



DSI RF Systems, Inc. introduces a cost-effective wireless digital transmission solution for program and data transport. Utilizing state-of-the-art IP transport technologies, RF~IP^{MAX} revolutionizes the role of microwave transmission in the Broadcast facility.

RF~IP^{MAX} is a user-defined full-duplex microwave link for the dynamic transmission of recording studio-grade audio, DVD-quality video, multiple TDM (T-1/DS1) interfaces, as well as wideband IP network interconnectivity. Utilizing the 5.8 GHz license-free band, RF~IP^{MAX} provides single links up to 50 miles Line-Of-Sight (LOS) up to a maximum Average Ethernet Rate of 49 Mbps. RF~IP^{MAX}'s superior error-correction allows shorter Non-Line-Of-Sight (NLOS) hops.

RF~IP^{MAX}'s dual-format IP and multiple T-1 transport streams allows the Broadcaster the flexibility of using existing codecs and IP equipment, providing a cost-effective, IBOC-friendly transport solution.

RF~IP^{MAX} has been successfully deployed at such sites as The Empire State Building and 4 Times Square in New York City—two of the most RF-saturated environments in the United States.

Typical System Applications:

- Wireless Digital STL/TSL main or backup
- Multiple channel Inter-City Relay (ICR)
- Provide off-site backup of program automation systems and office business computer systems
- Provide high-speed Virtual Private Network (VPN) Internet connections between facilities
- Mirror program automation at Transmitter or other off-premise locations
- Backhaul multiple satellite feeds
- Interconnect remote offices/studios for disaster recovery IP/Telco
- Duplex video feeds for security, video conferencing
- Broadcast/DVD-grade video links
- Remote ENG
- Transport 24-bit resolution audio with minimal delay
- Transmitter Remote-Control using state-of-the-art IP Tunneling technologies
- Supports VOIP, Wi-Fi and Small Network Management Protocol (SNMP)

RF~IP^{MAX}'s superior system features provides the Broadcaster with the freedom to control all aspects of System Operation—using VPN techniques—from anywhere, even your home computer. Access to all System Parameters enable the Broadcaster to modify nominal system settings and to immediately isolate and correct any system anomalies.

System Features:

- High Capacity Transmission Link under your control
- Reliable range of 50 miles Line-of-Sight
- Multiple Configurations to meet diverse needs
- Up to 49 Mbps IP throughput
- Portability
- High Quality minimal delay, IBOC Friendly, multiple coding resilient
- License free spectrum, 5.8 GHz
- Point-to-Multipoint configurations available
- Scalable
- 99.999% Reliability



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Specifications

Wireless WAN System

- Range of 50 miles in PTP mode enables remote locations to be connected, and reduces the cost of multiple links.
- Range of 15 miles in PMP mode enables access providers to cover a larger service area.
- Leading OFDM technology provides superior non-line-of-sight operation for easier and more reliable installations and a larger coverage area.
- Offers Connectivity for one to eight, full and fractional (nx64) TDM links and the simultaneous transport of mixed IP and TDM traffic streams
- Operation in sub-10 GHz spectrum provides superior range and immunity to fading over competing upper band microwave backhaul solutions.
- 802.1p prioritizations gives TDM traffic priority
- Provides full loop-back capability
- Supports ETS, ANSI, G703/4/6, G732/3, G821/3/4/6
- High data rate-72 Mbps in the air, 49 Mbps net Data Rate-makes this system ideal for backhaul and serving more subscribers with high bandwidth needs.
- Extremely low end-to-end latency of less than 3 ms is ideal for backhaul and multi-hop backhaul, for the delivery of real time services like voice, video, and interactive applications.
- High Spectral Efficiency using TDD-3.6 bps/Hz Air Rate, 2.25 bps/Hz net Data Rate-means more bandwidth can be delivered to more subscribers using much less spectrum
- Using a patented Adaptive Modulation and coding technique provides an industry leading BER of 1×10^{-9} , meeting carrier-class reliability specifications.
- Eight modulation and coding schemes from BPSK to 64 QAM adjust to link quality while providing the highest throughput for a given deployment scenario. Basic package includes QPSK modulation, 24 Mbps peak code rate/36 Mbps burst rate to Ethernet layer.
- Patented ARQ (Automatic Repeat Request) algorithm with advanced forward error correction offers a link availability of 99.999%.
- Support for Dynamic Frequency Selection (DFS) and Automatic Transmission Power Control (ATPC) minimizes the impact of interference
- A highly secured 64-bit encryption scheme provides enhanced over-the-air security

Typical Audio Codecs

- Available audio bandwidths from 10Hz to 22.5 kHz and DAB applications
- Delivers high quality audio (AM, FM, IBOC) for Studio-to-Studio and Studio to Transmitter applications
- 16 bit word resolution, suitable for CD Mastering
- Analog I/O's via industry standard XLR's
- RS232 ancillary data for RDS
- 4 TTL Input/Outputs for remote control
- AES/EBU I/O (AES3), AES/EBU Sync In
- Audio can be transported via synchronous or packetized networks.
- Ethernet interface capable for WAN/LAN data transfer
- By allocating timeslots on an E1 or a T1 circuit, simultaneous audio and data transfer can be achieved on a single circuit.

Typical Video Codecs

General Specifications

Video Input Formats

- NTSC and PAL

Ethernet

- 10baseT ethernet or 100baseTX fast ethernet compatible (auto-sensing)

Streaming MPEG-2 over IP

- "Transport stream over UDP" or "RTP over UDP"
- Multicast or unicast modes

True Multicast Streaming

- Unlimited number of client view stations

Quality of Service

- Packet shaping - reduces packet bursts and maintains a consistent, controlled packet rate with minimum latency.
- Forward error correction (FEC) - enables lost packet reconstruction

Web Server

- Integral web server
- Configure the AVN210 with a standard web browser

Remote Configuration Management

- Configure with PC host software, HTTP (webserver), Telnet or direct serial menu-driven commands
- Configurable IP address, net mask, gateway, and DHCP
- Configurable A/V settings

Compression

MPEG-2

- MPEG-2 standards compliant RFC-1889 and RFC-2250

User Controlled Bandwidth

- Minimum 1.5 Mbit/s: NTSC: 30 fps, 352h X 240v PAL: 25 fps, 352h X 288v
- Recommended 3.8 Mbit/s: NTSC: 30 fps, 720h X 480v PAL: 25 fps, 720h X 576v
- Maximum 7.5 Mbit/s: NTSC: 30 fps, 720h X 480v PAL: 25 fps, 720h X 576v

Input/Output

General

- Ethernet, RJ-45
- RS-232 serial connector, full duplex

Audio Video Input to Encoder

- S-Video
- Composite video (BNC)
- Composite (RCA)
- XLR balanced audio
- RCA unbalanced audio

