Telit EVK2 User Guide

1vv0300704 Rev.9- 28/05/08

Making machines talk.

This document is relating to the following product:

Model	P/N	GSM Engine
EVK2	3 990 150 463	-
GM862 Interface	3 990 250 670	-
GE863-PY Interface	3 990 250 684	GE863-PY
GE863-QUAD Interface	3 990 250 685	GE863-QUAD
GE863-GPS Interface	3 990 250 671	GE863-GPS
GE863-SIM	3 990 250 703	GE863-PY
GE864-PY Interface	3 990 250 672	GE864-PY
GE864-QUAD Interface	3 990 250 688	GE864-QUAD
GC864 Interface	3 990 250 680	-
GC864-C2 Interface	3 990 250 683	GC864-QUAD
UC864 Interface	4 990 150 470	UC864-CC864

Contents

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1 Overview

Aim of this document is the handling description of the *developer's Evaluation KIT* second edition, a laboratory tool named ***EVK2*** in the rest of this document.
All given information shall be used as a guide and a starting point for properly developing of your product. Obviously this document cannot embrace all the hardware solutions and products that may be designed.

2 Generality

Telit supplies the ***EVK2*** to assist the designer during his developing project phase to develop his own applications based on Telit modules.
The ***EVK2*** provides a fully functional solution for a complete data/phone application.
The ***EVK2*** is formed by a motherboard *CS1139B* and several dedicated *Telit modules Interface Boards* with RF antenna connectors.
The motherboard has multiple power supply possibilities and is equipped with SIM card housing, RS 232 serial port level translator, direct USB1.1 connection, and two audio input/output paths.

The only items you have to provide are:

1) a personal computer or microcontroller;
2) a SIM card with a valid Network subscription;
3) the audio accessories;
4) a knowledge of AT commands programming;
5) a power supply.

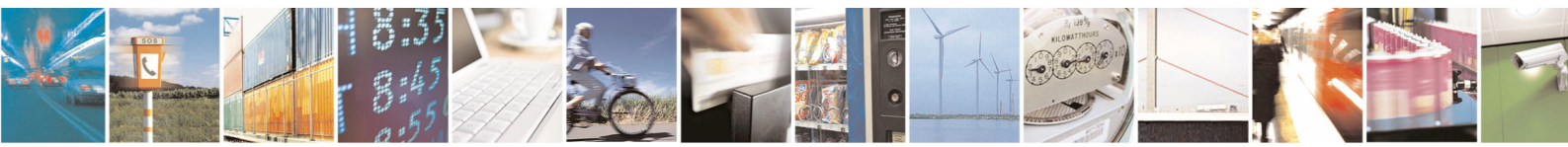
The connection between the ***EVK2*** and your PC (or other DTE) are realized by standard *RS232* or *USB 1.1* ports.

The communications between your application and Telit Modules are realized connecting the Asynchronous Serial Interfaces of the module's Base Band Chips (*ASC0* and *ASC1*) through:
→ *a double stacked standard DB9 connector,* that provides 2 serial communication paths *RS232* protocol up to 115Kbit/sec;
→ a CMOS *HUB,* that makes both serial interfaces accessible through one physical connection providing two-way communication in compliance with *USB version 1.1* specification up to 1,5Mbytes/sec.
The second one is the only possibility with portable personal computers that generally have not the RS232 port.

Furthermore, the ***EVK2*** allows benefiting of the special features of the new Telit Module versions with *PYTHON Script Interpreter* and *GPS satellite positioning* receiver.
The *ASC1*, accessible as RS232 on lower DB9 connector or through the USB1.1 HUB, is used for:

- continuous of debug messages of the PYTHON Script Interpreter (requires PYTHON version modules;
- continuous direct output of GPS NMEA sentences (geographical coordinates) from modules with GPS.

The development of the applications utilizing Telit modules presents a proper design of all the interfaces towards and from the module (e.g. power supply, audio paths, level translators),



otherwise a decrease in performance will be introduced or, in the worst case, a wrong design can even lead to an operating failure of the module.
It is also easily feasible the use of the Telit modules in the so called " *stand-alone configuration* ", connecting the module mounted on its own interface board directly to your application, through 2x40 pin header connectors.

2.1 Content of the kit

Please check out the content of your ***EVK2*** kit; if any of the items is missing, please contact your supplier.

Description	Quantity
EVK2 MOTHERBOARD	1
INFORMATION NOTE	1
2 PIN JUMPER FEMALE CONN	18
ASSEMBLED USB A-B CABLE L-1800	1
RED & BLACK CABLE WITH PLUGS L-60cm	1
GSM-UMTS MAGNETIC ANTENNA CABLE RG174 WITH SMA/M	1

Table 1

Figure 1: ***GE863-PY Interface Board*** (upper) fitted on ***EVK2 Motherboard (***lower).

3 Description

The motherboard *CS1139B* can be split into several functional blocks depending on the implemented function; the following drawings show a block diagram and the displacement of the main blocks on motherboard.

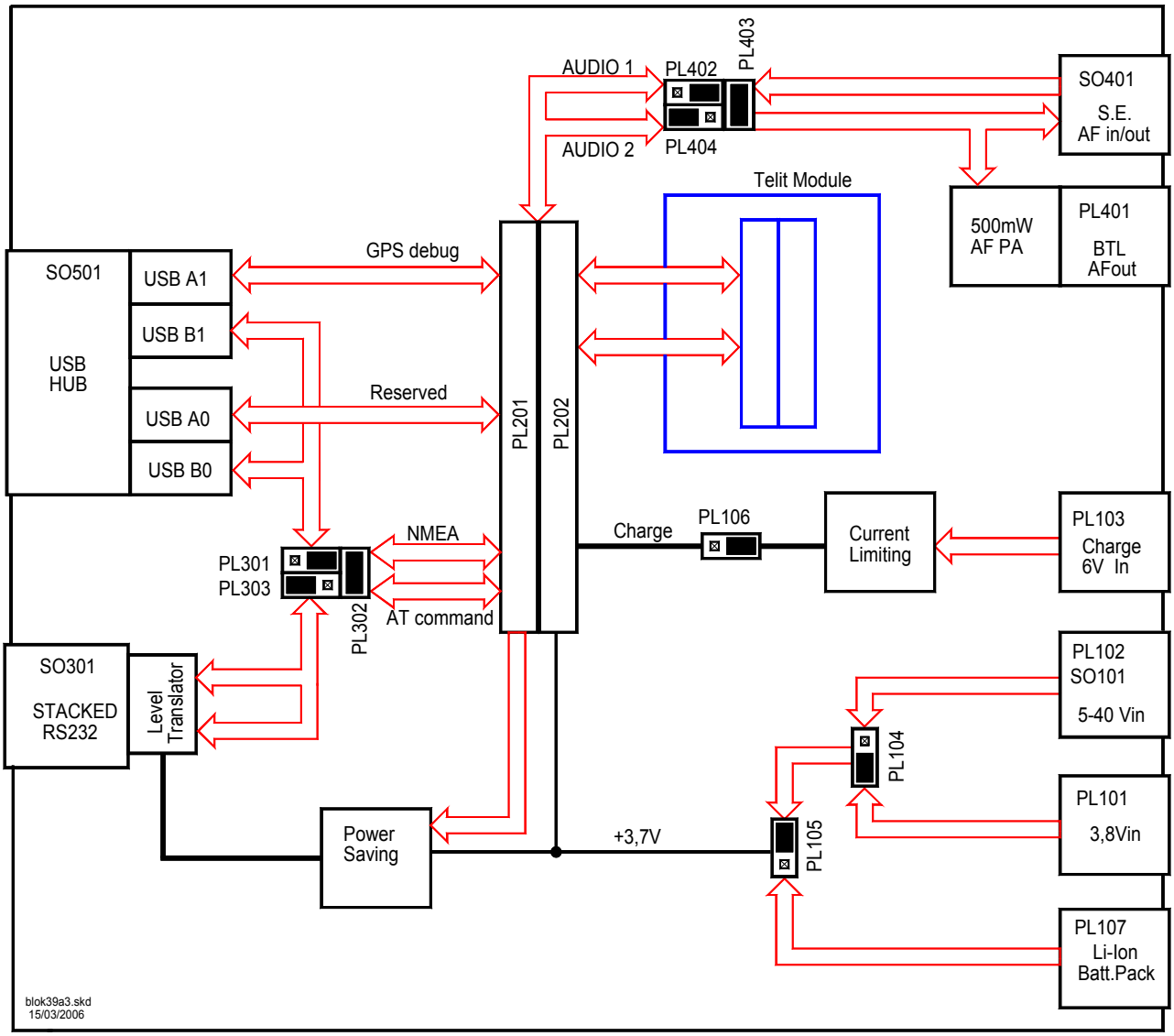
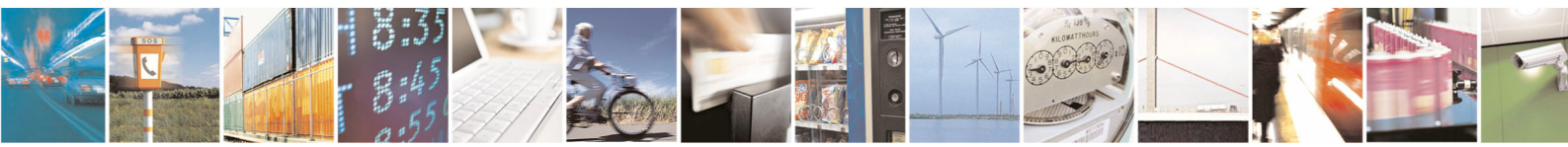


Figure 2: Miscellaneous signals, connections and routing on *CS1139B*.



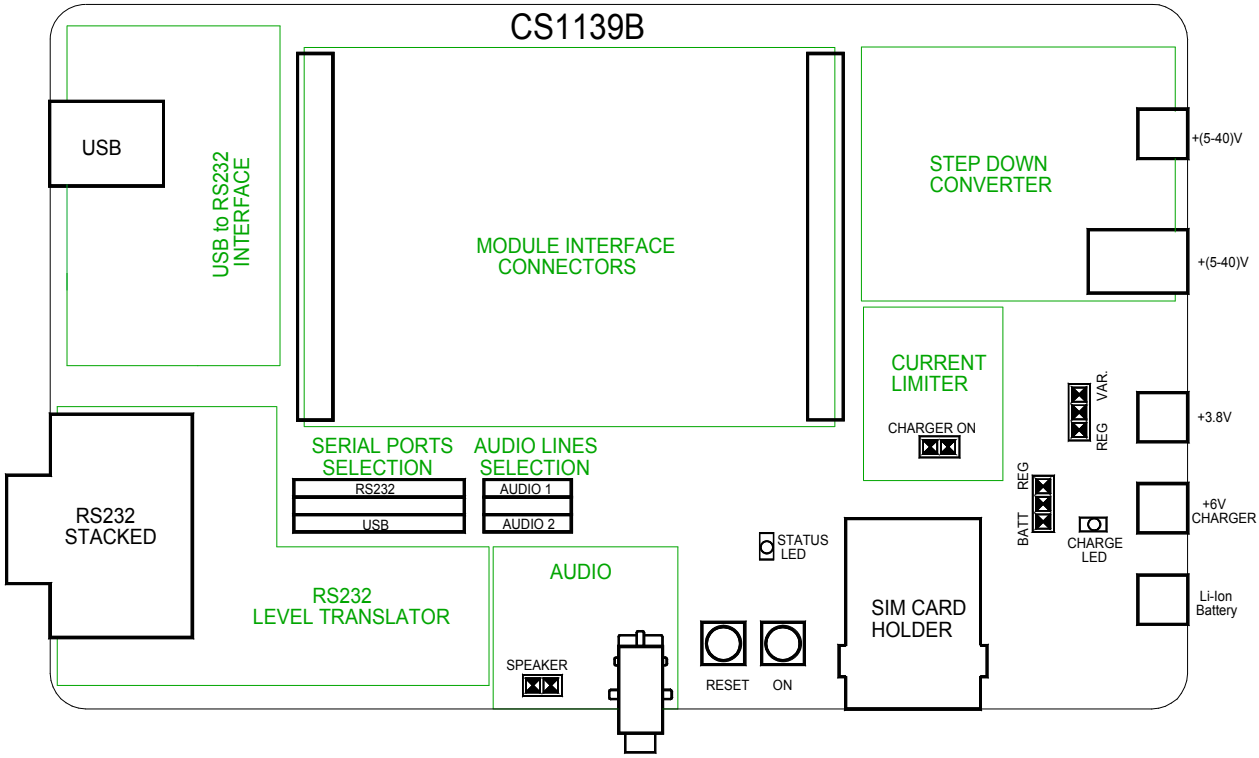


Figure 3: *CS1139B* circuital displacement

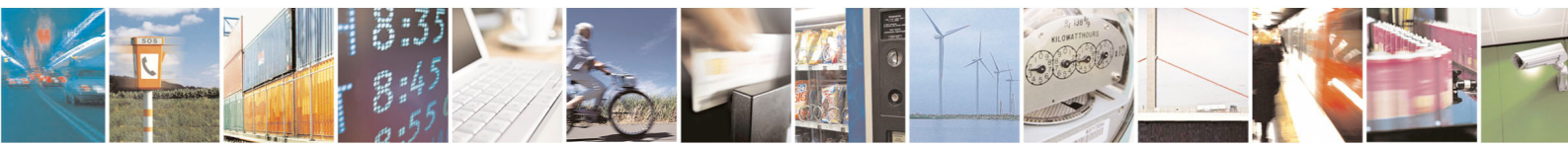
3.1 PCB characteristics

Material	FR4
Thickness	0, 95 mm
Surface finishing	Chemical gold plate Ni 5um/ Au 0,1um

3.2 Mechanical characteristics of the assembled PCBs

3.2.1 Mother Board CS1139B

Length	100	mm (max 102,6 mm)
Width	160	mm (max 166,10mm)
Height	47,6	mm (included the support with columns)
Weight	200	gr (without any interface)



3.2.2 GM862 Interface CS1150B

Length	66,04 mm
Width	78,74 mm
Height	21,00 mm
Weight	27 gr (without the module)

3.2.3 GE863 Interface CS1151A

Length	75 mm (max 84,70mm)
Width	78,74 mm
Height	21,00 mm
Weight	40 gr (with module)
Weight	44,3 gr (with module for GPS version)

3.2.4 GE864 Interface CS1152B

Length	66,04 mm (max 75,20mm)
Width	78,74mm
Height	21,00 mm
Weight	36 gr (with module)

3.2.5 GC864 Interface CS1203B

Length	66,04 mm
Width	78,74 mm
Height	21,00 mm
Weight	27 gr (without the module)

3.2.6 GC864-C2 Interface CS1231X

Length	50,00 mm
Width	33,00 mm
Height	5,60 mm
Weight	13,8 gr (with module)

3.2.7 UC864-CC864 Interface

Length	102,00 mm
Width	67,50 mm
Height	20,80 mm
Weight	55 gr (without module)

Note: The overall height for every combination *(mother board+interface board)* is still the height of the mother board

4 Startup procedure

The motherboard factory setup is:

Serial port ***RS232***
DC source .....***+ (5÷40) V /≥ 1A***
Batt.Charger connector (PL106)…***On***
RX Amplifier.....***Audio 1***

Respect the following order to use the EVK2:

- ✓ insert your SIM card
- ✓ set properly all jumpers in the desired position
- ✓ plug the module Interface board into PL201 and PL202
- ✓ connect the antenna to RF connector (on module or on Interface Board)
- ✓ connect the audio accessories if required
- ✓ plug the external power supply into the right socket, depending from DC source
- ✓ switch ON the power supply
- ✓ connect the serial cable between your PC and UART (RS232 or USB 1.1)
- ✓ push ON/OFF button for at least 2 seconds until the STATUS LED is on

Your EVK2 should now be operational and ready to receive AT Commands.

4.1 Golden rule

When you use USB port, it is very important to respect the following sequences:

start first turning *ON* your *EVK2* and then connecting it to your *PC* ;
stop first disconnecting your PC and then turning *OFF* your *EVK2* .

5 Insertion of the Interface Boards

Every *Interface Board* must be inserted on *CS1139B* paying great attention to match the position of the main connectors; this has been made easy:

→ *optically* by a triangle drawn on both printed circuits (except CS1231X) ;
→ *mechanically* shifting a column out of regular square cross position.

Both guide systems are highlighted by orange color as shown on the next figure.

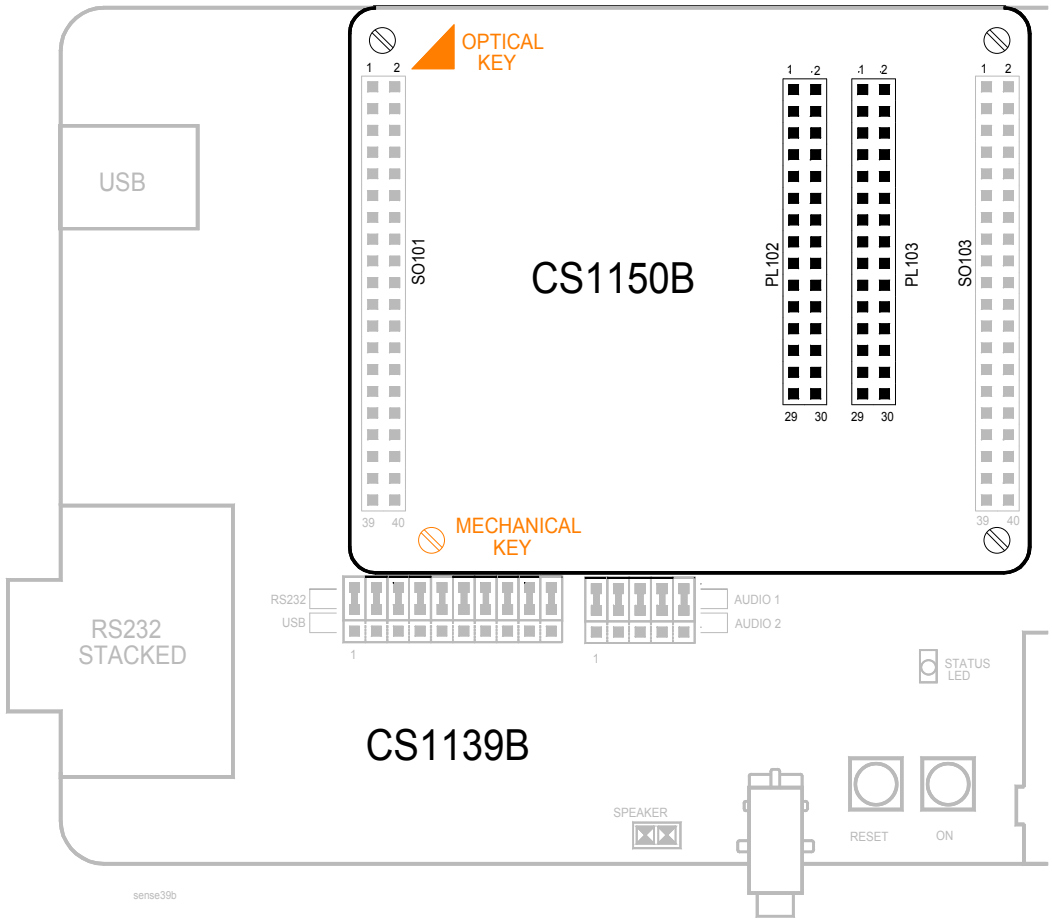


Figure 4: Positioning Guide Systems of *GM862 Interface Board* on CS1139B.

6 Power supply setting

The ***EVK2*** could be powered by different external sources, only one at time. The requested setting is made inserting the proper jumper connectors in the right position as described in the following paragraphs.
Be careful to the connections, even if every supply line is protected by a diode against "*polarity reversing*" and by a 0Ω resistor against "*short circuiting*".

6.1 Fixed DC source

Connect a ***+3,8V / ≥ 2A*** fixed DC source to PL101 respecting the polarization; short *pin2 & pin3 - PL104* and pin1&pin2- PL105 by *2 contacts jumper* connectors. No other jumpers are needed.

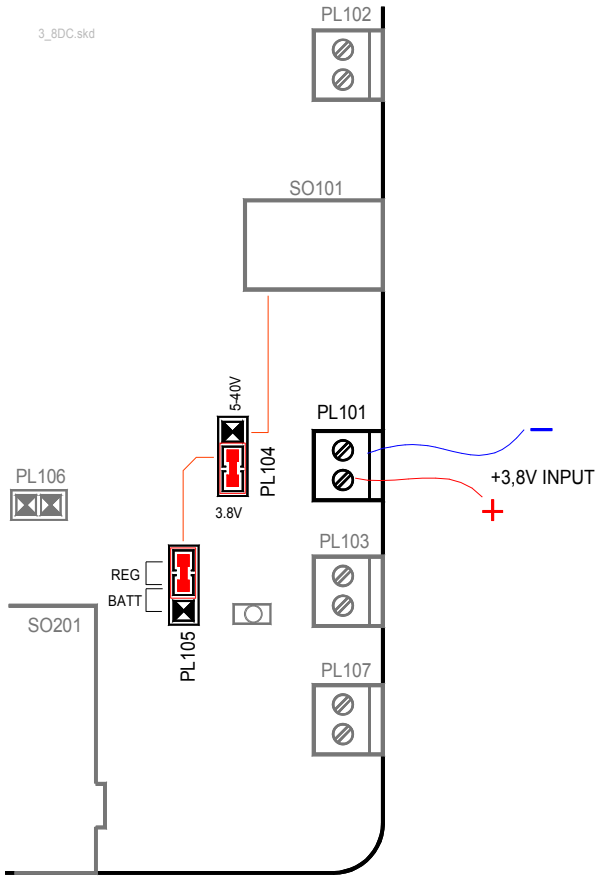


Figure 5: *+3,8V fixed* source setting

6.2 Variable DC source

Connect a ***+ (5÷40) V /≥ 1A*** variable DC source to PL102 (*by wires*) or to SO101 (*by coaxial plug*), with care to the polarities. Short *pin1& pin2-PL104* and *pin1& pin2-PL105* by inserting 2 *contacts jumper* connectors.
No other jumpers are needed.

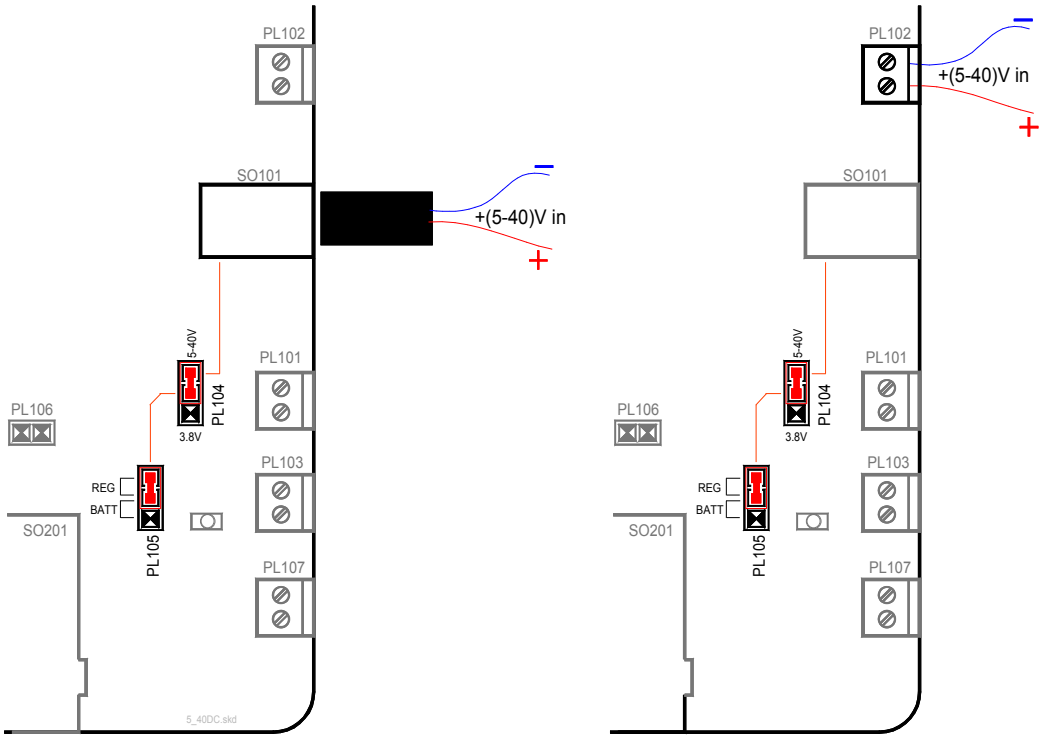
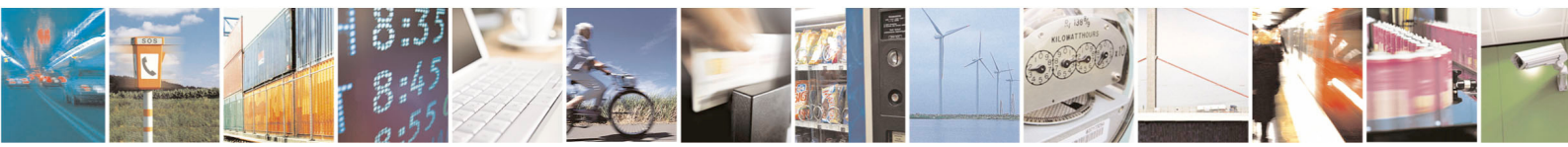


Figure 6: Variable DC source setting

6.2.1 Suggestion

It is useful set the variable DC source at 6V minimum to avoid problems with voltage drops due to the length of the wires or the conductors gauge .



6.2.2 Coaxial Plug

The figure 7 shows the connections of the Power Plug of left part of figure 6.

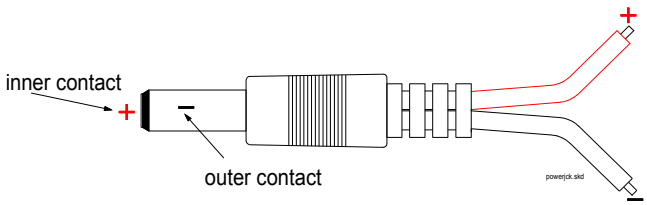


Figure 7: Coaxial "*Power Plug*" connection.

6.3 Li-Ion Battery pack and Charger

Connect a ***Li-Ion battery pack*** to PL107 with care to the polarity then short p*in2*&*pin3*- PL105 by inserting the *2 contacts jumper* connector.

If the battery pack needs to be recharged, connect a ***+6V /≥ 0,5A*** fixed DC source to PL103, with care to the polarity; short PL106 inserting a *2 contacts jumper* connector as shown in figure 8: the yellow CHARGE LED will be on during the initial phase of charge. If you remove the battery pack when the charge stops (no current flows), immediately **REMOVE** also the jumper of PL106.

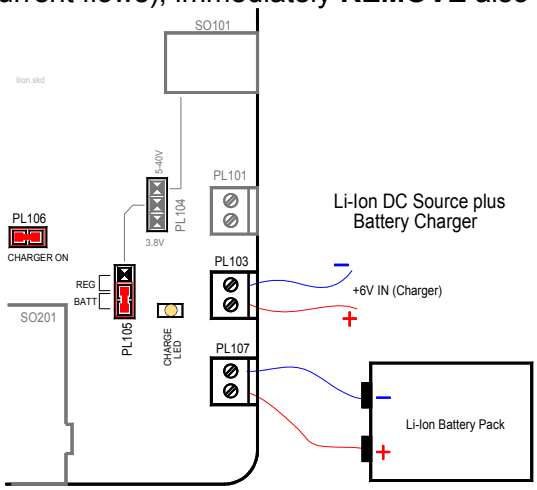


Figure 8: Battery Pack and Battery Charger wired connections and setting.

NEVER** CONNECT any Battery charging source to PL103 of CS1139B **WITHOUT the Battery Pack

6.4 Application Notes

6.4.1 About Li-Ion Battery Pack

The 3.7V Li-Ion rechargeable Battery Pack should be connected directly to PL107 connector.
Remember to use the connection cables as short as possible, with the appropriate conductors gauge and the other attributes, such as device power budget and cable flexibility, in order to match the specified voltage drop (especially during the high current absorption periods).
To obtain the best performance we suggest a capacity of ***1000 mAh*** (*not lower than 500 mAh*).

6.4.2 About Current Charger

With a ***+6V Current Unlimited Source*** connected to PL103 connector, the battery pack will be directly charged through *VBATT connector pins* of the Telit Modules, under control of the *Internal Charge Algorithm*.
Depending on the size, the Li-Ion cell manufacturers suggest a charge current value not greater than *1,5C*[1]; even if a lower current means a longer charging time, a current equal to *0,5C* is considered to be a good choice.

With reference to the schematic diagram *30276SE11139A -sheet1*, the Current Limiting Circuit (*Q102, Q103, R106, R107, R108, R109, R110, R111, R112, R113, C105*) sets the maximum value of the Charge Current in respect to the law:

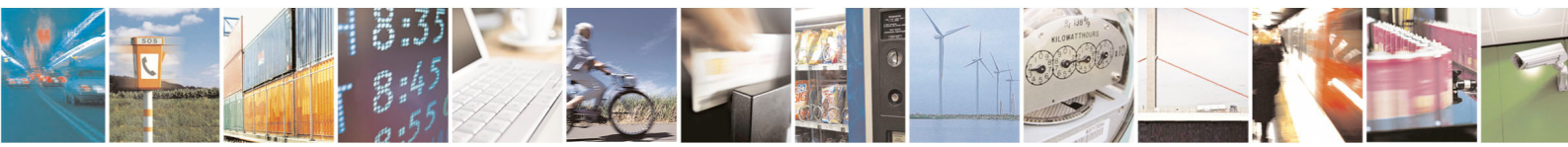
$$I\,ch = \frac{Vbe\ Q102}{R\ par} \rightarrow where \quad R\ par = //R110,\ R111,\ R112,\ R113$$

With the default values, the charge current will be ~ 470mA, which will charge Battery Packs with a capacity from 350mAh to 1000mAh, **without any dissipation problem**.

If a higher capacity Battery Pack is needed, you must increment the Time Out in the Telit Modules.

Set the maximum voltage of the
Current Unlimited Source
*lower then +**8V***

[1] Capacity of the battery pack, expressed in mAh



7 Serial interface

The following figure shows the architecture of the serial ports.

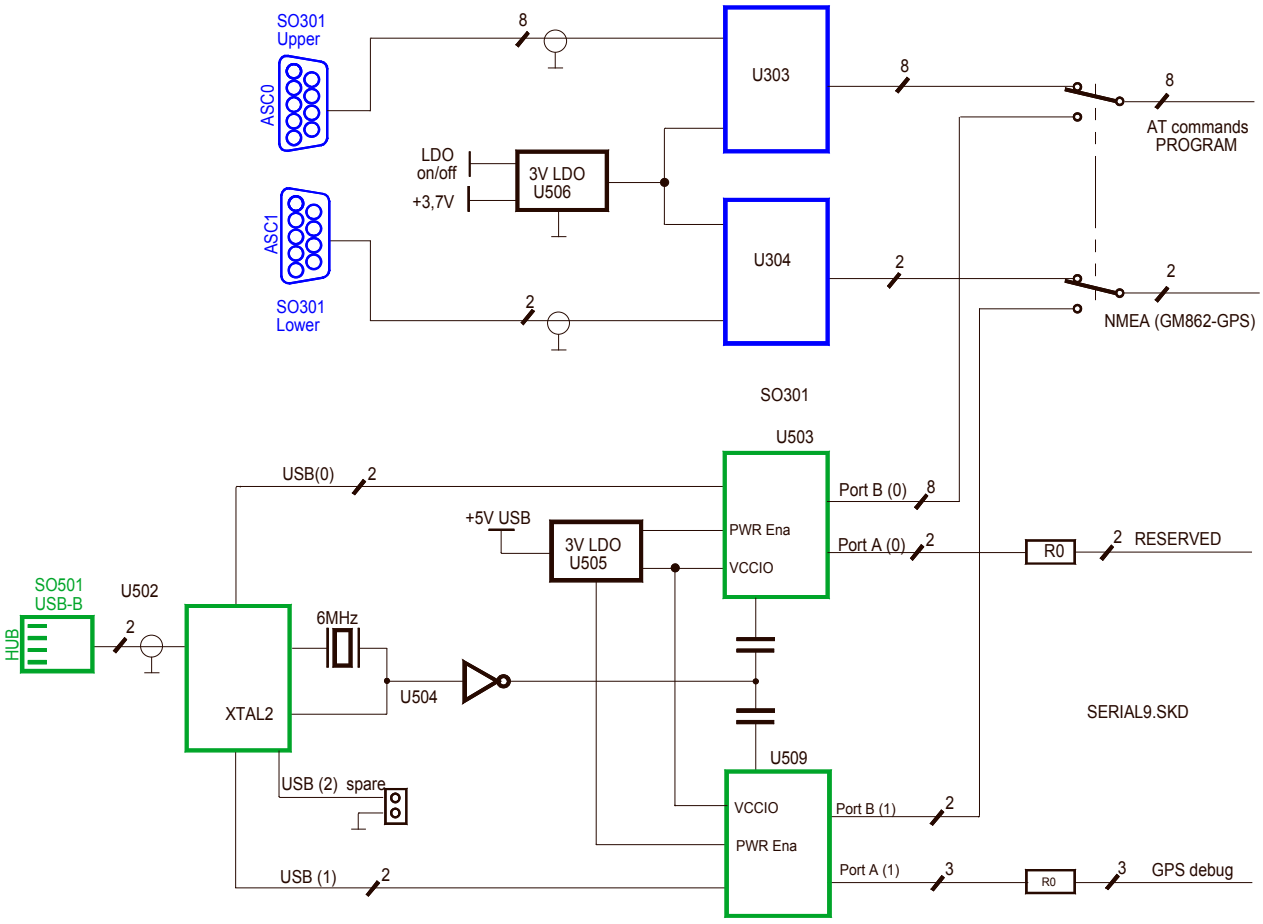


Figure 9: Serial ports block diagram.

7.1 Serial Port Setup

Communications between your application and the Telit modules are allowed connecting the DTE to the *Asynchronous Serial Interfaces* of Base-Band Chip, ASC0 and ASC1, through the *stacked standard RS232 communications port* (*double 9way D-socket connector* at slow data rates of *RS232 protocol)* or *a standard USB-B Series receptacle* (*at higher data rates of USB1.1 specification through a CMOS HUB that realizes a multiple attachment point device*).

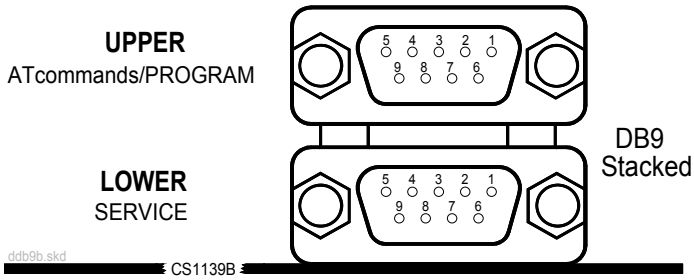


Figure 10: Double 9way D-Socket Connector

The selection is made short circuiting *PL302&PL303* (*RS232 mode*) or *PL302&PL301* (*USB 1.1 mode*) by 10 pieces of *2 contacts jumpers*. This solution has been implemented because you can isolate every single line during the development.

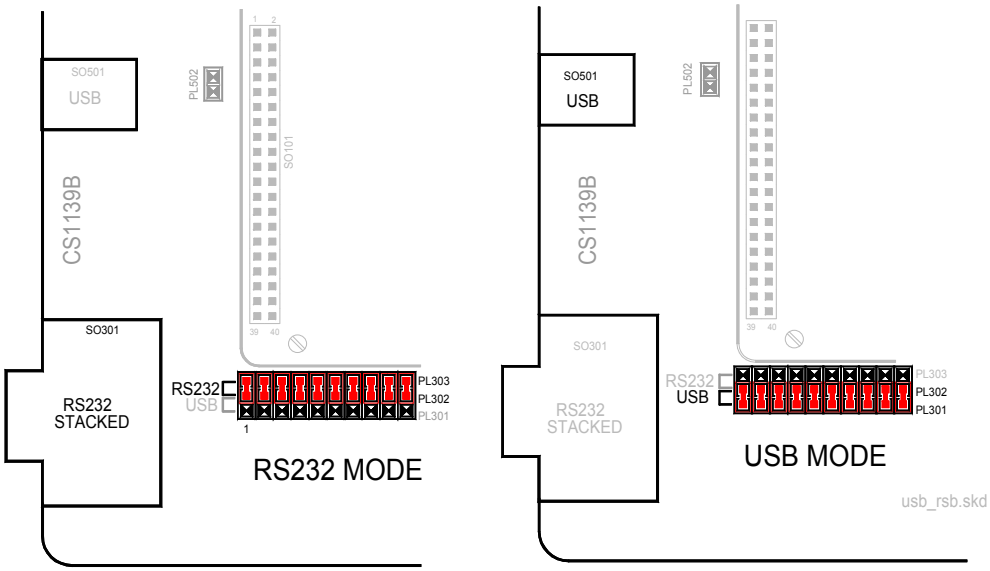
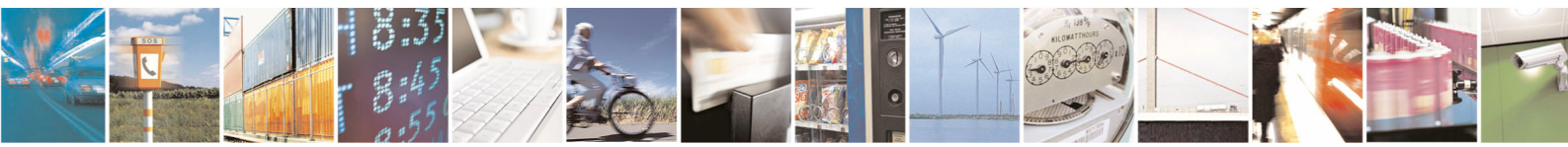


Figure 11: Serial Ports selection



8 Audio Section

8.1 Overview

The BaseBand chip of our modules provides two audio paths both in receive and in transmit sections, which could be active only one at time.
To turn on your well-suited section on EVK2, please refer to "*AF Amplifiers Setting* "paragraph and followings.
To know which are the suggested performances of the EVK2 audio transducers, refer to "*Audio Accessories* "paragraph.

8.1.1 History

The Baseband chip of our modules was developed for the cellular phones, which needed two separated amplifiers both in RX and in TX section. A couple of amplifiers had to be used with internal audio transducers (Handset mode, *HS*) while the other couple of amplifiers must be used with external audio transducers (Handsfree mode, *HF*).

8.1.1.1 Transducers definitions

Headsets are transducers that receive an electrical signal from a receiver and use speakers placed in close proximity to the ears to convert the signal into audible sound waves.
In the context of telecommunication, the word *Headset* is also commonly understood to refer to a combination of ***Headphone*** and Microphone used for two-way communication, like with a mobile phone.
Earphones are small Headphones that are placed directly outside of the ear canal, but without fully enveloping it. They are generally inexpensive and are favored for their portability and convenience.
Earpiece
A part whether of a telephone receiver or hearing aid, that fits in or is held next to the ear.

8.1.2 Actual

The *HS* and *HF* definitions have been kept in the Software and on the schematics of theTelit modules. But with EVK2 we will refer to *Audio1* or *Audio2* section instead of *Handset* and *Handsfree* respectively, remembering that:

- they can have fully equivalent electrical performances (*like the two microphone amplifiers*)
- they can activate the same functionalities (*like the Echo Canceller module*)
- they can offer slightly different performances (*like the two speaker buffering stages)*

8.1.3 The choice

The activation of the audio path is made Hardware by ***AXE*** line or Software by ***AT#CAP*** command. If you don't have any load driving constraint (*like a speaker with an impedance coil lower than 16Ω*), the choice between one or other "*block*" could be done without consideration related to the electrical performances; for example in order to overcome the PCB design difficulties.

8.2 Differential and Single Ended

8.2.1 Concepts

Any voltage can be characterized by a potential difference between two terminals.
The configuration of the two terminals and how the signal is delivered from output to input allows the signal to be more generally described in one of three ways:

- *Single-ended signal*. This is a signal delivered between a signal trace and a ground. One terminal for a single-ended connection is always at fixed potential (*usually Ground*).
- *Differential Signals*. These are signals that travel through a pair of traces. On the signal pair, neither of the terminals is Ground.
- *Common mode Signals. They represent a special case of differential signals, also traveling between a pair of traces, where the voltage potential on both signals is the same.*

8.2.2 Benefits and disadvantages

Differential amplifiers are desirable to use, especially in audio applications where signal levels are very low such as those from microphones.
Classically, the benefits obtained from differential amplification are:

- *Increase of Common Mode Rejection Ratio (CMRR)*
  Differential inputs enable cancellation of any noise common on both inputs. Noise generated at the input of the amplifier has a greater effect than noise generated at the output, because any noise on the input is multiplied by the gain of the amplifier.
- *Increase Signal to Noise Ratio (SNR)*
  The inputs to the amplifier are especially sensitive to noise because they are typically not driven by a very low impedance source.
- *High Rejection in Electromagnetic Interference (EMI)*
  Noise immunity is very important in wireless phones because the RF signal is sent in bursts such that the frequency between bursts is in the audio band. RF rectification is such a problem that many manufacturers shield the audio portion of the phone.
- *Double Useful signals level*
  The signal levels from microphone and the voltage swing to the load are doubled. Then the AF power to the load it is 4 times the single-ended AFpower at the same voltage supply.

- *No output blocking capacitor is needed*
  Even if the differential outputs are biased at half-supply; no DC voltage exists across the load. You do not need the big, expensive and heavy blocking capacitors (generally from 33 µF to 1000 µF), lowering the cost and saving PCB space
  There is no frequency limiting effect due to the high pass filter network created with the speaker impedance and the coupling capacitance.
- *Less shielding is required from amplifier to load*

Mainly we have only one disadvantage using differential amplification: the routing of one more signal line could be more difficult and the additional trace requires more board space.

8.2.3 Settings

Connecting your accessories to *SO401 in/out connector,* you will implement Single Ended Input/Output configurations.
Removing all *2 contacts jumpers* inserted between *PL402&PL403* or *PL403&PL404,* the *in/out lines* of our modules will be directly available on *PL402* and *PL404* connectors.
In such a way, you will be able to implement fully Differential Input/Output configurations.
Only with GC864-QUAD/PY-C2 modules the *Ear output* lines are AC coupled.

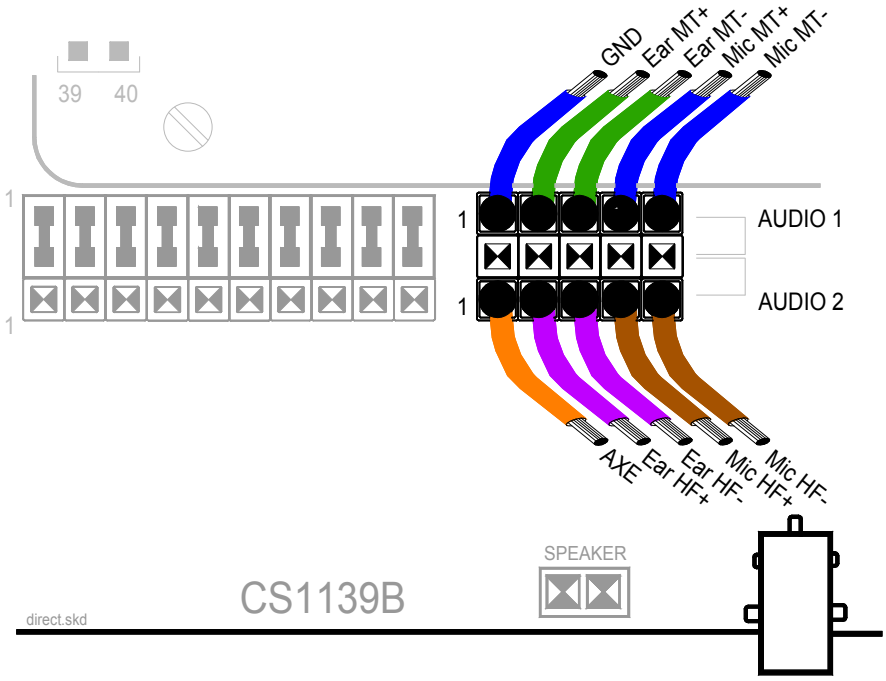


Figure 12: *PL402* and *PL404 Fully Differential audio lines.*

9 AF Amplifiers Setting

The *Base Band Processor Audio Amplifiers* selection is made short-circuiting *PL403&PL402* (*RX Amplifier 1*) or *PL403&PL404* (*RX Amplifier 2*). In such a way you could verify the complete performance of both audio paths.

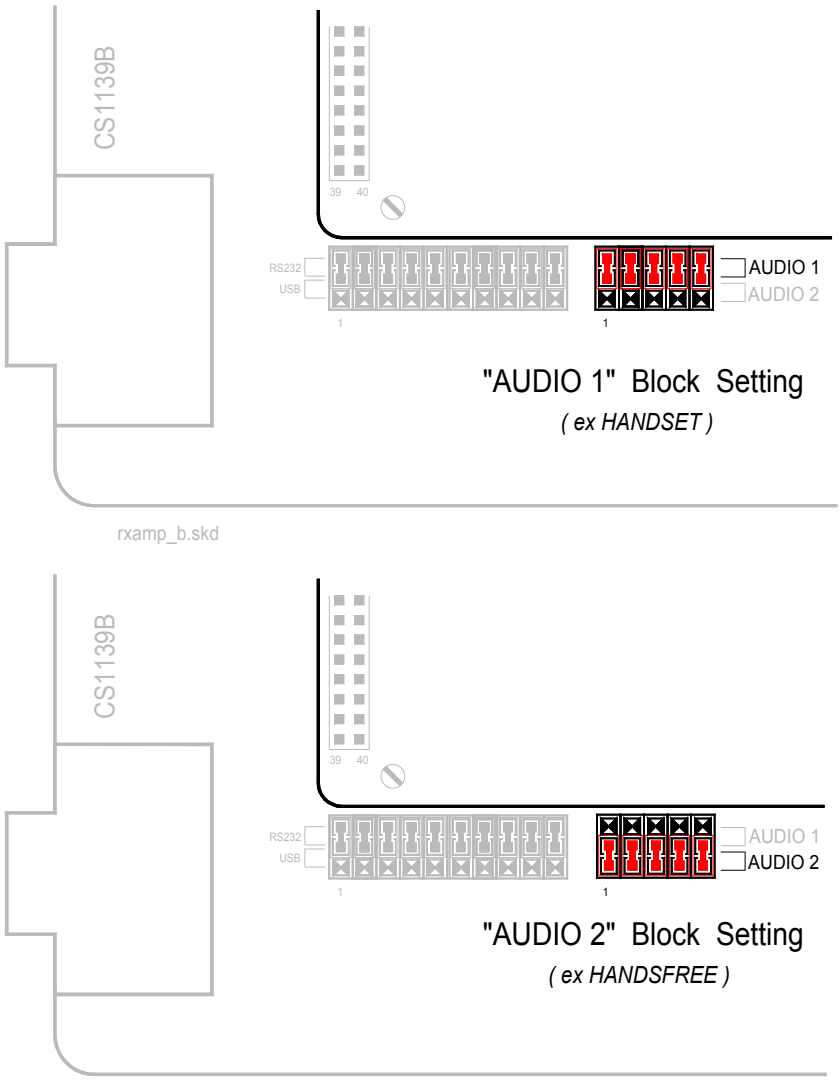
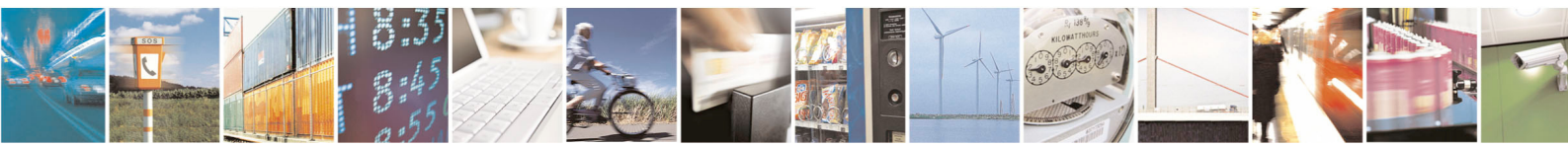


Figure 13: BaseBand Audio Amplifiers selection



10 Audio outputs

The EVK2 output audio signals could be drive a device connected to *SO401* (LOW AF POWER mode) or to *PL401* (HIGH AF POWER mode).

10.1 Low AF Power Mode

Inserting the *2 contacts jumpers* as explained at paragraph 9A, a standard *off-the-shelf Headset* should be connected to the *SO401* (*3 contacts, 2.5mm diameter jack connector*).
With such an insertion, the Telit Modules will power the Microphone through a Single Ended input circuit and the Earpiece through a Single Ended/ AC coupled output circuit.

Note that the acoustic performance of the *Headset* (*frequency response, loudness*) largely depends by its housing, fitting and acoustic impedance.

REMINDER: the coil impedance of the *Headset* should be higher than 15Ω@1KHz

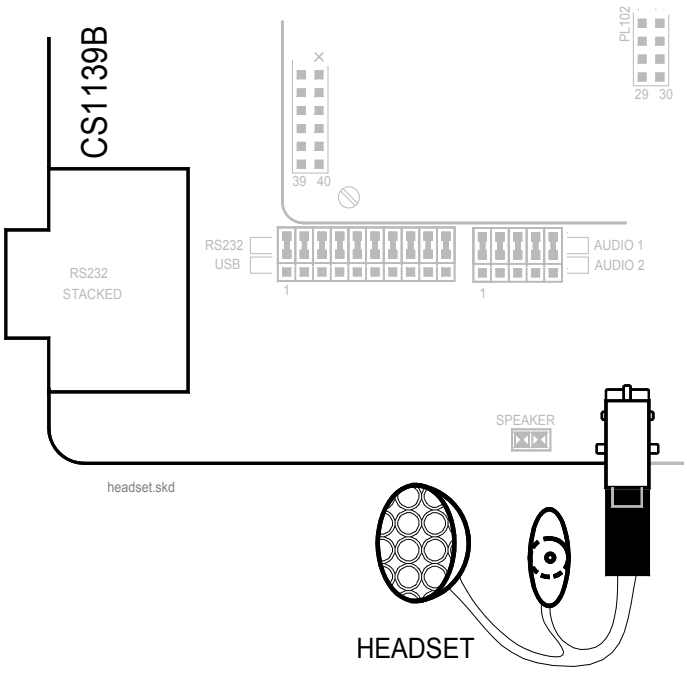


Figure 14: Headset insertion

10.1.1 Audio connector

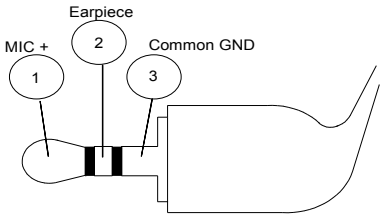


Figure 15: Audio Plug Pin-out

10.2 High AF Power Mode

Connecting an ***8Ω*** Speaker to PL401 by a 2 contacts female connector, you could drive it through the 500mW Power Amplifier.
In this case the Speaker will be driven in fully differential configuration, with no side connected to ground and without any output coupling capacitor. Therefore care must be taken because there is DC voltage on both sides of the Speaker.
The overall gain of this amplifier can be modified varying the ratios R406/R404 and R407/R410:

$$A_v = 2 \bullet \frac{R404}{R406} = 2 \bullet \frac{R407}{R410}$$ if R404=R407 and R406=R410

REMINDER: the coil impedance of the Speaker should be higher than 8Ω@1KHz

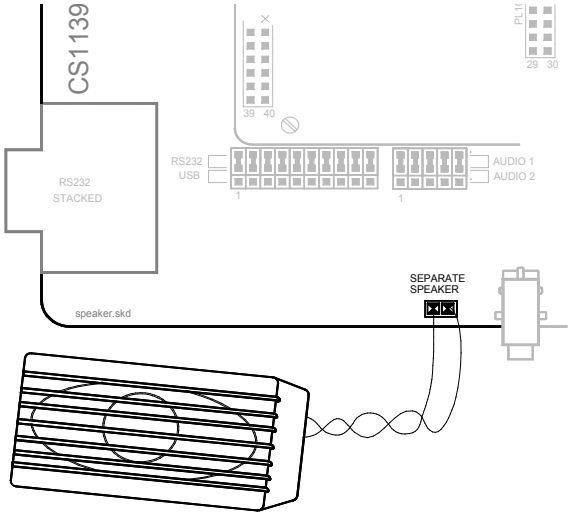
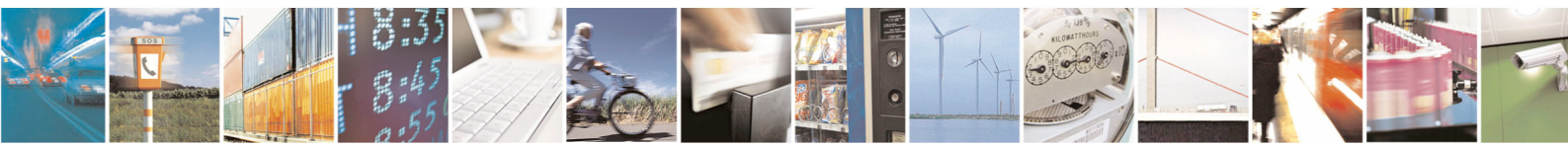


Figure 16: Speaker insertion



10.2.1 Speaker and Stand-alone Microphone

If you are using a Speaker, you can connect a *stand-alone electrete microphone* by a coaxial 2,5mm plug to SO401, respecting the following pin-out.

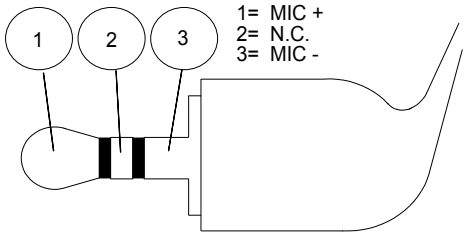


Figure 17: Electrete Microphone Plug Connection

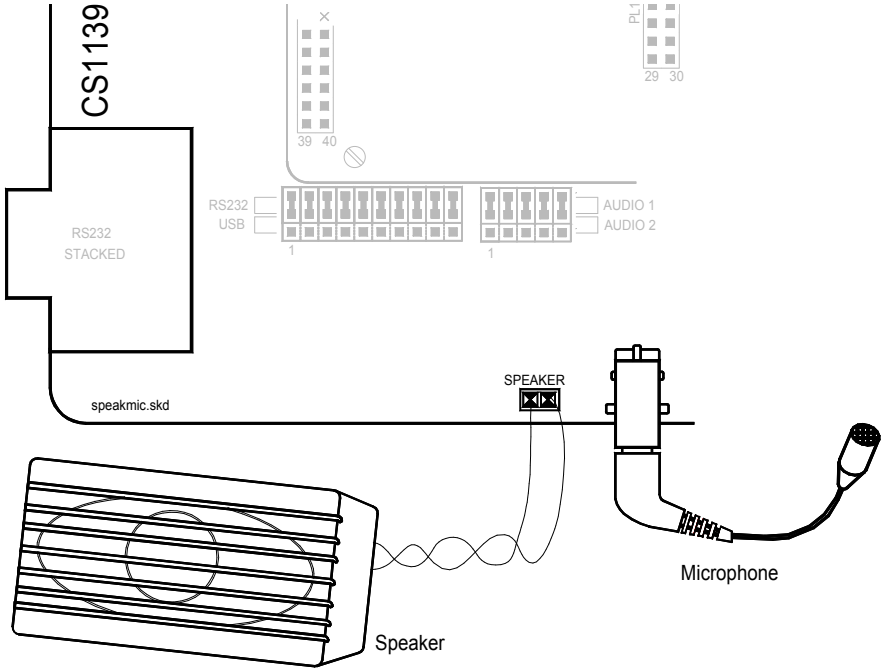


Figure 18: *Speaker & Electret Microphone* case insertion

10.2.2 Speaker plus Headset

If you have chosen to connect the Speaker to *HIGH AF POWER* output, without having a stand-alone electret microphone, it is also possible to connect a standard *off-the-shelf Headset* to SO401 without any problem, as shown in the figure 18: the AF output signal will be heard on both Speaker and Earpiece.

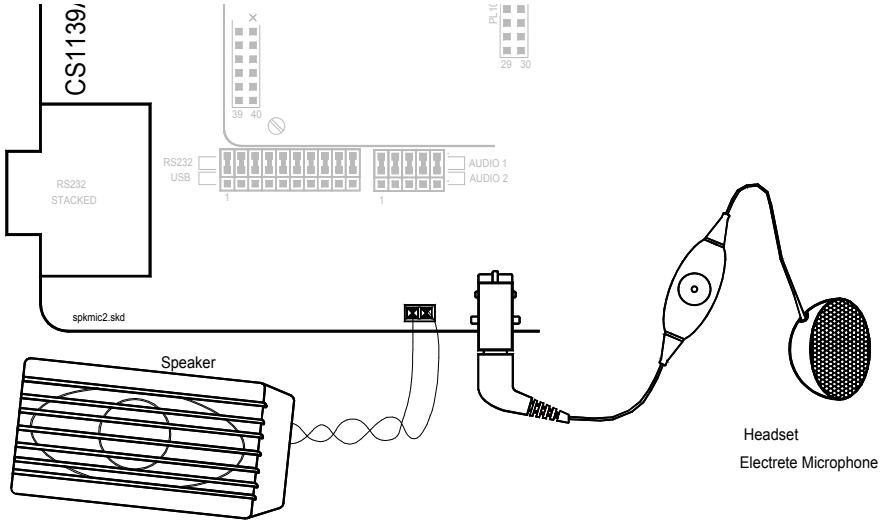


Figure 19: Speaker plus Headset insertion

10.3 Warning

10.3.1 Coil impedance

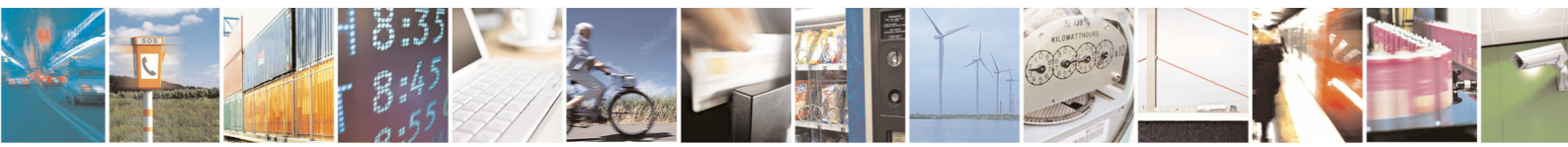
You must use the right coil impedance depending from audio output you want to use.

10.3.2 Earpiece

If you sort out the LOW AF POWER solution connecting your Headset to SO401, the coil impedance ***must be at least 16Ω@1KHz or higher.***

10.3.3 Speaker

If you sort out the HIGH AF POWER solution connecting your Speaker to PL401, the coil impedance ***must be at least 8Ω@1KHz or higher.***



11 Audio Accessories

The following tables show the suggested specification to obtain the best performance from *off-the-shelf* accessories.

11.1 Headset

Nominal sensitivity	-45dBV$_{rms}$/1Pa (+/- 3dB)
Line coupling	AC
Nominal Voltage	2V
Range of Using Voltage	(1÷10)V
Consumption Current	(150÷500) µA
Impedance	2,2KΩ
Signal to Noise Ratio	56dB /1KHz/1Pa (A curve)
Inner EMI capacitor between terminals	10pF, 33pF

Table 2: Microphone electrical characteristics

Rated Input Power	5mW
Maximum Input Power	20mW
Coil Impedance	32Ω ± 5Ω @ 1kHz
SPL	95±3 dB @ 1KHz/1mW sine wave
Resonance frequency (Fo)	< 350Hz
Useful Bandwidth	Fo ÷ 8000 Hz @ -3dB

Table 3: Earpiece electrical characteristics

11.2 Stand-alone microphone

Nominal sensitivity	-45dBV$_{rms}$/1Pa (+/- 3dB)
Line coupling	AC
Nominal Voltage	2V
Range of Using Voltage	(1÷10)V
Consumption Current	(150÷500) µA
Impedance	2,2KΩ
Signal to Noise Ratio	56dB /1KHz/1Pa /A curve
EMI capacitor between terminals	10pF, 33pF

Table 4: Microphone electrical characteristics

11.3 Speaker

Rated Input Power	500 mW
Maximum Input Power	1W
Coil Impedance	≥ 8Ω
SPL	≥ 85±3 dB @ 1KHz
Resonance frequency (Fo)	< 350Hz
Useful Bandwidth	Fo ÷ 8000 Hz @ -3dB

Table 5: Speaker electrical characteristics

12 Indication and services

12.1 Optical Indicators

12.1.1 Status Led

It is a debug aid that shows information on the network service availability and Call status.

LED status	Device Status
Permanently off	Device off
Fast blinking (period 1s, Ton 0,5s)	Net search / Not registered / turning off
Slow blinking (period 3s, Ton 0,3s)	Registered: full service
Permanently on	A call is active

Table 6: STAT_LED indications

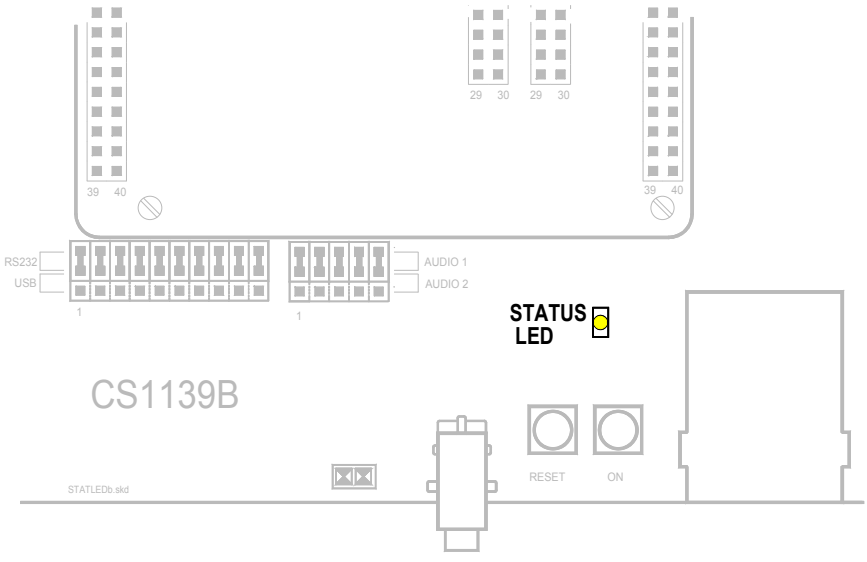
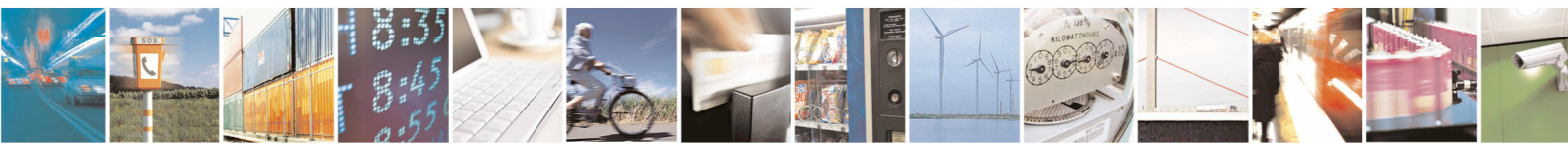


Figure 20: STAT_LED position



12.1.2 CHARGE Led

A yellow LED is used as *Charge In Act* Indicator, as explained in the following table.

CHARGE LED	Meaning
Always on	Start Charge/ Hugh current Charge in act
Always off	Low current Charge in act/Charge stop

Table 7: CHARGE LED indications

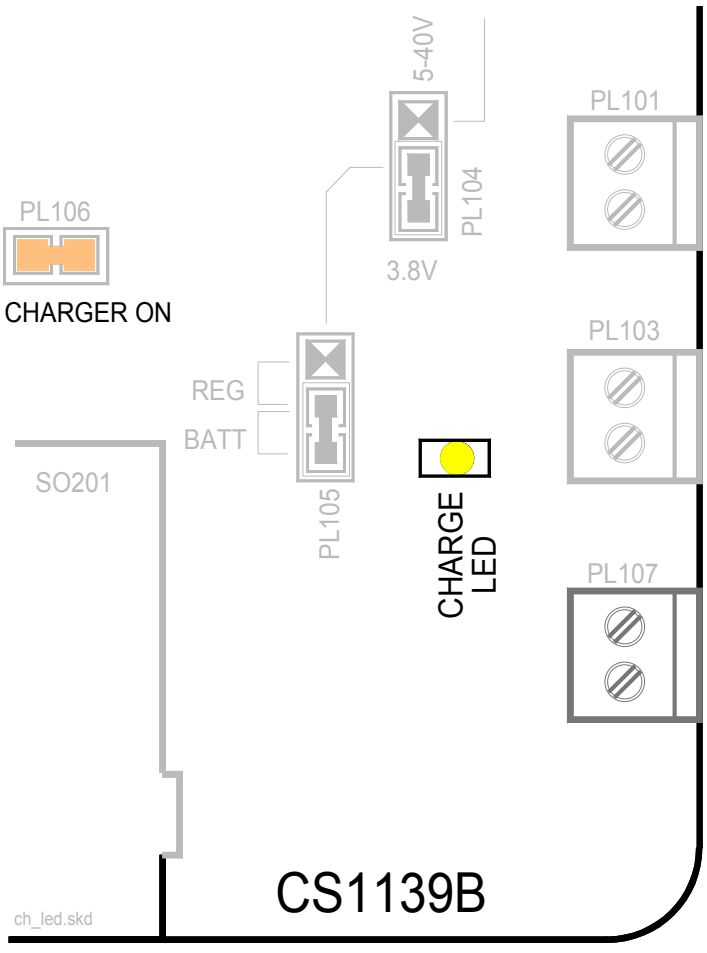
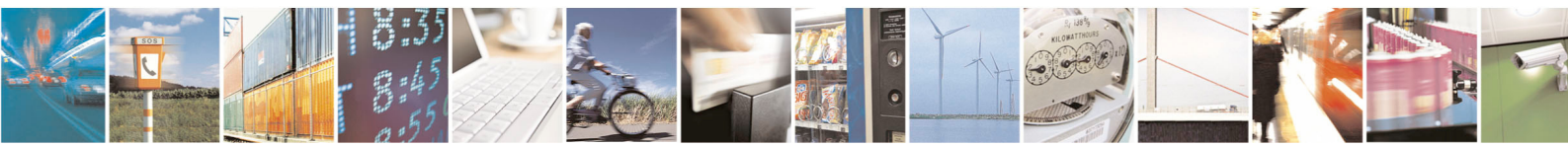


Figure 21: CHARGE LED position



12.2 Switches

You *turn On/Off* or *Reset* the EVK2 by 2 push buttons.

12.2.1 POWER ON Switch

Pressing for at least 2 seconds the *Power ON SWITCH*, you turn *On/Off* the whole ***EVK2*** and the Telit module in use: the *STAT_LED* starts to slowly blink (*ON state*) or stops to blink (*OFF state*).

12.2.2 RESET Switch

Whenever the RESET SWITCH is pressed, you could reset the Telit module in use.
When the device is reset, it stops any operation without doing any detach operation from the network where it is registered and it reboots after the release of the Reset Switch.
This behavior is not a proper shut down because any GSM device is requested to issue a detach request at turning off. For this reason the Reset pressing action must not be used to normally reboot/shutting down the device, but only as an emergency exit in the rare case the device remains stuck waiting for some network response.
The RESET is internally controlled at start-up to achieve always a proper power-on reset sequence, so there is no need to control this pin on start-up. It may only be used to reset a device already on that is not responding to any command.

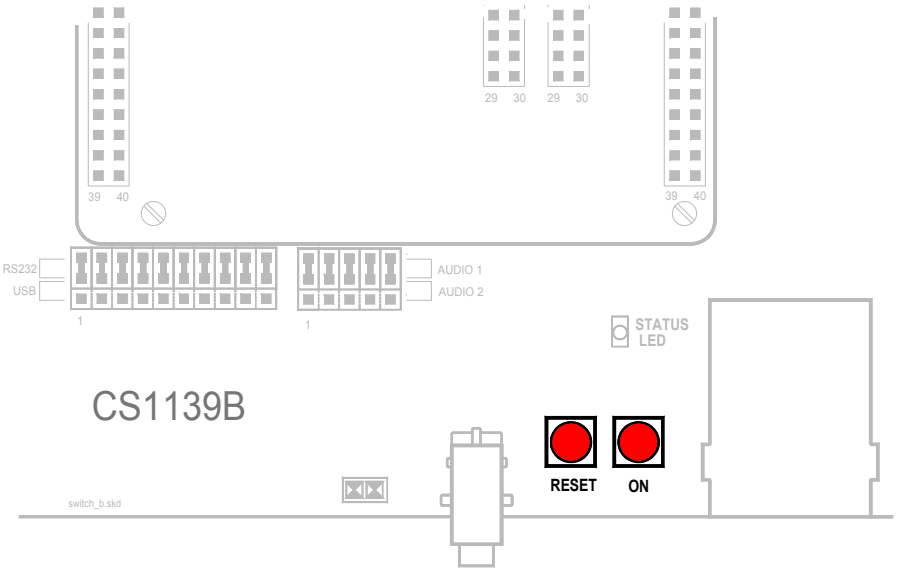


Figure 22: SWITCHES position

13 Connectors pinout

13.1 Motherboard to Module

The connections between CS1139B and every Telit module Interface Board are made through *2x 40contacts male* connectors. Theirs pin functions are listed in the following tables.

Pin	Signal	Type	Function
1	NC[2]		
2	TX_Trace	Digital Output	to RS232 or USB level translators
3	RX_Trace	Digital Input	from RS232 or USB level translators
4	IIC_SDA_HW	Digital In/Out	from/to USB level translators
5	GND	DC voltage	Power
6	IIC_SCL_HW	Digital Input	from USB level translators
7	SSC0_CLK	Digital Output	to USB level translators
8	SSC0_MTSR	Digital In/Out	from/to USB level translators
9	SSC0_MRST	Digital In/Out	from/to USB level translators
10	NC		
11	GND	DC voltage	Power
12	GND	DC voltage	Power
13	GND	DC voltage	Power
14	GND	DC voltage	Power
15	C109/DCD	Digital Output	to RS232 or USB level translator
16	C104/RXD	Digital Output	to RS232 or USB level translator
17	C103/TXD	Digital Input	from RS232 or USB level translator
18	C108/DTR	Digital Input	from RS232 or USB level translator
19	GND	DC voltage	Power
20	C107/DSR	Digital Output	to RS232 or USB level translator
21	C105/RTS	Digital Input	from RS232 or USB level translator
22	C106/CTS	Digital Output	to RS232 or USB level translator
23	C125/RING	Digital Output	to RS232 or USB level translator
24	NC		
25	GND	DC voltage	Power
26	GND	DC voltage	Power

[2] DO NOT CONNECT

27	GND	DC voltage	Power
28	GND	DC voltage	Power
29	EAR_HF+	AC Out Voltage	Audio
30	EAR_MT-	AC Out Voltage	Audio
31	EAR_HF-	AC Out Voltage	Audio
32	EAR_MT+	AC Out Voltage	Audio
33	AXE	DC voltage	INT/EXT Switching
34	MIC_HF-	AC In Voltage	Audio
35	MIC_MT+	AC In Voltage	Audio
36	MIC_HF+	AC In Voltage	Audio
37	MIC_MT-	AC In Voltage	Audio
38	GND	DC voltage	Power
39	GND	DC voltage	Power
40	GND	DC voltage	Power

Table 8: PL201-CS1139B

Pin	Function	Type	NOTES
1	VBATT	DC voltage	Power
2	VBATT	DC voltage	Power
3	VBATT	DC voltage	Power
4	VBATT	DC voltage	Power
5	GND	DC voltage	Power
6	GND	DC voltage	Power
7	GND	DC voltage	Power
8	GND	DC voltage	Power
9	CHARGE	DC voltage	Power
10	CHARGE	DC voltage	Power
11	GND	DC voltage	Power
12	GND	DC voltage	Power
13	GND	DC voltage	Power
14	GND	DC voltage	Power
15	ON_OFF*	DC voltage	Pull up to VBATT
16	NC		
17	RESET*	DC voltage	Module Reset
18	NC		
19	NC		
20	NC		
21	STAT_LED	Open Collector	Status Indicator LED
22	NC		
23	NC		
24	NC		
25	GND	DC voltage	Power
26	GND	DC voltage	Power
27	GND	DC voltage	Power
28	GND	DC voltage	Power

29	NC		
30	NC		
31	SIMIO	3V Only	SIM Data I/O
32	SIMCLK	Digital Signal	SIM Clock
33	SIMRST	DC voltage	SIM Reset
34	SIMVCC	DC voltage	SIM Power
35	SIMIN	DC voltage	SIM inside detector
36	NC		
37	NC		
38	GND	DC voltage	Power
39	GND	DC voltage	Power
40	GND	DC voltage	Power

Table 9: PL202-CS1139B

14 Module Interface Boards

14.1 Generality

You can use your **EVK2** with GM862/GE863/GE864/GC864/GC864-C2 Telit modules fitted on its own *Interface Board;* all connections are made through *2x40 contacts* connectors.
It's possible to use these *Interface Boards* also in stand-alone mode, inserting the "*not mounted"* components (*related to RESET BUTTON, ON BUTTON, SIM HOLDER and STATUS LED functions*) plus the use of an external *level translator* circuit.

For more information please refer to Telit Product Specification

14.2 Short Description

Interface boards convert the module connection technology (*board-to-board or BGA soldering*) into a PTH pin connector .The part of the basic interfaces is served by the motherboard, whereas specific interfaces according to the type of the module (*antenna, general purpose inputs/outputs GPIO, ADC/DAC, UART*) are available on the adapter board to connect it to the user applications, extension boards, measurements equipment or other tools.

14.3 Interface Boards Cross list

Function	GSM engine	Interface Boards	Order Code
EVK2 Mother Board	-	CS1139B	3990150463
GM862 interface	N/A	CS1150A	3990250670
GE863–PY interface	GE863-PY	CS1151A	3990250684
GE863–QUAD interface	GE863–QUAD	CS1151A	3990250685
GE863-GPS interface	GE863-GPS	CS1151A	3990250671
GE863-SIM interface	GE863-PY	CS1151A	3990250703
GE864-PY interface	GE864-PY	CS1152B	3990250672
GE864-QUAD interface	GE864- QUAD	CS1152B	3990250688
GC864 interface	N/A	CS1203B	3990250680
GC864-C2 interface	N/A	CS1231X	3990250683
UC864-CC864 interface	N/A	KS101	4990150470

Table 10: Interface Boards Cross List Table.

N/A=NOT APPLICABLE. Because the module is not soldered on its *Interface Board,* all signals are routed by connectors (*RF, Audio & Data*) and you can insert on Interface Board every version of the module

14.4 Further Accessories for GPS version

When test the GPS products, besides the content of the single kits you need the accessories listed in below table.

Module under test	Interface Board	GPS Antenna	SMA/MMCX cable adapter
	P/N	1rr0100071tlb	1ff1400073tlb
GM862-GPS	3990250670	1	1
GE863-GPS	3990250671	1	-

Table 11. GPS versions further accessories.

15 GM862 Interface

This board allows easily interfacing the module with the EVK2 and testing its functionalities; any version of GM862 can be insert.
No settings are needed.

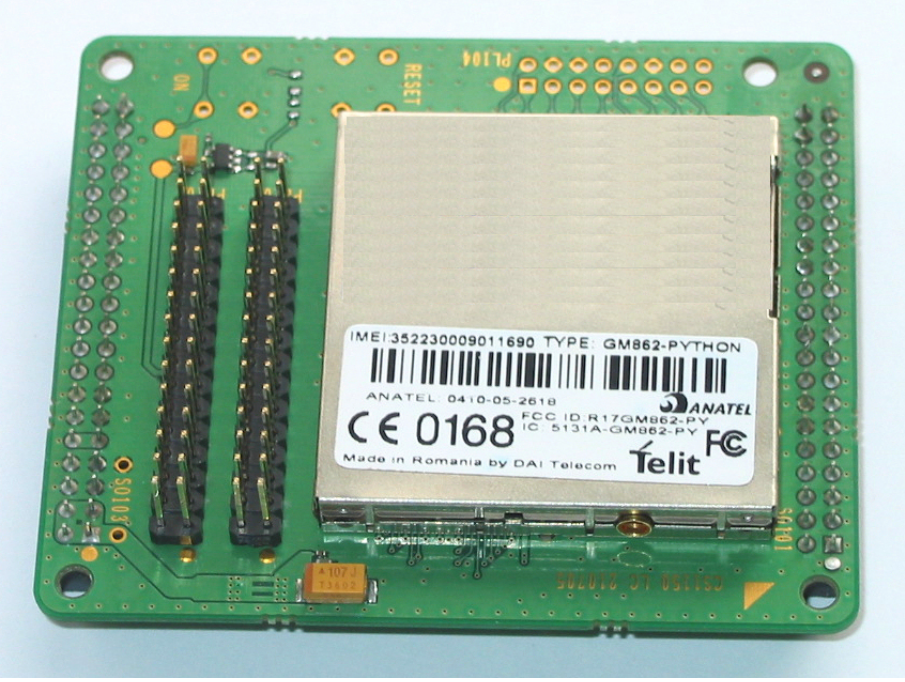
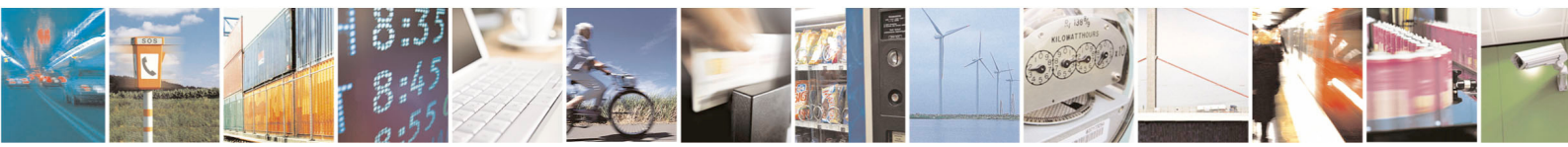


Figure 23. GM862 Interface Board

15.1 Stand-alone setup

If you need to use the interface out of EVK2 (*Stand-alone* setup) you have to mount the following missing components:

- the RESET Button
- the ON Button;
- the STATUS LED and its load resistance.



15.2 Interface connectors

The following connectors are available:

- 2 male connectors (30 pins each one: PL102, PL103), on which it is possible to connect external devices like user's application, Telit extension boards, measurements equipment or other tools
- 2 female connectors (40 pins each one: SO101, SO102), to connect the interface to the EVK2 mother board circuits (power supply lines, serial in/out lines, audio in/out lines).

15.3 Content of the kit

Please check out the contents of your interface kit; if any of the items is missing, please contact your supplier.

Description	Quantity
GM862 INTERFACE	1
ASSEMBLED CABLE L–250 RG174 TERMINALS SMA F & MMCX 90 M	1

Table 12.

16 GE863 Interface

This board allows easily interfacing the module with the EVK2 and testing its functionalities; any version of GE863 can be soldered on it.
Depending by the version a different module version is needed, and some components have to be mounted (GE863-GPS) or not (GE863-PY/QUAD, GE863-SIM).

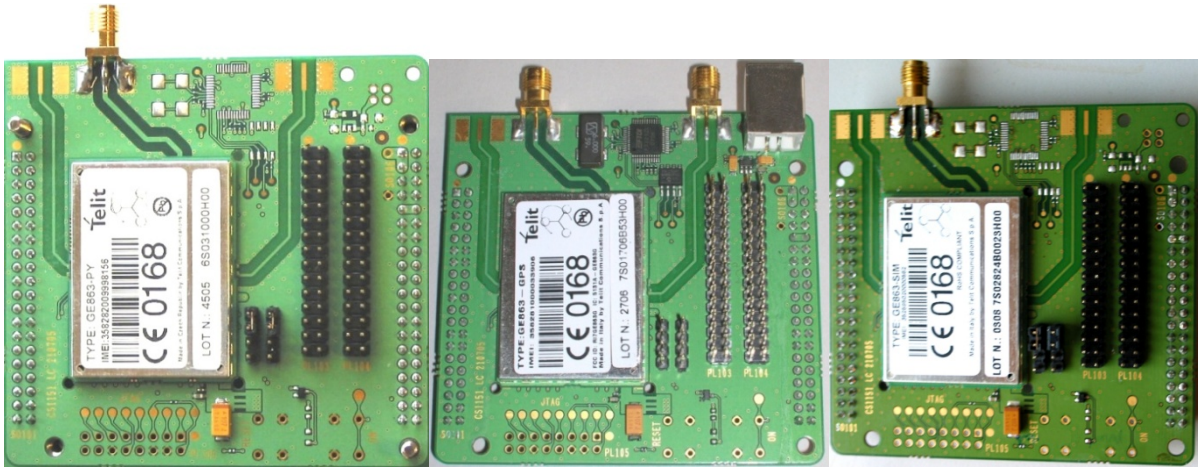
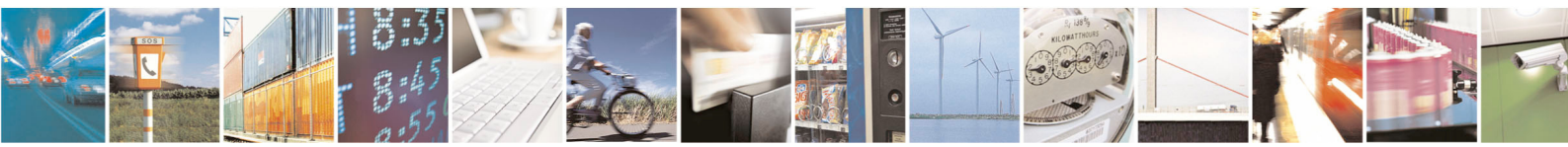


Figure 24. GE863 Interface Boards: GE863-PY/QUAD (*at left*) GE863-GPS (*at center*) and GE863-SIM (*at right*)

16.1 Stand-alone setup

If you need to use the interface out of EVK2 (*Stand-alone* setup) you have to mount also:

- the SIMCARD Holder;
- the RESET Button
- the ON Button;
- the STATUS LED and its load resistance.



16.2 Content of the kits

Please check out the contents of your interface kit; if any of the items is missing, please contact your supplier.

16.2.1 GE863-PY/QUAD version

Description	Quantity
GE863 INTERFACE BOARD	1
2 PIN JUMPER FEMALE CONN	2

Table 13

16.2.2 GE863-GPS version

Description	Quantity
GE863–GPS INTERFACE BOARD	1
2 PIN JUMPER FEMALE CONN	2

Table 14

16.2.3 GE863-SIM version

Description	Quantity
GE863-SIM INTERFACE BOARD	1
2 PIN JUMPER FEMALE CONN	2

Table 15

16.3 Interface connectors

The following connectors are available in any version:

- GSM RF connector (*SMA Female*)
- 2 male connectors (4 pins each one: PL101, PL102) to select the Serial port configuration
- 2 female connectors (*40 pins each one: SO101, SO106*) to connect the interface to the EVK2 mother board circuits (*power supply lines, serial in/out lines, audio in/out lines*)
- 2 male connectors (*30 pins each one: PL103, PL104*), on which it is possible to connect external devices like user's application, Telit extension boards, measurements equipment or other tools

16.4 Additional components for GPS version

The following components are available only in GPS version (P/N 3990250671):

- GPS RF connector (*SMA Female*)
- USB B-type connector and its circuitry (*see schematic 30276SE11151A*)

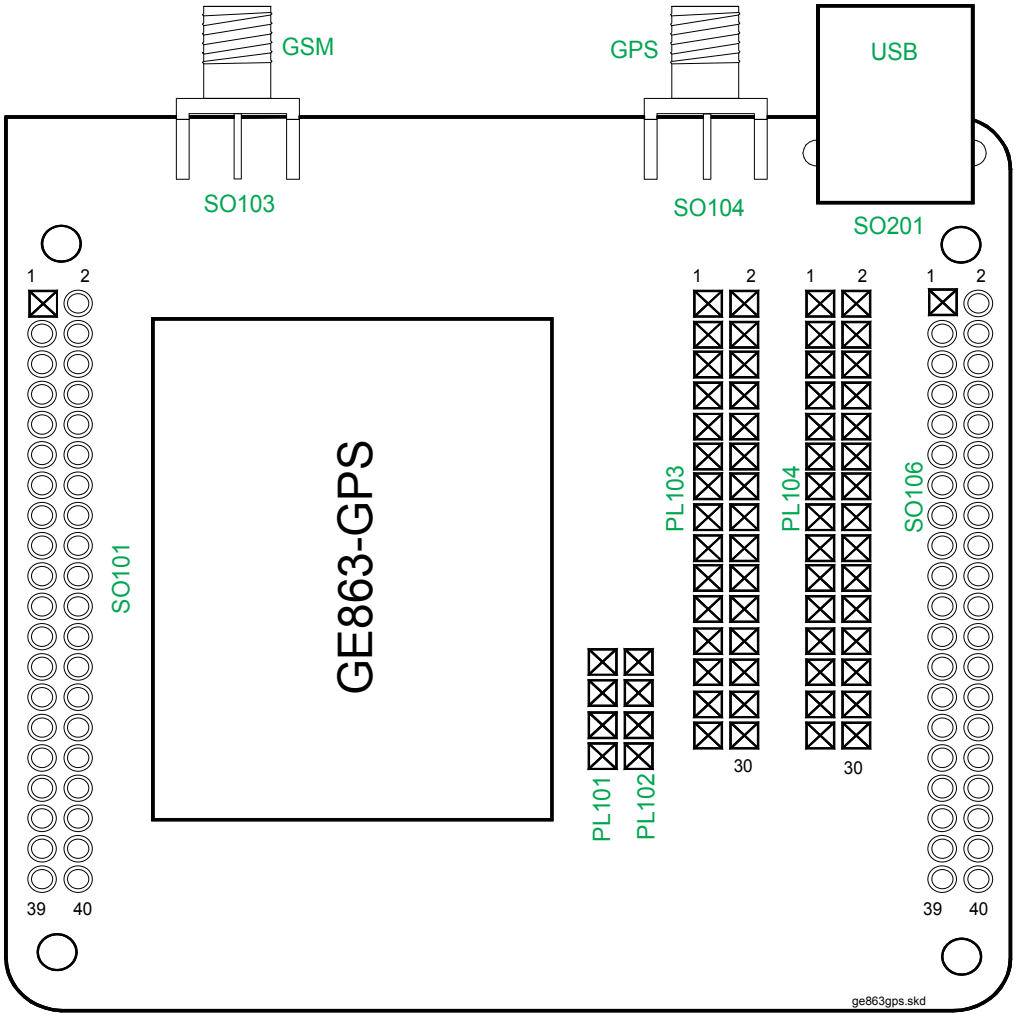
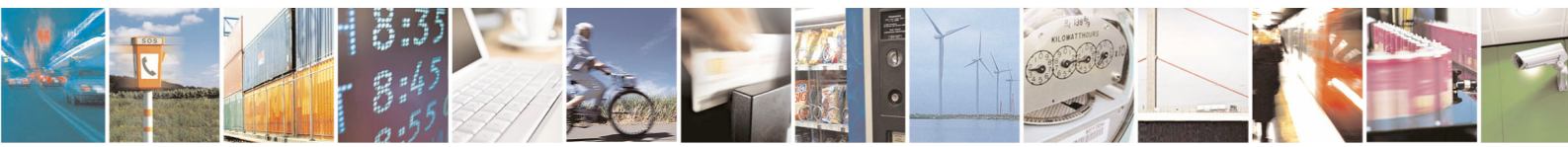


Figure 25: Connectors displacement on GE863-GPS



16.5 USB connector

The USB interface provides 2 serial ports that are related to the *NMEA* serial port and *SIRF-Binary* serial port of GE863-GPS module.
It is possible to select if the *SIRF Binary* serial port will be available on the USB connector or directly connected to the second serial port of the modem (***CONTROLLED MODE***).
For setting refer to paragraphs 16.7.1, 16.7.2.1, 16.7.2.2.

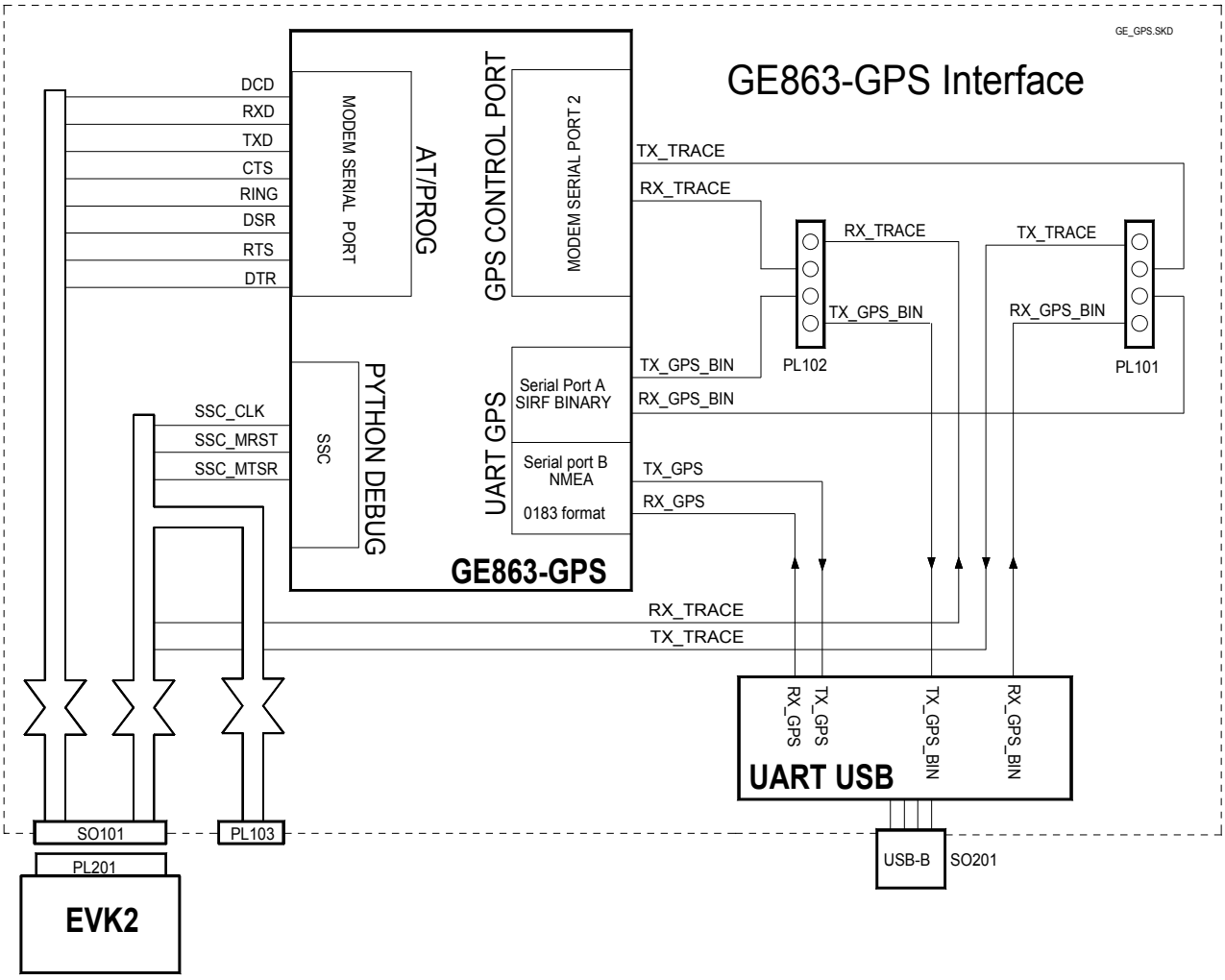


Figure 26: GE863-GPS Serial ports block diagram

16.6 Serial port configuration

To switch the serial lines you must short-circuit the PL101-PL102 connectors by 2 contacts jumpers.

16.6.1 GE863-PY/QUAD

The 2 contacts jumpers have to be fitted between ***pin1&pin2*** of PL101-PL102 connectors.
This carries out the *Python Debug Port* on Trace Port of EVK2.

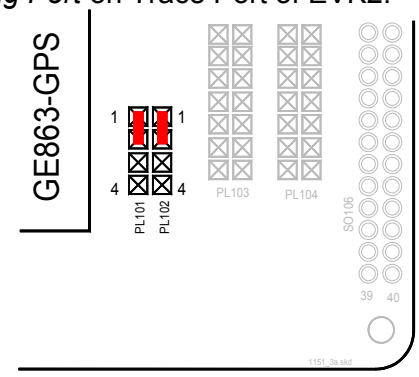


Figure 27: Jumpers setting for GE863-PY/QUAD

16.6.2 GE863 - GPS

The 2 contacts jumpers have to be fitted between ***pin2&pin3*** or **pin3*&pin4*** of PL101-PL102 connectors.

16.6.2.1 "CONTROLLED MODE"

This set the *SIRF Binary* to serial port of the modem. (*Typical application Design*)

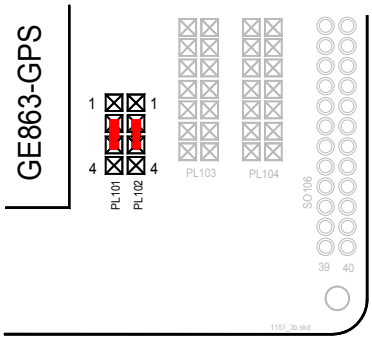


Figure 28: Jumpers setting for SIRF BINARY port connected to MODEM port 2

NOTE. All *AT GPS commands* are available in this configuration

16.6.2.2 "SEPARATED SERIAL PORT"

This set the *SIRF Binary* available on the USB connector.

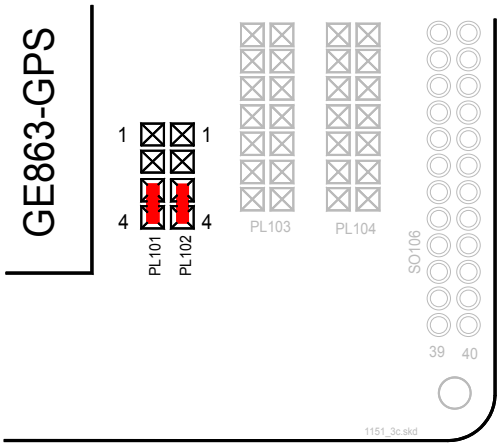


Figure 29: Jumpers setting for SIRF BINARY port available on USB connector

NOTE. In this configuration some *AT GPS commands* are not available. *Refer to AT Commands Reference User Guide*

16.7 ANTENNA connectors

16.7.1 GPS ANTENNA connector

An active GPS antenna should be connected to SO104; the GPS section provides the DC feeding.

WARNING: don't connect a *GSM* antenna on this connector.

16.7.2 GSM ANTENNA connector

A GSM antenna should be connected to SO103.

16.7.3 RFU ANTENNA connector

On PCB there is the mounting possibility of a further RF connector (*SO105*): it is related to future implementation.

17 GE864 Interface

This board allows easily interfacing the module with the EVK2 and testing its functionalities; any version of GE864 can be soldered on it.
No settings are needed.

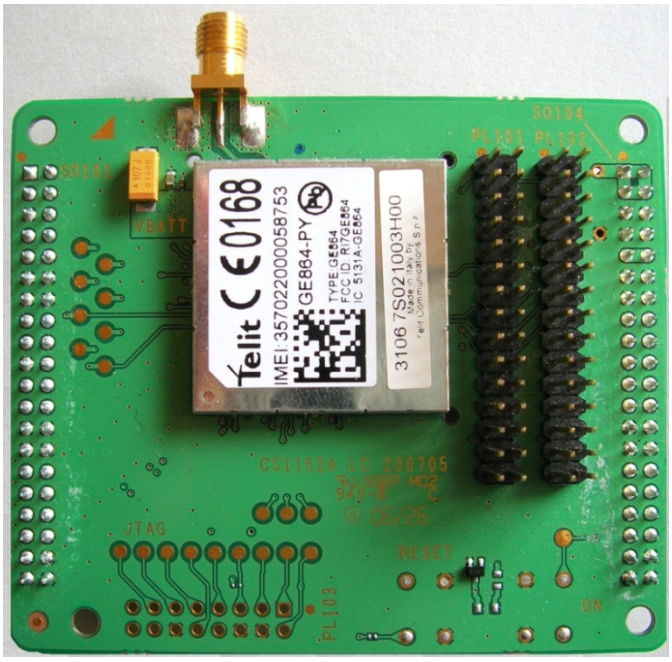
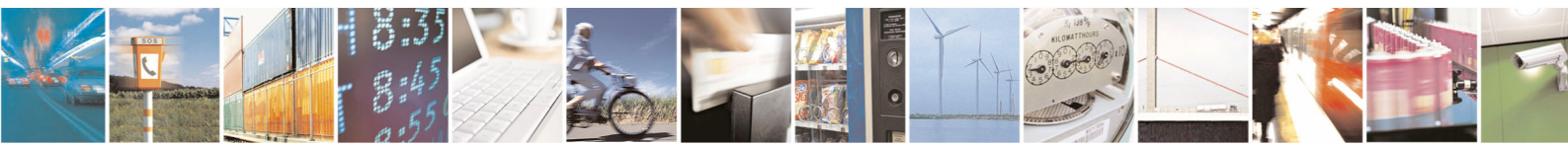


Figure 30. GE864 Interface Board

17.1 Stand-alone setup

If you need to use the interface out of EVK2 (*Stand-alone* setup) you have to mount the following missing components:

- the SIMCARD Holder;
- the RESET Button
- the ON Button;
- the STATUS LED and its load resistance.



17.2 Interface connectors

The following connectors are available:

- 2 male connectors (30 *PTH pins each one: PL102, PL103*), by which it is possible to connect external devices, user's application, Telit extension boards, measurements equipment or other tools;
- 2 female connectors (*40 PTH pins each one: SO101, SO102*), to connect the interface to the EVK2 mother board circuits (*power supply lines, serial in/out lines, audio in/out lines*);

17.3 Content of the kit

Please check out the contents of your interface kit; if any of the items is missing, please contact your supplier.

Description	Quantity
GE864–PY INTERFACE	1

Table 16

18 GC864 Interface

This board allows easily interfacing the module with the EVK2 and testing its functionalities; any version of GC864 can be inserted.
No settings are needed.

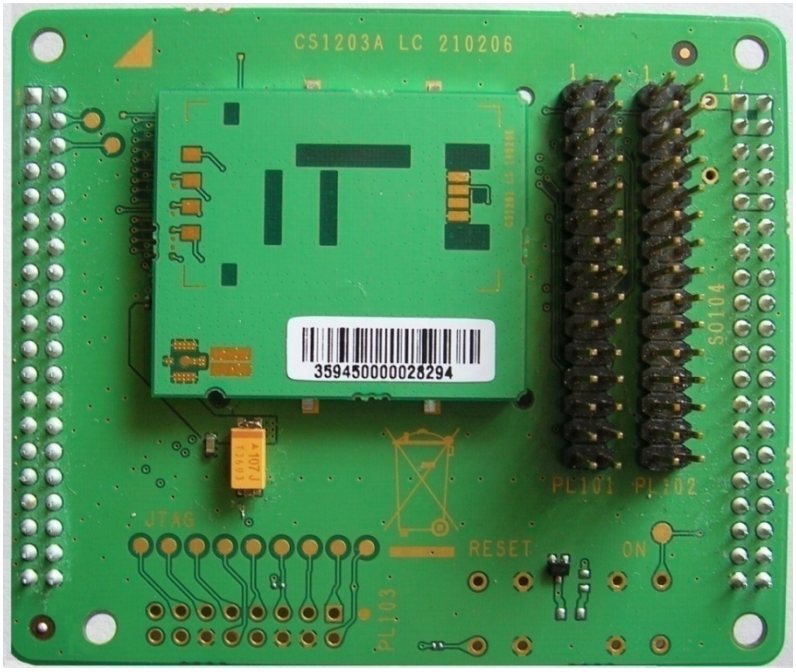
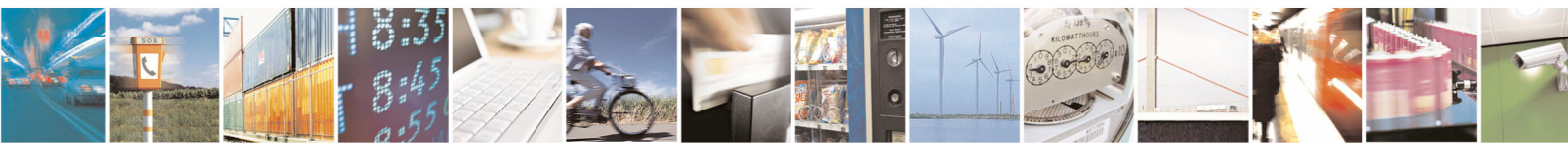


Figure 31. GC864 Interface Board

18.1 Stand-alone setup

If you need to use the interface out of EVK2 (*Stand-alone* setup) you have to mount also:

- the SIMCARD Holder;
- the RESET Button
- the ON Button;
- the STATUS LED and its load resistance.



18.2 Interface connectors

The following connectors are available:

- 2 male connectors (*30 PTH pins each one: PL102, PL103*), by which it is possible to connect external devices, user's application, Telit extension boards, measurements equipment or other tools
- 2 female connectors (*40 PTH pins each one: SO101, SO102*), to connect the interface to the EVK2 mother board circuits (*power supply lines, serial in/out lines, audio in/out lines*).

18.3 Content of the kit

Please check out the contents of your interface kit; if any of the items is missing, please contact your supplier.

Description	Quantity
GC864 INTERFACE	1
ASSEMBLED CABLE L–200 COAX 0.8 TERMINALS GSC & SMA F PANNEL	1

Table 17

19 GC864-C2 family Interface

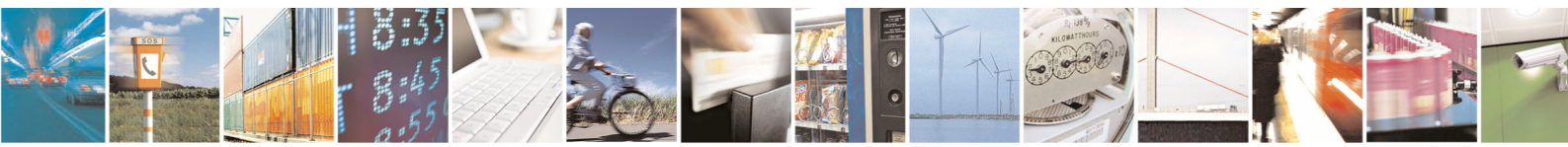
This board allows easily interfacing the module with the EVK2 and testing its functionalities; any version of GC864-C2 can be inserted.
No settings are needed.

Figure 32. GC864-C2 Interface Board

19.1 Stand-alone setup

If you need to use the interface out of EVK2 (*Stand-alone* setup) you have to mount the following missing components:

- the SIMCARD Holder ;
- the ON Button ;
- the STATUS LED and its load resistance.



19.2 Interface connectors

The following connectors are available:

- 2 male connectors (*30 PTH pins each one: PL101, PL102*), by which it is possible to connect external devices, user's application, Telit extension boards, measurements equipment or other tools;
- 2 female connectors (*40 PTH pins each one: SO101, SO104*), to connect the interface to the EVK2 mother board circuits (*power supply lines, serial in/out lines, audio in/out lines*);

19.3 Content of the kit

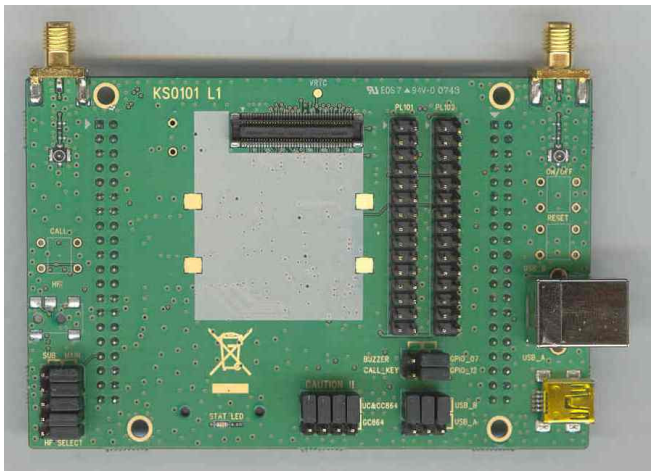
Please check out the contents of your interface kit; if any of the items is missing, please contact your supplier.

Description	Quantity
GC864-C2 INTERFACE	1
ASSEMBLED CABLE L–250 RG174 TERMINALS SMA F & MMCX 90 M	1

Table 18

20 UC864 family Interface

This board allows easily interfacing the module with the EVK2 and testing its functionalities; any version of UC864 can be inserted.
For more information please refer to ***1vv0300771 UC864-E Interface User Guide.***
No settings are needed.



TOP View

BOTTOM View

Figure 33. UC864 Interface Board

21 GPIO ports

A certain number of GPIO ports (General Purpose Input/Output) are available on every Telit Module Interface Board, giving you the possibility to drive digital devices and report their own status.
Some of these ports are dedicated. *Refer to Telit Product Specification to have all information about characteristics of every GPIO port.*

You can consult the following paragraphs to see the displacement of GPIO on every Interface Board.

21.1 GPIO location

21.1.1 GM862 Interface (p/n 3990250670)

There are 13 GPIO ports available on PL102 and PL103
(Refer to schematic diagram *30276SE11150B*)

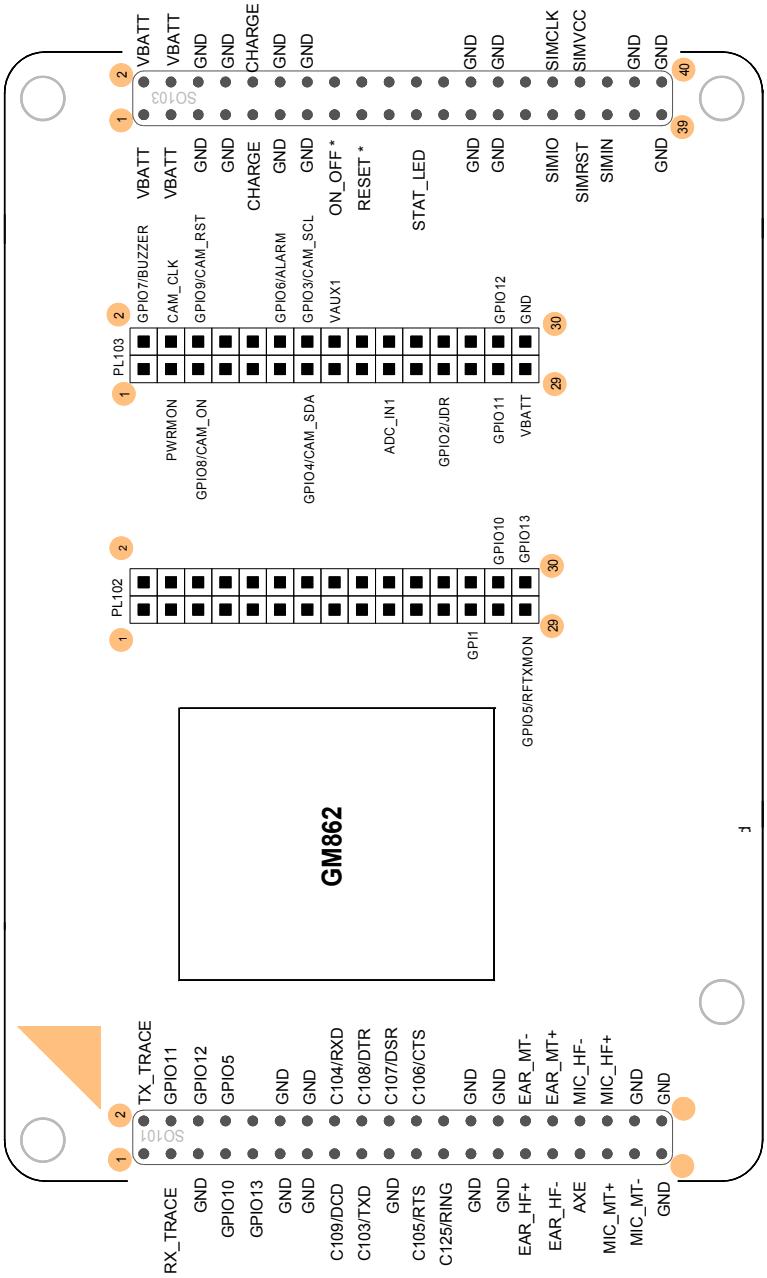


Figure 34: Position of GPIO ports on GM862 interface

21.1.1.1 Note on GM862-GPS version

If you use this interface in conjunction with GM862-GPS version ***be careful*** that the following two pins of SO101 connector assume different functions, and precisely:

Pin 2 = TX_GPS
Pin 3 = RX_GPS

21.1.2 GE863-GPS Interface (p/n 3990250671)

There are 18 GPIO ports available on PL103 and PL104
(Refer to schematic diagram *30276SE11151A*)

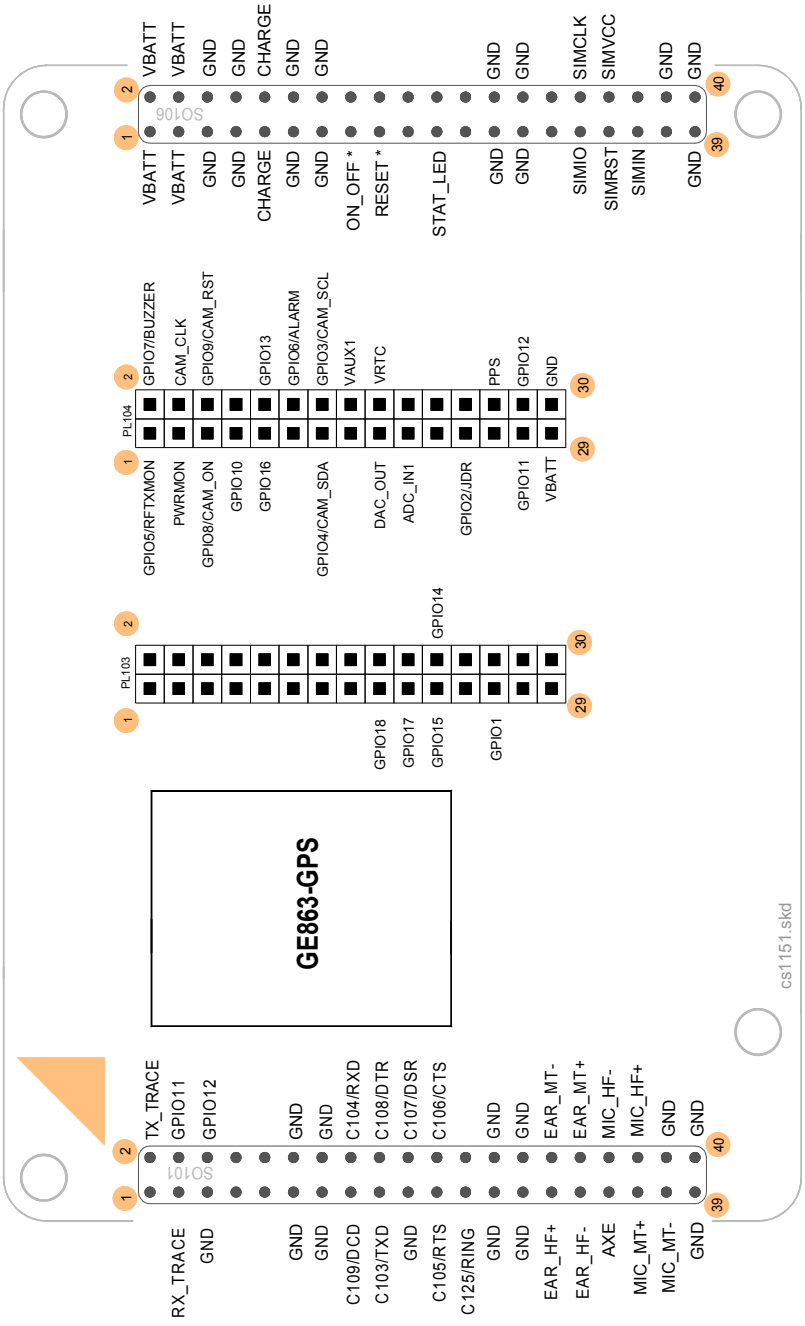
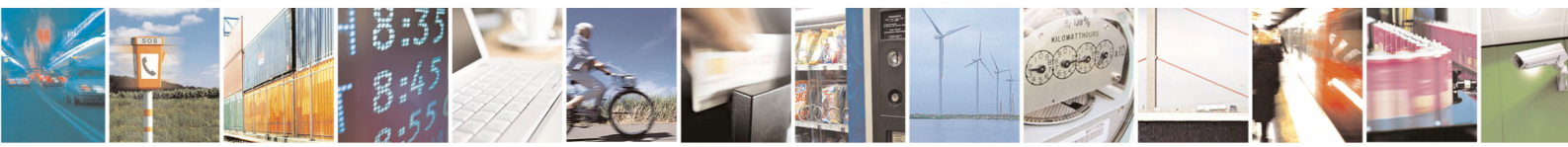


Figure 35: Position of GPIO ports on GE863-GPS interface



21.1.2.1 Note on p/n 3990250684 and p/n 3990250685 GE863

(Refer to schematic diagrams *30276SE11151A-C*, *30276SE11151A-D*)

If you use these interfaces the following two pins of PL104 connector assume different functions, and precisely:

Pin 20 = ADC_IN2
Pin 21 = ADC_IN3
Pin 26 = N.C

21.1.3 GE863 Interfaces (p/n 3990250684 -3990250685-3990250703)

There are 18 GPIO ports available on PL103 and PL104

Refer to schematic diagrams *3\0276SE11151A-C*
30276SE11151A-D
30276SE11151A-G

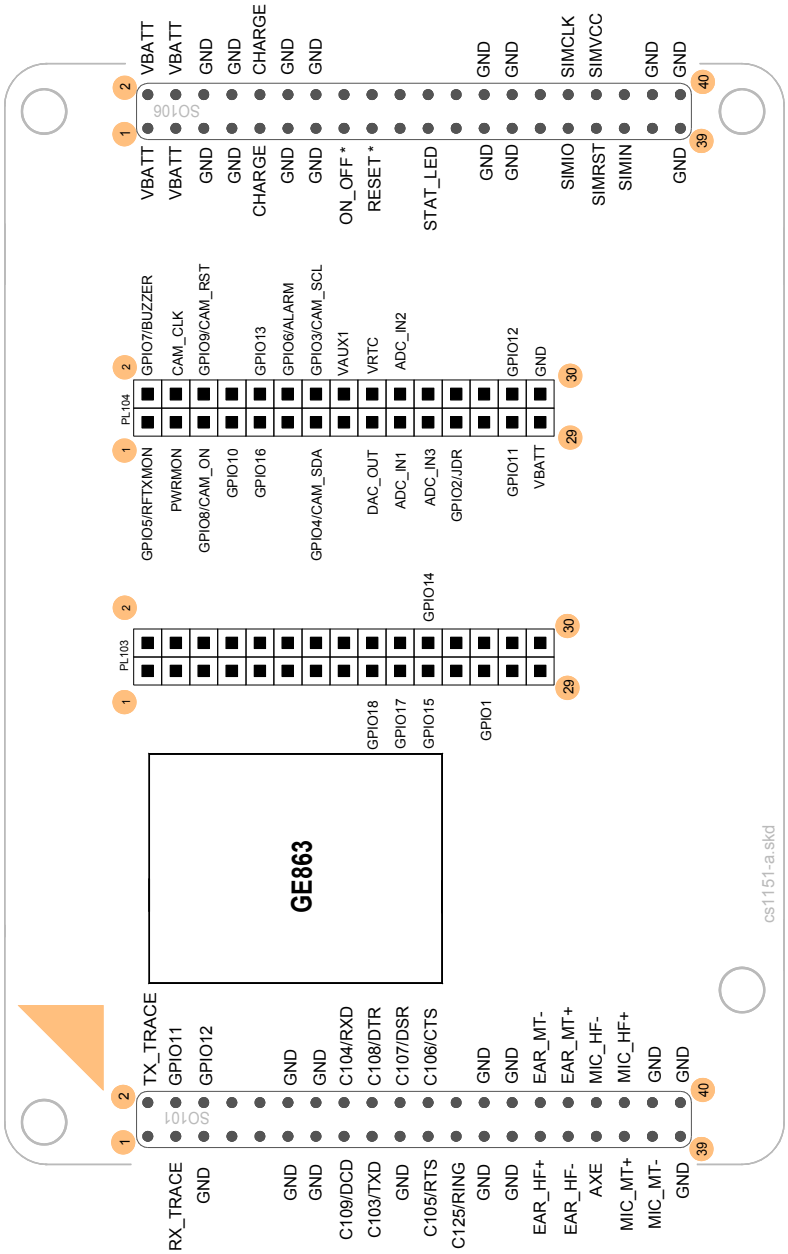
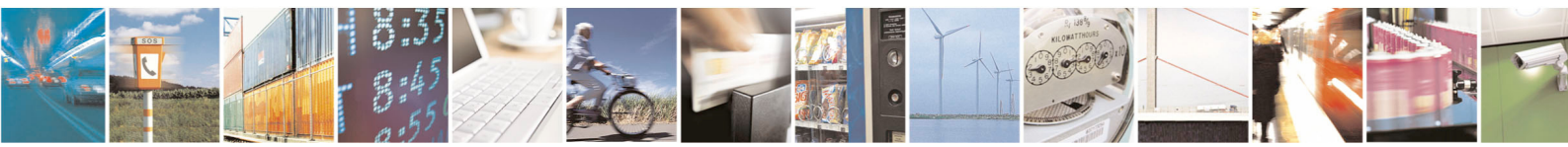


Figure 36: Position of GPIO ports on GE863 interfaces



21.1.4 GE864 Interface (p/n 3990250672)

There are 22 GPIO ports available on PL101and PL102

(Refer to schematic diagram *30276SE1152B*)

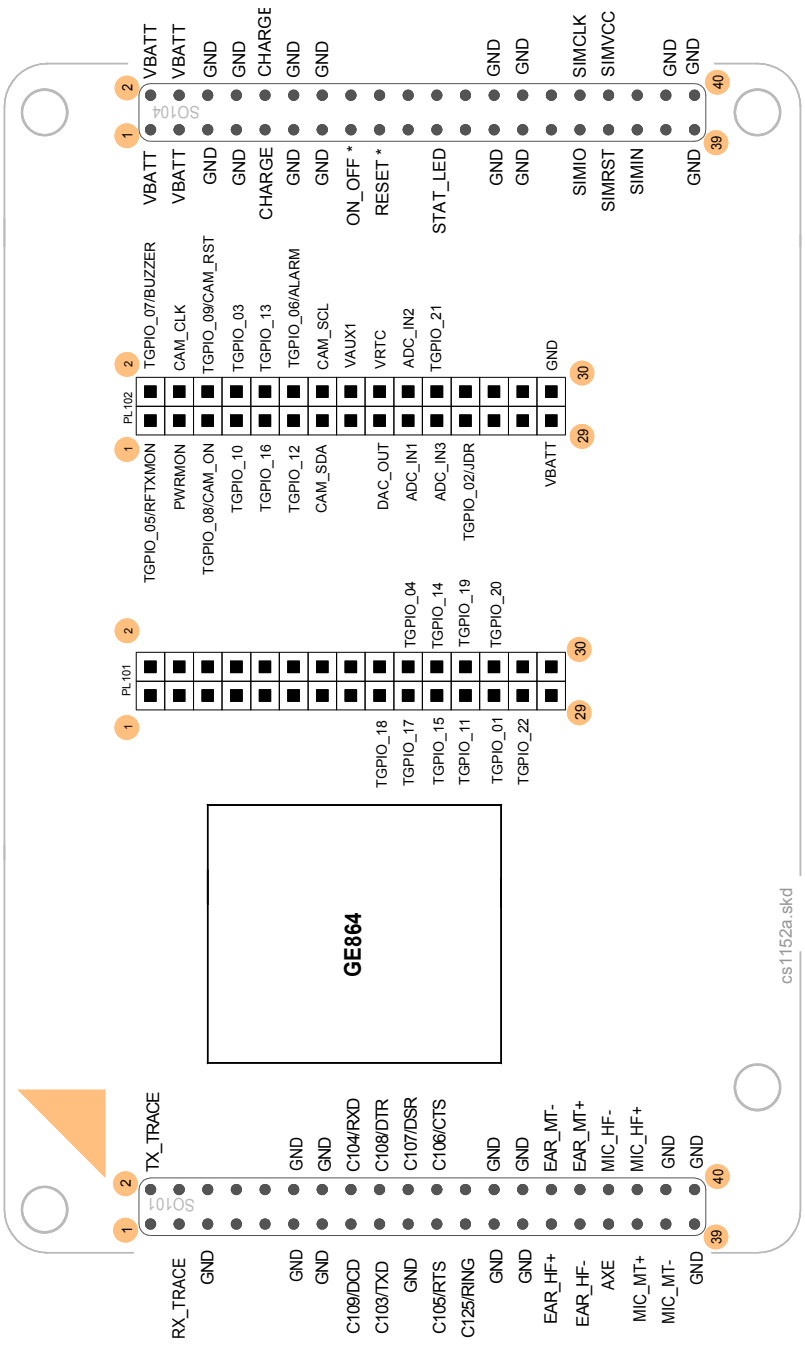


Figure 37: Position of GPIO ports on GE864 interface

21.1.5 GC864 Interface (p/n 3990250680)

There are 23 GPIO ports available on PL101and PL102
(Refer to schematic diagram *30276SE111203B*)

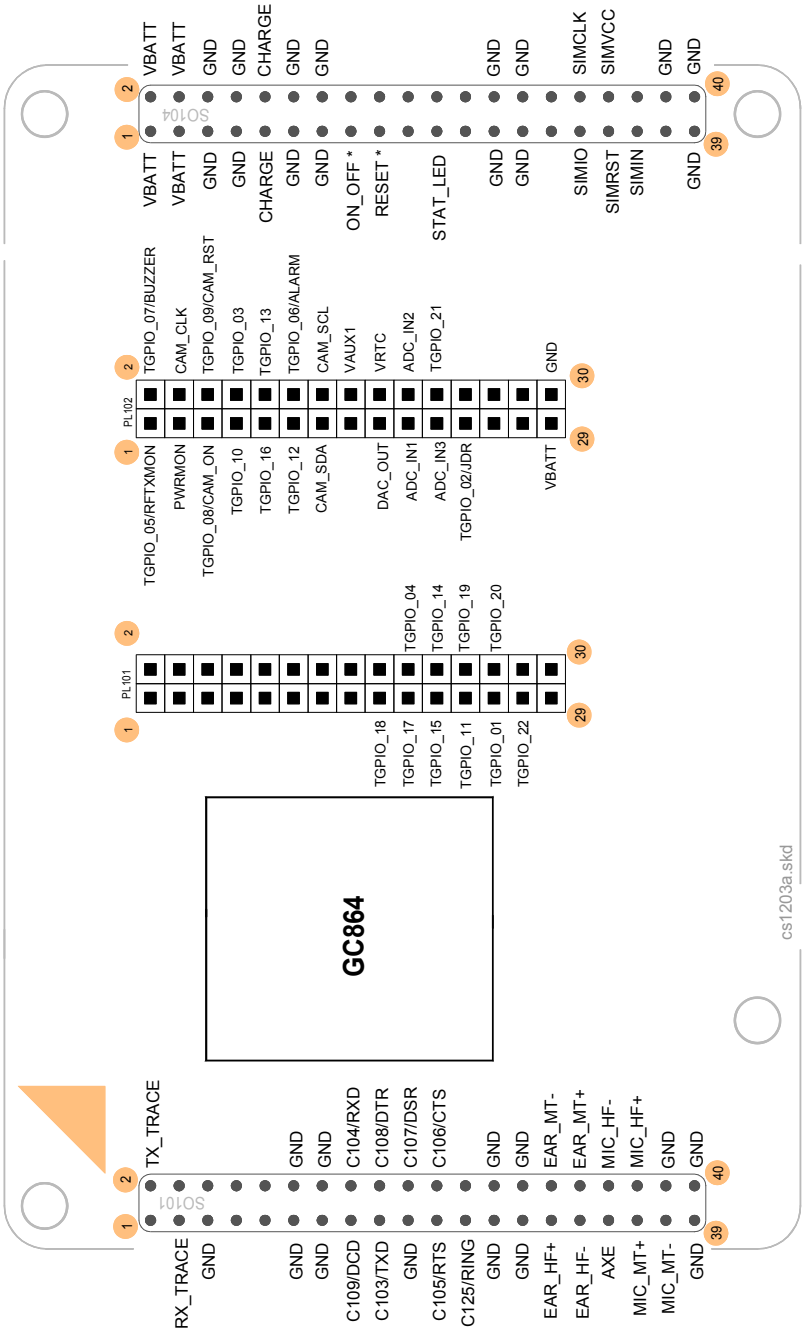


Figure 38. Position of GPIO ports on GC864 interface

21.1.6 GC864-C2 Interface (p/n 3990250683)

There are 6 GPIO ports available on PL101and PL102
(Refer to schematic diagram *30276SE11231X*)

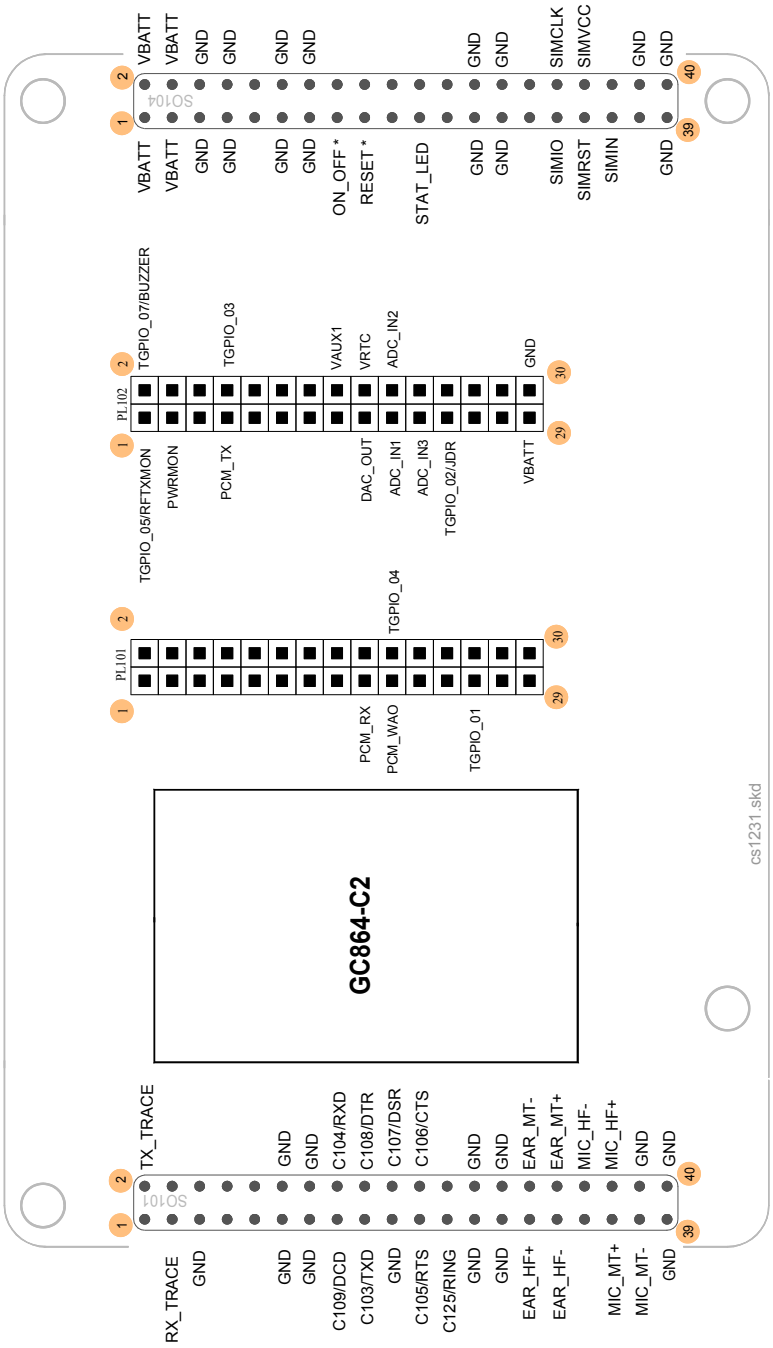


Figure 39. Position of GPIO ports on GC864-C2 interface

21.1.7 UC864 Interface (p/n 4990150470)

There are 22 GPIO ports available on PL101 and PL102.

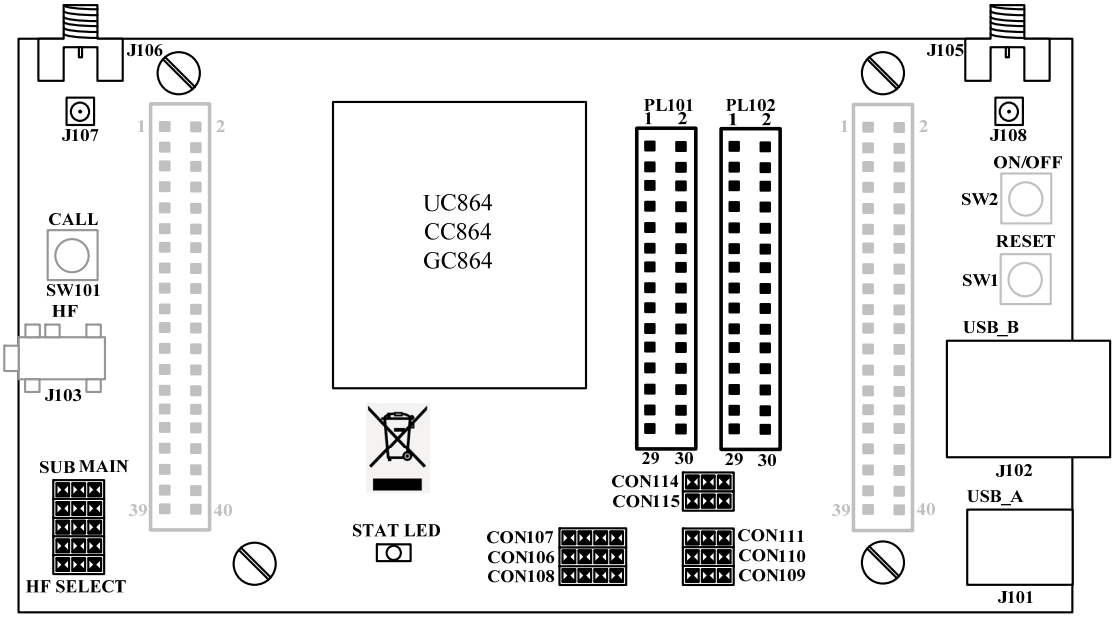
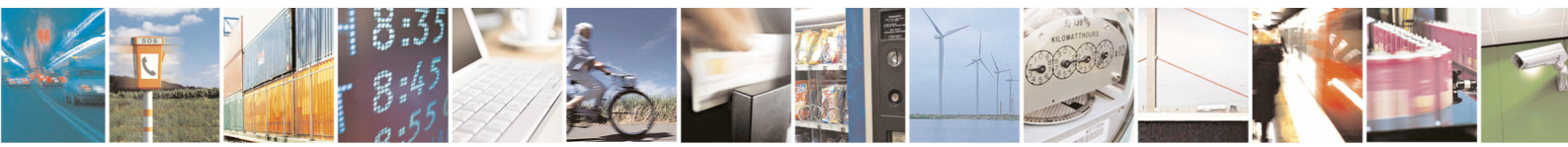


Figure 40. Position of GPIO position on connectors of UC864 interface

PL101			
N.C	1	2	N.C
N.C	3	4	N.C
N.C	5	6	N.C
N.C	7	8	N.C
N.C	9	10	N.C
N.C	11	12	N.C
N.C	13	14	N.C
N.C	15	16	N.C
TGPIO_18/ PCM_RX	17	18	N.C
TGPIO_17/ PCM_SYNC	19	20	TGPIO_04
TGPIO_15	21	22	TGPIO_14
TGPIO_11	23	24	TGPIO_19
TGPIO_01	25	26	TGPIO_20
TGPIO_22	27	28	N.C
N.C	29	30	N.C

PL102			
TGPIO_05/ RTXMON	1	2	TGPIO_07/ BUZZER
PWRMON	3	4	RESERVED
TGPIO_08	5	6	TGPIO_09
TGPIO_10/ PCM_TX	7	8	TGPIO_03
TGPIO_16	9	10	TGPIO_13
TGPIO_12	11	12	TGPIO_06/ ALARM
PCM_CLOCK	13	14	USB_ID
N.C.	15	16	VAUX1
DAC_OUT	17	18	VRTC
ADC_IN1	19	20	ADC_IN2
ADC_IN3	21	22	TGPIO_21
TGPIO_02/JDR	23	24	N.C
N.C	25	26	N.C
RESERVED	27	28	RESERVED
VBATT	29	30	GND

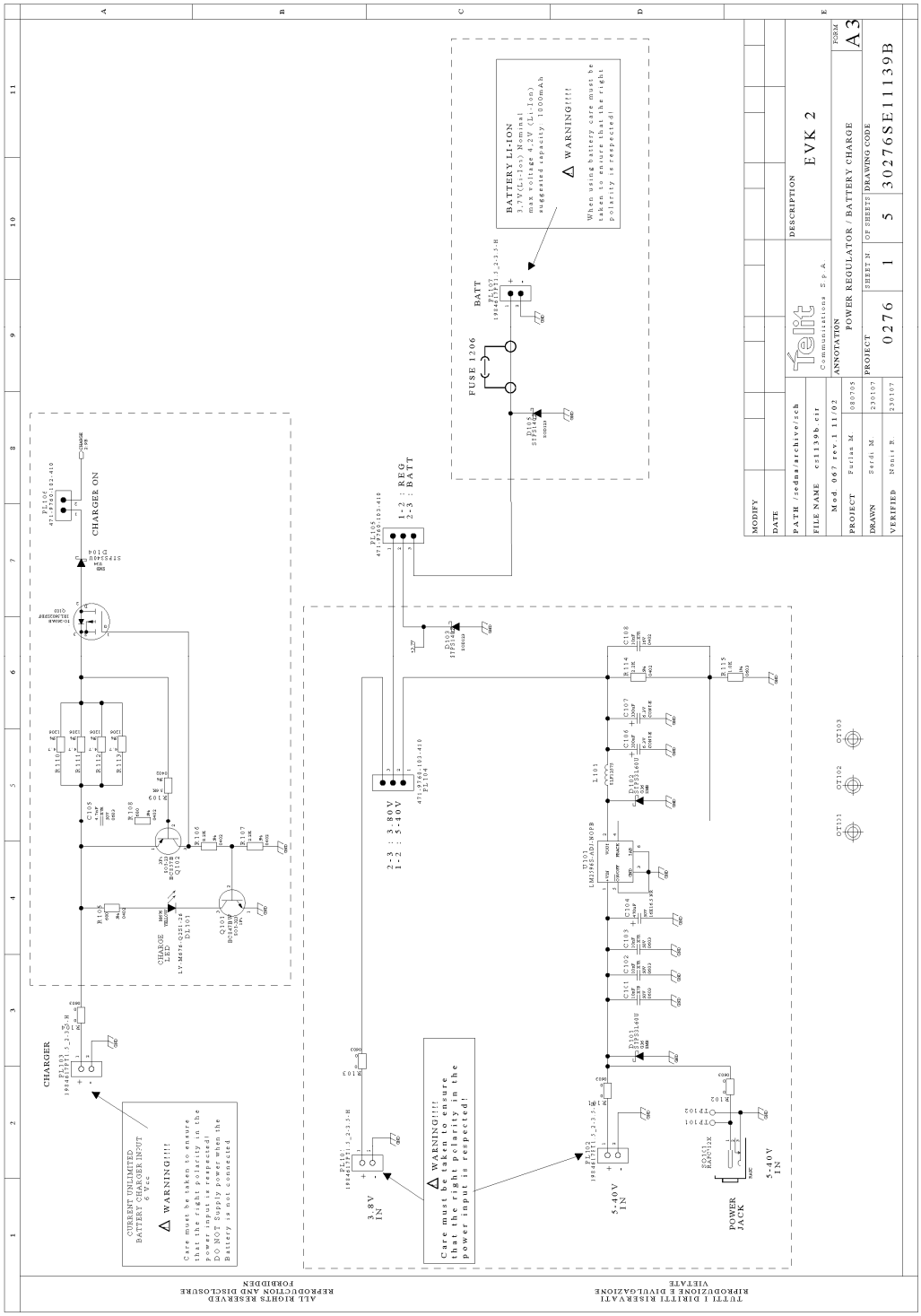
Table 19 GPIO pin positioning

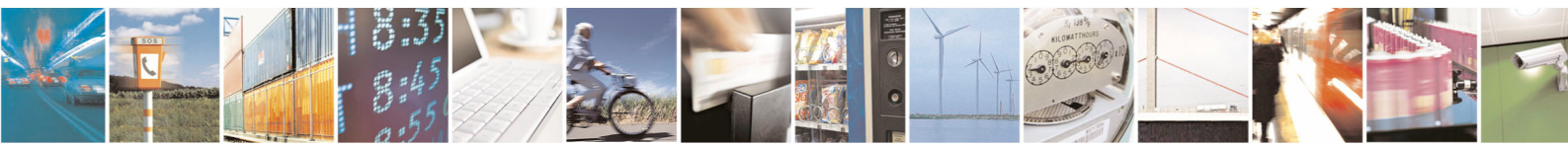


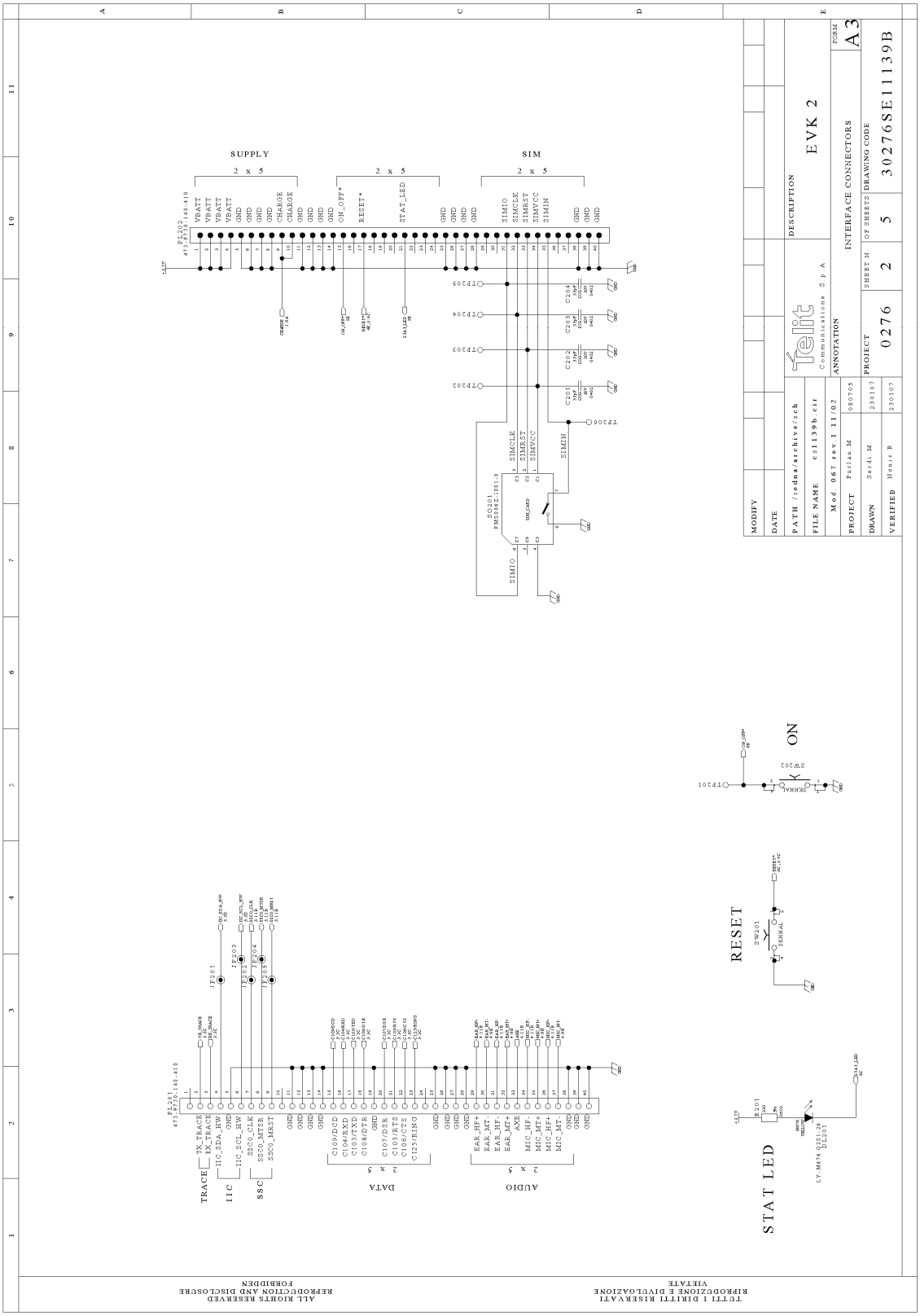
22 SCHEMATICS

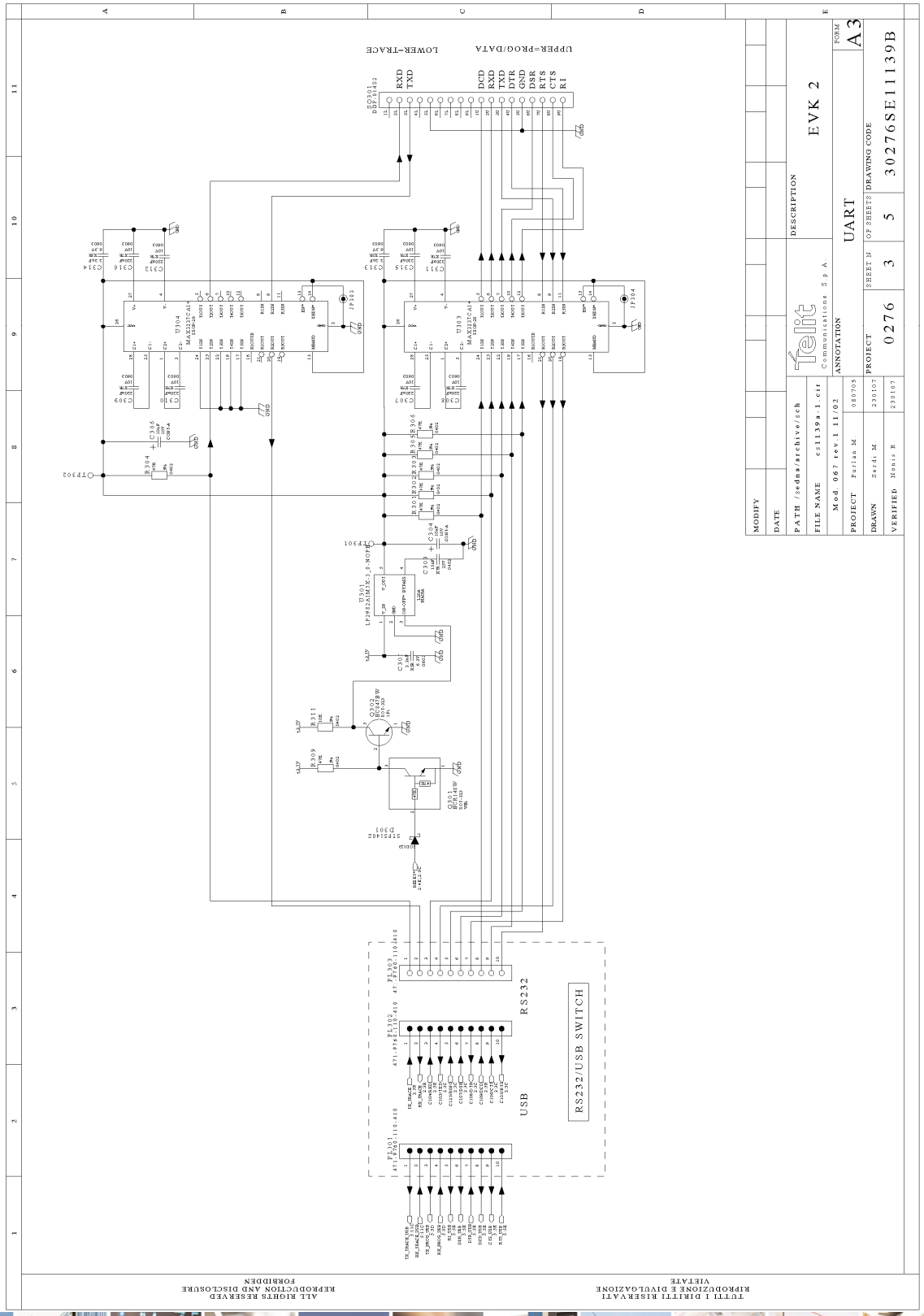
In the following paragraphs the user can find the schematics related to all EVK2 boards, therefore to the Mother Board, to the Interface Boards and to the Extension Boards.

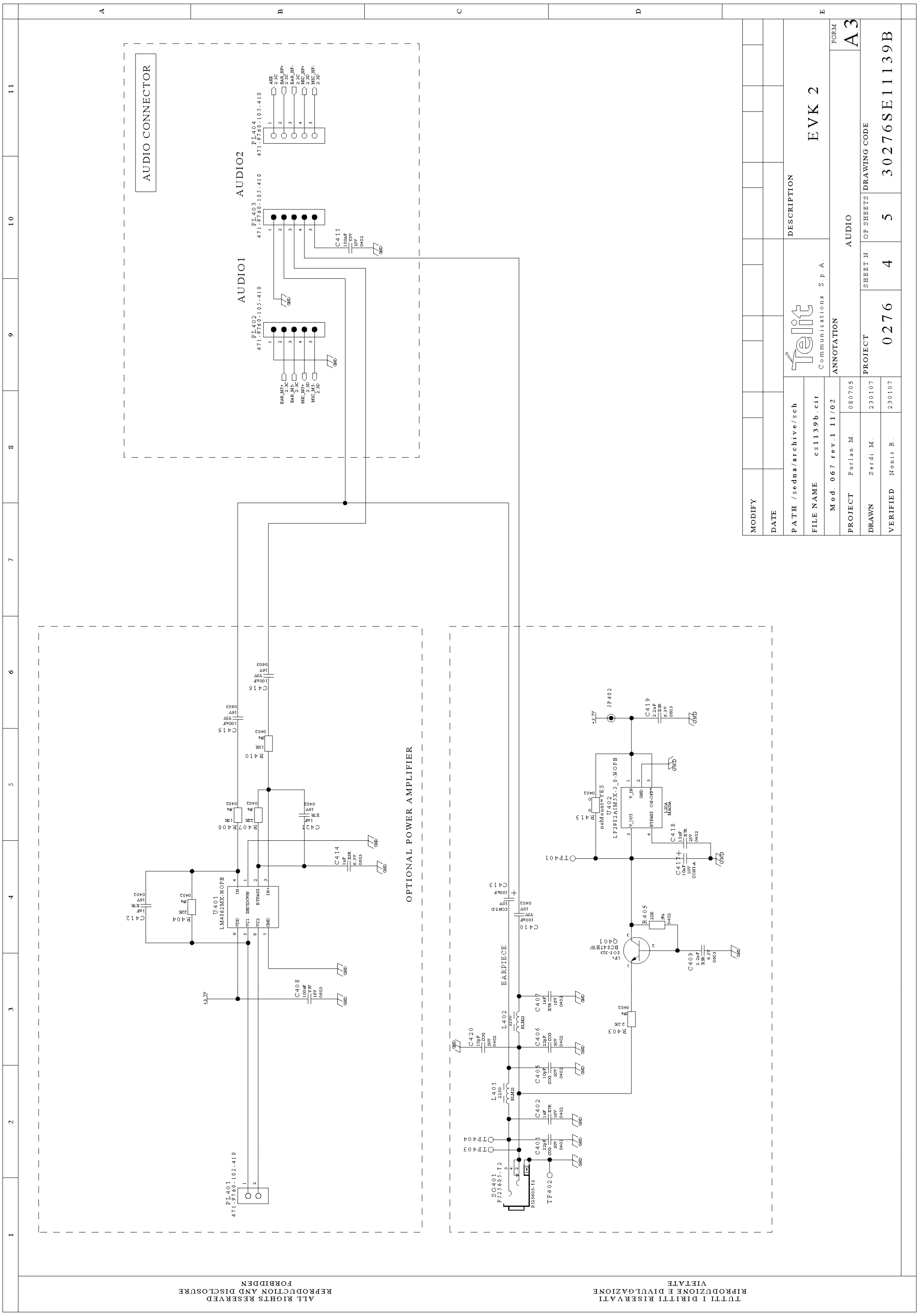
22.1 EVK2 Mother Board

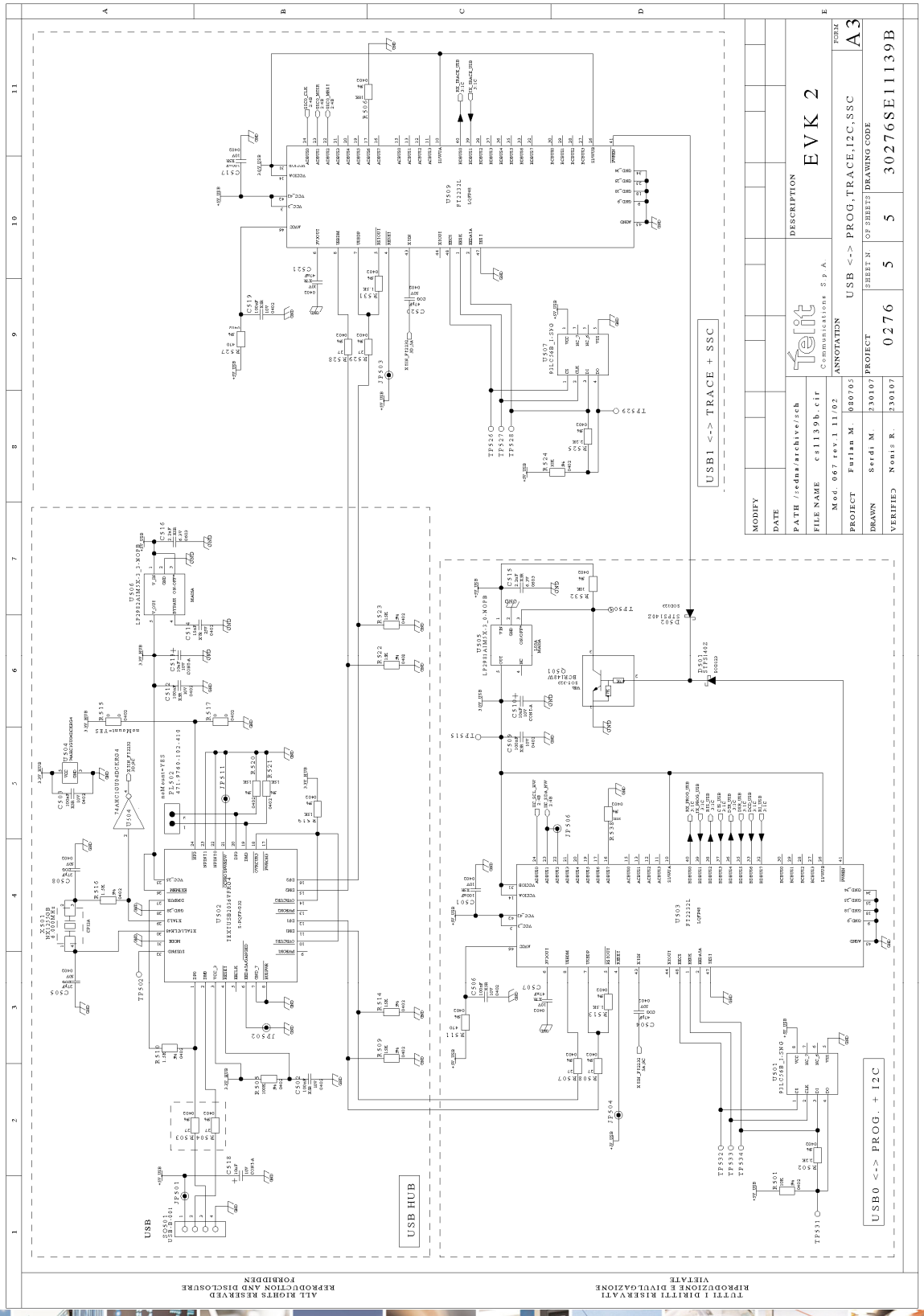




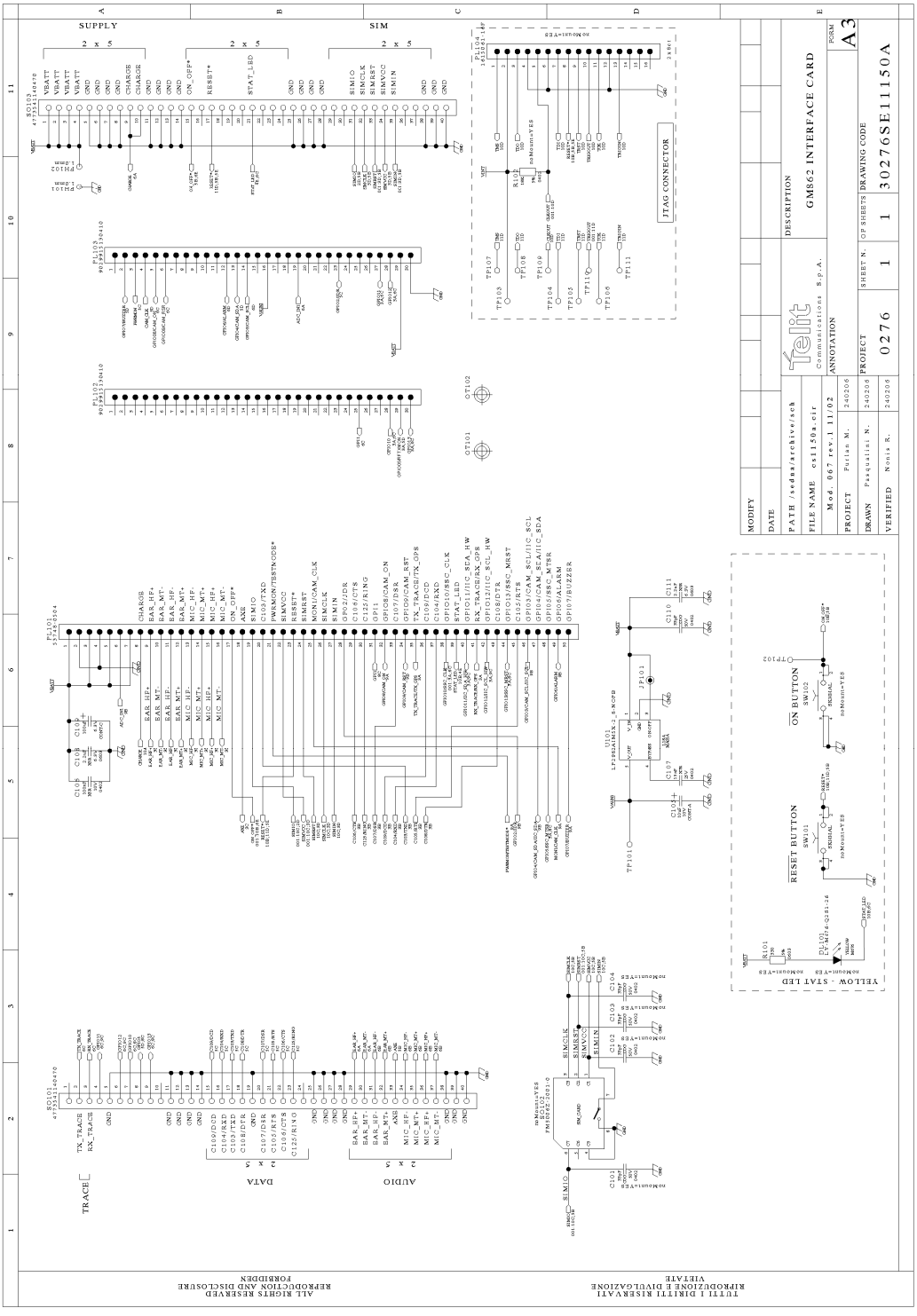



UPPER=PROG/DATA
LOWER=TRACE
DCD
RXD
TXD
DTR
GND
DSR
RTS
CTS
RI
RS232
USB
RS232/USB SWITCH
EVK 2
UART
A3
ALL RIGHTS RESERVED
REPRODUCTION AND DISCLOSURE
FORBIDDEN
TUTTI I DIRITTI RISERVATI
RIPRODUZIONE E DIVULGAZIONE
VIETATE

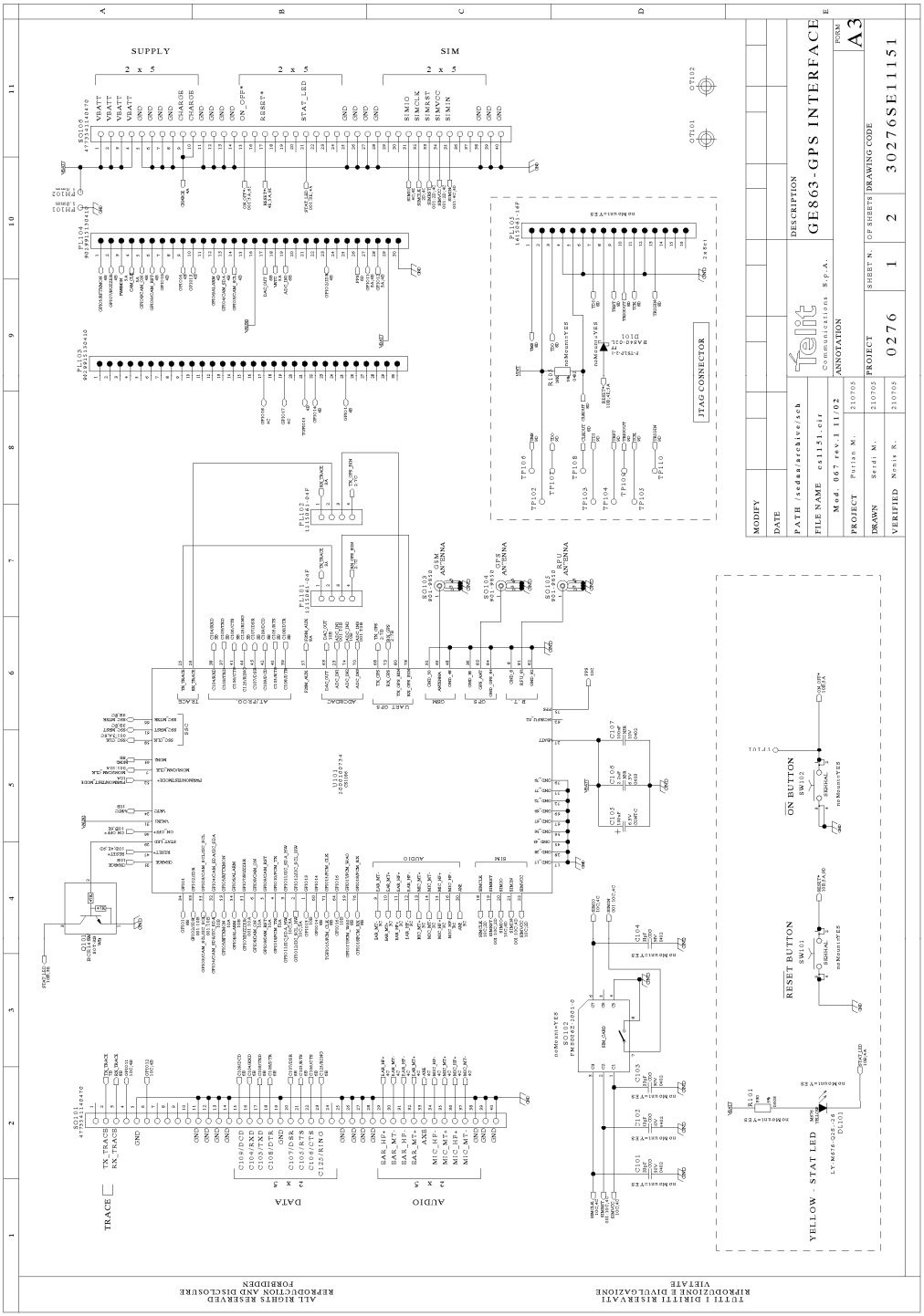

AUDIO CONNECTOR
AUDIO1
AUDIO2
OPTIONAL POWER AMPLIFIER
EARPIECE
EVK 2
AUDIO
30276SE11139B
0276

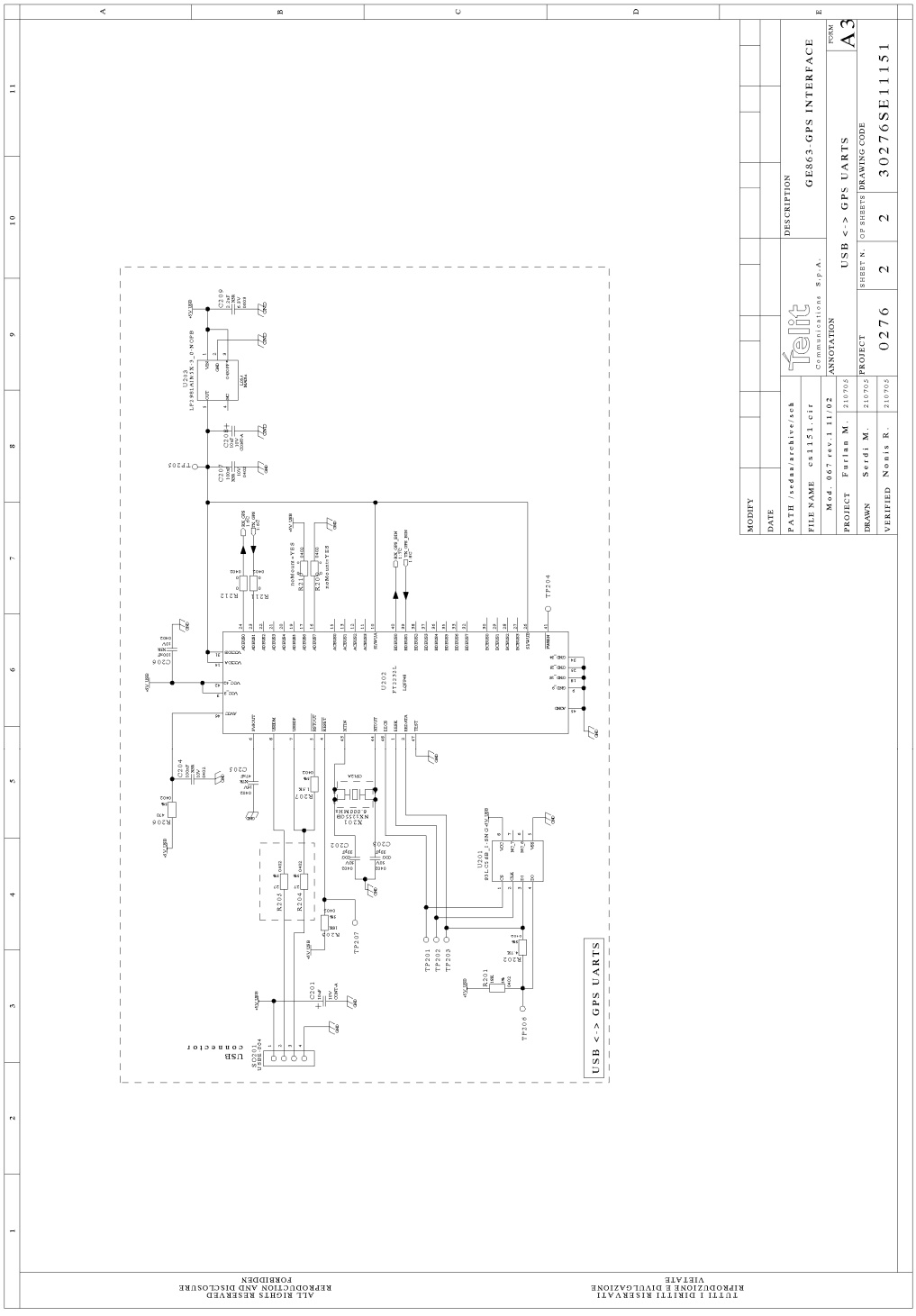

USB1 <-> TRACE + SSC
USB0 <-> PROG. + I2C
USB HUB
USB
USB <-> PROG.TRACE,I2C,SSC
EVK 2
DESCRIPTION
ANNOTATION
PROJECT
DRAWING CODE
30276SE11139B
A3
MODIFY
DATE
PROJECT
DRAWN
VERIFIED
ALL RIGHTS RESERVED
REPRODUCTION AND DISCLOSURE
FORBIDDEN
TUTTI I DIRITTI RISERVATI
RIPRODUZIONE E DIVULGAZIONE
VIETATE

22.2 GM862 Interface Board



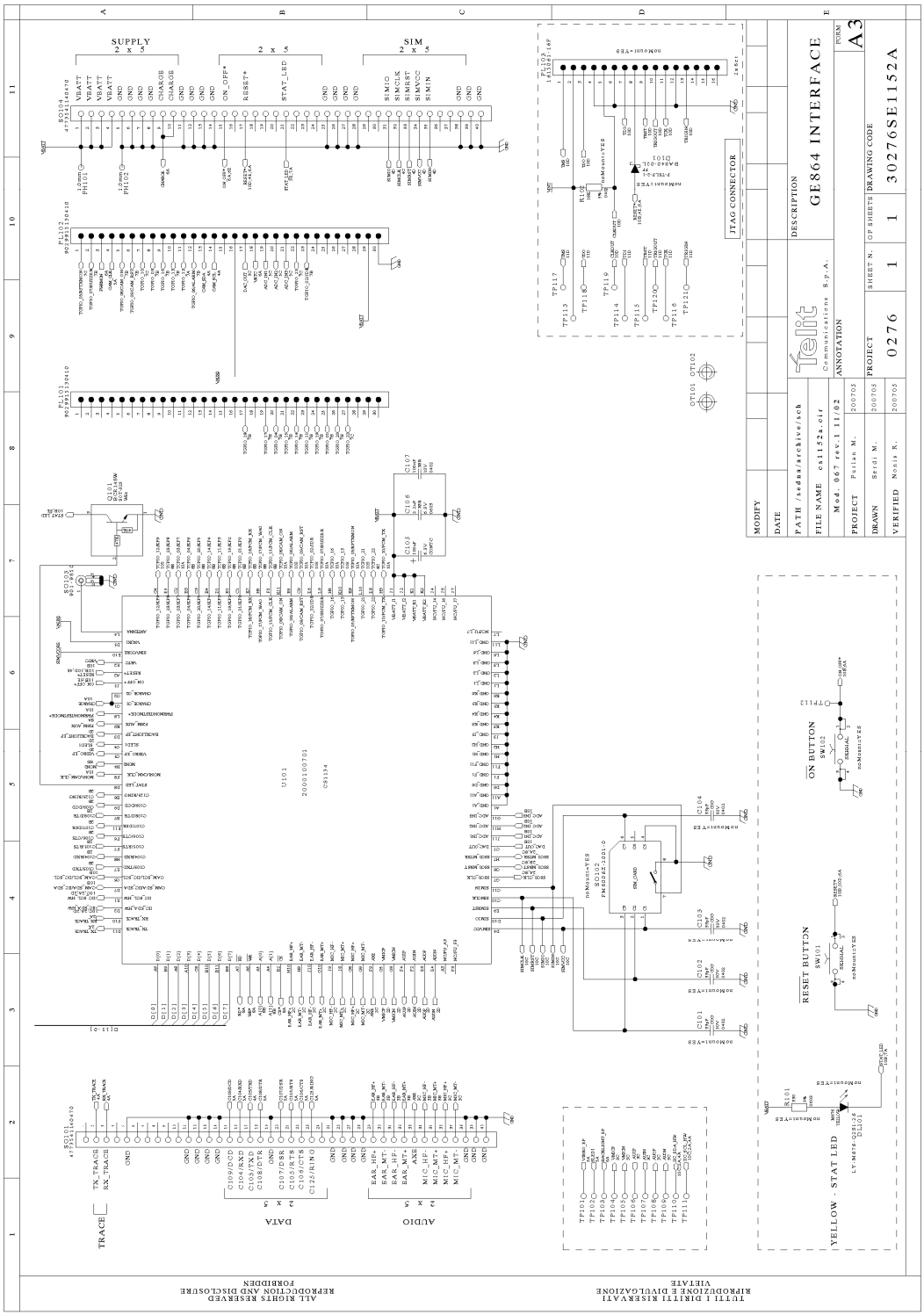
22.3 GE863 Interface Board



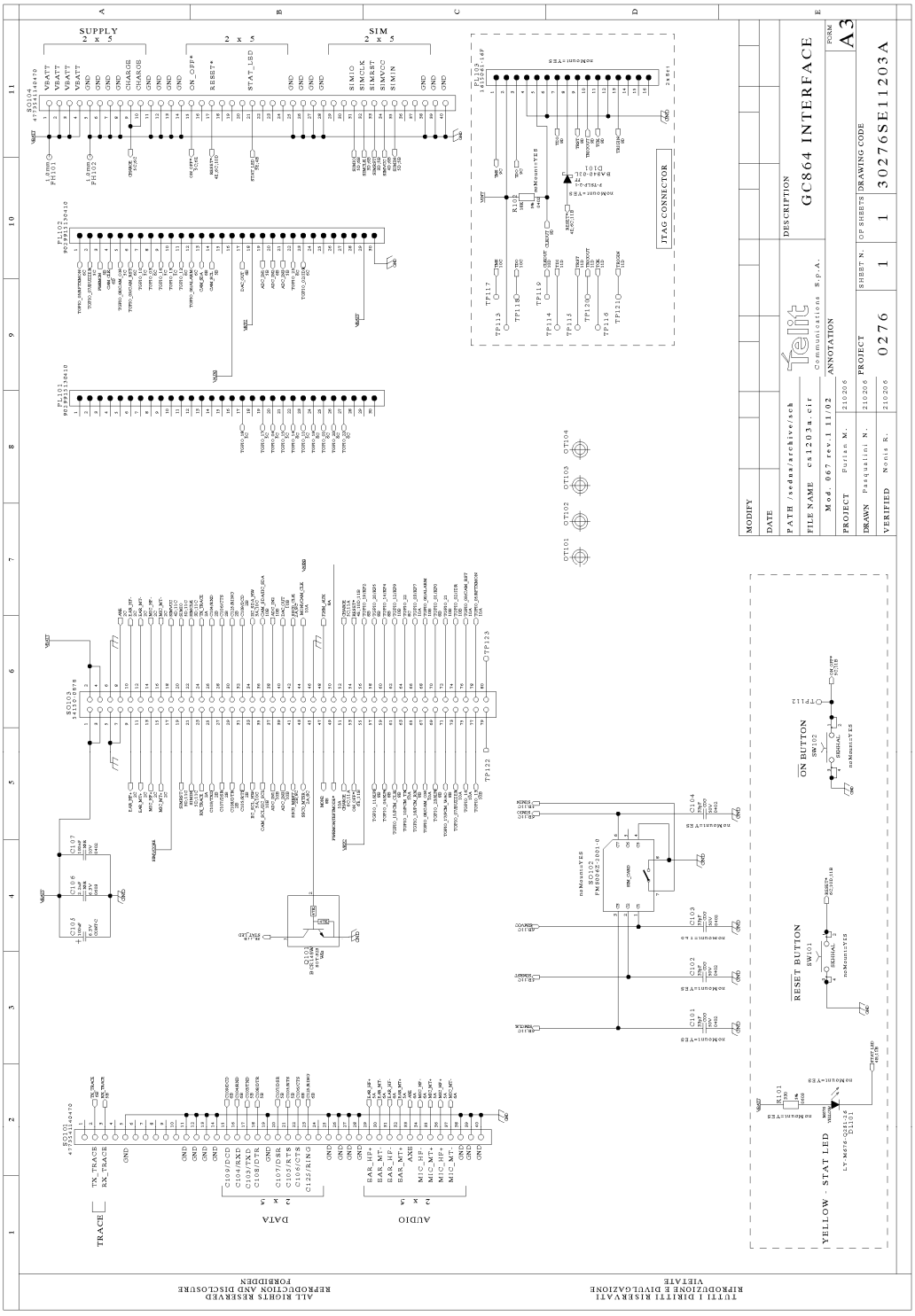


This sheet is related only to GPS version

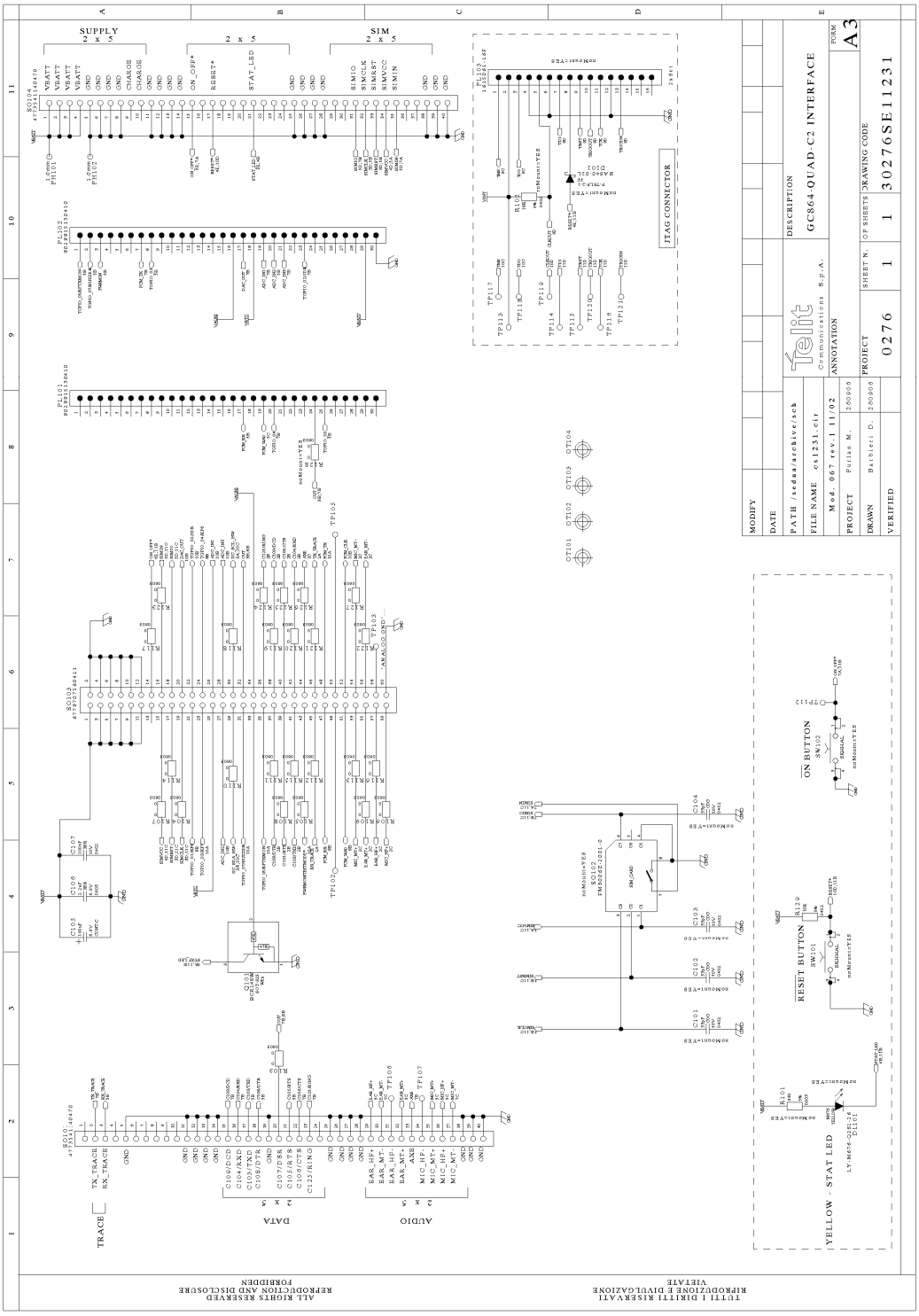
22.4 GE864 Interface board



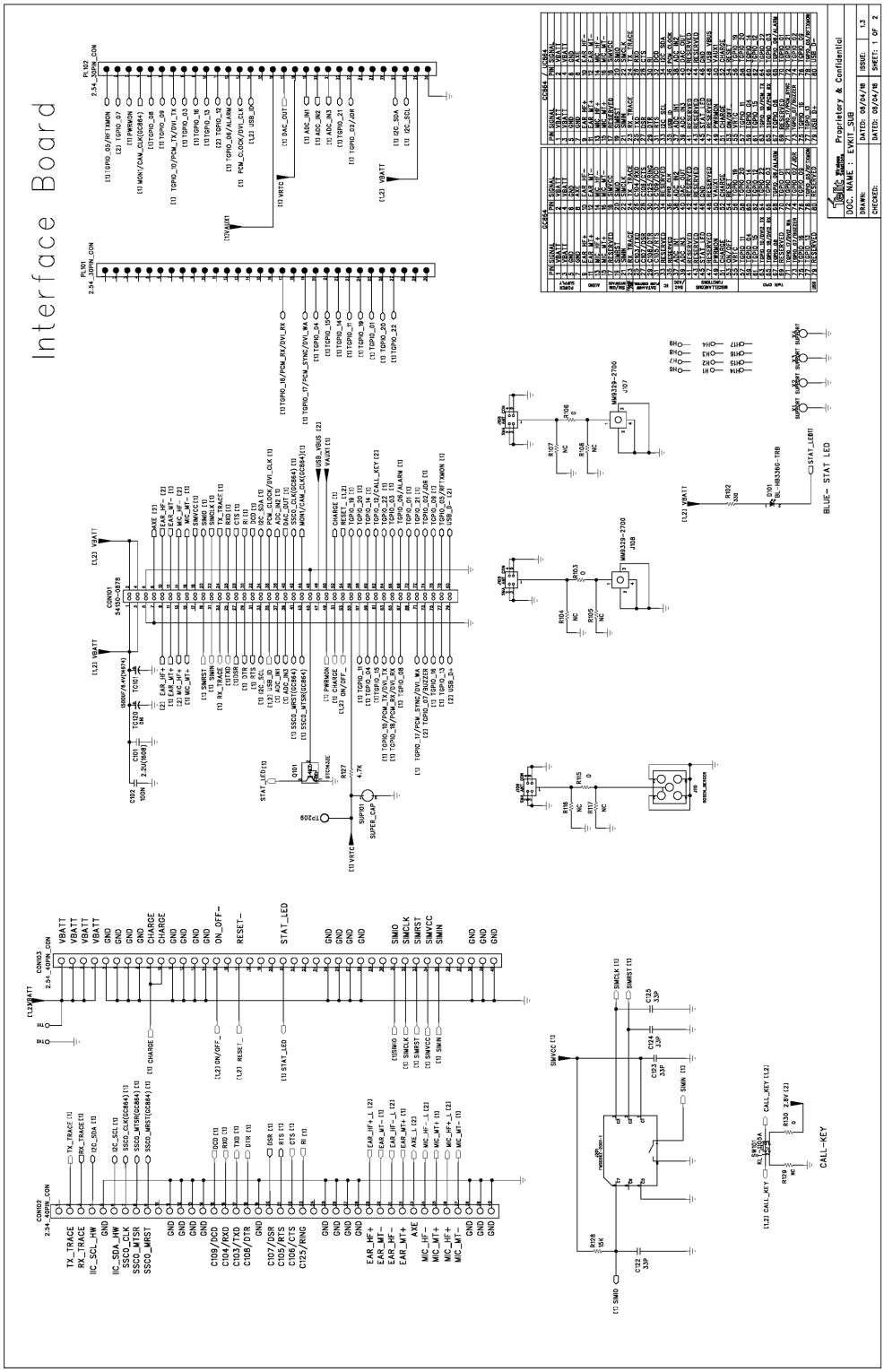
22.5 GC864 Interface board

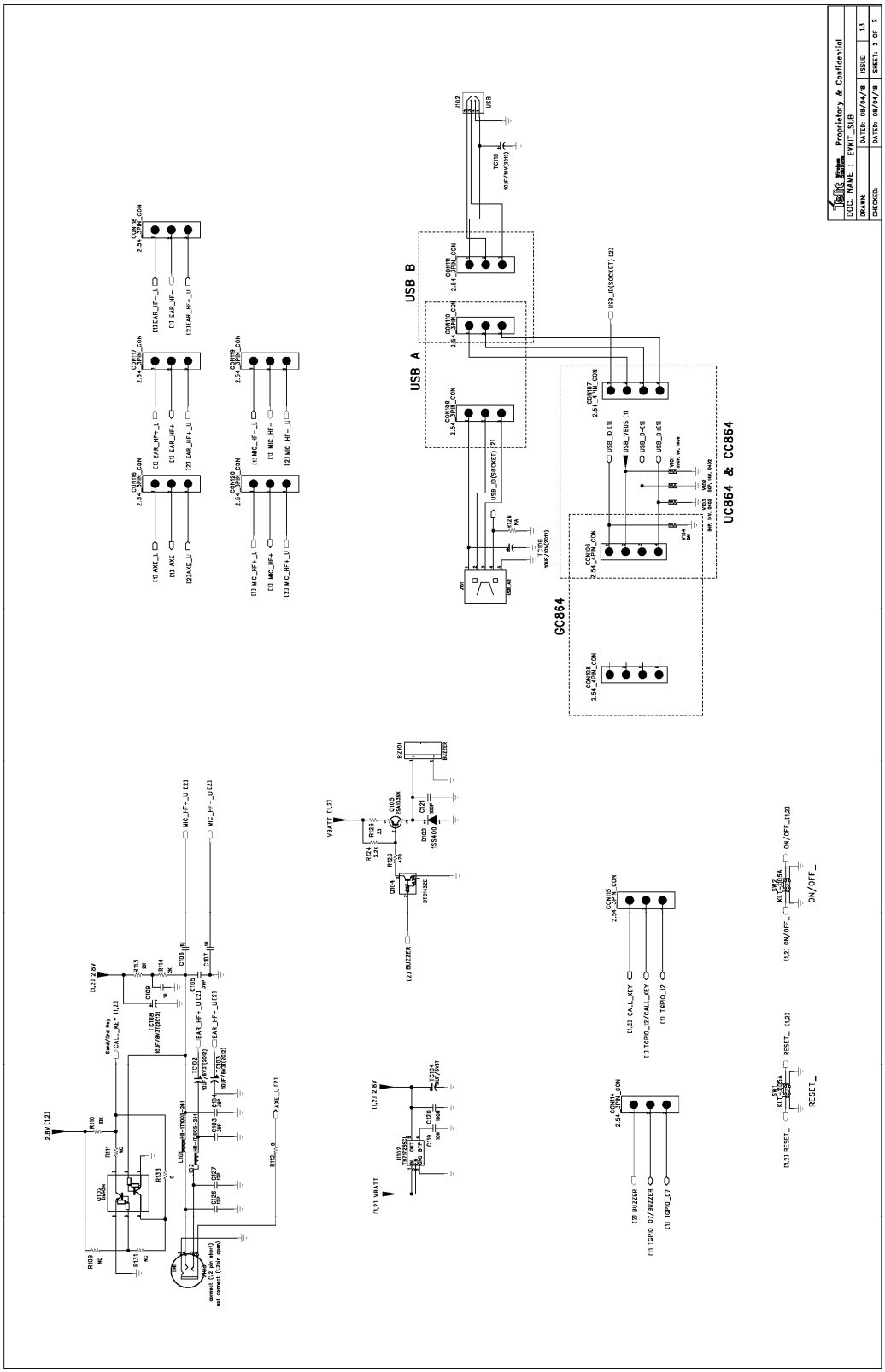


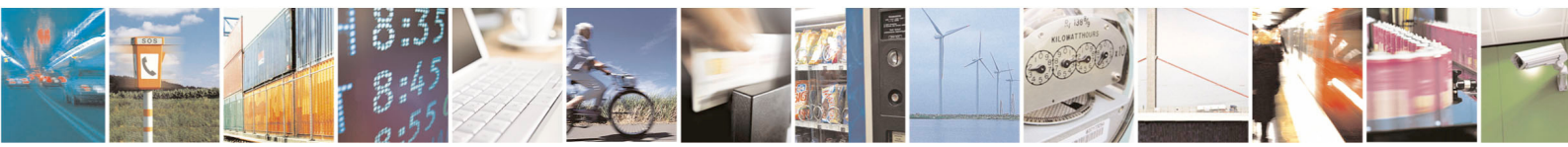
22.6 GC864-C2 Interface board



22.7 UC864 Interface board




USB B
USB A
GC864
UC864 & CC864
Proprietary & Confidential
DOC. NAME : EVKIT_SUB
DRAWN:
CHECKED:
ISSUE: 1.3
SHEET: 2 OF 2



23 Service and firmware update

You can update the Telit Module firmware through the serial cables (RS232 or USB 1.1) used for the communication with a PC. The firmware update can be done with a specific software tool provided by Telit that runs on windows based PCs.

All levels are conformed to RS232 and V.24 standard and a PC serial port can be directly connected to this connector.

24 SAFETY RECOMMENDATIONS

READ CAREFULLY

Be sure the use of this product is allowed in the country and in the environment required. The use of this product may be dangerous and has to be avoided in the following areas:

- Where it can interfere with other electronic devices in environments such as hospitals, airports, aircrafts, etc
- Where there is risk of explosion such as gasoline stations, oil refineries, etc

It is responsibility of the user to enforce the country regulation and the specific environment regulation.

Do not disassemble the product; any mark of tampering will compromise the warranty validity.

We recommend following the instructions of the hardware user guides for a correct wiring of the product. The product has to be supplied with a stabilized voltage source and the wiring has to be conforming to the security and fire prevention regulations.

The product has to be handled with care, avoiding any contact with the pins because electrostatic discharges may damage the product itself. Same cautions have to be taken for the SIM, checking carefully the instruction for its use. Do not insert or remove the SIM when the product is in power saving mode.

The system integrator is responsible of the functioning of the final product; therefore, care has to be taken to the external components of the module, as well as of any project or installation issue, because the risk of disturbing the GSM network or external devices or having impact on the security. Should there be any doubt, please refer to the technical documentation and the regulations in force.

Every module has to be equipped with a proper antenna with specific characteristics. The antenna has to be installed with care in order to avoid any interference with other electronic devices and has to guarantee a minimum distance from the people (20 cm). In case of this requirement cannot be satisfied, the system integrator has to assess the final product against the SAR regulation.

The European Community provides some Directives for the electronic equipments introduced on the market. All the relevant information's are available on the European Community website:
http://europa.eu.int/comm/enterprise/rtte/dir99-5.htm

The text of the Directive 99/05 regarding telecommunication equipments is available, while the applicable Directives (Low Voltage and EMC) are available at:
http://europa.eu.int/comm/enterprise/electr_equipment/index_en.htm

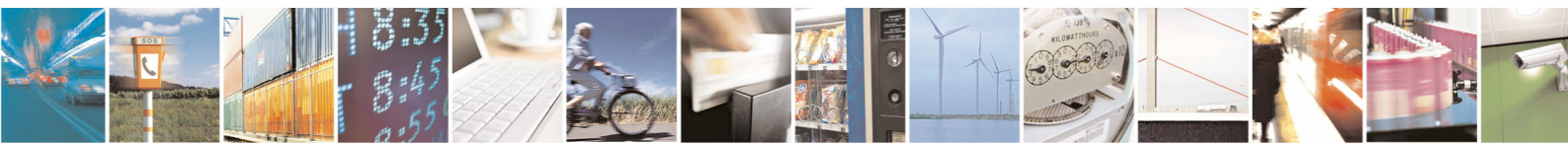
24.1 Disposal of this product in the European Union

According to the directives 2002/95/CE, 2002/96/CE and 2003/108/CE, which have been transposed in Italian Legislative Decree of July 25, 2005, n. 151, Telit Communications S.p.A informs that:

- The symbol of the crossed-out wheeled bin reproduced on the product or on the packaging, indicates that the product, at the end of life cycle, must be gathered separately from the other waste.
- The separate collection of rubbish for this product at the end of its life cycle is arranged and managed by the manufacturer. The user, who wants to dispose the product, must contact the manufacturer and follow the available system that allows the separate collection of rubbish for this product that has reached the end of the life cycle.
- The suitable separate collection of rubbish, necessary for the subsequent transfer of the obsolete product for the recycling, the treatment and the compatible environment disposal, contributes to avoid possible negative effects to the environment and the health, and helps in the re-use and/or recycle of the materials from which this product is composed.
- The illegitimate disposal of the product by the holder implies the enforcement of the administrative penalties provided for the regulations in force.
- The company is enrolled on the register of the manufacturers of Electric and Electronic Equipment (EEE) of the Italian Minister for the Environment with the number: **IT08020000002357**

Reference Directives and Laws

2002/95/EC	Directive of the European Parliament and of the Council of 27 January 2003 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS)
2002/96/EC	Directive of the European Parliament and of the Council on waste electrical and electronic equipment (WEEE)
2003/108/EC	Directive of the European Parliament and of the Council of 8 December 2003 amending directive 2002/96/EC on waste electrical and electronic equipment (WEEE)
Italian Legislative Decree of July 25, 2005, n. 151	Attuazione delle direttive 2002/95/CE, 2002/96/CE e 2003/108/CE, relative alla riduzione dell'uso di sostanze pericolose nelle apparecchiature elettriche ed elettroniche, nonche' allo smaltimento dei rifiuti.



25 RoHS Certifications

25.1 EVK2 Mother Board p/n 3990150463

Telit
Communications S.p.A.

DECLARATION OF EU RoHS Compliance

We,
Telit Communications S.p.A

Of:
Via Stazione di Prosecco, 5/b
34010 Sgonico (TRIESTE)
ITALY

declare under our sole responsibility that the products

SYS EVK2 (commercial name)

3990150463 (internal code)

to which this declaration relates, is in full compliance with EU Directive 2002/95/EC and subsequent amendments, on restriction of the use of certain Hazardous Substances in electrical and electronic equipment (RoHS).

The technical documentation or other information showing that electrical and electronic equipment which has put on the market, complies the requirements of regulation, will be held at:

Telit Communications S.p.A
Via Stazione di Prosecco, 5/b
34010 Sgonico (TRIESTE)
ITALY

Trieste, ***24 March 2007***

Dott. Giuseppe Surace
R&D Technical Director

Ing. Guido Walcher
Qualiy Director

25.2 GM862 Interface p/n 3990250670

Telit
Communications S.p.A.

DECLARATION OF EU RoHS Compliance

We,
Telit Communications S.p.A

Of:
Via Stazione di Prosecco, 5/b
34010 Sgonico (TRIESTE)
ITALY

declare under our sole responsibility that the products

***GM862 INTERFACE** (commercial name)*

3990250670 (internal code)

to which this declaration relates, is in full compliance with EU Directive 2002/95/EC and subsequent amendments, on restriction of the use of certain Hazardous Substances in electrical and electronic equipment (RoHS).

The technical documentation or other information showing that electrical and electronic equipment which has put on the market, complies the requirements of regulation, will be held at:

Telit Communications S.p.A
Via Stazione di Prosecco, 5/b
34010 Sgonico (TRIESTE)
ITALY

Trieste, *27 September 2006*

Ing. Sandro Spanghero
R&D Technical Director

Ing. Guido Walcher
Qualiy Assurance Director

25.3 GE863-GPS Interface p/n 3990250671

Telit Communications S.p.A.

DECLARATION OF EU RoHS Compliance

We,

Telit Communications S.p.A

Of:

Via Stazione di Prosecco, 5/b
34010 Sgonico (TRIESTE)
ITALY

declare under our sole responsibility that the products

***GE863-GPS INTERFACE** (commercial name)*

3990250671 (internal code)

to which this declaration relates, is in full compliance with EU Directive 2002/95/EC and subsequent amendments, on restriction of the use of certain Hazardous Substances in electrical and electronic equipment (RoHS).

The technical documentation or other information showing that electrical and electronic equipment which has put on the market, complies the requirements of regulation, will be held at:

Telit Communications S.p.A
Via Stazione di Prosecco, 5/b
34010 Sgonico (TRIESTE)
ITALY

Trieste, *12 July 2006*

Ing. Sandro Spanghero
R&D Technical Director

Ing. Guido Walcher
Qualiy Assurance Director

25.4 GE863 Interface p/n 3990250684

Telit Communications S.p.A.

DECLARATION OF EU RoHS Compliance

We,

Telit Communications S.p.A

Of:

Via Stazione di Prosecco, 5/b
34010 Sgonico (TRIESTE)
ITALY

declare under our sole responsibility that the products

GE863-PY INTERFACE (commercial name)

3990250684(internal code)

to which this declaration relates, is in full compliance with EU Directive 2002/95/EC and subsequent amendments, on restriction of the use of certain Hazardous Substances in electrical and electronic equipment (RoHS).

The technical documentation or other information showing that electrical and electronic equipment which has put on the market, complies the requirements of regulation, will be held at:

Telit Communications S.p.A
Via Stazione di Prosecco, 5/b
34010 Sgonico (TRIESTE)
ITALY

Trieste, ***16 October 2006***

Ing. Sandro Spanghero
R&D Technical Director

Ing. Guido Walcher
Qualiy Director

25.5 GE863 Interface p/n 3990250685

Telit
Communications S.p.A.

DECLARATION OF EU RoHS Compliance

We,
Telit Communications S.p.A

Of:
Via Stazione di Prosecco, 5/b
34010 Sgonico (TRIESTE)
ITALY

declare under our sole responsibility that the products

GE863-QUAD INTERFACE (commercial name)

3990250685(internal code)

to which this declaration relates, is in full compliance with EU Directive 2002/95/EC and subsequent amendments, on restriction of the use of certain Hazardous Substances in electrical and electronic equipment (RoHS).

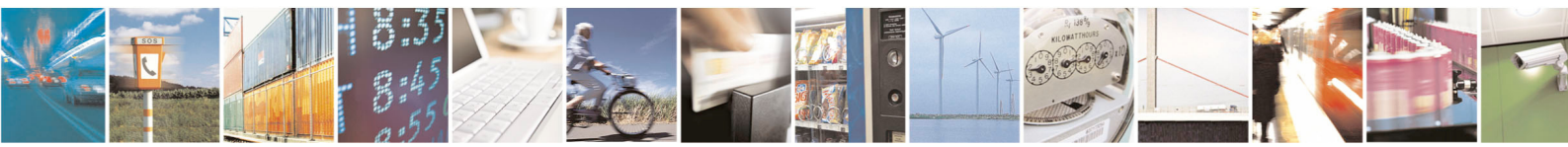
The technical documentation or other information showing that electrical and electronic equipment which has put on the market, complies the requirements of regulation, will be held at:

Telit Communications S.p.A
Via Stazione di Prosecco, 5/b
34010 Sgonico (TRIESTE)
ITALY

Trieste, ***16 October 2006***

Ing. Sandro Spanghero
R&D Technical Director

Ing. Guido Walcher
Qualiy Director



25.6 GE864 Interface p/n 3990250672

Telit Communications S.p.A.

DECLARATION OF EU RoHS Compliance

We,

Telit Communications S.p.A

Of:

Via Stazione di Prosecco, 5/b
34010 Sgonico (TRIESTE)
ITALY

declare under our sole responsibility that the products

***GE864-PY INTERFACE** (commercial name)*

3990250672 (internal code)

to which this declaration relates, is in full compliance with EU Directive 2002/95/EC and subsequen amendments, on restriction of the use of certain Hazardous Substances in electrical and electronic equipmen (RoHS).

The technical documentation or other information showing that electrical and electronic equipment which has put on the market, complies the requirements of regulation, will be held at:

Telit Communications S.p.A
Via Stazione di Prosecco, 5/b
34010 Sgonico (TRIESTE)
ITALY

Trieste, *29 September 2006*

Ing. Sandro Spanghero
R&D Technical Director

Ing. Guido Walcher
Qualiy Assurance Director

25.7 GE864 Interface p/n 3990250688

Telit
Communications S.p.A.

DECLARATION OF EU RoHS Compliance

Telit Communications S.p.A

Via Stazione di Prosecco, 5/b
34010 Sgonico (TRIESTE)
ITALY

declare under our sole responsibility that the products

GE864-QUAD INTERFACE (commercial name)

3990250688(internal code)

which this declaration relates, is in full compliance with EU Directive 2002/95/EC and subsequ
ndments, on restriction of the use of certain Hazardous Substances in electrical and electronic equipn
HS).

technical documentation or other information showing that electrical and electronic equipment which
on the market, complies the requirements of regulation, will be held at:

t Communications S.p.A
Stazione di Prosecco, 5/b
10 Sgonico (TRIESTE)
LY

ste, ***24 March 2007***

Dott. Giuseppe Surace
R&D Technical Director

Ing. Guido Walcher
Qualiy Director

25.8 GC864 Interface p/n 3990250680

Telit
Communications S.p.A.

DECLARATION OF EU RoHS Compliance

We,
Telit Communications S.p.A

Of:
Via Stazione di Prosecco, 5/b
34010 Sgonico (TRIESTE)
ITALY

declare under our sole responsibility that the products

***GC864-PY INTERFACE** (commercial name)*

***3990250680**(internal code)*

to which this declaration relates, is in full compliance with EU Directive 2002/95/EC and subsequer amendments, on restriction of the use of certain Hazardous Substances in electrical and electronic equipmer (RoHS).

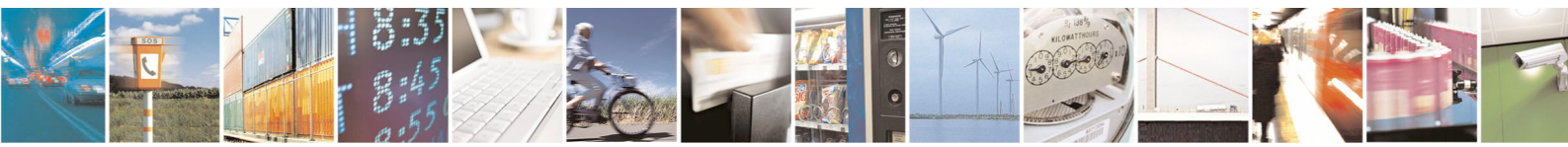
The technical documentation or other information showing that electrical and electronic equipment which ha put on the market, complies the requirements of regulation, will be held at:

Telit Communications S.p.A
Via Stazione di Prosecco, 5/b
34010 Sgonico (TRIESTE)
ITALY

Trieste, ***5 October 2006***

Ing. Sandro Spanghero
R&D Technical Director

Ing. Guido Walcher
Quality Director



25.9 GC864-QUAD-C2 Interface p/n 3990250683

Telit
Communications S.p.A.

DECLARATION OF EU RoHS Compliance

/e,
Telit Communications S.p.A

f:
Via Stazione di Prosecco, 5/b
34010 Sgonico (TRIESTE)
ITALY

declare under our sole responsibility that the products

GC864-QUAD-C2 INTERFACE (commercial name)

3990250683 (internal code)

which this declaration relates, is in full compliance with EU Directive 2002/95/EC and subsequ
nendments, on restriction of the use of certain Hazardous Substances in electrical and electronic equipm
RoHS).

ne technical documentation or other information showing that electrical and electronic equipment which
ıt on the market, complies the requirements of regulation, will be held at:

elit Communications S.p.A
ia Stazione di Prosecco, 5/b
4010 Sgonico (TRIESTE)
TALY

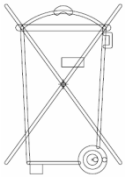
ieste, ***24 March 2007***

Dott. Giuseppe Surace
R&D Technical Director

Ing. Guido Walcher
Qualiy Director

26 Disposal of old Electrical & Electronic Equipment (WEEE Mark)

This symbol, applied on our products and/or on its packaging, indicates that this product should not be treated as household waste when you wish to dispose of it. Instead, it should be handed over to an applicable collection point for the recycling of electrical and electronic equipment. By ensuring this product is disposed of correctly, you will help prevent potential negative consequences to the environment and human health, which could otherwise be caused by inappropriate disposal of this product. The recycling of materials will help to conserve natural resources. For more detailed information about the recycling of this product, please contact your local city office, household waste disposal service or the retail store where you purchased this product.



27 Technical Support

Telit Communications S.p.A. technical support to **EVK2** customer is included into official Website *www.telit.com*, which contains also all available technical documentation to download.

28 Document Change Log

Revision	Date	Changes
Rev 0	05/01/2006	First issue
Rev 1	23/01/2006	Added PCB weight and dimensions pag.9 Added default setup pag.8 Correct mA/h with mAh pag.16 Unified the scripting “impedance coil” pag.19 and pag.20 Insert the power supply pag.7 Correct the serial lines scripting on block diagrams Insert the pin number of CS1150 connector. Correct the serial interfaces descriptions pag.7
Rev 2	31/01/2006	Modified in chapter 11.1 description of CS1170 pag. 29
Rev.3	14/04/2006	Moved par.2.2 to par.4 and extended the STARTUP PROCEDURE to pag.11 Par.3 pag.9: Added mother boards block diagrams Pag.11: Correct GE863 Interface physical dimensions and added Dual Camera Interface physical dimensions. Moved par.4.4 and 4.5 to par.6.5 as Application Notes Moved par.7.3, 7.4 and 7.5 to par.9.3 as Warning Pag.26: Correct the Reset Button function description. Pag.20: Updated the Cross List Table From par.14 to par.18: Added interfaces description Removed all “Interface Board” “Printed Circuits Name” cross references Par.20: Added all electric diagrams.
Rev.4	14/07/2006	Replaced GC864 interface photo pag.46
Rev.5	13/10/2006	Renamed figure from 38 to 42 Pag.2 Added products name and P/N for GE863-PY/QUAD interface and GC864-C2 interface 3.2.6 Added mechanical characteristics GC864-C2 interface 5.0 Correct Optically Positioning Guide system description 7.1 Correct the line selection description 6.5.2 Updated Current Charger footnote 13.1 Generality: added note for the VGA camera 13.3 Added in the Cross List GE864-PY/QUAD interface and GC864-C2 interface 15.2.1 Inserted P/N of GE863-GPS version 18.0 Added GC864-C2 interface description 20.1 Corrected GPIO location and added p/n of GM862 interface 20.2 Corrected GPIO location and added p/n of GE863-GPS interface 20.3 Corrected GPIO location and added p/n of GE863 interface 20.4 Corrected GPIO location and added p/n of GE864 interface 20.5 Corrected GPIO location and added p/n of GC864 interface 20.6 Corrected GPIO location and added p/n of GC864-C2 interface 21.6 Added GC864-C2 interface Schematic 24.1 GM862 Interface p/n 3990250670: added RoHS certification 24.2 GE863-PY Interface p/n 3990250669: added RoHS certification 24.3 GE863-GPS Interface p/n 3990250671: added RoHS certification 24.4 GE863-PY Interface p/n 3990250684: added RoHS certification 24.5 GC864-QUAD Interface p/n 3990250685: added RoHS certification 24.6 GE864-PY Interface p/n 3990250672: added RoHS certification 24.7 GC864-PY Interface p/n 3990250680: added RoHS certification

Rev.6	24/05/2007	Pag. 2 Product Table updated Pag. 10 Table 1 updated Pag.24 Modified the formula Pag.22 Inserted the Audio Section chapter Pag.39 Table 10 modified PCB release updating Erased all Dual Camera paragraph Figures and table updated Paragraph 15.3 16.2 17.3 18.3 19.3 inserted 24.1 EVK2 SYS p/n 3990150463: added RoHS certification 24.9 GE864-QUAD Interface p/n 3990250688: added RoHS certification 24.11 GE864-QUAD-C2 Interface p/n 3990250683: added RoHS certification
Rev.7	22/01/2008	Pag. 2 Product Table updated with UC864-E and GE863-SIM Pag.7 Disclaimer Date modified Pag.13 Inserted UC864 Interface dimensions Pag.36 Inserted refer to GE863-SIM Pag.38 Table 10 Inserted UC864 and GE863-SIM Interface Code Pag.38 Order Code Table updated Pag.42 Added figure 24 with GE863-SIM photo Pag.43 Added GE863-SIM version kit list Pag.54 Inserted UC864 Interface photo Pag.64 Inserted figure 40 and Table 17 of UC864 GPIO positioning Pag.77-78 Inserted UC864 Interface Schematic diagrams Removed notes regarding interface board of phased out models from the GE863 family (Please refer to the previous version of this document if you need information for the interfaces with the following P/N: 3990250669 & 3990250677)
Rev.8	20/03/2008	Pag.64 Updated 40 and Table 19 of UC864 GPIO positioning Pag.66-70 Updated EVK mother board schematics Pag.81 Added new European WEEE directive
Rev9	28/05/2008	Pag.77-78 Replaced UC864 Interface board schematics with more readable drawings.