

Modular Industrial Router MRX

Flexible.
Powerful.
Future-proof.



M2M Communication Technology that adjusts to your needs

Changing demands requires flexible solutions. Modularity is the answer to this challenge. The new MRX industrial router series provides you with the necessary scope for developing future- and investment-proof applications and adjust them if required. This results in an optimum cost/performance ratio and extended service life.

Like all routers of INSYS icom, this fully-modular platform is characterised by very high system stability, longevity and consistent user guidance. VPN, a stateful firewall and further IT security features are integrated. An integrated Linux programming environment (icom SmartBox) based on LXC technology is available to run programs and scripts (edge computing).

The new MRX series is available in two basic variants, LAN and LTE, each in two housing widths. It can be tailored to the application using various plug-in cards (MRXcards) that can also be developed customer-specific.

Highlights

- **NEW:** Integrated Linux programming environment for edge computing (icom SmartBox)
- Several VPN tunnels can be used in parallel
- Firewall in tunnel
- Segmentation in several local IP networks
- Flexible administration with profile manager
- Extended event-based control (e.g. profiles, connections, redundancy)
- Access control via user roles
- High performance for broadband networks and high VPN data rate
- Quick start for INSYS Connectivity Service

Housing Widths

- MRX3: 3 slots, 2 of them preallocated
- MRX5: 5 slots, 2 of them preallocated

Basic Variants

- MRX LTE: Base card + 4G card
- MRX LAN: Base card + power card



MRXcard **ES**

- 4-port switch (10/100 MBit)



MRXcard **PL**

- LTE
- UMTS/HSPA
- GPRS/EDGE
- 2 digital inputs



MRXcard **SI**

- RS232
- RS485
- 2 digital inputs
- 2 switch outputs

Technical Data

MRX (Basic Variants)

Mobile communication (only MRX LTE)	
Frequency bands	2G/GPRS/EDGE: 900, 1,800 MHz; GPRS/EDGE Class 12 3G/UMTS/HSPA: 900, 1,800, 2,100 MHz; UMTS, HSPA+ (DL Cat. 24, UL Cat. 6) 4G/LTE*: 800, 900, 1,800, 2,100, 2,600 MHz; LTE Cat. 3 (DL: 100 Mbps, UL: 50 Mbps)
Antenna connection	2x SMA (2G/3G/4G: Main, 3G: Rx Diversity, LTE: MIMO)
SIM	Slot for 1 Mini-SIM card (2FF), locked
Router	
Function	Up to 5 IP networks local (LAN) or as WAN (separated via VLAN); own DHCP server per IP network, static routing, routing priority configurable; netfilters: DNAT, SNAT, IP forwarding, netmapping, port forwarding, IP filters (stateful Firewall), DNS relay, dynDNS support
Security	OpenVPN (client and server), IP filters (stateful firewall) also in VPN tunnel, several VPN tunnels in parallel possible, IPsec and GRE
Redundancy	WAN chains: several WAN accesses configurable (prioritised and event-controlled), WAN groups: parallel operation of WAN interfaces or VPNs, several OpenVPN servers, additional redundancy via further MRXcards
Ethernet switch, interfaces	
Ports	5 x RJ45, 10/100 MBit/s, Full/half duplex, Auto MDI-X, 1.5 kV isolation voltage
Inputs	2 digital inputs, 1x low-active, 1x high-active (as per EN 61131-2, Type 1)
Events (selection)	Change: input, Ethernet port, WAN chain, profile, supply input, cellular field strength; timer expiry, firewall violation, login attempt detection, detection of digital input pulses
Event-controlled actions (selection)	Messages via e-mail, SMS, SNMP traps, start timer, profile switching, connection switching, reset, log out/turn off modem, activate firmware
Function	Each port can be freely assigned to the IP networks, Link up/down detection, Configuration port
Operation	
Wizard	Connection configuration incl. VPN, INSYS Connectivity Service, further LAN networks
Help	Web interface with inline help texts, online help, FAQ, exemplary profiles, plausibility check
Configuration	Web interface local and remote (http, https; with session management), Command line interface (CLI), Telnet, SSH, ASCII and binary file (also for backup), configuration management with switchable profiles (event-controlled)
Indications (LEDs)	Power, WAN (Internet connection), 1x configurable, 1x Signal (for cellular radio)
Authentication	Several users, different user roles and rights, RADIUS
Diagnosis	Comprehensive log files, support package, integrated help functions, Diagnosis tools: ping, tcpdump, traceroute, DNS lookup, AT commands
Firmware updates	Incremental, failsafe, automated via update server (http, ftp, https, ftps)
Edge Computing	
icom SmartBox	Linux programming environment: Setup of LXC containers for programs and scripts (apps), ARMv7 CPU, 192 MB RAM, 2 GB flash memory
Additional features	
NTP client and server, buffered real-time clock	
Supply	
Voltage	12 ... 24 V DC ($\pm 20\%$), 2 supply connections with changeover detection
Terminals	5-pin push-in terminal connectors (maintenance free), rigid/flexible conductors up to 2.5 mm ²
Power consumption (basic variants without further MRXcards)	MRX LAN: typical approx. 2.0 W, max. 3.5 W (depending on data throughput amongst others) MRX LTE: typical approx. 2.5 W, max. 8.0 W
Environmental conditions	
Dimensions (WxDxH)	MRX3: 82 x 88 x 117 mm MRX5: 136 x 88 x 117 mm
Operating temperature	-30...+70 °C, -30...+75 °C under restricted conditions (refer to www.insys-icom.com/restricted)
Humidity	0...95% (non-condensing)
Mounting / protection class	DIN rail mounting/housing: IP40, terminals: IP30

* Please check the availability of the LTE frequencies in the planned operating area. Above specified frequencies are currently used in Europe, Middle East, Africa and, to some extent, in the Asia-Pacific region and South America.

Technical Data

MRXcards

Approvals & Standards	
Certifications	CE, MRX LAN additionally: FCC Part 15 Class B, IC
EMC	Emission: EN 55022 Class B; Immunity: EN 61000-6-2 Criterion A, EN 55024 Criterion A
Security	EN 60950 / EN 62311
Environmental conditions	Vibration/shock as per PLC standard EN 61131-2; various temperature tests as per: EN 60068-2-1, EN 60068-2-2, EN 60068-2-14, EN 60068-30, EN 60068-2-6, EN 60068-2-27

MRXcard ES

Ethernet switch	
Ports	4 x RJ45, 10/100 MBit/s, Full/half duplex, Auto MDI-X, 1.5 kV isolation voltage
Function	Each port can be freely assigned to the IP networks, Link loss detection
Supply	
Voltage	Supplied via MRX
Power consumption	Typical approx. 1.0 W, max. 1.5 W
Certifications	CE, FCC Part 15 Class B, IC

MRXcard PL

Mobile communication	
Frequency bands	2G/GPRS/EDGE: 900/1,800 MHz; GPRS/EDGE Class 12 3G/UMTS/HSPA: 900, 1,800, 2,100 MHz; UMTS, HSPA+ (DL Cat. 24, UL Cat. 6) 4G/LTE*: 800, 900, 1,800, 2,100, 2,600 MHz; LTE Cat. 3 (DL: 100 Mbps, UL: 50 Mbps)
Antenna connection	2x SMA female (2G/3G/4G: Main, 3G: Rx Diversity, LTE: MIMO)
SIM	Slot for 1 Mini-SIM card (2FF), locked
Inputs	2 digital inputs for configurable actions, 1x low-active, 1x high-active (as per EN 61131-2, Type 1)
Indications (LEDs)	Power, 1x configurable, 1x Signal
Supply	
Voltage	Supplied via MRX, 2 further supply connections optional (redundancy) 12 ... 24 V DC ($\pm 20\%$)
Power consumption	Typical approx. 1.0 W, max. 5.0 W
Certifications	CE, FCC Part 15 Class B, IC

Order Numbers, Accessories

MRX

MRXcard SI

Serial interface	
RS232 (Serial1)	1 x RS232/D-Sub-9(m)
RS485 (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 file, conversion of phone numbers into IP addresses)
USB 2.0	Prepared, USB 2.0 host, socket type A, output current max. 200 mA
Inputs/Outputs	
Digital inputs	2x via terminals, activated by connection to GND, can be monitored with an event
digital outputs	2x via terminals, potential-free change-over relay, can be operated by an action
Indications (LEDs)	Condition of digital inputs and outputs
Supply	
Voltage	Supplied via MRX
Power consumption	Typical approx. 1.0 W, max. 2.5 W
Terminals	Push-in terminal connectors (maintenance free), rigid/flexible conductors up to 2.5 mm ² Inputs/outputs: 2x 5-pin, RS485: 3-pin
Certifications	CE, FCC Part 15 Class B, IC

Product description	Features	Order number
MRX3 LAN	5 Ethernet ports, 2 inputs, 1 free MRXcard slot	10016582
MRX5 LAN	5 Ethernet ports, 2 inputs, 3 free MRXcard slots	10017036
MRX3 LTE	Cellular radio (4G/3G/2G), 5 Ethernet ports, 2 inputs, 1 free MRXcard slot	10016583
MRX5 LTE	Cellular radio (4G/3G/2G), 5 Ethernet ports, 2 inputs, 3 free MRXcard slots	10017037
MRXcard PL	Cellular radio (LTE/HSPA/UMTS/EDGE/GRPS), 2 digital inputs	10017035
MRXcard ES	4-port switch (10/100 Mbit)	10016584
MRXcard SI	RS232, RS485, USB 2.0, 2 digital inputs, 2 switch outputs	10016585

Suitable accessories

Product description	Description	Order number/Information
LTE magnetic base antenna	GSM/UMTS/LTE; frequencies (MHz): 800, 900, 1800, 2100, 2600	10017462
LTE outside mounted antenna	GSM/UMTS/LTE; frequencies (MHz): 800, 900, 1800, 2100, 2600	10015911
Antenna extension	5 m; device connection: SMA (f), antenna connection: SMA (m)	10015193
Antenna extension	10 m; device connection: SMA (f), antenna connection: SMA (m)	10000742
Antenna extension	15 m; device connection: SMA (f), antenna connection: SMA (m)	10000735
Power supply unit	TDK Lambda DSP 10-24 AC/DC power supply unit for DIN rail	10014249
INSYS Connectivity Service	VPN Service for M2M Applications	insys-icom.com/connectivity
M2M SIM cards	Cards, management portals, etc.	insys-icom.com/M2M-SIM

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