

Stabilized Remote Head **SRH-3**

USER MANUAL

Date 01.03 2019



Imprint

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1.2			01.11.2018
1.3			01.03.2019

Scope

This document describes the components and the setup of the SRH-3 Stabilized Remote Head system and its components.

Disclaimer

Before using the products described in this manual, be sure to read and understand all the respective instructions.

Otherwise the customer must contact ARRI before using the product.

While ARRI endeavors to enhance the quality, reliability and safety of their products, customers agree and acknowledge that the possibility of defects thereof cannot be eliminated entirely. To minimize the risk of damage to property or injury (including death) to persons arising from defects in the products, customers must incorporate sufficient safety measures in their work with the system and heed the stated conditions of use.

ARRI or its subsidiaries do not assume any responsibility for losses incurred due to improper handling or configuration of the TRINITY or other system components.

ARRI assumes no responsibility for any errors that may appear in this document. The information is subject to change without NOTICE.

For product specification changes after this manual was published, refer to the latest published ARRI data sheets or release notes, etc., for the most up-to-date specifications.

Not all products and/or types are available in every country. Please check with an ARRI sales representative for availability and additional information.

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1 For your safety

Warning

The SRH-3 system and products should only be used by experienced and trained operators. This product is **NOT** designed for inexperienced users and should not and must not be used without proper training.

ARRI recommends that all users of the SRH-3 system read the manual in its entirety prior to use.

All directions are given from a camera operator's point of view. For example, camera-right side refers to the right side of the camera when standing behind the camera and operating it in a normal fashion.

The appendix at the back of the manual contains useful reference material including specifications, connector pin-out diagram.

Before use, please ensure that all users comprehensively read, understand, and follow the instructions in this document.

1.1 Risk Levels and Alert Symbols

Safety warnings, safety alert symbols, and signal words in these instructions indicate different risk levels:

DANGER

DANGER indicates an imminent hazardous situation which, if not avoided, **will result in** death or serious injury.

Warning

WARNING indicates a potentially hazardous situation which, if not avoided, **may result in** death or serious injury.

CAUTION

CAUTION indicates a potentially hazardous situation which, if not avoided, **may result in** minor or moderate injury.

NOTICE

NOTE explains practices not related to physical injury. No safety alert symbol appears with this signal word.

NOTE

Provides additional information to clarify or simplify a procedure.

1.2

User Advisory / Application Requirements

The SRH-3 system and products should only be used by experienced and trained operators. This product is NOT designed for inexperienced users, and must not be used without proper training.

Stabilization of Remote Heads is an extremely complex and at times difficult task and therefore stabilized remote heads do have their limitations. For example, the SRH-3 will only correct for angular movement and not parallel movement. This means that when the SRH-3 is attached directly to a lift, or to a pole, or structure that is subjected to vertical movement, it cannot compensate for lift as it moves up and down (because that movement is parallel). In order to absorb vertical and parallel movements, the SRH-3 must be mounted on a suitable shock absorber.

Stabilization systems are limited by engine power, as well as their bandwidth or frequency response. Very fast movements required to correct the camera position may not be within system capabilities. This can be seen when using longer lenses.

The use of suitable Iso Dampers devices improves the application.

Mounting a suitable Iso Dampers device between the SRH-3 and the mounting point of the head, will soak up the fast, unwanted movements, leaving the stabilization with unwanted movements that are slower and within the bandwidth of the system.

There are many Iso Damper devices that follow different designs and qualities. Choosing the right Iso Damper is as important as the stabilized head itself.

Another purpose of Iso Dampers is that they decouple the stabilized remote head from some resonance and flexing of the mounting point.

All gimbal-based stabilized remote heads will always face some kind of drift.

Drift is unwanted movement of the system usually caused by the gyros and the earth's rotation, which can't be measured by the MEN sensors.

Drift is normally measured in degrees per hour.

The SRH-3 has a very small amount of drift that would only be noticed while the head is stationary over a long period of time. The average drift can be up to approximately 10° in 30 minutes.

Drift can also be caused by a non-calibrated joystick or a loose camera setup, or an Iso Damper that is too soft.

Reduction of flexing or bending of the camera and lens package, and flexing of the remote head attachment are critical. The overall setup needs to be as rigid as possible because any flexing can cause the head to vibrate or oscillate. Every attempt to improve the stiffness of the camera setup and the head attachment, and to reduce or eliminate any flexing should be made.

Many different camera and lens packages can be used with the SRH-3, and there are also many different ways to mount the SRH-3. As a result, it is not always possible or practical to obtain perfect conditions regarding rigidity and balance. This may cause the load to become unstable and it will then shake and oscillate when the stabilization is active. In these situations, adjustment of the PID parameters will be required. The correct setting of these PID values is crucial for the proper working of the system.

An unbalanced camera setup will place more strain on the motors of the SRH-3. The system will need more force to move the load and this will sometimes increase the possibility of the load becoming unstable, and that the SRH-3 may over compensate or shake and oscillate.

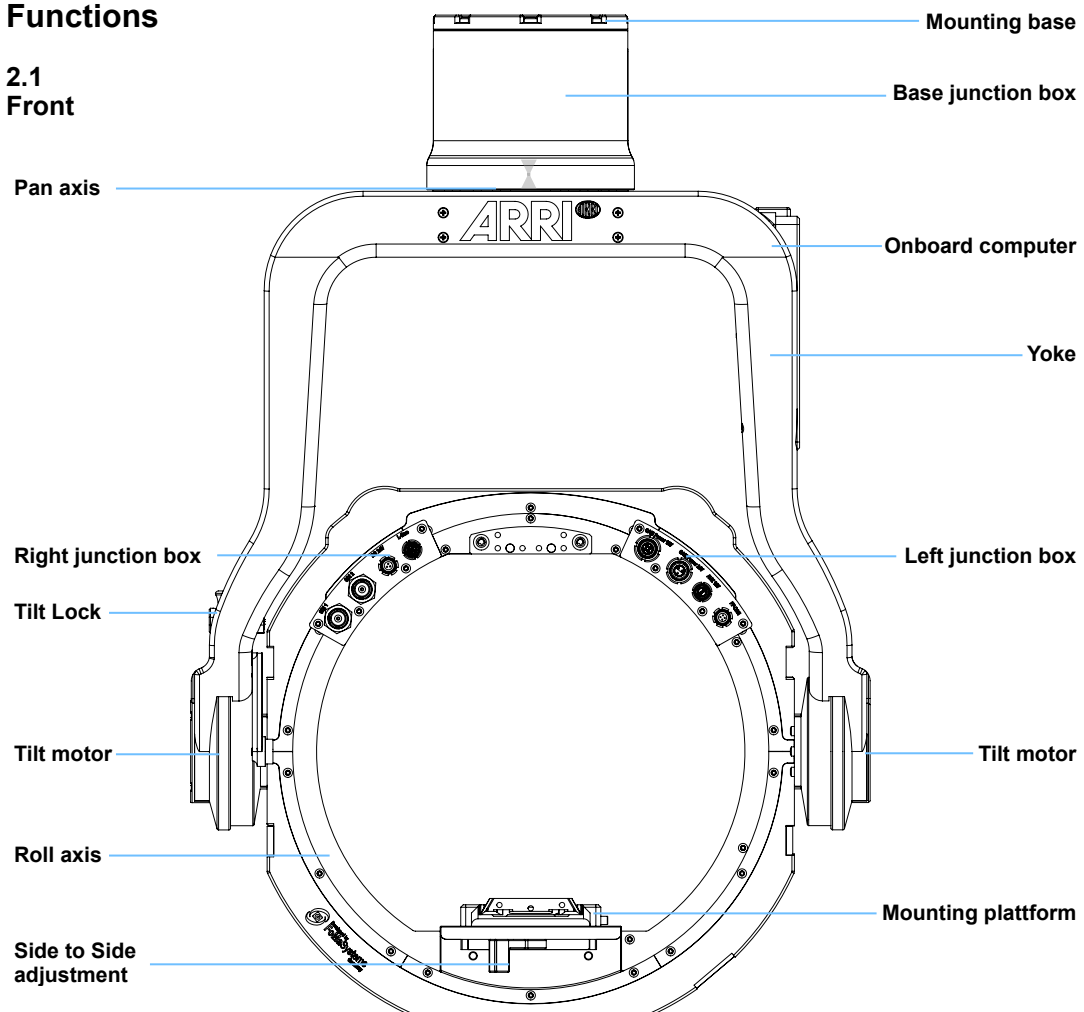
Please remember that what the SRH-3 is mounted on, and the manner in which it is mounted, will directly impact on its performance. The total mass of the head and its load are an important consideration when choosing how and where to mount it. This torque will change in direction and amplitude in varying amounts. The more solid the mount, the easier it is for the system to perform well. Sometimes even the levelling linkage on a camera crane will have play or backlash that allows the mounting point to move slightly when loads are reversed. If there is mechanical play between the components in the shock absorber, vibrations of the overall system may occur. Iso Dampers with the appropriate dimensions and hardness should always be used - the system may become too elastic if the Iso Damper used is too soft, causing vibration.

CAUTION

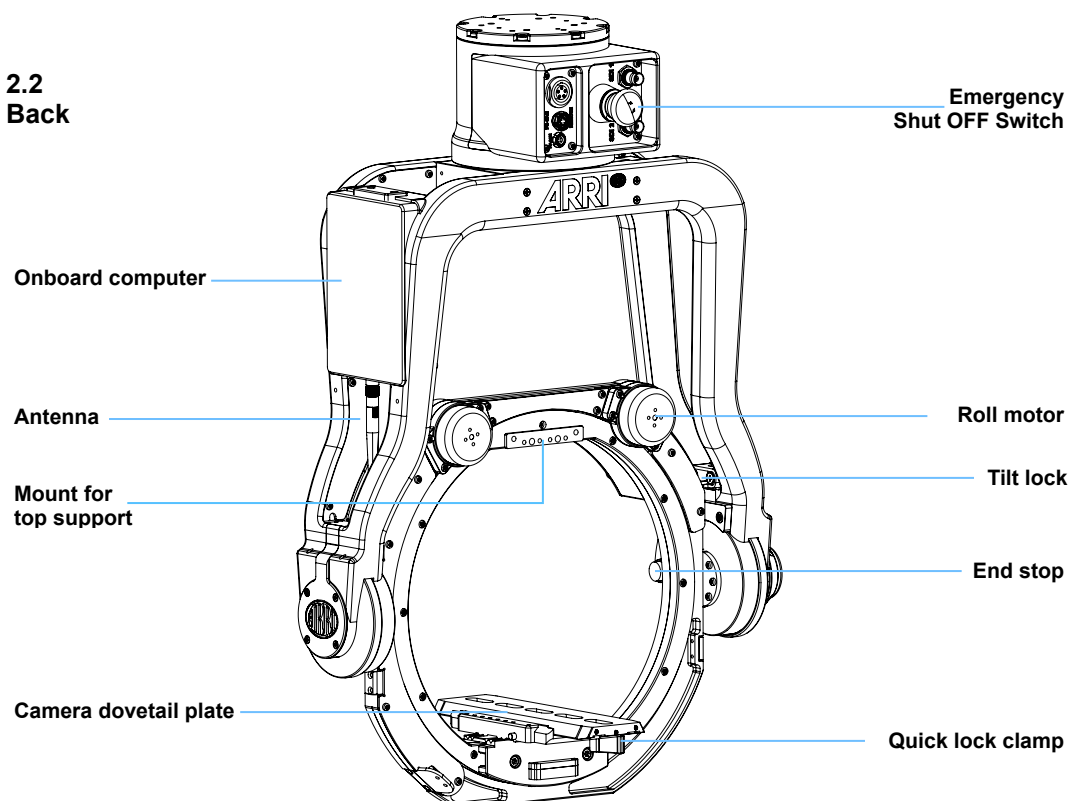
Each of these aspects can lead to the motor power of single axis having to be lowered, which will limit the effectiveness of the overall stabilization.

2 Functions

2.1 Front

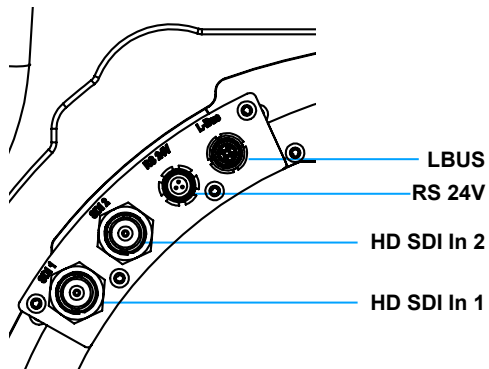


2.2 Back

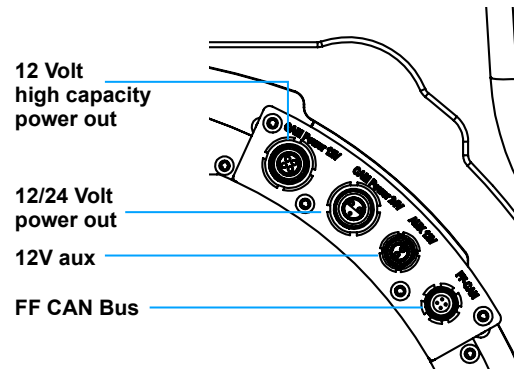


2.3 Connectors

2.4 Right junction box



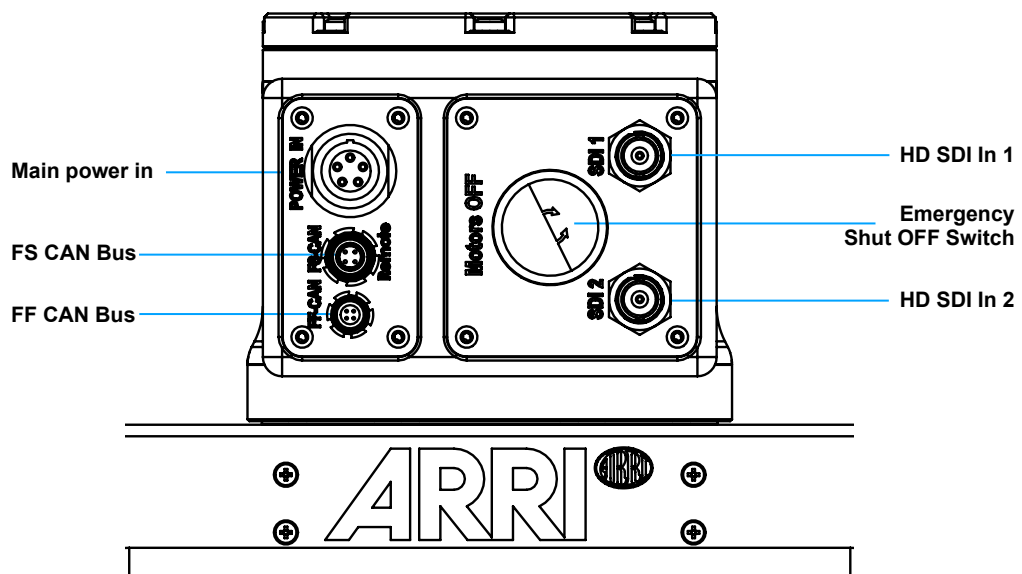
2.5 Left junction box



⚠ CAUTION

The 12V aux power consumption should not exceed 14,4V / 5 Amps.

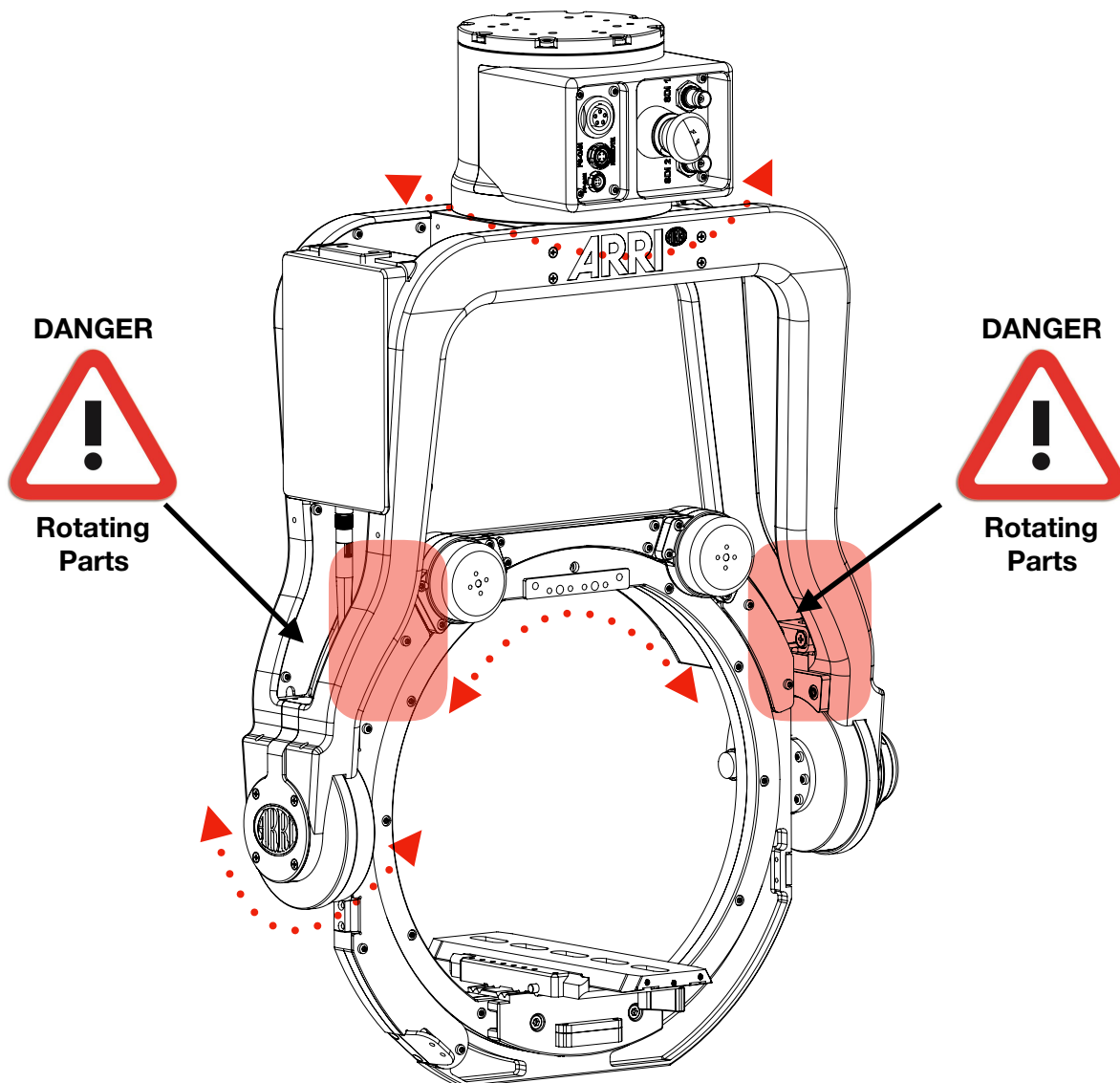
2.6 Base Junction Box / Rear



3 Safety Instructions

⚠ DANGER

Pay attention during setup and the entire operation that no fingers or limbs end up between the outer yoke and inner ring.
A high kinetic force can result between the outer and inner ring, depending on the weight and length of the camera.
Serious injuries can result through negligence.
If this does happen then, cut off the power supply straight away and seek medical attention if necessary.

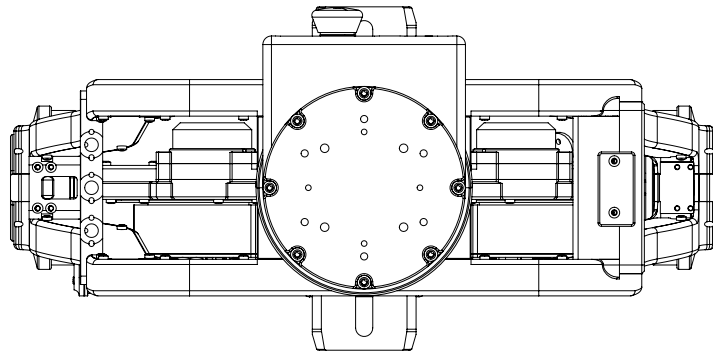


4 Mounting the Mitchell Mount

⚠ DANGER

Mounting the the SRH-3 to a crane, dolly, support arm or any other device, has to be done by experienced operator or grip personal.

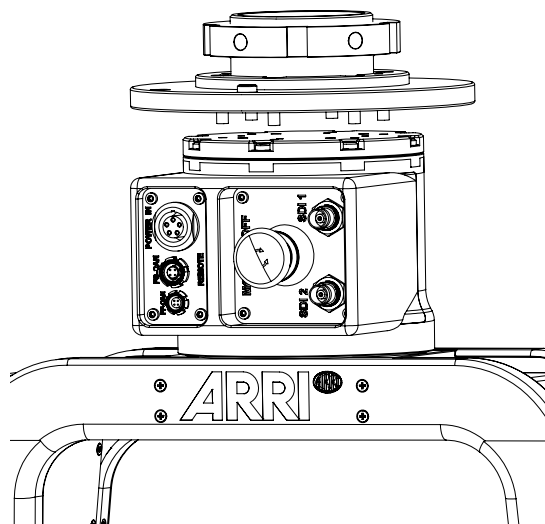
Make sure that all safety regulations have been considered.



The base of the SRH-3 is prepared to mount an ARRI Mitchell Mount 2. The SRH-3 has to be connected to ARRI Mitchell Mount 2 and will be used as stationary equipment. The SRH-3 Mitchell Mount is screwed on with 6 x M5 screws onto the mounting base of the SRH-3.

NOTE

To mount the Mitchell Mount, you will need a 4mm or 5/32" hex key.



⚠ CAUTION

Make sure that all 6 screws are fully tightened.

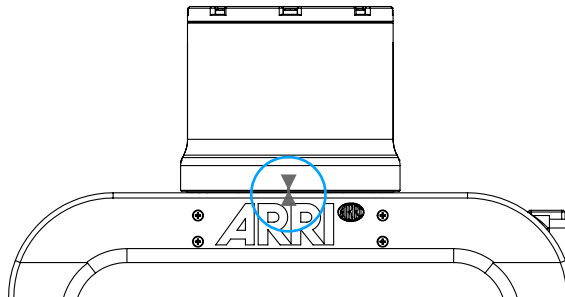
5 Home Position

5.1 Home Position

⚠ CAUTION

Before powering the head, align the Home Position Indicator arrows.

When initially setting up the SRH-3 on any camera support device, ensure that the home position indicator arrows on the yoke and on the base of the unit are aligned as shown.



⚠ CAUTION

Failure to align the home position will affect the performance of the SRH-3 and reduce pan range by more than 50%.

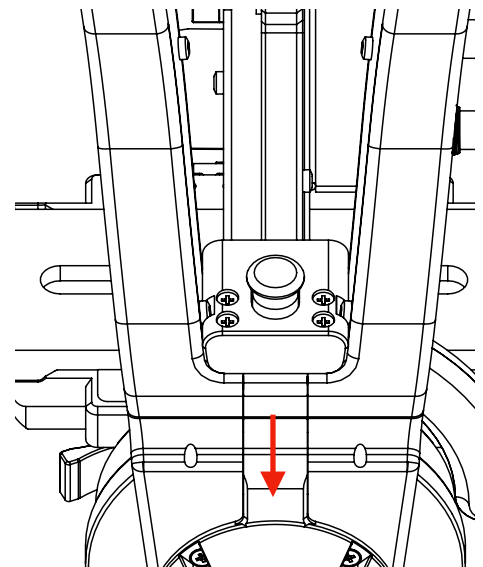
6 Tilt Lock

6.1 Tilt Lock

The remote head offers a locking mechanism for the tilt axis.
This allows the tilt axis to be blocked during assembly of the head at the crane and during mounting the camera.

To lock the mechanism, push in the locking pin.

To unlock the locking mechanism, pull out the locking pin.



⚠ DANGER

**The locking mechanism must be UNLOCKED before powering and using the remote head.
An active tilt lock will cause motor damage by overheating the tilt motors.**

7 Camera Preparation

Foreword

The entire balancing procedure of the SRH-3 stabilized remote head is based on **SYMMETRY** and **NEUTRAL BALANCE**.



NOTE

Only a precisely executed camera preparation will enable you to get the best performance out of the SRH-3.

The camera preparation must meet the following requirements:

Compact length

You should keep the COG (center of gravity) of the SRH-3 as low as possible and the total length of the camera should be as compact as possible.

If an ALEXA Mini is being used, a Zoom Lens similar to the ARRI/ FUJINON Alura 15.5-45/T2.8 will keep the Camera setup at an optimum length.

If the ARRI ALEXA or AMIRA is being used a Prime Lens will be required.

Most box type cameras with a zoom lens are very close to the length of a full bodied camera with a prime lens.



Setup with two motors

Low COG (center of gravity)

Any accessories mounted to the camera should be attached as low as possible.

Symmetry

Camera components and accessories that are mounted on the camera have to be attached symmetrically and balanced.

For example:

If two Focus Motors are needed, use two 15mm rods (equal length and same material) and mount them on the base of the camera.

Now place one Focus Motor on each rod. Make sure that the gears are facing the front of the lens and the motor housing of the camera body.

If only one Focus Motor is required then two rods are also required.

Place the Focus Motors vertical below the lens.

This configuration optimizes COG and symmetry.



Setup with one motor

7.1 Secure Component / Accessory Attachment

⚠ CAUTION

Keep in mind the SRH-3 head is a fully stabilized Gimbal based device with a payload capacity of 30kg / 66 lb. The amount of available torque is very high.

NOTICE

Make sure that all components of the camera and accessories in the setup are fully tightened.
Ensure that none of the components are loose or have any play to avoid vibration and costly performance issues.

⚠ CAUTION

Please double check all clamps are tight and that all components are fitted correctly.



7.2 Mounting the Camera Dovetail Plate

The SRH-3 comes with a symmetric camera dovetail plate, the so called Quick Lock plate.

⚠ CAUTION

Always use two 3/8" screws to ensure a solid fit.
Using only one screw or a too short distance between the screws will force sidewise rotation of the camera, as also vibration of the entire system.
Try to maximize the distance in between the camera screws.

NOTE

Using the SAM1, SAM2 and the SAM3 plates will speed up the later balancing process and guarantee the best performance of the SRH-3.



SAM-1 Stabilizer Adapter Mount for
ALEXA
K2.0018851



SAM-2 Stabilizer Adapter Mount for
ALEXA Mini
K2.0014215



SAM-3 Stabilizer Adapter Mount for
AMIRA
K2.0014630

NOTE

If the Head is mounted underslung to a crane, the overall balance of the camera setup should be a bit bottom heavy.

8 Preparing the Quick Lock Camera Mount

The SRH-3 comes with a Quick Lock mounting mechanism. It offers one clamp mechanism for the Camera Dovetail Plate located at the right back of the mount and a side to side adjustment located at the front of the mount.

⚠ DANGER

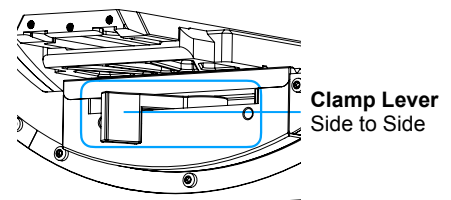
Ensure that the SRH-3 is switched OFF and that the Tilt Lock is locked.

Under no circumstances push fingers or limbs in between the moving parts of the SRH-3 as this can result in injury.

8.1 Centering the Quick Lock Camera Mount

NOTE

Make sure that the side to side adjustment is in a center position before you start with the balancing procedure. To move the Quick Lock Camera Mount left and right, the clamp lever at the front Quick Lock Camera Mount has to be open.

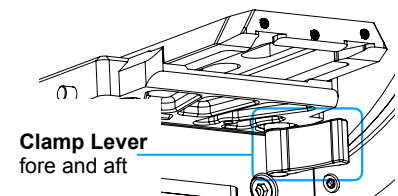


NOTE

Make sure that the clamp is tightened after the adjustment has been done.

8.2 Opening the Quick Lock Camera Mount

To open the Quick Lock Camera Mount clamp mechanism, open the clamp lever on the right side at the back of the Quick Lock Camera Mount.



After you opened the clamp mechanism you can slide in the camera dovetail plate inside the ring.

NOTE

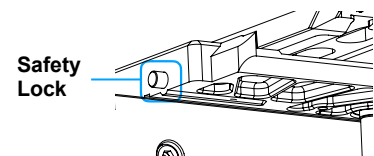
It may be necessary to detach some accessories to mount the camera inside the SRH-3 ring. These can be reattached after the camera is mounted.

NOTE

When adding or removing components from the camera, adjust the fore and aft to bring the camera into a neutral and horizontal position.

NOTE

To remove the camera dovetail plate, you will need to push the safety lock, to be able to release the plate.



NOTE

Make sure that the camera is always level front to back with the COG fully neutral when the camera is horizontally adjusting fore and aft.

NOTE

When adding or removing components from the camera adjust the fore and aft to bring the camera into a neutral and horizontal position.

9 Mounting the Camera

⚠ DANGER

Ensure that the SRH-3 is switched OFF and that the Tilt Lock is locked.

Under no circumstances push fingers or limbs in between the moving parts of the SRH-3 as this can result in injury.

9.1 Top Down Setup

NOTICE

To be able to do a 90° Top down shot, the camera needs to be mounted in a certain way into the ring.

The junction boxes of the ring need to point in the same direction as the lens.

NOTE

Ensure that the camera setup is rigid.
The top support bracket will also help to reduce unwanted vibrations.
Also a higher Drop compensation may be needed.



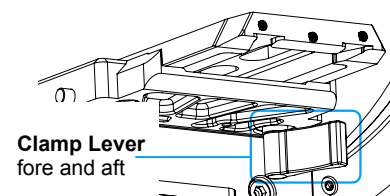
9.1 Fore and Aft Balance

NOTE

Unlock the Tilt lock mechanism.
To get the entire system in a neutral balance, the **COG** of the camera has to be positioned right in the center of the main ring.



The Quick Lock Camera Mount clamp mechanism allows you to adjust the **fore** and **aft** adjustments to move the camera into its COG (center of gravity).



⚠ CAUTION

Make sure that the clamp mechanism is fully tightened after the fore and aft adjustment. A slightly loose screw will produce vibrations.

9.2 Side to Side Balance

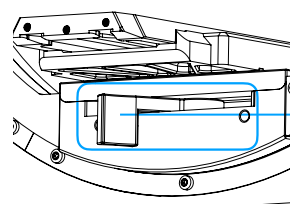
At the front of the QL mount, you will find the clamp mechanism for the side to side adjustment.



NOTE

You should always try to keep the camera setup as symmetrical as possible.

But if the camera is still too heavy on any side, you should use the side to side adjustment, to get the camera sidewise in perfect **COG**.



Clamp Lever
Side to Side

CAUTION

**Make sure that the clamp mechanism is fully tightened after the fore and aft adjustment.
A slightly loose screw will produce vibrations.**

10 Powering the SRH-3

10.1 Introduction

NOTICE

The entire system will only perform in the desired way, if adequate and recommended power cables, batteries and power supply are used.

⚠ CAUTION

The SRH-3 head itself needs to be powered through the 3pin socket with min. 24 Volt / 5 Amps and with 12V through the 4 pin XLR.

The power supply for the EUT, has to provide "SELV" and a short-circuit-proof „limited power source", according to EN 60950-1.

10.2 Batteries

Currently we recommending the following batteries:

Anton Bauer CINE VCLX www.antonbauer.com

Block Battery www.blockbattery.com

Cinepower Magnum 60 www.cinepower.com

BEBOB CUBE 1200 www.bebob.de



10.3 Power cables for the SRH-3 head:

SRH-3, Battery Power Cable, 12V/24V, 0.5m/1.64ft

K2.0019306



SRH-3 High Capacity Battery Power Cable 24V, 3pin XLR, 10m/33ft.

K2.0021427



SRH-3 High Capacity Battery Power Cable 12V, 4pin XLR, 10m/33ft.

K2.0021428



SRH-3 High Capacity Battery Power Cable 24V, 3pin XLR, 20m/66ft.

K2.0021429



SRH-3 High Capacity Battery Power Cable 12V, 4pin XLR, 20m/66ft.

K2.0021430



SRH-3, Main Power, Data Cable, 12V/24V, 20m/65.6ft

K2.0019303

Remote Control Power Cable:

12V Battery Power Cable, D-Tab, 4pin XLR, 1,5m/5ft.

K2.0021422



10.4

Camera power cables

Cam Power, Cine, 12V HiCap, XLR
 Cam Power, Cine, 12V HiCap, ALEXA
 Cam Power, Cine, 12V HiCap, MINI
 Cam Power, 12V, XLR
 Cam Power, 24V, ARRI
 Cam Power, Cine, 24V, ALEXA Mini

K2.0010470
 K2.0010538
 K2.0010540
 K2.0010469
 K2.0010471
 K2.0020467



Video cables

HD SDI, Video Cable, BNC

K2.0010476



Can Bus Cables

SRH-3, FS CAN Bus Cable, 10m/32.8ft
 SRH-3, FS CAN Bus Cable, 25m/82 ft
 SRH-3, FS CAN Bus Coupler, 0.2m/0.65ft

K2.0019302
 K2.0019301
 K2.0019300



Focus Power

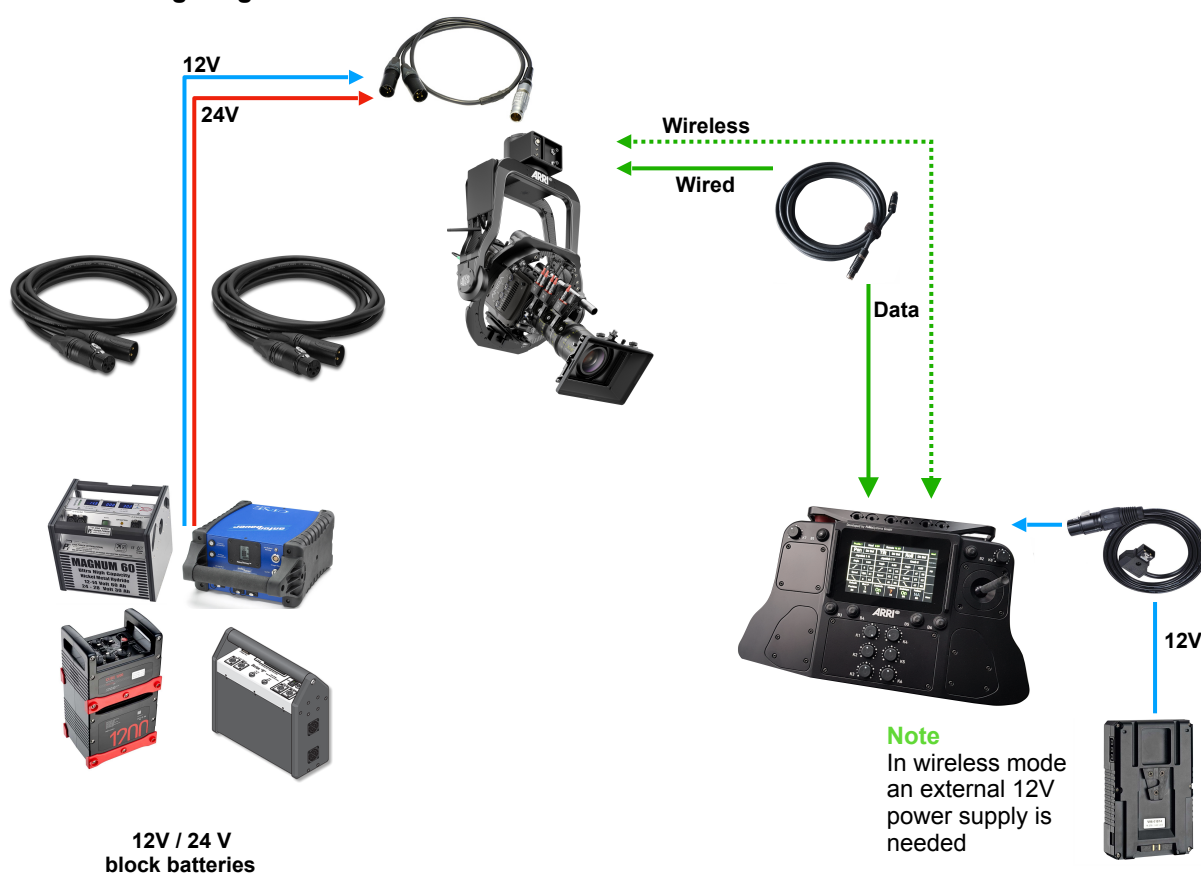
Focus Power, ARRI, 3pin Fischer RS

K2.0010548



10.5

Wiring Diagram



11 Dimensions

10.1 Head

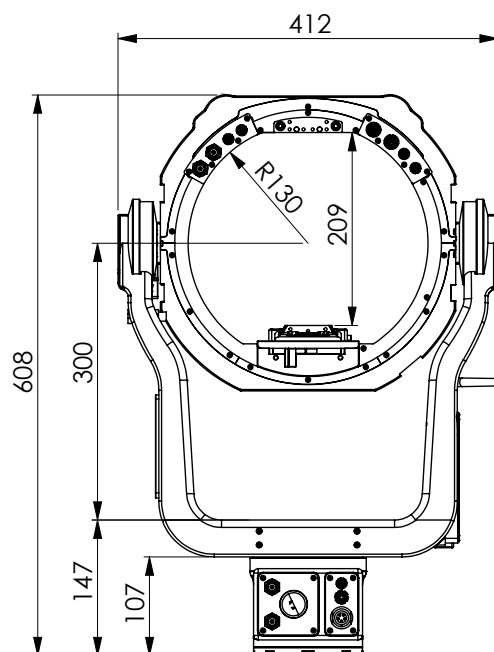
Stabilized Axis 3 (Pan, Tilt, Roll)
Max. Payload up to 30 Kg / 66 lbs.

Height 60,8 cm / 23,93"
Width 41,2 cm / 16,22"

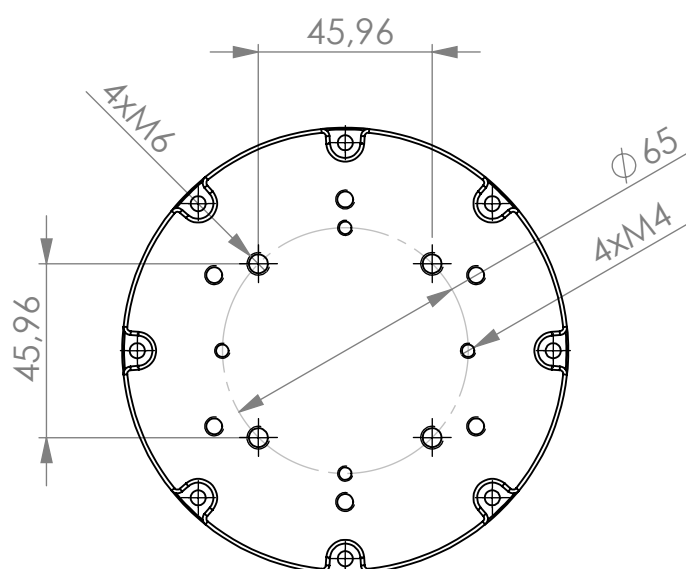
Depth Head 13 cm / 5.12"
Death Base 16,5 cm / 6,49"
Ring Diameter 26 cm / 10,23"
Ring Height centre 20,9 cm / 8,23"

Weight 9,0 Kg / 19.8 lbs.

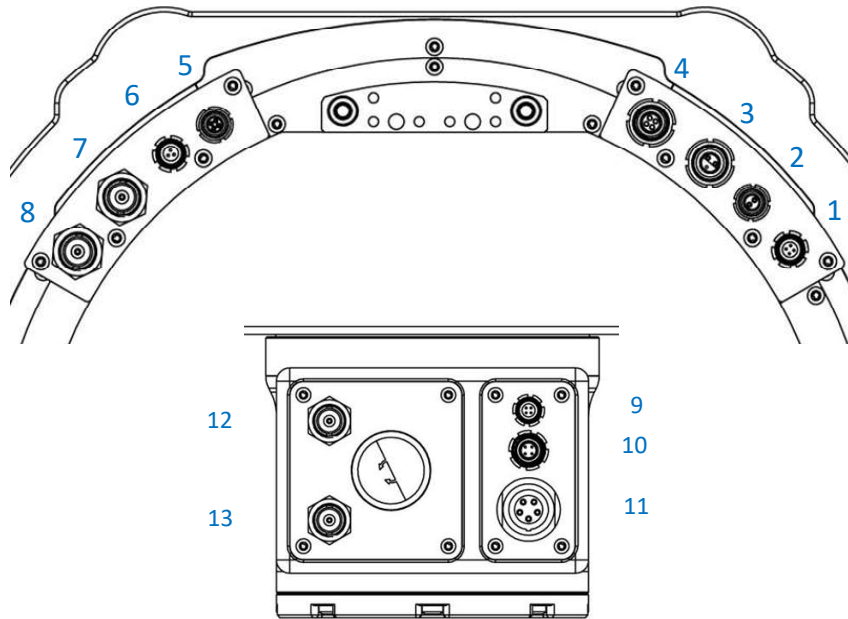
Max. Tilt Range + 60° / -110°
Max. Roll Range +/- 90°
Max. Pan Range 540° +/-270°
Max. Pan Rate 240° / Sec.
Max. Tilt Rate 240° / Sec.



10.2 Dimensions Baseplate

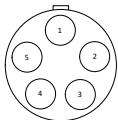


12 Pinout



12V/ 24V / FS-CAN IN
Lötseite Buchse

LEMO ECG.3B.305.CLL



1 = GND
2 = FOMA BUS Slow L
3 = FOMA BUS Slow H
4 = 12 V IN
5 = 24 V IN

11

FS-CAN
Lötseite Buchse

Fischer DBP 103 A053 - 140



1 = GND
2 = CAN1 L
3 = CAN2 H
4 = 12V OUT

10

FF-CAN
Lötseite Buchse

Fischer DBP 102 A053 - 140



1 = GND
2 = CAN1 L
3 = CAN2 H
4 = 12V

9

HD BNC 6G-SDI

AMPHENOL 112522



6, 7, 12, 13

FF-CAN: 4 POL
Lötseite Buchse

Fischer DBP 102 A053 - 140



1 = GND
2 = CAN1 L
3 = CAN2 H
4 = 12V

1

AUX Pwr 12V
Lötseite Buchse

LEMO ECG.0B.302.CLN



1 = GND
2 = 12V OUT

2

CAM PWR 12V/ 24V
Lötseite Buchse

LEMO ECP.1S.303.CLN



1 = 12V
2 = GND
3 = 24V

3

12V HiCap
Lötseite Buchse

LEMO ECG.1B.304.CLN



1 = 12V
2 = GND
3 = GND
4 = 12V

4

LBUS
Lötseite Buchse

LEMO ECG.0B.304.CLN



1 = GND
2 = CAN L
3 = 12V
4 = CAN H

5

RS 24V
Lötseite Buchse

FISCHER DGP 102 A052 - 130



1 = GND
2 = 12V/24V

6

13

EU-Declaration of Conformity

Brand Name: ARRI
 Product Description: Camera Stabilizer System:

- **ARRI Stabilized Remote Head SRH-3 Pro Set including ARRI Stabilized Remote Head – SRH-3 and ARRI Remote Control Panel – RCP-1**

+ Europe Setting for Software 01.14.00 or later and Antenna Proant 333 Ex-It 2400 Foldable, Accessories regarding Appendix I

The designated products conform to the specifications of the following European directives:

1. Directive 2014/53/EU of the European Parliament and the Council of 16 April 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of radio equipment - OJ L 153, 22 May 2014, p. 62–106
2. Directive 2011/65/EU of the European Parliament and the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment - OJ L 174, 1 July 2011, p. 88–110

The compliance with the requirements of the European Directives was proved by the application of the following standards:

Essential Requirements regarding No 1

- Art. 3.1 a following 2014/35/EU
 o EN 62368-1: 2014 + AC:2015-05 + AC:2015-11; EN 60950-1: 2006+A11:2009+A1:2010+A12:2011+AC2011+A2:2013 ; EN 62479 :2010
- Art. 3.1 b following 2014/30/EU
 o EN 301 489-1 V2.1.1; EN 301 489-17 V3.1.1; EN 61000-4-2:2009; EN 61000-4-3:2006 A1:2009 A2:2010 ; EN 55032: 2012, EN 55035 :2017
- Art. 3.2
 o EN 300 328 V2.1.1;
 Essential Requirements regarding No 2
 • EN 50581: 2012;

To evaluate the respective information, we used:

http://ec.europa.eu/growth/single-market/european-standards/harmonised-standards/index_en.htm

Year of affixed CE-marking: 2018

Munich 13.12.2018

Sign

Sign

Walter Trauninger
 Managing Director

Dr. Sebastian Lange
 Head of Quality Management

APENDIX-I

List of additional accessories:

Item	Model name
1	ARRI Digital Remote Wheels - DRW-1

13 Declaration of Conformity

Note: Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

FCC Compliance Statement

Class A Statement: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

Note: This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

- **ECS transceiver module:** FCC ID: Y7N-EMIP400

Industry Canada Compliance Statement

Complies with the Canadian ICES-003 Class A specifications.

Cet appareil numérique de la Classe A est conforme à la norme NMB-003 du Canada.

This device complies with RSS-210 of Industry Canada.

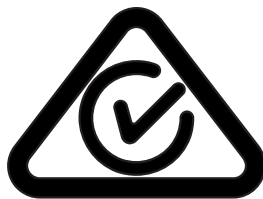
Cet appareil est conforme à CNR-210 d'Industrie Canada.

This Class A device meets all the requirements of the Canadian interference-causing equipment regulations

Cet appareil numérique de la Classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

- **ECS transceiver module:** IC ID: 9482A-EMIP400

Australia / New Zealand



China

- **ECS transceiver module:**

本设备包含型号核准代码（分别）为：

CMIIT ID: 2017DJ7865 (M)

CMIIT ID: 2017DJ7863 (M)

- **SRH-3 Pro Set**

本设备包含型号核准代码（分别）为：

CMIIT ID: 2018DP6608

... 的无线电发射模块。

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India

- **ECS transceiver module:** Certification no.: ETA-1386/2018/ERLO
ETA-1385/2018/ERLO

Japan

- **ECS transceiver module:** MIC-ID: 020-180029
020-180030



Taiwan

- **ECS transceiver module:** NCC: CCAH18LP0650TO
CCA18LP0660TO

低功率電波輻射性電機管理辦法

警語一

經型式認證合格之低功率射頻電機，非經許可，公司、商號或使用者均不得擅自變更頻率、加大功率或變更原設計之特性及功能。

(即低功率電波輻射性電機管理辦法第十二條)

The low-power radio-frequency devices must not be altered by changing the frequency, enhancing emission power, adding external antenna, and modification of original design characteristic as well as function.

警語二

低功率射頻電機之使用不得影響飛航安全及干擾合法通信；經發現有干擾現象時，應立即停用，並改善至無干擾時方得繼續使用。

前項合法通信，指依電信法規定作業之無線電通信。低功率射頻電機須忍受合法通信或工業、科學及醫療用電波輻射性電機設備之干擾。

(即低功率電波輻射性電機管理辦法第十四條)

The operation of the low-power radio-frequency devices is subject to the conditions that no harmful interference is caused. The user must stop operating the device immediately should harmful interference is caused and shall not resume until the condition causing the harmful interference has been corrected.

Moreover, the interference must be accepted that may be caused by the operation of an authorized communications, or ISM equipment.

Regarding §10(10) of Radio equipment directive 2014/53/EU, the wireless video module has restrictions in the following markets: Non