

# Mini-Z<sup>™</sup> WLAN SSR Kit

#### **Quick Start Guide**

## Introduction

This quick start guide describes how to set up and use Zilog's Mini-Z WLAN 28-Pin Module, a 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 WLAN Module using Zilog's optically-isolated <u>Mini-Z Solid State Relay Design Board</u>.

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, which you can do without any advance programming.



Figure 1. The Mini-Z WLAN 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 WLAN 28-Pin Module is included within the Mini-Z WLAN SSR Kit.

### Hardware

The Mini-Z WLAN SSR Kit includes the following hardware:

- Mini-Z WLAN 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 WLAN 28-Pin Module. A standard USB driver is available for download from the <u>FTDI website</u>.

### Documentation

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

- Mini-Z WLAN 28-Pin Module Reference Design Document (RD0005)
- Mini-Z WLAN Shell and Flash Loader Reference Manual (RM0062)
- RN-171 Wi-Fi Class 1 Module Datasheet and User Manual

Please refer to the Zilog website at <u>www.zilog.com</u> 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.

- <u>Step 1: Unpack the Hardware</u>: see page 3
- <u>Step 2: Attach the Mini-Z Module</u>: see page 3
- <u>Step 3: Establish Hardware Connections</u>: see page 4
- <u>Step 4: Apply Power to the SSR Design Board</u>: see page 4
- <u>Step 5: Acquire the Mini-Z Shell Prompt</u>: see page 4
- <u>Step 6: Establish A Wireless Connection</u>: see page 6



### Step 1: Unpack the Hardware

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

### Step 2: Attach the Mini-Z Module

Carefully attach the Mini-Z WLAN 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 1
- Pin 1 on Zilog's Mini-Z Solid State Relay Design Board is labeled, simply, "1".



Figure 2. The Location of Pin 1 and Chamfer on the Mini-Z WLAN 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 3: 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 power (5V to 12V) to the SSR Design Board via Power Terminal J3.

• Note: Because Power Terminal J3 is not accessible after the Mini-Z Module is attached, Zilog suggests adopting a provision for a detachable power connection.

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

## Step 4: Apply Power to the SSR Design Board

Apply power to the Mini-Z Solid State Relay Design Board. The blue power status LED on the Module will illuminate, and two LEDs adjacent to the Roving Networks RN-171 WiFly module will blink to signify the connection state

To determine specific lighting pattern information, refer to the <u>RN-171 Wi-Fi Class 1</u> <u>Module Datasheet and User Manual</u>.

• 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.

### Step 5: Acquire the Mini-Z Shell Prompt

Open a terminal emulation program such as HyperTerminal, then observe the following procedure:

1. Select the appropriate port where the Mini-Z is located.

• Note: This port can be found within HyperTerminal by monitoring the Port setup window while plugging and unplugging the USB cable from the SSR

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Design Board; the port will appear and disappear. Similarly, this task can also be performed using the Windows Device Manager.

2. Configure HyperTerminal to reflect the following port settings:

Baud Rate: 57600 Data: 8 bit Parity: none Stop: 1 bit Flow Control: none

- 3. Press the RESET switch on the SSR Design Board. The WLANMiniZ> prompt will appear on the HyperTerminal screen.
- 4. Using your PC's keyboard, enter ? to see list of available commands.
- 5. Enter a command followed by a space ("")and a question mark ("?") to see a description for a particular command. By the same token, enter a command followed by its parameter(s) to execute a particular 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 PB0 bit 0 ON.

```
setport p0 on
```

### Step 6: Establish A Wireless Connection

Observe the following procedure to establish a wireless link between the two Mini-Z WLAN Modules. The Mini-Z Shell commands (such as scan) will assist toward verifying the link.

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:

WLANMiniZ>

2. On each PC's keyboard, verify the Mini-Z Shell Library installation by entering the ? character for a list of commands (for example: flashapp ?); see Figure 3.



Figure 3. Mini-Z Shell Command Set



3. To enter Command Mode, enter wcmd on each machine. A new prompt (e.g., "<2.23>"), will appear in the console.

**Note:** After entering the wcmd command, a short delay may occur before the HyperTerminal prompt is acquired.

4. Choose one PC to be the client machine and label it *MyZlan1*. Input the settings for *MyZlan1*, as shown in Figure 4. Refer to <u>Table 1</u> on page 16 for the *MyZlan1* settings.



Figure 4. WLAN Settings for MyZlan1

5. Enter save and press the Enter key. Next, enter reboot and press the Enter key a second time for the settings to take effect; see Figure 5.





	test - Hyperiermmal	
e <u>E</u> dit <u>V</u> iew <u>C</u> all <u>Transfer</u> <u>H</u>	<u>i</u> elp	
6 8 8 6		
<2.23> set wlan joi	n Ø	
юк		
(2.23> set wlan ssi	d MyZlan1	
<2.23> set wlan cha	n Ø	
AOK	h E (adhaa)	
AOK		
(2.23) set ip addre	ss 169.254.1.1	
<2.23> set ip netma	sk 255.255.0.0	
40K (2 23) set in dhen (	0	
AOK		
<2.23> set ip proto ANK	3	
<2.23> set ip local	port 2000	
10K (2 23) save		
Storing in config		
(2.23) reboot PobootzWiElu Vor 2	23 04-26-2011 on DN-171	
4AC Addr=00:06:66:7	1:a7:83	
*READV*		

Figure 5. Output of the Save and Reboot Commands

6. The second PC will be the host machine; label it *MyZlan2*. Input the settings for *MyZlan2*, as shown in Figure 6. Refer to <u>Table 1</u> on page 16 for the *MyZlan2* settings.



🏶 Mini-Z 2 - HyperTerminal	E 🗖 🔀
File Edit View Call Transfer Help	
	· ^
WLANMiniZ>wcmd	
<2.23> set wlan join 4	
<2.23> set wlan ssid MyZlan2 AOK	
<2.23> set wlan chan 1 AOK	
<2.23> set wlan auth 6 AOK	
<2.23> set ip address 169.254.1.2 AOK	
<2.23> set ip netmask 255.255.0.0 AOK	
(2.23) set 1p dhcp 0 AOK	
<2.23> set ip proto 3 AOK	
<2.23> set ip localport 80 AOK	
<2.23> _	1
*	3
Connected 0:45:26 ANSIW 57600 8-N-1 SCROLL CAPS. MORE T	V. Prtell

Figure 6. WLAN Settings for MyZlan2

7. Enter save and press the Enter key. Next, enter reboot and press the Enter key a second time for the settings to take effect; see Figure 5.

**Note:** The settings for *MyZlan2* differ from the settings shown in Figure 4. Refer to <u>Table 1</u> on page 16 for the *MyZlan2* settings.

8. On both machines, Press Ctrl-D to exit Command Mode. Again on both machines, enter the wreset command and press the Enter key to start from a known state. The result of entering this wreset command on *MyZLAN1* is shown in Figure 7.



	test - HyperTerminal	
File Edit View Call	ransfer Help	
0603000	ď	
<2.23> set w1	an chan Ø	
AOK <2.23> set w1 AOK	an auth 6 (adhoc)	
<2.23> set ip	address 169.254.1.1	
<2.23> set ip	netmask 255.255.0.0	
<2.23> set ip	dhcp 0	
<2.23> set ip AOK	proto 3	
<2.23> set ip AOK	localport 2000	
<2.23> save		
Storing in co	ntig	
*Reboot*WiFly MAC Addr=00:0 *READY*	Ver 2.23, 04-26-2011 on RN-171 5:66:71:a7:83	
WLANMiniZ>wre	set	
Reset Request	edReady	
WLANMiniZ>		

Figure 7. Output of the wreset Command

**Note:** To learn more about the settings for the RN-171 module's RESET state, please refer to the Roving Networks User Manual at <u>http://www.rovingnet-works.com/Docs/WiFly-RN-UM.pdf</u>.

9. Enter womd to reenter Command Mode and press the Enter key. Next, enter scan and press the Enter key. As a result, *MyZlan1* should be able to detect *MyZlan2*; you can validate this connection by noting the SSID column in Figure 8. Press the Enter key a second time to return to the prompt.



	test - HyperTerminal	
File Edit View Call	Transfer Help	
12 3 10	ዓ 💣	
004		17
HUN		
(2 23) set i	n proto 3	
AOK		
<2.23> set i	p localport 2000	
AOK		
<2.23> save		
Storing in c	onfig	
<2.23> reboo	t	
*Keboot*W1F1	y Ver 2.23, 04-26-2011 on KN-171	
MHC HOOF-00:	00:00:11:07:00	
ALLINT .		
WI ANMini7>wr	fasa	
Reset Reques	tedReadv	
WLANMiniZ>wc	nd	
<2.23> scan		
(2.23)		
SCHN:Found J	COTD Ch DCCT Can HOC Oddward Switze	
1	$M_{\rm U}$ $Z_{\rm Ian}^{2}$ $M_{\rm I} = 61$ $M_{\rm Ian}^{2}$ $M_{\rm I}$ $M_{\rm Ian}^{2}$ $M_{\rm Ian}$	
2	ixcorp 02 -67 WPA2PSK 00:16:c2:a9:69:90 AFSM-AFS 1106	6
3	2WIRE525 11 -76 Open 26:87:e4:b1:43:48 Adhoc 200 9b	
17		
nnected 0:12:03	Auto detect Auto detect SCROLL DARS HUM Capture Photecho	

Figure 8. Output of the scan Command

10. On *MyZlan1*, enter join *MyZlan2* and press the Enter key to join *MyZlan1* and *MyZlan2*. The result of entering this join command is shown in Figure 9. Press the Enter key a second time to establish the connection.





	test - HyperTerminal	
<u>File Edit View Gall Transfer H</u> elp		
WLANMiniZ>wreset		-
Reset RequestedReady		
WLANMiniZ>wcmd		
<2.23> scan		
SCAN: Found 3		
Num         SSID         Ch         RSSI           1         MyZlan2         01         -61           2         ixcorp         02         -67           3         2WIRE525         11         -76	Sec         MAC Address         Suites           Open         00:06:66:71:a7:92         Adhoc 2200         0           WPA2PSK         00:14:c2:a9:69:90         AESM-AES         1104           Open         26:87:e4:b1:43:48         Adhoc 200         9b	4
<pre>&lt;2.23&gt; join MyZlan2 Auto-Assoc MyZlan2 chan=1 mode=</pre>	=open scan ok	
ADhoc on MyZlan2 chan=1	W-710	
Using Static IP	Myzianz	
IF=UP		
TP=169.254.1.1:2000		
NM=255.255.0.0		100
GW=0.0.0.0 Listen on 2000		
Connected 0:12:51 Auto detect Auto detect	SCPCIEL CARS INNIM Septure Printecho	

Figure 9. Output of the join Command

11. On *MyZlan1*, enter open 169.254.1.2[SPACE]80. The following message is displayed, as shown in Figure 10.

\*OPEN\*\*HELLO\*





Reference and a second	test - HyperTerminal	
File Edit View Call	Transfer Help	-
	9 m <sup>2</sup>	
		(2)
WLHNM1n12>WCM	πα	-
(2 23) scan		
<2.23>		
SCAN: Found 3	The second second second second second	
Num	SSID Ch RSSI Sec MAC Address Suites	
	MyZlan2 01 -61 Open 00:06:66:71:a7:92 Adhoc 2200 0	
2	1xcorp 02 -67 WPH2PSK 00:14:c2:a9:69:90 HESM-HES 1104	4
3	2W1RE525 11 -76 Upen 26:87:e4:01:43:48 Hdnoc 200 90	
(2 23) join k	Mu71an2	
Auto-Assoc Mu	vZlan2 chan=1 mode=OPEN SCAN OK	
ADhoc on MvZl	lan2 chan=1	
<2.23> Connec	cted via Ad-Hoc on MyZlan2	
Using Static	IP	
IF=UP		
DHUP=UFF	1.0000	
117=109.204.1. NM-255 255 0	.1:2000 0	
GU=0 0 0 0	. 0	
listen on 200	00	
276-120 EV. 61		
<2.23> open 1	169.254.1.2 80	
Connect to 16	69.254.1.2:80	
<2.23> *0PEN*	**HELLU*_	
Connected 0:14/15	Auto detect Auto detect Of Office CADE LAUA Connue Dank store	
Connected 0:14:45	MATO REFERE MATO REFERE AND A MATCHINE AND A MATCHI	)+(.)

Figure 10. Output of the open Command

**Notes:** The HyperTerminal screen may display the message ERR:Connected! However, the redirection is functioning properly.

IP and WLAN values can be determined by entering get ip or get wlan at the prompt. A complete list of commands is available in the <u>Rov-ing Networks Users Manual</u>.

12. Press Ctrl-D to exit Command Mode and return to the Mini-Z Shell.



13. At the prompt, enter wredirect on both computers. As a result, commands that you entered on one screen will appear on the other screen. See the examples in Figures 11 and 12.

8.6		test - Hyperi	Ferminal		
Elle Edit View	<u>Call</u> <u>Iransfer</u> <u>H</u> elp				
0683	10 <del>2</del> 6				
1	MyZlan2 01 -61	Open	00:06:66:71:a7:92	Adhoc 2200 0	
2 3	ixcorp 02 -67 2WIRE525 11 -76	WPA2PSK Open	00:14:c2:a9:69:90 26:87:e4:b1:43:48	AESM-AES 1104 Adhoc 200 9b	4
<pre>&lt;2.23&gt; jo Auto-Asso ADhoc on &lt;2.23&gt; Co Using Sta IF=UP DHCP=0FF IP=169.255 GW=0.0.0. Listen on &lt;2.23&gt; op Connect t &lt;2.23&gt; *0 WLANMiniZ The Conso</pre>	in MyZlan2 c MyZlan2 chan=1 mode= MyZlan2 chan=1 nnected via Ad-Hoc on tic IP 4.1.1:2000 5.0.0 0 2000 en 169.254.1.2 80 pEN**HELL0* >wredirect le is now redirected f	OPEN SCF MyZlan2	IN OK		
hello to	you pc2!_ Auto detect Auto detect	SCRULL	CAPS NUM Capture	Phinkesho	

Figure 11. Output of the wredirect Command on MyZlan1



🥐 test - Hyper Terminal	
File Edit View Call Transfer Help	
АОК	0
<2.23> set ip dhcp 0 AOK <2.23> set ip proto 3 AOK (2.23> set ip localment 80	
ADK AOK <22.23> save Storing in config <2.23> reboot *Reboot*WiFly Ver 2.23, 04-26-2011 on RN-171 MAC Addr=00:06:66:71:a7:92 Creating ADhoc network ADhoc on MyZlan2 chan=1 *READY*	
WLANMiniZ>wreset Reset RequestedReady	
WLANMiniZ>wredirect The Console is now redirected to the WLAN fff	
hello to you pc2!           Connected 0:41:50         Auto detect         57600 8-N-1         CARES (MUM) Capping (Printment))	

Figure 12. Output of the wredirect Command on MyZlan2

14. If MyZlan1 and MyZlan2 are communicating with each other, the test is complete.



## **Appendix A. Wireless Communication Reference**

Table 1 lists the Roving Networks RN-171 Module settings necessary to establish a wireless link between two Mini-Z WLAN Modules.

Host PC: MyZlan2	Client PC: MyZlan1
set wlan join 4	set wlan join 4
set wlan ssid MyZlan2	set wlan ssid MyZlan1
set wlan chan 1	set wlan chan 0
set wlan auth 6	set wlan auth 6
set ip address 169.254.1.2	set ip address 169.254.1.1
set ip netmask 255.255.0.0	set ip netmask 255.255.0.0
set ip dhcp 0	set ip dhcp 0
set ip proto 3	set ip proto 3
set ip localport 80	set ip localport 2000

Table 1	Wireless	Connection	Settings
	1110023	CONNECTION	Settings

Tables 2 and 3 show the Host-Client communication settings for the get ip and get wlan commands, respectively.

Host PC: MyZlan2	Client PC: MyZlan1
IF = DOWN	IF = DOWN
DHCP = OFF	DHCP = OFF
IP = 169.254.1.2:80	IP = 169.254.1.1:2000
NM = 255.255.0.0	NM = 255.255.0.0
GW = 0.0.0.0	GW = 0.0.0.0
HOST = 0.0.0.0:2000	HOST = 169.254.1.2:80
PROTO = UDP, TCP	PROTO = UDP, TCP
MTU = 1524	MTU = 1524
FLAGS = 0x7	FLAGS = 0x7
BACKUP = 0.0.0.0	BACKUP = 0.0.0.0

#### Table 2. Mini-Z WLAN Settings for the get ip Command



Host PC: MyZlan2	Client PC: MyZlan1
SSID = MyZlan2	SSID = MyZlan1
Chan = 1	Chan = 0
ExtAnt = 0	ExtAnt = 0
Join 4	Join 4
Auth = ADHOC	Auth = ADHOC
Mask = 0x1fff	Mask = 0x1fff
Rate = 12, 24 Mb	Rate = 12, 24 Mb
Linkmon = 0	Linkmon = 0
Passphrase = rubygirl	Passphrase = rubygirl
TxPower = 0	TxPower = 0

#### Table 3. Mini-Z WLAN Settings for the get wlan Command



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