GSM-BGS5-E2N

1. Introduction

Modem in an industrial metal aluminum case which is suitable for installation into a control cabinet. Modem has two communication ports (RS232 and USB) with adjustable watchdog. The modem is equipped with a GSM module Gemalto (Cinterion) BGS5 rel.2. Thanks to standard RS232 and USB interface, the modem is suitable for fast implementation in devices that require remote communication. It also includes the monitoring of communication with the master device (watchdog), both via RS232 serial port as well as the USB.

The modem has JAVA OPEN PLATFORM in which you can write your own program, for example a program for downloading and sending data from connected technology.

For RS232 and USB parameter setting see the chapter 7.4.

Modem can be powered directly from the USB connector.

2. Package Content

1pc GSM modem
1pc 2-pin connector 3,5mm

3. Recommended Accessories

3.1 Antenna

GSM-ANT11K	2dB, Whip jointed antenna, without cable
GSM-ANT01S	5dB, magnetic, cable 3m
GSM-ANT51S	9dB, magnetic, cable 3m
GSM-ANT07S	9,5dB log–per, cable 10m

3.2 Power Supply

GSM-PWR12	Power supply adapter into socket 230V_{AC} / 12V_{DC}, 1A
GSM-PWR1	DIN rail mounted supply module 230VAC / 12VDC, 1.25A

Note: for DIN rail mounting inside of a cabinet suitable:

GSM-75-DIN	Plastic DIN rail holder or
GSM-ZIP50	Industrial 3M Dual-Lock ZIP 25x50mm for wall mounting

3.3 Cables

HW-11.99.6218	CANON MD9-FD9 (connected as an extension), length 1.8 m
HW-11.99.8752	USB 2.0 AB (micro USB to a modem), length 1.8m

4. Technical Specification

Parametr		Symbol	MIN.	TYP.	MAX.	Unit
Power Supply (PWR)	Voltage DC		7 V_{DC}	8 až 30	33 V	V_{DC}
	Standby power. consumption	connected to GSM network (call o GPRS)	0,36 (30mA for 12 V_{DC})			W
	Max. power. consumption		2.1			W
POWER supply conn.		2-pin removable screw terminal block, pitch 3.5 mm (PWR), or micro USB connector				
Power supply via USB	Voltage			5		V
	Current			120	360	mA
Ingress Protection	IP			40		
Temperature	Storage	tSTG	-40		+85	°C
	Operating	tA	-30		+65	°C
Humidity	Operating				95	% R.V.
Dimensions	Width	W		54		mm
	Height	H		24		mm
	Length	L		82		mm
Weight				0.103		kg

Note: If the power supply and USB connectors are connected at the same time, current goes only from power supply connector.

5. Modem Parameters

Parameter	Description
GSM , GPRS 12	850/900/1800/1900 MHz (GPRS 85.6 kbps DL, 85.6 kbps UL)
Antenna connector	Device - SMA (F), 50 Ohm
Internet services	TCP/UDP server/client, DNS, Ping, FTP client, HTTP client
JAVA	2 MB RAM and 4 MB Flash File System
USB 2.0	Micro USB; USB2.0
RS232	CANON 9F; 120 to 921600 bps fix bit rate. Autobauding is available. Factory setting is 115200 baud, 8 data bits, no parity, 1 stop bit
HW watchdog	HW Watchdog is available for both RS232 and USB. Note: Watchdog setting is available only via RS232.

6. Documentation

USB driver (driver for RS232 port is not needed), a list of **AT commands** and other information, visit the www.seapraha.cz , type "GSM-BGS5-E2N" into the search box. In the Name field, enter the text **sea**. In the Password box, type **siemens**.

If you are using WIN10 and you will use only control via AT commands, do not download the driver, WIN10 will install its own driver automatically.

7. Hardware

7.1 Power supply and it's indication

Supply voltage is connected to terminals PWR and must be in the range of 7-33 V_{DC}. The device is protected against overvoltage and has a built-in refundable SMD fuse. If the external fuse is needed, use 1.25 A fuse at V_{CC} line. As the power consumption from USB is higher than 100mA, it is sometimes needed to reserve the current or use powered USB hub.

The modem can be powered directly from the USB connector, even using RS232.

If the modem uses power supply from USB cable, the communication is posible only via USB (not vir RS232. For communication via RS232 you must use external power supply (GSM-PWR12).

LED PWR is located on the bottom-right side of PWR connector, LED RS232 is located bottom-left side of RS232 connector.

LED	COLOR	MEANING
PWR	green	*dark* ... device is not supplied, or internal power convertor is out of order *light* ... device in operation state
RS232	yellow	*Blinking* ... communication from the GSM module

7.2 NANO SIM card reader and GSM state indication

Insert the nano SIM card into the holder (cut corner first, contacts up - towards the inscription SIM). The correct insertion is indicated by mechanical click noise. Push gently and release to remove the SIM card.

Above the SIM card holder is located the LED which indicates status of GSM.

LED	COLOR	MEANING
Located above SIM card holder SIM	blue	Device state indication. *Dark* ... device failure; Device was switched of using AT command *blinking 1:1* ... device starting up *1 short blink per 4 seconds* ... device operational

7.3 Antenna

The antenna is connected via SMA connector. The device is fitted with SMA female. The connected antenna must have SMA male. The impedance is 50 Ω.

7.4 Communication ports (RS232 and micro-USB)

To communicate with the modem (AT commands) is designed interface RS232 and USB. The device includes a female connector RS232 and micro-USB. The modem can be controlled using both interfaces, for setting up of the watchdog function is possible to use only RS232 interface.

Factory default baud rate for communication with the modem for RS232 is **115200bps, 8 data bits, no parity, 1 stop bit.** For changing the rate, see the Chapter „RS232 Setting". Baud rate for USB is not needed to set.

You will see two COM ports in WIN Control panel. For sending AT commands you must use the port, which you find in Device Manager „Modems" (Parameters/Modem). Other port is determined for JAVA application´s development.

7.5 DIN rail mounting

If you need to place the device into the switchboard on DIN rail, screw the plastic holder GSM-75-DIN drilled hole in the side of the modem.

8. Warranty

General warranty period is 24 months after purchase, when eventual malfunction device will be repaired free of charge in SEA spol. s r.o. while shipping to SEA is paid by customer and SEA pays for shipping back to customer.

The warranty does not cover any damage caused by wrong use which does not comply the technical specifications and user instructions and any accidental damage (e.g. by water, lightening etc.).

SEA spol. s r.o. has NO RESPONSIBILITY for any damage, lost, costs and any other problems direct or inducted, caused by device malfunction from any reason.

In case of incompleteness or any damage in the packaging it is necessary to inform SEA spol. s r.o. immediately (within five days).

CE Declaration of conformity

in accordance with the Radio and Telecommunications Terminal Equipment Directive 1999/5/EC (R&TTE) and Directive 2011/65/EU (ROHS).

We SEA, spol. s r.o., Dolnoměcholupská 21, CZ 102 00 Praha 10, **ID:** 47117931 (**manufacturer**) **declare under our sole responsibility, that product** GSM modem with serial ports RS232 a USB type GSM-BGS5-E2N **is in conformity with the following standards:**

health and safety: EN 62368-1:2015 + Opr.1:2016 + A11:2017
EMC: EN 301489-1 v2.1.1   EN 301489-52 v1.1.0
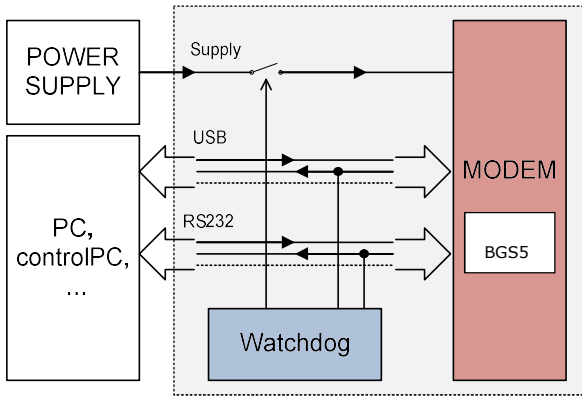**radio frequency:** EN 301 511 v 12.1.10

Place of issue: Praha   **Name:** Ing. Vladimír Rosůlek
Date of issue: 19.7.2018   **Grade:** director

SEA s.r.o.

9. Watchdog setting

9.1 RS232

The device contains a built-in watchdog which checks whether the modem answers (if there are changes in the internal line RxD between GSM module and connected apliance). If it is no change on the line for specified time period, the modem is considered broken and is cut off from the power supply for 15 seconds. After that the modem and monitoring process starts again.

Time, which is still not considered an error of modem is configured using commands via serial interface RS232. USB port is not possible to use for Watchdog setting!

Factory default is **115200bps, 8 data bits, no parity, 1 stop bit.**

Notes:

- Before each command must be a time of 1 second when there are no characters sent!
- Characters '-' and '+' in the following examples are sent. '-' ... mean Data are sent to the device, '+' means data are sent by the device.
- '<#0D>' is a placeholder for ENTER (13d, 0x0D).

Command ECHO

Display current Watchdog setting

- GSMWDG<#0D>
+ WDG: OK 123456 D2251D v1.0

or

- GSMWDG?<#0D>
+ WDG: OK 123456 D2251D v1.0

Part	Description
WDG:	Watchdog respond identification
OK	Command accepted OK
123456	Actual Watchdog setting value in seconds (HEX code): 123456 HEX = 1 193 046 seconds ~ 13,8 day 000000 HEX = Watchdog function disabled (default setting) 00003C HEX = 60 seconds ~ 1 minute 000E10 HEX = 3 600 seconds ~ 1 hour 008CA0 HEX = 36 000 seconds ~ 10 hours 015180 HEX = 86 400 seconds ~ 1 day
D2251D	Device Identification
V1.0	Device version

Command SET

Watchdog setting

- GSMWDG 112233<#0D>
+ WDG: OK 112233 D2251D v1.0

The parameter '112233' means seconds (coded in HEX). See the table for command ECHO. Exactly 6 HEX numbers has to be entered, including leading zeroes.

Value '000000' disables Watchdog function = modem is never restarted by Watchdog.

Example: Disable Watchdog
- GSMWDG 000000<#0D>
+ WDG: OK 000000 D2251D v1.0

Example: set Watchdog for 1 hour
- GSMWDG 000E10<#0D>
+ WDG: OK 000E10 D2251D v1.0

Example: set Watchdog for 10 hours
- GSMWDG 008CA0<#0D>
+ WDG: OK 008CA0 D2251D v1.0

Example: set Watchdog for 1 day
- GSMWDG 015180<#0D>
+ WDG: OK 015180 D2251D v1.0

Command RESET

Immediate modem reset

- GSMWDG RESET<#0D>
+ WDG: OK RESET D2251D v1.0

9.2 USB

USB port has a special circuit for restart of GSM module.

10. RS232 port setting

Factory default setting is made in red bold print.

Baudrate: (AT+IPR)
- 0 Autobauding
- 1200
- 2400
- 4800
- 9600
- 19200
- 38400
- 57600
- **115200   (Factory default)**
- 230400
- 460800
- 500000
- 750000
- 921600

Parity and data bits: (AT+ICF)
- 7 bits, even parity, 1 stop bit (AT+ICF=5,1)
- 7 bits, odd parity, 1 stop bit (AT+ICF=5,0)
- 8 bits, even parity, 1 stop bit (AT+ICF=2,1)
- **8 bits, no parity, 1 stop bit (AT+ICF=3)**
- 8 bits, odd parity, 1 stop bit (AT+ICF=2,0)
- 8 bits, no parity, 2 stop bits (AT+ICF=1)

Flow control: (AT\Q)
- No flow control
- Software flow control – XON/XOFF
- **Hardware flow control – RTS/CTS**

11. Frequently Asked Question

11.1 Command for Watchdog setting does not respond

- GSMWDG 52<#0D>
+ <nothing>

The problem is in the assignment of the time "52". It is required to enter the exactly 6-HEX digits. The correct command is this:

- GSMWDG 000052<#0D>
+ WDG: OK 000052 D2251D v1.0