

HARDWARE MANUAL



WP543
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REVISION HISTORY

Revision	Information / Changes
Rev 1.0	First release for WP543 BareBoard
Rev 1.01	Added Build and Install Process (For OpenWRT Firmware On Complex Mylo Loader)
Rev 1.02	Changes to Default MiniPCI Slot.
Rev 1.03	Added "How to JTAG Complex Loader"
Rev 1.04	Modified GPIO Pins
Rev 1.05	Revised for WP543A HV

REASONS USING DEVELOPMENT KIT

The Development Kit is especially useful for customers who are developing their firmware. Below are the reasons how we have made it more user-friendly for you.

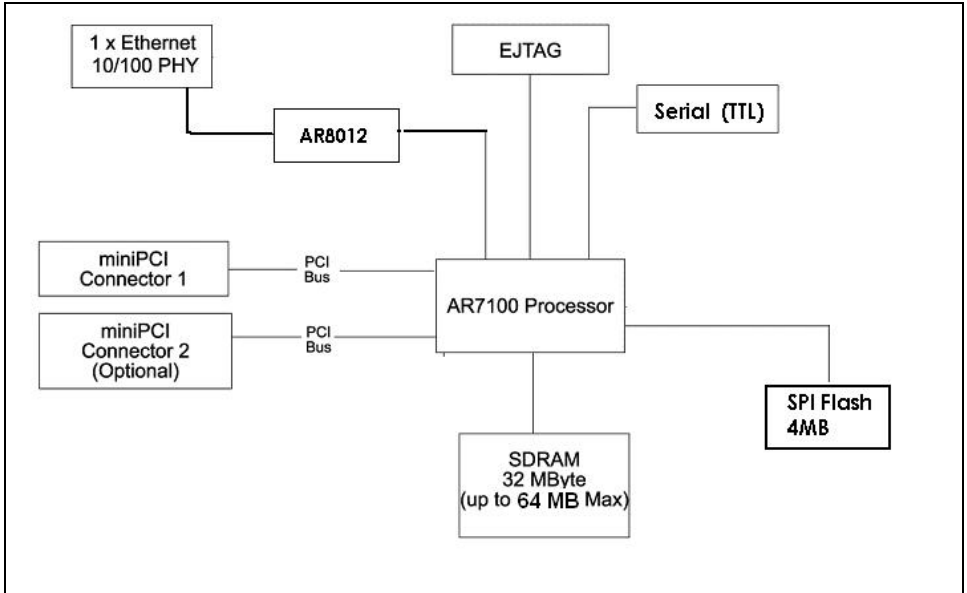
PURPOSE	WHY IS DEVELOPMENT KIT USEFUL?
<ul style="list-style-type: none">● Develop customer's own firmware using Compex mylo loader.● Develop openWRT Firmware on using Compex Mylo loader)	Serial Converter can be used to debug the firmware on Compex Mylo loader.
<ul style="list-style-type: none">● Port Own Firmware and Loader Over to WP543	Serial Converter can be used to debug the Serial Output messages. JTAG Programmer can be used to load in your loader.

Ordering Options - Standard Configurations*

Currently item codes are not available; please contact our sales team at sales@compex.com.sg

* Configurations are subjected to change without notice

BLOCK DIAGRAM



Differences between WP543 Series

Differences	WPJ543	WP543 HV	WP543A HV
CPU Processor	AR7130 300MHz	AR7130 300MHz	AR7161 680MHz
Default Flash Size (Max 16MB Opt.)	4MB	4MB	8MB
Default RAM Size (Max 64MB Opt)	32MB	32MB	32MB
MiniPCI Slots	1 Slot (9.2mm)	1 Slot (9.2mm)	2 Slots (9.2mm + 15.5mm)
Input Voltage	Passive PoE (12V – 24V) DC (12V-2A / 24V-1A)	Passive PoE (24V – 48V) 802.1af PoE (48V – 56V) DC (24V – 48V)	Passive PoE (24V – 48V) 802.1af PoE (48V – 56V) DC (24V – 48V)
Dimensions	105 x 95 x 18 (mm)	129 x 109 x 18.5 (mm)	129 x 109 x 20.2 (mm)
Packaged Product	Mimo Junior (MMJ/MMJ2) Mimo Station (MMS/MMS2)	Mimo Classic (MMC) Mimo Station (MMS/MMS2)	Mimo Classic (MMC) (Single Slot) Mimo Station (MMS/MMS2)

CONFIGURATION AND INSTALLATION

GPIO Bit Mapping

GPIO Bit	Description
0	N/A
1	N/A
2	N/A
3	DE1(LED1)---LED
4	DS1(LED2)---LED
5	DS3(WLAN)---LED
6	DS4(CONN)---LED
7	DS5(DIAG)---LED
8	SW4(Normal High) Reset Switch
9	UART_SIN
10	UART_SOUT
11	N/A
12	JTAG(TCK)
13	JTAG(TDO)
14	JTAG(TDI)
15	JTAG(TMS)
16	JTAG(TRST_L)

Interface Connectors

The board interface connector pin assignments and signal descriptions are included in the following sections. The connectors are listed in the section below and the connector locations are shown in the following diagrams.

Connector	Function
J5	Power Jack
J6	Ethernet Ports
J11	JTAG Port
J29/J30	MiniPCI Slot
J31	Serial Port
SW6	Reset Button

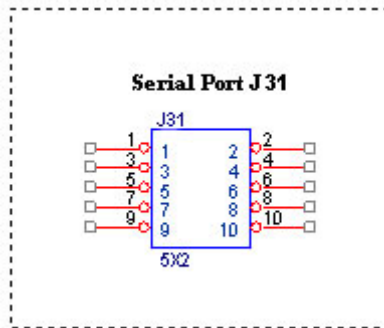
Serial Port Header

The Serial Port (J31) Header signaling is shown in the following table.

Pin	Signal
1	VCC – 3.3V
2	UART 0 Transmit Data
3	UART 0 Receive Data
4	GND

Note:

Our Serial port Implementation requires an external high-impedance serial port not usually available with the serial ports of the notebooks/computers. You will need a Serial Converter available in the market. For our customers' convenience, it is bundled together with the board Development Kit.



Serial Console Settings

The serial console settings used together with the serial port is given below. This serial port uses TTL signals, and therefore you have to use serial converter using MAX-211 IC (or other IC in the market that convert TTL signals to RS232 signals) in order to use it with the PC.

Baud Rate	115200
Data	8 Bit
Parity	None
Stop	1 Bit
Flow Control	None

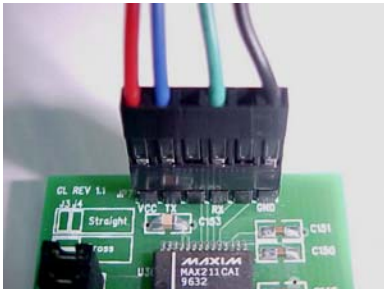
Precaution when using Serial Converter

Please attach the serial converter first on the board serial header, before attaching the power supply. This is to ensure that there is no surge of power to the serial converter, and prevent any damage the chipset on the serial converter.

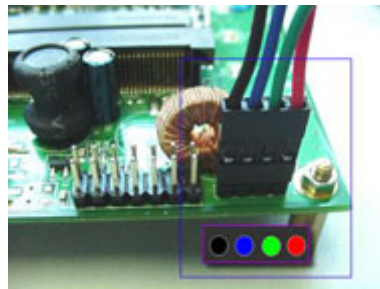
Serial Converter Pin Layouts

Cables on the serial converters are provided. You can use the 6 Pin (Fixed) to 4 Pin (Fixed) provided. The pin layouts of the serial converters for use with the board are as follows:

Pin Assignment (Serial Converters)	Signal (Serial Converters)	Connected to Pin on WP543	Signal (WP543)
Pin 1	VCC(3.3V) – Red	Pin 1	VCC (3.3V)
Pin 2	TX – Blue	Pin 5	RX
Pin 4	RX - Green	Pin 3	TX
Pin 6	GND – Black	Pin 7	GND



Arrangement of Cables on Serial Converter to the board



Arrangement of Cables on the board itself

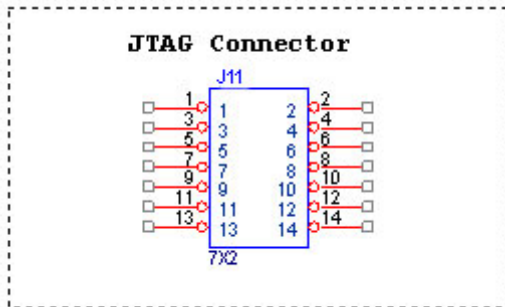
JTAG Port Header

The primary purpose of the board JTAG Port Header is to facilitate program download into Flash memory.

Pin	Signal	Pin	Signal
1	TRST_N	2	GND
3	TDI	4	GND
5	TDO	6	GND
7	TMS	8	GND
9	TCK	10	GND
11	RESET	12	NC
13	DINT	14	3V3

Note:

Normally, it has a JTAG Programmer compatible with the board. It is bundled with the board Development Kit. This JTAG programmer is able to download file onto the Flash, and thus recover a corrupted loader.



Ethernet Connectors

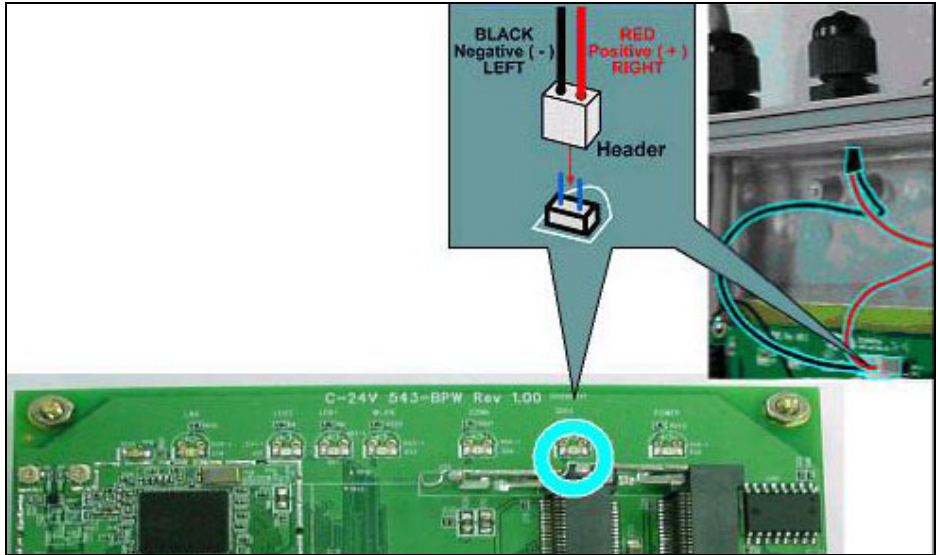
The board contains 1 X 10/100 Base-TX Ethernet Channels. The Ethernet Channels are available through standard 8-pin RJ45 connectors.

Ethernet Connectors (J6) signaling is shown below.

Pin	Signal
1	TX+
2	TX-
3	RX+
4	PoE+V
5	PoE+V
6	RX-
7	GND
8	GND

How to Extend Antenna Alignment to Case LED

You might want to extend the Antenna Alignment LED to the LED of the case. You just need to do a simple extension.



1. Jumper Added on the DIAG LED.
2. Attach a cable to the Antenna Alignment LED to extend to Case LED

JTAG Process

Minimum Requirement

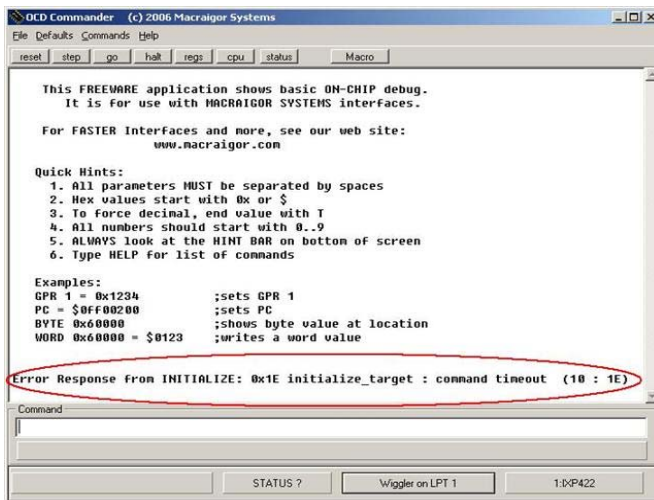
1. OCD Commander ver2.5.4
2. upbios.tst file (same for all Compex device)
3. zMylo.bin file(different device have different zMylo.bin)
4. JTAG cable

Steps

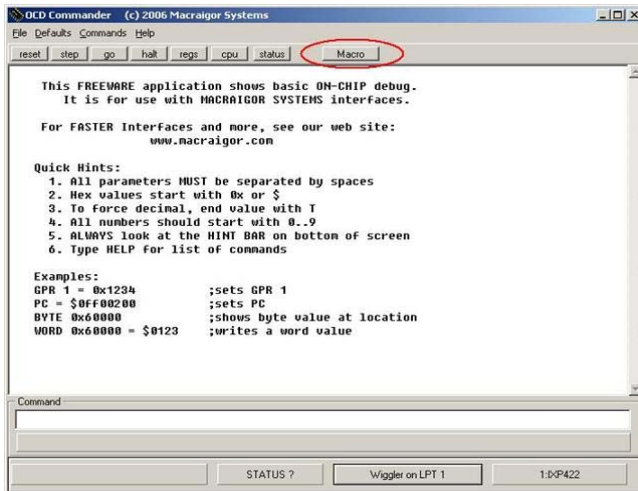
1. Install the OCD Commander to your PC
2. Plug the JTAG cable to the JTAG port of the device
3. Run OCD Commander Program
Set "Target Processor" for the particular device
eg. WP18 - INTEL, IXP422

Click "OK"

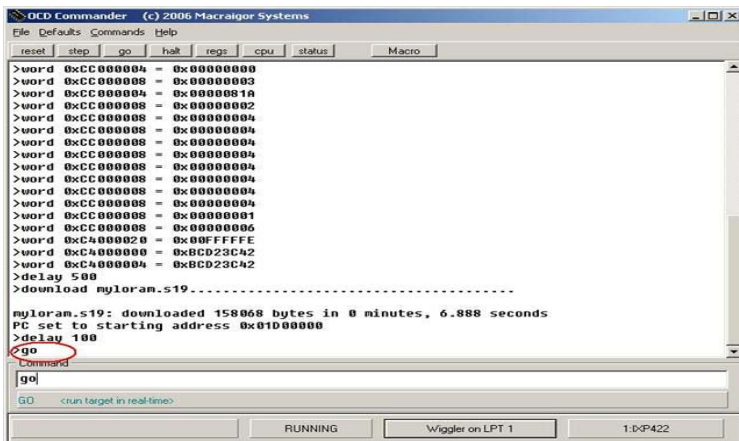
4. If there is this error message "Error Response from INITIALIZE....", please check the JTAG cable connection. Close the OCD Commander Program and go back to Step 3.



5. Click on the "Macro" and choose a specific .mac file.



6. Let it run until u see "go"



7. Open command prompt
8. tftp upbios.tst
9. tftp zMylo.bin (please observe the DIAG LED is off)
10. If either step 9 or step 10 fails, please start from step 3 again.
11. Power off the device and unplug JTAG cable
12. Power on the device and tftp the firmware into the device.
13. Reboot when done.

Build and Install Process

(For OpenWRT - ABG firmware on Compex Mylo Loader)

Minimum Requirement

1. Compex loader version 2.54 or above.
2. OpenWRT will only be supported on WP543 Series with 4MB NOR flash and above.
3. Please ensure that the Ethernet connection is able to ping address = 192.168.168.1
4. Please note that this only supports 11ABG cards. Please take a look at the next section for support of 11n cards.

Compiling OpenWRT suitable for use on WP543

1. Getting source codes
>svn co -r 12448 <https://snv.openwrt.org/openwrt/trunk>
2. Apply patches from the files mod-wp543.tgz
>tar zxvf mod-wp543.tgz
>cp -a mod-wp543/* trunk/
3. Compile
>cd trunk
>cp wp543.config .config
>make

OpenWRT Firmware will be in bin/openwrt-ar71xx-wp543.bin

Uploading the OpenWRT firmware to WP543 running MyLoader v2.54.0717

- a. Via Compex Firmware
 - Put the AP in Firmware Upgrade mode and upload the file.
 - This file is for WP543 with 4MB or 8MB NOR flash.
- b. Via TFTP
 - Go to the firmware upgrade mode (By pressing and hold the Reset button and plug-in the power adapter).
 - Upload the OpenWRT image to the device (tftp -i 192.168.168.1 put openwrt-ar71xx-wp543.bin)

First run of OpenWRT

- For customers with Serial console

Build and Install Process

(For OpenWRT - ABGN firmware on Compex Mylo Loader)

Minimum Requirement

1. Compex loader version 2.54 or above.
2. OpenWRT will only be supported on WP543 Series with 4MB NOR flash and above.
3. Please ensure that the Ethernet connection is able to ping address = 192.168.168.1
4. Please note that this only supports 11N cards. Please take a look at the previous section for support of 11ABG cards.

Getting source codes

```
-----  
svn co https://svn.openwrt.org/openwrt/tags/8.09  
or  
http://downloads.openwrt.org/kamikaze/8.09/kamikaze_8.09_source.tar.bz2
```

Apply patches from the file mod-wp543.tgz

```
-----  
tar zxvf mod-wp543.tgz  
cp -a mod-wp543/* 8.09/
```

Compile

```
-----  
cd 8.09  
cp wp543.config .config (wp543fusion.config for fusion driver config)  
make
```

Update firmware on WP543

```
-----  
Press and hold the config button when power up the board,  
so the board is in firmware update mode (DIAG LED blinking).
```

Run tftp to upload the firmware, e.g.

```
tftp -i 192.168.168.1 put wp543_openwrt_abgn_v100_b091104.img
```

First run of Openwrt

WP543

During first run after flashing the firmware, do not power off the AP until the following messages appear:

jffs2_scan_eraseblock(): End of filesystem marker found at 0x0

jffs2_build_filesystem(): unlocking the mtd device... done.

jffs2_build_filesystem(): erasing all blocks after the end marker... done.

If you do not have console, just wait for 5 minutes.

Default configurations

LAN: (br-lan)

ip address: 192.168.1.1

This is a bridged interface consists of ethernet interface eth0 and wireless interface ath0

WLAN: (ath0)

driver: Fusion 7.3.0.387

mode: ap

ssid: openWrt

Note: Please contact Complex Sales for a manual on the settings for OpenWRT