

MDS ORBIT PowerNet

Wireline Solutions for Critical Applications

MDS™ Orbit with PowerNet is a broadband powerline communications solution built on the MDS Orbit platform, a next generation industrially hardened communications networking platform designed with a common operating system, device management tools, and a comprehensive networking and cyber-security framework. The commonalities in the platform significantly reduce the overall learning time for users, simplifying the set-up and commissioning of networks, and enables the deployment of a variety of network designs and topologies.

The MDS Orbit platform is available in two models, the Multiservice-Connect Router (MCR) which supports dual Wide Area Network (WAN) transmission options and the Edge-Connect Router (ECR) which supports a single WAN transmission option. The Orbit platform supports multiple wired and wireless technologies including PowerNet, 4G cellular, unlicensed, and licensed narrowband radios.

In addition to the core feature suite derived from the MDS Orbit platform, the PowerNet interface enables operators to extend broadband secure and reliable networks for critical applications. The PowerNet interface uses an IEEE 1901 compliant Nessum wire, enabling reuse of existing power lines or pilot wires for signal transmission.

The MDS Orbit platform features rich networking capabilities with integrated routing and switching, tunneling, VPNs as well as advanced Quality of Service. It further supports a rigid enterprise-class security framework to enable the secure transport of data and advanced protection of network and assets.

Key Benefits

- Protect network assets and access with enterprise-class security such as firewalling, IPSec VPNs, X.509 certificate management, and RADIUS
- Overcome harsh environments with IEC 61850-3 certification

Applications



Industrial Plants

- Building automation
- Moving machines, cranes
- Field bus retrofit



Mining

- Drilling machines control
- Traffic signaling
- Voice and safety coms



Electric Utilities

- Distribution automation
- Industrial Metering
- EV charging stations



Smart Cities & Municipalities

- Traffic signals control
- Street Lighting control
- Digital Signage



Industry Leading Reliability

- Support for Nessum wire, IEEE1901:2020
- 30 years of extensive experience with more than 2 million devices deployed
- Built for harsh environments with compliance to IEEE 1613, IEC 61850-3
- Industry leading Mean Time Between Failures (MTBF) of 50 years
- 5-year manufacturer warranty lowers total cost of ownership

Advanced Networking & Security

- Flexible Quality of Service enables simultaneous applications on the same uplink while preserving performance
- Concurrent routing and bridging enables flexibility for a variety of network designs and topologies
- Enterprise-class device with network cyber security functionality and VPNs ensures advanced protection for network assets
- FIPS 140-2 (Level 2) based design

Ease of Use & Compact Design

- Intuitive user interface and configuration wizards simplify complex network configuration tasks resulting in accelerated deployment of advanced networking
- Very compact design to fit a large majority of automation cabinets



Technical Specification

NETWORKING
Routing: Static Routing with Failover, Dynamic routing: OSPFv2, RIPv2, BGPv4
Ethernet IEEE 802.3, 802.1Q/VLANs, IGMP, STP, 64 VLANs
Concurrent Bridging & Routing
Tunneling Layer 2 (Ethernet) and Layer 3 (IP) – GRE, IPsec, Dynamic Multipoint VPN (DMVPN)
High Availability Failover between any two interfaces, performance-based failover (latency and packet loss)
Quality of Service 16 egress queues, Priority Queuing, Fair Queuing, Traffic Shaping, Classification based on DSCP, 802.1p and Layer, 2-4 classifiers
IP Protocols TCP, UDP, ARP, DHCP, ICMP, NTP, FTP, SFTP, TFTP, DNS, configurable, HTTP and HTTPS, SSH
Serial TCP server, Modbus/TCP, Modbus RTU, TCP client, UDP Unicast and Multicast, BSAP, and DNP3

CYBER SECURITY
IPSec VPN Server (responder) and Client (initiator)
Authentication Public Key, EAP TLS, Pre-Shared, Ike 1-2
Encryption 3DES, AES 128/192/256, CBC, CTR, CCM, GCM, SHA 256/384/512 HMAC
Firewall Stateful L3-4 Access Control List, Layer
L2 MAC Filtering, NAT, Source NAT (Masquerading), Static NAT, Port Forwarding
Device Security Secure Boot, Secure Firmware, Digitally Signed Hardware and Software, Magnetometer Tamper Detection
Certificate Management X.509, SCEP, PEM, DER, RSA
User Authentication Local RBAC, AAA/RADIUS
FIPS 140-2 (level 2) based design

NETWORK MANAGEMENT
Secure device management via HTTP/HTTPS (GUI) and Juniper- style CLI via SSH or local console
Event logging, Syslog over TLS
Iperf throughput diagnostic
Packet capture
NETCONF
SNMPv1/v2c/v3, MIB-II, Enterprise MIB

PHYSICAL INTERFACES
10/100 Ethernet RJ45
RS-232/RS-485 Serial RJ45
USB Management: 1 x Mini-USB 2.0 port
2 x BPL I/O connector on 6 pins connector
LEDs PWR, ETH, COM, NIC1, NIC2

AGENCY APPROVALS / STANDARDS
CE marking
IEC/UL/CSA 62368-1
IEC 55032
IEC 61850-3, IEEE1613
IEC 61000-4-2/3/4/5/6

NESSUM WIRE
IEEE 1901:2020 Wavelet FDM compliant interface
Operation mode: Master/Terminal
Scalable networks using CSMR auto routing protocol ITU-T G.9905: <ul style="list-style-type: none"> Up to 1024 nodes Up to 10 hops
Max Data rate: <ul style="list-style-type: none"> Channel 'x-4': 34 Mbps Channel 'x-5': 42 Mbps
Real Time adaptive modulation and FEC per carrier
Long haul capability <ul style="list-style-type: none"> Flexible Wavelet Channels Tx Power (adjustable) up to -37 dBm/Hz Sensitivity < -130 dBm/Hz
Dual signal I/O for: <ul style="list-style-type: none"> Resilient schemes By-pass of signal obstacles Media diversity
Security <ul style="list-style-type: none"> Whitelist authentication

ENVIRONMENTAL & MECHANICAL
Operating Temp -40° to +70°C (-40° 158°F)
Storage Temp -40° to +85°C (-40° 185°F)
Humidity 95% at 60°C (140°F) non-condensing
Case Die Cast Aluminum
Mounting: Integrated DIN Rail or Standard Mounting Brackets
No Fans, No Moving Parts
HALT& HASS Testing
ECR Dimensions: <ul style="list-style-type: none"> 2.1 H x 4.3 W x 4.6 D in 5.4 H x 10.9 W x 11.7 D cm
ECR Weight 1.45lbs (0.66 Kg)

ELECTRICAL & POWER CONSUMPTION
Input Voltage 10 to 60 VDC
Orbit ECR Power Consumption < 10W

WARRANTY
5-year standard manufacturer warranty

For more information
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