Technical Data Sheet

MIRO
MIROdul

Compact cellular router

MIRO – simply industrial

Compact. Easy. Secure.

The MIRO series from INSYS icom provides secure and stable routing in a very compact device for an attractive price. The cellular routers are suitable for secure Internet connections and remote maintenance, and impress with their high system stability, durability and ease of use.

Highly compact design
Easy integration into automatic dispensing machines and digital signage solutions, also available as module

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

Flexible mounting
Top-hat rail mounting for control cabinets/small distribution boards and wall mounting

Ethernet and I/O
Up to two Ethernet connections and configurable digital input/output

High level of IT security
Hardened operating system, extensive monitoring and security functions

Professional router operating system
Extensive VPN and routing functions with easy usability

MIRO
MIROdul

Technical Data

Cellular communication		
Frequency bands [1], data rates MIRO-L100 /-L200 & MIROdul-L100 /-L200	4G/LTE:	1 (2100 MHz), 3 (1800 MHz), 7 (2600 MHz), 8 (900 MHz), 20 (800 MHz), 28A (700 MHz) LTE Cat 1 (DL: max. 10 Mbit/s, UL: max. 5 Mbit/s)
	3G/UMTS/HSPA:	1 (2100 MHz), 8 (900 MHz) , HSDPA/HSUPA (DL: max. 42 Mbit/s, UL: max. 5.7 Mbit/s) [3]
	2G/GPRS/EDGE:	900, 1800 MHz, GPRS/EDGE Class 12 (DL: max. 296 kbit/s, UL: max. 237 kbit/s)
Frequency bands, data rates MIRO-L110 /-L210 & MIROdul-L110 /-L210 (North America)	4G/LTE:	2 (1900 MHz), 4 (2100/1700 MHz AWS), 12 (700 MHz) LTE Cat 1 (DL: max. 10 Mbit/s, UL: max. 5 Mbit/s)
	3G/UMTS/HSPA:	2 (1900 MHz), 4 (2100/1700 MHz AWS), 5 (850 MHz) HSDPA/HSUPA (DL: max 42 Mbit/s, UL: max 5.7 Mbit/s) [3]
Frequency bands, data rates MIRO-L230 (world wide frequency bands)	4G/LTE:	1 (2100 MHz, 2 (1900 MHz), 3 (1800 MHz), 4 (2100/1700 MHz), 5 (850 MHz), 7 (2600 MHz), 8 (900 MHz), 12 (700 MHz), 13 (700 MHz), 18 (850 MHz), 19 (850 MHz), 20 (800 MHz), 25 (1900 MHz), 26 (850 MHz), 28 (700 MHz), 38 (2600 MHz), 39 (1900 MHz), 40 (2300 MHz), 41 (2500 MHz) LTE Cat 4 (DL: max. 150 Mbit/s, UL: max. 50 Mbit/s) [3]
	3G/UMTS/HSPA:	1 (2100 MHz), 2 (1900 MHz), 4 (2100/1700 MHz AWS), 5 (850 MHz), 6 (800 MHz), 8 (900 MHz), 19 (800 MHz) HSDPA/HSUPA (DL: max 42 Mbit/s, UL: max 5.7 Mbit/s) [3]
	2G/GPRS/EDGE:	850, 900, 1800, 1900 MHz, GPRS/EDGE Class 12 (DL: max. 296 kbit/s, UL: max. 237 kbit/s)
Antenna connection	1x SMA female	
SIM	Slot for 1 Mini-SIM card (2FF), locked Provider redundancy with multi-roaming SIM cards (see section “Suitable accessories”)	
Cellular Status	Signal field strength, RSSI, RSCP / Ec/No, RSRP / RSRQ, Cell-ID, Location-ID	
Hardware interfaces		
Ethernet ports	MIRO-L1x0 / MIROdul-L1x0: 1x RJ45 shielded, MIRO-L2x0 / MIROdul-L2x0: 2x 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	
I/Os	1 digital input or output, configurable: Input low active (contact input) or output open drain (24 V / 50 mA)	
Displays (LEDs)	Power, WAN (Internet connection), Signal (cellular communication)	
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, dynamic routing (OSPF, BGP, RIPv1, RIPv2, RIPng)	
Connection check	Periodic, ping/icmp, DNS request, link up/down	
DSL	PPPoE for external DSL modems	
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	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,	

MIRO
MIROdul

Technical Data

	DH-Group 1-31 (Diffie-Hellman 768 - 25519), ChaCha20-Poly1305
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
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
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, 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 (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 % 9,6-28,8 V), reverse-polarity protected
Terminals	3-pol. push-in terminal connectors, rigid/flexible conductors up to 1,5 mm²
Power consumption	Typical approx. 1,5 W (variants -L1x0) / 1,8 W (variants -L2x0), max. 5,0 W
Ambient conditions	
Dimensions	MIRO: 26 x 77 x 99 mm (W x D x H) MIROdul: approx. 17 x 70 x 82 mm (W x D x H)
Weight	MIRO-L1x0 /-L2x0: 94 g / 100 g MIROdul-L1x0 /-L2x0: 42 g / 48 g
Mounting	MIRO: DIN rail mounting, horizontal pitch (HP) on DIN rail: Switch cabinet: 1.5 HP, depth on DIN rail 92 mm Small distribution board: 4.5 HP, requires additional lateral DIN rail adapter set MIRO (accessory) MIRO/MIRO dul: screw mounting via holes in the housing/module
Operating temperature	-40 .... +75 °C [2]
Humidity	0 ... 95 % (non-condensing)
IP rating	Housing: IP40

MIRO
MIROdul

Technical Data

Approvals & Standards		
Certifications	MIRO-L100:	CE, UKCA
	MIRO-L200:	CE, UKCA, AT&T – SIM only
	MIRO-L110/-L210:	FCC part 15 class B, IC, PTCRB & IoT network certification, AT&T - NR-AM-DO
	MIRO-L230:	CE, UKCA, FCC part 15 class B, IC, PTCRB & IoT network certification, AT&T - NR-AM-DO, AT&T – SIM only, CCC/CQC, SRRC, NAL
	MIROdul -L1x0 /-L2x0:	Approval takes place in the application, INSYS supports [4]
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/shock as per PLC standard DIN 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 60068-2-30	
Operating time	MTBF > 1.000.000 h (25 °C), according to SN 29500 (according to IEC 61709)	

[1] Please check the availability of the Cellular 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 … +75 °C: extended temperature range

(refer to www.insys-icom.com/en/extended-temperature-range/)

[3] These values concern the radio interface. Due to the 100 Mbit/s Ethernet interface and a single antenna solution, the achievable data rates are lower.

[4] The MIROdul variants are integration modules without housing and therefore without approval. Since the MIRO products with approvals are internally identical, reference can be made to the MIRO approvals when approving a MIROdul application. However, a differential assessment is necessary, which INSYS supports.

MIRO
MIROdul

Order Numbers and Accessories

Available Variants

Product description	Features	Art. no.
MIRO-L100	Cellular router, 1 Ethernet port, 1 dig. Input/Output (configurable)	10022846
MIRO-L110	Cellular router (North America variant), 1 Ethernet port, 1 dig. Input/Output (configurable)	10022847
MIRO-L200	Cellular router, 2 Ethernet ports, 1 dig. Input/Output (configurable)	10023341
MIRO-L210	Cellular router (North America variant), 2 Ethernet ports, 1 dig. Input/Output (configurable)	10023342
MIRO-L230	Cellular router (worldwide frequencies), 2 Ethernet ports, 1 dig. Input/Output (configurable)	10024177
MIROdul-L100	Cellular router module, 1 Ethernet port, 1 dig. Input/Output (configurable)	10023100
MIROdul-L110	Cellular router module (North America variant), 1 Ethernet port, 1 dig. Input/Output (configurable)	10023101
MIROdul-L200	Cellular router module, 2 Ethernet ports, 1 dig. Input/Output (configurable)	10023343
MIROdul-L210	Cellular router module (North America variant), 2 Ethernet ports, 1 dig. Input/Output (configurable)	10023344
MIROdul-L230	Cellular router module (worldwide frequencies), 2 Ethernet ports, 1 dig. Input/Output (configurable)	10024706

Suitable accessories

Product description	Description	Art. no.
Magnetic Antenna 4G/3G/2G SMA	Magnet mounting, height 72 mm, 3 m cable, SMA (m), IP rating IP65	10019504
Outdoor Wall Antenna 4G/3G/2G SMA	Wall mounting incl. bracket, height 220 mm, 5 m cable, SMA (m), IP rating IP65	10020596
Allround Antenna 5G/L4G/3G/2G	Screw or wall mounting, incl. steel angle, height 82 mm, 5 m cable, SMA (m), protection class IP67	10022961
Roof mount antenna 4G/3G/2G SMA	Screw mounting, height 15 mm, 3 m cable, SMA (m), ingres protection IP67	10022309
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/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,	various

© INSYS 240219 - Subject to technical changes and correction

INSYS icom GmbH
Hermann-Köhl-Str. 22
D-93049 Regensburg

Phone +49 941 58 58692-0
Fax +49 941 58692-45
E-mail info@insys-icom.de