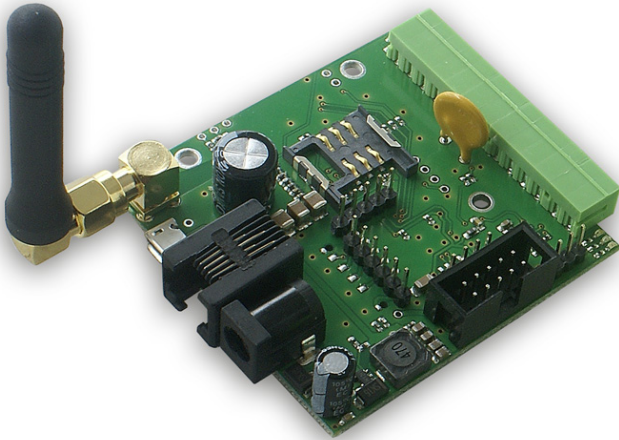# GSM Controller v3.0

Manual
for firmware 3.15 and subsequent

GSM Controller

GSM v3 controller allow monitor by gsm network different phisical parameters and control remotely on/off 5 outputs. Control is done through SMS messages and monitoring can be run by SMS or gprs data transmission to internet server. Http datas can be sent for example to www.thingspeak.com server, where are not only collected but can be read as dynamically presented graphs. Further GSM controller functionality is action automating. After simple set up when some input parameters reach the set size, outputs actions will be performed, eg send a message or switching outputs.

Examples

ISP
• control power supply - notification of his disappearance
• reserve battery voltage control
• temperature control or the presence of people in the server and I reaction

Home automation
• automatic control of the radiator and notification of status or temperature
• control on / off lighting or other devices remotely or by part program
• simple alarm system notification

Fittings
• temperature control and possible notification, switching valve, etc.
• monitoring of voltage and possibly automatic switching to source spare

Monitoring for Environment and agriculture
• collection of environmental data with the extensive grounds
• the meteorological monitoring

RESTARTER, MONITOR, WATCHDOG, CONTROLLER

BASIC POSSIBILITIES:

- management by SMS or USB (after connecting to computer),
- monitoring by gprs transmission to http server, by SMS received on user phone or by USB,
- upgrade new firmware by USB port
- monitoring logic states, for example move sensors, position detectors
- measurment of voltage, temperature, humidity i and many more by analog voltage inputs
- pulse counting on INP4D
- transistor output (up to 1A), possibility to connect additinal board with 4 realys or PoE injector with power switching
- SMS or http notification about logical inputs
- supported sensors: PT1000, DS18B20, DHT22 (temperature and humidity)
- up to 99 phone numbers in memory allowing to controll - solution for gate opener in restricted areas
- command authentication by password
- remote power supply measurement.

The default authorization code is „1234",

Technical specification

- GSM module bands   900 / 1800 / 1900 MHz
- SIM interface   1,8 and 3V
- USB interface   virtual COM port (115200, 8 bits, 1 bit stop, no parity, no parity and flow control)
- other interfaces   1-Wire (RJ11), SPI, I2C, UART
- transistor out   1 x 1A / turn on supply voltage
- OC outs   4x outs open collector type, transistor BC847B (45V-100mA)
- logical inputs   4 pcs., max. 20V
- analog inputs   3 pcs., 2x voltage 0÷3,6V, 1x voltage 0÷36V
- temperature meas.   1x PT1000, 1 wire sensors x8 DS18B20
- antenna   attached
- input power supply   6÷28V DC, socket size 5,5 mm
- power consumption   0.3W without GSM transmission
- operational temp.   from −20 to +70 °C
- board size   68 x 61 mm
- board weight   57g

INPUT/OUTPUT:

- **1 TRANSISTOR OUTPUT:**
  to power other devices, it gets voltage from the power supply, max 28V - 1A

- **4 OUTPUT open collector type (transistor BC847B):**
  for switching relays, PoE ports, or other devices;

- **4 LOGICAL INPUTS:**
  to monitor other devices, such as power supply units, the reed switches.
  Cooperation with the outputs of OC, NO, NC

- **4 ANALOG INPUTS, 12-bit converter**
  INP1A: voltage measurement to 35V
  INP2: voltage measurement to 3.3V
  INP3: voltage measurement to 3.3V

- **PT1000:**
  for connecting a temperature sensor PT1000

- **SENSOR INTERFACE for DHT22:**
  humidity measurement

- **BUS 1-Wire (RJ11 connector):**
  for connecting the sensor DS18B20, max 8 pieces,

- **USB BUS:**
  to configure the module, a preview of sensors and software updates

- **I2C BUS:**
  for connecting additional sensors, expansion platelets,
  not supported in version 1.0.

- **UART INTERFACE:**
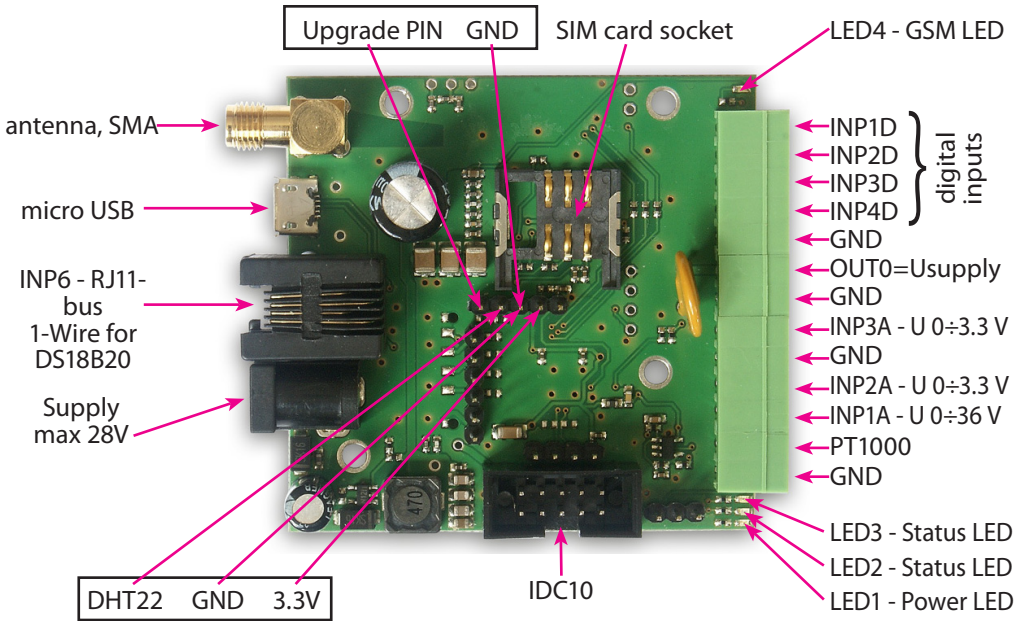 for connecting additional sensors, expansion platelets,
  not supported in version 1.0.

- **SPI INTERFACE:**
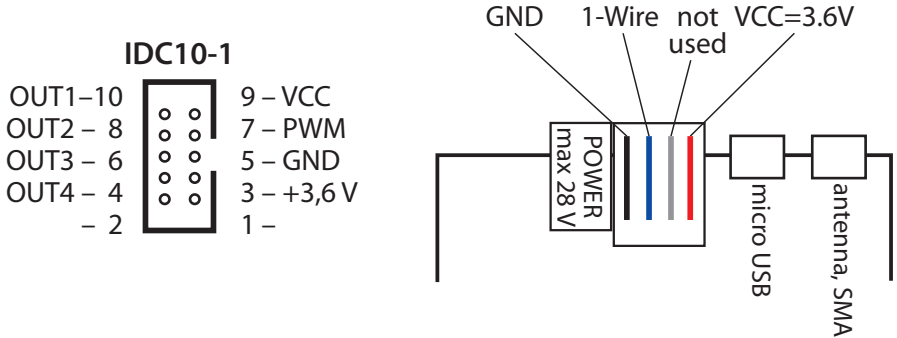 for connecting additional sensors, expansion platelets,
  not supported in version 1.0.

PINS and COMPONENTS DESCRIPTION

Upgrade PIN   GND   SIM card socket   LED4 - GSM LED

antenna, SMA

micro USB

INP6 - RJ11-
bus
1-Wire for
DS18B20

Supply
max 28V

INP1D
INP2D
INP3D
INP4D
digital inputs

GND
OUT0=Usupply
GND
INP3A - U 0÷3.3 V
GND
INP2A - U 0÷3.3 V
INP1A - U 0÷36 V
PT1000
GND

LED3 - Status LED
LED2 - Status LED
LED1 - Power LED

DHT22   GND   3.3V   IDC10

PIN / Component	Description
Power	Power supply 6V ÷ 28V DC
LED1 – Power (green)	Shine LED means power on board
LED2 – Status (red)	Shine with LED3 after start - wrong PIN. Blink when command is running
LED3 - Status (amber)	Fast blinking when system starts up, 1 flash per second means system logged and ready to work
LED4 – GSM (green)	Start fast blinking when GSM module starts up, flashes slowly when in base station range
IDC10	To connect additional relay board
INP1÷3D	Logical inputs
INP4D	Logical input, pulse counter
GND	General ground
OUT0	Transistor output (+), voltage = power supply, max 1A
INP3A	Input for voltage measure 0 ÷ 3.3V
INP2A	Input for voltage measure 0 ÷ 3.3V
INP1A	Input for voltage measure 0 ÷ 35V
PT1000	Input for PT1000 sensor for high temperature measure
DHT22	To connect the humidity sensor DHT22
micro USB	For managing and software updating
Upgrade PIN + GND	For software updating - activates Bootloader mode

IDC10 and RJ11 (bus 1-Wire):

IDC10-1

OUT1–10		9 – VCC
OUT2 – 8		7 – PWM
OUT3 – 6		5 – GND
OUT4 – 4		3 – +3,6 V
– 2		1 –

GND   1-Wire   not   VCC=3.6V
used

POWER max 28 V

micro USB

antenna, SMA

DESCRIPTION OF COMMANDS:

Commands can be issued by SMS or via a dedicated application or any terminal (eg Hyper-terminal in Windows) that supports COM serial ports.

The command issued by the SMS is:
authorization code: command = parameters

for example:
1234:reboot=1,2,t3 – activates output 1 and 2 for 3 seconds.

Commands issued by the terminal are not preceded by an authorization code, authorization code we give only the first time you log in after turning on the device. The command help (available only through the terminal) displays all available commands.

Commands can be read and write or read-only, read-only commands given without any arguments.

Command to read and write must have parameters:
to record the equal sign „="
for reading question mark „?"
for example:
time=4 – sets the default time switching outputs for 4 seconds,
time? – reads the set time.

LIST OF COMMANDS:

1. **reboot** – activates certain output / output for the specified time
Examples:
reboot=3,4 – will switch outputs 3 and 4 to the default time set by the command "time";
reboot=1,0,3,t34 – activates output 1, 0 (transistor output), 3 at time 34 seconds;
reboot? – reads the current state of the outputs, to check whether switching time set has already elapsed

2. **on** – output activates
Examples:
on=1,2,3,4,0 – turns on all outputs
on=0 – activates only output 0 (transistor)

3. **off** – output switched off
Examples:
off=1,2 – off output 1 and 2

4. **time** – sets the default output switching, as we spend reboot command without a parameter t

5. **code** – sets the authorization code, by default 4 digit code 1234;

6. **pin** – set a 4-digit PIN on your SIM card, if the card requires a pin. You need to set the pin as a set card. NOTE: The command does not change the pin on the card itself

7. **inpd** – reads the state of the digital inputs (logic), read-only command

8. **outs** – reads the current state of the outputs, the command read-only

9. **number** – sets one of the 100 telephone number that will be able to execute when you call on the device. Up to 12 digits. In addition to the first four numbers (from position 1 to 4) will also be sent SMS messages (if enabled monitoring logic inputs) in the case of changes in the inputs. The number of phone numbers (1 to 4) which will be sent SMS, define command **acnumber**.
Examples:
number=1:666777888 – sets the phone number for the first position
number?1 – reads the number of the first position

10. **acnumber** – sets the number of active phone numbers for SMS alerts

11. **call** – sets the function called when dialing device
Examples:
call=reboot=1,2,t3 – when dialing reboot function will be called with parameters as given

12. **remouts** – enter the value of 1 causes the output states when remembering switched on again

13. **uptime** – shows the amount of time elapsed since the inclusion of the device, read--only command

14. **name** – sets the name of the device, max. 32 characters
Examples:
name=home device

15. **upgrade** – runs the bootloader mode to update the software, flash simultaneously LED2 and LED3, to update special software is needed, the command without parameters

16. **desinpd** – content of the notifications sent when changing the state of the logic inputs
Examples:
desinpd=1:0:test content – sets the content for INP1D, sent the high state on this input
desinpd=1:1:content test2 – sets the content for INP1D, sent the low state at this input
desinpd?1 – reads the setting content for INP1D
desinpd=2:0:test content – sets the content for INP2D, sent the high state on this input

17. **desanalog** – content of the notifications for the analog inputs, the numbers are:
1–VIN,
2–PT1000
3–INP1A,
4–INP2A,
5–INP3A
The software 1.0 notifications only come to the VIN (supply voltage)
Examples:
desanalog=1:0:test content – sets the content of the VIN (voltage), if exceeded more than set
desanalog=1:1:test content2 – sets the content of the VIN (voltage) if it is dropped below the set
desanalog=2:0:test content – sets the content for the PT1000, if exceeded more than set

18. **monitoron** – enables monitoring of the selected logic input
Examples:
monitoron=1,2,3,4 – enables monitoring of all four inputs
monitoron=1 – enables monitoring only INP1D if the previous were previously on, it is necessary to disable the command **monitoroff**
monitoron? – verify that the inputs are included to monitoring

19. **monitoroff** – disables the monitoring logic inputs
Examples:
monitoroff=1,2 – off input monitoring INP1D and INP2D, will not be a notifications in changed states of these inputs

20. **version** – shows the current versions of the hardware (HW) and software (SW), read--only command

21. **adcprint** – displays the status of each input every 2 seconds, the command works only in the terminal
Examples:
adcprint=1 – automatically displays the values of VIN, PT1000, INP1A, INP2A, INP3A, DHTT (DHT temperature), DHTH (DHT humidity) for the voltage to obtain a result in volts value

must be divided by 100, for PT1000 and DHT divided by 10.

adcprint=2 – displays the values directly (without any conversion to a voltage as above) with 12-bit converter for analog inputs VIN, PT1000, INP1A, INP2A, INP3A, values can vary from 0 to 4096, depending on the size of the measured voltage, eg for INP1A - for 0 volts will be set to 0, the 35V will be similar to 4096, for INP2A and INP3A, for 0 volts is 0 for 3.3V will be close to 4096.

adcprint=3 – displays the values of the sensors DS18B20, the result must be divided by 10

adcprint=0 – disables the display of the above-mentioned values

22. **confirm** – value of 1 enables sending return SMS after commands: reboot, on, off

23. **vinread** – reads the value of VIN (the supply voltage), read-only command

24. **ptread** – reads the value of PT1000, read-only command,

25. **inp1aread** – reads the value of INP1A, read-only command

26. **inp2aread** – reads the value of INP2A, read-only command

27. **inp3aread** – reads the value of INP3A, read-only command

28. **dthtread** – reads the value of the temperature DHT sensor, a read-only command

29. **dthhread** – reads the value of the humidity DHT sensor, a read-only command

30. **dsread** – reads the value of 8 sensors DS18B20, read-only command

31. **vinset** – sets the voltage at which, if exceeded / decrease will be sent SMS
Examples:
vinset=12,34 – sets the value of the 12.34V
vinset? – reads the set value

32. **vinhis** – sets the hysteresis for the above set voltage
Examples:
vinhis=0,80 – histereza ±0,80V

33. **gprsapn** – sets the apn, username and password for GPRS
Examples:
gprsapn="internet","user","paswd" – enter values as in the example of quotes, below an example of how to set a blank password and user
gprsapn="internet","",""

34. **gprsstart** – GPRS starts, you do not have to run like we want to send data to the server via HTTP

35. **gprsstop** – stops GPRS

35. **httpver** – sets the http client version
Examples:
httpver=1 – sets the http client versions 1.1
httpver=0 – sets the http client versions 1.0

36. **httpurl** – sets the url as GET requests sent to the server
Examples:
httpurl=api.thingspeak.com/update?key=H2PN0O35KRVRG6Q0&field1=#1,&field2=#2
– hash of the value is the number of the sensor, and this place will insert the value of this sensor. The following numbering for individual inputs / sensors. The first five mean values directly from the transmitter

VIN_ADC	0
PT1000_ADC	1
INP1A_ADC	2
INP2A _ADC	3
INP3A _ADC	4
VIN	5
PT1000	6
INP1A	7
INP2A	8
INP3A	9
DTHT	10
DTHH	11
HTST	12
HTSH	13
HX711	14
DIFF	15
DS1	16
DS2	17
DS3	18
DS4	19
DS5	20
DS6	21
DS7	22
DS8	23
INP4D_impulsy	24

37. **httpsend** – send typed url GET request to the server

38. **httpautosend** – automatically send data to the server at a specified time
Examples:
httpautosend =15 – sending every 15 seconds
httpautosend =0 – are switched off. The minimum value is 10 seconds as you type less, and so it will be set to 10 seconds

39. **inp4con** – enter 1 turns on at the input pulse counting INP4D

40. **inp4count** – reads the number of pulses counted or resets the counter
Examples:
inp4cont=0 – resets the counted pulses
inp4count? – reads the pulses counted

41. **cusd** – sending short codes
Examples:
cusd=*100# – shows the status of the account on the GSM operator (PLUS (PL))

42. **signal** – reads the GSM signal strength

43. **upinpd** – determines the logic input activates the state of high
Examples:
upinpd=1,3 – INP1D input and INP3D activated state of high
upinpd? – reads the settings

44. **downinpd** – determines the logic input activates the low status
_Examples:_
downinpd=1,3 – INP1D input and INP3D activated by the low status

45. **restart** – reboot the device

46. **settingsreset** – enter 1 to restart the settings stored in the memory to default, reset occurs when you turn on the device, as you enter a value of 0 before re-run the device will not reset

47. **help** – displays all the commands

Software upgrade

Upgrade PIN GND

micro USB

POWER max 28 V

2
1
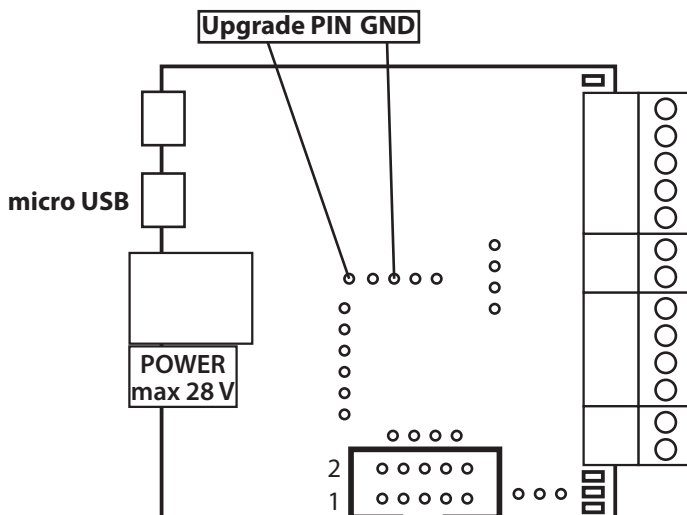
Upgrade Procedure
Turn off the power.
Connect GSM v3 controller to a Windows computer via a USB cable.
Short together the pins **Upgrade** and **GND**.
Turn on the power - the controller will start in bootloader mode. (*system should recognize and install the DFU driver*)
Start the application **GSM3upgrade.exe** If Windows is properly installed drivers that recognize the board as: **STM Device in DFU Mode**
Select new firmware file using **Open File** (*in the window opening change preview from DFU files to **All files***)
Press the „**upgrade**" button
After uploading the firmware (*first waiting for the progress bar one, then the second*), you can exit the program and reset the GSM controller.

Contents of the instructions is regularly checked and if necessary corrected. If the observations errors or inaccuracies, please contact us. It can not be ruled out that, despite best efforts, however, some discrepancies arose. To get the latest version, please contact us or distributors.