

## modu570: I/O module, analogue outputs and universal inputs

### How energy efficiency is improved

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

### Areas of application

Control via standardised signal (0...10 V), acquisition of digital (alarm/status) and analogue inputs (Ni/Pt1000, U/I/Pot) in technical installations, e.g. HVAC.

### Features

- Pluggable element for extending the modu525 automation station
- 4 outputs
- 8 inputs
- Modular design (baseplate/electronics)
- Power supply from modu525 automation station
- Direct inscription on front
- Part of the SAUTER EY-modulo 5 family of systems
- Can be equipped with a local override/indicating unit

### Technical description

- 4 analogue outputs (0...10 V)
- 8 universal inputs (Ni/Pt1000, U/I/R, DI)

### Products

Type	Description
EY-IO570F001	I/O module, analogue outputs and universal inputs

### Technical data

#### Electrical supply

Power supply	from modu525 via I/O bus
Power consumption <sup>1)</sup>	up to 1.5 VA/0.80 W
Dissipated power	up to 0.80 W
Current consumption <sup>2)</sup>	up to 50 mA

#### Version

Analogue outputs	4 (push-pull)
Load	up to 2 mA
Universal inputs	8
Analogue	Ni/Pt1000, U/I/R, Pot
Digital	DI (approx. 3 Hz)

#### Interfaces, communication

Connection, modu6 . . (LOI)	6-pole, integrated
Connection, I/O bus	12-pole, integrated
Connection terminals	24, 0.5...2.5 mm <sup>2</sup>

#### Permitted ambient conditions

Operating temperature	0...45 °C
Storage and transport temperature	-25...70 °C
Humidity	10...85% rh no condensation

1) On the primary side of modu525 base station (230 V~)

2) Supply from modu525 base station

#### Installation

Fitting	on top-hat rail
Dimensions W × H × D (mm)	42 × 170 × 115
Weight (kg)	0.285

#### Standards, guidelines and directives

Degree of protection	IP 30 (EN 60529)
Protection class	I (EN 60730-1)
Environmental class	3K3 (IEC 60721)
CE conformity as per	
EMC Directive 2004/108/EC	EN 61000-6-1
	EN 61000-6-2
	EN 61000-6-3
	EN 61000-6-4

#### Additional information

Fitting instructions for electronics	MV P100001574
Fitting instructions for baseplate	MV P100001575
Material declaration	MD 92.061
Dimension drawing	<a href="#">M11416</a>
Wiring diagram	<a href="#">A10510</a>

### Accessories

Type	Description
	<b>Local override and indication devices (LOIs)</b>
EY-LO630F001	16 LED indicators, bi-colour
EY-LO670F001	4 setpoint adjusters (A-0...100%), 8 LEDs for operation/indicating
	<b>Components</b>
0920360003	24 V I/O module baseplate (pack of three)
0929360570	Module electronics modu570 8 UI/4 AO 24 V



T10599

**Engineering notes**

The I/O module modu570 generally consists of two components: the baseplate, in which the I/O bus system and connection terminals are integrated, and the actual I/O module electronics.

**Installation & assembly**

The baseplate of the I/O module is fitted to a top-hat rail (EN 60715) inside a motor control centre and connected on one side directly with the I/O bus of the modu525 automation station or modules. This connection work must be done only when there is no voltage.

The baseplate contains the 'bus module' that is responsible for the voltage supply and continuous communication. This ensures that disturbances due to a malfunction or partial defect of the electronic component do not affect the functionality of other modules in the sequence.

I/O module pcbs can be inserted in and removed from the baseplate whilst the automation station is in operating mode.

I/O module pcbs should be inserted and removed only when the basis station is switched off for reasons of plant safety and to avoid input/output malfunctions.

**Labelling concept**

The I/O module can be labelled by means of a paper insert behind the transparent cover on the front side. Perforated labelling templates are available for this purpose.

These labels are normally inscribed using text generated from within CASE Suite and are printed out on normal DIN A4 paper using generic printers.

**Assigning modules to an automation station**

The I/O module's electronic hardware has pin coding so that only the correct baseplate can be used. The modu525 automation station detects whether or not a module baseplate is plugged into the I/O bus. CASE Suite is used to assign the baseplate number and module types of I/O modules to the automation station. This information is stored permanently in the automation station.

**LED display/function**

The I/O module is equipped with a system LED that indicates the following operating conditions:

**System LED**

LED I/O Bus	Condition	Indicator sequence	Description
No name	green, continuously lit	—————	Module in operation
	green, pulsating	• • • •	Module not assigned to base station
	red, pulsating fast	••••••••••	AS in configuration, update or download mode
	red, flashing	• • • • • •	Module incorrectly assigned or internal error
	alternating green - red - off	•• •• •• ••	lamp test active (display type has priority)
	no display		no voltage supply

**Description of function**

The I/O module has a total of 4 analogue outputs and 8 universal inputs.

**Outputs**

Number of outputs	4
Type of outputs	Analogue outputs 0(2)...10 V= Load up to 2 mA per output Return conductor connected to earth
Updated	100 ms
Resolution	13 bits

The output voltage is measured between the relevant output terminal (a0...a3) and an earth terminal. The outputs are designed as push-pull outputs with active sink capability. A load of 2 mA can be applied to each output. The sum of all outputs should not exceed 20 mA.

The outputs are protected against static discharges, but not against the presence of direct or alternating currents!

**Universal inputs**

Number of inputs	8 (UI)
Type of inputs (software coding)	Ni1000 (DIN 43760) Pt1000 (EN 60751) Voltage measurement (U) Current measurement (I) only on channels u8, u9. Potentiometer input (Pot) Resistance (R)
Protection against extraneous voltage	
Ni/Pt/U/R/Pot/DI	± 30 V / 24 V~ (without damage)
I (channel u8, u9)	+12 V / -0,3 V (without damage)
Reference	Uref 1.23 V (terminal 22)
Scan rate 100 ms	Channels u8, u12
Scan rate 500 ms	Channels u9, u10, u11, u13, u14, u15
Resolution	14 bits

**Measuring ranges**

Voltage (U)	0 (2)...10 V, 0 (0.2)...1 V
Current (I)	0 (4)...20 mA
Potentiometer (Pot)	0...1 (100%) with 3-line connection (1...2.5 kΩ)
Reference	Uref 1.23 V (terminal 22) > 1 kΩ, max. load 10 mA
Resistance (R)	200...2,500 Ω
Temperature Ni1000	-50...+150 °C
Pt1000	-50...+150 °C
Digital input	Potential-free contacts, wired to earth  Opto-coupler, transistor (open collector) approx. I <sub>out</sub> = 1.2 mA
Pulse counter	max. 3 Hz (100 ms update interval) max. 0.5 Hz (500 ms update interval)  Digital input (DI fixed)
Protection against extraneous voltage	
Ni/Pt/U/R/Pot/DI	< 24 V~/30 V (without destruction)
I (channel u12, u13)	+12 V/-0.3 V (without destruction)
Reference	Uref 1.23 V (terminal no. 22)

**Temperature measurement (Ni/Pt)**

The Ni/Pt1000 sensors are connected using the two-wire method between one of the input terminals for universal inputs (channel u8...u15) and an earth terminal. Inputs do not require calibration and can be used directly. A corresponding line resistance of 2 Ω is pre-compensated as standard. With the corresponding line resistance of 2 Ω (cable cross-section: 1.5 mm<sup>2</sup>), the connection cable may be a maximum of 85 m in length. Greater line resistances can be compensated using the software. The measuring voltage is pulsed so that the sensor does not heat up (I<sub>Meas</sub> approx. 0.3 mA).

### Voltage measurement (U)

The voltage to be measured is connected between one of the input terminals for universal input (channel u8...u15) and an earth terminal. The signal must be potential-free. The two measurement ranges with or without offset 0 (0.2)...1 V and 0 (2)...10 V are selected by means of the software. The input's internal resistance  $R_i$  (burden) is 9 M $\Omega$ .

### Current measurement (I)

The current can only be measured on two inputs. The voltage to be measured is connected between one of the two input terminals for universal input (channel u8, u9) and an earth terminal. The current signal must be potential-free. The measurement ranges with or without offset 0 (4)...20 mA are selected by means of the software. The internal resistance  $R_i$  of the maximum input current must be restricted to 50 mA. The internal resistance  $R_i$  is < 50  $\Omega$ .

### Potentiometer measurement (Pot)

The potentiometer is connected between one of the input terminals for universal inputs (channel u8...u15), an earth terminal and the terminal  $U_{ref}$  (reference voltage). So as not to overload the reference outputs, the lowest potentiometer value should be at least 1 k $\Omega$ . The reference output is not short-circuit-proof. The upper value of 2.5 k $\Omega$  is predefined to guarantee stable, interference-free measurement.

#### Note:

In order to maintain the measuring accuracy, earthing connections should be occupied only with the same type of input.

To obtain an ideal connection, it is recommended to connect one of the I/O module's earthing terminals direct (short) to the automation station or to a corresponding cabinet terminal.

### Digital inputs (DI with UI)

The AS also uses the universal inputs to record binary information. This information (alarm/status) is connected between an input terminal (u8...u15) and an earth terminal. The station applies a voltage of approx. 13 V to the terminal. This usually corresponds to INACTIVE (bit = 0) for an open contact. When a contact is closed it is ACTIVE (bit = 1) and 0 V are applied, whereby the current flow equates to approx. 1 mA. Brief temporary changes of at least 20 ms are buffered between the station's polling enquiries and are then processed in the next cycle.

Each input can be defined via software configuration as an alarm or status input.

Digital inputs can be displayed on a local indicating unit (e.g. modu630).

### Technical specifications of inputs and outputs

Universal input	Measuring range	Resolution	Accuracy	
			of measuring span	plus measurement value
Ni/Pt1000	-50...+150 °C	< 0.05 K	$\pm$ 0.5%	0.5%
U (0/0.2...1 V)	0.02...1.1 V	< 0.1 mV	$\pm$ 0.5%	0.5%
U (0/2...0.10 V)	0.15...10.2 V	< 1 mV	$\pm$ 0.5%	0.5%
I (0/4...20 mA)	0.02...22 mA	< 0.02 mA	$\pm$ 1%	2%
R	200...2500 $\Omega$	< 0.1 $\Omega$	$\pm$ 0.2%	1%
Pot (> 1 k $\Omega$ )	1...100%	< 0.5%	$\pm$ 1%	1%

Analogue output	Correcting range	Pitch error
AO (0/2...10 V)	0.01...10.2 V	

Binary input (0-1)	Universal input (UI)
Switching threshold, active	> 3 V
Switching threshold, inactive	< 1.5 V
Switching hysteresis	> 0.4 V

### Channel and terminal occupancy

Description	Terminals	
	Channel	Wiring diagram
<b>modu570</b>		
<b>Analogue output</b> (0...10V)	0	a0
	1	a1
	2	a2
	3	a3
<b>Universal input</b> (Ni/Pt1000/U/R/Pot)	8	u8
	9	u9
	10	u10
	11	u11
	12	u12
	13	u13
	14	u14
Current measurement only on channels 8,9 or or terminals 13, 14	15	u15
Reference voltage 1.23 V		

### Connecting a local override unit

The I/O module modu570 can be supplemented using a modu670 override/indicating unit (LOI: Local Override and Indication Device) to enable the direct control of output signals and the display of digital inputs. The function complies with the EN ISO 16484-2:2004 standard relating to local priority override/indicating units.

The modu630 local indicating unit can also be used.

The unit can be installed and removed during ongoing operations (hot-plug capable) without impeding any functions of the automation station or I/O module.

Detailed information on control functions and LED display can be referenced from PDS 92.081 EY-LO6...



All the LEDs (red and yellow) will start to flash if an incompatible override unit is connected; there is no danger of destroying the I/O module.

**Note:**

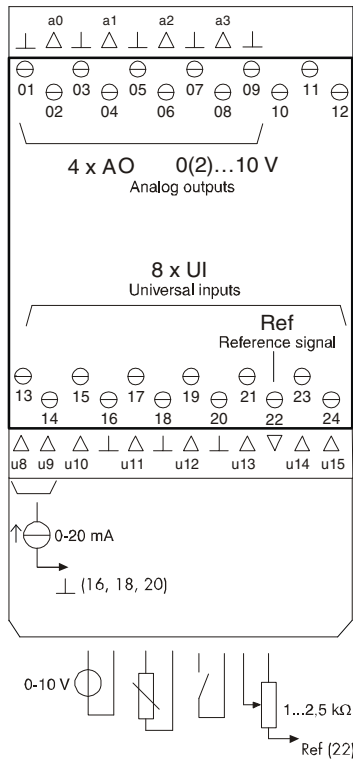
Check all control positions (Auto) prior to installation to avoid unintended signal emissions. When the unit is removed all outputs are operated using the automatic values of the automation station or I/O module.

In keeping with the applicable standard, the local override and indication devices allow the restricted operation of plant components without involving the automation station intended for the application. Outputs from automation stations or I/O modules that are in manual operating mode may temporarily change value during a user program download. The local override unit can be used to control analogue outputs directly in the automation station without a user application (CASE Engine).

**Accessories**

<b>EY-LO630F001</b>	Single unit for indicating I/O modu530 or AS modu525 data points		
	<b>16 LED</b>	LED indicators, bi-colour green/red (freely configurable for event/alarm)	
<b>EY-LO670F001</b>	Single unit for overriding and indicating I/O modu570 or AS modu525 data points		
	<b>8 LED</b>	LED indicators, bi-colour green/red (freely configurable for event/alarm)	
	<b>4 slide switches with LED display</b>	Setpoint adjuster 0...100%, yellow indicates manual operation LED indicator, red, (freely configurable for event/alarm)	

**Wiring diagram**



A10510a

Dimension drawing

