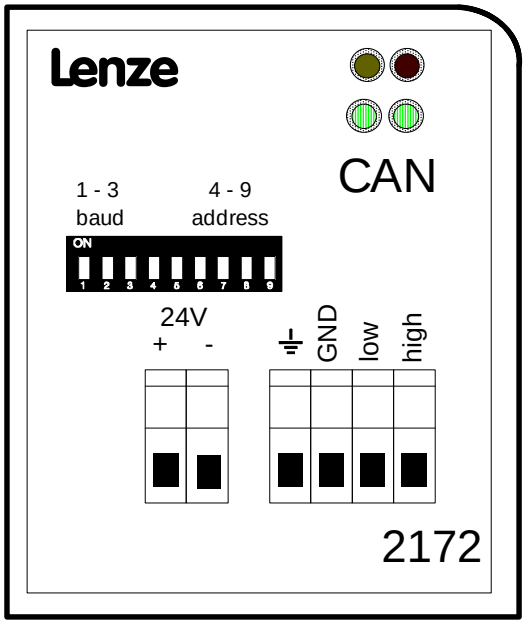
EDB2171UB
00417883

Lenze

Operating Instructions



Fieldbus module type 2171/2172

System bus (CAN)

These Operating Instructions are valid for fieldbus modules with the nameplate:

2170IB	0x.	0x
2171IB	1x.	1x
2172IB	1x.	1x

In connection with the unit series as from the nameplate data:

820X	E.	2x.	1x.		(8201 - 8204)
820X	E./C.	2x.	1x.	Vxxx	(8201 - 8204)
821X	E.	2x.	2x.		(8211 - 8218)
821X	E./C.	2x.	2x.	Vxxx	(8211 - 8218)
822X	E.	1x.	1x.		(8221 - 8225)
822X	E.	1x.	1x.	Vxxx	(8221 - 8227)
824X	E.	1x.	1x.		(8241 - 8246)
824X	E./C.	1x.	1x.	Vxxx	(8241 - 8246)
82EV		VA	0x		8200 vector
82EV		1x	0x		8200 vector

Type

Design:
E = Enclosure IP20
IB = Module

Hardware level and index

Software level and index

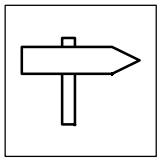
Version

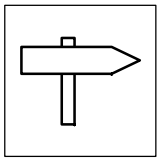
Explanation

Important:
These Operating Instructions are only valid together with the corresponding Instructions for 82XX; 8200 vector or 93XX controllers.

Version 1.0 11/00

Contents





Contents

1 Preface and general information

1.1 How to use these Operating Instructions

- These Operating Instructions are intended for safety-relevant operations on and with the 2171/2172 fieldbus module. They contain safety information which must be observed.
- All personnel working on and with the 2171/2172 fieldbus module must have these Operating Instructions available and observe the information and notes relevant for them.
- The Operating Instructions must always be complete and perfectly readable.

These Operating Instructions inform about the most important technical data and the installation of the 2171/2172 fieldbus module. They are only valid in combination with the Operating Instructions of the corresponding controller.

1.1.1 Terminology used

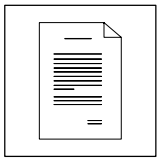
Controller	In the following, the term ”controller” is used for ”93XX servo inverters” or ”82XX frequency inverters”.
Drive system	In the following the term ”drive system” is used for drive systems with fieldbus modules and other Lenze drive components.
Fieldbus module	In the following text the term ”fieldbus module” is used for ”fieldbus module type 2171/2172 System bus (CAN)”.
Cxxx/y	Subcode y of code Cxxx (e.g. C0410/3 = subcode 3 of code C0410)
L-Cxxx/y	Lenze code
Xk/y	Terminal strip Xk/terminal y (e.g. X3/28 = terminal 28 on terminal strip X3)
(📖xx-yyy)	Cross reference (chapter - page)

1.1.2 What is new?

Material no.	Edition	Important	Contents
402381	06/1998		• Extended by 2172 • Editorially reviewed
417883	11/2000	replaces 402381	• Adaptation to 8200 vector (all chapters) • Format change to DIN A4

1.2 Scope of supply

Packing list	Important
• 1 2171/2172 fieldbus module with housing (enclosure IP20) • 1 M3 fixing screw • 1 two-pole male connector for voltage supply • 1 four-pole connection plug for the bus system • 1 Short Instructions	After the delivery has received, check immediately whether the items supplied match the accompanying papers. Lenze does not accept any liability for deficiencies claimed subsequently. Claim • visible transport damage immediately to the forwarder • visible deficiencies/incompleteness immediately to your Lenze representative.



1.2.1 Legal regulations

Labelling	**Nameplate**	**CE-identification**	**Manufacturer**
	Lenze 2171/2172 fieldbus modules are unambiguously identified by their nameplates.	In compliance with the EC Low Voltage Directive	Lenze GmbH & Co KG Postfach 101352 D-31763 Hameln
Application as directed	**2171/2172 fieldbus module** • Operate the fieldbus module only under the conditions prescribed in these Operating Instructions. • The fieldbus module is an additional module and can be optionally attached to the Lenze controller series 820X, 821X, 822X, and 8200 vector. The 2171/2172 fieldbus module links Lenze controllers with the fast serial communication system CAN. • The fieldbus module must be attached and electrically connected so that it complies with its function and does not cause any hazards when attached and operated as instructed. • Observe all notes given in chapter "Safety information" (📖 2-1). • Please observe all information given in these Operating Instructions. This means: – Read these Operating Instructions carefully before you start to work with the system. – These Operating Instructions must always be available during operation of the fieldbus module. **Any other use shall be deemed as inappropriate!**		
Liability	• The information, data, and notes in these instructions met the state of the art at the time of printing. Claims referring to drive systems which have already been supplied cannot be derived from the information, illustrations, and descriptions given in these Operating Instructions. • The specifications, processes, and circuitry described in these instructions are for guidance only and must be adapted to your own specific application. Lenze does not take responsibility for the suitability of the process and circuit proposals. • The specifications in these Instructions describe the product features without guaranteeing them. • Lenze does not accept any liability for damage and operating interference caused by: – disregarding these Instructions – unauthorized modifications to the controller – operating faults – improper working on and with the controller		
Warranty	• Warranty conditions: see Sales and Delivery Conditions of Lenze GmbH & Co KG. • Warranty claims must be made to Lenze immediately after detecting the deficiency or fault. • The warranty is void in all cases where liability claims cannot be made.		
Disposal	**Material**	**recycle**	**dispose**
	Metal	●	-
	Plastic	●	-
	Printed-board assemblies	-	●
	Short Instructions/Operating Instructions	●	

2 Safety information

2.1 Persons responsible for safety

Operator

- An operator is any natural or legal person who uses the drive system or on behalf of whom the drive system is used.
- The operator or his safety personnel is obliged
  - to ensure the compliance with all relevant regulations, instructions and legislation.
  - to ensure that only skilled personnel works on and with the2102IB fieldbus module.
  - to ensure that the personnel has the Operating Instructions available for all corresponding work.
  - to ensure that all unqualified personnel are prohibited from working on and with the drive system.

Qualified personnel

Qualified personnel are persons who - because of their education, experience, instructions, and knowledge about corresponding standards and regulations, rules for the prevention of accidents, and operating conditions - are authorized by the person responsible for the safety of the plant to perform the required actions and who are able to recognize potential hazards.
(Definition for qualified personnel to VDE 105 or IEC 364)

2.2 General safety information

- These safety notes do not claim to be complete. In case of questions and problems please contact your Lenze representative.
- At the time of delivery the fieldbus module meets the state of the art and ensures basically safe operation.
- The indications given in these Operating Instructions refer to the stated hardware and software versions of the fieldbus modules.
- The fieldbus module is hazardous if:
  - unqualified personnel works on and with the fieldbus module.
  - the fieldbus module is used inappropriately.
- The processing notes and circuit sections shown in these Operating Instructions are proposals which cannot be transferred to other applications without being tested and checked.
- Ensure by appropriate measures that neither personal injury nor damage to property may occur in the event of failure of the fieldbus module.
- The drive system must only be operated when no faults occur.
- Retrofittings, modifications, or redesigns are basically prohibited.Lenze must be contacted in all cases.
- The fieldbus module is electrical equipment intended for use in industrial high-power plants. The fieldbus module must be tightly screwed to the corresponding controller during operation. In addition, all measures described in the Operating Instructions of the controller used must be taken. Example: Fasten covers to ensure protection against contact.

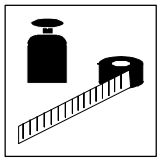
2.3 Layout of the safety information

- All safety information have a uniform layout:
  – The icon characterizes the type of danger.
  – The signal word characterizes the severity of danger.
  – The note text describes the danger and gives information on how to prevent dangerous situations.

Signal word

Note

	Icons used		Signal words	
Warning of damage to persons		Warning of hazardous electrical voltage	**Danger!**	Warns of **impending danger**. Consequences if disregarded: Death or severe injuries.
		Warning of a general danger	**Warning!**	Warns of **potential, very hazardous situations**. Possible consequences if disregarded: Death or severe injuries.
			Caution!	Warns of **potential, hazardous situations**. Possible consequences if disregarded: Light or minor injuries.
Warning of damage to material			**Stop!**	Warns of **potential damage to material**. Possible consequences if disregarded: Damage of the controller/drive system or its environment.
Other notes			**Tip!**	This note designates general, useful notes. If you observe it, handling of the controller/drive system is made easier.



3 Technical data

3.1 General

The serial bus system, originally developed for networks required in cars, **CAN** (**C**ontroller **A**rea **N**etwork) is now used more often for networking industrial systems.
The internationally standardized CAN bus is mainly characterised by

- high interference immunity
- short transfer times
- low expenditure for connection

These advantages have made CAN products interesting for other industries too.

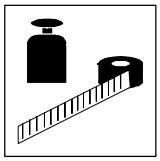
For standardisation purposes drive, control and sensor/actuator manufacturers have specified a protocol which solves drive and control tasks efficiently: the CANopen Specification.
The protocol has been developed by the **CiA** (**C**AN **i**n **A**utomation) in conformity with the **CAL** (**C**AN **A**pplication **L**ayer). Parts of it were included in the CAN module 2171/2172.

3.2 Features

- Attachable additional module for Lenze controller series 820X, 821X, 822X and 8200 vector
- Easy connection because of pluggable screw terminals
- Bus extension
  – 25 m at a baud rate of 1 Mbit/s,
  – up to 1 km with reduced baud rate
- Extremely reliable data transmission (Hamming distance = 6)
- Bus medium: screened twisted pair cable
- Sender output level differential (similar to RS-485) according to ISO 11898
- Up to 63 bus participants possible
- Standardised parameter and controller functions according to CANopen
- Access to all Lenze parameters
- Software integration of 2 interfaces
  i.e. processing (e.g. using a PLC) and parameter setting at the same time.
  (e.g. with PC) via CAN directly to the controller
- Topology: Line terminated on both ends

Special features of the 2172 interface module

- Use module 2172 to set baud rate and address externally via switch.
  In all other respects compatible with module 2171.



3.3 General data and application conditions

Field	Values
Order name	33.2171IB or 33.2172IB
Communication media	DIN ISO 11898
Protocol	CANopen
Baud rate [KBit/s]	50, 125, 250, 500, 1000
Ambient temperature	During operation: 0 °C to 40 °C Transport: -25 °C to 70 °C Storage: -25 °C to 55 °C
Permissible humidity	Class 3K3 to EN 50178 (without condensation, average relative humidity 85 %)
24-V-DC-Voltage supply	• 820X / 8200 vector (observe chapter 4.3.1): only external supply • 821X / 822X / 8200 vector (observe chapter 4.3.1): internal or external supply

3.4 Rated data

Field	Values	
Communication media	DIN ISO 11898	
Voltage supply	24 V DC ± 10 %; max. 60 mA	
Insulation voltages for bus systems		
• to PE	50VAC	
• to external supply (term. 39/59)	0 VAC	(no mains isolation)
• to power stage		
– 820X / 821X	270 V AC	(single basic insulation)
– 822X / 8200 vector	270 V AC	(double basic insulation)
• to control terminals:		
– 820X / 8200 vector (with internal supply)	0 V AC	(no mains isolation)
– 8200 vector (with external supply	100 V AC	(single basic insulation)
– 821X	50 V AC	(electrical isolation)
– 822X	270 V AC	(single basic insulation)
• to external bus systems	0 V AC	(no mains isolation)
Degree of pollution	VDE0110, part 2, pollution degree 2	

3.5 Dimensions

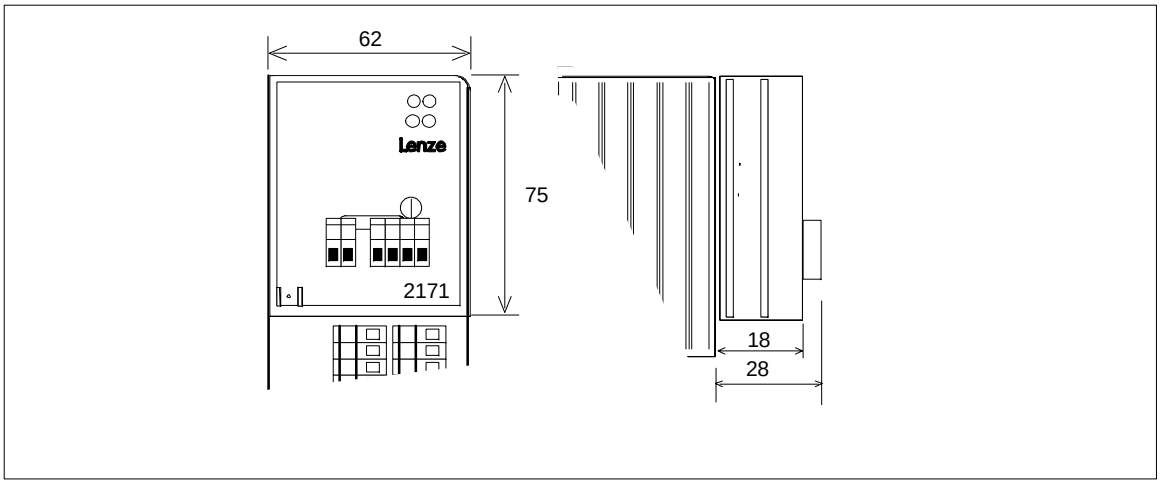
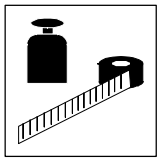


Fig. 3-1 Dimensions of the 2171 and/or 2172 fieldbus module (all dimensions in mm)



3.5.1 Communication times

The communication times with the CAN bus depend on the priority of data, bus load, baud rate and processing time in the controller.

More information about bus access control can be obtained from corresponding literature specialised on Controller Area Networks.

The telegram run time depends on the baud rate:

	Baud rate [kbit/s]				
	50	125	250	500	1000
Telegram time [ms]	2.7	1.05	0.52	0.26	0.13

Processing times in the controller

The processing times for the 8200 controllers differ from the times for the 821X/822X/8200 vector series.

Processing times 820X

In opposite to the 821X/822X/824X series, which have parallel process data processing, the 8200 series process process and parameter data sequentially. Therefore the time needed to respond process data depends on previous actions.

The processing time needed for telegrams also depends on the actual value conditioning (process data from controller). If these data (status word, actual frequency) are not required, they can be deactivated with the control word "Bit 15" (PE inhibit).

The individual telegram times are:

Telegram	Processing time	
	PE-inhibit = 0	PE-inhibit = 1
Parameter	62...140 ms	62...70 ms
Change of a process data value to controller (*)	27...105 ms	27...35 ms
Change of both process data values to controller *	62...140 ms	4...70 ms
Process data from controller *	108...140 ms	not possible

* The processing times for the process data refer to the sync telegram (chapter 6.7 (📖 6-4))

Processing times 821X/8200 vector/822X:

The processing times are as follows:

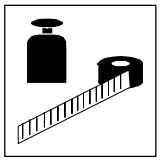
Parameter 30...50 ms

Process data, 3...5 ms (*)

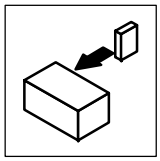
Maximum bus length

The following bus lengths are possible (depending on the baud rate):

	Baud rate [KBit/s]				
	50	125	250	500	1000
Cable length [m]	1000	550	250	120	25



Technical data



4 Installation

4.1 Connections of the 2171/2172 fieldbus module

4.1.1 Overview

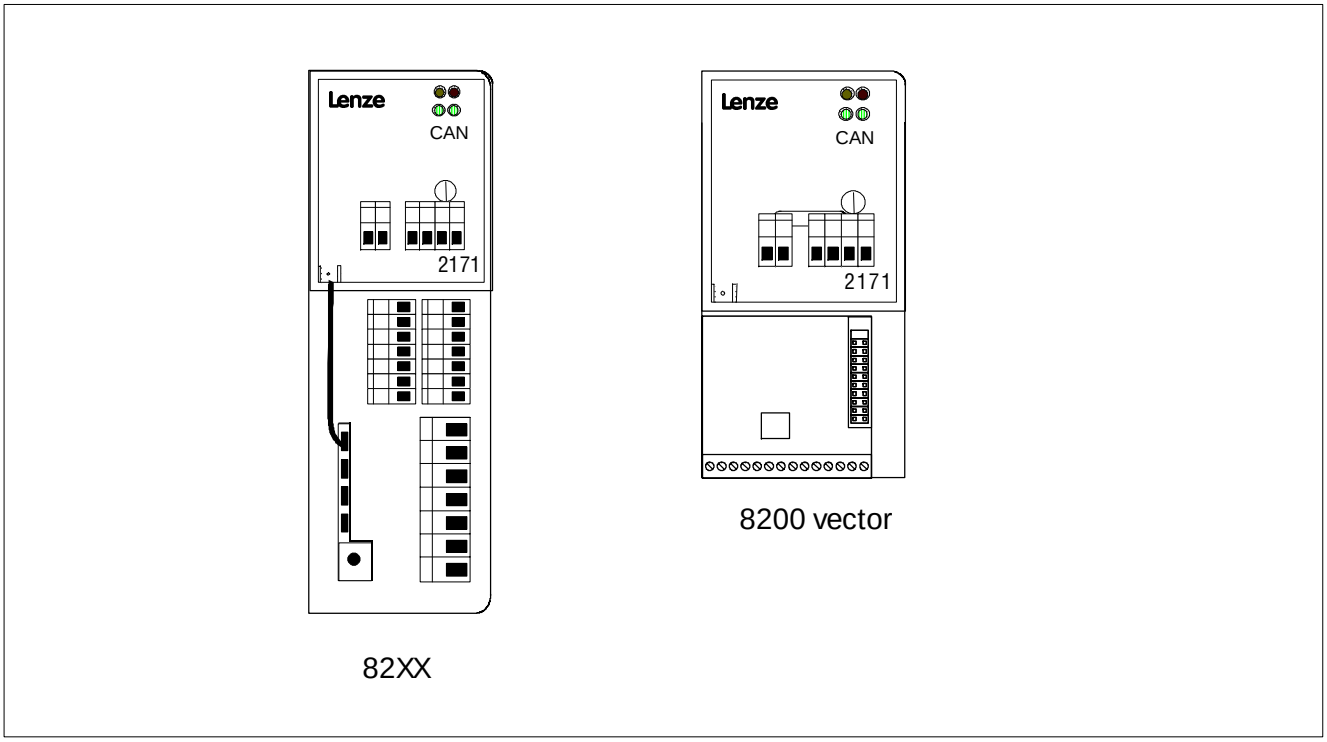


Fig. 4-1 Controllers with fieldbus module 2171

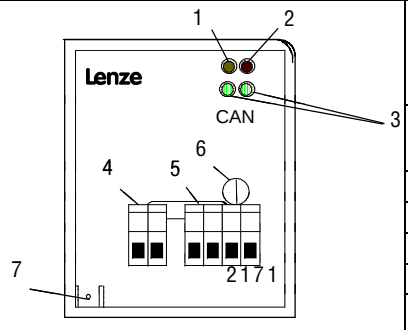
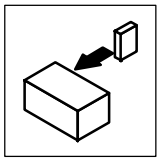


Fig. 4-2 Fieldbus module 2171

Pos.	Name/meaning
1	Vcc LED green for supply voltage ON: 2171 and controller are supplied with voltage. BLINKING: 2171 is live, but the controller is switched off or not connected.
2	RxD LED yellow for received signal BLINKING: Drive unit receives telegram
3	Operating status display of the basic unit
4	External supply 24 V ±10 %
5	CAN bus connection
6	Fixing screw for the 217X fieldbus module
7	Only for 820X and 821X necessary: additional PE-screen cable, which avoids communication interference (EMC) in high-interference environments.

4.1.2 Plug-in terminal for 2-pole male plug (external voltage supply)

Name	Input/output	Explanation
+	Input	External voltage supply +24 V DC ± 10 %, 60 mA
-	Input	GND; reference for external supply



4.1.3 Male plug, 4 pole plug-in terminal (CAN connection)

Name	Input/output	Explanation
⏚	–	Screening PE
GND	–	Reference potential CAN bus – with internal series resistance of 100 Ω max. current load 30 mA
low	Input/output	CAN-Bus Low
high	Input/output	CAN-Bus High

4.2 Mechanical installation

- If a keypad is attached to the front of the controller, remove it.
- Use the fixing screw (📖 4-1) pos. 6) to bold the fieldbus module to the controller.

4.2.1 Address and baud rate setting

4.2.1.1 Fieldbus module 2171

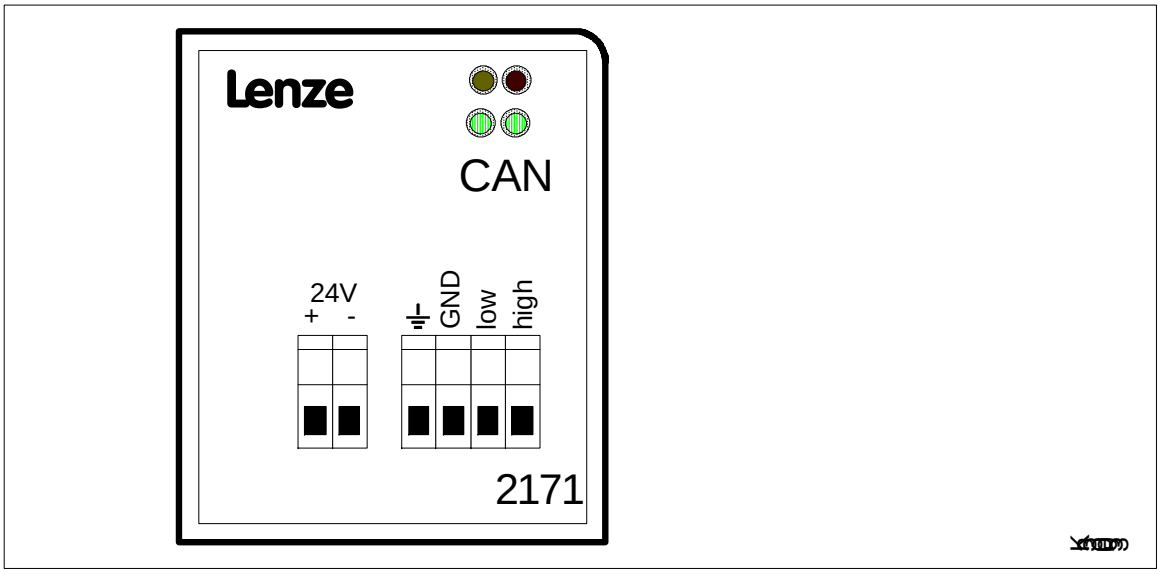
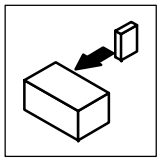


Fig. 4-3 Contact assignment 2171

The addresses are set through code C0009 (Code table, chapter 8.1), the baud rate is set under C0125.



4.2.1.2 Fieldbus module 2172

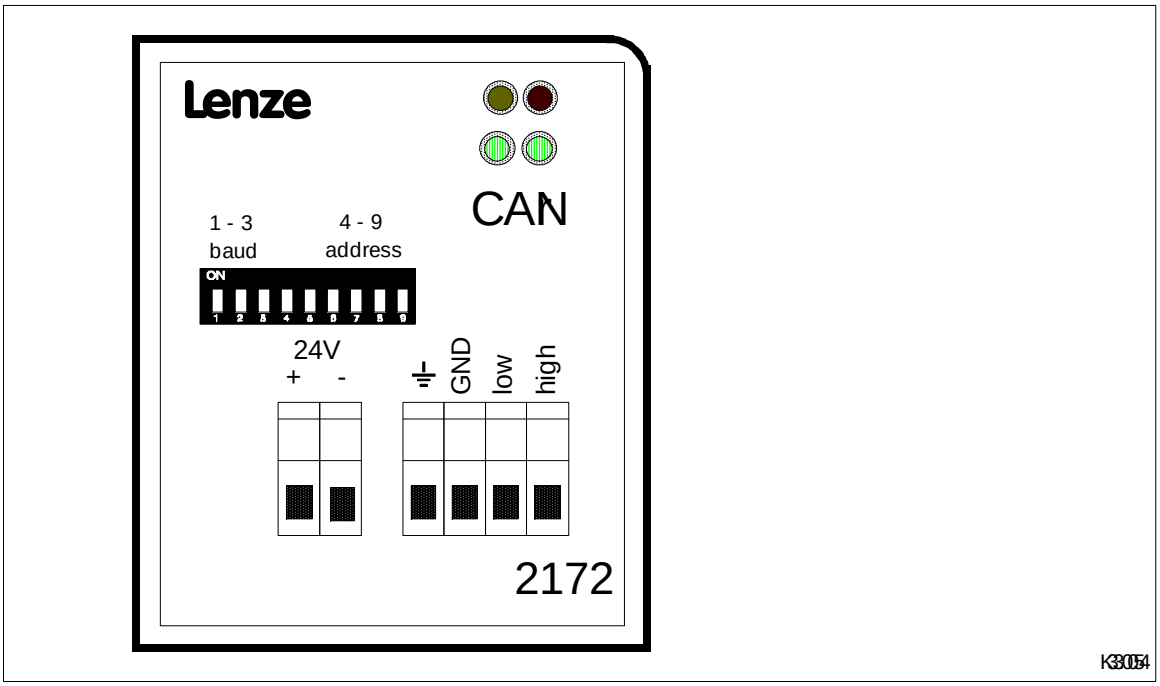


Fig. 4-4 Contact assignment 2172

Codes C0009 (controller address) and C0125 (baud rate) are not active if one or several switches have been set to ON before a restart.

The controller address and baud rate, which can be set using the DIP switch, will only be active after a mains reconnection.

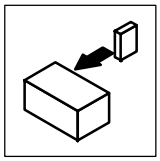
Switch positions 0 = OFF

1 = ON

S1	S2	S3	S4	S5	S6	S7	S8	S9	
0	0	0	0	0	0	0	0	0	The controller address is taken from code C0009, the baud rate from C0125 from the basic unit.

Baud rate settings

Baud rate	S1	S2	S3
500 Kbaud	0	0	0
250 Kbaud	1	0	0
125 Kbaud	0	1	0
50 Kbaud	1	1	0
1000 Kbaud	0	0	1



Installation

Address settings

$$Address_{10} = S_4 \cdot 2^0 + S_5 \cdot 2^1 + S_6 \cdot 2^2 + S_7 \cdot 2^3 + S_8 \cdot 2^4 + S_9 \cdot 2^5$$

The address (decimal number) is calculated by inserting the switch status S4 ... S9 ('0' = OFF and '1' = ON) into the equation above.

The equation also indicates the valency of a switch. The sum of valencies results in the controller addresses to be set (see examples 1 and 2):

Switch valencies:

Switch	S4	S5	S6	S7	S8	S9
Valency	1	2	4	8	16	32

Example 1:

Switch	S4	S5	S6	S7	S8	S9
Switch position	1	1	1	0	0	0
Address (= 7)	1	2	4	0	0	0

Example 2:

Switch	S4	S5	S6	S7	S8	S9
Switch position	1	0	0	1	1	0
Address (= 25)	1	0	0	8	16	0

4.3 Electrical installation

Note!

The communication of controllers 820X and 821X may be interfered by electromagnetic radiation.

If necessary, use an additional PE shield cable at position 7. (📖 4-1)

4.3.1 Voltage supply

If required, supply the 2171/2172 fieldbus module via the plug-in contacts +/- (📖 4-1) in pos 4 using external voltage supply 24 V DC ±10 %.
The 821X, 8200 vector, 822x and 822X should always be driven without a separate voltage supply.

820X controllers always require a separate voltage supply.
Use a separate supply unit for the external voltage supply of the 2171/2172 fieldbus module with 24 V.
Use separate supply units for longer distances between the control cabinets.

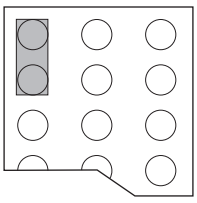
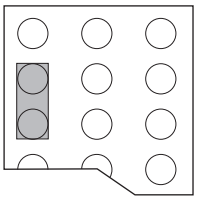
The following chapter describes how to connect the 2171/2172 fieldbus module to the bus system, see chapter 4.3.2.

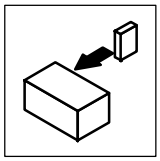
Note!

Internal voltage supply of the fieldbus module connected to a 8200 vector

Controllers with an extended AIF interface (front of the 8200 vector) can be internally supplied. The part of the drawing highlighted with grey shows the jumper position.

In Lenze setting, the fieldbus module is not internally supplied.
For internal voltage supply, put the jumper in the position indicated below.

Lenze setting (only external voltage supply)	**Internal voltage supply**
	



4.3.2 Wiring to a host

Warning!

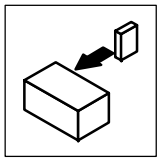
An additional mains isolation is required if

- a 820X, 821X or 8200 vector controller will be connected to a host

and

- a safe electrical isolation (double basic insulation) to VDE 0160 is required.

For this, you can use an interface module for the host with an additional electrical isolation (see the corresponding manufacturer's information).
For wiring, the electrical isolation of the supply voltage must be taken into account. The supply voltage is assigned to the same potential as the data bus.



4.4 Structure of the CAN bus system - example: fieldbus module 2171

The CAN bus system is designed as 2 conductor (twisted pair) shielded with additional mass and termination at both ends of the line (see diagram (📖 4-8)).

Three channels are available for the data:

- 1 process data channel (PDO = Process Data Object)
  - – Process data are send via the process data channel and are used for high-speed and high-priority control tasks. Two typical process data are, for instance, setpoint and actual value of a controller
- 2 parameter channels (SDO = Service Data Object)
  - – the modules 2171 and 2172 integrate 2 parameter channels. The parameters - also called codes (Lenze) - are transferred at lower priority than the process data. Parameters are set, for instance with individual system setting, during commissioning or while changing the material at the production machine.
  - – 2 masters can be connected to the controllers because of the 2 parameter channels. Thus, parameters can be changed directly at the controller during operation of a machine or system networked via PLC, using a PC or a keypad. For this, a second controller address (with an offset of 64) is installed in addition to the address set under C0009. For instance, if a PLC addresses the controller with address 1 and second commanding unit the address 65, the same controller will be addressed. Please observe that the last telegram determines the parameter when a parameter is accessed by two units.

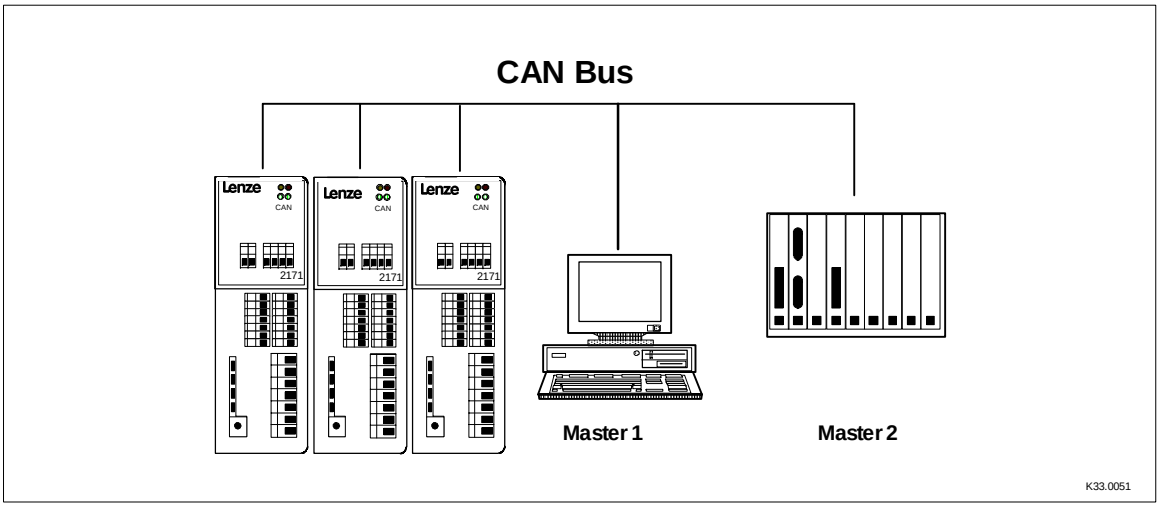
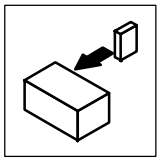


Fig. 4-5 Parameter setting of the controllers via two masters



4.4.1 Wiring of the CAN bus

The following figure shows how to connect the CAN bus.

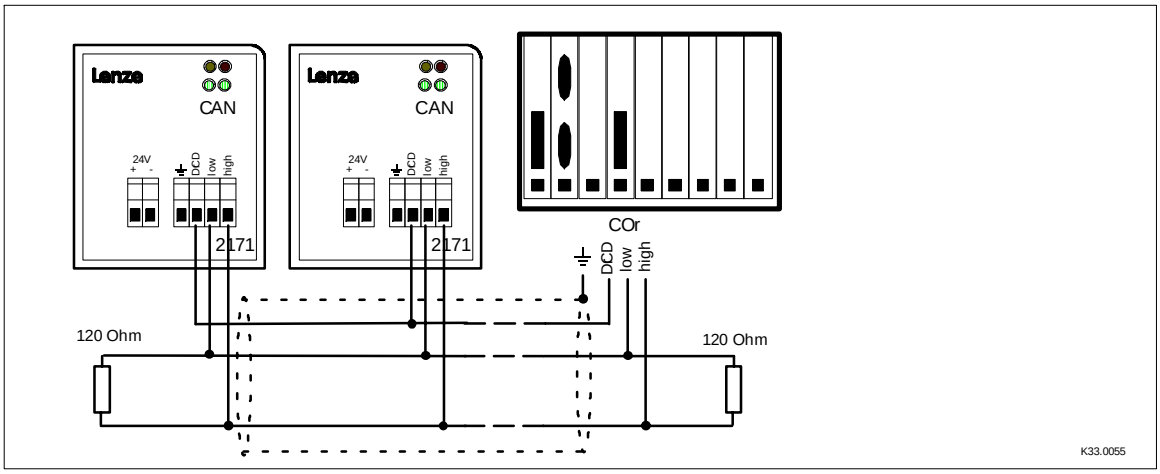


Fig. 4-6 Wiring

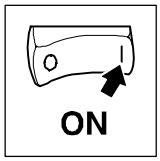
Please observe our recommendations for signal cables:

Total length up to 300 m	
Cable type	LIYCY 2 x 2 x 0,5 mm² (twisted in pairs with shield)
Cable resistance	≤ 40 Ω/km
Capacitance per unit length	≤ 130 nF/km
Length	≤ 300 m

Total length up to 1000 m	
Cable type	CYPIMF 2 x 2 x 0.5 mm² (twisted in pairs with shield)
Cable resistance	≤ 40 Ω/km
Capacitance per unit length	≤ 60 nF/km
Length	≤ 1000 m

The conductor pairs are to be used as follows:

Pair 1 (white/brown)	CAN-Low and CAN-High
Pair 2 (green / yellow)	GND



5 Commissioning

Stop!

- Before switching on the mains voltage check the wiring for completeness, short circuit and earth fault.
- **Keep to the switch-on sequence!**

5.1 Initial switch-on

When switching on the unit for the first time, observe the following sequence:

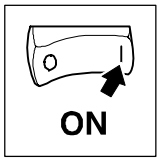
1. Switch on the controller and, if necessary, the external supply of the 2171 fieldbus module.
   The operating status light of the basic unit must be on or blinking and the green Vcc light must be on, too ((📖 4-1): point 3 and point 1).
   If this is not the case, see chapter ”Troubleshooting” (📖 7-1).
2. If necessary, change the baud rate rate (C0125) of the controller using the keypad (default setting: 500 Kbaud).
   This setting must be the same for all controllers and the host.
3. With several controllers in a network:
   Set the CAN controller address (C0009) at the controller using the keypad (default setting: 1).
   This address is used by the host to address the controller. Every controller must have its own address. Addresses cannot be used twice.
4. You can now communicate with the drive.
   All codes can be read and written to except codes C046 (frequency setpoint) and C0135 (control word). Overwriting is also possible.
   If you want to preselect also the codes C0046 and C0135 through 2171, C0001 = 3 must be set.
   For more information please see the chapter ”Communication phases of the CAN network” (📖 6-5) .

Note!

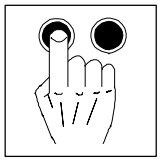
Codes C0009 (CAN controller address) and C0125 (CAN baud rate) can also be selected via CAN.

The values will only be accepted after a node reset (see chapter 6.7.2) or a restart.

5. The controller is set to quick stop.
   If bit 3 in control word C0135 is set to 0, quick stop will be reset.



Commissioning



6 Parameter setting

6.1 General

The parameter setting for the 2171/2172 fieldbus module comprises

- Basic unit parameters (parameters which can also be set using the 8201BB keypad)
- 2171 parameters, which can only be accessed via the 2171 fieldbus module.

Only the basic unit parameters are saved as non-volatile data in the basic unit.

Only the parameters important for the serial communication are listed in the following and in the code table (see chapter 8.1). For further information about the parameter setting see the Manual or the Operating Instructions of the controllers.

6.2 Code numbers / index

The controller parameters are addressed by the index. The index for Lenze code numbers is between 20576 (5060_{hex}) and 24575 ($5FFF_{hex}$).

Conversion formula:

Index = 24575 - Lenze code number

6.3 Parameter sets

6.3.1 Lenze parameters

In general, the Lenze parameters of the Lenze controllers are addressed via the Lenze codes. For detailed information about the Lenze parameters and their value ranges, see the Operating Instructions of the corresponding controllers.

Lenze codes

In these Operating Instructions, Lenze codes are identified by „L-Cxxxx“ to avoid confusion with the CANopen index (e.g. L-C0001 for Lenze code C0001).

82Xx parameter sets

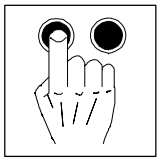
The 82XX controller is equipped with two parameter sets, which can be directly addressed via the PCP. They are addressed by means of a code-digit offset:

- Offset 0 addresses parameter set 1 with the Lenze codes L-C0000 to L-C1999
- Offset 2000 addresses parameter set 2 with the Lenze codes L-C2000 to L-C3999

If a parameter is only available once (see 82XX Operating Instructions), use the code offset 0.

Example for L-C0011 (maximum field frequency):
L-C0011 in parameter set 1: Lenze code = 11
L-C0011 in parameter set 2: Lenze code = 2011

Changes of the parameters are automatically saved in the controller (see Operating Instructions 82XX).Process data, for instance control words or setpoints are excluded.



Parameter sets 8200 vector

The 8200 controllers are equipped with four parameter sets, which can be directly addressed via the CAN interface PCP.
They are addressed by means of a code-digit offset:

- Offset 0 addresses parameter set 1 with the Lenze codes L-C0000 to L-C1999
- Offset 2000 addresses parameter set 2 with the Lenze codes L-C2000 to L-C3999
- Offset 4000 addresses parameter set 3 with the Lenze codes L-C3000 to L-C4999
- Offset 6000 addresses parameter set 4 with the Lenze codes L-C6000 to L-C7999

If a parameter is only available once (see Operating Instructions 8200 vector), use the code offset 0.

Example for L-C0011 (maximum field frequency):
L-C0011 in parameter set 1: Lenze code = 11
L-C0011 in parameter set 2: Lenze code = 2011
L-C0011 in parameter set 3: Lenze code = 4011
L-C0011 in parameter set 4: Lenze code = 6011

Depending on the settings under code L-C0003 parameter changes will be saved in the controller (see Operating Instructions for 8200 vector) Process data, for instance, control words or setpoints are excluded.

6.4 CAN controller address

To address the controller, the CAN protocol uses the CAN unit address.

The CAN controller address is set under code C0009 via the controller. An address must only be used once in a bus system.

6.5 Operating mode

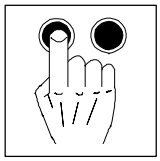
82XX / 8200 vector controllers

Code C0001 (operating mode) determines the source (terminal, keypad, CAN) which writes the frequency setpoint (C0046) and the control word (C0135).

Independently of the selected operating mode C0001, the controller can be inhibited under C0040 via LECOM.

Note!

Please note that the operating mode C0001 is available in both parameter sets. Thus, C0001 must be set identically in both parameter sets.
The operating mode set in parameter set 1 applies to the CAN control (C0001 = 3). The operating mode set in parameter set 1 and parameter set 2 applies to terminal control (C0001 <> 3).



6.6 Notes to be observed when setting the parameters for the controllers

6.6.1 8200 controller

The following applies to the inverter series 8200:

Caution!

Parameter setting (codes except C046, C0135) is only possible when the controller is inhibited. Parameters are accepted when the controller is enabled, but they are not saved.
After having set a parameter, the controller must not be addressed for approx. 50 ms; otherwise the command will be ignored.

After parameter setting, the controller needs up to approx. 70 ms to set the status 'enabled' (terminal, C040, C0135).

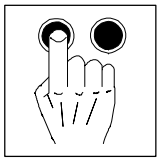
Caution!

The function TRIP reset is activated by inhibiting the controller and enabling it again under C040 or C0135.

The function TRIP reset initializes the 8200 inverter and the 2171 fieldbus module. Therefore the TRIP reset command is not acknowledged for the master.

6.6.2 Controller 8200 vector

The digital and analog input and output signals can be configured freely (see Operating Instructions vector; codes C0410, C0412, C0417 and C0421).



6.7 CANopen for the fieldbus module 2171/2172

-Identifier (11 bit)	**User data** (up to 8 byte)							

Tab. 6-1 Simplified structure of a CAN telegram

Identifier (For description see chapter 6.7.1)

The identifier determines the priority of the message.

In addition, the identifier of the CANopen holds the codes for the controller address and information about the transfer of user data.

User data

There are three different ways to use user data:

1. initialization (For description see chapter 6.7.2)
   User data help to build up communication via CAN bus.
2. Parameter setting (For description see chapter 6.7.3)
   User data are important for parameter setting.
   In Lenze units, the parameters are saved in the codes (e.g. C0012 acceleration time).
3. Process data, (For description see chapter 6.7.4)
   User data are used for quick, often cyclic processes
   (e.g. speed setpoint and actual speed).

6.7.1 Addressing

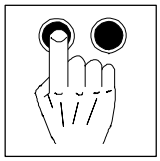
The CAN bus system is message and not participant-oriented. Each message is clearly identified by the identifier. With CANopen the participant orientation is clear because there is only one sender per message.

The identifiers are calculated from the controller addresses. This does not apply to the identifiers of the network management (see chapter 6.7.2) and the synctelegram (see chapter 6.7.4).

Identifier = Basic identifier + unit address

The identifiers are assigned as follows:

Network management	0
Sync telegram	128
Process data channel to the drive	512 + unit address
Process data channel from the drive	384 + unit address
Parameter channel 1 to drive	1536 + unit address
Parameter channel 2 to drive	1600 + unit address
Parameter channel 1 from drive	1408 + unit address
Parameter channel 2 from drive	1472 + unit address



6.7.2 The communication phases of the CAN network

11 bit identifier	2 byte user data	

To change between the different communication phases, telegrams with the identifier 0 and 2 byte user data are used.

The drive provides three communication status:

A ”Initialisation” ***(Initialisation)***
The drive does not take part in the data transfer. Various initialization activities are carried out. This status is reached after the controller has been switched on. Furthermore it is possible to restart the entire initialization phase or parts of it by transferring different telegrams. All parameters already set are overwritten with their standard values. After the initialization has been completed, the drive is automatically set to the status ”Preoperational”.

B ”Preoperational” ***(before being ready for operation)***
The drive can receive parameter-setting data. However, the process data are ignored.

C ”Operational” ***(Ready for operation)***
The drive can receive process and parameter-setting data.

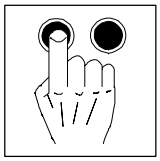
A bus participant, the network master, carries out the changes between the communication phases for the whole network.

The status is changed by transmitting certain telegrams:

From	to	Data (hex)	Note
Preoperational	Operational	01xx	Process and parameter-setting data active
Operational	Preoperational	80xx	Only parameter-setting data active
Operational	Initialisation	81xx	Resets the drive, all parameters
Preoperational	Initialisation	81xx	are overwritten with standard values
Operational	Initialisation	82xx	Resets the drive, only communication
Preoperational	initialisation	82xx	relevant parameters

The assignment of the bytes marked with ”xx” means the following:

- **xx = 00_{hex}**
  With this assignment, all controllers connected are addressed by the telegram. All controller can change their status at the same time.
- **xx = Controller address**
  If a certain address is indicated, the status will only be changed for the controller addressed.



6.7.3 Parameter setting

Two separate software channels, which are selected through the controller address, are available for parameter setting (see chapter 6.7.1 ”Addressing of controllers”).

Telegram structure:

11 bit identifier	8 byte user data							
	Command code	**Index Low Byte**	**Index High Byte**	**Subindex**	**Data 1**	**Data 2**	**Data 3**	**Data4**

Command code

The command code contains the following information.

Services	**All Lenze codes in 8200 / 8210 except for C0135 and C0150**		**Codes C0135 and C0150**	
	Hexadecimal	Decimal	Hexadecimal	Decimal
Write request (Send parameters to drive)	23_{hex}	35	27_{hex}	39
Write response (Controller response to the write request (acknowledgement))	60_{hex}	96	64_{hex}	100
Read request (Request to read a parameter from the drive)	40_{hex}	64	44_{hex}	68
Read response (Response to the read request with an actual value)	42_{hex}	66	46_{hex}	70
Error response The controller indicates a communication fault)	80_{hex}	128	80_{hex}	128

Index Low Byte / Index High Byte

The parameter or the Lenze codes are selected with these 2 bytes according to the formula:

Index = 24575 - Lenze code - 2000 · (parameter set -1)

Example 1:

The parameter C0012 (acceleration time) in parameter set 1 is to be addressed:

24575 - 12 - 0 = 24563 = $5FF3_{hex}$

Entries according to the left-justified Intel data format (see description of the data format, chapter 6.7):

Index Low Byte = $F3_{hex}$

Index High Byte = $5F_{hex}$

Example 2:

Add an offset of 2000 to address the parameter set 2 (see chapter ”Parameter sets”, chapter 6.3).

Corresponding calculation:

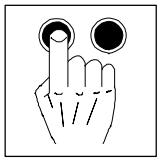
24575

- 12 Lenze code C0012 (acceleration time)

- 2000 (offset for parameter set 2)

= 22563 = 5823_{hex}

Index Low Byte = 23_{hex}, Index High Byte = 58_{hex}



Subindex

Table position of a parameter under the Index.

With the controller series 8200 / 8210 / 8220 / 8200 vector the subindex is without any meaning since the controller does not contain tables.

Setting of 8200 / 8210 / 8220 / 8200 vector always 0.

Data 1 to data 4

The value to be transmitted in 4 bytes.

The parameters of the series 8200 / 8210 / 8220 except C0135 and C0150 are saved in the fixed point format with 4 decimal positions.
The user should observe that the parameters must be multiplied by 10000, e.g. value 10 is transmitted as 100000. The parameters C0135 and C0150 must be transferred as bit code and without factor.

Fault

Command code = 128 = 80_{hex}

In the event of an error, the drive generates an error response. In data 4 of the user data part a 6, and in data 3 an error code is transmitted.

Possible error codes:

Command code	Data3	Data4	Meaning
80_{hex}	6	6	Wrong index
80_{hex}	5	6	Wrong subindex
80_{hex}	3	6	Access denied

6.7.3.1 Example for the description of the data format

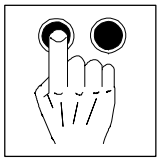
The user data are represented as left-justified Intel format.
A telegram example shows the left-justified Intel data format:

Transfer 20 s for the code C0012, parameter set 1.

Index = 24575 - Lenze code = 24575 - 12 = 24563 = **5F F3**$_{hex}$

Value (data1 - data4) = 20 s · 10.000 = 200.000 = **00 03 0D 40**$_{hex}$

Identifier	Command code	Index Low Byte	Index High Byte	Subindex	Data 1	Data 2	Data 3	Data4
		F3	**5F**		**40**	**0D**	**03**	**00**



6.7.3.2 Example for parameter setting: Parameter writing

The acceleration time C0012 (parameter set 1) of the controller with address 1 is to be changed to 20 s via parameter channel 1.

- Identifier calculation

Identifier parameter channel 1 to controller	= 1536 + controller address
Identifier	= 1536 + 1 = 1537

- Command code write request (send parameter to drive)

Command code	= 23_{hex}

- Index calculation

Index = 24575 - code number - 2000 (PS - 1)	Index = 24575 - 12 - 2000 V 0 = 24563 = $5FF3_{hex}$

- Subindex
  - for the controller series 8200 / 8210 is always 0 !
- Calculation of the acceleration time

Acceleration-time value	20 s · 10.000 = 200.000 = 00 03 0D 40_{hex}

- Response to drive

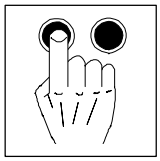
Identifier	Command code	Index Low Byte	Index High Byte	Subindex	Data 1	Data 2	Data 3	Data4
1537	23	F3	5F	00	40	0D	03	00

Response of the controller when no fault occurs

Identifier	Command code	Index Low Byte	Index High Byte	Subindex	Data 1	Data 2	Data 3	Data4
1409	60	F3	5F	00	00	00	00	00

Identifier parameter channel 1 from controller = 1408 + controller address = 1409

Command code = write response (controller response (acknowledgement)) = 60_{hex}



6.7.3.3 Example for parameter setting: Parameter reading

Read the heat sink temperature C0061 (43 °C) from the controller with the address 5 using parameter channel 1.

- Identifier calculation

Identifier parameter channel 1 to controller	= 1536 + controller address
Identifier	= 1536 + 5 = 1541

- Command read request (request to read a parameter from the drive)

Command code	= 40_{hex}

- Index calculation

Index = 24575 - code number - 2000 (PS - 1)	Index = 24575 - 61 - 2000 · 0 = 24514 = $5FC2_{hex}$

Telegram to drive:

Identifier	Command code	Index Low Byte	Index High Byte	Subindex	Data 1	Data 2	Data 3	Data4
1541	40	C2	5F	00	00	00	00	00

Telegram from drive

Identifier	Command code	Index Low Byte	Index High Byte	Subindex	Data 1	Data 2	Data 3	Data4
1413	42	C2	5F	00	B0	8F	06	00

Identifier parameter channel 1 from controller = 1408 + controller address = 1413

Command code = response to the read request, actual value = 42_{hex}

Index of the read request = $5FC2_{hex}$

Subindex = 0 (for all parameters of the series 8200 / 8210)

Data1 to data 4 = 43°C · 10.000 = 430.000 = 00 06 8F B0

6.7.4 Process data

Process data are always acknowledged by a

- process data telegram **to** the drive (see chapter 6.7.4.1)
- process data telegram **from** the drive (see chapter 6.7.4.2)

To ensure that the process data **to** the controller are accepted (or the controller accepts the process data), a special telegram, the sync telegram, is required.

The sync telegram is the trigger point for data acceptance in the controller and starts the sending action from the controller. For cyclic process data processing, the sync telegram must be generated according.

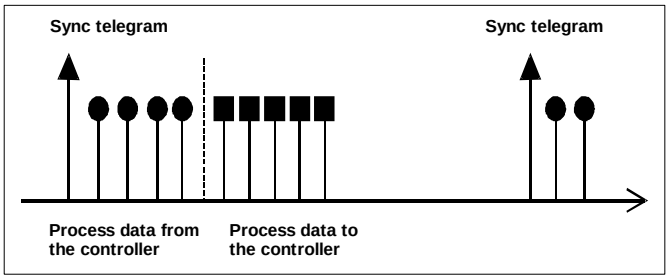


Fig. 6-1 Synchronisation of process data

After a sync telegram, the actual values and process data are send from the controller (see Fig. 6-1).

The data are then transferred to the controllers which accept the data as determined in the synctelegram.

All other telegrams, for instance parameters, are accepted asynchonously by the controller after transfer. The asynchronous data are not considered above.

6.7.4.1 Process data telegram to the controller

The process-data telegram to the drive is 8 byte long and structured as follows:

	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7	Byte 8
Identifier	**Control word C0135 low byte**	**Control word C0135 high byte**	**Setpoint C46 low byte**	**Setpoint C46 high byte**	**Zero**	**Zero**	**Zero**	**Zero**

Control word C0135 low byte

The bits 0 to 7 of the control word under C0135 are entered here

Control word C0135 high byte

The bits 8 to 15 of the control word under C0135 are entered here

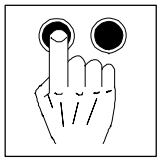
The description of the bits can be obtained from the Code Table.

Setpoint low byte / setpoint high byte

The frequency setpoint, which can also be written as parameter under C046, is entered here as process data word.

The normalization differs from the setting under C046. It is a signed value, 24000 = 480 Hz.

Bytes 5 to 8 are not assigned.



6.7.4.2 Process data telegram from the controller

The process-data telegram from the drive is structured as follows:

	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7	Byte 8
Identifier	Status word C0150 low byte	Status word C0150 high byte	Actual value Low byte	Actual value High byte	Setpoint low byte (only 8210)	Setpoint high byte (only 8210)	Zero	Zero

Status word C0150 low byte

The bits 0 to 7 of the control word under C0150 are entered here

Status word C0150 high byte

The bits 8 to 15 of the control word under C0150 are entered here

The description of the bits can be obtained from the Code Table.

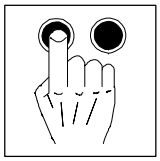
Act. value low byte / Act. value high byte

The actual frequency value with the signed normalisation
24000 = 480 Hz is provided here.

Setpoint low byte / setpoint high byte

The frequency setpoint under C046 can here be read with a signed normalisation 24000 = 480 Hz.

The bytes 7 and 8 are not assigned.



Parameter setting

7 Troubleshooting and fault elimination

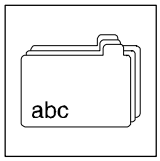
7.1 No communication with the controller

Possible causes	Diagnostics	Remedy
Is the controller switched on?	The operation status LED of the basic unit must be on 📖 4-1 Point 3.	Supply controller with voltage (see Operating Instructions for the basic unit)
Is the 2171 fieldbus module supplied with voltage?	The green Vcc-LED at the 2171 📖 4-1 Point 1 must be on (Remedy 1) or blinking (Remedy 2)	With supply from the basic unit (only with 8210) check the connection. With external supply check the 24 V voltage at terminals 39 and 59. A voltage of 24 V +10 % must be applied.
		The fieldbus module has not been initialized with the controller yet. Possibility 1: Controller not switched on (see fault possibility 1). Possibility 2: Check the connection to the controller
Does the controller receive telegrams?	The yellow RxD-LED at the 2171 📖 4-1 point 2 must flash with every telegram received correctly. For testing, send telegrams cyclically from the master.	Check whether the connection corresponds to the instructions given in chapter "CAN bus wiring", page 4-8. Check whether host sends telegrams and uses the appropriate interface.
		The CAN address (C0009) or the CAN baud rate (C0125) can be set differently for master and slave. Ensure that the addresses are identical.
		The CAN addresses (C0009) must be different for all controllers connected. Ensure not to use one address twice. Check wiring to the master.

7.2 Controller does not execute write job

Possible causes	Diagnostics	Remedy
Does the controller send a negative acknowledgement?		Operating mode C0001: The operating mode C0001 does not match when accessing (write) C046 or C0135. Set operating mode 3. Please observe the information under chapter "Information on parameter setting", page 6-1 ff.
		Read parameter This parameter can only be read. See the corresponding Operating Instructions.
Does the controller send a positive acknowledgement?	ACK response from the controller.	Operation status - 8200 With 8200 the parameters can only be changed when the controller is inhibited. Please observe the information under chapter "Information on parameter setting", page 6-1 ff.
		Parameter set The controller works with the other parameter set. The parameter change will become active after the parameter set has been changed.

Troubleshooting and fault elimination



8 Appendix

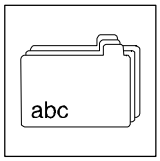
8.1 Code table

In the following, you will only find parameters which are important for the serial communication. For further information on inverter parameter setting, see the corresponding Operating Instructions.

Notes:

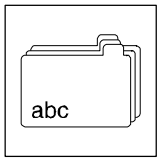
Code	Code number of the parameter	Leading zeros are not required. Codes marked with * are only available in parameter set 1.
Name	Name of the parameter	The text in parenthesis informs whether the codes are available in the fieldbus module or the controller:
		(P2171): Parameter in fieldbus module 2171
		(P820X/P821X/8200 vector/822X): Parameters in controllers 820X, 821X und 822X. The parameters can also be set via the 8201BB keypad.
Parameters	Contents and meaning of the parameter values	Parameters printed in bold are set by Lenze.

Code	Name	Note	
C0001	Operating mode for • 82XX • 8200 vector (P82XX)	**82XX**	**8200 vector**
		0 Control (C0135): Terminal **Setpoint (C0046): Terminal** (Lenze setting: 0) 1 Control (C0135): Terminal Setpoint (C0046): Keypad: 2 Control (C0135): Terminal Setpoint (C0046): Terminal 3 Control (C0135): CAN Setpoint (C0046): CAN The operating mode defines the source which writes on a parameter. The keypad and CAN are always authorized for parameter setting	see Operating Instructions 'Vector'
C0009*	CAN controller address (P82XX)	**1** 1 to 99 Controller address for unambiguous addressing in a CAN network. Do not set the values 00, 10, ..., 90, since they are reserved for group addressing.	
C0040*	Controller inhibit (P2171/2172)	0 Controller inhibited 1 Controller enabled Parameter C0040 is independent of operating mode C0001. The controller can also be enabled with control word C0135.	
C0043*	TRIP reset for: • 821X • 8200 vector • 822X (P2171/2172)	0 No actual fault, fault reset by overwriting with value 0 1 Actual fault Parameter C0043 is independent of operating mode C0001. A TRIP can also be reset using the control word C0135. (TRIP reset for 820X)	
C0046*	Frequency setpoint for: • 820X (P2171/2172)	0 to 480 Hz	
	Frequency setpoint for: • 821X • 8200 vector • 822X (P821X/P8200 vector/P822X)	0 to 480 Hz The value can be changed through the display factor C500/C501 (see Code table included in the Operating Instructions 820X, 821X and 822X).	

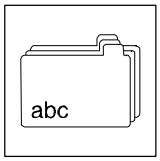


Appendix

Code	Name	Note		
C0125*	CAN baud rate (P82XX)	**0** **500** **kbaud** (Factory setting) 1 250 kbaud 2 125 kbaud 3 50 kbaud 4 1000 kbaud Baud rate for CAN bus in kbit/s (= kbaud).		
C0135*	Controller control word (parameter channel) for : • 820X • 821X • 8200 vector • 822X (P2171/2172)	**Bit**	**820X**	**821X, 8200 vector, 822X**
		0 1	JOG1, JOG2, JOG3 0 = C0046 active 1 = JOG1 (C0037) active 2 = JOG2 (C0038) active 3 = JOG3 (C0039) active JOG1, JOG2, JOG3	
		2	CW/CCW (CW rotation/CCW rotation) 0 = CW rotation 1 = CCW rotation	
		3	QSP (quick stop) 0 = QSP not active 1 = QSP active	
		4	Reserved	RFG stop (stop of the ramp function generator) 0 = RFG stop not active 1 = RFG stop active
		5	Reserved	RFG zero (deceleration along the T_{if} ramp C0013) 0 = RFG zero not active 1 = RFG zero active
		6	Reserved	UP function for motor potentiometer 0 = UP not active 1 = UP active
		7	Reserved	DOWN function for motor potentiometer 0 = DOWN not active 1 = DOWN active
		8	Reserved	
		9	Ctrl. inhibit (controller inhibit) 0 = No controller inhibit 1 = Controller inhibit	
		10	Reserved	
		11	Reserved	TRIP reset 0 ⇒ 1 Edge from 0 to 1 causes TRIP reset
		12	PAR (parameter set changeover) 0 ⇒ 1 (= parameter set 2) 1 ⇒ 0 (= parameter set 1)	
		13	Reserved	
		14	DC brake (DC injection brake) 0 = DCB not active 1 = DCB active	
		15	Reserved	
			The control word controls the controller. It compresses and summarizes control commands in bit commands. CAN format: VH	

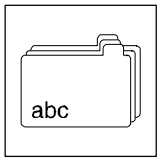


Code	Name	Note			
C0150*	Controller status word (parameter channel) for : • 820X • 821X • 8200 vector • 822X	**Bit**	**820X**	**821X, 822X**	**8200 vector** **Free configuration via C0417** (see Operating Instructions for 8200 vector)
		0	Reserved	Actual parameter set 0 = PS 1 active 1 = PS 2 active	FREE 0 (free access)
		1	IMP (pulse inhibit) 0 = Pulses for power stage enabled 1 = Pulses for power stage inhibited		
		2	I_{max} (current limit reached) 0 = Current limit not reached 1 = Current limit reached		FREE 2 (free access)
		3	Reserved	$f_d = f_{dset}$ (Act. frequency = Frequency setpoint) 0 = $f_d <> f_{dset}$ 1 = $f_d = f_{dset}$	FREE 3 (free access)
		4	$f_d = f_{dset}$ (Act. frequency = Frequency setpoint) 0 = $f_d <> f_{dset}$ 1 = $f_d = f_{dset}$	RFG on = RFG off (RFG input = RFG output) 0 = RFG in < > RFG out 1 = RFG on = RFG off	FREE 4 (free access)
		5	Q_{min} ($f_d \leq f_{dQmin}$) 0 = Q_{min} not active 1 = Q_{min} active		FREE 5 (free access)
		6	f_d = 0 (act. frequency = 0) 0 = f_d < > 0 1 = f_d = 0		
		7	Ctrl. inhibit (controller inhibit) 0 = No controller inhibit 1 = Controller inhibit		
		8 - 11	Controller status 0 = No fault 1 = Fault	controller status 0 = Unit initialization 1 = Autostart lock 3 = Operation inhibited 4 = Flying-restart circuit active 5 = DC-injection brake active 6 = Operation enable 7 = Message active (dynamically set pulse inhibit, e.g. at OU) 8 = Fault active	controller status 0 = Unit initialization 1 = Autostart lock 3 = Operation inhibited 6 = Operation enable 7 = Message active (dynamically set pulse inhibit, e.g. at OU) 8 = Fault active 9 = Power off
			Note: If the 2171 fieldbus module is externally supplied with 24V and the basic unit (8200/8210/8220) is disconnected from the mains supply, the status is indicated as 15. With this status, only the process data is active. Parameter setting is not possible (-> condition: status Operational; see chapter "Communication phases of the CAN network"). When applying a voltage to the basic unit, the frequency setpoint in the process data channel is set to 0.		
		12	Overtemperature warning (ϑ_{max} - 10 °C) 0 = No controller inhibit 1 = Controller inhibit		Warning 0 = No warning 1 = Warning
		13	V_{Gmax} (DC-bus overvoltage) 0 = No overvoltage 1 = Overvoltage		Message 0 = No message 1 = Message
		14	Direction of rotation 0 = CW rotation 1 = CCW rotation		FREE 14 (free access)
		15	Ready for operation (no error, overvoltage or undervoltage) 0 = Not ready for operation 1 = Ready for operation		FREE 15 (free access)
		The status word contains the most important status information in a compressed form. CAN format: VH			



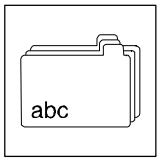
Appendix

Code	Name	Keypad	PC 1)	Fault	Cause	Remedy
C0161* C0162* C0163* C0164*	Fault memory (P82XX)	---	0	No fault	-	-
		CCr	71	System error	Strong interference on control cables	Shield control cables
					Ground or earth loops in the wiring	
		CE0	61	Communication error to AIF	Faulty transmission of control commands via AIF	Insert the communication module into the hand terminal
		CE1	62	Communication error to CAN-IN1 with sync control	CAN-IN1-object receives faulty data or communication is interrupted	Plug-in connection - bus module ⇔ Check FIF Check transmitter Increase monitoring time under C0357/1 if necessary
		CE2	63	Communication error to CAN-IN2	CAN-IN2-object receives faulty data or communication is interrupted	Plug-in connection - bus module ⇔ Check FIF Check transmitter Increase monitoring time under C0357/2 if necessary
		CE3	64	Communication error to CAN-IN1 with event or time control	CAN-IN1-object receives faulty data or communication is interrupted	Plug-in connection - bus module ⇔ Check FIF Check transmitter Increase monitoring time under C0357/3 if necessary
		CE4	65	BUS-OFF (many communication errors occured)	Controller has received too many incorrect telegrams via the system bus and has been disconnected	Check whether bus terminator is available Shield control of the cables Check PE connection Check bus load, if necessary, reduce the baud rate
		CE5	66	CAN Time-Out	For remote parameter setting via system bus (C0370): Slave does not answer. Communication monitoring time exceeded.	Check system bus wiring Check system bus configuration
					For operation with module in FIF: Internal fault	Contact Lenze
		EEr	91	External fault (TRIP-Set)	A digital signal assigned to TRIP set has been activated	Check external encoder
		H05	105	Internal fault		Contact Lenze
		Id1	140	Faulty parameter identification	Motor not connected	Connect motor
		LP1	32	Fault in motor phase (TRIP)	Failure of one/several motor phase(s)	Check motor cables,check V_{min} boost, connect the motor with the corresponding power or adapt it under C0599.
			182	Fault in motor phase (warning)	Motor current too low	
		LU	103 0	DC-bus undervoltage (only message without TRIP)	Mains voltage too low	Check mains voltage
					DC-bus voltage too low	Check supply module
		OC1	11	Short-circuit	Short-circuit	Find reason for short-circuit; check motor cable
					Excessive capacitive charging current of the motor cable	Use shorter motor cables with lower charging current
		OC2	12	Earth fault	Grounded motor phase	Check motor, check motor cable
					Excessive capacitive charging current of the motor cable	Use shorter motor cables with lower charging current
		OC3	13	Overload inverter during acceleration or short circuit	Acceleration time too short (C0012)	• Increase acceleration time • Check drive selection
					Defective motor cable	Check wiring
					Interturn fault in the motor	Check motor
		OC4	14	Controller overload during deceleration	Deceleration time set too short (C0013)	• Increase deceleration time • Check size of external brake resistor
		OC5	15	Controller overload in stationary operation	Frequent and long overload	Check drive selection
		OC6	16	Motor overload (I^2 x t overload)	Motor is thermally overloaded, for instance, because of • impermissible continuous current • frequent or too long acceleration processes	• Check drive selection • Check setting of C0120

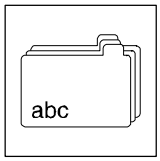


Code	Name	Keypad	PC 1)	Fault	Cause	Remedy
		OH	50	Heat sink temperature exceeds the value entered for the controller	Ambient temperature T_{amb} > +60 °C	• Allow controller to cool and ensure better ventilation • Check ambient temperature
					Heat sink very dirty	Clean heat sink
					Impermissibly high currents or acceleration is too frequent and long	• Check drive selection • Check load, if necessary, replace defective bearings
		OH3	53	PTC monitoring (TRIP)	Motor too hot because of excessive current, or acceleration is too frequent and too long	Check drive selection
		OH51	203	PTC monitoring (warning)	PTC not connected	Connect PTC or switch off monitoring
		OU	102 0	DC-bus overvoltage (only message without TRIP)	Mains voltage too high	Check voltage supply
					Brake operation	• Prolong deceleration times. • For operation with brake transistor: – Check the selection and connection of the brake resistor – Increase the deceleration times
					Earth leakage on the motor side	Check motor cable and motor for earth fault (disconnect motor from inverter)
		Pr	75	Faulty parameter transfer when using the keypad	All parameter sets are defective	It is absolutely necessary to repeat the data transfer or load the Lenze setting before enabling the controller.
		Pr1	72	Wrong PAR1 transfer when using the keypad.	PAR1 is defective.	
		Pr2	73	Wrong PAR2 transfer when using the keypad.	PAR2 is defective.	
		Pr3	77	Wrong PAR3 transfer when using the keypad.	PAR3 is defective	
		Pr4	78	Wrong PAR4 transfer when using the keypad.	PAR4 is defective	
		PTS	81	Time error during parameter set transfer	Data flow from keypad or PC interrupted, e. g. keypad was disconnected during transmission	
		rST	76	Faulty auto-TRIP reset	More than 8 fault messages in 10 minutes	Depends on the fault message
		Sd5	85	Open circuit at analog input	Current at analog input < 4 mA	Close circuit at analog input

1) CAN fault number



8.2 Table of keywords



P

R

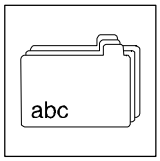
S

T

U

V

W



Appendix

Appendix