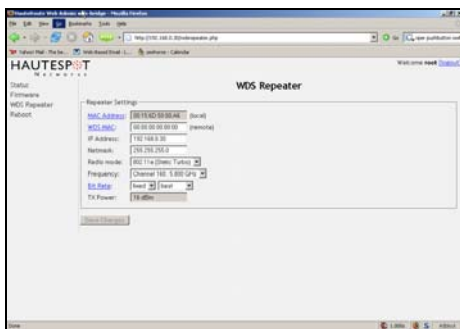


## Features

- ✓ High Performance Intel® XScale® IXP Network Processor for near wire speed packet forwarding
- ✓ Ruggedized Outdoor design
- ✓ 16Mbytes Flash for Booting the HauteRoute OS™ Operating System
- ✓ Simple to configure Web Based management interface
- ✓ Choice of Optional Radio Modules Supporting 900Mhz at up to 700mW, 2.4Ghz at up to 400mW, 4.9 Ghz 400mW or 5Ghz at up to 400mW
- ✓ 10/100 Base-TX Ethernet Port (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-IXPDXP Modular High Availability, Low Latency Bridge/Router

Frequency Diversity, Load Balanced, Low Latency Point to Point, Multipoint or Mesh



When mission critical wireless network connectivity is essential, the HauteSpot Networks HR-IXPDXP is the ideal solution.

With optional two radio modules which can be configured to support either unlicensed ISM 2.4-2.5GHz, FCC Part 90Y Public Safety 4.9GHz, unlicensed NII 5GHz or unlicensed ISM 900MHz,

you can select any combination of frequencies to run in parallel with all data simultaneously transmitted over both frequencies. If either of the two frequencies fail due to interference, atmospheric, or temporary obstruction, the remaining frequency remains functional.

When both radio modules are up and functioning, load balancing between the frequencies is active, allowing for maximum throughput and broadband performance.

## Applications

For **SCADA** applications, the HR-IXPDXP provides a highly reliable, low latency, frequency flexible solution. Connect any Ethernet device to the wired port of the device, point your antennas at your remote end, and you are ready to run. By using standard off the shelf Voice Over IP encoders you can replace costly E&M circuits for serial devices, eliminating costly leased circuits.

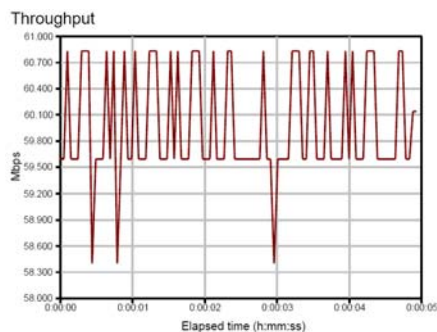
Where ultimate reliability is required, a pair of HR-IXP-DXP units can be configured at each end of your point to point link, with VRRP (Virtual Router Redundancy Protocol) running on each unit, complete device fail over can be configured, allowing not only frequency diversity, but also hardware diversity.

With the flexibility to create point to multipoint links, the HR-IXP-DXP can be used to create very complex network topologies, with each leg of the network supporting frequency diversity.

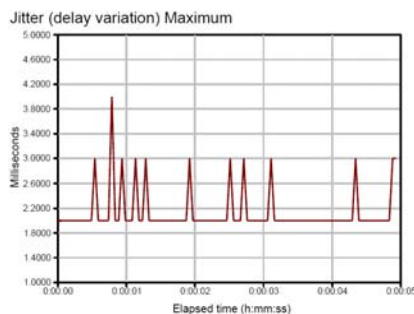
For **Public Safety** and other mission critical backhaul networks, the HR-IXPDXP can provide the ultimate in network reliability. Link fire stations, field stations, emergency response vehicles and more. With the ability to run off of 9-48VDC power and weighing only 3 lbs, the HR-IXPDXP is highly portable. **NOTE: current implementation limits interoperability between 4.9GHz radios and other frequencies for diversity.**

### High Availability Features

- Virtual Router Redundancy Protocol
- Interface Bonding with link failover
- Watchdog timer
- Remote System Monitoring via SNMP, Syslogd, or Dude Monitor
- NEMA IP 6/7 waterproof enclosure
- No moving parts
- Systemboard MTBF of 90,000 hours
- Mesh Configurations using WDS and Rapid Spanning Tree
- WPA2 provides government grade security by implementing the National Institute of Standards and Technology (NIST) FIPS 140-2
- Support for DiffServ Quality of Service Management
- Traffic Monitoring and Firewall



Throughput Test Results For 60Mbps RTP stream



Jitter Variation for 60Mbps RTP stream

### Ordering Information

- HR-IXPDXP – Base unit no radios
  - HR-IXPDXP-22 – Two radio 2.4 GHz
  - HR-IXPDXP-25 – One 2.4 GHz radio and one 5GHz radio
  - HR-IXPDXP-29 – One 2.4 GHz radio and one 900 Mhz radio
  - HR-IXPDXP-44 – Two radio 4.9 GHz
  - HR-IXPDXP-55 – Two radio 5 GHz
  - HR-IXP-DXP-59 – One 5 GHz radio and one 900 Mhz radio
  - HR-IXPDXP-99 – Two radio 900MHz
- Use HR-IXPDXPi-xx for indoor versions

Electronic components warranted for 1 year.

### Interface Bonding and High Availability

Networking vendors have long offered functionality for aggregating bandwidth across multiple physical links to a wired switch. This allows a machine (frequently a server) to treat multiple physical connections to switch units as a single logical link. The standard moniker for this technology is IEEE 802.3ad, although it is known by the common names of trunking, port trunking and link aggregation.

The HauteSpot Networks HR-IXPDXP supports link aggregation, or interface bonding, of wireless interfaces.

Two wireless interfaces are configured as one virtualized interface. The bandwidth of both interfaces is aggregated together improving throughput. Each of the two wireless links are monitored at a configurable rate. If one of the two links fails, all traffic is shifted to the working interface until the failed interface is returned to service. This technique significantly reduces the chances of a link going down due to external sources of interference, changes in atmospheric conditions or weather, or hardware failure.

### Virtual Router Redundancy Protocol (Coming Soon)

Virtual Router Redundancy Protocol (VRRP) is a non-proprietary redundancy protocol described in IEEE RFC 3768 designed to increase the availability of WAN links through failover and redundancy. Two or more physical routers are configured to act as one virtual router, with only one doing the actual routing at any given time. If the current physical router fails, an arrangement is made for another physical router to automatically replace it. The HR-IXP-DXP can be configured in pairs to create highly available, redundant wireless links with frequency diversity, spreading bandwidth over 2,4,6 or more radio spectrums.

### Low Latency, High Performance

The HR-IXPDXP is ideal for demanding low latency applications such as industrial automation control or streaming applications such as uni-cast, multi-cast or point to point RTP streaming, IPTV, and other related applications.

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

In real world testing, the HR-IXPDXP, 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 5 GHz band.

Quality Of Service management at both layer 2 and layer 3 allows for prioritization of services as well.

The HauteRoute OS™ firmware operating system 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.

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