

## EY6IO31: 8 x UI (DI/CI/AI) and 8 x DI/CI I/O module, modu631-IO

### Features

- Part of the SAUTER modulo 6 system family
- Plug-in element for extending the modu660-AS and modu680-AS automation stations and modu6\*2-LC link coupler
- Receiving digital inputs (alarm, status or pulse counter) and analogue inputs (Ni/Pt1000, R, U) in operational systems, e.g. in HVAC
- Eight digital inputs and eight universal inputs
- Power supply from automation station (modu6\*-AS), link coupler (modu6\*2-LC) or supply module (modu601-LC)
- Can be equipped with a local operating and indicating unit (modu600-LO)



EY6IO31F001

### Technical data

#### Power supply

Power supply	From AS or LC via I/O bus
Dissipated power <sup>1)</sup>	≤ 0,8 W

#### Ambient conditions

Operating temperature	0...45 °C
Storage and transport temperature	-25...70 °C
Admissible ambient humidity	10...90% rh, no condensation

#### Inputs/outputs

Digital inputs (DI/CI)	Number of inputs	8
	Power supply for DI	Internal, ~13 V=
	Pulse counter	≤ 50 Hz
Universal inputs (UI)	Number of inputs	8
	Analogue	0...10 V, Ni1000, Pt1000, R
	Digital <sup>2)</sup>	DI/CI: ≤ 50 Hz

#### Interfaces and communication

Connection, LOI	4-pin
Connection, I/O bus	7-pin, spring contact
Connection terminals	4 x 8-pin spring-loaded plug-in connectors
Earth connector	Spring contact against DIN rail

#### Construction

Fitting	On metallic DIN rail 35 x 7.5/15 as per EN 60715
Dimensions W x H x D	55.7 (3 HP) x 100 x 59 mm
Weight	131 g

#### Standards and directives

Protection type (as per EN 60730)	Connections and terminals:IP00 Front in DIN cut-out:IP30
Protection class	I (EN 60730-1)
Environment class	3K3 (IEC 60721)
Software class <sup>3)</sup>	A (EN 60730-1, Appendix H)

CE conformity according to	EMC Directive 2014/30/EU	EN 61000-6-1, EN 61000-6-2, EN 61000-6-3, EN 61000-6-4, EN 50491-5-1, EN 50491-5-2, EN 50491-5-3
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<sup>1)</sup> Measured value without accessories

<sup>2)</sup> DI: 50 Hz only with PC module, otherwise 5 Hz

<sup>3)</sup> The product is not suitable for safety functions



**Overview of types**

Type	Features
EY6IO31F001	8 x UI(DI/CI/AI) and 8 x DI/CI I/O module

**Accessories**

Type	Description
EY6LO00F001	Local operating and indicating unit for I/O modules

**Manuals**

Document number	Language	Title
D100397589	de	Systembeschreibung SAUTER modulo
D100408512	de	EY-modulo 6 – Best Practice I
D100402674	en	SAUTER modulo system description
D100410201	en	EY-modulo 6 – Best Practice I
D100402676	fr	Description du système SAUTER modulo
D100410203	fr	EY-modulo 6 – Meilleures pratiques I

**Description of operation**

The modu631-IO is an I/O module for extending the modu660-AS and modu680-AS automation stations and the modu6\*2-LC link coupler.

The modu631-IO serves the following purposes in operational plants (e.g. in HVAC):

- Receiving digital, status, alarm and pulse counter inputs
- Receiving analogue inputs (Ni/Pt1000, R, U)

The module provides eight digital and eight 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.

**Improper use**

The SAUTER modulo 6 system does not have functional safety and is not fail-safe. MTTF, MTBF and MTTR data is not available.

This product is not suitable:

- for safety functions
- in transportation means and storage facilities as per Directive 37/2005
- as a measuring device as per EU Measuring Instruments Directive 2014/32/EU
- for use outside and in rooms with the risk of condensation

**Fitting notes**

Note

Only qualified electricians are permitted to fit and connect the module. Prevent laypersons from accessing it.

The modu631-IO is a module that is connected frontally on the DIN rail. It is not necessary to slide it in from the side. The connection between the modules is made via spring contacts on the side. The modules must be pushed together on the DIN rail in such a way that the spring contacts ensure that the signal cable is connected to the I/O bus system.

The spring contacts of the last module on the right side must be covered by the bus cover provided with the automation station (AS).

All external power supplies must have safe, undamaged insulation.



Note

The ground terminal must not be earthed.

For examples and procedures for problem-free installation and wiring, see the manual “EY-modulo 6 – Best Practice I”

**Assignment to the automation station (AS)**

The type and position of the I/O module in the system are defined using CASE Suite. This information is stored permanently in the AS.

If the configuration with CASE Suite does not match the physical arrangement of the module, this is indicated by the system LED of the module.

### LED indicators

The I/O module is equipped with a system LED. The various operating statuses are displayed as follows:

Status	Description
Continuous green	Normal operation
Continuous red	Not configured
Flashing red	I/O bus communication error
Continuous orange	Startup mode
Flashing orange	Configuration error
Off→Green→Red	LED test run
Off	No power supply

### Digital inputs (DI/CI)

Number of inputs	8
Type of inputs	Potential-free contacts, connected to ground Opto-coupler Transistor (open collector)
Pulse counter <sup>4)</sup>	≤ 50 Hz
Pulse status	> 4 ms
Protection against external voltage	± 30 V= / 24 V~
Output current	≤ 1.5 mA
Refresh rate	60 ms

### Pulse counters (CI with DI)

At the digital inputs, signals of potential-free contacts, opto-couplers or transistors with an open collector can be connected. The maximum pulse frequency may be 50 Hz.

The de-bounce time can be configured so that switching contacts are correctly detected (CASE Suite: filter setting) (0...100 ms). Pulses can be captured on the falling or rising edge, or on both edges. The minimum pulse duration should be 4 times the de-bounce time.

### Universal inputs (UI)

Number of inputs	8	
Type of inputs (software coding)	Temperature, Ni1000 (DIN 43760) Temperature, Pt1000 (EN 60751) Resistance (R) Voltage measurement (U) Digital input (DI/CI)	
Protection against external voltage	Ni/Pt1000:	± 30 V= / 24 V~
	R:	± 30 V= / 24 V~
	U, 0...10 V:	± 30 V= / 24 V~
	DI:	± 30 V= / 24 V~
Refresh rate	Ni/Pt1000:	1250 ms
	R:	1250 ms
	U, 0...10 V:	200 ms
Resolution	12 bit ADC oversampled to 14 bit	
	Ni/Pt1000:	0.02 K
	R:	0.1 Ω
	U, 0...10 V:	1 mV

<sup>4)</sup> 50 Hz only with PC module, otherwise 5 Hz

Measuring ranges	Temperature, Ni1000:	-50...185 °C
	Temperature, Pt1000:	-50...185 °C
	Resistance (R):	200...2500 Ω
	Voltage (U):	0.1...11.4 V
Digital input	Pulse counter	≤ 50 Hz
	Overview of pulse recording firm-ware module	Potential-free contacts with ground connection, opto-coupler, transistor (open collector) approx. $I_{out} \leq 1.5$ mA
	BI	≤ 5 Hz
	PC	≤ 50 Hz

### Temperature measurement (Ni/Pt)

The Ni/Pt1000 sensors are connected using two wires between one of the input terminals for universal inputs (channels u8...u15) and the related ground terminal.

The inputs require no calibration and can be used directly. A line resistance of 2 Ω is pre-compensated as standard. With a cable cross-section of 1.5 mm<sup>2</sup>, the maximum length of the connecting cable is therefore 85 m. Larger line resistances can be compensated by the software. The measurement current is pulsed to ensure that the sensor is not heated ( $I_{meas} \leq 1.8$  mA).

### Voltage measurement (U)

The voltage signal is connected between an input terminal for voltage (channels u8...u15) and the related ground terminal.

The measuring ranges with or without offset 0(2)...10 V are selected using the CASE software.

0(4)...20 mA signals can be converted into 0(2)...10 V signals using 500 Ω resistors (directly on the terminals).

### Digital inputs (DI/CI with UI)

The automation station (AS) also records binary information via the universal inputs. The information (alarm and status) is connected between an input terminal (u8...u15) and the related ground terminal. The module applies a voltage of > 9.5 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 1.5 mA.

Every input can be defined individually as an alarm, status or pulse counter by setting software parameters.

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

### Technical specification of the inputs and outputs

Universal input (UI)	Measuring range	Resolution	Accuracy <sup>5)</sup>
Ni/Pt1000	-50...+185 °C	0.02 K	Ni1000: ± 1.7 K ± 1.0 K (measured value: 15...30 °C) Pt1000: ± 2.9 K ± 1.6 K (measured value: 15...30 °C)
R	200...2500 Ω	0.1 Ω	± 13 Ω
U, 0...10 V	0.1...11.4 V	1 mV	± 0.03 V

Binary input	Switching threshold high "0"	Switching threshold low "1"	Switching hysteresis	Pulse counter <sup>6)</sup>
Digital input (DI)	4 V	1 V	0.4 V	≤ 50 Hz
Universal input (UI)	4 V	1 V	0.4 V	≤ 50 Hz

<sup>5)</sup> At an I/O module temperature of 25 °C

<sup>6)</sup> 50 Hz only with PC module, otherwise 5 Hz

## Channel and terminal assignment

### Digital input for pulse counter (DI/CI)

Channel	Schematic	Terminals	
		Signal	GND
0	d0	2	1
1	d1	4	3
2	d2	6	5
3	d3	8	7
4	d4	10	9
5	d5	12	11
6	d6	14	13
7	d7	16	15

### Universal input (Ni/Pt1000, R, U, DI/CI)

Channel	Schematic	Terminals	
		Signal	GND
8	u8	17	18
9	u9	19	20
10	u10	21	22
11	u11	23	24
12	u12	25	26
13	u13	27	28
14	u14	29	30
15	u15	31	32

### Connection of the local operating and indicating unit (LOI)

The modu600-LO LOI can be added to the modu631-IO. The analogue and digital inputs can be displayed on the LOI.

For more information on the control function and display, see product data sheet 91.141 for the modu600-LO.

LOIs allow limited operation of plant components without the intervention of the AS intended for the application. Outputs of the I/O modules in manual operation may change the value briefly when the user program is downloading.

With the modu601-LC module for separate I/O module supply, the I/O modules can be supplied independently of the station, so that the signals can continue to be displayed in the event of absence, failure or a soft reboot of the station.

#### Note



The modu600-LO LOI is not suitable to be used as an emergency operating device as per Machine Directive 2006/42/EU.

Standard EN ISO 13849-1 has not been considered. If applicable, a local emergency operating device must be installed on the plant side.

### Access security

#### CAUTION!



Priority operating units can lose their priority function.

- ▶ Limit the access to the local operating level (incl. via apps) on site.
- ▶ Consider the access security during the planning and risk assessment of the plant.

### Labelling concept

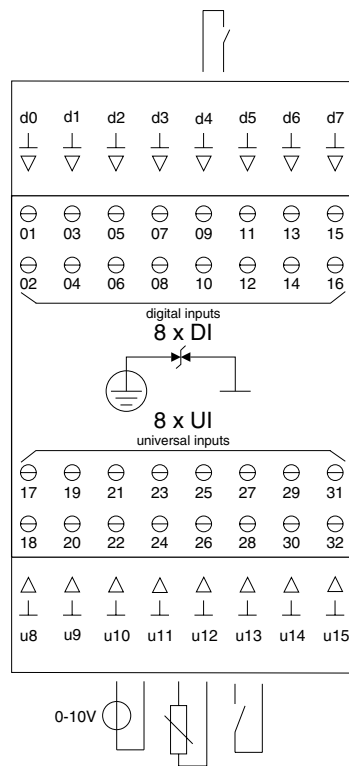
The LED display of the modu600-LO shows the individual channels as configured with CASE Suite.

### 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

All dimensions in millimetres.

