

Data logger

AP-logger is an indispensable device for experimenting, data logging and debugging of measurement and control systems. It is a compact device designed for synchronized recording of data transmitted over 7 serial UART channels and 2 CAN2.0 buses. Synchronously with this data, the logger can record the state of several digital inputs and the voltage value of one analog input and power input.

The available number of digital inputs depends on the number of active UART channels: from only one input when using all seven channels and up to eight inputs when all UARTs are turned off. The logger writes data to a ring buffer in the built-in Flash memory. Flash memory capacity can be 8, 16 or 32 Gb.

Each event (received byte, CAN information frame, change of state of digital inputs and voltage measurements) is supplemented with a time stamp. The built-in non-volatile real-time clock (RTC) is used to tie events to the absolute time.

There are two modes of data recording: controlled and unmanaged. In the unmanaged mode, recording starts when the logger is turned on (immediately after the power is on) and continues until it is turned off. In the guided mode, you can start and stop the recording using one of the digital inputs.

1 Digital Inputs

Each digital input can be independently configured to operate in UART mode with a Baud rate of up to 3 Mbaud or as a logic input. The logger's logic inputs can accept signals with standard CMOS / TTL logic levels with a supply voltage of 3 to 5 V. The sampling rate is set to 100 kHz.

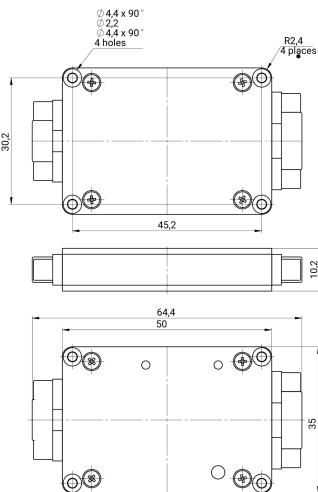
In UART mode, the logger can receive signals with physical levels corresponding to the RS232, RS422 / 485 standards or with the levels of standard CMOS / TTL logic with a supply voltage of 3 to 5 V.

For correct data reception, types of the physical interfaces and UART parameters must be set in the configuration file. Each receiver is individually configured. Each received byte is written to the built-in flash memory along with a tag that contains the time of receiving the byte with an accuracy of 10 μ s.

2 CAN2.0 Bus Receivers

The logger has two independent CAN2.0 receivers. For each receiver, you can set the baud rate of up to 1 Mbit/s and individual bit timing. The logger software allows receiving base CAN frame and extended frame formats (11 or 29 bit identifiers, respectively). To record only the information you need, you can configure message filtering.

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Message filtering is implemented by a combination of up to 64 filter elements, where each element can be configured in the following modes: identifier range, bit mask or specific identifier.

3 Analog Measurements

Synchronously with the other data, the logger records the measurements of two analog values: supply voltage and voltage at the analog input, using a 12-bit ADC with an input range of 0 to 33 V.

The sampling frequency of analog inputs is set in the configuration file, the maximum frequency is 100 kHz.

4 Operation Modes

The logger has two modes of operation: data recording mode and read/configuration mode.

When the logger is powered via the data recording connector, it turns on and automatically sets to the data reading mode. It will remain in this mode until the power is turned off.

When a turned off logger is connected to the USB computer port (via the interface connector), it receives power from the USB and sets to the read/configuration mode. In this mode, it behaves like a regular flash drive and the data can be extracted using the pi-logger utility, which reads the data from the logger buffer and writes it to several files. For each enabled input, a separate file is recorded and, additionally, a common file is recorded with the data for synchronization.

A text file located on a flash drive is used to configure the logger. Data recording cannot be done in the read/configuration mode.

5 Specifications

AP-logger specs:

Supply voltage	4.5 ... 33 V
Power consumption in data recording mode	750 mW
Overall dimensions	64×35×10.2 mm
Weight	38 g
Environmental protection	IP-67
Flash memory capacity	8, 16 or 32 Gb

6 Pin Configuration

AP-logger has 2 connectors. One is a 15-pin Micro-D type connector for data logging (Data recording connector) and the other is a 9-pin Micro-D connector for connecting

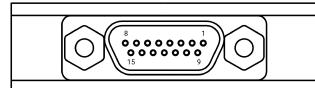
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the logger to the computer (Interface connector). Pin functional description for the 15-pin data logging connector is:

01	D4
02	D3
03	CAN1_LO
04	CAN1_HI
05	D2
06	D1
07	D0
08	POWER
09	GND
10	CAN2_HI
11	D7
12	ANALOG
13	CAN2_LO
14	D6
15	D5

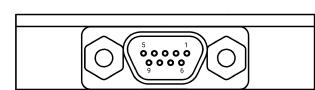
Data recording connector
Micro-D NorComp
380-015-213L001



Pin functional description for the 9-pin interface connector is:

01	FACTORY USE ONLY
02	FACTORY USE ONLY
03	FACTORY USE ONLY
04	FACTORY USE ONLY
05	FACTORY USE ONLY
06	USB 5VDC
07	USB_DM
08	USB_DP
09	USB_GND

Interface connector
Micro-D NorComp
380-009-213-L001



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