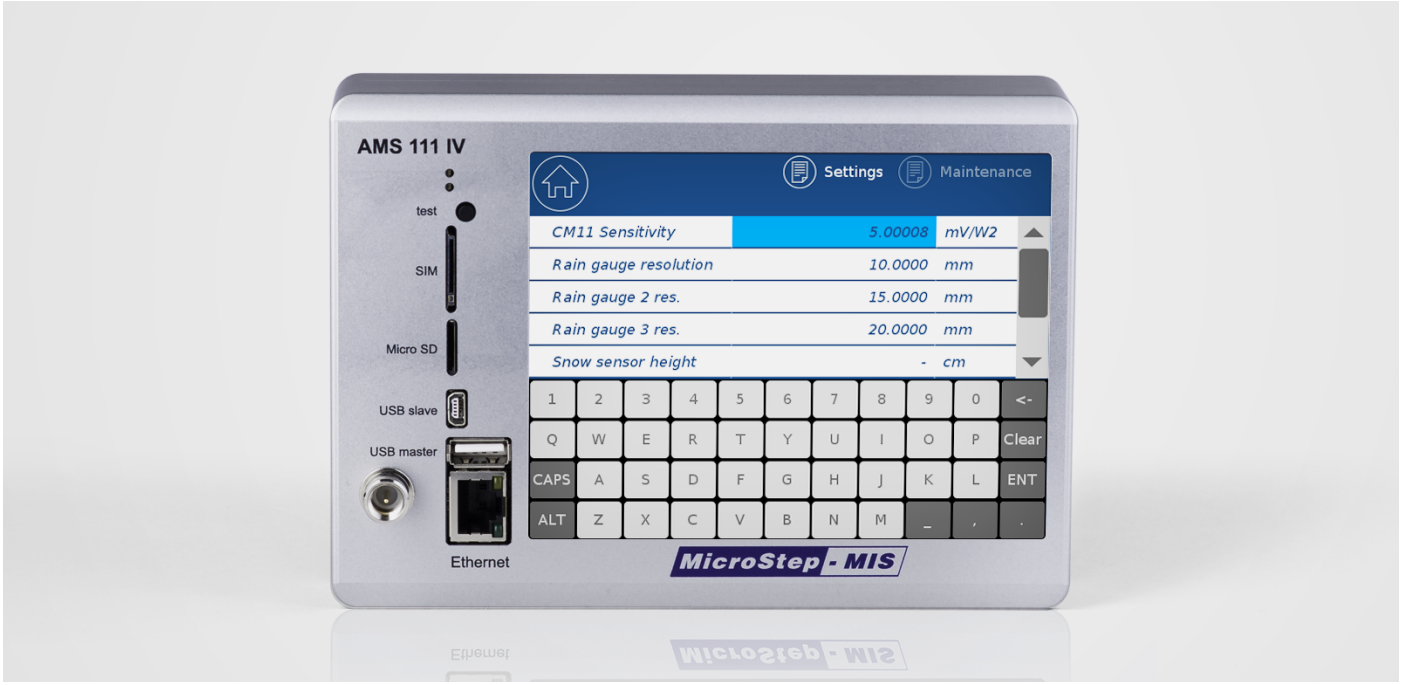
AMS 111 IV

Data Logger

The MicroStep-MIS AMS 111 IV data logger is designed for standard or mobile meteorological stations, as well as for the applications in areas where the commercial power or communication networks are limited or do not exist.



Rich set of interfaces

Low power consumption, high reliability

Native communication to central system

Easily customizable configuration of inputs and outputs

Special aviation software

The AMS 111 IV is the third generation of MicroStep-MIS data loggers. Now it is designed on modular platform which supports different main systems and is based on Linux supporting modules.

The AMS 111 IV interfaces with various sensors and telecommunication devices. Embedded with the state-of- the-art software, AMS 111 IV is a reliable and cost-effective solution for meteorological and environmental monitoring.

System flexibility allows wide application range from simple compact systems to multipurpose stations. 24 bit A/S conversion and software features such as data validation and quality control ensure the accuracy of the measured data. System supports data output to RS-232/485 lines, modems and cellular phones (SMS, GPRS, 4G), radio-modems and satellites.

Modular design

The AMS 111 IV data logger may be supplied with or without touchscreen graphic display, and optionally with GSM (wireles) or PSTN modem - depending on user's requests. Two sizes of special housing boxes are optional.

AMS 111 IV supports intelligent sensors on RS-485 and SDI-12 bus. Support for USB mass storage devices now allows easy distribution of data, configuration or firmware updates between AMS stations, as well as from/to the managing PC systems.

The typical AMS 111 IV is usually housed in weather-proof enclosure (up to IP 67), which includes mainboard, display (optional), sensor-connection terminal, AC adapter or battery power supply (optional), backup battery (optional), and pressure sensor (optional).

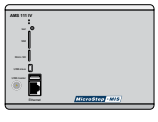
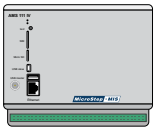
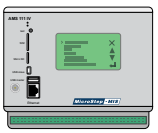
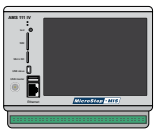
Basic AMS 111 IV module

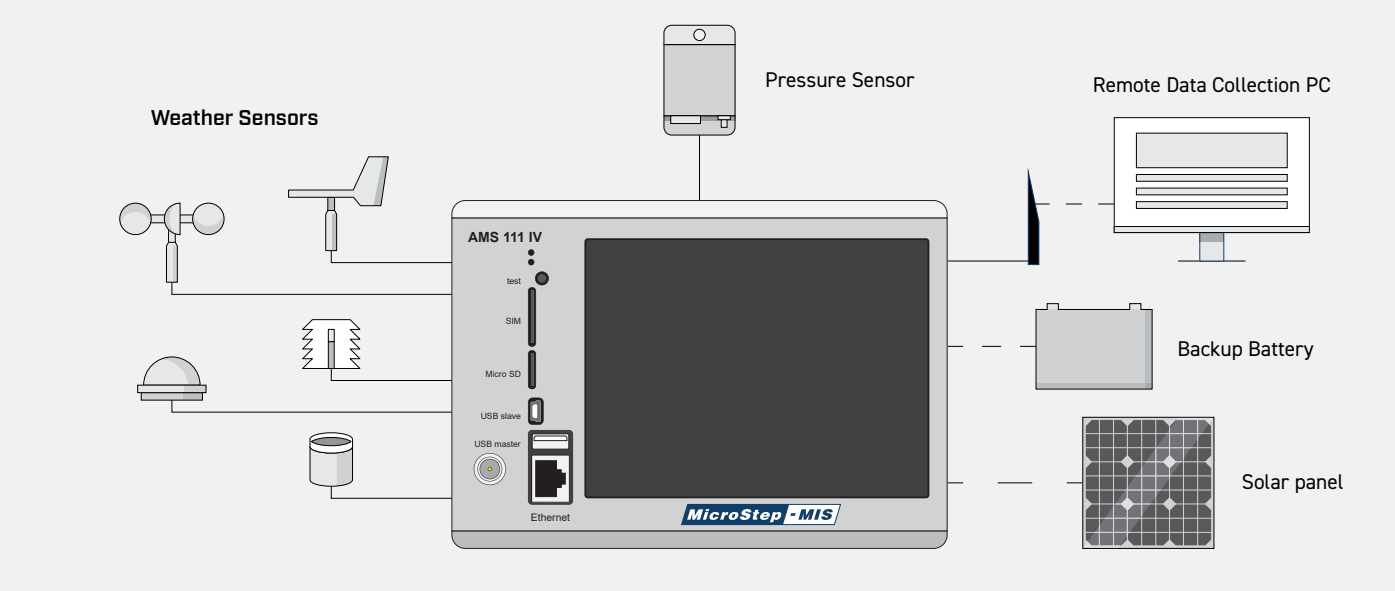
P4-MBDA3	mainboard - the board for interfacing sensors and/or communication devices

Optional extension modules

P4-DSP	touchscreen display (128 x 64 graphic display with 32-button touch screen)
P4-DSP57T	5,7" TFT display with touchscreen and resolution 640 x 480 (larger display on request)
P4-GSM	modem module (wireless GSM/GPRS modem)*
P4-4G	modem module (4G support)*
P4-WiFi	WiFi module*

**only one module can be used / installed at the same time*

	AMS 111 IV - S	AMS 111 IV - LCD	AMS 111 IV - TFT	AMS 111 IV - S - C	AMS 111 IV - LCD-C	AMS 111 IV - TFT-C
P4-DSP						
MicroStep-MIS OS	optional	optional	no	optional	optional	no
Linux OS	optional	optional	optional	optional	optional	optional
GSM modem	optional	optional	optional	optional	optional	optional
4G modem	optional	optional	optional	optional	optional	optional
WiFi module	optional	optional	optional	optional	optional	optional
External terminal board	yes	yes	yes	no	no	no
Analog inputs	22	22	22	7	7	7
Digital outputs	4	4	4	4	4	4
Power outputs	8	8	8	4	4	4



Meteorological station example

The AMS 111 IV data logger board is running on the embedded Linux with the MicroStep-MIS data logger application.

Analog inputs

- 22 x precise differential inputs, ±2.5 V to ±19.5 mV
- Resolution 24 bit
- Minimal sampling period 0.25 s
- Input impedance more than 10 MΩ
- **Accuracy:**
  Voltage measurement 0.031 %
  Resistance measurement 0.042 %
  5x additional analog inputs 0 - 5 V / 0 - 2.5 V
  ±2.5 mV (on special request)

Digital inputs

- 12 x digital input, 0 V to 20 V
- (log0 < 6.2 V log1 > 7.1 V) or 0-5 V TTL (optional)
- counters up to 5 kHz

Digital outputs

- 4x digital output, open collector 35 V / 1 A

Power outputs

- 8x switching power supply up to 1.5 A

Battery charger

- Integrated automatic battery charger
- Digital configuration of battery parameters
- Maximal charging current 2 A
- Battery monitoring with full charge state and cut off voltage

Memory and RTC

- Internal 128 MB Flash memory
- Internal 128 MB DRAM memory
- Secure digital card up to 64 GB
- External USB mass storage up to 256 GB
- Real time clock (backup with Lithium battery)

Processors

- Main processor 32 bit ARM® Cortex® M7
- Slave processor 32 bit ARM® Cortex® M4

Communication I/O ports

- 3x RS-232 port (baud rate: 300 to 115200), 1x UART
- 2x RS-485 port
- Interface for GSM / Wifi / Radio module
- Ethernet 10/100 Mbit
- USB master, USB slave
- 2x SDI-12
- **Supported Protocols:** FTP server, FTP client, HTTP server, telnet, SMTP, SMTPS, MODBUS RS-485, MODBUS, NTP Ethernet

Power supply

- Voltage 3.5 V to 18 V
- Consumption max.: 2.5 W (205 mA @ 12 V all peripherals on, Ethernet connected, with TFT display)
- Consumption middle: 780 mW (65 mA @ 12 V without Ethernet, RS-485, modem and display)
- In sleep mode: 72 µW (6 µA @ 12 V all peripherals off)

Environmental parameters

Operating temperature range	-40 °C to +70 °C
Operating humidity range	0 to 100 %

P4-DSP LCD display with touchscreen

Monochrome graphic display with 32-button touchscreen matrix - optional user interface for previewing of measured values, adjusting system time, setting system variables and more - directly on the logger.

Resolution	128 x 64 pixels

P4-DSP57T 5,7“ TFT display with touchscreen

Resolution	640 x 480 pixels, color 262k, TFT transmissive
Operating temperature range	–10 °C to +60 °C
Brightness	400 cd/m^2
Viewing angle	60°
Responsive time	15 ms
Effective area	117.2 x 88.4 mm

P4-4G modem

Data rates	• LTE-FDD Max 100 Mbps (DL) Max 50 Mbps (UL) • LTE-TDD Max 61 Mbps (DL) Max 18 Mbps (UL) • DC-HSPA+ Max 42 Mbps (DL) Max 5.76 Mbps (UL) • UMTS Max 384 Kbps (DL) Max 384 Kbps (UL) • TD-SCDMA Max 4.2 Mbps (DL) Max 2.2 Mbps (UL) • CDMA Max 5.4 Mbps (DL) Max 14.7 Mbps (UL) • EDGE Max 236.8 Kbps (DL) Max 236.8 Kbps (UL) • GPRS Max 85.6 Kbps (DL) Max 85.6 Kbps (UL)
Operating temperature range	–40 °C to +85 °C
Environmental conditions	Operating temperature range: –40 °C to +70 °C Operating humidity range: 0 to 100 %

P4-GSM modem

Specification	• Quad Band GSM/GPRS/3G modem E-GSM 850/900/1800/1900 • Class 4 (2 W at 900 MHz) • Class 1 (1W at 1800 MHz) • Data, SMS • Fax and data transmission without extra hardware
Operating temperature range	–40 °C to +85 °C
Environmental conditions	Operating temperature range: –40 °C to +70 °C Operating humidity range: 0 to 100 %