OPERATION MANUAL

Device type	**HELIO-STROB tripLED V2**
Manufacturer	ELMED Dr. Ing. Mense GmbH Weilenburgstr. 39 D-42579 Heiligenhaus Germany Phone.: +49 2056 / 9329-0 Fax: +49 2056 / 9329-33 E-mail: helio-strob@elmedgmbh.com Web: www.elmedgmbh.com
Version / date	Version 3.0 / 26.11.2025

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1. GENERAL INFORMATION

1.1 Use

1.1.1 Appropriate use

The *HELIO-STROB tripLED V2* is a stroboscope (strobe light) for industrial applications. This device is used to produce snapshots of sequences which, due to the rapidity with which they proceed, are not perceivable by the human eye.

- Appropriate use also includes reading and understanding these operating instructions and complying with the information given in them, especially the safety information. This also includes carrying out all the inspection and maintenance work at the specified intervals.

- The operation of stroboscopes may cause failure or interference of nearby radio devices or radio service. In this case, suspend the operation of the device. As a basic principle, keep the operation of the device as short as possible.

- Any work with the *HELIO-STROB tripLED V2* may be only performed by adequately instructed personnel that meet the requirements for a proper and intended use of the device.

- Safe operation cannot be assured if the *HELIO-STROB tripLED V2* is not used in accordance with the above definition of appropriate use.

1.1.2 Inappropriate use

- Any use other than what is described in the section “Appropriate use” is considered inappropriate use!

- The user, not the producer, shall assume any liability related to any personal injury or material damage resulting from the inappropriate use of the device!

Operating the device in explosion-prone environments is prohibited.

1.2 Technical terms used

1.2.1 Explanations of terms

The following explanations of terms are provided for a better understanding of the functionality of the *HELIO-STROB tripLED V2*.

Term	**Explanation**
triggering	trigger impulses for the flash rate (internal / external)
rising edge	The flash tube flashes at a change in the trigger signal from “0” to “1”.
falling edge	The flash tube flashes at a change in the trigger signal from “1” to “0”.
flash rate	number of flashes per time unit
display	display for indication of set values
fpm	**f**lashes **p**er **m**inute
fps	**f**lashes **p**er **s**econd
phase shift	positioning of the observed object (e.g. marking) to any observation point (0° - 540°)
slow motion	constantly changing phase shift
transformation ratio	factor by which an external trigger frequency is divided or multiplied
touch panel	screen surface operated by touch

1.2.2 Definitions

Term	Explanation
electrical hazard	risk of possible severe injury or the impairment of health due to electrical energy
electrically skilled person	person with suitable technical training, knowledge and experience to be able to identify and avoid the hazards that can be associated with electricity
qualified person	person with suitable technical training, knowledge and experience to be able to identify and avoid hazards
electrically instructed person	person who has received adequate instruction from electrically skilled persons to be able to avoid hazards associated with electricity
instructed person	person who has received adequate instruction from qualified persons to be able to avoid hazards
supervisor	person appointed to bear direct responsibility for the completion of the work – this responsibility can be transferred in part to other persons when required

1.3 Design

Special emphasis was placed on safety in the course of developping the H*ELIO-STROB tripLED V2 devices*.

The devices are built according to the recognised European safety-related rules and correspond to the state of the art at the time of delivery.

The basic construction of the *HELIO-STROB tripLED V2* includes the following components:

Housing	full metal housing with handle	
Power supply	rechargeable battery (pluggable) / power supply unit	
Operation	twist knob and touch panel	
Display	LCD display	
Connection	2-pin jack	(operation via power supply unit)
	5-pin jack	(triggering IN / OUT)
	USB jack type B	(serial interface)
	Connection battery	(pluggable on the handle)

To exclude electrical hazards, any changes to the device may only be made by trained electrically skilled persons authorised by the manufacturer.

Take special care when opening the device, since it is possible to touch parts carrying a voltage that is considerably higher than the supply voltage.

Working on the device is only permitted after waiting 2 or more minutes after shutting it off. The rechargeable battery must be removed and, when using the power supply unit, the device must be disconnected from the mains. This is due to the hazards of possible residual charges in electronic components.

1.4 Functional description

A stroboscope is a device that emits very short flashes of light (usually in ranges around a few µs) at a consistent time interval and in the selected number per second (frequency in Hz).

Fast, periodically recurrent movements such as rotation, oscillation or pressure processes that cannot be clearly perceived by the naked eye can be observed, optically stopped or measured through manual or external synchronisation of the repetition frequency with the flash rate of the stroboscope. Thus, the repetition frequency can be determined.

Through special functions, the sequence of movements can be optically slowed down (slow motion) or the observed point in time of a periodical movement process can be determined precisely (phase shift).

It can be used separately or also in combination with cameras or other light-sensitive devices / sensors.

1.5 Performance characteristics

The *HELIO-STROB tripLED V2* device type features the following performance characteristics:

- Internal / external triggering
- Phase shift
- Slow motion function
- Transmission ratio
- Display of system errors
- Serial interface via USB

1.6 Declaration of conformity

DECLARATION OF CONFORMITY

ELMED Dr. Ing. Mense GmbH
Weilenburgstr. 39
D-42579 Heiligenhaus
Germany

hereby declares that the product

Device type **Stroboscope**

Type designation **HELIO-STROB tripLED V2**

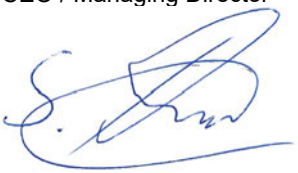
complies with all relevant regulations of EU Directives 2014/30/EU and 2011/65/EU.

The following harmonized standards were used as a reference:
DIN EN 61326-1:2022
DIN EN 61000-6-2:2019
DIN EN 61000-4-2:2009
DIN EN 61000-4-3:2021
DIN EN 61000-4-4:2013
DIN EN 61000-4-6:2014
DIN EN 62471:2009

ELMED Dr. Ing. Mense GmbH

Heiligenhaus, 26.11.2025

CEO / Managing Director



Stefan Schneider

1.7 Modifications

Modifications by the device operator without consulting the manufacturer are prohibited in principle. Modifying the device without consulting the manufacturer voids the warranty. The device operator assumes full liability for the consequences of unauthorised modifications. Design engineering modifications that have such significant effects on the technical specifications and appropriate use defined in this operation manual so as to change the device considerably void the declaration of conformity!

1.8 Measurement units

The following thread standards are used in all technical documentation and drawings:

- Metric system (ISO)
- UNC (Unified Thread Standard)

1.9 Packaging / Transportation / Storage / Delivery

1.9.1 Packaging

To prevent transportation damage, all components are packaged and supplied in sturdy transport packaging (plastic case/carton). The transport packaging is designed for air freight and lorry transportation.

The following ambient conditions apply for transportation:

- Temperature range -20 °C ... +50 °C
- Air humidity no condensation
- Thermal time constant < 10 K/h

Attention:
Extreme impacts and vibrations can cause damage!
The transport packaging must be protected against direct contact with water and high air humidity!

All of the packaging materials used correspond to the regulations of the destination country and can be disposed of according to the applicable regulations and laws.

1.9.2 Storage

Until putting into operation, the transport packaging can be used for storage. The transport packaging must be protected against direct contact with water and high air humidity. If you have questions about transportation or storage, please contact the manufacturer.

The following ambient conditions must be met for storage:

- Temperature range -20 °C ... +50 °C
- Air humidity no condensation
- Thermal time constant < 10 K/h

1.9.3 Delivery

Immediately upon receipt, the delivery has to be inspected for integrity and completeness.

Scope of delivery:
The type and scope of delivery is documented on the enclosed delivery note.
The standard scope of delivery consists of the following components:

- *HELIO-STROB tripLED V2* hand-held stroboscope
- Rechargeable battery Li-Ion 14.4 V / 4 Ah
- Charger
- Operation manual
- 5-pin male jack, triggering IN / OUT
- Transport box

Optional:
- Power supply unit 100 - 240 VAC
  (Various primary plugs available on request (EU / UK / US))
- Handle cover as a replacement for the rechargeable battery
- USB connection cable, A/St – B/St, length 1.8 m

Receiving inspection:
Complaints regarding the type and scope of delivery have to be submitted to the manufacturer immediately after delivery, no later than within 5 days.

Damages:
Contact the final carrier immediately in case of transportation damage!
Keep the transportation packaging until the completeness and integrity of the delivery have been verified.

2. SAFETY-RELATED INFORMATION

2.1 General safety instructions

Read the following safety instructions prior to putting into operation.

Do not put the device into operation if you have concerns about safety.

Contact the manufacturer if you have questions about safety.

2.2 User's due diligence

All *HELIO-STROB tripLED V2* devices were designed and built with due consideration of a hazard analysis and according to the carefully selected applicable harmonised standards, as well as other technical specifications. They meet the requirements of the Equipment Safety Act, which means they are state-of-the-art and guarantee the highest safety standards.

In operational practice however, this safety can only be achieved if all necessary measures have been taken. Planning and implementing these measures as well as verifying proper compliance falls under the user's due diligence.

In particular, the operator is required to ensure that:

- the *HELIO-STROB tripLED V2* is only used as intended.
- devices are operated only in proper, fully functional condition.
- the operation manual, legible and complete, is available at the operating site of the devices at all times.
- the devices are operated only by adequately qualified and authorised personnel which is regularly trained in all aspects related to occupational health and safety; the personnel is familiar with and follows the operation manual, especially the relevant safety information contained therein.
- all safety and warning labels are clearly legible and none of them are removed from the device.

2.3 Safety symbols and their meaning

Safety symbols impart safety information through a combination of:

- geometric shape
- colour
- graphical symbol / text

They are used both on the device and in the operation manual to point out situations with a possible hazard potential quickly and clearly.

All safety-related passages in this operation manual are highlighted with one of the following safety symbols. Provide all persons working with the device with the safety information.

Special symbols indicate important information that must be strictly observed.

The following symbols are used in this operation manual:

This symbol indicates a hazardous situation which, if it is not avoided, can lead to serious injuries or death.

This symbol indicates a warning of hazardous electrical voltage.

This symbol indicates important information in the operation manual that must be strictly observed.

This symbol warns he user against staring into the light source.

This symbol indicates information provided for improving the understanding of processes.

2.4 Basic safety measures

The fundamental safety directives and regulations of the Employer's Liability Insurance Association and national authorities apply for the operation of the devices.

Before the initial start-up, the stroboscope and all accessories have to be inspected for proper and functional condition, and accepted and released by a supervisor.

In commercial operations the employer / entrepreneur has to inform the employees / insured persons about possible hazards related to their work and the safety precautions to be applied.

- Do not look into the flash tube directly and unprotected as this could be dangerous for the eyes – especially over longer periods of time.
- Due to the dazzle effects caused by looking into the LEDs at short distances, the ability to see may be disturbed in such manner as to make orientation impossible.
- LED rays must not be aimed at the eyes of persons or animals.
- Using strongly focussing optical instruments to view the beam of light is not permitted.

Classification according to DIN EN 62471:2009-03
According to DIN EN 62471, the light source is assigned to risk group 1 and does not represent a hazard “due to normal behavioural limitations”. This means, e.g. that the user automatically looks away from the light source. If the above safety instructions are observed, there is no risk of eye injuries.

2.5 Requirements concerning the operating personnel

The devices may only be operated by persons who have been instructed and authorised accordingly. These persons must have read and understood the operation manual, in particular the section “SAFETY-RELATED INFORMATION”, and then act accordingly.
They must have been instructed in the basic principles of health and safety at work and accident prevention.

2.6 Help with safety-related questions

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Web: www.elmedgmbh.com

2.7 Specific warnings

The persons listed below have to be informed of the hazards described in the following.

2.7.1 Wearers of active implants

Safety information for wearers of active implants
When using stroboscopes, an influence on active implants (e.g. pacemakers) cannot be completely excluded. For safety reasons we recommend that people wearing active implants are excluded from working with stroboscopes. Persons wearing active implants have to be expressively instructed in this regard.

2.7.2 Epileptics

In case of users with a neurological proneness to epileptic seizures, the light effects produced by a stroboscope may cause photo-induced epilepsy. Users with such predisposition must not use stroboscopes!

3. TECHNICAL DATA / INPUTS & OUTPUTS

3.1 Technical data

Power supply	12 – 14.4 VDC (nominal voltage)
Power consumption	max. 10 W
Dimensions of the case	182.5 x 117 x 117 mm³ (handle not included)
Weight	approx. 1.32 kg (without battery) approx. 1.86 kg (with battery)
Light source	15 CREE high-performance LEDs
Internal control of the flash rate	twist knob and touch panel
External control of the flash rate	pos. impulses 5 to 30 V (triggering edge individually adjustable)
Signal propagation delay for external triggering	approx. 51 µs
Internal flash rate in Hz / fpm	1 - 840 Hz / 60 - 50400 fpm
External flash rate in Hz / fpm	1 - 8000 Hz / 60 - 480000 fpm, incoming flash rates > 845 Hz are split integrally.
Measurement duration	0.33 s (min. 1 period)
Measuring value display	LCD screen, height of digits 8.5 mm
Display in	fps / fpm
Display resolution	up to 0.01 Hz / 0.1 fpm
Phase shifting in	degree / ms
Range degree / ms	0° - 540° / 0 - 999.99 ms
Resolution degree / ms	0.1° / 0.001 - 0.01 ms
Slow motion	fps / fpm
Resolution fps / fpm	-5 fps - +5 fps / -300 fpm - +300 fpm
Resolution slow motion	0.01 Hz / 0.1 fpm
Variable transmission ratio (external triggering)	1:10 - 10:1
Resolution variable transmission ratio	0.001
Flash duration	< 100 Hz: 1 - 100 µs (adjustable) > 100 Hz: 1 µs – max. 1 % of the period duration of the configured flash rate
Light output	max. 0.17 Ws
Light intensity	max. 5500 Lux (distance: 50 cm)
Accuracy	0.01 % ± 1 digit
Operating temperature	0° ... +40° C
Storage temperature	-20° ... +50° C
Air humidity	80% relative air humidity at 30° C

Power Supply – battery mode

Battery type	lithium-ion battery
Output voltage	14.4 V
Capacity	4000 mAh
Battery life (performance-related)	approx. 12 h. (at 50 Hz / 50 µs flash duration)
Charging time	approx. 40 min.

Charger

Input voltage	220 - 240 VAC / 50 - 60 Hz
Output voltage	7.2 – 18 VDC – 9 A
Operating temperature	+10° C ... +40° C

Power supply unit (optional)

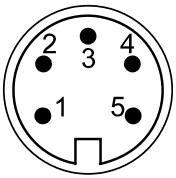
Input voltage	100 - 240 VAC / 47 - 63 Hz
Output voltage	12 VDC – 0.85 A
Operating temperature	0° C ... +40° C

3.2 Inputs / Outputs

3.2.1 Connector pin assignment POWER jack

Jack	Pin	Description
	1 2	+12 VDC 0 V (GND)

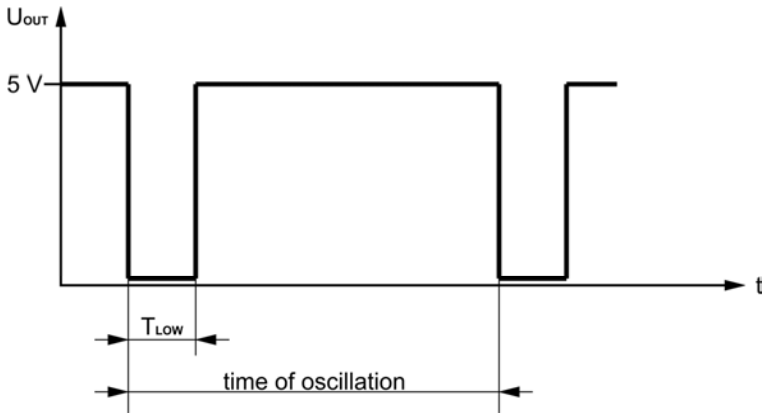
3.2.2 Connector pin assignment IN/OUT jack

Jack	Pin	Description
	1 2 3 4 5	0 V (GND) +5 VDC (output) +12 VDC (output) Trigger OUT Trigger IN

3.2.3 Trigger output

The *HELIO STROB tripLED V2* is equipped with a trigger output (Trigger OUT), for example to control other devices. The signal on the IN/OUT jack is TTL compatible. The period duration depends on the flash rate; T_{LOW} is constant (200 µs). If the stroboscope is controlled by an external signal, the output frequency corresponds to the input frequency up to 845 Hz. For frequencies above 845 Hz up to 8000 Hz, the trigger output provides the flash frequency divided by an integer, not exceeding 845 Hz. The undivided frequency of the external signal source is shown on the display.

Signal sequence:



4. INTIAL STARTUP

4.1 General information for putting into operation

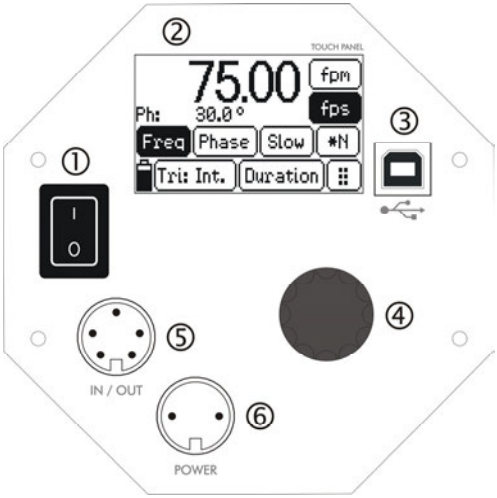
In order to avoid damage to the device or injuries during putting into operation, observing the following points is essential:

- The initial startup may only be performed by qualified persons under observation of the operation manual and the safety information.
- Switching on the device is only permitted after verifying that proper and safe operation is ensured.

If defects are found in the course of inspection, these have to be properly rectified prior to putting the device into operation. The device may only be put into operation after all noted defects have been rectified.

Do not use any parts that have been damaged!

4.2 Electrical initial startup



1 On / Off switch

2 Display / touch panel

3 USB jack

4 Twist knob

5 IN/OUT jack

6 POWER jack

4.3 Operation

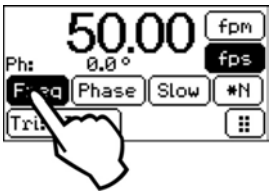
Battery operation
Slide/plug the battery on the handle. Switch on the stroboscope. The last settings (frequency / revolution speed etc.) are automatically loaded. New devices are generally de-livered with partly charged batteries. Charge the batteries for extended use.

Mains operation via power supply unit (optional):
Switch off the stroboscope before connecting the power supply unit to the stroboscope (“POWER” jack). The power supply unit is connected to the mains voltage and the POWER jack on the stroboscope. Allowable input voltage 100 – 240 VAC. Verify that the mains voltage corresponds to the information on the type plate. Switch on the device. The last settings (frequency / revolution speed etc.) are automatically loaded. Note: The power supply unit is not a charger for the battery. Alternatively, the rechargeable battery can be removed from the handle. To protect the contacts, we recommend using the handle cover.

4.4 Functions

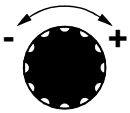
Select the functions by touching the corresponding buttons on the touch panel. Active functions and options are shown **inverted** on the display. To enter or change a value in the top row (large numbers), use the twist knob or alternatively the numeric keypad following selection on the touch panel (see below).
Twist knob: Turning quickly results in changes in large increments, turning slowly results in changes in small increments.
An additional value in smaller numbers is shown on the bottom row of the display – when adjusting the frequency for example, the current phase shift value is shown in addition.

Touch panel



Touch

Twist knob

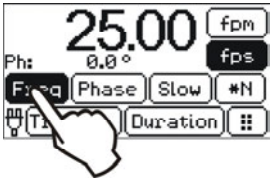


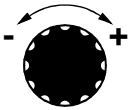
Turn

4.4.1 Buttons of the touch panel

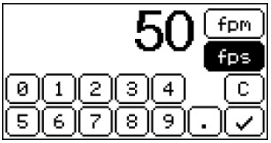
Freq	Flash rate
Phase	Phase shift
Slow	Slow motion
*N	Multiplier
N:M	Transmission ratio
Duration	Duration (flash duration)
fpm	Display in **f**lashes **p**er **m**inute
fps	Display in **f**lashes **p**er **s**econd
ms	Display in milliseconds in “Phase” mode
°	Display in degrees in “Phase” / “Duration” mode
us	Display in microseconds in “Duration” mode
⠿	Show numeric keypad
0 1 2 3 4 5 6 7 8 9	Numeric keypad
:	Division ratio input
.	Decimal point
–	Leading sign, slow motion value
C	Correct / delete
✓	Confirm input / accept determined frequencies
✕	Cancel
*1	Return to original frequency
*↓	Reduce multiplier
*↑	Increase multiplier
Tri: Int.	Trigger mode selection: Internal status
Tri: Ext↑	Trigger mode selection: External status, rising edge
Tri: Ext↓	Trigger mode selection: External status, falling edge
Int.	Internal triggering
Ext↑	External triggering, rising edge
Ext↓	External triggering, falling edge
	Battery operation / battery charge level
	Mains operation (optional)
	Twist knob

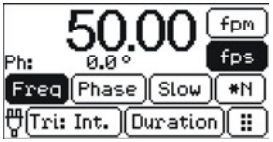
4.4.2 Adjusting the frequency





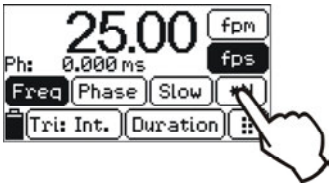
or





Freq	Selecting the flash rate mode
fpm	Display in [fpm] - flashes per minute
fps	Display in [fps] - flashes per second
●	Adjust value fpm / fps
⠿	Show numeric keypad
0 1 2 3 4 5 6 7 8 9	Direct input as decimal number fpm / fps
.	Decimal point
C	Correct / delete
✓	Confirm input
✕	Cancel

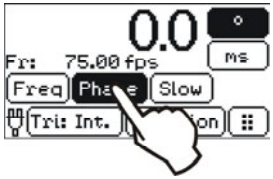
To determine revolution speeds or frequencies, begin with the maximum value (flashes) and slowly reduce the frequency until the test object being observed appears to stand still. ATTENTION: When starting with the lowest frequency, there is a risk of determining a low frequency. This is because the test object appears to stand still even at an integral fraction of (for example half) the frequency.
For checking the determined value in the INTERNAL trigger mode use the function *N by means of which the flash rate can be multiplied in integer numbers:

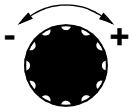


*N	Verify and double the flash rate
*↑	Factor to increase the flash rate (max. 10 times)
*↓	Factor to reduce the flash rate
*1	Return to original frequency
✓	Accept determined frequency

(max) in the second row of the display indicates that you cannot further increase the frequency using the multiplier *↑ .

4.4.3 Phase shift





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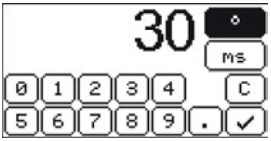
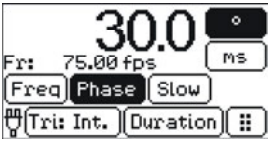
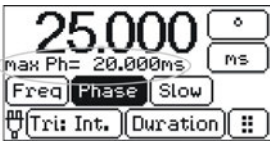




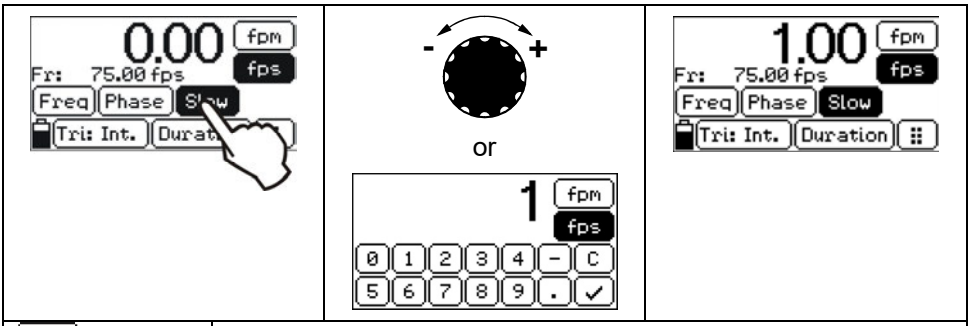
Phase	Phase shift mode selection
°	Display in degrees
ms	Display in milliseconds
●	Set value degrees / millisecond
⠿	Show numeric keypad
0 1 2 3 4 5 6 7 8 9	Direct input as decimal number degrees / millisecond
.	Decimal point
C	Correct / delete
✓	Confirm input
✗	Cancel

The phase shift causes a delay between the trigger signal and the flash. This makes it possible to observe specific movement states in case of periodic movements of the test object. With the setting in degrees, the object being observed is always seen in the same position regardless of the revolution speed.

If a delay in milliseconds is set, corresponding to a phase shift greater than 540°, a corresponding notice appears in the second line of the display alternating with the standard message (see illustration).



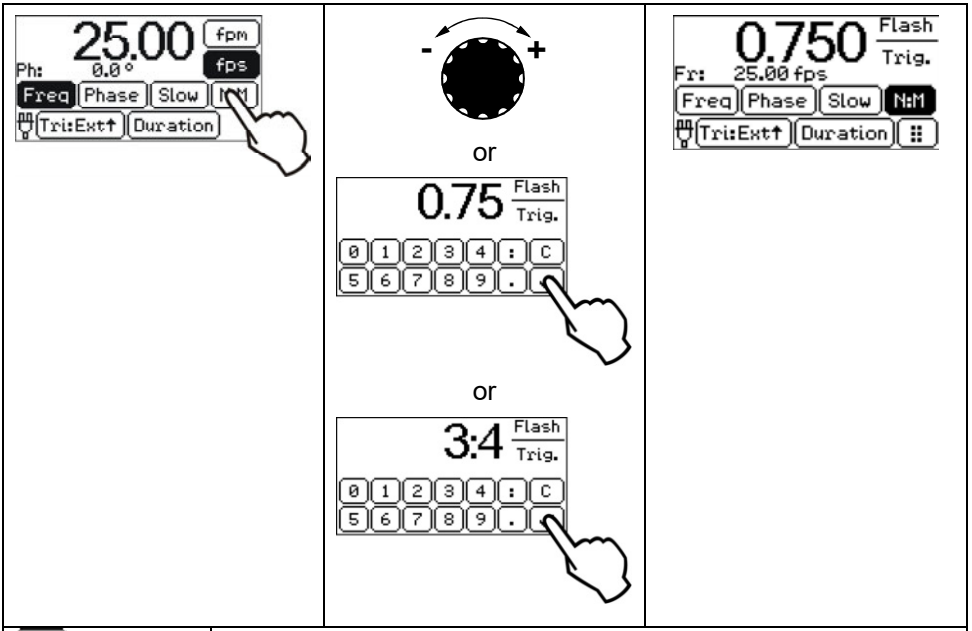
4.4.4 Slow motion



Slow	Select slow motion mode
fpm	Display in [fpm] - flashes per minute
fps	Display in [fps] - flashes per second
●	Adjust value fpm / fps
⠿	Show numeric keypad
0 1 2 3 4 5 6 7 8 9	Direct input as decimal number fpm / fps
.	Decimal point
-	Leading sign, slow motion value
C	Correct / delete
✓	Confirm input
✗	Cancel

The entire periodic movement sequence of a test object can be observed with the help of slow motion. It creates the impression that the object is moving slowly and continuously. Select the speed and movement direction between +5 Hz and -5 Hz (beat frequency).

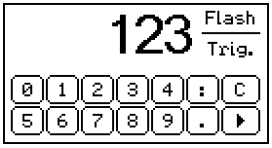
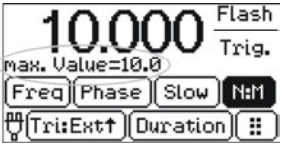
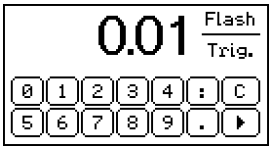
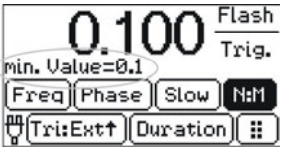
4.4.5 Transmission ratio



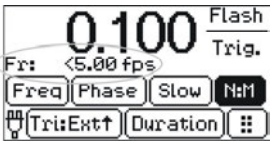
N:M	Select “Transmission Ratio” mode
	Set the ratio as a decimal number
⠿	Show numeric keypad
0 1 2 3 4 5 6 7 8 9	Direct input of the ratio as a decimal number / ratio
:	Numeric input of the ratio
.	Decimal point
C	Correct / delete
✓	Confirm input
✗	Cancel

This function can only be activated with “external triggering”. The ratio between the flash and the trigger frequency can be entered in the range of 0.100 to 10.00 (decimal) or as a ratio (such as 3:4).
With the “Transmission Ratio” function it is for example possible to use the trigger signal of a transducer on the motor axis in order to obtain a still image of a shaft connected via a transmission.

Notes on entering the “transmission ratio”

	Exceeding the allowable range of 0.100 to 10.00	
	Falling below the allowable range of 0.100 to 10.00	

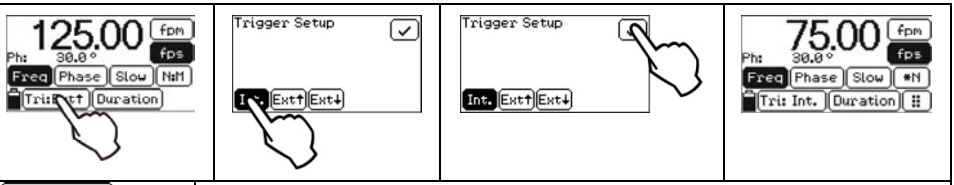
If the entered ratio exceeds or falls below the allowable range of 0.100 to 10.00, a corresponding message is shown on the display for 4 seconds. The smallest possible ratio (0.100) is automatically set if the value is too low, and the largest possible ratio (10.00) is set if the value is too high.

	If the flash rate resulting from the configured ratio falls below the allowable range (< 1 Hz), a “<” character is shown before the frequency. If the resulting flash rate exceeds the allowable range (> 845 Hz), there is no warning and the frequency is automatically divided integrally.

4.4.6 Triggering

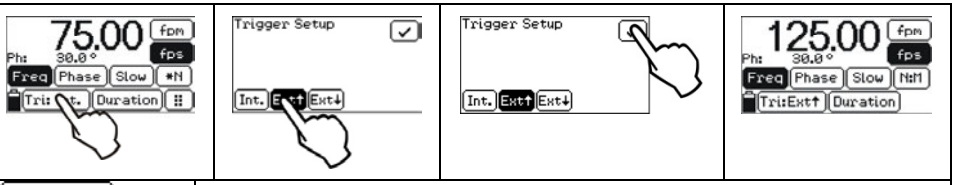
Supplying the external trigger signal via the IN / OUT jack. If no external trigger signal is applied or the frequency of the external trigger source is less than 1 Hz in “external triggering” mode, the display shows “-.--”. With external signals > 0 Hz, the stroboscope flashes at the external clock. Frequencies > 845 Hz to 8000 Hz are integrally divided. The undivided frequency of the external clock is shown on the display.

4.4.6.1 Internal triggering



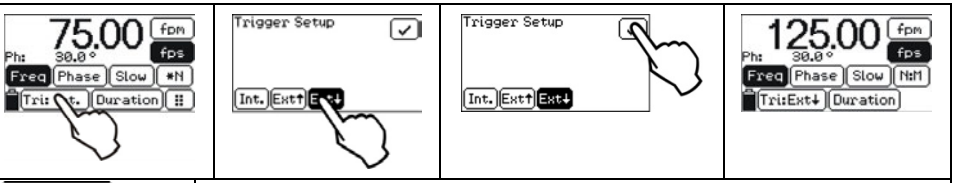
Tri: Int.	Select the triggering mode
Int.	Select the option “Internal Triggering”
✓	Confirm input

4.4.6.2 External triggering, rising edge



Tri: Int.	Select the triggering mode
Ext↑	Select the option “External triggering, rising edge”
✓	Confirm input

4.4.6.3 External triggering, falling edge



Tri: Int.	Select the triggering mode
Ext↓	Select the option “External triggering, falling edge”
✓	Confirm input

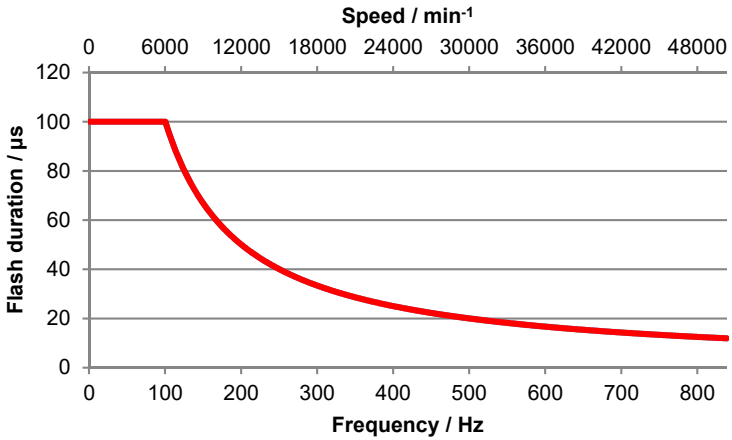
4.4.7 Flash duration (button “*Duration*”)

The LED technology offers the opportunity to vary the flash duration (the on-time of the light source), either in “µs” (microseconds) or in “ ° ” (degrees). Hereby the following features can be varied:

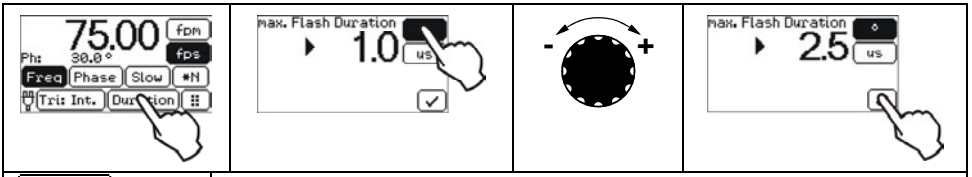
- the contour sharpness of a test object and simultaneously
- the output brightness of the device

A shorter flash duration improves the contour sharpness. At the same time, the brightness decreases. Depending on the application, the optimum combination of contour sharpness and brightness can be found.
With the setting in “ ° ” (degrees), the flash duration changes depending on the flash rate. The ratio of the flash duration to the period duration remains constant.
If the option “µs” (microsecond) is chosen, it stays the same length for any flash rate (within limits). This means a maximum *flash duration* of 100 microseconds can be set up to 100 Hz.
The flash duration can also be set to max 1 % of the period duration for the currently selected flash rate.
Since the two modes work independently of each other, the active (selected) mode is shown **inverted**.

Max. flash duration depending on the frequency

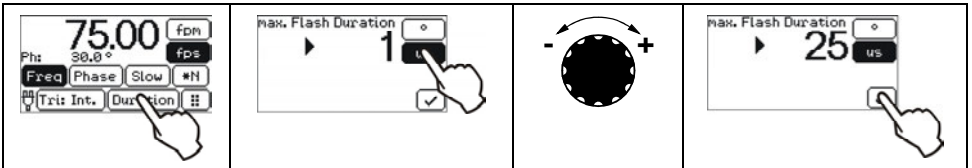


4.4.7.1 Flash duration, degrees



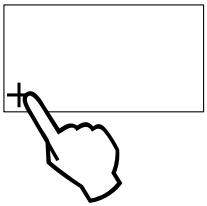
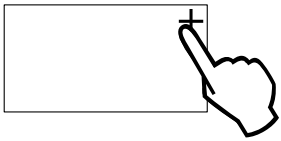
Duration	Select Duration mode (flash duration)
°	Select the option “Degrees”
	Set value
✓	Confirm input

4.4.7.2 Flash duration, microsecond



Duration	Select Duration mode (flash duration)
us	Select the option “Microsecond”
	Set value
✓	Confirm input

4.5 Touch panel calibration

Recalibration of the touch panel may be necessary, e.g. due to ageing of the panel or failure to recognise contact. To calibrate the touch panel, please proceed as follows:		
		
After turning on the stroboscope, touch the home screen on the display for about 5 seconds.	Touch the cross that appears in the bottom left corner.	Touch the cross that appears in the upper right corner. Finished!

4.6 Serial interface via USB

Via the serial interface, the *HELIO-STROB tripLED V2* can be computer-controlled.
It is also possible to update the firmware via the serial interface.
Further information on controlling via PC and firmware updating can be found on our Internet service page.

URL:	http://support.elmed.eu/helio/
Username:	helio
Password:	8yBMJoDQ

4.7 Power supply

For the use of rechargeable batteries, chargers, or power supply units that are not supplied or specified by the manufacturer (ELMED), there is no liability.

Furthermore, there are the following hazards:

- Electrical hazard
- Fire hazard
- Explosion hazard

4.7.1 Battery operation

The *HELIO-STROB tripLED V2* is operated with a changeable lithium-ion battery. The battery operating time depends on the configured flash rate and duration. At a flash rate of 50 Hz and a flash duration of 50 µs, the *HELIO-STROB tripLED V2* can be operated on battery for approximately 12 hours.

Important information about the rechargeable battery:
Please note the separately enclosed safety instructions and the operation manual of the manufacturer!

Used batteries have to be disposed of according to the applicable legal regulations.

4.7.1.1 Charging the battery

To charge the battery, the supplied external charger is used. Allowable input voltage 220 – 240 VAC. Verify that the mains voltage corresponds to the information on the type plate. The charging time is approx. 40 minutes.

Important information about the charger:
Please note the separately enclosed safety instructions and the operation manual of the manufacturer!

4.7.2 Mains operation (optional)

The *HELIO-STROB tripLED V2* can optionally be operated using a power supply unit connected to the mains voltage. The connection is made to the POWER jack of the stroboscope. Allowable input voltage 100 – 240 VAC. Verify that the mains voltage corresponds to the information on the type plate. The power supply unit is not a charger for the battery. Alternatively, the rechargeable battery can be removed from the handle. To protect the contacts, we recommend using the handle cover.

Important information about the power supply unit:
Please note the separately enclosed safety instructions and the operation manual of the manufacturer!

5. MAINTENANCE

5.1 Maintenance

According to the design, the *HELIO-STROB tripLED V2* is not susceptible to disturbance. However, the following should be generally observed:

- Do not throw the device or expose it to heavy impacts.
- Store the device protected from damage.
- Clean the device using only a soft, slightly moist cloth.
  Use only mild detergents.

Maintenance schedule

	Before putting into operation	Daily	Weekly	Monthly	Annually	As needed
Inspect the *HELIO-STROB tripLED V2* for mechanical damage	X					X
Inspect the rechargeable battery, charger, power supply unit for mechanical damage	X					X
Safety inspection					X	X

The time intervals specified in the maintenance plan are guidelines. The intervals have to be established by the customer and verified depending on the operating conditions.

5.2 Inspection / Calibration

To maintain the reliability and the high quality standard of the *HELIO-STROB tripLED V2* over a long period of time, the device should be inspected by the manufacturer on a regular basis. All device-specific functions are checked in the course of maintenance. A works calibration certificate is issued by request.
The result of maintenance work is documented in an inspection record and stored in a product database.

5.3 Repairs

Devices that are damaged or do not perform according to their specifications shall not be used any more. To provide a safe and functional device, only original spare parts shall be used for repair.

To dispose of the old device according to legal rules and provisions, please send the *HELIO-STROB tripLED V2* to the manufacturer.

For maintenance / repair or disposal, please send the *HELIO-STROB tripLED V2* free to the door addressed to:

ELMED Dr. Ing. Mense GmbH
Stroboscope Service
Weilenburgstr. 39
D-42579 Heiligenhaus
GERMANY

Proper execution of maintenance and repair is guaranteed only by the manufacturer or by qualified and authorised service centres.

5.4 Replacement parts / Accessories

Item no.	Designation
0D59301520005	Rechargeable Li-Ion battery 14.4 V / 4 Ah
0D59301520006	Charger for Li-Ion battery (14.4V / 4 Ah), 220-240 VAC
0310210013	Power supply unit 100-240 VAC + handle cover
0310610050	5-pin plug (triggering IN / OUT)
0310200070	USB connection cable, A/St – B/St, length 1.8 m
0310550022	Transport box