



T E C H N O L O G Y

Inyoni

Ethernet to Wireless Converter

The Inyoni Ethernet to Wireless Converter is 4D Technology's offering in the broadband Customer Premises Equipment (CPE) market. Inyoni supports the IEEE 802.11a, 802.11b and 802.11g wireless standards and offers exceptional bandwidth at a very low cost.

- Inyoni is designed for ease-of-use and extensibility.
- A Linux kernel is embedded on the device, enabling customisation and the installation and use of any Open Source Linux application.
- Inyoni is equipped with most of the commonly used networking applications. Inyoni includes a Simple Network Monitoring Protocol (SNMP) agent, which offers secure remote configuration and monitoring.
- Includes on board firewalling to protect your network from intrusion. Inyoni currently offers software encryption and IPSec tunneling, enabling the user to transmit data securely.
- Includes traffic shaping and bandwidth limiting features.
- Inyoni may be configured to support a serial to wireless interface as well as an ethernet to wireless interface.

Inyoni is supplied with either a 2.4 GHz or a 5.6 GHz integrated directional antenna. Since these frequencies are unlicensed and free to use, the user is not faced with a monthly charge for use of telecoms infrastructure, further enhancing the cost benefit provided by the device.



Applications

- Secure Wireless Local Area Networks (LANs) and Wide Area Networks (WANs).
- Secure Wireless bridging between LANs that are geographically separated.
- Distributed Control transport medium.
- Secure broadband access.
- Telecontrol over wireless



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Technical Details

Inyoni is designed and developed in South Africa. It uses the latest Intel Network Processor with XScale® technology, running a customized, embedded version of the Linux Operating System.

Hardware is designed around the Intel IXP425 Network Processor and the Atheros Wireless chip set. The processor encapsulates hardware acceleration for encryption and authentication in its Network Processor Engines (NPE). These are specifically targeted at wireless applications.

Features supported by the NPE are as follows:

- Encryption and Decryption Operations: Encrypt or Decrypt, Forward or reverse authentication, Encryption followed by authentication, Authentication followed by decryption
- Cryptography Algorithms: DES (key size – 56-bit), 3DES (3 keys – 56-bit each)
- Authentication Algorithms: HMAC-SHA1 (key size – 160-bit), HMAC-MD5 (key size – 128-bit)

The device is compactly and efficiently packaged, with the enclosure containing both the wireless board and the antenna. Power is supplied either via Power over Ethernet if the board is configured for Ethernet to Wireless, or a serial cable carrying power in the case where the board is configured from serial to wireless. Both 2.4 and 5.0 Ghz antennas are available.

Software is a customized version of the Linux Operating System. This is tailored to be compact and efficient with specific support for Ethernet and Wireless Ethernet devices. Software is stored in Flash Memory and runs from RAM. Software configuration is customizable and can be modified and updated to suit specific requirements. The following applications are resident on the device :

- SNMP v3 agent, supporting RFC 1213 as well as a dedicated MIB.
- IPTables, with a solid firewall, incorporating MAC address matching.
- DHCP server/client
- DNS – name server
- SSH – secure shell
- A choice of PPPoE, GRE or IPSec tunneling

Upgrades that are planned include :

- Migration to Linux 2.6.x kernel
- Traffic Shaping and QoS
- VOIP





Summary

Inyoni Ethernet to Wireless Network Adapter	
Description	IEEE 802.11a,b,g compliant Wireless Network Adapter
Processor	Intel XScale Network Processor @266MHz
Connector	RJ-45
Ethernet	10/100 Mbps
Wireless Frequencies	2,4GHz or 5GHz
Configuration Management	SNMP
Protocols	PPPoE, TCP, UDP, DHCP Client/Server OpenSSL
Security	Encryption (DES) Authentication (MD5/SHA) Firewall
Antenna	Integrated 13 dB 60 degree sector directional
Dimensions	150x330x70mm (WxHxD)
Power	PoE (9-24VDC at < 5W)
Mounting	Wall or pole
Enclosure	Watertight poly-carbonate
Transmission range	15 kms line of sight (2.4GHz), up to 150 meters indoors
Effective bandwidth	See table below.

The table below is modified from a white paper published by Atheros Communications, entitled 802.11 Wireless LAN Performance.

	Modulation	Maximum Link Rate	Max. Effective TCP bandwidth	Max. Effective UDP bandwidth
802.11b	CCK	11 Mb/s	5.9 Mb/s	7.1 Mb/s
802.11g	OFDM/CCK	54 Mb/s	24.4 Mb/s	30.5 Mb/s
802.11a	OFDM	54Mb/s	24.4 Mb/s	30.5 Mb/s

Where CCK means Complimentary Code Keying, and OFDM means Orthogonal Frequency Domain Multiplexing.



Power Injector

