

# CENTRAL UNITS

Model number: **AL-CPU-M.1-A.10i**

## DESCRIPTION:

Ambity Line™ Series Central Unit.

The device has a built-in (internal) 8-channel input/output module AL-IO-A.10i.

8 configurable (universal) channels: AI/DI/DO, working as:

- Current analog inputs: nominal ranges 0-20mA
- Voltage analog inputs: nominal ranges 0-10V, 0-24V
- digital inputs (realized as voltage measurement; this allows to set the threshold and hysteresis): nominal ranges 0-24V
- digital outputs: OC (active low) 100mA

All channels are configurable in the above-mentioned range (each channel can operate as voltage input, current input, digital input or digital output).

The device can be extended with external expansion modules, thus increasing the number of inputs/outputs and communication ports.

## SPECIFICATION:

### Power supply:

|                                       |   |
|---------------------------------------|---|
| Voltage                               | 22..24..26 VDC  |
| Power consumption                     | Typically 150mA @24V (max. 250mA)   |
| Power source                          | External stabilized power supply  |
| Protection against change of polarity | YES   |
| Internal overload protection          | YES (1.5A)  |
| Emergency power supply                | YES – external 12V 1.2Ah battery pack<br>Charging with 150mA current via built-in charger |

### Processor, memory, performance:

|                                    |  |
|------------------------------------|--|
| Processor                          | ARM Cortex-M7 200MHz   |
| User program size                  | Up to 2 MB<br>Stored in the internal file system   |
| User program memory                | 1 MB MCU FLASH (fast; program code only)<br>128 kB MCU SRAM (fast; only stack and program data)<br>4 MB SDRAM (shared between code and data)             |
| RETAIN data size                   | 0.25 MB (saved to the internal file system when the user program is stopped and restored when the user program is started)                               |
| Supported number of inputs/outputs | It results from the modules used. The CPU allows you to connect up to 10 I/O modules, obtaining up to 120 supported I/O (10x external 12-channel module) |
| Configurable program cycle time    | 50..1000ms   |

### Interfaces:

|                         |   |
|-------------------------|---|
| Modbus RTU isolated     | Operating modes: master, slave<br>Transmission speed: 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200<br>Insulation strength: Basic insulation; Vmax 560Vrms;<br>Test voltage 2500Vrms@1min |
| Modbus RTU non-isolated | Operating modes: master, slave  |

|                      |  |
|----------------------|--|
|                      | Transmission speed: 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200  |
| Ethernet             | 10/100 Base-T  |
| Local user interface | OLED display 128x64 pixels, monochrome white<br>6 buttons  |
| USB-OTG              | MicroUSB slot type<br>In HOST mode: USB memory support (data transfer from to AL-CPU); supported formats: FAT32<br>In DEVICE mode: communication with the computer (AL Utility™ program) |
| microSD              | Support for a memory card for data recording and data transfer from/to AL-CPU<br>Supported formats: FAT32  |
| AL-IO-bus            | System bus: for communication with AL-IO modules (RS-485 with dedicated communication protocol)  |

### Measurement and control:

|  |   |
|--|---|
| Number of channels                               | 8   |
| including configurable                           | 8 (all types of signals)                              |
| Signal type                                      | AI/DI/DO (current, voltage or digital)                |
| Galvanic isolation from the system               | NO  |
| Galvanic isolation between channels              | NO  |
| Measurement speed                                | min. 10 measurements per second (each channel)        |
| Current inputs:                                  |   |
| ranges of work                                   | 0-20mA (max. 0-24mA)                                  |
| input impedance                                  | ~100 Ohms   |
| accuracy   | 0.15% of the nominal range                            |
| temp. stability                                  | 0.01%/°C  |
| overcurrent protection                           | YES   |
| protection against change of polarity            | NO (changing the polarity risks damaging the channel) |
| Voltage inputs:                                  |   |
| ranges of work                                   | 0-10V (max. 0-11V)<br>0-24V (max. 0-28V)              |
| input impedance                                  | ~100 kOhm   |
| accuracy   | 0.15% of the nominal range                            |
| temp. stability                                  | 0.01%/°C  |
| protection against change of polarity            | NO (changing the polarity risks damaging the channel) |
| Digital input (realized as voltage measurement): |   |
| ranges of work                                   | 0-24V   |
| input impedance                                  | ~100 kOhm   |
| accuracy   | 5% of the nominal range                               |
| protection against change of polarity            | NO (changing the polarity risks damaging the channel) |
| Digital outputs:                                 |   |
| type   | OC (active low) (N-MOSFET transistor)                 |
| maximum voltage                                  | 30V   |
| maximum current                                  | 100mA   |
| impedance in the open state                      | ~100 kOhm   |
| impedance in the short-circuit state             | ~5 Ohms   |
| overload protection                              | YES (100 mA)  |
| protection against change of polarity            | NO (changing the polarity risks damaging the channel) |

### ADDITIONAL INFORMATION:

#### Installation:

|                          |  |
|--------------------------|--|
| Type of installation     | DIN rail, Type O, 35 mm  |
| Mounting method          | Built-in latches (apply-and-press type), no need for additional brackets or adapters                             |
| Replacement or expansion | Directly on the DIN rail   |
| Combining modules        | Using a bus connector, forming a communication and power bus, installed inside the DIN rail (no wiring required) |

#### Housing:

|                      |                    |
|----------------------|--------------------|
| Degree of protection | IP 20/DIN EN 60529 |
|----------------------|--------------------|

|                                    |                                   |
|------------------------------------|-----------------------------------|
| Fabrication material               | Polyamide (PA66)                  |
| Flammability and fire safety class | UL 94 V0                          |
| Color                              | Light gray RAL 7035 (green plugs) |
| Dimensions (without plugs)         | 35 x 99 x 114.5 mm (W x H x D)    |
| Dimensions (with plugs)            | 35 x 109 x 114.5 mm (W x H x D)   |

#### Input/output terminals:

|                             |   |
|-----------------------------|---|
| Type                        | Terminal block detachable, screw connectors, single-section                     |
| Raster                      | 5.0 mm  |
| Ø hole / cable dimensions   | max. power cable cross-section 2.5 mm <sup>2</sup> / max. cable diameter 2.0 mm |
| Insulation stripping length | 7 mm  |
| Screw type                  | M3  |

#### Conditions of use:

|             |            |
|-------------|------------|
| Temp. range | 0... +55°C |
| Humidity    | 85% max.   |

#### Transportation and storage:

|                              |                               |
|------------------------------|-------------------------------|
| Temp. range                  | -20... +70°C                  |
| Humidity                     | 85% max.                      |
| Unit packaging               | Cut cardboard box             |
| Number of pieces per package | 1                             |
| Package dimensions           | 118 x 80 x 140 mm (W x H x D) |
| Country of origin            | PL                            |

#### Compliance/certifications:

|                  |     |
|------------------|-----|
| CE mark          | YES |
| RoHS rating      | YES |
| REACH Assessment | YES |

<http://www.edscontrollers.com/al-cpu-m1-a10i>



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