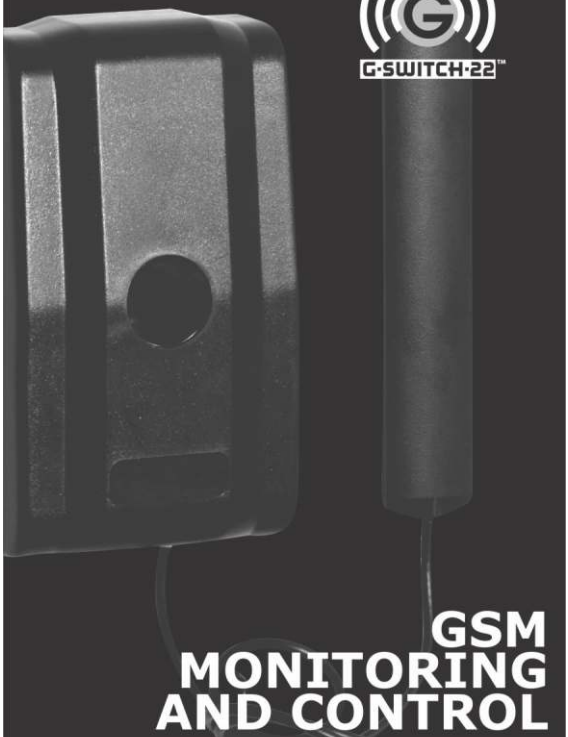
G-SWITCH-22 GSM module
installation guide

CENTURION

G-SWITCH-22™



GSM MONITORING AND CONTROL

1. Introduction

The **G-SWITCH-22** GSM module allows up to 300 individual users to activate a maximum of two outputs on the module using their mobile phones. These outputs can be used to open a gate, activate an alarm system, turn on a borehole pump* etc. Activation can be either via a missed call (no charge), or a pre-specified text message (SMS).
In addition, users can also be notified by SMS, of the activation of either of two inputs on the module, in the event of an alarm activation, a power failure* etc. An optional online interface allows for easy programing of the module.

* May require additional external switchgear

2. Important Safety Instructions

1. All installation, repair, and service work to this product must be done by a suitably qualified person.
2. Do not in any way modify the components of the system.
3. Do not install this product near sensitive electrical components (e.g. the DOSS sensor inside a CENTURION operator housing).
4. Do not install the equipment in an explosive atmosphere: the presence of flammable gas or fumes is a serious danger to safety.
5. Do not leave packing materials (plastic, polystyrene, etc.) within reach of children as such materials are potential sources of danger.
6. Dispose of all waste products like packaging materials, according to local regulations.
7. Centurion Systems does not accept any liability caused by improper use of the product, or for use other than that for which the automated system was intended.
8. This product was designed and built strictly for the use indicated in this documentation. Any other use, not expressly indicated here, could compromise the service life/operation of the product and/or be a source of danger.
9. Anything not expressly specified in these instructions is not permitted.

This icon indicates tips and other information that could be useful during the installation

This icon denotes variations and other aspects that should be considered during installation

3. Security consideration

It is strongly advised that a pre-paid SIM card (with limited airtime) is used, and that it is also password protected. These measures will give you peace of mind as they will ensure that your SIM card will have little or no value should it ever get stolen.

Record the IMEI of your **G-SWITCH-22** in the blocks provided in Section 6.

In the event that the **G-SWITCH-22** is stolen, you can use the IMEI number to blacklist the **G-SWITCH-22.**

4. General description

The **G-SWITCH-22** GSM module uses the GSM mobile phone network to enable remote control and communication between itself and up to 300 users via their mobile phones. A valid, and activated SIM card is required in order to use the module on the GSM network.

When programming the **G-SWITCH-22**, each user's phone number can be set to:

- Activate a specified output/s with a missed call;
- Activate either output via a unique, user defined SMS;
- Be notified by a unique, user defined SMS of either input being activated

- Programming of the module is password protected
- All users calling or sending an SMS to the module need to ensure that their Caller Line Identification is activated on their phone to ensure that the module recognises the user's learned-in phone number
- The module requires a power supply of 10-30V DC, capable of delivering 500mA peak
- Both outputs are potential-free, and rated to 30V DC @ 1A
- Both normally-open and normally-closed contacts are provided
- Inputs are activated by switching to negative

5. Technical specifications

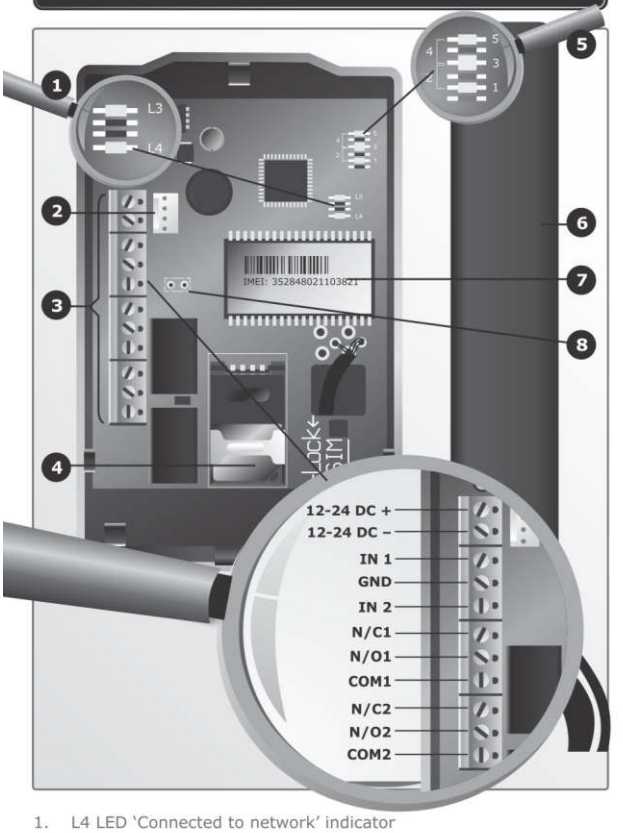
Physical specifications:

Supply voltage:	10-30V DC only
Standby current:	100mA
Maximum current:	500mA
Operating temperature:	-20°C - +85°C
Output relay rating:	1A @ 30V DC (Output 1 and 2)
Housing material:	ABS
Degree of protection:	IP55

Functional specifications:

Memory capacity:	300 individual numbers
Memory retention:	>200 years
Output pulse time range:	1 ms to 50 days (default 1 sec)
Network required:	GSM 900/1800MHz
SIM card required:	Yes (activated)
Outputs:	Two (potential-free)
Inputs:	Two (switch to negative)

6. G-SWITCH-22 GSM Module identification



1. L4 LED 'Connected to network' indicator
2. Backup module port
3. Terminals
4. SIM card inside SIM card holder
5. LED Signal strength indicators
6. Antenna
7. IMEI number

(Record your IMEI number here)

8. Defaulting pads

7. Required tools and equipment

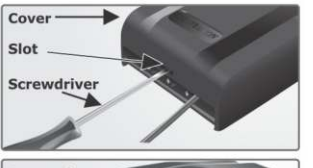
- Screwdriver - 3.5mm flat
- Side cutter
- Drill
- Drill bits - 5mm masonry
  6mm drill bit
- Silicone sealant
- Fasteners and rawl plugs

8. Mounting instructions

The housing of the **G-SWITCH-22** is weatherproof allowing it to be mounted externally in order to pick up the maximum GSM network signal. However, the unit can be mounted inside the housing of the device that it is operating, such as the gate motor if the GSM network signal is adequate. (refer to Section 11 – GSM network signal detection) The following section describes the procedure for mounting the unit to either an internal or external wall. If mounting the **G-SWITCH-22** externally, give consideration to its location as it should not be within reach of unauthorised persons.

8A. Remove cover

8.1. Insert screwdriver into slot and twist.



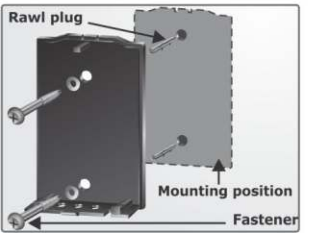
8B. Mount unit

8.2. Remove the cover and unclip the circuit board from the retaining clips.

8.3. Mark position of the unit against the mounting surface.

8.4. Using a 5mm masonry bit, drill a hole into mounting surface.

8.5. Mount the unit using suitable fasteners.



8. Mounting instructions

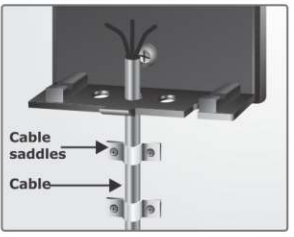
8B. Mount unit (continued)

8.6. Use a 6mm drill bit to open the required cable entry hole.

8.7. Re-insert the circuit board and ensure that the retaining clips are holding it in place.

8.8. Fix the cable to the wall using cable saddle.

8.9. Seal all the holes with silicone sealant.



9. Wiring Diagrams

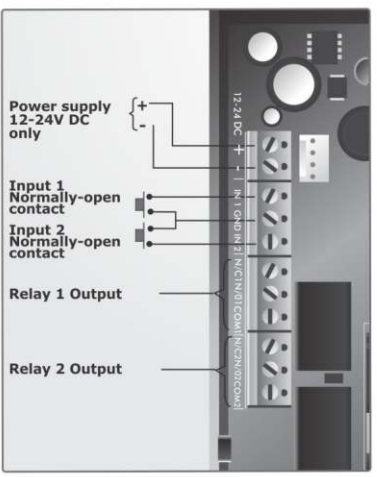
9A. Connections

9.1. Supply the unit with 12-24V DC only.

9.2. The inputs are potential-free and must be pulled to GND/common for the module to react.

9.3. Both outputs are potential-free. Some applications might require an external link between NEG and COM.

9.4. Mount the antenna in a suitable place.

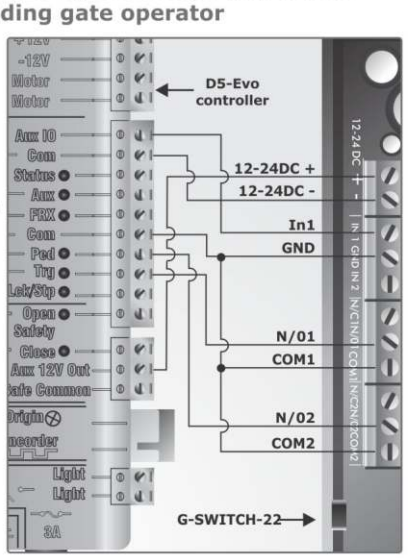


9B. Example 1 of a typical connection to the D5-Evo Sliding gate operator

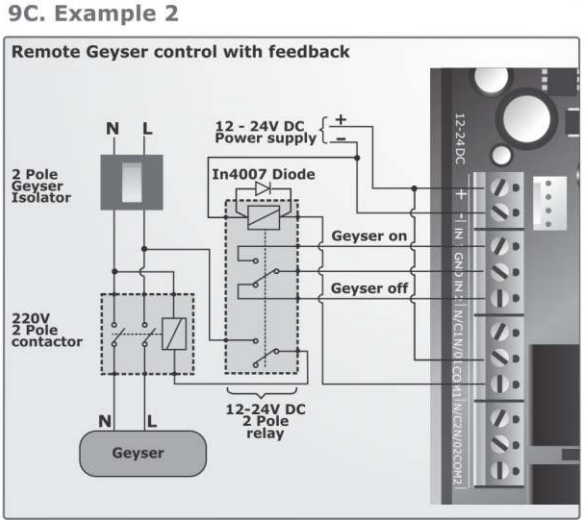
9.5. Output 1 will be connected to Trg and will open gate fully.

9.6. Output 2 will be connected to Ped and will open the gate to pedestrian opening.

9.7. Input 1 will send an SMS when the Beam Alarm is triggered (gate safety beams must be activated and mapped to Aux IO).



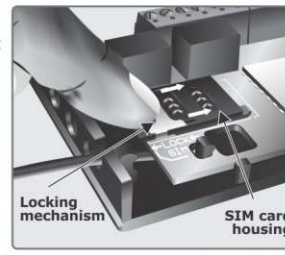
9C. Example 2



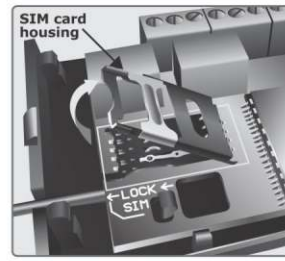
10. Insert activated SIM card

Ensure that a SIM card that goes into the module for the first time is not PIN protected

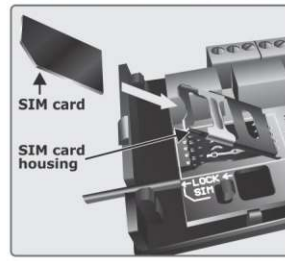
10.1. Slide the SIM card housing's locking mechanism up to release the housing.



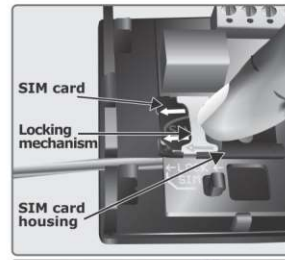
10.2. Raise the SIM card housing.



10.3. Insert the activated SIM card and ensure that the SIM card is correctly oriented. Align the cropped corner to be in the correct position as per the diagram on the circuit board.



10.4. Once the SIM card is inserted correctly in the SIM card housing, lower the housing onto the circuit board. Then slide the SIM card housing locking mechanism down to ensure that the SIM card housing is securely locked in place.



10A. Replace cover

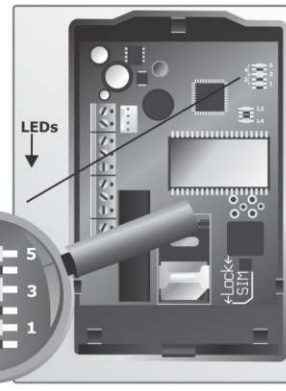
10.5. Hook the top of the edge of the cover onto the top of the unit.

10.6. Lower the cover and press securely into position.

11. GSM network signal detection

When powered up, the **G-SWITCH-22** signal strength indicator LEDs will light up indicating the GSM network signal strength.
The GSM signal strength can be determined based upon the combination of the three LEDs that illuminate:

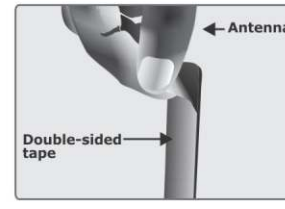
LED	Signal strength
1	1/5
1+2	2/5
2	3/5
2+3	4/5
3	5/5



The signal strength can be queried by sending the "request signal strength" command p.xxxx.**CO**.SS to the module. The querying phone will receive a reply SMS with a value 5 (strongest) to 1 (weakest) indicating signal strength

The GSM signal strength may be enhanced by repositioning the antenna. Ideally the antenna should be mounted externally, and away from any sensitive electrical components.

The rear side of the antenna has a double-sided tape backing, which may be used to affix the antenna to a desirable location. Please ensure that the surface to which you affix the antenna is smooth, clean and dry, to ensure reliable adhesion



12. Setting up the G-SWITCH-22 commands

Multi-user capability (300 phone numbers)

It is important to note that the memory of the **G-SWITCH-22** GSM module is limited to 300 phone numbers. In other words a maximum of 300 phone numbers can be registered on the system at any one time. Each phone number can be configured uniquely with respect to inputs and outputs, as well as activation and notification messages. Each phone number can be assigned a limited number of uses for each output.

When the memory limit is reached, trying to add new phone numbers will not overwrite or affect the existing numbers stored into the system. It will just not be possible to add the additional numbers.

13. In a hurry?

To simply add a phone number to the module to trigger Output 1, default pulse time with a missed call, send the following SMS to the module: '**p.xxxx.ap.yyyyyyyyyy**, where **xxxx** is the system password (default is 1234✱), and **yyyyyyyyyy** is the phone number you wish to add'.

✱ For your own security, it is recommended that the default password be changed and that SIM PIN checking be enabled (see '**CO**. Configuring the module')

Ensure that a record of your system password is kept in a safe place.

Record system password here ☐☐☐☐

Ensure that a record of the new SIM PIN number is kept in a safe place.

Record new SIM PIN here ☐☐☐☐

14. Command structure

Programming commands are sent to the module using a standard text message (SMS)

The command structure must always take the following form: **p.xxxx.command1.parameter1.parameter2 command2. parameter1.parameter2**, etc.

All commands must start with '**p.xxxx.** Where **xxxx** is a user defined four digit password. The default password is **1234**. For security purposes, this should be changed on commissioning.

- Each command and parameter must be separated by a **period (.)**
- Commands can be concatenated, and must be separated by a **space ( )**
- The maximum message length is limited to 160 characters
- Commands are **not** case sensitive

15. Command overview

	Description	Parameters
P	**(Password)** System password	four digit password
AP	**(Add phone)** Add a phone number to the system	Phone number(s) (up to 16 digits each). Output to be activated by a missed call or sms (OU1/OU2) Input to be monitored (IN1/IN2) **Sub Parameters** User Limit UL (1 – 65536 activations)✱ Output text string (1 - 50 characters) Input text string (1 - 50 characters) ✱ A user limit restricts the number of times a missed call will activate the unit. Once the user limit is reached, the phone number will automatically be deleted from the system
DP	**(Delete phone)** Delete a phone	Phone number (up to 16 digits)
EP	**(Edit phone)** Edit phone	Phone number (up to 16 digits) OU1 Activates Output 1 DOU1 Deletes Output 1 OU2 Activates Output 2 DOU2 Deletes Output 2 In1 Activates Input 1 DIN1 Deletes Input 1 IN2 Activates Input 2 DIN2 Deletes Input 2 DIN1S Deletes Input 1 string DIN2S Deletes Input 2 string DOU1S Deletes Output 1 string DOU2S Deletes Output 2 string
AT	**(Airtime)** Loads or queries	Load airtime (L) Query airtime (Q) **Sub-Parameters** Airtime voucher number
QP	**(Query phone)** Query phone settings	Phone number (up to 16 digits)
CO	**(Configuration)** Configure inputs, outputs and system settings	OU1PU Sets Output 1 as pulsed OU1LA Sets Output 1 as latched OU1PT Sets Output 1 pulse time in milliseconds OU2PU Sets Output 2 as pulsed OU2LA Sets Output 2 as latched OU2PT Sets Output 2 pulse time in milliseconds

		SS	Requests Signal strength
		CS	Change SIM card PIN number
		EP	Enable SIM card PIN checking
		DP	Disable SIM card PIN checking
		SP	Set SIM PIN in memory only
		QF	Queries the firmware version
		QS	Query the module settings
		NP	New system password
		BE	Backup EEPROM
		RE	Restore EEPROM
		IO	Input/Output mappings
		Reset.all	Resets all settings on the module
		Reset.usr	Resets User Data on the module
		Reset.con	Resets Config. data on the module
		Sub-Parameters	
		Pulse time	In milliseconds
		New PIN	four digits
		New password	four digits
		IO Mapping	

P. Setting a new system password

Command	Description
p.xxxx.**CO**.NP.yyyy	yyyy is the new password.

Reset to factory default settings

In the event that you forget the system password you will need to reset the module to the factory default settings. To do this, please follow the steps below:

1. Power down the module.
2. Bridge the following terminals: IN1, IN2 and GND.
3. Short out the defaulting pads by touching across them with the tip of a screwdriver.
4. Power up the module.
5. Remove the bridges to the terminals as mentioned in point 2 and 3 above, as well as the defaulting pads.
6. The module will now be reset to the factory default settings.

All of the information on the module will be erased

AP. Adding a phone

This command allows new phone numbers to be added to the system. When adding a new phone, it is possible to specify which outputs are to be activated by a missed call from the phone, and which inputs will cause a message to be sent to the phone. The number of times the phone can be used to activate the system can also be specified.

	Description	Parameters
AP	**(Add phone)** Add a phone number to the system	Phone number(s) (up to 16 digits each) Output to be activated by a missed call or sms (OU1/OU2) Input to be monitored (IN1/IN2) **Sub-Parameters** User Limit UL (1 – 65536 activations) Output text string (1-50 characters) Input text string (1-50 characters)

Examples (Commands have been highlighted for clarity)

Command	Description
p.xxxx.**AP**.0841234567	Adds phone number 0841234567 to the system and, since no parameters are specified, **by default** assigns Output 1 to be activated by a missed call from this number. This allows easy addition of new phones to a basic system.
p.xxxx.**AP**.0841234567.**OU2**	Adds phone number 0841234567 to the system, and assigns Output 2 to be activated by a missed call from this number.
p.xxxx.**AP**.0841234567.**OU2**."Ou2 Text"	Adds phone number 0841234567 to the system, and assigns Output 2 to be activated by sending an SMS with the message specified in "Ou2 Text" . "Ou2 Text" is **not** case sensitive, and MUST begin and end with double quotation marks ("). The quotation marks (" ")are only required when programming – They must **not** be included when sending the text message to activate the output.
p.xxxx.**AP**.0845632347.**OU1**.**UL**20."Ou1 text"	Adds phone number 0841234567 to the system, and assigns Output 1 to be activated sending an SMS with the message specified in "Ou1 Text", with a user limit of 20 uses. After 20 SMSs (activations) this number will automatically be deleted from the system.
p.xxxx.**AP**.0841234567.**OU1**.**OU2**	Adds phone number 0841234567 to the system, and assigns both Output 1 and Output 2 to be activated by a missed call from this number.
p.xxxx.**AP**.0841234567.0837654321.**OU1**	Adds phone numbers 0841234567 **and** 0837654321 to the system, and assigns Output 1 to be activated by a missed call from EITHER of these numbers. The number of phone numbers that can be added in one command is limited only by the maximum allowed message length (160 characters).

p.xxxx.**AP**.0841234567.**OU1**.**UL**5	Adds phone number 0841234567 to the system, and assigns Output 1 to be activated by a missed call from this number, with a limit of five uses. After five missed calls (activations), this number will automatically be deleted from the system.
p.xxxx.**AP**.0841234567.**OU1**.**UL**25.**OU2**	Adds phone number 0841234567 to the system, and assigns both Output 1 and Output 2 to be activated by a missed call from this number. Output 1 has a limit of 25 uses. After 25 missed calls (activations), Output 1 will no longer be activated by a missed call. However, Output 2 will continue to function indefinitely.
p.xxxx.**AP**.0841234567.**OU1**.**UL**25.**OU2**.**UL**100	Adds phone number 0841234567 to the system, and assigns both Output 1 and Output 2 to be activated by a missed call from this number. Output 1 has a limit of 25 uses, and Output 2 has a limit of 100 uses. After 25 missed calls (activations), Output 1 will no longer be activated by a missed call. However, Output 2 will continue to function for a further 75 calls. Thereafter, this number will automatically be deleted from the system.
p.xxxx.**AP**.0841234567.**IN1**."In1 Text"	Adds phone number 0841234567 to the system, and assigns Input 1 to be monitored. In the event that Input 1 is triggered, the message specified in "In1 Text" will be sent to this number. "In1 Text" is case conscious – the message sent will exactly reflect the "In1 Text" specified. In1 Text **must** begin and end with double quotation marks ("). The quotation marks (" ") are only required when programming – They will **not** be included in the text message sent when the input is activated. A missed call from this number will **not** trigger an output.
p.xxxx.**AP**.0841234567.OU1.IN2."In2 Text"	Adds phone number 0841234567 to the system, and sets a missed call from this number to trigger Output 1. It also assigns Input 2 to be monitored. In the event that Input 2 is triggered, the message specified in "In2 Text" will be sent to this number.

DP. Deleting a phone

This command allows one or more numbers to be deleted from the system

	Description	Parameters
DP	**(Delete phone)** from the system	Phone number(s) (up to 16 digits)

Examples (Commands have been highlighted for clarity)

Command	Description
p.xxxx.**DP**.0841234567	Deletes phone number 0841234567 from the system
p.xxxx.**DP**.0841234567.0837654321.0827766554	Deletes phone numbers 0841234567, 0837654321 and 0827766554 from the system

EP. Editing a phone

This command allows the functionality of a phone to be edited. It is useful when a number has been added with the wrong functionality, or when circumstances have changed

	Description	Parameters	
EP	**(Edit phone)** Edit phone	Phone number (up to 14 digits)	
		OU1	Activates Output 1
		DOU1	Deletes Output 1
		OU2	Activates Output 2
		DOU2	Deletes Output 2
		IN1	Activates Input 1
		DIN1	Deletes Input 1
		IN2	Activates Input 2
		DIN2	Deletes Input 2
		DIN1S	Deletes Input 1 string
		DIN2S	Deletes Input 2 string
		DOU1S	Deletes Output 1 string
		DOU2S	Deletes Output 2 string
		Sub-Parameters	
		Output text string (1-50 characters)	
		Input text string (1-50 characters)	

QP. Querying a phone

This command allows the functionality of a phone in the system to be queried. Information for that phone, including what outputs and inputs are active, text strings and limited use counters will be sent in a text message to the querying phone

	Description	Parameters
QP	**(Query phone)** Query phone settings	Phone number (up to 16 digits)

Examples (Commands have been highlighted for clarity)

Command	Query
p.xxxx.**QP**.0841234567	Queries phone number 0841234567. Phone settings are sent via SMS to the querying device.

AT. Airtime

This command allows an airtime voucher to be loaded, or remaining airtime to be queried

	Description	Parameters
AT	**(Airtime)** Loads or queries airtime	Load airtime (L) Query airtime (Q) **Sub-Parameters** Airtime voucher number

Examples (Commands have been highlighted for clarity)

Command	Description
p.xxxx.**AT**.L.1234567890	Loads airtime voucher number 1234567890 onto the SIM.
p.xxxx.**AT**.Q	Airtime remaining on the SIM is sent via SMS to the querying device.

CO. Configuring the module

This command allows the functionality of the system to be configured. Outputs can be set up, states of input/outputs checked, PINs and passwords managed, etc.

	Description	Parameters	
CO	**(Configuration)** Configure inputs, outputs and system settings	OU1PU	Sets Output 1 as pulsed
		OU1LA	Sets Output 1 as latched
		OU1PT	Sets Output 1 pulse time in ms
		OU2PU	Sets Output 2 as pulsed
		OU2LA	Sets Output 2 as latched
		OU2PT	Sets Output 2 pulse time in milliseconds
		SS	Requests Signal strength
		CS	Change SIM card PIN number
		EP	Enable SIM card PIN checking
		DP	Disable SIM card PIN checking
		SP	Set SIM PIN in memory only
		QF	Queries the firmware version
		QS	Query the module settings
		NP	New system password
		BE	Backup EEPROM
		RE	Restore EEPROM
		IO	Input/Output mappings
		Reset.all	Resets all settings on the module
		Reset.usr	Resets User Data on the module
		Reset.con	Resets Config. Data on the module
		Sub-Parameters Pulse time (milliseconds) 1s = 1000ms New PIN number (four digits) New password (four digits) IO Mapping	

Examples (Commands have been highlighted for clarity)

Command	Output configuration
p.xxxx.**CO**.OU1PU.OU1PT.2000	Sets Output 1 as pulsed, and sets Output 1 pulse time to 2 seconds (2000 milliseconds).
p.xxxx.**CO**.OU1LA.OU2PU.OU2PT.15	Sets Output 1 as latched, sets Output 2 as pulsed, and sets Output 2 pulse time to 1.5 seconds (1500 milliseconds).
p.xxxx.**CO**.SS	Sends an SMS to the querying phone with a value of 10 (strongest) to 1 (weakest) for signal strength.

SIM card PIN number settings

Command	Description
p.xxxx.**CO**.CS.yyyy	Change the SIM card PIN number. yyyy is the NEW PIN number. The old PIN number does not have to be entered.
p.xxxx.**CO**.EP	Enable checking of the SIM PIN number on startup.
p.xxxx.**CO**.DP	Disable checking of the SIM PIN number on startup.
p.xxxx.**CO**.SP.yyyy	Setting the new SIM PIN number in memory only (Useful when a new SIM is going to be inserted in the future. On startup, the module will automatically try this PIN if the old PIN does not work). yyyy is the new PIN number. The old PIN number does not have to be entered.

Query Firmware version

Command	Description
p.xxxx.**CO**.QF	Sends an SMS to the querying phone with the module firmware version.

Query controller status/settings

Command	Description
p.xxxx.**CO**.QS	Sends an SMS to the querying phone with the following information: • Current state of the outputs • Current state of the inputs • Output configuration (Pulsed/Latched) • Output pulse times • Input-Output mappings • IP address and port of host server

Backing up and restoring the memory

The following commands require an optional Memory Backup Module (Product code PCA12201V1.0). See Section 6 for location of Backup module port

Command	Description
p.xxxx.**CO**.BE	Backup the entire module memory (EEPROM) onto a CENTURION Backup Memory Module. This includes all user information and module settings. The Memory Backup Module must be in place before the command is sent to the module. After sending the command, a confirmation SMS will be sent back indicating whether the backup was successful or not.
p.xxxx.**CO**.RE	Restore the entire module memory (EEPROM) from a CENTURION Backup Memory Module. This includes all user information and module settings. The Memory Backup Module must be in place before the command is sent to the module. After sending the command, a confirmation SMS will be sent back indicating whether the restore was successful or not.

Mapping inputs to outputs

P.xxxx.**CO**.IO.	Allows activation and deactivation of input-output mappings. If an input is mapped to an output, and that input is activated, the mapped output will also activate, responding according to its configuration settings: IN1OU1: Maps Input 1 to Output 1 IN1OU2: Maps Input 1 to Output 2 IN2OU1: Maps Input 2 to Output 1 IN2OU2: Maps Input 2 to Output 2 DIN1OU1: Deletes Input 1 to Output 1 mapping DIN1OU2: Deletes Input 1 to Output 2 mapping DIN2OU1: Deletes Input 2 to Output 1 mapping DIN2OU2: Deletes Input 2 to Output 2 mapping

Clearing memory

Command	Description
p.xxxx.**CO**.reset.all	Reset the entire module. All user information is deleted, and all module settings are restored to factory default.
p.xxxx.**CO**.reset.usr	Delete all user information on the module. Module settings are not affected.
p.xxxx.**CO**.reset.con	Reset all module settings to factory defaults. User information is not affected.

Alternative SMS activation of outputs

Even though preconfigured SMS text may have been assigned to outputs when adding a phone to the system, the outputs on the module can also be explicitly activated by sending an SMS to the module, from a valid phone (a valid phone is one for which a number exists in the system, and for which outputs have been assigned), with one of the commands below:

- **OU1.on**; **OU1.off**; **OU2.on** or **OU2.off**

Examples

Command	Description
OU1.on	Activates Output 1. If OU1 is set as pulsed, the output will activate for the configured pulse time If OU1 is set as latched, it will turn on and remain on.
OU2.off	Deactivates Output 2. If OU2 is set to pulsed, the command will have no effect. If OU2 is set to latched, and currently on, it will turn off.

Tips and tricks

- You can use the text "me" instead of specifying your own number when adding, deleting, editing or querying your phone i.e. p.xxxx.**AP**.me
- If you add a 'space' and then the text "**ACK**" to the end of any command, you'll receive an SMS back confirming that the command has been received by the module. For example, p.xxxx.**DP**.0841234567 **ACK**
- If you make a mistake during the programming via a cell phone, you will receive an "**error**" sms to let you know

The module must have sufficient airtime credit to send the SMS

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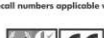
Sharecall Technical Support 0861 003 123 or
+27 11 699 2481
from 07h00 to 18h00 (GMT+2)

(Sharecall numbers applicable when dialed from within South Africa only)



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