USER'S MANUAL

LONG DISTANCE LASER RANGEFINDER
DS series

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1. About this document

This document describes the installation, configuration and use of the long-distance laser rangefinder DS-120 produced by Dongguan Dadi Electronic Technology Co., Ltd. (hereinafter referred to as "DADISICK"), including but not limited to: safety information, functions, mechanical installation, electrical installation, network configuration, equipment operation, host computer software operation, etc. At the same time, this document also describes the functional parameters and performance parameters of Ld100.

Before any installation or operation of the equipment, the operator must read this guide to avoid equipment damage and personal injury caused by illegal operation, including:

1. Damage to DS-120 or other equipment associated with DS-120 during the installation of Ld100.
2. Personal injury to the installer caused during the installation of Ld100.
3. Damage to DS-120 and other equipment caused during the use of Ld100.
4. Personal injury to the operator caused during the use of Ld100.
5. Personal injury to non-operating personnel caused during the use of DS-120, such as laser damage to human eyes.

Any installation, operation, or secondary development of the DS-120 without reading this guide is considered extremely dangerous and must be prohibited.

The company will not be liable for any losses caused by installing or using the DS-120 without reading this guide.

2. Safety Information

Specified Use

The long-distance laser rangefinder DS-120 is used for non-contact measurement of the distance of linear moving objects. The distance measurement must be completed on a specified reflective board.

Dongguan Dadi Electronic Technology Co., Ltd. shall not be liable for losses caused by the use of the product in a manner inconsistent with the intended use and not described in this document.

Illegal Use

Any use of DS-120 outside the specified scope, especially the use that does not comply with technical specifications and regulations, shall be deemed as illegal use.

■ It is prohibited to use the device in explosive or corrosive environments and extreme environmental conditions.

■ The use of accessories without the express written permission of DADISICK Optoelectronics shall be at your own risk.

Network Security

The operation of DS-120 can be completed through the software provided by Dadi Electronics. The communication between the software and DS-120 is based on the CP/IP protocol, so when using it, the user must pay attention to the prevention of network threats and prevent malicious and non-malicious network damage. Dongguan Dadi Electronic Technology Co., Ltd. shall not be liable for any losses caused by this.

Equipment modification

Dongguan Dadi Electronic Technology Co., Ltd. prohibits any other organization or individual from performing electrical or mechanical modification on DS-120, and prohibits the use of other software other than the software to operate DS-120. Dongguan Dadi Electronic Technology Co., Ltd. shall not be liable for compensation for losses caused by modification or use of other unauthorized software to operate DS-120.

Requirements for professionals and operators
Dongguan Dadi Electronic Technology Co., Ltd. requires that personnel who perform mechanical installation, electrical installation, and use of DS-120 must have certain professional qualifications.

Operation	Qualification requirements for personnel
Mechanical installation, maintenance	■ Basic training in mechanical technology ■ Knowledge of current workplace safety regulations
Electrical installation, equipment replacement	■ Electrical technical training ■ Knowledge of current electrical safety regulations ■ Knowledge of equipment operation and operation in the application area

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Debugging, parameter configuration	■ Basic knowledge of the computer operating system used ■ Basic knowledge of establishing and setting up connections and interfaces ■ Basic knowledge of data transmission
Operate the equipment within the relevant application area	■ Knowledge of equipment operation and operation in the application area ■ Knowledge of software and hardware environment in the application area

Specific hazards

Laser radiation

The product emits a laser beam of laser class 2. There is no risk of injury when the laser beam is exposed to the eye for a short time (no more than 0.25 seconds). If the laser beam is stared at for a longer period of time, it may cause retinal damage. The laser beam is harmless to human skin. The user must be aware of the following risks when using DS-120:

■ Do not deliberately stare into the laser beam.

■ Do not direct the laser beam into the eye.

■ If direct viewing of the laser beam cannot be prevented (e.g. during commissioning and maintenance work), use suitable eye protection.

■ Avoid reflections of the laser beam from mirrors. This should be observed especially during installation and alignment work.

■ Do not open the housing. Opening the housing may increase the hazard.

■ Observe the current national regulations for laser protection.

Electrical hazards

■ Only qualified electrical personnel may work on electrical equipment.

■ Connect and disconnect electrical connections only when the power is not on.

■ Only connect the product to a power supply that complies with the requirements of these operating instructions.

■ Observe the regulations of national and professional associations.

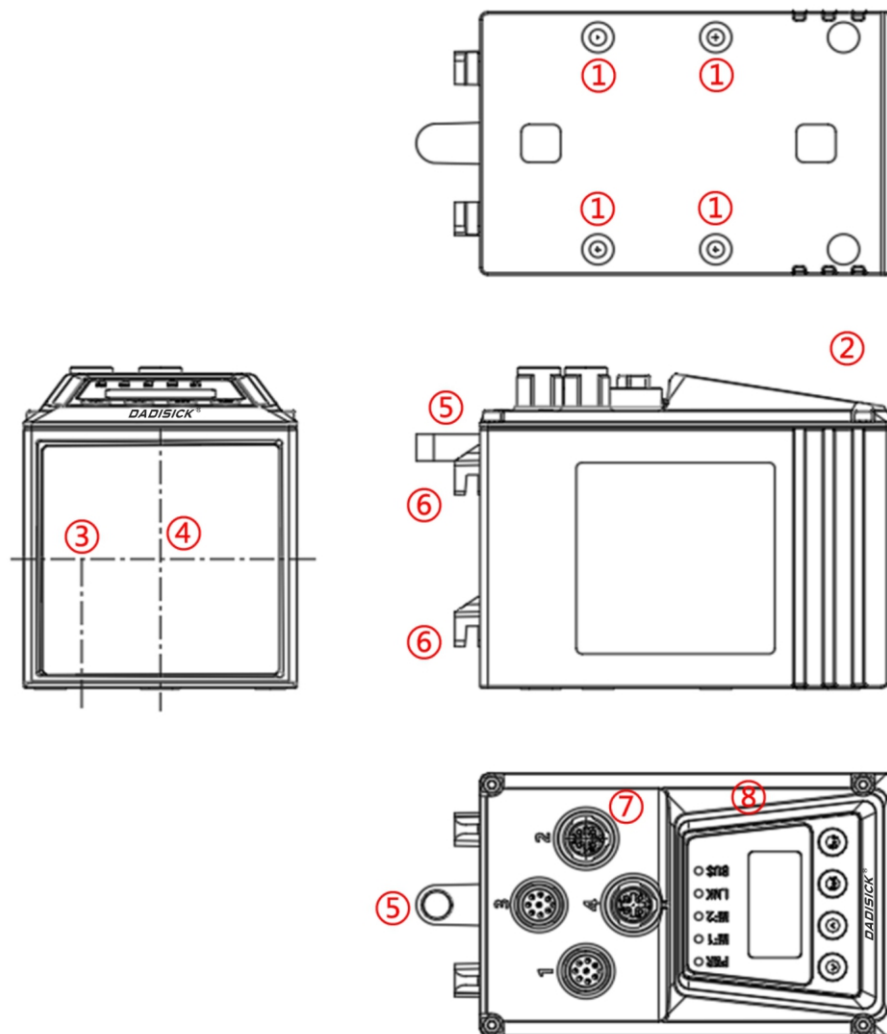■ Observe the safety regulations for operating electrical equipment.

3 Function and structure

3.1 Basic function

DS-120 consists of a laser, an optical receiver, and a built-in processing circuit system and software system. The sensor emits a light beam, which is reflected by the reflector to the optical receiver. The built-in evaluation and measurement unit determines the distance between the sensor and the reflector using the phase-correlated time-of-flight measurement method.

During the measurement, the reflector or the device can be moved linearly along the laser beam. The measured distance is transmitted via the data interface.

3.2 Structure

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Note: ① Fastening thread M5

② Device zero point

③ Transmitter optical axis

④ Receiver optical axis

⑤ Bolt hole for star handle of calibration bracket

⑥ Locking hook of calibration bracket

⑦ Electrical connection

⑧ Indicator and operating elements

3.3 Indicator and operating elements
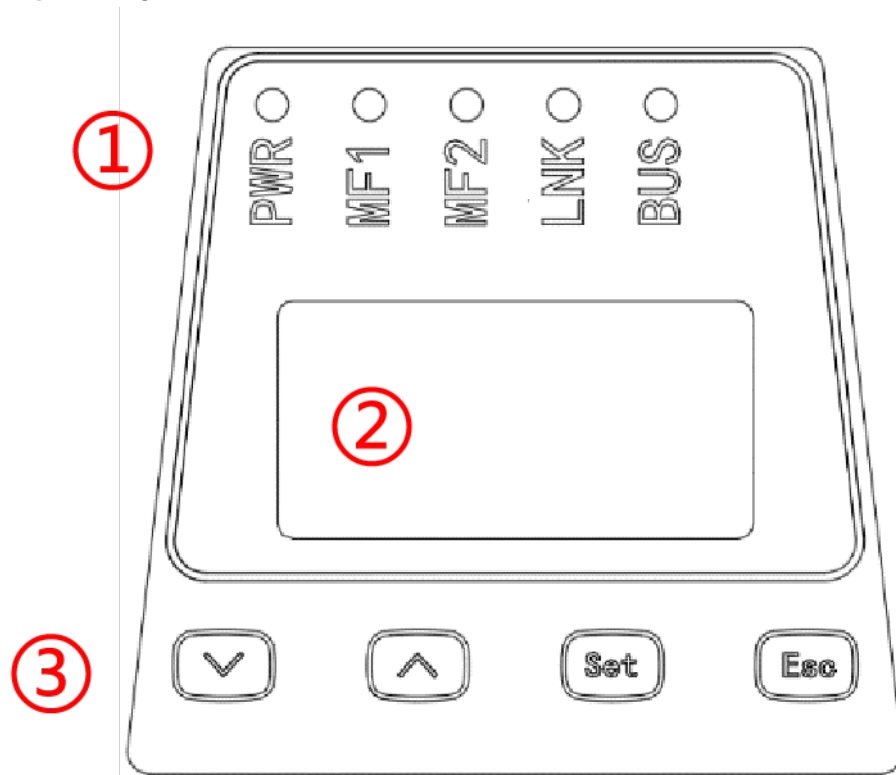
Note: ①LED indicator light

②Display screen

③Operation buttons

3.4 LED Indicator

LED	directions
PWR	Device status display (red, green, blue) ■ LED off: not operating ■ LED green: trouble-free operation ■ LED flashing blue: warning ■ LED flashes red: Fault

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| LNK	Ethernet port 1 connection status (Link) (red, green, blue) ■ LED flashes blue: data exchange is active ■ LED green: connection with external device (Link) ■ LED red: no connection with external device (Link)
MF1	Multifunctional input/output terminal MF1 (blue) ■ LED on: output high ■ LED off: output low
MF2	Multi-function output MF2 (blue) ■ LED on: output high ■ LED off: output low
BUS	Interface (SSI) (blue) ■ LED on: SSI clock signal present ■ LED off: SSI clock signal not present

3.5 LED display

The DS-120 has an LED display that shows status and control information related to it. In addition, parameters can be read and set via the display.

Operating mode icons

The operating mode of the device is divided into measured value display and menu display. In the display, the operating mode is distinguished by the RUN (measured value) and MEN (menu) icons.
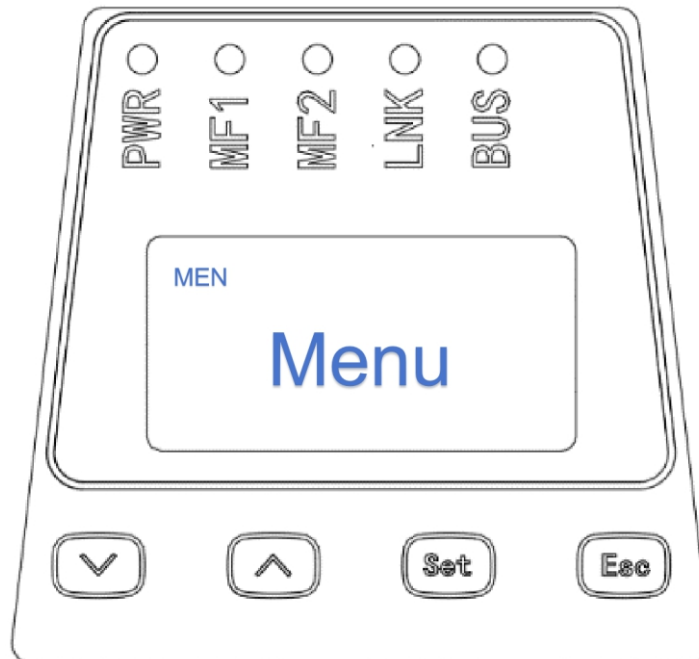
Measurement value display
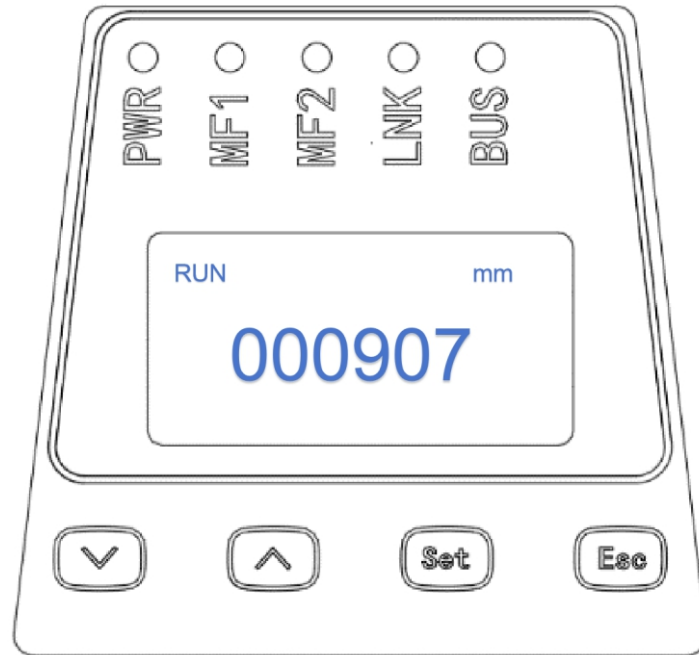
After startup, the device is in the measured value display operating mode. The RUN icon and the current distance value are displayed.

Menu Display

The MEN icon is displayed in the menu display operating mode. In this operating mode, device parameters can be read or set via the interface.

3.6 Operation buttons

Button	Operate
∨	■ Select menu, parameter or page downward ■ Decrease value
∧	■ Select menu, parameter or page upwards ■ Increase value
Set	■ Enter menu mode ■ Switch to the next menu level ■ Confirm selection
Esc	■ Exit without saving parameter values/input options ■ Return to the previous menu level or enter measurement value display mode

4 Assembly

4.1 Installation process

1. Determine the mounting position while observing the installation instructions, see "Notes".

2. Select and install the reflector, see "Select and install the reflector".

3. Install the calibration bracket and distance sensor.

4. Make the electrical connection, see "Electrical installation".

5. Align the distance sensor and reflector with each other, see "Align the distance sensor and reflector with each other".

Notes

■ Observe the technical specifications, see Technical Data.

■ Protect the sensor from direct sunlight.

■ To avoid condensation, do not subject the device to rapid temperature changes.

■ The mounting position must be strong enough to bear the weight of the device.

■ At low ambient temperatures (e.g. in frozen storage), use sensors with optional heating.

■ At higher temperatures, use sensors with optional cooling housing.

■ Maintain a sufficient distance to other distance sensors, see "Arrangement of multiple distance sensors".

■ Maintain a sufficient distance to data transmission photoelectric sensors.

4.2 Selecting and installing reflectors

Reflector dimensions

■ Select the appropriate reflector dimensions to ensure that the light spot completely hits the reflector.

■ If the reflector is mounted on the vehicle and the distance sensor is mounted in a fixed position, the minimum reflector dimensions can be calculated from the distance-dependent light spot size.

■ If the distance sensor is mounted on the vehicle, a larger reflector is usually required to take into account the swaying of the vehicle and the laser.

■ Even if the light spot is small due to the short measuring distance, the reflector dimensions must be at least 100 mm x 100 mm.

Reflector inclination

To avoid direct surface reflections: Mount the reflector at an angle of approx. +1° ... +3° on 2 coordinate axes (horizontal or vertical).

■ Shiny surfaces parallel to the laser beam axis can cause beam deflection or scattered light, which can lead to measurement errors. Therefore, the reflector should be tilted away from the shiny surface at an angle of 1...3°. Aim at an unobstructed space. Shiny surfaces can be shelf profiles, floor panels with stretch film, gantries or running rails, etc.

■ If the sensor is mounted in a moving axis of a storage and retrieval system, tilt the reflector away from the running rail in the direction of the lid.

■ If the sensor is mounted in a lifting axis of a storage and retrieval system, tilt the reflector away from the gantries.
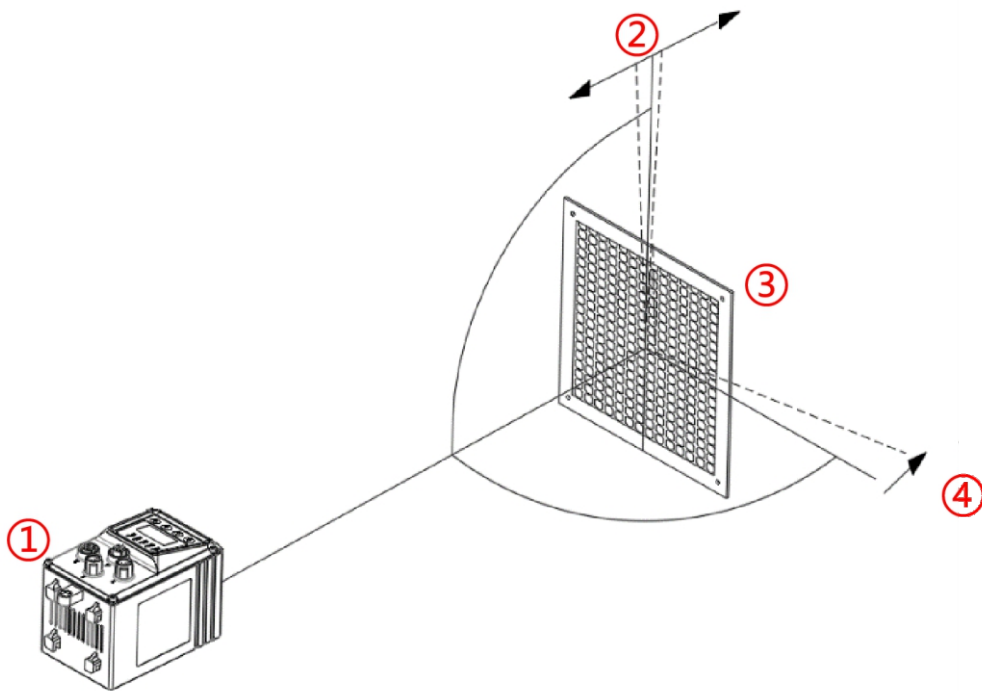
Note: ①LED indicator light
②Display screen
③Operation buttons

4.3 Arrangement of several distance sensors

If you want to install several sensors side by side, you must take into account the minimum distance between them. The minimum distance H of the optical axis depends on the maximum travel distance Smax. This distance applies to installations with beams pointing in the same direction and in opposite directions.

Co-directional beam
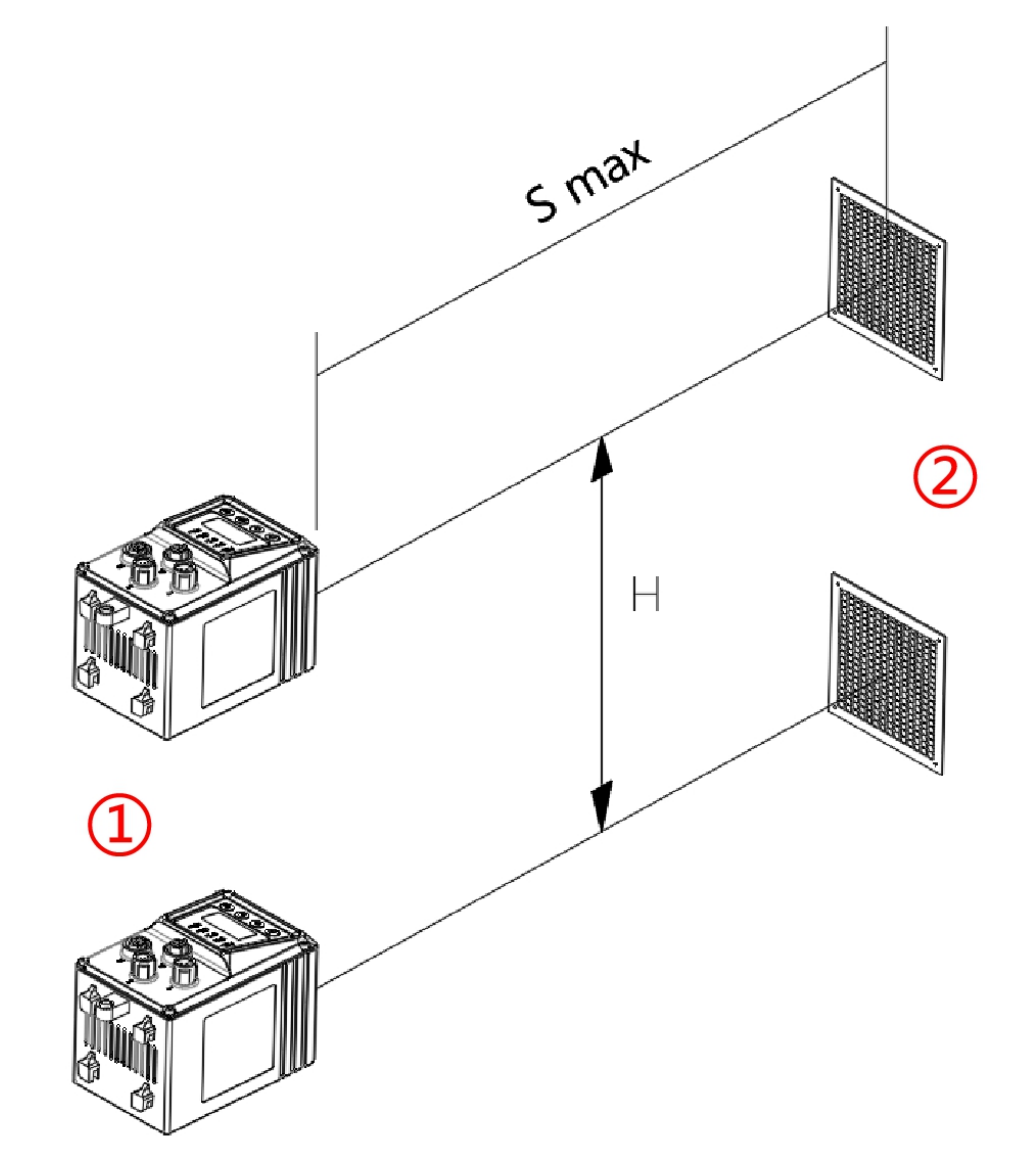
Note: ①Distance sensor

②Reflector

H: minimum distance

Smax: maximum travel distance

Reverse beam
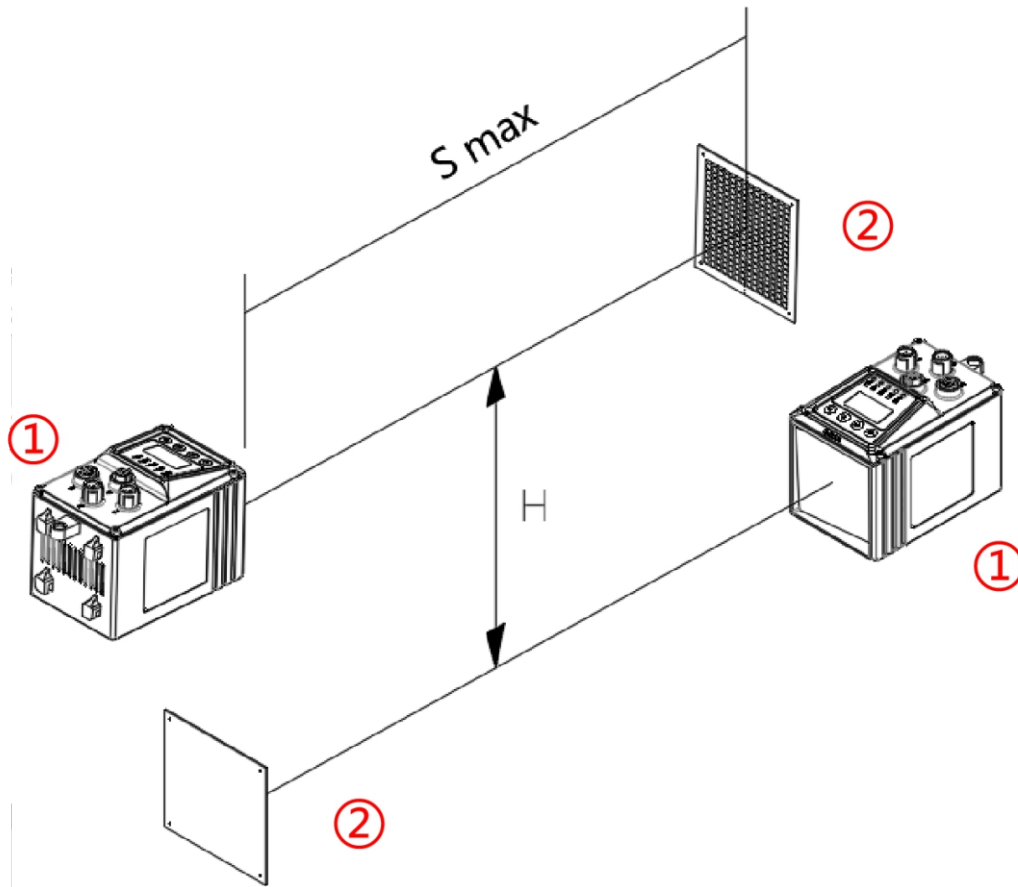
Note: ①Distance sensor

②Reflector

H: minimum distance

Smax: maximum travel distance

The minimum distance calculation formula is as follows:

Formula

$H \geq 0.1m + 0.01 \times Smax[m]$

Example

■ If the maximum travel distance Smax is 60 m

■ Then, calculate the minimum distance: $H \geq 0.1\ m + 0.01 \times 60\ m = 0.1\ m + 0.6\ m = 0.7\ m$

4.4 Reception level

An accurate measurement requires the highest possible reception level. The reception level decreases as the distance increases and/or the optical contact surfaces (sensor, transparent protective cover of the reflector) become increasingly dirty. This means that the signal attenuation, the dB value that can be read in the main menu, increases.

The table below shows the signal attenuation values as a function of the distance between the sensor and the reflector. The values in the "Typical signal attenuation" column indicate the values to be expected for a normal state of the measuring section and the distance sensor. If the signal attenuation exceeds the value in the "Maximum signal attenuation" column, check the state of the measuring section and the optical contact surfaces. If the signal attenuation reaches the critical value of approximately −83 dB, the distance sensor issues a level warning. If the signal attenuation continues to increase, level errors and plausibility errors are output as well as a "0" measured value.

Distance [m]	Typical signal attenuation [dB]	Maximum signal attenuation [dB]
10m	−46.3	−51.3
20m	−52.2	−57.2
30m	−57.6	−62.6
40m	−62.3	−67.3
50m	−66.4	−71.4
60m	−69.9	−74.9
70m	−72.8	−77.8
80m	−75.2	−80.2
90m	−76.9	−81.9
100m	−78.0	−83.0
110m	−78.5	−83.5
120m	−79.0	−84.0

5 Electrical Installation

Warning:

Incorrect operating voltage can cause personal injury!

Working with power on can cause equipment damage or unexpected operation!

- Only perform wiring work when the power is off.
- Only connect and disconnect electrical connections when the power is off.

5.1 Equipment electrical interface
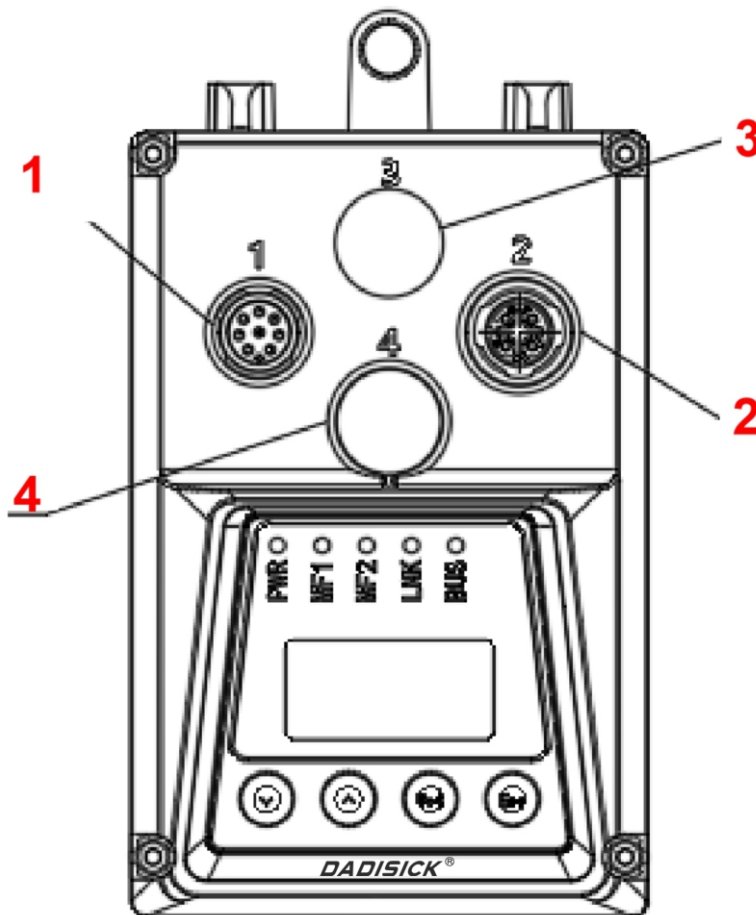
Note: 1: Operating voltage, MF1, MF2, SSI (M12 plug, 8-pin)

2: Ethernet (M12 socket, 4-pin)

3: Reserved

4: Reserved

5.2 Wiring diagram

5.2.1 Working voltage wiring diagram
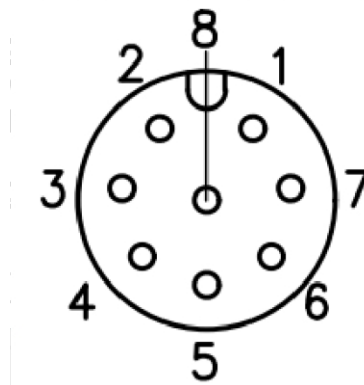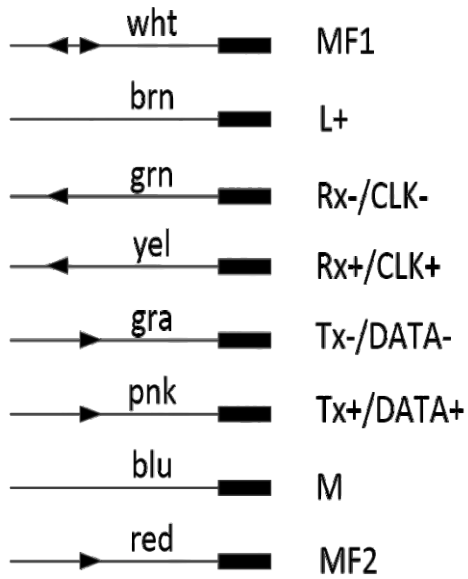
Number	Mark	Core color	Description
1	MF1	white	Multifunctional input and output terminal MF1, type B
2	L+	brown	Operating voltage: +18… +30V DC
3	Rx–/CLK–	green	Receive signal –/clock signal –
4	Rx+/CLK+	yellow	Receive signal –/clock signal +
5	Tx–/Data–	grey	Data signal –
6	Tx+/Data+	pink	Data signal +
7	M	blue	Operating voltage: 0V
8	MF2	red	Multifunctional output terminal MF2, type B

5.2.2 Ethernet wiring diagram
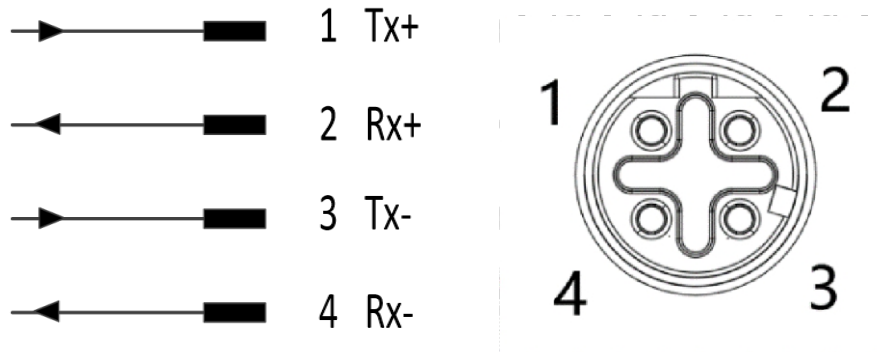
Number	Mark	Description
1	Tx+	Send data signal +
2	Rx+	Receive data signal +
3	Tx-	Send data signal -
4	Rx-	Receive data signal -

6 Device operation

Tips

■ Improper operation can damage the keys! This can make operation difficult or even impossible.

■ Only use your fingers or a suitable pointing device to operate the keys.

■ Do not use sharp or hard objects to operate the keys.

6.1 Main Menu

By default, the distance value is shown in the display. Other functions can be operated in the main menu by pressing the ⌃ and ⌄ buttons.

Display	Description
Distance value	Displays the distance value in mm.
Digital level	Shows the signal attenuation as a digital value. See "Receive level".
Temperature	Shows the internal temperature of the device.
Laser run time	Shows the operating time of the rangefinder.
Warning	Shows existing warnings. If there is a warning, the PWR LED flashes orange. If there is no warning, NoWarn is displayed, see "Warning messages".
Fault	Shows existing faults. If there is a fault, the PWR LED flashes red. If there is no fault, NoErr is displayed, see "Fault report".

Press the set key to enter the menu mode from the measured value display mode. Use the ⌄ key to select the display device parameters in the main menu and press the set key to select a specific menu.

6.2 SwVers Menu

The SwVers menu displays all information related to the software.

Parameters	Description
App-uC	Displays the device firmware version.
FPGA	Displays the device FPGA version.

6.3 Menu

Menu The menu includes all device parameters.

Option	Description
SSI	Set parameters for the SSI interface See "SSI menu".
more?	Enable extended menu view See "more? menu".

6.4 SSI menu

This menu allows you to set parameters for the SSI interface.

Parameters	Description
Coding	■ Select the data format for the SSI interface. For more information on the data format, see "SSI protocol (data format)". ■ Options Gray code • Gry24E: 24-bit Gray measured value, 1-bit error, binary • Gry24: 24-bit Gray measured value • Gry25: 25-bit Gray measured value Binary code • Bin24E: 24-bit measured value, binary, 1-bit error, binary • Bin24: 24-bit measured value, binary • Bin25: 25-bit measured value, binary ■ Factory setting: Gry24E.
E-bit (error bit)	■ Select the function of the error bit. This parameter is only displayed if the Gry24E or Bin24E option is selected for the Coding parameter. ■ The error bit is set whenever the device loses the ability to measure and therefore has a plausibility error. ■ In addition, the error bit is set when one of the following options is enabled and an event occurs. Several options can be enabled (On) or disabled (Off). The error bit is set to "1" when a warning occurs. Options • WrnLsr: The error bit is activated when the device is about to be replaced due to aging of the laser diode. • WrnLev: The error bit is activated when the amount of signal attenuation (e.g. due to contamination) reaches a critical value. • WrnTemp: The error bit is activated when the internal temperature of the device reaches a critical value. • WrnPlb: The error bit is activated when an extrapolated measured value is output for an implausible measured value. • NotRdy: The error bit is activated when the device is not ready for operation. • MF1Act: The error bit is activated when MF1 is activated. • MF2Act: The error bit is activated when MF2 is activated. ■ Factory setting: All options are disabled.
ResDst	■ Selection of the output value resolution in mm via the digital data interface. The output value is equal to the measured value [mm] divided by the selected resolution. This parameter has no influence on the measured value shown on the display. ■ Options • 0.1 • 0.125 • 1.0 • 10.0 • 100.0 ■ Factory setting: 0.1.

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6.5 more? menu

The more? menu allows you to enable and disable the extended menu view.

Option	Description
Yes / No	■ Enables and disables the extended menu view. When enabled, the full menu is displayed. When disabled, the MF1, Mf2, Offset and SpecFu parameters are hidden. ■ Options · Yes · No ■ Factory setting: No.

6.6 MFx On menu

This menu enables and disables the multifunctional output/input MF1 and the multifunctional output Mf2.

Prerequisite for display:

■ more? menu: Yes option.

Option	Description
Enable / Disable	■ Enable or disable MF1 and Mf2. ■ Options · Enable: MF1 and MF2 are enabled from the hardware side. · Disabl: MF1 and MF2 are disabled from the hardware side and therefore hidden in the menu. ■ Factory setting: Enable.

6.7 MF1 menu

This menu allows you to set the parameters of the multifunctional input/output MF1.

Prerequisites for display:

■ more? menu: Yes option.

■ MFx On menu: Enable option.

Parameter	Description
ActSta	■ Select the level or signal edge at which MF1 is activated. ■ Options · ActLow: Output low level when the output is active (switching criteria fulfilled) or enable the input at a falling edge. · ActHi: Output high when the output is active (switching criteria are met) or the input is enabled on a rising edge. ■ Factory setting: ActLow.

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Functn	■ Select the function of Mf1. ■ Options • Dist: MF1 will be used as a distance output signal switching device. • Speed: MF1 will be used as a speed output signal switching device. • Srvice: MF1 will be used as a service output. • LsrOff: MF1 will be used as an input to switch off the laser. • Preset: MF1 will be used as an input to activate a static preset value. ■ Factory setting: Dist. Depending on the selection of the Functn parameter, the corresponding menu is displayed. For a description of the parameters, see the corresponding table.
Dist / Speed /Srvice / LsrOff /Preset	■ Depending on the selection of parameter "Functn", the corresponding submenu is displayed. For parameter descriptions, see the relevant table in the following chapters. ■ For the "LsrOff" option, no submenu is displayed. In this case, when MF1 is activated as input, the laser is turned off.
Count	Counts the number of times MF1 is activated. Restarting the device resets the counter.

6.8 MF1 – Dist submenu

This submenu allows you to set the MF1 as a distance output signal switching device.

Prerequisites for display:

■ more? menu: Yes option.

■ MFx On menu: Enable option.

■ Functn parameter: Dist option.

Parameter	Description
Limit	■ Set the distance switch threshold. When the current distance value falls below the set threshold, the output signal switching device is enabled. ■ Setting range: −300,000 … +300,000 [mm] ■ Factory setting: 1,990 [mm]
	Since the display has only six positions, the minimum value for entering negative values via the operating keys is "−99,999". The entire value range can be entered via the software. In the display, the highest decimal place is omitted for values less than "−99,999".
Hyst	■ Setting of the hysteresis value in relation to the distance threshold. ■ Setting range: 1 … +300,000 [mm] ■ Factory setting: 10 [mm]
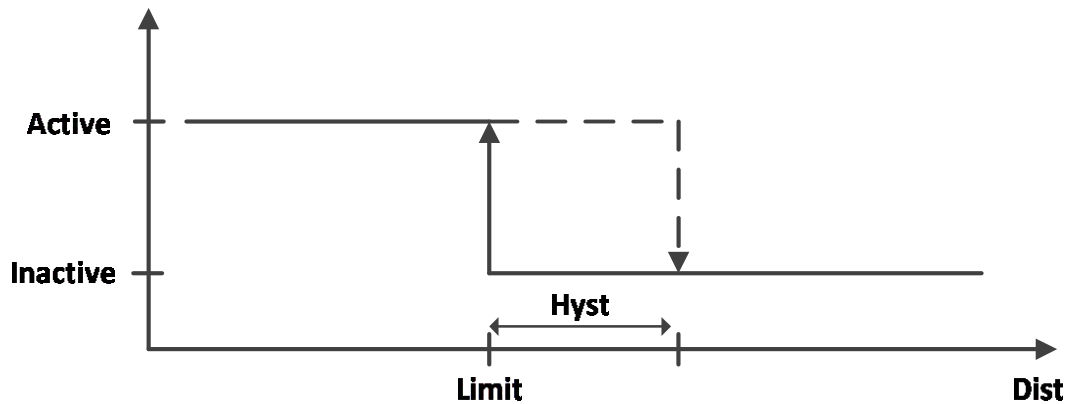
Limit: Distance switch threshold.

Hyst: Hysteresis value related to the distance threshold.

Dist: Measured distance.

6.9 MF1 – Speed submenu

This submenu allows you to set the MF1 as a speed output signal switching device.

Preconditions for display:

■ more? menu: Yes option.

■ MFx On menu: Enable option.

■ Functn parameter: Speed option.

Parameter	Description
Limit	■ Setting the switching threshold for the speed. When the current speed exceeds the set switching threshold, the output signal switching device is enabled. The switching hysteresis value is fixed to 100 mm/s. ■ Setting range: 50 … 15,000 [mm/s] ■ Factory setting: 5,000 [mm/s]
Sign	■ Select the speed direction to be monitored. ■ Options • + / −: Monitor both directions of movement • +: Monitor the "+" direction of movement (increasing distance) • −: Monitor the "−" direction of movement (reducing distance) ■ Factory setting: + / −
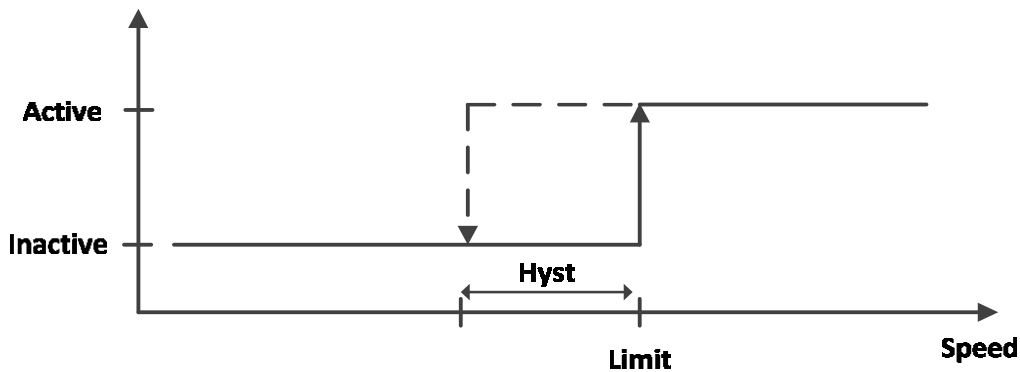
Limit: The switch threshold for speed.

Hyst: The hysteresis value related to the speed switch threshold.

Speed: The measured speed.

6.10 MF1- Srvice submenu

Through this submenu, MF1 can be set as the output signal switching device for the fault to be processed.

Once at least one selected parameter reaches the alarm limit, the output signal switching device will be activated. If other parameter values reach the error limit, the output signal switching device will remain activated. Users can choose multiple parameters to associate with MF1, which is the comprehensive output terminal of multiple signals.

Prerequisite for display:
■ more? Menu: Yes option.
■ MFx On menu: Enable option.
■ Functn parameter: Srvice option.

Parameter	Description
WrnLsr	■ Enable MF1 when the device is about to be replaced due to aging of the laser diode. ■ Options • On • Off ■ Factory settings: On
WrnLvl	■ When the amount of signal attenuation (such as due to pollution) reaches a critical value, activate Mf1. ■ Options • On • Off ■ Factory settings: On
WrnTemp	■ When the internal temperature of the device reaches a critical value, activate Mf1.

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	■ Options ・ On ・ Off ■ Factory setting: On
WrnPlb	■ MF1 is activated when the measured value is not plausible. Possible causes include internal error, hardware failure, beam break, optical interference or electrical interference. ■ Options ・ On ・ Off ■ Factory setting: On
NotRdy	■ MF1 is activated when the device is not ready for operation. Possible causes include hardware failure, optical or electrical interference factors, or the laser is disabled. This warning message is also output during the initialization of the LD100. ■ Options ・ On ・ Off ■ Factory setting: On

6.11 MF1 – LsrOff Submenu

By selecting LsrOff, MF1 is configured as a switching input for switching off the laser diode. If MF1 is activated, the laser diode is switched off.
Switching off the laser diode during downtimes prolongs its service life. The minimum time interval between deactivation of MF1 and the re-output of the measured value is 45 ms.

6.12 MF1 – Preset submenu

This submenu allows you to set MF1 as a switching input for activating a static preset value. This allows the measured distance values to be automatically adjusted to a known reference value (preset value) for the device during commissioning, maintenance or replacement of the device.

The static preset value here determines the time for which the reference value is applied to the device by activating MF1. The distance values measured during this time are automatically compensated and adjusted to the reference value. The formula is:

Compensation value = Preset value – Measured distance value

Tips

When the preset is activated, the distance sensor will temporarily stop outputting measured values. It is recommended to activate the preset function when stationary or at very low speeds. The maximum number of activations is usually 10,000 cycles. The compensation values calculated when the preset is activated are saved in the device.

Preconditions for display:

■ more? menu: Yes option.

■ MFx On menu: Enable option.

■ Functn parameter: Preset option.

Parameter	Description
sPrset	■ Default value for the setting. When MF1 is activated, the reference value is adopted and the associated compensation value is calculated. ■ Setting range: −600,000 … +300,000 [mm]. ■ Factory setting: 0 [mm]
	Tip: Since the display has only six positions, only negative values as low as "−99,999" can be entered. The entire value range can be entered with SimiView. In the display, the highest decimal place is omitted for values less than "−99,999".

Operation sequence:

1. Select the Preset function for the multifunctional input MF1.

2. Enter the desired initialization value for the Preset parameter.

3. Move the vehicle to the initialization position.

4. Enable the multifunctional input MF1, e.g. by a proximity detector, photoelectric sensor or switch.

5. The device output value in the initialization position corresponds to the set Preset value.

6.13 MF2 menu

This menu and the associated submenus are used to configure the parameters of the MF2.

Preconditions for display:

■ more? menu: Yes option.

■ MFx On menu: Enable option.

Parameter	Description
ActSta	■ Select the activated MF2 level. ■ Options • ActLow: Output low when the output is active (switching criteria are met) • ActHi: Output high when the output is active (switching criteria are met) ■ Factory setting: ActLow
Functn	■ Select the function of MF2. ■ Options • Dist: MF2 will be used as a distance output signal switching device. • Speed: MF2 will be used as a speed output signal switching device. • Srvice: MF2 will be used as a service output. ■ Factory setting: Srvice

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Dist / Speed / Srvice	Depending on the selection of parameter "Functn", the corresponding submenu is displayed. For parameter descriptions, see the relevant tables in the following chapters.
Count	Counts the switching events of MF2. Switching the device off and on again resets the counter.

MF2 – Dist submenu

This submenu is identical to the Dist submenu in the MF1 menu. See "MF1 – Dist submenu".

MF2 – Speed submenu

This submenu is identical to the Speed submenu in the MF1 menu. See "MF1 – Speed submenu".

MF2 – Service submenu

This submenu is identical to the Service submenu in the MF1 menu. See "MF1 – Service submenu".

6.14 Offset Menu

This menu allows you to set the compensation value.

Prerequisites for display:

■ more? menu: Yes option.

Parameter	Description
Offset	■ Specify the compensation value. The compensation value is added to the measured distance value. The compensation value has an effect on all outputs and on the distance display on the display. ■ In the case of negative values, the value "0" is output on the SSI interface. ■ The triggered preset value overwrites the compensation value. The formula applies here: Compensation value = preset – measured distance value. ■ Setting range: −600,000 … +300,000 [mm] ■ Factory setting: 0 [mm]

6.15 SpecFu menu

This menu allows you to set special functions.

Prerequisites for display:

■ more? menu: Yes option.

Parameter	Description
AvgDst	■ Select the filter characteristic for the distance measurement. ■ Options ・Slow ・Medium ・Fast ■ Factory setting: Medium
AvgSpd	■ Select the filter depth for the speed measurement (smoothing average filter). ■ Options ・Slow (32 values) ・Medium (8 values) ・Fast (1 value) ■ Factory setting: Medium
ErrRej	■ Select the maximum error suppression time. If the device cannot measure due to a fault (e.g. a brief light beam interruption), the measured value is output at most until the set error suppression time has expired. During this time, the WrnPlb plausibility warning is also output. If measurement is still not possible after the error suppression time has expired, the measured value 0, the plausibility error ErrPlb and possibly other faults (e.g. level fault ErrLvl) are output. ■ Options ・200 ms: If the fault persists for longer than 200 ms, a plausibility error is reported. ・50 ms: If the fault persists for longer than 50 ms, a plausibility error is reported. ・Off: If the fault persists for longer than 5 ms, a plausibility error is reported. ■ Factory setting: 200[ms]
Reset	Reset to factory settings, see the "Performing a reset" section.

6.16 Device reset

1. Select the reset parameter in the SpecFu menu See "SpecFu menu".

2. Press the set key.

√ The display confirms whether to reset.

3. Press the ESC key to terminate the process. Press the Set key to restore the measuring device to factory settings.

√ The OK reset confirmation message is displayed.

4. Press the ESC key several times to return to the measured value display operating mode.

We reserve the right to make technical changes
2024-11-09

7 SSI interface

7.1 Overview of SSI interface

The SSI (Synchronous Serial Interface) interface provides distance measurements of the LD100 via serial data transmission. The interface can transmit clock signals and data signals.

Data transmission is carried out according to the request of the external control system. The cycle time and transmission speed can be set over a wide range. The connected control system inputs a clock sequence to the receiving input of the device. At each positive clock edge, the data output device pushes a data bit to the device's transmit cable, starting with the highest bit. There is a clock delay of at least 30us between two clock sequences. The bit clock is between 70 kHz and 500kHz, depending on the cable length.

The SSI data interface is subject to the cable length, see the table below:

Cable length [m]	Transmission rate [kBd]
< 25	< 500
< 50	< 400
< 100	< 300
< 200	< 200
< 400	< 100

7.2 SSI Data Format

Bin24E/Gry24E

MSB   LSB

Bit24	Bit23	Bit22	Bit21	···	Bit3	Bit2	Bit1	Bit0
D24	D23	D22	D21	···	D3	D2	D1	E

Bin24/Gry24

MSB   LSB

Bit23	Bit22	Bit21	Bit20	···	Bit2	Bit1	Bit0
D24	D23	D22	D21	···	D3	D2	D1

Bin25/Gry25

MSB   LSB

Bit24	Bit23	Bit22	Bit21	···	Bit2	Bit1	Bit0
D25	D24	D23	D22	···	D3	D2	D1

8 Dimensions

6,75

4-M5 depth 10mm

56

6,75

30

45,5

Light outlet position

34,25

20

34,75

17,7

84,95

105,5

121,7

Unit: mm (millimeter)