

## 0.1 AC121 - HIPERFACE Encoder Interface

### 0.1.1 General Description

The AC121 plug-in module can be used in an ACOPOS slot. The module is equipped with a HIPERFACE encoder interface.

This module can be used to evaluate encoders which are built into OEM motors and also encoders for external axes (encoders that evaluate any machine movement). The input signals are monitored. In this way, broken connections, shorted lines and encoder supply failure can be recognized.

HIPERFACE is a standard developed by Max Stegmann GmbH ([www.stegmann.de](http://www.stegmann.de)), similar to EnDat, incorporating the advantages of absolute and incremental position measurement and also offers a read/write parameter memory in the encoder. With absolute position measurement (absolute position is read in serially), the homing procedure is usually not required. When necessary, a multi-turn encoder (4096 revolutions) should be installed. To save 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 delay times necessary for position measurement on drives with exceptional dynamic properties. With the sinusoidal incremental signal and the fine resolution in the HIPERFACE module, a very high positioning resolution is achieved in spite of the moderate signal frequencies used.

The parameter memory contained in the HIPERFACE encoder is currently not used by B&R. Therefore, the "embedded parameter chip" function is not available.

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

### 0.1.2 Order Data


Model Number	Short Description	Image
	<b>Plug-in Module</b>	
8AC121.60-1	ACOPOS plug-in module, HIPERFACE encoder interface	

Table 1: Order data for AC121

### 0.1.3 Technical Data

Product ID	8AC121.60-1
<b>General Information</b>	
C-UL-US Listed	Yes
Module Type	ACOPOS plug-in module
Slot <sup>1)</sup>	Slots 2, 3 and 4
Power Consumption	
With Encoder Current Req. of 0 mA	0.35 W
With Encoder Current Req. of 100 mA	1.4 W
With Encoder Current Req. of 170 mA	2.1 W
<b>Encoder Input <sup>2)</sup></b>	
Connection, Module Side	15 pin DSUB socket, 2 pins closed
Indication	UP/DN LEDs
Electrical isolation Encoder - ACOPOS	No
Encoder Monitoring	Yes
Encoder Supply	
Output Voltage	8 ... 9 V
Load	170 mA
Sense Lines	... <sup>3)</sup>

Table 2: Technical data for AC121

Product ID	8AC121.60-1
Sine-Cosine Inputs Signal Transfer Differential Voltage Common Mode Voltage Terminating Resistance Signal Frequency Resolution <sup>4)</sup> Precision <sup>5)</sup>	Differential signal, asymmetric 0.5 ... 1.25 V <sub>SS</sub> Max. ±7 V 120 Ω DC ... 200 kHz 16384 * number of encoder lines ---
Serial Interface Signal Transfer Baud Rate	Asynchronously RS485 9600 baud
Operational Conditions	
Environmental Temperature during Operation	0 to +50 °C
Relative Humidity during Operation	5 to 95 %, non-condensing
Storage and Transport Conditions	
Storage Temperature	-25 to +55 °C
Relative Humidity during Storage	5 to 95 %, non-condensing
Transport Temperature	-25 to +70 °C
Relative Humidity during Transport	95 % at +40 °C

Table 2: Technical data for AC121 (cont.)

- 1) The AC121 is an encoder module. Several encoder modules can also be inserted. In this case, the module in the slot with the lowest number is automatically used for motor feedback.
- 2) The HIPERFACE encoder must be wired using a cable with a single shield.
- 3) No sense lines are present because the supply voltage for the HIPERFACE encoder is permitted to lie 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) The precision is actually limited by the encoder.

### 0.1.4 Indication

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.

### 0.1.5 Firmware

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

## 0.2 AC121 - HIPERFACE Encoder Interface

### 0.2.1 Pin Assignments

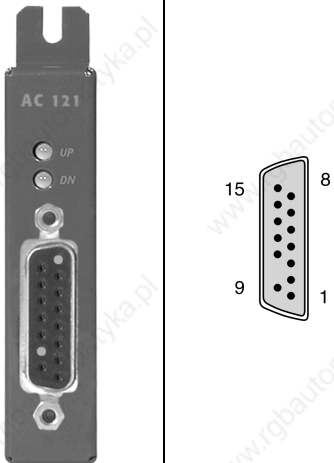
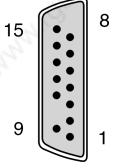
Image	X1	Pin	Description	Function
 <p>The image shows the AC 121 module on the left and a detailed view of the X1 connector on the right. The module has a top handle, two buttons labeled 'UP' and 'DN', and a D-sub connector. The X1 connector is a 15-pin D-sub connector with pins numbered 1 to 15. Pins 8 and 10 are marked with a '1)' indicating they are closed with plastic plugs.</p>	 <p>Diagram of the X1 connector showing 15 pins. Pins 8 and 10 are marked with a '1)' indicating they are closed with plastic plugs.</p>	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: Pin assignments for AC121 - HIPERFACE Encoder Interface

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