

# 8AC122.60-3

## 1 General information

The AC122 plug-in module can be used in an ACOPOS slot. The module is equipped with a resolver interface.

The plug-in module handles the output from resolvers which are built into B&R servo motors or used as an encoder for external axes. This resolver delivers the absolute position over one revolution. Normally, the movement path is longer than one revolution. In this case, a reference switch must be used and a homing procedure carried out.

The encoder input signals are monitored. In this way, broken connections, shorted lines and encoder supply failure (reference signal) can be recognized.

During start-up, the AC122 module is automatically identified by the ACOPOS operating system. Making automatic adjustments to the motor (motor parameters, limit values, encoder resolution, etc.) is not possible because the resolver does not have parameter memory like the EnDat encoder.

If the precision, resolution, bandwidth or ease of setting parameters is not sufficient with the resolver, the EnDat system should be used (see "AC120 - EnDat encoder interface").

## 2 Order data

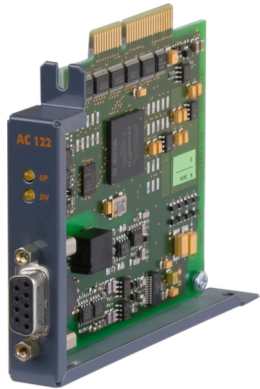
Model number	Short description	Figure
	<b>Plug-in modules</b>	
8AC122.60-3	ACOPOS plug-in module, resolver interface 10 kHz	
	<b>Optional accessories</b>	
	<b>Resolver cables</b>	
8CR005.12-1	Resolver cable, length 5 m, 3x 2x 24 AWG (19x 0.127), 12-pin female Intercontec resolver connector, 9-pin male DSUB servo connector, can be used in cable drag chains	
8CR007.12-1	Resolver cable, length 7 m, 3x 2x 24 AWG (19x 0.127), 12-pin female Intercontec resolver connector, 9-pin male DSUB servo connector, can be used in cable drag chains	
8CR010.12-1	Resolver cable, length 10 m, 3x 2x 24 AWG (19x 0.127), 12-pin female Intercontec resolver connector, 9-pin male DSUB servo connector, can be used in cable drag chains	
8CR015.12-1	Resolver cable, length 15 m, 3x 2x 24 AWG (19x 0.127), 12-pin female Intercontec resolver connector, 9-pin male DSUB servo connector, can be used in cable drag chains	
8CR020.12-1	Resolver cable, length 20 m, 3x 2x 24 AWG (19x 0.127), 12-pin female Intercontec resolver connector, 9-pin male DSUB servo connector, can be used in cable drag chains	
8CR025.12-1	Resolver cable, length 25 m, 3x 2x 24 AWG (19x 0.127), 12-pin female Intercontec resolver connector, 9-pin male DSUB servo connector, can be used in cable drag chains	

Table 1: 8AC122.60-3 - Order data

## 3 Technical data

Model number	8AC122.60-3
<b>General information</b>	
Module type	ACOPOS plug-in module
B&R ID code	0xA48B
Slot <sup>1)</sup>	Slots 2, 3 and 4
Power consumption	Max. 2.5 W
Max. cable length	100 m
Certifications	
CE	Yes
UL	cULus E225616
	Power conversion equipment
KC	Yes

Table 2: 8AC122.60-3 - Technical data

Model number	8AC122.60-3
<b>Resolver inputs</b>	
Reference output	
Output current	Max. 50 mA <sub>eff</sub>
Differential voltage	Typ. 3.4 V <sub>eff</sub>
Frequency	10 kHz
Signal transmission	Differential signals
Angular position resolution	14 bits/rev <sup>2)</sup>
Module-side connection	9-pin female DSUB connector
Status indicators	UP/DN LEDs
Bandwidth	2.5 kHz
Encoder monitoring	Yes
Accuracy	±8 angular minutes
Electrical isolation	
Resolver - ACOPOS	No
<b>Resolver</b>	
Input frequency	10 kHz
Input voltage	3 to 7 V <sub>rms</sub>
Number of pins	2-pin
Type	BRX <sup>3)</sup>
Max. phase shift	±45°
Max. elec. angular error	±10 angular minutes
Nominal transformation ratio <sup>4)</sup>	0.5 ±10%
<b>Sine/Cosine inputs</b>	
Input impedance at 10 kHz (per pin)	10.4 kΩ - j 11.1 kΩ
Signal transmission	Differential signals
Encoder-ACOPOS electrical isolation	No, common-mode voltage on the sine-cosine inputs max ± 20 V
<b>Ambient conditions</b>	
<b>Temperature</b>	
Operation	
Nominal	5 to 40°C
Maximum	55°C
Storage	-25 to 55°C
Transport	-25 to 70°C
<b>Relative humidity</b>	
Operation	5 to 85%
Storage	5 to 95%
Transport	Max. 95% at 40°C

Table 2: 8AC122.60-3 - Technical data

- 1) The AC122 is a single encoder module. It is also possible to insert multiple encoder modules. In this case, the encoder module in the slot with the lowest number is automatically used for motor feedback.
- 2) A resolution of 12 bits/rev is configured by default, but it can be changed to 14 bits/rev.
- 3) BRX resolvers are fed with a sine signal (reference signal) from the module and provide two sine signals with a 90° phase shift as a result. The amplitude of these signals changes with the angular position of the resolver. Unlike BRX resolvers, BRT resolvers can be fed with two sine signals which are offset by 90°. A single sine signal with constant amplitude is returned. The phase position of this signal changes with the angular position of the resolver. An evaluation of BRT resolvers with the 8AC122.60-3 is fundamentally possible starting with firmware V2.040; however, resolution and accuracy are limited by the inverse operation of the resolver. Additionally, the nominal conversion ratio deviates from the default value of 0.5 and must be configured accordingly.
- 4) Starting with firmware V2.040, the nominal gear ratio can be configured in the range 0.3 ... 0.5 (default value).  
Starting with firmware V2.230, the nominal gear ratio can be configured in the range 0.2 ... 0.5 (default value).

## 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

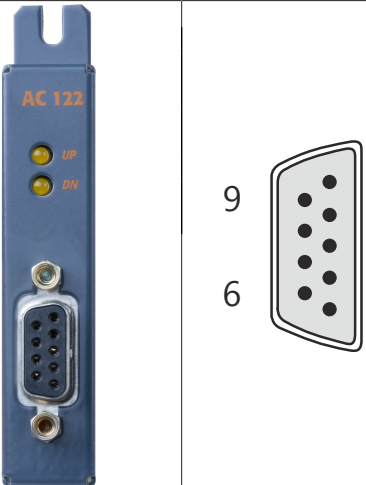
Figure	X11	Pin	Name	Function	Typical wire colors for the resolver
		1	---	---	---
		2	---	---	---
		3	S4	Sine input +	Blue
		4	S1	Cosine input -	Red
		5	R2	Reference output +	black/white (or yellow/white)
		6	---	---	---
		7	S2	Sine input -	Yellow
		8	S3	Cosine input +	Black
		9	R1	Reference output -	red/white

Table 3: AC122 resolver interface - Pinout

### 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

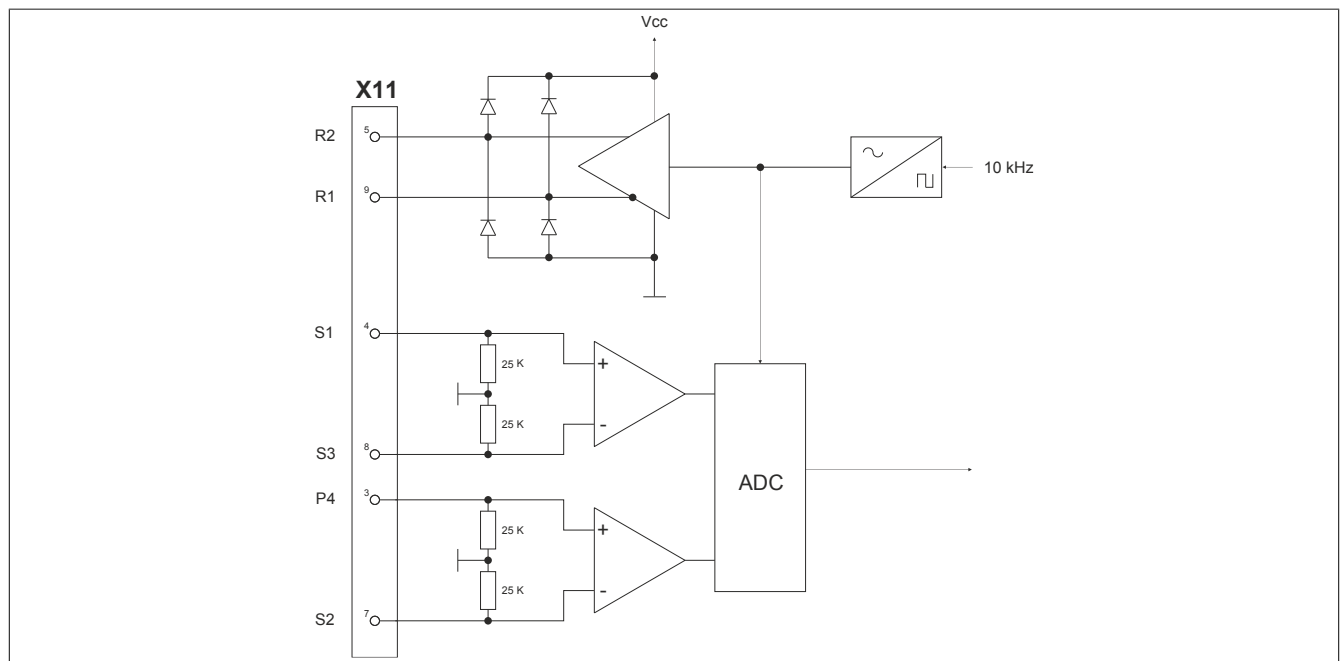


Figure 1: Input/Output circuit diagram AC122 - Resolver interface