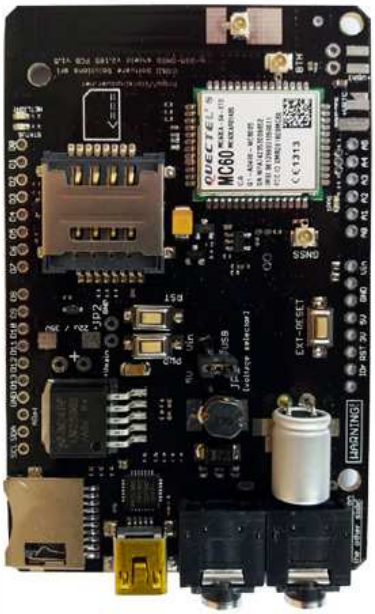
b-gsmgnss series

Integrated GSM antenna, dual SIM, quad band GSM modem + GNSS[GPS+GLONASS] + BTH 3.0
ARDUINO, TEENSY, BBB & RASPBERRY PI compatible shield



- **Integrated GSM antenna and uFL connector for external antenna**
- **DUAL SIM socket***
- **Worldwide compatibility # quad band module**
- **GSM / GPRS / SMS / DTMF supported**
- **GNSS engine embedded**
- **BTH 3.0 interface**
- **Integrated uSD(TF) socket**
- **USB miniB interface**
- **2.8V-5V serial interface**
- **5.30-24V wide voltage switching power supply**
- **ARDUINO, BBB and RASPBERRY PI direct compatibility**
- **Windows, MAC and Linux PC connectivity**
- **Audio jacks (out-800 mW, in- capacitor MIC)**
- **Complex code examples**
- **Ideal for small-medium series gadget / project integration**

* single SIM active

The new **b-gsmgnss v2.105**, together with **a-gsmII v2.105**, belongs to the next generation of the successfully **a-gsm v2.064**, - ARDUINO, BBB & RASPBERRY PI compatible shied – and offers to best market performances for their product class, accompanied by reasonable cost.

Designed in EUROPE by **R&D Software Solutions** team -awarded in 2006 with the **GST SSC Bronze Award**, the b-gsmgnss shield proudly represents the concept of porting of professional solutions to the hobby/DYI market. This new version enhance the integration and performances of the previous **a-gsm** shield, including GNSS engine, Bluetooth 3.0 and some new features inspired by customers feedback

The **a-gsm/b-gsmgnss series** answers at your needs for a fully integrated, functional and affordable cellular modem shield / platform. Smart complete design of the b-gsmgnss shield brings you the flexibility and easiness in integration, wherever your platform and application. Beyond ARDUINO / RASPBERY PI / others hobby / DYI platforms integration, the b-gsmgnss series can be easily and in a time manner incorporated into your equipment regardless your previous experience in modem technology. The b-gsmgnss series represents your best choice for usage into a wide range of designs requiring robust and reliable performance.

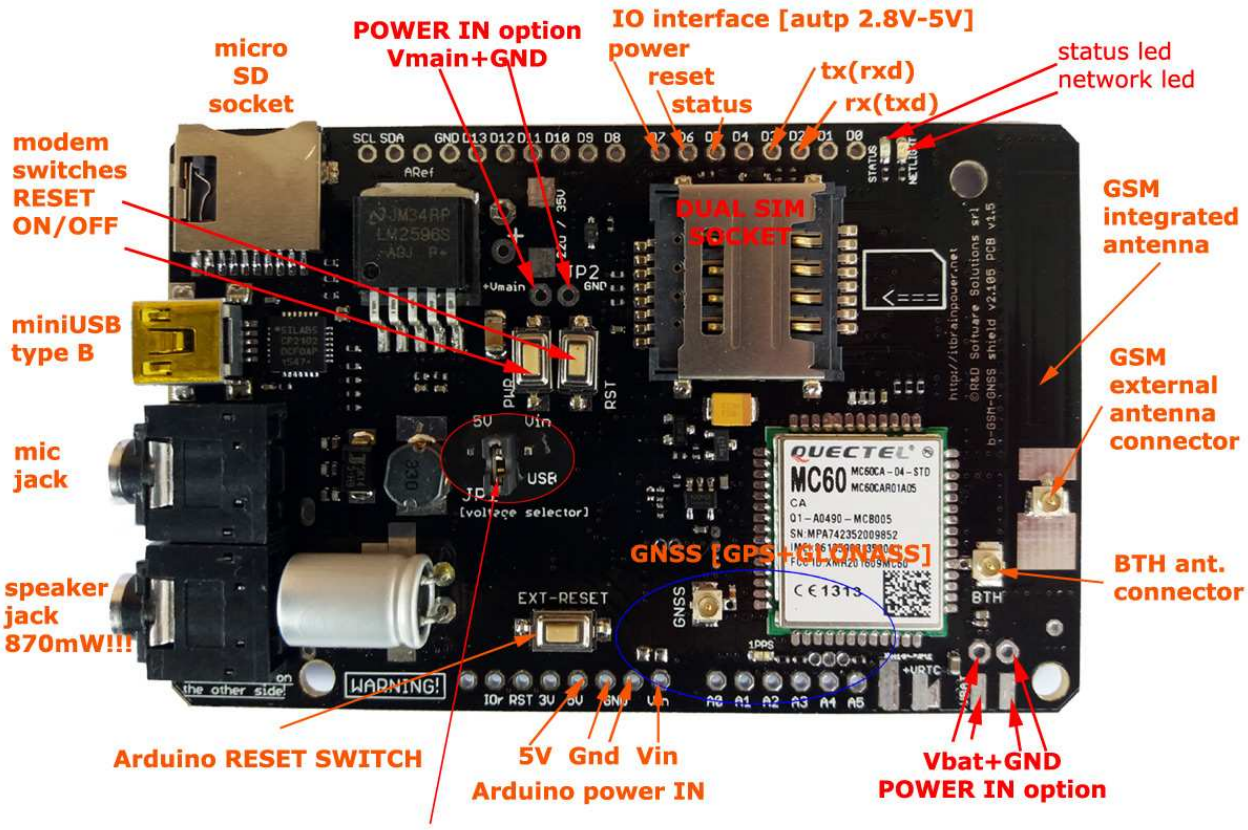
Standard b-gsmgnss features: high performance GSM/GPRS module (Quectel MC60) with worldwide coverage- 850/950/1800/1900 MHz, high accuracy GNSS engine embedded, BTH 3.0 interface, integrated GSM antenna and u.FL socket for external antennas, DUAL SIM socket (placed on the top side of the shield), USB (WIN/LINUX/MAC, RPI/BBB [Debian] support; USB mini type B) and UART [TX, RX], POWER ON/OFF, MODEM STATUS and MODEM RESET 2.8V up to 5V compliant interfaces, micro SD slot (supporting micro TF cards up to 32Gb), high performance switching power supply [5 powering modes available], 2 x standard 3.5mm stereo jacks for high power output (870mW RMS) audio and for capacitor microphone input and a lot of other electrical interfaces, including SERIAL2, all in 84.00x53.34mm standard ARDUINO form factor.

Plug and replace [compatible with] the original Arduino GSM/Arduino GSM V2, in (almost) all projects using the ITBP Arduino GSM hack class [free download on https://itbrainpower.net/downloads].

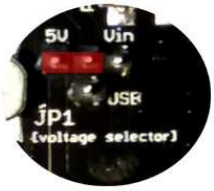
Manufactured in EU.

Part number	Description	Usage
BGSMGNSS2105#BAP	b-gsmgnss 2.105 2xSIM, Arduino headers bundle	GLOBAL
BGSMGNSS2105#0AP	b-gsmgnss 2.105 2xSIM, no Arduino headers	GLOBAL
BGSMGNSS2105#IND	b-gsmgnss 2.105 2xSIM, industrial grade	GLOBAL

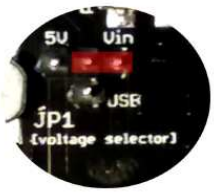
Part number	Accessories description
ITBP-UFL-SMAF#085	u.FL to SMA female panel 85mm pigtail
ITBP-UFL-SMAF#100	u.FL to SMA female panel 100mm pigtail



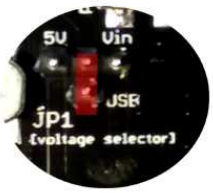
use 5V pin



use Vin pin



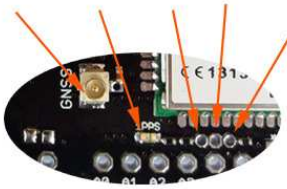
use USB as power



via Vmain + GND
DO NOT PLACE JUMPER!!!

via Vbat + GND
DO NOT PLACE JUMPER!!!

GNSS [GPS+GLONASS]
uFL LED TX/GND/1PPS



top side, details
b-gsmgnss by itbrainpower.net

FEATURES AT A GLANCE:

INTEGRATED GSM antenna and **u.FL connector for external GSM antenna**;
DUAL SIM socket, SINGLE STANDBY - (SIM cards required not included)
Quad band GSM/GPRS module (Quectel M95F) with true worldwide coverage: 850MHz, 900MHz, 1800MHz and 1900MHz
High performances GNSS engine embedded with parallel GPS and Glonass satellites interpolation for best accuracy and signal sensitivity. NMEA sentences are available via AT commands and via independent GPS UART port [115200bps, TX only]. GNSS ENABLE/DISABLE and GNSS setup commands are available via modem UART AT commands. 1PPS [pulse per second] synchronization is available via signal pad. Supports active and passive GNSS antennas.
Bluetooth 3.0 interface with SPP and HFP profile support.
USB adapter embedded standard - SERIAL UART to USB bridge adapter with USB mini type B socket (you can use the b-gsmgnss board as wireless modem with your PC, connecting it directly thought USB to your PC – Windows, MAC and Linux compatible),
SERIAL TTL interface, down to 2.8V compliant (TX and RX) available in Arduino pin-out,
MicroSD card socket standard (support uTF cards up to 32 Gb),
SWITCH POWER Supply* with efficiency up to 95%; the shield can be powered using various powering inputs: Arduino Vin pin(5-12V), Arduino 5V pin and thought USB connector(*).
Audio in and out 3.5 stereo jacks standard - HIGH power audio output (870mW) and capacitor Microphone interfaces embedded,
Embedded switches: control for modem ON/OFF & modem RESET and Arduino Reset
DIGITAL AUDIO interface and SERIAL2 (3V TXD and RXD) interfaces available thought additional back PCB side pads.
COMPACT FORMAT: 84.00x53.34mm, around 15g.
* 5.30V-24V input support, 5 way powering profiles: via USB, Arduino Vin pin, Arduino 5V, Vmain pin [up to 24V] and Vbat+GND [4V/LiPo] pins with manual selector [1xjumper] for users convenience
** High Speed GPRS Multi-slot class 12 (configurable 1~12) Downlink and uplink speed - 85.6 kbps Max
Extended Arduino, RaspberryPI and BBB support, with code examples: - **GSM, TCP/UDP, HTTP[s], DTMF coding and decoding, SMS** and other features and utilities like **DUAL SIM**, others.
RaspberryPI PPP and TCPIP routing support (Debian based) trough easy installation and usage scripts.

PIN definition:

Pin D2 = GSM TXD(RX),
Pin D3 = GSM RXD(TX),
Pin D7 = PWRKEY – MODEM ON/OFF,
Pin D5 = MODEM-STATUS,
Pin D6 = RESET-MODEM,
PinRST = Arduino RESET OUT,
Pin5V = Arduino 5V,
PinVin = Arduino Vin,
Pin GND(1&2) = GND

Independent GNSS TX [115200bps], GNSS GND and GNSS 1PPS signals are accessible via GNSS extension pads [see "b-gsmgnss top side, details" image up-here]. *
* GNSS NMEA sentences [GPS positioning info], GNSS ENABLE/DISABLE and GNSS setup commands are available via modem UART [and USB] AT commands.

Standard Arduino Pin-out

ONE to ONE connection without additional cables for Arduino UNO/LEONARDO and Arduino MEGA ADK/MEGA 2560*
* Arduino LEONARDO & Arduino MEGA ADK/MEGA 2560, additional strap / 1k resistor may be needed

Easy RaspberryPI II, B+, III & Zero wiring

Connection name	**RPi pin**	**b-gsmgnss shield pin**
POWER b-gsmgnss	**16**	D7 - power(UP/DOWN)
RESET b-gsmgnss	18	D6 - reset *
b-gsmgnss STATUS	**12**	D5 - status
serial TXD0	**08**	D3 - RX(TXD)
serial RXD0	**10**	D2 - TX(RXD)
GND	**06**/14	GND - on Arduino power IN connector
5V power supply	**02**/04	5V - on Arduino power IN connector **

* connection not mandatory
** recommendation: do not power b-gsmgnss from the RPI 5V PIN, power the b-gsmgnss shield from independent PS.

CODE EXAMPLES and UTILITIES:

Arduino examples list (C code):

- SD_SS.ino - b-gsmgnss shield 2.105 microSD files list/read/write/delete example >> GSM SHIELD micro SD USAGE tutorial code
- SMS_SS.ino - b-gsmgnss shield 2.105 send/read/list SMS example >> GSM SHIELD SEND/RECEIVE SMS tutorial code
- GPRS_HTTP.ino - b-gsmgnss shield 2.105 HTTP client over GPRS example>> GSM SHIELD GPRS over HTTP tutorial code
- SIM_UTILITIES.ino - b-gsmgnss shield 2.105 SIM/MODEM/NETWORK/POWER ON/POWER OFF utilities >> GSM SHIELD UTILITIES tutorial code
- DTMF_SEND.ino - b-gsmgnss shield 2.105 send DTMF example >> GSM SHIELD DTMF SEND tutorial code
- DTMF_RECEIVE.ino - b-gsmgnss shield 2.105 receive/decode DTMF example >> GSM SHIELD DTMF RECEIVE tutorial code

Raspberry PI[BBB] examples list (python):

- powerOnOff.py - b-gsmgnss 2.105 power on / power off / modem communication example >> GSM SHIELD POWER ON/OFF tutorial code
- setSerial.py - b-gsmgnss 2.105 set serial communication speed example >> GSM SHIELD SET SERIAL SPEED tutorial code
- readSMS.py - b-gsmgnss 2.105 list/read SMS example >> GSM SHIELD READ/LIST SMS tutorial code
- sendSMS.py - b-gsmgnss 2.105 send SMS example >> GSM SHIELD SEND SMS tutorial code
- GprsHttp.py - b-gsmgnss 2.105 HTTP client over GPRS example >> GSM SHIELD GPRS over HTTP tutorial code
- b-gsmgnssUtilities.py - b-gsmgnss 2.105 SIM/MODEM/MISCELLANEOUS (including DTMF) usage example utility >> GSM SHIELD UTILITIES tutorial code

UTILITIES:

- Arduino GSM class hack. Run (almost) any project written for the original Arduino GSM using the b-gsmgnss shield
- b-gsmgnss kickstart for Arduino **-** an interactive interface that allows to test the modem facilities with Arduino. Library based, Arduino C.
- itbpGSM REST IoT class. – light IoT GSM class support for itbrainpower.net modems with examples.
- b-gsmgnss-raspian-ppp-1.0.tar.gz **- Raspian PPP and routing utility**
- setSerial.py – change and save b-gsmgnss serial communication speed Python utility (included in b-gsmgnss-raspian-ppp.tar.gz and in b-gsmgnss-series-RaspberyPI-code-examples-1.0.tar.gz)

Additional documentation: (available on http://itbrainpower.net/downloads)

- Arduino/RaspberryPI gsm shield communication debug how to
- a-gsm audio wiring [valid for b-gsmgnss]
- b-gsmgnss shield block schematics
- b-gsmgnss shield series - TOP description
- b-gsmgnss shield series - ARDUINO wiring using software serial (used in CURRENT Arduino code examples)
- b-gsmgnss shield series - Arduino wiring for hardware serial
- a-gsm shield series - Raspberry PI B+ wiring schema [valid for b-gsmgnss]
- QUECTEL MC60 AT command manual