

MT-APN16 MEDICAL GAS AND VACUUM ALARM PANEL



INSTALLATION & OPERATING MANUAL

8 Park Edge Mews
21 Link Way, Edgemoor 7407
Cape Town RSA
Tel (27) (021) 558-7040
gas@mediteksystems.co.za
www.mediteksystems.co.za



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DESCRIPTION

Housed in a weather-proof enclosure with a transparent hinged lid ensures that the system is capable of indoor or outdoor operation. The fascia depicts each monitored point with an engraved colour symbol and two LED's (light emitting diode), indicating NORMAL and ALARM conditions.

The status of 16 inputs (switches) can be monitored. These inputs can be individually configured for 'normally open' or 'normally closed' switches. Any voltage-free contact switch can be used including pressure, magnetic, proximity and PIR switches. 4 to 20ma signals can also be accommodated using a converter.

The input switches are connected to the Master panel which then transmits the status of these switches to the Slave (mimic) panel/s. In the occurrence of one or more switches being a long distance from the Master, but close to a Slave panel, these switches can be connected to that Slave panel. This Slave panel will then become a 'SLAVE PANEL WITH INPUTS' and must be configured as such.

Using 'normally closed' switches ensure a 'Fail Safe' condition with the alarm being activated should the cable be cut or damaged. This system can also be coupled to other existing alarm systems via our interface module.

During an alarm condition an audible buzzer is activated which can be manually muted. The visual alarm LED's will however continue to indicate a fault until such time as the fault's rectified. The audible alarm is re-activated should an additional alarm condition occur.

A maximum of 15 Slave (mimic) panels can be placed up to 1 Km from the Master panel, linked via a serial interface 2-core cable. All panels have TEST and MUTE buttons to test all LED's and to mute the buzzer during alarm conditions.

Computer 'Link-Up' is possible using either a RS232 or RS485 interface. The computer software allows OSD (On Screen Display) of the Alarm Network with usage and fault logging statistics.

Operating from a standard 110 / 230V ac supply, the system uses a dual 5V DC power supply to supply the input switches and to power the motherboard.

FEATURES

OPERATION

- 1) Master and Slave panels are identical ensuring easy replacement.
- 2) Test and Mute on all panels.
- 3) Maximum of 38 hi-bright LED's per panel indicate operating status and functions.
- 4) 5V DC audible alarm buzzer provided on all panels.
- 5) On-board configuration facilities for selecting various modes of operation (eg Master/Slave, Buzzer On/Off, Slave ID No's, Fault LED's Flash On/Off, Switch type, Services enable/disable etc).
- 6) On-board microprocessor 'Watch-Dog' circuitry.
- 7) Slaves reflect current status of all inputs.
- 8) Two modes of alarm condition indication:
 - i) Dual warning LED's – Green for normal and flashing Red for alarm condition.
 - ii) Single Warning LED – Green disabled and red continuously for alarm condition.
- 9) Audible alarm buzzer can be enabled or disabled at each panel.
- 10) Audible alarm is re-activated on a new alarm condition if already muted.
- 11) All panels on the network are muted when MUTE is pressed on the Master panel.
- 12) Pressing the TEST button will activate the buzzer and test all LED's.
- 13) Weather-proof, rustproof plastic enclosure for internal or external use.
- 14) Removable inspection cover for access to front panel buttons, buzzer and comms terminals.
- 15) Light-weight enclosure with hinged transparent door and mounting holes for easy installation.
- 16) Colour coded mimic pictures on the fascia indicate each monitoring point and description.
- 17) Special function mimic pictures can be manufactured to end-user's specifications for use on the fascia.
- 18) 6 Status LED facilities. (Power, Network Error, Mains Fail, uP Reset, Network Tx, Rx, and PC Tx).

FEATURES

(CONTINUED)

INPUT SWITCHES

- 1) The status of 16 inputs can be monitored. Each of these can be individually configured for 'Normally Open' or 'normally closed' switches.
- 2) Failsafe operation. Alarm activated on the cable being cut or damaged while using 'Normally Closed' switches.
- 3) Optically isolated inputs to protect against induced voltages on input lines.
- 4) Input switches can be connected to the Master panel or any Slave panel (With Inputs).

COMMUNICATIONS

- 1) Switched relay output for connection to other external devices. Mutable/Non-Mutable selection jumper.
- 2) Computer link-up software to monitor Alarm Network and provide stats with OSD.
- 3) Two-wire, half-duplex, RS485 party-line interface for Master/Slave communication up to 1Km apart.
- 4) RS485 or RS232 Serial interface for Computer link-up.
- 5) Master panel monitors the communication line and indicates a fault should any Slave with inputs not respond when polled.
- 6) Slave panel indicates a fault should the transmission from the Master not be received thus warning of a network failure.
- 7) Slave (with Inputs) panel will indicate a comms error if not polled by the Master.
- 8) Maximum of 15 Slaves can be connected to the Master.
- 9) Master to Slave communications requires only 0.22 Mylar screen 2 core cable.

POWER SUPPLY

- 1) All panels have a dual 5V DC power supply with 230V or 110V ac inputs.
- 2) 12V DC battery charger on-board.
- 3) Battery back-up with on-board battery charger. (Batteries optional).
- 4) Built in mains failure alarm.

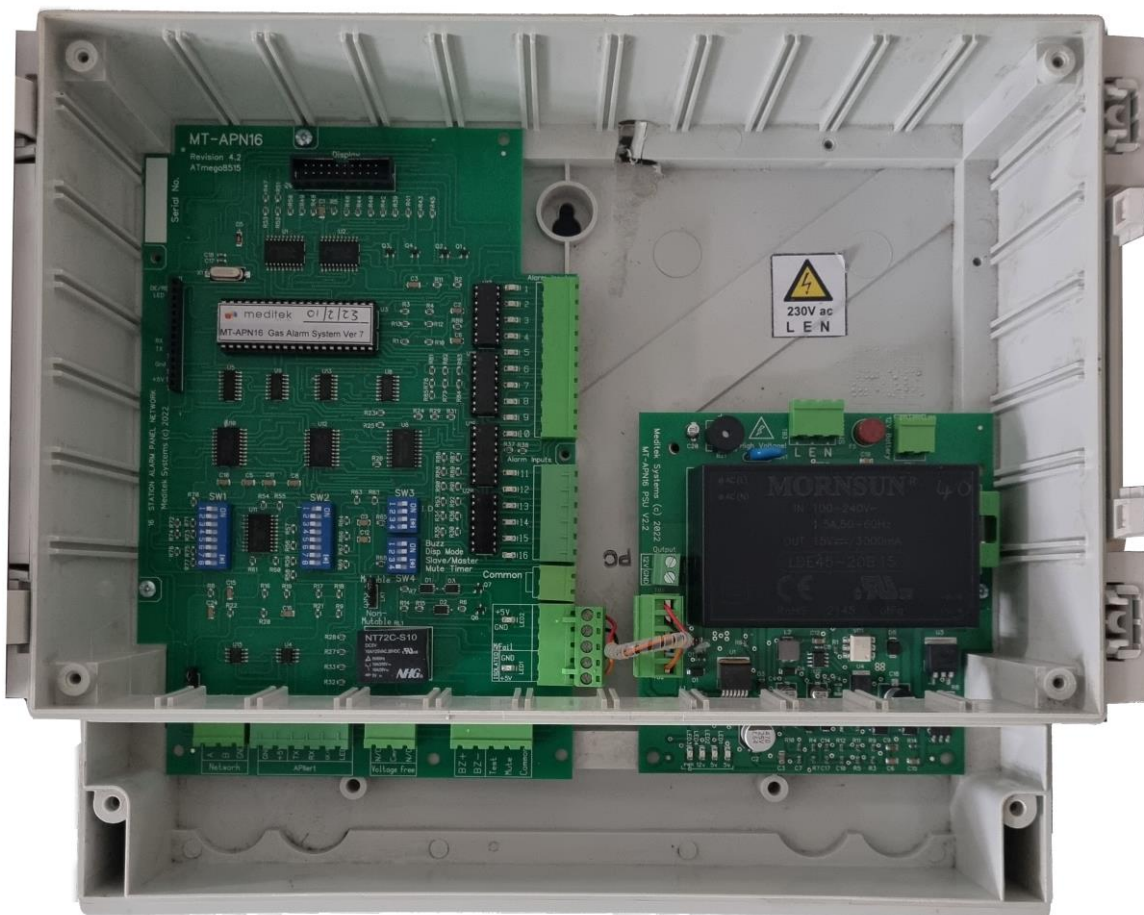
NOTE: *Features are subject to change without notice.*

INSTALLATION INSTRUCTIONS

MOUNTING

Open the hinged door and carefully remove the screws holding the fascia. Remove the fascia plate. Remove the plastic hole-cover situated at the top in the middle of the panel. Hold the panel over the required mounting position and mark.

Once secured, remove the bottom inspection cover and mark the corner mounting position. Tighten all mounting screws and replace inspection cover and fascia.



SWITCHES

Connect one side of all the switches (1-16) to COMMON.
(See Master Connections Instructions- Page 9).

Connect the other side of the switch to the connector as shown in the key.

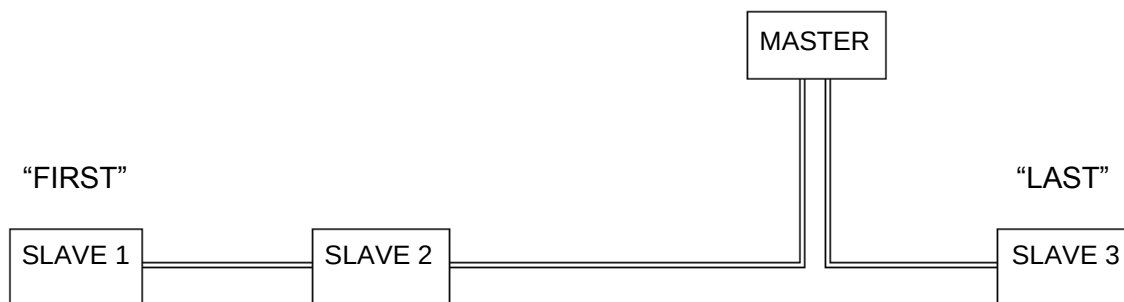
INSTALLATION INSTRUCTIONS (CONTINUED)

COMMS CABLE

If the system incorporates Slave panel/s, communications between the Master and these Slave(s) is via a 2-core comms cable. Connect Gnd, A and B of terminal TB15 on the Master to terminal TB15 on the Slave panel(s). (See Diagrams- Pages 14, 15 & 16).

COMMUNICATIONS PROBLEMS.

In case of unreliable communications, as a result of electrical noise, terminating resistors should be connected on TWO of the panels in the network. This is achieved by placing a jumper across link LK2 (located on the PC board) on the panels at the “ends” of the network. The ‘first’ and ‘last’ panels can generally be identified as the panels with only one comms cable connected to them. ie: those panels at the ‘END OF THE LINE’.



Place the link across LK2 to connect the terminating resistors.
(See Diagrams- Pages 14, 15 & 16).

NOTE: ONLY THE ‘First’ AND ‘Last’ PANELS MUST BE TERMINATED!

POWER SUPPLY

The system requires a 230V ac mains supply. Connect the mains supply to the PSU (Power Supply Unit) on the Master and Slave panels. (See Power Supply Connections- Page 18).

The PSU supplies a dual 5V DC for the main PCB and for the isolated inputs. Optional rechargeable 9,6 to 12V batteries can be connected to provide power in the event of a power failure. The back-up time of these batteries is approx 30 Min.

This 230V ac supply should be a dedicated line without any other equipment connected to it to ensure a stable and constant supply voltage.

INSTALLATION INSTRUCTIONS

(CONTINUED)

PC (Computer) LINK

If the computer link is required, a cable must be connected between the Master and the PC. This can be achieved by using one of two methods. The system has two 'PORTS' which can be used for the link.

The RS232 Serial Port is used if the distance between the Master and the PC is short. (Typically less than 30 meters.) This PORT is more susceptible to electrical noise and should not be used in noisy environments. Connect the PC Serial to TB16 (See PC Communications Connections - Page 17).

The RS485 Serial Port is used over longer distances. When using this port a RS485-RS232 converter is required. This device forms a link between the cable from the Master and the Computer Serial Port. (See Schematic Diagram - Page 14).

EXTERNAL RELAY

This relay makes provision for the connection of external devices to the alarm network such as sirens, buzzers, lights and other alarm systems. The relay's voltage-free outputs (TB10) include Normally Open, Normally Closed and Common Connections. It is activated on any alarm condition with a maximum load current of 1.5A at 230V ac or 3A at 24 V DC.

There are two operating modes for this relay output. They are 'Mutable' and 'Non-Mutable'. This mode is changed using LK1. Closing pins 1 & 2 set 'Mutable' mode and closing pins 2 & 3 set 'Non-Mutable' mode. (See Diagrams- Pages 14, 15 & 16).

MASTER CONFIGURATION

MONITORING POINT SWITCHES (SW 1 AND SW 2)

SW1 and **SW2** are DIP (Dual In-line Pin) switches located on the PC board (See Master Panel Connections-Page 14). These are used to configure the type of switches used at the monitoring points. These can be either 'Normally Open' or 'Normally closed' switches under normal conditions.

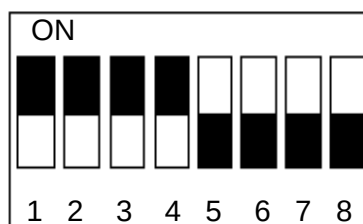
SW 1 - numbers 1 to 8 represent monitoring points 1 to 8.
SW 2 - numbers 1 to 8 represent monitoring points 9 to 16.

Set each DIP switch to represent the type of switch at the corresponding monitoring point.



ON - 'Normally Closed' switch. (Opens on fault)
OFF - 'Normally Open' switch. (Closes on fault)

NOTE: ALL UNUSED DIP SWITCHES MUST BE SET TO OFF

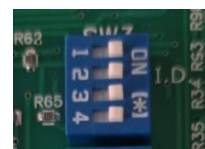


SAMPLE

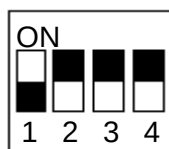
PANEL IDENTITY (SW 3)

SW 3 is a DIP (Dual In-line Pin) switch used to configure the number of Slaves with inputs on the network. This DIP switch is normally factory set and requires no adjustment

NOTE: If there are NO SLAVES with inputs, then all switches are set to ON.



1 Slave with inputs.



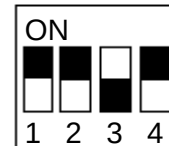
2 Slaves with inputs



3 Slaves with inputs



4 Slaves with inputs



MASTER CONFIGURATION

(CONTINUED)

FUNCTION MODE (SW 4)

No 1 is the Buzzer Mode.
No 2 is the Alarm Indication Mode.
No 3 is the Master/Slave Mode.
No 4 is the Mute Time Mode



DEFAULT



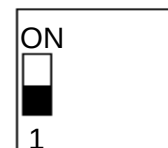
BUZZER MODE

When set to ON the buzzer is ENABLED.
When set to OFF the buzzer is DISABLED.

BUZZER ON



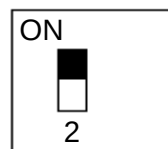
BUZZER OFF



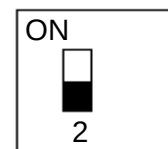
ALARM INDICATION MODE

When set to ON the Green LED shows for 'Normal' and the Red LED flashes for 'FAULT'.

MODE 1



MODE 2

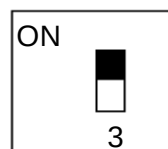


When set to OFF the Green LED is always 'DISABLED' and the Red LED flashes for 'FAULT' only.

MASTER/SLAVE SELECTION

This configures a panel as a Master or a Slave.
As a Master this is always set to ON.

MASTER



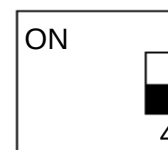
MUTE TIME SELECTION

When set to ON the Mute time is set to 30 Min.
When set to OFF the Mute time is set to 15 Min.
After this period the panel gives a reminder buzz

30 MIN



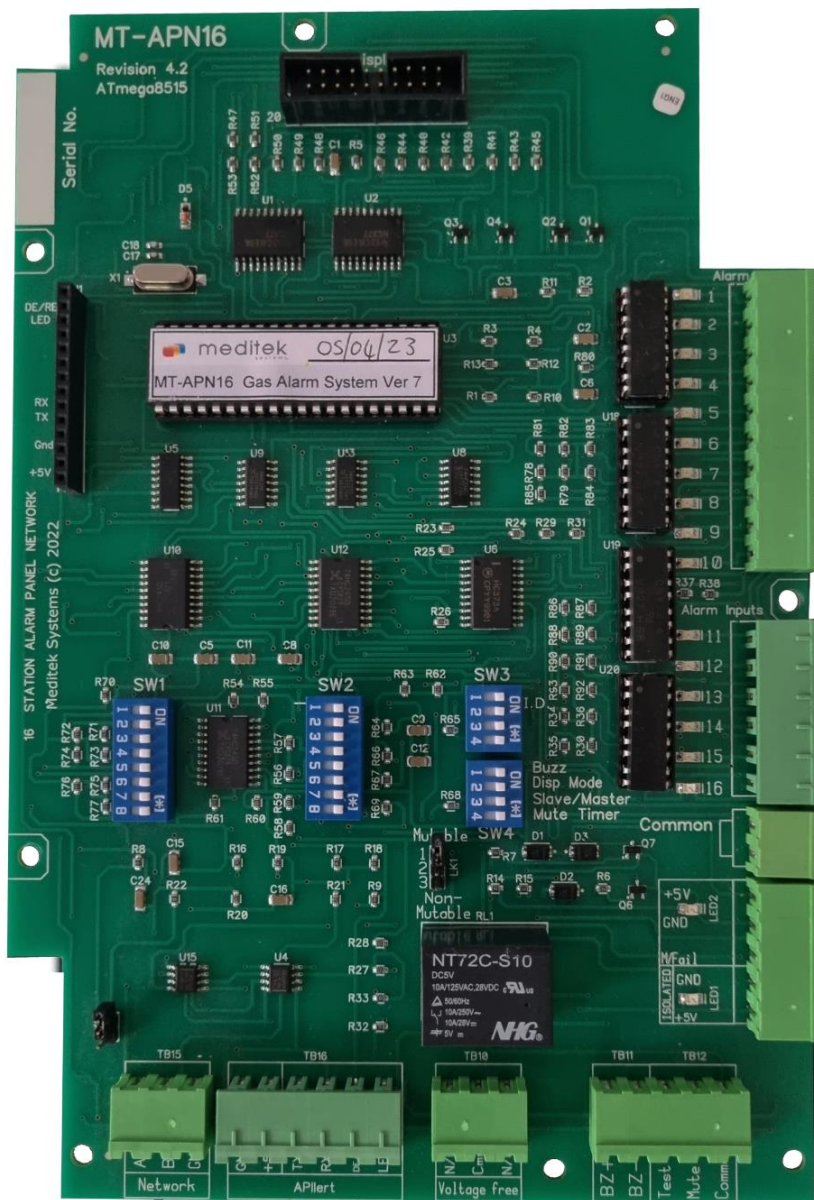
15 MIN



MASTER WIRING CONNECTIONS

Power & Switch Inputs

Connect all inputs using one side of each switch as a common. These switches must be voltage-free. These switches are powered by a built-in 5VDC power supply.



1. Oxygen Left Bank
2. Oxygen Right Bank
3. Nitrous Oxide Left Bank
4. Nitrous Oxide Right Bank
5. Medical Air Left Bank
6. Medical Air Right Bank
7. Compressor
8. Vacuum Plant
9. Generator
10. U.P.S.

11. Bulk Oxygen Contents
12. Bulk Oxygen Pressure
13. Carbon Dioxide Left Bank
14. Carbon Dioxide Right Bank
15. Entonox Left Bank
16. Entonox Right Bank

Common (to each switch contact)

- | | |
|------------|----------|
| 5V+ a | (RED) |
| Gnd a | (BLACK) |
| Mains Fail | (YELLOW) |
| Gnd b | (GREY) |
| 5V+ b | (ORANGE) |



2 core Mylar screen cable to connect to slave/s panels.
(Network communications)

SLAVE CONFIGURATION

MONITORING POINT SWITCHES (SW 1 AND SW 2)

SW 1 and **SW 2** are DIP (Dual In-line Pin) switches located on the PC board (See Slave Panel Connections – Page 16). These are used to 'ENABLE' or 'DISABLE' the individual alarm inputs ie: when a particular service be disabled, the panel will ignore any alarm condition relating to that service.

SW 1 - numbers 1 to 8 represent monitoring points 1 to 8.

SW 2 - numbers 1 to 8 represent monitoring points 9 to 16.

Set each DIP switch to ENABLE or DISABLE that corresponding service. Normally all services are enabled.



ON – ENABLED.

OFF – DISABLED (Will ignore alarm condition).

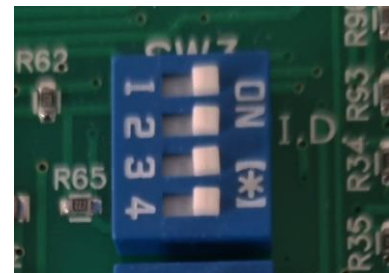


SAMPLE

NOTE: ALL UNUSED DIP SWITCHES MUST BE SET TO OFF.

PANEL IDENTITY (SW 3)

SW 3 is a DIP (Dual In-line Pin) switch used to configure the Slave ID on the network.



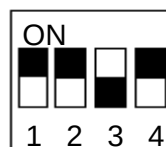
NOTE: ALL SWITCHES ARE SET TO ON.

SLAVE CONFIGURATION

(CONTINUED)

FUNCTION MODE (SW 4)

No 1 is the Buzzer Mode.
No 2 is the Alarm Indication Mode.
No 3 is the Master/Slave Mode.
No 4 is the Mute Time Mode.



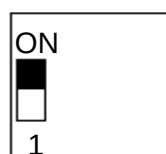
DEFAULT



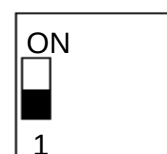
BUZZER MODE

When set to **ON** the buzzer is ENABLED.
When set to **OFF** the buzzer is DISABLED.

BUZZER ON



BUZZER OFF

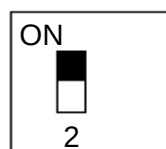


ALARM INDICATION MODE

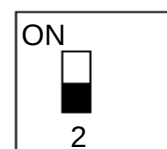
When set to **ON** the Green LED shows for 'NORMAL' and the Red LED flashes for 'FAULT'.

When set to **OFF** the Green LED is 'DISABLED' and the Red LED is on for 'FAULT' only.

MODE 1

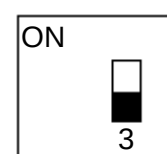


MODE 2



MASTER/SLAVE SELECTION

This configures the panel as a Master or Slave.
As a Slave this is always set to OFF.



MUTE TIME SELECTION

When set to **ON** the Mute time is set to 30 Min.
When set to **OFF** the Mute time is set to 15 Min.
After this period the panel gives a reminder buzz.

30 MIN



15 MIN



DIP SWITCH SETTINGS

SW1 (1-8) REPRESENTING INPUTS 1 - 8

- ON - ALARM ENABLED
- OFF - ALARM DISABLED

SW2 (1-8) REPRESENTING INPUTS 9 - 16

- ON - ALARM ENABLED
- OFF - ALARM DISABLED

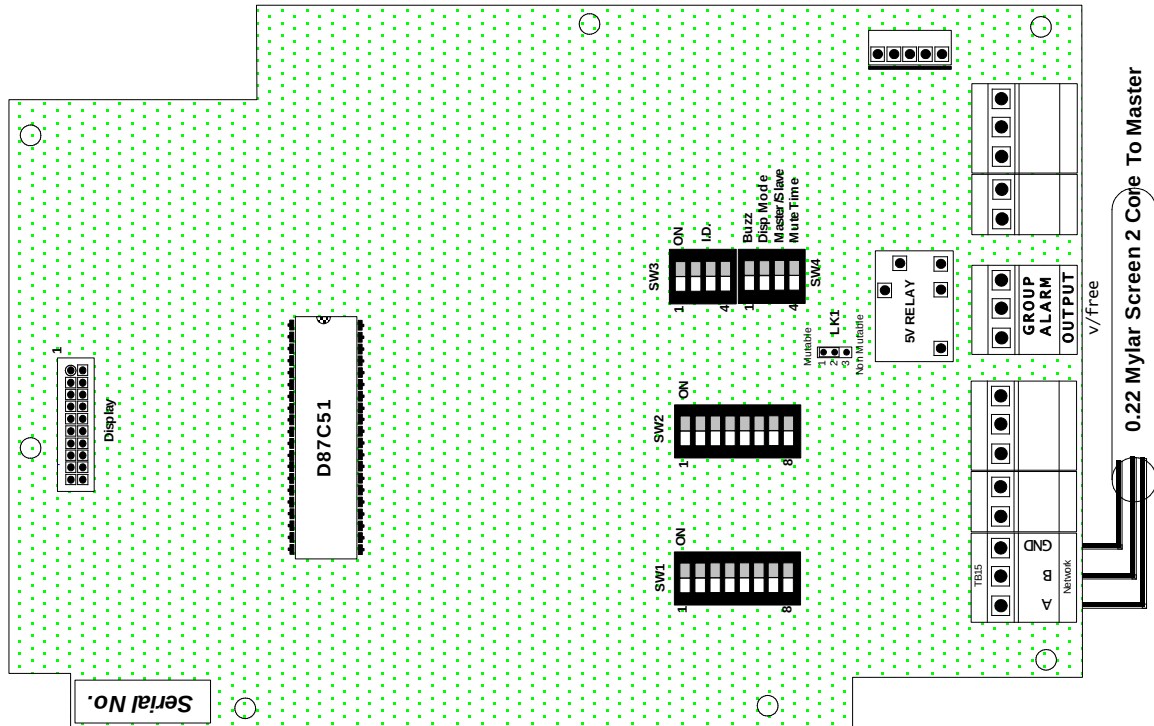
SW3 (1-4)

SLAVE I.D. See Page 8

SW4 (1-4) MODE SETTINGS

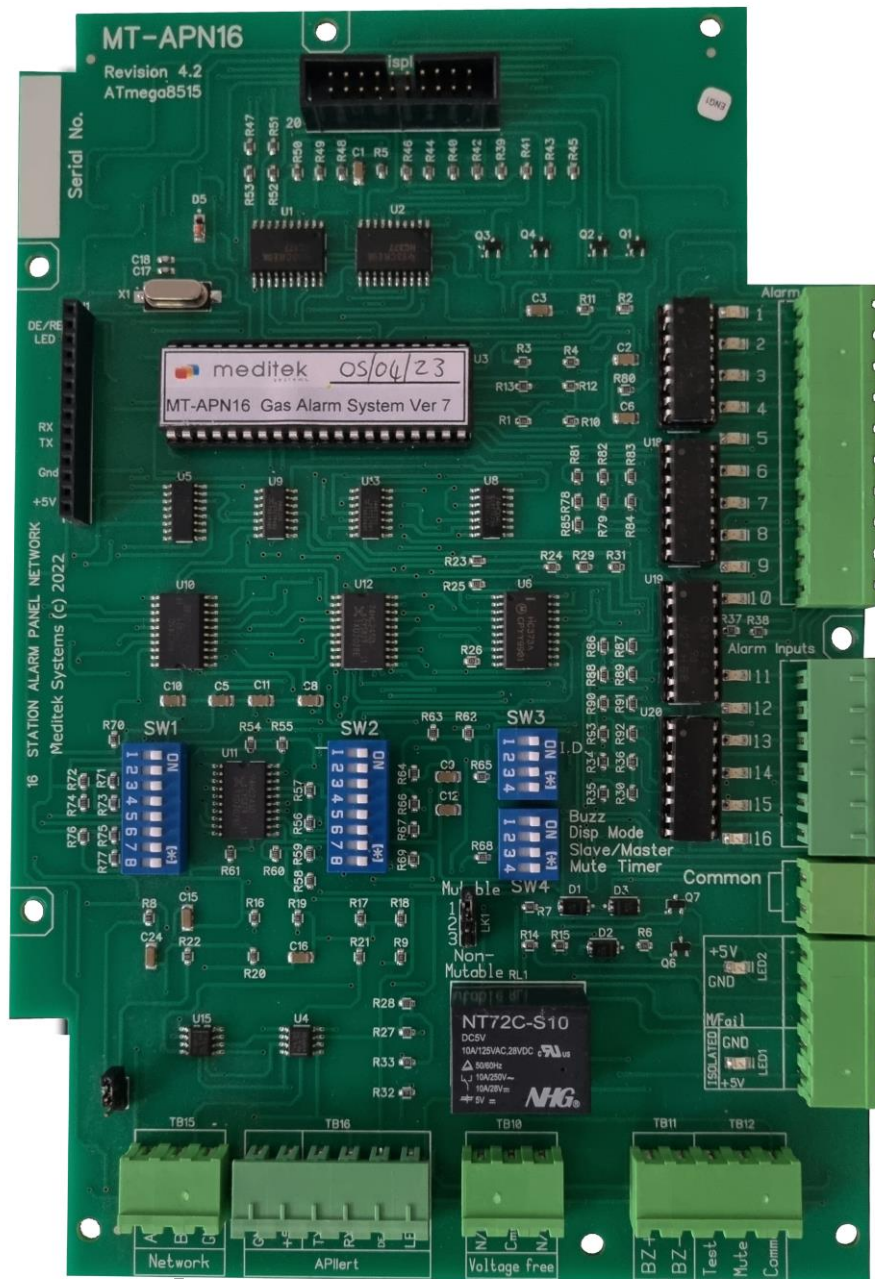
- 1 - BUZZER ON / OFF
- 2 - ON :Normal & Fault LEDs / OFF - Fault LEDs on
- 3 - OFF (Slave)
- 4 - MUTE TIME (15 / 30 Min)

MT-APN16 Slave Panel Connections	
MT-APN16 ALARM NETWORK	28 / 06 / 2001



SLAVE WIRING CONNECTIONS

Power & Network Connections

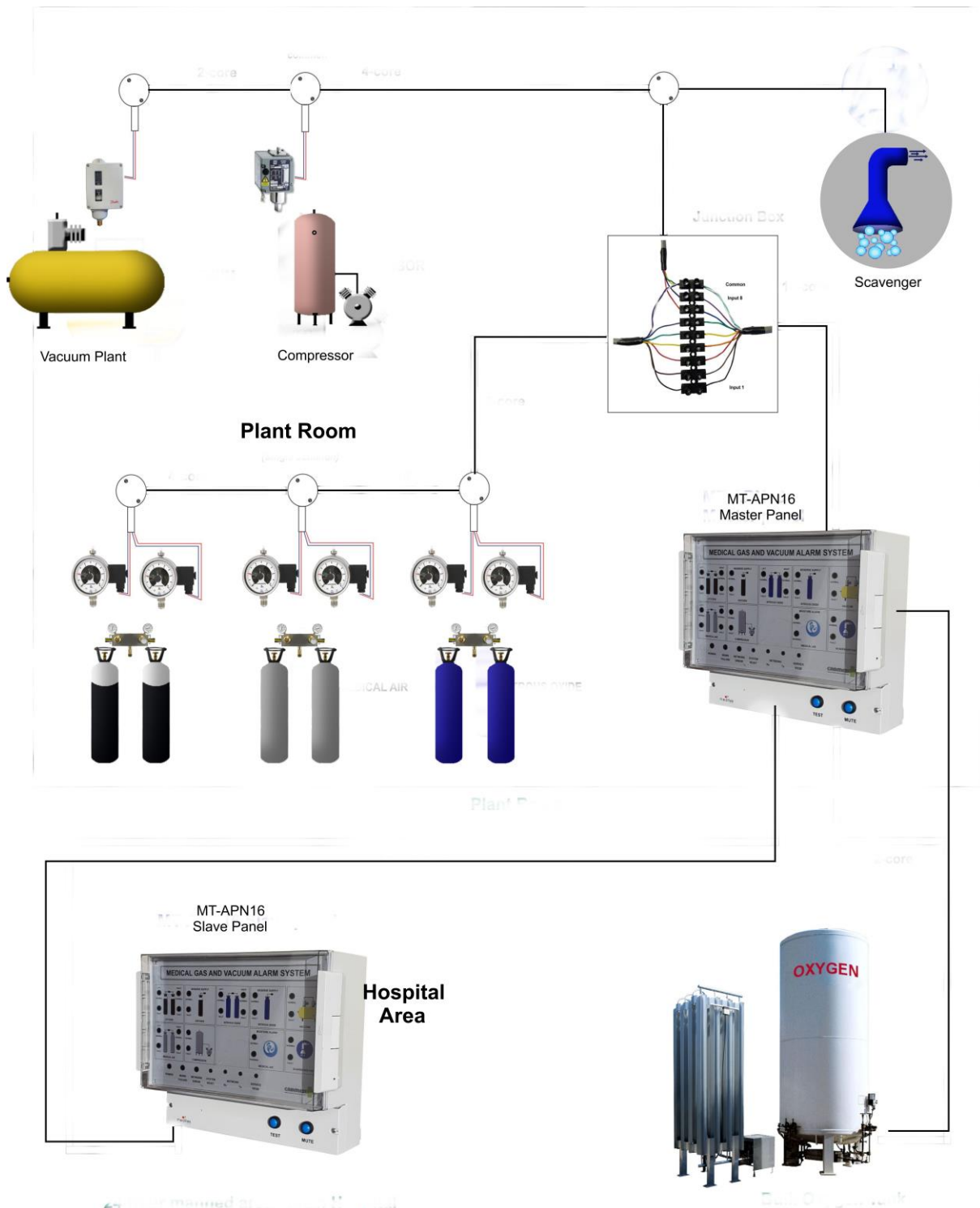


5V+ a (RED)
 Gnd a (BLACK)
 Mains Fail (YELLOW)
 Gnd b (GREY)
 5V+ b (ORANGE)

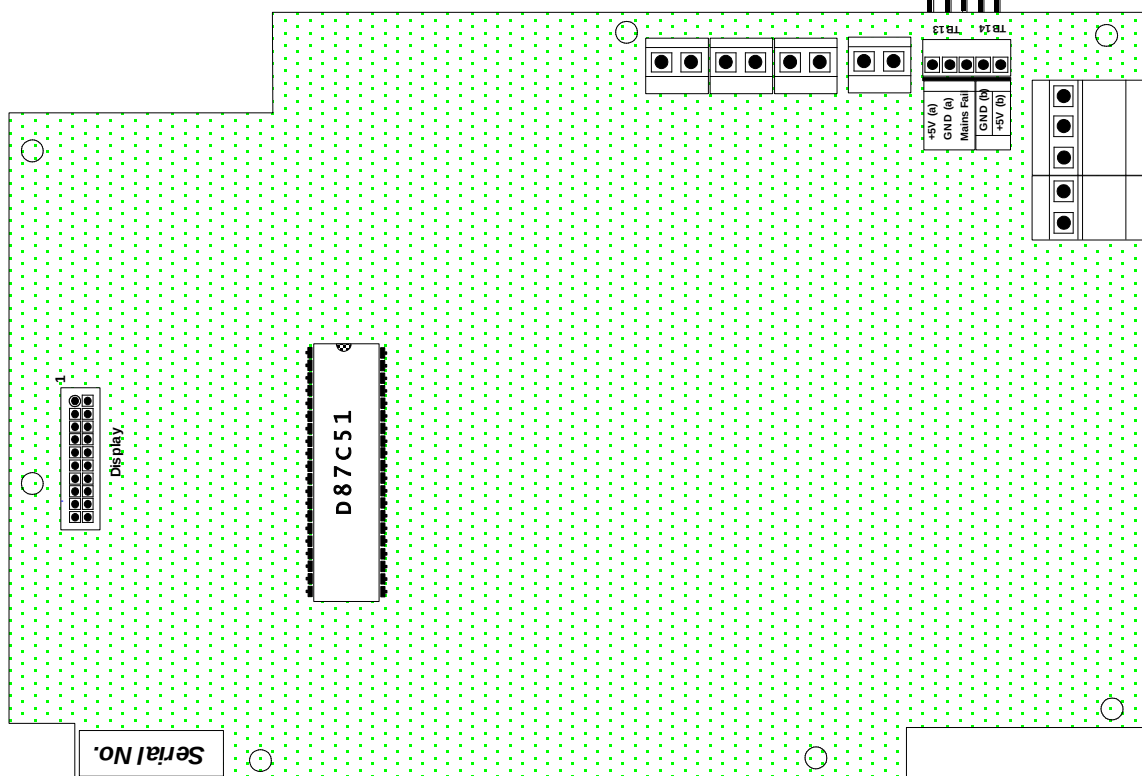


2 core Mylar screen cable to connect to Master panel.
 (Network communications)

SCHEMATIC DIAGRAM

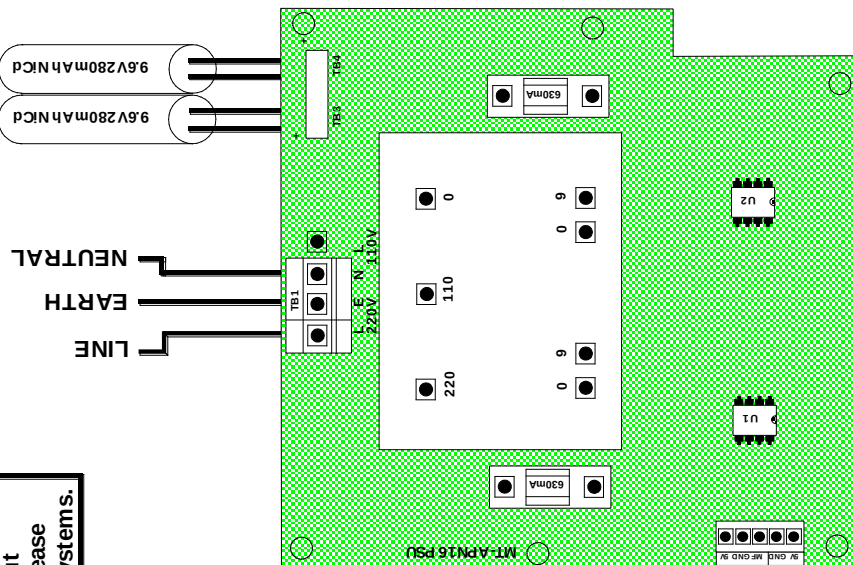


MT-APN16 Power Connections	28 / 06 / 2001
MT-APN16 ALARM NETWORK	



220V ac

For alternative power supply input configurations, please contact Meditek Systems.



SPECIFICATIONS



POWER SUPPLY

- 110/220 Volt ac supply with max 20% tolerance.
- Surge suppressers- 275V.
- Dual 9 Volt ac/12 Volt DC 500mA input (optional).
- Dual 9.6V 280mAh Ni-Cad standby batteries (optional).
- Dual 5V DC 400mA outputs.
- Fuses 22mm 630mA glass cartridge.

INPUTS

- 16 inputs.
- Each input is optically isolated.
- Each input requires a voltage-free contact.
- Inputs can be individually configured for Normally Open or Normally Closed operation.
- One common for all inputs.
- Maximum input lead length of 30m.

OUTPUT RELAY

- Normally Open and Normally Closed contacts.
- Voltage-free contacts.
- Contact ratings: 1.5A at 220V ac.
3A at 24V DC/110V ac.

COMMUNICATIONS

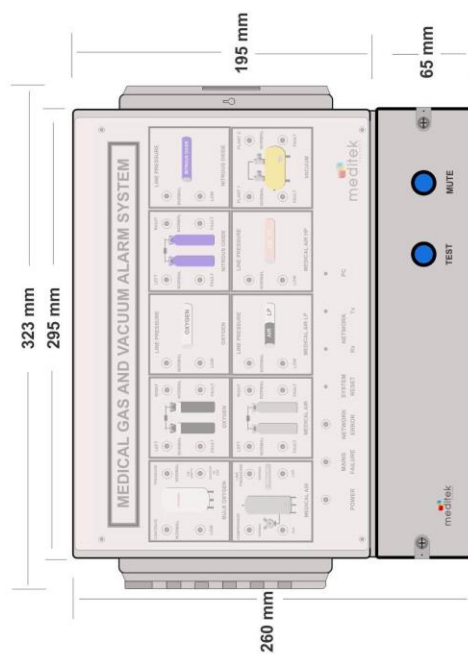
ALARM NETWORK

Interface: Half Duplex RS485.
Speed: 9600 Baud.
Distance: 1Km.
Cable: 2-core 0.22 mylar screen.

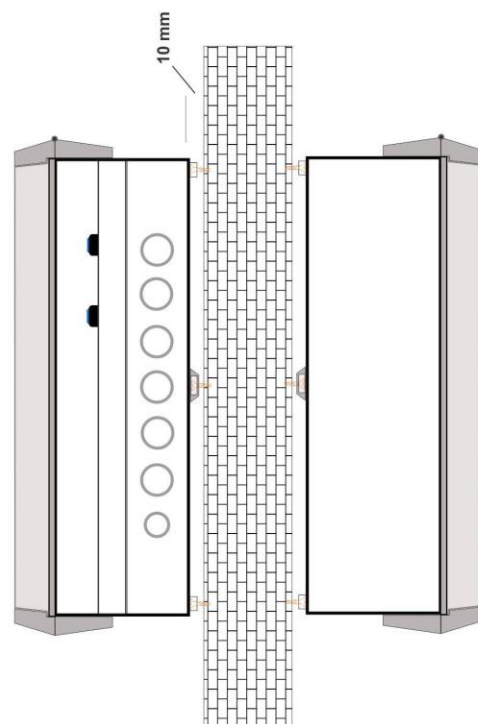
PC LINK (TRANSMIT ONLY INTERFACE)

	<u>RS232</u>	<u>RS485</u>
Speed:	9600 Baud.	9600 Baud.
Distance:	30m.	1Km
Cable:	2-core 0.22 mylar screen.	2-core 0.22 mylar screen.
Connector:	9-Way or 25-Way D- Type female.	RS485-PC Interface required

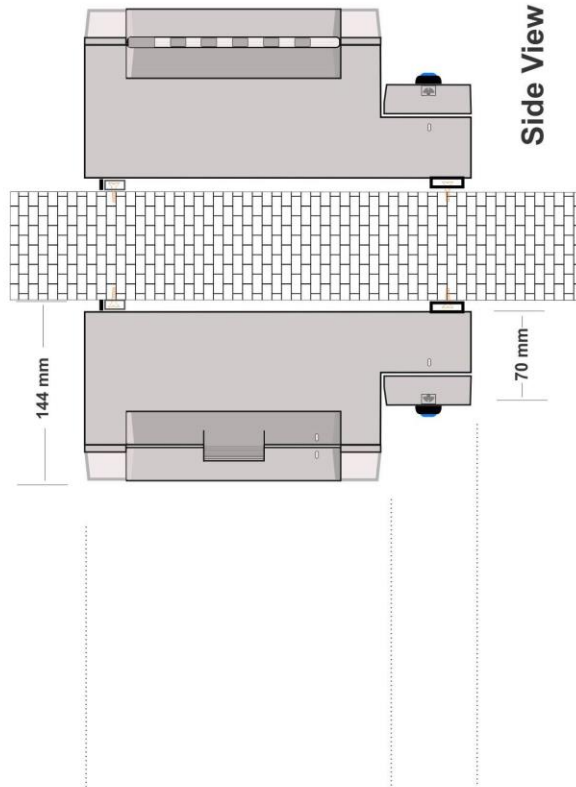
FrontView



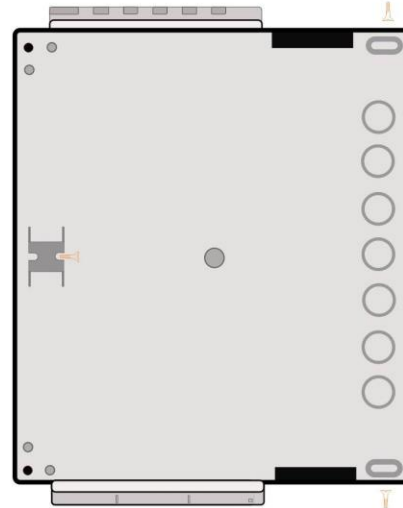
Bottom



Top



Side View



Rear View

MEDICAL GAS AND VACUUM ALARM SYSTEM

BULK OXYGEN

CONTENTS: NORMAL, LOW

PRESSURE: NORMAL, V.E., EMPTY, BACKUP IN USE

OXYGEN

LEFT: NORMAL, FAULT

RIGHT: NORMAL, FAULT

LINE PRESSURE: NORMAL, LOW

NITROUS OXIDE

LEFT: NORMAL, FAULT

RIGHT: NORMAL, FAULT

LINE PRESSURE: NORMAL, LOW

VACUUM

PLANT 1: NORMAL, FAULT

PLANT 2: NORMAL, FAULT

MEDICAL AIR

LEFT: NORMAL, FAULT

RIGHT: NORMAL, FAULT

LINE PRESSURE: NORMAL, LOW

MEDICAL AIR LP

LINE PRESSURE: NORMAL, LOW

MEDICAL AIR HP

LINE PRESSURE: NORMAL, LOW

AIR FILTER

NORMAL, LOW

POWER

POWER, FAILURE

MAINS

MAINS, FAILURE

NETWORK

NETWORK, ERROR

SYSTEM

SYSTEM, RESET

PC

Rx, Tx

MUTE

TEST

meditek

POWER	Power LED - Indicates Panel is ON.
MAINS FAILURE	220V ac Main Supply has Failed.
NETWORK ERROR	Problem has occurred with network communications between panels.
SYSTEM RESET	Microprocessor has Reset after a problem caused it to 'Hang-Up'
NETWORK Rx Tx	Panel is Transmitting (Tx) and / or Receiving (Rx) data on the network.
PC Tx	Panel is Transmitting (Tx) data to a Computer (PC) if connected.
TEST	Press to check all lights (LED's) & buzzer.
MUTE	Mute alarm buzz. Remind beep every 30 min.

MT-APN16 Front Panel Layout & description	
MT-APN16 ALARM NETWORK	08/06/2004

SWITCH EQUIPMENT

PM11 Pressure Switch
(1..10 bar)
NC contacts



F4 Pressure Switch
(1..12 bar) / (20..200 bar)
NO/NC contacts



WF41/M3 Vacuum Switch
(0 .. -0.8 bar)
NC/NC contacts



MTSA1 .. MTSA6V
Switch Assemblies



These switch assemblies are manufactured using Ranco LP and Danfos RT121 Vacuum switches.

Assemblies are made to order and range from single pressure switch to a 6 positive pressure and a single vacuum switch. All include the PSU for the alarm panel in a wiring enclosure, complete with a 20m alarm cable.

They are mounted on a galvanised cable tray for easy mounting in the roof space close the alarm panel.

TROUBLESHOOTING

The MT-APN16 Alarm System contains no user serviceable components. All repairs and maintenance must be carried out by qualified, Meditek Systems' appointed personnel. Failure to comply may render any warranty null and void.

All panels are factory set and configured prior to installation. Changing these DIP switch settings may cause the entire alarm network to malfunction. This configuration is only to be done by qualified personnel.

Problem	Cause	Solution
Panel dead	No power or PSU failure.	Check 230Vac supply. Replace PSU.
Panel powered, but unresponsive	Microprocessor has hung-up or PSU failure.	Power the panel down, leave for 1 minute & repower. Replace PSU.
Slave panel displaying "Comms" Error	No Signal from Master panel or network comms cable damaged.	Check Master panel operation or search for cable damage.
Master panel displaying "Comms" error	Incorrect configuration or faulty motherboard.	Check DIP switch configuration or replace motherboard..
Panel in "false" alarm	Faulty switch operation or switch cable damage.	Confirm correct corresponding switch operation and check for cable damage.
Panel displays random incorrect LED	Facia cable incorrect/damaged or faulty display driver circuit.	Check facia ribbon cable orientation or replace motherboard.
Alarm condition with audio, but without LED indication.	Faulty LED or facia PCB or Ribbon cable incorrect or damaged.	Check facia ribbon cable or LED or replace facia PCB.
Master in alarm condition, but Slave panel is unresponsive.	Slave panel incorrectly configured.	Set DIP switches on Slave panel for Slave operation
Service is in alarm condition, without response from panel.	Broken or damaged switch cable or misconfigured Master DIP switches. (Input DIP sw)	Set Master panel DIP switches to suit NO/NC switch type. (SW1 & SW2)
Panel indicated reversed alarm condition.	Misconfigured Master DIP switch	Set Master panel DIP switches to suit NO/NC switch type. (SW1 & SW2)

Please refer any other errors to the relevant service department or contact gas@mediteksystems.co.za for assistance.

WARRANTY

Limited Warranty Statement

Meditek Systems warrants its products to be free from defects in material and workmanship under normal use for a period of twelve (12) months from the date of purchase. If the warranted products are returned during this period, Meditek Systems will repair or replace (at its option) without charge those items found to be defective. Any replacement or repairs parts are warranted for the remainder of the original warranty or ninety (90) days, whichever is longer. The original purchaser must promptly notify Meditek Systems in writing during the warranty period, of the defect in material or workmanship. Returned goods must be accompanied by a copy of the original invoice or proof of purchase. Prior authorization is required before returning the product as Meditek Systems will not accept any shipment for which prior authorized has not first been obtained. This warranty does not cover damage incurred in shipping or handling, problems that result from external causes such as accident, abuse, misuse or problems with electrical power failures or other damage caused by:

- Peripherals or unauthorized alterations or modifications.
- Servicing not authorized by Meditek Systems.
- Usage that is not in accordance with product instructions
- Failure to provide a suitable installation environment for the products
- Improper maintenance or failure to perform regular preventative maintenance

MEDITEK SYSTEMS DOES NOT ACCEPT LIABILITY BEYOND THE REMEDIES PROVIDED FOR IN THIS LIMITED WARRANTY OR FOR ANY SPECIAL, INDIRECT, CONSEQUENTIAL OR INCIDENTAL DAMAGES, INCLUDING WITHOUT LIMITATION , ANY LIABILITY FOR THIRD PARTY CLAIMS AGAINST YOU FOR DAMAGE. MEDITEK SYSTEMS 'S MAXIMUM LIABILITY WILL BE NO MORE THAN THE AMOUNT YOU PAID FOR THE PRODUCT THAT IS THE SUBJECT OF THE CLAIM.

Meditek Systems will not be responsible for any custom fees, taxes, freight, travel, replacement charges or VAT that may be due.

We strongly recommend that your alarm systems be tested and maintained on a regular basis.

Warning: Dealers, installers and/ or other selling, distributing Meditek Systems product (s) are not authorized to modify this warranty or make any additional warranties.

Meditek Systems may change the terms of its limited warranty, without notice, as its discretion.

Limitations of Alarm Systems: It must be understood that while your Meditek Systems product is highly advanced and sophisticated, it does not offer any guaranteed protection in case of emergency. This is due to a number of reasons, including by not limited to inadequate or improper installation and positioning, switch or sensor limitations, power limitations and network functionality. As a result, Meditek Systems does not represent that the alarm system will prevent personal injury or property, or in all cases provide adequate warning or protection.