

MOROS.neo

VPN-Router / IoT-Gateways



MOROS.neo – The DIN rail standard router for industry and control cabinets. Durable. Secure. Reliable.

Reliable remote maintenance and network segmentation – complemented by INSYS-icom Services for VPN, SIM, and device management

MOROS.neo stands for highly reliable Internet connectivity as a router, industrial firewall, and machine gateway – for industrial and critical infrastructure applications



WiFi: Client + Access Point

WiFi service access; client and access point mode; deliberately activatable service window on the device



4G Cellular with Dual SIM

Cellular connectivity for flexible WAN access; dual Nano-SIM for higher availability; options for separating operations and service



RS-485/Modbus & I/Os

RS-485/Modbus connectivity for existing installations; digital inputs/outputs for signals and actions; integration without additional hardware



Hardened Router OS

Security, firewall, and network functions; protection against tampering during system startup through Secure Boot



Gigabit & VLAN

4x Gigabit Ethernet; VLAN and segmentation options; managed switching for clean network separation



EDGE Apps on the Device

EDGE apps via LXC containers; local data processing; extensibility for protocol gateways, data logging, and IoT/cloud connectivity



Remote Maintenance & VPN Protocols

Worldwide remote maintenance; OpenVPN, WireGuard, IPsec; plug-and-play with INSYS-icom Services



Quick Start & Open Interfaces

Quick-start wizard; personal support for initial commissioning and project implementation; REST-API for integration and automation

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Cellular communication 4G (MOROS.neo-E.4G / -EW.4G)	
Frequency bands, data rates	4G/LTE: 1 (2100 MHz), 2 (1900 MHz), 3 (1800 MHz), 4 (2100/1700 MHz, AWS), 5 (850 MHz), 7 (2600 MHz), 8 (900 MHz), 12 (700 MHz), 13 (700 MHz), 14 (700MHz), 18 (850 MHz), 19 (850 MHz), 20 (800 MHz), 25 (1900MHz), 26 (850 MHz), 28 (700 MHz), 38 (2600 MHz), 39 (1900MHz), 40 (2300 MHz), 41 (2500 MHz), 66 (2100 MHz), 71 (600MHz) LTE Cat 4 (DL: max. 150 Mbit/s, UL: max. 50 Mbit/s) 3G/UMTS/HSPA: 1 (2100 MHz), 2 (1900 MHz), 4 (2100/1700 MHz AWS), 5 (850 MHz), 6 (800 MHz), 8 (900 MHz), 19 (850 MHz) DC-HSPA+, HSUPA (DL: max. 42 Mbit/s, UL: max. 5,76 Mbit/s)
Antenna connection	2x SMA female (main antenna & optional additional antenna, MIMO)
SIM	1 tray for 2 Nano-SIM cards (4FF), dual SIM single standby (DSSS) Provider scan, provider redundancy with multi-roaming SIM cards (see section "Suitable accessories")
Cellular Status (UI)	Signal field strength, RSSI, RSCP / Ec/No, RSRP / RSRQ, SINR, cell ID, location ID
WLAN (WiFi) (MOROS.neo-EW / -EW.4G)	
Standard	IEEE 802.11a/b/g/n/ac/ax (WiFi 6)
Frequency, TX power	2,4 & 5GHz, max. 100 mW
WLAN (Wi-Fi) modes	WLAN (Wi-Fi) Station (Client) or WLAN (Wi-Fi) Access Point with up to 16 stations simultaneously
WLAN button	Activation/deactivation, automatic deactivation adjustable (default 120 minutes after activation)
Security	WPA/WPA2/WPA3 (AES, TKIP), 802.1x (EAP: TLS, TTLS, PEAP)
Antenna connection	1x RP-SMA male (Reverse Polarity SMA)
Hardware interfaces	
Ethernet ports	4x RJ45 shielded, 10/100/1000 Mbit/s, Full/half duplex, Auto MDI-X, 1.5 kV isolation voltage
Ethernet function	Assignment to IP network freely configurable per port, link up/down detection, configuration port
I/Os	Variants without cellular: 2 digital inputs or outputs, configurable Variants with cellular: 4 digital inputs or outputs, configurable; 1 digital input, high-aktiv (connection to 10...24 V DC, as per EN 61131-2, type 1)
RS-485	1x RS-485, push-in terminal connector (A, B, GND)
RS-232	Variants with cellular: 1 x RS-232, push-in terminal connector (RX, TX)
Functions of serial interfaces	Serial-Ethernet gateway (incoming and outgoing connections, Modbus TCP/RTU gateway, modem emulation, editable AT answer list, translation of phone numbers to IP addresses)
Indicators (LEDs)	Power (supply/boot/reset), WAN (internet connection), Info (konfigurabel), WLAN (WiFi status) Variants with cellular: SIG (signal indicator), SIM1/SIM2 (aktive SIM card), DI/O (activity at inputs/outputs)
Network	
Network functions	Up to 100 IP networks, IP static/DHCP, TCP, UDP, IPv4, IPv6, NTP, DHCP, DNS, HTTP/S, ARP, SSH, 802.1Q VLAN incl. tags and trunk ports
Service	DHCP Server v4/v6 per IP network, DHCP relay, NTP server, DNS, DynDNS, IPv6 Router Advertiser
Routing	Static routing, routing priority, RSTP, dynamic routing (OSPF, BGP, RIPv1, RIPv2, RIPng)
WAN redundancy/failover	Several WAN connections configurable also in parallel operation, fallback level for connection breakdown (failover), event-based WAN changeover (see events)
Connection check	Periodic, ping/icmp, DNS request, link up/down
NAT/PAT	SNAT/DNAT (masquerade, netmapping, port forwarding, IP forwarding) unlimited number of rules
VPN	
icom Connectivity Suite	Supports VPN service for remote maintenance, remote access and M2M-communication
OpenVPN	Client/server, several parallel tunnels, server with up to 20 clients, tls-auth/tls-crypt, dead peer detection (DPD)
OpenVPN encryption	DES EDE 128, DES EDE3 192, AES 128-256 CBC/GCM, SHA 256-512, ChaCha20-Poly1305
IPsec	IKEv1, IKEv2 (automatic, fix), several parallel tunnels, pre-shared keys, certificates, tunnel mode, transport mode, dead peer detection (DPD)

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IPsec encryption	DES EDE3 192, AES 128-256 CBC/GCM, SHA 256-512 DH-Group 1-31 (Diffie-Hellman 768 - 25519), ChaCha20-Poly1305
WireGuard	WireGuard VPN client/server support
GRE	GRE via IPsec, point-to-point, multipoint
PPTP	PPTP client/server; PAP/CHAP/MS CHAP/MS CHAP V2; MPPE 40-128
Dynamic VPN	Dynamic multipoint VPN (GRE, IPsec, NHRP, OSPF, RIPv1/v2, BGP)
IT security	
Authentication	Pre-shared key, X.509 certificates, RADIUS, access rights (read, write, status)
Firewall / netfilter	IP filters (stateful firewall) also in VPN tunnel; packet filter: TCP, UDP, ICMP, ESP, AP, GRE; MAC filter; pre-defined firewall rules can be activated
Security	Secure Boot: cryptographically secured boot process with integrated hardware Root of Trust; Encrypted file system: data encryption using a unique, hardware-protected device key (Arm® TrustZone®); HTTP/HTTPS attack prevention; response upon events: configuration change, link up/down, restart, login attempt, netfilter violation, password hashing
Container and IoT	
Container Runtime	Edge computing with local data processing
Edge applications	Proprietary or third-party apps in a Docker-like container environment (LXC)
Remote Deployment	Centralized container rollout across the fleet - icom Router Management (iRM)
Interfaces	Ability to access the router's peripherals
Events & Actions	
Event & Action Handler	Notification, alarming, diagnosis, attack detection, fault handling, operation and commissioning logic
Events / alarms (selection)	Change: digital input, Ethernet port, WAN chain, profile status, supply input, cellular field strength; timer expired, firewall violation, login attempt detection, pulse sequence on digital input, counter, netfilter rule, ping/icmp
Event-triggered actions (selection)	Messages via e-mail, SMS (only cellular variants), SNMP traps, MCIP; switch profile, switch connection, change modem state, start timer, switch output or pulse sequence, activate firmware, reset, restart container
Programming environment/scripting	
Container environment	Installation of several application containers (LXC), container with own IP end point, assignment to IP networks - full firewall and routing transparency, access control, SDK available
Container resources	CPU: 50% of 64-bit ARM Cortex-A53 Dual Core, RAM: 800 MB, Flash: 7 GB eMMC
Lua scripting	Lua interpreter for own scripts
Monitoring and Management	
Monitoring	SNMP traps and agent, system logs, remote syslog (RFC 5424 & 3164), link up/down detection, netfilter violation
Certificate management	EST, CRL
icom Router Management	Supports central router management for FW updates, configuration management, connection monitoring, container updates, mass rollout, certificate management, available as public/private cloud (server) installation or onPremises
Administration	
Configuration	Web Interface HTTP(S) with session management, command line interface (CLI), Telnet, SSH, configuration profiles as ASCII and binary file, ample configuration profiles event-triggered, REST API
Diagnosis tools	Ping/icmp, tcpdump, traceroute, DNS lookup, AT commands, port mirroring
FW update	Incremental, failsafe, update server (HTTP, FTP, HTTPS, FTPS), icom Router Management
System time	NTP client and server, buffered real time clock (RTC, power reserve of typ. 25 days)
Help	Web interface: inline help, online help; example profiles, Configuration Guides
Supply	
Voltage	12 ... 24 V DC ($\pm 20\%$: 9,6 ... 28,8 V), protected against reverse polarity and surge/transient pulses
Terminal	6-pin push-in terminal connectors (maintenance free), rigid/flexible conductors up to 1.5 mm ²

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Power consumption (value depends on data throughput amongst others)	MOROS.neo-E: typical approx. 3W, max. 5W MOROS.neo-EW: typical approx. 3W, max. 5W MOROS.neo-E.4G: typical approx. 4W, max. 8W MOROS.neo-EW.4G: typical approx. 4W, max. 8W
Ambient conditions	
Dimensions	45 x 113 x 94 mm (W x H x D)
Weight	MOROS.neo-E: 180 g MOROS.neo-EW: 185 g MOROS.neo-E.4G: 255 g MOROS.neo-EW.4G: 260 g
Mounting	DIN rail mounting (integrated clip), 2,5 horizontal pitch (HP) on DIN rail
Operating temperature	-30 ... +75 °C ¹ MOROS.neo-E / -EW -30 ... +70 °C ² MOROS.neo-E.4G / -EW.4G
Storage temperature	-30 ... +75 °C
Humidity	0 ... 95 % (non-condensing)
IP rating	IP30
Approvals & Standards	
Certifications	All variants: CE Additionally for MOROS.neo-E / -E.4G: FCC part 15 class B, IC (ISED Canada)
Validity regions of certifications	CE: all EU countries, Albania, Bosnia and Herzegovina, Georgia, Iceland, Liechtenstein, Moldova, Montenegro, North Macedonia, Norway, Switzerland, Serbia, Ukraine, United Kingdom FCC part 15 class B: USA IC (ISED Canada): Canada
EMC	Emission: EN 55032 Class B, EN 61000-6-3; immunity: EN 55035 (replaces EN 55024), EN 61000-6-2
Safety	IEC/EN 62368-1
Environmental conditions	Vibration and mechanical shock tests as per DIN EN 61131-2 in accordance with EN 60068-2-6 and EN 60068-2-27; Temperature tests as per EN 60068-2-1, EN 60068-2-2, EN 60068-2-14, EN 60068-2-30
Operating time ³	MTBF > 645,000 h (25 °C), according to SN 29500 standard (according to IEC 61709)

¹ +70 ... +75 °C: extended temperature range (refer to www.insys-icom.com/en/extended-temperature-range/)

² +65 ... +70 °C: extended temperature range (refer to www.insys-icom.com/en/extended-temperature-range/)

³ MTBF determined with variant MOROS.neo-EW.4G

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Order Numbers and Accessories

Available variants MOROS.neo

Product name	Features	Art. no.
MOROS.neo-E	LAN-to-LAN router, 4 Gbit-Ethernet-Ports, 2 digital inputs/outputs, 1x RS-485	10026220
MOROS.neo-EW	WiFi-/LAN-to-LAN router, WiFi 6, 4 Gbit Ethernet ports, 2 digital inputs/outputs, 1x RS-485	10026221
MOROS.neo-E.4G	4G cellular router, worldwide frequency bands, 4 Gbit Ethernet ports, 4 digital inputs/outputs, 1 digital input, 1x RS-485, 1x RS-232	10026219
MOROS.neo-EW.4G	4G cellular/WiFi router, worldwide frequency bands, WiFi 6, 4 Gbit Ethernet ports, 4 digital inputs/outputs, 1 digital input, 1x RS-485, 1x RS-232	10026166

Suitable accessories

Product name	Description	Art. no.
Magnetic Antenna 4G IP65 3m	Magnet mounting, height 72 mm, 3 m cable, SMA (m), ingres protection IP65	10019504
Wall Antenna 5G/4G IP67 5m	Wall mounting incl. bracket, height 220 mm, 5 m cable, SMA (m), ingres protection IP67	10020596
Allround Antenna 5G/4G IP66 5m	Screw or wall mounting, incl. steel angle, height 82 mm, 5 m cable, SMA (m), ingres protection IP67	10022961
Roof Mount Antenna 4G IP67 3m	Screw mounting, height 15 mm, 3 m cable, SMA (m), ingres protection IP67	10022309
Screw/wall Antenna 2x2 MIMO 5G IP69 IK09 3m	Dual antenna MIMO, screw oder wall mounting, height 126 mm, width 104 mm, depth 100 mm, 2x 3 cable, SMA (m), ingres protection IP69, IK09	10026305
Magnetic Antenna 2x2 MIMO 5G/4G IP65 3m	Dual antenna MIMO, magnetic mounting, height 61 mm, width 150 mm, 2x 5 m cable, SMA (m), ingres protection IP65	10022963
Panel Antenna 2x2 MIMO 5G/4G IP65 5m	Dual antenna MIMO, wall- / pole- / desk mounting, height/width 155 mm, 2x 5 m cable, SMA (m), ingres protection IP65	10022962
Antenna extension cable 5 m SMA	Device connector: SMA (f), antenna connection: SMA (m)	10015193
Antenna extension cable 10 m SMA	Device connector: SMA (f), antenna connection: SMA (m)	10018607
Antenna extension cable 15 m SMA	Device connector: SMA (f), antenna connection: SMA (m)	10000735
Magnetic Antenna WiFi 2.4 GHz IP67 1.5m	2,4 GHz, magnet mounting, height 72 mm, 1.5m cable, RP-SMA(m), ingres protection IP67	10019797
Wall Antenna WiFi IP54 2.5m	2,4 & 5 GHz, wall mounting, height 270 mm, 2.5 m cable, RP-SMA (m), ingres protection IP65	10022599
Antenna with hinge WiFi 2.4 GHz	Mointing directly on device socket, length 137 mm, variable angle 0-90°	10000661
Power supply 24V 15W	Power supply unit for DIN rail, wide-range input voltage AC and DC, 15 W output power, protection against short circuit / overload / over voltage	10022848
Power supply 24V 30W	Power supply unit for DIN rail, wide-range input voltage AC and DC, 30 W output power, protection against short circuit / overload / over voltage	10026178
Wall power supply 24V 25W international	Power supply AC/DC with mains plug, suitable for desktop use, wide input voltage range, 25W output power, protection against short, circuit/overload/over voltage	10022849
icom Connectivity Suite - VPN	Supports VPN service for remote maintenance, remote access and M2M communication www.insys-icom.com/en/products/managed-services/vpn-service/	various
icom Connectivity Suite - M2M SIM	Industrial SIM cards, multi-roaming, pooling, management portal www.insys-icom.com/en/products/managed-services/m2m-sim-service/	various
icom Router Management	Supports central router management for FW updates, configuration management, connection monitoring, container updates, mass rollout, certificate management; Available as public/private cloud (server) installation or onPremises www.insys-icom.com/en/products/managed-services/device-management/	various

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