

Product Specifications

Wireless Gateway

BLW-04EX

WG3005B1-JR

Version 3.0

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Revision History

<i>Edition #</i>	<i>Reason for revision</i>	<i>Issue date</i>
V1.0	First Release	March 6, 2002
V2.0	Change LAN port from 3 to 4 Change Accton internal model name from WG3004B1 to WG3005B1 Add PCI model name BLW-04EX Change LED definition	May 8, 2002

1. Introduction

The BLW-04EX is a wireless residential gateway specially designed by Accton for PCI aiming to provide simple and cost attractive Internet Access solution for both home and SOHO users. Its wireless LAN IEEE802.11b, 10/100Mbps Ethernet LAN connectivity, and Ethernet WAN interfaces provide users the flexibility of Internet connection. The Ethernet WAN interface is defined to link BLW-04EX to Internet through any xDSL or Cable modem, and this connection will enable users link to Internet through its built-in 10/100Mbps Ethernet LAN or WLAN (wireless LAN) interface.

Besides of flexibility on LAN connectivity, BLW-04EX also provides network security and management features for users. Network allocation translation (NAT), dynamic host connectivity protocol (DHCP), advanced packet filtering with hacker attack monitoring, logging and stateful packet inspection (Firewall), and wireless to wire Ethernet bridging are all supported.

1.1. Scope

This document describes the hardware architecture for the BLW-04EX and its software specifications.

1.2. Product Features

- Flexible connectivity interface (wireless and conventional RJ45 LAN port) suitable for different user environment
- Wireless-Ethernet bridge (access point without roaming)
- Browser-based configuration – OS independent and easy-of-use
- Comprehensive LED display showing the device and network status
- Simple Network Time Protocol supported
- DHCP Server / Client
- NAT
- Firewall (hacker attack logging, DoS and client filtering)
- PPP over Ethernet (WAN port)

2. Hardware Platform

2.1. General Overview

- LAN: 4 X 10/100 BaseT Ethernet ports
1 X Wireless 802.11b Access Point module
- WAN: 1 X RJ-45 10 Base-T WAN port
- Antenna: Extenal Antenna
- Reset button
- LED indicate 1 LED for system power indication
1 LED for WAN status indication
1 LED for wireless status indication
8 LED for LAN ports status indication

2.2. Hardware Architecture

The major internal components and external interfaces of the BLW-04EX are illustrated in Figure 1-1.

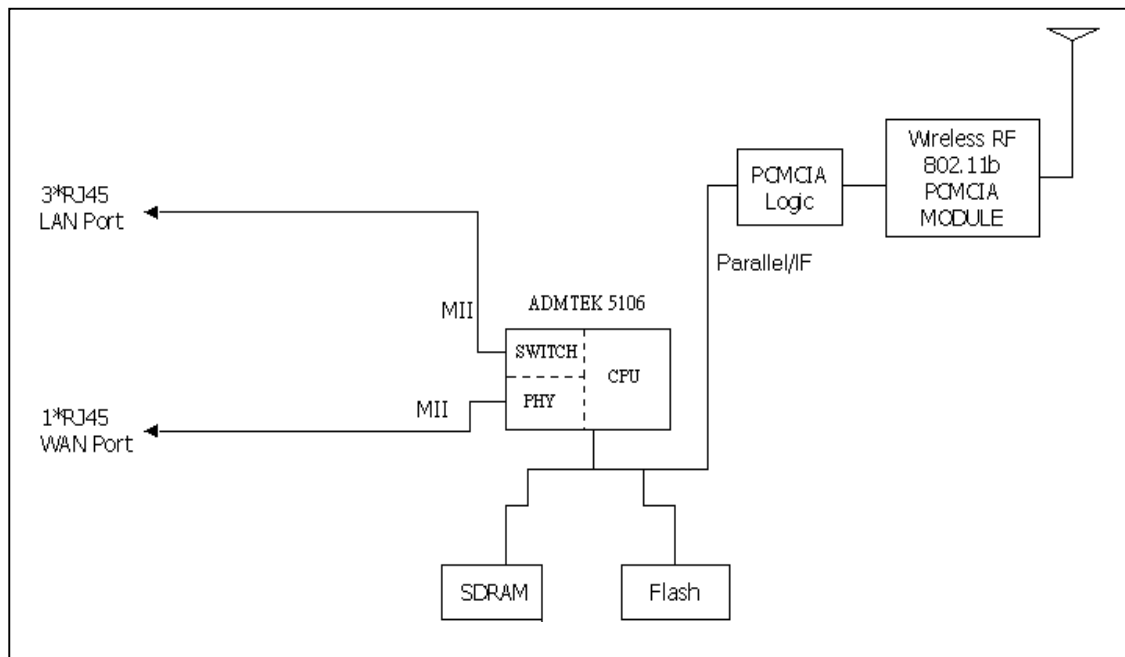


Figure 1-1 BLW-04EX Major Component and System Interface

2.3. Main Chipset Information

Item	Vender	Model # & Edition	Remark
CPU	ADMTEK	ARM7 5106	PHY & Switches Included
SDRAM			8MB
Flash			1MB

2.3.1. Host Processor

The ADM5106 is an ARM7-based home gateway controller integrated with 7-port switch, 5-port 10/100BaseT/TX PHY, and peripheral interface such as USB, SDRAM and flash memory. It provides a low cost solution to build a home gateway product allowing the home users to connect to the internet via an Ethernet port (or USB) through any xDSL modem or cable modem. There are five embedded DSP based 10BASE-T/100BASE-TX transceivers. An auto-negotiation function determines the selection of either the 10BASE-T or 100BASE-TX mode. The device fully complies with the IEEE 802.3 specification that determines the requisite registers, coding and waveforms to ensure proper transmitter and receiver operation. The ADM5106/5107 is implemented in a .25u CMOS technology and is featured in a 208 PQFP package. It is suitable for the BLW-04EX project with its comprehensive design and cost.

2.3.2. Flash

Upgradeable FLASH memory (1MByte).

2.3.3. SDRAM

Size: 8 MByte

2.3.4. Wireless Module

PCMCIA interfaced wireless module with Atmel and RFMD solution will be selected and implemented for wireless purpose.

2.3.5. Antenna

Two external Antenna

2.4. Reset Button

Reset button is designed and positioned at rear panel for rebooting and resetting system configuration to its default parameters. The reset button acts as:

- Reboot: by pushing 2 second.
- Back to factory default settings: by pushing 5 seconds

3. Software

3.1. Overview

The BLW-04EX provides following software features for users:

- WAN:
 - PPP over Ethernet
 - DHCP Client
 - NAT (IP Sharing)
 - DNS relay
 - SNTTP
 - Firewall
 - WAN to wireless routing
- LAN: DHCP Server
- Management: Web-based configuration
- Web-based Firmware upgradeable
- Wireless to LAN bridging

3.2. IP Address Settings

The default setting of BLW-04EX IP address is 192.168.2.1 and IP subnet mask is 255.255.255.0. With regard to the WAN port interface IP address, three mode provided by BLW-04EX to set its value, the fixed IP mode, DHCP client mode and PPPoE mode.

3.3. WAN

3.3.1. PPPoE (Point-to-Point Protocol over Ethernet)

Some DSL-based ISPs use PPPoE to establish communications with an end-user, and BLW-04EX support PPPoE client. Users don't have to run specific PPPoE client software in their station, BLW-04EX will do the translation automatically if when the WAN port in configured as using PPPoE.

3.3.2. DHCP (Dynamic Host Configuration Protocol) Client

BLW-04EX is a DHCP client when connecting to Internet environment and it will acquire the IP address information (IP address of its Ethernet WAN port, gateway IP address, and DNS IP address) from Internet through ADSL or Cable modem connection. However users have to assign DNS IP address manually if the DNS IP address cannot be automatically acquired from ISP.

3.3.3. NAT (Network Address Translation)

BLW-04EX supports NAT protocol (rfc1631) to the Internet and this NAT translation

works for both WAN Ethernet and PPP links. It maps IP addresses from one group to another and ensures private network is concealed from the general public.

NAPT (Network Address Port Translation) is also implemented by BLW-04EX and it translates network addresses and respective TCP/UDP ports into a single network address and its TCP/UDP port.

All the IP packets to (from) the Internet (through Cable/ADSL modem) will be NAT translated on BLW-04EX. This ensures Internal IP addresses would not be accessible and from the Internet users. Sessions are uni-directional, outbound from the private network. Sessions in the opposite direction may be allowed on an exceptional basis using static address maps for pre-selected hosts.

3.3.4. DNS (Domain Name Service) Relay

DNS protocol is to get IP address by using a specific domain name from the DNS server. By default, the BLW-04EX act as a DNS relay server. The internal LAN users may set the DNS server to BLW-04EX, and the BLW-04EX will then relay the DNS request to the DNS server provided by the ISP or a well known DNS server, and responds to packet from the DNS server to the client in the internal LAN.

The DNS relay table size is 20, while the table is full, the oldest one will be free and this entry will be used when a new DNS request coming. The DNS relay entry time-out time is 5 minutes.

3.3.5. SNTP (Simple Network Time Protocol)

BLW-04EX does not have a real time clock on board, so it uses the SNTP to obtain the current time from the SNTP server.

BLW-04EX sends the SNTP request every 1 to 10 minutes, and get the time by interpolation between two consecutive SNTP responses. BLW-04EX retrieves the information from the SNTP respond packet, and adjust the software real time clock program accordingly. The real time value is usually used in event logging, such as DHCP server, Hacker Attack logging and the user privilege settings.

3.3.6. Firewall

3.3.6.1. Client Filtering (Access Control)

The Client Filtering function lets administrator block specified services for specified client. The privileged clients are recognized by IP address. The specified services are: web (HTTP), file transfer (FTP), send email (SMTP), retrieve email (POP3), telnet, and news (NNTP).

3.3.6.2. Hacker Attack Logging and DoS(Denial of Service)

BLW-04EX deploys the most commonly reported hacker patterns to check the hacker activities. The device is able to detect when it is attacked by a hacker which matching the recorded patterns. The monitor function of the web-based management is able to retrieve and display the logged packets.

The following are the list of hacker patterns and DoS that can be detected by BLW-04EX:

- IP Spoofing
- Land Attack
- Ping of Death
- IP with zero length
- Smurf Attack
- TCP null scan
- SYN flood
- UDP flooding
- Tear Drop Attack
- ICMP defect
- RIP defect
- Fragment flooding

3.4. LAN

3.4.1. DHCP Server

Users can enable BLW-04EX as a DHCP server if the network does not have a DHCP server. It manages IP address of the internal local network and provides IP address, subnet mask, gateway address and DNS IP address to DHCP client in the network. Its managed IP address pool is available for users to set the segment and the default pool is from 192.168.2.2 to 192.168.2.254. Besides, it also provides a Class C subnet mask and it maintains a 5 entries static table in order to let user remains its existing IPs.

3.5. Management

3.5.1. Web-Based Configuration

The BLW-04EX supports HTTP1.0 (rfc 1945) and HTML (rfc1866) and base64 algorithm and provides management with HTTP protocol. The system provides a series of web pages in HTML format, which displays the configuration and status of the system. Users can view and manage the system with a standard web browser such as Netscape or Internet Explorer.

3.5.2. Status

A status function is supported in the web configuration to display the current connection status of BLW-04EX.

3.5.3. Diagnostics

A diagnostic function is supported in the web configuration to diagnose BLW-04EX and display the diagnostic result.

3.5.4. Upgradeable Firmware for Downloadable Software Services

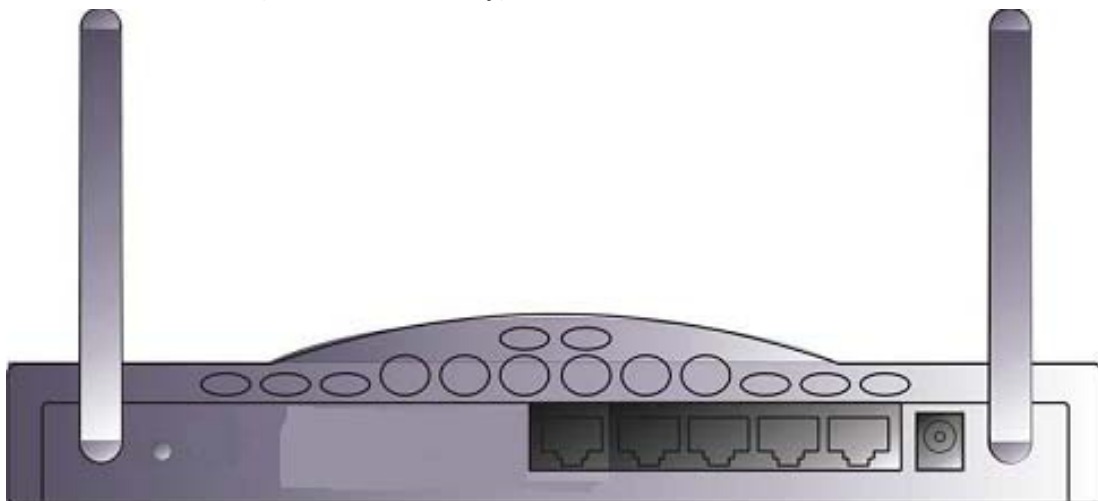
New firmware can be downloaded into BLW-04EX for upgrading product features through web-based management.

3.6. Appearance

3.6.1. Front Panel (for reference only)



3.6.2. Rear Panel (for reference only)



3.6.3. LED Definition



PWR	Power	Green X 1:	stays on when power connection is on
WLAN	Wireless AP	Green X 1:	stays on when wireless AP built
WAN	WAN port	Green X 1:	stays on when a good link is established
LAN	LAN port	Green X 4:	stays on when a good link is established blinking when packet is transmitting (stays off otherwise)
		Amber X 4:	stays on when link on 100Mbps stays off when links on 10Mbps

3.6.4. Brower Based Interface

TBD

4. Specifications

4.1. Hardware

- Dimension: 221 × 139 × 33.8 mm
- Power: 9V, 1000 mA
- Temperature 0°C ~ 40°C in operating
-25°C ~ 60°C in storage
- Humidity 15%~95%
- IEEE Standards: IEEE802.3, 802.3u, 802.11b
RFC DHCP
RFC NAT
- Cable Specification: Catg.5 UTP
- Electromagnetic Compatibility: VCCI/JATE/Telec
Drop

4.2. Wireless RF

- Radio: Complies with IEEE 802.11b
- Frequency Band:
 - USA – FCC 2412~2462MHz (Ch1~Ch11)
 - Canada – IC 2412~2462MHz (Ch1~Ch11)
 - Europe – ETSI 2412~2472MHz (Ch1~Ch13)
 - Spain 2457~2462MHz (Ch10~Ch11)
 - France 2457~2472MHz (Ch10~Ch13)
 - Japan – STD-T66/STD-33
2412~2484MHz (Ch1~Ch14)
- Operating Channels: IEEE 802.11 compliant
- Channels 14 channels (Japan)
- Modulation Type: BPSK for 1Mbps
QPSK for 2Mbps
CCK for 5.5/11Mbps
- Radio Technology: Direct Sequence Spread Spectrum (DSSS)
- Data Rate: 1 / 2 / 5.5 / 11 Mbps
- Output Power: > +15dBm; Typically +17dBm
- Current consumption: TX 450mA Max;
RX 320mA Max;
Typical 350mA
- Receive sensitivity: -80dBm for 11Mbps, 8% @ BER 1E-5

-83dBm for 5.5Mbps, 8% @ BER 1E-5

-88dBm for 2Mbps, 8% @ BER 1E-5

-90dBm for 1Mbps, 8% @ BER 1E-5

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FEDERAL COMMUNICATIONS COMMISSION INTERFERENCE STATEMENT

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

CAUTION:

Any changes or modifications not expressly approved by the grantee of this device could void the user's authority to operate the equipment.

FCC RF Radiation Exposure Statement

This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20cm between the radiator and your body.