uniLIGHT.at Schleppseilwinde NG3

The uniLIGHT winches of the new generation are another milestone for glider towing in model flying. With these winches, it is possible to experience towing operations extremely comfortably and safely in everyday life. After the glider has been released, the tow rope can be retrieved completely automatically, allowing for a safe flight and carefree landing. The intelligently controlled automatic roll-up allows numerous possibilities for beginners and professionals. The functionality, electronics and software of the three models are completely identical, the only differences are the winding space and the installation size/weight/rigidity.

SMALL Optimized for minimum size and lightest weight, ideal for electric operation, gliders up to 10-12kg and ropes with 0.8 and 1mm thickness

MEDIUM Standard version for ambitious towing, universal use up to +25kg ropes 1mm to 1.5mm thick

LARGE Increased winding space for thicker and longer ropes, use up to +25kg large rope guide and ropes with a thickness of 1.5 to 2.5 mm
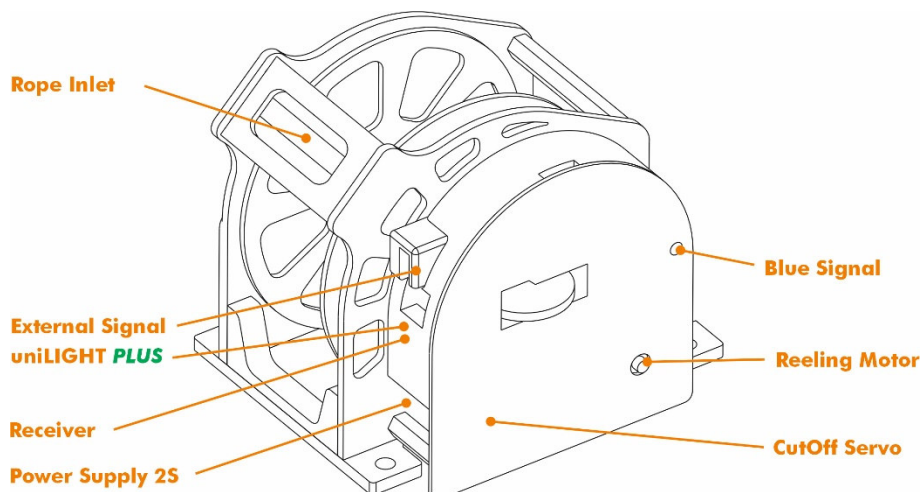
The winches consist of CNC machined aluminum parts and milled fiber composite panels. This enables us to achieve the lowest weight with the highest strength. It is powered by a lightweight, brushless motor with a non-locking belt drive. With a slip clutch, operation as an electric spring is therefore also possible. The motor output stage, the entire control electronics and the servo for the emergency jettison are already integrated. Each winch comes with a powerful uniLIGTH.at flashing light to allow the operating status bee seen from the ground. Each winch can be configured via the uniLIGHT.PLUS interface and our uniLIGHT.DESK in Windows and Android.

The correct teaching of the cable length is of central importance for the many automatic functions of the winch. Please pay close attention to the point "learning process" in this description in order to be familiar with the simple but necessary process.

Properties and functions

- winch mechanics aluminum-fiber composite
- non-blocking belt slip drive
- different cable guides possible
- integrated brushless drive
- power level integrated, ESC
- integrated emergency cut-off servo
- integrated control electronics
- output for signal light uniLIGHT
- movement detection to shutdown
- braking function when de-energized

- magnetic kinematics detection

- automatic rope length calibration
- intelligent dynamic operation
- configurable winding speed
- rewind limitation for remaining length
- automatic remainder winding
- intelligent emergency eject integrated
- controllable via just one servo channel
- programmable via **uniLIGHTPLUS**

Details

Rope Inlet
Blue Signal
External Signal uniLIGHT *PLUS*
Reeling Motor
Receiver
CutOff Servo
Power Supply 2S

Rope-Guide the tow rope must be fed through the guide from the hull bushing to the drum to enable knot-free winding. Depending on the winding speed, there should be sufficient aerodynamic braking effect.

uniLIGHT_PLUS_ data interface for advanced configuration of the winch

Signal EXTERNAL connection for a uniLIGHT strobe light for external display of the EXTERNAL signal. This signal provides information about the operating status of the winch.

Internal signal BLUE provides information about the signal from the receiver and the internal status.

Winding motor brushless electric motor with belt drive to the spool. Make sure that the motor can rotate freely. Pay attention to the direction of rotation under the item "Mounting position".

Cut-Off Servo Integrated high-performance servo for emergency drop of the tow rope (full metal, 95Ncm)

Fuselage Inlet

Area for Fuselage Inlet

Rope Inlet

Rope Inlet
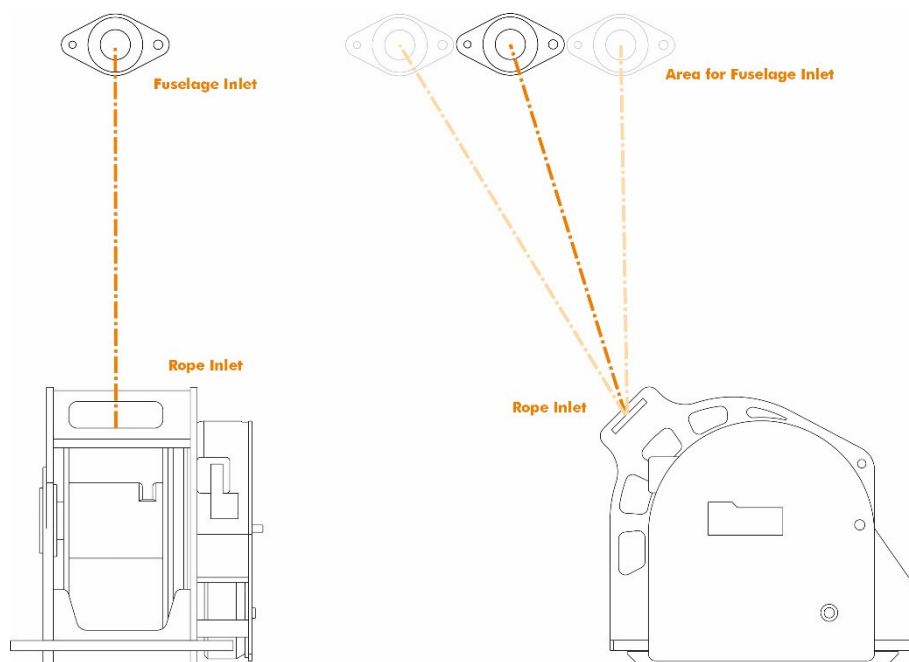
Connection

1. Plug the 2-pin JST power cable into a 2S LiPo/LiIon battery
2. Plug the 3-pin servo cable into the receiver and switch on your receiving system. Make sure that the servo position is approximately in the middle position (1500-1600µs).
3. Optionally connect the uniLIGHT PLUS data cable to a PC or Android tablet to analyze the condition of the winch or make changes.
4. Depending on how the servo position is now changed, different functions of the winch are activated. To do this, configure your transmitter to ensure easy and reliable selection of the functions; the emergency cut-off in particular must be able to be reached quickly and safely, but not unintentionally. Depending on the manufacturer of the transmitter, this can be implemented very flexibly and elegantly via control settings, flight phases and mixers. Note the following explanations about the operating modes and their properties.

Operation modes

Betriebszustand

Aktueller Betriebsmodus

Hier wird das aktuelle Betriebsverhalten, aufgerufen vom Signal über den Empfängeransc...

NEUTRAL 1500µs. The operating modes are called via the servo travel. In the middle position, the neutral range is active. Here the winch does nothing by itself and goes into hibernation. The rope is locked. In this state, it is usually towed. Pull the rope out of the model, attach it to the glider and tow it.

EMERGENCY CUT-OFF about 1800µs. The rope is usually unwound, the motor is inactive and the retaining pin is opened. The rope is released before something happens to the tow plane in a critical situation.

DYNAMIC TOW about1400µs. This operating mode can be activated during tow, e.g. to help unexperienced pilots to maintain the rope tension.

ROLLUP of the rope at about 1200µs. This position is usually selected after the glider has been released in order to retract the rope for the return flight and landing. Unrestricted aerobatics and low landing approaches can be performed without a rope.

Neutral

In neutral state, the winch is in standby mode. The rope is locked and if the deactivation of the dropping servo and motor is allowed in the uniLIGHT.DESK, all components are switched off. Now you can tow as normal without consuming energy and all functions are available at all times. The status is indicated by a single, short flash on blue/internal signal and external signal.

Zugehöriges Lichtmuster

Emergency Cut-Off

With the "emergency release" the central retaining pin in the center of the spool is opened so that the tow rope can be released in a critical situation. Normally, the rope is already unrolled and the load is only hanging on this pin. Structurally, make sure that the loop of the rope cannot get caught inside your model. It is advisable to use ropes with sewn loops or spliced eyelets without knots. This rapidly flashing light pattern is displayed internally and externally to indicate emergency cut-off:

Zugehöriges Lichtmuster

If the option "allow learning process" is set in uniLIGHT.DESK (default off), then the learning process is always started after the release in order to re-measure the new or reinserted rope. All advanced functions are only possible with a valid learning process!

DESK If the "intelligent rope ejection" option is set in uniLIGHT.DESK, the pin is only ejected when the remaining amount on the drum falls below the tolerance range (default approx. 5% of the rope length). This prevents the rope from being thrown off accidentally when the model is being set up and then having to be taught in again. This option must be set in uniLIGHT.DESK.

5%
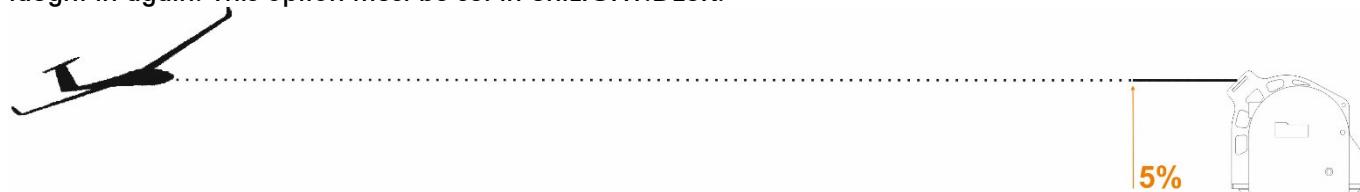
A successful ejection process is indicated by a 2-second continuous light on the external signal output.

Zugehöriges Lichtmuster

Learning process

After a drop, the new or old rope must be measured freshly if the "allow learning process" has been set in uniLIGH.DESK. This operation is unavoidable and cannot be skipped via servo position after exiting emergency release.

Hold the rope in the appropriate position at the central pin and switch to the neutral position. Internal and external LEDs will indicate this with this slow blinking light signal:

Zugehöriges Lichtmuster

During the learning process, the rope can be stopped briefly without any problems, pulling out/moving again activates the motor again until the rope is completely retracted. After a waiting period of 10 seconds and a minimum winding amount of 80 revolutions (approx. 10m), the learning process is automatically exited, the external LED indicates this with a 2-second continuous light.

Zugehöriges Lichtmuster

Dynamic Tow

This operation offers the possibility of activating an intelligent elastic function by the motor if required. In the case of inexperienced towing teams, the rope can often sag and thus lead to dangerous situations. During dynamic operation, the winch tries to keep the rope taut by winding it up quickly, but only up to the adjustable rope length so as not to pull the towed model completely. Approx. 50% of the rope length is preset here. Due to the gentle intervention of the motor, this area is variable by half the rope length (adjustable). So the rope is always pulled when it is pulled out more than 50% of the winch, the more it deviates, the faster it is pulled. Please note that the engine can run a lot here and the slipping clutch is put under a lot of strain, which means that the belt needs to be serviced more frequently.

50%
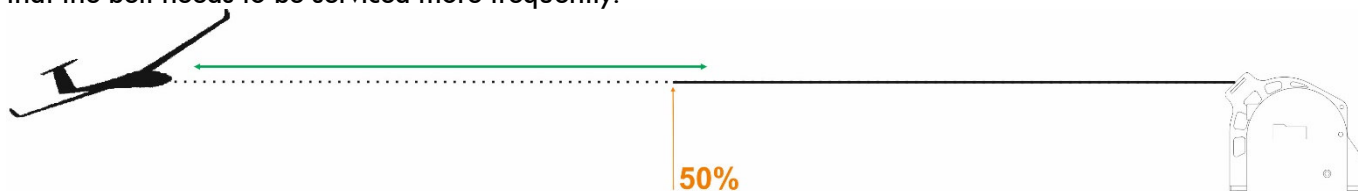
Dynamic towing operation will be indicated on the internal LED with a double blink.

Zugehöriges Lichtmuster
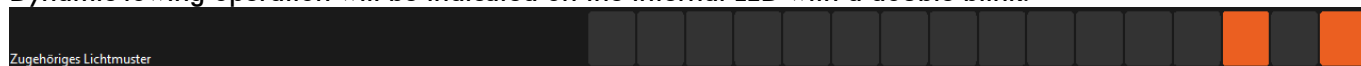
DESK   If the "dynamic tow" operating mode is not switched off and you land with half the rope length, then the "automatic rest winding" can automatically pull in the rest of the rope when the model comes to a complete standstill. This function is activated by default in uniLIGHT.DESK. Rolling up is indicated with a triple flash and acknowledged with a 2 second steady light.

Zugehöriges Lichtmuster

Roll-up

If you tow normally, the rope can be pulled back into the fuselage after the glider has been released in the „rolling up" operating mode.

However, this function can also be used to keep the rope under tension manually in the case of inexperienced towing teams. In contrast to dynamic tow, here the rope is pulled in the entire range as long as there are changes in tension and position. If the rope is pulled out completely for a few seconds or if there is no further movement for some other reason, the motor is switched off.

10%
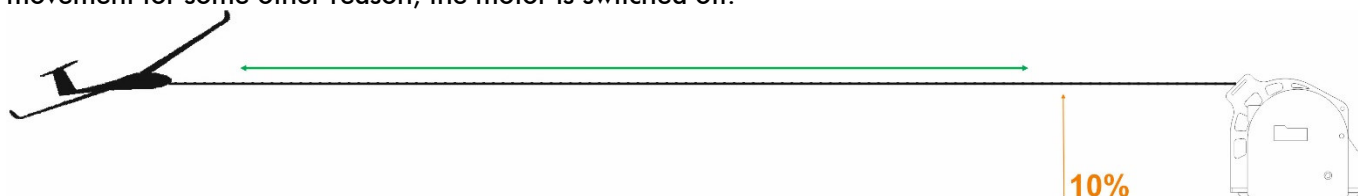
The winding process is indicated by a triple flash on the external LED

Zugehöriges Lichtmuster

DESK   If the option "stop winding rope end" is activated in uniLIGHT.DESK (default), then the rope is not fully retracted and stopped at approx. 10% remaining length so that the rope end and the aerodynamic brake are not pulled into the tail units.

DESK   If the "automatic rest winding" option is activated, the rest of the rope is automatically retracted after a few seconds if the model has come to a complete standstill. This function is activated by default in uniLIGHT.DESK. Rest winding can be started manually by changing to NEUTRAL and BACK to winding.

Installation of the cable guide

The winch itself can be mounted on the bottom of the hull or on a supporting frame, but the cable guide must be installed neatly above the winch in backside area of the hull. (However, there have also been successful realizations with "tail towing" as with the original models).

Fuselage Inlet

Area for Fuselage Inlet

Rope Inlet

Rope Inlet
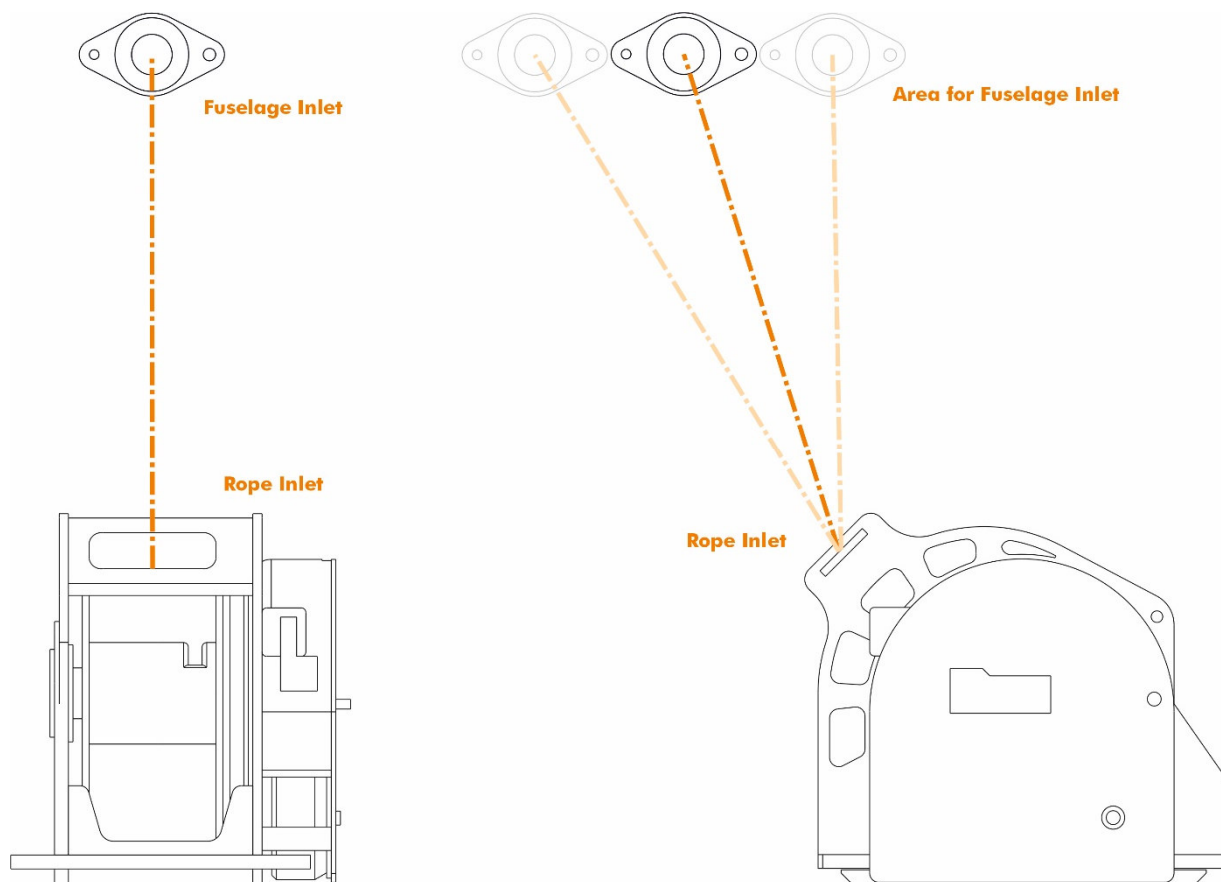
Note that very high forces can also occur here when towing and look for a correspondingly solid point. Also note that a rope thrown off in an emergency can cause a whiplash under high tension - there should be no system-relevant components in the possible impact area.

Picture 1: Be sure to mount the guidance **EXACTLY** over the winch along the vertical axis of the model. If the tensile forces are not introduced straight into the mounting points, damage can easily occur. Also mount the winch horizontally on the bottom of the hull. Deviations in these two points lead to an asymmetrical winding pattern on the spool.

Picture 2: The fuselage entry can be flexibly placed on the vertical level of the rope guide. Just make sure that the rope always runs over the metal bolts and does not constantly rub against a fiber/wood parts. The straighter the guide, the more reliable the winding process will be.

Care and tear

The belt drive is a simple and safe spooling method that cannot jam. However, this belt is a wearing part and must be changed depending on use. To do this, open the screws on one side of the winch and remove the spool. "Dynamic" operating mode significantly increases wear.

Likewise, the nylon guides of the fuselage insertion are designed as wearing parts. If there are clear grooves, please change the nylon bushing.

For the emergency release, a 2mm steel pin is moved via an eccentric drive. The spool rotates around this pin. Due to the implementation, this ejector pin lies freely in the guide and can cause slight rattling noises when winding up. You can lubricate this pin from the back of the winch through the hollow shaft.

Installation position in the model

The tow winch can be mounted horizontally on the hull floor or vertically on a supporting frame. In principle, it is not relevant for the function. You just have to make sure that the correct winding direction is selected for the corresponding installation position. If the preset orientation is not correct, this can be changed via the uniLIGHT PLUS interface, or two motor lines can be crossed.

HORIZONTAL MOUNTING

VERTICAL MOUNTING
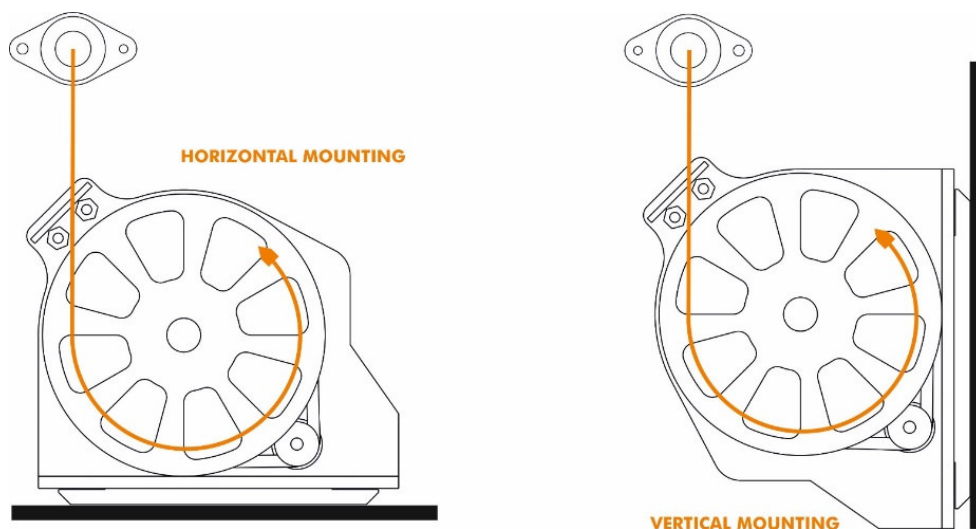
security features

The tow winch constantly checks the voltage of the drive battery. If this mainly falls below the switch-off threshold, the undervoltage protection function is activated. This is indicated by the blue LED flashing multiple times with pauses.

In the event of undervoltage, the winch motor will no longer start, but the emergency release servo will remain functional for a long time. An operation like in the classic aerobatic tow with a rigid rope is therefore still possible. Nevertheless, the battery should of course be charged or replaced as soon as possible.

Technical Data

Technical Data	SMALL	MEDIUM	LARGE
Control side receiver:	3.6-9.6V	3.6-9.6V	3.6-9.6V
Operating voltage winch:	8V/2S LiPo	8V/2S LiPo	8V/2S LiPo
Additional weight to conventional system *	ca. 60g	ca. 115g	ca. 150g
Dimensions:	55/88/77mm	70/92/80mm	85/92/80mm
Power consumption:	15-20mAh/flight	20-25mAh/flight	20-30mAh/flight
Control:	1x PPM	1x PPM	1x PPM
Galvanically isolated system:	YES	YES	YES
Master/Slave shutdown system:	YES	YES	YES
Winding space:	ca. 30m/0.8mm rope	>40m/0.8mm rope	>40m/1.3mm rope
	ca. 25m/1.0mm	ca. 35m/1.0mm rope	ca. 40m/1.5mm rope
		ca. 30m/1.3mm rope	ca. 30m/2.0mm rope
		ca. 25m/1.5mm rope	ca. 25m/2.5mm rope
Fuselage Rope Guide:	nylon	nylon	aluminum spool
Stiffed Frame:	-	YES	YES
Discharge protection:	YES	YES	SEY
Total weight:	170g	225g	260g
uniLIGHT signal light:	RND-050x2-WE	RND-050x2-WE	RND-050x2-WE

*) bases on a standard servo with 80g and tow release mechanism with approx. 30g