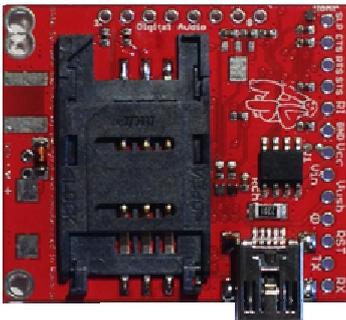


# d-u3G series

## ARDUINO & RASPBERRY PI 3G / UMTS shield (micro)



- **900/2100MHz@UMTS & 900/1800MHz@GSM - EUROPE version**
- **850/1900MHz@UMTS 3G only - NORTH AMERICA version**
- HSDPA Max.7.2Mbps
- HSUPA Max.5.76Mbps
- **RPI compatible built in USB interface**
- **built in LiPol battery charger**
- 1.35"x1.57" (34.29 x 39.88mm), around 10g implementation
- **ARDUINO & RASPBERRY PI I&II direct interfacing** compatibility with auto 2.8-5V interfaces
- **Windows and Linux PC connectivity via USB**
- **uFL or SMA F connector**
- Standard size SIM
- Digital audio interface
- **C and Python complex code examples**

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

**d-u3G v1.13 series revision 1 - ARDUINO & RASPBERRY PI micro 3G shield / board**, our latest released product, compact as 1.35x1.57" (34.29x39.88mm) and with weight around 10g, it is probably the most compact 3G module board on market.

d-u3G series it is pin to pin compatible with the GSM only version ([c-uGSM dual SIM series](#)) and together, are parts of a bigger family build on top so call "plug-able boards concept".

d-u3G 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.

d-u3G v1.13 series integrates in this format the following main features:

- USB serial connectivity adapter with **RaspberryPI, Windows and Linux**. USB connection, offers multiple serial ports support for concurrent application/threads communication.
- 2.8-5V auto-level digital interfaces (UART TX+RX / RESET / POWER ON-OFF / RI / STS / RTS / CTS / SLEEP), for direct connection with **Arduino boards, Raspberry PI** or any other 2.8V up to 5V micro-controller board
- built 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 and RESET push micro switches
- Standard size SIM support
- uFL or SMA F antenna connector

The d-u3G series answers at your needs for a fully lightweight, integrated, fully functional and affordable cellular 3G modem shield / platform. Smart complete design of the d-u3G micro shield brings you the flexibility and easiness in integration, wherever your platform and application. Beyond ARDUINO / RASPBERRY PI / others hobby / DIY platforms integration, the d-u3G series can be easily and in a time manner incorporated into your equipment regardless your previous experience in modem technology. The d-u3G series represents your best choice for usage into a wide range of designs requiring robust 3G mobile communications and reliable performance.

Manufactured in EU.

Part number	Description	Usage
DU3G113#UFL-EUR	3G module 900/2100MHz@UMTS & 900 / 1800MHz @GSM - equipped with u.FL connector	EUROPE *
DU3G113#SMA-EU	3G module 900/2100MHz@UMTS & 900/1800MHz@GSM - equipped with SMA F connector	EUROPE*
DU3G113#UFL-NA	3G module 850/1900MHz@UMTS - equipped with u.FL connector	NORTH AMERICA*
DU3G113#SMA-NA	3G module 850/1900MHz@UMTS - equipped with SMA F connector	NORTH AMERICA*

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" d-u3G 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" d-u3G 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

\* EUROPE and other countries with 900/2100MHz bands 3G networks

\* NORTH AMERICA and other countries with 850/1900MHz bands 3G networks

## FEATURES AT A GLANCE:

**3G UMTS module** (Quectel UG95F) with 850/1900MHz@UMTS - North American or 900/2100MHz@UMTS & 900/1800MHz@GSM - European versions.

**Very compact and light weight:** 1.35"x1.57" (34.29x39.88mm), 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 d-u3G 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](#)).

**Digital interface (SERIAL and CONTROL interfaces): 3-5V auto-level** (UART TX+RX / RESET / POWER ON-OFF / RI / STS / RTS / CTS / SLP); **you can directly connect (without the need for any level adapter board) your d-u3G 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 [c-uGSM shield](#).

**Embedded LiPol battery charger** - the d-u3G shield can run in configurations [with or without LiPolimer battery](#), depending on chosen powering schema.

**STANDARD SIZE SIM** 1x3G STANDARD SIM/USIM format.

**Multiple powering schemas:** - via **USB**, via **POWERING**, **SERIAL** and **CONTROL** interface (digital interface) or via optional external(20.3x34.29mm) **pin to pin plug-able 5-25V switching power supply**

**Digital audio interface** - via standard 0.1"(2.54mm) pin header

**Two embedded switches:** control for modem POWER ON & modem RESET

**Extended Arduino and RaspberryPI code examples support files:** - 3G, UMTS, GSM, SMS, DTMF, TCP/UDP, **HTTPS** and HTTP over 3G/GPRS\*, smart features like RAM DISK SYSTEM for FILE STORAGE, DUAL SIM usage and other. RaspberryPI PPP and TCPIP routing support (RaspbianOS) through easy installation and usage scripts. And, last but not least, d-u3G it 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**"<sup>©</sup> concept.

\* 3G/UMTS HSDPA Release 7 (category 8) 7.2Mbps max. and 3G/UMTS HSUPA Release 7 (category 6) 5.76Mbps max.

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:

### 3G UMTS SHIELD POWERING, SERIAL and CONTROL INTERFACE

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

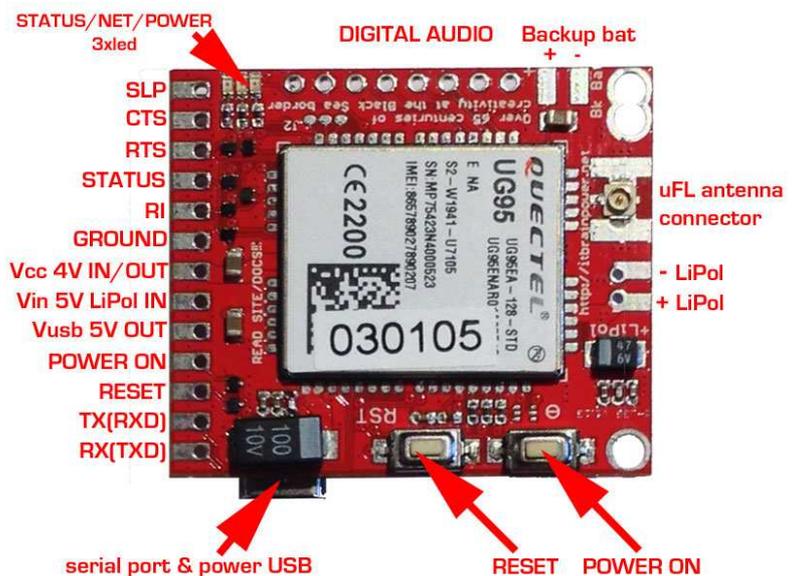
1. RX(TXD) - 3G SHIELD SERIAL RX (TXD) - input
2. TX(RXD) - 3G SHIELD SERIAL TX (RXD) - output
3. RESET - 3G SHIELD RESET - input, active HIGH\*
4. POWER ON - 3G SHIELD POWER ON - input, active HIGH\*
5. Vusb - POWER PIN - output +5V (USB +5V)
6. Vin - POWER PIN - input +5V for LiPol charger only
7. Vcc - POWER PIN - input/output +4V\*\*
8. GND - POWER and DIGITAL GROUND
9. RI - 3G SHIELD RING INDICATOR - output
10. STATUS - 3G SHIELD STATUS - output
11. RTS - 3G SHIELD READY TO SEND - output
12. CTS - CLEAR TO SEND - input
13. SLP - SLEAP - input, active HIGH

\* min. 200msec. Pulse

### 3G UMTS 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. 3G/UMTS antenna connector - uFL or SMA F



**3G UMTS SHIELD (micro) d-u3G v 1.13 top PCB view**

## 3G SHIELD DIGITAL AUDIO INTERFACE\*\* and BACKUP BATTERY

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

1-8. DIGITAL AUDIO interface

9. BkBat+ : Backup battery + pole\*\*\*

10. BkBat- : Backup battery - pole

\*\*\* **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.**

### 3G UMTS SHIELD SWITCHES

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

1. RESET - 3G SHIELD RESET

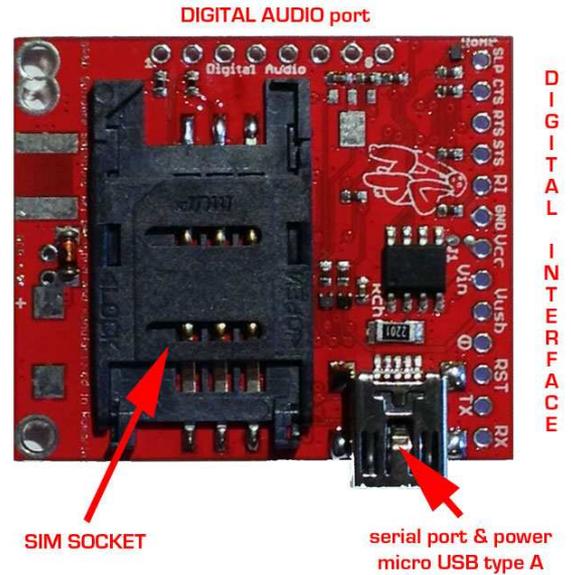
2. POWER ON - 3G SHIELD POWER ON

### 3G SHIELD SIM SOCKET AND USB PORT

In the bottom PCB side, left to right:

1. SIM SOCKET - hinge type STANDARD SIZE 1.8-3V SIM/USIM supported

2. USB PORT - micro USB type A - **3G SHIELD POWERING and SERIAL to USB bridge adapter**



3G UMTS SHIELD (micro) d-u3G v 1.13 bottom PCB view

## Arduino /Raspberry PI logical interfacing

d-u3G 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 d-u3G 1.13 by itbrainpower.net" document.**

Raspberry PI interfacing schema: <http://itbrainpower.net/images/3G-SHIELD-RPI-logical-wiring-d-u3G.png>

## **CODE EXAMPLES and UTILITIES:**

### **Arduino code examples (c):**

#### **d-u3G series 3G / UMTS shield (micro) kickstart for Arduino**

Interactive interface with you're d-u3G 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

#### **d-u3G series 3G / UMTS shield (micro) ARDUINO examples list**

Compliable code (IP DATA TRANSFER w or wo SSL, DTMF, SMS, CALL handling, file handling, and other) examples for you're d-u3G 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):**

#### **d-u3G 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 d-u3G 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:**

d-u3G-raspian-ppp-1.0.tar.gz - **Raspian PPP and routing utility**

setSerial.py - change and save d-u3G serial communication speed Python utility (included in d-u3G-raspian-ppp.tar.gz and in d-u3G-series-RaspberyPI-code-examples-1.0.tar.gz)

### **Additional documentation:**

Available on <http://itbrainpower.net/micro-3G-shield-module-du3G>