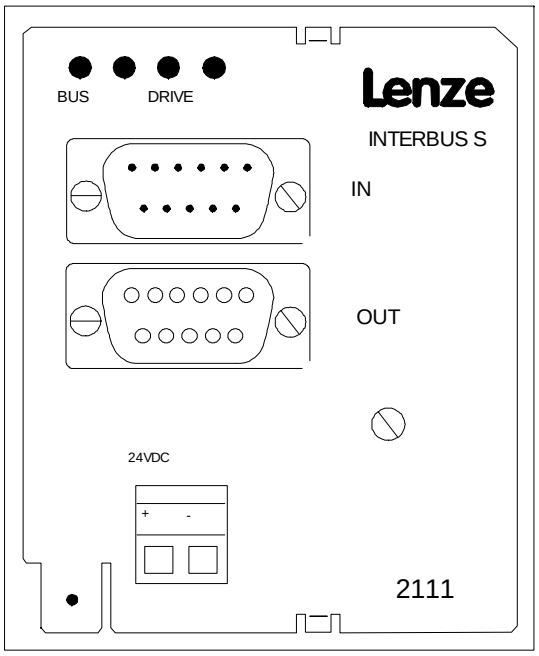
EDB2111UB
00408821

Lenze

Operating Instructions



Fieldbus module type 2111

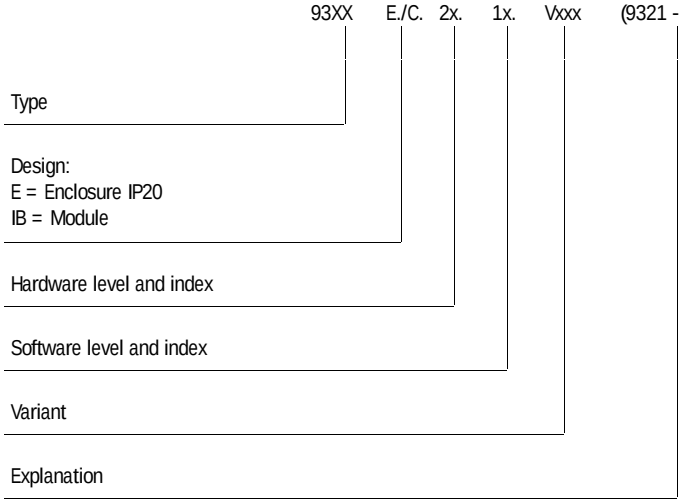
INTERBUS

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

2111	IB.	2x.	4x.		(INTERBUS)

Together with the unit series as from the nameplate data:

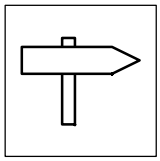
820X	E.	2x.	1x.		(8201 - 8204)
820X	E./C.	2x.	1x.	Vxxx	(8201 - 8204)
821X	E.	2x.	2x.		(8211 - 8218)
821X	E./C.	2x.	2x.	Vxxx	(8211 - 8218)
822X	E.	1x.	1x.		(8221 - 8225)
822X	E.	1x.	1x.	Vxxx	(8221 - 8227)
824X	E.	1x.	1x.		(8241 - 8246)
824X	E./C.	1x.	1x.	Vxxx	(8241 - 8246)
82EV		VA	0x		8200 vector
82EV		1x	0x		8200 vector
93XX	E.	2x.	1x.		(9321 - 9333)
93XX	E./C.	2x.	1x.	Vxxx	(9321 - 9333)

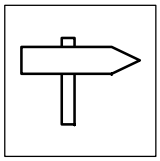


Important:
These Operating Instructions are only valid in combination with the Operating Instructions of the controller 82XX; 8200 vector or 93XX.

Version 1.0 06/99

Contents





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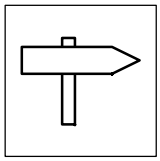

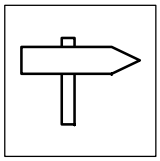

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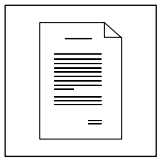


1 Preface and general information

1.1 About these Operating Instructions

- These Operating Instructions are intended for safety-relevant operations on and with the 2111 fieldbus module. They contain safety information which must be observed.
- All personnel working on and with the 2111 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 2111 fieldbus module. They are only valid in combination with the Operating Instructions of the corresponding controller.

1.1.1 Terminology used

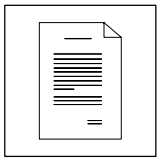
Controller	In the following, the term "controller" is used for "93XX servo inverters" or "82XX frequency inverters".
Drive system	In the following the term "drive system" is used for drive systems with fieldbus modules and other Lenze drive components.
Fieldbus module	In the following text, the term "fieldbus module" is used for the fieldbus module type 2111 INTERBUS.
Cxxx/y	Subcode y of code Cxxx (z.B. C0410/3 = subcode 3 of code C0410)
L-Cxxx/y	Lenze code (see chapter 📖 6.1.1))
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?

Ident. no.	Edition	Important	Content
393 424	02/12/96	1st edition	
408 821	01/06/99	replaces 393 424	Format change to DIN A4 • Editorially reviewed • Adaptation to software version 4x • Adaptation to 8200 vector (all chapters) • Process-data assignment (chapter 6.4.8) • Process-data configuration (chapter 6.4.9)

1.2 Items supplied

Items supplied	Important
• 1 2111 fieldbus module with housing (enclosure IP20) • 1 M3 fixing screw • 1 two-pole male connector for voltage supply • 1 Short Instructions	After the delivered 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

<table>
<tr><td>Labelling</td><td>Nameplate</td><td>CE mark</td><td>Manufacturer</td></tr>
<tr><td></td><td>Lenze 2111 fieldbus modules are unambiguously identified by their nameplates.</td><td>Conforms to the EC Low Voltage Directive</td><td>Lenze GmbH & Co KG
Postfach 101352
D-31763 Hameln</td></tr>
<tr><td>Application as directed</td><td colspan="3">2111 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, 8200 vector and 93XX. The 2111 fieldbus module links the Lenze controllers with the fast serial communication system INTERBUS.
● The fieldbus module must be attached and electrically connected so that it complies with its function and does not cause any hazards when being 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 inappropriate!</td></tr>
<tr><td>Liability</td><td colspan="3">● 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 Operating 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 indications given in these Operating Instructions describe the features of the product without warranting 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</td></tr>
<tr><td>Warranty</td><td colspan="3">● 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.</td></tr>
<tr><td>Disposal</td><td>Material</td><td>recycle</td><td>dispose</td></tr>
<tr><td></td><td>Metal</td><td>●</td><td>-</td></tr>
<tr><td></td><td>Plastic</td><td>●</td><td>-</td></tr>
<tr><td></td><td>Printed-board assemblies</td><td>-</td><td>●</td></tr>
<tr><td></td><td>Short Instructions/Operating Instructions</td><td>●</td><td></td></tr>
</table>

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 works.
  - 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 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 used controller must be taken. Example: Fasten covers to ensure protection against contact.

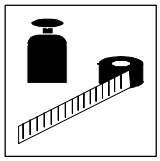
2.3 Layout of the safety information

- All safety information has 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 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.



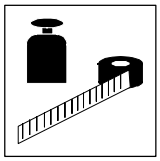
3 Technical data

3.1 Features

- Attachable additional module for the Lenze controller series 820X, 821X, 8200 vector, 822X and 93XX
- Bus connection via remote bus to RS485 standard
- Maximum distance between participants: 400 m
- Standardized parameters and controller function according to the DRIVECOM profile 21.
- Access to all Lenze parameters
- Intelligent module with 16-bit microprocessor

3.2 General data and application conditions

Field	Values
Order designation	33.2111IB
Communication smedium	RS485
INTERBUS participant	Slave
Communication profile	PCP 1.5
Drive profile	DRIVECOM profile 21
Baud rate	500 kbit/s
Ambient temperature	during operation: 0 °C to 55 °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) / 93XX: internal or external supply



Technical data

3.3 Rated data

Field	Values	
Communication medium	RS485	
Supply voltage	24 V DC ± 10 %; max 60 mA	
Insulation voltage - bus systems:		
• to PE	50 V AC	
• to external supply (terminal 39/59)	0 V AC	(no electrical isolation)
• to power stage		
– 820X / 821X	270 V AC	(single basic insulation)
– 822X / 93XX / 8200 vector	270 V AC	(double basic insulation)
• to the control terminals		
– 820X / 8200 vector (internal supply)	0 V AC	(no electrical isolation)
– 8200 vector (external supply)	100 V AC	(single basic insulation)
– 821X	50 V AC	(Electrical isolation)
– 822X / 93XX	270 V AC	(single basic insulation)
• to external bus system	0 V AC	(no electrical isolation)
Degree of pollution	VDE 0110 part 2 pollution degree 2	

3.4 Dimensions

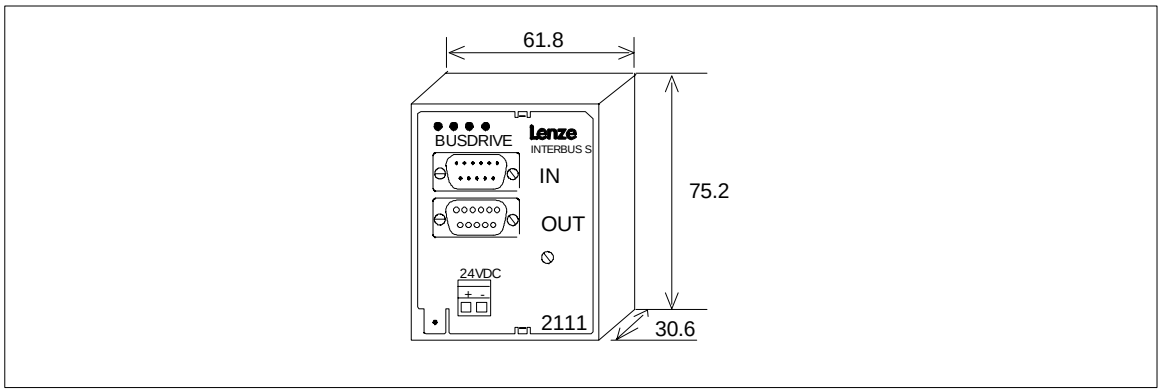
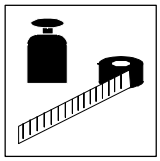


Fig. 3-1 Dimensions of the 2111 fieldbus module

3.5 Protocol data

Field	Values
Maximum number of controllers	63
Process-data words (PCD): • Lenze setting (L-C1910= 4) • extended (L-C1910= 6)	 • 2 words (32 bit) • 3 words (48 bit)
Parameter-data words	1 (16 bit)
INTERBUS deignation	227 (decimal) or E3 (hex)
Maximum PDU length	64 byte
Supported PCP services	Initiate, abort, status, identify, Get-0V-long, read, write



3.6 Communication data

3.6.1 Cycle time

The cycle time of the communication system is the time to exchange all process data (chapter 6.2, (📖 6-3)) between the host and the field units (e. g. controllers).

It depends on the data of the communication system and is calculated as follows (e.g. for SIMATIC-S5, Siemens):

$$t_{cycl} = (n + 48 + 3 \times BK) \times 3.35 \times 10^{-3} + 0.24 \times L + 0.2$$

t_{cycl}: Cycle time in ms
n: Sum of all data bit in the INTERBUS ring
BT: Number of bus terminals
L: Length of the remote bus cable in km

The figure (Fig. 3-2) shows the proportional relation between cycle time and the number of connected controllers.

The indicated values refer to the connection of Lenze controllers (e. g. 82XX) with 48 data bit (1 communication data word + 2 process data words, see chapter 3.5).

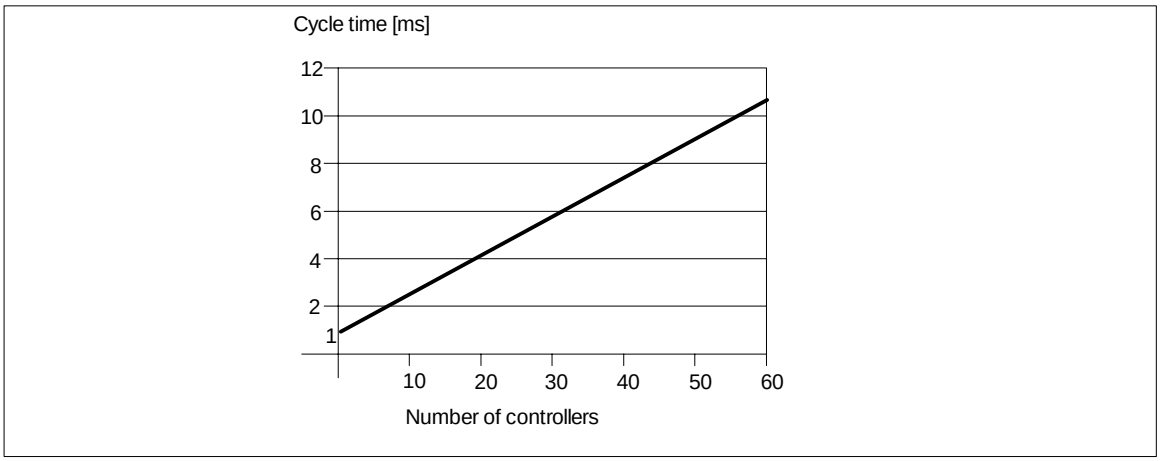


Fig. 3-2 INTERBUS cycle time for controllers

3.6.2 Processing time of the controller

The processing time of the controller is added to the INTERBUS cycle time.

The processing time of the controller depends on the series and version:

Processing time 820X

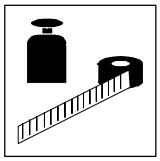
For the 820X series several processing steps are required. These steps are processed cyclically.

A processing cycle consists of:

- Writing of control word or setpoint, if the value has changed
- Alternating reading of status word and actual value
- Processing of PCP parameter access, if there is a service.

If the time tolerances caused by cyclic reading of the status word/actual value are too large, the alternating reading of the status word and the actual value can be suppressed. This is controlled by the bit 15 (PE inhibit) of the DRIVECOM control word:

- PE inhibit = 0: Status and actual-value update active



- PE inhibit = 1: Status and actual-value update inactive

A suppression of the processing of PCP parameter access is not necessary, since this is controlled by the user.

In the following table you will find a list of the processing times:

Processing step	Max. processing time in ms	Processing tolerance in ms	Additional parameters in ms
Parameters	70	-8	-
Setpoint	35	-8	180
Control word	35	-8	180
Actual value	35	-8	180
Status word	35	-8	180
Setpoint + control word	70	-16	180
Setpoint + control word + actual value + status word	140	-32	180

Note:
A change of the setpoint signal results in writing the control word.

Processing time 821X / 8200 vector / 822X

The parameter data (transmission via PCP channel) and process data are independent of each other.

- Parameter data (PCP): approx. 30 ms + 20 ms tolerance
- Process data: approx. 3 ms + 2 ms tolerance

Processing time 93XX

The parameter data (transmission via PCP channel) and process data are independent of each other.

- Parameter data (PCP): approx. 30 ms + 20 ms tolerance
- Process data: approx. 2 ms + 1 ms tolerance

3.6.3 Number of participants

The maximum number of participants in an INTERBUS communication depends on the host and here especially on the available I/O range.

The DRIVECOM compatible Lenze controller assigns two process data words (32 bit; L-C1910=4) or three process data words (48 bit; L-C1910=6) in both directions. The additional communication-data word does not appear in the I/O area of the host system.

4 Installation

4.1 Connections of the fieldbus module 2111

4.1.1 Overview

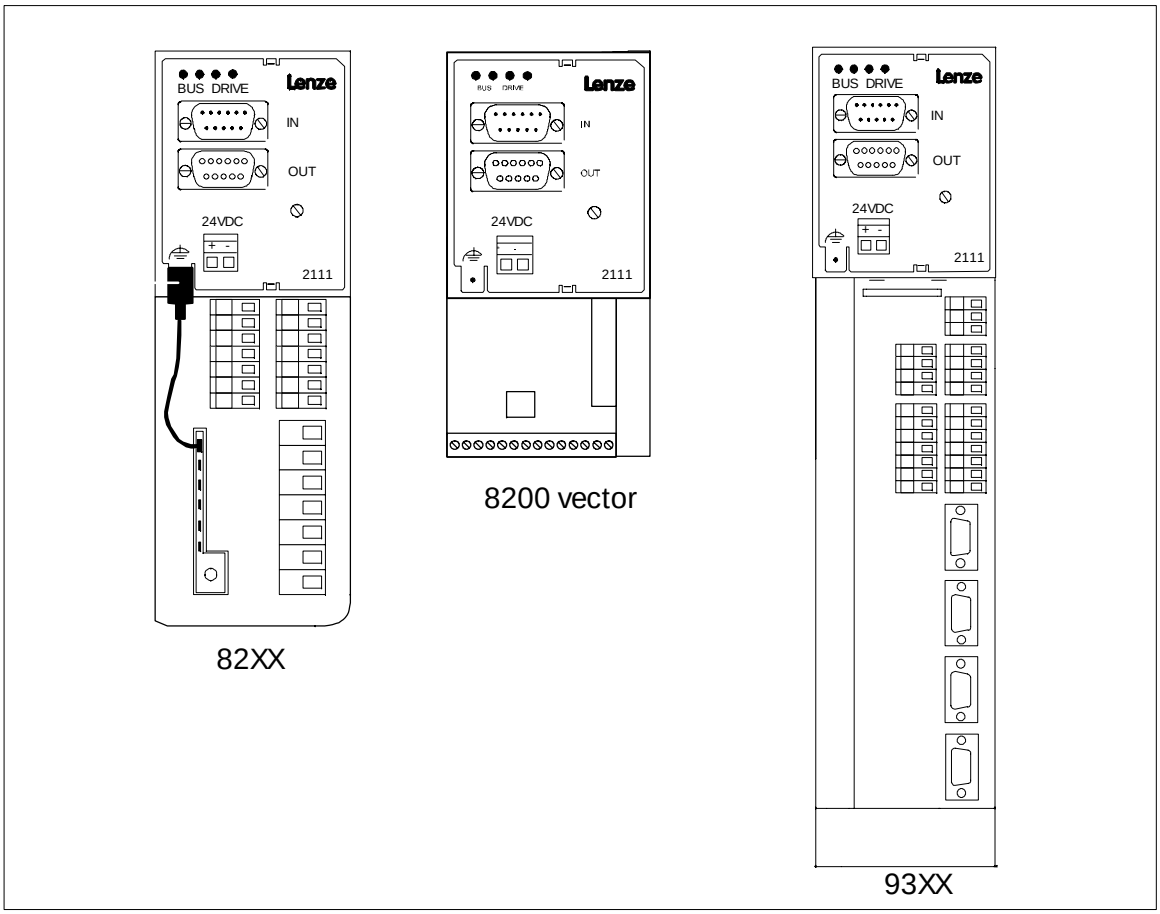
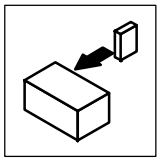
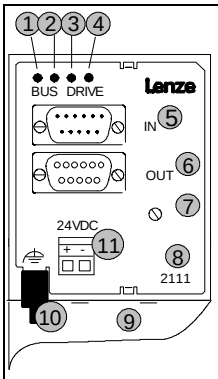


Fig. 4-1 82XX, 8200 vector and 93XX controllers (with fieldbus module 2111)

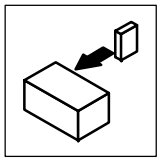


Installation



Pos.	Name/Meaning
1	**Green bus LED** for voltage supply of the 2111 fieldbus module ON: 2111 f eldbus module is supplied with voltage and is connected to the controller. OFF: 2111 fieldbus module is not supplied with voltage; controller or external voltage supply is switched off. BLINKING: 2111 fieldbus module is supplied with voltage and is connected to the controller (controller is switched off, initialized, or not available).
2	**Yellow bus LED** for communication of the 2111 fieldbus module ON: 2111 fieldbus module is initialized but there is not INTERBUS communication from the master. OFF: 2111 fieldbus module is not initialized yet. FAST BLINKING (4 times per second): INTERBUS communication is active – only process data. SLOW BLINKING (once per second): INTERBUS communication is active – process data and PCP communication.
3	**Red drive LED (DRIVE)** Operating status of the 82XX or 93XX controllers. (See Operating Instructions of the controller.)
4	**Green drive LED (DRIVE)** Operating status of the 82XX or 93XX controllers. (See Operating Instructions of the controller.)
5	**INTERBUS input (IN)** 9-pole SubD pin connector (see chapter 4.1.2)
6	**INTERBUS output (OUT)** 9-pole SubD socket connector (see chapter 4.1.3)
7	Fixing screw for the 2111 fieldbus module
8	2111 fieldbus module
9	82XX or 93XX controller
10	Only for 820X and 821X necessary: additional PE-screen cable, which avoids communication interference (EMC) in high-interference environments.
11	**Connection for external voltage supply (24 V DC ±10%)** External voltage supply for the 2111 fieldbus module (see chapter4.1.3). For 8200 controllers please observe chapter 4.3.1. Always required for **820X** ! Optionally for all others.

Fig. 4-2 Name/meaning of the module elements



4.1.2 9-pole SubD connections

Pin	9-polge SubD pin connection (IN)			9-pole SubD socket connector (OUT)		
	Name	Input/output	Explanation	Name	Input/output	Explanation
1	DO1	Input	RS485: DO1 not inverted	DO1	Output	RS485: DO2 not inverted
2	DI1	Output	RS485: DI1 not inverted	DI1	Input	RS485: DI2 not inverted
3	GND		Reference potential	GND		Reference potential
4	free			GND		Reference potential
5	Vcc5		5 V DC 1)	Vcc5	Output	5 V DC 1)
6	/DO1	Input	RS485: DO1 inverted	/DO2	Output	RS485: DO2 inverted
7	/DI1	Output	RS485: DI1 inverted	/DI2	Input	RS485: DI2 inverted
8	Vcc5		5 V DC 1)	Vcc5		5 V DC 1)
9	free			RBST	Input	Message input

1) Total current approx. 130 mA (IN + OUT)

4.1.3 Plug-in terminal for 2-pole plug (External voltage supply)

Name	Input/output	Explanation
+	Input	External voltage supply +24 V DC ± 10 %, 150 mA
-	Input	GND; reference for external supply

4.2 Mechanical installation

- If necessary, remove the keypad which had been attached to the controller before.
- Plug the 2111 fieldbus module in the corresponding interface of the controller and fasten it with the fixing screw. (📖 4-2; pos. 7) fixing.

4.3 Electrical installation

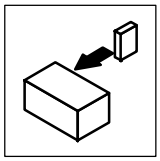
Tip!

The communciation of 820X and 821X controllers may be interfered by electromagnetic radiation.
If necessary, use an additional PE screen cable. (📖 4-2; pos. 10) .

4.3.1 Voltage supply (+24V DC ±10%)

If required, supply the 2111 fieldbus module via the plug-in contacts 1/2 (📖 4-2; pos. 11) using an external voltage supply 24 V DC ±10 %.

Controller	Voltage supply
820X (8201...8204) / 8200 vector	always required
821X / 822X / 824X and 93XX	only required to avoid interruption of the communication ring in the event of a mains switch-off.



Installation

Use a separate supply unit for the external supply of the fieldbus module (+24V DC ± 10%).

Use separate supply units for longer distances between the control cabinets.

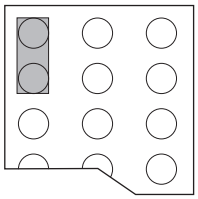
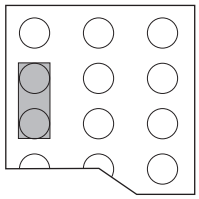
The following chapter describes how to connect the 2111 fieldbus module to the bus system, see chapter 4.3.2.

Tip!

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 potential isolation must be installed if

- a 820X, 821X or 8200 vector controller will be connected to a host
- a safe electrical isolation (double basic insulation) to VDE 0160 is required

For this, you can use a bus terminal or an interface module for the host with an addition potential isolation (see the corresponding manufacturer information).
For wiring, the electrical isolation of the supply voltage must be taken into account.

Features:	
Communication medium	RS485
Network topology	Ring
Possible number of controllers	63
Maximum cable length	400m between the single 2111IB fieldbus modules
Maximum baud rate	500 kbit/s

For an example of the INTERBUS structure, see the drawing (Fig. 4-3). The required accessories (e.g. connection cables) are listed in chapter 8.1.

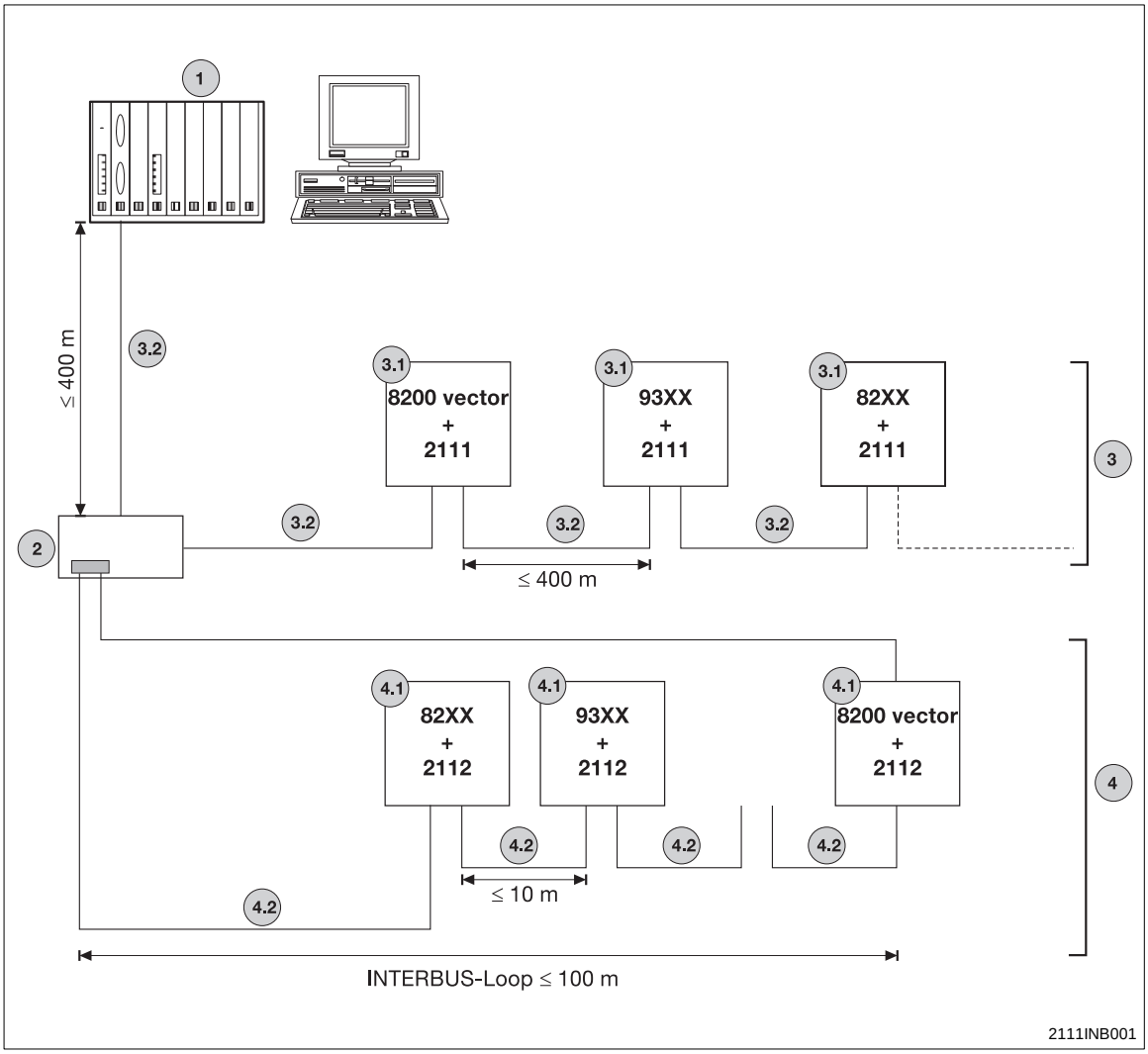
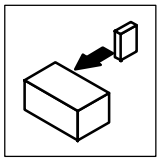


Fig. 4-3 Wiring example for the bus system INTERBUS

Pos.	Element	Function
1	Host (e.g. PC or PLC) with INTERBUS master interface module	Master
2	INTERBUS loop bus terminal	Connects the long distance bus and the INTERBUS loop (network nodes)
3	Long distance bus	Connection ● Host interface module ⇨ first bus terminal or first Lenze controller with INTERBUS module ● Bus terminal ⇨ Lenze controller with INTERBUS module ● Lenze controller with INTERBUS module ⇨ Lenze controller with INTERBUS module
3.1	Long distance bus module	Bus participant in the long distance bus; e.g. Lenze controller with INTERBUS module (slave). Here, networking does not require a bus participant.
3.2	Long distance bus module	Connects the INTERBUS master interface module with the bus terminal and/or the long distance bus modules.
4	INTERBUS loop	Bus terminal and max. 8 peripheral bus participants
4.1	INTERBUS looo module	Bus participant in the INTERBUS loop; e.g. Lenze controller with INTERBUS loop module 2112
4.2	INTERBUS loop cable	Connection in the loop



Installation

The INTERBUS is a ring system. Both transmission directions are transmitted in the same bus cable. The ring connects the host-interface module with all bus participants. Two different bus types can be distinguished:

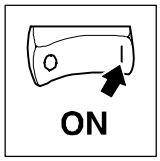
- Long distance bus (Fig. 4-3 pos. 4)
  Connection between
  – the host-interface module and the first bus terminal or the first 2111 fieldbus module
  – the bus terminal and the 2111 fieldbus module
  – two 2111 fieldbus modules
- Peripheral bus (Fig. 4-3 pos. 5)
  Connection in a peripheral-bus station

A peripheral-bus station consists of:

- a bus terminale (Fig. 4-3 pos. 2)
- up to eight peripheral bus modules (Fig. 4-3 pos. 3)

The bus terminal connects a long distance bus to a peripheral bus.

The bus system is a master-slave system, i.e. a host (master) is connected to several field units (slaves).



5 Commissioning

Stop!

- Before switching on the mains voltage, check the wiring for completeness, earth fault and short circuit.
- **Keep to the switch-on sequence!** (Chapters 5.1 to 5.2.2)

5.1 Configuration of the host for communication with the 2111 fieldbus module

The host parameters (PC, PLC, etc.) are typically set via the PC program ”SYSSWT” of Phoenix Contact.

Tip!

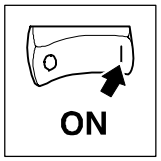
Please observe the information given in the ”SYSSWT” program. Program by Phoenix Contact.

5.1.1 The program ”SYSSWT”

1. Install “SYSSWT“ on the host.
2. Start the program “SYSSWT”.
3. Select “Applications“ from the main menu.
4. Then select “Planning“.
   – A list for field assignment (field names) is displayed. Please enter the following values:

Field name	Entry	Explanation
Module/PD length	2 2 3	Process-data length in words (16 bit each) for 82XX for 93XX, factory setting (L-C1910 = 4) for 93XX, when code L-C1910 = 6
Module ID	227	Module identification
CR	2 or higher	Communication reference for PCP communication

   – All other fields must be entered inidividually.
5. Select the menu “File“.
6. Then select the menu point “Save planning data“.
   – Before saving the new settings, mark the options not to be executed:
   ( ) NO bus start
   ( ) NO communication initialization
   ( ) NO transfer stop
   Mark the options not to be executed.
   – Save your settings
7. Close the program “SYSSWT“.



5.1.2 Different program

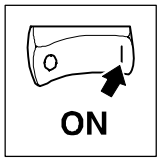
If you do not use the program ”SYSSWT”, the following settings must be made:

Process-data communication

Name	Entry	Explanation
Module/PD length	 2 2 3	Process-data length in words (16 bit each) for 82XX for 93XX, factory setting (L-C1910 = 4) for 93XX, when code L-C1910 = 6
Module ID	227	Module identification

PCP communication

Name	Entry	Explanation
COM_REF	2 or higher	Communication reference (CR)
CONN_TYPE	Acyclic master/slave	Connection type
CONN_ATTR	Defined	Connection attribute
Max PDU sending high prio	0	Sending history high priority
Max PDU sending low prio	64	Sending history low priority
Max PDU receiving high prio	0	Receiving history high priority
Max PDU receiving low prio	64	Receiving history low priority
Supported service request	803000_{hex}	Supported service, master request
Supported Services Response	000000_{hex}	Supported service, slave response
Maximum SCC	1	
Maximum RCC	0	
Maximum SAC	0	
Maximum RAC	0	



5.2 Start up of the 2111 fieldbus module

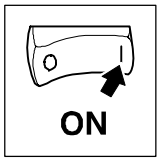
1. Switch on the controller and, if required, the external voltage supply of the 2111 fieldbus module.
   – The green LED for the voltage supply (📖 4-2) pos.1) must be on or blinking.
   – The internal initialization between control and 2111 fieldbus module follows. The initialization time is up to 10 s.
2. Initialization is completed when
   – the green bus LED (📖 4-2) pos. 1) is on permanently and
   – the yellow bus LED (📖 4-2) pos. 2) is on or blinking.

If the LEDs are not on as expected, see chapter 7 ”Troubleshooting and fault elimination”.

Tip!

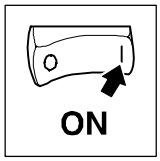
When attaching the fieldbus module to the 93XX controller, the controller is inhibited and the DRIVECOM status switch-on inhibit is set. For enabling the controller, the status OPERATION ENABLE must be set once with the DRIVECOM control word. (📖 5-5). Afterwards, the controller can be controlled as usually, e.g. via terminals.

3. It is now possible to communicate with the drive.
   – With a PCP communication it is only possible to access the parameters of the controller after having executed the PCP service “Initiate“ (see chapter 6.6.2).
4. It is then possible to access the parameters via the PCP services “Read“ and “Write“ (see chapter 6.6.4).



5.2.1 Drive control via INTERBUS

<table>
<tr><td rowspan="4">82XX /
8200 vector</td><td>1. For drive control via INTERBUS, change the setting of the Lenze parameter operating mode (L-C0001) from 0 to 3 (see chapter 6.5.1). This change can be made using the 8201BB keypad or the keypad for the 8200 vector or directly via INTERBUS.
Examples for INTERBUS PCP write (L-C0001=3):
– Index = $5FFE_{hex}$
(results from $5FFF_{hex}$ – $(L\text{-}C0001)_{hex}$; see Lenze code addressing 📖 6-1)
– Subindex: 0
– Value: 30000_{dec} (results from $3x10^4$; see chapter 6.1)</td></tr>
<tr><td> 
For 8200 vector controllers up to software version V1.1, C0410/y (y = 1...16) must be assigned to the AIF control word (AIF-CTRL), i.e.
C0410/1 = 10, C0410/2 = 11 .... C0410/16 = 25 (see Operating Instructions for 8200 vector).</td></tr>
<tr><td>2. Terminal 28 (ctrl. enable) is always active and must be set to HIGH level during INTERBUS operation (see the Operating Instructions for the controller).
– Otherwise, the controller cannot be enabled by the INTERBUS (DRIVECOM unit status ”OPERATION ENABLED”).
– With 821X, 8200vector and 822X, the function QSP (quick stop) is always active. If QSP is assigned to an input terminal (default setting: not assigned), this terminal must be at HIGH level during INTERBUS operation (see the corresponding Operating Instructions).
The controller now accepts control and parameter-setting data from the INTERBUS.</td></tr>
<tr><td>93XX</td><td>1. For drive control via INTERBUS set the Lenze parameter Signal Configuration (L-C0005) to a value xxx3. This change can be carried out using the 9371BB keypad or the INTERBUS. For the first commissioning, select the signal configuration 1013.
Examples for INTERBUS PCP write (L-C0005=1013):
– Index = $5FFA_{hex}$
(results from $5FFF_{hex}$ – $(L\text{-}C0005)_{hex}$; see Lenze code addressing 📖 6-1)
– Subindex: 0
– Value: 10 130 000_{dec} (results from $1013x10^4$; see chapter 6.1)
2. Set the parameter L-C0142 to 0
3. Terminal 28 (ctrl. enable) is always active and must be set to HIGH level during INTERBUS operation (see the Operating Instructions for the controller). Otherwise, the controller cannot be enabled by the INTERBUS (DRIVECOM unit status ”OPERATION ENABLED”).
– With the signal configuration L-C0005=1013, the function QSP (quick stop) and the CW/CCW changeover are assigned to the digital input terminals E1 and E2 and thus they are always active. For INTERBUS operation E1 must be set to HIGH level (see Operating Instructions 93XX).</td></tr>
<tr><td> 
With the signal configuration L-C0005=xx13, terminal A1 is switched as voltage output. Therefore, only the following terminals must be connected via cables:
• X5.A1 with X5.28 (ctrl. enable)
• X5.A1 with X5.E1 (CW/QSP)</td></tr>
<tr><td colspan="2">The controller now accepts control and parameter-setting data from the INTERBUS.</td></tr>
</table>



5.2.2 Enable controller

Tip!

As soon as the fieldbus module is attached to the 93XX controller, the controller is inhibited. DRIVECOM sets the status SWITCH-ON INHIBIT.

The DRIVECOM control word must once be set to the status ”OPERATION ENABLED” to enable the controller (description see below).

Afterwards the controller can be controlled via e. g. terminals.

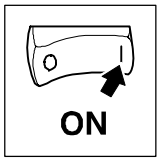
The controller can be controlled with the DRIVECOM process data (see chapter 6.4.6). The host has direct access to the process data. In the PLC, for instance, data are directly assigned to the I/O area.

The controller is enabled with the DRIVECOM parameter ”control word”. The actual unit status is described with the the DRIVECOM PARAMETER ”status word”.

For standard enabling of the controller proceed as follows:

1. Speed setpoint (2nd process word; POW2 [1]) selection (value not 0).
2. Change to the status “READY FOR SWITCH ON“
   POW1 = 0000 0000 0111 1110_{bin} ($007E_{hex}$).
3. Wait for the status “READY FOR SWITCH ON“.
   PIW1 [2] = xxxx xxxx x01x $0001_{bin.}$
4. Change to the status “OPERATION ENABLED“
   POW1 = 0000 0000 0111 1111_{bin} ($007F_{hex}$).
   (wait for operation enabled)

[1] POW = process output word
[2] PIW = process input word



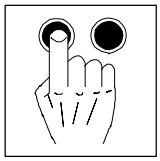
5.3 DRIVECOM compatibility

The DRIVECOM profile 21 is a specification of important parameters and unit performance of several manufacturers. The DRIVECOM profile 21 mainly describes the unit control and a speed operating mode. In addition to the DRIVECOM specifications there are further Lenze-specific functions, e.g. digital-frequency coupling or DC injection-brake. These manufacturer-specific specifications require slight setting changes to comply with the desired DRIVECOM compatibility. In the following, you will find the changes required for the Lenze controllers.	
820X	With 820X controllers, parameters can only be set when the controller is inhibited. The controller is inhibited in DRIVECOM status. ● "SWITCH-ON INHIBIT" ● "READY FOR SWITCH ON" ● "SWITCHED ON" ● "TRIP"
821X, 8200 vector and 822X	The automatic DC-injection brake must be deactivated in all parameter sets, i. e. ● L-C0106=0 ● L-C2106=0 ● L-C4106=0 (only 8200 vector) ● L-C6106=0 (only 8200 vector) If the automatic DC-injection brake is not deactivated (holding time of the DC-injection brake L-C0106 not 0), the controller automatically switches from the status "OPERATION ENABLED" to the status "SWITCHED ON" when the speed is 0 and the holding time of the DC-injection brake is elapsed. If the setpoint is higher than 0, the controller is automatically reset to the status "OPERATION ENABLED".
93XX	Set a DRIVECOM speed signal configuratin under code L-C0005, e. g.: ● L-C0005=1013 This configuration corresponds to the signal configuration 1000 with the following changes: ● Setpoint selection with INTERBUS ● Unit control with INTERBUS ● Output X5.A1 is selected as voltage output for the internal supply of the digital inputs. ● Actual values and status signals for INTERBUS For the detailed description of the signal configuration, see 93XX Manual.

5.4 Special features with 82XX, 8200 vector and 93XX

	Please note ● For safe operation it is absolutely necessary to observe the notes for the controllers given in this chapter. ● Please observe the corresponding Operating Instructions of the controllers.

820X	● Parameter setting (codes except process data) is only possible when the controller is inhibited (DRIVECOM controller status unequal "OPERATION ENABLED"). Parameters are accepted when the controller is enabled, but they are not saved. ● A TRIP must only be reset through INTERBUS: If the controller is set to the status TRIP while being operated with INTERBUS control (L-C0001 = 3) and if the TRIP is reset through terminal 28, the drive can start for a short time. When resetting a fault via INTERBUS, this does not occur. ● After the command "TRIP reset" the 820X controller is basically initialized. During this time the controller does not accept any services. ● Always send the direction of rotation with a low setpoint before the new setpoint: If the setpoint and the direction of rotation are changed at the same time via the DRIVECOM speed setpoint, the speed can change to the wrong direction or rotation for a short time. This is because the setpoint is sent to the controller as unipolar value before and the information about the direction of rotation is sent.
8200 vector	● Digital and analog input and output signals can be freely configured (see Operating Instructions for 8200 vector; codes C0410, C0412, C0417 and C0421) ● The change of the code L-C0001 to xxx3 starts the preconfiguration of the process data words in the controller
93XX	● Set the signal configuration L-C0005 = xxx3 instead of the operating mode L-C0001. ● The change of the code L-C0005 to xxx3 starts the preconfiguration of the process data words in the controller ● Set the parameter L-C0142 = 0 (auto start lock), to avoid a short time start of the drive during the initialization phase.



6 Parameter setting

The INTERBUS transmits two different types of data between the host and the controllers.

- **Parameters**, e.g. operation parameters, diagnostic information, motor data.
  In general, the transmission of parameters is not as time-critical as the transmission of the second group of process data, but there is a larger data volume.
- **Process data,** e. g. setpoints and actual values, which must be exchanged as fast as possible.
  The data volume is small (e. g. 2 bytes with DRIVECOM or Lenze) and must be transmitted cyclically.

For these two different tasks the transmitted data is divided into two logical communication channels:

- **PCP channel** (PCP = Peripherials Communication Protocol) for the transmission of parameters with services according to the PROFIBUS standard (PCP services; see page 6-25).
- **Process-data channel** for fast transfer of process data. The process data are cyclically transmitted via the ring cable. Thus, the latest input and output data are constantly exchanged between the host and the controllers.

6.1 Parameters

The system distinguishes two parameter types: Lenze parameters which are implemented in Lenze controllers, and the DRIVECOM parameters, which are standardized according to the DRIVECOM profile 21. This chapter gives a short description of the two parameter types and their relation to each other.

6.1.1 Lenze parameters

In general, the parameters of Lenze controllers are addressed via 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 with L-Cxxxx, to ensure that they are not mixed up with the DRIVECOM index (e. g. L-C0001 for the Lenze code C0001).

Lenze code addressing

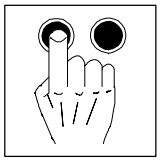
The access to Lenze parameters is possible. However, the addressing of the parameters (code numbers) has been changed and is calculated as follows:

Index = 24575 - LENZE_CODENR
$Index_{hex}$ = $5FFF_{hex}$ - $LENZE\_CODENR_{hex}$

Example:
The Lenze parameter L-C0001 (operating mode) can be accessed via INTERBUS under index 24574 (= 24575 - 1).

Lenze data types

The possible Lenze parameters and their value ranges can be obtained from the corresponding Operating Instructions for the controller.
The data of the Lenze parameters are mainly represented in a fixed-point format of the data type Integer32 with four decimal digits. This means, that the parameter value listed in the Operating Instructions must be multiplied by 10000.



Example:
Operating Instructions:
L-C0039 (JOG) = 150.4 Hz
results in 150.4 x 10000 = 1504000_{dec} ($0016F300_{hex}$)

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 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). Exceptions are process data, such as control words or setpoints as well as some DRIVECOM profile parameters (see chapter 8.2 ”DRIVECOM code table”)

Parameter sets for 8200 vector

The 8200 controller is equipped with four parameter sets, which can be directly addressed via the INTERBUS 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

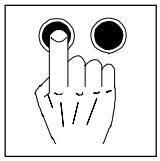
Depending on the settings under code L-C0003 parameter changes will be saved in the controller (see Operating Instructions for 8200 vector) Exceptions are process data such as control words or setpoints as well as some DRIVECOM parameters (see chapter 8.2 ”DRIVECOM code table”)

Parameter sets for 93XX

The 93XX controllers are equipped with 4 parameter sets for non-volatile storage. Another parameter set is in the user memory of the controller. This is the current parameter set. Only the current parameter set can be directly addressed via INTERBUS. For the codes, see Operating Instructions or Manual for 93XX. Changes of the current parameter set will be lost after switching off the controller. Code C0003 is for saving the current parameter set. After switching on the controller, parameter set 1 is automatically loaded into the current parameter set.

6.1.2 DRIVECOM parameters

In the following, the controller parameters, which are standardized according to the DRIVECOM profile 21, are named DRIVECOM parameters.
Each DRIVECOM parameter is addressed by means of the index. The indices are listed in the survey of the implemented DRIVECOM parameters (see chapter 8.2).



6.2 Process-data assignment

Process data are data memories in which several parameters for a new parameter - the process data - are summarized for fast transmission. The host has direct access to the process data. In the PLC, for instance, the data are directly assigned to the I/O area. These process data are cyclically exchanged between the controller and the master. They are subdivided into

- Process output data (PO data)
- Process input data (PI data)

Here the data flow starts from the master, i.e. the PO data of the master are input data for the controller.The controller gets the control information from the master and returns status information.

The default setting for the process-data length is 4 byte. When using 93XX, the process-data length can be extended to 6bytes via code L-C1910.

Default setting of the PI data:

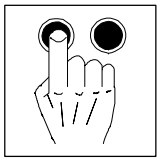
Byte No.		Meaning
1:	Word1-HIGH byte; bit 8-15	PIW1 DRIVECOM status word
2:	Word1-LOW byte; bit 0-7	
3:	Word2-HIGH byte; bit 8-15	PIW2 DRIVECOM speed
4:	Word2-LOW byte; bit 0-7	

Default setting of the PO data:

Byte No.		Meaning
1:	Word1-HIGH byte; bit 8-15	POW1 DRIVECOM control word
2:	Word1-LOW byte; bit 0-7	
3:	Word2-HIGH byte; bit 8-15	POW2 DRIVECOM speed setpoint
4:	Word2-LOW byte; bit 0-7	

With the 82XX controllers, the process data PIW2/POW2 can be alternatively assigned to the actual DRIVECOM percentage value or the setpoint of the DRIVECOM percentage value.

With 93XX controllers the 2nd (PIW2/POW2) and the third (PIW3/POW3) process data word can be assigned to different controller signals (see chapter. 6.4.6 ”Process data”).



6.3 Controller status

6.3.1 Standard unit control

For standard control you enter the control information via the corresponding control inputs (terminal):

For 82XX controllers, the corresponding control input is selected by means of the Lenze parameter L-C0001 (operating mode).

The information about the current unit status (rectangles in the status diagram Fig. 6-1) are available in the DRIVECOM parameter “status word“. Commands in the DRIVECOM parameters “control word“ are switched off and cannot change the controller status. The commands to change the controller status are entered via the corresponding control inputs. These commands are marked by arrows in the following diagram.

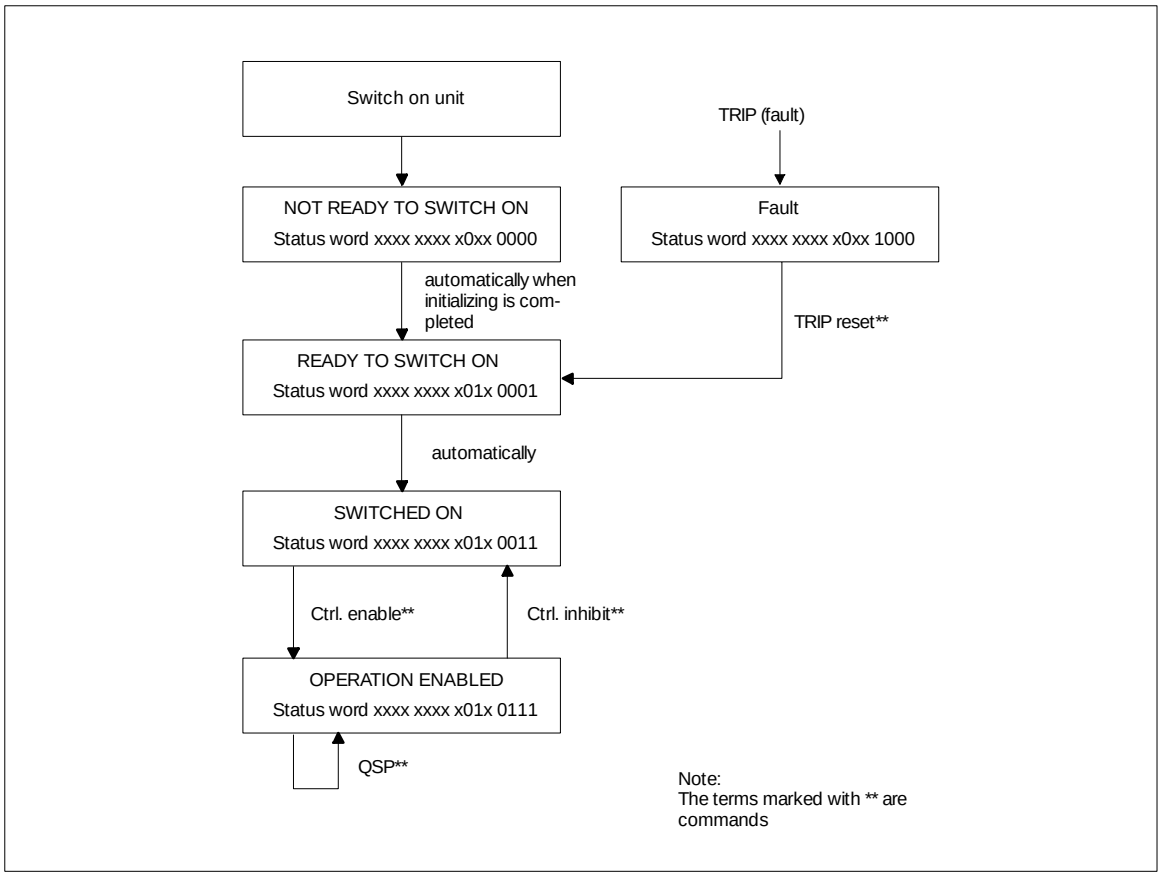


Fig. 6-1 Status diagram for standard unit control

Status	Meaning
NOT READY TO SWITCH ON	The controller is being initialized and is not yet ready to operate. It then automatically switches to the status READY TO SWITCH ON.
READY TO SWITCH ON	The controller is inhibited and waits for the power stage to be charged. It then automatically switches to the status “SWITCHED ON“.
SWITCHED ON	The controller is inhibited and waits for controller enable.
OPERATION ENABLED	The controller is enabled. In this status, a pulse inhibit can be set automatically.
FAULT	The controller is in the status “FAULT“ (TRIP).

6.3.2 DRIVECOM unit control

With INTERBUS control (for 82XX: Lenze parameter L-C0001 = 3; for 93XX: always) and when using the 2111 fieldbus module, Lenze controllers have a controller status as standardized in the DRIVECOM profile 21.

The information about the current unit status (rectangles in the status diagram Fig. 6-2) are available in the DRIVECOM parameter "status word". Commands in the DRIVECOM parameter control word can change the controller status. These commands are marked by arrows in the following diagram.

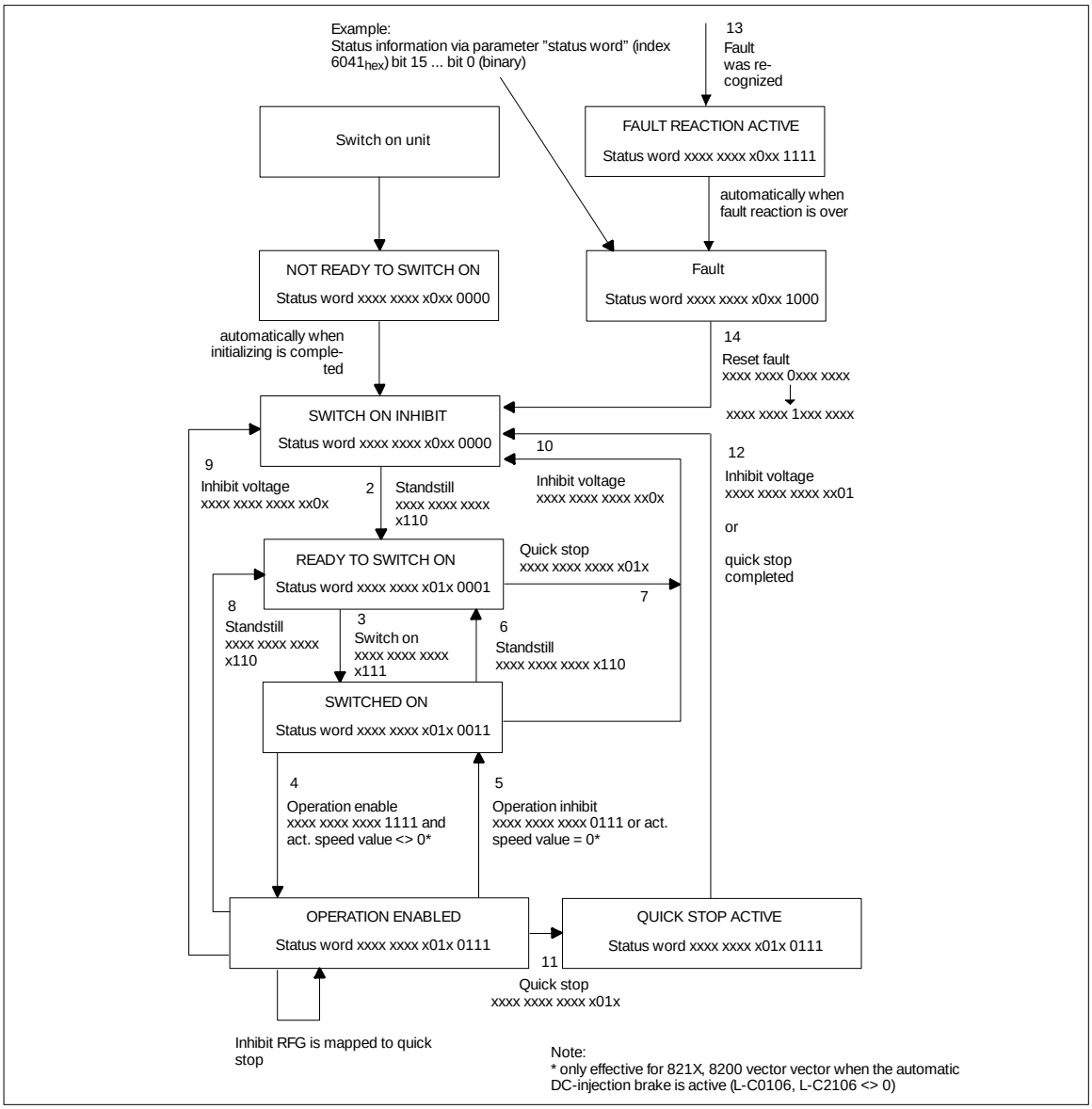
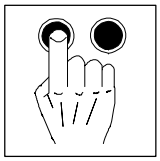


Fig. 6-2 Status diagram DRIVECOM unit control

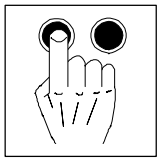


Parameter setting

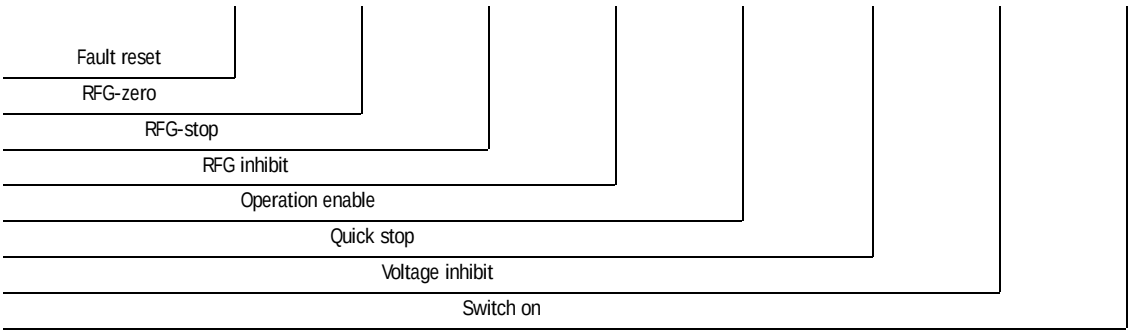
Status	Meaning
NOT READY TO SWITCH ON	The controller is being initialized and is not yet ready to operate. It then automatically switches to the status READY TO SWITCH ON.
SWITCH ON INHIBIT	The controller is inhibited and waits for command 2 (shut down).
READY TO SWITCH ON	The controller is inhibited and waits for command 3 (switch on).
SWITCHED ON	The controller is inhibited and waits for command 4 (enable operation).
OPERATION ENABLED	The controller is enabled. In this status, a pulse inhibit can be set automatically.
FAULT REACTION ACTIVE	A malfunction (TRIP) was recognized and a fault response initiated.
FAULT	The controller is in the status “FAULT“ (TRIP).
QUICK STOP ACTIVE	While being in the status “OPERATION ENABLED“ the command “quick stop“ was set. The controller is decelerated in a controlled way (quick-stop ramp). After deceleration, the controller automatically changes to the controller status “SWITCH ON INHIBIT“.

Command	Meaning
COMMAND 2, 6, 8 (standstill) Control word: bit 0 = 0	Command to change from different states to the status “READY TO SWITCH ON“.
COMMAND 3 (switch on)	Command to change to the controller status “SWITCHED ON“.
COMMAND 4 (enable operation)	Command to change to the controller status “OPERATION ENABLED“. The controller inhibit is deactivated.
COMMAND 5 (inhibit operation)	Command to change to the controller status “SWITCHED ON“. The controller inhibit is activated.
COMMAND 7, 9, 10, 12 (voltage inhibit) Control word: bit 1 = 0	Command to change to the controller status “SWITCH ON INHIBIT“. The controller inhibit is activated.
COMMAND 7, 10, 11 (quick stop) Control word: bit 2 = 0	Command to change to the controller status “SWITCH ON INHIBIT“. If the controller was enabled, it is decelerated in a controlled way along the Lenze quick-stop ramp.
COMMAND 13 (malfunction/TRIP))	The controller has recognized a malfunction. For some malfunction a controlled deceleration may be necessary (depending on the controller). Once completed, the controller changes to the status FAULT.
COMMAND 14 (reset fault/TRIP) Control word: bit 7 = 0 ⇒ 1	With the series 821X, 8200 vector this command acknowledges a fault. The controller changes to the status “SWITCH ON INHIBIT“ when a fault is no longer recognized.

The single bit-control commands depend on other bit positions. In the following you will find a description of the bits required to effect the command.



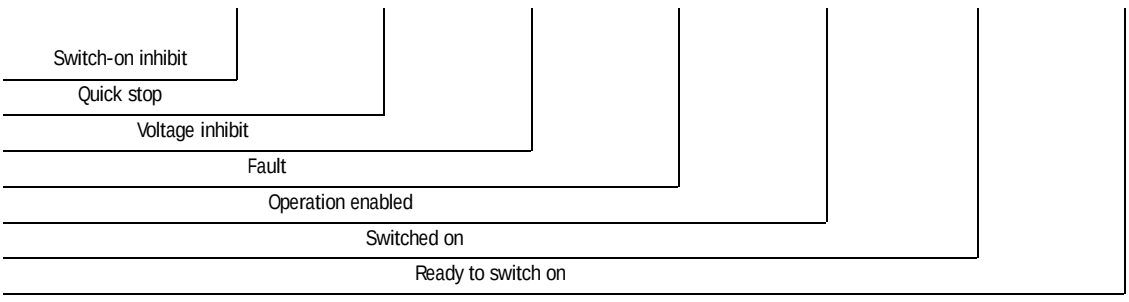
Controller status commands	Bits of the control word							
Bit	**7**	**6**	**5**	**4**	**3**	**2**	**1**	**0**
1 Standstill						1	1	**0**
2 Switch on						1	1	**1**
3 Operation enable					**1**	1	1	1
4 Operation inhibit					**0**	1	1	1
5 Voltage inhibit							**0**	
6 Quick stop						**0**	1	
8 Fault reset	0→1							



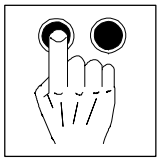
Explanation:
- 0 = Bit status is 0
- 1 = Bit status is 1
- empty = Any bit status, no influence

The actual unit status can only be clarified by combining the unit-status information bits (bit 0 to 6). This is shown in the following:

Unit status	Bits of the status word						
Bit	**6**	**5**	**4**	**3**	**2**	**1**	**0**
NOT READY TO SWITCH ON	0			0	0	0	0
SWITCH ON INHIBIT	1			0	0	0	0
READY TO SWITCH ON	0	1		0	0	0	1
SWITCHED ON	0	1		0	0	1	1
OPERATION ENABLED	0	1		0	1	1	1
FAULT	0			1	0	0	0
FAULT REACTION ACTIVE	0			1	1	1	1
QUICK STOP ACTIVE	0	0		0	1	1	1



Explanation:
- 0 = Bit status is 0
- 1 = Bit status is 1
- empty = Any bit status, no influence



6.4 DRIVECOM profile parameters

6.4.1 Control word (6040_{hex})

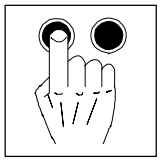
Tip!

The single bit control commands of the control word depend on other bit positions. Chapter 6.3.2 describes the bits required to effect the command.

Parameter name (Index)	Subindex	Data Str.	Data Type	Meaning
Control word (6040_{hex})	0	S	OS	The controller is controlled via this parameter. It contains comannds for the transition between the different controller states (see chapter 6.3.2) and other important control commands (see the follwowing table).

Structure of the parameter “control word“:

Bit	Name	Meaning
0	Switch on	Controller status 0 = command 2, 6, 8 (controller inhibit) 1 = command 3 (controller inhibit)
1	Inhibit voltage	Controller status 0 = command 9, 10, 12 (controller inhibit) 1 = command “voltage inhibit“ not active
2	Quick stop	Controller status 0 = Command 7, 10, 11 (quick stop) 1 = Command “quick stop“ not active
3	Operation enable	Controller status 0 = Command 5 (controller inhibit) 1 = Command 4 (controller inhibit not active)
4	RFG inhibit	Inhibit of the ramp-funtion generator. Quick stop is activated without the controller leaving its status. 0 = RfG inhibit (quick stop) 1 = RFG inhibit not active
5	FREE DRIVECOM: RFG-stop	820X: Not assigned 821X, 822X: Output of the ramp function generator (speed setpoint integrator) will be ”frozen”. 0 = RFG stop 1 = RFG stop not active 8200 vector, 93XX: free. Mapping to bit AIF-CTRL.B4 negated [1].
6	FREE DRIVECOM: RFG-zero	820X: Not assigned 821X, 822X: Input of the ramp function generator (speed setpoint integrator) will be set to 0. Thus controlled deceleration along the ramp. 0 = RFG zero 1 = RFG zero not active 8200 vector, 93XX: free. Mapping to bit AIF-CTRL.B5 negated [1].
7	Reset malfunction	Fault reset (TRIP). For this, a bit change from 0 to 1 is required. For 82XX, the controller is initialized. During this time, the controller does not accept any commands.
8	Reserve	DRIVECOM reserved
9	Reserve	DRIVECOM reserved
10	Reserve	DRIVECOM reserved
11	FREE DRIVECOM: Manufacturer	820X, 821X, 822X: Not assigned 8200 vector, 93XX: free. Mapping to bit AIF-CTRL.B7 [1].
12	FREE DRIVECOM: Manufacturer	820X, 821X, 822X: Parameter set changeover: 0 → 1 = Parameter set 2 1 → 0 = Parameter set 1 8200 vector, 93XX: free. Mapping to bit AIF-CTRL.B12 [1].



Bit	Name	Meaning
13	FREE DRIVECOM: Manufacturer	820X, 821X, 822X: DC-injection brake: 0 = DCB not active 1 = DCB active 8200 vector, 93XX: free. Mapping to bit AIF-CTRL.B13 [1].
14	FREE DRIVECOM: Manufacturer	820X, 821X, 822X: Not assigned 8200 vector, 93XX: free. Mapping to bit AIF-CTRL.B14 [1].
15	FREE DRIVECOM: Manufacturer	820X: PE inhibit Actualization of the PO data of the controller inhibited (input data for the master The update of status and actual information of the process data channel can be inhibited to trans control information more precisely in time (see chapter 3.6.2). 0 = Read status and actual value 1 = Do not read status and actual value 821X, 822X: Not assigned 8200 vector, 93XX: free. Mapping to bit AIF-CTRL.B15 [1].

[1] For the assignment see the following table

Dependence of the assignment of the DRIVECOM control word 93XX on the signal configuration selected under L-C0005:

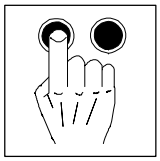
Signal configuration L-C0005	Bit 5 (AIF-CTRL.B4)	Bit 6 (AIF-CTRL.B5)	Bit 11 (AIF-CTRL.B7)	Bit 12 (AIF-CTRL.B12)	Bit 13 (AIF-CTRL.B13)	Bit 14 (AIF-CTRL.B14)	Bit 15 (AIF-CTRL.B15)
Speed control 1003 / 1013 / 1113	NSET-RFG-STOP (RFG stop)	NSET-RFG-0 (RFG zero)	Not assigned	DCTRL-PAR*1	DCTRL-PAR-LOAD	NSET-TI*1	NSET-TI*2
Torque control 40034 / 4013 / 4113	NSET-RFG-STOP (RFG stop)	NSET-RFG-0 (RFG zero)	Not assigned	DCTRL-PAR*1	DCTRL-PAR-LOAD	NSET-JOG*1	NSET-JOG*2
DF master 5003 / 5013 / 5113	NSET-RFG-STOP (RFG stop)	NSET-RFG-0 (RFG zero)	Not assigned	DCTRL-PAR*1	DCTRL-PAR-LOAD	REF-ON	NSET-TI*1
DF-slave bus 6003 / 6013 / 6113	Not assigned	Not assigned	Not assigned	DCTRL-PAR*1	DCTRL-PAR-LOAD	REF-ON	Not assigned
DF-slave cascade 7003 / 7013 / 7113	Not assigned	Not assigned	Not assigned	DCTRL-PAR*1	DCTRL-PAR-LOAD	REF-ON	Not assigned

6.4.2 Status word (6041_{hex})

Tip!

The current controller status can only be clarified by combining the bits with the status information (bit 0, 1, 2, 3, 4, 5 and 6). This is shown in chapter 6.3.2.

Parameter name (Index)	Sub-Index	Dat.-Str.	Dat.-Type	Meaning
Status word (6041_{hex})	0	S	OS	This parameter provides compact information about the controller. It contains commands for the transition between the different controller states (see chapter 6.3.2) and other important information (see the following table).

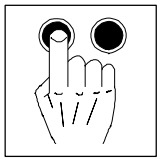


Parameter setting

Structure of the parameter “status word“:

Bit	Name	Meaning
0	Ready to switch on	Controller status information 0 = Status lower than “READY TO SWITCH ON“ 1 = Status at least “READY TO SWITCH ON“
1	Switched on	Controller status information 0 = Status lower than “SWITCHED ON“ 1 = Status at least “SWITCHED ON“
2	Operation enabled	Controller status information 0 = Status lower than “OPERATION ENABLED“ 1 = Status “OPERATION ENABLED“
3	Fault	Controller status information 0 = No fault (TRIP)) 1 = Fault (TRIP) occured
4	Voltage inhibited	Information on command “voltage inhibit“ (see chapter 6.4.1 “control word“) 0 = Command active 1 = Command not active
5	Quick stop	Information on command “quick stop“ (see chapter 6.4.1 “control word“) 0 = Command active 1 = Command not active
6	Switch-on inhibit	Controller status information 0 = Statu not “SWITCH-ON INHIBIT“ 1 = Status “SWITCH-ON INHIBIT“
7	Warning	Collective warning 0 = No warning 1 = Warning (overtemperature)
8	Message	Collective message. Automatic setting and resetting of pulse inhibit in the controller status ”OPERATION ENABLED”. Reasons for this can be undervoltage or overvoltage as well as overcurrent (clamp). 0 = No message 1 = Message (IMP)
9	Remote	82XX, 821X, 822X, 8200 vector: Bus access, depends on Lenze parameter ”operating mode” (L-C0001): 0 = L-C0001 < > 3 or L-C1911 = 0 1 = L-C0001 = 3 and L-C1911 = 1 93XX: 0 = L-C1911 = 0 1 = L-C1911 = 1
10	FREE DRIVECOM: Setpoint reached	Status of speed/frequency deviation 0 = RFG_{on} < > RFG_{off} 1 = RFG_{on} = RFG_{off}
11	Limit value	Status of the DRIVECOM speed limitation 0 = Limitation not addressed 1 = Limitation addressed
12	FREE DRIVECOM: Reserve	820X, 821X, 822X: Not assigned 8200 vector, 93XX: free. Mapping to bit L-C0150.B14 1)
13	FREE DRIVECOM: Reserve	82XX: Not assigned 8200 vector: free. Mapping to bit L-C0150.B15 93XX: free. Mapping to bit L-C0150.B3 1)
14	Manufacturer	820X, 821X, 822X: I_{max} (current limit reached) 0 = Current limit not reached 1 = Current limit exceeded 8200 vector, 93XX: free. Mapping to bit L-C0150.B2 1)
15	Manufacturer	820X, 821X, 822X: Q_{min} ($f_d \leq f_{dQmin}$) 0 = Q_{min} not active 1 = Q_{min} active 8200 vector, 93XX: free. Mapping to bit L-C0150.B5 1)

1) For the assignment see the following table

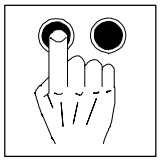


Dependence of the assignment of the DRIVECOM status word 93XX on the signal configuration selected under L-C0005:

Signal configuration L-C0005	**Bit 10 (L-C0150.B4)**	**Bit 12 (L-C0150.B14)**	**Bit 13 (L-C0150.B3)**	**Bit 14 (L-C0150.B2)**	**Bit 15 (L-C0150.B5)**
Speed control 100x 101x 111x	NSET-RFG- I=0	Not assigned	Not assigned	MCTRL-IMAX	QMIN
Torque control 400x 401x 411x	MCTRL-IMAX negated	Not assigned	Not assigned	MCTRL-IMAX	QMIN
DF master 500x 501x 511x	NSET-RFG- I=0	Not assigned	Not assigned	REF-OK	REF-BUSY
DF-slave bus 600x 601x 611x	MCTRL-MMAX negated	Not assigned	Not assigned	REF-OK	REF-BUSY
DF-slave cascade 700x 701x 711x	MCTRL-MMAX negated	Not assigned	Not assigned	REF-OK	REF-BUSY

6.4.3 Speed channel

Parameter name (Index)	**Subindex**	**Dat.-Str.**	**Dat.-Type**	**Meaning (Initialization is printed in bold)**
Pole number ($604D_{hex}$)	0	S	U8	Value range: 2, 4, 6, ..., 254
The parameter indicates the pole number of asynchronous motors and is used to convert frequency values into speed values. Only even values are possible.				
Setpoint factor ($604B_{hex}$)	1	A	I16	Value range: – 32768 to 32767 **1** Numerator of the “setpoint factor“
	2	A	I16	Value range: – 32768 to 32767 **1** Denominator of the “setpoint factor“
This parameter is used to change the resolution or the setting range of the setpoint input. It consists of numerator and denominator. The setpoint is multiplied by the setpoint factor; the actual values (reference variable, actual value) are multiplied by the inverse setpoint factor.				
Speed reference value ($604E_{hex}$)	0	S	U32	$\frac{L - C0011}{2}$ in rpm
This parameter is the reference value for the relative speed parameters, e.g. nominal percentage, actual percentage and acceleration time. The parameter is mapped to the Lenze parameter L-C0011. A conversion to frequency values is possible. The parameter determines the internal maximum speed, which is also active with terminal control.				
Speed setpoint (6042_{hex})	0	S	I16	Value range: – 32768 to 32767
This parameter indicates the speed setpoint (in rpm). When changing this parmeter, also the nominal percentage will be changed.				
Speed reference variable (6043_{hex})	0	S	I16	Value range: – 32768 to 32767



Parameter name (Index)	Subindex	Dat.-Str.	Dat.-Type	Meaning (Initialization is printed in bold)
This parmeter is the output value of the speed ramp-function generator (in rpm).				
Actual speed value (6044_{hex})	0	S	I16	Value range: −32768 to 32767
The parameter indicates the actual speed (in rpm).				
Speed min-max value (6046_{hex})	1	A	U32	Value range: 0 to 32000 **0** Minimum speed setpoint in rpm
	2	A	U32	Value range: 0 to 32000 **L-C0011 in rpm** Maximum speed setpoint in rpm
This parameter indicates the minimum and the maximum speed (in rpm). It is initialized with the Lenze parameter L-C0011. Changing this parameter does not result in a change of L-C0011 (see Speed-reference value).				
Percentage setpoint (6052_{hex})	0	S	I16	Value range: −32768 to 32767 (100 % = 16383)
This parameter is the nominal speed in percent. It is scaled to the “speed reference value“ (= 100 %). When changing this parameter, also the „nominal speed“ will be changed. If the “nominal speed“ exceeds the limit value of the “nominal percentage“ of 200 % during reading, it will be returned as a value limited to 200 %.				
Master percentage (6053_{hex})	0	S	I16	Value range: −32768 to 32767 (100 % = 16383)
This parameter is the “speed reference variable“ in percent. It is scaled to the “speed reference value“ (= 100 %). The “percentage reference variable“ is multiplied by the inverse “setpoint factor“.				
Actual percentage (6054_{hex})	0	S	I16	Value range: −32768 to 32767 (100 % = 16383) **Map of L-C0381**
This parameter is the “actual speed“ in percent. It is scaled to the “speed reference value“.				

6.4.4 Ramps

The DRIVECOM profile 21 provides two ramps for the speed setpoint:

- The conversion is done according to the formula: **Absolute ramp** is determined by the following ramp slope:

$$\text{Slope} = \frac{\text{Delta\_speed}}{\text{Delta\_time}}$$

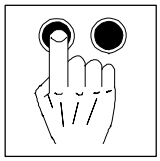
  The absolute ramps in the DRIVECOM profile 21 are acceleration, deceleration and ”quick stop”.

- The conversion is done according to the formula: **Relative ramp** is determined by the following ramp slope:

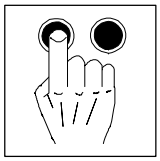
$$\text{Slope} = \frac{\text{Speed reference value}}{\text{Delta\_time}}$$

  This definition corresponds to the Lenze ramp functions L-C0012 and L-C0013.
  The relative ramps in the DRIVECOM profile 21 are acceleration time, deceleration time and ”quick-stop time”.

The ramp-min function determines and activates the slower ramp. The absolute ramps are deactivated in default setting.



Parameter name (Index)	Subindex	Data Str.	Data Type	Meaning (Initialization is printed in bold)
Speed Acceleration (6048_{hex})	1	RS (21_{hex})	U32	Value range: 0 to 4294967295 **0** Delta_speed in rpm
	2	RS (21_{hex})	U16	Value range: 0 to 65535 **0 (ramp is switched off)** Delta_time in seconds
This parameter contains data of the absolute speed ramp for acceleration. The slope is determined as follows: $\text{Slope} = \frac{\text{Delta\_speed}}{\text{Delta\_time}}$ The parameter is mapped to the Lenze acceleration ramp (L-C0012) via the ramp-min-function. If the "delta_time" = 0, the ramp is switched off.				
Speed delay (6049_{hex})	1	RS (21_{hex})	U32	Value range: 0 to 4294967295 **0** Delta_speed in rpm
	2	RS (21_{hex})	U16	Value range: 0 to 65535 **0 (ramp is switched off)** Delta_time in seconds
This parameter contains data of the absolute speed ramp for deceleration. The slope is determined as follows: $\text{Slope} = \frac{\text{Delta\_speed}}{\text{Delta\_time}}$ The parameter is mapped to the Lenze deceleration ramp (L-C0013) via the ramp-min-function. If the "delta_time" = 0, the ramp is switched off.				
Speed quick stop ($604A_{hex}$)	1	RS (21_{hex})	U32	Value range: 0 to 4294967295 **0** Delta_speed in rpm
	2	RS (21_{hex})	U16	Value range: 0 to 65535 **0 (ramp is switched off)** Delta_time in seconds
This parameter contains the data of the absolute speed ramp for deceleration in the status "QUICKSTOP" or "RFG INHIBIT" or the QSP terminal function. The slope is determined as follows: $\text{Slope} = \frac{\text{Delta\_speed}}{\text{Delta\_time}}$ The parameter is mapped to the Lenze quick-stop ramp (L-C0105) via the ramp-min-function. If the "delta_time" = 0, the ramp is switched off.				
Acceleration time ($604F_{hex}$)	0	S	U32	Value range: 0 to 495000 (max. L-C0012 / 2) $\frac{\text{L-C0012}}{2}$ Acceleration time in milliseconds
This parameter is for the acceleration of the relative speed ramp. The acceleration time refers to the parameter speed reference with the following slope: $\text{Slope} = \frac{\text{Speed reference value } (604E_{hex})}{\text{Acceleration time } (604F_{hex})}$ The parameter is mapped to the Lenze acceleration ramp (L-C0012) via the ramp-min-function. If the "acceleration time" = 0, the ramp is switched off.				
Deceleration (6050_{hex})	0	S	U32	Value range: 0 to 495000 (max. L-C0013 / 2) $\frac{\text{L-C0013}}{2}$ Deceleration time in milliseconds
This parameter is for the deceleration of the relative speed ramp. The deceleration time refers to the parameter speed reference with the following slope:				



Parameter name (Index)	Subindex	Data Str.	Data Type	Meaning (Initialization is printed in bold)
$\text{Slope} = \frac{\text{Speed reference value } (604E_{hex})}{\text{Deceleration time } (6050_{hex})}$ The parameter is mapped to the Lenze deceleration ramp (L-C0013) via the ramp-min-function. If the "deceleration time" = 0, the ramp is switched off.				
Quick stop time (6051_{hex})	0	S	U32	Value range: 0 to 495000 (max. L-C0105 / 2) L-C0105 2 Quick stop time in milliseconds
This parameter is assigned to the relative speed ramp for the unit-control commands quick stop and RFG inhibit or the QSP terminal function. The quick-stop time refers to the parameter speed reference with the following slope: $\text{Slope} = \frac{\text{Speed reference value } (604E_{hex})}{\text{Deceleration time } (6051_{hex})}$ The parameter is mapped to the Lenze quick-stop ramp (L-C0105) via the ramp-min-function. If the "quick stop time" = 0, the ramp is switched off.				

6.4.5 Error code ($603F_{hex}$)

Parameter name (Index)	Subindex	Data Str.	Data Type	Meaning (Initialization is printed in bold)
Error code ($603F_{hex}$)	0	S	U16 OS	If the drive set TRIP, the error code transmits a fault detection which corresponds to the DRIVECOM profile (see chapter 7.5 "DRIVECOM error code). The history of faults which occured in the controllers is stated under the following Lenze parameters: • 82XX: L-C0162 - L-C0164 • 93XX: L-C0168 with subindex 1 to 8

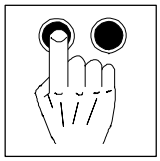
6.4.6 Process data

General information on process data can be obtained from chapter6.2.

The process of combining several parameters to form one parameter is called **Process-data configuration**. The process-data configuration is carried out by means of the following parameters:

- PI-data description (index = 6000_{hex})
- PO-data description (index = 6001_{hex})

These parameters have a data structure (parameter "process data description structure" (index = 20_{hex})), which is shown in the following.



6.4.7 Process-data description structure

The following table shows the process-data description structure:

Sub index	Data Type	Meaning (general)	(Byte PCD)	(Word PCD)	(Double word PCD)
1	U8	Display of process data length Value: 4 or 6			
2	U16	Index for	1. PCD byte	1. PCD byte	0 = not used
3	U8	Subindex for	1. PCD byte	1. PCD byte	0 = not used
4	U16	Index for	2. PCD byte	0 = not used	0 = not used
5	U8	Subindex for	2. PCD byte	0 = not used	0 = not used
6	U16	Index for	3. PCD byte	2. PCD word	1. PCD double word
7	U8	Subindex for	3. PCD byte	2. PCD word	1. PCD double word
8	U16	Index for	4. PCD byte	0 = not used	0 = not used
9	U8	Subindex for	4. PCD byte	0 = not used	0 = not used
10	U16	Index for	5. PCD byte	3. PCD word	0 = not used
11	U8	Subindex for	5. PCD byte	3. PCD word	0 = not used
12	U16	Index for	6. PCD byte	0 = not used	0 = not used
13	U8	Subindex for	6. PCD byte	0 = not used	0 = not used

In the first subindex of the parameter process-data description structure, the length of the data process is entered. There follows a description of the parameter assignment for every byte of the process data. The parameter address, which consists of index and subindex, is used for the description.

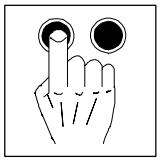
Example:
The first process-data word is assigned to the DRIVECOM control word (address: index=6040_{hex}, subindex=0). The process-data description structure has the following entries:

- Subindex 1: 6040_{hex}
- Subindex 2: 0_{hex}

The parameters are distinguished as follows:

- Byte parameter (byte PCD; not used for 82XX and 93XX)
- Word parameter (word PCD; 16 bit, I16, U16, OS2)
- Double word parameter (double word PCD; 32 Bit, I32, U32)

If a word parameter (16 bit) is assigned to the process data, the parameter address (index, subindex) will be entered in the first byte. The second byte will not be used and must contain a 0. Accordingly, three bytes are unused with double-word parameters (32bit). The configuration can be completely or selectively changed (subindex=0). If you want to change the configuration selectively and the address of the application datum is not 0, you first must delete the structure of the index entry for the corresponding byte.



6.4.8 Process-data assignments

Tip!

The assignment of the unit control word to the PO data only makes sense, if the Drivecom status machine is switched off.
For this enter 0 under C1911.

Process-data assignments for 82XX

The following parameters can be assigned to the **PI-data**:

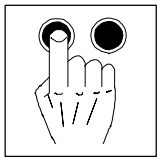
Index	Subindex	Name	Explanation
6041	0	DRIVECOM status word	Default setting PIW1
6044	0	DRIVECOM actual speed value	Default setting PIW2 Act. speed in RPM
6054	0	DRIVECOM actual percentage value	Act. speed in % ± 100% = ± 16383
5F69	0	Controller status word (C150)	
5CA5	1	AIF-OUT.W1	AIF word 1
	2*	AIF-OUT.W2*	AIF word 2

*) note: only 8200 vector

The following parameters can be assigned to the **PO-data**:

Index	Subindex	Name	Explanation
6040	0	DRIVECOM control word	Factory setting POW1
6042	0	DRIVECOM speed setpoint	Default settin POW2 Speed setpoint in RPM
6052	0	DRIVECOM percentage setpoint	Speed setpoint in % ± 100% = ± 16383
5F78	0	Unit control word (C135)	
5CA7	1	AIF-IN.W1	AIF word 1. See the following description.
	2*	AIF-IN.W2*	AIF word 2. See the following description.

*) note: only 8200 vector



Process-data assignment for 93XX

The function block AIF (AIF=automation interface) is the data interface between 93XX and the 2111IB fieldbus module and is subdivided into AIF-OUT and AIF-IN.

The following parameters can be assigned to the **PI-data**:

Index [hex]	Subindex	Name	Explanation
6041	0	DRIVECOM status word	Default setting PIW1
6044	0	DRIVECOM actual speed value	Default setting PIW2 Act. speed in RPM
6054	0	DRIVECOM actual percentage value	Act. speed in % ±100% = ±16383
5F69	0	Controller status word (C150)	
5CA5	1	AIF-OUT.W1	AIF word 1. See the following description.
5CA5	2	AIF-OUT.W2	AIF word 2. See the following description.
5CA5	3	AIF-OUT.W3	AIF word 3. See the following description.
5CA4	0	AIF-OUT.D1	AIF double word 1. See the following description.

Dependence of the assignment of AIF-OUT.W1 to AIF-OUT.W3 on the signal configuration selected under L-C0005:

Signal configuration (L-C0005)	AIF-OUT.W1	AIF-OUT.W2	AIF-OUT.W3	AIF-OUT.D1
Speed control 1003 1013 1113	MCTRL-NACT Actual speed ±100%=±16383	MCTRL-MSET2 Torque display ±100%=±16383	MCTRL-NSET2 Speed controller input ±100%=±16383	Not assigned
Torque control 4003 4013 4113	MCTRL-MSET2 Torque display ±100%=±16383	MCTRL-NACT Act. speed in % ±100%=±16383	MCTRL-NSET2 Speed controller input ±100%=±16383	Not assigned
DF master 5003 5013 5113	MCTRL-NACT Actual speed ±100%=±16383	MCTRL-MSET2 Torque display ±100%=±16383	MCTRL-NSET2 Speed controller input ±100%=±16383	Not assigned
DF-slave bus 6003 6013 6113	MCTRL-NACT Actual speed ±100%=±16383	MCTRL-PHI-ACT Actual phase	MCTRL-MSET2 Torque setpoint in % ±100%=±16383	Not assigned
DF-slave cascade 7003 7013 7113	MCTRL-NACT Actual speed ±100%=±16383	MCTRL-PHI-ACT Actual phase	MCTRL-MSET2 Torque setpoint in % ±100%=±16383	Not assigned
not equal to xxx3 (except self ckonfigurations)	MCTRL-NACT Actual speed ±100%=±16383	MCTRL-MSET2 Torque display ±100%=±16383	MCTRL-PHI-ACT Actual phase	Not assigned

For detailed description of the 93XX signal configuration see the Operating Instructions for 93XX (only the main configurations: 1000, 4000, 5000, etc.) or the Manual 93XX.
In the controller, other signals can be assigned to AIF-OUT.W1 to AIF-OUT.W3. For this, the function-block configuration is used - described in the Manual 93XX. The function block AIF-OUT determines the output data of the controller as data interface for the 2111IB fieldbus module.

Parameter setting

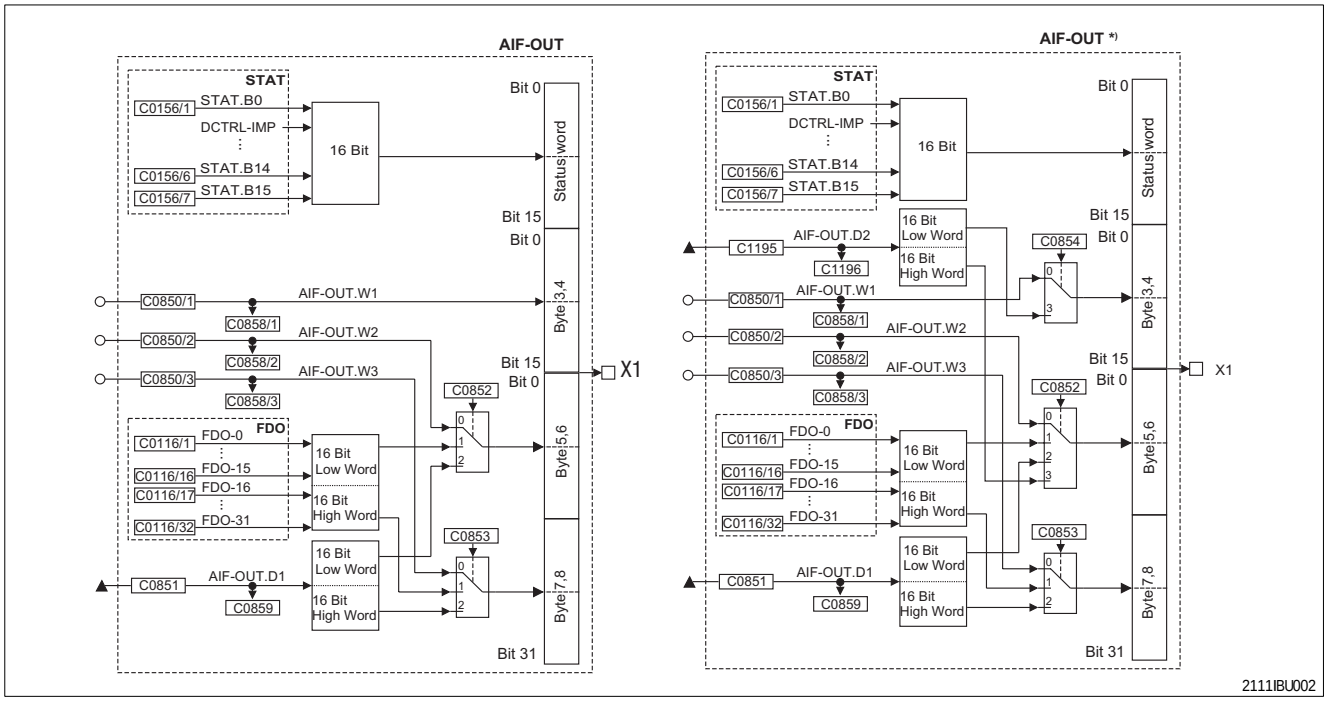
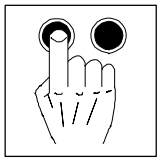


Fig. 6-3 Function block AIF-OUT and AIF-OUT*)
(AIF-OUT*) is available for the 9300 technology variants: servo inverter, positioning controller and cam profiler as of software version 2.0).

For more detailed information on the function block AIF-OUTx see the Manual 93XX.

The following parameters can be assigned to **PO-data**:

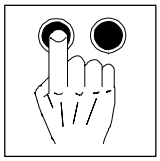
Index	Subindex	Name	Explanation
6040	0	DRIVECOM control word	Factory setting POW1
6042	0	DRIVECOM speed setpoint	Default setting POW2. Speed setpoint in RPM
6052	0	DRIVECOM percentage setpoint	Speed setpoint in [%] (± 100% = ± 16383)
5F78	0	Unit control word (C135)	
5CA7	1	AIF-IN.W1	AIF word 1. See the following description.
5CA7	2	AIF-IN.W2	AIF word 2. See the following description.
5CA7	3	AIF-IN.W3	AIF word 3. See the following description.
5CA6	0	AIF-IN.D1	AIF double word 1. See the following description.



The assignment of AIF-IN.W1 to AIF-IN.W3 depends on the signal configuration selected under L-C0005:

Signal configuration (L-C0005)	AIF-IN.W1	AIF-IN.W2	AIF-IN.W3	AIF-IN.D1
Speed control 1003 1013 1113	NSET-N Speed setpoint	Not assigned	Not assigned	Not assigned
Torque control 4003 4013 4113	MCTRL-MADD Torque setpoint	Not assigned	Not assigned	Not assigned
DF master 5003 5013 5113	NSET-N Speed setpoint	Not assigned	Not assigned	Not assigned
DF-slave bus 6003 6013 6113	DFSET-A-TRIM Phase trimming	DFSET-N-TRIM Speed trimming	Not assigned	Not assigned
DF-slave cascade 7003 7013 7113	DFSET-VP-DIV DF factor	DFSET-A-TRIM Phase trimming	Not assigned	Not assigned
not equal to xxx3	Not assigned	Not assigned	Not assigned	Not assigned

For detailed description of the 93XX signal configuration see the Operating Instructions for 93XX (only the main configurations: 1000, 4000, 5000, etc.) or the Manual 93XX.
In the controller, other signals can be assigned to AIF-IN.W1 to AIF-IN.W3. For this, the function-block configuration is used - described in the Manual93XX. The function block AIF-IN determines the input data of the controller as data interface for 2111 fieldbus module.



Parameter setting

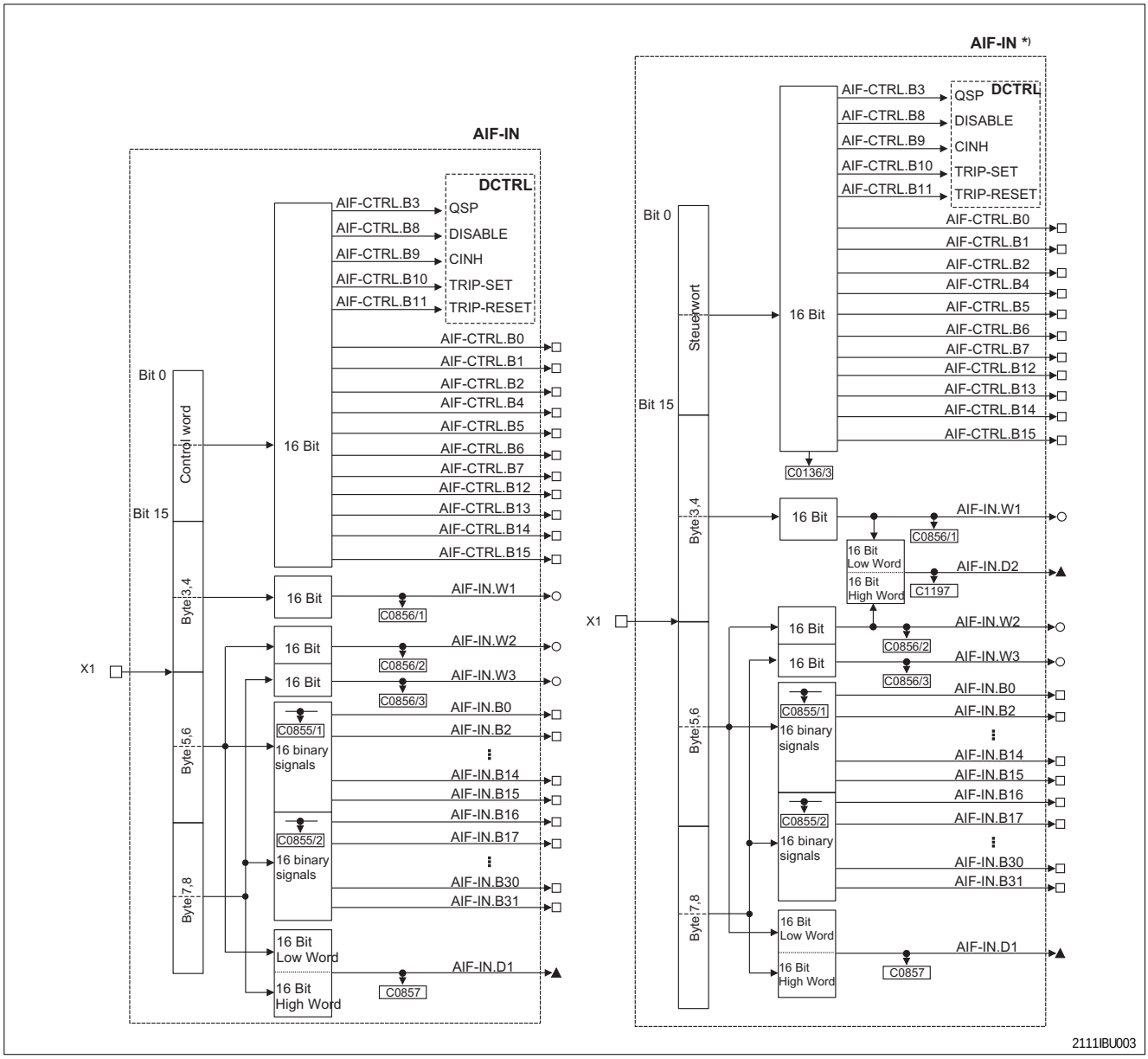
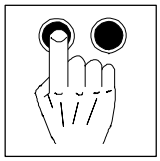


Fig. 6-4 Function block AIF-IN and AIF-IN*)
(AIF-IN*) is available for the 9300 technology variants: servo inverter, positioning controller and cam profiler as of software version 2.0).

For more detailed information on the function block AIF-INx see the Manual 93XX.



6.4.9 Process-data configuration

Process-data configuration according to C009

C009	Number	PCD word 1	PCD word 2	PCD word 3	Note
11	2	Unit control	AIF-IN/OUT.W1	-	Loop
12	2	AIF-IN/OUT.W1	AIF-IN/OUT.W2	-	Loop
13	2	AIF-IN/OUT.W2	AIF-IN/OUT.W3	-	
14	2	DRIVECOM control	DRIVECOM speed [rpm]	-	Default setting
15	2	DRIVECOM control	DRIVECOM speed [%]	-	
16	2	DRIVECOM control	AIF-IN/OUT.W1	-	
17	2	Unit control	DRIVECOM speed [rpm]	-	
18	2	Unit control	DRIVECOM speed [%]	-	
21	3	DRIVECOM control	DRIVECOM speed [rpm]	AIF-IN/OUT.W2	
22	3	DRIVECOM control	DRIVECOM speed [%]	AIF-IN/OUT.W2	
23	3	DRIVECOM control	AIF-IN/OUT.W1	AIF-IN/OUT.W2	
24	3	DRIVECOM control	AIF-IN/OUT.W2	AIF-IN/OUT.W3	V903
25	3	Unit control	AIF-IN/OUT.W1	AIF-IN/OUT.W2	
26	3	Unit control	AIF-IN/OUT.W2	AIF-IN/OUT.W3	
27	3	AIF-IN/OUT.W1	AIF-IN/OUT.W2	AIF-IN/OUT.W3	V904

The following values result:

C009	C1910	C1911	0x6000.2 / .3	0x6001.2 / .3	0x6000.4 / .5	0x6001.4 / .5	0x6000.10 / .11	0x6001.10 / .11
11	40000	0	0x5F69 / 0	0x5F78 / 0	0x5F69 / 0	0x5F78 / 0	0 / 0	0 / 0
12	40000	0	0x5CA5 / 1	0x5CA7 / 1	0x5CA5 / 2	0x5CA7 / 2	0 / 0	0 / 0
13	40000	0	0x5CA5 / 2	0x5CA7 / 2	0x5CA5 / 3	0x5CA7 / 3	0 / 0	0 / 0
14	40000	10000	0x6041 / 0	0x6040 / 0	0x6044 / 0	0x6042 / 0	0 / 0	0 / 0
15	40000	10000	0x6041 / 0	0x6040 / 0	0x6054 / 0	0x6052 / 0	0 / 0	0 / 0
16	40000	10000	0x6041 / 0	0x6040 / 0	0x5CA5 / 1	0x5CA7 / 1	0 / 0	0 / 0
17	40000	0	0x5F69 / 0	0x5F78 / 0	0x6044 / 0	0x6042 / 0	0 / 0	0 / 0
18	40000	0	0x5F69 / 0	0x5F78 / 0	0x6054 / 0	0x6052 / 0	0 / 0	0 / 0
21	60000	10000	0x6041 / 0	0x6040 / 0	0x6044 / 0	0x6042 / 0	0x5CA5 / 2	0x5CA7 / 2
22	60000	10000	0x6041 / 0	0x6040 / 0	0x6054 / 0	0x6052 / 0	0x5CA5 / 2	0x5CA7 / 2
23	60000	10000	0x6041 / 0	0x6040 / 0	0x5CA5 / 1	0x5CA7 / 1	0x5CA5 / 2	0x5CA7 / 2
24	60000	10000	0x6041 / 0	0x6040 / 0	0x5CA5 / 2	0x5CA7 / 2	0x5CA5 / 3	0x5CA7 / 3
25	60000	0	0x5F69 / 0	0x5F78 / 0	0x5CA5 / 1	0x5CA7 / 1	0x5CA5 / 2	0x5CA7 / 2
26	60000	0	0x5F69 / 0	0x5F78 / 0	0x5CA5 / 2	0x5CA7 / 2	0x5CA5 / 3	0x5CA7 / 3

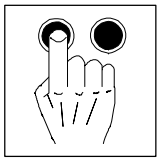
The process-data configuration which results from C009 is automatically stored in the interface module. There is no difference between the configuration via C009 and the direct re-configuration via the INTERBUS parameter channel.

With all other values under C009, the process-data configuration of the module remains the same. Therefore, the module can be easily preset by initializing a unit configured under C009.
These presettings can be made with any 8200/9300 controller even if they are not connected to INTERBUS.

Furthermore, the interface module can still be configured through the parameter channel of the INTERBUS. This configuration is however no longer completely independent of C009.

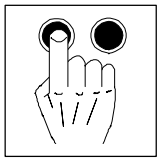
Automatic reconfiguration is only difficult when the process data length is changed.
At present, the process data length can be set via a parameter in the interface module (code 1910). This change will however not be effective before switching the mains.

The INTERBUS is a self-configuring bus, but in general, a setpoint configuration is stored in the connected master. If setpoint and actual configuration are not the same when starting the drive, for instance because a participant has 2 instead of 3 words, the system will stop.
If the INTERBUS module 2111 starts with 2 words as standard and changes to 3 words after having read C009 (after approx. 3 seconds), an INTERBUS error will occur.



Parameter setting

Parameter name (Index)	Sub Index	Data str.	Data type	Meaning	
PI data description (6000_{hex})		R	PBS(20_{hex})	**Value**	**Meaning**
	1			04_{hex}	Number of bytes of a process data word
	2			6041_{hex}	Status word
	3			00_{hex}	No entry
	4			00_{hex}	No entry
	5			00_{hex}	No entry
	6			6044_{hex}	Actual speed
	7			00_{hex}	No entry
	8			00_{hex}	No entry
	9			00_{hex}	No entry
	The following subindex (10 to 13) is only effective for L-C1910=6				
	10			$5CA5_{hex}$	No entry
	11			03_{hex}	No entry
	12			00_{hex}	No entry
	13			00_{hex}	No entry
The parameter describes the process data which are transmitted from the controller to the master (input data of the master). Parameters of the DRIVECOM profile which have the PCD attribute PI or POI (see survey) can be assigned to the values of the individual subindices. **Exception:** The value for subindex 1 cannot be changed.					
PO data description (6001_{hex})		R	PBS(20_{hex})	**Value**	**Meaning**
	1			04_{hex}	Number of bytes of a process data word
	2			6040_{hex}	Control word
	3			00_{hex}	No entry
	4			00_{hex}	No entry
	5			00_{hex}	No entry
	6			6042_{hex}	Speed setpoint
	7			00_{hex}	No entry
	8			00_{hex}	No entry
	9			00_{hex}	No entry
	The following subindex (10 to 13) is only effective for L-C1910=6				
	10			$5CA7_{hex}$	No entry
	11			03_{hex}	No entry
	12			00_{hex}	No entry
	13			00_{hex}	No entry
The parameter describes the process data which are transmitted from the master to the controller (output data of the master). Parameters of the DRIVECOM profile which have the PCD attribute POI (see survey) can be assigned to the values of the individual subindices. **Exception:** The value for subindex 1 cannot be changed.					
PO data enable (6002_{hex})	0	S	OS-1 Info: OS= Octett string; 1=length	00_{hex} **$0F_{hex}$**	Inhibit output data **Enable output data**
The parameter enables or inhibits the PO data (output data of the master). By this, the data consistency of the PO data is guaranteed.					



Reconfiguration of PI data

The following example shows how to structure the parameters in PI data.

Example:
The actual percentage (index = 6054_{hex}) is to be assigned to the second process data word of the PI data.

Procedure:

1. Find the data type in the code table in chapter 6.4.3. – The data type of the parameter actual percentage value isI16, i.e. it is a word parameter (16bit). You can see from the code table for the parameter process-data description structure (index = 20), that the second process data word is to be entered under subindex 6 and 7. – To describe these subindices of the parameter "PI data description" (index = 6000_{hex}), use the PCP service "Write" (see chapter 6.6.4).
2. Enter the index of the parameter "Actual percentage": Write (index = 6000_{hex} , subindex = 6_{hex}, value = 6054_{hex})
3. Enter the subindex of the parameter "Actual percentage": Write (index = 6000_{hex}subindex = 7_{hex}, value = 0_{hex})

Reconfiguration of PO data

The following example shows how to structure the parameters in PO data.

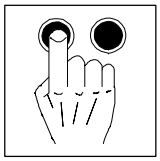
Example:
The percentage setpoint (index = 6052_{hex}) is to be assigned to the second process data word of the PO data.

Procedure:

1. Find the data type in the code table in chapter 6.4.3. → The data type of the parameter "Percentage setpoint" is I16, i.e. it is a word parameter 816 bit). You can see from the code table for the parameter process-data description structure (index = 20), that the second process data word is to be entered under subindex 6 and 7. To describe these subindices of parameter "PO data description" (index = 6001_{hex}), use the PCP service "Write". The description of PO data results in inconsistent data, as the data are exchanged between controller and host in very short cycle times. Therefore, the PO data are automatically inhibited when changing the PO data configuration. After the adaptation of the PO data to the new configuration, the data can be enabled via the parameter "PO data enable" (index 6002hex).
2. Enter the index of the parameter "Percentage setpoint": Write (index = 6001_{hex}, subindex = 6_{hex}, value = 6054_{hex})
3. Enter the subindex of the parameter "Percentage setpoint": Write (index = 6001_{hex}subindex = 7_{hex}, value = 0_{hex}) Change the index 6001 to zero to change the subindex after the PCD word has been configured.
4. Enter the index of the parameter "PO data enable" (6002_{hex}) to enable process data: Write (index = 6002_{hex}, subindex = 0_{hex}, value = FF_{hex})
Now the PO data can be read again from the controller. If a parameter is configured for the PO data (e.g. the parameter "Control word" (6040hex) in Lenze setting), it is not possible to write this parameter directly via its index (example: index = 6040hex)

Process data monitoring

Parameter name (Index)	Sub Index	Data str.	Data type	Meaning
Process data monitoring time (6003_{hex})	0	S	U16	If the transmission of the process data is inactive for longer than the set monitoring time (PCD watchdog), the action set in the parameter "process-data monitoring selection code" (6004_{hex}) will be activated. Value range: 0 - 65535 (65535 = monitoring is switched off)
Process data monitoring selection code (6004_{hex})	0	S	I16	The parameter determines the reaction of the controller after after the end of the process-data monitoring time (6003_{hex}). **0:** No action **2:** Unit control command "Inhibit voltage" (controller inhibit with latching in the status "SWITCH ON INHIBIT") **3:** Unit control command "Quick stop" (quick stop (QSP) with latching in the status "SWITCH ON INHIBIT").



6.5 Lenze-specific parameters

6.5.1 Only 82XX: Lenze parameter Operating Mode (L-C0001)

Parameter name (Index)	Sub-Index	Dat.-Str.	Dat.-Type	Meaning (Initialization is printed in bold)
Operating mode ($5FFE_{hex}$)	0	S	I32	**Value** **Control source** **Setpoint source** **Parameter source** 0 Terminal Terminal INTERBUS 1 Terminal 8201BB INTERBUS (Operating module) 2 Terminal Terminal INTERBUS 3 INTERBUS INTERBUS INTERBUS

6.5.2 Parameter L-C1910

With the 2111IB fieldbus module, the amount of INTERBUS process data can reach 6 bytes. C1910 can be written with values from 4 to 6. A value of 5 is internally round off to 4. The value is saved in the EEPROM of the 2111 fieldbus module. The change of the process-data length is only effective after the next basic initialization of the 2111 fieldbus module, i.e. after switching the voltage supply off and on again.
A value higher than 4 bytes should only be used for 93XX and 8200 vector since only here the data can be passed on. However, also with 82XX a length of 6 bytes can be set.

6.5.3 Parameter L-C1911

The parameter L-C1911 enable the access of the DRIVECOM status machine to the unit control word (see chapter 8.2.1).

0 = No access

1 = Access (default setting)

6.5.4 Parameter L-C0142

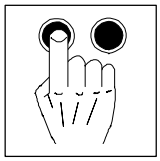
This parameter L-C0142 prevents the drive from uncontrolled restarts after:

- Mains switching
- Internal fault
- Internal message (with pulse inhibit) > 0.5 s

If the controller sets the status ”message” because of a failure (e.g. short mains failure) and the fault remains active for longer than 0.5 s, controller inhibit will be set automatically.

The parameter L-C0142 has the following function:

- L-C0142 = 1:
  The controller restarts automatically as soon as the fault is not active any longer
- L-C0142 = 0:
  The controller remains inhibited and the drive cannot restart even if the fault is no longer active.
  – The drive restarts after a LOW-HIGH transition at one of the inputs for ”controller inhibit” (CINH, e.g. at terminal X5/28).



6.6 PCP services

The DRIVECOM parameters are transmitted via the PCP channel (PCP = Peripherials Communication Protocol) according to the PROFIBUS standard. This is carried out via PCP services.

The following PCP services are supported by a Lenze controller:

- Initiate:
  – Connection between master and controller
- Abort:
  – Aborts connection
- Read:
  – Read parameters
- Write:
  – Write parameters
- Get-OV:
  – Read object directory (OV)
- Identify:
  – Controller identification
- Status:
  – Read controller status

In the following, you will find all the parameters and their contents which are returned by the Lenze controllers. All other transmission parameters of the stated PCP services can be obtained from the corresponding host description.

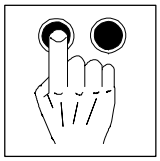
6.6.1 CRL entries

CRL (Communication Reference List) entries are required to ensure communication between the master and the 2111 fieldbus module.
The following entries are to be set in CRL of the master:

Field name	Entry
Communication reference (CR)	2
Connection type	Acyclic master/slave
Connection attribute	Defined
Max PDU sending high prio	0
Max PDU sending low prio	64
Max PDU receiving high prio	0
Max PDU receiving low prio	64
Supported service request	$80\ 30\ 00_{hex}$
Supported Services Response	$00\ 00\ 00_{hex}$
Maximum SCC	1
Maximum RCC	0
Maximum SAC	0
Maximum RAC	0

6.6.2 Initiate

The PCP service “Initiate“ creates a logic between the master and the 2111 fieldbus module. The controller returns the following parameters:



Name	Value	Meaning
Profile number	21_{hex}	DRIVECOM profile of version 1
Password	0	Password function of PROFIBUS is not supported
Access groups	0	No access groups
Access protection supported	TRUE	Access protection is supported
Version OV	0	Version of the object directory

6.6.3 Abort

The PCP service “Abort“ interrupts a logic between the master and the 2111 fieldbus module.

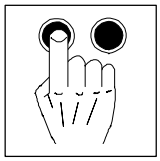
6.6.4 Read and write

The PCP service “Read“ reads parameters from the controller. The controller transmits the required parameter or a fault message.

The PCP service “Write“ writes parameters of the controller.The controller transmits a positive or negative acknowledgement or a fault message.

The following fault messages can occur:

Error class	Error code	Additional code	Meaning
6	3	00_{hex}	No access
6	5	10_{hex}	Invalid service parameter
6	5	11_{hex}	Invalid subindex
6	5	12_{hex}	Data too long
6	5	13_{hex}	Data too short
6	6	00_{hex}	Object is not a parameter
6	7	00_{hex}	Object does not exist
6	8	00_{hex}	Data types are not identical
8	0	00_{hex}	Service cannot be executed
8	0	20_{hex}	Service cannot be executed currently
8	0	21_{hex}	Cannot be executed because of local control
8	0	22_{hex}	Cannot be executed because of unit status
8	0	30_{hex}	Leave value range/parameter can only be changed while controller is inhibited
8	0	31_{hex}	Parameter value too high
8	0	32_{hex}	Parameter value too small
8	0	33_{hex}	Subparameter out of value range
8	0	34_{hex}	Subparameter value too high
8	0	35_{hex}	Subparameter value too small
8	0	36_{hex}	Maximum value smaller than minimum value
8	0	41_{hex}	Communication object cannot be mapped to process data
8	0	42_{hex}	Process-data length exceeded
8	0	43_{hex}	Collision with other values



6.6.5 Get-OV

The PCP service “Get-OV“ reads the object description for each parameter and data type.

6.6.6 Identify

The PCP service “Identify“ informs about the identification of the controller. The controller returns the following parameters:

Name	Value	Meaning
Name of the manufacturer	”Lenze“ (as visible string)	Company name
Controller name	Visible string with 15 characters	Unit name for controller and bus-interface module
Controller version	Visible string with 15 characters	Software version of the controller

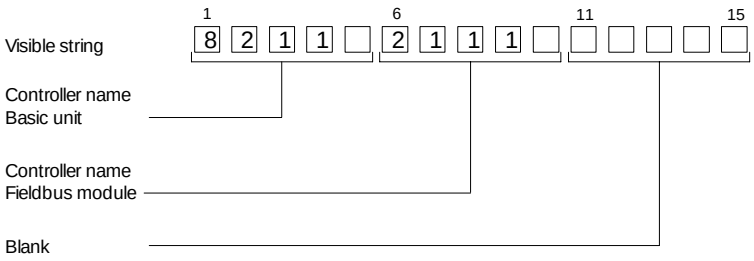
Controller name

The visible string consists of the following characters:

- Characters 1 to 5: Name of the controller
  (4 characters for the controller name plus 1 blank)
- Characters 6 to 10: Name of the fieldbus module
  (4 characters for the controller name plus 1 blank)
- Characters 11 to 15: No name
  (5 blanks)

If a fieldbus module is not available, the corresponding area is filled with blanks.

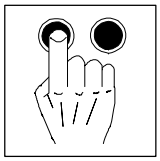
Example:
For a 8211 controller with a 2111 fieldbus module: “8211 2111 “



Controller version

The visible string consists of the following characters:

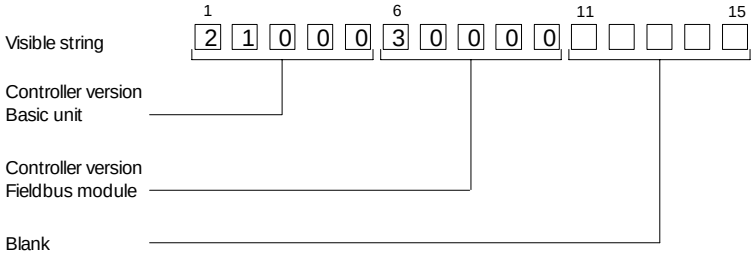
- Characters 1 to 5: software version of the controller:
  – 2 characters for the basic version
  – 2 characters for the variant
  – 1 character for the version of the variant
- Characters 6 to 10: software version of the fieldbus module
  – 2 characters for the basic version
  – 2 characters for the variant
  – 1 character for the version of the variant
- Characters 11 to 15: No name



– 5 blanks

If a fieldbus module is not available, the corresponding area is filled with blanks.

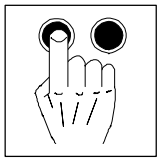
Example:
For a 8201 controller 8201 (version V2.1; without variant and variant version) with 2111 fieldbus module (version V3.0; without variant and variant version): “2100030000 “



6.6.7 Status

The PCP service “Status“ informs about the controller status. The controller returns the following parameters:

Status	Value	Meaning
Logical Status	0 = ready to communicate	Information about the current operating mode (L-C0001) of the controller concerning communication
Physical Status	• 0 = ready for operation Controller status “OPERATION ENABLED“ • 1 = partly ready for operation All other controller states	Information about the current operating state of the controller. For controller states see chapter 6.3.2.
Local detail	Parameter “Status word“	24-bit value comprising: • Bit 0 to 15: Profile parameter “Status word“ (index = 6041_{hex}) • Bit 16 to 23: value 0



7 Troubleshooting and fault elimination

In the following you will find information about troubleshooting in the INTERBUS system in connection with controllers. It is the advanced diagnostics help of Phoenix Contact or the manufacturer of the INTERBUS master.

The help is in the form of troubleshooting trees with the following elements:

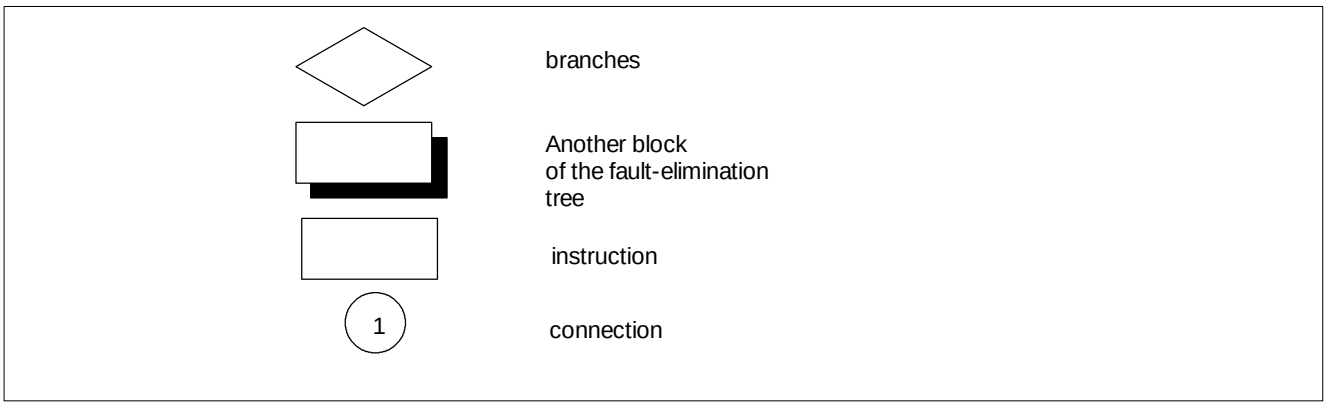
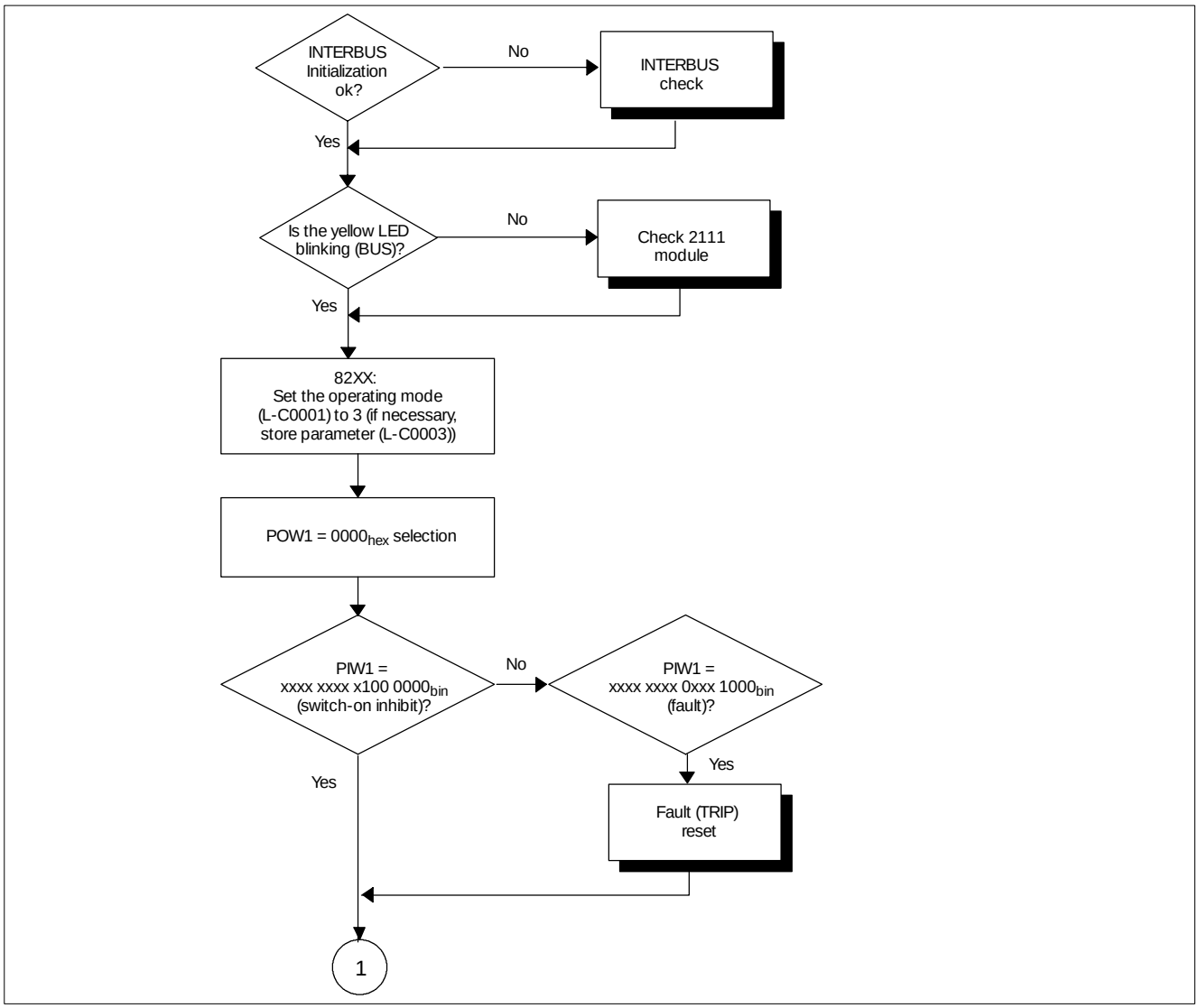
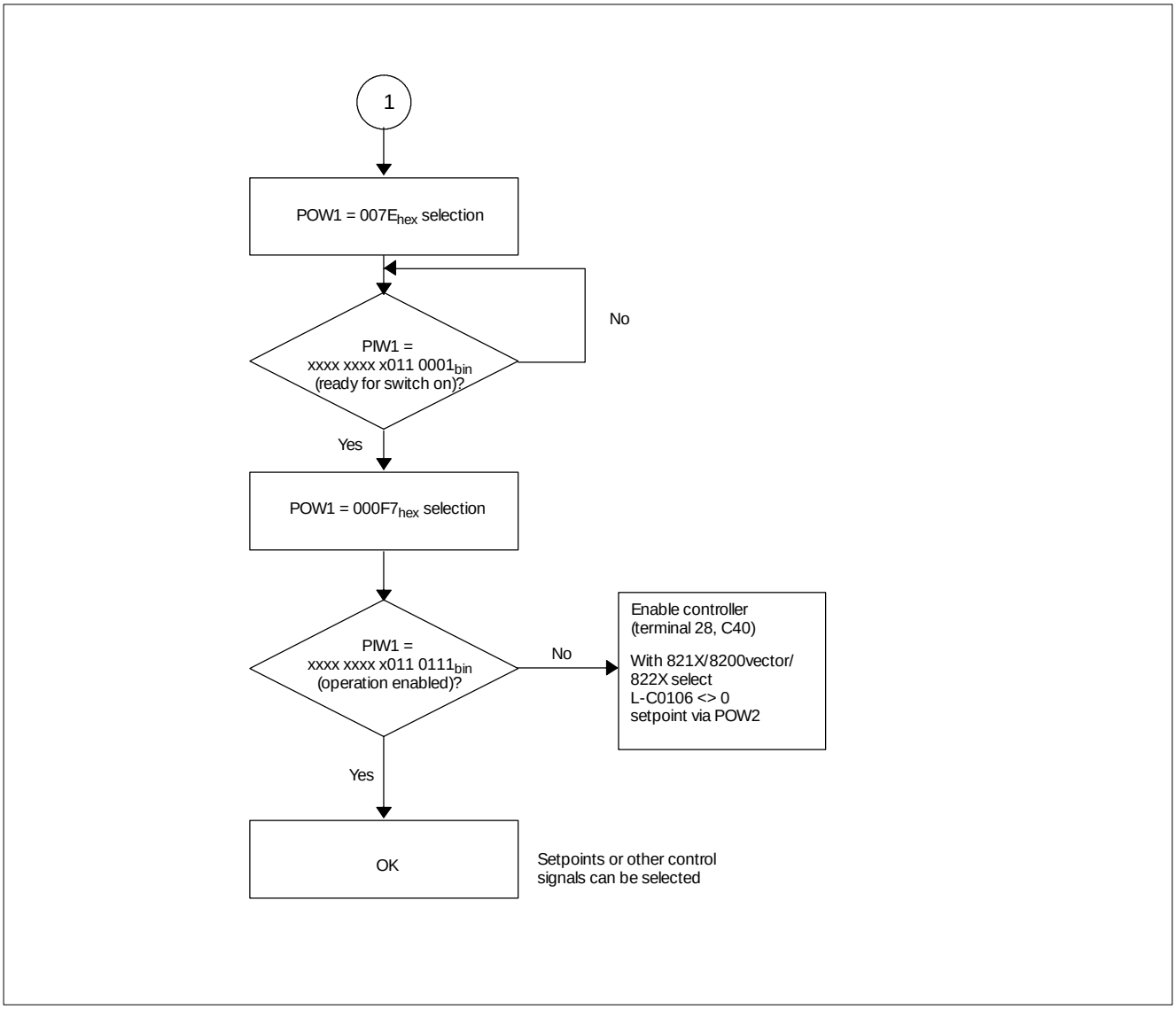


Fig. 7-1 Elements of a troubleshooting tree

7.1 Controller is inhibited

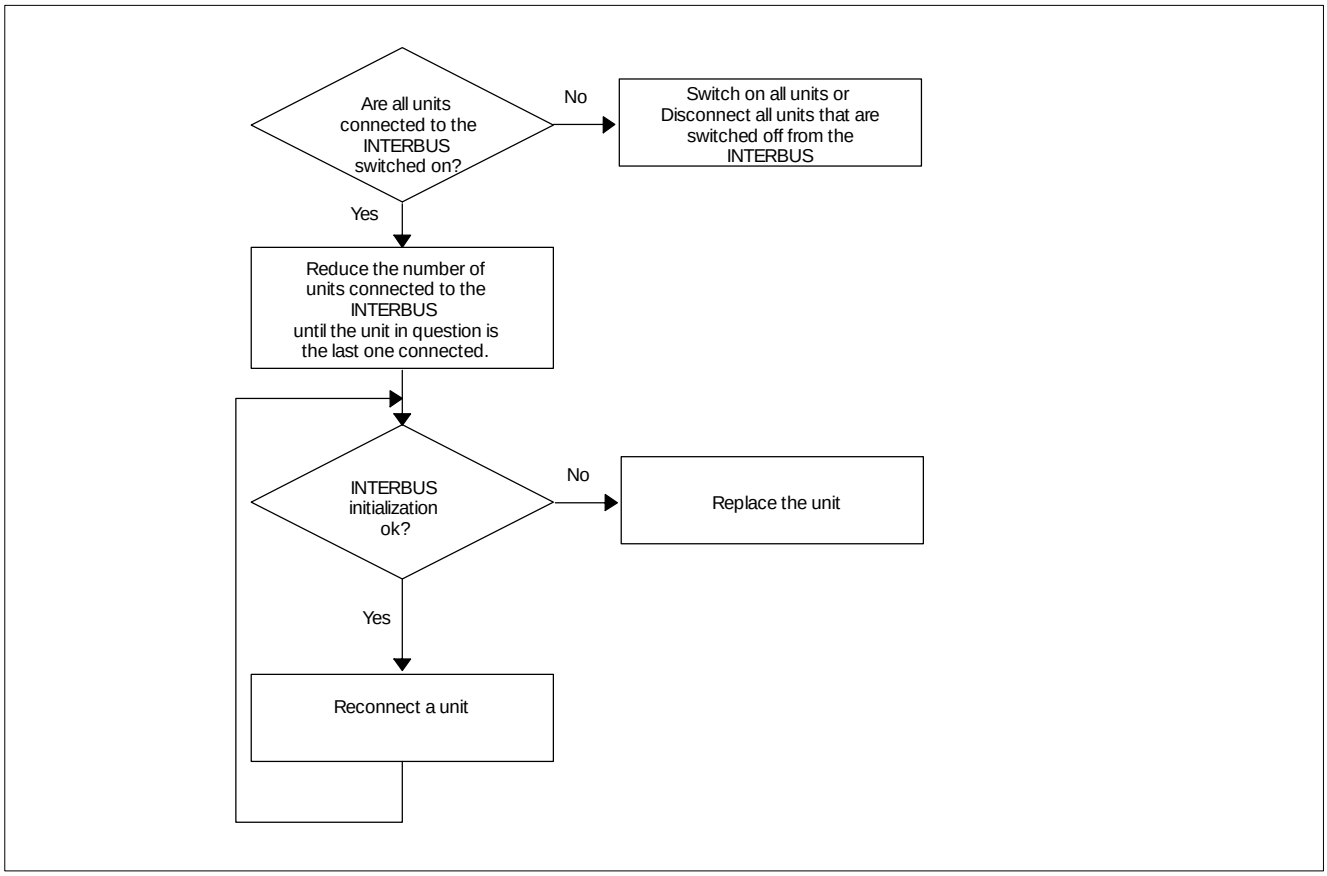
The controller cannot be enabled via INTERBUS process data, i.e. the status ”OPERATION ENABLED” will not be reached.




1
POW1 = 007E$_{hex}$ selection
PIW1 =
xxxx xxxx x011 0001$_{bin}$
(ready for switch on)?
No
Yes
POW1 = 000F7$_{hex}$ selection
PIW1 =
xxxx xxxx x011 0111$_{bin}$
(operation enabled)?
No
Enable controller
(terminal 28, C40)
With 821X/8200vector/
822X select
L-C0106 <> 0
setpoint via POW2
Yes
OK
Setpoints or other control
signals can be selected

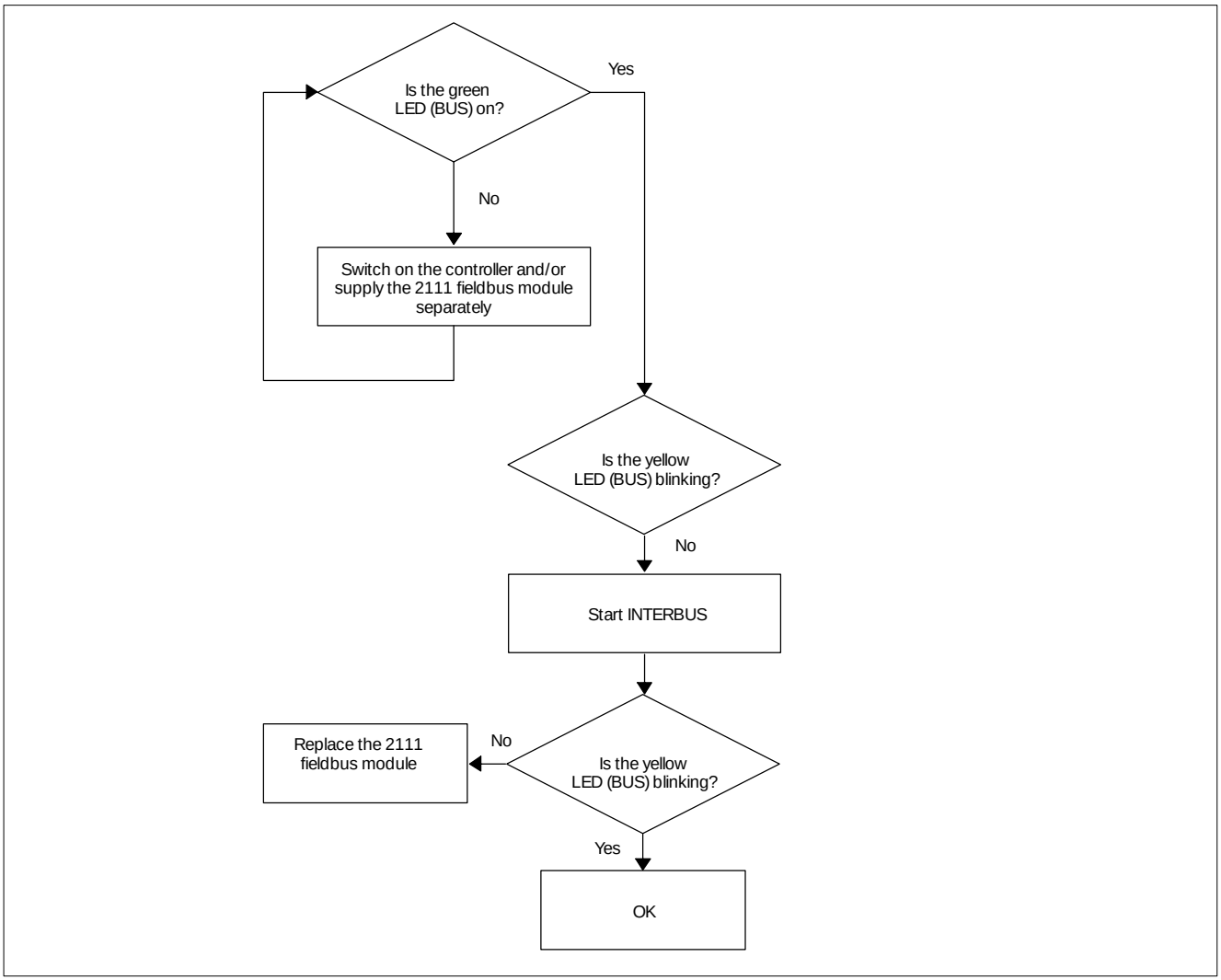
7.2 Check INTERBUS

Short test of the INTERBUS system in the event of faulty initialization. The diagnostics information of the INTERBUS fieldbus modules in the host must be considered.
For troubleshooting it can be reasonable to reduce the bus so that only one unit is connected to the INTERBUS.



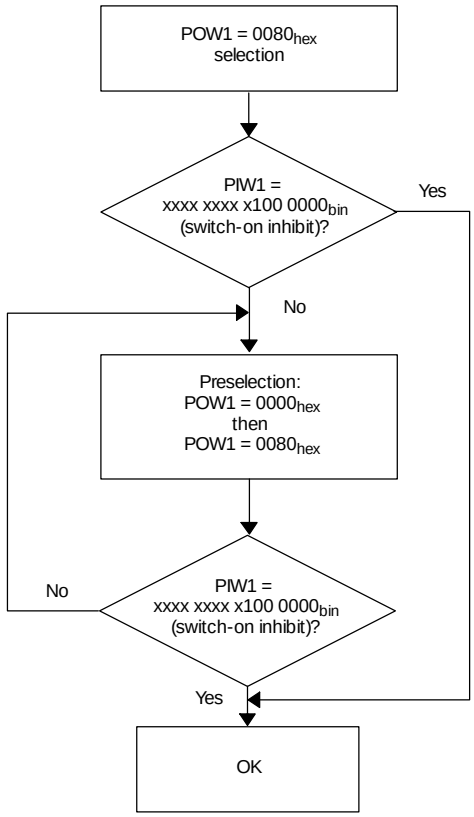
7.3 Activate fieldbus module

Activate the fieldbus module in connection with a controller or the 2210MP automation module.



7.4 Reset fault (TRIP)

Fault reset via INTERBUS process data.



7.5 DRIVECOM error code

DRIVECOM fault codes, which can be generated at present:

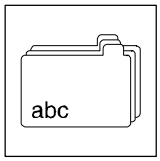
Lenze Fault abbreviations	Lenze Fault no.	DRIVECOM Fault code hex	dec	Meaning
---	0	0	0	No fault
OC3	13	2213	8723	Controller overload during acceleration
OC4	14	2214	8724	Controller overload during deceleration
OC	10	2300	8960	General overcurrent
OC5	15	2311	8977	Controller overload
OC6	16	2312	8978	Motor overload
OC1	11	2320	8992	Short circuit (motor side)
OC2	12	2330	9008	Earth fault (motor side)
LUQ	35	3100	12544	Undervoltage at n < Q_{min}
LP1	32	3130	12592	Motor phase failure
OUE	22	3212	12818	Undervoltage
OH	50	4210	16912	Heatsink overtemperature
OH3	53	4310	17168	Motor overtemperature
OH8	58	4310	17168	Motor overtemperature
U15	70	5111	20753	Faulty voltage supply
H02	102	5200	20992	Internal fault
H07	107	5200	20992	Internal fault
H10	110	5210	21008	Internal fault
H11	111	5210	21008	Internal fault
H05	105	6000	24576	Internal fault
CCr	64	6010	24592	System error
PEr	74	6100	24832	Program error
PR0	75	6300	25344	General fault in parameter sets
PI	79	6100	24832	Fault during initialization
PR1	72	6301	25345	Fault in parameter set 1
PR2	73	6302	25346	Fault in parameter set 2
PR3	77	6303	25347	Fault in parameter set 3
PR4	78	6304	25348	Fault in parameter set 3
Sd5	85	7300	29440	Faulty master current
Sd6	86	7300	29440	Sensor fault - motor temperature (X7 or X8)
Sd7	87	7300	29440	Initialization of absolute-value feedback
Sd2	82	7303	29443	Resolver fault
Sd3	83	7305	29445	Feedback fault to X9 pin 8
P00	150	8000	12576	General process fault
P13	163	8000	32768	Monitoring (phase fault)
CE0	61	8100	33024	Communication fault (AIF)
CE1	62	8100	33024	Communication fault (CAN-IN1)
CE2	63	8100	33024	Communication fault (CAN-IN2)
CE3	64	8100	33024	Communication fault (CAN-IN3)
NMAX	200	8400	33792	Maximum speed exceeded
P03	153	8611	34321	Contouring error
P01	151	8612	34322	Limit-stop switch negative

Troubleshooting and fault elimination

Lenze Fault abbreviations	Lenze Fault no.	DRIVECOM Fault code hex	dec	Meaning
P02	152	8612	34322	Limit-stop switch positive
EEr	9000	9000	36864	External fault (TRIP)

Tip!

Only faults and errors caused by the controller can occur.
Please read the Operating Instructions for the controller.



8 Appendix

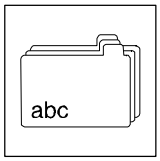
8.1 Accessories

In the following, you will find the accessory components for INTERBUS with the order information of Phoenix Contact:

Tip!

Please ask the manufacturer of the accessory components for the latest order information and the technical data.

Name	Order information of Phoenix Contact	Note
Installation manual	IBS SYS INST UM Order no. 27 54 28 6	Technical data for connection cables to be prepared by the user.
Long-distance bus cable: • by the meter • preparation	 • IBS RBC Meter-T Order no. 28 06 28 06 • IBS DSUB9-KONFEKT-T Order no. 27 58 46 0	Bus connection between IP20 long-distance bus participants (all prepared cables require both components).
Controls:		Bus-interface modules for different host systems
• Siemens: SIMATIC-S5	IBS S5 DCB/I-T	with electrical isolation
• AEG: MODICON A250	IBS A25 DCB/I-T	with electrical isolation
• Bosch: CL 300-600	IBS BA AT/I	with electrical isolation
• Klöckner Moeller: IPC620	IBS IPC DCB/I-T	with electrical isolation
• GE-Fanuc: Serie 90-70	IBS GE AT/I	with electrical isolation
• ABB, Klaschka, Pilz		Further information can be obtained from Phoenix Contact or any other manufacturer of the control system.
• PC cards (AT compatible) – non-intelligent interface – intelligent interface	 – IBS PC AT/I-T – IBS PC CB/COP/I-T IBS PC CB/I-T	 – with electrical isolation – with co-processor without co-processor
• VME bus systems	IBS VME 6H CB/I-T	with electrical isolation
• others		DEC MicroVax SMP bus



Appendix

Contact addresses:

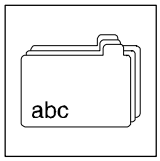
Phoenix Contact GmbH & CoKG
Flachsmarktstr. 8 - 28
D-32819 Blomberg
Phone: ++49 52 35 / 3-00
Fax: ++ 49 52 35 / 3-412 00
http://www.phoenixcontact.com

INTERBUS Club
Postfach 1108
D-32817 Blomberg
Phone: ++ 49 52 35 / 34 21 00
Fax: ++ 49 52 35 / 34 12 34
http://www.interbusclub.com

8.2 Code table DRIVECOM

Explanation of the following code tables:

Name	Meaning
R/W	Write/read authorization via LECOM
	Ra = only read access permitted
	Ra/W= Read access always permitted, write access permitted under certain conditions (e.g. depending on Lenze parameter L-C0001 (operating mode) or controller status)
PCD	Mapping to INTERBUS process data (index 6010_{hex}, 6011_{hex})
	PI = Process input data (from the controller to the host)
	PO= Process output data (from the host to the controller)
	POI= Process input and output data (see PO and PI)
	- = Mapping of the process data not possible
SP	Non-voltatile saving of the parameter
	y = Yes Parameter will be saved
	n = No Parameter will not be saved
	- = Parameter depends on the process and will therefore not be saved
Data str.	Data structure
	S = Simple variable (parameter) The parameter consists of one value and can only be addressed via subindex 0.
	A = Array variable (field parameter) The parameter contains several values of the same data type. The individual elements can be directly addressed by means of the subindex. Subindex = 0 addresses the whole parameter contents.
	R = Record variable (combined parameter) The parameter contains several values of different data types. Subindex = 0 addresses the whole parameter contents.
Data type	Data type
	BOL = Boolean FALSE = 00_{hex}; TRUE = FF_{hex}
	I8 = Integer8 $-128 \le x \le 127$
	I16 = Integer16 $-32768 \le x \le 32767$
	I32 = Integer32 $-2147483648 \le x \le 2147483647$
	U8 = Unsigned8 $0 \le x \le 255$
	U16 = Unsigned16 $0 \le x \le 65535$
	U32 = Unsigned32 $0 \le x \le 4294967295$
	OS = Octet string 8 bit/byte [= 1 byte or 8 bit per byte] binary coded
	VS = Visible string; text coded to ISO 646
	PDS = Process data description structure (index 20_{hex}); see chapter 6.4.7
	RS = Ramp structure (index 21_{hex}) Subindex 1: U32 Numerator „delta_speed“ in rev/min Subindex 2: U16 Denominator „delta_time“ in seconds
Data number	Display of the parameter elements
Data length	Total length of the parameter in byte



According to the standardization of controller parameters according to the DRIVECOM profile 21 the following parameters are implemented:

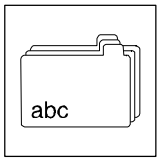
Index hex	dec	Parameter name	R/W	PCD	SP	Data str.	Data type	Data number	Data length
6000	24576	Process-input data description	Ra/W	-	Y	CW	PDS	9 11[1)]	13 19[1)]
6001	24577	Process-output data description	Ra/W	-	Y	CW	PBS	9 11[1)]	13 19[1)]
6002	24578	Process-output data - release	Ra/W	-	n	S	OS	1	1
6003	24579	Process data - monitoring time	Ra/W	-	Y	S	U16	1	2
6004	24580	Process-data - selection code	Ra/W	-	Y	S	I16	1	2
6005	24581	Communication monitoring time	Ra/W	-	Y	S	U16	1	2
6006	24582	Communication monitoring-selection code	Ra/W	-	Y	S	I16	1	2
603F	24639	Fault code	Ra	-	n	S	OS	1	2
6040	24640	Control word	Ra/W	POI	-	S	OS	2	2
6041	24641	Status word	Ra	PE	-	S	OS	2	2
6042	24642	Speed setpoint	Ra/W	POI	-	S	I16	1	2
6043	24643	Master speed	Ra	-	-	S	I16	1	2
6044	24644	Actual speed	Ra	PE	-	S	I16	1	2
6046	24646	Speed - min./max. value	Ra/W	-	n	O	U32	2	8
6048	24648	Acceleration	Ra/W	-	n	R	RS	2	6
6049	24649	Deceleration	Ra/W	-	n	R	RS	2	6
604A	24650	Quick stop	Ra/W	-	n	R	RS	2	6
604B	24651	Setpoint factor	Ra/W	-	Y	A	I16	2	4
604D	24653	Pole number	Ra/W	-	Y	S	U8	1	1
604E	24654	Speed reference value	Ra/W	-	n	S	U32	1	4
604F	24655	Acceleration time	Ra/W	-	n	S	U32	1	4
6050	24656	Deceleration	Ra/W	-	n	S	U32	1	4
6051	24657	Quick stop time[2)]	Ra/W	-	n	S	U32	1	4
6052	24658	Percentage setpoint	Ra/W	POI	-	S	I16	1	2
6053	24659	Master percentage	Ra	-	-	S	I16	1	2
6054	24660	Actual percentage	Ra	PE	-	S	I16	1	2

1) only reasonable with 93XX 2) not with 820X

8.2.1 Code table 2111

Code	Values	Default setting	Explanation
C1810	33S2111I_xy000		Software registration number of 2111
C1910[1)]	4.6	4	INTERBUS process data length in byte
C1911[2)]	0/1	1	The control word is transmitted from the host to the controller via the DRIVECOM status machine. With L-C1911 the access on the way from the DRIVECOM status machine to the controller (L-C1911=1) can be permitted or avoided (L-C1911=0).

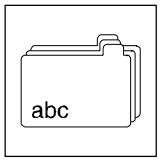
1) / 2) See also chapter 6.5.2[1)] and chapter 6.5.3[2)]



Appendix

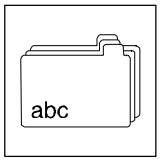
8.3 List of abbreviations

Abbreviation	Meaning
AIF	Automation Interface; interface between controller and automation or fieldbus modules. It also contains defined process data.
ASCII	American Standard Code for Information Interchange: 7 bit code with one free parity bit
bin	Display of values in the binary character format (0,1).
CRL	Communication reference list
Ctr. inhibit	Controller inhibit
Ctrl. enable	Controller enable
DC injection brake	DC-injection brake
DI1, DI2	Name for the SubD connection.
DO1, DO2	Name for the SubD connection.
EMC	Electromagnetic compatibility
hex	Display of values in the hexadecimal character format (0, …, 9, A, B, …, F).
Imax	Current limit
IMP	Pulse inhibit
JOG	Fixed speed or input for activation of the fixed speed
L-CXXXX	Lenze code number XXXX
LECOM	Lenze communication
LSB	Least Significant Bit; low-weighting bits of a binary value
Max-PDU	Maximum Process Data Unit
MSB	Most Significant Bit; high-weighting bits of a binary value
OV	Object list
PC	Personal Computer
PCD	Process data
PCP	Peripherials Communication Protocol
PDU	Process Data Unit: Usable length of a PROFIBUS-compatible telegram
PE	Protective earth
PI-data	Process-input data
PIWx	Process-input word x from PROFIBUS: Reference point is the master, i.e. a word is transmitted from the controller to the master. “x“ characterizes the word address (starts at x = 1).
PO-data	Process-output data
POWx	Process-output word x to PROFIBUS: Reference point is the master; i.e. a word is transmitted from the master to the controller. “x“ characterizes the word address (starts at x = 1).
PROFIBUS	Process Field Bus; communication standard DIN 19245 part 1 to 3
QSP	Quick stop
RFG	Ramp-function generator; setpoint integrator
RS232	Interface standard
RS485	Interface standard with difference signals
TRIP	Operation fault
Vcc	Controlled constant voltage supply

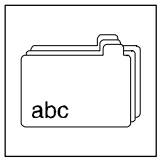


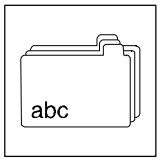
8.4 Glossary

Technical term	Meaning
Acknowledgement	Acknowledgement of a setting or change (e. g. of parameters))
Application	as directed: Appropriate use of the machine according to the manufacturer's information or to common use because of its design and function. inappropriate The use of the machine which does not comply with the manufacturer's declaration.
Baud rate	Transmission speed of data in bit/s
Bus participant	Unit which communicates with the host via the bus
Bus terminal	Network node between long-distance and peripheral bus
Code	For input and display (access) of parameter values.
Code number	Clear labelling of a parameter, e.g. C0106. For calculation information see Lenze code addressing in chapter "Parameter setting", page 6-1.
Controller	General term for servo drives, frequency inverters and DC drives
Cycle time	The cycle time of the communication system is the time required for the exchange of all process data between the host and the field units (e.g. controllers).
Data format	Data description, consisting of the components data structure and data type. The data formats of the DRIVECOM parameters are described in chapter 8.2.
DRIVECOM	Group of more than 30 drive manufacturers. They have created uniform communication solutions for power transmission. A result is a standardized drive profile "DRIVECOM profile drive technology 21" (see Profile).
Field bus	For the exchange of data between higher-level controls (hosts) and positioning controls (e. g. controllers).
Host	PC or PLC
Icon	Sign or symbol with an unambiguous message.
Index	Parameter number according to the PROFIBUS and DRIVECOM definitions. If a parameter comprises several values (e.g. arrays and records), they are addressed by an additional subindex.
InterBus	Serial bus system of Phoenix Contact
Lenze code number	see code number
Master	see host/host system
Network topology	Design and structure of a network: e.g. point-to-point network, line network, ring network)
Parameter	Adjustable controller variables and values addressable via codes
Peripheral-bus module	Bus participant in the peripheral bus
Peripheral-bus station	Consists of bus terminal, peripheral-bus module and long-distance bus controller.
Process data	Small amounts of data (e.g. 2 bytes, DRIVECOM) for fast and cyclic transmission; e.g. setpoints and actual values
Process-data channel	Communication channel for fast and cyclic transmission of process data
Profile	The word "profile" originates from the communication standard DIN 19245 and describes supplementary and restrictive regulations, which are valid for industry groups or device groups. The DRIVECOM-Nutzergruppe e. V. has standardized some important unit functions and summarized the results in the "DRIVECOM profile drive technology 21".
Slave	Bus participant which is only allowed to transmit data after a request by a master. For instance, controllers are slaves. (See host/host system)



8.5 Table of keywords





Appendix

Appendix