

2.4 AC112 - ETHERNET Powerlink Interface

2.4.1 General Description

The AC112 plug-in module can be used in an ACOPOS slot. The module is equipped with an ETHERNET Powerlink interface. This fieldbus interface is used for communication and setting parameters on the ACOPOS servo drive for complex and time critical applications.

The plug-in module is set up as a 2x hub. This makes it easy to establish a device to device connection (line topology).

2.4.2 Order Data

Model Number	Short Description	Image
	Plug-in Module	
8AC112.60-1	ACOPOS plug-in module, ETHERNET Powerlink interface	

Table 21: Order data for AC112

2.4.3 Technical Data

Product ID	8AC112.60-1
General Information	
C-UL-US Listed	Yes
Module Type	ACOPOS plug-in module
Slot	Slot 1
Power Consumption	Max. 2.5 W

Table 22: Technical data for AC112

Product ID	8AC112.60-1
Powerlink Interface	
Connection, Module Side	2 x RJ45 socket
Indications	Status LEDs
Electrical Isolation ETHERNET - ACOPOS	Yes
Maximum Distance per Segment	100 m ¹⁾
Baud Rate	100 Mbit/s
Network Capable	Yes
Hub, 2x	Yes
Maximum Number of Hub Levels	10; see section 2 "ACOPOS™ Configurations" on Page 22
Cabling Topology	Star or tree with level 2 hubs
Possible Station Operating Modes	Synchronous to Powerlink cycle
Watchdog Function Hardware Software	Yes (via ACOPOS servo drive) Yes (via ACOPOS servo drive)
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 22: Technical data for AC112 (Forts.)

1) With a cycle time of 400 µs and 10 ACOPOS servo drives, the maximum total cable length is 200 m.

2.4.4 Powerlink Station Number Settings

The Powerlink station number can be set using two HEX code switches:

Image	Code switch	Powerlink station number
	●	16s position (high)
	●	1s position (low)
	<p>The Powerlink station number change takes effect the next time the ACOPOS servo drive is switched on.</p> <p>Information:</p> <p>In principle, station numbers between \$01 and \$FD are permitted. However, station numbers between \$F0 and \$FD are reserved for future system expansions. For reasons of compatibility, we recommend avoiding these station numbers.</p> <p>Station numbers \$00, \$FE and \$FF are reserved and are therefore not allowed to be set.</p>	

Table 23: Setting the Powerlink station number

2.4.5 Indications



Figure 13: Status LEDs AC112

The status is indicated on the AC112 using one green (❶) and one red LED (❷).

LED Test

Immediately after resetting the module, both LEDs are switched off for 0.5 s, then switched on for 1.5 s.

Then the green LED is cleared for one second and the following boot procedure. After proper initialization, the red LED is switched off and the green LED is switched on.

Status of the LEDs

The following timing is used for the indication diagram:

Block size: 150 ms

Status	LED	Display
Error-free operation	Green	[Solid Green]
	Red	[Solid White]
Fatal system error ¹⁾	Green	[Solid White]
	Red	[Solid Red]
Master has dropped out	Green	[Pulsing Green]
	Red	[Pulsing Red]
System stop ²⁾	Green	[Solid White]
	Red	See System Stop Error Codes

Table 24: Indication diagram for the AC112 status LEDs

- 1) This is a problem which cannot be repaired, the system can no longer carry out tasks correctly. This status can only be changed by resetting the module.
- 2) The red LED blinks an error code, the output of the error code occurs in 4 short (150 ms) or long (600 ms) phases.

System stop error codes

The following timing is used for the indication diagram:

Block size: 150 ms

Pause: 2000 ms

Error	Display																			
Stack overflow	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█
RAM error	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█
Undefined address ¹⁾	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█
Instruction fetch memory abort ²⁾	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█
Data access memory abort ³⁾	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█
Assertion failed ⁴⁾	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█
Programming failed ⁵⁾	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█

Table 25: System stop error codes

- 1) Access of non-existent address.
- 2) Invalid memory access during instruction fetch (e. g. WORD access of add numbered address).
- 3) Invalid memory access during data access (e. g. WORD access of add numbered address).
- 4) This system stop code only occurs in debug mode. The condition for a software assertion was not fulfilled.
- 5) Error during programming.

2.4.6 Firmware

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

6.2 AC112 - ETHERNET Powerlink Interface

6.2.1 Pin Assignments

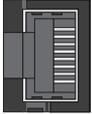
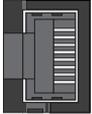
Image	X1	Pin	Description	Function	
		1	RXD	Receive Signal	
		2	RXD\	Receive Signal Inverted	
		3	TXD	Transmit Signal	
		4	Shield	Shielding	
		5	Shield	Shielding	
		6	TXD\	Transmit Signal Inverted	
		7	Shield	Shielding	
		8	Shield	Shielding	
		X2	Pin	Description	Function
		1	RXD	Receive Signal	
		2	RXD\	Receive Signal Inverted	
		3	TXD	Transmit Signal	
		4	Shield	Shielding	
		5	Shield	Shielding	
		6	TXD\	Transmit Signal Inverted	
		7	Shield	Shielding	
8		Shield	Shielding		

Table 111: Pin assignments for AC112 - ETHERNET Powerlink Interface

Information:

In general, crossover Ethernet cables must be used for ETHERNET Powerlink connections!

Take care when plugging the cable in and out because otherwise the shield connection could break between the RJ45 plug and the cable shield which could then cause connection disturbances!

Information:

ETHERNET Powerlink cables must have crossover pin assignments. Unassigned wires cannot be omitted.

6.2.2 Input/Output Circuit Diagram

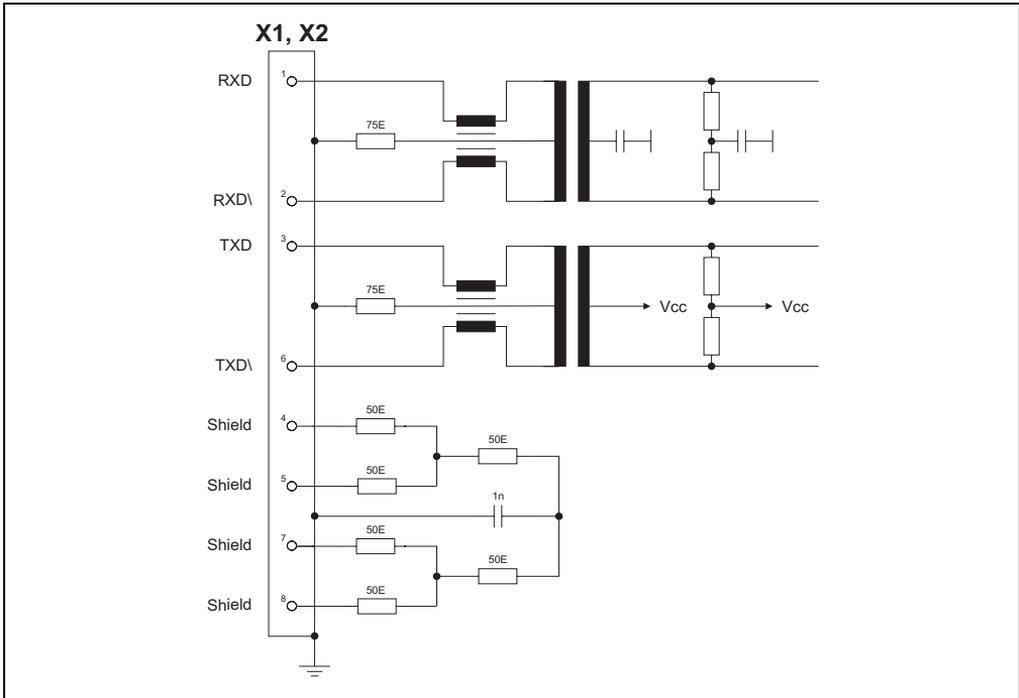


Figure 49: Input/Output Circuit Diagram AC112