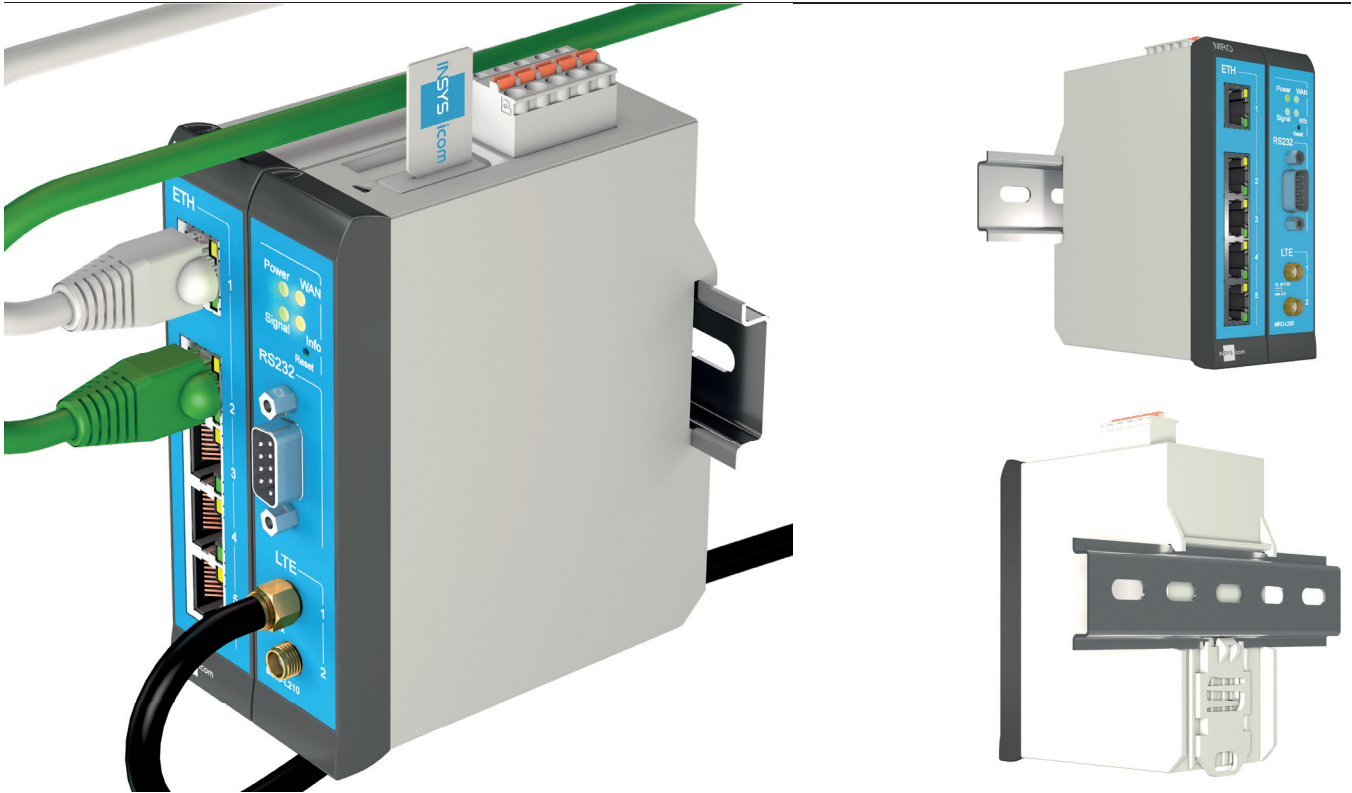# MRO-L200/-L210

INSYS icom

MRO - the compact 4G power

MRO - the compact 4G power
A powerhouse for mobile radio applications

MRO routers are characterised by their high performance and extensive interfaces in a slim housing. They are suitable both for secure remote maintenance and for recording and processing application data (edge computing). Like all routers from INSYS icom, the devices of the MRO series stand out for their high system stability, durability and uniform user guidance.

Serial interface
RS232 interface for connecting external devices

Ethernet and I/O
Five RJ45 ports; two digital inputs and one digital output

Network
Comprehensive network functionality with multiple IP networks

Easy remote access & device updates
Plug & play connection of VPN service and central device management

High security levels
Hardened operating system, extensive monitoring and security functions

IoT-ready
Local data processing as well as connection to IoT platforms and cloud systems

MRO-L200/-L210

INSYS icom

Technical Data

Mobile communication		
Frequency bands MRO-L200	4G/LTE*:	800, 900, 1.800, 2.100, 2.600 MHz (bands 1, 3, 7, 8, 20); ; LTE Cat. 3 (DL: 100 Mbps, UL: 50 Mbps)
	3G/UMTS/HSPA:	900, 1.800, 2.100 MHz (Bänder 1, 3, 8); UMTS, HSPA+ (DL Cat. 24, UL Cat. 6)
	2G/GPRS/EDGE:	900, 1.800 MHz; GPRS/EDGE Class 12
Frequency bands MRO-L210 (USA/Kanada-version)	4G/LTE:	700, 850, 1.800, 1.700/2.100 (AWS), 1.900 MHz (bands 2, 4, 5, 13, 17); LTE Cat. 3 (DL: 100 Mbps, UL: 50 Mbps)
	3G/UMTS/HSPA:	850, 1700/2100 (AWS), 1.900 MHz (bands 2, 4, 5); UMTS, HSPA+ (DL: max. 42 Mbps, UL: max. 5,76 Mbps)
	2G/GPRS/EDGE:	850, 900, 1.800, 1.900 MHz; GPRS/EDGE Class 12 (DL: max. 237 kbps, UL: max. 237 kbps)
Antenna connection		2x SMA female (2G/3G/4G: Main, 3G: Rx Diversity, LTE: MIMO)
SIM		Slot for 1 Mini-SIM card (2FF), locked
Dual APN		Splitting of mobile data traffic over 2 APNs, e.g. separation of user and management data
Cellular Status		Signal field strength, RSSI, RSCP / Ec/No, RSRP / RSRQ, Cell-ID, Location-ID
Hardware interfaces		
Ethernet ports		5 x RJ45 shielded, 10/100 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
RS232 (serial1)		1 x RS232 / D-Sub-9 (m)
Functions Serial interface		Serial Ethernet gateway (incoming and outgoing connections, Modbus TCP/RTU gateway, modem emulation, editable AT answer list, translation of phone numbers to IP addresses)
Digital Inputs		2 digital inputs, status can be monitored: 1x low active (connection to GND) 1x high active (connection to 10...24 VDC as per EN 61131-2, type 1)
Digital Outputs		1 Open collector output
Displays (LEDs)		Power, WAN (Internet connection), Info (configurable), Signal
Network		
Network functions		5 local 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
DSL		PPPoA and PPoE (MRX3/5 DSL und MRcard PD-A/B); external DSL modems: PPoE
NAT/PAT		SNAT/DNAT (masquerade, netmapping, port forwarding, IP forwarding)
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		Blowfish 128 Bit, DESX 192 Bit, DES 64 Bit, DES EDE 128 Bit, DES EDE3 192 Bit, AES 128-256 Bit, RC2 40-128 Bit, IDEA 128, CAST5 128 Bit, SHA1, SHA 224-512
IPsec		IKEv1, IKEv2 (automatic, fix), several parallel tunnels, pre-shared keys, certificates, tunnel mode, transport mode, dead peer detection (DPD)
IPsec encryption		DES EDE3 192 Bit, AES 128-256 CBC/GCM, SHA1, MD5, SHA 256-512, DH-Group 1-31 (Diffie-Hellman 768 - 25519), ChaCha20-Poly1305

www.insys-icom.com

MRO-L200/-L210

INSYS icom

Technical Data

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, EIGRP, 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	Booting signed firmware, HTTP/HTTPS attack prevention; response upon events: configuration change, link up/down, restart, login attempt, netfilter violation, password hashing
IoT and Cloud (icom Data Suite, license required)	
Function icom Data Suite	Machine connection and data processing; connection to cloud and SCADA Systems; arithmetic & logic functions; data logger; dashboard
Data acquisition	CODESYS, Modbus TCP/RTU, MQTT, Siemens S7, OPC UA Client, IEC 60870-5-101, digital input, analogue input (if present)
Data transmission	MQTT, OPC UA Server, IEC 60870-5-104, Modbus TCP/RTU, e-mail, SMS, SFTP, digital input, analogue input (if present)
IoT platforms	MQTT compatibility: Thingsboard, Cumulocity, AnyViz, Azure IoT Hub, Bosch IoT Suite, AWS IoT Core
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 (with MRX), cellular field strength; timer expired, firewall violation, login attempt detection, pulse sequence on digital input, counter, netfilter rule
Event-triggered actions (selection)	Messages via e-mail, SMS (only LTE 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, container with own IP end point, assignment to IP networks - full firewall and routing transparency; access control, SDK available
Lua scripting	Lua interpreter for own scripts
Monitoring and Management	
Monitoring	SNMP traps and agent, configurable system logs, remote syslog, link up/down detection, netfilter violation
Certificate management	SCEP, 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, apple 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 (WebSocket)
System time	NTP client and server, buffered real time clock
Help	Web interface: inline help, online help; example profiles, plausibility check, Configuration Guides
Supply	
Voltage	12 ... 24 V DC (± 20%), 2 supply connections with changeover detection

www.insys-icom.com

MRO-L200/-L210

INSYS icom

Technical Data

Terminals	5-pin push-in terminal connectors (maintenance free), rigid/flexible conductors up to 2.5 mm²
Power consumption	typical approx. 2,5 W, max. 8,0 W
Ambient conditions	
Dimensions	54 x 88 x 117 mm (W x D x H)
weight	280 g
Mounting	DIN rail mounting
Operating temperature	-30….+75°C ²
Humidity	0 … 95% (non-condensing)
IP rating	Housing: IP40
Approvals & Standards	
Certifications	MRO-L200: CE
	MRO-L210: FCC Part 15 Class B, IC
EMC	Emission: EN 55032 Class B, EN 61000-6-2; Immunity: EN 55024
Safety	IEC/EN 62368
Environmental conditions	Vibration/shock as per PLC standard EN 61131-2 and EN 60068-2-6, EN 60068-2-27; Temperature tests as per EN 60068-2-1, EN 60068-2-2, EN 60068-2-14, EN 60068-30
Operating time	MTBF 880,000 h (25°C), according to SN 29500 standard (according to IEC 61709)

* Please check the availability of the Mobile communication 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.

² +70°C … +75 °C: extended temperature range (refer to www.insys-icom.com/en-extended/)

MRO-L200/-L210

INSYS icom

Order Numbers and Accessories

Available Variants

Product description	Features	Art.-nr
MRO-L200	LTE-Router, international communication frequencies, 2 inputs, 1 output, 1x RS232	10019400
MRO-L210	LTE-Router, mobile communiction frequencies for horth america, 2 inputs, 1 output, 1x RS232	10019403

Suitable accessories

Product description	Description	Art.-nr
Magnetic Antenna LTE/UMTS/GSM SMA	Magnet mounting, height 72 mm, 3 m cable, SMA (m), IP rating IP65	10019504
Outdoor Wall Antenna LTE/UMTS/GSM	Wall mounting incl. bracket, height 220 mm, 5 m cable, SMA (m), IP rating IP65	10020596
Allround Antenna 5G/LTE/UMTS/GSM SMA	Screw or wall mounting, incl. steel angle, height 82 mm, 5 m cable, SMA (m), protection class IP66	10022961
Roof mount antenna LTE/UMTS/GSM MIMO SMA	Height 1,5 cm, screw mounting, 3 m cable, SMA (m), IP rating IP67	10022309
Magnetic Antenna MIMO 5G/4G/3G/2G SMA	Dual antenna MIMO, magnetic mounting, height 61 mm, width 150 mm, 2x 5 m cable, SMA (m), protection class IP65	10022963
Outdoor Panel Antenna MIMO 5G/4G/3G/2G SMA	Dual antenna MIMO, wall- / pole- / desk mounting, heigt/width 155 mm, 2x 5 m cable, SMA (m), protection class IP65	10022962
Panel Antenna 4G/3G/2G MIMO SMA	Dual antenna MIMO, Montage mit Saugnäpfen, height 84 mm, width 184 mm, 2x 2 m cable, SMA (m), protection class IP67	10020565
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
Power supply 24V 15W	Power supply unit for DIN rail, wide-range input voltage ACDC protection against short circuit / overload / over voltage	10022848
Wall power supply 24V 25W international	Power supply AC/DC with mains plug, suitable for desktop use, wide input, voltage range, 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-VPN/	various
icom Connectivity Suite - M2M SIM	Industrial SIM cards, multi-roaming, pooling, management portal www.insys-icom.com/en-SIM/	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-iRM/	various

www.insys-icom.com