GENERAL MONITORS

MODEL MD002

Zero Two Series Monitored Driver Module

INSTRUCTION MANUAL 01/99

Part No. MANMD002
Revision: B/01.99

Warranty

General Monitors warrants the Model MD002 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.

Safety Warning

Installation and maintenance must be carried out by suitably skilled and competent personnel only.

Warning

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.

i For EC Declaration, see Page 27

List of Illustrations

The Introduction provides a brief description of the Model MD002, its features and benefits and a partial list of applications. More detailed information on the features and benefits listed in Section 1.2 will be presented in later chapters.

1.1 General Description

The General Monitors Model MD002 (see Figure 1) features four outputs to drive DC solenoids connected to fire extinguishant, horns or bells (or any other such device). This card monitors the output circuitry so that short circuits and open circuits in the field wiring will be detected as faults. The MD002 provides many options that satisfy a wide variety of applications.

The Model MD002 is electrically and physically compatible with the other modules in the Zero Two Series.

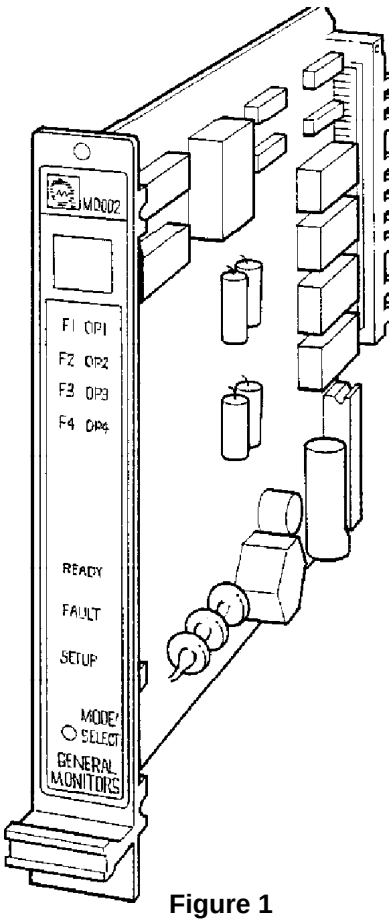


Figure 1

The Model MD002 is designed for use in non-hazardous (safe) environments.

1.2 Features and Benefits

Microprocessor Based electronics:
Monitors the field device for open or short circuits and generates output signals in the form of front panel LED's and current sourcing 1.2A @ 24 VDC monitored driver outputs.

Four Monitored Driver Outputs:
Drives DC solenoids connected to fire extinguishant or other compatible devices.

LED Test:
Test each front panel LED in the system by pressing the Master Reset button on the Facilities Module (Model FM002A).

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:
Fault LED will illuminate and Fault Code will be displayed when the input voltage drops below 18VDC.

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.

Modes of Operation:
Include Inhibit Mode, Fault Mode, Setup and Setup Check Mode.

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

Executive Inputs:
The alarm inputs can be active low/high. Manual Abort and Release inputs are available for each channel.

Activation Time Delay:
Alarm outputs can be delayed from 0 to 60 seconds.

Reverse Monitoring:
Outputs are monitored for open or short circuits. Reverse monitoring is used in fire alarm bell and siren system utilising a blocking diode.

1.3 Applications

The General Monitors Model MD002 is designed to supplement fire and gas detection systems and to provide increased flexibility by providing outputs to a variety of field deices. The list below is a partial representation of suitable applications:

- Refineries
- Drilling Platforms and Rigs
- Gas and Oil Production Platforms
- Gas Collection Facilities
- Oil Well Logging Operations
- LPG/LNG Processing and Storage
- Gas compressor stations
- Sewage and Wastewater Treatment Facilities
- Chemical and Petrochemical Plants
- Mud Logging Operations
- Sulphur Recovery Plants
- Desulphurisation Facilities
- Aircraft Hangers and Military Installations

This chapter provides detailed specifications for the Model MD002 Four Channel Monitored Driver Module which can be inserted into written specifications.

2.1 System Specifications

Application:
Four channel DC output driver for fire extinguishant solenoids, beacons, horns or other applicable devices.

Approvals:
CSA Approved. Conforms to NFPA 72A-72E Guidelines.

Warranty:
Two years

2.2 Mechanical Specifications

Height:	173mm (6.8”)
Width:	25mm (1”)
Length	251mm (9.9”)
Weight:	318 grams (11.2oz)

2.3 Electrical Specifications

Input Voltage:
20.0 to 35.0 VDC (rage)
24.0 VDC (nominal)
18.0 (low voltage threshold)
PSU noise and Ripple voltage 1V pk/pk max.
The customer supplied PSU must comply with IEC 1010-1, limiting current to 8A under Fault conditions, in order to comply with CE Marking requirements.

Driver Inputs:
2mA max @ 35 VDC sinking

Output Ratings:
1.2A max, 24VDC max.
Min. coil resistance 20 ohms

Open Collector Ratings:
100mA @ 35 VDC max
Fault, Fault-Unaccept and Inhibit

Electrical Classification:
The Model MD002 is designed for use in non-hazardous or safe environments for general purpose applications.

EMC Susceptibility:
10 V/m max.

2.4 Environmental Specifications

Operating Temperature Range:
- 18°C to + 66°C (0°F to + 150°F)

Storage Temperature Range:
- 40°C to + 66°C (- 40°F to + 150°F)

Operating Humidity Range:
5 to 100% maximum relative humidity, non-condensing.

2.5 Engineering Specifications

Zero Two System
Each system utilises modules capable of monitoring gas sensing elements to a 0 to 21.7mA analogue signal from gas or flame detection transmitters. The system chassis is available in 4, 8 and 16 channels. Each chassis contains a buss for the following independent signals:

A1 Alarm
A2 Alarms
Fault
Master Reset
Master Accept
Unaccept
CAL
+ 24VDC
System Common

Module signals are 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 are electrically and physically compatible and capable of being used in the same chassis to form combined fire and gas detection systems. The system consists of Zero Two Series component modules as manufactured by General Monitors in Lake Forest, California, U.S.A. or General Monitors, Galway, Ireland.

Monitored Driver Output Module
The Monitored Driver Output Module conforms to CSA, FM and ISA performance standards and is designed to NFPA guidelines 72A-72E where applicable. The module provides four driver outputs intended to drive DC solenoids or other applicable devices. All outputs are software selectable. A functional card test and front panel LED test is capable without interrupting normal on-line service. The module is capable of insertion and removal during power ON conditions without damage to any component or module in the system. The module is capable of monitoring DC outputs connected to fire extinguishant, fire alarm systems or any other applicable devices.

The unit has a variety of ordering options:

Number of active channels - 1 to 4

Pre-discharge time delay - 0 to 60 seconds in one second increments

Manual Abort Enable - 1 to 4

Latched/Non-latched outputs - 1 to 4

Alarm Inputs Active Low/High - 1 to 4

Fault Outputs Active/Not active during Inhibit Mode

Outputs Active/non Active during Card Test

This chapter discusses what to do when the Model MD002 is received, how to install the module, what the terminal connections and their functions are and making the initial application of power.

Safety Warning

Installation and maintenance must be carried out by suitably skilled and competent personnel only.

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 MD002 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. Equipment is to be installed in Rack System or Cabinet meeting the fire enclosure requirements of IEC 1010-1.

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).

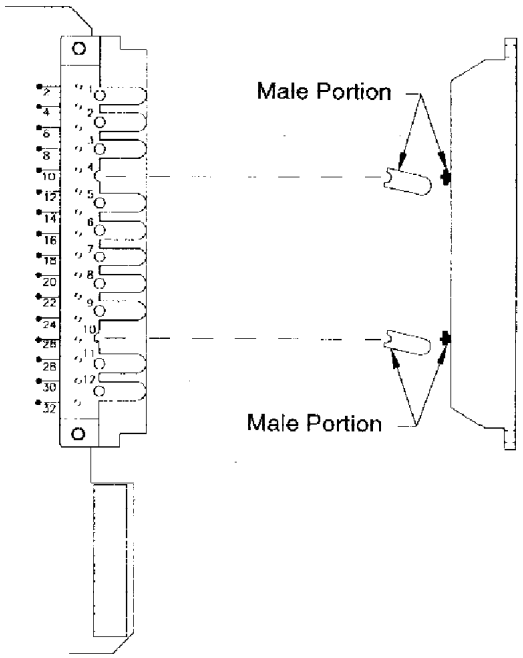
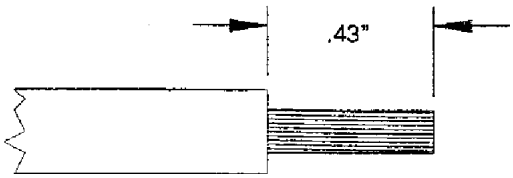


Figure 2

Zero Two Series module require air circulation to avoid excessive heat build-up. If the chassis are stacked vertically within an enclosure, forced air circulation may be required.

3.3 Rear Terminal Connections

All wire connections to the Model MD002 are made to the terminal block located at the rear of the chassis. The terminal block accepts 1.5mm^2 to 0.75mm^2 (16 AWG to 20 AWG), stranded or solid core wire. 2.5mm^2 (14 AWG) wire may be used if it is properly stripped according to Figure 3.



Strip length

Figure 3

Contact with the PC board components should be avoided in order to prevent damage by static electricity. To connect wires to the terminal block on the Model MD002, loosen the desired screw, insert the stripped end of the wire and tighten. Non-screw type connectors are available, check with General Monitors representative or details.

For the rear terminal designations refer to figure 4 below.

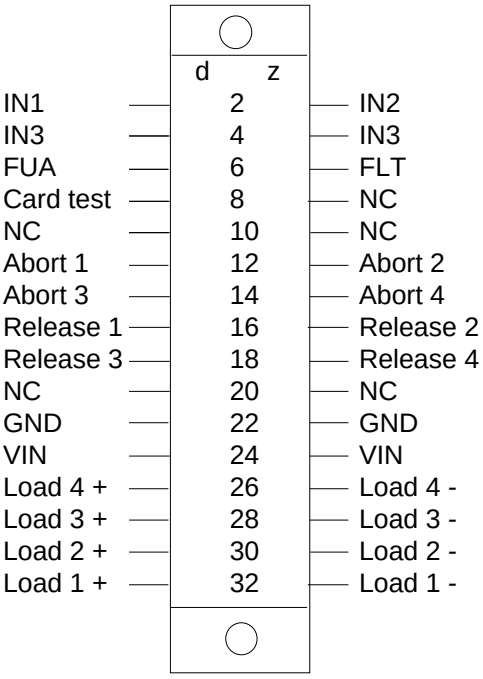


Figure 4

Output Drivers (Field Device)

Each channel provides two wire outputs to a DC solenoid or DC device. The terminal designations for these outputs are:

Designation	Term	Description
Load 1 (Out +)	32d	Signal Output Channel 1
Load 1 RTN (-)	32z	Signal Return Channel 1
Load 2 (Out +)	30d	Signal Output Channel 2
Load 2 RTN (-)	30z	Signal Return Channel 2
Load 3 Out (+)	28d	Signal Output Channel 3
Load 3 RTN (-)	28z	Signal Return Channel 3
Load 4 Out (+)	26d	Signal Output Channel 4
Load 4 RTN (-)	26z	Signal Return Channel 4

Figure 5 is a block diagram of DC solenoid or device connections to Channel 1 of the MD002.

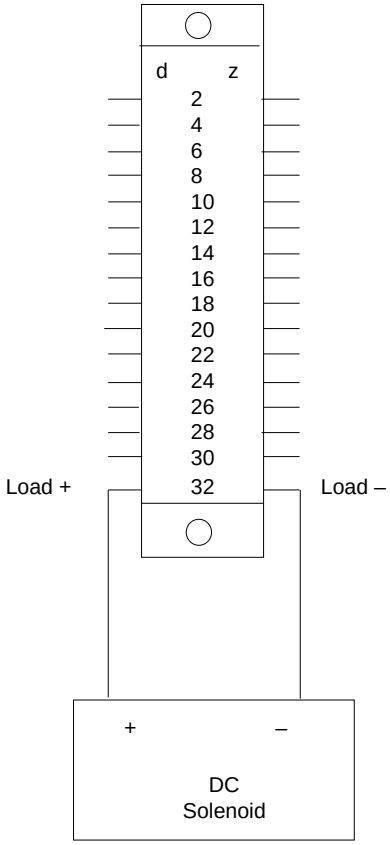


Figure 5

Manual Abort Connections

Each channel provides a manual abort terminal for aborting a pending activation during the pre-discharge time-out or to deactivate a currently activated driver. The terminal designations for the manual abort contacts are:

Designation	Term	Description
Abort 1	12d	Channel 1 Abort
Abort 2	12z	Channel 2 Abort
Abort 3	14d	Channel 3 Abort
Abort 4	14z	Channel 4 Abort

Manual Release Connections

Each channel provides a manual release terminal for overriding a previously aborted activation. If still within the pre-discharge time-out the time-out will continue. If the time-out has expired, it will immediately activate the driver. The terminal designations for the manual release contacts are:

Designation	Term	Description
Release 1	16d	Channel 1 Release
Release 2	16z	Channel 2 Release
Release 3	18d	Channel 3 Release
Release 4	18z	Channel 4 Release

Open Collector Inputs

The Model MD002 accepts four separate open collector inputs. These inputs are referenced to system common, and will activate the output drivers either in the programmed active low or active high state. The terminal designations for the open collector inputs are:

Designation	Term	Description
IN 1	2d	Channel 1 Input
IN 2	2z	Channel 2 Input
IN 3	4d	Channel 3 Input
IN4	4z	Channel 4 Input

Fault Outputs

There are two fault open collector outputs. The first (FLT) 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
FLT	6z	Fault OC
FUA	6d	Fault Unaccept OC

All of the open collector outputs on the Model MD002 have an electrical rating of 100mA @ 35 VDC. Figure 6 illustrates some typical open collector external circuits.

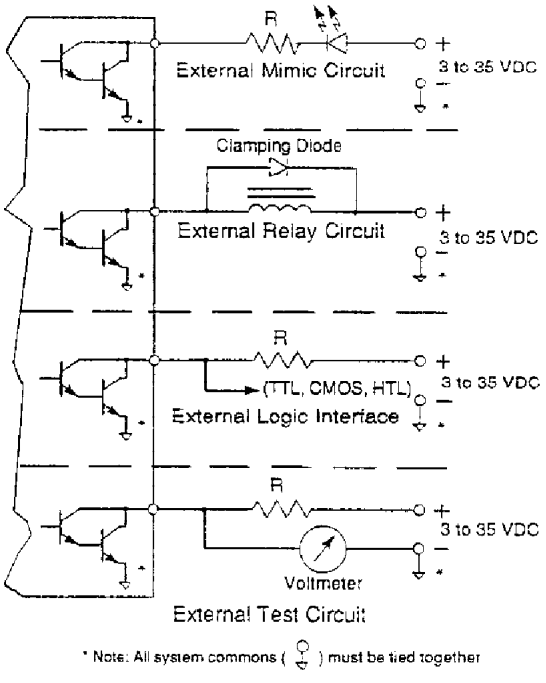


Figure 6

Card Test Input

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

Designation	Term	Description
Card test	8d	Card test Connection

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

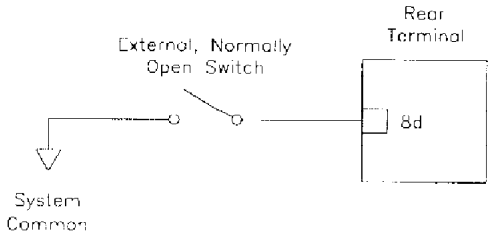


Figure 7

Remaining terminations are not used at this time.

Designation	Term	Description
NC	8z	No connection
NC	10d	No connection
NC	10z	No connection
NC	20d	No connection
NC	20z	No connection

3.4 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.

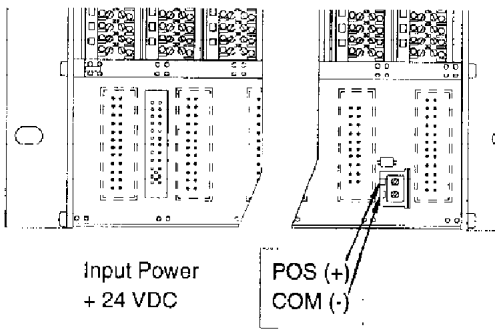


Figure 8

Do not daisy chain chassis. Supply separate power and common to each chassis.

3.5 LED Test

The MD002 LED'S and 7 segment display segments can be tested by depressing the Master Reset button on the General Monitors Facilities Module (FM002A) and holding for 3 or more seconds.

This chapter discusses general maintenance, refers to the electrical inputs, describes the electrical outputs, setup options and fault diagnostics.

Safety Warning

Installation and maintenance must be carried out by suitably skilled and competent personnel only.

4.1 General Maintenance

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

- 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, input and output wiring should be checked for tightness, verifying that all of the components and devices are connected correctly.
- GM recommend use of Password to prevent unauthorised changes of module configuration.

4.2 Input/Output Connections

The Model MD002 has four driver inputs which are driven with an open collector input referenced to system common. Each optional driver is activated by an active low/high input. To activate an output, the appropriate open collector compatible input must be driven to active low or active high state. The open collector output is rated to 35VDC maximum.

The MD002 provides four driver outputs that drive DC solenoids connected to fire extinguishant (or other similar application). These outputs are monitored for short or open circuits of the DC solenoids. Any detected short or open circuits will activate the fault open collector output. The monitored outputs are capable of sourcing 1.2A @ 24VDC and are capable of driving devices with a coil resistance as low as 20 Ohms.

4.3 Card Test Input

The card test input is provided to allow the operator to perform a functional test of the circuitry.

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 the switch is closed.

4.4 Setup Mode

The Model MD002 allows the user to change various card functions by entering the setup mode (see flow chart on Page 11). This mode may be protected by a password.

To enter the setup mode, depress the Mode/Select Switch for approximately five seconds. If the password is enabled, it must then be entered at this point.

Upon entering the password correctly, or if the password option is not invoked, the card will display '**In'**. If the user requires the cards' output drivers to be inhibited, press the Mode/Select switch and the **'In'** will begin to flash, the **READY** LED will illuminate and the inhibit open collector will activate to show that the outputs are now inhibited.

The following options are chosen for each of the four output drivers independently. The appropriate OP1 through OP4) LED will be flashing to show which driver is being configured.

To change a particular option, press the Mode/Select switch repeatedly to cycle through the available options.

Output Driver Configuration

The configurable options are then displayed for **each** channel in the following order:

1 **'IU'** for output driver In Use or **'nU'** for output driver Not in Use. If Not in Use is selected, the card will skip steps 2 through 9 and change to the next Output Driver.

2 Wait five seconds.

3 **‘00’** to **‘60’** for driver output activation time delay (in 1 second increments).

4 Wait five seconds.

5 **‘Ab’** for Manual Abort active or **‘nA’** for Manual Abort Not Active.

6 Wait five seconds.

7 **‘LA’** for Latched output or **‘nL’** for Non-latched output.

8 Wait five seconds.

9 **‘AL’** for alarm input Active Low or **‘AH’** for alarm input Active High.

10 Wait five seconds.

The card will now change to the next output driver and return to step one above.

See Re-order information page 20, for Factory Default Configuration (standard).

Following configuration of output driver four, the card will cycle through three more options that affect **all** of the channels.

Fault during Inhibit Mode

The **FAULT** LED will flash, choose **‘Ac’** if the fault outputs should be active during Inhibit Mode, or **‘nA’** to deactivate the outputs during Inhibit Mode.

Card Test Output

The card will display **‘ct’** for five seconds then display **‘Ac’** if the output drivers should be active during the Card Test, or **‘nA’** to deactivate the outputs during the Card Test.

Setting the Password

The last option is to enable and choose the password, or to disable the password. **‘PE’** is displayed for password enabled and **‘Pd’** for password disabled. If the password is enabled, the left digit will be displayed. To change the password, press the Mode/ Select switch repeatedly until the desired digit is displayed and wait for five seconds. The right digit will now be displayed. Press the Mode/Select switch repeatedly until the desired digit is displayed and wait for five seconds. The password is now set.

The card now returns to normal operation.

See Re-order information page 20, for Factory Default Configuration (standard).

4.5 Setup Mode Flowchart

Setup Mode **Options Chosen**

Note: Press Mode/Select Switch repeatedly to change option.

Depress Mode/Select switch for five seconds

Enter password (if required)
Press Mode/Select Switch repeatedly until left digit is correct, wait five seconds
Press Mode/Select Switch repeatedly until right digit is correct, wait five seconds

Inhibit Output Drivers
Steady **'In'** equals Output Drivers **not** inhibited
Flashing **'In'** equals Output Divers **are** inhibited, wait five seconds

Configure Output Drivers	OP1	OP2	OP3	OP4
Loop for Drivers 1 through 4				
OP1 (**2, 3** or **4**) LED flashing				
'IU' equals current Output Driver in use				
'nU' equals current Output Diver **not** in use, wait five seconds				
'00' to **'60'** equals Output Diver **time delay** in seconds, wait five seconds				
'Ab' equals Manual Abort **active**				
'nA' equals Manual Abort **not active**, wait five seconds				
'LA' equals Latching Output Driver				
'nL' equals Non-latching Output Diver, wait five seconds				
'AL' equals Active **Low** alarm input				
'AH' equals Active **High** alarm input, wait five seconds				

Go on to the next Output Driver configuration

Fault During Inhibit Mode
FAULT LED flashes
'Ac' equals Fault Outputs are **active** during Inhibit Mode
'nA' equals Fault Outputs are **not active** during Inhibit Mode, wait five seconds

Card Test Output
'ct' displayed, wait five seconds
'Ac' equals Output Drivers **active** during Card Test
'nA' equals Output Divers **not active** during Card Test, wait five seconds

Password Option
'PE' equals Password **enabled**
'Pd' equals Password **disabled**, wait five seconds

If password is **enabled** - Enter password
Press Mode/Select switch repeatedly until desired left digit is displayed, wait five seconds
Press Mode/Select switch repeatedly until desired right digit is displayed, wait five seconds

Card returns to normal operation.

4.6 Manual Abort Input

Each channel has a Manual Abort connection so that an impending output activation can be averted. If the channel is in the pre-discharge time-delay or currently activated, grounding this terminal to system common will deactivate the output driver.

This option allows a control room operator to override the MD002's automatic discharge, and hold, for example, the fire deluge system for Manual Release.

4.7 Manual Release Input

Each channel has a Manual Release connection so that the user can override a previously aborted output driver. If the channel is still in the pre-discharge time-delay, the time-out will continue. If the time-out has expired, grounding this terminal to system common will immediately activate the output driver.

This option, used in conjunction with the Manual Abort option, allows a control room operator to manual activate, for example, the fire deluge system after being Manual Aborted.

4.8 Fault Codes

The Model MD002 displays fault codes on the digital display covering various malfunctions that may occur.

The Model MD002 fault codes are listed below for reference:

F1 Unused
F2 Vin Voltage Disconnected
F3 EEPROM Checksum error
F4 Output Diver Open Circuited. (Corresponding **F1 - F4** LED will illuminate)
F5 Output Driver shorted circuited. (Corresponding **F1 - F4** LED will illuminate)
F6 Low power supply voltage
F7 EEPROM verification failure
F8 Failure to complete setup

For **F4** and **F5** faults, check output wiring.
For **F6** fault, check power supply voltage.
F8 fault, card must go through the setup process again.
For all other faults, return card to General Monitors for repair.

Engineering Documentation

Schematic Diagram - Display Board

Reference Drawing # 11409-1

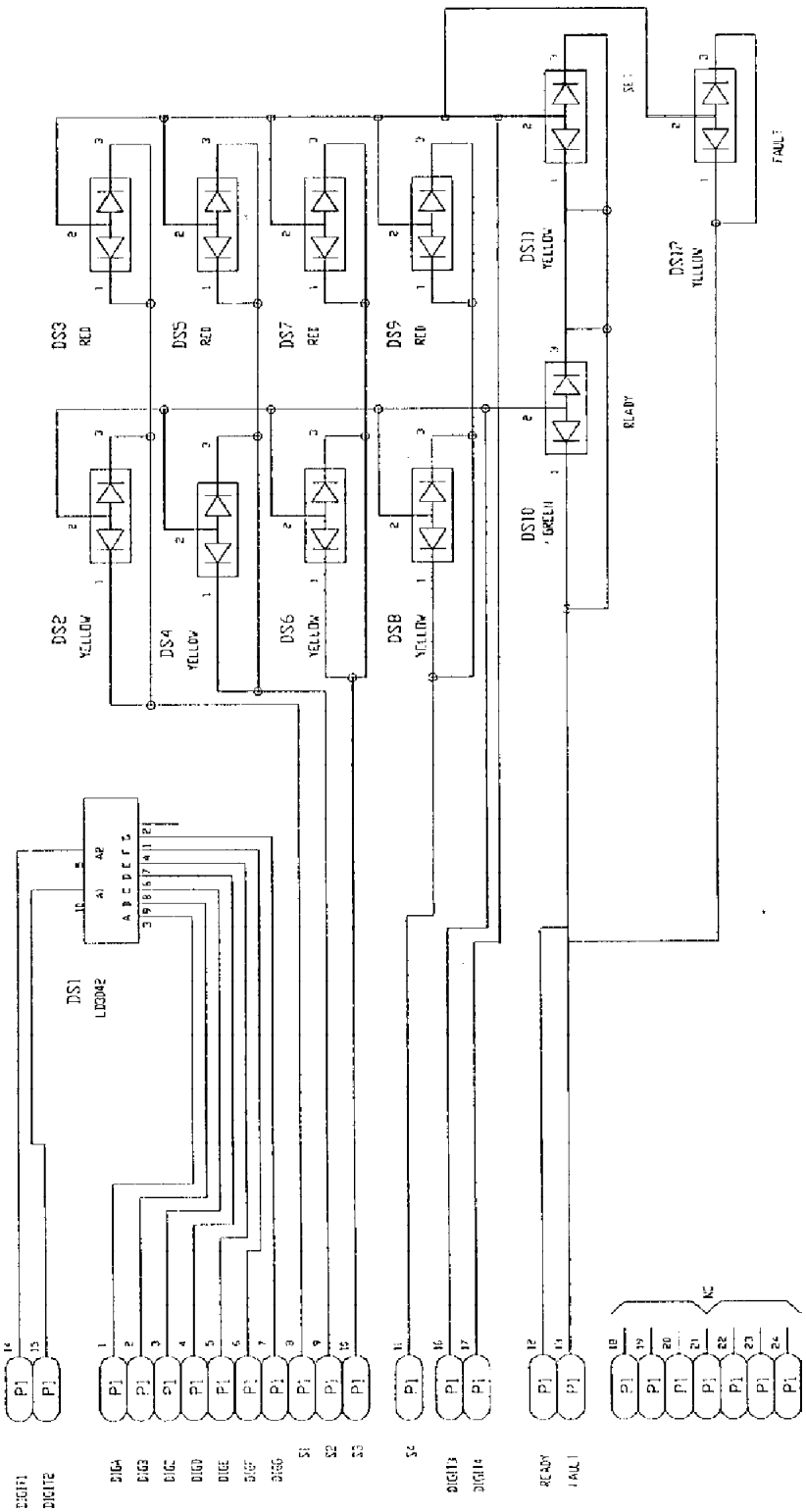


Figure 9

Engineering Documentation (continued) **Schematic Diagram - Control Board**

Reference Drawing # 11405-1

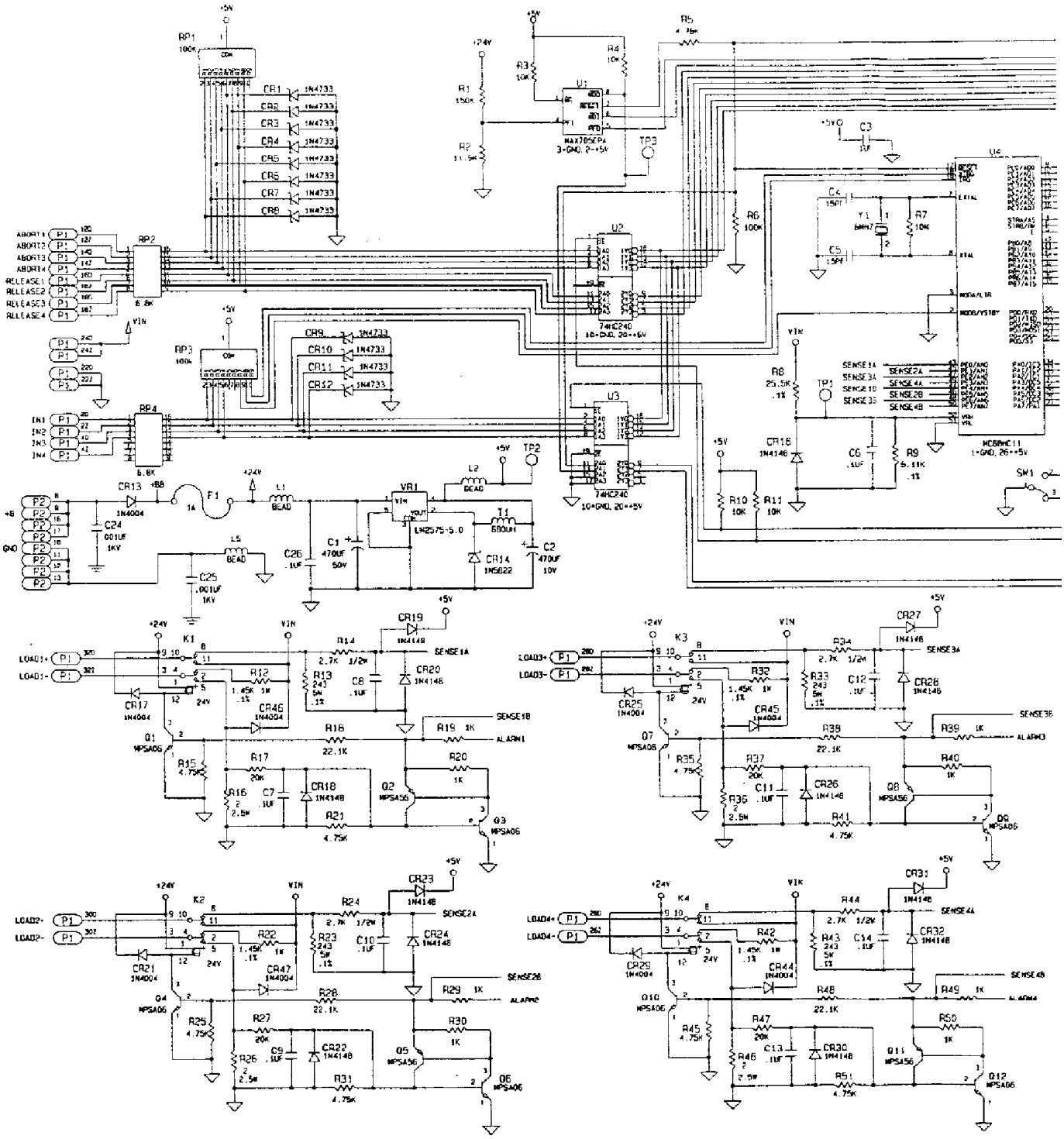


Figure 10 - Left side

Engineering Documentation (continued) **Schematic Diagram Control Board**

Reference Drawing # 11405-1

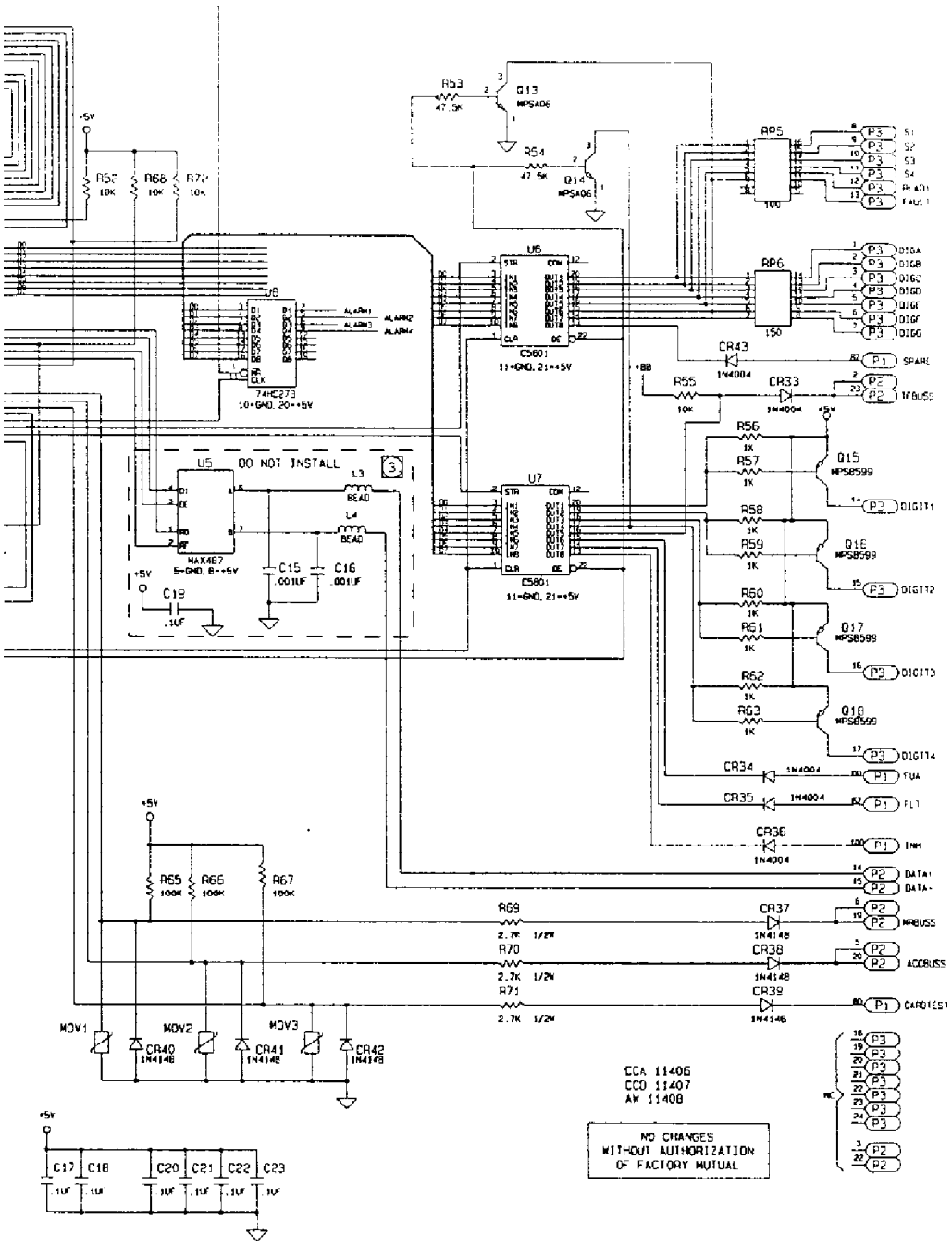


Figure 10 - Right side

Engineering documentation (continued) **Circuit Card Assembly - Display Board**

Reference Drawing # 11410-1

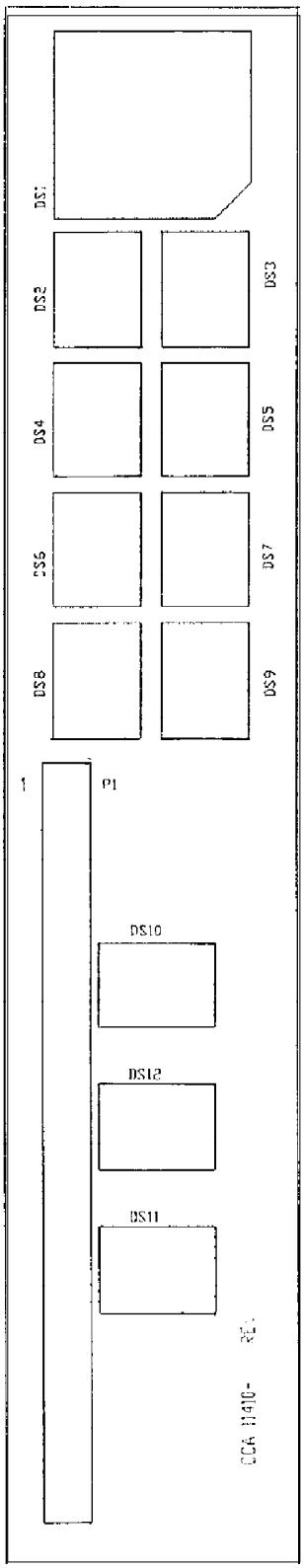


Figure 11

Engineering Documentation (continued) **Circuit Card Assembly - Control Board**

Reference Drawing # 11406-1

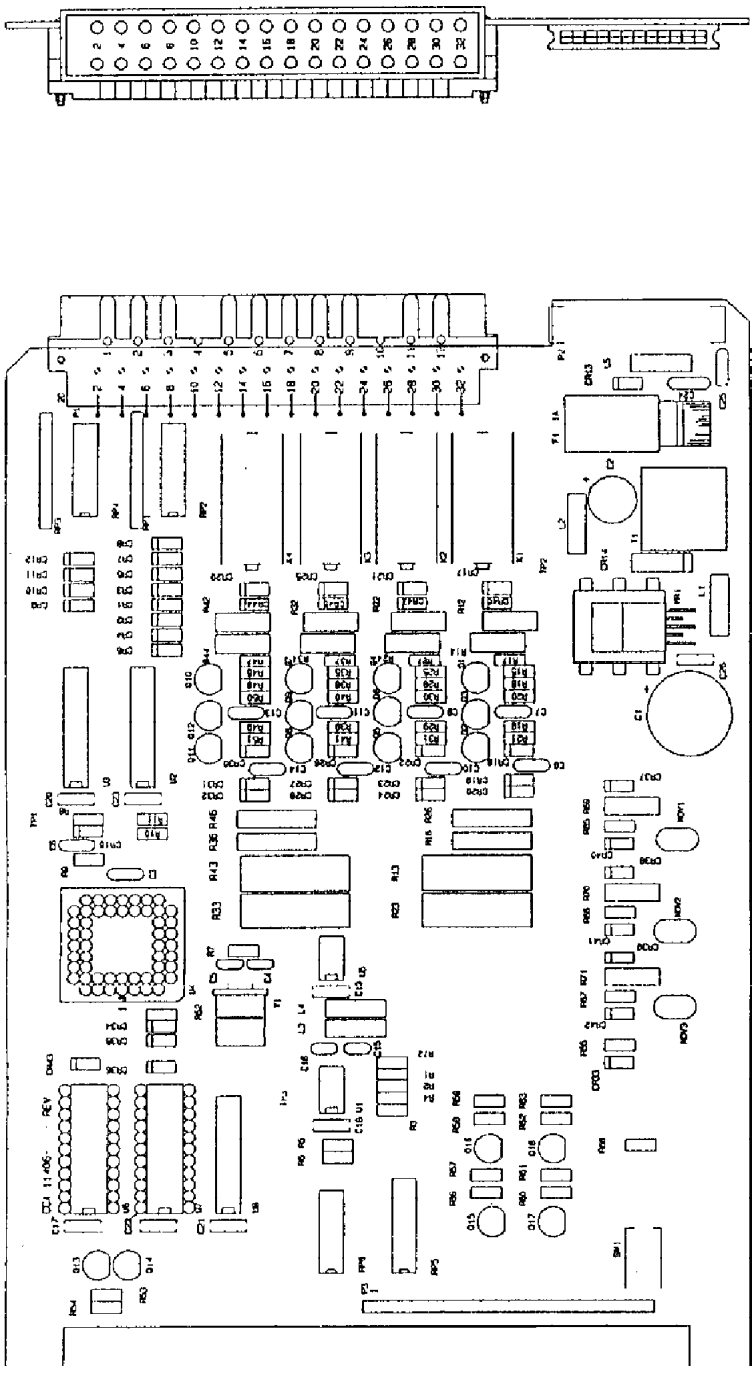


Figure 12

Engineering Documentation (continued) **Outline & Terminal Connection Drawing**

Reference Drawing # 11401-1

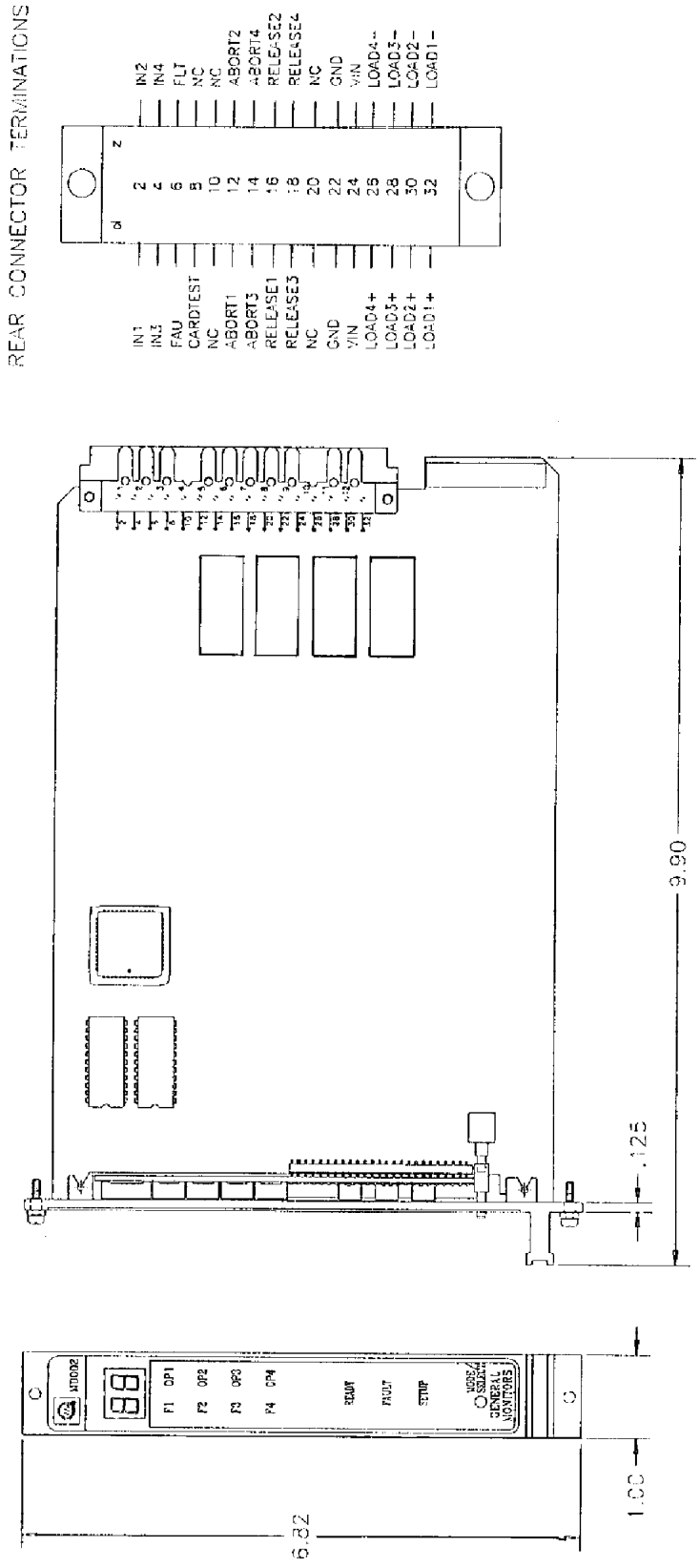
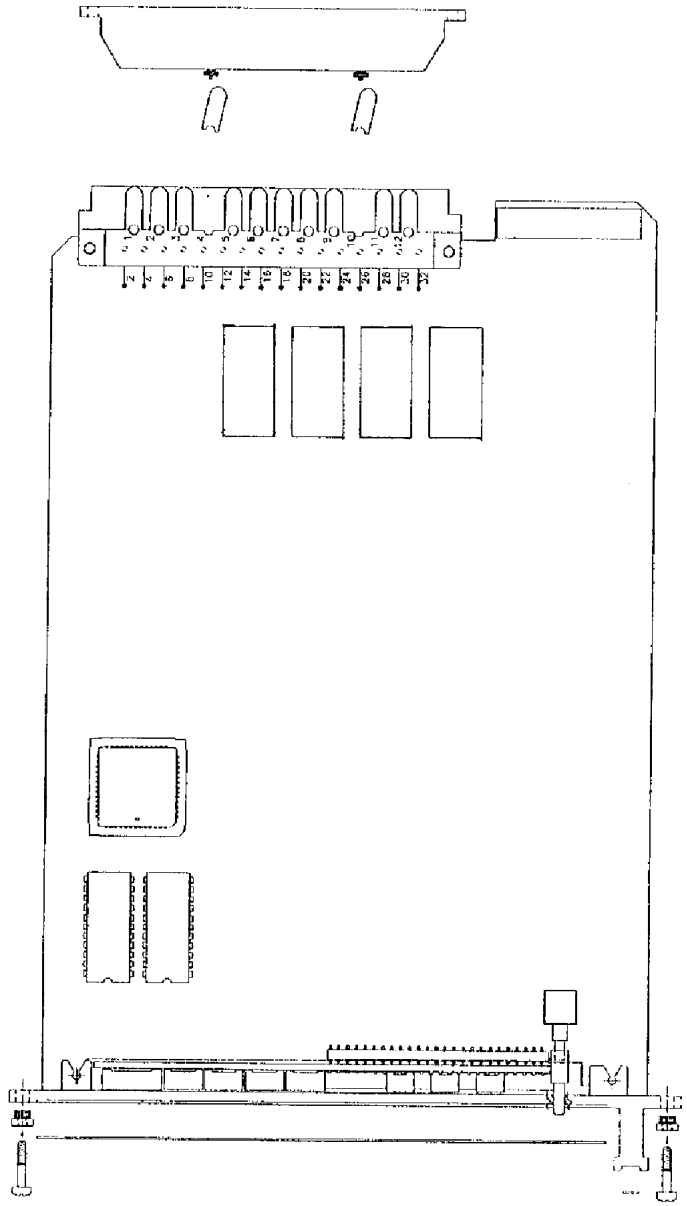


Figure 13

Engineering Documentation (continued) **Final Assembly Drawing**

Reference Drawing # 11400-1



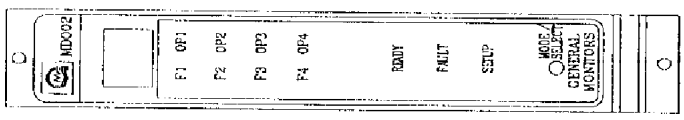


Figure 14

Ordering Information

The standard configuration for the Model MD002 is:

MD002-311-400-111

MD002-3□□-□□□-□□□

Inhibit Mode
1 = Fault not active (standard)
2 = Fault active

Card Test
1 = Inhibited Alarm outputs (standard)
2 = Active Alarm outputs

Manual-Abort/Approval
1 = Enabled - All drivers/CE (standard)
2 = Disabled - All drivers/CE
3 = Other (specify)/CE
4 = Enabled - All drivers/Gost
5 = Disabled - All drivers/Gost
6 = Other (specify)/Gost

Activation Time Delay
00 = 0 second delay all drivers (standard)
01 = 10 second delay all drivers
02 = 20 second delay all drivers
03 = 30 second delay all drivers
04 = 40 second delay all drivers
05 = 50 second delay all drivers
06 = 60 second delay all drivers
07 = Other (specify)

Active Drivers
0 = No active channels (not in use)
1 = One Active channel
2 = Two Active channels
3 = Three Active channels
4 = Four Active channels (standard)

Alarm Outputs
1 = Latching (all outputs) (standard)
2 = Non-latching (all outputs)
3 = Other (specify per output)

Alarm Inputs
1 = Low Activation (all outputs) (standard)
2 = High Activation (all outputs)
3 = Other (specify per input)

Power
3 = 24 VDC Standard

Note:
1 Gost approved cards are only supplied with Russian Nameplates.

Zero Two Series Modules

Model 2602A
Zero Two Series Control Module for Hydrogen Sulphide Gas Applications

Model 4802A
Zero Two Series Control Module for Combustible Gas Applications

Model TA102A
Zero Two Series Trip Amplifier Module for Combustible Gas Applications

Model TA202A
Zero Two Series Trip Amplifier Module for Hydrogen Sulphide Gas Applications

Model TA402A
Zero Two Series Trip Amplifier Module for Flame Detection Applications

Model TA502A
Zero Two Series Generic Trip Amplifier Module

Model FM002A
Zero Two Series Facilities Module Performs Common Functions for Zero Two Systems

Model ZN002A
Zero Two Series Zone Control Module Performs Zoning and Voting Functions for Zero Two Systems

Model MD002
Zero Two Series Driver Card for Monitoring/ Driving High Current Output Devices

Model IN042
Zero Two Series Four Zone Input Card for Callpoints, Smoke & Thermal Detectors

GENERAL MONITORS

Model MD002

EC Declaration of Conformity in accordance with EC Directives

We at General Monitors Ireland Limited, Ballybrit Business Park, Galway, Republic of Ireland, hereby declare that the equipment described below, both in its basic design and construction, and in the version or versions marketed by us, conforms to the relevant safety and health related requirements of the appropriate EC Directives, only as follows.

a) Conforms with the protection requirements of Council Directive 89/336/EEC, + Amd 92/31/EEC, + Amd 93/68/EEC relating to Electromagnetic Compatibility, by the application of:

A Technical Construction File No. 95005, Competent Body Certificate No. 4473-95-106 and Report No. 4473/1K8.

and

b) Conforms with protection requirements of IEC 1010-1:1990 + Amd 1: 1992 (+ Amd 2: 1995 as applicable) relating to safety by the application of:

A Technical Construction File No. 95005 and Competent Body Certificate No. 4146/699L-6870, 4146/1119/9510 and 4146/1119/9507 issued by:

ERA Technology Ltd. Cleeve Road, Leatherhead, Surrey, KT22 7SA, England. Tel: +44-1372-367000

This declaration shall cease to be valid if modifications are made to the equipment without our approval.

PRODUCT: 02 series gas, flame and fire detection and monitoring cards
MODEL/S: 4802A, 2602A, TA102A, TA202A, TA402A, TA502A, IN042, ZN002A, MD002, FM002A and 02 series chassis.

It is ensured through internal measures and our ISO 9001: 1994 certification, that series production units conform at all times to the requirements of these current EC Directives and relevant standards.

Responsible Person _____ Date 15.07.97

General Manager Eur. Ops

The signatory acts on behalf of the company management, and with full power of attorney.