



AVS Wireless LAN Developers Kit Version 1.3

For embedded system developers who need to quickly and easily produce embedded wireless applications, the **AVS Wireless LAN Developers Kit** is an embedded system development kit that provides an integrated hardware and software development solution which drastically reduces the time and cost of developing embedded wireless applications. Unlike general-purpose embedded development kits, the **AVS Wireless LAN Developers Kit** is a focused development environment reflecting over ten years of experience in wireless system development.



Introduction

AVS has distilled more than ten years of wireless systems development experience into the **AVS Wireless LAN Developers Kit**. For the individual developer or for companies with their own development staff, the **AVS Wireless LAN Developers Kit** is a focused starting point for embedded wireless application development.

Product Features

- World's first complete 802.11 Embedded Wireless LAN developer's kit which contains:
 - ◆ A target single board computer
 - ◆ 802.11b (11Mbps) compliant Wireless LAN cards
 - ◆ Software Development Environment
 - ◆ Embedded O/S, drivers and utilities configured and optimized for wireless applications
 - ◆ Full Source Code
 - ◆ Developer's Documentation
 - ◆ Installation Documentation
- Allows the setup of a fully functional Wireless LAN system within minutes of opening the box
- Provides a complete hardware and software development solution that shaves months off a development schedule
- Includes all needed documentation and source code
- Operates at 11Mbps, the highest data rate currently allowed by the IEEE Wireless LAN standard 802.11B
- RF transceiver uses the 2.4GHz unlicensed frequency band usable anywhere in the world

Version 1.3 New Features

- **Supports all current versions of PRISM** (PRISM2, 2.5, and 3)
- Kit now includes 2 PRISM(tm) 2.5 wireless LAN adapter cards and 2 PRISM(tm) 2 cards
- Support for Ad Hoc peer-to-peer networking without an access point
- Complete web-based management application now included
- Software will support all available adapter types (pcmcia, PLX/PCI, PCI, mini PCI, and USB)
- EtherSTA mode allows wireless connection for any single Ethernet device (e.g. wireless printer)
- Enhanced DHCP client and server operation

Version 1.2 Features

- Enhanced security through use of 128 bit WEP encryption
- AP and Station capability provides flexibility for developing point-to-point and point-to-multipoint wireless bridge products
- Full control of Authentication modes allows more secure-access options
- Full point-to-multipoint ethernet bridging solution solves network addressing problems
- Network Address Translation (NAT) allows the AP to be used as an Internet Gateway for home and small office network applications
- Dynamic Host Control Protocol (DHCP) server capability makes wireless client setup process much simpler
- Reduced filesystem size takes up less space in memory, freeing up system resources for other features and functions
- Integrated http web server will make it possible to develop web-based management tools
- Includes the latest PRISM(tm) AP firmware version providing many improvements including enhanced WEP performance, more robust roaming, and better support for multicast mode

AVS Wireless LAN Developers Kit Applications

The AVS Wireless LAN Developers Kit can reduce the application development time for any application requiring an embedded computer platform and wireless communications capability. Example applications include:

- Wireless LAN Access Points
- Robotics
- Telemetry (Medical, Remote Sensing, Agricultural, System monitoring)
- Mobile workforce

- Wearable computers
- Security systems
- Industrial automation systems
- Special Wireless LAN applications
 - ◆ Point-to-point wireless bridge
 - ◆ Outdoor point-to-multipoint 'Wireless Internet' systems
 - ◆ Home gateway to broadband (cable modem, xDSL)
 - ◆ Home networks
 - ◆ Public access wireless networks (hotels, airports, conference centers)
- Research projects
 - ◆ Communication protocols
 - ◆ Network topologies
 - ◆ Network traffic management

AVS Wireless LAN Developers Kit Contents

The AVS Wireless LAN Developer's Kit includes:

- Four PCMCIA 11Mbps 802.11b Wireless LAN adapter cards (2 ea. PRISM 2 and PRISM 2.5)
- Target Single Board Computer preconfigured to operate as a WLAN Access Point
- Serial and Network cables
- Power Supply
- AVS Wireless LAN Developers Kit (DK802.11B) Tools, Source Code, and Documentation CD
- RedHat Linux™ CD's (2)
- Station Driver software CD
- Documentation Set: Quickstart, Installation, Users Manual, SBC Documents

CD Contents:

1. **AVS Wireless LAN Developers Kit Tools, Source Code, and Documentation CD** –
 - ◆ Baseline embedded Linux™ kernel source code used to develop the customized kernel used in the **AVS Wireless LAN Developers Kit**. This CD also contains the development tools used to build executables for the target single board computer. The contents of this CD are installed on the development host PC running RedHat Linux™.
 - ◆ The **linux-wlan** driver and utility software with full source code for access point drivers.
 - ◆ Pre-compiled binary that has been configured and optimized by AVS for wireless applications.
 - ◆ Makefiles and scripts for automating the compilation of software for various software/hardware configurations of the target single board computer. Configurations include:
 - ◇ Kernel and root filesystem accessed through a network connection.
 - ◇ Kernel in flash memory, root filesystem accessed through a network connection.
 - ◇ Kernel and root filesystem in flash memory (usually the final stand-alone configuration).
2. **RedHat Linux™ CD's** – The RedHat Linux™ 6.2 system will need to be installed on the development host PC and is used as the development environment. Code is developed on this platform and then downloaded to the target single board computer.
3. **Station Driver CD** – Linux and Windows driver software for configuring client PCs to use the pcmcia WLAN cards included with the kit.

Documentation Contents:

- **AVS QuickStart Guide** – Quick guide to setting up the hardware components and having a fully functional wireless LAN system operational in less than an hour.
- **AVS Installation Guide** – Guide to installing all the tools necessary to compile and download custom code into the target single board computer.
- **AVS Wireless LAN Developers Kit Manual** – A complete reference guide for the contents of the AVS Wireless LAN Developers Kit. This manual includes a step-by-step example walking you through the development cycle of compiling source code on the host development PC, downloading the compiled binary to the target single board computer and executing the binary. Other examples in the manual include customizing common aspects of an access point configuration.
- **SBC Documents** – Guides for usage of the single board computer.

Hardware Specifications

PCMCIA Wireless LAN Adapter Specifications (applies to both PRISM2 and PRISM2.5 cards)

Specification	Value	Units	Comment
Mechanical	PCMCIA Type II		
Host Interface	PC Card 16		PCMCIA std.
Dimensions	110 x 54 x 6 (PRISM 2.5 115 x 54 x 7)	millimeters	
Weight	39	grams	
Operating Frequency	2.400 to 2.4835	GHz	
# Channels – Americas	11		FCC
# Channels – France	4		
# Channels – Japan	14		Telec
# Channels – Europe/Kor	13		ETSI
Supply voltage	3.3 +- 5%	Volts	
Operating current – Rx/Tx	260/350	mA	
Data rate	1, 2, 5.5, 11	Mbps	
Modulation – 1Mbps	Differential BPSK	DS Spread Spectrum	802.11 1997
Modulation – 2Mbps	Differential QPSK	DS Spread Spectrum	802.11 1997
Modulation–5.5/11Mbps	CCK	DS Spread Spectrum	802.11b
RF Transmit Power	14	dBm (minimum)	16 dBm typ.
Sensitivity at 11Mbps	-84	dBm	
Sensitivity at 1Mbps	-90	dBm	
Security	128 or 64	Bit key encryption	802.11 WEP
Antenna	Built-in dual antennas		Diversity
Temperature Range	0 to 50 operating	°C	
Humidity	Max. 95%		Non-condensing
Range 11Mbps/2Mbps	100/300	feet	Indoor office env.
Range 11Mbps/2Mbps	600/1000	feet	Outdoor LOS

Single Board Computer Specifications

Specification	Value	Units	Comment
CPU	Motorola MPC850		PowerPC-based
Clock Frequency	48	MHz	
RAM	16	Mbytes	4Mbytes option
Flash	4	Mbytes	Options for 2M to 32M
Network interface	Ethernet	10B-T	
Adapter card interface	PCMCIA	Type II	5V or 3.3V
Serial interface	RS-232/422		Serial terminal i/f
Dimensions	3.550 x 3.775 x 1.03	inches	PC104 compatible (physical)
Weight	75	grams	
Operating voltage	5 or 3.3	Volts	Uses ext. power module
Power consumption	700	mA	with wlan card operating
Dev. environment	RedHat 6.2		
Operating System	Linux		

AVS WLAN Developer Kit Version 1.3 Access Point Features

Number	Feature/Requirement	AVS WLAN Developers Kit
1	Wired Network Connection	RJ45/10BaseT
2	Wired Network Protocol	IEEE 802.3 and Ethernet blue book
3	Wired Supported Signalling Rate	10 Megabits per second
4	Wireless Network Connection	Integrated Antenna (with diversity), 2.4GHz Direct Sequence Spread Spectrum (DSSS)
5	Wireless Network Protocol	IEEE 802.11 and 802.11b
6	Wired/Wireless Integration Options	802.1d Bridging, TCP/IP Routing, or TCP/IP Routing with Network Address Translation
7	802.1d Bridging options	Spanning Tree Protocol (STP) on/off
8	IP Protocol support	BOOTP Client, DHCP, Telnet, TFTP Client, NAT, TCP/IP, HTTP
9	Wireless Medium	2.4GHz Direct Sequence Spread Spectrum (DSSS)
10	Wireless Media Access Protocol	Carrier Sense Multiple Access with Collision Avoidance (CSMA/CA)
11	Wireless Supported Signalling Rates	1, 2, 5.5, and 11 Megabits per second
12	Wireless Station Authentication Methods	802.11 Open System or Shared Key(64 bit or 128 bit key)
13	Maximum observed data rate	5.9 Megabits per second (ftp throughput test using 802.11 long preamble)
14	Wireless Range at 1Mb/s (typical)	Open environment: 1300 feet (400 meters) Office: 250 feet (77m)
15	Wireless Range at 11Mb/s (typical)	Open environment: 300 feet (90 meters) Office: 80 feet (25m)
16	Wireless Encryption	802.11 Wired Equivalent Privacy (WEP) using 64 or 128 bit keys
17	Point Coordination Function (PCF)	Not Supported
18	Bandwidth Management	Not Supported
19	Maximum Associated Wireless Stations	Physical Maximum: 2007 Upper limit before protocol and medium restrictions reduce throughput to near zero: 250
20	Roaming Wireless Stations	Wireless Stations may seamlessly change from one access point to another one with the same ssid when the AP's are in Bridge mode and the AP's are connected to the same Layer 3 network (e.g. IP network).
21	Power Saving Wireless Stations	Not Supported
22	Wireless Operating Channels	11 channels (US, Canada, Japan)
23	Distinct, non-overlapping channels	Three

24	Wireless Channel Selection	Manual channel selection allows the Administrator to select the channel used by the AP.
25	External Antenna Connection	None
26	LED Indicators	2 Red LEDs, Function defined by software
27	Local configuration	Direct Console Port: Serial EIA-232 RJ45 connector (DB9 female adapter included)
28	Remote configuration	Telnet (via a telnet client)
29	Receive Sensitivity	-90dbm @ 1Mbps -88dbm @ 2Mbps -87dbm @ 5.5Mbps -84dbm @ 11Mbps
30	RF Output Power	40 mW
31	Power Consumption	5V 5% @ 700mA
32	Power Requirements	110-120V/220-240V
33	Simple Network Management Protocol Support	None
34	Certifications	FCC Class B, FCC Part 15.247, UL
35	Operating Temperature	32 to 131F (0 to 55 C)
36	Humidity (non-condensing)	10 to 90%
37	Dimensions	approx. 5" x 3.55" x 1.1" (board and radio, no enclosure or power supply)
38	Weight	114 grams excluding power supply

Support

AbsoluteValue Systems assumes the developer has experience in C programming for embedded systems and Unix/Linux™. Many resources are available in print and on the Internet for gaining a general understanding of these topics.

Installation

Each copy of the **AVS Wireless LAN Developers Kit** includes 30 days of free installation support via telephone and e-mail.

Post Installation

Additional technical support can be acquired via one of our fee based support options. Contact AbsoluteValue Systems for details and pricing.

Product Defects

AbsoluteValue Systems places high importance on our product quality. We are committed to assuring that our product meets all stated specifications. Inquiries reporting product flaws or manufacturing defects will be given the highest priority.

Pricing

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