TrueTime

560-5167-1
ALARM MODULE MANUAL

June 14, 1999 Serial Number _____

SECTION ONE

1. GENERAL INFORMATION

1.1 PURPOSE OF EQUIPMENT

The 560-5167-1 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, a reset line, relay connections, and primary, secondary, and tertiary status inputs.

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
STATUS(P):	Primary Status, J2-4
STATUS(S):	Secondary Status, J2-6
STATUS(T):	Tertiary Status, J2-8
CC-NC1:	Energized Closed Relay 1 Contact, J2-14
CC-COM1:	Common Relay 1 Contact, J2-15
CC-NO1:	Energized Open Relay 1

	Contact, J2-16
CC-NC2:	Energized Closed Relay 2 Contact, J2-17
CC-COM2:	Common Relay 2 Contact, J2-18
CC-NO2:	Energized Open Relay 2 Contact, J2-19
SPARE	TTL Input with Internal 4.7 KΩ Pull-Up to +5 Vdc
/RESET	TTL Input with Internal 4.7 KΩ 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 560-5167-1 Alarm Module has 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
JP9 Not Installed

2.4 OPERATION

2.4.1 GENERAL INFORMATION

The 560-5167-1 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 provides Primary, Secondary, and Tertiary fault alarms to be sent to the Fault Monitor card. 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 560-5167-1 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
STATUS(P) (Primary Status)	NA	4
STATUS(S) (Secondary Status)	NA	6
STATUS(T) (Tertiary Status)	NA	8
CC-NC1 (Relay 1 Normally Closed Contact)	NA	14
CC-COM1 (Relay 1 Common Contact)	NA	15
CC-NO1 (Relay 1 Normally Open Contact)	NA	16
CC-NC2 (Relay 2 Normally Closed Contact)	NA	17
CC-COM2 (Relay 2 Common Contact)	NA	18
CC-NO2 (Relay 2 Normally Open 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 560-5167-1 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± input and TOUT± 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 KΩ 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). NCx pins are connected to their associated COMx when energized and open when de-energized.

NOx 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 KΩ 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 KΩ 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 560-5167-1 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.

3.2.8 STATUS (P,S,T)

The STATUS lines are a direct input connection to the Fault Monitor Card through the bus connector P1. The Fault Monitor setup determines whether a low signal or a high signal signifies a fault condition.

SECTION FOUR

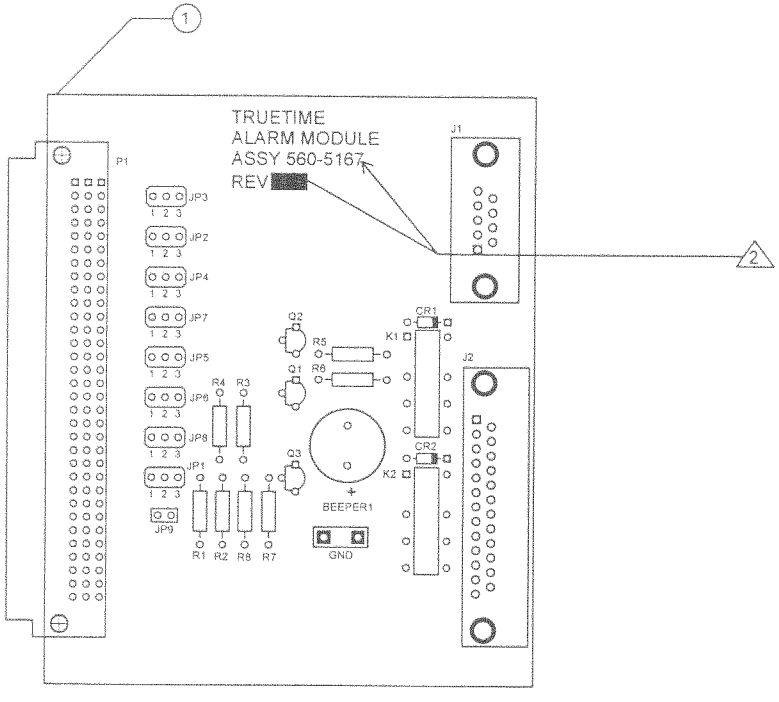
4. DETAILED DRAWINGS

4.1 560-5167-1 DETAILED DRAWINGS / BILL OF MATERIALS

NOTES: UNLESS OTHERWISE SPECIFIED

1. RESISTORS ARE IN OHMS AND CAPACITORS ARE IN MICRO FARADS.
2. STAMP PART NUMBER & REVISION LEVEL.
3. ASSEMBLE PER ASSEMBLY REQUIREMENTS DOCUMENT 421-11.

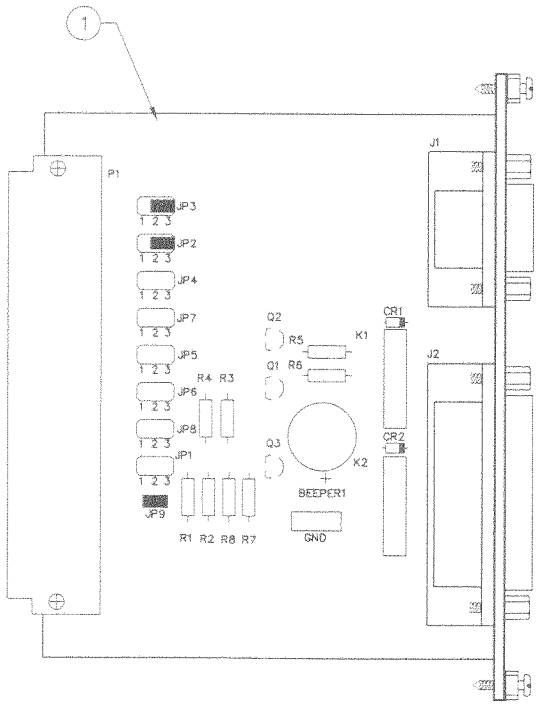
REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED

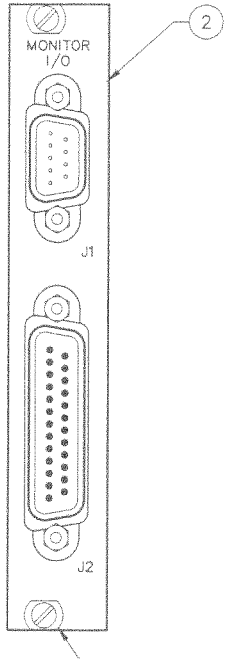


CONTRACT NO.		
APPROVALS		DATE
DRAWN BY	S.B.K.	05-26-99
CHECKED		6-1-99
APPROVED		6-1-99
NEXT ASSY		

TrueTime, Inc.
Santa Rosa, California

Title	ASSY DRAWING ALARM MODULE		
Size	Number		Rev
B	560-5167-1		N/C
Date	05-27-99		S.B.K.
Filename	5167-1.ASY	Sheet	1 of 3





10. PLACE JUMPER (USE PRELEG WIRE) FROM J2-8 TO P1-A10; ON SOLDER SIDE.
9. PLACE JUMPER (USE PRELEG WIRE) FROM J2-6 TO P1-A15; ON SOLDER SIDE.
8. PLACE JUMPER (USE PRELEG WIRE) FROM J2-4 TO P1-A13; ON SOLDER SIDE.
7. PLACE JUMPER (USE PRELEG WIRE) FROM K1-1 TO GND CONNECTION; ON SOLDER SIDE.
6. CUT TRACE BETWEEN CR2-ANODE AND BEEPER 1 PIN 2; ON COMPONENT SIDE.
5. CUT TRACE BETWEEN P1-A13 TO GROUND; ON SOLDER SIDE.
4. CUT TRACE BETWEEN P1-A10 TO GROUND; ON SOLDER SIDE.

NOTES: (CONTINUED)

FILENAME: \560\5167-18
DATE: 05-27-99

TrueTime®
"Where Customer Satisfaction is our Highest Priority"
2835 Duke Ct. Santa Rosa, CA 95407

SIZE	CODE IDENT NO.	DRAWING NO.	REV
B		560-5167-1	N/C
SCALE NONE			SHEET 2 OF 3

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

PART IDENTIFIER	DESCRIPTION 1	DESCRIPTION 2	EFF DATE	ECN #	QTY/ASSY	UOM	REV LVL	REFERENCE DESCRIPTION
560-5167-1	ASSY ALARM MOD/STATUS IN	TO INTFC W/560-5179 CPU				EA		
0000-APPROVAL	PARTS LIST APPROVAL		000000		1.0000	EA		6-1-99
0000-PL	PARTS LIST REV LEVEL		000000		1.0000	EA		REV N/C (05-27-99)
0000-PRINT	REFERENCE PRINT		000000		1.0000	EA		560-5167-1 REV N/C
0000-REV	PCB REV LEVEL HERE >>>>		000000		1.0000	EA		560-2167 REV B
002-049	RES 100 OHM 1/4W 5%	R25J201	000000		2.0000	EA		R5,6
002-073	RES 1K OHM 1/4W 5%	R25J102	000000		3.0000	EA		R3,4,7
002-097	RES 10K OHM 1/4W 5%	R25J103	000000		3.0000	EA		R1,2,8
057-4148	DIODE 1N4148	1N4148	000000		2.0000	EA		CR1,CR2
069-012	RELAY,2 FORM C,5V	CP CLARE LM44B00	000000		2.0000	EA		K1,K2
175-3906	XSISTOR PNP 2N3906	MOTOROLA 2N3906	000000		3.0000	EA		Q1-Q3
223-379	SCREW CAP NP M2.5 X 11	SCHROFF #21100-379	000000		2.0000	EA		03
223-464	SLEEVE, STAINLESS	SCHROFF 21100-660	000000		2.0000	EA		04
273-009	TERMINAL TEST POINT	COMP CORP PJ-201-25	000000		1.0000	EA		GND
361-005	BEEPER 8-16VDC	STAR MICRONICS HMB-12	000000		1.0000	EA		BEEPER1
372-09P	CONN 9-P D-SUB RT ANG ML	AMP 748879-1 (BOM NAV)	000000		1.0000	EA		J1
372-25SR	CONN 25-P RIGHT ANGLE	LZR #WD 25F-A4A0(OR A4B0)	000000		1.0000	EA		J2
372-609-003	JACK SOCKET SET OF 2	THOMAS & BETTS 609-003	000000		1.0000	EA		FOR J1
372-96RA	CONN,96-P FM DIN RT ANGLE	BERG 68353-296 (BOM NAV)	000000		1.0000	EA		P1
391-004	ADAPTER FOR RS PORT	FAITECH MCM70029	000000		1.0000	EA		DELIVER TO SHIPPING
401-01-01-34	CONN 36-P HDR SNGL RW W/W	3M 929834-01-36	000000		1.0000	EA		JP1-JP9 (CUT TO FIT)
403-000LP	JUMPER FEMALE LOW PROFILE	SAMTEC SNT-100-BK-T	000000		3.0000	EA		JP2,JP3,JP9
560-1214	PANEL,REAR 9-P/25-P	SCREEN 560-1181-3	000000		1.0000	EA		02
560-2167	PCB ALARM MODULE	FAB	000000		1.0000	EA		01
LA	LABOR ASSEMBLY COST HRS		000000		0	EA		
LT	LABOR TEST COST HOURS		000000		0	EA		
OSV560-5167-1	OUTSIDE LABOR 560-5167-1	PCA	000000		1.0000	EA		