WBD 222

Hardware Manual

Revision 1.2

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Contents

Product Description

WILIBOARD WBD-222 is fast single board computer designed to work as a quick time-to-market solution for different applications: WISP customer premise equipment, 3G routers, point-to-point and point-to-multipoint wireless bridges, wireless mesh repeaters and 802.11 access points.

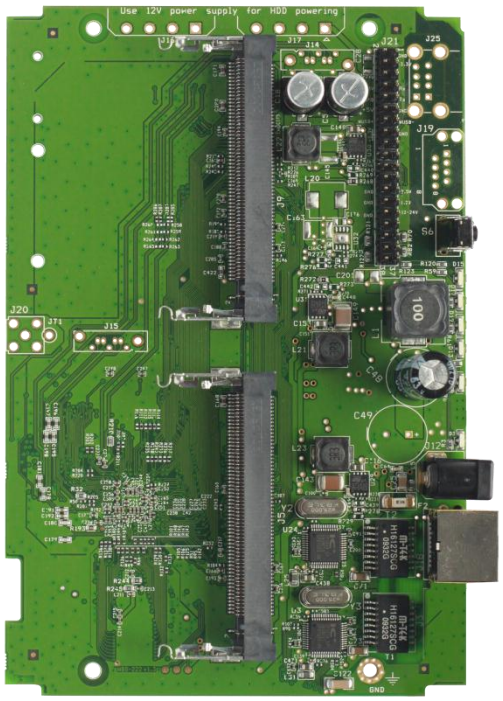


Figure 1 – Front View of the WBD-222

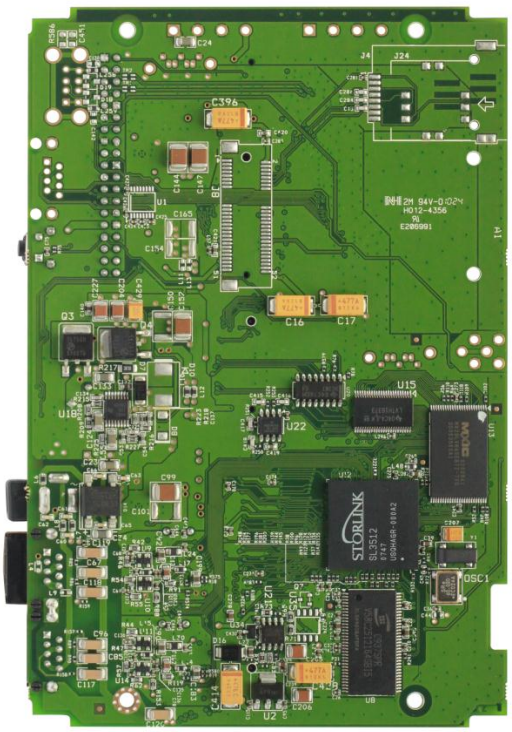


Figure 2 – Rear View of the WBD-222

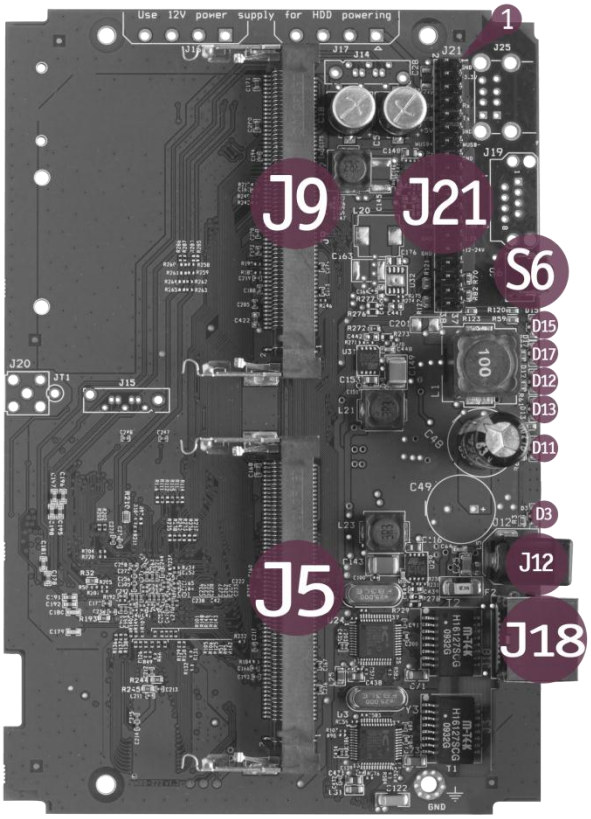
Features

- 32-bit 400 MIPS ARM architecture processor with embedded MMU, data/instruction caches, network and security acceleration engines
- 32 MB RAM and 8 MB Flash
- Two Mini-PCI slot accepts 802.11 and high power radios
- 10/100 Base-TX Ethernet port (2 ports optional)
- Low power consumption
- Accepts power from 12-48V DC power supply directly or over Ethernet, has overvoltage/overheating/6kV electrostatic discharge protection and is polarity insensitive
- Jumpers to access processor GPIO, Hi-Speed USB

Optional features:

- MiniPCI Express
- SIM holder
- 2 USB
- 2 SATA
- SMA connector for GSM antenna

WBD 222 Details



Item	Signification
J5	Type III Mini-PCI socket
J9	Type III Mini-PCI socket
J21	Jumpers with GPIO, Hi-Speed USB, power (number 1 signifies the first pin)
J12	Power connector
J18	Ethernet connector
D3	3.3V power LED*
D11	LAN activity LED
D12	GPIO controlled LED (GPIO0_3)*
D13	GPIO controlled LED (GPIO0_2)*
D15	GPIO controlled LED (GPIO0_1)*
D17	GPIO controlled LED (GPIO0_5)*
S6	Reboot button

* - LEDs can be turned off by software.

Figure 3 – WBD-222 Details

CPU

Storm Semiconductor Gemini™ SL3512 network processor.

Feature highlights:

- 32-bit 400MIPS ARM9 RISC architecture processor
- 300MHz speed
- Embedded MMU and 8K/16K data/instruction cache
- Supports 512MByte 16-bit 333MHz (PC2700) of external DDR SDRAM
- Dual USB2.0 selectable host or slave
- Built-in hardware security accelerator engine
- Hardware acceleration engine for TCP/IP/UDP processing
- Dual 802.3 compliant Ethernet MACs with 10/100 MII and 10/100/1000 RGMII
- Hardware 32-bit true random number generator
- 32-bit PCI 2.2 bus interface at 66MHz with four master device support
- Embedded Real Time Clock
- Timer, GPIO, UART, Watch Dog Timer
- 0.13um standard CMOS with approximately 1.3W dissipation

RAM

256Mbit (32MB) of 16-bit 333MHz double data rate (DDR) SDRAM.

Flash

64 Mbit (8MB) of 3V supply Flash memory.

Mini PCI

Mini-PCI is an adaptation of PCI standard for small devices. It is functionally equivalent to PCI version 2.2. WBD-222 board has two Type III Mini-PCI sockets (**J9** and **J5** in the *Figure 3 – WBD-222 Details*) and supports 3.3V and 5V cards. Each Mini-PCI has different power consumption at 3.3V: use high power radio cards up to 5W on J5 slot, and 10W on J9 slot. The 5V supports cards up 30W.

Ethernet

WBD-222 10/100 Base-TX Ethernet port features automatic MDI/MDIX switching, full duplex 10/100 Base-TX operation with auto-negotiation, electrostatic discharge (ESD) protection rated at 6 kV, accepts power over Ethernet (PoE functionality) with 12-48V voltage power injectors.

LEDs

Device has 6 green LEDs (see *Figure 3 – WBD-222 Details*): D3 – power LED, D11 – LAN activity LED and 4 green LEDs which are GPIO controlled. LAN LED turns on when Ethernet cable is connected and blinks when activity is detected on Ethernet port. Power and 4 GPIO controlled LEDS can be switched off by software:

CPU GPIO port	LED is on, when GPIO=1
GPIO0_3	D12
GPIO0_2	D13
GPIO0_1	D15
GPIO0_5	D17

Reset button

Software reset button (S6 in the *Figure 3 – WBD-222 Details*) allows upgrading firmware via TFTP, reset software to default configuration.

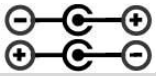
Connectors

Connector **J21** provides access to processor's GPIO pins, High-Speed USB and power sources. J21 connector (refer at the *Figure 3 – WBD-222 Details*) has #1 pin marked with a small copper square on a PCB.

J21 Pin	Connection	J21 Pin	Connection
1	GND	2	SYS_RESET#
3	+3.3V	4	+5V
5	GPIO0_4	6	input voltage +12-48V
7	GPIO0_9	8	+3.3V
9	GPIO0_10	10	GND
11	GND	12	+5V
13	No connection	14	No connection
15	GND	16	+3.3V
17	GPIO0_4	18	GPIO0_6
19	GPIO0_7	20	GPIO0_8
21	GPIO0_11	22	GPIO0_12
23	GPIO0_13	24	GPIO0_20
25	+2.5V	26	GND
27	+1.3V	28	GND
29	+12-48V	30	GND
31	GPIO1_28	32	+3.3V
33	LED D3	34	LED D12
35	No connection	36	LED D13
37	LED D17	38	LED D15

Power

WBD-222 can be powered by connecting 12-48V voltage power supply to **J12** jack (see *Figure 3 – WBD-222 Details*) or via Ethernet by using power injector. Insertion of power supply connector disconnects Ethernet power feed line. Device has polarity independent DC-DC converter with overvoltage and overheating protection, with two onboard SMD fuses. Power jack accepts J12 2.5/6.4 mm coaxial power connectors.


J12 12-48V

Conditions	12V	18V	48V
Idle with no radio card and LAN disconnected	0.22A/2.0W	0.16A/1.9W	0.10A/1.8W
Idle with no radio card and LAN connected	0.24A/2.2W	0.17A/2.2W	0.11A/2.0W
With different 802.11a radio cards while idle, LAN connected	0.37A/3.3W-0.40A/3.6W	0.26A/3.1W-0.29A/3.5W	0.17A/3.1W-0.18A/3.2W
With 802.11a radio card under load, 18dBm transmit power, LAN connected	0.49A/4.4W	0.35A/4.2W	0.22A/4.0W
With high power 802.11a radio card under load, LAN connected	0.87A/7.8W	0.61A/7.3W	0.39A/7.0W

Table 1 – Power consumption according provided voltage

Specifications

Electrical

Input voltage	12-48V
Operating current	0.17A Typical @ 12V

Mechanical

Dimensions	105 mm x 154 mm
Weight	108g

Environmental

Operating parameters

Temperature	-25°C to +65°C
Humidity	20% to 90% (non condensing)

Storage parameters

Temperature	-40°C to +85°C
Humidity	5% to 95% (non condensing)

Software

FWBD-222 comes preloaded with WILIBOX WILI software. Device can be accessed from a web browser using the following parameters:

Device IP address:	**192.168.2.66**
Username:	**admin**
Password:	**admin01**

For more information refer to WILI User's Guide which can be found at http://www.wiligear.com website.