



GENERAL MONITORS

Protection for life.

MODEL IN042

Zero Two Series
Four Zone Input Module



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INSTRUCTION MANUAL 08/95

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Part No.
Revision

MANIN042
A/08-95



A/08-95

Warranty Statement

General Monitors warrants the Model IN042 to be free from defects in workmanship or material under normal use and service within two (2) years from the date of shipment. General Monitors will repair or replace without charge any equipment found to be defective during the warranty period. Full determination of the nature of, and responsibility for, defective or damaged equipment will be made by General Monitors' personnel. Defective or damaged equipment must be shipped prepaid to General Monitors' plant or the representative from which shipment was made. In all cases this warranty is limited to the cost of the equipment supplied by General Monitors. The customer will assume all liability for the misuse of this equipment by its employees or other personnel. All warranties are contingent upon proper use in the application for which the product was intended and do not cover products which have been modified or repaired without General Monitors' approval or which have been subjected to neglect, accident, improper installation or application, or on which the original identification marks have been removed or altered. Except for the express warranty stated above, General Monitors disclaims all warranties with regard to the products sold, including all implied warranties of merchantability and fitness and the express warranties stated herein are in lieu of all obligations or liabilities on the part of General Monitors for damages including, but not limited to consequential damages arising out of/or in connection with the use or performance of the product.

Warnings

- All Zero Two Series Modules contain components which can be damaged by static electricity. Special care must be taken when wiring the system to ensure that only the connection points are touched.

- General Monitors has approved certain field devices for use with the Model IN042 (see Appendix E). Any attempt to use a device that has not been approved by General Monitors will void the warranty.

- **SAFETY WARNING: Installation and maintenance must be carried out by suitably skilled and competent personnel only.**

- The General Monitors Model IN042 is designed to replace the Model IN002, however due to the increased flexibility offered by the new Module, the Model IN042 is not compatible with the Model IN002.



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The Introduction provides a brief description of the Model IN042, its features & benefits and a partial list of applications. More detailed information on the features & benefits listed in section 1.2 will be presented in later chapters.

1.1 General Description

The General Monitors Model IN042 (see figure 1) features four zone inputs, each monitoring two wire field devices. Field devices can be smoke detectors, manual call points, heat detectors, etc. This card provides separate open collector outputs for Fault and Alarm conditions in each of the four zones. Additionally, the alarm output options are DIP switch selectable.

The Model IN042 is electrically and physically compatible with the other modules in the Zero Two Series.

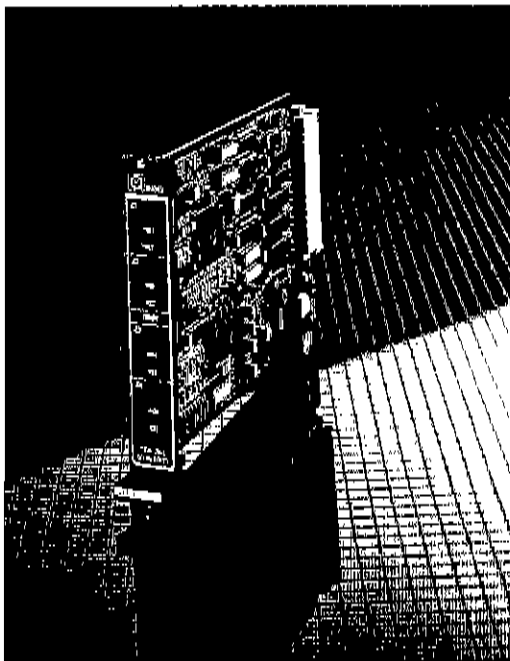


Figure 1

It is distinguished from the other modules by its 4 pairs of Reset/Inhibit switches that are evenly spaced on the front panel.

The Model IN042 is designed for use in non-hazardous (safe) environments.

1.2 Features & Benefits

Microprocessor Based Electronics: monitors the field device, fault & alarm conditions and generates output signals in the form of front panel LEDs and open collector activations.

LED Test: tests each front panel LED in the system by pressing the Master Reset button on the Facilities Module (Model FM002).

Card Test: tests the functionality of the card by simulating an alarm condition. The alarm outputs may be enabled or disabled (programmable) for a card test.

Low Supply Power Indication: all front panel Fault LEDs will illuminate when the input voltage drops below 20Vdc.

DIP Switch Selectable Options: the following alarm output options are user selectable for each zone - time delay, normally on/off, latching/non-latching. Additionally, the alarm outputs can be enabled/disabled for a card test via a DIP switch setting and each zone can have its input type be Callpoints or Detectors.

Live Insertion/Removal: allows the user to insert or remove a module while power is applied to the system without damage to any of the components in the system.

Inputs/Outputs Protected: against opens, shorts, shorts to ground and reverse polarity.

Modes of Operation: includes Call Point Mode, Detector Mode, Inhibit Mode, Fault Mode and Alarm Mode.

Executive Outputs: the Alarm outputs can be active/inactive during a Card Test and the Fault outputs can be latching/non-latching.



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1.3 Applications

The General Monitors Model IN042 is designed to supplement fire and gas detection systems and to provide increased flexibility by accepting inputs from a variety of field devices. The list below is a partial representation of suitable applications:

- Refineries
- Drilling platforms & rigs
- Gas & oil production platforms
- Gas collection facilities
- Oil well logging operations
- LPG/LNG processing & storage
- Gas compressor stations
- Sewage & wastewater treatment facilities
- Chemical & petrochemical plants
- Mud logging operations
- Sulfur recovery plants
- Desulfurization facilities
- Aircraft hangars & military installations



This chapter provides detailed specifications for the Model IN042 Four Zone Input Module. The system, mechanical, electrical and environmental specifications present the Model IN042 in technical terms. The engineering specifications provide a written specification that can be inserted into other written specifications.

2.1 System Specifications

Application:

Smoke or Heat Detection, Pull Switches or Call Points.

Detector Type:

Ionized chamber smoke & heat detectors,
Optical smoke and heat detectors,
Normally open pull switches and call points,
Normally closed pull switches and call points.

Barrier Type:

Galvanic isolation or dual channel passive

Detectors per Channel:

The maximum number of detectors per channel varies with the detector type and barrier type. Use the table below to determine the maximum number of detectors per zone by cross referencing the detector with the barrier.

The maximum number of callpoints per channel must not exceed 500.

Approvals:

CSA certified, UL & FM approvals are pending. NFPA 72A-72E Guidelines.

Warranty:

Two years

2.2 Mechanical Specifications

Height	6.825 in.	173 mm
Width	1.000 in.	25 mm
Length	9.900 in.	251 mm
Weight	11.200 oz.	318 grams

2.3 Electrical Specifications

Input Voltage:

20.0 to 35.0 Vdc (range)
24.0 Vdc (nominal)
17.6 to 19.1Vdc (low voltage threshold)
1.0Vp-p (supply noise & ripple)

Supply Current:

0.5A max. @ +18Vdc
0.3A max. @ +35Vdc

	No Barrier	MTL3043	MTL4061	MTL787	MTL787S	MTL788
Cerberus F905	40	29	35	39	39	39
Cerberus F906	65	47	56	62	62	62
Cerberus F910	65	47	56	62	62	62
Cerberus F911	65	47	56	62	62	62
Cerberus F915	40	29	35	39	39	39
Cerberus F922	80	57	69	76	76	76
Cerberus R925	22	16	19	21	21	21
Cerberus D915 w/Z9	20	14	17	19	19	19
Cerberus D915 w/Z94	20	14	17	19	19	19
Apollo Series 60	55	38	46	51	51	51

**Electrical Specifications** *(continued)***Input Limitations:**

- Callpoint, NO : series resistance
390 to 820 Ohms (detector mode)
- Callpoint, NO : series zener diode
5.6V to 10V $\pm 5\%$, $\frac{1}{2}$ W (detector mode)
- Callpoint, NC : EOL resistance
390 to 5600 Ohms (call point mode)

Open Collector Output Ratings:

- 100mA max., 35Vdc max.
- 2.0Vsat max. @ 100mA

Output Voltage:

- 16 to 24Vdc (with 5.6Kohm, EOL resistor)
- 2.0Vdc (reset voltage)
- 27Vdc (open circuit)

Output Current:

- 2.0mADC (not including EOL resistor)
- 1.5mADC (with MTL3043 barrier)
- 27mA (loop terminals shorted)
- 35mA (positive terminal shorted to supply RTN)

Cable Parameters, Field Loop:

- 10 Ohms (end to end)

Electrical Classification:

The Model IN042 is designed for use in non-hazardous or safe environments for general purpose applications.

2.4 Environmental Specifications**Operating Temperature Range:**

0°F to +150°F (-18°C to +66°C)

Storage Temperature Range:

-40°F to +167°F (-40°C to +70°C)

Operating Humidity Range:

0 to 100% maximum relative humidity,
(non-condensing)

2.5 Engineering Specifications

Zero Two System - Each system shall utilize modules capable of monitoring gas sensing elements or a 0 to 21.7mA analog signal from gas or flame detection transmitters. The system chassis shall be available in 4, 8 and 16 channels. Each chassis shall contain a bus for the following independent signals: A1 Alarm, A2 Alarm, Fault, Master Reset, Master Accept, Unaccept, CAL, +24Vdc and System Common. Module signals shall be capable of being bussed from one chassis to another so that up to 100 modules can comprise a single system. The gas and flame detection modules shall be electrically and physically compatible and capable of being used in the same chassis to form combined fire and gas detection systems. The system shall consist of Zero Two Series component modules as manufactured by General Monitors in Lake Forest, California, U.S.A. or General Monitors, Galway, Ireland.

Four Zone Input Module - The Four Zone Input Module, with field device shall meet the requirements of CSA C22.2 No. 142-M1987 for process control instruments, Factory Mutual Research Corporation and Underwriters Laboratory UL 864 control units for fire protective signaling systems where applicable. The module shall provide a discrete reset switch, a discrete inhibit switch and discrete alarm outputs for each zone. All alarm outputs shall be DIP switch selectable. A functional card test and front panel LED test shall be capable without interrupting normal on-line services. The module shall be capable of insertion and removal during power ON condition without damage to any component or module in the system. The four zone input module shall be capable of monitoring optical or ionized chamber smoke and heat detectors, pull switches and call points in each zone.



Engineering Specifications *(continued)*

The unit shall have a variety of ordering options that consist of:

Common fault & discrete inhibit outputs or common inhibit & discrete fault outputs,

Latching or non-latching fault outputs

Alarms inhibited or active during a Card Test,

Immediate or 2 second time delay for alarm outputs

Callpoint-NC or detector/callpoint-NO mode,

The number of active channels (1 to 4),

Barrier or no barrier option.



This chapter discusses what to do when the Model IN042 is received, how to install the module, what the terminal connections and their functions are and making the initial application of power.

3.1 Upon Receipt of Equipment

All equipment shipped by General Monitors is packaged in shock absorbing containers which provide considerable protection against physical damage. The contents should be carefully removed and checked against the packing slip. If any damage has occurred or if there is any discrepancy in the order, notify General Monitors as soon as possible. All subsequent correspondence with General Monitors must specify the equipment part and serial numbers.

Each Model IN042 is completely checked at the factory, however, a complete check-out is necessary upon initial installation and start up to ensure system integrity.

3.2 Module Installation

A rack or panel mounted chassis will be required when installing any Zero Two Series Module. These chassis should be mounted in a non-hazardous, weather protected location and should be subjected to minimal shock and vibration. The rack and panel mounted chassis are available in 4, 8 and 16 channel sizes. Multiple 16 channel chassis may be connected to each other to form larger systems.

In installations where two or more module types are to be mixed in the same chassis, ensure that the individual coding strips match the channel application. The coding strips are pre-configured at the factory and the male portion is already on each module.

The female portion, if unmounted, must be fastened into position on the mounting strip of the desired chassis channel so as to mate with its counterpart on the module (see figure 2 below).

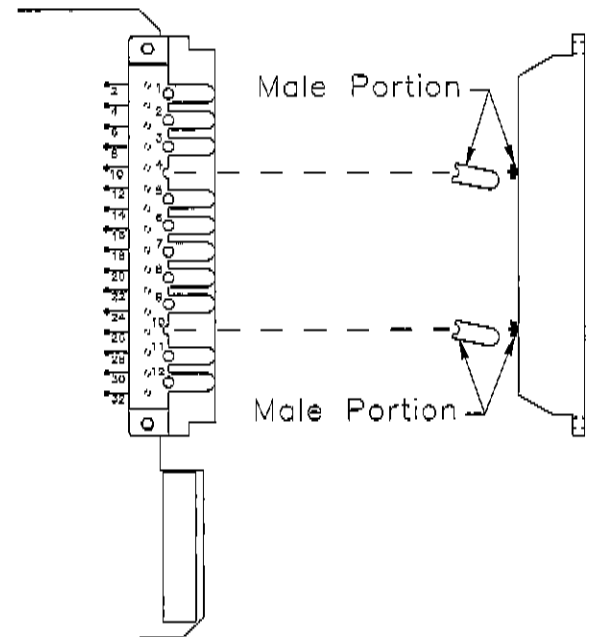


Figure 2

(not compatible with Model IN002)

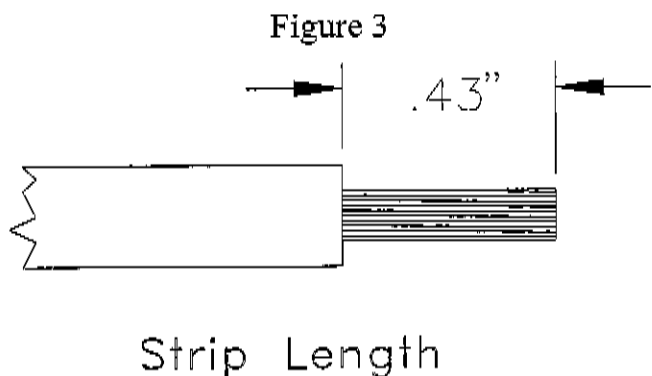
Zero Two Series modules require air circulation to avoid excessive heat build-up. If chassis are stacked vertically within an enclosure, forced air circulation may be required. The control modules are, to a great extent, immune to electromagnetic interference (EMI) and comply with the EMC Directive for application of CE Marking. However, they should not be mounted in close proximity to radio transmitters or similar equipment.



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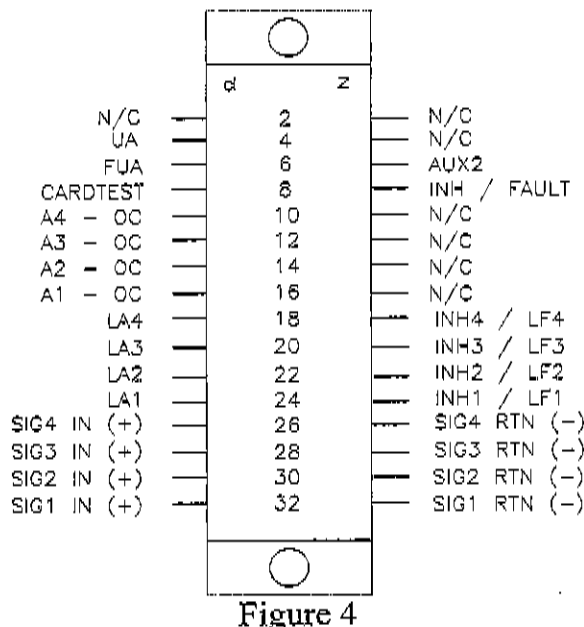
3.3 Rear Terminal Connections

All wire connections to the Model IN042 are made to the terminal block located at the rear of the chassis. The terminal block accepts 16 AWG to 20 AWG, stranded or solid core wire. 14 AWG wire may be used if it is properly stripped according to figure 3.



Contact with PC Board components should be avoided in order to prevent damage by static electricity. To connect wires to the terminal block on the Model IN042, loosen the desired screw, insert the stripped end of the wire and tighten.

For the rear terminal designations refer to figure 4 below:



Signal Connections (field device)

Each zone accepts two wire inputs from the field device. The terminal designations for these inputs are:

Designation	Term.	Description
SIG1 IN (+)	32d	Signal Input Zone 1
SIG1 RTN (-)	32z	Signal Return Zone 1
SIG2 IN (+)	30d	Signal Input Zone 2
SIG2 RTN (-)	30z	Signal Return Zone 2
SIG3 IN (+)	28d	Signal Input Zone 3
SIG3 RTN (-)	28z	Signal Return Zone 3
SIG4 IN (+)	26d	Signal Input Zone 4
SIG4 RTN (-)	26z	Signal Return Zone 4

Figure 5 is a block diagram of field device connections to zone 1 of the IN042 Module.

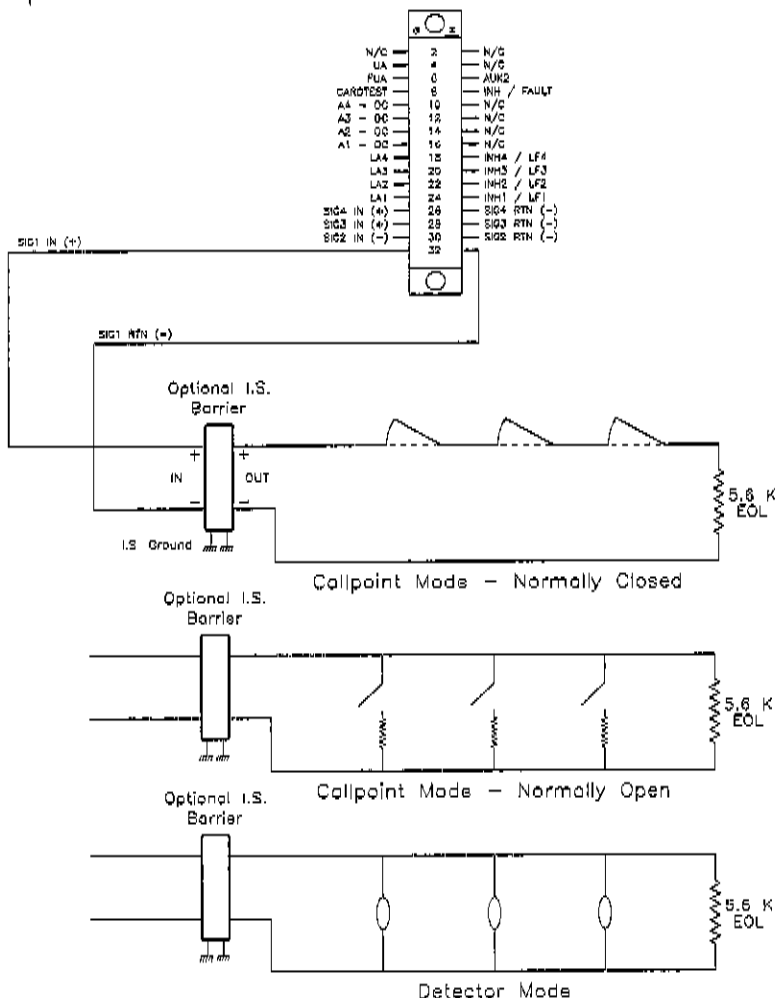


Figure 5



Rear Terminal Connections *(continued)*

Alarm Outputs

Each zone provides an alarm open collector output and an additional open collector output that mimics the logic of the front panel LED. The terminal designations for these outputs are:

Designation	Term.	Description
A1 - OC	16d	Zone 1 Alarm OC
LA1	24d	Alarm LED Zone 1 OC
A2 - OC	14d	Zone 2 Alarm OC
LA2	22d	Alarm LED Zone 2 OC
A3 - OC	12d	Zone 3 Alarm OC
LA3	20d	Alarm LED Zone 3 OC
A4 - OC	10d	Zone 4 Alarm OC
LA4	18d	Alarm LED Zone 4 OC

Fault Outputs *(see Inhibit Outputs)*

Each zone provides an optional fault open collector output that inversely mimics the logic of the front panel LED. If these discrete outputs are not present, a common Fault open collector is available on pin 8z. The terminal designations for the Fault outputs are:

Designation	Term.	Description
FAULT	8z	Common Fault OC
LF1	24z	Fault LED Zone 1 OC
LF2	22z	Fault LED Zone 2 OC
LF3	20z	Fault LED Zone 3 OC
LF4	18z	Fault LED Zone 4 OC

Inhibit Outputs *(see Fault Outputs)*

Each zone provides an optional inhibit open collector output. If these discrete outputs are not present, a common Inhibit open collector is available on pin 8z.

The terminal designations for the Inhibit outputs are:

Designation	Term.	Description
INH	8z	Common Inhibit OC
INH1	24z	Inhibit Zone 1 OC
INH2	22z	Inhibit Zone 2 OC
INH3	20z	Inhibit Zone 3 OC
INH4	18z	Inhibit Zone 4 OC

The Fault and Inhibit outputs are DIP switch selectable. The two configurations that are available are:

- Discrete Fault and Common Inhibit
- Common Fault and Discrete Inhibit

Unaccept Outputs

There are two unaccept open collector outputs. The first (UA) is dedicated to new alarm conditions and the second (FUA) is dedicated to new fault conditions. The terminal designations for these outputs are:

Designation	Term.	Description
UA	4d	Unaccept OC
FUA	6d	Fault Unaccept OC

All of the open collector outputs on the Model IN042 have an electrical rating of 100mA @ 35Vdc. Figure 6 illustrates some typical open collector external circuits.

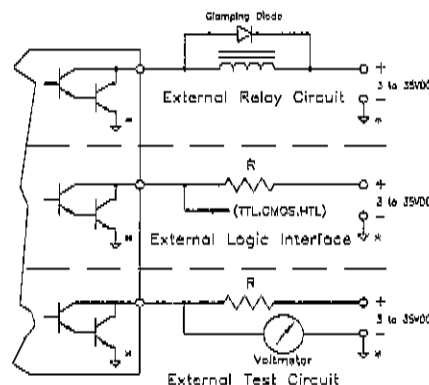


Figure 6

* Note: All system commons (⊕) must be tied together.



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Rear Terminal Connections (continued)**Card Test Input**

There is an input that is dedicated to the Card Test. The terminal designation for this input is:

Designation	Term.	Description
CARDTEST	8d	Card Test Connection

Figure 7 is a block diagram of the Card Test connection.

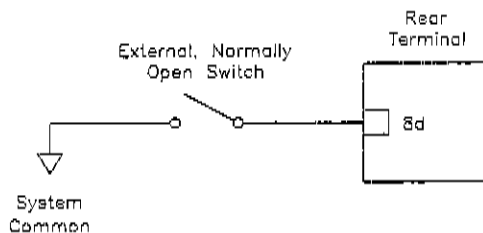


Figure 7

Other Designations

There are several terminations that fall under two categories (No Connection & Future Use). These designations are:

Designation	Term.	Description
N/C	2d	No Connection
N/C	2z	No Connection
N/C	4z	No Connection
AUX2	6z	Future Use
N/C	10z	No Connection
N/C	12z	No Connection
N/C	14z	No Connection
N/C	16z	No Connection

3.4 Switch Selectable Options

DIP switches have been provided to allow the operator to select or change options that affect certain functions on the module. There are four DIP switches on the Model IN042, 3 eight position and 1 four position.

The eight position DIP switches have a number corresponding to the position printed on the opposite edge of the switch that is labeled **OPEN**. When a switch position is down on the **OPEN** side, the state of that position is open.

The four position DIP switch has its numbers printed on the switch positions of the DIP switch. The numbered side of the switch positions is the open side.

Switch SW9 is an eight position DIP switch that allows the operator to select the time delay and latching or non-latching alarm options (see table below).

Switch SW9 Options		
#	State	Function
1	Open	Zone 1 - No Time Delay
	Closed	Zone 1 - 2 Second Time Delay
2	Open	Zone 2 - No Time Delay
	Closed	Zone 2 - 2 Second Time Delay
3	Open	Zone 3 - No Time Delay
	Closed	Zone 3 - 2 Second Time Delay
4	Open	Zone 4 - No Time Delay
	Closed	Zone 4 - 2 Second Time Delay
5	Open	Zone 1 - Alarm Non-Latching
	Closed	Zone 1 - Alarm Latching
6	Open	Zone 2 - Alarm Non-Latching
	Closed	Zone 2 - Alarm Latching
7	Open	Zone 3 - Alarm Non-Latching
	Closed	Zone 3 - Alarm Latching
8	Open	Zone 4 - Alarm Non-Latching
	Closed	Zone 4 - Alarm Latching

Switch SW10 is an eight position DIP switch that allows the operator to select the normally energized or de-energized option for the alarm outputs and the zone input type, detector or call point, normally open or closed (see table on the next page).



Switch Selectable Options *(continued)*

Switch SW10 Options		
#	State	Function
1	Open	A1-OC, Normally De-Energized
	Closed	A1-OC, Normally Energized
2	Open	A2-OC, Normally De-Energized
	Closed	A2-OC, Normally Energized
3	Open	A3-OC, Normally De-Energized
	Closed	A3-OC, Normally Energized
4	Open	A4-OC, Normally De-Energized
	Closed	A4-OC, Normally Energized
5	Open	Zone 1 - Detector + Callpoint NO
	Closed	Zone 1 - Callpoint NC
6	Open	Zone 2 - Detector + Callpoint NO
	Closed	Zone 2 - Callpoint NC
7	Open	Zone 3 - Detector + Callpoint NO
	Closed	Zone 3 - Callpoint NC
8	Open	Zone 4 - Detector + Callpoint NO
	Closed	Zone 4 - Callpoint NC

Switch SW11 is a four position DIP switch that allows the operator to specify the following options (see table below):

- Fault Latching/Non-Latching
- Alarms on the A1BUSS/A2BUSS
- Discrete/Common Fault & Inhibit
- Alarms Enabled/Disabled for Card Test

Switch SW11 Options		
#	State	Function
1	Open	Latching Fault Outputs
	Closed	Non-Latching Fault Outputs
2	Open	Alarms > A1BUSS
	Closed	Alarms > A2BUSS
3	Open	Discrete Fault/Common Inhibit
	Closed	Common Fault/Discrete Inhibit
4	Open	Card Test - Alarms Disabled
	Closed	Card Test - Alarms Enabled

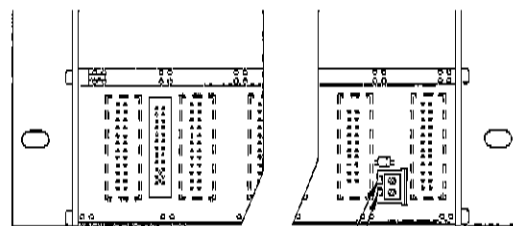
Switch SW12 is an eight position DIP switch that allows the operator to select the safety barrier option and the end of line resistor (see table below).

Switch SW12 Options		
#	State	Function
1	Open	Zone 1 - No Safety Barrier
	Closed	Zone 1 - Safety Barrier
2	Open	Zone 2 - No Safety Barrier
	Closed	Zone 2 - Safety Barrier
3	Open	Zone 3 - No Safety Barrier
	Closed	Zone 3 - Safety Barrier
4	Open	Zone 4 - No Safety Barrier
	Closed	Zone 4 - Safety Barrier
5	Open	Zone 1 EOL Resistor Disabled
	Closed	Zone 1 EOL Resistor Enabled
6	Open	Zone 2 EOL Resistor Disabled
	Closed	Zone 2 EOL Resistor Enabled
7	Open	Zone 3 EOL Resistor Disabled
	Closed	Zone 3 EOL Resistor Enabled

3.5 Applying Power

Zero Two Series Modules do not have an ON/OFF power switch. Each module in the Zero Two Series operates from 24Vdc. Current requirements vary according to the number and type of modules in the system, as well as the number and type of field devices. Figure 8 indicates where the power connections for the chassis are made.

NOTE: *if the application of power does not turn the unit ON, check fuse F1 on the control board.*



PRIMARY INPUT POWER { POS (+)
+24 VDC COM (-)

Figure 8



This chapter discusses general maintenance, refers to the electrical inputs, describes the electrical outputs, accepting and resetting alarms and fault diagnostics.

4.1 General Maintenance

Once a Zero Two Series System has been installed, very little maintenance is required other than periodic checks to verify the integrity of the system.

- The user should evaluate conditions in the field and determine how often calibration checks should be performed.
- A functional test of the system should be performed at least once each year. This test should include full operation of stand-by systems or back up power for the prescribed period.
- The power, field device and output wiring should be checked for tightness, verifying that all of the components and devices are connected correctly.
- Periodic checks of the DIP switch settings should be performed to ensure that the module has not been tampered with.

4.2 Two-Wire Field Device Inputs

Each zone interfaces with the field device through a Safety Barrier which must be of the dual-channel or Galvanic Isolation type. Operation without a Safety Barrier can also be selected. Single-channel barriers are NOT supported. Smoke and/or heat detectors may be of the chamber ionization or the optical type (consult factory for listing).

Functional Limits - Each of the four zones provides 16.0Vdc to 24.0Vdc to the field devices. The Safety Barriers approved for this product (consult factory for listing),

under normal conditions, ensure that the stated voltage will not be exceeded. Under open circuit conditions the line voltage is clamped at 27.0Vdc, maximum, to guarantee the detector voltage is not exceeded. The loop current is limited to 35mADC maximum under all Alarm and Fault conditions.

4.3 Card Test Input

The card test input is provided to allow the operator to perform a functional test of the alarm circuitry. The alarm open collector outputs can be disabled for a card test via a DIP switch setting (see section 3.4).

Connect one end of a normally open SPST switch to the card test input on the terminal block at the rear of the chassis and the other end to ground or system common (see section 3.3). To activate the card test, close the switch for at least 3 seconds. The card test will be active for as long as there is a path from the card test input to ground or system common (i.e. as long as the switch is closed).

4.4 Zone Inhibit Switch

When the zone inhibit switch is pressed for 2 or more seconds the zone is inhibited. During the Inhibit Mode the front panel LED associated with the inhibited zone will be illuminated. Depressing the zone inhibit switch a second time for one or more seconds will cause the zone to exit the inhibit mode.

Alarm, Fault, normal Reset and Accept functionality are unaffected by the inhibit mode. All front panel LEDs and their associated outputs will function normally in the inhibit mode.



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Zone Inhibit Switch (*continued*)

The inhibit function suppresses the following open collector outputs:

UA

FUA

A1, A2, A3 or A4 (for the inhibited zone)

These signals will be kept in a reset or de-activated state for as long as the zone is inhibited.

4.5 Zone Reset & Master Reset

Activation of the Zone Reset Switch will reset the detector(s) in that zone by dropping the voltage to the detector(s) below a maximum of 2.0Vdc. Activation of the Master Reset switch for a maximum of 1.5 seconds will reset the detectors in all four zones similarly. Subsequent Alarm and Fault conditions will be ignored for a maximum of 1 second following the re-application of voltage to the field devices, allowing a settling time for the detectors and barriers.

The Master Reset push-button is located on the front panel of the Facilities Module.

Non-Latching Alarm

Depressing the Master Reset push-button (FM002) or the Reset push-button on the front panel of the IN042 will return the Alarm LED, corresponding LA and Alarm open collector outputs to their de-activated state regardless of the Alarm condition. Following the Reset the Model IN042 will treat a remaining Alarm condition in that zone as a new Alarm. Resetting the card before Accepting will have no effect.

Latching Alarm

Depressing the Master Reset push-button or the Reset push-button on the front panel of the IN042 will return the Alarm LED, corresponding LA and Alarm open collector outputs to their de-activated state regardless of the Alarm condition. Following the Reset the Model IN042 will treat a remaining Alarm condition in that zone as a new Alarm. Resetting the card before "Accepting" will have no effect. Removal of the Alarm condition after detection will have no effect on the functionality of the LED and outputs until the latched condition has been Accepted and Reset.

Non-Latching Fault

Depressing the Master Reset push-button or the Reset push-button on the front panel of the IN042 will return the Fault LED and the corresponding LF open collector output to their de-activated state regardless of the Fault condition. Following the Reset the Model IN042 will treat a remaining Fault condition in that zone as a new Fault. Resetting the card before Accepting will have no effect.

Latching Fault

Depressing the Master Reset push-button or the Reset push-button on the front panel of the IN042 will return the Fault LED and the corresponding LF open collector output to their de-activated state regardless of the Fault condition. Following the Reset the Model IN042 will treat a remaining Fault condition in that zone as a new Fault. Resetting the card before Accepting will have no effect. Removal of the Fault condition after detection will have no effect on the functionality of the LED and output until the latched condition has been Accepted and Reset.

Accept/Reset Note: No Alarm or Fault can be Reset until it has been Accepted.



Zone Reset & Master Reset *(continued)*

LED Test

Depressing the Reset push-button on the Facilities Module for a minimum of 2 seconds will cause the Model IN042 to enter the LED Test. During the LED Test all front panel LEDs will be illuminated for as long as the Reset push-button on the Facilities Module is held depressed. All outputs are unaffected. The LED Test is unavailable during an Alarm condition in any of the four zones, during a power-fault condition and during an active Card Test. An alarm detected in any of the four zones during a LED Test will terminate the test.

4.6 Master Accept

The Master Accept push-button is located on the front panel of the Facilities Module.

Non-Latching Alarm

Depressing the Master Accept push-button (FM002) will reset the UA outputs on the Model IN042 and the Facilities Module (Model FM002). As long as the Alarm condition remains, the Alarm LED, corresponding LA and Alarm open collector output states will be activated (LED and LA open collector output will stop flashing). If the Alarm condition ceases to exist the Alarm LED, corresponding LA and Alarm open collector output states will be de-activated. If the Alarm condition ceases to exist and has not been Accepted the Alarm LED and the corresponding LA open collector output will continue to flash and the Alarm open collector output state will remain activated.

Latching Alarm

Depressing the Master Accept push-button performs the same sequence as listed in the paragraph under **Non-Latching Alarm** with the following exceptions: If the Alarm condition ceases to exist the Alarm LED,

corresponding LA and Alarm open collector output states will not de-activate until the Master Reset push-button or the Zone Reset push-button is depressed. If the Alarm condition ceases to exist and has not been Accepted the Alarm LED, corresponding LA and Alarm open collector output states will continue to be activated until Accepted and the Master Reset push-button or the Zone Reset push-button is depressed.

Non-Latching Fault

Depressing the Master Accept push-button will reset the FUA outputs on the Model IN042 and the Facilities Module (Model FM002). As long as the Fault condition remains, the Fault LED and the corresponding LF open collector output state will be activated (they will be ON steady, not flashing). If the Fault condition ceases to exist the Fault LED and the corresponding LF open collector output state will be de-activated (they will be OFF). If the Fault condition ceases to exist and has not been Accepted the Fault LED and the corresponding LF open collector output will continue to flash.

Latching Fault

Depressing the Master Accept push-button performs the same sequence as listed in the paragraph under **Non-Latching Fault** with the following exceptions: If the Fault condition ceases to exist the Fault LED and the corresponding LF open collector output state will not de-activate until the Master Reset push-button or the Zone Reset push-button is depressed. If the Fault condition ceases to exist and has not been Accepted the Fault LED and the corresponding LF open collector output state will continue to be activated until Accepted and the Master Reset push-button or the Zone Reset push-button is depressed.



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Master Accept (*continued*)

Accept/Reset Note: No Alarm or Fault can be Reset until it has been Accepted.

4.7 Fault Diagnostics

Each zone has a yellow LED Fault indicator on the front panel and a corresponding open collector output (LF) that inversely mimics the LED. When the Fault LED is ON the corresponding LF open collector output is OFF or de-energized. Conversely, when the Fault LED is OFF the corresponding LF open collector output is ON or energized (sinking current). Under a normal, no Fault condition, the LF open collector output is ON or energized, therefore, if the Model IN042 should lose power, the LF open collector output will change states, i.e. the output will turn OFF or de-energize.

The following Faults can be detected per zone in the Detector and Callpoint NO Mode:

- Open circuit in the detector loop
- Short across the end-of-line resistor
- Positive or negative line short to ground

The following Fault can be detected per zone in the Callpoint NC Mode:

- Short across the end-of-line resistor



This chapter lists the recommended field devices and safety barriers approved for use with the Model IN042.

5.1 Detectors

The following Detectors are recommended for use with the Model IN042. The use of alternative Detectors is not excluded, but if a detector is used that is not listed below, consult General Monitors or your General Monitors Representative.

<u>Manufacturer</u>	<u>Model</u> _____
Cerberus	F905, F906, F910, F911, F915, F922, R925, D915 all with Z91 or Z94 base
Apollo	Series 60

5.2 Safety Barriers

The following Safety Barriers are recommended for use with the Model IN042. The use of alternative Safety Barriers is not excluded, but if a Safety Barrier is used that is not listed below, consult General Monitors or your General Monitors Representative.

<u>Manufacturer</u>	<u>Model</u>
MTL	MTL3043, MTL4061, MTL787, MTL787S, MTL788



Glossary of Terms

A#-OC : Alarm # - open collector output, the # is the channel number or zone number.

Accept : This term is synonymous with acknowledge. Accepting an alarm provides an indication that someone is aware of an impending alarm condition.

Activated : Made active, engaged in activity. An activated LED or output indicates that a state other than "normal" is present.

Alarm : A warning of danger or an approaching danger.

AUX2 : Auxiliary 2.

Call Point : A device which can be activated manually, like a "Glass-Break" Fire Alarm (see Pull Switch).

CH : Channel.

CSA : Canadian Standards Association.

De-Activated : The opposite of activated. A de-activated LED or output is the normal state, usually safe (see Activated).

De-Energized : The opposite of energized. A state where electrical voltage/current is not applied (see Energized).

DIP Switch : Dual-Inline-Package Switch. Usually a multiple switch package used to configure inputs and outputs.

EMI : Electromagnetic Interference.

Energized : The opposite of de-energized. A state where electrical voltage/current is applied (see De-Energized).

EOL : End of Line.

Fault : An error or malfunction.

Field Device : Any device used to monitor and/or signal changes in field conditions (i.e. sensors, detectors, etc.).

FM : Factory Mutual Research Corporation.

FUA : Fault Unaccept.

Heat Detector : A device which monitors the level or a change in temperature (usually higher temperatures).

INH : Inhibit.

Inhibit : To prevent from occurring.

Ionized : Under the influence of radiation or an electrical charge.

Kohm : Kilo-Ohm, 1000 Ohms.

LA# : Alarm LED Open Collector Designation.

Latching : To hold on to (see Non-latching).

LED : Light Emitting Diode.

LF# : Fault LED Open Collector Designation.

mA : Milliampere, 1/1000 of an Ampere.

mADC : Milliampere, Direct Current.

N/C : No Connection.

NFPA : National Fire Protection Association.

Non-Latching : Opposite of latching (see Latching).

OC : Open Collector.

Open Collector : The output element of a transistor, when properly biased, collects charge carriers.

Pull Switch : A device which can be activated manually, like a "Glass-Break" Fire Alarm (see Call Point).



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Glossary of Terms (*continued*)

Reset : To return to the previous state.

Smoke Detector : A device which monitors for levels of smoke.

SPST : Single Pole, Single Throw.

SW : Switch.

UA : Unaccept.

UL : Underwriters Laboratory.

Zone : Any area or region considered as separate or distinct from others.



Engineering Documentation

Reference Drawing # 11345-2

Schematic Diagram - Display Board

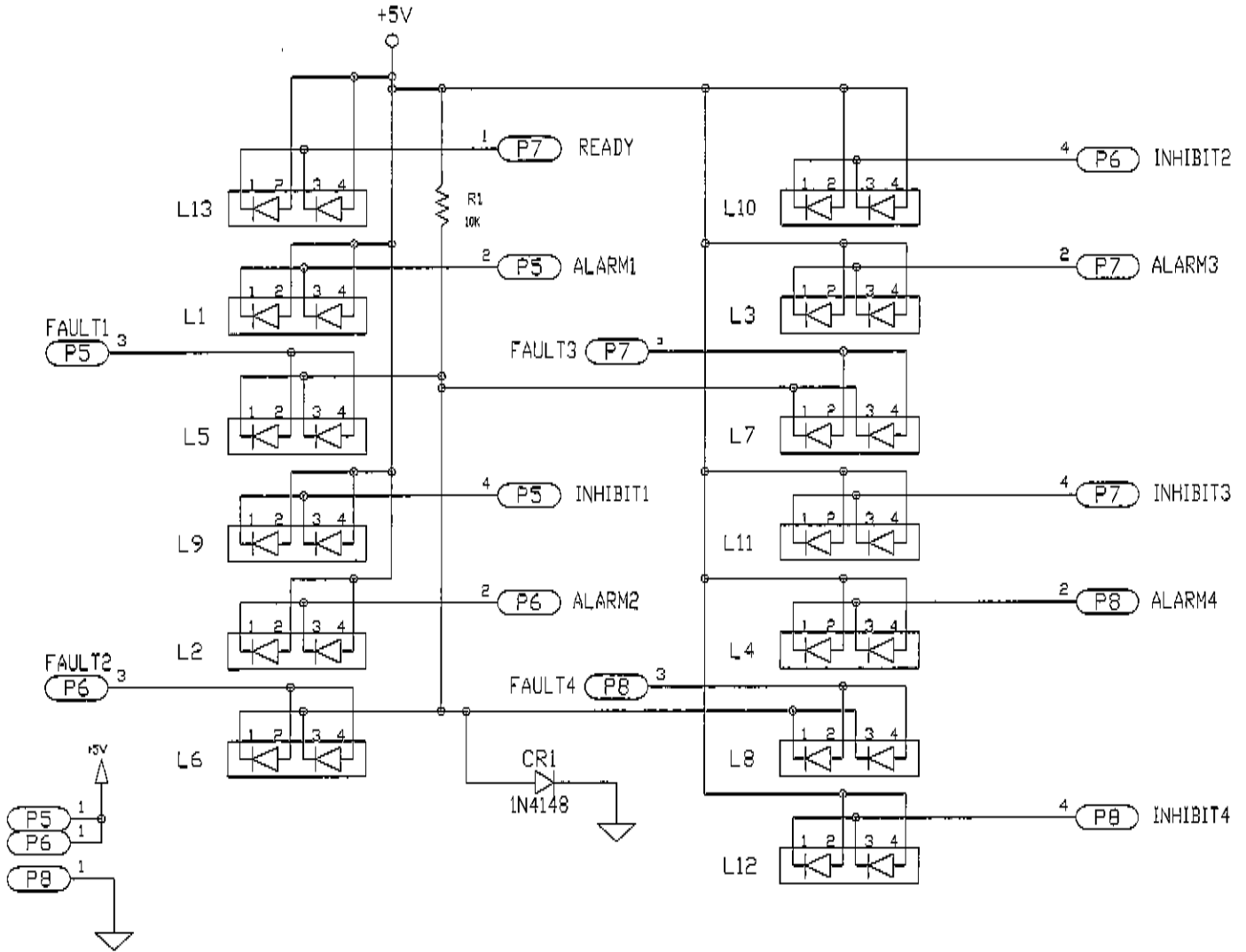


Figure 9

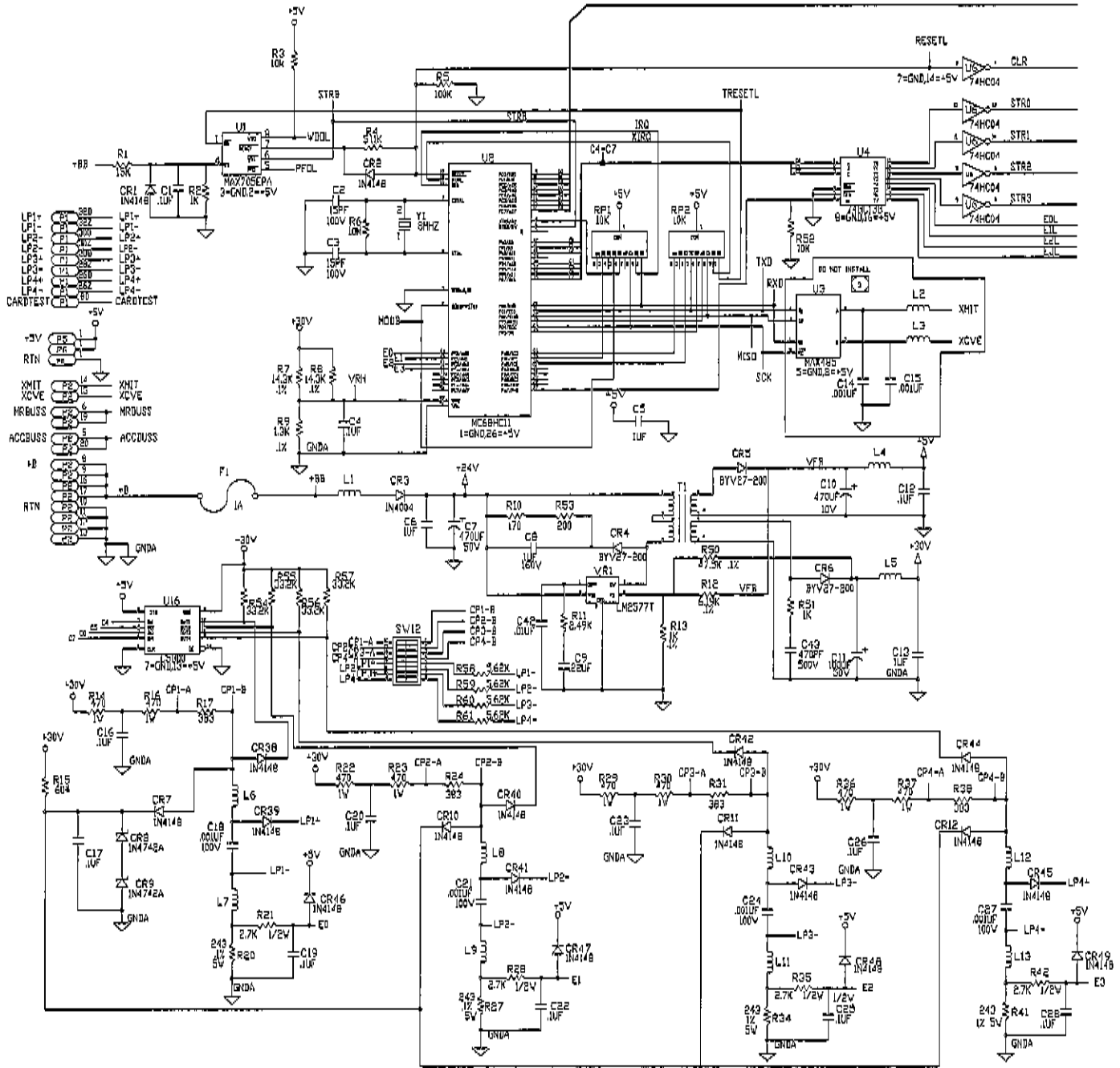


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Engineering Documentation (continued)

Reference Drawing # 11340-2

Schematic Diagram - Control Board





Engineering Documentation (continued)

Schematic Diagram - Control Board

Reference Drawing # 11340-2

Engineering Documentation (continued)

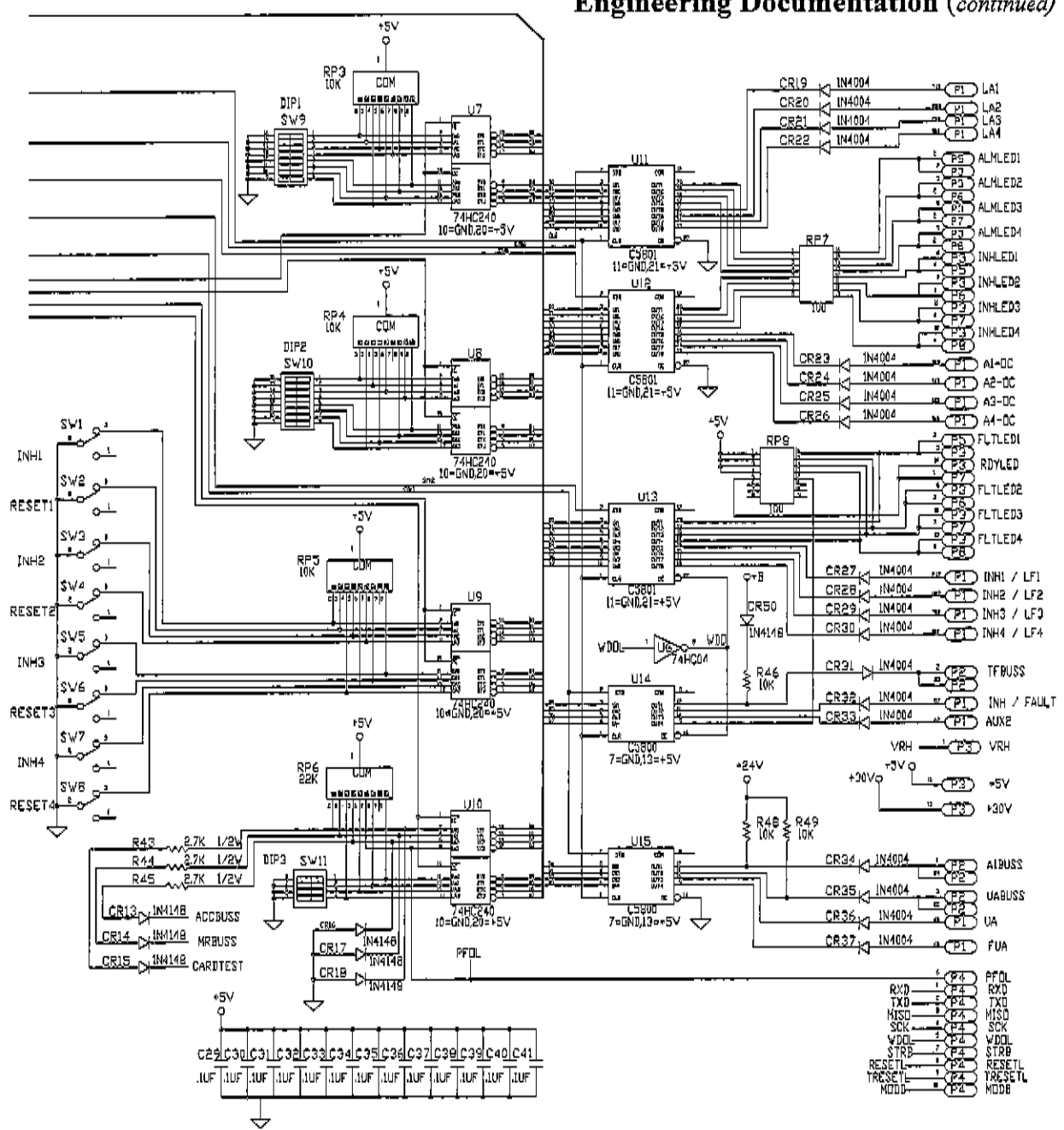


Figure 10
Right Side



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Engineering Documentation *(continued)*

Circuit Card Assembly - Display Board

Reference Drawing # 11346-2

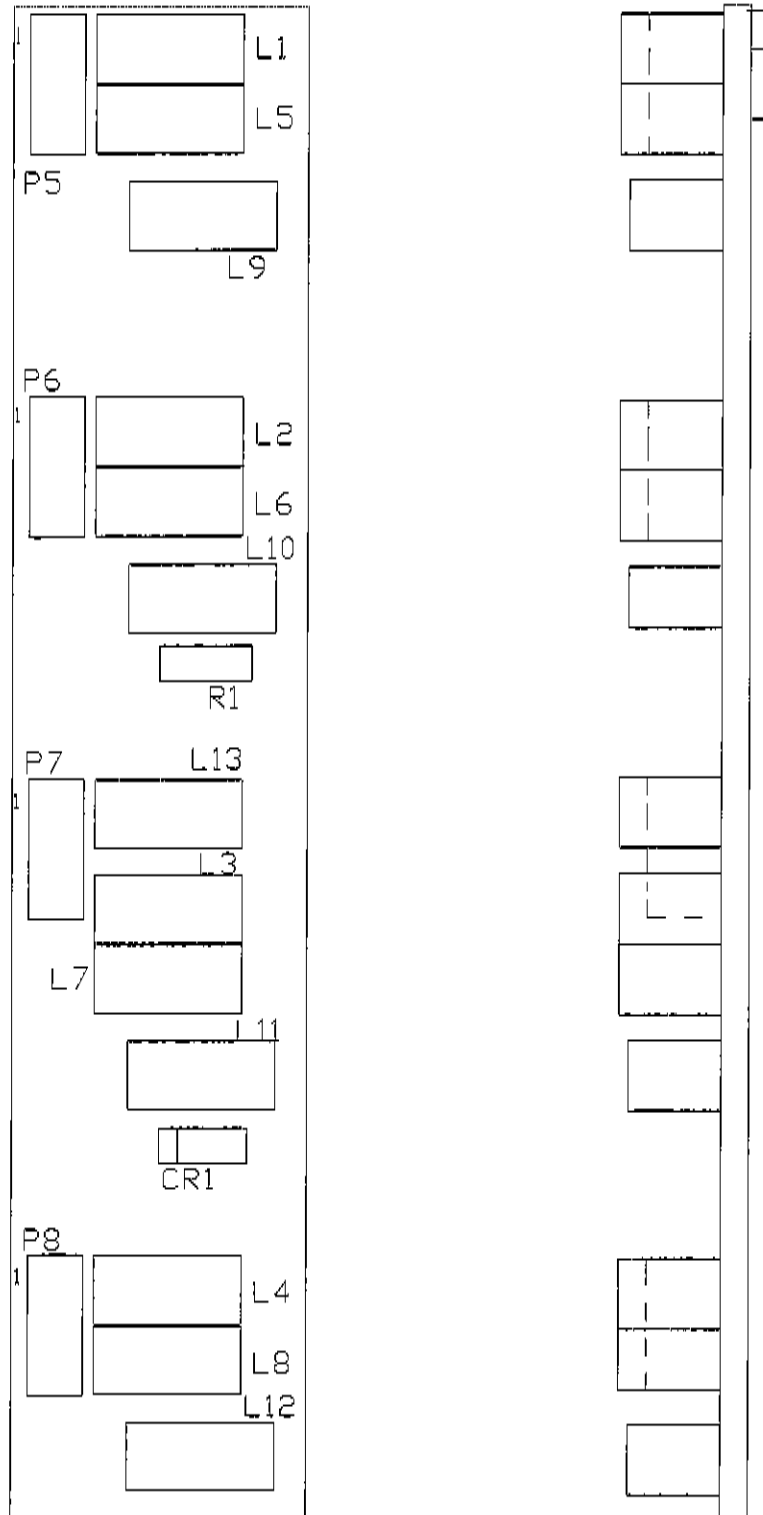


Figure 11



Engineering Documentation (continued)

Circuit Card Assembly - Control Board

Reference Drawing # 11341-1

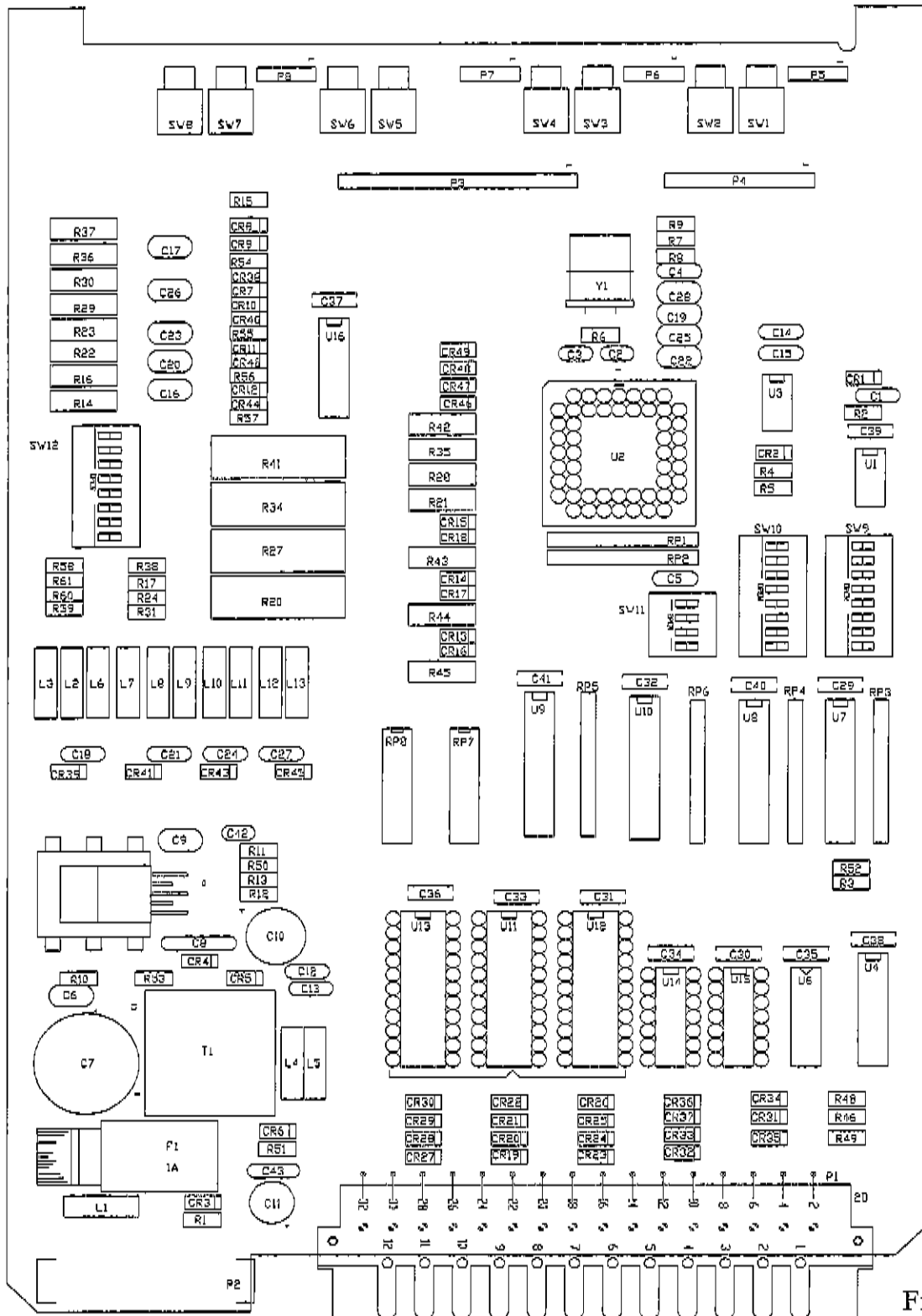


Figure 12

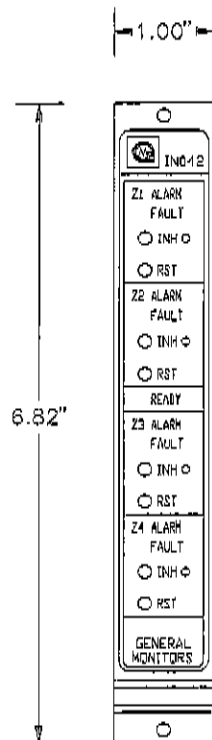
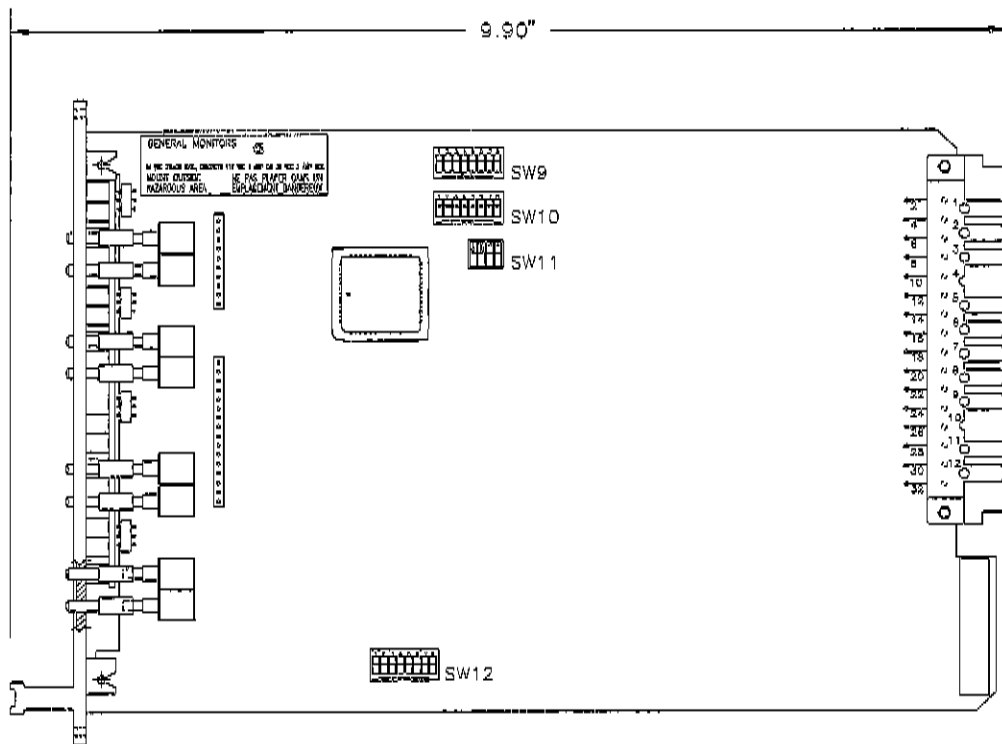


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Engineering Documentation (continued)

Outline & Terminal Connection Drawing

Reference Drawing # 11331



REAR CONNECTOR TERMINATIONS

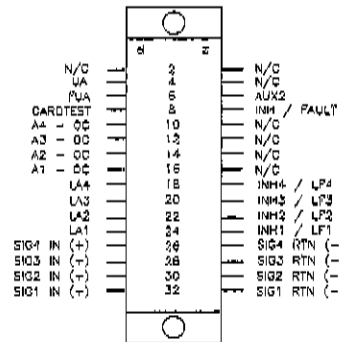


Figure 13



Engineering Documentation (continued)

Final Assembly Drawing

Reference Drawing # 11330-1

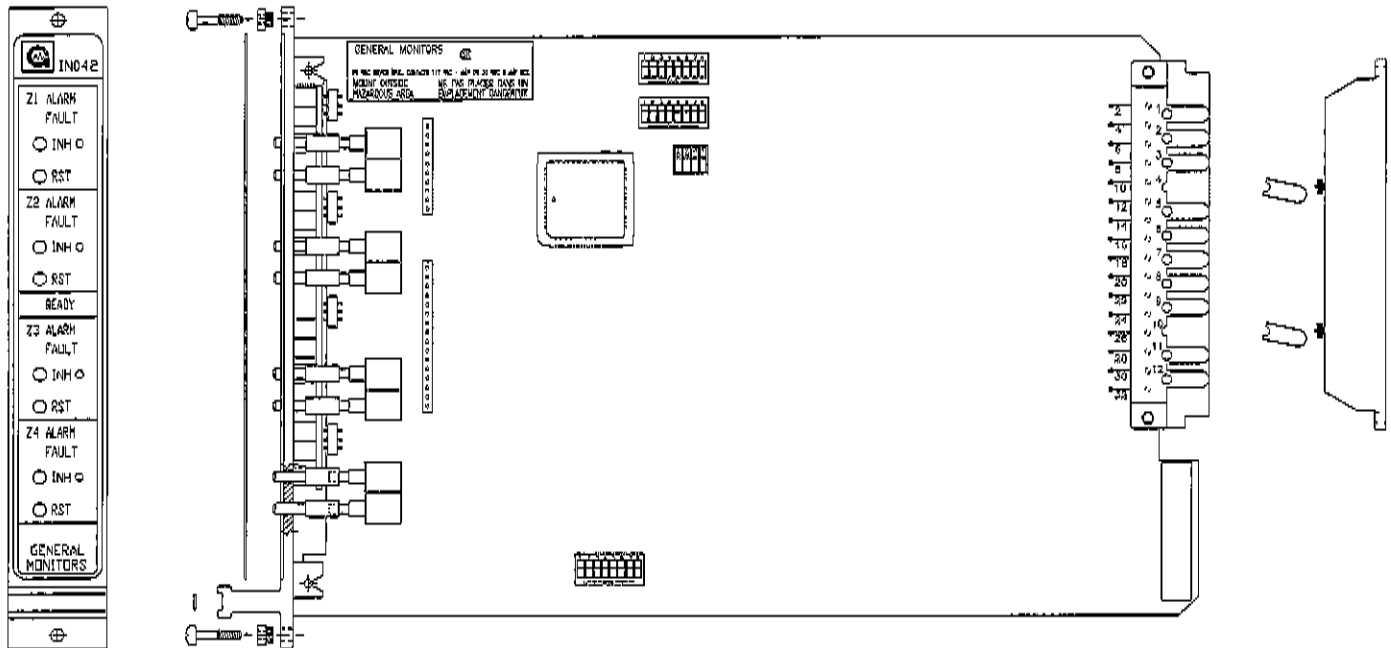


Figure 14