EVMB
Evaluation Kit for Connect One's WiFi and LAN modules

WARNING: THE Nano WiReach G2 N1 IS AN RF MODULE INTENDED FOR EMBEDDING IN A HOST DEVICE. LOCAL RELEVANT RF REGULATIONS SUCH AS ALLOWED FREQUENCIES AND USAGE IN COMMERCIAL FLIGHTS MUST BE OBSERVED. SAFETY INSTRUCTIONS MUST BE INCLUDED IN THE MANUALS OF THE HOST DEVICE. CONNECT ONE ASSUMES NO LIABILITY FOR CUSTOMER FAILURE TO COMPLY WITH THESE PRECAUTIONS.

This section is pending for approvals from FCC and IC

Modifications
The FCC requires the user to be notified that any changes or modifications made to this device that are not expressly approved by Option could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC rules.
This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions:
(1) this device may not cause harmful interference, and
(2) this device must accept any interference received, including interference that may cause undesired operation.

Exposure Information to Radio Frequency Energy
This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance of 20 cm between the radiator and your body.
This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

---

iChip, Nano WiReach, Nano WiReach SMT, Nano LANReach, Nano Socket iWiFi, Nano Socket LAN, IP Communication Controller, SerialNET, AT+i, Pico WiReach and Connect One are trademarks of Connect One Ltd.

Table of Contents

Revision History

Version	Date	Description
1.0	Nov 1st 2014	Initial preliminary version
2.0	Dec 15th 2014	Name changing and images
3.0	Dec 14th 2016	Adding Pico WiReach EVM

1. Introduction

The Connect One's EVMB is an evaluation platform designed to allow engineers and developers to evaluate Connect One's WLAN and LAN modules.

The EVMB has three female header connector, on which a daughter board with the evaluated module can be installed.

Using the accessories packed with the EVMB and the configuration software, the user can easily connect to a host computer or any embedded platform and start applying AT+i® commands, upload new firmware, changing mode of operation and reconfigure the module to any mode of operation the user requires for proper evaluation of the product.

The EVMB evaluation platform can be used to evaluate the following modules

Module name	Module part number	Evaluation Daughter Board
Nano WiReach G2 N1	iW-SMG2N1	EVM-iW-SMG2N1
Nano Socket iWiFi G2 N2	iW-SMG2N2	EVM-iW-SMG2N2
Nano WiReach SMT G2 -OB	iW-SMG2SMT-OB	EVM-iW-SMG2SMT-OB
Nano WiReach MAX-C	iW-SM2144SMT-N-OB-C	EVM-iW-SM2144SMT-N-OB-C
Nano LAN Reach	iL-SM2144N1-I	EVM-iL-SM2144N1-I
Nano Socket LAN	iL-SM2144NH-I	EVM-iL-SM2144NH-I
Pico WiReach	iW-SMG3SMTS-OB	EVM-iW-SMG3SMTS-OB

2. Unpacking

1) The EVMB package includes the followings:

- EVMB – Evaluation Board

- Serial cable with two DB-9 connectors

- USB to RS232 adaptor cable + installation CD

- Power Cable (USB to mini USB)

- Power Supply

- Quick installation guide

- RF Antenna

- RF Cable

2) The EVM-iW-SMG2N1 package includes the followings:

- EVM-iW-SMG2N1 - Evaluation module daughterboard with Nano WiReach G2 N1 module mounted

EVM-iW-SMG2N1

3) The EVM-iW-SMG2N2 package includes the followings:

- EVM-iW-SMG2N2 - Evaluation module daughterboard with Nano Socket iWiFi G2 N2 module mounted

EVM-iW-SMG2N2

4) The EVM-iW-SMG2SMT-OB package includes the followings:

- EVM-iW-SMG2SMT-OB – Evaluation module daughterboard with Nano WiReach SMT Onboard Antenna module mounted

EVM-iW-SMG2SMT-OB

5) The EVM-iW-SM2144SMT-N-OB-C

- EVM-iW-SM2144SMT-N-OB-C – Evaluation module daughterboard with Nano WiReach MAX SMT Commercial version with on board antenna.

6) The EVM-iL-SM2144N1-I package includes the followings:

- EVM-iL-SM2144N1-I – Evaluation module daughterboard with Nano LAN Reach module mounted

EVM-iL-SM2144N1-I

7) The EVM-iL-SM2144NH-I package includes the followings:

- EVM-iL-SM2144NH-I – Evaluation module daughterboard with Nano Socket LAN module mounted

EVM-iL-SM2144NH-I

8) The EVM-iW-SMG3SMTS package includes the followings:

J11-Pin 1
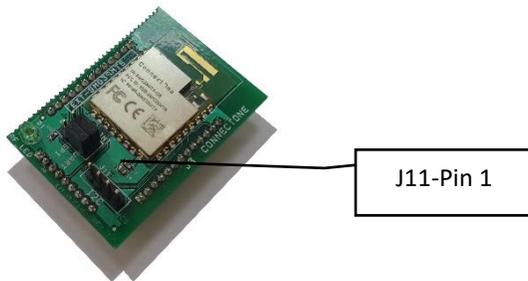
EVM-iW-SMG3SMTS-OB

J-11 – I^{2}C connection		
Pin 1	I2C_RESET	Output
Pin 2	I2C_DATA	Input / Output
Pin 3	I2C_CLK	Output
Pin 4	GND	Ground

J-12 – Host Interface Select	
	Serial interface
	SPI Interface

3. Mounting the evaluation module daughterboard

The evaluation module daughterboard is installed on a dedicated location on the EVMB as illustrated below
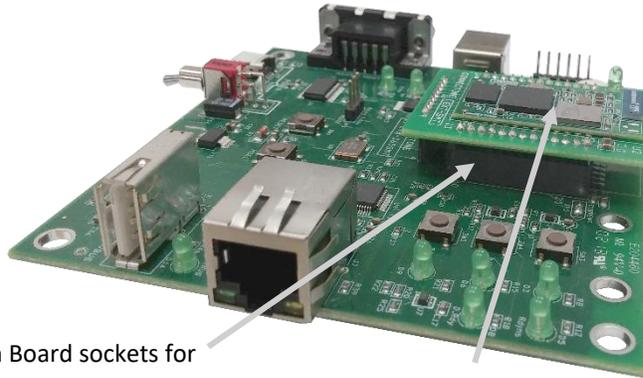
Evaluation Board sockets for modules daughterboard

EVM-iW-SMG2SMT-OB
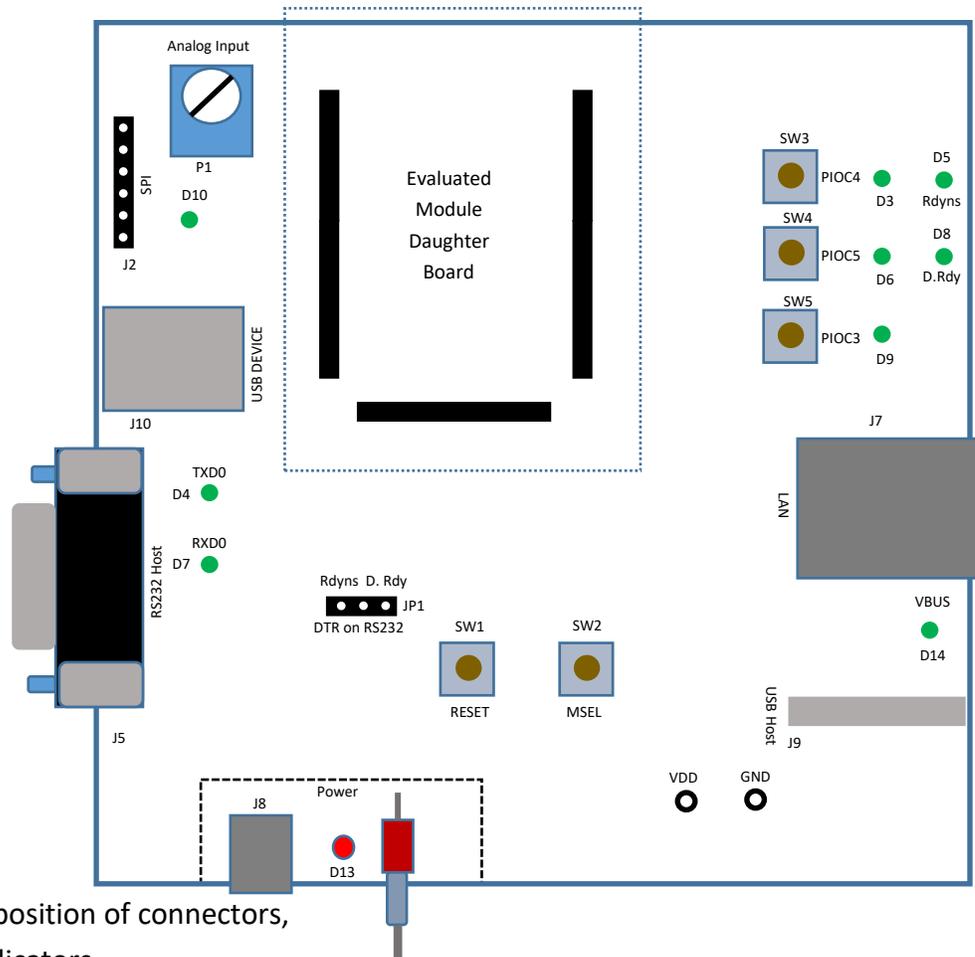
EVMB Mechanical - position of connectors, switches and LED indicators

4. Connectors, switches and LED indicators

LED Indicators	
D3	PIOC4 Status indication
D4	TXD0
D5	Rdyns
D6	PIOC5 - is used for output indication from when PIOC5 is programmed as *output*
D7	RXD0
D8	D. Rdy
D9	PIOC3 Status indication
D10	Indicate SPI activity
D13	Power indicator
D14	VBUS
Connectors and jumpers	
J2	SPI connection header
J5	RS232 Host Connection
J7	RJ45 LAN Connection - N/C while using EVM-iW-SMG3SMTS-OB
J8	Power input
J9	USB HOST Connection – Active only when testing the SMT devices
J10	USB Client- N/C while using EVM-iW-SMG3SMTS-OB
JP1	Indicate which signal will be on DTR pin of the RS232 – D.RDY or RDYNS
Switches and potentiometers	
SW1	Reset
SW2	MSEL
SW3	PIOC4 – is used when PIOC4 is programmed as input
SW4	PIOC5 – is used when PIOC5 is programmed as input
SW5	PIOC3 – is used when PIOC3 is programmed as input
P1	Analog input

5. Host Connection

Two method of quick Host connection are available:

1) Using the Serial cable for 2 X DB9 connectors

- Connect one end of the RS232 Cable to the female D 9 pin connector on the EVMB
- Connect second end of the RS232 Cable to one of the COM ports in your PC or serial RS232 port of a targeted embedded platform

2) Using the USB to Serial adaptor

- Connect the USB side of the adaptor to the USB port of your computer
- Connect the RS232 connector to the female D 9 pin connector on the EVMB
- Install the adaptor drivers using the adaptor's installation CD located in the EVMB box.

6. Installing the iChipConfig Utility and Evaluation Software

The EVMB enable you to evaluate the WiReach modules without any changes in your current development environment. AT+i commands could be sent to the module and responses could be seen by using a simple terminal program on PC.

AT+i command are used to configure parameters values into the module flash memory and activate the internal tasks like sending and receiving emails, socket manipulation, FTP sessions, web and many more.

A full description of the AT+i commands could be found in the AT+i programmers manual located in Connect One's website in the support section.

To assist in the configuration and evaluation of the module functionalities, Connect One supplies the iChipConfig utility. This is a windows based software with intuitive dialog boxes to which allows for a full configuration of the module including local firmware upgrades. The iChipConfig requires no special knowledge of the AT+i commands.

7. Testing the module's Wireless Connection

Testing the Wireless LAN connection, requires the module to be connected to an Access Point using the following steps:

1. Make sure an Access Point is operating, connected and configured properly.
2. Start the iChipConfig Utility on your PC.
3. In the main window of the utility, click the Dumb Terminal icon.

4. In the Dumb Terminal window, enter the **AT+i** command to verify that the iChip is communicating with your PC. You should receive an **I/OK** in response. If this has failed, click the "Setup Port" button and select the correct COM port. When using a USB to Serial connection, select the USB virtual COM being used.

5. Enter the **AT+iRP11** command to obtain a report of all the Access Points available in your area.

6. Enter **AT+iWLSI**=<*ssid*>. *ssid* is a case sensitive string ID of the Access Point you wish to connect to.

7. If you want to enable WEP encryption, configure the following parameters:

    a. **AT+iWLWM**=<*n*>   where *n*=0 means no security, *n*=1 means 64-bit key, and *n*=2 means 128-bit key

    b. **AT+iWLKI**=<*n*>   where *n* is the WEP key index (*n*=1..4)

    c. **AT+iWLK**<*n*>=<*keyString*>   where *n* is an index between 1 and 4, and *keyString* is the WEP key string in the *n*th position.

8. If you want to enable WPA encryption, configure the following parameter:

    a. AT+iWLPP=<passphrase>   where *passphrase* is the pass-phrase to be used in generating the WPA1-PSK encryption key. (in this case, it is normal for the module to take a few moments before returning I/OK)

9. Enter AT+iDOWN in order to reset the module and connect to the WiFi network.

At this stage a connection to the Access Point should be established. Verify that the module has received an IP address from the Access Point's DHCP server by issuing the AT+iIPA? command. The module should reply with I/<IP address>.

To test the connection, use the iChipConfig utility to perform any activity that requires network connection such as retrieving a web page, sending an email, or opening a socket. You may also try to PING the iChip from another station on the network.

8. Testing the module's Ethernet Connection

The EVMB contains a standard 10/100BaseT RJ45 connector that allows a direct connection to a wired LAN. Testing the Ethernet LAN connection, requires a configuration of the module using the following steps:

1. Using a standard LAN cable,
   a. While testing WLAN modules, connect the EVMB LAN RJ45 connector to the LAN port of your access point.
   b. While testing LAN only modules, connect the module's RJ45 connector to the LAN port of your access point.
2. Start the iChipConfig Utility on your PC.
3. In the main window of the utility, click the Dumb Terminal icon.
4. In the Dumb Terminal window, enter the **AT+i** command to verify that the iChip is communicating with your PC. You should receive an **I/OK** in response. If this has failed, click the "Setup Port" button and select the correct COM port. When using a USB to Serial connection, select the USB virtual COM being used.
5. Configure the module IP address in the DIP parameter. Set AT+iDIP=0.0.0.0 if you want the module to receive IP settings from the network's DHCP server.
6. Set DIP to an IP address to skip the DHCP process and use a fixed IP. In this case you should also define the SNET (subnet) parameter. For example, AT+iSNET=255.255.255.0
7. Change the LAN type parameter to 2 (LAN) using the following command: AT+iLTYP=2
8. Enter AT+iDOWN in order to reset the module and connect to the LAN network.

To test the connection, use the iChipConfig utility to perform any activity that requires network connection such as retrieving a web page, sending an email, or opening a socket. You may also try to PING the iChip from another station on the network.

9. Restore the LTYP parameter to 0 by applying AT+iLTYP=0 command, to return to the default Wireless-LAN operation.
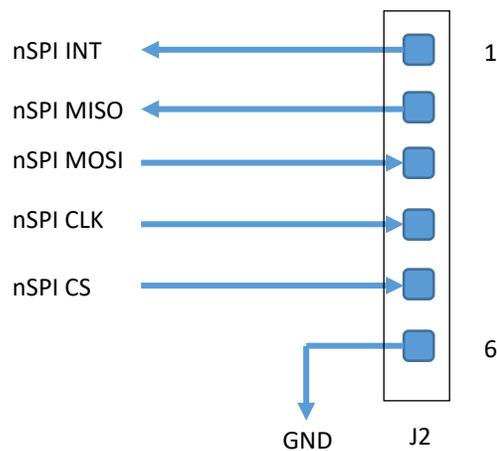
9. Additional Connection

The EVMB supports two additional connections which are also available in the evaluated modules

1) SPI Slave

The modules support an alternative Host interface to the RS232 Serial port and the USB connection. A host equipped with an SPI Master connection may connect to the module's SPI Slave port and interact with the module with AT+i commands.

An SPI cable (not supplied) connects to the EVMB J2 SIP connector

A full description of the SPI interface is described in the Appendix section of this manual

10. Ordering Information and Instruction

Ordering the EVMB is requires for evaluating the Connect One's module. In addition to the EVMB, a daughter board equipped with the requested module should be ordered. While possessing the EVMB, customer can order different daughter boards in case a requirement for multiple modules evaluation is needed.

1) Ordering examples

To evaluate the Nano WiReach SMT G2 product, the following parts needs to be ordered:

1) EVMB – Evaluation Master Kit
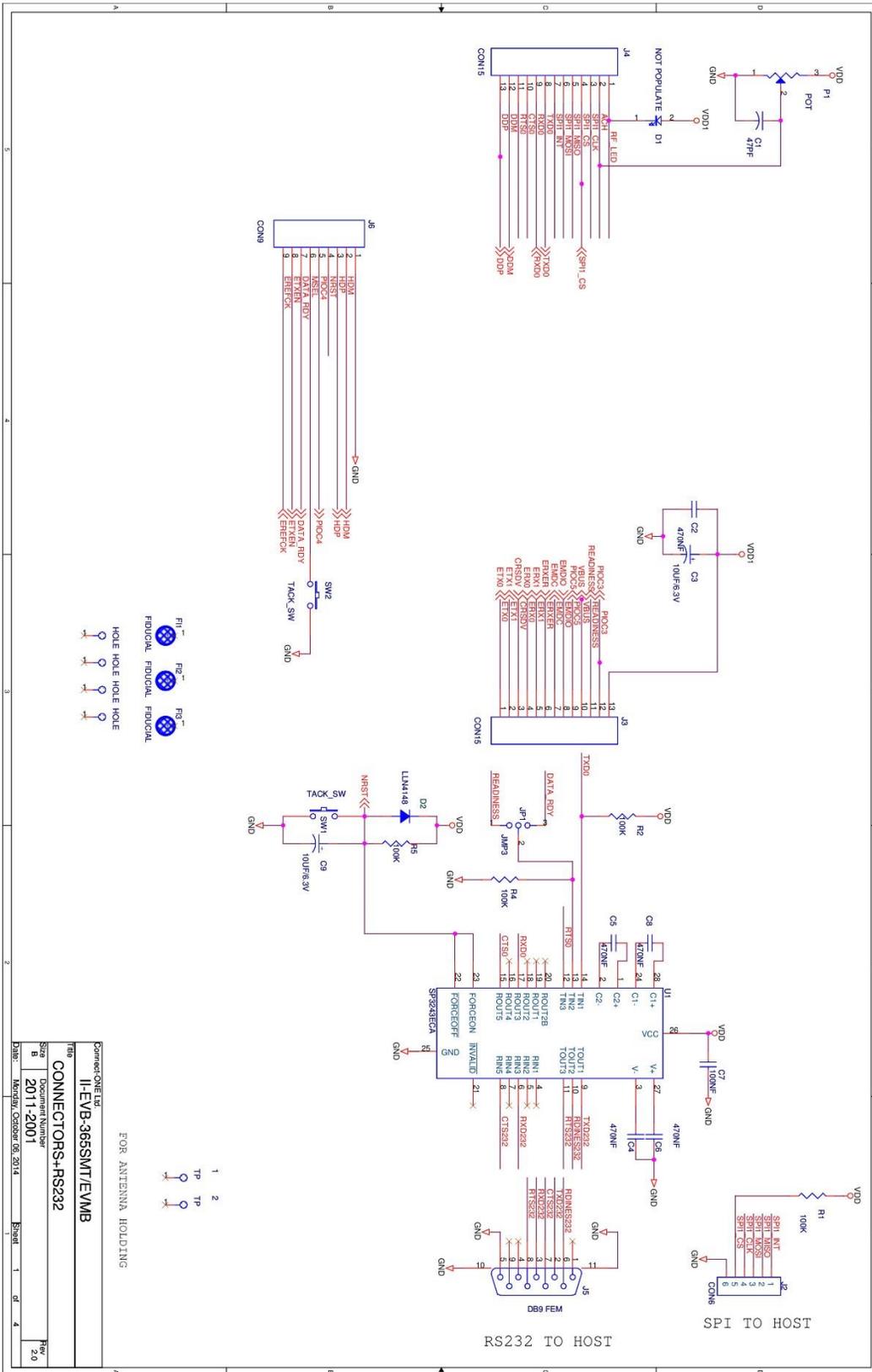2) EVM-iW-SMG2SMT-OB Evaluation Daughter Board for Nano WiReach SMT G2

To evaluate the Nano WiReach G2 product, the following parts needs to be ordered:

1) EVMB – Evaluation Master Kit
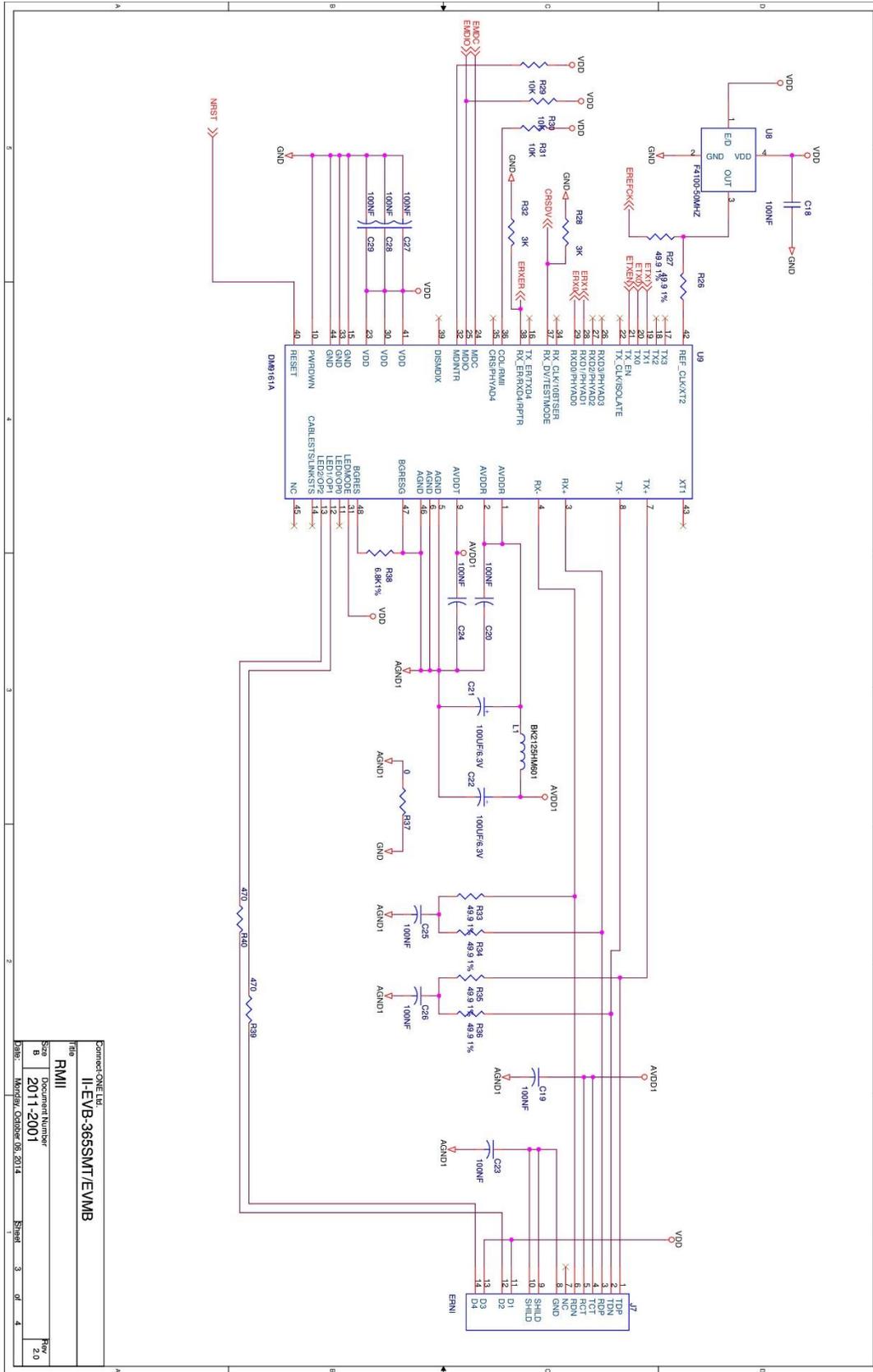2) EVM-iW-SMG2N1 Evaluation Daughter Board for Nano WiReach G2

2) Order Information

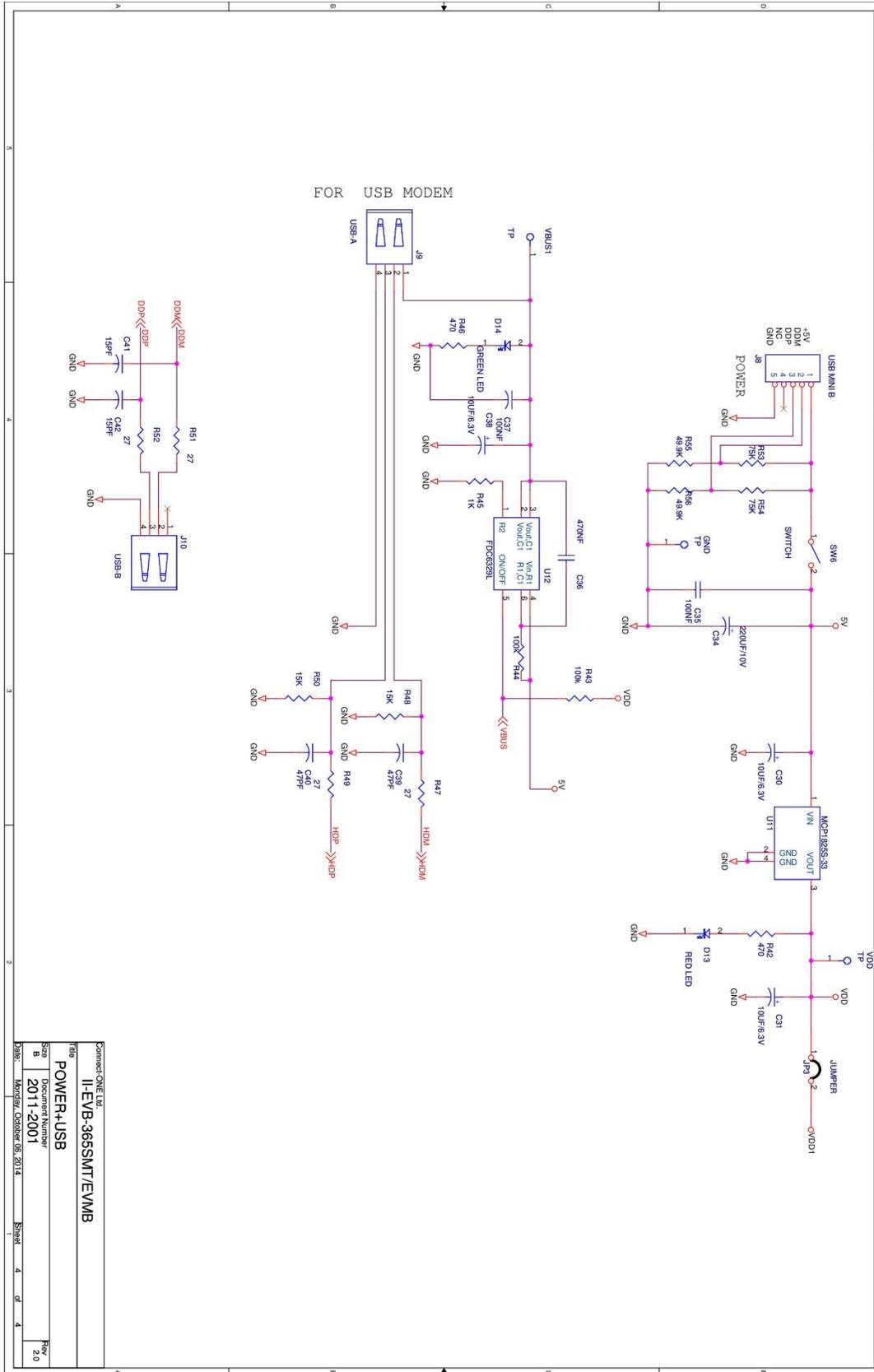| Part Number	Module part number
EVMB	Evaluation Master Kit with no module included
EVM-iW-SMG2N1	Evaluation Daughter Board for iW-SMG2N1
EVM-iW-SMG2N2	Evaluation Daughter Board for iW-SMG2N2
EVM-iW-SMG2SMT-OB	Evaluation Daughter Board for iW-SMG2SMT-OB
EVM-iW-SM2144SMT-N-OB-C	Evaluation Daughter Board for iW-SM2144SMT-N-OB-C
EVM-iL-SM2144N1-I	Evaluation Daughter Board for iL-SM2144N1-I
EVM-iL-SM2144NH-I	Evaluation Daughter Board for iL-SM2144NH-I

Appendix A – EVMB Schematics

Appendix B – AT+I Configuration Examples

Automatically connect to a specific Access Point:

AT+iFD	(restore to factory defaults)
AT+iHIF=1	(set the serial interface to RS232)
AT+iBDRF=9	(fix baud rate to 115200 after power cycle)
AT+iRP20	(list visible networks)
AT+iWLSI=My_WiFi	
AT+iWST0=4	(WPA2 security)
AT+iWPP0=<WPA2 passphrase>	
AT+iAWS=1	(enable website upon reboot)
AT+iDOWN	(reboot to apply settings)

Create an Access Point to allow connection from mobile devices:

AT+iFD	(restore to factory defaults)
AT+iHIF=1	(set the serial interface to RS232)
AT+iBDRF=9	(fix baud rate to 115200 after power cycle)
AT+iWLSI=My_AP	
AT+iDIP=10.0.0.1	(IP address)
AT+iDPSZ=8	(Enable internal DHCP server, up to 8 clients)
AT+iWST0=0	(open security)
AT+iAWS=1	(enable website upon reboot)
AT+iSTAP=1	(Switch to Access point Mode)
AT+iDOWN	(reboot to apply settings)

LAN – WiFi switch mode - merges Ethernet station(s) with WiFi client(s) into one logical subnet

AT+iFD	(restore to factory defaults)
AT+iHIF=1	(set the serial interface to RS232)
AT+iBDRF=9	(fix baud rate to 115200 after power cycle)
AT+iwlsi=SWITCH	
AT+idpsz=8	(Enable internal DHCP server, up to 8 clients)
AT+iwst0=0	(open security)
AT+iltyp=4	(LAN type: WiFi+Ethernet)
AT+idip=192.168.0.1	(WiFi side IP address)

AT+isnet=255.255.255.0   (WiFi side subnet mask)

AT+iedip=192.168.0.100   (Ethernet side IP address)

AT+iesnt=255.255.255.0   (Ethernet side subnet mask)

AT+istap=1   (WiFi in Access Point mode)

AT+iswen=1   (Enable Switch Mode)