G-SWITCH-22 GSM Module Programming Guide

CENTURION

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G·SWITCH·22™

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GSM MONITORING AND CONTROL

1. Programming the G-SWITCH-22 Commands

Multi-user capability (1200 phone numbers)

It is important to note that the memory of the **G-SWITCH-22** GSM Module is limited to 1200 authorised phone numbers. In other words a maximum of 1200 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 also 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.

Special functionality

The **G-SWITCH-22** offers various advanced and useful features which can be easily set up via SMS or using the **G-WEB** online user interface. These features are intended to enhance the Module's capabilities and offer the user more flexibility in applying the Module as a full monitoring and control solution.

Below appears a list of the **G-SWITCH's** advanced features as well as a definition of each.

- **Sticky Latches:** The Module's Outputs can be configured to 'remember' their state between power cycles. For instance, if Output 2 was active, i.e. the relay in an energised state, and the power is removed, when power is reapplied Output 2 will return to the activated state. This functionality is referred to as a 'sticky latch' and can be enabled or disabled. Sticky latches don't apply to pulsed Outputs and are enabled by default

- **Filter Time:** Filter Time determines how long an Input event (rising or falling edge) must be present before it is recognised, i.e. an SMS is sent. The time is set in increments of one second and the default is 0

- **Blanking Time:** Blanking Time determines how long the unit will wait between events before it will recognise the next event

- **Event Count:** This refers to how many Input events must occur before it is recognised and an SMS notification is sent to users

- **All Pass Mode:** When enabled, this useful mode allows any number that gives the Module a Missed Call to activate the Outputs, irrespective of whether they are learned into memory. A typical application would be an event such as a wedding where many guests need to be given temporary access. Instead of manually learning in a 100 guests and then having to delete them again after the occasion, the administrator can simply enable All Pass Mode and disable it again afterwards

2. In a Hurry? >>

To simply add a phone number to the Module to trigger Output 1, with the default pulse time activated through 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 the SIM PIN code protection enabled (see '**CO**. Configurating 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 ☐☐☐☐☐

3. 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 (linked), and must be separated by a **space ( )**
- The maximum message length is limited to **160 characters**
- Commands are **not** case-sensitive

4. 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 19 digits each). Output to be activated by a Missed Call or SMS (OU1/OU2) Input to be monitored (IN1/IN2)

	Description	Parameters
AP	**(Add Phone)** Add a phone number to the system	**Sub parameters** User Limit UL (1–65536 activations)◇ Output text string (user-configured messages 1-20) Input text string (user-configured messages 1-20) ◇ 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 19 digits)
EP	**(Edit Phone)** Edit a phone	Phone number (up to 19 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 airtime	Load airtime **(L)** Query airtime **(Q)** **Sub-parameters** Airtime voucher number
QP	**(Query Phone)** Query phone settings	Phone number (up to 19 digits)
CO	**(Configuration)** Configure Inputs, Outputs and system settings	**OU1PU** Set Output 1 as pulsed **OU1LA** Set Output 1 as latched **OU1PT** Set Output 1 pulse time in milliseconds **OU2PU** Set Output 2 as pulsed **OU2LA** Set Output 2 as latched **OU2PT** Set Output 2 pulse time in milliseconds **SS** Request 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** Query the Firmware version **QS** Query the Module settings **NP** New system password **BE** Backup EEPROM **RE** Restore EEPROM **IO** Input/Output mappings **QB** Query the battery voltage **CL** Clear the transaction logs **REBOOT** Reboot the Module **SLD** Disable sticky latches **SLE** Enable sticky latches **RSL** Reset sticky latches **STR** Set the string number and associated text **ATE** Enable the automatic hourly airtime query **ATD** Disable the automatic hourly airtime query **INxR** Make the selected Input rising edge active **INxF** Make the selected Input falling edge active **INxB** Make both of the selected Input edges active **INxBT** Set the selected Input Blanking Time **INxEC** Set the Input event count **LM** List all the messages stored in the system; Up to 20 messages are allowed **Reset.all** Reset all settings on the Module **Reset.usr** Reset User Data on the Module **Reset.con** Reset Configuration. Data on the Module **APME** Enable All Pass Mode so that any number that gives the Module a Missed Call will activate the Outputs **AMPD** Disable All Pass Mode Sub-parameters **Pulse time**: In milliseconds New PIN: Four digits New password: Four digits IO Mapping Blanking Time: In seconds Filter Time: In seconds Event count: Numeric value

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

Reset to the 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.

The system allows the user to pre-program up to 20 text messages (of 25 characters each); the user can then associate messages with specific actions such as the activation of an Output or as an Input notification message. Each message is assigned a number, between 1 and 20, by the user and when an Input is configured to send notifications, or an Output configured to be activated via SMS, the user must specify what message number that Input/Output will use.

To configure text strings for Output activation and Input notification, send the following command to the Module:

p.xxxx.CO.STR.y."text string", where **'x'** represents the **password** and 'y' represents the **memory slot** – between 1 and 20 – to which the text string should be assigned in the system's memory.
The text between the double inverted commas is the command that will be sent to the Module in order to activate an Output, or the text that will appear on the user's mobile phone screen when the associated Input is activated.

Text strings are allocated to specific Outputs or Inputs by means of the following command structure:

p.xxxx.AP.phone number.OUz."y".INz."y". In this instance, **'x'** again represents the **password**, **'z'** is the number of the **Input/Output** to which one wishes to assign a text string, and **'y'** is the **text string slot in the system's memory**.

Examples

p.xxxx.CO.STR.1."pump active"

This command will configure text string **'1'** as **'pump active'**.

p.xxxx.CO.STR.5."tank full".STR.6."tank empty"

Configures **text string 5** as **'tank full'** and **text string 6** as **'tank empty'**.

p.xxxx.AP.0821234596.OU1."3"

Adds phone number 0821234596 to the system and enables Output 1 to be **activated by an SMS**. To **activate the Output**, either SMS the text stored in memory location 3 to the Module, or use the Output activation command **p.xxxx.OU.OU1on**

p.xxxx.AP.0823359981.OU2."10".IN1R."3".IN1F."4"

Adds phone number 0823359981 to the system and configures Output 2 to be **activated by text string 10, Input 1** to send an SMS with text string 3 on rising edge activation and the same Input to send an SMS with text string 4 on falling edge activation. In such a case, **text string 3** would typically be something like **'power off'** and **text string 4** could be **'power back on'**.
For your convenience, a template has been provided below which can be used to note down which text strings have been associated with which number in the system's memory. It is also possible to query the Module as to which messages are saved in its memory by sending the following command:

p.xxxx.co.lm, where 'x' represents the system password.

Message number	Message text string (max. 25 character including spaces)
1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	
9.	
10.	
11.	
12.	
13.	
14.	
15.	
16.	
17.	
18.	
19.	
20.	

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 19 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 (user-configured messages 1-20) Input text string (user-configured messages 1- 20)

Examples (Commands have been highlighted for clarity)

Command	Description
p.xxxx.**AP.0841 234567**	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.0841 234567.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.0841 234567.OU2** "5"	Adds phone number 0841234567 to the system, and assigns Output 2 to be activated by sending user-configured message number 5. When programming the Output to be activated by a specific text string, the text string number 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.0845 632347.OU1. UL20.** "7"	Adds phone number 0841234567 to the system, and assigns Output 1 to be activated by sending user-configured message number 7 with a user limit of 20 uses. After 20 SMSs (activations), this number will automatically be deleted from the system, but only if the number has no other functionality associated with it.
p.xxxx.**AP.0841 234567.OU1.O**	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.0841 234567.083765 4321.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.08412 34567.OU1.UL5**	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, but only if the number has no other functionality associated with it.
p.xxxx.**AP.0841 234567.OU1. UL25.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.0841 234567.OU1. UL25.OU2. UL100**	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.0844 332211.ou1.ou 2.**"9".**IN1r.**"2". **IN1f.**"1"	This command produces the following Output: • A Missed Call from this number will trigger Output 1 • Output 2 is enabled for SMS and will be triggered by message number 9 • A rising edge on Input 1 will send message number 2 • A falling edge on Input 1 will send message number 1

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 19 digits)

Examples (Commands have been highlighted for clarity)

Command	Description
p.xxxx.**DP.0841 234567**	Deletes phone number 0841234567 from the system
p.xxxx.**DP.0841 234567.08376 54321.082776 6554**	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(s) (up to 19 digits each)	
		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 (user-configured message)	
		Input text string (user-configured message)	

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(s) (up to 19 digits)
QPM	**(Query Phone Master)** Returns the master phone number	

Examples (Commands have been highlighted for clarity)

Command	Description
p.xxxx.**QP.0841 234567**	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.123 4567890**	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.

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.1500**	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 5 (strongest) to 1 (weakest) for signal strength.
p.xxxx.**CO.QB**	Sends an SMS to the querying phone with the battery voltage value.
p.xxxx.**CO.CL**	Clears all the transaction logs stored in the system's memory.
p.xxxx.**CO.DSL**	Disables sticky latches, so that when the Module's power is cycled, the Outputs will return to their default state and will not assume the state they were in prior to the power cycle.
p.xxxx.**CO.ESL**	Enables sticky latches, so that when the Module's power is cycled, the Output relays assume the state they were in prior to the power cycle.
p.xxxx.**CO.STR.1."alarm activated".STR.5."power failed"**	Configures text string 1 as "alarm activated" and text string 5 as "power failed". If, for instance, these text strings are assigned to certain Inputs, an SMS containing this text will be sent to users upon activation of the Inputs associated with them.
p.xxxx.**CO.STR.18."open gate"**	Configures text string 18 as "open gate". The text string "open gate" (without quotation marks) can be SMSd to the Module and used to activate an Output.
p.xxxx.**CO.IN1R**	Configures Input 1 to send an SMS if a rising edge signal is present.
p.xxxx.**CO.IN2B**	Configures Input 2 to send SMSs on both rising and falling edge activation.
p.xxxx.**CO.IN2BT.4**	Sets Input 2 to only become active and send an SMS once 4 seconds have elapsed since the previous trigger.
p.xxxx.**CO.IN1FT.2**	Sets Input 2 to become active and send an SMS only if the Input has been valid for 2 seconds.
p.xxxx.**CO.IN2EC.3**	Sets Input 1 to send an SMS only if it has been triggered three times.
p.xxxx.**CO.LM**	Sends an SMS to the querying phone with a list of all the messages stored in the system.

A. SIM card PIN code settings

Command	Description
p.xxxx.**CO.CS.yyyy**	Change the SIM card PIN code. **yyyy** is the NEW PIN code. The old PIN code does not have to be entered.
p.xxxx.**CO.EP**	Enable checking of the SIM PIN number on
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.

B. Query Firmware version

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

C. 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

D. 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**	Back up 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 Backup Memory 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.

E. 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:** Map Input 1 to Output 1 **IN1OU2:** Map Input 1 to Output 2 **IN2OU1:** Map Input 2 to Output 1 **IN2OU2:** Map Input 2 to Output 2 **DIN1OU1:** Delete Input 1 to Output 1 mapping **DIN1OU2:** Delete Input 1 to Output 2 mapping **DIN2OU1:** Delete Input 2 to Output 1 mapping **DIN2OU2:** Delete Input 2 to Output 2 mapping

E. 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.

F. Alternative SMS activation of Outputs

Even though a 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.

For added convenience and flexibility, the system does allow numbers that have not been learned into memory to activate Outputs via SMS; however, this functionality is password-protected and the owner of the originating number will have to be in possession of the system password in order to activate Outputs in this manner.

- **OU.OU1on**   Output command --- Output 1 on
- **OU.OU2on**   Output command --- Output 2 on
- **OU.OU1off**   Output command --- Output 1 off
- **OU.OU2off**   Output command --- Output 2 off
- **OU.OU1on2off** Output command --- Output 1 on and 2 off
- **OU.OU2on1off** Output command --- Output 2 on and 1 off
- **OU.allon**   Output command --- both Outputs on
- **OU.alloff**   Output command --- both Outputs off

Example
- p.1234.OU.OU2ON Switches Output 2 on

Examples

Command	Description
p.xxxx.**OU.OU1on**	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.
p.xxxx.**OU.OU2off**	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. For example, p.xxxx.**AP.me**
- If you add a 'space' and then the text '**ACK**' to the end of any command, you will 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 mobile phone, you will receive an '**error**' SMS to let you know

The Module must have sufficient airtime credit to send the SMSs.

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