

Stroboscope

SCHMIDT
control instruments



DSL Series

Model **DSL-300**
DSL-300-T (with trigger connection)

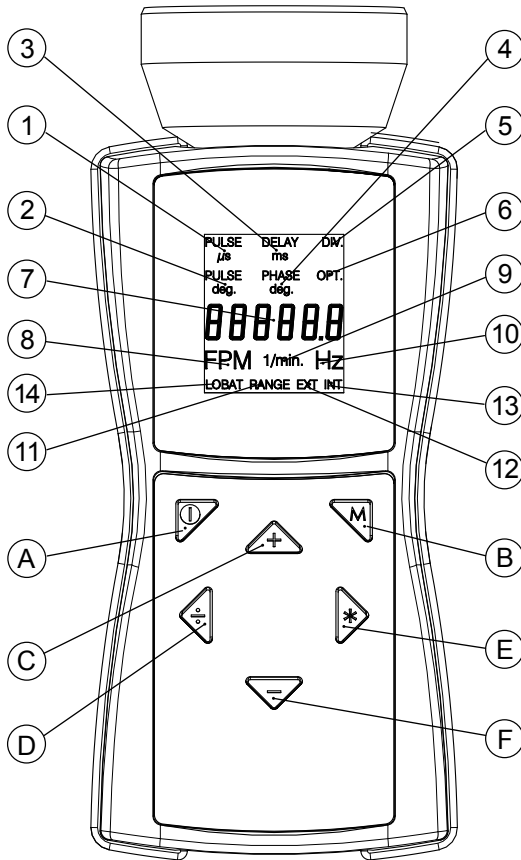
Operating Instructions



SCHMIDT · ALL OVER THE TECHNICAL WORLD



Figure 1



Printed declaration of CE-conformity on request

We reserve the right to make technical changes without prior notice. We have taken the utmost care to prevent errors. Liability in the event of any errors shall be excluded.

Technical Data

General data

Protection class	IP65
Frequency range	30 – 300.000 FPM (flashes per minute)
Display	LCD, multiple lines
Accuracy	0,02% (+/- 1 digit)
Resolution	+/- 0,1 (30 ... 999 FPM) +/- 1 (1.000 ... 300.000 FPM)
Certificates	CE

Flash parameter

Flash duration	Adjustable
Light emission	1500 Lux @ 6000 FPM / 20 cm
Flash colour	ca. 6.500 K / Approx. 6.500 K

Power supply

Power supply	3 x AA size disposable batteries or 3 x NiMH rechargeable batteries
Continuous use time dependent on setting	NiMH-batteries: approx. 11 h @ 6.000 FPM Disposable batteries: approx. 6 h @ 6.000 FPM

Housing

Material	Aluminium / ABS Heavy duty design
Dimensions	191 x 82 x 60 mm
Weight	Approx. 400g (including batteries)

Ambient conditions

Ambient temp.	0° ... 45° C
Humidity	Protection code IP65

Additional information for Stroboscope DSL-300-T with trigger input and output

Trigger input

Principle	Optocoupler, voltage-free
Low level	< 1 V
Level	3 ... 32 V, NPN + PNP
Minimum pulse length	50 µs
Reverse voltage protection	Yes

Trigger output

Principle	Short-circuit and overvoltage proof transistor output to the optocoupler control, non-isolated
Level	NPN, max. 32V
Pulse length	Adjustable
Maximum current	50mA
Reverse voltage protection	Yes

These operating instructions are an integral component of the device. They must be accessible at all times and passed on to future users. If there is something you do not understand please contact your supplier.

The manufacturer reserves the right to continue to develop this device without documenting this in all cases. Your supplier will be pleased to inform you of updates to these operating instructions.

1. Intended use

This device is intended for monitoring the movement of rotating and vibrating objects. It may only be used in accordance with these operating instructions. No alterations may be made to the device. The manufacturer is not liable for damage resulting from improper or non-intended use. In this case the right to claim under guarantee is rendered void.

2. Safety advice

The device may not be opened, other than to change the battery (see chapter 5).

- ⚠ WARNING!** In stroboscopic light, moving objects appear to be still or in slow motion. Do not touch the objects under any circumstances.
- ⚠ WARNING!** The device may not be used in areas where there is a danger of explosion.
- ⚠ WARNING!** Stroboscopic light can trigger epileptic fits in susceptible people.

ATTENTION! Repairs on the device may only be carried out by the manufacturer or the supplier.

ATTENTION! The electronic components of the device contain substances which are harmful to the environment. They must be disposed of in compliance with the environmental guidelines which apply in the country of use.

3. Switching on the device

To switch on the device, please follow these instructions:

- Place batteries / charged rechargeable batteries (optional) into the device.
- Point device towards moving object and switch on. To switch the device on hold down button **(A)** for approximately 3 seconds.
- The device will flash at the most recently set frequency. The display shows the set flash frequency in flashes per minute.

If the flash frequency corresponds to the motion frequency, a static image will be created. If necessary, reset to the default settings by pressing buttons **(B)** and **(F)** simultaneously.

- ⚠ INFORMATION!** Static images are not only created at a precisely corresponding flash frequency, but also at multiples and fractions of this frequency.

4. Operation

- △ **NOTE!** This chapter gives instructions for the operation of the version of the device without trigger connection.
- △ **NOTE!** Special functions and information on how to use the version of the device with trigger connection are described in chapter 9: „Additional operating information...“.

Position of buttons (Figure 1)

- Ⓐ = on/off. Hold down the button for approximately 3 seconds.
Ⓑ = mode button. This button enables you to switch between different settings and modes in the order determined by the display (picture 7, numbers 1-10).
- △ **NOTE!** Some modes only have an effect on the functioning of the device when external triggering is employed.

- Ⓒ = Increases the currently set value. Speeds up when this button is held down.*
Ⓓ = Halves the currently set value. Speeds up when this button is held down.*
Ⓔ = Doubles the currently set value. Speeds up when this button is held down.*
Ⓕ = Lowers the currently set value. Speeds up when this button is held down.*

The following functions are activated by simultaneously pressing the buttons shown below:

- Ⓑ+Ⓕ = Reset to the default settings.
Ⓐ+Ⓕ = Activate button lock / deactivate button lock.

Display fields (Figure 1) Influencing the set signal.

- ① PULS μ s Flash duration (in microseconds).
② PULS μ s Flash duration (in degrees).
③ DELAY ms Delay time (in milliseconds) between the internal trigger signal and the flash.
④ PHASE deg Delay time between the internal trigger signal and the flash (in degrees, relative to the frequency).

Display

- ⑦ Display. For unit – see numbers 8-10.

Unit displayed

- ⑧ FPM Flashes per minute.
⑩ Hz Frequency of motion per second.

Operating information

- ⑭ INT Device is generating flash frequency.
⑮ LOBAT Battery running low.

- △ **NOTE!** A parameter which has been set to differ from the default setting flashes during operation.

5. Information on use of special functions

PULS μ s / PULS deg

Flash duration. This function enables you to set the flash duration. Using this function, you can influence the brightness and focus of the object of observation. This adjustment can either be made in absolute form (microseconds) or in relative form (degrees).

DELAY ms

Adjustment of delay time between the internal trigger signal and the flash (in milliseconds). This function enables you to set a fixed delay time between the internal trigger signal and the flash.

Example: The position of observation can be adjusted extremely precisely without altering the flash frequency. You can shift the observation position within a motion cycle.

PHASE deg

Phase shift adjustment between the internal trigger signal and the flash (in degrees, relative to the frequency). This function enables you to set a fixed angle between the internal trigger signal and the flash.

Example: The position of observation can be adjusted extremely precisely without altering the flash frequency. You can shift the observation position within a motion cycle.

6. Changing the batteries

Using batteries/rechargeable batteries which are not completely charged reduces the operational life until the next battery change. Never use or store the device with the battery compartment uncovered.

How to proceed:

- Switch off device
- Unscrew the screws on the back of the device
- Remove batteries
- Insert new, charged batteries
- Dispose of old batteries in an appropriate way or recharge them (rechargeable batteries)

7. Scope of delivery

- Stroboscope, operating manual, certificate, batteries, case

Additional scope of delivery for the version with trigger connection:

- Cable with plug for trigger signal

8. Accessories, optional

- Tripod adapter, tripod, calibration certificate, belt pouch

9. Additional operating information for the version with trigger connection (DSL-300-T)

ATTENTION! Do not use signals over 300,000 FPM Hz to trigger the device.

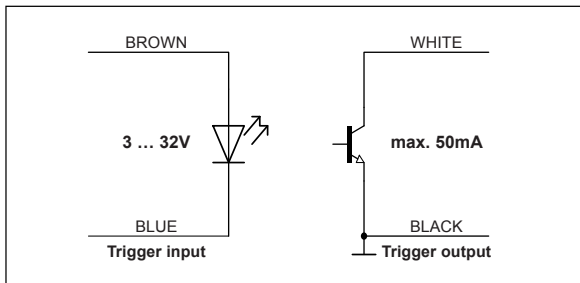
- △ **INFORMATION!** The device must be switched manually between external and internal trigger signal.
- △ **RECOMMENDATION:** Only use original material from the manufacturer for trigger signal connection.

Terminal connection assignment – trigger jack (Figure 2)

ATTENTION! Please observe the terminal connections shown in the terminal connection diagram (Figure 2).

The trigger input is potential-free. The potential-free input is suitable for PNP and NPN signals. A cable with plug, corresponding to these input jacks, is provided with the device.

Figure 2



Position of buttons (Figure 1)

The following functions are activated by simultaneously pressing the buttons shown below:

Ⓑ+Ⓓ = switch between internal and external trigger signal.

Display fields (Figure 1)

Influencing the input signal before the flash is generated

- ③ DELAY ms adjustment of delay time (in milliseconds) between the internal trigger signal and the flash.
- ④ PHASE deg phase shift adjustment between the internal trigger signal and the flash (in degrees, relative to the frequency).
- ⑤ DIV pulse divider, maximum value 255.
- ⑥ OPT trigger signal edge selection
0 = positive edge
1 = negative edge

Unit displayed

- ⑨ 1/min rotations per minute.
- ⑩ Hz frequency of motion per second.

NOTE! When an external trigger signal is used, the units 1/min (rather than FPM) or Hz are displayed.

Operating information

- ⑫ RANGE external trigger signal is causing the flash frequency to be too high.
- ⑬ EXT external trigger signal selected.
- ⑭ INT device is generating flash frequency.

NOTE! A parameter which has been set to differ from the default setting flashes during operation.

Instructions on the use of special device functions in the version with trigger connection (DSL-300-T)

DELAY ms

Adjustment of delay time between the internal trigger signal and the flash (in milliseconds). This function enables you to set a fixed delay time between the input signal and the output signal.

Example: The external trigger signal is generated before the required observation point (= flash position of the stroboscope). In this case the connected stroboscope would regularly flash too soon. With the DELAY ms function, you can set the value by which the output signal should be delayed.

PHASE deg

Phase shift adjustment between the internal trigger signal and the flash (in degrees, relative to the frequency). This function enables you to set a fixed angle between the internal trigger signal and the flash.

Example: The external trigger signal is generated before the required observation point (= flash position of the stroboscope). In this case the connected stroboscope would regularly flash too soon. With the PHASE deg function, you can adjust the delay so that the flash position of the stroboscope is altered by a set angle. This setting is independent of the current speed of rotation, which means that the stroboscope will flash at the required position even during the start-up process or when the speed of rotation is fluctuating.

DIV (pulse divider)

This function is only active when an external trigger signal is employed. With the pulse divider you can set a value x, by which the external trigger signal is then divided.

Example: An external trigger (e.g. rotation sensor) scanning a gear wheel issues a signal for every tooth scanned. At a DIV value of 10, only every tenth input pulse is transmitted to the connected stroboscope as a trigger signal.

OPT

Trigger signal edge selection. 0 = positive edge, 1 = negative edge. With this option, the polarity of the trigger signal can be defined.

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