











Legend for fold-out page

Pos.	Description	Detailed information
A	Status display (green) for voltage supply	
B	Status display (yellow) for INTERBUS communication	 69
C	Status display (red/green) of drive	
D	DIP switches <ul style="list-style-type: none">• for configuration<ul style="list-style-type: none">– of process data words– of PCP data words– of ID code– of baud rate• for selecting the AIF-CTRL device control or DRIVECOM profile 21	 62  63  63  65  64
E	INTERBUS output (OUT), Sub-D socket connector, 9-pole	 59
F	INTERBUS input (IN), Sub-D pin connector, 9-pole	 57
G	PE connection (only with 82XX)	
H	Fixing screw	
I	Plug connector, connection for external voltage supply	 49
J	Nameplate	 41



Tip!

Documentation and software updates for further Lenze products can be found on the Internet in the "Services & Downloads" area under <http://www.Lenze.com>

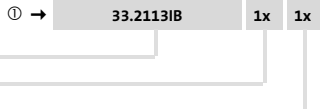
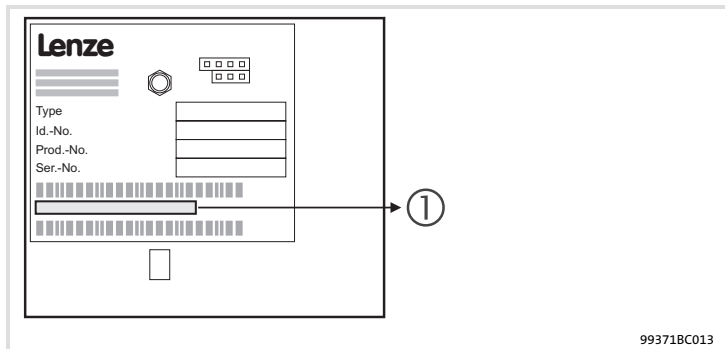
Validity information

These instructions are valid for

► EMF2113IB communication modules (INTERBUS) as of version 1x.1x.

These instructions are only valid together with the documentation for the standard devices permitted for the application.

Identification



Order designation

EMF2113IB

Function

The communication module connects Lenze controllers to the INTERBUS communication system.

Application range

The communication module can be used together with basic devices with the following nameplate data:

Device type	Design	Version		Variant	Explanation / notes
		HW	SW		
33.820x	E./C.	2x.	1x.	Vxxx	8201 - 8204
33.821x	E./C.	2x.	2x.	Vxxx	8211 - 8218
33.822x	E.	1x.	1x.	Vxxx	8221 - 8227
33.824x	E./C.	1x.	1x.	Vxxx	8241 - 8246
82EVxxxxxBxxxXX		Vx	1x		8200 vector
82CVxxxxxBxxxXX		Vx	1x		8200 vector, cold plate
82DVxxxKxBxxxXX		Vx	1x		8200 vector, thermally separated
EPL 10200	E	1x	1x		Drive PLC
33.93XX	xE.	2x	1x	Vxxx	9321 - 9332
33.938x	xE.	1x	0x		9381 - 9383
33.93XX	xC.	2x	1x	Vxxx	9321 - 9332, cold plate
33.93XX	EI / ET	2x	1x	Vxxx	9300 Servo PLC
33.93XX	CI / CT	2x	1x	Vxxx	9300 Servo PLC, cold plate
¹⁾ ECSxPxxxx4xxxxXX		1A	6.0		ECSxP (Posi and Shaft)
¹⁾ ECSxSxxxx4xxxxXX		1A	6.0		ECSxS (Speed and Torque)
¹⁾ ECSxAxxxx4xxxxXX		1A	2.3		ECSxA (Application)

¹⁾ Basic device cannot be used with DRIVCOM control

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1 Safety instructions

Notes used

Notes used

The following pictographs and signal words are used in this documentation to indicate dangers and important information:

Safety instructions

Structure of safety instructions:






Danger!




(characterises the type and severity of danger)

Note

(describes the danger and gives information about how to prevent dangerous situations)

Pictograph and signal word	Meaning
 Danger!	Danger of personal injury through dangerous electrical voltage. Reference to an imminent danger that may result in death or serious personal injury if the corresponding measures are not taken.
 Danger!	Danger of personal injury through a general source of danger. Reference to an imminent danger that may result in death or serious personal injury if the corresponding measures are not taken.
 Stop!	Danger of property damage. Reference to a possible danger that may result in property damage if the corresponding measures are not taken.

Application notes

Pictograph and signal word	Meaning
 Note!	Important note to ensure troublefree operation
 Tip!	Useful tip for simple handling
	Reference to another documentation

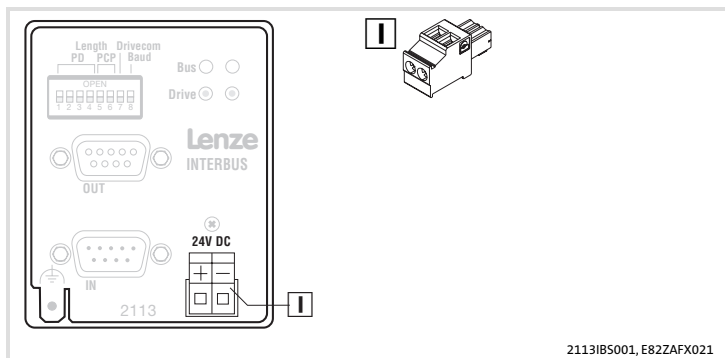
Residual hazards



Danger!

Observe the safety instructions and residual hazards included in the instructions for the standard device.

2 Scope of supply



2113IB5001, E82ZAFX021

Item	Scope of delivery	see
	EMF2113IB communication module	
	Mounting Instructions	
I	Plug connector with screw connection, 2-pin	50

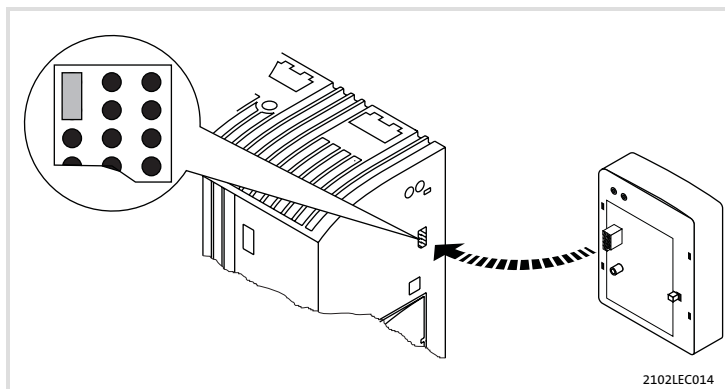


Fig. 1 Attaching the communication module

- ▶ Plug the communication module onto the standard device (here: 8200 vector).
- ▶ Tighten the communication module to the standard device using the fixing screw in order to ensure a good PE connection.



Note!

For the internal supply of the communication module by the 8200 vector frequency inverter the jumper has to be adjusted within the interface opening (see illustration above).

Observe the notes (📖 51).

4 Electrical installation

Wiring according to EMC

Wiring according to EMC

Please observe the following for wiring according to EMC guidelines:



Note!

- ▶ With 820X and 821X controllers, communication can be impaired by electromagnetic interferences. For safe communication, use an additional cable between the PE connection of the basic device and the PE connection of the communication module.

This is not necessary for all other controllers that can be used together with the communication module.

- ▶ Differences in potential between the devices can be avoided by using an equalizing conductor with a large cross-section (reference: PE).
- ▶ Separate control cables from motor cables.
- ▶ Connect the data cable shields *at both ends*.
- ▶ Please see the information on wiring according to EMC guidelines in the Operating Instructions for the basic device.

DC voltage supply

External voltage supply

If required, feed the communication module with a separate supply voltage via the two-pole plug connector.

Use a separate supply unit in every control cabinet if the distance between the control cabinets is larger than normal.


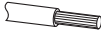
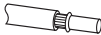

Plug connector	Explanation
"+"	U = 24 V DC (21.6 V - 0% ... 26.4 V + 0 %) I = 120 mA
"-"	Reference potential for external voltage supply

Controller	External voltage supply
820X	Always required
821X / 822X / 824X / 93XX / 9300 Servo PLC / Drive PLC / ECSxS / ECSxP / ECSxA	Only required if the mains supplying the corresponding controller is to be switched off but communication must not be interrupted. For these basic devices the internal voltage supply can be used.
8200 vector	See notes given in "Internal voltage supply" 51

4 Electrical installation

DC voltage supply

Terminal data

Area	Values
Electrical connection	Plug connector with screw connection
Possible connections	rigid:
	 1.5 mm ² (AWG 16)
	flexible:
	 without wire end ferrule 1.5 mm ² (AWG 16)
 with wire end ferrule, without plastic sleeve 1.5 mm ² (AWG 16)	
 with wire end ferrule, with plastic sleeve 1.5 mm ² (AWG 16)	
Tightening torque	0.5 ... 0.6 Nm (4.4 ... 5.3 lb-in)
Stripping length	6 mm

Internal voltage supply



Note!

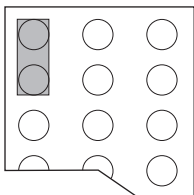
Internal voltage supply has been selected in the case of standard devices with an ALF advanced interface opening (e.g. front of 8200 vector). The area shown on a grey background in the graphic marks the jumper position.

- ▶ By default, this is **not** supplied internally in the standard device.
- ▶ For internal voltage supply place the jumper on the position indicated below.

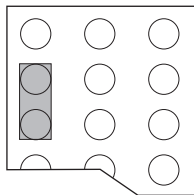
In the case of all other device series (9300, ECS), voltage is always supplied from the standard device.

Lenze setting

(Only external voltage supply possible.)



Internal voltage supply



4 Electrical installation

Wiring

Wiring

Wiring to a host



Note!

Additional electrical isolation is required, if

- ▶ an 820X or 821X controller is connected to an INTERBUS master **and**
- ▶ a safe electrical isolation (reinforced insulation to EN 61800-5-1) is necessary.

Use e.g. a bus terminal or an interface module for the INTERBUS master with an additional electrical isolation (see the corresponding information of the manufacturer).

The incoming bus (IN) is isolated from the supply voltage and the outgoing bus (OUT).

The supply voltage has the same potential as the outgoing data bus (OUT).

- ▶ The bus system must be designed as a ring.
- ▶ Go- and return lines are both contained in the same bus cable.
- ▶ The ring connects the INTERBUS master with all devices connected to the bus.

Wiring example

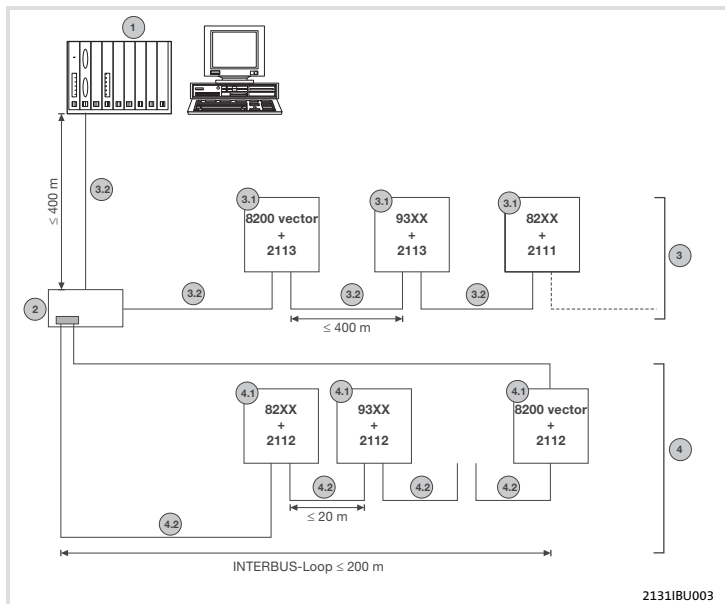


Fig. 2 Wiring example, INTERBUS (baud rate 500 kbits/s)

4 Electrical installation

Wiring

Item	Element	Explanation
1	INTERBUS master with interface module	The bus system is a master-slave system, i.e. an INTERBUS master is connected to several field devices (slaves).
2	INTERBUS loop bus terminal	The bus terminal connects a remote bus to a peripheral bus.
3	Remote bus Fig. 2 pos. 3	The following connections are possible with remote buses: <ul style="list-style-type: none">● Connections between INTERBUS master interface module and first bus terminal or first 2113 communication module● Connection between bus terminal and 2113 communication module● Connection between two 2113 communication modules
3.1	Remote bus module	Node in the remote bus, e.g. Lenze controller with INTERBUS module (slave). Networking does not require bus terminals.
3.2	Remote bus cable	Connects the INTERBUS master interface module with the bus terminals and/or the remote bus modules.
4	INTERBUS loop, peripheral bus Fig. 2 pos. 4	Connection in a peripheral-bus station A peripheral-bus station consists of: <ul style="list-style-type: none">● a bus terminal (Fig. 2 pos. 2)● up to eight peripheral bus modules (Fig. 2 pos. 3)
4.1	INTERBUS loop module	Node in the INTERBUS loop; e.g. Lenze controller with INTERBUS loop module 2112
4.2	INTERBUS loop cable	Connection within the loop

Features	
Communication medium	RS485
Network topology	Ring
Maximum number of controllers	<p>Dependent on INTERBUS master (e.g. Phoenix Contact G4 master). For the following data, always the smaller value applies dependent on the fact, whether PCP communication is available or not:</p> <ul style="list-style-type: none"> ● with PCP communication: 62 <i>or</i> ● without PCP communication: 256 / number of PCD
Baud rate	<ul style="list-style-type: none"> ● 500 kbits/s with a distance of 400 m between neighbouring nodes ● 2 Mbits/s with a distance of 150 m between neighbouring nodes

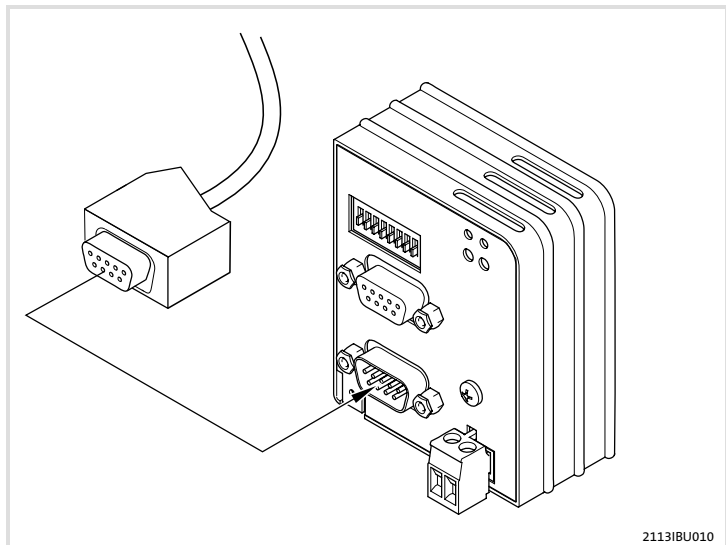
Specification of the transmission cable

General characteristics	
Cable type	Sold by the meter, (e.g. PHOENIX CONTACT: IBS RBC Meter-T, Order No. 28 06 28 6)
Number of conductors	3 × 2, twisted pairs, with shared shield
Conductor cross-section	> 0.2 mm ²
DC cable resistance	< 96 Ω/km
Impedance (characteristic)	<ul style="list-style-type: none"> ● 120 Ω ± 20 % (f = 64 kHz) ● 100 Ω ± 15 Ω (f > 1 MHz)
Capacitance per unit length	< 60 nF/km (f = 800 Hz)

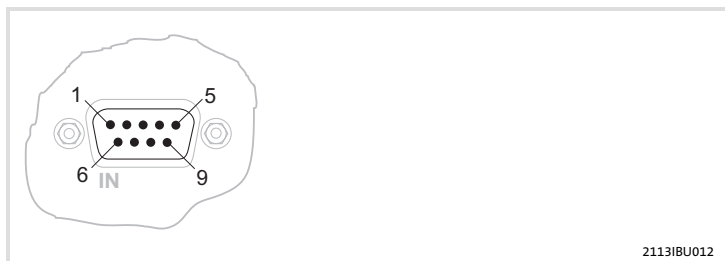
4 Electrical installation

Connection from INTERBUS

Connection from INTERBUS



2113IBU010



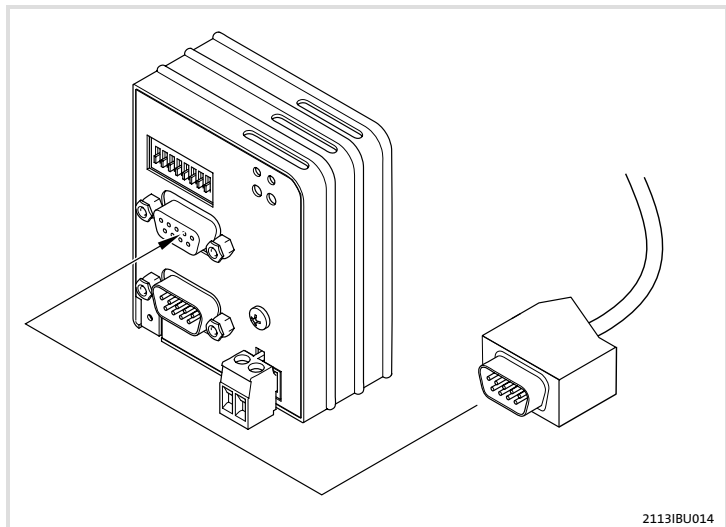
2113IBU012

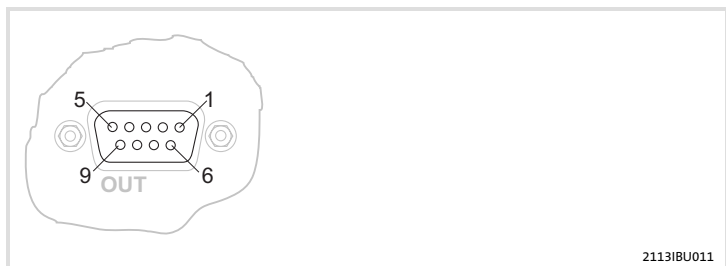
Pin	Designation	Input/Output	Description
1	DO1	Input	RS485: DO1 not inverted
2	DI1	Output	RS485: DI1 not inverted
3	GND		Reference potential
4	free		not assigned
5	Vcc5	Output	5 V DC
6	/DO1	Input	RS485: DO1 inverted
7	/DI1	Output	RS485: DI1 inverted
8	Vcc5	Output	5 V DC
9	free		not assigned

4 Electrical installation

Connection to INTERBUS

Connection to INTERBUS





Pin	Designation	Input/Output	Description
1	DO2	Output	RS485: DO2 not inverted
2	DI2	Input	RS485: DI2 not inverted
3	GND		Reference potential
4	GND		
5	Vcc5	Output	5 V DC
6	/DO2	Output	RS485: DO2 inverted
7	/DI2	Input	RS485: DI2 inverted
8	Vcc5	Output	5 V DC
9	RBST	Signal input	Connection to outgoing INTERBUS plugged in.

5 Commissioning

Before switching on

Before switching on



Stop!

Please check the entire wiring with regard to completeness, short circuit and earth fault, before you switch on the basic device with function module in the INTERBUS network.

Possible settings via the front DIP switches



Note!

If switches S1 ... S8 remain in the Lenze setting **OFF**, the configurations set under the *codes C1910, C1911 and C1912* will become active when the device is switched on.

If one or several switches of switches S1 ... S7 are switched over to **ON**,

- ▶ all switch positions are valid!
- ▶ the following must be set:
 - Number of process data words (PCD),
 - Number of parameter data words (PCP), and
 - Device control AIF-CTRL / DRIVECOM control

Switch off the voltage supply of the communication module and afterwards on again to activate changed settings.

As a maximum, the data word sum (PCD + PCP) is to amount to 10 words.

Please note that only the switch combinations listed in the following tables represent *defined* states. If the settings are unacceptable, the yellow LED at the front of the communication module will start blinking with $f = 8$ Hz.

5 Commissioning

Possible settings via the front DIP switches

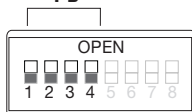
Setting the number of process data words (PCD)



Note!

- ▶ Impermissible settings are indicated by the yellow LED (communication) (□ 69).
- ▶ The current switch position of S1 ... S4 for the number of process data words (PCD) can be displayed under code C1915.

Length
PD



2113IBU005

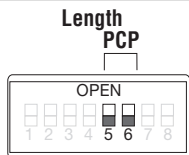
PCD	Switches				Max. number of parameter data words (PCP)
	S1	S2	S3	S4	
1	OFF	OFF	OFF	ON	4
2	OFF	OFF	ON	OFF	
3	OFF	OFF	ON	ON	
4	OFF	ON	OFF	OFF	
5	OFF	ON	OFF	ON	2
6	OFF	ON	ON	OFF	
7	OFF	ON	ON	ON	
8	ON	OFF	OFF	OFF	
9	ON	OFF	OFF	ON	1
10	ON	OFF	ON	OFF	0

Setting the number of parameter data words (PCP)

**Note!**

Impermissible settings are indicated by the yellow LED (communication) (☐ 69).

The current switch position of S5/S6 for the number of parameter data words (PCP) can be displayed under code C1917.



2113IBU005

PCP	Switches		Max. number of process data words (PD)	ID code
	S5	S6		
0	OFF	OFF	10	0x03
1	OFF	ON	9	0xE3
2	ON	OFF	8	0xE0
4	ON	ON	6	0xE1

5 Commissioning

Possible settings via the front DIP switches

Selecting AIF-CTRL or DRIVECOM control



Note!

The current switch position of S7 can be displayed under code C1916.

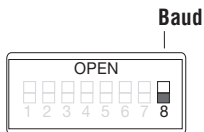


Switch S7	Explanation
OFF	with AIF-CTRL device control
ON	with DRIVECOM control

Setting the baud rate

**Note!**

The baud rate can only be set via switch S8.



2113IBU005

Switch S8	Baud rate	Maximum cable length between neighbouring nodes
OFF	500 kbits/s	400 m
ON	2 Mbits/s	150 m

5 Commissioning

Possible settings by INTERBUS master

Possible settings by INTERBUS master



Note!

If switches (S1 ... S8) remain in the Lenze setting **OFF**, the configurations set under the codes *C1910*, *C1911* and *C1912* will become active when the device is switched on.

Switch off the voltage supply of the communication module and afterwards on again to activate changed settings.

Please note:

- ▶ Impermissible settings are indicated by the yellow LED (communication) (📄 69).
- ▶ As a maximum, the data word sum (PCD + PCP) is to amount to 10 words.
- ▶ Index determination: 24575 - Lenze code number (Cxxxx)

Codes for configuration

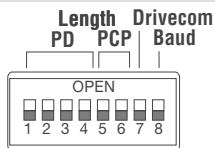
Code	Values	Explanation	
C1910	2 ... 20 (1 ... 10 words)	Number of process data bytes (2 process data bytes = 1 process data word)	
C1911	0: AIF-CTRL device control 1: DRIVECOM control	Operation with AIF-CTRL device control or operation with DRIVECOM profile 21	
C1912	Number of parameter data words (PCP)	Number of parameter data words (PCP)	
	0		0x03
	1		0xE3
	2		0xE0
	4		0xE1

Conformity with 2111 INTERBUS fieldbus module

**Note!**

The response is the same as that of the EMF2111IB communication module (INTERBUS), if the following Lenze settings for the switches and codes remain unchanged:

- ▶ Switches S1 ... S7 = OFF
- ▶ C1910 = 4
- ▶ C1911 = 1
- ▶ C1912 = 1



2113IBU005

S1 ... S8**Explanation**

OFF

Lenze setting for the switches

5 Commissioning

Initial switch-on

Initial switch-on

1. The communication module must be attached to the controller (☞ 47).
2. Switch on the controller and, if required, the separate voltage supply for the communication module (☞ 49).
3. Check communication module signals:
 - The green bus LED indicates the operating status according to the description under pos. A (☞ 69).
 - The yellow bus LED indicates the communication status according to the description under pos. B (☞ 69).
 - Quick blinking (8 Hz) is the reaction of the yellow bus LED to impermissible settings.
4. You can now communicate with the drive.



Note!

PCP communication

- ▶ With a PCP communication the controller parameters can only be accessed after having executed the PCP service "Initiate". After this, the controller parameters can be accessed with the PCP services "Read" and "Write".
- ▶ For a detailed description, please see the INTERBUS Communication Manual.

LEDs at the front of the communication module

Please see the notes for the status display (☞ 69).

Status display

LED			Description
Pos.	Colour	Condition	
A	green	on	Communication module is supplied with voltage and is connected to the basic device.
		off	Communication module is not supplied with voltage. Basic device or external voltage supply is switched off.
		blinking	Communication module is supplied with voltage, but is (still) not connected to the basic device because <ul style="list-style-type: none"> ● the communication module has not been correctly attached to the basic device ● it is not yet possible to transfer data from/to the basic device (e.g. basic device in the initialisation phase).
B	yellow	on	Communication module is being initialised, inactive INTERBUS communication of the master
		off	Communication module is not yet initialised.
		blinking	Active INTERBUS communication <ul style="list-style-type: none"> ● SLOW (1 Hz): process data and PCP communication ● FAST (4 Hz): only process data ● VERY FAST (8 Hz) <ul style="list-style-type: none"> – Indicates impermissible settings: Data word sum: $PD + PCP > 10$ or number of process data words: $PD = 0$. – The communication module continues internally with the following values: $PD = 2$ and $PCP = 1$
C	red / green	Red and green drive LEDs indicate the operating status of the 82XX, 8200 vector, 93XX, Servo PLC 9300 and Drive PLC basic device (see Operating Instructions for the basic device)	

6 Technical data

General data and operating conditions

General data and operating conditions

Field	Values
Communication media	RS485
Network topology	Ring
Communication profile	PCP 2.0
Drive profile	DRIVECOM profile 21
INTERBUS node	Slave
Baud rate	<ul style="list-style-type: none">• 500 kbits/s• 2 Mbits/s

External voltage supply	Values
"+"	U = 24 V DC (21.6 V - 0% ... 26.4 V + 0 %) I = 120 mA
"-"	Reference potential for external voltage supply

Ambient conditions

Climatic conditions

Storage	1 K3 to IEC/EN 60721-3-1	- 25 °C ... + 60 °C
Transport	2 K3 to IEC/EN 60721-3-2	- 25 °C ... + 70 °C
Operation	3 K3 to IEC/EN 60721-3-3	0 °C ... + 55 °C
Degree of pollution	2 to IEC/EN 61800-5-1	
Enclosure	IP20	

Protective insulation

Insulation between incoming bus and ...	Type of insulation (to EN 61800-5-1)
<ul style="list-style-type: none"> ● Reference earth / PE 	Functional insulation
<ul style="list-style-type: none"> ● With external supply 	Functional insulation
<ul style="list-style-type: none"> ● Power stage <ul style="list-style-type: none"> – 820X / 821X – 822X / 8200 vector – 93XX / 9300 Servo PLC – ECS servo system 	Basic insulation Reinforced insulation Reinforced insulation Reinforced insulation
<ul style="list-style-type: none"> ● Control terminals <ul style="list-style-type: none"> – 820X / 8200 vector – 821X – 822X – Drive PLC – 93XX / 9300 Servo PLC – ECS servo system 	Functional insulation Functional insulation Basic insulation Basic insulation Basic insulation Reinforced insulation
<ul style="list-style-type: none"> ● Outgoing bus (OUT) 	No electrical isolation

6 Technical data

Protective insulation

Insulation between outgoing bus and ...	Type of insulation (to EN 61800-5-1)
<ul style="list-style-type: none">● Reference earth / PE	Functional insulation
<ul style="list-style-type: none">● With external supply	No electrical isolation
<ul style="list-style-type: none">● Power stage<ul style="list-style-type: none">– 820X / 821X– 822X / 8200 vector– 93XX / 9300 Servo PLC– ECS servo system	Basic insulation Reinforced insulation Reinforced insulation Reinforced insulation
<ul style="list-style-type: none">● Control terminals<ul style="list-style-type: none">– 820X / 8200 vector (with internal supply)– 8200 vector (with external supply)– 821X– 822x– Drive PLC– 93XX / 9300 Servo PLC– ECS servo system	No electrical isolation Basic insulation Functional insulation Basic insulation Basic insulation Basic insulation Reinforced insulation
<ul style="list-style-type: none">● Incoming bus (IN)	Electrical isolation

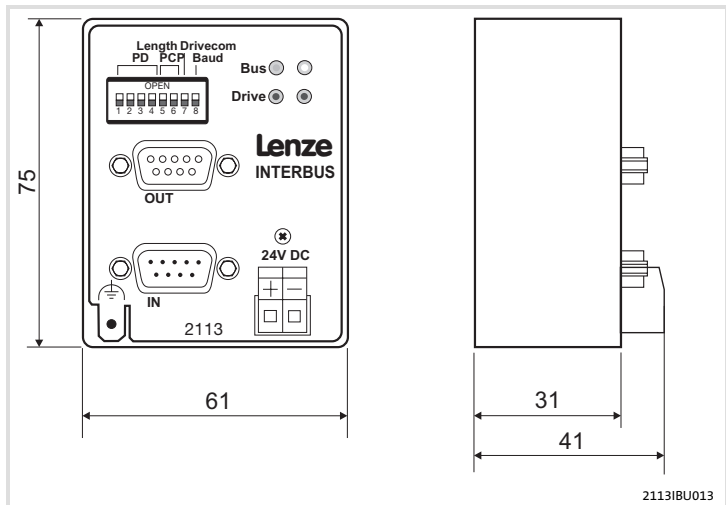
Protocol data

Field	Values
Maximum number of controllers	<p>Dependent on INTERBUS master (e.g. Phoenix Contact G4 master). For the following data, always the smaller value applies dependent on the fact, whether PCP communication is available or not:</p> <ul style="list-style-type: none"> ● with PCP communication: 62 <i>or</i> ● without PCP communication: 256/number of PD
Process data words (PD)	1 ... 10 (selectable) Lenze setting: 2 words
Parameter data words (PCP)	0, 1, 2, 4 Lenze setting: 1 word
Maximum number of data words	As a maximum, the data word sum (PD + PCP) is to amount to 10 words.
INTERBUS ID (module ID)	Module ID for set length
	3 = 0x03 PCP, 0 words
	227 = 0xE3 PCP, 1 word
	224 = 0xE0 PCP, 2 words
	225 = 0xE1 PCP, 4 words
Maximum PDU length	64 bytes
Supported PCP services	Initiate, Abort, Status, Identify, Get-0V-long, Read, Write

6 Technical data

Dimensions

Dimensions



All dimensions in mm