



MSR165E VEHICULAR ROUTER NODE IP ACCESS & NETWORKING

MSR165E is a tactical vehicular node for networking IP based communications of modern armoured vehicles and units. Within the Sentinel Family of products, MSR165E is the core component of the new generation C4ISR Military Internet Theatre. By integrating several C4ISR assets, it provides Size-Weight-and-Power (SWaP) optimisation in conjunction with increased capabilities in hostile conditions.

MSR165E establishes Self-Forming and Self-Healing MANET, inter-vehicles and aboard in connection to a wide set of heterogeneous radio technologies. It successfully operates in tactical mobile networks sometimes characterised by unsteady and low bandwidth links. MSR165E performs units position dissemination for increasing situational awareness of the military operations.

Although the node can interoperate aboard radios and equipment from other manufacturers, MSR165E provides optimal performance when connected to the company's SWave family of software defined radios.

KEY FEATURES

- Designed to comply with today's and tomorrow's Vehicle Electronic Architecture/GVA requirements
- Tactical Server capability for Vehicle/Mission specific applications
- Integrates routing of new generation IP radios, satellite modems and former CNRs
- CNR Voice E&M Audio Interfaces
- Multi-bearer priority routing across heterogeneous radio technologies
- Fast setup and rapid activation time favoring the operations effectiveness
- Embedded Radio Control Management features (VEMS) DDS based Situational Awareness Data Distribution
- SIP/H.323 VoIP Call Management suite
- Custom Link Encryption for unprotected transportation system
- Embedded VEMS Radio Control Management
- Qualified for Wheeled and Tracked tactical Vehicles

MSR165E



HIGH PERFORMANCE

MSR165E combines market leading throughput performance with innovative services and protocols support, providing a dual stack IPv4-IPv6 networking solution.

A range of electrical and optical interfaces is available to establish network connections over Ethernet. 6-wires E&M analogue interfaces allow audio communications with different radio devices and INTCOM system, thus enabling automatic relay of voice and data between different radio technologies. Serial interfaces assure a packet data service according to MIL-STD-188-220 and MIL-STD-188-184 data link protocols.

A communication management system enabling configuration and control of the connected communication means - like radio devices, satellite modems and sensors - is integrated in the equipment.

Embedded services more the IP Calling Suite make MSR165E a complete IP solution to deliver voice and data services on vehicles. In addition to standard IP protocols, proprietary networking strategies are introduced for faster system topology convergence and graceful network performance degradation upon link failures or nodes disruption or rapid nodes mobility.

Along with standard Differentiated Services QoS policies, advanced traffic management strategies inclusive of traffic control and resources optimisation mechanisms, are implemented in support of mission critical real time applications.

INTEGRATION OF BEARERS AND SERVICES

The MSR165E completes Sentinel Multiservice Access and Networking device family with layer 3 processing capabilities, supplying Integrated Service Router functions, radio management functions and dissemination services for distributing unit positioning information.

The MSR165E, via embedded IP Calling Suite application software, provides VoIP services in accordance with H.323 and SIP standards. This IP Calling Suite makes MSR165E fulfil important tactical operational requirements as independence from the physical network topology, management of PTT signalling and integration of non-IP assets now directly connected to the MSR165E itself.

The support of a wide set of interworking and transcoding functions makes MSR165E capable of end-to-end communications across many technology domains like legacy voice CNR and VoIP systems.

ROUTING PROTOCOLS SET

MSR165E MANET routing algorithms dynamically select the best radio bearer/radio equipment in the route to the final destination. The capability to achieve fast network topology convergence with a significant reduction of bandwidth consumption and the efficient handling of narrowband radio bearers make these routing algorithms best-in-breed for military CNR networks. Policy Based Routing (PBR) and Generic Routing Encapsulation (GRE) modes complete the new routing features set.

TECHNICAL SPECIFICATIONS

IP Interworking

- OSPFv2, v3
- BGPv4, v4+
- GRE Tunnelling
- PIMv2-SM
- IGMP
- MLDv2

Advanced Routing

- Multi-vector Priority Routing
- Policy Based Routing
- MANET Routing algorithms (WSPF)

Security

- Firewalling through Access Control Lists

QoS

- DiffServ
- Enhanced traffic management strategies for mission critical applications

Radio Datalink Protocols

- MIL-STD-188-220C
- MIL-STD-188-184

Integrated Service Features

- Embedded Call Management suite, supporting:
 - H.323
 - SIPv2with telephonic addressing formats according to standard and military numbering plans.
- Embedded Radio control management functions (VEMS)
- Embedded Processing Unit for Core Applications / Services (DDS based)

Network Services

- DHCP
- IPv6 Stateless Address Auto-configuration
- Proxy ARP

Layer 2 Features

- Transparent bridging
- MAC learning, aging and switching by hardware
- VLAN according to IEEE 802.1q
- Rapid Spanning Tree Protocol according to IEEE 802.1d
- InterVLAN routing

INTERFACES

- 8 Ethernet 10/100/1000 Base T LAN/WAN interfaces
- 1 Ethernet 1000 Base Sx LAN/WAN interface
- 12 Ethernet 10/100 Base T for radio/satellite WAN connectivity and management functions
- 4 synchronous serial RS232/MIL-STD-118-114A for WAN connectivity via legacy UHF/VHF/HF radio devices supporting MIL-STD-188-220 and MIL-STD-188-184 datalink protocols
- 8 asynchronous serial interfaces for management functions of legacy UHF/HF/VHF radio devices
- 7 analogue 6 Wires E&M interface to perform voice communications through legacy UHF/VHF/HF radio devices and to interconnect analogue INTERCOM
- 1 asynchronous serial interface towards an external GPS interface configurable RS232/RS422 supporting NMEA protocol
- 1 Ethernet 10/100 Base T local management interface
- 1 RS232 asynchronous local management interface
- 1 USB local management interface

MSR165E

Management

- Auto-diagnostic
 - Power-on self-test
 - General Alarm
- Local Terminal
 - RS232 asynchronous serial line with ASCII protocol
- NMS Control through an Ethernet 10/100 Base
 - SNMPv3 protocol
 - Telnet protocol
 - Configuration files (XML)
 - TFTP saving and restoring configuration
 - Integrated Web Server

Main Supported Standards

- IPv4 (RFC 791)
- ICMP (RFC 792)
- GRE tunneling protocol for IPv4 (RFC 2784)
- IGMPv1,v2 for IPv4 (RFC 2236)
- UDP (RFC 768)
- IP over Ethernet (RFC 894)
- TCP (RFC 793)
- ARP (RFC 826)
- Proxy ARP for IPv4 (RFC 1027)
- DHCPv4 (RFC 2131)
- IPv6 (RFC 2460)
- IPv4-IPv6 dual stack (RFC 4213)
- ICMPv6 (RFC 2463)
- Neighbor Discovery for IPv6 (RFC 4861)
- IPv6 Stateless Address Autoconfiguration (RFC 2462)
- OSPFv2 (RFC 2328)
- OSPFv3 (RFC 2740)
- BGPv4 (RFC 4271)
- BGPv4+ (RFC 2545)
- PIMv2 Sparse Mode for IPv4 (RFC 2362)
- MIL-STD-188-220C datalink protocol
- MIL-STD-188-184 datalink protocol
- Session Description Protocol (SDP) (RFC 2327, RFC 3264)
- Session Initiation Protocol (SIP) (RFC 3261)
- The SIP INFO Method (RFC 2976)
- Real-Time Transport Protocol (RTP) (RFC 1889, RFC 2833, RFC 3550)
- H.323
- E.164
- Stanag 4214
- Stanag 5046
- VLAN Tagging (IEEE 802.1q)
- Rapid Spanning Tree Protocol (IEEE 802.1d)
- A Simple Network Management Protocol (SNMP) (RFC 1157)
- Structure of Management Information for SNMPv2 (RFC 1442)
- SNMPv3 Applications (RFC 2263)
- SNMP Applications (RFC 2573)

- Management Information Base for Version 2 of the Simple Network Management Protocol (SNMPv2) (RFC 1907)
- Telnet (RFC 854)
- TFTP (RFC 783)
- NMEA
- OMG DDS
- NFFI (STANAG 5527)

Power Supply

- DC source
 - 19VDC to 34VDC according to MIL-STD-1275E
 - Average consumption 60W

Physical

- Size (H x W x D) 120mm x 266mm x 328mm
- Weight 7 kg

Electrical Safety

- According to CEI EN 60950-1

Installation

- Wheeled or tracked combat and combat support vehicles, tactical logistics platforms and ships
- Fixed in deployable area

ENVIRONMENTAL SPECIFICATION

Operating Temperature	-31°C to + 49°C MIL-STD-810G Method 501.5 & 502.5, Procedure II
Storage Temperature	-46°C to + 71°C MIL-STD-810G Method 501.5 & 502.5, Procedure I
Temperature Shock	MIL-STD-810G Method 503.5 Procedure IA
Humidity	MIL-STD-810G Method 507.5 (Aggravated temperature-humidity cycle), operating & storage
Immersion	MIL-STD-810G Method 512.5, Procedure I (0.5m water depth)
Vibration	MIL-STD-810G Method 514.6, wheeled and tracked vehicle
Functional Shock	MIL-STD-810G Method 516.6, Procedure I, sawtooth pulse at 40g/10ms
Altitude	MIL-STD-810G Method 500.5, Procedure I (storage) & II (operating)
Salt Fog	MIL-STD-810G Method 509.5
Fungus	MIL-STD-810G Method 508.6
Dust and Sand	MIL-STD-810G Method 510.5, Procedure I (Blowing Dust) e II (Blowing Sand)
EMI Emission	MIL-STD-461F, RE101, RE102, CE102
EMI Susceptibility	MIL-STD-461F, RS101, RS103, CS101, CS114, CS115, CS116

