Analogue Addressable
Fire Alarm Repeater Panel

Alarm System Limitations

An automatic fire alarm system–typically made up of smoke detectors, heat detectors, manual Call Points, audible warning devices, and a fire alarm control with remote notification capability–can provide early warning of a developing fire. Such a system, however, does not assure protection against property damage or loss of life resulting from a fire. The Manufacturer recommends that smoke and/or heat detectors be located throughout a protected premise following the recommendations of the current edition of the National Fire Protection Association Standard 72 (NFPA 72), manufacturer's recommendations, State and local codes, and the recommendations contained in the Guide for Proper Use of System Smoke Detectors, which is made available at no charge to all installing dealers. A study by the Federal Emergency Management Agency (an agency of the United States government) indicated that smoke detectors may not go off in as many as 35% of all fires. While fire alarm systems are designed to provide early warning against fire, they do not guarantee warning or protection against fire. A fire alarm system may not provide timely or adequate warning, or simply may not function, for a variety of reasons:

Smoke detectors may not sense fire where smoke cannot reach the detectors such as in chimneys, in or behind walls, on roofs, or on the other side of closed doors. Smoke detectors also may not sense a fire on another level or floor of a building. A second-floor detector, for example, may not sense a first-floor or basement fire.

Particles of combustion or "smoke" from a developing fire may not reach the sensing chambers of smoke detectors because:

- Barriers such as closed or partially closed doors, walls, or chimneys may inhibit particle or smoke flow.
- Smoke particles may become "cold," stratify, and not reach the celing or upper walls where detectors are located.
- Smoke particles may be blown away from detectors by air outlets.
- Smoke particles may be drawn into air returns before reaching the detectors.

The amount of "smoke" present may be insufficient to alarm smoke detectors. Smoke detectors are designed to alarm at various levels of smoke density. If such density levels are not created by a developing fire at the location of detectors, the detectors will not go into alarm.

Smoke detectors, even when working properly, have sensing limitations. Detectors that have photoelectronic sensing chambers tend to detect smoldering fires better than flaming fires, which have little visible smoke. Detectors that have ionizing-type sensing chambers tend to detect fast-flaming fires better than smoldering fires. Because fires develop in different ways and are often unpredictable in their growth, neither type of detector is necessarily best and a given type of detector may not provide adequate warning of a fire.

Smoke detectors cannot be expected to provide adequate warning of fires caused by arson, children playing with matches (especially in bedrooms), smoking in bed, and violent explosions (caused by escaping gas, improper storage of flammable materials, etc.).

While a fire alarm system may lower insurance rates, it is not a substitute for fire insurance!

Heat detectors do not sense particles of combustion and alarm only when heat on their sensors increases at a predetermined rate or reaches a predetermined level. Rate-of-rise heat detectors may be subject to reduced sensitivity over time. For this reason, the rate-of-rise feature of each detector should be tested at least once per year by a qualified fire protection specialist. *Heat detectors are designed to protect property, not life.*

IMPORTANT! *Smoke detectors must be installed in the same room as the control panel and in rooms used by the system for the connection of alarm transmission wiring, communications, signaling, and/or power.* If detectors are not so located, a developing fire may damage the alarm system, crippling its ability to report a fire.

Audible warning devices such as bells may not alert people if these devices are located on the other side of closed or partly open doors or are located on another floor of a building. Any warning device may fail to alert people with a disability or those who have recently consumed drugs, alcohol or medication.

Please note that:

- Strobes can, under certain circumstances, cause seizures in people with conditions such as epilepsy.
- Studies have shown that certain people, even when they hear a fire alarm signal, do not respond or comprehend the meaning of the signal. It is the property owner's responsibility to conduct fire drills and other training exercise to make people aware of fire alarm signals and instruct them on the proper reaction to alarm signals.
- In rare instances, the sounding of a warning device can cause temporary or permanent hearing loss.

A fire alarm system will not operate without any electrical power. If AC power fails, the system will operate from standby batteries only for a specified time and only if the batteries have been properly maintained and replaced regularly.

Equipment used in the system may not be technically compatible with the control. It is essential to use only equipment listed for service with your control panel.

The most common cause of fire alarm malfunction is inadequate maintenance. To keep the entire fire alarm system in excellent working order, ongoing maintenance is

required per the manufacturer's recommendations, and UL and NFPA standards. At a minimum, the requirements of NFPA 72 shall be followed. Environments with large amounts of dust, dirt or high air velocity require more frequent maintenance. A maintenance agreement should be arranged through the local manufacturer's representative. Maintenance should be scheduled monthly or as required by National and/or local fire codes and should be performed by authorized professional fire alarm installers only. Adequate written records of all inspections should be kept.

WARNING – Several different sources of power can be connected to the fire alarm control panel. Disconnect all sources of power before servicing. Control unit and associated equipment may be damaged by removing and / or inserting cards, modules, or interconnecting cables while the unit is energized. Do not attempt to install, service, or operate this unit this manual is read and under stood.

CAUTION – System Reacceptance Test after software changes. To ensure proper system operation, this product must be tested in accordance with NFPA 72 after any programming operation or change in site-specific software. Re-acceptance testing is required after any change, addition or deletion of the system components or after any modification, repair or adjustment to system hardware or wiring.
All components, circuits, system operations, or software functions known to be affected by a change must be 100% tested. In addition, to ensure that other operations are not inadvertently affected, at least 10% of initiating device that are not directly affected by the change, upto maximum of 50 devices, must also be tested and proper system operation verified.

This system meets NFPA requirements for indoor dry operation at 0-49° C/32-120° F and at a relative humidity of 93 ±2% RH (non-condensing) at 32 ±2° C/90 ±3° F. However, the useful life of the system's standby batteries and the electronic components may be adversely affected by extreme temperature ranges and humidity. Therefore, it is recommended that this system and all peripherals be installed in an environment with a nominal room temperature of 15-27° C/60-80° F.

Verify that wire sizes are adequate for all initiating and indicating device loops. Refer to manual Specifications section for maximum allowable I.R. drop from the specified device voltage.

Like all solid state electronic devices, this system may operate erratically or can be damaged when subjected to lightning-induced transients. Although no system is completely immune from lightning transients and interferences,
proper grounding will reduce susceptibility. *Overhead or outside aerial wiring is not recommended, due to an increased susceptibility to nearby lightning strikes.* Consult with the Technical Services Department if any problems are anticipated or encountered.

Disconnect AC power and batteries prior to removing or inserting circuit boards. Failure to do so can damage circuits.

Remove all electronic assemblies prior to any drilling, filing, reaming, or punching of the enclosure. When possible, make all cable entries from the sides or rear. Before making modifications, verify that they will not interfere with battery, transformer, and printed circuit board location.

Do not tighten screw terminals more than 9 in-lbs.Over-tightening may damage threads, resulting in reduced terminal contact pressure and difficulty with screw terminal removal.

This system contains static-sensitive components.
Always ground yourself with a proper wrist strap before handling any circuits so that static charges are removed from the body. Use static-suppressive packaging to protect electronic assemblies removed from the unit.

Follow the instructions in the installation, operating, and programming manuals. These instructions must be followed to avoid damage to the control panel and associated equipment. FACP operation and reliability depend upon proper installation by authorized personnel.

Cautions and Warnings

READ AND SAVE THESE INSTRUCTIONS. Follow the instructions in this installation manual. These instructions must be followed to avoid damage to this product and associated equipment. Product operation and reliability depends upon proper installation.

DO NOT INSTALL ANY PRODUCT THAT APPEARS DAMAGED. Upon unpacking your equipment, inspect the contents of the carton for shipping damage. If damage is apparent, immediately file a claim with the carrier.

ELECTRICAL HAZARD - Disconnect electrical field power when making any internal adjustments or repairs. Servicing should be performed by qualified personnel.

STATIC HAZARD - Static electricity can damage components. Therefore, handle as follows:
- Ground yourself before opening or installing components
- Prior to installation, keep components wrapped in anti-static material at all times.

RADIO FREQUENCY ENERGY - This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area may cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

SYSTEM REACCEPTANCE TEST AFTER SOFTWARE CHANGES - To ensure proper system operation, this product must be tested in accordance with NFPA72-1996, Chapter 7 after any programming operation or change in site-specific software. Reacceptance testing is required after any change, addition or deletion of system components, or after any modification, repair or adjustment to system hardware or wiring.

All components, circuits, system operations, or software functions known to be affected by a change must be 100% tested. In addition, to ensure that other operations are not inadvertently affected, at least 10% of initiating devices that are not directly affected by the change, up to a maximum of 50 devices, must also be tested and proper system operation verified.

Table of Contents

Chapter 1: Product Description

The RE-517RP is a compact, cost effective, intelligent addressable repeater panel has an extensive list of powerful features. The power supply with separate metal cabinet and all other control and indicating boards housed in a metal cabinet, providing a complete fire control system for most applications. The panel has maximum capable of showing all the information of all the panels in the network.

1.1   Features.

- ➢ 32 bit processor Arm Cortex M3.
- ➢ 160 (40X4) character LCD display.
- ➢ Real Time Clock.
- ➢ 2000 events log.

Network options:
- ➢ RS 485 Communication for Network/Repeater.
- ➢ USB 2.0 Interface for PC Connectivity.
- ➢ GSM Module (Optional).
- ➢ Printer Interface Module (Optional).
- ➢ Operates on 120 to 220V AC, 60/50 Hz.
- ➢ Battery Backup 24VDC with built in Charger.
- ➢ One programmable form C relay for Fire & Fault, supervisory.
- ➢ Extensive, built-in transient protection.

Notification appliance Circuits (NACS):
- ➢ One onboard Class B Style Y NACs.
- ➢ Programmable Auto Silence.
- ➢ Programmable Silence Inhibit.
- ➢ Programmable Synchronized, Temporal, 120 BPM, Steady output.

Programming and Software:
- ➢ Programmable trouble reminder.
- ➢ Programmable AC loss delay.
- ➢ Lamp test.
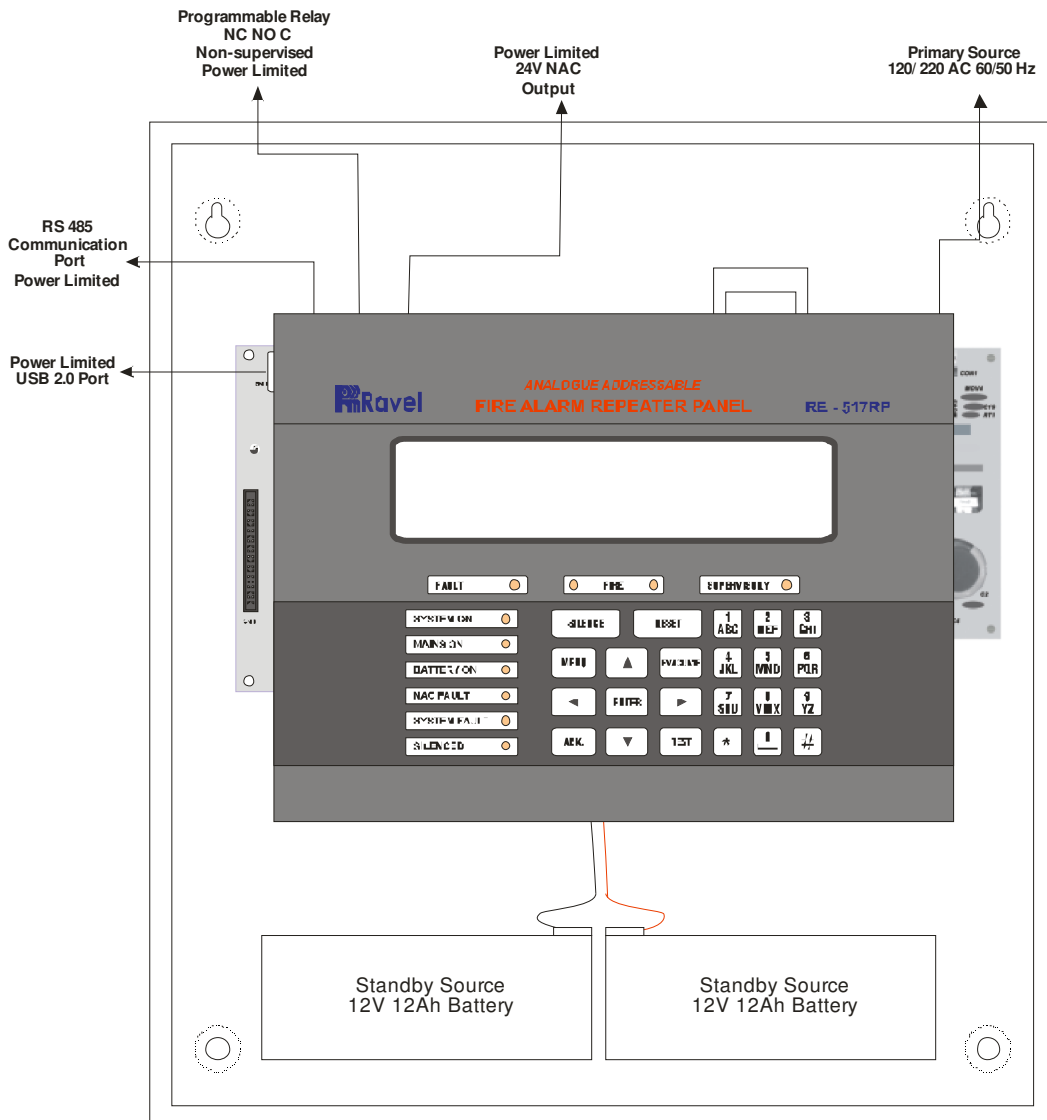
Figure - 1

1.2   Specifications.

Primary Power

120 / 220VAC + 10% -15%, 60 / 50 Hz, Amps.

Standby Power

24V D.C (2 Nos of 12v, 12Ah (Max.) Sealed Lead acid battery)

Operating Condition

Operating Temperature – 0 - 49° C/32-120° F.
Relative Humidity – 93 ± 2% RH (non-condensing) at 32 ±2° C/96 ±3° F.

Charging Circuit

Charging Voltage – 28V, ± 2% Nominal
Charging Current – 0.8A (Max.).

Notification Appliance Circuits – CN1

Class B, Style - Y wiring
Operating Nominal Voltage: 24 VDC Nominal
Current for NACs: 1Amps
Line Drop: 2.4V
End-Of-Line Resistor: 4K7, ½ watt

Common One Form – C Relay

Relay Contact Rating: 2Amps @ 30 VDC, 2Amps @ 30VAC.
Power Factor: 0.6

1.3   Control and Indications
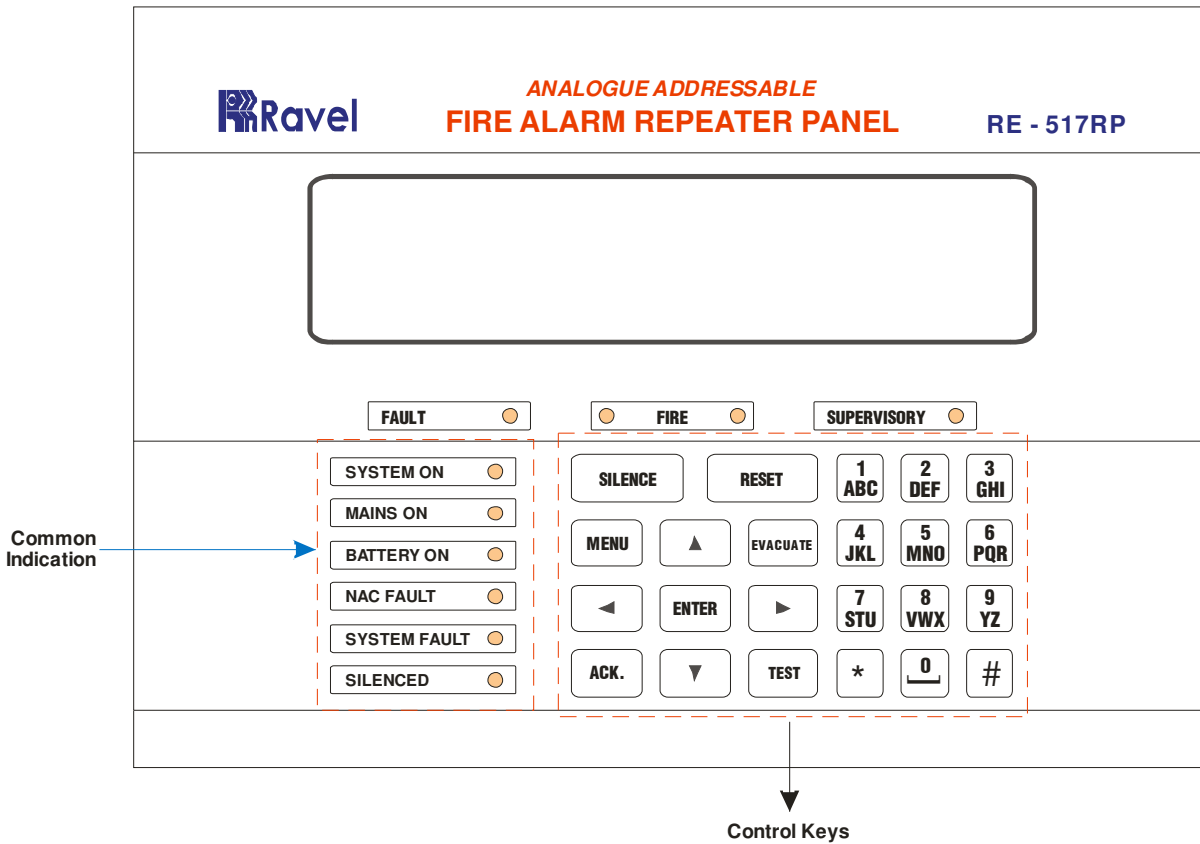
Figure – 2

1.3.1.   Controls:

ACK. Key:

- ✓ To mute local buzzer in alarm condition.
- ✓ To mute local buzzer in Supervisory or fault condition.
- ✓ User or Admin password protected.

SILENCE Key:

- ✓ To silence the external NACs in Fire Condition.
- ✓ User or Admin password protected.

RESET Key:

- ✓ To reset the Fire alarm or Latched Supervisory condition.
- ✓ User or Admin password protected.
- ✓ Possible to access only after silence in alarm condition.

EVACUATE:

- ✓ To activate External NACs Manually.
- ✓ User or Admin password protected.

CURSOR KEYS:

✓ To move the curse point in the LCD as required.

ENTER Key:

✓ To accept the programmed or edited menu, mode or value in the LCD.

MENU Key:

✓ To enter into the programming Main Menu through the LCD.

TEST Key:

✓ To enter into the Lamp Test mode.
✓ To enter into the self test for individual loop.

ALPHANUMERIC KEYS:

✓ These keys are used for entering the names etc. and numbers.
✓ '*' Key is used to go back the previous screen in programming mode.
✓ '#' is used for the Back Space / Delete the content.

1.3.2.   Indications:

1.3.2.1   LED indication

System On – Green
Mains On – Green
Battery On – Green
NAC Fault – Yellow
System Fault – Yellow
Silenced – Yellow
Fire – Red
Fault – Yellow
Supervisory – Yellow

1.3.2.2   LCD Indication

The 40 X 4 Character LCD is mainly used for the programming of the panel. It also indicates all events along with the LED indications except system on and system fault. Programmed zone wise location details can be viewed.

1.3.2.3   Local Buzzer

A piezo buzzer provides separate and distinct sounds for alarm, trouble and supervisory conditions:

- Alarm – Continuous
- Fault – pulse 0.5sec ON and 5sec OFF
- Supervisory – pulse 0.25sec ON and 0.25sec OFF

## 1.4	Circuits

The main circuit board provides system control and visual indication control and contains the system microcontroller, programming part (USB-2.0), non-volatile memory for system events storages. The main circuit board is used for the critical functions like programmable logic and timing functions and non critical functions.

The visual display board consists of a series LED's for common indication of power, alarm, fault and supervisory. The display board has 40 X 4 characters LCD, which describes for the system information with real time clock and it helps the user to program the system options easily. It also contains matrix touch key pad, which helps the user friendly access.

### 1.4.1	Main Circuit Board

The main circuit board controls the display board, input / output ports like RS 485 and USB 2.0. The main circuit board contains one relay output and one NAC output.

### 1.4.2	RS 485 IO Port

The main circuit board is having two RS 485 port one as input to get the information from the other panels and another one as output to connect next panel in network.

### 1.4.3	Output Circuit

The following outputs are available with this FACRP:
- 24VDC Battery charger up to 26 Ah max.
- 1 no. of Class B Style Y NACs, 1 Amp each.

### 1.4.4	Relay

One programmable Form-C dry contact relays are provided. This programmable relay is factory default programmed for alarm. Contacts are rated 2 amps @ 30 VDC and 2 Amps @ 30 VAC.

1.5   Components

The main circuit board contains the system CPU, other primary components wiring interface terminal outputs and RS 485 communication port for networking.
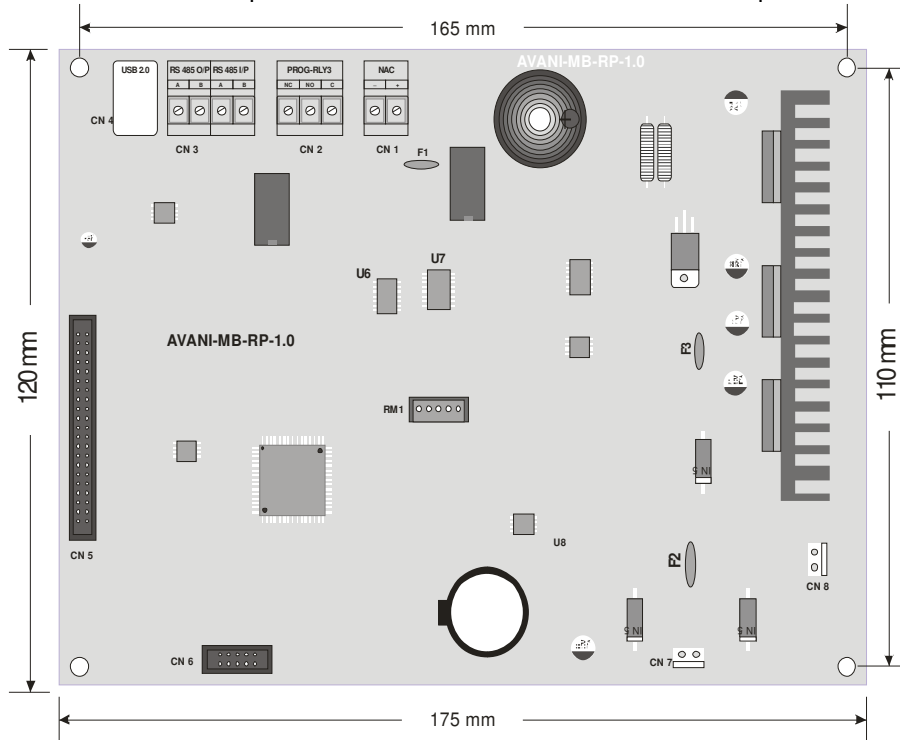
Figure - 3

The display board contains the LED display for common indications, zone group indications and touch key pad.

The power supply gives the power for the main circuit board and for outputs. It is SMPS type power supply, gives the output for 3 amps max.
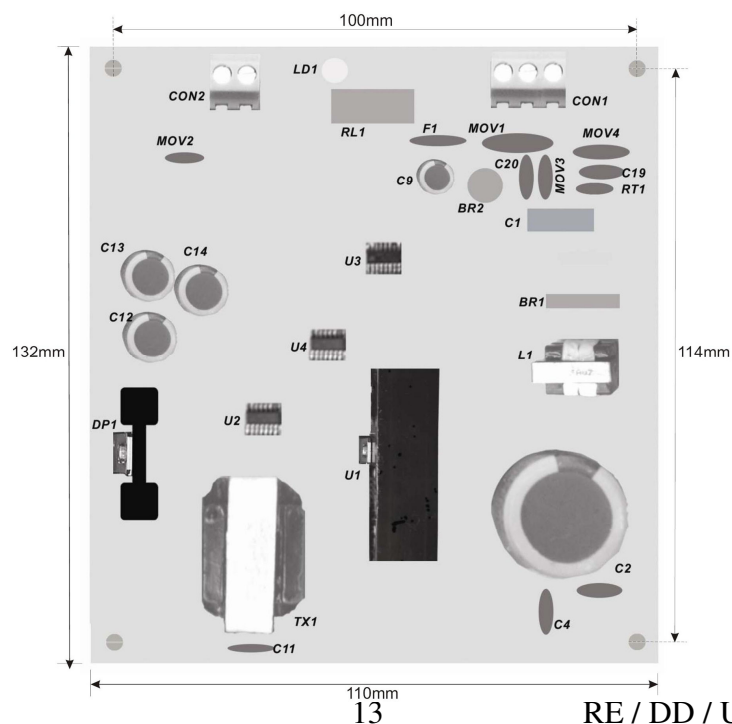
Figure - 4

1.6   Mechanical Construction

The enclosure of the Panel is constructed by 18 gauge (1.22mm) CRCA sheet with powder-coated finish. The Ø22.25mm (Ø19mm [8No's] for Indian Std.) 7 no's of knockouts are given for cable entry at the top of the cabinet. The lockable hinged door is provided to access the inside the cabinet. The panel also has sufficient space to accommodate 2 Nos. of 12v, 12Ah batteries.

Figure - 6

TOP SIDE VIEW

Knockout Ø19mm

20.00

90.00

5.00

M4 tapped hole

19.00

RIGHT SIDE VIEW

30.00

334.00

340.00

36.00

290.00

30.00

20.00

10.00

30.00

PLAN

Figure - 7

15   RE / DD / UM / 517 - RP V 1.0- 00

Non Power Limited
Cable Entry

Wire Size = 18 AWG

Display & Control
Board

(AVANI-RP-DISP-1.0)

Master Board

(AVANI-MB-RP-1.0)

CON 8

CON 2

Power Supply
Board

(RE-SMPS-4A-R1)

12v 12Ah
Sealed Lead Acid
Battery

12v 12Ah
Sealed Lead Acid
Battery
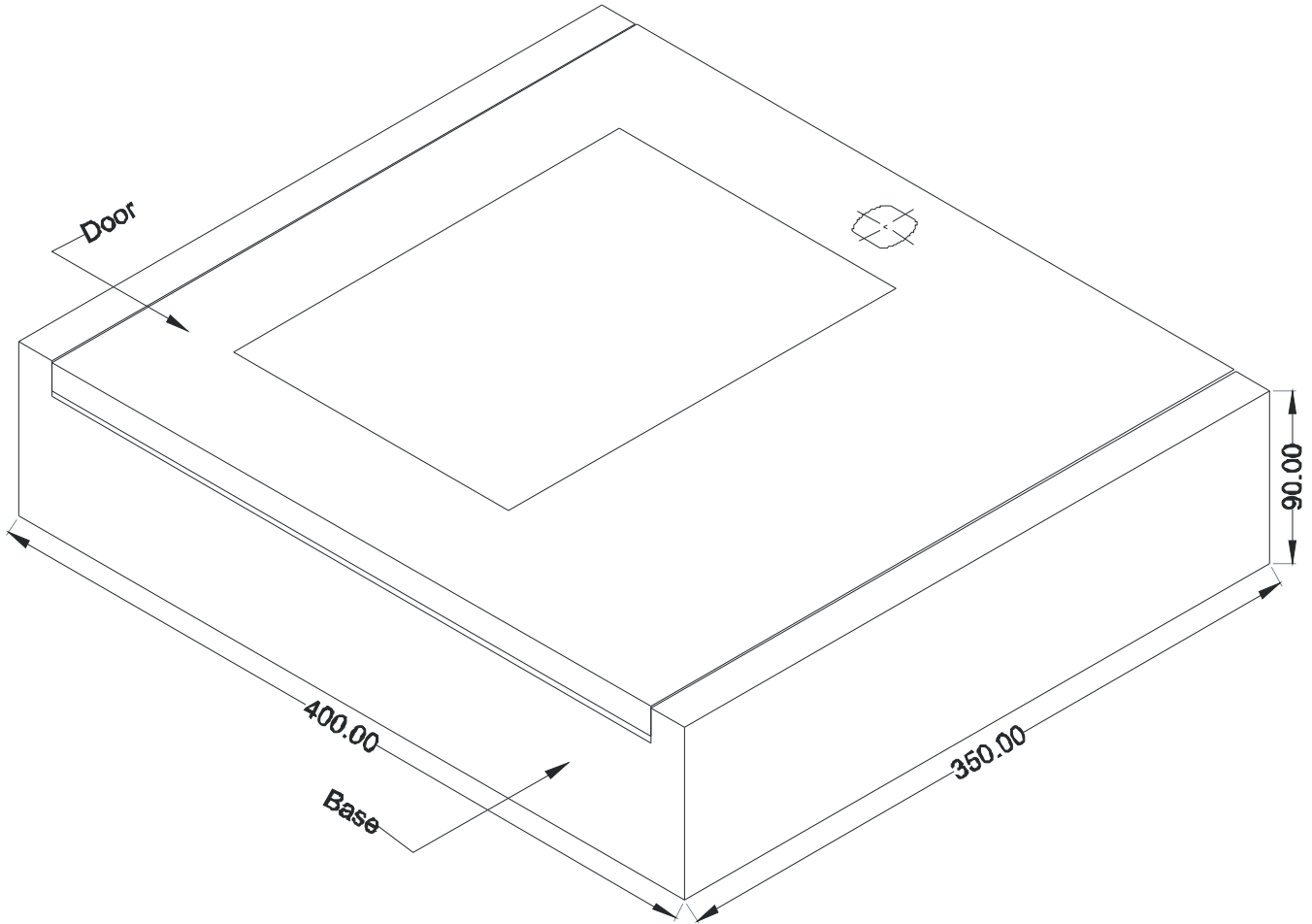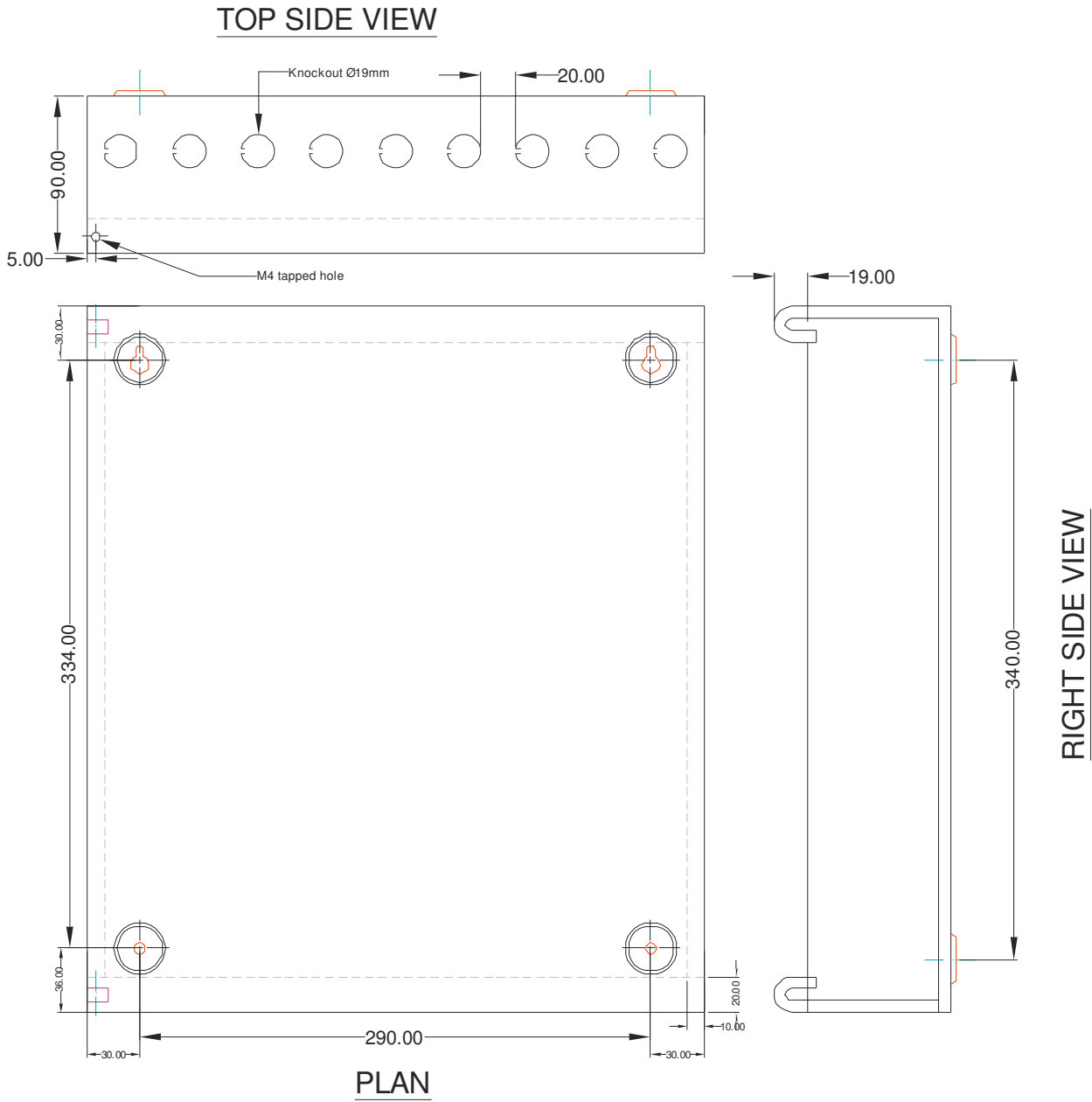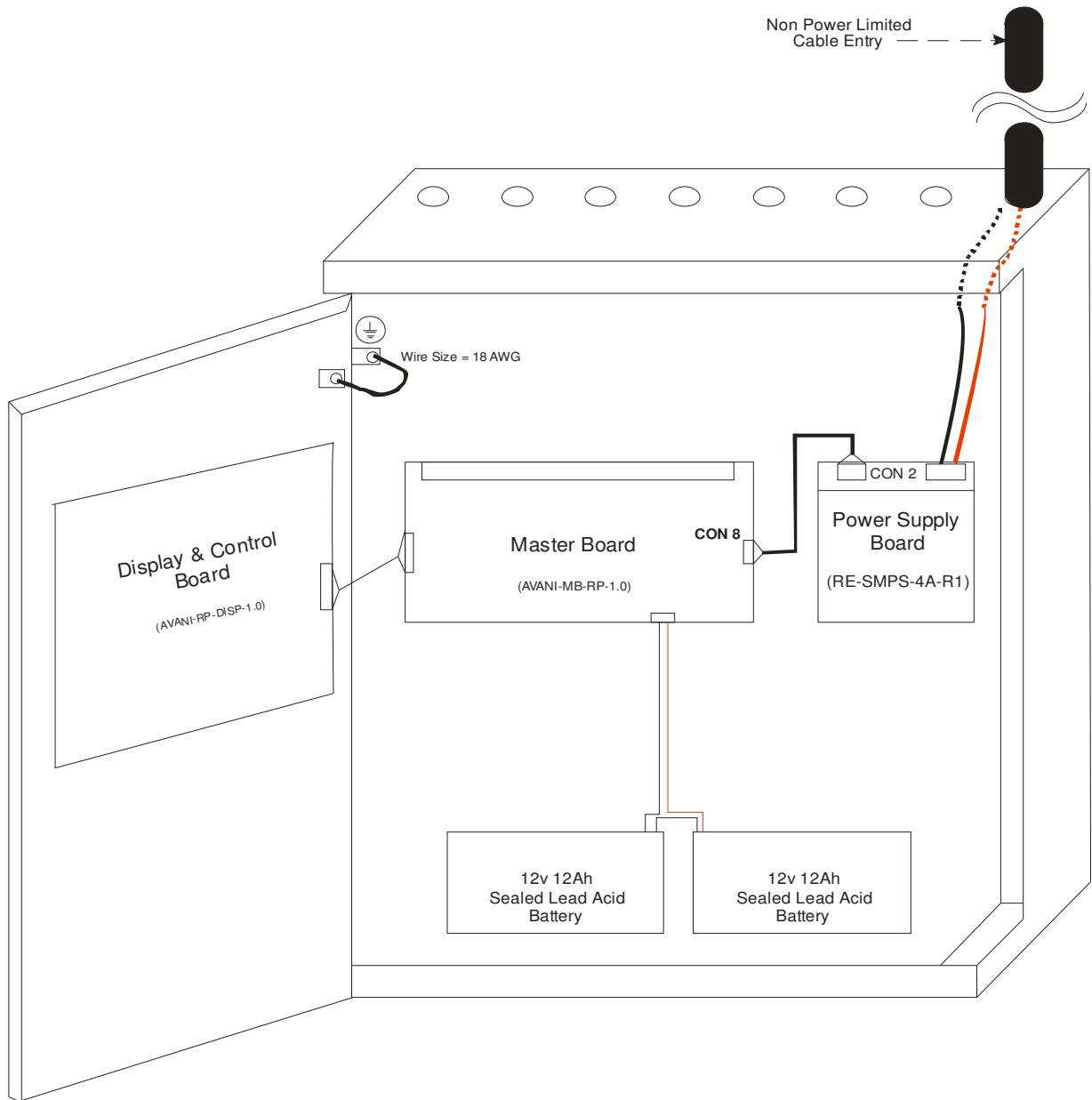
Figure – 8

Chapter 2: Installation

2.1   <u>Installation Precaution</u>

<u>Installation Precautions</u>

WARNING - *Several different sources of power can be connected to the fire alarm control panel.* Disconnect all sources of power before servicing. Control unit and associated equipment may be damaged by removing and/or inserting cards, modules, or interconnecting cables while the unit is energized. Do not attempt to install, service, or operate this unit until this manual is read and understood.

CAUTION - *System Reacceptance Test after Software Changes.* To ensure proper system operation, this product must be tested in accordance with NFPA 72 after any programming operation or change in site-specific software. Reacceptance testing is required after any change, addition or deletion of system components, or after any modification, repair or adjustment to system hardware or wiring. All components, circuits, system operations, or software functions known to be affected by a change must be 100% tested. In addition, to ensure that other operations are not inadvertently affected, at least 10% of initiating devices that are not directly affected by the change, up to a maximum of 50 devices, must also be tested and proper system operation verified.

This system meets NFPA requirements for indoor dry operation at 0-49° C/32-120° F and at a relative humidity of 93 ±2% RH (non-condensing) at 35 ±2° C/77 ±3° F. However, the useful life of the system's standby batteries and the electronic components may be adversely affected by extreme temperature ranges and humidity. Therefore, it is recommended that this system and all peripherals be installed in an environment with a nominal room temperature of 15-49° C/60-120° F.

Verify that wire sizes are adequate for all IDC's loops. Most devices cannot tolerate more than a 10% I.R. drop from the specified device voltage. *Adherence to the following will aid in problem-free installation with long-term reliability:*

Like all solid-state electronic devices, this system may operate erratically or can be damaged when subjected to lightning-induced transients. Although no system is completely immune from lightning transients and interferences, proper grounding will reduce susceptibility. *Overhead or outside aerial wiring is not recommended, due to an increased susceptibility to nearby lightning strikes.* Consult with the Technical Services Department if any problems are anticipated or encountered.

Disconnect AC power and batteries prior to removing or inserting circuit boards. Failure to do so can damage circuits.

Remove all electronic assemblies prior to any drilling, filing, reaming, or punching of the enclosure. When possible, make all cable entries from the sides or rear. Before making modifications, verify that they will not interfere with battery, transformer, and printed circuit board location.

Do not tighten screw terminals more than 1.0168 N-m. Over-tightening may damage threads, resulting in reduced terminal contact pressure and difficulty with screw terminal removal.

Though designed to last many years, system components can fail at any time. This system contains static-sensitive components. Always ground yourself with a proper wrist strap before handling any circuits so that static charges are removed from the body. Use static-suppressive packaging to protect electronic assemblies removed from the unit.

Follow the instructions in the installation, operating, and programming manuals. These instructions must be followed to avoid damage to the control panel and associated equipment. FACP operation and reliability depend upon proper installation by authorized personnel.

2.2   Panel Mounting
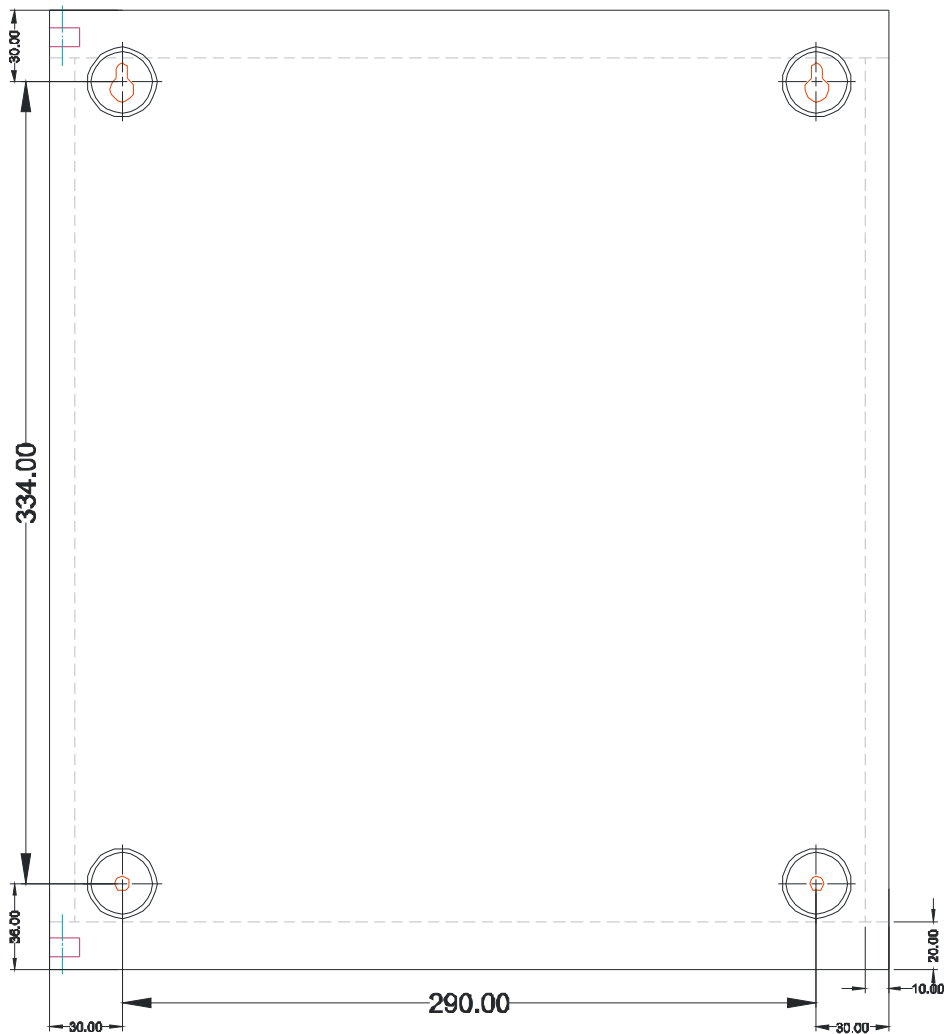
Figure – 9

Remove all the Boards before placing the panel in its mounting position. Place the panel in its mounting position and fix the panel to the wall using the slots of the four screws. Ensure the enclosure and the inner parts of the panel are given sufficient protection during installation. Fix the all boards in its position (Refer Figure 24, 25 & 26). All external cables are to be entered via the 6 numbers of Ø22.25mm and 7 Numbers of Ø19mm preformed knockouts located at top of the panel.

When the installation of all the cables has been completed, clean the interior of the enclosure ensuring all masonry debris and drilling swords are removed.

2.3   Panel Wiring

Warning: Several different sources of power can be connected to this panel. Disconnect all sources of power before servicing. The panel and associated equipment may be damaged by removing and / or inserting cards, modules or inter connecting while this unit is energized.

Primary Power source (AC) and Earth Ground Connections
AC Power connections are made inside the control panel cabinet. The Primary source for the RE-517RP is 120/220 VAC, 60/50Hz, 3 Amps. Run a pair of wires with Earth conductor from the protected premises main breaker box to connector (AC Terminal) of the power supply board. As per National Electrical Code, use 14 AWG (2.00 mm^2, 1.6mm O.D) or heavier gauge wire with 600V insulation. No other equipment may be connected to this circuit. In addition, this circuit must be provided with over current protection and may not contain any power disconnect devices. A separate Earth Ground connection must be made to ensure the proper panel operation and lighting and transient protection. Connect the Earth Ground wire (Min. 14AWG / 2.00 mm^2) to the connector CN1 of the power supply board (SMPS-4A-R1).

Standby Power Source (Batteries)
Observe polarity when connecting the battery. Connect the battery cable to connector CN7 on the Zone board (AVANI – MB – RP-1.0) using the connector and cable provided. The battery charger is current – limited and capable of recharging sealed lead acid type batteries up to 26Ah.
During alarm condition, the charger section is disconnected from the battery hence there will not be any charging at that time.

Power Supply Circuit Board (RE – SMPS – 4A – R1)
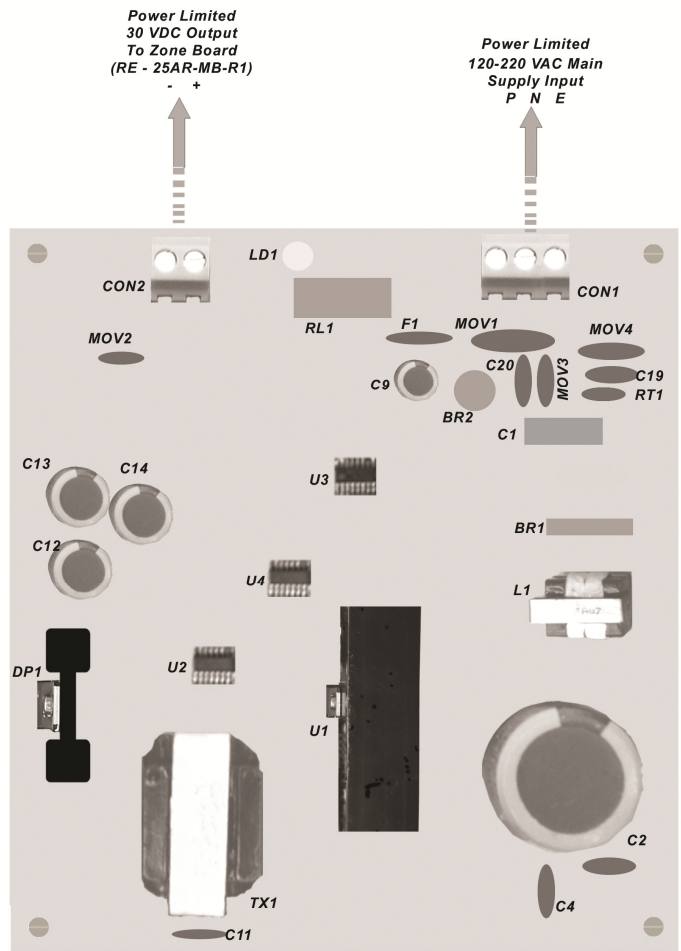
Figure – 10

Master Board (AVANI – MB – RP-1.0)
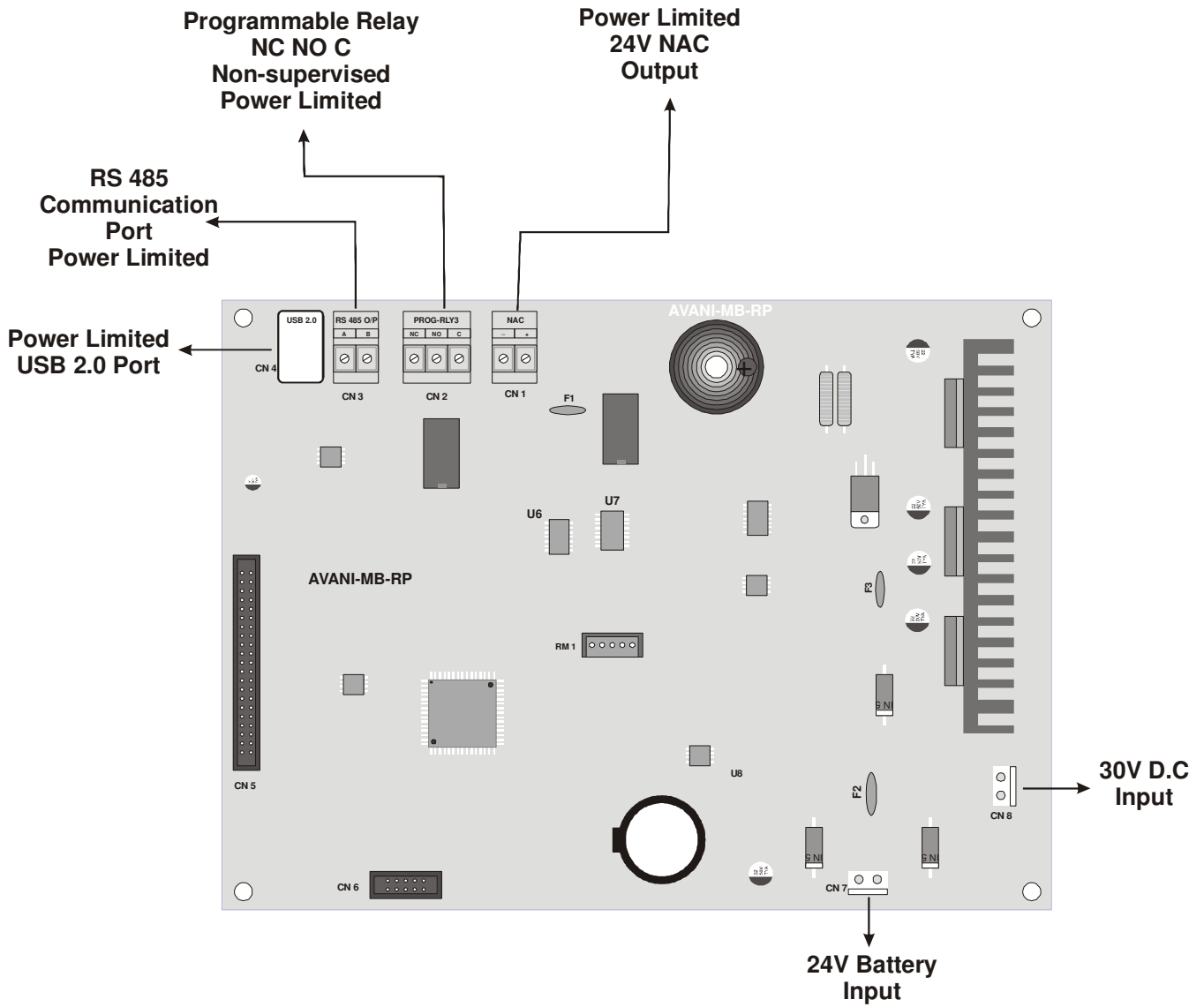
Figure – 11

Field Wiring Diagram

USB 2.0
Connector

RS 485 Output	A
	B

Programmable Potential Relay
For Fire, Fault, Supervisory Power
Limited outputs.
Contact Rating:
2.0A @ 30VDC
2.0A @ 30VAC
Power Factor: 0.6

Program. Relay	NC
	NO
	C0

Notification Appliance Circuit
Class B Style Y
End of Line - 4K7 1/2W
PN: RE4K7

NAC - 2 (1A)	−
	+

EOL
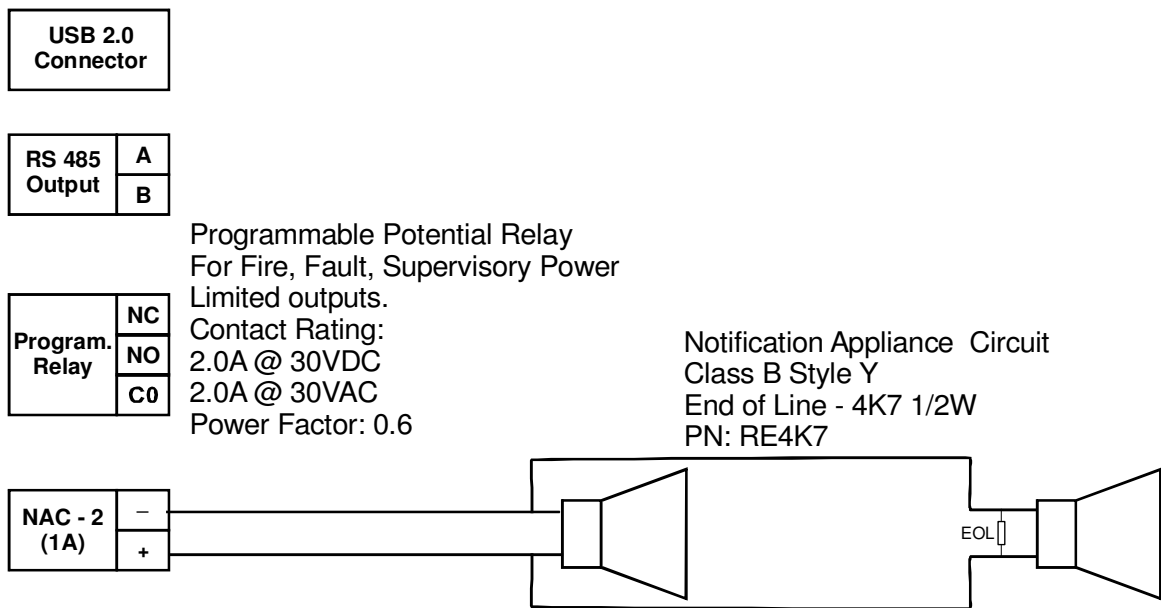
Note:
  All the field wiring circuits are supervised
  All the field wiring circuits are Power limited
except Battery.

Figure – 12

2.4   Relays

The one Form – C programmable relay is provided in this FACRP with the contact rating for 2 Amps @ 24 VDC or 1 Amps @ 120 VAC. The default options for the Programmable Relay as Fire.
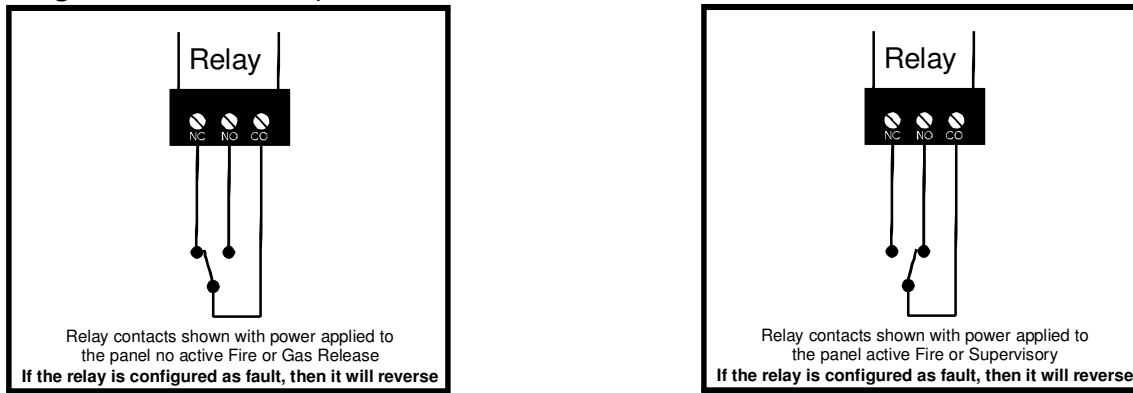
Figure - 13

Note: *The relay connections may be power limited or non – power limited, provided that 0.25" spacing is maintained between conductors of power limited and non – power limited circuits.*

2.5   NACs

The one programmable, Class B Style Y, supervised NAC is provided with the current rating of 1 Amps. This NAC (Notification Appliance Circuit) is programmable for the following options like Continuous, Synchronized, Temporal and 60 BPM.
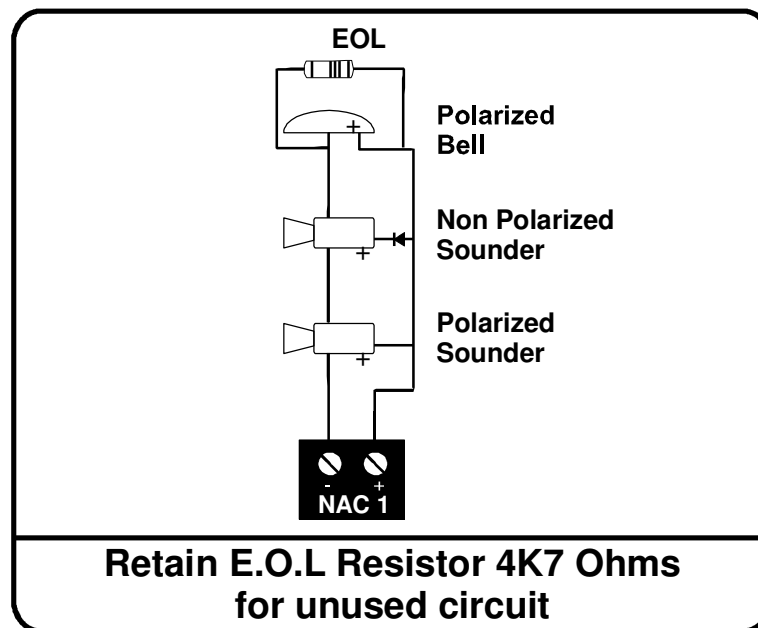
Figure – 14

2.6 UL Power-limited wiring requirements

The power limited and non-power limited circuit wiring must remain separated in the cabinet. All power limited circuit wiring must remain at least 0.25" (6.35mm) away from any other non- power limited circuit wiring and non-power limited circuit wiring must enter and exit the cabinet through different knockouts and/or conduits as shown in the figure - 8.

Chapter 3: Programming

3.1 programming Concept

Warnings: Before Programming

1. All applicable codes and standards should be considered when the programming the control unit.
2. The Control Unit continues to monitor inputs circuits and devices and acts according to the current program settings if and alarm is received wile it is being programmed.
3. Loading a new database erases the current database before loading the new database. If the new database is not loaded after the erase, the panel will not operate.
4. The Database must be completely loaded fro it to be considered valid. The program keeps track if the last database load was valid/complete or not. An invalid database load disables the panel until a valid database load is done.

3.1.1 General Comments

Programming can be accomplished using the AVANI keypad or by connecting an optional standard computer keyboard. The keyboard can be connected to the USB 2.0 connector on the control panel main circuit board. The information presented in this section refers to programming the AVANI via the onboard keypad.

3.1.2 User Programming

The AVANI is completely field programmable and requires no special software skill. While programming the AVANI, the fire protection capabilities of the control panel are enabled.

Site specific programming may be accomplished in following ways.

- Autoprogramming Feature – This is a convenient method for the quickly bringing the FACP addressable SLC devices online without the necessity of programming each device individually. Refer to "Auto Learn" on the Page 19 for a detailed description of Auto programming.
- Manual Programming or editing, using the FACP keypad or a PC keypad
- Off line programming and Editing feature allows creation and editing of site specific custom programs using a windows based computer. For programs requiring a large amount of data entry, this method may be preferred. AVANI-

RGS programming kit can be ordered for this purpose.

The system all normal screen will be displayed in a programmed system with no active alarms, troubles or supervisory, as illustrated below.

To access the programming or view the status & history, press menu key, which is shown in LCD as below.

```
DD/MM/YY        <Panel Status>        HH:MM:SS
  1.  View
  2.  Program
  3.  About                           [Main]
```
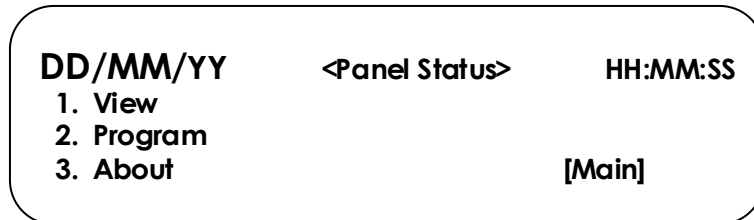
From this menu screen by pressing '1', the panel enters into status/history view mode. It allows user to view the event and program setting of the control panel. The password is not required for this feature.

From this menu screen by pressing '2', the panel enters into programming mode which only can access by the authorized persons. After pressing '2', LCD screen will be in password prompt. After pressing correct password and by pressing enter key, user can select the programming options to change it.

From this menu screen by pressing '3', the panel enters into the loop test mode. In this mode the detectors connected in the loop can check from the panel. It required admin password.

From this menu screen by pressing '4', the panel shows the about the version and revision levels.

Exit from view & Program Mode

The programmer can exit from the view / Program mode by pressing '*'key repeatedly until the "System Healthy" screen.

3.1.3   Initial Power up

Here the initial programming procedure for a new system is described. The same procedure is used for modify the programming settings in existing system.

After completing the wiring of the addressable devices to the SLC, apply power to the control panel. If the addressable devices are not programmed in the Fire Alarm Panel, the following trouble message will be displayed.

3.1.4 Programming Description

By pressing menu key, the view and program options have multiple functions or features which may be chosen. To view all of the choices, it is necessary that the programmer scroll through a number of the additional screen and cursor keys. Refer "Programming Instruction", for additional information of the various screens.

The title of the main option screen will always be displayed at bottom right of the sub-screens. To select the one of the choices in a screen, the programmer presses the keypad numerical key corresponding to the desired choice.

Note: That sub-screen may also have multiple options which require viewing more than one screen. The same process, as detailed in the previous paragraph is followed to view all options.

3.1.5 Programming Password

There is a factory set password which will access the programming screens as indicated in the following examples. From either of the screens, access to specific system and device feature or programming may be obtained. All user programming and entries are stored in the nonvolatile memory. The factory set password can be changed by user. Refer "Password Change" for additional information.

3.2   Programming Instruction

3.2.1   Menu Key Flow Diagram

MENU KEY - FLOW DIAGRAM

DEFAULT PASSWORD

USER - 1 to 5
ADMIN - 6
Installer - 9

MENU

1 VIEW

ADMIN
PASSWORD REQUIRED
(Default: 6)

2 PROGRAM

3 ABOUT

1. Suppressed Events

DD/MM/YY   <Panel Status>   HH:MM:SS
1. System

[Program]

DD/MM/YY   <Panel Status>   HH:MM:SS
Addressable Fire Alarm Control Panel
Ravel, Avani 1.0   [About]

1
DD/MM/YY   <Panel Status>   HH:MM:SS
1. PreAlarm
2. Supervisory
3. Faults

1
DD/MM/YY   <Panel Status>   HH:MM:SS
1. Settings
2. Advanced

[System]

A

2
DD/MM/YY   <Panel Status>   HH:MM:SS
1. All
2. Alarm
3. Delete

1
DD/MM/YY   <Panel Status>   HH:MM:SS
1. Date & Time
2. Caption
3. Password   [Settings]

1
DD/MM/YY   <Panel Status>   HH:MM:SS
Date : DD / MM / YY   (#.Edit)
Time : HH : MM : SS   [Date / Time]

DD/MM/YY   <Panel Status>   HH:MM:SS
Evt No: XXX/Z ZZ
Events : Event
Date: dd/mm/yy Time: hh:mm:ss   [History]

2
DD/MM/YY   <Panel Status>   HH:MM:SS
Caption :
Ravel Electronics   (#.Edit)
[Caption]

DD/MM/YY   <Panel Status>   HH:MM:SS
EVENT
[Suppressed Condition]

3
DD/MM/YY   <Panel Status>   HH:MM:SS
1. User 1   4. User 4
2. User 2   5. User 5
3. User 3   6. Admin   [Password]

DD/MM/YY   <Panel Status>   HH:MM:SS
New Password ?
[Chg User X Pass]

DD/MM/YY   <Panel Status>   HH:MM:SS
Old Password ?
[Chg User X Pass]

X = 6 - [Chg AdmPass]   X = 1 - 6

DD/MM/YY   <Panel Status>   HH:MM:SS
Re-New Password ?
[Chg User X Pass]

DD/MM/YY   <Panel Status>   HH:MM:SS
New Password Updated
[Chg User X Pass]

A

2 *Configuration Password required*

```
DD/MM/YY    <Panel Status>    HH:MM:SS

           Password?

                          [Password]
```

```
DD/MM/YY    <Panel Status>    HH:MM:SS
1. Network
2. Chg AdvPass
3. Factory Default        [Advanced]
```

1

```
1. Network Status
2. Network Sync

                  [N/W]
```

1

Use ◄► Key to go the Feature   Use ▲▼ Key to change the Options, Enabled & Disabled

```
P.No : 1  2  3  4  5  6  7  8
Stat:  E  D  D  D  D  D  D

                    [N/W PNL *]
```

2

```
Wait...
```

```
Network Synchronized
                [Net sync]
```

2

```
Same as done in User and
Admin password change
```

3

```
DD/MM/YY    <Panel Status>    HH:MM:SS
           Warning !
All Configuration Changes get lost
 ( ↵. Continue)    (#. Cancel)
```

```
Factory Default
Recovering .....
```

Main Menu

The MENU key navigates the user to view & edit system settings, Features settings, etc. It also possesses help menu for lamp test and About. By Selecting Menu key the display shows the options as like below,

```
DD/MM/YY          <Panel Status>          HH:MM:SS
  1.  View
  2.  Program
  3.  About                               [Main]
```

3.2.1.1   View

View Option can be accessible by User. By this option user can view the past history and exiting configuration, however they cannot change preserved settings. By selecting '1' when in Main menu, the system enters into View mode and shows the viewing category options as like below,
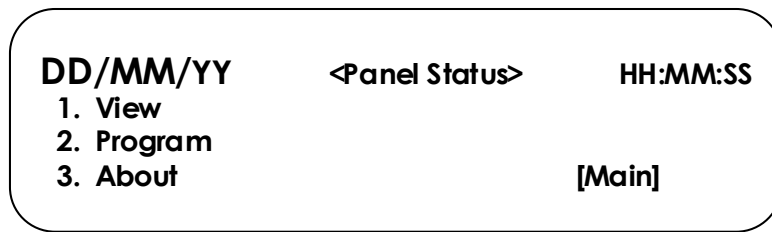
```
DD/MM/YY          <Panel Status>          HH:MM:SS
  1.  Suppressed Events


                                          [View]
```
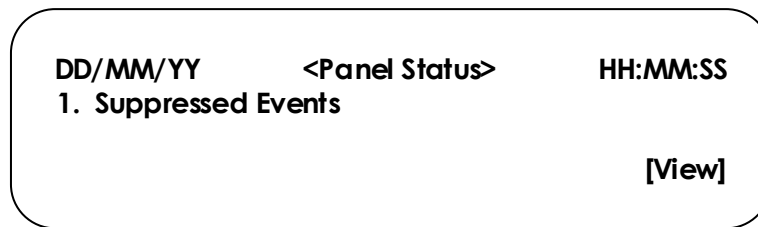
3.2.1.1.1   Suppressed Events

Suppressed Events option is used to view the suppressed events during Fire condition. The suppressed events like Prealarm, Supervisory and faults events can be viewed from this menu using corresponding number keys. By selecting '1' from view menu brings the suppressed events and shows the suppressed events category options as like below.

```
DD/MM/YY          <Panel Status>          HH:MM:SS
  1.  PreAlarm
  2.  Supervisory
  3.  Faults                     [Suppressed Events]
```
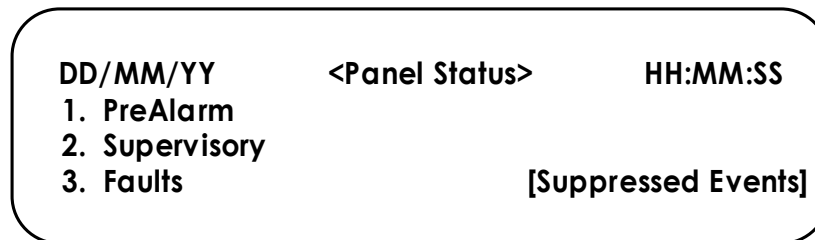
3.2.1.2   Program

By selecting the number 2 from the main menu screen, the system enters into program mode. This mode is protected by password and it requires admin password (Default – 6). In this mode, the panel loop card configuration, RTC & password settings, to alter the optional features and to reset the panel for factory setting. After entering into the view mode, screen will be as below.

```
DD/MM/YY          <Panel Status>          HH:MM:SS
1. System

                                          [program]
```
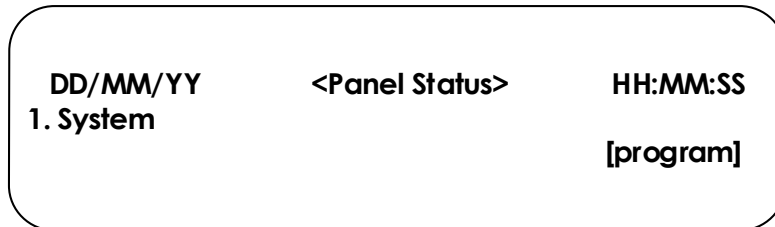
3.2.1.2.1   System

By selecting the number 1 from the program screen, the system enters into panels configuration mode. In this mode, panel settings (RTC, Caption, and Password), Advanced. After entering into this mode, screen will be as below.

```
DD/MM/YY          <Panel Status>          HH:MM:SS
1. Settings
2. Advanced

                                          [System]
```
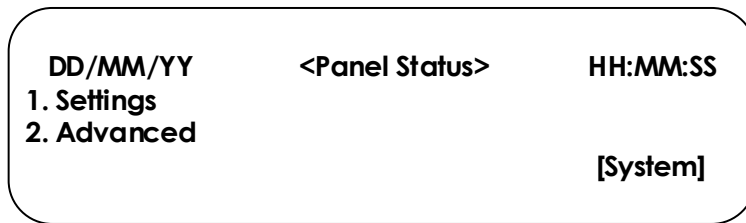
3.2.1.2.1.1   Settings

By selecting the number 1 from the System screen, the system enters into panel settings mode. In this mode, Date & Time, caption and Password are changed by entering into the corresponding menu. After entering into this mode, screen will be as below.

```
DD/MM/YY          <Panel Status>          HH:MM:SS
1. Date & Time
2. Caption
3. Password                               [Settings]
```
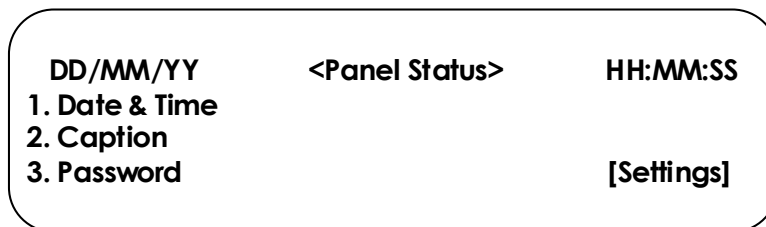
By selecting a number from the list in the system menu, respected subject relevant configuration alone displayed.

3.2.1.2.1.1.1 Date&Time

By selecting the number 1 from the setting screen, the system enters into Date & Time settings mode. In this mode, time and date settings are changed by using '#' key. After entering into this mode, screen will be as below.

```
 DD/MM/YY            <Panel Status>         HH:MM:SS

 Date :  DD/MM/YY
 Time :  HH/MM/SS                           [System]
```

3.2.1.2.1.1.2 Caption

By selecting the number 2 from the system screen, the system enters into Caption editing mode. In this mode, caption is changed by using '#' key, maximum 20 characters can entered which will be display in front screen in system healthy mode. After entering into this mode, screen will be as below.

```
 DD/MM/YY            <Panel Status>         HH:MM:SS
 Caption:
 Ravel Electronics                          (#.Edit)
                                            [Caption]
```

3.2.1.2.1.1.3 Password

By selecting the number 3 from the system screen, the system enters into password change mode. In this mode, the user 1 to 5 and admin password can be changed by selecting corresponding number, after entering into this mode, screen will be as below.

```
 DD/MM/YY             <Panel Status>         HH:MM:SS
 1. User 1            4.  User 4
 2. User 2            5.  User 5
 3. User 3            6.  Admin              [Chg Pass]
```

After selecting corresponding number, password changing screen as follows:

```
┌─────────────────────────────────────────────┐
│                                             │
│  DD/MM/YY         <Panel Status>    HH:MM:SS │
│                                             │
│        Old Password?                        │
│                                             │
│                              [Chg XXX Pass] │
│                                             │
└─────────────────────────────────────────────┘
```

⇓

XXX – User 1/2/3/4/5/admin

```
┌─────────────────────────────────────────────┐
│                                             │
│  DD/MM/YY         <Panel Status>    HH:MM:SS │
│                                             │
│        New Password?                        │
│                                             │
│                              [Chg XXX Pass] │
│                                             │
└─────────────────────────────────────────────┘
```

⇓

```
┌─────────────────────────────────────────────┐
│                                             │
│  DD/MM/YY         <Panel Status>    HH:MM:SS │
│                                             │
│        Re-New Password?                     │
│                                             │
│                              [Chg XXX Pass] │
│                                             │
└─────────────────────────────────────────────┘
```

⇓

```
┌─────────────────────────────────────────────┐
│                                             │
│  DD/MM/YY         <Panel Status>    HH:MM:SS │
│                                             │
│        New Password Updated                 │
│                              [Chg XXX Pass] │
│                                             │
└─────────────────────────────────────────────┘
```
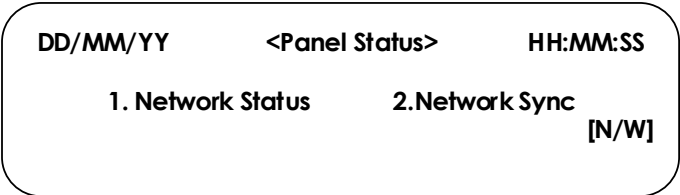
3.2.1.2.1.2   Advanced

By selecting the number '2' from the system screen, the system enters into advanced settings mode. It required the Configuration password. In this mode, the system up gradation like changing the network address, changing the configuration password and factory resetting can be done. The default Configuration password is "9". After entering into this mode, screen will be as below.

```
 DD/MM/YY          <Panel Status>          HH:MM:SS
 1.  Network
 2.  Chg AdvPass
 3.  Factory Default                        [Advanced]
```
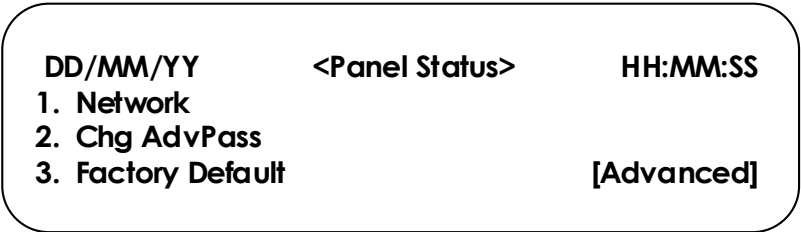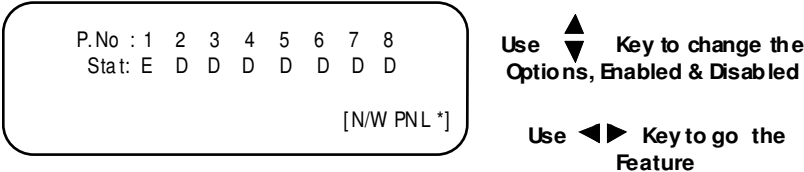
3.2.1.2.1.2.1 Network:

By selecting the number 1 from the advanced screen, the system enters into the network mode. In this mode using alpha numeric keys the panel address shall be entered. After entering into this mode, screen will be as shown below.

```
 DD/MM/YY          <Panel Status>          HH:MM:SS

      1. Network Status        2.Network Sync
                                          [N/W]
```

By pressing the number 1 from the above screen, it enters in to the Network status

```
   P.No : 1  2  3  4  5  6  7  8       Use ▲▼  Key to change the
   Stat: E  D  D  D  D  D  D  D        Options, Enabled & Disabled

                      [N/W PNL *]      Use ◄►  Key to go  the
                                                Feature
```

By pressing the number 2 from the network screen, it enters into the Network Synchronization mode. The screen will be as shown below.

```
  Wait...       ➜      Network Synchronized
                                  [Net sync]
```
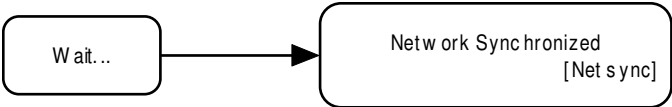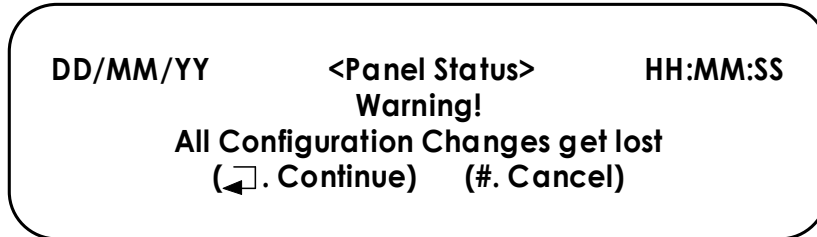
3.2.1.2.1.2.2 Changing Adv Password:

By selecting the number 2 from the advanced screen, the system enters into the configuration password change mode. The procedure for changing the password is similar to the user/admin password changing method. After entering into this mode, screen will be as below.
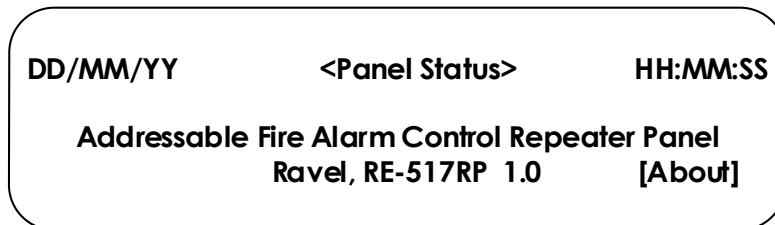
3.2.1.2.1.2.3 **Factory Default:**

By selecting the number 3 from the advanced screen, the system enters into the factory default setting mode. In this mode, it gives the warning screen before changing configuration. After entering into this mode, screen will be as below.

```
DD/MM/YY          <Panel Status>          HH:MM:SS
                     Warning!
        All Configuration Changes get lost
          (⏎. Continue)     (#. Cancel)
```

3.2.1.3   About

It shows the details of the panel by pressing number 4 from the menu screen. The LCD will show as below. In this screen the model and software version has shown.

```
DD/MM/YY               <Panel Status>          HH:MM:SS

     Addressable Fire Alarm Control Repeater Panel
                Ravel, RE-517RP  1.0        [About]
```

Chapter 4 Operating Instruction

4.1 Panel Operation

The operation of the panel is described in this manual. In this manual the following details are described in detail, like inputs / outputs, indications, control keys, alarm, fault supervisory conditions etc.,

4.2 Initial Power up Condition

When the power is applied to the panel, the LCD will first display "System Initializing" and the panel will not respond to any key presses or to zone activity. Once this step is done the panel will shows "System Healthy" in LCD display and System On, Mains On and Battery On LED will glow.

4.3 Indications

SYSTEM ON: This LED will glow when the panel is energized by primary and standby power. This is the only LED glowing in the normal monitoring condition. The LCD Display as shown below.

```
 DD/MM/YY                          HH:MM:SS

                  System Healthy
                  Ravel Electronics
```

MAINS ON: It indicates that panel is operated through the mains supply (120 / 220VAC). Whenever the Main Supply (220v A.C) fails, the Mains ON LED will goes to off condition and it also indicated in LCD with toggle Buzzer tone.

BATTERY ON: It indicates that the battery is connected with the panels and it under charging. Whenever the backup battery fails, the battery fault LED will goes to off condition and it also indicated in LCD with toggle Buzzer tone. Similarly the same LED will blink when the battery voltage goes down below the 21.6v (Battery Low).

SYSTEM FAULT: Glowing of this LED indicates the failure of the CPU.

SILENCED: This LED will glow when the silence key is pressed in fire condition only.

NAC FAULT: Whenever there is any fault in Notification Appliances Circuits like NAC loop Open / Short / Earth fault, it will be identified by COMMON NAC FAULT LED.

FIRE: This twin fire LED will glow when any one or more of the zones are in fire condition.

SUPERVISORY: This supervisory LED will glow when any one or more of the zones are in supervisory condition.

FAULT: This fault LED will glow when any one or more of the zones are in fault condition.

4.4 Buzzer

A piezo buzzer provides separate and distinct sounds for alarm, trouble and supervisory conditions:

- Alarm – Continuous
- Fault – pulse 0.5sec ON and 5sec OFF
- Supervisory – pulse 0.25sec ON and 0.25sec OFF

Operating Keys

The control keys are located at center of the front sticker and these keys are touch pad. They are as follows:

SILENCE Key: When the silence key is pressed, after entering the user or admin password the following will occur:
➢ The silenceable Notification Appliance Circuits will be turned OFF
➢ The Silence LED will be turned ON
Upon the occurrence of a subsequent fire event, Signal Silence is overridden and the control panel will respond to the new event. The panels connected in the network shall be silenced from the repeater panel.

RESET Key: When the Reset key is pressed, after entering user or admin password, the control panel will:

➢ Clear the status LED's.
➢ Bring back the LCD display to the healthy condition.
➢ Turn off the Notification Appliance Circuits.
➢ Reset fire zones by temporarily removing power.
➢ Restore all system relays to normal.
➢ Temporarily remove power from the resettable power output CN7.

The Reset key is accessible only after silencing in alarm condition. The panels connected in the network shall be reset from the repeater panel. Any alarm, supervisory or trouble condition that exists after a system reset, will resound the system, reactivating normal system activity.

ACK. Key: This key is used to acknowledge the buzzer tone during the fault and fire condition. This key can be operated with user or admin password. The panels connected in the network shall be acknowledged from the repeater panel.

EVACUATE Key: This key is used to energize the all-external NAC's without actual fire, It will operate at user or admin level. Using the silence key NAC output can be silenced.

ENTER KEY: This key is used to accept the password during silence, reset in Fire Condition And also used for the Evacuate and wherever requires.

CURSOR KEYS: The cursor keys (Right / Left arrows) are used to move the cursor point wherever required.

ALPHANUMERIC KEYS: These keys are used for entering the names etc. and numbers. '*' Key is used to go back the previous screen in programming mode. '#' key is used for the Lamp test in system healthy condition.

MENU KEYS: The menu key is used to get into the program menu to change the required configurations. It requires password to change the configurations.

TEST KEYS: The help key is used to test the lamps.

4.6 Normal Monitoring Mode

Normal Mode is the standard mode of operation. In this mode, the panel continuously monitors system status. When no fire or supervisory or trouble conditions exist, all LEDs will be off except the System On, Mains On and Battery On LED. The Notification Appliance Circuits will be off, all relays are in their normal state and the onboard buzzer will be off. When the system is in normal condition the LCD screen will be as "System Healthy".

4.7 Alarm Condition

When the control panel detects Fire via the Detector / MCP, the repeater panel will cause the following:

- ✓ The common twin Fire LEDs will glow.
- ✓ Turn on the NAC.
- ✓ Turn on the panel buzzer with continuous tone.
- ✓ Turn on the fire relay.

To change the other indexed fire event zones which are suppressed use right / left arrow keys.

Restoral: Silence the NAC's by appropriate user or admin password. after silencing the panel will perform the following;

- ➢ Turn off the Internal Buzzer.
- ➢ Turn off the External NAC's connected in repeater and other panels.
- ➢ Turn on the silenced LED.

When the Fire condition is cleared and Reset key has been pressed after entering the user or admin password. The Reset is accessed only after silencing the panel in alarm condition and it also accessed from the repeater panel. The panel will perform the following after clearing fire and resetting:

➢ Turn off the common twin Fire LEDs.
➢ Turn off the Fire relay.
> The LCD screen will be as below.

```
DD/MM/YY                              HH:MM:SS

              System Healthy
              Ravel Electronics
```

4.8 Supervisory Condition

When the control panel detects supervisory signal via the any normally open contact devices, the repeater panel will cause the following:

✓ The common supervisory LED will glow.
✓ Turn on the panel buzzer with intermittent buzzer tone (pulse 0.25sec ON and 0.25sec OFF).
✓ Turn on the supervisory relay.

To change the other indexed supervisory event zones which are suppressed use right / left arrow keys.

Restoral: When the supervisory condition is cleared and Reset key has been pressed after entering the user or admin password if the zones are programmed for latching, the panel will perform the following:

➢ Turn off the supervisory LEDs.
➢ Turn off the supervisory relay.

> The LCD screen will be as below.

```
DD/MM/YY                              HH:MM:SS

              System Healthy
              Ravel Electronics
```

Note:
If the supervisory mode is selected as resettable, the resetting the zone / SLC is not required. The zone / SLC is retrieved automatically after clearing the supervisory condition.

4.9 Fault Condition

The fault may any one of the following Zone fault / disable / earth fault, NAC fault and power section fault. When there is one or more fault condition, the fire alarm control panel performs the following:

- ➢ Turn on the common fault LED.
- ➢ Turn on the panel buzzer tone with intermittent buzzer tone (pulse 0.5ec ON and 5sec OFF).
- ➢ Activate the fault relay.

Restoral: When the fault condition is cleared, the panel will perform the following automatically:

- ➢ Turn off the fault LEDs.
- ➢ Turn off the NAC fault / power fault LED.
- ➢ Turns off the buzzer tone.
- ➢ Deactivate the fault relay.

The LCD screen will be as below.

DD/MM/YY	HH:MM:SS
System Healthy	
Ravel Electronics	
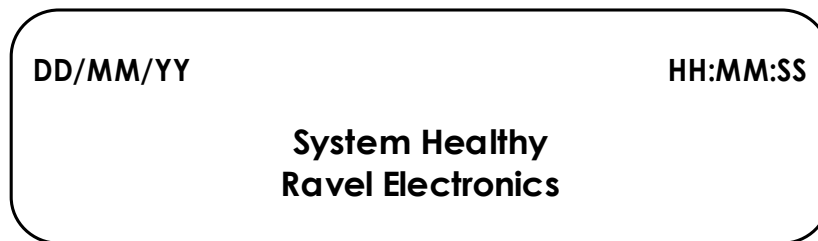
Note: The Fault occurred will not affect the other normal functions of the panel

4.10 Lamp Test

By entering into this menu, the LED in the panel will turn on. The LED status shall be checked by using this menu.

Chapter 5: Networking:

The AVANI can be incorporated into a network including other AVANI panels and AVANI RP annunciators. Though up to 8 panels and 8 annunciators (Repeater) can be supported by the network. The network can be setup for single building or multiple building operations.
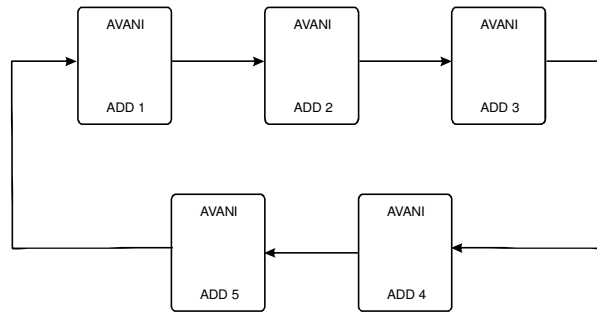

Figure – 20

The basic layout of the network is a single loop (see figure 20). Each panel and annunciator has a unique ID. The panels work in a peer to peer fashion using token pass method. This means panel having a lower address takes the token first and it is broadcast its status. Then token is passed to next addressed panel and so on. The Information is exchanged over the network by two basic means: a - specific frames (token pass) which are from one panel to another and 2 – broadcast frame, which are from one panel to all other.

Note:

1. For correct operation of the network, all panels and annunciators need to be loaded with same version.
2. When the panels and annunciators are first installed, the panel ID should not repeat.

Network communication

Information is sent across the network in frames. There are two types of frames: specific and broadcast. Specific frames are sent from one unit to another. Broadcast frames are sent from one unit all other.
Specific Frames: Specific frames deal with information generated at one panel and required at another. It is passed from panel to panel until reaches its destination. Each panel has a list as to which port to send frames from to reach all other panels through the fewest number of panels. Since networks will generally have all communications links running at the same baud rate, this is generally the shortest time as well.
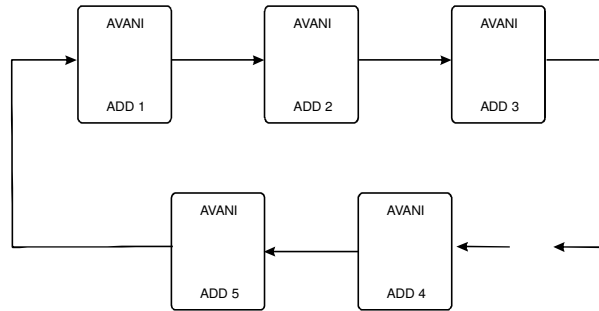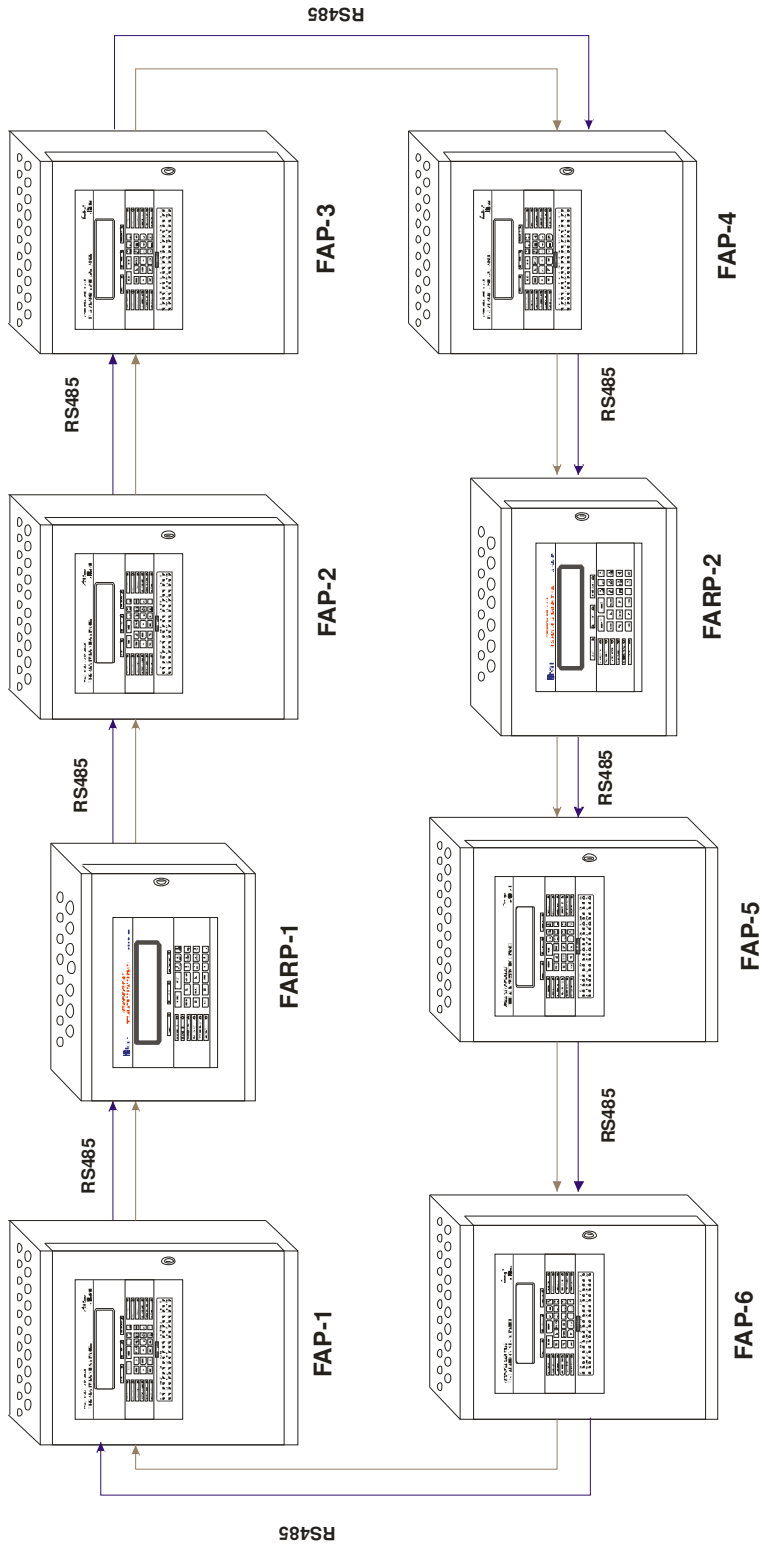
Figure – 21

If there is a break in the communication (see Figure 21), the panel that can not back the way it came. If there is single open as shown in the figure 21, the network would not affect the intended application. If there is more than one open will affect the network communication, the panels in between two open will not be in network.

Broadcast Frames

Broadcast frames deal with information that affects the entire network. When a broadcast frame is created by a panel or annunciator, it is sent out both network communications port. Each unit in turn will receive the broadcast in one port, act upon it and pass it on out the other port. Upon reaching the unit that generated the broadcast frame, that unit then disposes of it. This means that under normal circumstances, all units will receive a broadcast twice and act upon it twice.

Network topology:

Figure – 23

Chapter 6: Servicing:

6.1   Installation/Replacem1ent of PCB:

Remove the screws of PCB, which has to be change and remove the PCB from the mounting position and place the new PCB in that same position as shown below.

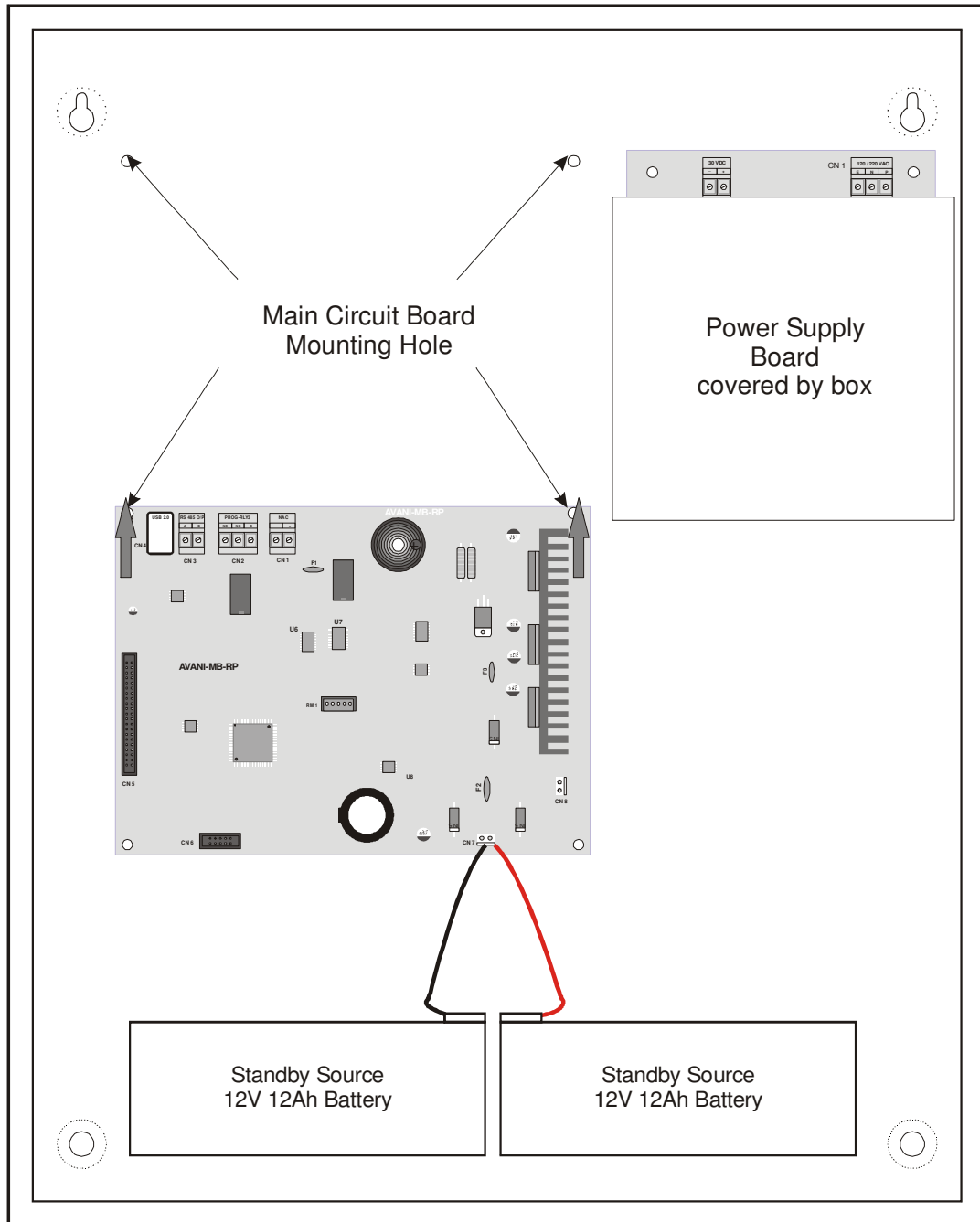**Mounting position for Main Circuit board (RE – AVANI – MB – RP-1.0):**

Figure – 24

Mounting position for Display board (RE – AVANI – RP - DISP):
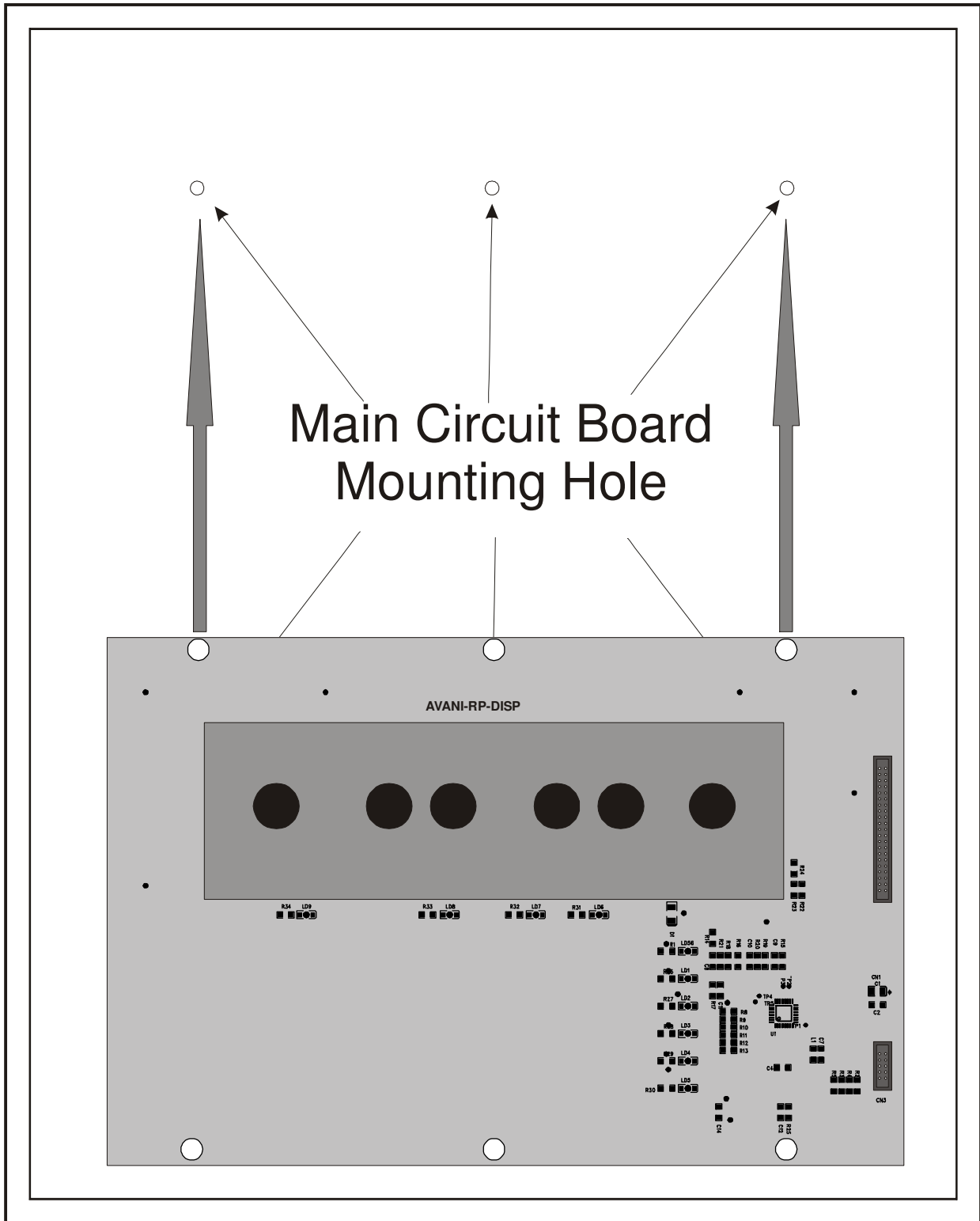
Main Circuit Board
Mounting Hole

AVANI-RP-DISP

Figure – 25

Mounting position for Power supply unit (RE – SMPS – 4A – R1):

Power Supply Board Mounting Hole

Standby Source 12V 12Ah Battery

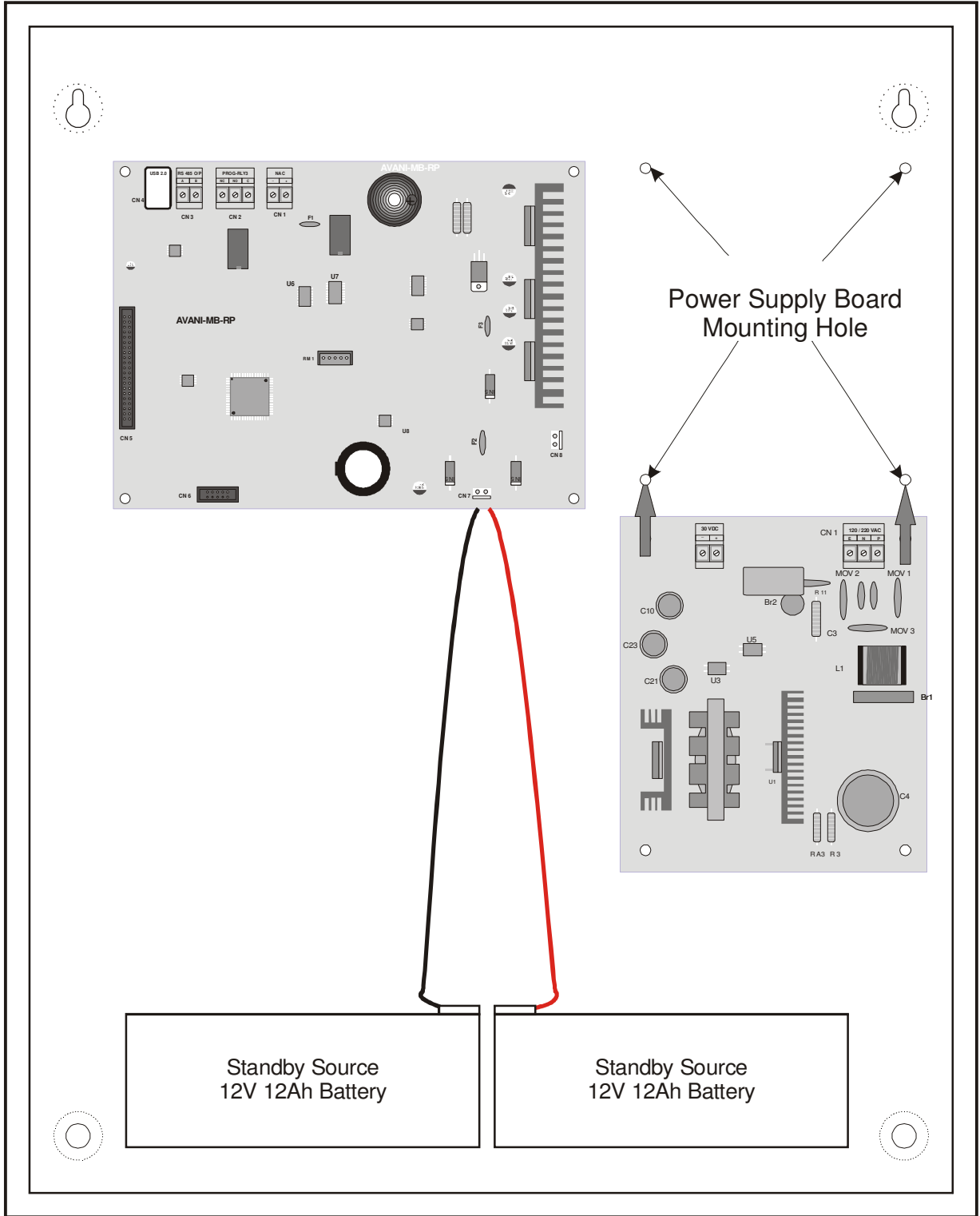Standby Source 12V 12Ah Battery

Figure – 26

6.2   Lamp Test

The lamp test function done through the sub menu by pressing 'Test' key, system (Panel) is in normal condition. In this mode, all the LED's are checked for good condition by glowing all LED's.

6.3   System Power

Power	Current	Max. AH Capacity	Derating Factor	Max. standby current	Max. Alarm current	Max. standby time	Max. alarm duration
Primary (power supply)	3A	N/A	N/A	0.04A	0.4A	N/A	15 Min
Secondary (back up)	1.3A	12Ah	10%	0.2A	1.3A	24 Hrs.	5 Min.

6.4   Trouble Shooting

Condition	Root Cause	Remedy
There is no indication on The panel	No power to the Panel	Check Primary (AC) power and Standby power.
During Mains fail condition Battery fault LED is glowing	May be battery low (<21.6V) or the battery reaches the de-rated (<19.5V) Voltage.	Check the Battery voltage and charge the battery or replace the battery.
The Battery fault and charger fail shown in LCD.	The Battery connected in reverse.	Connect the battery properly.

Chapter 7: Battery Calculation

Use Table 6-1 to calculate the total standby and alarm load in ampere hours (AH). This total load determines the battery size (in AH), required to support the control panel under the fail of the AC Power Supply. Complete the table 6-1 as follows:

1. Enter the NFPA standby and alarm times (refer to NFPA requirements below).
2. Calculate the ampere-hours fro standby and Alarm, and then sum the standby and alarm ampere-hours.
3. Multiply the sum by the derating factor of 1.2 to calculate the proper battery size (in AH).
4. Write the ampere hour requirements on the protected premises lable located inside the cabinet door.

TABLE 7-1: Total Secondary Power Requirements at 24 VDC

Normal Condition :   X = **S** (Amps) x ____ Hrs. (Backup time

                                                                   required)

Alarm Condition :   Y = **F** (Amps) x ____ Hrs. (Backup time

                                                                   required)

Battery Ah required   :   AH = (X + Y) x 1.2 (Derating Factor).

Note: _Refer specification (Page 10) for Quiescent, standby, alarm currents_
System current (**S**) = Quiescent Current +
                                        (Standby current X No. of zone)
Fire current (**F**) = (Alarm Current x no. of zones) +
                                        (NAC Current x No. of NAC's).

Chapter 8: Wire Requirements

Connecting external system accessories to the AVANI main circuits must be carefully considered to ensure proper operation. It is important to use the correct type of wire, wire gauge and wire run length per each AVANI circuit. Reference the chart below to specify wire requirements and limitations for each AVANI.

TABLE 8-1: Wire Requirements

CIRCUIT TYPE	CIRCUIT FUNCTION	WIRE TYPE AND LIMITATIONS	RECOMMENDED MAX. DISTANCE Feet (meters)	WIRE GUAGE
Initiating Device Circuit	Connects to Initiating Devices	Untwisted, unshielded wire (Do not exceed 100 ohms)	10,000 (3,000 m) 8,000 (2,400 m) 4,875 (1,480 m) 3,225 (975 m)	12 AWG (3.25 mm2) Belden 9583 WPW999 14 AWG (2.00 mm2) Belden 9581 WPW995 16 AWG (1.30 mm2) Belden 9575 WPW991 18 AWG (0.75 mm2) Belden 9574 WPW975
24 VDC resettable, nonresettable	Connects to annunciators and other accessories	No more than 1.2 volt drop allowed from supply source to end of any branch	Distance limitation set by 1.2 volt maximum line drop	12 AWG (3.25 mm2) - 18 AWG (0.75 mm2)

Chapter 9: Compatible Devices (ID: CD 03)

Compatible NAC's:

1. System Sensor Mini Horn – Model: MHR / MHW – 50 No's / Circuit.
2. System Sensor Strobes – Model: MHR / MHW – 15 No's (@15cd setting) / Circuit.

End Of Line Devices:

1. RE4K7 for External Inputs, Zone, and NACs.

Chapter 10: Abbreviations

NFPA	–	National Fire Protection Association
AC	–	Alternate Current
FACP	–	Fire Alarm control Panel
LCD	–	Liquid Crystal Display
SLC	–	Signaling Line Circuit
Evt	–	Event
NOD	–	Number Of Device
NOM	–	Number Of Modules
DD	–	Date
MM	–	Month
YY	–	Year
LC	–	Loop Card
RTC	–	Real Time Clock
OPTI	–	Optical Detector
MULT	–	Multiple Detector
IP_M	–	Input Module
OP_M	–	Output Module
IO_M	–	Input / Output Module
Cat	–	Category
Del	–	Delete

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DATE:

TEST CERTIFICATE

We hereby certify that the items details hereon have been manufactured, inspected and electrically tested to ensure the compliance with ravel products and process specification.

Model No.:　　**RE-517RP**

Serial No.:

For **RAVEL ELECTRONICS PVT.LTD,**

Q.C. – Engineer　　　　　　　　　　Tested By

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WARRANTY CERTIFICATE

Model No.: **RE-517RP**

Serial No.:

  Ravel Electronics warrants each product to be free from defects in material and workmanship. This obligation is limited to servicing or part returned to the company for that purpose and making good any parts thereof which shall be within warranty period, returned to the company under a written intimation and which to the company's satisfaction to be found defective. The company reserves the right to decide the workplace for the repair work. The freight for defective material will have to be borne by the purchaser, and the transit risk for such material will rest with the purchaser.

  This warranty will last for a period of **12 months** from the date of Invoice of the product from the factory. The warranty is applicable only if the product is used within its specifications. The warranty for the replaced components will lapse along with that of the main product.

THIS WARRANTY IS VALID UP TO: **12 months from the date of invoice**

Authorised Signatory