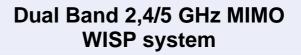# Modus)

Modus – ALX22M

Universal outdoor unit for WISP providers and WLAN systems.

- **802.11n 2Tx/2Rx MIMO**
- **2 radios 802.11abgn with N-female antenna ports**
- **selectable 2.4 GHz and 5 GHz bands**
- **data rates 1-11 Mbps DSSS, 6-300 Mbps OFDM**
- **Motherboard x86/500MHz ALIX**
- **2 Ethernet ports 10/100 RJ45**
- **Power over Ethernet 802.3af/at or pasive PoE 12-56 VDC**
- **Eth/PoE/radio ports surge protection**
- **PoE chaining, outdoor clustering**
- **operating temperature -30 to +60 °C**
- **IEC IP68**
- **RouterOS on Compact Flash (-ML4 model) or without CF/SW (-0 model)**
- **mounting on mast or wall**
- **CE, RoHS conformity**

Modus-ALX22M is ideal solution for Internet Service Providers, outdoor installations of WLAN or Hot Spots, private networks over large geografic area, campus networks, IP-video security systems, especially in harsh environments. The compact unit, rugged design and flexible SW provides robust wireless solution for quick deployment of many applications.

Two multi-mode 802.11abgn 2Tx/2Rx radios can be controlled independently of each other. So you can configure to run 802.11a/b/g/n or mixed mode on the radio/ antenna ports, as appropriate to your application. Up to 23 dBm radio provides a power enough for an access cells or point-to-point links. Dual 10/100 Ethernet ports with PoE and PoE power chaining provides simple installation and possible outdoor clustering more units without any other network components as switches or routers. With Modus-ALX22M you can get flexible, multifunctional wireless unit for your data network infrastructure.

Embedded ALIX motherboard with 500 MHz x86 CPU can run a number of different types of operating systems. The unit comes alternatively with RouterOS/L4 license pre-installed on CF (-ML4 model) or without CF (-0 model), so customer can use its own SW.

The unit with RouterOS (-ML4 model) provides rich functionality in wireless, bridging, routing, security, data throughput shaping and QoS, that can meet any application in converged networks carrying data, VoIP, IP video traffic. The diagnostic tools are included to quickly analyze any network problems. The unit can run wi-fi AP, PtMP base station with proprietary polling or TDMA protocol or PtP HDX or FDX link.

Fully sealed cast aluminim box with pressure vent and stainless steel mounting hardware provides reliable solution in any harsh environments as a telecom towers, city area, heavy-industry plants, see coasts and harbours with salt fog. Mounting kit on the mast or wall for a simple installation is provided.

Product models:

Modus-ALX22M-NX-ML4 – an universal unit for 2,4/5 GHz bands with RouterOS on Compact Flash.
Modus-ALX22M-NX-0 – an universal unit for 2,4/5 GHz bands without Compact Flash (no SW), SW delivered by customer.

Technical specifications (sw features only for RouterOS –ML4 model)

Radio performance

Frequency bands	2,312 – 2,483 GHz and 4,800 – 6,075GHz, country regulations (SW) Selectable channels 5/10/20/40 MHz
Radio standard	802.11 abgn 2Tx/2Rx MIMO
Modulation	OFDM: BPSK, QPSK, 16QAM, 64QAM 802.11agn DSSS: DBPSK, DQPSK, CCK 802.11b
Data rates	802.11ag: 6,9,12,18,24,36,48,54 Mbps /20 MHz 802.11n: MCS0 (6.5) to MCS15 (150) Mbps /20 MHz, up to 300 Mbps/40 MHz 802.11b: DSSS 1,2,5.5,11 Mbps/20 MHz
Transmitt power	Up to 23 dBm (2,4/5GHz) on antenna ports
Receiver sensitivity	802.11b: -95 dBm/1 Mbps, -91 dBm/11 Mbps 802.11g/n: -95 dBm/6 Mbps, -81 dBm/54 Mbps, -95 dBm MCS0, -78 dBm/MCS7 802.11a/n: -95 dBm/6 Mbps, -80 dBm/54 Mpbs, -95 dBm MCS0, -77 dBm/MCS7
Antenna port	4x N-female, 2x per radio

Wireless protocol

Wi-Fi	Wi-Fi 802.11abgn AP, bridge/WDS/client, virtual AP (up 7 per radio), Hot Spot
Nstreme	PtMP Base Station, PtP HDX mode, proprietary polling protocol
NstremeDual	PtP FDX mode, proprietary dual-radio protocol
Nstreme v2	PtMP Base Station , PtP HDX, proprietary TDMA protocol

Networking

Ethernet	2 ports 10/100 Base – TX (RJ45)
Transparent bridge	MAC address/protocol ID/multicast/broadcast filters, Spanning tree, VLAN bridging
IP router	IPv4/v6,NAT, static routing, RIP v1/v2, OSPF v2, BGP v4 PPTP, PPPoE, L2TP, EoIP DHCP client/server
Data Rate Mgmt	CIR, MIR, QoS

Security

802.11abgn HW	64/128 WEP, WPA – PSK/TKIP, WPA2 – PSK or EAP/AES-CCM
SW	ACL, RADIUS autentization, firewall, IP Sec

Configuration / Management

Config	GUI for Windows (WinBox), monitoring, wireless link test, reset, reboot over Ethernet or wireless interface http (WebBox),Telnet, MACTelnet, SSH, serial port (service)
Firmware upgrade	FTP,HTTP

Electrical parameters

Power consumption	max. 10 W
Power	PoE 802.3af /at or pasive PoE 12-56 VDC, PoE chaining for pasive PoE
Surge protection	Ethernet, PoE, radio ports

Fysical parameters

Dimensions	190x190x55 mm (w x h x d), without mounting hardware
Weight	1,58/1,65 kg, without mounting hardware
Operating temperature	–30 to + 60℃
Storage temperature	–40 to + 75℃
Protection	IEC IP68

Mounting hardware

Options	Mast bracket (for 30-80mm diameter)
	Wall bracket, security option

Standards

Radio	ETSI EN 300 328, ETSI EN 301 893
EMC	ETSI EN 301 489 – 17, EN 61000-4-5
Safety	EN 60950
Conformity	CE,RoHS