Modibus

INDUSTRIAL REMOTE ACCESS GATEWAY

MB-213 + CM-SERIES

Secure remote access to PLCs, HMIs and field devices — wired, wireless and cellular connectivity in a modular DIN-rail platform powered by **ModiOS**.

MB-213-W	Gateway · onboard Wi-Fi antenna
MB-213-WS	Gateway · external SMA antenna
CM-214	4G / LTE cellular module
CM-215	Serial module · RS-232 + RS-485
CM-216	Ethernet switch · 4 × LAN

Product Datasheet

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modibus

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MB-213

Secure remote access to PLCs, HMIs & field devices — wired or wireless.

The Modibus MB-213 is a compact, DIN-rail mountable industrial remote-access gateway running **ModiOS** — a hardened embedded Linux platform engineered for unattended field deployment. The MB-213 establishes outbound, encrypted VPN sessions to the Modibus Cloud, allowing engineers and integrators to reach on-site PLCs, HMIs, drives and IP cameras through a browser or VPN client without exposing the customer network. With dual Ethernet (WAN & LAN), built-in Wi-Fi, USB host expansion, and three CM-series add-on modules, the MB-213 adapts to nearly every industrial connectivity scenario.

KEY FEATURES

- **ModiOS** hardened embedded Linux with secure boot
- **Outbound VPN** to Modibus Cloud — no public IP required
- **Browser-based remote access** to PLCs & HMIs (MDS Cloud)
- **Dual Ethernet** — separate WAN & LAN 10/100 Mbps
- **Wi-Fi 2.4 GHz** — Access Point & Station modes
- **Onboard antenna or SMA** connector variants available
- **USB 2.0 host** for storage, modems and peripherals
- **Firewall & NAT** — strict LAN/WAN segmentation
- **Three CM-series modules**: 4G/LTE · Serial · Ethernet Switch
- **Wide-range DC** input 9–36 V DC, fan-less metal enclosure
- **OTA firmware updates** with rollback protection
- **Audit logging** — every remote session recorded

TYPICAL APPLICATIONS

Remote Machine Access
OEM technicians remotely diagnose PLCs & drives in customer sites.

Cloud Telemetry
Send field data to private/public cloud platforms over encrypted tunnel.

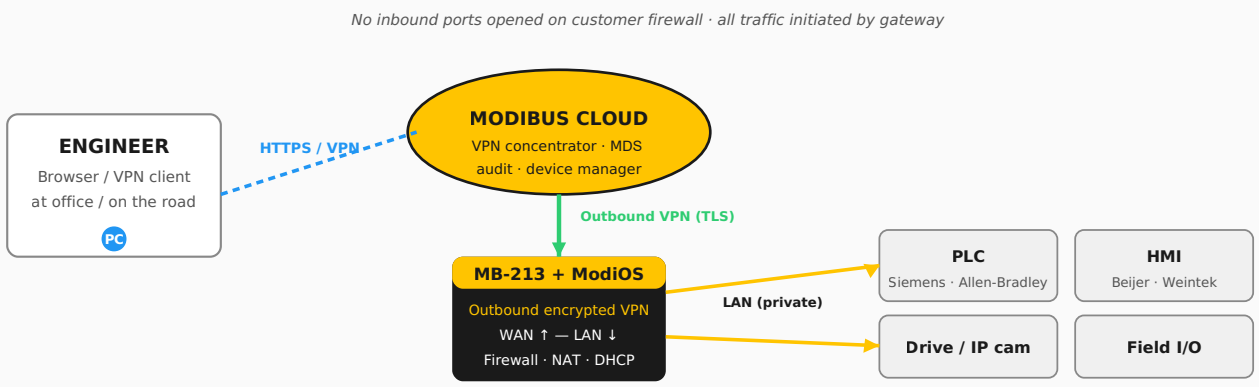
Site VPN Router
Branch-to-branch encrypted networking over public internet.

Wi-Fi Service Hotspot
Provide local Wi-Fi for service technicians on the cabinet.

Multi-WAN Failover
Wired Ethernet primary with 4G/LTE fallback (CM214 module).

Legacy Serial Bridging
Tunnel Modbus RTU / RS-485 traffic over IP (CM215 module).

REMOTE ACCESS ARCHITECTURE



The MB-213 initiates an outbound TLS-encrypted tunnel to Modibus Cloud, letting authorized engineers reach LAN-side devices without VPN-server hosting, public IPs, or inbound firewall rules.

WI-FI VARIANTS

MB-213-W

Onboard Wi-Fi Antenna

Integrated PCB / chip antenna inside the enclosure. Ideal for cabinet-mount installations where the gateway sits close to client devices and a clean, cable-free deployment is required.

MB-213-WS

External SMA Antenna

Front-panel SMA-female connector for external Wi-Fi antenna (rod, magnetic-mount, or directional). Recommended for metallic cabinets, long-range Wi-Fi backhaul, or harsh RF environments.

FRONT PANEL LAYOUT

1. **PWR LED** — power status (solid green = supply within range)
2. **ACS LED** — cloud / VPN access tunnel status
3. **MDS LED** — ModiOS service heartbeat
4. **WAN Port** — RJ45 10/100 Mbps Ethernet, uplink to internet/router
5. **LAN Port** — RJ45 10/100 Mbps Ethernet, downlink to machine network
6. **USB Port** — USB 2.0 Type-A (mass storage, modem, peripherals)
7. **Wi-Fi Antenna** — onboard (variant `-W`) or SMA-female (variant `-WS`)

LED INDICATOR BEHAVIOR

LED	STATE	MEANING
PWR	Solid Green	Power supply within nominal range
PWR	Off	No power / hardware fault
ACS	Solid Green	Cloud / VPN access session established
ACS	Blinking	Connecting · negotiating tunnel
ACS	Off	No active remote session
MDS	Heartbeat (1 Hz)	ModiOS services running normally
MDS	Solid / Off	Service halted — check system logs

PROCESSING & MEMORY

CPU	Industrial-grade ARM application processor
Operating System	ModiOS
RAM	256 MB DDR3 (typical configuration)
Flash Storage	512 MB eMMC — system, user data & rollback partitions
Real-Time Clock	Battery-backed RTC, retains time during power-off
Watchdog	Hardware watchdog — automatic recovery from system hang

NETWORK INTERFACES

WAN Port	1 × RJ45 10/100 Mbps Ethernet · auto-MDIX · status LEDs
LAN Port	1 × RJ45 10/100 Mbps Ethernet · auto-MDIX · status LEDs
Wi-Fi Standard	IEEE 802.11 b/g/n · 2.4 GHz
Wi-Fi Modes	Access Point (`ethap0` , default `10.0.50.1`) and Station (`ethsta0`) — simultaneous operation supported
Wi-Fi Antenna	Onboard PCB antenna (`MB-213-W`) or SMA-female connector for external antenna (`MB-213-WS`)
USB	1 × USB 2.0 Host, Type-A (500 mA max)
Expansion Bus	Internal expansion connector for CM-series modules (CM214/215/216)

REMOTE ACCESS & SECURITY

Cloud Platform	Modibus Cloud — VPN concentrator, browser-based device access (MDS Cloud), audit trail, fleet management
VPN Protocols	OpenVPN (UDP/TCP, ports configurable incl. 443/TCP for restrictive networks), IPsec (StrongSwan)
Connection Direction	Outbound-only — no public IP, no inbound firewall rules required at customer site
Encryption	AES-128 / AES-256, SHA-256, TLS 1.2 / 1.3
Authentication	Per-device X.509 certificates, optional 2-factor for cloud user accounts, RADIUS support
Firewall	Linux netfilter (iptables / nftables) · stateful inspection · strict LAN/WAN segmentation
Routing & Services	Static routing, NAT, port forwarding, DHCP server/client, DNS forwarder, NTP client
Local Management	Web UI (HTTPS), SSH, USB recovery
Audit Logging	Every remote session, login, configuration change recorded; exportable to syslog server

POWER SPECIFICATIONS

Input Voltage	9 – 36 V DC (industrial wide-range)
Nominal Voltage	12 V DC / 24 V DC
Power Consumption	Typical 3 W · Maximum 6 W (Wi-Fi + USB load)
Power Connector	2-pin pluggable terminal block
Protections	Reverse-polarity, over-voltage, over-current

MECHANICAL & ENVIRONMENTAL

Enclosure	Perforated steel housing with ABS front panel · fan-less, passive cooling
Mounting	35 mm DIN-rail (EN 50022) · integrated metal bracket
Dimensions (W × H × D)	Approx. 35 × 110 × 110 mm *(verify against final mechanical drawing)*
Weight	Approx. 350 g
Operating Temperature	−20 °C to +60 °C
Storage Temperature	−40 °C to +80 °C
Operating Humidity	10 % – 90 % RH, non-condensing
Ingress Protection	IP20 (panel-mount cabinet installation recommended)
Compliance	CE, RoHS · EMC EN 61000-6-2 / EN 61000-6-4 (industrial)

MODIOS — SOFTWARE PLATFORM

Base	Hardened embedded Linux (LTS kernel) · read-only root filesystem · A/B partition scheme
Pre-installed Services	OpenVPN, StrongSwan (IPsec), hostapd (Wi-Fi AP), wpa_supplicant (Wi-Fi STA), dnsmasq, nftables, SSH server, web management UI, Modibus Cloud agent
Scripting	Python 3 & Bash for custom edge logic and integration scripts
OTA Updates	Signed firmware images, atomic A/B updates, automatic rollback on boot failure
Security	Secure boot, signed packages, per-device keys, optional disk encryption

EXPANSION MODULE · CELLULAR WAN

CM-214

4G / LTE cellular uplink — wireless broadband, anywhere.

The CM-214 adds 4G / LTE cellular connectivity to the MB-213 gateway, enabling deployment in locations without fixed-line internet, on mobile assets, or as automatic WAN failover when wired Ethernet is unavailable. It connects to the MB-213's internal expansion bus and is fully managed by **ModiOS** — APN auto-detection, dial-up, signal-quality monitoring and keep-alive are all handled out of the box.

KEY FEATURES

- **4G LTE Cat 4** — typical 150 Mbps DL / 50 Mbps UL
- **2 × SMA-female** antenna connectors (ANT 1 + ANT 2)
- **Single SIM holder** — front-accessible, push-push slot
- **Multi-WAN failover** — Ethernet primary, LTE backup
- **Signal monitoring** — RSSI, RSRP, RSRQ, SINR via ModiOS UI
- **–20 °C to +60 °C** industrial operating range
- **3G UMTS / 2G GSM** automatic fallback
- **LTE MIMO 2 × 2** — diversity reception for robust signal
- **Global / regional** band variants available
- **Connection manager** — APN auto-detect, dial-up, keep-alive
- **PWR LED** — module power and status indicator
- **Powered from MB-213** expansion bus — no extra supply

TYPICAL APPLICATIONS

Mobile Machinery
Construction equipment, agricultural fleets, mining trucks — connect anywhere with cellular coverage.

Remote Sites
Pump stations, water-treatment plants, weather stations and remote metering installations.

Cellular WAN Backup
Automatic failover from primary Ethernet uplink — keep tunnels alive during ISP outage.

Field Cabinets
Temporary or rapid-deploy installations where running fibre or DSL is impractical.

Energy & Utilities
Substation monitoring, smart-grid endpoints, distributed generation assets.

Logistics & Fleets
Always-on connectivity for GPS-tracked assets, refrigerated containers, mobile cabinets.

EXPANSION MODULE · SERIAL FIELDBUS

CM-215

RS-232 + RS-485 — bridge legacy serial devices to IP.

The CM-215 brings two independent, simultaneously-active serial ports to the MB-213 — one RS-232 and one RS-485 — both on standard DB9 male connectors. It enables Modbus RTU master / slave operation, Modbus RTU ↔ Modbus TCP gateway functionality, and transparent serial-over-IP forwarding for legacy PLCs, drives, energy meters and field devices that pre-date the move to Ethernet.

KEY FEATURES

- **2 × DB9 male** — port 1 RS-232, port 2 RS-485, both active
- **1200 – 115200 bps** · 7 / 8 data bits · N / E / O parity
- **Modbus RTU slave** — exposes registers to remote SCADA
- **Serial-over-IP** raw tunnel — transparent remote-port forwarding
- **ESD-protected** line drivers — survive harsh field wiring
- **–20 °C to +60 °C** industrial operating range
- **Independent settings** — baud rate / parity / framing per port
- **Modbus RTU master** — poll up to 247 slaves per port
- **RTU ↔ TCP gateway** — translate serial Modbus to Ethernet
- **Galvanic isolation** on both ports — break ground loops
- **RS-485 termination** — software-selectable 120 Ω end-of-line
- **Powered from MB-213** expansion bus — no extra supply

TYPICAL APPLICATIONS

Legacy PLCs
Connect to RS-232 programming ports for remote upload / download, online debug.

RS-485 Sensor Networks
Read multi-drop Modbus RTU sensors, energy meters and I/O blocks over long cable runs.

Drive & VFD Access
Remote parameter changes, fault diagnostics on inverters and servo drives.

Energy Metering
Tunnel Modbus RTU traffic over the encrypted VPN to your central reading platform.

HMI / SCADA Bridge
Convert RS-485 RTU to TCP so modern HMIs can read legacy field devices.

Console Server
Out-of-band serial console access to industrial PCs, switches and routers.

EXPANSION MODULE · LAN PORT EXPANSION

CM-216

Add 4 × LAN ports — keep cabinet wiring tidy.

The CM-216 provides four additional 10 / 100 Mbps Ethernet LAN ports without requiring a separate industrial switch. It is integrated directly into the MB-213's LAN bridge, so connected devices receive IP addresses from the gateway's DHCP server seamlessly. Plug-and-play operation, no configuration required — just snap the module to the DIN-rail next to the MB-213 and start cabling.

KEY FEATURES

- **4 × RJ45** 10 / 100 Mbps Ethernet ports (LAN 1 – LAN 4)
- **Auto-negotiation** — duplex and speed detected per port
- **MAC-table learning** — efficient unicast traffic forwarding
- **Per-port LEDs** — link / activity / speed indication
- **Plug & play** — no configuration, no firmware updates
- **–20 °C to +60 °C** industrial operating range
- **Auto-MDIX** — straight-through or crossover, both work
- **Store-and-forward** switching with non-blocking backplane
- **LAN bridge integration** — devices share MB-213's DHCP scope
- **PWR LED** — module power-good indicator
- **Reduced BOM** — eliminate the need for an external switch
- **Powered from MB-213** expansion bus — no extra supply

TYPICAL APPLICATIONS

Multi-PLC Cabinets
Connect HMI + drive + I/O block + safety controller to one gateway with neat wiring.

IP Camera Integration
Add up to 4 IP cameras to the LAN-side network for remote video monitoring.

Drive Networking
Multiple VFDs / servo drives sharing the gateway's protected internet uplink.

Edge Compute Nodes
Industrial PCs, IPCs and gateways consolidated behind one outbound VPN tunnel.

Test & Commissioning
Service-laptop port for on-site engineers without unplugging field devices.

Cabinet Consolidation
Replace a separate unmanaged switch — save DIN-rail space and reduce BOM.

ORDERING INFORMATION

MB-213-W	Industrial remote-access gateway with onboard Wi-Fi antenna
MB-213-WS	Industrial remote-access gateway with external SMA Wi-Fi connector
CM-214	Add-on 4G / LTE cellular module (SIM & antennas sold separately)
CM-215	Add-on serial module — 2 × DB9 (RS-232 + RS-485) / Modbus RTU
CM-216	Add-on Ethernet switch module — 4 × RJ45 LAN ports

ACCESSORIES & RECOMMENDED ANTENNAS

ANT-LTE-MAG	Magnetic-mount LTE antenna, dual-feed, 3 m cable, SMA-male × 2 (for CM-214)
ANT-LTE-DIR	Directional outdoor LTE antenna, 7 dBi, 5 m cable, SMA-male (for CM-214)
ANT-WIFI-EXT	External 2.4 GHz Wi-Fi antenna, 3 dBi, RP-SMA-male (for MB-213-WS)
PSU-24V-30W	DIN-rail 24 V DC / 30 W power supply, wide-range AC input
CBL-DB9-RJ45	DB9-to-RJ45 console cable for serial-port wiring (with CM-215)