

## EY-IO 532: I/O module, universal inputs, modu532

### How energy efficiency is improved

SAUTER EY-modulo 5 technology: modular, fast and universal

### Features

- Part of the SAUTER EY-modulo 5 system family
- Plug-in element for extending the modu524/525 automation station (AS)
- Receiving digital (alarm/status) and analogue inputs (Ni/Pt1000, U/I/R) in operational systems, e.g. in HVAC engineering
- 16 universal inputs
- Power supply of the automation station
- Direct labelling on the front
- Can be equipped with a local indicating unit



EY-IO532F001

### Technical data

#### Power supply

Power supply	From modu525 AS via I/O bus
Power consumption <sup>1)</sup>	≤ 1.2 VA/0.5 W
Dissipated power	≤ 0.5 W
Current consumption <sup>2)</sup>	35 mA

#### Ambient conditions

Operating temperature	0...45 °C
Storage and transport temperature	-25...70 °C
Admissible ambient humidity	10...85% rh, no condensation

#### Inputs/outputs

Universal inputs	16
Analogue	Ni1000/Pt1000, U/I/R, Pot
Digital	DI (≤ 3 Hz)

#### Interfaces and communication

Connection for modu 6 (LOI)	6-pin, integrated
Connection, I/O bus	12-pin, integrated
Connection terminals	24 (0.5...2.5 mm <sup>2</sup> )

#### Construction

Fitting	On top-hat rail
Dimensions W x H x D	42 × 170 × 115 mm
Weight	0.29 kg

#### Standards and directives

Type of protection	IP30 (EN 60529)
Protection class	I (EN 60730-1)
Environment class	3K3 (IEC 60721)

CE conformity according to	EMC Directive 2004/108/EC	EN 61000-6-1, EN 61000-6-2, EN 61000-6-3, EN 61000-6-4
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#### Overview of types

Type	Properties
EY-IO532F001	I/O module, universal inputs, modu532

#### Accessories

##### Local operating and indicating units (LOI)

Type	Description
EY-LO630F001	16-LED indication, bi-colour

<sup>1)</sup> Primary side of base station

<sup>2)</sup> supply via base station



### Engineering notes

The modu532 I/O module is generally comprised of two components: the baseplate in which the I/O bus system and the connection terminals are integrated and the actual I/O module electronics.

### Description of operation

The modu532 I/O module is used to extend the modu524 and modu525 automation stations. It is used to receive analogue inputs in operational systems such as HVAC engineering. It provides a total of 16 universal inputs.

### Intended use

This product is only suitable for the purpose intended by the manufacturer, as described in the "Description of operation" section.

All related product regulations must also be adhered to. Changing or converting the product is not admissible.

### Fitting/assembly

The baseplate of the I/O module is fitted in a cabinet using a DIN rail (EN 60715) and connected on the side directly to the I/O bus of the AS or the extension modules. This work may only be carried out when the system is disconnected from the electrical supply.

The "bus module", through which the power supply and continuous communication flows, is located in the baseplate. This ensures that faults due to a failure or partial defect in the electronic component do not affect the function of other downstream modules.

Removal/insertion of the I/O module electronics from/to the baseplate is possible during operation of the AS.

To ensure plant safety and to avoid any faults at inputs or outputs, the I/O module electronics should only be removed or inserted while the base station is switched off.

The return line of the Ni/Pt1000 sensors must be separated from the other inputs and outputs, i.e. separate GND terminals  $\perp$  must be used.

### Labelling concept

The I/O module can be labelled with a paper insert in the frontal transparent cap. Labelling is usually carried out using texts generated from CASE Suite, and the labels are printed on normal A4 paper using a commercial printer.

### Assigning modules to AS

The I/O module electronics are encoded on the hardware side using pin inserts so that only the appropriate baseplate can be used. The AS detects whether a module baseplate is plugged into the I/O bus. The baseplate number and the assignment of module types for the I/O modules on the AS are defined with CASE Suite. This information is permanently stored in the AS.

### LED indicator/function

The I/O module is equipped with a system LED that indicates the operating statuses as follows:

#### System LED

LED I/O bus	Status	Description
No designation	Continuous green light	Module in operation
	Flashing green or red	Module not ready for operation
	Alternating green – red – off	Lamp test active (indicator type priority)
	No indicator	No power supply

#### Universal inputs

Number of inputs	16 (UI)
Type of inputs (software coding)	Ni1000 (DIN 43760) Pt1000 (EN 60751) Voltage measurement (U) Current measurement (I), channel u0, u1, u8, u9 only! Potentiometer input (Pot) Resistance (R) Digital input (DI)
<b>Protection against external voltage</b>	
Ni/Pt/U/R/Pot/DI	$\pm 30$ V / 24 V~ (without destruction)
I (channels u12, u13)	+12 V / -0.3 V (without destruction)

<b>Update rate</b>	
Channels u0, u4, u8, u12	100 ms
Channels u1, u2, u3, u5, u6, u7, u9, u10, u11, u13, u14, u15	500 ms
For temperature measurement (independent of channel)	≤ 3 s
<b>Resolution</b>	14 bits
<b>Measuring ranges</b>	
Voltage (U)	0 (2)... V, 0 (0.2)...1 V
Current (I)	0 (4)...20 mA
Potentiometer (Pot)	0...1 (100%) with 3-wire connection (1...100 kΩ)
Reference	U <sub>ref</sub> 1.23 V (terminal no. 22) load max. 10 mA
Resistance (R)	200...2500 Ω
Temperature	
Ni1000	-50...+150 °C
Pt1000	-50...+150 °C
Digital input	Potential-free contacts with ground connection opto-coupler, transistor (open collector) approx. I <sub>out</sub> = 1.2 mA
Pulse counter	≤ 3 Hz

### Temperature measurement (Ni/Pt)

The Ni/Pt1000 sensors are connected using two wires between one of the input terminals and a ground terminal. The inputs require no calibration and can be used directly. Line resistance of 2 Ω is pre-compensated as standard. With the correct line resistance of 2 Ω (cable cross-section 1.5 mm<sup>2</sup>), the power cable (wire) may be no more than 85 m. Larger line resistances can be compensated by the software. The measurement current is pulsed to ensure that the sensor is not heated (I<sub>meas</sub> approx. 0.3 mA).

### Voltage measurement (U)

The voltage to be measured is connected between an input terminal and a ground terminal. The signal must be potential-free. The measuring ranges with or without offset 0 (0,2)...1 V or 0 (2)...10 V are selected through the software. The internal resistance R<sub>i</sub> of the input (load) is 9 MΩ.

### Current measurement (I)

The current can be measured at four inputs. The current to be measured is connected at one of the input terminals for channel u0, u1, u8, or u9 and a ground terminal. The current signal must be potential-free. The measuring ranges with or without offset 0 (4)...20 mA are selected via the software. The maximum input current must be limited to 50 mA; the internal resistance R<sub>i</sub> is < 50 Ω.

### Potentiometer measurement (Pot)

The potentiometer is connected between an input terminal, a ground terminal and a U<sub>ref</sub> (reference voltage) terminal. The reference output is not short circuit-proof. To avoid overloading the reference output, the overall resistance of all connected potentiometers may not drop below 123 Ω (max. 10 mA load). For a stable, interference-free measurement, a potentiometer value of ≤ 10 kΩ is recommended.



#### Note

To maintain measuring accuracy, ground connections should always be connected to the same type of input.

For an optimum connection, we recommend connecting one ground terminal of the I/O module directly with the AS or each appropriate cabinet terminal.

### Digital inputs (DI with UI)

The AS also records binary information with the universal inputs. The information (alarm/status) is connected between an input terminal and a ground terminal. The station applies a voltage of approximately 13 V to the terminal. If a contact is open, this usually corresponds to an INACTIVE state (bit = 0). If a contact is closed, there is an ACTIVE state (bit = 1) and 0 V is applied, giving a current of approximately 1 mA. Short-term changes (default 33 ms) between the station queries are saved briefly and processed at the next cycle.

Every input can be defined individually as an alarm or a status through software parameter setting.

The digital inputs can be displayed with the local indicating unit (e.g. modu630 accessory).

In the universal inputs, meter inputs of potential-free contacts, opto-couplers or transistors can be connected with an open collector.

### Technical specifications of the inputs and outputs

Universal input	Measuring range	Resolution	Precision	
			a x measuring span + b x measured value	
Ni/Pt1000	-50...+150 °C	< 0.05 K	±0.5%	±0.5%
U (0/0.2...1 V)	0.02...1.1 V	< 0.1 mV	±0.5%	±0.5%
U (0/2...10 V)	0.15...10.2 V	< 1 mV	±0.5%	±0.5%
I (0/4...20 mA)	0.5...22 mA	< 0.02 mA	±1%	±2%
R	200...2500 Ω	< 0.1 Ω	±0.2%	±1%
Pot (≥ 1 kΩ)	2...100%	< 0.5%	±1%	±1%

**Example of calculating the accuracy:** Measured value 20 °C. Measuring span: -50 °C + 150 °C = 200K

Precision = a x measuring span + b x measured value = ±0.5% x 200K ±0.5% x 20 °C = ±1K ±0.1K = ±1.1K

Binary input (0-I)	with universal input (UI)
Switching threshold inactive "0"	> 3 V
Switching threshold active "1"	< 1.5 V
Switching hysteresis	> 0.4 V
Pulse counter	≤ 3 Hz

### Channel and terminal assignment

Description modu532	Channel	Schematic	Terminals	
			Signal	GND
Universal input (Ni/Pt1000 / U/I/R/Pot / DI) Power signal only on channels 0, 1, 8, 9 or terminals 1, 2, 13, 14	0	u0	1	
	1	u1	2	3
	2	u2	4	5
	3	u3	6	7
	4	u4	8	
	5	u5	10	
	6	u6	11	
	7	u7	12	
	8	u8	13	
	9	u9	14	
	10	u10	15	16
	11	u11	17	18
	12	u12	19	20
	13	u13	21	
	14	u14	23	
	15	u15	24	
Reference voltage 1.23 V		Ref	9	
		Ref	22	

### Connection of local operating unit

The I/O module can be complemented with a modu630 local indicating unit to allow digital inputs to be displayed directly. The function corresponds to the standard EN ISO 16484 2:2004 for local override and indicating units. The unit can be installed and removed during operation (hot-pluggable) without affecting functions of the AS or I/O module.

modu630 contains 16 indicators in the form of bi-colour LEDs. It can be defined individually for each input whether it is used as an alarm or a status input. An alarm is generally indicated in red when the contact is open; a status is generally green when the contact is closed.

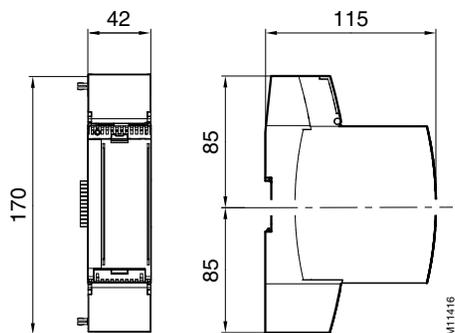
Detailed information/functions of the LED actuation options can be seen in the PDS 92.081 for EY-LOG\*\*.

If an incompatible operating unit is connected, this status is indicated by the flashing of all LEDs (red and yellow); there is no risk of the I/O module being destroyed.

### Disposal

When disposing of the product, observe the currently applicable local laws.  
 More information on materials can be found in the Declaration on materials and the environment for this product.

### Connection diagram



### Dimension drawing

