



Laser Measuring Device OMS2/120 PB OMS2/170 PB

Technical Description
for the
Profibus DP- and SSI-Interface



Imprint

Leuze electronic GmbH + Co KG

Postfach 11 11, D-73277 Owen/Teck

In der Braike1, D-73277 Owen/Teck

Tel.: (0049) 07021/5730

Fax: (0049) 07021/573199

E-mail: info@leuze.de

<http://www.leuze.de>

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Revision index

Revision	Date
- Revision of the warning label in chapter "Intended purpose"	17.12.2003
New functions in the module "Error Display": <ul style="list-style-type: none">• Warning Bit "Speed"• Warning Bit "Fail Plausibility Measured Value"	01.12.2004

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Transportation / Storage

Transport instructions

Do not drop the device or expose it to shocks or vibrations!

Device contains an optical system with glass elements.

Only use the original packaging!

The wrong packaging material can cause damage to the device during transportation.

Storage

Storage temperature : -20 to +75°C

Store in dry conditions.

1 Safety

1.1 General risk potential

The Laser Measuring Device OMS2 Profibus cannot be operated independently, but is installed as part of an overall system usually consisting of several interacting components. For this reason, the laser measuring device is not equipped directly with a protective device.



Warning

The corresponding measures must be taken in order to avoid person and property damages.

However, different error reports can be read out via an error message. It is therefore essential **to integrate the error reports into your own safety system** via the evaluation software (e.g. a PLC).

All persons responsible for the assembly, start-up and operation of the device must

- be suitably qualified
- adhere strictly to this operating manual.

Your safety and the safety of your equipment depends on this!

1.2 Safety information

This operating manual contains information which must be observed in the interests of your own personal safety and that of your equipment. The safety hints are emphasised by a warning triangle and classified according to the degree of danger as follows:



Warning

means that failure to take the relevant safety precautions can lead to serious damage to property or injuries.



Note

refers to important information and features of the product, plus tips on its application.

1.2.1 Hints on installation

Since the Laser Measuring Device is normally used as part of a larger system, these hints are merely intended as a guide for integrating the device safely into its environment.



Warning

- During the operation of the Laser Measuring Device it isn't allowed to interrupt the laser beam. If it comes nevertheless to an interruption, at the restart of the automatic operation mode first the validity (plausibility) of the measured value has to be checked.
- Precautionary measures must be taken to allow an interrupted program to be properly resumed following a voltage drop or failure. Dangerous operating conditions must not be permitted to arise even for short periods. If necessary, an **"EMERGENCY STOP"** must be forced.
- EMERGENCY STOP devices according to EN 60204/IEC 204 (VDE 0113) must remain operational in all operating modes of the programmable controller. The release of the EMERGENCY STOP devices must not trigger an uncontrolled or undefined reactivation of the equipment.
- The safety and accident prevention regulations applicable to the specific application must be observed.
- In the case of permanently installed plants or systems without an all-pole mains switch and/or fuses, one of these devices must be installed accordingly and the equipment connected to a PE conductor.
- In the case of 24 V supplies, make sure the extra-low voltage is reliably disconnected. Only use power supply units manufactured to the standards IEC 364 - 4 - 41 / HD 384.04.41 (VDE 0100 Part 410).
- Fluctuations or deviations of the supply voltage from the nominal value must not exceed the tolerance limits stated in the specifications, otherwise operational failures and dangerous states in the electrical assemblies cannot be ruled out.
- Connecting and signal wires must be installed in such a way as to prevent the automation functions from being hampered by inductive and capacitive interference.
- The units of the automation system and their operating elements must be installed in such a way as to ensure adequate protection against accidental actuation.
- In order to prevent a wire or strand breakage on the signal side from causing undefined states in the programmable controller, suitable hardware and software safety precautions must be taken with regard to the I/O interface.

1.2.1.1 General interference suppression measures

- Lay the (shielded) connecting cable to the device at a sufficient distance or in a separate room from any power cables which are subject to interference. Otherwise the data transmission of the measured value can be interfered.
- To ensure reliable data transmission, use fully shielded cables and make sure they are well earthed. For differential data transfer (SSI, Profibus), twisted-pair wires must be used in addition. For the Profibus absolutely the installation requirements (bus cable, line length, shielding etc.) specified in the EN 50170 standard are to be considered.
- Use a minimum cable cross-section of 0.22 mm² for data transfer purposes.
- Avoid crossing cables where possible. If unavoidable, only cross them at right-angles.
- Especially with the SSI interface it has to be taken care that the screen cover of the SSI signal lines Clock+/- and Data+/- reaches as near as possible to the connection place. A screen-free wiring of longer than 10cm (approximate value) must be avoided.
- Ensure continuous wiring of the shield and a large contact area on special shield clampings or cable screw glands (see arrows).

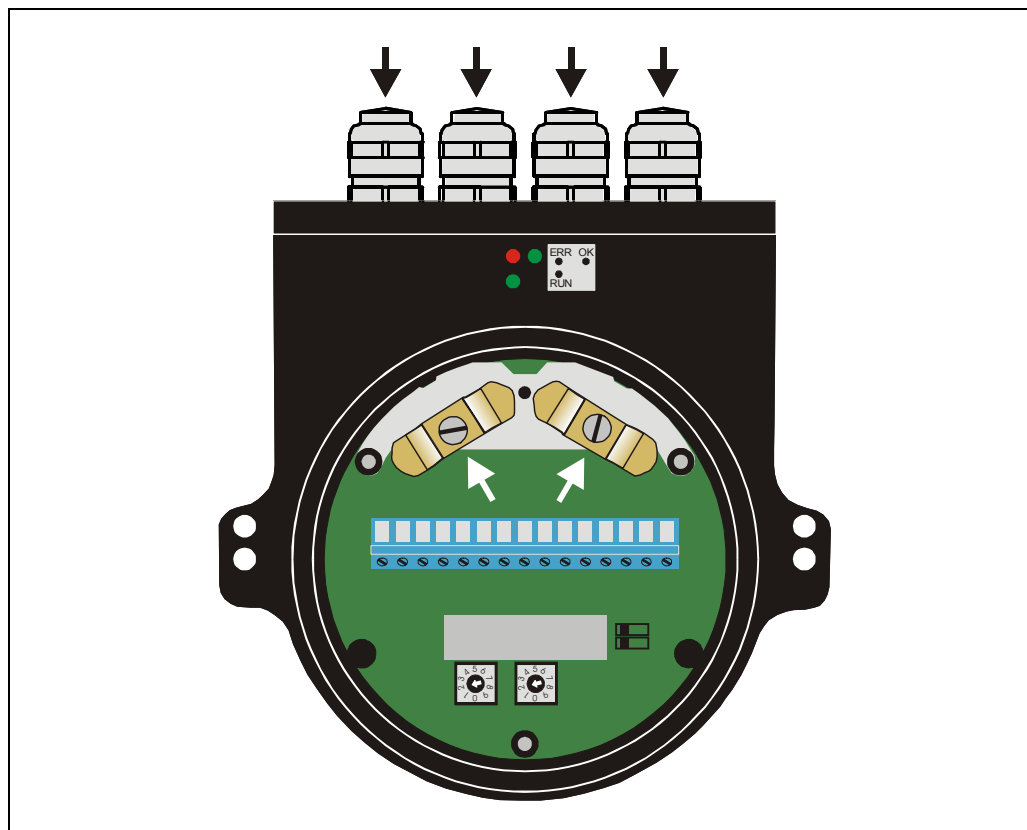


Figure 1: Connection cap with cable screw glands and shield clampings

1.3 Intended purpose

The measuring system is used for recording linear movements and processing the measured data for a downstream control system with a PROFIBUS-DP- or SSI-interface.

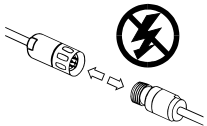
Particularly the measuring system is designed for the use of distance measurements for the detection of the position and positioning of:

- High-bay storage devices and lifting gears
- Crane systems
- Side-tracking skates and truck storage vehicles
- Transfer machines

To programme the device parameters, the measuring system is programmed about the Profibus-DP directly. However, the PROFIBUS-DP master must be able to send a parameterizing telegram. For this Leuze electronic supplies the device master file (.GSD). For further information see chapter "Operating requirements", page 17.



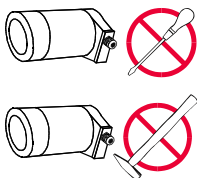
Warning



Switch off the voltage supply before carrying out wiring work or opening and closing electrical connections!

Check all electrical connections before switching on the system!

Incorrectly wired connections can cause operating failures of the laser, while wrong connections can lead to serious personal injuries and damage to property.



Mechanical or electrical modifications to the measuring systems **are prohibited for safety reasons!**

In particular the following uses are forbidden

- operation in areas where interruption of the laser beam, e.g. by covering the laser lens opening, can lead to equipment damage or injury to personnel
- in environments, in which strong rain, snow, fog, steams or direct insulations etc. can influence the laser beam intensity negatively
- operation in rooms with explosive atmospheres
- operation for medical purposes

With use-purposes larger 120m measuring length, a special reflector must to be used!

**Warning**

- In the case of Class 2 laser devices, the eye is not endangered if the exposure of the laser radiation is very short (up to 0.25 s) and accidental. For this reason, devices of this class can be used without additional protective measures, provided for the application it is not necessary to look into the laser beam deliberately for longer periods, i.e. 0.25 s, or to look repeatedly into the laser beam itself or the specular reflected beam.

The existence of the blinking reflex for the protection of the eyes may not be assumed. Therefore the eyes should be closed consciously, or the head should be turned away immediately!

- The device must be installed in such a way that the exposure of persons to the laser beam can only happen accidentally.
- The laser beam may only extend as far as is necessary for the range measurement. The beam must be limited at the end of the useful range by a diffusely reflecting target area in such a way as to minimise the danger from direct or diffuse reflection. For this purpose, you should use the Leuze electronic reflecting foil supplied with the device.
- The area outside the operating range where the unshielded laser beam falls should be limited as far as possible and should remain out of bounds, particularly in the area above and below eye level.
- Observe the legal and local regulations applicable to the operation of laser units.

i**Note**

The start-up, operating and programming instructions contained in this manual are mandatory.

1.4 Authorised operators

The start-up and operation of this device may only be performed by qualified personnel. For the purposes of this manual, the term "qualified personnel" refers to persons who are authorised to operate, earth and label equipment, systems and power circuits according to recognised safety standards.

1.5 Safety measures at the installation site



Warning

Do not perform any welding work once the device is connected and switched on!
Variations in potential can destroy the device or restrict its operation.

Do not touch plug contacts with your hands!
Static charges may destroy electronic components of the device.

Do not connect unused inputs!

Observe the voltage supply range:
Standard device: 18-27 V DC (+/- 5 %)
Device with heating: 24 V DC

Clean lens opening of the laser and the reflecting foil regularly!
(see chapter "Maintenance", page 27)



Note

Make sure that the environment of the installation site is protected against corrosive media (acids, etc.)

2 Assembly instructions

The adjustment of the laser measuring device in the vertical plain is carried out via four studs (A) in the mounting plate. The adjustment in the horizontal plane can be made by four hexagon bolts (B). It has to be taken into account that the screw diameter is approx. 1-2 mm smaller than the through bore of the mounting plate. Exact dimensional properties are on the dimensional drawing in the rear part of the document.

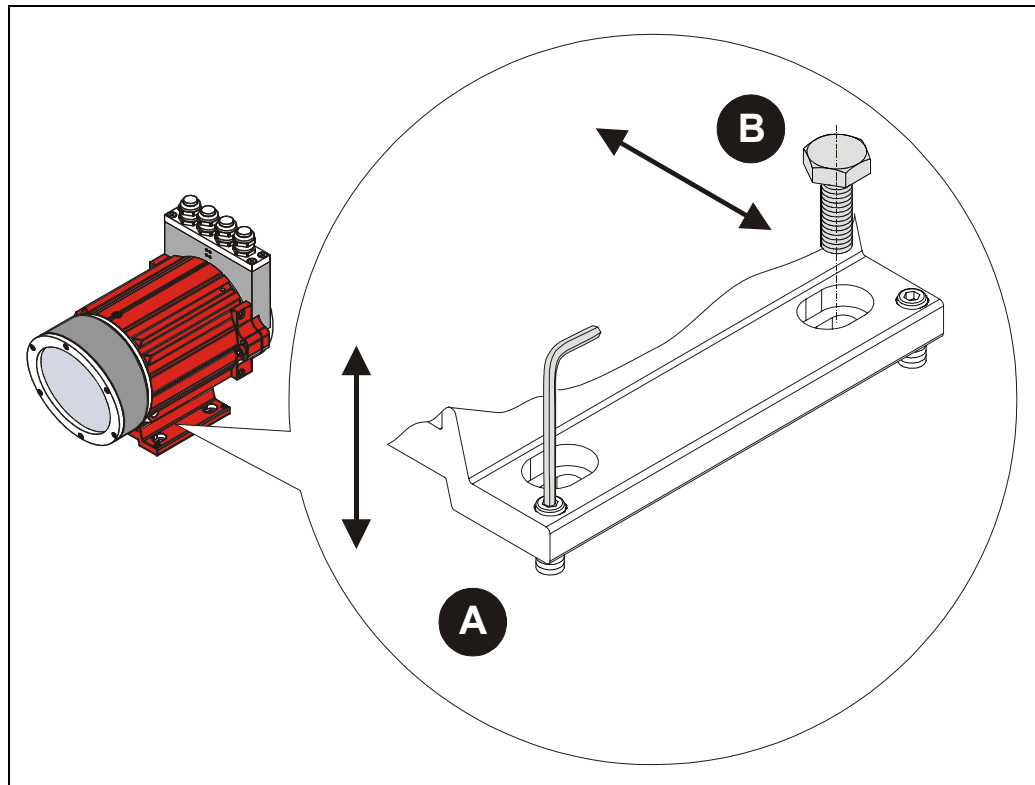


Figure 2: Mechanical adjustment possibilities

2.1 Aligning of the laser light spot to the reflector / foil inclination

The laser beam of the OMS2 must be on the reflecting foil at any time. This can be done using the light spot of the laser diode, which is still clearly visible on the reflecting foil even at long distance. When aligning the laser measuring device, the user may need to take measures to ensure that it can be mechanically adjusted.

The size of the reflecting foil must be such that the light spot cannot be displaced from the reflector by vibrations. The laser light spot must always be on the reflecting foil to 100%.

With the shipment of the OMS/120 a reflection foil with the size of 20 x 20 [cm] is provided. Other sizes can be ordered on request.

For the laser measuring device OMS/170 a special reflector (Fresnel Retro Reflector) Art.-No.: 500 36208 must be used.

i

Note

Reflecting foils by other manufacturers should be used only after consultation with Leuze electronic, as all the information in the "Specifications" chapter refers to the foil already supplied with the device.

Procedure:

- **Figure 3: Detection of the surface reflectivity:**
 - At first attaching the reflector foil flatly and drive plant on minimal distance Laser – Foil.
 - Centering paper (C) in front of the laser optics so, that the laser beam can unhinderedly emerge by an approx. 2 cm hole. Now, the interfering signal (B) should get visible on the paper (C). To the better location of the interfering signal (B) the reflector foil can be moved also a little. Here it is valid: angle of incidence = angle of reflection

- **Figure 4: Transmitting away the surface reflectivity:**
 - Rotate the reflector foil in the Y- or in the Z-axis so, that the interference signal (B) always is outside the laser lens. Nevertheless keeping the inclination of the reflector foil as low as possible to minimize measuring errors caused by misalignments in the procedure movement. For example, if the light spot drifts on the reflector foil around, small differences arise as a result of the oblique position.
 - Fix reflector foil

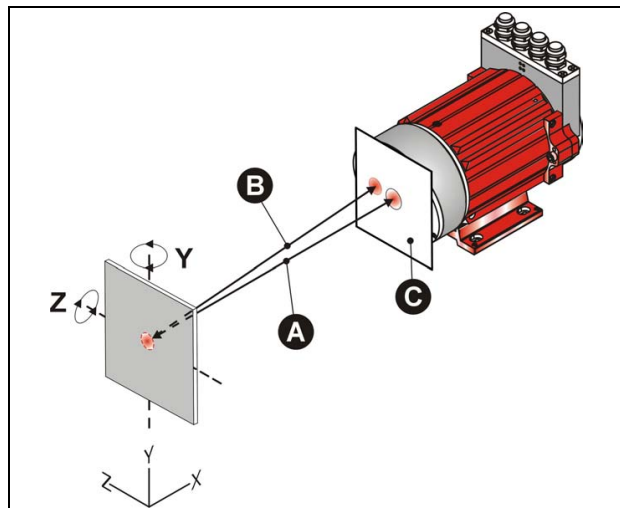


Figure 3: Detection of the surface reflectivity

(A) real wanted signal, is always thrown back 180° independently of the reflector inclination

(B) Surface reflectivity (interference signal)

(C) Paper with an approx. 2 cm large hole in the center

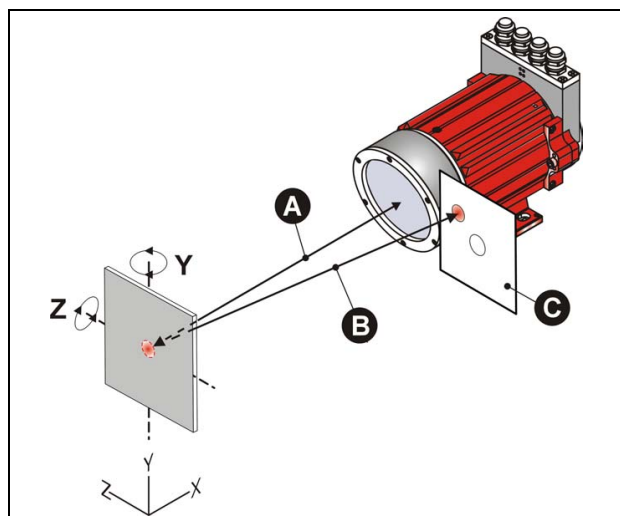


Figure 4: Transmitting away the surface reflectivity

2.2 Parallel operation of laser linear paths

It has to be taken care in the parallel operation of laser linear paths that a minimum distance of 1 m is kept. The reflector foil inclination must be made in such a way that the surface reflectivity (see arrows) points not into the other laser linear path.

The alignment is carried out as described in chapter 2 / 2.1.

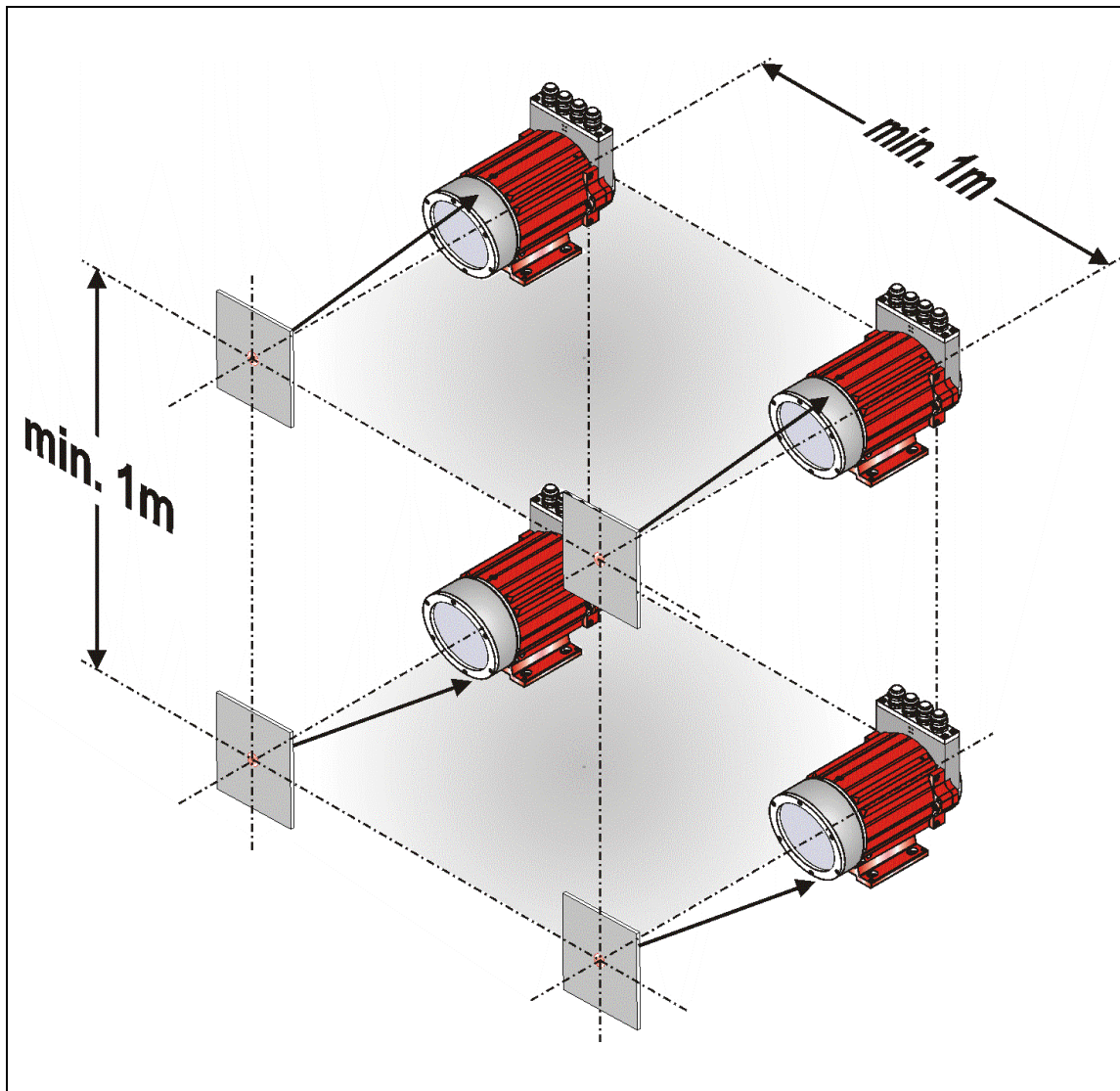


Figure 5: Minimum distance in parallel operation

3 Commissioning / Installation

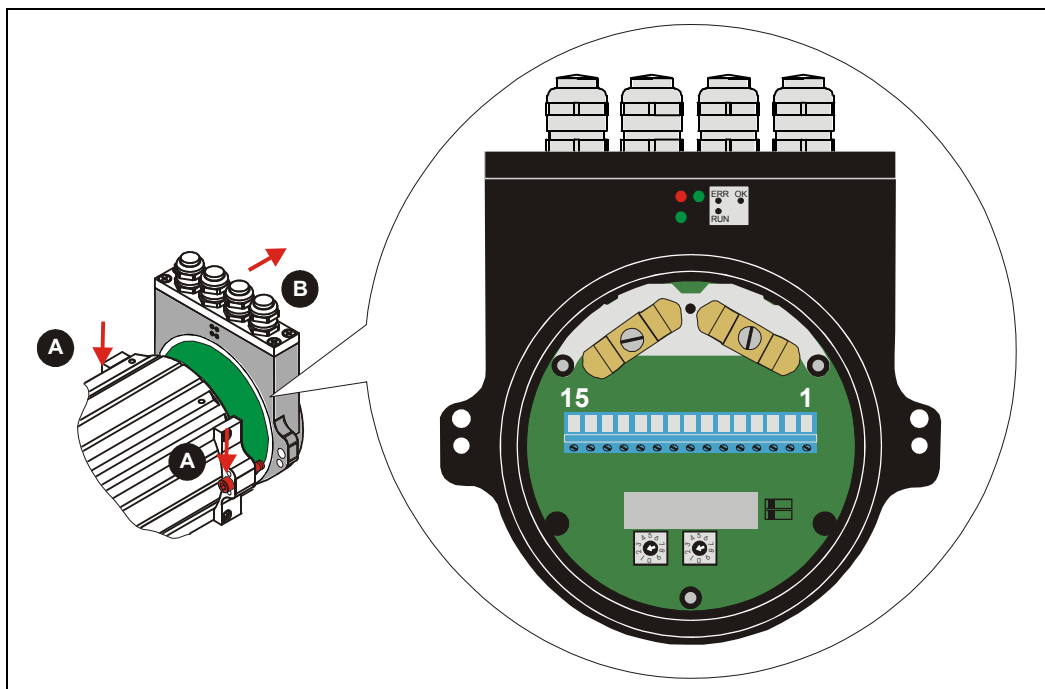
3.1 Electrical connection

i **Note**

At the realization of the electrical connection the references in chapter 1.2.1, starting from page 6 must be considered.

In order to be able to carry out the connection, the connection cap must be removed from the laser first.

For this the screws **(A)** are loosened and the cap **(B)** is removed away from the laser.



3.1.1 Supply voltage

Pin 10 Standard: 18 – 27 V DC
Device with heating: 24 V DC (±5%)

Pin 11 0V, GND



3.1.2 Profibus-DP

Simultaneous use of the Profibus DP- and SSI - interface possible.

Pin 1 Profibus Data PB_A_IN

Pin 2 Profibus Data PB_B_IN

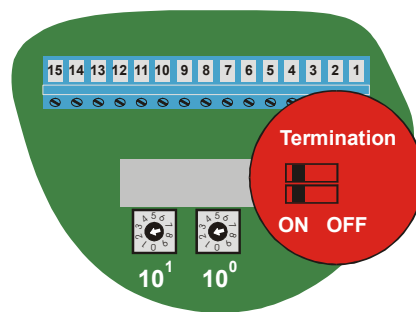
Pin 3 Profibus Data PB_A_OUT

Pin 4 Profibus Data PB_A_OUT



3.1.2.1 Bus termination

If the laser measuring device is the last slave in the Profibus segment, the bus line is to be terminated by the termination switches = ON.

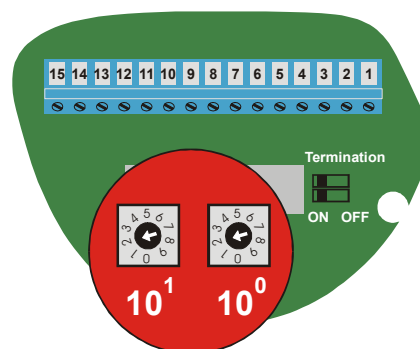


3.1.2.2 Bus addressing

Valid Profibus addresses: 3 – 99

10⁰: Setting of the units position

10¹: Setting of the decimal position



3.1.3 SSI interface

Simultaneous use of the SSI- and Profibus DP - interface possible.

Pin 12 SSI-Clock +

Pin 13 SSI-Clock –

Pin 14 SSI-Data +

Pin 15 SSI-Data –



3.1.4 Switching input / Switching output

The programming of the switching input /switching output is carried out either directly via the bus, or via the PC software "OMSConfiguration Tool".

Functions of the switching input:

- Preset, - Switch off laser diode, - Failure quit

Functions of the switching output:

- Temperature-, Intensity-, Hardware-Fail-Output or every fail

Pin 5 Switching input

Pin 6 Switching output

Pin 7 GND, reference potential pin 6



3.1.5 Programming interface

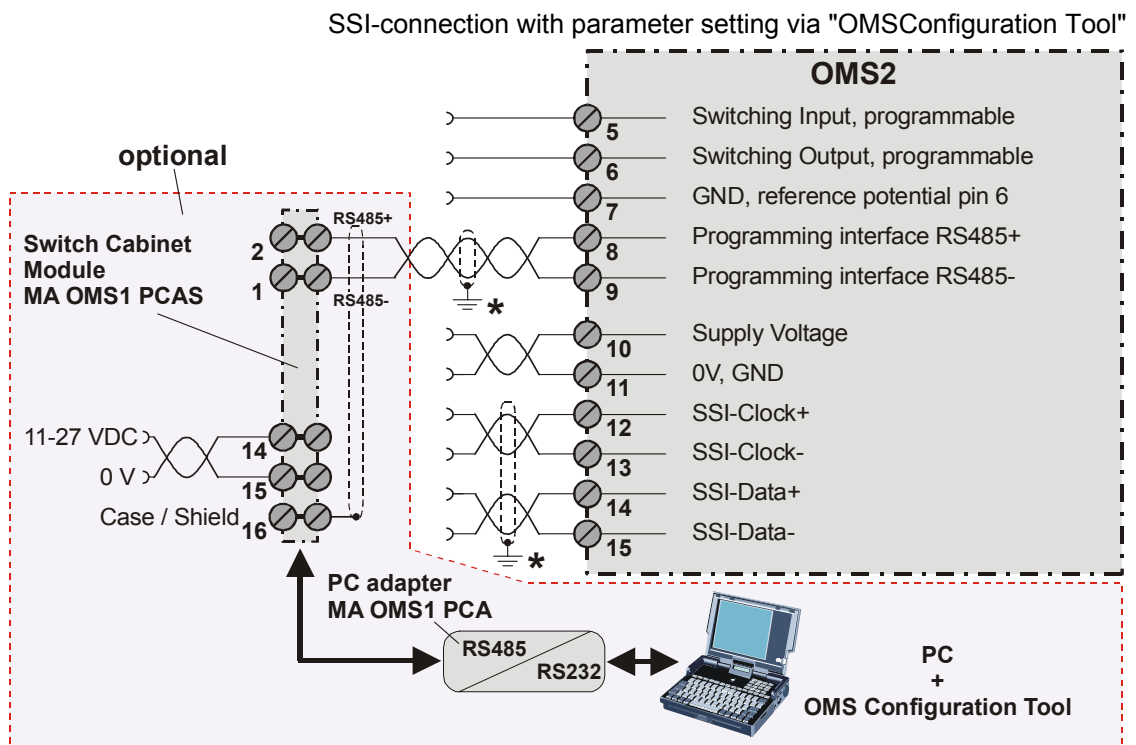
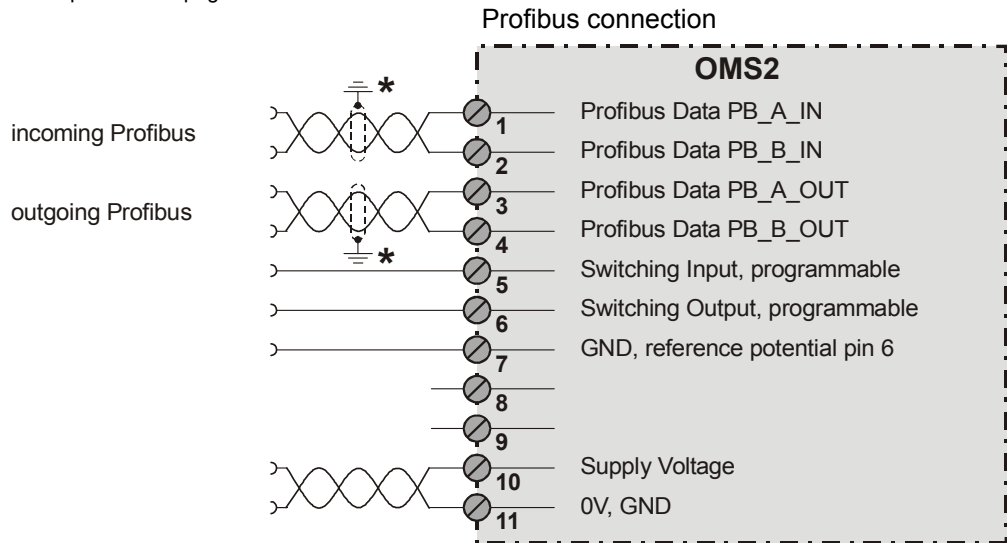
The RS485-programming interface is used only for the configuration (change of the default values) of the SSI interface. Via the PC software "OMSConfiguration Tool" and a PC adapter the connection to the laser measuring device is established. More informations see below or in the OMSConfiguration Tool software manual.

- Pin 8** RS485+
- Pin 9** RS485-



3.1.6 Wiring examples

* Shield connection, see chapter 1.2.1.1 page 7.



3.2 Profibus-DP interface / Profibus-DP master

3.2.1 Operating requirements / GSD-file

Theoretically, the Laser Measuring Device can be connected to any Profibus-DP network, provided the PROFIBUS-DP master is capable of transmitting a parameter message. Similarly, the configuration software should be able to display the parameter structure specified in the device master file in order to allow the parameters to be entered. If this is not the case, the Laser Measuring Device can not be put into operation.

Leuze electronic supplies a disk containing the device master file (.GSD). The disk is component of the device.

The current device master file of the laser has the file name **OMS22_2601.GSD**, dated from 27.03.2003 (consider "Revision index" on page 2).

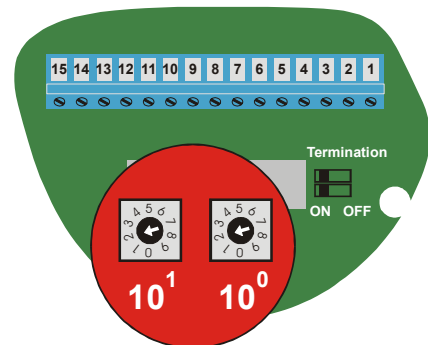
The Laser Measuring Device also has two bitmap files named LZ_2601N.BMP and LZ_2601S.BMP which represent the Laser Measuring Device in the normal and faulty states respectively. For details of how to integrate the files (*.GSD, *.BMP) into the system configuration, please refer to the relevant documentation of the configuration program for the Profibus master.

3.2.2 Setting the station address

The station address of the Laser Measuring Device is set exclusively via the rotary switches which becoming visible after removing the cover:

- 10⁰: Setting of the units position
- 10¹: Setting of the decimal position

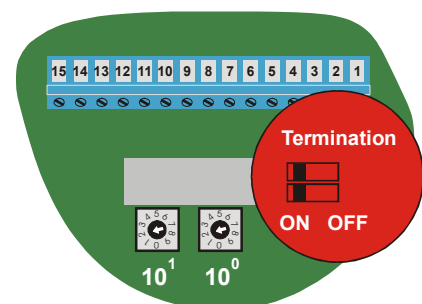
The addressing of the Laser Measuring Device is limited within the Profibus address area. Valid station addresses are 3 - 99. If an invalid station address is set, the device will not start up!



3.2.3 Bus termination

All PROFIBUS networks must be terminated by a resistor at the ends of the bus segments. The termination resistor and resistors for connecting to the data reference potential are located in the bus cap with the terminals, and can be connected via DIL-switches if necessary, provided the Laser Measuring Device is the last station of a bus segment.

In this case the outgoing bus line (PB_A_OUT, PB_B_OUT) is interrupted!

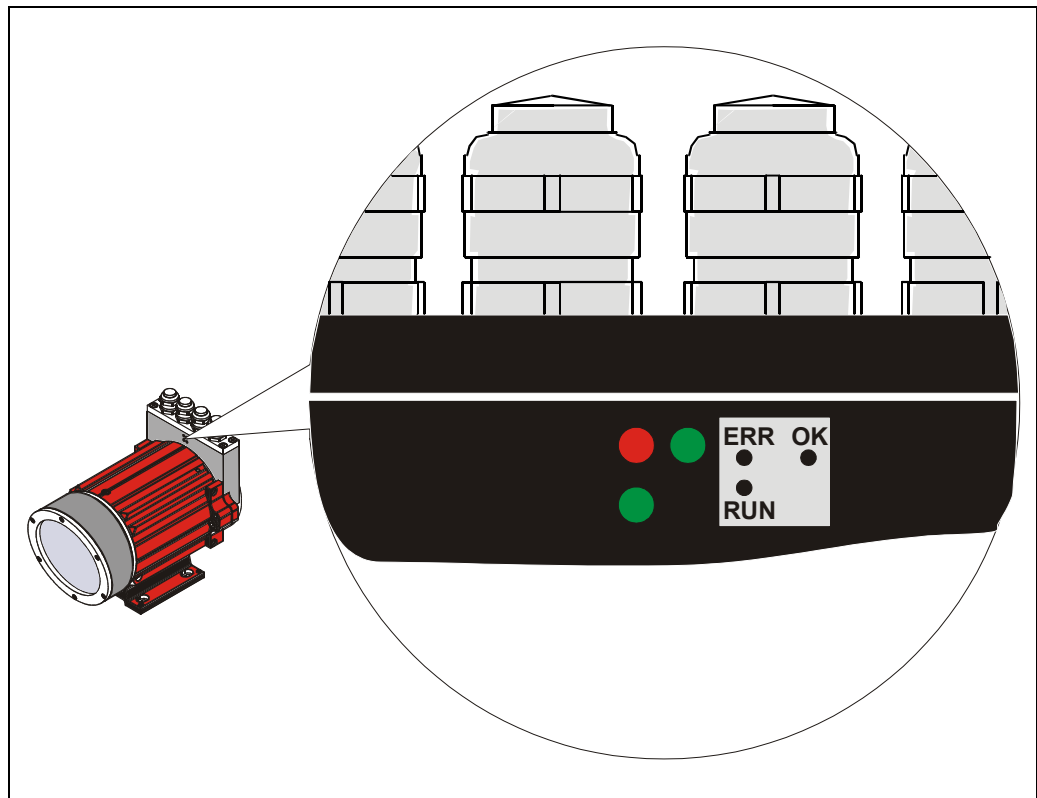


3.2.4 Baud rate

The Baud rate at which the PROFIBUS is operated may lie within the range of 9.6 kBaud to 12 Mbaud, and is detected automatically by the Laser Measuring Device.

3.2.5 Bus status

At the connection cap the laser has 3 LEDs, which display the bus status of the laser:



RUN	(green):	Profibus-DP active
ERR	(red):	flashing = Profibus-DP not active, static = hardware failure
OK	(green):	Hardware ok

4 Configuration / Parameter setting via the Profibus-DP master

The configuration of the laser occurs alternatively via the configuration software of the Profibus-DP - master or via the OMSConfiguration Tool-software. With a download of the control parameters the parameters, which were configured via the OMSConfiguration Tool-software, will be overwritten by the control.

In this instruction only the configuration via the Profibus-DP - master is described. The PC program OMSConfiguration Tool is described in an instruction of its own.

4.1 Modular configuration

Since all functions of the Laser Measuring Device are used not at any time, individual functions can be disabled on the bus.

For this, in the mask of configuration software of the profibus master, the Laser Measuring Device is represented as a modular compact device .

That means after insertion of the laser into the configuration list of the master, the corresponding configuration list at first is empty.

Every module requires inputs and outputs and has a parameter data set. The parameter data set must be set dependent of the application.

That the laser starts at the profibus, in the configuration list at least one module must be entered.

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Important note:

It exist configuration programs which include an "universal module".

This module is not defined in the device master file of the laser and must not be used.

4.1.1 Module Position

The module uses two input words which are consistently transferred via the bus. The position of the Laser Measuring Device is transferred via these two input words.

Position of the I/O data in the input double word ID x



corresponding parameter data:

Resolution

Sets the resolution of the measurement system.
The available options are:

Centimeter
Millimeter (Default)
1/10 millimeter
1/100 millimeter
Inch
1/10 Inch
Free resolution (in 1/100 mm), valid values are 1 - 65535, default = 100

Count direction

Sets the count direction of the measurement system.

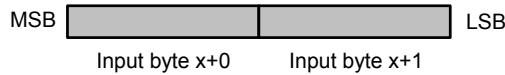
The available options are:

positive (default)	position values increasing
negative	position values decreasing

4.1.2 Module Speed

The module uses one input word which is consistently transferred via the bus. Here the momentary actual speed is output in mm/ms.

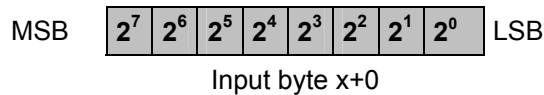
Input word IW x



4.1.3 Module Error Display

The module uses 1 input byte, which is coded bit by bit. Over the input byte the error message of the laser will transfer and is reset, if the error were recovered, or is no more present.

Input byte IB x



No error Input byte = 0x00	Corresponds to the normal condition
Intensity Bit 0 in the input byte	The bit is set, if an intensity value of smaller 8% is present, or the laser beam is interrupted and leads to the error value output.
Temperature Bit 1 in the input byte	The bit is set, if the device temperature is outside of the range from 0 - 50 °C. A low range deviation has still no influence on the measurement and is therefore to be regarded as a warning.
Hardware Bit 2 in the input byte	The bit is set, if an internal hardware error were noticed and leads to the error value output.
Laser diode switched off Bit 3 in the input byte	The bit is set, if the laser diode was switched off over the bus, or the switching input. Serves only for information purposes.
Warning bit Intensity Bit 4 in the input byte	The bit is set, if an intensity value of smaller 12% were determined and means that the measuring system optics, or the reflecting foil is to be cleaned. However, the device operates error-freely furthermore.
Warning bit Speed Bit 5 in the input byte	The bit is set if the speed, adjusted in the PC program OMSConfiguration Tool, is exceeded. About the default setting the speed-check is switched off. A configurability over the bus is not possible.
Warning bit Plausibility Bit 6 in the input byte	The bit is set if the plausibility of the measured value cannot be guaranteed. E.g. this is the case at a position skip if a second reflection foil is held into the laser beam.

corresponding parameter data:

Error value

Determines, which data value should be transmitted in the module position in the case of an error. The data value is output, if the laser can output no more measurement. This is given e.g., if a beam interruption is present.

The available options are:

Null (default)	The position is set to "0"
0xFF	All 24 bits are set to '1' (0xFFFFFFFF or -1)
last valid value	Output of the last valid position

4.1.4 Module Acceleration

Is not supported at the moment!

4.1.5 Module Counter Measuring-Cycle

The module uses two input words which are consistently transferred via the bus. Over the input words the counter reading of the measuring-cycle counter is transferred. Every correct measuring cycle in the device increases the counter reading by 1. An overflow of the 32-bit counter causes a new beginning with "0".

Input double word ID x



4.1.6 Module Function External Input

The module uses no inputs and no outputs and is only used for the parameterization of the function of the external input at the Laser Measuring Device.

The available options are:

Function ext. input

Determines, whether the switching input is to be used as Preset input or for switching-off of the laser diode (LD). With connection of the switching input as Preset-input the laser is adjusted on the predefined position value (Preset HI word and LO word). With connection the switching input as LD-input the laser diode is switched off for the extension of the life time. If in the PC-program "OMSConfiguration-Tool" in the basic parameters the switching-off of the laser diode is carried out automatically, the LD-switching input does not have a function.

disabled (default)	Function switched off, following parameters without meaning
Preset-function	External switching input is determined as Preset input
LD-switching input	External switching input is used for switching-off of the laser diode. Alternative: Software switching-off see chapter 4.1.9 page 25.

Preset 1 HI word and LO word

It determine the position value to which the laser is adjusted, when the preset function is executed. The preset value must be programmed in the range from 0 ... measuring length. **Default value is "0"**.

active edge

Determines, whether the function of the switching input is activated with an rising or falling edge at the switching input.

This parameter has no influence at the release of a function over a control bit via the Profibus. There is always the rising edge valid.

L->H (default)	Function release with rising edge
H->L	Function release with falling edge

Response time

It determines the response time of the switching edge of the switching input up to the actual execution. This parameter is used for the interference suppression of the signal at the switching input.

100 ms (default)	Response time = 100 ms
250 ms	Response time = 250 ms
500 ms	Response time = 500 ms
1000 ms	Response time = 1000 ms

4.1.7 Module SSI interface

The module SSI interface uses no inputs and no outputs and is used only for the parameterization of the SSI interface of the laser.

corresponding parameters:

SSI data bits

24 Bit (default)	Number of SSI data bits = 24
25 Bit	Number of SSI data bits = 25
26 Bit	Number of SSI data bits = 26

Code

Gray (default)	SSI output code = Gray
Binary	SSI output code = Binary

SSI error bit

The SSI error bit is an additional bit in the SSI protocol and is attached after the "LSB bit".

disabled (default)	No SSI error bit
Temperature	SSI error bit = Temperature The bit is set, if the device temperature is outside of the range from 0 - 50 °C. A low range deviation has still no influence on the measurement and is therefore to be regarded as a warning.
Intensity	SSI error bit = Intensity The bit is set, if an intensity value of smaller 8% is present, or the laser beam is interrupted and leads to the error value output (see "Module Error Display", page 21).
Hardware	SSI error bit = Hardware The bit is set, if an internal hardware error were noticed and leads to the error value output (see "Module Error Display", page 21).

The SSI output value specifies the value, which is output on the SSI interface.

Position (default)	Output of the Laser position
Intensity	Output of the Laser intensity value
Speed	Output of the Laser actual speed

4.1.8 Module Adjustment (software Preset)

The module adjustment uses 4 output bytes and determines the position value to which the laser is adjusted, if the control bit (bit 4) in "**Module Control Bits With Acknowledgement**" is actuated. The adjustment value must be programmed in the range from 0 ... measuring length and is written by the user into the predefined address range. The adjustment value is not configurable therefore over the module.

4.1.9 Module Control Bits With Acknowledgement

The module uses 1 input byte and 1 output byte. The bytes are coded in bits. Via the output byte control commands can be transmitted to the laser. Via the input byte the control commands transmitted to the laser are acknowledged by the laser.

Switch off laser diode Bit 0 in the output byte	By setting this bit the laser diode (LD) is switched off for the extension of the life time. If in "Module Function External Input", page 23 = "LD-switching input" is preselected, or in the PC-program "OMSConfiguration-Tool" in the basic parameters the switching-off of the laser diode is carried out automatically, this function is ineffective.
Switch on laser diode Bit 1 in the output byte	By setting this bit the laser diode is switched on. This function is ineffective if: see "Switch off laser diode" above.
Bit 2 and 3	not used
Execute adjustment Bit 4 in the output byte	By setting this bit the laser is adjusted to the value deposited in "Module Adjustment (software Preset)", page 25.
Execute Preset Bit 5 in the output byte	By setting this bit the laser is adjusted to the value deposited in "Module Function External Input", page 23.
Clear Preset Bit 6 in the output byte	By setting this bit a Preset executed before is cancelled and the deposited value in "Module Function External Input", page 23 is set to "0".
Clear Error Bit 7 in the output byte	If in this module in parameter "Error Acknowledgement" the setting is preselected "not automatically", by setting this bit an occurring error report is deleted. If the error could not be eliminated, the corresponding bit in "Module Error Display", page 21 is set in the next cycle again.

corresponding parameter data:

Error Acknowledgement

Determines, whether occurring error reports should be cleared automatically after eliminating the trouble.

not automatically (default)	An occurring error report can be cleared only via bit 7 in the output byte.
automatically	An occurring error report is cleared automatically after remedying of the error.

4.1.10 Module Laser-Diode Operating Hours

The module uses one input word which is consistently transferred via the bus. Here, the operation hours of the **activated laser diode** are output.

Input word IW x



5 Causes of Faults and Remedies

The error causes are determined in "Module Error Display", page 21. Depending on setting the error must be possibly acknowledged for resetting the malfunction code in the input byte (see "Module Control Bits With Acknowledgement", page 25). If the switching input was adjusted via the OMSConfiguration Tool-software for error resetting, the error can be acknowledged also about the external switching input.

Malfunction Code	Cause	Remedy
Bit 0 Intensity error	The device checks the intensity of the received laser signal continuously, it was detected a below-minimum intensity.	<ol style="list-style-type: none"> 1. Clean measuring system optics 2. Clean reflecting foil 3. Rule out an interruption of the laser beam <p>If the possibility of soiling or interruption of the laser signal can be ruled out, the device must be replaced.</p>
Bit 1 Device temperature	The temperature has exceeded or fallen short of the range of 0 - 50°C at the housing of the device	Appropriate measures must be taken to prevent the device from overheating or undercooling.
Bit 2 Hardware error	The device has detected an internal hardware error.	If the error occurs repeated, the device must be replaced.
Bit 3 Laser diode switched off	The bit is set, if the laser diode was switched off over the bus, or the switching input.	Serves only for information purposes.
Bit 4 Intensity warning	The device determined an intensity of < 12%.	This message is only a warning and means that the measuring system optics, or the reflecting foil is to be cleaned. However, the device operates error-freely furthermore.

6 Maintenance

6.1 General Maintenance Information

The Laser Measuring Device does not, in general, require maintenance by the operator.

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Note

If the lens opening of the laser or the reflecting foil become dirty, clean with a soft cloth.

Do not use an aggressive cleaning material such as thinner or acetone !

6.2 Repair, Maintenance

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

Contact your Leuze electronic distributor or service organisation should repairs be required. The addresses are listed on the last page of this description.

7 Appendix

7.1 Specifications



Note

The electric characteristics have validity, only after an operating time of approximate 30 minutes.

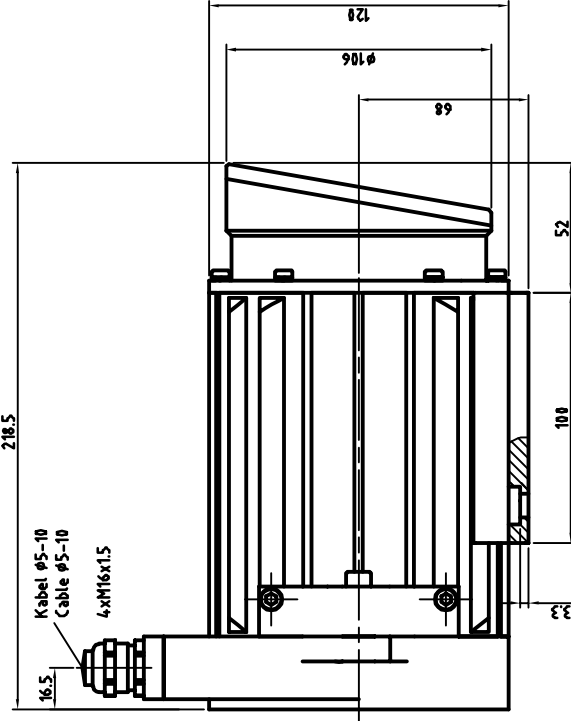
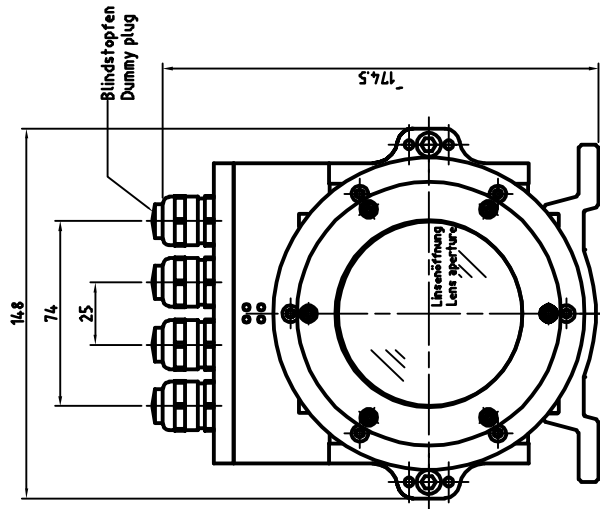
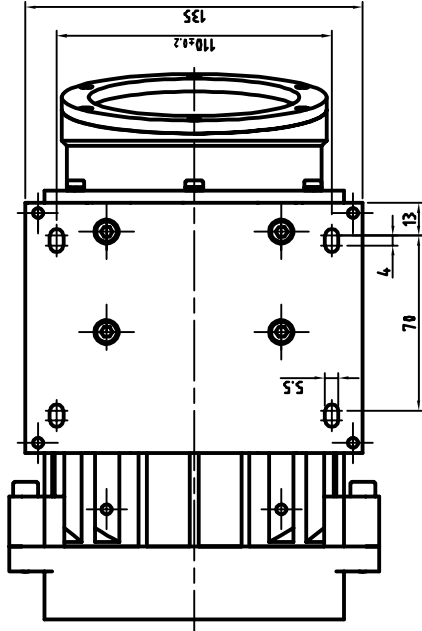
Measuring principle	Phase delay time measurement
Range OMS2/120 PB / OMS2/170 PB	0,2 – 120 m / 0,2 – 170 m (with Fresnel Retro Reflector)
* Resolution	Standard resolution 1mm, other one programmable
Operating voltage Standard device Device with heating	18-27 V DC (± 5%) 24 V DC (± 5%)
Power consumption (no-load)	< 6 watts
Power consumption with heating	< 60 watts
Opto-transmitter	Laser diode (red light)
Wavelength λ Max. laser power Laser protection class Average Lifetime	670 nm $P \leq 1 \text{ mW}$ 2 according to DIN EN 60 825-1: 2003-10 50 000 h
Measured value output / refresh cycle	1000 values / s
Integration time	1 ms
Reproducibility	± 2 mm
Programming via	Profibus-DP by means of GSD-file alternatively via RS485 and PC soft "OMSConfiguration Tool"
SSI Interface * Output code Clock input Clock frequency Cable length SSI transmission * Number of data bits	Binary, Gray Optocoupler 80 kHz - 820 kHz Depending on clock frequency, shielding etc. RS422 (4-wire), twisted pair cables and shielded 24 - 26, with error bit transmission
Profibus-DP Interface Output code Baud rate Special features Stationsadressen	PROFIBUS-DP according to DIN 19245 Part 1-3 Binary 9,6 kBaud to max. 12 MBaud Programming is performed via the parameterization telegram at the start-up of the laser or the PROFIBUS-DP master 3 - 99
* Switching input / Switching output Levels switching input Levels switching output	1-level > +8V, 0-level < +2V, up to ±35V, 5 kOhm 1-level > US-2V, 0-level < 1 V, up to 100mA

* programmable parameter


Environmental conditions

EMC	EN 61000-4-2 (IEC-801-2) / EN 61000-4-4 (IEC-801-4)
Operating temperature range Device with heating	0-50°C -30 to +50°C
Thermal drift	1 ppm / °C
Storage temperature range	-20 to +75°C
Relative air humidity	98 % (non condensing)
¹⁾ Degree of protection	IP 65 (DIN 40 050)

¹⁾ The protection class is valid for the device with screwed-together cable glands.



Artikel-Nr. und Steckerbelegung: siehe Datenblatt
 Article-No. and pin connections: see data sheet

 Leuze electronic GmbH + Co. In der Bräule 1 D-73277 Owen/Teck Telefon 07021/573-0		Maßstab 1:2 DIN A3 Projekt-Nr.		Zeichnungs-Nr. nur für diese Ausführung gültig Drawing-No. only for this type valid	
		OMS2		Zeichnungs-NR./Drawing-No.: 04-K2200-001	
Datum Erteilt 30.10.02		Name Habelter		Blatt 1	
Bearb.		Gepr.		Norm	
1. Justagebohrungen Zust. Änderung		02.12.02 Habelter		Datum Name	



Vertrieb und Service

Leuze electronic GmbH + Co KG
Postfach 11 11, D-73277 Owen/Teck
Tel. (07021) 5730, Fax (07021) 5731 99
E-mail: info@leuze.de
http://www.leuze.de

A
Ing. Franz Schmachtl KG
Tel. Int. + 43 (0) 732/7646-0
Fax Int. + 43 (0) 732/785036
E-mail: office.linz@schmachtl.at
http://www.schmachtl.at

ARG
Nortecnica S. R. L.
Tel. Int. + 54 (0) 11/4757-3129
Fax Int. + 54 (0) 11/4757-1088
E-mail: info@nortecnica.com.ar

AUS + NZ
Balluff-Leuze Pty. Ltd.
Tel. Int. + 61 (0) 3/97642366
Fax Int. + 61 (0) 3/97533262
E-mail: balluff_leuze@balluff.com.au

B
Leuze electronic nv/sa
Tel. Int. + 32 (0) 2/2531600
Fax Int. + 32 (0) 2/2531536
E-mail: leuze.info@leuze.be

BR
Leuze electronic Ltda.
Tel. Int. + 55 (0) 11/4195-6134
Fax Int. + 55 (0) 11/4195-6177
E-mail: leuzeelectronic@originet.com.br
http://www.leuze.com.br

CH
Leuze electronic AG
Tel. Int. + 41 (0) 1/8340204
Fax Int. + 41 (0) 1/8332626
E-mail: info@leuze.ch

CO
Componentes Electronicas Ltda.
Tel. Int. + 57 (0) 4/3511049
Fax Int. + 57 (0) 4/3511019
E-mail: rigogigu@col3.telecom.com.co

CZ
Schmachtl CZ Spol. SR. O.
Tel. Int. + 420 (0) 2/44001500
Fax Int. + 420 (0) 2/44910700
E-mail: office@schmachtl.cz
http://www.schmachtl.cz

DK
Desim Elektronik APS
Tel. Int. + 45/70220066
Fax Int. + 45/70222220
E-mail: desim@desim.dk

D
Leuze electronic GmbH + Co KG
Geschäftsstelle Dresden
Telefon (0351) 284 1105
Telefax (0351) 284 1103
E-mail: vgd@leuze.de

Lindner electronic GmbH
Vertrieb Nord, Hannover
Telefon (0511) 966057-0
Telefax (0511) 966057-57
E-mail: lindner@leuze.de

W+M plantechnik
Dipl.-Ing. Würtler GmbH + Co.
Vertrieb West, Wuppertal
Telefon (0202) 37112-0
Telefax (0202) 318495
E-mail: wrmplan@rga-net.de

Leuze electronic GmbH + Co KG
Geschäftsstelle Frankfurt
Telefon (06181) 9177-0
Telefax (06181) 917715
E-mail: vgf@leuze.de

Leuze electronic GmbH + Co KG
Geschäftsstelle Owen/Bad.-Württ.
Telefon (07021) 9850-910
Telefax (07021) 9850-911
E-mail: vgo@leuze.de

Leuze electronic GmbH + Co KG
Geschäftsstelle München
Telefon 08141/5350200
Telefax 08141/5350220
E-mail: vgm@leuze.de

E
Leuze electronic S.A.
Tel. Int. + 34 93/4097900
Fax Int. + 34 93/4903515
E-mail: leuze@leuze.net

ET
APlus Systems
Tel. Int. + 20 (0) 2/ 4189036
Fax Int. + 20 (0) 2/ 4141280
E-mail: ellfaf@aplusystems.com.eg

F
Leuze electronic sarl.
Tel. Int. + 33 (0) 1/60051220
Fax Int. + 33 (0) 1/60050365
E-mail: infos@leuze-electronic.fr
http://www.leuze-electronic.fr

FIN
SKS-automaatio
Tel. Int. + 358 (0) 9/852661
Fax Int. + 358 (0) 9/8526820
E-mail: automaatio@sksf.fi
http://www.sksf.fi

GB
Leuze Mayser electronic Ltd.
Tel. Int. + 44 (0) 1480/408500
Fax Int. + 44 (0) 1480/403808
E-mail: mail@leuzemayser.co.uk
http://www.leuzemayser.co.uk

GR
UTECO A.B.E.E.
Tel. Int. + 30 (0) 210/4210050
Fax Int. + 30 (0) 210/4212033
E-mail: uteco@uteco.gr

RUS + EST + LV + LT
All Impex GmbH
Tel. + Fax + 7 095/ 9332097
E-mail: adz-sensor@narod.ru

H
Kvalix Automatika Kft.
Tel. Int. + 36 (0) 1/3990615
Fax Int. + 36 (0) 1/3698488
E-mail: info@kvalix.hu
http://www.kvalix.hu

HK
Sensortech Company
Tel. Int. + 852/26510188
Fax Int. + 852/26510388
E-mail: sensortech@netnavigator.com

I
IVO Leuze Vogtle Malanca s.r.l.
Tel. Int. + 39 02/26110643
Fax Int. + 39 02/26110640
E-mail: ivoleuze@tin.it
http://www.ivoleuze.com

IL
Galoz electronics Ltd.
Tel. Int. + 972 (0) 3/9023456
Fax Int. + 972 (0) 3/9021990
E-mail: admin@galoz.co.il

IND
Global Tech Corp.
Tel. Int. + 91 (0) 20/4470085
Fax Int. + 91 (0) 20/4470086
E-mail: global_tech@vsnl.com

J
C. Illies & Co., Ltd.
Tel. Int. + 81 (0) 3/34431111
Fax Int. + 81 (0) 3/34434118
E-mail: tyo-mp@illies.de
http://www.illies.de

KOR
Leuze electronic Co., Ltd.
Tel. Int. + 82 (0) 31/3828228
Fax Int. + 82 (0) 31/3828522
E-mail: hgsim@leuze.co.kr
http://www.leuze.co.kr

MAL
Ingermark (M) SDN.BHD
Tel. Int. + 60 (0) 3/60342788
Fax Int. + 60 (0) 3/60342188
E-mail: ingmal@tm.net.my

MEX
Leuze Lumiflex México, S.A. de C.V.
Tel. Int. + 52 (0) 81/83524060
Fax Int. + 52 (0) 81/83524034
E-mail: info@leuzemexico.com.mx
http://www.leuze.de

N
Elteco A/S
Tel. Int. + 47 (0) 35/573800
Fax Int. + 47 (0) 35/573849
E-mail: firmapost@elteco.no
http://www.elteco.no

NL
Leuze electronic B.V.
Tel. Int. + 31 (0) 418/653544
Fax Int. + 31 (0) 418/653808
E-mail: info@leuze.nl
http://www.leuze.nl

P
LA2P, Lda.
Tel. Int. + 351 (0) 21/4447070
Fax Int. + 351 (0) 21/4447075
E-mail: la2p@ip.pt
http://www.la2p.pt

PL
Balluff Sp. z. o. o.
Tel. Int. + 48 (0) 22/6519679
Fax Int. + 48 (0) 22/8429728
E-mail: balluff@balluff.pl

RCH
Imp. Tec. Vignola S.A.I.C.
Tel. Int. + 56 (0) 32/256521
Fax Int. + 56 (0) 32/258571
E-mail: vignova@entelchile.net

ROC
Great Cofue Technology Co., Ltd.
Tel. Int. + 886 (0) 2/29838077
Fax Int. + 886 (0) 2/29853373
E-mail: service@cofue.com.tw

RO
O Boyle s.v.l.
Tel. Int. + 40 (0) 56201346
Fax Int. + 40 (0) 56221036
E-mail: oboyle@dslink.ro
http://www.oboyle.ro

RSA
Countpulse Controls (PTY.) Ltd.
Tel. Int. + 27 (0) 11/6157556
Fax Int. + 27 (0) 11/6157513
E-mail: clive@countpulse.co.za

S
Leuze SensorGruppen AB
Tel. + 46 (0) 8/7315190
Fax + 46 (0) 8/7315105
E-mail: info@leuze.se

SGP + RI + RP
Balluff Asia Pie Ltd
Tel. Int. + 65/62524384
Fax Int. + 65/62529060
E-mail: balluff@balluff.com.sg

SK
Schmachtl SK s.r.o.
Tel. Int. + 421 (0) 2/54789293
Fax Int. + 421 (0) 2/54772147
E-mail: office@schmachtl.sk

SLO
Tipteh d.o.o.
Tel. Int. + 386 (0) 1/2005150
Fax Int. + 386 (0) 1/2005151
E-mail: info@tipteh.si
http://www.tipteh.si

TH
Industrial Electrical Co. Ltd.
Tel. Int. + 66 (0) 2/642-6700
Fax Int. + 66 (0) 2/642-4249
E-mail: iec@ie.co.th

TR
MEGA Teknik elek. San. ve Tic. Ltd.
Tel. Int. + 90 (0) 212/3200411
Fax Int. + 90 (0) 212/3200416
E-mail: mega@netone.com.tr
http://www.megateknik.com

USA + CDN
Leuze Lumiflex Inc.
Tel. Int. + 1 (0) 873/5860100
Fax Int. + 1 (0) 873/5861590
E-mail: info@leuze-lumiflex.com
http://www.leuze-lumiflex.com

VC
TR Electronic GmbH
Shanghai Rep. Office
Tel. Int. + 86(0)21/ 58314825
Fax Int. + 86(0)21/ 58314829
E-mail: tr-electronic@online.sh.cn