

Basic module – Description uLAB Control Unit LAB-CU



Operating principle

LAB-CU is the basic module in Netavent system solutions for laboratory and safety ventilation.

In terms of hardware, LAB-CU functions as a programmable unit that achieves differentiating functions depending on the software and connected devices.

For the same reason, the appearance of all controllers is the same, as the software is crucial for the product's properties.

Product features

uLAB Control Unit can act as:

- Fume hood controller
- Zone controller
- Summation unit.
- Point Extract monitoring.
- Room pressure controller

For further description of the above functionality, please refer to the system description of **ControlAir – uLAB**.

Connectivity

The basic module has two RS485 network connections, both of which support the **Modbus RTU** protocol. One port functions as a Modbus **Master** and the other as a Modbus **Subunit** ('slave'). In a control system, there can only be one Master connected, but up to 16 Subunits.

The Master is primarily used to communicate with underlying components, while the subunit responds to requests in connection with, among other things, adjustment, monitoring and general control.

A distinction is made between the levels of Modbus communication in a system.

- During setup and operation of the basic module, several parameters can be set and read. Some parameters relate to the setup and are normally only set once by an installer with in-depth product knowledge. Other parameters are used during operation for monitoring, troubleshooting and override. The connection to the basic module is made via computer either via a service connector in the room or the BMS system.

The specific function of the LAB-CU is achieved during commissioning, where the relevant software setup is selected. Regardless of the function, the basic module includes a cover box. This contains a DIN rail for mounting the basic module. All connections to the Uranos Manager are with plug-in terminals of the appropriate type, depending on the function.

Connection layout for LAB-CU.

Technical specifications

Supply voltage	24VDC +/- 10%.
-----------------------	----------------

Power consumption

Typ.	0,1A.
Max.	1,6A.

Analog Inputs

AI1	0 - 10VDC, Ri > 100kΩ.
AI2	0 - 10VDC, Ri > 100kΩ.
AI3	0 - 10VDC, Ri > 100kΩ.
AI4	0 - 10VDC, Ri > 100kΩ.
AI5	0 - 10VDC, Ri > 100kΩ.
Vout AI5	10 VDC, max. 5mA.

Analog Outputs

AO1	0 - 10VDC, max. 5mA.
AO2	0 - 10VDC, max. 5mA.
AO3	0 - 10VDC, max. 5mA.
AO4	0 - 10VDC, max. 5mA, galvanically isolated.

Digital Inputs

DI1	15 V open circuit (pull up), 2 mA closed circuit.
DI2	15 V open circuit (pull up), 2 mA closed circuit.
DI3	15 V open circuit (pull up), 2 mA closed circuit.
DI4	15V open circuit (pull up), 2 mA closed circuit.

Digital Output

DO1	Relay NC, 30 VDC, 0,2A.
DO2	Relay (wolfram) NO, 230VAC, 2A.
DO3	"Open Collector" 24V DC on/off, max. 100 mA.

Panel RS485

Protocol	Modbus RTU.
A	Data +.
B	Data -.
Baud rate	19,2k.
Parity	Even.
Data bits	8 bit.
Stop bits	1.
Power out	15 V DC (9 V DC at backup), max. 0,1 mA.

Master RS485

Protocol	Modbus RTU.
A	Data +.
B	Data -.
Baud rate	115,2k / 19,2K / 9,6k.
Parity	Non / Even / Odd.
Data bits	8 bit.
Stop bits	1 or 2 bit (always 1 bit at Even/Odd parity).
Power out	24 V DC, max. 1,2A.

Sub unit (slave) RS485

Protocol	Modbus RTU.
A	Data +.
B	Data -.
Baud rate	115,2k / 19,2k / 9,6k.
Parity	Non / Even / Odd.
Data bits	8 bit.
Stop bits	1 or 2 bit (always 1 bit at Even/Odd parity).
Request Time ^{*)}	< 20 mS.
Poll Time ^{**)}	> 1 mS.

^{*)} Requests time is defined here as the time from the last byte in a request being received to the start of the first byte in the corresponding response.

^{**)} Poll Time is defined here as the time from when a response is received until the next request is sent.