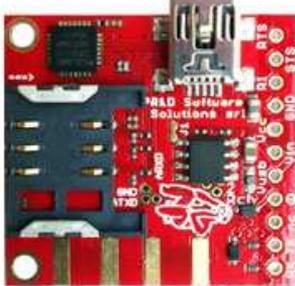


h-nanoGSM series

ARDUINO & RASPBERRY PI GSM + BTH 3.0 shield (nano)



h-nanoGSM v1.08 series revision 2 - ARDUINO & RASPBERRY PI nano GSM + BTH 3.0 shield, one of our latest released product, compact as 1.25"x1.16"(31.75x29.46mm) and with weight around 8g, it is probably the most compact GSM module board on market. h-nanoGSM series it is pin to pin compatible with the dual SIM GSM micro shield ([C-uGSM series](#)), with the 3G micro shield ([d-u3G series](#)) and together, are parts of a bigger family based on "plug-able boards concept".

h-nanoGSM 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.

The **h-nanoGSM v1.08 series** integrates in this format the following main features:

- Not only a GSM break board, but an GSM shield in nano format having big soldering pads
- GSM / GPRS / SMS / DTMF with worldwide coverage (Quad band 850 / 900 / 1800 / 1900MHz)
- Bluetooth 3.0 interface (SPP and HFP profile support)
- USB serial connectivity adapter with **Raspberry PI, 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 / POWER ON-OFF / RI / STS / RTS), 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 Lithium Polymer battery.
- Plug-able accessories as: switching power supply (stand alone or with LiPol usage), (future) u-controller boards, other.
- POWER ON/POWER OFF push micro switch
- Standard size SIM.
- uFL or SMA F antenna connector

The h-nanoGSM 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 h-nanoGSM 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 h-nanoGSM series can be easily and in a time manner incorporated into your equipment regardless your previous experience in modem technology. The h-nanoGSM 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
HNANOGSM108#UFL	Quad band GSM module - equipped with u.FL connector	Worldwide
HNANOGSM108#UFL	Quad band GSM module - equipped with SMA F connector	Worldwide
Part number	Accessories description	
ihatGSM3G101B	Raspberry PI[Zero, B+, II, II] HAT adapter board - connect the h-nanoGSM with the your RPI without wires	
j328GSM3GLader102B	Arduino Micro / Arduino Mini / Arduino Nano adapter board - connect the h-nanoGSM with the your Arduino Micro / Arduino Nano USB / ArduinoPro Mini (or othe compatible boards) without wires	
fAUDIO102B	Audio expander board - 2 x audio sockets bundle expander board	
gSPS102#4V(DDRv)	g-SPS 4V adapter board external plug-able switching power supply, 5-15V input, 4V output, max 2A. 20.3x34.29mm. Use in "without LiPol/stand-alone" h-nanoGSM boards configuration.	
gSPS102#5V(LiPOL)	g-SPS 5V adapter board external plug-able switching power supply, 6-15V input, 5V output, max 2A. 20.3x34.29mm. Use in "with LiPol battery" h-nanoGSM 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	

- **Worldwide compatibility**
- **# Quad band 850 / 900 / 1800 / 1900MHz**
- **GSM / GPRS / SMS / DTMF supported**
- **Standard size SIM**
- **Bluetooth 3.0 interface (SPP and HFP profile support)**
- **RPI compatible built in USB interface**
- **Built in LiPol battery charger**
- **1.25"x1.16"(31.75x29.46 mm), around 8g**
- **ARDUINO & RASPBERRY PI ZERO & I & II & III direct interfacing**
- auto 2.8-5V compatible interfaces
- Windows and Linux PC connectivity via USB
- uFL or SMA F connector
- Analog audio interface
- **C and Python complex code examples**

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

FEATURES AT A GLANCE:

Quad band GSM/GPRS module (Quectel M66F) with true worldwide coverage: 850MHz, 900MHz, 1800MHz and 1900MHz.

Bluetooth 3.0 interface with SPP and HFP profile support.

Very compact and light weight: compact as 1.25"x1.16"(31.75x29.46mm) and with weight around 8g, probably the best on his class. Not only a GSM break board, but an GSM shield in nano format having big soldering pads, for convenient integration and handling.

Embedded USB adapter with SERIAL to USB bridge adapter - with micro-USB type A socket (you can connect the **h-nanoGSM 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): 2.8-5V auto-level (UART TX+RX / POWER ON-OFF / RI / STS / RTS); **you can directly connect (without the need for any level adapter board) the h-nanoGSM 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 micro-controller**. The digital (and powering) interface it is available in standard 0.1"(2.54mm) pin header and it is pin 2 pin compatible with our dual SIM GSM micro shield c-uGSM shield and with our 3G micro shield d-u3G shield.

Embedded LiPol battery charger - the h-nanoGSM shield can run in configurations with or without Lithium Polymer battery, depending on chosen powering schema.

Analog audio interface (output- 32ohm speaker, in- capacitor MIC) - via standard 0.1"(2.54mm) pin header or via **BLUETOOTH audio** interfacing

Embedded switch: control for modem ON/OFF

Multiple powering schemas: - via USB, via POWERING, SERIAL and CONTROL interface (digital interface) or via optional external(20.3x34.29mm) pin to pin plugable 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 + FLASH FILE SYSTEM for FILE STORAGE and other. RaspberryPI PPP and TCPIP routing support (RaspbianOS) trough easy installation and usage scripts.

And, last but not least, h-nanoGSM 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.

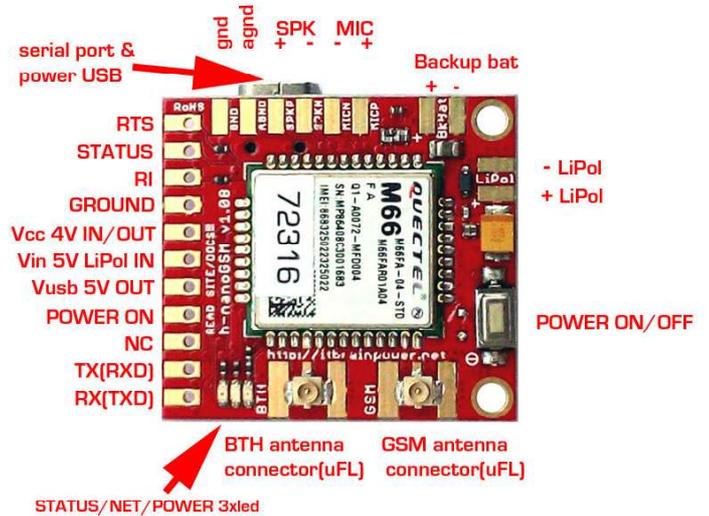
PIN definition:

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. NC - not connected
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

* min. 200msec. Pulse



GSM SHIELD (nano) h-nanoGSM v 1.08 top PCB view

GSM SHIELD BATTERY and ANTENNAS

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

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

1. BTH 3.0 antenna connector - uFL
2. GSM antenna connector - uFL or SMA F

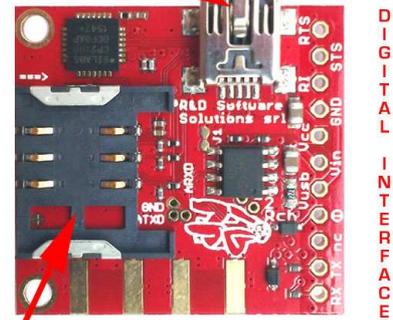
GSM SHIELD AUDIO INTERFACE** and BACKUP BATTERY

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 - speaker output + pole
4. SPK-/SPKN - speaker output - pole
5. MIC-/MICN - cap. microphone input - pole
6. MIC+/MICP - cap. microphone input + pole
7. BkBat+ : Backup battery + pole**
8. 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 GSM shield "BkBat+" pad. 1N4148 anode must be connected with the battery.**

serial port & power
micro USB type A



SIM SOCKET

GSM SHIELD SWITCHES

In the right bottom corner of the top PCB side:

1. ON/OFF - GSM SHIELD TOGGLE POWER

GSM SHIELD (nano) h-nanoGSM v 1.08 bottom PCB view

GSM SHIELD SIM SOCKET AND USB PORT

On the bottom PCB side, left to right:

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

Arduino /Raspberry PI logical interfacing

h-nanoGSM shield PIN NAME	UNO / MINI / NANO / (Mega328)	MEGA2560 using software serial	DUE / MEGA2560 using hardware serial	Raspberry PI B+, PI ZERO, PI II, PI 3
1. RX(TXD)	D3	D3	D18(TX1)	PIN10 RXD0 *
2. TX(RXD)	D2	D10	D19(RX1)	PIN08 TXD0 *
3. NC	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!

* Raspberry PI: i-hat3GGSM adapter usage it is recommended!

**** 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 (SAME as for the c-uGSM).**

Raspberry PI interfacing schema: use similar wiring as for c-uGSM, but do not wire h-nanoGSM PIN3.
<http://itbrainpower.net/images/GSM-SHIELD-RPI-logical-wiring-c-uGSM.png>

Read more about powering configuration and logical wiring on <http://itbrainpower.net>:

- c-uGSM, d-u3G shields (micro) and h-nanoGSM shield (nano) how to start - tutorial RECOMMENDED READING
- gSPS adapter board - plug and run switching power supply companion family for h-nanoGSM shield

CODE EXAMPLES and UTILITIES:

Arduino code examples (c):

h-nanoGSM series GSM shield (nano) kickstart for Arduino

Interactive interface with your h-nanoGSM 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

h-nanoGSM series GSM shield (nano) ARDUINO examples list

Compliable code (IP DATA TRANSFER w or wo SSL, DTMF, SMS, CALL handling, file handling and other) examples for your h-nanoGSM 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):

h-nanoGSM series GSM shield (nano) Raspberry PI examples list

Running code (IP DATA TRANSFER w or w/o SSL, DTMF, SMS, CALL handling, file handling, and other) examples for your h-nanoGSM 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:

h-nanoGSM-raspian-ppp-1.0.tar.gz - Raspian PPP and routing utility

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

Arduino GSM class hack:

Run (almost) any project written for Arduino GSM using the h-nanoGSM shield

All this and other can be accessed at: <http://itbrainpower.net/downloads#h-nanoGSM>

Additional documentation:

Available on <http://itbrainpower.net/h-nano-GSM-shield-Arduino-RaspberryPI/>