



**Model 2003b**

**Secure SMS Alarm & Switch**

**Handbook**

Mobilarm, 88 Castle St., Portchester, Fareham, Hants PO16 9QG, UK  
Tel: +44 (0) 23 9238 6602 Fax: +44 (0) 23 9261 7230 e-mail: sales@mobilarm.co.uk  
V00.00.02

Mobilarm, 88 Castle St., Portchester, Fareham, Hants PO16 9QG, UK  
Tel: +44 (0) 23 9238 6602 Fax: +44 (0) 23 9261 7230 e-mail: sales@mobilarm.co.uk



## Model 2003b Secure SMS Alarm & Switch

### Contents

1. Installation	2
2. Quick Start	3
3. Typical Electrical Installation	4
4. Configuration	5
5. Commands	7
6. 'Back-door' commands	9
7. PC program and level shifting lead	10
8. Additional Tips	10

**EXTRA mmmmmmmmm** where mmmmmmmmm is a phone number either in local format 96342873 or in international format +44 77 1957 5335. In the high security mode this command is only available to the manufacturer's phone but if set-up gives access to this command and the 'backdoor' commands from the phone with the number mmmmmmmmm. If this facility is set-up in the high security mode then it can be transferred to another phone by using this command.

**NOTE.** It is very important to set this number before configuring the unit to be in the high security mode otherwise access to these commands is locked out and can only be released by the manufacturer or by using the optional PC program and level shifting lead.

**CONFIG** - This 'Backdoor' command is described fully in the Configuration section.

### PC program and level shifting lead

These extras can be used to download the configuration of a unit, save it to disc, edit it, load it from disc and upload a configuration to the unit. The ability to save several files means that standard configurations can be set-up for specific tasks and rapidly entered into a unit.

The PC level shifter lead is terminated in a 3 way socket which mates with the 3 pin header near the centre top of the circuit board. This is marked SET-UP just to the left of the header. The socket will fit either way round and no damage will be caused but to operate correctly the white mark must be toward the SET-UP legend.

Run the Easyterm program and set the serial port number to the one the lead is connected to and then use the Read button to download the stored settings from the unit. The progress of the download is shown. If there is any message from the GSM engine the progress bar may stop. Just press the Read button again. The Edit button will allow entries to be edited. Those that display in red can not be changed. Once editing is complete the Write button will write the modified settings back to the unit. Note. Any new output settings will not be effective until the unit is powered down and restarted.

### Additional Tips

The unit detects when the phone switches to another cell and will send a **MOVED** alarm when the alarm is set the first time it detects a change of cell. This can cause a false alarm when the power is switched off and on again with the alarm set. Provided the feature is switched on this feature may be re-enabled on demand by sending the **SET ALARM** message again.

**LOW BATT** and **HIGH BATT** alarms are sent if the supply voltage falls below 10.8 (21.6) volts or rises above 14.6 (29.2) volts. The low voltage condition must last for 2 minutes before the alarm message is sent. As the unit operates on 12 or 24 volt supplies it may give a battery alarm on start-up. This can be corrected by sending the **LOW BATT ON** command.

**PASSWORD** This provides the means for logging a new phone onto the unit. Sending **PASSWORD your\_password** will log the new phone on in place of the existing phone 1. This message can also be used for changing the password by sending **PASSWORD your\_password new\_password**. Initially change the password from MOBILARM to your own choice by sending **PASSWORD MOBILARM your\_new\_word**.

The following are messages sent back from the unit either as a response to a command or to the notified phone(s) as a result of an alarm condition.

**ALARM SET** is a response confirming the state of the unit.

**ALARM CLEAR** is a response confirming the state of the unit.

**TAMPER ALARM** is sent if an optional tamper switch is used and tampering occurs.

**ALARMn** is sent to indicate that input n has gone to an alarm condition.

**NORMALn** is sent to indicate that input n has left the alarm condition. This message is only sent if the option is selected.

**LOW BATT** is sent to indicate that the supply has dropped below 10.8 (21.6) volts for more than 2 minutes

**HIGH BATT** is sent to indicate that the supply has exceeded 14.6 (29.2) volts.

**MOVED** is sent to indicate that either the Cell ID or LAC that the GSM engine is registered with has changed. This can be due to movement of the equipment or sometimes due to network operational requirements.

## 'Back-door' commands

**DISABLE** This command sets a pattern in an EEPROM byte which when set prevents the unit from responding correctly to commands. It effectively disables the unit.

**DEFAULT** This command returns all the EEPROM messages including the password back to the original default messages so when a user makes all his messages the same or forgets his password its possible to start again. It also clears the disable pattern from the EEPROM.

**VERSION** This command returns the hardware and firmware versions of the unit.

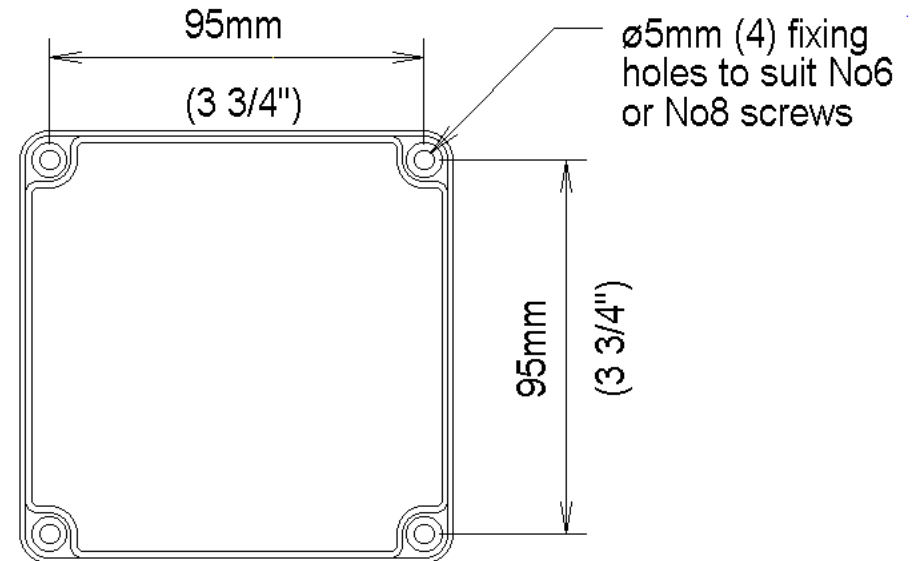
**AS NEW** This command clears out the three phone number locations and the notify locations. This enables a user to start again as if he had just taken the unit from the box and will set up numbers automatically when he logs on using the **PASSWORD your\_password** command after this command has been sent. This needs to be the last command sent by the phone with 'backdoor' access otherwise any other command will cause its number to be automatically installed in the **NOTIFY1** and **PHONE1** locations.

## Installation

Remove the unit from its packing and undo the 4 screws retaining the cover and remove the front cover taking care not to break the light pipe going to the red LED. Decide where the power, input and output wiring is going to run and carefully remove one or more knock-outs for the wiring. If the IP rating of the box is to be maintained fit appropriately rated glands.

The Secure SMS Alarm & Switch is designed to run from a nominal 12 or 24 Volt DC supply such as a car battery or two in series or a pack of alkaline cells.

The Unit measures 110mm (4.3") wide x 110mm (4.3") high x 67mm (2.6") deep and can be mounted to a wall by four 5 mm or No 6 fixing screws as shown in the drawing using the mounting holes behind the cover fixing screws. Ensure there is sufficient room for the aerial or aerial lead.



Drill the 4 mounting holes and offer the box up to the wall, insert the screws and tighten.

Remove the fuse from the circuit board and connect the 12 or 24 Volt supply with the correct polarity to the left hand terminal block. If an optional back-up battery is fitted don't connect this up at this stage.

Each Input and/or Output circuit is marked appropriately with the common - supply to the left hand terminal of each pair.

As an input the + terminal can be pulled up to the full supply voltage and beyond to +40V and pulled down to the - terminal. The unit can be configured to give an alarm with either a n/c or n/o condition.

As an output the + terminal sinks up to 200mA current down to the - terminal. When off the + terminal can withstand +40V. For heavier current loads a current boosting transistor or relay can be used with the coil between the output + terminal and the + supply as shown in the typical electrical installation. Any load switched by an output does not pass through the unit fuse and consideration should be given to providing an appropriate fuse between the supply and load.

The FME connector of the module must be connected to a suitable GSM aerial.

Header 4 on the board provides optional connections for a N/O tamper switch between the 2 connections.

Header 1 is the connector for programming the microcomputer and is not for normal use.

Header 2 is marked SET-UP and is for connection through an optional level shifter to a PC running the optional configuration SW.

Fit a GSM phase 2+ SIM (this is the normally available SIM) into the holder marked SK2 near the top right of the circuit board.

**NOTE The SIM must always be removed or replaced with the power to the board OFF. Failure to do this will damage the SIM.**

When the wiring is complete and the supply polarity has been checked replace the fuse on the circuit board. If an optional back-up battery is being used reconnect it. The red LED should be illuminated steadily and the green LED after a few seconds delay should flicker intermittently as the GSM engine registers onto the network, then flash strongly for about 6 times and finally flash briefly every 2 seconds for 3 times before finally extinguishing. Offer up the front cover so that the light pipe sits over the red LED. Tighten the 4 lid retaining screws to provide a splash proof seal.

The Mobilarm Secure SMS Alarm & Switch unit is now ready for use with the default settings of circuits 1 & 2 being n/c inputs and circuits 3 & 4 as outputs. The unit may be logged onto the user's phone and then configured as described below.

## Quick Start

Use the mobile phone that will be used to normally operate the alarm unit and send the following message to the phone in the Secure SMS Switch unit. (You will need to know its phone number to operate it in future.)

### PASSWORD MOBILARM

Sending this message registers your mobile phone with the unit and automatically sets your phone as the alarm notify number. It also sends the manufacturer a registration message for warranty purposes.

**LOW BATT ON** Sending this message turns on the low supply alarm which operates when the supply drops below 10.8 Volts for 2 minutes. It also enables the high supply alarm.

**LOW BATT OFF** Sending this message turns off the low supply alarm. It also disables the high supply alarm.

**OPn ON** Sending this message with n=1, 2, 3 or 4 turns on Output n providing it has been enabled.

**OPn OFF** Sending this message turns off Output n.

**MOVE ON** Sending this message turns on the alarm which is given when the Cell or LAC of the module changes. This can be due to movement or operational requirements of the network. The alarm will only occur when the unit has been armed with the **SET ALARM** command and will only occur once until the **SET ALARM** command is sent again.

**MOVE OFF** Sending this message turns off the 'movement' alarm.

**VOLTS** Sending this message returns the supply voltage to the originating mobile phone e.g 13.46V.

**STATUS** Sending this message returns any alarms such as **LOW BATT** followed by 2 groups of 4 digits (either 0 or 1). The first group represent the 4 inputs (1 to 4) and the second group the 4 outputs (1 to 4). For the first group 0s represent normal condition and 1s the alarm condition. For the second group 0s are outputs that are off (unused ones are off) and 1s are the outputs that are on.

**WHERE** Sending this message returns the Cell ID and LAC of the network the GSM module is currently attached to.

**CREDIT** Sending this message returns the first part of the last credit message obtained from the network operator. If using a contract SIM or working with a network that doesn't provide text credit messages the message returned will be unpredictable and may be blank or return an old irrelevant credit value.

**CH** Sending this message allows existing messages to be changed and customised. It is used by sending **CH existing message new message**. For example if OP1 is used to switch a light send **CH OP1 ON LIGHT ON** After sending this message sending **LIGHT ON** will switch the light on. The change is stored in EEPROM so is non-volatile even after power down.

## Commands

The commands below are the default commands of the unit. Each command can be customised by the user to suit the circumstances of use and the user's convenience. All the messages are shown in uppercase but the unit is not case sensitive.

**SET ALARM** Sending this command will arm the unit and allow any alarm inputs, set to be armed and disarmed, to become operable. A message **ALARM SET** will be returned to the originating mobile phone as confirmation.

**CLEAR ALARM** Sending this command will disarm the unit and prevent any alarm inputs, set to be armed and disarmed, from operating. A message **ALARM CLEAR** will be returned to the originating mobile phone as confirmation.

**ALARM STATUS** Sending this message will return either **ALARM SET** or **ALARM CLEAR** to confirm whether the unit is armed or disarmed.

**PHONE1** Sending this message followed by a phone number either in local (077.....) or international (+4477.....) format will allow a phone with this number to operate the unit. Sending **PHONE1** followed by a space will clear the authorised phone.

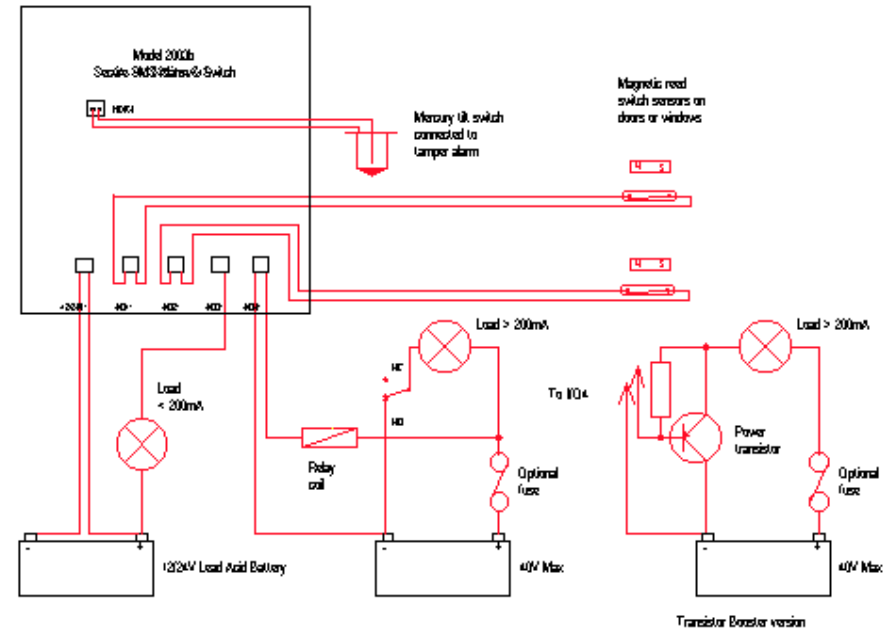
**PHONE2** Sending this message followed by a number will set up a second authorised number in a similar fashion.

**PHONE3** Sending this message followed by a number will set up a third authorised number in a similar fashion.

**NOTIFY1** Sending this message followed by a phone number either in local (077.....) or international (+4477.....) format will make the phone with this number receive any alarm notification messages. Sending **NOTIFY1** followed by a space will clear the notified phone.

**NOTIFY2** Sending this message followed by a phone number either in local (077.....) or international (+4477.....) format will make the phone with this number the second phone to receive any alarm notification messages. Sending **NOTIFY2** followed by a space will clear this notified phone.

**SET CRED NO** Sending this message followed by the network operator's phone number for obtaining a credit balance by text message. For example with O2 in the UK the number is \*#10# and for Vodafone the number is \*#1345#. Orange and T-mobile do not provide a balance by text. In this instance or when using a contract SIM send this message followed by a space to erase any existing number and switch off the facility.



A typical electrical installation

To check your phone is now registered send the message **STATUS** and obtain a reply message.

For security you now need to change your password so send the message:

### **PASSWORD MOBILARM YOUR NEW WORD**

where **YOUR NEW WORD** is the new password you want to use. This must be between 5 and 15 characters long.

You can now operate the alarm by sending **SET ALARM** and **CLEAR ALARM** messages to the unit. When armed the red LED on the Mobilarm unit will flash and when clear the LED will be steadily illuminated.

You should now be able to configure the unit by using the commands in the following section.

## Configuration

Sending the text message **CONFIG wwxxyyzz abcde** will configure the unit in the following manner:

**ww** is used to configure I/O1  
**xx** is used to configure I/O2  
**yy** is used to configure I/O3  
**zz** is used to configure I/O4

**abcde** is used to configure the credit alarm and the level of security used by the unit.

**ww**, **xx**, **yy** and **zz** represent 2 characters which are used to configure the appropriate output. If the pair consists of 2 hexadecimal digits 00 through to FF (decimal 0 through to 255) the I/O port is configured. If the pair consists of 2 other characters such as **qq** the port is not configured. For example **CONFIG qqqq40qq** will just configure I/O3 as an output and leave the configuration of the other I/O ports unchanged.

To configure the ports only the final space and **abcde** can be left off and the currency alarm and security setting will not be changed.

The setting of the I/O port is performed by setting or clearing each of the 8 bits that form the hexadecimal digit pair. The table below details the coding.

The units are initially programmed with the default values 11115050.

Bit	Clear (0)	Set (1)
0 (Least Sig)	not an input (off)	use as an input (on)
1	alarm state high or open	alarm state low or short
2	operates 24/7	operates when set
3	no message on clear	message on clear
4	reserved	one time notification
5	reserved	reserved
6	not an output (off)	use as an output (on)
7	normal switched output	pulse o/p (on for 5 secs)

The default value 11115050 makes I/O1 and I/O2 as inputs with alarm state high or open circuit, always operational, not sending an alarm clear message, notifying one time only per event with the output function turned off.

I/O3 and I/O4 are set with the input functions turned off, one time notification selected (but irrelevant) and a normal switched output which can be switched on and off by separate commands.

To make an output that operates briefly each time the **OPn ON** command is sent send the configuration C0. To obtain a confirmation message that the output is operating correctly send the configuration 59.

The credit alarm is configured in the following manner:

**a** is the first currency symbol e.g £ sign.

**b** is an alternative currency symbol if used e.g # sign. If no alternative is used set this to a character unlikely to be used e.g @ sign.

**c** is the decimal value of the most significant digit of the alarm level e.g 2 for 2, 20, 200 or 2000 currency units.

**d** is the number of digits before the decimal point e.g 1 for 2, 2 for 20, 3 for 200 etc.

The security setting is controlled by the digit **e** which is used to set the security to 'low', 'medium' or 'high'.

Setting **e** to 0 selects 'low' security. All the commands including the back door commands can be used by any user with no checking of the originating phone number.

Setting **e** to 1 selects 'medium' security. All the commands including the back door commands can be used by any user 'logged on' or set up in the authorised user list.

Setting **e** to 2 or any other number selects 'high' security. All the commands except the back door commands can be used by any user that is set up on the authorised user list. The backdoor commands can only be used by any number set-up by the **EXTRA** command or by the manufacturer. It is probably a good idea for a supplier to set-up his own phone as the **EXTRA** number and to change the security to 'high' to prevent users fiddling with the settings and causing problems.

Hence for the UK the message is **CONFIG qqqqqqqq £#311** to give a credit alarm once the credit falls below £3.00. O2 uses the £ sign and Vodafone uses the # sign before the credit balance. This also leaves the security setting at 'medium'.