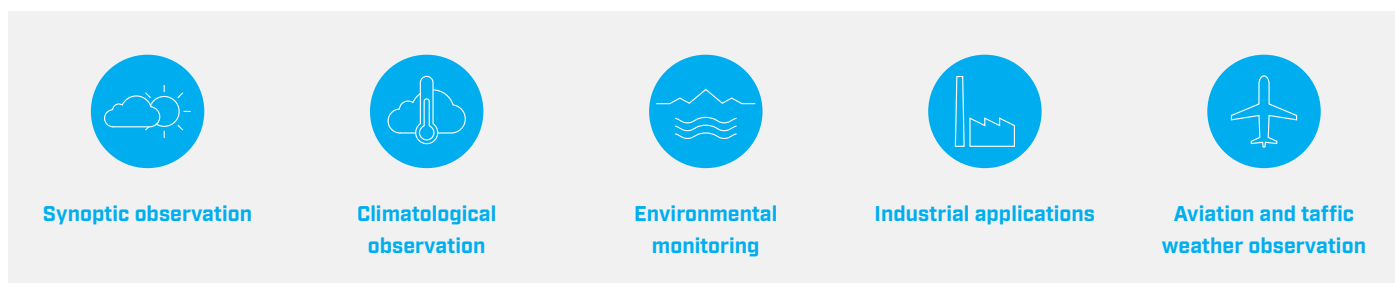# AMS 111 II

Data Logger

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

SD memory card

LED indicator for operating

SD memory card

Terminal board

Synoptic observation	**Climatological observation**	**Environmental monitoring**	**Industrial applications**	**Aviation and taffic weather observation**

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

Consisting of the building blocks interconnected by a RS-485 system bus, AMS 111 II serves as a modular and flexible platform for construction of various measuring and logging systems, which include AMS 111 II modules, intelligent sensors, displays and PCs.

System flexibility allows wide application range from simple compact systems to multipurpose stations. 24 bit A/D 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), radio-

modems and satellites. PPP protocol support makes AMS 111 II Internet-ready.

User-friendly software applications (e.g. AWS Setup and AWS Service) allow easy and comfortable system configuration, setup and maintenance also remotely / locally via available connection.

Modular design

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

Addressable RS-232/485 converters allow to integrate AMS 111 II with intelligent sensors, displays and computers to common virtual monitoring station with individual

components located within 1 km. Handy secure digital memory cards allows easy distribution of data, configuration or firmware updates between AWS stations, as well as from / to the managing PC systems.

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

Automatic self-diagnostic functions:

- Memory consistency control
- Running task consistency control
- Internal measurements for correct voltage levels

Basic AMS 111 II module

PL-MBDA2	mainboard - the board for interfacing sensors and / or communication devices

Optional extension modules

PL-DSP	touchscreen display (128 x 64 graphic display with 32-button touch screen)
PL-SR21	2 x RS-232, 1 x RS-485
PL-PSTN	modem module (leased line / dial-up modem)
PL-GSM	modem module (wireless GSM / GPRS / 3G / LTE modem)

Enclosure and accesories options

Enclosure	PL-CSB1slim	PL-CSB1	PL-CSB2	PL-CSB3	LC1-II
Dimensions	195 x 175 mm	195 x 175 mm	225 x 200 mm	260 x 230 mm	160 x 160 mm
Depth	65 mm	105 mm	140 mm	140 mm	51.5 mm
Display*	✖	•	•	•	•
GSM modem**	•	•	•	•	•
PSTN Modem**	•	•	•	•	•
4x AA battery (internal supply)***	✓	•	✖	✖	✖
Car adapter (12V)	•	•	•	•	✖
Mains AC adapter	✖	✖	•	•	✖
Backup battery	✖	•	•	•	✖
Air pressure sensor	✖	✖	•	•	✖
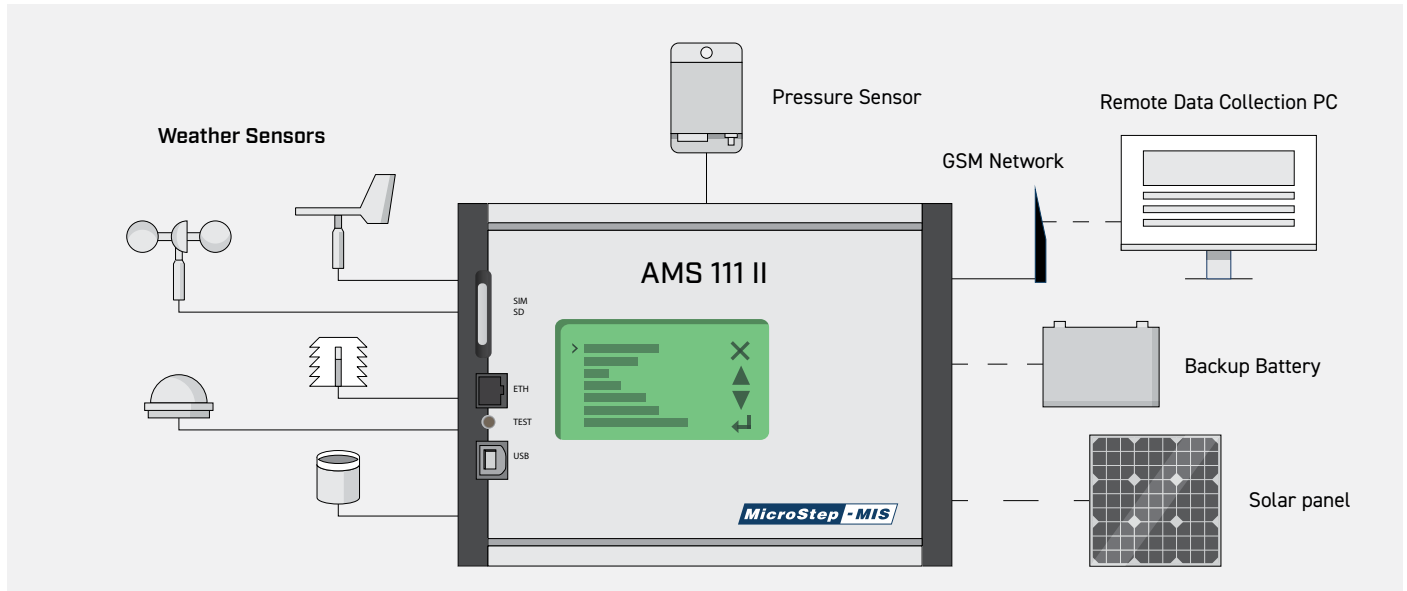
Meteorological station example

Technical data

The AMS 111 II data logger board is running the MicroStep-MIS multi-tasking real-time executive. The add-on external secure digital card with the data capacity up to 2 GB is sufficient for the several months in the typical applications.

Analog inputs

22x precise differential inputs, ±2.5 V to ±19.5 mV
Port for up to 50-pin peripheral

Resolution 24 bit

Accuracy:
Voltage meassurement 0.031 % Resistance meassurement 0.042 %
5 x 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)

1 counter up to 500 kHz

>10 counters up to 5 kHz

Digital outputs

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

Power outputs

4x 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 1 MB Flash memory
Internal 1 MB SRAM memory
Internal Secure Digital card 128 MB (up to 2 GB)
External Secure Digital card up to 64 GB
Real time clock (backup with Lithium battery)

Processors

Main processor 32 bit ARM
Slave processor 8 bit AVR
RS-232 port (baud rate: 300 to 115200)
RS-485 port
UART in 3.3 V
Ethernet 10/100 Mbit
USB
SDI-12
2 x RS-232, 1 x RS-485 (optional)

Supported protocols:
FTP server, FTP client, HTTP server, telnet, SMTP, SMTPS, MODBUS RS485, MODBUS Ethernet, Network Time Protocol - NTP server, NTP client

Power supply

Voltage 3.5 V to 18 V
Consumption max.: 1.9 W (160 mA @ 12 V all peripherals on, Ethernet connected, without optional modules)
Consumption middle: 180 mW (15 mA @ 12 V without Ethernet, RS485, modem and display)
In sleep mode: 400 µW (30 µA @ 12 V without modem and display)

Touchscreen display

Monochrome graphics display (128 x 64 pixels) - with 32-button touch screen matrix - optional user interface for previewing of measured values, adjusting system time, setting system variables and more - directly on the logger.

Power consumption	102 mW (17 mA @ 6 V)
In sleep mode	180 µW (30 µA @ 6 V)

PSTN modem (optional)

PSTN modem is suitable for dial-up or leased-line connection. It supports V.34bis, V.34, V.32bis, V.32, V.22.bis, V.22A/B, V.23, V.21, BELL 212A, BELL 103 com. protocols (opt. V.90). and AT command set with extensions.

Supported speeds	300 bps to 14400 bps, 28800 bps, 33600 bps
Error correcting	V.42 LAMP, MNP 2 to 4 and MNP 10
Data compression	V.42 bis and MNP 5

GSM modem [optional]

GSM modem for wireless communication via GSM network.

Specification

Quad Band GSM / GPRS / 3G modem E-GSM 850 / 900 / 1800 / 1900

Class 4 (2 W at 900 MHz)

Class 1 (1 W at 1800 MHz)

Data, SMS

Fax and data transmission without extra hardware

Power supply

310 mA average in GSM 900 at Tx power max 2 W

410 mA average in GSM / GPRS 900

At Tx power max 2 W

13 mA in idle mode in GSM 90

Operating temperature range

−20 °C to +55 °C

limited operation in range: −30 °C to +70 °C

Environmental conditions

Operating temp. range	−40 °C to +70 °C
Operating humidity range	0 to 100 %
Degree of protection	IP 65 (EN 60529) IP 67 (when installed in junction box)