

Chapter 3

Wireless UART

The Wireless UART demonstration application uses the Freescale KW01-MRB to communicate at typematic rates over the air from one board to another. This allows you to implement a UART-to-Wireless communication bridge.

The following is a simplified example and the code as it exists cannot be used as a cable replacement. If cable replacement is the goal, then queues, buffers, and other constructs must be added to increase the reliability and efficiency of this demonstration.

The Wireless UART application includes PAN ID and Address ID filtering. Only boards with the same PAN ID will be able to communicate between themselves. You can choose the Destination Address ID for each message. The application implements acknowledge messages over the air (OTA). However, this feature is optional and can be disabled at compile time.

The interface implemented to use this application is terminal based serial interface that uses menus to navigate application functionality.

3.1 Generating the Wireless UART Application

The Wireless UART demonstration requires at least two boards to perform Over-the-Air (OTA) communication.

Import the application to each board using the steps as shown in Chapter 1, “Introducing the SMAC”.

3.2 Compile and Load the Wireless UART Application

To compile and load a demonstration application into the evaluation boards, see Section 1.4, “Loading an Application into a Board”.

3.3 Starting the Wireless UART Application

To start the Wireless UART, perform the following tasks:

1. Configure the COM Port as shown in Section 1.5, “Virtual COM Port Setup”.
2. Connect each board to a USB cable and a USB port (one PC USB port for each board) and ensure they are enabled as shown in section 1.5, “Virtual COM Port Setup”.
3. Press reset button once on both boards. The terminal displays text as shown in [Figure 3-1](#).

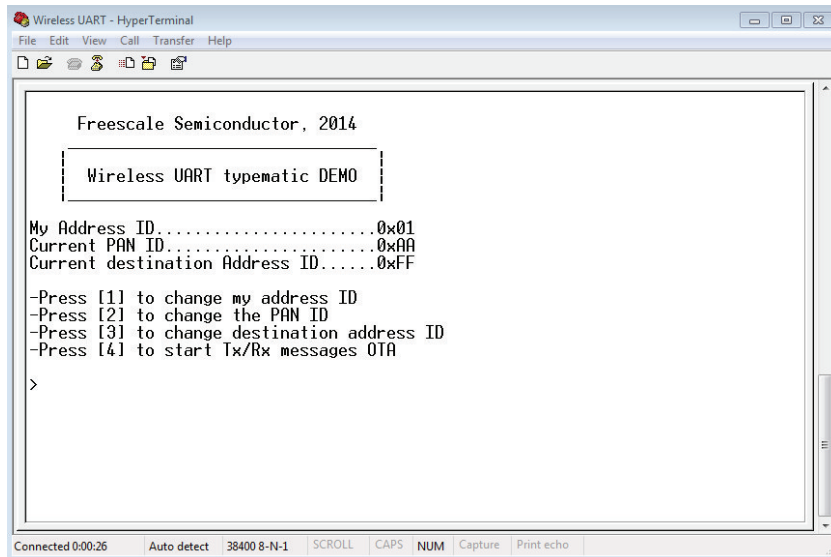


Figure 3-1. Wireless UART Start screen

3.4 Entering My Address ID, PAN ID, Destination Address

The My Address ID field is defined at compile time and filters the incoming messages. If the incoming message is a broadcast message (destination address ID = 0xFF) or if it has its destination address equal to My Address ID, the message is processed as a received message by the application. Otherwise, the message is ignored.

The My Address ID, PAN ID and Destination Address ID may be changed by following the directions from the main menu. The default values for these three fields are selected at compile time.

1. To change the My Address ID value, press "1" from the main menu screen and the My Address ID string appears as shown in Figure 3-2.

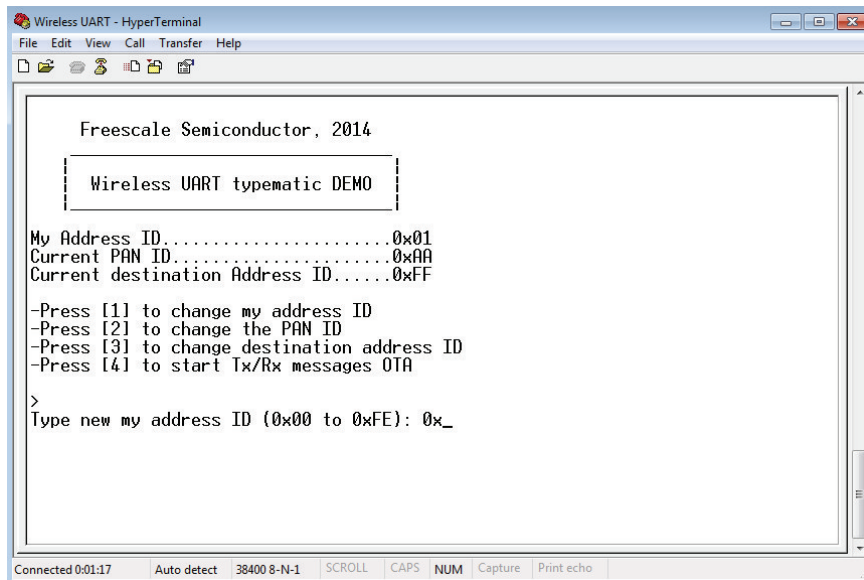


Figure 3-2. My Address ID String

2. To change the PAN ID value, press “2” from the main menu screen and the PAN ID string should appear as shown in [Figure 3-3](#).

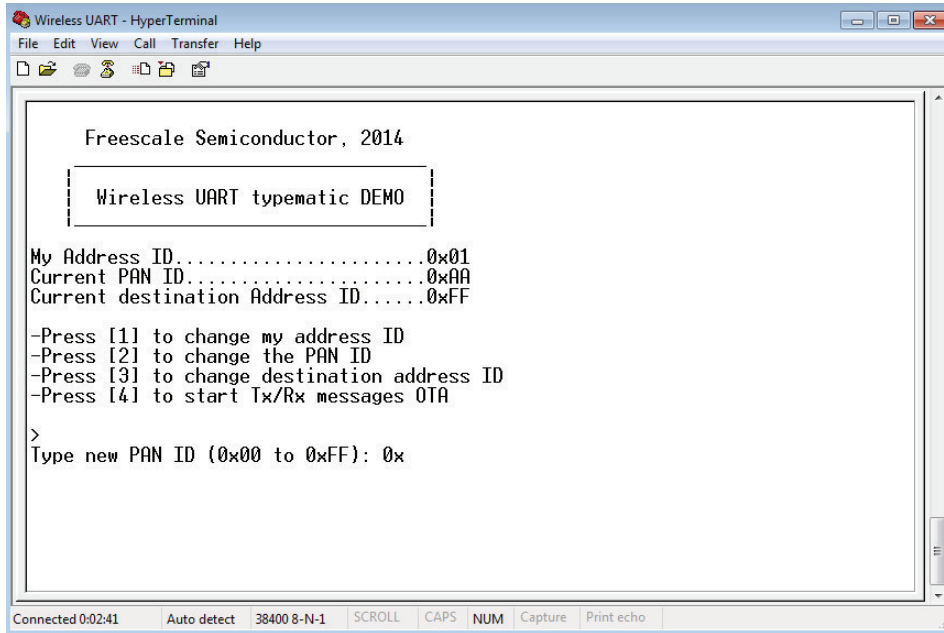


Figure 3-3. PAN ID String

3. To change the Destination Address ID, press “3” from the main menu and the Address ID string should appear as shown in [Figure 3-4](#).

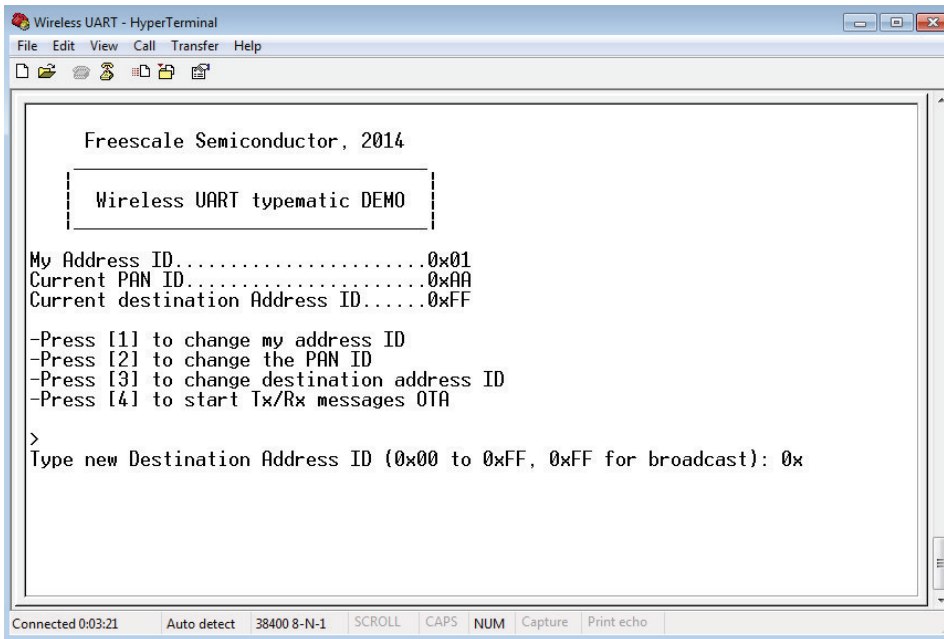


Figure 3-4. Destination Address ID string

4. If valid values were entered and both boards have correct values (Same PAN ID and a valid Destination Address ID), you are ready to start sending or receiving messages over the air. Press “4” in the main menu. The screen should be cleared and the “Typing message” screen should appear as shown in [Figure 3-5](#).

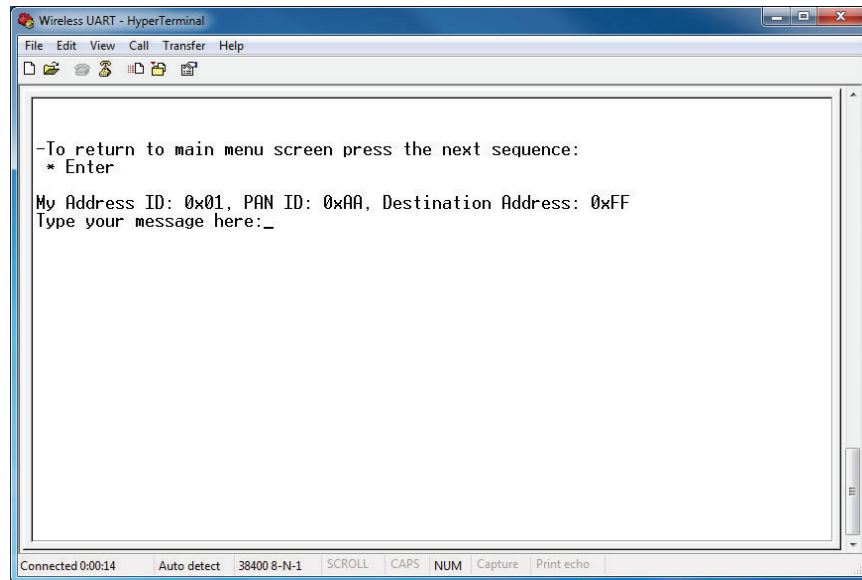


Figure 3-5. Wireless UART Typing Message Screen

This screen allows you to send the data that was typed into one Hyper Terminal window and see all the received messages displayed in the other Hyper Terminal window.

5. After both boards are configured and set in the “Typing Message Screen”, type some characters in the Hyper Terminal Session (Board 1) window ([Figure 3-6](#)) and the typed message should appear on the other Hyper Terminal Session (Board 2) window ([Figure 3-7](#)).

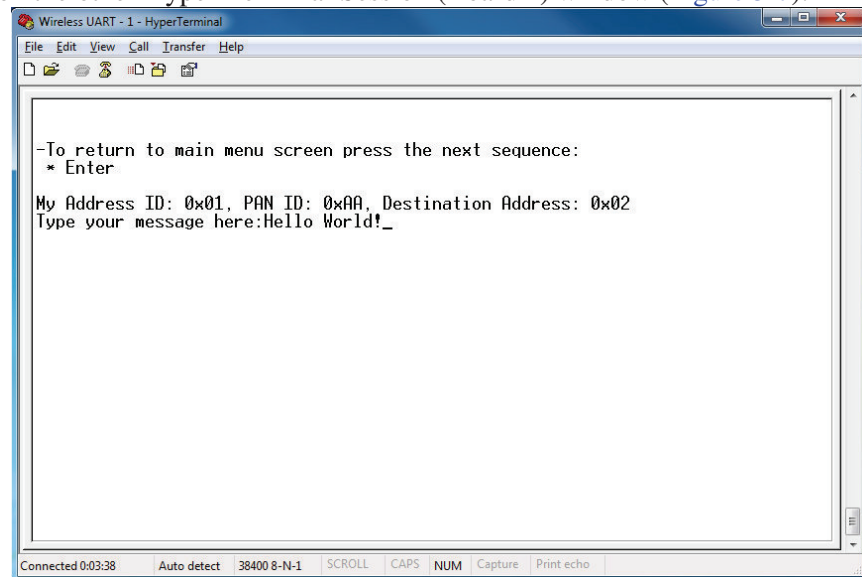


Figure 3-6. Typing Message on Board 1

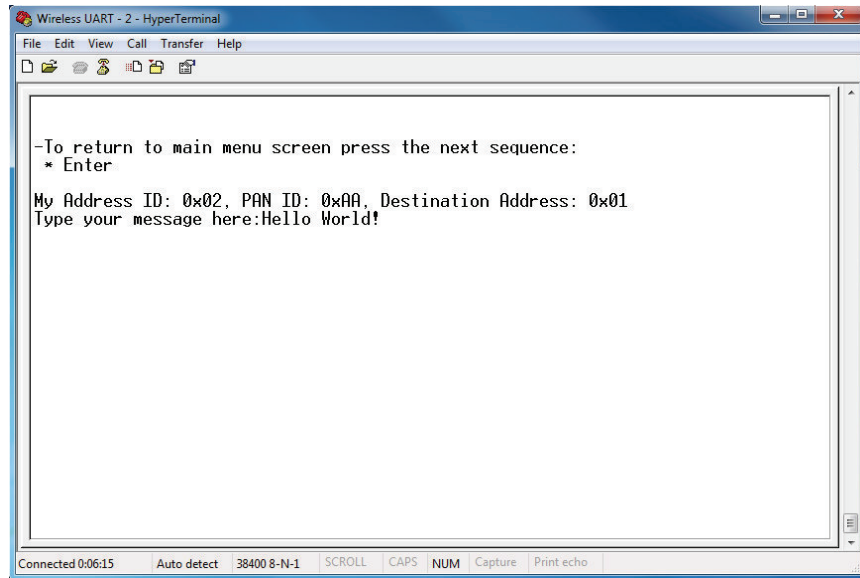


Figure 3-7. Received Message on Board 2

6. To return to the main menu, enter the following character sequence: ‘*’ + ‘Enter’

Because the Wireless UART demonstration is a two-way communication protocol, the boards retry their packets up to three times if an acknowledgement is not received. As already stated, this application highlights a very basic SMAC wireless UART implementation and because it is a basic demonstration application, it is not intended for large file transfers.

NOTE

You can disable the configuration mode so that the application defaults directly to the typing message window (Figure 3-5) with the default values for My Address ID, PAN ID and Destination Address ID already loaded. This option is included for users who do not need to change the ID values.

Chapter 4

Simple Range Demo

The simple range demonstration runs as a standalone application without any user interface which allows users to perform dynamic range tests.

The Simple Demonstration consists of two nodes:

- TX Node
- RX Node

4.1 Generating the Simple Range Demonstration Application

The Simple Range Demonstration requires at least two boards to perform Over-the-Air (OTA) communication.