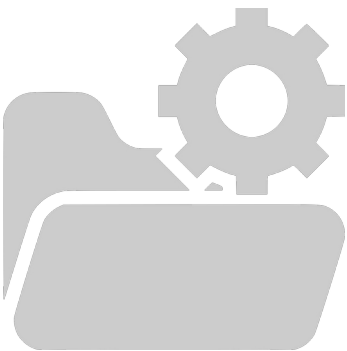


# AG-811

CCMS gateway with timer, 3 outputs and LTE



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## 1. Introduction

The AG-811 is a Gateway dedicated to work with central controlling and monitoring systems. It supports two-way communication with server through LTE/GSM or Ethernet<sup>1</sup>. It has inbuilt timer with 10 ON/OFF schedule within 24h, auto configurable sunrise/sunset timer based on geolocation and has 3 independent relays with NO/NC outputs. Every output can be controlled by separate time schedule. Gateway has isolated Modbus RTU interface to communicate with energy meters, PLCs and other Modbus devices. Can be configured by: internal website, SMS, string from server and configuration file loaded in predefined URL. For accurate time and location it has GPS and RTC.

Gateway is for use in street light control panels and other application where it is needed to control accurate on/off time with support of Modbus devices. It can be controlled remotely from server or via SMS or also work in stand alone mode.

The AG-811 has advance alert option with 10 mobile number list for SMS alerts. In SuperCap models there is power backup with power loss alert facility.

### 1.1. Control from server overview

The AG-811 Gateway can be controlled via TCP commands from server. All Modbus queries can be controlled from server. In addition Gateway has support of JSON string format but limited to Modbus device interface. JSON communication is one way communication dedicated mostly to energy meters and sensors. In case of failure of GSM communication, Gateway has capability to store records in internal memory and sending archive data to the server after communication is reestablished for continuous energy monitoring. This option is available only in JSON string format. It is not supported by TCP/IP communication. TCP/IP communication can control all modbus features, send commands and control any device like PLC in real time.

### 1.2. Control and configuration option list

Gateway can be controlled through:

- Commands from TCP/IP server
- SMS

Configuration of Gateway can be done through:

- Internal website
- Configuration file from URL
- Commands from TCP/IP server
- Configuration file from predefined URL

### 1.3. Table of supported functions by different types of interface

Sn	Functions	www	TCP/IP	SMS	JSON
1	ABC outputs direct control	√	√	√	
2	ABC outputs schedule configuration	√	√	√	

<sup>1</sup> The current firmware version does not support SSL over Ethernet

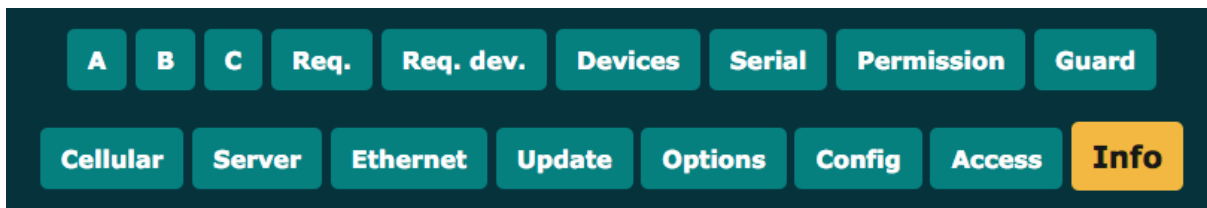
3	ABC outputs astronomical schedule configuration	√	√	√
4	ABC output Event status checking: instant action, once action	√		√
5	Modbus testing	√		√
6	Modbus configuration: address, register, ID, endian, timeout	√		
7	Modbus direct remote control		√	
8	Serial interface configuration: baud rate, data bit, parity, stop bit.	√		
9	Modbus device data		√	√
10	Modbus device archive data			√
11	Modbus direct device control from server		√	
12	Mobile number permission and roles	√		√
13	GSM configuration: APN, user, password	√		√
14	GSM signal strength	√	√	√
15	Device phone number	√		√
16	Testing mobile network: send SMS, make call	√		
17	TCP/IP server configuration: IP, port, update interval	√		√
18	JSON server configuration: URL, token/key, update interval, archive update interval	√		√
19	Ethernet configuration: IP, mask, gateway, DNS1, DNS2	√		√
20	Locally update firmware by LAN	√		
21	Configuration update firmware URL	√		√
22	Start remote update from URL		√	√
23	Time zone configuration	√	√	√
24	Time configuration	√	√	√
25	Device configuration backup	√		
26	Device configuration restore	√		
27	Device configuration from URL setting	√	√	√
28	Start device configuration from URL	√	√	√
29	Set access via LAN, user name, password	√		√
30	Restart Gateway	√		√
31	Device default (factory reset)	√		√

## 2. Configuration and control by internal website

### 2.1. Login to internal website

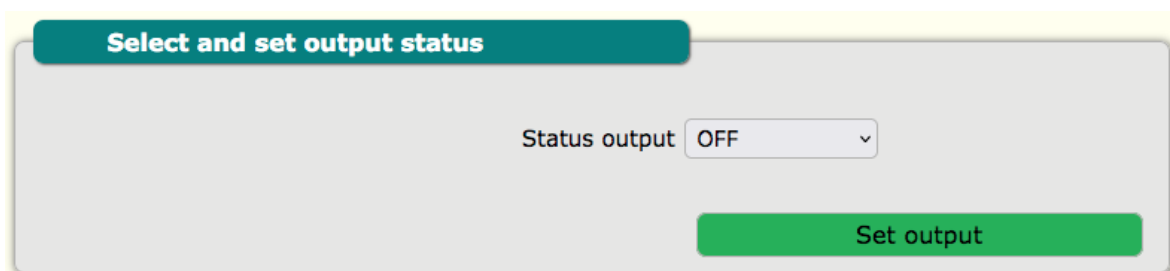
To enter internal website of Gateway make proper LAN connection and in browser address tab enter Gateway IP. The default IP is 192.168.10.50. User name is atreyo and password atreyo. In the main menu are:

- A, B, C – for digital outputs
- Req – request modbus device
- Req. dev. – request modbus device
- Devices – RTU configurations devices
- Serial – configuration serial communication
- Permission – permission configuration for mobile numbers
- Guard – for monitoring communication and activity
- GSM – GSM, LTE, GPRS configuration like APN, password etc.
- Server – server configuration
- Ethernet – Ethernet configuration
- Update – upload firmware and remote update configuration
- Options – for date, time, location, default etc.
- Config – backup, restore and remote configuration.
- Access – access configurations for internal website
- Info – main page with information about model, firmware version etc.



### 2.2. Manual ABC outputs control by website

There is individual tab for each output channel A, B, C. User can change status of output using internal website. This facility is for testing of outputs.



### 2.3. Channel functionality configuration

There are 2 options of channel functionality:

1. Instant action
2. Once action

If there is selected instant action the system is checking the schedule time table for this output every few second and correct the output status accordingly. We choose this configuration when we want to control the Gateway from internal schedule. In this mode of configuration the SMS and server commands on/off command are not working.

Once action allow to control by SMS, but in case of power failure the device will not return to previous status of outputs.

#### Channel functionality selection

Set **Instant Action** if you want to use this channel on live refresh.  
Set **Once Action** if you want to control channel via SMS.

Event status checking

### 2.4. Schedule configuration of outputs A, B, C

In order to set the time of switching ON/OFF the Gateway A, B C outputs, all parameters for each output must be set separately. User also needs to select whether to use a given configuration. Maximum 10 schedulers can be added for every output.

**Channel 'A' timer settings**

	Use	On				---	Off			
		Hour		Minute			Hour		Minute	
	<input checked="" type="checkbox"/>	23	22	---	---	06	35			
	<input type="checkbox"/>	[ ]	[ ]	---	---	[ ]	[ ]			
	<input type="checkbox"/>	[ ]	[ ]	---	---	[ ]	[ ]			
	<input type="checkbox"/>	[ ]	[ ]	---	---	[ ]	[ ]			
	<input type="checkbox"/>	[ ]	[ ]	---	---	[ ]	[ ]			
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	<input type="checkbox"/>	[ ]	[ ]	---	---	[ ]	[ ]			
	<input type="checkbox"/>	[ ]	[ ]	---	---	[ ]	[ ]			
	<input type="checkbox"/>	[ ]	[ ]	---	---	[ ]	[ ]			
	<input type="checkbox"/>	[ ]	[ ]	---	---	[ ]	[ ]			

Save channel

### 2.5. Astronomical schedule

The astronomical schedule is 2 ON and 2 OFF option for each output.

**Channel 'A' sunrise / sunset timer settings**

	Use	Timer	On				---	Timer	Off			
			Time of day	Action	Hours	Minutes			Time of day	Action	Hours	Minutes
	OFF	Sunset	Add	[ ]	[ ]	---	---	Sunrise	Add	[ ]	[ ]	
	OFF	Time	None	[ ]	[ ]	---	---	Time	None	[ ]	[ ]	

Save daylight

### 2.6. Req - Modbus request section

This section is for testing communication with modbus device. You can enter request in HEX format and get response from modbus device.



## 2.7. Req. dev. – Request device log

In this section is visible log of modbus devices. In this tab is optional feature to make support for Selec<sup>®</sup> company meter without necessity to set modbus device details. In window the reply from Selec<sup>®</sup> device will be visible. Now 2 models of meters are supported MFM383 and EM2M.

## 2.8. Devices – Modbus devices

Modbus devices configuration of modbus devices connected to Gateway. Configuration of: device ID, register, endian, start address, offset address, registers, timeout. It can add multiple devices up to maximum 16.

Sn	Parameter	Details information
1	Use	To activate device configuration
2	Modbus Device ID	The ID of modbus device. 01 up to FF.
3	Register structure	8 bit UINT, 16 bit UINT, 32 bit UINT, 8 bit INT, 16 bit INT, 32 bit INT, 32 bit float, 16 bit HEX, 32 bit HEX, Array HEX
4	Endian Structure	ABCD, BADC, CDAB, DCBA
5	Start address	First Modbus register address
6	Offset address	Offset address for add or subtract of actual query address, according to slave device data storage system
7	Number of registers	How many registers needed to query

8 Timeout [ms]

Response time-out for query

**Modbus RTU devices configuration**

Use	MODBUS Device ID	Register structure	Endian structure	Start address	Offset address	Number of registers	Timeout [ms]
<input checked="" type="checkbox"/>		32 bit UINT	DCBA				
<input checked="" type="checkbox"/>		8 bit UINT	ABCD				
<input checked="" type="checkbox"/>		8 bit UINT	ABCD				

Example for query: 01 04 00 00 00 28 F0 14

In this example F0 14 is checksum CRC-16 big endian.

**Modbus RTU devices configuration**

Use	MODBUS Device ID	Register structure	Endian structure	Start address	Offset address	Number of registers	Timeout [ms]
<input checked="" type="checkbox"/>	01	32 bit float	CDAB	30001	30001	40	900

### 2.9. Serial – Configuration of serial communication

In this section are RS485 parameter configuration: baud rate, data bit, parity and stop bit.

Sn	Parameter	Option/range
1	Baudrate	2400 to 460800
2	Data bit	8, 9
3	Parity	None, Even, Odd
4	Stop bit	1, 1.5, 2

**Serial interface configuration**

Baud

Data Bit

Parity

Stop Bit

### 2.10. Permission – Users phone number permissions and role

This tab is for permissions of mobile numbers to protect from unauthorised access via SMS commands. By default any number can access Gateway but after input of any number only number from list is able to control Gateway. Mobile number has roles of "normal" and

"emergency". Normal role allow to make control of Gateway, and emergency in addition is the emergency number for alerts. In AG-811 digital inputs high status is event for emergency SMS. It is possible to add maximum 13 telephone numbers. Number format with + before country prefix.

**Mobile number role configuration**

Phone number	Status
<input style="width: 100%;" type="text" value="+9837787878798"/>	<input style="width: 100%;" type="text" value="Emergency"/>
<input style="width: 100%;" type="text"/>	<input style="width: 100%;" type="text" value="Normal"/>

## 2.11. Guard

Guard has the ability to reset the device if it occurs: 1. no response to a ping from any IP entered, 2. no response from the server to which it sends data.

**Ping guard configuration**

LAN Connection is correctly working when guard is enable

Guard is

Enter the IP address of the device responding to the ping/ICMP (like gateway)

IP:

Set the number of erroneous replays every 1 min

Restart connection after:

**Server data guard configuration**

Restart LAN connection when it will not be data any packet from server for 60 minutes

Server TCP/IP guard

## 2.12. Cellular – Cellular network configuration

Configuration for mode of connection. Default is auto. But if you are using a SIM card that has only GPRS available, set the connection type to GPRS. If it has only LTE then select LTE and if it has both then you can leave it at auto.

**Cellular network mode selection**

Operating mode:  Auto  GPRS  LTE

GSM configuration include: APN, user and password.

**APN user and password**

APN:

User:

Password:

Gateway phone number is Gateway SIM card phone number. It is not necessary to provide this, but in future this information is accessible by TCP/IP and for maintenance is good practice to add this number.

**Gateway phone number**

Device phone number:

Cellular network testing is for testing of SIM card and network. You can add your number and Gateway will call or send SMS to this number. For this purpose, call and SMS support must be enabled with the mobile operator.

**Testing call and SMS service**

Enter the phone number:

LTE modem LOG for viewing LOG of modem. For diagnosis purpose.

**Modem data log**

...

### 2.13. Server – TCP/IP server configuration

TCP/IP server configuration section is for configuration of: server IP, server port and update interval.

**TCP/IP server configuration**

Server TCP IP:

Server TCP port:

TCP/IP server polling time interval configuration.

**Update interval**

Updating:

Interval [s]:

### 2.14. Server – JSON server configuration

JSON server configuration section is for configuration of server URL, token/key, update interval and archive update interval.

**JSON config for Modbus RTU data**

Server URL:

Token/key:

Update interval [s]:

Archive update interval [s]:

### 2.15. Ethernet – Ethernet configuration

Ethernet configuration for LAN. Default value is:

IP = 192.168.10.50, Mask = 255.255.255.0, Gateway = 192.168.10.1, DNS1 = 8.8.8.8, DNS2 = 8.8.4.4

**Ethernet configuration**

IP:

Mask:

Gateway:

DNS1:

DNS2:

## 2.16. Update - Firmware update

This section is for firmware update. The Gateway can update firmware from remote URL and locally direct by uploading BIN file with proper firmware. To load firmware click load firmware file and select firmware. After loading Gateway will automaticity restart. Firmware update in normal condition will not reset configuration.

**Upload firmware locally**

...

Click to load firmware file

Remote file update configuration is for update from server. It is possible to start update from server by clicking "update" button.

**Update remotely from the server**

Update file URL:

## 2.17. Options - General configuration - communication and other config

This section is for general configuration. Time zone configuration and enable/disable GSM network. Also here is an option to synchronize the Gateway RTC time with NTP servers. You can choose between LTE/GSM NTP server and LAN NTP server and none. LAN NTP server can be used when your network is not connected to the Internet. Then we should run the NTP server on the local server. In addition, the time can be set via SMS or commands from the server.

**General configuration**

Connection via interface

GSM

Time Zone

Synchronizing time

LAN NTP IP server

## 2.18. Options - Gateway identification number / name

This is an option for additional identification of the Gateway from the server side. You can enter your Gateway ID here.

**Gateway identification number / name**

Device ID:

## 2.19. Options - Date and time configuration

This section is for configuration of real time clock in Gateway. The time is taken from the time that is currently set on the computer.

**Time and date of the gateway**

SYSTEM PC TIME: 2022-06-17 14:29:12

DEVICE DATE TIME:

## 2.20. Options - Factory default - reset Gateway configuration

To make default all configurations of Gateway for safety reason type "Atreyo" in the tab and press "set default values".

**Gateway configuration reset - default**

Enter **Atreyo** below, to set the device to default values.

Confirm:

[Set default values](#)

**2.21. Options - GPS configuration**

Device GPS location tab is for configuration of Gateway location. In AG-811 there is inbuilt GPS but some time in case of problems with the GPS signal need to be selected "Manual GPS ON". This is necessary for the correct configuration of the astronomical schedule.

**GPS localization of gateway**

Manual GPS

Latitude:

Longitude:

[Find out how to enter coordinates](#)

[Atreyo headquarter Latitude:23.033537, Longitude:72.524789](#)

[Save GPS options](#)

**2.22. Config - Backup and restore configuration**

To backup all configuration of Gateway use this tab. The configuration file has checksum so do not edit configuration file in not dedicated PC software. Use dedicated Atreyo software.

**Backup configuration**

[Download configuration file](#)

For loading previous saved configuration from computer, select and load file:



**Restore configuration**

...

Click to select configuration file

### 2.23. Config - Remote configuration from server

This tab is for configuring URL of remote file with Gateway configuration. By clicking "get configuration" URL device will update from remote file.

**Configuration file url in server**

Config file URL:

Get configuration from URL Save config URL

### 2.24. Access - Password configuration

This section is for internal website access. Default password is **atreyo**.

**Change password**

User:

Password:

New password:

Retype new password:

Save

### 2.25. Access - User configuration

For user change. Default user is **atreyo**.

**Change user name**

User:

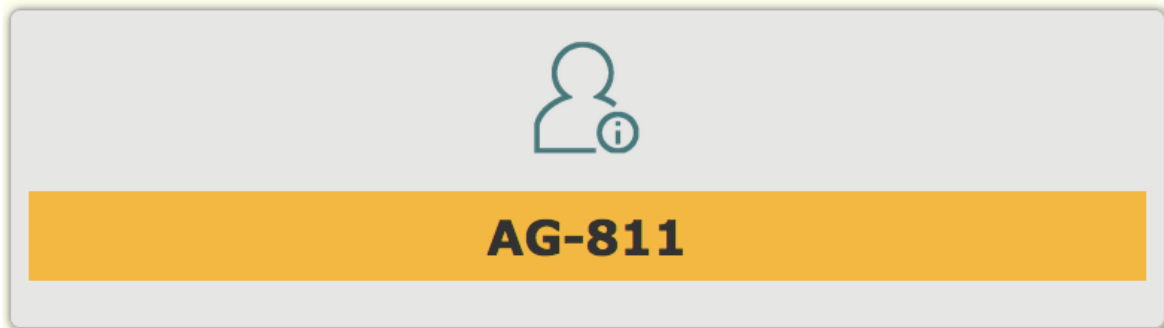
Password:

New user name:

Retype new user name:

## 2.26. Info

This is information screen about AG-801 with firmware version etc.



## 2.27. Digital input status

In this tab from info section can test digital input status.

STATE OF INPUTS

A:

B:

## 3. Info - Restart Gateway

By this tab you can restart Gateway.

RESTART DEVICE

## 4. Configuration and control by SMS

### 4.1. SMS overview

Many functions of the Gateway can be controlled by SMS commands. Remember that the SMS function is available from your cellular operator in the SIM in Gateway. Gateway responds to each command with an SMS informing that it will execute the command. SMS commands in server address configuration and password configuration are case sensitive. For all other commands it is case insensitive. The Gateway after processing command will send reply by SMS with confirmation.

### 4.2. System commands

Sn	Description	Command	Example
1	For status of Gateway, serial number etc.	STATUS	
2	To restart Gateway	RESTART	
3	To get info about some important commands	HELP	
4	Erasing whole data aggregating from Modbus devices	ERASEARCHIVE	
5	Make device default factory configuration	MAKEDEFAULT	
6	To set Gateway ID	MYID=	MYID=AG811-1
7	To get info about Gateway ID	MYID?	
8	Not in use	NAME=	
9	Not in use	NAME?	
10	Not in use	ADMIN=	
11	Not in use	ADMIN?	
12	Not in use	DEVUSER=	
13	Not in use	DEVUSER?	

### 4.3. Server commands

Sn	Description	Command	Example
1	To set server IP	SERVERIP=	SERVERIP= 231.23.4.216
2	To get info about server IP	SERVERIP?	
3	To set server port	SERVERPORT=	SERVERPORT=7301
4	To get info about server port	SERVERPORT?	
5	Poll time for TCP/IP poll. Format in seconds	SLTPOLL=	SLTPOLL=30
6	To get info about polling time configuration for TCP/IP	SLTPOLL?	
7	To set JSON server address	RTUSER=	http://example.com/rtu
8	To get info about JSON server address	RTUSER?	
9	To set token for JSON server	RTUTOKEN=	RTUTOKEN=kjakaj567\$
10	To get info about JSON server	RTUTOKEN?	

11	Poll time for RTU section. Format in seconds	RTUPOLL=	RTUPOLL=15
12	To get info about poll time for RTU section.	RTUPOLL?	
13	Poll time for RTU archive data section. Format in seconds	RTUPOLLARCH=	RTUPOLL=60
14	To get info about poll time for archive data from RTU	RTUPOLLARCH?	

#### 4.4. GSM commands

Sn	Description	Command	Example
1	To set APN for internet connection.	APN=	APN=internet
2	To get info about APN for internet connection	APN?	
3	To set APN user name for internet connection	APNUSER=	APNUSER=internet
4	To get info about APN user name for internet connection.	APNUSER?	
5	To set APN password for internet connection	APNPASS=	APNPASS=password
6	To get info about APN password for internet connection.	APNPASS?	

#### 4.5. Ethernet commands

Sn	Description	Command	Example
1	Set LAN IP of AG-811	LANIP=	LANIP=192.168.10.50
2	To get info about LAN IP	LANIP?	
3	To set LAN mask	LANMASK=	LANMASK=255.255.255.0
4	To get info about LAN mask	LANMASK?	
5	Set LAN Gateway	LANGATE=	LANGATE=192.168.10.1
6	To get info about LAN Gateway	LANGATE?	
7	Set DNS Primary	LANDNS1=	LANDNS1=8.8.8.8
8	To get info about LAN primary DNS	LANDNS1?	
9	Set DNS Secondary	LANDNS2=	LANDNS2=8.8.4.4
10	To get info about LAN secondaryDNS	LANDNS2?	
11	To get all info about network parameters	LAN?	

#### 4.6. Date, time and GPS configuration

Sn	Description	Command	Example
1	To set Gateway time. Always in format: HHMMSS or HH:MM:SS the dividing sign is meaningless - always format 24H	SETTIME=	SETTIME=060129 or SETTIME=06:01:29
2	To get info about internal RTC time	GETTIME?	
3	To set Gateway date. Always in format: YYYYMMDD or YYYY/MM/DD. The dividing sign is meaningless.	SETDATE=	SETDATE=20210218 or SETDATE=2021/02/18
4	To get info about RTC date	GETDATE?	

	To get info about internal RTC time and date	GETDATETIME?	
5	To set GPS manual (simulates hardware GPS)	GPSMANUAL=ENABLE or GPSMANUAL=E	
6	To set off GPS manual (simulates hardware GPS)	PSMANUAL=DISABLE or PSMANUAL=D	
7	To set latitude	GPSMANLAT=	GPSMANLAT=50.313168
8	To set longitude	GPSMANLONG=	GPSMANLONG=18.887417
9	To get info about longitude and latitude	GPS?	

#### 4.7. Firmware update via URL configuration file

Sn	Description	Command	Example
1	Command for start update from URL address	UPDATEGO=1	
2	Set URL address where is firmware file	UPDATEURL=	UPDATEURL=http:// example/update/gateway/
3	To get info about firmware update URL	UPDATEURL?	

#### 4.8. Configuration of update via URL configuration file

Sn	Description	Command	Example
1	Command for start update from URL address	CONFIGGO=1	
2	Set URL address of config file	CONFIGURL=	CONFIGURL=http:// example/config/gateway/
3	To get info about URL address of config file	CONFIGURL?	

#### 4.9. To set role and access permissions

After the default configuration of the device has an empty list, when someone adds a mobile number, this number gives the permission to add another one. (website config)

Sn	Description	Command	Example
1	Show list of enabled phone numbers with status, "emergency" status means alert notification - for inputs IN1 and IN2	USERLIST?	
2	Add user phone number to list with function - exception notification	USERADD=	USERADD=+919936612345 -E
3	Add user phone number for access to device	USERADD=	USERADD=+919936612345
4	Remove this phone number from the list	USERDEL=	USERDEL=+919936612345
5	set user name for access to internal website	HTTPUSER=	HTTPUSER=admin
6	show user name for access to internal website	HTTPUSER?	
7	Set password for access to internal website	HTTPPASS=	HTTPPASS=atreyo
8	Show password for access to internal website	HTTPPASS?	
9	Show user name and password for access to internal website	HTTPACCESS?	

#### 4.10. Digital inputs status

Sn	Description	Command	Example
1	To get status of digital inputs (reply will be like: INPUT A=ON B=OFF)	GETINPUTS?	

#### 4.11. Output direct control by SMS

If you like to control Gateway's outputs direct by SMS only you have to set "once action". This configuration has to be apply for ABC outputs separately. For working with server user needs to set "INSTANT".

Sn	Description	Command	Example
1	If you want to control A channel via SMS	ACTION-A=ONCE	
2	If you want to use this A channel on live refresh control by server application on internal timer.	ACTION-A=INSTANT	
3	To get info about action configuration of channel A	ACTION-A?	
4	If you want to control B channel via SMS	ACTION-B=ONCE	
5	If you want to use this B channel on live refresh control by server application on internal timer.	ACTION-B=INSTANT	
6	To get info about configuration of channel B	ACTION-B?	
7	If you want to control C channel via SMS	ACTION-C=ONCE	
8	If you want to use this C channel on live refresh control by server application on internal timer.	ACTION-C=INSTANT	
9	To get info about configuration of channel C	ACTION-C?	

#### 4.12. Output section

Sn	Description	Command	Example
1	Set OUT A to ON state	OUTA=ON	
2	Set OUT A to OFF state	OUTA=OFF	
3	To get info about state of OUT A	OUTA?	
4	Set OUT B to ON state	OUTB=ON	
5	Set OUT B to OFF state	OUTB=OFF	
6	To get info about state of OUT B	OUTB?	
7	Set OUT C to ON state	OUTC=ON	
8	Set OUT C to OFF state	OUTC=OFF	
9	To get info about state of OUT C	OUTC?	

#### 4.13. Output channel schedule section

Sn	Description	Command	Example
1	OUT A, schedule 1 turn ON	CHA1=ON	

2	OUT A, schedule 1 turn OFF	CHA1=OFF
3	OUT A, schedule 1 turn on 19:04	CHA1ON=19:04
4	OUT A, schedule 2, turn off 7:15	CHA2ON=7:15
5	OUT A, schedule 1 time turn on 7:00	CHA1OFF=7:00
6	OUT A, schedule 2 time turn off 9:30	CHA2OFF=9:30
7	Output B and C same as 'A'	replace 'A' with "B/C"
8	OUT A, schedule 2 turn ON	CHA2=ON
9	OUT A, schedule 2 turn OFF	CHA2=OFF
10	Output B and C same as 'A'	replace 'A' with "B/C"
11	OUT A, schedule 10 turn ON	CHA10=ON
12	OUT A, schedule turn OFF	CHA10=OFF
13	Output B and C same as 'A'	replace 'A' with "B/C"
14	In one SMS it possible to send all commands.	CHA1=ON CHA1ON=18:00 CHA1OFF=6:00
15	Completely manage few channel in one SMS. Maximum is 160 signs	CHA1=ON CHA1ON=18:00 CHA1OFF=6:00 CHA2=ON CHA2ON=19:00 CHA2OFF=7:00 CHB1=ON CHB1ON=17:00 CHB1OFF=5:00 CHC1=ON CHC1ON=18:30 CHC1OFF=6:30
16	Use these commands to find out how the channels are set show single channel content	CHDA1? CHDA2? CHDB1? CHDB2? CHDC1? CHDC2?
17	Show all channel content	CHDA? CHDB? CHDC?
18	To get info about CHANNEL A which schedules are active	CHA?
19	To get info about CHANNEL B which schedules are active	CHB?
20	To get info about CHANNEL C which schedules are active	CHC?

#### 4.14. Output channel astronomical schedule section

Sn	Description	Command	Example
1	Event when SUNRISE time on GPS device location	SUNRISE	
2	event 30 minutes after SUNRISE		SUNRISE,ADD,0:30
3	event 12 minutes before SUNRISE		SUNRISE,SUB,0:12

4	event when SUNSET time on device location	SUNSET	
5	event 83 minutes after SUNSET		SUNSET,ADD,1:23
6	event 80 minutes before SUNSET		SUNSET,SUB,1:20
7	event will occur on time 21:45		TIME,21:45
8	event will occur on time 0:07		TIME,0:07
9	ON when SUNSET; OFF when SUNRISE (note the separating characters)		CHDA1=SUNSET;SUNRISE
10	ON when SUNSET; OFF when SUNSET + 30 minutes		CHDA1=SUNSET,SUB,0:30; SUNSET,ADD,0:30
11	ON when SUNSET; OFF when SUNSET + 30 minutes		CHDA1=SUNSET;SUNRISE, SUB,1:20
12	ON when SUNSET; OFF when SUNRISE - 1:20h = 80 minutes		CHDA1=SUNSET;SUNRISE, SUB,1:20
13	ON when TIME is 22:00 ; OFF when SUNRISE		CHDA1=TIME,22:00;SUNRISE
14	ON when TIME is 21:45 ; OFF when SUNRISE + 20 minutes		CHDA1=TIME,21:45;SUNRISE,ADD,0:20
15	CHDA1=OFF		OFF this channel
16	All channels on device		CHDA1,CHDA2 CHDB1,CHDB2 CHDC1,CHDC2



## 5. Server commands

### 5.1. Overview

Gateway's main real time communication format is TCP/IP. All ON/OFF, digital inputs, most of other functions and configurations can be done from server by this protocol. The string format is small to provide quick response from Gateway. In the TCP/IP format it is possible to control Modbus interface from server.

### 5.2. TCP/IP server commands

Server command are in separate API document. Go to [product page](#) for download

## 6. JSON format

### 6.1. Overview

The gateway is capable of sending the Modbus slave device's data to the server in JSON string format. The implementation of JSON is a very easy task on server side.

### 6.2. JSON format benefits

- Easy to use and interpret data
- Have built in device id and time stamp for easy traceability
- Faster data parsing
- Archive data availability

### 6.3. JSON string format

The JSON string format is provided in separate document.

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