MiWi STAR DEMO USING 8-BIT WIRELESS DEVELOPMENT KIT WITH MRF89XA PICTAIL BOARD

HARDWARE REQUIREMENTS

The following hardware is required to run the demo application:

• Three 8-bit Wireless Development Boards+ MRF89XA PICtail Boards.

• Six AA batteries for powering up the boards or 9V Power Supply or USB cable.

Part Number: DM182015-3 (915MHZ), DM182015-2 (868MHZ)

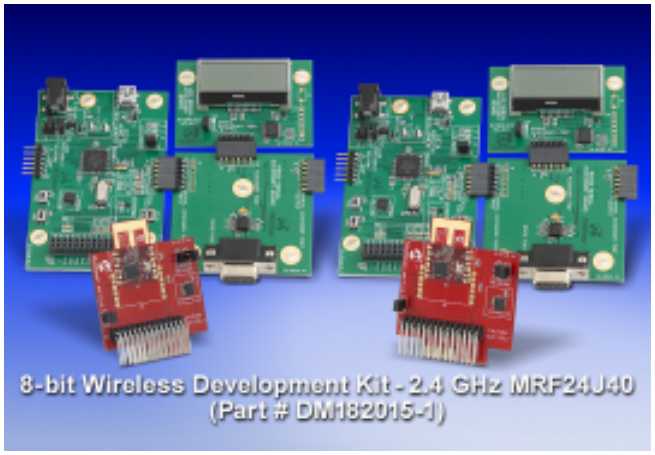
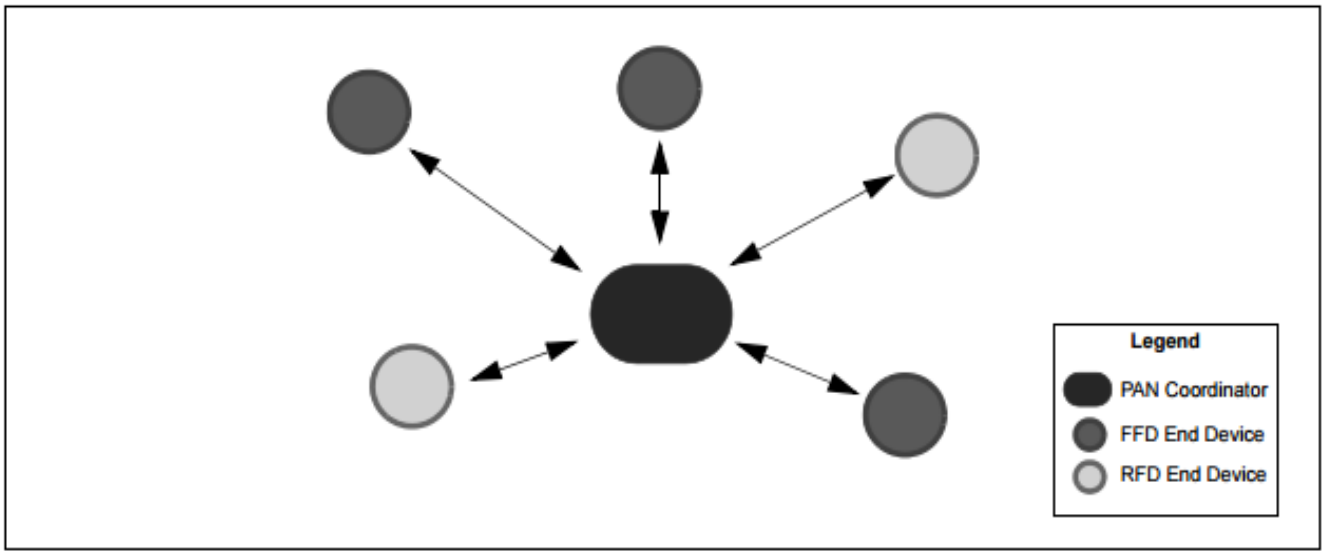


FIGURE 1: STAR NETWORK CONFIGURATION



DEMO SETUP

Program all the three Development boards with miwi_p2p_star_FFD.X.production.hex from the path ..\MiWiP2PStarDemoVer1.0\apps\miwi_p2p_star\MiWiP2PStar_FFD\firmware\hex\8bitwdk_pic18f46j50_89xa\8bitwdk_pic18f46j50_89xa_star.hex

Configure one of the 8-bit WDKBoards as the PAN Coordinator and the other two as END Nodes.

Follow these steps to set up the demo:

To power up the board, plug in two AA batteries on each 8-bit WDK Board.

DEMO OPERATION

1. On powering the boards, the following splash screen message will be displayed on the LCD screen.

Simple STAR
MRF89XA Node

2. The display changes to network selection screen either to form a new network or select freezer.

RB0:New Network
RB2:Freezer

3.Press RB0 to select New Network. The node performs scan of nearby network. The LCD screen displays the operating channel

Connecting Peer
On Channel XX

4. If no network is found, the node creates its own network and acts as a MiWi PAN Coordinator. The LCD display changes to:

PC :RB0 or RB2
To Broadcast

5. If any other MiWi PAN Coordinator node is found in the vicinity, then it gets connected to the PAN Coordinator as End Node. The LCD display changes to

Connected Peer
On Channel XX

Note: For every 15 seconds, PAN Coordinator broadcasts the connection table to all the end nodes and End nodes sends the link status to PAN Coordinator.

After the PAN Coordinator has established a network, power on a second node and follow the instructions in step #5 above to join the PAN Coordinator.

This process may be repeated to add any number of Nodes to the network.

6. After getting connected to PAN Coordinator, the LCD displays options to Unicast a message to either the Pan Coordinator or to another Node in the network.

RB0: Unicast
RB2: Next Node

Pressing RB0 sends the unicast message.

7. Pressing RB2 push button on the Node, displays the address of the next node in the Unicast address selection list. The LCD Screen will display the three bytes of short address followed by "me" keyword indicating its own MAC address in the list, or MAC address of the next node in the Unicast address selection list. Depending on the location within the list, the LCD screen will show one of the following text:

RB0: 00-XXXXXX-me
RB2: Next Node

or

RB0: 00-XXXXXX
RB2: Next Node

8. Now if RB0 push button is pressed at End Node, a unicast message is sent to PAN Coordinator in the case of **RB0:xx-xxxxxx-me** or to the destination node as indicated by **RB0: xx-xxxxxx**. After a successful transmission, the **TX** value gets incremented at the source End Node. The **RX** value gets incremented at the destination node (PAN CO) and three bytes of source MAC address is displayed.

At the source End Node the LCD will display:

TX: xx , RX: yy
Message Count

At the Destination Node:

TX: xx , RX: yy
Message Count

After One second the display changes to

Data Packet from
Address: XXXXXX

9. If RB2 push button is pressed at End Node, the LCD displays the next node present in the connection table.

RB0: 01-XXXXXX
RB2: Next Node

Note: At End Nodes, RB0 push button is used to unicast message to the selected node. RB2 push button is used to change/select the other destination node of the unicast message.

10. Press RB0 or RB2 push button at PAN CO to broadcast message to all the End nodes in the network. The LCD displays the incremented TX value.

TX: xx , RX: yy
Message Count

Note: Whenever the destination node receives the message from source (End Nodes or PAN CO) RX value gets incremented. The respective nodes display the three bytes of source MAC address from which they have received the message.

11. After few seconds the display reverts back to following messages on the LCD Display

At PAN CO:

PC :RB0 or RB2
To Broadcast

At Source or Destination End Nodes:

RB0: Unicast
RB2: Next Node

If power is recycled on an End Node, the description given below may be used to restore the node onto the network using the “Freezer” option.

12. On power recycle the End Node. The LCD will display

Simple STAR

MRF89XA Node

Followed by this:

RB0:New Network
RB2:Freezer

Now press the RB2 push button to retrieve the previous network information. Next the LCD display will be update to:

On the PAN Coordinator:

PC :RB0 or RB2
To Broadcast

On the End Node:

RB0: Unicast
RB2: Next Node

The next steps for sending messages will be similar to the steps discussed above.