


1. INTRODUCTION

The MAX-20MC is a wireless, programmable fully-supervised alarm control panel notable for simplicity, ease of installation and cost effectiveness. The system's main features are:

- On-board PowerCode/CodeSecure™ type receiver for collecting alarm and trouble data.
- On-board PowerCode-type transmitter for controlling wireless auxiliary devices.
- Up to 20 wireless detectors (one per zone).
- Zones 1, 2 and 3 are compatible with hard-wired detectors in addition to their wireless function.
- All 3 hard-wired zones may be defined as N.C. or E.O.L, and may be wired for tamper recognition.
- One of eight zone types may be attributed to each zone.
- Arming/disarming (full or partial) using a key or a wide variety of hand-held transmitters.
- Alarm memory data displayed on request.
- Transmitter-controlled programmable open-collector AUX output - used for opening doors or switching lights.

- Various trouble alerts: tamper, low battery, detector inactivity, partial arming
- Two open-collector outputs for triggering a dialer in case of alarm.
- Two fuse protected siren relay outputs.
- Fuse protected strobe light relay output.
- Option for wireless siren and wireless strobe light

A fully equipped alarm system based on the MAX-20MC consists of the units shown in Fig. 1.1.



A. All servicing should be undertaken by qualified services personnel.

B. Electrical wiring must comply with the local standards and regulations that are valid at the time of installation.

C. Do not perform service or repair operations unless the mains power supply to the control panel is cut off by the circuit breaker.

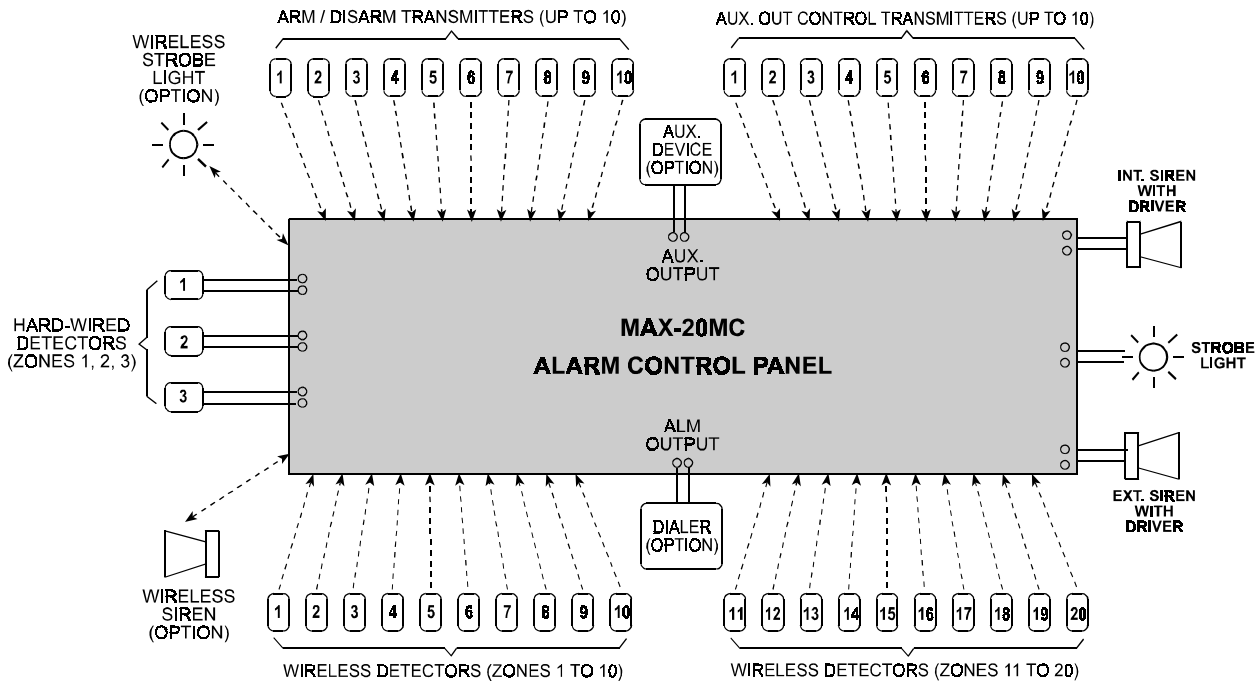


Figure 1.1 MAX-20MC - Fully Equipped Configuration

2. SPECIFICATIONS

2.1 General Data

Number of Zones: 20 wireless zones, 3 of which accept hard wired detectors.

Zone Types: Delay-perimeter, delay-interior, follower-perimeter, follower-interior, instant-perimeter, instant-interior, 24 hours-audible, 24 hours-silent.

Alarm Loop Type (Zones 1, 2 and 3 only): N.C. with tamper recognition (1 kΩ in parallel with the alarm contacts) or End-of-Line (1 kΩ in series with the alarm contacts).

Arm/Disarm Facilities: Keyswitch or PowerCode / CodeSecure™ hand-held transmitters

Arming Modes: AWAY, HOME, FORCED

Alarm Types: Silent or audible, in accordance with zone attributes

Siren Timeout: 3 minutes

Exit Delay: Programmable, 15 / 30 / 60 / 90 / 120 seconds

Entry Delay: Programmable, 15 / 30 / 60 / 90 / 120 seconds

Inactivity Alert: Generated 8 hours from last transmission

Special Functions: Zone bypassing, walk test

Data Retrieval: Alarm memory and trouble indications

Compliance with Standards: Meets FCC part 15, ETS 300-220, ETS 300-683 and MPT 1340 requirements

2.2 RF Section

Operating Frequencies: 315, 404, 418, 433.92 MHz, per local requirement in country of use

Receiver Type: Super-heterodyne, fixed frequency

Transmitter Type: Low power, fixed frequency

Coding and Data Transfer: PowerCode and/or CodeSecure™

2.3 Electrical Data

Alarm Relay Contact Ratings: 8A @ 30 Volts (SPST).

Strobe Relay Contact Rating: 5A @ 30 Volts (SPST)

Supply Voltage: 230 VAC

Power Transformer AC Output: 19 VAC, 40 VA.

Current Drain: Approx. 60 mA standby, 120 mA on alarm (excluding external devices).

DC Output (via the 12 VDC terminals): 12 VDC, 700 mA max.

Siren DC Output: 0.3 A max.

Open Collector Outputs Current Sinking: 100 mA max.

Fuse Ratings:

230 VAC input - 315 mA (time lag type T315 mA / 250 V)

12 VDC for detectors and accessories - 1A;

12 VDC supply for siren - 2 fuses, 0.5 A each

12 VDC supply for strobe light: 0.5 A

Standby Battery: Lead-acid type, 12 V, up to 7 Ah.

Battery Protection: 5A fuse

Charging Current: Electronically limited to 300 mA

2.4 Physical Properties

Operating Temperature Range: 0°C to 49°C (32°F to 120°F)

Storage Temperature Range: -20°C to 60°C (-4°F to 140°F)

Size (H x W x D): 235 x 317 x 90 mm (9-1/4 x 12-1/2 x 3-1/2 in.).

Weight: 1.9 kg (4.2 lb) less Battery

3. INSTALLATION

3.1 Construction Details

The alarm control panel is a self-contained unit that accommodates the alarm control module, the AC power supply circuit, the backup battery (supplied separately) and the internal siren (if used). Wireless receiver and transmitter modules are mounted on the alarm control module (see Figure 3.1).

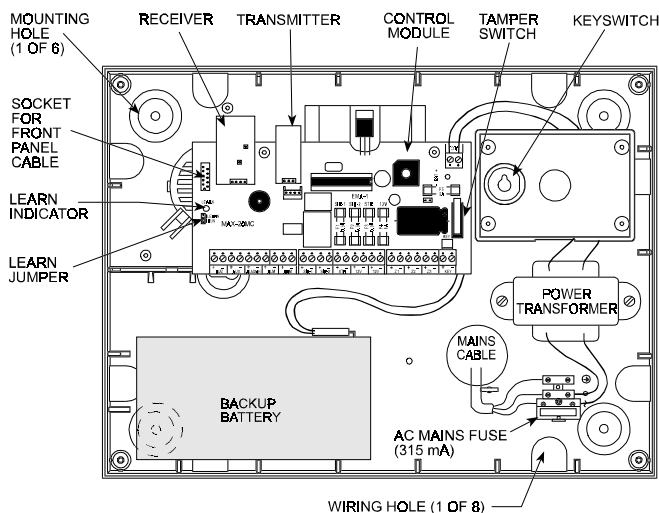


Figure 3.1. MAX-20MC with Front Panel Removed

A 10-conductor flat cable interconnects the alarm control module and the front panel assembly, that consists of the indicator LED array and two control pushbuttons.

The control module accommodates a voltage regulator and a charger for the backup battery. Two pairs of 12VDC output terminals are provided, to allow easier supply of operating power to a large number of accessories.

3.2 Programming

Gather up all transmitters used in the system and mark each one in accordance with the desired deployment plan. Use the lists in the appendix at the end of the Programming Guide to register the intended location of each detector and the holder of each transmitter.

Enrolling the detectors' identification codes in the MAX-20MC memory is easier to accomplish with all detectors near the control panel, preferably on a work bench.

Remove the front panel, taking care not to yank the cable loose. Temporarily power up the MAX-20MC by connecting a 12 V battery or a 12 VDC power supply across its 12 V input terminals. The black lead found within the cabinet goes to the negative (-) battery terminal and the red lead goes to the positive (+) battery terminal. **Observe polarity!**

Put the front panel back on and put the cabinet on its back for easier manipulation of the front panel pushbuttons.

For programming instructions, refer to the MAX-20MC programming Guide.

3.3 Mounting the Control Cabinet

Having completed the programming process, disconnect the battery. Choose a concealed location, yet easily accessible to prospective users of the alarm system. Make sure that an uninterrupted AC power is available near the installation spot. To open the front panel, simply remove the screws at the four corners and pull the front panel off.

Mounting and wiring holes are provided on the rear wall of the cabinet. Mount the cabinet on the wall, using at least 3 of the mounting holes at the rear.

3.4 Terminal Block Wiring

Caution! Do not connect the AC power or the battery until all other wiring is completed

Wiring instructions are given by order of terminals, from left to right.

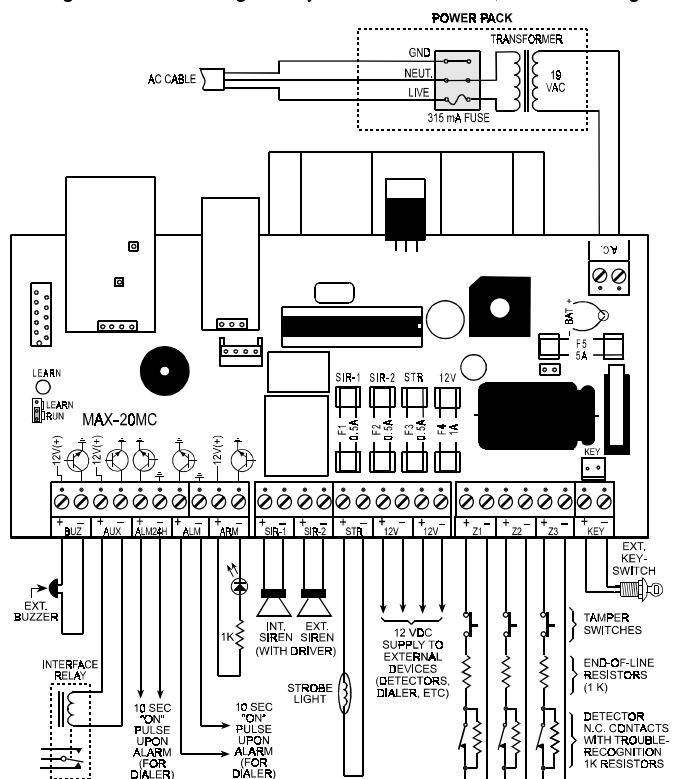


Figure 3.2. Terminal Block Wiring Diagram

Terminals	Wiring Information
BUZ + BUZ -	These terminals in parallel with the internal buzzer. You may install an external 12 VDC piezo-type buzzer at a remote point and connect it with a 2 lead cable across BUZ + and BUZ - (observe polarity).
AUX + AUX -	AUX+ is constantly connected to the 12 VDC (+) line. AUX (-) is an open collector output (100 mA max.) controlled by up to 10 wireless transmitters. AUX(-) pulls LOW or pulses LOW upon pressing the button of an AUX control transmitter. 3 different pulse durations or toggle operation may be programmed (see Programming manual, Para. 4.4). Use these terminals to operate an interface relay that activates a courtesy light or an access gate.
ALM24H- ALM24H+	ALM24H(-) is constantly at ground potential (-). ALM24H(+) is an open collector output (100 mA max.) that pulls to ground for 10 seconds upon alarm in any one of the 24-Hour zones. These terminals may be used to trigger an automatic dialer such as the DL-125C, that requires a negative pulse for activation.
ALM - ALM +	ALM (-) is constantly at ground potential (-). ALM (+) is an open collector output (100 mA max.) that pulls to ground for 10 seconds upon alarm in any zone except for 24-hour zones. These terminals may be used to trigger an automatic dialer such as the DL-125C, that requires a negative pulse for activation.
ARM + ARM -	ARM (+) is constantly connected to 12 VDC (+). ARM (-) is an open collector output (100 mA max.) that pulls LOW upon arming the system and remains LOW until the system is disarmed. These terminals may be used to illuminate an LED indicator somewhere away from the control panel. Make sure to connect a 1 kohm resistor in series with the LED.
SIR-1 - SIR-1 +	SIR-1 (-) is constantly at ground potential (-). SIR-1 (+) gets 12 VDC (+) through the alarm relay and SIR-1 fuse on the printed circuit board. A siren with an integral driver (oscillator) connected across these terminals will sound for 3 minutes upon alarm.
SIR-2 - SIR-2 +	SIR-2 (-) is constantly at ground potential (-). SIR-2 (+) gets 12 VDC (+) through the alarm relay and SIR-2 fuse on the printed circuit board. A siren with an integral driver (oscillator) connected across these terminals will sound for 3 minutes upon alarm.
STR - STR +	STR (-) is constantly at ground potential (-). STR (+) gets 12 VDC (+) through the strobe relay and STR fuse on the printed circuit board. A strobe light device connected across these terminals will function upon alarm until the system is disarmed.
12 V + 12 V - (two pairs)	Two pairs of terminals used to supply operating power to hard-wired detectors and auxiliary devices used in the system. 12V (+) is connected to the 12 VDC (+) supply via the 12V fuse on the printed circuit board. 12 V (-) is constantly connected to the common ground (-).
Z1 + Z1 -	Zone 1 input for connecting a hard-wired detector. The circuit options are explained in Para. 3.5 below. The tamper switch of the control cabinet is internally connected in series with these terminals. If the zone is not used, these terminals should be shorted together with a small piece of jumper wire.
Z2 + Z2 -	Zone 2 input for connecting a hard-wired detector. The circuit options are explained in Para. 3.5 below. If the zone is not used, these terminals should be shorted together with a small piece of jumper wire.
Z3 + Z3 -	Zone 3 input for connecting a hard-wired detector. The circuit options are explained in Para. 3.5 below. If the zone is not used, these terminals should be shorted together with a small piece of jumper wire.
KEY + KEY -	These terminals are internally connected in parallel with the internal keyswitch. They serve for connecting an optional, remote keyswitch somewhere else within the protected site.

3.5 Hard-Wired Zone Circuit Options

The hard-wired zone inputs of the MAX-20MC can be set to operate with normally closed (N.C.) or End-of-Line (E.O.L.) loops. Whatever the loop type, the zone circuit can be wired to distinguish between a TAMPER event (the detector's cover has been removed) and an ALARM (the alarm contacts of the detector opened).

A. Normally Closed Circuit Configuration (see Figure 3.3)

If N.C. operation is programmed and distinction between tamper and alarm is desired, the circuit must be wired as follows:

- The tamper switch in series with the detector's alarm contacts
- A 1 kΩ resistor across the detector's alarm contacts

This configuration allows the system to distinguish between a TAMPER event (the cover of the detector has been removed) and an ALARM (the alarm contacts of the detector open).

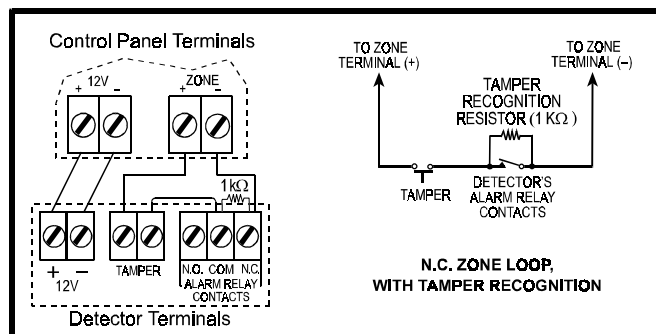


Figure 3.3. N.C. Configuration with Tamper Recognition

Event recognition works as follows:

Event	Effect on zone input
None	The zone input "sees" a closed loop (no resistance except for negligible resistance of the loop wires).
Alarm	The detector's alarm contacts open and the zone input "sees" a loop resistance of 1k ohms .
Tamper	The tamper switch opens and the zone input "sees" an open loop (infinite resistance).

B. E.O.L. Circuit Configuration (see Figure 3.4)

If E.O.L. operation is programmed and tamper / loop-trouble recognition are desired, the circuit must be wired as follows:

- The tamper switch in series with the detector's alarm contacts
- A 1 kΩ resistor across the detector's alarm contacts.
- an E.O.L. resistor in series with the detector's alarm contacts.

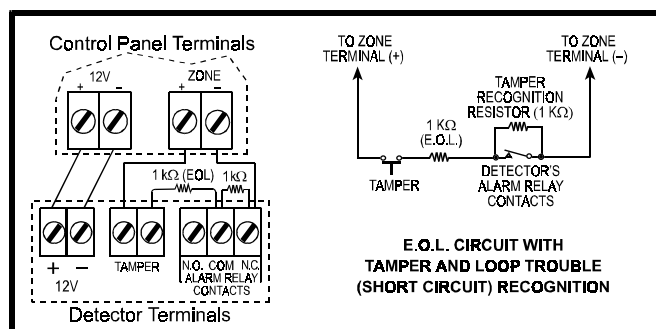


Figure 3.4. E.O.L. Configuration with Trouble / Tamper Recognition

Event recognition works as follows:

Event	Effect on zone input
None	The zone input "sees" a 1k ohm resistance.
Alarm	The detector's alarm contacts open and the zone input "sees" a loop resistance of 2k ohms (two 1k ohm resistors in series).
Tamper	The tamper switch opens and the zone input "sees" an open loop (infinite resistance).
Loop trouble	Upon a short circuit between the loop wires, the zone input "sees" a closed loop (no resistance).

3.6 Connecting the Backup Battery and the AC Supply

After finishing all other wiring, connect the battery leads (red [+] and black [-]) found within the alarm control cabinet to the battery terminals. Observe polarity. The **Power** indicator will light.

When done, connect the AC supply input – Phase (~) and Neutral (0) to the AC input terminal block. You may clip off the ground wire, since the control cabinet is made of non-conducting plastic.

Make sure your installation complies with the following safety requirements:

- Conductors carrying the AC mains voltage should be physically separated from other conductors used to wire the alarm system.
- The cross section of the AC input conductors must be not less than 1.0 mm² (17 AWG).
- The diameter of the plastic conduit for the mains cable should be at least 16 mm (5/8 in.)
- Insert the plastic conduit as far as 3 cm (1-1/8 in.) into the case, to protect the mains conductors from the sharp edges of the entry hole.
- All 3 AC power supply leads must be tied together firmly with a plastic tie wrap as close as possible to the terminal block to which these leads are connected.

- The phase (~) input wire must be routed via a single-pole, 3A exclusively dedicated circuit breaker.

3.7 Recommended Auxiliary Devices

The following auxiliary devices are optionally available from Visonic Ltd. for use with the MAX-20MC:

Ref. Designation	Purpose and Use
RL-1	Interface relay for controlling an auxiliary electrical device such as a gate or a courtesy lighting device.
DL-125C	Speech Dialer for automatic transfer of a speech message to a central station.
DP-4 or RP-7	Panel with hole for arming keyswitch and an LED indicator (DP-4 has two LEDs).
Internal Siren	Piezo sounder, 12 VDC / 115 dB.
External Siren	Horn with driver mounted within a metallic enclosure (includes a tamper switch).
TK-30 or TK-34	Wire-connected strobe lights
Wireless Siren + Strobe light	Siren and strobe light in a single housing, with built-in receiver and transmitter allowing wireless operation.

IMPORTANT NOTICE! As soon as you finish programming and installing the system, conduct a walk test as instructed in the User's Guide, Paragraph 4.3. This way the alarm control module will register the status of each zone (the system can not be armed if a zone is open or has "tamper" trouble).

WARRANTY

Visonic Ltd. and/or its subsidiaries and its affiliates ("the Manufacturer") warrants its products hereinafter referred to as "the Product" or "Products" to be in conformance with its own plans and specifications and to be free of defects in materials and workmanship under normal use and service for a period of twelve months from the date of shipment by the Manufacturer. The Manufacturer's obligations shall be limited within the warranty period, at its option, to repair or replace the product or any part thereof. The Manufacturer shall not be responsible for dismantling and/or reinstallation charges. To exercise the warranty the product must be returned to the Manufacturer freight prepaid and insured.

This warranty does not apply in the following cases: improper installation, misuse, failure to follow installation and operating instructions, alteration, abuse, accident or tampering, and repair by anyone other than the Manufacturer.

This warranty is exclusive and expressly in lieu of all other warranties, obligations or liabilities, whether written, oral, express or implied, including any warranty of merchantability or fitness for a particular purpose, or otherwise. In no case shall the Manufacturer be liable to anyone for any consequential or incidental damages for breach of this warranty or any other warranties whatsoever, as aforesaid.

This warranty shall not be modified, varied or extended, and the Manufacturer does not authorize any person to act on its behalf in the modification, variation or extension of this warranty. This warranty shall apply to the Product only. All products, accessories or attachments of others used in conjunction with the Product, including batteries, shall be covered solely by their own warranty, if any. The Manufacturer shall not be liable for any damage or loss whatsoever, whether directly, indirectly, incidentally, consequentially or otherwise, caused by the malfunction of the Product due to products, accessories, or attachments of others, including batteries, used in conjunction with the Products.

The Manufacturer does not represent that its Product may not be compromised and/or circumvented, or that the Product will prevent any death, personal and/or bodily injury and/or damage to property resulting from burglary, robbery, fire or otherwise, or that the Product will in all cases provide adequate warning or protection. User understands that a properly installed and maintained alarm may only reduce the risk of events such as burglary, robbery, and fire without warning, but it is not insurance or a guarantee that such will not occur or that there will be no death, personal damage and/or damage to property as a result.

The Manufacturer shall have no liability for any death, personal and/or bodily injury and/or damage to property or other loss whether direct, indirect, incidental, consequential or otherwise, based on a claim that the Product failed to function. However, if the Manufacturer is held liable, whether directly or indirectly, for any loss or damage arising under this limited warranty or otherwise, regardless of cause or origin, the Manufacturer's maximum liability shall not in any case exceed the purchase price of the Product, which shall be fixed as liquidated damages and not as a penalty, and shall be the complete and exclusive remedy against the Manufacturer.

Warning: The user should follow the installation and operation instructions and among other things test the Product and the whole system at least once a week. For various reasons, including, but not limited to, changes in environmental conditions, electric or electronic disruptions and tampering, the Product may not perform as expected. The user is advised to take all necessary precautions for his/her safety and the protection of his/her property.

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