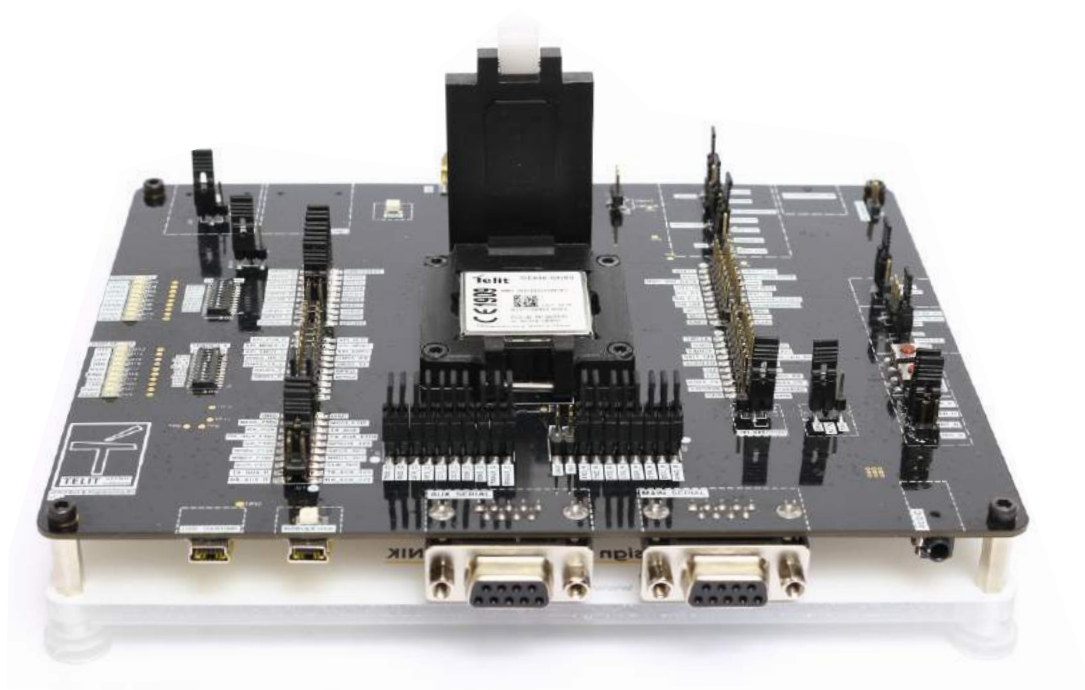


xE910-Prog

xE910 Family Socket Kit
Programming & Development

User Guide



Contents

1. Introduction.....	3
1.1. Related Documents.....	3
1.2. Content of the kit.....	3
2. Description.....	4
3. Startup procedure	5
4. Power Supply Section	6
4.1. 12V/24V External Power Input.....	6
4.2. 3.8V and 1.8 Power supply	7
4.3. Power Supply section Schematic.....	8
5. ON_OFF and RESET	9
5.1. ON_OFF*	9
5.2. RESET*	9
6. Communication Ports	9
6.1. Main UART.....	9
6.1.1. RS232 Mode.....	10
6.1.2. USB Mode	10
6.2. AUX UART.....	11
6.2.1. RS232 Mode.....	11
6.2.2. USB Mode	11
6.3. LED and Flow Control.....	12
6.4. USB HS	12
6.5. SIM.....	13
6.5.1. SIM Holder	13
7. GPIO Section.....	14
7.1. GPIO Configuration	14
8. GNSS Section.....	15
9. Status and Pwrmod Leds.....	15
10. AUDIO Section.....	16
10.1. Digital Audio	16
10.2. Analog Audio.....	17
10.2. Audio Schematics	17-18



1. Introduction:

Purpose of this manual is to describe the use of the "xE910-Prog" Development & Programming Kit.

1.1. Related Documents:

- Telit's GSM/GPRS Family Software User Guide,
- Audio settings application note ,
- Digital Voice Interface Application Note,
- HE910 Digital Voice Application Note,
- SIM Holder Design Guides,
- AT Commands Reference Guide,
- HE910 AT Commands Reference Guide,

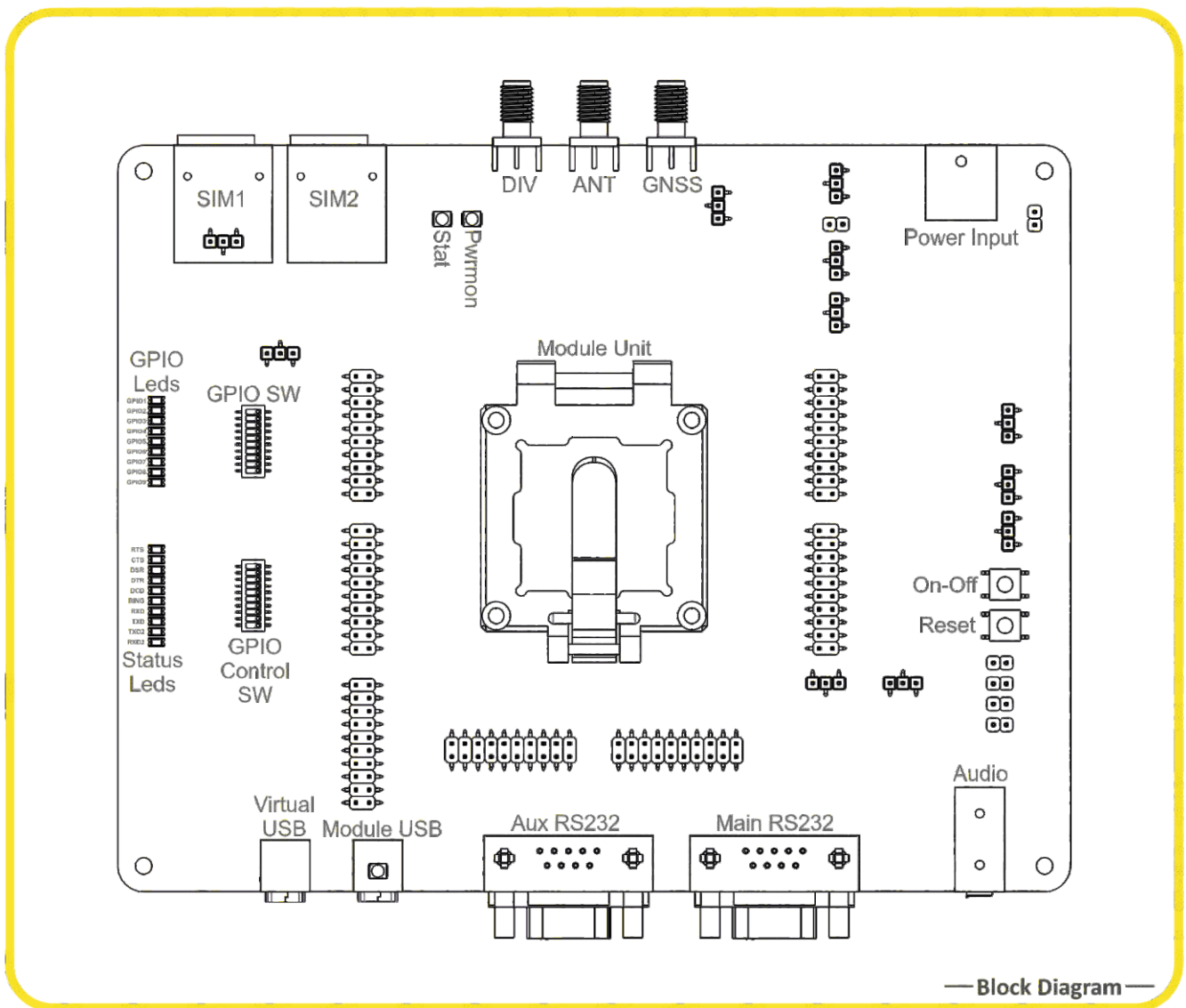
1.2. Content of the Kit:

Description	Qty
xE910-Prog Development Board with Socket	1
USB Mini-B Cable	1
GPRS/3G/4G Capable Cellular Antenna - SMA/M	1
GPS/GNSS Active Antenna - SMA/M	1
12V/2A Switch Mode AC/DC Adapter	1



2. Description:

The xE910 Development Board can be split into several functional blocks depending on the implemented function; the following drawing shows the main blocks on the board:



3: Startup Procedure

The motherboard factory setup is:

- Serial port **MAIN_SERIAL or MODULE_USB**
- DC source **12V/24V only**
- Audio Headset **Analog Audio Channel**

Follow this sequence of commands to use the Development Board:

- Insert your SIM card
- Set properly all jumpers in the desired position,
- Connect the antenna to RF connector,
- Connect VDD_IO and VIO1_1V8 pins on J29 Jumpers; Connect default AUX Mode on J14; Connect 1V8 and V_LV on J19,
- Insert the module in the Socket (ensure to properly place the module in it following the A1 pin reference as in the below picture),

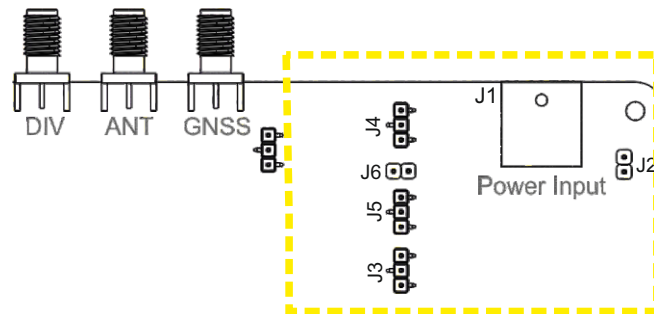


- Close the Socket,
- Plug the 12V/24V Power Supply into the +12V_IN,
- Switch ON the power supply,
- Connect the cable between your PC and MAIN_SERIAL (RS232 PORT) or MODULE_USB,
- Push ON/OFF button for at least 5 seconds,
- Your module should now be operational and ready to receive AT Commands.



4: Power Supply Section :

The following picture is showing the board section related to the Power supply:



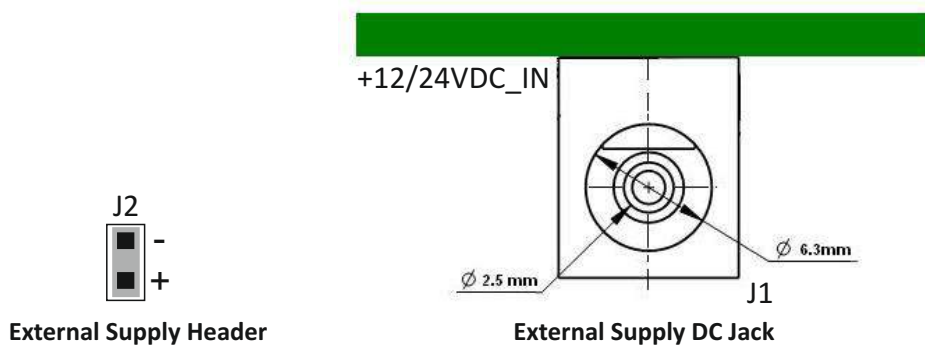
Note:

The **Development Board** could be powered in two different ways:
 12V/24V DC using the provided Power supply
 3.8V DC using the provided External Battery

The requested setting is made inserting the proper jumper connectors in the right position as described in the next paragraphs.

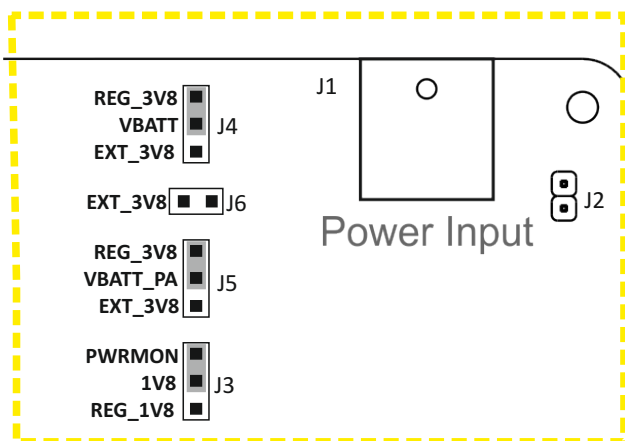
4.1. 12V/24V External Power Input:

Development Board can be supplied from external DC Power Jack or external Supply header (J2). The Suggested Supply Voltage Range is 12V-24V / 1A.

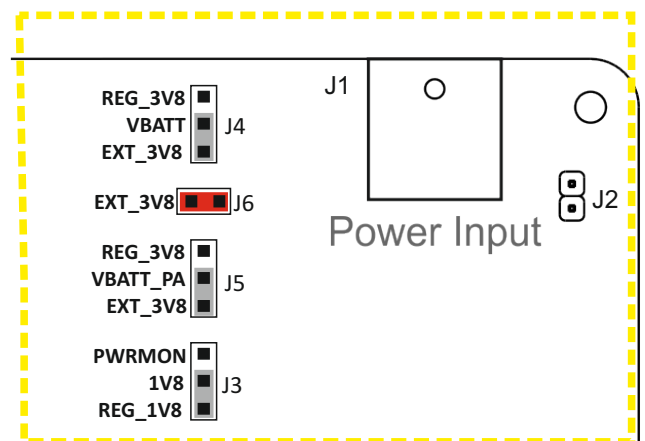


4.2. 3.8V and 1.8V Power Supply:

There are possibilities to supply module with 3.8V. One of them is that supplying it with external 12V/24V and to regulate it; other possibility is that supplying module directly with External battery or supply.



Power Activation with External 12V/24V Supply
and
Internal 1V8 Supply from PWRMON



Power Activation with External Battery
and
Internal 1V8 Supply from REG_1V8

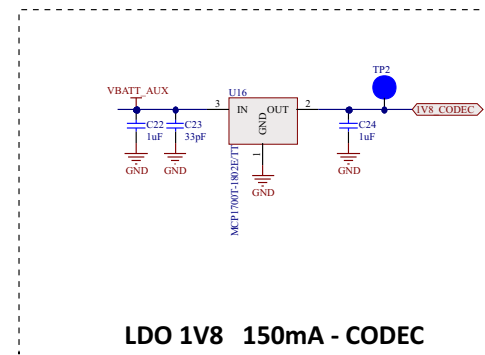
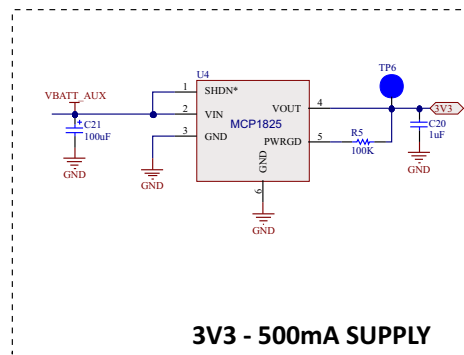
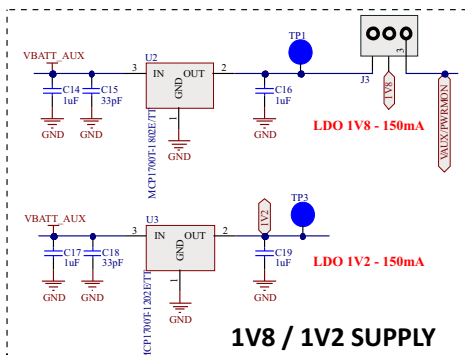
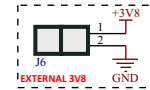
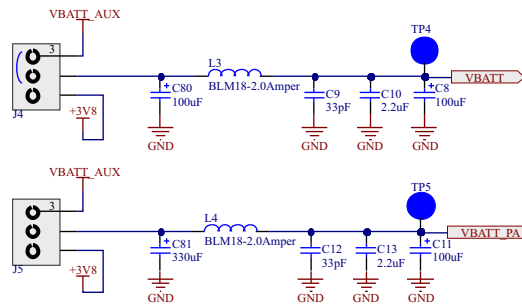
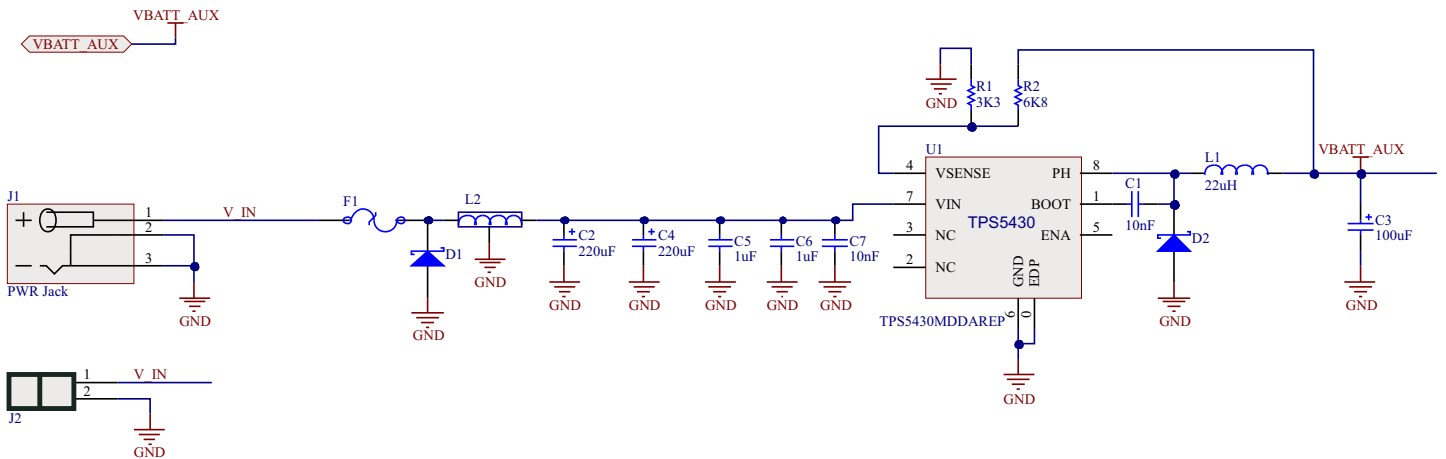
Note:

For HE910 family, VDD_IO and VIO1_1V8 pins of module should be connected on J29 header. At other modules there is no need to connect these pins.



4.3 Power Supply Section Schematic :

The following schematic is related to the 12V to 3.8V switching regulator



5: ON_OFF and RESET :

It is possible to control the module's ON_OFF and RESET lines using two buttons present on the Development Board.

5.1. ON_OFF:

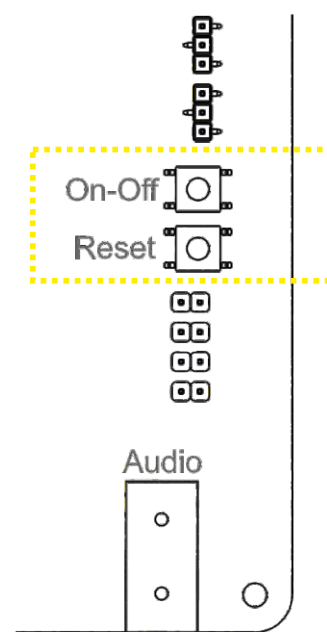
This button permits to power on and off the module. Its behaviour and the related reaction time has to be checked on the product's Hardware User Guide.

5.2. RESET:

When the RESET* button is used you perform an HW shutdown of the module. When the device is reset, it stops any operation without doing any detach operation from the network where it is registered and it doesn't reboot after the release of the Reset button. This behavior is not a regular 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 shutting down the device, but only as an emergency exit in the rare case the device remains stuck waiting for some network response.

It may only be used to reset a device already on that is not responding to any command.



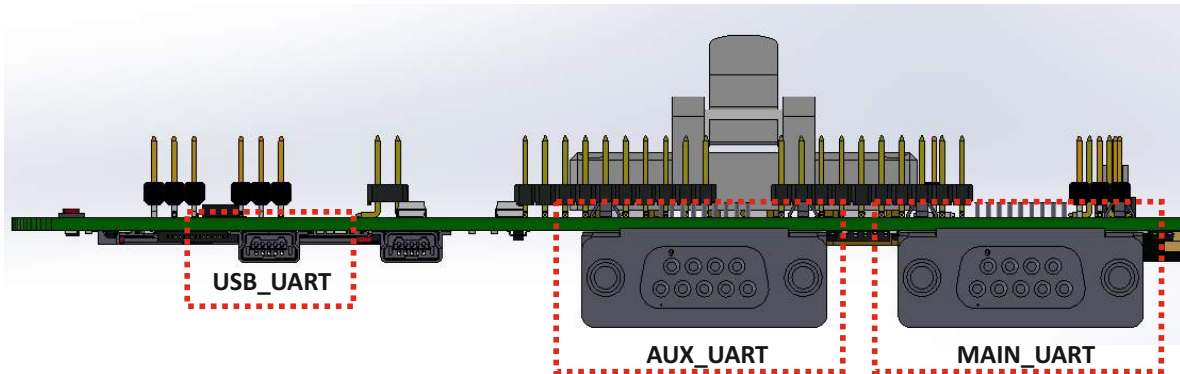
6: Communication Ports :

The xE910 Development board is permitting to interface the module using all the supported communication ports.

6.1. Main UART:

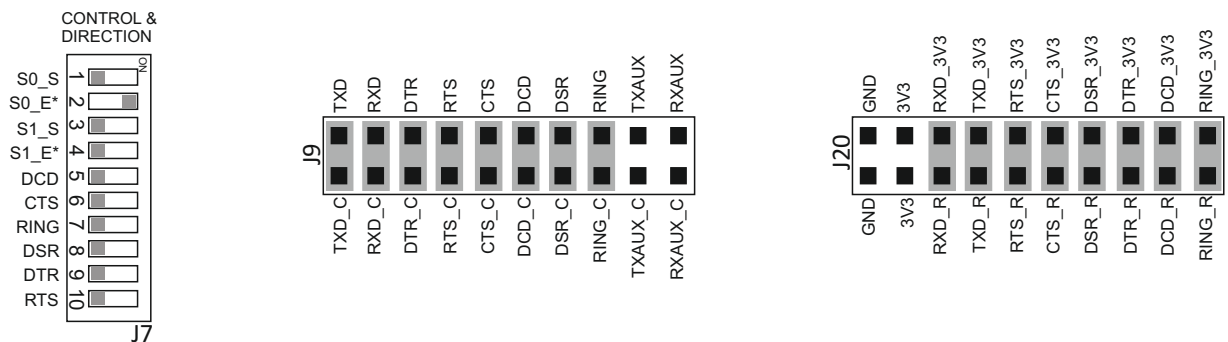
Communications between your application and the Telit modules are allowed connecting the DTE to the Asynchronous Serial Interfaces of Base-Band Chip, USIF0, through the two standard RS232 communications ports (9 way D-socket connector at slow data rates of RS232 protocol) or a standard Mini USB receptacle.





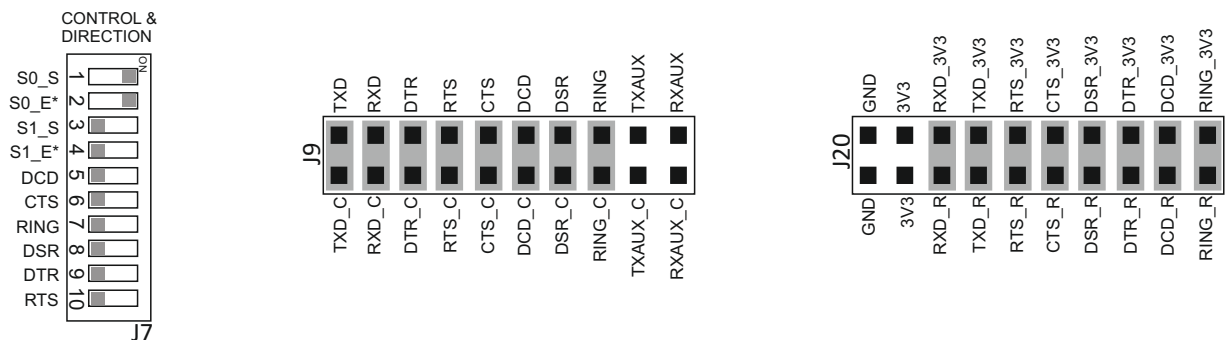
6.1.1. RS232 Mode:

Do connection with serial cable between your application and MAIN_SERIAL RS232 Port. After that apply below connections at header and switch. You can do communication with AT-commands over MAIN_SERIAL Rs232 Port.



6.1.2. USB Mode:

Do connection with USB cable between your application and USB-UART/SPI Mini-B USB Port. After that apply below connections at header and switch. You can do communication with AT-commands over Virtual Port3.

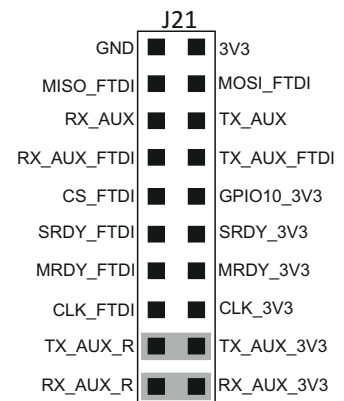
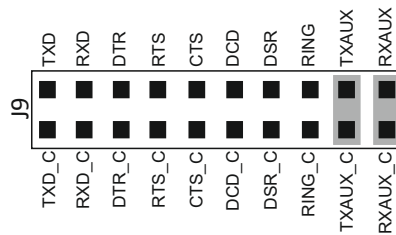
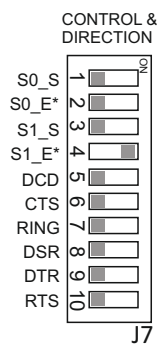


6.2. AUX UART:

Communications between your application and the Telit modules are allowed connecting the DTE to the Asynchronous Serial Interfaces of Base-Band Chip, USIF1, through the two standard RS232 communications ports (9 way D-socket connector at slow data rates of RS232 protocol) or a standard Mini USB receptacle.

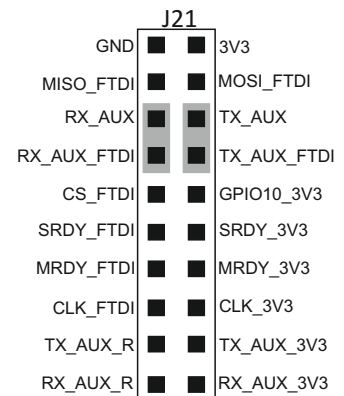
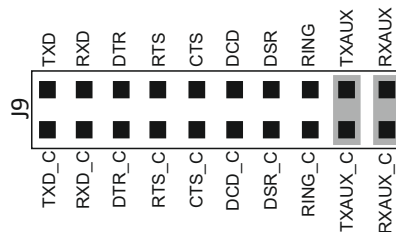
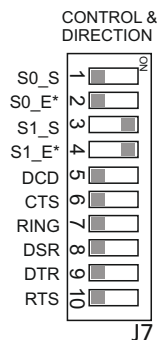
6.2.1. RS232 Mode:

Do connection with serial cable between your application and AUX_SERIAL RS232 Port. After that apply below connections at header and switch. You can do communication with AT-commands over AUX_SERIAL RS232 Port.



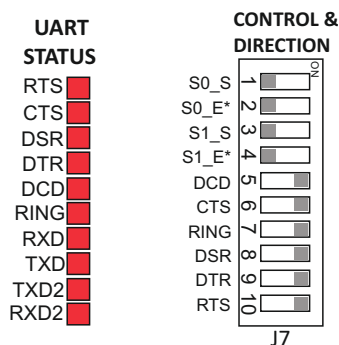
6.2.2. USB Mode:

Do connection with USB cable between your application and USB-UART/SPI Mini-B USB Port. After that apply below connections at header and switch. You can do communication with AT-commands over Virtual Port1.



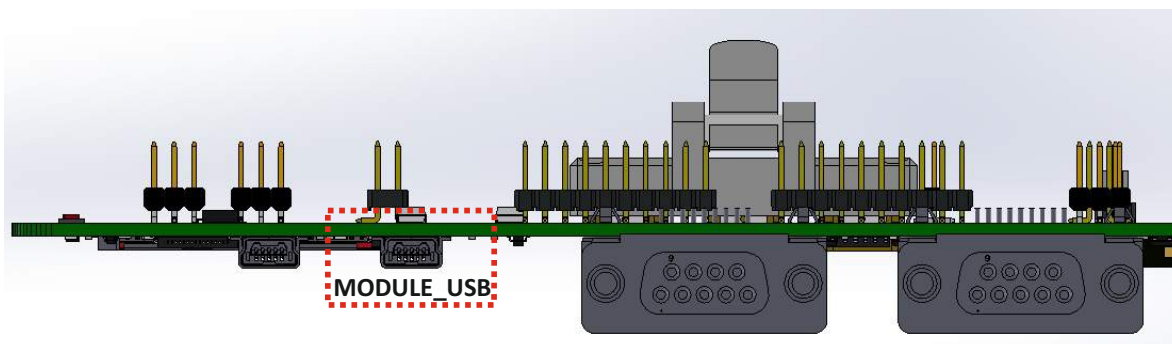
6.3. LED and Flow Control:

The Development Board is provided by a section that permit to force/show the status of the Serial Port Lines. The following Image shows where the controls are located.



6.4 USB HS:

The USB port section of the Development Board is shown in the following picture:



The USB HS port is related to the connector named as **USB MAIN**. The connector is a MINI-B USB. When the USB is connected the LED D23 will be lighted on. Selecting USIF0 Virtual Port or Modem Virtual Port, you can do communication with AT-commands.

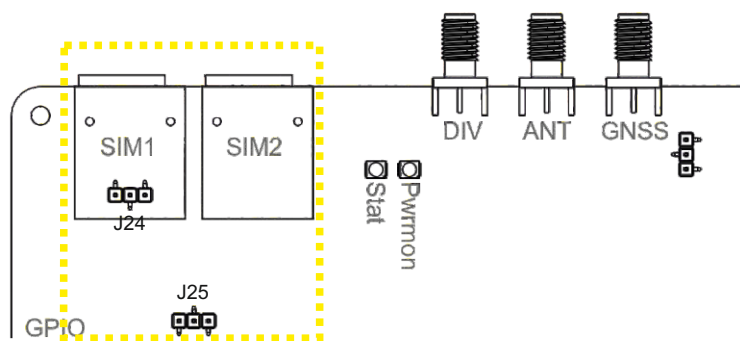


6.5. SIM:

The Development board is provided by two Push Push SIM Holders that could be selected using the Jumper J25. Also SIM1 has SIM Detection function as optional and can be activated using the Jumper J24.

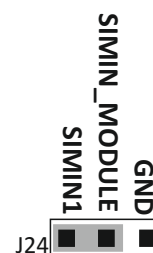
6.5.1. SIM Holder:

The Development Board is provided by a push-push SIM Holder and the following image is showing its position and how to insert the SIM.



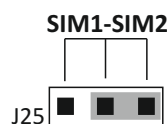
SIM1 Detection:

Jumper between pin 1 and 2 (Holder SIMDET Pin Connecting to Module SIMIN Pin)
 Jumper between pin 2 and 3 (Holder SIMDET Pin Connecting to GND directly)



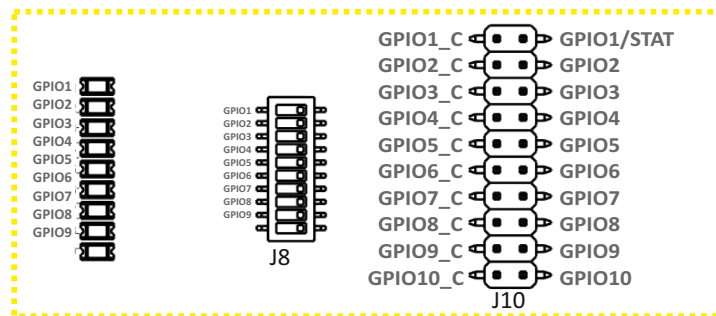
SIM1 & SIM2 Selection:

Jumper between pin 1 and 2 (Selecting SIM1)
 Jumper between pin 2 and 3 (Selecting SIM2)



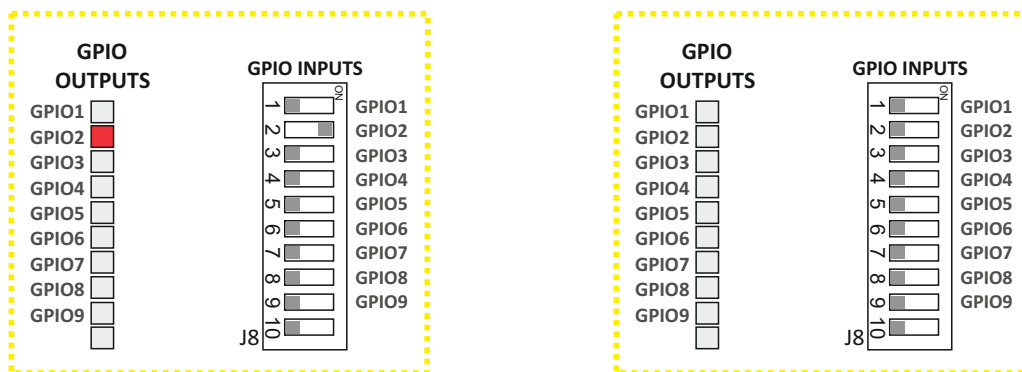
7: GPIO Section :

The Development Board is providing an indication of the GPIO status (LED) and a possibility to force the GPIO status to LOW using a Switch J8.



Note: For He910 Family, Connect VDD_IO and VIO1_1V8 pins on J29 Jumper to activate UART and GPIO Interfaces.

7.1 GPIO Configuration:



EXAMPLE-1

EXAMPLE-2

Commands:

```
AT#GPIO=2,0,0
OK
AT#GPIO=2,3,0
OK
AT#GPIO=2,2
#GPIO: 0,0,3
```

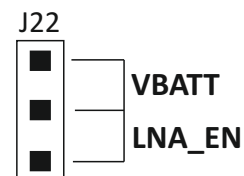
Commands:

```
AT#GPIO=2,0,0
OK
AT#GPIO=2,3,0
OK
AT#GPIO=2,2
#GPIO: 0,1,3
```



8: GNSS Section :

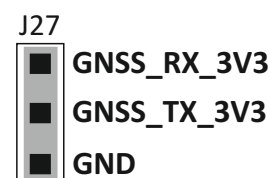
To Supply Active External GNSS Antenna, there is 3.3V supply circuit and it can be controlled by J22 Jumper. As default, there is no need to do any connection on J22 Jumper to activate supply circuit.



For GE910-GNSS module, there is need to enable GNSS unit of module. To activate GNSS unit of module GNSS_EN* pin should be connect to GND.



For GE910-GNSS module, GNSS Serial port can be monitored and controlled on J27 Connector as 3.3V Level.

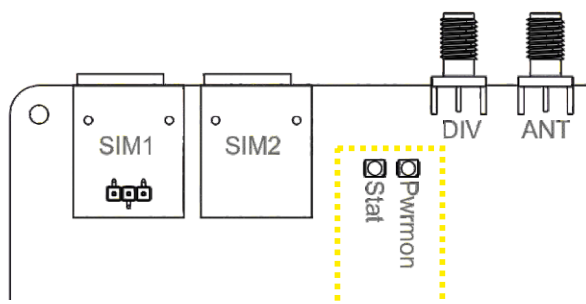


9: Status and Pwrmon Leds :

The STAT (LED) shows information on the network service availability and Call status.

The function is available as alternate function of GPIO_01 (to be enabled using the AT#GPIO=1,0,2 command). Please refer to the module's HW User Guide to have the details on the STAT LED behavior.

The Pwrmon (LED) shows the activation of module and when module is Powered ON, Pwrmon (LED) is activated.



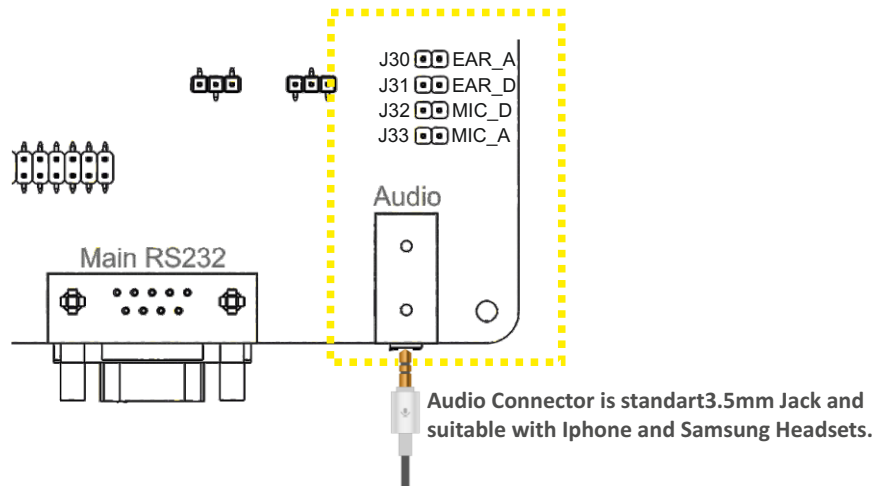
10: AUDIO Section :

This section of the Development Board permits to interface the DVI of the module and, when supported, the Analog Audio.

The Board is equipped with the following functionalities:

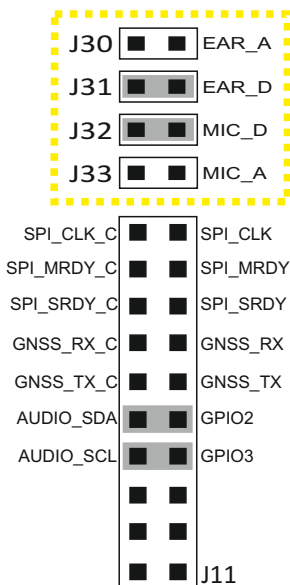
- 1 Audio Codec (MAX9867) usable in connection with the module's DVI
- 1 Audio amplifier section that could interface the Analog Audio

The Audio section on the Development board is shown in the following image:



10.1 Digital Audio:

To activate Digital Audio Interface, Jumper J31 and J32 should be short circuit and SDA & SCL pins connected on J11. On the other hand, AT-commands configurations should be done as shown below:



Commands:

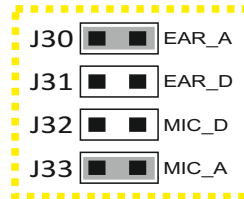
```
AT#DVI=1,2,1 (For HE910 Family)
OK
AT#DVI=1,1,1 (For GE910 Family)
OK
AT#DVIEXT=1,0,0,1,0
OK
AT#HSMICG=4
OK
AT+CLVL=10
OK
AT#I2CWR=2,3,30,4,19
OK
```

```
>>00109000100A330000330C0C09092424400060(CTRL-Z)
AT#I2CWR=2,3,30,17,1
>>8A(CTRL-Z)
ATD05303218283;
OK
```

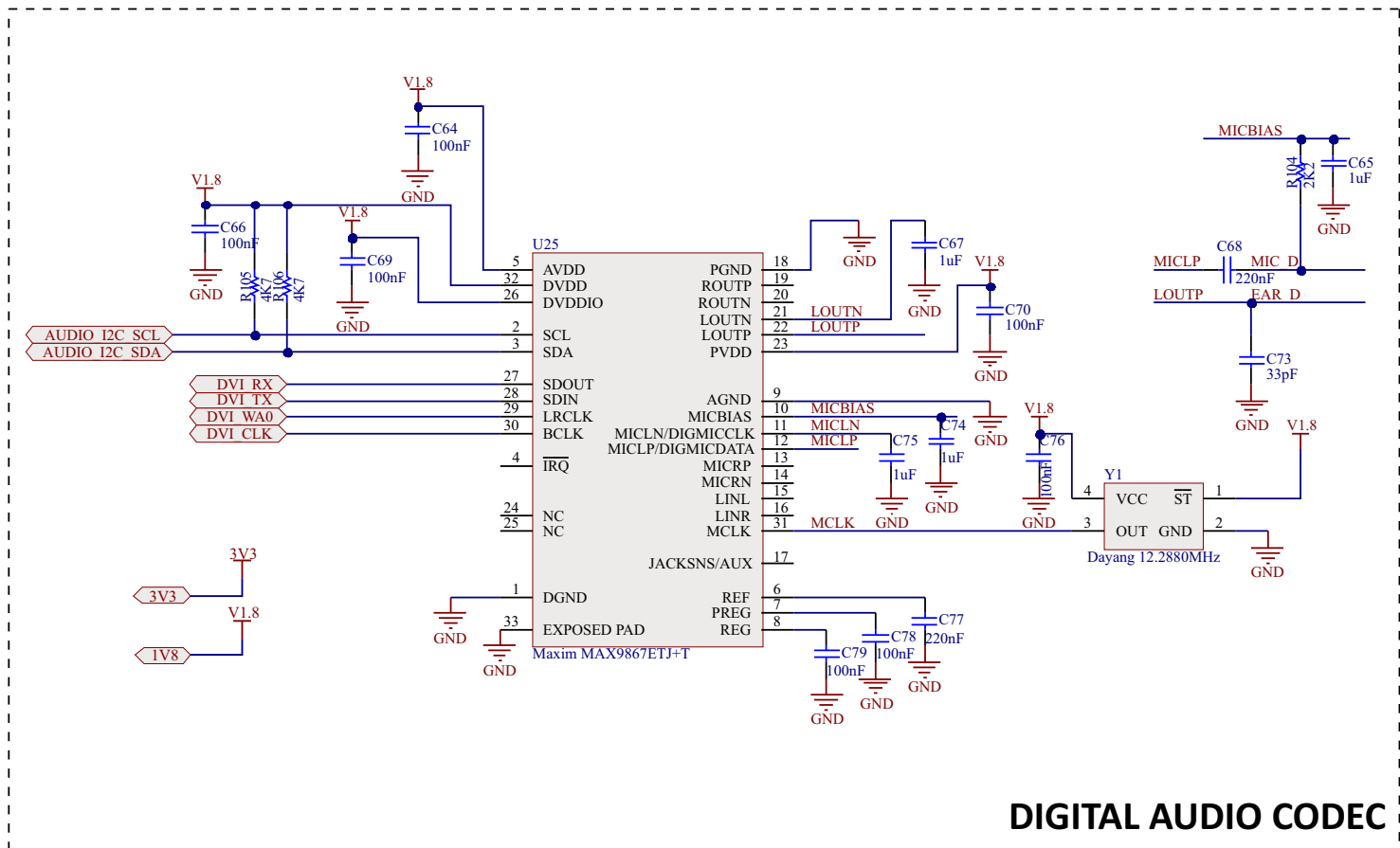


10.2 Analog Audio:

To activate Analog Audio Interface, Jumper J30 and J33 should be short circuit. On the other hand, There is no need to do any AT-commands configurations.

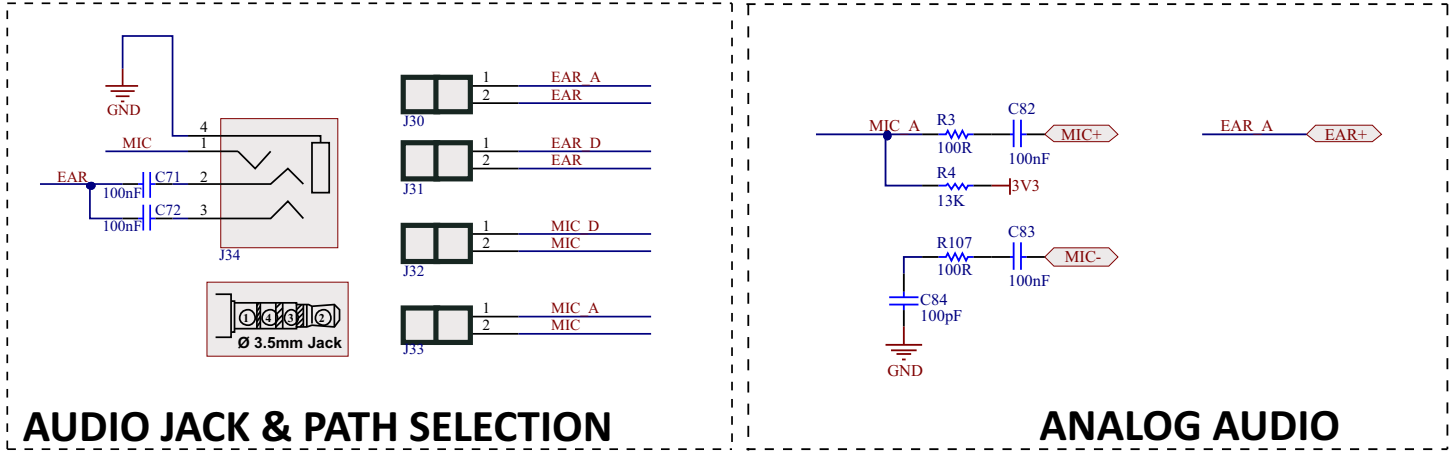


10.3 Audio Schematics:



DIGITAL AUDIO CODEC





AUDIO JACK & PATH SELECTION

ANALOG AUDIO



Document History	Date

