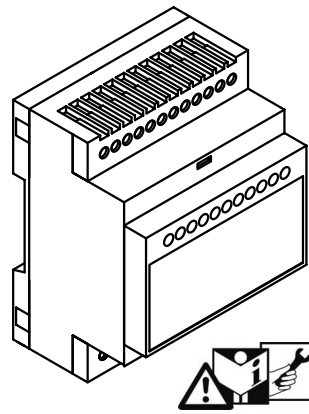


# MobiControl

GSM REMOTE CONTROL



CE 0681

This device complies with Part 15 of the FCC Rules  
CONTAINS FCC ID N7NQ2687

## EN USER GUIDE

**MobiControl 2500.** **2 2 . X B**

OUTPUTS	
NO OUTPUT RELAYS	0
1 OUTPUT RELAY	1
2 OUTPUT RELAYS	2
ANALOG INPUTS	
NO INPUTS	0
2 INPUTS	2
ANTENNA	
EXTERNAL FME	X
INTERNAL	I
BATTERY	
NO BATTERY	0
Li-Poly BATTERY	B

STANDARD VERSION: 2500.22.XB  
OTHER OPTIONS ON REQUEST  
ANTENNA IS NOT PROVIDED AND  
MUST BE PURCHASED SEPARATELY

## Quick Start

Remote control of local outputs by means of free calls or SMS is allowed only to authorized users previously stored into the SIM card or device phonebooks. A very simple solution to

add, modify or delete  
SIM card USERS

is by using a GSM mobile phone: following operating instructions provided by phone manufacturer, insert the SIM card into the SIM cardholder, turn on the phone and scroll the option menu to enter the SIM card phonebook edit mode: enter the users name and telephone number using international format. Insert the SIM card into the device SIM cardholder and turn on the power supply: users will operate the unit from remote by means of free calls and SMS.

Although it's not mandatory to store a supervisor and we suggest to use MobiSuite for a complete configuration of the unit, anyone can register itself as the

first supervisor

issuing the following SMS once the unit is registered in the network and operative:

```
#xxxx.Name.email*
# start character
xxxx system PIN (default = 0000) 4 CHARACTERS
Name supervisor's name to be stored 14 CHARACTERS MAX
email optional email address 40 CHARACTERS MAX
* end character
```

Example: #0000.Harry Potter.harry.potter@hogwarts.com\*

The telephone number of SMS sender is automatically collected from the incoming call presentation (thus the telephone number must be kept visible) and will be assumed as the first supervisor's telephone number. First supervisor will be stored at position 401 and the unit will send back a confirmation or error SMS.

Dots are allowed ONLY within the email address field. It's possible to use both ? and @ characters before the domain name.

If one or more supervisors are already present, this procedure is not allowed.

**i** SMS delivery failure is usually less than 1% but you must keep in mind that a message could not arrive and you cannot complain with your

## SAFETY INFORMATION

- Do not install this unit near medical devices like pacemakers or hearing aids. This unit may interfere with the operation of these devices.
- Switch off this unit when flying. Secure it so that it cannot be switched on inadvertently.
- Do not install this unit near petrol stations, fuel depots, chemical plants or blasting operations when this unit can disturb the operation of technical equipment.
- Interference can occur if this unit is used near televisions, radios or personal computers.
- If the device has been stored in a cold environment, condensation can occur. Before starting operations, the device must be absolutely dry. Thus, an acclimatization period of at least three hours must be observed.
- In order to avoid possible damage, we recommend that you only use the specified accessories. These have been tested and shown to work well with this unit.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- this device may not cause harmful interference, and
- this device must accept any interference received, including interference that may cause undesired operation.

This device should be installed only by qualified personnel. Carefully read the instruction manual in its entirety and keep it safe for future reference.

It is essential to know the information and comply with the instructions given in the manual to ensure the fitting is installed, used and serviced correctly and safely.

This RF unit is not designed for and intended to be used in portable applications (within 20 cm or 8 inches of the body of the user) and such uses are strictly prohibited. This unit is not authorised for use as critical component in life-support devices or systems unless a specific written agreement has been given.

If incorrectly installed in a vehicle, the operation of GSM device could interfere with the correct functioning of vehicle electronics. Verification of the protection of vehicle electronics should form a part of the installation.

Regulations must be considered to operate a vehicle's light or horn on public roads.

No complex software or hardware system is perfect.

Bugs are always present in a system of any size.

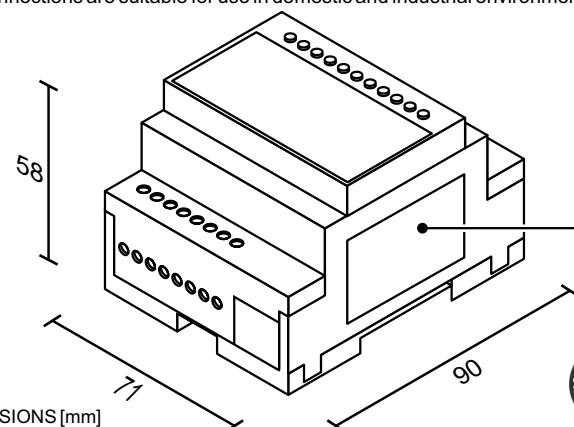
In order to prevent danger to life or property, it is the responsibility of the system designer to incorporate redundant protective mechanism appropriate to the risk involved.

All units are 100% functionally tested. Specifications are based on characterisation of tested sample units rather than testing over temperature and voltage each unit.

Contrive disclaims all liability for damage to the fitting or to other property or persons deriving from installation, use and maintenance that have not been carried out in conformity with this instruction manual, which must always accompany the fitting.

## PRODUCT DESCRIPTION

MobiControl is an industrial DIN rail GSM modem for the supervision and control of remote inputs and outputs by means of enhanced features available through GSM network. Industrial standard interface and an integrated SIM card reader mean it can be used rapidly, easily and universally to quickly implement new applications in telemetry, telematics and remote control. All interfaces are integrated in the housing. The connections are suitable for use in domestic and industrial environments.



DIMENSIONS [mm]

## PRODUCT FEATURES

Quad band GSM / GPRS / EDGE communication with manual / automatic selection on bands 850 / 900 / 1800 / 1900 MHz for data, sms, fax and voice applications. Full Type Approved and compliant with ETSI GSM Phase 2+

Output power:	Class 4 ( 2W for GSM850 and EGSM900 ) Class 1 ( 1W for DCS1800 and PCS1850 )
Temperature:	-30 to 60°C (-40 to 85°C when relays are not in use) -20 to 60°C recommended for battery
Relative humidity:	operating 5 to 95% non-condensing storage & transport 5 to 95% condensation allowed outside
Enclosure:	EN-50022 rail 4 modules, polycarbonate, UL94 -V0
Overall dimensions:	mm 71 x 90 x 58 ( W x H x D )
Weight:	200 g
Degree of protection:	IP 40 (EN-60529 / IEC 529) properly fitted

## CONFIGURATION

MobiControl is an event driven device. The user can configure the unit to deploy actions when a specific event occurs.

**MobiSuite** is the configuration software tool available for free, it could be used with direct connection through local com port but it's useful also for remote configuration. Settings are stored into SIM card and internal device memory into a wide table:

- 0. SIM USERS** Up to 250 users stored into SIM card Phonebook.
  - 1. ME USERS** Up to 250 users with additional settings.
  - 3. RECIPIENTS** Up to 100 recipients for alerts on specific events:
    - power supply status (good/fail)
    - digital inputs status (opening/closing)
    - battery thresholds (low/high)
    - internal temperature thresholds (below/above)
    - analog input thresholds (below/above)
    - counter inputs threshold/status (above/opening/closing)
    - output status (activating/releasing)
- For each recipient is possible to set:
- Phone call to a destination number
  - SMS message to a destination number
  - SMS message + status to a destination number
  - FAX message to a destination number
  - Email message to a destination address
  - Text of the message to be sent

**4. SUPERVISORS** Up to 100 that can change configuration from remote.

**6. COMMANDS** Received TEXT commands within SMS / TWEET:

- D SMS status request
- B Ringback request
- S1 turn on output 1 (time or date may follow)
- S2 turn on output 2 (time or date may follow)
- R1 turn off output 1
- R2 turn off output 2
- P1 pulse output 1 (1...300 seconds)
- P2 pulse output 2 (1...300 seconds)

DTMF commands received from keyboard during a call:

- 0 status request
- 1 turn on output 1
- 2 turn on output 2
- 3 pulse output 1 (1...300")
- 4 turn off output 1
- 5 turn off output 2
- 6 pulse output 2 (1...300")

**7. INTERACTIVE** Up to 9 information SMS for ME users

**8. IN / OUT** Name, activation, mode and thresholds for each channel

**9. SYSTEM** Behavior on incoming calls from USERS (CLIP):

- no action
- output pulse (1...300 seconds)
- output toggle
- outputs reverse sequence
- answer call and wait for DTMF keyboard commands
- time to answer

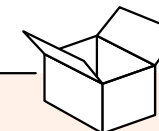
Originated call duration, hysteresis, feedback mode  
Device name, APN, CLOCK, EMAIL,  
Remote tracing, **twitter**

**10. SCHEDULED** Up to 100 operation to be executed on time basis (once or recursive)

Factory default CLIP: PULSE 3"

Please perform the following tasks after receiving the product :

- Inspect the unit for damage. If the unit appears damaged upon receipt, contact the shipper immediately.
- Verify receipt of the correct unit by checking the label on the right side of the unit.
- If you have received the wrong model or the device does not function properly, contact your supplier.



## OPERATION

Up to 5 commands can be issued to MobiControl within SMS or TWEET. Commands will be recognized both uppercase, lowercase and mixed, nested within other text wherever placed inside the incoming message.

Complete command list and detailed information: [www.contrive.it/mobicontrol](http://www.contrive.it/mobicontrol)

Commands reserved to SUPERVISORS:

Stop	CLIP Disable:	all incoming calls rejected
Start	CLIP Enable:	incoming calls from registered users processed
Zero1	Reset pulse/time counter for input C1	
Zero2	Reset pulse/time counter for input C2	
Set1=x	A1 setpoint = x	in the range 1...100000
Set2=x	A2 setpoint = x	in the range 1...100000
Set1	Ask for SMS:	current A1 setpoint
Set2	Ask for SMS:	current A2 setpoint
Lista	Ask for SMS:	list of last 10 answered callers
Listu	Ask for SMS:	list of last 10 unanswered callers
Ver	Ask for SMS:	current firmware version
Dvc	Ask for SMS:	device type
Dop	Ask for SMS:	date of production
Pbook	Ask for Email:	users, recipients, supervisors
Pbook++	Ask for Email:	users, recipients, supervisors, settings
Log	Ask for Email:	log memory, up to 99 entries

Example: **Stop Zero1 Zero2 Set1=22**  
disable CLIP feature, reset both counters  
new setpoint for Analog input 1 is 22

Commands reserved to REGISTERED USERS (default text could be changed).

Specifying a time interval after the set command, outputs will be released once set time has elapsed:

S1DDhhmm	DD	days	00 - 99
	hh	hours	00 - 23
	mm	minutes	00 - 59

Specifying date/time after the set command, outputs will be released at specified expiry date/time:

S1DDMMYYhhmm	DD	day	01 - 31
	MM	month	01 - 12
	YY	year	00 - 99
	hh	hours	00 - 23
	mm	minutes	00 - 59

Example: **S1000830 S22504141230 text D alien trailer**  
turn ON output 1 for 8 hours and 30 minutes  
turn ON output 2 until April 25, 2014 12:30  
send back a status SMS

REGISTERED USERS can control outputs by means of phone calls:

**NOACTION**

Clip feature is disabled, nothing happens on incoming calls.

**PULSE (default mode, 3")**

Selecting this mode, incoming voice (or fax) call will turn on out 1 for the specified time. A data call will do the same on output 2. Call terminated without answer.

**TOGGLE**

Incoming voice (or fax) call will toggle output 1 on to off or vice-versa, data calls will do the same on output 2. A ringback will be issued only when an output is turned on. If the user waits online, after the specified time to answer MobiControl will answer, playing a low tone on output release or four high tones on output activation. No ringback will be issued in such case.

**REVERSE**

Any incoming call from registered users will start a sequence: output 1 pulse, pause, output 2 pulse (all times configurable). Call terminated without answer.

**DTMF**

MobiControl answers to incoming call, after a short welcome tone type up to 5 the command codes on the phone keyboard.

\* (star) to confirm once all commands are issued

# (hash) to delete and start from the beginning

Four short high tones: commands accepted

Single low tone: commands rejected

1	2	3
1 ON	2 ON	3 PULSE
4	5	6
1 OFF	2 OFF	2 PULSE
7	8	9
-	-	-
*	0	#
CONFIRM	STATUS	DELETE

## CARE AND MAINTENANCE

Your MobiControl is the product of advanced engineering, design and craftsmanship and should be treated with care. The suggestion below will help you to enjoy this product for many years.

- Do not expose the unit to any extreme environment where the temperature or humidity are out of operating range.
- Do not use or store the unit in dusty or dirty areas.
- Do not use chemical cleaning agent on the unit or the SIM card.
- Do not attempt to disassemble the unit or remove any part or label.
- Do not expose the unit to water, rain or spill beverages. It is not waterproof.
- Do not abuse the unit by dropping, knocking or violently shaking it. Rough handling can damage it.
- Do not place the unit alongside computer discs, credit or travel cards or other magnetic media. The information contained on these devices may be affected.

- This unit is under your responsibility. Please treat it with care respecting all local regulations. It is not a toy: keep it in a safe place and out of the reach of children.
- Treat the SIM card with the same care as your credit card: do not bend or scratch or expose it to static electricity.
- Keep your unlock and PIN codes in safe place.

Both fixed and mobile applications are allowed, as defined below:

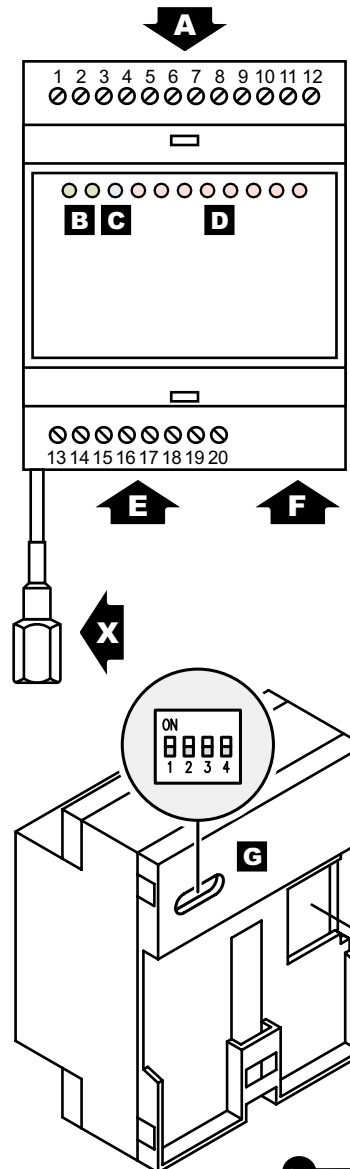
**Fixed** means that the device is physically secured at one location and is not able to be easily moved to another location.

**Mobile** means that the device is designed to be used in other than fixed locations and generally in such a way that a separation distance of at least 20 cm (8 inches) is normally maintained between the transmitter's antenna and the body of the user or nearby persons.

Do contact an authorized service center in the unlikely event of a fault in the unit.

## INSTALLATION

This unit can be installed on any standard EN-50022 rail by simple snap-in. For safe operation, the unit must be installed only by qualified personnel in an enclosure which prevents accidental contact with hazardous voltages. Protection degree IP40 must be guaranteed, raised to IP54 for open air application.



- F. RS232 COM port
- A. Analog and digital input terminals 12 x 2,5mm<sup>2</sup> (AWG14)
- B. Output green LED indicators
- C. GSM operation blue LED indicator
  - OFF
  - No power supply
  - ON
  - PERMANENTLY
  - Module switched ON
  - Not registered on the network, missing SIM or invalid PIN
  - SLOW FLASH
  - 200ms ON / 2s OFF
  - Module switched ON
  - Registered on the network
  - QUICK FLASH
  - 200ms ON / 600ms OFF
  - Module switched ON
  - Registered on the network
  - Communication in progress
- D. Digital input red LED indicators
- E. Outputs, counter inputs and power supply terminals 8 x 2,5mm<sup>2</sup> (AWG14)
- X. Antenna connector NOT AVAILABLE FOR IPEX VERSION

- G. Analog input selector
  - Disconnect all power supplies and battery before to insert or remove the SIM card.
  - Replace the plastic cover before to operate the unit.

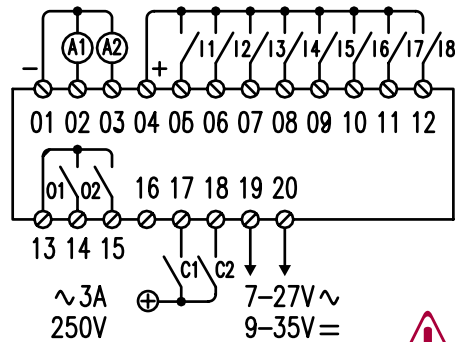
- F. SIM card holder 3V and 1,8V SIM card allowed
- SIM PIN**  
Put your SIM card into a cellular phone and program it so it won't ask for the PIN: the SIM card is 'open' and someone could steal the SIM card, use it and read the information inside. You may protect the SIM card later using **MobiSuite** configuration software.

### WARNING

If you insert a SIM card that asks for a PIN number different from that stored into MobiControl, the device will not operate. If you enter the PIN 3 times incorrectly, SIM card will lock up and you must provide the PUK (PIN Unblocking Key).

## WIRING

- 01. Negative
- 02. Analog Input 1
- 03. Analog Input 2
- 04. Positive 3,3Vdc
- 05. Digital Input 1
- 06. Digital Input 2
- 07. Digital Input 3
- 08. Digital Input 4
- 09. Digital Input 5
- 10. Digital Input 6
- 11. Digital Input 7
- 12. Digital Input 8
- 13. Output common
- 14. Relay output 1
- 15. Relay output 2
- 16. —
- 17. Counter input 1
- 18. Counter input 2
- 19. Power supply
- 20. Power supply

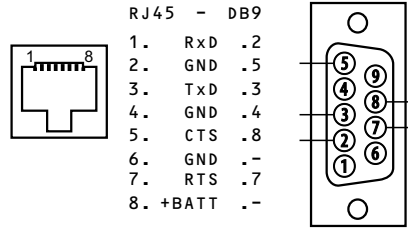


**POWER SUPPLY, INPUTS AND COM PORT MUST MEET THE DEMANDS PLACED ON SELV (SAFETY EXTREMELY LOW VOLTAGE) CIRCUITS ACCORDING TO EN60950 / IEC950**

Regulated 3,3V – 50 mA MAX available at terminal 04 respect to negative terminal 01. On battery equipped units such power supply is provided also when main power supply is missing; to prevent permanent damage to battery external loads must be disconnected when voltage drops below 3Vdc.

## COM PORT

Easy configuration, local control, tracing and other advanced features are available through serial communication link. Configuration software **MobiSuite** for PC running Microsoft® Windows® is available for free download at [www.contrive.it](http://www.contrive.it).



RS-232  
300 ... 115200 bit/s  
8N1  
Hardware handshake

MobiLink cable available from resellers:  
**2505.00.01 RS232**

## ANALOG INPUTS

Up to 2 analog signal can be connected at terminals 02 – 03 respect to negative terminal 01. Select input mode by means of dipswitch [G] before to operate the unit.

Software configuration available for each input:

full scale value	1 ... 100000
zero (offset) unit	0 ... 90% any text
Input range	0 ... 20 mA
Voltage drop	2 V @20mA
Resolution	0,02 mA
Accuracy	±1%
Impedance	100 Ω
Input range	0 ... 10 V
Resolution	0,01 V
Accuracy	±1%
Impedance	25 kΩ
Input range	0 ... 2 V
Resolution	0,002 V
Accuracy	±1%
Impedance	5 kΩ

**NTC temperature sensor** measuring in the range -10...60°C can be directly connected to analog inputs: set inputs for 2V and enable NTC software linearization.

Input range	0 ... 2 V
Resolution	0,1 °C
Accuracy	±1 °C
NTC	10 kΩ @25°C B:3435@25+85°C

SHIELDED CABLE COULD BE USED FOR LONG LINES  
SHIELD CONNECTED TO NEGATIVE TERMINAL 01 ONLY  
LEAVE OTHER SIDE UNCONNECTED

Active devices could be powered directly from MobiControl when voltage and output are compatible and total current consumption remains within 50 mA.

<b>LM60</b> PRECISION TEMPERATURE SENSOR [ TEXAS INSTRUMENTS ]	TEMP °C	OUT mV
1. Positive +2,7...12Vdc	+125	+1205
2. Out 6,25mV/°C +424mV OFFSET	+100	+1049
3. Negative	+25	+580
	0	+424
	-25	+268
	-40	+174

## POWER SUPPLY

This unit can be supplied either by alternating or direct current, polarity independent, in a wide voltage range. Power supply connection terminals 19 and 20. The power supply must not be shared with other equipment: suggested power supply source is a simple 12VAC / 10VA transformer.

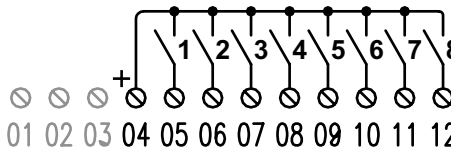
Supply Voltage	9...35 V DC 7...27 V AC
Power consumption	<200 mW IDLE <5 W PEAK

An automatic 2-pole circuit breaker or equivalent protection capable of disconnecting circuit in the event of short circuit or over-current condition should be placed on the AC mains side of power supply unit. Maximum permissible connection length between device and low voltage supply source is 3 m.

## DIGITAL INPUTS

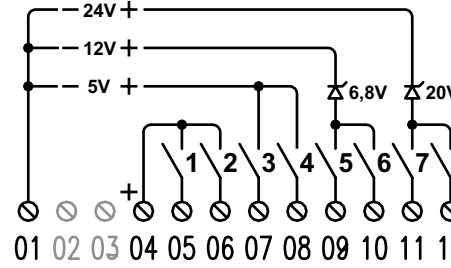
Up to 8 SPST contacts can be wired to terminals 05 – 12, status reported on LED indicators [D]. Internal power supply is available at terminal 04. Independent debounce time setting for each input in the range 1... 300 seconds.

Input voltage 3 ... 9 Vdc  
Input current 5mA @5V  
Output voltage 3,3V DC AT TERMINAL 04



When inputs are supplied by external source, negative must be connected to terminal 01. Insert a zener diode to keep inputs voltage within 9Vdc. Multiple options can be used, see example below:

- inputs 1 and 2 using internal supply
- inputs 3 and 4 using external 5Vdc supply
- inputs 5 and 6 using external 12Vdc supply reduced by zener diode 6,8V
- inputs 7 and 8 using external 24Vdc supply reduce by zener diode 20V

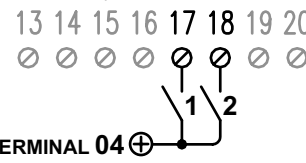


External power supply for inputs must meet SELV circuits requirements according to EN60950 / IEC950: maximum allowed voltage is 60Vdc.

## COUNTER INPUTS

Two special digital inputs are available at terminals 17 – 18. Inputs can be used as a standard digital input in addition to 8 channels already available (without LED indication). Independent debounce time setting for each input in the range 1... 300 seconds. Inputs can operate also as a pulse or time counter. SPST contacts, magnetic reed or hall sensor and electronic switches can be used. Internal power supply is available at terminal 04, using electronic switches this is the positive leg.

Input voltage 3...9 Vdc  
Input current 5mA @4V  
Output voltage 4V DC ±20% AT TERMINAL 16  
Pulse width > 200 ms  
Frequency < 2,5 Hz

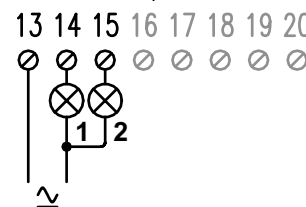


## OUTPUTS

Two SPST relay contacts are available for process or appliance control at terminals 14 – 15, status reported on LED [B]. Common return at terminal 13.

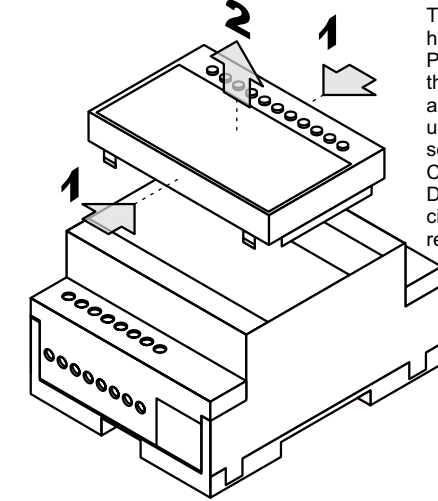
Rated current 3 A  
Rated voltage 250 VAC  
Breaking voltage 277 VAC  
Max breaking capacity 750 VA  
Minimum contact load 1 mA, 5 VDC  
Cadmium free contacts  
Insulation to IEC60664  
Voltage rating 277 V  
Pollution degree 2  
category as basic insulation III  
category as reinforced insulation II

Surge voltage coil contacts: 5000VRMS  
Dielectric strength  
coil-contacts 3000VRMS  
open contact circuit 750VRMS



To prevent relay contacts from damaging, an external protection should be provided (fuse or similar), according to the relay breaking capacity.

## BATTERY



This unit could be equipped with an high efficiency Lithium-Ion Polymer battery having a long life, that largely depends on temperature and frequency of main power failures, used in normal condition can last several years. Connector is located inside the unit. Disconnect power supply and all live circuits that may be connected before removing any protection.

Remove the front cover to access the inside of the unit:

1. Push with two fingers on top and bottom sides of front cover to release it.
2. Pull the front cover and keep it in a safe place.

Plug the battery connector onto the socket [K], the unit will start to operate, unless the battery is completely depleted.

Voltage 3,7 V 4,2V FULL CHARGE  
Capacity > 320 mAh 1,26 Wh  
Temperature -20...60°C 0...45°C CHARGING

Battery status is reported at any time by the LED located near the connector:

OFF	OFF	Charge OFF
RED	OFF	Charge in progress
OFF	GREEN	Charge completed
RED	GREEN	Bad or NO battery

Disconnect the battery if the unit is not used for an extended period of time.



RECYCLING OPTIONS AVAILABLE IN YOUR AREA MUST BE CONSIDERED WHEN DISPOSING BATTERIES. DO NOT DISPOSE OF IN FIRE!

## ANTENNA

The antenna must be connected to the RF interface, implemented as a 50Ω connector available in 2 different options:

- External FME male coaxial jack at the end of a short RG178 cable stub exiting from the bottom left side of the unit.
- Internal IPEX connector suitable for embeddable antennas.

The antenna must fulfil the requirements given below:

Frequency TX	880 to 915 MHz	1710 to 1785 MHz	824 to 849 MHz	1850 to 1910 MHz
Frequency RX	925 to 960 MHz	1805 to 1880 MHz	869 to 894 MHz	1930 to 1990 MHz
Impedance	50 ohms			
VSWR	RX max	1.5 : 1		
	TX max	1.5 : 1		
Polarization	Linear			
Typical gain	0 dBi in one direction at least			

The gain must not exceed 8,4dBi @ 850MHz and 3,5dBi @ 1900MHz. We recommend a VSWR max of 1.5:1 although a VSWR max of 2:1 can be accepted without affecting performance and certification. The DC impedance is floating but there is no problem when using antennas that present a short to ground.

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