***Please use this document together with the lab 1 note**
----------Section 3 ----------

Compile the source code and program the hardware

The ZigBee device types – Coordinator, Router and Reduce Function End Device (RFD) are included as part of the application. A separate project file is provided for each device type such that each device can be built and be customized for specific operations.

In order to run the sample demo applications, the appropriate software must be downloaded onto the hardware platform. The Coordinator and the Router and/or RFD devices must be programmed with the proper device type selected in MPLAB.

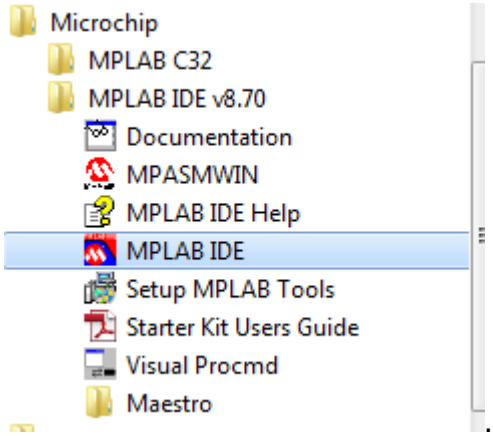
Building the Demo Applications

1. Please download the "Lab1.zip" folder into C:\work. The source code for this demo applications are available in the following folders:

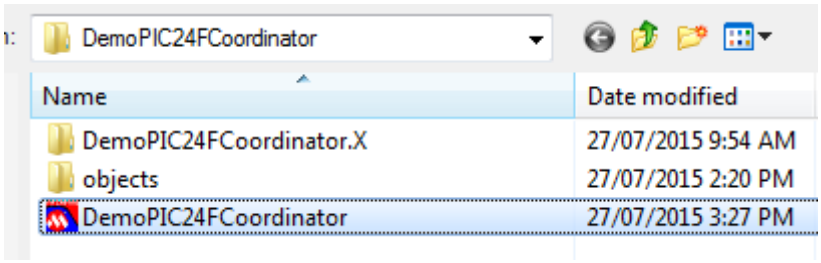
   "\ ZigBee2006res source code & Zena Analyzer \DemoPIC24FCoordinator"
   "\ ZigBee2006res source code & Zena Analyzer \DemoPIC24FRouter"
   "\ ZigBee2006res source code & Zena Analyzer \DemoPIC24FRFD"

   In these directories, you will find all of the application level source and header files as well as the project and workspace files for each of the hardware platforms.

2. To begin with, go to the start menu, and choose the Microchip file -> MPLAB IDE v8.70 -> MPLAB IDE



   After opened the MPLAB IDE, then you can select the workspace you want to open. Click file -> Open Workspace and choose the device type you want. Here we select "DemoPIC24FCoordinator".



After opened the workspace, then click "Build All" button to build the project. If "BUILD SUCCEEDED" displays, you can connect your device to

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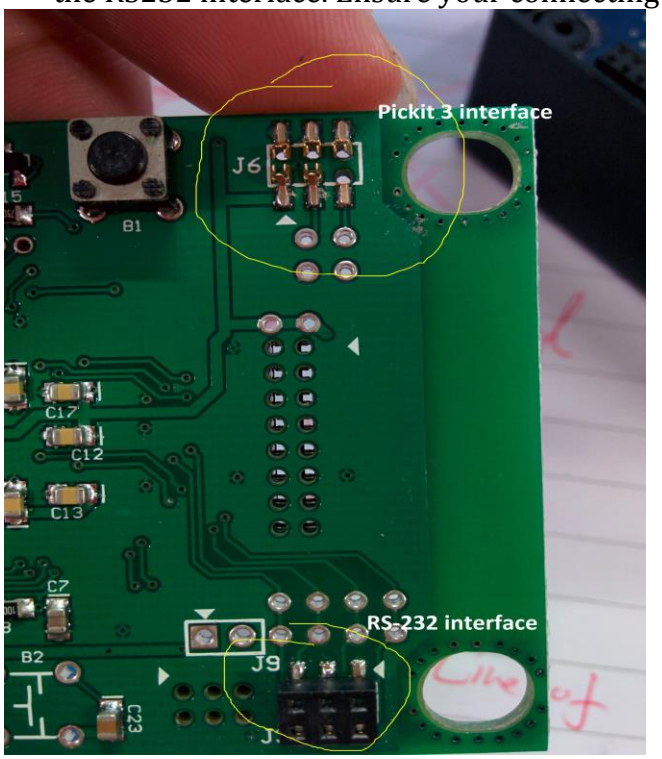
BUILD SUCCEEDED

the PC and program it.

3. Connect your device to the computer. Firstly, connect the Pickit3 compiler to the PC. Then click the "Programmer" button, choose the Pickit3 as the programmer. Then connect your ZigBee node to the Pickit3. (Hint: there are 2 interfaces in the board. J6 is the debug interface J3 is the RS232 interface. Ensure your connecting is right.)



----------Section 3 stops here----------

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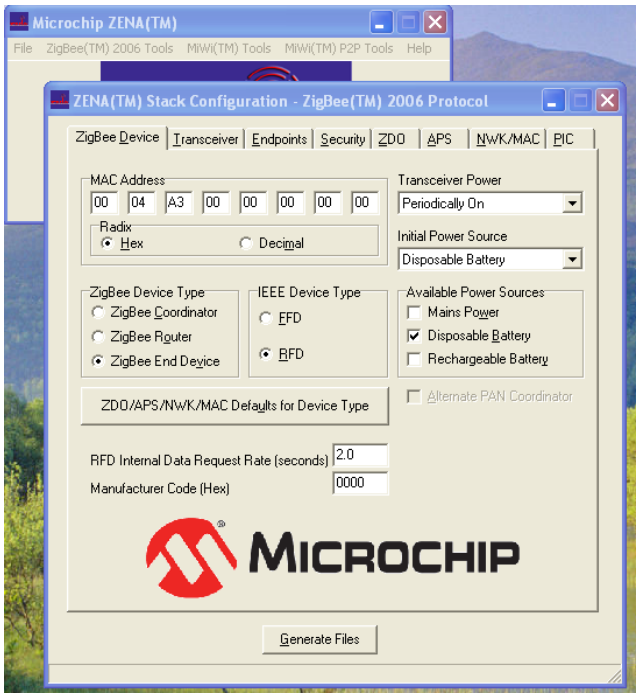
----------Section 4 ----------

Use Zena to monitor the network and change the channel

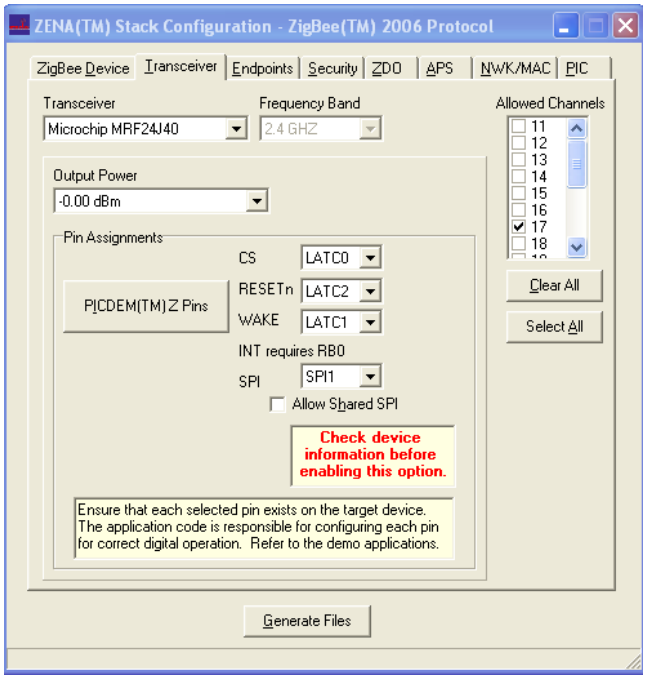
Change the channel

1. Open Zena software; -> ZigBee(TM)2006 Tools; -> Stack configuration;
   Then you will see the following window.

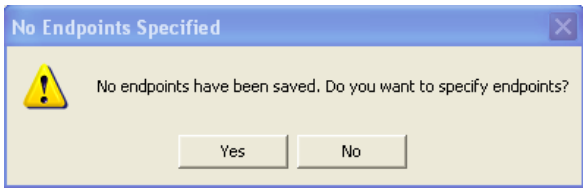


   Remember to fill up the MAC Address blank, otherwise you cannot generate the file.

2. Now go to the “Transceiver” option:



On the right side, tick the channel you will use, then generate the file.



When you see this, click “no”.

3. Select a path to output the file. Then open the “ZigBee.def” and find the new allowed channel value like this:

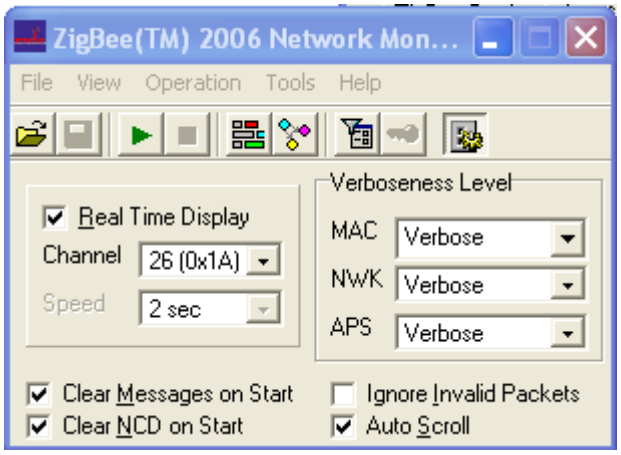
```
#define ALLOWED_CHANNELS 0x00020000
```

4. Now go back to MAPLAB IDE, open the ZigBee.def file with notepad; Replace it with the new allowed channel value.

Reprogram the ZigBee nodes with the new code. Now, you are working in your own channel.

Monitor the network and see the topology

1. Connect the Zena analyser hardware to the PC first. Open Zena software; -> ZigBee(TM)2006 Tools; -> Network Traffic Monitor;
   Do the configuration as the following window. Remember to choose the right channel.



2. Click on the "Run" button, the monitoring will begin.
3. Also click on the  button, you will be able to see the network topology.

----------Section 4 stops here----------

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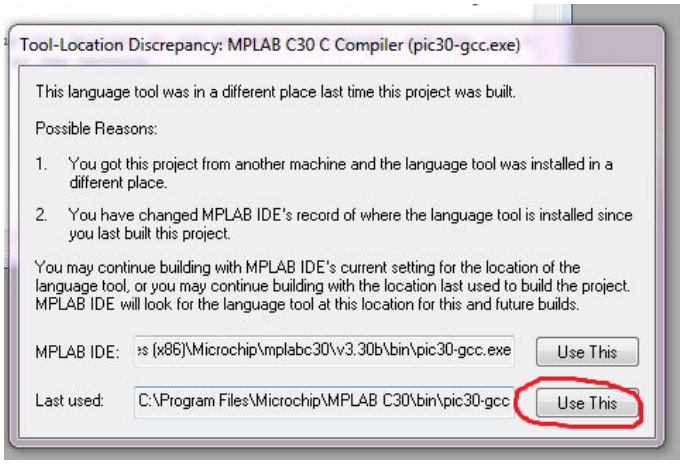
----------Section 5 ----------

RUNNING THE APPLICATIONS via the PUTTY CONSOLE

To operate the application from the hyper terminal menu system please do the following:

1. Program two devices, one coordinator and one router. Then switch the devices' power off.

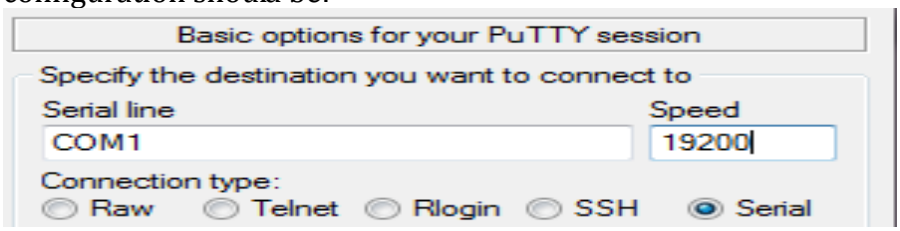
(Attention: 

when you build your project, if this window display, it remind you to locate the C

Compiler, click the marked button in most cases. If still "Build Failed", please let me know.)

2. Connect a RS-232 cable from the Coordinator device to the PC.

3. Open up a Putty window (Start->All programs->Putty) on the PC to the COM port to which the RS-232 is connected (COM 1). The Putty configuration should be:



4. Hit the <Enter> Key and the menu system will be displayed on the PC console.
   Note the seven menu options 1 - 7 that are available.

5. Get the Router to rejoin the network. Note the 16-bit Network and the 64-bit MAC addresses of Router are displayed on the Coordinator's console. In a typical two device network, the network address of the Router is 0x0001.

6. To request data from the Router via the Coordinator menu, do the following:
   From the menu select menu option < **2** >:
   2: Request Data From Another Device
   How many bytes are you requesting(hex): **0a**
   What is the short address of device you want data from: **0001**
   or whatever the network address of the router is
   This will send a data request to the Router via a unicast – directly and only to the Router asking for 0x0a bytes of data to be returned.

   The response from the Router will be:
   Len: 0a
   From Address: 0001
   00000102030405060708090A
   i.e. A payload of length 0x0a bytes is returned from the device at network address 0001, followed by the raw payload bytes that was requested. The payload is preceded by a one-byte status byte which has a value 00.

7. To send data directly to the Router from the Coordinator menu use menu option <4>:
   4: Request Data From Another Device
   Please enter the number of bytes to send (hex): **0a**
   Please enter the short address of the destination device: **0001**
   This will send ten bytes of data directly to Router. The Coordinator will display: Message sent successfully. Observe the traffic on Zena to confirm that the message is successfully sent.

8. To see what devices are currently stored in the Coordinator's Neighbor Table choose menu option '7' on the Coordinator menu:
   7: Dump Neighborhood Information
   The information that will be displayed is the following -

Short	**MAC**	**Type**	**Relationship**
0001	0000000100000000	RTR	CHILD

This means that the Router with the noted network address 0001 and MAC address 0000000100000000 is a child of the Coordinator.

As more devices join the network, this table will contain more entries.

----------**Finished ☺**----------