inim

ELECTRONICS

CE 0470

**SmartLink-G, SmartLink-GP
GSM Dialler**

Installation
Manual

PATENT PENDING

Copyright

Directive
1999/5/CE (R&TTE) compliance.

Hereby INIM ELECTRONICS S.R.L. declares that the SmartLink-G and SmartLink-GP are in compliance with the essential requirements and other relevant provisions of Directive 1999/5/CE.

The full declarations of conformity of the above-mentioned devices are available at URL: www.inim.biz/dc.html.

Table of contents

Chapter 1

Introduction

SmartLink is available in the following models:

- SmartLink-GP
- SmartLink-G

Besides the features of the SmartLink-G model, the SmartLink-GP model also provides the following advanced features:

1. intrusion control

2. voice dialler (requires SmartLogos60 accessory board)

3. PSTN line call management

The Smartlink-G model does not manage these features.

This manual describes the Smartlink-GP features and programming process. SmartLink-G users can skip the sections which refer to the advanced features.

Refer to *Appendix B* for a detailed list of the extra features provided by Smartlink-GP and respective programming process.

1.1 Application and use

The SmartLink-GP device described in this manual is a reserve telephone line generator.
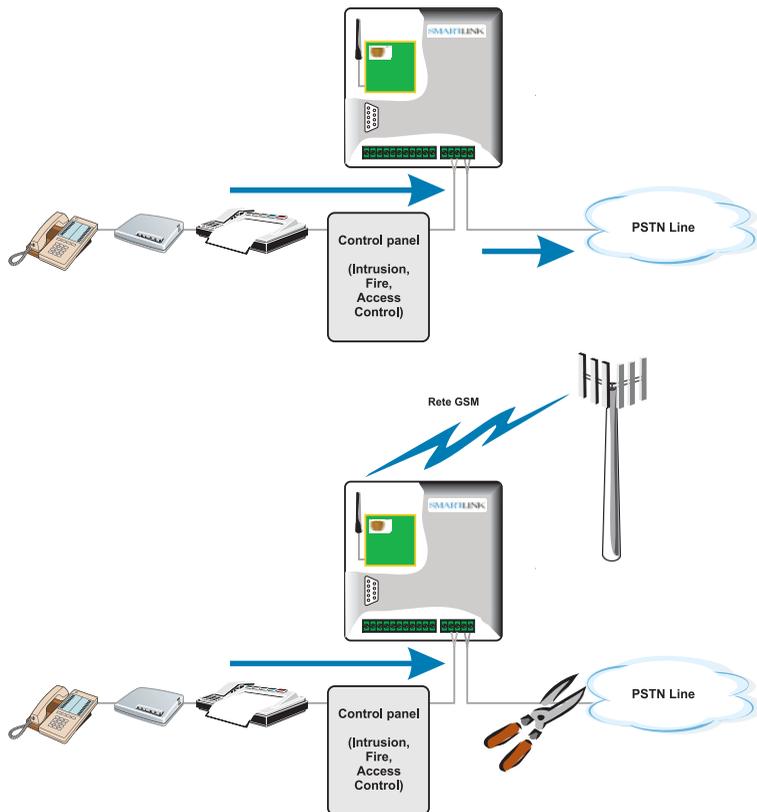
Figure 1 - Reserve telephone line

In the event of land line trouble (PSTN line down) the Smartlink-GP will switch all calls to the GSM network (simulated-line mode). This operating mode will not affect any of the connected devices. During simulated-line mode, the SmartLink-GP will check the land-line for restoral at regular intervals. If the land line restores during GSM line-free status, the system will switch back to the land line. Otherwise it will switch back when the ongoing call ends.

The Smartlink-GP provides a series of optional features, some of which require accessory boards:

- Intrusion control
- Operations manager (e.g. sends calls, output commands) generated by internal events (e.g. low battery) or external events (e.g. input status changes, received calls, received SMS text messages)
- Output status enquiry and commands via SMS
- Output status enquiry and commands via DTMF
- Caller ID Output commands
- Digital dialler (Contact ID)
- SMS dialler
- Voice dialler (optional feature)

1.2   Other applications

The following figures illustrate some of the vast range of SmartLink-GP applications.

Figura 2 – Intrusion panel feature – digital telephone dialler (Contact ID) – land line (PSTN) and GSM network

Contact ID

PSTN network (land line)

Contact ID

GSM network

Detector

Detector
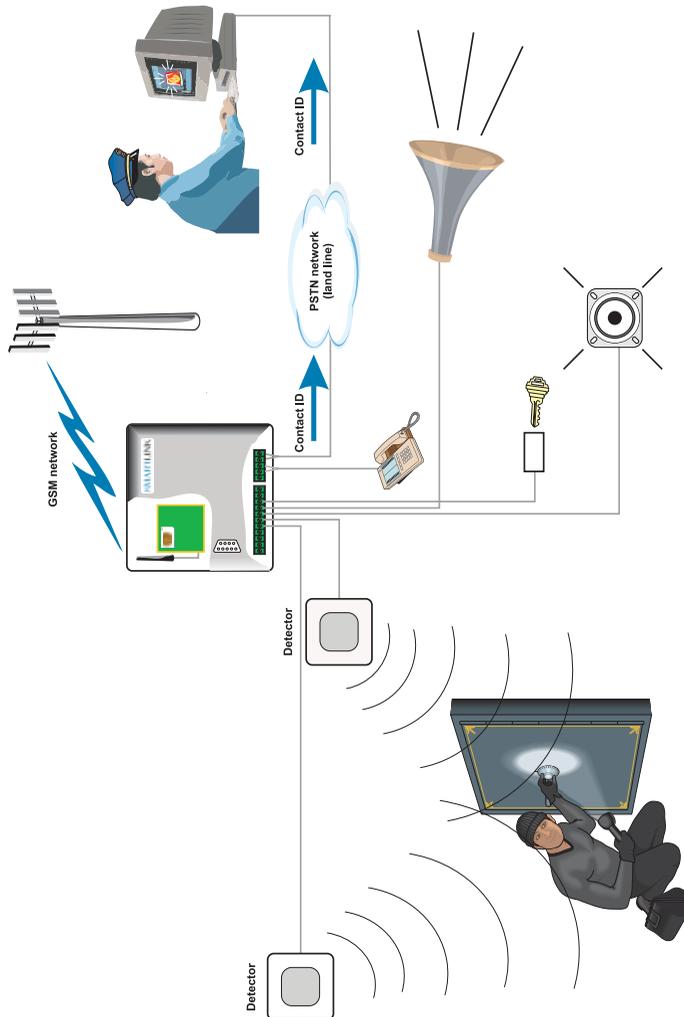
Figura 3 - Operations manager in response to external events – SMS dialler– Voice dialler (optional feature)
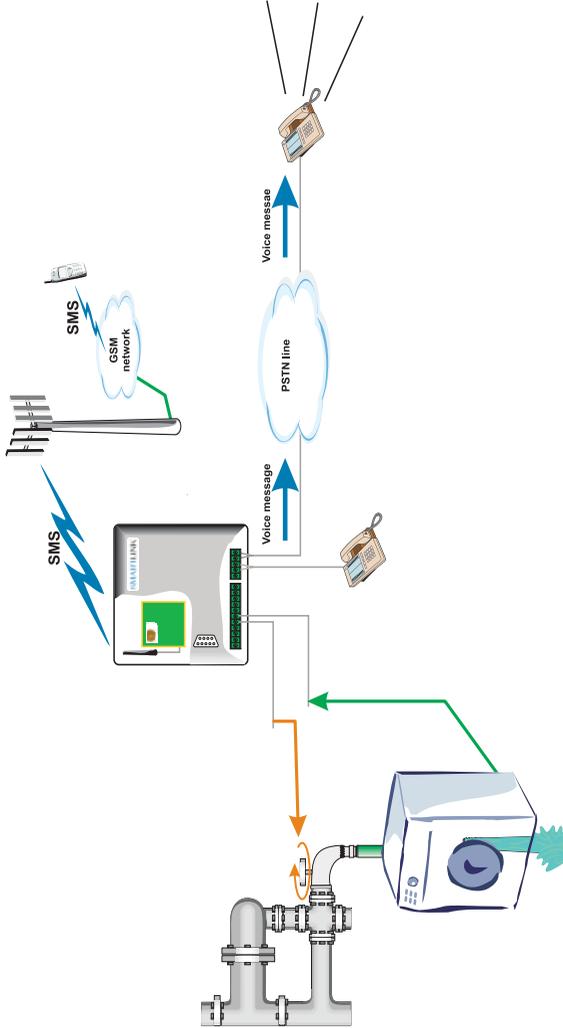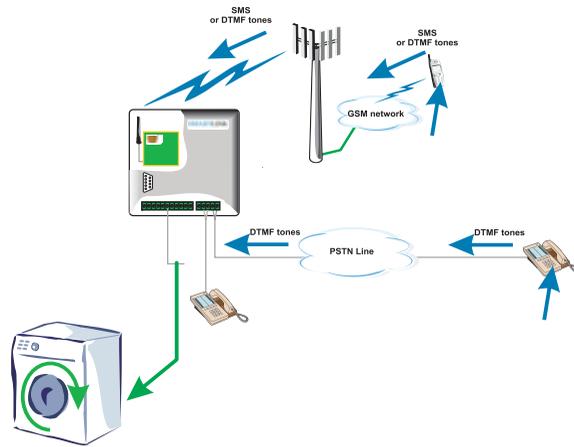
Figure 4 - Output status enquiry and commands via DTMF and SMS text messages — PSTN (land line) or GSM network

Chapter 2

General information

2.1   Documentation supplied

- Installation manual (this manual)
- Programming manual

If you require the Programming manual, please contact INIM electronics and specify the order code shown in *Appendix B* .

2.2   Manual

Title: SmartLink-G and Smartlink-GP Installation Manual

- Edition, Issue: 1.11
- Month and Year of issue: June 2007
- Order code: DCMIINE0SLINK

2.3   Addresses

- Installer
- Technical assistance

2.4   Software information

- Smartleague software version: 2.1.x
- Firmware version : 1.1.x

2.5   Intellectual property rights

The information contained in this document is private property. All rights reserved.

No part of this document may be copied or reproduced unless expressly authorized in writing by INIM Electronics, in particular the parts regarding the device specified in *2.8 Device identifier*.

INIM Electronics s.r.l. shall not be responsible for damage arising from improper application or use.

2.6   Key

2.6.1   Glossary and terminology

Device: refers to the device defined in *2.8 Device identifier*.

Left, right, behind, above, below: with regards to the operator in front of the mounted device.

Pulse output: same as "monostable output".

Dialler (telephone, SMS, digital)**:** same as "communicator".

Qualified personnel: those persons whose training, expertise and knowledge of the respective laws and bylaws regarding service conditions and the prevention of accidents, are able to identify and avoid all possible situations of danger.

2.6.2   Graphics

Text in italics: indicates the title of a chapter, section, paragraph, table or figure in this manual or other published reference.

[Uppercase letters] (e.g.[A]): indicate the device parts.

Note:	*The detached notes contain important information relating to the respective text.*

Attention:	**The attention prompts indicate that total or partial disregard of the procedure could damage the connected devices.**

Danger:	**The danger warnings indicate that total or partial disregard of the procedure could injure the operator or persons in the vicinity.**

2.7 Manufacturer's name and address

INIM Electronics s.r.l.

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63033 Monteprandone (AP) - Italy

Tel: +39 0735 70 50 07

Fax: +39 0735 70 49 12

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2.8 Device identifier
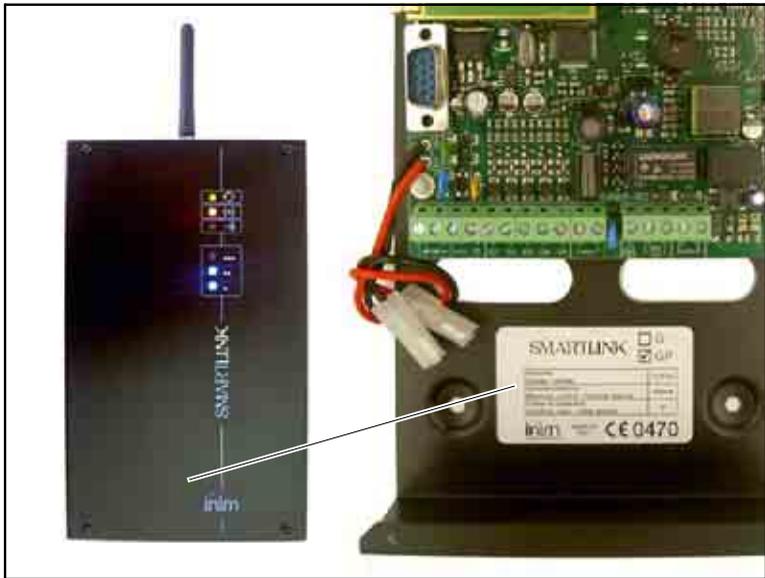
Figure 5 - Overview

Product class: GSM dialler

Model: SmartLink-GP

Year of manufacture: 2006

2.9 Warranty

INIM Electronics s.r.l. warrants the original purchaser that for a period of 24 months from the date of production, the product shall be free of defects in materials and workmanship. The warranty applies only to defects in parts and workmanship relating to normal use. It does not cover:

• Improper use or negligence

- Damage caused by fire, flood, wind, or lightning
- Vandalism
- Fair wear and tear

Inim Electronics s.r.l. shall, at its option, repair or replace any defective products.   Improper use, that is, use for purposes other than those mentioned in this manual will void the warranty. For the full details and conditions regarding the warranty, refer to the purchase order.

2.10   Safety laws

The aim of the instructions in this section is to ensure that the device is installed and handled properly. This chapter contains vital information. The installer should be familiar with this section and bring each item to the attention of the system users.

2.10.1 Managing electronic devices

The normal motions of any person may generate electrostatic potential of thousands of volts. Discharge of this current through semiconductor devices during handling may cause serious damage which although may not be immediately evident may reduce the reliability of the circuits.

If located in their housings, the electronic circuits of INIM Electronics products are highly immune to electrostatic discharge.

Do not expose the circuits to damage by removing the modules unnecessarily from their housings.

1.   When removing or handling the boards, hold the board edges only.

2.   Do not touch the electronic components, the printed circuits or the metal parts of the connectors.

3.   Up to 100Vdc may be applied to terminals 13 and 14 during the ring phase.

4.   Do not hand the module to another person without first ensuring that you both have the same electrostatic potential. This can be obtained by simply shaking hands.

5.   Place the module on an anti-static surface or a conductor surface with the same potential.

Further information regarding procedures relating to safety when working with electronic devices can be found in normative *IEC 60147-0F.*

2.10.2 Setting up the system

In order to provide adequate protection and instructions for proper use, security professionals (Installers and maintenance/test technicians) must be familiar with the operating procedure of this device.

Please read the instructions carefully before installing and/or servicing the system.

Before first power-up, be sure that the earth connection has been completed properly on the respective terminal.

The recommended minimum wire cross section for the earth connection is 2.5 mm^2, that is, unless expressly stated in the respective documentation.

2.10.3 Replacement and disposal of used devices

Replacement

When replacing used devices, disconnect the devices concerned then complete the connections of the replacement devices in compliance with the instructions printed on the respective inserts.

Contact your local municipal offices for information regarding the disposal of used electronic devices.

Disposal

Do not burn used electronic devices, or allow them to pollute the environment (countryside, rivers, etc.). Electronic devices must be disposed of in a safe environment-friendly way. In order to avoid short-circuits, take all the necessary precautions when removing used batteries. Contact your local municipal offices for information regarding the disposal of batteries.

Chapter 3

Device management

3.1   Shipping

Once the device has been properly packed and put into cartons, care must be taken to avoid accidental damage during transport. The cartons should be placed in such a way as to avoid knocks and falls, and special care must be taken to protect the devices from extreme heat and/or cold.

3.2   Environmental conditions

Temperature limits

-10° / +55°C for transport and storage

+5° / +40°C operating temperature

3.3 Unpacking the device

The goods must be unpacked with care. All waste packaging materials must be disposed of in compliance with the local laws and bylaws in force. The device is packed in a side-opening cardboard.

Note: *The package does not include: the 1.2 A/h Battery, and the SIM card. Be sure to have these items on hand before starting.*

Inside the box:

- SmartLink-GP PCB mounted on one metal and three plastic supports
- The plastic box (inside) contains:
  - 1 Antenna
  - 10 resistors @ 15kohm
  - 4 wall anchor screws
  - 4 frontplate screws

Figure 6 - SmartLink-GP PCB with antenna

The following accessory items must be ordered separately (see *Appendix B* for the order codes):

- SmartLogos60 voice board (see *Figure 16 - Connecting the SmartLogos60*).
- DC power supply
- SmartLink-REM-ANT remote indoor antenna

Figure 7 - SmartLogos60 voice board, power supply, SmartLink-REM-ANT remote indoor antenna (pictures not in scale)

Chapter 4

Technical description
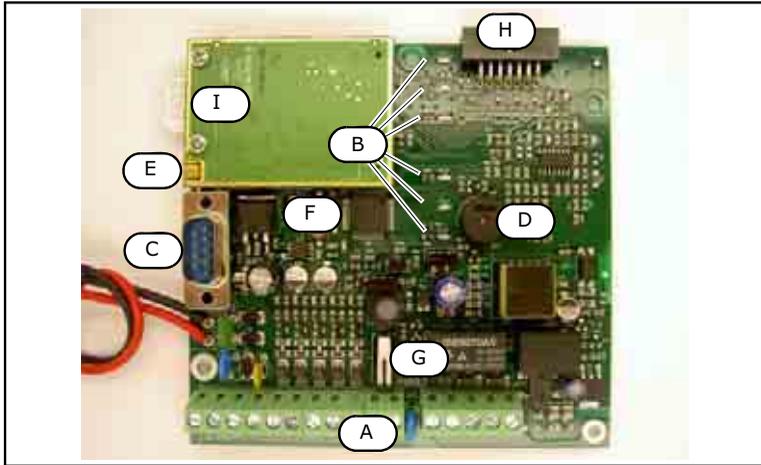
Figure 8 - SmartLink-GP PCB

Main components

[A]	Terminal board
[B]	LEDs
[C]	RS232 serial port connector
[D]	Buzzer
[E]	Antenna connector
[F]	Microchip with firmware version label
[G]	Tamper microswitch
[H]	SmartLogos 60 voice board connector
[I]	SIM card holder

Chapter 5 - Internal devices provides an in-detail description of the main components.

Note:	*INIM s.r.l. reserves the right to change, replace, in part or entirely, the components not strictly relating to the user and therefore, do not involve the installation process described in Chapter 7 - Installing the SmartLink-GP.*

4.1   Technical specifications

DC power	13.8 Vdc
PCB operating current draw	150 mA in standby, 350mA during transmission
Maximum current draw on terminal +AUX	400mA
Maximum battery-charge current	400mA
Battery specifications	12V 1, 2Ah
GSM band frequence	900 and 1800 Mhz (Dual band)
Outputs	Maximum 5 open-collectors @ 150 mA
Inputs	Maximum 5, with 3 programmable thresholds
Dimensions (W x H x D) without Antenna	134 x 220 x 53 mm
Weight (without battery)	890g

4.2   Reserve line electrical specifications

Current	40Vdc
Loop current	25mA
Dialling tone	Continuous @ 425Hz
Engaged tone	200ms 425Hz - 200ms silence
Recognised dialling tone	DTMF
Ring voltage	100Vpp

Chapter 5

Internal devices

5.1 Terminal board
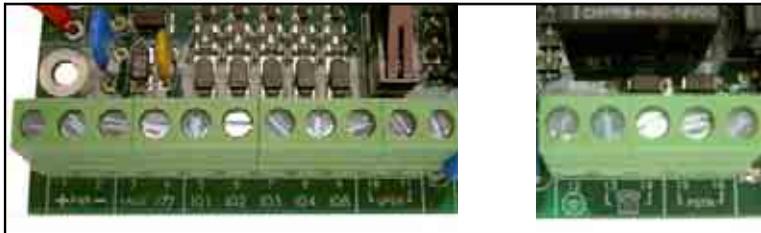
Figure 9 - Terminal board

Nr.	Identifier	Description	Operating limits
1	+PWR	DC power	13.8Vdc ±10% 650mA
2	-PWR	DC power	13.8Vdc ±10% 650mA
3	+AUX	Ancillary	12Vdc 400mA
4		Ground: reference for signals on terminals; DC power negative	
5	IO1	Input/Output terminals	13.8Vdc 150mA sink
6	IO2		
7	IO3		
8	IO4		
9	IO5		

Nr.	Identifier	Description	Operating limits	
10	OPEN	Tamper microswitch [G] terminals — see *Figure 8 - SmartLink-GP PCB*.	13.8Vdc 100mA	
11				
12	⏚	To be connected to the mains earth.		
13	☎	To be connected to devices which access the telephone line (e.g. telephone devices, control panels, etc.).	up to 4 telephone devices connected in parallel	
14				
15	PSTN	Land line (PSTN) connection		
16				

Attention: **The device that supplies power to terminals 1 and 2 must be overvoltage and short-circuit protected.**

Note: *A custom power supply to terminals 1 and 2 is available on request. Order code: INIM SmartPower12015. Devices with same voltage and current specifications can also be used.*

5.1.1 Line-down management

The devices which will access the reserved line during line-down status must be connected to terminals 13 and 14.

During normal operating conditions, terminals 13 and 14 are connected to the land line terminals 15 and 16. If the voltage drops below 3Vdc for over 10 seconds, the SmartLink-GP will switch from the land line (PSTN) to the reserve line. After 10 minutes, the SmartLink-GP will check the status of the land line.

"Enable PSTN Down Warning"

If this option is enabled, the Fault LED and the Status Enquiry window in the SmartLeague software will indicate the status of the land line (PSTN) in real-time.

- Example:
  If the land line (PSTN) restores during the 10 minute 'constraint to GSM time', the restored status will be signalled instantly on the Fault LED and in the Status Enquiry window, as follows: PSTN line = Present

5.1.2 IN&OUT Input/Output terminals

Terminals 5 to 9 can be configured as input terminals or output terminals or both.[1]

Note:	*For details regarding the configuration of the terminals, refer to the Programming manual.*

Used as Inputs

Three threshold values can be applied thus each input can be associated with four statuses. During status transition, SmartLink-GP can perform the following operations:

• Send an SMS text message
• Transmit a Contact ID report
• Send a voice message (optional feature)
• Command an output
• Perform operations and commands

Used as Outputs

The outputs operate as open-collector outputs and allow external device management (e.g. lights ON, Open gate, etc.).

On output activation SmartLink-GP can:

• Send an SMS text message, a feedback ring or both
• Activate an external buzzer
• Attivate an external LED

The standby conditions of the outputs can be:

• Open
• Closed

The outputs can be configured as:

• Bistable
• Pulse

An output can be activated by:

• an event
• an SMS text message
• a DTMF call
• an incoming call using CallerID

Example of Input configuration and terminal statuses

If SmartLink-GP is used as a intrusion control panel, the statuses of "DEOL" inputs will be as follows:

1. Wire-cut tamper

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1. Patent pending

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2. Alarm

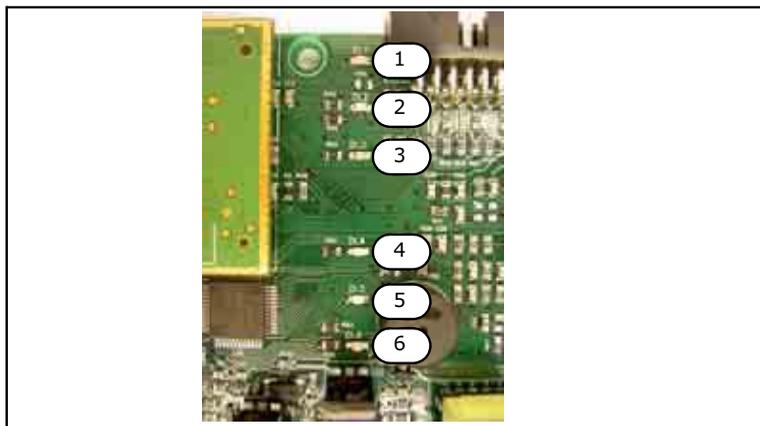3. Standby (normal condition)

4. Short-circuit tamper

During the transition from one status to another, it is possible to activate one of the following actions:

 • Send an SMS text message
 • Call a Central Station
 • Send a recorded message,

etc.

5.2   Status LEDs

The SmartLink-GP board provides six status LEDs, with the following meaning.

Figure 10 - LED

LED	Colour	Indicates	Status
1	Green	Operating status	- ON: device in service - Blinking: device initialising
2	Red	Trouble	Blink pause sequence: - 1 blink: low battery - 2 blinks: SIM card trouble - 3 blinks: communication trouble with the GSM unit - 4 blinks: land line down - 5 blinks: line engaged during initialising phase

LED	Colour	Indicates	Status
3	Yellow	Smartlink arming status	- On: SmartLink is armed - 1750 mS ON and 250mS OFF: SmartLink is armed and is dealing with a call - 1750 mS OFF and 250mS ON: SmartLink is disarmed and is dealing with a call - Off: SmartLink is disarmed no ongoing calls.
4	Blue	GSM signal status	The three LEDs indicate the signal strength: - One LED On: poor - Three LEDs On: good - Three LEDs blinking: No GSM signal - LED 6 blinking: limited service
5	Blue		
6	Blue		

Attention: **At least two of the three blue LEDs must be On solid for good communications/transmissions.**
At least two of the three blue LEDs must be On solid for certain operations (for example, central station transmissions using Contact ID, SIA, CESA, 10 and 20bps reporting formats).

Note: *All six LEDs will blink during the programming phase.*

Chapter 6

Device features

| **Note:**	*See also "Other applications" at page 7.*

Note:	*For the programming procedures, refer to the Programming menu.*

Besides functioning as a reserve-line generator, this device also provides the following features:

- Intrusion control
  - via land-line (PSTN) and GSM — activates sirens, sends voice calls and ContactID reports;
  - via GSM — sends SMS text messages.
- SMS dialler
  - via GSM — sends SMS text messages generated by events (input signals or internal events).
- Contact ID Dialler
  - via PSTN and GSM — sends event associated Contact ID reports to central stations and/or other enabled services.
- Voice dialler (optional feature)
  - via land line (PSTN) and GSM networks — sends voice messages generated by events or calls from recognised numbers.
- Remote activation via SMS text message
  - via GSM — allows output activation and status enquiry.
- Remote activation via DTMF
  - via PSTN and GSM — allows output management and status enquiry.
- Caller ID
  - Commands the outputs or activates the buzzer in response to calls from enabled numbers.

6.1   Intrusion control
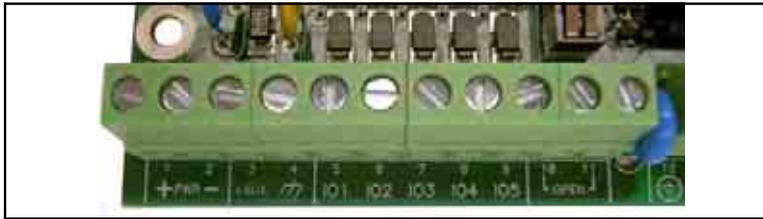
Figure 11 - Terminal board

The intrusion control feature uses the IN&OUT terminals, as follows:

- Terminals 5-8 (IO1-IO4) — inputs or outputs for external device connections, such as: front door, siren, etc.
- Terminal 9 (IO5) — Keyswitch for arm/disarm operations.

The SmartLink-GP intrusion panel feature, could require the following accessory items:

- 1 relay
- 1 Keyswitch

Note: *These items are not included in the SmartLink-GP kit.*

Appendix A in the Programming manual, provides a typical wiring diagram of the SmartLink-GP intrusion panel feature.

6.2   Digital dialler (Contact ID)

The Contact ID dialler feature sends Contact ID reports to central stations.

6.3   SMS dialler

The SMS dialler feature sends SMS text messages to preselected contact numbers. The outgoing SMS messages are generated by events.

6.4   Voice dialler

The Voice dialler feature sends pre-recorded voice messages.

The SmartLink-GP voice dialler feature requires installation of the SmartLogos60 voice board (accessory item).

6.5   Remote activation via SMS text message

This feature will allow enabled users to send commands to the system and make status enquiries by means of SMS text messages.

SMS text messages can:

- Activate outputs
- Activate the buzzer
- Make status enquiries

6.6   Remote control via DTMF

This function manages commands entered at remote DTMF telephone keypads.

Accepted commands:

- Input status enquiry
- Activate outputs
- End call
- Clear call queue
- Arm/Disarm the intrusion panel feature
- Arm/Disarm status inquiry

6.7   Caller ID

This feature allows GSM network calls to:

- Block incoming calls
- Block outgoing calls
- Activate outputs
- Activate the buzzer
- Arm/Disarm the intrusion panel feature
- Divert incoming SMSs

Chapter 7

Installing the SmartLink-GP

7.1 Wall mounting

Figure 12 - Wall mounting

- Pull the wires through the wire entry on the backplate, be sure not to obstruct the components.
- Using the anchor screws, attach the backplate to the wall.

Danger:	**Care must be taken not to drill in the vicinity of electrical wiring, heating ducts and plumbing.**

Attention:	**- Carry out a placement test before mounting the device. Do not mount the SmartLink-GP in a location where the GSM signal is poor.** **- Do not mount the SmartLink-GP near large metal objects which may shield the antenna.** **- Do not mount the SmartLink-GP near sources of interference, such as electrical noise (minimum distance 2 metres).**

7.2   Mounting the antenna

Figure 13 - Mounting the antenna

- Remove the antenna from the plastic bag.
- Remove the nut and washer from the antenna.
- Pass the antenna connector wire through the wire entry on the top of the back box and fit the antenna into its housing, as indicated in the figure.
- Using the nut and washer, secure the antenna firmly in place then connect it to the board, as indicated in the figure.

7.3   Mounting the remote antenna

Figure 14 - Mounting the remote antenna — SmartLink-REM-ANT

If you are mounting the SmartLink in a placement with insufficient GSM signal strength, you can substitute the in-box attenna with a SmartLink-REM-ANT remote attenna *(see Appendix B)*. This item must be ordered separately. The remote attenna has an extra-long cable and a magnetic base and can be placed in a location which provides adequate GSM signal strength.

- Remove the antenna and antenna connector wire from the plastic bag.
- Remove the nut and washer from the antenna connector wire.
- Pass the antenna connector wire through the wire entry on the top of the back box and connect it to the board, as indicated in the figure.
- Screw on the end nut of the remote antenna cable.
- Position the remote antenna in a location which provides the best possible GSM coverage.

7.4   Connecting the antenna
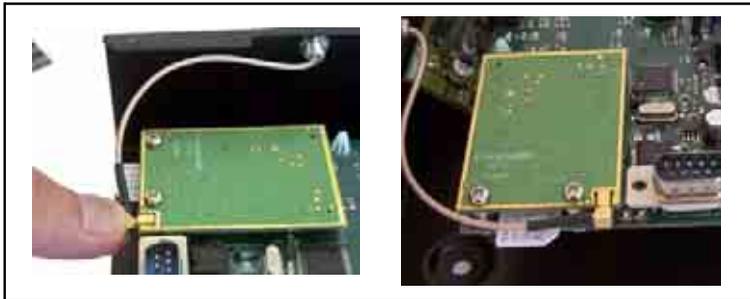
Figure 15 - Connecting the antenna

- Insert the antenna connector into the respective connector on the PCB, as indicated in the figure.
- Push it in gently until you hear a locking click.

7.5   Connecting the land line (PSTN)

Connect the land line (PSTN) to terminals 15 and 16.

7.6   Connecting telephone devices

Connect the telephones devices which will access the reserve line to terminals 13 and 14 (up to four telephone devices can be connected).

Danger:	Up to 100Vdc may be applied to terminals 13 and 14 during the ring phase.

7.7   Earthing

Terminal 12 must be earthed.

| Danger:	This operation is telecommunications network safety regulations compliant, and protects the device against overload and/or electrical discharge from the external telephone line.

7.8   Connecting the tamper microswitch

Connect terminals 10 and 11 to the tamper line of the external control panel.

7.9   Connecting the IN&OUT terminals

Connect the terminals to the command device/devices to be commanded, as described in *5.1.2 IN&OUT Input/Output terminals*.

7.10 Connecting the SmartLogos60 (accessory item)
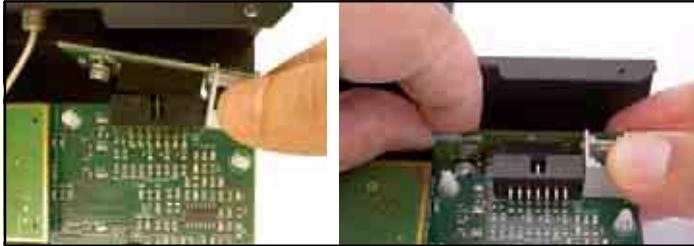
Figure 16 - Connecting the SmartLogos60

Insert the SmartLogos60 connector into the respective connector on the PCB.

7.11 Inserting the SIM card

Figure 17 - SIM card

Insert the SIM card into its holder.

|	
Attention:	**Any numbers and/or SMS text messages previously saved to the SIM card may be deleted when it is inserted into the SmartLink.**

7.12 Connecting the DC power

- Connect the two external power poles to terminals 1 and 2 (+PWR and -PWR).
- If you are installing an ancillary power supply, connect it to terminals 1 and 2. Be sure the polarity is correct.

Attention:	To guarantee proper operation, connect a 12V-1.2Ah battery to the Red wire (1) and the Black wire (2), as indicated in the following figure. Be sure the polarity is correct.
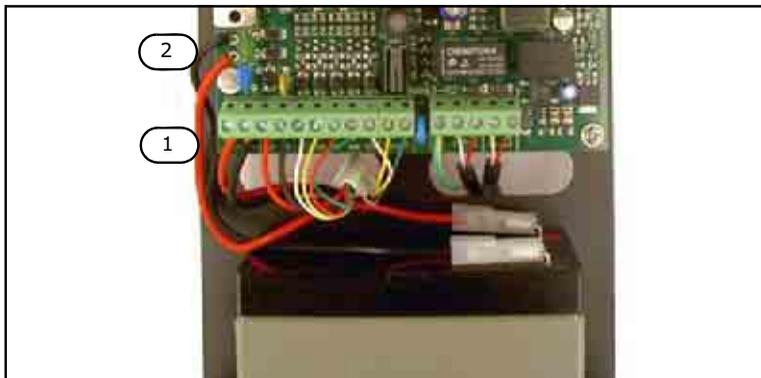
Figure 18 - Connecting the battery

7.13   Connecting an ancillary power supply

Connect the ancillary power supply (terminal 3) in compliance with the limits described in *5.1 Terminal board* on page 21.

7.14   Connecting the RS232 PC serial link

Connect the RS232 cable to the device as indicated in the figure.

Figure 19 - RS232 serial port connection

The cable should be connected to the device as shown:

SmartLink-GP end DB9F connector	PC end DB9F connector
2	3
3	2
4	4
5	5
6	6
7	7
8	8

SmartLink-GP end DB9F connector	PC end DB25F connector
2	2
3	3
4	20
5	7
6	6
7	4
8	5

Note: *The RS232 link is a custom accessory item. Order code: Link232F9F9.*
If your PC does not have a RS232 port but has a USB, use an RS232-USB adaptor.
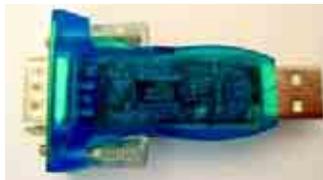
7.15   DC power

Once the installation has been completed, power up the device.

7.16   Closing the box

Using the screws (supplied), secure the frontplate in place. Be sure that the battery is not in the way of the screws.

7.17   Initialising phase

On first power up, the device will perform self-diagnosis. The green LED will blink throughout this phase.

If no anomalies are detected during this phase, the device will stabilize and enter standby status after 30 seconds.

The green LED will stop to blink to indicate that the device is working (the green LED will stay On).

If anomalies are detected, the Trouble LED will signal them as shown in the table in *5.2 Status LEDs*.

7.18   Test

To test the reserve telephone line feature, disconnect the land line (line-down simulation) then check the signal on the connected devices.

The figure shows the accessorized wired-to-go SmartLink-GP board.

Figure 20 - SmartLink-GP ready to go

Appendix A

Features not managed
by the SmartLink-G model

Features and programming not provided by the SmartLink-G model

Land line (PSTN) interface	Performs voice and/or digital dialler and land-line (PSTN) answerphone functions.
Telephone tone check	Checks for the dialling tone before dialling a number.
Pulse dialling	Sets pulse dialling mode on the land line (PSTN).
Land-line answerphone and DTMF command management	Answers land line (PSTN) calls and manages a group of DTMF activated commands.
Access to DTMF menu without code	Allows access to the DTMF command menu without user code entry.
GSM priority	Uses the GSM network during GSM Service Available status. Switches to the land line (PSTN) during No GSM Service status
Land line (PSTN) as the GSM network reserve line	Uses the land line (PSTN) as GSM network reserve line.
Connecting the SmartLogos60 board	The SmartLogos60 board provides full voice features.
GSM network voice dialler	Sends event generated voice messages on the GSM network.
Land line (PSTN) voice dialler	Sends event generated voice messages on the land line (PSTN).
Call all voice numbers	Sends calls to all the pre-set voice dialler numbers.
Intrusion control feature	Works as a an intrusion panel
Input terminal parameters	Useful programming for the intrusion panel feature.
Delay	Allows an entry/exit delay when the intrusion panel feature is in service.

Appendix B

Order code

Following are the order codes of INIM Electronics s.r.l. products:

Code	Description
SmartLink-G	Reserve line generator and GSM network dialler
SmartLink-GP	Reserve line generator and GSM network and land line (PSTN) dialler.
DCMIINE0SLINK	Installation manual
DCMPINE0SLINK	Programming manual
SmartLink REM-ANT	Remote antenna for indoors
SmartLogos60	Voice board — 60 seconds, eight messages
SmartLeague	Programming software, Windows ambient
SmartPower12015	Ancillary switching power supply/battery charger
Link232F9F9	RS232 link

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