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Multi-protocol bus interface for Industrial Ethernet

1 Overview

Frequency inverters of the NORDAC *PRO* series have a communication interface for Industrial Ethernet on board. This interface is based on NORD's new "multi-protocol hardware philosophy" and supports the PROFINET IO, EtherNet/IP, EtherCAT and POWERLINK dialects. The selection of a required dialect takes place via parameterisation during commissioning by the customer.

In connection with the CANopen-based system bus, which each NORD frequency inverter is equipped with, up to 7 additional frequency inverters can be connected to a frequency inverter with Industrial Ethernet interface and can be integrated into the communication. The frequency inverters integrated into the network do not require their own interface for Industrial Ethernet and therefore significantly contribute to cost savings.

2 Solution approach

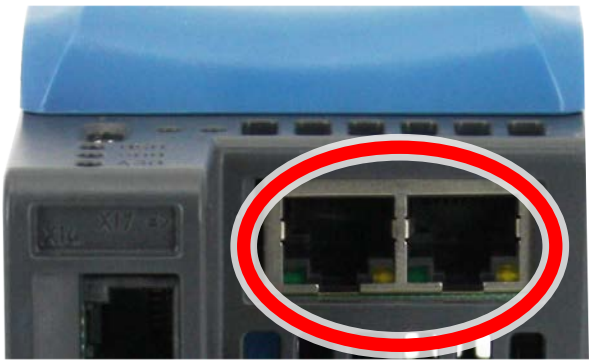
For the creation of a corresponding network and the integration into Industrial Ethernet, you will need the following devices:

- 1x SK 550P frequency inverter
- Up to 7x frequency inverters SK 500P and higher

3 Connections

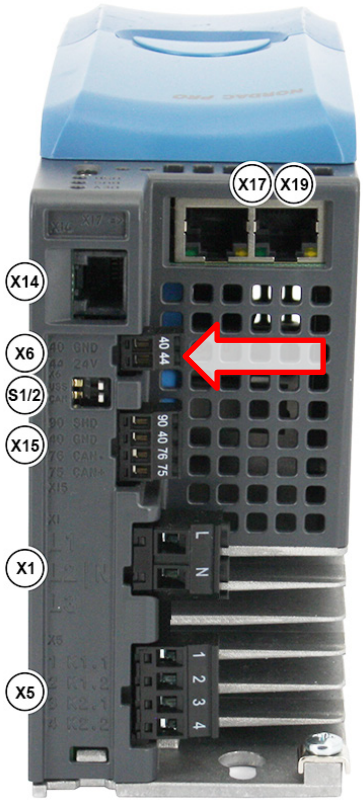
3.1 Industrial Ethernet

Connection to Industrial Ethernet is made via RJ45 plug connectors.



	RJ45 (1)	RJ45 (2)
PROFINET IO	Port 1	Port 2
Ethernet/IP	Port 1	Port 2
EtherCAT	IN	OUT
POWERLINK	Port 1	Port 2

Note that the interface requires additional 24-V-DC supply.



Terminal strip		Signal	Contact
X6	24 V DC	GND	40
		24 V	44

3.2 System bus connection via CANopen

The frequency inverter is connected to the system bus via X15 on each frequency inverter. It is possible to make the connection by wiring the respective contacts directly on the terminal strip of the device or via optional “SK TIE5-CAO-WIRE-2X4P” double terminals.

When using the SK TIE5-CAO-2X-RJ4 option, the connection is alternatively made via a standard patch cable.

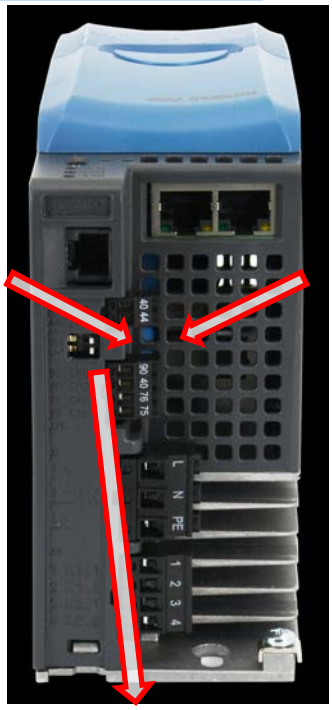
Direct wiring

Connection adapter

SK TIE5-CAO-WIRE-2X4P

Part number: **275 292 201**

Contact	Designation	Function
90	SHD	Cable shield
40	GND	Reference potential 0 V
76	CAN-	CAN_L CAN/CANopen signal
75	CAN+	CAN_H



Wiring via patch cable

Connection adapter

SK TIE5-CAO-2X-RJ45

Part number: **275 292 202**

Contact	Designation	Function
1	CAN_H	CAN/CANopen signal
2	CAN_L	
3	CAN_GND	Reference potential 0 V
4	n.c.	No function
5	n.c.	
6	CAN_SHLD	Cable shield
7	CAN_GND	Reference potential 0 V
8	CAN_24V	24 V DC potential

The terminating resistors for CAN [DIP S2] must be set correctly (default = “OFF”) before commissioning the communication via the system bus.

4 Parameterisation

Parameter		Frequency inverter settings (FI)							
No.	Designation	FI 1 [1)]	FI 2	FI 3	FI 4	FI 5	FI 6	FI 7	FI 8
P503	Leading func. output	Setting 4 = “Systembus active“							

P509	Source control word	8	6	6	6	6	6	6	6
P512	USS address	0	0	0	0	0	0	0	0
P513 [-03]	Telegram time-out	0.6 [s]							
P514	CAN bus baud rate	Setting 5 = “250 kbaud“							
P515	CAN bus address	32	34	36	38	40	42	44	46
P899	Change bus protocol	2)	- 3)	- 3)	- 3)	- 3)	- 3)	- 3)	- 3)

1) SK 550P required. Only this version has an interface for communication via Industrial Ethernet.

2) See the following table.

3) Not available

Parameter P899	
Selection	**Protocol**
0	No change
1	PROFINET IO
2	EtherCAT
3	EtherNet/IP
4	POWERLINK

1) After confirming the selection, the display jumps back to setting “0”.

Information

For the frequency inverters to adopt this configuration and addressing, they must be switched off entirely for 30 s after the configurations are complete.

5 Integration into the PLC

For smooth integration of the project into an automation system, NORD provides the device configuration files under the following link:

Device configuration files: Field bus files