



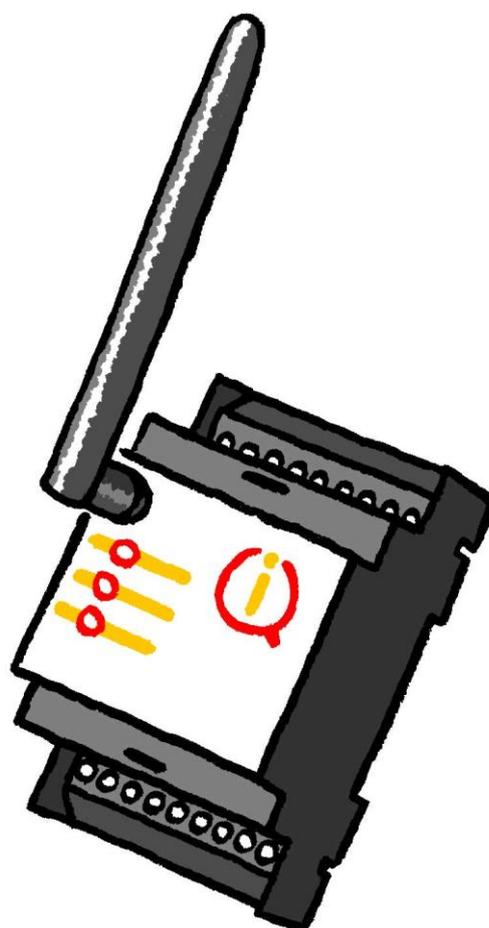
Intelligent power sockets

IQsocket™ DIN / IQSD-GSM

...makes your life more comfortable

User Guide

IQSD-GSM
documentation v1.1.1 R3



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Important information

Every effort has been taken to ensure the accuracy of this document, however we do not accept responsibility for damage, injury, loss or expense resulting from errors and omissions, and we reserve the right of amendment without further notice.

WARNING: This product is not designed for use in, and should not be used for, medical applications.

Product must be mounted on DIN rail (35mm, EN50022), inside a suitable enclosure providing environmental protection.

The product contains no serviceable parts, or internal adjustments. No attempt must be made to repair this product. Faulty units must be returned to supplier for repair.

This product must be installed by a qualified person. All electrical wiring must be carried out in accordance with the appropriate regulations for the place of installation.

Before attempting any electrical connection work, please ensure all supplies are switched off.

1 Introduction

No one doubt in recent IT world about the fact that communication technologies help us to live our lives easier. There was never such a need of data networking features at products which have had no networking features in the past. Need of data communication in companies even in homes is especially visible in this Internet age. Intelligent power socket IQsocket IQSD-GSM is a member of wide product family of intelligent sockets which helps people to do some tasks remotely. These IQsocket products have following main features:

- Various communication data interfaces
- Various number of switched power outputs
- Various housings to suit particular applications, such as wall-mount style, 19" rack, DIN rail, power socket types for different countries
- Various inputs / outputs besides switched power outputs

1.1 Product description

Intelligent power controller for DIN rail mounting IQsocket IQSD-GSM helps to control any electric appliance remotely over GSM network. IQSD-GSM is managed by SMS messages or phone call. It can work also as a programmable regulator with two independent thermometer inputs, two digital inputs and analogue voltage input, allowing to control an appliance by turning it on/off according to user-defined algorithm/rules.

In general, product has following communication features:

- Sending alarm or informational SMS messages to user
- Providing status of main/aux switched power output and inputs upon request
- Sending values of configured parameters upon request
- Configuring IQSD-GSM parameters simply by sending SMS commands
- Controlling Main and auxiliary switched outputs by SMS or by call
- Listening of sound using integrated microphone by call

IQsocket IQSD-GSM provides following application features:

- Control electric appliances over SMS, by call or manually
- Remotely turnon/turnoff of 230V/10A appliance (main contact output)
- Remotely turnon/turnoff of 230V100mA appliance (aux contact output)
- Remotely turnoff or turnon power for specified time

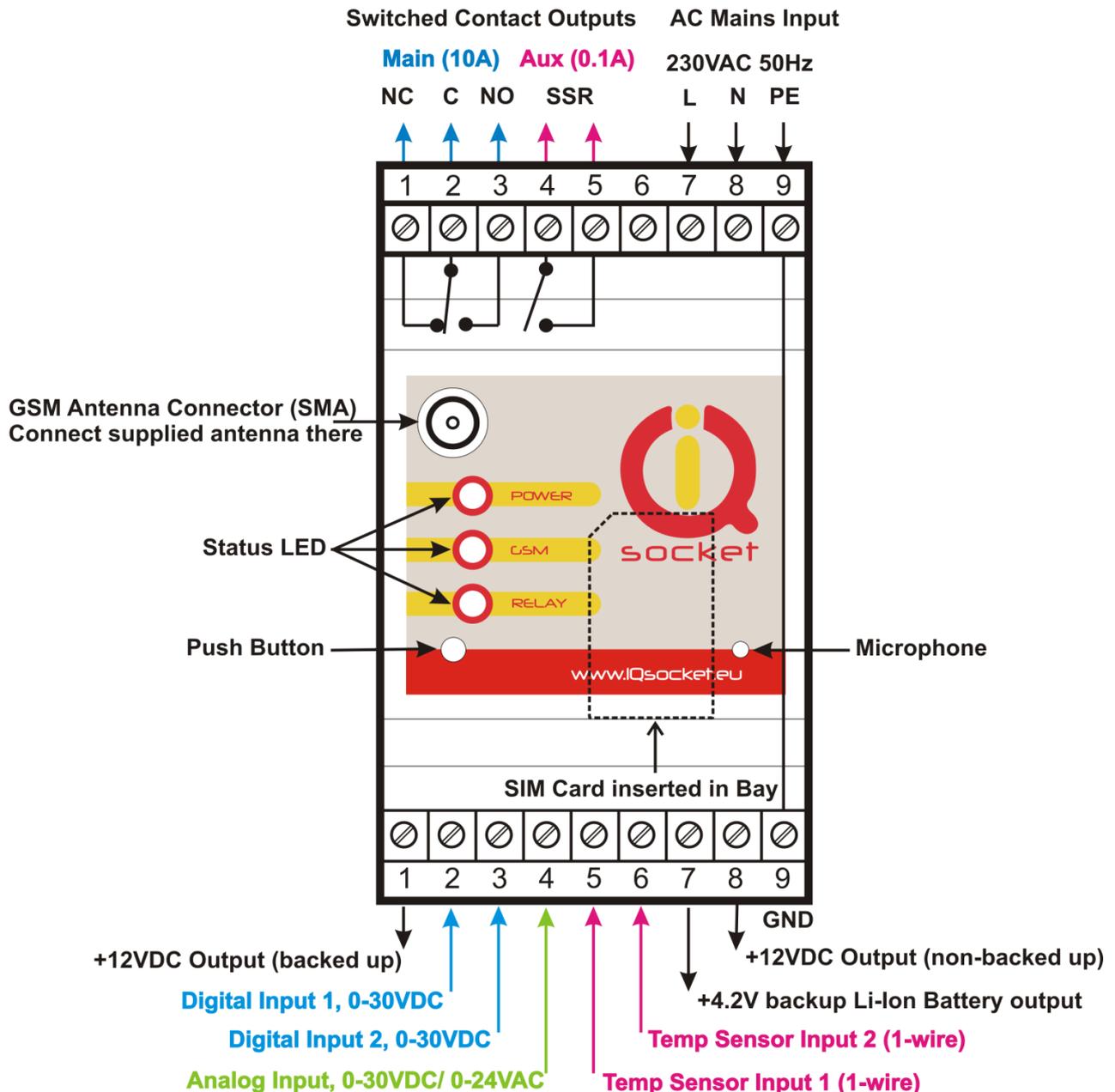
- Remotely reboot appliance by cutting power for a couple seconds (e.g. server restart)
- Remotely switch of appliance status (turnon to turnoff or back)
- Remotely measuring of temperature
- Thermoregulation feature, with custom program definition:
 - Control outputs based on state of inputs: temperature, digital and voltage input
 - Notify user by SMS (user defined text or status message) or by making call based on state of inputs
- Scheduler, based on real time clock
 - Turnon/turnoff appliances connected via main/aux outputs based on time/day of week
- Alarm detection – two independent digital inputs:
 - External detector of motion, gas, fire, water; not included in product package
 - External detector of opened door, window, shake detector; not included in product package
 - Any other external detector with contact output can be connected
- Alarm detection – analogue voltage-sensing input 0-30VDC/0-24VAC:
 - Measuring of voltage at the input, autosensing if AC or DC
 - Any external sensor with voltage output can be connected
- Alarm detection – Input power and backup battery status:
 - Notifying of AC mains power failure and restoring back
 - Providing charge status of internal backup Li-Ion battery, including alarm on automatic shutdown due to low battery status.
- Counters readable by SMS:
 - 6 independent counters, incrementing when a change occurs on outputs, digital inputs, control button has been pressed and GSM registration has occurred.
- Monitoring of sound in surrounding environment via integrated microphone

2 Installation

Before starting installation, please read this manual and take into account Important information section at beginning of this manual.

2.1 Wiring the IQSD-GSM

Wire connections per following schematic diagram.



Note all signals at the bottom terminal block are referenced to the GND pin (#9, most right).

Be careful when using any from provided voltage outputs, +12V DC and +4.2VDC outputs are not fused, please respect nominal current ratings of these outputs. Damage caused by overload is not covered by warranty.

Please place supplied GSM antenna outside of metal enclosure and keep it away from metal structures which can shield GSM signal. Avoid to run IQSD-GSM without antenna connected.

Do not power on the 230VC mains voltage yet.

2.2 Inserting SIM Card

NOTE: Before SIM is finally used in IQSD-GSM, please turn off PIN authorization.

Authorization can be turned off by inserting the SIM card into a GSM phone and disabling SIM PIN usage using appropriate command usually located in 'Settings' phone menu. Now you can remove the SIM card from phone and insert it into your IQSD-GSM.

- Insert SIM card with inactive PIN code authorization into the SIM socket bay, accessible from bottom side of IQSD-GSM housing.
- Push the card into the bay until you feel a click so card is locked inside.
- To remove the card from IQSD-GSM, gently push the card further into the bay until a click is felt, then card is unlocked and can be pulled out.

NOTE: Before using a SIM card in IQSD-GSM, ensure all received SMS messages, stored on the card, are deleted.

2.3 Powering IQSD-GSM On

Once the SIM card has been inserted, you can switch on 230VAC mains to power the IQSD-GSM on. Verify device is operating by observing status of the LEDs.

- Once AC power is connected, all three LED indicators will blink shortly and if everything is ok, the Power LED will turn to solid Red.
- In case of active PIN authorization on the SIM card, GSM LED starts blinking fast (approx. three times per second).
- GSM LED start to blink slowly (approx. every three seconds) Green, once device was successfully logged into a GSM network. If the LED blinks about every second, searching of GSM network is in progress.
- The Relay LED indicates state of main switched power contact.

Your IQSD-GSM is now ready to use.

3 Managing IQSD-GSM

This chapter guides you through management commands and features of IQSD-GSM.

3.1 Managing by SMS

Commands are send in form of SMS messages to call number of SIM card inserted into your device. Messages have following syntax:

pinCOMMAND (e.g. *3366STATUS*)

- With pre-configured security password by command *SMSPIN=3366*

COMMAND (e.g. *STATUS*)

- with un-configured security password/SMSPIN

There are two kinds of commands:

Control commands (labeled as Ctrl in tables)

- Used to control of the IQSD-GSM and can be used at any time. Security settings, such as SMSPIN, permitted callers list, DO apply.

Configuration commands (labeled as Cfg in tables)

- Allows to configure the IQSD-GSM parameters and functions. Their use is limited by time to 10 minutes after device has been powered on or after last configuration command has been received. Security settings, such as SMSPIN, permitted callers list, DO NOT apply. Device can be put into configuration mode using *CONFIG* command instead of physically turning it off and on again.

Each command is normally confirmed by a response SMS sent back to the command sender number. In case of an error is detected in a command, IQSD-GSM will respond with error message to the sender. Sending response and error SMS messages can be disabled.

Case of commands is ignored; STATUS or sTaTUS is the same command. All incoming SMS messages longer than 30 characters or messages containing space and dot characters are being deleted without any error response.

SMS Command	Description	SMS Response	Type
TURNOFF	Turn off both Main and Aux switched outputs	TurnedOff*	Ctrl
TURNON	Turn on both Main and Aux switched outputs	TurnedOn*	Ctrl
TURNOFF1	Turn off Main switched output	TurnedOff1*	Ctrl
TURNON1	Turn on Main switched output	TurnedOn1*	Ctrl
TURNOFF2	Turn off Aux switched output	TurnedOff2	Ctrl
TURNON2	Turn on Aux switched output	TurnedOn2	Ctrl
TURNOFF=123	Turn off Main switched output for 123 minutes. Maximum acceptable value is 180 minutes.	TurnedOff 123 min*	Ctrl
TURNON=123	Turn on Main switched output for 123 minutes. Maximum acceptable value is 180 minutes.	TurnedOn 123 min*	Ctrl
RESTART	Change (negate) status of Main switched output for time preconfigured by command RESTARTTIME.	Restarted*	Ctrl
STATUS	Get status of IQSD-GSM: Outputs, Temperature, digital and voltage inputs, AC mains, Backup Battery charge, time and GSM signal	Output:OFF/OFF, Temperature:22.5 C/ NA, Input:OFF/OFF, VoltageIn:0VDC, Bcap: 100%, Power:ON, Time:03/01/01,12:01:25, Signal:76%	Ctrl
RINGON	A call-back to the sender's number will be made. Useful to keep-alive of credit in prepaid SIM cards.		Ctrl
CREDIT*XX#	Check remaining credit value of the SIM card, using the same code like dialed on a phone in order to check credit for particular GSM operator, answer of the operator is provided in command response.	YOUR CREDIT IS xxx	Ctrl

* Commands working with Main switched output cannot be performed during AC power failure. In such case, response to these commands is *Command failed*. IQSD-GSM use a bistable relay for Main switched output so its state remains unchanged during a power failure.

Please ensure a proper code is used for *CREDIT* command, since entering a wrong code can cause unexpected problems like change settings of the SIM card. IQSD-GSM does not send any error response for the *CREDIT* command. It is strongly encouraged to verify the code on a regular phone first.

If a power failure occurs during *TURNON=123/ TURNOFF=123* commands, time of power failure is not included in the countdown, so e.g. you need to run an appliance for a hour issuing *TURNON=60* command, but AC power is lost after 30minutes and restored back say after 2hours, appliance will be running for half an hour after power is restored back.

3.2 Managing by phone call

The Main switched output of IQSD-GSM can be also controlled by dialing the number of its SIM card. Call is for most commands rejected by IQSD-GSM so its use is free of charge, with exception for listening sounds using embedded Microphone.

Behavior of IQSD-GSM to incoming calls must be configured in advance using RING command per following table.

SMS Command	Description	SMS Response	Type
RING=NOACTION	No action is performed, call is rejected	RING=NOACTION - OK	Cfg
RING=RESTART	Change (negate) status of Main switched output for time preconfigured by command RESTARTTIME, call is rejected.	RING=RESTART - OK	Cfg
RING=SWITCH	Change (negate) status of Main switched output, call is rejected.	RING=SWITCH - OK	Cfg
RING=MIC	Monitoring of sound in surrounding environment via integrated microphone for one minute, call is answered.	RING=MIC - OK	Cfg
RING?	Get current configuration of RING action, active setting is in () parentheses.	RING=(NOACTION),RESET , SWITCH, MIC	Cfg

3.3 Timing setup

Following table summarizes settings of time interval of *RESTART* command and ringing period used by *RINGON* command and by alerts by dialing a number under an alarm condition.

SMS Command	Description	SMS Response	Type
RESTARTTIME=XX	Configures time of RESTART command. Range is 1 to 180 seconds.	RESTARTTIME=XX - OK	Cfg
RESTARTTIME?	Get current configuration of RESTARTTIME parameter.	RESTARTTIME=10 seconds	Cfg
RINGONTIME=XX	Configures how long will IQSD-GSM keep ringing during a call, initiated by RINGON command or sending alarm alert. Range is 20 to 60 seconds.	RINGONTIME=XX - OK	Cfg

RINGONTIME?	Get current configuration of RINGONTIME parameter.	RINGONTIME=30 seconds	Cfg
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3.4 Date/Time setup

IQSD-GSM is equipped with real-time clock, clock is running during a AC power failure until internal backup battery is not empty. There are two ways of date/time setup:

- Automatic setup based on time stamp of incoming SMS message
- Manual setup using *DATE=* command. Enter target time in following format: *DATE=yy/mm/dd,hh:mm:ss+zz* where zz is Time zone, with either + or - sign.

SMS Command	Description	SMS Response	Type
DATE	Date/time is set from timestamp of incoming SMS message	DATE yy/mm/dd,hh:mm:ss+zz - OK	Cfg
DATE=yy/mm/dd,hh:mm:ss+zz	Set Date/time manually	DATE=yy/mm/dd,hh:mm:ss+zz - OK	Cfg
DATE?	Get current settings of Date/time.	DATE yy/mm/dd,hh:mm:ss+zz - OK	Cfg

3.5 Manual Control

IQSD-GSM can be controlled manually using push button located in the bottom left corner of front panel, see drawing in section 3.1. Operate button using a suitable narrow tool, e.g. a pen.

- Main Switched output: Short pressing of the push button will switch state of Main switched output
- Reset to default settings: By pressing of the push button for longer than 2 seconds but shorter than 5 seconds, all LED indicators start blinking, when the push button is pressed again during LED blinking, IQSD-GSM configuration will be set back to factory default values.
- Turn Off: Pressing the push button for time longer than 5 seconds, while powered by backup battery (AC mains off), will turn the device off. This is useful e.g. during maintenance or device uninstalling, where device is still running, powered from backup battery, even AC mains power is already switched off.

Please note commands working with Main switched output, including manual control using the push button, cannot be performed during AC power failure. IQSD-GSM use a bistable relay for Main switched output so its state remains unchanged during a power failure.

3.6 Security features

IQSD-GSM is equipped with advanced authorization features to avoid controlling by unauthorized users. The security features include:

- Allowing control only from authorized phone numbers
- Authentication of each SMS command by PIN code (SMSPIN)

Both features can be used simultaneously.

In case of using authorized numbers list, device will ignore all SMS messages and calls received from numbers not included in the permitted phone numbers list. If this security feature is not enabled, device can be controlled by anyone who knows number associated with inserted SIM card.

IQSD-GSM allows to define up to 20 permitted phone numbers, each containing up to 15 numerals.

In case of using SMSPIN, right before each SMS command is placed PIN code without any space or special character, as shown here:

pinCOMMAND (e.g. 3366STATUS)

Command will be accepted only when entered PIN code matches with the code predefined by *SMSPIN* command.

NOTE: Pin code (SMSPIN) is having no relation with SIM card PIN code. It is just a password called SMSPIN and used by IQSD-GSM for SMS message authentication, having the same structure as standard PIN = 4 numbers.

Security settings can be configured and viewed simply by following commands.

SMS Command	Description	SMS Response	Type
SECNUMBER=NO	Security using permitted phone numbers list is turned off/inactive.	SECNUMBER=NO - OK	Cfg
SECNUMBER=YES	Security using permitted phone numbers list is turned on/active.	SECNUMBER=YES - OK	Cfg
SECNUMBER?	Get current configuration of SECNUMBER parameter.	SECNUMBER=(NO),YES	Cfg
SECNUMBER+42123335777	Add new number to security list.	SECNUMBER+421233355777 - OK	Cfg

SECNUMBER-421233355777	Delete specific number from permitted phone numbers list.	SECNUMBER-421233355777 - OK	Cfg
SECNUMBER-ALL	Delete all numbers from permitted phone numbers list.	SECNUMBER-ALL - OK	Cfg
SECNUMBER=LIST	Get dump of permitted phone numbers list.	LIST 421903123456,42190311 1222,421235678235 Or LIST - NO NUMBER!	Cfg
SMSPIN=1234	Configuration of SMS password/SMSPIN.	SMSPIN=1234 - OK	Cfg
SMSPIN=NOPIN	Using of password/SMSPIN is deactivated.	SMSPIN=NOPIN - OK	Cfg
SMSPIN?	Get configuration of SMSPIN parameter.	SMSPIN=(NOPIN), 1234	Cfg

Permitted phone numbers list accept only numbers in international format:

Example: *SECNUMBER+421265440655* means add number +421-2-65440655
 Example: *SECNUMBER-421265440655* means delete number +421-2-65440655. 421 is country code in this example and 2 is area code.

3.7 Response messages settings

When you communicate with your IQSD-GSM, it is important to make you sure if command was understood and executed successfully. For this purpose we implemented response messages, confirming each command or informing you when an error is detected. In case of SMS commands, you will be notified by back SMS response message. In case of managing IQSD-GSM by phone call, your command will be confirmed by back phone call to your phone number. Note it is not supposed you will answer such back call, you can simply reject it. Configuration commands of response messages settings are summarized in following table.

SMS Command	Description	SMS Response	Type
SMSCONFIRM=YES	SMS confirmation is enabled/active for all SMS commands	SMSCONFIRM=YES - OK	Cfg
SMSCONFIRM=NO	SMS confirmation is disabled/inactive for all SMS commands	SMSCONFIRM=NO - OK	Cfg
SMSCONFIRM?	Get configuration of SMSCONFIRM parameter, active setting is in () parentheses.	SMSCONFIRM=NO,(YES)	Cfg
RINGCONFIRM=YES	Phone call confirmation is turned on for all commands. Hang off after 10 seconds	RINGCONFIRM=YES - OK	Cfg
RINGCONFIRM=NO	Phone call confirmation is turned off for all commands	RINGCONFIRM=NO - OK	Cfg
RINGCONFIRM?	Get configuration of RINGCONFIRM parameter, active setting is in ()	RINGCONFIRM=(OFF),ON	Cfg

	parentheses.		
ERRORREPLY=YES	Sending error SMS messages is enabled/active	ERRORREPLY=YES- OK	Cfg
ERRORREPLY=NO	Sending error SMS messages is disabled/inactive	ERRORREPLY=NO- OK	Cfg
ERRORREPLY?	Get configuration of ERRORREPLY parameter, active setting is in () parentheses.	ERRORREPLY=NO,(YES)	Cfg

NOTE: When RINGCONFIRM=YES command is used, realized are confirmation back calls only for SIM cards with active CLIP service.

3.8 Scheduler feature

IQSD-GSM is equipped with scheduler, allowing to control Main switched output and to get status message, based on time and day of week. Up to 8 scheduled tasks are supported.

Following table summarizes usage of *SCHEDULER* command.

SMS Command	Description	SMS Response	Type
SCHEDULER+hh:mm ,DOW,ACTION	Insert scheduler record to execute particular ACTION at time hh:mm every day of week DOW.	SCHEDULER+hh:mm, DOW,ACTION - OK	Ctrl
SCHEDULER-hh:mm	Remove scheduler record for particular time hh:mm	SCHEDULER-hh:mm - OK	Ctrl
SCHEDULER?	Get list of all scheduler records.	hh:mm,DOW,ACTION	Ctrl

Where

hh:mm denotes hour and minute of time in 24h format.

DOW denotes day of week.

Days of week numbers are recognized as follows:

1- Monday, 2-Tuesday, 3-Wednesday, 4 Thursday, 5-Friday, 6-Saturday, 7- Sunday

If "*" symbol is inserted, action will be executed daily. If number of day within week is inserted, action will be executed only in the particular day of week.

Possible actions are:

- ON for turning on, OFF for turning off Main switched output, same as *TURNON1/TURNOFF1* commands
- RES for restarting Main switched output, same as *RESTART* command

- INF, to send *STATUS* message by SMS to number preconfigured by the *ALARMNUMBER* command (e.g. *ALARMNUMBER+421903123456*, see chapter Alarms)

Example of SCHEDULER? command output (four actions were recorded):

- 11:00,*,ON Turn on Main switched output every day at 11:00
- 14:30,*,OFF Turn off Main switched output every day at 14:30
- 01:30,1,RES Restart Main switched output every Monday at 01:30
- 19:00,5,INF Send Status SMS every Friday at 19:00

3.9 Counters

Six independent counters increments their status upon change on IQSD-GSM inputs and outputs.

SMS Command	Description	SMS Response	Type
COUNTER1?	Get status of Counter1, increments on change of Digital Input1	COUNTER1=0	Ctrl
COUNTER2?	Get status of Counter2, increments on change of Digital Input2	COUNTER2=0	Ctrl
COUNTER3?	Get status of Counter3, increments on change of Main switched output	COUNTER3=0	Ctrl
COUNTER4?	Get status of Counter4, increments on change of Aux switched output	COUNTER4=0	Ctrl
COUNTER5?	Get status of Counter5, increments on pressing of Push Button	COUNTER5=0	Ctrl
COUNTER6?	Get status of Counter6, increments on loosing registration into GSM network	COUNTER6=0	Ctrl
COUNTERX?	Get status of all counters	COUNTER=0,0,0,0,0,0	Ctrl
CLEARCOUNTER1	Clear status of counter 1 (2-6)	CLEARCOUNTER1- OK	Ctrl
CLEARCOUNTERALL	Clear status of all counters	CLEARCOUNTERALL- OK	Ctrl

Counter1 is incremented by 1 after commands *RESTART*, *TURNOFF*, *TURNON*
Highest possible status of a counter is 65535.

3.10 Alarms

IQSD-GSM supports three independent alarms.

- Alarm invoked by change on inputs, having highest priority
- AC mains power failure alarm
- Backup battery remaining charge alarm, having lowest priority

An alarm can generate alert by calling of or sending SMS to up to three predefined phone numbers or in case of alarm invoked by change of inputs, possible alert actions include control of Main switched output and supporting simple scripting allowing IQSD-GSM to act as user-programmable, event-driven controller.

3.10.1 Defining phone numbers for SMS and ringing up alerts

Phone numbers must be entered in international format, see following table.

SMS Command	Description	SMS Response	Type
ALARMNUMBER+421265440655	Add a new number into list for alarm alerts using SMS message and call back.	ALARMNUMBER+421265440655- OK	Cfg
ALARMNUMBER-421265440655	Remove a number from list for alarm alerts using SMS message and call back.	ALARMNUMBER-421265440655- OK	Cfg
ALARMNUMBER-ALL	Remove all numbers from list for alarm alerts using SMS message and call back.	ALARMNUMBER-ALL- OK	Cfg
ALARMNUMBER=LIST	Get list of phone numbers for alarm alerts using SMS message and call back.	LIST 421265440655	Cfg

When generating alerts, numbers in list are processed per their order – first number as first, the last number as last.

3.10.2 Battery charge alarm

Monitoring remaining charge of IQSD-GSM' internal backup battery when AC mains power is temporary failed is easily possible thanks to *BATALARM* command.

You can define up to three battery charge thresholds, given in % of remaining charge. Threshold value can be from 30 to 95 %. Device is automatically switched off once remaining charge falls below 20%.

SMS Command	Description	SMS Response	Type
BATALARM=30,60,90	Send alert SMS every time when remaining battery charge falls below defined thresholds 30,60 and 90%.	BATALARM=30,60,90, OK	Cfg
BATALARM=00,00,50	Send alert SMS every time when remaining battery charge falls below defined threshold 50%.	BATALARM=00,00,50, OK	Cfg
BATALARM=00,00,00	Disable sending remaining battery charge alerts	BATALARM=00,00,00, OK	Cfg
BATALARM?	Get configuration of BATALARM	BATALARM=00,00,00	Cfg

	thresholds.		
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Once remaining battery charge reach a predefined threshold, IQSD-GSM will send following SMS alert message to the numbers set by *ALARMNUMBER* command: *Battery! 50%*

3.10.3 AC mains power failure alarm

IQSD-GSM can send you an SMS alert to inform you when there is a temporary failure of AC mains power for time longer than 10 seconds. Configuration of the power failure alarm is done by using *POWERFAULT* command.

SMS Command	Description	SMS Response	Type
POWERFAULT=NO	Disable sending alerts when power failed alarm occurs	POWERFAULT=NO, OK	Cfg
POWERFAULT=INFO	Send alert SMS when power failed alarm occurs – AC mains power fail for time longer than 10 seconds.	POWERFAULT=INFO, OK	Cfg
POWERFAULT?	Get configuration of POWERFAULT parameter, active setting is in () parentheses.	POWERFAULT=(NO),INFO	Cfg

When AC mains fails for time longer than 10 seconds, device will send following SMS alert message to the numbers set by *ALARM* command: *Power failed.*

In case power is failed for such a long time that charge of internal backup battery falls below 20%, IQSD-GSM will be automatically switched off and following SMS alert message is sent to the numbers set by *ALARM* command: *Low battery shutdown!*

When AC mains power is restored back, device will send following SMS alert message to the numbers set by *ALARM* command: *Power restored.*

NOTE: Commands working with Main switched output cannot be performed during AC power failure. In such case, response to these commands is *Command failed*. A scheduled action is also not executed. IQSD-GSM use a bistable relay for Main switched output so its state remains unchanged during a power failure.

3.10.4 Input change alarm (programmable controller mode)

IQSD-GSM is equipped with following inputs:

- Two independent thermometer inputs

- Two independent digital inputs to connect various sensors
- Analogue voltage input to connect various analogue sensors

State of all inputs can be read by SMS command *STATUS*, which returns following SMS message:

STATUS SMS Response	Description
Output:OFF/OFF,	State of Main and AUX switched outputs
Temperature:22.5 C/ NA,	State of Temp.Sensor1 (connected) /Temp.Sensor2 (disconnected)
Input:OFF/OFF,	State of digital input1/digital input2
VoltageIn:0VDC,	State (in [V]) and voltage type (AC or DC) of analogue voltage input
Bcap: 100%,	Capacity - remaining charge of backup battery
Power:ON,	State of AC mains power 230VAC (ON/OFF)
Time:03/01/01,12:01:25,	Current system time and date
Signal:76%	Current GSM signal strength in %

IQSD-GSM supports a simple scripting language that allows to create custom programs, so device will act as event-driven programmable controller.

In order to use scripting language, user must know at least basic knowledge of algorithmization.

Program is defined in form of row; there can be up to 6 such rows. A program row can be inserted using *ID+* command, and removed using *ID-* command.

Each row consists from identification, evaluation conditions part containing conditions to be evaluated and actions part, each section is separated by comma.

Evaluation conditions include besides state of IQSD-GSM inputs also a system variable. Initial value of the variable is set to 0. Value of the variable can be modified in action part of a row executed previously.

In order to execute actions part of a row, all the conditions in particular row must be evaluated **true**. If a condition needs to be skipped/ignored, it can be simply replaced with a star * symbol.

Program is processed by rows from left to right and from top to bottom. Once a condition being evaluated is true, evaluation of following condition begins. If a condition being evaluated is false, rest of row is skipped and evaluation continues on following row of the program. Last row is followed in a loop by the first row every second.

Syntax of *ID commands* is:

IDNr+E_Var,E_Temp1,E_Temp2,E_VoltageIn,DigIn1,DigIn2,A_Alert,A_SetVar,A_Main,SMStext

Where

- *IDNr* means identification of row with order number *Nr* in range 1 to 6,
- + sign indicating to add particular row.
- *E_Var* is a value of system variable, which is being compared with the current value of the system variable - evaluation is true when both values are equal.
- *E_Temp1* and *E_Temp2* means evaluation condition for Temperature Input 1 and 2, each having syntax beginning with condition symbol (< or >) followed by sign (+ or -) of positive or negative value and by the value itself, having one or two numerals with one decimal place - AB.C or A.B, zero value must be entered as 0.0. Some examples:

<+25.5 condition will be true if input temperature is lower than 25.5 °C
>+103.5 condition will be true if input temperature is higher than 103.5 °C
<-3.7 condition will be true if input temperature is lower than -3.7 °C
* evaluation will be ignored, like if it is always true

- *E_VoltageIn* means evaluation condition for VoltageIn input, having syntax beginning with condition symbol (< or >) followed by the value in Volts itself. Some examples:

<5 condition will be true if voltage at the VoltageIn input is lower than 5V
>12 condition will be true if voltage at the VoltageIn input is higher than 12V
* evaluation will be ignored, like if it is always true

- *DigIn1* and *DigIn2* means evaluation condition for state of Digital Input1 resp. 2 – evaluation is true, when current input state equals to the specified state. Some examples:

1 condition will be true if particular Digital Input is in logical High state
0 condition will be true if particular Digital Input is in logical Low state
* evaluation will be ignored, like if it is always true

- *A_Alert* means action to send an alert, possible values are:

S SMS message with SMStext content will be sent to all phone numbers predefined by *ALARM* command. SMStext can contain up to 10 characters.

R Ringing of all numbers predefined by *ALARM* command, for time predefined by *RINGONTIME* command.

* Represents no Alert action

In case of *ALARMS* were not defined, action *A_Alert* will be ignored.

- *A_SetVar* means action to set a new value of the system variable.
- *A_Main* means action with the Main switched output, possible values are:
 - TURNON Turn on Main switched output
 - TURNOFF Turn off Main switched output
 - RESTART Change (negate) status of Main switched output for time preconfigured by command *RESTARTTIME*.
- *SMStext* defines text to be sent by *A_Alert* action, can contain up to 10 characters. If a star symbol * is entered, text of alert will be the same as text of *STATUS* message.

Following table summarizes use of *ID* command:

SMS Command	Description	SMS Response	Type
IDLIST	Get list of all program rows	ID1+0, *,*,*,*,1,*,1,TURNON,* ID2+0, *,*,*,1,*,*,1,TURNON,* ID3+1, *,*,*,0,0,*,0,TURNOFF,*	Ctrl
ID+.....	Insert a program row, see above for syntax and examples bellow.	ID+....., OK	Ctrl
IDNr-	Delete program row number Nr. Nr can be in range from 1 to 6.	IDNr-, OK	Ctrl
ID0-	Delete all program rows.	ID0-, OK	Ctrl

Once program rows were entered into IQSD-GSM, use command *PROGRAM* to start its execution.

SMS Command	Description	SMS Response	Type
PROGRAM=START	Start execution of the program	PROGRAM=START, OK	Ctrl
PROGRAM=STOP	Stop execution of the program	PROGRAM=STOP, OK	Ctrl
PROGRAM?	Get current configuration of PROGRAM, active setting is in () parentheses.	PROGRAM=(STOP),START	Ctrl

Please note program is executed in loop with 1s periodicity. Detection of change on inputs with duration shorter than 1 second is then unreliable. Typically 1s periodicity is OK for detection of alarm impulse from a PIR sensor, but it is not recommended to use program for detection of events with shorter than 1s duration.

Examples of program scripts:

Example 1 – Thermostat

When temperature at Temp1 sensor rises beyond 25.5°C, send SMS alert containing STATUS text and switch off Main switched output. When temperature falls bellow 15.1°C, turn the Main switched output on and ring my phone number up.

Lets' predefine the phone number at first by sending following SMS command:

ALARM+421903123456

Then enter following two program rows:

*ID1+0, >25.5, *, *, *, *, S, 1, Turnon, **

*ID2+1, <15.1, *, *, *, *, R, 0, Turnoff, **

And then let's start the program issuing SMS command:

PROGRAM=START

When needed, program can be stopped by command:

PROGRAM=STOP

Example 2) – Observing a state of a contact sensor, e.g. door contact

Once there is a change of state on Digital Input1, send to my phone number SMS message with text "Open" and "Closed"

Lets' predefine the phone number at first by sending following SMS command:

ALARM+421903123456

Then enter following two program rows:

*ID1+0, *, *, *, 1, *, S, 1, *, Closed*

*ID2+1, *, *, *, 0, *, S, 0, *, Open*

And then let's start the program issuing SMS command:

PROGRAM=START

When needed, program can be stopped by command:

PROGRAM=STOP

Example 3) – PIR sensor application

Once there is an impulse (input going from steady log1 to log0 for a short period of time) of state on Digital Input2, ring my phone number up.

Lets' predefine the phone number at first by sending following SMS command:

ALARM+421903123456

Then enter following two program rows:

*ID1+0, *, *, *, *, 0, R, 1, *, **

*ID2+1, *, *, *, *, 1, *, 0, *, **

And then let's start the program issuing SMS command:

PROGRAM=START

When needed, program can be stopped by command:

PROGRAM=STOP

Example 4)

When there is Log.1 level at both digital inputs, restart the Main switched output (cut the power for an appliance for a couple seconds)

Enter following two program rows:

```
ID1+0, *,*,*,1,1,*,1,RESTART,*
ID2+1, *,*,*,0,*,*,0,*,*
ID3+1, *,*,*,*,0,*,*,0,*,*
```

And then let's start the program issuing SMS command:

PROGRAM=START

When needed, program can be stopped by command:

PROGRAM=STOP

Example 5)

When there is Log.1 level at any digital input, switch on the Main switched output. When there is Log.0 level at both inputs, turn off the Main switched output.

Enter following two program rows:

```
ID1+0, *,*,*,*,1,*,1,TURNON,*
ID2+0, *,*,*,1,*,*,1,TURNON,*
ID3+1, *,*,*,0,0,*,*,0,TURNOFF,*
```

And then let's start the program issuing SMS command:

PROGRAM=START

When needed, program can be stopped by command:

PROGRAM=STOP

3.11 Various settings

SMS Command	Description	SMS Response	Type
CONFIG	After this command, it is again possible to issue configuration commands, like if device is freshly turned on.	CONFIG, OK	Ctrl
OUTPUT=REMEMBER	When device is powered on, Main switched output is set to the same state as was when device was powered off	OUTPUT=REMEMBER- OK	Cfg
OUTPUT=NC	When device is powered on, Main	OUTPUT=NC- OK	Cfg

	switched output is in TurnedOn state – contacts C and NC connected		
OUTPUT=NO	When device is powered on, Main switched output is in TurnedOff state – contacts C and NO connected	OUTPUT=NO- OK	Cfg
OUTPUT?	Get configuration of OUTPUT parameter, active setting is in () parentheses.	OUTPUT =(REMEMBER),NC,NO	Cfg
VERSION	Get firmware version	Ver. 1.1.1 @2009	Ctrl

Please note firmware can be currently upgraded only by sending unit back to the factory or to an authorized service center.

3.12 Error messages

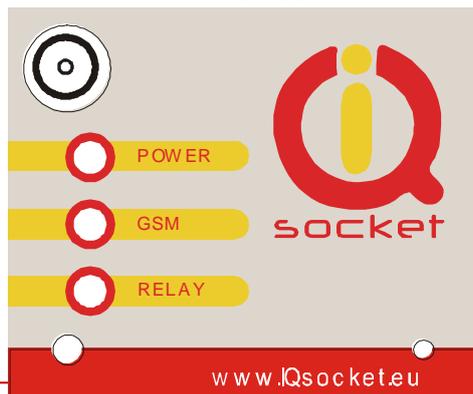
Error messages are being sent only when sending response messages is permitted (see *ERRORREPLY* command).

SMS response	Description
Error!	Incorrect control or configuration command; or wrong SMSPIN
Not allowed!	In case of permitted phone numbers list is active but used number is not included in it.
Timeout!	10 minutes interval since power on or since last configuration command has timed out. In order to continue using configuration commands, you must either power on the device again or use <i>CONFIG</i> command.
Full memory!	Memory for storing permitted phone numbers is full.
no number	When trying to get permitted phone number list but the list is empty.
No record	When trying to delete non-existing items or records, scheduled tasks or program rows.

4 Indicators

4.1 Indication of operation state

IQSD-GSM is equipped with three LED indicators:



- **POWER** – red color, steady lighting is indicating presence of AC mains (230v AC) voltage.
- **GSM** – green color, blinking every second indicates searching for a GSM network in progress; blinking every three seconds indicates successful logging into a GSM network. Very fast blinking (about twice per

second, 0.5s on/0.1s off) indicates an outgoing call in progress, e.g. a ringing alert in case of alarm or during *RINGON* command.

- **RELAY** – yellow color, indicates state of Main switched output relay: steady lighting means turned on - connected contacts C and NO; not lighting means turned off – connected contacts C and NC.

4.2 Indication of error state

- **POWER** – red color, blinking fast about twice per second indicated SIM card is not inserted. When battery is deeply discharged (voltage under 3.65V), charging process will start, which is indicated by slow blinking (1.5sec on/ 0.1sec off). When battery reaches usable voltage (3.75V), GSM module is powered on and device is fully enabled.
- **GSM** – green color, blinking fast about twice per second indicates SIM card with active PIN authorization. It is necessary to disable the PIN authorization using a GSM phone.
- **RELAY** – yellow, blinking fast indicated a HW failure.

5 Factory default settings

Each device come from factory preconfigured with factory default values. Device can be anytime returned back to these default values by using reset to factory defaults procedure.

5.1 Reset to factory default procedure

Reset is done by pushing the push button located in bottom left corner at the front panel. See also chapter 3.5.

By pressing of the push button for longer than 2 seconds but shorter than 5 seconds, all LED indicators start blinking, when the push button is pressed again during LED blinking, IQSD-GSM configuration will be set back to factory default values. After this step is your device in original factory configuration.

BE CAREFULL! This step will erase all your IQsocket configuration.

5.2 Factory default settings

Parameter	Default setting
RING	NOACTION
RESTARTTIME	10
RINGONTIME	30
SMSPIN	NOPIN
SECNUMBER	NO
SMSCONFIRM	YES
RINGCONFIRM	NO
ERRORREPLY	YES
BATALARM	00,00,00
POWERFAULT	NO
PROGRAM	STOP
OUTPUT	REMEMBER

6 Technical specification

Model	IQsocket IQSD-GSM
Mains power	230VAC / 50Hz, 15mA
Backup battery	4.2V Li-Ion
Switched Outputs	MAIN 230V, 10A max (resistance load) AUX 230V 100mA (resistance load)
Inputs	2x Digital, optic-isolated, max. 30V input, detection threshold 1V 1x Analog voltage sensing 0-30VDC/0-24VAC. Resolution 1V 2x Temperature sensor inputs, 1-Wire, for Dallas DS18B20 sensor
Voltage outputs	5VDC/100mA, protected by auto-resettable fuse 12VDC/80mA, non-protected! 4.2VDC/1A, non-protected!
Management	Via SMS messages
Security	PIN code protected commands Permitted phone numbers list
Detectors	Inbuilt thermometer Alarm input for external detectors (motion, gas, water, fire, door/Windows, and more.)
GSM	EGSM900, GSM850 Class4 (2W) DCS1800, PCS1900 Class1 (1W) SIM card Plug-in 3V External 2dBi antenna via SMA connector
Indicators	POWER: red LED GSM: green LED RELAY: yellow LED

Features	Appliance control over SMS, by call or manually Remote restart of appliances Temperature monitoring Digital sensors monitoring Analogue sensor monitoring Programmable event-driven controller Alarm detection Monitoring of sound using integrated microphone
Dimensions	90x53x58mm
Weight	0.1kg netto
Operating temperature	0 to +50 °C
Humidity	Max. 80%, non-condensing
Operating temperature	0 to +50 °C
Mounting	DIN rail (35mm, EN50022), 3 modules wide
Compliance	CE

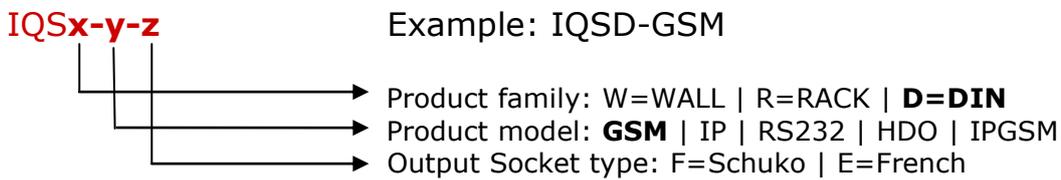
6.1 Operation, maintenance and safety recommendations

- Do not modify product in any way and do not operate product modified any way. Warranty is void when product was disassembled or modified in any way.
- Product is not fused; ensure it is installed in fused electric installation only.
- Product is not intended as security device, alarm functions are just auxiliary.
- Product can be operated only indoor office/house environment. Do not expose it to humid, wet nor chemically aggressive environment.
- Product is not designed for industrial operation with aggressive environment.
- Before use, please check, if mobile phones can be used in the area. In not, please don't put product into operation, it can have negative influence to other electronic systems.
- Don't expose product to vibrations, shaking or fall downs to avoid product damage.
- When use sound monitoring for taping purposes, ensure you have prior permission to do it from affected people.
- Load current 10A/0.1A is valid for resistive load. If you need to switch an non-resistive or higher current load, use an external contactor rated for target load among the product. Switching a non-resistive load or higher than nominal rating currents can cause permanent damage of switching elements, which is not covered by warranty.

- Before using a SIM card, ensure all received SMS messages stored on the card are deleted.
- Product is not a toy for children, SIM card represents a small part that can be easily ingested.
- WARNING: This product is not designed for use in, and should not be used for, medical applications.

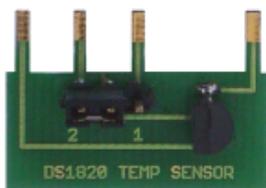
7 Ordering and accessories

IQsocket product family uses following ordering code system:



Optional accessories

Code	Description
TEMPDIN1820DPS	PCB with temperature sensor
TEMPDIN1820A	Temperature sensor with metal housing, 1m cable



TEMPDIN1820DPS



Detail of installation



TEMPDIN1820A