

AeroFLASH

PowerBox (PRO)

“See and Avoid” starts with being SEEN...



*CanopyFlasher LITE, AeroFlash BASIC,
PowerBox, PowerBox PRO.*

Installation and Operating Manual

Revision 3 - August 2021

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1. Important notices and limited warranty

The AeroFlash system is designed for VFR use only, as an aid to collision avoidance. AeroFlash is in no way designed for operation in IFR or IMC conditions. Installing AeroFlash does not refrain from exercising the regular See and Avoid procedures.

The pilot is **always** responsible for this action and may NEVER fully rely on being seen by the other traffic. AeroFlash is only an aid to enhance visibility of your aircraft.

The installation of an AeroFlash system **must comply** with EASA regulations as per Standard Change **CS-SC036a “INSTALLATION OF VISUAL AWARENESS LIGHTS”**: [click here for the link to the EASA document](#).

Information in this document is subject to change without notice. AeroFlash reserves the right to change or improve their products and to make changes in the content of this material without obligation to notify any person or organisation of such changes or improvements.



A yellow triangle is shown for parts of the manual which should be read very carefully and are important for operating the system.



Notes with a red triangle describe procedures which are critical and may result in serious damage or any other critical situation.



A bulb icon is shown when a useful hint is provided to the reader.

This AeroFlash product is warranted to be free from defects in materials or workmanship for **two years** from the date of purchase. Within this period, AeroFlash will, at its sole discretion, repair or replace any components that fail in normal use. Such repairs or replacement will be made at no charge to the customer for parts and labour, provided that the customer shall be responsible for any transportation cost. This warranty does not cover failures due to abuse, misuse, accident, or unauthorised alterations or repairs.

THE WARRANTIES AND REMEDIES CONTAINED HEREIN ARE EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES EXPRESSED OR IMPLIED OR STATUTORY, INCLUDING ANY LIABILITY ARISING UNDER ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, STATUTORY OR OTHERWISE. THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, WHICH MAY VARY FROM STATE TO STATE. IN NO EVENT SHALL AEROFLASH BE LIABLE FOR ANY INCIDENTAL, SPECIAL, INDIRECT OR CONSEQUENTIAL DAMAGES, WHETHER RESULTING FROM THE USE, MISUSE, OR INABILITY TO USE THIS PRODUCT OR FROM DEFECTS IN THE PRODUCT. Some states do not allow the

exclusion of incidental or consequential damages, so the above limitations may not apply to you. AeroFlash retains the exclusive right to repair or replace the unit or firmware, or to offer a full refund of the purchase price, at its sole discretion. SUCH REMEDY SHALL BE YOUR SOLE AND EXCLUSIVE REMEDY FOR ANY BREACH OF WARRANTY.

To obtain warranty service, contact your local AeroFlash dealer or contact AeroFlash directly.

2. Introduction

A printed version of this installation manual may be in grayscale. Some figures and diagrams are coloured, like coding of power- and data wires. Please refer to the electronic version to see the correct colours. Confusion of color coded wires may cause serious system damage and is not covered by the limited warranty. The latest electronic version of this manual can be downloaded from www.AeroFLASH.de, section downloads - manuals. Please refer to your hardware version if certain items apply to your device.

This manual will guide you through the installation process of all systems, components, basic setup and check of the system.

If in any case confusion exists, please contact us for a clarification.



Before using any part of the system, please read and understand this Installation and Operating manual.



There are no serviceable parts within the unit, hence the unit must be taken to the dealer or factory for service.



Opening of any AeroFlash product by the user will void all warranty!



Never plug any unauthorized devices into the DB9 connectors! These will certainly cause serious damage to the PowerBox, CanopyFlasher and/or your computer. PowerBox cannot be connected to your computer!

2.1 Terminology

PowerBox: stand-alone power supply and Flasher activator for CanopyFlasher LITE only.

PowerBox PRO: all-in-one, stand-alone power supply and synchronised flashing sequencing for one CanopyFlasher LITE and one FuselageFlasher.

CanopyFlasher: canopy mounted forward flashing device.

FuselageFlasher: top or bottom fuselage external mounted, 360° by 180° flashing device. This may also be an "external flasher" - not necessarily supplied by AeroFlash (read further for compatibility).

CanopyConnector: the opposite 7-pin connector that is fitted to the CanopyFlasher, and is mounted on the canopy or canopy frame, supplying power and data between Nexus/PowerBox and the CanopyFlasher.

SidewallContact: a 7-pin contact fitted to the Nexus/PowerBox cable set, which is to be mounted on the interior sidewall. It is **universal for every glider** with a side opening canopy. It connects to the CanopyFlasher.

CanopyContact: a 7-pin contact fitted to the Nexus/PowerBox cable set, which is to be mounted on the instrument panel cover, specially made for Schempp-Hirth gliders, which connects to the CanopyFlasher. SH-glider owners may also choose the SidewallContact if they prefer not to drill a hole in the instrument panel cover.

3. System overview and installation planning

The *CanopyFlasher LITE* and *AeroFlash BASIC* Visual Awareness Light system features multiple parts:



The system is designed to be plug-and-fly. It comes complete with everything you need. No additional wiring, splitters or soldering is required, other than connecting it to your aircraft's power supply. Typical installations can be done in 60 to 120 minutes. For an overview of the scope of delivery please refer to [chapter 3.1](#).

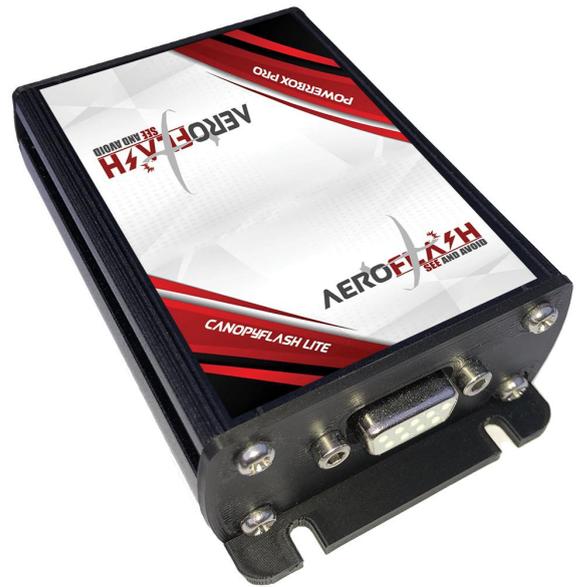
PowerBox (PRO)

PowerBox (PRO) is fully stand-alone.

PowerBox powers the CanopyFlasher LEDs and provides flashing timing.

PowerBox (PRO) is not connectable to Flarm and does not have Bluetooth features. It's a simple, cost-effective solution for those who do not need all the “luxury” features.

PowerBox PRO as part of AeroFlash BASIC kit can also supply power to one FuselageFlasher and provides optimised synchronised flashing sequencing.



PowerBox (PRO) continuously monitors the temperature of the CanopyFlasher system. If an overheat situation is present, it automatically shuts down the system to prevent damage to the system and to your expensive canopy. After a short cooling the system will restart automatically if conditions permit. Don't worry, the system generally doesn't get very warm in flight, but in summer conditions on ground without air flow your glider is well protected.

A neat removable screw-terminal system allows a quick connection of the power wires, and easy removal when needed. No need for soldering; everything is plug-and-fly.

CanopyFlasher - canopy mounted, forward-facing flasher

CanopyFlasher is made from a high strength, UV-resistant ABS based polymer. The unit is delivered as standard painted in a high quality, matte “Space Grey” (Nextel like) finish.

Optionally it can be delivered in different colors.

The heart of the CanopyFlasher is the array of **6 extremely bright CREE LEDs emitting approximately 4000-4500 (red/white) Lumens**, with powerful, oval lenses; 2 beams orientated vertically, and 4 beams orientated horizontally.



This makes the Flasher well visible at distances of even up to 3500m, ± 30 degrees above and below- and up to ± 45 degrees left and right of the nose.

The CanopyFlasher system incorporated many safety features, like heat sinks, a temperature sensor to prevent overheat conditions and two status LEDs for indication of the operating modes.



Never look straight into the illuminated CREE LEDs as this will certainly result in temporary blindness, with risk of permanent damage to the eye sight! It is your responsibility to inform anyone who is not familiar with this system.

FuselageFlasher - 360° external, top/bottom fuselage mounted flasher

The PowerBox system features an additional flasher data port for connection to our Fusion/FuselageFlasher system. The FuselageFlasher is made out of a very strong, super clear UV resistant epoxy and features **16 extremely bright CREE LEDs, emitting approximately 7500-8500 (red/white) Lumens**. It can be installed on the top or bottom of the fuselage, flashing in a 360 degrees view. The FuselageFlasher is extremely sleek and aerodynamic, measured at only 110mm long x 15mm wide x 11mm high. Only one small hole of 5mm is required for the three power wires. Mounting of the flasher can be done simply with the (included) super strong 3M double sided adhesive foam tape, sealed off with some silicone mounting kit for weather-proofing. A simple and sturdy mounting, but less "permanent" than other solutions.



Install the FuselageFlasher on one of the wheel- or engine bay doors (close to the center-line of the fuselage) to avoid drilling in the fuselage. This is the quickest and easiest installation with the least amount of impact on the airframe.

3.1 Scope of delivery

CanopyFlasher LITE system:

1x PowerBox device.

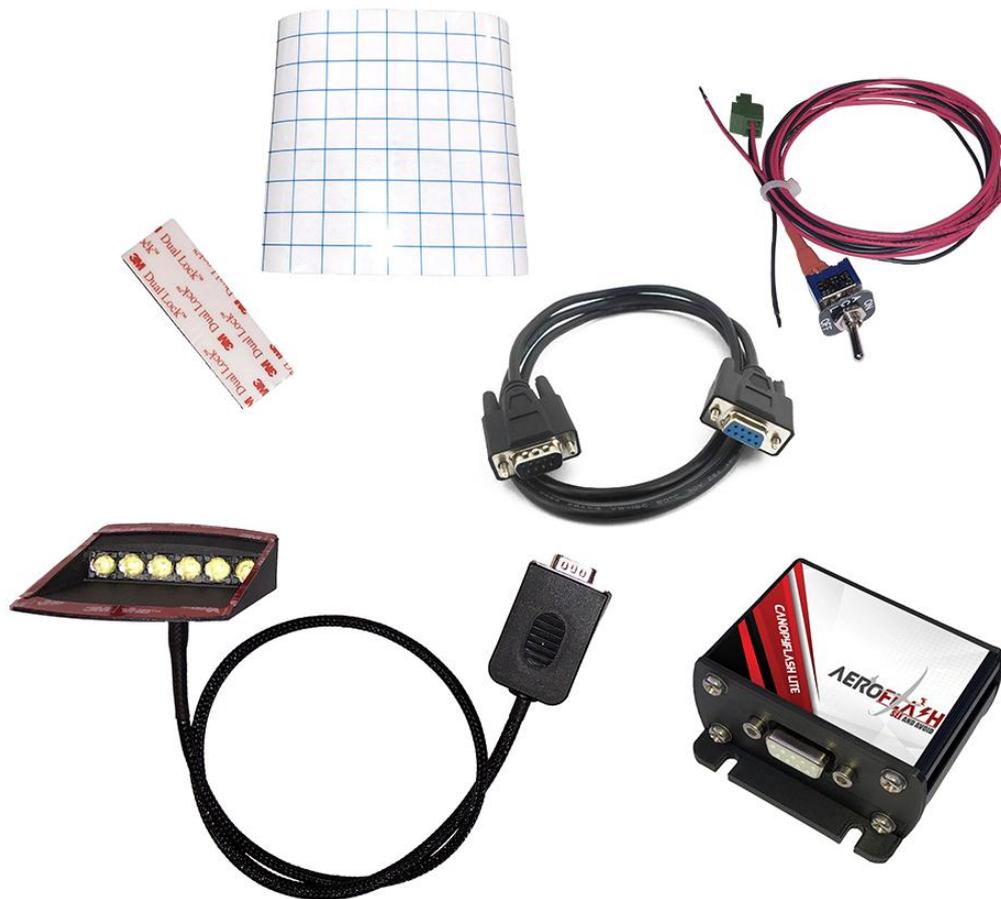
1x CanopyFlasher with 3M double sided adhesive foam tape pre-applied and cable set***.

1x DB9 - DB9 extension cable (1 meter).

1x Dual Lock adhesive tape for mounting of the PowerBox.

1x Vinyl sticker template for aligning the CanopyFlasher during installation.

1x 1 meter power cable with ON/OFF switch and marking/label.



*** The cable set version and length depends on the canopy opening direction:

- Vertical opening canopies receive a DB9 connector set.
- Other glareshield/panel mounted DB9-connection solutions for side-opening canopies on special request.

AeroFlash BASIC system:

1x PowerBox PRO device.

1x FuselageFlasher, with 3M double sided adhesive foam tape pre-applied, with 4 meter pre-attached AWC20 wiring (3 wires: red, red, black) - other lengths available on request.

1x CanopyFlasher with 3M double sided adhesive foam tape pre-applied and cable set***.

1x DB9 - DB9 extension cable (1 meter).

1x Dual Lock adhesive tape for mounting of the PowerBox PRO.

1x Vinyl sticker template for aligning the CanopyFlasher during installation.

1x 1 meter power cable with ON/OFF switch and marking/label.



*** The cable set version and length depends on the canopy opening direction:

- Vertical opening canopies receive a DB9 connector set.
- Other glareshield/panel mounted DB9-connection solutions for side-opening canopies on special request.

NOT included, optionally available and may be required for the installation:

Fuse/circuit breaker, 2A or 3A - available from us separately.
Silicone sealant/kit (for weather-proofing the FuselageFlasher).
Additional power cable. Crimp or soldering tools. Cable ties, cable clips.

3.2 Status LEDs

The CanopyFlasher LITE features two different colored status LEDs indicating the following:

Green status LED:

Off	System switched off.
Steady	System operating normally (flashing).
Blinking (1 Hz)	Flasher temperature high, overheat protection active.

Red status LED:

Off	Flasher temperature normal
Blinking (1 Hz)	Flasher temperature high, overheat protection active.

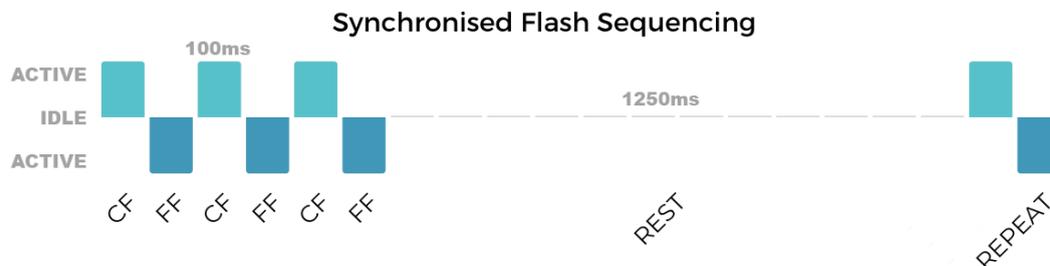


GREEN and **RED** status LEDs blinking rapidly (2Hz) at the same time indicate that an overheat condition is detected. Subsequently, the CanopyFlasher is deactivated until the overheat condition disappears.

3.3 Flashing logic

PowerBox (PRO) automatically starts flashing once switched on. The CanopyFlasher and FuselageFlasher never flash at the same time. They each alternate every pulse, meaning only one flasher is draining power at the same time, resulting in lower peak currents and less stress on your battery.

PowerBox (PRO) flashes at **3 flash**-cycles followed by a rest/cooling cycle of 1250 milliseconds, continuously until switched off. The flashing sequencing or timing cannot be changed.



3.4 Power consumption

Due to the efficient technology and smart synchronised flash-sequencing we incorporated in PowerBox (PRO) and all AeroFlash products, power consumption is very reasonable and should not be an obstacle to installing AeroFlash systems. Typical power consumption will result in an average power consumption of only 210-720mAh (milliamps per hour).

System situation & setup	Power usage <u>per hour</u>
CanopyFlasher LITE <i>(PowerBox + CanopyFlasher. 3-Flashes per 1250 milliseconds).</i>	±210mAh
AeroFlash BASIC <i>(PowerBox PRO + CanopyFlasher + FuselageFlasher. 2 x 3-Synchronised flashes per 1250 milliseconds).</i>	±720mAh



AeroFlash can strongly recommend special [AIRENERGY high capacity LiNiMnCoO2 \(NMC\) batteries](#), which double capacity versus LiFePO4 (LFP) for the same size and even lower weight!

3.5 Power supply

PowerBox (PRO) systems accept a power input of 10V to 20V DC. There is **NO** fuse inside, nor included with the system. Suitable fuses or circuit breakers are available from our dealers, or from AeroFlash directly. PowerBox (PRO) requires a minimum thickness of 20AWG wire (standard supplied), and a circuit breaker rated at 2 or 3A:

System setup	Circuit breaker requirement
CanopyFlash LITE + PowerBox	2A
CanopyFlash LITE + FuselageFlasher + PowerBox PRO(basic)	3A



We strongly advise to install an automatic circuit breaker that can be tripped manually, rather than a fast blowing glass-fuse. These automatic circuit breakers are available from AeroFlash webshop or our dealers. Contact us for more information.

3.6 Dimensions and weights

PowerBox:

Dimensions LWH: 100 x 63 x 31mm (including mounting flanges).

Weight: ±100 grams.

PowerBox PRO:

Dimensions LWH: 100 x 63 x 31mm (including mounting flanges).

Weight: ±190 grams.

CanopyFlasher:

Dimensions LWH: 90 x 64 x 23mm (±10%, length/height varies per glider type).

Weight: ±100 grams with 100cm cable.

FuselageFlasher:

Dimensions LWH: 110 x 15 x 11mm (including mounting-foam tape).

Weight: ±15 grams without cable / ±95 grams with 4m cable.

3.7 Temperature specifications and cooling requirements

All AeroFlash components are designed to operate in temperatures ranging from -30 to +60°C. These temperature limitations depend on the actual ambient conditions. Generally with high-summer (>30°C) temperatures some precautions must be observed.

Maximum operating times at high ambient temperatures:

CanopyFlasher		FuselageFlasher	
<u>On ground</u>	<u>In flight</u>	<u>On ground</u>	<u>In flight</u>
Max 10 minutes	50°C OAT	Max 5 minutes!	50°C OAT
<i>(temperature sensor prevents overheating in normal conditions)</i>	<i>(with forward canopy airflow open)</i>	<i>(limited* temperature protection installed!)</i> 	<i>(no additional cooling requirements)</i>



*Temperature protection linked to CanopyFlasher temperature.

In flight there are no special precautions that must be made for cooling of the system. Multiple heat sinks, cooling slots and a temperature sensor are built-in the CanopyFlasher to monitor the system and automatically shut it down when an overheat condition is experienced (LED temperature of 70°C). Ensure to never block the cooling slots.

Generally even in hot summer conditions, the airflow from the front of the canopy is more than sufficient to cool the system and the system will not even come close to the maximum operating temperature of 70°C. These protections are built-in solely to prevent aircraft- and system damage in case of a failure of the electronics.



In high ambient temperatures (and strong sunlight), the CanopyFlasher and FuselageFlasher LEDs may become quite warm when operated continuously ***on the ground***, without cooling from the (canopy) airflow ventilation. Do not rely on the temperature sensor and avoid activating the system on the ground for prolonged times. Serious damage to the flasher, as well as to the fuselage (overheating) may occur due to the lack of air-cooling, especially in strong sunlight and high ambient temperatures!



Please **always** use a canopy cover whenever the glider is not in use, and switch off the power supply to the system. This will benefit the life-time of all the components due to less exposure to heat and UV light.

3.8 Humidity

PowerBox (PRO), CanopyFlasher and FuselageFlashers are designed to operate in humidity ranging from 0 to 95%.

The FuselageFlasher is waterproof. Please refer to the specific installation instructions in [chapter 4.8](#) for more details.

3.9 Mounting requirements

PowerBox (PRO) may be mounted with up to 4 screws, or by using the supplied 3M "Dual Lock" super strong double sided adhesive tape and some cable ties.

In any case AeroFlash should be mounted in accordance with the installation requirements as per (a.o.) CS-SC036a and CS-SC402b.

The CanopyFlasher comes prepared with super strong black 3M double sided adhesive foam tape. It is strongly recommended to use this black tape as it blocks out any reflections that may appear in the canopy when the flasher is activated. This 3M tape is safe to use on plexiglass.

4. Installation instructions and examples

The installation of an AeroFlash system **must comply** with EASA regulations as per Standard Change **CS-SC036a “INSTALLATION OF VISUAL AWARENESS LIGHTS”**: [click here for the link to the EASA document](#).

4.1 Installation and connection of PowerBox (PRO)

Find a suitable location for the PowerBox (PRO) unit. It may be required to make some brackets and use the mounting flanges to mount it with two or four screws. Avoid over-tightening of screws on the plastic flanges, as the plastic may break! It may also be possible to use some cable ties to mount the PowerBox (PRO) to another device, or use a piece of the 3M Dual Lock adhesive tape that we included.



Wiring up the PowerBox

The cable set comes already prepared with a pluggable 2-pin Camdenboss CTB922HE/2 power connector. In case you wish to shorten the wires; it uses the following pinout which must be carefully observed. Wrong connection will permanently damage the device.



Pin	Color	Description
1	Black	Ground INPUT (GND, negative) (AWG20)
2	Red	+10 to 20V INPUT (VCC, positive) (AWG20)



For **PowerBox PRO** pinout refer to [chapter 4.6 Installation of the FuselageFlasher and PowerBox PRO](#).

Install a fuse/circuit breaker. Observe the tripping current as per [chapter 3.5](#), and connect these to the glider’s power network.

4.2 Mounting the CanopyFlasher

Mark the centerline of the canopy with a piece of white PVC tape. Please be cautious to use the yaw string as centerline reference, as often these are not placed in the exact center!



Using the supplied vinyl grid sticker may make it easier to align the CanopyFlasher so it's perfectly straight. It may be very difficult to see the alignment once you try to stick it to the canopy from the inside.



Before permanently mounting the CanopyFlasher, check if the selected location does not intervene with the canopy ventilation mechanism!

After marking the correct position, it may be easiest to remove the canopy and place it upside down on a soft/safe location.

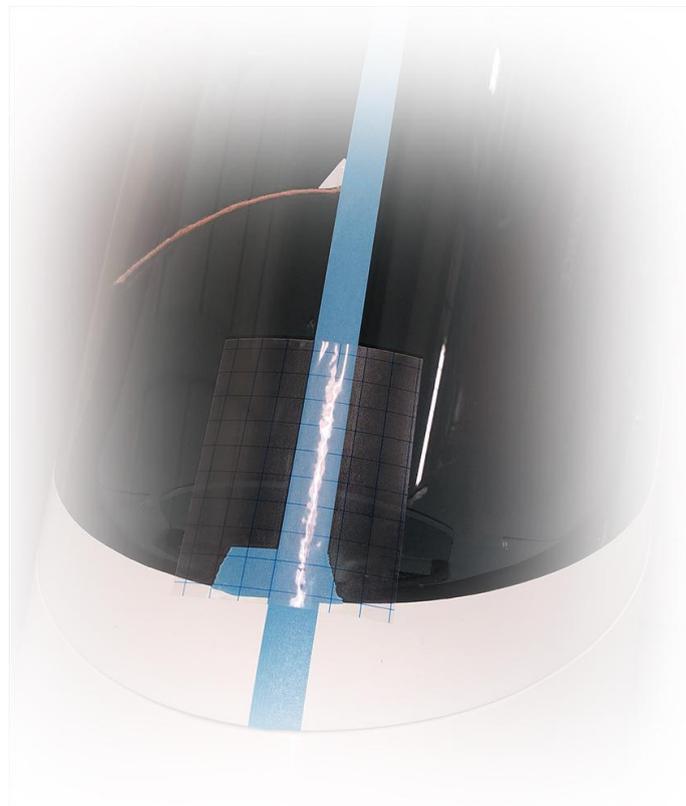
Clean the surface of the canopy with a non-aggressive cleaning agent to remove dirt and grease, to ensure the adhesive tape sticks well. Normally water and a bit of soap is fine.

The CanopyFlasher is pre-applied with black 3M VHB double sided adhesive foam tape. It is strongly recommended to use this black tape as it blocks out any reflections that may appear in the canopy when the flasher is activated. This 3M tape is safe to use on plexiglass canopies.

Remove the film and carefully stick the CanopyFlasher against the canopy. Be careful not to apply too much force to the canopy, but make sure the tape is attached well in all corners. If there is a small air bubble between the canopy and the tape, don't attempt to remove the CanopyFlasher. Most likely the bubble will disappear in a couple of days or with some warmth from the sun.



The 3M VHB double sided adhesive foam tape is best applied at temperatures above 15°C.



4.3 Vertical-opening canopy installations

This section mostly applies to JS, Schleicher, HPH, Rolladen Schneider (LS) and Glaser Dirks (DG) gliders. In some side-opening canopy installations it may be preferential to use the vertical-opening cable set solution. This applies to for example DG500/DG1000, (Twin) Astir and Standard Cirrus, and perhaps other gliders.



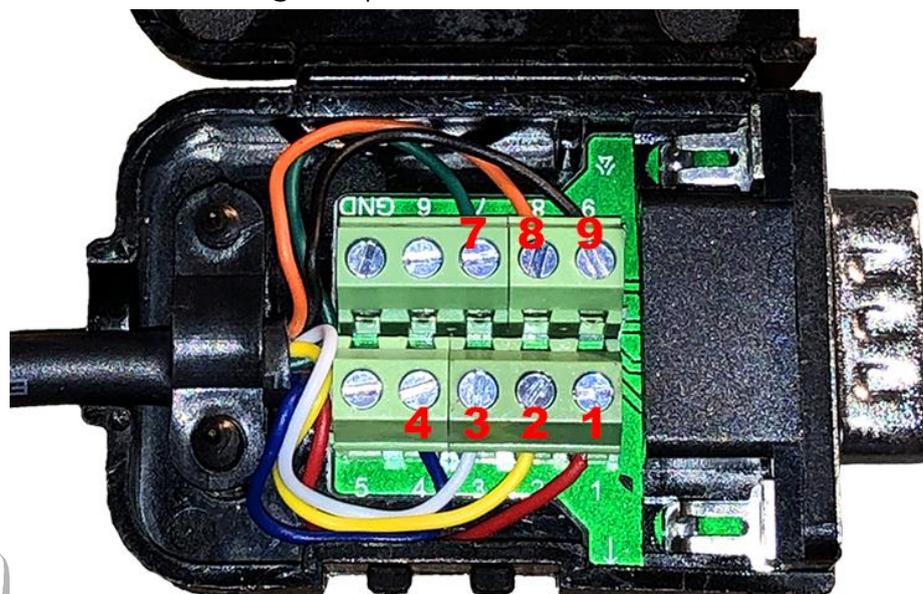
Vertically opening canopies need an easy to attach, but most importantly, easy to DETACH connector. When jettisoning the canopy in case of an emergency, our connectors are designed to easily separate. Do not modify these connectors, or install a different type.

Now that you have mounted the CanopyFlasher, it's time to take care of the cable set.

The AeroFlash installation consists of commonly seen male and female DB9 (D SUB 9) type connectors for the data cables (status LEDs and temperature sensor), and for the power supply of the CanopyFlasher. It is sturdy, easy to attach, separate, and highly suited for the currents.

Step 1

The DB9 connector comes pre-attached to the CanopyFlasher. In certain installations there may be required to make a hole through the instrument panel cover to feed the cable through. Of course it's highly desirable to keep this hole as small as possible. Our DB9 connector is fitted with certain easy to install screw-type terminals (no soldering required!). Open the connector cover by loosening the clip on the side with a screwdriver and take note of the color coding and pinout of the connector:



Pin	Wire color	Wire description
1	RED	Flasher +9-20V VCC/Positive (internally connected with pin 6)
2	YELLOW	Temperature sensor +5V
3	WHITE	Temperature sensor signal
4	BLUE	Common signal GND (ISOLATE FROM PIN 9!)
5	-	Flasher GND/Negative (internally connected with pin 9)
6	-	Flasher +9-20V VCC/Positive (internally connected with pin 1)
7	GREEN	Status LED 1 (green LED)
8	ORANGE	Status LED 2 (red LED)
9	BLACK	Flasher GND/Negative (internally connected with pin 5)

Loosen the screws on the DB9 terminals to temporarily remove the wires. It is now possible to feed the data cable through a hole of approximately 5mm.

Carefully replace the wires in the original pinout and tighten the screw terminals. Do not overtighten the screws to avoid damage to the threads. Replace the connector cover.

You may use the supplied DB9 female - DB9 male extension cable (1 meter) to more optimally route the cables underneath the instrument panel cover. In case you need a different length, any 1:1 DB9 or RS232 extension cable will work.



If using the supplied extension cable, it's recommended to secure both sides of the cable to a sturdy point on the frame of the instrument panel or canopy with a cable tie. In case someone forgets to manually separate the connectors during regular maintenance/removal of the canopy, no chance exists to accidentally damage the CanopyFlasher cable.

Step 2

In case of a **PowerBox PRO** installation, continue with [chapter 4.6 Installation of the FuselageFlasher and PowerBox PRO](#), or continue to [4.7 Installation of the OFF/ON switch](#).

Depending on the glider type, you may have removed the canopy. You can now reinstall the canopy as the installation is nearly complete and we need to correctly orientate the OFF/ON switch and test its function. Make sure not to forget to attach the system's cables.

4.4 Side-opening canopy installations - general

Each glider type requires a specially designed connector solution. This is unique to every different glider type. A brief installation instruction manual together with installation example pictures will be delivered together with these orders.

Below / on the side are a few examples suitable for Grob G102 Club/Standard Astir and G103 Twin Astir gliders.

If your glider is not yet supported, please contact us to develop a solution together.



4.5 Side-opening canopy installations - Schempp-Hirth

This section mostly applies (but is not limited to, or possible for all) to Schempp-Hirth gliders. For example Cirrus gliders require a vertical-opening canopy connector solution.

Schempp-Hirth glider owners may also choose to install a panel mounted DB9 connector option when the instrument panel cover has a lot of play. It must be fairly sturdy in order to work well/reliable.

For safety reasons, we require a connector that is easily DETACHED in case of an emergency. We designed a special 7-pin spring loaded connector to be mounted on the glareshield/panel cover and the canopy edge, which requires absolutely no force to separate. There is no need to solder any wiring, however you will need to install the connector in a suitable location and drill some holes.



Find a suitable place to install the 7-pin *CanopyConnector* that is attached to the CanopyFlasher. You need to install this *CanopyConnector* to the canopy frame using one of the supplied mountings at a location where when the canopy is closed, it can make good contact with the opposite part. This should be done on the right side of the instrument panel cover. Ideally there should be no or limited movement of the panel cover. A good place is close to the instrument panel, and near the canopy hinge.

The opposite connector part (called *PanelContact*) is already attached to the PowerBox's cable set and is ideally mounted through a small hole (approximately 25 x 10mm) in the instrument panel top cover, using the supplied stainless steel M3 cylinder head bolts. These bolts are designed to align correctly with the *CanopyConnector*.



Please note that certain glider types may use or require a "vertical-opening canopy installation", even though they have side-opening canopies. This applies to for example: DG500/DG1000, Standard Cirrus, etc, and is due to the difficulty finding a suitable location for installing this *CanopyConnector*.



Step 1

Depending on your glider type, we included a suitable angled mounting support in order for you to optimally mount it in your specific glider. It may be required to make some adjustments to this mount to optimize it for your specific glider, as each glider is slightly different than the other... To fixate it to the canopy frame it's possible to use thickened (cotton flakes) epoxy glue to fixate the canopy frame. Make sure to roughen up the surfaces first with some sandpaper.

Alternatively, 2 holes may be drilled from the bottom through the canopy frame, to mount this support using regular self-tapping screws. Make sure these are drilled flush with the surface.



Step 2

To find the proper mounting position for the connector on top of the mounting support, it's recommended to use some simple double-sided adhesive tape to try various positions. When positioning the CanopyConnector (canopy closed and locked!), make sure that all of the 7 pins **equally touch** the surface of the instrument panel cover. Do **not** allow them to compress more than 1mm; The PanelContact is approximately 1mm thick and the travel of the pins about 3mm maximum! You may glue the CanopyConnector on top of this mounting support, or better: use some self-tapping screws.



Warning: in case the CanopyConnector is not fitted properly/securely on the canopy frame and is allowed to come loose during opening or closing of the canopy, a short-circuit may cause permanent damage to the CanopyFlasher or PowerBox. Damage from improper mounting of the CanopyConnector is **not covered by warranty**. It's imperative that the CanopyConnector is fitted securely.

Step 3

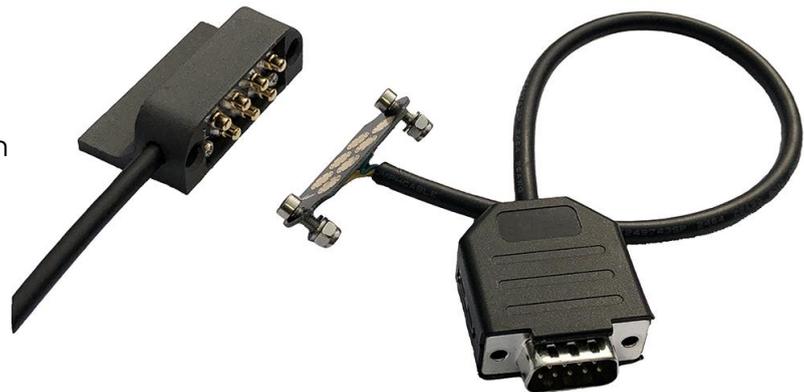
Included with the kit is a simple plastic drilling template to resemble the *PanelContact*. It comes pre-applied with some general purpose double sided adhesive tape. On the other side are two slightly oversized pins that clamp into the alignment holes in the *CanopyConnector*. Gently press the template in the *CanopyConnector*. Now remove the film of the double sided tape, and close and lock the canopy. Re-open the canopy. If fitted correctly, the template should now remain in place on the instrument cover, indicating the matching placement of the *PanelContact*. Mark the location for the M3 mounting- and cable holes, and drill/cut the required holes.



Step 4

Remove the template. You won't need this anymore. Feed the *PanelContact* that is already attached to the cable set of PowerBox, on it's side through the hole that you just made, and mount it in the right orientation.

Take note of the correct orientation of the *CanopyConnector* that you already mounted on the canopy frame. You can't really get it wrong: there are 4 pins/contacts on top, and 3 pins/contacts on the bottom.



When you are certain the orientation is correct, use the supplied M3x10 stainless steel bolts, spring-washer and locking nuts to fasten the connector. It is recommended to use these bolts as they align the connector in the right position to avoid any short circuits. Do not place a

washer underneath the head of the bolt; only between the instrument panel cover and the locking nut. Do not over-tighten the bolts. It's better to leave a tiny bit of play between the connector and the instrument panel cover, so that the alignment is easier. Check if the connectors are sitting perfectly level on top of each other with sufficient spring tension. If not, it may be required to adjust its position.

Step 5

Connect the cable to the PowerBox. It is highly recommended to fixate the cable to a sturdy point. In case someone removes the instrument panel cover and does not remove the cable set from PowerBox, damage may occur to the *PanelContact*. For this reason no locking screws are installed on this connector. Use some cable ties or tape to secure the cable set to a sturdy point on the instrument panel cover.

4.6 Installation of the FuselageFlasher and PowerBox PRO

PowerBox PRO is equipped with a pluggable 5-pin Camdenboss CTB922HE/5 power connector with easy to connect screw-on terminals. No soldering is required. The pinout of this pluggable 5-pin connector is described in **step 6**.

Step 1

Find a suitable place to mount the FuselageFlasher. We recommend installing the flasher just behind the main wheel, or on top of the fuselage behind the canopy. Sometimes there is already a perfectly suitable water drain hole which you may be able to use. This hole can still be functional when mounting the flasher. More later in Step 4. Alternatively you can mount the flasher on a wheel door or engine bay door. This has the least amount of impact on the glider, provided that you find a safe way to route the cable, without it being damaged by mechanisms, or interfering with other equipment, limit switches, sensors or moving parts. Avoid routing cables near potentially hot parts of the engine bay (exhaust, cylinder, etc). Do not mount the flasher underneath the front part of the cockpit, in front of the Center of Gravity (CoG/winch) hook where the winch/tow rope or the



trailer fuselage support can damage it. Ensure that the selected location is also accessible from the inside of the fuselage.

Observe the roundness of the fuselage: The FuselageFlasher has a 1,6mm thick foam/gel type of 3M double sided adhesive pre-applied, which if compressed enough will allow mounting on a slightly curved surface, but not too extreme. In certain areas the fuselage may not be flat enough for the FuselageFlasher to stick well.

Step 2

Find the center of the fuselage and mark the location of the intended hole with some painters tape and securely press this onto the surface. This will prevent your drill from running away, and reduces the chance of paint chipping. Use a small size drill bit first: 2mm will do. Only then drill the final size of 4mm!



Step 3

Remove the painters tape and be cautious not to pull off any loose paint chips, in case the paint cracked. Clean the surface with non-aggressive sticker/adhesive remover (never use acetone or thinner on gliders!).

Now feed the cable through the hole until the last 5cm. Remove film from the pre-applied 3M double-sided adhesive tape.

There is no front or back of the flasher, it can be rotated in either direction. Please note that the cable-hole is slightly offset from the middle. Align the FuselageFlasher so it is as straight as possible. Securely press the front, back and middle of the flasher to the surface of the fuselage, to ensure all sides stick well. Observe the roundness of the fuselage and see where more pressure may need to be applied.

Step 4

FuselageFlasher is completely waterproof. We do however strongly recommend to seal the edge of the flasher and fuselage with a bit of white silicone kit. This will prevent dirt and water from coming underneath the flasher, which may affect the adhesive tape. This will ensure a longer life time of the adhesive tape.

A small seal of silicone kit may also further improve the aerodynamics. If mounted in the water drain hole on the bottom of the fuselage, this drain hole may still remain functional if a small opening is kept on the side of the FuselageFlasher near the cable.



Recommended daily maintenance:

Ensure the FuselageFlasher is kept clean. If mounted behind the main wheel, grass and mud may easily stick to the Flasher, seriously reducing the light output. After cleaning your glider, make sure to avoid scratching the surface of the lens with a dirty cloth. Use plenty of water.

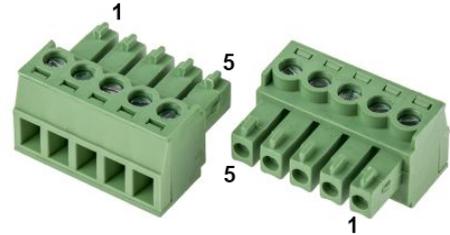


Step 5

Route the 3-wire flasher cable through the interior and secure the cable with cable ties or cable clips. Ensure that the cable does not intervene with moving levers, like the controls from the stick, air brakes, flaps and landing gear. The cable has twisted wires, which reduces RF interference on other systems. If possible however, avoid routing the cable immediately next to coax cable or radio wires.

Step 6 - wiring up the PowerBox PRO

Time to connect the wires. The pluggable 5-pin Camdenboss CTB922HE/5 power connector has the following pinout which must be carefully observed. Wrong connection will permanently damage the device.



Pin	Color	Description
1	Black	FuselageFlasher Ground OUT (GND, negative) (AWG20)
2	Red	FuselageFlasher Power OUT (positive) (AWG20)
3	Red	FuselageFlasher Power OUT (positive) (AWG20)
4	Black	Ground INPUT (GND, negative) (AWG20, do NOT connect to pin 1!)
5	Red	+11* to 20V INPUT (VCC, positive) (AWG20)

**FuselageFlasher may not work optimally at voltages below 11V. It is not advisable to use weaker lead-acid batteries with AeroFlash FuselageFlasher.*

4.7 Installation of the OFF/ON switch

A drill hole of 6mm is required for the OFF/ON switch. Please do not tighten the nut just yet! Correct orientation of the switch should be observed after the first power-up. One hint: the wires are soldered on the “bottom” positions of the switch, that also implies the “OFF side”...

We included an ACL OFF/ON label/markings for the switch. This plate is placed between the panel and the nut of the switch. A commonly made error is scratching the instrument panel or label/markings when rotating the nut with pliers. Be careful!

As per EASA Standard Change CS-SC036a and ARC airworthiness requirements, it is mandatory to correctly mark or label the switch as part of the installation procedures.



4.8 Post-installation system check

After installation, please double-check if you correctly wired everything up. The system is not protected from reverse polarisation!

Check if the OFF/ON switch and label is correctly orientated on the instrument panel and only hand-tighten the nut.

The green status LED should be steady green indicating the system is ON. If one of the Flashers is not working, check the wiring or connectors.

5. Troubleshooting

[Reserved].

Contact us at info@aeroflash.de in case you need support.

6. Revision history

Revision 3 - August 2021;

Revised/added General- and Schempp-Hirth type connector installation instruction pages.

Added pictures to various installation instruction pages.

Revision 2 - July 2021;

Revised power consumption figures.

Revision 1 - June 2021;

Initial issue.

7. Appendix

7.1 AeroFlash product comparison

	Nexus	Nexus MINI	Fusion (Nexus)	Fusion DUO (Nexus)	Fusion LITE	Fusion DUO LITE	Fusion FLARM	Fusion DUO FLARM	Power Box	Power Box PRO
Flarm compatible	✓	✓	N/A	N/A	✗	✗	✓	✓	✗	✗
RJ12 IGC ports	3	1 ***	N/A	N/A	✗	✗	1 ***	1 ***	✗	✗
AUTO-mode	✓	✓	✓	✓	✗	✗	✓	✓	✗	✗
Standby-mode	✓	✓	✓	✓	✗	✗	✓	✓	✗	✗
Hazard-mode	✓	✓	✓	✓	✗	✗	✓	✓	✗	✗
Flash sequence adjustable	✗	✗	N/A	N/A	✗	✓	✗	✗	✗	✗
Updatable (PC)	✓	✓	N/A	N/A	✗	✓	✓	✓	✗	✗
Bluetooth	✓	✓	N/A	N/A	✗	✗	✗	✗	✗	✗
USB (Mini /Micro)	✓	✓	N/A	N/A	✗	✓	✓	✓	✗	✗
Canopy Flasher control	✓	✓	✗	✗	✗	✗	✗	✗	✓	✓
Fuselage Flasher control	✓	✓	✓ 1	✓ 2	✓ 1	✓ 2	✓ 1	✓ 2	✗	✓ 1
Temperature protection	✓	✓	✓	✓	✓ *	✓ *	✓	✓	✓	✓
Enclosure size**	A	B	B	A	B	A	A	A	B	A

* Limited temperature protection: only for Fusion devices.

** Model A: LWH: 100 x 63 x 31mm. Model B: LWH: 50 x 63 x 31mm.

*** External 4-way splitter included in delivery.