

## MODGSMII

### **MODGSMII: GSM module for remote control**

MODGSMII module allows to receive information from **CONTATTO** bus and to send commands using a standard GSM portable phone.

The way to exchange information with the **CONTATTO** bus is based upon the SMS messages (Short Message Service): each sent/received message contains literal strings fully configurable by the user. In comparison to similar systems based on DTMF tones, MODGSMII module allows to exclude any misunderstanding about the sent commands and to have clear and explicit information about the status of the system.

MODGSMII contains a "GSM engine" that may operate both with pre-paid and contract SIM cards.

The main features of MODGSMII module are the following:

- **Enabled telephone numbers:** up to 8 telephone numbers may be defined; each number is enabled to exchange information with MODGSMII module (send/receive). An optional password may be assigned to each telephone number
- **SMS from MODGSMII to user:** up to 30 SMS may be defined; MODGSMII module will send a message to one or more phone numbers at the occurrence of an event (e.g. alarm system, failure of the boiler, etc.); each one of these SMS may report information about one or more points of **CONTATTO** bus
- **SMS from MODGSMII to user at breaking and restoring of the power supply:** thanks to an internal rechargeable battery, MODGSMII can send a message at the breaking and/or at the restoring of its power supply; these two messages may be defined by the user and they may be individually enabled. This feature does not depend on the bus activity and it is useful to be informed about the status of the electrical network. At the breaking of the power supply, MODGSMII module will be automatically switched off after a user-defined time; during this time, the load inputs remain fully operating
- **SMS from user to MODGSMII for command execution:** up to 32 "command strings" may be defined; upon receiving a SMS containing one or more of these strings, MODGSMII module will execute the specified commands, but only if the SMS has been sent from an enabled phone number. If a password was assigned to the phone number, the SMS must contain the same password (otherwise the commands will not be executed); this feature increases the safety level. The portable phones allow to store many SMS: the user may save some SMS related to the configured commands in order to recall them from the phone memory, thus reducing the time required to send the commands. In addition, considering that the same SMS may contain more commands, a good cost saving may be achieved
- **SMS from user to MODGSMII for information request:** the command SMS described at previous point may contain also (or only) a request for SMS sending from MODGSMII to the user reporting information about one or more points of the system

- **Execution of commands by a voice call:** "voice call" is a standard call from any telephone (GSM or wired); if the calling number is among the enabled ones, then MODGSMII module will reject the call after some rings (typ. 2) without answer to it and it will execute the commands configured for that phone number, if any. The advantage of this feature is to execute some commands at zero cost because MODGSMII, as said, does not answer to the voice call
- **Local inputs and outputs:** MODGSMII provides 8 inputs, 2 relay outputs (with floating contacts) and 2 NPN output, absolutely independent of the **CONTATTO** bus; these points may be used to acquire status and to send commands regardless the bus activity

MODGSMII module must be set by the tool program *Taco* in order to define the various parameters required for the proper operation; for more details, refer to the documentation of the program.

**The SIM card, depending on the GSM engine used, must be inserted on the right side of the module or under the upper right terminal cover.** In the first case, a little opening on the right side of the module allows the access to the holder of the SIM card; to open the holder, press the little button on the left side of the holder itself using the tip of a pencil (or similar object). In the second case, remove the terminal cover and insert the SIM card directly in the opening and push it down; at each pushing, the SIM will be locked and unlocked.

The use of the PIN code is optional; if the PIN has to be used, it should be set and enabled by any GSM phone. MODGSMII module does not allow enabling or changing the PIN code of the SIM card.

The assigned pin must be also entered in the proper configuration window of the *Taco* program.

### **Address programming**

MODGSMII module takes 2 consecutive input addresses of **CONTATTO** system; each address provides 8 digital points to be used to execute the commands on the real or virtual outputs of the system.

In other words, MODGSMII provides 2 x 8 = 16 input points that are controlled by the messages received by the module, instead of being connected to "physical" contacts (switches, buttons or others). These points can be used to execute the desired actions by a proper programming of the system.

MODGSMII module also takes 2 consecutive output addresses, allowing MCP to send information about the status of up to 127 virtual points (see in the next pages).

The tool program *Taco* allows to set the desired input and output addresses of MODGSMII module.

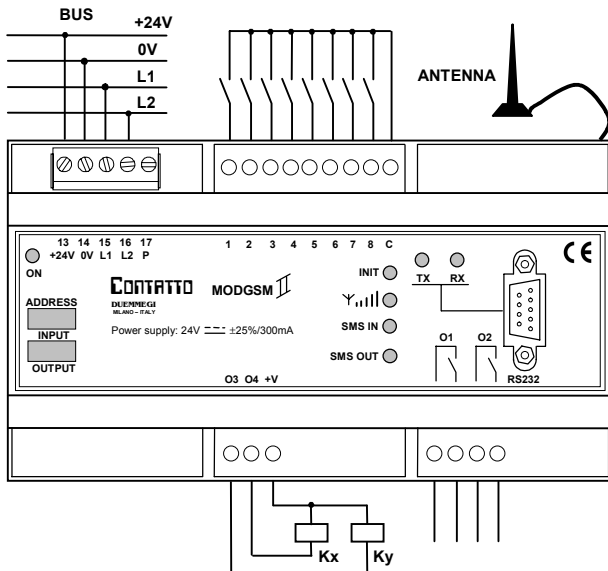
Two white labels on the front panel of MODGSMII module are meant for writing the programmed base addresses (input and output) for an immediate visual identification. MODGSMII housing is a standard DIN 9M module.

## MODGSMII

### Connections

A 5-way terminal block on the top side of MODGSMII module allows the connection to the **CONTATTO** bus.

From the top right side of the module exits the small coaxial cable to be connected to the antenna (included). The antenna should be placed in order to allow a good reception of GSM signal.



On the bottom side of the module are placed the terminal block for the connection of two dc-coil external relays (K1 and K2) and the terminal block for the 2 internal output contacts. These are the "local outputs" of the module (O1, O2, O3 and O4). A terminal block on the top side of the module allows the connection of the 8 local inputs; the contacts connected to these inputs must be free of any potential.

A DB-9 connector on the front panel allows the connection, through the serial RS232 port, to the PC for the configuration of MODGSMII module; this port is electrically insulated from all other circuits.

### LED signalling

Two LEDs (TX and RX) monitor the activity on the serial port. A green LED (ON) lights when the module is supplied.

Four LEDs report the activity of GSM module:

- ❑ **INIT:** 1) Very fast blinking: MODGSMII is reading the configuration from its internal memory. 2) Fast blinking: GSM engine configuration. 3) OFF: GSM engine configuration has ended. 4) Fixed ON: internal memory is not valid (failure, not configured, configuration stopped)
- ❑ **Y...** (very slow blinking, 2sec period): the LED gives an indication about the level of GSM signal; the duration of the ON time in respect to the OFF time is proportional to the signal level (the ON time increases when increasing the signal).
- ❑ **SMS IN:** 1) Blinking: an SMS has been received and its interpretation begins. If it blinks together to SMS OUT LED, then a voice call is incoming. 2) OFF: no SMS are incoming.

- ❑ **SMS OUT:** 1) Blinking: the module is preparing or transmitting an outgoing SMS. If it blinks together to SMS IN LED, then a voice call is incoming. 2) OFF: no SMS are outgoing.

### Message examples

#### Messages from MODGSMII to user

Each SMS message transmitted from MODGSMII may report information about one or more points; the composition and the arrangement of the messages are fully configurable by the user through the tool program *Taco*. This program allows to assign a string (or "label") to desired **CONTATTO** point (real or virtual input). In details, the following information must be defined:

1. the **CONTATTO** input point to which the string is referred
2. a name (or string) to be assigned to the point status when it is at "0" logic level (e.g. "Alarm system normal")
3. a name (or string) to be assigned to the point status when it is at "1" logic level (e.g.. "Alarm system activated").

Also, the event causing the sending of each SMS must be defined, together to the phone number (one or more) to which the message has to be sent. The following is an example of SMS message that user can receive from MODGSMII module:

Alarm system activated , Zone 1 OK, Zone 2 OK, Zone 3 alarm

Remark that the message reports a lot of information about the Alarm System (this is only an example). Another example of SMS from MODGSMII to user is the following:

Air Conditioning ON, External lamps OFF, Windows closed

Two additional and distinct messages may be defined for the breaking and restoring of power supply; if enabled, these SMS will be automatically sent to the user at the occurrence of the related events; as example:

Power supply failure

Power supply restored

#### Messages from user to MODGSMII for command execution or information request

Each SMS message sent by the user to MODGSMII module may contain one ore more commands; the commands to **CONTATTO** system must take place through the ("phantom") inputs of MODGSMII module.

The tool program *Taco* allows to define the required information as follows:

1. the string that, when received by MODGSMII, causes an action (e.g. Switch-ON-Lamp)
2. the type of command to be executed; possible options are:
  - ❑ On (switch ON the point)
  - ❑ Off (switch OFF the point)
  - ❑ Pulse (causes a pulse on the related point; the duration of the pulse is 1 second)

- Send a SMS (cause the sending to the user of a SMS that may be selected among the defined ones)
- 3. the point on which the selected action must be executed; each point has to be chosen among the 16 input points or the 2 local output provided by MODGSMII module
- 4. a name (or comment) to be assigned to the point; if the required action is the sending of a SMS to the user, the message to be sent has to be chosen among those defined

The following are examples of command messages from user to MODGSMII module:

Enable-Watering Switch-Off-External-Lamps

Close-Shutters On-Air-Conditioning Switch-Off-Ext-Lamps Send-Alarm-Status

Note the last string in the last example: in addition to "physical" commands, the string "Send-Alarm-Status" will cause the sending to the user of a SMS reporting the Alarm System status. This is an example of message containing an information request.

**Transferring the status of virtual points from MCP to MODGSMII**

MODGSMII automatically detects the status (0 or 1) of input and output physical points (usually named "real" points) of **CONTATTO** bus. In other words, no special programming is necessary on MCP when MODGSMII application requires SMS reporting of real points only. Instead, when MODGSMII has to report on virtual points, MCP must be programmed with "BINARY" instruction as described here.

"B" values are sent to MODGSMII by mean of MCP "BINARY" instruction. BINARY can be used for sending to MODGSMII any virtual point available in MCP. Each MCP virtual point can be defined as combination and/or function of real and/or virtual points, as well known from applications. "B" value transfer from MCP to MODGSMII requires using of both MODGSMII output addresses.

In the following example, 110 is the base output address, thus, also output address 111 is used; to send to MODGSMII the status of virtual points V31, V40, V41 and the "special" virtual point V1000 (used for MOD F, module failure), MCP must include the following instructions:

```
BINARY 110 ( \
    B1 = V31 \
    B2 = V40 \
    B3 = V41 \
    B4 = V1000 )
```

This sends to MODGSMII the binary codes B1, B2, B3 and B4, corresponding to V31, V40, V41 and V1000 respectively. Of course, V31, V40 and V41 require to be defined according to the desired information to be reported. This allows sending to MODGSMII any logic combination of real and/or virtual points.

For completing the program, the following instructions are also required:

```
V100 = !V31
V101 = !V40
V102 = !V41
V103 = !V1000
BINARY 111 ( \
    B1 = V100 \
    B2 = V101 \
    B3 = V102 \
    B4 = V103 )
```

As shown, it is necessary to define a group of virtual points (e.g. V100...V103) that are the complement (!) of virtual points used on BINARY 110 instruction. This group is used on the same B1...B4 codes but in BINARY 111 block.

Available "B" codes range from **B1 to B127**.

**Technical characteristics**

Supply voltage	24V $\pm$ 25% SELV
MAX current consumption	0.3A @24V
Internal battery	3.6V / 600mAh NiMH
Number of local input	8
Current for each input (IN1 and IN2)	1mA
MAX voltage on output contacts O1 and O2	60V, 250V~
Contact rating (O1 and O2)	1A @ 60V, 1A @ 250V~
MIN load on contacts O1 and O2	10mA @ 12V
Type and MAX current outputs O3 and O4	NPN, 150mA
+V voltage for external relay supplying	About the module supply voltage
Occupied address in the <b>CONTATTO</b> bus	2 consecutive input and 2 consecutive output addresses
Number of outgoing SMS	30 + 2 at breaking/restoring of power supply
Number of incoming SMS for commands	32
Number of phone numbers for outgoing/incoming SMS	8, each one with its own optional password
Number of voice call for command execution	1 for each phone number
GSM ENGINE DATA:	
- Frequency bands	Dual band EGSM900 and GSM1800 MHz
- Transmit power	- Class 4 (2W) for EGSM900 - Class 1 (1W) for GSM1800
- Sensitivity	-104dBm, DCS: 100dBm
- SIM interface	SIM card reader 3V small SIM card
PC interface	RS232 electrically insulated
Housing	Standard DIN 9M for DIN rail
Operating temperature	-5 ÷ +50 °C
Storage temperature	-20 ÷ +70 °C
Protection degree	IP20

**Outline dimensions**

