



## EFX IO84 Input/Output Module

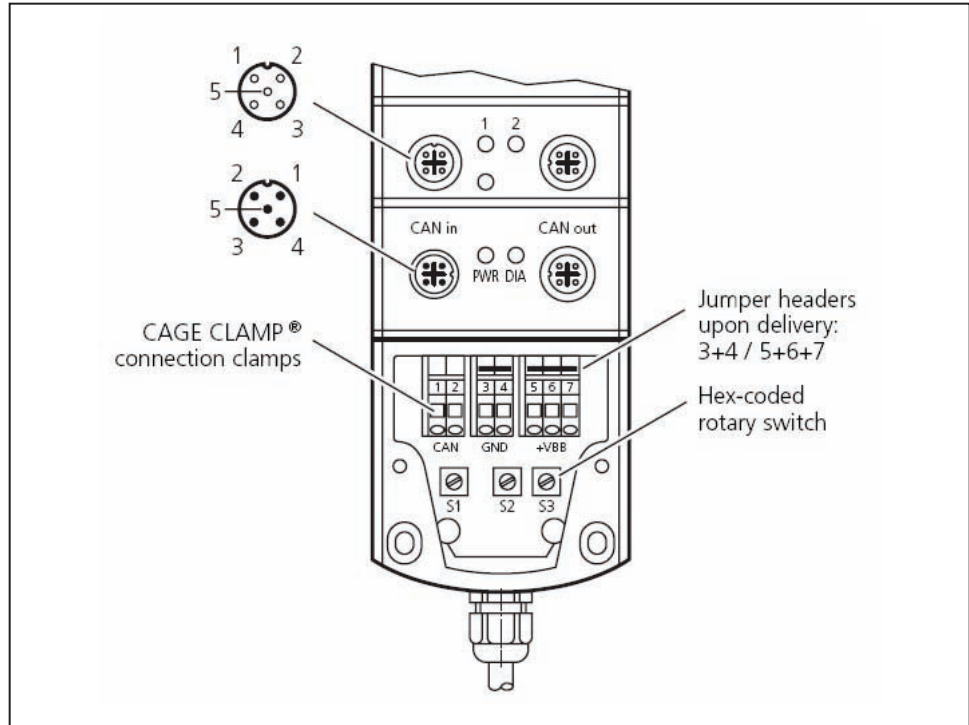
Input/Output expansion module for EFX Controllers

CANopen interface

Surface electrostatically coated (cathodic immersion) 10...32V DC

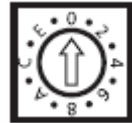
<b>TECHNICAL DATA</b>		<b>8 INPUTS (4 DIGITAL / 4 ANALOGUE) 4 OUTPUTS (DIGITAL OR PWM)</b>
<b>Housing</b>		Die-cast zinc housing with 8 outputs and terminal chamber surface electrostatically coated (cathodic immersion), black
<b>Dimensions (l x w x h)</b>		227 x 77 x 39 mm (without cable gland)
<b>Installation</b>		Screw connection by means of 3 M5 x l screws to DIN 912 or DIN 7984
<b>Connection</b>	Operating voltage and CAN bus	7-pole terminal strip with CAGE CLAMP <sup>®</sup> connection technology (2 x 2-pole / 1 x 3-pole) 0.08...4 mm <sup>2</sup> (AWG 28...AWG 12), nominal current 20 A Identical potentials can be linked using a jumper header (GND and UB potentials linked upon delivery) Cable entry via M16 cable gland
	Inputs/Outputs CANin/CANout	8 x M12 connector (socket), 5-pole 2 x M12 connector (plug/socket), 5-pole
<b>Weight</b>		1.2 kg
<b>Inputs</b>	can be configured as	8 4 digital, positive-switching (high side) 4 analogue, 0...10/32 V, 0/4...20 mA, ratiometric or digital, positive-switching
<b>Sensor supply I<sub>max</sub></b>		400 mA
<b>Outputs</b>	can be configured as switching current per output total current	4 digital, positive-switching (high side), with diagnostic capability PWM channel max. 4 A max. 16 A
<b>Operating voltage U<sub>b</sub></b>		10...32 V DC
<b>Current consumption</b>		≤ 50 mA (without external load at 24 V DC)
<b>Operating temperature</b>		- 40...85 °C
<b>Storage temperature</b>		- 40...85 °C
<b>Protection</b>		IP 67
<b>Interface</b>		CAN interface 2.0 B, ISO 11898
<b>Baud rate</b>		20 Kbits/s...1 Mbit/s (default setting 125 Kbits/s) (adjustable using hex-code switches in the terminal chamber or via the CANopen object directory)
<b>Communication profile</b>		CANopen, CiA DS 301 version 4, CiA DS 401 version 2.1
<b>Node ID (default)</b>		hex 20 (= dec 32) (adjustable using 2 hex-code switches in the terminal chamber or via the CANopen object directory)
<b>Displays</b>		1 LED green (PWR) 1 LED red (diagnosis, DIA) 8 LEDs yellow (status of the inputs / outputs)

Connecting and operating elements



Hex-code switch coding

Switch	Position	Description
S1 Baud rate	0	1000 Kbits/s
	1	800 Kbits/s
	2	500 Kbits/s
	3	250 Kbits/s
	4	125 Kbits/s
	5	100 Kbits/s
	6	50 Kbits/s
	7	20 Kbits/s
S2 Node ID <sub>H</sub>	8..E	not defined
	F	adjustment via object directory (default)
S3 Node ID <sub>L</sub>	0..7	high nibble, e.g. 20 hex (= 32 dec) adjustment via object directory (default)
	8..E	low nibble, e.g. 20 hex (= 32 dec) adjustment via object directory (default)



Operating states (LEDs)

LED	Status	Description
PWR (green)	OFF	no supply voltage
	ON	module in stand-by mode CANopen status: PREOPERATIONAL / PREPARED outputs = OFF
DIA (red)	OFF	module active
	ON	communication disturbed CANopen status: OPERATIONAL outputs are updated <ul style="list-style-type: none"> <li>node guard / heartbeat error (if node guarding / heartbeat is activated)</li> <li>no synch objects (if synch monitoring is activated)</li> </ul>
IN (yellow)	ON	output switched
OUT (yellow)	ON	binary output: output switched (ON) analogue output: PWM preset value ≠ 0 current preset value > 20

**EFX IO84****Characteristics of the outputs****Inputs**

Channel 1, 3, 5, 7 (pin 4)

■ Digital inputs	
Switch-on level	0.4...0.7 UB
Switch-off level	0.2...0.24 UB
Input resistance	3 kΩ
Input frequency	max. 1 kHz

**Channel 1...8 (pin 2)**

can be configured as ...

■ Analogue inputs (voltage, current or ratiometric)  
The analogue signals can be connected to the sockets 1, 3, 5, 7 or alternatively to the sockets 2, 4, 6, 8 (pin 2 of the sockets 1-2, 3-4, 5-6 and 7-8 linked).  
The LED (yellow) for the analogue input is on the socket side 1, 3, 5, 7.

Voltage inputs	
Input voltage	0...10/32 V
Resolution	10 bits
Input resistance	50/30 kΩ
Input frequency	50 Hz
Accuracy	± 1 % FS

Current inputs	
Input current	0/4...20 mA
Resolution	10 bits
Input resistance	400 Ω
Input frequency	50 Hz
Accuracy	± 1 % FS

Ratiometric inputs for potentiometric transducers (e.g. joystick)

Function	$((U_{IN} - \frac{1}{2}UB) \div \frac{1}{2}UB) \times 1000 \text{‰}$
Value range	0...1000 ‰

Digital inputs	
Switch-on level	0.7 UB
Switch-off level	0.4 UB
Input resistance	30 kΩ
Input frequency	max. 50 Hz

**Outputs**

Channel 2, 4, 6, 8 (pin 4)

can be configured as ...

■ Semiconductor outputs, with diagnostic capability (wire break and short circuit) Channel 2, 4, 6, 8 (pin 4)  
short-circuit and overload protected can be configured as ...

Switching voltage	10...32 V DC
Switching current	max. 4 A
Total current max.	16 A

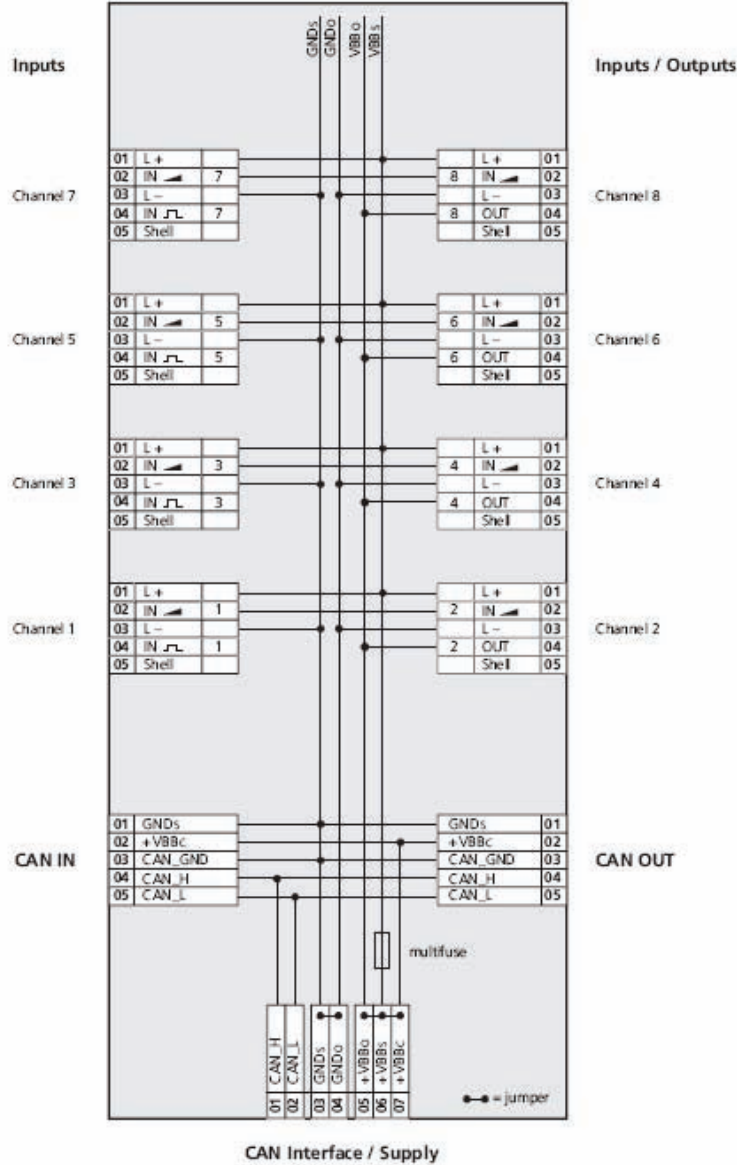
■ PWM outputs	
PWM frequency	20...250 Hz
Pulse duty factor	0...1000 ‰
Resolution	1 ‰
Switching current	max. 4 A (referred to PWM value 1000 ‰.)
Total current	max. 16 A

**Note**

also see wiring (following page)

**Test standards and regulations**

Climatic test	Damp heat to EN 60068-2-30, test Db ( $\leq 95\%$ rel. humidity, non-condensing), Salt mist test to EN 60068-2-52, test Kb, severity level 3, Protection test to EN 60529
Mechanical resistance	Vibration to EN 60068-2-6, test Fc, Shock to EN 60068-2-27, test Ea, Bump to EN 60068-2-29, test Eb
Immunity to conducted interference	to ISO 7637-2, pulses 2, 3a, 3b, severity level 4, function state A to ISO 7637-2, pulse 5, severity level 1, function state A to ISO 7637-2, pulse 1, severity level 4, function state C
Immunity to interfering fields	directive 95/54/EC at 100 V/m (e1 type approval) and DIN EN 61000-6-2 :2001 (CE)
Interference emission	directive 95/54/EC (e1 type approval) and DIN EN 61000-6-4 :2001 (CE)



**Abbreviations**

CAN<sub>H</sub> = CAN interface (high)  
 CAN<sub>L</sub> = CAN interface (low)

GND<sub>o</sub> = ground (output)  
 GND<sub>s</sub> = ground (module)

PWM = output for pulse-width modulated signals  
 VBBC = operating voltage (via CANin/  
 CANout plug)

VBB<sub>o</sub> = operating voltage (output)  
 VBB<sub>s</sub> = operating voltage (module)

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