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## Definitions

The following definitions are used throughout this document and generally in connection with the control unit.

- Message** An SMS ('text') message sent from one mobile station to another.
- Denotes a 'space' in the format of a message.
- Alphanumeric.** Characters in the range A to Z (upper and lower case), numbers in the range 0 – 9.
- Mobile.** A mobile telephone that is used to send and receive SMS messages.

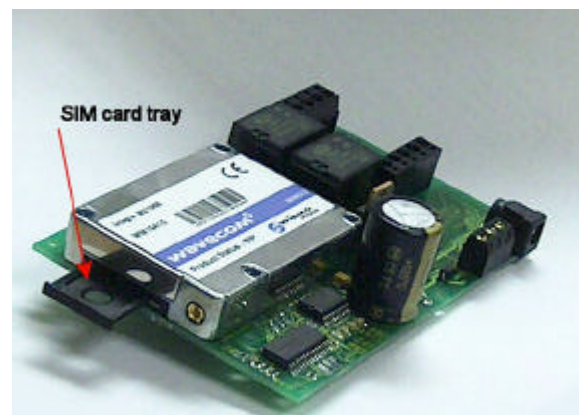
## SIM card

The unit will accept SIM cards of most types subject to the following restrictions.

1. Only 3 volt SIM cards will be correctly read and older 5 volt types will be ignored.
2. Some types of pay-as-you-go SIM cards may require regular call activity (once every six months) to remain registered.
3. SIM cards purchased from RF Solutions can be topped up by credit or debit card by calling Virgin Mobile Customer Services on 0845 6000789.
4. SIM cards that have been protected by means of a PIN (in a mobile phone) will not operate in the unit.
5. Incoming voice calls to the SIM card should be barred before it is used in the GSM 250 unit to avoid any error messages being sent back the user. This can be achieved by calling the service provider (0845 6000789 – Virgin).

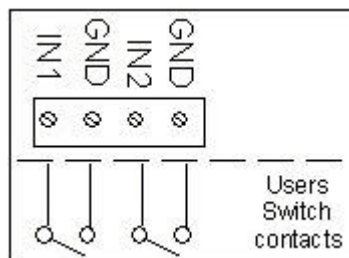
The SIM card should be inserted into the tray, which slides out of the side of the modem. On no account should the modem be removed from the PCB during this process since the connector between the modem and the PCB is easily damaged.

To remove the tray the user must depress the small plastic tab to the right of the tray and pull out the tray.



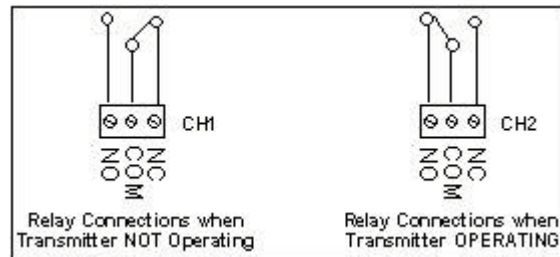
## Input and output circuits

The two inputs are provided via screw terminals GND/IN1 and GND/IN2 terminals. These two volt-free digital inputs are designed to be actuated by contact 'switch' closures across the input pins.



## Output Relays

Two relay outputs are provided, which when activated provide a 'switch' output as below.



## Power up

The 250 unit can be powered from 12 or 24Vdc, a mains power supply is also available. Connecting power maybe via;

1. Connection to the 3 pin terminal block
2. Connection via the 2.5m jack socket

On power up the PWR LED will illuminate steady green and the GSM and STAT LED's will come on steady red. After several seconds the GSM and STAT LED's should both start to blink, indicating that the GSM modem has registered with the network and that the unit is ready to accept user commands.

## Power Loss

In the event of a power loss to the 250 the user will maintain the user configured data entered during the User set-up sequence, as this information is stored in non-volatile memory. However the status of the relays will be lost.

## User Set-Up of 250

Prior to usage, it is necessary to program the 250 unit with the following parameters. (some are optional)  
Note that the User Password **is** case sensitive but that all other commands are **not** case sensitive and will be converted into upper case before the unit handles them. This means that any user command responses, which echo the original command will do so in upper case.

All commands are sent as text messages from a mobile phone.

User Set-Up Commands

Command	Description	Command Syntax	Example
Unit Password (UPW)	<p>The string &lt;UNIT PW&gt; is an alphanumeric string containing from 4 to 10 characters and is always case sensitive.</p> <p>Selection of the UPW must be completed within 5 minutes from power applied. Sending a text message to the unit carries out setting the UPW.</p> <p>If for any reason the unit password is lost or miss-entered the user must remove all power to the unit for 1 minute, when power is reapplied the user may then use the UPW command to set a new unit password.</p>	UPW~<UNIT PW>	<p>Command: UPW~Password38</p> <p>Response: UPW~OK</p>
Unit Identity (UID)	<p>The &lt;UNIT ID&gt; is an alphanumeric string consisting 4 to 10 characters.</p> <p>This string of characters sets the 'identity' of the 250 unit, and is included in any response to identify the 250 unit to the user</p>	<UNIT PW>~UID~<UNIT ID>	<p>Command: Password38~UID~Identity7</p> <p>Response: Identity7~UID~OK</p>
Input number-to-text (INUM)	<p>This command sets the mobile number to where the SMS Text message is sent when input 1 or 2 is changed. The number must be in full international format including country code.</p> <p>Note the country code for the United Kingdom is 44.</p>	<p>&lt;UNIT PW&gt;~INUMn~&lt;num to call&gt;</p> <p>n=1 for input1 n=2 for input 2</p>	<p>Command: Password38~INUM1~33612345678</p> <p>Response: Identity7~INUM1~33612345678~OK</p> <p>This example selects a French mobile (country code 33) with national number 06 12 34 56 78 (leading 0 omitted), this number will be text if IN1 changes state.</p>
Output delay time (ODEL)	<p>This command sets an activation time of the relay outputs. The default is to remain on following an ON command and turn off following an OFF command.</p> <p>If 't' is set to a value from 1 to 9 then this sets the number of seconds for which the output remains on after an ON command. The OFF command is then ignored. If 't' is set to '0', then the output returns to default setting</p>	<p>&lt;UNIT PW&gt;~ODELn~t</p> <p>n=Relay number t=Delay time (seconds)</p>	<p>Command: Password38~ODEL1~7</p> <p>Response: Identity7~ODEL1~7~OK</p>
Response on/off (RESPONSE)	<p>These strings are used to control the responses that are to be sent from the unit following receipt and carrying out of a command.</p> <p>NOTE: messages which specifically demand a response such as requests for input status will always be responded to as will the UPW, UID and RESP~OFF messages.</p>	<p>&lt;UNIT PW&gt;~RESPONSE~x</p> <p>x=ON or OFF</p>	<p>Command: Password38~RESPONSE~ON</p> <p>Response: Identity7~RESPONSE~ON~OK</p>



**Control Commands**

Command	Description	Command Syntax	Example
Activate and deactivate outputs  (OUT)	This command is used to turn a relay output on or off.	<UNIT PW>~OUTn~x  n=Relay number = 1 or 2 x=Relay Status = ON, OFF	Command: Password38~OUT1~ON  Response: Identity7~OUT1~ON~OK
Retrieve status of inputs and outputs  (STATUS)	This command requests that the status of the inputs and outputs be returned to this caller.	<UNIT PW>~STATUS	Command: Password38~STATUS  Response: Identity7~STATUS~IN1ON~IN2 OFF~OUT1ON~OUT2ON
Retrieve unit settings  (SETTINGS)	This command requests that the settings of the unit be returned to the caller.	<UNIT PW>~SETTINGS	Command: Password38~SETTINGS  Response: Identity7~SETTINGS~INUM1~01234567890~~INUM2~01234987654~~ODEL1~2~~ODEL2~0~~RESPONSE~ON

**Incoming voice call**

Any incoming voice calls to the GSM telemetry unit will be intercepted and automatically 'hung up'.



**Messages generated by the unit**

Message	Description	Message Syntax	Example
Change Of Status Of Inputs (IN)	<p>This message reports a change of input state to the designated mobile number (set using the INUM command). A message is sent with the following format.</p> <p>A change of input will only be 'valid' after 5mSecs Where the 250 unit is processing an SMS messages then the response time could be up to 250mS.</p>	<p>&lt;UNIT ID&gt;~INn~x</p> <p>n=input channel =1 or 2 x=input status=ON or OFF</p>	Identity7~IN1~ON
Error in received message (!!ERROR!!)	<p>When an incoming SMS contains an error in the message format, no action will be taken by the unit other than to send an error message back to the calling mobile along with a copy of the erroneous message itself.</p>	<p>&lt;UNIT ID&gt;~m~!!ERROR!!</p> <p>m=Your Message Returned</p>	Identity7~UPW~OUTn~OFF~!!ERROR!!



## Technical Specifications

Storage Temperature: -10 to +70° Celsius. Operating Temperature: 0 to +55° Celsius.  
 Enclosure Dimensions: 145 x 90 x 45mm  
 PCB Dimensions: 124 x 78mm

Electrical Characteristics	Min	Typical	Max	Dimension	Notes
Supply Voltage for 12Vdc	9.0	12.0	16.0	V	
Supply Voltage for 24Vdc	21.0	24.0	26.0	V	
Supply Current for 250:					
Idle			75	mA	1
Operating			950	mA	2
Supply Current for 255:					
Idle			100	mA	1
Operating			1000	mA	2
Supply Current for 251:					
Idle			10	mA	1
Operating			200	mA	3
Digital Input : Min Time of input				mSecs	
Mains rated Relay Rating (230Vac)		5	12	A	4

### Notes

1. Refers to maximum supply current required with all components idle.
2. Refers to peak supply current required with all components operating. In practice internal reservoir capacitance limits the instantaneous peak current to less than 500 mA.
3. Refers to maximum supply current required with all components operating
4. The relay contacts in this unit are for functional switching only and must not be used for isolation purposes.