MP 200

Installation and Maintenance Manual

BUS Control Unit

IS0084-CQ

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SAFETY INSTRUCTIONS

In compliance with electrical safety standards, when using a 230V~ power supply, the use of a cable with double insulation (double screened) is indispensable. Moreover, a suitable sectioning device such as a bipolar, differential or other type of magnetothermic switch must be installed as protection for the mains supply. Remember that installation of security systems is regulated including the application of workplace accident prevention legislation and only personnel with legally recognised qualifications are authorised to carry out this type of operation. ATTENTION: **never** solder the input cable terminals from the 230V~ mains power supply cables connected to the PS28 terminal board.

1.0 General Characteristics

- The MP200 is a multifunction, multi-user system that can be remote controlled and is based on a family of expandable control units on a serial Bus line, with a shared range of devices for managing the system (concentrators, keypads, key readers, etc.). The MP200 was designed for installation with one of the most innovative microprocessor technologies and is a flexible system created to satisfy the requirements of an increasingly demanding market. The software was designed to be "open" to any innovation and as a consequence may be integrated simply and quickly with future functions.

1.1 SYSTEM FEATURES

User-friendly

- The guided menu on the keypad display is user friendly for system programming and management. High visibility script display for the individual areas (e.g. IR STOREROOM), the various codes and/or keys (e.g. ROSSI MARIO) and the various sectors (e.g. OFFICE AREA) means that the end user can identify quickly and unequivocally the alarm triggered or the operation to carry out.

Multifunction

- The areas and outputs may be programmed individually to take into account a series of alarms or conditions such as burglary, 24hr burglary, tampering, armed robbery, fire, technological alarm, technological control, telehelp, system status, breakdown and many other functions.

Multi-user

- Possibility of acting simultaneously from more than one key reader and/or keypad.
  Subsystem management (separate systems) from a single central unit, each of which must be split into one or more sectors.

Clock-calendar and Time programmer

- The MP200 system fits a clock-calendar for chronological event classification and for time programmer control. The latter offers ample management flexibility thanks to different daily and weekly timetables that are fully programmable. It may be associated not only to the activation and deactivation of the burglar alarm, but also to other functions such as technical control (heating, lighting, etc.).

Remote Management

- The various systems installed can be programmed and controlled thanks to telephone line modem transmission using a Personal Computer and Telemanagement Fast-Link software. All programming data can be uploaded and downloaded, zones can be excluded and included, system status and memory events situations can be requested, as well as testing of batteries and yet other functions. Remember that the same operations may be undertaken locally by connecting the personal computer to the control unit using the special cable and RS232 connector found on the motherboard. The end user may also achieve remote interaction with the system using a telephone line.

Alarm Transmission

- The MP200 system may transmit alarm conditions via a telephone line and this may be programmed in three different ways: using a modem connecting a control unit installed with a Personal Computer and Fast-Link software; using numerical protocol (selected from the choices available on the board) to a remote-surveillance centre; by sending messages previously recorded in voice mode (if the SV108 voice synthesis board is installed). When transmitting via modem and when using the numerical protocol (for those protocols that allow it) data transfer to the reception centre envisages “point-to-point” information, that is to say for each zone involved in the alarm.

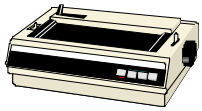
Modem - Communicator STM200

- A telephone alarm transmission board for remote management and remote programming of the system.

2.0 System Components

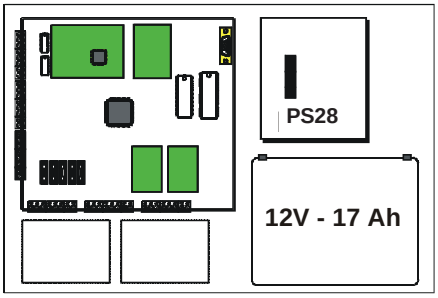
2.1 MP 200/64 CONTROL UNIT

- 8 alarm zones, expandable to 64 using I/O concentrators (for 8 or 4 zones) connected to serial lines. As well as alarm zone inputs there is also a tamper input and an electromechanical key input.
- Each alarm zone is freely programmable. Zone balancing may be programmed as single or double and thus offers the possibility of defining a tamper alarm for each zone.
- The control unit has 11 individually programmable outputs, of which 8 are relay (free switch) and 8 are electric (open collector). **The board manages 2 RS 485 type serial lines** (serial 2 is optional using an IT485 module), and each line may connected to a maximum of 8 KP200D keypads, 8 DK4000M key readers, 4 DK4Z/4000M splitters and up to 7 concentrators. In any case the maximum number of concentrators is limited to the number of zones that can be managed by the control unit (64).
- The MP200/64 system may be subdivided into **12 different sectors** (or areas), to which the zones, outputs, keys, codes, keypads, readers and splitters may be freely associated. Apart fom the two techincal codes envisaged, it is also possible to manage up to 64 users, which may be codes or DK4000 digital keys, all programmable on a hierarchical scale at various levels, and associable to one or more sectors.
- The RS232 serial connector on the board may be used for a direct local printer link-up for online printing of alarm events, or to a Personal Computer with FastLink dedicates software for up/download of programming parameters.

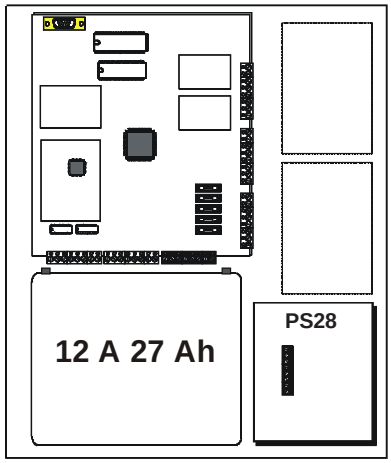


- The standard PS228 power supply unit is able to offer maximum current of 2.8 A. All supply outputs on the central board are protected against short-circuiting by a fuse.
- The MP200 64-zone control unit is available in 2 models with different case sizes:

1. the M200/64 has a medium-size sealed metal case suitable for housing a 17 Ah battery



2. the MP200/64OM has a larger sealed metal case suitable for housing a battery no larger than 27 Ah.



2.2 MP 200/256 CONTROL UNIT

Differs from the MP200/64 control unit as follows:

- expandable up to 256 zones using the I/O concentrators connected to the serial lines
- the board manages 3 RS485 serial lines of which 2 are serial connections (one integrated on the base plate and the other on a IT485 module), whils the third is an optional via a further IT485 module.
- the system may be subdivided into 24 different sectors and up to 256 code and key users may be managed.
- the system buffer can store up to 1000 events.

2.3 I/O CONCENTRATORS (REMOTE UNITS)

- Two versions are available, both using the same system: an **EP200/8Z** with 8 zones and 6 outputs (2 relay and 4 electric) and an **EP200/4Z** with 4 zones and 3 outputs (1 relay and 2 electric). The 4 electric outputs present on the EP200/8Z may become relay outputs by installing a DKR4 module with direct coupling connettors.
- In both versions all zones and outputs may individually programmed as is the case with the control unit. Concentrators are connected via an RS485 serial line and acknowledged via a programmable dip-switch address.
- The equipment is supplied in modules and is suitable for a range of locations: in special cases (CP8Z), in the back-up supply units or even in the control unit case.
- A direct interface connector to the back-up supply units uses a serial BUS line to convey trouble-shooting information (power failure, low battery, error) to the control unit.

EP200/8Z

EP200/4Z

2.4 KP 200D KEYPAD

- The keypad has a 2 line/16 character integrated backlight LCD display. The device is used to programme and control the system, to which they may be partially or totally associated (control and management of one or more sectors). The keypad has an incorporated buzzer for the following sound signals:
  - · a short tone to confirm that a numerical key was pressed.
  - · a longer tone to indicate an error.
  - · three short tones if the letter **F** is pressed to quit a menu.
  - · chime function (programmable).
  - · input/output delay time signal (programmable).

There are 6 useful LEDs for controlling specific system conditions. See the User Manual details.

- Keypads are addressed by use of dipswitches. Keypads with the same address cannot be included in the same BUS. When the system is powered up for the first time, at least the keypad with address 1 must be connected to serial 1. From here it will be possible to configure and, if necessary, programme the system by accessing the relevant menus.

2.5 DK 4000M READERS

- These are devices for optical/digital reading and decoding of DK 40 digital keys. They are used for activating/deactivating relevant sectors each time a recognised optical key is introduced. They are fitted with 4 LEDs for signalling specific system events (see User Manual details). They are addressed by rotary switches whose use is described in the Functions and Programming Manual, Para. “Reader Configuration".

2.6 DZ 4/4000M SPLITTERS

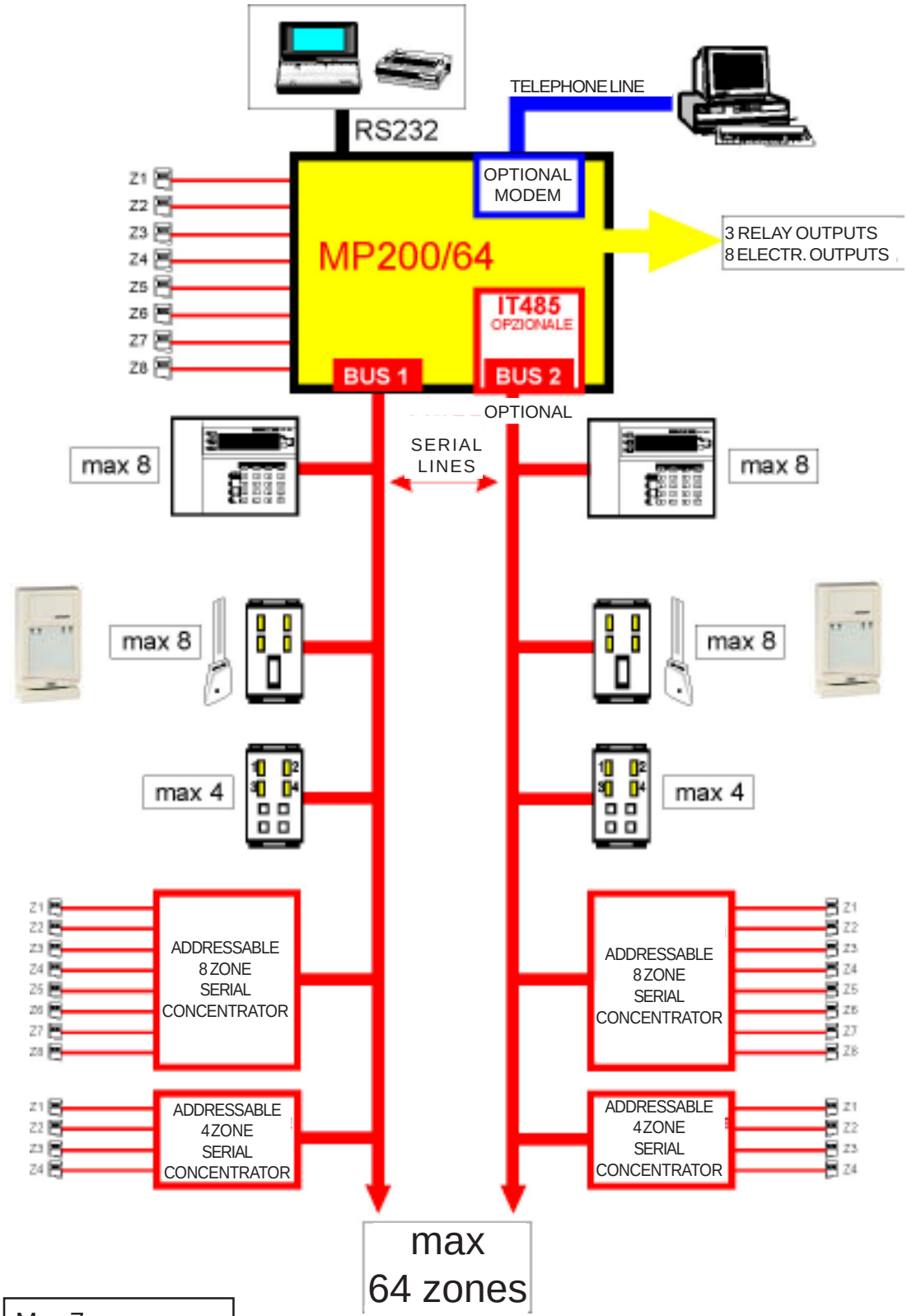
- These devices work in association with DK 4000M readers and are used for partial activation/deactivation of associated sectors. They fit 4 keys, each of which is associated to a system sector, and 4 LEDs for signalling sector status (see User Manual details). They are addressed by rotary switches whose use is described in the Functions and Programming Manual, Para. “Configuration”.

2.7 AC200M MAGNETIC CARD AND AC200P PROXIMITY READERS

The magnetic card and proximity readers (AC200M and AC200P) are used to activate/deactivate the associated sectors. They are managed in the same way as MP200 key readers. Unlike these devices, either a magnetic card (badges) is swiped through the slot equipped with a magnetic head or a special AC400TP transponder is read simply by being approached to the proximity reader in the point printed on the front of the device.
The addressing and badge/transponder acquisition procedures are similar as those of key readers because each magnetic card or proximity key is managed by the MP200 in the same way as an electronic key. The devices are provided with anti-opening/anti-removal protection. The four LEDs on the front panel provide the same indications as key readers. No partial association is allowed.

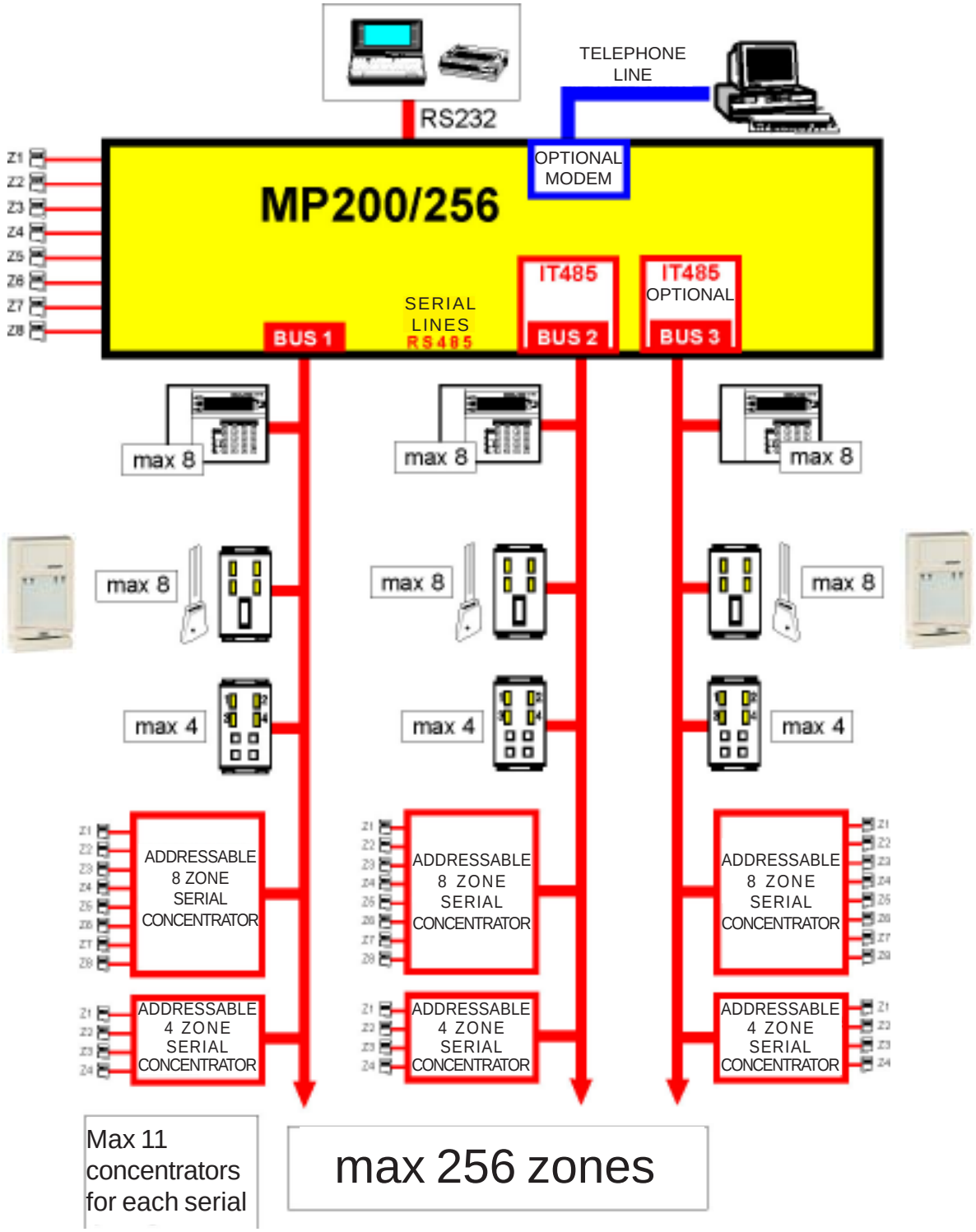
3.0 Control Unit Configuration

3.1 MP 200/64 CONFIGURATION



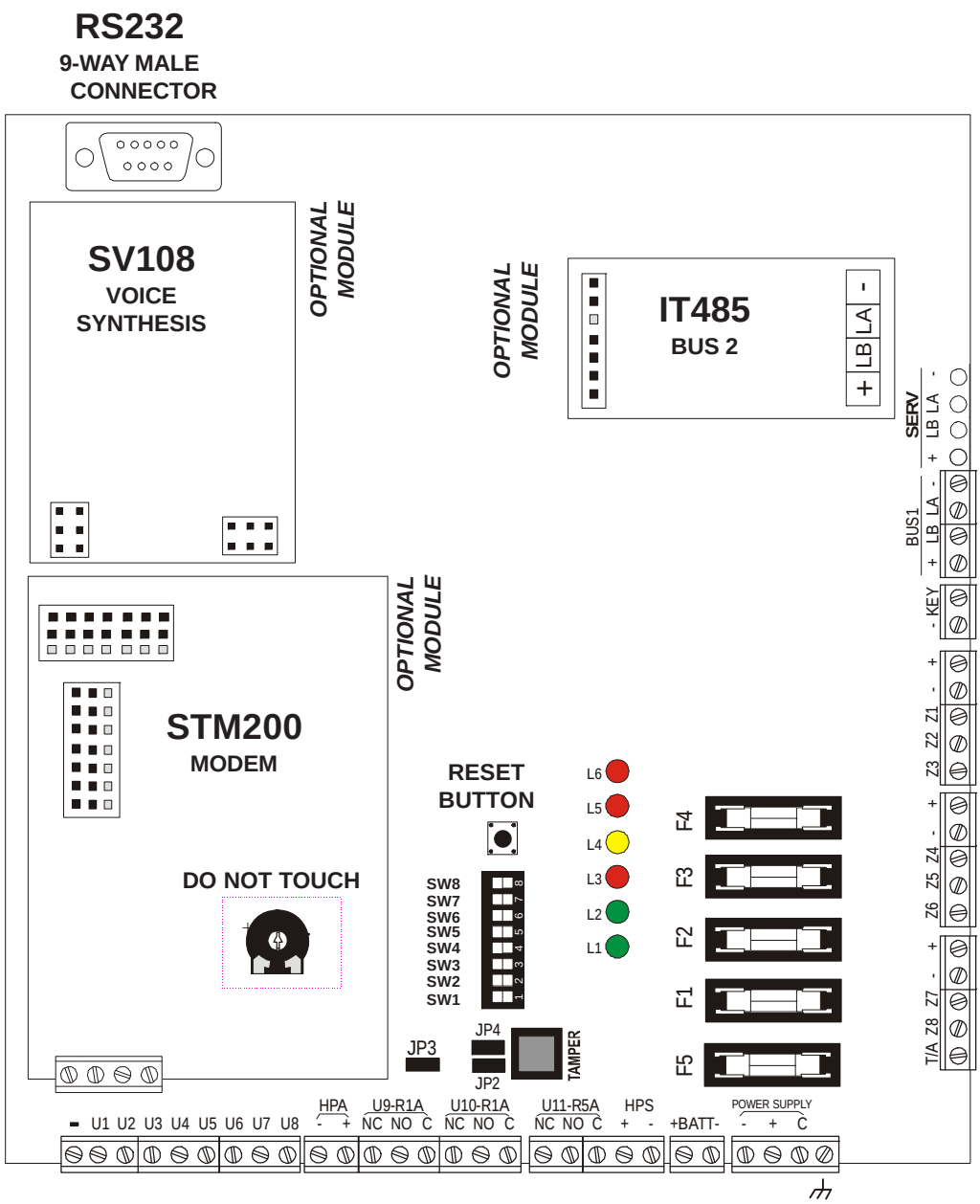
Max 7 concentrators for each serial line

3.2 MP 200/256 CONFIGURATION



4.0 Control Unit Board Description

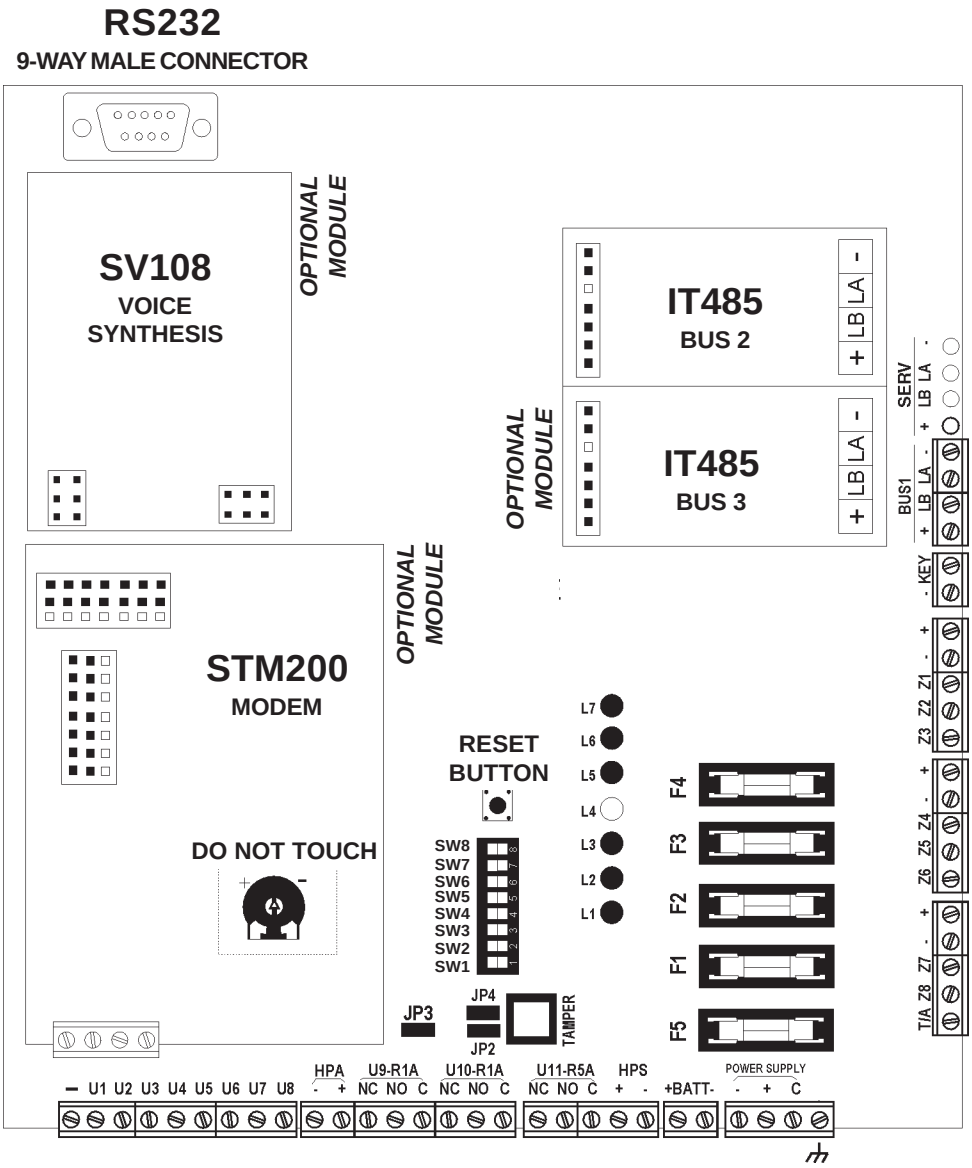
4.1 MP 200/64 BOARD



NOTE:
Active connection points for optional modules are shown by the symbol ■

4.2 MP 200/256 BOARD

NOTE:
Active connection points for optional modules are shown by the symbol ■

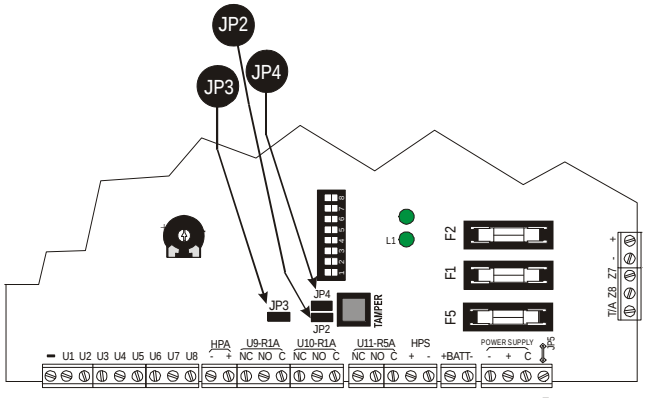


4.3 JUMPER DESCRIPTION

JP2: Jumper for connecting the anti-tampering micro. Install jumper if the micro is not fitted.

JP3: Jumper INSTALLED during production. **DO NOT TOUCH.**

JP4: If INSTALLED excludes control unit anti-tampering



4.4 FUSE DESCRIPTION

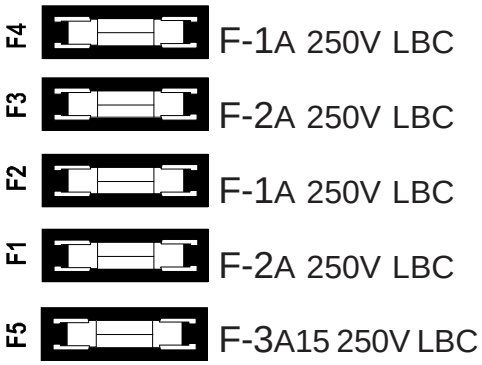
F1: 2A 250V protection for non-self-powered sirens

F2: 1A 250V sensor power supply

F3: 2A 250V power supply self-powered sirens HPS+

F4: 1A 250V BUS 1 line protection

F5: 3A15 250V battery charging protection



4.5 DESCRIPTION OF LEDS

L7 RED : **(ONLY MP200/256) BUS 3 CONTROL**
if present OPTIONAL module - IT485
WHEN ON: BUS 3 FAILURE

L6 RED : **BUS 2 CONTROL**
if present OPTIONAL module - IT485
WHEN ON: BUS 2 FAILURE

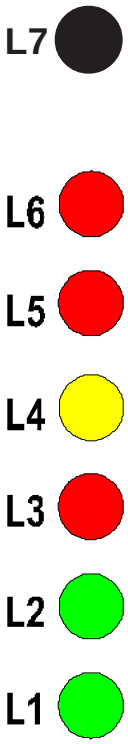
L5 RED : **BUS 1 CONTROL**
WHEN ON: BUS 1 FAILURE

L4 YELLOW: **TELEPHONE LINE ENGAGED**
FLASHING: LINE ENGAGED

L3 RED : **CONTROL UNIT FAILURE SUMMARY**
WHEN ON: FAILURE PRESENT

L2 GREEN: **SYSTEM STATUS**
WHEN ON: SYSTEM ACTIVE TOTAL
WHEN OFF: SYSTEM NOT ACTIVE
FLASHING: PARTIALLY ACTIVE

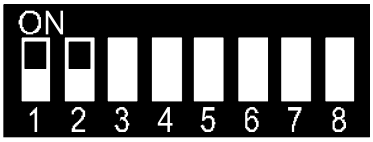
L1 GREEN: MAINS SUPPLY PRESENT /BATTERY CONTROL
WHEN ON: MAINS SUPPLY PRESENT
FLASHING: LOW UC BATTERY and any remote concentrator power supply unit
WHEN OFF: NO MAINS SUPPLY PRESENT



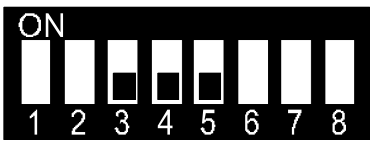
4.6 DIP SWITCH DESCRIPTION

- ***Default Setting:*** ***double balancing zone, Italian parameters***

1	2	ZONE MODES
ON	ON	NON BALANCED ZONES
ON	OFF	SINGLE BALANCING ZONE
OFF	ON	DOUBLE BALANCING ZONE



3	4	5	LANGUAGE PARAMETERS
OFF	OFF	OFF	ITALY
ON	OFF	OFF	FRANCE
OFF	ON	OFF	U.K.
ON	ON	OFF	SPAIN
OFF	OFF	ON	PORTUGAL
ON	OFF	ON	GERMANY
OFF	ON	ON	CZECH REPUBLIC
ON	ON	ON	POLAND



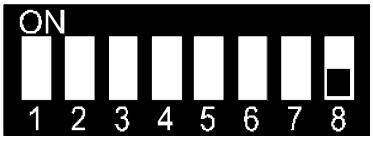
- Language parameter settings affect the language used by the local printer and naming default (Zones, Sectors, etc.)

NOTE: If you enter a different country from the current setting, you will then have to reload default parameters.

6 **NOT IN USE**

7 **NOT IN USE**

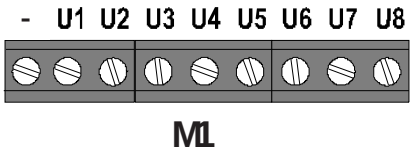
8	DEFAULT PARAMETRES
ON	LOAD DEFAULT PARAMETRES



4.7 TERMINAL BOARD DESCRIPTION

M1 TERMINAL BOARD

-	Supplementary electrical ouptut negative
U1	Electrical output, programmable, protected. Max current = 10 mA
U2	Electrical output, programmable, protected. Max current = 10 mA
U3	Electrical output, programmable, protected. Max current = 10 mA
U4	Electrical output, programmable, protected. Max current = 10 mA
U5	Electrical output, programmable, protected. Max current = 10 mA
U6	Electrical output, programmable, protected. Max current = 10 mA
U7	Electrical output, programmable, protected. Max current = 10 mA
U8	Electrical output, programmable, protected. Max current = 10 mA



M1

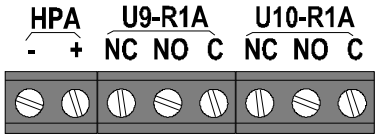
M2 TERMINAL BOARD

-	(-HPA) siren power supply negative
+	(+HPA) siren power supply positive (2A 14.5V) protected by F1
NC	NC relay contact
NO	NA relay contact
C	Relay com.

RELAY U9 = ROBBERY (I MAX = 1A)

NC	NC relay contact
NO	NA relay contact
C	Relay com.

RELAY U10 = SABOTAGE (I MAX = 1A)



M2

When the control unit is powered up, the 2 relays, U9 and U10, are normally excited. During normal operation the NC and NO terminals will appear swapped.

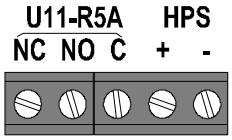
M3 TERMINAL BOARD

NC	Relay 3 NC contact
NO	Relay 3 NA contact
C	Relay com.

RELAY U11 = FREELY PROGRAM. I MAX = 5A

+	(+HPS) Positive self-powered siren power supply (I max 2A), protected by F3
-	(-HPS) Negative self-powered siren power supply

NOTE: the HPS+ will fail if there is no mains power supply; for this reason it can only be used to connect self-powered devices.



M3

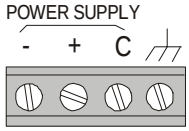
M4 TERMINAL BOARD

+	Battery positive. Protected by F5.
-	Battery negative

M4

M5 TERMINAL BOARD

-	Negative power supply input
+	Positive 14.5V power supply input
C	Power supply unit control (connect to power supply unit terminal C)
⏚	Ground terminal (see para. Ground connection)



M5

M6 TERMINAL BOARD

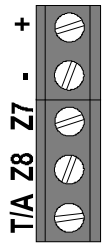
+ Positive sensor power supply

- Negative sensor power supply

Z7 Zone 7: programmable input

Z8 Zone 8: programmable input

T/A Tamper/self-protection input balanced positive via an R =15Kohm.



M6

M7 TERMINAL BOARD

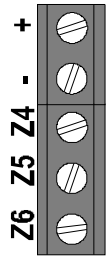
+ Positive sensor power supply

- Negative sensor power supply

Z4 Zone 4: programmable input

Z5 Zone 5: programmable input

Z6 Zone 6: programmable input



M7

M8 TERMINAL BOARD

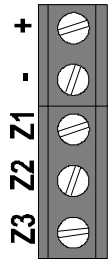
+ Positive sensor power supply

- Negative sensor power supply

Z1 Zone 1: programmable input

Z2 Zone 2: programmable input

Z3 Zone 3: programmable input

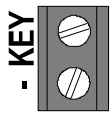


M8

M9 TERMINAL BOARD

- Reference negative

KEY Electromechanical key input
Note: this dedicated input (not programmable) may be connected to an electromechanical normally open push contact key. Each complete sequence: open - closed - open of the key contact causes a total system status change (of all sectors). If this input is not used, it may be left free and with no special device.



M9

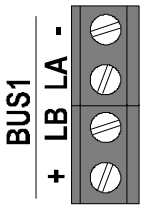
M10 TERMINAL BOARD

- Device power supply on serial tamper input will be

LA serial data line

LB serial data line

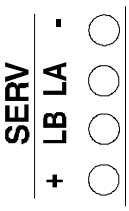
+ Device power supply on serial line



M10

M11 TERMINAL BOARD

Support terminal board for service keypad (in parallel with BUS1 terminal boards). To allow programming with a service keypad without disconnecting peripherals already connected.

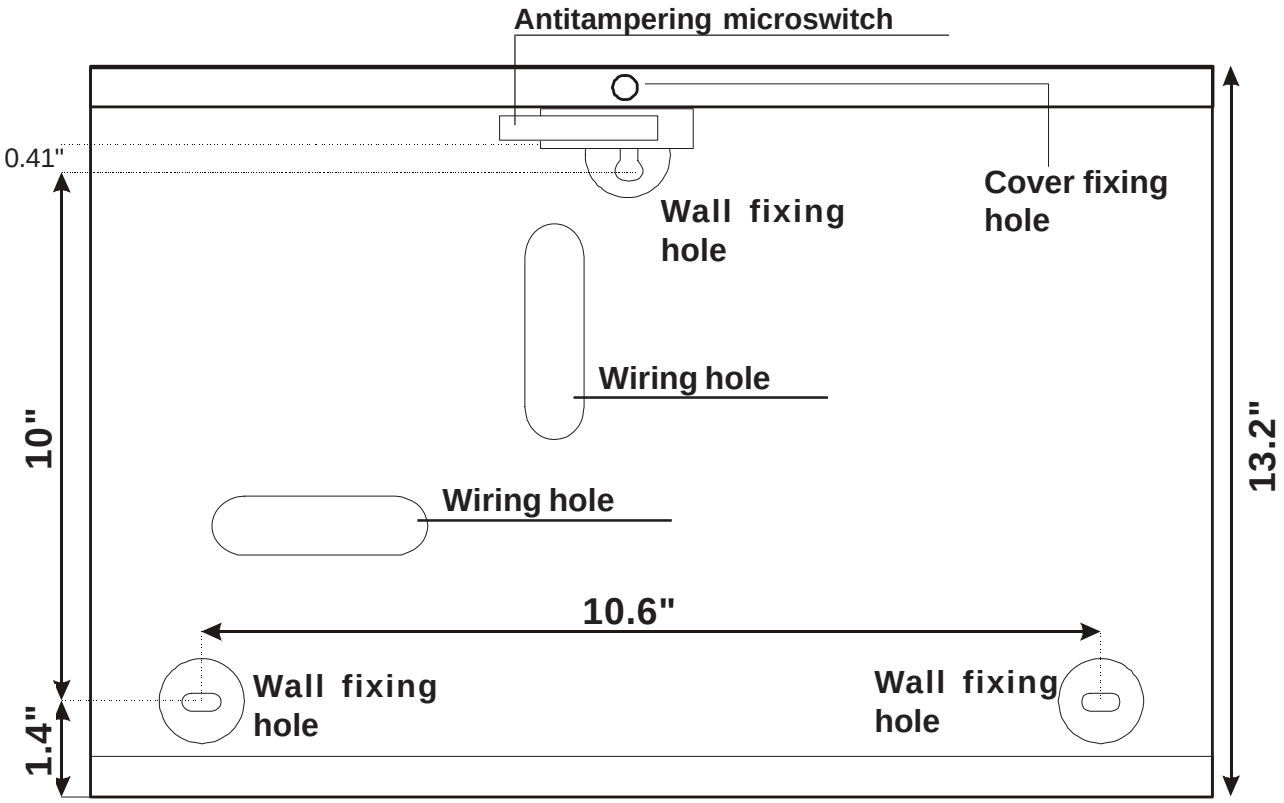


M11

5.0 Installation Procedures

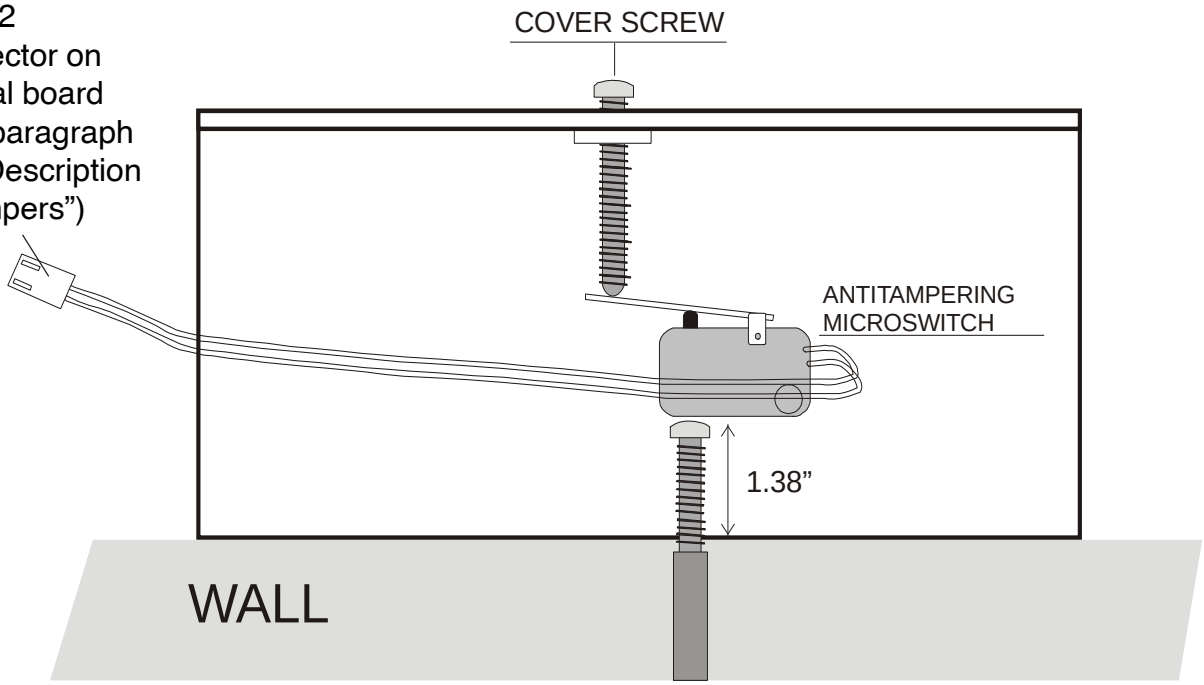
- The MP200 control unit must be located in a sufficiently large and suitably air-conditioned room where there are no strong electromagnetic fields. The environment must not be subject to excessive changes in temperature. We recommend fitting the unit at an easy to reach height so that it is accessible for installation and maintenance operations. Fit the device to the wall using plugs.

5.1 STANDARD CABINET WALL MOUNTING

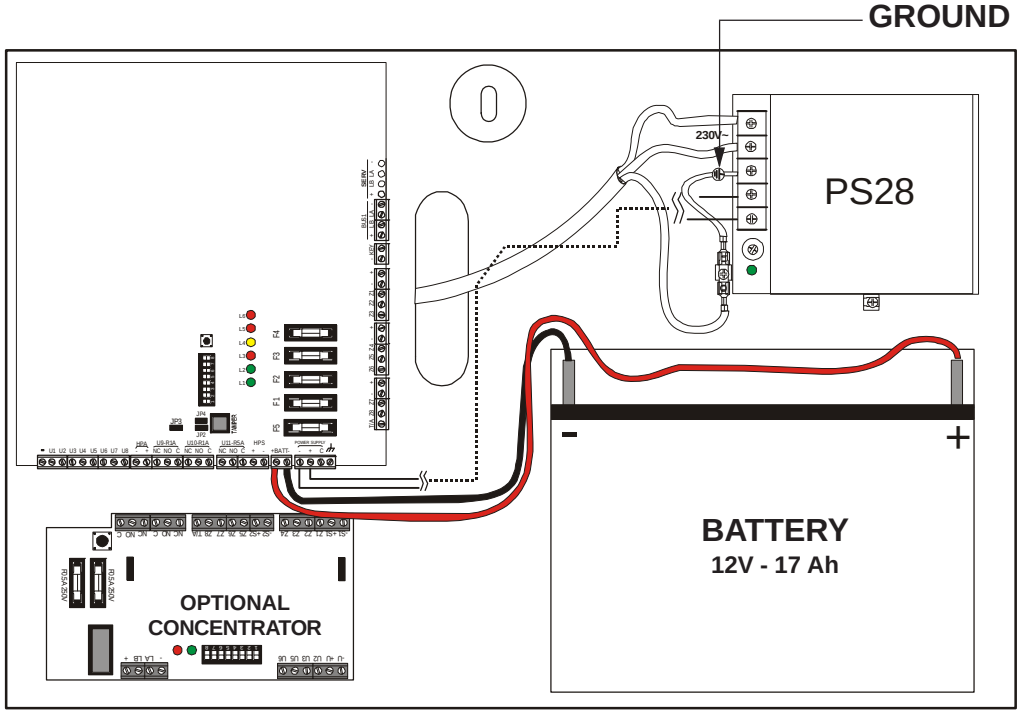


ANTIOPENING-ANTIREMOVAL MICROSWITCH

To JP2 connector on central board (see paragraph 4.3 “Description of jumpers”)



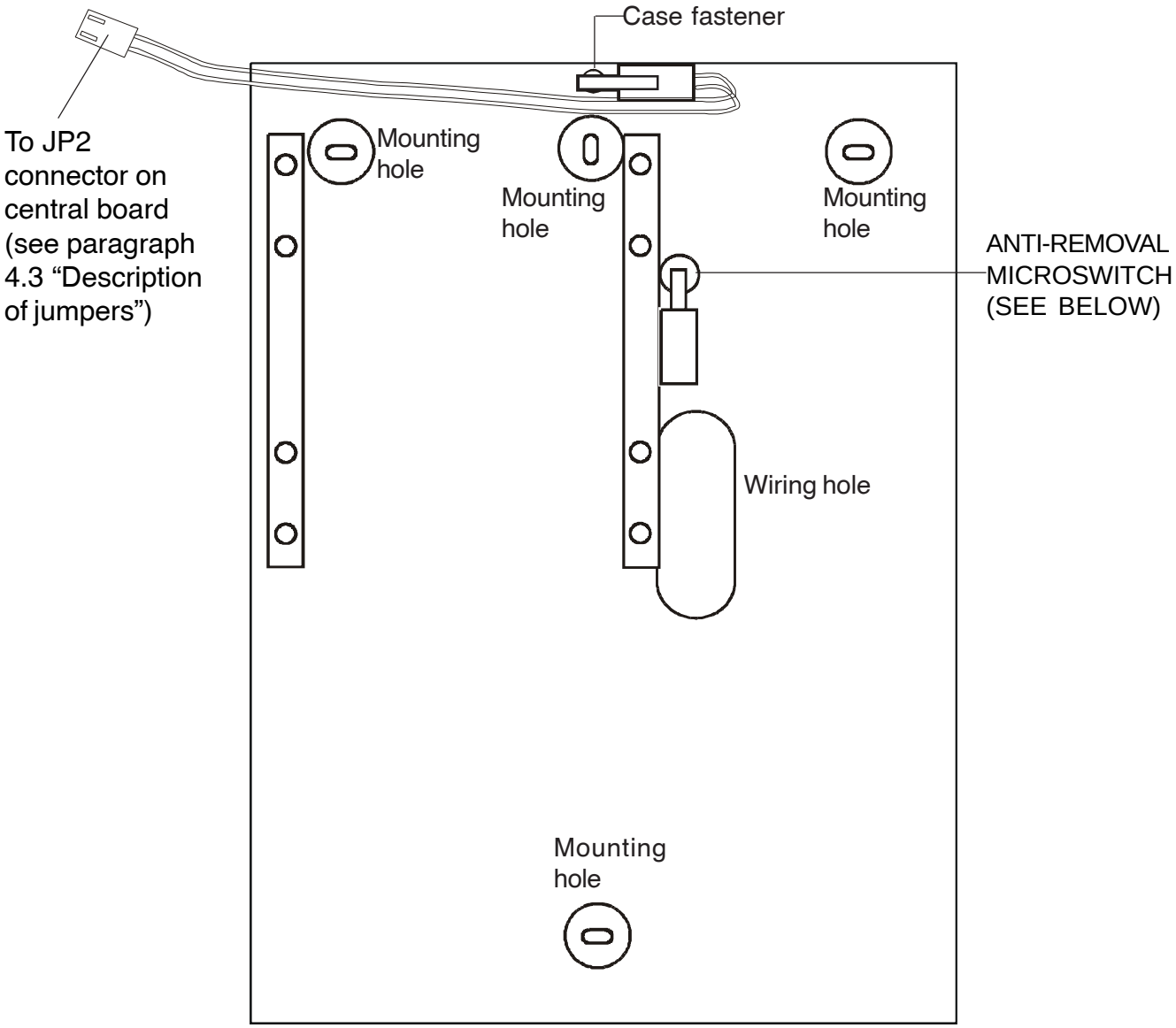
5.1.1 Device lay-out in the cabinet Power Supply Connections



PS28 FUSE

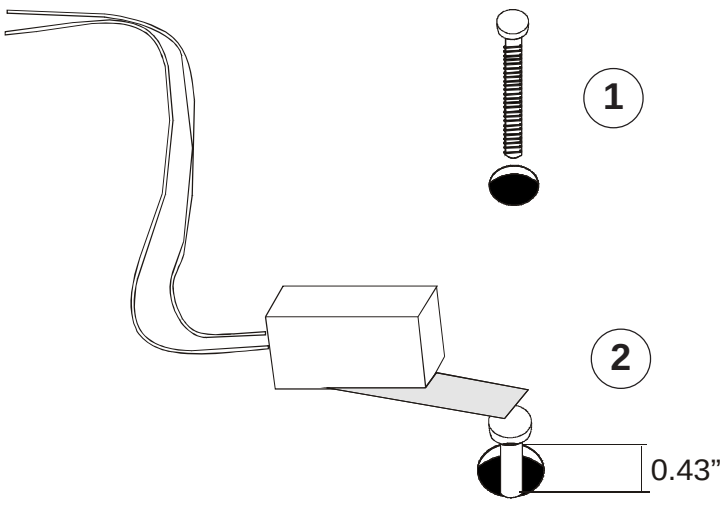
The PS28 is fitted with a type F safety fuse: 3A15/ 250V LBC on the 230V mains input. Please do not open the PS28 power supply unit unless 230V~ mains power has been disconnected.

5.2 OM CABINET WALL MOUNTING

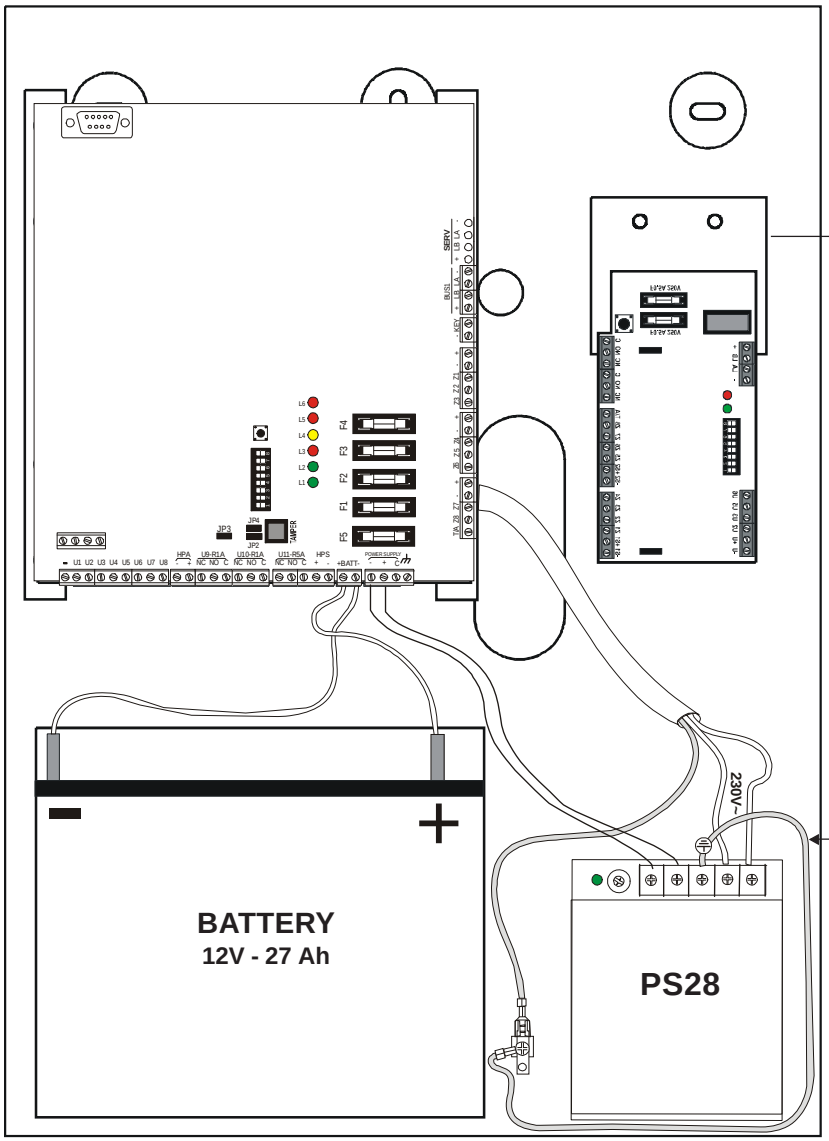


INSTALLING THE CABINET ANTI-TAMPERING SWITCH

Connect anti-removal micro switch wires to “+” and “T/A” terminals (balanced input)



5.2.1 Devices lay-out in the cabinet Power Supply Connections



In the space beneath the control unit plate, there is a set-up for installation of 2 concentrators for 4 zones (FIG.1) or for fitting an 8-zone concentrator (FIG.2)

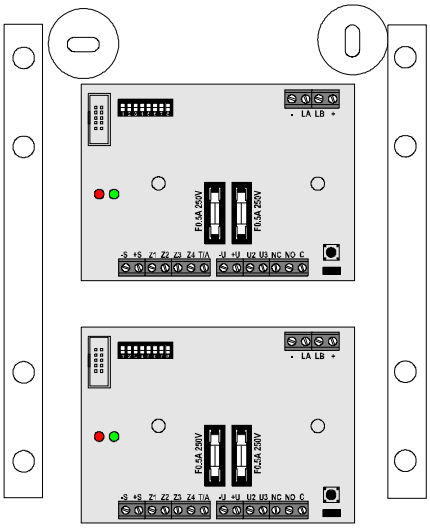


FIG.1

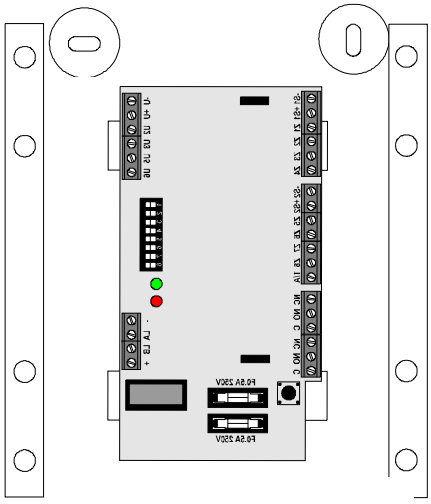


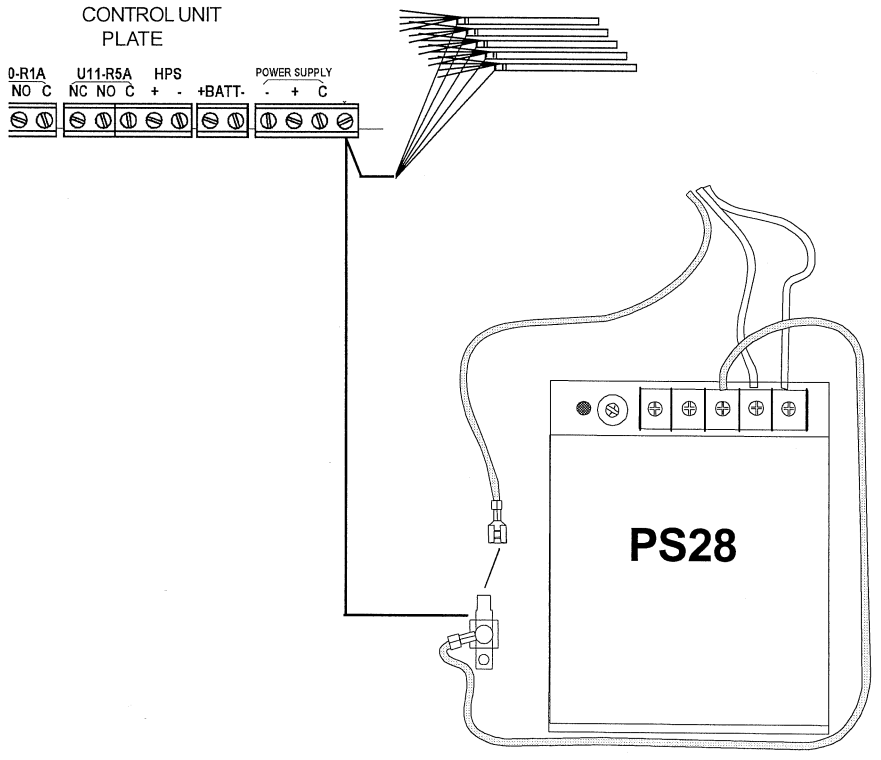
FIG.2

5.3 GROUND SHIELD CONNECTIONS

- For special installation requirements, where necessary, ground cable shields may be connected to the terminal board " ⏚ " as shown in the illustration below.

  Note: Excellent EMC immunity is achieved by connecting cable sheaths to the NEGATIVE (-12) power supply, ONLY ON THE CONTROL UNIT SIDE.

- To connect ground cable sheaths the board ground terminal and the power supply terminal must be connected with leads.

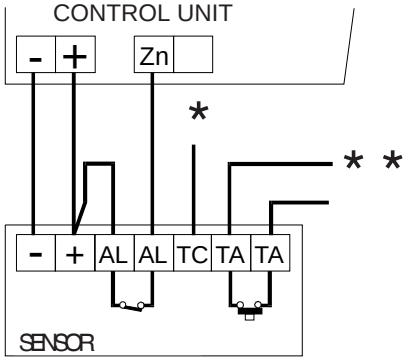


6.0 Operation modes and connections

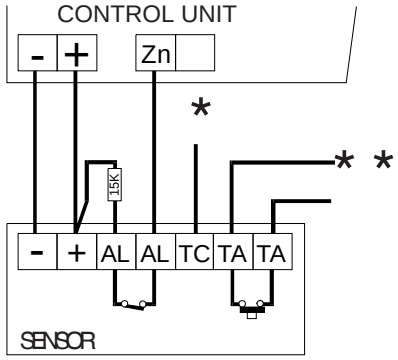
- The control unit zones may operate in one of the following three modes:
  - *Non Balanced Zones (NC)*: when at rest they must be closed directly in the positive direction (+12V). In this way they can indicate only that they are being opened, but will not indicate tampering.
  - *Single Balanced Zones*: when at rest they are closed in the positive direction (+12V), via a 15K resistance so that the voltage level is kept below that at which the zone is held to be open. If the level exceeds the predefined limit, for instance because of an attempt to close directly in the positive direction, which is the equivalent of excluding the balancing resistance, a Sabotage attempt will be signalled. Consequently this offers a greater level of security compared to a non balanced zone.
  - *Double Balanced Zones*: this mode resembles single balancing, but offers an extra option of being able to differentiate alarm and tamper events on a single line, based on different voltage levels derived from a divider made up of two 15K resistances. In this mode Sabotage is also recognized if, for instance, a cable is cut.
- The mode is selected by positioning the special dip switches present on the control unit. See Paragraph 4.6
- The intervention limit rated voltage measured at the control unit inputs is shown below:

- *Non Balanced Zones (NC)*:	closed (rest)	from +2.05V to + V power supply
	open	from +2.05V to 0V.
- *Single Balanced Zones*:	closed (rest)	from +2.05V to +3.75V
	open	from +2.05V to 0V
	sabotage	from +3.75V to +V power supply
- *Double Balanced Zones*:*:*	closed (rest)	from +2.05V to +3.75V
	open	from +2.05V to +1.24V
	sabotage	from +3.75V to +V power supply
	sabotage	from 1.24V to 0V

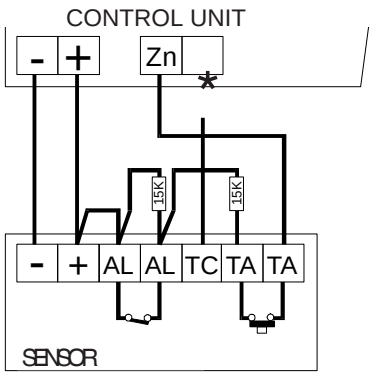
Non balanced zones connected with NC sensor



Single balanced zones connected with NC sensor



Programmed, double balanced zones connected with NC sensor



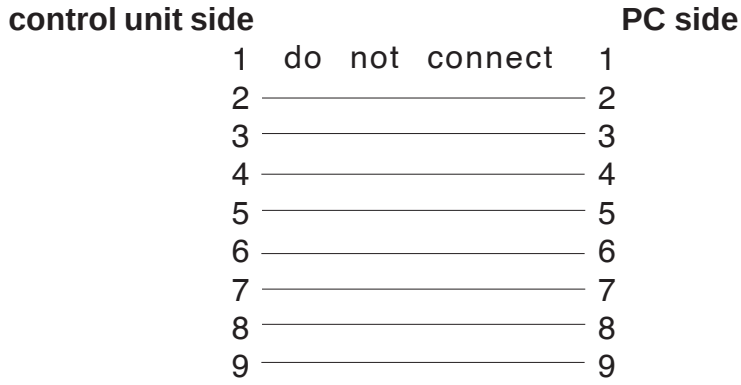
* * To connect in series with other sensors and one system tamper

* To connect to a programmed TC output of the control unit

7.0 Connections to local PC/Printer

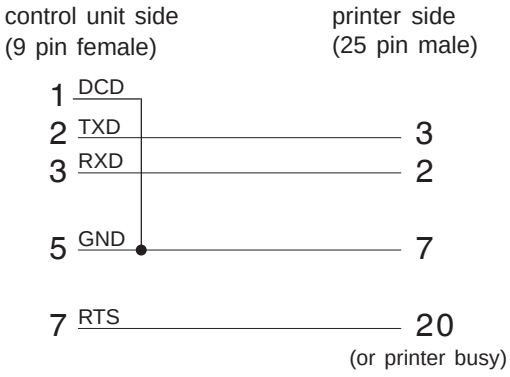
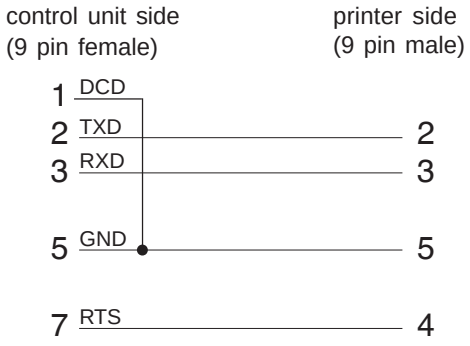
7.1 CONNECTION TO A LOCAL PC

- A local connection to a PC may be achieved with FASTLINK software using the RS232 interface present on the control unit board. A straight, 9-pole cable and a DB9 female-to-female connector shall be used. Do not connect pin 1 (on the control unit side).



7.2 CONNECTION TO A LOCAL PRINTER

- A connection to a serial printer may be set up via the RS232 interface present on the control unit board, to obtain reports on system events. A specific lead for the type of printer is required. The following diagram regards an EPSON LX300 printer.

PRINTER 25 PIN FEMALE	PRINTER 9 PIN FEMALE
	

- Serial transmission parameters are the following: data bits: 8 bit, parity: no stop bit: 1 bit, baud-rate:1200 bps

7.3 SERIAL ALARM MANAGEMENT

The MP 200 is capable of sending different types of alarms, in real time, through a direct RS232 connection to a dedicated PC with the Fast Link being run.
Connection between the PC and the MP 200 shall always be active to ensure continuous monitoring. The serial cable shall be wired and connected as described in paragraph 7.1 (“Connecting to the local PC”).
Note. Using this performance will automatically exclude the event dispatch through the telephone communicator in any mode (vocal, modem, numeric). Therefore, the installation of the STM 200 Modem Communicator card may be avoided, or a telephone number (if any) need not be programmed.

The alarm dispatch through serial line shall be enabled by accessing the User Menu through the Master code (default: 111111). Scroll through the menu items until you reach the “Remote Access Program.” Item, then enable “Remote Surveillance Remote Access” in the “Always Enabled” mode.

From the Fast Link main page corresponding to the MP200 system to be monitored, get connected (after selecting “RS232 direct”) by means of the “Call” button. After connection has been made, open the “Alarm Archive” page. Manual Control shall be enabled on the Fast Link (Archives > Configuration > Call Management).

Below are the events that can be sent through the RS232 line:
Theft (Instant, Delayed, 24-h with sirens, Delayed path, Last exit) – Sabotage – Fire – Line error – System faults – Battery low – No mains supply – Maintenance.

8.0 Maintenance procedure

Maintenance procedure is useful whenever the installer must open one or more tampering systems of any device, including CU, to perform operations such as repair, replacement, etc. without generating tampering alarms. In this condition, also a possible temporary disconnection of one or more serial connections is not generating any tampering alarms.
To access maintenance, following operations are performed:

- Entering installer code (where installer code is not validated, access has to be made via master code and installer code has to be validated).

- Within one minute, opening control unit tampering system: no tampering alarm is generated and a start of maintenance event is created, stored in the historical file and sent via telephone line to the centres (if system on/off sending is validated, see STM200 manual para. 6.16).
- Remaining in maintenance procedure until control unit tampering system is closed back, or until the last peripheral tampering system is still open.

- At the time when control unit tampering system input is closed back, or when the last peripheral tampering system is still open, an end of maintenance event is generated, stored in the historical file and sent via telephone line to the centres (if system on/off sending is validated, see STM200 manual para. 6.16).

Notes:
It is reminded that during maintenance it is not possible to start the system and, which is more important, it is not possible to exclude areas; generally, the system is out of service.
Tampering systems open during maintenance are not stored in the historical file but signalled in real time on (S LED) keyboards without storing the alarms.

9.0 Troubleshooting

9.1 SYSTEM FAILURE

- The following systems failures are managed by the MP200:
  - E-eprom failure
  - Serial lines (BUS) failure
  - Modem failure
  - Fuse breakage on the control unit and on the remote unit

- The E-eprom failure may arise when saving data in a protected memory (e.g. change code, store an event in the Log Event memory etc).
- The serial line (BUS) failure may arise for any dialogue problems that occur between the control unit and the peripherals units, caused by tampering or an accidental breakdown.
- The modem failure may arise for any communication problems occurring on the telephone line. See details in the STM 200 Modem Communicator manual.

- In general systems failures are indicated by the following:
  - red LED 3 lights up on the control unit board
  - a sponaneous message on all KP200D keypad displays, with relative details.
  - detailed description of the event is entered in Historic Events memory.
  - switching of any programmed Failure outputs
  - communication to programmed telephone numbers (if the STM 200 Modem Communicator board is present).
- Removal of the cause of the failure will restore normal conditions and thus generate Failure Eliminated events via the Modem/Communicator and in the Historic Events memory.

9.2 POWER FAILURE

- A power failure to the control unit as well as to any concentrator remote units is managed according to the length of time the power supply is interrupted. In fact, it is more usual for mains interruptions to last just a few minutes due to momentary problems suffered by the service supplier. The MP 200 treats these interruptions/ recoveries as temporary events. If the power failure exceeds an hour the event is considered to be a breakdown.

- <u>In the case of temporary mains interruption/recoveries</u>, the sequence of events managed by the MP 200 is as follows:

  - when power fails: LED L1 on the control unit switches off.
    LED  on the keypad switches off.
    A "power failure" + details is recorded in Historic Events.

  - when power is restored: LED L1 on the control unit switches on.
    LED  on the keypad switches on.
    “Mains OK” + details is recorded in Historic Events
    “Mains Not OK” + details is recorded in Historic Events.
    Communication of the power failure event to programmed telephone numbers (if the STM200 Modem Communicator board is present).

- If the mains power supply failure continues:

- after one hour with no power:	Switching of Breakdown programmed outputs. A spontaneous message appears on the keypad display: “Message” + details. The red LED flashes rapidly on any key configured readers. “Mains Not OK” + details is recorded in Historic Events. Communication of the power failure event to programmed telephone numbers (if the STM200 Modem Communicator board is present).
- when power is restored:	an immediate return of power is handled as described on the previous page
after 15 minutes of mains OK:	Breakdown programmed outputs are restored.
- when power is restored:	an immediate return of power is handled as described on page 21.
after 15 minutes of mains OK:	Breakdown programmed outputs are restored. The spontaneous message on the keypad display is erased. The red LED on any configured key readers will switch off (any alarm memory remains active). “Mains signal OK”is recorded in Historic Events. Communication of the power failure event to programmed telephone numbers (if the STM200 Modem Communicator board is present).

10.0 Conductor Sizing

10.1 SECTION SIZING OF CONDUCTORS SUPPLYING A SENSOR OR AN ACTUATOR (IN D.C.)

- The purpose of this paragraph is to offer a method for calculating the section of cables that supply a sensor or an actuator. As well as defining the battery capacity and defining the current to be supplied by the power supply unit, the correct size for cable section ensures that devices receive the best voltage values, in line with criteria laid down by the manufacturer. A sensor or an actuator that is supplied with a lower value than the minimum declared means that the device will risk instability, lack of efficiency and poor protection from interference.

10.1.1 Procedure

- A series of parameters are involved in creating the quality of the power line (screening section, connections, welding, etc). The objective is to size the cable section that make up the line between the source (for instance the control unit, the power supply unit, a junction) and a load (for instance a sensor, a siren, a junction).

source ***load***

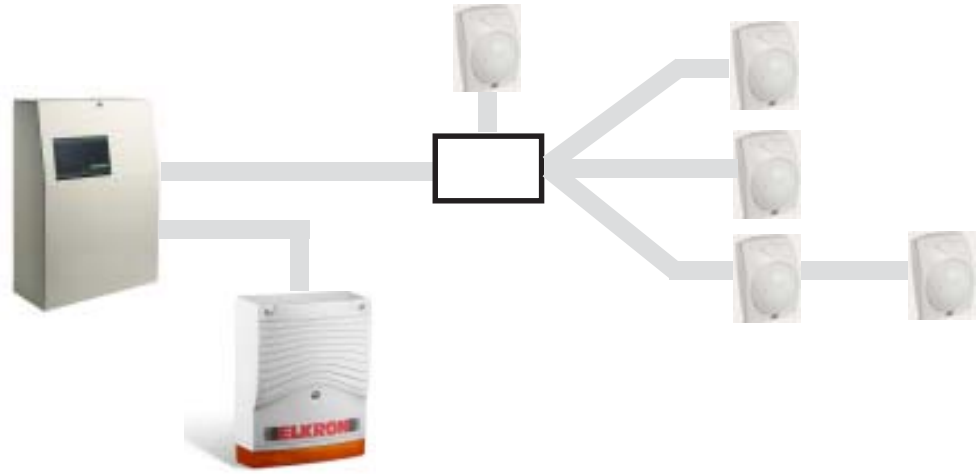
- There follows a list of some of the data that should be read:

Source power	**Vs**	for a correct result it is preferable to consider a critical situation such as a mains power failure.	**13V**
Minimum power for the load	**Vc**	read from the manufacturer's data, for instance 11.5:15, read the lowest value in the range	**11.5V**
Load consumption	**Ic**	read from the plaque data or measured with a multimeter (in milliamperes) NOTE: if the devices are NOT self-powered, use the highest consumption (when idle, during an alarm, on stand-by)	**10mA**
Length of the line	**L**	length of cable laid between the source and the load (in metres)	**5 0 m**

• When the data has been obtained, use it in a simple formula to obtain the size of the smallest cable section possible for ensuring best functioning: minimum section Sm, expressed in square millimetres must be greater than or equal to: **Sm (L x Ic x 0.038) : [(VS - Vc) x 1000]**

- In the example:
  Sm (50 m x 10 mA x 0.038) : [{13V-11,5V) 1000) = 0.012 mm²
  The cable for our installation must therefore have conductors with a section greater than or equal to **0.012 mm².**

The method described may also be used quite successfully to size a more complex power supply network, with ramifications, such as that shown below:



In this case it will be sufficient to identify the points of connection, beginning at the source and calculating for each single section that is included between the two points.

NOTE: in any case, standards specify that cable section should never be less than 0.1 mm²

10.2 NORMOGRAM FOR SIZING CABLES

- This technical sheet offers a graphical method that will make it possilbe to calculate cable sizing.

- It is possible to find:
  - the voltage drop △V that will occur as a consequence of the length of the line L, of power consumption I, and section S of the cable used;
  - what section S is required to obtain no more than a voltage drop of △V as a consequence of the length of line L and of power consumption I;
  - maximum amount of power consumption as a consequence of the length of line L, the voltage drop △V accepted and the section S of the cable used.

EXAMPLE 1

- a siren that consumes 2A (2000mA) with a cable section of 1mm must be connected over a distance of 100 metres. What voltage drop will be found at the end of the line?
  Solution
  Trace a segment that starts from length **L** (100 metres) of the line then intersects **S** (cable section) in **1** (mm²) and extend it to the central line **R**. From this point trace a second segment that passes through power consumption **I** (2000mA) and extends as far as the line △V.
- with this procedure the voltage drop that occurs in a 100 metre line with 1mm section cable and 2A power consumption has been found and it is 3.7V.

EXAMPLE 2

- On the basis of example 1, the decision is made to accept a maximum voltage drop of no more than 2V.
  Solution

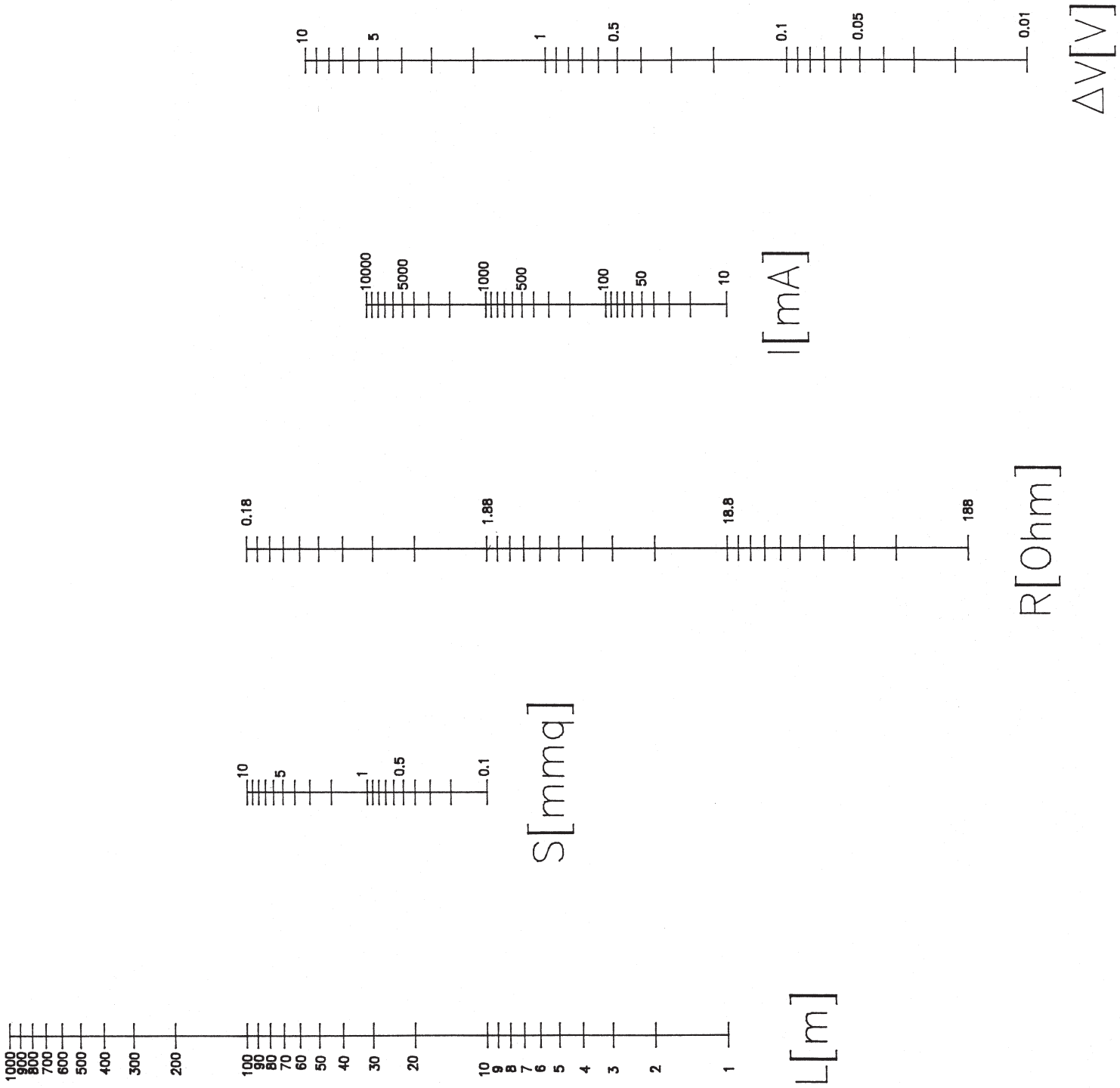
  Trace a segment that starts from △ V (2V) then extends to central line **R**, intersecting **I** in 2000 (mA), which is the power consumption of the siren when active. From this point trace a second segment that meets at **L** (100 metres). At intersection **S** it will be possible to read the minimum section value for the cable required for the purpose, in mm², which will be slightly less than 2 mm². This procedure can be used to obtain any other variables that may be required.

OBSERVATIONS:

1. The graphical use of the normogram is bilateral. In fact, the aforementioned examples show how it is possible to begin with the parameters shown on the left (line length and cable section) to then arrive at the voltage drop and vice versa, which is to say unless we wish to accept a maximum voltage drop V with an established circulating current, it is possible to find which cable section S is required with respect to the length L.

2. For each parameter (cable section, length, power consumption, accepted voltage drop) the logarithmic scale has been sized in such a way as to consider the values of more current use, consequently abandoning those that are either too large or too small, that are not suitable for the applications considered in this document.

NORMOGRAM



11.0 Batteries and Power Supply Unit sizing

11.1 CALCULATING SYSTEM AUTONOMY

- The purpose of this paragraph is to offer a method for calculating the consumption of a system and as a consequence pinpoint actual self-sufficiency during a mains 230V~power failure.
- First of all the consumption data during service must be collected for all elements in the alarm system. There follow several examples of indicative consumption data taken from the product instructions or obtained by measuring with a multimeter (see chart below).

WHEN IDLE:

1 Control unit	70 mA
1 Connector	15 mA
2 infrared sensors	20 mA
1 dual sensor	32 mA
1 telephone dialing device	30 mA
1 outdoor self-powerd siren	22 mA
1 indoor siren	0 mA
Total consumption when idle:	190 mA

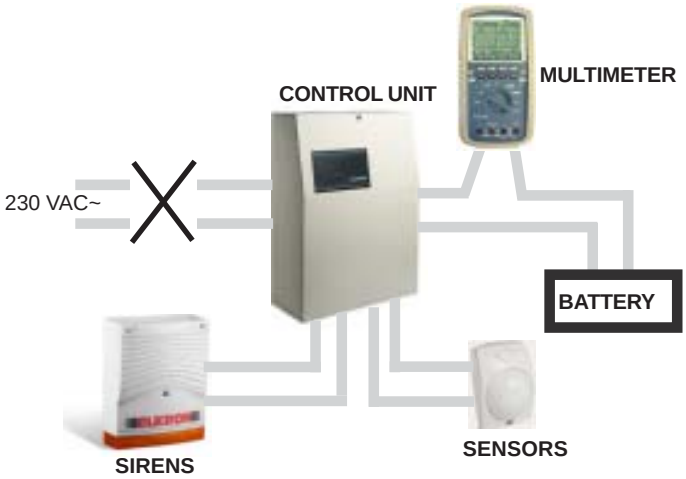
DURING ALARM:

Consumption when idle:	190 mA
1 telephone dialing device	50 mA
1 indoor siren	1000 mA
Total consumption during an alarm	1240 mA

11.2 HOW TO CALCULATE BATTERY SIZE

- The formula for defining the minimum battery capacity for achieving “n” hours of self-sufficiency is:

$$\frac{\text{(Consumption when idle x no. hours x 1.25) + (Consumption during alarm x minutes of alarm x 0.02)}}{1000}$$



Example of how to calculate minimum battery capacity. The following data is required:

- Total control unit and means of alarm consumption when idle (all components that are not self-powered) in mA* in the example:190mA
- Length of self-sufficiency required in hours: in the example 24h
- Total consumption during alarm in mA: in the example 1240 mA*
- Duration of an alarm cycle in minutes: in the example 5 minutes

* From technical data sheets or by supplying the system without 220V power mains network and inserting a current measurement tester between the battery and the control unit

$$\frac{\text{(190 mA x 24 hours x 1.25) + (1,240mA x 5 minutes x 0.02)}}{1,000} = \frac{5,700 + 124}{1,000} = \textbf{5.82 Ah}$$

- This means that to ensure 24h autonomy the battery to use must have a rated capacity on its label equal to or greater than 6 Ah.

11.3 HOW TO CALCULATE POWER SUPPLY UNIT SIZE

- The sizing of the power supply unit is essential if the system is to operatore correctly. Often the problems encountered on security systems are caused by sizing errors in batteries and power supply units.

- To be sure that the power supply unit is able to offer the correct power supply, **the following data is required:**

  - Total control unit, sensor and means of alarm consumption when idle (all components that are not self-powered) in mA* in the example.

  - **Minimum recharging time** for batteries, when required, in hours.

  - Total capacity of batteries used in the system and charged by the same power supply unit (sum of the control unit and means of alarm battery capacities).

- Voltage supplied with continuity by the power supply unit, in Ah =

$$\frac{\text{Control unit battery capacity + means of alarm battery capacity} \times 800 + \text{Total consumption when idle}}{\text{hours}}$$

- In the example being examined (supping the control unit has one 6.5 Ah battery and 1 siren with a 1.9 Ah battery), and applying this ratio the following is obtained:

$$\text{Power supply unit current} = \frac{6{,}5\ \text{Ah} + 1{,}9\ \text{Ah}}{24} \times 800 + (190\ \text{mA}) = 280\ \text{mA} + (190\ \text{mA}) = 470\text{mA}$$

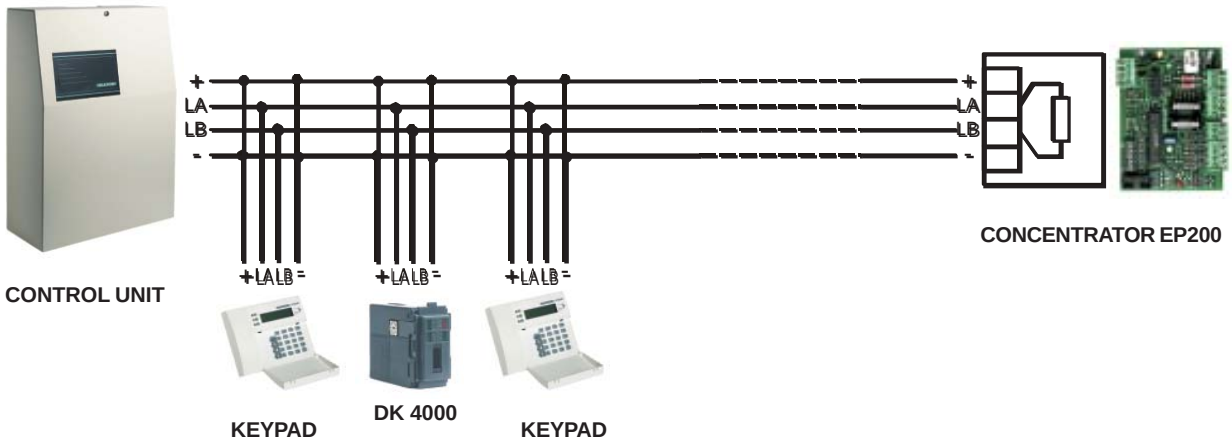
- Thus the power supply unit for our system will have to supply with **continuity** a current of 470 mA or greater, to ensure the functioning of the system and at the same time recharge the batteries correctly.

12.0 Installation Phases

- *The following is a list & order of the fundamental phases that must be followed when starting up a new system.*

NOTE: points 1 to 7 must be carried out with the control unit powered down.

1. Jumper control and setting for the anti-removal micro on the control unit board: see Paragraph 4.3.
2. Setting of control unit board dipswitches (zone mode, national parameters): see Paragraph 4.6
3. Connect control unit board to optional modules (STM 200 Modem Communicator; SV 108 Voice Synthesis; KV 100 Synthesis Kit).
4. Calculate the total load on the serial line according to the peripherals used, and if necessary split it equally over two or three *(MP200-256)* BUS. In this case, connect the control unit board to the IT 485 serial interfaces. Bear in mind that consumption on one serial line cannot exceed a value of 800mA.
   NOTE: any addition of a serial to a previously programmed control unit means that the programming will be lost as the acquisition of a new serial requires that the control unit be restored to default parameters.
5. Address all peripherals (keypads, concentrators, connectors, splitters etc.)
6. Connect all peripherals on each serial as "loops". See figure below. Each serial line must be terminated with a resistance of 100/120 ohm 1/2 watt connected between the LA and LB leads of the furthest peripherals.



7. Connect all sensors and actuators (sirens, controllers etc.)
8. Connect the power supply unit to the cotnrol unit and then to the mains power supply (para. 5.1.1 / 5.2.1). The control unit and the peripheral units will then be powered up. Check that they are working correctly, first with an eyecheck (LEDs light up, display on keypads etc.). In case of short circuits on any part of the system, the power supply limitation circuit will intervene to avoid damage. For this reason, in this phase the control unit battery should not connected.
9. After checking that the system is working properly, connect the control unit battery to the respective poles.
10. Set default parameter values:
    see Paragraph 1.4 in the Functioning and Programming manual.
11. Perform system configuration procedure for all devices:
    see Paragraph 6.0 in the Functioning and Programming manual.
12. Program the system according to user requirements:
    see Paragraph 7.0 in the Functioning and Programming manual.
13. Carry out a full system test.

13.0 Technical Characteristics

NOTE: for Safety Instructions: see the bottom of page 2 in this manual!!!

CONTROL PANEL

- Supply voltage ..... 230V~ 50Hz +10-15%
- Maximum power consumption at rated voltage 500mA
- Control unit board power consumption at 12V- ..... 210mA (at ON with NC inputs at +) – MP200/64 board
- Control unit board power consumption at 12V- ..... 235mA (at ON with NC inputs at +) – MP200256 board
- CU board power consumption + 1KP200D keypad ... 250mA a 12V- +) – MP200/64 board
- CU board power consumption + 1KP200D keypad ... 275mA a 12V- +) – MP200/256 board
- Power consumption of the KP200D alone ..... 40mA (with network LED on – backlight off)
- Control unit operating voltage ..... from 10V5 to 15V—
- PS28 power supply unit consumption (M.S-40-15) ..... 13.8V— (14.5V set during manufacturing)
- Max. current available from PS28 (Meanwel S-40-15) . 2.8A (1.4A max. current available from control unit)
- Max. ripple .....100 mV with I = 2,8A
- Current available for ext. devices ..... 315mA (vers. MP200/64 + 1 KP200) 24hr autonomy:17Ah battery
  290mA (vers. MP200/256 + 1 KP200) 24hr autonomy: 17Ah battery
  415mA (vers. MP200/64 OM + 1 KP200) 24hr autonomy: 24Ah battery
  415mA (vers. MP200/256 OM + 1 KP200) 24hr autonomy: 24Ah battery
  415mA (vers. MP200/64 OM+ 1 KP200) 24hr autonomy: 27Ah battery
  415mA (vers. MP200/256 OM+ 1 KP200) 24hr autonomy: 27Ah battery
- Batteries for housing in metal case ..... 12V - 17Ah metal case vers.MP200/64, MP200/256
  12V- 24/27Ah metal case version MP200/64 OM, MP200/256 OM
- Anti-tamper ..... 1A - 24V—
- Operating temp. guaranteed by the manufacturer .... -10°C + 55°C
- Operating temp. certified by IMQ ..... + 5°C + 40°C
- Performance level guaranteed ..... I (NC lines positive); II (single/double balance lines)
- Max. length of serial line between control unit/periph. 500 metres* (cable sec. 2x0.75 to supply + 2 x 0.22 x data)
- Min/max input time ..... from 00 sec. to 180 sec. per 10 sec. step
- Min/max output time ..... from 00 sec. to 180 sec. per 10 sec. step
- Robbery alarm time U9 relay ..... 30sec, 1, 3, 4, 5, 6, 7, 8, 9 min.
- 24h alarm time U10 relay ..... 30sec, 1, 3, 4, 5, 6, 7, 8, 9 min.
- Max. current available from electrical output ..... 10 mA supplementary U1 – U8 exits
- Flat battery limit setting 11.4V
- Protection level of control unit case ..... IP30 - IK04
- MP200/64 - 256 standard case size ..... 330 x 415 x 85 mm
- MP200/64 - 256 OM case size ..... 445 x 325 x 145 mm

NOTE: The following models are covered by IMQ - SECURITY SYSTEMS:

MP200/64-OM with a 17Ah battery; 24Ah; 27Ah (large case)
MP200/256-OM with a 17Ah battery; 24Ah; 27Ah (large case)

DEDICATED ACCESSORIES

EP200/8Z Concentrator

- Supply voltage ..... 12V min 10,5V max 15V
- Power consumption at 12V rated voltage— ..... 48 mA max. with all inputs NC (with 2 R/G LEDs flashing)
  28 mA max with all inputs balanced
- Type of interface ..... RS485 serial protocol
- Max. length of serial line between concentrator/CU .... 500 metres* (cable section 2x0.75 for power supply + 2 x 0.22 x data)

Kp200d Remote Keypad

- Supply voltage ..... 12V— (from motherboard – serial line)
- Minimum/maximum operating voltage ..... da 10.5V a 15V—
- Power consumption at 12V rated voltage— ..... 40 mA (system ON - network present – backlight off)
  78 mA max. (backlight on and all LEDS lit)
- Type of interface ..... RS485 serial protocol
- Max. length of serial line between concentrator/CU .... 500 metres* (cable section 2x0.75 for power supply + 2 x 0.22 x data)
- Anti-tamper/anti-removal ..... standard with uncoded identification of each element tampered with
- Protection level of case ..... IP30 - IK04
- Max. number of possible combinations ..... 100,000 for each single access code
  10,000,000 for remote management and remote surveillance code

Stm200 Modem Board

- Power consumption when idle at 12V— ..... 18 mA
- Max. power consumption (during transmission) ..... 40 mA

SV108 Voice synthesis Module

- Power consumption at 12V— ..... 20 mA
- Max. power consumption (during transmission) ..... 25 mA

Dk4000 Series Connectors and Splitters

- Supply voltage ..... 12V— (taken from the motherboard – serial line)
- Min/max operating voltage ..... da 10.5V a 15V—
- Power consumption at 12V— ..... 13 mA (all LEDs ofF)
  35 mA max. (LEDs1-2-4 lit)
  60 mA with key inserted (code transmission)
- Type of interface ..... RS485 serial protocol
- Max. length of serial line between concentrator/CU .... 500 metres*(cable section 2x0.75 for power supply + 2 x 0.22 x data)
- Max. number possible key combinations ..... 1099 billion
- Max. number memorised by the system ..... (64 – no. access codes managed) for MP200/64
  (256 – no. access codes managed) for MP200/256

***** The maximum distance that can be achieved depends directly on the power supply cable section (+ and -) of the serial itself and the **consumption** occurring at **the other end**. In this respect, remember that for every **200m** of 2x0.75 mm^2 cable with **100mA of consumption**, account for approximately **1V** of drop.

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