



GSM/GPRS *Dual Band*

- **GPRS/GSM** Modem
- **AT commands** management (GSM07.07 and 07.05)
- Send/Receive **SMS** (PDU and Text)
- 900/1800MHz **Dual Band**



Pocket GPRS Micro

User's Guide
rev. 2.0 06/2011



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PREFACE

In order to guarantee your safety and a correct functioning, be sure to follow these safety warnings. The whole set (with cables included) must be installed in a place lacking of or distant from:

- Dust, humidity, high temperatures and direct exposure to sunlight.
- Heat irradiating objects, which may damage your device or cause any other problem.
- Objects producing a high electromagnetic field (Hi-Fi speakers, etc.).
- Corrosive liquids or chemical substances.

ENVIRONMENTAL CONDITIONS

Environment temperature: from -20 °C to +55 °C Relative humidity: from 20 to 80 % n.c.

CLEANING INFORMATION

Use a soft dry cloth and avoid any solvents or abrasive materials.

SHOCKS OR VIBRATIONS

Caution against shocks or vibrations.

DECLARATION OF CONFORMITY

We, Digicom S.p.A., with registered office at Cardano al Campo (VA - Italy) - Via Volta 39, declare under our sole responsibility, that the products named **Pocket GPRS Micro**, to which this declaration refers to, satisfy the essential requirements of following Directive:

- 1999/5/CE 9th March 1999, R&TTE (concerning radio equipment and telecommunication terminal equipment and the acknowledgment of their conformity) Law Decree 9th May 2001, n.269, (G.U. n. 156 of 7-7-2001).

As indicated in conformity with the requirements of following Reference Standards or of other regulations documents:

EN 301 489-01

EN 301 489-07

EN 55022

EN 61000-3-2

EN 61000-3-3

EN 301 511

EN 60950-1

ASSISTANCE AND CONTACTS

Most of questions can be answered by looking up in the Support > F.A.Q. section of our website at www.digicom.it.

If you can't find the answer you're looking for, please contact our Technical Support at support@digicom.it

SAFETY WARNINGS

Read these instructions and norms carefully before powering the device. Violation of such norms may be illegal and cause hazard situations. For any of the described situations please refer to the specific instructions and norms.

The device is a low power radio transmitter and receiver. When it is ON, it sends and receives radio frequency (RF) signals.

The device produces magnetic fields. Do not place it next to magnetic supports such as floppy disks, tapes, etc.

Operating your device close to other electrical and electronic equipment - such as a television, phone, radio or a personal computer - may cause interferences.



INTERFERENCES

The device, like all other wireless devices, is subject to interferences that may reduce its performances.



ROAD SAFETY

Do not use your device while driving. In case of use on cars, you must check that the electronic equipment is shielded against RF signals. Do not place the device in the air bag deployment area.



AIRCRAFT SAFETY

Switch off your device when on board aircrafts by disconnecting the power supply and deactivating the internal backup battery. Using GSM devices on aircrafts is illegal.



HOSPITAL SAFETY

Do not use the device near health equipment, especially pacemakers and hearing aids, in order to avoid potential interferences. Take care when utilizing the device inside hospitals and medical centres, which make use of equipment that could be sensitive to external RF signals. Switch it off when use is expressly forbidden.



EXPLOSIVE MATERIALS

Do not use the device in refuelling points, near fuel or chemicals. Do not use the device where blasting is in progress. Observe restrictions and follow any specific regulation or instruction.



INSTRUCTIONS FOR USE

Do not use the device in direct contact with the human body and do not touch the antenna if not strictly necessary.

Use approved accessories only. Consult documentation regarding any possible device connected to the device. Do not connect incompatible products.

INFORMATION FOR USERS

According to the 2002/95/CE, 2002/96/CE and 2003/108/CE Directives, relative to reduction in the use of hazardous substances in electrical and electronic apparatus, as well as to disposal of waste materials.



The symbol of a crossed box applied on the apparatus or on its package indicates that at the end of its useful life the product must be collected separately from other waste materials.

The user must therefore take the apparatus which has reached the end of its useful life to appropriate separate collection centres for electronic and electro-technical waste materials, or deliver it back to the reseller when purchasing new apparatus of an equivalent type, giving one piece in for one piece out.

Suitable separate waste collection for then sending the cast-off apparatus for recycling, treatment and environmentally friendly disposal, contributes towards preventing any possible negative effects on the environment and on health and encourages recycling of the materials the apparatus is made up of.

Unauthorised disposal of the product by the user will lead to payment of the administrative sanctions in force in the country where it is put on the market.

1. INTRODUCTION

1

Congratulations for choosing Digicom Pocket GPRS Micro.

Pocket GPRS Micro is a GSM Dual-Band modem (900/1800 Mhz) perfect for DATA and SMS applications. It has been designed to operate on any digital GSM network both directly and in roaming. Pocket GPRS Micro is GSM Class 4 (900Mhz) and Class 1 (1800 Mhz) compliant. The dual-band functionality depends on the network. Please refer to your GSM provider for the availability of the service.



Attention: In factory configuration AT commands are managed at 9600bit/s only. Before going on with your settings, you must set your terminal emulator (i.e. HyperTerminal) or your application as follows: 9600,8,N,1 then you can modify the interface speed with the values included between 1200 and 115200bit/s with the AT+IPR command.

For further information see the chapter "AT Commands" in the user's manual on Digicom website www.digicom.it



1.1. TECHNICAL FEATURES

- Power supply: from 5 to 32Vdc
- Size: 88x75x25 mm
- Connectors
 - Power supply: Mini-Fit™ 2pin
 - Data interface: 9 pin RS232 (V24/V28)
 - Antenna: SMA female
 - SIM: Plug-In 3V and 1,8V

1.2. PACKAGE CONTENT

Cod. 8D5680

- 1 PocketGPRS Micro
- 1 GSM Antenna with 3 mt cable (cod. 8E4432)
- 1 Power cable 2 wires (red-black) 2 mt with Mini-Fit™ 2pin (cod. 6D1193)
- 1 Quick Guide

Cod. 8D5690

- 1 PocketGPRS Micro
- 1 GSM Antenna with 3 mt cable (cod. 8E4432)
- 1 Power supply with Mini-Fit™ 2 pin (cod. 8D6066)
- 1 Serial cable DB9M-DB9F 1,8mt (cod. 9D0527)
- 1 Quick Guide

2. INSTALLATION

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2.1. START UP

- **Insert the SIM card** into Pocket GPRS Micro.
- **Connect the serial port of your Pocket GPRS Micro** to the PC. In factory configuration AT commands are managed at 9600bit/s only.
- **Connect the GSM antenna.**
- **Turn on Pocket GPRS Micro.** See "Power supply" paragraph.

2.2. CONNECTION TO THE EXTERNAL ANTENNA

To connect the external antenna go on as follows:

1. Turn off your **Pocket GPRS Micro** by **disconnecting the power connector**.
2. Connect the SMA male **connector to the external antenna** of Pocket GPRS Micro, screwing it clockwise.
3. Place the antenna and the device, and check if there is a good quality signal (AT+CSQ command).



You can check the signal:

- **Using a cellular phone**

Insert the SIM of the Pocket GPRS Micro in a cellular phone and check the quality of the signal.

- **Through the AT+CSQ command**

By using this command it is possible to detect a more precise signal. Power on Pocket GPRS Micro and connect it to a Personal computer, using a serial cable. With a hyperterminal send to the modem the command AT+CSQ.

The modem will answer with +CSQ: x,y; where "x" is the signal quality, "y" is the BER (But Error Rate).

The value of "x" can be included between 0 to 31; the higher value indicates a better signal.

From 0 to 9 : poor

From 10 to 15 : good

From 16 to 31 : excellent

99 = Unknown or uncalculable



For further information about commands, see the chapters "Functional Examples" and "AT Commands".

2.3. THE SIM CARD

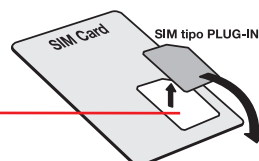
Plug-in SIM are supported by Pocket GPRS Micro. To prevent damaging or losing information do not touch the sim gold area.

Attention: Check with your GSM provider if your SIM is enabled for SMS and DATA traffic, if not ask him for this service, he will give you another number for data calls.

Insert the SIM

Probably the SIM card will be supplied in a card holder compliant with devices using full-size SIM.

1. **Remove the SIM** carefully from the SIM holder.
2. Turn off PocketGPRS Micro by **disconnecting the power connector**.
3. **Insert the SIM** card into the holder. Be sure the angled corner is top right.



To remove the SIM card, push it in the device, then release it.

2.4. POWER SUPPLY

The modem power supply must be included between +5Vdc and +32Vdc with ground negative.

The Mini-Fit™ 2 pin connector Pin-out:

- + = from +5Vcc to +32Vcc
- = GND

⚠ Attention: the power supply voltage must not exceed the indicated maximum value as this may cause a damage of the product.



2.5. LED INDICATORS

Through two led indicators you can control the status of Pocket GPRS Micro:

LED	STATUS	DESCRIPTION
Status	OFF	No power supply
	ON	Power supply ON
GSM	Blinking	Pocket GPRS Micro is in one of the following status: <ul style="list-style-type: none">- network search mode- SIM card not present- PIN not inserted- emergency mode
	ON	Pocket GPRS Micro detected by the GSM network



To verify that Pocket GPRS Micro is ready for calls and SMS, follow these commands:

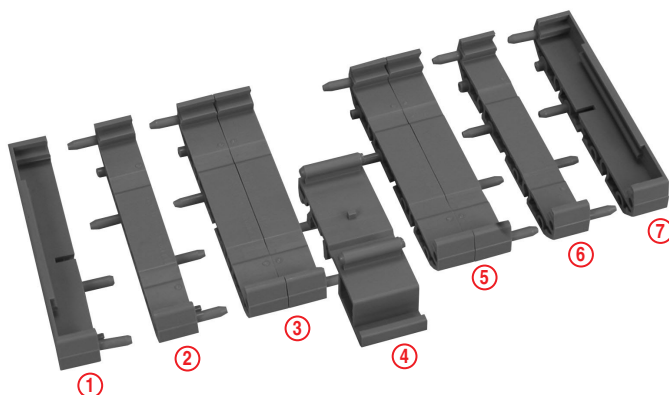
COMMAND	DESCRIPTION
AT+CPIN?	Verifies the presence of the SIM and the PIN code
AT+CREG?	Verifies the registration to the GSM network
AT+COPS?	Verifies the current GSM operator
AT+CSQ	Verifies the quality of GSM signal

⚠ For further information about commands, see the chapters “Functional Examples” and “AT Commands”.

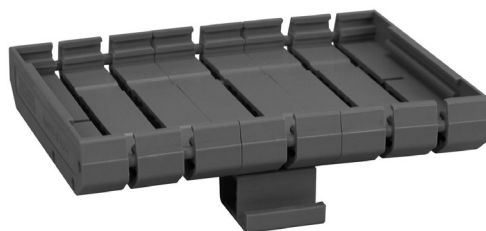
2.6. SUPPORT FOR DIN RAIL MOUNTING

To install the "PocketGPRS Micro" on DIN rail, you can purchase the "DIN rail Pocket Kit" accessory. (code 8D5720).

Look at the next photos for a correct assembling.



- Align the pieces in sequence as shown, paying attention to the piece #4 because it will be positioned to a lower level respect to the other parts.



- Now, before press all the pieces, place the "PocketGPRS Micro" in the space created.



- After insert the modem in the space created, press all the pieces to fix the "PocketGPRS Micro".

3. FUNCTIONAL EXAMPLES

Pocket GPRS Micro can be programmed through a set of AT commands for the execution of all its functionalities.

⚠ Attention: In the factory configuration the AT commands are managed at 9600bit/s only. Before going on with your settings, you must set your terminal emulator (e.g. HyperTerminal) or your application as follows: 9600,8,N,1 then you can modify the interface speed with the values included between 1200 and 115200bit/s with the command AT+IPR.

⚠ For further information see the chapter “AT Commands”.

3.1. PIN MANAGEMENT

Due to security reasons, usually SIM cards require the insertion of PIN code. With Pocket GPRS Micro you can insert the PIN code through the AT+CPIN command.

If your application has other security systems, you can disable the PIN request using a mobile phone.

Examples:

Command:	AT+CPIN?	(Verify the SIM and the PIN status)
Answer:	ERROR	(SIM card reading failed)
Answer:	+CPIN: READY	(PIN code present: SIM ready)
Answer:	+CPIN: SIM PIN	(PIN code insertion is required)
Answer:	+CPIN: SIM PUK	(PUK code insertion is required)
Answer:	+CPIN: SIM PIN2	(PIN2 code insertion is required)

In case the PIN code is not present, it must be inserted before using the SIM card:

Command:	AT+CPIN="4321"	(PIN insertion)
Answer:	OK	(PIN code right)
Answer:	ERROR	(PIN code wrong)

⚠ Attention: remember that if the PIN code is wrongly inserted for three times, the SIM card will block. To unblock it you must insert the PUK code.

⚠ For further information see the chapter “AT Commands”.

3.2. POCKET GPRS MICRO READY TO WORK

Pocket GPRS Micro can work only after it has been detected by the network and with a good GSM signal. To verify Pocket GPRS Micro is ready to manage calls and SMS, follow these commands:

Command:	AT+CPIN?	
Answer:	+CPIN: READY	(SIM is ready)
Command:	AT+CREG?	
Answer:	+CREG: 0,1	(GSM modem is registered by the network)
	OK	
Command:	AT+COPS?	
Answer:	+COPS: 0,2,"22288"	(Pocket GPRS Micro is registered at operator 22288)
	OK	
Command:	AT+CSQ	
Answer:	+CSQ: 15,99	(GSM signal: good)
	OK	

The first value of CSQ can be included between 0 and 31, where 0 = -113dBm and 31 = -51dBm.
Every unit corresponds to 2 dBm.

From 0 to 9 = not sufficient
From 10 to 15 = good
From 16 to 31 = excellent



For further information see the chapter “AT Commands”.

3.3. POCKET GPRS MICRO WITH PLC

In case your application (eg. PLC) supports only TD and RD signals (Trasmission and Reception), it is however possible to connect it to the Pocket GPRS Micro. In this case you will use a non-completed serial cable; for this reason it is important to configure Pocket GPRS Micro so that it ignores the serial criteria not present. Usually Pocket GPRS Micro, during the communication phase, checks the following criteria: 108 (Data Terminal Ready) and 105 (Request To Send); to disable them use the commands AT&D and AT+IFC.

Examples:

Command: AT&D0 (Criterion 108 ignored)
Answer: OK

Command: AT+IFC=0,0 (Criterion 105 ignored: flow control OFF)
Answer: OK



Pocket GPRS Micro is configured with interface speed at 9600bps. If the PLC works with different speed interface, you must change the interface speed of Pocket GPRS Micro with AT+IPR command.

3.4. DATA TRANSFER

Pocket GPRS Micro can call and be called by analog (PSTN), digital (ISDN) and GSM devices. Usually DATA connections with analog modems are at 9600bit/s (V.32 protocol); ISDN connections use V.110 protocol with speed at 9600bit/s. The data transfer with another GSM device is carried out using V.32 or V.110 protocols.

DATA Calls

Using the ATD command it is possible to make a call. For example, to call the number 0123456789 you must send to the modem the command ATD0123456789<Enter>.

Depending on the AT+CBST command setting it is possible to program Pocket GPRS Micro for analog, digital or GSM calls:

AT+CBST=0,0,1 connection with analog or GSM modems in multistandard (V.32)
AT+CBST=7,0,1 connection with analog or GSM modems only in V.32 at 9600bit/s
AT+CBST=71,0,1 connection with digital or GSM modem only in V.110 at 9600bit/s



**Attention: check with your telephone operator if your SIM is enabled for DATA. In fact most SIMs are enabled for Voice(call and reception) while for DATA and FAX only the call is enabled.
To enable the reception of DATA traffic it is necessary to ask the telephone operator that will assign two additional numbers (one to receive DATA calls).**

Examples:

Command: AT+CBST=7,0,1 V.32 call at 9600bit/s
Answer: OK
Command: ATD0123456789
Answer: CONNECT 9600

Command: AT+CBST=71,0,1 V.110 call at 9600bit/s
Answer: OK
Command: ATD0123456789
Answer: CONNECT 9600

DATA calls reception

Generally in Pocket GPRS Micro the automatic answer is disabled (S0=0): in this case the modem will answer only after it received the ATA command.

In case you want to enable the automatic answer, you must set the S0 register with the number of rings after which to answer (eg. S0=2 automatic answer after two rings).

Pocket GPRS Micro factory configuration has the AT+CBST=0,0,1 setting, in this way it will be able to answer to any call coming from an analog, ISDN or GSM modem.



For further information see the chapter "AT Commands".

3.5. SMS MANAGEMENT (TEXT MODE)

Pocket GPRS Micro manages the SMS in TEXT and PDU format.

Send an SMS (TEXT mode)

You find here the necessary commands to send SMS in TEXT mode.

1) Reading and Setup of the Services Center

To activate the SMS management, you must insert the identifier number of the Services Center for your GSM operator. In the most recent SIM cards, the identifier is already present in memory: to verify you can use a mobile phone or, with Pocket GPRS Micro, you can act as follows:

```
Command: AT+CSCA?                (reading of Services Center)
Answer:  +CSCA: "+393205858500",145 (Services Center present)
         OK
```

If the Services Center number is not present, ask the telephone operator, then insert the identifier as follows:

```
Command: AT+CSCA="+393359609600" (eg. TIM Services Center)
Answer:  OK
```



Attention: the above mentioned numbers (Services Centers) could be modified by the telephone operator. In case of error after you send the SMS, check the identifier of the Services Center with your Telephone Operator.

2) Define the mode

```
Command: AT+CMGF=1                (TEXT mode)
Answer:  OK
```

3) Send a message:

```
Command: AT+CMGS="+393217654321"<enter>
Answer:  >
Text:    First SMS message with Pocket GPRS Micro<ctrl z>
Answer:  +CMGS: <sms index>
         OK
```

After you digit your message, press <ctrl z> (Hex =1A).

In this example the message "First SMS message with Pocket GPRS Micro" is sent to number +393217654321.



Attention In case of error after you send the SMS, check the identifier of the Services Center with your Telephone Operator.

Read the SMS (TEXT mode)

The PocketGPRS Micro manages the transmission and reception of the SMS in TEXT and PDU modes.

In the factory configuration when a SMS is received there is not any automatic reporting because the setting is AT+CNMI=1,0
To read correctly the message it is important to set the TEXT mode and view the SMS:

Command: AT+CMGF=1 (TEXT mode)
Answer: OK

To view all the messages list:

Command: AT+CMGL="ALL"
Answer: +CMGL: 1,"REC READ","+393217654321",,"01/01/75,12:05:46+04"
First SMS message with Pocket GPRS Micro
+CMGL: 2,"REC UNREAD","+393217654321",,"01/01/75,12:06:26+04"
Second SMS message with Pocket GPRS Micro
OK

To view a specific message in memory:

Command: AT+CMGR=2
Answer: +CMGR: "REC UNREAD","+393217654321",,"01/01/75,12:05:46+04"
Second SMS message with Pocket GPRS Micro

To store the AT+CMGF command parameters it is necessary send the following AT commands:

Command: AT+DGI1=+CMGF=1
Answer: OK
Command: AT+DGTPW=3
Answer: OK

To receive a reporting to every SMS reception it is possible change the AT+CNMI settings.

Command: AT+CNMI=1,1
Answer: OK

Thanks the above setting, when the modem receives a SMS from the GSM network, an automatic reporting is showed directly on the serial port: +CMTI:"MT",2 (the value 2 is the memory index where the message is been stored). To view the message use AT+CMGR command.

Command: AT+CNMI=1,2
Answer: OK

Thanks the above setting, when the modem receives a SMS from the GSM network, the message text is showed directly on the serial port without save it.

+CMT: "+393217654321",,"01/01/75,12:06:14+04"
First SMS message with Pocket GPRS Micro.

Cancel the SMS

For example, to cancel the second message:

Command: AT+CMGD=2
Answer: OK



For further information see the chapter "AT Commands".

3.6. GPRS CONNECTIONS

If available for the best use of the GPRS function, we suggest to set and to save the configuration with AT&W command. After the driver installation, select in driver properties the interface speed at 115200.

GPRS activation

Verify with your GSM Operator the GPRS activation.

GPRS configuration

To configure Pocket GPRS Micro for GPRS connection, you must send the AT+CGDCONT to set the access profile to the service.

Check with the GSM Operator your access profile.

AT+CGDCONT=1,"IP","APN"

You can insert the AT+CGDCONT command in the Additional string in the driver properties or send the command by HyperTerminal and save it with AT&W command.

Connection

Now you are ready for a Dial-Up connection and a GPRS connection, using the drivers.

Verify with your GSM Operator the GPRS parameters (e.g. User ID, password, phone number).



For further technical information and for the driver, see the Support area on our web site www.digicom.it, or send a e-mail to support@digicom.it

4. AT COMMANDS

4

Pocket GPRS Micro supports a complete AT commands set to configure and test the modem and all its functionalities.

These commands are based on the following recommendations:

- ETSI GSM 07.07: Digital cellular telecommunications system (Phase 2); AT command set for GSM Mobile Equipment (ME);
- ETSI GSM 07.05: Digital cellular telecommunications system (Phase 2); Use of DTE-DCE interface for Short Message Service (SMS) and Cell Broadcast Service (CBS);
- ITU-T Recommendation V.25ter: Serial asynchronous automatic dialling and control.

The factory configuration of Pocket GPRS Micro accepts AT commands only at 9600bit/s.

Before going on you must set your terminal emulator (e.g. HyperTerminal) or your application with these values:

Bit per second	= 9600
data bit	= 8
parity	= None
stop bit	= 1
flow control	= Disabled

Use the commands AT+IPR, AT+ICF, AT+IFC to change the modem interface speed and the flow control.

4.1. COMMANDS NOTES

Please read these before using Pocket GPRS Micro:

- The commands always start with AT; it means Attention, and end with <CR> (Hex=0D) character.
- The answer messages in extended format (ATV1 command) start and end with <CR><LF> (Hex=0D 0A). If Pocket GSM is programmed to manage numeric answers (ATV0), then the answer will not have the prefix <CR><LF> and will be ended with the <CR> character.
- To disable the answer messages use ATQ1 command.
- If the syntax of the command is wrong, the modem sends the answer ERROR
- If the syntax of the command is correct but some incorrect parameters are used, the strings +CME ERROR: <Err> or +CMS ERROR: <SMSErr> are sent with different error codes.
- If the command has been successfully executed, the answer will be OK.
(In some cases, such as AT+CPIN? the modem will return the information requested without OK).



In the “Functional Examples”, and in the “AT commands description”, the characters <CR> and <CR><LF> have been intentionally omitted.

4.2. AT COMMANDS DESCRIPTION

4.2.1. General commands

ATA Answer an incoming call

When the modem receives a call, it sets the Ring Indicator signal and sends to the DTE (e.g. PC) the RING string (or +CRING: <type> if AT+CRC=1). If the automatic answer is disabled (ATSO=0), the ATA command enables the answer to an incoming call.

Command	Possible answers	Action
ATA	CONNECT	DATA call accepted

ATD Dial command

This command will dial the number entered after the ATD string. When the modem detects the carrier from the GSM base station, it will answer with the message CONNECT: at this point the data transmission starts.

For further information on ATD command, see chapter "Functional Examples".

Command	Possible answers	Action
ATD<str>	CONNECT BUSY NO ANSWER NO CARRIER	DATA / FAX connection is established Remote device busy No answer from the called number Failed or refused call

<str>	Description	Examples
Numbers 0...9	National call	ATD0123456789
+	International call	ATD+987654321
>"text"	Call to the number in the phonebook associated with the "text" identifier (by AT+CPBS command)	ATD>"Digicom"
>mem<idx>	Call to the number contained in mem position n	ATD>SM2
>n	Call to the number stored in the position n of the current phonebook; it can be selected with the AT+CPBS command	ATD>1

ATE Echo command

When the modem receives a command, it executes the echo of the received characters. With this command it is possible to enable and disable the echo.

Command	Possible answers	Action
ATE0	OK	Echo disabled
ATE1	OK	Echo enabled
Default: ATE1		

ATH Hang up

When the modem is on-line after the escape sequence "+++", this command forces the modem to disconnect.

Command	Possible answers	Action
ATH	OK	The modem disconnects

ATO Back to On-Line mode

If you have to interrupt the data flow temporarily to verify the modem status or some registers without disconnecting, you can use the "+++" escape sequence. Then send the ATO command to return to data mode.

Command	Possible answers	Action
ATO	CONNECT	Back to On-Line mode

ATQ Answer messages

This command is used to enable and disable the modem answers.

Command	Possible answers	Action
ATQ0	OK	Answer messages enabled
ATQ1	OK	Answer messages disabled
Default: ATQ0		

ATS0 Auto answer

The S0 register allows to disable (ATS0=0) or to enable the modem autoanswer when arriving an incoming call.

Command	Possible answers	Action
ATS0=<n>	OK / ERROR	Auto answer after n rings
ATS0?	OK	Reading of S0 register
Default: ATS0=0		

ATV Result code format

This command determines the modem response format: verbose code or numeric code.

Command	Possible answers	Action
ATV0	OK	Result code display as digit
ATV1	OK	Result code display as words
Default: ATV1		

ATZ Load user profile

This command will load a user profile previously saved with the AT&W command.

Command	Possible answers	Action
ATZ	OK	Loads the user profile

AT&C Data Carrier Detect (C109)

This command defines the management of the DCD (C109) on the modem serial port. If controlled (AT&C1), the DCD ON indicates the connection with a remote device. If forced (AT&C0) regardless of the status (connected/disconnected), the DCD is always ON.



Note: Data Carrier Detect can be controlled in DATA mode.

Command	Possible answers	Action
AT&C0	OK	Data Carrier Detect always ON
AT&C1	OK	Data Carrier Detect is controlled and follows the connection status
Default: AT&C1		

AT&D Data Terminal Ready (C108)

This command defines the management of the DTR (C108) on the modem serial port. The DTR comes from the DTE (e.g. PC) to the modem, for this reason the criterion can be present or absent. If absent, the modem must be configured to ignore the criterion (AT&D0). If present, the modem will accept the call only if the criterion is ON.

For further information on AT&D command, see chapter "Functional Examples".

Command	Possible answers	Action
AT&D0	OK	DTR is ignored
AT&D1	OK	Modem switches from data to command mode when DTR switches from ON to OFF.
AT&D2	OK	When DTR switches from ON to OFF the modem disconnects.
Default: AT&D1		

AT&F Restore factory settings

This command is used to load the factory settings for the command listed in the table.

Command	Possible answers	Action
AT&F	OK	Loads the factory configuration

Commands restored with AT&F

E	Q	S0	V	8C	8D	8S	+CBST
+CMGF	+COPS	+CR	+ERC	+CREG	+IFC	+KF	+IPR

AT&S Data Set Ready (C107)

This command defines the management of DSR (C107) criterion present on the modem serial port. If controlled (AT&S1), the DSR ON indicates a connection with a remote device. When OFF it indicates the disconnection with the remote modem. If forced (AT&S0), regardless of the status (connected/disconnected), the DSR is always ON.



Note: Data Set Ready can be controlled in DATA modes only.

Command	Possible responses	Action
AT&S0	OK	Data Set Ready always ON
AT&S1	OK	Data Set Ready is controlled and follows the connection status

Default: AT&S1

AT&V Display configuration

Command	Possible answers	Action
AT&V	OK	Displays the current configuration

AT&W Save current configuration

This command saves the active configuration, in the EEPROM.

Command	Possible answers	Action
AT&W	OK	Saves the configuration

This command can be saved with AT&W

E	Q	S0	V	8C	8D	8S	+CBST
+CMGF	+COPS	+CR	+ERC	+CREG	+IFC	+KF	+IPR



**Wait the answer "OK" before sending other commands. For faster answer set the command AT+DWG=0
To restore automatically the commands after a power off and power on, set the command AT+DGTPW**

+++ Escape command

By sending the escape sequence, the modem switches from data to command mode. If the escape sequence is followed by the ATH command, the connection will be ended.

Command	Possible answers	Action
+++	OK	Return to command mode

AT+CGMM Model identification

Command	Possible answers	Action
AT+CGMM	<model> OK	Device identification

AT+CGMR Modem firmware release

Command	Possible answers	Action
AT+CGMR	<revision> OK	Modem firmware release

AT+CGSN Product Serial Number (IMEI)

Command	Possible answers	Action
AT+CGSN	012345678901234 OK	International Mobile Equipment Identity (IMEI) of the GSM module

AT+CIMI IMSI (International Mobile Subscriber Identity)

This command is used to read and identify the IMSI of the SIM card.

Command	Possible answers	Action
AT+CIMI	222016200858803 OK	222 : Mobile Country Code (222 = Italy) 01 : Mobile Network Code (01 = Tim) 6200858803 : Mobile Subscriber Identification Number

AT+IPR Fixed DTE rate

This command specifies the data rate at which the modem will accept data from the DTE (e.g. PC); the answer messages from the modem will use the same speed.

Command	Possible answers	Action
AT+IPR=<speed>	OK / ERROR	Set the interface rate
AT+IPR?	+IPR: 9600	Shows the current speed
AT+IPR=?	+IPR: (1200,...)	Shows the available speeds
Default: AT+IPR=9600		
<speed>	Description	
From 1200 to 115200 bit/s	Interface speed set at one of the following values: 300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200 bit/s.	

AT+ICF Data format

This command allows to select the data synchronous format, the modem will use to accept data from the DTE (e.g. PC); the modem answer messages will use the same format.

Comando	Possibili risposte	Azione
AT+ICF=<format>,<parity>	OK / ERROR	Set data format
AT+ICF?	+ICF: 5,1	Shows the current settings
AT+ICF=?	+ICF: (3-5), (0-1)	Shows the available settings
Default: AT+ICF=3,1		

<format>	Data Format		
3	Data: 8bit;	Parity: 0bit (None);	Stop: 1bit
4	Data: 7bit;	Parity: 0bit (None);	Stop: 2bit
5	Data: 7bit;	Parity: 1bit;	Stop: 1bit

<parity>	Parity Format
0	Odd
1	Even

Examples

AT+ICF=3,0 or AT+ICF=3,1	Data: 8bit; Parity: None; Stop: 1bit
AT+ICF=5,0	Data: 7bit; Parity: Odd; Stop: 1bit
AT+ICF=5,1	Data: 7bit; Parity: Even; Stop: 1bit

AT+IFC Flow control

This command is used to set the flow control to be used.

For further information on the AT+IFC command, see the chapter "Functional Examples".

Command	Possible answers	Action
AT+IFC=0,0	OK	Flow control disabled
AT+IFC=2,2	OK	Enables the Hardware flow control (RTS/CTS)
AT+IFC?	+IFC: 2,2	Shows the current flow control
AT+IFC=?	+IFC: (0,2), (0,2)	Shows the available values
Default: AT+IFC=0,0		

4.2.2. 07.07 GSM commands

AT+CBST Line Speed Setting

This command is used to select the line speed and the protocol for the DATA calls.

If Multistandard is selected:

- when transmitting, the modem sets with the maximum speed available on the GSM network (for Italy V.32 9600 bit/s)
- when receiving the modem recognizes the speed and the protocol suggested from the remote device.



For further information on AT+CBST command, see the chapter “Functional Examples”.

Command	Possible answers	Action
AT+CBST=<speed>,<mode>,<ce>	OK / ERROR	Sets the speed and the protocol
AT+CBST?	+CBST: 0,0,1	Shows the current settings
AT+CBST=?	+CBST: (0-7...), (0),...	Shows the available settings
Default: AT+CBST=7,0,1		

<speed>	<mode>	<ce>	Description
0	0	1	Multistandard
4	0	1	V.22 bis 2400 bit/s No Transparent
6	0	1	V.32 4800 bit/s No Transparent
7	0	1	V.32 9600 bit/s No Transparent
68	0	1	V.110 2400 bit/s No Transparent
70	0	1	V.110 4800 bit/s No Transparent
71	0	1	V.110 9600 bit/s No Transparent

AT+CEER Extended error report

This command gives a report with the cause of the last disconnection.

(See Appendix A for the error codes).

Command	Possible answers	Action
AT+CEER	+CEER: Error <err> OK	Cause of last disconnection

AT+CLIP Calling Line Identification (CLI)

When receiving a call, this command allows to identify the calling number. With the command AT+CLIP? It is possible to obtain the status of the “CLIP Service” in the network. The caller ID is displayed after any RING message.

Command	Possible answers	Action
AT+CLIP=0	OK	CLI displaying is disabled
AT+CLIP=1	OK	CLI displaying id enabled
AT+CLIP?	+CLIP: 0,<n>	Shows the current settings and the CLIP Service state
AT+CLIP=?	+CLIP: (0,1)	Shows the available settings
Default: AT+CLIP=0		

<n>	CLIP Service status in the network (reading only)
0	CLIP Service not available
1	CLIP Service available
2	Service Status: Unknown (no network...)

AT+CLIR Calling Line Identification restriction (CLI)

This command allows to hide the Calling Line Identification to the remote device.

⚠ Note: Independently from the setting of AT+CLIR, it is possible to add an “i” small letter at the end of the calling string to present the CLI to the remote user (e.g. ATD0123456789i); or the letter “I” capital letter to hide the CLI (e.g. ATD0123456789I).

Command	Possible answers	Action
AT+CLIR=0	OK	CLI presentation depends on the CLIR Service status.
AT+CLIR=1	OK	CLI is not displayed
AT+CLIR=2	OK	CLI is displayed
AT+CLIR?	+CLIR: 0,<n>	Shows the current settings and CLIR Service status
AT+CLIR=?	+CLIR: (0-2)	Shows the available settings
Default: AT+CLIR=0		

<n>	CLIR Service status in the network (reading only)
0	CLIR Service not available
1	CLIR Service available
2	Service Status: Unknown (no network...)
3	CLIR Service temporary suspended
4	CLIR Service temporary available

AT+CMEE Report Mobile Equipment errors

This command enables the report +CME ERROR: <err> and +CMS ERROR <SMSErr> with the indication of the error code, instead of a generic answer. (See Appendix A for error codes).

Command	Possible answers	Action
AT+CMEE=0	OK	Report disabled
AT+CMEE=1	OK	Report enabled
AT+CMEE?	+CMEE: 0	Shows the current settings
Default: AT+CMEE=0		

AT+COPS Operator selection

Pocket GPRS Micro can automatically detect the GSM operator both directly and in roaming. With this command you can check the current provider. Moreover, in extreme cases it is possible to force the registration to a specific provider: in this case check the registration status with the command AT+CREG.

With the command AT+COPS=? it is possible to verify the situation of the operators: 0 unknown operator; 1 operator is available; 2 current operator; 3 the operator is forbidden and cannot be selected.

⚠ For further information on AT+COPS command, see the chapter “Functional Examples”.

Command	Possible answers	Action
AT+COPS=<mode>,<format>,<oper>	OK / ERROR	Selects the operator
AT+COPS?	+COPS: 0,2,22201	Shows the current operator
AT+COPS=?	+COPS: (2,"I TIM","TIM",22201")...	Shows the available operators
Default: AT+COPS=0,0		

<mode>	Registration mode
0	Automatic (<oper> is ignored)
1	Manual
4	If manual selection fails, automatic mode is entered
<format>	Operator format
0	Long alphanumeric format (e.g. I OMNITEL)
1	Short alphanumeric format (e.g. OMNI)
2	Numeric format (e.g. 22210)
<oper>	Operator identifier

AT+CPIN Enter PIN code

This command is used to enter the PIN and PUK codes. If the SIM card, used with Pocket GSM, has the PIN code enabled, it will be necessary to insert it each time you turn the modem on, to permit the registration to the GSM network. The PIN and the PUK code management can be carried out with any mobile phone.



For further information on the PIN code management, see chapter “Functional Examples”.



Attention: If the PIN code is three times wrongly inserted, the SIM card is blocked. To unblock, insert the PUK code and the new PIN code. (e.g. AT+CPIN="12345678", "1234").

Command	Possible answers	Action
AT+CPIN="pin"	OK / ERROR	PIN code insertion
AT+CPIN="puk","pin"	OK / ERROR	PUK and PIN insertion
AT+CPIN?	<status>	Shows the SIM status

<status>	Description
+CPIN: READY	PIN code is present: SIM ready
+CPIN: SIM PIN	PIN is required
+CPIN: SIM PUK	PUK is required
+CPIN: SIM PIN2	PIN2 is required
ERROR	SIM card reading failed

AT+CR Connection report

This command enables the report +CR: <type> that identifies the current connection. The report is given before the connection message.

Command	Possible answers	Action
AT+CR=0	OK	Report disabled
AT+CR=1	OK	Report enabled
AT+CR?	+CR: 0	Shows the current settings
Default: AT+CR=0		

AT+CRC Cellular Result Code

This command enables the report +CRING: <type>, instead of the traditional RING message.

Command	Possible answers	Action
AT+CRC=0	OK	Report disabled
AT+CRC=1	OK	Report enabled
AT+CRC?	+CRC: 0	Shows current settings
Default: AT+CRC=0		

AT+CREG GSM Network registration

This command enables the automatic report to any change of status during the modem registration to the GSM network. For further information on AT+CREG command, see the chapter "Functional Examples".

Command	Possible answers	Action
AT+CREG=<n>	OK	Report enabled or disabled
AT+CREG?	+CREG: <n>,<stat>,[<lac>,<ci>]	Shows the current registration status of the GSM modem to the network
AT+CREG=?	+CREG: (0-2)	Shows the available settings
Default: AT+CREG=0		
<n>	Report status	
0	Report disabled	
1	Report enabled with +CREG: <stat>	
2	Report enabled with +CREG: <stat>,<lac>,<ci>	
<stat>	Registration status	
0	Modem not registered, Pocket GPRS Micro is not currently searching for a new operator	
1	Modem registered with the same operator of the SIM card	
2	Modem not registered, Pocket GPRS Micro is searching for a new operator	
3	Registration denied	
4	Registered at an unknown network	
5	Modem registered in roaming	
<lac>	Location Area Code in hexadecimal format (e.g. "00C3" is the same as "195" in decimal)	
<ci>	Cell ID in hexadecimal format	

AT+CSQ GSM Signal Quality

This command is used to control the GSM quality signal.

For further information on AT+CSQ command, see the chapter "Functional Examples".

Command	Possible answers	Action
AT+CSQ	+CSQ: <rssi>,<ber>	Reads the signal power and ber
	OK	
<rssi>	Reception level	
0	-113 dBm or less	
1	-111 dBm	
2...30	-109...-53 dBm	
31	-51 dBm or greater	
99	unknown or not detectable	



Note: each unit corresponds to 2 dBm.

<ber>	bit error rate
0	ber < 0,2%
1	0,2% < ber < 0,4%
2	0,4% < ber < 0,8%
3	0,8% < ber < 1,6%
4	1,6% < ber < 3,2%
5	3,2% < ber < 6,4%
6	6,4% < ber < 12,8%
7	ber > 12,8%
99	unknown or not detectable

4.2.3. Phonebook commands

AT+CPBS Select Phonebook

This command selects the memory to be used for the phonebook.

Command	Possible answers	Action
AT+CPBS=<"storage">	OK / ERROR	Select the current phonebook memory and the available memory
AT+CPBS?	+CPBS: <"storage">,<used>,<total>	
Default: AT+CPBS="ME"		
<"storage">	Phonebook	
"ME"	Modem phonebook (250 memory locations)	
"SM"	SIM phonebook (the number of locations depends on the SIM)	
"LD"	Last 10 dialled numbers	
"RC"	Last 10 received calls	
<used>	Locations used	
<total>	Total locations	

AT+CPBW Write and cancel a telephone number

This command allows to write or to delete a telephone number in the current phonebook. It can be selected with the command AT+CPBS.

Command	Possible answers	Action
AT+CPBW=<index>,<"number">,<type>,<"text">	OK / ERROR	Insert the telephone number
AT+CPBW=<index>	OK	Cancel the telephone number
AT+CPBW=?	+CPBW: (lista <index>),<ilength>,(lista <type>),<tlength>	Shows the information on the memory of the selected phonebook
<index>	Location where to save the telephone number	
<"number">	telephone number	
<type>	145 if <"number"> includes the "+" character in the international prefix 129 if <"number"> does not include the "+" character in the international prefix	

 **Note: this parameter can be omitted.**

<"text">	Mnemonic name of the telephone number
<ilength>	Max length for <"number">
<tlength>	Max length for <"text">

Examples

AT+CPBW=1,"+39320xxxxxx","Rome Office"	Location 1 inserted
AT+CPBW=2,"320xxxxxx",129,"Milan Office"	Location 2 inserted
AT+CPBW=3,"320xxxxxx","Home"	Location 3 inserted
AT+CPBW=3	Location 3 cancelled

AT+CPBR Read a telephone number

This command is used to read a telephone number in the current phonebook and can be selected with the command AT+CPBS.

Command	Possible answers	Action
AT+CPBR=<idx1>,<idx2>	+CPBR: <idx1>,<number>,<type>,<text> ... <idx2>,<number>,<type>,<text>	Reads the numbers in the phonebook from <idx1> to <idx2>
<idx1> e <idx2>	Location range	
AT+CPBR=1	Read entry 1	
AT+CPBR=1,10	Read entries from 1 to 10	

AT+CPBF Search for a telephone number (knowing the stored text)

This command is used to find a telephone number inside the phonebook, knowing the associated identifier (e.g. starting with D...).

Command	Possible answers	Action
AT+CPBF=<"text">	+CPBF: <idx1>,<number>,<type>,<text> <idx2>,<number>,<type>,<text>	Displays the telephone numbers with the specified <"text"> identifier

AT+CPBP Search for a telephone number (knowing the number)

This command is used to find an identifier associated with a telephone number inside the phonebook, knowing the number itself.

Command	Possible answers	Action
AT+CPBP=<"number">	+CPBP: <idx1>,<number>,<type>,<text>	Displays the identifier associated with the specified <"number">

4.2.4. SMS control commands (GSM 07.05)

AT+CMGF Messages format

This command is used to define the SMS format (Short Message Service).

For further information on AT+CMGF command, see the chapter "Functional Examples".

Command	Possible answers	Action
AT+CMGF=0	OK	SMS in PDU mode
AT+CMGF=1	OK	SMS in Text mode
AT+CMGF?	+CMGF: 1	Shows the current settings

AT+CSCA Service Center Number

This command allows to set the Service Center number in the SIM card memory. An error will occur if trying to send an SMS using a wrong number of the Services Center. Verify with your GSM Operator the number of the Service Center.

 **For further information on AT+CSCA command, see the chapter "Functional Examples".**

Command	Possible answers	Action
AT+CSCA?	+CSCA: "Service Center Address"	Displays the Service Center number
AT+CSCA=" Service Center Address"	OK	Inserts the Service Center number

AT+CSMP Period of Validity for the SMS

This command is used to define period of validity of the message in the Services Center.

Command	Possible answers	Action
AT+CSMP=<fo>,<vp>,<pid>,<dc>	OK / ERROR	Sets the period of validity
AT+CSMP?	+CSMP: <fo>,<vp>,<pid>,<dc>	Shows the current settings

Default: AT+CSMP=1,167

<fo>	Reserved (value is 1, do not modify)
<vp>	Period of validity
"1"	1 hour
"7"	6 hours
"167"	24 hours
"173"	1 week
"255"	Higher
<pid>	Reserved
<dc>	Reserved

AT+CNMI Indication of New incoming message

This command displays a report when a new SMS arrives.



For further information on AT+CNMI command, see the chapter “Functional Examples”.

Command	Possible answers	Action
AT+CNMI=<mode>,<mt>	OK / ERROR	Select the report display mode
AT+CNMI?	+CNMI: <mode>,<mt>	Shows the current settings
Default: AT+CNMI=1,0		

<mode>	Display Mode
2	If the modem is Off-line, the message will be displayed on the DTE in <mt> format. If the modem is On-line, the message will be displayed on the DTE in <mt> format at the end of the connection.
0,1,3	Equal to 2
<mt>	Report format
0	No report
1	Report with format: +CMT: <mem>,<index>
2	Report with format: +CMT:<oa>,<alpha>,<scts>,<tooa>,<fo>,<pid>,<dcs>,<sca>,<tosca>,<length> <data>

Examples

- 1) AT+CNMI=1,1
Report: +CMT: "MT",2
Description: The received SMS has been stored in the location 2 of the memory.
- 2) AT+CNMI=1,2
Report: +CMT: "+393217654321",,"01/01/75,12:06:14+00"
First SMS message with Pocket GPRS Micro
Description: the received SMS is displayed directly on the DTE.

AT+CMGD Delete messages

This command is used to delete the SMS messages stored in the memory.



For further information on AT+CMGD command, see the chapter “Functional Examples”.

Command	Possible answers	Action
AT+CMGD=<index>	OK / ERROR	Cancella i messaggi SMS
<index>	Memory index	

AT+CMGL Messages List

This command displays the list of the SMS messages stored in the SIM memory.

 **For further information on AT+CMGL command, see the chapter “Functional Examples”.**

Command	Possible answers	Action
AT+CMGL=<stat>	OK / ERROR	Shows the list of SMS
<stat>		Display method
Text mode	PDU mode	Description
"REC UNREAD"	0	Displays all the received unread messages
"REC READ"	1	Displays all the received and read messages
"STO UNSENT"	2	Displays all the stored unsent messages
"STO SENT"	3	Displays all the stored sent messages
"ALL"	4	Display all the messages

AT+CMGR Display message

This command allows to display a specific SMS stored in the SIM memory

 **For further information on AT+CMGR command, see the chapter “Functional Examples”.**

Command	Possible answers	Action
AT+CMGR=<index>	OK	Shows the message

AT+CMGS Send SMS

This command is used to send a SMS message in Text mode.

 **For further information on AT+CMGS command, see the chapter “Functional Examples”.**

Examples

Command:	AT+CMGS="+393217654321"<enter>
Answer:	>
Text:	First SMS message with Pocket GPRS Micro<ctrl z>
Answer:	+CMGS: <sms index>
	OK

Compose your message, press <ctrl z> (Hex =1A). To cancel the procedure, press <esc> (Hex = 1B).
In this example the message "First SMS message with Pocket GSM" is sent to number +393217654321.

AT+CMSS Send a stored SMS

This command is used to send a previously stored SMS message in Text format. Check the memory location with the AT+CMGL="ALL" command.

Command	Possible answers	Action
AT+CMSS=<index>	OK	Sends the SMS message stored in <index> location

AT+CMGW Store an SMS

This command is used to store an SMS message in text format into the SIM memory.

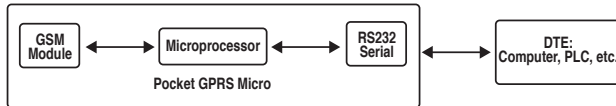
Examples

```
Command: AT+CMGW="+393217654321"<enter>
Answer:  >
Text:    First SMS message with Pocket GPRS Micro<ctrl z>
Answer:  +CMGW: <sms index>
        OK
```

Compose your message, press <ctrl z> (Hex =1A). To cancel the procedure, press <esc> (Hex = 1B).
In this example the message "First SMS message with Pocket GSM" is stored.

5. MICROPROCESSOR MANAGEMENT

Pocket GPRS Micro is equipped with an internal microprocessor that will allow you to go on using the software you normally use without giving them up due to AT commands incompatibility. With Pocket GPRS the eventual AT commands not foreseen in the software can be directly managed by the Microprocessor as additional strings, while the AT commands non recognized by the GSM module will be executed correctly by the Micro without any ERROR message.



Here is the description of the functionalities managed by the microprocessor (micro).

1. Possibility to enable/disable the microprocessor management.
2. Management of configuration strings that can be customized by the user. The microprocessor can send these strings to the GSM module in case they are not sent to the Pocket GPRS Micro by the application or by the device (i.e. PLC) connected to the serial port.
These strings can be sent by the micro to the GSM module:
 - before any call: ATD command
 - before any answer: ATA command
 - after a set time with regards to the last detected AT command
 - after a set time with regards to the device power on
3. Detection and modification of AT commands sent to the module. In case an AT command is not supported by the GSM module, it is possible to intercept it and to decide not to send it or eventually to substitute it with a different command.
4. Detection and modification of answer messages of GSM module. For example the answer "CONNECT 9600" can be changed with "CONNECT".
5. Speed support on the serial interface (between Pocket GPRS Micro and device connected on the serial port) included between 1200bps and 115200bps.
6. Possibility to restart the device periodically. In order to force a new registration to the GSM network avoiding the GSM operator can insulate the device for no traffic.
7. To remote manage the device restart via SMS.
8. To remote modify the configuration via SMS.

5.1. REMOTE MANAGEMENT VIA SMS

Enabling the remote management (AT+DGRC) you can remote modify the device configuration.



NOTE: when Pocket GPRS Micro receives the configuration message, it executes the configuration and it will send a message with the answer got at command execution.



Attention: for the right security, we suggest to define the users list authorized to the device remote management (AT+DGUN).



**Attention: for a correct management of the remote configuration SMSs, when the GSM module receives the AT+DGRC=1 command, it is automatically set with the commands AT+CNMI=1,2 (display SMS towards the serial port) and AT+CMGF=1 (SMS management in text format).
For further information on SMS format, see the paragraph "Functional Examples".**

Format: the SMS for the remote management must be formatted as follows: #command with no at prefix#



Note: Only one command can be inserted into an SMS.

Some examples:

- To test the GSM signal: #+CSQ#
- To modify the configuration: #+CBST=71#
- To modify the initialization string: #+DGI1=S0=0#
- To modify the authorized users: #+DGUN1=3380011223#
- To remote restart the device: #+DGRS#

5.2. MICROPROCESSOR AT COMMANDS

Here is the AT commands list for the microprocessor management (AT+DG). The values of these commands are automatically saved and no additional command is needed.

AT+DGM	It enables the microprocessor
AT+DGI<index>	It sets the initialization strings
AT+DGAI<index>	It verifies the answer to initialization strings AT+DGI<index>
AT+DGID	Initialization string to send before the ATD command
AT+DGAID	Answer of GSM module against AT+DGAID command
AT+DGIA	Initialization string to send before ATA command
AT+DGAIA	Answer of GSM module against AT+DGAIA command
AT+DGTAT	Timer to send the init strings after the last AT command
AT+DGTPW	Timer to send the init strings after power on
AT+DGCL<index>	List of commands to be intercepted and modified by micro
AT+DGML<index>	GSM module messages list to intercept and modify
AT+DGTR	Periodical startup timer of the device
AT+DGRS	Device startup command
AT+DGRC	It enables the device remote management
AT+DGUNn	List of users authorized to remote interact with the device
AT+DGW	It manages the storage command for AT&W
AT+DGAPP	View the device firmware version
AT+DGF	Restore the factory configuration of the microprocessor

AT+DGM Microprocessor enabling

AT+DGM=status

It enables or disables the microprocessor management.

Status: 0 Micro disabled, transparent mode.
1 Micro enabled, non transparent mode with micro operation.

Default: 1

AT+DGM?

It displays the current setting.

i.e. +DGM: 1
OK

AT+DGI<index> Initialization strings configuration

AT+DGI<index>=AT commands

It sets the initialization strings (up to 3). The initialization string can contain multiple AT commands.

i.e. AT+DGI1=+CNMI=1,2

Whatever is the answer of GSM module, the micro will go on with the next event. The answer of GSM module will be stored and you can display it with AT+DGAI<index>?

<index>= string number, this field accepts the values "1", "2" and "3".

AT+DGI<index>=

It removes the initialization string set in the <index> field.

AT+DGI<index>?

It displays the initialization string set in the <index> field.

i.e. +DGI1: +CNMI=1,2
 OK

AT+DGAI<index> Answer control to initialization strings

AT+DGAI<index>?

It controls the answer given by GSM module to AT+DGI<index> command.

For example to verify the answer to the AT+DGI1 command string, you must digit the following command:

+DGAI1: OK
OK

<index>= string number, this field accepts the values "1", "2" and "3".

AT+DGAI<index>=

It removes the AT+DGAI<index> memory.

AT+DGAI<index> memory is automatically cancelled at device power off.

AT+DGID Initialization string before ATD command

AT+DGID=AT commands

It sets the initialization string to send before ATD command. The initialization string can contain multiple AT commands.

Whatever is the answer of GSM module, the micro will go on with the next event. The answer of GSM module will be stored and you can display it with AT+DGAID?

i.e. AT+DGID=+CBST=71

AT+DGID=

It removes the initialization string and then it disables the forwarding of the command before ATD.

AT+DGID?

It displays the initialization string.

i.e. +DGID: +CBST=71
 OK

AT+DGAID Answer control to AT+DGID command

AT+DGAID?

It verifies the last answer given by GSM module to commands in AT+DGID.

i.e. +DGAID: OK
 OK

AT+DGAID=

It removes the AT+DGAID memory.

AT+DGAID memory is automatically cancelled at device power off.

AT+DGA Initialization string before ATA command

AT+DGA=AT commands

It sets the initialization string to send before ATA command. The initialization string can contain multiple AT commands.

Whatever is the answer of GSM module, the micro will go on with the next event. The answer of GSM module will be stored and you can display it with AT+DGAIA?

es. AT+DGA=+CBST=71

AT+DGIA=

It removes the initialization string and then it disables the forwarding of the command before ATA.

AT+DGIA?

It displays the initialization string.

i.e. +DGIA: +CBST=71
 OK

AT+DGAIA Answer control to AT+DGIA command**AT+DGAIA?**

It verifies the last answer given by GSM module to commands in AT+DGIA.

i.e. +DGAIA: OK
 OK

AT+DGAIA=

It removes AT+DGAIA memory.

AT+DGAIA memory is automatically cancelled at device power off.

AT+DGTAT Timer to send initialization strings after last AT command**AT+DGTAT=timer**

It sets the waiting time with respect to the last AT command, excepted ATD and ATA commands, after which the micro sends the INIT strings.

Unit of time (seconds). Values from 1 to 255. The value 0 disables the timer and the forwarding of the INIT strings.
Default: 0

AT+DGTAT?

It displays the timer value.

i.e. +DGTAT: 10
 OK

AT+DGTPW Timer to send initialization strings after power on**AT+DGTPW=timer**

It sets the waiting time with respect to modem power on, after which the micro sends the INIT strings.

Unit of time (seconds). Values from 1 to 255. The value 0 disables the timer and the forwarding of the INIT strings.
Default: 0

AT+DGTPW?

It displays the timer value.

i.e. +DGTPW: 40
 OK

AT+DGCL<index> AT commands list to intercept**AT+DGCL<index>=real cmd,modify cmd**

It sets the commands list to intercept and it defines the correspondent command that must be sent to the GSM module. It is possible to set the "real cmd" only and to skip the "modify cmd". In this case the command set in "real cmd" will be intercepted and no command is sent to the module. Write in "real cmd" only one command.

<index>: values from 1 to 10



Note: If the message to be written in "real cmd" or "modify cmd" contains the comma (,) symbol, this must be repeated twice in order not to mistake it with the separation symbol in msg,modify msg

Examples:

AT+DGCL1=&Q0,+IFC=0,,0

(&Q0 command is intercepted and substituted with +IFC=0,0 command that will be sent to GSM module)

AT+DGCL2=&D2,
(&D2 is intercepted and it will not be sent to the GSM module)

AT+DGCLn=

It removes the command.

AT+DGCLn?

It displays the specific position n.

i.e. AT+DGCL1?
+DGCL1: &Q0,+IFC=0,0
OK

AT+DGMCL?

It displays the entire list.

i.e. +DGCL1: &Q0,+IFC=0,0
+DGCL2: &D2,
OK

AT+DGML<index> List of messages to intercept

AT+DGML<index>=real msg,modify msg

It sets the list of the answers that must be intercepted and the correspondent answer to send to the DTE (application/device connected to RS232 serial port).

<index>: values from 1 to 10

examples:

AT+DGML1=CONNECT 0,CONNECT 9600



Notes:

1. If the message to be written in “real msg” or “modify msg” contains the comma (,) symbol, this must be repeated twice in order not to mistake it with the separation symbol real msg,modify msg
2. If necessary, <cr> character can be indicated with <cr>.
3. If necessary, <lf> character can be indicated with <lf>.
4. The answers of the following commands can not be changed: AT&F, AT&W, ATZ, ATO, AT&V, AT+CREG, AT+COPN, AT+CGED, AT+NPSD=0, AT+CMGS, AT+CMGL, AT+CMGR, +CMT

AT+DGMLn=

It cancels the message.

AT+DGMLn?

It displays the specific position n.

i.e. +DGML1:=CONNECT 0,CONNECT 9600
OK

AT+DGML?

It displays the entire list.

i.e. +DGML1: CONNECT 0,CONNECT 9600
+DGML2:
OK

AT+DGTR Periodical restart Timer

AT+DGTR=timer

It sets the time for the periodical device restart in order to perform a new registration to the GSM network in case of signal loss. This command avoids the GSM operator insulating the device for no traffic.

Unit of time (minutes). Values from 1 to 65535. The value 0 disables the timer and the forwarding of INIT strings.

Default: 0

AT+DGTR?

It displays the timer value and the time to the next restart.

i.e. +DGTR: 1440,23
 OK

AT+DGRS Device Restart

AT+DGRS

It executes an immediate device restart in order to perform a new registration to the GSM network.

AT+DGRC Remote Management enabling

AT+DGRC=status

It enables or disables the device remote management. In order to have the necessary security, we suggest to define the list of users authorized to the device remote management (AT+DGUN). If the remote management is disabled, the micro will not perform any control on incoming SMS. The received SMS will be always sent also to the serial port.

Values: 0 Remote management disabled
 1 Remote management enabled.

Default: 0

AT+DGRC?

It displays the command setting.

i.e. +DGRC: 0
 OK

AT+DGUN<index> List of users authorized to remote management

AT+DGUNn=phone number

It sets the list of users authorized to remote interact with the device.

<index>: values from 1 to 10.



Attention: if the remote management is enabled (AT+DGRC=1) and the users list empty, anyone will be able to remote interact.

Examples:

AT+DGUN1=3351234567
AT+DGUN2=+393409876543

AT+DGUNn=

It removes the user.

AT+DGUN1?

It displays the specific position n.

i.e. +DGUN1: 3351234567
 OK

AT+DGUN?

It displays the entire list.

i.e. +DGUN1=3351234567
 +DGUN2=+393409876543
 OK

AT+DGW Management of configuration storage command AT&W

AT+DGW=status

It enables or disables the configuration save executed with AT&W

Values:

- | | |
|---|---|
| 0 | Storage of disabled configuration. The answer OK to AT&W command will be immediate but the configuration will not be stored. |
| 1 | Storage of enabled configuration. The AT&W command allows the storage of configuration but the answer OK to the command will take about 8 seconds; during the correct storage it will be performed an automatic restart of GSM module and a new registration to the GSM network. If using a SIM with PIN request, the PIN must be newly inserted. |

AT+DGAPP Firmware version

AT+DGAPP

View the device firmware version eg. PocketGPRS Micro 1.42 (Jan 31 2011 10:22:12)

AT+DGF Restore the factory configuration of the microprocessor

AT+DGF

Restore the factory configuration of the microprocessor and a reboot of the device.

APPENDIX A

A

A1. REPORT ERROR CODES: +CEER: ERROR <ERR>

<err>	Description
1	unassigned (unallocated) number
3	no route destination
6	channel unacceptable
8	operator determined barring
16	normal call clearing
17	user busy
18	no user responding
19	user alerting, no answer
21	call rejected
22	number changed
26	non selected user clearing
27	destination out of order
28	invalid number format (incomplete number)
29	facility rejected
30	response to STATUS ENQUIRY
31	normal, unspecified
34	no circuit / channel available
38	network out of order
41	temporary failure
42	switching equipment congestion
43	access information discarded
44	requested circuit / channel not available
47	resources unavailable, unspecified
49	quality of service unavailable
50	requested facility not subscribed
55	incoming calls barred with in the CUG
57	bearer capability not authorized
58	bearer capability not presently available
63	service or option not available, unspecified
65	bearer service not implemented
68	ACM equal to or greater than ACMmax
69	requested facility not implemented
70	only restricted digital information bearer capability is available
79	service or option not implemented, unspecified
81	invalid transaction identifier value
87	user not member of CUG
88	incompatible destination
91	invalid transit network selection
95	semantically incorrect message
96	invalid mandatory information
97	message type non-existent or not implemented
98	message type not compatible with protocol state
99	information element non-existent or not implemented
100	conditional IE error
101	message not compatible with protocol state
102	recovery on timer expiry
111	protocol error, unspecified
127	interworking, unspecified
244	normal
245	alternate call unsuccessful modify
246	mobile originated unsuccessful call setup

247	mobile terminated unsuccessful call setup
248	unsuccessful in-call-modification
249	normal user request
250	last call release
251	last data call release
252	unsuccessful GPRS attach
253	GPRS detach
254	unsuccessful PDP context activation
255	PDP context deactivation

A.2. REPORT ERROR CODES: +CME ERROR: <ERROR>

<error>	Description	
0	phone failure	undetermined
1	no connection to phone	
2	phone-adaptor link reserved	
3	operation not allowed	all +C.. commands described in GSM07.07
4	operation not supported	all +C.. commands described in GSM07.07
5	PH-SIM PIN required	all +C.. commands described in GSM07.07
10	SIM not inserted	all +C.. commands described in GSM07.07
11	SIM PIN required	all +C.. commands described in GSM07.07
12	SIM PUK required	all +C.. commands described in GSM07.07
13	SIM failure	all +C.. commands described in GSM07.07
14	SIM busy	all +C.. commands described in GSM07.07
15	SIM wrong	all +C.. commands described in GSM07.07
16	incorrect password	+CLCK, +CPWD, +CPIN, ATD*...#...
20	memory full	+CPBW, +CPOL
21	invalid index	+CPBR, +CPBW
22	not found	+COPS, +CHLD, +CGATT, ATD*...#...
23	memory failure	+CSAS, +CRES, +CSGT
24	text string too long	+CPBW
25	invalid characters in text string	ATD*...#...
26	dial string too long	ATD, +CPBW
27	invalid characters in dial string	ATD, +CPBW, ...
30	no network service	ATD, +COPS, +CLIR, ...
31	network timeout	ATD
100	unknown	commands with wrong syntax
103	illegal MS	+CGATT
106	illegal ME	+CGATT
107	GPRS services not allowed	+CGATT
111	PLMN not allowed	+CGATT
112	Location area not allowed	+CGATT
113	roaming not allowed in this location area	+CGATT
132	service option not supported	+CGACT, or other non-GPRS cmds.
133	requested service option not subscribed	+CGACT, or other non-GPRS cmds.
134	service option temporarily out of order	+CGACT, or other non-GPRS cmds.
149	PDP authentication failure	+CGACT
148	unspecified GPRS error	all GPRS related commands
150	invalid mobile class	all GPRS related commands
701	incorrect security code	+XPIN, +XSECSTATE
702	max attempts reached	+XPIN, +XSECSTATE

A.3. REPORT ERROR CODES: +CMS ERROR: <SMSERROR>

<error>	Description	
1 to 127	Error cause values from the GSM recommendation 04.11 Annex E-2	+CMGS, +CMMS
128 to 301	Error cause related to GSM 3.40	(SMS commands)
301	SMS service of ME reserved	+CSMS
302	operation not allowed	all SMS commands
303	operation not supported	all SMS commands
310	SIM not inserted	all SMS commands
311	SIM PIN required	all SMS commands
312	PH-SIM PIN required	all SMS commands
313	SIM failure	all SMS commands
314	SIM busy	all SMS commands
315	SIM wrong	all SMS commands
316	SIM PUK required	all SMS commands
320	memory failure	+CMGR
321	invalid memory index	+CMGR, +CMGL
322	memory full	
330	SMSC address unknown	+CMGR
332	network timeout	
500	unknown error	commands with wrong syntax
512	MN_SMS_RP_ACK	This and the following codes are manufacturer specific
513	MN_SMS_TIMER_EXPIRED	
514	MN_SMS_FORW_AVAIL_FAILED	
515	MN_SMS_FORW_AVAIL_ABORTED	
516	MS invalid TP-Message-Type-Indicator	
517	MS no TP-Status-Report in Phase 1	
518	MS no TP-Reject-Duplicate in phase 1	
519	MS no TP-Replay-Path in Phase 1	
520	MS no TP-User-Data-Header in Phase 1	
521	MS missing TP-Validity-Period	
522	MS invalid TP-Service-Centre-Time-Stamp	
523	MS missing TP-Destination- Address	
524	MS invalid TP-Destination-Address	
525	MS missing Service-Centre-Address	
526	MS invalid Service-Centre-Address	
527	MS invalid alphabet	
528	MS invalid TP-User-Data-length	
529	MS missing TP-User-Data	
530	MS TP-User-Data too long	
531	MS no Command-Request in Phase 1	
532	MS Cmd-Req invalid TP-Destination-Address	
533	MS Cmd-Req invalid TP-User-Data-Length	
534	MS Cmd-Req invalid TP-User-Data	
535	MS Cmd-Req invalid TP-Command-Type	
536	MN MNR creation failed	
537	MS CMM creation failed	
538	MS network connection lost	
539	MS pending MO SM transfer	
540	MS MO SM rejected by SIM MO SMS control	
541	RP-Error OK	
542	RP-Error OK no icon display	
543	Unspecified SMS PP error	

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