Leuze electronic

the sensor people

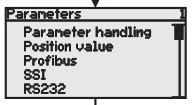
AMS 200

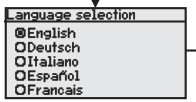
Optical Laser Measurement System

GB 01-03/08 50104729

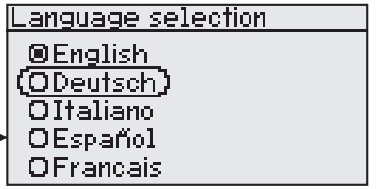
TECHNICAL DESCRIPTION

Selecting the display language





Language selection in PROFIBUS operation:
When operating the laser measurement system on the PROFIBUS, the language must be selected in GSD module 18.

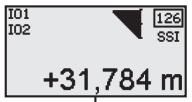


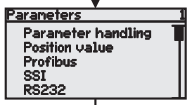
Select language

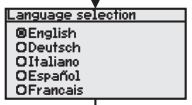
+

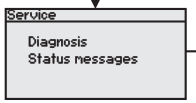
Confirm

Service display - Min/Max diagnosis



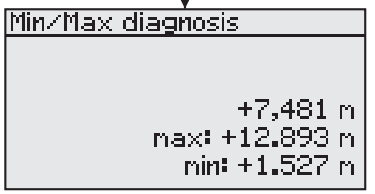






Min/Max diagnosis:
Displayed are the
- current measurement value
- max. measurement value after diagnosis activation
- min. measurement value after diagnosis activation

Status messages:
for internal use only by Leuze electronic.

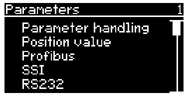


Reset min/max measurement values to current measurement value and reset diagnosis messages

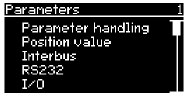
AMS 200 Parameter menu

Leuze electronic

AMS 200/…-11…:



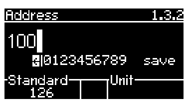
AMS 200/…-20…:



Device buttons:

- **Page up/laterally**
- **Page down/laterally**
- **ESCAPE** Exit
- **ENTER** Confirm

Entering values:



- + ENTER: Delete digit
- 0…9 + ENTER: Enter digit
- save + ENTER: Save entry

Menu	Options	Explanation	Profibus module
Parameter handling			
– Parameter enabling	ON **OFF**	Enable parameter handling	
– Password	ON **OFF**		
– –	Input: ... (**0000**)	Password activation	18
– Set parameter to def.		Set parameters to default values	
Position Value			
– Unit	**Metric** Inch	Units	1
– Count Direction	**positive** negative	Count direction	1
– Offset	Input: ... (**0**)	Enter offset value	1
– Preset	Input: ... (**0**)	Enter preset value	2,3
– Error delay	**ON** OFF	Error delay - Plausibility filter	
– –	Input: ... (**100**)	Error delay	9
– Pos.val. on error	Last valid value **Zero**	Measurement value on error	9
Profibus	**only AMS 200/…-11… !**		
– Activation	**ON** OFF	Profibus interface on/off	
– Address [**126**]	Input: ... (**126**)	Profibus address	
Interbus	**only AMS 200/…-20… !**		
– Activation	**ON** OFF	Interbus interface on/off	
SSI	**only AMS 200/…-11… !**		
– Activation	**ON** OFF	SSI interface on/off	
– Coding	Binary **Gray**	Measurement value coding	17
– No. of data bits	**24-Bit** 25-Bit 26-Bit	SSI data format	17
– Resolution SSI	0.001 0.01 **0.1** 1 10	SSI measurement value resolution	17
– Error bit	**ON** OFF	Error bit content (OR link)	17
– –	Overflow, Intensity (ATT), Temp. (TMP), Laser (LSR), **Plausibility (PLB)**, **Hardware (ERR)**		
– Refresh rate	**1.6** 0.2	Refresh rate	17
RS 232			
– Activation	ON **OFF**	RS 232 interface on/off	19
– Address	Input: ... (**0**)	RS 232 interface address	19
– Baudrate	19.2 **38.4** 57.6 115,2	RS 232 interface baudrate	19
– Format	**8,n,1** 8,e,1 8,o,1	Transmission format	19
– Transm. cycle	Input: ... (**1**)	Transmission cycle 1 … 20 • 1.6 ms	19
– Pos. resolution	0.01 **0.1** 1 10	Resolution of RS 232 position values	19
– Vel. resolution	**1** 10 100	Resolution of RS 232 velocity values	19
I/O			
– I/O 1			4
– – Function	**Output** Input	I/O 1 function	4
– – – (Input)	**Preset** Laser	Preset teach function or laser on/off	4
– – – (Output)	Pos. limit val. 1, Pos. limit val. 2, Velocity, Intensity (ATT), Temp. (TMP), Laser (LSR), **Plausibility (PLB)**, **Hardware (ERR)**	Output event (OR link)	4
– – Activation	Active high **Active low**	Level at output / Edge at input	
– I/O 2			5
– – Function	**Output** Input	I/O 2 function	5
– – – (Input)	**Preset** Laser	Preset teach function or laser on/off	5
– – – (Output)	Pos. limit val. 1, Pos. limit val. 2, Velocity, **Intensity (ATT)**, **Temp. (TMP)**, **Laser (LSR)**, Plausibility (PLB), Hardware (ERR)	Output event (OR link)	5
– – Activation	Active high **Active low**	Level at output / edge at input	
– Limits			
– – Upper pos. limit 1	Input: ... (**0**)	Enter upper limit value for distance range 1	7
– – Lower pos. limit 1	Input: ... (**0**)	Enter lower limit value for distance range 1	7
– – Upper pos. limit 2	Input: ... (**0**)	Enter upper limit value for distance range 2	8
– – Lower pos. limit 2	Input: ... (**0**)	Enter lower limit value for distance range 2	8
– – max. Velocity	Input: ... (**0**)	Enter velocity limit value	11-15
Other			
– Display back lighting	**10 Min.** ON	Display back lighting	18
– Display contrast	Weak **Medium** Strong	Display contrast	18
– Service RS232			
– – Activation	ON **OFF**	RS 232 interface	19
– – Baudrate	57.6 **115.2**		
– – Format	8,e,1 **8,n,1**		

1 General information

1.1 Explanation of symbols

The symbols used in this technical description are explained below.

Attention!

This symbol precedes text messages which must strictly be observed. Failure to comply with this information can result in injuries to personnel or damage to the equipment.

Attention Laser!

This symbol warns of possible danger caused by hazardous laser radiation.

Notice!

This symbol indicates text passages containing important information.

1.2 Declaration of conformity

The AMS 200… absolute measuring optical laser measurement system was designed and manufactured in accordance with applicable European directives, standards and guidelines.

Notice!

A copy of all declarations of conformity available for this product can be found in the appendix of this handbook (chapter 12.1 on page 107).

The manufacturer of this product, Leuze electronic GmbH + Co. KG in D-73277 Owen/Teck, uses a certified quality assurance system in accordance with ISO 9001.

1.3 Description of AMS 200…functions

The AMS 200… optical laser measurement system measures distances to stationary as well as moving plant components. The measurement principle is based on the measurement of the propagation time of the radiated light. The light emitted by the laser diode is reflected onto the receiving element of the laser measurement system by a reflector. The AMS 200… calculates the distance to the reflector based on the propagation time of the radiated light. The high absolute measurement accuracy of the laser measurement system as well as the fast integration time are designed for position control applications.

1.4 Nomenclature

AMS 200 = **A**bsolute **M**easurement **S**ystem **200**.

2 Safety notices

2.1 General safety notices

Documentation

All entries in this technical description must strictly be observed, in particular those in the "Safety notices" section. Keep this technical description in a safe place. It should be accessible at all times.

Repair

Repairs must only be carried out by the manufacturer or an authorised representative.

Attention!

The device must not be opened. Failure to comply will render the guarantee void. Warranted features cannot be guaranteed after the device has been opened.

2.2 Safety standards

The AMS 200… absolute measuring optical laser measurement system was developed, manufactured and tested in accordance with the applicable safety standards. It corresponds to the state of the art.

2.2.1 Intended use

The AMS 200… device series is an absolute measurement system based on laser technology. The devices use a visible optical laser to measure distances of up to 200 m contactlessly. The laser is designed so that position measurements are made against a reflector.

Attention!

The protection of personnel and the device cannot be guaranteed if the device is operated in a manner not complying with its intended use.

Areas of application

The AMS 200… is suitable for the following areas of application:

- Distance measurements for determining the position of automated, moving plant components such as:
  - Travel and lifting axes of high-bay storage devices
  - Gantry crane bridges and their trolleys
  - Repositioning units
  - Lifts

2.3 Working safely

Attention!

Access to or changes on the device, except where expressly described in this operating manual, are not authorised.
The device must not be opened. Failure to comply will render the guarantee void. Warranted features cannot be guaranteed after the device has been opened.

Safety regulations

Observe the locally applicable legal regulations and the rules of the employer's liability insurance association.

Attention!

The AMS 200… is not a safety module acc. to EU machine guidelines.

Qualified personnel

Mounting, commissioning and maintenance of the device may only be carried out by qualified personnel.
Electrical work must be carried out by a certified electrician.

Attention, laser radiation!

The AMS 200… operates with a red light laser of class 2 acc. to EN 60825-1. If you look into the beam path over a longer time period, the retina of your eye may be damaged!

Never look directly into the beam path!

Do not point the laser beam of the AMS 200… at persons!

When mounting and aligning the AMS 200… take care to avoid reflections of the laser beam off reflective surfaces!

Heed the laser safety regulations according to DIN EN 60825-1 in their most current version! The output power of the laser beam at the reading window is at most 4.0 mW acc. to EN 60825-1. The average laser power is less than 1 mW in accordance with laser class 2 as well as CDRH class 2.

The AMS 200… uses a laser diode with low power in the visible red light range with an emitted wavelength of 650 … 690 nm.

Attention!

CAUTION! The use of operating and adjusting devices other than those specified here or carrying out of differing procedures may lead to dangerous exposure to radiation.

The housing of the AMS 200… is provided with the following labels:

A

B

AVOID EXPOSURE – LASER LIGHT
IS EMITTED FROM THIS APERTURE

C

LASER LIGHT
DO NOT STARE INTO BEAM

Maximum Output: 4.0mW
Pulse duration: 18µs
Wavelength: 655nm

CLASS 2 LASER PRODUCT
EN60825–1:2003–10
IEC 60825–1:1993+A2:2001
Complies with 21 CFR 1040.10
except for deviations pursuant to
Laser Notice No.50, dated July 2001

Leuze electronic
Made in Germany
PO Box 1111
73277 Owen/Teck

c UL us LISTED
I.T.E. 85PA
class 2

AMS 200/40–11
50103156
Manufactured:
Serial Number:

18–30V DC | ≤330mA | III | Profibus SSI RS232 | +50°C –5°C

or

Leuze electronic
Made in Germany
PO Box 1111
73277 Owen/Teck

c UL us LISTED
I.T.E. 85PA
class 2

AMS 200/200–20
50108135
Manufactured:
Serial Number:

18–30V DC | ≤330mA | III | Interbus RS232 | +50°C –5°C

D

A Hazard warning & logotype
B Aperture label
C Warning label and certification label
D Name plate with part no., version no., date of manufacture and serial no.

Figure 2.1: Attachment of the stick-on labels at the AMS 200…

3 Commissioning steps at a glance

Notice!

*Below you will find a **short description for the initial commissioning** of the laser measurement system. Detailed explanations for all listed points can be found throughout the handbook.*

① Mechanical design

The AMS 200… and the corresponding reflector are mounted on two opposing, plane-parallel, flat and vertical walls or plant components.

For error-free position measurement there must be unobstructed visual contact between the AMS 200… and the reflector.

Mounting the device

The laser is mounted on a vertical wall using 4 screws (M5).

Alignment is performed using 2 adjustment screws. (Laser light spot centred on the reflector.) Once aligned, the device is secured in place with the knurled nut and locked using the M5 nut.

➔ chapter 7.1 on page 31

Mounting the reflector

The reflector is mounted on a vertical wall using 4 screws (M5). The reflector is angled using the included shims. For specific information please refer to chapter 5 (Reflectors). AMS 200… and reflector oppose each other such that the laser light spot is positioned in the centre of the reflector.

➔ chapter 5 on page 19

Attention!

For position calculation purposes the laser beam must reach the reflector without interruption. Ensure that the laser beam is always incident on the reflector when the system is moving.

② Connecting PWR, PROFIBUS, Interbus, SSI or RS 232

The laser measurement system is connected using M12 connectors.

The voltage supply is connected via the **PWR** M12 connection.

The PROFIBUS/Interbus is connected via **BUS IN** or, in the case of a continuing network, via **BUS OUT**.

PROFIBUS: If **BUS OUT** is not used, the PROFIBUS must be terminated at this point with a M12 terminator plug (see chapter 10.5 "Accessory PROFIBUS terminating resistor"PROFIBUS).

INTERBUS: The Interbus does not require a terminator plug at the **BUS OUT** connection.

SSI: The SSI interface is connected via the **SSI** M12 connection.

RS 232: The RS 232 interface is connected via the **SERVICE** M12 connection.

➔ chapter 4.3 on page 15

③ Display

When the laser measurement system is supplied with voltage, the device status as well as the measured position value can be read. The display automatically switches to the display of the measurement values.

Use the **Up** ▲ and **Down** ▼ buttons at the left of the display to read and change a variety of data and parameters. For the PROFIBUS the network address of the AMS 200… must be configured on the display.

PROFIBUS: The green **PWR** LED indicates that the device is ready for operation. The green **BUS** LED indicates correct configuration and correct bus connection. The configured PROFIBUS address appears on the display.

SSI: The default settings can be used when using the device as an SSI device. The PROFIBUS is deactivated via the display to prevent the BUS LED from signalling a missing PROFIBUS. If other SSI adjustments are desired, they can also be changed via the display.

INTERBUS: The green **PWR** LED indicates that the device is ready for operation. The **BUS** LED is not active and is permanently off. While the Interbus is in an activated state, `IBS` appears on the display.

➔ chapter 6 on page 23

④ The AMS 200… on the PROFIBUS

Install the GSD file associated with the AMS 200… in the PROFIBUS manager of your control. Activate the desired modules (at least module 1 - position value).

Store the slave address for the AMS 200… in the PROFIBUS manager. Ensure that the address is the same as the address configured in the device. The SSI and RS 232 interfaces available on the AMS 200 can be used simultaneously with the PROFIBUS interface.

➔ chapter 8.1 on page 38

⑤ The AMS 200… on the Interbus

The laser measurement system is delivered with preset Interbus parameters (see chapter 8.3.7 "Default settings of the AMS 200/…-20…" on page 90). The AMS 200 is classified with Ident-Code 32_H, which is stored in the control. The AMS 200 is connected via the **BUS IN** M12 connection or, in the case of a continuing network, via **BUS OUT**. The RS 232 interface available on the AMS 200 can be used simultaneously with the Interbus interface.

➔ chapter 8.3 on page 85

⑥ The SSI interface of the AMS 200…

The laser measurement system is delivered with preset SSI parameters (see chapter 8.2.4 "Default settings of the SSI interface"). Should it be necessary to adapt the parameters to the control/regulator, these settings are made directly via the display, or, during operation, on the PROFIBUS using the GSD file (see chapter 6 "Control panel display AMS 200…" and see chapter 8.1.6.17 "Module 17: SSI interface").

➔ chapter 8.2 on page 80

Notice!

You can find additional information on maintaining the laser measurement system in chapter 9 "Diagnostics and troubleshooting".

4 Specifications

4.1 General specifications

Measurement data	**AMS 200/40-…-(H)**	**AMS 200/120-…-(H)**	**AMS 200/200-…-(H)**
Measurement range	0.2 … 40m	0.2 … 120m	0.2 … 200m
Accuracy	± 2mm	± 2mm	± 3mm
Consistency [1]	0.3mm	0.5mm	0.7mm
Measurement value output	1.6ms		
Measurement value calculation time / integration time	approx. 8ms		
Resolution	adjustable, PROFIBUS/Interbus default: 1mm, SSI/RS 232 default : 0.1mm		
Temperature drift	≤ 0.1mm/K		
Ambient temperature sensitivity	1ppm/K		
Air pressure sensitivity	0.3ppm/hPa		
Traverse rate	≤ 10m/s		
Electrical data			
Supply voltage VIN [2]	18 … 30VDC		
Current consumption	without optics heating: ≤ 250mA / 24VDC with optics heating: ≤ 500mA / 24VDC		
Optical data			
Transmitter	laser diode, red light, wavelength 650 … 690nm		
Laser class	2 acc. to EN 60825-1, CDRH		
Laser life expectancy [3]	average temperature / year: 50°C: 23.000h; 25°C: 60.000h; 20°C: 75.000h; 10°C: 120.000h		
Light spot diameter	≤ 40mm (at 40m)	≤ 100mm (at 120m)	≤ 150mm (at 200m)
Interfaces			
PROFIBUS DP acc. to V_0, V_1	≤ 12Mbit/s		
SSI	50kHz … max. 800kHz		
Interbus	500kBit/s		
RS 232	19.2kBit/s … 115.2kBit/s		
Operating and display elements			
Keyboard	4 buttons		
Display	monochromatic graphical display, 128 x 64 pixels		
LED	2 LEDs, two-colour		
Inputs/outputs			
Quantity	2, programmable		
Input	low: 0 … 2VDC, high: 18 … 30VDC protected against polarity reversal		
Output	low: 0 … 2VDC, high: VIN - 2VDC max. 100mA, short-circuit proof, protection against overvoltage, transients, excess temperature		

Mechanical data	
Housing	diecast zinc
Optics	glass
Weight	approx. 2.8kg
Protection class	IP 65 acc. to EN 60529[4)]
Environmental conditions	
Operating temperature	without optics heating: -5°C … +50°C with optics heating: -30°C … +50°C
Storage temperature	-30°C … +70°C
Air humidity	max. 90% rel. humidity, non-condensing
Vibrations	acc. to EN 60068-2-6
Noise	acc. to EN 60068-2-64
Shock	acc. to EN 60068-2-27, EN 60068-2-29
EMC	acc. to EN 61000-6-2:2005 and EN 61000-6-4:2007[5)]

1) **statistical error 1 sigma**, minimum switch-on time 2min.
2) For UL applications: only for use in Class 2 circuits according to NEC.
3) Switching off the laser diode during system downtime can considerably extend the life expectancy of the device. The laser life expectancy is calculated using a failure rate of 1%.
4) with screwed-on M12 connectors or mounted caps
5) see "EU Declaration of Conformity" on page 107.

Table 4.1: Specifications

4.2 Dimensioned drawing of AMS 200

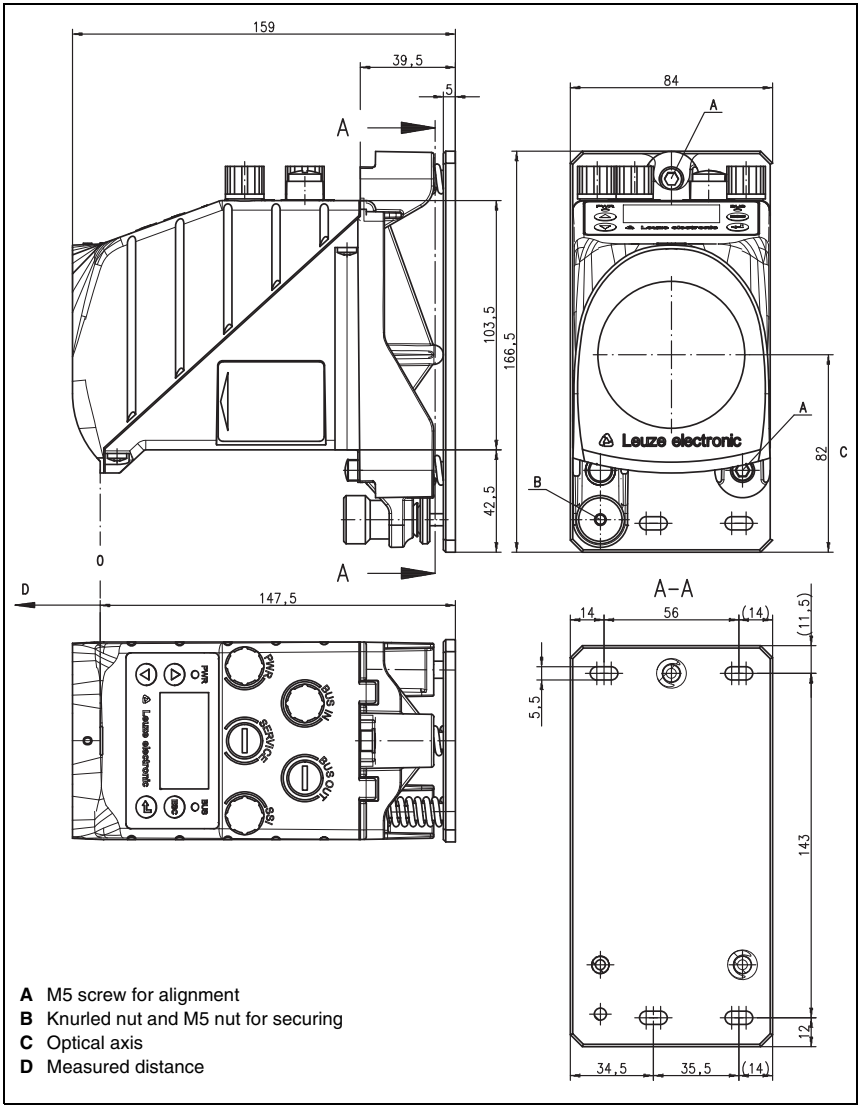


Figure 4.2: Dimensioned drawing of AMS 200…

4.3 Electrical connection

The AMS 200… is connected using M12 connectors.

For the locations of the individual device connections please refer to the device detail shown below.

The corresponding mating connectors and ready-made cables are available as accessories for all connections (see chapter 10 "Type overview and accessories").

Attention!

Connection of the device and maintenance work while under voltage must only be carried out by a qualified electrician.

If faults cannot be cleared, the device should be switched off from operation and protected against accidental use.

Before connecting the device please ensure that the supply voltage matches the value printed on the nameplate.

The AMS 200… is designed in accordance with safety class III for supply with PELV (protective extra-low voltage with reliable disconnection). For UL applications use is permitted solely in Class 2 circuits according to NEC (National Electrical Code).

Please ensure that the protective conductor is connected correctly. Trouble-free operation is only guaranteed if the device is properly earthed.

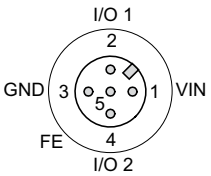
Figure 4.3: Location and designation of the electrical plug connections

Attention!

Protection class IP 65 is achieved only if the connectors and caps are screwed into place!

4.3.1 PWR - Voltage supply and input/output

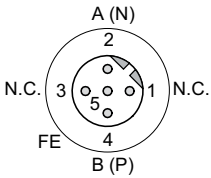
PWR - I/O

PWR (5-pin plug, A-coded)			
PWR  **M12-plug (A-coded)**	**Pin**	**Name**	**Remarks**
	1	**VIN**	Positive supply voltage +18 … +30VDC
	2	**I/O 1**	Input/output 1 (see also modules 4/5)
	3	**GND**	Negative supply voltage 0VDC
	4	**I/O 2**	Input/output 2 (see also modules 4/5)
	5	**FE**	Functional earth
	Thread	**FE**	Functional earth (housing)

For configuring the input/output, see Display, PROFIBUS or Interbus chapters.

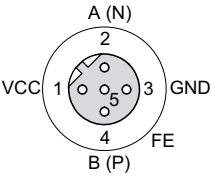
4.3.2 BUS IN - (PROFIBUS DP IN)

PROFIBUS:

BUS IN (5-pin plug, B-coded)			
BUS IN  **M12 plug (B-coded)**	**Pin**	**Name**	**Remarks**
	1	**N.C.**	Not used
	2	**A (N)**	Receive/transmit data A-line (N)
	3	**N.C.**	Not used
	4	**B (P)**	Receive/transmit data B-line (P)
	5	**SHIELD**	Shield or functional earth
	Thread	**FE**	Functional earth (housing)

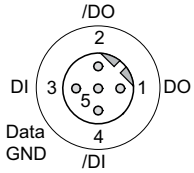
4.3.3 BUS OUT - (PROFIBUS DP OUT)

PROFIBUS:

BUS OUT (5-pin socket, B-coded)			
BUS OUT  **M12 socket (B-coded)**	**Pin**	**Name**	**Remarks**
	1	**VCC**	Supply voltage +5V (termination)
	2	**A (N)**	Receive/transmit data A-line (N)
	3	**GND**	Data reference potential
	4	**B (P)**	Receive/transmit data B-line (P)
	5	**SHIELD**	Shield or functional earth
	Thread	**FE**	Functional earth (housing)

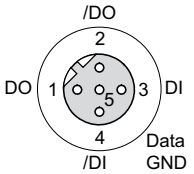
4.3.4 BUS IN - (Interbus)

INTERBUS:

BUS IN (5-pin plug, B-coded)			
BUS IN  M12 plug (B-coded)	**Pin**	**Name**	**Remarks**
	1	**DO**	From the Interbus master
	2	**/DO**	From the Interbus master - inverted
	3	**DI**	To the Interbus master
	4	**/DI**	To the Interbus master - inverted
	5	**Data GND**	Data Ground
	Thread	**SHIELD**	Shield via RC element on the housing

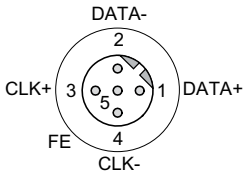
4.3.5 BUS OUT - (Interbus)

INTERBUS:

BUS OUT (5-pin socket, B-coded)			
BUS OUT  M12 socket (B-coded)	**Pin**	**Name**	**Remarks**
	1	**DO**	From the Interbus master
	2	**/DO**	From the Interbus master - inverted
	3	**DI**	To the Interbus master
	4	**/DI**	To the Interbus master - inverted
	5	**Data GND**	Data Ground
	Thread	**SHIELD**	Shield directly on the housing

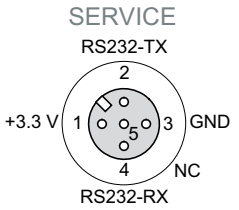
4.3.6 SSI interface

SSI

SSI (5-pin plug, B-coded)			
SSI  M12 plug (B-coded)	**Pin**	**Name**	**Remarks**
	1	**DATA+**	**+** Data line SSI (output)
	2	**DATA-**	**-** Data line SSI (output)
	3	**CLK+**	**+** Clock line SSI (input electrically insulated)
	4	**CLK-**	**-** Clock line SSI (input electrically insulated)
	5	**FE**	Functional earth
	Thread	**FE**	Functional earth (housing)

4.3.7 SERVICE - (RS 232)

RS 232

SERVICE (5-pin socket, A-coded)			
 **M12 socket (A-coded)**	**Pin**	**Name**	**Remarks**
	1	**+3.3V**	Voltage supply 3.3VDC
	2	**RS232-TX**	Transmission line for RS232/service data
	3	**GND**	Voltage supply 0VDC
	4	**RS232-RX**	Receiving line for RS232/service data
	5	**NC**	Not used
	Thread	**FE**	Functional earth (housing)

Notice!

The shown connections, specifically the assignment of connectors or sockets, describe the M12 connections of the AMS 200.

5 Reflectors

5.1 General information

The laser measurement system measures distances against a reflective tape (reflector). The reflective tape is available pre-mounted on an aluminium plate or as self-adhesive tape. Different sizes of reflective tape are available for various measurement distances and installation sites.

Notice!

On the front side of the reflector is a stick-on label with the designation "TOP". Particularly for measurement distances greater than 120m, it is important to always mount the reflector with the ***reflector side labelled with "TOP"*** *so that it* ***has the same alignment as the M12 connections*** *of the AMS 200:*

- *M12 connections of the AMS 200* ***on top****–> TOP on reflector* ***on top*** *!*
- *M12 connections of the AMS 200* ***on side****–> TOP on reflector* ***on side*** *!*
- *M12 connections of the AMS 200* ***on bottom****–> TOP on reflector* ***on bottom*** *!*

Attention!

The range, accuracy and consistency specified in the technical data for the laser measurement system are achieved only when using the reflective tape specified by Leuze electronic.

5.2 Specifications of reflectors

The reflective tape consists of a white, microprism-based reflective material. The beam reflection system is located under a hard, highly transparent, protective coating. The adhesive tape is covered with a protective foil.

Specifications

Recommended application temperature for adhesive tape	+5°C … +25°C
Temperature resistance (affixed)	-40°C … +80°C
Mounting surface	the mounting surface must be clean, dry and free of grease
Cutting the tape	with sharp tools always on the side of the tape with the prism structure.
Cleaning	do not use any abrasive agents
Cleaning agents	warm water with commercially available household detergent
Cleaning method	rinse with clear water and wipe
Storage	store in a cool, dry place

Attention!

For applications in low-temperature areas less than -10 °C, the max. distance may be affected when measuring distances greater than 120m. For distances greater than 120m we recommend "floating" mounting of the reflective tape, i.e. the edge of the foil may only be fastened or secured with an additional adhesive tape. For measurement distances greater than 120m avoid full-surface adhesive mounting.

5.3 Selecting reflector sizes

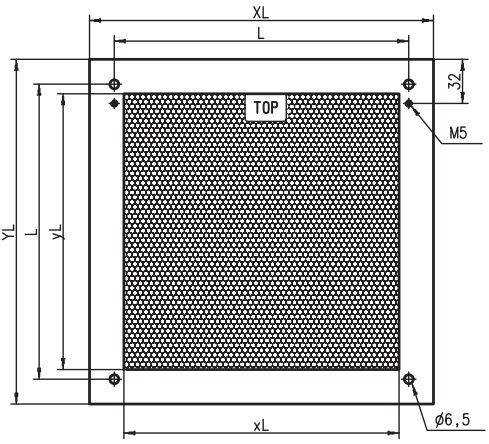
Depending on the system design, the reflector may either be mounted on the moving vehicle or in a stationary location.

Attention!

The reflector sizes shown below are recommended by Leuze electronic for mounting the AMS 200 on a vehicle. The system supplier must always perform a check to determine whether a larger reflector than the one recommended has to be used by reason of mechanical travel tolerances. This applies, in particular, when the laser measurement system is mounted on a vehicle. The laser beam must not leave the reflector during travel. For stationary mounting of the AMS 200, a small 200 x 200 mm reflector will be adequate for all measurement distances.

Recommended reflector sizes			
Laser measurement system (range in m)	**Recommended reflector size (H x W)**	**Type designation …-S = Self-adhesive …-M = Mounted**	**Part No.**
AMS 200/40… (**max. 40 m**)	200 x 200 mm	Reflective tape 200x200-S Reflective tape 200x200-M	50104361 50104364
AMS 200/120… (**max. 120 m**)	500 x 500 mm	Reflective tape 500x500-S Reflective tape 500x500-M	50104362 50104365
AMS 200/200… (**max. 200 m**)	749 x 914 mm 914 x 914 mm	Reflective tape 749x914-S Reflective tape 914x914-M Reflective tape 914x914-S	50104363 50104366 50108988

5.4 Dimensioned drawing of reflectors



Always align the **TOP** marking with the AMS connections! (chapter 5.1)

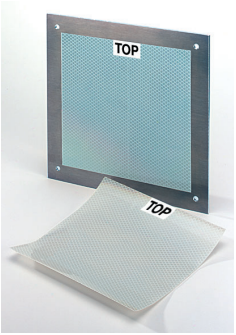


Figure 5.1: Dimensioned drawing of reflectors

Part	Reflective tape		Reflector plate	
	xL(mm)	yL(mm)	XL(mm)	YL(mm)
Reflective tape 200x200-S	200	200	N/A	N/A
Reflective tape 500x500-S	500	500	N/A	N/A
Reflective tape 749x914-S	914	749	N/A	N/A
Reflective tape 914x914-S	914	914	N/A	N/A
Reflective tape 200x200-M	200	200	250	250
Reflective tape 500x500-M	500	500	550	550
Reflective tape 914x914-M	914	914	946	946

5.5 Mounting the reflector

5.5.1 General information

The reflective tape of the "Reflective tape …x…-**S**" – **self-adhesive** – series must be affixed to a flat, clean and grease-free mounting surface. We recommend using a separate metal plate, which is to be provided on-site.

The reflective tape must be angled as described in Table 5.4.

The reflective tape of the "Reflective tape …x…-**M**" – **mounted on aluminium plate** – series is provided with appropriate mounting holes. Spacer rings are provided in the packet for achieving the necessary pitch angle. For further information see Table 5.4.

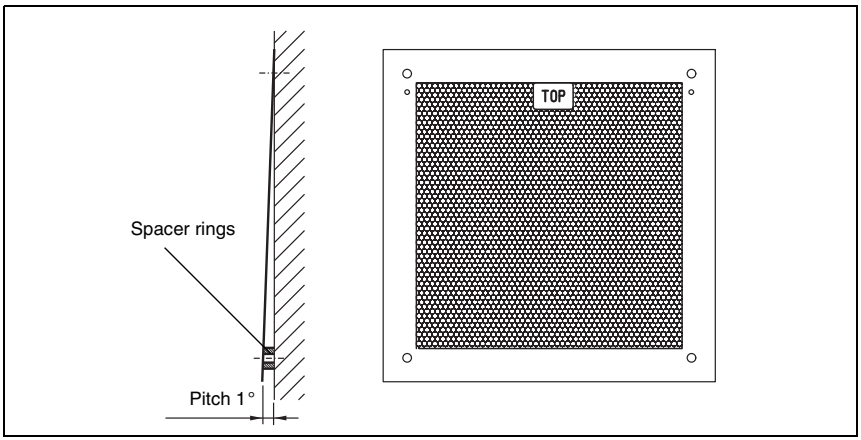


Figure 5.2: Pitch of the reflector

5.5.2 Mounting the reflector

The combination of laser measurement system and reflective tape is mounted in such a way that the laser light spot hits the reflective tape as centred as possible and without interruption.

For this purpose use the provided adjustment elements on the AMS 200… (see chapter 7 "Mounting"). If necessary, remove the protective foil from the reflector.

Notice!

The reflector must be angled. To do this, use the spacer rings. Angle the reflectors so that the ***surface reflections of the foil seal are deflected to the left, right or upwards****.* ***Avoid a downward pitch,*** *as additional reflections may occur on the running rails. The chapter 5.5.3 gives the correct pitch with respect to the reflector size and thus the length of the spacer rings.*

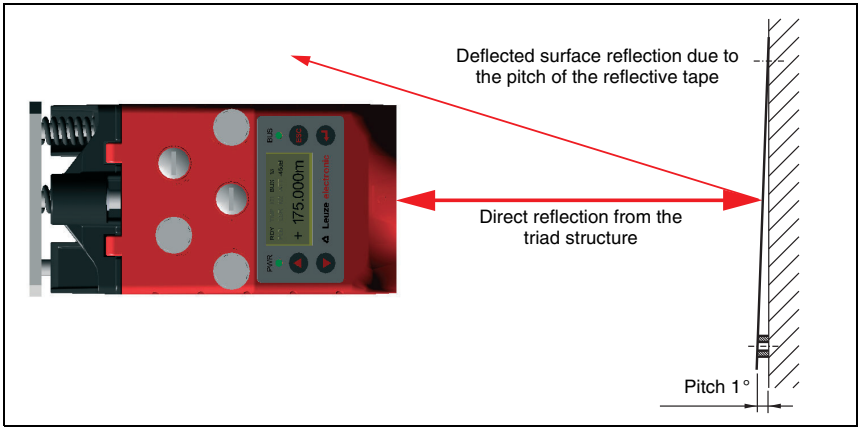


Figure 5.3: Reflector mounting

5.5.3 Table ofreflector pitches

Reflector type	Pitch by spacer rings[1)]
Reflective tape 200x200-S Reflective tape 200x200-M [1)]	**4mm**
Reflective tape 500x500-S Reflective tape 500x500-M [1)]	**10mm**
Reflective tape 749x914-S	**20mm**
Reflective tape 914x914-S Reflective tape 914x914-M [1)]	**20mm**

1) Spacer rings are included in the delivery contents of the reflective tape…**-M**

Table 5.4: Reflector pitch by spacer rings

6 Control panel display AMS 200…

6.1 Structure of the control panel

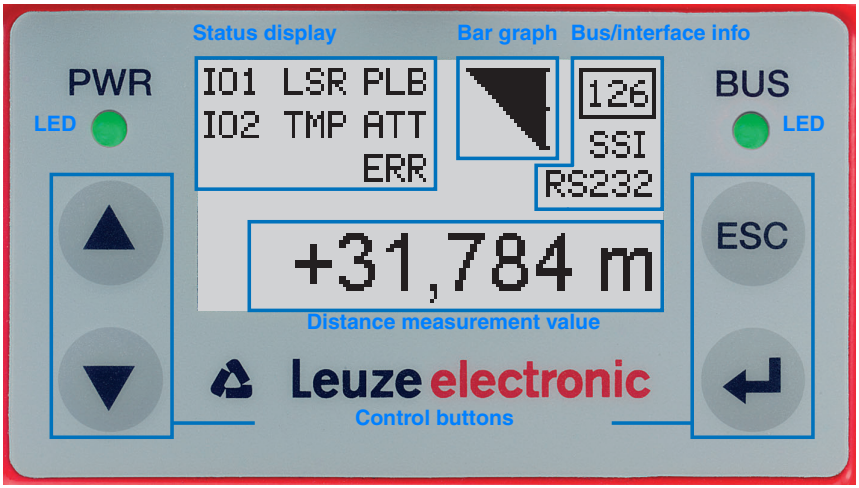


Figure 6.1: Structure of the control panel using the PROFIBUS device model as an example

6.2 Status display and operation

6.2.1 Control buttons

▲	**Up**	Navigate upward/laterally.
▼	**Down**	Navigate downward/laterally.
ESC	**ESC**	Exit menu item.
↵	**ENTER**	Confirm/enter value, change menu levels.

6.2.2 Status displays

6.2.2.1 LED PWR

PWR	**off**	**device OFF** - no supply voltage
PWR 	**flashes green**	**device ok, initialisation phase** - no measurement value output - voltage connected - self test running - initialisation running - parameter download running - booting
PWR	**green continuous light**	**device ok** - measurement value output - self test successfully finished - device monitoring active
PWR 	**flashes red**	**device ok, warning set** - measurement value output - light beam interruption detected - plausibility error detected
PWR	**red continuous light**	**device error** - no measurement value output - for details see status displays on the display

6.2.2.2 BUS LED (for PROFIBUS only; no function for Interbus)

BUS	**off**	**no supply voltage** - PROFIBUS deactivated (SSI interface only)
BUS	**green continuous light**	**bus ok** - device active on PROFIBUS ("data exchange")
BUS 	**flashes red**	**bus error** - configuration failed ("parameter failure") - DP error - no data exchange
BUS	**red continuous light**	**bus error** - no DP protocol established to the master ("no data exchange")

6.2.2.3 Status displays on the display

IO1 **Input 1 or output 1 active**:
Function dependent on configuration (see also modules 4/5).

IO2 **Input 2 or output 2 active**:
Function dependent on configuration (see also modules 4/5).

LSR **Warning laser prefailure message**:
Laser diode aged, device still functional; have replaced or repaired.

TMP **Temperature monitoring warning:**:
Above/below permissible internal device temperature.

PLB **Plausibility error**:
Implausible measurement value. Possible causes: light beam interruption, outside of measurement range, permissible internal device temperature considerably exceeded or traverse rate >10m/s.

Depending on the configuration, either zero or the last valid measurement value is output at the interfaces.

ATT **Received signal warning** :
Laser emission window or reflector dirty. Clean surfaces.

ERR **Internal hardware error**:
The device must be sent in for inspection.

6.2.2.4 Bar graph

Indicates the **strength of the received laser light**.

The middle line represents the **ATT** warning threshold. The distance value remains valid and is output at the interfaces.

If no bar graph is available, the **PLB** status information appears at the same time. The measurement value has thus been assessed as being implausible. Depending on the configuration, either zero or the last valid measurement value is output at the interfaces.

6.2.2.5 Bus/interface info

126 Displays the set PROFIBUS address (default 126).
If the PROFIBUS is deactivated, this field is suppressed.

SSI Displays the activated SSI interface. If the SSI interface is deactivated, this field is suppressed.

IBS Displays the activated Interbus interface. If the Interbus interface is deactivated, this field is suppressed.

RS232 Displays the activated RS 232 interface. If the RS 232 interface is deactivated, this field is suppressed.

6.2.2.6 Measured position value

The measured position value is displayed in the configured unit of measurement.

+200,000 m In the **metric** setting, the measurement value is always displayed in **m** with **3 decimal places**.

+2000,0 in In the **inch** setting, the measurement value is always displayed in **in** with **1 decimal place**.

6.3 Operation

6.3.1 The 5 main menus

After voltage has been applied to the laser, device information will be displayed for several seconds. The display then shows the measurement window with all status information.

The main menus are selected with the up/down buttons ▲ ▼.

The selected main menu is activated with the enter button ↵.

Use the ESC button ESC to exit an activated main menu or submenu.

When one of the buttons is actuated, the display illumination is activated for 10 min.

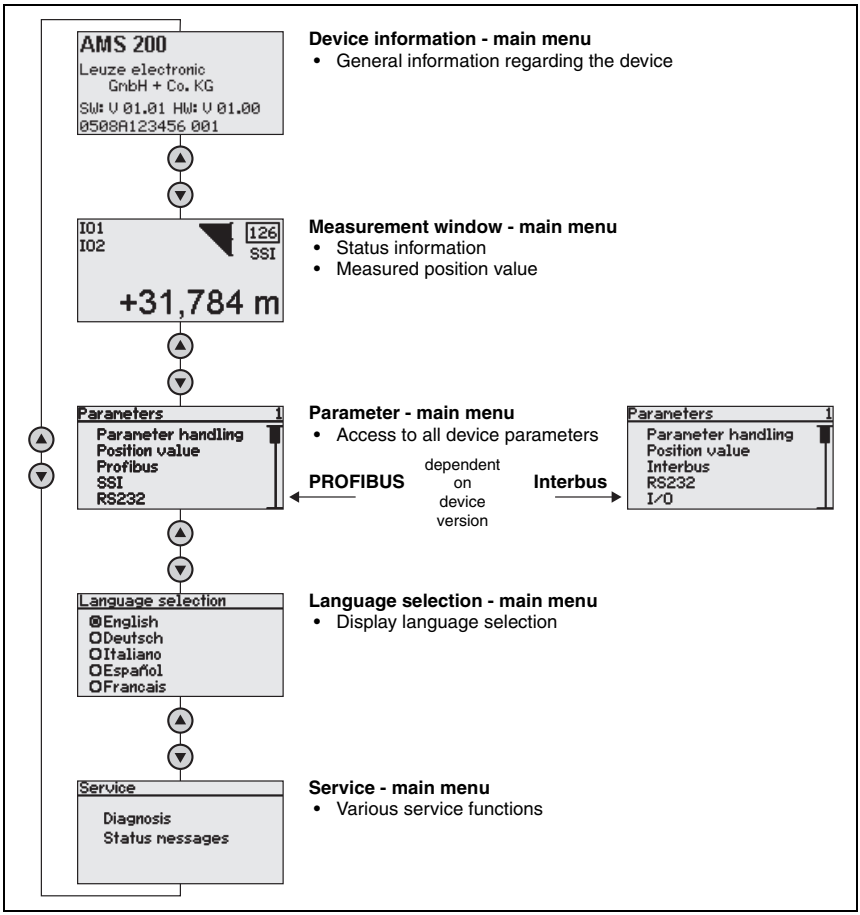


Figure 6.2: The 5 main menus

6.3.2 Parameter - Main menu

Notice!

Included in the front cover *of this handbook is a* ***fold-out page*** *with the complete* ***parameter menu structure****. The parameters are briefly described and the respective default values are listed.*

PROFIBUS: *A detailed description of the individual PROFIBUS parameters can be found in the description of the PROFIBUS GSD modules (chapter 8.1.6 on page 45).*
Parameter handling is described in the following chapter.

INTERBUS: *An extensive description of the default settings for Interbus can be found in chapter 8.3 on page 85.*

Parameter handling is described in the following chapter.

6.3.2.1 Parameter handling menu item

Viewing and editing parameters

During normal operation parameters can only be viewed. If parameters need to be changed, the **ON** menu item in the **Parameter enabling** display mask must be activated (see figure 6.3).

Notice!

If a password was set, parameter enabling cannot be accessed until this password has been entered, see "Password for parameter enabling" on page 29.

The entire display of the AMS 200… is inverted as long as parameter enabling is activated.

Attention!

Depending on the device version the bus system or interface is deactivated upon activation of parameter enabling:

PROFIBUS: *The laser measurement system is deactivated on the PROFIBUS when parameter enabling is activated via the display. The device is reactivated on the PROFIBUS after parameter enabling is exited.*

SSI: *The SSI interface remains active even during parameter enabling. Changes to parameters have an immediate effect.*

INTERBUS: *The Interbus interface remains active even during parameter enabling. Changes to parameters have an immediate effect.*

RS 232: *The RS 232 interface remains active even during parameter enabling. Changes to parameters have an immediate effect.*

Parameter enabling

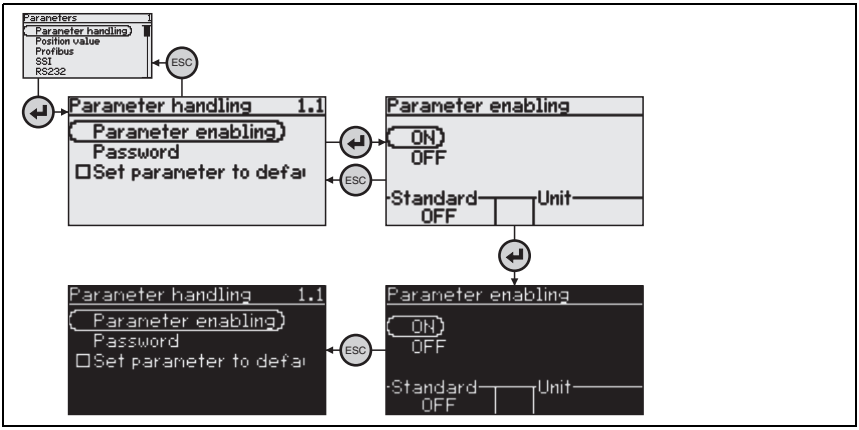


Figure 6.3: Parameter enabling

Notice!

If the AMS 200… is operated on a PROFIBUS network, configuration is performed exclusively via the PROFIBUS.

PROFIBUS: Parameters set via the display are overwritten by the parameters set in the GSD modules when operating the laser measurement system on the Profibus. For GSD modules which are not actively used on the PROFIBUS, the default settings of the laser measurement system apply, see "Detail description of the modules" on page 45. Thus the PROFIBUS presets values to all parameters.

Attention!

If parameters are changed via the display during bus operation, the laser measurement system is separated from the PROFIBUS when parameter enabling is activated via the display. Parameters set via the PROFIBUS are moved to the background, and changes to parameters can then be made via the display. When parameter enabling is exited, the laser measurement system is automatically reconnected to the PROFIBUS. Upon connection to the PROFIBUS, the laser measurement system receives all parameters from the PROFIBUS master.

PROFIBUS: *Changes made via the display are overwritten!*
Device settings for operating the laser measurement system on the PROFIBUS are managed and configured exclusively by the PROFIBUS master.

SSI: *If the PROFIBUS is deactivated and the laser measurement system transmits its data via the SSI interface, it may be necessary to adjust the laser parameters via the integrated display. In this operating mode the PROFIBUS default parameters have no effect; the SSI default parameter set applies (see chapter 8.2.4).*
Settings made on the display apply permanently. As the parameters are only stored in the device in this operating mode, the parameters must be reset on the replacement device if device replacement is required.

6.3.2.2 Password for parameter enabling

The password query is deactivated by default. To protect against unwanted changes the password query can be activated. The preset password is **0000** and can be changed as necessary (see figure 6.4).

Notice!

In order to enter the password parameter enabling must be activated.

A selected password is saved with save.

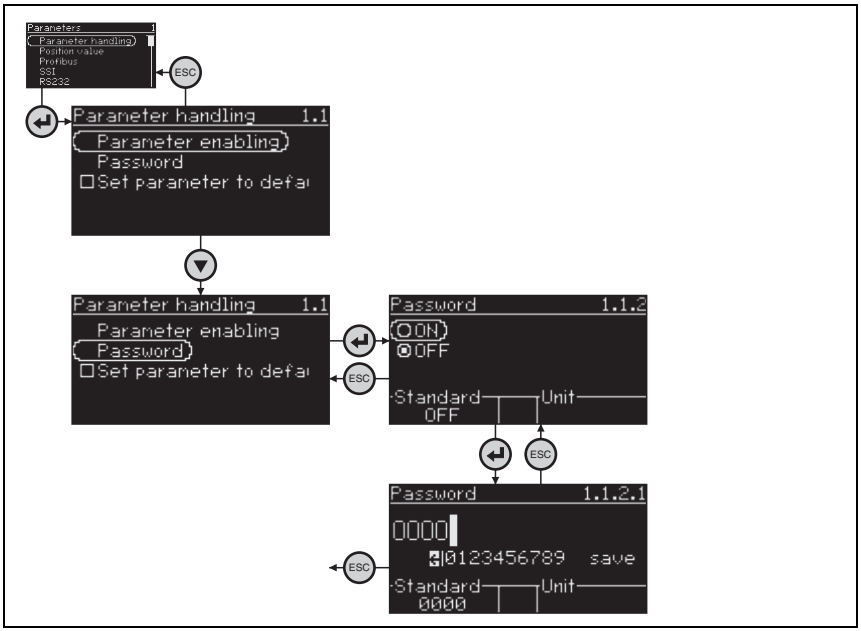


Figure 6.4: Changing the password

If the password is not known, the **master password 2301** can always be used to enable the device.

Attention!

When operating the laser measurement system on the PROFIBUS, the password entered on the display has no effect. The PROFIBUS overwrites the password with the default settings.

PROFIBUS: *If a password is desired for PROFIBUS operation, it must be configured via module 18 d, e (see page 78).*

6.3.3 Language selection - Main menu

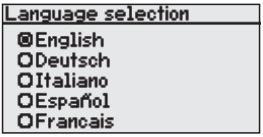


Figure 6.5: Language selection - Main menu

PROFIBUS:

Notice!

When operating the laser measurement system on the PROFIBUS, the language configured in the GSD file is displayed.

6.3.4 Service - Main menu

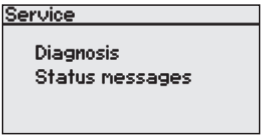


Figure 6.6: Service - Main menu

Diagnosis

Selecting the **Diagnosis** menu item displays the following values:

- current measurement value.
- minimum value measured after diagnosis activation.
- maximum value measured after diagnosis activation.

Actuate the **Up** (▲) or **Down** (▼) button to reset the min./max. memory to the current measurement value.

In the **Min/Max diagnosis** window, displayed and stored device messages, such as **ATT**, **PLB**, **TMP** etc., are reset by pressing any button or with Power ON/Power OFF.

Status messages

This menu item is used exclusively for service purposes by Leuze electronic.

7 Mounting

7.1 Mounting the AMS 200…

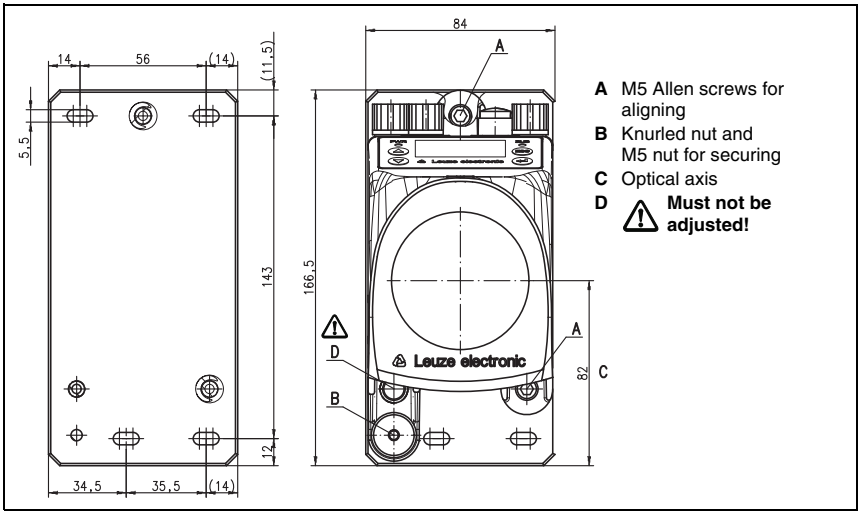


Figure 7.1: Mounting the device

The AMS 200… and the corresponding reflector should be mounted on two opposing, **plane-parallel, flat** walls or plant components. For error-free position measurement there must be **unobstructed line of sight between the AMS 200… and the reflector**.

Use the M5 screws to mount the laser measurement system. **Secure the screws with a toothed lock washer** to protect against loosening caused by vibrations.

The laser light spot has to be aligned so that it always hits the centre of the opposing reflector, both at close range as well as at the maximum measurement distance. Use **the two M5 hexagon socket screws to align the device** ("**A**" in figure 7.1). When aligning please ensure that the knurled nut and the M5 lock nut ("**B**" in figure 7.1) are opened wide.

Attention!

*To prevent the laser measurement system from becoming misaligned during continuous operation, then **hand-tighten the knurled nut** and **securely lock into place with the M5 nut** ("**B**" in figure 7.1). Knurled nut and M5 nut must not be tightened until **after aligning**.*

Attention!

The device must not be opened. Failure to comply will render the guarantee void. Warranted features cannot be guaranteed after the device has been opened.

7.1.1 Optional mounting bracket

An optional mounting bracket is available as an accessory for mounting the AMS 200 on a flat, horizontal surface.

Type designation: MW OMS/AMS 01

Part No.: 50107255

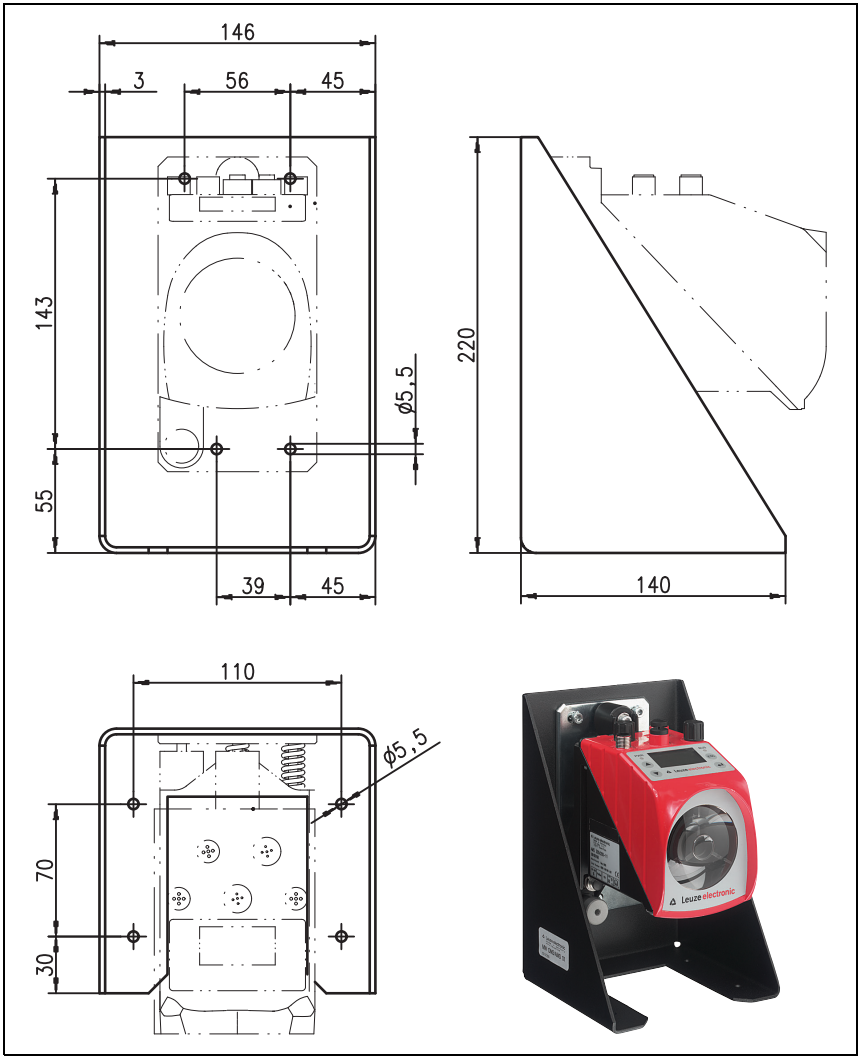


Figure 7.2: Optional mounting bracket

7.1.2 Mounting distances

Minimum parallel distance to adjacent AMS 200

The smallest possible parallel distance to an adjacent AMS 200 is determined by the maximum measured distance as well as the characteristics of the reflector. To prevent adjacent devices from interfering with each other the parallel distance of the laser light spots on the reflector is crucial.

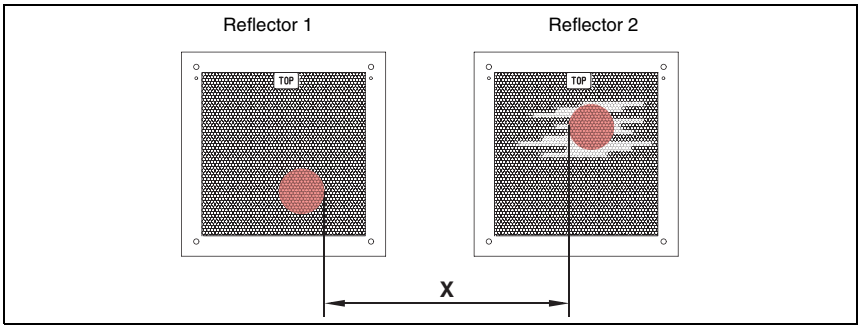


Figure 7.3: Minimum parallel distance X to adjacent AMS 200

Min. parallel distance of the laser light spot X = 100 mm + (max. measurement distance in mm • 0.01)

Notice!

Please note that travel tolerances could cause the two laser light spots to move towards each other.

If both AMS 200 devices are optically separated from each other, e.g. if mounted in different shelf alleys, the parallel distance can be chosen somewhat smaller, as there is no interference in this case.

Minimum distance to an adjacent DDLS 200 optical data transmission device

The DDLS 200 series optical data transceivers and the AMS 200 do not interfere with each other. Depending on the size of the used reflector, the optical data transceiver can be mounted with a minimum mounting spacing of 100 mm to the AMS 200. The mounting spacing is independent of the distance.

7.2 Mounting the reflector

The combination of laser measurement system and reflective tape or reflector is mounted in such a way that the laser light spot hits the reflective tape as centred as possible and without interruption.

Notice!

For further information on mounting the reflector please refer to chapter 5 "Reflectors".

7.3 Mounting with deflector unit

7.3.1 General information

The two available deflector units are used for the 90° deflection of the laser beam, see "Accessory deflector unit" on page 101.

Attention!

The deflector units are designed for a maximum range of 40m.
Longer distances on request.

7.3.2 Mounting the US AMS 01 deflector unit with integrated mounting bracket

For this purpose the laser measurement system is screwed onto the body of the US AMS 01 deflector unit. For stand mounting the mirror can be mounted for 3 different directions of deflection:

1. Upward beam deflection
2. Beam deflection to the left
3. Beam deflection to the right

The deflector unit is mounted on plane-parallel, flat and vertical walls or plant components. For error-free position measurement there must be unobstructed line of sight between the AMS 200… and the deflection mirror as well as between the mirror and the reflector.

Use the M5 screws to mount the deflector unit. Secure the screws with a toothed lock washer to protect against loosening caused by vibrations.

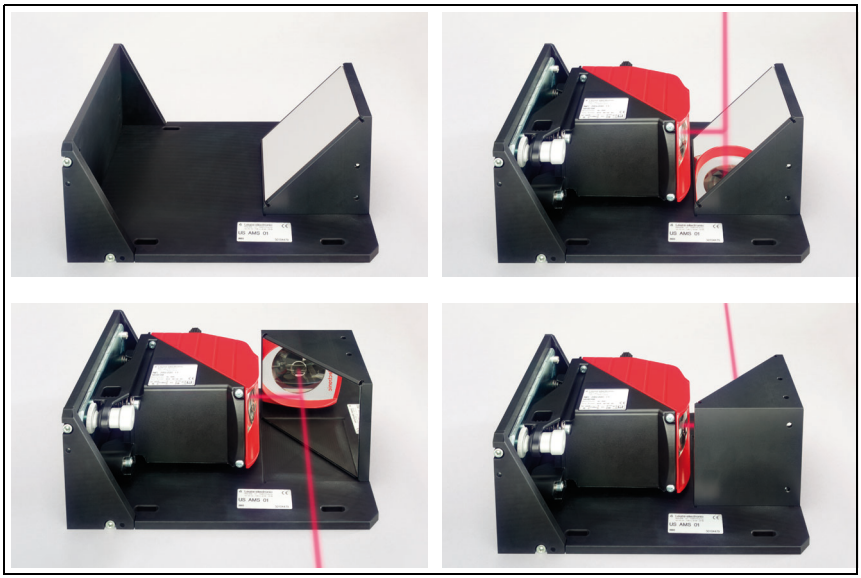


Figure 7.4: Mounting variants of the US AMS 01 deflector unit

7.3.3 Dimensioned drawing of US AMS 01 deflector unit

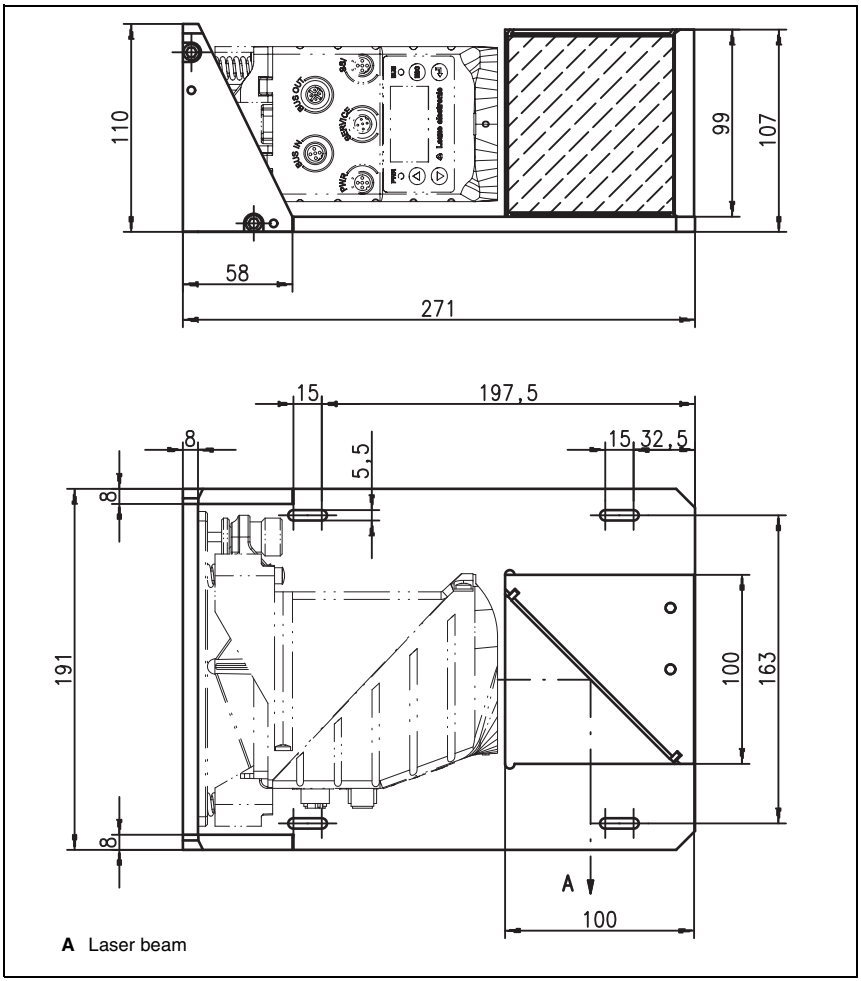


Figure 7.5: Dimensioned drawing of US AMS 01 deflector unit

7.3.4 Mounting the US 1 OMS deflector unit without mounting bracket

The US 1 OMS deflector unit and the AMS 200 are mounted separately from one another.

Notice!

When mounting please ensure that the laser light spot of the AMS 200 is positioned in the centre of the deflection mirror.

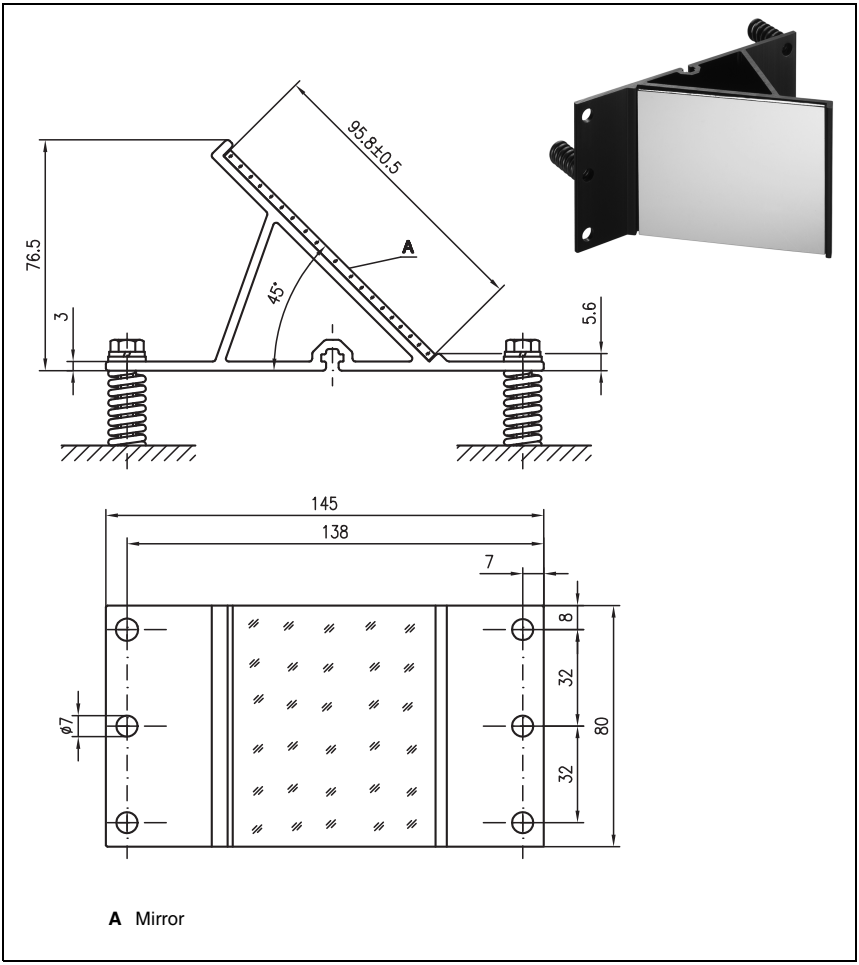


Figure 7.6: Photo and dimensioned drawing of the US 1 OMS deflector unit

Alignment of the laser light spot on the reflector is performed as described in chapter 7.3.5.

7.3.5 Aligning the laser light spot in the centre of the reflector

Using the alignment screws of the laser measurement system the laser light spot is aligned in the centre of the reflector via the deflector mirror. When adjusting please ensure that the knurled nut and the M5 lock nut are opened wide.

When the laser is aligned, hand-tighten the knurled nut and lock it securely into place using the M5 nut (see chapter 7.1 "Mounting the AMS 200…").

8 Device parameters and interfaces

8.1 PROFIBUS

8.1.1 General information

The AMS 200… is designed as a PROFIBUS-DP device. For this purpose the functionality of the laser is defined via GSD parameter sets. The max. baud rate of the data to be transferred is 12Mbit/s.

PROFIBUS, SSI and RS 232 interfaces can be used simultaneously as fully-fledged interfaces. PROFIBUS and SSI interfaces are activated by default.

Notice!

The PROFIBUS interface can be activated/deactivated via the display.
When the PROFIBUS is activated, the address set is visible on the display.

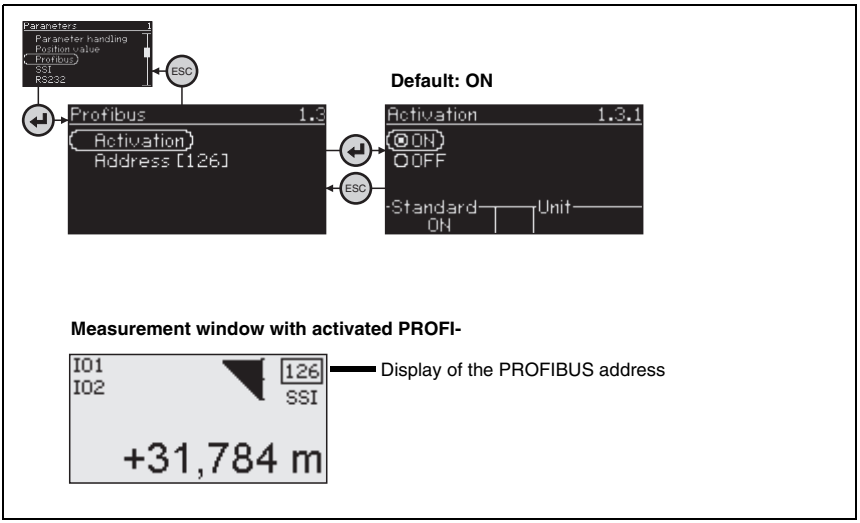


Figure 8.1: PROFIBUS activation

8.1.2 PROFIBUS - Electrical connection

BUS IN (5-pin plug, B-coded)		
Pin	**Name**	**Remarks**
1	**N.C.**	Not used
2	**A (N)**	Receive/transmit data A-line (N)
3	**N.C.**	Not used
4	**B (P)**	Receive/transmit data B-line (P)
5	**SHIELD**	Shield or functional earth
Thread	**FE**	Functional earth (housing)

BUS OUT (5-pin socket, B-coded)		
Pin	**Name**	**Remarks**
1	**VCC**	Supply voltage +5V (termination)
2	**A (N)**	Receive/transmit data A-line (N)
3	**GND**	Data reference potential
4	**B (P)**	Receive/transmit data B-line (P)
5	**SHIELD**	Shield or functional earth
Thread	**FE**	Functional earth (housing)

Figure 8.2: PROFIBUS - Electrical connection

Notice!

*For connecting **BUS IN** and **BUS OUT** we recommend our ready-made PROFIBUS cables (see chapter 10.8 "Accessory ready-made cables for interface connection" on page 103).*

Attention!

*The laser measurement system can be used to branch out the PROFIBUS network. The **continuing network** is connected via **BUS OUT**.*
*If the laser measurement system is the last subscriber in the network, the **BUS OUT** connection must be connected to a terminator plug, see "Accessory PROFIBUS terminating resistor" on page 102.*

8.1.3 PROFIBUS address

Notice!

For basic operation of the display please refer to chapter 6.3.2.
To set the address parameter enabling must be activated. The display is inverted.

Attention!

The laser measurement system is deactivated on the PROFIBUS when parameter enabling is activated via the display. The device is reactivated on the PROFIBUS after parameter enabling is exited.

The PROFIBUS-DP address is entered via the display.

To do this proceed as follows:

- *Enable parameter handling.*
- *Select the **PROFIBUS** submenu (figure 8.3).*
- *Select the **Address [ ]** menu item (figure 8.3).*
- *Enter the PROFIBUS address of the laser measurement system; set to a value between 1 and 126 (default: 126, figure 8.3).*
- *Reset parameter enabling.*

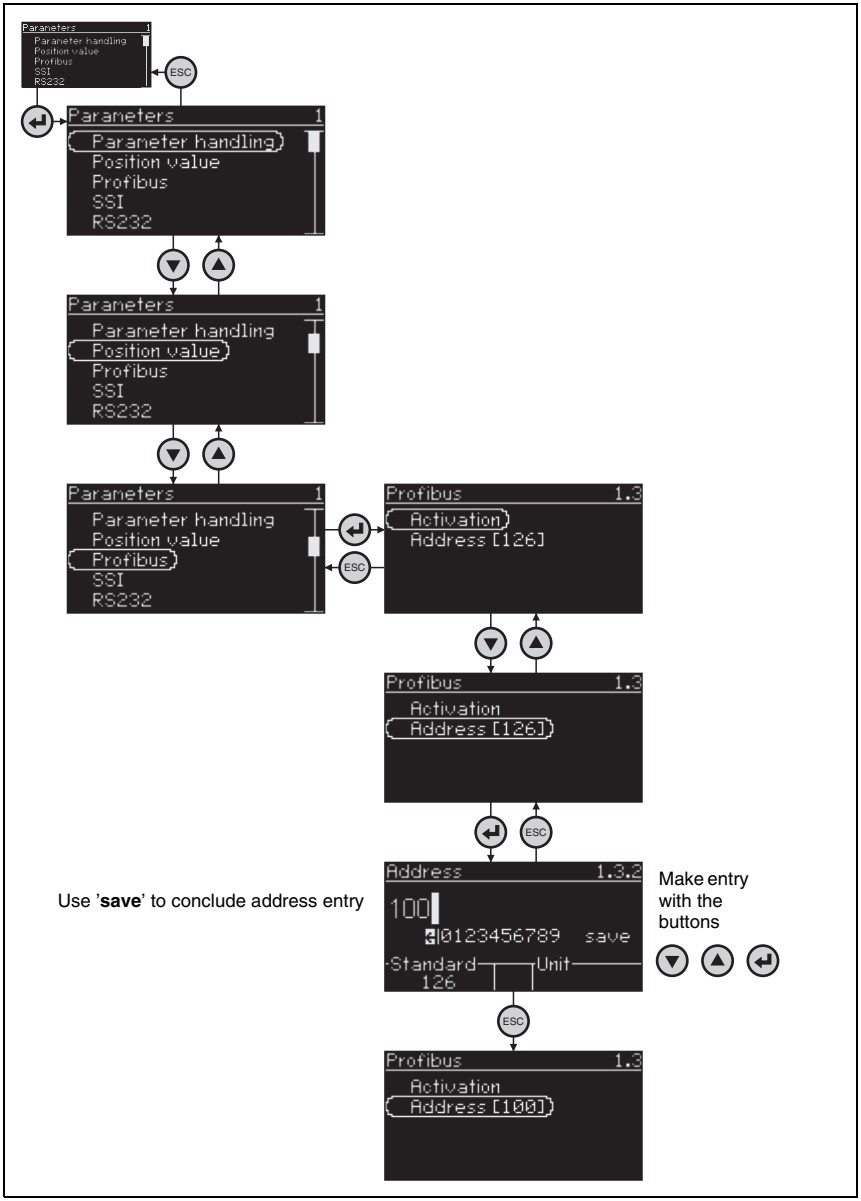


Figure 8.3: Setting the PROFIBUS address

8.1.4 General information on the GSD file

If the AMS 200… is operated in a PROFIBUS network, configuration must be performed exclusively via the PROFIBUS. The functionality of the laser measurement system is defined via modules. The parameters and their functions are structured in the GSD file using modules. A user-specific configuration tool is used during PLC program creation to integrate the required modules and configure them appropriately for the measurement application.

During operation of the laser measurement system on the PROFIBUS all parameters are set to default values. If these parameters are not changed by the user, the device functions using the default settings supplied by Leuze electronic. For the default settings of the device please refer to the following module descriptions.

Notice!

A least one module in the GSD file must be activated in the configuration tool for the control, usually the ***Position value module****.*

Notice!

Some controls make available a so-called "universal module". This module must not be activated for the AMS 200…

Attention!

The AMS 200… makes available a PROFIBUS, an SSI and an RS 232 interface. All interfaces can be operated in parallel. If the laser is operated via the PROFIBUS, the SSI/RS 232 parameters must also be changed via the PROFIBUS/SSI/RS 232 modules if they differ from the default settings.
SSI/RS 232 parameters which are only changed via the display are overwritten by the PROFIBUS manager with the SSI/RS 232 default values stored in the GSD file.

Notice!

For test purposes parameters can be changed via the display on a laser measurement system operated on the PROFIBUS. As soon as parameter enabling is activated on the display, the device is deactivated on the PROFIBUS. All parameters set via PROFIBUS modules remain effective. Parameter changes can now be made via the display for test purposes. If parameter enabling is deactivated via the display, only the parameters set in the PROFIBUS modules and the PROFIBUS default settings are in effect.

Parameter changes made via the display are no longer in effect on the PROFIBUS!

Attention!

The laser measurement system does not permanently store parameters changed via the PROFIBUS. Following Power OFF/ON the currently configured parameters are downloaded by the PROFIBUS manager. If no PROFIBUS manager is available following Power OFF/ON, the parameters set on the display apply.

Notice!

All input and output modules described in this documentation are described ***from the perspective of the control****:*
Described inputs (I) are inputs of the control.
Described outputs (O) are outputs of the control.
Described parameters (P) are parameters of the GSD file in the control.

Notice!

The ***current GSD file*** *for the AMS 200… can be found on our homepage under:*
www.leuze.com -> Download -> Identify -> Optical distance measuring and positioning -> GSD files AMS 200

8.1.5 Overview of the GSD modules

Module	Module name	Module contents (P) = Parameter, (O) = Output, (I) = Input
M1 page 46	**Position value**	(I) Position value
		(P) Sign
		(P) Unit
		(P) Resolution
		(P) Count direction
		(P) Offset
M2 page 48	**Static preset**	(P) Preset value
		(O) Preset teach
		(O) Preset reset
M3 page 49	**Dynamic preset**	(O) Preset value
		(O) Preset teach
		(O) Preset reset
M4 page 50	**I/O 1**	(P) Output or input defined
		(P) Level/edge input/output
		(P) Function for output wiring
		(P) Function for input wiring
		(I) Signal level input/output
		(O) Output activated
M5 page 53	**I/O 2**	(P) Output or input defined
		(P) Level/edge input/output
		(P) Function for output wiring
		(P) Function for input wiring
		(I) Signal level input/output
		(O) Output activated
M6 page 56	**Status and control**	(I) Diagnosis and status of AMS 200
		(O) Laser control ON/OFF
M7 page 58	**Position limit value 1**	(P) Upper and lower position limit value
M8 page 59	**Position limit value 2**	(P) Upper and lower position limit value

M9 page 60	**Error handling procedures**	(P) Position value in case of error
		(P) Position error message delay ON/OFF
		(P) Position error message delay
		(P) Velocity value in case of error
		(P) Velocity error message delay ON/OFF
		(P) Velocity error message delay
M10 page 62	**Velocity**	(I) Velocity value
		(P) Velocity value resolution
		(P) Velocity integration time
M11 page 64	**Velocity Limit value 1**	(P) Monitoring for over/under values
		(P) Monitoring direction dependent yes/no
		(P) Velocity limit value 1
		(P) Hysteresis of velocity limit value
		(P) Start of velocity monitoring range
		(P) End of velocity monitoring range
M12 page 66	**Velocity Limit value 2**	(P) Monitoring for over/under values
		(P) Monitoring direction dependent yes/no
		(P) Velocity limit value 2
		(P) Hysteresis of velocity limit value
		(P) Start of velocity monitoring range
		(P) End of velocity monitoring range
M13 page 68	**Velocity Limit value 3**	(P) Monitoring for over/under values
		(P) Monitoring direction dependent yes/no
		(P) Velocity limit value 3
		(P) Hysteresis of velocity limit value
		(P) Start of velocity monitoring range
		(P) End of velocity monitoring range
M14 page 70	**Velocity Limit value 4**	(P) Monitoring for over/under values
		(P) Monitoring direction dependent yes/no
		(P) Velocity limit value 4
		(P) Hysteresis of velocity limit value
		(P) Start of velocity monitoring range
		(P) End of velocity monitoring range
M15 page 72	**Velocity Limit value Dynamic**	(O) Release/lock limit value control
		(P) Monitoring for over/under values
		(P) Monitoring direction dependent yes/no
		(O) Dynamic velocity limit value
		(O) Hysteresis of velocity limit value
		(O) Start of velocity monitoring range
		(O) End of velocity monitoring range
M16 page 73	**Velocity status**	(I) Status of velocity monitoring
M17 page 75	**SSI interface**	(P) Gray/Binary coding
		(P) Number of data bits
		(P) Resolution
		(P) Update rate
		(P) Function of the error bit

M18 page 78	**Other**	(P) Display language selection
		(P) Display illumination
		(P) Display contrast
		(P) Activate/inhibit password
		(P) Password
M19 page 79	**RS 232 interface**	(P) Address
		(P) Baud rate
		(P) Format
		(P) Output cycle
		(P) Position resolution
		(P) Velocity resolution

Table 8.4: Overview of the GSD modules

8.1.6 Detail description of the modules

Notice!

In the following detailed descriptions of the modules you will find in the last column of the tables ***cross references (CR) to parameters and input/output data of other modules*** *which are directly related to the described parameter. These cross references must absolutely be observed during configuration.*

The individual ***modules*** *are* ***numerically*** *labelled from* ***1 … 18****.*
The ***parameters and input/output data*** *within a module are* ***alphanumerically labelled*** *from* a … z*.*

Example*:*

The a **preset** parameter in module 2 becomes active only when the preset teach occurs via module 2 b, 4 d or 5 d.

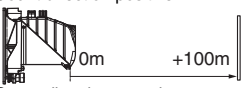
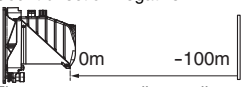
8.1.6.1 Module 1: Position value

Description

Outputs the current position value.

The parameters for sign, unit, resolution, count direction and offset remain adjustable.

Parameter

Parameter	Description	Rel. addr.	Data type	Value	Default	Unit		CR to module
						metr.	inch	
a **Sign**	Output mode of the sign. Sign affects position and velocity output.	0.0	Bit	**0: two's complement** 1: sign + quantity	**0**	–		–
b **Measure-ment unit**	Selection of the measurement unit [1]. The parameter applies to all values with measurement units. The parameter applies to all interfaces.	0.1	Bit	**0: metric** 1: inch (in)	**0**	–		–
c **Resolution**	Resolution of the position value applies only to the PROFIBUS output. The resolution does not apply to: - Static preset - Dynamic preset - Offset The SSI interface has a separate parameter for the resolution.	0.2 … 0.4	Bit	001=1: 0.001 010=2: 0.01 011=3: 0.1 **100=4: 1** 101=5: 10	**4**	mm	in/100	–
d **Count direction**	Count direction positive  Count direction negative  The parameter applies to all interfaces. The count direction changes the sign during velocity measurement. For the SSI interface, no negative position values can be transferred. In this case, the value 0 is output at the SSI interface. A suitable offset is to be selected so that only positive values are transferred.	0.5	Bit	**0: positive** 1: negative	**0**	–		–

e **Offset**	Output value=measurement value+offset. The parameter applies to all interfaces. **Attention**: If the preset is activated, it has priority over the offset. Preset and offset are not offset against each other. The resolution of the offset value is independent of the resolution selected in module 1. The entered offset applies immediately without any further release.	1 - 4	sign 32 bit	-999999 … +999999	**0**	mm	in/100	–
Parameter length: 6 bytes								

1) see following notice!

Notice!

*If the **unit of measurement is changed from metric to inch** (or vice versa), **previously entered numerical values** (e.g. for offset, preset, limit values etc.) **are not automatically converted**. This must be performed manually!*

Example:
Preset = 10000mm -> Change from metric to inch -> Preset = 10000 inch/100

Hex coding of the "position value" parameter

The value listed in this table shows the hex coding of the default settings:

Module address	Sign Unit Resolution Count direction	Offset
01	**10**	**00 00 00 00**

Input data

Input data	Description	Rel. addr.	Data type	Value	Default	Unit		CR to module
						metr.	inch	
f **Position value**	Output of the current position.	0	sign 32 bit	-999999 … +999999	–	scaled		9a
Input data length: 4 bytes consistently								

Output data

none

8.1.6.2 Module 2: Static preset

Description

With this module, a preset value can be specified. The specified preset value becomes active in the position in which preset teaching is performed.

Notice!

In the event of a device change the preset value is retained in the PROFIBUS manager. The activation of the preset value (preset teach) at the intended position must, however, be performed again.

Parameter

Parameter	Description	Rel. addr.	Data type	Value	Default	Unit		CR to module
						metr.	inch	
a **Preset**	Preset value. The value is accepted during a corresponding teach event (see output data). The parameter applies to all interfaces. The resolution of the preset value is independent of the resolution selected in module 1.	0	sign 32 bit	-999999 … +999999	**0**	mm	in/ 100	2b 4d 5d
Parameter length: 4 bytes								

Hex coding of the "preset value" parameter

The value listed in this table shows the hex coding of the default settings:

Module address	Preset value
02	**00 00 00 00**

Input data

none

Output data

Output data	Description	Rel. addr.	Data type	Value	Default	Unit		CR to module
						metr.	inch	
b **Preset teach**	Read in the preset value.	0.0	Bit	0→1 Preset teach	–	–		4d 5d
c **Preset reset**	Preset value is deactivated.	0.1	Bit	0→1 Preset reset	–	–		4d 5d
Output data length: 1 byte								

8.1.6.3 Module 3: Dynamic preset

Description

With this module, a preset value can be specified. The specified preset value becomes active in the position in which preset teaching is performed. The preset value can be adjusted within the control to meet plant requirements without intervening in the static parameter structure.

Parameter

none

Input data

none

Output data

Output data	Description	Rel. addr.	Data type	Value	Default	Unit		CR to module
						metr.	inch	
a **Preset teach**	Read in the preset value.	0.0	Bit	0→1 Preset teach	–	–		4d 5d
b **Preset reset**	Preset value is deactivated. Output value=measurement value+offset.	0.1	Bit	0→1 Preset reset	–	–		4d 5d
c **Preset**	The value is accepted during a corresponding teach event, The output data apply to all interfaces. The resolution of the preset value is independent of the resolution selected in module 1.	1	sign 32 bit	-999999 … +999999	–	mm	in/100	3a 4d 5d
Output data length: 5 bytes								

8.1.6.4 Module 4: I/O 1 Input/Output

Description

The module defines the mode of operation of the digital input/output **I/O 1**.

Parameter

Parameter	Description	Rel. addr.	Data type	Value	Default	Unit		CR to module
						metr.	inch	
a **Function**	The parameter defines whether **I/O 1** functions as an input or as an output.	0.0	Bit	0: Input **1: Output**	**1**	–		4cd
b **Activation**	The parameter defines the level of the output when the "output" event is received. If **I/O 1** is configured as an input, the response is edge-controlled.	0.1	Bit	**0: Low** **1-0 transition** 1: High 0-1 transition	**0**	–		–
c **Output**	The parameter defines which event triggers activation of the output. The individual functions are **OR**-linked to one another.					–		4a
	Position limit value 1 If the position value lies outside of configured limit range 1, the output is set.	1.0	Bit	**0 = OFF** 1 = ON	**0**	–		
	Position limit value 2 If the position value lies outside of configured limit range 2, the output is set.	1.1	Bit	**0 = OFF** 1 = ON	**0**	–		
	Velocity limit value If the velocity value lies outside of the configured values, the output is set. Monitoring from modules 11 to 15 is OR-linked.	1.2	Bit	**0 = OFF** 1 = ON	**0**	–		
	Intensity (ATT) If the intensity of the received signal is less than the warning threshold, the output is set.	1.3	Bit	**0 = OFF** 1 = ON	**0**	–		
	Temperature (TMP) If the internal device temperature exceeds the set limit value, the output is set.	1.4	Bit	**0 = OFF** 1 = ON	**0**	–		
	Laser (LSR) Laser prefailure message.	1.5	Bit	**0 = OFF** 1 = ON	**0**	–		
	Plausibility (PLB) If implausible measurement values are diagnosed, the output is set.	1.6	Bit	0 = OFF **1 = ON**	**1**	–		

c **Output**	**Hardware (ERR)** If a hardware error is diagnosed, the output is set.	1.7	Bit	0 = OFF **1 = ON**	**1**	–	4a
	Pseudodynamic output If bit 0.0 is set in the output data, the output is set.	2.0	Bit	**0 = OFF** 1 = ON	**0**	–	
d **Input**	**Preset** The HW input is used as preset teach input (valid for static or dynamic preset). **Laser** The HW input is used as laser OFF.	3.0 … 3.2	Unsig n8Bit	**000 = HW input no function** 001 = HW input as preset teach function 010 = HW input as laser OFF function	**000**	–	4a
Parameter length: 4 bytes							

Hex coding of the "I/O 1 input/output" parameter

The value listed in this table shows the hex coding of the default settings:

Module address	Function Activation	Position limit value 1 Position limit value 2 Velocity limit value Intensity (ATT) Temperature (TMP) Laser (LSR) Plausibility (PLB) Hardware (ERR) Pseudodynamic output	Input Preset / Laser
04	**01**	**00 C0**	**00**

Notice!

Behaviour of the AMS 200 on laser ON/OFF:

If the laser light spot is positioned on the reflector when the laser diode is switched on, the AMS 200 returns valid measurement values after approx. 330ms.

*If the laser light spot is **not** positioned on the reflector when the laser diode is switched on, the AMS 200 cannot calculate any distance values. If the laser beam hits the reflector at a later point in time while switched-on, the AMS 200 returns valid measurement values after the following time span:*

t = (measurement distance / 20m) sec.

Example: Corridor change of a high-bay storage device during which the laser diode is not switched off while travelling around curves.
Measurement distance 100m –> t = 5sec., measurement distance 200m –> t = 10sec.

Input data

Input data	Description	Rel. addr.	Data type	Value	Default	Unit		CR to module
						metr.	inch	
e **State**	Signal state of the input or output.	0.0	Bit	0: Input/Output at signal level **not active** 1: Input/Output at signal level **active**	–	–		–
Input data length: 1 byte								

Output data

Output data	Description	Rel. addr.	Data type	Value	Default	Unit		CR to module
						metr.	inch	
f **State**	The output can be activated/ deactivated with this bit. The corresponding release is performed in module 4, output parameter bit 2.0.	0.0	Bit	0: Output at signal level **not active** 1: Output at signal level **active**	–	–		4c
Output data length: 1 byte								

8.1.6.5 Module 5: I/O 2 Input/Output

Description

The module defines the mode of operation of the digital input/output **I/O 2**.

Parameter

Parameter	Description	Rel. addr.	Data type	Value	Default	Unit		CR to module
						metr.	inch	
a **Function**	The parameter defines whether **I/O 2** functions as an input or as an output.	0.0	Bit	0: Input **1: Output**	**1**	–		5cd
b **Activation**	The parameter defines the level of the output when the "output" event is received. If **I/O 2** is configured as an input, the response is edge-controlled.	0.1	Bit	**0: Low** **1-0 transition** 1: High 0-1 transition	**0**	–		–
c **Output**	The parameter defines which event triggers activation of the output. The individual functions are **OR**-linked to one another.					–		5a
	Position limit value 1 If the position value lies outside of configured limit range 1, the output is set.	1.0	Bit	**0 = OFF** 1 = ON	**0**	–		
	Position limit value 2 If the position value lies outside of configured limit range 2, the output is set.	1.1	Bit	**0 = OFF** 1 = ON	**0**	–		
	Velocity limit value If the velocity value lies outside of the configured values, the output is set. Monitoring from modules 11 to 15 is OR-linked.	1.2	Bit	**0 = OFF** 1 = ON	**0**	–		
	Intensity (ATT) If the intensity of the received signal is less than the warning threshold, the output is set.	1.3	Bit	0 = OFF **1 = ON**	**1**	–		
	Temperature (TMP) If the internal device temperature exceeds the set limit value, the output is set.	1.4	Bit	0 = OFF **1 = ON**	**1**	–		
	Laser (LSR) Laser prefailure message.	1.5	Bit	0 = OFF **1 = ON**	**1**	–		
	Plausibility (PLB) If implausible measurement values are diagnosed, the output is set.	1.6	Bit	**0 = OFF** 1 = ON	**0**	–		

c **Output**	**Hardware (ERR)** If a hardware error is diagnosed, the output is set.	1.7	Bit	**0 = OFF** 1 = ON	**0**	–	5a
	Pseudodynamic output If bit 0.0 is set in the output data, the output is set.	2.0	Bit	**0 = OFF** 1 = ON	**0**	–	
d **Input**	**Preset** The HW input is used as preset teach input (valid for static or dynamic preset). **Laser** The HW input is used as laser OFF.	3.0 … 3.2	Unsign 8Bit	**000 = HW input no function** 001 = HW input as preset teach function 010 = HW input as laser OFF function	**000**	–	5a
Parameter length: 4 bytes							

Hex coding of the "I/O 2 input/output" parameter

The value listed in this table shows the hex coding of the default settings:

Module address	Function Activation	Position limit value 1 Position limit value 2 Velocity limit value Intensity (ATT) Temperature (TMP) Laser (LSR) Plausibility (PLB) Hardware (ERR) Pseudodynamic output	Input Preset / Laser
05	**01**	**00 38**	**00**

Notice!

Behaviour of the AMS 200 on Laser ON/OFF:

If the laser light spot is positioned on the reflector when the laser diode is switched on, the AMS 200 returns valid measurement values after approx. 330ms.

*If the laser light spot is **not** positioned on the reflector when the laser diode is switched on, the AMS 200 cannot calculate any distance values. If the laser beam hits the reflector at a later point in time while switched-on, the AMS 200 returns valid measurement values after the following time span:*

t = (measurement distance / 20m) sec.

Example: Corridor change of a high-bay storage device during which the laser diode is not switched off while travelling around curves.
Measurement distance 100m –> t = 5sec.,
measurement distance 200m –> t = 10sec.

Input data

Input data	Description	Rel. addr.	Data type	Value	Default	Unit		CR to module
						metr.	inch	
e **State**	Signal state of the input or output.	0.0	Bit	0: Input/Output at signal level **not active** 1: Input/Output at signal level **active**	–	–		–
Input data length: 1 byte								

Output data

Output data	Description	Rel. addr.	Data type	Value	Default	Unit		CR to module
						metr.	inch	
f **State**	The output can be activated/ deactivated with this bit. The corresponding release is performed in module 5, output parameter bit 2.0.	0.0	Bit	0: Output at signal level **not active** 1: Output at signal level **active**	–	–		5c
Output data length: 1 byte								

8.1.6.6 Module 6: Status and control

Description

This module supplies various AMS 200… status information to the PROFIBUS master. The laser can be controlled via the master's output data.

Parameter

none

Input data

Input data	Description	Rel. addr.	Data type	Value	Default	Unit		CR to module
						metr.	inch	
a **Laser status**	Signals the laser status.	1.0	Bit	0: Laser ON 1: Laser OFF	–	–		–
b **Preset status**	Status of the preset value.	1.1	Bit	0: Preset not active 1: Preset active	–	–		–
c **Preset teach**	This bit toggles on each teach event of a preset value.	1.2	Bit	0 or 1	–	–		–
d **Overflow**	The output value has exceeded the maximum value which can be represented by the SSI interface. In the event of an overflow the SSI interface data are set to 0xFF.	1.3	Bit	0: OK 1: Overflow	–	–		–
e **Intensity (ATT)**	If the intensity of the received signal is less than the warning threshold, the status bit is set.	1.4	Bit	0: OK 1: Warning	–	–		–
f **Temperature (TMP)**	If the internal device temperature exceeds or drops below the set limit value, the status bit is set.	1.5	Bit	0: OK 1: Temperature above/ below limit	–	–		–
g **Laser (LSR)**	Laser prefailure message.	1.6	Bit	0: OK 1: Laser warning	–	–		–
h **Plausibility (PLB)**	If implausible measurement values are diagnosed, the status bit is set.	1.7	Bit	0: OK 1: Implausible measurement value	–	–		–
i **Hardware (ERR)**	If a hardware error is diagnosed, the status bit is set.	0.0	Bit	0: OK 1: Hardware error	–	–		–
j **Lower position limit value 1**	Signals that the value is less than lower limit value 1.	0.4	Bit	0: OK 1: Value less than limit	–	–		–
k **Upper position limit value 1**	Signals that the value is greater than upper limit value 1.	0.5	Bit	0: OK 1: Value greater than limit	–	–		–

l **Lower position limit value 2**	Signals that the value is less than lower limit value 2.	0.6	Bit	0: OK 1: Value less than limit	–	–	–
m **Upper position limit value 2**	Signals that the value is greater than upper limit value 2.	0.7	Bit	0: OK 1: Value greater than limit	–	–	–
Input data length: 2 bytes							

Output data

Output data	Description	Rel. addr.	Data type	Value	Default	Unit		CR to module
						metr.	inch	
n **Laser**	Controls the laser.	0.0	Bit	0: Laser ON 1: Laser OFF	–	–		–
Output data length: 2 bytes								

8.1.6.7 Module 7: Position limit value range 1

Description

The position limit value range 1 parameter defines a distance range with lower and upper limits. If the measured value lies outside of the configured range, the corresponding bit is set in module 6 or, if configured, an output is set.

Parameter

Parameter	Description	Rel. addr.	Data type	Value	Default	Unit		CR to module
						metr.	inch	
a **Lower pos. limit 1**	Specifies the lower position limit.	0…3	sign 32 bit	-999999 … +999999	**0**	mm	in/ 100	–
b **Upper pos. limit 1**	Specifies the upper position limit.	4…7	sign 32 bit	-999999 … +999999	**0**	mm	in/ 100	–
Parameter length: 8 bytes								

Hex code of the "position limit value range 1" parameter

The value listed in this table shows the hex coding of the default settings:

Module address	Lower pos. limit 1	Upper pos. limit 1
07	**00 00 00 00**	**00 00 00 00**

Input data

none

Output data

none

8.1.6.8 Module 8: Position limit value range 2

Description

The position limit value range 2 parameter defines a distance range with lower and upper limits. If the measured value lies outside of the configured range, the corresponding bit is set in module 6 or, if configured, an output is set.

Parameter

Parameter	Description	Rel. addr.	Data type	Value	Default	Unit		CR to module
						metr.	inch	
a **Lower pos. limit 2**	Specifies the lower position limit.	0…3	sign 32 bit	-999999 … +999999	**0**	mm	in/ 100	–
b **Upper pos. limit 2**	Specifies the upper position limit.	4 … 7	sign 32 bit	-999999 … +999999	**0**	mm	in/ 100	–
Parameter length: 8 bytes								

Hex code of the "position limit value range 2" parameter

The value listed in this table shows the hex coding of the default settings:

Module address	Lower pos. limit 2	Upper pos. limit 2
08	**00 00 00 00**	**00 00 00 00**

Input data

none

Output data

none

8.1.6.9 Module 9: Error handling procedures

Description

The module makes parameters available to handle any errors should they occur.

In the event of a temporary error in the value/velocity calculation (e.g. plausibility error caused by light beam interruption) the laser measurement system transmits the last valid measurement value for a length of time xx which is to be configured.

If the configured time is exceeded, the error display or the faulty measurement value output is activated.

Parameter

Parameter	Description	Rel. addr.	Data type	Value	Default	Unit		CR to module
						metr.	inch	
a **Position value in the case of error**	Specifies which position value is to be output in the event of an error after the position suppression time has elapsed.	0.0	Bit	0: Last valid value **1: Zero**	**1**	mm	in/ 100	–
	No function.	0.1	Bit	Always 0	**0**	–		–
b **Suppress position status**	Specifies whether the PLB status bit is set immediately in the event of an error or if it is suppressed for the configured position suppression time.	0.2	Bit	0: OFF **1: ON**	**1**	–		–
c **Error delay (position)**	Specifies in the event of an error whether the position value immediately outputs the value of the "position value in the case of error" parameter or outputs the last valid position value for the duration of the configured "error delay time".	0.3	Bit	0: OFF **1: ON**	**1**	–		–
d **Error delay time (position)**	Errors which occur are suppressed for the configured time. If no valid position value can be ascertained during the configured time, the last valid position value is output. If the error persists after the time elapses, the value stored in the "position value in the case of error" parameter is output.	1…2	unsign 16 bit	100 … 1000	**100**	ms		–
e **Velocity in the case of error**	Specifies which velocity is to be output in the event of an error after the velocity suppression time has elapsed.	3.0	Bit	0: Last valid value **1: Zero**	**1**	–		–
	No function.	3.1	Bit	Always 0	**0**	–		–
f **Suppress velocity status**	Specifies whether the PLB status bit is set immediately in the event of an error or if it is suppressed for the configured velocity suppression time.	3.2	Bit	0: OFF **1: ON**	**1**	–		–

g **Error delay (velocity)**	Specifies in the event of an error whether the velocity immediately outputs the value of the "velocity in the case of error" parameter or outputs the last valid velocity for the duration of the configured "error delay time".	3.3	Bit	0: OFF **1: ON**	**1**	–	–
h **Error delay time (velocity)**	Errors which occur are suppressed for the configured time. If no velocity position value can be ascertained during the configured time, the last valid velocity value is output. If the error persists after the time elapses, the value stored in the "velocity in the case of error" parameter is output.	4…5	unsign 16 bit	200 … 1000	**200**	ms	–
Parameter length: 6 bytes							

Hex code of the "Error handling procedures" parameter (position and velocity)

The value listed in this table shows the hex coding of the default settings:

Module address	Position value in the case of error Suppress position status Error delay (position)	Position suppression time	Velocity output in the case of error Suppress velocity status Error delay (velocity)	Velocity suppression time
09	**C0**	**00 64**	**C0**	**00 C8**

Input data

none

Output data

none

8.1.6.10 Module 10: Velocity

Description

Outputs the current velocity with the configured resolution. The unit (metric or inch) is set in module 1 (position value) and also applies to the velocity. If module 1 is not configured, the AMS 200… operates with the default unit (metric).

The sign of the velocity is dependent on the count direction in module 1d.

In the default setting a positive velocity is output when the reflector moves away from the AMS 200… When the reflector moves towards the AMS 200…, negative velocities are output. If the "negative" count direction is configured in module 1, the velocity signs are reversed.

Measurement value preparation averages all velocity values calculated during the selected period to yield a velocity value.

Parameter

Parameter	Description	Rel. addr.	Data type	Value	Default	Unit		CR to module
						metr.	inch	
a **Velocity resolution**	The parameter specifies the resolution for the velocity value.	0.0… 0.2	Bit	**001=1: 1** 010=2: 10 011=3: 100 100=4: 1000	**1**	mm/s	(in/ 100) /s	–
b **Average**	The parameter specifies the integration time (averaging time) of the calculated velocity values.	0.3 … 0.5	Bit	000=0: 2 001=1: 4 010=2: 8 **011=3: 16** 100=4: 32 101=5: 64 110=6: 128	**3**	ms		–
Parameter length: 2 bytes								

Hex coding of the "velocity" parameter

The value listed in this table shows the hex coding of the default settings:

Module address	Velocity resolution Average
0A	**00 19**

Input data

Input data	Description	Rel. addr.	Data type	Value	Default	Unit		CR to module
						metr.	inch	
C **Velocity**	Current velocity	0	sign 32 bit	**-999999** … +999999	**0**	scaled		–
Input data length: 4 bytes consistently								

Output data

none

8.1.6.11 Module 11: Static velocity limit value 1

Description

The **static velocity limit value 1** function compares the current velocity with a velocity stored in the configuration. This occurs in the configured range, which is defined by **range start** and **range end**.

Notice!

*If **range start** and **range end** are identical, velocity monitoring is not activated.*

If a direction-dependent limit value check is activated via the **direction selection** parameter, the values of **range start** and **range end** also define the direction. The check is always performed from **range start** to **range end**. For example, if the range start is "5500" and the range end is "5000", the direction-dependent check is only performed in the direction from "5500" to "5000". The limit value is not active in the opposite direction.

If the check is independent of direction, the order of **range start** and **range end** is irrelevant. Depending on the selected **switching mode**, if the value is above or below the defined limits, the limit value status in module 16 is set and, if configured, the output is appropriately set via module 4 or 5.

Parameter

Parameter	Description	Rel. addr.	Data type	Value	Default	Unit		CR to module
						metr.	inch	
a **Switching mode**	Condition for the "velocity limit value 1" signal, which applies to the output (module 4/5) and the status bit (module 16).	0.0	Bit	**0: Value greater than limit** 1: Value less than limit	**0**	–		–
b **Direction selection**	Selection of direction-dependent or direction-independent limit value checking.	0.1	Bit	**0: Direction independent** 1: Direction dependent	**0**	–		–
c **Velocity limit value 1**	Limit value is compared to the current velocity.	1…2	unsign 16 bit	0 … 20000	**0**	mm/s	(in/100) /s	16d
d **Velocity hysteresis 1**	Relative shift to prevent signal bouncing.	3…4	unsign 16 bit	0 … 20000	**100**	mm/s	(in/100) /s	–
e **Limit value 1 range start**	The velocity limit value is monitored beginning at this position.	5…8	sign 32 bit	-999999 … +999999	**0**	mm	in/100	–
f **Limit value 1 range end**	The velocity limit value is monitored up to this position.	9 … 12	sign 32 bit	-999999 … +999999	**0**	mm	in/100	–
Parameter length: 13 bytes								

Hex code of the "static velocity limit value 1" parameter

The value listed in this table shows the hex coding of the default settings:

Module address	Switching mode Direction selection	Velocity limit value 1	Velocity hysteresis 1	Limit value 1 range start	Limit value 1 range end
0B	00	00 00	00 64	00 00 00 00	00 00 00 00

Input data

none

Output data

none

8.1.6.12 Module 12: Static velocity limit value 2

Description

The **static velocity limit value 2** function compares the current velocity with a velocity stored in the configuration. This occurs in the configured range, which is defined by **range start** and **range end**.

Notice!

*If **range start** and **range end** are identical, velocity monitoring is not activated.*

If a direction-dependent limit value check is activated via the **direction selection** parameter, the values of **range start** and **range end** also define the direction. The check is always performed from **range start** to **range end**. For example, if the range start is "5500" and the range end is "5000", the direction-dependent check is only performed in the direction from "5500" to "5000". The limit value is not active in the opposite direction.

If the check is independent of direction, the order of **range start** and **range end** is irrelevant. Depending on the selected **switching mode**, if the value is above or below the defined limits, the limit value status in module 16 is set and, if configured, the output is appropriately set via module 4 or 5.

Parameter

Parameter	Description	Rel. addr.	Data type	Value	Default	Unit		CR to module
						metr.	inch	
a **Switching mode**	Condition for the "velocity limit value 2" signal, which applies to the output (module 4/5) and the status bit (module 16).	0.0	Bit	**0: Value greater than limit** 1: Value less than limit	**0**	–		–
b **Direction selection**	Selection of direction-dependent or direction-independent limit value checking.	0.1	Bit	**0: Direction independent** 1: Direction dependent	**0**	–		–
c **Velocity limit value 2**	Limit value is compared to the current velocity.	1…2	unsign 16 bit	0 … 20000	**0**	mm/s	(in/100) /s	16e
d **Velocity hysteresis 2**	Relative shift to prevent signal bouncing.	3…4	unsign 16 bit	0 … 20000	**100**	mm/s	(in/100) /s	–
e **Limit value 2 range start**	The velocity limit value is monitored beginning at this position.	5…8	sign 32 bit	-999999 … +999999	**0**	mm	in/100	–
f **Limit value 2 range end**	The velocity limit value is monitored up to this position.	9 … 12	sign 32 bit	-999999 … +999999	**0**	mm	in/100	–
Parameter length: 13 bytes								

Hex code of the "static velocity limit value 2" parameter

The value listed in this table shows the hex coding of the default settings:

Module address	Switching mode Direction selection	Velocity limit value 2	Velocity hysteresis 2	Limit value 2 range start	Limit value 2 range end
0C	00	00 00	00 64	00 00 00 00	00 00 00 00

Input data

none

Output data

none

8.1.6.13 Module 13: Static velocity limit value 3

Description

The **static velocity limit value 3** function compares the current velocity with a velocity stored in the configuration. This occurs in the configured range, which is defined by **range start** and **range end**.

Notice!

*If **range start** and **range end** are identical, velocity monitoring is not activated.*

If a direction-dependent limit value check is activated viathe **direction selection** parameter, the values of **range start** and **range end** also define the direction. The check is always performed from **range start** to **range end**. For example, if the range start is "5500" and the range end is "5000", the direction-dependent check is only performed in the direction from "5500" to "5000". The limit value is not active in the opposite direction.

If the check is independent of direction, the order of **range start** and **range end** is irrelevant. Depending on the selected **switching mode**, if the value is above or below the defined limits, the limit value status in module 16 is set and, if configured, the output is appropriately set via module 4 or 5.

Parameter

Parameter	Description	Rel. addr.	Data type	Value	Default	Unit		CR to module
						metr.	inch	
a **Switching mode**	Condition for the "velocity limit value 3" signal, which applies to the output (module 4/5) and the status bit (module 16).	0.0	Bit	**0: Value greater than limit** 1: Value less than limit	**0**	–		–
b **Direction selection**	Selection of direction-dependent or direction-independent limit value checking.	0.1	Bit	**0: Direction independent** 1: Direction dependent	**0**	–		–
c **Velocity limit value 3**	Limit value is compared to the current velocity.	1…2	unsign 16 bit	0 … 20000	**0**	mm/s	(in/100)/s	16f
d **Velocity hysteresis 3**	Relative shift to prevent signal bouncing.	3…4	unsign 16 bit	0 … 20000	**100**	mm/s	(in/100)/s	–
e **Limit value 3 range start**	The velocity limit value is monitored beginning at this position.	5…8	sign 32 bit	-999999 … +999999	**0**	mm	in/100	–
f **Limit value 3 range end**	The velocity limit value is monitored up to this position.	9 … 12	sign 32 bit	-999999 … +999999	**0**	mm	in/100	–
Parameter length: 13 bytes								

Hex code of the "static velocity limit value 3" parameter

The value listed in this table shows the hex coding of the default settings:

Module address	Switching mode Direction selection	Velocity limit value 3	Velocity hysteresis 3	Limit value 3 range start	Limit value 3 range end
0D	00	00 00	00 64	00 00 00 00	00 00 00 00

Input data

none

Output data

none

8.1.6.14 Module 14: Static velocity limit value 4

Description

The **static velocity limit value 4** function compares the current velocity with a velocity stored in the configuration. This occurs in the configured range, which is defined by **range start** and **range end**.

Notice!

*If **range start** and **range end** are identical, velocity monitoring is not activated.*

If a direction-dependent limit value check is activated via the **direction selection** parameter, the values of **range start** and **range end** also define the direction. The check is always performed from **range start** to **range end**. For example, if the range start is "5500" and the range end is "5000", the direction-dependent check is only performed in the direction from "5500" to "5000". The limit value is not active in the opposite direction.

If the check is independent of direction, the order of **range start** and **range end** is irrelevant. Depending on the selected **switching mode**, if the value is above or below the defined limits, the limit value status in module 16 is set and, if configured, the output is appropriately set via module 4 or 5.

Parameter

Parameter	Description	Rel. addr.	Data type	Value	Default	Unit		CR to module
						metr.	inch	
a **Switching mode**	Condition for the "velocity limit value 4" signal, which applies to the output (module 4/5) and the status bit (module 16).	0.0	Bit	**0: Value greater than limit** 1: Value less than limit	**0**	–		–
b **Direction selection**	Selection of direction-dependent or direction-independent limit value checking.	0.1	Bit	**0: Direction independent** 1: Direction dependent	**0**	–		–
c **Velocity limit value 4**	Limit value is compared to the current velocity.	1…2	unsign 16 bit	0 … 20000	**0**	mm/s	(in/100)/s	16 g
d **Velocity hysteresis 4**	Relative shift to prevent signal bouncing.	3…4	unsign 16 bit	0 … 20000	**100**	mm/s	(in/100)/s	–
e **Limit value 4 range start**	The velocity limit value is monitored beginning at this position.	5…8	sign 32 bit	-999999 … +999999	**0**	mm	in/100	–
f **Limit value 4 range end**	The velocity limit value is monitored up to this position.	9 … 12	sign 32 bit	-999999 … +999999	**0**	mm	in/100	–
Parameter length: 13 bytes								

Hex code of the "static velocity limit value 4" parameter

The value listed in this table shows the hex coding of the default settings:

Module address	Switching mode Direction selection	Velocity limit value 4	Velocity hysteresis 4	Limit value 4 range start	Limit value 4 range end
0E	00	00 00	00 64	00 00 00 00	00 00 00 00

Input data

none

Output data

none

8.1.6.15 Module 15: Dynamic velocity limit value

Description

The **dynamic velocity limit value** compares the current velocity with a stored velocity within the defined range. If the value is above or below the limit value, the dynamic limit value status in module 16 is set and, if configured, the output is appropriately set. **Limit value**, **hysteresis**, **range start** and **range end** are transferred with the output data of this module by the PROFIBUS master. The transferred values are activated by **Bit 0.0**, i.e. if this bit is set, the AMS 200… compares the current velocity with the new limit value conditions.

Notice!

*If **range start** and **range end** are identical, velocity monitoring is not activated.*

Parameter

none

Input data

none

Output data

Output data	Description	Rel. addr.	Data type	Value	Default	Unit		CR to module
						metr.	inch	
a **Limit value control**	Controls internal processing of the transferred dynamic limit value parameters.	0.0	Bit	0: Do not process 1: Process parameter	–	–		–
b **Switching mode**	Condition for the signal change of the output/status bit.	0.1	Bit	0: Value greater than limit 1: Value less than limit	–	–		–
c **Direction selection**	Selection of direction-dependent or direction-independent limit value checking.	0.2	Bit	0: Direction independent 1: Direction dependent	–	–		–
d **Velocity limit value**	Limit value is compared to the current velocity.	1…2	unsign 16 bit	0 … +20000	–	mm/s	(in/100) /s	16 h
e **Velocity hysteresis**	Relative shift to prevent signal bouncing.	3…4	unsign 16 bit	0 … +20000	–	mm/s	(in/100) /s	–
f **Limit value range start**	The velocity limit value is monitored beginning at this position.	5…8	sign 32 bit	-999999 … +999999	**0**	mm	in/100	–
g **Limit value range end**	The velocity limit value is monitored up to this position.	9 … 12	sign 32 bit	-999999 … +999999	**0**	mm	in/100	–
Output data length: 13 bytes consistently								

8.1.6.16 Module 16: Velocity status

Description

This module supplies the PROFIBUS master with various status information for velocity measurement.

Parameter

none

Input data

Input data	Description	Rel. addr.	Data type	Value	Default	Unit		CR to module
						metr.	inch	
a **Velocity measure-ment error**	Signals that no valid velocity could be ascertained.	1.0	Bit	0: OK 1: Error	–	–		–
b **Movement status**	Signals whether a movement >0.1m/s is currently being detected.	1.1	Bit	0: No movement 1: Movement	–	–		–
c **Movement direction**	When the movement status is activated, this bit indicates the direction.	1.2	Bit	0: Positive direction 1: Negative direction	–	–		–
d **Velocity limit value status 1**	Signals that limit value 1 has been exceeded.	1.3	Bit	0: Limit value maintained 1: Limit value violated	–	–		11c
e **Velocity limit value status 2**	Signals that limit value 2 has been exceeded.	1.4	Bit	0: Limit value maintained 1: Limit value violated	–	–		12c
f **Velocity limit value status 3**	Signals that limit value 3 has been exceeded.	1.5	Bit	0: Limit value maintained 1: Limit value violated	–	–		13c
g **Velocity limit value status 4**	Signals that limit value 4 has been exceeded.	1.6	Bit	0: Limit value maintained 1: Limit value violated	–	–		14c
h **Dynamic velocity limit value status**	Signals that the dynamic limit value has been exceeded.	1.7	Bit	0: Limit value maintained 1: Limit value violated	–	–		15bd
i **Velocity comparison limit value 1**	Signals whether the current velocity is compared with this limit value.	0.3	Bit	0: Comparison not active 1: Comparison active	–	–		–
j **Velocity comparison limit value 2**	Signals whether the current velocity is compared with this limit value.	0.4	Bit	0: Comparison not active 1: Comparison active	–	–		–
k **Velocity comparison limit value 3**	Signals whether the current velocity is compared with this limit value.	0.5	Bit	0: Comparison not active 1: Comparison active	–	–		–

l **Velocity comparison limit value 4**	Signals whether the current velocity is compared with this limit value.	0.6	Bit	0: Comparison not active 1: Comparison active	–	–	–
m **Dynamic velocity comparison**	Signals whether the current velocity is compared with this limit value.	0.7	Bit	0: Comparison not active 1: Comparison active	–	–	–
Input data length: 2 bytes							

Output data

none

8.1.6.17 Module 17: SSI interface

Description

The module defines the parameters for the SSI interface.

Attention!

The SSI interface can only represent positive distance values. If negative output values are ascertained due to the offset or count direction, a zero value is output at the SSI interface! In the event of a number overflow, all data bits are set to "1".

The **unit**, **offset** and **count direction** parameters of module 1 also apply to the SSI interface.

Notice!

If the SSI interface is not configured via module 17 (SSI interface) in PROFIBUS operation, the SSI interface is deactivated.

If the SSI interface is operated without PROFIBUS (PROFIBUS OFF/SSI ON), configuration is performed via the display.

Parameter

Parameter	Description	Rel. addr.	Data type	Value	Default	Unit		CR to module
						metr.	inch	
a **Coding**	The parameter defines the coding of the SSI data.	0.0	Bit	0: Binary **1: Gray**	**1**	–		–
b **Mode**	The parameter defines the number of data bits.	0.1 … 0.2	Bit	**00=0: 24Bit** 01=1: 25Bit 10=2: 26Bit	**0**	–		–
c **Resolution**	The parameter defines the resolution of the SSI position value.	0.3 … 0.5	Bit	001=1: 0.001 010=2: 0.01 **011=3: 0.1** 100=4: 1 101=5: 10	**3**	mm	in/ 100	1b 6d
d **Update rate**	The parameter defines the update rate of the measurement values at the SSI interface. The measurement value is updated independent of the clock frequency.	0.6	Bit	**0: 1.6ms** 1: 0.2ms	**0**	ms		–
e **Error bit** **Attention! The attached error bit always has the following significance:** **0: No error** **1: Error**	**Error bit off/on** The parameter defines the meaning of the error bit. If the error bit = **OFF**, no bit is attached to the data. The remaining bits 1 to 6 activate the various events which apply to the error bit. The bits are **OR**-linked to each other.	1.0	Bit	0: OFF **1: ON**	**1**	–		–
	Overflow Output value exceeds the maximum value which can be represented. In the event of an overflow, all data bits are set to 1.	1.1	Bit	**0: OFF** 1: ON	**0**	–		–
	Intensity (ATT) If the intensity of the received signal is less than the warning threshold, the bit is set.	1.2	Bit	**0: OFF** 1: ON	**0**	–		–
	Temperature (TMP) Maximum internal device temperature exceeded.	1.3	Bit	**0: OFF** 1: ON	**0**	–		–
	Laser (LSR) Laser prefailure message.	1.4	Bit	**0: OFF** 1: ON	**0**	–		–
	Plausibility (PLB) Plausibility error.	1.5	Bit	0: OFF **1: ON**	**1**	–		–
	Hardware (ERR) Hardware error.	1.6	Bit	0: OFF **1: ON**	**1**	–		–
Parameter length: 2 bytes								

Hex coding of the "SSI interface" parameter

The value listed in this table shows the hex coding of the default settings:

Module address	Coding Mode Resolution Update rate	Error bits
11	19	61

Input data

none

Output data

none

Notice!

Resolution and maximum position value which can be represented:

SSI setting	Max. distance which can be represented Metric	Max. distance which can be represented Inches (in)	
24-bit; resolution 0.1	1,677m	16,777in	≈ 426m
24-bit; resolution 0.01	167m	1,677in	≈ 42m
24-bit; resolution 0.001	16m	167in	≈ 4m
25-bit; resolution 0.1	3,355m	33,554in	≈ 852m
25-bit; resolution 0.01	335m	3,355in	≈ 85m
25-bit; resolution 0.001	33m	335in	≈ 8m
26-bit; resolution 0.1	6,710m	67,108in	≈ 1,704m
26-bit; resolution 0.01	671m	6,710in	≈ 170m
26-bit; resolution 0.001	67m	671in	≈ 17m

Table 8.5: SSI interface - resolution and maximum position value which can be represented

8.1.6.18 Module 18: Other

Description

Parameters for general operation are set in this module.

Parameter

Parameter	Description	Rel. addr.	Data type	Value	Default	Unit		CR to module
						metr.	inch	
a **Language selection**	Language selection for the display. A language which was selected via the display is overwritten by this parameter.	0.0 … 0.2	Bit	**000=0: English** 001=1: German 010=2: Italian 011=3: Spanish 100=4: French	**0**	–		–
b **Display illumination**	Off after 10 min. or always on.	0.3	Bit	**0: Off after 10 min.** 1: Always on	**0**	–		–
c **Display contrast**	Contrast setting of the display. The contrast changes under extreme ambient temperatures and can be adjusted with this parameter.	0.4 … 0.5	Bit	000=0: Weak **001=1: Medium** 010=2: Strong	**1**	–		–
d **Password protection**	Password protection on/off.	0.7	Bit	**0: OFF** 1: ON	**0**	–		–
e **Password**	Specifies the password. Password protection must be on.	1…2	unsign 16 bit	0000 … 9999	**0000**	–		–
Parameter length: 4 bytes								

Hex coding of the "other" parameter

The value listed in this table shows the hex coding of the default settings:

Module address	Language Display illumination Display contrast Password protection	Password
12	10	00

Input data

none

Output data

none

8.1.6.19 Module 19: RS 232 interface

Description

The parameters of the RS 232 interface can be set in this module. The **Unit**, **Offset** and **Count direction** parameters from module 1 also apply to the RS 232 interface.

If module 19 is not configured via the PROFIBUS, i.e. not integrated into the configuration, the RS 232 interface is deactivated by default. If the AMS 200 is operated without PROFIBUS only on the RS 232 interface, the interface must be activated via the display (**RS 232** parameter menu item).

Parameter

Parameter	Description	Rel. addr.	Data type	Value	Default	Unit		CR to module
						metr.	inch	
a **Address**	Address of the AMS 200 for serial communication	0.0 … 0.3	Bit	0 … 15	**0**	–		–
b **Baud rate**	Transmission rate on the RS 232 interface.	0.4 … 0.7	Bit	8: 19.2 **9: 38.4** 10: 57.6 11: 115.2	**9**	kBit/s		–
c **Format**	Data format of RS 232 communication.	1.0 … 1.3	Bit	**6: 8, n, 1** 8: 8, e, 1 10: 8, o, 1	**6**	–		–
d **Output cycle**	Output cycle on the RS 232 interface in multiples of the AMS 200 measurement cycle = approx. 1.7ms.	2	unsign 8 bit	1 … 20	**1**	–		–
e **Position resolution**	Resolution of the RS 232 position value.	3.0 … 3.2	Bit	2: 0.01 **3: 0.1** 4: 1 5: 10	**3**	mm	in/100	–
f **Velocity resolution**	Resolution of the RS 232 velocity value.	3.3 … 3.4	Bit	**1: 1** 2: 10 3: 100	**1**	mm /s	(in/100) /s	–
Parameter length: 4 bytes								

Hex coding of the "RS 232 interface" parameter

The value listed in this table shows the hex coding of the default settings:

Module address	Address Baud rate	Format	Output cycle	Position resolution Velocity resolution
13	**90**	**06**	**01**	**0B**

Input data

none

Output data

none

8.2 SSI

8.2.1 General information about the transmission procedure

Data communication of the SSI interface is based on differential transmission as used for RS 422 interfaces. Transmission of the position value, beginning with the MSB (most significant bit), is thus synchronised with a clock cycle (CLOCK) specified by the control.

In the quiescent state both the clock line as well as the data line are at HIGH level. At the first HIGH-LOW edge (point ① in figure 8.6) the data in the internal register are stored. Thus it is ensured that the data cannot change during serial transmission.

When the next clock signal change from LOW to HIGH level (point ② in figure 8.6) occurs transmission of the position value begins with the most significant bit (MSB). With each successive change of the clock signal from LOW to HIGH level the next least-significant bit is transmitted on the data line. After the least significant bit (LSB) has been output, the clock signal switches from LOW to HIGH for one last time and the data line switches to LOW level (end of transmission).

A monoflop retriggered by the clock signal determines the time span before the SSI interface can be called for the next transmission. This results in the minimum pause time between two successive clock cycles. If time t_m = 20 µs has elapsed, the data line is returned to the quiescent level (HIGH) (point ③ in figure 8.6). This signals completed data communication and that the device is again ready for transmission.

Notice!

If the off-cycle of data transmission is interrupted for longer than t_m = 20µs, the next cycle will begin with a completely new transmission cycle with a newly calculated value.

If a new transmission cycle is started before time t_m has elapsed, the previous value is output again.

Attention!

The SSI interface can only represent positive distance values. If negative output values are ascertained due to the offset or count direction, a zero value is output at the SSI interface! In the event of a number overflow, all data bits are set to "1".

8.2.1.1 SSI sequence diagram

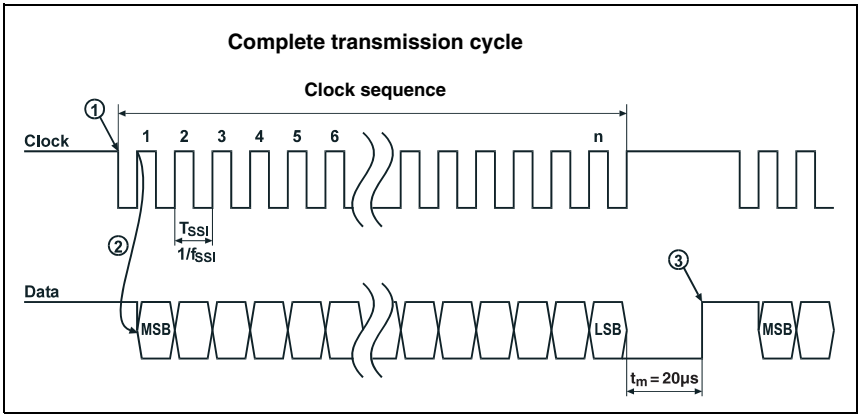


Figure 8.6: SSI data transmission sequence diagram

Notice!

*In the default setting the **LSB** bit is the error bit.*

Attention!

***Significance of the error bit**:*
By default a 25th error bit (LSB) is appended to the 24-bit measurement value.
The error bit is not included in the Gray coding of the measurement value.
The error bit is 1 = active, 0 = not active.

Notice!

The data can be read out with a clock rate between 80kHz and 800kHz.

Attention!

***Updating the measurement values on the SSI interface of the AMS 200**:*
The measurement value on the SSI interface of the AMS 200 is updated every 1.6ms (default) independent of the clock frequency.
The update rate on the interface can be reduced to 0.2ms via the display under the SSI menu item or in PROFIBUS module 17.
The shorter update rate is only valid for the SSI interface and has no influence on the PROFIBUS DP interface.

8.2.1.2 Cable length as a function of the data rate

Only shielded and twisted pair lines (pin 1 with 2 and pin 3 with 4) are permitted as data lines for the SSI interface (see chapter 8.2.2 "SSI - Electrical connection").

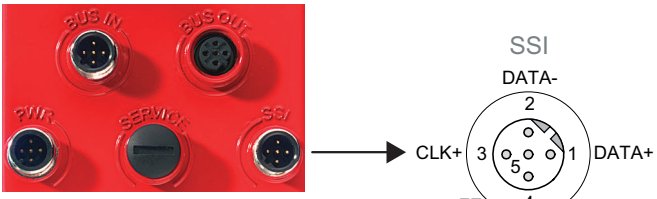
- *The shielding must be connected at both ends.*
- *Do not lay the cable parallel to power cables.*

The maximum possible cable length is dependent on the cable used and the clock rate:

Data rate	80kBit/s	100kBit/s	200kBit/s	300kBit/s	400kBit/s	500kBit/s	1,000kBit/s
Max. cable length (typical)	500m	400m	200m	100m	50m	25m	10m

Table 8.7: Max. cable length as a function of the clock rate

8.2.2 SSI - Electrical connection



SSI connector (5-pin plug, B-coded)		
Pin	**Name**	**Remarks**
1	**DATA+**	+ Data line SSI (output)
2	**DATA-**	- Data line SSI (output)
3	**CLK+**	+ Clock line SSI (input electrically insulated)
4	**CLK-**	- Clock line SSI (input electrically insulated)
5	**FE**	Functional earth
Thread	**FE**	Functional earth (housing)

Figure 8.8: SSI - electrical connection

Notice!

To connect the SSI interface we recommend our ready-made SSI cables, see "Order codes for interface connection cables" on page 105.

8.2.3 Notice regarding software parameters

Attention!

***Using the PROFIBUS and SSI interface simultaneously**:*
The SSI interface settings are performed by the PROFIBUS. If settings which differ from the default settings for the parameters, are to be used, they must be configured via module 17 (SSI interface).

***Using the SSI interface without PROFIBUS**:*
For this operating mode deactivate the PROFIBUS via the display (PROFIBUS = OFF).
Default parameters are stored in the laser measurement system for the sole use of the SSI interface. The preset default parameters can be changed at any time via the display.
This also applies when using parameters which do not relate directly to the SSI interface (for example: I/O 1 or I/O 2, position value or others).
The SSI interface remains active even during parameter enabling. Changes to parameters have an immediate effect.

8.2.4 Default settings of the SSI interface

Default parameters which apply only to the SSI interface.	
SSI activation	ON
Measurement value coding	Gray
Transmission mode	24-bit measurement value + 1-bit error (error: 1 = active), error bit = LSB
Resolution	0.1mm
Default error bit	Plausibility error or hardware error
Update rate	1.6ms
Default parameters which apply to both PROFIBUS and SSI.	
Measurement unit	Metric
Count direction	Positive (the SSI interface cannot represent negative values)
I/O 1	Output – plausibility error or hardware error
I/O 2	Output – temperature error, intensity error or laser prefailure message
Static preset	+000.000
Dynamic preset	+000.000
Position limit value range 1	Lower limit and upper limit: both 0
Position limit value range 2	Lower limit and upper limit: both 0
Error handling procedures	Position output: 0
	Suppress position status: active
	Position suppression time: 100ms
Display language	English
Display illumination	OFF after 10min.
Display contrast	Medium
Password protection	Off
Password	0000

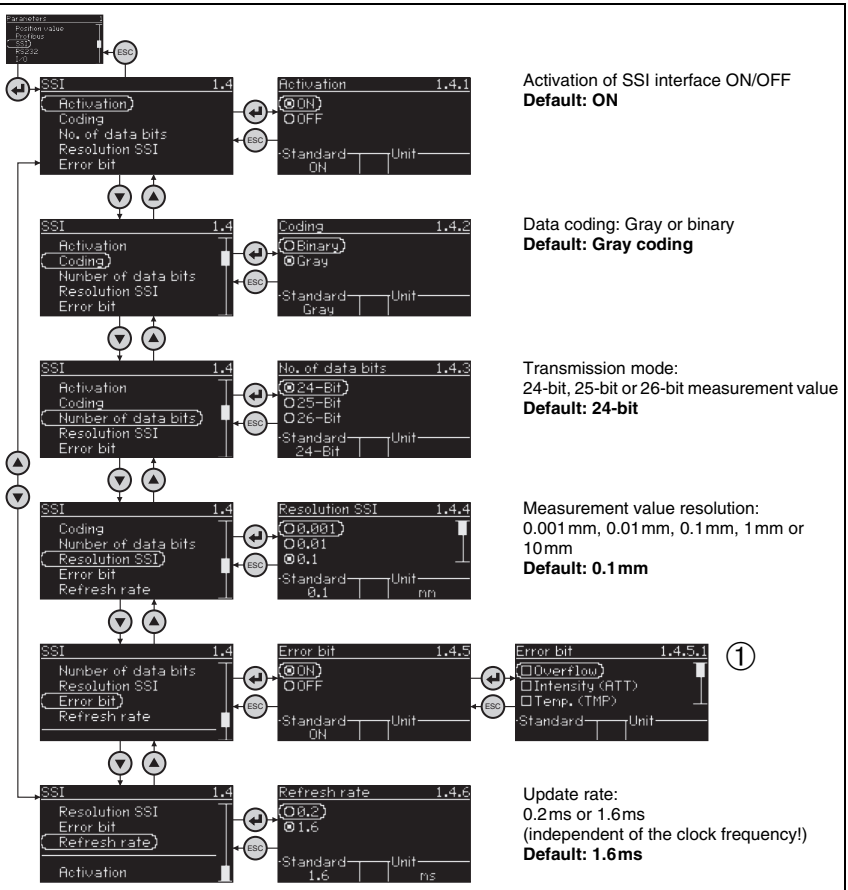
Table 8.9: Default settings of the SSI interface

8.2.5 Changing the SSI default settings via the display

Notice!

For basic operation of the display please refer to chapter 6.3.2.
In order to change the parameters please activate parameter enabling.
The SSI interface remains active even during parameter enabling. Changes to parameters have an immediate effect.

8.2.6 SSI parameter display



① Error bit: ON or OFF, **default: ON**
Error bit is set in the event of overflow or intensity (ATT) or excess temperature (TMP) or laser prefailure warning (LSR) or plausibility error (PLB) or hardware error (ERR).
Default: Plausibility error (PLB) or hardware error (ERR).

Figure 8.10: SSI parameter display

8.3 Interbus

8.3.1 General information

The AMS 200/xxx**-20**-(H) is designed as an Interbus device. The functionality of the AMS 200 is thereby permanently defined by default settings.

The baud rate of the data to be transferred is 500 kbit/s.

The RS 232 interface available on the AMS 200 can be used simultaneously with the Interbus interface. The SSI interface cannot be used.

8.3.2 Activation/deactivation of the Interbus interface on the AMS 200

Notice!

*The Interbus interface can be activated/deactivated via the display. With the Interbus activated, the **IBS** lettering is visible on the display. By default the Interbus interface is activated and the RS 232 interface is deactivated.*

If Interbus "**OFF**" is switched, the **IBS** lettering is also deactivated on the display.

Continuing participants are addressed even with the Interbus deactivated.

A deactivated AMS 200 can be recognised on the process data monitor of the Interbus master by means of the data double word 80 00 00 00_H.

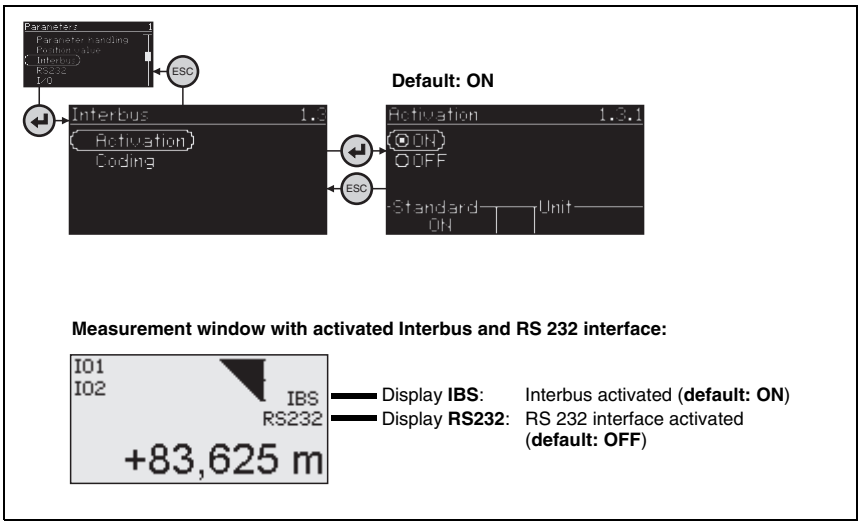


Figure 8.11: Interbus activation

8.3.3 Indicator LEDs

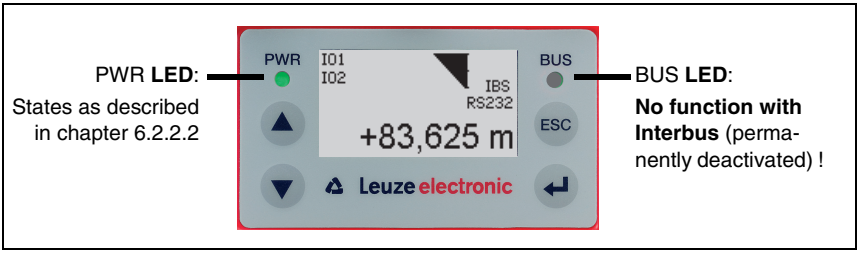


Figure 8.12: Indicator LEDs of Interbus version

8.3.4 Interbus - Electrical connection

8.3.4.1 BUS IN and BUS OUT connections

BUS IN (5-pin plug, B-coded)		
Pin	**Name**	**Remarks**
1	**DO**	From the Interbus master
2	**/DO**	From the Interbus master - inverted
3	**DI**	To the Interbus master
4	**/DI**	To the Interbus master - inverted
5	**Data GND**	Data Ground
Thread	**SHIELD**	Shield via RC element on the housing

BUS OUT (5-pin socket, B-coded)		
Pin	**Name**	**Remarks**
1	**DO**	From the Interbus master
2	**/DO**	From the Interbus master - inverted
3	**DI**	To the Interbus master
4	**/DI**	To the Interbus master - inverted
5	**Data GND**	Data Ground
Thread	**SHIELD**	Shield directly on the housing

Figure 8.13: Interbus - BUS IN and BUS OUT electrical connections

Notice!

*For connecting **BUS IN** and **BUS OUT** we recommend our ready-made Interbus cables (see chapter 10.8 "Accessory ready-made cables for interface connection" on page 103).*

Attention!

*The laser measurement system can be used to branch out the Interbus network. The **continuing network** is connected via **BUS OUT**.*
The integrated SUPI (Serial Universal Peripheral Interface) automatically detects whether additional participants are connected to BUS OUT. Termination of BUS OUT is not necessary.

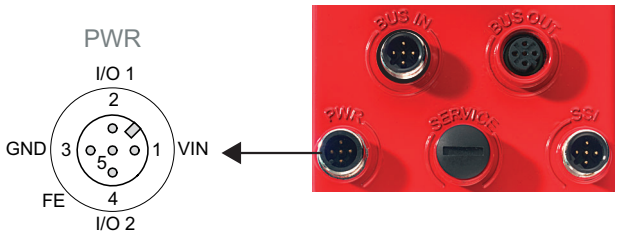
8.3.4.2 Shielding and grounding concept

The cable shielding must be concentric and have the largest possible surface area on the M12 connector (thread).

The M12 thread for BUS IN is connected to the functional earth (FE) inside the AMS 200 via an RC element (1MΩ || 15nF).

The M12 thread for BUS OUT is conductively connected to the housing and is thus directly connected to the functional earth (FE).

8.3.4.3 PWR connection



PWR (5-pin plug, A-coded)		
Pin	**Name**	**Remarks**
1	**VIN**	Positive supply voltage +18 … +30 VDC
2	**I/O 1**	Input/output 1, **by default:** **Input**: low (0 V) = laser on, high (VIN) = laser off
3	**GND**	Supply voltage 0 VDC
4	**I/O 2**	Input/output 2, **by default:** **Output**: low (0 V) = velocity limit value exceeded high (VIN) = below velocity limit value
5	**FE**	Functional earth
Thread	**FE**	Functional earth (housing)

Figure 8.14: Interbus - electrical connection PWR

Notice!

Input I/O 1 (pin 2) - laser ON/OFF:

*If the laser diode of the AMS 200 is deactivated, the data double word A0 00 00 00_H is transferred. In this case, bit 31 is permanently set to logic **1** and message "**PLB**" is transferred; the values of the four bytes are thus A0 00 00 00_H (see chapter 8.3.6 "Data format - 32-bit input data").*

8.3.5 Ident number of the AMS 200/xxx-20-(H)

The AMS 200 is classified with Interbus **Ident-Code No. 32_H**.

The classification describes the AMS 200 as a remote bus participant with 32-bit input data.

8.3.6 Data format - 32-bit input data

byte 0								byte 1								byte 2								byte 3							
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0
"1" level	**ERR**	**PLB**	**ATT**	**LSR**	**TMP**	**Reserved**	**Reserved**	**Sign**	**MSB measurement value**							**Measurement value, Gray coded, resolution 1 mm**															**LSB measurement value**
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
MSB																															LSB

Table 8.15: Interbus data format - 32-bit input data

The AMS 200 makes available 32-bit input data. The breakdown of the 32 bits is shown in the above table.

The data format in detail:

Bit 0 … Bit 22 **Measurement value**:
Representation of the measured distance, Gray coded with a resolution of 1mm.
The coding of the measurement value can be switched from **Gray** (default) to **binary**. The setting can be found in the **Parameter** -> **Interbus** -> **Coding** menu.

Bit 23 **Sign** of the measured distance:
0 = positive distance value
1 = negative distance value (e.g. through the use of the offset function)

Bit 24 … Bit 25 Reserved, statically set to binary **0**

Bit 26 **TMP** - Temperature monitoring warning.
Above/below permissible internal device temperature.

Bit 27 **LSR** - Warning laser prefailure message.
Laser diode aged, device still functional,
please initiate replacement or repair.

Bit 28 **ATT** - Received signal warning.
Laser emission window or reflector dirty.

Bit 29 **PLB** - Plausibility error.
Implausible measurement value. Possible causes:
- Light beam interruption
- Measurement range exceeded
- Internal device temperature considerably above/below limit
- Traverse rate >10m/s.

Bit 30 **ERR** - Internal hardware error.
The device must be sent in for inspection.

Bit 31 Statically set to binary **1**

Notice!

The AMS 200 makes a new 32-bit long data set available every 1.6ms. Depending on the number of configured participants and the quantity of data to be transferred by the participants, the baud rate of 500kbit/s can result in the same data set of the AMS 200 being read multiple times in succession.

*With the Interbus deactivated (Interbus **OFF** via control panel/display), bit 31 remains statically set to binary **1**. Bit 30 … bit 0 are statically set to binary **0**.*

A deactivated AMS 200 can be recognised on the process data monitor of the Interbus master by means of the data double word 80 00 00 00_H.

Continuing participants are addressed even with the Interbus deactivated.

8.3.7 Default settings of the AMS 200/…-20…

Default parameters of the AMS 200/xxx-20-(H)	
Interbus activation [1)]	ON
RS232 activation [1)]	OFF
Ident-Code	32H
Number of data bits	32
Data breakdown	23-bit measurement value, 1-bit sign, 2-bit reserved, 3-bit pre-failure messages, 2-bit errors, 1-bit statically set to binary **1**
Measurement value representation [1)]	Gray
Unit [1)]	Metric
Resolution [1)]	1mm
Count direction [1)]	Positive
I/O 1 [1)]	Input LOW = laser on, HIGH = laser off
I/O 2 [1)]	Velocity monitoring output set to > 0.2m/s (configurable)
Static preset [1)]	+ 000.000
Dynamic preset [1)]	+ 000.000
Pos. limit value range 1 [1)]	Lower and upper limit, both 000.000
Pos. limit value range 2 [1)]	Lower and upper limit, both 000.000
Error handling procedures [1)]	Position output: 000.000 Position status suppression: active Error delay time: 100ms
Display language [1)]	English
Display illumination [1)]	Off after 10min.
Display contrast [1)]	medium
Password protection [1)]	Off
Password [1)]	0000

1) Parameter can be changed via the control panel/display

Table 8.16: Default settings of the Interbus interface

Notice!

The AMS 200 cannot be configured via the Interbus.

The settings labelled with footnote 1) can only be changed via the display. Changed parameters are stored in the AMS 200 and are reactivated following power off/on.

8.3.8 Configuration via the control panel/display

First, you must activate parameter enabling (ON).

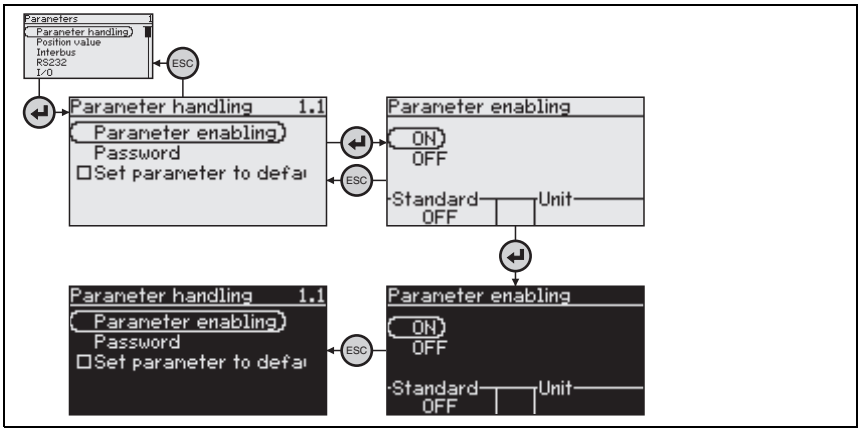


Figure 8.17: Parameter enabling

After enabling the parameters (display is inverted) the parameters shown in the following image can be changed.

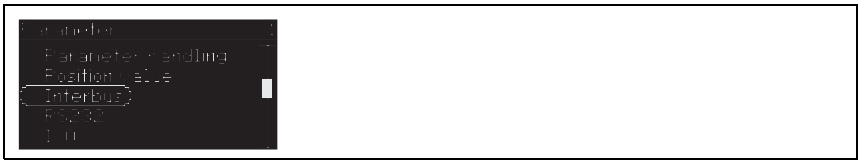


Figure 8.18: Interbus parameter

An overview of the parameter menu is included in the fold-out page behind the cover page of this technical description.

8.4 RS 232

8.4.1 General information

The AMS 200 offers the option of using the SERVICE M12 connection to communicate with other devices via an RS 232 interface. The RS 232 interface can be used as a full-fledged interface in parallel with the PROFIBUS, the SSI interface or the Interbus interface.

On delivery, the RS 232 interface is deactivated.

PROFIBUS If the RS 232 is used simultaneously with the PROFIBUS interface, activation is performed via the GSD file in module 19.

INTERBUS SSI If the RS 232 is used simultaneously with the Interbus or with the SSI interface, activation is performed via the display.

Notice!

Upon consultation with Leuze electronic, ***a MA… connector unit can be used to convert to the RS 485 or RS 422 interfaces****.*

8.4.2 Activation/deactivation of the RS 232 interface on the AMS 200

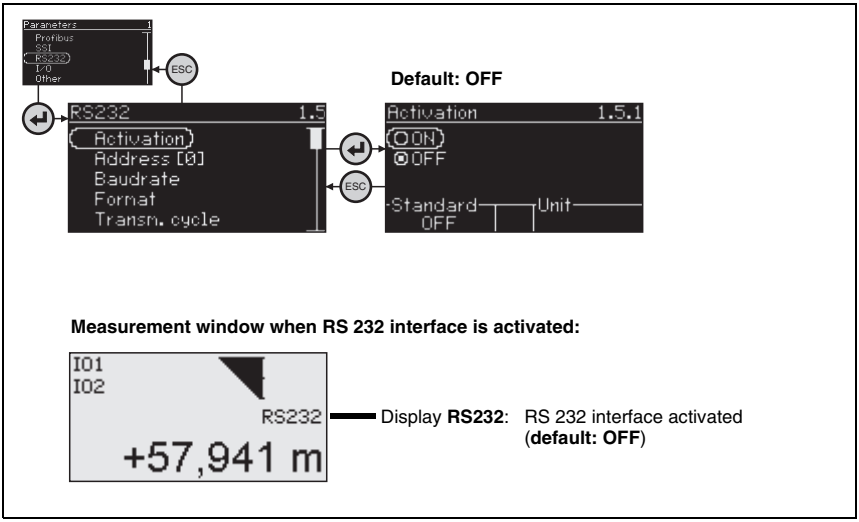
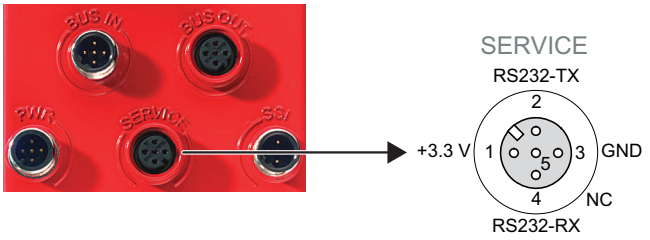


Figure 8.19: RS 232 activation

Notice!

With the RS 232 interface activated the ***RS232*** *lettering appears on the display.*

8.4.3 RS 232 - Electrical connection



RS 232 socket (5-pin socket, A-coded)		
Pin	**Name**	**Remarks**
1 [1)]	**+3.3V** [1)]	Voltage supply 3.3VDC [1)]
2	**RS232-TX**	Transmission line RS 232 interface
3	**GND**	Voltage supply 0VDC
4	**RS232-RX**	Receiving line RS 232 interface
5	**N.C.**	Not used
Thread	**FE**	Functional earth (housing)

1) Must not be connected/used!

Figure 8.20: RS 232 - electrical connection

Attention!
The RS 232 interface is not electrically insulated.
Line length should not exceed 10m.

8.4.4 Configuration via the control panel/display

Attention!

Simultaneous use of PROFIBUS and RS232

The settings of the RS 232 interface are performed by the PROFIBUS. For this purpose, module 19 must be activated. If parameters other than those specified in the default settings are used, they must be configured via module 19 (RS 232 interface).

Using the RS 232 interface without PROFIBUS

For this operating mode, default parameters are stored for the RS 232 interface by the laser measurement system. The preset default parameters can be changed at any time via the control panel/display.

This also applies when using parameters that do not directly affect the RS 232 interface. This RS 232 interface is also active during parameter enabling. Changes to parameters have an immediate effect.

Default settings of the RS232 interface

Designation	Default setting	Value range
Activation of the RS232	**OFF**	ON OFF
Address	**0**	0 … 15
Baud rate	**38.4kbit/s**	19.2kbit/s 38.4kbit/s 57.6kbit/s 115.2kbit/s
Format (number of data bits, parity **n**one/**e**ven/**o**dd, number of stop bits)	**8,n,1**	8,n,1 8,e,1 8, o, 1
Output cycles **(Value range 1 … 20) x 1.7ms**	**1**	1 … 20
Position resolution **Unit mm** Unit inch (in/100)	**0.1mm**	0.01 0.1 1 10
Velocity resolution **Unit mm/s** Unit inch/s (in/100)/s	**1mm/s**	1 10 100

Changing the RS 232 default settings via the control panel/display

Notice!

For basic operation of the display please refer to chapter 6.3.2. In order to change the parameters please activate parameter enabling. The RS 232 interface remains active even during parameter enabling. Changes to parameters have an immediate effect.

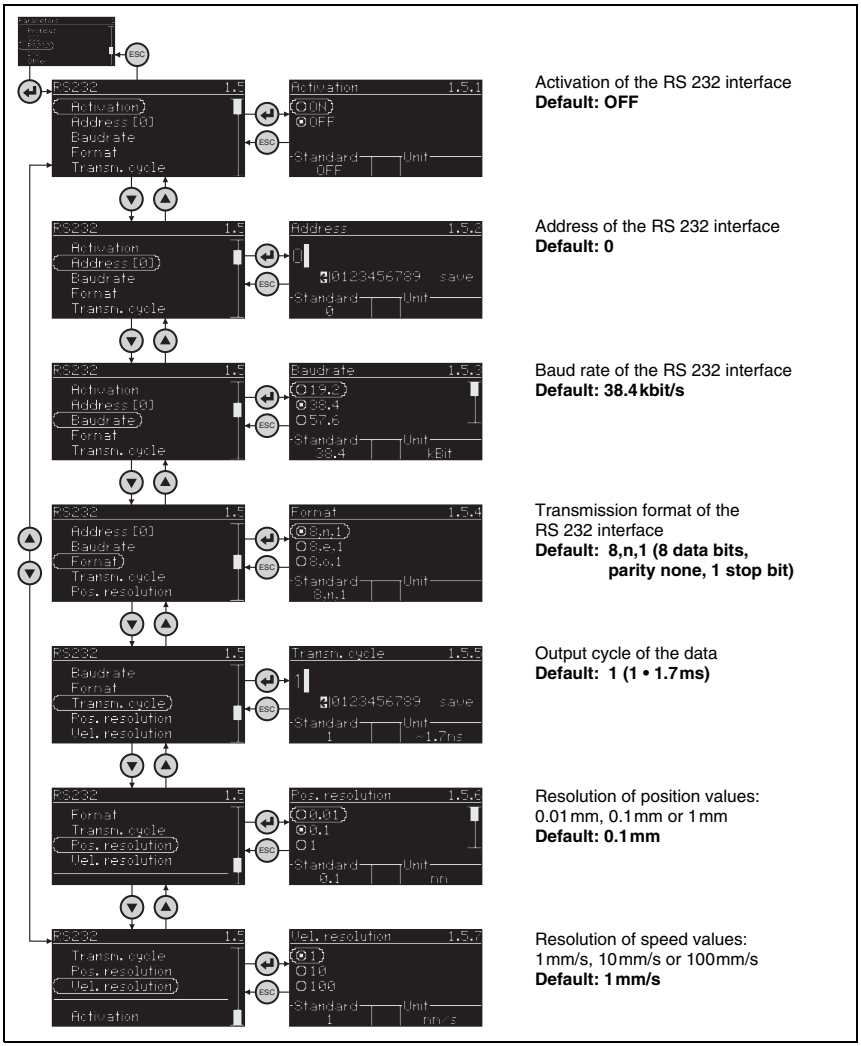


Figure 8.21: Display - RS 232 parameters

8.4.5 Communication protocol (binary protocol)

8.4.5.1 Querying AMS data (request)

The transfer of the measured distances, the speed or the control of the laser diode (ON/OFF) is controlled by a protocol which is 3-byte long.

Request structure

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	1	1	0	0	ADR	ADR	ADR	ADR
1	CMD	CMD	CMD	CMD	CMD	CMD	CMD	CMD
2	XOR	XOR	XOR	XOR	XOR	XOR	XOR	XOR

Function byte 0

ADR = address

Function byte 1

CMD = command

Bit coding	Hex coding	Function
1111 0001	$F1_H$	Transfer individual position value (single shot)
1111 0010	$F2_H$	Cyclically transfer position values (note **output cycle** parameter!)
1111 0011	$F3_H$	Stop cyclical transfer
1111 0100	$F4_H$	Laser diode on
1111 0101	$F5_H$	Laser diode off
1111 0110	$F6_H$	Transfer single speed value
1111 0111	$F7_H$	Cyclically transfer speed values (note **output cycle** parameter!)

Function byte 2

XOR link of byte 0 and byte 1

8.4.5.2 Response from the AMS 200

In the response telegram the AMS 200 transfers the available status information and the requested data.

Response structure

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	0	Laser	IO2	IO1	ADR	ADR	ADR	ADR
1	Ready	LSR	TMP	ERR	ATT	PLB	OVFL	SIGN
2	D23	D22	D21	D20	D19	D18	D17	D16
3	D15	D14	D13	D12	D11	D10	D09	D08
4	D07	D06	D05	D04	D03	D02	D01	D00
5	XOR	XOR	XOR	XOR	XOR	XOR	XOR	XOR

Function

Designation	Function
Laser	Laser status; 0 = laser on; 1 = laser off
IO1	IO1 status; 0 = signal level inactive, 1 = signal level active
IO2	IO2 status; 0 = signal level inactive, 1 = signal level active
ADR	Address 0 … 15, binary coding
Ready	AMS 200 status; 0 = not ready; 1 = ready
LSR	Laser prefailure message; 0 = OK; 1 = prefailure warning
TMP	AMS temperature range not maintained; 0 = OK; 1 = warning
ERR	Device error; 0 = OK; 1 = error
ATT	Decreasing signal level; 0 = OK; 1 = warning
PLB	Implausible measurement values; 0 = OK; 1 = warning
OVFL	Measurement value cannot be represented in 24 bits (overflow); 0 = OK; 1 = warning
SIGN	Measurement value sign; 0 = positive; 1 = negative
D23 … D00	Distance value or velocity value
XOR	XOR link of byte 0 through byte 4

9 Diagnostics and troubleshooting

9.1 General errors causes

Error	Possible error causes	Measures
PWR LED = "OFF"	• No supply voltage connected to the device. • Hardware error.	❑ Check device supply voltage. Send device to customer service.
PWR LED = "flashing red"	• Warning: Light beam interruption. • Warning: Plausibility error.	❑ Check alignment. ❑ Traverse rate >10m/s.
PWR LED = "permanently red"	• Hardware error.	❑ See display for error description. Send device to customer service.

9.2 Status displays on the AMS 200… display

Error	Possible error causes	Measures
PLB appears on the display	• Indicates that implausible measurement values have been ascertained. • Light beam interruption. • Perm. measurement range exceeded. • Temperature far outside the perm. range (Display: PLB+TMP).	❑ Check alignment. ❑ Check traverse rate >10m/s. ❑ Check whether the laser beam is always pointing on the reflector during travel. ❑ Restrict traversing path or select an AMS 200… with longer measurement range ❑ Ensure that the environmental conditions lie within the perm. range.
ATT appears on the display	• Indicates that the level of the received signal is in the warning range.	❑ Check alignment. ❑ Clean the optics of the AMS 200… ❑ Remove protective foil from reflector. ❑ Clean reflector surface.
TMP appears on the display	• Temperature outside the permissible parameters.	❑ Ensure that the environmental conditions lie within the perm. range.
LSR appears on the display	• Laser prefailure message.	Replace device at the next possible opportunity. Have replacement device ready.
ERR appears on the display	• Indicates a hardware error.	If necessary, send device to customer service.

9.3 PROFIBUS errors

Error	Possible error causes	Measures
No communication via PROFIBUS (BUS LED red)	• Incorrect wiring. • Wrong termination. • Incorrect PROFIBUS address set. • PROFIBUS deactivated. • Incorrect configuration.	❑ Check wiring. ❑ Check termination. ❑ Check PROFIBUS address. ❑ Activate PROFIBUS interface. ❑ Check configuration of the device in the configuration tool.
Sporadic errors at the PROFIBUS	• Incorrect wiring. • Wrong termination. • Effects due to EMC. • Overall network expansion exceeded.	❑ Check wiring. ❑ Check termination. ❑ Check shielding. ❑ Check grounding concept and connection to FE. ❑ Avoid EMC coupling caused by power cables laid parallel to device lines. ❑ Check max. network expansion as a function of the baud rate set.

9.4 SSI interface errors

Error	Possible error causes	Measures
No communication via SSI interface	• Incorrect wiring. • SSI interface deactivated. • Clock rate outside of permissible parameters. • SSI interface incorrectly configured.	❑ Check wiring. ❑ Activate SSI interface. ❑ Check limit values for clock rate. ❑ Check configuration.
Sporadic errors at the SSI interface	• Incorrect wiring. • Wrong termination. • Effects due to EMC. • Overall network expansion exceeded.	❑ Check wiring. ❑ In particular, check wire shielding. ❑ Check termination. ❑ Check cable used (see chapter 10.8). ❑ Check shielding (shield covering in place up to the clamping point). ❑ Check grounding concept and connection to FE. ❑ Check max. network expansion as a function of the clock rate set.

9.5 RS 232 interface errors

Error	Possible error causes	Measures
No communication via RS 232 interface	• Wiring/line length not correct. • Protocol structure incl. XOR not correct. • RS 232 interface is deactivated. • Interface parameters of AMS 200 and control do not match. • RS 232 output cycles are not adapted to the control. • RS 232 parameters have not been defined via module 19 (for simultaneous use of PROFIBUS and RS 232). • Laser diode is deactivated by means of parameters.	❑ Check wiring/line length. ❑ Note protocol structure (see chapter 8.4.5). ❑ Activate RS 232 interface (RS232 appears on the display). ❑ Check interface parameters. ❑ Adapt output cycle parameters. ❑ Activate module 19 in the PROFIBUS master and check parameters. ❑ Switch on laser diode.
Sporadic errors at the RS 232 interface	• Effects due to EMC.	❑ Lay data lines separately from supply lines, check shielding, check grounding concept and connection to FE.

9.6 Interbus interface errors

Error	Possible error causes	Measures
No communication via Interbus interface	• Incorrect wiring. • Interbus interface deactivated. • Ident no. 32H for AMS 200 is not stored in the control. • Laser diode is deactivated via input **I/O 1**.	❑ Check wiring. ❑ Activate Interbus interface (IBS appears on the display). ❑ Store ident no. 32H for the AMS 200 in the control. ❑ Switch on laser diode.
Sporadic errors at the Interbus interface	• Effects due to EMC.	❑ Lay data lines separately from supply lines, check shielding, check grounding concept and connection to FE.

Notice!

*Please use **pages 98, 99 and 99 as a master copy** should servicing be required.*
Mark the items in the "Measures" column which you have already examined, fill out the following address field and fax both pages together with your service contract to the fax number listed below.

Customer data (please complete)

Device type:	
Company:	
Contact person/ Department:	
Phone (direct):	
Fax:	
Street / No:	
ZIP code/City:	
Country:	

Leuze Service fax number:

+49 7021 573 - 199

10 Type overview and accessories

10.1 Overview of AMS 200…types

Part No.	Type designation	Remarks
50103156	AMS 200/40-11	40m operating range, PROFIBUS, SSI and RS 232 interfaces
50103157	AMS 200/120-11	120m operating range, PROFIBUS, SSI and RS 232 interface
50103158	AMS 200/200-11	200m operating range, PROFIBUS, SSI and RS 232 interfaces
50103159	AMS 200/40-11-H	40m operating range, PROFIBUS, SSI and RS 232 interface, heating
50103160	AMS 200/120-11-H	120m operating range, PROFIBUS, SSI and RS 232 interface, heating
50103161	AMS 200/200-11-H	200m operating range, PROFIBUS, SSI and RS 232 interface, heating
50108137	AMS 200/40-20	40m operating range, Interbus and RS 232 interface
50108136	AMS 200/120-20	120m operating range, Interbus and RS 232 interface
50108135	AMS 200/200-20	200m operating range, Interbus and RS 232 interface
50108134	AMS 200/40-20-H	40m operating range, Interbus and RS 232 interface, heating
50108133	AMS 200/120-20-H	120m operating range, Interbus and RS 232 interface, heating
50108131	AMS 200/200-20-H	200m operating range, Interbus and RS 232 interface, heating

10.2 Overview of reflector types

Part No.	Type designation	Remarks
50104361	Reflective tape 200x200-S	Reflective tape, 200x200mm, self-adhesive
50104362	Reflective tape 500x500-S	Reflective tape, 500x500mm, self-adhesive
50104363	Reflective tape 749x914-S	Reflective tape, 749x914mm, self-adhesive
50108988	Reflective tape 914x914-S	Reflective tape, 914x914mm, self-adhesive
50104364	Reflective tape 200x200-M	Reflective tape, 200x200mm, affixed to aluminium plate
50104365	Reflective tape 500x500-M	Reflective tape, 500x500mm, affixed to aluminium plate
50104366	Reflective tape 914x914-M	Reflective tape, 914x914mm, affixed to aluminium plate

10.3 Accessory mounting bracket

Part No.	Type designation	Remarks
50107255	MW OMS/AMS 01	Mounting bracket for mounting the AMS 200 on horizontal surfaces

10.4 Accessory deflector unit

Part No.	Type designation	Remarks
50104479	US AMS 01	Deflector unit with integrated mounting bracket for 90° deflection of the laser beam
50035630	US 1 OMS	Deflector unit without mounting bracket for 90° deflection of the laser beam

10.5 Accessory PROFIBUS terminating resistor

Part No.	Type designation	Remarks
50038539	TS 02-4-SA	M12 connector with integrated terminating resistor for BUS OUT

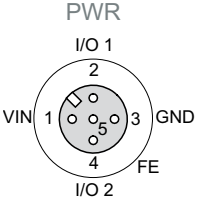
10.6 Accessory connectors

Part No.	Type designation	Remarks
50038538	KD 02-5-BA	M12 connector socket for BUS IN or SSI interface
50038537	KD 02-5-SA	M12 connector pin for BUS OUT
50020501	KD 095-5A	M12 connector for voltage supply

10.7 Accessory ready-made cables for voltage supply

10.7.1 Contact assignment of PWR connection cable

PWR connection cable (5-pin socket, A-coded)



M12 socket (A-coded)

Pin	Name	Core colour
1	VIN	**brown**
2	I/O 1	**white**
3	GND	**blue**
4	I/O 2	**black**
5	FE	**grey**
Thread	FE	**bare**

10.7.2 Technical data for voltage supply cable

Operating temperature range in rest state: -30°C … +70°C
in motion: -5°C … +70°C

Material Sheathing: PVC

Bending radius > 50mm

10.7.3 Order codes for voltage supply cables

Part No.	Type designation	Remarks
50104557	K-D M12A-5P-5m-PVC	M12 socket for PWR, axial connector, open line end, cable length 5m
50104559	K-D M12A-5P-10m-PVC	M12 socket for PWR, axial connector, open line end, cable length 10m

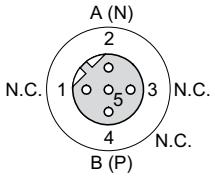
10.8 Accessory ready-made cables for interface connection

10.8.1 General information

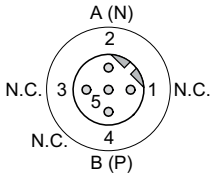
- **KB PB…** cable for connecting to the BUS IN/BUS OUT M12 connector
- **KB SSI…** cable for connecting to the SSI M12 connector
- Standard cables available in lengths from 2 … 30m
- Special cables on request.

10.8.2 Contact assignment for PROFIBUS connection cable KB PB…

PROFIBUS connection cable (5-pin socket/connector, B-coded)

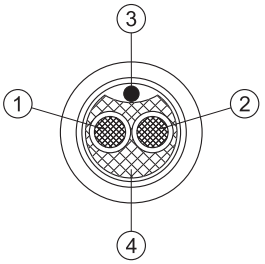


M12 socket (B-coded)



M12 plug (B-coded)

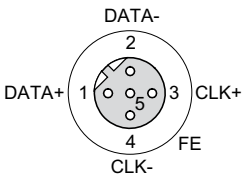
Pin	Name	Core colour
1	N.C.	–
2	A (N)	**green**
3	N.C.	–
4	B (P)	**red**
5	N.C.	–
Thread	FE	**bare**

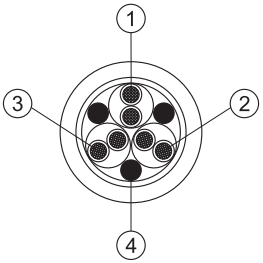


1 Conductor with **red** insulation
2 Conductor with **green** insulation
3 Drain wire
4 Fibrous fleece

Figure 10.1: Cable structure of PROFIBUS connection cable

10.8.3 Contact assignment for SSI/Interbus connection cable KB SSI/IBS…

SSI/IBS connection cable (5-pin socket, B-coded)			
 **M12 socket (B-coded)**	**Pin**	**Name**	**Core colour**
	1	DATA+	**yellow**
	2	DATA-	**green**
	3	CLK+	**grey**
	4	CLK-	**pink**
	5	FE	**brown**
	Thread	FE	**bare**



1 Conductor pair with **white/brown** insulation
2 Conductor pair with **green/yellow** insulation
3 Conductor pair with **grey/pink** insulation
4 Filler (polyester threads)

All conductor pairs stranded,
colours acc. to DIN 47100

Figure 10.2: Cable structure of SSI/IBS connection cable

10.8.4 Technical data of interface connection cable

Operating temperature range	in rest state: -40°C … +80°C in motion: -5°C … +80°C
Material	The lines comply with the PROFIBUS requirements, free of halogens, silicone and PVC
Bending radius	> 80mm, suitable for drag chains

10.8.5 Order codes for interface connection cables

Part No.	Type designation	Remarks
50104181	KB PB-2000-BA	M12 socket for BUS IN, axial connector, open line end, cable length 2m
50104180	KB PB-5000-BA	M12 socket for BUS IN, axial connector, open line end, cable length 5m
50104179	KB PB-10000-BA	M12 socket for BUS IN, axial connector, open line end, cable length 10m
50104178	KB PB-15000-BA	M12 socket for BUS IN, axial connector, open line end, cable length 15m
50104177	KB PB-20000-BA	M12 socket for BUS IN, axial connector, open line end, cable length 20m
50104176	KB PB-25000-BA	M12 socket for BUS IN, axial connector, open line end, cable length 25m
50104175	KB PB-30000-BA	M12 socket for BUS IN, axial connector, open line end, cable length 30m
50104188	KB PB-2000-SA	M12 socket for BUS OUT, axial connector, open line end, cable length 2m
50104187	KB PB-5000-SA	M12 socket for BUS OUT, axial connector, open line end, cable length 5m
50104186	KB PB-10000-SA	M12 socket for BUS OUT, axial connector, open line end, cable length 10m
50104185	KB PB-15000-SA	M12 socket for BUS OUT, axial connector, open line end, cable length 15m
50104184	KB PB-20000-SA	M12 socket for BUS OUT, axial connector, open line end, cable length 20m
50104183	KB PB-25000-SA	M12 socket for BUS OUT, axial connector, open line end, cable length 25m
50104182	KB PB-30000-SA	M12 socket for BUS OUT, axial connector, open line end, cable length 30m
50104096	KB PB-1000-SBA	M12 connector + M12 socket for PROFIBUS, axial connectors, cable length 1m
50104097	KB PB-2000-SBA	M12 connector + M12 socket for PROFIBUS, axial connectors, cable length 2m
50104098	KB PB-5000-SBA	M12 connector + M12 socket for PROFIBUS, axial connectors, cable length 5m
50104099	KB PB-10000-SBA	M12 connector + M12 socket for PROFIBUS, axial connectors, cable length 10m
50104100	KB PB-15000-SBA	M12 connector + M12 socket for PROFIBUS, axial connectors, cable length 15m
50104101	KB PB-20000-SBA	M12 connector + M12 socket for PROFIBUS, axial connectors, cable length 20m
50104174	KB PB-25000-SBA	M12 connector + M12 socket for PROFIBUS, axial connectors, cable length 25m
50104173	KB PB-30000-SBA	M12 connector + M12 socket for PROFIBUS, axial connectors, cable length 30m
50104172	KB SSI/IBS-2000-BA	M12 socket, B-coded, for SSI/Interbus, axial connector, open line end, cable length 2m
50104171	KB SSI/IBS-5000-BA	M12 socket, B-coded, for SSI/Interbus, axial connector, open line end, cable length 5m
50104170	KB SSI/IBS-10000-BA	M12 socket, B-coded, for SSI/Interbus, axial connector, open line end, cable length 10m
50104169	KB SSI/IBS-15000-BA	M12 socket, B-coded, for SSI/Interbus, axial connector, open line end, cable length 15m
50104168	KB SSI/IBS-20000-BA	M12 socket, B-coded, for SSI/Interbus, axial connector, open line end, cable length 20m
50108447	KB SSI/IBS-25000-BA	M12 socket, B-coded, for SSI/Interbus, axial connector, open line end, cable length 25m
50108446	KB SSI/IBS-30000-BA	M12 socket, B-coded, for SSI/Interbus, axial connector, open line end, cable length 30m
50108595	KB IBS-2000-SA	M12 connector, B-coded, for Interbus, axial connector, open line end, cable length 2m
50108596	KB IBS-5000-SA	M12 connector, B-coded, for Interbus, axial connector, open line end, cable length 5m
50108597	KB IBS-10000-SA	M12 connector, B-coded, for Interbus, axial connector, open line end, cable length 10m
50108598	KB IBS-15000-SA	M12 connector, B-coded, for Interbus, axial connector, open line end, cable length 15m

50108599	KB IBS-20000-SA	M12 connector, B-coded, for Interbus, axial connector, open line end, cable length 20m
50108600	KB IBS-25000-SA	M12 connector, B-coded, for Interbus, axial connector, open line end, cable length 25m
50108601	KB IBS-30000-SA	M12 connector, B-coded, for Interbus, axial connector, open line end, cable length 30m

11 Maintenance

With normal use, the AMS 200… laser measurement system does not require any maintenance by the operator.

11.1 Cleaning

- *In the event of dust build-up or if the (ATT) warning message is displayed, clean the device with a soft cloth; use a cleaning agent (commercially available glass cleaner) if necessary.*
- *Also check the reflector for possible soiling.*

Attention!

Do not use solvents and cleaning agents containing acetone. Use of such solvents could blur the reflector, the housing window and the display.

11.2 Repairs and maintenance

Attention!

Access to or changes on the device, except where expressly described in this operating manual, are not authorised.
The device must not be opened. Failure to comply will render the guarantee void. Warranted features cannot be guaranteed after the device has been opened.

Repairs to the device must only be carried out by the manufacturer.

Contact your Leuze distributor or service organisation should repairs be required.
For addresses please refer to the inside cover of this operating manual.

12 Appendix

12.1 EU Declaration of Conformity

Leuze electronic

the sensor people

EG-Konformitätserklärung

EC-Declaration of Conformity

Der Hersteller:
The Manufacturer:

Leuze electronic GmbH + Co. KG
In der Braike 1
73277 Owen / Teck
Deutschland

erklärt unter alleiniger Verantwortung, dass die folgenden Produkte:
declares under its sole responsibility that the following products:

Gerätebeschreibung:
Description of Product:

AMS 200/xxx-xx-x Optisches Entfernungsmeßsystem
Optical distance measurement system

folgenden Richtlinien und Normen entsprechen.
are in conformity with the following standards and directives.

Angewandte EG-Richtlinie(n):
Applied EC-Directive(s):

2004/108/EG EMV-Richtlinie / *EMC Directive*

Angewandte harmonisierte Normen:
Applied harmonized standards:

EN 61000-6-2:2005 EMV-Fachgrundnorm Störfestigkeit (Industrie)
Immunity standard for industrial environments

EN 61000-6-4:2007 EMV-Fachgrundnorm Störaussendung (Industrie)
Emission standard for industrial environments

Sonstige angewandte Normen:
Other applied standards:

EN 60825-1:1994 + A1:2002 + A2:2001 Sicherheit von Lasereinrichtungen
Safety of laser products

Leuze electronic GmbH + Co. KG
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73277 Owen / Teck
Deutschland

Owen, den 24. 2008

Dr. Harald Grübel (Geschäftsführer)
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