Repeater
Matrix 2000

Installation and operation Manual.

Repeater for
Conventional Fire alarm Panels

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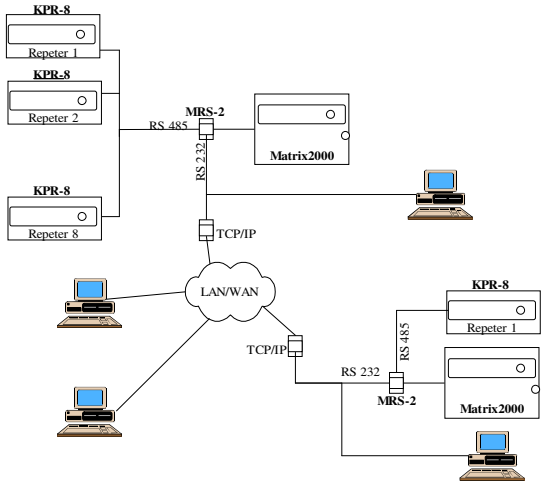
1. General description

Matrix 2000 conventional fire alarm panels have been designed to be controlled by a maximum of 8 repeaters or 7 repeaters plus a monitoring PC using the ***ViewMatrix*** software. The repeaters can support panels from 4 up to 24 zones
They can fully represent the different indications and status of the panel, additionally to providing full control. The maximum distance between the last of the repeaters and the panel can be 1200 meters.
They are designed and manufactured so that they fulfill the requirements of **EN 54 Part 2 and 4**, 1998.
The analytic indications and the simple handling of the Repeaters of ***Matrix 2000*** series ensure the easy handling and control of the system by the operator.

Attention: In order to connect repeater(s) on the *Matrix 2000* panel it is necessary to use the RS232 module (MRS-232).

This module gives the Matrix2000 panels the ability to connect either to a local PC or to LAN/WAN through the RS–232 port. In the case of LAN/WAN connection a TCP/IP module is also required. Monitoring and control of the system from a PC can be performed with the aid of specially developed software ***ViewMatrix*** running under Windows. This software simulates the keyboard and the settings of the panel in a user-friendly graphic environment on the PC screen. All actions are performed with the use of a simple mouse.
MRS-232 also provides Matrix2000 panels with the ability to accommodate through the RS-485 port up to 8 different fully functional repeater keyboards for each panel.

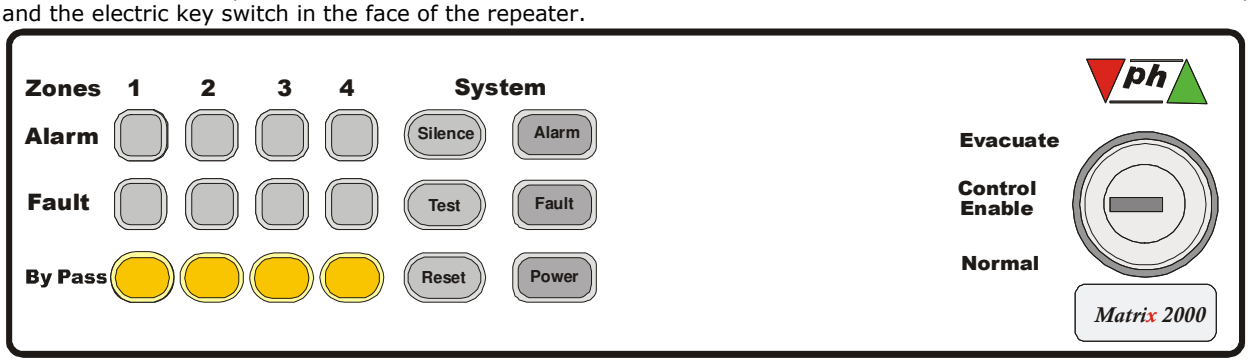


Note that the fire alarm panel's repeaters contain static sensitive high quality electronic control equipments. Care should be taken when connecting field wiring.

Do not make any connections with mains power applied.

2. Indications – handling of keyboard

Operating and monitoring of the panels through the repeater is done in two different access levels, always in accordance with European standard EN 54-2: 1998. Access to levels 1 and 2, is achieved with the silicon rubber keypad and the electric key switch in the face of the repeater.



2.1 Indication "Power"

In normal system operation and when voltage 220 ACV and the batteries are connected, the indication "**Power**" of the repeater (as well as the "**Power**" indication of the panel) is turned on constantly.
It provides the installer with the information that the software of the panel is "running" without problems.
Concisely the indication "**Power**" turns off when we have either malfunction of the software or disconnected power supply to the mainboard (burned mainboard fuse).
Furthermore the indication starts to blink when we have:
(a) Removal or voltage loss of batteries only
(b) Total break of main power supply only
In the above two cases, indication "**Fault**" (in the System Column) also turns on while the buzzer sounds continuously.

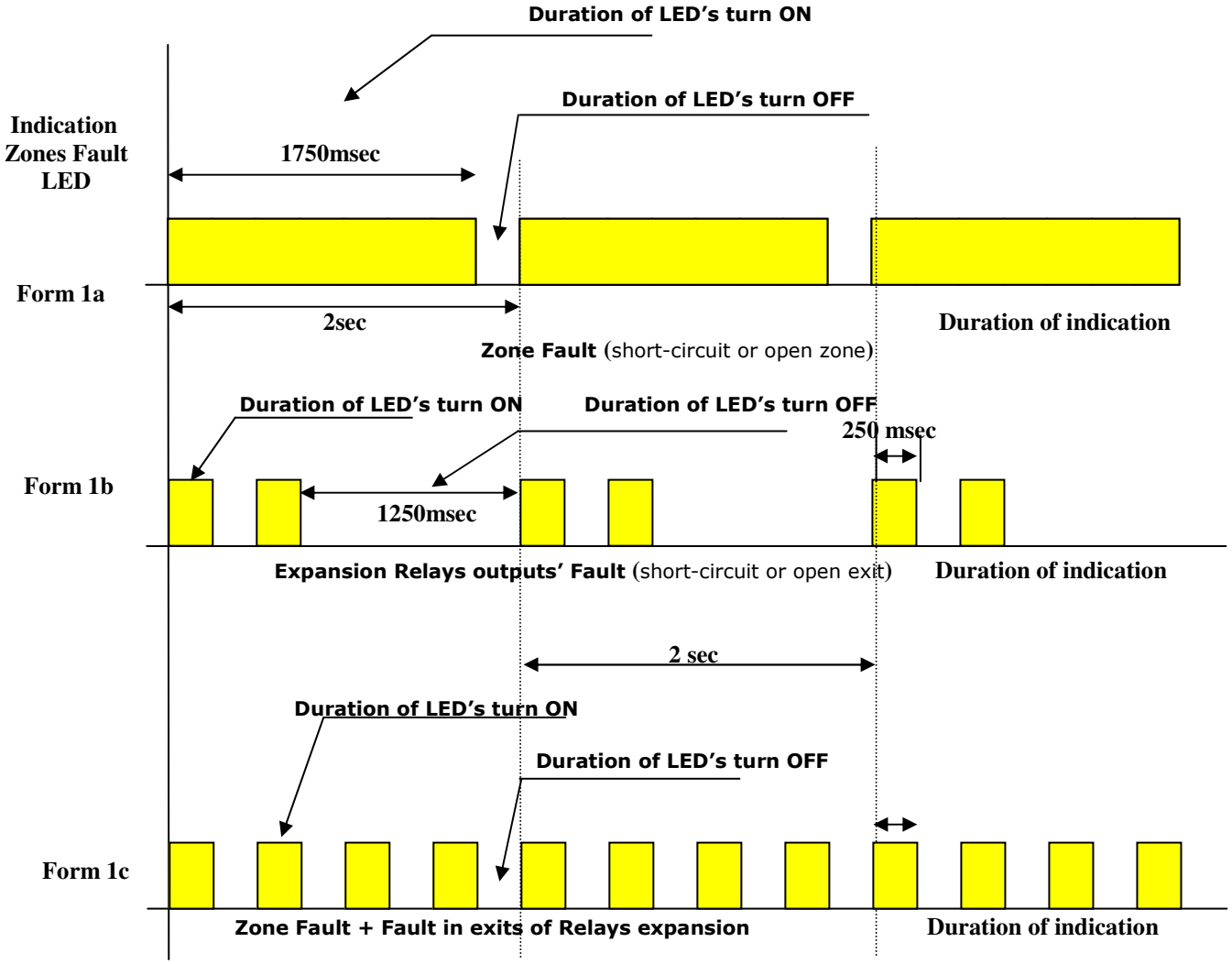
2.2 "System Fault" indication (general fault)

The indication of general problem, "**Fault**" on the keypad of the repeater as well as on the panel, turns on in the case that something happens to the connections of the zones, the outputs of the sirens or the outputs of the extra Relays of zones (PCB of auxiliary relays).
More specifically, in the case that opening or short-circuiting occurs in the connection cables of the siren in the main board, the general Fault indication will turn on, while at the same instant we will have continuous sound notice from the the repeater's integrated Buzzer.
The general Fault indication will turn on and at the same moment we will have sound notice from the repeater's integrated Buzzer, in every case that some problem occurs in the zones or in the outputs of Relays of the zones, as it is analytically described in the next paragraph.
In all the above cases it is possible for the user to stop the Buzzer by pressing the Silence key, with the keyswitch in Control Enable position. All the indications turn off after restoring the problem.

2.3 "Zones Fault" indications

The **"Zones Fault"** indications are blinking, in a different way, (schematic 1) in every case that a problem occurs to the connections of the zones of the panel or the outputs of the extra Relays of zones (in the case where the relays expansion board is used).
More analytically:
(a). In the case that short-circuit or opening of a zone exists, **"System Fault"** indication will turn on as well as the corresponding "**Zones Fault"** indication will blink, (form 1a) while at the same moment we will also have sound notice from the repeater's integrated Buzzer.
Possible causes of a zone problem are:
(a1) disconnection or interruption of wiring of the zone
(a2) short-circuit in the wiring of the zone
(a3) removal of sensor from its base
(a4) removal of terminal resistance
(a5) testing procedure for the particular problem
(b). In the case where the Relays expansion board is used in the panel and we have short-circuit or opening of the wiring in the corresponding outputs or removal of the output monitoring resistance, then **"System Fault"** indication will turn on and the "**Zones Fault"** indication of the corresponding zone will blink (in a different way from when we have Fault of zone, form 1b). At the same moment we will also have sound notice from the repeater's integrated Buzzer.
(c). Finally, in the case that we have both of the above situations, the LED indication starts blinking according to form 1c, while at the same time we have sounder warning from the repeater's integrated Buzzer.

In all above cases it is possible for the user to stop the Buzzer, by pressing the **Silence** key on the repeater's keypad, with the keyswitch in position **Control Enable**. The **"System Fault"** indication remains **ON** in order to show that a problem exists in the installation. The Buzzer of the repeater sounds in regular time intervals, in order to remind the user the existence of the problem.
All the Fault indications turn off after restoring the problem.



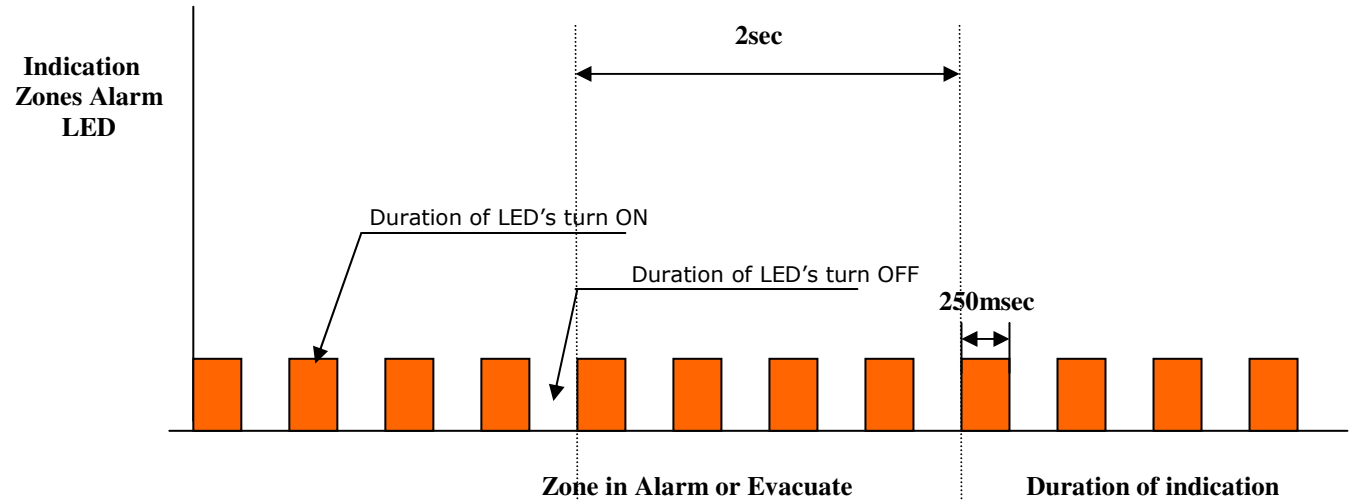
Schematic 1

2.4"System Alarm" indication

In the case that a connected detector in the system detects some sign of fire (smoke, high temperature etc), the panel goes in alarm mode and the indication **"System Alarm"** on the repeater's keypad turns on as well as the indication **"System Alarm"** on the panel. At the same moment we have continuous alarm from the sirens of the system. **"System Alarm"** indication also turns on when the operator – user of the system orders the evacuation of the protected area, turning the key of the keyswitch on the repeater's or panel's keypad in **Evacuate** position. In both above cases we also have activation of **Zones Alarm** indications, which blink in the way presented in schematic 2.

2.5 "Zones Alarm" indications

The **"Zones Alarm"** indications on the repeater's keypad blink as well as on the panel's keypad, each time the corresponding zone is activated. If the cause of the activation of the zone is restored, the system continues in alarm mode with the indication of the activated zone blinking. Also the sirens sound. In this case, pressing the **"Silence"** key makes the sirens stop and the Zones Alarm indication/s remain turned on continuously. Pressing the Reset button can turn them off. All the buttons are active only when the keyswitch is in position **Control Enable**.



Schematic 2

3. Central Electric Keyswitch

Via the central Electric Keyswitch of the repeater as well as of the one on the panel, we have the ability of accessing the 1st and 2nd Access Level of the system.
The central electric Keyswitch has three positions:
1st position. (Access Level 1) **Normal**: the system is in normal operation mode ready to accept commands of alarm from the zones or recognize any problem that occurs in the installation.
2nd position (Access Level 2) **Control Enable**: all buttons on the silicon rubber keyboard on the face of the panel are active and we can control the panel.
3rd position: (Access Level 2) **Evacuate**: By turning the key in this position and after a small delay of 2 seconds all the zones of the system go into evacuating alarm mode, resulting in the activation of all sirens of the protected area (interrupted mode). Bypassed zones and even numbered zones of the zone pairs chosen as cross zoning (***Matrix 2000*** manual par. 6.4 & 6.5) for extinguishing, are omitted, in order to avoid useless triggering of the extinguishing systems. The system returns to standby mode by turning the key to **Control Enable** position and pressing the reset button. Removing the key from the keyswitch is allowed only in **Normal** position.

4. Controls Via Keyboard

4.1 "System Silence" key

In order to stop the sounding of the Buzzer in any case (alarm or fault) and the sirens in case of alarm, the operator – user simply has to press the key **"Silence"**. The **"Silence"** key, as all the keys of the keyboard, is active only when the key of the Central Electric Keyswitch is in position **Control Enable**.

4.2 "System Test" key

By pressing of the **"System Test"** key all the luminous indications in the repeater's keyboard turn on, confirming that none of the LEDs is burned. At the same moment and for the time that the **"System Test"** key is pressed the Buzzer sounds. The **"System Test"** key, as all the keys of keyboard, is active only when the key of the Central Electric Keyswitch is in position **Control Enable**.

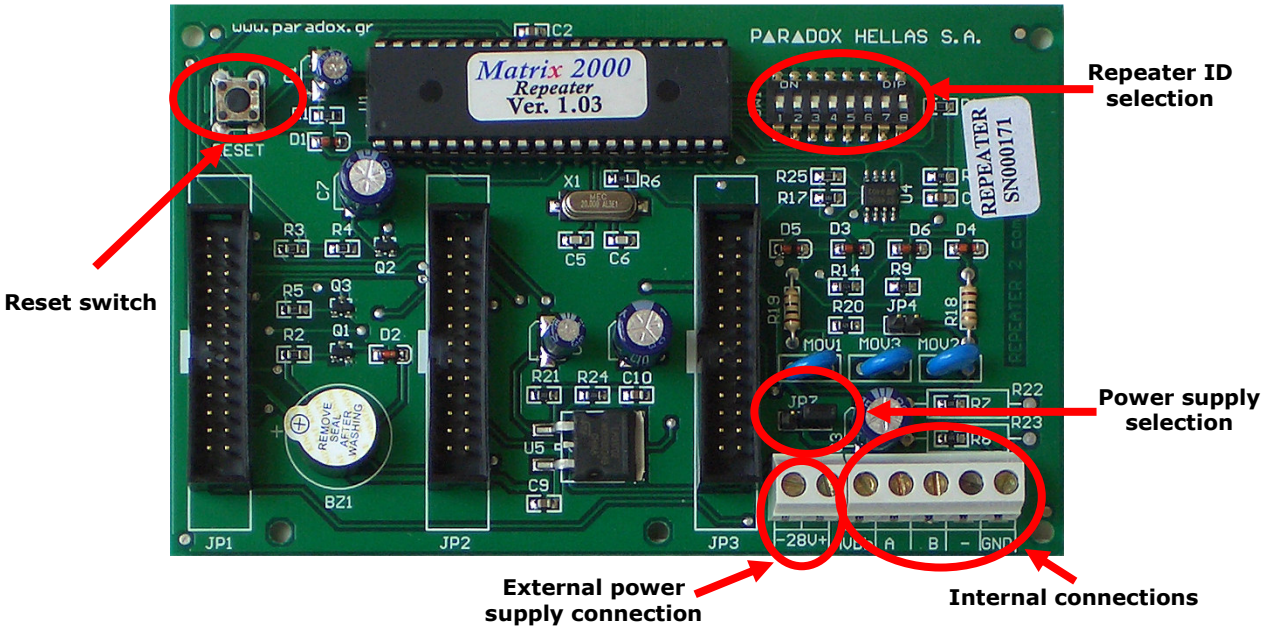
4.3 "System Reset" key

The **"System Reset"** key is used for resetting the zones of the system in Stand By mode after an alarm. The **"System Reset"** key, as all the keys of keyboard, is active only when the key of the Central Electric Keyswitch is in position **Control Enable**.

4.4 "Zones By Pass" keys

The **"Zones By Pass"** keys are used to isolate a zone in the case that works take place in the building that can cause false alarm or when the connected appliances present some problem or give false alarms. With the keyswitch in position **Control Enable**, we press the corresponding **"Zones By Pass"** key, which turns on, indicating that the area has been isolated. Resetting in normal mode occurs when pressing the key once again. If one of the keys **"Zones By Pass"** is turned on (yellow colour) the corresponding zone is isolated and it does not function. In this case, the **"Fault"** indication is constantly ON and the buzzer sounds every 30 seconds to remind the user of the existing problem.

5. Internal Connections and Settings



Schematic 4

a) Repeater's general Reset switch
The Reset switch can only be used by the installer. It must be used only to restart the microcontroller program or to make any changes made via the micro dipswitches effective.

b) Repeater ID selection
The micro switches in the inside of the repeater, in access level 3, only affect the repeater's ID. More specific the switches from 5 to 8 are used to define the ID number from 1 to 8 of the repeater. Through them and depending witch one is ON we define the ID of the repeater(s).
This procedure must be performed only by the **installation engineer** and with great care.

8th switch	ON	ID 1
7th switch	ON	ID 2
6th switch	ON	ID 3
5th switch	ON	ID 4
8th & 5th switches	ON	ID 5
7th & 5th switches	ON	ID 6
6th & 5th switches	ON	ID 7
8th&7th&5th switches	ON	ID 8

When we connect a PC via the RS232 module to the panel, for the ***ViewMatrix*** software, this always takes the ID 8.

c) Power supply selection
There are 2 possibilities for power supply. The first one is connecting the repeater directly to the panel through the RS232 module and the second, using an external power supply. In the first case we connect the repeater via a 5 wires cable, point to point, directly to the RS232 module that is installed in the panel and is connected to the main board. In that case the Jumper JP7 has to be connected in the right side position.
The second case (external power supply) is used when more than three repeaters are connected to the panel or the distance between the panel and the last repeater is more than 400 meters. In that second case the Jumper has to be connected in the left side position.
Note: The default setting of this jumper is on the right side position (no external power supply).

6. Transquiscent current of *Matrix 2000* panels

In the below table current consumption of series repeaters ***Matrix 2000*** is listed.

REPEATER MODEL	ZONES	POWER SUPPLY	Current in Standby Mode	Current in Alarm Mode
Repeater Matrix 2004	4	27.6 V DC 2A	20mA	60mA
Repeater Matrix 2008	8	27.6 V DC 2A	20mA	75mA
Repeater Matrix 2012	12	27.6 V DC 2A	40mA	135mA
Repeater Matrix 2016	16	27.6 V DC 2A	40mA	150mA
Repeater Matrix 2020	20	27.6 V DC 2A	60mA	210mA
Repeater Matrix 2024	24	27.6 V DC 2A	60mA	225mA

7.Recommended Cables

Recommended cable for installation with length up to 400 meters with internal power supply is UTP or FTP (network type cable). For longer lengths you can use LISE 4x0,8 or UTP with an external power supply. For installations complying with EN standards, cables with resilience to flame / temperatures up to 830°C for 15 minutes (EN50200 standard, PH30 category, at least).

***PARADOX HELLAS S.A. recommends that a test from the user should be performed periodically, in order to detect any malfunctions of the system. This test should be made by triggering the detectors.**

For any additional information, clarification or suggestion that concerns this manual or the Matrix 2000 series fire alarm panels, please contact our sales dept. at tel. No. +30 – 2102855000 or email us at sales@paradox.gr.