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Inspired Wireless M2M Technology



ZOOM-EVK

Hardware Reference Manual
Rev 2.1

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Introduction

This document is intended to provide guidance when adding the ZOOM-EVK to your system. The ZOOM-EVK is an evaluation platform used to evaluate the ZOOM series embedded socket modems.

This document discusses the layout and functions of the ZOOM-EVK.

About Siretta

Siretta, located in Reading, United Kingdom have been manufacturing antennas, cable assemblies and cellular terminals for over 10 years. We supply our products globally to many of the world's leading organisations.

Whether you require an off the shelf or custom solution, Siretta has a wide portfolio of antenna, RF cable assemblies and terminals to fit your application.

Our extensive knowledge and experience in the wireless market allows us to support a wide range of customer applications, focusing on frequencies typically within the 75MHz - 5.8GHz range. These encompass the HF, VHF, ISM, GSM/GPRS/3G/4G and GPS frequencies as well as industrial WLAN and VHF/UHF antenna/Wi-Fi antenna solutions.

With a heavy emphasis on design, we have a team of dedicated Application Engineers and Product Managers, backed up by Field Sales Engineers, who specialise in wireless applications.

We have made significant investments in R&D facilities which boast GPS hardware development equipment and a GSM Pico Cell on site, as well as development software and a comprehensive suite of Industrial, Scientific and Medical band, and non ISM band frequency products. We have many technology partners enabling us to keep at the forefront of the communications industry and offer class leading wireless solutions.

ZOOM-EVK

Embedded Socket Modem Evaluation Platform

Figure 1. ZOOM-EVK



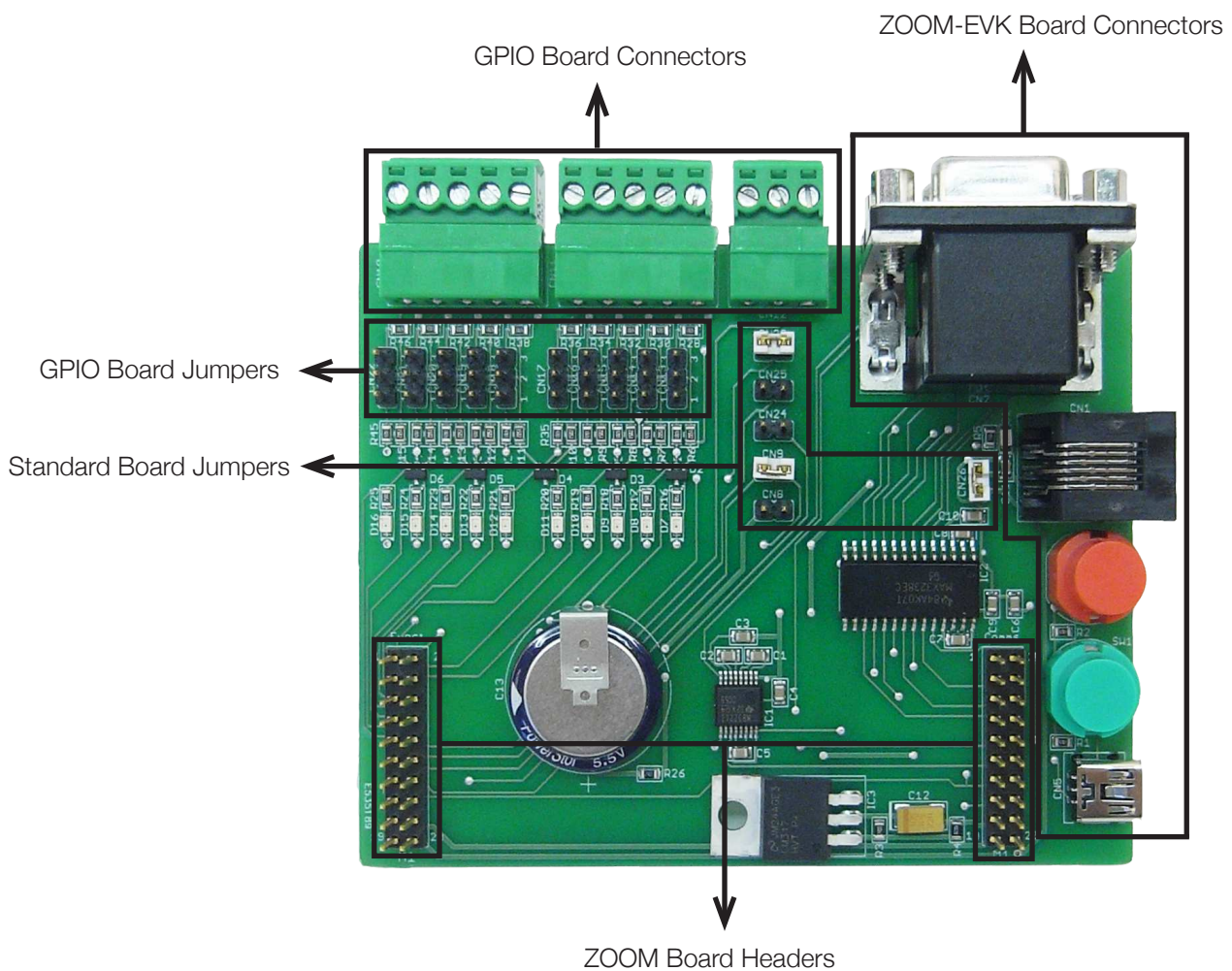
The ZOOM-EVK is an evaluation platform to easily evaluate the ZOOM Series of embedded socket modems. The ZOOM-EVK gives you access to all of the ZOOM modems functionality including the following:

- » RS232 AT command port
- » RS232 debug port
- » USB serial port
- » 4 x GPI
- » 4 x GPO
- » 2 x GPO (Optional GPI)
- » 1 x ADC
- » RTC power
- » Autopower on
- » Manual power on/power off

Below, **figure 2** shows the ZOOM-EVK layout and descriptions for each of the sections is explained in more detail. The board is split into the following sections:

- » ZOOM-EVK Board Headers
- » ZOOM-EVK Board Connectors
- » GPIO Board Connectors
- » Standard Board Jumpers
- » GPIO Board Jumpers

Figure 2. ZOOM-EVK board layout



ZOOM-EVK Board Headers

Figure 3. ZOOM-EVK board headers

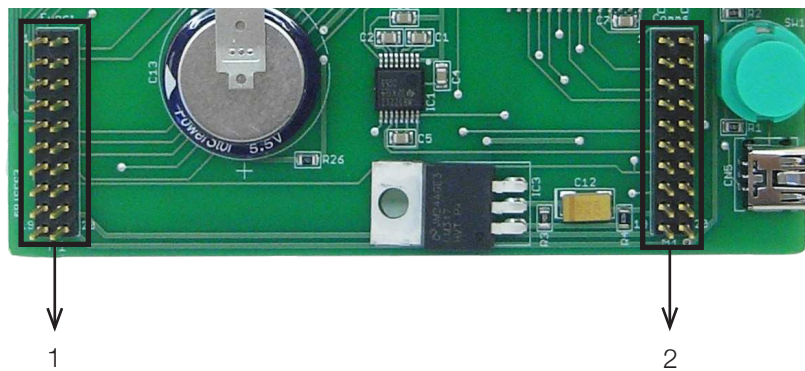


Table 1. Functions of ZOOM-EVK board headers

No.	Item	Description
1	Function Header	Used to connect the ZOOM modem to the ZOOM-EVK
2	Communication Header	Used to connect the ZOOM modem to the ZOOM-EVK

ZOOM-EVK Board Connectors

Figure 4. ZOOM-EVK board connectors

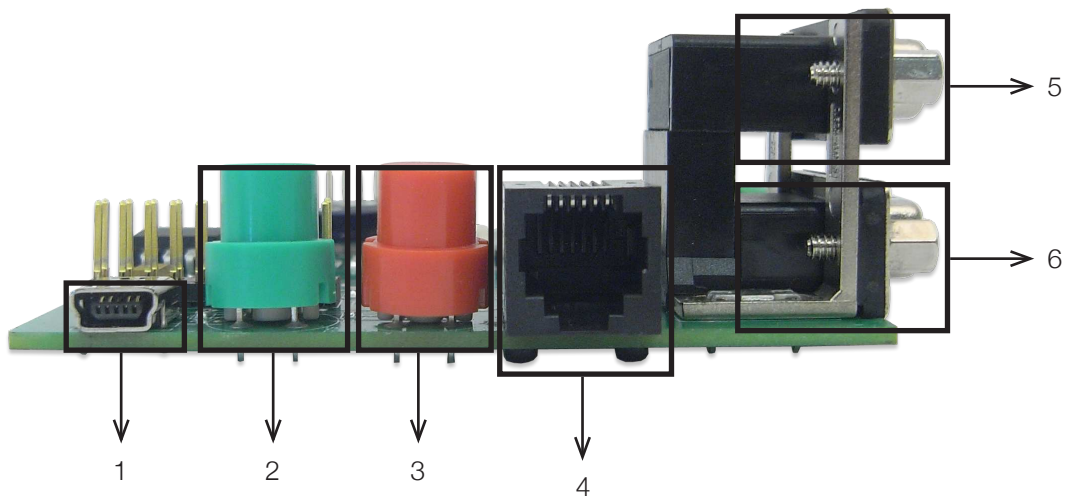


Table 2. Functions of ZOOM-EVK board connectors

No.	Item	Description
1	Modem USB connection	Used to communicate with the modem via USB serial cable
2	Power ON/OFF switch	Used to switch the modem ON/OFF when CN9 (auto power on) is not connected
3	Hardware RESET switch	Used to reset the modem when it has stopped responding. DO NOT use to power off the modem, only use as a disaster recovery option
4	12V power input	Used to power the board from a standard RJ12 power supply (See 'Power Supply Requirements' on page 9)
5	RS232 AT command port	Used to control modem and send AT commands to configure the modem settings
6	RS232 Debug / Trace Port	Used to communicate with the modem to enable Trace Client diagnostics and Python debug output

Power Supply Requirements

The DC power supply must be connected to the power input.

Table 3. Characteristics of power inputs

	ZOOM-EVK
Input voltage	5 to 42V
Recommended input voltage	12V DC
Supply current:	
Peak (20ms at registration)	2A
Average standby	25mA
Call in progress	250mA
Ringling	250mA

The module is supplied with a 12V mains adaptor. It can also be powered from an alternative power source with a voltage range, as shown in **table 1** above.

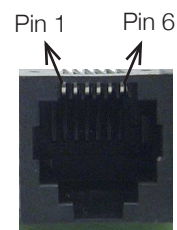
Input power protection :

- » On board voltage reverse polarity protection
- » Overvoltage spike protection to 70V for 1mS.
- » ESD protection to +/-4KV contact discharge and +/-8KV air discharge.

Table 4. Power connector pin functions

PIN	PIN Name	Pin Description	ZOOM-EVK
1	POWER +Vcc	ZOOM POWER	Vcc (12V nominal)
2	N/C	Not connected	
3	N/C	Not connected	
4	N/C	Not connected	
5	N/C	Not connected	
6	GND	ZOOM GND	Common GND connection (0v)

Figure 5. Power connector



GPIO Connectors

Figure 6. GPIO connectors

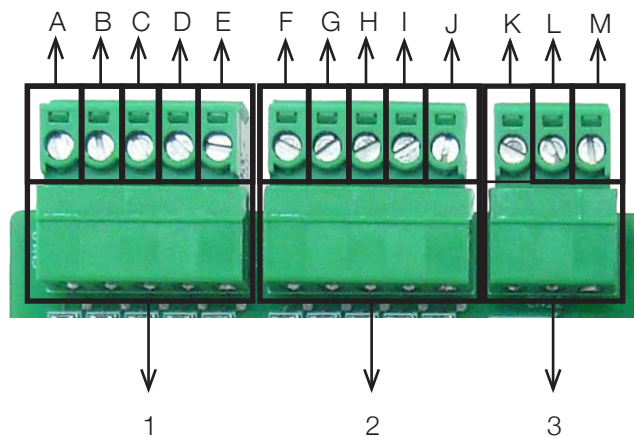


Table 5. Functions of GPIO connectors

No.	Item	Description
1	GPI5 Input, GPI6 Input, GPI7 Input, GPO8 Output, GPO9 Output	Used to connect external devices to the modem to read an input or set an output
2	GPO0 Output, GPO1 Output, GPO2 Output, GPO3 Output, GPI4 Input	Used to connect external devices to the modem to read an input or set an output
3	GPIO power supply and ADC input	Used to power external voltage sources for GPI inputs and provide GND reference. ADC input to read external analogue voltage from the modem.

Table 6. Pin functions of GPIO connector 1

Connector 1

Letter	PIN	Description	Direction
A	Pin 1	GPO6	Output
B	Pin 2	GPO5	Output
C	Pin 3	GPI4	Input
D	Pin 4	GPI3	Input
E	Pin 5	GPI2	Input

Table 7. Pin functions of GPIO connector 2

Connector 2

Letter	PIN	Description	Direction
F	Pin 1	GPI1	Input
G	Pin 2	GPO4	Output
H	Pin 3	GPO3	Output
I	Pin 4	GPO2	Output
J	Pin 5	GPO1	Output

Table 8. Pin functions of GPIO connector 3

Connector 3

Letter	PIN	Description	Direction
K	Pin 1	3.3V	Output
L	Pin 2	GND	Output
M	Pin 3	ADC1	Input

Table 9. GPIO minimum/maximum voltage for ZOOM-EVK

Signal Name	Parameter	Minimum	Nominal	Maximum
GPI 1-4	Input high level	1.65V	3.3V	3.6V
GPI 1-4	Input low level	0V	0V	0.5V
GPO 1-6	Output high level	1.65V	3.3V	3.6V
GPO 1-6	Output low level	0V	0V	0.5V

Standard Board Jumpers

Figure 7. Standard board jumpers

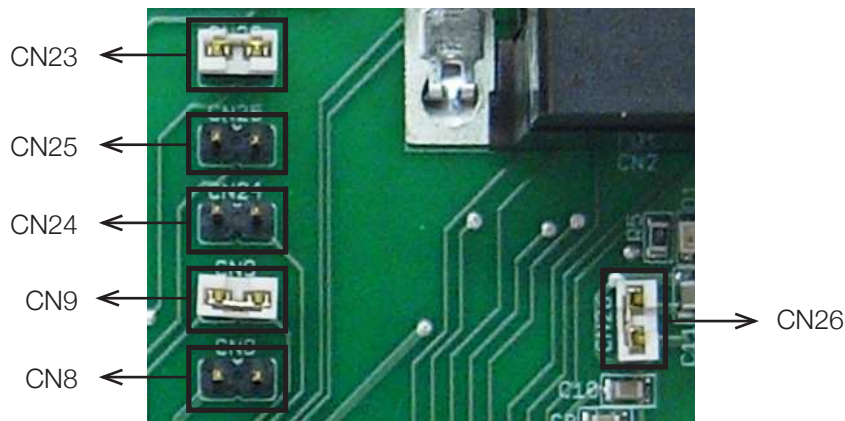


Table 10. Functions of standard board connectors

No.	Item	Description
CN23	GPIO1 to red status LED	<p>Used to display GSM network registration status when GPO1 is used in alternate function mode and enabled by AT commands (link fitted).*</p> <p>Link fitted = connects Zoom STAT_LED pin to Zoom GPO1 pin.</p> <p>Link not fitted = Zoom GPO1 pin works as a GPO.</p>
CN25	GPIO3 to blue status LED	<p>Configure GPIO3 to turn blue status LED on and off (link fitted)</p> <p>Link fitted = connects Zoom BLUE_LED pin to Zoom GPO3 pin</p> <p>Link not fitted = Zoom GPO3 pin works as a GPO.</p>
CN24	GPIO2 to green status LED	<p>Configure GPIO2 to turn green status LED on and off (link fitted)</p> <p>Link fitted = connects Zoom GREEN_LED pin to Zoom GPO2 pin.</p> <p>Link not fitted = Zoom GPO2 pin works as a GPO.</p>

CN9	Auto power on mode connection	<p>Modem will power up automatically when main power is applied (link fitted).</p> <p>Link fitted = connects Zoom HLDLORST pin to ground.</p> <p>Link not fitted = Zoom HLDLORST pin floats.</p>
CN8	VRTC enable pin to VRTC battery connection	<p>Used to provide power for the RTC when main power is removed (link fitted).</p> <p>Link fitted = connects Zoom VRTC pin to 1F Supercap.</p> <p>Link not fitted = Zoom VRTC pin floats.</p>
CN6	Vin to main power board connection	<p>Connects VIN of Zoom to the EVK power supply (link fitted).</p> <p>Link fitted = normal operation</p> <p>Link not fitted = Zoom unpowered</p> <p>Removing the link allows an ammeter to be connected between the jumper pins to measure the current being used by the Zoom module.</p>

***Note:** AT commands need to be sent to the Zoom to make the STAT_LED flash with network registration status:

AT#GPIO=1,0,2

AT#SLED=3

AT#SLEDAV

GPIO Board Jumpers

Figure 8. GPIO board jumpers

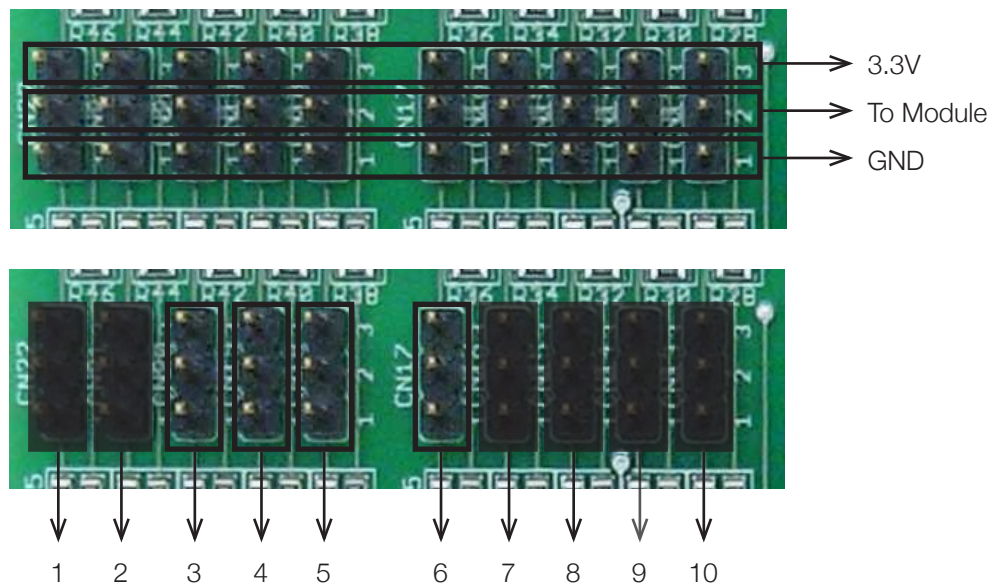


Table 11. Functions of GPIO board jumpers

No.	Item	Description
1	GPIO10 jumper	Not used for GPIO function
2	GPIO9 jumper	Not used for GPIO function
3	GPIO8 jumper	Used to manually set GPIO to logic 1 or logic 0
4	GPIO7 jumper	Used to manually set GPIO to logic 1 or logic 0
5	GPIO6 jumper	Used to manually set GPIO to logic 1 or logic 0
6	GPIO5 jumper	Used to manually set GPIO to logic 1 or logic 0
7	GPIO4 jumper	Not used for GPIO function
8	GPIO3 jumper	Not used for GPIO function
9	GPIO2 jumper	Not used for GPIO function
10	GPIO1 jumper	Not used for GPIO function

Default Configuration

Use the following configuration setup to get started with the ZOOM-EVK evaluation platform. The following jumpers are used to implement the following functions:

- » Connect Vin power to the main power supply to power the main board
- » Connect the GSM registration status to the red LED to display network registration
- » Connect auto power on jumper to auto power up the modem when power is applied.

Figure 9. Default ZOOM-EVK board configuration

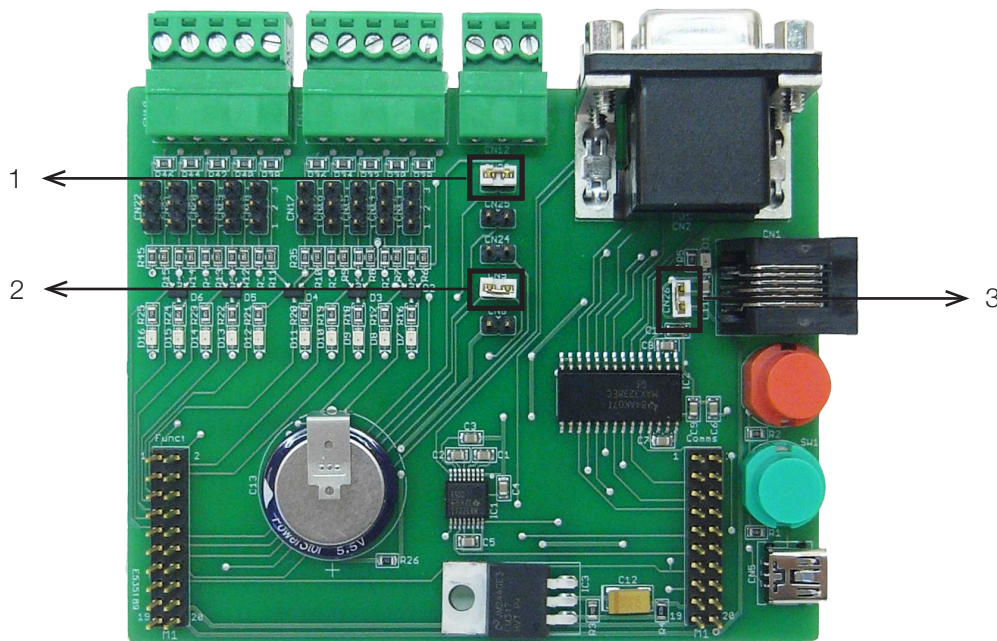


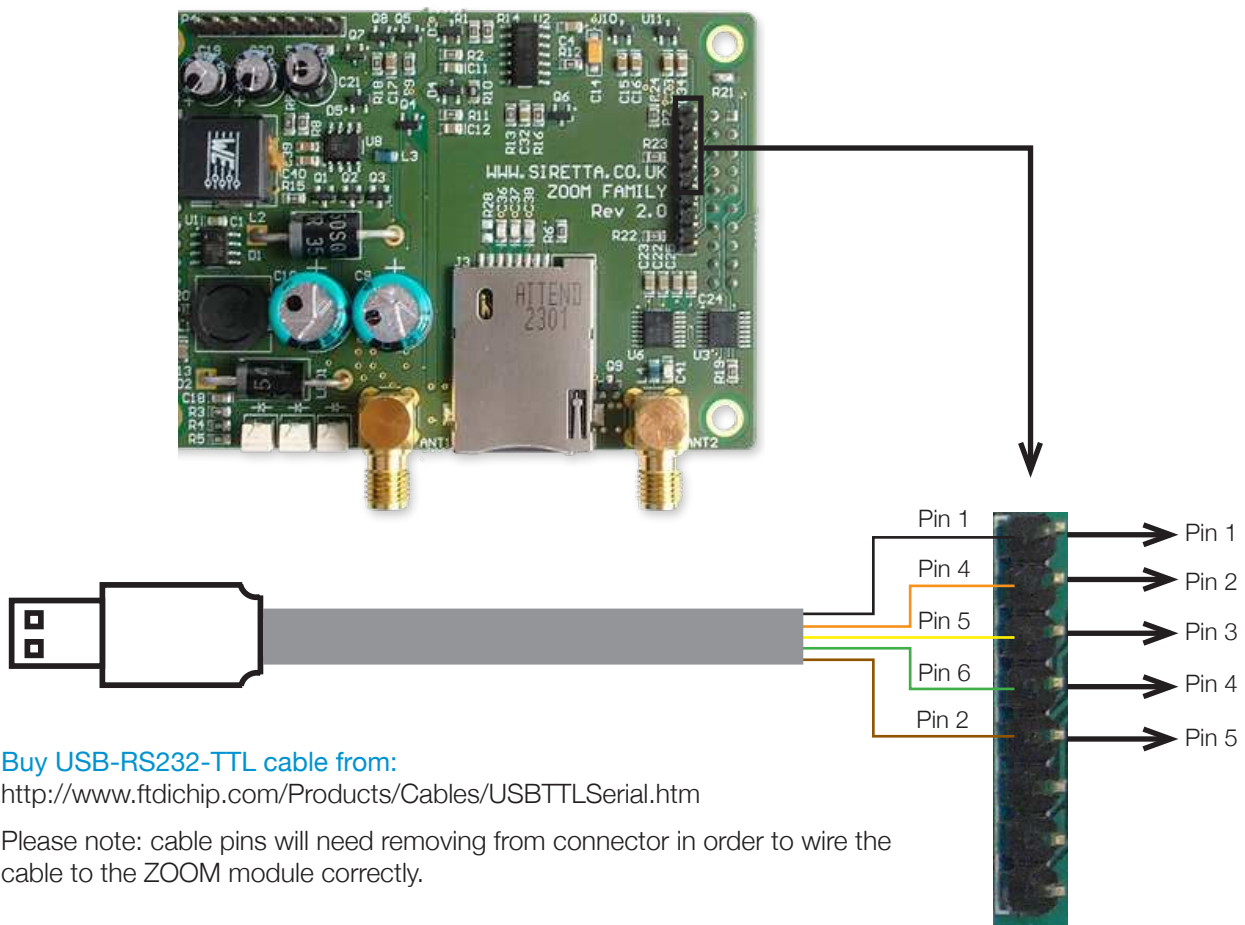
Table 12. Functions of default ZOOM-EVK configuration

No.	Item	Description
1	GPIO1 to red status LED connection	Used to display GSM network registration status when GPIO1 is used in alternate function mode AT#GPIO=1,0,2 AT#SLED=2 AT#SLEDSAV
2	Auto power on mode connection	Modem will power up automatically when main power is applied
3	Vin to main board power connection	Used to measure current usage on board or directly power the board when jumper is fitted

In System Debug

USB-RS232-TTL Cable to ZOOM Header Connection

Figure 10. ZOOM header connection



Buy USB-RS232-TTL cable from:

<http://www.ftdichip.com/Products/Cables/USBTTLSerial.htm>

Please note: cable pins will need removing from connector in order to wire the cable to the ZOOM module correctly.

Table 13. Pin functions of ZOOM header connection

ZOOM Header Pin No.	Cable Pin No./Colour	RS232 Pin Out
1	1/Black	GND
2	4/Orange	TX
3	5/Yellow	RX
4	6/Green	RTS
5	2/Brown	CTS



Figure 11. USB-RS232-TTL Cable

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Definitions

Term	Definition
3G	3rd Generation Mobile Telecommunications
ADC	Analog to Digital Converter
CAN	Controller Area Network
CDMA	Code Division Multiple Access
DAC	Digital to Analog Converter
ESD	Electro-Static Discharge
GPI	General Purpose Input
GPIO	General Purpose Input Output
GPO	General Purpose Output
GPRS	General Packet Radio Service
GPS	Global Positioning System
GSM	Global System for Mobile Communications
I2C	Multimaster serial single-ended computer bus
I/O	Input/Output
JTAG	Joint Test Action Group
LED	Light Emitting Diode
LTE	Long Term Evolution
RS232	Recommended Standard 232 - binary serial communications
Sequoia	Sequoia Technology Group Ltd
SIM	Subscriber Identity Module
SMA	Sub Miniature version A
STM32F4	Microcontroller Family
TTL	Transistor-Transistor Logic
UART	Universal Asynchronous Receiver/Transmitter
UMTS	Universal Mobile Telecommunications System (Same as 3G)
USB	Universal Serial Bus
VSWR	Voltage Standing Wave Ratio



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