Developed and Manufactured by Advent Controls Ltd, Liverpool, UK
BOLD indicates default settings

Command	Action			Comments
ACKNOWLEDGE	**DISABLE**	ENABLE		SMS on Relay Change State
ADD	*number*	.		Add User Number
AUTODIAL	**OR**	AND		
CALL	**LIST**	ANY	NONE	Call Handling
CALLNUM(A/B)	*number*			Add Autodial Call Number
CLEARALL				Factory Reset
CLOSE				Deactivate Relay
CONNECT	**NONE**	CL	OP	Connect Call Condition
CSQ				Get RSSI
CTIME	*<seconds>*	.		Set Call Maximum Time Limit
CUSTOM				Custom input message
DIAL	*number*			Dial Number on Receipt
DIVERT	**ENABLE**	DISABLE		Enable Dialling Diverted Calls
EXIT	**DISABLE**	ENABLE		Exit Switch Enable
FORWARD	DISABLE	ENABLE	TEMP	Forward SMS/SSD
INPUTX	**BOTH**	AUTO	TEXT	INPUT Control (4.1)
INPUTX	DISABLE			
INLEVELX	**OPEN**	CLOSE	BOTH	Input Edge (4.2)
KA	*number*	*frequency*		Keep Alive Message
LIST				List All Numbers
MASTER	*number*	.		Add Master User
MUSER	**DISABLE**	ENABLE		Treat all users as Master
OFF [as CLOSE}				Deactivate Relay
OPEN/ON	*<minutes>*m.			Activate Relay (with Time)
PSMS	**ENABLE**	DISABLE		Power Up Text Alert
QUERY/QNUM	*number*	.		Find Number in Memory
REJECT	ALL	**NEVER**	OPEN	Call Handling
REMOVE(C/D/M/T)	*number*	.		Remove Number
RESET				Remote Restart
RLYMODE	**PULSE**	TOGGLE	RING	Relay Mode Toggle/Pulse
RLYTIME	*<seconds>*			(default 3s)
RLYTIME	*<minutes>*m	.		relay time in minutes
RSMS	**ENABLE**	DISABLE		Reset Text Alert (Network)
RTIME	*<seconds>*			Maximum Ring Time
SILENCE	*<seconds>*			Maximum Line Silence Time
SMS	*number,*	*interval (days)*	.	PAYG Keep Alive
STATUS				Get Relay and Input Status
TEXTNUM(A/B)	*<master>*	*number*	.	Input Trigger Text Numbers
TEXTRES	**DISABLE**	ENABLE		Result Acknowledgement

Advent Controls

QUAD Band GSM
Relay Board and Auto-Dialler

Alpha 3.02/Firmware 3.08

Open-on-Call Access Control
with Text Alert & Auto-Dial

**for GSM850MHz, GSM900MHz
DCS1800MHz & PCS1900MHz**

www.adventcontrols.co.uk

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Contents

6.5   Antenna Connection

The standard antenna can be used where a good signal exists. In areas with a poor signal an external antenna is recommended connected via RG174 coaxial cable. The system antenna connection is a male Hirose U.FL connector. The supplied pigtail is a U.FL female to SMA female connector. It is not recommended to use an extension greater than 3m in length.
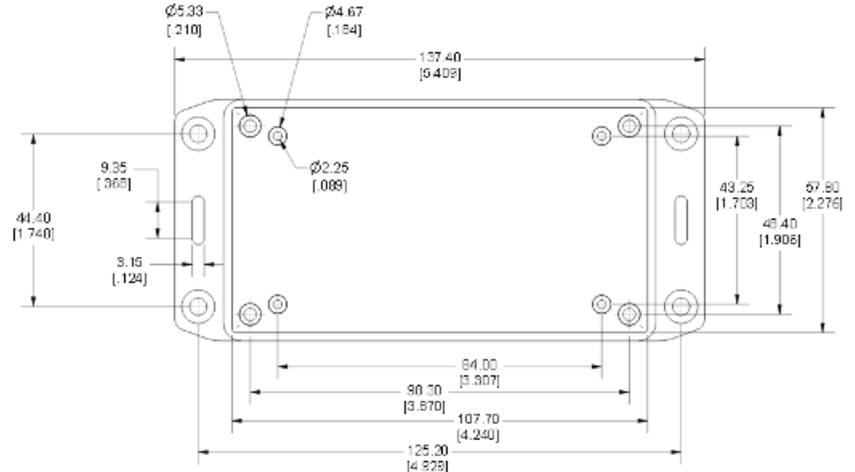
6.6   Mounting

The PCB has been designed to fit into a Hammond 1591B enclosure. When mounting the unit into such an enclosure the enclosure must be modified to allow for the antenna/coaxial cable to be connected. When mounting in a metal cabinet, an external antenna must be used, connected using 50ohm impedance coaxial cable. If required, please contact support@adventcontrols.co.uk for assistance.
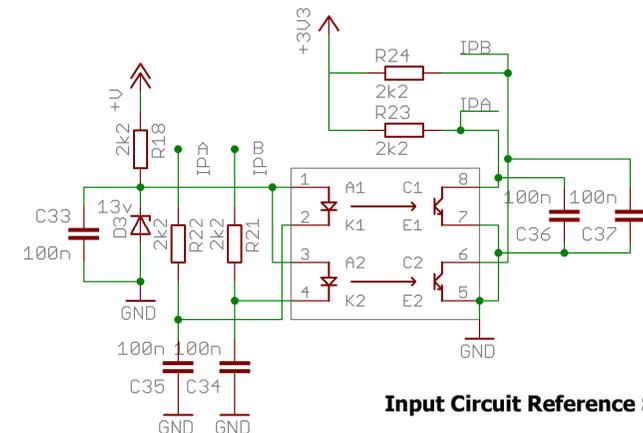
Input Circuit Reference Schematic

6.3 Connection to a Burglar Alarm

The system features an optically isolated input terminal which is driven low (to GND or -VE) in the active state. The A or B terminal is held at approximately 13V (or +VE if VIN is less than 13V) through a 4400 Ohm load. The A or B terminal on the Alpha Relay Board may be connected to the –VE terminal of a burglar alarm bell output (or other programmable open collector output) to allow the system to be used as an alarm auto-dialler and SMS sender. **Both equipment must share a common GND connection—connect GND to panel ground.**

Please note, whilst most alarms pull the negative terminal down to ground when active, the installer should ensure this is the case with their alarm system. If the alarm output goes from GND to +VE or open circuit the INLEVEL settings must be changed (see section 4.3). Alternatively it may be necessary to use an intermediate relay board for connection to some systems. Please contact support@adventcontrols.co.uk for assistance.

Switched -VE

Alarm Power Supply with
Bell Box permanent live

6.4 Output Connection

The relay output has Normally Open (NO) and Normally Closed (NC) relative to COMmon (COM) connections. These can be actuated in a momentary operation or can be toggled (see **3 Setup**).

The connections are 'voltage free' with no connection to +VE or GND. The relay connections have a minimum creepage distance to GND greater than 5mm and are CATII rated to 220V.
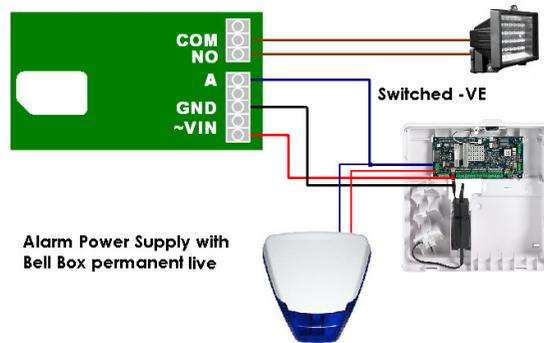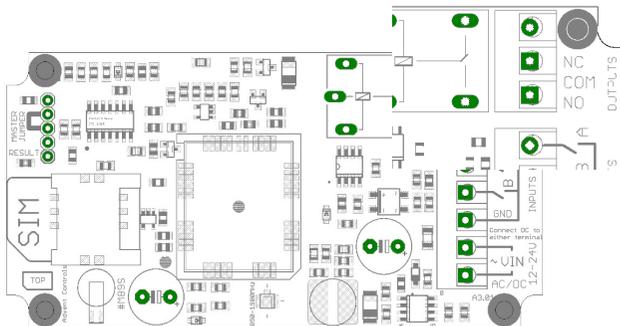

1. Introduction

The Advent Controls Alpha GSM Relay Board has been primarily designed for security applications although can be used as a general purpose call/SMS activated relay. The board also features two optically-isolated DC inputs which can be used to trigger dialling and/or sending of customisable Short Message Service (SMS) alert messages to up to 512 numbers.

The relay can be activated by a call or SMS text from up to 512 stored telephone numbers or can be configured to activate when receiving a call from any number. By default the call will not be answered and hence costs the caller nothing. However, the system can also be set to reject the call or connect a call when either the input is open or closed (or both). This allows the input status to be determined even when the SIM card does not have credit for SMS text messages.

Setup and operation is performed by simple SMS text messages including adding and removing user telephone numbers. A complete list of accepted telephone numbers can be viewed via SMS text message. The memory can also be scanned to see if it contains an individual number and the result is displayed by the on-board LED and (if enabled—see **2.10 TEXTRES**) by SMS text message. SIM card balance checking can also be achieved using the SMS and Service data forwarding functions.

The output relay has both Normally Open (NO) and Normally Closed (NC) with Common (COM) connections. The action of the relay can be a single timed actuation from either 1s to 999s or 1 to 999 minutes or the relay can be set to toggle between calls.

1.2 Technical Specification

Power Supply	12-24V AC or DC 400mA Max. (35-20mA idle)
Average Current (in-call)	60mA @ 28VDC, 95mA @ 18VDC, 130mA @12VDC
Relay Output	5A Max. CATII 220VAC
SIM	1.8/3.6V
Compliant with GSM Phase 2/2+	Class 4 (2W @850/900 MHz)
	Class 1 (1W @1800/1900 MHz)
Antenna	50Ω U.FL

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1.3 Number Types

When adding a telephone number to the system it can be set up as one of five different telephone number types with each type having a specific purpose. There is space for 512 numbers and each number can be set up as any type of number. For example you may wish to have 200 masters and 312 users. **All four user (non-data) number groups can operate the output relay by SMS text or by calling the board.**

Master Numbers

These numbers are used to make changes to the system including adding other numbers. At least one master number must be set up when the system is first used (see **section 2.3**). Once one master number is set up it can then be used to set up other master numbers

Example Master Number setup command:

Master 07000000000.

User Numbers

User numbers are only able to operate the relay output. This can be via SMS text or by calling the board. Unless MUSER is enabled (this makes all numbers master numbers) user numbers cannot access any command functions.

Example User Number setup command:

Add 07000000000.

Text Numbers

These numbers are the recipients of input triggered SMS text messages. The board sends SMS text messages to these numbers in the order in which they are added. These numbers cannot access any of the board's command functions but are able to operate the output relay by call or text. Note, if a master or user sends a command to the board which results in a SMS text reply, the reply is sent to the sender of the command and not the list of text numbers.

Example Text Number setup command:

TEXTNUM 07000000000.

Call Numbers

Call numbers are dialled when the input is triggered. Call numbers are dialled before the sending of SMS text messages to the Text Numbers. They are dialled in the order in which they are added. The numbers are dialled sequentially until a call is answered and rejected or a call is answered and the # key is pressed. See Section 4.1 Auto-Dialler for details.

Example Call Number setup command:

Callnum 07000000000.

Data Numbers

Data Numbers are setup in a similar way to master numbers and allow settings to be amended using software. A call from a data number may leave the unit unresponsive for up to 3 minutes after the call has ended. Data numbers cannot activate the output relay. Details of the software are not covered in this manual. Please see the Advent Controls website/blog.

Data 07000000000,**37212.**   for module with IMEI 355073034**37212**

2.   Operation

2.1   Registration

A valid GSM Subscriber Identity Module (SIM) card must be present in the SIM holder for the system to operate. Immediately on power up the system will attempt to register on the SIM card on it's home network. Once registration has occurred LED1 will change from flashing approximately once every second to a momentary flash once every two seconds. If the LED1 continues to flash once every second for some time, the system cannot register the SIM on the network. The system will restart should this occur. If the problem persists check the antenna and strength of signal in your area/validation of the SIM card. **Remove any PIN numbers from the SIM card.** Observe anti-static precautions when inserting the SIM.

6   Installation

6.1   Power Connection

A fused AC or DC power supply of between 12 and 24V (MAX!) should be used with this unit. AC voltages over 27VAC will cause the on board thermal fuse to trip and may cause erratic operation. We recommend you measure the supply voltage when using AC to ensure it does not exceed this voltage during normal operation.
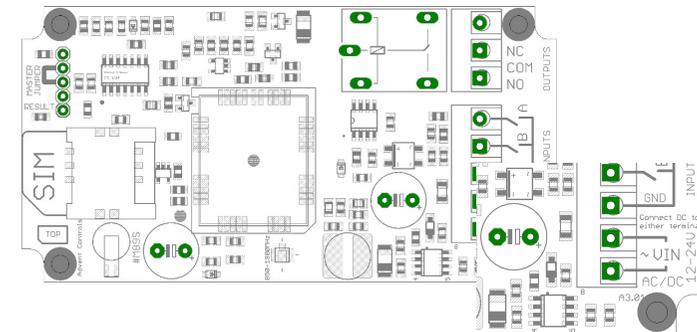
AC power supplies should be connected to either of the ~VIN terminals. Similarly DC supplies should be connected to these terminals with the polarity connected either way around (i.e. +ve and –ve connected to either of the ~VIN terminals).
If DC supply voltages are liable to drop below 12VDC or it is mandatory that the GND terminal be at the same voltage level as the supply ground, connect the negative (0v) supply to the GND terminal and the supply +ve to the outer-most ~VIN terminal (terminal number 5). This will bypass the bridge rectifier for the GND negative supply.

Please note if using this equipment in a motor vehicle please consult Advent Controls prior to fitting (support@adventcontrols.co.uk)

6.2   Input Connection

The inputs are optically isolated from the digital circuitry. Both inputs are active low and should be connected to the GND terminal in the active state. Input impedance is 4.4kΩ and is limited to 13V max. The input features protection against over-voltage but should not exceed 50V.
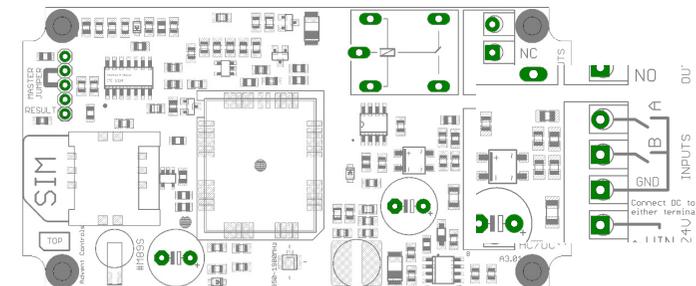
To achieve an improved RSSI the standard antenna can be upgraded to a model with higher gain and/or the antenna should be positioned in an area with less physical obstruction. An extension lead can be attached to the SMA connector on the PCB to locate the antenna away from the control unit housing.

5.3 Power Up/Reset Text Message

The system can send an message to all the text numbers when a system reset or power up has occurred. This can be due to network failure or power cycling (power off followed by power on). Note the system repeatedly resets during network outage. You will only receive 1-message after a network outage.

RSMS Enable	enables the reset text message
RSMS Disable	disables the reset text message
PSMS Enable	enables the power up text message
PSMS Disable	disables the power up text message

5.4 SIM Card Balance Checking and Service Data Forwarding

The system is able to forward SMS messages and Service Data which networks use to display remaining air-time minutes or credit. The forward function can also send network data used to register a SIM with the network website. All forwarded data is sent to the phone which set the service up. The forwarding service can be permanently enabled to forward all unsolicited messages from unrecognised numbers (i.e. not user or master numbers) to the forwarding phone number. However, to stop excessive 'spamming' and wasting credit, the service can be enabled in temporary mode limiting to forwarding messages for only 3 minutes after a master user has sent a valid message (typically the SMS or DIAL command). Additionally only one message will be forwarded every minute to ensure excessive numbers of messages are not sent.

Forward Enable	Forwarding service permanently enabled
Forward Temp	Forwarding for up to 3 mins after a valid messaged received only
Forward Disable	No SMS/Service Data Message forwarding

Networks require either a SMS text message to be sent to retrieve a balance or a network code to be dialled. Please check with your network to find your balance checking method.

5.5 Forwarding SMS Messages to any Number

Typically the SMS command is used to forward a SMS text to the network to request a balance. However the SMS function will forward the text to any number specified.

SMS *<number>,<text>*.

Typical example (Orange, T-Mobile Balance Request)

SMS 150,Balance   sends 'Balance' to 150

This will text 'Balance' to number 150. Please note you need to ensure the forward service set up as above to receive a reply from the system

For network which require a code to be dialled use the DIAL for example Vectone UK:

DIAL *102#   dials '*102#' for a balance request (see section 4.10 Dial Now)

The second LED, LED2 found by the 5 pin header, is used to display the result of a command. **The LED will flash twice to acknowledge the successful receipt of a command** and will light continuously for 2s to show the instruction has failed. It also illuminates during any call (valid or invalid) and lights continuously when a signal cannot be found (network dependent).

2.2 Command Message Format

To operate the system a master GSM phone is used to send SMS text messages to the system telephone number. All message follow a similar format as follows:

COMMAND<space>*action*. *(eg.* Master 07000000000.*)*

The command (see **Section 7**) is always written first followed by a space and the action required. Although not necessary, it is useful to include a full stop immediately after the action as some mobile phones can enter superfluous characters at the end of a message, which can invalidate the message. The message is **not** cAsE sensitive.

2.3 Master Number Setup

The system is controlled by the master GSM mobile phone numbers (see **2.2 Number Types**). The system must first be associated with at least one master phone's number before it can be used. To do this the supplied 2.54mm jumper connector must be fitted to pins 3 & 4 on HDR1 as shown in red in Figure 1. Do not connect the jumper to any other pins or damage may result.
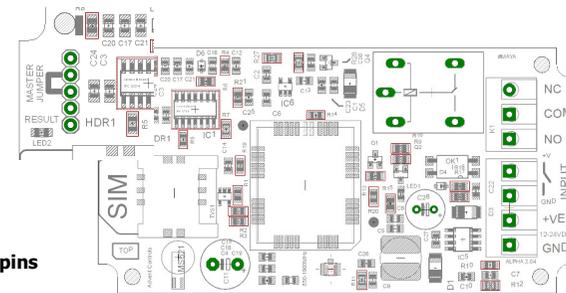
Figure 1. Jumper pins

The master phone number must then be sent via a SMS text message to the system phone number as follows:

MASTER<space>*number*.

For example, if the master telephone number is 07000 000 000:

MASTER 07000000000.

Also valid are the following:

Master 07000000000 and master 07000000000

The following messages are invalid:

master 07000 000 000. (spaces in the number)
master07000000000 (no space after 'master')

The result LED, LED2, will flash two times to indicate the master number has been successfully setup. Calling the board's telephone number with the master phone will now activate the relay. Once one master number has been setup further masters (up to 512) can be setup by this and subsequent master phones without the jumper fitted (using the same message).

Using the PIN for Master Setup

The Master Number can also be set up using the PIN. This is only possible for the first master number that is added to the system. Subsequent masters must be added by a master using the MASTER command. The PIN is the last 5 characters of the IMEI number written on the QUECTEL GSM module sticker. The command is sent as follows:

Master 07000000000,37212.   for module with IMEI 3550730342**37212**

2.4 Allowing Master Control for all Users

To enable any user to control master commands (such as adding and removing numbers) the MUSER command is sent to the board, by a master number, as follows:

MUSER ENABLE   Allows any valid user number to modify settings
MUSER DISABLE   Only master numbers can modify settings

By default MUSER is set to disable full access for all users. N.B. Only master numbers can add other master numbers despite this setting

2.5 Adding a User Number

Any telephone number of at least 5 digits where caller ID is available is valid. The system only compares the last 8 digits (if present) of any calling number against the numbers stored in memory. Therefore it is not necessary to enter the international dialling code format of the telephone number.

i.e. for 070**00000000** only the characters shown in **BOLD** text are considered

The ADD command is used to add a new telephone number. To add a new number any master phone must send the following SMS text message to the system telephone number:

add<space>*number*.   e.g. **Add 07000000000.**

If TEXTRES is enabled the system will respond with the 'Operation Successful' message.

2.6 Removing a User Number

The REMOVE command is used to remove an existing telephone number. To remove an existing telephone number any master phone must send the following SMS text message:

remove<space>*number*.   e.g. **REMOVE 07000000000.**

The REMOVE command can must be sent for each number in the memory. The user can specify which number type is desired to be removed and only that type will be removed regardless of whether the number is already in the memory in a different form.

4.11 International Calling/Texting

The system can call/text international numbers, however the exit code should not be specified and should be replaced with the '+' symbol e.g:

UK Number 07574163367 should be entered as +7574163367 when outside the UK

4.12 Dial Now

If necessary the system can make a call to a number not stored in it's memory at any time. This is achieved using the DIAL command. The call observes the RTIME, CTIME and SILENCE time settings

DIAL<space>*number*.   make an ad-hoc call to the specified number

e.g.   dial 01517283167.

The call will end when the other party hangs up or the CTIME or SILENCE time limit is reached.

5   Setup

5.1   SIM Keep Alive Text

When using a Pay As You Go (PAYG) SIM card, to avoid SIM card deactivation, the system can periodically send a SMS text message to keep the SIM active. Ensure the SIM card has sufficient credit to make a call or text (even if the call goes unanswered). To setup the Keep Alive Text function the following SMS text message is sent to the system:

KA<space>*number,frequency*.   enables periodic text message sending

e.g.   **KA 07000000000,10.**   (text 07000000000 every 10 days)
          KA Off   disables periodic text message sending

Frequency—number of days interval

Most UK networks require the equivalent spend of one one minute call per quarter. It is recommended a text is sent at least once per month (28 days).

5.2   Signal Strength Indicator

When setting up the system it is important to know the strength of signal for reliable operation. To receive a message showing the Received Signal Strength Indicator (RSSI) the CSQ command is sent to the system as follows:

CSQ

When the system SIM card has sufficient credit a SMS text message is sent to the number which sent the command displaying the current RSSI.

e.g. >RSSI 21

It is recommended that the minimum signal level for the installation is 15 (-83dBm) to ensure reliable operation. The system will operate below 8 (–100dBm) but may become unresponsive at times.

4.5 Changing the Maximum Ring Time

The maximum time for which the system will attempt dialling before dialling the next number is set using the RTIME command. The default time limit is 60s. The RTIME command is specified in seconds and can be set from 1s to 255s. Most calls will require at least 15s for connection which is included in RTIME.

RTIME 45.   sets the maximum ring time to 45 seconds

4.6 Changing the Maximum Call Time

The maximum time limit for an answered call is set using the CTIME command. The default time limit is 45s. The CTIME command is specified in seconds and can be set from 1s to 255s.

CTIME 45.   sets the maximum call time to 45 seconds

4.7 Changing the Maximum Line Silence Time

The maximum time for which a silent call will remain connected is set using the SILENCE command. This is useful were a call may be redirected to voicemail. The silence during recording will cause the system to hang the call. The default silence time is 15s and can be set from 1s to 255s.

SILENCE 25.   sets the maximum line silence time to 25 seconds

4.8 Adding Auto-dialler SMS Text Numbers

The system can send the input triggered message (2.16) to up to all 511 numbers. To add a text number the following SMS text message is sent to the system by any master number:

TEXTNUM<space>*number***.**

e.g. **textnum 07000000000.**

4.9 Adding Auto-dialler Call Numbers

The system can call up to all 511 numbers when the input is triggered. To add a call number the following SMS text message is sent to the system by any master number:

CALLNUM<space>*number***.**

e.g. **callnum 07000000000.**

4.10 Assigning a Number to One Channel Only

Both Call and Text Numbers can be assigned to call/text only when one particular channel is activated. This is done by appending A or B to the CALLNUM and TEXTNUM commands as follows:

CALLNUMA 07000000000   calls the number 07000000000 only when channel A is active
TEXTNUMB 07000000000   texts the number 07000000000 only when channel B is active

N.B. Text/Call numbers can also activate the output—there is no need to ADD the number

For example to remove a Call Number the 'C' character is appended after the word remove as follows:

REMOVEC 07574163361.

This will only remove instances of the number 07574163367 that are stored as Call Numbers.

The following shows the characters associated with each number type:

T—**T**ext Number
C—**C**all Number
M—**M**aster Number
D—**D**ata Number
None specified—Any number (including User Numbers)

If TEXTRES is enabled the system will respond with the 'Operation Successful' message. If the number is not found the 'Operation Failed' message will be sent by the system.

2.7 Viewing the Valid Number List

The system can send a SMS text message containing a complete list of valid user numbers to any master phone.

To receive the list of numbers the LIST command is used. The master phone must send the following SMS text message to the system:

List

The response format shows the number type, the channel (if applicable) and the last 8 digits of the stored number followed by a space and the next number and so on…

Number Types:

T—**T**ext Number
C—**C**all Number
M—**M**aster Number
U—**U**ser Number
D—**D**ata Number

Input Channels:

A—Channel **A**
B—Channel **B**
M—**M**ultiple (Both A&B)

The numbers are in the reverse order to the order they were added with the primary master not displayed.

e.g. TA74163367 CM17283167 D51953899 U17283167 M30666575

07574163367 is a Text Number for Channel A
01517283167 is a Call Number for both channels and so on...

2.8 Finding a Number in the Memory

When a large number of numbers are stored in the memory using the LIST command can be impractical. To find whether an individual number is stored in the memory the master user sends the following command to the board:

QUERY<space>*number*.   or
QNUM<space>*number*

NB the number should be the full number (not the 8-digit truncated number)

If the number is present the LED will flash 4 times and if not in the memory the LED will light twice for 2 seconds. If TEXTRES is enabled an SMS text message will be sent with the result.

2.9 Clearing All Numbers and Settings

The CLEARALL command is used to erase all stored user and master numbers. To erase all numbers the following SMS text message is sent by a master number:

CLEARALL

No response is sent by the system to acknowledge the command. This does not affect the customisable input text messages.

2.10 Result Acknowledgement Message

The system can be setup to send a SMS text message to acknowledge a command. This acknowledges the result of the last command processed such as adding a new user number. The SIM card in the system must have sufficient credit for sending SMS text messages. To enable/disable the service the following text message is sent by the master number:

TEXTRES enable   (or also valid: **TEXTRES e**)

TEXTRES DISABLE   (or also valid: **TEXTRES d)**

The result message 'Operation Successful' is sent when the service is enabled

---

If the trigger is required when the input goes open the following message is sent:

INLEVEL OPEN   trigger when input A open (+VE)

The input functions become inactive whilst the input remains in the active state (i.e. GND for INLEVEL CLOSED/+V for INLEVEL OPEN) and remains inactive for 5 seconds after returning to the idle state. **INLEVEL BOTH** allows triggering on either edge (no inactive state)

INLEVEL BOTH   trigger input A on either edge

By default changes will only be made to input A if not specified by the INLEVEL command. To change input B the following commands are sent:

INLEVELB CLOSED	trigger when input B closed (GND)
INLEVELB OPEN	trigger when input B open (+VE)
INLEVELB BOTH	trigger input B on either edge

similarly;

INLEVELA C	trigger when input B closed (GND)
INLA O	trigger when input A open (+VE)
INL B	trigger input A on either edge (BOTH)

4.3 Customising the Input Alert Message

The default input alert message is '>INPUTX ACTIVE'. This can be customised by the user using the CUSTOM command for each input. The maximum length of the message is 64 characters and it **must** end with a full stop. The custom command is used as follows:

CUSTOMA THE GATE IS OPEN.
CUSTOMB THE PUMP HAS STOPPED PLEASE CALL 07000000000.

Use only text or number characters in the message. The message will end where there is a full stop. Do not use a full stop in the middle of the message.

CUSTOM BOTH A and B GET THIS.

By not specifying input A or B the message is applied to both input A and B.

4.4 Autodial Logic

By default, if both inputs are set to autodial, then if either input is triggered dialling will commence (OR configuration). If desired the system can be set to require both inputs to be in the active state in order to initiate dialling (AND configuration). To change the autodial logic settings the following message is sent to the board:

autodial AND	requires both inputs to be active to initiate dialling
autodial OR	triggering either input initiates dialling

aut A
aut o

4.1 Auto-dialler: Input Triggered SMS Text Message Sending and Autodialing

The inputs can be used to trigger the sending of customisable SMS text messages to all of the 'text numbers' (see section **1.3 Number Types**) and to sequentially dial all of the 'call numbers' (see section **1.3 Number Types**).

Call numbers are given priority and are dialled before the sending of SMS text messages to the Text Numbers. If no call numbers are stored no call dialling will occur and the system will begin sending SMS text messages straight away.

Each input can be configured to either send a text message, initiate dialling or both send a text message and dial the call numbers. Each input can also be disabled by SMS remotely.

Each input has it's own customisable message (see section 4.3) which can be sent when the associated input is triggered.

Dialling can be triggered by either input in a logical OR configuration or can be triggered only when both inputs are active in a logical AND arrangement (see section 4.4).

Calls are dialled in the order in which they are added. The numbers are dialled sequentially until a call is answered and rejected (hung-up) or a call is answered and the # key is pressed or until all of the numbers have been dialled.

If a call is answered the system will automatically hang up the call after 5s. The board will then call the next number. During the 5s call the recipient can end dialling by holding the # key on their phone or by ending the call if the recipient is a mobile phone After dialling is complete, the system will proceed to send the customisable text message to the list of text numbers.

The maximum call length in auto-dialler mode is fixed at 5s. The maximum ring time (the time between dialling and call pick up) can be set using the RTIME command.

To enable autodialing on either input the following command is sent via a SMS text message by any master telephone number:

INPUTA Auto	enables autodialing on input A
INPUTA Text	enables SMS text sending on input A
INPUTA Both	enables both autodialing and SMS text sending on input A
INPUTA Disable	disables input A

INPUTB Auto	enables autodialing on input B
INPUTB Text	enables SMS text sending on input B
INPUTB Both	enables both autodialing and SMS text sending on input B
INPUTB Disable	disables input B

also valid;

inputb a	enables autodialing on input B
input t	input A is the default input if not specified
inpb b	
INPB D	

4.2 Input Change State Level

The INLEVEL sets the active state of the input for triggering the auto-dialler. For example, if the user requires triggering when the input is closed (GND), then the following message is sent by the master number:

INLEVEL CLOSED	trigger when input A closed (GND)

3 Relay Operation/Access Control

3.1 Enabling Any Number and Disabling Open-on-Call

The system can be setup to allow any number to operate the relay output. To enable any call the CALL command is used with the action ANY and is sent by the master phone in the following format:

Call any

To return the system to operate from only valid user numbers the LIST action is sent with the CALL command as follows:

call list

To disable activation of the relay by calling the following command is sent to the board (the relay can still be activated by SMS text; see OPEN/ON & CLOSE/OFF commands):

CALL NONE

If TEXTRES is enabled the system will respond with the 'Operation Successful' message.

3.2 Call Reject

By default any call to the system will be allowed to ring indefinitely (or up to the host network time limit). This is to avoid calls being diverted to voicemail when rejected by the system. However the system can be instructed to reject (hang up) calls using the REJECT command:

REJECT ALL	rejects all *valid* calls

The reject command can also be used to determine the status of the relay when in toggle mode by sending the following command:

REJECT OPEN	rejects the call when the call is deactivating the relay connects the call when the call is activating the relay
REJECT NONE	disables all call rejection

3.3 Connecting a Call

By default, when called the system is set to ring indefinitely or until the SIM card network operator transfers the call to voicemail. However the system can be set to connect a call when the input is **OP**en (high/12V) or **Closed** (low/0V). This is done to allow the caller to know the state of the input even when the system has insufficient credit to send a status SMS text message. See also the REJECT command if call rejection is preferred.

To change the connect mode the CONN command is sent by the master phone with the action **CL** or **OP**. To disable connect on call the **NO**ne action is sent.

e.g.	**CONN CL**	connect when input high
	CONN OP	connect when input low
	CONN NO	do not connect call

3.4 Input/Output Status Message

To determine the current status of the input terminal and output relay the STATUS command is sent to the system telephone number by a master phone as follows:

STATUS

The system will respond with a SMS text message as follows:

RELAY OPEN INPUT LOW   relay not activated/input closed (GND)
RELAY CLOSED INPUT HIGH   relay activated/input open (+V)

3.5 Relay Activation Mode

When a valid call is received the relay can be set to activate for a set period of time (set by the RLYTIME command), to activate whilst the caller is ringing or to toggle between states on each call. By default the relay mode is set for timed (pulsed) activation. To switch to toggle mode the following message is sent to the system by the master number:

RLYMODE TOGGLE   enables toggle mode

To activate the relay for however long the caller rings (n.b. turn off voicemail!)
RLYMODE RING   relay active whilst phone rings

To revert to timed (pulsed) mode the following message is sent:
RLYMODE PULSE   relay Normally Open (NO)

3.6 Relay Activation Time

The RLYTIME command is used to adjust the time the relay is active following a call when RLYMODE is set to PULSE. By default the relay time is set to 3s. The time can be set from 1s to 999 seconds or 1 to 999 minutes using this command.

To change the activation time the master number sends a SMS text message as follows:

RLYTIME *seconds.*

e.g. **rlytime 10.**   1 second activation time
      rlytime 250s   250 second activation time
      Rlytime 1m.   1 minute activation time
      RLYTIME 960m.   16 hour (16 x 60mins) activation time

3.7 OPEN/ON & CLOSE/OFF Commands

The OPEN and ON commands are used to activate the relay with a SMS text message. The CLOSE and OFF commands deactivate the relay, whether activated by the OPEN or ON command or a call. When the OPEN command is sent without any additional instructions the relay is activated indefinitely. When sent with a value and **m**(inutes) or **s** (econds) parameter the relay activates for a set period of time. The maximum number length is three characters therefore the timer is limited to 999 seconds or 999 minutes. If the m or s parameter is not sent then the timer value is read as the number of seconds.

The ON and OFF commands are identical to the OPEN and CLOSE commands respectively and can be used interchangeably.

When sent with additional time information the relay is activated for however many seconds or minutes specified.

e.g. **OPEN**   activates relay indefinitely
      on   activates relay indefinitely
      open 10.   10 second activation time (s parameter optional)
      Open 250s   250 second activation time
      ON 1m.   1 minute activation time
      open 960m. 16 hour (16 x 60mins) activation time

      CLOSE   deactivates relay under all conditions
      OFF   deactivates relay under all conditions

If the system loses power the relay state is restored when the power is reconnected!

3.8 Exit Switch Enable

The INPUTA connection can be used to activate the output relay which is ideal for connection to a secure-side exit switch. It uses the trigger level for the input text message (see INLVL) and activates the relay as per a phone call. To enable the exit switch input the EXIT command is sent to the board as follows:

EXIT ENABLE   enables the exit switch input
Exit disable disable the exit switch input

3.9 Output Change Acknowledge SMS

Where necessary the board can send an acknowledgement SMS text message to all of the TEXTNUM numbers showing the current status of the output. When the output is actuated by a telephone call or text message the activating number is also sent. When the output is activated via an exit switch (see section 3.8) on INPUTA the relay status and 'MANUAL' message is sent. To activate and de-activate the acknowledge message the following command is sent to the board:

Acknowledge Enable   enables the acknowledge text
ACKNOWLEDGE DISABLE   disables the acknowledge text

also valid,

ack e   acknowledge enable
ack d   acknowledge disable