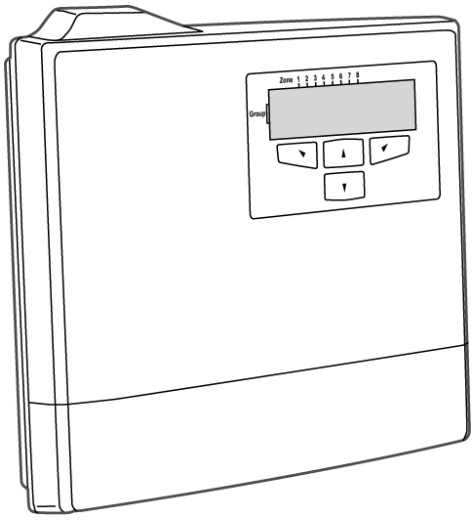
ELECTRONIC ENGINEERING LTD.

Merlin Pro (Ver-2.0)

PROGRAMMABLE STAND ALONE WIRELESS RECEIVER



Installation and Programming Guide

Safety Technology International (Europe) Ltd

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Introduction

The Merlin Pro is a programmable standalone wireless receiver with a small LCD display for easy programming and status indication.

The unit can accept up to 64 wireless detectors and 256 remote controls, eight wireless units for each one of the outputs.

As soon as a wireless unit is learned into the system, any detection signal from the unit automatically triggers an output on the Merlin. This output depends on which group and zone the device is assigned to.

The Merlin Pro has eight outputs (dry contact) that can be connected to Zone inputs on any wired Control Panel unit, or other suitable device.

The Merlin Pro is protected with a tamper switch that indicates when its service cover is opened. Merlin Pro will also indicate if a tamper switch is activated on one of the detectors.

Features

- ✓ **Full 2 x 16 Character LCD display**
- ✓ **Keypad with 4 touch pads for programming.**
- ✓ **Scrolling menu**
- ✓ **Simple to configure**
- ✓ **Can learn up to 64 wireless detectors (8 detectors to each output).**
- ✓ **Can learn up to 256 remotes control devices each with 4 separate modes: Toggle, Pulse 3 Sec, Pulse 5 Sec, 1 & 2**
- ✓ **Password protected access to installer mode**
- ✓ **Real Time Clock with back up battery**
- ✓ **Tamper protected**
- ✓ **Fully supervised – beeps every minute when detector supervision signal is missing for more than two hours**
- ✓ **Beeps every minute when receiving a Low battery signal from one of the detectors**
- ✓ **64 event log (FIFO)**

FREEWAVE Fully Supervised Wireless Accessories

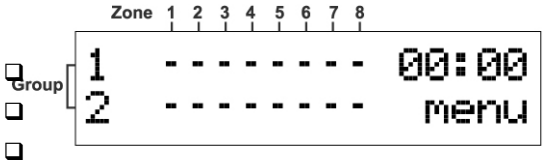
All of the following devices are compatible with Merlin Pro.

- ❑ FW-RMT – Wireless Remote Control Unit
- ❑ FW-PIR – Wireless PIR detection
- ❑ FW-360 – Wireless 360° PIR detection
- ❑ FW-MAG – Wireless magnetic contacts
- ❑ FW-GBD/FW-VIB – Wireless glass break detector/Wireless vibration sensor
- ❑ FW-SMOKE – Wireless smoke detector
- ❑ FW-WAB – Wireless outdoor infra-red beam

User Mode

Using the Display and Keypad

When the unit powers **ON** the unit displays the **Menu** screen as shown below.

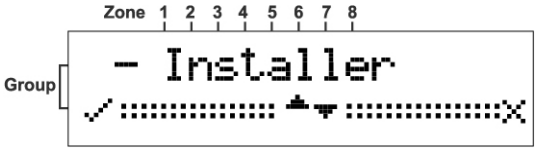


Press the ► button to start scrolling the menus.

Navigating the Screens

All operations are performed using the four buttons marked, ▲, ▼, ◄ and ►.

In the example below:



Button	Description
▲, ▼	Scrolls the screens.
◄	Accepts the operation or enters the mode.
►	Exits the mode or returns to the **Main** menu.

Memory (Event Log)

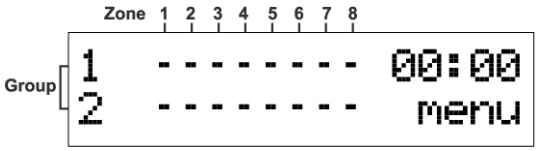
The memory buffer can store up to 64 events; and is scrolled using the **Up** and **Down** arrow ▲▼ buttons.

An **Event** is any alarm activity while the Status input is at **Low** Level (armed) or when a tamper condition is reported from a detector while in any condition.

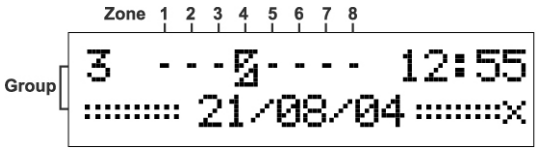
Every event is displayed with the date and time (timestamp).

Displaying the Event Log

1. From the Main screen.



2. Press the ► button to open the **Memory** screen.



The example above shows that a detector (device) - Zone 4, Group 3 - has transmitted a tamper event on 21/08/04 at 12:55

Setting the Date and Time

Setting the date and the time is done using the Up and Down arrow ▲▼ buttons. The Merlin contains a Real Time clock with back up batteries so that the date and time is not erased when external power is removed from the Merlin Pro.

For setting the **Date/Time** clock see **Setting the Date and Time** on p age 10.

Installing the Merlin Pro

This section describes how to install the Merlin Pro hardware.

Important Notes

If you are supplying power to the unit using an external power supply you must connect the GND to the Control Panel. (C.P.)

On the C.P you must set an output to apply a Low while the system is armed and connect the output to the STAT input in the Merlin Pro.

The tamper switch is operated whenever the service cover is removed.

1. Choose the most suitable location for installing the device.
   - We recommend that the Merlin is installed in a central position so that the detectors are evenly spaced around it
   - The unit should be easily accessible to allow for retrieval of information from the LCD display
   - Ideally the unit should be no more than 30 meters from the Control.
2. Locate the screw bracket on a flat surface and mark the two holes (see Figure 1).
3. Drill the two marked holes and install the bracket with two screws (see Figure 1).
4. Assemble the Merlin on the holder and mark the third drill hole (see Figure 2).
5. Remove the Merlin and drill the third hole.
6. Assemble the Merlin on the bracket and fix using the third screw (see Figure 3).
7. Ensure that the unit is **POWERED OFF.**
8. Connect the output wires to the C.P.

   Connect an external 12 VDC source to the power input terminals marked + 12 – (see Figure 5).
9. Replace the service cover and tighten the 2 screws (see Figure 4)
10. Connect the power cable to a battery or a power source.

    The unit powers **ON**.
11. Ensure that the unit is working correctly (Display is lit).

Installation Diagrams

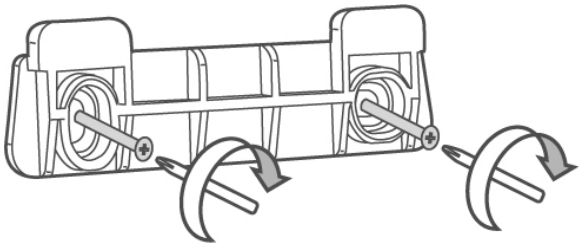


Figure 1: Attach the Screw Bracket to a Flat surface.

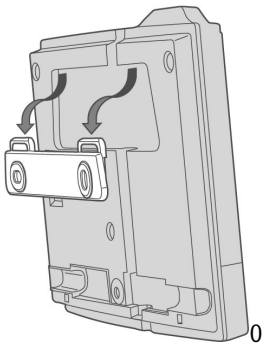


Figure 2: Attach the Unit to the Screw bracket.

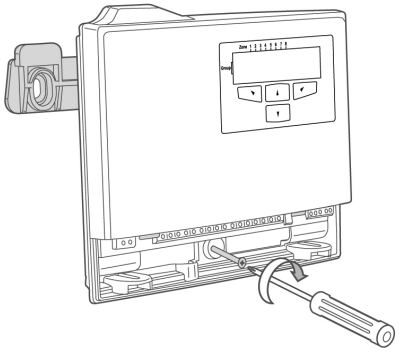


Figure 3: Installing the Third Screw

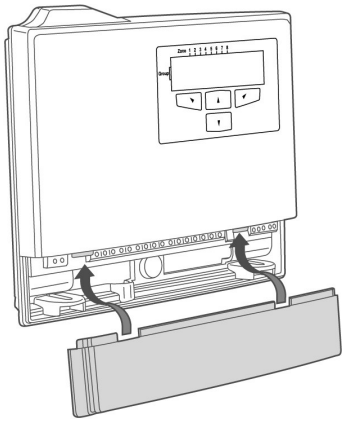


Figure 4: Replacing the Service Cover

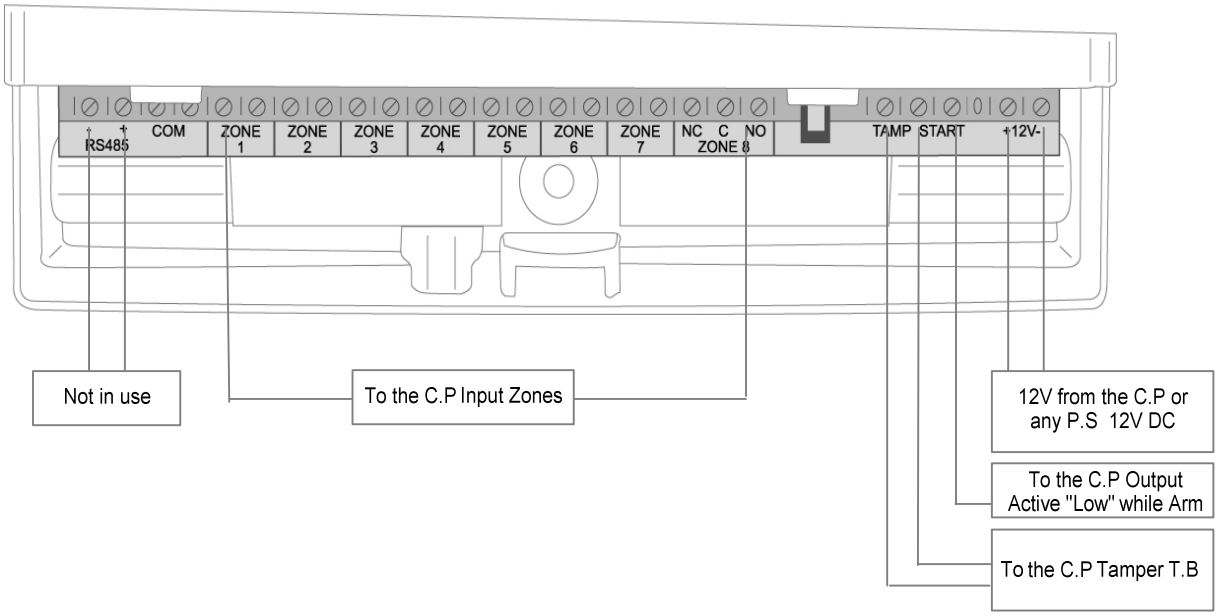


Figure 5: Unit Power and Output Connection Programming the Unit

Programme Sequence List

We recommend that the Merlin Pro is programmed on the bench before taking it to the intended site. The factory default password is **111**.

1. First set the clock (NOT setting the clock gives an incorrect time stamp in the Event Log).
2. Programme all required detectors and remotes that are needed for the installation it is recommended that the detectors are marked according to their assigned group and zone.
3. Locate the detectors and the Merlin Pro close to the point you want to install them and perform the Radio signal strength test.
4. Change the password and record it for your/your customer files.

LCD Display Symbol Table

Table 1: Meaning of the Symbols Displayed on the LCD Screen

Icon	Meaning	Description
	Tamper Switch	Tamper transmission from a detector.
	Alarm	Alarm transmission from a detector or remote key.
	Supervision	Missed supervision transmissions for more then 120 minutes.
	Low Battery	Low Battery on a Detector.
! Manu	New Event	New events recorded in the Event Log.
	Arm	While the Input STA set to Low ,its indicate that the unit ARM

Entering Numbers

You can use the ▲ and ▼ buttons to enter numbers into the unit..

Button	Description
▲	Use for the **ODD** digits.
▼	Use for the **EVEN** digits.

Examples of Number Sequences

Button Sequence	Number
▲▼▲	111
▲▼▼▲▲▲	123
▲▲▲▲ ▼ ▲▲	412

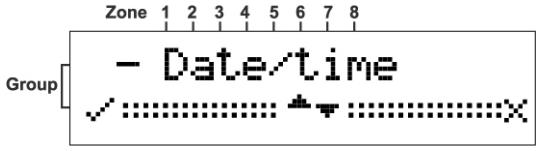
Setting the Clock

The following sections describe in detail how to set each mode.

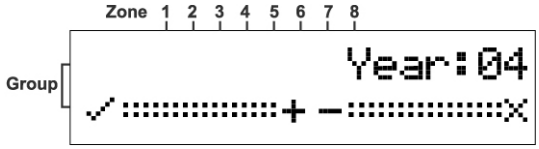
1. From the **Main** menu, press the ► button.

   The **Memory** screen is displayed.

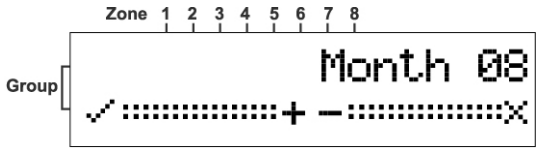
2. Press the ▼ button to display the **Date/Time** screen.



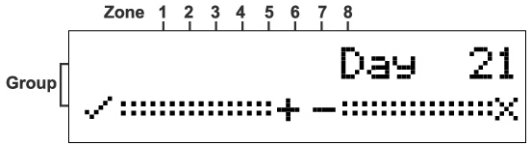
3. Press the ◄ button to confirm.



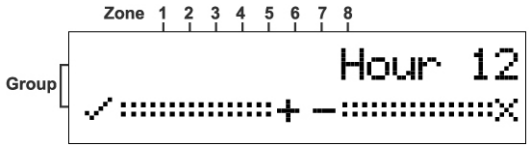
4. Press either the ▲ or ▼ buttons to select the **Year**.
5. Press the ◄ button to set the **Year**.



6. Press either the ▲ or ▼ buttons to select the **Month**.
7. Press the ◄ button to set the **Month**.

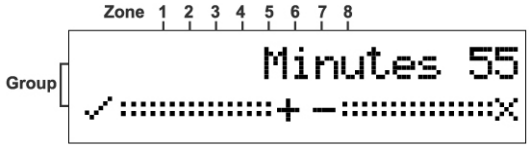


8. Press either the ▲ or ▼ buttons to select the **Day**.
9. Press the ◄ button to set the **Day**.

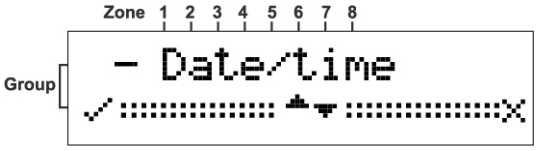


10. Press either the ▲ or ▼ buttons to select the **Hour**.

11. Press the ◄ button to set the **Hour**.



12. Press either the ▲ or ▼ buttons to select the **Minutes**.
13. Press the ◄ button to set the **Minutes**.



The time and date are updated and the **Date/Time** screen is displayed.

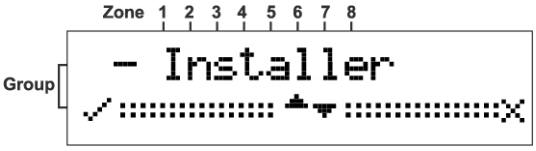
Installer Mode

Accessing the Installer Mode

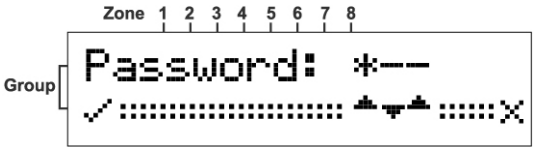
1. From the Main menu, press the ► button.

The **Memory** screen is displayed.

2. Press the ▲ button to display the **Installer** screen.



3. Press the ◄ button to confirm.



The **Password** screen is displayed.
The factory default password is 111.

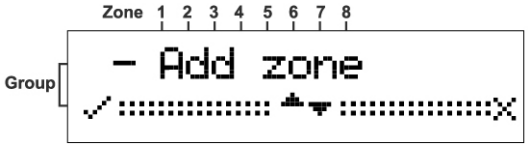
4. Press the ▲ or ▼ buttons to enter the password.

Button	Description
▲	Use for the **ODD** digits.
▼	Use for the **EVEN** digits.

Adding a Wireless Device (Add Zone)

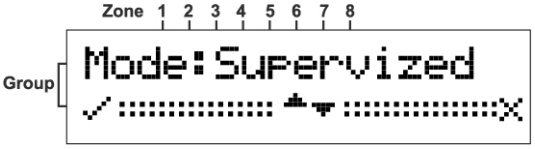
This mode is used for assigning a **Group** and a **Zone** for each detector or key. First assign a **Group** and **Zone** and then on the selected device open the service cover and press the tamper switch. This sends a signal to Merlin to learn and complete the device setup.

1. Enter the **Installer** mode.



See **Accessing the Installer Mode** on page 12 for instructions.

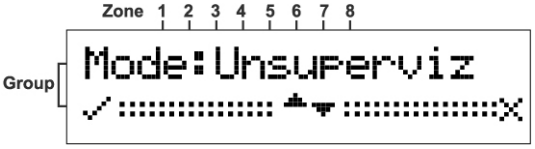
2. Press the ◄ button to confirm.



The supervised mode uses an "**Are You Alive"** time out mechanism to ensure that all the devices are communicating with the unit.

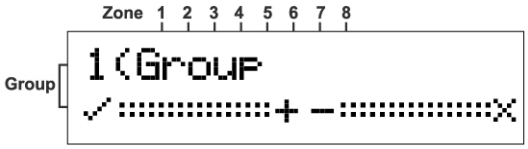
OR

Press either the ▲ or the ▼ buttons to toggle to **Un-supervised** mode



The units will be active but with no supervision.

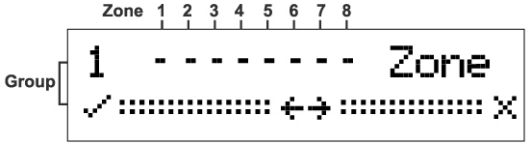
3. Press the ◄ button to confirm.



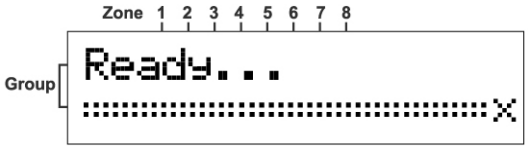
Any **Group** already selected displays an **S** in that position.

4. Press the ▲ or the ▼ buttons select a **Group**.

5. Press the ◄ button to accept the group selection.



Any **Zone** already selected displays an **S** in that position.



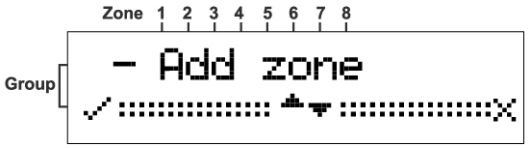
The unit beeps while waiting a tamper signal sent from the selected device.

6. Learn the device in to the system by Opening the detector cover and operating the tamper switch.

   The device is registered and assigned the selected **Group** and **Zone**.

Adding a Remote Control key

1. Enter the **Installer** mode.



   See **Accessing the Installer Mode** on page 12 for instructions.

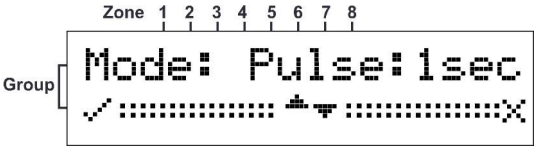
2. Press the ▼ button to scroll to the **Add Remote** Screen.

3. Press the ◄ button to confirm.

   Toggle will allow you to change the output state (on or off) by a single depression of the remote key button.

OR

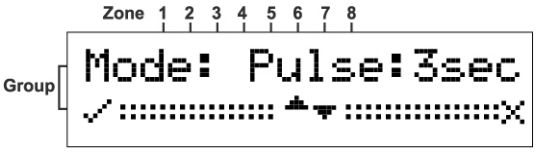
   Press the ▼ button to display the 1 second screen.



   In this mode the output is activated for 1 seconds.

OR

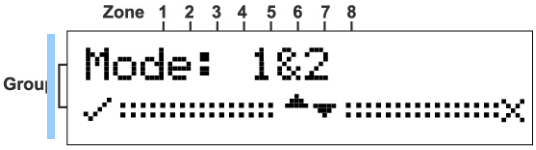
Press the ▼ button to display the 3 second screen.



In this mode the output is activated for 3 seconds

OR

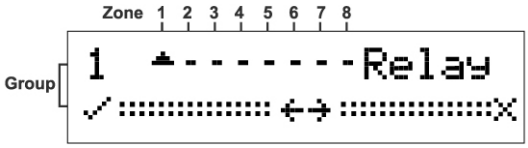
Press the ▼ button to display the **1&2** screen.



NOTE

If you choose this mode then the Relay screen opens enabling you to select an output for one of the buttons on the remote key. You can then repeat this procedure for selecting a different output for a second button on the remote.

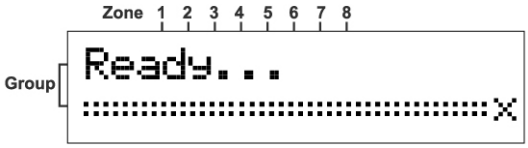
4. Press the ◄ button to set the mode.



The **Relay** output screen opens.

5. Press the ▲ or ▼ buttons to choose an output.

   Positions 1 to 7 are NC (dry contacts) and position 8 is a form C relay (NO/NC).



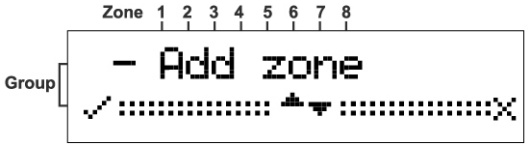
   The **Ready** screen opens and the unit beeps waiting for a remote key signal.

6. Press a button on the remote key unit.

   The remote key is registered and the **Add remote** screen is displayed.

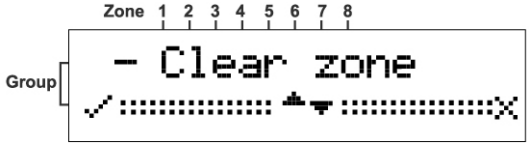
Clear Zone

1. Enter the **Installer** mode.

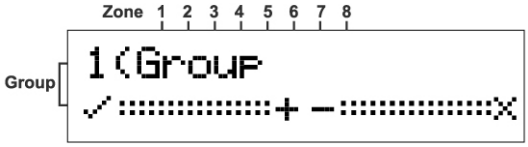


   See **Accessing the Installer Mode** on page 12 for instructions.

2. Press the ▼ button to scroll to the **Add Remote** Screen.

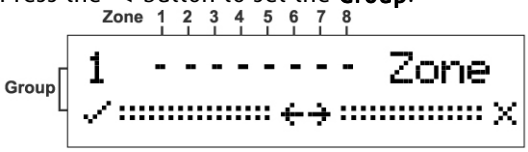


3. Press the ◄ button to confirm.



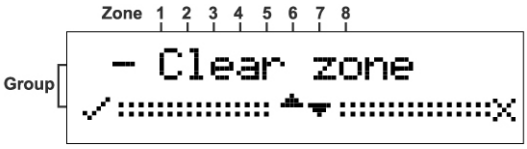
4. Press the ▲ or ▼ buttons to choose a **Group**.

5. Press the ◄ button to set the **Group**.



6. Press the ▲ or ▼ buttons to select a **Zone**.

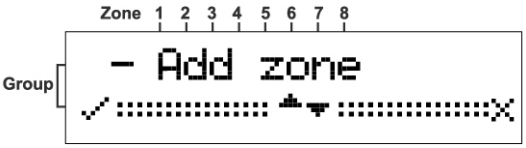
7. Press the ◄ button to set the **Zone**.



The unit will beep twice and the **Zone** is cleared.

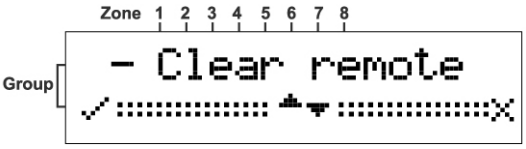
Clear Remote

1. Enter the **Installer** mode.

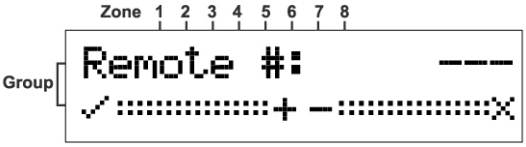


See **Accessing the Installer Mode** on page 12 for instructions on how to enter this mode.

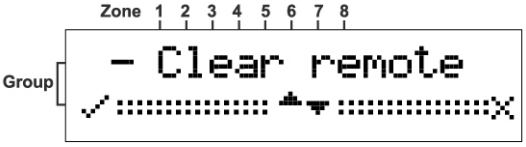
2. Press the ▼ button to scroll to the **Clear Remote** Screen.



3. Press the ◄ button to confirm.



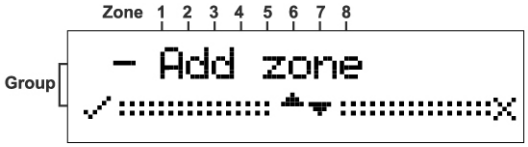
4. Press the ▲ or ▼ buttons to select a **Remote**.



The unit will beep twice and the **Remote** is cleared.

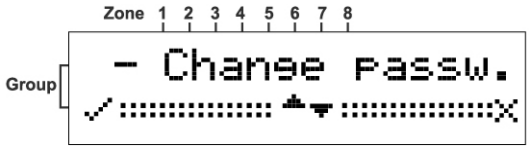
Changing the Password

1. Enter the **Installer** mode.



   See **Accessing the Installer Mode** on page 12 for instructions on how to enter this mode.

2. Press the ▼ button to scroll to the **Change Password** Screen.

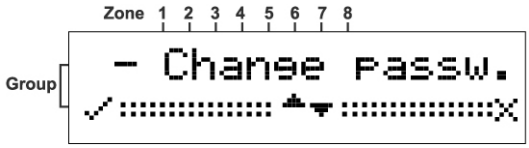


3. Press the ◄ button to confirm.

4. Enter the new **Password**.

   For example, for a password of 123 press in sequence the following buttons:
   ▲ ,▼ ▼, ▲ ▲ ▲

5. Press the ◄ button to confirm the new password.

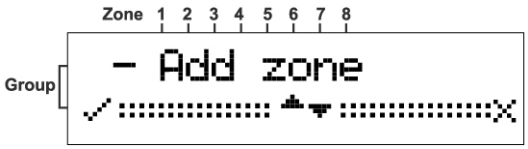


   The **Change Password** screen is displayed.

6. Record the password and store in a safe place.

Checking the RSSI (Radio signal strength)

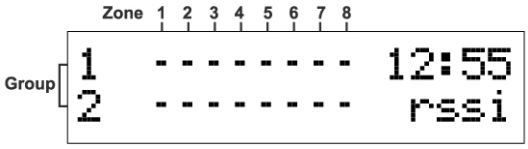
1. Enter the **Installer** mode.



   See **Accessing the Installer Mode** on page 12 for instructions.

2. Press the ▼ button to scroll to the **RSSI** Screen.

3. Press the ◄ button to confirm.



The RSSI screen opens.

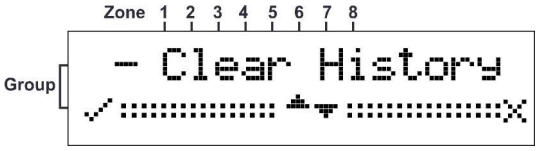
4. Either operate a tamper switch of one of the devices or press the remote key button. The signal strength is displayed on the screen.

5. Press the ◄ button to clear the screen.

6. Press the ► button to exit this mode.

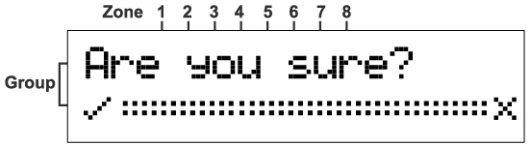
Clear History

1. Enter the **Installer** mode.

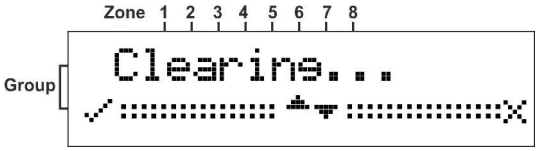


See **Accessing the Installer Mode** on page 12 for instructions on how to enter this mode.

2. Press the ◄ button to confirm.



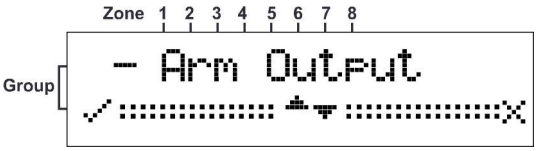
3. Press the ◄ button to confirm acceptance.



The Log Events is cleared.

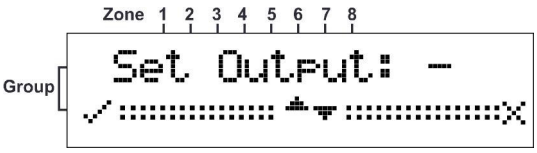
Arm To Output

1. Enter the **Installer** mode.



See **Accessing the Installer Mode** on page 12 for instructions on how to enter this mode.

2. Press the ◄ button to confirm.



3. Press the ▲or ▼ button to choose the Output you want to assign for arming the C.P .

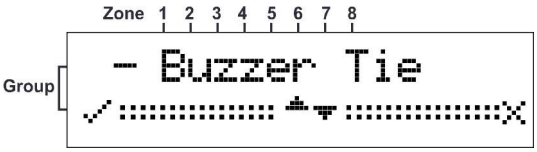
4. Press the ◀ button to confirm.

NOTE

While you assign one Output to Arm this Output will not activated if one of the detectors is in Alarm and a long beep will be heard to indicate that the Arm isn't allowable. If all zones are sealed the output will activate and few beeps will heard for success.

Buzzer Tie

1. Enter the **Installer** mode.



See **Accessing the Installer Mode** on page 12 for instructions on how to enter this mode.

2. Press the ◀ button to confirm.

3. Press the ▲or ▼ button to choose Yes or No .

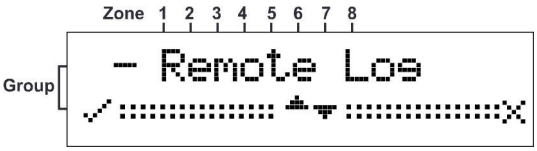
4. Press the ◀ button to confirm.

NOTE

While you assign one Outputs to buzzer ,every Output activation will activate the buzzer until the Output will restore.

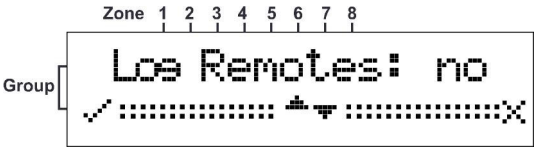
Remotes Log

1. Enter the **Installer** mode.



See **Accessing the Installer Mode** on page 12 for instructions on how to enter this mode.

2. Press the ◄ button to confirm.



5. Press the ▲or ▼ button to choose Yes or No .

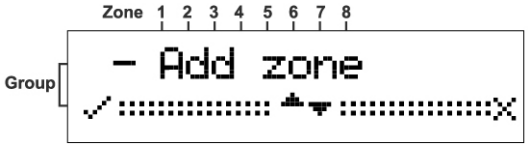
6. Press the ◄ button to confirm.

NOTE

If you will choose yes for Remotes to Log all the remotes activation will be recorded on the Log Event.

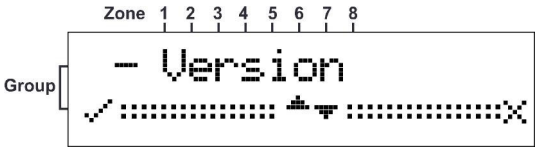
Version

1. Enter the **Installer** mode.

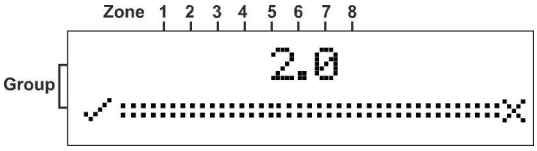


See **Accessing the Installer Mode** on page 12 for instructions.

2. Press the ▼ button to scroll to the **version** Screen.

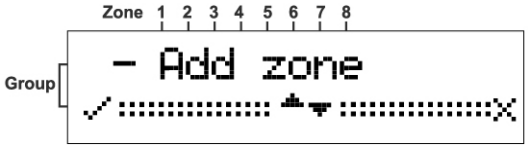


3. Press the ◄ button to confirm.



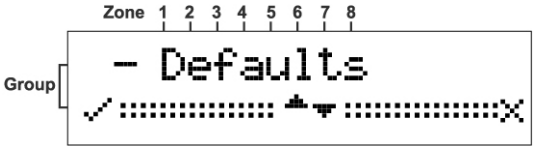
Setting the Unit Defaults

1. Enter the **Installer** mode.

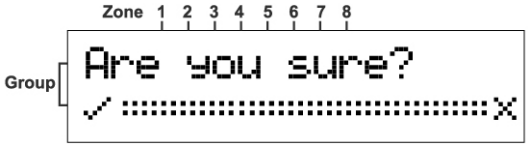


   See **Accessing the Installer Mode** on page 12 for instructions.

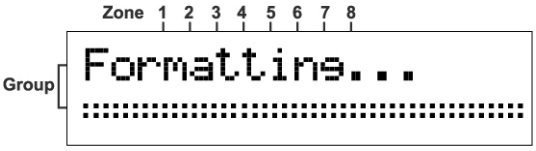
2. Press the ▼ button to scroll to the **Defaults** Screen.



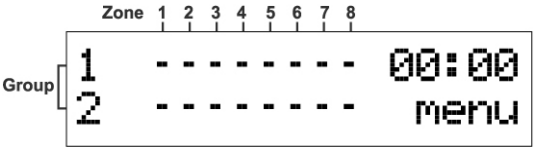
3. Press the ◀ button to confirm.



4. Press the ◀ button to confirm acceptance.



   The unit is formatted.



   Formatting has completed successfully and the **Main** screen is displayed. The unit is now returned to its factory default condition.

Functions

NOTE

While the Merlin Pro is in normal operation it must display the main screen or reported events will be ignored.

Function	Description
Outputs	Outputs 1 to 8 and Tamper are dry contact (Not relative to GND) **Outputs 1 to 7** are Normally closed. **Output 8**: Relay with three terminals for, NO, NC, and C (C-Common, NC- Normally closed, NO- Normally open) **Tamper** is normally closed.
STA Input	When this Input is **Low** it indicates that the **Control Panel** is armed. In this mode all the events are recorded in the Log buffer.
Alarm event	Displayed on the LCD screen and activates the assigned output to **Open** for 3 seconds. In **Armed** mode the event is displayed until disarmed.
Tamper Event	Activates the tamper and then assigns Output to Open until restored. Recorded in the event log.
Supervision missing	If a detector is programmed as Supervised and the Merlin does NOT receive any transmission from it for more than 120 minutes it indicates **Supervision** missing by beeping every 1 minute as a warning and will record it on the events log.
Detector Low Battery	When a detector transmits that it has **Low Battery** the Merlin Pro will record it in the events log and will beep every 1-minute.

NOTE

The warning beeps will not sound while viewing the event log or by pressing the ◄ key. The warning beeps will start again after the next Disarm.

Technical Specifications

Input Voltage	10 to 15V DC
Current Consumption	Max. 130mA
Outputs	**Outputs 1 to 7** Opto MOSFET, Contact Resistance 17 ohm Maximum Current - 100mA
	Output 8 Relay, Contact Resistance- 0 ohm Maximum Current - 1A
	Tamper Opto MOSFET, Contact Resistance- 17 ohm Maximum Current - 100mA
STA Input	Applied low in the armed condition activates memory log.
Real Time Clock	Real time clock with backup battery lasting for 2000 hours or five years.
Wireless Detectors	Up to 64 detectors (8 per group)
Wireless Remotes	Up to 256 remote keys can be connected
Log Buffer (event)	256 records (FIFO)
Receiver Sensitivity	Up to 300 m in open areas

CROW ELECTRONIC ENGINEERING LTD. (Crow) WARRANTY POLICY CERTIFICATE

This Warranty Certificate is given in favor of the purchaser (hereunder the "**Purchaser**") purchasing the products directly from Crow or from its authorized distributor.

Crow warrants these products to be free from defects in materials and workmanship under normal use and service for a period of 24 months from the last day of the week and year whose numbers are printed on the printed circuit board inside these products (hereunder the "**Warranty Period**").

Subject to the provisions of this Warranty Certificate, during the Warranty Period, Crow undertakes, at its sole discretion and subject to Crow's procedures, as such procedures are form time to time, to repair or replace, free of charge for materials and/or labor, products proved to be defective in materials or workmanship under normal use and service. Repaired products shall be warranted for the remainder of the original Warranty Period.

All transportation costs and in-transit risk of loss or damage related, directly or indirectly, to products returned to Crow for repair or replacement shall be borne solely by the Purchaser.

Crow's warranty under this Warranty Certificate does not cover products that is defective (or shall become defective) due to: (a) alteration of the products (or any part thereof) by anyone other than Crow; (b) accident, abuse, negligence, or improper maintenance; (c) failure caused by a product which Crow did not provide; (d) failure caused by software or hardware which Crow did not provide; (e) use or storage other than in accordance with Crow's specified operating and storage instructions.

There are no warranties, expressed or implied, of merchantability or fitness of the products for a particular purpose or otherwise, which extend beyond the description on the face hereof.

This limited Warranty Certificate is the Purchaser's sole and exclusive remedy against Crow and Crow's sole and exclusive liability toward the Purchaser in connection with the products, including without limitation - for defects or malfunctions of the products. This Warranty Certificate replaces all other warranties and liabilities, whether oral, written, (non-mandatory) statutory, contractual, in tort or otherwise.

In no case shall Crow be liable to anyone for any consequential or incidental damages (inclusive of loss of profit, and whether occasioned by negligence of the Crow or any third party on its behalf) for breach of this or any other warranty, expressed or implied, or upon any other basis of liability whatsoever. Crow does not represent that these products can not be compromised or circumvented; that these products will prevent any person injury or property loss or damage by burglary, robbery, fire or otherwise; or that these products will in all cases provide adequate warning or protection.

Purchaser understands that a properly installed and maintained product may in some cases reduce the risk of burglary, fire, robbery or other events occurring without providing an alarm, but it is not insurance or a guarantee that such will not occur or that there will be no personal injury or property loss or damage as a result.

Consequently, Crow shall have no liability for any personal injury; property damage or any other loss based on claim that these products failed to give any warning.

If Crow is held liable, whether directly or indirectly, for any loss or damage with regards to these products, regardless of cause or origin, Crow's maximum liability shall not in any case exceed the purchase price of these products, which shall be the complete and exclusive remedy against Crow.

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