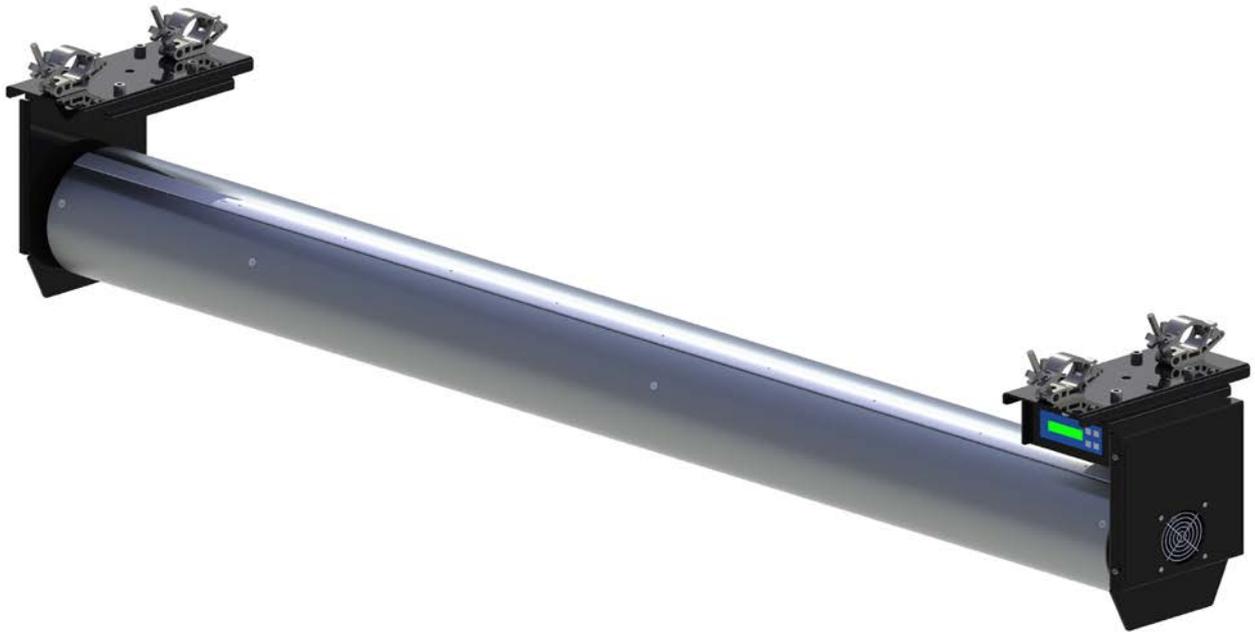


Roll Down Item No 249

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 an 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 Roll Down; follow the safety precautions listed below and observe all warnings in this manual and printed on the Roll Down. If you have questions about how to operate the Roll Down safely, please contact you Wahlberg Motion Design supplier or Wahlberg Motion Design.



PROTECTION FROM ELECTRIC SHOCK

- Disconnect the Roll Down from AC power before removing or installing any cover or part and not when in use.
- Always ground (earth) the Roll Down 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 Roll Down, 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 mm² (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> or equivalent.
- Use only Neutrik powerCON TRUE1 NAC3FX-W cable connectors to connect to power input sockets.
- Assembly power supply cables following the instructions in this manual only (see page 17).
- Isolate the Roll Down from power immediately of 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

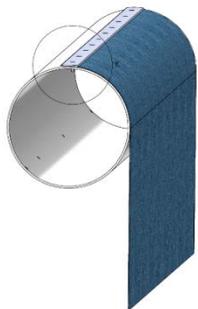
- Do not expose the Roll Down to rain or moisture.
- Refer any service operation not described in this manual to a qualified technician.

PROTECTION FROM BURNS AND FIRE

- Do not operate the Roll Down if the ambient temperature exceeds 40° C (104° F).
- Do not modify the Roll Down in any way not described in this manual.
- Install only genuine Wahlberg parts.

PROTECTION FROM INJURY

- Fasten the Roll Down securely to a fixed surface, rig, or structure when in use. The Roll Down 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 Roll Down using the supplied 4× Manfrotto slim coupler according to the manual, see page 12.
- Always install the Roll Down as described in this manual. If the Roll Down is installed in a location where it may cause injury or damage if it falls, install as described in 12.
- If possible, allow enough clearance beneath the Roll Down so it cannot cause any danger to personnel beneath it. Alternatively, 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 Roll Down.
- Do not operate the Roll Down with missing or damaged covers, shields, or wire.
- Do not use the Roll Down over the head of people
- Do not use the Roll Down to lift people or animals.



Inspection points!

Before each use

- Check that the Roll Down is safely and correctly installed.
- Inspect the entire length of the tube for bends, damage, wear, corrosion, and abuse.
- Inspect the **fabric attachment** for damage, wear, or abuse.
- Check that the fabric weighs maximum 35 kg.
- Check all safety devices (limit switches, and emergency stop)
- Make sure that the operator has visual confirmation of all possible movements of the Roll Down at all time.

Warning!

Do not use the Roll Down 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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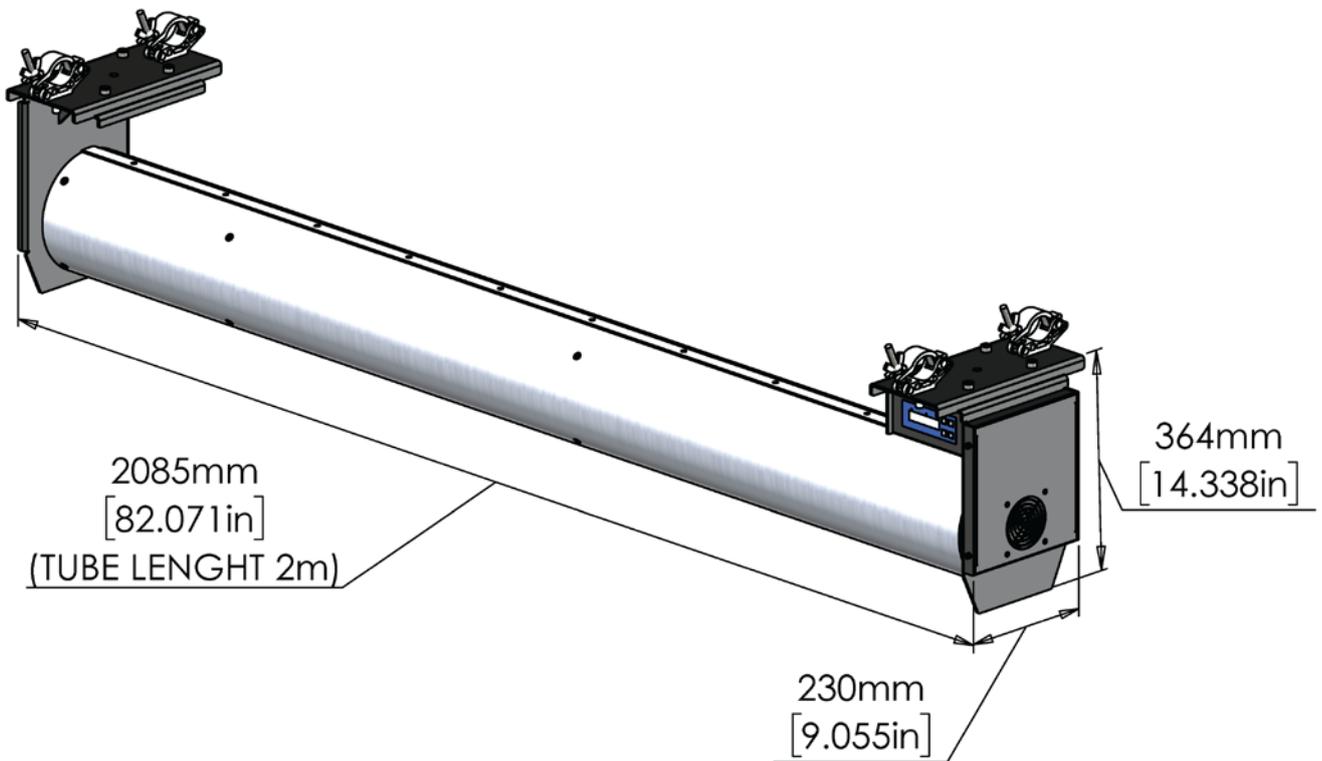
Technical specifications

Model:	Roll Down
Item no.:	249
Dimensions (L×W×H):	
Motor clamp	81.6 × 230 × 345 mm (3.2 × 9.1 × 13.6 in)
Tube	Ø200 × 1500-12000 mm (Ø7.87 × 59.1-472.4 in)
Power supply:	200-240V AC 50-60 Hz
Power consumption:	500 Watt
Power inlet:	Neutrik powerCON TRUE1 NAC3PX (F/M)
DMX control signal:	DMX 512 1990 + DMX512A / 6 channels used
DMX connection:	5 pole XLR, male & female
Lifting height:	18 m (59 ft.) Limit set to 15m as default!
Lifting capacity:	35 kg (77 lb)
Lifting speed:	Variable, 0.05-1.0 m/s (2.0-39.3 in/s)
Minimum load:	None
Noise emission:	~70 dB
Ambient temperature:	0-40°C (32-104°F)
Own weight:	
Motor clamp	40 kg (88.2 lb)
Tube	5.1 kg/m (3.43 lb/ft.)
Mounting clamp:	4× Slim eye coupler 50 mm (2 in)
Motor:	230V AC, 0.55 kW 2800 rpm
Duty cycle:	Maximum 30% at max. load (refer to page 30) Minimum 23 min OFF after 10 minutes ON

Drawing

Roll Down (249)

More detailed drawings and from more angles can be found in Appendix 1 on page 37



Introduction

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

Package content

- 1× Roll Down
- 1× PowerCON NAC3FX-W female plug for power cable
- 1× User manual
- 1× Cheat sheet

Description

Roll Down is a Roll Down for stage use, mainly for use in theatres, shows and concerts. It lifts fabrics in and out of the stage sphere at a maximum load of 35 kg up and down. The lifting height is 15 m (can be extended to 18 m). The lifting speed is between 5 cm/s and 100 cm/s.

The Roll Down is controlled by the standard DMX controlling signal, so a normal lighting desk can be used to control the movement, programmed as normal light. For a low number of Roll Downs, a standard lighting desk can be used, but when many Roll Downs are used, more advanced desks should be used to maintain easy control of the units.

The Roll Down uses 6 channels of the DMX-line, and they control the position, speed, limits, and reset functions.

The Roll Down has an advanced internal positioning system with 16 bit, used for finding the position desired by the operator. With a 16 bit positioning channel (ch1 and ch2) the operator set the desired position, and the Roll Down will run to this position, with the speed applied on the speed channel (ch3).

Channel 4 is used to enable power.

With channel 5 and 6 it is possible to set the soft TOP and BOTTOM limits of the movement of the Roll Down, adjusting its span of motion. Channel 5 is likewise used for resetting the Roll Down, when powering up.

On the Roll Down it is possible to adjust the hard TOP and BOTTOM limits and in that way set the absolute span of motion.

Multiple Roll Downs are easily daisy chained with power in-out and DMX in-Out, allowing to create advanced and dynamic movements with 100's of Roll Downs working together in the same installation.

Safety functions

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 which a PID regulator calculates the motor speed and distance.
- No overload.

Roll Down 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 Roll Down will stop when the speed is put to 0 %. It is also possible for the user to stop the Roll Down by disconnecting it from the main. After power failure the start position of the Roll Down needs to be reset before the Roll Down can function again.

Manual operation of the Roll Down is only intended for mounting, service, and tests.

Area of use



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!

The Roll Down is intended for indoor use only. It is designed for lifting and lowering material at the weight and speed stated in "Technical specifications" on page 6. Any other use of the Roll Down may result in a risk of injury of persons or equipment damage.

Exceeding the load rating may cause failure of the equipment.

Use only the Wahlberg approved mounting connectors to secure the load to the tube. Failure to mount the load securely can result in a risk of injury of persons or equipment damage.

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

It is the customer's sole responsibility to comply with any relevant local laws, regulatory requirements, and restrictions, concerning the use of the Roll Down.

Using for the first time



Important! The Roll Down 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 Roll Down. Before applying power to the Roll Down:

- Check the Wahlberg Motion Design website at www.wahlberg.dk for the most recent documentation and technical information about the Roll Down. 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 Roll Down 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 using the power from a mains power outlet, install a suitable power plug on the power cable.

Transport



Important! The Roll Down must be protected from environmental factors such as physical shocks and vibration during transportation.

Before transport, it is important to roll the fabric of the Roll Down up until the hard TOP limit, and wrap the remaining fabric around the tube. Fix the fabric with a cable tie or an elastic cord.

Use only the original packaging or flight case for protecting the Roll Down during transport. Contact Wahlberg for enquiries regarding flight cases or pallet frames.

Physical installation



Warning! The Roll Down 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 mounting clamp points upwards. Do not apply power to the Roll Down if it is not securely fastened.

Warning! The supporting surface must be hard and flat. Fasten the Roll Down securely.

Warning! Use only the supplied rigging clamps.

Fastening the Roll Down to a flat surface

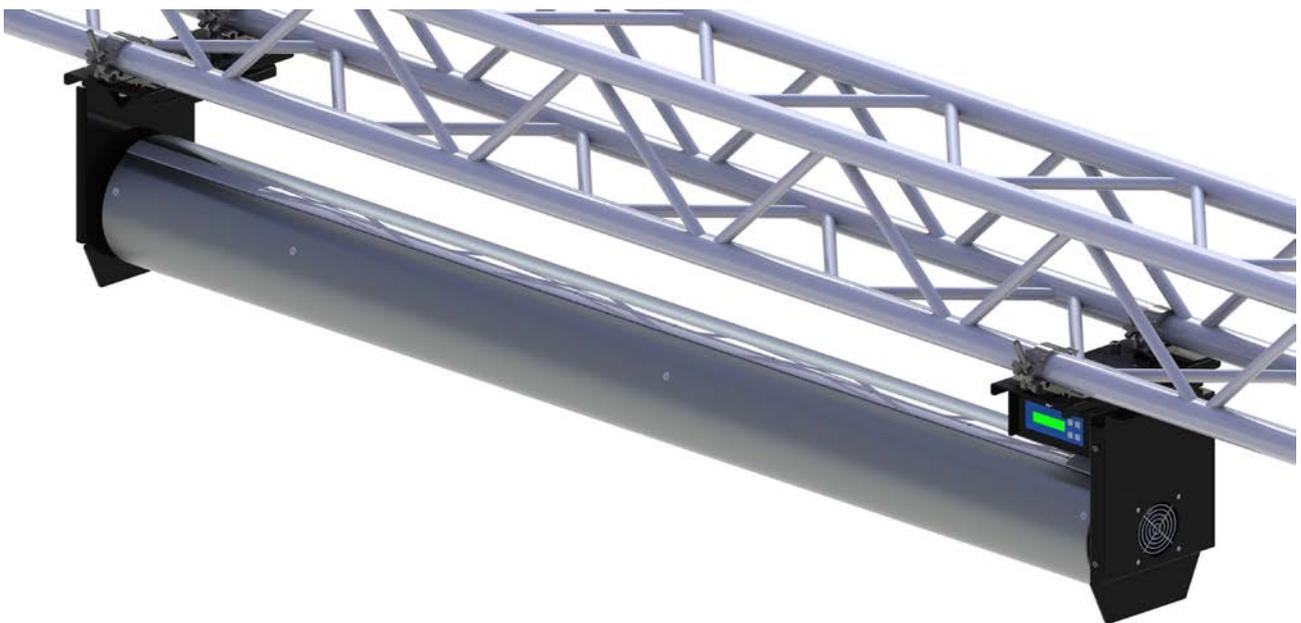
The Roll Down can be fastened to flat surface such as a roof. Check that the surface can support at least 10 times the weight of all Roll Downs and equipment to be installed on it.

Mounting the Roll Down on a truss

The Roll Down can be clamped to a truss or similar rigging structure.

To clamp a Roll Down to a truss:

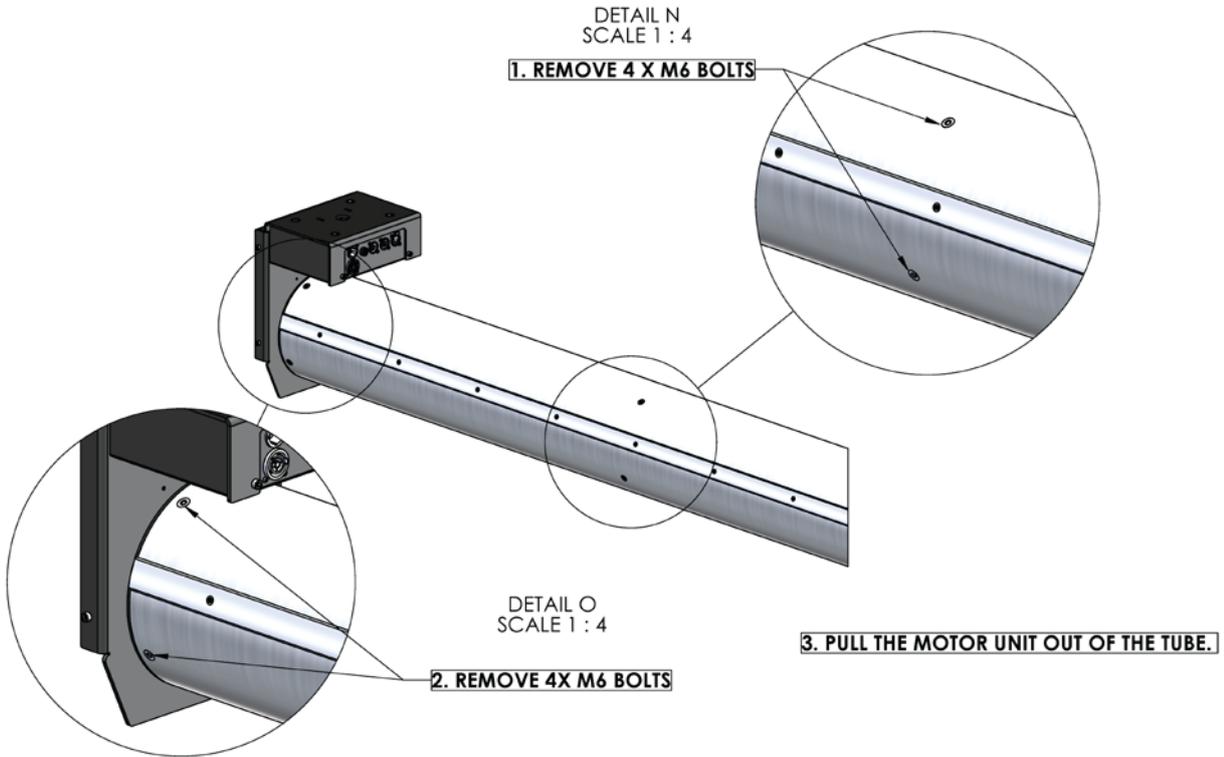
1. Check that the rigging clamps are undamaged and that the rigging structure can support at least 10 times the combined weight of all Roll Downs and equipment to be installed on it.
2. Block access under the work area. Working from a stable platform, hang the Roll Down on the truss with the mounting clamp upwards. Tighten the rigging clamp.
3. Use the supplied 2 slim couplers sitting on the top plate. It is important to use both slim couplers for mounting because the load is not evenly distributed across the Roll Down.



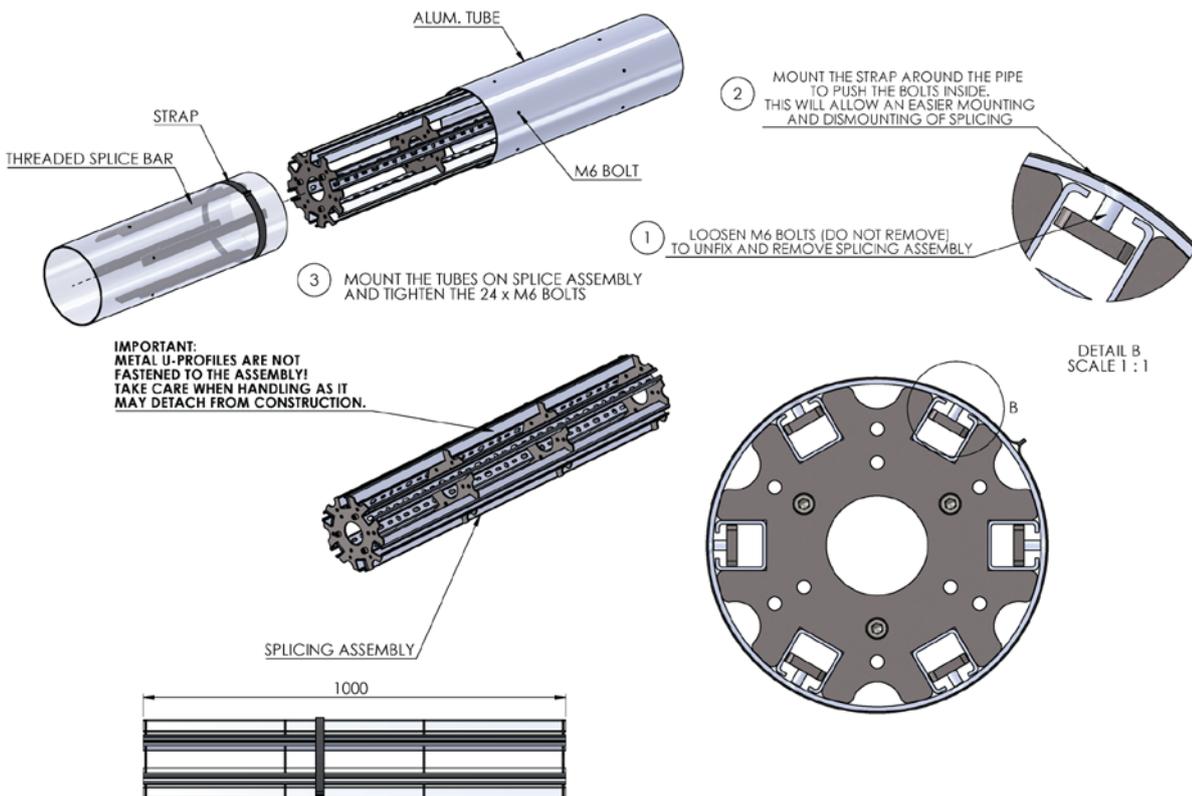
Mounting the tube

The Roll Down comes with either a single tube, or two tubes with a splice that allows a total length of the tube up to 12 meters.

Single tube:



Using a splice:



Mounting the fabric



Attention! The fabric must be mounted on the tube in a way to insure that the fabric never can damage the Roll Down.

Attention! There should be minimum 1 round left on the tube when the fabric is rolled all the way out if it is mounted with the rail.

Attention! There should be minimum 2 round left on the tube when the fabric is rolled all the way out if it is mounted with tape.

Mount the fabric in the right position

When mounting the fabric it is important to move the tube to the correct position before you mount anything.

If you are mounting a 4 meter fabric follow these steps.

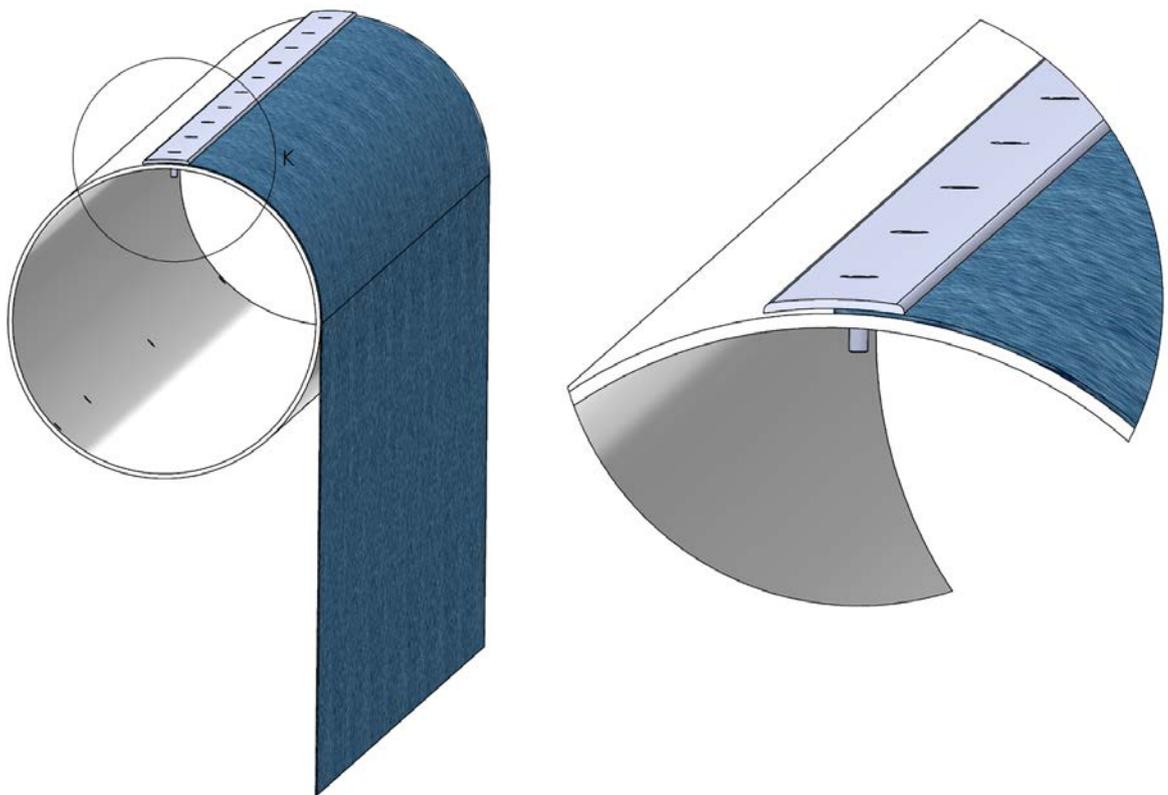
1. Move the tube to the TOP position with channel 5.
2. Move the tube at least 4 meters down with channel 6
(6.4 rotations: 400cm/62.8cm per rotation)
3. Mount the fabric on the tube either with the rail or with tape.
4. Now Go back up to the desired top position with channel 5
5. Then set the range for the desired movement with channel 6
Less than 4 meter to ensure 2 rounds of fabric should remaining on the tube.
6. Now the 100% position will be with the fabric rolled all the way up and the 0% position will be with the fabric rolled all the way out.
Attention! If you do not move the Roll Down, down before mounting the fabric the hard TOP limit will prevent you from rolling the curtain all the way up.

Using the mounting rail

The Roll Down has a rail that can be used for mounting the fabric along the entire length of the tube.

The fabric is mounted by loosening the HEX screws holding the rail in place. When they are all loose, place the fabric under the rail and tighten the screws again to hold it in place.

Make sure the fabric is mounted on the correct side of the rail. If it is mounted on the wrong side it will fold over itself when moving to the TOP limit. Refer to Appendix 1 on page 37 for additional illustrations.



Using tape

The fabric can also be taped to the tube, using single or double faced tape. This allows the fabric to be mounted at any angle. If tape is used for securing the fabric 2 rounds must remain on the tube when it is fully rolled out.

AC power



Warning! Read “Safety Information” on page 2 before connecting the Roll Down to AC mains power.

Warning! For protection from electric shock, the Roll Down 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 Roll Down with power must be located near the Roll Down and easily accessible so that the Roll Down can easily be disconnected from power.

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

Power cables and power plug

The Roll Down 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.

Wahlberg Motion Design can supply the PowerCON input connector without a cable.

If you install a power plug on the power cable, install a grounding-type (earthed) plug that is rated 20 A. Follow the plug manufacturer’s instructions. The Neutrik assembly guide below 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.

Installing a power input connector on a power cable

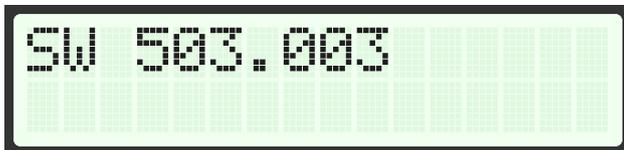
To install a Neutrik powerCON TRUE1 NAC3FX-W input connector on a power Cable, follow the original Neutrik instructions as described in Appendix 3 in page 38.

By supplying power to the Roll Down, the display will show a start-up screen sequence showing the model number



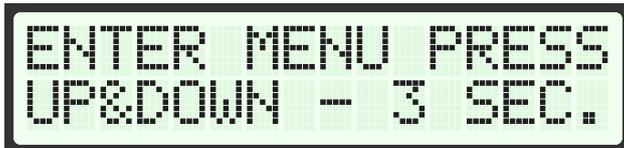
ROLLDOWN
WAHLBERG

Followed by a screen showing the software version, e.g. SW 503.003 as shown below



SW 503.003

Then a description of how to enter the menu



ENTER MENU PRESS
UP&DOWN - 3 SEC.

When it changes to the following, the Roll Down is ready to be operated:



DMX CONTROL
START CHAN 1

Data link

A DMX 512 data link is required in order to control the Roll Down via DMX. The Roll Down 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 Roll Down but are available for possible additional data signals as required by the DMX512-A standard.

The Roll Down is subject to the common limit of 32 devices per daisy-chained link. Note that if independent control of a Roll Down is required, it must have its own DMX channels. Roll Downs that are required to behave identically can share the same DMX channels. To add more Roll Downs or groups of Roll Downs 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. AWG24 cable is suitable for runs up to 100 meters (328 ft.).

Never split a DMX line without using 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 Roll Down to data:

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

The DMX lamp is the green led, above the display.

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

Emergency stop switch (Optional)



Warning! By default the emergency stop is NOT enabled!

The Roll Down can be configured with an emergency stop; by default the emergency stop is not enabled.

The DMX control from a lighting desk should always have a set up so there is a button that sets the speed of the Roll Down in operation to 0%. Normally lighting desks have a "blackout" button that sets all signals to 0% and this will also cause the Roll Down to stop.

If the emergency stop switch is activated the red Error LED will be lit and the screen display shows: 'EMERGENCY STOP PRESSED':



The emergency stop switch is connected to the male 4 pole XLR connector on the Roll Down. Pin 1 and Pin 4 should be powered with 12-15 volt DC to enable operation of the Roll Down.

Pin out:	Connection
Pin 1	GND
Pin 2	Not connected
Pin 3	Not connected
Pin 4	12-15 V DV

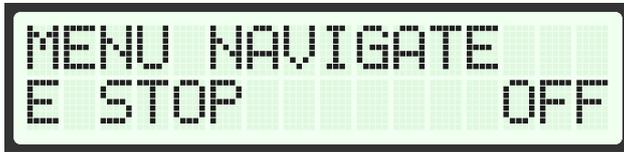


Enable Emergency stop

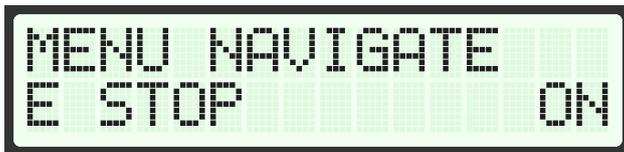
To enable emergency stop two steps are required.

Step 1: In 'MENU NAVIGATE' change 'E STOP' from OFF

Refer to section Menu setting on page 21 for guidance on how to navigate the menu.



to ON



Step 2: Inside the unit there is an orange wire that needs to be set correctly for operation with/without emergency stop.

Emergency stop disabled



Orange wire loops pin 3 and 7

Emergency stop enabled



When the emergency stop is enabled and the little piece of orange wire is not connected it is recommended that it is secured in some way so it does not touch anything. Some electrical tape will be enough to keep it in place.

Ready to use

When the emergency stop has been enabled both in the menu and in the Roll Down, the Roll Down connected to power, DMX, and an emergency stop switch, it is ready for use, and can be controlled from the lighting desk.

Setup

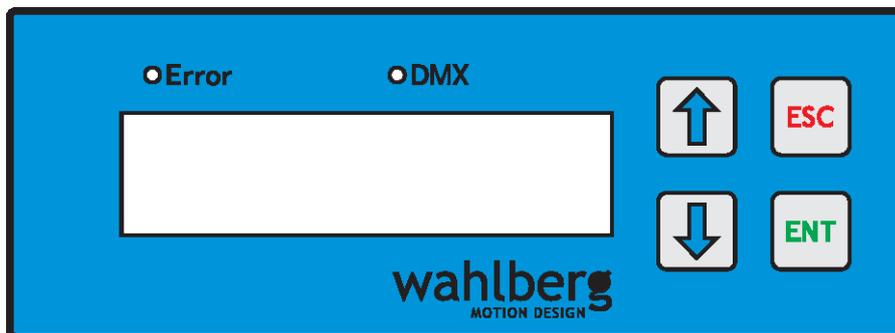


Warning! Read "Safety Information" on page 2 before installing, powering, operating, or servicing the Roll Down.

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

Menu setting

Use the push buttons on the display to enter and change menu settings



Use the arrows  &  to go up or down in the menu

Push  to set values.

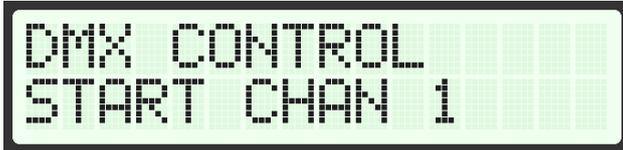
Push  to go back one level in the menu

Menu structure

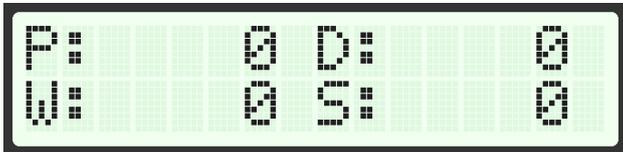
The menu structure is divided into two different areas for safer motor control.

Control mode

The display shows:



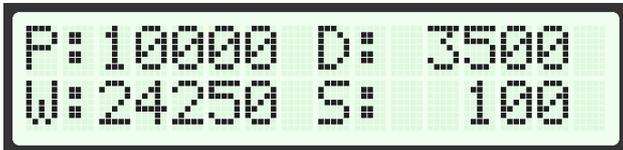
Shift to next screen by pushing  and hold for 3 seconds:



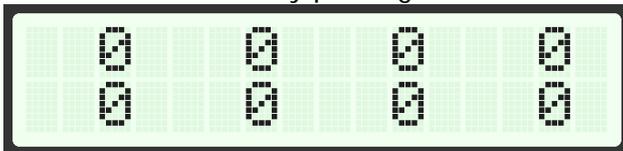
P: Current position (values from 0-50000)
 W: Wanted position (values from 0-50000)
 D: Distance from current to wanted position (maximum shown value 3500)
 S: Speed (values from 0-100)

The screen shows the TAC value for the current position, wanted position, distance and speed.

E.g. the Roll Down is moving with 100% speed from current position with TAC value 10,000 and the wanted position has the TAC value 24,250:

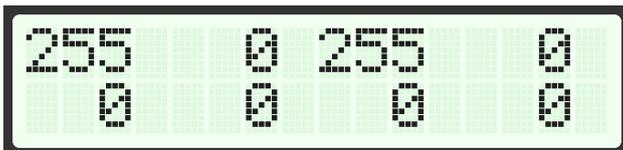


Shift to next screen by pushing  and hold for 3 seconds:



DMX channel 1	DMX channel 2	DMX channel 3	DMX channel 4
DMX channel 5	DMX channel 6	DMX channel 7 (not used)	DMX channel 8 (not used)

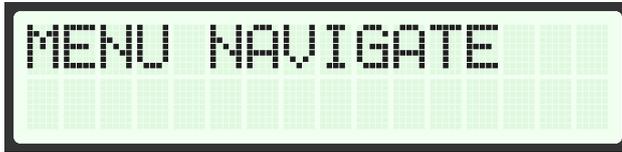
The screen shows the DMX channel values, if e.g. DMX channel 1 is set to 100% and DMX channel 3 is set to 100%, the screen will show:



To shift back to the previous screens push  and hold for 3 seconds.

Menu navigation mode

The display shows:

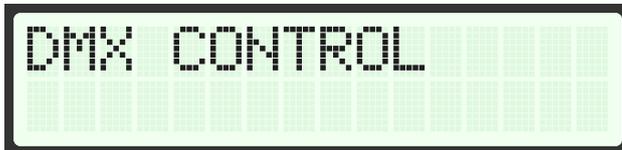


In menu navigate mode, the different parameters can be changed.
In menu navigate mode the motor is stopped and DMX input has no effect, the motor can be moved by the MAN UP/DWN menu though.

Menu mode change

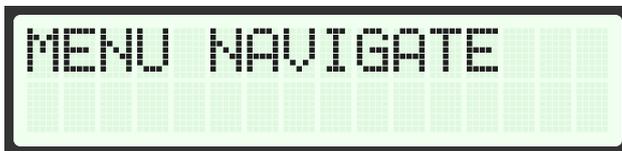
MENU - NAVIGATE:

The top line of the display is showing:



Push both buttons & and hold them for 3 seconds.

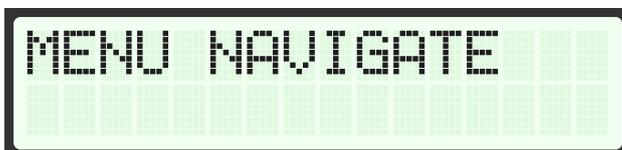
Now the top line of the display should show:



MENU - DMX CONTROL:

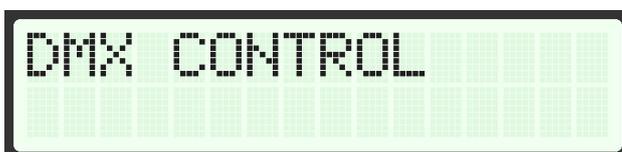
Go back to the starting position and activate DMX control

The top line of the display is showing:



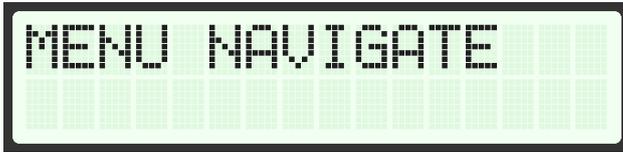
Push both buttons & and hold them for 3 seconds.

Now the top line of the display is showing:



Navigate the menu

The top line of the display is showing:

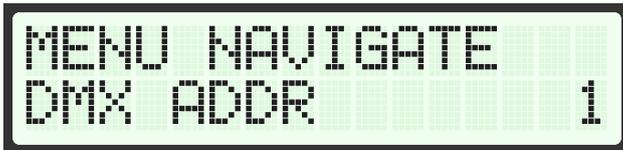


or



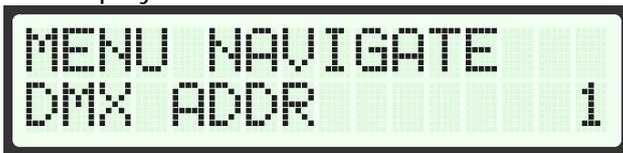
Push the arrows to go up or down in the menu choices.

The bottom line of the display is showing:



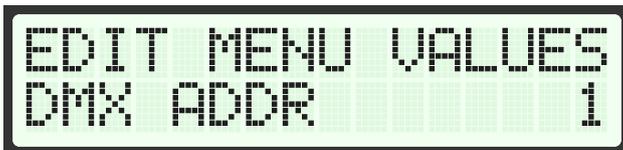
Adjusting menu parameters

The display shows:



Push to change the *DMX ADDR* value.

The display shows:



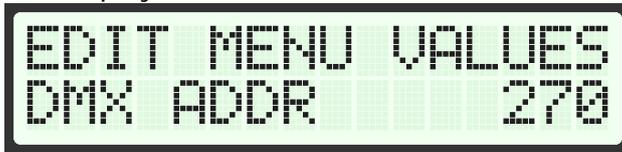
or



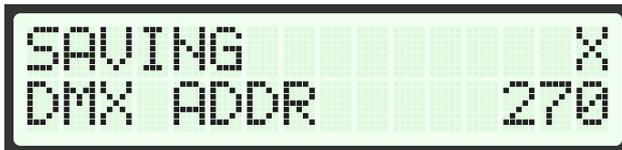
Use the arrows to adjust the *DMX ADDR*.

Save changed value

The display shows:



Push  to change the top line to:

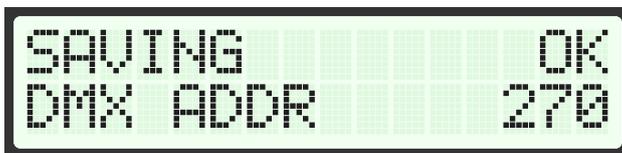


Where X is an increasing number from 1 to 20.



Then push and hold 

The top line of the display counts up to 20 then shows *OK*.



The Value is now saved in the memory.

Adjustable parameters

Menu	Description	Range	Default
MAN SPEED	Speed for manual driving	200 - 2500	800
MAN UP/DWN	Run the motor manual from the menu	MOTOR UP / MOTOR DOWN	
DMX ADDR	DMX start address	1-506	1
TAC RANGE	Tacho range	1-50,000	N/A
SPEED MAX	Maximum speed	500-3,500	3,500
SP MIN UP	Minimum speed UP	50-1,000	200
SP MIN DWN	Minimum speed DWN	50-1,000	200
E STOP	Enable/disable emergency stop	ON/OFF	OFF
REVERSE DIR	Enable/disable reverse direction	ON/OFF	OFF

MAN SPEED and MAN UP/DWN are used for manual control of the motor.

Detailed explanation of parameters

MAN SPEED	Speed for manual driving	Range	200-2,500
MAN SPEED sets the speed for manual driving the motor			
MAN UP/DWN	Manually driving the motor		
MAN UP/DWN is used for manual control of the motor. Pressing the <i>UP</i> button, makes the fabric run up. Pressing the <i>DOWN</i> button, makes the fabric run down, unless the limit switch or slack detection is activated. The Roll Down will stop if the Emergency Switch is activated.			
DMX ADDR	DMX start address	Range	1-506
DMX start address defines which DMX address the Roll Down reacts on. The Roll Down uses 6 DMX channels.			
TAC RANGE	Tacho range	Range	1-50,000
The tacho range is setting the range of the Roll Down from the soft TOP limit to the soft BOTTOM limit. The tacho range can be adjusted, using channel 6 for the soft BOTTOM limit. If the same tac range is required for a range of Roll Downs, use the menu to set the same tac range easily.			
SPEED MAX	Maximum speed	Range	500-3,500
SPEED MAX sets the maximum speed. If set to 1000, the motor runs at 1000 RPM when DMX speed is set to full. SPEED MAX can be used to lower the maximum speed, if desired.			
SP MIN UP	Minimum speed up	Range	50-1,000
The motor minimum speed, for the up direction. The motor is allowed to run at different minimum speeds for each direction; this is to differentiate between different mechanical loads for up and down, see SP MIN DWN. Set this value to a speed where the motor will still run up at full load.			
SP MIN DWN	Minimum speed down	Range	50-1,000
The motor minimum speed, for the down direction. The motor is allowed to run at different minimum speeds for each direction; this is to differentiate between different mechanical loads for up and down, see SP MIN UP. Set this value to a speed where the motor will still run down at full load.			
E STOP	Enable/disable emergency stop	Range	ON / OFF
This enables/disables the emergency stop from the software. However, to get the full functionality of the emergency stop a wire has to be plugged in inside the Roll Down. See section on how to change the wire setting for more details.			
REVERSE DIR	Enable/disable reverse direction	Range	ON / OFF
This enables/disables the reverse direction in the software. This means the way the fabric rolls on the tube is reversed. So instead of rolling over the front of the tube, it rolls down from the back. When this is enabled, the hard limits are also switched so the one that was DOWN becomes UP, and vice versa.			

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 Roll Down must be assigned its own control channels.

The DMX address is configured in the menu as described in the section above. The selected DMX address states from which channels, on the lighting desk, the Roll Down is controlled. The DMX address can be selected from 1 - 506. The Roll Down uses 6x DMX channels.

DMX channel overview

DMX channel	Function	Description
1	Position rough	<p>This channel controls the position of the Roll Down, with the speed (DMX channel 3).</p> <p>This rough position works together with the fine position (DMX channel 2).</p> <p>The rough position and the fine position are multiplied in to a 16 bit channel. The rough position is the <i>MSB</i>.</p>
2	Position fine	<p>This channel controls the position of the Roll Down, with the speed set on DMX channel 3.</p> <p>This fine position works together with the rough position (DMX channel 1).</p> <p>The fine position and the rough position are multiplied in to a 16 bit channel. The fine position is the <i>LSB</i>.</p>
3	Speed	<p>This channel controls the speed and defines the max lifting/lowering speed of the Roll Down.</p> <p>This channel also works as a main brake; the motor does not run unless the channel is set above 0%.</p>
4	Motor enable	<p>Channel 4 is used as a security channel. The value on channel 4 needs to be between 50 and 55 %, for the motor to run.</p> <p>All other values make the motor stop.</p> <p>All other values will also reset any error.</p> <p>All other values will save the current position before a power down. If channel 4 is between 50-55% when powering up, the motor will not run.</p>
5	Setting the soft TOP limit	<p>Channel 5 is used to move the fabric up. When channel 5 is set $\geq 10\%$ the Roll Down will move up until it reaches the hard TOP limit. 10 - 100% makes the motor run up, at variable speed. (10% = low speed - 100% = full speed).</p> <p>Setting DMX channel 5 to 0 resets the soft TOP limit, to the current position.</p> <p>There is a 3s delay on this channel to reduce risk of accidentally resetting the soft TOP limit.</p>
6	Setting the soft BOTTOM limit	<p>Channel 6 is used to move the fabric down and setting the soft BOTTOM limit. When channel 6 is set $\geq 10\%$ the Roll Down will move down, until it reaches the hard BOTTOM limit. 10 - 100% makes the motor run down, at variable speed. (10% = low speed - 100% = full speed).</p> <p>The position is reset and a new TAC RANGE is calculated. The new range is the tach pulses, between the soft TOP limit set by channel 5 and soft BOTTOM limit set by channel 6.</p> <p>The Roll Down should be reset to the soft TOP limit with channel 5, before the range is set with channel 6.</p> <p>There is a 3s delay on this channel to reduce risk of accidentally setting a new tac range.</p>

Adjusting hard limit switches

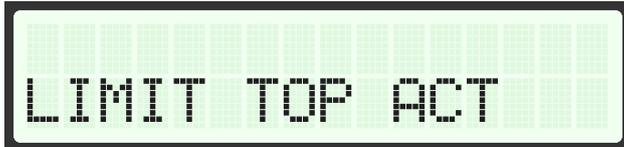


Warning! There must be at least 1 rounds left on the tube when the Roll Down is at the hard BOTTOM limit.

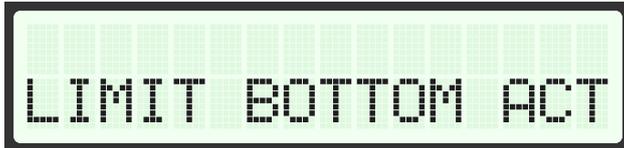
Attention! Be careful that the hard TOP limit is not set in a position where the load can run into the Roll Down itself, this will damage the Roll Down.

The hard limit switch determines the maximum and minimum travel distance of the Roll Down. The hard limits are adjusted by rotating the white levers using the screws for hard TOP and BOTTOM limit.

When the hard TOP limit is activated, the display will show:



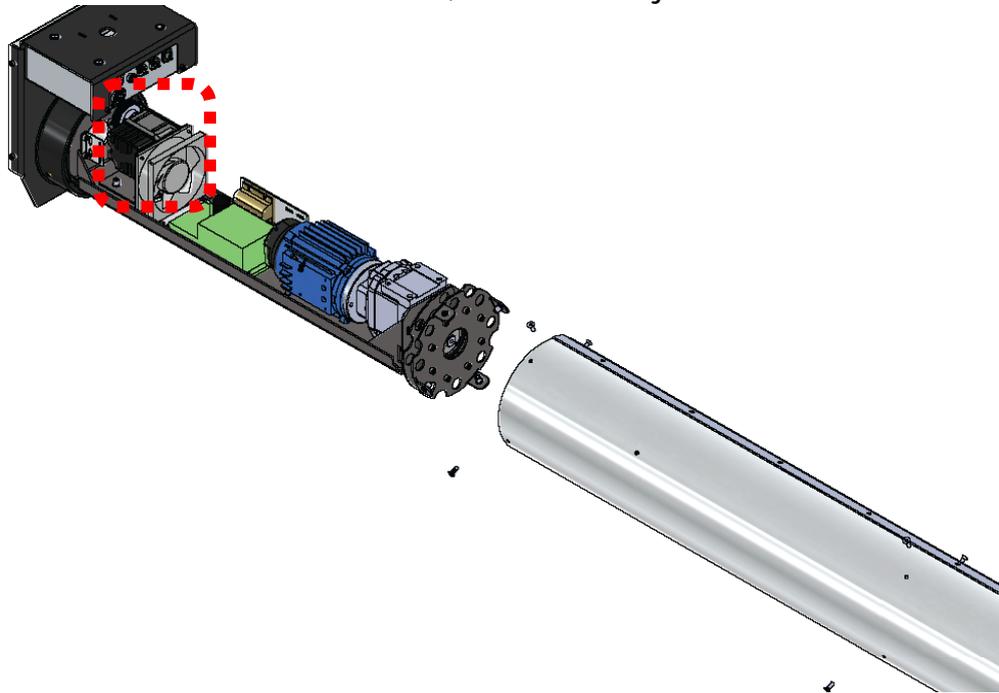
When the hard BOTTOM limit is activated, the display will show:



The hard limit switch makes a 'click-sound' when the limit switch is pressed or released.

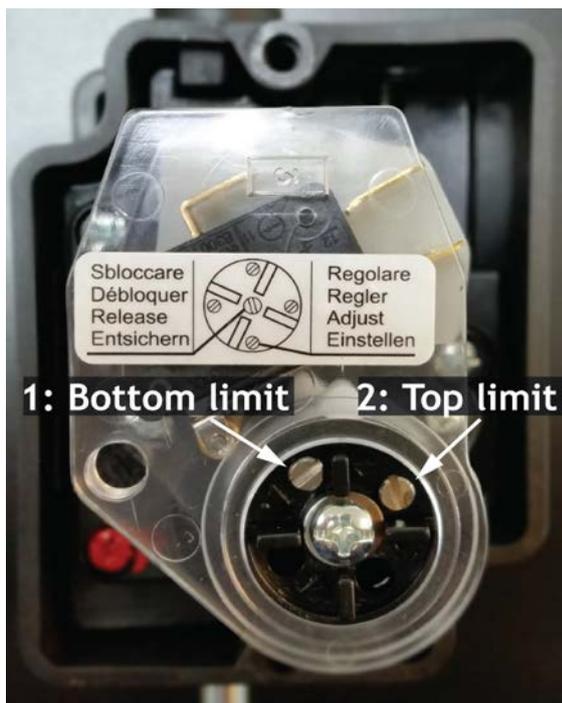
Adjusting procedure

1. Put the Roll Down in manual mode while adjusting the limits.
2. Localise the hard limit switch box, the black box just in front of the fan.



3. Loosen the two screws holding the lid.
4. Loosen the middle screw.
5. Hard BOTTOM limit is adjusted by turning the screw with a 1 next to it.
6. The hard TOP limit is adjusted by turning the screw with a 2 next to it.
7. When adjustments are done tighten the middle screw again.
8. Mount the lid with the two screws again.

The hard limits are factory pre-set to have a travel length of 15 m (can be extended to 18 m).



Normal Operation

Temperatures

If the surface temperature of the Roll Down exceeds 90°C (194°F) there is a risk of damaging the Roll Down.

Duty cycle

The Roll Down should not be operated at a duty cycle higher than 30% for longer periods of time.

The duty cycle is the fraction of a period where the motor is active. The duty cycle is commonly expressed as a percentage or a ratio. It can be described as the period of time it takes for a system to complete an on-and-off cycle.

Thus, a 10% duty cycle means the system is on 10% of the time and off 90% of the time. The "on time" for a 10% duty cycle is normally connected to a cycle length in minutes. E.g. a max duty cycle of 30% (10 min ON / 23 min OFF), means that the motor may not be active more than 10 minutes every 33 minutes or after 10 minute of ON the motor must be OFF for 23 minutes.

Lifting speeds and weight

The load of the Roll Down impacts the minimum speed it can operate at. At heavy loads the minimum speed up must be increased to a point where the Roll Down can still move.

If a light load is used with high minimum speeds the Roll Down might have problems with finding its position. Lower the minimum speeds if this is a problem.

The minimum speed can be adjusted from the menu.

Synchronized movements of multiple Roll Downs

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

This difference in speed can be solved by running the Roll Downs with fading positions, like when fading conventional light over time, the position of the Roll Down should be faded from one position to another over a certain amount of time. In that way the Roll Downs will follow the fade-curve, and multiple Roll Downs can follow the same fade curve.

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 assigned as a 16 bit channel with *MSB* and *LSB*.
3. The speed of the fade needs to be slower than the maximum speed, so the motors have speed enough to follow the fade-curve.

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

If the fade is too slow the Roll Downs will move - stop - move - stop, when the position changes, thus giving a discontinuous movement.

LED Functions

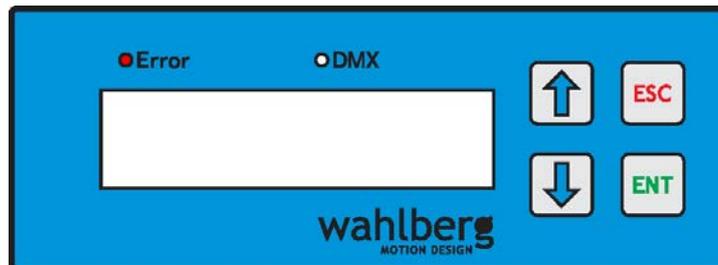
DMX LED

The DMX lamp will be steady green when receiving a DMX signal.
The DMX lamp will flash green if no DMX signal is present.



Error LED

The error LED will light red if there is an error.
Reset error is done by setting DMX channel 4 to 0.
When the Error LED lights red, there will also be an error description in the display.



Error and error codes:

Error	Possible solution
Roll Down will not start, display shows nothing.	Check if the Roll Down is connected to mains power. Check if the fuse in the Roll Down is intact
Roll Down will not start, DMX lamp is blinking.	Check DMX signal
The fabric is not wound up on the tube correctly.	Manually lower the fabric totally off the tube, while controlling that the fabric comes out of the Roll Down evenly. Afterwards the fabric is rolled back onto the tube. Reset the top position afterwards.
Display says "Not in Pos"	The Roll Down cannot move to its position, this usually occurs when the load is high. To solve this go into the menu and increase the Minimum speed up.
Power failure	The Roll Down will stop at power failure. When the power is re-established, the Roll Down has to be reset before it is ready to use. It is advisable to set all the DMX channels on 0% before the power is re-established.

When an error occurs, the control system shuts down the connected motor and issues a corresponding error code. This can be queried, and used to determine the cause of the error.

Code	Error message	Cause	Solution
1	UNDERVOLTAGE	Shutdown due to undervoltage in the DC link.	The input voltage might be too low.
2	OVERVOLTAGE	Shutdown due to overvoltage in the DC link.	The input voltage might be too high.
4	OVERTEMP. >70C	Shut down due to inverter overheat.	<p>The temperature of the power electronics in the frequency inverter is too high.</p> <p>The cooling is insufficient, for example, ambient temperature too high, insufficient air circulation, dirty air grate or the fan is defective.</p> <p>The drive can only be restarted when it has been allowed to cool down.</p>
5	MOTOR OVERTEMP.	Shut down due to motor overheat	<p>This message is issued when the motor thermostat is triggered or the temperature of the motor PTC is exceeded.</p> <p>The motor is being insufficiently cooled, for example, due to a defective fan.</p> <p>The drive can only be restarted when it has been allowed to cool down.</p>
6	INV OVERCURRENT.	Shut down due to inverter overload.	<p>Inverter output current (active current) too high.</p> <p>Possible cause:</p> <ul style="list-style-type: none"> → The motor load is too high
7	INV OVERCURRENT.	Shut down due to inverter overcurrent.	<p>The momentary output current is permanently exceeding the rated current by more than 150%.</p> <p>Possible causes:</p> <ul style="list-style-type: none"> → The motor load is too high
8	INVERTER EEPROM	Malfunction in the inverter memory.	Power cycle the Roll Down. Unplug the power and wait 30 seconds before applying power again.
9, 64	INVERTER SHORT	This is the switch off function due to a short-circuit on the frequency inverter	<p>The inverter was heavily overloaded (also short term).</p> <p>Causes can be for example:</p> <ul style="list-style-type: none"> a short-circuit / earth fault in the motor or in the supply leads.

10	INV NOT ENABLED	Inverter enable signal missing at the control terminal rail, terminal 3.	<p>The inverter can only be started if an active enabling signal (12-15 V) is applied to the control terminal rail. If this signal fails during drive operations, the motor will shut down and coast to a standstill. The shutdown immediately affects the inverter power section.</p> <p>This signal is provided by an orange wire connected to the number 3 connection on the terminal rail in the Roll Down. If this wire is not connected this error will occur.</p>
11	INV SER TIME OUT	Shutdown when telegrams fail (serial interface).	<p>Power cycle the Roll Down. Unplug the power and wait 30 seconds before applying power again.</p>
255	INV SER TIME OUT	Timer reset of the watchdog.	<p>Power cycle the Roll Down. Unplug the power and wait 30 seconds before applying power again.</p>
12	INVERTER TIMING	Internal timing error	<p>Power cycle the Roll Down. Unplug the power and wait 30 seconds before applying power again.</p>
13	INVERTER SYSTEM	System error	<p>Power cycle the Roll Down. Unplug the power and wait 30 seconds before applying power again.</p>
14	INV START DIRECT	Start attempt with direction error	<p>Power cycle the Roll Down. Unplug the power and wait 30 seconds before applying power again.</p>
15	INV PROGRAM CRC	Program memory CRC error	<p>Power cycle the Roll Down. Unplug the power and wait 30 seconds before applying power again.</p>
16	INV NOT ENABLED	Inverter enabling signal error	<p>The inverter can only be started if an active enabling signal (12-15 V) is applied to the control terminal rail. If this signal fails during drive operations, the motor will shut down and coast to a standstill. The shutdown immediately affects the inverter power section.</p> <p>This signal is provided by an orange wire connected to the number 3 connection on the terminal rail in the Roll Down. If this wire is not connected this error will occur.</p>
17, 250	INV WATCHDOG RST	Reset through WatchDog	<p>Power cycle the Roll Down. Unplug the power and wait 30 seconds before applying power again.</p>

Service and maintenance



Warning! Read “Safety Information” on page 2 before servicing the Roll Down.

Warning! Disconnect the Roll Down from AC mains power and allow cooling down for at least 10 minutes 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 Roll Down.

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

Parts

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

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.

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 Roll Down 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 Roll Down, before running the Roll Down - and at least every week when the Roll Down is in use:

- Check that the Roll Down is safely and correctly installed/mounted.
- Inspect the entire length of the **tube** for bends, damage, wear, and abuse.
- Inspect the **fabric attachment** for damage, wear, or abuse.
- Check that the fabric winds neatly around the tube
- Check that the fabric weighs maximum 35 kg.
- Check all safety devices (limit switches, and emergency stop)
- Check that the Roll Down's LEDs are visible from the operating station.
- Make sure that the operator has visual confirmation of all possible movements of the Roll Down at all time.

Monthly

At regular intervals - but at least every month when the Roll Down is in use:

- Check the mounting clamps for damages and proper fastening.
- Change damaged parts according to this manual.

Yearly

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

Every 48 months

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

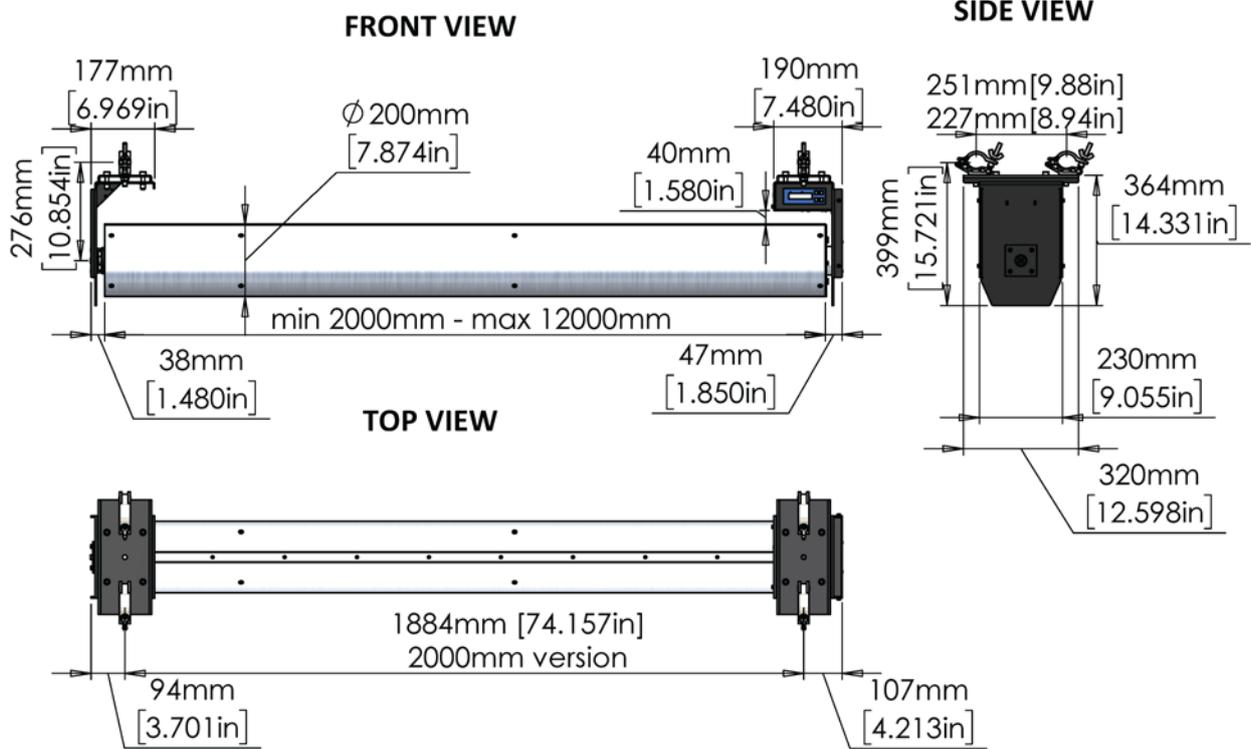
Checklist

Use the checklist accordingly; before each use, each month etc.

Check	Type	Result
Installed / mounted correct	Inspection	
Load and LEDs visible for the operator	Inspection	
Entire tube length OK	Inspection	
Emergency stop	Functional test	
Fabric is winds neatly around the tube	Inspection	
Fabric attachment	Inspection	

Appendix 1

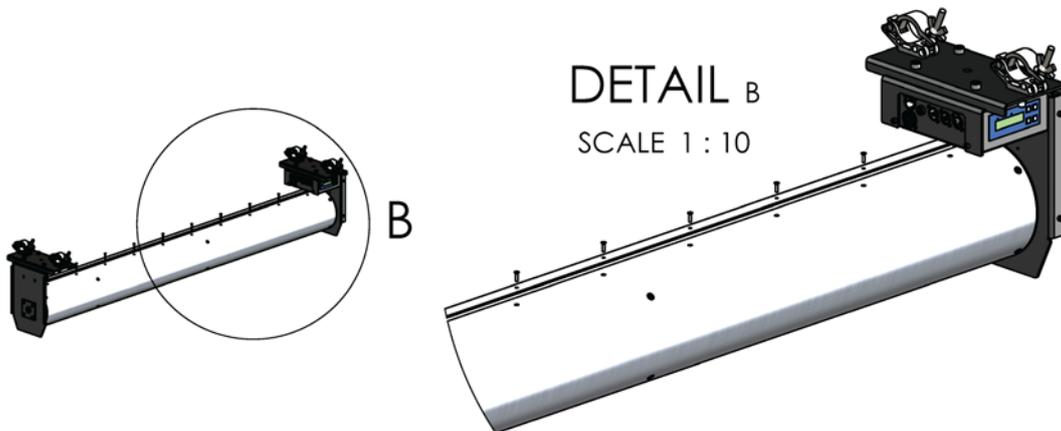
Roll Down (249)



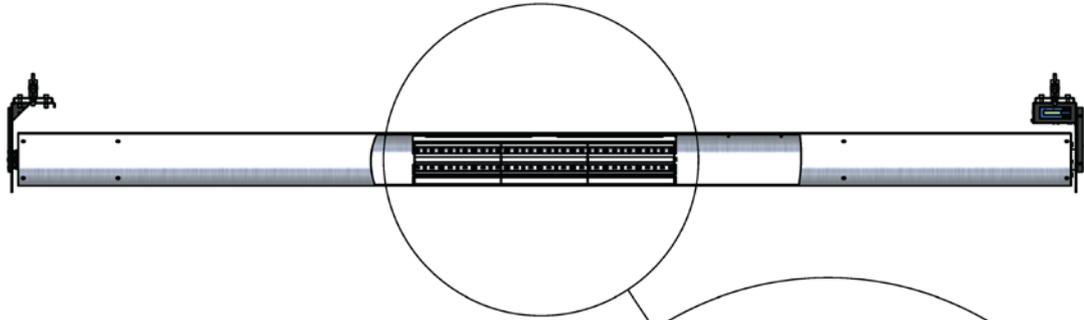
OPTIONAL SPLICE



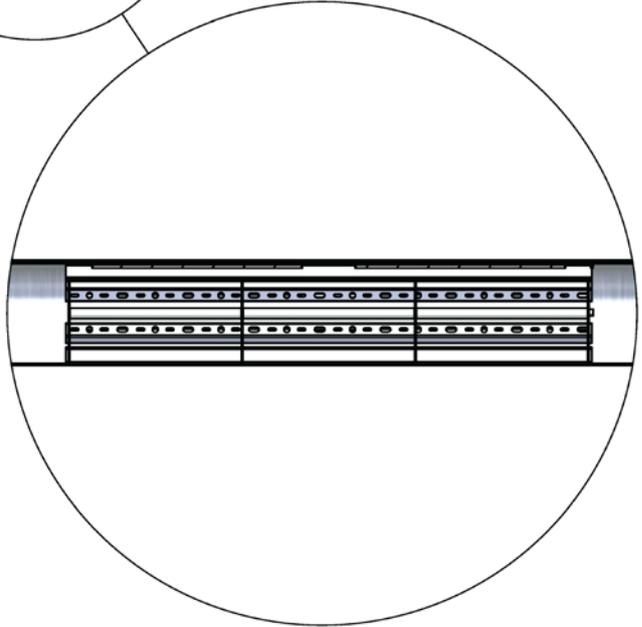
INSTALLING FABRIC



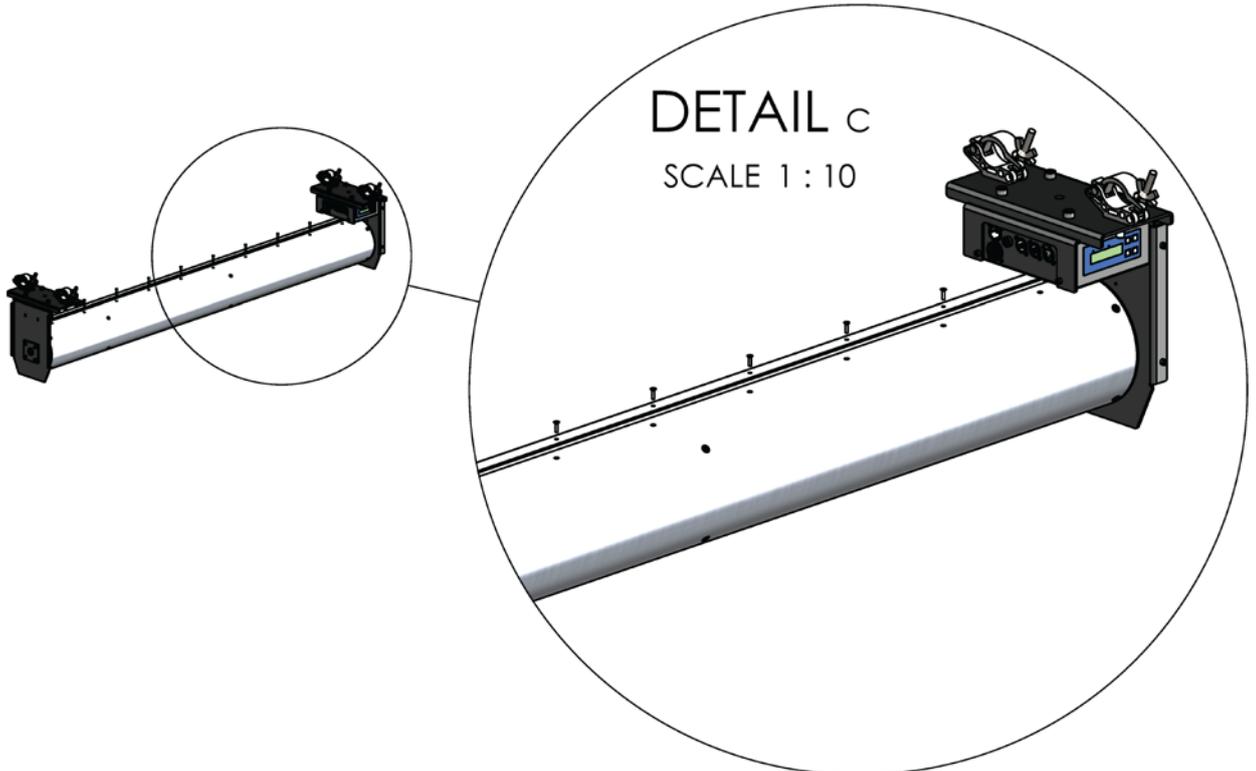
OPTIONAL SPLICE



DETAIL D
SCALE 1 : 13



INSTALLING FABRIC



Appendix 2



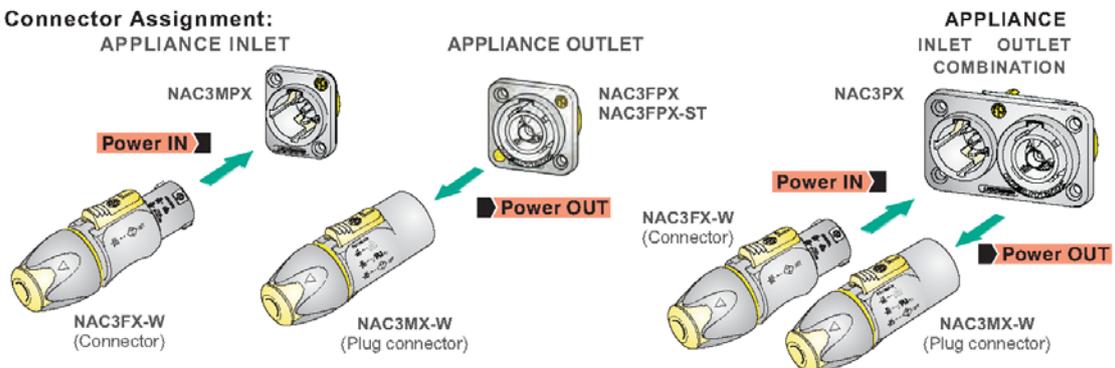
OPERATING & ASSEMBLY INSTRUCTION NAC3FX-W | powerCON TRUE1

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:

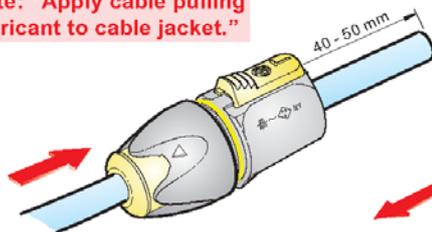


Approval based:	VDE EN 60320-1/EN60320-2-2	UL UL 498 / CSA C22.2 No. 182.3
Rating:	250 V ac / 16 A	250 V ac / 20 A
Cable Type:	H05VV-F3G 1.0 mm ² , Length max. 2 m H05VV-F3G 1.5 - 2.5 mm ² H07RN-F3G 1.5 mm ²	SJTOW, SJOOW 3 x 12 AWG
Strain Relief:	White chuck	White chuck
Cable O.D.:	6.0 - 12.0 mm	6.0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

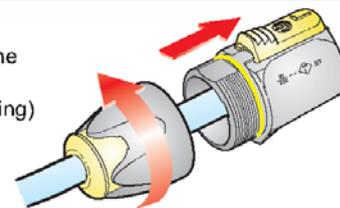
B. ASSEMBLY INSTRUCTION

- A** Insert cable into the bushing and housing.

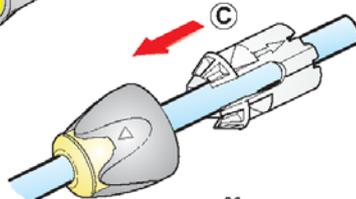
Note: "Apply cable pulling lubricant to cable jacket."



- B** Separate the housing from the bushing (cable remain in bushing)

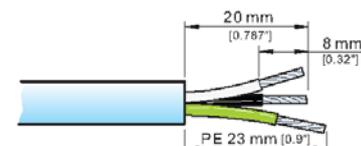
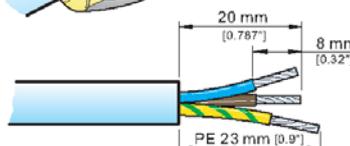


- C** Place chuck over the cable.



- i Recommendation:**
Wire Pulling Lubricant - LUB-I/0.95 from 3M™

- D** Prepare cable as shown.



VDE (EN 60320-1/EN60320-2-2)

UL (UL 498 / CSA C22.2 No. 182.3)

E

Torx size T8
Torque Value 0.7 Nm

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

F

Important: Push and turn simultaneously.

Slide chuck onto insert (1) and then both into housing (2).
Important: Align the chuck by positioning the nose into keyway.

Torque Value 2.0Nm

G

Wrench size 13 mm

PRESS FIRMLY

Slide the cable clamp (3) bushing up the cable and tighten it with the tool (4) as shown (5).
Important: Yellow O-ring to hide to achieve IP protection (6).

(Tool available: Art. No. HTAC)

FOR DISASSEMBLY - OPEN TWIST LOCK!

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

CAUTION

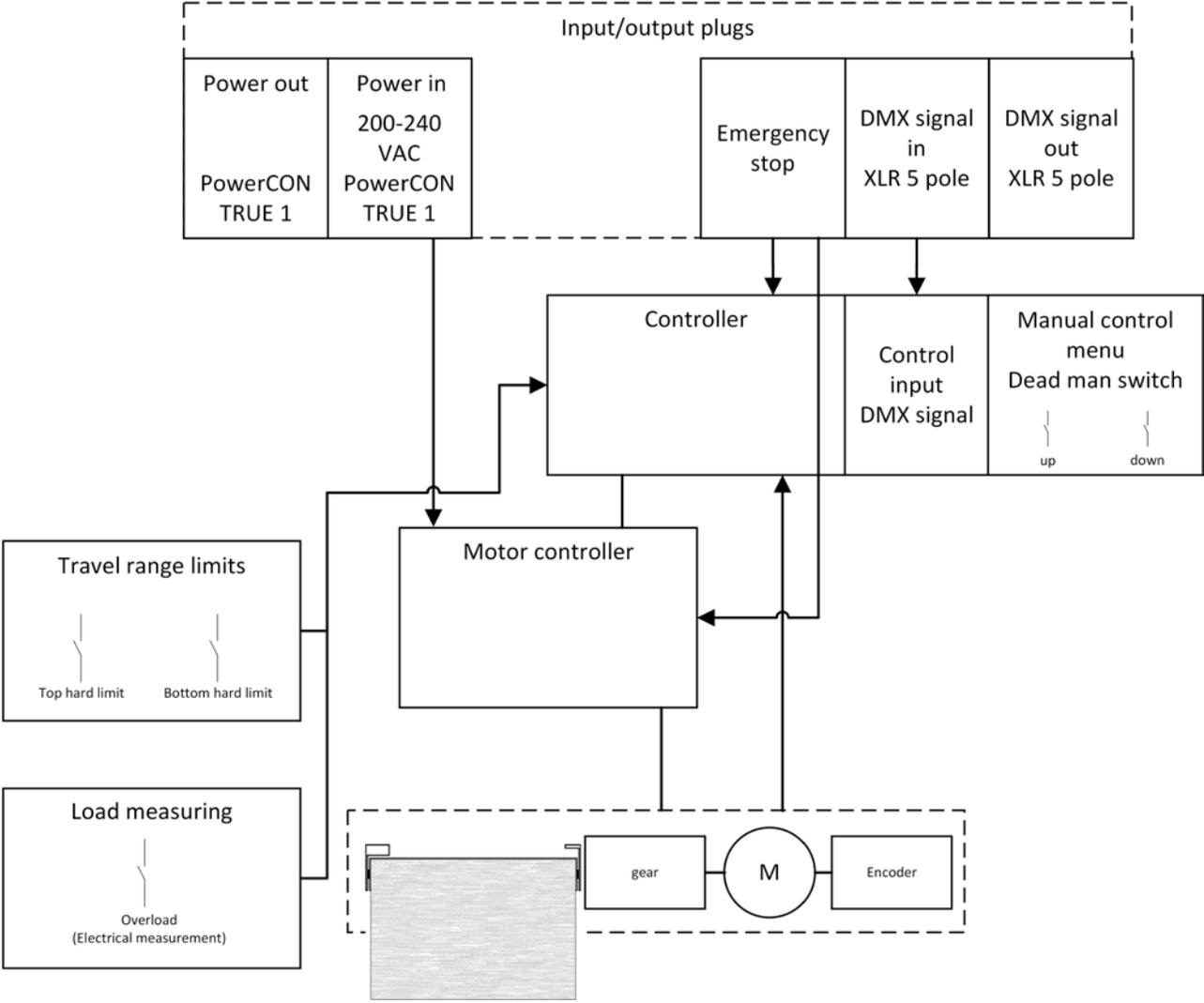
To ensure protection category, do not expose the connection to bending forces (e.g. do not attach loads to the cable, no free-dangling cable windings etc.).

SAFETY WARNING

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

NEUTRIK AG	LI	T: +423 / 237 24 24	F: +423 / 232 53 93	NEUTRIK France	FR	T: +33 1 / 4131 6750	F: +33 1 / 4131 0511
NEUTRIK USA Inc.	USA	T: +1 704 / 972 3050	F: +1 704 / 438 9202	NEUTRIK Tokyo Ltd.	JP	T: +81 3 / 3663 4733	F: +81 3 / 3663 4796
NEUTRIK (UK) Ltd.	UK	T: +44 1983 / 811441	F: +44 1983 / 811 439	NEUTRIK Hong Kong Ltd.	HK	T: +852 / 2687 6055	F: +852 / 2687 6052
NEUTRIK Vertriebs GmbH	DE/NL/AT/DK	T: +49 8131 / 280 980	F: +49 8131 / 280 830	NEUTRIK India Pvt. Ltd.	IND	T: +91 982 05 43 424	F: +91 22 26163 540

Appendix 3



Block diagram of the control system of the Roll Down.

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DMX channels	Function
1	Position rough (Hi of a 16 bit DMX channel)
2	Position fine (Lo of a 16 bit DMX channel)
3	Set the maximum speed
4	Motor Enable - between 50% and 55% to enable the motor output
5	Setting soft TOP limit
6	Setting soft BOTTOM limit

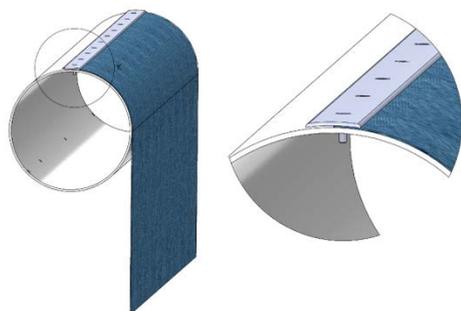
How to get started

1. Place / Rig the Roll Down in something high with minimum 2-3 meter clearance below.
2. Connect the Roll Down to 230VAC - The Roll Down turns on and the display shows the start-up message.
3. Connect emergency switch (if enabled) - make sure the error LED no longer is glowing red.
4. Set the DMX start address to 1 and apply DMX from a lighting desk, preferably with manual faders. Make sure that the 6 channels are patched from DMX channel 1 to 6. Pull all channels on to 0%
5. Set DMX channel 4 between 50% and 55% - the motor is now enabled
6. Set DMX channel 5 to 30% - After 3s the Roll Down moves towards its hard TOP limit. To stop the Roll Down, set DMX channel 5 to 0%. Stop when the desired or at the hard TOP limit. The reached position is now the soft TOP limit.
7. Set DMX channel 6 to 50% - The Roll Down moves towards its hard BOTTOM limit. To stop the Roll Down, set DMX channel 6 to 0%. Stop when desired or at the hard BOTTOM limit. The reached position is the soft BOTTOM limit, and hence the travel range has now been set: from the soft TOP limit to the soft BOTTOM limit.
8. Set DMX channel 1 to 100% and DMX channel 3 to 20% - The Roll Down moves with 20% speed to the 100% position.
9. Set DMX channel 1 to 90% and DMX channel 3 to 50% - The Roll Down moves with 50% speed to the 90% position.

Emergency stop switch (Only when emergency stop is enabled)

The emergency stop switch is connected to the female 4 pin XLR connector.
Pin 1 and Pin 2 should be connected to each other; otherwise the motor will not run.

Pin out:		
Pin 1	GND	Emergency stop input
Pin 2	NC	
Pin 3	NC	
Pin 4	12-15 volt DC	Emergency stop input



Inspection points!

Before each use

- Inspect the entire length of the tube for bends, damage, wear, corrosion, and abuse.
- Inspect the fabric attachment for damage, wear, or abuse.
- Check that the fabric weighs maximum 35 kg.
- Check all safety devices (limit switches, and emergency stop)
- Make sure that the operator has visual confirmation of all possible movements of the Roll Down at all time.

Warning!

Do not use the Roll Down if any damage or error is found!