

Operating instructions

Phase Trigger

Event 5.2

v.01.02 / 2012-09



www.phasetrigger.com



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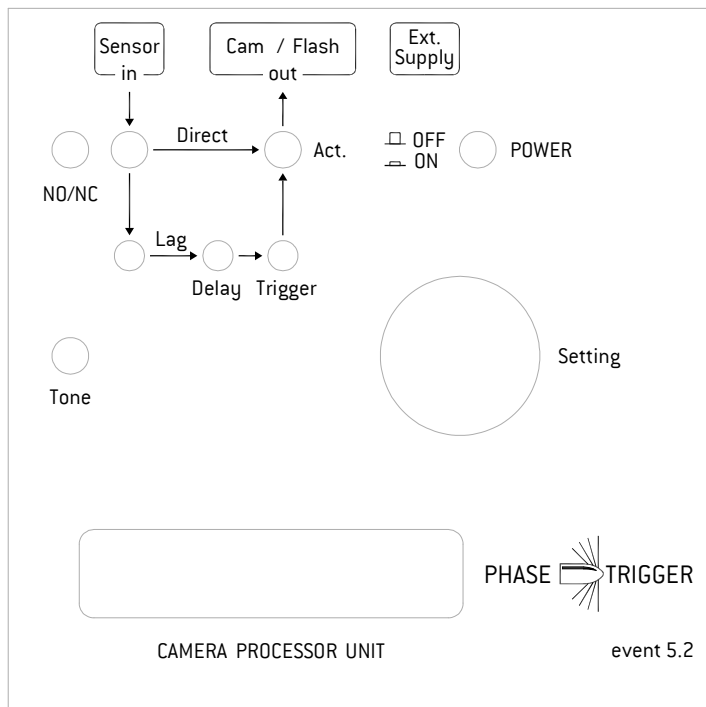
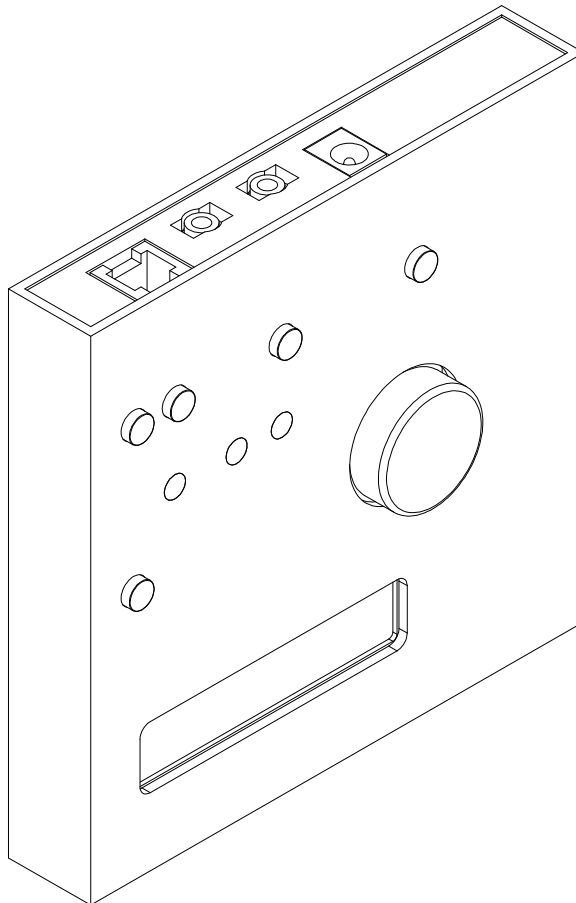
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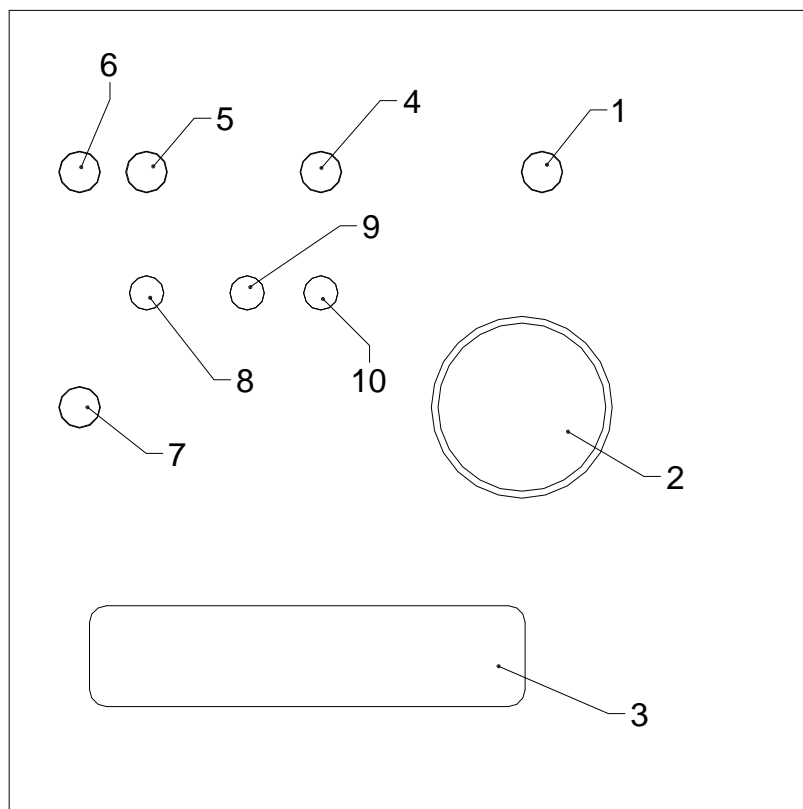
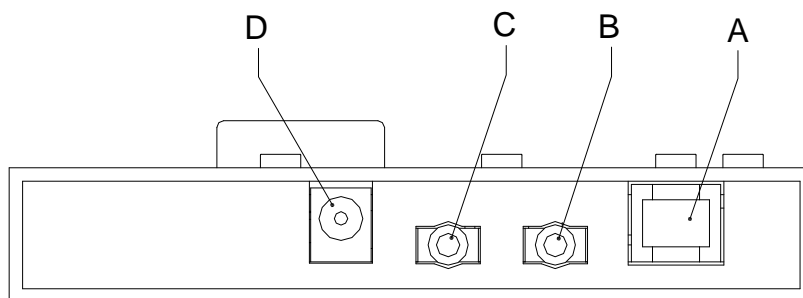
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1. General description

Phase Trigger is a camera control device that enables an accurate shooting in various situations. It can be used as an auxiliary device in cases where a picture taking is to take place at a certain point in time that was difficult to define previously. Phase Trigger is able to trigger different types of camera in various situations.

2. General information

2.1 Installation

In order to avoid deformation, discolouration or serious damage, do not expose the device to the following factors:

- high temperatures (such as in the proximity of a heating source or in a vehicle during the day)
- direct, strong sunlight
- low temperatures (under -15°C)
- excessive moisture or rainfall
- above-average exposure to dust
- strong vibrations.



Some sensors work with LASER light. Please note that LASER light can damage the eye if you look directly at the beam of light!

Please note that only sensors included in the delivery or which were ordered subsequently are to be connected to the Phase Trigger, whereas other untested types can lead to malfunctions, or they can even damage the device!

Please be sure to observe the correct polarity of each individual battery, when inserting or replacing the batteries. The wrong polarity can lead to the destruction of the electronics! For more information, please read Chapter 2.2.2.

Please note that the device is not protected against splash water! It is therefore necessary to ensure that, if operated in open air, the device will not be damaged by rainfall or snow.

Please note that any water condensation forming at the interior of the device could also lead to temporary malfunctioning, or even damage the device permanently. In order to avoid this, when you move the device from a significantly lower temperature to a warmer environment, keep the device packed for a longer time, and allow it, this way, to reach the room temperature before putting it into operation. Please take into consideration that in the event of a thunderstorm, close lightning strikes could destroy the sensitive electronics. It is thus advisable not to operate or leave the sensor or the Phase Trigger positioned outdoors during thunderstorms.

2.2 Power supply

Phase Trigger can be operated optionally either by using a power adaptor or by batteries. When the power adaptor is connected to the device, the batteries are turned off, and will not be used. Before you connect, or as the case may be, disconnect the power adaptor to or from the device, turn off the device. The rechargeable batteries, will not be charged by the Phase Trigger.

2.2.1 Operation by power adaptor / External power source

Please use exclusively the delivered power adaptor to supply your Phase Trigger with power. Other adaptors could cause damages to the Phase Trigger. Please also make sure that the adaptor to be used is designed as for the mains voltage of the area where you wish to use the Phase Trigger. The tension of the external power source should be between 9 and 15 Volt and be a direct current voltage. Alternating voltage is definitely not adequate to run the Phase Trigger!

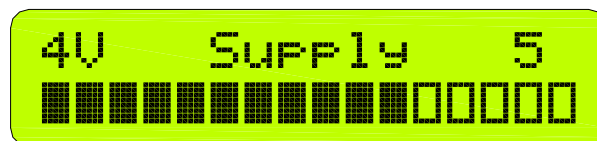
The device can also be operated by a vehicle battery (12 V). For this, use a cord with an adequate connector. A vehicle battery can ensure the ongoing operation of the Phase Trigger for several days, even weeks.

2.2.2 Battery operation / Internal power source

The Phase Trigger can be operated with 4 rechargeable batteries type NiMH or, if necessary with 4 dry-cells batteries. Both types must have the „AA“, „Mignon“ or „LR6“ format. The device has a function that protects the battery cells against destruction due to low battery voltage. If the cells' voltage reaches the lower limit of approx. 4.2 V, the device shuts off the battery cells. At a value of approx. 4.4 V, the message „LOW BATTERY“ appears, which indicates that the batteries must be replaced.

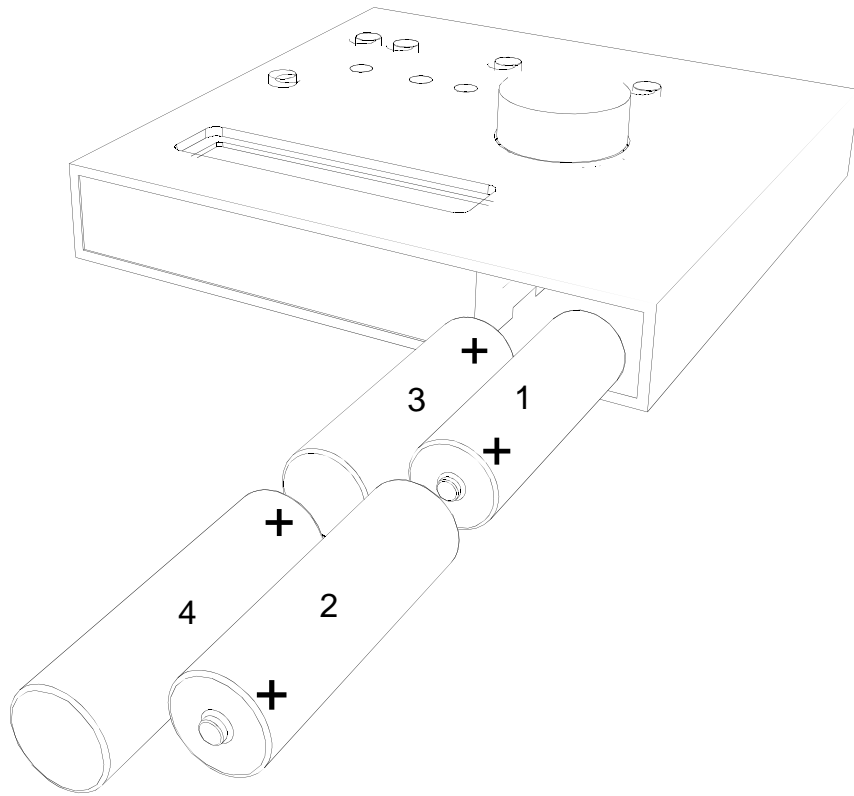


You can have the batteries' voltage displayed at any time by pressing the dial (2) for 2 seconds long. However, during this time the Phase Trigger will not receive signals, nor will it perform its trigger function.

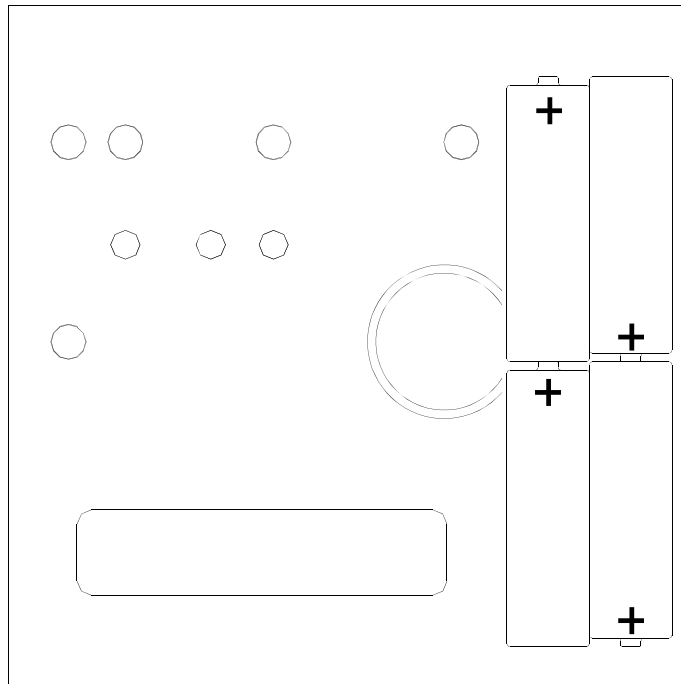


Never mix different battery types! Always use powerful rechargeable batteries and charge them completely and properly with an adequate, intelligent battery charger. Only use battery chargers that are able to charge each rechargeable battery individually. With battery chargers that can only charge 2 or 4 batteries together at the same time, load them up only partially.

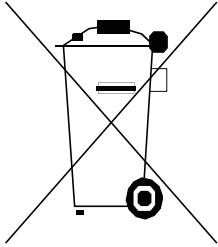
When inserting or replacing the batteries, please be sure to observe the correct polarity of each battery. Wrong polarities can lead to the destruction of the electronics! Please see the illustrations for the correct succession when inserting, or removing each individual battery from the device.



Order of insertion of batteries: 1-2-3-4
 Order in which the batteries must be removed: 4-3-2-1



The correct polarity of the battery-cells



The user is legally obliged (battery regulation) to return used batteries and rechargeable batteries. Disposing used batteries in the household waste is prohibited! Batteries/ rechargeable batteries containing hazardous substances are marked with the crossed-out wheeled bin. The symbol indicates that the product is forbidden to be disposed via the domestic refuse. The chemical symbols for the respective hazardous substances are:

Cd = Cadmium, Hg = Mercury, Pb = Lead.

You can return used batteries/ rechargeable batteries free of charge to any collecting point of your local authority, our stores or where batteries/ rechargeable batteries are sold.

Consequently you comply with your legal obligations and contribute to environmental protection!

2.3 Handling and transportation

Phase Trigger should always be carried and stored in the delivered case. Never exercise excessive violence on the controller, on the control keys and on other parts of the device. Handle the switch and the connections with caution. Always pull the cable holding the plug and never pull holding the cable directly. Drops or strong blows can damage the Phase Trigger. Please handle the device with the appropriate caution!

2.4 Maintenance

The device is maintenance-free but should be cleaned occasionally. When cleaning, the device must be removed from any power source. Only use dry and soft cloth to clear the housing of the charger. Do not use abrasive or solvents!

3. Operation

3.1 Device ON / OFF (1)

It enables the user to switch the Phase Trigger on and off. The lower position of the button stands for turned on, whereas the upper position indicates that the device is turned off.

Please switch the device off every time when not in operation. This way you will be able to avoid an unnecessary battery drain.

3.2 Dial (2)

It enables the access to the value of the intervals and mode, as well as the display of the battery status.

3.2.1 Setup the time-delay or the shooting time

Phase Trigger is able to effect a time-delay between the sensors' signal and the triggering of the camera or of the flash unit. Similarly, it can also operate a long shooting for pictures series.

The resolution of value is 0.2 milliseconds, whereas the maximum time is 9.9999 seconds, which means practically 10 seconds. In this regard, it should be noted that, notwithstanding setting a zero value „00000“, Phase Trigger induces a time-delay of approximately 0.06 milliseconds.

A shooting without any time delay can be attained in the direct mode (see Chapter 3.5).

By pressing and rotating the dial simultaneously, the position of the cursor can be shifted, and thus you can select the desired position of the value.

The value can be entered each time by rotating the dial. When the position has reached the figure 9, it increases the value of the nearby higher position by one. If the value is to be decreased, it counts down to 0, and only when it reaches 0 does it change the value of the neighbouring, lower position to 9. This way, the user can decide if he wants to make use of this position change.

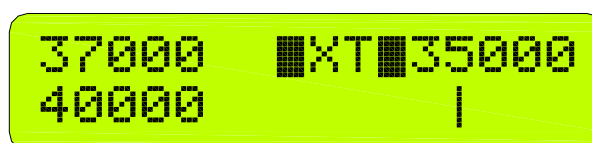
3.2.2 Mode selection

Phase Trigger can be operated in the following mode:

Triggering of image-series (XT)

In this mode, Phase Trigger executes a long shooting, so that the camera will produce series of pictures. In order to achieve this, the camera's shutter button must be pressed manually. The lengths of the shooting can be defined using the time value. This value depends on the speed with which the connected camera shoots image series, and on the desired number of pictures.

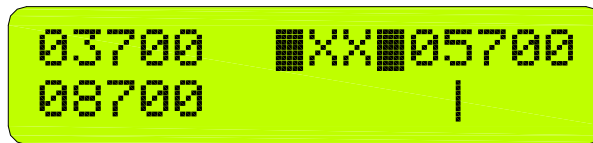
Most of the single-lens reflex cameras can produce approx. 20 pictures in a sequence, with a speed of 4 to 8 pictures/sec. It makes, therefore sense, to set up values in this mode from 1 to 5 seconds.



Typical time values from 0.3 s to 6 s.

Chain-Triggering (XX)

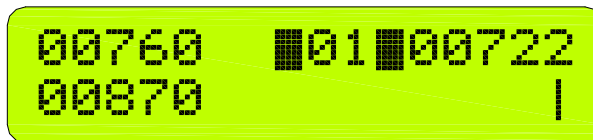
In this mode, Phase Trigger will shoot continuously for as long as the sensor is active. The set time is the time interval between each individual shot. The first shot will be taken without any time-delay.



Typical time values from 0.3 s to 10 s.

Single Triggering (01)

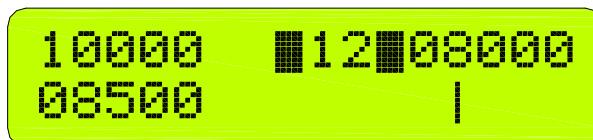
This mode executes a single shot. The shooting takes place after the activation of the sensor, with time-delay.



Typical time values range from 0.0 s to 0.5 s.

Multiple Triggering (02 to 99)

produces the corresponding number of shootings. The set time is the time interval between each single shooting. The first shooting follows the activation of the sensor, without any time-delay.

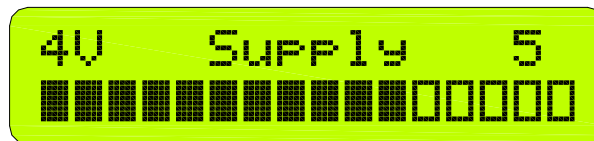


Typical time values from 0.2 s to 10.0 s.

The duration of the time-delay or the length of the shooting corresponds to the set current time value, that appears on the display. Please take into account that it is not advisable here to set a shorter time than the response time of the camera. For instance, if the camera needs 0.3 seconds to detect two distinct shootings, then the delay value set in the Phase Trigger should be higher, in order to allow it to execute the shortest interval between the shootings.

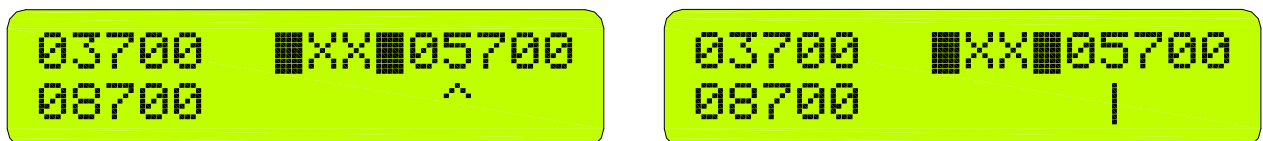
3.2.3 Battery status display

By pressing the dial for 2 seconds, the operating voltage will be displayed. When the Phase Trigger runs by batteries, the displayed value of the voltage represents the voltage of the batteries. The display registers only the voltage interval from 4.2 Volt to 5 Volt, which is relevant for the battery mode.



3.3 Display (3)

The double-spaced display consists of 3 areas. On the right side there is the figure of the current time-value and the number of shootings, between two black beams. On the lower row there is a cursor which shows „|“ for stand-by and switches on to „^“ during active input mode.



Left on the display there are the previous two time values, on the upper row the value of the last shooting, which is different from the current value. On the lower row is displayed the second last value. These should help the user to determine de facto the required time values, using empirical values.

The backlight of the display is switched on just during settings. If there are no setting operation the display will be switched off after around 10 minutes to save battery. But this is not a standby modus, Phase Trigger is still working continuously without any restrictions. The display will start again when you turn the dial (2).

3.4 Connection to the camera or to the flash unit (4)

The user has the possibility to decide if Phase Trigger should trigger the camera or the flash unit by making use of the switch (4). For instance, when the system is being installed and customised, shootings are mostly unwelcome. The switch (4) interrupts the connection to the connected devices.

3.5 Direct shooting (5)

The switch makes possible a direct connection between the sensor and the camera or flash unit (5). Using this direct setting, the time-delays as well as all the other functions will be bypassed. The signal of the sensor is being transferred directly to the camera, or to the flash unit.

3.6 Selection of sensors' logic (6)

Most of the sensors have two switching outputs which operate with opposite logic: NC – normally closed and NO - normally open. Depending on the change of state to which the triggering must react, the suitable switching output will be chosen.

3.7 Sound ON / OFF (7)

In order to simplify the positioning of the sensors, Phase Trigger was equipped with a control tone. This is activated simultaneously with the sensor-activation LED (8), and notifies the user with

regard to the switching status of the sensor. When an audio signal is heard, a change of sensors' state occurred, that makes a shooting possible.

The control tone can be turned on or off using the switch (7). In order not to disrupt the monitoring, the control tone should remain switched off during the standard operation of the Phase Trigger.

3.8 Sensor activates LED / Colour RED (8)

In order to enable a better control of the switching status of the sensor to the device, Phase Trigger was equipped with a control light, This is activated simultaneously with the control tone (7), and signals the user the switching status of the sensor. When the LED (RED) lights up, it means a change of status of the sensors occurred, which makes possible a shooting.

3.9 Time-delay LED / Colour BLUE (9)

For a better visualisation of the time-delay that was set for the shooting, Phase Trigger has a control light, which signals the duration of the delay.

3.10 Triggering LED / Colour GREEN (10)

For a better monitoring of the shooting, Phase Trigger was equipped with a control light, which lights up shortly when Phase Trigger executes a shooting. This also occurs when the connection between the switching output of the Phase Trigger and the switch (4) is interrupted.

3.11 Connecting sensor (A)

There are various sensors which can be connected here. Please, only use the delivered cord and sensor. Otherwise the device can be damaged.

3.12 Connecting the camera or the flash unit (B and C)

Phase Trigger has two connection jacks and overall 4 channels to which cameras or flash units can be connected. These switching outputs are electrically disconnected from the control electronics of the Phase Trigger. This way, a potential destruction of the connected devices becomes impossible.

Older flash units could, nevertheless, damage the Phase Trigger if they have a primitive shooting system, that is to say, when they have at the pins a voltage higher than 60 V. In order to avoid this, please refrain from connecting the Phase Trigger to a no-name flash unit that was produced before the 1990. You will recognise them by the fact that they only have one monopolar flash socket pin. More recent brands, on the other hand, can be operated without any hesitation.

3.13 External power supply (D)

Phase Trigger can also be operated using an external power supply, especially if you need to operate it over a longer period of time. This could be a power supply unit or a different direct current source, that supplies without interference direct current voltage from 9 V to 14 V and has minimum 1 A., such as a car battery which can perform, according to its capacity, a continuous operation for several days up to several weeks.

4. Using the Phase Trigger

In order to use Phase Trigger efficiently, you should work out a concept that allows you to best achieve your ideas related to the picture taking. In this regard, you should devise a kind of screen-play according to which you should set up the scene and decide the positioning of the sensors.

You should determine accurately:

- how likely, or how frequently the object will appear there
- how the object behaves in the camera's visual field
- which distances you should have between sensors, Phase Trigger and the camera
- which type of sensors are best suited for the location of the object
- how unobtrusive the installation needs to be, in order to take the picture undisturbed
- which perspective should be used (wide-angle to telephoto)
- the duration of the operation considering the power supply

The characteristics of the object play a very important role:

- Speed
- Colour, transparency and properties of the surface
- Size

Moreover, you need to consider:

- the lighting conditions
- temperatures
- wind
- moisture/rainfall
- speeds

When drafting the concept, good knowledge in the field of photography would be very helpful. Furthermore, the user should be informed with regard to the durations and the speed at which the processes related to the contemplated event occur. Likewise, the user should be familiar with the technical data and the functions of the camera or of the flash unit used. For this, read each manual carefully. In most of the cases, setting the camera on automatic modes will not lead to satisfactory results.

4.1 Sensors

The selection of the correct sensor-type depends, respectively on the best way in which the event can be automatically recorded and on the best way in which the object can be localised.

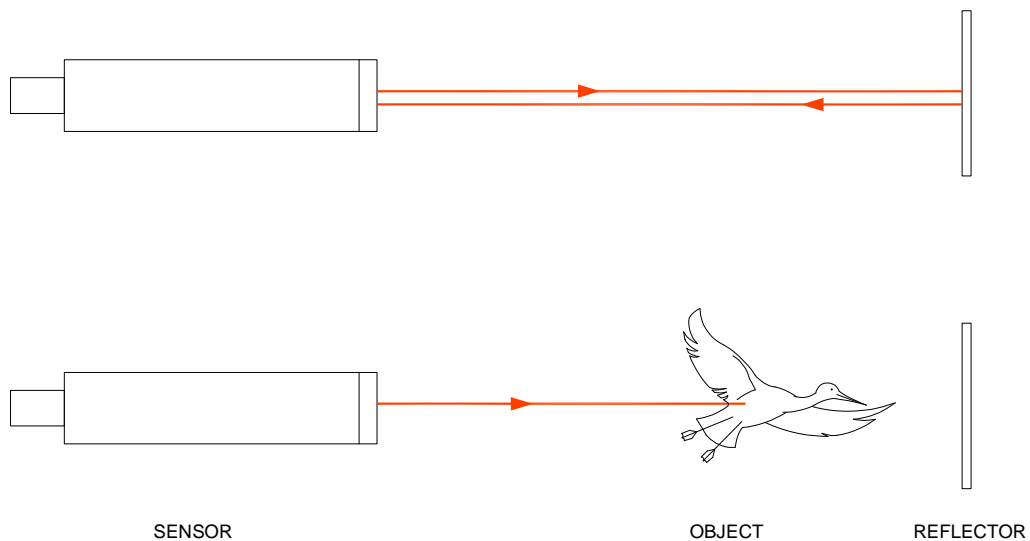
Photoelectronic sensors can operate as light barrier or as sensors. As long as light barriers are being activated by the object interrupting the ray of light, the sensors notice the proximity of the object. Both types of sensors can monitor distances of just a few millimetres up to several metres. Light barriers which work with reflected light need a reflector.

The light to be used can be:

- red light
- infrared light
- LASER - light beam

Retro-Reflex Sensors

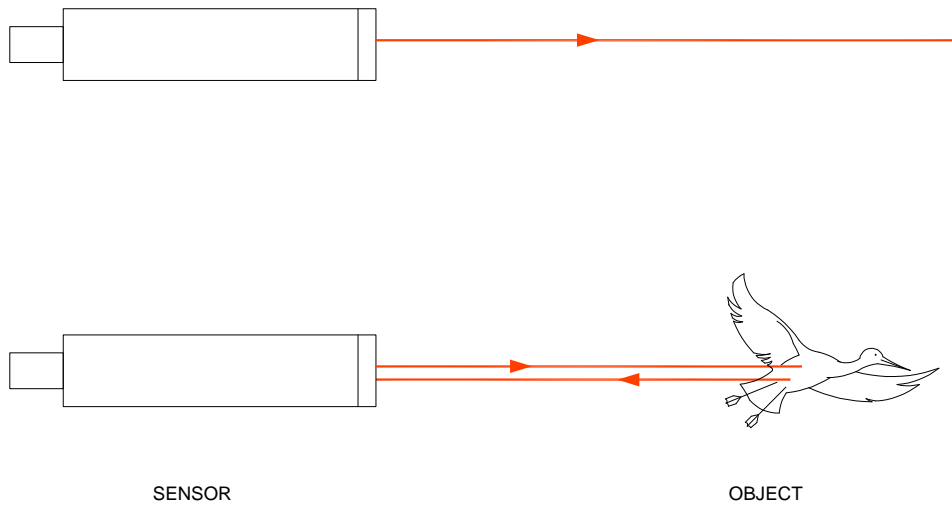
Retro-Reflex Sensors work with red light or laser light. The transmitter and the receiver are integrated into a single housing and a reflector is required. If the light beam between the sensor and the reflector is interrupted by an object, the output is switched. Glossy objects such as mirrors, chrome plated or other reflective surfaces can be reliably recognized thanks to the integrated polarization filter.



How Retro-Reflex Sensors work

Reflex Sensors

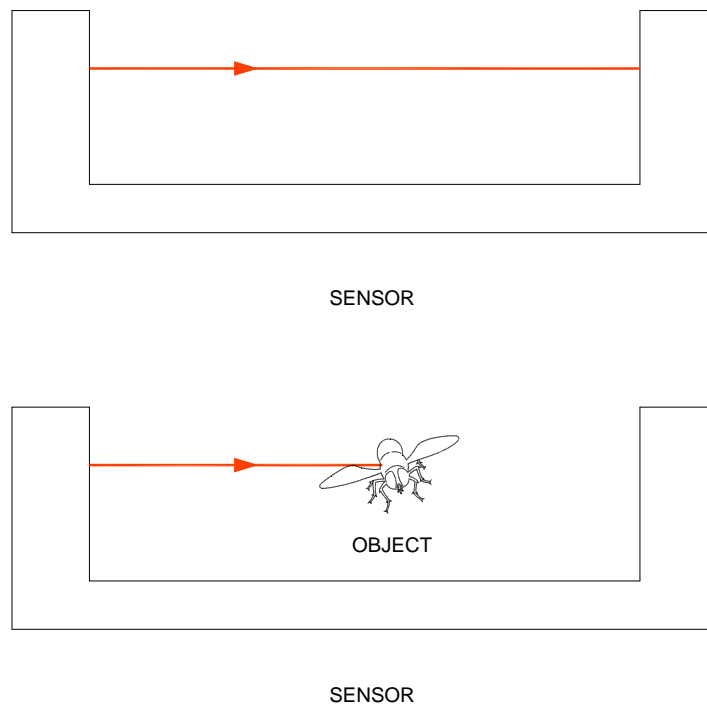
These sensors have the transmitter and receiver integrated into a single housing. The light beam emanating from the transmitter is reflected by the surface of the object to be recognized. A part of this light is detected by the receiver and it is transformed into a signal for switching by an evaluation unit integrated in the sensor.



How Reflex Sensors work

Fork Sensors

With Fork Sensors the transmitter and the receiver are integrated into a single housing as a light barrier. If the light beam between the transmitter and the receiver is interrupted, the output is switched. Thanks to the use of visible laser light, the sensor is very easy to align to the object. The use of a fine light beam ensures a small diameter spot over the entire width of the fork. This allows for the recognition of extremely small parts.



How Fork Sensors work

Most of the photoelectronic sensors possess a control element to set the switching distance. With fast events, one should particularly consider the reaction speed of the sensors' models in order to ensure that the object will be recorded reliably. For the characteristics and performance of the sensors, please refer to the data sheet of each sensor-type.

Please note that LASER-light beam can damage the eye if you look directly into the ray of light! Please remember that only delivered or subsequently ordered sensors should be connected to the Phase Trigger, whereas other, untested types can lead to malfunctions or even damage the device!

The item number of the sensors are structured as follows.

Scanning methode –	Distance in [cm]	Light
RL = Reflex / Sensors RR = Retro-Reflex / Barrier with reflector FU = Fork sensors	0020 = 20cm 0050 = 50cm 0100 = 1m 0600 = 6m 1200 = 12m	R = Red light I = Infrared light L = LASER

Example:

RR-0600-R = Reflex barrier (incl. reflector) with red light for 6m working distance

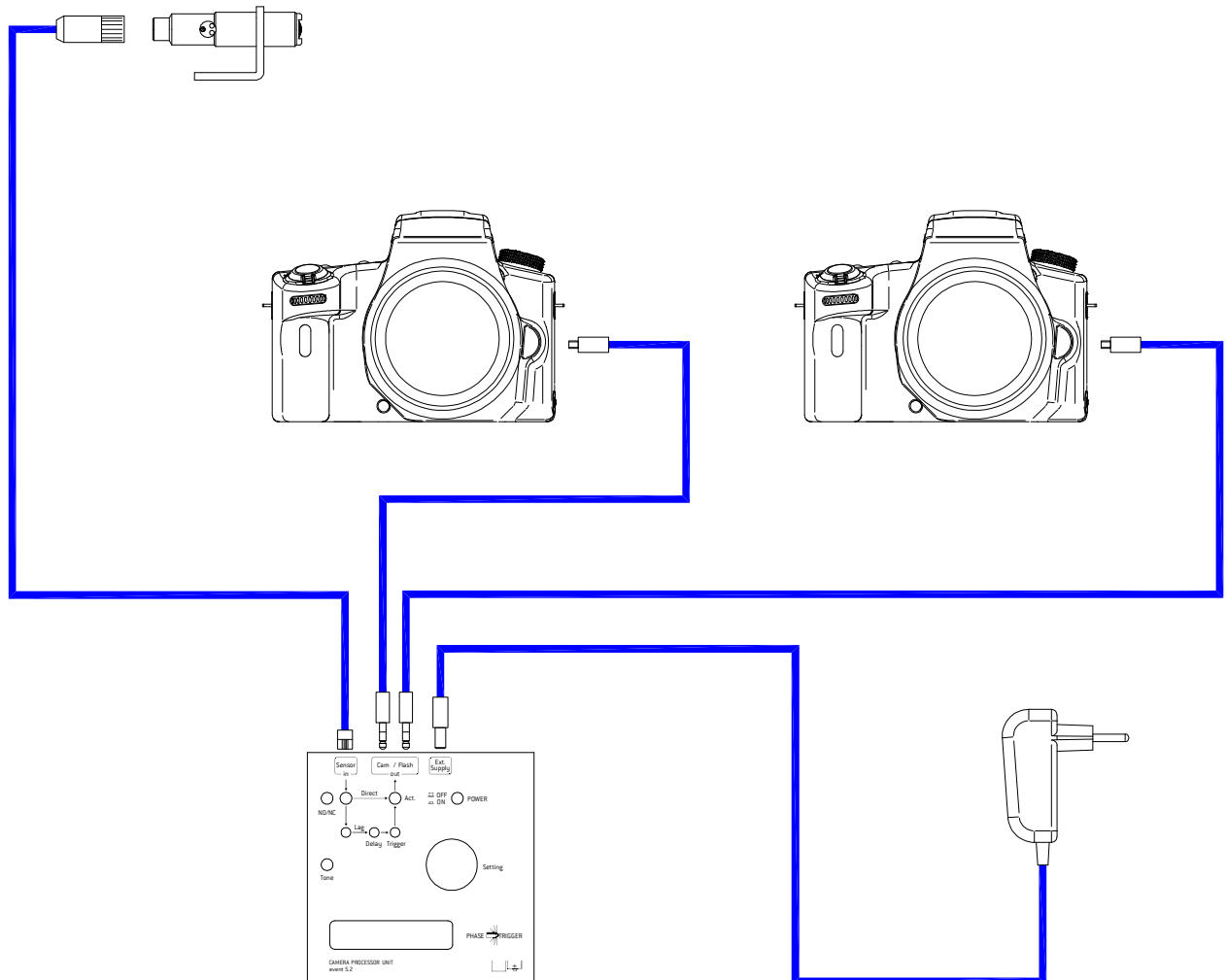
RL-0050-I = Reflex sensor with infrared light for 50cm working distance

The sensors and the reflectors were equipped with a mounting bracket with a ¼-inch thread hole that allows their attachment to a commercially available tripod.

4.2 Configuring the system

The standard structure of the trigger system consists of:

- Sensor with mounting bracket
- Sensor cord
- Phase Trigger control device
- Camera shutter-release cord
- Camera or Flash
- Power supply



The standard structure of the trigger system

In order to create the concept for the photo shooting, you should consider carefully the equipment. If necessary, use tripods, flash units, extension cables, mains adaptors or power batteries. When assembling the equipment, it is advisable to set up the equipment first at home, in order to avoid situations when components are possibly not compatible to one another, or they work deficiently. Particularly the cable lengths should be determined carefully. Once on site, it is generally too late to correct the error. In this regard, it is very important to choose and test the correct sensor type.

5. Frequently asked questions - FAQ

Can I trigger any camera with Phase Trigger?

- No, especially because most of the compact cameras do not have a shutter-release port. However, the most common single-lens reflex cameras have an adequate port and can be triggered using a cord. You can find the list of the cameras on www.phasetrigger.com

Could Phase Trigger, as the case may be, inflict any damages to my camera?

- No, the connection and control of the camera is electrically disconnected from the electronics of Phase Trigger, whereas the control signal is conveyed exclusively through an optical path.

Can I simultaneously trigger a camera and a flash unit using Phase Trigger?

- Yes, this is technically possible, however a simultaneous triggering of the camera and the flash unit is not advisable. The flash unit is normally triggered by the camera, so it can be synchronised correctly. For this reason, the flash should be, as is usually the case, attached to the camera. The two switching outputs of the Phase Trigger enable a simultaneous triggering of two cameras. This makes it possible, for instance, to shoot the same event from two different angles or perspectives. Nevertheless, there are exposure techniques in which the camera is set on BULB in the darkness, and the flash is being triggered separately. For such cases, however, Phase Trigger is able to trigger up to four flash units simultaneously, in order to increase the luminosity, for instance, or so that it can expose the scene from various distances, colours etc.

Do I need well-founded photography knowledge to be able to operate Phase Trigger?

- No, everything you need to know can be found in this instructions manual. Thanks to the digital photographic technology, the pictures are no longer limited by the length of the film and therefore the ideal settings can easily be tested and readjusted.

Are the batteries in Phase Trigger being charged when operated by mains adaptor?

- No, the batteries will not be charged by Phase Trigger, they must be charged with a battery charger.

Can I use non-rechargeable, so-called dry-cell batteries?

- Yes, it is possible. However, please note that the Phase Trigger had been conceived to work best with Ni-MH-batteries. See also Chapter 2.2.2

6. Technical data

Data		Value	Description
BxLxH	[mm]	120x120x30	
Weight	[g]	200	
Battery		4x1.2V	rechargeable Ni-MH batteries
External power supply	[V] [mA]	9-15 min. 750	Filtered direct voltage
Min. time	[ms]	0.1	Minimum adjustable time
Max. time	[s]	9.9999	Maximum adjustable time

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