MAINTENANCE MANUAL
SUBSYSTEM ALARM MODULE
19D902334G1

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SPECIFICATION

Tables 1 through 4 show the specifications of the of the Subsystem Alarm Module used in Simulcast Systems as follows:

- Table 1 outlines the general specifications.
- Table 2 outlines the power drain specification.
- Table 3 outlines the P1 connector interface to the Subsystem Alarm module.
- Table 4 outline the diode configuration to enable the alarm sense in generating the major and minor alarms.

Table 1 - General Specifications

ITEM	SPECIFICATION
INPUT VOLTAGE	+5 VOLTS ±10%
TEMPERATURE	-30 TO +60 DEGREES C
DIMENSION	8.0 (L) BY 4.0 (W) IN
WEIGHT	10 OUNCES
DIGITAL DATA TYPE	TTL
RELAY TYPE	ONE DOUBLE POLE DOUBLE THROW 2 AMP AT 48 VOLT

ERICSSON

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Table 2 - Power Specifications

VOLTAGE	CONNECTOR POINT	TOLERANCE ±%	CURRENT DRAIN TYPICAL mA	CURRENT DRAIN MAXIMUM mA	CURRENT DRAIN STANDBY mA
GND	P1-A2 P1-C2 P1-A31 P1-C31	NA	NA	NA	NA
+5	P1-A1 P1-C1 P1-A32 P1-C32	10	100	150	NA

Table 3 - P1 Connector Definition

CONNECTOR PIN	SIGNAL NAME	INPUT/ OUTPUT	LEVEL DIGITAL DC-VOLT AC-VRMS	CONTROL/ TRANSMITTER SITE
P1-A1	+5	I	+5 V	C/T
P1-C1	+5	I	+5 V	C/T
P1-A2	GND	I	0 V	C/T
P1-A3	R1COM	O	NA	C/T
P1-C3	R2COM	O	NA	C/T
P1-A4	R1NC	O	NA	C/T
P1-C4	R2NC	O	NA	C/T
P1-A5	R1NO	O	NA	C/T
P1-C5	R2NO	O	NA	C/T
P1-A6	ALARM1	I	0-5 TTL	C/T
P1-C6	ALARM2	I	0-5 TTL	C/T
P1-A7	ALARM3	I	0-5 V TTL	C/T
P1-C7	ALARM4	I	0-5 V TTL	C/T
P1-A8	ALARM5	I	0-5 V TTL	C/T
P1-C8	ALARM6	I	0-5V TTL	C/T
P1-A9	ALARM7	I	0-5 V TTL	C/T
P1-C9	ALARM8	I	0-5 V TTL	C/T
P1-C10	ALARM9	I	0-5 V TTL	C/T
P1-A11	ALARM12	I	0-5 V TTL	C/T
P1-C11	ALARM13	I	0-5 V TTL	C/T
P1-A12	ALARM14	I	0-5 V TTL	C/T
P1-C12	ALARM15	I	0-5 V TTL	C/T
P1-A13	ALARM16	I	0-5 V TTL	C/T
P1-C13	ALARM17	I	0-5 V TTL	C/T
P1-A14	ALARM18	I	0-5 V TTL	C/T
P1-C14	ALARM19	I	0-5 V TTL	C/T
P1-A15	ALARM20	I	0-5 V TTL	C/T
P1-C15	ALARM21	I	0-5 V TTL	C/T
P1-A16	ALARM22	I	0-5 V TTL	C/T
P1-A17	ALARM10	I	0-5 V TTL	C/T
P1-A30	ALARM11	I	0-5 V TTL	C/T
P1-A31	GND	I	0 V	C/T
P1-A32	+5	I	+5 V	C/T
P1-C32	+5	I	+5 V	C/T

DESCRIPTION

The Subsystem Alarm Module is used in the **EDACS®** Simulcast System to provide the alarm input sense enable and detection functions. The Subsystem Alarm Module is used at both the control point and transmit sites and is physically located in the Universal Sync Unit Assembly of the control or transmit simulcast site. The Subsystem Alarm Module plugs into slot 1 (J1) of the Universal Sync Unit Assembly.

The Subsystem Alarm Module obtains alarm status inputs from several sources: power supply alarms, a **WWVB** receiver alarm, **DATA SELECTOR 1** alarm, 1 alarm **DATA SELECTOR 2** alarm, **FSK MODEM** alarm, 10 **DELAY MODULE** alarms (22 alarm inputs).

The alarm status inputs are buffered and drive LED displays which are viewed through the front of the Subsystem Alarm Module panel. The LED is lit when a failure is detected. A switch is provided to disable unused inputs.

The alarm output is a double pole, double throw relay. This relay is activated when any of the 22 alarm failures are detected.

CIRCUIT AND FUNCTION DESCRIPTION

The Subsystem Alarm Module provides alarm monitoring for various units that are part of the simulcast system. The unit monitors 22 alarms: power supplies, **WWVB** receivers, the **FSK MODEM** Module, the **DATA SELECTOR 1** Module (150 baud selector), the **DATA SELECTOR 2** Module (9600 Hz selector), and **DELAY Modules.**

The input voltage to the alarm circuitry is a high (+ 5 volts) at the input pin, during an alarm condition. A 1k internal pullup to 5V is on all of the inputs to the alarm module. Therefore if a module is removed from the system, an alarm module will occur until it is replaced or the dip-switch on the alarm module is set to the disabled position.

An output alarm signal is generated through the output relay. The relay is a double pole, double throw, 2 ampere capacity relay. The outputs are used to activate user defined controls (horns, buzzers, lights) or can be connected to the remote alarm unit at the simulcast site.

Light emitting diodes on the module visually display the status of each alarm at the site.

Resistor packs **(RP1-RP3)** are used to supply the pullup voltage at the alarm inputs and set the current through the light emitting diodes.

Four Darling ton arrays are used to drive the LED's and the alarm relay. .

The alarm control input to the relay is generated from the diode (D1-D22) logic.

The DPDT relay has all six contacts brought to the P1 connector, **R1COM, R2COM, R1NC, R2NC, R1NO,** and **R2NO.** If there are no alarms at the input to the alarm module, relay (K1) will be de-energized.

Three Dip switch modules (8 switches to a module) are used to enable/disable an alarm input. If the switch is **"On"** (closed) the alarm input is connected, to the Darlington drivers. If the switch is **"Off"** the input is open. This selection does not prevent the individual alarm from being used elsewhere, it only removes the alarm from the common alarm indication. If no circuit/module is being monitored by an input, the switch must be in the **"Off"** (disabled) position.

A typical Alarm Circuit of the Subsystem Alarm Module is shown in Figure 1.

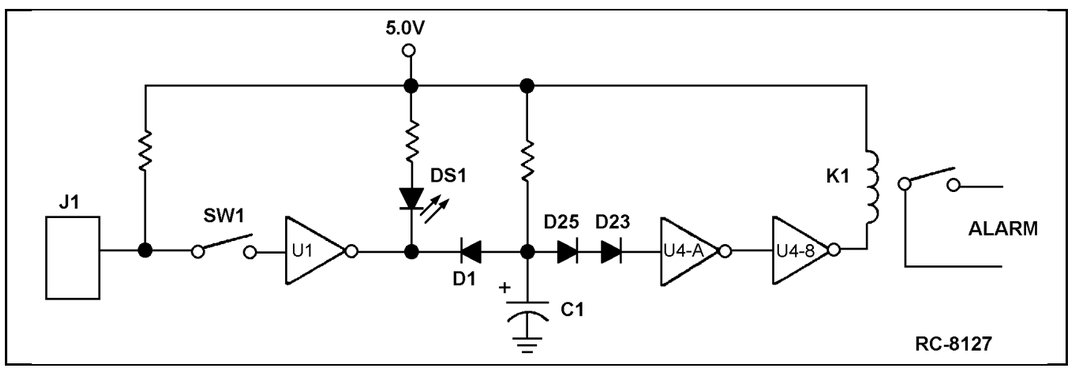


Figure 1 - Typical Alarm Circuit

CONNECTORS AND SYSTEM INTERFACE

There is only one connector on the Subsystem Alarm Module, P1. Connector P1 is used to mate the Subsystem Alarm Module to the Sync Unit Assembly. The Subsystem Alarm Module plugs into slot (J1) of the Sync Unit. A description of the various signals used between the Subsystem Alarm Module and the Sync Unit is summarized in Table 3.

SUBSYSTEM ALARM MODULE AND CROSS CONNECT PANEL SIGNAL FLOW

R1COM, R1NC, R1NO, R2COM, R2NC and R2NO

R1COM, R1NC, R1NO, R2COM, R2NC and R2NO comprise the alarm circuit to the customer equipment at the site. R1COM is the pole (common) of the double throw relay. R1NC is the contact that is normally closed (when the coil of the relay is de-energized) to the R1COM pole. R1NC is opened (un-connected to the pole) when the relay coil is energized (schematic shows a non-alarmed condition, relay de-energized).

ALARM1 Through ALARM22

ALARM1 through ALARM22 are the alarm inputs to the Subsystem Alarm Module. These inputs are derived from various sources in the simulcast system. The alarm condition presented to the Subsystem Alarm Module is a high level.

POWER DISTRIBUTION AND FILTERING

The +5 volt power supply used by the Subsystem Alarm Module is derived from the simulcast power supplies. The +5 volt power is used to power the components on the Subsystem Alarm Module. The powered components include the Darlington drivers, the resistor packs, other pull up resistors, the light emitting diodes, and the relay coil.

There are bypass capacitors on the Subsystem Alarm Module to filter any power noise transients or spikes from affecting circuit operation and module performance. The capacitors are 0.1 µF in value and are numbered C2 through C5.

SUBSYSTEM ALARM SENSE ENABLE AND ALARM DETECTION

The alarms from the connector, P1, are inputs to the Darlington drivers (U1, U2, U3). The normal (no alarm) condition is for the input circuits to be in a low state (less than 1 volt).

The following discussion details the circuit operation for an active alarm input (alarm condition) at the connector P1. The alarm signal goes high (+5 volts) the enable/disable switch is "On" (closed) therefore the input to the Darlington driver goes high. The output at the Darlington drivers is an alarm bus.

The alarm bus signal goes low grounding the cathode of the corresponding light emitting diodes (DS1-DS11 A1B) and grounding the input to one of the diode array (D1-D22).

The LED's will be turned on when the alarm input is activated (a high level). However, a specific active alarm input may not activate the relay closure unless the appropriate switch for the active alarm input is enabled.

The low output of the Darlington driver will sink current through the LED and thereby turn it on. The Darlington driver will also sink current through the appropriate diode and pull down the voltage at the anode of diode D25. Removing the input to the Darlington driver, U4, Pin 2 will produce a high at U4, Pin 15. This output is the input to the second Darlington driver, U4, Pin 3. This high input will cause the output, U4, Pin 14, to go low and sink current through the relay coil, closing the relay contacts.

SUBSYSTEM ALARM DISPLAYS

The LED's indicate the presence of an active alarm failure from the appropriate module or subsystem component or if the module is not installed, the pullup on the Subsystem Alarm Module will enable the LED to be turned on. All unused inputs must be disabled by setting the Dip Switch on the module.

MAINTENANCE

Dip Switches SW1-SW3 must be set before installing the Subsystem Alarm Module into the Universal Sync Unit assembly.

TEST SERVICE

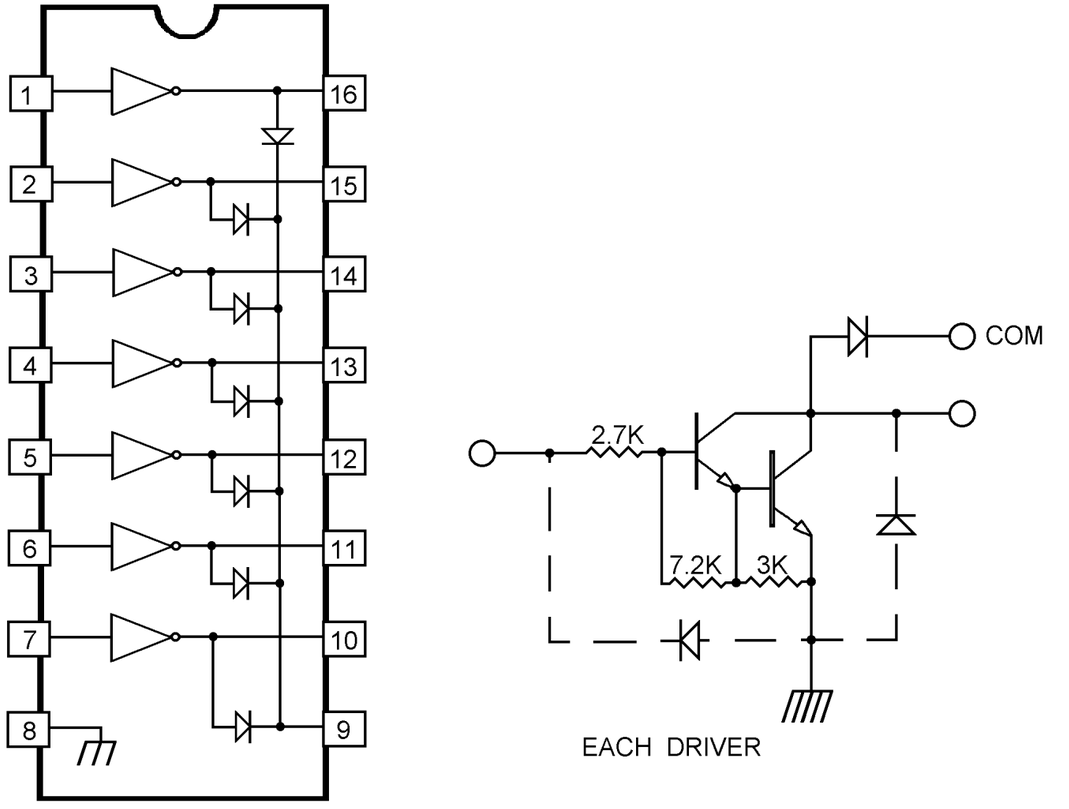
The following equipment is necessary to test the Subsystem Alarm Module as part of the simulcast system.

1. Extender Card
2. Triplett Model 630-PL Type 5 or equivalent

The following step is necessary to test the Subsystem Alarm Module as part of the simulcast system:

For the appropriate Subsystem Alarm Module assembly, remove each module monitored by the subsystem alarm module from the system and verify that the appropriate LED is turned on. Also verify that the poles of the alarm relay are switched.

7-Darlington Array U1 thru U4
19A134693P1



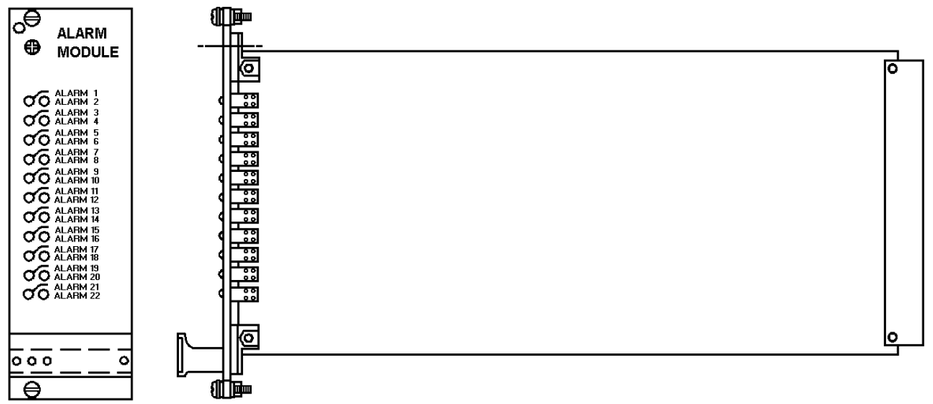
RC-8153

SUBSYSTEM ALARM BOARD
19D902334

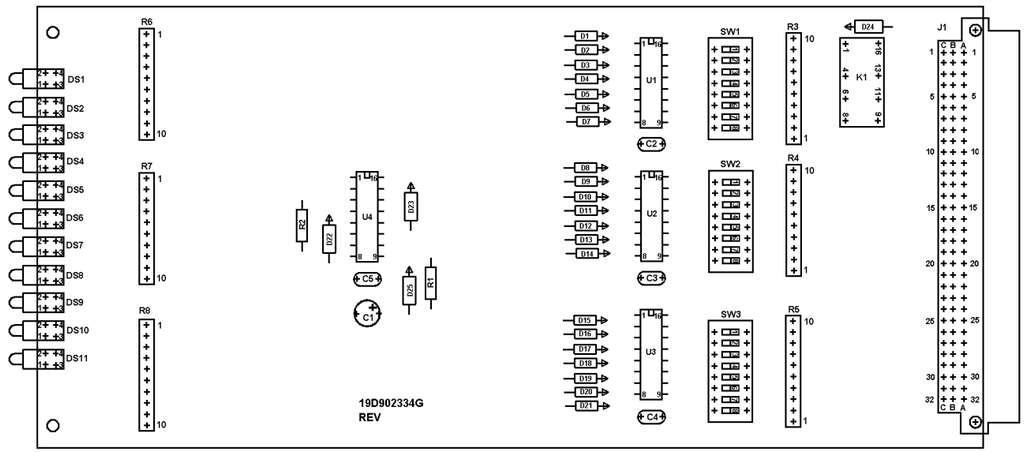
ISSUE 2

SYMBOL	PART NO.	DESCRIPTION
		--CAPACITORS--
C1	19A701514P7	Cap, Tantalum 10 mF 16 VWDC
C2	T6344CP310K	Capacitor, PYES, .01 mF.thruC5
		--DIODES--
D1 thru D23	19A700028P1	Diode, silicon last recovery, sim to 1N4148.
D24	T324ADP1041	Rectifier, silicon.
D25	19A700028P1	Diode, silicon fast recovery, sim to 1N4148.
DS1 thru DS11	19A705876P1	LED, Bilevel.
		--RELAY--
K1	DS2E-M-DC5V	Relay, DPDT.
		--CONNECTOR--
J1	100-964-023	Panduit connector, PW.
		--RESISTORS--
R1	H212CRP210C	Resistor, Carbon File 1K ohm .2W.
R2	H212CRP210C	Resistor, Carbon File 1K ohm .2W.
R3 thru R5	19A701630P4	SIP Resistor Network 1K ohm.
R6 thru R8	4310R-101-331	SIP Bussed Resistor Network, 330 ohm .3W.
		--SWITCHES--
SW1 thru SW3	19B800010P2	Switch, SPST DIP.
		--INTEGRATED CIRCUIT--
U1 thru U4	19A134693P1	Darlington Driver.

*COMPONENTS, ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES

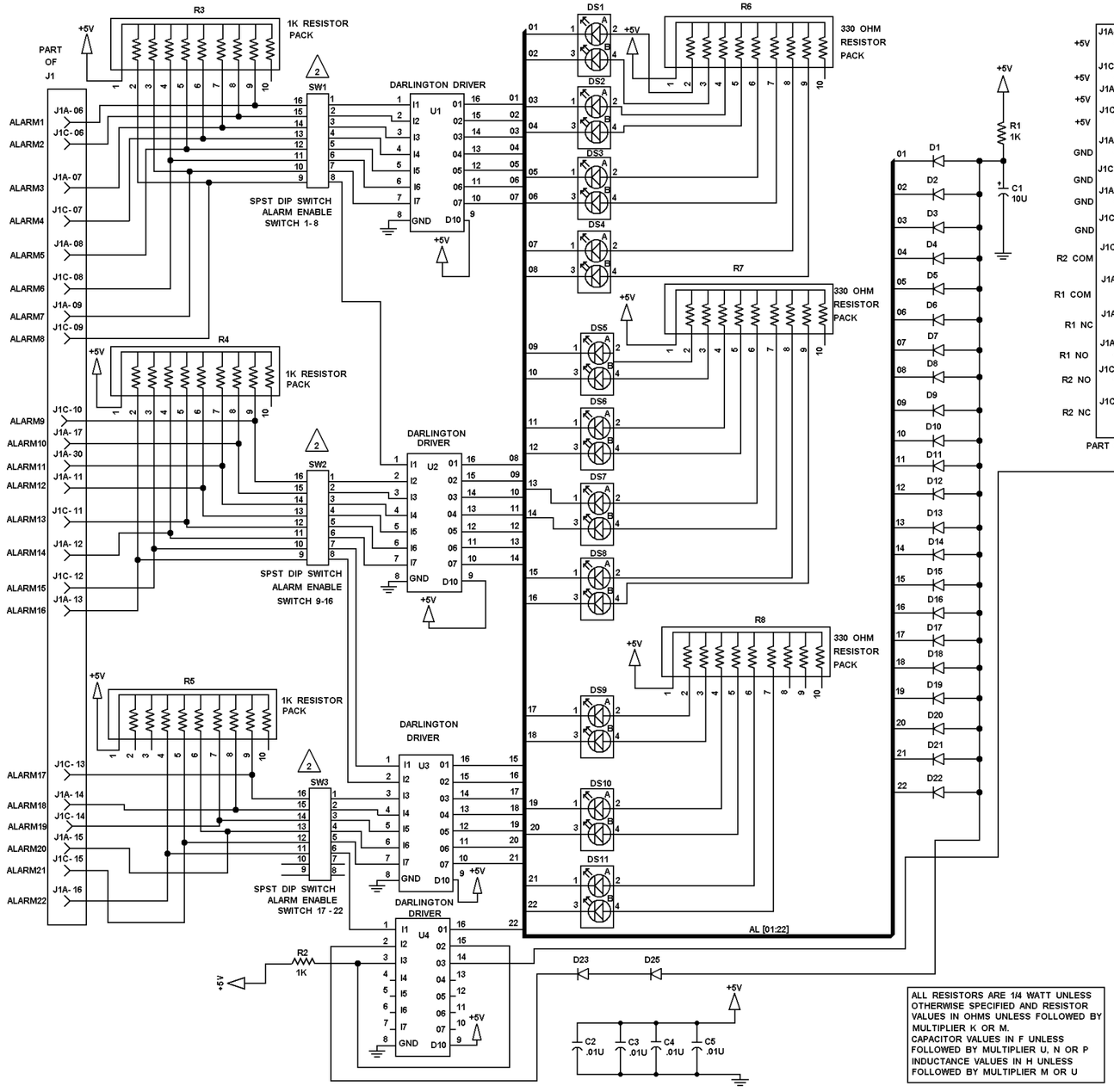


PANEL MARKING



SUBSYSTEM ALARM MODULE

(19D902334, Sh. 3, Rev. 3)
(19D902334, Sh. 1, Rev. 3)



NOTES:

1. RESISTORS, CAPACITORS, AND INDUCTORS ARE 10% TOLERANCE UNLESS OTHERWISE SPECIFIED.

DIP SWITCH DEFINITION CHART

SWITCH	POSITION	FUNCTION
SW1 1	ON	ALARM 1 SENSE ENABLED
	OFF	ALARM 1 SENSE DISABLED
SW1 2	ON	ALARM 2 SENSE ENABLED
	OFF	ALARM 2 SENSE DISABLED
SW1 3	ON	ALARM 3 SENSE ENABLED
	OFF	ALARM 3 SENSE DISABLED
SW1 4	ON	ALARM 4 SENSE ENABLED
	OFF	ALARM 4 SENSE DISABLED
SW1 5	ON	ALARM 5 SENSE ENABLED
	OFF	ALARM 5 SENSE DISABLED
SW1 6	ON	ALARM 6 SENSE ENABLED
	OFF	ALARM 6 SENSE DISABLED
SW1 7	ON	ALARM 7 SENSE ENABLED
	OFF	ALARM 7 SENSE DISABLED
SW1 8	ON	ALARM 8 SENSE ENABLED
	OFF	ALARM 8 SENSE DISABLED
SW2 1	ON	ALARM 9 SENSE ENABLED
	OFF	ALARM 9 SENSE DISABLED
SW2 2	ON	ALARM 10 SENSE ENABLED
	OFF	ALARM 10 SENSE DISABLED
SW2 3	ON	ALARM 11 SENSE ENABLED
	OFF	ALARM 11 SENSE DISABLED
SW2 4	ON	ALARM 12 SENSE ENABLED
	OFF	ALARM 12 SENSE DISABLED
SW2 5	ON	ALARM 13 SENSE ENABLED
	OFF	ALARM 13 SENSE DISABLED
SW2 6	ON	ALARM 14 SENSE ENABLED
	OFF	ALARM 14 SENSE DISABLED
SW2 7	ON	ALARM 15 SENSE ENABLED
	OFF	ALARM 15 SENSE DISABLED
SW2 8	ON	ALARM 16 SENSE ENABLED
	OFF	ALARM 16 SENSE DISABLED
SW3 1	ON	ALARM 17 SENSE ENABLED
	OFF	ALARM 17 SENSE DISABLED
SW3 2	ON	ALARM 18 SENSE ENABLED
	OFF	ALARM 18 SENSE DISABLED
SW3 3	ON	ALARM 19 SENSE ENABLED
	OFF	ALARM 19 SENSE DISABLED
SW3 4	ON	ALARM 20 SENSE ENABLED
	OFF	ALARM 20 SENSE DISABLED
SW3 5	ON	ALARM 21 SENSE ENABLED
	OFF	ALARM 21 SENSE DISABLED
SW3 6	ON	ALARM 22 SENSE ENABLED
	OFF	ALARM 22 SENSE DISABLED
SW3 7	ON OFF	NO FUNCTION
SW3 8	ON OFF	NO FUNCTION

ALL RESISTORS ARE 1/4 WATT UNLESS OTHERWISE SPECIFIED AND RESISTOR VALUES IN OHMS UNLESS FOLLOWED BY MULTIPLIER K OR M.
CAPACITOR VALUES IN F UNLESS FOLLOWED BY MULTIPLIER U, N OR P
INDUCTANCE VALUES IN H UNLESS FOLLOWED BY MULTIPLIER M OR U

SUBSYSTEM ALARM MODULE

(19D902314, Sh. 1, Rev. 1)

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