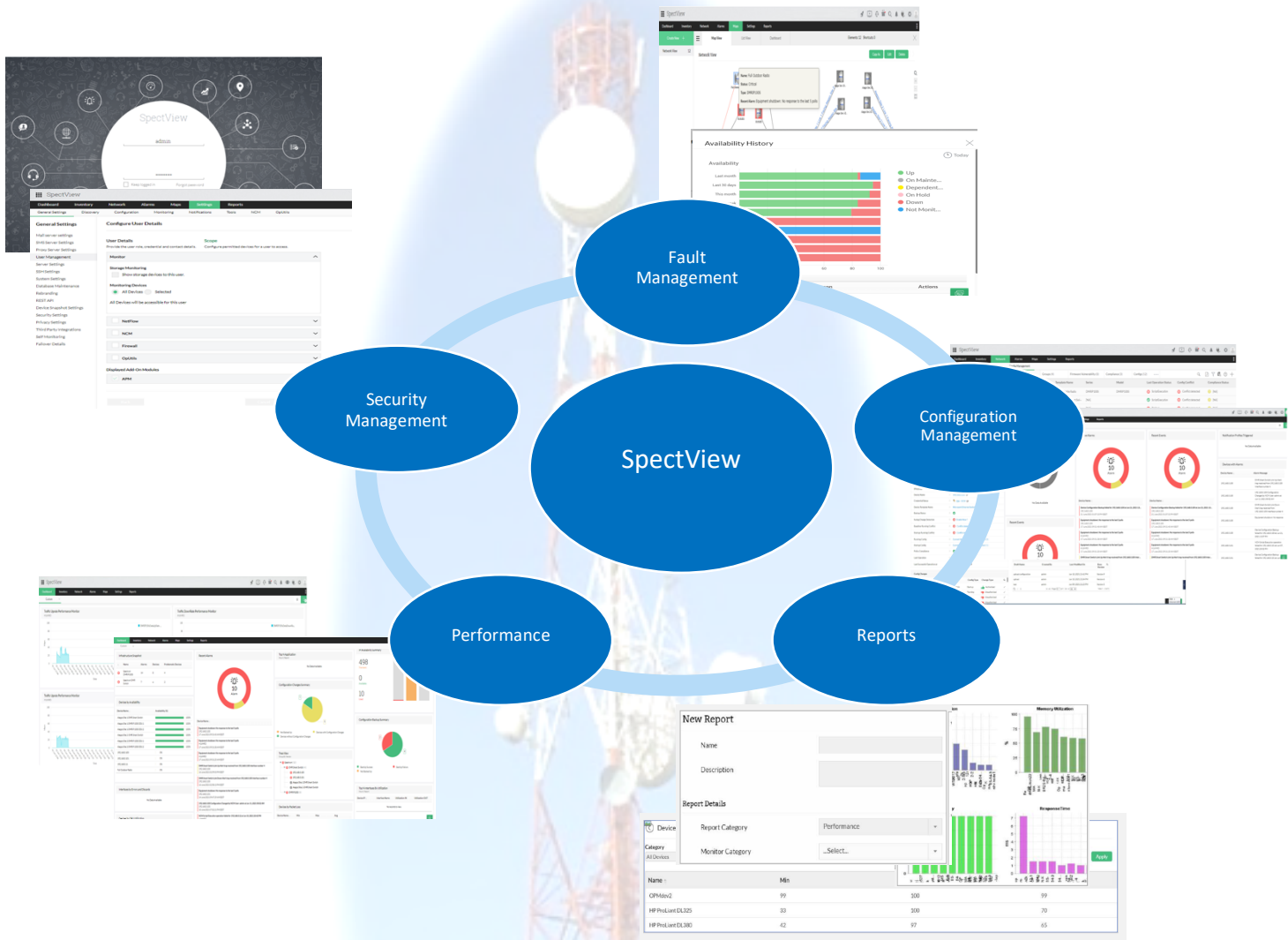




## Spectrum Radio Portfolio

Spectrum offers a range of versatile radios to suit the many needs of different countries while complying with different regulations and efficiency requirements.

## Spectrum Managed Radio Systems Spectview NMS System



### Key Points:

FCAPS Functionality

Multi Vendor Support

Network Discovery Platform,

Flexible and Customizable Dashboards

Smart Network Map View

Alarms View /Escalation

Device Configuration Backup/restore

Syslog and Event log Monitoring

Scalable architecture supports up to 10,000 Devices

Database : MSSQL 2008, 2012, 2014 and 2016 | Bundled PostgreSQL

## Spectrum Managed Radio Systems

### Spectrum-DMRIP-100s (Packet Radio)

- Backhaul solution for 4G (LTE/WiMAX) mobile network.
- Guarantees easy installation and offers seamless compatibility for all IP based operators.
- Conventional IDU function (modem/switch) incorporate into one box.
- Considerable reduction of customer OPEX and increase of feasibility without sacrificing performances and reliability.
- **Optional High Power Radio available**

#### Key Features:

- Light & Compact; 20% energy saving compared to conventional IDU + ODU configuration.
- Built-in software for SNMP v.1, Web HTTP, FTP and Telnet command line interface protocol for fast integration.
- Extreme durability; IP65 to withstand dust and water, operational temperatures between -33°C and +55°C.
- Configurable data ports
- Fully software configurable
- Remote upgrades
- Diagnostics & Maintenance, Built-in OAM for performance monitoring & metering.



### Spectrum-DMRIP-200s & Spectrum-DMRIP-400s

- Generates significant CAPEX and OPEX savings.
- Robust and durable single-box structure withstands harsh weather conditions and can be easily mounted on towers, rooftops, lamp posts, traffic light poles and small outdoor mobile cell-sites.
- Enhanced spectrum utilization, low-latency traffic and comprehensive synchronization solution.
- Compliant with the IEEE 802.1/3 and RFC standards for various Ethernet functionalities.
- DMRIP-400s follows the same specifications as the DMRIP-200s with double the throughput of the DMRIP-200s.
- Built-in Bit Error Rate (BER) monitoring and spectrum scan
- Support Local and Remote loopback for Line checking

#### Key Features:

- Zero footprint, fully outdoor and cost-effective solution
- Advanced multilevel LDPC and RS FEC
- Power supply with coaxial cable or 2-wire cable
- Software-scalable bandwidths (ETSI up to 112 MHz, FCC up to 80MHz) and adaptive modulation schemes (QPSK-4096QAM) provide traffic with more flexibility and strong adaptability to various application environments.
- User-friendly Management- Telnet, WEB GUI, NMS, SNMP Manager. Software and firmware online upgradeable.



### DMR-EBand - 801FX

- Delivers up to 10Gbps Full Duplex throughput for high capacity networks in Metro, Aggregation and Infrastructure or Backhaul applications.

#### Applications for a Wide Range of Vertical Markets

- Fiber Network Extension/ Backup
- Enterprise Multi Gigabit-Connectivity
- Metro and Aggregation Networks
- Multi-Dwelling Unit Gigabit Broadband

#### Key Features:

- Up to 10Gbps Over Longer Distances
- Small Size, Easy to Deploy & Manage
- Wire-speed, AES Secure
- Exceptional Value, from 2Gbps to 10Gbps
- Massive Spectrum Availability and High Reusability; using a high-gain pencil-beam antenna helps guarantee spectrum will be available everywhere and maximizes spectrum re-use



## Spectrum Managed Radio Systems

### SPECTRUM DMR-X-ST

- Single-transceiver all outdoor, IP radio system operating from 6GHz to 42GHz, modulations to 4096QAM, and ultra- wide bandwidth operation to 112MHz ETSI and 160MHz ANSI.
- Can operate with either a single carrier or dual sub-carriers to efficiently increase capacity without requiring any additional equipment.
- Easily and inexpensively field convertible to different sub-bands via user friendly customer replaceable diplexers.
- Radio sparing only needs to include the base radio resulting in no longer a need to spare radios in specific sub-bands.

#### Key Features:

- Up to 3.2 Gbps per radio using stacked quad sub-carriers
- Dual transceivers with each transceiver supporting single carrier or stacked dual sub-carrier operation to efficiently increase capacity without adding any more equipment
- Ultra wide bandwidth operation to 160MHz ANSI and 112MHz ETSI
- Built-in Advanced Digital Pre-Distortion to drive
- Adaptable antenna interface supports third party antennas to ease migration and upgrade



### SPECTRUM DMR-X-DT

- Dual-transceiver all outdoor, IP radio operating from 6GHz to 42GHz, modulations to 4096QAM, and ultra-wide bandwidth operation to 112MHz ETSI and 160MHz ANSI.
- Can achieve capacities up to 3.2Gbps per radio without compression.
- Supports dual sub-carriers resulting in up to four sub-carriers per dual transceiver radio to increase capacity without requiring any additional equipment.

#### Key Features:

- Up to 3.2 Gbps per radio using stacked quad sub-carriers
- Dual transceivers with each transceiver supporting single carrier or stacked dual sub-carrier operation to efficiently increase capacity without adding any more equipment
- Ultra wide bandwidth operation to 160MHz ANSI and 112MHz ETSI
- Built-in Advanced Digital Pre-Distortion to drive
- Adaptable antenna interface supports third party antennas to ease migration and upgrade
- The DMR-X-DT has similar features to the DMR-X-ST except it can handle double the capacity



## Spectrum Managed Radio Systems

### DMR-EBand - 120F

- The DMR-Eband-120F series provides carrier grade Gigabit connectivity with fast ROI.
- Up to 1000 Mbps full-duplex over the uncongested 71-76/81-86 GHz spectrum.

#### Applications for a Wide Range of Markets

- Business Broadband
- GTTH - Gigabit To The Home Mobile Backhaul
- Campus Connectivity
- Video Surveillance Connectivity

#### Key Features (Both EBand-120F & EBand-250F):

- Best ROI for any Application
- No Interference – Reliable Operations
- Small Size, Easy to Deploy & Manage
- Carrier Grade Performance over Wireless
- Streamline Operations with Carrier Ethernet & Synchronization
- Based on a Cost Reducing All-Silicon Technology



### DMR-EBand - 250F

- Provides 2Gbps full-duplex capacity with extended range for accelerating broadband deployment in urban, suburban or rural areas.
- The carrier grade radio delivers fiber-like performance, reliability and throughput, with low CAPEX.

#### Applications for a Wide Range of Markets

- Business Broadband
- Video Surveillance Connectivity
- GTTH - Gigabit To The Home
- Campus Connectivity
- Mobile Backhaul

### Switch for IP Radio

#### (2+0 Aggregation, Load Balancing, E1 Support)

#### Key Features (Switch for IP Radio):

- Support 2+0 IP radio with load balance function
- Traffic distribution is based on MAC/IP/Port for Load balance
- Provides 8 x E1 which are complaint to G.703,G.704,G.8261, G.823 and MEF18
- 8 x E1(RJ45) with LOS indicator
- Provide 4-Ethernet ports, 6 GE optical ports, and 2 10/100/1000 Management Ports
- Support SAToP and CESoP, compliant to RFC4553,RFC5086,Y.1413,Y.1453,MEF18
- Clock frequency generation meets 16ppb requirements
- Support AIS, RDI, RAI, LOS, LOF, LOMF, FERF alarm detection and processing
- Support SNMP, Web-based and Console management



### Throughput versus Frequency

