

8EAC0134.000-1

1 General information

I/O plug-in module 8EAC0134.000-1 can be used in the slot of an ACOPOS P3 8EI servo drive. The plug-in module provides 10 digital inputs/outputs, 3 analog inputs and 3 analog outputs.

Digital inputs/outputs 1 to 8 can be configured individually; digital inputs/outputs 9 and 10 can be configured in pairs as inputs or outputs.

Up to 4 high-speed (push-pull) outputs with maximum current of 100 mA, 4 standard (high-side) outputs with maximum current of 400 mA and 2 slow (high-side) outputs with maximum current of 2 A are available.

The digital inputs/outputs are also equipped with an internal reverse current protection circuit:

Even if the input voltage on one of the digital I/O connections exceeds the value of the supply voltage on connections X41E/29 and X41E/30, they are protected against damage by the internal reverse current protection circuit.

Information:

The type of individual digital I/O connections is not predefined at the factory.

Before commissioning, configure the desired type (input or output) for each I/O connection in Automation Studio!

The analog inputs (± 10 V differential inputs) are equipped with a configurable high-performance filter.¹⁾

The analog outputs can be used as either current or voltage outputs.

Information:

The type of individual analog outputs connections is not predefined at the factory.

Before commissioning, configure the desired type (current or voltage output) for each analog output in Automation Studio!

2 Order data


Order number	Short description	Figure
	Plug-in modules	
8EAC0134.000-1	ACOPOS P3 plug-in module, 8 digital I/O 24 V (4x 400 mA, 4x 100 mA) individually configurable as inputs or outputs, 2 digital I/O 24 V 2 A configurable in pairs as inputs or outputs, 3 analog differential inputs, 14-bit, 3 analog outputs, 12-bit, individually configurable as current or voltages outputs, order terminal block 8TB0230.221A-00 separately!	
	Required accessories	
	Terminals	
8TB0230.221A-00	30-pin push-in terminal block, 2-row, pitch: 2.54 mm, label 1: Numbered consecutively	

Table 1: 8EAC0134.000-1 - Order data

3 Technical data

Order number	8EAC0134.000-1
General information	
Module type	ACOPOS P3 plug-in module
B&R ID code	0xF038
Slot	Slot 1
Power consumption	Typ. 3 W

Table 2: 8EAC0134.000-1 - Technical data

¹⁾ Combination of slew rate and linear-phase low-pass filter. Configuration takes place in Automation Studio.

Order number	8EAC0134.000-1
Certifications	
CE	Yes
UKCA	Yes
UL	cULus E225616
KC	Power conversion equipment
	Yes
Inputs/Outputs	
Module-side connection	30-pin multipoint connector
Status indicators	None
Configuration of digital inputs/outputs	Input/Output 1 - 8: Individually configurable as inputs or outputs Input/Output 9 - 10: Configurable in pairs as inputs or outputs
Configuration of analog outputs	Individually configurable as current or voltage outputs
Incremental encoders ¹⁾	
Counter size	16-bit
Input frequency	Max. 125 kHz
Evaluation	4x
Signal form	Rectangle
Encoder monitoring	Yes
Counter frequency	Max. 500 kHz
Reference frequency	Max. 125 kHz
Distance between edges	Min. 0.64 µs
Inputs	
Input 1	Channel A
Input 2	Channel B
Input 3	Reference pulse R
Power supply ²⁾	
Reverse polarity protection	Yes
Power supply	
Minimum	18 VDC
Nominal	24 VDC
Maximum	30 VDC
Digital inputs ³⁾	
Quantity	Max. 10
Input current at 24 VDC	Inputs 1 - 8: Typ. 2.5 mA Inputs 9 - 10: Typ. 3 mA
Input filter	
Hardware	Inputs 1 - 8: No filter Inputs 9 - 10: Yes
Software	5.12 µs (default) Between 0 and 20.97 ms
Connection type	1-wire connections
Circuit	Sink
Input frequency ⁴⁾	Inputs 1 - 8: Max. 125 kHz Inputs 9 - 10: Max. 10 kHz
Switching threshold	
Low	≤5 V
High	≥15 V
Input voltage	
Maximum	Supply voltage
Electrical isolation	
Channel - ACOPOS	Yes
Channel - Channel	No
Switching delay ⁵⁾	
Digital input	Inputs 1 - 8: Approx. 1 µs Inputs 9 - 10: Typ. 34 µs
Event counters ¹⁾	
Signal form	Square wave pulse
Input frequency	Max. 125 kHz
Counter size	16-bit
Inputs	
Input 1	Counter 1
Input 2	Counter 2
Trigger inputs ⁶⁾	
Quantity	4
Channels	Digital I/O 5 - 8
Analog inputs ⁷⁾	
Quantity	3
Converter resolution	14-bit ⁸⁾
Open-circuit detection	Yes
Variants	Differential input
Electrical isolation	
Input - ACOPOS	Yes
Input - Input	No

Table 2: 8EAC0134.000-1 - Technical data

Order number	8EAC0134.000-1
Input signal	
Nominal	-10 to +10 V
Data output	Synchronous to 400 µs cycle of the servo drive
Input filter	Hardware: Third-order low-pass filter Software: Configurable high-performance filter ⁹⁾
Max. gain drift	±800 µV/°C
Max. offset drift	±300 µV/°C
Additional EMI noise ¹⁰⁾	±0.5% ¹¹⁾
Common-mode range ¹²⁾	-12 to +12 V
Common-mode rejection	Up to 1 kHz: 80 dB Starting at 1 kHz: -20 dB/dec
Basic accuracy ¹³⁾	±0.05% ¹⁴⁾
Digital outputs	
Quantity	Max. 10
Variant	Output 1 - 4: Push-pull transistor outputs Output 5 - 8: High-side transistor outputs Output 9 - 10: High-side transistor outputs
Connection type	1-wire connections
Readable outputs	Yes
Continuous current	Outputs 1 - 4: Max. 100 mA Outputs 5 - 8: Max. 400 mA Outputs 9 - 10: Max. 2 A
Peak short-circuit current	Outputs 1 - 8: Approx. 10 A, 0.5 µs Outputs 9 - 10: Max. 90 A, 800 µs
Switching frequency (resistive load) ¹⁵⁾	Outputs 1 - 4: Max. 125 kHz Outputs 5 - 8: Max. 10 kHz Outputs 9 - 10: Max. 100 Hz
Switching delay ¹⁶⁾	Outputs 1 - 8: <3 µs Outputs 9 - 10: 50 to 150 µs
Electrical isolation	
Output - ACOPOS	Yes
Output - Output	No
Switching voltage	
Nominal	≤Supply voltage
Protection	
Short-circuit proof	Yes
Overload-proof	Yes
Encoder emulation ¹⁾	
Switching frequency	Max. 125 kHz
Outputs	
Output 1	Channel A
Output 2	Channel B
Output 3	Reference pulse R
Analog outputs ¹⁷⁾	
Quantity	3
Variant	±10 V or 0 to 20 mA (switchable)
Converter resolution	12-bit ¹⁸⁾
Settling time on output change ¹⁹⁾	Voltage output 0 - 10 V: Max. 200 µs Current output 0 - 20 mA: Max. 300 µs
Output protection	Voltage output: Short-circuit proof typ. 30 mA
Load per channel	Voltage output: Load ≥ 1 kΩ Current output: Load ≤ 600 Ω
Max. gain drift	Voltage output: ±66 µV/°C Current output: ±360 nA/°C
Max. offset drift	Voltage output: ±110 µV/°C Current output: ±480 nA/°C (offset at 0 LSB: typ. 10 µA)
Basic accuracy ¹³⁾	
Voltage	±0.1% ¹⁴⁾
Current	±0.1% ¹⁴⁾
Electrical isolation	
Output - ACOPOS	Yes
Output - Output	No
Support	
Motion system	
mapp Motion	5.08.2 and higher
ACP10/ARNC0	5.08.2 and higher
Ambient conditions	
Temperature	
Operation	
Nominal	5 to 40°C
Maximum	55°C
Storage	-25 to 55°C
Transport	-25 to 70°C

Table 2: 8EAC0134.000-1 - Technical data

Order number	8EAC0134.000-1
Relative humidity	
Operation	5 to 85%
Storage	5 to 95%
Transport	Max. 95% at 40°C
Mechanical properties	
Dimensions	
Width	82 mm
Height	24 mm
Depth	103 mm
Weight	79 g

Table 2: 8EAC0134.000-1 - Technical data

- 1) Carry out wiring with shielded lines!
- 2) Carry out wiring for line lengths > 3 m with shielded lines!
- 3) When controlled by a push output or normally closed contact, the filter time should be increased to 655 µs in order to avoid disturbances from electromagnetic interference (EMI).
- 4) The maximum input frequency depends on the selected software function.
- 5) When controlled by a push output or normally closed contact, the switch-off time is extended depending on the length of the power supply cable since the line capacity is only discharged by the input current.
- 6) For additional technical data, see section "Digital inputs".
- 7) Carry out wiring with shielded lines! The measured value may temporarily deviate with cable lengths > 30 m when affected by electromagnetic interference (EMI).
- 8) The smallest measurable voltage change (voltage quantization) is typically 1.526 mV.
- 9) Combination of slew rate and linear-phase low-pass filter. Configuration takes place in Automation Studio.
- 10) During operation without high-performance filter.
- 11) Based on measured value 10 V.
- 12) Voltage of terminals + and - against GND
- 13) 25°C at the factory.
- 14) Based on the current measured value.
- 15) Outputs 1 to 8: The maximum switching frequency depends on the selected software function.
- 16) Without and with resistive load at continuous current.
- 17) Carry out wiring with shielded lines! The signal may temporarily deviate with cable lengths > 30 m when affected by electromagnetic interference (EMI).
- 18) The smallest configurable voltage change (voltage quantization) is typically 5.371 mV.
The smallest configurable current change (current quantization) is typically 5.86 µA.
- 19) With resistive load.

4 Pinout


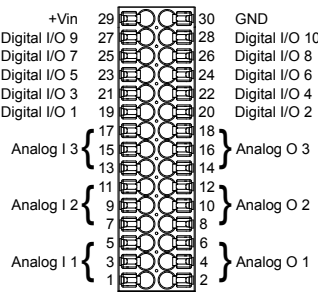
Figure	X41E	Pin	Description	Function			
				Incremental encoders / Encoder emulation	Event counter	Trigger	
		1	Analog I 1 -	Analog input 1 minus	---	---	---
		2	Analog O 1	Analog output 1	---	---	---
		3	Analog I 1 +	Analog input 1 plus	---	---	---
		4	GND	GND	---	---	---
		5	Shield	Shield	---	---	---
		6	Shield	Shield	---	---	---
		7	Analog I 2 -	Analog input 2 minus	---	---	---
		8	Analog O 2	Analog output 2	---	---	---
		9	Analog I 2 +	Analog input 2 plus	---	---	---
		10	GND	GND	---	---	---
		11	Shield	Shield	---	---	---
		12	Shield	Shield	---	---	---
		13	Analog I 3 -	Analog input 3 minus	---	---	---
		14	Analog O 3	Analog output 3	---	---	---
		15	Analog I 3 +	Analog input 3 plus	---	---	---
		16	GND	GND	---	---	---
		17	Shield	Shield	---	---	---
		18	Shield	Shield	---	---	---
		19	Digital I/O 1	Digital input/output 1	Channel A	Counter 1	---
		20	Digital I/O 2	Digital input/output 2	Channel B	Counter 2	---
		21	Digital I/O 3	Digital input/output 3	Reference pulse R	---	---
		22	Digital I/O 4	Digital input/output 4	---	---	---
		23	Digital I/O 5	Digital input/output 5	---	---	Trigger
		24	Digital I/O 6	Digital input/output 6	---	---	Trigger
		25	Digital I/O 7	Digital input/output 7	---	---	Trigger
		26	Digital I/O 8	Digital input/output 8	---	---	Trigger
		27	Digital I/O 9	Digital input/output 9	---	---	---
		28	Digital I/O 10	Digital input/output 10	---	---	---
		29	+Vin	External power supply +18 ... +30 VDC	---	---	---
		30	GND	External power supply 0 V	---	---	---
Terminal cross section			[mm²]	[AWG]			
Solid core / Multiple-conductor lines			0.14 - 0.5	26 - 20			
Flexible, multiple wire line							
Without wire end sleeves			0.14 - 0.5	26 - 20			
With wire end sleeves			0.14 - 0.25	26 - 24			
Approbation data							
UL/C-UL-US			---	26 - 20			
CSA			---	26 - 20			

Table 3: DIO/AIO interface 8EAC0134.000-1 - Pinout

Information:

The digital and analog inputs/outputs can only be used if voltage is supplied to the module via connectors X41E/29 and X41E/30.

Notice!

Reverse current protection for the digital inputs is only ensured if the module is supplied with voltage via connections X41E/29 and X41E/30.

Danger!

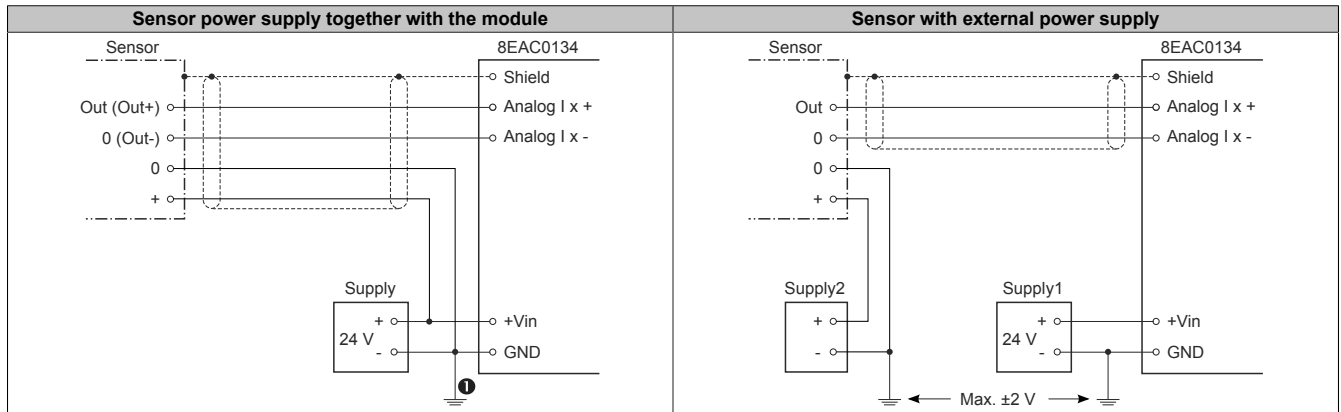
The digital inputs are isolated circuits. Therefore, only devices or components that have at least safe isolation per IEC 60364-4-41 or EN 61800-5-1 are permitted to be connected to these connections.

4.1 Wiring the analog inputs

The analog inputs are designed as balanced differential inputs. Both the + and - connections are high-impedance. This ensures that practically no input currents flow and thus no voltage drops occur on the signal lines. When connecting sensors without ground reference, however, it is important to ensure that their electric potential does not drift due to external couplings and the permissible common-mode voltage of the analog inputs is subsequently exceeded!

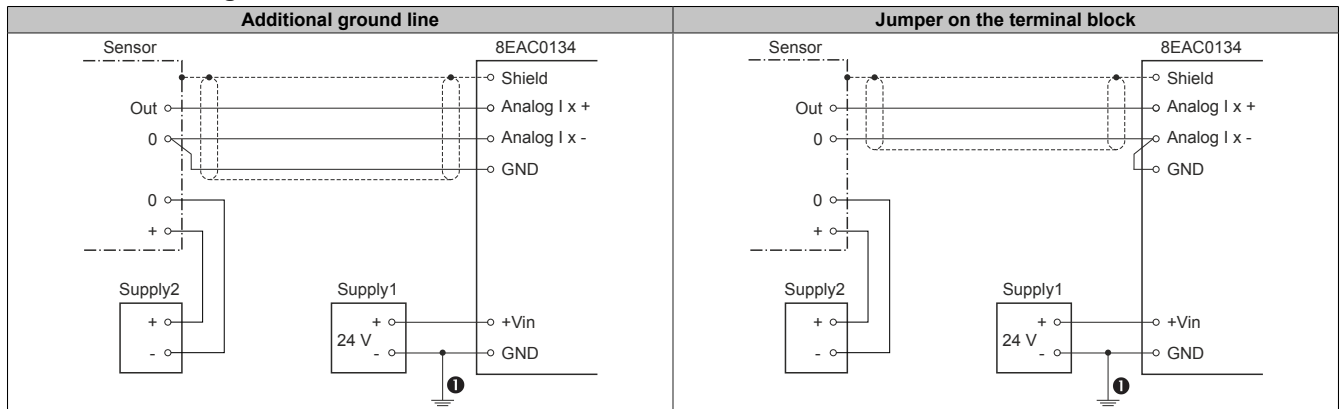
4.1.1 Connection examples

Sensors with ground reference



1) Grounding recommended

Sensors without ground reference



1) Grounding recommended

5 Input/Output circuit diagram

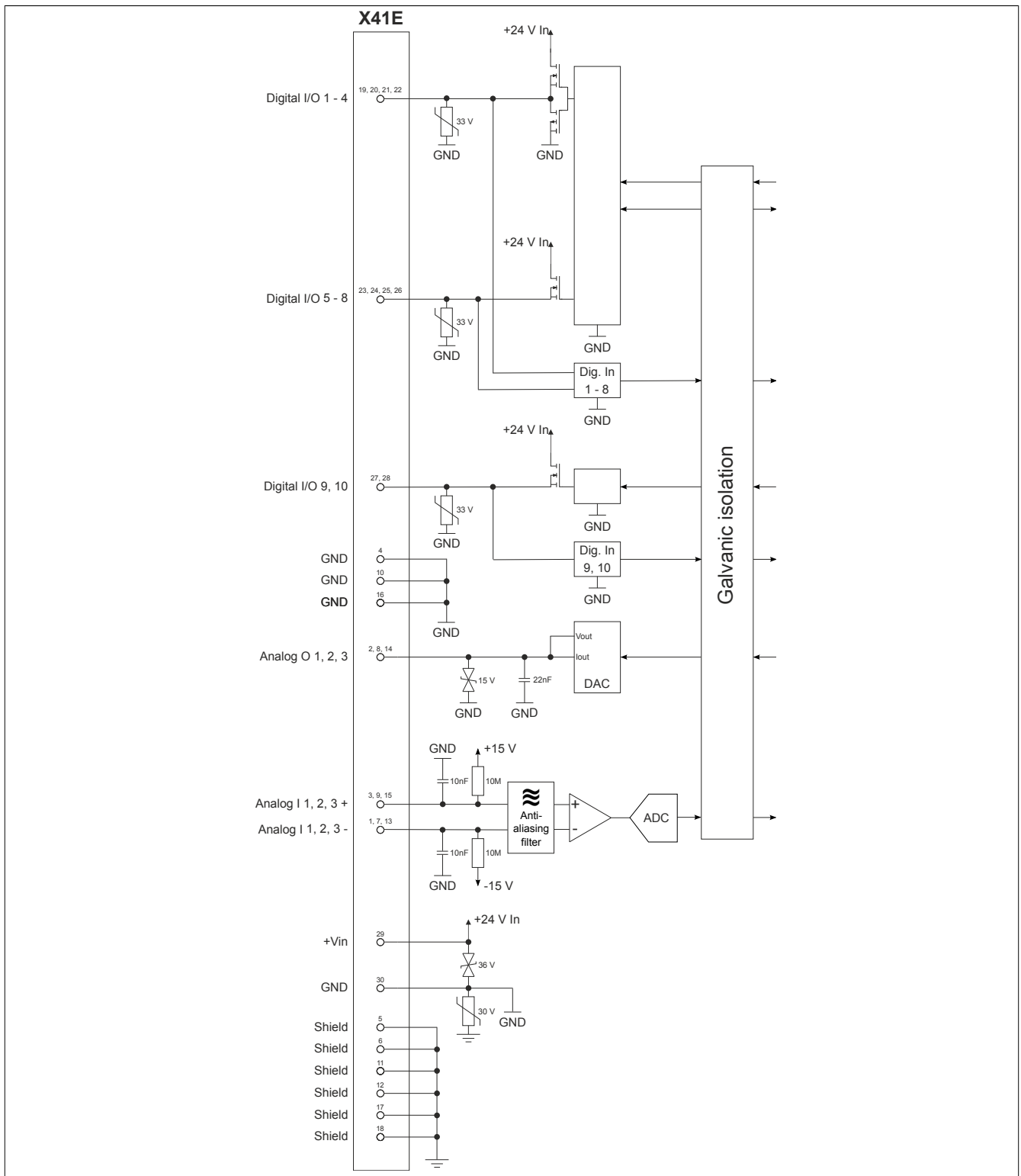


Figure 1: DIO/AIO interface 8EAC0134.000-1 - Input/Output circuit diagram