

# INSTALLATION MANUAL

## MASTERLINE Ultimate Power

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### SAFETY NOTES



Installation and maintenance work on this device must be carried out only by an authorised electrician.

National laws and regulations must be observed during installation. The housing and the components used must be checked for exterior damage prior to installation. If the cabling system is defective, it must not be used.

### HANDLING OF THE CABLING SYSTEM



To avoid any damage due to improper installation, please note the following points:

- AVOID any additional stress on the connector head causing by twisting or bending during routing or location
- AVOID installation paths around any sharp objects
- AVOID uncontrolled impacts of the connector head against any hard object
- AVOID any contact between the connector head and any additional substance such as glue, oil or fat, unless prior authorisation is given by HUBER+SUHNER AG

See also the "User handling manual for cables and cable systems" available at [www.hubersuhner.com/en/support](http://www.hubersuhner.com/en/support)

### HANDLING OF FIBER OPTIC ASSEMBLIES



To guarantee proper performance, fiber optic assemblies must be handled carefully with due attention to the minimum bend radius and never exposed to dirt.

See also the "User handling manual for cables and cable systems" available at [www.hubersuhner.com/en/support](http://www.hubersuhner.com/en/support)

### RRH END OF ASSEMBLY

#### Step 1

Use a smartphone to scan the QR code on the side of the reel. The QR code provides a link to the HUBER+SUHNER website, where you can find the latest valid revision of installation manual.



## MLUP

### INSTALLATION MANUAL

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#### Step 2

Remove the mounting bracket attached to the spool. Secure the mounting bracket with hose clamps (when fitting to a pole/mast) or screws (when fitting to a wall).

We recommend that you use HUBER+SUHNER's quick hose clamps and tighten the clamps using a torque of 4.0 Nm.

Item no. 84076411 (pole Ø 30 – 155 mm)

Item no. 84076412 (pole Ø 60 – 500 mm)



**Step 3**

Mount the cable spool onto suitable de-reeling equipment. Start unwinding from the side where the MLUP connector head is located. Do not pull on the side where the pulling tube is attached. Make sure that the spool can rotate freely when unspooling.

Do not remove the protective bubble foil until immediately before attaching the MLUP connector head to the mounting bracket.



**Step 4**

Use a rope to pull up the cable system.



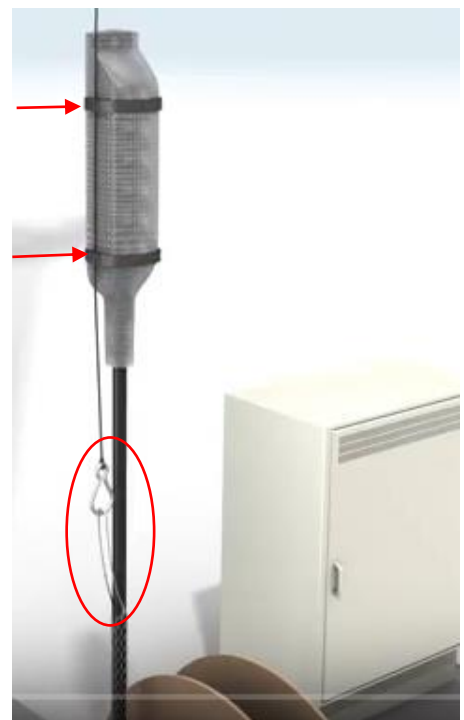
Check the maximum pulling force (at 50°C ambient temperature for 1 hour) as specified on the label attached to the hoisting grip. Do not apply higher force! The maximum pulling force equates to the weight of 100 m of cable.

The cable weight is specified on the data sheet. Cabling systems longer than 100 m may not be lifted more than 100 m vertically unless a second hoisting grip is used. Contact HUBER+SUHNER for further installation instructions.



Note: 950 N / 95 kg is only an example and depends on the power cable used

Lead the rope along the left side of the MLUP connector head down onto the cable hoist and secure it. Use two tapes to fix the rope to the lower and upper end of the connector head. Do not remove the air bubble bag which protects the connector head while lifting the cabling system. Pull the cabling system up the mast. Make sure that the MLUP connector head does not impact against any structures and is not bent over edges.



<p><b>Step 5</b></p>	<p>Remove the MLUP head fixture (tape) from the rope and remove the air bubble bag from the MLUP connector head. Hook the MLUH head into the mounting bracket.</p> <div data-bbox="263 510 411 645" data-label="Image"> </div> <p>Do not remove the rope from the hoisting grip until after all cable clamps are mounted.</p>	
<p><b>Step 6</b></p>	<p>Secure the MLUP connector head on the mounting bracket by tightening the two M6 screws on the bottom left and top right corner.</p> <div data-bbox="263 920 411 1055" data-label="Image"> </div> <p>Tighten the M6 screws using a torque of 2 Nm. Be careful not to damage the housing by tightening the screws too tightly.</p>	
<p><b>Step 7</b></p>	<p>Fix the cable to the mast using HUBER+SUHNER clamps, which are available for different profiles. Clamps should be applied to the hybrid cable starting from a point 0.5m to 1.0m below the cable entry proceeding down to the bottom of the mast. The cable has to be fixed straight and in line with the MLUP enclosure between the cable entry and the first cable clamp. Maximum allowed misalignment is 15° respective 0.14 m at 0.5 m below the cable entry.</p> <p>Recommended spacing between the clamps is 1 m. The minimum bending radius of the cable is 10x cable diameter.</p> <p>After all cable clamps are attached, remove the rope.</p> <div data-bbox="263 1787 411 1921" data-label="Image"> </div> <p>Do not remove the rope before all cable clamps are mounted.</p>	

### Step 8

The MLUP enclosure has an integral earth point suitable for M8 lug for grounding. Connect the earth point to an earth bar with a grounding assembly with minimum 16 mm<sup>2</sup> / 6 AWG cross section. Consider the correct order: first the grounding wire lug, secondly the washer, thirdly the spring washer.



Tighten the M8 earth screw with a torque of 5 Nm. Be careful not to damage the enclosure by tightening the M8 earth screw too tightly.

H+S offers different grounding assemblies:

- Item no. 85086667: 0.5m, black, 16mm<sup>2</sup>, 2x M8 lug
- Item no. 85083781: 0.5m, yellow/green, 16mm<sup>2</sup>, 2x M8 lug
- Item no. 85086668: 0.5m, black, 25mm<sup>2</sup>, 2x M8 lug
- Item no. 85083792: 0.5m, yellow/green, 25mm<sup>2</sup>, 2x M8 lug

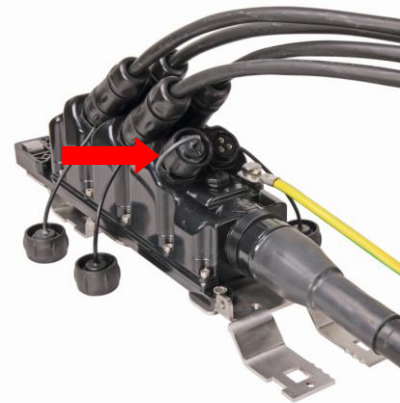


### Step 9

All connectors are protected with water proof (IP67) protection caps.



Do not remove the cap only at the moment when the plug connector is mated.



### Step 10

The remote radios are connected with power jumpers which are terminated with a rugged circular plastic plug connector and are blunt cut on the RRH side.



### Step 11

Connect power jumper of connector head.

The 6 power connector sockets are marked with the numbers 1L to 3L on the left side and 1R to 3R of the ride side starting at the top of the housing.



Switch off the power supply before you mate or un-mate the power connector. Otherwise the contacts will get damaged. Connector is not for hot plugging.

#### Mating:

Remove protection caps of the plug. Twist (120°) the coupling ring of the plug connector to remove protecting cap as shown. Note the lock / unlock symbol on the coupling ring.

Remove protection caps of the socket on the MLUP. Twist (120°) the coupling ring of the socket connector anticlockwise to remove protecting cap as shown.

Connect the two protection caps together for later reuse.

Push plug connector slightly and in-line into socket connector, rotate to find keying position, twist coupling ring of the plug connector clockwise as shown until you hear and feel a “click”. Align white strip on the plug with the white strip on the socket to find keying position easier.



Make sure the plug connector is in-line with the socket connector before coupling ring is twisted. Otherwise the connector might be damaged. Avoid any tilt during mating process since the connector might be damaged

#### Un-mating:

Twist coupling ring anticlockwise as shown to un-mate the plug connector. Note the lock / unlock symbol. Mount the protection cap to avoid ingress of water or dirt.

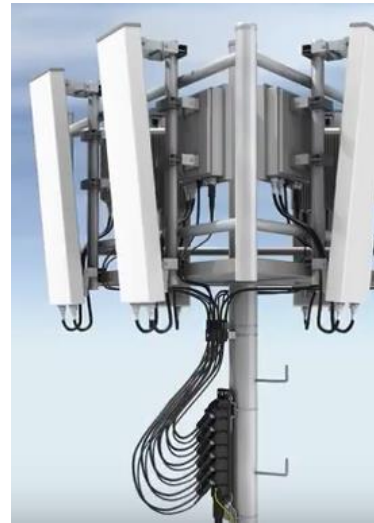


**Step 12**

Ensure smooth routing of all cables from connector head to RRH equipment using HUBER+SUHNER cable clamps, which are available for different profiles.



Do not over bend the cables. Minimum bend radius for power cable is 10 cm. Avoid side load on the power connector.  
 Do not use cable ties to fix cables



**Step 13**

Optional, a stainless steel protective cover can be easily fitted over MLUP connector head and secured with two screws.



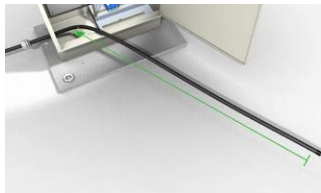
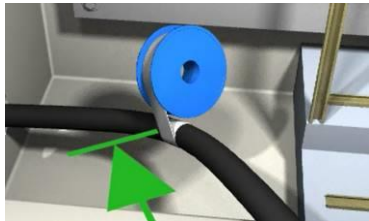
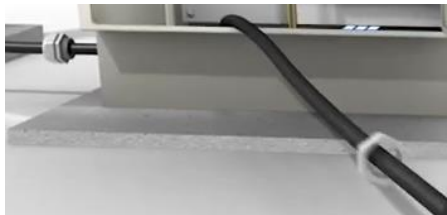



Attach the safety cord to the bracket and the protective cover.

Protection cover for MLUP6:  
 Stainless steel, dimensions (L x H x W) 365 x 200 x 90 mm

- Item no. 85032157



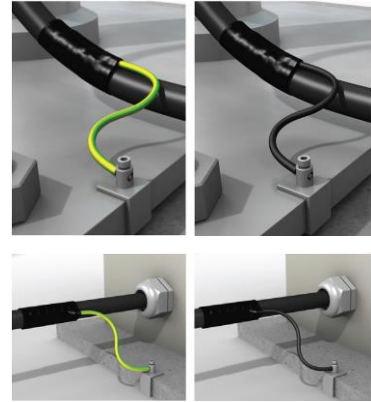
BASE STATION END OF ASSEMBLY		
<b>Step 1</b>	Unwind the whole assembly from the reel and lay the cable to the end equipment. Use the pulling eye to feed the power cable through a conduit.	
<b>Step 2</b>	Remove gland nut from cable and keep it safe.	
<b>Step 3</b>	Feed tails through cabinet/cabin.	
<b>Step 4</b>	Mark the "strip-back point" using tape.	
<b>Step 5</b>	Feed gland nut over cable to secure to cable entry gland if required.	
<b>Step 6</b>	<p>Remove pulling eye from the cable system and strip cable jacket off the right position. Remove cable jacket carefully.</p> <p>Route conductors to their respective termination points and connect.</p> <p>The conductors are numbered 1 to 12 (black number on white insulation) or are color coded.</p> <p>Route the braided copper shielding to earth bonding point and connect</p>	



**Step 7**

If earthing is required outside cabinet/cabin use universal grounding kit and follow separate instructions.

**NOTE:** the grounding cable can also come in black.



**POWER CODING**

Power connector number on MLUP connector head	RRH end Power jumper 2-core cable			BTS end Multi-core power cable	
	conductor color code			conductor numbering / color code	
	Option 1 (Europe)	Option 2 (USA)	Option 3 (USA)	Option 1 (Europe)	Option 2 (USA)
1L	Brown	Black	Black	1-White	1-Black
	Blue	Grey	White	2-White	2-White
	Braided screen			Braided screen	
2L	Brown	Black	Black	3-White	3-Red
	Blue	Grey	White	4-White	4-Green
	Braided screen			Braided screen	
3L	Brown	Black	Black	5-White	5-Orange
	Blue	Grey	White	6-White	6-Blue
	Braided screen			Braided screen	
1R	Brown	Black	Black	7-White	7-White/Black
	Blue	Grey	White	8-White	8-Red/Black
	Braided screen			Braided screen	
2R	Brown	Black	Black	9-White	9-Green/Black
	Blue	Grey	White	10-White	10-Orange/Black
	Braided screen			Braided screen	
3R	Brown	Black	Black	11-White	11-Blue/Black
	Blue	Grey	White	12-White	12-Black/White
	Braided screen			Braided screen	

**REVISION HISTORY**

<b>Revision</b>	<b>Description of detailed changes</b>	<b>Manager/Engineer</b>	<b>Applicable date</b>
Rev. A	First Version	René Müller	2018-01-17
Rev. B	Power coding table: Power connector number on MLUP connector head corrected (1L to 3L and 1R to 3R)	Marco Senn	2020-06-23