SAUTER
Für Lebensräume mit Zukunft.

PDS 92.815 | РУ Каталог | **EY-AS210**

Станция автоматизации modu210

Достижение большей энергоэффективности

SAUTER-EY-modulo2 – это многократно проверенная и испытанная технология в новом дизайне. Для точного выполнения задач регулирования и управления 24 часа в сутки.

Область применения

Регулирование, управление, мониторинг и оптимизация инженерных систем, в таких областях, как инженерные системы ОВК.

Свойства

- Компактная станция автоматизации
- Часть серии систем автоматизации SAUTER EY-modulo
- 28 входов
- 14 выходов
- коммуникация SAUTER novaNet
- программирование/параметризация через компьютер с помощью программ CASE Suite Software (согласно IEC 61131-3)
- библиотеки техники регулирования и управления
- временные и календарные функции
- запись данных (Историческая база данных)

Техническое описание

- питание 24 V~/=
- 12 бинарных входов (неисправность/статус)
- 8 аналоговых входов (Ni/Pt1000)
- 6 аналоговых входов (U, потенциометр)
- 2 импульсных счетчика
- 6 аналоговые выходы (0...10 V) (2x 0...20 mA)
- 8 бинарных выходов (реле)

Изделия

Тип	Описание
EY-AS210F001	Компактная станция автоматизации

Технические данные

Электропитание	
Напряжение питания	24 V~ (50/60 Hz) ± 20%
	24 V= (18…30 V)
Потребляемая мощность	up to 14.5 VA
Мощность потери	up to 7.5 W
Батарея (питание RTC/SRAM)	CR2032, вставная

Разъемы, коммуникация	
Сеть CA/novaNet	1x a/b-клеммы, вставные
Сервисная панель (modu240)	1x RJ-45-разъем
Языки:	
немецкий, французский, английский, итальянский, голландский, испанский, шведский, норвежский, датский, португальский, финский, польский, словенский, венгерский, румынский, русский, чешский, турецкий, словацкий	
TMA	256
Команд временной программы	320 записей

Монтаж	
Размеры Ш x В x Г (мм)	300 x 120 x 73
Вес (кг)	0.75

Стандарты, правила	
Уровень защиты	IP 00 (EN 60529) 1)
Класс защиты	I (EN 60730-1)
Класс окружающей среды	IEC 60721 3K3
Совместимость согласно:	
EMC правилам 2004/108/EC	EN 61000-6-1
	EN 61000-6-2 2)
	EN 61000-6-3
	EN 61000-6-4
Правила низкого напряжения	
2006/95/EC	EN 60730-1
	EN 60730-2-9
Класс программного обеспечения A	EN 60730-1 Приложение H

Accessories

Type	Description	
	Manual operating panel	
EY-OP240F001	Local operating unit modu240	
	Touch-panel	
EY-OP250F001	Touch-panel modu250: colour	
EY-OP250F002	Touch-panel modu250: monochrome	
	Connecting cables	
0367842 002	Automation station - modu240 1.5 m	
0367842 003	Automation station - modu240 2.9 m	
0367842 004	Automation station - modu240 6.0 m	
	Data memory	
0367883 002	PROM memory, 1 Mb empty (User Data), pack of 5	
	General	
0900240 002	Terminal cover (295 mm), pack of 2	

Engineering notes

Installation and power supply

The modu210 automation station can be fitted in a cabinet (MCC) by means of a top-hat rail (EN 60715) and is supplied with 24V alternating or DC voltage. This work must only be done when there is no voltage (dead). The earthing terminals are internally connected to the earth connection (PELV power circuits). The plant devices and the data line (novaNet) are connected via screw terminals, and the following conditions must be observed:

- Conductor cross-section, min. 0.8 mm², max. 2.5 mm², copper conductor compliant with standards and national installation regulations
- When the power supply is connected, it is mandatory to connect the protective earth to the terminal provided for this purpose
- Communication cabling must be undertaken correctly, must be separated from cabling carrying power, and must meet the requirements of standards EN 50174-1, EN 50174-2 and EN 50174-3.
- No account has been taken of special standards such as IEC/EN 61508, IEC/EN 61511, IEC/EN 61131-1 and IEC/EN 61131-2 or similar standards.
- Local standards regarding installation, application, access, access authorisations, accident prevention, safety, dismantling and disposal must be observed. Compliance is also required with installation standards EN 50178, 50310, 50110, 50274, 61140 and similar.
- For further information, consult the fitting instructions.

Data line

novaNet	2-pole with twisted cable (screening advised) capacitance C ≤ 200 nF resistance R ≤ 300 Ω

Inputs/outputs

Digital inputs:	Potential-free contacts, opto-couplers, transistors (open collector)
Meters/counters:	Potential-free contacts, opto-couplers, transistors (open collector)
Digital outputs:	Relay contacts
Analogue inputs:	< 24 V, no extraneous potential
Analogue outputs:	0…10 V (0…20 mA), no Voltage

Description of inputs and outputs

Temperature measurement

Number of inputs	8
Type of inputs	Ni1000 (without coding) Pt1000 (software coding)
Measuring range:	
Ni1000	-50...+150 °C
Pt1000	-100...+500 °C

The temperature inputs do not require calibration and can be used directly for Ni1000 and Pt1000.
A 2 Ω-line resistance is included in the calculation and pre-compensated.
The sensors are connected using two-wire technology. With the corresponding line resistance of 2 Ω (cable cross-section: 1.5 mm²), the connection cable may be a maximum of 85 m in length. The measuring voltage is pulsed so that the sensor does not heat up. While the inputs were basically designed for Ni1000 sensors, they can also be used for Pt1000 by means of software coding.

U/Pot/(I) measurement

Number of inputs	6
Type	Voltage measurement (without extraneous potential)
Voltage	0...10 V
Current	0...20 mA with external resistance wired
Potentiometer	2…10 kΩ
Specifications:	
Voltage measurement	max. 24 V
Common signal return path	Earth
Resolution:	U = 5 mV
Processing:	MFA08, 09, 10: 5 second (card code 50) MFA11, 12, 13: 1 second (card code 60)

Linear correction with **a** (multiplier) and **b** (zero point correction):
(Y = a X + b)
The linearity can be adapted precisely for each input.

Settings for display of standardised analogue signal (AI 0...1)

Input signal	Correction values	
Y	**a**	**b**
0…10 V	1	0
0…1 V	10	0
0…20 mA	1	0
0…1 mA	20	0
2…10 V	1,25	-0,25
4…20 mA	1,25	-0,25
0,2…1 V	12,5	-0,25

Voltage measurement (U)

Voltage measurement is possible on all U-I-R inputs. The voltage to be measured is connected between one of the input terminals for voltage (see the wiring diagram) and an earth terminal. The signal must not be subject to extraneous potential!
The two measurements 0 (0.2)...1 V and 0 (2)...10 V are selected by means of the software.
The maximum voltage without destruction is < 24 V, but the display range is limited to 10 V; the internal resistance R_i of the input is > 50 kΩ.

Current measurement (I)

Current measurement is possible on all U-I-R inputs with an external resistor connected in parallel with the voltage input. The signal must not be subject to extraneous potential!

Potentiometer measurement

Potentiometers are connected to terminals U, earth and +5 V.
So as not to overload the reference outputs, the lowest potentiometer value should not be less than 2 kΩ. Potentiometers can be used on all U-I-R inputs.
Important note: the +5 V voltage output (terminal 64) is not protected against short-circuits! For this reason, it is essential to check that the potentiometers are connected correctly before starting operation.

Pulse counting

Number of inputs	2
Type of input	Potential-free contacts, opto-couplers, transistors (open collector)
Input frequency	< 15 Hz
Max. output current for inputs	0.5 mA in respect of earth
Debounce time	20 ms
Protection against extraneous voltage	up to 24 V

Potential-free contacts, opto-couplers or transistors with an open collector can be connected to the counter inputs. The maximum pulse frequency may reach 15Hz.
To ensure that switched contacts are registered correctly, provision is made for a debounce time of 20ms. The pulse is measured on the falling flank and can remain for any length of time.
The internal counter value of the station is interrogated every cycle and the totalling to the actual counter value is performed after no more than 30 sec by the processor of the automation station, using the software. The format allows presentation of numerical values up to 67,108,864 with a resolution of 1.

Digital inputs

Number of inputs	12
Type of inputs	Potential-free contacts, wired to earth opto-couplers, transistors (open collector)
Condition "Closed contact"	max. 1 V in respect of earth
Max. output current	0.5 mA in respect of earth
Max. permitted line resistance	1 kΩ
Debounce time	20 ms
Protection against extraneous voltage	24 V

12 digital inputs can be connected directly with the modu210 automation station. The inputs are connected between the input and earth terminals. When a contact is open, it corresponds to one Bit = 0, and with a closed contact, it corresponds to one Bit=1. The station applies a voltage of approx. 13 V to the terminal and in this case, a current of approx. 0.4 mA flows with the contact closed. Brief changes of at least 30 ms are buffered between the station's polling enquiries and are then processed in the next cycle.

For each digital input, software parameterisation allows individual selection of whether the input should be processed as an alarm or status value.

Digital outputs

Number of outputs	8x 0-I
Type of outputs	Relays
Load for outputs	250 V~ / 2 A (resistive load)

Note: the following are not permitted: mixed connections for power circuits, different phases (L1/L2) or different voltage ranges (low voltage).

8 digital outputs can be controlled directly with the modu210 automation station. Real feedback signals can only be implemented via the digital inputs.

Analogue outputs

Number of outputs	6
Type of outputs	4x 0...10 V=, 10 mA max. (source-sink) 2x 0...10 V or 0...20 mA (source)

Note: The outputs are not protected against the presence of extraneous voltage.

A total of 6 analogue signals can be outputted directly with the modu210 automation station.
The output voltage is measured between the relevant output terminal and an earth terminal. Two outputs can supply 0...20 mA (see the wiring diagram).

Timer and battery concept

A real-time clock (RTC) for the time programmes is integrated in the modu210 automation station. The date, time and summer time / winter time changeover must be checked and adjusted if necessary when operating for the first time.
A plug-in button-cell lithium battery (type CR2032) ensures that the user data (CASE Engine data), parameterised time programmes and historical data (HDB) are retained in the SRAM in the event of a power failure. The battery makes it possible to retain the data and run the real-time clock without power for at least 3 years from the production date of the automation station. When mains power is restored, the automation station will check the data consistency and launch communication.
It is advisable to store the user data in a User-PROM for added security against data loss. The User-PROM can be programmed with a normal commercial device and then inserted directly into the station.

Technical data for the battery:

Type	CR2032 lithium button-cell
Nominal voltage	3 V
Capacitance	210 mAh
Dimensions	20 mm x 3.2 mm

Changing the battery

If it becomes necessary to change the battery during the operating period, this must only be done by trained specialist staff.

User programme

The modu210 automation station contains a fast operating program. It reads all the inputs, processes the parameterised modules, updates the outputs and effects the necessary communication with other automation stations and visualisation PCs via novaNet.
The modu210 automation station has a total of 256 Machine Fine Addresses (MFAs) for parameterisation with CASE Engine. Of these, MFAs 0…59 are generally used for HW addressing and MFAs 64…255 for SW addressing. MFAs 60…63 are reserved service addresses for internal use.

All user programmes can be read in or out by any desired novaNet connection. The data are retained in the battery-assisted SRAM even in case of a power failure. In addition, the data can be stored in a persistent user memory (User-PROM).
This provides very high protection against data loss.

Memory structure

The automation station has a RAM memory totalling 4Mbit, divided into 3 sections of 1Mbit each. These are the working memory, the microprogramme memory and the HDB memory. Each of these sections is divided into 256 Machine Fine Addresses (MFA) of 128 double words (DW) with 32 Bits each.

The working memory is used for processing the loaded application data by CASE Engine and it can be parameterised (read and write). On initialisation of the AS, all stored user data are loaded automatically from the User-PROM (if available).

The microprogramme working memory is reserved for internal use by the current microprogramme and cannot be overwritten.

The HDB memory (historical data base) is used to store and reproduce digital and analogue values. A historic MFA entry is parameterised by CASE Engine and requires a total of 72 Bits, including the date and time. It is possible to store a total of 14,336 historic entries in an automation station (ring memory).
It is divided into 4 blocks with 3584 entries each.

Block 1:	3584 items of digital information recorded in MFA range 0-127
Block 2:	3584 items of analogue information recorded in MFA range 0-127
Block 3:	3584 items of digital information recorded in MFA range 128-255
Block 4:	3584 items of analogue information recorded in MFA range 128-255

Time programme and calendar

The automation station has a special area within the working memory which can accommodate a total of 320 time commands. Parameterisation of the time profiles is handled via the management software or the manual operating panel.
Above the individual time programmes, there is a yearly table designed for 2 years (even/uneven year numbers) which can be configured.

Summer and winter time

Automatic switching between summer and winter time is an element of the automation station and can be modified or deactivated by means of parameterisation software or via the manual operating panel. The factory setting provides for a switchover between summer and winter time on the last weekend of March or October, from Saturday to Sunday.

Manual operating panel

Operating panel modu240 (EY-OP240F001) is available as an accessory for the modu210 automation station. It is connected directly via the RJ-45 socket. The operating panel allows treatment of data (except HDB data) from the automation station, e.g. reading measured values, alarms and status, changing setpoints, outputting positioning commands and changing time profiles.

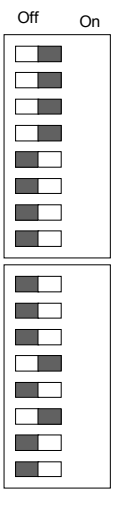
Commissioning the automation station

When connecting the voltage supply, it is essential to connect the protective earth with the connection terminal provided (protection class I). This work must always be undertaken while the equipment is dead (no voltage).

The automation station has LED displays for the operating voltage and communication. When continuously lit, the green LED indicates that the automation station is in "On" mode, and a flashing yellow LED indicates "Send", i.e. telegram traffic to the novaNet.

Before a station is integrated into the novaNet , it must receive a unique (single) address between 0 and 28671. The address is binary-coded by hand, using the 16 DIP-switches (underneath the housing cover).

Note: In conjunction with a BACnet application (moduNet300, EYK220, 230, 300), the station coding must be in the range from 0 to 4194.



Value	Off	On	
1		×	1
2		×	2
4		×	4
8		×	8
16	×		
32	×		
64	×		
128	×		
256	×		
512	×		
1024	×		
2048		×	2048
4096	×		
8192		×	8192
16384	×		
Even Parity	×		

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Example of a setting:
AS number 10255

1 + 2 + 4 + 8 + 2048 + 8192
= 10255 (Even Parity: Off)

The parity switch is set so that the number of switches set to "On", including parity switches, produces an even number.
If the parity is incorrectly set, the yellow "Send" LED goes out. No communication (CASE Engine, management
level) takes place with the AS on the novaNet.

The user data are basically read in via CASE-Engine. Communication is handled via the Sauter system bus, novaNet, at terminals a and b. Programming can be undertaken while data traffic is in progress. To avoid reducing the communication speed of other novaNet participants, the station can be disconnected from novaNet for the programming period, and the parameterising PC can be connected locally. The data are active immediately after the data transfer.

Initialisation

Initialisation is performed by short-circuiting the two half-moon 'Ini' switches (under the housing cover) for 1-2 seconds. This causes the station to delete the entire RAM memory and to load all user data from the User-PROM (if available) in order to restart the control and regulation function with defined start conditions.

If no User-EPROM is available, all user data (CASE Engine Plan, time programmes, HDBs) are deleted after an initialisation!

An initialisation makes it possible to reload the automation station directly with CASE Engine data. This requires previous storage of the CASE Engine data on a User-PROM and their insertion in the automation station.

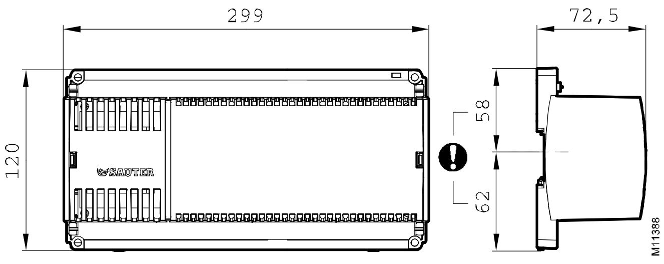
Reference of MFAs to terminals:

modu210 connections	MFA		KC	Terminals			
Ni/Pt 1000				GND			
	00		51	01	02		
	01		51	03	04		
	02		51	05	06		
	03		51	07	08		
	04		51	09	10		
	05		51	11	12		
	06		51	13	14		
	07		51	15	16		
Analogue inputs				**GND**	**U/Pot/(I)**	**+13 V**	**+5 V** [1]
U/Pot/(I)	08		50	17	18	63	64
U/Pot/(I)	09		50	19	20		
U/Pot/(I)	10		50	21	22		
U/Pot/(I)	11		60	23	24		
U/Pot/(I)	12		60	25	26		
U/Pot/(I)	13		60	27	28		
Analogue outputs				**GND**	**U**	**I**	
0…10 V	24		82	65	66		
0…10 V	25		82	67	68		
0…10 V	26		82	69	70		
0…10 V	27		82	71	72		
0…10 V or 0…20 mA	28		81	73	74	x	
0…10 V or 0…20 mA	29		81	75	76	x	
Digital outputs (relays with normally open contact)				**In**	**Out**		
0-I	40		20	47	48		
0-I	41		20	49	50		
0-I	42		20	51	52		
0-I	43		20	53	54		
0-I	44		20	55	56		
0-I	45		20	57	58		
0-I	46		20	59	60		
0-I	47		20	61	62		
Pulse counter				**GND**			
	50		C1	29	30		
	51		C1	31	32		
Digital inputs	**MFA**	**fc** [2]	**Bit**		**GND**		
					33		
	58	1	24	10		34	
		2	25	10		35	
		3	26	10		36	
		4	27	10		37	
		5	28	10		38	
		6	29	10		39	
					40		
		7	30	10		41	
		8	31	10		42	
	59	8	31	10		43	
		7	30	10		44	
		6	29	10		45	
		5	28	10		46	

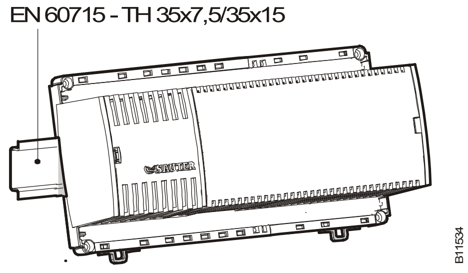
1) Voltage output not protected against short circuits!

2) Connection flag – CASE Engine binary input (BI)

Dimension drawing



Mounting on top-hat rail



Wiring diagram