



# M10

## Quectel Cellular Engine

### **EVB User Guide**

M10\_EVB\_User\_Guide\_V2.0

















Your cellular terminal or mobile receives and transmits radio frequency energy while switched on. RF interference can occur if it is used close to TV set, radio, computer or other electric equipment.



Road safety comes first! Do not use a hand-held cellular terminal or mobile while driving a vehicle, unless it is securely mounted in a holder for hands-free operation. Before making a call with a hand-held terminal or mobile, park the vehicle.



GSM cellular terminals or mobiles operate using radio frequency signal and cellular network. Because of this, the connection cannot be guaranteed in all conditions, for example no mobile fee or an invalid SIM card. While you are in this condition and need emergent help, please remember using emergency call. In order to make or receive calls, the cellular terminal or mobile must be switched on and in a service area with adequate cellular signal strength.

Some networks do not allow for emergency call if certain network services or phone features are in use (e.g. lock functions, fixed dialing etc.). You may have to deactivate those features before you can make an emergency call.

Also, some networks require that a valid SIM card be properly inserted in cellular terminal or mobile.



## 2. EVB Kit Introduction

### 2.1. EVB Top and Bottom View

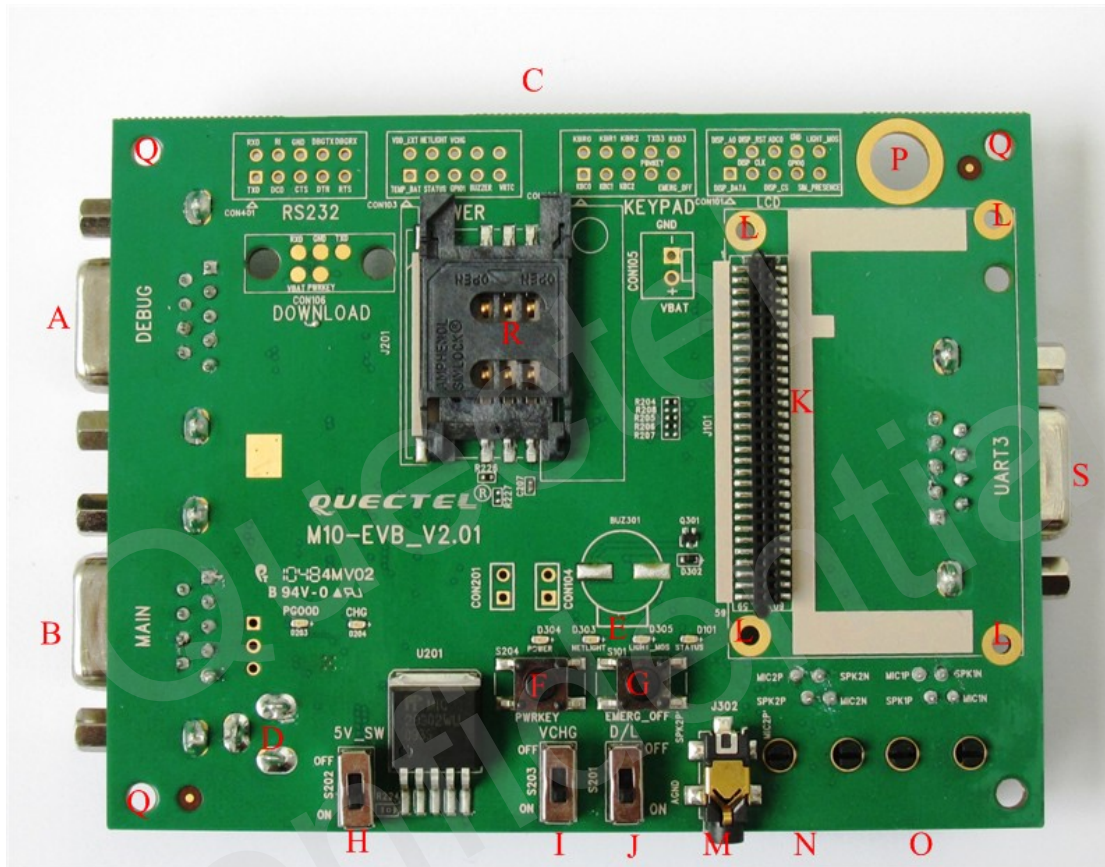


Figure 1: EVB top view

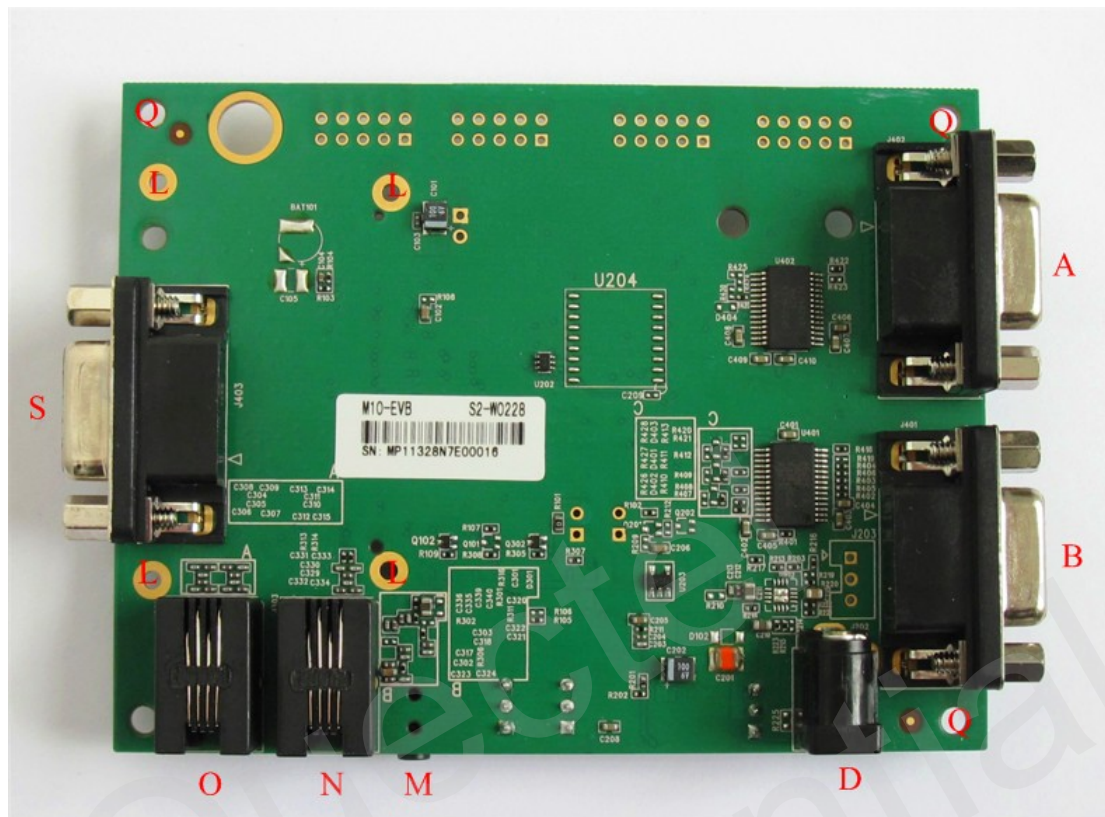
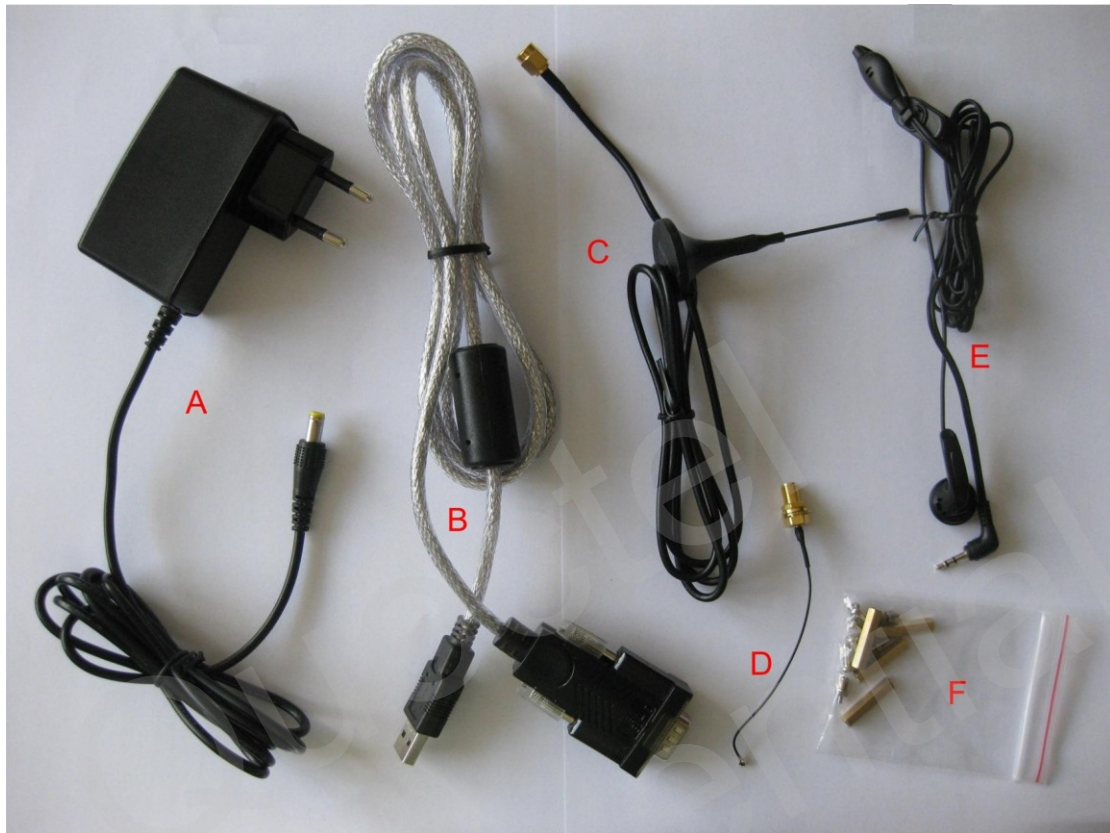


Figure 2: EVB bottom view

- A: Debug port
- B: Serial port
- C: Test points
- D: Adapter interface
- E: LED indicating module status
- F: PWRKEY button
- G: EMERG\_OFF button
- H: VBAT switch
- I: VCHG switch (charging function)
- J: Download switch
- K: 60 pins M10-TE-A interface
- L: Screw holes for fixing the module
- M: Earphone interface
- N: Handset interface of audio channel 2
- O: Handset interface of audio channel 1
- P: Fixture hole for RF cable connector
- Q: Fixture holes for EVB poles
- R: SIM card interface
- S: UART port 3

## 2.2. EVB Accessories



**Figure 3: Accessories introduction**

- A: 5V DC switching adapter
- B: USB to UART converter cable
- C: Antenna
- D: RF cable
- E: Earphone
- F: Bolts and nuts for fixing module and EVB

## 3. Interface Application

### 3.1. Power Interface

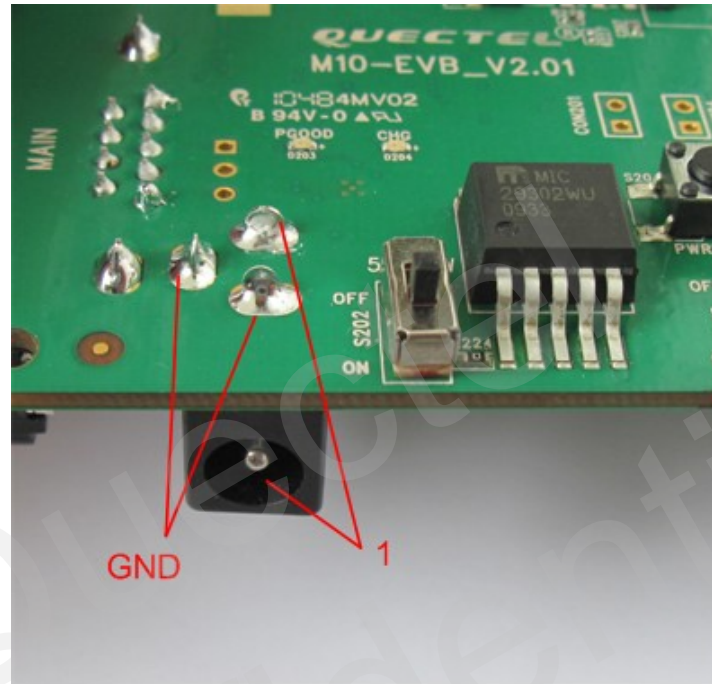
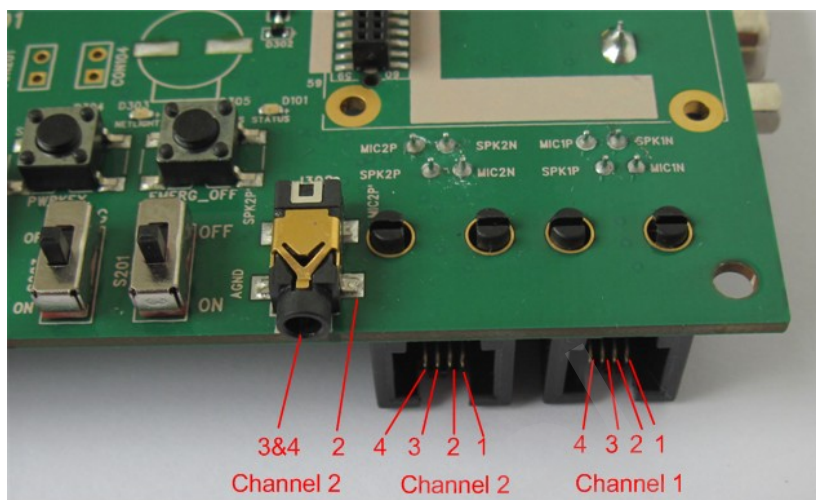


Figure 4: Power interface

Table 2: Pin of power interface

Pin	Signal	I/O	Description
1	Adapter input	I	5V/2A DC source input

### 3.2. Audio Interface



**Figure 5: Audio interface**

**Table 3: Pins of audio channel 2**

Pin	Signal	I/O	Description
1	MIC2N	I	Negative microphone input
2	AGND		AGND of audio circuits
3	SPK2P	O	Positive receiver output
4	MIC2P	I	Positive microphone input

An earphone or handset can be used in audio channel 2.

**Table 4: Pins of audio channel 1**

Pin	Signal	I/O	Description
1	MIC1N	I	Negative microphone input
2	SPK1N	O	Negative receiver output
3	SPK1P	O	Positive receiver output
4	MIC1P	I	Positive microphone input

### 3.3. SIM Card Interface

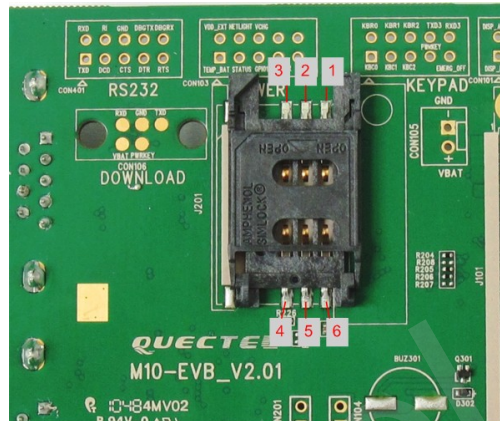


Figure 6: SIM card interface

Table 5: Pins of SIM card interface

Pin	Signal	I/O	Description
1	GND		Ground
2	VPP		Not connected
3	SIM_DATA	I/O	SIM card data I/O
4	SIM_CLK	O	SIM card clock
5	SIM_RST	O	SIM card reset
6	SIM_VDD	O	SIM card power output

### 3.4. Antenna Interface

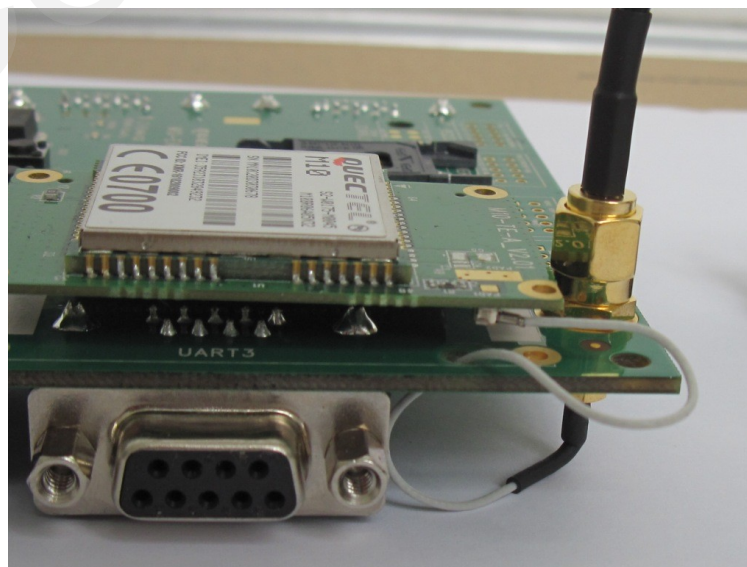


Figure 7: Antenna interface

### 3.5. Serial Port and Debug Port

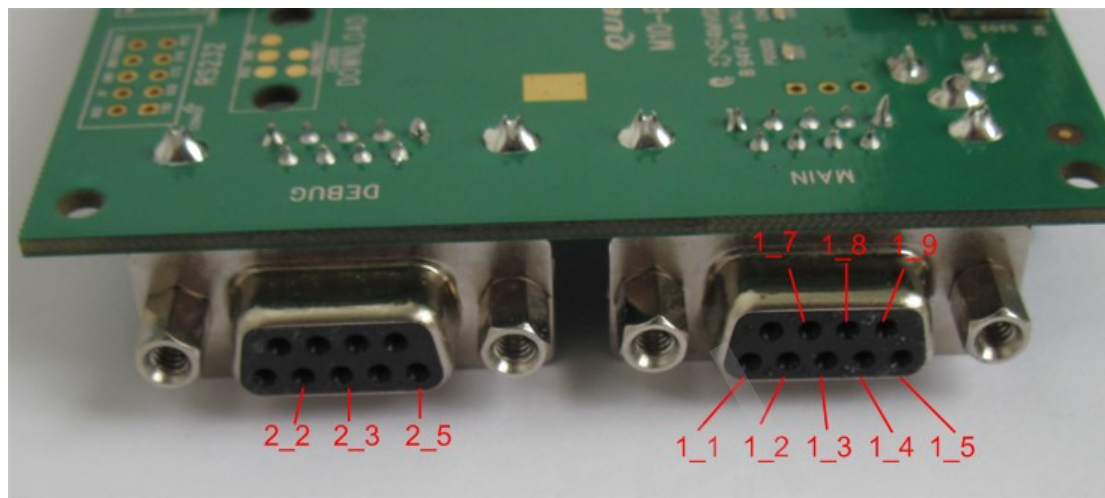


Figure 8: Serial port and Debug port

Table 6: Pins of Serial port

Pin	Signal	I/O	Description
1_1	DCD	O	Data carrier detection
1_2	TXD	O	Transmit data
1_3	RXD	I	Receive data
1_4	DTR	I	Data terminal ready
1_5	GND		Ground
1_7	RTS	I	Request to send
1_8	CTS	O	Clear to send
1_9	RI	O	Ring indicator

Table 7: Pins of Debug port

Pin	Signal	I/O	Description
2_2	DBG_TXD	O	Transmit data
2_3	DBG_RXD	I	Receive data
2_5	GND		Ground

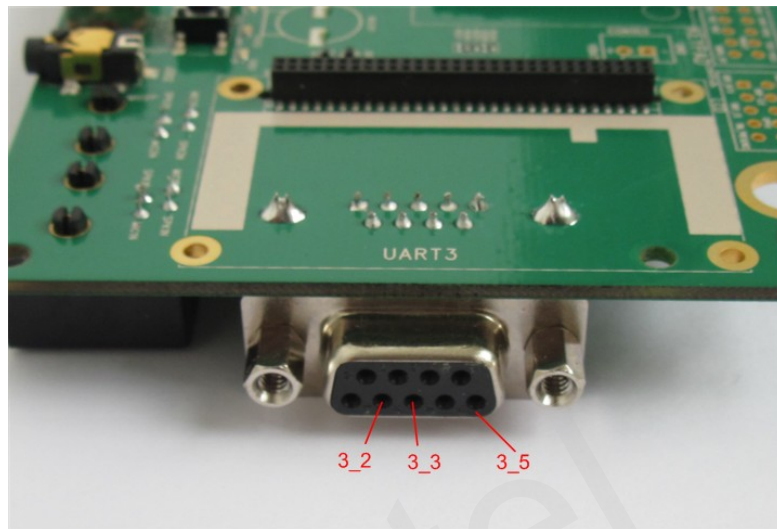


Figure 9: UART 3

Table 8: Pins of UART port3

Pin	Signal	I/O	Description
3_2	UART3_TXD	O	Transmit data
3_3	UART3_RXD	I	Receive data
3_5	GND		Ground

### 3.6. Switches and Buttons

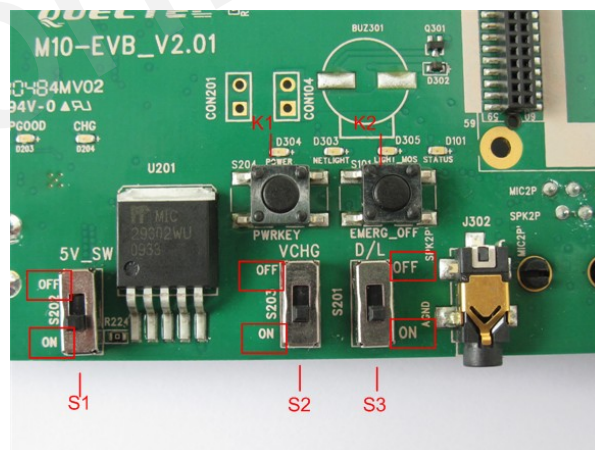


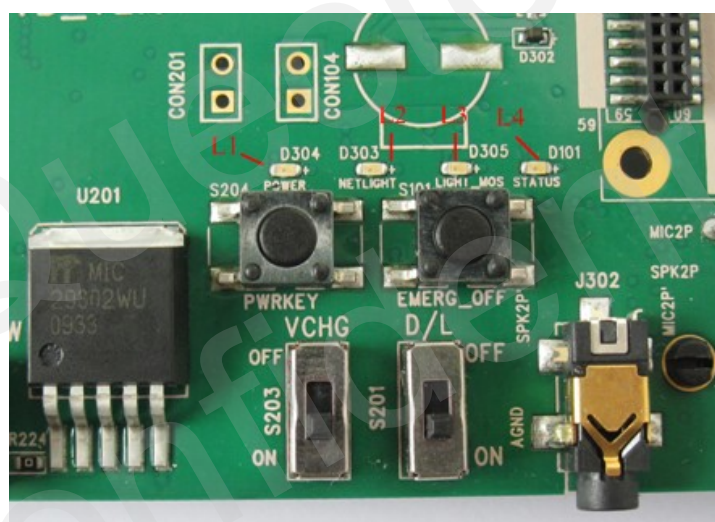
Figure 10: Switches and buttons



**Table 9: Switches and buttons**

Part	Name	I/O	Description
S1	VBAT	I	Control power supply via adaptor
S2	VCHG	I	Control charging if module has charging function
S3	D/L	I	Pull to “ON” when downloading firmware
K1	PWRKEY	I	Turn on/off the module
K2	EMERG_OFF	I	Emergency button for shutting down the system

### 3.7. Operating Status LED

**Figure 11: Operating status LED****Table 10: Status LEDs**

Part	Name	I/O	Description
L1	VBAT ON/OFF indicator	O	Bright: VBAT ON Extinct: VBAT OFF
L2	GSM_NET status indicator	O	Blinking at a certain frequency according various GSM network status
L3	LIGHT_MOS indicator	O	Specially for LIGHT_MOS demo
L4	Module status indicator	O	Indication of module operating status;

### 3.8. Test Points

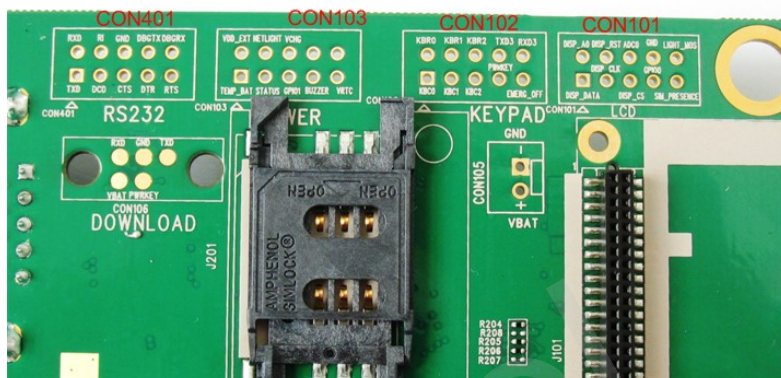


Figure 12: Test points overview

#### 3.8.1 RS232



Figure 13: RS232 points

Table 11: Pins of CON401

Pin	Signal	I/O	Description
1	TXD	O	Transmit data
2	RXD	I	Receive data
3	DCD	O	Data carrier detection
4	RI	O	Ring indicator
5	CTS	O	Clear to send
6	GND		Ground
7	DTR	I	Data terminal ready
8	DBG_RXD	I	Receive data
9	RTS	I	Request to send
10	DBG_TXD	O	Transmit data

### 3.8.2 POWER

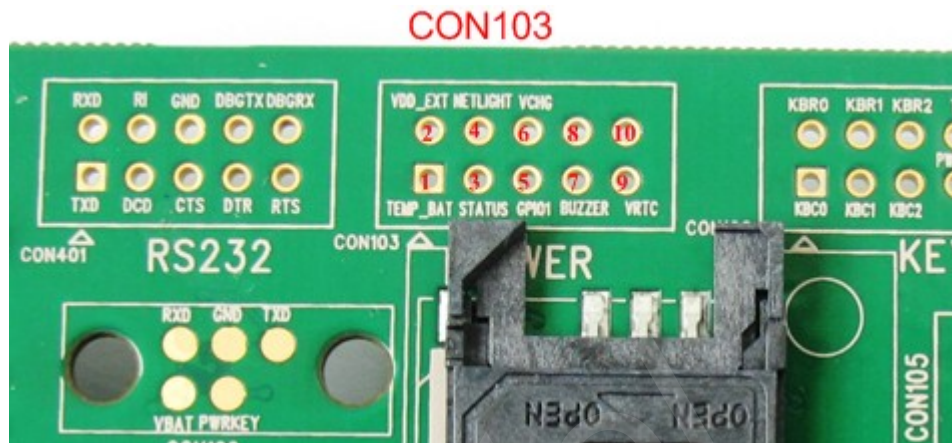


Figure 14: POWER points

Table 12: Pins of CON103

Pin	Signal	I/O	Description
1	TEMP_BAT	I	Measurement of battery temperature
2	VDD_EXT	O	Supply 2.8V voltage for external circuit
3	NC		Not connected
4	VBAT	I	Power supply for module
5	STATUS	O	Module operating status
6	VCHG	I	Voltage input for the charging circuit
7	BUZZER	O	Buzzer output
8	GND		Ground
9	VRTC	I/O	RTC supply
10	NC		Not connected

### 3.8.3 KEYPAD



Figure 15: KEYPAD points

Table 13: Pins of CON102

Pin	Signal	I/O	Description
1	KBC0	I	Keypad interface
2	KBR0	O	
3	KBC1	I	
4	KBR1	O	
5	KBC2	I	
6	KBR2	O	
7	PWRKEY	I	Turn on/off the module
8	TXD3	O	Transmit data
9	EMERG_OFF	I	Shut down the module in emergency.
10	RXD3	I	Receive data

### 3.8.4 LCD

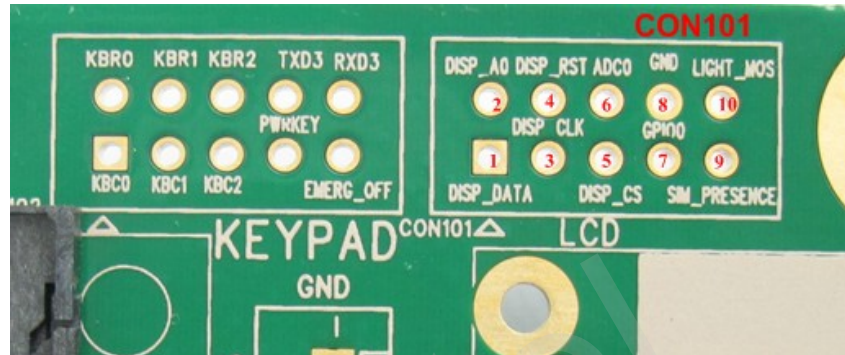


Figure 16: LCD points

Table 14: Pins of CON101

Pin	Signal	I/O	Description
1	DISP_DATA	I/O	LCD display interface
2	DISP_D/C	O	
3	DISP_CLK	O	
4	DISP_RST	O	
5	DISP_CS	O	
6	ADC0	I	Analog to digital converter
7	GPIO0	I	General purpose input/output Port
8	GND		Ground
9	SIM_PRESENCE	I	SIM card detection
10	LIGHT_MOS	O	Open drain output port

## 4. EVB Accessories Assembly

Generally, the EVB and its accessories are equipped as Figure 17 and Figure 18.



Figure 17: EVB and accessories equipment

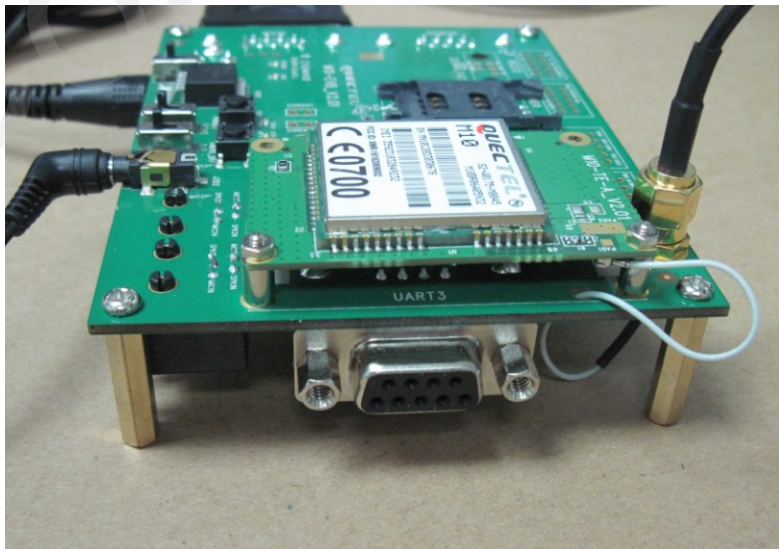


Figure 18: Side view of EVB

## 5. Illustration

### 5.1. Power on

- (1) Connect the M10-TE-A to the 60 pins connector on M10 EVB.
- (2) Insert the plug of the 5V power adapter.
- (3) Turn the Switch S1 to **ON** state, Switch S2 to **OFF** state, and Switch S3 to **OFF** state. The LED L1 on the EVB will be bright.
- (4) Press the PWRKEY for about 2 seconds. The LED L4 will be flashing which indicates the module in working status. With L4 is on, the module begins running. Otherwise, please check the circuit.
- (5) The LED L2 will be flashing at a certain frequency. The GSM working status of the module can be judged by the LED status.

Please refer to *document [3]* for detailed network status indication. .

### 5.2. Communicate with the module

- (1) Connect the Serial Port 1 on EVB to PC's USB port with the USB to UART converter cable.
- (2) Open the HyperTerminal (AT command window) on PC. The location of the HyperTerminal in windows XP is: START →program →accessory →communication →HyperTerminal. Set appropriate Baud Rate (such as 115200 bps) and COM number which can be checked by the Device Manager on PC.
- (3) Connect an antenna to M10-TE-A with an RF cable.
- (4) Insert SIM card into the SIM card socket.
- (5) Insert earphone or handset into audio interface.
- (6) For Power On operation, please refer to *chapter 5.1*.
- (7) After waiting for 2~3 seconds, customer should first input "AT" or "at" string once or more until receiving "OK" from the module in the HyperTerminal.  
The module is set to autobauding mode in default configuration. This operation is to synchronize the baud rate between the computer and the module.
- (8) Input AT command and the module will execute its corresponding function.  
Customer can refer to *document [1]* for the details of AT commands. For instance, when input "ATD112;" an emergency call is established.

### 5.3. Firmware upgrade through UART1

- (1) Start the Firmware Upgrade Tool in the PC.
- (2) Press the **START** button in the Firmware Upgrade Tool.
- (3) Switch the S3 and S1 in the EVB to **ON** state as shown in *Figure 18*.

After these steps, the firmware refreshing process will be proceeding. For more details, please refer to *document [4]*.

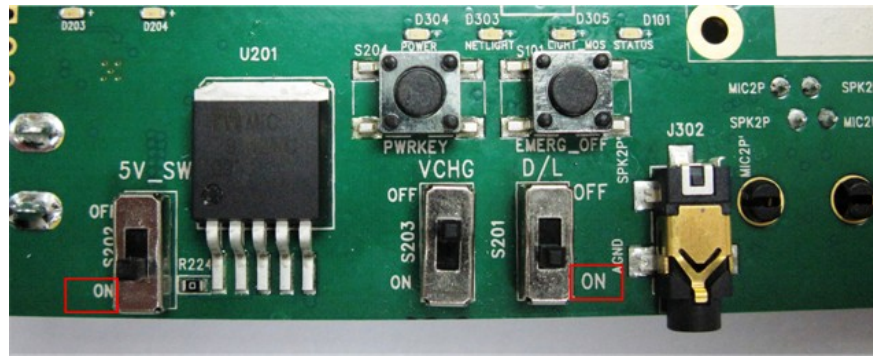


Figure 19: Switches state for firmware downloading

#### 5.4. Turn Off

Press the PWRKEY button for about 2 seconds, the module will be turned off.

#### 5.5. Emergency Off

Press the EMERG\_OFF button for more than 0.1 second, the module will be shut down immediately. After that, the module can be restarted by pressing the PWRKEY button. Please note that this operation is harmful to the whole module system and should only be done in emergency such as failing to turn off the module through the PWRKEY button.



## 5.6. UART 3

Quectel module provides two UART ports for achieving Dual UART. One is UART1 which is the main UART; the other is UART3 which is the assisted UART.

**AT+QEAUART=1** is used to enable UART3. Please restart the module after executed the command. For more details, please refer to *document [5]*.

UART3 only includes TX data (TXD), RX data (RXD). For the connection of serial port 3, please refer to *Figure20*.

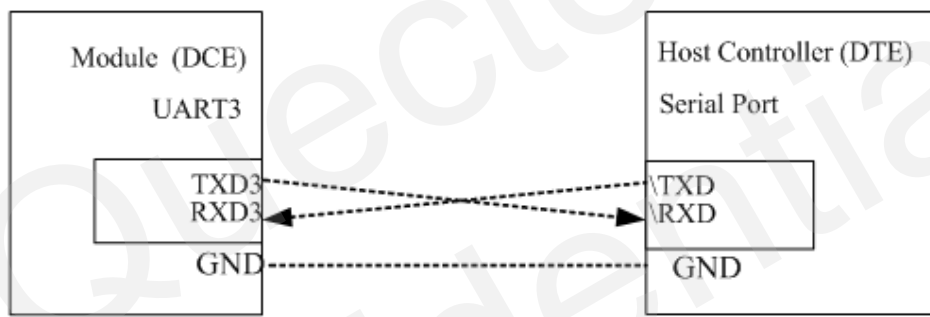


Figure 20: Connection of UART 3

## 6. 60 PINs Assignment of DIP Connector

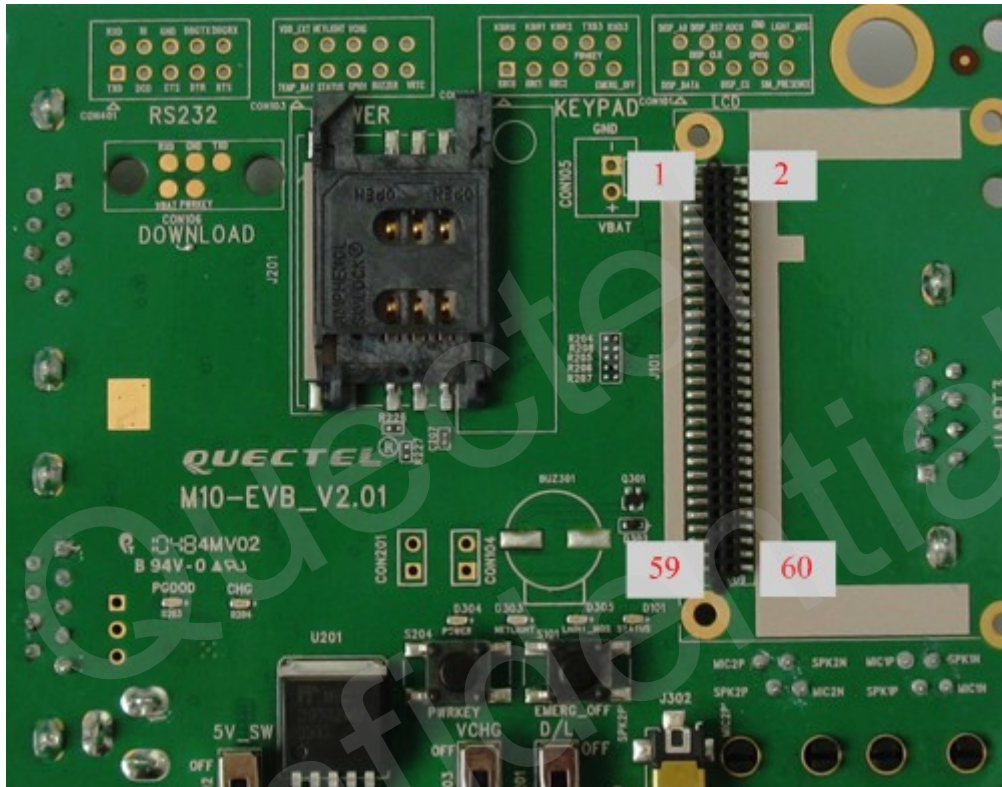


Figure 21: DIP connector of EVB

Table 15: Pin definition of the 60-pin DIP connector

PIN NO.	PIN NAME	I/O	PIN NO.	PIN NAME	I/O
1	VBAT	I	2	GND	
3	VBAT	I	4	GND	
5	VBAT	I	6	GND	
7	VBAT	I	8	GND	
9	VBAT	I	10	GND	
11	VCHG	I	12	ADC0	I
13	TEMP_BAT	I	14	VRTC	I/O
15	VDD_EXT	O	16	NETLIGHT	O
17	PWRKEY	I	18	KBR0	O
19	STATUS	O	20	KBR1	O
21	GPIO0	I/O	22	KBR2	O

23	BUZZER	O	24	TXD3	O
25	SIM_VDD	O	26	RXD3	I
27	SIM_RST	O	28	KBC0	I
29	SIM_DATA	I/O	30	KBC1	I
31	SIM_CLK	O	32	KBC2	I
33	SIM_PRESENCE	I	34	LIGHT_MOS	O
35	GPIO1_KBC5	I/O	36	EMERG_OFF	I
37	DCD	O	38	DISP_CS	O
39	DTR	I	40	DISP_CLK	O
41	RXD	I	42	DISP_DATA	I/O
43	TXD	O	44	DISP_D/C	O
45	RTS	I	46	DISP_RST	O
47	CTS	O	48	DBG_RXD	I
49	RI	O	50	DBG_TXD	O
51	AGND		52	AGND	
53	SPK1P	O	54	MIC1P	I
55	SPK1N	O	56	MIC1N	I
57	SPK2P	O	58	MIC2P	I
59	AGND		60	MIC2N	I

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