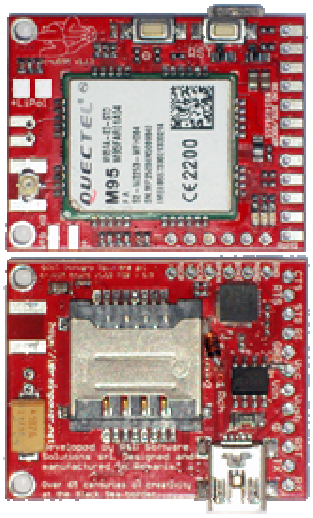
c-uGSM series

ARDUINO & RASPBERRY PI dual SIM GSM shield (micro)



- **Worldwide compatibility # Quad band 850 / 900 / 1800 / 1900MHz**
- GSM / GPRS / SMS / DTMF supported
- **Two standard size SIM***
- **RPI compatible built in USB interface**
- **built in LiPol battery charger**
- 1.25"x1.57"(31.75x39.88 mm), around 10g
- **ARDUINO & RASPBERRY PI I&II direct interfacing** compatibility with auto 3-5V interfaces Windows and Linux PC connectivity via USB
- uFL or SMA F connector High power analog audio inteface(out-700 mW RMS, in- capacitor MIC)
- **C and Python complex code examples**

Ideal for small & medium series gadget / drones / wearables / IoT project integration where sizes and weights matters.

* single SIM active

c-uGSM v1.13 series revision 1 - ARDUINO & RASBERRY PI micro dual SIM GSM shield / board, one of our latest released product, compact as 1.25"x1.57"(31.75x39.88mm) and with weight around 10g, it is probably the most compact GSM module board on market.
c-uGSM series it is pin to pin compatible with the 3G version (d-u3G series) and together, are parts of a bigger family build on top so call "plug-able boards concept".

c-uGSM series has been released without performance compromises and brings to you the best market solution at reasonable cost and becomes the reference for this new product class. It is designed and manufactured in EUROPE by R&D Software Solutions team -awarded in 2006 with the GST SSC Bronze Award.

c-uGSM v1.13 series integrates in this format the following main features:

- USB serial connectivity adapter with RaspberryPI, Windows and Linux. The USB connection offers, for Raspberry PI usage, the possibility to leave free the serial connection for other application/shields as GPS.
- 2.8-5V auto-level digital interfaces (UART TX+RX / RESET / POWER ON-OFF / RI / STS / RTS / CTS), for direct connection with **Arduino boards, Raspberry PI** or any other 2.8V up to 5V micro-controller board
- build in Lithium Polymer battery charger. Depending on powering schema, all boards version can be used with or without LiPol battery.
- Plug-able accessories as: switching power supply (stand alone or with LiPol usage), (future) u-controller boards, other.
- POWER ON/POWER OFF and RESET push micro switches
- TWO standard size SIM support* as default hardware.
- uFL or SMA F antenna connector

The c-uGSM series opens to you the access to a fully light weight, integrated, fully functional and affordable cellular GSM modem shield / platform. Smart complete design of the c-uGSM micro shield brings you the flexibility and easiness in integration, wherever your platform and application. Beyond ARDUINO / RASPBERRY PI / others hobby / DYI platforms integration, the c-uGSM series can be easily and in a time manner incorporated into your equipment regardless your previous experience in modem technology. The c-uGSM series represents your best choice for usage into a wide range of designs requiring a robust GSM mobile communication and reliable performance.

Manufactured in EU.

Part number	Description	Usage
CUGSM113#UFL	quad band GSM module - equipped with u.FL connector	Worlwide
CUGSM113#SMA	quad band GSM module - equipped with SMA F connector	Worlwide

Part number	Accessories description
gSPS101#4V(DDRV)	g-SPS 4V adapter board external plug-able switching power supply, 5-25V input, 4V output, max 2A. 20.3x34.29mm. Use in "without LiPol/stand-alone" c-uGSM boards configuration.
gSPS101#5V(LiPOL)	g-SPS 5V adapter board external plug-able switching power supply, 6-25V input, 5V output, max 2A. 20.3x34.29mm. Use in "with LiPol battery" c-uGSM boards configuration.
ITBP-EMB1-UFL#50	sticker embedded flex antenna 850Mhz->2250Mhz u.FL and 50mm cable
ITBP-UFL-SMAF#100	u.FL to SMA female panel 100mm pigtail
ITBP-UFL-SMAF#085	u.FL to SMA female panel 85mm pigtail
ITBP-GSM-ANT-SMA90D#001	mini GSM/UMTS antenna, 0-1db, rod type, SMA F, 90 degree, no cable

FEATURES AT A GLANCE:

Quad band GSM/GPRS module (Quectel M95F) with true worldwide coverage: 850MHz, 900MHz, 1800MHz and 1900MHz.
DUAL SIM, SINGLE STANDBY 2x2G STANDARD SIM format (unique feature).
Very compact and light weight: 1.25"x1.57" (31.75x39.88mm), around 10 grams, probably the best on his class.
Embedded USB adapter with SERIAL to USB bridge adapter - with micro-USB type A socket (you can **connect the c-uGSM shield, via USB or SERIAL TTL with your Raspberry PI** or you can use it as wireless USB modem with your Windows or Linux PC) (unique feature).
Digital interface (SERIAL and CONTROL interfaces):3-5V auto-level (UART TX+RX / RESET / POWER ON-OFF / RI / STS / RTS / CTS); **you can directly connect (without the need for any level adapter board) the c-uGSM shield with any 3/5V Arduino shield or any version of RASPBERRY PI, BEAGLEBONE, BANANA PI or any other 2.8V up to 5V compatible microcontroller.** The digital (and powering) interface it is available in standard 0.1"(2.54mm) pin header and it is 99% pin 2 pin compatible with d-u3G shield.
Embedded LiPol battery charger - the c-uGSM shield can run in configurations with or without LiPolimer battery, depending on chosen powering schema.
High power analog audio interface (output-700 mW RMS, in- capacitor MIC) - via standard 0.1"(2.54mm) pin header
Two embedded switches: control for modem ON/OFF & modem RESET
Multiple powering schemas: - via USB, via POWERING, SERIAL and CONTROL interface (digital inteface) or via optional external(20.3x34.29mm) pin to pin plug-able 5-25V switching power supply
Extended Arduino and RaspberryPI code examples support files: - GSM, SMS, DTMF, TCP/UDP, **HTTPS** and HTTP over GPRS**, smart features like RAM DISK SYSTEM for FILE STORAGE, DUAL SIM usage and other. RaspberryPI PPP and TCPIP routing support (RaspbianOS) trough easy installation and usage scripts. And, last but not least, c-uGSM is supported by our "**mobile IoT 2 CLOUD**" for **Arduino** prototype - quite tiny IoT implementation (~16Kb free on ATMEGA328), with mobile data transfer optimization** and based on our original "**IoT2CLOUD ABSTRACTIZATION LAYER**"© concept.
* High Speed GPRS Multi-slot class 12 (configurable 1~12) Downlink and uplink speed - 85.6 kbps max.
** Extra license charges may apply and special EULA must be accepted. Cloud service provided by our partner: restack.io.

PIN definition:

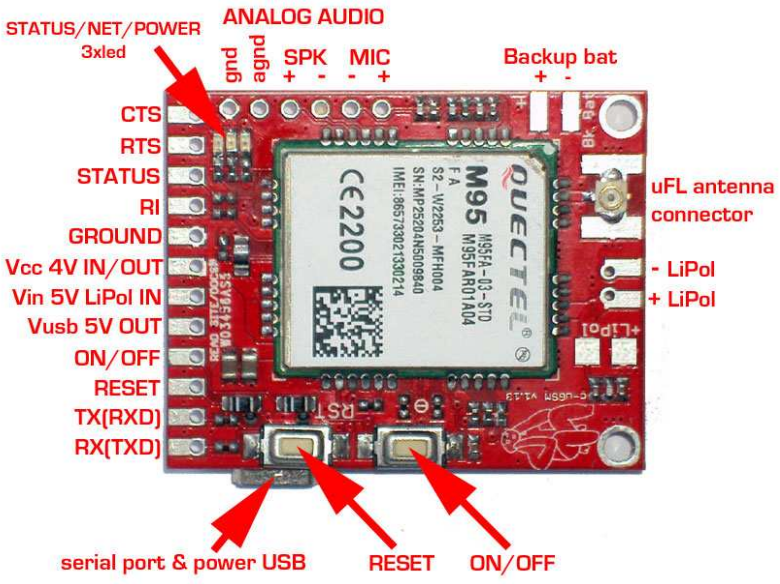
GSM SHIELD POWERING, SERIAL and CONTROL INTERFACE

In the left edge of the top PCB side, bottom to top:
1. RX(TXD) - GSM SHIELD SERIAL RX (TXD) - input
2. TX(RXD) - GSM SHIELD SERIAL TX (RXD) - output
3. RESET - GSM SHIELD RESET - input, active LOW*
4. ON/OFF - GSM SHIELD POWER ON - input, active LOW*
5. Vusb - POWER PIN - output +5V (USB +5V)
6. Vin - POWER PIN - input +5V for LiPol charger only
7. Vcc - POWER PIN - input/output +4V**
8. GND - POWER and DIGITAL GROUND
9. RI - GSM SHIELD RING INDICATOR - output
10. STATUS - GSM SHIELD STATUS - output
11. RTS - GSM SHIELD READY TO SEND - output
12. CTS - CLEAR TO SEND - input

* min. 200msec. Pulse

GSM SHIELD BATTERY and ANTENNA

In the right edge of the top PCB side, bottom to top:
1. + LiPol - connect + pole of the LiPol battery
2. + LiPol - connect - pole of the LiPol battery
3. GSM antenna connector - uFL or SMA F



GSM SHIELD (micro) c-uGSM v 1.13 top PCB view

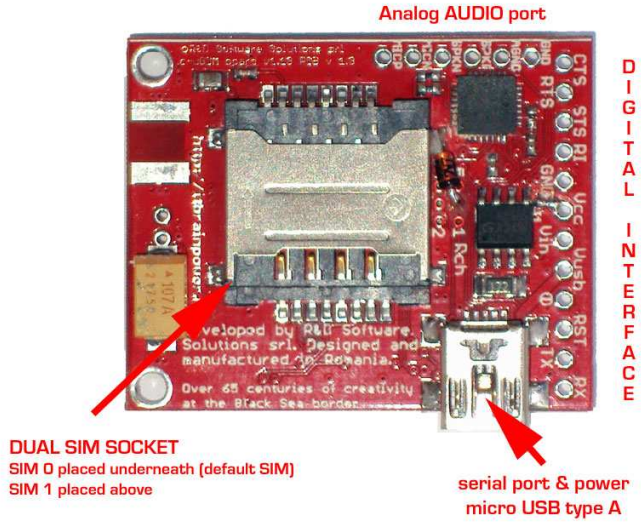
GSM SHIELD AUDIO INTERFACE and BACKUP BATTERY**

In the top edge of the top PCB side, left to right:

1. GND - GND connection for analog audio
2. AGND - Analog GND for analog audio
3. SPK+/SPKP - loudspeaker output + pole**
4. SPK-/SPKN - loudspeaker output - pole**
5. MIC-/MICN - cap. microphone input - pole
6. MIC+/MICP - cap. microphone input + pole
9. BkBat+ : Backup battery + pole***
10. BkBat- : Backup battery - pole

**** WARNING! The HIGH POWER AUDIO output may drive up to 600mW RMS! Headset usage can damage your ears!**

***** WARNING! For non rechargeable battery (eg. Silver Oxide coin cell): insert one diode (1N4148) between the battery plus pole and the 3G shield "BkBat+" pad. 1N4148 anode must be connected with the battery.**



GSM SHIELD (micro) c-uGSM v 1.13 bottom PCB view

GSM SHIELD SWITCHES

In the bottom edge of the top PCB side, left to right:

1. RESET - GSM SHIELD RESET
2. ON/OFF - GSM SHIELD TOGGLE POWER

GSM SHIELD DUAL SIM SOCKET AND USB PORT

On the bottom PCB side, left to right:

1. DUAL SIM SOCKET - SIM0 (default SIM) placed underneath (in the very proximity of the PCB) and SIM1 (secondary SIM) placed above SIM0
2. USB PORT - micro USB type A - **3G SHIELD POWERING and SERIAL to USB bridge adapter**

Arduino /Raspberry PI logical interfacing

c-uGSM shield PIN NAME	UNO / MINI / NANO / (Mega328)	MEGA2560 using software serial	DUE / MEGA2560 using hardware serial	Raspberry PI B+ or Raspberry PI II
1. RX(TXD)	D3	D3	D18(TX1)	PIN10 RXD0 *
2. TX(RXD)	D2	D10	D19(RX1)	PIN08 TXD0 *
3. RESET	D6	D6	D6	PIN18
4. POWER ON	D7	D7	D7	PIN16
6. Vin (5V LiPol)**	+5V	+5V	+5V	PIN02 or 04
8. GND	GND	GND	GND	PIN04 or 14
10. STATUS	D5	D5	D5	PIN 12

* Raspberry PI: do not wire 1 and 2 (serial TX and RX) if USB communication is used!

** WITH Lithium Polymer batteries configuration: wire 6 (Vin) OR do not wire it and use via USB powering placing a jumper between PIN5 (Vusb) and PIN6 (Vin). **Read more about powering configuration on: "kick-start for c-uGSM 1.13 by itbrainpower.net" document.**

Raspberry PI interfacing schema: http://itbrainpower.net/images/GSM-SHIELD-RPI-logical-wiring-c-uGSM.png

CODE EXAMPLES and UTILITIES:

Arduino code examples (c):

c-uGSM series 3G / UMTS shield (micro) kickstart for Arduino

Interactive interface with you're c-uGSM shield (micro). You can dial, pick up, hang up calls, read, delete or send SMSs, see the signal strength, read/write the RTC(real time clock), enable / disable the synchronization of the RTC, read modem serial(IMEI), SIM serial(IMSI), GSM and GPRS registration status, perform DTMF tasks, GET and POST (with or without SSL encryption) requests and even interact with the modem trough AT commands, directly from the application. More features will be added

c-uGSM series 3G / UMTS shield (micro) ARDUINO examples list

Compliable code (IP DATA TRANSFER w or wo SSL, DTMF, SMS, CALL handling, file handling, toggle Primary/Secondary SIM and other) examples for you're c-uGSM board and Arduino. Can be used as foundation starter for your 3G projects. Compile and running directives inside the code and associated txt files.

Raspberry PI code examples (python):

c-uGSM series 3G / UMTS shield (micro) Raspberry PI examples list

Running code (IP DATA TRANSFER w or w/o SSL, DTMF, SMS, CALL handling, file handling, and other) examples for you're c-uGSM board and Raspberry PI. Can be used as foundation starter for your 3G projects. You may chose between SERIAL and USB communication, in order to fit to your hardware interfacing option (see inside python files)

Raspberry PI UTILITIES:

c-uGSM-raspian-ppp-1.0.tar.gz **- Raspian PPP and routing utility**

setSerial.py – change and save c-uGSM serial communication speed Python utility (included in c-uGSM -raspian-ppp.tar.gz and in c-uGSM-series-RaspberyPI-code-examples-1.0.tar.gz)

Additional documentation:

Available on **http://itbrainpower.net/micro-GSM-shield-module-cuGSM**