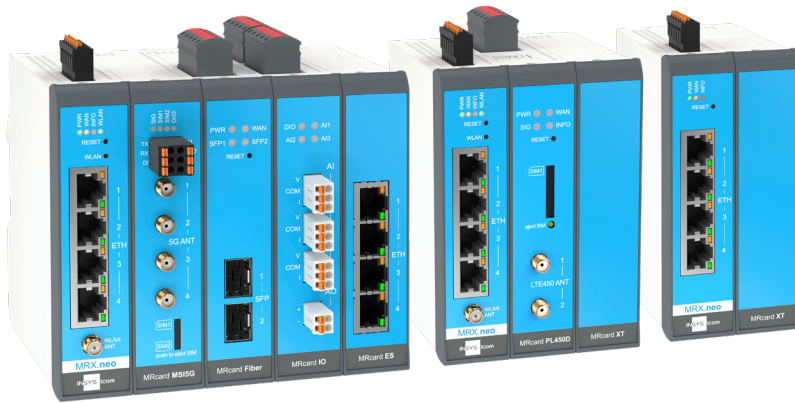


MRX2 / MRX3 / MRX5.neo

Modular industrial router

Durable. Secure. Reliable.



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made
in
Germany

Trust Seal
www.teletrust.de/itsmig

MRX.neo – The modular high-performance industrial router

Reliable, secure, durable. Remote maintenance and network segmentation

MRX.neo provides highly reliable internet connectivity as a router, industrial firewall, and machine gateway—for industrial and critical infrastructure applications. Modular expansion of interfaces and technologies via MRcards, as well as INSYS-icom services for VPN, SIM, and device management.



Modularity with MRcards

Modular design for customized router configurations; expandable and upgradable via MRcards



Remote Maintenance & VPN Protocols

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



5G Mobile Networks & Dual SIM

5G option for remote locations; 4G fallback & dual nano-SIM for operational reliability



Hardened Router OS

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



RS-485/Modbus & I/Os

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



EDGE Apps on the Device

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



Gigabit, VLAN & WiFi

Gigabit Ethernet with managed switching; VLAN and segmentation options for network isolation; WiFi in client or access point mode



Quick Start & Open Interfaces

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

MRX.neo (Basic Variants)

Technical Data

Device variants	
Modular base devices	MRX2.neo-E: 4x Gbit/s-Ethernet, 2 digital inputs/outputs, 1x RS-485, 1 extension slot
	MRX2.neo-EW: WLAN, 4x Gbit/s Ethernet, 2 digital inputs/outputs, 1x RS-485, 1 extension slot
	MRX3.neo-E: 4x Gbit/s-Ethernet, 2 digital inputs/outputs, 1x RS-485, 2 extension slots
	MRX3.neo-EW: WLAN, 4x Gbit/s Ethernet, 2 digital inputs/outputs, 1x RS-485, 2 extension slots
	MRX5.neo-E: 4x Gbit/s Ethernet, 2 digital inputs/outputs, 1x RS-485, 4 extension slots
	MRX5.neo-EW: WLAN, 4x Gbit/s Ethernet, 2 digital inputs/outputs, 1x RS-485, 4 extension slots
Modularity with extension cards	The base units listed above are LAN-to-LAN routers, optionally with WiFi. The extension slots mentioned above allow for the flexible addition of further interfaces and functions by inserting the extension cards (MRcards) listed below.
Preconfigured variants	MRX2.neo-8.LAN: 4x Gbit/s- & 4x 100 Mbit/s Ethernet, 2 digital inputs/outputs, 1x RS-485 Description of Ethernet 100 Mbit/s: see extension card MRcard ES
	MRX2.neo-Fiber: 2x Gbit/s-SFP-Slots, 4x Gbit/s Ethernet, 2 digital inputs/outputs, 2x digital inputs, 1x RS-485 Description of SFP functionality: see extension card MRcard Fiber
	MRX2.neo-5G. WLAN: 5G cellular, WLAN, 4x Gbit/s Ethernet, 4 digital inputs/outputs, 1 digital input, 1x RS-485, 1x RS-232; Description of 5G functionality: see extension card MRcard MSI.5G
WLAN (WiFi)	
Standard	IEEE 802.11a/b/g/n/ac/ax (WiFi 6)
Frequency TX power	2.4 & 5 GHz, max. 100 mW
WLAN (WiFi) modes	WLAN Station (Client) or WLAN 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	Base devices MRX.neo: 2 digital inputs/outputs (configurable) MRX2.neo-Fiber: 2 digital inputs/outputs (configurable), 2 digital inputs MRX2.neo-5G.WLAN: 4 digital inputs/outputs (configurable), 1x digital input as per EN 61131-2, type 1
RS-485	1x RS-485, plug-in terminal connector (A, B, GND)
RS-232	Only variant MRX2.neo-5G.WLAN or with extension card MSI.4G/5G: 1x RS-232, plug-in terminal (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 (configurable), WLAN (WiFi status) Variant MRX2.neo-5G.WLAN: SIG (signal indicator), SIM1/SIM2 (active SIM card), DI/O (activity inputs/outputs)
Further interfaces	Optional addition of MRcards (modular design)
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, RIPvng)
WAN	Several WAN connections configurable also in parallel operation, fallback level for connection
redundancy/failover	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)

MRX.neo (Basic Variants)

Technical Data

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

MRX.neo (Basic Variants)

Technical Data

Power consumption (value depends on data throughput amongst others)	MRX2/3/5.neo: typical approx. 2.5 W, max. 5 W Installed MRcards increase power consumption (see below for MRcard specifications)
	MRX2.neo-8.LAN: typical approx. 3.5 W, max. 6.5 W
	MRX2.neo-Fiber: typical approx. 6.5 W, max. 9 W
	MRX2.neo-5G.WLAN: typical approx. 3.5 W, max. 12 W
Ambient conditions	
Dimensions	MRX2.neo: 54 x 117 x 88 mm (W x H x D) MRX3.neo: 82 x 117 x 88 mm (W x H x D) MRX5.neo: 136 x 117 x 88 mm (W x H x D)
Weight	MRX2.neo-E: 235 g MRX2.neo-EW: 240 g MRX2.neo-8.LAN: 305 g MRX2.neo-Fiber: 295 g MRX2.neo-5G.WLAN: 310 g MRX3.neo-E: 310 g MRX3.neo-EW: 315 g MRX5.neo-E: 410 g MRX5.neo-EW: 415 g
Mounting	DIN rail mounting, horizontal pitch (HP) on DIN rail : 3 HP (MRX2), 5 HP (MRX3), 8 HP (MRX5)
Operating temperature	-30 ... +75 °C ¹ MRX2/3/5.neo, MRX2.neo-8.LAN, MRX2.neo-Fiber This temperature range may be limited by installed MRcards -30 ... +70 °C ² MRX2.neo-5G.WLAN
Storage temperature	-30 ... +75 °C
Humidity	0 ... 95 % (non-condensing)
IP rating	IP30
Approvals & Standards	
Certifications	MRX2/3/5.neo-E: CE, FCC part 15 Class B, IC (ISED Canada) MRX2/3/5.neo-EW: CE MRX2.neo-8.LAN: CE, FCC part 15 Class B, IC (ISED Canada) MRX2.neo-Fiber: CE, FCC part 15 Class B, IC (ISED Canada) MRX2.neo-5G-WLAN: CE
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)

MRcards

Modular plug-in cards for MRX.neo series routers



MRcard PL

- 4G/LTE
- 2 digital inputs
- 1 mini-SIM



MRcard PD

- VDSL2
- ADSL2/2+
- 2 digital inputs
- 2 variants (-A, -B)



MRcard ES

- 4-Port-Switch (10/100 MBit/s)



MRcard IO

- 3 analog inputs
- 1 analog output
- 4 digital inputs
- 4 digital outputs



MRcard Fiber

- 2 SFP-Ports
- 2 digital inputs



MRcard SI

- RS-232 / RS-485
- 2 digitale inputs
- 2 digitale outputs



MRcard MSI.4G

- 4G/LTE
- RS-232
- 2 digital inputs/outputs
- 1 digital input
- 2 nano-SIM



MRcard MSI.5G

- 5G, 4G/LTE
- RS-232
- 2 digital inputs/outputs
- 1 digital input
- 2 nano-SIM



MRcard PL450D

- 4G/LTE incl. LTE450
- 2 mini-SIM
- 2 digital inputs



MRcard PL450

- 4G/LTE incl. LTE450
- 2 mini-SIM
- 2 digital inputs

MRX.neo (Basic Variants)

Technical Data

MRcard MSI.5G (5G cellular)

Cellular communication	
Frequency bands, data rates ⁴	5G (NSA/SA): n1 (2100 MHz), n2 (1900 MHz), n3 (1800 MHz), n5 (850 MHz), n7 (2600 MHz), n8 (900 MHz), n12 (700 MHz), n13 (700 MHz), n14 (700 MHz), n18 (850 MHz), n20 (800 MHz), n25 (1900 MHz), n26 (850 MHz), n28 (700 MHz), n29 (700 MHz), n30 (2300 MHz), n38 (2600 MHz), n40 (2300 MHz), n41 (2500 MHz), n48 (3600 MHz), n66 (2100 MHz), n71 (600 MHz), n75 (1500 MHz), n76 (1500 MHz), n77 (3500 MHz), n78 (3500 MHz), n79 (4500 MHz) 5G NSA bis zu: 3.4 Gbit/s DL / 0.46 Gbit/s UL 5G SA bis zu: 2.5 Gbit/s DL / 0.90 Gbit/s UL 4G (LTE): 1 (2100 MHz), 2 (1900 MHz), 3 (1800 MHz), 4 (1700/2100 MHz), 5 (850 MHz), 7 (2600 MHz), 8 (900 MHz), 12 (700 MHz), 13 (700 MHz), 14 (700 MHz), 17 (700 MHz), 18 (850 MHz), 19 (850 MHz), 20 (800 MHz), 25 (1900 MHz), 26 (850 MHz), 28 (700 MHz), 29 (700 MHz), 30 (2300 MHz), 32 (1500 MHz), 34 (2000 MHz), 38 (2600 MHz), 39 (1900 MHz), 40 (2300 MHz), 41 (2500 MHz), 42 (3500 MHz), 43 (3700 MHz), 46 (5200 MHz), 48 (3600 MHz), 66 (2100 MHz), 71 (600 MHz) LTE Cat 19, up to: 1.6 Gbit/s DL / 211 Mbit/s UL 3G (UMTS/HSPA): 1 (2100 MHz), 2 (1900 MHz), 4 (1700/2100 MHz), 5 (850 MHz), 6 (850 MHz), 8 (900 MHz), 19 (850 MHz) HSPA+ Rel. 8, DL 42 Mbit/s / UL 11 Mbit/s
Antenna connection	4x SMA female (for assignment, see user manual)
SIM	Tray for 2 Nano-SIM cards (4FF), dual SIM single standby (DSSS) Provider scan, provider redundancy with multi-roaming SIM cards (see section "appropriate accessories")
Indications (LEDs)	SIG (signal indicator), SIM1/SIM2 (active SIM card), DI/O (activity at inputs/outputs)
Cellular status (UI)	Signal field strength, RSSI, RSCP / Ec/No, RSRP / RSRQ, SINR, cell ID, location ID
Serial interface	
RS-232	1x RS-232, plug-in terminal (RX, TX), only functional if the extension card is installed in slot 2
Inputs / outputs	
Digital inputs/outputs	2 digital inputs/outputs (configurable), 1x digital input as per EN 61131-2, type 1
Supply / environmental conditions	
Voltage	Power is supplied via MRX.neo; installation in slot 2
Power consumption	Typical approx. 1.0 W, max. 7.0 W
Operating temperature	-30 ... +70 °C ²
Storage temperature	-30 ... +75 °C
Weight	85 g
Certifications ⁵	CE, FCC part 15 Class B, IC (ISED Canada)

MRcards

Technical Data

MRcard MSI.4G (4G cellular)

Cellular communication	
Frequency bands, data rates ⁴	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 external antenna MIMO)
SIM	Tray for 2 Nano-SIM cards (4FF), dual SIM single standby (DSSS) Provider scan, provider redundancy with multi-roaming SIM cards (see section "appropriate accessories")
Indications (LEDs)	SIG (signal indicator), SIM1/SIM2 (active SIM card), DI/O (activity at inputs/outputs)
Cellular status (UI)	Signal field strength, RSSI, RSCP / Ec/No, RSRP / RSRQ, SINR, cell ID, location ID
Serial interface	
RS-232	Note: The RS-232 interface on this MRcard is not functional on the MRX (only on the MRX.neo).
Inputs / outputs	
Digital inputs/outputs	2 digital inputs/outputs (configurable), 1x digital input as per EN 61131-2, type 1
Supply / environmental conditions	
Voltage	Power is supplied via MRX.neo; installation in slot 2
Power consumption	Typical approx. 1.0 W, max. 5.0 W
Operating temperature	-30 ... +70 °C ²
Storage temperature	-30 ... +75 °C
Weight	75 g
Certifications ⁵	CE, FCC part 15 Class B, IC (ISED Canada)

MRcard PL (4G cellular)

Cellular communication	
Frequency bands MRcard PL 1.1 (worldwide variant)	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), 18 (850 MHz), 19 (850 MHz), 20 (800 MHz), 26 (850 MHz), 28 (700 MHz), 38 (2600 MHz), 40 (2300 MHz), 41 (2500 MHz), 66 (2100 MHz) LTE Cat 4 (DL: max. 150 Mbit/s, UL: max. 50 Mbit/s) 3G (UMTS/HSPA): 1 (2100 MHz), 2 (1900 MHz), 3 (1800 MHz), 4 (2100/1700 MHz AWS), 5 (850 MHz), 6 (800 MHz), 8 (900 MHz), 19 (850 MHz) HSPA+, HSUPA (DL: max. 21 Mbit/s, UL: max. 5.7 Mbit/s) 2G (GPRS/EDGE): 850, 900, 1800, 1900 MHz; GPRS/EDGE class 12 (DL/UL: max. 237 kbit/s)
Antenna connection	2x SMA female (main antenna, optional external antenna MIMO)
SIM	1 slot for Mini-SIM card (2FF)
Indications (LEDs)	Signal (cellular communication); (the LEDs Power, WAN, Info are not functional in MRX.neo)
Cellular status (UI)	Signal field strength, RSSI, RSCP / Ec/No, RSRP / RSRQ, SINR, cell ID, location ID
Inputs	
Inputs	2 digital inputs (1x as per EN 61131-2, type 1)

MRcards

Technical Data

Supply / environmental conditions	
Voltage	Supplied via MRX.neo, supply terminals of MRcard not usable
Power consumption	Typical approx. 1.0 W, max. 5.0 W
Temperature	-30 ... +75 °C ² (operation and storage; maximum, possibly limited by MRX variant used)
Weight	85 g
Certifications ⁵	MRcard PL 1.1: CE, FCC part 15 class B, IC (ISED Canada)

MRcard PD (VDSL/ADSL)

Wire-bound VDSL/ADSL communication	
DSL standards	MRcard PD-A (Annex A): - VDSL2 G.993.2 Profile 8a, 8b, 8c, 8d, 12a, 12b, 17a. 30a, VDSL2 Vectoring G.993.5 - ADSL/ADSL2/ADSL2+ G.992.1 Annex A, G.992.3. Annex A/L/M, G.992.5 Annex A und M, T1.413 MRcard PD-B (Annex B): - VDSL2 G.993.2 Profile 8a, 8b, B13 8d, 12a, 12b, 17a. 30a, VDSL2 Vectoring G.993.5 - ADSL/ADSL2/ADSL2+ G.992.1 Annex B, G.992.3. Annex B, G.992.5 Annex B und J
DSL connection	RJ45 socket
DSL function	PPPoE, PPPoA
Indications (LEDs)	DSL (connection); (the LEDs Power, WAN, Info are not functional in MRX.neo)

Inputs	
Inputs	2 digital inputs (1x as per EN 61131-2, type 1)
Supply / environmental conditions	
Voltage	Supplied via MRX.neo, supply terminals of MRcard not usable
Power consumption	Approx. 5.0 W
Temperature	-25 ... +60 °C ⁶ (operation maximum); -30 ... +75 °C (storage)
Weight	95 g
Certifications ⁵	CE

MRcard ES (Ethernet Switch)

Ethernet switch	
Ethernet ports	4 x RJ45, 10/100 Mbit/s, full/half duplex, Auto MDI-X, 1.5 kV isolation voltage
Ethernet function	Each port can be freely assigned to the IP networks, link-up/down detection
Supply / environmental conditions	
Voltage	Supplied via MRX.neo
Power consumption	Typical approx. 1.0 W, max. 1.5 W
Temperature	-30 ... +75 °C (operation and storage; maximum)
Weight	70 g
Certifications ⁵	CE, FCC part 15 Class B, IC (ISED Canada)

MRcard SI (serial / I/O)

Serial interface	
RS-232 (Serial1)	1 x RS-232 / D-Sub-9 (m)
RS-485 (Serial2)	Terminal connector (D+, D-, GND), termination and bias via DIP switch
Functions	Serial-Ethernet gateway (incoming and outgoing connections, Modbus TCP/RTU gateway, modem emulation, editable AT answer list, phone number conversion to IP addresses)
Inputs / Outputs	
Digital inputs	2 digital inputs, monitorable status, high active, as per EN 61131-2, type 1, push-in terminal connectors
Digital outputs	2x via terminals, potential-free change-over relay (2A at max. 30 V DC/42 V AC), switchable via action
Indications (LEDs)	Condition of digital inputs and outputs

MRcards

Technical Data

Supply / environmental conditions	
Voltage	Supplied via MRX.neo
Power consumption	Typical approx. 1.0 W, max. 2.5 W
Temperature	-30 ... +75 °C (operation and storage; maximum)
Terminals	Push-in terminal connectors (maintenance free), rigid/flexible conductors up to 2.5 mm ² Inputs/outputs: 2x 5-pin, RS-485: 3-pin
Weight	75 g
Certifications ⁵	CE, FCC part 15 class B, IC (ISED Canada)

MRcard IO

Inputs / Outputs	
Analogue inputs	3x on push-in terminal (3-pin), measuring range individually selectable: voltage 0 ... 10 V / current 0 / 4 ... 20 mA, accuracy: $\pm 0.3\%$ to range value ± 100 ppm/K, galvanic isolation, also between the inputs
Analogue outputs	1x on push-in terminal (2-pin), mode selectable: voltage 0 ... 10 V / current 0 / 4 ... 20 mA, accuracy: $\pm 0.3\%$ to range ± 100 ppm/K, resolution 12 bits
Digital inputs	4x on push-in terminal (5-pin), can be switched together: contact input (active) or voltage-sensitive (passive, level as per EN 61131, Type 1), galvanic isolation
Digital outputs	4x on push-in terminal (5-pin), relay normally open, load capacity max. 3 A per output, altogether max. 5 A, maximum switching voltage: 30 V (DC) / 42 V (AC)
Indications (LEDs)	4x LEDs change of digital inputs, states of analogue inputs, change of digital outputs

Supply / environmental conditions	
Voltage	Supplied via MRX
Power consumption	Typ./max. 1.5 W
Temperature	-30 ... +70 °C (operation maximum); -30 ... +75 °C (storage)
Weight	95 g
Certifications ⁵	CE, FCC part 15 class B, IC (ISED Canada)

MRcard Fiber

SFP ports	
SFP-Ports	2x SFP cages for SFP transceiver modules as per SFP-MSA, 1000BASE-X, 100BASE-X
Indications (LEDs)	SFP1, SFP2 (SFP status and activity); (the LEDs Power & WAN are not functional in MRX.neo)

Inputs	
Inputs	2 digital inputs (1x as per EN 61131-2, type 1)

Supply / environmental conditions	
Voltage	Supplied via MRX.neo, supply terminals of MRcard not usable
Power consumption	Typ./max. 5 W (thereof 4 W MRcard Fiber + assumption approx. 0.5 W per SFP module, depends on modules used)
Temperature	-30 ... +65 °C (operation maximum); -30 ... +75 °C (storage)
Weight	85 g
Certifications ⁵	CE, FCC part 15 class B, IC (ISED Canada)

MRcards

Technical Data

MRcard PL450 (4G cellular incl. LTE450)

Cellular communication	
Frequency bands (EMEA incl. LTE450)	4G (LTE/LTE450): 1 (2100 MHz), 3 (1800 MHz), 5 (850 MHz), 7 (2600 MHz), 8 (900 MHz), 20 (800 MHz), 28 (700 MHz), 31 (450 MHz), 72 (450 MHz) LTE Cat 1 (DL: 10 Mbit/s, UL: 5 Mbit/s) 2G (GPRS/EDGE): 900, 1800 MHz; EDGE: max 237 kBit/s (DL/UL), GPRS: max 85.6 kBit/s (DL/UL)
Antenna connection	1x SMA female
SIM	2 slots for Mini-SIM cards (2FF), automatic failover
Displays (LEDs)	Signal (cellular communication); (the LEDs Power, WAN, Info are not functional in MRX.neo)
Cellular status (UI)	Signal field strength, RSSI, RSCP / Ec/No, RSRP / RSRQ, SINR, cell ID, location ID
Inputs	
Inputs	2 digital inputs (1x as per EN 61131-2, type 1)
Supply / environmental conditions	
Voltage	Supplied via MRX.neo, supply terminals of MRcard not usable
Power consumption	Typically approx. 1.0 W, max. 5.0 W
Temperature	-30 ... +75 °C ² (operation and storage; maximum)
Weight	85 g
Certifications ⁵	CE, whitelisting 450connect (provider certification)

MRcard PL450D (4G cellular incl. LTE450, two antenna connectors)

Cellular communication	
Frequency bands (worldwide, w/o North America, incl. LTE450)	4G (LTE/LTE450): 1 (2100 MHz), 2 (1900), 3 (1800 MHz), 4 (2100/1700/AWS), 5 (850 MHz), 7 (2600 MHz), 8 (900 MHz), 20 (800 MHz), 28 (700 MHz), 31 (450 MHz), 38 (2600 MHz), 40 (2300 MHz), 41 (2500 MHz), 66 (2100 MHz), 72 (450 MHz), 87 (410 MHz) LTE Cat. 4 (DL: 150 MBit/s, UL: 50 MBit/s) 3G (UMTS/HSPA): 1 (2100 MHz), 2 (1900 MHz), 4 (2100/1700 MHz /AWS), 5 (850 MHz), 8 (900 MHz) HSPA+, HSUPA (DL: max. 21 Mbit/s, UL: max. 5,7 Mbit/s)
Antenna connections	2x SMA female
SIM	2 slots for Mini-SIM cards (2FF), automatic failover
Displays (LEDs)	Signal (cellular communication); (the LEDs Power, WAN, Info are not functional in MRX.neo)
Cellular status (UI)	Signal field strength, RSSI, RSCP / Ec/No, RSRP / RSRQ, SINR, cell ID, location ID
Inputs	
Inputs	2 digital inputs (1x as per EN 61131-2, type 1)
Supply / environmental conditions	
Voltage	Supplied via MRX.neo, supply terminals of MRcard not usable
Power consumption	Typically approx. 1.0 W, max. 5.0 W
Temperature	-30 ... +70 °C ⁶ (operation and storage; maximum)
Weight	85 g
Certifications ⁵	CE, whitelisting 450connect (provider certification)

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 MRX2.neo with MRcard MSI.4G

⁴ In practice, the maximum data rates of the 4G/5G wireless interface are usually not achievable, as they are limited by factors such as the achievable throughput of the respective Ethernet interface, current reception conditions, the antenna (use of MIMO, power, and positioning), and support from the respective provider (contract terms and network utilisation).

⁵ An approval is only achieved if the MRX router and optionally installed plug-in cards (MRcards) fulfil this approval.

⁶ -25 ... 0 °C and +55 ... +60 °C: extended temperature range

MRX | MRcards

Order Numbers and Accessories

Available variants MRX.neo

Product name	Features	Art. no.
MRX2.neo-E	LAN-to-LAN modular router, 4x Gbit/s-Ethernet, 2 digital inputs/outputs, 1x RS-485, 1 extension slot	10026228
MRX2.neo-EW	WLAN-/LAN-to-LAN modular router, WiFi 6, 4x Gbit/s-Ethernet, 2 digital inputs/outputs, 1x RS-485, 1 extension slot	10026229
MRX3.neo-E	LAN-to-LAN modular router, 4x Gbit/s-Ethernet, 2 digital inputs/outputs, 1x RS-485, 2 extension slots	10026223
MRX3.neo-EW	WLAN-/LAN-to-LAN modular router, WiFi 6, 4x Gbit/s-Ethernet, 2 digital inputs/outputs, 1x RS-485, 2 extension slots	10026222
MRX5.neo-E	LAN-to-LAN modular router, 4x Gbit/s-Ethernet, 2 digital inputs/outputs, 1x RS-485, 4 extension slots	10026226
MRX5.neo-EW	WLAN-/LAN-to-LAN modular router, WiFi 6, 4x Gbit/s-Ethernet, 2 digital inputs/outputs, 1x RS-485, 4 extension slots	10026227
MRX2.neo-8.LAN	LAN-to-LAN router, 4x Gbit/s & 4x 100 Mbit/s Ethernet, 2 digital inputs/outputs, 1x RS-485	10026233
MRX2.neo-Fiber	SFP router, 2x Gbit/s SFP slots, 4x Gbit/s Ethernet, 2 digital inputs/outputs, 2 digital inputs, 1x RS-485	10026234
MRX2.neo-5G.WLAN	5G cellular / WiFi router, 2x Nano-SIM, WiFi 6, 4x Gbit/s Ethernet, 4 digital inputs/outputs, 1 digital input, 1x RS-485, 1x RS-232	10026235

Available extension cards

Product name	Features	Art. no.
MRcard ES	4-Port-Switch (10/100 Mbit/s)	10016584
MRcard MSI.5G	Cellular 5G/4G/3G, 2x Nano-SIM, worldwide frequency bands, 3 digital inputs/outputs, 1x RS-232	10026231
MRcard MSI.4G	Cellular 4G/3G, 2x Nano-SIM, worldwide frequency bands, 3 digital inputs/outputs, 1x RS-232	10026230
MRcard PL 1.1	Cellular 4G/3G/2G, 1x Mini-SIM, worldwide frequency bands, 2 digital inputs	10023227
MRcard PL450	Cellular 4G/2G (frequency bands EMEA) inkl. LTE450, 2x Mini-SIM, 2 digital inputs	10023900
MRcard PL450D	Cellular 4G/3G (worldwide frequency bands w/o North Amer.) inkl. LTE450, 2x Mini-SIM, 2 digital inputs	10025618
MRcard PD-A	VDLS2, ADSL/2/2+, Annex A, 2 digital inputs	10019434
MRcard PD-B	VDLS2, ADSL/2/2+, Annex J/B, 2 digital inputs	10019435
MRcard Fiber	2 SFP-Ports, 2 digital inputs	10026232
MRcard SI	RS-232, RS-485, 2 digital inputs, 2 digital outputs (relay)	10016585
MRcard IO	3 analog inputs, 1 analog output, 4 digital inputs, 4 digital outputs (relay)	10022272

Accessories

Order Numbers and Accessories

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, height 220 mm, 5 m cable, SMA (m), ingres protection IP67	10020596
Allround Antenna 5G/4G IP66 5m	Screw or wall mounting, height 82 mm, 5 m cable, SMA (m), ingres protection IP67	10022961
Roof Mount Antenna 4G IP67 3m	Screw or wall mounting, height 82 mm, 5 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
Panel Antenna 4x4 MIMO 5G/4G IP69 3m	Quad antenna MIMO, wall & adhesive mounting, height 127 mm, width 198 mm, 4x 3 m cable, SMA (m), ingres protection IP67 & IP69	10026179
LTE450 Wall Antenna IP67 5m	Wall mounting, only for LTE450, height 220 mm, 5 m cable, SMA (m), ingres protection IP67	10024225
LTE450 Wall Antenna 5G/4G IP67 IK10 5m	Wall or mast mounting, LTE450 and standard cellular, Height 255 mm, 5m cable, SMA (m), protection IP67 (ingres) & IK10 (vandalism)	10024263
LTE450 Screw Mount Antenna 5G/4G IP67 IK10	Screw mounting on metallic surfaces, LTE450 and standard cellular, heigth 50 mm, 5m cable, SMA (m), protection IP67 (ingres) & IK10 (vandalism)	10024278
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
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