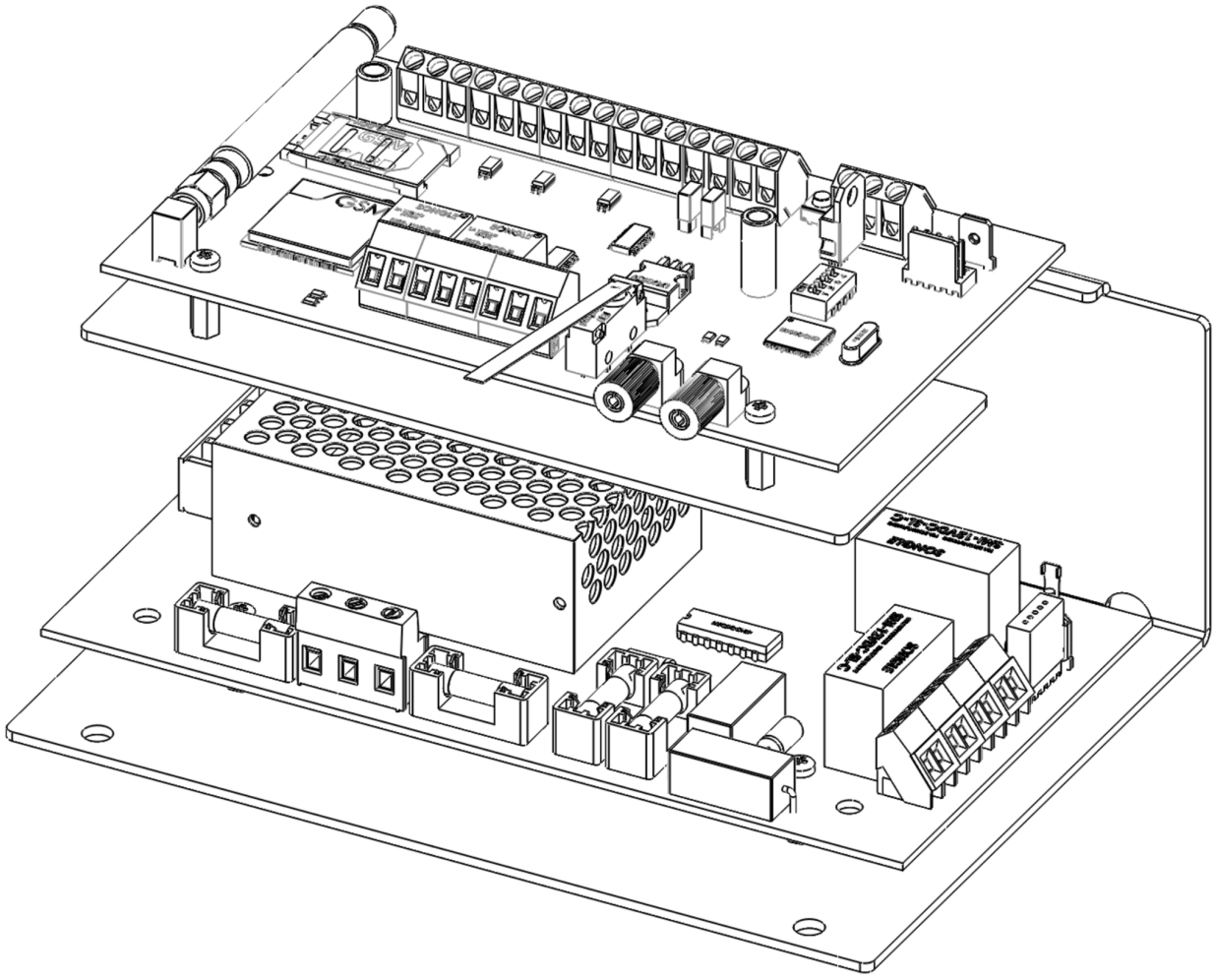
MARSS security system

Solar Defender
THE ANTI-THEFT SYSTEM FOR PHOTOVOLTAIC PANELS

INSTALLATION AND PROGRAMMING MANUAL

ALM-6818/6819



www.marss.eu

Solar Defender System

This essential guide provides installation and configuration specifics of devices ALM-6818/6819.

Important: The MARSS Srl reserves the right to change the manual without prior notice, or any part thereof, in order to improve the quality and performance of the product and the installation of the system itself.

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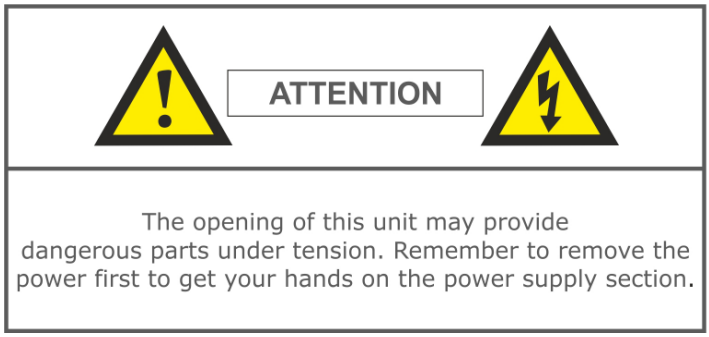
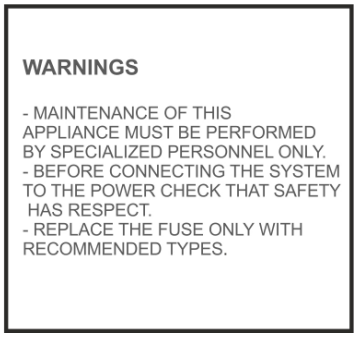
1 Safety Precautions

The installation of the product must be performed by qualified personnel in accordance with local laws and regulations on safety.
In agreement with the European Directive 2004/108/EC (EMC), the product must be installed using equipment, cables and accessories that allow it to meet the requirements of the Directive for fixed installations.
The product must be connected to the mains supply by following the instructions in this manual.
Keep physically separated extra low voltage wires, including the battery, the wire low voltage (230Vac).

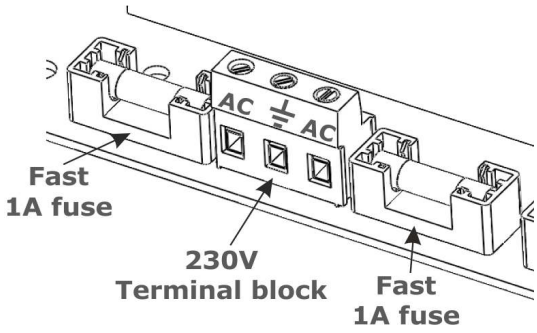
Important:

Only trained and authorized personnel can service the product, with the aim of making the connections described in this manual. In case of failure do not attempt to repair the product or the warranty will no longer be valid.
The opening of this unit may provide dangerous parts under tension. Remember to disconnect the power before you get your hands on the power supply section.
It is recommended to periodically verify the proper functioning of the alarm system, however, a reliable electronic alarm system will not prevent theft, tampering, fire, etc., but merely reduce the risk that such situations occur.
ACCORDANCE WITH THE EUROPEAN DIRECTIVES
The product meets the essential requirements of European Directive 2004/108/EC (Electromagnetic Compatibility Directive - EMC) and is therefore consistent with the harmonized standards EN 50130-4, EN 61000-6-3.





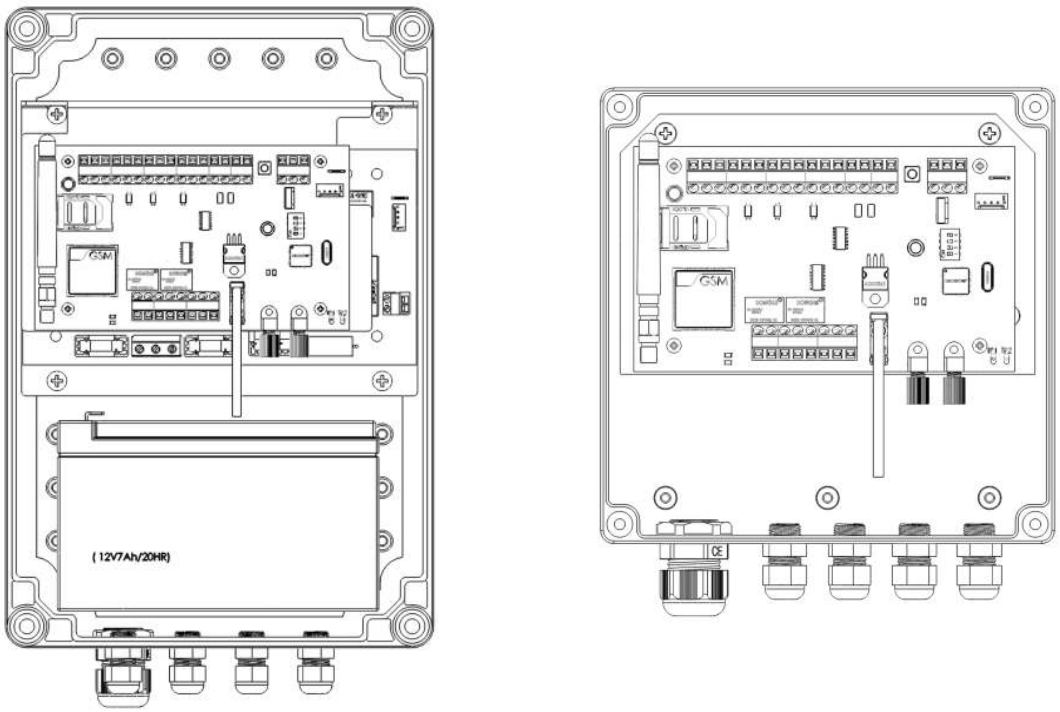
To connect to the 230V, use cables with greater than 0.5 mm and with an extra jacket to ensure greater protection. Is recommended to connect the power supply 230V with a safety circuit breaker.



2 Important notice for box installation

The cable grommets used on the box are mounted on the bottom. The boxes must be mounted with the grommet facing down and tightened after the passage of cables and of the fiber to avoid the infiltration of water, or any other liquid, inside the box. These infiltrations can cause irreparable damage to the module resulting in loss of warranty.

It 's very important to remember that inside the module ALM-6819 is present a voltage of 230 VAC and therefore a infiltration of of any liquid inside can be dangerous to people and animals.



Devices housed inside the box

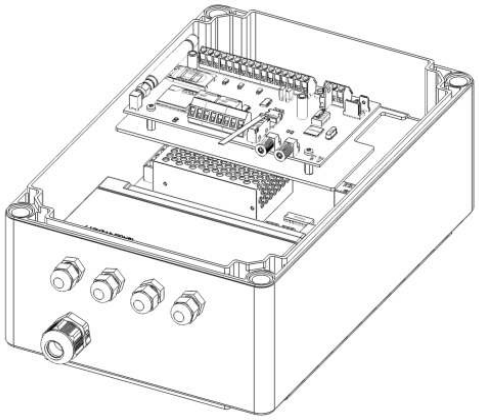
For the box fixing methods , refer to section "**Charatteristics and fixing of the boxes**"

3 Device's features

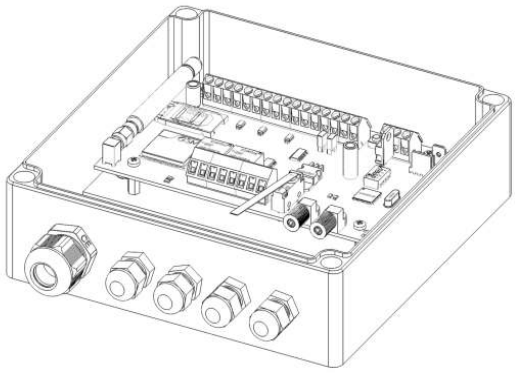
In this part of the manual are listed the major hardware and related functions of the plastic optical fiber modules ALM-6818, ALM6819.

ALM6819 is a burglar Alarm device equipped qith a single loop of plastic optical fiber with alarm signaling via SMS. Its operation is based on the control cutting of the optical fiber. It works in stand-alone mode (without interfacing with any device) using the GSM module, relays and open collector outputs onboard for alarm signaling. Is housed in 200x300x132 box equipped with a supervised power supply with power failure and battery failure signaling via sms.

ALM6818 has the same module inside with characteristics identical to ALM6819, but without the power module 230V. For this model, the module operates at 12V and is housed in a 175x175x75 box. The ALM-6818 does not support power and battery fault via SMS signaling.



ALM-6819



ALM-6818

ALM-6818 and ALM-6819 have the following characteristics:

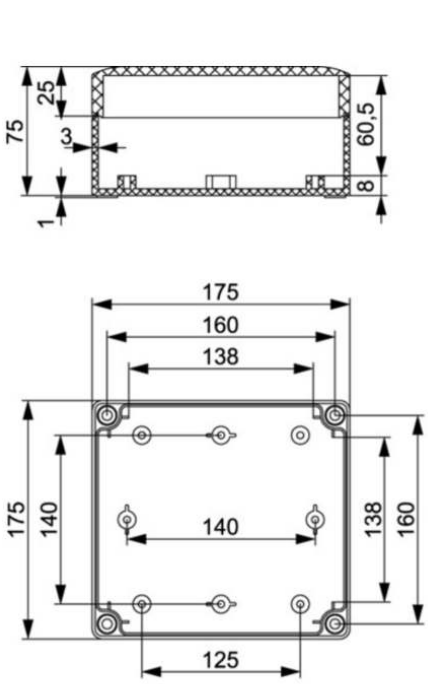
1. Single 200mt fiber loop;
2. Relay output for cut fiber alarm signaling;
3. Open Collector output for module failure signaling;
4. GSM module on board for alarm signaling via sms.

4 Charatteristic and fixing of the box

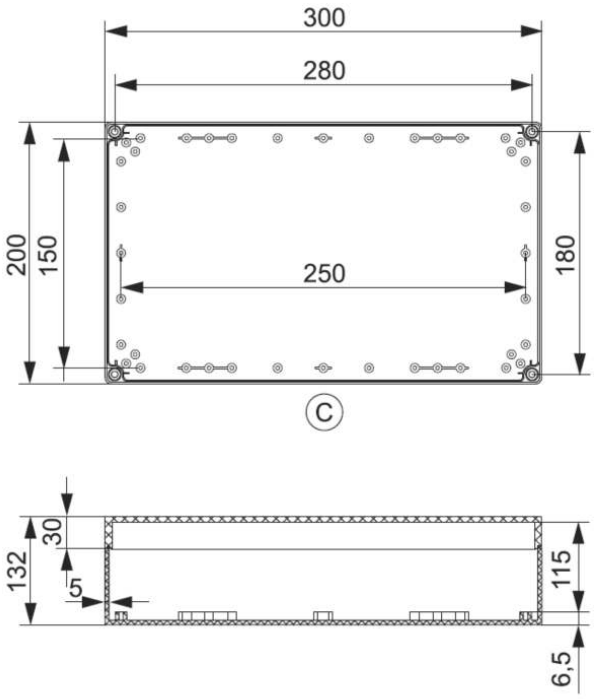
Technical Data for boxes used.

Techinal data (with grommets)	
Termoplastic Material	**Polycarbonate**
Protection EN60529	**IP 55**
Shock resistance EN 50102 (-25°C/+35°C)	**IK 08 / IK08**
Temperature	**-50°C/+100°C**
Fire resistance UL94	**V-2**
Colour	**gray RAL7035**
Cover	**Polycarbonate**
Gasket	**PUR (polyurethane)**
Cover fixing screw	**polyamide**

Dimensions



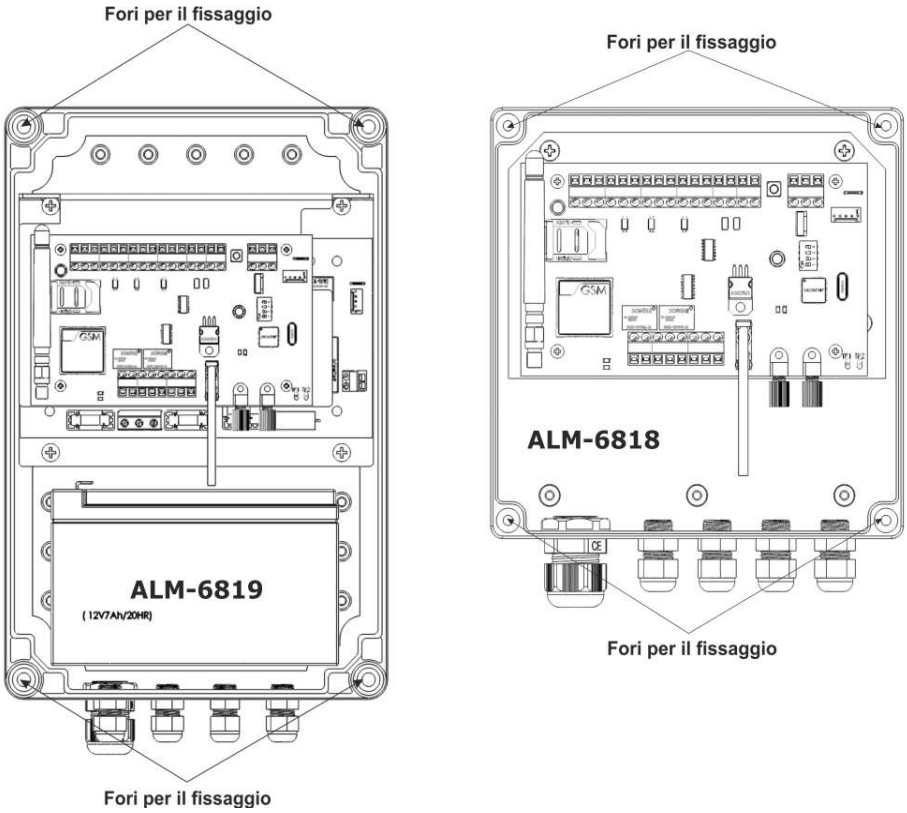
ALM-6818



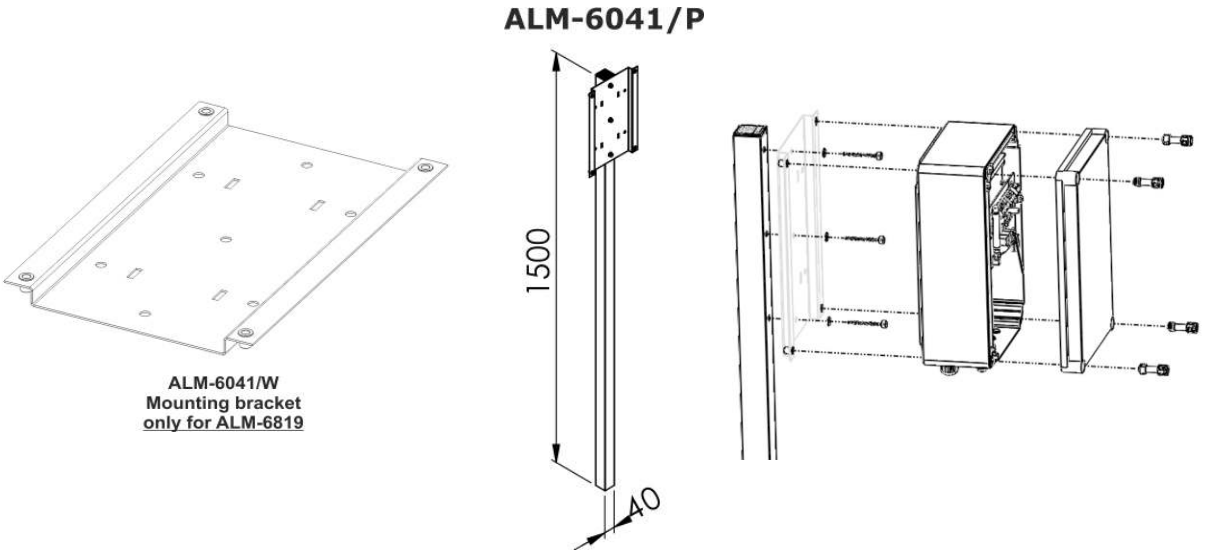
ALM-6819

<u>Important notice: The modules are fixed using only the four holes. Drill the container</u>

to find additional mounting solutions is expressly not recommended because it affects the degree of protection of the container and void the warranty.

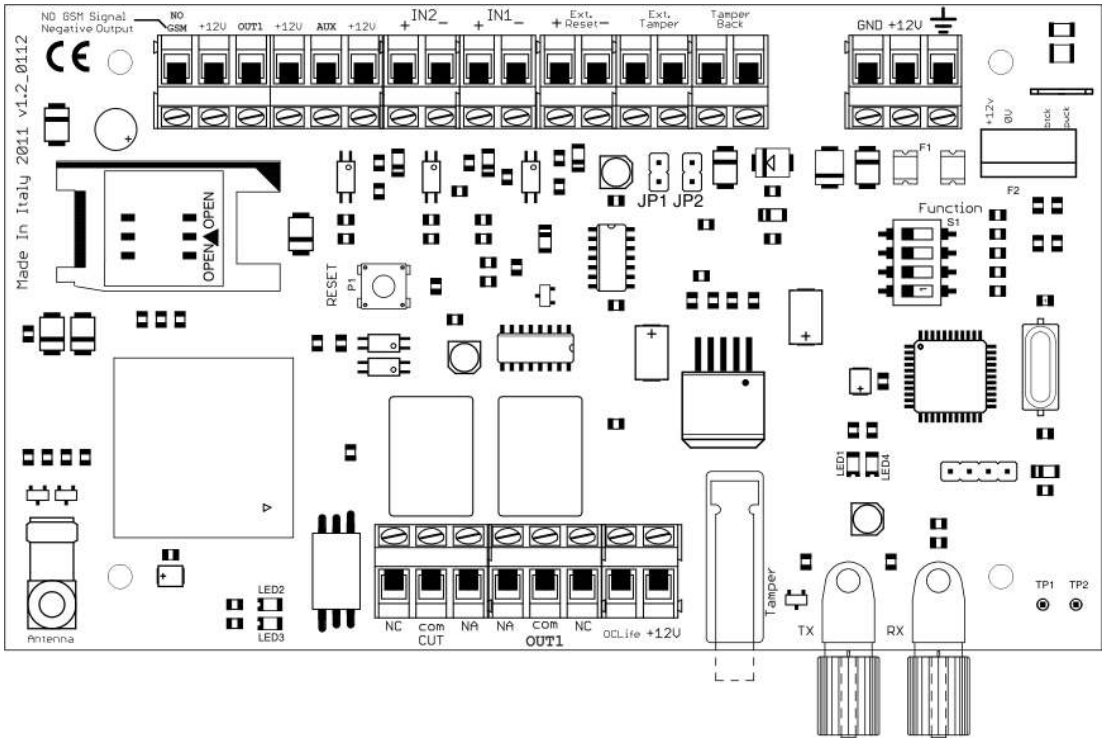


For the model, ALM-6819 is available a bracket plate for mounting on a wall, bar mod. ALM-6041 / W, and a bracket comprehensive of pole mod. ALM-6041P



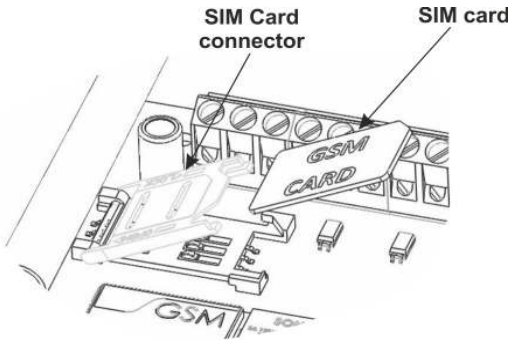
Installing ALM-6819 on the mounting bracket ALM-6041 / P

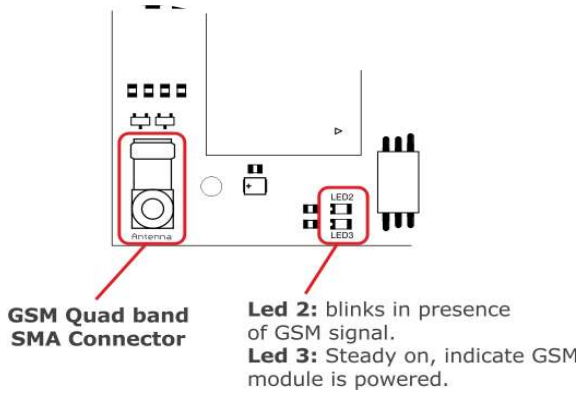
5 Device overview



5.1 SIM Card Connector

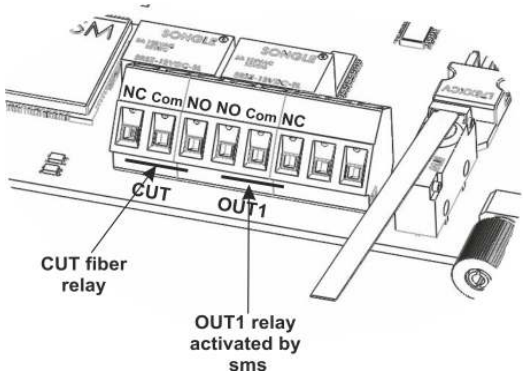
Is a connector for telephonic SIM cards. Can be used all types of sim cards except those which require UMTS connection (H3G).





5.2 CUT and OUT1 terminal blocks

Cut fiber terminal block and OUT1 activated by sms.



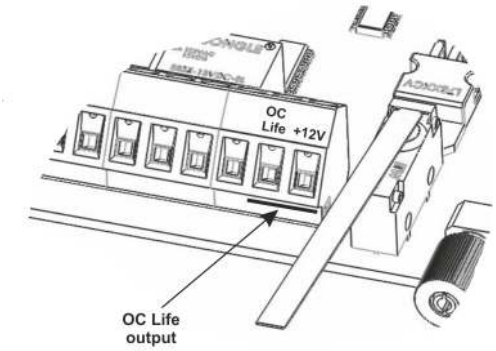
The output relay cut fiber (CUT) is always active during normal operation of the module. If cutting or breakage of the fiber, the relay is deactivated and the GSM modul will send an SMS alarm.

Important notice: The relay remains off until the first connection to the GSM cell. Once hooked the bridge GSM the relay will be activated.

The relay output 2 (OUT1 on the silkscreen on the PCB) is always turned off during normal operation of the module. Can be enable and disable the output by sending a text message (see p. 27 for the text to send) from any cell phone number of the SIM inserted in the module.

5.3 OC Life terminal block

Open collector output with closing to negative (with negative power supply is always present on the terminal) always active during normal operation.



In case of hardware failure of the module, the output OC Life off within 60 seconds of failure by removing the negative of terminal block (+12 V is always present).

The output OC Life will also turn off in the following cases:

- After power on of the module until the first connection to the GSM network;
- In test mode (see section Function dip-switch);
- When there is no number stored for sending text messages.

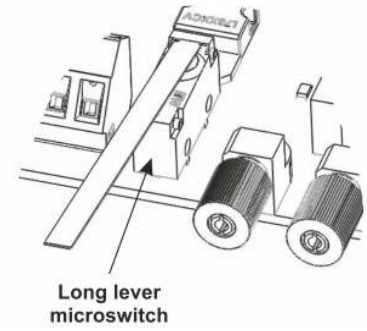
5.4 Using the OC Life Open Collector output

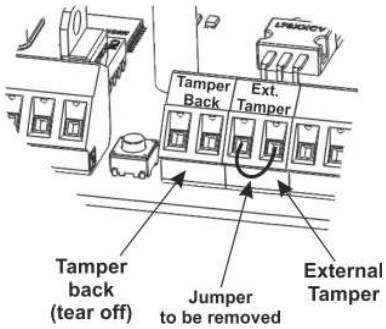
L'uscita OC Life è un controllo di sicurezza di funzionamento del modulo. E' sempre attiva fino a quando il modulo è in funzione. Nel caso di mancanza dell'alimentazione rete 230VAC e quella fornita dalla batteria Tampone, di blocco del funzionamento del microprocessore a bordo, o di guasto se si utilizza il modulo senza alimentatore supervisionato modello ALM-6818, sull'uscita OC Life non vi sarà presente alcuna tensione negativa.

Nota Importante: L'utilizzo dell'uscita OC Life è necessario per avere la segnalazione di del mancato funzionamento del modulo.

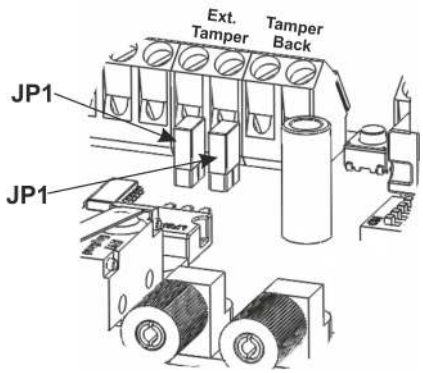
5.5 Tamper

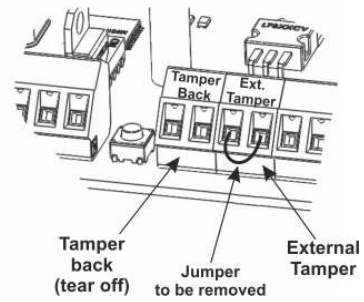
The module has an internal microswitch with long lever for the protection against opening of the container and a terminal block for the connection of a button tear resistant of the container (forced removal of the container from the point where it has been fixed).





In case of tamper activation (opening of the container or tear) the module will signal tampering via sms.

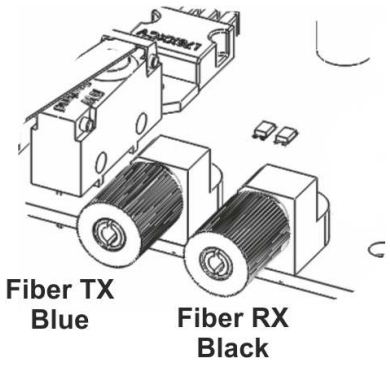


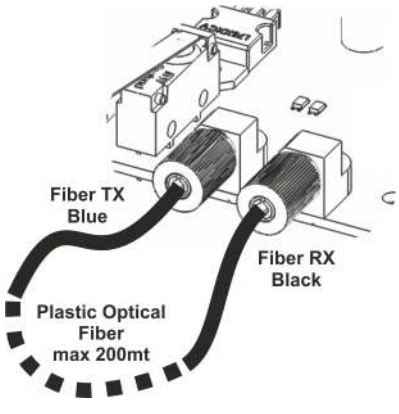


Note: After installing and testing of the module, must remove the jumper on the terminal block external tamper. Leaving the jumper connected to the tamper terminal block will remain inactive.

Can be use the terminal block for connection to external tamper to any central alarm or signaling device. In this case it is necessary to remove the jumpers JP1 and JP2.

5.6 Fiber Optic TX and RX



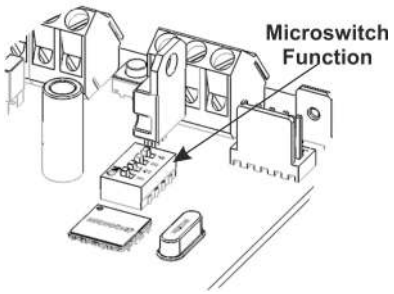


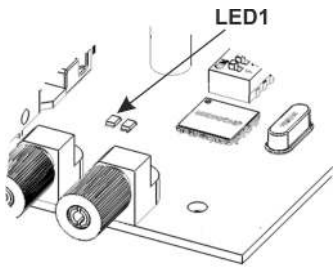
The module has 2 fiber connectors. A TX and RX (no need to do fine lapping before connection of the fiber).

TX and RX fiber are calibrated to to use plastic optical fiber to a maximum length of 200 meters. When an interruption occurs, the optical receiver detects the absence of light transmitted and notifies the microprocessor on board. The Cutting alarm is identified by a relay and is signaled by sending a text message.

5.7 Dip-switch "Function"

The dip-switch has 4 microswitches. The dip switches 1 and 3 are not used.



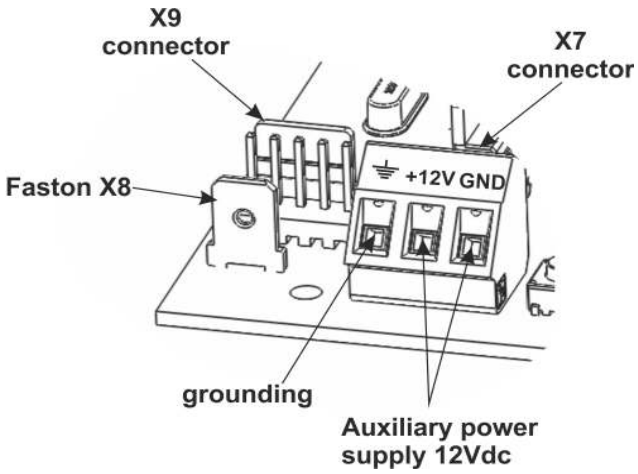


Microswitch 1 => Not used.
Microswitch 2 ON => Test mode enable. Block sending text messages during the installation of the module. The output OC Life it turned off and the output No Signal (OC1) is activated.
Microswitch 3 => Not used.
Microswitch 4 su ON => Turning on the module with the switch 4 to ON, will activate the reset procedure of the module. Will load the factory settings, the phone numbers stored will be erased, and the LED1 will flash quickly. Turn off the module, replace the microswitch 4 OFF and back on to proceed with the new programming.

Important Note: Remember to put all the switches to OFF after the installation and programming of the module.

5.8 X8, X9 and Faston X8 Connectors

The power supply to the module ALM-6819 is equipped with a battery charging circuit with a test charge and operation. In case of failure wil sent a text message with the corresponding fault message.
Can be, however, use any other power supply 12V 1.5 A minimum of any brand buying the single module Fibre ALM-6818 power supply module without supervision functionality.



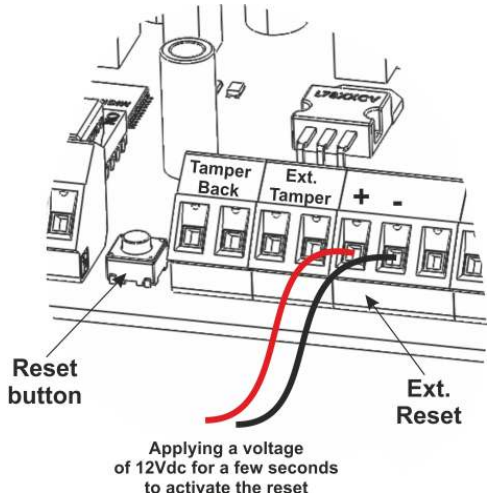
In this case it is not possible to check power presence and efficiency of the battery.

For the operation of the module with supervised power supply module is used the connector X9 and the faston X8 for connection to ground. While for the ALM-6818 model, without supervised power supply module, must use the connector X7.

Important Note: The PSU, and the module have protection systems against voltage surges and lightning that works with the grounding. This makes it necessary to connect the ground.

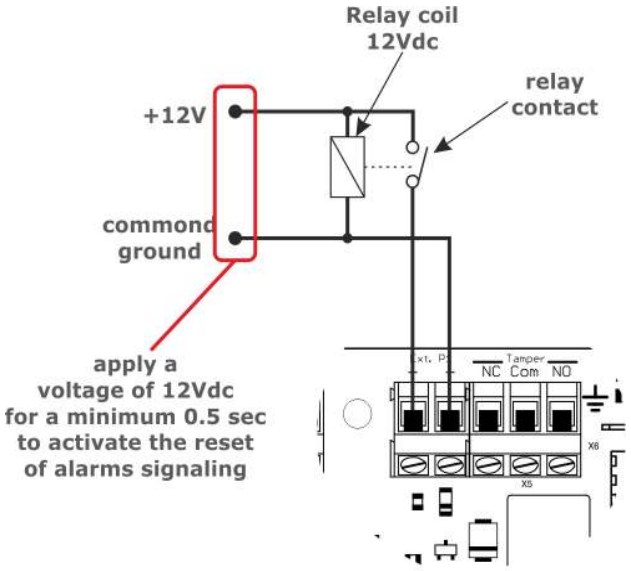
5.9 RESET button and Ext. Reset terminal block

The button P1 is used to reset the module after an alarm signaling. Can be also reset the device using the external input optocoupled "External Reset". The reset command occurs by applying a voltage between 10 and 24Vdc on terminal for several seconds.



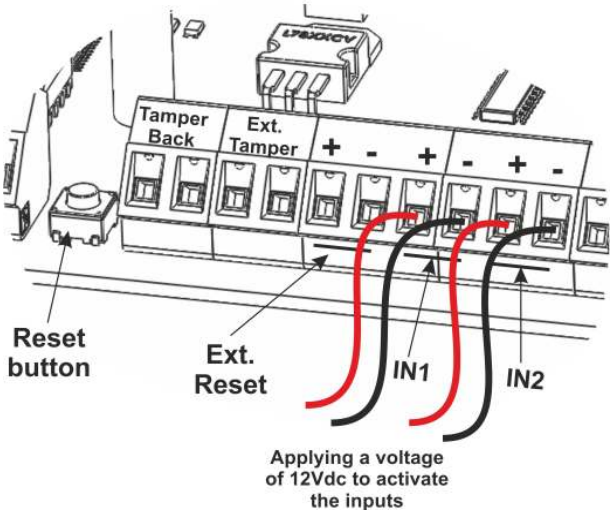
Note: The maximum voltage applied to the reset terminal block is 24V continuous.

Use this method to connect the reset input to prevent noise generated by the lighting of big inverter may cause the reset of the control unit.



5.10 IN1 and IN2 inputs

Optocoupled with negative external inputs not connected to the ground of the module. It is activated by applying a DC voltage between 10 and 24Vdc. The minimum time for the activation of the inputs is 500ms.

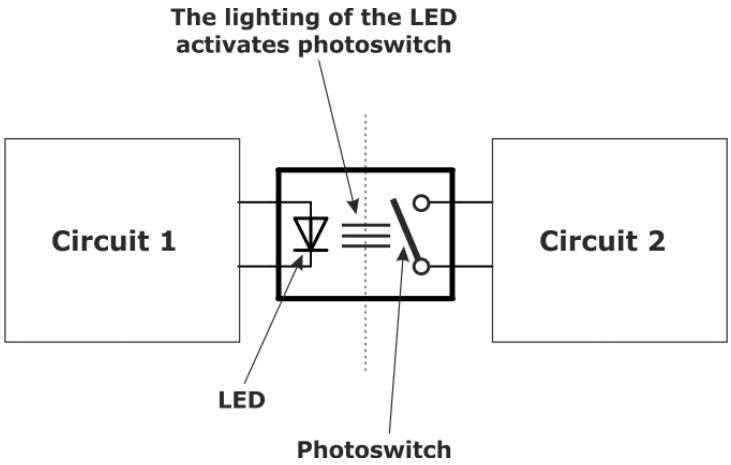


Activation inputs confirmed sms

MARSS POCKET GSM
Alarm External
Input 1 / 2

Important Note: The inputs are Optocoupled. This means that the voltage applied to the inputs must come from external devices with power supply different from that in module without connecting a common ground.
Because it uses a DC voltage, it is important to note the polarity indicated on the silkscreen.

Input optocoupled means an input galvanically isolated from the circuit. This isolation is performed using electronic devices called photocouplers, or optocouplers, which allow to transfer a signal between two different circuits while maintaining the galvanic insulation between them.

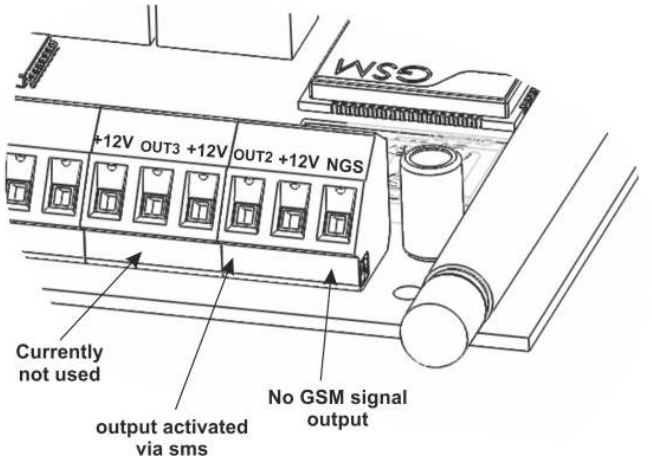


Simplified schematic of the operation of an optocoupler

The optocoupler is normally made by coupling an LED optically with a photosensitive element in order to simplify will be called photo interrupter.
The lighting of the LED, applying a voltage input, is detected by the photo interrupter that will transfer the information from one circuit to another without that there is electrical continuity. That's why it is important that the grounds of the two devices are separate and different from power supply.

5.11 Open Collector NGS (NO GSM Signal), OC2 and OC3 outputs

The output NGS (NO GSM signal) is activated in case of lack of connection to the GSM cell. It is active even if the module is in test mode (DIP microswitch 4 2 of the Function switch to ON). The output OUT2 can be activated via text message (see "Programming SMS")
OUT3 is currently not used.



6 How to use Open Collector Outputs

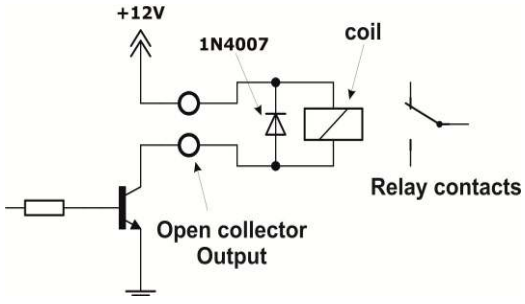
All open collector outputs on the module are with closing negative. The scheme of operation of this output is as follows:

When the transistor is at rest, on the collector there is no voltage. When activated through the base resistor, the transistor becomes conductive giving at the output a negative voltage. To test the output, simply connect a voltmeter between the positive and the collector (the positive form is a voltage of +12 V). When the open collector output is activated between the collector and positive will measure the supply voltage of 12V.

Following two ways to use an open collector output. These rules also apply to any open collector output of any system, with closing to negative.

6.1 First mode

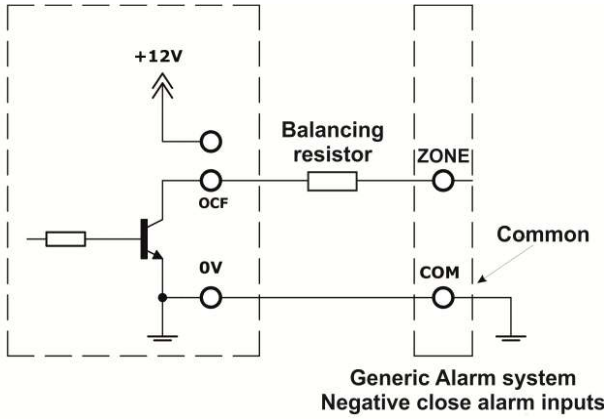
Direct connection to an open collector output to a 12V relay



This is the simplest way to connect an open collector output with a negative closing.

6.2 Second mode

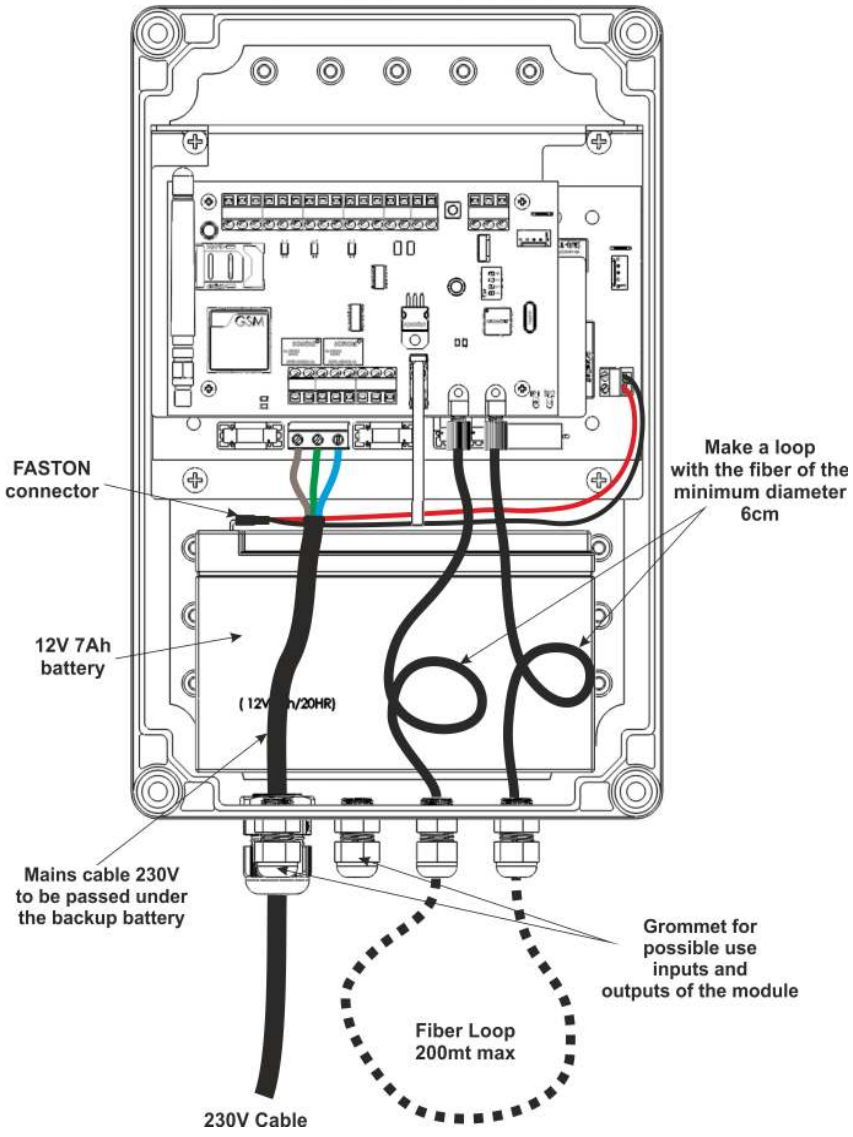
Direct connection open collector output to an input a burglar alarm system.



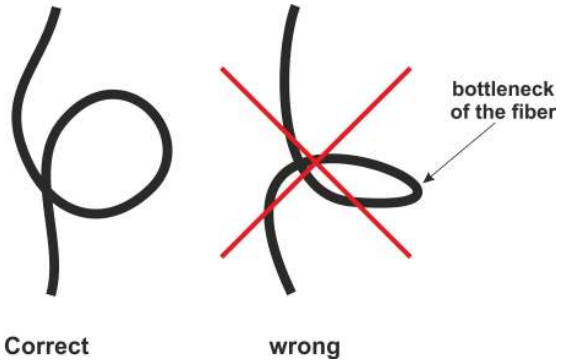
Can be connect the open collector output directly to an input of any burglar alarm or other device that has the zones operating at negative. To test this, just check on the Central, the phone dialer, or expansion of these inputs, the continuity between the common of zones and the negative supply. If there is continuity, then Can be connect the 'OC as the diagram above. 0V is any negative power supply of the module ALM-6818/6819 (for convenience use the negative terminal block of the auxiliary power X7. Otherwise avoid this mode of connection.

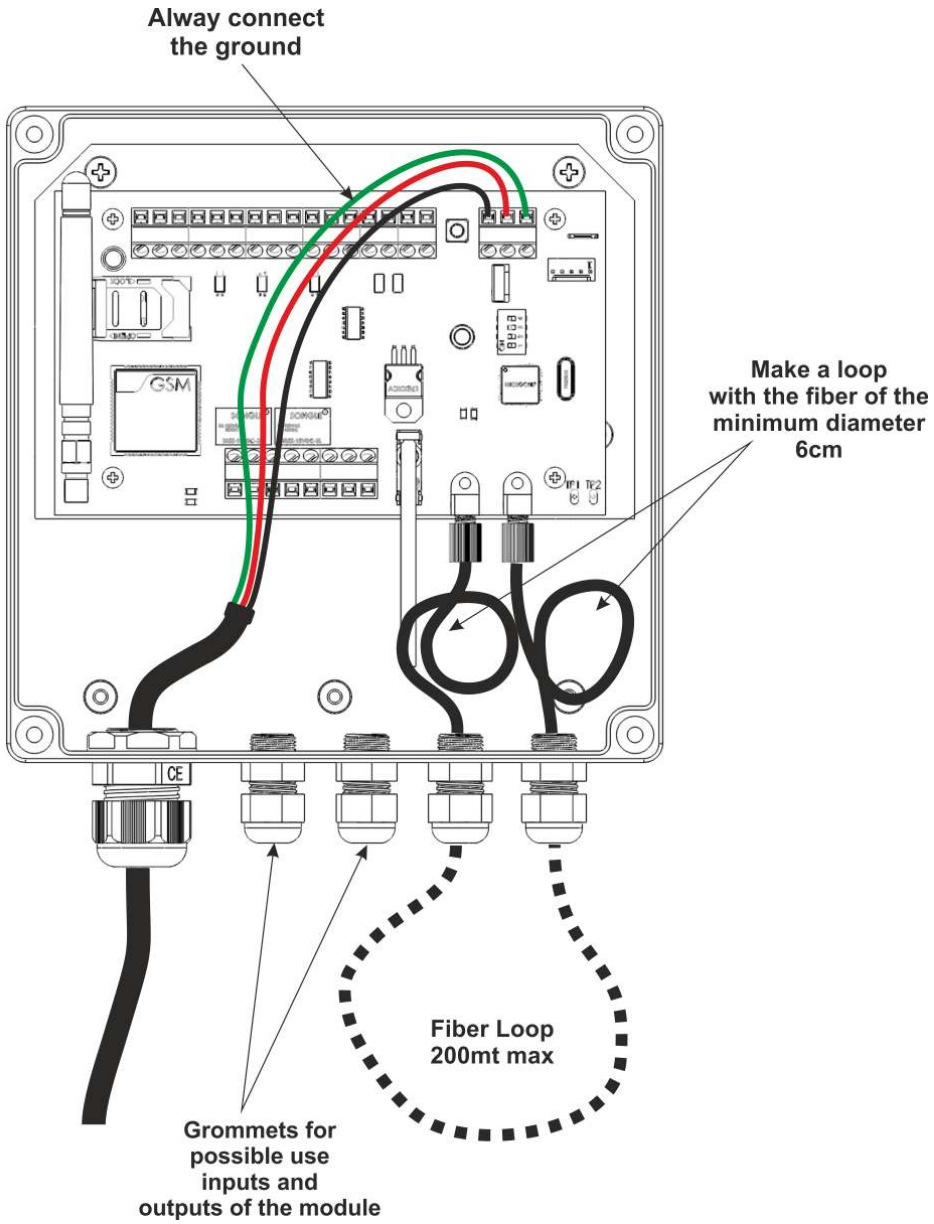
7 Internal box wiring

During the wiring inside the concentrator is important to always connect the grounding to ensure the proper functioning of the surge and lightning protection.
It 's also recommended to perform a loop of fiber with a minimum diameter of 6 cm, taking care not to bend too much.
After installation of the fiber, the cable must be clamped.

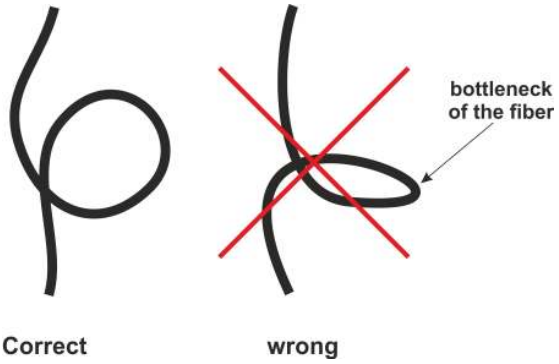


ALM-6819 internal wiring





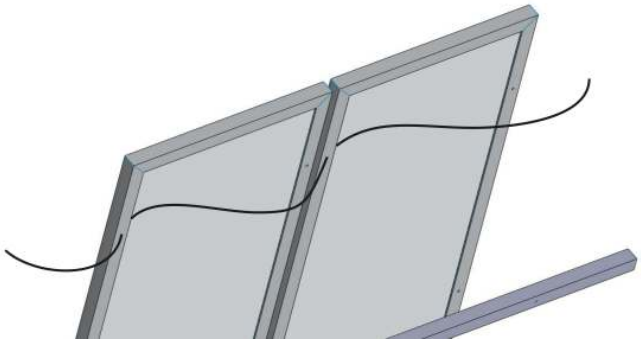
ALM-6818 internal wiring



After installation of the fiber, the grommets must be clamped.

8 Optical Fiber installation with Sigillo Solar Defender ALM-6006

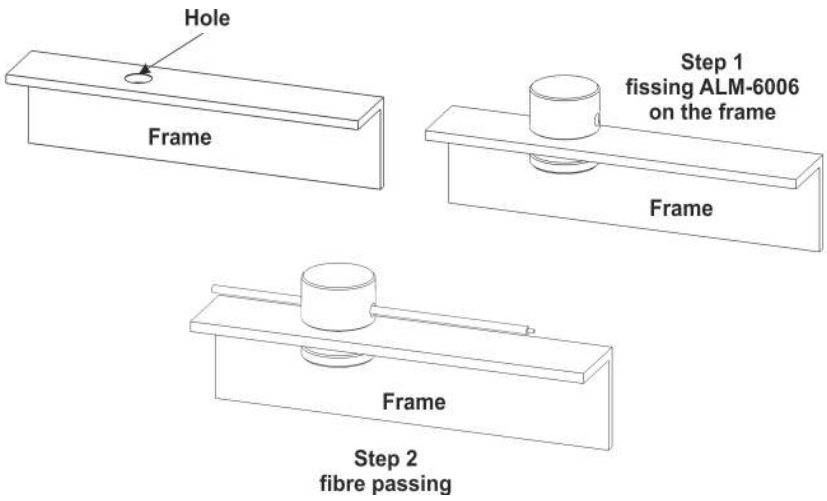
Many photovoltaic panels have holes on the frame that are often not used. Through these holes is possible to pass the optical fiber, but with the risk of obtaining of tight bends which may drastically affect the transmission of the optical signal. The passage of the fiber in this case, presents many difficulties and risks of excessive abrasion of the fiber.



Optical Fiber passing without ALM-6006

ALM-6006 is designed to facilitate the installation of optical fiber through the panels to obtain several advantages:

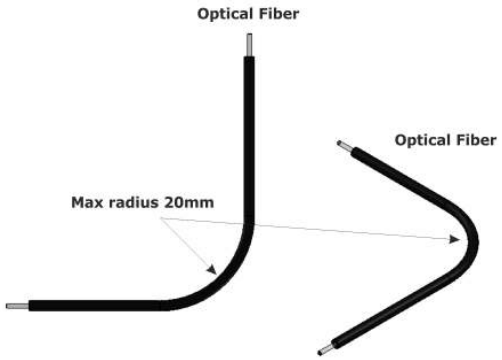
- 70% reduction time of the optical fiber installation;
- Fiber installation with precision;
- Mechanical protection of the panel;



Fiber passing with ALM-6006

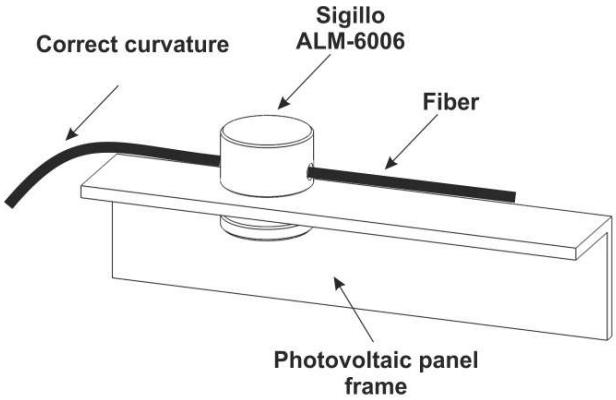
8.1 Maximum curvature of the fiber

The maximum radius for the transmission and reading of the optical signal through the fiber, must be greater than or equal to 20mm. With a curvature radius lower, besides being able to cause a damage of the fiber with the inevitable substitution of same, will drastically reduce the transmission and reading of the signal causing alarm cut fiber.

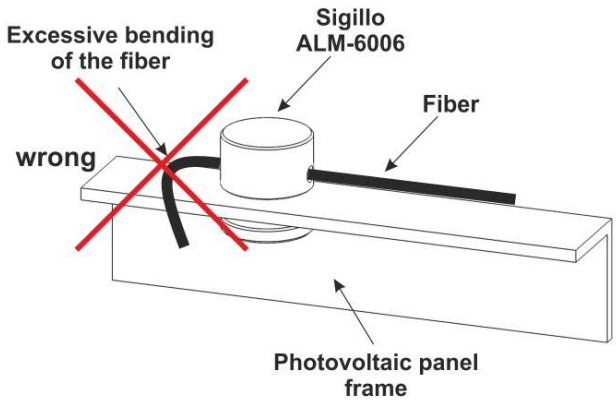


The optimal reading of the signal through the fiber, is calibrated on a maximum length of approximately 200 meters. If you use longer cables, the transmission / read signal may be lower than threshold value set on the module. In this way will be possible false alarm cut fiber. Therefore, the plastic optical fiber is supplied in reels of 200 meters.

The fiber can be fixed with cable ties and making sure that all the curves that are obtained during the installation, can be as "soft" (20mm radius).



Passaggio corretto della fibra



Misplaced pass of the fiber optic

9 Powering the module

Important notice

After powering the GSM module performs a cancellation of all messages on the SIM. Therefore, do not use personal phone or SIM which may contain important messages.

After performing the passage and connection of the plastic optical fiber, and the 230V, proceeds to the step of programming of the module.
To operate the device is necessary in order to follow this procedure:

1. Ensure that the module is not powered.
2. If this is the first time that turn on the module, position the microswitch 2 of the dip-switch FUNCTION to ON (test mode).
3. Insert a active SIM card with credit and PIN disabled.
4. Turn on the module.
5. Wait for the SIM card is registered on the GSM network operator. A successful registration will be released the alarm relay cut (CUT).
6. Leaving the microswitch 2 to ON to do some test cutting fiber (also simply remove it from the connector the module TX or RX).
7. After testing is complete, place the microswitch 2 to OFF.

Note: After the tests, the microswitch 2 must be set to OFF

The device is now ready for use and you can proceed to the next steps of programming via SMS.

10 Programming via SMS

The Pocket GSM module is programmed by sending commands via SMS text to the phone number of the SIM card inserted in the module.

All commands must be sent in upper case

With programming via SMS, you can:

- Add or overwrite into memory of the module, one or more telephone numbers to receive event in SMS format
- Delete one or more telephone numbers stored
  Get a list of stored numbers
- Perform a reset of the alarms
- Stop sending SMS of:
  - absence and restore 230V
  - inputs IN1 and IN2 alarms
  - Return GSM signal
- Check the level of GSM signal
- Enable or disable the outputs OUT1 and OUT2

The events and their SMS the module can send to the stored telephone numbers are as follows

Tipo evento	*Messaggio sms*
Alarm Cut Fiber	MARSS POCKET GSM Alarm Cut Fiber
Tamper Box	MARSS POCKET GSM Tamper Box
Alarm Input 1	MARSS POCKET GSM Alarm external Input 1
Alarm Input 2	MARSS POCKET GSM Alarm external Input 2
Enabling output OUT1	MARSS POCKET GSM OUT1 Enabled
Disabling output OUT1	MARSS POCKET GSM OUT1 Disabled
Enabling output OUT2	MARSS POCKET GSM OUT2 Enabled
Disabling output OUT2	MARSS POCKET GSM OUT2 Disabled
Restoring GSM Signal	MARSS POCKET GSM GSM Network restored
Battery Fault *(only ALM-6819)*	MARSS POCKET GSM Battery Fault
Power fault 230V *(only ALM-6819)*	MARSS POCKET GSM Power fault 230V
Restoring power 230V *(only ALM-6819)*	MARSS POCKET GSM Power 230V restored

All phone numbers stored will receive the same SMS.

Example: If a tamper alarm box occurs, all the phone numbers stored on the Pocket GSM module will receive text messages related to those events.

10.1 Add or overwrite a phone number

On the Pocket GSM module can store up to 5 phone numbers for receiving events, in SMS format.
Telephone numbers are inserted one at a time with a command by sending the following SMS to the phone number of the module Pocket, from any phone and phone number:

ADD [space] **position** [space] **number**

Command	Description
ADD	Is the command to insert and / or overwriting a telephone number in the memory of the module Pocket GSM
[space]	Is a space created with the phone's keypad without parentheses.
position	It is a number between 1 and 5 that indicates the location of the memory of the telephone numbers
[space]	Is a space created with the phone's keypad without parentheses.
number	It is the phone number that receive events in in SMS format. All phone numbers will be entered preceded by the country code and must not contain spaces or other characters

Legend

***Example 1**: Insert the memory of a telephone number at position 1*

After sending the above command the module Pocket responds with a text message containing the updated list of phone numbers stored

***Example 2**: Inserting the memory of a telephone number at position 2*

After sending the above command the module Pocket responds with a text message containing the updated list of phone numbers stored

To overwrite, the procedure is the same.

10.2 Delete one or more numbers stored

Removing of stored telephone numbers is done one at a time with a text command to be sent via SMS to the phone number of the Pocket module, from any phone and phone number:

REM[space]**position**

Legend

Command	Description
REM	E' il comando per la rimozione di un numero di telefono all'interno della memoria del modulo Pocket GSM
[space]	Is a space created with the phone's keypad without parentheses.
position	It is a number between 1 and 5 that indicates the location of the memory of the telephone numbers

Example 1: *Removing a telephone number at position 1*

After sending the above command the module Pocket responds with a text message containing the updated list of phone numbers stored

10.3 List of stored numers

You can get a list of phone numbers stored. The request for this list is done by sending the following SMS to the phone number of the module Pocket, from any phone and phone number:

After sending the command module Pocket responds with a text message containing the list of stored telephone numbers and their respective position (between 1 and 5) in the memory module.

Example: If the Pocket GSM module has 3 phone numbers stored in the first 3 positions, after sending the above command the user who made the request will receive the following SMS on your phone:

10.4 Alarm Reset

It is possible to reset the alarms. This command is performed by sending the following SMS to the phone number of the Pocket module, from any phone and phone number:

After sending the command module GSM Pocket responds with the following sms confirmation of reset:

Note: The 'SMS notification is only sent to the mobile phone number from which the command is sent to reset the alarms.

10.5 Disabling and enabling sms sending

When necessary, it is possible to disable the sending sms of:

- Absence and restore 230V
- Inputs IN1 and IN2 alarms
- Return GSM signal

This command is performed by sending the following SMS to the phone number of the Pocket module, from any phone and phone number:

New sms
LOCK

After sending the command module GSM Pocket, responds with the following sms confirmation of successful interruption:

Sms received
MARSS POCKET GSM
Locked SMS IN1, IN2, 230V, GSM until restore command

Note: The LOCK remains active until the receipt of the restore command.

To restore sending SMS send the command.

This command is performed by sending the following SMS to the phone number of the Pocket module, from any phone and phone number:

New sms
UNLOCK

After sending the command module GSM Pocket, responds with the following sms confirmation of successful restore:

Messaggio ricevuto
MARSS POCKET GSM
Restored SMS IN1, IN2, 230V, GSM

10.6 Check the GSM signal

To check the quality of GSM signal, send the following SMS command to the phone number of the Pocket GSM module, from any phone and phone number:

New sms
SIGNAL

After sending the command module GSM Pocket responds with the following text message notification providing a value between 0 and 31.

Sms received
MARSS POCKET GSM
28

10.7 "ring" Function

It is possible perform the pulse activation by remote relay output OUT1. This command is activated by making a voice call to the telephone number of the Pocket module, from any **telephone number on the memory module.**

If the caller belongs to one of the five numbers stored, the OUT1 relay is activated for a second and GSM module closes the call immediately. If the call does not automatically stop close conversation manually.

If the caller does not recognize the call will be rejected without any activation of the relay.

10.8 OUT1 and OUT2 activation via sms

On the Pocket GSM module can also enable and disable the outputs OUT1 (relay) and OUT2 (Open Collector).

The activation of these outputs is performed one at a time by sending the following SMS to the phone number of the Pocket module, from any phone and phone number:

OUT1[space]**ON**
OUT1[space]**OFF**
OUT2[space]**ON**
OUT2[space]**OFF**

Comando	Descrizione
OUT1	Is the command to enable or disable the output OUT1 relay on the module GSM Pocket
OUT2	Is the command to enable or disable the output O.C. OUT2 on the Pocket GSM module
[space]	Is a space created with the phone's keypad without parentheses.
ON	Enable the output
OFF	Disable the output

***Example 1**: Output OUT1 activation*

After sending the command module Pocket responds with the following sms confirmation of successful activation

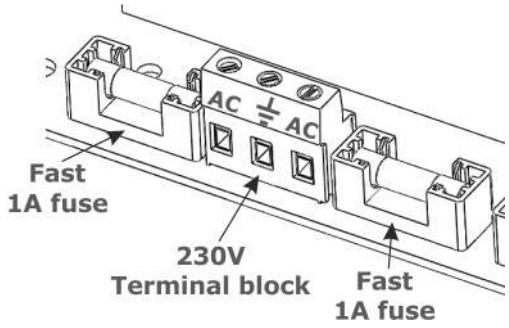
***Example 2**: Output OUT2 disabling*

After sending the command module Pocket responds with the following sms confirmation of successful disabling

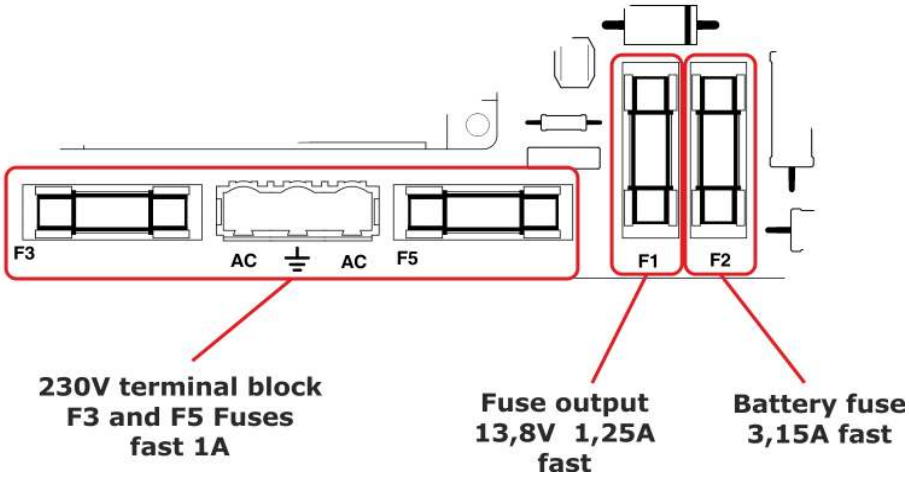
11 Terminal blocks on power supply unit

230V Terminal block

Terminal for the connection of the mains voltage 230V ac 50Hz. The line 230V is protected by two fast fuses 1A (F3, F5). Replace the fuses F3 and F5 only with equal values and use cables with a minimum section of 0.5 mm.

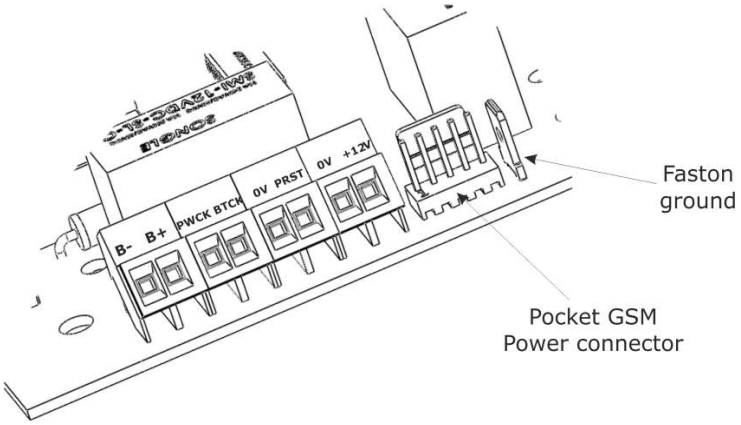


Important Note: For correct operation of protection devices on board and the power supply must be connected to ground.



Detail board power supply fuses.

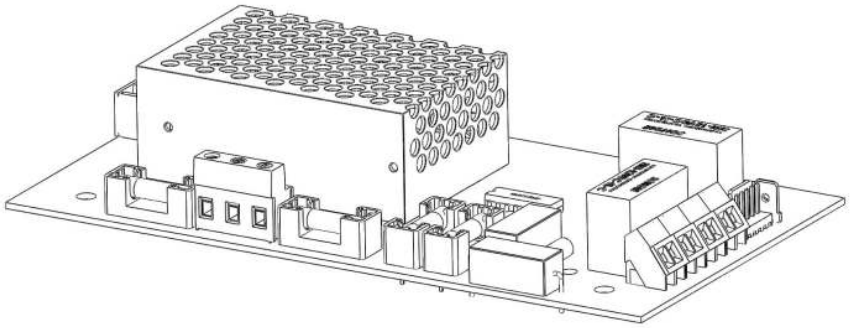
11.1 PSU terminal blocks



The Pocket GSM is supplied through the 5-pin connector. On board power supply unit is also a terminal block to 8 poles.

11.2 Switchg power supply charatteristics

- Tension input 88 ~ 264VA
- Frequency 47 ~ 63Hz
- Tension output 15V (13.5 ~ 16.5V regolabile)
- Current max 1,7A
- Power nominal 25W
- Dimensions 78x51x28mm
- Working temperature -20°C ~ 70°C
- Working umidity 20 ~ 90%
- Protection Overcurrent and overvoltage in input and output



11.3 Autonomy with battery backup

The operating time with battery 12V 7Ah tested without 230V is 24 hours (with battery efficient). The data refer to the module with the ALM-6819 power supply module supervised.

Note: The autonomy of operation with battery depends on:

- **the type of battery used;**
- **the condition of the battery used (suggested periodic replacement of batteries within 3 years and not over, by the installation;**
- **the possible load applied on the terminals of open collector outputs (100mA max).**

12 Technical specifications

- Fiber Loop : 1
- Optical Fiber lenght : Max. 200 (mt.)
- Fiber tipology : Plastic Optical Fiber ALM-6008
- Alarm segnalation: sms and relay
- Power Supply: 230 Vac, 50Hz
- Backup power supply: Battery 12Vdc/7Ah
- Consumption in stand by: 180mA
  Consumption during the operations of Sending text messages or communication with the cells GSM operator: 700mA max
- Battery autonomy in alarm : >8
- ALM-6819 dimensions (mm) (LxHxD): 200x300x132
- ALM-6818 dimensions (mm) (LxHxD): 175x175x75

3 Declaration of Conformity

Marss s.r.l.
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tel.+39 0833 531175 fax.+39 0833 790387
info@marss.eu
P.IVA 04079900751

MANUFACTURERS DECLARATION OF CONFORMITY

CE

The company **MARSS srl,**
Via Cavallo, 73 - 73030 Tiggiano (Le)

Declares under its own responsibility that the

product	GSM Pocket Module for Optical Fiber, 12 Vcc
model	**ALM-6818**
product	GSM Pocket Module for Optical Fiber, 230 Vca
model	**ALM-6819**

complies to the essential requirements of **Electromagnetic and Security Compatibility** of the European Directives 2004/108/EC (EMC) and 2006/95/CE (EMC) and than is in conformity with the harmonized norms EN 50130-4, EN 61000-6-3, EN 60950.

The compliance with these essential requirements is evidenced by affixing the "**CE**" **logo** on "product and / or the packaging and instructions for use".

Tiggiano, June 05th 2012
(Place, Data)

Marss srl
Legal Representative
Ippazio Martella

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