

TrueTime

560-5167 ALARM MODULE MANUAL

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SECTION ONE

1. GENERAL INFORMATION

1.1 PURPOSE OF EQUIPMENT

The 560-5167 Alarm Module card is designed to interface between the Fault Monitor card and the user. The Alarm Module provides two I/O connectors. A Male DB-9 connector is designed for RS-232 and RS-422 serial communication. A Female DB-25 connector provides RS-232 access, relay connections, a reset input, and a spare connection for expansion.

1.1.1 SPECIFICATIONS

1.1.1.1 PHYSICAL

Height:	4.4 in
Width:	0.8 in
Depth:	4.5 in
Weight:	1/8 kg

1.1.1.2 ENVIRONMENTAL

Storage Temp:	-50° to +100°C
Operating Temp:	0° to +50°C
Humidity:	Up to 95% relative, non-condensing
Cooling Mode:	Convection

1.1.1.3 POWER

Voltage:	±5 Vdc Provided by Fault Monitor
Current:	25 mA max

1.1.1.4 I/O SIGNALS

RXD:	RS-232 Input, J1-2 & J2-3
TXD:	RS-232 Output, J1-3 & J2-2
RIN+:	RS-422 Input, J1-7
RIN-:	RS-422 Input, J1-6
TOUT+:	RS-422 Output, J1-9
TOUT-:	RS-422 Output, J1-8
GND:	J1-5 & J2-1,7,24
CC-NO1:	De-energized Open Relay 1 Contact, J2-14
CC-COM1:	Common Relay 1 Contact, J2-15
CC-NC1:	De-energized Closed Relay 1 Contact, J2-16

CC-NO2:	De-energized Open Relay 2 Contact, J2-17
CC-COM2:	Common Relay 2 Contact, J2-18
CC-NC2:	De-energized Closed Relay 2 Contact, J2-19
SPARE	TTL Input with Internal 4.7 K Ω Pull-Up to +5 Vdc
/RESET	TTL Input with Internal 4.7 K Ω Pull-Up to +5 Vdc

SECTION TWO

2. INSTALLATION AND OPERATION

2.1 HOT SWAPPING

All cards, input cables, and output cables are hot swappable. It is not necessary to remove chassis power during insertion or removal. The system is designed to protect against permanent effects and minimize any temporary effects of hot swapping.

Adjacent-card hot swapping has no effect on the Alarm Module.

2.2 REMOVAL AND INSTALLATION

CAUTION: Individual components on this card are sensitive to static discharge. Use proper static discharge procedures during removal and installation.

Refer to CARD COMPATIBILITY section prior to installing new card.

To remove card, loosen the captive retaining hardware at the top and bottom of the assembly, then firmly pull on the handle (or on any connector on rear panel adapter cards) at the bottom of the card. Slide the card free of the frame. Refer to the SETUP section for any required switch settings or set them identically to the card being replaced.

Reinstall the card in the frame by fitting it into the card guides at the top and bottom of the frame and sliding it in until it mates with the connector. Seat card firmly to avoid contact bounce. Secure the retaining screws at the top and bottom of the card assembly.

2.3 SETUP

The 560-5167 Alarm Module has the selectable jumpers. The first two are placed on JP1-8 to select which signal line controls the relay outputs. When a jumper is placed on pins 1 and 2 of a header, the signal is controlling relay K1 which is connected to J2 pins 14-16 (refer to schematic drawing). When a jumper is placed on pins 2 and 3 of a header, the signal is controlling relay K2 which is connected to J2 pins 17-19 (refer to schematic drawing). The center pins of JP1-8 are connected to the OUT1-8 outputs from the associated Fault Monitor (#?) card. Refer to the software description for the Fault Monitor to determine if special software is present. Otherwise, select Pins 1-2 on one of JP1-8, and Pins 2-3 on another of JP1-8. Be certain that the jumpers are in opposite locations (1-2 and 2-3). The final jumper, JP9, is used to enable and disable the audible beeper. When the jumper is installed, the beeper is enabled and will be controlled through software. When the jumper is removed, the beeper is disabled and will be silent regardless of software control.

Jumper default settings:

JP1 2-3
JP8 1-2
JP9 Installed

2.4 OPERATION

2.4.1 GENERAL INFORMATION

The 560-5167 Alarm Module is primarily an interface card and has very few active components. It relays the RS-232 and RS-422 signals between the Fault Monitor card and the user. It also provides access to the /RESET and SPARE input lines as well as the fault relay output lines. Refer to the schematic drawing sheet 3 of the 560-5167 assembly.

2.4.2 HARDWARE

2.4.2.1 SERIAL COMMUNICATION

Serial communication signals are carried directly from the rear panel D connectors to the backplane. See table for pinout. Lines common to both connectors are not buffered separately.

Signal	DB-9 Male (J1)	DB-25 Female (J2)
RXD (RS-232 Input)	2	3
TXD (RS-232 Output)	3	2
RIN+ (RS-422 Input)	7	NA
RIN- (RS-422 Input)	6	NA
TOUT+ (RS-422 Output)	9	NA
TOUT- (RS-422 Output)	8	NA
CC-NO1 (Relay 1 Normally Open Contact)	NA	14
CC-COM1 (Relay 1 Common Contact)	NA	15
CC-NC1 (Relay 1 Normally Closed Contact)	NA	16
CC-NO2 (Relay 2 Normally Open Contact)	NA	17
CC-COM2 (Relay 2 Common Contact)	NA	18
CC-NC2 (Relay 2 Normally Closed Contact)	NA	19

2.4.2.2 FAULT RELAYS

The fault relay connections are used to monitor the status of fault conditions within the unit. Refer to the Fault Monitor for operational details.

2.4.2.3 BEEPER

The audible beeper signals an alarm condition within the chassis. The beeper may be defeated and/or controlled by firmware in a number of ways. Refer to the Fault Monitor for operational details.

SECTION THREE

3. THEORY OF OPERATION

3.1 GENERAL INFORMATION

This section contains a detailed description of the 560-5167 Alarm Module circuitry. Refer to the drawings in part four of this section.

3.2 HARDWARE DESCRIPTION

3.2.1 RS-232

RXD input and TXD output lines are connected to J1 pins 2 and 3, and J2 pins 1 and 2, respectively. These signals are passed directly through to the Fault Monitor card installed in the front slot opposite the Alarm Module.

3.2.2 RS-422

RIN \pm input and TOUT \pm output lines are connected to J1 pins 7 and 6 and pins 9 and 8, respectively. These signals are not connected to J2. The four RS-422 signals are passed directly to the Fault Monitor card installed in the front slot opposite the Alarm Module card.

3.2.3 FAULT RELAYS

The fault relays are controlled by two selectable signals from the Fault Monitor. JP1-8 are used to select which of the signals OUT1-8 from the Fault Monitor control the relays. Relay K1 is controlled by the signal which has pins 2 and 3 selected. Relay K2 is controlled by the signal which has pins 1 and 2 selected. When standard software is installed, all eight control signals OUT1-8 are identical and the position of the jumpers is not critical. They must however be placed in opposing positions to prevent shorting two output signals from the Alarm Monitor. Check the software description in the Fault Monitor documentation for any special software configurations. When a low signal is applied to the relays through Pin 3 of one of JP1-8 for K1 or Pin 1 of one of JP1-8 for K2, the associated PNP transistor Q1 or Q2 turns on. This allows current to flow through the relay coil and energizes the relay. The energized state is the No Fault state. When a high signal is applied to one of the relays, the associated PNP transistor turns off which de-energizes the relay. The de-energized state is the alarm state. Pull-up resistors of 10 K Ω to +5 Vdc cause the relays to de-energize indicating an alarm when a jumper is not installed. The relays are de-energized when Pin 1 of JP1-8 is Low (Fault). NOx pins are connected to their associated COMx when energized and open when de-energized.

NCx pins are open when the relay is energized and connected to COMx when de-energized.

3.2.4 RESET

The /RESET input line is passed from J2-25 directly through to the Fault Monitor via P1-A14. The signal is active low and is pulled up on the Fault Monitor card through a 4.7 K Ω resistor to +5 Vdc.

3.2.5 SPARE

The SPARE input line is passed from J2-23 to the Fault Monitor through P1-A15. The signal is pulled up via a 4.7 K Ω resistor to +5 Vdc on the Fault Monitor.

3.2.6 SIGNAL GROUND

Signal ground is connected to J1-5 and J2-1,7,24. It is connected to the backplane signal ground via P1-A1, B1, and C1. Signal ground is connected through a via to chassis ground on the 560-5167 the body of J1-J2.

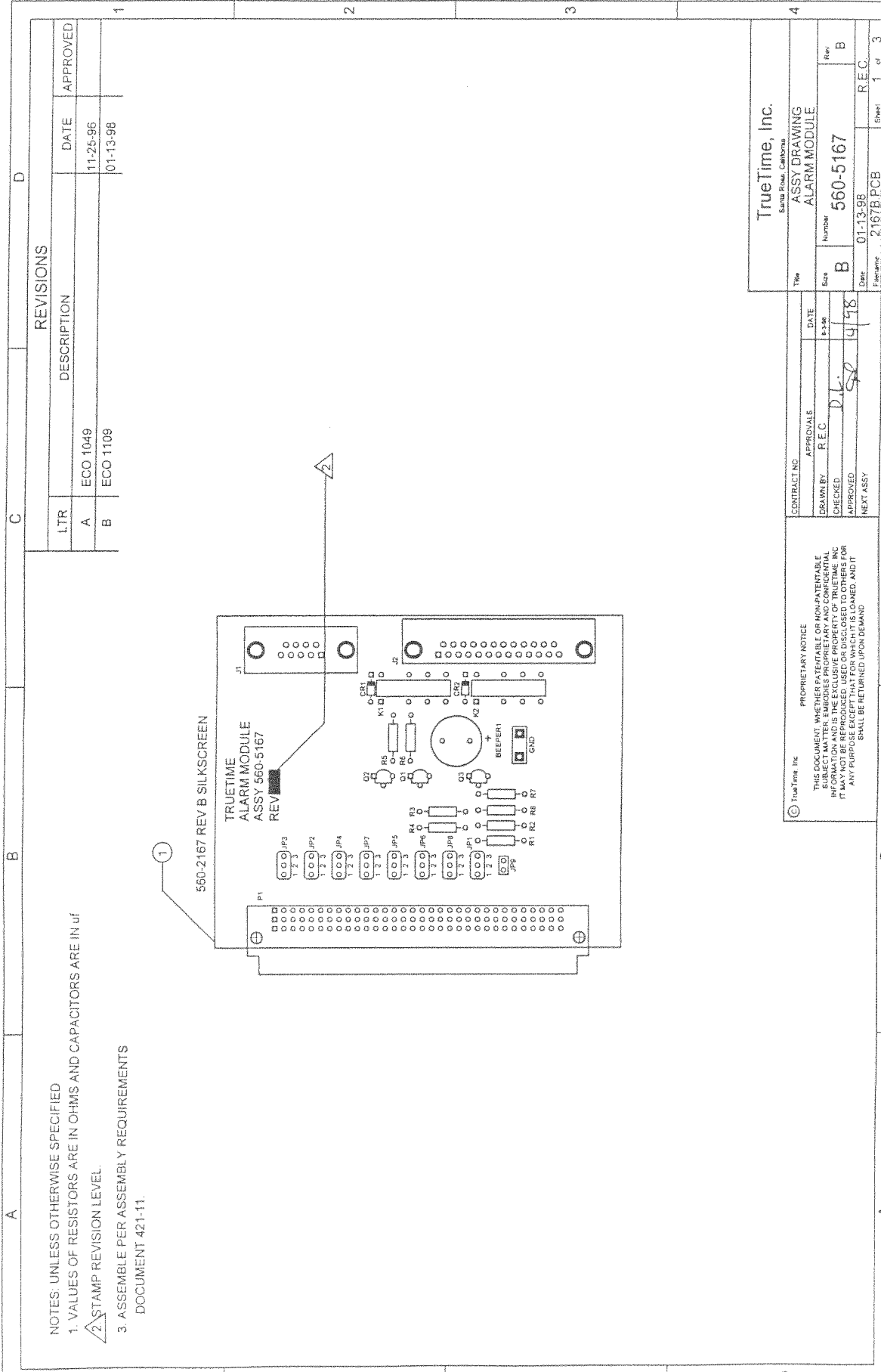
3.2.7 BEEPER

The beeper BEEPER1 is activated by applying a low signal to the base of PNP transistor Q3. This allows current to flow through the beeper. When JP9 is installed, the Fault Monitor controls the beeper via software. When JP9 is removed, the beeper is disabled by the pull-up resistor R8.

SECTION FOUR

4. DETAILED DRAWINGS

4.1 560-5167 DETAILED DRAWINGS / BILL OF MATERIALS



NOTES: UNLESS OTHERWISE SPECIFIED
 1. VALUES OF RESISTORS ARE IN OHMS AND CAPACITORS ARE IN uF
 2. STAMP REVISION LEVEL.
 3. ASSEMBLE PER ASSEMBLY REQUIREMENTS DOCUMENT 421-11.

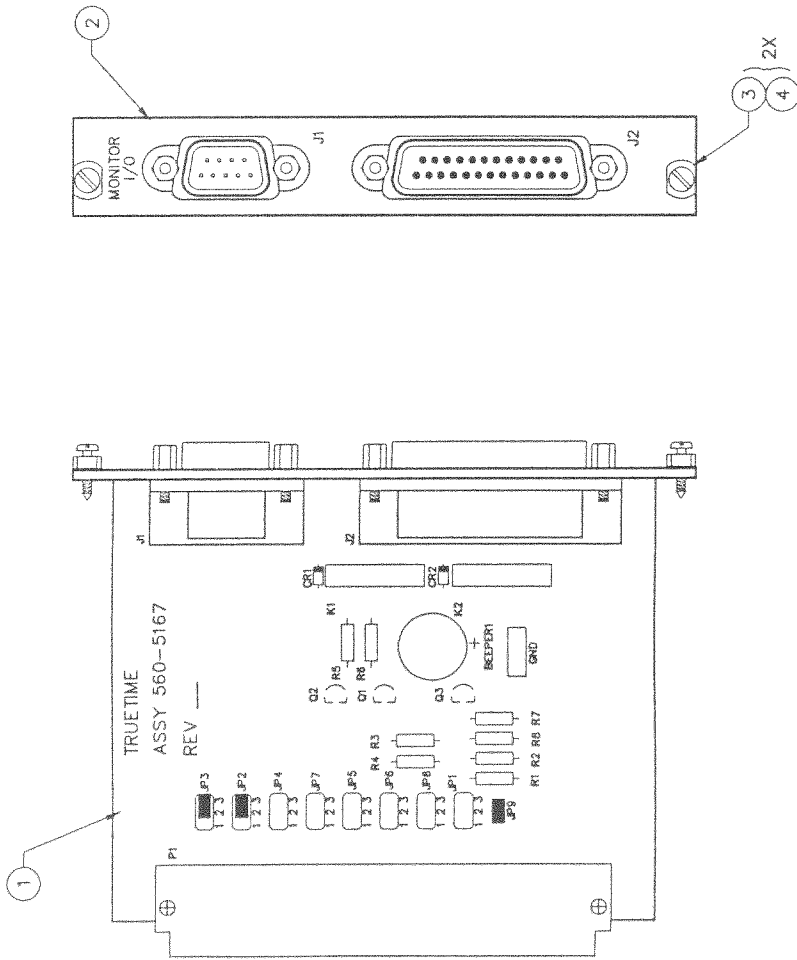
REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
A	ECO 1049	11-25-96	
B	ECO 1109	01-13-98	

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CONTRACT NO.	APPROVALS	DATE	
	DESIGNED BY: R.E.C.	8-2-96	
	CHECKED: D.L.	4-98	
	APPROVED:		
	NEXT ASSY:		

TrueTime, Inc.
 Santa Rosa, California

Type	ASSY DRAWING
Size	ALARM MODULE
Number	560-5167
Rev.	B
Date	01-13-98
Filename	2167B.PCB
Sheet	1 of 3



TrueTime[®]
 "We're Customer Satisfaction in our Highest Priority"
 2835 Duke Ct. Santa Rosa, CA 95407

SCALE	NONE	REV	B
SIZE	B	CODE IDENT NO.	560-5167
NEXT ASSY		DRAWING NO.	
FILENAME: \560\5167B		SHEET 2 OF 3	
DATE: 04-24-98			

MAX * BILL OF MATERIALS * SINGLE-LEVEL EXPLOSION BY PART IDENTIFIER W/REFERENCE

PART IDENTIFIER	DESCRIPTION 1	DESCRIPTION 2	EFF	ECN #	QTY/ASSY	REV	REFERENCE DESCRIPTION
			DATE			UOM LVL	
560-5167	ASSY ALARM MODULE	MADE FROM 560-2167				EA	
0000-APPROVAL	PARTS LIST APPROVAL		0000		1.0000	EA	<u>4/98</u>
0000-PL	PARTS LIST REV LEVEL		0000		1.0000	EA	REV B (04-24-98)
0000-PRINT	REFERENCE PRINT		0000		1.0000	EA	560-5167 REV B
0000-REV	PCB REV LEVEL HERE >>>>		0000		1.0000	EA	560-2167 REV B
002-049	RES 100 OHM 1/4W 5%	R25J201	0000		2.0000	EA	R5,6
002-073	RES 1K OHM 1/4W 5%	R25J102	0000		3.0000	EA	R3,4,7
002-097	RES 10K OHM 1/4W 5%	R25J103	0000		3.0000	EA	R1,2,8
057-4148	DIODE 1N4148	1N4148	0000		2.0000	EA	CR1,CR2
069-012	RELAY,2 FORM C,5V	CP CLARE LM44800	0000		2.0000	EA	K1,K2
175-3906	XSISTOR PNP 2N3906	MOTOROLA 2N3906	0000		3.0000	EA	Q1-Q3
223-379	SCREW CAP NP M2.5 X 11	SCHROFF #21100-379	0000		2.0000	EA	03
223-464	SLEEVE, STAINLESS	SCHROFF 21100-660	0000		2.0000	EA	04
273-009	TERMINAL TEST POINT	COMP CORP PJ-201-25	0000		1.0000	EA	GND
361-005	BEEPER 8-16VDC	STAR MICRONICS HMB-12	0000		1.0000	EA	BEEPER1
372-09P	CONN 9-P D-SUB RT ANG ML	748879-1 (BOM NAV NOTES)	0000		1.0000	EA	J1
372-25SR	CONN 25-P RIGHT ANGLE	LZR #WD 25F-A4A0(OR A4B0)	0000		1.0000	EA	J2
372-96RA	CONN,96-P FM DIN RT ANGLE	BERG 68353-296	0000		1.0000	EA	P1
401-01-01-34	CONN 34-P HDR SNGL RW W/W 3M	#929834-01-36	0000		1.0000	EA	JP1-JP9 (CUT TO FIT)
403-000LP	JUMPER FEMALE LOW PROFILE	SAMTEC SNT-100-BK-T	0000		3.0000	EA	JP2,JP3,JP9
560-1214	PANEL,REAR 9-P/25-P	SCREEN 560-1181-3	0000		1.0000	EA	02
560-2167	PCB ALARM MODULE	FAB	0000		1.0000	EA	01
LA	LABOR ASSEMBLY COST HRS		0000		0	EA	
LT	LABOR TEST COST HOURS		0000		0	EA	
OSV560-5167	OUTSIDE LABOR 560-5167	PCA	0000		1.0000	EA	