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**wahlberg**  
MOTION DESIGN

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## Winch 10 cable

Item No .212 / .213

## User Manual



# Safety Information



## WARNING!

**Read the safety precautions in this section before installing, powering, operating or servicing this product.**

The following symbols are used to identify important safety information on the product and in this manual:



**DANGER!**  
Safety hazard.  
Risk of severe injury or death.



**DANGER!**  
Hazardous voltage. Risk of lethal or severe electric shock.



**WARNING!**  
Fire hazard.



**WARNING!**  
Burn hazard. Hot surface. Do not touch.



**WARNING!** Refer to user manual.



This product is for professional use only. It is not for household use.

This product presents risks for severe injury or death due to fire hazards, electric shock, and falls.



Read this manual before installing, powering or servicing the winch; follow the safety precautions listed below and observe all warnings in this manual and printed on the winch. If you have questions about how to operate the winch safely, please contact your Wahlberg Motion Design supplier or Wahlberg Motion Design.



### PROTECTION FROM ELECTRIC SHOCK

- Disconnect the winch from AC power before removing or installing any cover or part and not when in use.
- Always ground (earth) the winch electrically.
- Use only a source of AC power that complies with local building and electrical codes and has both overload and ground-fault (earth-fault) protection.
- Before using the winch, check that all power distribution equipment and cables are in perfect condition and rated for the current requirements of all connected devices.
- Power input throughput cables must be rated 20 A minimum, have three conductors 1.5 mm<sup>2</sup> (AWG16) minimum conductor size and an outer cable diameter of 5-15 mm (0.2-0.6 inch). Cables must be hard usage type (SJT or equivalent) and heat-resistant to 90 °C (194 °F) minimum. In the EU the cables must be <HAR> approved or equivalent.
- Use only Neutrik powerCON TRUE1 NAC3FX-W cable connectors to connect to power input sockets. Use only Neutrik powerCON TRUE1 NAC3FX-W cable connectors to connect to power throughput sockets.
- Assembly power supply cables following the instructions in this manual only (see page 12).

- Isolate the winch from power immediately if the power plug or any seal, cover, cable, or other component is damaged, defective, deformed, wet, or showing signs of overheating. Do not reapply power until repairs have been completed
- Do not expose the winch to rain or moisture.
- Refer any service operation not described in this manual to a qualified technician.


#### PROTECTION FROM BURNS AND FIRE

- Do not operate the winch if the ambient temperature (Ta) exceeds 40° C (104° F).
- The exterior of the winch becomes warm during use. Avoid contact by persons and materials. Allow the winch to cool for at least 10 minutes before handling.
- Do not modify the winch in any way not described in this manual.
- Install only genuine Wahlberg parts.

#### PROTECTION FROM INJURY

- Fasten the winch securely to a fixed surface, rig, or structure when in use. The winch is not portable when installed.
- Ensure that any supporting structure and/or hardware can hold at least 10 times the weight of all the devices they support
- If suspending from a rigging structure, fasten the winch using the supplied Manfrotto slim coupler and M12 bolt, nut, and washers supplied with the winch according to the manual, see page 10.
- Always install the winch as described in this manual. If the winch is installed in a location where it may cause injury or damage if it falls, install as described in 10.
- If possible, allow enough clearance beneath the winch so it cannot cause any danger to personnel beneath it. Else, adjust the lower limit accordingly following the instructions in this manual.
- Check that all external cobbles and rigging hardware are securely fastened.
- Block access below the work area and from a stable platform whenever installing, servicing or moving the winch.
- Do not operate the winch with missing or damaged covers, shields, or wire.

Intact cable 

Broken cable 



Inspection points

#### Before each use

- Inspect the entire length of the **lifting cable** for bends, damage, wear, and abuse.
- Inspect the **lifting cable** for conductivity
- Inspect the **Cable-lock** and **thimble** for damage, wear, corrosion, or abuse.
- Check all limit switches.
- Check the slack detection device
- Check that the wire is wound neatly on the drum.

**Warning! Do not use the winch if any damage or error is found!**



### **Disposing of this product**

Wahlberg Motion Design products are supplied in compliance with Directive 2002/96/EC of the European Parliament and of the Council of the European Union on WEEE (Waste Electrical and Electronic Equipment), as amended by Directive 2003/108/EC, where applicable.

Help preserve the environment! Ensure that this product is recycled at the end of its life. Your supplier can give details of local arrangements for the disposal of Wahlberg Motion Design products.

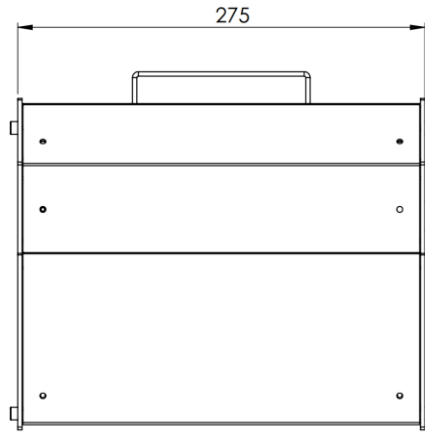
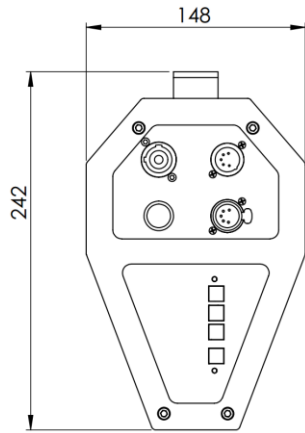
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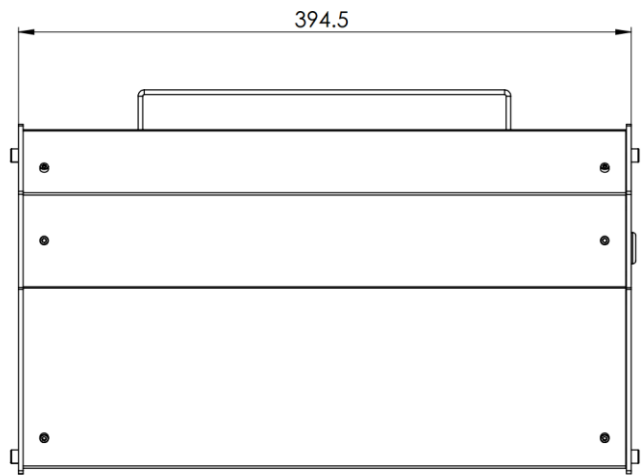
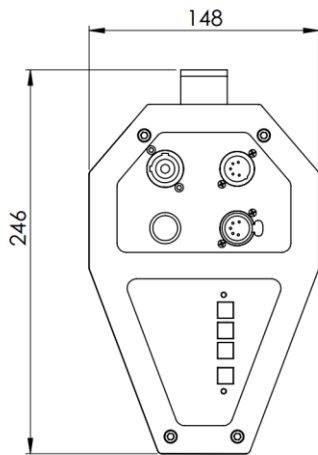
# Technical specifications

Model:	Winch 10 Cable (4 m .212 / 10 m .213)
Item no.:	.212 / .213
Dimensions(without mounting clamp):	
.212:	242 × 275 × 148 mm. / 9.5 × 10.8 × 5.8 in. (L×W×H)
.213:	242 × 395 × 148 mm. / 9.5 × 15.6 × 5.8 in. (L×W×H)
Power supply:	230 V AC 50 Hz (optional 120V/60Hz).
Power consumption:	Max 200 Watt.
Power plug:	Neutrik powerCON TRUE1 NAC3FX-W
DMX control signal:	DMX 512 1990 + DMX512A / 7 channels used.
DMX connection:	5 pole XLR, In & link
Lifting height:	
.212:	3.8 m. (13 ft.)
.213:	9.8 m. (33 ft.)
Lifting capacity:	10 kg. (22 lbs.)
Lifting speed:	Variable, 5-30 cm/sec. (2-11.8 inch/sec.)
Lifting cable:	Special Cable, UL approved
Maximum cable current:	
Red / Black wire 0.75 mm <sup>2</sup> :	5A through power connection
White / yellow wire 0.25 mm <sup>2</sup> :	1A through data connection
Minimum breaking load (cable):	> 100 kg
Wire fleet angle:	None
Minimum load:	2.5 kg (5.5 lb)
Maximum load:	10.0 kg (22.0 lb)
Noise emission:	~50 dB (1m distance)
Weight:	
.212:	6.1 kg (13.4 lb)
.213:	8.4 kg (18.5 lb)
Mounting clamp:	Slim eye coupler (Max load: 300 kg) 50 mm (2 inch)
Motor:	24 V DC, 28.9 W, IP30
Maximum expected cable lifetime:	
– At 2.5 kg load	Up to 250,000 cycles running up and down.
– At 5.0 kg load	Up to 100,000 cycles running up and down.
– At 10 kg load	Up to 5,000 cycles running up and down.

**.212 Winch 10 Cable 4 meter**



**.213 Winch 10 Cable 10 meter**



# Introduction

Thank you for selecting the winch 10 cable, a DMX controlled winch from Wahlberg Motion Design. Before using the winch for the first time, please read this manual carefully. Failure in handling can cause injury of persons and/or damage the winch.

## Package content

1×	Winch 10 cable
1×/2×	Manfrotte Slim coupler (.212 / .213)
2×	Mounting bolt, nut, and washers (M12) for slim coupler mounting
1×	PowerCon Male plug for power cable
1×	8 mm snap hook
1x	Instruction manual

## Description

Winch 10 cable is a small winch for stage use, mainly for use in theatres, shows and concerts. It is designed for lifting lamps and other electrical devices in and out of the stage sphere at maximum load of 10 kg up and down. The standard lifting height is 10 m. The lifting speed is between 5 cm/s and 30 cm/s.

The winches are easily connected as a chain, allowing for advanced and creative ways of making dynamic movements. The winch is controlled by the DMX channels from the lighting desk. It has a built-in positioning system which is utilized in locating the desired position. The positioning system is controlled from a 16 bit DMX channel and is highly accurate; the winch stops within 15 mm. The speed of the winch is likewise controlled from the lighting desk, and it is possible to set the upper and lower limits of the movement of the winch, adjusting its span of motion. Seven DMX channels controls the wanted position and the speed of the movement, and the winch finds the position applied on the lighting desk. The movements are programmed as lighting and in interaction with the light.

The control system ensures that the motor only is powered when:

- The control signal is reliable.
- The position and speed control is on.
- The motor position is calculated after with a PID regulator calculates the motor speed and distance.
- No overload.

Winch 10 cable should only be operated by an experienced DMX-controlled-lighting-desk-operator.

The lighting desk has to be programmed according to the manual, so the winch will stop when the speed is put to 0 %. It is also possible for the user to stop the winch on the main. After power failure the start position of the winch needs to be reset before the winch can function again.

Manually operation of the winch is only intended for mounting, service, and tests.



## Area of use

The Winch is intended for indoor use only. It is designed for lifting and lowering lamps and other electrical devices at the weight and speed stated in "Technical Data". Any other use of the winch may result in a risk of injury of persons or equipment damage.

Exceeding the load rating may cause failure of the equipment.

Use only approved rigging connectors to secure the load to the lifting cable and do not wrap the lifting cable around the load as this will damage the lifting cable and result in a risk of injury of persons or equipment damage.

Do not modify the winch. For any modification of your winch, contact Wahlberg.

It is the customers' responsibility that any local restrictions concerning the use of the winch are complied with.



**For indoor use only!**

**Caution! To reduce the risk of electric shock or injury: use indoors only**

**Caution! To reduce the risk of electric shock, do not expose to rain: store indoors!**

## Using for the first time

**Important! The winch 10 cable must be protected from environmental factors such as physical shocks and vibration during transportation and storage.**

**Warning! Read "Safety Information" on page 2 before installing, powering, operating, or servicing the winch. Before applying power to the winch:**

- Check the Wahlberg Motion Design website at [www.wahlberg.dk](http://www.wahlberg.dk) for the most recent documentation and technical information about the winch 10 cable. Wahlberg user manual revisions are identified by the revision number in the bottom of each page.
- Carefully review the "Safety Instructions" on page 2.
- Check that the local AC mains power source is within the winch power voltage and frequency ranges.
- See "Power cables and power plug" on page 2. Install a Neutrik powerCON TRUE1 NAC3FX-W power input connector on a suitable power cable. If drawing the power from a mains power outlet, install a suitable power plug on the power cable.

# Physical installation



**Warning!** The Winch 10 cable must be either fastened to a flat surface such as a roof, or clamped to a truss or similar structure in such a way that the lifting cable exit points downwards. Do not apply power to the Winch 10 cable if it is not securely fastened.

## Fastening the winch to a flat surface

The Winch 10 cable can be fastened to flat surface such as a roof. Check that the surface can support at least 10 times the weight of all winches and equipment to be installed on it.



**Warning!** The supporting surface must be hard and flat. Fasten the winch securely.

## Mounting the winch on a truss

The Winch 10 cable can be clamped to a truss or similar rigging structure.



**Warning!** Use only the supplied rigging clamp and M12 bolt. The clamp must be screwed into the central hole in the winch's mounting bracket using the supplied M12 washers and M12 locking-nut.

### To clamp a Winch 10 cable to a truss:

1. Check that the rigging clamp is undamaged and that the rigging structure can support at least 10 times the combined weight of all Winches and equipment to be installed on it.
2. Use the supplied rigging clamp or contact Wahlberg Motion Design for a replacement.
3. Fasten the clamp to the winch with the supplied M12 bolt, nut, and washers in the hole in the mounting clamp of the winch.
4. Block access under the work area. Working from a stable platform, hang the winch on the truss with the lifting cable downwards. Tighten the rigging clamp.




# AC power

 **Warning!** Read “Safety Information” on page 2 before connecting the winch 10 cable to AC mains power.

**Warning!** For protection from electric shock, the Winch 10 cable must be grounded (earthed). The power distribution circuit must be equipped with a fuse or circuit breaker and ground-fault (earth-fault) protection.

**Warning!** Socket outlets or external power switches used to supply the Winch 10 cable with power must be located near the winch and easily accessible so that the winch can easily be disconnected from power.

## Power voltage



 **Warning!** Check that the voltage range specified on the winch’s serial number label matches the local AC mains power voltage before applying power to the winch. Do not apply AC mains power to the winch at any other voltage than that specified on the winch’s serial number label.

## Power cables and power plug

The Winch 10 cable requires a power input cable with a Neutrik powerCON TRUE1 NAC3FX-W cable connector for AC mains power input. The cable must meet the requirements listed under “Protection from electric shock” on page 2.

If you install a power plug on the power cable, install a grounding-type (earthed) plug that is rated 20 A minimum. Follow the plug manufacturer’s instructions. Table 1 shows standard wire color-coding schemes and some possible pin identification schemes; if pins are not clearly identified, or if you have any doubts about proper installation, consult a qualified electrician.

Table 1 - Colour guide

Wire Colour	Conductor	Symbol	Screw (US)
Brown	Live	L	Yellow or brass
Blue	Neutral	N	Silver
Yellow/green	Ground (earth)	 or 	Green

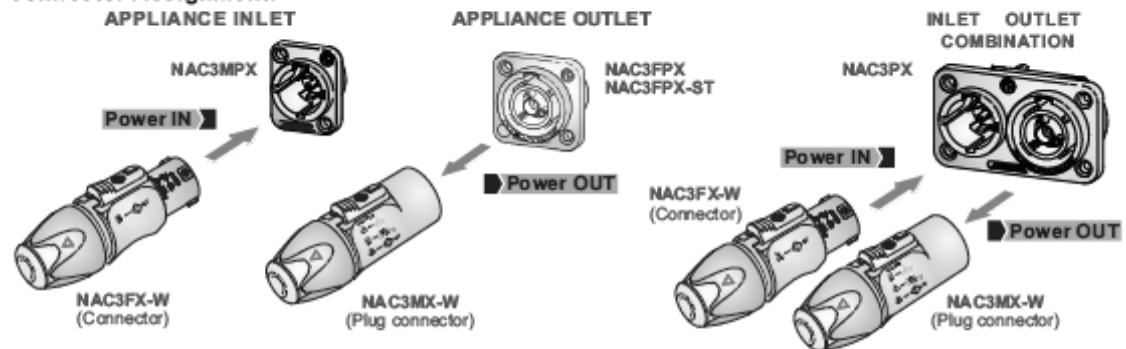
# Installing a power input connector on a power cable

To install a Neutrik powerCON TRUE1 NAC3FX-W input connector on a power Cable, follow the original Neutrik instructions below:

## A. OPERATING INSTRUCTION

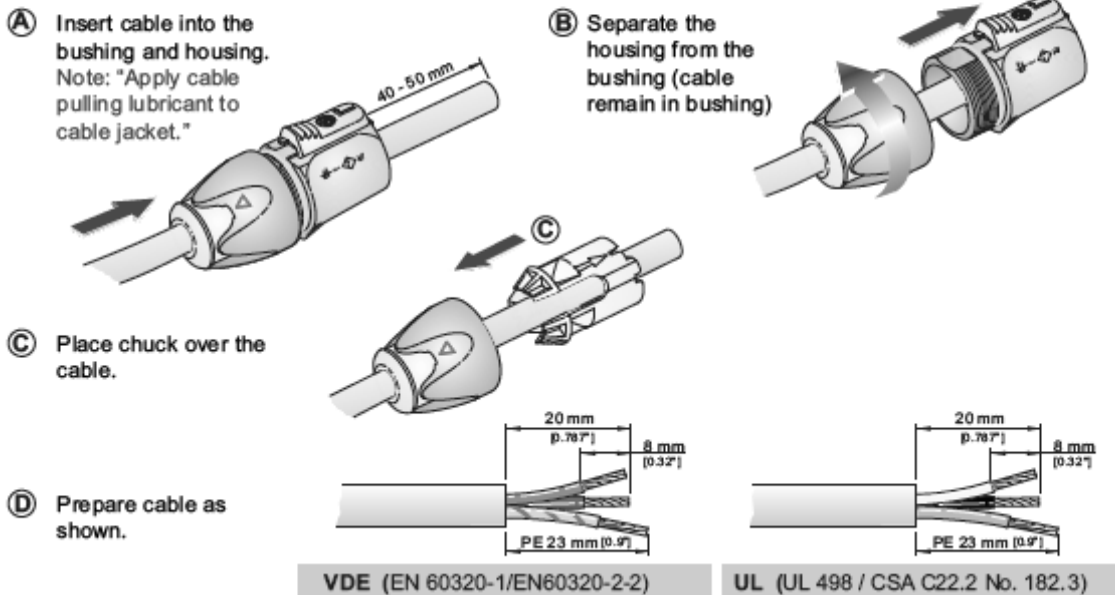
**Application:**  
The powerCON TRUE1 system is certified as connector with breaking capacity according IEC 60320, VDE 0625. It is intended for use as appliance couplers and interconnection couplers. It serves to supply power to an appliance and from an appliance to another equipment. To be installed by qualified person only.

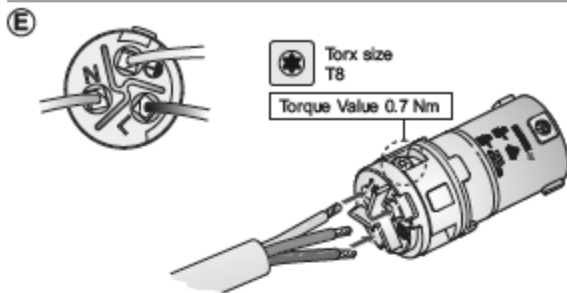
### Connector Assignment:



<b>Approval based:</b>	<b>VDE</b> EN 60320-1/EN60320-2	<input checked="" type="checkbox"/>	<b>UL</b> UL 498 / CSA C22.2 No. 182.3	<input checked="" type="checkbox"/>
<b>Rating:</b>	250 V ac / 16 A		250 V ac / 20 A	
<b>Cable Type:</b>	H05VV-F3G 1.0 mm <sup>2</sup> , Length max. 2 m H05VV-F3G 1.5 - 2.5 mm <sup>2</sup> H07RN-F3G 1.5 mm <sup>2</sup>		SJTOW, SJOOW 3 x 12 AWG	
<b>Strain Relief:</b>	White chuck		White chuck	
<b>Cable O.D.:</b>	6.0 - 12.0 mm		6.0 - 12.0 mm	

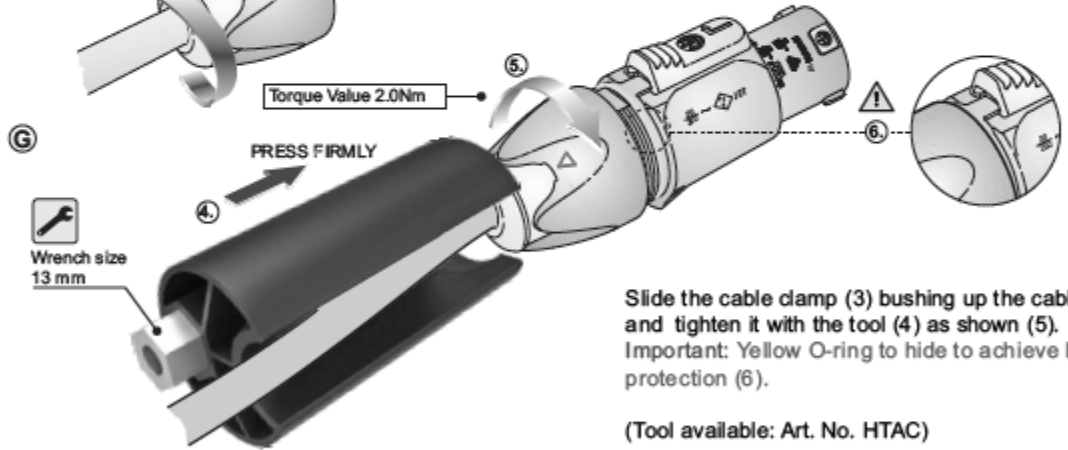
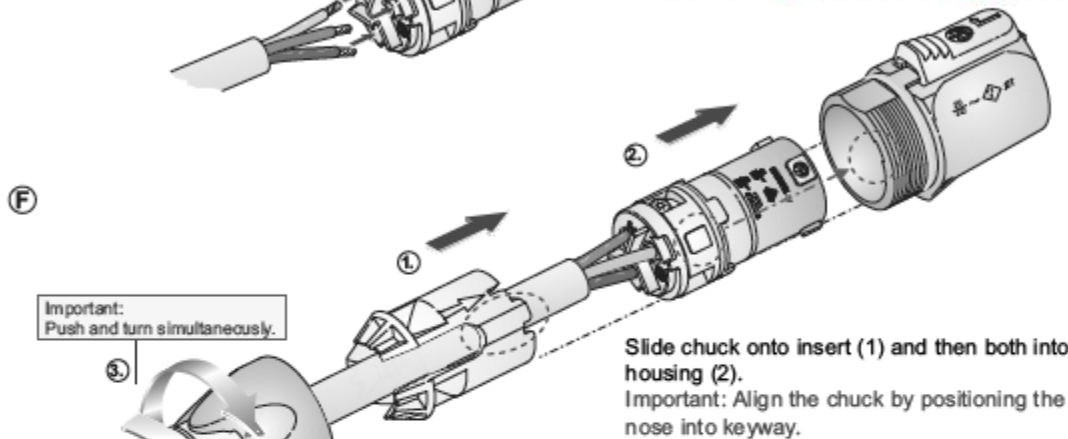
## B. ASSEMBLY INSTRUCTION






Slide the cable into the contacts and clamp with the screw with Torx size T8.

Wiring	VDE	UL
L ⇒	 brown	 black
N ⇒	 blue	 white
⊥ ⇒	 green/yellow	 green

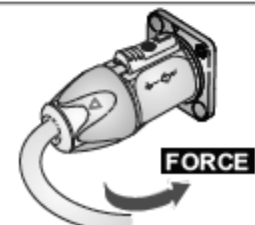


**FOR DISASSEMBLY - OPEN TWIST LOCK!**

1. Press with screw driver to unlock
2. Turn bushing 360°.
3. Repeat step 1+2 until bushing is unscrewed.




**CAUTION**



To ensure protection category, do not expose the connection to bending forces (e.g. do not attach loads to the cable, no free-dangling cable windings etc.).

**SAFETY WARNING**



For safety and certification reasons the connector must be replaced in case of any broken parts or serious damage.

# Data link

A DMX 512 data link is required in order to control the winch via DMX. The Winch 10 cable has 5-pin XLR connectors for DMX data input and output. The pin-out on all connectors is pin 1 = shield, pin 2 = (-), and pin 3 = (+). Pins 4 and 5 in the 5-pin XLR connectors are not used in the Winch 10 cable but are available for possible additional data signals as required by the DMX512-A standard.

Standard pin-out is pin 4 = data 2 (-) and pin 5 = data 2 (+). The Winch 10 cable is subject to the common limit of 32 devices per daisy-chained link. Note that if independent control of a winch is required, it must have its own DMX channels. Winches that are required to behave identically can share the same DMX channels. To add more winches or groups of winches when the above limit is reached, add a DMX universe and another daisy-chained link.

## Tips for reliable data transmission

- Use shielded twisted-pair cable designed for RS-485 devices: standard microphone cable cannot transmit control data reliably over long runs. 24 AWG cable is suitable for runs up to 100 meters (328 ft.).
- Never use both a winch's outputs to split a DMX link. To split the link into branches, use an opto-isolated RS-485 splitter/amplifier.
- Terminate the link by installing a termination plug in the output socket of the last winch. The termination plug, which is a male XLR plug with a 120 Ohm, 0.25 Watt resistor soldered between pins 2 and 3, "soaks up" the control signal so it does not reflect and cause interference. If a splitter is used, terminate each branch of the link.

## Connecting the data link

To connect the Winch 10 cable to data:

1. Connect the DMX data output from the DMX controller to the Winch 10 cable's male 5-pin XLR DMX input connector (DMX 512 IN).
2. Connect the DMX output of the winch to the DMX input of the next winch and continue connecting winches output to input (DMX 512 OUT).
3. Terminate the last winch on the link with a 120 Ohm resistor.

The DMX lamp is the green led, next to the DMX-selectors.

- Glows constant, when the DMX connection is correct.
- Flash if the DMX signal is missing or wrongly connected.



# Lifting cable power and data link



**Warning!** Read “Safety Information” on page 3 before connecting AC mains power to the lifting cable.

**Warning!** Socket outlets or external power switches used to supply the lifting cable attachment with power must be located near the winch and easily accessible so that the lifting cable attachment can easily be disconnected from power.

## Power voltage



**Warning!** Check that the voltage range specified on the winch’s serial number label matches the local AC mains power voltage before applying power to the winch. Do not apply AC mains power to the winch at any other voltage than that specified on the winch’s serial number label.

## Lifting cable connection plug

The Winch 10 cable requires a power and data input a Neutrik speakON NL4FX cable connector. The cable for connecting the speakON plug on the winch for the lifting cable power and data, must meet the requirements listed under “Protection from electric shock” on page 3.

The lifting cable has four conductors; two for power and two for data.

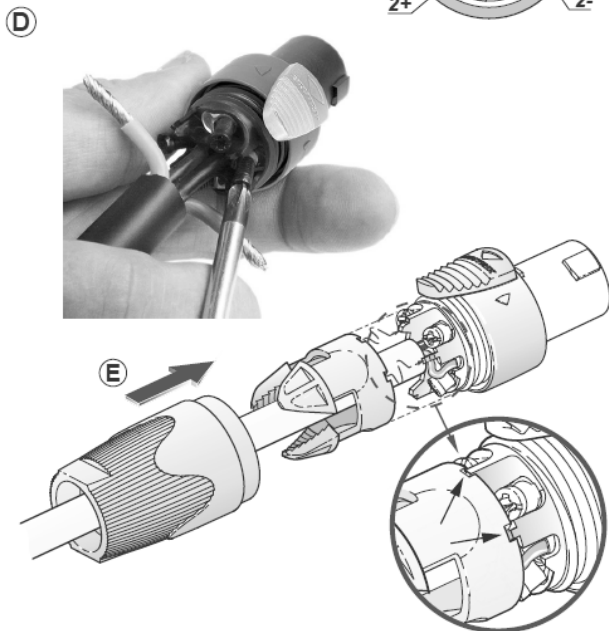
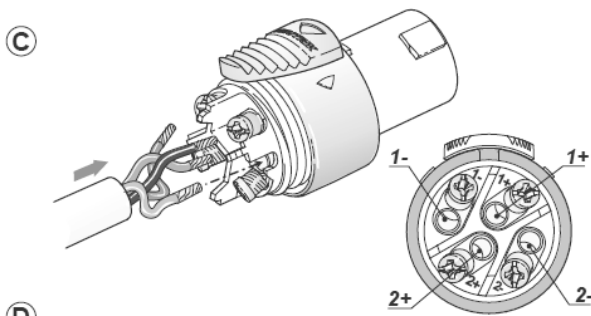
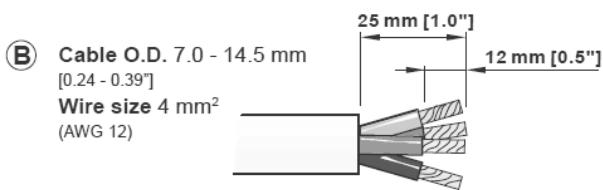
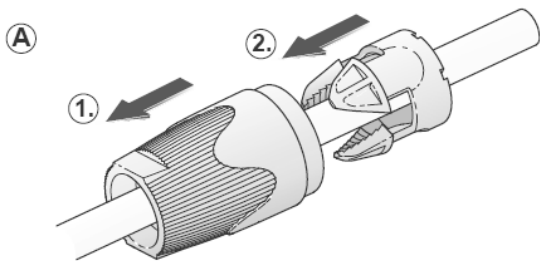
## Connecting the power cable

Refer to the section “AC power” on page 11 for installation of the power connection.

## Connecting the data link

Refer to the section “Data link” on page 14 for installation of the data connection.

To install a Neutrik speakON NL4FX cable connector, follow the original Neutrik instructions below:



### Assembly of the Connector:

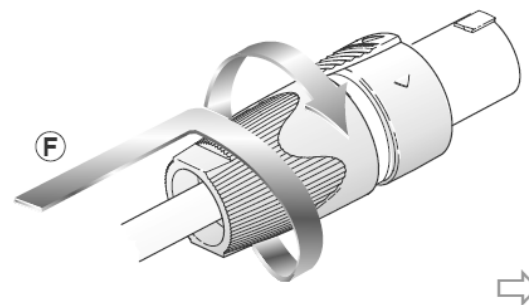
- A** Place the bushing and chuck over cable.
- B** Prepare the cable as shown.  
Important is the stripping length of 25 mm and 12 mm.
- C** Insert wires into terminals and secure clamp terminals with screw driver (**POZIDRIV® #1**) at max. torque 0.8 Nm.  
For 6 mm<sup>2</sup> (AWG 10) remove screws, clamping sheet and solder.
- D** For easy wiring especially on big cables, first screw on the inner contacts 1+ and 2+ and afterwards the outer contacts 1- and 2- !
- E** Push chuck up to housing .  
Important: Align the chuck by positioning the nose into the recess.
- F** Tighten the bushing

### INFO to the screw driver:



**POZIDRIV® #1**

**Philips**





# Setup



**Warning!** Read “Safety Information” on page 2 before installing, powering, operating, or servicing the Winch 10 cable.

**Warning!** Before running the winch, it is important to put a counterbalance on the lifting cable. This is necessary, as the slack detection switch otherwise will be activated and stop the winch.

**Warning!** Only experienced DMX users should operate the winch. Contact Wahlberg for further information and education on DMX protocol.

## Counterbalance

When the winch has been mounted, it is important to hook on a counterbalance before running with it. This can be done by hanging some sort of weight in the snap hook at the end of the lifting cable. The counterbalance is very important, because the winch will not run without it.

## MODE setting

The MODE setting allows you to operate the winch in different ways. Each MODE setting has a given function. Each mode gives an opportunity for different run settings of the winch. The MODE is selected using the MODE selector on the Winch. The winch needs to be reset, before the positioning MODE is possible. The winch can be reset manually or automatically. The winch must be reset each time its power supply has been disconnected.



Read the passage about controlling the top- and bottom-positions, to explore and setup the winch best for your own particular need.



**Warning!** Only operate the winch when there is a clear view to the winch and area beneath it.

**Warning!** Before running the winch ensure that the area beneath the winch is cleared so no people can be harmed.

### MODE 0 – Neutral position

The winch is in neutral position. The motor is not powered and the winch does not move.

### MODE 1 - Positioning with AUTO reset

The winch resets automatically and thereby also sets the top-position automatically. The winch runs up until the snap hook reaches the motor-house and stops. Because of this, the top-positions in this MODE will always be at the motor-house. To start the automatic resetting, speed must be added on the speed-channel (DMX channel 3). When the winch has been reset, it is possible to use it in positioning mode.



**Warning!** When resetting the winch in MODE 2, it is important to decrease the speed, as the snap hook is closing in on the motor-house, otherwise the lifting cable and winch can be damaged.

**MODE 2 - Positioning with MANUAL reset**

The winch is manually reset on the DMX channels 6 or 7. The top-position is, because of this, also set manually, which makes it possible to decide the position of the top-position.

We suggest anyway that it is set near by the motor-house. When the winch has been reset, it is possible to use it in positioning mode.

**MODE 3 – No function assigned**

The winch stops

**MODE 4 – No function assigned**

The winch stops

**MODE 5 – No function assigned**

The winch stops

**MODE 6 – No function assigned**

The winch stops



**Warning! MODE 7 and MODE 8 is only for service and tests!**

**Warning! Before running the winch in MODE 7 or MODE 8, ensure that the area beneath the winch is cleared so no people can be harmed.**

**MODE 7 – Manual run up (no DMX needed)**

The winch runs up with the speed set on the DMX-selectors. This function can be used as a test-function or in association with on- and off-applying of lifting cable.

E.g. Set the winch to MODE 7 and the DMX address to 100, for a slow movement, or set the DMX address to 500 for fast movement.

**MODE 8 – Manual run up (no DMX needed)**

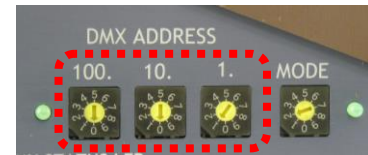
The winch runs down with the speed set on the DMX-selectors. This function can be used as a test-function or in association with on- and off-applying of lifting cable.

E.g. Set the winch to MODE 8 and the DMX address to 100, for a slow movement, or set the DMX address to 500 for fast movement.

**Table 2 - Overview of MODE functions**

<b>MODE</b>	<b>Function</b>	<b>Note</b>
0	Neutral function – motor stops	
1	Positioning with auto TOP reset	
2	Positioning with manual TOP reset	
3,4,5,6	Stops the motor unless specified otherwise	
7	Manual run up (no DMX needed)	Warning! Only for service and tests!
8	Manual run down (no DMX needed)	Warning! Only for service and tests!
9	Used for re-calibrating overload see page 21	

## DMX ADDRESS setting



The DMX address, also known as the start channel, is the first channel used to receive instructions from the controller. For independent control, each winch must be assigned its own control channels.

The DMX address is configured using the three DMX ADDRESS selectors on the winch. The selected DMX address states from which channels, on the lighting desk, the winch is controlled. The DMX address can be selected from 1 – 505. The Winch 10 cable uses 7× DMX channels.

### **DMX channel 1 – Position rough:**

This channel controls the position of the winch, with the speed (DMX channel 3). This rough position works together with the fine position (DMX channel 2). The rough position and the fine position are multiplied in to a 16 bit channel. The rough position is the *MSB*.

### **DMX channel 2 – Position fine:**

This channel controls the position of the winch, with the speed set on DMX channel 3. This fine position works together with the rough position (DMX channel 1). The fine position and the rough position are multiplied in to a 16 bit channel. The fine position is the *LSB*.

### **DMX channel 3 – Speed:**

This channel controls the speed of the winch.

This channel defines the maximum speed. The winch runs with the set max speed, but slows down as closing in on the wanted position. This channel also works as a main brake; the motor does not run unless the channel is set above 0%. The speed-channel can also be used to make soft and slow movements or fast and sudden movements.

### **DMX channel 4 – Max travel top:**

This channel controls the maximum top travelling height of the winch. When the winch has been reset and the top-position thereby has been declared, it is possible, by adjusting this channel, to change how high the winch may run in proportion to the top-position. So the top travelling height for the winch is changed. Where 0% declares the maximal top travelling height, which means it runs all the way up to the reset top- position. Where 100% declares the minimal top travelling, which means it is as far from the reset top-position as possible.

By adjusting this channel the positioning run from 0 - 100% will be within this new parameter. The top travelling height can be changed as needed, without resetting the winch top position.

### **DMX channel 5 – Max travel bottom:**

The channel controls the maximum bottom travelling height of the winch. When the winch has been reset and the top-position thereby has been declared, it is possible, by adjusting this channel, to change how low the winch may run in proportion to the bottom-position. So the bottom travelling height for the winch is changed. Where 0% declares the maximal bottom travelling height, which means it runs all the way down to the reset bottom-position. Where 100% declares the minimal bottom travelling, which means it is as far from the reset bottom position as possible.

By adjusting this channel the positioning run from 0 - 100% will be within this new parameter. The bottom travelling height can be changed as needed, without resetting the winch top-position.

**DMX channel 6 – Find TOP position, moving UP:**

The channel is used to manually finding the top-position. The channel controls the speed from 0-100%. The winch starts to run up when channel 6 is set above 0 %. When the winch reaches the wanted top-position, the speed must be set to 0 %, so that the motor stops. The top-position of the winch is thereby set, where the motor has been left at. The top-position should always be near by the motor-house. See more details in the passage controlling the top- and bottom-positions. **Attention! The positioning run in MODE 2 works only, when the winch has been reset.**

**DMX channel 7 – moving DOWN:**

The winch starts to run down when the speed is set above 0 %. This can be used to manually move the winch down without using positioning. This does not change the top position.

**Table 3 - Overview of DMX addresses**

<b>DMX Channel</b>	<b>Function</b>	<b>Note</b>
1	Position rough (Hi of a 16 bit DMX channel)	MSB
2	Position fine (Lo of a 16 bit DMX channel)	LSB
3	Set the maximum speed	
4	Set the maximum travel top	
5	Set the maximum travel bottom	
6	Find top position, moving up (reset speed)	
7	Moving down	

**Manual reset**

When the winch is ready, the first thing to do is to reset it. This is done manually in MODE 2 on DMX channel 6.

**Reset example:**

- The DMX channel 6 is set to 30% → the winch starts to roll up the lifting cable.
- When the snap hook approaches the motor house reduce the speed by reducing the DMX channel 6 input. High speed can damage the winch and lifting cable.
- Let it run until the snap hook, at the end of the lifting cable, reaches the motor-house.

The winch is now reset and the top-position is at the build-in motor-house top (10 cm below). If you want to have a lower top stop, simply just set the DMX channel 6 to 0% and the place where the winch stops is your new top position.

## Positioning

When the winch has been reset and the top-position is set, it is possible to use it for positioning run. The green LED next to the MODE selector indicates, by fast flashing, that the winch needs to be reset, before it can be used.



The position is set on the DMX channel 1 and 2, which controls the rough-and fine-position. Where 100 % is the top-position and 0 % is the bottom-position.

The positions lamp indicates, by slow flashing, that the winch has been reset and that it is going towards the wanted position. The position lamp indicates, by stable light, that the winch has found the wanted position and the motor has stopped.

The speed is set on the DMX channel 3, where 100 % is the fastest and 0 % is the slowest.

The winch does not run unless the DMX channel 3 is set above zero, and therefore also works as a main brake.

## Re-calibrating overload

The winch comes with overload calibrated to 11kg which means that overload will occur when loads above 10kg is loaded on the winch.

The overload can be re-calibrated to lower values as follows:

1. Ensure at least 1 m clearance below the winch
2. Load the winch with the desired overload threshold weight + 1kg (max 11kg total)
3. Set the DMX channels to 999
4. Then set mode to 9

The winch will now run down a number of times. When the winch has moved back to the top position the overload has re-calibrated.

Ensure to change the DMX channel and MODE away from 999 and 9 after re-calibration.

## Synchronized movements of multiple winches

If several winches are installed to perform synchronized movements the best result is achieved by using a fading 16 bit position. By nature there is a slight deviation in performance of the motors so some motors have a slightly higher maximum speed than others.

Like when fading light, the positions of the different winches should be faded, and the winches will tend to follow that fade. When fading the positions:

1. The speed channel should be set to 100 to gain the highest possible speed.
2. The position channel should be added as a 16 bit channel and not just the MSB on channel 1.
3. The speed of the fade needs to be slower than the maximum speed, so the motors have speed enough to perform the movement.

If the fade of the positions is too fast, the winches will move at the maximum speed, and you will see the difference in the motor speed.

If the fade is too slow the winches will move – stop – move – stop, when the position changes, thus giving a discontinuous movement.

## Controlling the top- and bottom positions

The top-position needs to be reset automatically or manually, before the winch is able to use for positioning run. To get the most precise run, fit for your own needs, it is possible to regulate the top- and bottom-positions.

The top-position is reset manually by the DMX channels 6. When the top-position is being reset it should always be set near by the motor-house. This is important to notice because the winch has a pre-set bottom-position, which is always set 10meters from the pre-set top-position. Therefore, if the top-position is set far from the motor-house and the bottom-position is not adjusted, the winch will still run 10m. (33ft.) down and eventually run out of lifting cable. This will activate the slack detection and the winch will not go any further down.

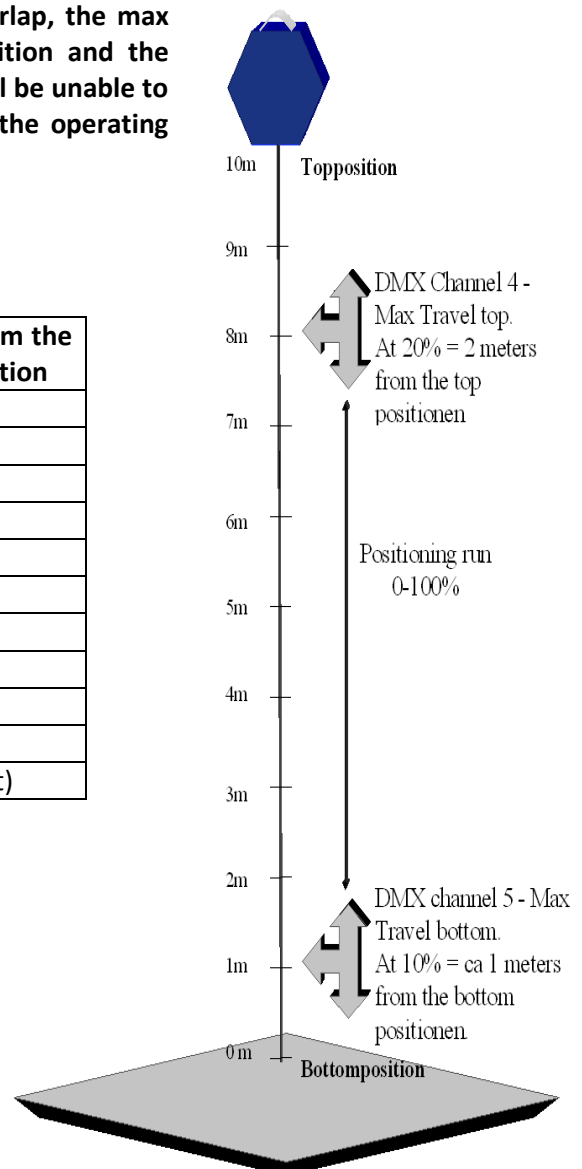
To avoid that the winch runs out of lifting cable, the max travel to the top and the bottom should instead be adjusted on DMX channels 4 and 5.



**Attention! If the two spectrums beneath overlap, the max top position overrules the max bottom position and the winch will move down to that position, but will be unable to be moved with normal positioning, because the operating spectrum has been reduced to 0.**

Table 4 - DMX Channel 4 & 5 relative positions

DMX channel 4	Distance from the top position	DMX channel 5	Distance from the bottom position
0 %	0 m (0 ft)	0 %	0 m (0 ft)
10 %	0.3 m (1.0 ft)	10 %	1 m (3.3 ft)
20 %	0.6 m (2.0 ft)	20 %	2 m (6.6 ft)
30 %	0.9 m (3.0 ft)	30 %	3 m (9.8 ft)
40 %	1.2 m (4.0 ft)	40 %	4 m (13.1 ft)
50 %	1.5 m (5.0 ft)	50 %	5 m (16.4 ft)
60 %	1.8 m (6.0 ft)	60 % <td 6 m (19.7 ft)	
70 %	2.1 m (7.0 ft)	70 %	7 m (23.0 ft)
80 %	2.4 m (8.0 ft)	80 %	8 m (26.2 ft)
90 %	2.7 m (9.0 ft)	90 %	9 m (29.5 ft)
100 %	3.0 m (10.0 ft)	100 %	10 m (32.8 ft)



# Service and maintenance



**Warning!** Read “Safety Information” on page 2 before servicing the Winch 10 cable.

**Warning!** Disconnect the Winch from AC mains power and allow cooling down for at least 10 minutes before handling.

**Warning!** Disconnect the lifting cable connection from AC mains power before handling.

**Warning!** Refer any service operation not described in this user manual to a qualified service technician.



**Attention!** Interval of inspections should be determined according to the frequency of use and the working scenario of the winch.

**Attention!** If the lifting cable runs in an angle the performance degrades and it causes the lifting cable to wear down faster; and shortens the life time of the lifting cable significantly! Lifting cable damage caused by mounting the winch in an angle is not covered by the product warranty.

**Attention!** Signs of malfunction or poor operation should always lead to an inspection of the winch, and the winch should be taken out of operation until the error is eliminated.

## Maintenance plan

The results of all the regular inspections are to be documented and kept available at the company. The written result of the last inspection must be kept available at the site of operation, e.g. by an inspection sticker on the winch showing the date of the inspection, the basis of the inspection and the name of the inspector.

### Before every use and weekly

Every time when rigging the winch, before running the winch – and at least every week when the winch is in use:

- Check the entire length of the lifting cable for bends, crushed areas, broken, or cut cord, corrosion and other damages.
- Check all safety devices.
- Check that the lifting cable is winded neatly on the drum.

### Monthly

At regular intervals – but at least every month when the winch is in use:

- Check the mounting clamp and snap hook for damages and proper fastening.
- Check that the lifting cable is running smoothly on the drum. If the insulation has a dry or rough surface, you can lubricate it with a tiny amount of silicone grease.
- Check the secure fastening of the attached lamp or electronic equipment
- Check the electric fastening of the lamp.
- Make sure the snap hook opens without binding and closes when released.
- Change damaged parts according to this manual.

**Yearly**

The winch has to be inspected by a specialist every 12 months.

**Every 48 months**

The winch should be inspected by an authorised expert every 48 months.

**On-site service**

On-site service and maintenance can be provided by the Wahlberg Motion Design, giving owners access to Wahlberg Motion Design's expertise and product knowledge in a partnership that will ensure the highest level of performance throughout the product's lifetime. Please contact Wahlberg Motion Design for details.



## Life of the lifting cable

It is Wahlberg policy to apply the strictest possible calibration procedures and use the best quality materials available to ensure optimum performance and the longest possible component lifetimes. However, lifting cables are subject to wear and tear over the life of the product, resulting in special attention to the state of the lifting cable. The extent of wear and tear depends heavily on operating conditions and environment, so it is impossible to specify precisely whether and to what extent the lifting cable performance will be affected.

The expected lifetime of the lifting cable depends on the load and travel length as well as duty cycle (refer to **Table 5**).

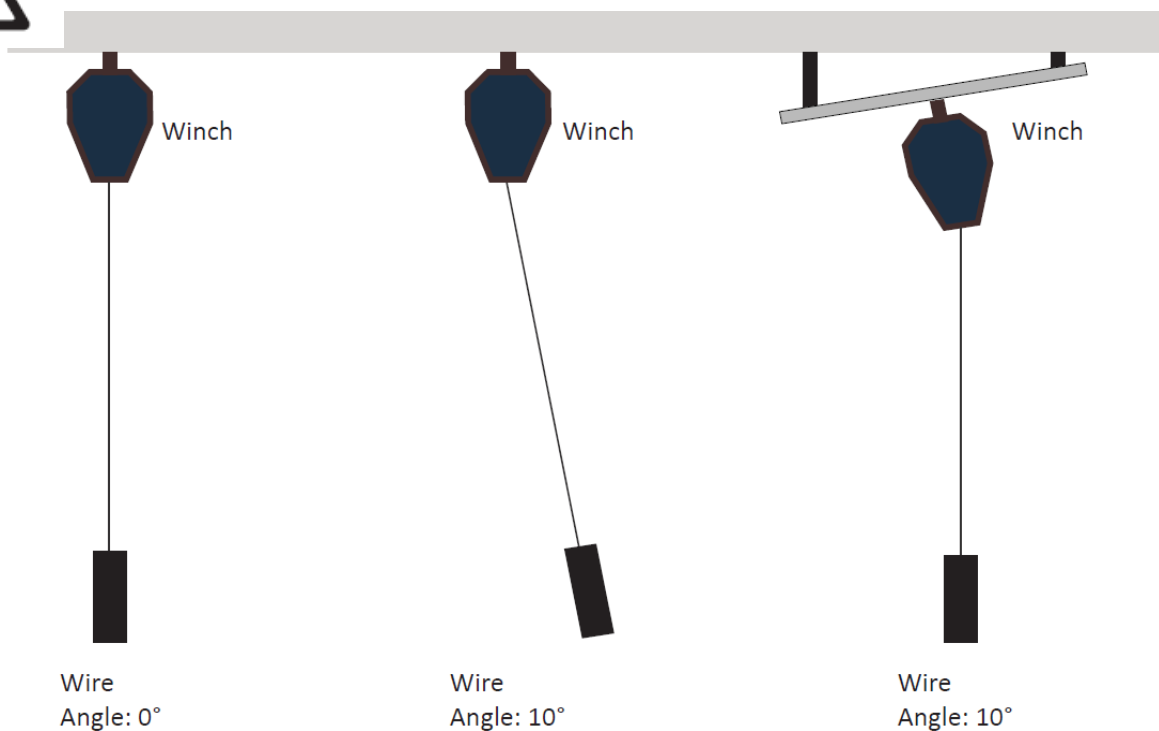
**Table 5 - Expected lifting cable life time at 0° angle**

Load	Max. expected number of cycles (up and down)
2.5 kg	250,000
5.0 kg	100,000
10 kg	5,000

*The lifting cable should be inspected long before these numbers are reached and checked for damages, and replaced if necessary*



**Attention! The cable itself will normally lose the ability to conduct electricity before it breaks**



## Spare parts

Only parts ordered at or approved by Wahlberg should be used in the winch to ensure product function and stability. Contact Wahlberg to inquire about spare parts.

## Lifting cable defect

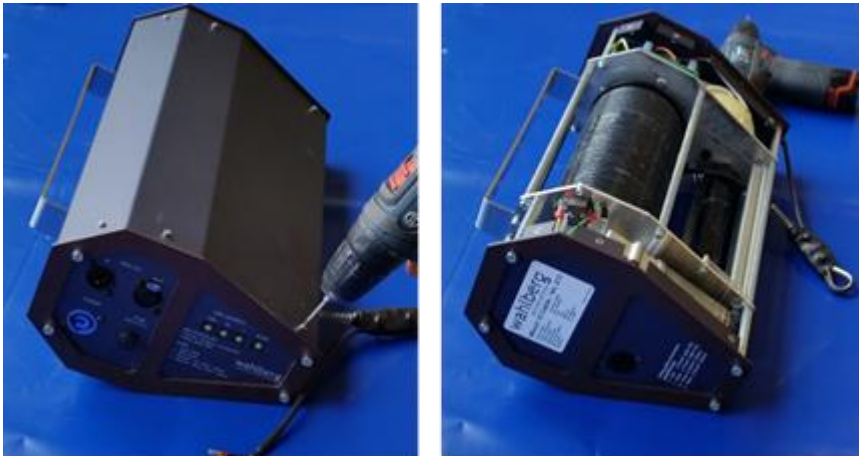
If the lifting cable in any way gets damaged, get stuck or have problems rolling on and off, the lifting cable and lifting cable roll-up needs to be inspected.

### This can be done the following way:

1. Disconnect the power and the lifting cable power.
2. Remove the six 3mm hexagonal socket screws, on one of the middle plates on the winch.
3. Take off the loose middle plate, to look into the winch. See the picture below.
4. If the lifting cable is not tight around the wire-wheel, or it is bungled up inside, the lifting cable needs to be unravelled.

This is done by manually unravelling and loosening the lifting cable and pulling it out of the winch.

It might be necessary to remove both middle plates on the winch for better access to the cable.



5. Roll out the entire length of the cable to check it properly for any damage.
6. Set the MODE to 0 and connect the power to the winch (NOT the cable).



**Warning! Be careful not to touch the power supply inside the winch as it is no longer shielded by the middle plates.**

7. When the power is connected, use the manual run.
8. Set the DMX start address to zero (000)
9. Set the MODE to manual down (MODE 8)
10. Set the speed on the DMX address - Suggested address is 100, which is a slow speed. Make sure that the cable does not get dirty when rolled out of the winch.



**Warning! Be careful not to use a too high speed. One can accidentally move the BCD to 9 instead of 0 leading to very high speed. Slack detection is active, so releasing the cable will activate the slack and stop the motor!**

**Warning! Be careful not to get your fingers or likewise caught in the drum as it turns. This can damage both you and the winch.**

11. When the motor starts and the cable is rolling out, it is important to hold on to the cable to prevent it from tangling around the drum.
12. When the cable is rolled off all the way, set the speed (DMX start address) to zero (000) and disconnect the power.
13. Check the entire cable for damages. If the cable is okay it must be rolled on again.



**Attention! If the cable is damaged, it has to be replaced.** Read the passage “Change lifting cable” on page 28, to learn how to replace the lifting cable.

**Roll cable back on the winch:**

14. Set the MODE to 0 and connect the power to the winch (NOT the cable).
15. Set the MODE to manual up (MODE 7)
16. Set the speed on the DMX address to 100.



**Warning! Be careful not to use a too high speed. One can accidentally move the BCD to 9 instead of 0 leading to very high speed. The lack detection is NOT active, so releasing the cable will NOT stop the motor! The top-stop is active, so holding on to the wire until it activates the topstop will stop the motor!**

**Warning! Be careful not to get your fingers or likewise caught in the drum as it turns. This can damage both you and the winch.**

17. When the motor starts and the cable is rolling on, it is important to hold on to the cable and thereby making a counterbalance, so it rolls on tightly around the drum.
18. While rolling up the cable, apply a tiny amount of silicone grease to the cable. (Just put a tiny amount of silicone grease on your fingers, and apply it to the cable while rolling up. Do not overdo it). This will make the cable roll smoothly and with less friction on the drum.
19. Make sure not to bend or damaged the loose cable as it rolls on.
20. When the cable is rolled on all the way, set the speed (DMX start address) to zero (000) and disconnect the power.
21. When the cable has been applied to the winch again it is a good idea, to run it up and down a couple of times, before assembling the winch. Remember always to make a counterbalance in the cable when running with the winch, as this is often the reason why the cable gets loose and tangled up in the first place.

## Changing lifting cable

If the lifting cable has any damaged the winch must not be used before the lifting cable has been replaced (See section "Spare parts" on page 25). This can be done following the instructions below, or by Wahlberg. Please contact Wahlberg for information regarding approved spare parts and questions for the procedure.

### Procedure for changing the lifting cable:

1. Roll off the lifting cable:
  - a. Set the winch to MODE 8 (Manual roll down)
  - b. Pull down in the wire to de-activate the slack detection.
  - c. Continue pulling until all the lifting cable has been rolled off the winch
  - d. Cut off the old lifting cable.
2. Disconnect the power.
3. Remove the six 3mm hexagonal socket screws, on each of the middle plates on the winch.
4. Take off the two loose middle plates, to access the wire mount.
5. Remove the end frame and plate by removing the four 4mm hexagonal socket screws.
6. Remove the two hexagonal spacers and the four bolts holding the Power supply plate.



7. Take the PVC tube out of the Power supply plate.
8. Remove the two bolts and nuts holding the mounting plate and the Power supply plate together.
9. Carefully, lift off the Power supply plate and tilt it. Ensure that none of the wires and plugs are damaged during this operation.
10. Lift off the cable drum and remove the old lifting cable.



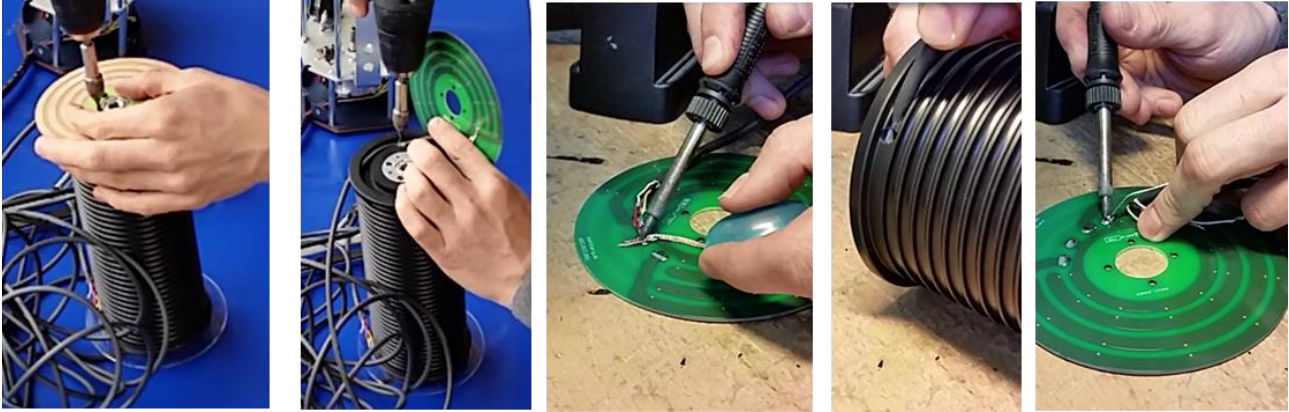
11. Remove the four screws holding the print, and the two screws holding the cable clip.
12. Remove the soldering of the wire on the print.



13. Put the new cable through the top-stop. Then through the angled hole in the cable drum.

**Attention! Use only original Wahlberg spare parts.**

14. Solder the wires in the cable on to the print in the same order as they were before.



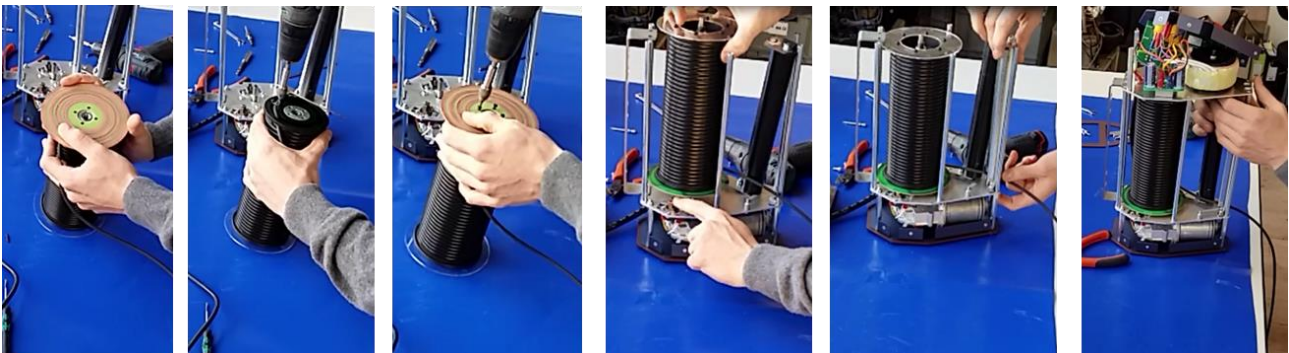
15. Place the print so the cable can be secured under the cable clip, and so the holes in the print fit with the holes in the drum.

16. Ensure that the 'loose' metal plate (with a hexagonal, four small holes and four large holes) is positioned correctly. Else the print will not be mounted flat on the drum.

17. Mount the cable clip. Fasten it slightly.

18. Mount the print using the four screws. Fasten slightly.

19. Mount the cable drum, and ensure that the top-stop and slack detection is mounted correctly.



20. Mount the Power supply plate again, with the two hexagonal spacers and the four hexagonal socket screws.

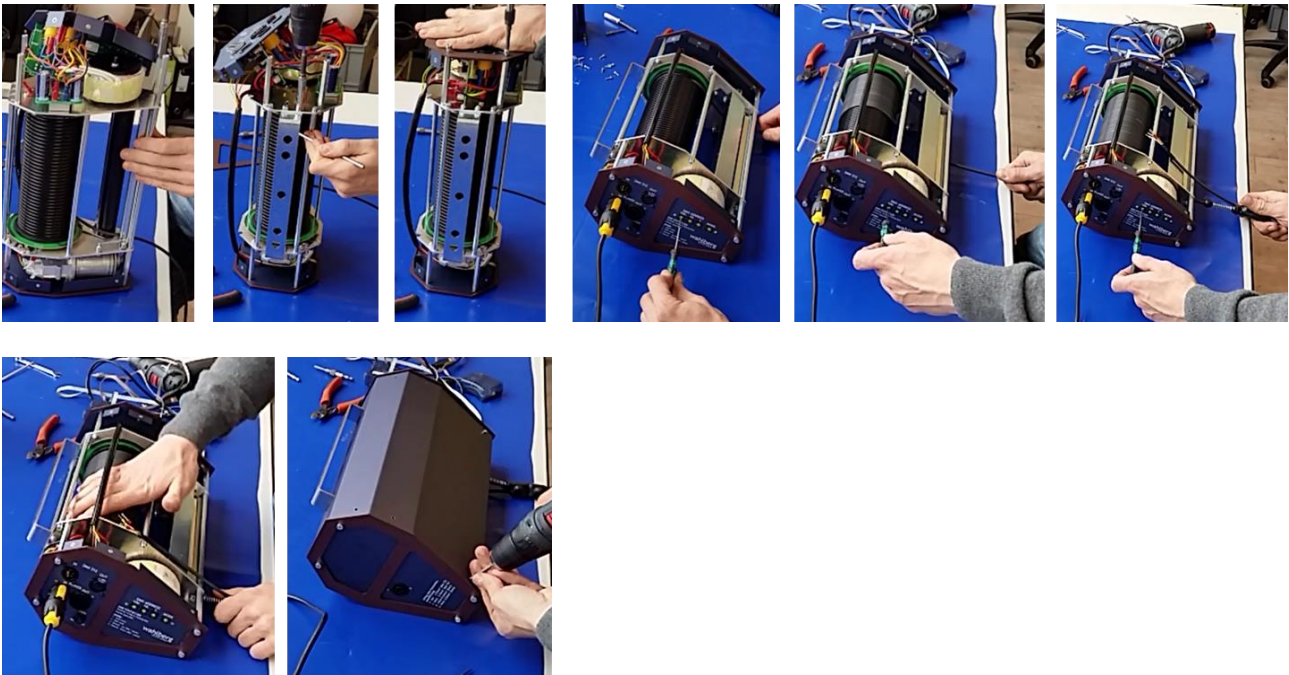
21. Tighten the bolts and nuts for the mounting bracket. Check that you use the right bolts, by ensuring that the bolt goes through the nut and self-locks.

22. Mount the four hexagonal spacers and the two bolts holding the Power supply plate.

23. Ensure that the top-stop and slack detection spring is correctly mounted.

24. Hereafter the lifting cable must be rolled on – See the section below: **Applying lifting cable.**

25. After applying the lifting cable. Mount the two middle plates again using the six 3mm hexagonal socket screws, on each of the middle plates on the winch. Fasten slightly.



## Applying lifting cable

**Warning!** Be careful not to touch the power supply inside the winch, as it is exposed. This can cause an electric shock and damage the winch.

**Warning!** Be careful not to get fingers or likewise caught in the wire-wheel as it turns. This can damage you and the winch.

**Procedure for applying wire:**

**Procedure for changing the wire:**

1. Set the MODE to natural function (MODE 0), to make sure the motor does not start inadvertently, when the power is connected.
2. Connect the power.
3. Set the DMX start address to zero (000)
4. Set the MODE to manual up (MODE 7)
5. Set the speed on the DMX address - Suggested address is 100, which is a fine slow speed and easy to follow.
6. Using a glove, hold firmly in the wire to ensure that the lifting cable is rolled up tightly around the cable drum.

**Attention! Keep the lifting cable stretched tight until it all is rolled up, to ensure that the lifting cable is rolled up tightly around the cable drum!**

**Attention! Make sure not to bend or damaged the loose lifting cable as it rolls on.**

7. When the lifting cable has rolled on all the way, disconnect the power or set the speed (DMX start address) to zero (000).

When the lifting cable has been applied to the winch again it is a good idea, to run up and down a couple of times, before assembling it again. Remember always to make a counterbalance in the lifting cable when running with the winch, as this is often the reason why the lifting cable gets loose and tangled up in the first place.

## Power defect

If the winch does not react when the power is connected check the following:

- Check that the power plug is properly connected, both to the POWER IN plug on the winch and to the main power plug.
- Check that the fuse is tightly screwed on in the fuse cap, also if it has just been changed.
- Check that the fuse is intact. It can be replaced with a new 2.0A fuse.
- Check that the voltage selector is set to the correct voltage.





MODE	Functions	DMX channels	Function
0	Neutral function – motor stops	1	Position rough (Hi of a 16 bit DMX channel)
1	Positioning with auto TOP reset	2	Position fine (Lo of a 16 bit DMX channel)
2	Positioning with manual TOP reset	3	Set the maximum speed
3,4,5,6	Stops the motor unless specified otherwise	4	Set the maximum travel top
7	Manual run up (no DMX needed)	5	Set the maximum travel bottom
8	Manual run down (no DMX needed)	6	Find top position, moving up (reset speed)
9	Used for re-calibrating overload see page 21	7	Moving down


## How to get started

Place / Rig the winch in something high with minimum 2-3 meter

2. Put on counterweight on the winch hock, minimum 1 kilo.
3. Set the DMX start address to 001, and the MODE to 2.
4. Apply DMX from a Lighting desk, best is a desk with manual faders.
5. Make sure that your 7 channels are patched from DMX channel 1 to 7.
6. Pull all channels on to 0%
7. Apply power to the winch.  
**DMX lamp should be lit, and the mode lamp should be flashing.**
8. Pull channel 6 to 20 % -- the winch starts pulling the wire.
9. Stop (pull channel 6 to 0%) when the wire is at the top position (pulled into the winch).  
**NOW the winch has found its TOP position and is ready to drive with position control.**
10. Pull channel 1 (position) to 95 %
11. Pull channel 3 (speed) to 20%  
**Now the winch start to move down, with 20% speed, to a position the is 95% up.**
12. Pull channel 1 (position) to 80%  
**Now the winch starts to move down, with 20% speed, to a position that is 80% up.**
13. Pull channel 1 (position) to 90 %
14. Pull channel 3 (speed) to 50%  
**The Winch starts to move UP again, with 50% speed, and stops 1 meter before the top.**

Intact cable 

Broken cable 

  
Inspection points

### Before each use

- Inspect the entire length of the **lifting cable** for bends, damage, wear, and abuse.
- Inspect the **lifting cable** for conductivity
- Inspect the **Cable-lock** and **thimble** for damage, wear, corrosion, or abuse.
- Check all limit switches.
- Check the slack detection device
- Check that the wire is winded neatly on the drum.

**Warning! Do not use the winch if any damage or error is found!**