ABB i-bus® EIB

Universal Concentrator, 32-fold, MDRC
UK/S 32.1, GH Q631 0026 R0111

The universal input/output device is a DIN rail mounted device for insertion in the distribution board. It is connected to the EIB via a bus connecting terminal.

The device has 32 freely programmable inputs/outputs, each with a terminal for the connection of floating contacts or signal lamps.

It is therefore possible for example to control operating or display panels.

The device requires an additional external power source which also serves as a reference potential for the inputs/outputs (see also Chapter 1: System components/accessories).

The channels that are used by the inputs are available for switching, dimming or for shutter control. The channels that are used by the outputs can switch signal lamps or LEDs either normally, inverted or make them flash.

Technical Data

Power supply	– EIB	24 VDC, via the bus line
	– Auxiliary power supply	Nominal values: 12 / 24 VDC Permitted range: 10 … 30 VDC
	– Max. current under full load	2.8 A
Inputs/outputs	– 32	can be assigned as inputs or outputs
	– Permitted cable length	≤ 10 m
	– Scanning voltage of the inputs	12 / 24 VDC
	– Signal level of the outputs	same as auxiliary voltage (for 1 signal)
	– Output current	max. 80 mA per output
	– Load types at the outputs	resistive
Connections	– EIB	Bus connecting terminal included with supply
	– Inputs/outputs	2 plug connectors each with 16 screw terminals Wire range 0.14 … 1.0 mm²
	– Auxiliary voltage	1 plug connector with 2 screw terminals Wire range 0.14 … 1.0 mm²
Operating and display elements	– LED and push button	for assigning the physical address
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, pro*M*	
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	– 0.16 kg	
Certification	– EIB-certified	
CE norm	– in accordance with the EMC guideline and the low voltage guideline	

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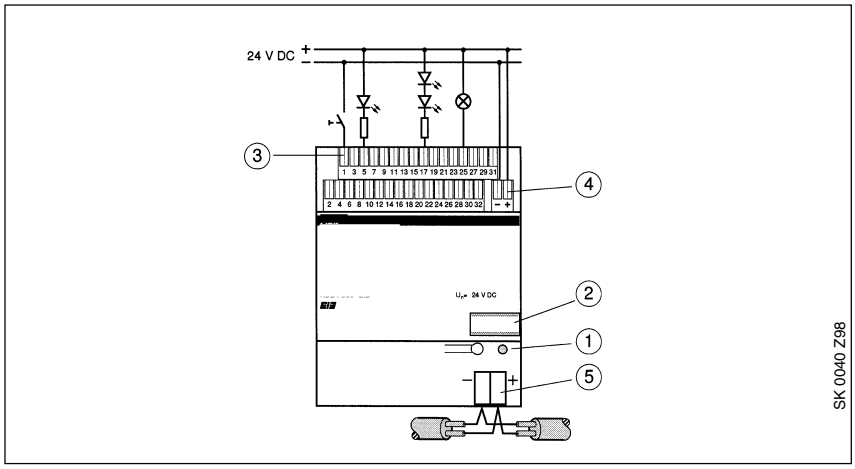
Application programs	Number of communication objects	Max. number of group addresses	Max. number of associations
Switch Edge Dim Shutter Value Cyclic /1	67	250	250

Wiring diagram



1 Programming LED
2 Designation plate
3 Input/output contacts
4 Connection for auxiliary supply
5 Bus connecting terminal

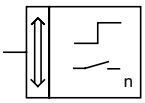
Note

If the LEDs glow faintly in the OFF state with a 24 V auxiliary supply, it is possible to avoid this by reducing the voltage to 12 V.

When connecting the display and operating elements to the universal I/O device, ESD (Electro Static Discharge) protective measures should be observed. It is sufficient for the electrician to discharge at earth potential before beginning the installation.

In order to avoid electrostatic discharges at the device during normal use, there should be no direct contact with any conductive components that are linked with the input or output terminals of the device.

Switch Edge Dim Shutter Value Cyclic /1



Selection in ETS2

– ABB
  └In/Output
    └Binary/binary

The application program can provide up to 67 communication objects, depending on the settings selected in the parameters. Due to the large number of communication objects and parameters, the program memory is clearly larger than that of many other devices. It therefore takes several minutes to load the parameters.

Channels 1 to 32 can be individually selected as inputs or outputs. Channels which are parameterised as outputs each use one communication object whereas channels that are parameterised as inputs have one or two objects. If a channel does not have a function, ETS2 does not display any objects for this channel.

Channels that are used as outputs can control signal lamps or LEDs (see “Switch”). Channels that are used as inputs can send switching telegrams (see “Edge”), dimming telegrams (see “Dim”), shutter control telegrams (see “Shutter”) or 1 byte value telegrams (see “Value”).

To avoid an excessive bus load, the following rules should be noted:
The repetition intervals for the cyclical sending of telegrams should be as long as possible and channel 32 should be used for monitoring the auxiliary voltage. This monitoring function also prevents the switching on and off of the auxiliary voltage from being evaluated as a reaction at the inputs.

After programming the device, the status of the display driver must be defined uniquely with an ON or OFF telegram.

Higher-level functions

Channel 32 is of particular importance. If its parameter “Function” is set to “none”, it is used internally for monitoring the auxiliary supply. If the auxiliary supply fails, object no. 31 “Telegr. aux. voltage fault” sends a telegram with the value “1”. All the channels that are used as inputs are blocked. Approximately 1 second after the auxiliary supply has been restored, the value of the object is set to “0” and the inputs are enabled again. If channel 32 is used as an input or an output, the auxiliary supply is not monitored.

Objects with nos. 64 to 66 have special functions that cannot be parameterised.

If object no. 64 “Lamp test” receives the value “1”, all the output channels switch on. If the object value is “0”, the outputs switch according to their parameter settings and their own object values.

If the bus voltage fails, the values of the communication objects and the internal data is saved for a certain period (20 s ... 5 min). Once the bus voltage has been restored, the device checks whether any data has been lost.

If no data loss has occurred, all the communication objects maintain their values and the time delays are extended by the duration of the bus voltage failure.

As soon as a data loss is detected, all the communication objects are set to the value “0” and all the outputs are set to their parameterised values.

Object no. 65 “Output fault” is used to detect and display faulty or short-circuited outputs. Every time there is a change in one of the outputs, the function is checked by an internal status display of the same input channel. If this status display fails to appear for more than 3 seconds, the object “Output fault” sends a telegram with the value “1”

If object no. 66 “Block inputs” has the value “1”, the inputs are disabled. If it has the value “0”, the inputs are enabled again after approx. 1 second. As an alternative to using a communication object to block the inputs, it is also possible to block them using a switch between input terminal 32 and the minus terminal of the auxiliary supply provided that input 32 is being used to monitor the auxiliary supply. If both object no. 66 and input 32 are being used to block the inputs, input 32 has priority.

Switch

The ETS2 program displays a communication object with the function “Display driver” for all the channels that are assigned the function of “Display driver”. Depending on the value of the object, it is possible to set whether a connected lamp should be switched on or off or should flash with one of three selectable frequencies.

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Edge

Channels that are assigned parameters as inputs with the function “switch sensor”, can be linked with switch or push button contacts. It is possible to set the reaction to rising edges (close) or falling edges (open), depending on the contact type.

If the function “Cyclic sending” is activated, the repetition rate can be set using the two parameters “Factor” and “Time base”.

Dim

ETS2 displays two communication objects for the channels that are parameterised as “switch/dimming sensors”.

If an input is to be used for dimming, the parameter “Contact type” must be set to “normally open contact” or “normally closed contact”.

The 1 bit communication object sends a switching telegram after a short operation. The value of the telegram is determined by the parameter “Reaction to short signal”. After a long operation, the 4 bit communication object sends a dimming telegram. The value of the telegram is set in the parameter “Reaction on long signal”.

The default settings are selected so that two channels can be used together. The input with the uneven channel number switches off or dims down and the input with the even number switches on or dims up. If the parameter “Reaction to short signal” is set to “TOGGLE” and the parameter “Reaction to long signal” is set to “Dim up/down ...”, a single push button contact is enough to be able to switch on or off and dim up or down. This corresponds to the function of a conventional touch dimmer.

Normally the start/stop process is used for dimming which means that after a long operation, the input object sends a telegram with the command “Dim up (or down)”. Once the operation has finished, the object sends a stop telegram. According to the EIB Interworking Standard, the object can also send telegrams for dimming step-by-step. In this case, it is also necessary to indicate the time for automatic repetition of the telegrams for stopping and the size of the dimming steps.

Shutter

ETS2 displays two communication objects for the channels that are parameterised as “shutter sensors”.

If an input is to be used for shutter control, the parameter “Contact type” must be set to “normally open contact” or “normally closed contact”.

The default settings are selected so that two channels can be used together. The input with the uneven channel number lowers the shutter while the input with the even number raises the shutter.

The input also distinguishes between a long and short operation during shutter control. There are two basic operating methods depending on the project and customer requirements :

– short operation for stopping and step-by-step lamella adjustment, long operation for raising or lowering the shutters completely

– short operation for raising or lowering the shutters completely, long operation for stopping and step-by-step lamella adjustment.

The two parameters “Reaction on short signal” and “Reaction on long signal” must be set according to these two options. If the long signal is used for lamella adjustment, it can also be repeated cyclically. The interval for repeating the telegram and the operating time of the relay in the controlled actuator should therefore match.

The simultaneous selection of the settings "raise shutter" and "lower shutter" for the parameters "Reaction on short signal" and "Reaction on long signal" should be avoided in principle.

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Value

Channels that are parameterised with the function “Send value (EIS 6)”, can either be linked with switch or push button contacts. ETS2 displays a 1 byte communication object for each of these channels for the rising edge (close contact) and one object for the falling edge (open contact).

The parameters “Reaction on rising edge” or “Reaction on falling edge” can be set according to the connected contact.

If the parameter is set to “Initial value ...”, the communication object always sends telegrams with the value that has been assigned in the parameters. If the parameter is set to “Object value ...”, the value can be changed externally by another telegram. It is therefore possible for example to adapt predefined brightness values at a later stage without having to recommission the device.

If the function “Cyclic sending” is activated, the repetition rate can be set separately for the reaction to rising or falling edges using the two parameters “Factor” and “Time base”.

If the settings "send initial value" and "send initial value cyclically" are selected in the parameters, the read flag must be removed for the associated channel object.

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Communication objects
for setting “no function” for channels 1 ... 32

No.	Type	Object name	Function
31	1 bit	32: Input (EIS 1)	Telegr. aux. voltage fault
64	1 bit	Input telegr.	Lamp test
65	1 bit	Output fault	Telegr. switch
66	1 bit	Input telegr.	Block inputs

Communication objects
for setting “display driver” for channels 1 ... 32

No.	Type	Object name	Function
0	1 bit	01: Display driver	Display driver
1	1 bit	02: Display driver	Display driver
…			
31	1 bit	32: Display driver	Display driver
…			

Communication objects
for setting “switch sensor” for channels 1 ... 32

No.	Type	Object name	Function
0	1 bit	01: Switch sensor	Telegr. switch
1	1 bit	02: Switch sensor	Telegr. switch
…			
31	1 bit	32: Switch sensor	Telegr. switch
…			

Communication objects
for setting “switch/dimming sensor” for channels 1 ... 32

No.	Type	Object name	Function
0	1 bit	01: Dimming sensor	Telegr. switch
1	1 bit	02: Dimming sensor	Telegr. switch
…			
31	1 bit	32: Dimming sensor	Telegr. switch
32	4 bit	01: Dimming sensor	Telegr. relative dimming
33	4 bit	02: Dimming sensor	Telegr. relative dimming
…			
63	4 bit	32: Dimming sensor	Telegr. relative dimming
…			

Communication objects
for setting “shutter sensor” for channels 1 ... 32

No.	Type	Object name	Function
0	1 bit	01: Shutter sensor	Telegr. shutter Up-Down
1	1 bit	02: Shutter sensor	Telegr. shutter Up-Down
…			
31	1 bit	32: Shutter sensor	Telegr. shutter Up-Down
32	1 bit	01: Shutter sensor	Telegr. lamella adj./stop
33	1 bit	02: Shutter sensor	Telegr. lamella adj./stop
…			
63	1 bit	32: Shutter sensor	Telegr. lamella adj./stop
…			

Communication objects
for setting “send value (EIS 6)” for channels 1 ... 32

No.	Type	Object name	Function
0	1 byte	01: Input (rising edge)	Telegr. value
1	1 byte	02: Input (falling edge)	Telegr. value
…			
31	1 byte	32: Input (rising edge)	Telegr. value
32	1 byte	01: Input (falling edge)	Telegr. value
33	1 byte	02: Input (falling edge)	Telegr. value
…			
63	1 byte	32: Input (falling edge)	Telegr. value
…			

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

For channels 1 … 32:	
– Function	**none** display driver switch sensor switch/dimming sensor shutter sensor send value (EIS 6)
only for channel 32 with no function:	
– Monitoring of auxiliary voltage is activated	**NOTE**
for function “display driver”:	
– Object value = 0	ON **OFF** flash with approx. 0.5 Hz flash with approx. 1 Hz flash with approx. 2 Hz
– Object value = 1	**ON** OFF flash with approx. 0.5 Hz flash with approx. 1 Hz flash with approx. 2 Hz
– Initial value	ON **OFF** flash with approx. 0.5 Hz flash with approx. 1 Hz flash with approx. 2 Hz
for “switch sensor” function:	
– Reaction on rising edge	none **ON** OFF TOGGLE
– Reaction on falling edge	none ON **OFF** TOGGLE
– Cyclic sending	**no** if ON if OFF if ON and OFF
only for “ON and OFF”:	
– Settings apply for ON and OFF	**NOTE**
for cyclic sending:	
– Factor (5 … 255)	**20**
– Time base	100 ms **1 s** 10 s 1 min 10 min 1 h

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for function “switch/dimming sensor”:	
– Contact type	normally closed contact **normally open contact**
for uneven channel numbers:	
– Reaction on short signal	**OFF** ON TOGGLE
– Reaction on long signal	**dim down (stop telegram)** dim down (dimming steps) dim up (stop telegram) dim up (dimming steps) dim up/down (stop telegram) dim up/down (dimming steps)
only for even channel numbers:	
– Reaction on short signal	OFF **ON** TOGGLE
– Reaction on long signal	dim down (stop telegram) dim down (dimming steps) **dim up (stop telegram)** dim up (dimming steps) dim up/down (stop telegram) dim up/down (dimming steps)
– Input signal is interpreted as long from	0.4 s / **0.5 s** / 0.6 s / 0.8 s / 1.0 s / 1.2 s / 1.5 s / 2.0 s
only for dimming steps:	
– Telegram is repeated every	0.4 s / **0.5 s** / 0.6 s / 0.8 s / 1.0 s / 1.2 s / 1.5 s / 2.0 s
– Change of brightness	**100 %** / 50 % / 25 % / 12.5 % / 6.25 % / 3.12 % / 1.56 %
for “shutter sensor” function:	
– Contact type	normally closed contact **normally open contact**
only for uneven channel numbers:	
– Reaction on short signal	move shutter “DOWN” move shutter “UP” move shutter “UP” and “DOWN” **lamella adjustment “DOWN”** lamella adjustment “UP”
– Reaction on long signal	**move shutter “DOWN”** move shutter “UP” move shutter “UP“ and “DOWN” lamella adj. “DOWN”(cycl. sending) lamella adj. “UP” (cycl. sending) lamella adj. “UP” and “DOWN” (cycl. s.)
only for even channel numbers:	
– Reaction on short signal	move shutter “DOWN” move shutter “UP” move shutter “UP” and “DOWN” lamella adjustment “DOWN” **lamella adjustment “UP”**
– Reaction on long signal	move shutter “DOWN” move shutter “UP” move shutter “UP” and “DOWN” lamella adj. DOWN” (cycl. sending) **lamella adj. “UP” (cycl. sending)** lamella adj. “UP” and “DOWN” (cycl. s.)
– Input signal is interpreted as long	0.4 s / **0.5 s** / 0.6 s / 0.8 s / 1.0 s / from 1.2 s / 1.5 s / 2.0 s
only for cyclical sending:	
– Telegram is repeated every	0.4 s / **0.5 s** / 0.6 s / 0.8 s / 1.0 s / 1.2 s / 1.5 s / 2.0 s

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for function “send value (EIS 6)”:	
– Reaction on rising edge	**none** send initial value send initial value cyclically send object value send object value cyclically
– Initial value	**255**
only for cyclical sending:	
– Factor (5 … 255)	**20**
– Time base	100 ms **1 s** 10 s 1 min 10 min 1 h
– Reaction on falling edge	**none** send initial value send initial value cyclically send object value send object value cyclically
– Initial value	**255**
only for cyclical sending:	
– Factor (5 … 255)	**20**
– Time base	100 ms **1 s** 10 s 1 min 10 min 1 h

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