MB CONNECT LINE

mbNET.mini

Version: 2.2.1
Date: Feb 2nd, 2023

Technical data

MDH860; MDH862 EU; MDH862 AT&T; MDH863; MDH866 EU; MDH866 AT&T; MDH867
from HW02 / 03 and FW from 2.2.0

The ***mbNET.mini*** is a very compact industrial router for DIN-rail mounting. It offers secure IP-based access to Ethernet devices and networks through the remote service platform ***mbCONNECT24***.
Therefore, it is not only suitable for remote maintenance applications but also for tasks such as data collection, visualization, alerts and M2M communication.

- Integrated Ethernet switch (3-port or 4-port)
- 4G modem variant
- Wi-Fi variant
- Failover function
  WAN to Modem
  WAN to Wi-Fi
- OpenVPN security protocol
- 2 pieces I/Os
  These connectors can be independently configured as a digital input or digital output.
- Robust metal housing
- Ideal for M2M applications

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1 General

Release notes

Version	Date	Comment
V 1.9.0 DR02	Jan 28th, 2019	Previous version: 1.9.0 DR01 (May 4th, 2018) Correction / completion of the encryption and OpenVPN parameters
V 1.9.19	Mar 11th, 2019	The following new device types have been added: MDH 865, MDH 866 EU, MDH 866 AT & T and MDH 867. Technical feature of the new types: 3 x LAN interface, 1 x WAN interface with failover function WAN > Modem / Wi-Fi.
V 2.0.0	May 5th, 2019	Inclusion of the hardware version HW2 in the extended temperature range.
V 2.0.0 DR01	Oct. 2nd, 2019	Technical data exclusively for devices from hardware version HW02.
V 2.0.6	Dec 3rd, 2019	For devices with hardware version HW 02 and firmware from V 2.0.6, the two I/Os can be configured independently of each other as a digital input or digital output.
V 2.0.6 DR01	Jan 13th, 2020	Changed data (frequencies and target region) for devices with LTE (4G) module (MDH 862 EU, MDH 866 EU) with hardware version: **HW 03**
V 2.0.6 DR02	July 6th, 2020	Adding the transmission power for radio modules.
V 2.0.6 DR03	Sept 23rd, 2020	Adding processor speed and RAM
V 2.2.0	May 27th, 2021	Elimination of devices with 3G modems (MDH 861, MDH 865). Adding the performance data for Wi-Fi devices (MDH 863, MDH 867) with hardware version: **HW 03**
V 2.2.0 DR01	Oct 27th, 2021	Correction of the performance data for the Digital Outputs: Changed from 1.5 A to 0.5 A per output.
V 2.2.1	Mar 28th, 2022	Addition of the performance data for device types with LTE (4G) module - AT&T from hardware version HW 03.

Issued by:

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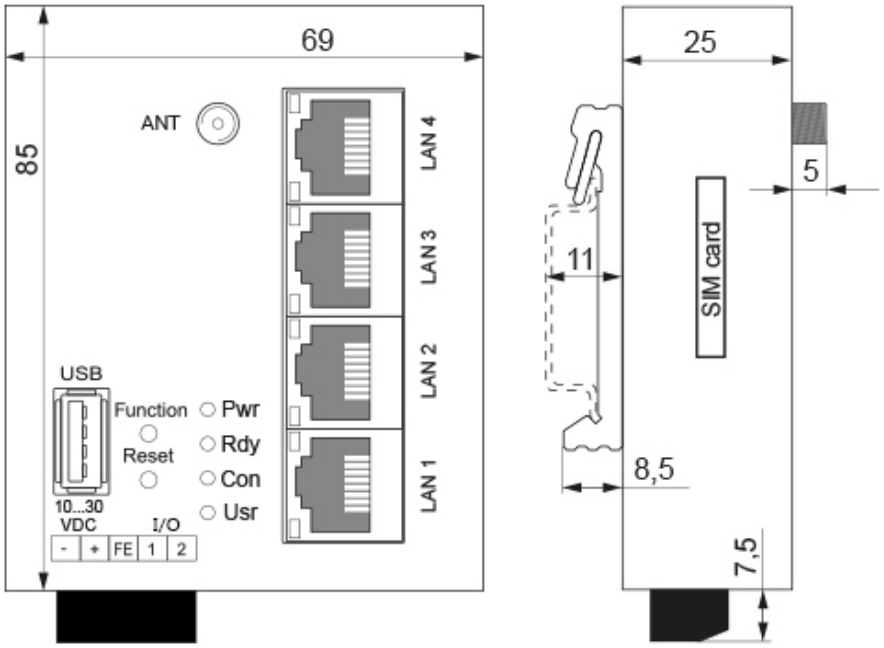
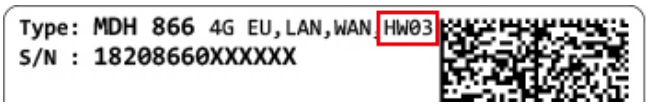
Great care was taken in compiling the texts and illustrations. Despite all efforts, mistakes can never be completely avoided. We are always grateful for suggestions for improvement and / or references to errors.
The latest information can be obtained on our homepage.

2 Technical data industrial router *mbNET.mini* MDH 860 – MDH 867

(Type: MDH 860, MDH 862 AT&T, MDH 862 EU, MDH 863, MDH 866 AT&T, MDH 866 EU, MDH 867).
From hardware version HW02, HW03* and firmware version from V 2.2.0



* You will find the hardware version on the device nameplate.



General data

Voltage ⎓ V (DC)	10 - 30 V DC (SELV and Limited Energy circuit)	
Power consumption (Normal mode)	250 mA @ 24 V - without additional consumers	
Power consumption under full load	max. 1.8 A @ 24 V - (including 2 digital outputs + USB port)	
Random Access Memory	128 MB	
Processor speed	454 MHz	
IP protection class	IP 30**	** at full occupancy of all connections and interfaces. Alternatively, unused interfaces can be covered with dust protection plugs.
Area of application	Dry environments	
Operating temperature	-40 – +75 °C (Type: MDH 860, MDH 862, MDH 866) -40 – +75 °C (Type: MDH 863, MDH 867 - **HW 03**)	
Operating temperature	0 – +60 °C (Type: MDH 863, MDH 867 - **HW 02**)	
Storage temperature	-40 – +85 °C	
Humidity	0 – 95% (non condensing)	
Weight (max.)	240 g	
Dimensions (max.)	69 mm x 38.5 mm x 92.5 mm (W x D x H)	
Housing (material)	metal	
Mounting	DIN rail mounting (based on DIN EN 50022)	

Interfaces / Communication

	Type				
	MDH 860	**MDH 862 EU / AT&T**	**MDH 863**	**MDH 866 EU / AT&T**	**MDH 867**
USB interface	1 x	1 x	1 x	1 x	1 x
Digital inputs / outputs	2 x	2 x	2 x	2 x	2 x
LAN interface	3 x	4 x	4 x	3 x	3 x
WAN interface	1 x	–	–	1 x	1 x
SIM card reader (mini SIM)	–	1 x	–	1 x	–
SMA socket 	–	2 x	–	2 x	–
RP-SMA socket 	–	–	1 x	–	1 x
GSM module 3G (UMTS)	–	–	–	–	–
GSM module 4G (LTE)	–	1 x	–	1 x	–
Wi-Fi modem	–	–	1 x	–	1 x
Failover WAN > Modem / Wi-Fi	–	–	–	✔	✔

Interface specification

LAN interface	10/100 Mbit/s full and half duplex operation, autodetection patch cable / crossover cable
WAN interface	10/100 Mbit/s full and half duplex operation, autodetection patch cable / crossover cable
USB interface	USB Host 2.0
2 pieces I/Os	These connectors can be independently configured as a digital input or digital output - only in the mbCONNECT24 **V2** portal.
Digital input	10 – 30 V DC (low 0 – 3.2 V DC, high 8 – 30 V DC)
Digital output	10 – 30 V DC to a maximum of 0.5 A per output

VPN

Can only be operated with (my)***mbCONNECT24 ****.	
VPN protocol	OpenVPN, 1 tunnel
Encryption parameter	Control Channel: TLSv1.2, cipher ECDHE-RSA-AES256-GCM-SHA384 Data Channel: Cipher 'AES-256-GCM' initialized with 256 bit key
Authorization	Pre-Shared-Key, X.509
* The types MDH 866 and MDH 867 can only be operated in the portal (my)mbCONNECT24 **V2**.	

Network /Security

Firewall	1:1 NAT, IP-Filter, Port-Forwarding, stateful inspektion
IP router	NAT-IP, TCP/IP routing, IP forwarding
Service	DHCP client, NTP client
Time synchronization	NTP server

Communication

> Devices with **LTE (4G)** module (MDH 862 EU, MDH 866 EU); hardware version: **HW 03**

Target region	Europe
GSM/GPRS/EDGE	900 (B8), 1800 (B3) MHz; max. 236 kbps
HSxPA	900 (B8), 2100 (B1) MHz; downlink max. 42 Mbps, uplink max. 5,76 Mbps
LTE	800 (B20), 900 (B8),1800 (B3), 2100 (B1), 2600 (B7) MHz; downlink max. 150 Mbps, uplink max. 50 Mbps
Transmission output power	CLass 3 (0.2 W, 23 dBm) @ LTE; CLass 3 (0.25 W, 23 dBm) @ 3G Class 4 (2 W) @ GSM 900; Class 1 (1 W) @ DCS 1800
TAC	35162207

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> Devices with **LTE (4G)** module (MDH 862 EU, MDH 866 EU); hardware version: **HW 04**

Target region	EMEA
GSM/GPRS/EDGE	900 (B8), 1800 (B3) MHz; max. 236 kbps
HSxPA	900 (B8), 1800 (B3), 2100 (B1) MHz; Downlink max. 42 Mbps, Uplink max. 5,76 Mbps
LTE	800 (B20), 900 (B8),1800 (B3), 2100 (B1), 2600 (B7), 700 (B28A) MHz; Downlink max. 150 Mbps, Uplink max. 50 Mbps

RF parameters

Output power - typical values for max output level	Sensitivity - typical sensitivity levels
• 2G: LB: 33 dBm; HB: 30 dBm • 3G/TD-SCDMA: 24dBm • 4G (FDD & TDD): 23dBm @1RB	• -108 dBm @ 2G • -113.5 dBm @ 3G • -103 dBm @ 4G FDD (BW=5 MHz)

Antenna connector	2 pieces SMA socket 
TAC	35162610

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> Devices with **LTE (4G) m**odule - **AT&T*** - Type: MDH 862 AT&T, MDH 866 AT&T; from hardware version: **HW 03**

Target region	North America (Public safety, AT&T, FirstNet, T-Mobile, Canada)
HSxPA	1900 PCS (B2), AWS (B4), 850 (B5) MHz; Downlink max. 42 Mbps
LTE	700 Lower (B12), 700 PS (B14), AWS (B4), 1900 PCS (B2), 850 (B5), 700 Upper (B13), AWS-3 (B66), 600 (B71) MHz; Downlink max. 150 Mbps, Uplink max. 50 Mbps

RF parameters

Output power - typical values for max output level • 2G: LB: 33 dBm; HB: 30 dBm • 3G/TD-SCDMA: 24dBm • 4G (FDD & TDD): 23dBm @1RB	Sensitivity - typical sensitivity levels • -108 dBm @ 2G • -113.5 dBm @ 3G • -103 dBm @ 4G FDD (BW=5 MHz)

Antenna connector	2 pieces SMA socket 
TAC	35034498; 35432809; 35604311
FCC	Contains FCC ID: RI7LE910CxNF

> Devices with **LTE (4G)** module - **AT&T*** - Type: MDH 862 AT&T, MDH 866 AT&T; hardware version: **HW 02**

Target region	North America
GSM/GPRS/EDGE	850, 1900 MHz; max. 236 kbps
HSxPA	1900 (B2), 850 (B5) MHz; downlink max. 21 Mbps, uplink max. 5,76 Mbps
LTE	1900 (B2), AWS 1700 (B4), 850 (B5), 700 (B17) MHz; downl. max. 100 Mbps, upl. max. 50 Mbps
Transmission output power	Class 4 (2 W, 33 dBm) @ GSM 850 / 900; Class 1 (1 W, 30 dBm) @ GSM 1800 / 1900 Class E2 (0.5 W, 27 dBm) @ EDGE 850 / 900; Class E2 (0.4 W, 26 dBm) @ EDGE 1800 /1900 Class 3 (0.25 W, 24 dBm) @ UMTS; Class 3 (0.2 W, 23 dBm) @ LTE
FCC	FCC ID: R17LE910NA

NOTICE

*The device types MDH 862 AT&T and MDH 866 AT&T are not CE marked and must not be operated or commissioned in the European Economic Area (EEA)!

> Devices with **Wi-Fi** module (MDH 863, MDH 867); hardware version: **HW 02**

Wi-Fi	IEEE802.11b/g & 802.11n (1T1R mode), up to 150 MBit/s
Wi-Fi specification	· EU (2.412 GHz-2.472 GHz, 1-13 channel) · USA (2.412 GHz-2.462 GHz, 1-11 channel) · WPA/WP2, 64/128/152bit WEP, WPS · 802.11b: 1,2,5.5,11 Mbps · 802.11g: 6,9,12,18,24,36,48,54 Mbps · 802.11n: (20 MHz) MCS0-7, up to 72 Mbps · 802.11n: (40 MHz) MCS0-7, up to 150 Mbps
Transmission output power (typical)	11b: 19+/- 1.0 dBm @ 11 Mbps 11g: 16+/- 1 dBm @ 54 mbps 802.11n: (HT20), 15 +/- 1dBm, 802.11n: (HT40), 15 +/- 1dBm
Reception sensitivity (typical)	11b: -84dBm @ 11 Mbps; 11g: -70dBm @ 54 Mbps 802.11n: (HT20), -66 dBm @ MSC7, (HT40), -62 dBm @ MSC7
FCC	FCC ID: YWTWFXM05

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> Devices with **Wi-Fi m**odule (MDH 863, MDH 867); hardware version: **HW 03**

Wi-Fi	IEEE 802.11b/g/n	
Frequency bands	2.4 GHz, channel 1 - 13* (2.412 GHz - 2.472*)	
Channel bandwidth	20 MHz	
Data rates	802.11b	1, 2, 5.5 and 11 Mbps
	802.11g	6, 9, 12, 18, 24, 36, 48 and 54 Mbps
	802.11n	MCS0-MCS7 (max 72.2Mbps)
Hardware supported Encryptions/Decryption	AES/CCMP, AES/CMAC, WAPI, WEP/TKIP	
Max. output power	19 dBm EIRP**	
Max. sensitivity	-97 dBm EIRP**	
FCC	FCC ID: XPYLILYW1 IC: 8595A-LILYW1	
IC	IC: 8595A-LILYW1	

* Maximum, depends on the region. ** RF power including maximum antenna gain (3 dBi).

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SIMPLIFIED EU DECLARATION OF CONFORMITY

Hereby, MB connect line GmbH declares that the radio equipment types MDH 861; MDH 862 EU; MDH 863; MDH 865; MDH 866 EU; MDH 867 are in compliance with Directive 2014/53/EU.
The full text of the EU declaration of conformity is available at the following internet address:
https://mbconnectline.com/conformity/