

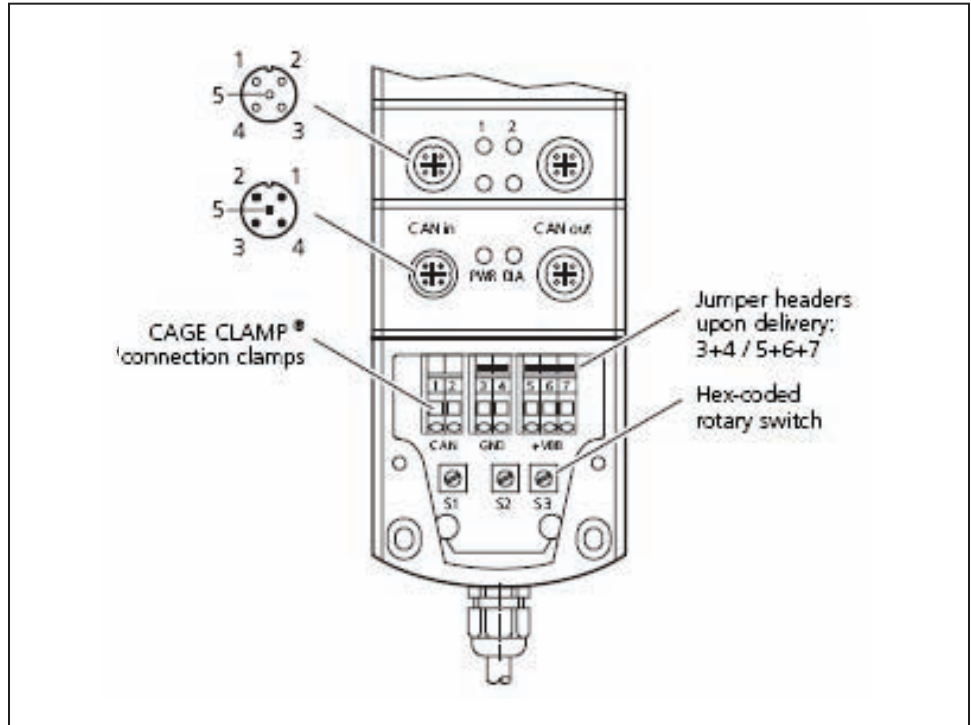


EFX IO88 Input/Output Module

Input/ Output expansion module for EFX Controllers
 CANopen interface
 Surface electrostatically coated (cathodic immersion) 10...32V DC

TECHNICAL DATA		8 INPUTS (4 DIGITAL / 4 ANALOGUE) 8 OUTPUTS (DIGITAL OR PWM)
Housing		Die-cast zinc housing with 8 outputs and terminal chamber surface electrostatically coated (cathodic immersion), black
Dimensions (l x w x h)		227 x 77 x 39 mm (without cable gland)
Installation		Screw connection by means of 3 M5 x l screws to DIN 912 or DIN 7984
Connection	Operating voltage and CAN bus	7-pole terminal strip with CAGE CLAMP [®] connection technology (2 x 2-pole / 1 x 3-pole) 0.08...4 mm ² (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
Weight		1.35 kg
Inputs	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
Sensor supply I_{max}		400 mA
Outputs	can be configured as switching current per output total current	8 digital, positive-switching (high side), with diagnostic capability PWM channel max. 2 A max. 16 A
Operating voltage U_b		10...32 V DC
Current consumption		≤ 60 mA (without external load at 24 V DC)
Operating temperature		- 40...85 °C
Storage temperature		- 40...85 °C
Protection		IP 67
Interface		CAN interface 2.0 B, ISO 11898
Baud rate		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)
Communication profile		CANopen, CiA DS 301 version 4, CiA DS 401 version 2.1
Node ID (default)		hex 20 (= dec 32) (adjustable using 2 hex-code switches in the terminal chamber or via the CANopen object directory)
Displays		1 LED green (PWR) 1 LED red (diagnosis, DIA) 16 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 _H	8..E	not defined
	F	adjustment via object directory (default)
S3 Node ID _L	0..7	high nibble, e.g. 20 hex (= 32 dec)
	F	adjustment via object directory (default)
	0..E	low nibble, e.g. 20 hex (= 32 dec)
	F	adjustment via object directory (default)



Operating states (LEDs)

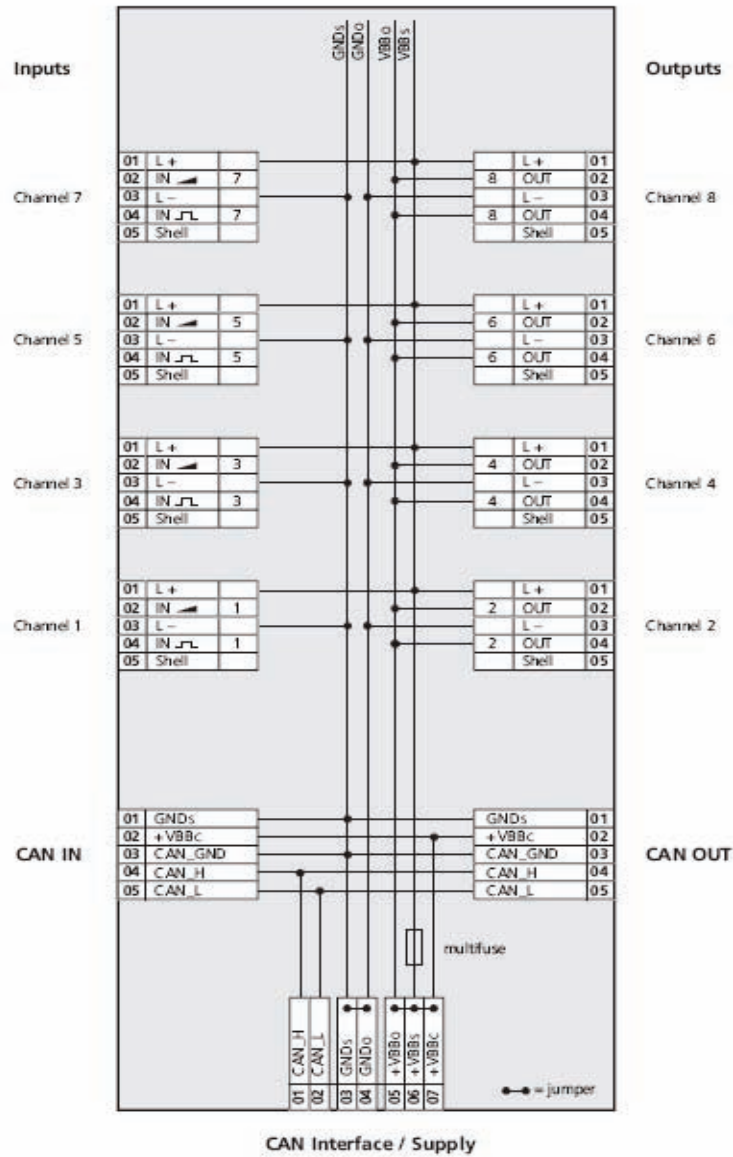
LED	Status	Description
PWR (green)	OFF	no supply voltage
	ON	module in stand-by mode CANopen status: PREOPERATIONAL / PREPARED outputs = OFF
	2.0 Hz	module active CANopen status: OPERATIONAL outputs are updated
	DIA (red)	OFF
	ON	communication disturbed <ul style="list-style-type: none"> node guard / heartbeat error (if node guarding / heartbeat is activated) no synch objects (if synch monitoring is activated)
	IN (yellow)	ON
	2.0 Hz	diagnosis failure
	OUT (yellow)	ON

EFX IO88**Characteristics of the outputs**

Inputs Channel 1, 3, 5, 7 (pin 4)	<ul style="list-style-type: none"> ■ Digital inputs Switch-on level 0.4...0.7 U_B Switch-off level 0.2...0.24 U_B Input resistance 3 kΩ Input frequency max. 1 kHz
Channel 1, 3, 5, 7 (pin 2) can be configured as ...	<ul style="list-style-type: none"> ■ Analogue inputs voltage, current, ratiometric or digital positive-switching <hr/> <p>Voltage inputs</p> <p>Input voltage 0...10/32 V</p> <p>Resolution 10 bits</p> <p>Input resistance 50/30 kΩ</p> <p>Input frequency 50 Hz</p> <p>Accuracy ± 1 % FS</p> <hr/> <p>Current inputs</p> <p>Input current 0/4...20 mA</p> <p>Resolution 10 bits</p> <p>Input resistance 400 Ω</p> <p>Input frequency 50 Hz</p> <p>Accuracy ± 1 % FS</p> <hr/> <p>Ratiometric inputs for potentiometric transducers (e.g. joystick)</p> <p>Function $((U_{IN} - \frac{1}{2}U_B) \div \frac{1}{2}U_B) \times 1000 \text{ ‰}$</p> <p>Value range 0...1000 ‰</p> <hr/> <p>Digital inputs, with diagnostic capability</p> <p>Switch-on level 0.7 U_B</p> <p>Switch-off level 0.4 U_B</p> <p>Input resistance 30 kΩ</p> <p>Input frequency max. 50 Hz</p>
Outputs Channel 2, 4, 6, 8 (pin 4) can be configured as ...	<ul style="list-style-type: none"> ■ 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. 2 A Total current max. 16 A <hr/> <ul style="list-style-type: none"> ■ PWM outputs PWM frequency 20...250 Hz Pulse duty factor 0...1000 ‰ Resolution 1 ‰ Switching current max. 2 A (referred to PWM value 1000 ‰.) Total current max. 16 A
Channel 2, 4, 6, 8 (pin 2) can be configured as ...	<ul style="list-style-type: none"> ■ 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. 2 A 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 (≤ 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_H = CAN interface (high)
 CAN_L = CAN interface (low)

GND_o = ground (output)
 GND_s = ground (module)

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

VBB_o = operating voltage (output)
 VBB_s = operating voltage (module)

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