VAISALA

Data Management Unit DMU801

Features

- Collects and processes sensor measurement data using advanced algorithms
- Stores observations, device information, and maintenance history
- Highly scalable and customizable
- Open design provides excellent sensor connectivity
- Low power consumption
- Latest hardware, firmware, and network security features
- Visual configuration tool for configuration creation and modification
- Robust design with long operating life
- Reliable also in extreme environmental conditions
- Built-in surge protection
- Easy to install, economical to maintain and upgrade both locally and remotely
- Self-diagnostics include monitoring of internal voltages, operating current and temperature
- Can also be used as a gateway between less secure subsystems and Internet

Vaisala Data Management Unit DMU801 acquires and manages the data flow from sensors in automatic weather stations. Its open design allows flexibility in sensor selection and data interfaces. DMU801 can be configured to send observation data for analysis and visualization to Vaisala Observation Network Manager NM10 or any desired customer system.

Reliability as design principle

DMU801 hardware has been designed and tested for extreme environmental conditions. Only industry-proven components are used.

A local database ensures that the collected data is secured also in case of external communication network downtime.

High quality data

DMU801 performs advanced algorithm calculations to process observation data from sensors. In addition, DMU801 validates sensor data accuracy using preconfigured criteria before sending the data forward.

Secure by design

DMU801 has a number of data security features to protect the data. The features include, for example, secure network protocols, secure communication interfaces with industry standard encryption protocols, and dynamic firewall protection. Systematic user management is implemented to prevent unauthorized access, and regular firmware updates are provided for continuous improvements.

Energy efficient

The low power consumption of DMU801 makes it an ideal solution also for remote locations. DMU801 can be powered by solar panels.

Scales to your needs

DMU801 is available in 3 sizes. It has a processor board and room for either 2, 4, or 8 optional plug-in modules. You can select the size of the base unit according to your expansion needs and complement it with additional plug-in modules.

Easy configuration creation

You can create your own configuration files or modify existing ones with Vaisala DMU801 Configuration Tool. The tool is designed to be intuitive and visual, which makes it easy to use.

Remotely managed

For maintenance, configuration, and troubleshooting tasks, DMU801 includes a built-in web user interface that allows controlling the system remotely as well as locally. Most new features can be taken into use over a remote connection.

Technical data

Operating environment

Operating temperature [1]	−40 … +85 °C (−40 … +185 °F)
Extended operating temperature (available on request)	−60 … +85 °C (−76 … +185 °F)
Storage temperature	−60 … +85 °C (−76 … +185 °F)
Operating humidity	0–100 %RH, non-condensing

1) *Operating temperature of some of the DMU801 plug-in modules may be different. See the plug-in module datasheets.*

Powering specifications

Operating voltage	8–32 V DC (maximum 10 A)
Power consumption, typical	500 mW
Heating voltage	24 V DC nominal
Maximum input current for heating	12 A
Mating connectors (power/heating input)	2 × Phoenix Contact FKCN 2,5/2-ST-5,08 (included)

Inputs and outputs

Ethernet	
Ports	**eth0** on CPU, additional ports with plug-in modules
Supported standard	IEEE 802.3u
Physical layer	Base-T
Data rate	10/100 Mbps
Connectors	RJ45 with link LEDs
Data transmission	Full/Half-duplex with auto-negotiation
USB	
Ports	1
Supported standard	USB 2.0
Signaling	High speed
Connectors	USB-C
Serial	
Ports	• 1 × RS-232 / RS-485 / SDI-12 port • 2 × RS-485 ports • Additional ports with plug-in modules
Supported bit rate	1200–115 200 bps
Power output	5 × software controllable power output pins
Signals	• RS-232: RXD, TXD • RS-485: D+/D−
Digital I/O	4 × 3.3 V logic level GPIO pins, pulse count capable
Mating connectors	• 2 × Phoenix Contact DFMC 1,5/4-ST-3,5-LR (included) • 1 × M8 4-pin male
Note: 4-wire RS-485/RS-422 is supported by using 2 × 2-wire RS-485.	
TCP/IP	
Supported protocols	DHCP, DNS, NTP, ARP, ICMP Echo, TCP/IP, SSH, UDP, DTLS, HTTPS [1]

1) *The list is subject to change.*

Processing system

Processor	ARM Cortex A9, 800 MHz
Memory	1 GB DDR3L RAM, 8 GB eMMC Flash
External memory	SD card up to 32 GB [1]
Operating system	Linux
Communications protocol	IPv4 and IPv6
Real-time clock (standard)	
Accuracy	Better than 20 s/month
Backup battery	CR1225/BR1225
Backup time	Minimum 5 years

1) *SD card available as accessory.*

Mechanical specifications

Weight	2-slot unit: 0.35 kg (0.77 lb) 4-slot unit: 0.48 kg (1.06 lb) 8-slot unit: 0.71 kg (1.57 lb)
Mounting	DIN rail 35 mm (1.4 in)
Dimensions (H × W × D) [1]	
2 slots	120 × 77 × 84 mm (4.72 × 3.03 × 3.31 in)
4 slots	120 × 113 × 84 mm (4.72 × 4.45 × 3.31 in)
8 slots	120 × 185 × 84 mm (4.72 × 7.28 × 3.31 in)
Materials	
Screws, washers	Stainless steel AISI 316
DIN rail locking piece	Stainless steel AISI 630
Frame profile	Aluminum EN AW-6060 T6
End covers	Plastic PC/ABS

1) *Reserve some extra space for connectors and cables. For example, sensor connectors require a minimum of 20 mm (0.8 in) additional space from the DMU801 frame.*

Compliance

EU directives and regulations	EMC, RoHS	
EMC immunity	EN 61326-1, industrial environment [1]	
EMC emissions	CISPR 32 / EN 55032, Class B [2] FCC part 15 B, Class B ICES-3 / NMB-3 (Class B)	
Compliance marks	CE, FCC, ICES, RCM, UKCA	
Test	**Applied standard**	**Description/Value**
Maritime	IEC 60945	–
Vibration (sinusoidal)	IEC 60068-2-6	5–13.2 Hz, 1 mm (0.04 in) amplitude 13.2–200 Hz, 0.7 g
Rough handling	IEC 60068-2-31	Drop height 100 cm (39.37 in)
Shock	IEC 60068-2-27	15 g, 11 ms, saw-tooth
Dry heat	IEC 60068-2-2	+85 °C (+185 °F)
Damp heat	IEC 60068-2-78	+40 °C (+104 °F), 95 %RH
Cold	IEC 60068-2-1	−60 °C (−76 °F)

1) *Modem Carrier Module DMX801 complies with EN 61326-1 basic level. Ethernet connection requires external surge protection to comply with EN 61326-1 industrial environment level.*
2) *Class A, if Ethernet Switch Module DME801 includes SFP modules.*

Plug-in modules

Analog Measurement Module DMA801	• 4 × differential analog inputs with protection • 2 × 0–30 V single-ended measurement channels • 2 × counter measurement channels • Sensor excitation power
Analog Measurement Module DMA802	• 4 × differential analog inputs with protection • 2 × 0–30 V single-ended measurement channels • 2 × frequency/counter measurement channels • Sensor excitation power

Serial Module DMS801	• 4 × serial ports with power control and protection:
	  • 3 × isolated RS-485 ports
	  • 1 × multipurpose RS-485 / RS-232 / SDI-12 port

Serial Module DMS802	• 4 × serial ports with power control and protection:
	  • 2 × standard RS-232 serial ports
	  • 1 × multipurpose RS-485 / RS-232 port
	  • 1 × multipurpose RS-485 / RS-232 / SDI-12 port

Ethernet Switch Module DME801	• 3 × Gigabit copper ports • 2 × SFP fiber optic ports
Modem Carrier Module DMX801	• Support for standard mPCIe card modems • SIM card holder or embedded SIM • Support for low-power LTE Cat 1 modem modules
Barometer Module DMB801	Class A calibrated barometer

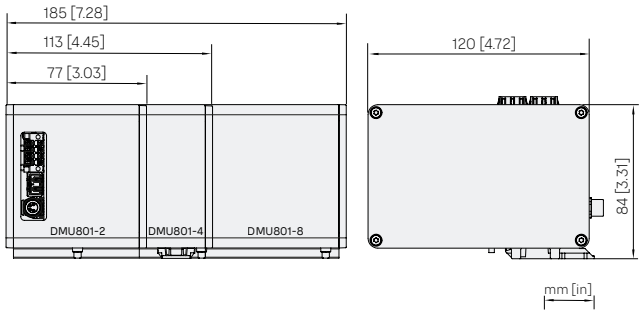
Note: For more detailed information on the plug-in modules, see the separate plug-in module datasheets.

Communication options

Wireless communication	LTE Cat 4 cellular modem (with UMTS/HSPA+ and GSM/GPRS/EDGE support)
Landline communication	RS-232, RS-485, LAN
Ethernet communication	HTTPS, TCP socket, SFTP, FTP, MQTT client, LwM2M
Communication protocols	Modbus TCP ASCII (SMSAWS, CSV, customized format)
Satellite communication	Vaisala GOES DCP Transmitter QST102-3
Local maintenance connection	USB-C, browser-based Web UI

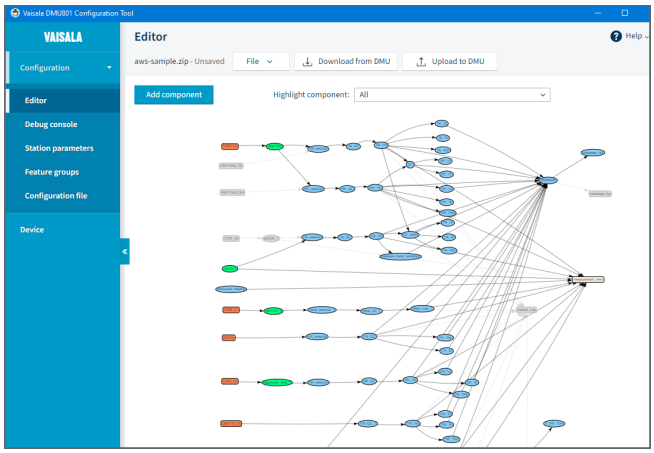
Self-diagnostics features

Internal temperature monitoring
Voltage monitoring
Current monitoring
Enclosure door monitoring (to detect if the door is open or closed)



DMU801 dimensions (all sizes)

Software tools

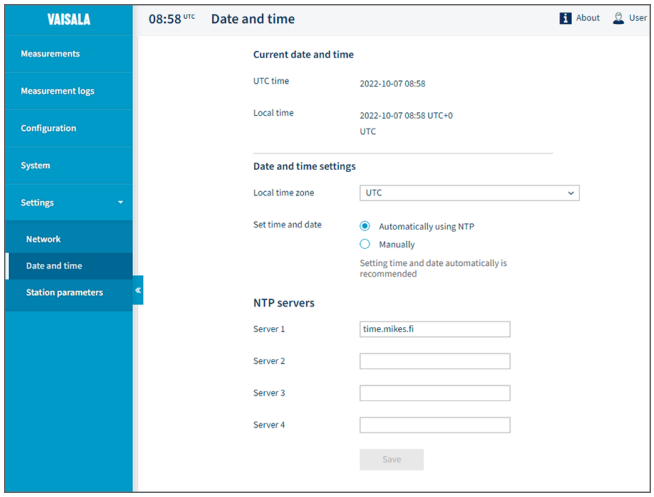


Vaisala DMU801 Configuration Tool

The configuration tool allows creating and modifying configuration files which define how a specific weather station works. The tool includes basic meteorological calculations which are easily extendable with existing Python modules as well as custom Python calculations. The configuration is visualized as colored nodes in the tool.

Features:

- Creating and modifying configuration files
- Backing up and importing configuration files
- Debug console for troubleshooting
- Configuration files consist of scripts and libraries based on Python 3
- Basic meteorological calculations and other data processing code
- Easily extendable with existing Python modules and custom Python calculations



Vaisala DMU801 Web User Interface

The web user interface allows setting station-specific parameters such as date and time. No separate installation is needed. A browser connection is automatically established when the user connects to the station through a USB-C or Ethernet connection.

The Web UI helps perform typical maintenance tasks, for example, enabling and disabling individual sensors and viewing or downloading log files. In addition, you can view the sensor status and have direct access to the sensor settings through a serial console.

Features:

- For maintenance tasks
- No dedicated software or drivers required
- Viewing station events, downloading log files
- Setting and modifying station parameters
- Configuring network settings
- Viewing station metadata, like power consumption details, memory and CPU usage, and sensor metadata
- Updating firmware remotely or locally

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