



The 6-fold switch actuator is a DIN rail mounted device for insertion in the distribution board. It is connected to the EIB via a bus terminal.

Using four floating contacts, it switches four groups of electrical consumer devices that are independent of each other.

Should the bus voltage fail, the actuator can activate the load circuit (e.g. for functional or emergency lighting).

The device does not require an additional power supply.

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Technical Data

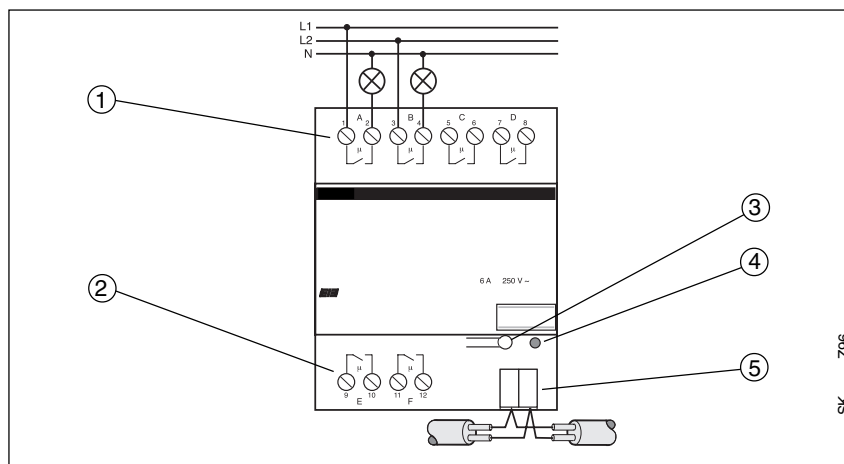
Power supply	– EIB	24 VDC, via the bus line
Outputs	– 6 floating contacts	
	– Switching voltage	230 VAC +10/-15 %, 50 ... 60 Hz
	– Switching current	10 A/AC1
	– Basic time delay on single operation	typically 20 ms per relay
Operating and display elements	– red LED and push button	for assigning the physical address
Connections	– Load circuit	two screw terminals each, Wire range 0.5 ... 2.5 mm ² finely-stranded 0.5 ... 4.0 mm ² single-core Bus terminal
	– EIB	
	– IP 20, EN 60 529	
Type of protection	– IP 20, EN 60 529	
Ambient temperature range	– Operation	- 5 °C ... 45 °C
	– Storage	-25 °C ... 55 °C
	– Transport	-25 °C ... 70 °C
Design	– modular installation device, proM	
Housing, colour	– Plastic housing, grey	
Mounting	– on 35 mm mounting rail, DIN EN 50022	
Dimensions	– 90 x 72 x 64 mm (H x W x D)	
Mounting depth/width	– 68 mm / 4 modules at 18 mm	
Weight	– 0.24 kg	
Certification	– EIB-certified	
CE norm	– in accordance with the EMC guideline and the low voltage guideline	

Application programs	Number of communication objects	Max. number of group addresses	Max. number of associations
Switch Logic Default /3	12	16	17
Switch Status Default /1	12	18	18
Switch Default Time /3	6	18	18
Switch Default Stairc.fct /3	6	21	22
Switch Priority Status Default /6	12	14	14
Fan coil 4-pipe Heat and Cool /1		5	5

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Circuit diagram



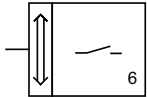
- 1 Connecting terminals - outputs A ... D
- 2 Connecting terminals - outputs E ... F
- 3 Programming push button
- 4 Programming LED
- 5 Bus terminal

Note

In order to avoid the danger of electric shock due to feedback from various external conductors, an all-pole disconnection must be complied with.

If the outputs are switched several times shortly after each other, the basic time delay is extended.

Switch Logic Default /3



Selection in ETS2

- ABB
 - └ Output
 - └ Binary output, 6-fold

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The application program offers each output the same parameters and communication objects.

Switch

In the default setting, the actuator switches the relay on when it receives a telegram with the value "1" and switches it off on receipt of a telegram with the value "0". If the parameter "Switch function" is set to "normally opened contact", the actuator switches the relay on when it receives a telegram with the value "0" and switches it off on receipt of a telegram with the value "1".

Logic

Using the parameter "Logical connection", it is possible to specify an AND or an OR connection.

In both cases the ETS2 program displays an additional communication object for the output. The actuator then links the values of communication objects 0 and 6 for output A, objects 1 and 7 for output B, objects 2 and 8 for output C, objects 3 and 9 for output D, objects 4 and 10 for output E or objects 5 and 11 for output F and switches the relay according to the result.

Normally all communication objects

have the value "0" after bus voltage recovery. If a logical connection has been assigned, it is possible to set a defined function using the parameters "Value of object no. 4 / no. 5 / no. 6 / no. 7 / no. 8 / no. 9 / no. 10 / no. 11 on bus voltage recovery".

The logical connection is evaluated immediately after bus voltage recovery.

Default

It is possible to assign parameters for each output to the default position on bus voltage failure. This setting refers to the relay contact and is independent and is independent of the parameter setting "Switch function".

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Communication objects

Nr.	Type	Name	Function
0	1 bit	Output A	Switch
1	1 bit	Output B	Switch
2	1 bit	Output C	Switch
3	1 bit	Output D	Switch
4	1 bit	Output E	Switch
5	1 bit	Output F	Switch

Communication objects
for OR connection

No.	Type	Name	Function
0	1 bit	Output A	OR connection
1	1 bit	Output B	OR connection
2	1 bit	Output C	OR connection
3	1 bit	Output D	OR connection
4	1 bit	Output E	OR connection
5	1 bit	Output F	OR connection
6	1 bit	Output A	OR connection
7	1 bit	Output B	OR connection
8	1 bit	Output C	OR connection
9	1 bit	Output D	OR connection
10	1 bit	Output E	OR connection
11	1 bit	Output F	OR connection

Communication objects
for AND connection

No.	Type	Name	Function
0	1 bit	Output A	AND connection
1	1 bit	Output B	AND connection
2	1 bit	Output C	AND connection
3	1 bit	Output D	AND connection
4	1 bit	Output E	AND connection
5	1 bit	Output F	AND connection
6	1 bit	Output A	AND connection
7	1 bit	Output B	AND connection
8	1 bit	Output C	AND connection
9	1 bit	Output D	AND connection
10	1 bit	Output E	AND connection
11	1 bit	Output F	AND connection

Parameters

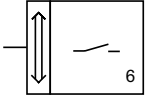
The default setting for the values is **printed in bold type**.

Separate for each output:	
– Switch function	normally closed contact normally opened contact
– Logical connection	no logical connection AND connection OR connection
only if a logical connection is selected:	
– Value of object no. ... on bus voltage recovery	logic '0' logic '1'
– Default position in case of bus voltage failure	contact unchanged contact closed contact opened

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Switch Status Default /1



Selection in ETS2

- ABB
 - └ Output
 - └ Binary output, 6-fold

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The application program offers each output the same parameters and communication objects.

Switch

In the default setting, the actuator switches the relay on when it receives a telegram with the value "1" and switches it off on receipt of a telegram with the value "0".

If the parameter "Switch function" is set to "normally opened contact", the actuator switches the relay on when it receives a telegram with the value "0" and switches it off on receipt of a telegram with the value "1".

Status

For objects 6 to 11, the actuator sends the current state of the relevant output. This status response takes the parameter setting "Switch function" into account. So that status responses, which indicate the state of the contact, can also be received when the "normally opened contact" setting is selected, it is possible to set the "Status response" parameter to "inverted".

As the status response option cannot be disabled, objects 6 to 11 must be linked with group addresses as otherwise the relays cannot carry out switching operations.

Default

It is possible to assign parameters for each output to the default position on bus voltage failure. This setting refers to the relay contact and is independent of the parameter setting "Switch function". On bus voltage recovery the relays maintain their current state.

Communication objects

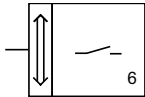
No.	Type	Name	Function
0	1 bit	Output A	Switch
1	1 bit	Output B	Switch
2	1 bit	Output C	Switch
3	1 bit	Output D	Switch
4	1 bit	Output E	Switch
5	1 bit	Output F	Switch
6	1 bit	Output A	Telegr. status
7	1 bit	Output B	Telegr. status
8	1 bit	Output C	Telegr. status
9	1 bit	Output D	Telegr. status
10	1 bit	Output E	Telegr. status
11	1 bit	Output F	Telegr. status

Parameters

The default setting for the values is printed in bold type.

Separate for each output:	
- Switch function	normally closed contact normally opened contact
- Status response	normal inverted
- Default position in case of bus voltage failure	contact unchanged contact closed contact opened

Switch Default Time /3



Selection in ETS2

- ABB
 - └ Output
 - └ Binary output, 6-fold

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The application program offers each of the outputs the same parameters and communication objects.

Switch

In the default setting, the actuator switches the relay on when it receives a telegram with the value "1" and switches it off on receipt of a telegram with the value "0".

If the parameter "Switch function" is set to "normally opened contact", the actuator switches the relay on when it receives a telegram with the value "0" and switches it off on receipt of a telegram with the value "1".

Default

It is possible to assign parameters for each output to the default position on bus voltage failure.

This setting refers to the relay contact and is independent of the parameter setting "Switch function".

Time

A delay for switching on and off can be set for the outputs. For both delays there is a common "Time base" parameter and a separate "Factor" parameter.

Communication objects

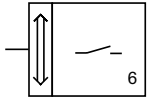
No.	Type	Name	Function
0	1 bit	Output A	Switch
1	1 bit	Output B	Switch
2	1 bit	Output C	Switch
3	1 bit	Output D	Switch
4	1 bit	Output E	Switch
5	1 bit	Output F	Switch

Parameters

The default setting for the values is **printed in bold type**.

Separate for each output:	
- Switch function	normally closed contact normally opened contact
- Time base for ON and OFF delay	130 ms / ... / 1.2 h
- Factor for switch ON delay (0 ... 127)	0
- Factor for switch OFF delay (0 ... 127)	0
- Default position in case of bus voltage failure	contact unchanged contact closed contact opened

Switch Default Stairc.fct /3



Selection in ETS2

- ABB
 - └ Output
 - └ Binary output, 6-fold

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The application program offers each output the same parameters and communication objects.

Switch

In the mode “normal operation”, the actuator switches the relay on when it receives a telegram with the value “1” and switches it off on receipt of a telegram with the value “0”.

If the parameter “Switch function” is set to “normally opened contact”, the actuator switches the relay on when it receives a telegram with the value “0” and switches it off on receipt of a telegram with the value “1”.

Default

It is possible to assign parameters for each output to the default position on bus voltage failure.

This setting refers to the relay contact and is independent of the parameter setting “Switch function”.

Staircase lighting function

In the operation mode “staircase lighting function”, the actuator switches on immediately on receipt of an “On” telegram. Once the time specified in the parameters “Time base” and “Factor” has elapsed, the actuator automatically switches off.

If the actuator receives further “On” telegrams during this interval, the period restarts each time.

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Communication objects

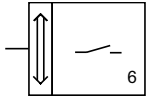
No.	Type	Name	Function
0	1 bit	Output A	Switch
1	1 bit	Output B	Switch
2	1 bit	Output C	Switch
3	1 bit	Output D	Switch
4	1 bit	Output E	Switch
5	1 bit	Output F	Switch

Parameters

The default setting for the values is **printed in bold type**.

Separate for each output:	
- Switch function	normally closed contact normally opened contact
- Operation mode	normal operation staircase lighting function
only applies to “staircase lighting function”:	
- Time base for staircase lighting function	130 ms / ... / 1.2 h
- Factor for staircase lighting function (0 ... 127)	100
- Default position in case of bus voltage failure	contact unchanged contact closed contact opened

Switch Priority Status Default /6



Selection in ETS2

- ABB
 - └ Output
 - └ Binary output, 6-fold

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The application program offers each output the same parameters and communication objects.

Switch

In the default setting, the actuator switches the relay on when it receives a telegram with the value "1" and switches it off on receipt of a telegram with the value "0". If the parameter "Switch function" is set to "normally opened contact", the actuator switches the relay on when it receives a telegram with the value "0" and switches it off on receipt of a telegram with the value "1".

Priority

Using the 2 bit communication object, an output can be positively driven by a primary control (e.g. application controller). There are three different states:

- The priority object has the value "3". The value of the switching object is not important. The output is switched off through priority control.
- The priority object has the value "2". The value of the switching object is not important. The output is switched on through priority control.
- The priority object has the value "1" or "0". The output is not priority controlled. It is operated via the switching object.

ges to the 1 bit object are stored, even if the current switching state has not been directly changed as a result. When the priority controlled operation has finished, a switching operation takes place according to the current value of the switching object.

Status

If priority control is disabled and the output is being controlled via the switching object, the priority sends a telegram with the status of the output with the values "0" or "1".

As the status response option cannot be disabled, objects 6 to 11 must be linked with group addresses as otherwise the relays cannot carry out switching operations.

Default

It is possible to assign parameters for each output to the default position on bus voltage failure. This setting refers to the relay contact and is independent of the parameter setting "Switch function". On bus voltage recovery the relays maintain their current state.

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Communication objects

If an output is priority controlled, chan-

No.	Type	Name	Function
0	1 bit	Output A	Switch
1	1 bit	Output B	Switch
2	1 bit	Output C	Switch
3	1 bit	Output D	Switch
4	1 bit	Output E	Switch
5	1 bit	Output F	Switch
6	2 bit	Output A	Priority / Telegr. status
7	2 bit	Output B	Priority / Telegr. status
8	2 bit	Output C	Priority / Telegr. status
9	2 bit	Output D	Priority / Telegr. status
10	2 bit	Output E	Priority / Telegr. status
11	2 bit	Output F	Priority / Telegr. status

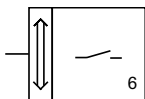
Parameters

The default setting for the values is **printed in bold type**.

Separate for each output:

- Switch function **normally closed contact**
normally opened contact
 - Default position in case of bus voltage failure **contact unchanged**
contact closed
contact opened
 - A group address has to be allocated to the object **NOTE**
- Priority / ... status

Fan coil 4-pipe Heat and Cool /1



Selection in ETS2

- ABB
 - └ Output
 - └ Binary output, 6-fold

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The application program enables a 4-pipe air convector (fan coil unit) to be controlled with the 6-fold switch actuator.

4-pipe

In a 4-pipe system, there is a heat exchanger available for heating and one for cooling. Warm or cold water is fed via a central unit into the two pipe systems (each with 2 pipes).

Heat and cool

The ETS2 program makes a 1 byte communication object available each for the control of the heating and cooling system. One is used to adopt the control value for heating while the other is for the control value for cooling. The two control values are sent by a room thermostat and are linked together via corresponding group addresses.

Fan coil

A fan coil unit has 3 levels of control. Depending on the required heating or cooling capacity, the first, middle or higher step is switched on.

The control is carried out via the 1 byte communication object "Ventilation/Output A...C - Control value heating" or "...- Control value cooling". The value that switches on step 1 is defined via the parameter "Threshold OFF -> step 1". The two other threshold parameters specify when step 2 and step 3 are switched on.

Note:

The threshold value that is set for "Step 2 -> 3" must always be higher than the threshold for "Step 1 -> 2". The threshold for "Step 1 -> 2" must likewise be higher than the threshold for "OFF -> step 1".

It is possible to activate a step limiting function. This means that it is no longer possible to exceed a step that has previously been set. Step limiting is often used in hotels so that the guest can reduce noise development during the night. The maximum cooling capacity is likewise restricted.

If step limiting is activated in the para-

eters, the ETS2 program displays a further 1 bit communication object "Ventilation - Step limiting". If an "On" telegram is received at this object, it is no longer possible to switch on a higher step than the one that has been defined with "Maximum step at step limiting". An "Off" telegram switches off the step limiting function.

If a forced position has been set, the ETS2 program enables the 1 bit object "Ventilation - Forced position". It is used to switch the actuator to a predefined step. If a "1" is received at this communication object, the switch actuator switches on the step which has been defined in the parameter "Behaviour at forced position". If a "0" is received, the actuator changes back to the previously active step.

The application has a monitoring function. The parameter "Fault alarm" must be activated. If the fault alarm has been activated, the actuator monitors the control value objects. If no telegrams are received at these objects within an adjustable period, the actuator switches to the fault function. This means that it sends a telegram with the value "1" to its communication object "Ventilation - Fault". If the actuator receives a control value again, it removes the fault and sends a "0" to the fault object.

The monitoring period before the actuator switches to the fault function can be set between 4 min and 50 min. As soon as the actuator is in the fault state, it switches its channels according to the parameter "Step at fault function".

Most fan coil units require a pause between the changeover from one step to another. This "...delay time of step switching" must be taken from the technical data of the respective unit or clarified by the manufacturer. The determined value must be entered in the appropriate parameter. The exact value cannot be entered under certain conditions. In this case, it is necessary to set a slightly higher value. The value that can be set is composed of a base and a factor, whereby the base has a fixed value of 850 ms.

$$Value = Base (850 ms) * Factor$$

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The fifth and sixth channel of the switch actuator can be used to activate heating or cooling controllers. As soon as a step has been switched to heating mode, channel E is automatically switched on. Channel F is automatically switched on in cooling mode.

Bus voltage failure / recovery

It is possible to set the behaviour of the switch actuator on bus voltage failure. It can be set whether the actuator switches off completely or retains its current state.

After bus voltage recovery, the switch actuator is in the OFF state by default. It can also be set however that the actuator switches on with step 1, 2 or 3.

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Communication objects

No.	Type	Object name	Function
0	1 byte	Ventilation/Output A...C	Control value heating
1	1 byte	Ventilation/Output A...C	Control value cooling

Communication objects
with activated fault alarm, forced position and step limiting

No.	Type	Object name	Function
...			
2	1 bit	Ventilation	Fault
3	1 bit	Ventilation	Forced position
4	1 bit	Ventilation	Step limiting
...			

Parameters

The default setting for the values is **printed in bold type**.

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General:

– Ventilation at bus failure	OFF Step 1 Step 2 Step 3
– Valves at bus voltage failure (Channels E_F)	OFF Cool Heat
Only if step limiting is enabled:	
– Step limiting at bus recovery	active inactive
Only if forced position is enabled:	
– Forced position at bus recovery	active inactive

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Ventilation:

– Factor delay time of step switching	4
– Threshold OFF -> step 1	1 % / 10 % / 20 % / 30 %
– Threshold step 1 -> 2	10 % / 20 % / 30 % / 40 % / 50 % / 60 % / 70 % / 80 % / 90 %
– Threshold step 2 -> 3	30 % / 40 % / 50 % / 60 % / 70 % / 80 % / 90 %

Note: threshold step 2->3 must be higher than threshold step 1->2
Threshold step 1->2 must be higher than OFF->step 1

Step limiting:

– Step limiting	yes / no
Only if “yes” is selected:	
– Maximum step at step limiting	Step 1 Step 2

Forced position:

– Forced position	yes / no
Only if “yes” is selected:	
– Behaviour at forced position	OFF Step 1 Step 2 Step 3

Fault alarm:

– Fault alarm	yes / no
Only if “yes” is selected:	
– Monitoring time fault report	4 min / 12 min / 24 min / 50 min
– Behaviour at fault signal	OFF Step 1 Step 2 Step 3

ABB i-bus® EIB

Switch Actuator, 6-fold, 10 A, MDRC
AT/S 6.6.1, GH Q631 0023 R0111

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