

## MiniEMBWFi Embedded controller

SKU16184



### Technical overview

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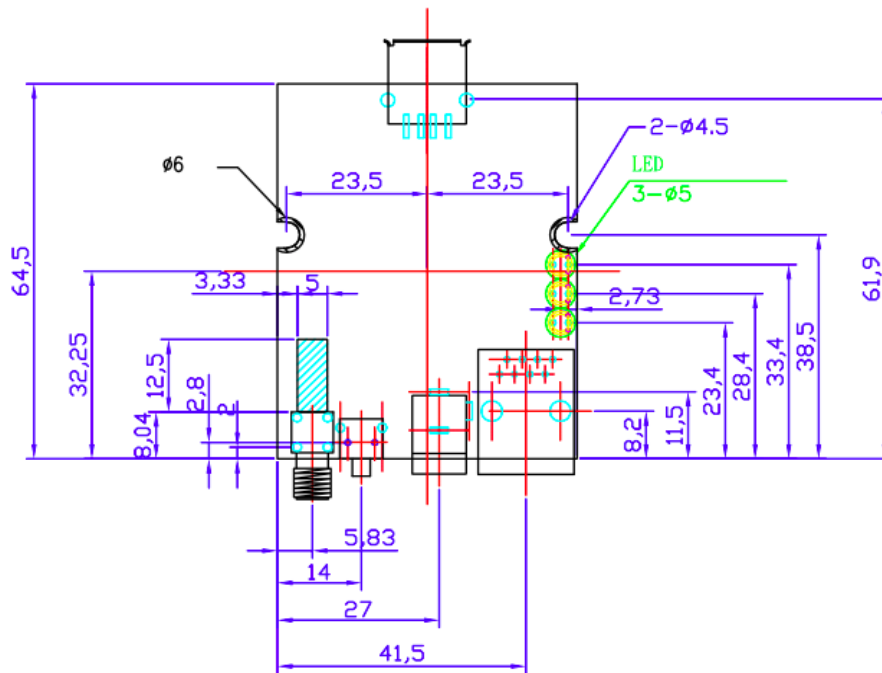
## 1. Technical details

- Ralink RT3050 based board
- 320Mhz CPU, MIPS 24KEc
- 1x UART serial port / programming port
- 8MB Flash / 32MB RAM
- 1x USB2.0 OTG
- 1x WAN/LAN Port 10/100M UTP
- 1x WLAN 802.11n, access point (AP), station (STA), A, B, G, N or mixed mode operation, Antenna 3dBi Dipole detachable antenna, Output Power 11n: 15±1dBm, 11g: 15±1dBm, 11b: 18±1dBm
- Size: 67mm x 50mm
- Operating Temperature: 0~50oC, Storage: -20~60oC
- Humidity range: 10~90% (Non-Condensing)
- Storage: Max.95% (NonCondensing)
- Certification FCC, CE

## 2. Main features

- Supports Linux OpenWrt and Ralink SDK Linux distribution
- Provides Internet/Ethernet connectivity for your project
- Provides USB host/device connectivity
- Uses GNU GCC open source tools as part of the SDK
- Works with Omnima STM32Extender IO board
- Cost effective

### 3. Mechanical drawing



### 4. Serial pinout for JP2

1	+3.3V
2	RX
3	GND
4	TX

Pins 2 and 4 are UART 3.3V powered. For a connection to a RS232 interface a level shifter such as MAX232 should be used. The connection settings are: 57600bps, 8N1

### 5. Power supply

The adapter used to power the board should have the following specification: 5V, 2.5A. The positive supply should be connected to the inner pin on the connector.

### 6. Physical dimensions

The size of the board is: 67mm long, 50mm wide, 15mm max height.

## 7. Enclosure

Small plastic enclosure dimensions: 74mm (L) x 62mm (W) x 23mm (H)



## 8. Development environment

Firmware	<a href="http://omnima.co.uk/docs/openwrt-omni-emb-20120306.bin">http://omnima.co.uk/docs/openwrt-omni-emb-20120306.bin</a>
FCC EMC test report	<a href="http://omnima.co.uk/docs/MiniEMBWiFi-FCC-EMC-Test-Report.zip">http://omnima.co.uk/docs/MiniEMBWiFi-FCC-EMC-Test-Report.zip</a>
OpenWrt source code and documentation	<a href="http://www.openwrt.org">http://www.openwrt.org</a>
STM32 expander daughterboard / Z-Wave controller / 1-Wire controller	<a href="http://www.omnima.co.uk/forums/index.php?showtopic=192">http://www.omnima.co.uk/forums/index.php?showtopic=192</a>
Omnima MiniEMBWiFi forum	<a href="http://www.omnima.co.uk/forums/index.php?showforum=15">http://www.omnima.co.uk/forums/index.php?showforum=15</a>

## 9. Uploading firmware using the programming cable (USB to UART cable)

To upload the firmware to the MiniEMBWiFi board flash:

- Setup a TFTP server on your host computer
- Copy the bin file to the TFTP folder and rename it to a shorter name such as: openwrt.bin
- Connect to the console serial port on MiniEMBWiFi
- Press 2 immediately after the U-boot menu text is printed
- Are you sure? Yes/No
- Enter the IP address for the board (in the same IP range as the TFTP server)
- Enter the IP address of the TFTP server
- Enter the name of the file to upload to flash (openwrt.bin)

To enter the U-Boot console press 4 when the menu is displayed.

Your new firmware will be uploaded and running.

The default IP address of the LAN interface will be: 192.168.1.1

**To change the LAN IP address via the serial console enter:**

```
uci set network.lan.ipaddr=192.168.1.111 (or an address of your choice)
```

```
uci commit network
/etc/init.d/netowrk restart
```

**To connect to the web interface enter the address of the device in your browser:**

http://192.168.1.111 (or an address of your choice)

#### 10. Developer notes for OpenWrt trunk - Linux 2.6.39 kernel

These steps where tested on Ubuntu 11.10 and OpenWrt trunk revision 28718.

- Setup the build environment on your host (Ubuntu or similar)
 

```
sudo apt-get install subversion zlib1g-dev gawk bison flex autoconf
libdigest-crc-perl intltool libncurses5-dev build-essential lua5.1
liblua5.1-0-dev gcc g++ ncurses-term quilt
```
- Checkout the OpenWrt code
 

```
svn co svn://svn.openwrt.org/openwrt/trunk/ openwrt
```
- Add the following feeds to openwrt/feeds.conf (if not already present)
 

```
src-svn packages svn://svn.openwrt.org/openwrt/packages/
src-svn luci http://svn.luci.subsignal.org/luci/trunk/contrib/package/
```
- Install packages needed for WiFi and LuCI web UI
 

```
./scripts/feeds update -a
./scripts/feeds install luci
make menuconfig

set Target System = Ralink RT288x/RT305x
set Subtarget = RT305x based boards
select hostapd and wpa_supplicant in 'Network' (select * for both options)
select LuCi -> Collections -> luci (select * for this option)
```

Then run: make

The built image is located in bin/ramips/openwrt-ramips-rt305x-omni-emb-squashfs-sysupgrade.bin

**To upload the image use TFTP as mentioned earlier in this document. You may need to shorten the name of the bin file so that it is recognised on your system and by the bootloader.**

#### 10. Powering up and connecting to MiniEMBWiFi for the first time

- Connect your LAN to the ethernet port on the unit
- Connect the 5V power supply to the unit
- The unit will try to obtain a DHCP IP address for your LAN router
- You can find the IP address assigned to the unit by:
  - Running 'nslookup omnima-mew' or
  - Looking up the client IP address assigned to 'omnima-mew' on your LAN router

- To connect to the OpenWrt LuCi web interface enter the IP address of the unit into your web browser or alternatively connect to the board using ssh.

**For more information visit the Omnima forums:**  
**<http://www.omnima.co.uk/forums/index.php?showforum=15>**

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