UMC-LORA User Manual

Revision History

Issue Date	Version	Description
2017/08/31	1.0	Initial Issued
2017/10/24	2.0	Updated according to reviewer
2017/10/31	3.0	Update OEM installation statement

Contents

1.　　Introduction

This User Manual of ISM module is to describe how to use the following sections for lab test by specific qualified engineers or technicians. Furthermore, this module is NOT intended for commercial use but designed as part of Smart Meter product which mainly provides ISM-900 access capabilities. For the procedure of SMCC installation into electric meter and the operation of SMCC in assembly factory, that information is described in assembly instruction document.

FCC ID Location

FCC ID is placed in manual instead of label area, for the reason that the device is too small to have FCC ID been properly placed on label area, because of over crowded identification of other product and regulatory information.

Model : UMC-LORA

P/N: 81.UMCLORA.G01

FCC ID: NKR-LMLORA

FCC Interference Statement

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

FCC Statement for a Class B digital device or peripheral,

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or

television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

—Reorient or relocate the receiving antenna.

—Increase the separation between the equipment and receiver.

—Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

—Consult the dealer or an experienced radio/ TV technician for help.

## *Radiation Exposure Statement*

This module complies with FCC radiation exposure limits set forth for an uncontrolled environment. This module should be installed and operated with minimum distance of 20cm between radiator and human body.

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the device.

2. Test Setup Configuration

2.1 Power Supply and Debug Console Connection

Interface Board

AC-DC 5V Adaptor

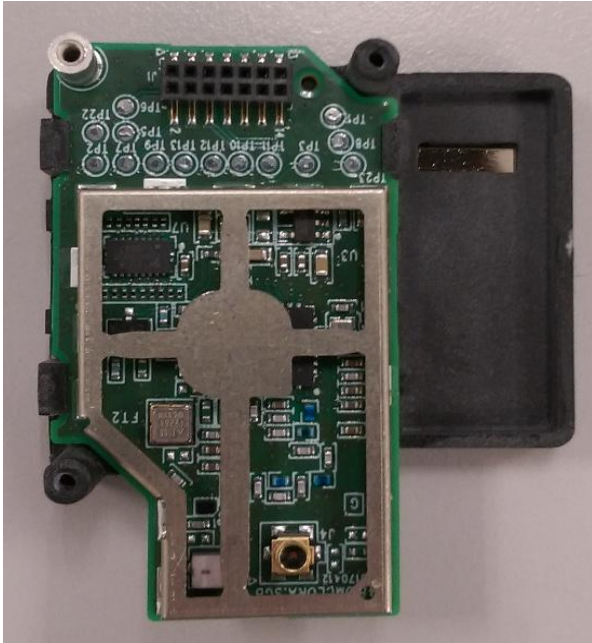**CB**

USB Debug Port Console

UMC-LORA (DUT)
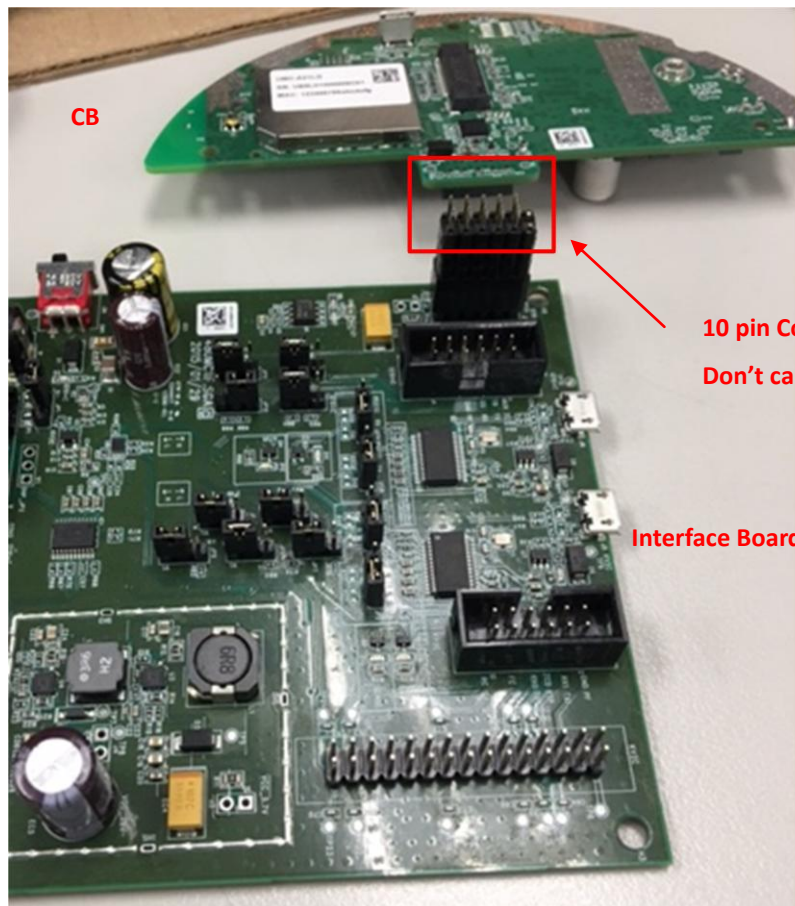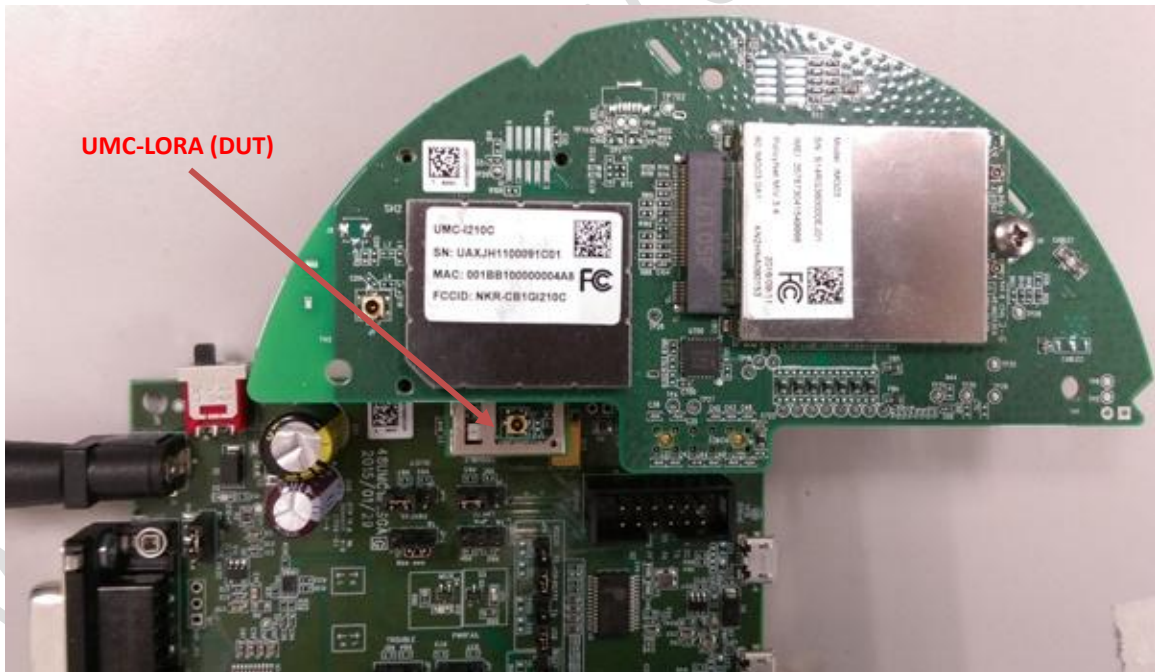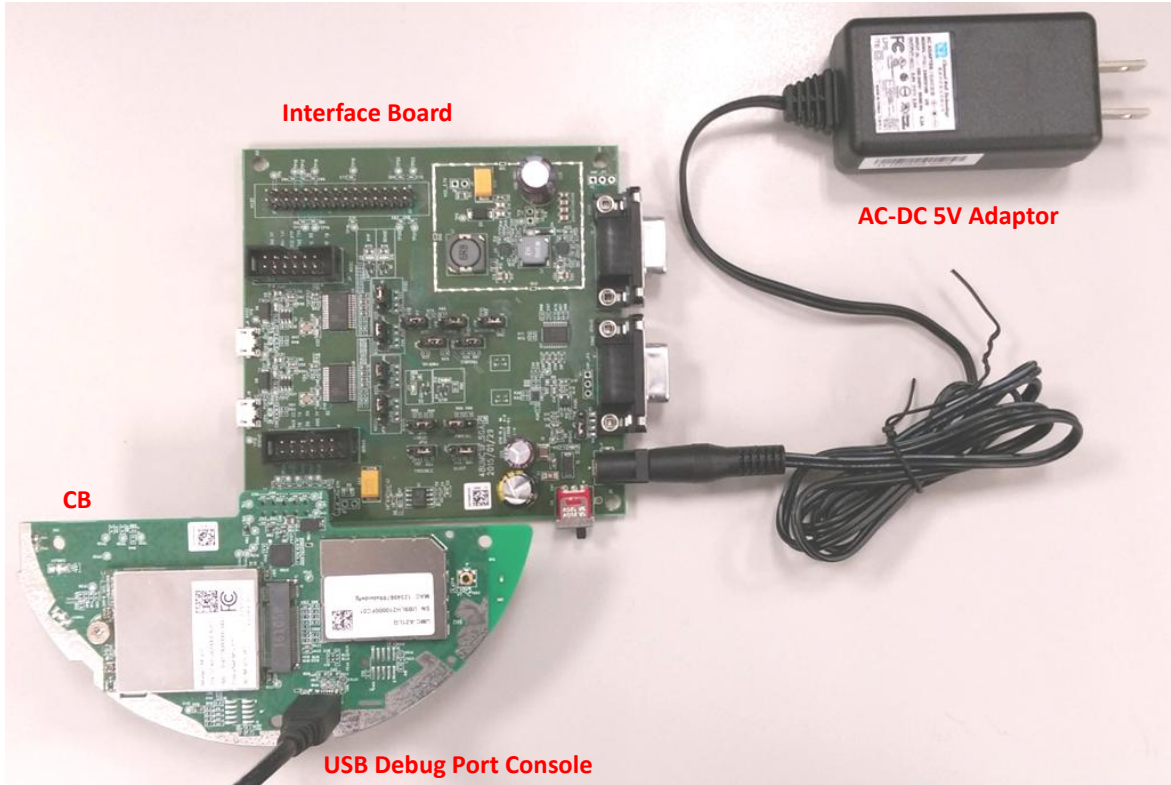
Power on Sequence:

I.   Connect DUT to interface board

II. Attach AC-DC Adaptor & USB Debug Port Cable

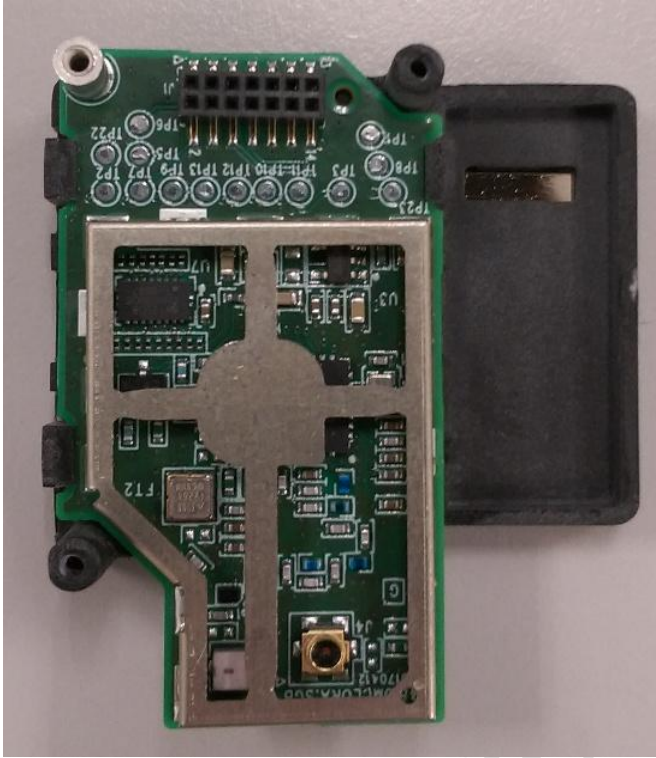III. Wait for 20 seconds when system ready

2.2   RF Connection

Connection for LORA internal antenna

Connection for conducted test

2.3   Hardware Component Introduction

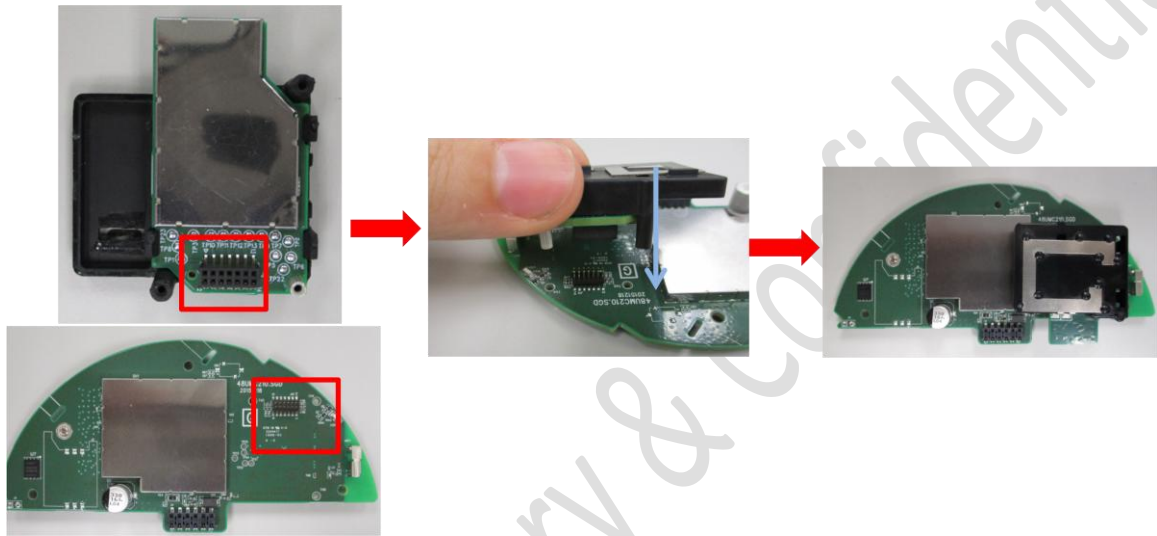| LORA card (DUT)	AC/DC Adaptor
SMCC	Interface Board

3. Installation and Test Method
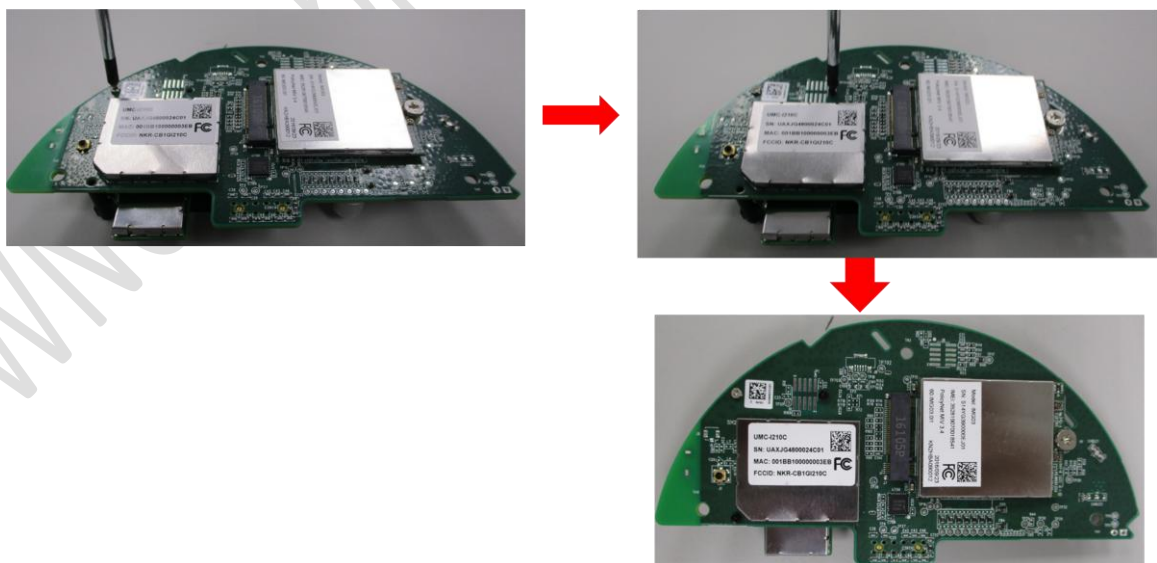
3.1 Attach UMC-LORA card onto SMCC

Step 1 : Connect the board to board connector

To invert Lora card and combine the female & male connector.

Step 2 : Fix the Lora card

To invert SMCC and screw 3 screws at indicated points on SMCC with Lora card. The black screw is corresponding to the SMT nut and the silver screws are corresponding to the holder bosses.

OEM installation statement:

This device is intended only for OEM integrators under the following conditions:

    1)   The antenna must be installed such that 20 cm is maintained between the antenna and users. For laptop installations, the antenna must be installed to ensure that the proper spacing is maintained in the event the users places the device in their lap during use (i.e. positioning of antennas must be placed in the upper portion of the LCD panel only to ensure 20 cm will be maintained if the user places the device in their lap for use) and

    2)   The transmitter module may not be co-located with any other transmitter or antenna.   As long as the 2 conditions above are met, further transmitter testing will not be required.   However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed (for example, digital device emissions, PC peripheral requirements, etc.).

    IMPORTANT NOTE: In the event that these conditions cannot be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID cannot be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

End Product Labeling:

    This transmitter module is authorized only for use in devices where the antenna may be installed such that 20 cm may be maintained between the antenna and users (for example access points, routers, wireless ASDL modems, certain laptop configurations, and similar equipment). The final end product must be labeled in a visible area with the following: "Contains TX FCC ID: {INSERT FCC ID HERE}".

RF Exposure Manual Information That Must be Included:

    The users manual for end users must include the following information in a prominent location "IMPORTANT NOTE: To comply with FCC RF exposure compliance requirements, the antenna used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter."
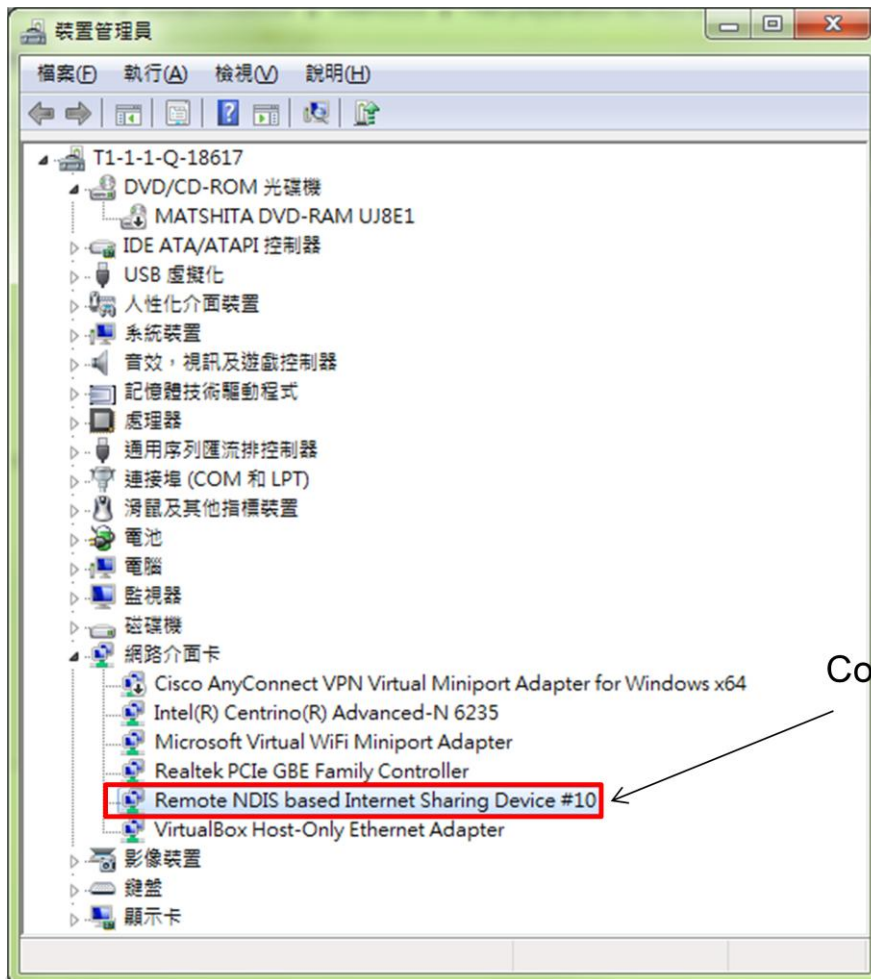
Additional Information That Must be Provided to OEM Integrators:

    The end user should NOT be provided any instructions on how to remove or install the device.

3.2　Install GDM7243 Driver

Install the GDM7243 driver "GDM7243_windows_acm_drivers_installer_v1.1.0.0.zip"
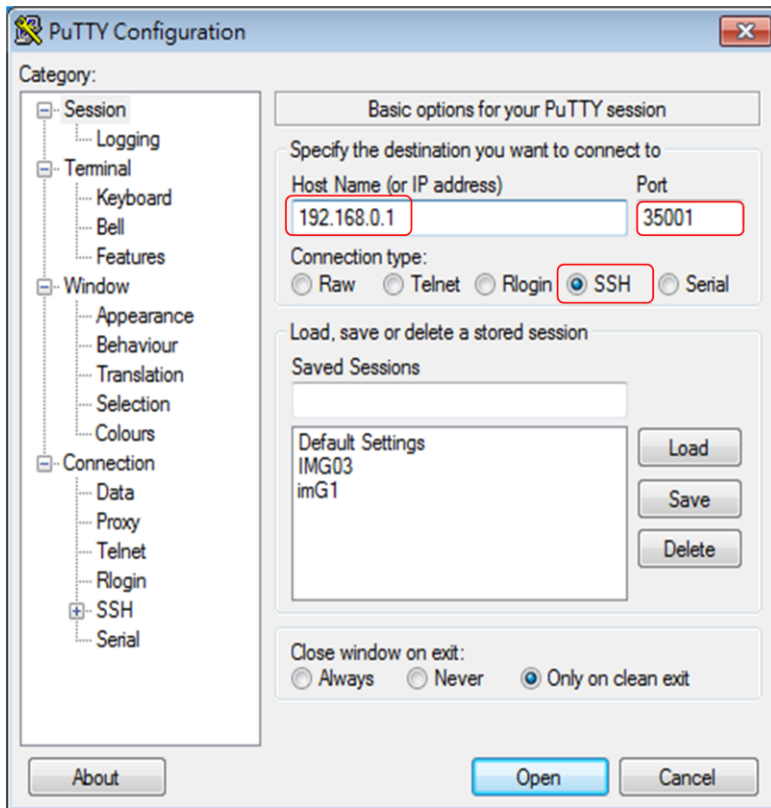
3.3　Confirm the GDM7243 device

Confirm the com port "Remote NDIS based Internet Sharing Device " in the Device Manager.
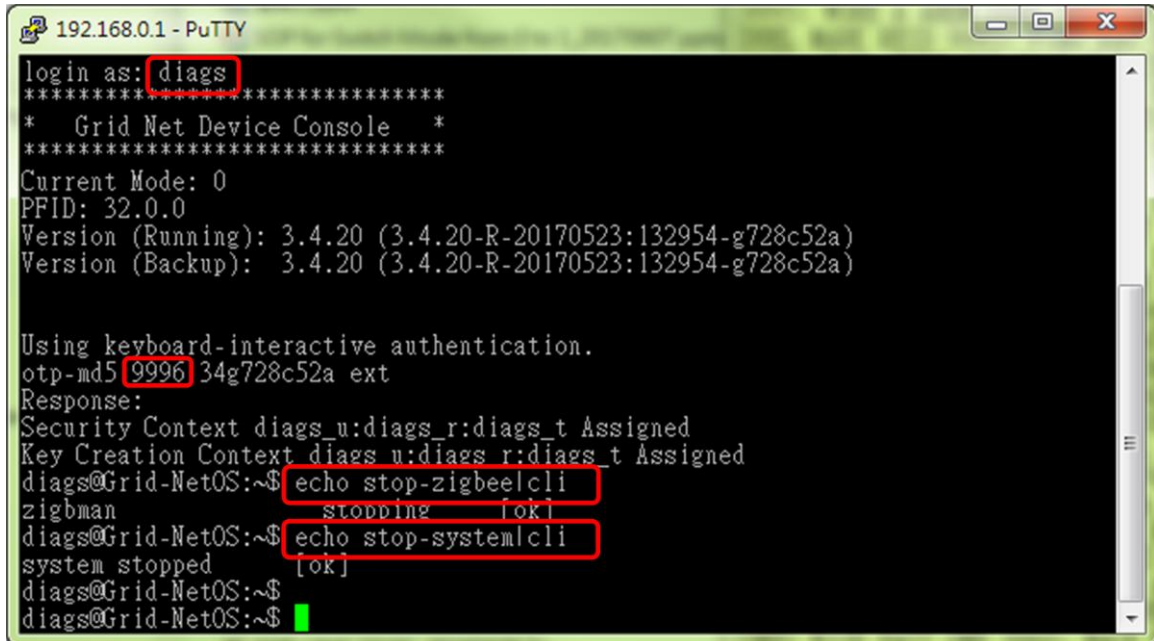
3.4 Open the com port by PuTTy

Install PuTTy for connection to DUT, refer to http://www.putty.org/

Host Name: 192.168.0.1 ; Port: 35001 ; Connection Type: SSH

no

1. Login as: **diags**
2. Find the one time password(OTP) with prompt number
3. **Ex: 9998: IDLE EYED MATE MID MAGI DIRT**
4. Enter command: **echo stop-zigbee|cli**
5. Enter command: **echo stop-system|cli**

OTP List:

9998: IDLE EYED MATE MID MAGI DIRT

9997: ACRE BULK MILE BOLO WAYS WOVE

9996: CHOU PAW OATH KANE ORE TERN

9995: NAG JIVE OS MUM LION HOBO

9994: SON DEAN MONK MAW LUCY ACRE

9993: BLUE FLAT LAWN HID TEET BOCK

9992: SOLD KIRK BOSS LULU INK ROOK

9991: SHOE OUST CASH ALAN ROSE LUSH

9990: CUBA HOLD HERB JUJU FUSS GAUL

9989: RITE FLAT TOOL HUM SEEK OS

9988: DOWN MITT FISK CAGE GEL MUCH

9987: HIGH DRY TORN LOY LUSH FROM

9986: SNOW FAWN LAME MURK BED EAT

3.5 Lora Test Command

```
# lora-mfgtool
Usage: lora-mfgtool [-crt] [-f freqInHz] [-p power] [-b bandwidth(0-2)
    Command Summary:
        -c      continous wave mode
        -r      lora rx mode (rssi and snr report)
        -t      lora tx mode
        -f      frequency in Hz
        -b      bandwidth, 0-125khz, 1-250kHz, 2-500khz
        -p      power (range -128 to 127, used with -c and -t modes)
```

```
# lora-mfgtool -t -f 915000000 -p 20 -b 2   → Tx command
freq: 915000000  power: 20 BW: 2
TxContinous mode.
```

```
# lora-mfgtool -r -f 915000000 → RX command
freq: 915000000  power: 14
```

```
Got Packet: size[64], rssi[-111], snr[21]
48 65 6c 6c 6f 20 72 61 64 69 6f 3a 00 00 01 02
03 04 05 06 07 08 09 0a 0b 0c 0d 0e 0f 10 11 12
13 14 15 16 17 18 19 1a 1b 1c 1d 1e 1f 20 21 22
23 24 25 26 27 28 29 2a 2b 2c 2d 2e 2f 30 31 00
```

4. Test Equipment

It is suggested to use Anritsu MT2830C for RF conductive tests.setc

5. Antenna performance

For ISM radiation tests, the ISM antenna gain shows in below table.

Frequency(MHz)	Average Gain(dB)	Peak Gain(dB)	Efficiency(%)
902	-5.16	1.03	30%
905	-5.18	0.97	30%
910	-5.09	0.84	31%
915	-5.18	0.73	30%
920	-5.19	0.7	30%
925	-5.28	0.58	30%
928	-5.25	0.57	30%