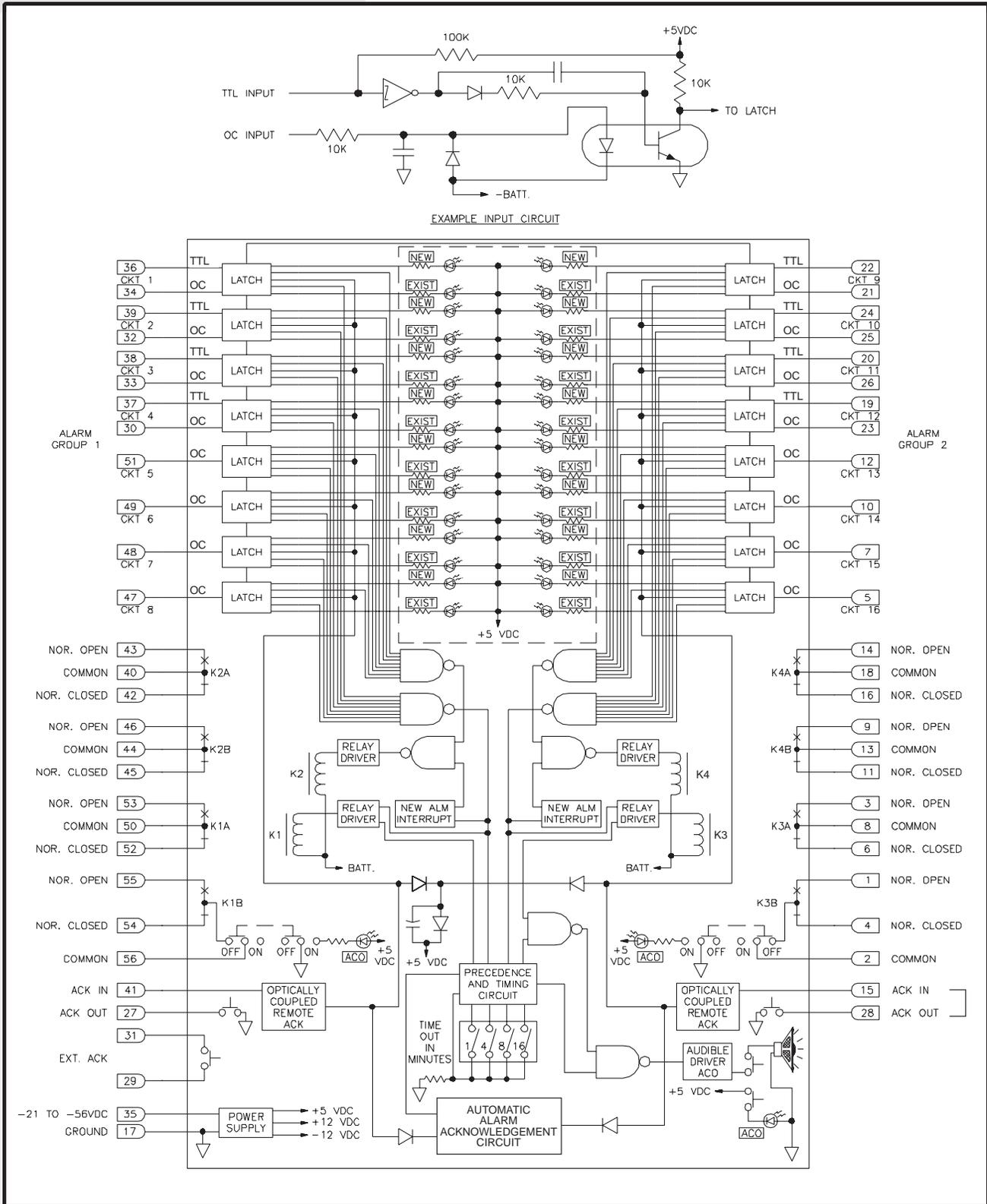
CIRCUIT DESCRIPTION

Precedence and Timing Circuit

The precedence and timing circuit receives alarm signals from the OR'd logic and sets the alarm group precedence (Alarm Group 2 always has precedence). This provides two advantages:

♦ It prevents more than one alarm at a time from turning on the audible alarm

♦ It provides a different output signal for each alarm group:

Group 1 - two seconds on, one second off

Group 2 (with precedence) - one second on, one second off

Alarms can be acknowledged automatically after a time-out of 1, 4, 8 or 16 minutes. The time-out disables the audible alarm, turns off any NEW alarm LEDs, and releases relays K1 and K3. After the time-out period, any new alarms will reactivate the relays and audible alarm, and restart the timer. When the time-out function is not used, the relays and audible alarm remain active until you acknowledge the alarms.

Audio Driver and ACO

When a NEW alarm comes in, the output from the precedence and timing circuit turns on the audio driver. The audio driver powers the audible alarm, and the sound alerts service personnel of the alarm condition.

On the front panel an ACO (Alarm Cut-Off) switch shuts off the audible portion of the alarm reporting. A front panel LED remains on as long as the ACO switch is on. This LED serves to remind service personnel that the audio has been shut off and they will not hear subsequent alarms.

Power Supply

The power supply operates on -21 to -56 VDC input power. It supplies regulated +5 VDC as well as +12 and -12 VDC power to the 46017 module's circuits.

APPLICATION INFORMATION

This section describes four example applications: Multiple Level, Single Level, Single or Multiple Level, and External Device.
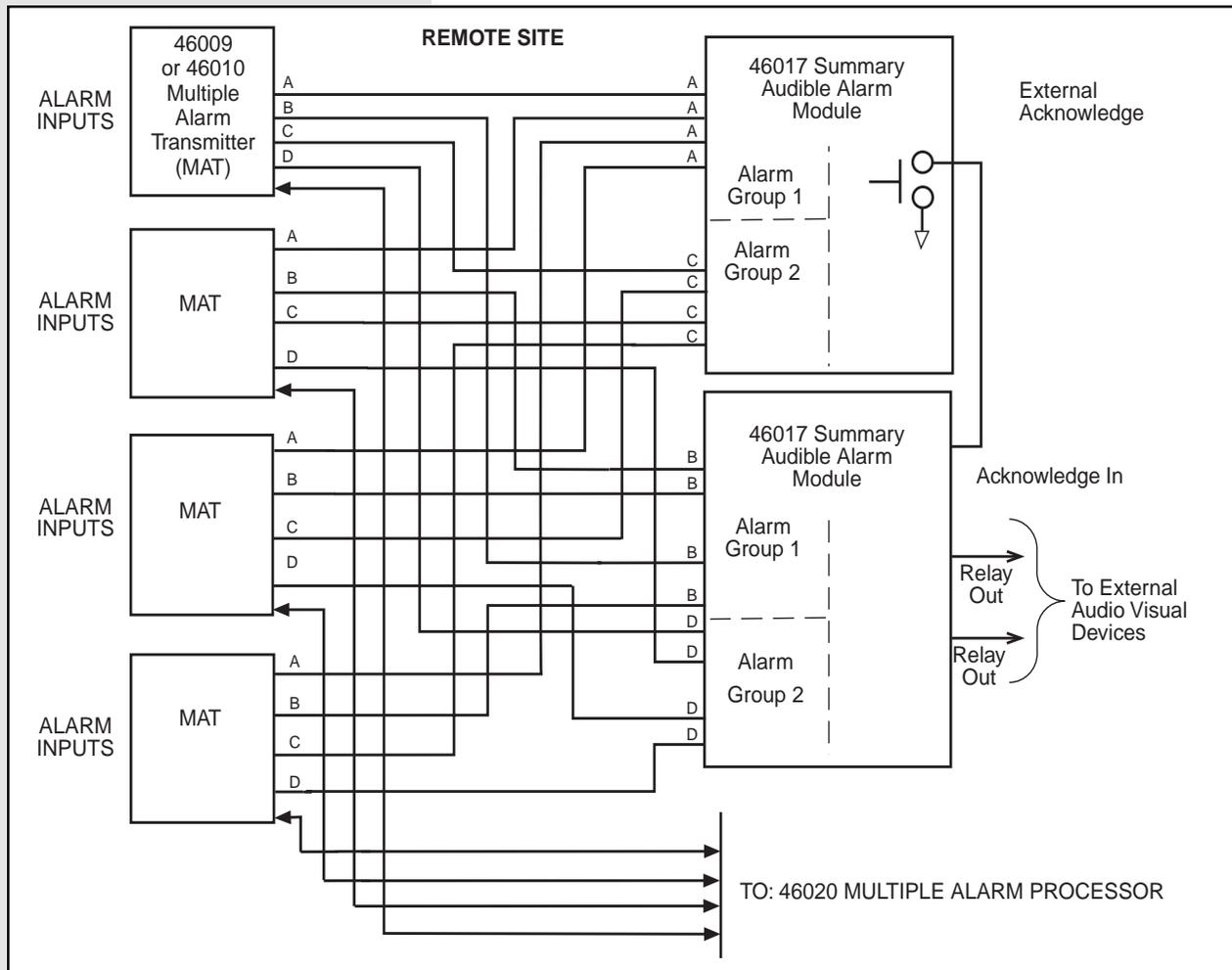
Multiple-Level Application

Fig. 2 shows a multiple-level alarm reporting application using 46009 and 46010 Multiple Alarm Transmitters (MATs). The 46017 SAAM optically coupled inputs connect to the MAT alarm bus outputs. This application can use up to 8 MATs.

The 46017 SAAM reports alarms on only two levels. Group 2 always precedes Group 1. Connect a second 46017 SAAM for additional alarm level inputs.

Each of the four groups provides a different audio and/or visual signal. Two groups use the 46017 SAMM on-board Sonalert. The other two control an external audio or visual device with their alarm-enabled relays (K1-B, pins 56 and 54 or 55 in Group 1, and K3-B, pins 2 and 1 or 4 in Group 2). Setting the ACO switch to ON disables the Sonalert.

FIG. 2 - MULTIPLE-LEVEL ALARM REPORTING APPLICATION

Single-Level Application

Fig. 3 shows a single-level alarm reporting application using 46009 and 46010 MATs. The 46017 SAAM connects to each of 16 MAT priority alarm level A outputs. The output indicates an alarm condition to service personnel. This application can use up to 16 MATs.

Level A outputs with the greatest priority should connect to Group 2, because that group always precedes Group 1.

FIG. 3 - SINGLE-LEVEL ALARM REPORTING APPLICATION
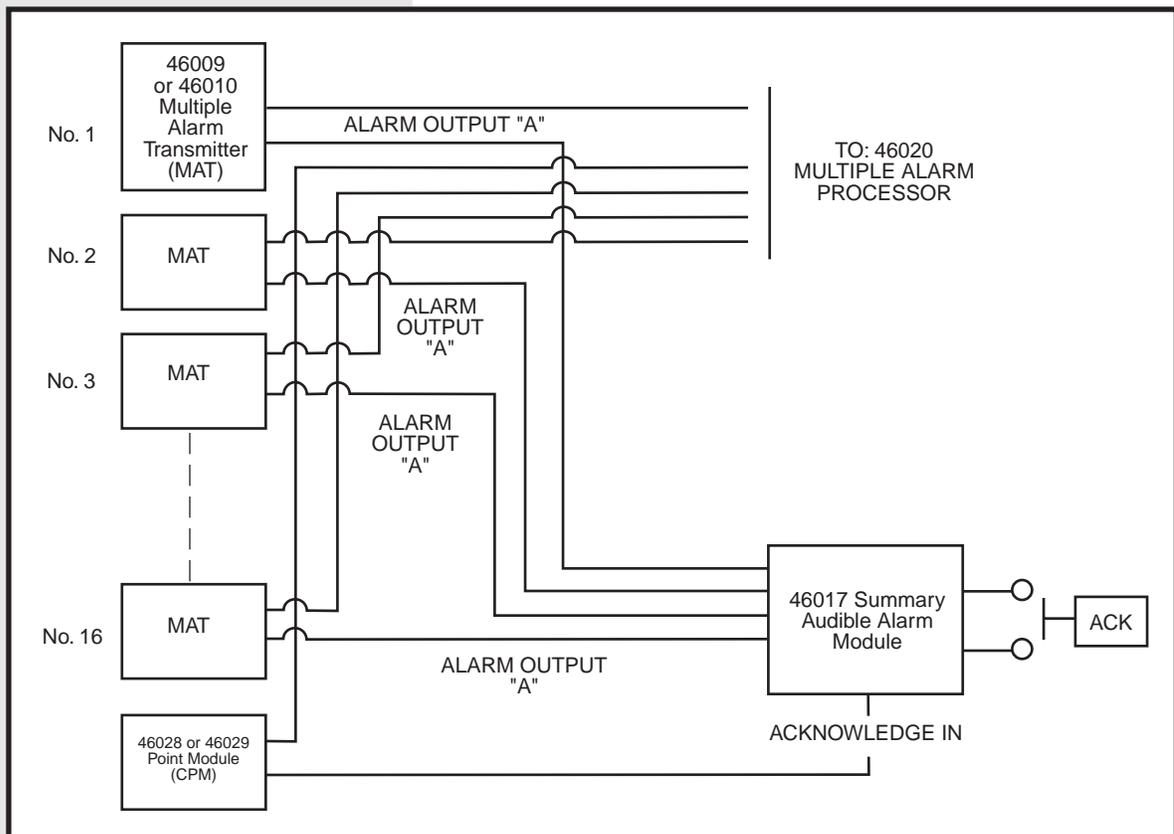
APPLICATION INFORMATION

Single or Multiple Level Application

Fig. 4 shows a single or multi-level alarm reporting application using 46020 Multiple Alarm Processors (MAPs). The 46017 SAAM TTL compatible alarm inputs connect to one or more MAP external alarm outputs (pins 29-32).

Use of 46017 SAAM TTL inputs reduces the available number of alarms from 16 to 8 (4 for each alarm group). Use alarm group TTL inputs for in-shelf applications only.

FIG. 4 - SINGLE-LEVEL OR MULTIPLE-LEVEL ALARM REPORTING APPLICATION
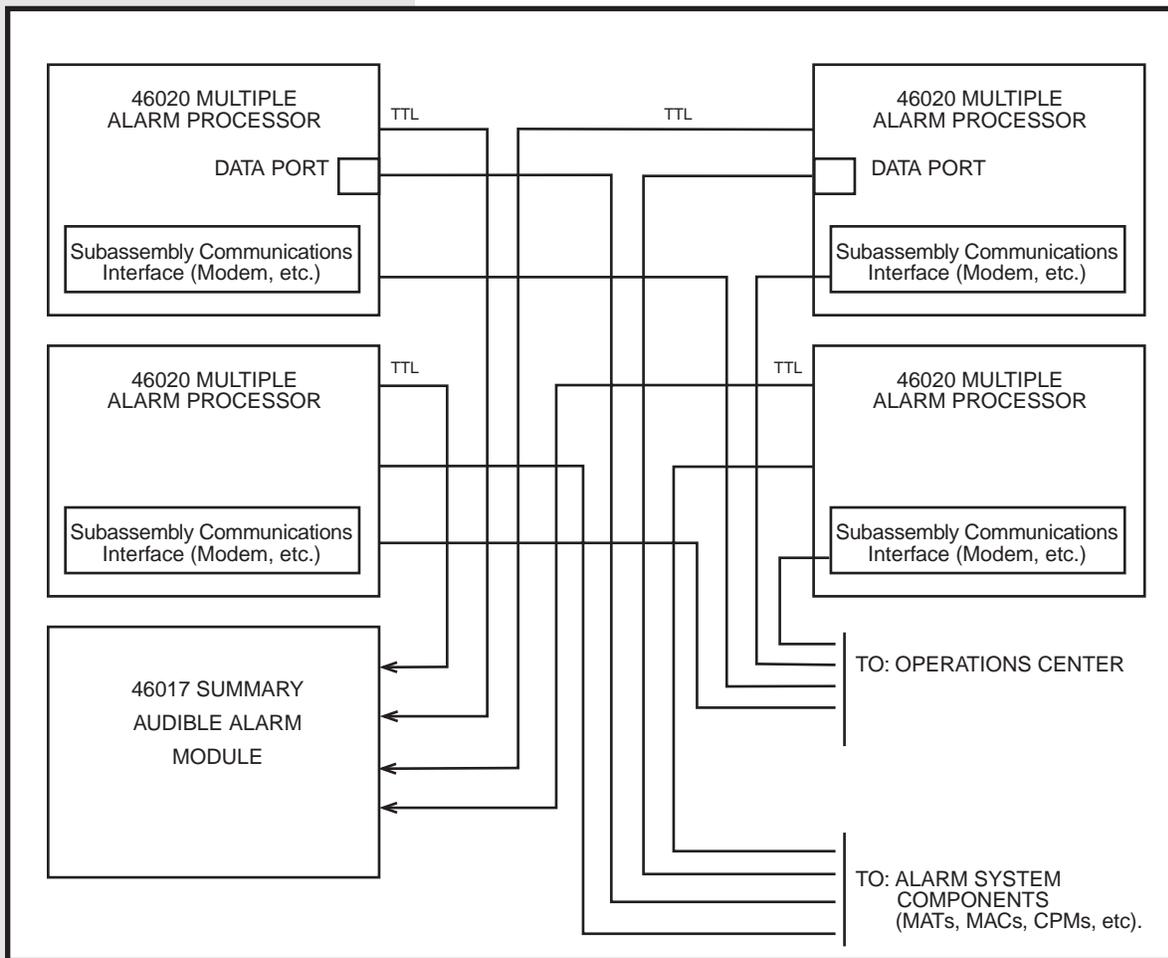
External Device Connection Application

Fig. 5 shows an external device connection application. External devices chain EXIST relay(s) and NEW relay(s) together after alarms or acknowledgment.

If the EXIST relay drops, its contacts open and the closed NEW relay contact does not signal the external device. If the NEW relay drops, the EXIST relay does not signal the external device.

The built-in audible device continues operating until it times out or it acknowledges the alarms.

FIG. 5 - EXTERNAL DEVICE CONNECTION APPLICATION
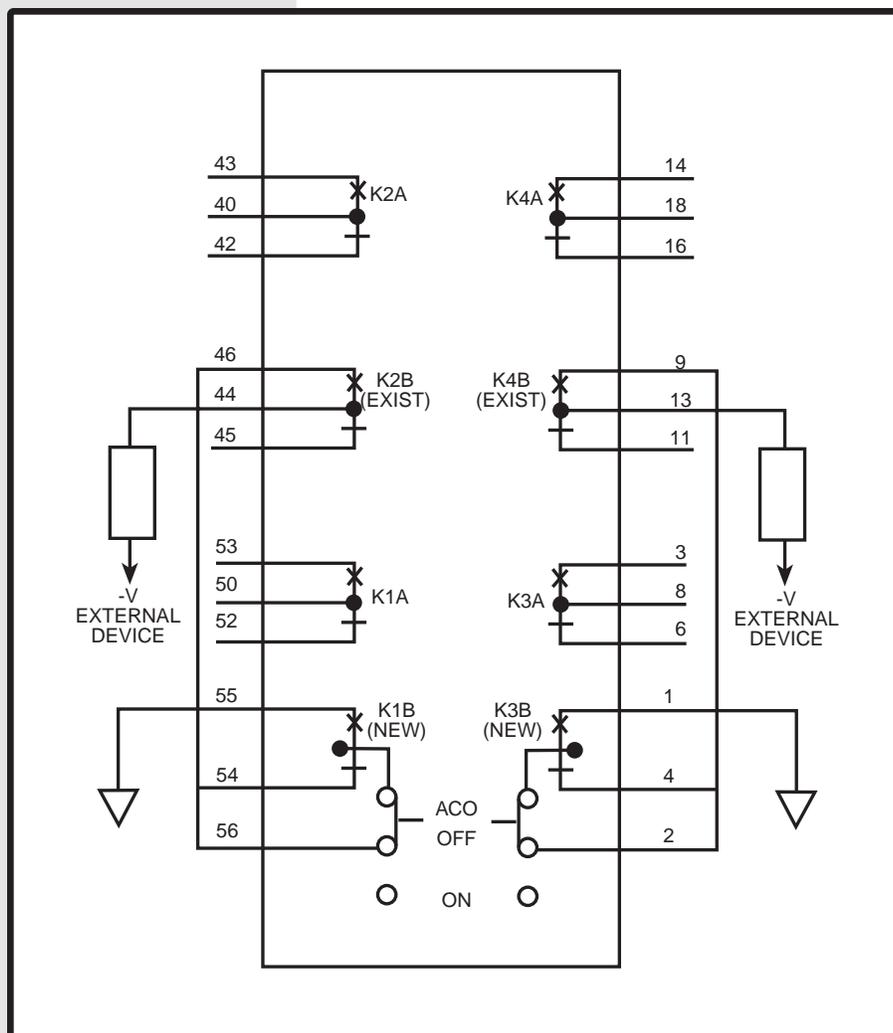
INSTALLATION

Installation consists of setting the switches, wiring for alarm acknowledgments, wiring relays, and installing the module in the equipment shelf.

1. Set the switches.

To set the time-out switch options, refer to Table B and Fig. 6. The time-out automatically disables the audible alarm, turns off any NEW alarm LEDs, and releases the NEW relays. After the time-out period, any new alarms will reactivate the relays and audible alarm, and restart the timer. When the time-out function is not used, the relays and audible alarm remain active until you acknowledge the alarms.

TABLE B - TIME-OUT SWITCH SETTINGS

TIME PERIODS	SWITCH SETTINGS			
	S1	S2	S3	S4
Continuous (no time-out)	OFF	OFF	OFF	OFF
1 minute	ON	OFF	OFF	OFF
4 minutes	OFF	ON	OFF	OFF
8 minutes	OFF	OFF	ON	OFF
16 minutes	OFF	OFF	OFF	ON

FIG. 6 - SWITCH LOCATION, 46017 SUMMARY AUDIBLE ALARM MODULE
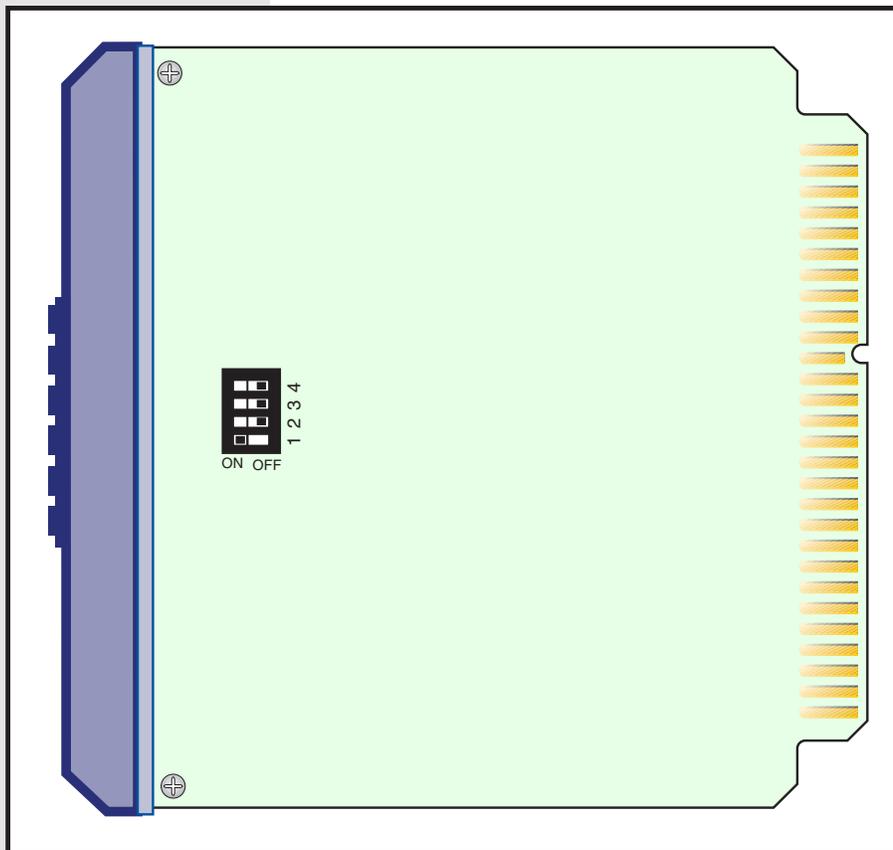
INSTALLATION

2. Wire for alarm acknowledgment, if necessary.

When the 46017 SAAM reports alarms, you can acknowledge them automatically with the time-out feature, or you can push the front panel ACK buttons. Or, you can wire the module as indicated below:

♦ Connect pin 41 for Alarm Group 1 and pin 15 for Alarm Group 2 to a remote ground source.

♦ Connect pin 29 of the EXT ACK to ground. Connect pin 31 to pins 41 and 15 of 46017 modules. Pressing the EXT ACK button will acknowledge alarms on all the modules to which the switch is wired.

3. Wire relays, if needed.

You can wire the relays to external audio and visual alarm indicating devices.

One method is shown in Fig. 7 where external devices follow the alarms or acknowledgment by chaining the EXIST and NEW relays together.

If an EXIST relay drops, its contacts open and the NEW relay contacts that are closed can not go to the external device. On the other hand, if the NEW relay drops, the EXIST relay can not signal the external device. This is true only for an external device. The built-in audible alarm continues to operate until it times out or until the alarms are acknowledged.

FIG. 7 - EXTERNAL DEVICE CONNECTION OPTION

4. Install the module in the proper slot in the equipment shelf.

The 46017 is usually installed in a pre-wired Dantel shelf. Refer to Fig. 8 if custom wiring is required.

FIG. 8 - PIN DESIGNATIONS, 46017

K1-B, Common `56`	`55` K1-B-NOR, Open
K1-B-NOR, Closed `54`	`53` K1-A-NOR, Open
K1-A-NOR, Closed `52`	`51` Circuit 5, O.C. Input
K1-A, Common `50`	`49` Circuit 6, O.C. Input
Circuit 7, O.C. Input `48`	`47` Circuit 8, O.C. Input
K2-B-NOR, Open `46`	`45` K2-B-NOR, Closed
K2-B, Common `44`	`43` K2-A-NOR,Open
K2-A-NOR, Closed `42`	`41` Group 1, Acknowledge In
K2-A, Common `40`	`39` Circuit 2, TTL Input
Circuit 3, TTL Input `38`	`37` Circuit 4, TTL Input
Circuit 1, TTL Input `36`	`35` -21 to -56 VDC
Circuit 1, O.C. Input `34`	`33` Circuit 3, O.C. Input
Circuit 2, O.C. Input `32`	`31` External Acknowledge
Circuit 4, O.C. Input `30`	`29` External Acknowledge
Group 1 Acknowledge Button `28`	`27` Group 1 Acknowledge Button
Circuit 11, O.C. Input `26`	`25` Circuit 10, O.C. Input
Circuit 10, TTL Input `24`	`23` Circuit 12, O.C. Input
Circuit 9, TTL Input `22`	`21` Circuit 9, O.C. Input
Circuit 11, TTL Input `20`	`19` Circuit 12, TTL Input
K4-A, Common `18`	`17` Ground
K4-A-NOR, Closed `16`	`15` Group 2 Acknowledge In
K4-A-NOR, Open `14`	`13` K4-B, Common
Circuit 13, O.C. Input `12`	`11` K4-B-NOR, Closed
Circuit 14, O.C. Input `10`	`9` K4-B-NOR, Open
K3-A, Common `8`	`7` Circuit 15, O.C. Input
K3-A-NOR, Closed `6`	`5` Circuit 16, O.C. Input
K3-B-NOR, Closed `4`	`3` K3-A-NOR, Open
K3-B, Common `2`	`1` K3-B-NOR, Open

← COMPONENT SIDE OF PC BOARD   CIRCUIT SIDE OF PC BOARD →

INSTALLATION

CHECKOUT

To check the operation of the 46017 SAAM, monitor the unit in a system:

1. Apply an alarm at each input being used and observe the front panel for proper audible alarm, LED, and relay operation.

2. Acknowledge the alarms and verify that the audible alarms stops, the NEW LEDs turn off, and the NEW relays release.

3. Clear the alarms and verify that the EXIST LEDs turn off and the EXIST relays release.

OPERATION

F or the most part, operation of the 46017 Summary Audible Alarm Module consists of observing the lamps and audible alarm for alarm indication or operating one of the front panel Alarm Cut-Off (ACO) switches.
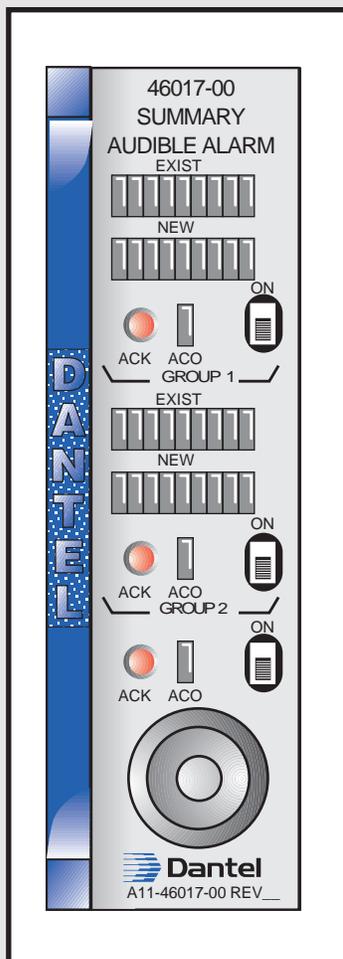
♦ The front panel of the 46017 Summary Audible Alarm Module has two LEDs for each alarm input:

  • The upper row of LEDs in each alarm group (EXIST) indicates which of the 16 alarm inputs has an alarm present.

  • The lower row of LEDs in each alarm group (NEW) indicates an alarm that has not been acknowledged.

♦ You can acknowledge alarms in one of several ways:

  • Press the acknowledge (ACK) buttons on the front panel.

  • Acknowledge the alarms remotely if the acknowledge inputs are connected to a remote ground source.

  • Press the EXT ACK button on the front panel if the button is wired for operation.

  • Wait for the alarms to acknowledge automatically if you are using the time-out function.

♦ To disable the audible alarm, place the bottom ACO switch ON. The bottom ACO LED will light.

♦ To disable external alarm indicating devices connected to the module relays, place the ACO switches for groups 1 or 2 ON. The corresponding ACO LED will light.

♦ To adjust the volume of the audible alarm, rotate the damper over the audible alarm at the bottom of the front panel.

46017-00
SUMMARY
AUDIBLE ALARM
EXIST

NEW

ON

ACK   ACO
GROUP 1

EXIST

NEW

ON

ACK   ACO
GROUP 2

ON

ACK   ACO

D A N T E L

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DESCRIPTION	VALUE
Input Power	-21 to -45 VDC
Input Current	
Idle (±20%)	
@ -21 VDC	50 mA
@ -56 VDC	40 mA
Operate (±10%)	
@ -21 VDC	250 mA
@ -56 VDC	280 mA
Heat Dissipation	
Idle (±20%)	
@ -21 VDC	3.6 Btu/Hr
@ -56 VDC	7.6 Btu/Hr
Operate (±10%)	
@ -21 VDC	17.9 Btu/Hr
@ -56 VDC	53.5 Btu/Hr
Relay Contact Ratings	
@ 30 VDC	2.0 Amp
@ 125 VAC	0.5 Amp
Alarm Input Requirements	
TTL Inputs	Ground to Operate (equal to or less than 1.0 volt above ground)
Optically Coupled Inputs	Ground to Operate (greater than 1.0 mA at -21 to -56 VDC)
Audio Alarm Type and Frequency	Sonalert #PAL-328N @ 3600 Hz
Temperature Range	0° to 60° C.
Physical Dimensions	1.4" x 6.0" x 5.6"
Weight	12.5 ounces

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