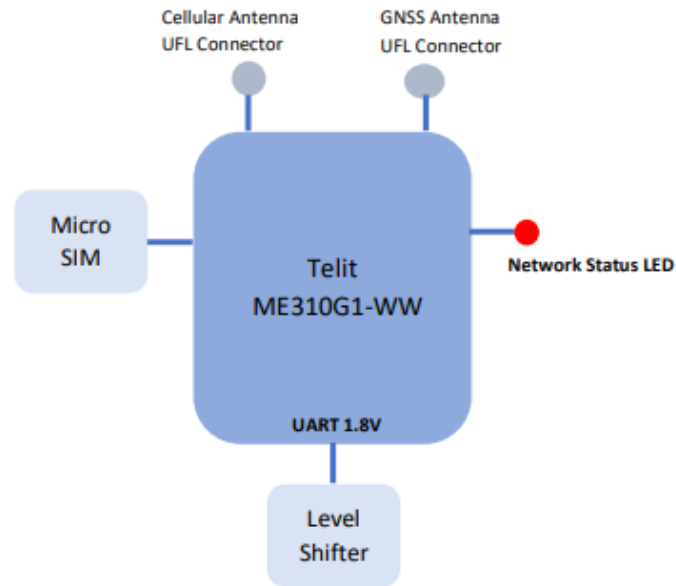# 1. Overview

The SWM is a complete board level Cellular Terminal solution for LTE Cat-M / NBiot with GNSS support. Based on Telit ME310G1-WW module.

2. Hardware Interface Description

2.1 Main features of the SWM

Feature	Implementation
Incorporates LTE Cat-M / NBiot Telit ME310G1- module	The Telit module handles all Cellular and GNSS
Frequency bands	**ME310G1-WW** **4G bands:** B1(2100), B2(1900),B3(1800),B4(AWS1700),B5(850), B8(900),B12(700), B13(700),B18(800), B19(800),B20(800),B26(850),B28(700) **2G bands:** B2(1900),B3(1800),B5(850),B8(900)
Certifications	FCC, PTCRB, VERIZON
Power supply	Single supply voltage 3.4-4.2 VDC
Communication	Modem TTL level, USB
Antennas	LTE, GNSS UFL Connectors

2.2 SWM Block Diagram

Options UART level (define at the order)
- Internal LDO 3.3V
- Internal 3.8V
- Input pin 7 J4 Vref pin (default)

Pin	Dir	J5 - Function
1	O	3.3vdc
2	I	TX AUX (TTL)
3	O	RX AUX (TTL)
4	*	GND
5	I	CTANK
6	I	BOOT

Pin	Dir	J4 - Function
1	*	Power ON (internal pull-up)
2	I	ADC
3	O	Net status indication (Open collector)
4	O	GPS PPS (TTL)
5	I	RST (TTL)
6	*	GND
7	I	Vref
8	*	Power Monitor
9	O	CTS (TTL)
10	*	GND

Pin	Dir	J3 - Function
1	*	VIN +3.8vdc
2	O	UART RX (TTL)
3	I	UART TX (TTL)
4	*	GND
5	I	RESET (internal pull – up
6	*	VUSB (5V)
7	*	USB+
8	*	USB-
9	I	DTR (TTL)
10	*	GND

Note:

J4 pin#1 - Power ON (ON OFF)

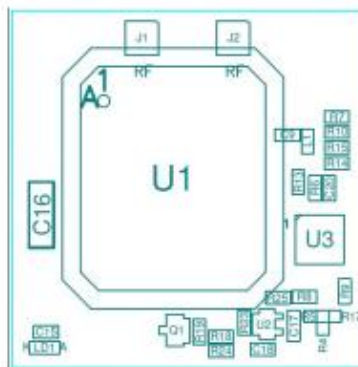J3 Pin#5 – Reset

Refer to Telit ME310G1 hardware user guide.

2.3 View Layout

Bottom View

Top View
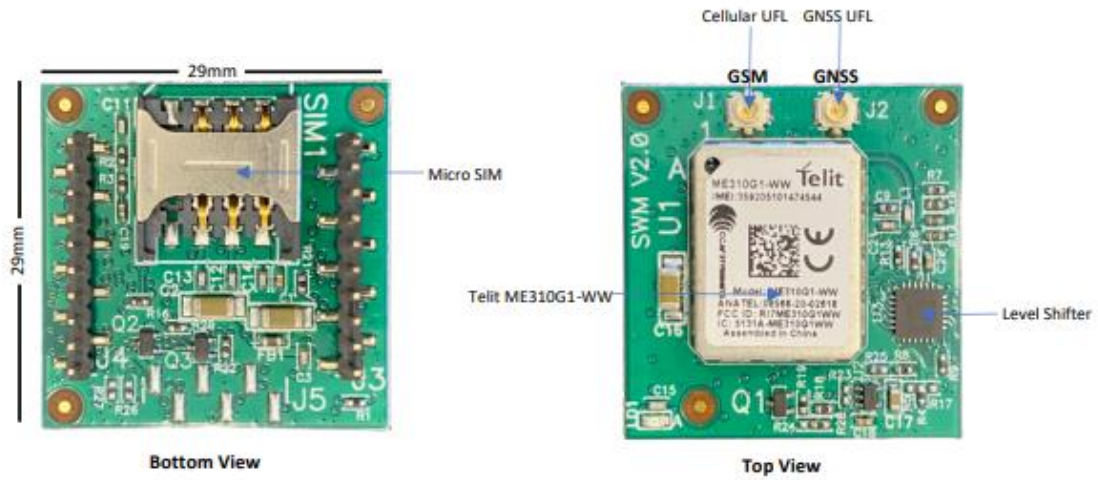
Pin	Dir	J4 - Function
1	*	Power ON
2	I	ADC
3	O	Net status (TTL)
4	O	GPS PPS (TTL)
5	I	RST (TTL)
6	*	GND
7	I	Vref
8	*	Power Monitor
9	O	CTS (TTL)
10	*	GND
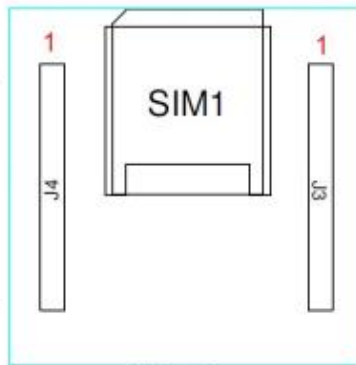
Pin	Dir	J3 - Function
1	*	VIN 3.8vdc
2	O	UART RX (TTL)
3	I	UART TX (TTL)
4	*	GND
5	I	RESET
6	*	VUSB
7	*	USB+
8	*	USB-
9	I	DTR
10	*	GND

Bottom view

Top view

3.1 Power Supply

The power supply of the SWM Board requires a single voltage source of 3.4V-4.2V capable of providing a peak during an active transmission. There is No internal fuse.

Option: Battery operated LiPo 3.7V or Li/SOCl2 battery 3.6V

Pin	Signal name	Use
J3 -- 1	VIN	Input Power supply range 3.4V – 4.2V nominal 3.8V
J3 -- 4	GND	Ground
J3 -- 10	GND	Ground
J4 -- 6	GND	Ground
J4 -- 10	GND	Ground

3.1.1 Supply voltage requirements

A DC power supply must be connected to the POWER input:
- Input voltage range 3.4- 4.2V DC
- Nominal Voltage 3.8V DC
- Power Supply current rating: max. 1A @3.8V
- Power Supply ripple: max. 120mV
- Input current in idle mode CatM: 10mA @ 3.8V
- Input average current in communication mode: 100mA @ 3.8V

3.2 RF CONNECTOR

The SWM Board uses UFL Connectors, for ANTENNAS
CELLULAR use the ANTENNA with 3.5-5dB gain.
GPS/GLONASS use ACTIVE GPS/GLONASS ANTENNA with 15dB gain or PASSIVE ANTENNA.

3.3 UART Interface

The serial interface of the SWM is intended for the communication between the LTE CatM GNSS module and the host application. This UART interface is a data and control interface for transmitting data. It accepts, AT commands and provides multiplexed channels. EMC immunity complies with the vehicular environment requirements according to EN 301 489-7. The user interface of the SWM is accessible from a Data Terminal Equipment DTE connected to the UART interface and it is managed by AT commands according to the LTE / GNSS specification. The supported commands are listed in the AT Commands Reference Guide.

Connector type on the terminal is:
- 2 mm header
- Baud default rate 115,200 bit/s
- The UART communication can be define by Vref J4- pin 7 (in defined at the unit order)

Pin no.	Signal name	I/O	Function of application
J3 -- 2	RXD	O	Receive Data
J3 -- 3	TXD	I	Transmit Data
J3 -- 9	DTR	I	Data Terminal Ready
J3 – 4,10	GND	-	Ground
J4 -- 5	RTS	I	Request To Send
J3 -- 9	CTS	O	Clear To Send
J3 – 6,10	GND	-	Ground

3.4 AUX Interface

The AUX interface provides the following options:

- 1 ADC (10 bit) input 0-5vdc.
- Power monitor pin - this pin when HIGH the modem is ON
- RESET pin - when connected to 'LOW' the modem will restart

Pin no.	Signal name	I/O	Function
J3 -- 5	RESET	I	RESET
J4 -- 2	ADC	ADC	ADC 0-5vdc
J4 -- 8	Power Monitor	O	Power Monitor
J4 -- 4	PPS	O	GNSS PPS

3.5 Status LED

3.5.1 Red LED
The Red LED is connected to GPIO1, OFF by default.

Red LED status	Device Status
Permanently ON	A call is active
Fast interrupt sequence (period 0.5s, Ton 1s)	Net search / Not registered
Slow interrupt sequence (period 0.3s, Ton 3s)	Registered full service
Permanently off	Device off

The LED can be used for Network status or controlled by the user.

AT Commands:

To activate GSM status Red LED: "AT#GPIO=1,0,2;#SLED=2,1,1" Turn Red LED ON: "AT#GPIO=1,1,1" Turn Red LED OFF: "AT#GPIO=1,0,1"

4. Environmental requirements

Operating temperature range	-40°C to +85°C
Humidity	5% - 90% non-Condensing

4.1 Protection class
IP40 Avoid exposing the board to liquid or moisture.

4.2 RoHS compliance
All hardware components are fully compliant with the EU RoHS and WEEE Directive

4.3 Board dimension
29mm * 29mm