Nodegrid Mini SR™

Out-of-band Cloud Gateway for IoT/OT/IoMD applications

Nodegrid™ Mini Service Router (MSR) brings versatility in a tiny package. Approximately the size of an iPhone, the MSR is your out-of-band cloud gateway to connect, isolate and control critical devices at remote locations. This fan-less device can be installed in remote manufacturing and commercial builds or even SCADA environments and connect directly to devices using its Gigabit interface thereby isolating them from the rest of the network.

Benefits

- **Reduce CAPEX & OPEX expenses** with a consolidated, extensible solution & automated management
- **Reduce downtime & trips to remote locations** with instant remote access
- **Minimize MTTR, downtime, & expenses** with secure, centralized remote device access & control
- **Increase site reliability** with open industry standard hardware & easy-to-use software

Features

- **Out-of-band IOT Gateway Platform**
- **Strong Out-of-Band Management integration**
- **Extensible applications with virtualization and containers**
- **Zero Touch Provisioning (ZTP)** over the WAN for fast and easy setup in remote locations
- **Integrates with ZPE Cloud** and Nodegrid Cluster feature for a vendor-neutral, unified management solution
- **Modern x86-64bit Linux Kernel** for fast security patching and widespread software availability
- **Extended Automation** based on actionable data
- **Connectivity over 4G/LTE and Wi-Fi with integrated SD-WAN**
- **Gateway and multi-routing table capability**
- **Encrypted data transit** with SSL, and IPsec and WireGuard VPN technologies
- **DHCP server** – extra IPs for your remote site or replace your current router altogether
- **Built in firewall and onramp to SASE/SSE**
- **Secure** – selectable encrypted cryptographic protocols and cypher suite levels, configuration checksum™
- **Power control and monitoring** – get alerts on IT device health and solve problems automatically
- **Automation/Orchestration** - Puppet, Chef, Ansible, RESTful API's

The Mini SR is managed by ZPE Cloud and can be centrally automated by ZPE Cloud to connect these IoT/OT devices out-of-band using Wi-Fi, LTE, Ethernet to their intended destinations and create secure IPSEC tunnels to private Firewalls or public SASE/SSE destinations. ZPE Cloud automation or even 3rd party orchestration can also deploy edge workloads such as VM's, Docker containers and Applications such as 3rd party firewalls and vulnerability scanners. In summary the Mini SR is the platform to simplify IOT/OT connectivity, provide secure out-of-band management, isolate devices, run applications that realistically should only be run on premises edge and connect the solution to easily deploy and manage edge networks.

Mini SR is preloaded with Nodegrid OS, which combines zero-touch provisioning from ZPE Cloud, out-of-band management and running 3rd party guest OS, custom applications, and Docker, Kubernetes, and LXC containers.

MSR has two optional SKU's to connect to Internet via Cellular & Wi-Fi client mode, serving as a platform to connect devices at the edge securely only to the services they need access to.

Secure Remote Access Branch, Edge, & Colocation Devices
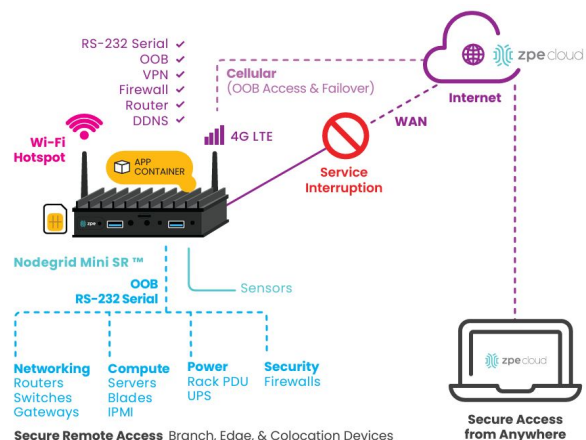
Nodegrid Mini SR Interfaces

- 2X **GbE on RJ45**
- 1X **Micro SD**
- 1X **Cellular 4G/LTE with Single SIM**
- **Environmental Sensors** (External via USB)
- 1X **Wi-Fi**
- 4X **USB**

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Technical Specifications

Accessibility
- 2x Gigabit Ethernet Ports on RJ45, 4 USB, 1 Wi-Fi (Optional), 1 Cellular Slot with Single SIM (Optional)

OOB Managed Power Devices
- Vendor neutral PDU support (IP and RS-232 serial via USB)

Managed IPMI Devices
- OpenBMC, HP iLO, Dell iDRAC, Supermicro/Quanta IPMI, IPMI 2.0 compatible devices, Cisco CIMC/UCS, IBM IMM, Oracle ILOM, EMC/NetApp Storage IPMI

Sensors
Support for a wide range of USB sensors

Managed Devices
Serial devices, USB devices, Network devices, PDU, and IPMI Devices

Wireless
- Latest generation IEEE 802.11ac Wi-Fi 5 compliant with 2 spatial streams in 2.4 GHz & 2 spatial streams in 5 GHz (2X2X2)
- Backward compatible with IEEE 802.11a/b/g/n
- Devices can be connected to both 5 GHz + 2.4 GHz bands concurrently
- 2 TX/RX antennas connected through RP-SMA connectors
- Supports 80 MHz bandwidth (BW) in 5 GHz band & 40 MHz B In 2.4 GHz band
- 867 Mbps Wi-Fi speed on 5GHz and 400Mbps on 2.4GHz
- LDPC / TX STBC / DL Multi User MIMO; DL & UL MU-OFDMA
- Energy saving Target Wait Time (TWT)
- No limits are placed on number of users or devices
- dual mode Bluetooth 4.2 Low energy support
- WMM, WMM-PS, WPA2, PMF,
- IEEE 802.11d, 802.11e, 802.11h, 802.11i, 802.11w, 802.11r, 802.11k

Networking
- IPv4 & IPv6 (stateful + auto-configuration)
- DHCP server / client / relay (IPv4, IPv6)
- Multi-Tenancy (VRF)
- IPv4 & IPv6 tunneling
- Network address translation (NAT)
- Multi-cast
- VLAN

Routing
- BGP
- RIPv1, RIPv2
- OSFP
- VXLAN

IP Services
- QoS • DHCP (Client & Server)
- NTP, global time zone, cellular tower time synchronization

Connectivity
- Ethernet, Bluetooth tethering, Wi-Fi hotspot, cellular 4G/LTE (with failover & healthcheck)
- HTTPS, SSHv2; optional HTTP, Telnet, & SSHv1

Device View Options
Tree, Table, Geo Map, Node, & WEB Interface with search

Data Logging & Notifications
- Local port buffering: 20 MB per port
- Local, NFS, syslog, off-line data logging
- Timestamp & rotation for data logging
- Event destination: email, syslog, local, syslog, email, ZPE Cloud, Splunk & more
- Notification: syslog, email, ZPE Cloud, Splunk & more"

System Management
- Extensible, automated control based on actionable real-time data
- Web GUI management portal, web console, Command Line Interface (CLI), Linux root shell, SNMP, RESTful API
- Zero Touch Provisioning (ZTP) via LAN/DHCP, WAN/ZPE Cloud, USB for configuration & firmware updates

- Multiple & customizable user levels of access
- Auto-discovery via network scan & custom probes
- SNMPv1,v2 & SNMPv3-v1 IPv4/IPv6 with MD5, SHA-224, SHA-256, SHA-384, SHA-512, DES, AES-192, AES-256
- Orchestration integration & automation: Puppet, Chef, Ansible, RESTful, ZPE Cloud & Nodegrid Cluster Feature / Manager
- File sharing via FTP, NFS, SSHFS, Windows Sharing, web file browser, ZPE Cloud
- Remote Procedure Call (RPC, gRPC)
- NetFlow, LLDP

Security
- Hardened device with BIOS protection, TPM 2.0, UEFI secure boot, signed OS, geofencing
- X.509 SSH certificate support, 4096-bit encryption keys
- Selectable cryptographic protocols for SSH OpenSSL3 & HTTPS (TLSv1.3, TLSv1.2, TLSv1.1)
- Selectable cypher suite levels: high, medium, low, custom
- IPsec, WireGuard, OpenSSL VPN with support for multi-sites
- Local, AD/LDAP, RADIUS, TACACS+, Kerberos authentication
- SAML2 SSO, DUO, Okta, Ping Identity, ADFS
- Two-factor authentication with RSA & DUO
- Local, backup-user authentication support
- User-access lists per port
- Group/role-based authorization: AD/LDAP, RADIUS, TACACS+, Kerberos
- Fine-grain & role-based access control
- Firewall: IP packet & security filtering, IP forwarding support
- MD5 / SHA system configuration checksum
- System event logging to file, syslog, email, ZPE Cloud, Splunk & more
- Custom security settings
- Strong password enforcement, Fail2ban"

Operating System
- Built-in x86-64bit Nodegrid OS (Linux Flavor)

Power Specifications
- 7-20 VDC power input
- Power consumption 5W to 15W typical
- 5.5 x 2.5mm standard barrel
- 12V 3A power supply included (with twist lock)

Warranty
- 2 year limited warranty

CPU & Storage (Upgrades Available)
- Intel x86 64 bit Dual-Core
- 4GB of DDR3 DRAM
- 16 GB Self Encrypted Disk (SED)

Interface
- 2 x Gigabit (10/100/1000BT) Ethernet interfaces on RJ45
- 4 x USB (2x 2.0 and 2x 3.0Hosts on Type A)
- 1 x Wi-Fi – Optional SKU
- 1 x Cellular Slots with Single SIM – Optional SKU
- 1 x HDMI port
- 1 x Micro SD port

Physical
- DIN Rail and Vesa Wall Mountable
- Kensington Lock
- Power Plug Twist Lock
- Mechanical disabling of power button
- Size (L x W x H): 112 X 84 X 34 mm (4.4 x 3.3 x 1.34 in)
- Weight: 0.35 kg (0.77 lb)
- Shipping weight: 1.58 kg (3.5 lb)
- Shipping (L x W x H): 112 X 84 X 34 mm (4.4 x 3.3 x 1.34 in)

Shock and Vibration
- MIL STD 810G compliant
- Vibration test: IEC TR 60721-4-7:2001+A1:03, Class 7M1, test
- method IEC 60068-2-64 (up to 2 KHz , 3 axis)
- Shock test: IEC TR 60721-4-7:2001+A1:03, Class 7M1, test
- method IEC 60068-2-27 (15g , 6 directions)

Environmental
- Operation: 0 to 45º C (–4 to 140º F), Extended Option: –20 to 70º C,
- 5-95% RH, non-cond.
- Storage: –40 to 85º C (–40 to 185º F), 10-90% RH, non-cond.

Ordering Information

Channel SKU	Description	CPU	Memory	Power	Special
ZPE-MSR-24-BASE	ZPE Systems Nodegrid Mini SR – 2 RJ45 1 Gb ETH, X86 64bit CPU 2-Cores, 4GB DDR3, Disk1: 16GB encrypted. AC Power adapter included. Order ZPE-cloud and app subscription. Includes Standard 2 year support and HW warranty. Includes 90-day ZPECloud.com subscription.	2 Cores	4GB	AC Adapter	Base
ZPE-MSR-24-W5	ZPE Systems Nodegrid Mini SR – 2 RJ45 1 Gb ETH, X86 64bit CPU 2-Cores, 4GB DDR3, Disk1: 16GB encrypted. With addition of: Wi-Fi 5 (866Mbps 2x2 dual stream 802.11ac). AC Power adapter included. Order ZPE-cloud and app subscription. Includes Standard 2 year support and HW warranty. Includes 90-day ZPECloud.com subscription.	2 Cores	4GB	AC Adapter	Wi-Fi
ZPE-MSR-24-4G	ZPE Systems Systems Nodegrid Mini SR – 2 RJ45 1 Gb ETH, X86 64bit CPU 2-Cores, 4GB DDR3, Disk1: 16GB encrypted. With addition of: Antennas and 4G LTE (CAT12) radio. AC Power adapter included. Order ZPE-cloud and app subscription. Includes Standard 2 year support and HW warranty. Includes 90-day ZPECloud.com subscription.	2 Cores	4GB	AC Adapter	4G
ZPE-MSR-24-4G-W5	ZPE Systems Nodegrid Mini SR – 2 RJ45 1 Gb ETH, X86 64bit CPU 2-Cores, 4GB DDR3, Disk1: 16GB encrypted. With addition of: Wi-Fi 5 (866Mbps 2x2 dual stream 802.11ac) and antennas and 4G LTE (CAT12) radio with dual-SIM. AC Power adapter included. Order ZPE-cloud and app subscription. Includes Standard 2 year support and HW warranty. Includes 90-day ZPECloud.com subscription.	2 Cores	4GB	AC Adapter	4G Wi-Fi
ZPE-MSR-24-BASE-EXT	ZPE Systems Nodegrid Mini SR – 2 RJ45 1 Gb ETH, X86 64bit CPU 2-Cores, 4GB DDR3, Disk1: 16GB encrypted. AC Power adapter included. Order ZPE-cloud and app subscription. Extended Temperature Range –20 to 70 C (–4 to 158 F). Includes Standard 2 year support and HW warranty. Includes 90-day ZPECloud.com subscription	2 Cores	4GB	AC Adapter	Base
ZPE-MSR-24-W5-EXT	ZPE Systems Nodegrid Mini SR – 2 RJ45 1 Gb ETH, X86 64bit CPU 2-Cores, 4GB DDR3, Disk1: 16GB encrypted. With addition of: Wi-Fi 5 (866Mbps 2x2 dual stream 802.11ac). AC Power adapter included. Extended Temperature Range –20 to 70 C (–4 to 158 F). Order ZPE-cloud and app subscription. Includes Standard 2 year support and HW warranty. Includes 90-day ZPECloud.com subscription	2 Cores	4GB	AC Adapter	Wi-Fi
ZPE-MSR-24-4G-EXT	ZPE Systems Nodegrid Mini SR – 2 RJ45 1 Gb ETH, X86 64bit CPU 2-Cores, 4GB DDR3, Disk1: 16GB encrypted. With addition of: Antennas and 4G LTE (CAT12) radio. AC Power adapter included. Extended Temperature Range –20 to 70 C (–4 to 158 F). Order ZPE-cloud and app subscription. Includes Standard 2 year support and HW warranty. Includes 90-day ZPECloud.com subscription.	2 Cores	4GB	AC Adapter	4G
ZPE-MSR-24-4G-W5-EXT	ZPE Systems Nodegrid Mini SR – 2 RJ45 1 Gb ETH, X86 64bit CPU 2-Cores, 4GB DDR3, Disk1: 16GB encrypted. With addition of: Wi-Fi 5 (866Mbps 2x2 dual stream 802.11ac) and antennas and 4G LTE (CAT12) radio with dual-SIM. AC Power adapter included. Extended Temperature Range –20 to 70 C (–4 to 158 F) . Order ZPE-cloud and app subscription. Includes Standard 2 year support and HW warranty. Includes 90-day ZPECloud.com subscription.	2 Cores	4GB	AC Adapter	4G Wi-Fi

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Accessories & Support

Channel SKU	Description
ZPE-MSR-PSU	ZPE Systems Nodegrid Mini SR - Primary and spare power supply
ZPE-MSR-DIN	ZPE Systems Nodegrid Mini SR - DIN rail connector
ZPE-MSR-WMNT	ZPE Systems Nodegrid Mini SR Wall Mounting Kit
ZPE-MSR-VESA	ZPE Systems Nodegrid Mini SR - VESA mount connector
ZPE-MSR-SCC	ZPE Systems Nodegrid Mini SR - Serial Console Cable
ZPE-USB-RJ45-4SRL	ZPE Systems - USB to RJ-45 4-port RS-232 Serial Console Adapter (Cisco Rolled pinout)
ZPE-MSR-TX-BASE-ALL-EW1G	ZPE Systems Nodegrid Mini SR - 1 year - 24x7 Gold Upgrade Support
ZPE-MSR-TX-BASE-ALL-EW2G	ZPE Systems Nodegrid Mini SR - 2 year - 24x7 Gold Upgrade Support
ZPE-MSR-TX-BASE-ALL-EW3G	ZPE Systems Nodegrid Mini SR - 3 year - 24x7 Gold Upgrade Support
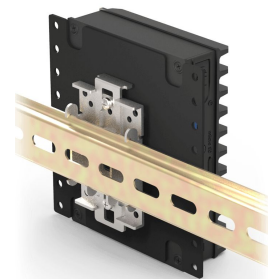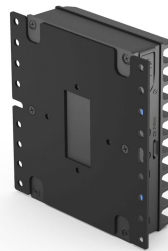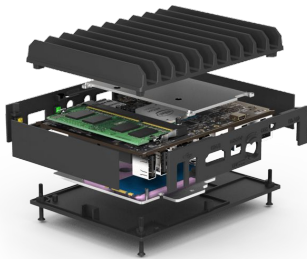
NOTE: If you need more storage or other combinations please contact ZPE Sales: sales@zpesystems.com

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