8AC121.60-1

1 General information

The AC121 plug-in module is equipped with a HIPERFACE encoder interface.

This module can be used to evaluate encoders installed in motors from other manufacturers as well as encoders for external axes (encoders that scan any machine movement). The input signals are monitored. This makes it possible to detect open or shorted lines as well as encoder supply failures.

During startup, the plug-in module is automatically identified, configured and its parameters set by the ACOPOS servo drive operating system.

HIPERFACE

HIPERFACE is a standard developed by Max Stegmann GmbH (www.stegmann.de), which like EnDat incorporates the advantages of absolute and incremental position measurement while also offering a read/write parameter memory in the encoder. With absolute position measurement (the absolute position is sampled serially), a homing procedure for referencing is usually not required. Where necessary, a multi-turn encoder (4096 revolutions) should be installed. To reduce costs, a single-turn encoder and a reference switch can also be used. In this case, a homing procedure must be carried out.
The incremental process allows the short deceleration periods necessary for position measurement when using drives with highly dynamic characteristics. The sinusoidal incremental signal and extremely high resolution in the HIPERFACE module also make it possible to achieve a very high degree of positioning precision despite the moderate signal frequencies used.
The parameter memory in the HIPERFACE encoder is available starting with firmware version V1.221.

2 Order data

Model number	Short description	Figure
	Plug-in modules	
8AC121.60-1	ACOPOS plug-in module, HIPERFACE interface	

Table 1: 8AC121.60-1 - Order data

3 Technical data

Product ID	8AC121.60-1
General information	
Module type	ACOPOS plug-in module
B&R ID code	0x1558
Slot [1)]	Slots 2, 3 and 4
Power consumption	
With encoder current consumption of 0 mA	0.35 W
With encoder current consumption of 100 mA	1.4 W
With encoder current consumption of 170 mA	2.1 W

Table 2: 8AC121.60-1 - Technical data

Product ID	8AC121.60-1
Certification	
CE	Yes
cULus	Yes
KC	Yes
Encoder inputs	
Quantity	1
Module-side connection	15-pin female DSUB connector, 2 pins closed
Status indicators	UP/DN LEDs
Electrical isolation	
Encoder - ACOPOS	No
Encoder monitoring	Yes
Max. encoder cable length	50 m [2]
Encoder supply	
Output voltage	8 to 9 V
Load capability	170 mA
Sense lines	- [3]
Sine/Cosine inputs	
Signal transmission	Differential signal, asymmetrical
Signal frequency	DC up to 200 kHz
Differential voltage	0.5 to 1.25 V_{ss}
Common-mode voltage	Max. ±7 V
Terminating resistor	120 Ω
Resolution [4]	16384 * number of encoder lines
Precision [5]	-
Serial interface	
Signal transmission	Asynchronous
Protocol	RS485
Baud rate	9600 baud
Environmental conditions	
Temperature	
Operation	
Nominal	5 to 40°C
Maximum	55°C
Storage	-25 to 55°C
Transport	-25 to 70°C
Relative humidity	
Operation	5 to 85%
Storage	5 to 95%
Transport	Max. 95% at 40°C

Table 2: 8AC121.60-1 - Technical data

1) The AC121 is a single encoder module. It is also possible to insert multiple encoder modules. In this case, the module in the slot with the lowest number is automatically used for motor feedback.
2) Requirements: The encoder is cabled using a shielded cable that has a wire cross section of at least 0.14 mm² for all signal lines and a wire cross section of at least 0.5 mm² for all encoder supply lines. The sense lines must be used.
3) No sense lines are present since the supply voltage for the HIPERFACE encoder is permitted to be between 7 and 12 V.
4) Noise on the encoder signal reduces the resolution that can be used by approx. 5 bits (factor of 32).
5) In practice, the precision is limited by the encoder.

4 Status indicators

The UP/DN LEDs are lit depending on the rotational direction and the speed of the connected encoder.

UP LED ... Lit when the encoder position changes in the positive direction.
DN LED ... Lit when the encoder position changes in the negative direction.

The faster the encoder position changes, the brighter the respective LED is lit.

5 Firmware

The firmware is part of the operating system for the ACOPOS servo drives. Firmware is updated by updating the ACOPOS operating system.

6 Wiring

6.1 Pinout

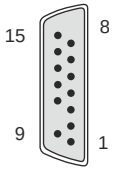
Figure	X11	Pin	Name	Function
		1	SIN	Channel SIN
		2	COM (1, 3 - 5, 9, 11, 13)	Encoder supply 0 V
		3	COS	Channel COS
		4	+8V out / 0.15A	Encoder supply +8 V
		5	D	Data
		6	---	---
		7	---	---
		8	---	--- [1)]
		9	REF SIN	Reference for SIN
		10	---	--- [1)]
		11	REF COS	Reference for COS
		12	---	---
		13	D\	Data inverted
		14	---	---
		15	---	---

Table 3: AC121 HIPERFACE encoder interface - Pinout

1) Pins 8 and 10 are closed with plastic plugs. This prevents the accidental connection of a B&R EnDat cable.

Danger!

The connections for the encoders are isolated circuits. These connections are therefore only permitted to be connected to devices or components that have sufficient isolation in accordance with IEC 60364-4-41 or EN 61800-5-1.

6.2 Input/Output circuit diagram

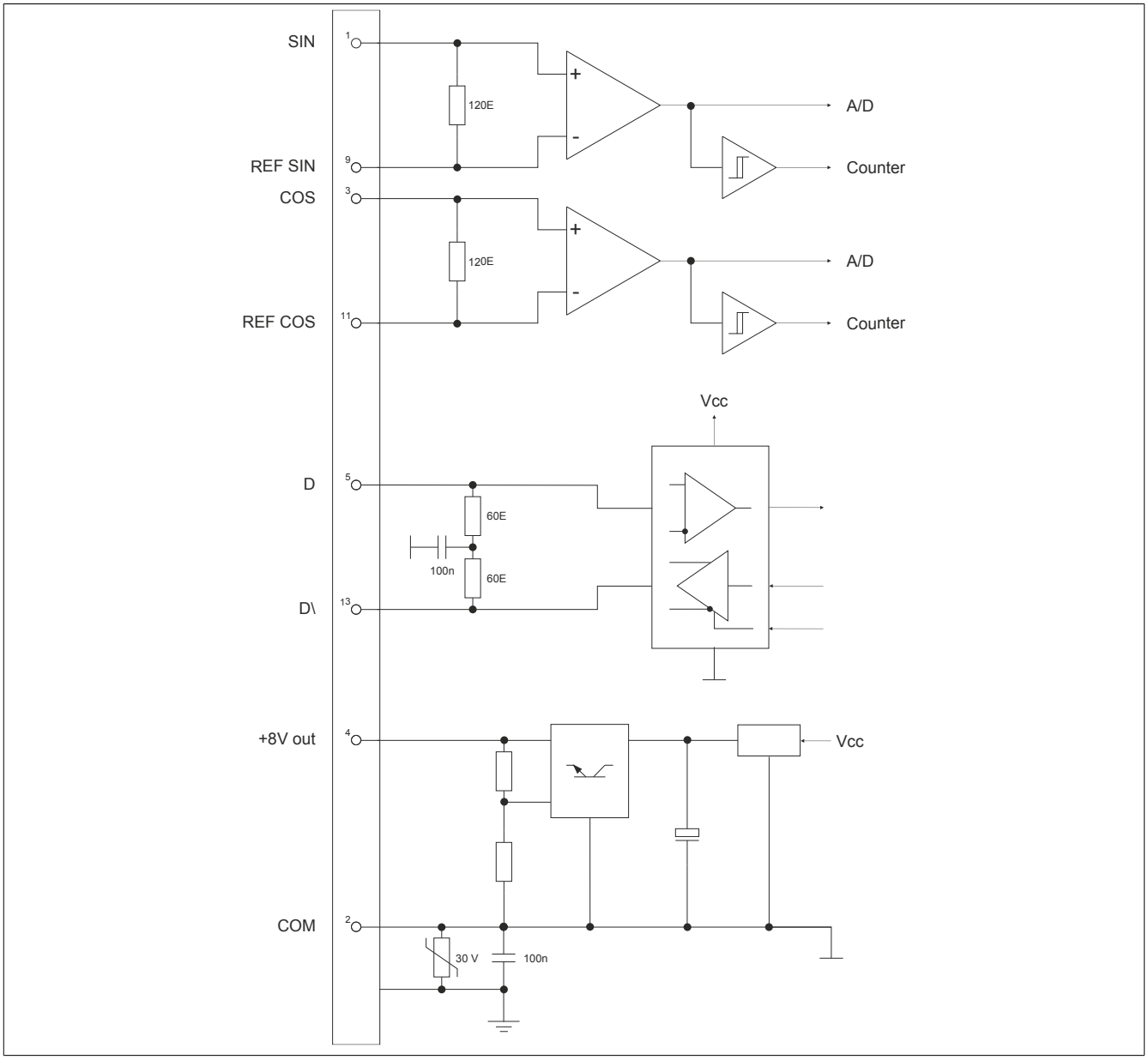


Figure 1: AC121 - Input/Output circuit diagram