Introduction

This quick start guide describes how to set up and use Zilog's Mini-Z Z-PAN® 28-Pin Module, a *Personal LAN* reference design that can be used with any Parallax stamp-compatible development board. In this quick start guide, we'll demonstrate the operation of the Mini-Z ZPAN Module using Zilog's optically-isolated Mini-Z Solid State Relay Design Board.

This guide also provides instructions about how to test certain I/O functions such as the Module's ADC block, or turning ports ON and OFF when using the Mini-Z Console Shell. Performing these tests does not require advanced programming skills.

Figure 1. The Mini-Z Z-PAN® 28-Pin Module

Kit Contents

All hardware (except an external adjustable power supply), software and documentation required to develop your application with the Mini-Z Z-PAN® 28-Pin Module is included within the Mini-Z Z-PAN® SSR Kit.

Hardware

The Mini-Z Z-PAN® SSR Kit includes the following hardware:

- Mini-Z Z-PAN® 28-Pin Module
- Mini-Z Solid State Relay Design Board
- USB Smart Cable
- Mini-Z to standard debug adapter
- USB cable (A male to Mini-B male)
- DIP Package Extractor

Software

A USB Driver may be required to enable the USB connection to the Mini-Z Z-PAN® 28-Pin Module. A standard USB driver is available for download from the FTDI website.

Documentation

Technical documentation supporting the Mini-Z Z-PAN® 28-Pin Module is available for download via the following links:

• Mini-Z Z-PAN 28-Pin Module Reference Design Document (RD0009)
• Mini-Z Z-PAN Shell and Flash Loader Reference Manual (RM0063)
• RN-41 Class 1 Bluetooth Module

Please refer to the Zilog website at www.zilog.com to obtain the most up-to-date documentation.

Setting up for Initial Operation

There are a few simple steps in order to begin using the Module; each of the following steps links to their respective descriptions on the pages that follow.

Step A: Unpack the Hardware

Remove the Mini-Z Z-PAN® 28-Pin Module from its protective packaging. ESD precautions must be used when handling the Mini-Z Z-PAN® 28-Pin Module and, if you also purchased it, the Mini-Z Solid State Relay Design Board.

Step B: Attach the Mini-Z Module

Carefully attach the Mini-Z Z-PAN® 28-Pin Module to your base board. Pay careful attention to the alignment, as follows:

• Pin 1 on the Mini-Z Module is marked by a chamfered corner near the 4-pin connector J1; see Figure 2.

• Pin 1 on Zilog's Mini-Z Solid State Relay Design Board is labeled with the numeral "1".

Figure 2. The Location of Pin 1 and Chamfer on the Mini-Z Z-PAN® 28-Pin Module

⚠ **Caution:** To avoid bending any pins while inserting the Mini-Z Module onto the baseboard, ensure that all of the Module's pins are properly aligned to the baseboard connector before gradually applying pressure to the Module.

Step C: Establish Hardware Connections

Before proceeding, it is important that you do not apply power to the Mini-Z Module until you have established all hardware connections. Observe the following brief procedure to establish these connections:

1. Connect a (6V to 12V) power supply to the SSR Design Board via power terminal J3.

2. Connect the USB Cable (A to Mini-B) from the PC to the Solid State Relay Board.

Step D: Configure the COM Port, Module and Wireless Link

Configure the COM Port Settings

1. Connect two SSR/ZPAN Mini-Z assemblies to two corresponding PCs with the USB Cable supplied in your Mini-Z ZPAN SSR Kit.

➤ **Note:** An alternative method for module setup and testing is to connect these two assemblies to a single computer using two USB ports.

2. Connect the power supply to J3 and turn the power ON to both modules. The blue power status LED on the Module will illuminate, and a green LED adjacent to the Roving Networks RN-41 Bluetooth module will begin blinking twice per second to signify the connection state. Table 1 presents additional LED Status information.

Table 1. Link Status Indicator LED

Mode	Blink Rate
Configuring	10 times per second
Startup/Config Timer	2 times per second
Discoverable/Inquiring/Idle	Once per second
Connected	Full ON

➤ **Note:** If the Windows OS displays a `Driver not found` message, you'll need to download and install a USB driver. A standard USB driver is available for download from the FTDI website.

3. Launch the Tera Term virtual terminal console software so that it is running on both PCs. In Tera Term, select **Serial Port...** from the **Setup** menu to open the **Tera Term: New connection** dialog box, as indicated in Figure 3.
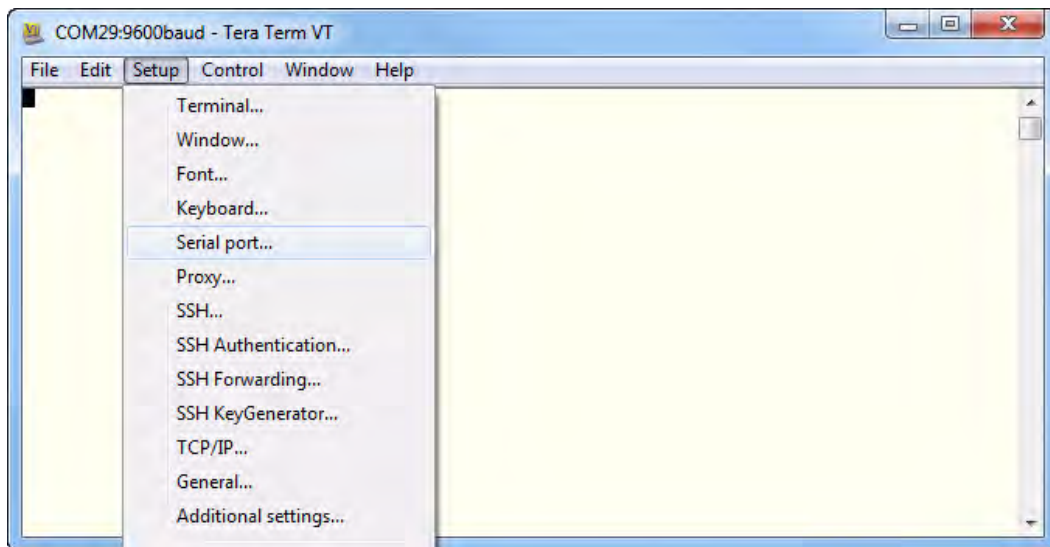
Figure 3. USB Serial Port Selection

4. From the **Port:** menu in the **Tera Term: New connection** dialog, select the USB serial port assigned to the ZPAN Module, as indicated in Figure 4, then click **OK**.

Figure 4. USB COM Port Selection

5. In the **Tera Term: Serial port setup** dialog box that appears, select 57600 from the **Baud rate:** menu, as shown in Figure 5. Allow the other settings to remain at the default values shown in Figure 6, and click **OK**.
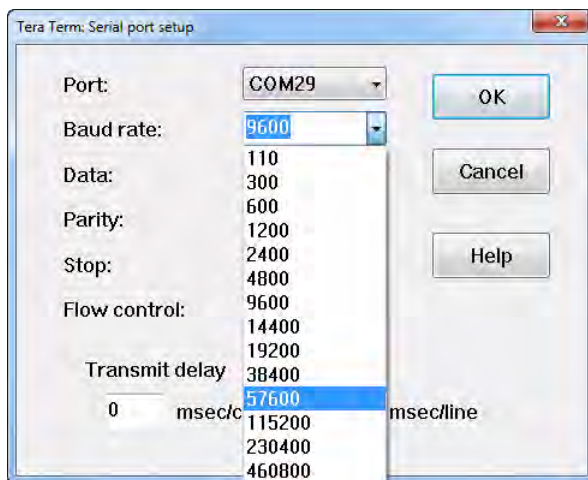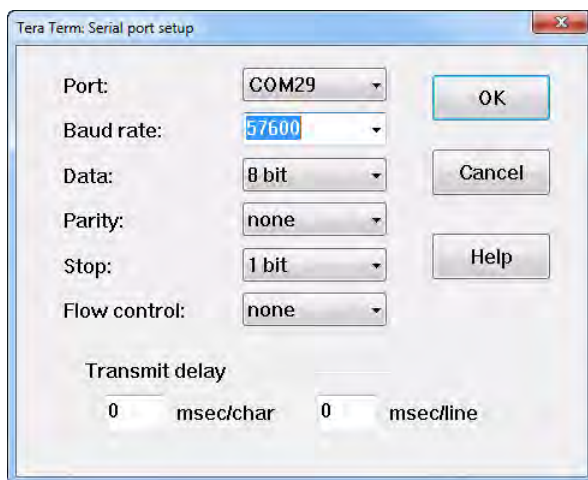
Figure 5. Baud Rate Selection

Figure 6. USB Serial Port Setup

Configure the RN-41 Bluetooth Module Settings

1. Press the RESET button on one of the SSR boards. A BTMiniZ> prompt will appear, as shown in Figure 7. Repeat this step for the other SSR board.
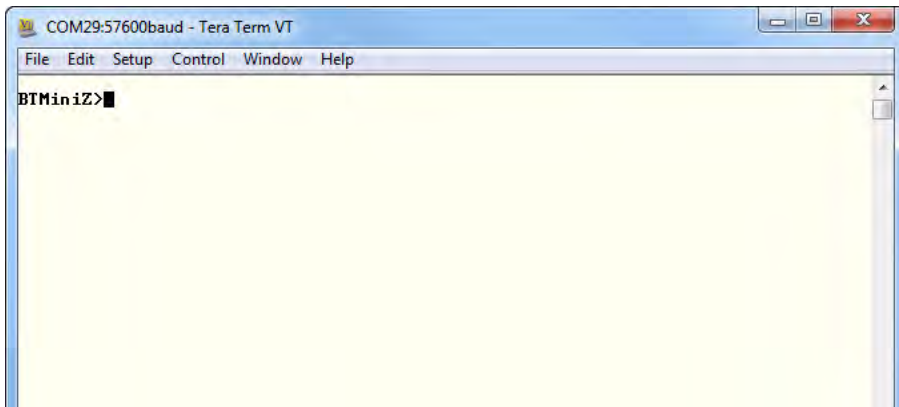

Figure 7. ZPAN Shell Prompt

2. At the BTMiniZ> prompt in each Tera Term window, enter the wCmd command to initiate the RN-41 Module's command mode. A question mark prompt (?) will appear, as shown in Figure 8.
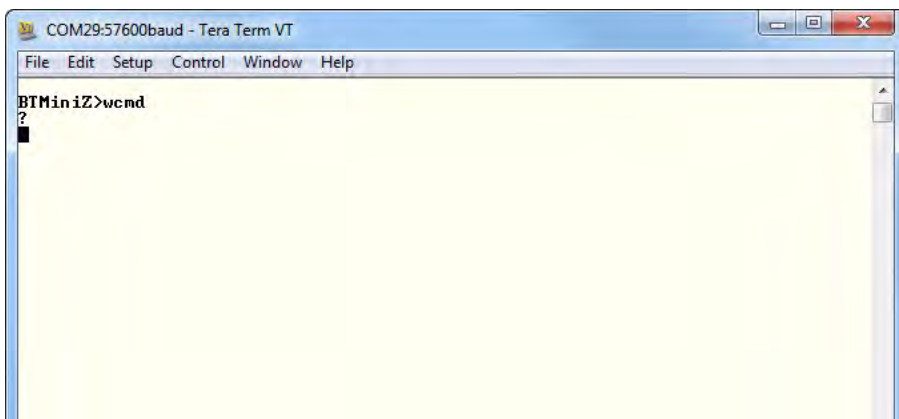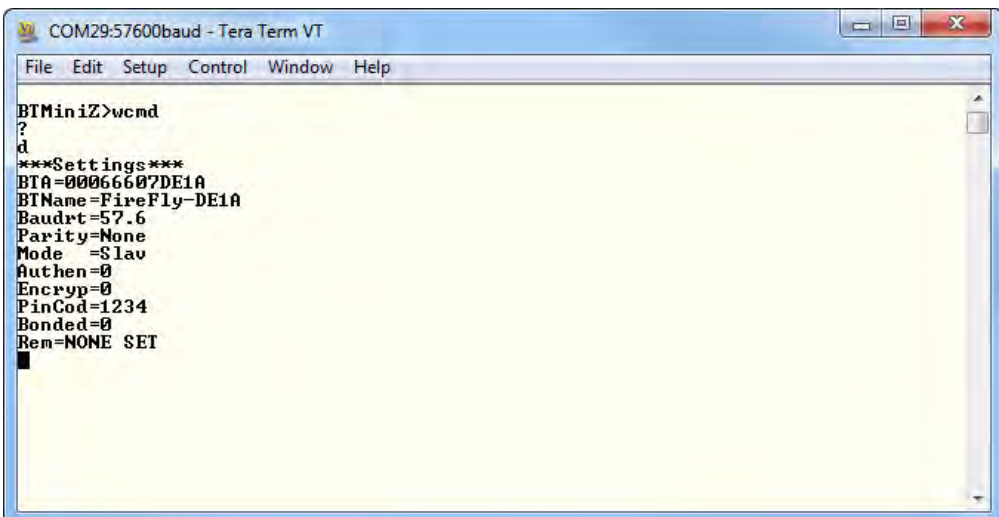

Figure 8. Command Mode Prompt

➤ **Note:** The settings discussed in this guide are the minimum required settings; the
BTName and Mode settings (among others) are not necessary to establish a
simple connection. For more advanced connections, see the RN-41 User
Guide.

3. At the ? prompt, enter the d command to display the RN-41 Module's default settings,
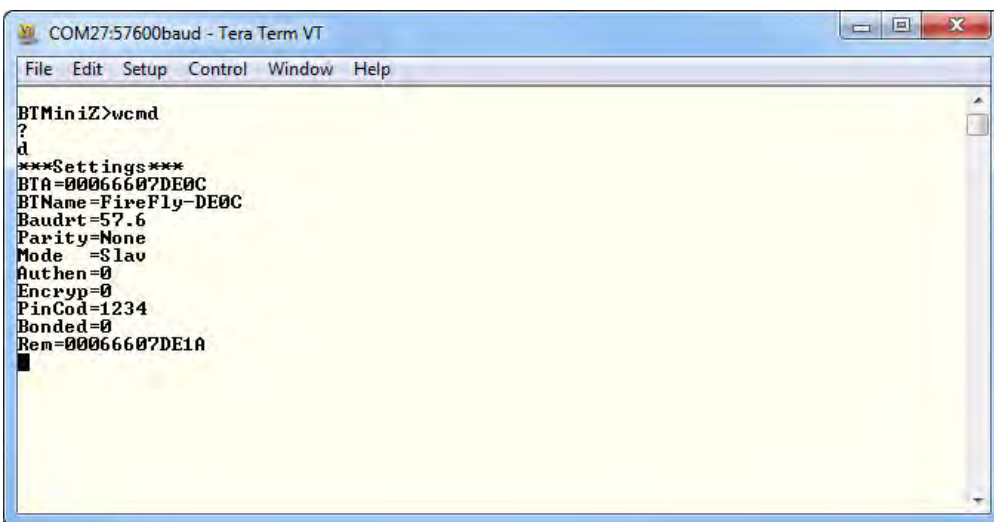as shown in Figure 9.

Figure 9. ZPAN Default Settings

➤ **Note:** In the Figure 9 example, the final line reads Rem=NONE SET. In this *remote
setting*, the NONE SET field will change to the Bluetooth Access (BTA) num-
ber from the computer you are linking to; the sr,address Set Remote com-
mand is used to make this change while in Command Mode. This BTA
number is shown at the top of the settings list; in Figure 9, the BTA number is
00066607DE1A.

4. At the blinking square prompt that appears next, enter the following code using the BTA number that has been generated from your own module settings (referred to below as BTAnum).

    a. Enter the sr,BTAnum,[1] command, then press the Enter key twice.

    b. Enter a d command, and verify that the value of Rem has now changed to the other Module's address, as shown in Figure 10.
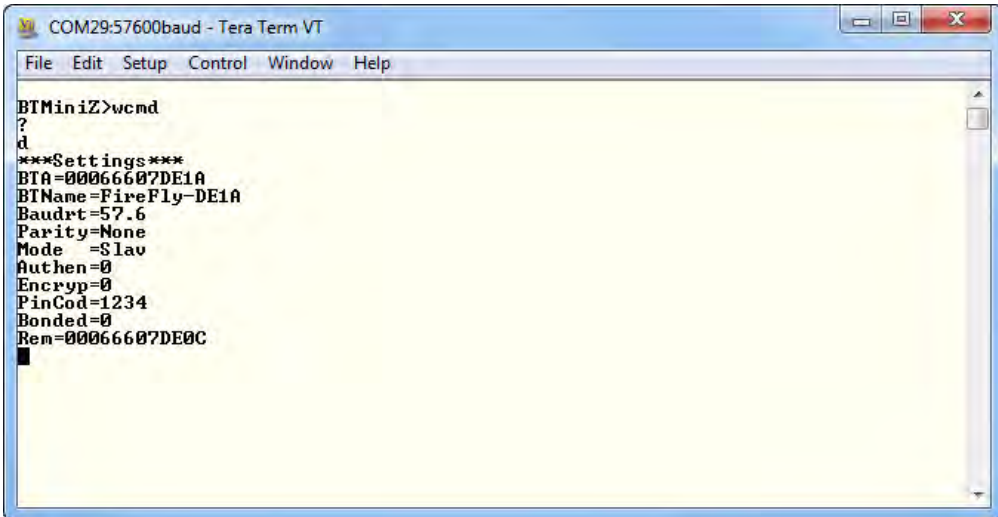

Figure 10. Remote Address Settings for Module 1

    c. Enter the Ctrl-D command to return to the ZPAN shell.

    d. Enter the wReset command.

➤ **Note:** The wReset command must be executed for the change to take effect. As an alternative to the wReset command, a power off/on reset can also be executed.

---

[1] For purposes of this demonstration, BTAnum = 00066607DE0C.

Upon execution, the other PC will reflect the values shown in Figure 11, in which the `Rem` value is swapped from the value shown in Figure 10.

Figure 11. Remote Address Settings for Module 2

Step E: Acquire the Mini-Z Shell Prompt

1. Press the RESET switch on the SSR Design Board. The `BTMiniZ>` prompt will appear on the Tera Term screen.

2. Using your PC's keyboard, enter `?` to see list of available commands.

3. Enter a command followed by a space (" ")and a question mark ("?") to see a description for a particular command. Similarly, enter a command followed by its parameter(s) to execute the command. See the following examples:

   Example 1. At the command prompt, enter the following command to display a list of parameters that you can use with the `getadc` command:

   `getadc ?`

   Example 2. At the command prompt, enter the following command to display the ADC0 value:

   `getadc 0`

Example 3. At the command prompt, enter the following command to turn the red LED ON.

```
setled r on
```

Similarly, entering the setled y on command will turn the yellow LED ON, and entering the setled g on command will turn the green LED ON.

Example 4. At the command prompt, enter the following command to turn P4 ON.

```
setport p4 on
```

Step F: Establish A Wireless Connection

Observe the following procedure to establish a wireless link between the two Mini-Z ZPAN modules. Be sure to perform all of the following steps in sequence to establish proper communication.

1. Press the RESET button on each of the SSR Design Boards to launch the Mini-Z Shell. As a result, the following prompt should appear on each PC's monitor:

   ```
   BTMiniZ>
   ```

2. On each PC's keyboard, verify the Mini-Z Shell Library installation by entering the ? character to display a list of commands; see Figure 12.
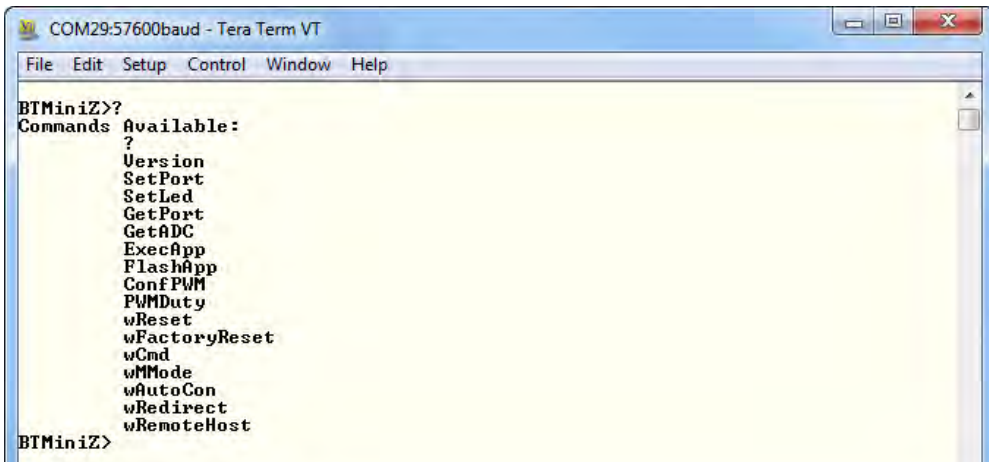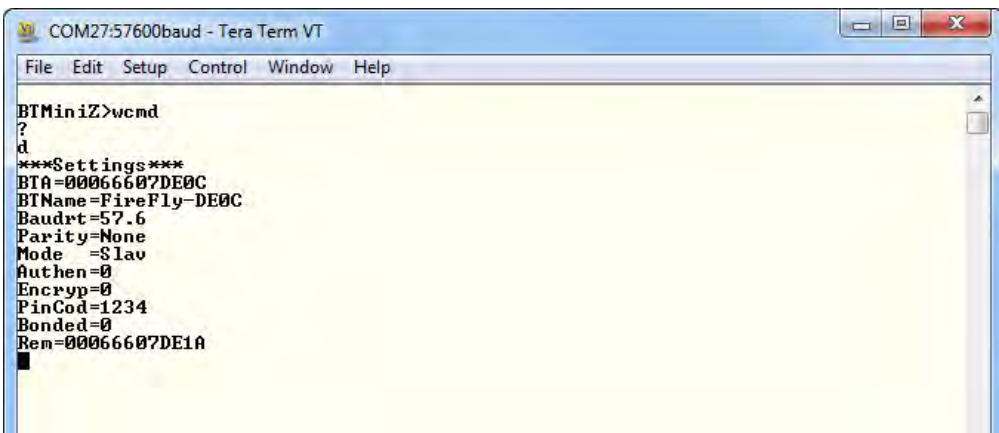

Figure 12. Mini-Z Shell Command Set

3. Confirm that all settings are correct for establishing a link by entering the RN-41 Module's Command Mode on each machine. At the BTMiniZ> prompt, enter the wCmd command and press Enter. The "?" prompt will appear on each console.

> **Note:** After you enter the wCmd command, a short delay may occur before the RN-41 Module's command prompt, ?, is acquired.

4. At the ? prompt, enter the i command to perform an inquiry scan and to assist in establishing a link by identifying available Bluetooth nodes.
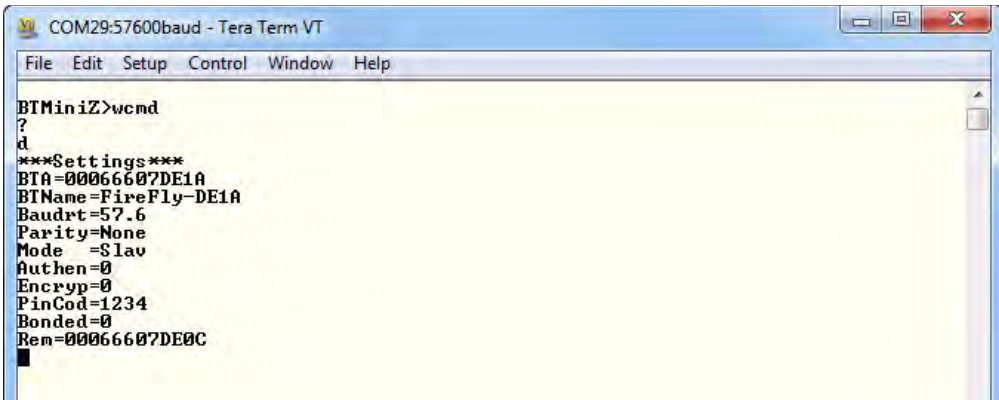
> **Note:** To investigate additional RN-41 commands, refer to the resources listed on Roving Networks' Class 1 Bluetooth Module web page, located at http:// www.rovingnetworks.com/products/RN_41.

5. Set the REM remote address parameters on both computers, as follows:

   (a) At the ? prompt enter sr,BTA (BTA is found in the complementary PC's settings); for example, sr,00066607DE1A.

   (b) Next, enter d to display the settings for each ZPAN module, as shown in Figures 13 and 14.
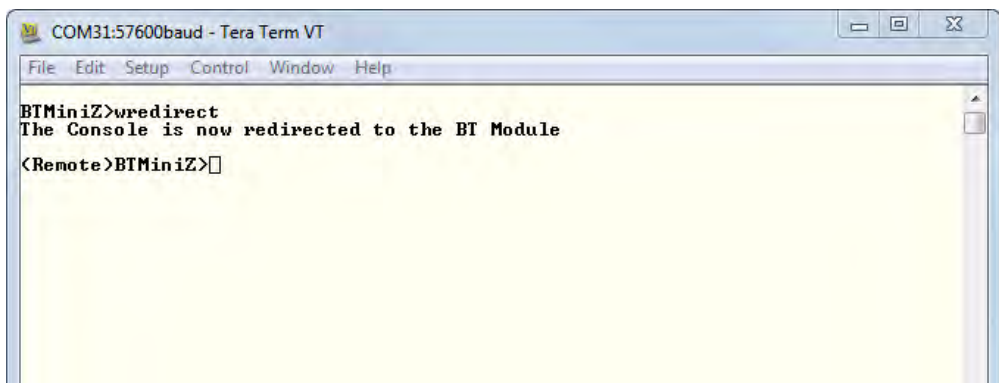
Figure 13. Settings for ZPAN Module 1

Figure 14. Settings for ZPAN Module 2

6. At this point, the settings on both RN-41 modules are set and ready to establish a connection. At the blinking square prompt, enter c in either computer, then press the Enter key to acquire the link and cause the Status LED to change from its blinking pattern to a solid ON.

7. Enter Ctrl-D on both terminals to exit RN-41 Command Mode and to enter the ZPAN Shell.

8. Choose one PC and enter the wRedirect command at the Shell prompt, then press Enter, as shown in Figure 15.

Figure 15. wRemotehost Command Screen

9. On the second PC, enter the wRemotehost command at the BTMiniZ> prompt, as
    shown in Figure 16, then press Enter. A <Remote>BTMiniZ> prompt will appear on
    the PC from which the wRedirect command was issued.

▶ **Note:** If the command order is reversed – for example, if the wRemotehost com-
    mand is issued before the wRedirect command – simply press the Enter key
    on the computer from which the wRedirect command is issued, and the
    <Remote>BTMiniZ> prompt will appear.
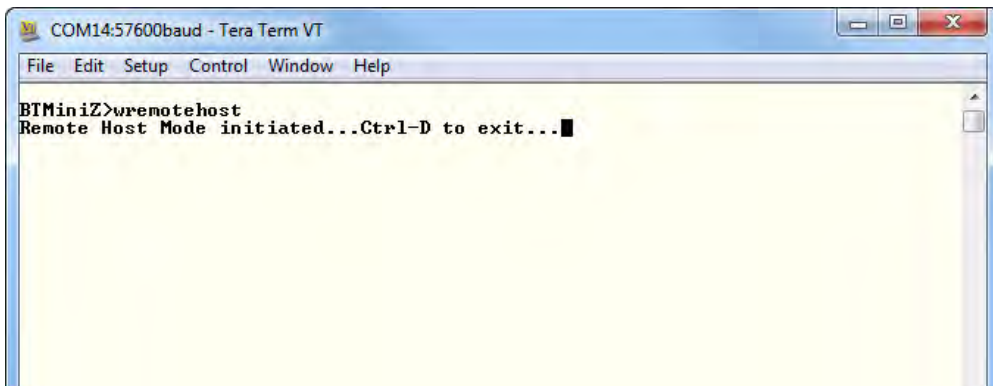
Figure 16. wRedirect Command Screen

▶ **Notes:** To view the host and client settings side by side, see Table 2 on page 17.

    To learn more about the settings for the RN-41 module's RESET state, refer to
    the resources listed on Roving Networks' Class 1 Bluetooth Module web
    page, located at http://www.rovingnetworks.com/products/RN_41.

    At this time, it is important to understand that upon issuance of the wRedirect
    command, the *client* ZPAN Module remotely controls the *host* ZPAN Module
    that is operating under the wRemotehost command.

10. To test for a successful wireless personal connection, enter the `setled r on` command to cause the (client) `wRedirect` shell to illuminate a red LED on the remote (host) ZPAN Module. Enter the `setled r off` command to turn this LED off. A similar routine can be used to toggle the yellow (`y`) and green (`g`) LEDs.

11. If both ZPAN modules are communicating with each other, your wireless Mini-Z ZLAN setup is complete.

Appendix A. Wireless Communication Reference

Table 2 lists the Roving Networks RN-41 Module settings necessary to establish a wireless link between two Mini-Z ZPAN modules. Note the BTA and Rem settings between host and client.

Table 2. Wireless Connection Settings

Host	Client
BTA = 00066607DE0C	BTA = 00066607DE1A
BTName = FireFly-DE0C	BTName = FireFly-DE1A
Baudrt = 57.6	Baudrt = 57.6
Parity = None	Parity = None
Mode = Slav	Mode = Slav
Authen = 0	Authen = 0
Encryp = 0	Encryp = 0
PinCod = 1234	PinCod = 1234
Bonded = 0	Bonded = 0
Rem = 00066607DE1A	Rem = 00066607DE0C

Customer Support

To learn more about this product, find additional documentation, get your technical questions answered or report issues, please contact esales@zilog.com.

> ⚠ **Warning:** DO NOT USE THIS PRODUCT IN LIFE SUPPORT SYSTEMS.

LIFE SUPPORT POLICY

ZILOG'S PRODUCTS ARE NOT AUTHORIZED FOR USE AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS WITHOUT THE EXPRESS PRIOR WRITTEN APPROVAL OF THE PRESIDENT AND GENERAL COUNSEL OF ZILOG CORPORATION.

As used herein

Life support devices or systems are devices which (a) are intended for surgical implant into the body, or (b) support or sustain life and whose failure to perform when properly used in accordance with instructions for use provided in the labeling can be reasonably expected to result in a significant injury to the user. A critical component is any component in a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system or to affect its safety or effectiveness.

Document Disclaimer

©2012 Zilog, Inc. All rights reserved. Information in this publication concerning the devices, applications, or technology described is intended to suggest possible uses and may be superseded. ZILOG, INC. DOES NOT ASSUME LIABILITY FOR OR PROVIDE A REPRESENTATION OF ACCURACY OF THE INFORMATION, DEVICES, OR TECHNOLOGY DESCRIBED IN THIS DOCUMENT. ZILOG ALSO DOES NOT ASSUME LIABILITY FOR INTELLECTUAL PROPERTY INFRINGEMENT RELATED IN ANY MANNER TO USE OF INFORMATION, DEVICES, OR TECHNOLOGY DESCRIBED HEREIN OR OTHERWISE. The information contained within this document has been verified according to the general principles of electrical and mechanical engineering.

ZNEO and Mini-Z are trademarks or registered trademarks of Zilog, Inc. All other product or service names are the property of their respective owners.