



networks@work

# HARDWARE MANUAL



COMPEX SYSTEMS

## WPE72

**RoHS-compliant**

Revision: 1.1

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## REVISION HISTORY

Revision	Information / Changes
Rev 1.1	First release for WPE72

## REASONS USING DEVELOPMENT

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.

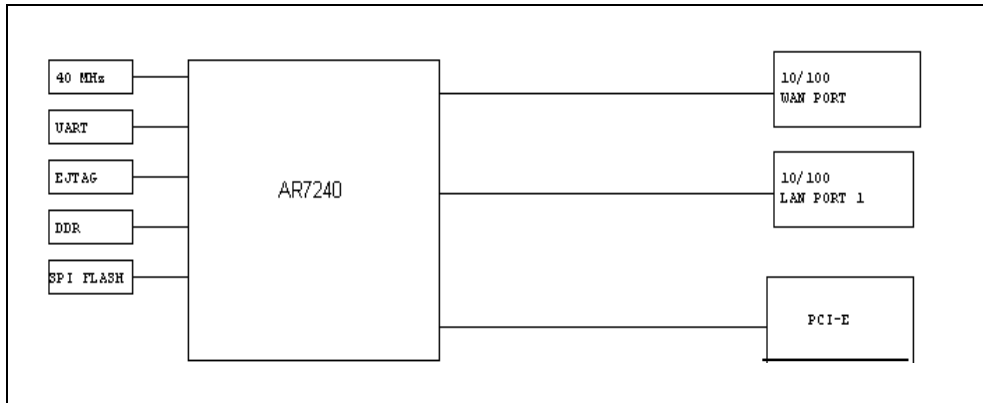
PURPOSE	WHY IS DEVELOPMENT KIT USEFUL?
Develop Open-WRT on WPE72	Serial Converter can be used to debug the Open-WRT firmware.
Port Own Firmware Over to WPE72	Serial Converter can be used to debug the Serial Output messages.
Port Own Firmware and Loader Over to WPE72	Serial Converter can be used to debug the Serial Output messages. JTAG Programmer can be used to load in your loader.

### Ordering Options - Standard Configurations\*

ORDER CODE	CONTENTS
WPE72 7A02PC832	WPE72 Bare-board (Pre-Loaded with Compex Firmware)
WPE72 DEV KIT	<ul style="list-style-type: none"> <li>• WPE72 Bareboard (Pre-loaded with Compex Firmware)</li> <li>• JTAG Programmer (Cable from PC to JTAG Programmer included)</li> <li>• Serial Converter (Cable from PC to Serial Converter included)</li> </ul>

\* Configurations are subjected to change without notice

# BLOCK DIAGRAM



## KEY FEATURES

### General Information

PROCESSOR	Atheros AR7240
MEMORY	32MB(max 64MB optional) DDR SDRAM
NOR FLASH	8MB (max 16MB optional.)
PHYSICAL PORTS	1 x Type III Mini-PCle Slots* 2 X 10/100 Base-TX Ethernet Port (with Auto MDI/MDIX)
RADIO SUPPORTED	802.11b/g/n, 803.11a/b/g/n
DEBUG INTERFACE	Serial (TTL) / JTAG (ARM-standard 20 pin ) Optional JTAG Programmer** available Optional Serial Converter*** available
OPERATING TEMPERATURE	-20°C to 70°C
LED INDICATORS	6 LEDs total: <ul style="list-style-type: none"><li>• Power, WLAN ,Diagnostic(DS11, DS12, DS13, DS14)</li></ul>
OTHER FEATURES	Push-Button Reset
DIMENSIONS	95mm x 68mm x 18mm
ENCLOSURE	Directly mountable into Compex's recommended WPE enclosure, with the need to separate mounting plates.

## Information On Power

POWER OVER ETHERNET	High-power passive PoE input voltage (Passive Range: 9V-24V)
TYPICAL OPERATING POWER	3W (Without MiniPCle Radio, Board Only)
DC JACK	5V ~ 24V DC Supply
MINIPCIE SLOTS	1)8 W total continuous power at 3.3V 2)only one miniPCle slot

\* Depend on Order Configuration

\*\* JTAG Programmer available to reprogram the flash in case of loader corruption.

\*\*\* Serial Converter available to change the TTL signals on board to RS232 signals for debugging

## PORTING OWN FIRMWARE OVER TO WPE72

To port over your own firmware over to WPE72, you will need to have the drivers to support the boards and also some image generating tool to help to generate the header for your firmware to be ported over to our platform. This process is appropriate for customers using Complex Loader.

### Drivers to Support the boards

1. Go to Open-WRT website <http://openwrt.org/>
2. (Please contact [support@compex.com.sg](mailto:support@compex.com.sg) to get this file) and put the files under the trunk folder you have uploaded.
3. You will get a kernel and a root file system that can work with our board. Alternatively, you can use and copy it to .config
4. Port your firmware over to the root file system.



## CONFIGURATION AND INSTALLATION (WPE72)

The following is the GPIO Bit mapping specific to the Compex WPE72.

### GPIO Bit Mapping

The Compex WPE72 GPIO bit mapping is shown below.

WPE72 GPIOFunction	
GPIO_0	P2 (RJ45)
GPIO_1	P1 (RJ45)
GPIO_2	SPI_CS_L
GPIO_3	SPI_CLK
GPIO_4	SPI_MO_SI
GPIO_5	SPI_MI_SO
GPIO_6	TDI
GPIO_7	TDO
GPIO_8	TMS
GPIO_9	SIN
GPIO_10	SOUT
GPIO_11	BUZZER
GPIO_12	RESET
GPIO_13	DIAG

GPIO_14	LED at DS11
GPIO_15	LED at DS12
GPIO_16	LED at DS13
GPIO_17	LED at DS14

## Interface Connectors

The Complex WPE72 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.

<b>Connector</b>	<b>Function</b>
J4	Power Jack
P1、 P2	Ethernet Ports
JP1	JTAG Port
S2	Reset Button
JP2	Serial Port

## Serial Port Header

The Complex WPE72 Serial Port (JP2) Header signaling is shown in the following table.

<u>Pin</u>	<u>Signal</u>
1	VCC – 3.3V
3	UART 0 Transmit Data
5	UART 0 Receive Data
7	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 Complex WPE72 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 WPE72 are as follows:

Pin Assignment (Serial Converters)	Signal (Serial Converters)	Connected to Pin on WPE72	Signal (WPE72)
Pin 1	VCC(3.3V) – Red	Pin 1	VCC (3.3V)
Pin 2	TX – Blue	Pin2	TX
Pin 4	RX - Green	Pin 3	RX
Pin 6	GND – Black	Pin 4	GND



Arrangement of Cables on Serial Converter to WPE72



Arrangement of Cables on WPE72.

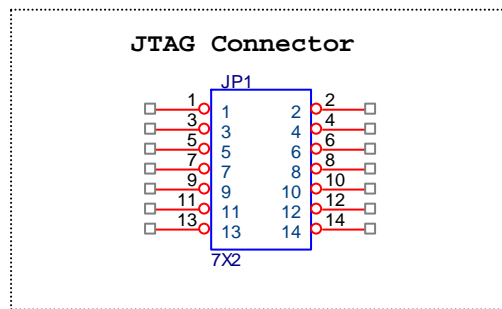
## JTAG Port Header

The primary purpose of the Compex WPE72 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:

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.

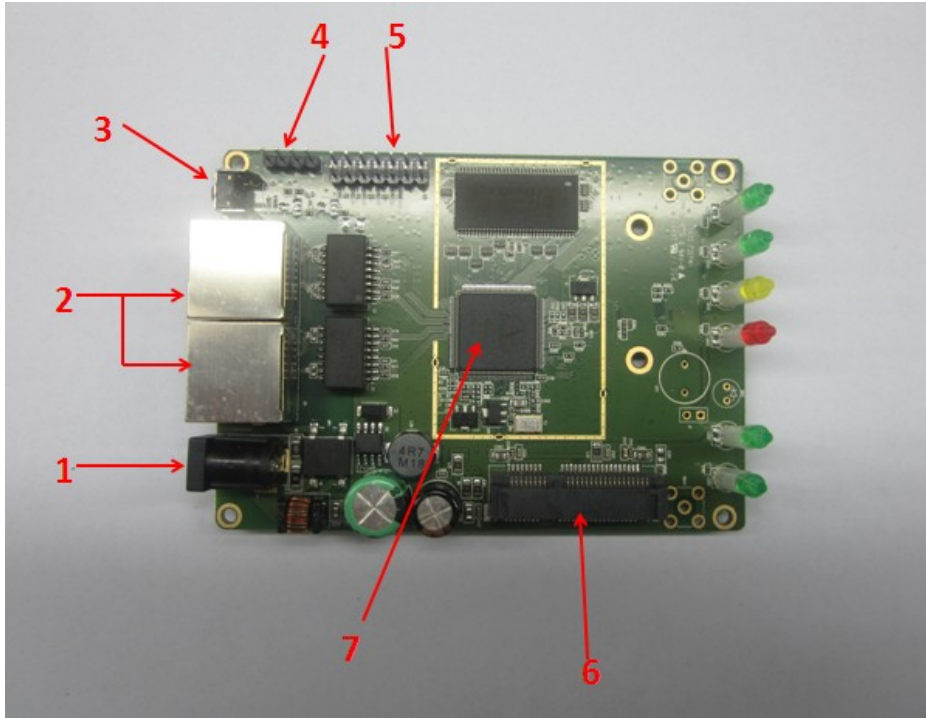


## WLAN Settings

The Compex WPE72 contains the WLAN settings in the last 64KB of the SPI Flash. The board data is in the 0x0, and the radio config is in the 0xF8.

# Appendix I

## Board Features



## Top Side Of Board

No:	Feature	Descriptions
1	DC Jack	5V - 24V DC Supply
2	Ethernet	10/100Base-T Ethernet port
3	Reset button	For board reset and startup mode control
4	Serial port	Serial port connection header
5	JTAG port	JTAG jumper header for programming
6	mini-PCIe slot	9.2mm mini-PCIe slot
7	AR7240	400MHz Network Processor