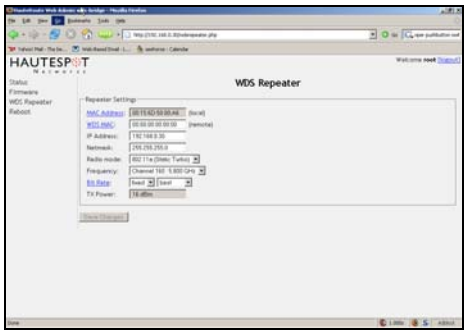
HAUTESPOT Networks

Wireless Broadband Solutions

Features

- ✓ **High Performance Intel® XScale® IXP420 266MHz Network Processor for near wire speed packet forwarding**
- ✓ **Ruggedized Outdoor design**
- ✓ **8Mbytes Flash for Booting the HauteRouterOSng™ Operating System**
- ✓ **Simple to configure Web Based management interface**
- ✓ **Choice of Radio Modules Supporting 900Mhz at up to 700mW, 2.3-2.5Ghz at up to 400mW, or 4.9-6.1Ghz at up to 400mW**
- ✓ **Two 10/100 Base-TX Ethernet Ports (with Auto MDI/MDIX)**
- ✓ **Full Feature Transparent Bridging using the HauteLine™ high performance, low latency protocol for rates of up to 68Mbps actual throughput**
- ✓ **Passive Power Over Ethernet Supporting 9 to 48VDC Input Voltage Range**
- ✓ **Reverse Voltage and Transient Protection**
- ✓ **6W Typical Operating Power with Radios at full power.**
- ✓ **0°C to 70°C Operating Temperature**
- ✓ **32Mbytes SDRAM**
- ✓ **Voltage and Temperature Monitor**
- ✓ **Watchdog Timer**
- ✓ **Real Time Clock**
- ✓ **USB 2.0 Host Interface**



Web Management Interface

HauteRoute™ HR-IXP420SXP

Wireless High Performance Bridging Router

Low Jitter, Low Latency, High Throughput for Streaming Media Applications

Shown with Optional Antenna

The HR-IXP420SXP Point to Point Wireless Bridging Router is a complete, turn key solution for creating unlicensed wireless links between buildings or remote locations. It is built on top of a high performance single board computer (SBC) based upon the Intel XScale IXP420 Network processor running at 266MHz. It incorporates your choice of three radio modules operating on either 900Mhz, 2.4, 4.9- 5.8 GHz bands and using HauteSpot Networks High Speed HauteLine™ protocol delivering over twice the speed of 802.11 with no jitter and is the most rugged solution available on the market today. The modularity of the radio elements of the HR-IXP420SXP allow it to be field upgradeable to future technologies such as 802.16 when they become available.

Combine this ruggedized hardware with state of the art software specifically designed for simplicity of use and robustness of features, and you have a solution which is scalable, extensible and very flexible.

The HR-IXP420SXP is a small form factor solution, which allows for it to be placed in a variety of locations from antenna towers, to neighborhood light posts, to an office building rooftop to the roof of a truck, rv or boat. The 10”x8”x3” NEMA 6 aluminum enclosure is waterproof, vandal resistant, easy to mount, and corrosion resistant. The connectors are water and vapor tight and allow for easy connection of both power and antennas without the need to even open the case.

The HR-IXP420SXP features either one Atheros AR5006xs or AR5004x based radio module standard (with options to select which frequency), also, two 10/100 Base-TX Ethernet channels and a RS232 serial port for management and debug, 32Mbytes SDRAM, Power over Ethernet (PoE), watchdog timer and a voltage/temperature monitor. Program storage consists of up to 8Mbytes of on-board Flash which hosts the HauteRouterOSng™ operating system.

Software includes a complete embedded, highly reliable, and operating system, and a feature rich routing stack.

A simple to configure Web management interface is standard.

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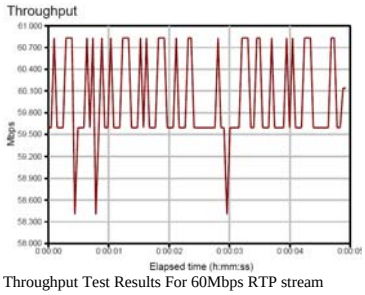
Processor Board Hardware Features:

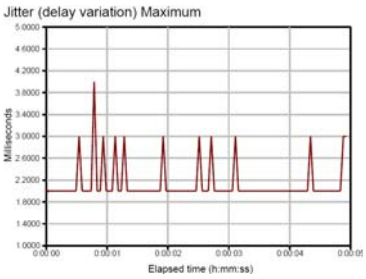
- Intel XScale IXP420 Processor Operating at 266MHz
- Two 10/100 Base-TX Ethernet Ports (with Auto MDI/MDIX)
- 32Mbytes SDRAM
- 8 Mbytes Flash
- 2 Type III Mini PCI Slots
- RS-232 Serial Management Port
- 5 Bits General Purpose Digital I/O
- Voltage/Temperature Monitor
- Watch-Dog Timer
- Serial EEPROM
- Wide Input Voltage (9 to 48VDC)
- Supports Power Over Ethernet (PoE)
- USB 2.0 Host Interface
- 0°C to 70°C Operating Temperature

Wireless Radio Features:

- 900 Mhz, 2.4GHz and 5GHz operation using high performance HauteLine™ protocol
- Up to 68Mbps actual throughput using HauteLine™ protocol - Capable of handling heavy data payloads such as MPEG video streaming
- Up to 152-bit WEP data encryption with TKIP, Wi-Fi Protected Access (64,128,152-WEP with TKIP)
- AES (Advance Encryption Security) Support



Throughput Test Results For 60Mbps RTP stream



Jitter Variation for 60Mbps RTP stream

High Performance Streaming

The HR-IXP420SXP is ideal for demanding streaming applications such as uni-cast or multi-cast MPEG 4, IPTV, and other related applications.

The HR-IXP420SXP uses a combination of a high performance embedded network processor, high gain/high performance radio modules available for either 900Mhz, 2.4Ghz or 5Ghz, the HauteRouterOSng™ operating system which is optimized for high performance wireless devices like the HR-IXP420SXP, and the HauteLine™ high performance wireless protocol which is specifically designed for streaming media.

In real world testing, the HR-IXP420SXP, in a point to point bridge configuration, was able to achieve actual RTP stream throughput of 60Mbps with no data loss and no jitter on the unlicensed 5 GHz band. Three simultaneous RTP streams of 10Mbps were also tested and showed the same results: no jitter and no data loss.

The HR-IXP420SXP achieves these amazing results through the use of a non-blocking hardware architecture where the CPU, the wireless MAC/PHY, and the on-board system bus are all matched to one another. All elements of the architecture are balanced for maximum performance and throughput. The hardware is packaged in a rugged waterproof enclosure and is powered by 802.3af compliant Power Over Ethernet (PoE).

The hardware architecture is complimented by the HauteRouterOSng™ firmware operating system which provides a stable, well tested environment which is optimized to the hardware platform and provides a set of simple Web management interfaces to users, allowing for simple installation and configuration.

Finally, the HauteLine™ wireless protocol, which is designed specifically to leverage the capabilities of the radio modules and HauteRouterOSng™ operating system used in the HR-IXP420SXP provides reliable, high performance throughput without jitter, data delay or packet.

Typical wireless applications using 802.11 protocols suffer from delay and stream interruption due to management overhead such as beaconing, polling and other functions. Management has been redesigned in the Hauteline™ protocol to not interrupt streaming.

The ability for the HR-IXP420SXP to operate on a variety of frequencies using the identical software and operating system means that customers can train their installers and operators once and deploy everywhere. 900Mhz operation allows for non-line-of-sight operations, 2.4Ghz allows for global operation without licensing, and 5Ghz operation allows for maximum throughput with limited noise.

Wireless Radio Features (contd):

- Data Rates –

(Auto-rate capable) 6, 9, 12, 18, 24, 36, 48, 54 & 108Mbps(Turbo Mode)

- Compliance - FCC Part 15 Class B, ETSI 300.328, ETSI 300 826, CE mark

Receive Sensitivity – HR-IXP420SXP-2 model

- 5Ghz:

-90dBm @ 6Mbps
-89dBm @ 9Mbps
-88dBm @ 12Mbps
-87dBm @ 18Mbps
-84dBm @ 24Mbps
-79dBm @ 36Mbps
-77dBm @ 48Mbps
-74dBm @ 54Mbps

- 2.4Ghz:

-96dBm @ 1Mbps
-96dBm @ 2Mbps
-96dBm @ 5.5Mbps
-92dBm @ 6Mbps
-91dBm @ 9Mbps
-92dBm @ 11Mbps
-90dBm @ 12Mbps
-87dBm @ 18Mbps
-85dBm @ 24Mbps
-80dBm @ 36Mbps
-78dBm @ 48Mbps
-76dBm @ 54Mbps

Transmit Output Power (Typical) – HR-IXP420SXP-2 model

- 5Ghz OFDM:

20dBm+/-2 @6-24Mbps
19dBm+/-2 @36Mbps
18dBm+/-2 @48Mbps
17dBm+/-2 @54Mbps
17dBm+/-2 @108Mbps

- 2.4Ghz OFDM :

26dBm +/-2dBm@6~24Mbps
25dBm +/-2dBm @ 36 Mbps
24dBm +/-2dBm @ 48 Mbps
23dBm +/-2dBm @ 54 Mbps

- 2.4Ghz DSSS :

26dBm +/-2dBm for all rates

Receive Sensitivity – HR-IXP420SXP-5 model

- 5Ghz OFDM :

-94dBm @ 6Mbps
-93dBm @ 9Mbps
-92dBm @ 12Mbps
-90dBm @ 18Mbps
-86dBm @ 24Mbps
-83dBm @ 36Mbps
-77dBm @ 48Mbps
-74dBm @ 54Mbps

Transmit Output Power (Typical) – HR-IXP420SXP-5 model

- 5Ghz OFDM:

26dBm+/-2 @6-24Mbps
24dBm+/-2 @36Mbps
22dBm+/-2 @48Mbps
21dBm+/-2 @54Mbps
21dBm+/-2 @108Mbps

Receive Sensitivity – HR-IXP420SXP-9 model

- 900-928Mhz :

-93dBm @ 1Mbps
-91dBm @ 2Mbps
-88dBm @ 5.5Mbps
-90dBm @ 6Mbps
-89dBm @ 9Mbps
-88dBm @ 11Mbps
-87dBm @ 12Mbps
-86dBm @ 18Mbps
-82dBm @ 24Mbps
-79dBm @ 36Mbps
-73dBm @ 48Mbps
-70dBm @ 54Mbps

Transmit Output Power (Typical) – HR-IXP420SXP-9 model

- 900-928Mhz :

28dBm +/-2dBm@1~24Mbps
26dBm +/-2dBm @ 36 Mbps
24dBm +/-2dBm @ 48 Mbps
23dBm +/-2dBm @ 54 Mbps

Variety of Antenna Options

The HR-IXP420SXP can be configured for use with a variety of antenna options.

For point to multipoint links (base stations/omni direction):

- ✓ DB05-0-MFN – 2.4 or 5.8GHz 5dBi gain multi polarized omni antenna. Good for short range outdoor use where obstructions are a problem.
- ✓ DB08-0-MFN – 2.4 or 5.8GHz 8dBi gain multi polarized omni antenna. Good for short range outdoor use where obstructions are a problem.
- ✓ 9009-0-HFN - 900MHz 9dBi omni antenna with horizontal polarity perfect for use in base station, especially where mounting space is limited
- ✓ 90011-0-VFN - 900MHz 11dBi omni antenna perfect for use in base station, although length (11 feet) makes some applications more difficult
- ✓ 2415-0-VFN – 2.4GHz 15dBi gain omni for long range coverage. Good general purpose omni where interference is not too severe.
- ✓ 2416-120-VFN(m) – 2.4GHz 16dBi 120 degree sector antenna perfect for use in three radio array for sector coverage.
- ✓ 2417-90-VFN(m) – 2.4GHz 17dBi 90 degree sector antenna perfect for use in four radio array for sector coverage.
- ✓ 5812-0-VFN – 5.8GHz 12dBi omni directional antenna which is a good general purpose base station antenna.
- ✓ 5816-120-HFN – 5.8GHz 16dBi 120 degree sector antenna with horizontal polarity perfect for use in three radio array for sector coverage where interference is an issue.
- ✓ 5817-90-VFN(m)– 5.8 GHz 17dBi gain 90 degree sector antenna perfect for use in four radio array for sector coverage.

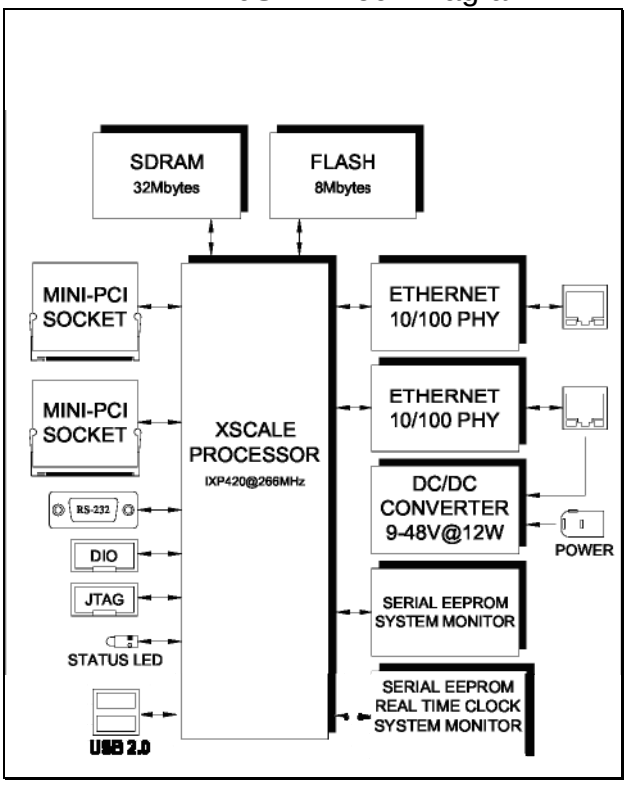
For point to point links (remote end/directional):

- ✓ 90011-20-DFN – 900 MHz 11dBi panel antenna with 20 degree spread which can be aligned for vertical or horizontal polarity
- ✓ 90018-35-DFN – 900MHz 18dBi yagi antenna with 35 degree spread
- ✓ 2412-60-MFN - 2.4 GHz 12dBi gain multi polarized sector antenna with 60 degree spread. Good for moderate range outdoor links through trees, snow or over water.
- ✓ 2417-40-MFN - 2.4 GHz 17dBi gain multi polarized sector antenna with 40 degree spread. Good for longer range outdoor links through trees, snow or over water.
- ✓ 2418-18-DFN (m) – 2.4GHz 18dBi panel antenna with 18 degree spread which can be aligned for vertical or horizontal polarity
- ✓ 2424-10-DFN(Grid) - 2.4GHz 24dBi parabolic grid antenna with 10 degree spread which can be aligned for vertical or horizontal polarity
- ✓ 5824-8-DFN - 5.8 GHz 24dBi panel antenna with 8 degree spread which can be aligned for vertical or horizontal polarity
- ✓ 5829-5-DFN(Grid) – 5.8 GHz 29dBi gain parabolic grid with 5 degree spread which can be aligned for vertical or horizontal polarity
- ✓ 5832-4-V-FN(Solid) – 5.8 GHz 32dBi gain parabolic dish with 4 degree spread which can be aligned for vertical or horizontal polarity

All antennas connect to the HR-IXP420SXP using the MNWBC195MN-2 2 foot long RF pigtail.

Use our Wireless Installations calculator spreadsheet to select the correct antenna for your application. Radio gain may need to be adjusted to remain within regulatory requirements. Consult your local regulatory agency for specific requirements.

HR-IXP420SXP Block Diagram



Ordering Information

HR-IXP420SXP-9 – 900MHz point to point bridge

HR-IXP420SXP-2 – 2.4 GHz point to point bridge

HR-IXP420SXP-5 – 5GHz point to point bridge

Electronic components warranted for 1 year. Antennas are warranted for 5 years.

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