GSM SWITCH

INPUT AND OUTPUT VIA SMS TEXT

FITTING AND OPERATING INSTRUCTIONS

NoWyr SMS Switch

The NoWyr SMS switch is designed to allow physical switching of electrical products and the reporting of electrical switching or alarm condition via the SMS text messaging system.

Standard Features

1. Tri-Band GSM connectivity.
2. Programmable by SMS text message.
3. Variable commands can be customised, simplifying user operation.
4. Self contained unit in IP65 rated enclosure.
5. Internal power supply allowing either 8-24V AC/DC supply or direct mains connection.
6. Voltage free relay output rated 10Amps 240 V AC.
7. Input can be detected by 5-24V AC/DC applied or voltage free contact.
8. Optional battery back-up operation allowing user to be aware of power failure.
9. Allows alarm/input status to be re-directed to multiple phones.
10. Alarm redirect management.
11. LED for indication of, signal strength, input, output, activity and supply.

Examples of uses

1. Setting and Unsetting of alarms systems.
2. Reporting of an alarm condition.
3. Remote operation of locking systems.
4. Operation of information systems, advertising, road conditions etc.
5. Control of Building management systems.
6. Monitoring systems.
7. Personal attack systems.

This system is designed as a completely self contained unit, that can be supplied from a low voltage source or directly from mains without the requirement for an additional power supply unit.

The unit is supplied with a SIM card; the customer can choose any of the 4 main UK network operators i.e. O2, Orange, T-Mobile or Vodafone.

Control Commands

The system can be controlled using the following texts default text messages, (These can easily be customised)

Message No.	Default	Operation
1	set output	This command energises the Relay.
2	clear output	This command turns off the Relay.
3	read output	This causes the unit to text the relay status to sender that requested report.
4	read input	This causes the unit to text the input status to sender that requested report.
5	output set	This is the message received back to sender confirming that Set output 'is actioned.
6	output cleared	This is the message received back to sender confirming that Clear output 'is actioned.
7	input off	Open status of input is sent every time there is a change to 'open '(see input reporting).
8	input on	Closed status of input is sent every time there is a change to 'closed '(see input reporting).

Fig1

Reset Defaults

When the unit is first commissioned it is recommended that 'reset defaults 'is 'texted ' from the primary sender, this will ensure that the unit is in a known condition and it will also provide a 'text destination 'for reporting the status of the input detection.

It is important to appreciate that 'reset defaults 'will overwrite any customised settings, therefore should only be used when total re-configuration is required

Update message

This allows for customisation. If for example the unit was to set an alarm at '17 Acacia Avenue '; then the message number 1 'set output 'could simply be changed to 'on '. This can be achieved by sending the text message "update message 1 'on '".
The mobile number that as associated with '17 Acacia Avenue 'can be stored under that name in the senders phonebook. To set the alarm, the user would simply have to text the word 'on 'to '17 Acacia Avenue '.
Although the commands can have upto 16 characters, it is a good idea to keep the instruction commands short so that the commands are more easily remembered and composed. Some phones have the ability to save instruction commands in 'templates '; if this is possible the user will not have to remember the commands used.

The information that is sent from the unit can be made more descriptive. By default an alarm condition received from a unit, would receive message 8 'Input on '. Message 8 could be changed to '17 ACACIA ALARM 'by simply sending the text "update message 8 '17 ACACIA ALARM '"

This method can be used to change any of the configurable messages, see the table in fig 1, for the relevant message numbers.

List Messages

Sending the text command "list messages" will make the unit reply with a list of the current message settings, this function is useful to confirm the 'updated messages' and remind user of the command set.

Update Number

The unit can store phone numbers in its memory. Number 1 is the "Master Number" and numbers 2, 3 and 4 are "Secondary numbers". These numbers allow the system to implement security access control and 'text' destinations for the status of the input detection.

For example, to allocate a number to "Master Number 1" text "Update number 1 07123456789", this will allocate 07123456789 'to the "Number 1"

"Update Number 2 07234567891" will allocate 07234567891 'to "Number 2" and so on.

List Numbers
The text command "List Numbers" will make the unit reply with the numbers that are stored; in the order they are allocated.

Security Level

FIG 2

Security No.	Response
0	Will respond to all phones, confirming commands, responding "unknown command" for invalid commands.
1	Will respond to all phones confirming commands, no response to invalid commands.
2	Will only respond to stored numbers, confirming commands, responding "invalid phone number" for phones not listed.
3	Will only respond to stored numbers, confirming commands. No response to 'unknown commands' or 'Invalid phone number' for phones not listed.

Text command "security level x" where 'x' is the security level required (see table in fig2).

The unit will confirm the security level by replying "Security level = x"

In the situation where the security level will only allow commands from "stored numbers", if the user loses the ability to use a phone from the "stored numbers" list then the user will be "locked out" of the system.
Putting DIP Switch '3' into the 'ON' position will set the security level to '0' allowing the user to allocate numbers from any phone.
Setting the DIP Switch '3' to 'ON' will send a 'text' to the Master Number, alerting the Master user of the change in security status, therefore preventing unauthorised users easily tampering with the security settings.

Once the user has regained access to the system, to reinstate the security, DIP Switch '3' must be turned 'OFF' and the "security level" reassigned.
The current security level can be ascertained by using the "read settings" command.

Maximum daily texts

In order to limit the potential of the unit sending excessive texts it is possible to control the maximum number of daily texts. By sending the command "max daily texts x", sets the maximum text limit to 'x' texts over the next 24 hour period. For example sending the command 'max daily texts 30' will allow the unit to send a maximum of 30 text messages over a 24 hour period. The maximum text limit is 255. If the user requires the number of texts that can be sent to be unlimited this can be achieved by sending the command 'max daily texts 0'. Re-sending the command will reset the text counter and the unit will be allowed to send the new daily text limit set.
All texts the unit sends will be added to the text limit counter if the switch 2 'is in the 'on' position.
If switch 2 'is in the 'off' position only unit generated status texts will be added to the text limit counter i.e. change of input status and power fail/restore messages.

Confirmation texts

The unit has the ability to send confirmation reports on a regular basis, if the unit is used for monitoring purposes, this reassurance may be important so that the user is confident that the system remains operational.
Some network providers, especially when a 'pay as you use' method of payment is applicable, will suspend a SIM card it insufficient 'traffic' has been recorded over an extended period, by sending text commands on an automated regular timetable may also have the benefit of preventing the SIM card from being suspended.

Sending the command "text every 'x' days" will instruct the system to send the command "System check OK", setting the value of 'x', 255 is the maximum number of days that is allowed between confirmation texts, '0' will inhibit this function.

For example sending the command "text every 7 days" will instruct the unit to send the message "System check OK" every 7 days. The unit does not use a 'real time clock' using the 'restart day' command will determine the time of day the 'System check OK' message will be sent, (see Restart Day section).

If the unit loses power during this period then the counter will be reset and as a consequence the confirmation may not arrive when expected, but the 'number of days' set after the power has been restored. If the 'System check OK' message is not received then sending the command 'read status' will allow the user to confirm that the system is fully functional.

If the unit is fitted with the optional battery, then the confirmation will be delayed by the duration that the main power was removed.

Restart Day

Sending the command 'restart day' will reset the daily text counter, the time of day that this command is sent will be approximately the time when any texts used out of the daily limit will be reset back to the maximum text limit.
A 'System check OK' message will be sent to the master phone once a 'restart day' message is received and this will also be the approximate time of day a 'System check OK' message will be sent. The accuracy of the timer is around 0.5% so the user must take this into consideration when this command is used.

07 Number Security

The unit has the ability to secure against premium rate 'scams'. If for example the unit receives a text from a premium rate service and the system and the 'security level' is less than '2', then the unit may echo commands, the cost of the commands in some circumstance can be several pounds. For this reason the system will only accept standard '07' numbers or stored numbers therefore, rejecting premium rate text services if '07 numbers only' is set. The command 'reply to all' removes this security feature.

Read Status

If the current status of the unit is required, sending the "Read Status" command will result in the unit sending out the following information:-

Status Parameters	Example Response	Comments
Output	Output Set	Denotes status of output (Text can be customised)
Input	Input off	Denotes status of input (Text can be customised)
Power	Normal	Shows "Battery" if power has failed but unit is in "back up" state
Network	Vodafone	Shows details of network operator
Signal	24	Shows signal strength 1 min, 30 max. When below 6 operation can not be reliable.
Text Count	67	Shows total number of texts unit has sent.
Daily text remaining	16 out of 20***	16 shows max texts that can be sent before the next 24 period , 20 the limit set.

*** This is not shown if a text limit is not set.

Read Settings

If the current status of the unit is required, sending the "Read settings" command will result in the unit sending out the following information on how the system has been set up:-

Status Parameters	Example Response	Comments
Security	0	Show the current security level set
DIP Sw	1100.	Shows hardware switch settings, example shows switches 1,2 "on", 3,4 "off"
07 Numbers Only	07 Numbers Only	Unit will only reply to 07 Numbers, prevents premium rate calls.
Max daily text	20	Show he maximum daily texts that the unit is permitted to send
Send text every	7 Days	Shows how frequently the unit will send an automatic confirmation System check OK''
Redirect phones	Redirect phones = 2	When an input is triggered, the unit can be forwarded to a defined number of phones from top of list.
Redirect delay	Redirect delay = 2	Sets the time in minutes between redirects from first input trigger.
Software Version	SW1.5C	Shows software version so that the current feature can be ascertained

Installation

First remove the lid and carefully retain the 4 lid screws. The receiver unit must be securely mounted using the mounting holes located in the enclosure, outside of the o ring seal. The unit must be positioned away from large metal objects and in an upright position with the sealing gland located at the bottom on the unit.

In areas where a strong GSM signal is available, the internal aerial can be used, an external aerial must be used if areas where the coverage is weaker. In normal conditions an 'amber' status of signal strength should be achieved.

All cabling must be passed through the sealing gland and connected in accordance with the required application, (see wiring diagrams). Ensure that the supply and load are appropriately fused and consult with a competent qualified electrician. All connections must be made into the screw terminals provided, where stranded cables are used it is essential to use appropriate ferrules in order to prevent loose strands creating potential hazards.

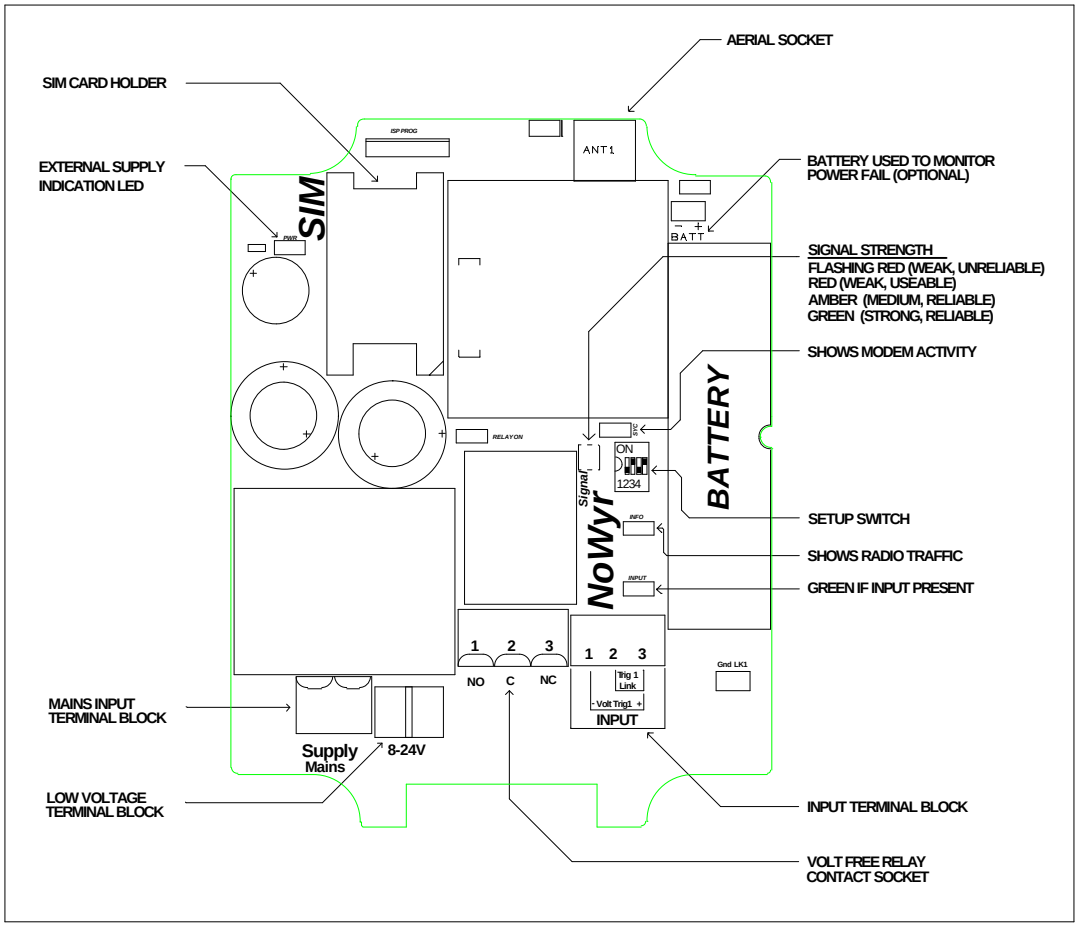
Prior to attaching the lid, check the integrity of the sealing gasket, using all 4 screws provided, tighten evenly until a weatherproof seal can be established.

Before applying power ensure that the installation is both complete and safe.

After the power is applied allow at least 1minute for the GSM unit to initialise and connect to network. The Red 'Info' LED will remain illuminated until the system is ready to send and receive 'text' messages, once this LED is extinguished the system is be fully operational.

The 'Info' LED will illuminate briefly every time a text message is sent or received.

Function Diagram

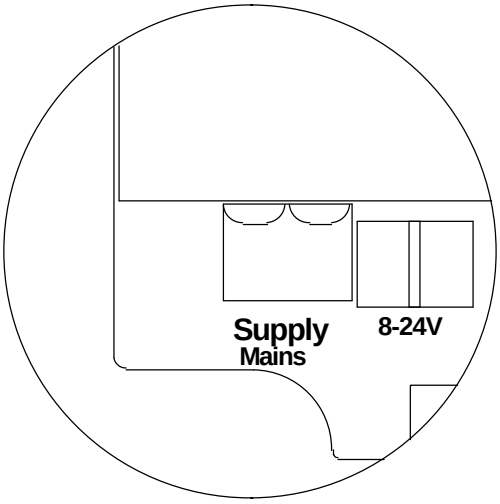


Power Supply

The unit can be powered directly from the mains or from a low voltage supply.

If supply is mains then the it must be connected to the 5mm pitch screw plug supplied and plugged into the connector that is labelled 'Supply Mains'.

If the unit is to be supplied by a low voltage 8-24v AC or DC then this must be connected into the 3.5mm pitch screw plug provided and plugged into the connector that is labelled '8-24V'. NB the supply must be at least 9V if the 'Power Fail' function is required.

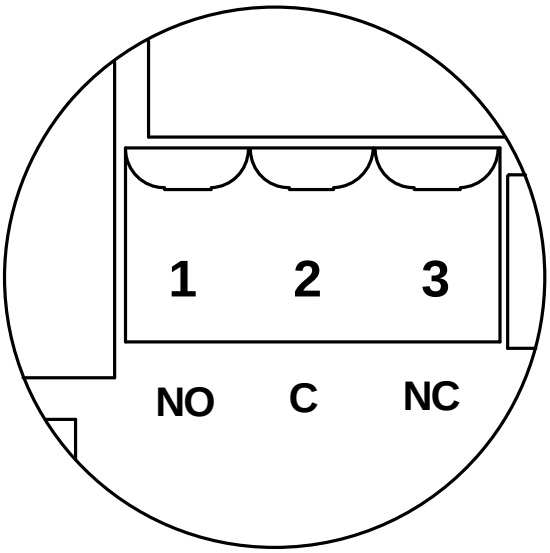


Great care must the observed when making the supply connections as connection of incorrect voltages into the wrong terminals can be extremely hazardous and likely to permanently damage the unit.

Output Switch

The unit is capable of switching 10 Amps @ 230VAC or 30V DC. The contacts are voltage free and electrically isolated from all other components within the unit.

The cables must be connected into the 5mm pitch screw terminal plug connector provided. Where stranded cable is used ferrules must be used in order to prevent lose 'stands' creating short circuits.



Input Terminals

A Closed ' message can to sent by either connecting terminals 2 and 3 on the input block from a clean contact or by applying a voltage between terminals 1 and 3. The voltage can be AC or DC, 5Vmin to 24V max. If the voltage is DC then the negative must be connected to terminal 1.

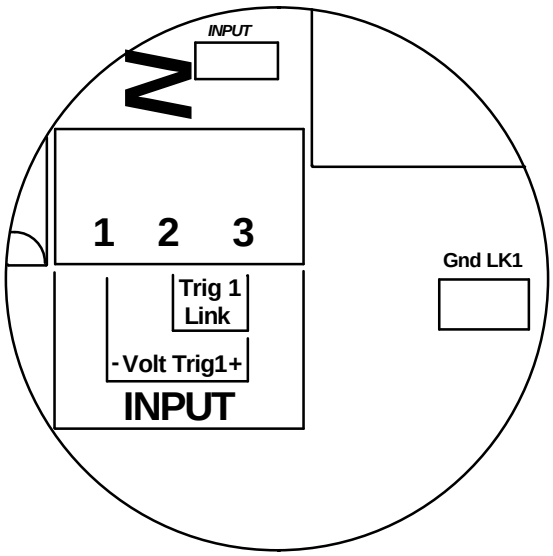
When a Closed ' condition is being detected the status LED will be green, when on Open ' condition is detected the status LED will not be illuminated.

The unit can be made to send an alarm condition to multiple phones on the list, the position of DIP switch 4 dictates weather an alarm condition is sent when input is (open/closed or on/off)

Setting redirect number 2 ' for example will send a trigger on input to the first 2 ' phones on the phone number list, if redirect number 0 ' is set, only input texts will be sent to the primary phone. The list can have a max of 4 phones.

The primary phone will receive both input states; the secondary phones will only report the transition to one state.

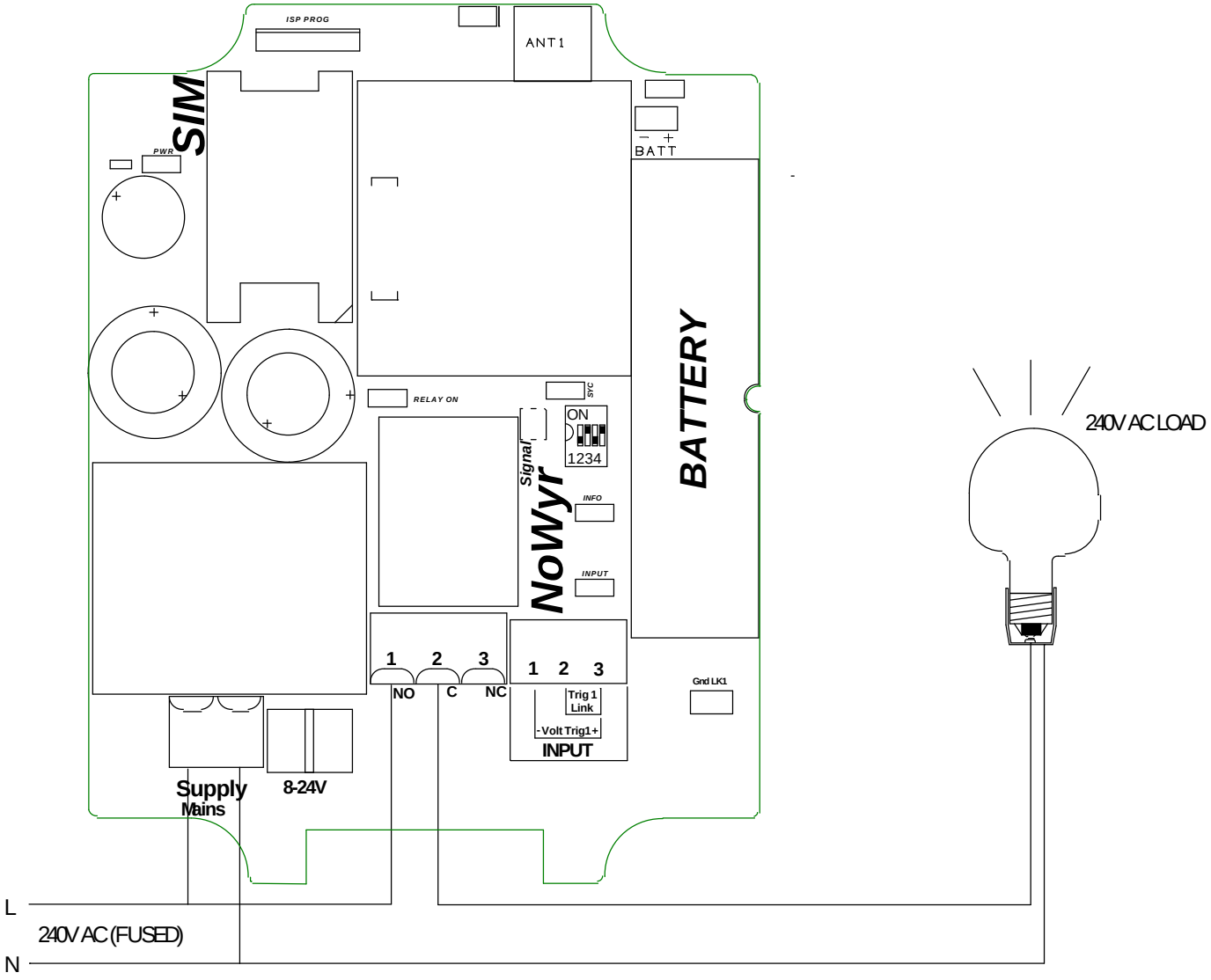
The redirect delay will set the delay between the change of input status is passed down ' the phone list. If for example the unit is set to redirect after 5 ', then when an input close change is detected the primary phone will be sent a input status text immediately, there will be a delay of 5 minutes before a text is in to phone 2 on the list and a further delay of 5 minutes before message is sent to phone 3 and so on. Provided ack ' (short for acknowledge) is sent to the unit before a message has been sent to the next phone down the list, the unit will be prevented from sending input close change to phones down the list. All phones on the list that have been contacted will receive a text confirming the acknowledgement together with the number of the phone that acknowledged the input.



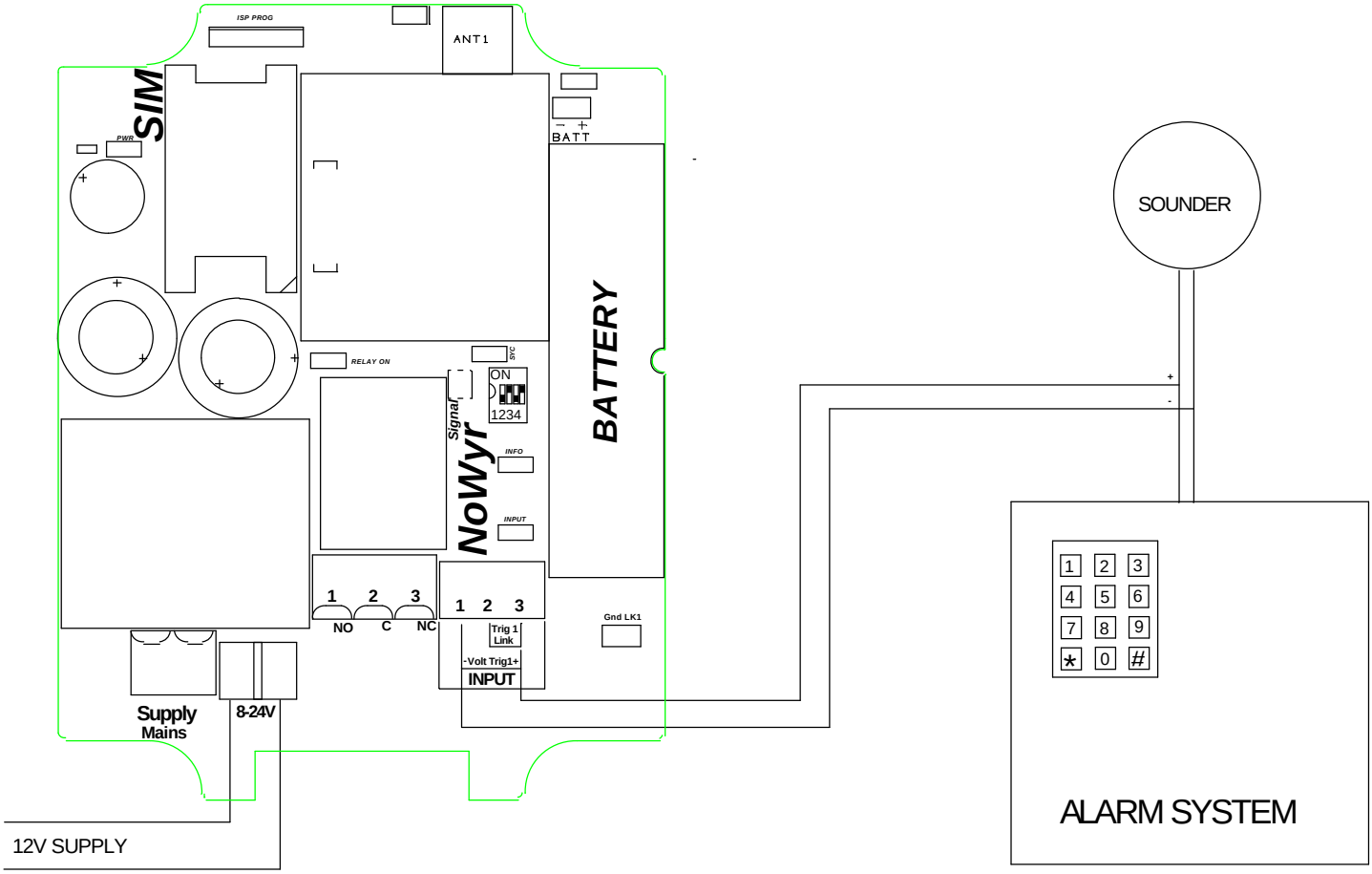
The Redirect feature is useful if the unit is used to detect an alarm, if for example the first key holder ' failed to respond to an alarm then the second and third key holder ' will be notified in turn. The first person to receive the alarm can acknowledge therefore preventing unnecessary disturbance the key holders ' down the list and confirming to key holders ' up the list that the alarm has been acknowledged.

If input is a low side switch derived for the same supply as the unit then the ground link can be cut to totally electrically isolate the input .

Typical Output Configuration



Typical Input Configuration



Dip Settings

The table below summarises the hardware switch settings. It must be noted that it is important that these settings are correctly set, as they cannot be changed remotely and will require a visit to site to make any alterations.

Dip Sw No	On	Off
1	Power fail text disabled	Power fail text enabled
2	Daily limit texts on all texts.	Only hardware generated texts deducted.
3	Force security to 0	Security set by text
4	Invert Input Pin (Closed = LED off)	Normal Input Pin (Open = LED on)

When the Read Settings' command is used, an typical result could be DIP SW 1101, this would represent the following (1 ON, 2 ON, 3 OFF, 4 ON).

Summary of commands

Custom commands

Message No.	Default	Example of change	New Command/Status
1	Set output	Update message 1 'on'	'on'
2	Clear output	Update message 2 'off'	'off'
3	Read output	Update message 3 'check heater'	Will be 'heater on' or 'heater off' dependent on last command.
4	Read Input	Update message 4 'check alarm'	Will be 'alarm triggered' or 'alarm clear' dependent on input
5	Output Set	Update message 5 'heater on'	'heater on' if last command was 'on' (message 1)
6	Output cleared	Update message 6 'heater off'	'heater off' if last command was 'off' (message 2)
7	input off	Update message 7 'alarm clear'	'alarm clear' if input open or 'volt free' **
8	Input on	Update message 8 'alarm triggered'	'alarm triggered' if input closed or 'volt applied' **

** Messages will be reversed if DIP Switch 4 is in the 'On' Position.

Fixed commands

Function	Command Example	Result of Command
Reset defaults	reset defaults	The phone sending command will assume master number and system will revert to factory settings.
Security level	security level 2	Security Level = 2 (see relevant section) , read settings will report the security level.
list numbers	list numbers	Will list all numbers stored in order (max 4)
update number	update number 2 07xxx'	Puts the number 07xxx' into phone list position 2 (max 4)
update message	update message 2 off'	Used to change message 2 to off (see custom commands)
list messages	list messages	Shows all 8 custom commands' that presently defined.
read status	read status	Shows current system status (see relevant section)
read settings	read settings	Shows current system settings (see relevant section)
redirect number	redirect number 2	Will direct input alarm to 2 phones starting from top of list.
Redirect delay	redirect after 10	Will wait 10 minutes before alarm input is sent to next phone. (0 = no delay)
Max texts	max daily texts 20	Will limit maximum texts unit will send in 24 hour period. (see relevant section).
Regular check	text every 7	Unit will text System Check OK' every 7 days. (See relevant section).
07 numbers	07 Only	Will only reply to messages received from UK mobiles. (see relevant section).
All numbers	reply to all.	Will reply to messages received from all numbers. (see relevant section).
Restart day	restart day	System check OK' confirmation and texts used out of maximum daily text limit will reset at approx the time of day this command is sent.

Sim Cards

The unit must have a valid SIM card inserted before it is possible for it to operate on a mobile network.
NoWyr include a free SIM card, and the purchaser can choose a SIM for use on any of the 4 major UK networks, Orange, O2, T-Mobile or Vodafone.

There or several considerations when choosing the Network and payment method to use.

1. The user must check that area where the unit is to operate must have a good signal available from the network that is to be used. The simplest way to verify that there is a good signal is to take a mobile phone that uses the proposed network to confirm a good signal is shown on the display.

2. As it is usually necessary to have the SIM card inserted into a mobile phone in order to setup, top up and register the card, it is necessary to have access to a mobile phone that allows access to the chosen network.

3. At the time of writing the cost of a text can typically be between 3 and 10 pence, if frequent text messages are to be sent from the unit, cost my be a consideration.

4. SIM cards funded using a þay as you use ’can be very cost effective and have the advantage that there is generally no charge when the system is not used and that cost liability is limited to the credit added to the card.

5. Contract SIM cards, generally have a monthly charge irrespective of weather messages or sent. Contact cards do often include and number of free ’texts, priority and less likely to be disconnected due to all credit being used up or falling foul of the network providers terms and conditions. If it envisaged that the unit is likely to sent text frequently and the reliability of the system is paramount a contract option should be considered. If a contract option is chosen then it would be wise to request the network provider to apply a realistic credit limit in order to limit the potential cost that could arise, if for some reason an excessive amount of text messages were sent by the unit.

Battery Backup

The option of adding a maintenance free battery it is possible to report the occurrence of a power failure

If the battery is connected and the power to the unit is removed for more than 10 seconds, the unit will send the message Power Fail ’.

The unit will stay powered for approx 10 minutes, with the input function still operational.

The output will not operate as there would be no supply available for the load in any case.

Once the power has been re-applied for more than 10 seconds the unit will send the text message Power Restored ’.

Turning Dip Switch 1 to the On position will disable the Power Fail ’function.

Intellectual Property

This product is licensed to Fastrace Ltd T/A Rust Industries. All intellectual property is subject to copyright and all rights reserved. All artwork, software, firmware, circuitry, design and documentation are subject to copyright.

Disclaimer

Rust Industries is continually developing their product range and reserve the right to modify the specification without prior notice. Whilst we believe all information that is supplied to be accurate, we do not accept any responsibility or liability arising from the application, use or for errors and or omissions.

As this system can automatically send information that is likely to incur cost, whilst we have implemented some safeguards to restrict the amount of potential data sent, we cannot guarantee total control of data flow by the unit. Consequently we do NOT accept responsibility for any billed costs whatsoever.

We recommend that the unit be used with either a SIM card that uses a 'prepaid credit' system or connected to a network provider that limits the 'credit' to an acceptable level, in order to minimize the potential cost liability that can be incurred.

NB It is important to operate the system in accordance with the 'Terms and Conditions' agreed with the network provider to which the system is connected in order to maintain a reliable level of service.

The seller's liability is limited to the replacement of the product ONLY, and is NOT liable for any other consequential losses including labour, damage to equipment or any other expenses incurred.

NOTES