

2021-03 r8

EN - User instructions

PALART
REDEYE

RedEye

This product is a laser instrument for forklifts to aid and improve safety while loading and unloading pallets in a warehouse environment.

Two bright laser lines illuminate the shelving in front of the forklift truck and guide the operator to fetch or place a pallet.

This minimizes collisions with shelving and potential damage to both merchandise and equipment.

Features

- Bright visual indicators to aid and guide the forklift operator
- Automatic activation of the laser lines by movement or vibration
- Two parallel laser lines, one to fetch and one to place a pallet
- Simple installation and operation of the device
- Long operation time with built-in battery, up to 10 days (8h/day)
- Dust and splash safe design for challenging environments

Package contents

Before installation, please check that the following equipment is included in the RedEye package.

- 1x RedEye laser unit with built-in battery
- 1x Walladapter for charging (110V/230V)
- 1x RedEye low adapter suitable for forklifts under 1.8 T
- 1x RedEye normal adapter suitable for forklifts over 1.8 T
- 1x Metal mounting bracket for alternative installation
- 4x Shims for angle correction

Accessories:

- 1x Universal magnet for additional support and mounting options

Specifications

RedEye-unit

Forklift support	Class 2 and 3 (1.0 - 4.5 T), 90% support
Carriage support	Standard and side-shifting carriages
Laser operation range	2 to 3 m, laser range up to 30 m
Laser lines	2
Beam direction	Horizontal, parallel, pre-calibrated
Beamwidth	60° ±3.5° horizontally
Line divergence	3° ±0.5° vertically
Laser type	Class 3R, <5 mW, 630-635 nm (red)
Power on/off	Magnetic switch, along with adapter
Operation time	10 days, when used actively 8h/day
Activation	Accelerometer (movement/vibration)
Battery	Built-in 5000 mAh lithium-ion polymer
Protection grade	IP55 - dust and splash proof
Target use case	Storage warehouse, indoor-/outdoors
Operation temperature	0° C to 40° C
Storage temperature	-25° C to 70° C
Dimensions	L107 x H51 x D45 mm
Weight	259 grams

RedEye-charger

Mains voltage	90-264 VAC, 50 Hz
Charging voltage	5.0 VDC
Charging current	0.5 A
Charging time	10 hours (0-100%), normally 8h

RedEye-mounting adapter

Mounting method	Magnets (neodymium)
Dimensions	B60 x H86 x D31 mm
Weight	105 grams

Liability

Liability of the manufacturer of the original equipment:

- PALART is liable for an operational safe and fault free product, in addition to the user instructions

Liability of the propereatiery operator of the product:

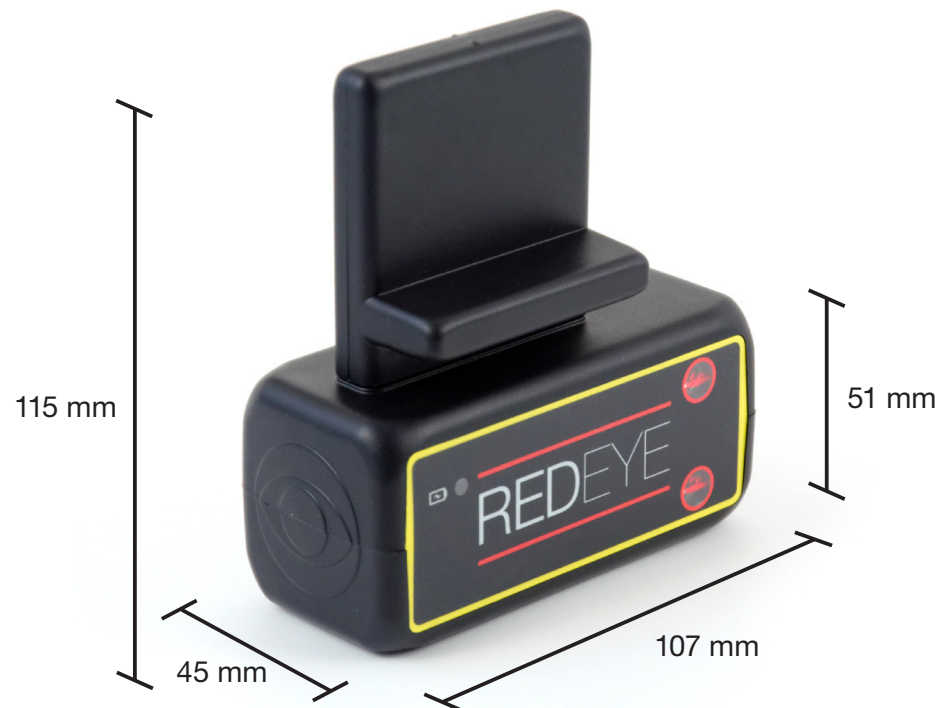
- The individual must be familiar with the safety instructions displayed on the product and in this user instruction manual
 - The individual must be familiar with the local regulations for work safety

Trademarks

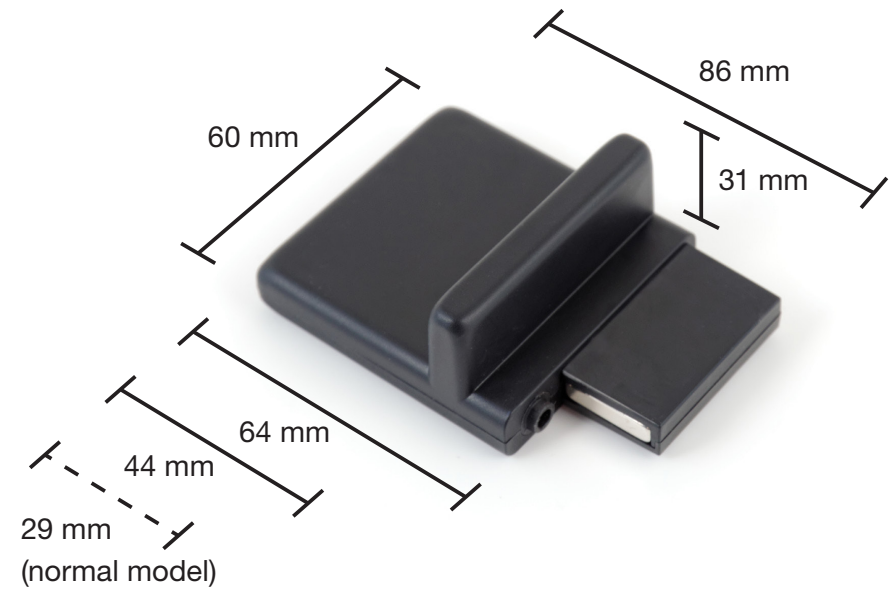
All other displayed trademarks belong to their respective entities.

Dimensions

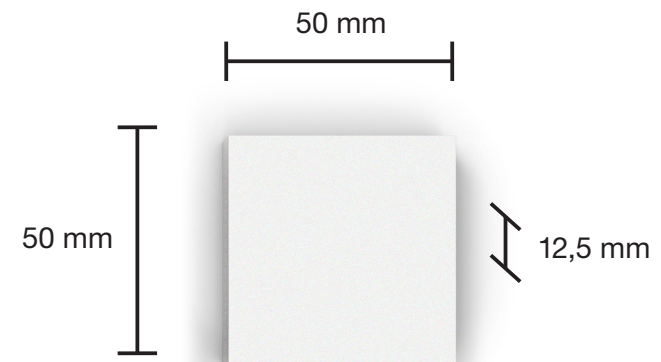
RedEye (with lower mount shown)



RedEye-mounting adapter (lower model shown)

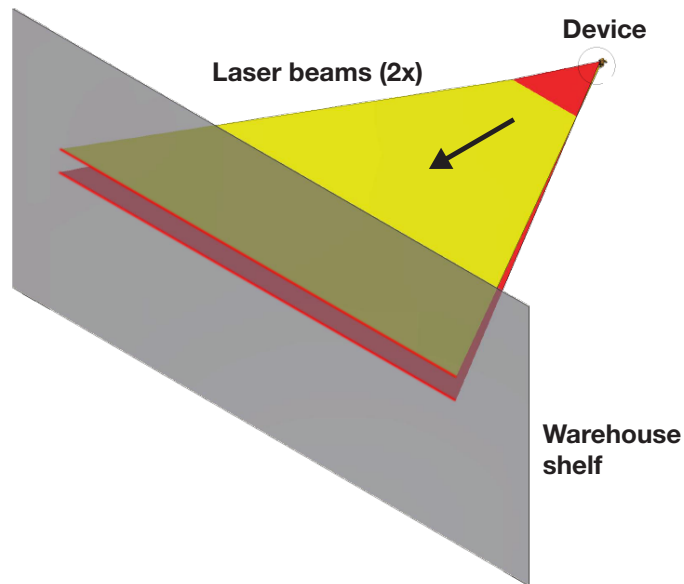


Universal mounting adapter



Laser classification and safety instructions

RedEye emits two visible red laser beams in the direction illustrated in the following figure.



The product has an emission level of laser energy in accordance with:

- IEC60825-1 : 2007 "Safety of laser products"

The following safety instructions apply to this product:

Products classified under laser class 1, class 2, and class 3R require:

- no involvement from a laser safety officer
- not protective clothing or eye protection
- no special hazard signage in the designated area

Products classified under laser class 2 or class 3R may cause glare, blink-blindness and temporary residual-imagery on the retina, especially under poor lighting conditions.

It may be dangerous to look directly into the laser beam, especially when the eyes are exposed intentionally. The risk of damage from a class 3R product is limited since:

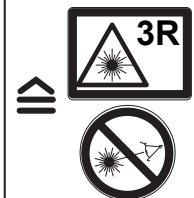
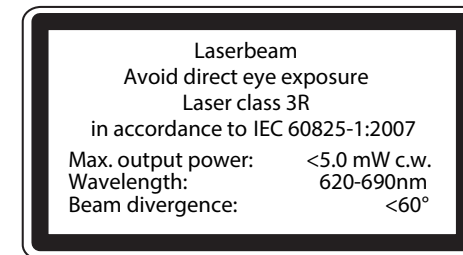
- unintentional exposure to the laser beam seldom results in the worst case scenario (e.g.) laser beam directed at the pupil; which is worst case scenario
- great safety margin outside the maximum permissible exposure to the laser beam (MPE); the dispersing of the laser line in a wide spread limits the exposure levels
- natural reflex to avoid direct exposure to bright light when dealing with focused light beams (blink reflexes)

WARNING:

It may be dangerous to look directly into the laser beam with an optical aid (f.ex. binocular or telescope.)

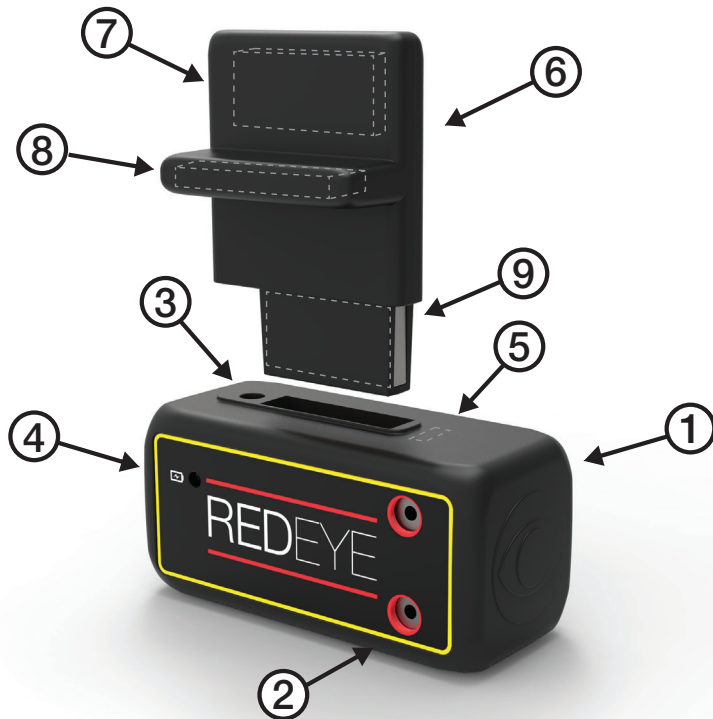
BE AWARE:

It can be dangerous for your eyes to look into the laser beam, especially when the eyes are exposed intentionally.



Overview

- ① RedEye-unit
- ② Laser emitting windows
- ③ Charging port
- ④ Charging indicator
- ⑤ Magnetic power switch (on/off)
- ⑥ RedEye-mounting adapter
- ⑦ Top magnet
- ⑧ Front magnet
- ⑨ Bottom magnet

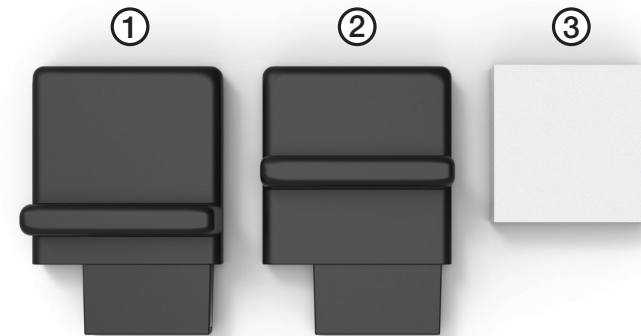


Adapter selection

Before the installation of the RedEye-unit, the unit has to be combined with a mounting adapter suitable for the particular forklift truck.

The product has been tested extensively on Toyota, Mitsubishi, and Clark forklift trucks. Other trucks are supported, either directly using one of our regular adapters, or in a combination with one of the adapters and the universal mounting block.

- ① Class 2 - 1.0 to 1.8 ton forklift truck - use the **lower adapter**
- ② Class 3 - 2.0 to 4.5 ton forklift truck - use the **normal adapter**
- ③ Other models/special cases - use the **universal mounting block** (magnet) along with the normal adapter, this extends the mounting range to allow laser alignment with the side of the fork.



	Lower adapter (1)	Normal adapter (2)	Normal adapter (2) + magnetblock (3)
1.0-1.8T	✓		
2.0-4.5T		✓	
Other setups			✓

Mounting accessories

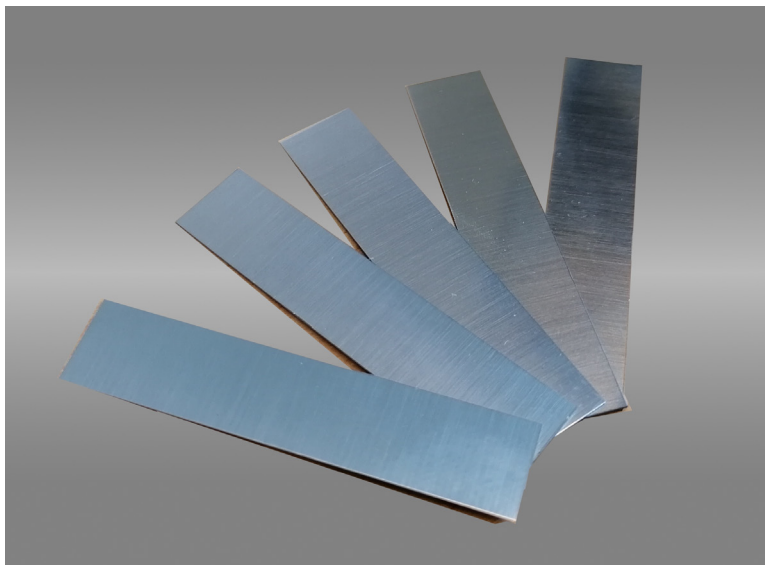
The following accessories are available to optimize the installation of the mounting adapter on the carriage.

Metal skims for angle adjustment

It is important that the mounting adapter sits straight and parallel to the carriage and forks. If there is a small discrepancy, thin skims can be put between the contact area on the carriage to tilt the adapter slightly. This will correct how the laser unit, and in the end, the laser lines will project along the forks. In the end it is imperative that the lower laser line is parallel with the side of the fork.

If the laser line diverges a bit, you can put a skim on the large face next to the L-corner on mounting adapter. Position it along the top-side to adjust the line up a bit, and put it along the L-corner to make it point down a bit.

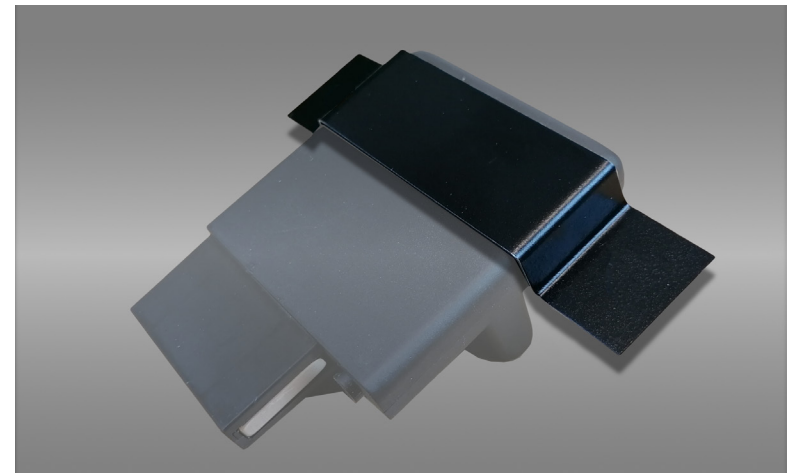
Two thicknesses are included; 0.2 mm and 0.4 mm



Metal bracket for permanent installation or alt. installation

To permanently mount the adapter on the carriage, use the metal bracket with two screw holes to lock the adapter in place. This is a great solution in environment with heavy vibrations and impacts. Normally the neodymium-magnet in the mounting adapter should be sufficient.

With a power drill, make two screw holes on the backside of the carriage and secure the bracket with two large bolts and nuts.



Installation

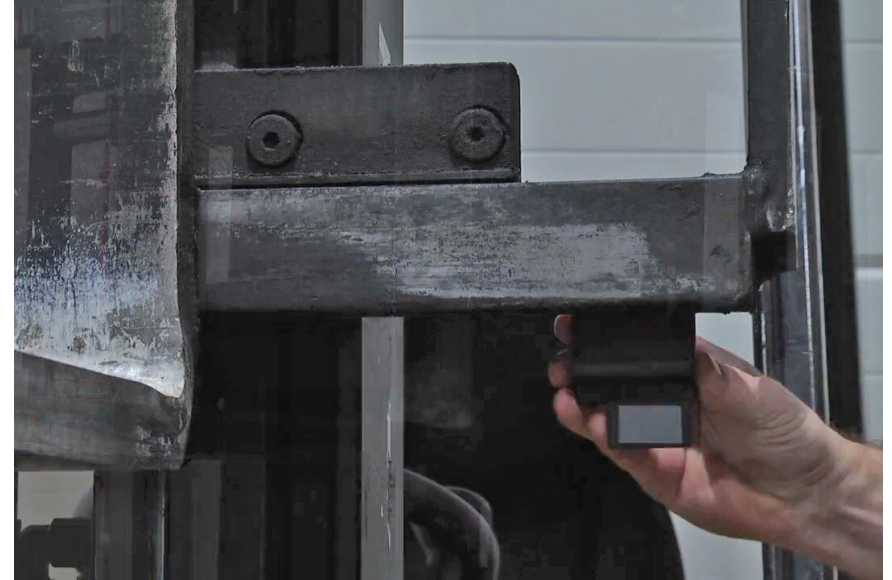
The RedEye-system must be installed on the left-hand side of the forklift carriage for optimal laser beam coverage. On standard forklifts, the mounting adapter is held to the underside of the carriage by two strong magnets found inside the adapter.

The goal of this is to mount the unit in a way such that the **upper laser line** (lower laser window on the unit) illuminates approximately mid-way on the side surface of the fork.

1. Begin by cleaning the steel beam with a metal brush to remove debris to make the surface flat and easy to work with.



2. Hold the suitable adapter with the top magnet turned up and mount it on the rear edge of the steel beam. The two magnets guides the adapter into position - make sure it is seated all the way! The magnets keeps the adapter secured even through heavy vibrations and bumps.



3. Position the mounting adapter as far to the left side of the carriage as possible, to maximize laser coverage. However, when the unit is mounted, it should not protrude to the side of the carriage.



4. After the adapter is attached and leveled to the carriage, continue by holding the RedEye-unit right side up and slide it on the adapter. The bottom magnet on the adapter bounds with a metal plate inside the unit and keeps it securely mounted.

A magnetic power switch (reed) inside the unit activates when it is in proximity of the bottom magnet.

When the unit starts up, the laser beams engage. An initial blinking sequence is performed. This sequence indicates the remaining battery capacity (see later chapter.) The unit is now powered up and ready to be used.

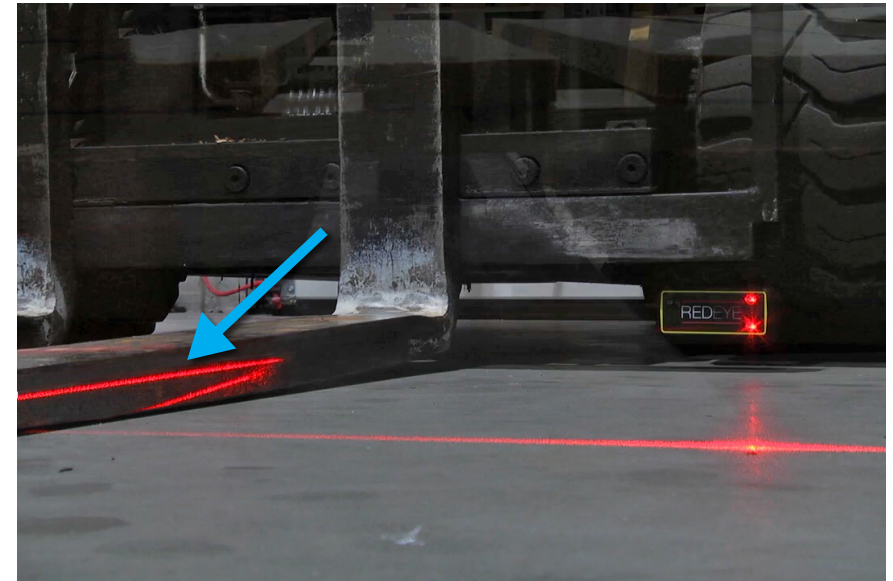
Caution: always hold and attach the unit with the laser windows facing away from you to avoid unintentional exposure of yourself or others.



5. When the adapter and unit are installed properly, the upper laser line (that is emitted on to a surface) should illuminate approximately mid-way on the side of the left fork. If it does not, the unit is either

mounted too low or too high, and needs a different mounting adapter.

Caution: If the laser lines are too low, be aware that lowering the carriage may crush and damage the product.



The unit can now be left on the carriage or detached. It enters a energy saving stand-by mode after 2 minutes.

The unit can be easily detached by gripping the unit firmly while pulling downwards - the unit will turn itself off as the magnetic power switch disconnects.

Operation

As a safety precaution before use, always check and make sure that the adapter and unit are mounted as described under “Installation.”

Activate/deactivate device (engage/disengage lasers)

1. Start the forklift truck as normal and move the forklift carriage slightly up or down.
2. RedEye detects the sudden change of movement and both laser lines activate automatically.



3. After a 2 minute period of no movement or vibration, the laser beams disengage and the device enters an energy saving stand-by mode (as long as the unit is attached to the adapter), waiting to be engaged again.

Fetch pallet from warehouse shelf

RedEye makes it easy to fetch a pallet safely from a tall warehouse shelf.

1. Position the forklift in front of the shelf with a 0.5 to 1 meter distance between the end of the fork and the shelf, and start to move the carriage up.
2. The **upper laser line** (that illuminates the shelf) indicates where the tips of the forks are going to hit and this makes it easy to judge when the appropriate safe height has been reached. Adjust the carriage slightly up or down until that the laser line illuminates the side of the pallet feet. It is now safe to move in.



3. Lift the pallet as normal and pick the pallet from the shelf, and lower the carriage. The pallet is now safely fetched.

Place pallet on warehouse shelf

1. Pick up the particular pallet as normal and position the forklift truck 0.5 to 1 meter in front of the shelf. Begin to raise the carriage and pallet.
2. Stop the carriage when the **lower laser line** (that illuminates the shelf) is just above the top edge of the shelf beam. This is an indicator that there is minimum 80 mm clarence between the pallet and shelf beam (caused by the slightly tilted laser line and distance from the shelf.)



3. Start moving the pallet into place. When pulling back, the upper laser line should be positioned mid-way on the pallet feet. This is a good indicator that it is safe to continue pulling back without the risk of touching the shelf or pallet. If the laser lines converge up or down, the tower is slightly tilted and needs to be corrected first before trying again.

Battery indicator

After the RedEye unit is attached to the adapter, it turns on and starts up. Part of the start-up phase is a blinking sequence that indicates the remaining battery capacity.

The following list provides an overview to interpret the battery status:

- 1 blink means battery is 100% full
- 2 blinks means over 75% battery capacity remains
- 3 blinks means 50-75% battery capacity remains
- 4 blinks means 25-76% battery capacity remains
- 5 blinks means under 25% battery capacity remains - charge now!

Operation time

As the RedEye has an automatic activation of the laser beams only when it is in use, it achieves a very long operation time and high energy efficiency.

The following table gives an estimation of the approximate operation time between each battery charge.

Active/in use	Approximate operation time
2 hours per day	40 days
4 hours per day	20 days
8 hours per day	10 days
16 hours per day	5 days

Charging

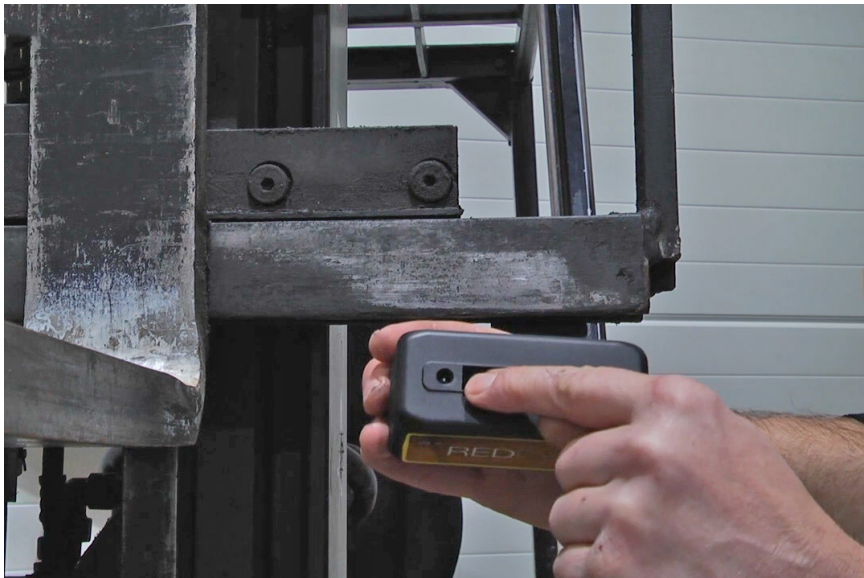
Before the first use, the battery must be charged as it is delivered at 50% capacity (to extend storage and battery life.)

Always charge the battery after a long period of use (for instance a week.) Try not to fully discharge the battery entirely between each charging session (under 25%), as this reduces the lifetime of the battery.

The unit is easily detached from the adapter by firmly gripping it and pulling away from the bottom magnet. Connect the wall adapter and plug the DC-jack into the charging-port on the unit.

On the front panel of the RedEye-unit is a battery indicator that shows the following charging status:

- **Orange light** means battery is charging (0.5A/hour)
- **Green light** means battery is fully charged (100%)



For optimal charging conditions, it is recommended to charge the battery in ambient temperature between +10 °C to +20 °C. The optimal ambient operation temperature for the battery is 0 °C to +30 °C. Avoid direct sun light.

The battery charging temperature range is 0 °C and +40 °C.

If the battery requires service, contact PALART to arrange this.

Care and advice

Only use the device in the designated and intended environment. Do not submerge the device in water. Dry off dirt and dust with a warm wet cloth. Do not use strong solvents on the products. Handle the product similarly to a camera or glasses.

The unit and adapter can be washed with a warm wet cloth and mild solvents (hand soap or dishwashing liquid.) Be extremely careful with the front two laser windows as scratches can inhibit and deteriorate the focus of the laser beams.

The product can be damaged from unusual heavy vibrations and hard impact. Avoid extreme high or low operating temperatures. Check the product for defects before putting it into service.

Recycling (reuse)

According to guidelines from the European Environment Agency, the product must be disposed of as EE waste at the end of its life cycle. Deliver product to the local recycling station or a suitable electronics recycling handler.

You can also ship the unit back to PALART for refurbishment or reuse of its parts.

The product must NOT be disposed of in household waste and must always be delivered for recycling.



Warranty

The warranty covers the entire product life span. Complementary repairs or direct replacement of all products with defects caused by manufacturing or material defects is offered.

If the product, under normal operating conditions, becomes defective or requires service, please contact PALART to arrange this:

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