

EY-LM 590: novaLink module, modu590

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 modu525 automation station (AS)
- Suitable for connecting EY-FM 1** and EYY 1** remote units
- 24 V \sim external power supply
- Up to 8 field modules per novaLink module with DC power supply, 6 with AC power supply
- I/O bus and novaLink are electrically isolated
- Direct labelling on the front
- Can be equipped with a local operating and indicating unit



EY-LM590F001

Technical data

Power supply		
Power supply	24 V \pm , \pm 10%	24 V \sim , +20%/-15%, 50...60 Hz
Power consumption	Max. 20 W	
Dissipated power	Max. 1 W	
Current consumption	Max. 1.2 A	
Max. peak inrush current	Max. 20 A (2 ms)	

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

Interfaces and communication		
Connection for modu 6 (LOI)	6-pin, integrated in electronics module	
Connection, I/O bus	12-pin, integrated in base	
Connection terminals	24 (0.5...2.5 mm ²)	

Construction		
Fitting	On top-hat rail	
Dimensions W x H x D	42 x 170 x 115 mm	
Weight	0.315 kg	

Standards and directives		
Type of protection	IP30 (EN 60529)	
Protection class	III (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

Overview of types	
Type	Properties
EY-LM590F001	novaLink module, 8 novaLink channels, modu590

Accessories	
Local operating and indicating units (LOI)	
Type	Description
EY-LO630F001	16-LED indication, bi-colour

Field modules	
Type	Description
EY-FM164F001	moduLink164 digital output 4x 0-I (change-over relay)
EY-FM165F001	moduLink165 digital output 2x 0-I-II (change-over relay)



Type	Description
EY-FM170F001	moduLink170 analogue output 4× 0...10 V (2× 0...20 mA)
EY-FM174F001	moduLink174 digital input 16×

Description of operation

The modu590 novaLink module is used for receiving digital inputs (alarm/status) and controlling actuators such as relays and final control elements, or for displaying information on operational systems. The module is designed for the I/O bus of the modu525 BACnet automation station. It enables EY-FM 1** moduLink or EYY 1** novaLink field modules to be connected to the EY modulo 5. The modu590 module has a total of 8 channels for point-to-point connection to the field modules.

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.

Engineering notes

The modu590 novaLink module is comprised of two components. The baseplate in which the I/O bus system and the connection terminals are integrated and the hood with the actual novaLink electronics module.

Fitting/assembly

The baseplate of the novaLink 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 modu525 AS or modules. This work may only be carried out when the system is disconnected from the electrical supply.

To avoid ground cross-currents, make sure that the potential between the field modules and the novaLink module is equal.

To ensure the optimum ground connection, it is recommended to connect one ground terminal of the novaLink module directly with a corresponding cabinet ground terminal.

Removal/insertion of the electronics module from/to the baseplate is possible during operation of the AS. However, to ensure plant safety and to avoid any faults at inputs or outputs, the novaLink electronics module should only be removed or inserted while the base station is switched off. If the electronics module is connected when the base station is switched on, the inputs and outputs of the field modules may temporarily take on undefined statuses. Up to 8 novaLink modules may be used per modu525. Here the novaLink modules, like the I/O modules, must be connected behind the EY-CM *** communication modules. No particular sequence must be adhered to between normal I/O modules and the novaLink modules.

Connection condition for novaLink:

- The connection cable must be twisted and shielded
- Shielding at both ends connected to ground
- 100 m max. (5 nF / 7.5 Ω)
- One module per channel

Labelling concept

The novaLink module can be labelled with a paper insert in the frontal transparent cap. The 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 electronics of the novaLink module are encoded on the hardware side using pin inserts so that only the appropriate baseplate can be used. The modu525 AS detects whether a module baseplate is plugged into the I/O bus. Baseplate number and assignment of module types for the modules on the AS are defined with CASE Suite (from version 3.4 onwards). This information is permanently stored in the AS.

Power supply of modu590

The modu590 novaLink module must be supplied with an external voltage.

The following connection conditions apply:

24 V_±, ±10% or 24 V_~, +20%/-15%, 50...60 Hz

The external power supply is required because the connected EY-FM 1** (or EYY 1**) field modules must be supplied by the modu590.

The internal power supply of the modu525 is not capable of this.

By using the external power supply it is possible to ensure the autonomous operation of the field modules, even if the power supply of the modu525 automation station fails. Under these conditions, the outputs of the field modules can be operated manually, but there is no longer any communication with the automation station.



Note

Please remember, that when 24 V AC is being used as the power supply, more heat is generated in the housing of the modu590 than when using 24 V DC. Therefore, when 24 V AC is being used, the number of field modules that can be used is reduced from 8 to 6 field modules. Additionally, when 24 V AC is being used, compliance with the limit values of the EMC Directives is only ensured up to a maximum number of 6 field modules. Therefore, during the engineering it must be ensured that no more than 6 field modules are connected. This is not prevented by locking.

modu525 program download

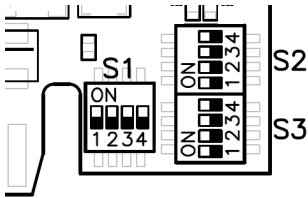
During a program download to the modu525 head station, the setpoints for the analogue and digital outputs are temporarily ignored and the outputs are on 0 for a few seconds. After the download, the program is restarted and the setpoints are met again.

If necessary, the outputs of the field modules can be set using the priority operation before the program download in order to avoid unintentional switching of the outputs.

novaLink channel assignment

I/O mix

In contrast to EY3600 and EY-modulo 2 automation stations, the novaLink channels of the modu590 can be used with different functions. However, they cannot be selected completely freely – various fixed I/O mixes have been defined instead. In most cases, this allows the available 8 channels to be used to the full. The settings are defined via DIL switches (components S1, S2 and S3). The hood must be removed to set the DIL switches.



Section of PCB with DIL switches

For every I/O mix, the modu590 appears in CASE under a different identification. The different I/O mixes are defined via 4 DIL switches (for component S1, see the picture above). At present there are 7 different I/O mixes, as described in the following table:

Identification	Component S1 (ON=1, OFF=0)				EY-FM 174 EYY 174	EY-FM 164/165 EYY 164/165	EY-FM 170 EYY 170
	1	2	3	4	(digital input)	(digital output)	(analogue output)
Not used	0	0	0	0	-	-	-
EY-LM591F001	1	0	0	0	8 (links 1-8)	-	-
EY-LM592F001	0	1	0	0	-	8 (links 1-8)	-
EY-LM593F001	1	1	0	0	-	-	8 (links 1-8)
EY-LM594F001	0	0	1	0	2 (links 1-2)	4 (links 3-6)	2 (links 7-8)
EY-LM595F001	1	0	1	0	3 (links 1-3)	4 (links 4-7)	1 (link 8)
EY-LM596F001	0	1	1	0	3 (links 1-3)	3 (links 4-6)	2 (links 7-8)
EY-LM597F001	1	1	1	0	3 (links 1-3)	2 (links 4-5)	3 (links 6-8)



Note

When a 24 V AC supply is being used, 2 of the novaLink channels must remain free in each device. It does not matter which input or output type remains free. Make sure that the number of occupied channels does not exceed 6.



Note

Theoretically, when there are 8 modu590 modules per modu525, all of which have the EY-LM591F001 I/O mix, up to 64 field modules with digital inputs (EY-FM 174 or EYY 174) can be used per modu525. This corresponds to 1024 digital inputs. However, the modu525 is limited to 512 BACnet objects. Therefore, such a configuration is not possible. Make sure that the I/O mixes are used meaningfully, with the maximum number of BACnet objects being considered.

The DIL switches for selecting the I/O mixes must be set when installing the module. When delivered ex works, the DIL switches are set to 0010. This corresponds to the frequently used configuration EY-LM594F001.

Additionally, 8 further DIL switches are available (for components S2 and S3, see the picture above) one for each novaLink channel, to differentiate between EY-FM 164 (or EYY 164) and EY-FM 165 (or EYY 165) when operating with field modules with digital outputs.

The following assignment applies:

Link channel	Component	Switch
Link 1	S3	1
Link 2	S3	2
Link 3	S3	3
Link 4	S3	4
Link 5	S2	1
Link 6	S2	2
Link 7	S2	3
Link 8	S2	4

DIL	Field module type
ON	EY-FM 165 or EYY 165
OFF	EY-FM 164 or EYY 164 EY-FM 170 or EYY 170 EY-FM 174 or EYY 174

Channel assignment

The following tables describe the channel assignment for the individual I/O mixes:

novaLink channel	Channel assignment on modu590 and input/output type						
	EY-LM 591	EY-LM 592	EY-LM 593	EY-LM 594	EY-LM 595	EY-LM 596	EY-LM 597
Link 1	0...15 DI	0...3 DO	0...3 AO	0...15 DI	0...15 DI	0...15 DI	0...15 DI
Link 2	16...31 DI	4...7 DO	4...7 AO	16...31 DI	16...31 DI	16...31 DI	16...31 DI
Link 3	32...47 DI	8...11 DO	8...11 AO	32...35 DO	32...47 DI	32...47 DI	32...47 DI
Link 4	48...63 DI	12...15 DO	12...15 AO	36...39 DO	48...51 DO	48...51 DO	48...51 DO
Link 5	64...79 DI	16...19 AO	16...19 AO	40...43 DO	52...55 DO	52...55 DO	52...55 DO
Link 6	80...95 DI	20...23 DO	20...23 AO	44...47 DO	56...59 DO	56...59 DO	56...59 AO
Link 7	96...111 DI	24...27 DO	24...27 AO	48...51 AO	60...63 DO	60...63 AO	60...63 AO
Link 8	112...127 DI	28...31 DO	28...31 AO	52...55 AO	64...67 AO	64...67 AO	64...67 AO

DI = digital input, DO = digital output, AO = analogue output

The assignment of the terminals on the modu590 can be found in the connection diagram. The assignment of the terminals on the field modules can be found in the technical data sheets for the relevant field modules.

Note: When used for multi-state objects with EY-FM/EYY 165, consecutive pairs of channels must be selected on the same field module in order to guarantee the correct switching sequence and function with the manual operation level.

LED indicator/function

System LED

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

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

modu630 indicator unit

A modu630 indicator unit can be used to display the status of the 8 novaLink connections. Channels 1 to 8 are assigned to LEDs 1 to 8.

LED indicators	Status	Description
No designation	Continuous green light	Field module connected, function OK
	Continuous red light	Error (e.g. short-circuited)
	Alternating green – red – OFF	Lamp test active (indicator type priority)
	No indicator	Field module not connected

If an incorrect field module type is connected, this cannot be detected due to the novaLink telegram. The LED lights up green.

The modu630 indicator unit is not supplied with the novaLink module (see accessories).

BACnet Reliability Property and Status Flags

A BACnet object in the modu590 displays the status if an error occurs: Error on the I/O bus, internal error in the modu590, communication error between modu590 and a field module. Under these conditions, the Reliability Property becomes “unplugged” (proprietary property, value 1000), and the status flags “In Alarm” and “Fault” are set.

Digital outputs on EY-FM/EYY 164/165

The polarity of the digital outputs can be inverted via the BACnet object (polarity = reverse). This inverts the polarity of the value in automatic mode. However, the set polarity does not have any effect on the manual control directly on the field module.

Note that this behaviour is in contrast to the behaviour of the manual operation level with EY-LO 625 and EY-LO 650. There the manual operation level has direct access to the BACnet objects and can take the polarity into account. With the moduLink field modules, the manual operation level is organised by the field module itself, independently of the BACnet objects. For reasons of compatibility with existing installations, this behaviour is not adjusted.

Analogue outputs on EY-FM/EYY 170

For the EY-FM/EYY 170 field modules with analogue outputs, note that, at a setpoint of 10 V, the outputs have an actual output value of approx. 10.1 to 10.2 V. This deviation is deliberate to make sure that, at a setpoint of 10 V, the maximum value is definitely achieved. This ensures, for example, that a valve actuator really opens completely. The deviation is linear across the entire measuring range. The longer the novaLink connection between modu590 and the field module, the higher this value can become. With the maximum cable length of 100 m, the value can be up to 10.4 V. If this value is too high, it can be adjusted in the CASE Engine module via the relevant parameters.

Digital inputs on EY-FM/EYY 174

With cable lengths from 30 m upwards, in rare cases incorrect measurements of the digital inputs can occur with EY-FM/EYY 174. Under these conditions, a 2.2 kΩ resistor can be fitted on the field module between the terminals of the novaLink connection (LINK n+ and LINK n-).

Monitoring function for EY-FM 164/165/170

To monitor the operability of the EY-FM 164, EY-FM 165 and EY-FM 170 field modules, these field modules have an additional output (monitor). During correct operation, a current of approx. 10 µA is output. With automation stations of the EY3600 and EY-modulo 2 series, it was possible to connect and evaluate this monitor output directly at an analogue input. With a modu525 or the corresponding I/O modules, this is not possible right away because the input resistance of the analogue inputs is too big (approx. 9 MΩ). If the monitor output of the field modules is to be used with a modu525 or I/O modules, a voltage must be measured across an external resistor. For this a 56 kΩ resistor can be

used parallel to a 0-10 V input. Thus the example applications for modu225, that are specified in the product data sheets of the field modules, can be used.

Maintenance

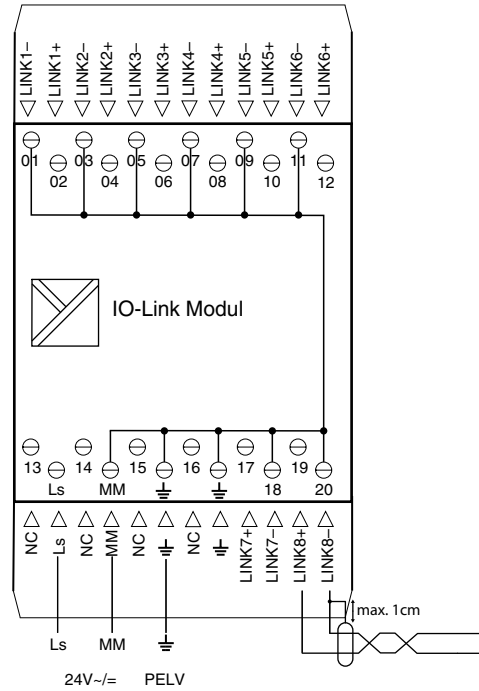
The novaLink module is maintenance-free. Repairs are carried out exclusively by Fr. Sauter AG. Modules may only be replaced by a qualified electrician.

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

