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HARDWARE MANUAL



COMPEX SYSTEMS

WP54 6E

RoHS-compliant

Revision: 1.4



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REVISION HISTORY

Revision	Information / Changes
Rev 1.1	First release for WP54 6E/ WP54 WRT6E BareBoard
Rev 1.2	Added 1 point to “Additional Notes”
Rev 1.3	Revert to using Complex Loader Version 2.40 to load Open-WRT.
Rev 1.4	WP54 6E / WP54 WRT 6E becomes WP54 6E. There is no longer any difference between these 2 versions. The CPLD security chip is removed. Added “Reasons for Using Development Kit” and “Ordering Configurations”

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?
Develop Open-WRT on WP54	Serial Converter can be used to debug the Open-WRT firmware.
Port Own Firmware Over to WP54	Serial Converter can be used to debug the Serial Output messages.
Port Own Firmware and Loader Over to WP54	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*

ORDER CODE	CONTENTS
P-C5 OEMWP546E	<ul style="list-style-type: none"> WP54 6E Bare-board (Pre-Loaded with Compex Firmware)
WP54AG 6E DEV KIT	<ul style="list-style-type: none"> WP54 6E Bareboard (Pre-loaded with Compex Firmware) Wireless AG mini-PCI (Compex WLM54AG) PoE+ Injector (Compex PoE+1A4815) JTAG Programmer (Cable from PC to JTAG Programmer included) Serial Converter (Cable from PC to Serial Converter included) 24V DC Power Supply

* Configurations are subjected to change without notice

CONFIGURATION AND INSTALLATION (WP54 6E)

The following is the GPIO Bit mapping specific to the Complex WP54 6E.

GPIO Bit Mapping

The Complex WP54 6E GPIO bit mapping is shown below.

GPIO Bit	Description
0	Not Used (CPLD)
LED22	Not Used (CPLD)
LED32	Not Used (CPLD)
LED41	Not Used (CPLD)
1	Temperature Sensor / Voltage Sensor (DS2438) (Optional for Board)
2	Output, LED (Diagnostic)
3	Output, System Reset
4	Input, Reset Button
5	Output, Flash A20 Control
6	Output, LED(WLAN)
7	Output, LED(LAN)

Interface Connectors

The Compex WP54 6E 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.

<u>Connector</u>	<u>Function</u>
J0	Power Jack
U10/U12	Ethernet Ports
JP1	JTAG Port
JU7_2	CPLD Pin Header
J3	MiniPCI Slot
J1	Serial Port
SW1	Reset Button

Serial Port Header

The Compex WP54 6E Serial Port (J1) Header signaling is shown in the following table.

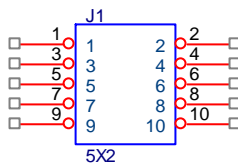
<u>Pin</u>	<u>Signal</u>	<u>Pin</u>	<u>Signal</u>
1	VCC – 3.3V	2	DTR – Data Terminal Ready
3	UART 0 Transmit Data	4	DSR – Data Set Ready
5	UART 0 Receive Data	6	DCD – Data Carrier Detect
7	GND	8	UART 1 Receive Data
9	UART 1 Transmit Data	10	GND

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 Compex WP54 Development Kit.



Serial Port J1



Serial Console Settings

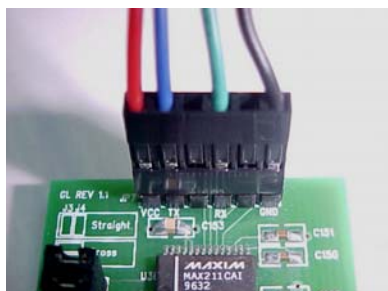
The serial console settings used together with the serial port is given below. This serial port uses TTL signals, and therefore you have to use serial converter using MAX-211 IC (or other IC in the market that convert TTL signals to RS232 signals) in order to use it with the PC.

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

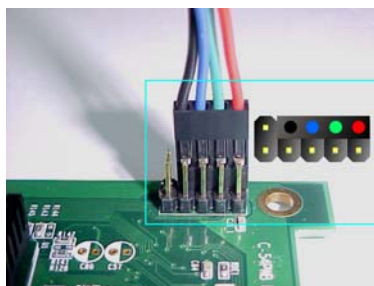
Serial Converter Pin Layouts

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 WP54 6E are as follows:

Pin Assignment (Serial Converters)	Signal (Serial Converters)	Connected to Pin on WP54	Signal (WP54)
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 WP54



Arrangement of Cables on WP54.

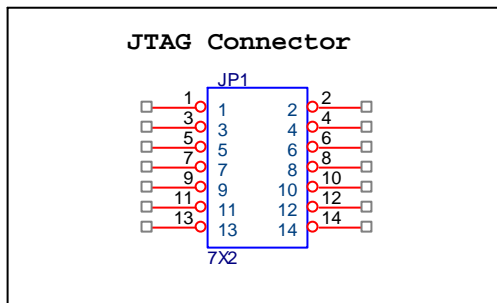
JTAG Port Header

The primary purpose of the Complex WP54 6E JTAG Port Header is to facilitate program download into Flash memory.

<u>Pin</u>	<u>Signal</u>	<u>Pin</u>	<u>Signal</u>
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:

Complex has a JTAG Programmer compatible with WP54 6E. It is bundled with Complex WP54 Development Kit. This JTAG programmer is able to download file onto the Flash, and thus recover a corrupted loader.



Ethernet Connectors

The CompeX WP54 6E contains 1 X 10/100 Base-TX Ethernet Channels. The Ethernet Channels are available through standard 8-pin RJ45 connectors. An additional Ethernet Channel is available on request.

Note: Only U10 support Power-over-Ethernet.

Ethernet Connectors signaling is shown below.

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

Ethernet Connector U10

Additional Notes (For WP54 6E)

1. Major difference between WP54 6E and WP54 1B are that
 - a. WP54 1B can only support 5V DC and 48V PoE. WP54 6E can support 12V to 48V DC and 15V to 48V PoE.
 - b. WP54 1B can only use DC Power when use the serial converter. WP54 6E can use both DC Power and the PoE when using the serial converter.
 - c. WP54 1B's both ports are PoE, but WP54 6E only has one port that is PoE.
2. Why do we need to use GPIO 5 to select the flash bank?

It is needed because the ADM5120 flash controller only supports 2MB flash space. A "0" on GPIO 5 selects the 1st 2MB of flash and a "1" selects the last 2MB flash.

3. Can we increase the flash size to 8MB?

No. ADMtek 5120 has a limitation of 4MB flash. If you are switching over from WRAP boards which is X86 based, after compilation, the codes recompiled to MIPS core is much smaller. Therefore you do not need such a huge space.

Additional Notes (For WP54 6E Using Open-WRT ONLY)

1. Our Open-WRT is based on the current development branch, Kamikaze.
2. Please download Open-WRT Source Codes from http://compex.com.sg/home/OEM/Open_wrt.htm
3. The Open-WRT is based on Linux 2.4. OpenWRT using Linux 2.6 is currently being developed by Compex team. It is also actively being debugged by the Open-WRT forum. Compex is committed to support Open-WRT in anyway we can.
4. Default IP address for
 - Port nearer the DC Supply is: 192.168.1.1
 - Port nearer the Ethernet Ports is: 192.168.0.2

5. MAC Address is Compex MAC Address (00-80-48-XX-XX-XX).
6. Please refer to the Read ME-WP54.txt in /WP546E(Open-WRT) if you want to upload the Open-WRT Source codes.
7. Flash Memory Map:

Offset:

0x00000000	Compex Loader
0x00050000	TRX (Linux Kernel + Root FS)
0x00300000	JFFS
0x003F0000	NVRAM Partition

8. Is there any space available for the JFFS partition?

The JFFS partition is dynamic. If the TRX size is less than (0x300000 – 0x50000), it always start at 0x300000. However, when the TRX size is larger than (0x300000 – 0x50000), the JFFS partition is moved (in 0x10000 size increment) to be after the TRX file.

9. What can be the maximum size for TRX?

The maximum size for TRX is (0x3F0000 – 0x50000) = 3801088 bytes. If the TRX reaches maximum size, there is no JFFS partition

10. What is the use of the JFFS partition? Can we store configuration files if there is no JFFS partition?

Our current Open-WRT stores configuration files in writable JFFS partition, not in the NVRAM partition. Configuration cannot be saved if there is no JFFS partition, although it can still run using default configurations.

11. Please do note that ONLY when Compex Loader is V2.40 and above, then it can support the use of Open-WRT.

WP54 6E



12. Please also note that if you have bought WP54G 6E, then you change back from Open-WRT to CompeX firmware, the CompeX firmware to be used must be a "G" version. It is the same for WP54AG 6E.