

DFGSMII: GSM module for remote control

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

The way to exchange information with the **Domino** 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, DFGSMII module allows to exclude any misunderstanding about the sent commands and to have clear and explicit information about the status of the system. DFGSMII contains a "GSM engine" that may operate both with rechargeable and contract SIM cards.

The main features of DFGSMII module are the following:

- **Enabled telephone numbers:** up to 8 telephone numbers may be defined; each number is enabled to exchange information with DFGSMII module (send/receive). An optional password may be assigned to each telephone number
- **SMS from DFGSMII to user:** up to 30 SMS may be defined; DFGSMII 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 **Domino** bus
- **SMS from DFGSMII to user at breaking and restoring of the power supply:** thanks to an internal rechargeable battery, DFGSMII may be set to send a message at the breaking and/or at the restoring of the 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 home. At the breaking of the power supply, DFGSMII module will be automatically switched off after a programmable delay; during this time the local inputs are still working
- **SMS from user to DFGSMII for command execution:** up to 32 "command strings" may be defined; sending a SMS containing one or more of these strings, DFGSMII 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 (on the contrary the commands will not be executed); these last feature increase 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, reducing in this way 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 DFGSMII to require information:** the command SMS described at previous point may contain also a request of SMS sending from DFGSMII 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 DFGSMII module will reject the calling after a pair of rings without answer to it and it will execute the commands (if enabled) configured for that phone number. This feature allows to execute some commands at zero cost because DFGSMII, as said, does not answer to the voice call
- **Local inputs and outputs:** DFGSMII provides 8 inputs, 2 relay outputs (with floating contacts) and 2 NPN outputs, absolutely independent from the **Domino** bus; these points may be used to acquire status and to execute commands regardless of the bus activity

DFGSMII 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.

DFGSMII module takes 4 consecutive *input* addresses of the **Domino** system; each address provides 4 digital points to be used to execute the commands on the real or virtual outputs of the system. In other words, DFGSMII provides 4 x 4 = 16 input points controlled by the messages received by the module, instead to be connected to "physical" contacts (switches, buttons or others). These points must be used, by a proper programming of the system, to execute the desired actions. The tool program *Taco* allows to define the starting address of DFGSMII module. *Note:* the address of DFGSMII module cannot be programmed by *BDTools* program.

A white label on the front panel of DFGSMII module allows the writing of the programmed starting address for an immediate visual identification. DFGSMII housing is a standard DIN 9M module.

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. MODGSM module does not allow enabling or changing the PIN code of the SIM card.

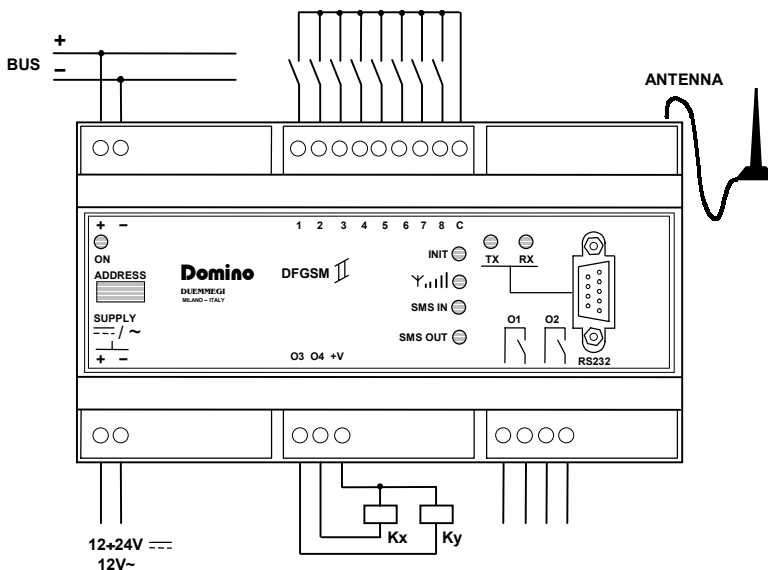
The assigned PIN code must be then entered in the proper configuration window of the *Taco* program.

DFGSMII

Module connection

A 2-pole terminal block on the top side of DFGSMII module allows the connection to the bus; DFGSMII requires a 12 ÷ 24V $\overline{\text{---}}$ dc power supply or a 12V~ transformer (not furnished) connected to SUPPLY terminal block.

From the top right side of the module exits the coaxial cable to be connected to the antenna using the proper adapter (both provided). The antenna may be placed in order to allow a good reception of GSM signal.



On the bottom side, the module also provides a terminal block for the connection of 2 external relays (Kx and Ky, coil 12 or 24Vdc depending on the voltage applied to SUPPLY terminals) and a terminal block connected to the contacts of the internal relays. 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 local inputs; these ones must be connected to potential-free contacts.

A DB-9 connector on the front panel allows the connection, through the serial RS232 port, to the PC for the configuration of DFGSMII module; this port is electrically insulated from all other circuits. Two LEDs (TX and RX) monitor the activity on the serial port. A green LED (ON) informs if the module is supplied.

Four LEDs report the activity status of the module as follows:

- **INIT:** 1) Very fast blinking: DFGSMII is reading the configuration from its internal memory. 2) Fast blinking: initialization of the GSM engine. 3) OFF: initialization of GSM engine ended. 4) fixed ON: invalid memory (failure, not configured, or other)

- **Y** (very slow blinking, 2sec period): the LED furnishes 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: a SMS message has been received and the unit is processing it. If this LED blinks together the SMS OUT LED, then a voice call is pending. 2) OFF: no incoming SMSs.
- **SMS OUT:** 1) Blinking: the unit is transmitting an outgoing SMS message. If this LED blinks together the SMS IN LED, then a voice call is pending. 2) OFF: no outgoing SMSs.

Message examples

Messages from DFGSMII to user

Each SMS message transmitted from DFGSMII may report information about one or more points, both digital and analog ones (e.g. temperature); *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 **Domino** point (real or virtual input). In details, the following information may be defined:

1. the **Domino** input point to which the string is referred
2. a name (or phrase) to be assigned to the point status when it is at "0" logic level (e.g. "Alarm system normal") or the name of the analog value
3. a name (or phrase) 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 DFGSMII module:

Alarm system activated , Zone 1 OK, Zone 2 OK, Zone 3 alarm Temperature=20degree

Note as the message reports more information about the Alarm System status and a temperature (this is only an example). Another example of SMS from DFGSMII 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 DFGSMII for command execution or information request

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

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

1. the string that, when received by DFGSMII, causes a command (e.g. Close-Shutters)
2. the type of command to be executed; the 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 "phantom" input points or the 2 local output provided by DFGSMII 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 DFGSMII module:

Enable-Irrigation 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.

For more information about the programming, refer to the on line help of the *Taco* program.

Technical characteristics

Power supply	12÷24V $\overline{\text{---}}$ SELV $\pm 20\%$ or 12V~ $\pm 10\%$
Current consumption MAX	0.6A @ 12V, 0.3A @ 24V
Internal battery	3.6V $\overline{\text{---}}$ / 550mAh NiMH
Local inputs	8
Current for each input	1mA
MAX voltage on output contacts O1 and O2	60V $\overline{\text{---}}$, 250V~
Contact rating (O1 and O2)	1A @ 60V $\overline{\text{---}}$, 1A @ 250V~
MIN load on contacts O1 and O2	10mA @ 12V $\overline{\text{---}}$
Type and MAX output current on output O3 and O4	NPN, 150mA
+V voltage for supplying external relays	Using dc supply: equal to the supply voltage itself. Using 12V~ supply: 15Vdc about
Occupied address in the Domino bus	4 (consecutive) with configurable starting address
Number of outgoing SMS	30 + 2 for 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 3/5V 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

