digicom

Alarm System *via SMS*

- 900/1800MHz **Dual Band GSM** Module
- **Remote control** of sensors
- **Configuration** through GSM phone
- Rechargeable **Backup Battery**

Pocket AL I/O

User's Guide
rev. 1.0 04/2010

6 IN & 6 OUT

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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 CE 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 AL I/O**, 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

Congratulations for choosing Pocket AL I/O Digicom.

Pocket AL I/O is a signalling system via SMS equipped with a last generation Dual-Band GSM/GPRS modem.
It can interface to different sensors according to your needs (i.e. gas, allarms, fumes, water or level sensors, etc.) and then it sends you an SMS at any change detected on each single sensor.
Furthermore you will be able to remote interact by sending appropriate SMS that will pilot the opening/closing of the outputs.

Pocket AL I/O has been designed to operate with the networks of all the GSM operators both directly and in roaming mode.
Pocket AL I/O complies with Class 4 (900 Mhz) and Class 1 (1800 Mhz).

1.1. TECHNICAL FEATURES

- **Power supply**
  Power supply: from 5 to 32 Vcc

- **Temperature**
  Operating: from -20°C to +55°C
  Storage: from -20°C to +70°C

- **Connectors**

Terminal board	6 PIN	screwless Power Two analog inputs
Terminal board	20 PIN	screwless Four non optoinsulated digital inputs Two optoinsulated digital inputs Four open collector outputs Two relay outputs (NO, C, NC)
Antenna	SMA female	
SIM	Plug-In 3V and 1,8V (USIM are not supported)	
Data	RS232 9 pin (V.24/V.28) It allows to connect the device to the PC in order to set it up via serial port (it can be also setup via SMS messages) and for firmware upgrades.	

- **Overall dimensions**
  Size 90x77x47mm
  Weight about 300 gr

1.2. PACKAGE CONTENT

- 1 Pocket AL I/O
- 1 GSM Antenna
- 1 User's Guide

2. INSTALLATION

The installation of Pocket AL I/O is extremely easy and fast. The configuration can be performed locally through a terminal emulator or remotely through a common GSM phone and SMS messages.

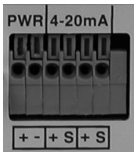
2.1. HARDWARE INSTALLATION

Before going on with the configuration, it is necessary to complete the hardware installation of Pocket AL I/O. Connect the sensors to the input contacts of Pocket AL I/O and then connect the eventual devices to be remote piloted to the output pins. When Pocket AL I/O receives the configuration messages, it will store the current situation of that input as "non alarmed" status, whether it is OPEN or CLOSED.

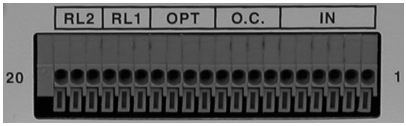
2.1.1. Starting procedure

- **Connect Pocket AL I/O to a computer COM port.** The device in factory configuration accepts commands at 115200 bps only. This operation is not necessary in case you configure the device via SMS.
- **Connect the inputs and outputs** to be managed. See the next paragraphs for the pins of terminal boards.
- **Connect the GSM antenna**.
- **Insert the SIM card** into Pocket AL I/O.
- **Power on Pocket AL I/O**. See the next paragraph for the 6 PINs terminal board.

2.1.2. 6 PIN terminal board description

Front view		PIN	LABEL	DESCRIPTION
	PWR	1	+	Power from +5 to +32 Vcc
		2	-	GND ground
	4-20mA	3	+	Power per sensor Out +12Vcc
		4	S	Analog input 1
		5	+	Power per sensor Out +12Vcc
		6	S	Analog input 2

2.1.3. 20 PIN terminal board description

Front view		PIN	DESCRIPTION
	IN	1	GND ground
		2	Non optoinsulated input 1
		3	Non optoinsulated input 2
		4	Non optoinsulated input 3
		5	Non optoinsulated input 4
		6	GND ground
	O.C.	7	Open Collector output 1
		8	Open Collector output 2
		9	Open Collector output 3
		10	Open Collector output 4
	OPT	11	Optoinsulated input 1
		12	Optoinsulated input 1
		13	Optoinsulated input 2
		14	Optoinsulated input 2
	RL1	15	Relay output 1 N.A.
		16	Relay output 1 C
		17	Relay output 1 N.C.
	RL2	18	Relay output 2 N.A.
		19	Relay output 2 C
		20	Relay output N.C.

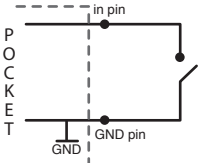
The wires must be **stripped for about 10 mm** so you can insert them correctly in the female clips

NOTE:
Open Collector: max 60Vcc - 700mA
Relay output: max 60Vcc - 1A

Optoinsulated input: from 5Vcc to 32Vcc

Non optoinsulated Digital Inputs

Two status are supported for each non optoinsulated input: open or closed to ground. It is necessary to connect a free contact only (without voltage) between the input pin and the ground pin.
It is not necessary to give voltage to inputs. You can use 1 and 6 GND ground pins present on 20 pins terminal board.

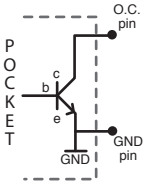


DIGITAL INPUTS FEATURES

Supported status : - Input open
- Input closed at ground (GND)

Open Collector outputs

The four Open Collector outputs of Pocket AL I/O allow the control of the devices that can be enabled and disabled when a switch is closed (i.e. Light, Alarm, Logic port, etc.).
When connecting your devices, keep into consideration the maximum voltage that can be applied between the collector and the emitter (Vce) of the Transistor and the maximum current that can pass through the collector circuit (Ic):



Vce (max)	Ic (max)
60V	700mA

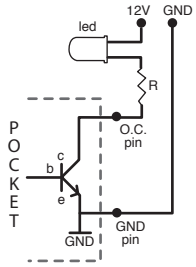
You can use 1 and 6 GND ground pins present on 20 pins terminal board.

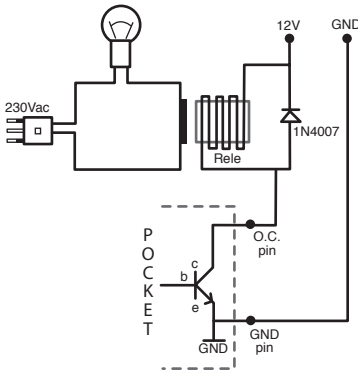
Connection examples

If with the output you want to manage a simple led (1,5V – 20mA) and you have at your disposal a 12V power supply, then you will have to insert a pull-up resistor of 470Ω to limit the current.

If you want to control the 230V bulb through the open collector output of Pocket AL I/O, you must connect to Pocket AL I/O an external relay and a protection diode for the internal transistor. In this case it is necessary to build a little external circuit inserting a 1N4007 or 1N4148 diode and then to connect a proper relay.

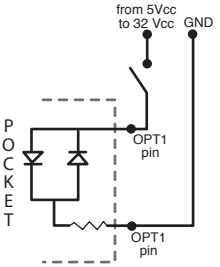
NOTE: if an extension cable is needed to reach the relay, insert the protection diode as security for the transistor.





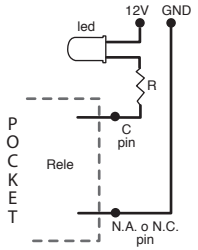
Optoinsulated digital inputs

In case you use optoinsulated inputs, it will be necessary to use an external power voltage in the range between +5V and +32Vcc.



Relay outputs

The two Relay outputs of Pocket AL I/O allow the control of the devices that can be enabled and disabled when a switch is closed (i.e. Light, Alarm, Logic port, etc.).
When connecting your devices, keep into consideration the maximum voltage and the maximum power: 60Vcc – 1A.

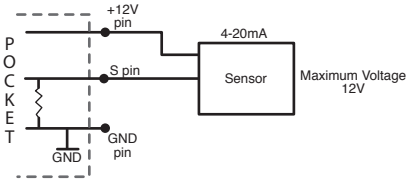


Analog Inputs

Pocket AL I/O supports both active and passive 4-20mA sensors.

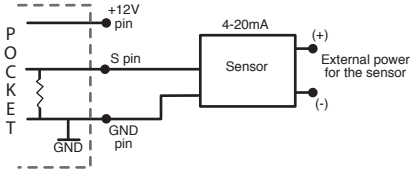
Passive Sensors

Pocket AL I/O manages passive sensors that have a maximum power of 12V. Connect the sensor between pins 3 and 4 or between pins 5 and 6 of the 6 PIN terminal board.



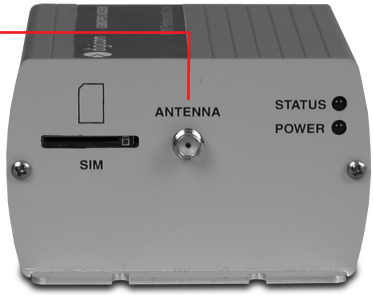
Active Sensors

Pocket AL I/O manages also active sensors that require a special power.
You can use 1 and 6 GND ground pins present on 20 pins terminal board.



2.1.4. Connection of external antenna

Once the inputs installation is over you can go on with the connection of the **external antenna**.
Be sure Pocket AL I/O is powerd off, then connect the antenna SMA male connector to the connector of Pocket AL I/O screwing it clockwise. In case of problems, do not force the connector but check the correct way.



Attention: for the best gain of the antenna, place it upward and at least one meter over the floor. In case Pocket AL I/O is installed inside cabinets with metal surfaces, we advice to place the antenna outside the cabinet for the best GSM signal.

Pocket AL I/O will operate only after the registration to the GSM network with a good quality signal. Three ways to check the GSM signal:

- **Through a mobile phone**
  Insert the SIM you will put in Pocket AL I/O in a mobile phone and verify which is the zone with the best signal.
- **Through the Power and Status leds**
  Power on the modem and verify that Power and Status leds start blinking after a few seconds. The Power led blinking means the modem is registered to the GSM network. The Status led blinking means there is a good GSM signal.

Attention: The sole signalling of registration to the GSM network through the POWER led does not guarantee the presence of a sufficient signal to use the device.

- **Through the #GSM# configuration command**
  Though this command you can verify precisely the best place to install the modem and the antenna. For further information see the paragraph CONFIGURATION MESSAGES.

2.1.5. SIM insertion

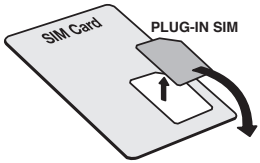
Now you can insert the SIM card. Any PLUG-IN SIM is supported by Pocket AL I/O. In order to avoid damaging or losing information, we suggest not to touch the SIM gold area.

Attention: USIM are not supported.

Attention: check with your telecom operator if the SIM is enabled for SMS traffic. We suggest to verify the correct operation by using it with a standard mobile phone; it is important to disable the PIN code request and to try sending/receiving SMS messages.
In case of problems:
- verify the residual amount (in case of prepaid SIM);
- verify and eventually insert the Service Center number (ask your telecom operator).

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. Be sure **Pocket AL I/O is off** by disconnecting the power supply.
3. **Insert the SIM in the specific slot** (refer to the information on the device). Then to extract the SIM, press on it and push it inside the device, then release it.



2.1.6. Power supply

Pocket AL I/O power supply is between 5 and 32 Vcc (Pwr of 6 PIN terminal board). With a 12Vcc power supply give at least 500mA.
The wires must be **stripped for about 10 mm** so you can insert them correctly in the female clips.

Attention: The voltage must not exceed the indicated maximum value as this may damage the product.

2.1.7. Powering on for the first time

- Once the hardware installation is over it is necessary to configure Pocket AL I/O.
- At the first power on check the status of Power and Status led.
- After few seconds Pocket AL I/O will register to the GSM network and the Power led will start blinking; the Status led will give the indication of the signal. In case Power led is fixed on or the Status led is off, power off Pocket AL I/O and verify as follows:
  - the SIM is correctly inserted into the SIM slot;
  - the PIN code request is disabled;
  - the GSM quality signal (insert the SIM card itself in a mobile phone).

2.2. LED INDICATORS

You can control the status of Pocket AL I/O through two leds:

LED	STATUS	DESCRIPTION
POWER	OFF	Device off
	ON	Power on and search for network
	BLINKING	Device registered to the GSM network
	SLOW BLINKING	Device powered by battery
STATUS	OFF	Trouble condition: search for network, low GSM signal, no SIM, PIN request or registration in Roaming (see command #GSM#)
	SLOW BLINKING	Good GSM signal
	FAST BLINKING	Receiving SMS. 3 seconds sequence time
	ON	Sending SMS. 3 seconds sequence time

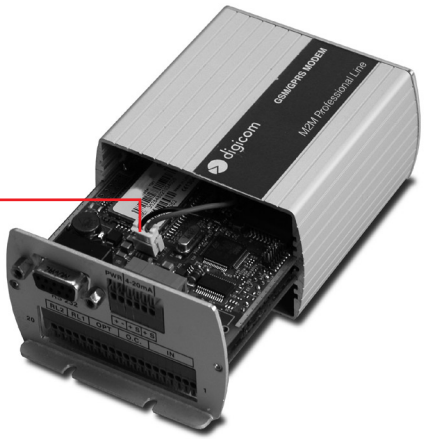
Note: in case the device is powered through a battery, the Power led will show this status (slow blinking); refer to the Status led to control the registration status.

2.3. BACK-UP BATTERY

The battery backup is placed into the product.
Back-up Battery features: Li-ion 3,7V – 950mAh rechargeable.
At the first power on, leave the device connected to the power supply for at least 5 hours for a correct and complete battery charging.
You will have the best performance in battery autonomy after 2 or 3 cycles of complete charge and discharge.

2.3.1. Remove the back-up battery

The replacement of battery must be carried out by qualified staff in our maintenance centre.
In special cases, to remove the battery disconnect the device from the main power.
Open the device, removing the terminal board panel.
Disconnect the **connector** as shown in picture.
Remove the board first, then you will be able to remove the battery.

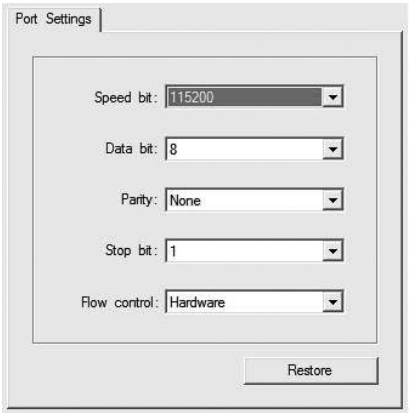


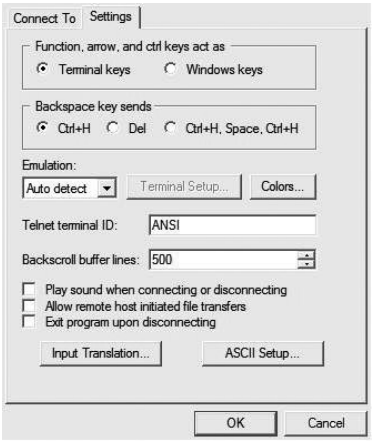
3. CONFIGURATION

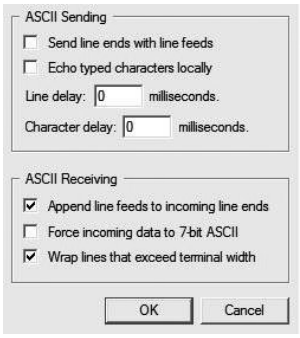
Pocket AL I/O is setup with simple configuration commands through the RS232 serial interface (terminal emulator set at 115200bps, 8, N,1) or through SMS messages using a standard mobile phone, to the SIM card number inserted in Pocket AL I/O.

In order to guarantee the security in the use of the device/application it is foreseen the configuration of users (cellular numbers) authorized to the device setup. For this reason it is important to perform this operation first and to define the list of authorized users.

Here following the screens concerning the configuration of Hyperterminal emulator. To correctly display the answer messages of Pocket AL I/O it is important to set in the "ASCII setup" the item "Append line feeds to incoming line ends".







3.1. DESCRIPTION OF CONFIGURATION MESSAGES

The commands here described can be sent both via serial port (terminal emulator) and via SMS (message text).
The configuration messages use "#" as starting, separation and end message character. You must respect the syntax described in the various commands.
The first "#" is followed by a "key" that defines the type of commands you are executing.

List of used keys

Key	Description
ACCLIST	Configuration of authorized users
0	Configuration of device identification
1,2,3,4	Configuration of non optoinsulated digital inputs
5,6,7,8	Configuration of open collector outputs
9,10	Configuration of optoinsulated digital inputs
11,12	Configuration of relay outputs
13,14	Configuration of analog inputs
15	Backup battery key
GSM	Check GSM operator and signal
CONFIG	Configuration test
STANDBY	Configuration of standby status
TEST	Contacts status test
RESET	Restore the verification of the blocked inputs
REBOOT	Set the periodical device reboot

Authorized Users
The users enabled to configure the device will be identified in the commands syntax with "USER 1", "USER n", "USER 6". Each user must be associated with a telephone number (mobile phone or device able to manage SMS). The number can be inserted both with and without international prefix (i.e. 3351122334 or +393351122334). The international prefix is not accepted in the "00xx" syntax.

ID
Some commands require the insertion of an ID that can be the one of the device or a single contact. This field can be 20 characters maximum and both numbers and letters can be used (Upper or Small case). The "#" character cannot be inserted in this field and no spaces are admitted. The ID field cannot be equal to one of the Keys.

3.2. MANAGEMENT OF SMS ALARM SIGNALLING

When Pocket AL I/O is configured for the control of input contacts, it will have to send an alarm message at any number inserted in configuration each time it will detect a status or transition change of the programmed contact.
Furthermore, if configurated, Pocket AL I/O will have to communicate the eventual power off to the configured users. In this condition Pocket AL I/O will go on working thanks to the backup battery for the time set in the Timer configuration parameter. When power will be on again, Pocket AL I/O will restore its standard operation either if the battery autonomy has been higher or lower than the power black-out by sending the power network restore message and the battery status on board.
When sending the SMS, the GSM network may communicate to the Services Center that the message has not been delivered: in these cases Pocket AL I/O will go on with the next number. Once the user list is over, it will wait for 1 minute and it will try again with the unsuccessful numbers.
After 10 failed attempts to the same number, Pocket AL I/O will renounce to send the SMS.
In case of malfunction of the external sensor, Pocket AL I/O could detect several transitions or status changes that will cause many SMS with consequent expenses. To avoid this malfunction Pocket AL I/O will count the alarm SMS coming from the same contact and if they are more than 10 during a time of 60 minutes, it will interrupt the control of that specific contact. The input will be automatically restored after 60 minutes. To manually restore the control of the input within 60 minutes, the user must send a reset message (#RESET#)

3.3. STARTING CONFIGURATION

3.3.1. Authorized users configuration

It defines the list of users authorized to set the device via SMS. Up to six users can be inserted. As default all numbers are authorized.

Command:
 # ACCLIST # USER 1 # USER 2 # USER 3 # USER 4 # USER 5 # USER 6 #

Description:

NAME	VALUE	DESCRIPTION
ACCLIST	ACCLIST	Key for the configuration of users enabled to the device management
User 1,n,6	+ 0..9	Phone numbers of users enabled to the device setting (up to six numbers can be inserted)

NOTES
1. If you want to add a number to a set list, it will be necessary to insert all the numbers again.
2. "0" (zero) character inserted in User1 will cancel all the list.
3. If the User field is empty, anyone will be able to set and manage the device.
4. Default: User = empty

EXAMPLES
#ACCLIST#+393351234567#+393409876543#
#ACCLIST#0#

3.3.2. Configuration of device ID

It allows the configuration of the device ID. This will be inserted in all the messages sent by Pocket AL I/O to allow the user receiving the SMS to recognize the sender.

Command:
 # 0 # ID #

Description:

NAME	VALUE	DESCRIPTION
0	0	Key of Pocket AL I/O ID
ID	A..Z,a..z, 0..9	ID associated to the contact (20 characters maximum; "#" and space characters not accepted in the ID field)

EXAMPLES
#0#HOME#

3.3.3. How to modify the configuration

After setting a contact, it might be necessary to change a field in the configuration (alarm name, phone numbers, etc.). To do this, it is necessary to send the new configuration that will overwrite the old one. If the single contact is not used anymore, then it is enough to send the message #chiave#

NAME	VALUE	DESCRIPTION
key	1..15	Device contacts key for which the cancellation of the configuration is requested
	99	It cancels the whole configuration

EXAMPLES
#2# (to cancel key 2 configuration)
#99# (to cancel the whole configuration)

3.3.4. Configuration test

To test the configuration, send this message to Pocket AL I/O:

#CONFIG#

Pocket AL I/O will send the configuration of all the set contacts.
If the command is sent via SMS, Pocket AL I/O will answer the message by formatting the replay in one or more messages.

Example of configuration forwarding

HOME
1)GasAlarm
T
+393359988776
+393491122334
+393295550006
5)OUTPUT1
6)OUTPUT2
7)OUTPUT3
8)OUTPUT4
11)OUTPUT5
12)OUTPUT6
13)Temperature
154
2588
5
+393359988776
+393491122334
+393285554446
15)MainPower
20
+393359988776
+393491122334
+393295550006
ACCLIST)
+393359988776
+393491122334
+393295550006
STANDBY)
AL

3.3.5. Search for GSM network

The user can verify the operator used by the GSM module and the signal quality by sending a message to Pocket AL I/O. The search for the GSM network can be executed at any time.
The message to Pocket AL I/O must have the following format:

#GSM#

When Pocket AL I/O will be asked for a search of the GSM network, it will return the following information:

1. ID
2. GSM operator of the SIM
3. Signal quality with 3 values:
   Excellent
   Good
   Bad
4. Eventual indication of roaming

Example of GSM network status forwarding

GSM network status

HOME
VODAFONE
GOOD
ROAMING

FORCING THE GSM OPERATOR
In the factory configuration Pocket AL I/O automatically registers to the GSM operator. If the device is installed next to the state border, it may register in roaming to a foreign GSM operator.
To verify this situation the user will check the Status and Power leds and he will send the #GSM# command.
In case of roaming registration you can force the operator with the fllowing command:

#GSM,operator code#

In this case the operator code is made of 5 digits and it corresponds to the univocal operator code assigned to each world-wide operator, for Italy it is:
22201 per TIM – 22210 per Vodafone – 22288 per WIND.
Pocket AL I/O is also enabled to accept codes different from the Italian ones.
In case the device registers to the operator with the above mentioned sequence, then the device will go on operating regularly. Otherwise if the device fails in registering to the operator, Pocket AL I/O will restore the automatic registration and if newly registered in roaming, it will be signalled by the Staus led.

Eventual black-out or power off will not cancel the configuration. At power on the device will start with the previously inserted configuration.

3.3.6. Device reboot configuration

During its standard operation Pocket AL I/O can remain on and registered to the GSM network for several days without using any GSM service. In these cases the GSM operator may disable the device from the GSM cell to which it is registered (ETSI 070905) cutting off Pocket AL I/O. For this reason Pocket AL I/O makes an automatic search of the GSM network. It is also possible to set the periodical update for the registration to the GSM network.

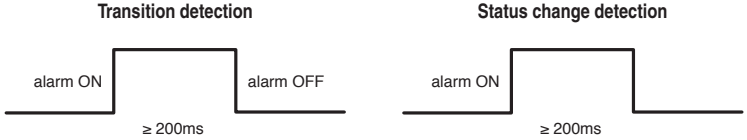
#REBOOT#	It forces a reboot of the GSM module in order to make a new registration.
#REBOOT,x#	Periodical reboot of the GSM module in order to make a new GSM registration. x = 0 disabled function ; x between 1 and 65535 minutes

3.4. DIGITAL INPUTS CONFIGURATION

For the inputs configuration you must assign:

- An alarm mnemonic name
- The type of change of the contact to be detected
- The addressees of the alarm message

Before starting with the inputs setting, be sure that the sensors connected to the inputs contacts are in the "alarm off" status. Once Pocket AL I/O receives the message of input configuration, it will store the actual input situation as "alarm off" status, whether it is OPEN or CLOSED.
Pocket AL I/O can be set to send the **alarm ON** message when the **changing** from "alarm off" to "alarm on" is detected and to send the **alarm OFF** message when the contact returns in "alarm off" status.
It can be set to send only the **alarm ON** message when the Status change from "alarm off" to "alarm on" is detected. Then when the status will return "alarm off", no message is sent. We suggest to use the Status configuration when the sensor connected to Pocket AL I/O is a photocell.



 # KEY # ID # DETECTION # USER1 # USERn # USER6 #

Message format to set the digital inputs:

NAME	VALUE	DESCRIPTION
Key	1,2,3,4	Key of non optoinsulated digital inputs: 1,2,3,4
	9,10	Key of optoinsulated digital inputs: 9,10
ID	A..Z,a..z, 0..9	ID associated to the contact (20 characters maximum. "#" and space characters not accepted in the ID field)
Detection	T,S,t,s	Type of detection to be signalled: T o t: detection of any transition; S o s: detection of status change.
User n	+ 0..9	Phone numbers to which the alarm message is sent (up to six phone numbers can be inserted)

NOTES
1. If you want to add a number to a set list, it will be necessary to insert all the numbers again.
2. By setting the filed user1="0" it will manage the input the status of which can be tear with the "test" command but no sms will be sent.

EXAMPLES
#1#GasAlarm#T#+393359988776#
#2#GatePhotocell#S#+393359988776#+393491122334#+393285554446#
#3#AntitheftAlarm#T#+393359988776#+393491122334#

3.4.1. SMS Alarm Messages

The message sent by the device in case of alarm to the devices set during the configuration will contain the following information:

- Pocket AL I/O ID (i.e. HOME)
- Contact number (i.e. 1)
- Contact ID (i.e. GasAlarm)
- Status
  ON (alarm condition)
  OFF (standard operating condition)

Examples

Contact 1 alarm
HOME
1)GasAlarm ON

Contact 1 alarm off
HOME
1)GasAlarm OFF

3.5. ANALOG INPUTS CONFIGURATION

Pocket AL I/O can read the values of two analog inputs where it is possible to connect analog sensors that operate with 4-20mA power.
To each single contact you can associate an input mnemonic name, 2 threshold values that can define 3 or 2 zones and the detection interval. Pocket AL I/O will monitor the analog input as set by the user. The messsage of treshold excedeed (and consequently of zone change) referred to the previous detection must be always sent after the first detected value exceeding the treshold, that is in the new zone.

 # KEY # ID # Level1 # Level2 # Detection Timer # USER 1 # USER n # USER 6 #

NAME	VALUE	DESCRIPTION
Key	13,14	Key of analog inputs: 13 e 14
ID	A..Z,a..z, 0..9	ID associated to the contact (20 characters maximum. "#" and space characters not accepted in the ID field)
Level1	0..1000	Lower level (0 = 4mA 1000 = 20mA)
Level2	0..1000	Higher level (0 = 4mA 1000 = 20mA)
Detection timer	1..999sec	Detection interval
User n	+ 0..9	Phone numbers to which the alarm message must be sent (up to six phone numbers can be inserted)

NOTES
1. If you want to add a number to an already set list, it will be necessery to insert all the numbers again.
2. Pocket AL I/O will continuously monitor the analog input with the timer set by the user: Detection timer.
3. You can set a single level by setting the value in Level1 and defining Level2 at the maximum value: 1000
4. By setting the field user1="0" it will manage the input the status of which can be read with "test" command, but no sms will be sent.

EXAMPLES
#13#Temperature#154#501#5#+393359988776#+393491122334#+393285554446#
#14#Waterlevel#258#409#1#+393359988776#+393491122334#+393285554446#

3.5.1. SMS alarm messages

The message sent by the device in case of alarm to the devices set during the configuration will contain the following information:

- Pocket AL I/O ID (i.e. HOME)
- Contact number (i.e. 13)
- Contact ID (i.e. Temperature)
- Status
  Level1 LOW (level lower than Level1)
  Level1 HIGH (level higher than Level1)
  Level2 LOW (level lower than Level2)
  Level2 HIGH (level higher than Level2)
- Detected value

NOTES:
1. To set a sole level, that means to set 2 zones only, configure Level2 = 1000
In this case you can receive only the following messags: Level1 LOW and Level1 HIGH
2. For the value detection it will be enough to send the message #TEST13# or #TEST14#.
3. The indication Level2 LOW or Level 1 HIGH depend on the previous status (if it was level1 LOW, it sends level1 HIGH, if it was level2 HIGH, it sends level2 LOW)

Examples of alarm messages

Contact 13 alarm

HOME
13)Temperature Level1 LOW
144

HOME
13)Temperature Level2 HIGH
500

3.6. OUTPUT CONFIGURATION

Pocket AL I/O is equipped with four digital outputs (Open Collector) and two relays outputs to remote interact after an alarm signalling, for example to open or to close a tank valve after the detection of exceeded level.

Outputs setting:

 # KEY # ID # USER 1 # USER n # USER 6 #

NAME	VALUE	DESCRIPTION
Key	5,6,7,8	Key of open collector outputs
	11,12	Key of relay outputs
ID	A..Z,a..z, 0..9	ID associated to the contact (20 character maximum. "#" and space characters not accepted in the ID field)
User n	+ 0..9	Phone numbers enabled to output management (up to six phone numbers can be inserted)

NOTES
1. If you want to add a number to an already set list, it will be necessary to insert all the numbers again.
2. 0 (zero) character in User1 will cause the list cancellation.
3. The factory configuration foresees the User n list empty. That means that anyone can manage the outputs through the proper command: #OUTPUTn ON# and OUTPUTn OFF#

EXAMPLES
#5#Tap#+393359988776#+393491122334#+393285554446#
#6#OUTPUT2#0#

3.6.1. Outputs status modification (SMS messages)

Pocket AL I/O outputs can be managed via SMS by authorized users associated to any single output. When the device receives the message for the outputs management it will check that the SMS is coming from an authorized user and, if so, it will modify the output status as indicated in the message. Pocket AL I/O will send back a confirmation message that the output status has changed. Furthermore, using a special syntax, you will be able to change for a few seconds the output status and then automatically the output status will return to the starting condition. As previuosly described the Status led will signal the SMS reception and transmission. The user's command message with the indication ON will pilot the opening of the output contact, while the indication OFF will pilot the contact closing.

OUTPUTS STATUS MODIFICATION
To modify the output status, send this message to Pocket AL I/O:

#output name ON# to pilot the opening of output contact
#output name OFF# to pilot the closing of output contact

Example:
#Tap OFF#
#OUTPUT2 ON#

After this message the device will modify or confirm the output status and then it will send a message with the current status.

Example:
HOME
5)Tap OFF

It is possible to modify the outputs status without any confirmation message:

#output name ON,N# To pilot the opening of the output contact without any notification
#output name OFF,N# To pilot the closing of the output contact without any notification

NOTES:
1. The output name must respect the Upper and Lower Case used in the contact configuration.

Example:
#Tap OFF,N#
#OUTPUT2 ON,N#

OUTPUTS STATUS MODIFICATION AND AUTOMATIC RESTORE
To modify the outputs status for a short time with automatic restore to the previous status, you must send this message to Pocket AL I/O:

#x output name x# to modify the output status for x seconds

NOTES:
1. The output name must respect the Upper and Lower Case used in the contact configuration.
2. The x value may have a numerical value included between 1 and 65535 (sec).

After Pocket AL I/O receives the command, it will modify the output current status into the opposite status for the period defined by x. When the period defined by x is over, Pocket AL I/O will automatically restore the previous status. Pocket AL I/O will notify the output current status after the automatic restore, then after x seconds.

To remove the notification end the previous message with ,N:

#x output name x,N# to modify the output status for x seconds without any notification
Example:
#Tap 5#
#Gate 1,N#

3.7. BACKUP BATTERY CONFIGURATION

Pocket AL I/O has been designed to guarantee the operation even when power is off. This functionality is performed by the backup battery. Pocket AL I/O factory configuration (default) foresees that when there is no power the device immediately turns off (disabled battery). The user must set the battery management as needed. Pocket AL I/O can be set so that when there is no power, the battery becomes operative for a set time (from 1 to 60 minutes). When the power is restored Pocket AL I/O will continue its standard operation sending the message of power restored and battery status.

 # 15 # ID # Timer # USER 1 # USER n # USER 6 #

NAME	VALUE	DESCRIPTION
15	15	Key of backup battery: 15
ID	A..Z,a..z, 0..9	ID associated to the contact (20 characters maximum. "#" and space characters not accepted in the ID field.
Timer	1..60 min.	Timer for power on with backup battery.
	99	Pocket will go on working till the backup battery expires.
User n	+ 0..9	Phone numbers to which the alarm message is sent (up to six phone numbers can be inserted)

NOTES

1. The Timer field defines the device power on time with backup battery. Without main power and once the set timer expires, the device will power off.

2. If black-out persists and the Timer set in configuration of key 15 is reached, the device must power off. Before powering off Pocket AL I/O will save the contacts current status: digital inputs, analog inputs, outputs.

When main power is restored Pocket AL I/O will restart from the situation stored before the power off and it will send immediately the eventual alarm message. As for the outputs, Pocket AL I/O will automatically restore the outputs status to the same condition before power off.

3. By setting the field user1="0" you will be able to read the status with the "test" command without sending any sms.

4. If this key is not set, the device will immediately power off.

Example:
#15#MainPower#20#+393359988776#

3.7.1. SMS Alarm Messages for no power

In case of no power the device will send a message containing the following information to the numbers inserted in configuration:

- Pocket AL I/O ID (i.e. HOME)
- Contact number (always 15)
- ID associated to battery management
- Power status
  ON (main power ON)
  OFF (main power OFF)
- Battery status
  BATTERY: FULL = backup battery full
  BATTERY: LOW = backup battery low
  BATTERY: ABSENT = backup battery absent
  BATTERY:CHARGING = backup battery is charging (through network power)

Note: at any power on or restore the message BATTERY: CHARGING will be displayed, while at any power off the message will be BATTERY: LOW or BATTERY: FULL. Before the device powers off for low battery, the message will be BATTERY: LOW.

Example of alarm messages of contact 15

HOME
15)MainPower ON
BATTERY: CHARGING

HOME
15)MainPower OFF
BATTERY: LOW

3.8. STANDBY MANAGEMENT

Pocket AL I/O is always active but it may be necessary to interrupt its operation temporarily and put it in STANDBY status without powering it off.
For particular needs you can also leave Pocket AL I/O always in Standby status. In this way, as you will not be automatically informed, you can verify the inputs status by remote querying Pocket AL I/O with the #TEST# message described in the next paragraph.
Pocket AL I/O can be remote enabled or disabled through a proper configuration message.
In STANDBY status Pocket AL I/O will not send automatically any message so no Status/Transition change will be signalled as well as the main power off.
Just after the remote activation, Pocket AL I/O will send a confirmation message to the user that requested the status change specifying the current device status.

3.8.1. Standby configuration message

The message format to set the STANDBY function is the following:

 # STANDBY # User 1 # User 2 # User 3 # User 4 # User 5 # User 6 #

NAME	VALUE	DESCRIPTION
STANDBY	STANDBY	Key used for the standby configuration: STANDBY
User n	+ 0..9	Phone numbers of the users enabled to manage the standby (up to six phone numbers can be inserted)

NOTES
1. If you want to add a phone number to the already set list, it will be necessary to insert all the numbers again.
2. The users' phone number can include or not the international prefix precedeed by + character (i.e. +393351122334).
3. 0 (zero) character inserted in User 1 will cancel the whole list.
4. If User field is empty, anyone will be able to manage the standby

Examples
#STANDBY#+393359988776#
#STANDBY#0#

3.8.2. Standby enabled/disabled message

The enabling/disabling of Pocket AL I/O can be controlled only by authorized users whose phone numbers are inserted during the STANDBY status configuration.

#ENABLE#	It enables Pocket AL I/O operative status (STANDBY disabled)
#DISABLE#	It disables Pocket AL I/O (STANDBY enabled)

NOTE
1. The words ENABLE and DISABLE are accepted both in upper and lower case.

3.8.3. Standby confirmation message

The enabling and disabling of STANDBY status must be confirmed with an SMS message; Pocket AL I/O will send it only to the authorized user that requested it.

- Pocket AL I/O ID
- Status
  STATUS: ON (Pocket AL I/O enabled, that is in the operative status)
  STATUS: OFF (Pocket AL I/O disabled, that is in Standby)

Examples of confirmation messages

Pocket AL I/O enabled

HOME
STATUS: ON

Pocket AL I/O disabled

HOME
STATUS: OFF

If you do not want to receive the notification of enabled/disabled, you must send the following messages:

#ENABLE,N#	It enables Pocket AL I/O operative status (STANDBY disabled)
#DISABLE,N#	It disables Pocket AL I/O (STANDBY enabled)

3.9. CONTACTS STATUS CHECK

During the operation the user can require the contacts status at any time to Pocket AL I/O.
To request it you must send and SMS to Pocket AL I/O with this format:

#TEST#

The TEST word can be written both in upper and lower case.

Furthermore with **#TESTn#** command (n has a value between 1 and 15) you can require the current status of n contact only. The answer to #TESTn# command will describe the current status of the requested contact.

3.9.1. Device status forwarding

Once Pocket AL I/O receives the verification message of the #TEST# contacts status, it will send the status of all the contacts at that moment. The message will have the following format:

- Pocket AL I/O ID
- Contact number
- ID associated to contact
- Contact status
  ON : alarm condition
  OFF : standard operating condition
- Battery status
  BATTERY: FULL = back battery full
  BATTERY: LOW = backup battery low
  BATTERY: ABSENT = backup battery absent
  BATTERY: CHARGING = backup battery charging (with power network)
- Device status
  STATUS: ON = Pocket AL I/O enabled in operative status
  STATUS: OFF = Pocket AL I/O disabled in Standby condition

Pocket AL I/O will send the current status of all the set contacts. If the requested information cannot be inserted in a sole SMS, it will be necessary to send multiple SMS. The contacts that haven't been already set will not be inserted in the configuration.

Example of device status forwarding:

HOME
1)GasAlarm OFF
2)AntitheftAlarm OFF
4)GateAlarm OFF
5)GARAGE OFF
6)DOOR ON
7)OUTPUT3 OFF
8)OUTPUT4 OFF
11)OUTPUT5 OFF
12)OUTPUT6 OFF
13)Temperature 128
BATTERY: FULL
STATUS: ON

When Pocket AL I/O receives the #TESTn# message, it will send only the current status of the requested contact:

#TEST4#

HOME
4)GateAlarm OFF

4. MANAGEMENT THROUGH RING

4

Pocket AL I/O can be set to perform some actions when it receives a phone ring. This operating mode, if compared with the SMS one, is free of charge as Pocket AL I/O will manage the action associated to the phone ring without answering the call.

When setting the device it will be important to define which action to perform at the ring reception.

Here below a table with the commands syntax, the users list where the phone number authorized to interact with Pocket AL I/O must be present and the command description:

Command syntax	User List	Description
#CALL#CONFIG#	#ACCLIST#	When the ring is received, the device will send the SMS containing the device current configuration.
#CALL#GSM#	#ACCLIST#	When the ring is received, the device will send the SMS containing the information of the GSM network.
#CALL#TEST#	#ACCLIST#	When the ring is received, the device will send the SMS containing the current situation.
#CALL#TESTn#	#ACCLIST#	When the ring is received, the device will send the SMS containing the current situation of the specified input.
#CALL#ID uscita#	#5,6,7,8,11,12#	When the ring is received, the device will modify the output status sending the notification SMS.
#CALL#ID uscita,N#	#5,6,7,8,11,12#	When the ring is received, the device will modify the output status without sending the notification SMS.
#CALL#ID uscita x#	#5,6,7,8,11,12#	When the ring is received, the device will modify the output status for x seconds sending the notification SMS.
#CALL#ID uscita x,N#	#5,6,7,8,11,12#	When the ring is received, the device will modify the output status for x seconds without sending the notification SMS.
#CALL#STANDBY#	#STANDBY#	When the ring is received, the device will enable/disable the device. The enabling of Pocket AL I/O will be confirmed with a phone ring while no action is performed for the disabling.
#CALL#STANDBY,N#	#STANDBY#	When the ring is received, the device will enable/disable the device without any notification.

5. POCKET AL I/O APPLICATIONS

Pocket AL I/O comes from Digicom know-how of PocketGSM AL and ArchimedeSMS; this allowed to identify the specific applications of the new product. The applications "**M2M**" and "**GATE**" have been implemented to increase the performances of Pocket AL I/O identified by "AL" application.

To enable one of the three applications you must send these comands:

#AL#	It enables the general application Factory default
#M2M#	It enables the M2M application
#GATE,output key#	It enables the GATE application

Through the **#CONFIG#** command you can verify which application is active on Pocket AL I/O.

Attention: passing from an application to another will cause the device reset to factory configuration.

5.1. M2M APPLICATION

In this application a couple of Pocket AL I/O interacts without the presence of a user. After an input status change of the first device a notification is sent directly to the second Pocket that will open or close the output.

The input of a Pocket will interact directly with the output of the second Pocket. It is really important that input and output are set with the same ID.

The M2M application brings only a semplification of signalling messages in order Pocket can interprete the message and manage the output.

ATTENTION: This kind of management requires a careful analysis of the application to avoid dangerous malfunctions that may compromise the whole installation.

5.1.2. Alarm messages

After the detection of input status/transition change, Pocket AL I/O will send the following messages:

Device ID#input ID ON
Device ID#input ID OFF

5.1.3. Outputs management

Pocket AL I/O will modify the output status when it receives an SMS message as described in the previous paragraph.
After the output status change, a confirmation SMS is sent.

NOTE: It is very important that the phone number sending the SMS is set in the "User" authorized to modify the output.

5.1.4. Particular managements

1. AL standard application foresees the control of the alarm SMS number generated by the same contact, in case of malfunction of an external sensor. This functionality is not enabled in the M2M application.

2. In the M2M application you can set a debounce between the detection of the input status change and the forwarding of the notification SMS. Eventual other input status changes between the first detection and the SMS forwarding is ignored. The management command is:

   #TMTDEBOUNCE#n#

   n is the number of tick (every 100ms). Admitted value from 2 (200ms) to 255; 10 is the dafault value, that is equal to 1000ms.

3. Besides the #TEST# command to test the inputs and output status, also the **STATOALL** command is supported (without "#" characters).

5.2. GATE APPLICATION

With the GATE application, through the ring, you can modify an output status exceeding the limit of 6 users present in the AL application. Only one output is managed but with the list of autorized users up to 80 users. This management is ideal for the access control.

The command to enable this application is:

#GATE,output key#

NOTE: in this application the inputs are not managed. As well as for other applications the configuration must be started by setting the keys #ACCLIST# and #0# (device ID).

The ring coming from enabled users will cause the temporary status change of the set output (1 second).

5.2.1. Users configuration

For the "**user**" configuration it is enough to send the following messages:

#Ux,telephone number# (x between 1 and 80)

Example
#U1,3351234567# ***Insertion/overwriting user 1***
#U2,3359988776# ***Insertion/overwriting user 2***
#U2,0# ***Cancellation user 2***

To test the configuration:

#Ux?#
Pocket AL I/O will send back the single user configuration.

#U?#
Pocket AL I/O will send back all the users list and the key of the output associated to the GATE application.

Italy 21010 Cardano al Campo VA
via Alessandro Volta 39
http://www.digicom.it