Stabilized Remote Head
SRH-3 SUP 2.2

Manual

Date 01.08.2019
Scope

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

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1 User Advisory / Application Requirements

The SRH-3 stabilized remote head and related 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 remote head will only correct for angular movement and not parallel movement. This means that when the remote head 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 remote head 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 remote head 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 MEMS sensors. Drift is normally measured in degrees per hour.

The SRH-3 remote head 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 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 remote head. 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 remote head may over compensate or shake and oscillate.

Please remember that what the remote head 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 leveling 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.

NOTE
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 stabilisation.
For your safety

<table>
<thead>
<tr>
<th>Warning</th>
</tr>
</thead>
</table>
| The SRH-3 stabilized remote head and related 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 stabilized remote head 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.

<table>
<thead>
<tr>
<th>NOTICE</th>
</tr>
</thead>
</table>
| The product is solely and exclusively available for commercial customers and shall be used by skilled personnel only. Every user should be trained according to ARRI guidelines. Use the product only for the purpose described in this document. Always follow the valid instructions and system requirements for all equipment involved.

2.1 Risk Levels and Alert Symbols

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

<table>
<thead>
<tr>
<th>DANGER</th>
</tr>
</thead>
</table>
| DANGER indicates an imminent hazardous situation which, if not avoided, will result in death or serious injury.

<table>
<thead>
<tr>
<th>Warning</th>
</tr>
</thead>
</table>
| WARNING indicates a potentially hazardous situation which, if not avoided, may result in death or serious injury.

<table>
<thead>
<tr>
<th>CAUTION</th>
</tr>
</thead>
</table>
| CAUTION indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

<table>
<thead>
<tr>
<th>NOTICE</th>
</tr>
</thead>
</table>
| NOTE explains practices not related to physical injury. No safety alert symbol appears with this signal word.

<table>
<thead>
<tr>
<th>NOTE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provides additional information to clarify or simplify a procedure.</td>
</tr>
</tbody>
</table>
2.2 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.

⚠️ CAUTION

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

3.1 Remote Head Front

- Pan axis
- Right junction box
- Tilt Lock
- Tilt motor
- Roll axis
- Side to Side adjustment

3.2 Remote Head Back

- Onboard computer
- Antenna
- Mount for top support
- Camera dovetail plate
- Emergency Shut OFF Switch
- Roll motor
- Tilt lock
- End stop
- Quick lock clamp
3.3 Remote Head Connectors

Right junction box

Left junction box

**CAUTION**

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

3.4 Remote Head Base Junction Box / Rear
4 Setup Remote Head

DANGER

Mounting the the SRH-3 stabilized remote head 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.

Step 1
Alignment for Top Down

NOTICE

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

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

Step 2
Home Position

CAUTION

Before powering up the remote head, align the home position indicator arrows as shown.

CAUTION

If you don’t align the home position, the performance of the remote head will be affected and the pan range will be reduced by more than 50%.

Step 3
Tilt Lock

DANGER

While the camera setup the Tilt Lock needs to be engaged!

Before powering up the remote head, the Tilt Lock must be disengaged!

An engaged Tilt Lock may cause damage by overheating the tilt motors.
5 Camera Setup / Balancing

Step 4

Camera Preparation

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 stabilized remote head.

Camera Dovetail Plates

We highly recommend to use the so called Stabilizer Adapter Mount plates: SAM-1, SAM-2, SAM-3 or the SAM-4.

<table>
<thead>
<tr>
<th>Model</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAM-1 Stabilizer Adapter Mount for ALEXA</td>
<td>€125</td>
</tr>
<tr>
<td>SAM-2 Stabilizer Adapter Mount for ALEXA Mini</td>
<td>€195</td>
</tr>
<tr>
<td>SAM-3 Stabilizer Adapter Mount for AMIRA</td>
<td>€350</td>
</tr>
</tbody>
</table>

Step 5

Mounting Camera Dovetail Plate

Open the clamp lever to insert the camera dovetail plate.

Push the safety lock to remove the camera dovetail plate.
Step 6

Fore and Aft Balance

Unlock the tilt lock mechanism first.

Open the clamp lever to move the dovetail plate forward or backward.

Move the camera forwards or backwards until the camera remains in a horizontal position.

**NOTE**
When adding or removing components, the camera position must be readjusted.
Move the camera forwards or backwards until the camera remains in a horizontal position.

Step 7

Side to Side Balance

Open the clamp lever at the front.

Move the camera left or right until the camera remains in a horizontal position.
6 Powering the remote head

⚠️ CAUTION

To perform in the desired way, the stabilized remote head requires at least min. 24V / 5A over the 3pin XLR plug and min. 12V / 5A via the 4pin XLR plug.

Use only suitable and recommended power cables, batteries, and power adapters.

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

Batteries (Recommended)

BEBOB CUBE 1200  https://www.bebob.de
Anton Bauer CINE VCLX  https://www.antonbauer.com
Block Battery  https://www.blockbattery.com
Cinepower Magnum 60  https://www.cinepower.com

Step 8

Wiring Diagram

- **12V**
  - 24V
  - K2.0019306
- **K2.0021428**
- **K2.0021427**
- **K2.0021429**
- **K2.0019300**
- **K2.0019301**
- **K2.0019302**
- **K2.0033762**
- **K0.0024195**
- **K0.0024196**
- **K2.0021422**
- **K2.0021430**
- **K2.0021427**
- **K2.0021429**
- **K2.0021428**
- **K2.0021427**
- **K2.0021429**
- **K0.0024195**
- **K0.0024196**
- **K2.0021422**

Note

In wireless mode an external 12V power supply is needed for the remote control.
7 Remote Control

7.1 Functions on the top

- Emergency Shut Off Switch
- Assignable Button B1
- Assignable Knob K7
- Touch Panel
- Cover (optional module)
- Buttons B3 / B4
- Cover (optional module)
- Assignable Knobs K1 / K2 / K3

**CAUTION**
Never use the remote control without an antenna. Otherwise, you may damage the radio amplifier.

7.2 Functions on the rear

- Main Pwr On/Off
- 12V Pwr In
- FS Can Bus
- 12V Pwr Out
- RC Data
- Mini USB
- Emergency Shut Off Switch
- Antenna

7.3 Functions on the right and left side

- LBUS In
- ARRI Mounting Rosettes
8  SRH-3 Remote Control / GUI (Graphical User Interface)
Step 9
Connect the remote control hardwired with the remote head

Step 10
Emergency Shut Off

NOTE
To release the Emergency Shut Off Switch, carefully turn the red knob to the left.

CAUTION
Do not pull the Emergency Shut Off knob! This may damage the knob!

Step 11
Mounting Position
Once the remote control is connected to the remote head, the display will ask for the position of the remote head.
9 PID / Quick Setup

Step 12
Camera Weight Preselection

To make setting the PID values as easy as possible, the user can select a light or heavy camera preset from the submenu.

Touch PID         Touch Default             Select preset

NOTE
Low stands for a camera weight of 5 kg - 10 kg, which is used in a low dynamic setup. High stands for a camera weight of 10 kg - 20 kg and more, which is used in a high dynamic setup.

Step 13
PID Setup Fine Trim

NOTE
Start with a solid camera setup

1 Set Ramp to ZERO on the Joystick (Pan & Tilt) (K4 & K5)

2 Adjusting the Power value for Tilt first.

By physical selecting the lens, try move the Tilt axis down and check if the camera slipping.

3 If the Tilt axis slips, you must increase the Power for the Tilt axis.

NOTE
When the remote head starts to vibrate, reduce the power value!

4 Once the Tilt Power value meets your expectations, the same Power value will be used for the Pan axis as well. Press Save!

5 Adjusting the PID values:

NOTE
First, you need a camera picture.

6 Choose a fixed point in the set.

7 Use the joystick to pan and stop the remote head at the selected point in the set.
8 Check if the camera:
• stops at the selected point
• whether the camera exceeds the point
• whether the camera is bouncing left and right

9 If the camera exceeds the desired point, increase the P and D values in increments of five.

NOTE
The D value must be min. 5 steps higher than the P value.

NOTE
When the remote head starts to vibrate, reduce the P value!

10 If the remote head bounces to the left and right when you reach the desired point, you must slowly increase the D value of the Pan axis.

11 Once the PID value of the Pan axis meets your expectations, the same PID value will be used for the Tilt axis as well.

Press Save!

---

Step 14

12 Drop

At very steep angles, the weight distribution of the camera setup changes extremely.

The Drop setting permanently balances the Pan and Tilt values as the camera angle gets steeper and steeper.

Slowly move the camera to the 90° top-down position.

As the remote head begins to vibrate, slowly increase the Drop value until the remote head stops vibrating.

NOTE
Without any Drop compensation, strong vibrations occur at steep angles.

---

NOTICE

It is important to understand and to accept that all necessary steps, such as setting up the camera, attaching the remote head to the crane, the quality of the crane itself and the PID settings, must be taken into account and properly performed. If only one step is missing, the desired overall system performance can not be achieved.
Controls Setup

10.1 Changing Profiles

Selecting Profile opens a new window where another profile can be selected.

Each time changes are confirmed with Save or OK, the changes are saved in the selected profile.

10.2 Auto Assignment

For a fast and easy setup, this menu will show up, as soon the DRW-1 or DEH-1 is connected to the remote control.

**NOTE**
Press Cancel if DRW-1 or DEH-1 has already been assigned and values have already been set.
Press OK to overwrite your last values.

The Auto Assignment function can be deactivated in the settings for the remote control.

10.3 Manual Assignment

Touch the field below Pan and select the desired controller in the submenu.

### Available controllers

<table>
<thead>
<tr>
<th>Controller</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>J1 V</td>
<td>Joystick 1 V, up/down</td>
</tr>
<tr>
<td>J1 H</td>
<td>Joystick 1 H, left/right</td>
</tr>
<tr>
<td>J2 V</td>
<td>Joystick 2 V, up/down</td>
</tr>
<tr>
<td>J2 H</td>
<td>Joystick 2 H, left/right</td>
</tr>
<tr>
<td>DRWP</td>
<td>DRW-1 Pan, ARRI Wheels, Pan</td>
</tr>
<tr>
<td>DRWT</td>
<td>DRW-1 Tilt, ARRI Wheels, Tilt</td>
</tr>
<tr>
<td>DRWR</td>
<td>DRW-1 Roll, ARRI Wheels, Roll</td>
</tr>
<tr>
<td>V R</td>
<td>VCW Roll, PLC VC Wheels, Roll</td>
</tr>
<tr>
<td>V T</td>
<td>VCW Tilt, PLC VC Wheels, Tilt</td>
</tr>
<tr>
<td>V P</td>
<td>VCW Pan, PLC VC Wheels, Pan</td>
</tr>
<tr>
<td>DEHP</td>
<td>DEH-1 Pan, DEH-1, ARRI Encoder Head, Pan</td>
</tr>
<tr>
<td>DEHT</td>
<td>DEH-1 Tilt, DEH-1, ARRI Encoder Head, Tilt</td>
</tr>
<tr>
<td>TS</td>
<td>Touchscreen, Control through the Touchscreen of the Remote Control</td>
</tr>
<tr>
<td>K1 ... K8</td>
<td>Knob 1 ... Knob 8, Knobs</td>
</tr>
<tr>
<td>B1 ... B6</td>
<td>Button 1 ... Button 6, Buttons</td>
</tr>
<tr>
<td>V SR</td>
<td>VCW Speed Roll, PLC VCW, Speed Roll Poti</td>
</tr>
<tr>
<td>V ST</td>
<td>VCW Speed Tilt, PLC VCW, Speed Tilt Poti</td>
</tr>
<tr>
<td>V SP</td>
<td>VCW Speed Pan, PLC VCW, Speed Pan Poti</td>
</tr>
<tr>
<td>V DR</td>
<td>VCW Direction Roll, PLC VCW, Direction Roll Switch</td>
</tr>
<tr>
<td>V DT</td>
<td>VCW Direction Tilt, PLC VCW, Direction Tilt Switch</td>
</tr>
<tr>
<td>V DP</td>
<td>VCW Direction Pan, PLC VCW, Direction Pan Switch</td>
</tr>
</tbody>
</table>
10.4 Changing Direction

This field indicates the selected direction of the assigned controller.

Selecting Dir will open the Direction submenu. Selecting the field in the middle toggles between Standard and Reverse.

10.5 Speed (K1, K2, K3)

The selected speed is displayed on the home screen.

10.6 Ramp (K4, K5, K6)

The selected ramp is displayed on the home screen.

10.7 Default Position Button / Home

This function moves the remote head back to its predefined starting position. By default, this function is assigned to button B3.

10.8 True Horizon (Page 24)

The True Horizon function, moves the roll axis back to the horizontal position. By default, this function is assigned to button B4.

10.9 Endstop On/Off (Page 22)

Indicates whether Endstops / Limits are active or not. By default, this function is assigned to button B5.

10.10 Follow On/Off (Page 23)

Indicates if the Follow Mode is active or not. By default, this function is assigned to button B6.
11 Additional Controls Setup

- Deadband
- Sensitivity
- Ramp Mode
- Filter
- Ratio

11.1 Deadband

This value determines when the remote head responds after the control device (joystick) has been moved.

**NOTE**
If the DRW-1 wheels or the DEH-1 encoder head is used as a controller, Deadband must be set to 0! Otherwise there would be a delay in response!

11.2 Sensitivity Submenu

All three parameters are related to each other. If the speed is adjusted to a value below 50, keep the ramp value as low as possible. If the value is too high, there will be more or less no movement in the end.

**NOTE**
If the DRW-1 wheels or the DEH-1 encoder head is used as a controller, Sensitivity must be set to 0! Otherwise there would be a delay in response!
11.3  
**Ramp Mode / Dynamic or Constant**

Selecting the field toggles between **Dynamic** ramp and **Constant** ramp.

**Constant Ramp** (preset) will keep the adjusted ramp, regardless of the speed values.

**Dynamic Ramp**  
The dynamic ramp can only be used when the controller is used in Speed Mode, like the joystick.

**Dynamic Ramp** is directly related the selected tilt and pan speed.

**Higher speed** will produce a **slower** and more **flat** ramp.

**Lower speed** will produce a **faster** and **steeper** ramp.

11.4  
**Filter**

Additional low pass filter function for encoder based controllers, like the DEH-1.  
When the DEH-1 is used in a car or a train, vibrations of the vehicle may be transmitted to the DEH-1’s encoders.

This can lead to irritations in the pan and tilt axis.  
In case of such irritations, the operator can use the **Filter** function to set a low-pass filter value, which allows to **eliminate** these disturbing vibrations.

**NOTE**  
A too high filter value may cause a **delay** in response.

11.5  
**Ratio**

Selecting **Ratio** will open a new touchscreen display where you can select the required **Speed Ratio** of the selected axis (Pan / Tilt / Roll).

**NOTE**  
When shooting with a extreme tele lens, it can be very helpful to change the speed ratio from 0 (1:1) to -30.  
This will reduce the speed development to -30%.

**NOTE**  
Refer to the **specific manuals** when using the DRW-1 wheels or the DEH-1 encoder head.
12 Remote Head Setup

- Pan Motor On/Off
- Motor Mode
- Endstops / Limits
- Follow / Pan Lock
- True Horizon
- High Dynamic Mode
- Mounting Position

12.1 Pan Motor On/Off

Selecting Motor On/Off will toggle between Pan motor On and Off.

12.2 Mode

In the Motor Mode column, the motors can be set for Speed or Angle mode.

**NOTE**
If you use the internal Joystick the Pan and Tilt motors should be set to Speed mode.

**NOTE**
If you use DRW-1 wheels or the DEH-1 encoder head, the Pan and Tilt motors should be set to Angle mode.

12.3 Endstops / Limits

In the Endstops menu you can define start and end positions for each axis and activate or deactivate them individually.

**Angle Display**
The angle column indicates the current position of single axes, measured as angles.

The Set Left / Top / Min selection opens a new touchscreen display with a slider that allows the operator to adjust the position of the left end stop, measured as an angle, for each axis individually.

The Set Right / Top / Min selection opens a new touchscreen display with a slider that allows the operator to adjust the position of the right end stop, measured as an angle, for each axis individually.
12.4 Follow / Pan Lock

The Follow mode allows the horizontal Pan and the vertical Tilt movement of the remote head to be synchronised with the horizontal Pan and the vertical Tilt movement of the crane. This function is also called Pan Lock.

Selecting Follow will open a new submenu.

The Follow Mode menu will control the Speed, Deadband and Ramp of the Follow mode individually for each axis.

**NOTE**
In general, the Follow function can be used to lock a selected axis by activating the Follow function and setting the speed for the selected axis to 100.

The Deadband slider should be set to 0 and the Ramp slider set to 0.

**Follow Speed**

The Follow Speed selection will open a new menu with a slider to allow the operator to set the speed of the follow function individually for each axis.

**NOTE**
The minimum speed should be 100 to enable the Pan Lock.

**Follow Deadband**

The Follow Deadband selection opens a new menu with a slider that allows you to set the Deadband of the Follow function for each axis individually.

**NOTE**
The Deadband should be 0 to max 30 to enable the Pan Lock.

**Follow Ramp**

The Follow Ramp selection opens a new menu with a slider that allows you to set the Ramp of the Follow function for each axis individually.

**NOTE**
The Ramp should be 0 to enable the Pan Lock.
12.5 True Horizon

Sometimes the composition of the frame requires manually adjusted horizon and an easy way to get the Roll axis back to the physical Zero position. This is especially important when using wheels, or for fast movements. The True Horizon function allows to move the head back into the Zero position just by Selecting the assigned button B4.

12.6 High Dynamic Mode

If the remote head is used under extreme centrifugal circumstances, you can increase the overall stabilization by activating the so-called High Dynamic Mode.

Selecting High Dynamic mode will activate the high dynamic mode.

<table>
<thead>
<tr>
<th>Notice</th>
</tr>
</thead>
<tbody>
<tr>
<td>The activation of the High Dynamic mode takes 5 - 10 seconds.</td>
</tr>
<tr>
<td>Do not move your head until the activation of the High Dynamic mode is complete.</td>
</tr>
</tbody>
</table>

12.7 Mounting Position

If necessary, the Mounting Position can also be selected manually.

12.8 Slider

Selecting the Slider will open the Slider home screen.

NOTE

Since this is a very special application, the setup will be covered in a separate manual.
13 Wireless Setup

13.1 Introduction

The SRH-3 remote head and remote control can communicate with each other in two ways:

1. The build-in 2.4 GHz wireless radio system using the so-called white-radio module EMIP400.

This radio module offers 14 channels and transmits on a fixed single channel, which is set to channel 13 as a preset.

2. External Radio Modules ERM-2400 and ERM-900

By connecting the external radio modules ERM-2400 and ERM-900 via the FS-CAN Bus cable to the remote control and the remote head, the modules will change after an initial setup automatically into transmitter and receiver mode. The FS-CAN Bus cable provides data and the needed power to the external radio modules.

ERM-2400 Ext. Radio Module 2.4 GHz RXD-TXD Set K2.0033757
ERM-900 Ext. Radio Module 900 MHz RXD-TXD Set K2.0033758

NOTE Please read the separate manual of the ERM modules.

NOTE The SRH-3 remote head and remote control will be delivered into your region with the required region settings and a deactivated radio module.

Step 1

13.2 Activating the build-in 2.4 GHz radio module

Notice

To activate or to change the built-in radio module and related settings, the remote control panel and the remote head must be connected via the FS Can Bus cable.
Step 2

Select **Menu** then select **Settings** then select **Radio**.

Step 3

Select **Internal Radio** to activate the internal radio module.

Step 4

Selecting **Mode** will toggle between radio **On** and radio **Off**.

**NOTE**
Once the radio module is activated, it is set to **channel 13** (factory preset).

Step 5

Changing the Region

**NOTICE**
Make sure that you select the proper area you are operating the device in. All available region settings comply with Part 15 of the FCC rules.

To change the regional settings, touch **Region** and enter the region code shown below.

<table>
<thead>
<tr>
<th>Region Code</th>
<th>Country</th>
<th>Region Code</th>
<th>Country</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Japan</td>
<td>6</td>
<td>Canada</td>
</tr>
<tr>
<td>1</td>
<td>Europe</td>
<td>7</td>
<td>China</td>
</tr>
<tr>
<td>2</td>
<td>USA</td>
<td>8</td>
<td>Egypt</td>
</tr>
<tr>
<td>3</td>
<td>South Korea</td>
<td>9</td>
<td>Hong Kong</td>
</tr>
<tr>
<td>4</td>
<td>World</td>
<td>10</td>
<td>India</td>
</tr>
<tr>
<td>5</td>
<td>Australia</td>
<td>11</td>
<td>Israel</td>
</tr>
<tr>
<td>12</td>
<td>New Zealand</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Philippines</td>
<td>14</td>
<td>Russia</td>
</tr>
<tr>
<td>15</td>
<td>Singapore</td>
<td>16</td>
<td>South Africa</td>
</tr>
<tr>
<td>17</td>
<td>Taiwan</td>
<td>18</td>
<td>South Africa</td>
</tr>
<tr>
<td>19</td>
<td>Thailand</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**NOTICE**
Wireless region settings specify where the wireless function can be used in compliance with local regulations. It may be illegal to use the wireless function in a region other than specified in the setting. Please ensure that the region is configured correctly, e.g. when traveling.
Step 6

Selecting Channels

Each time the Channel is touched, the next highest channel is selected.

Available Channels

The blue channels are the existing channels of the EMIP300 radio module, used by the WCU-4.

The green channels are new additional channels of the EMIP400.

The additional new channels are placed between the existing EMIP300 channels.

NOTE

Make sure that the selected frequencies are not too close together to avoid interference between the SRH-3 remote control and the WCU-4.

Not available channels

If one of the selected channels is already being used by another wireless device on set, the selected channel will be displayed as blocked.

13.3
Range

NOTICE

The quality and range of the radio connection strongly depends on the general radio situation on site.

1. Make sure that you select the correct region in which you operate the device.
2. Avoid multiple products that use the same frequency or the same channel in the 2.4 GHz bandwidth.
3. Start first those devices that use fixed frequencies. Then devices that work with channel hopping.
4. WiFi transmitters, receivers or networks can strongly influence the quality of the 2.4 GHz connection.
5. Ask your staff to turn off the "hotspot" function in their mobile phones.
6. Disable unnecessary, unused WiFi systems, such as routers for example.
7. Especially non-certified or illegal radio systems, can affect the range of the wireless connection extremely.
8. Disable all illegal radio systems.
14 Focus - Iris - Zoom / FIZ

14.1 Introduction

Using the optional internal focus wheel or the internal zoom rocker or LBUS-based controls such as Master Grips Focus and Zoom or the OCU-1 allows you to control the cforce mini motors or selected broadcast lenses via the LCUBE CUB-2.

Step 1

Assigning Focus, Iris and Zoom

The FIZ home screen can be reached by Selecting FIZ in the Home Screen.

Assigning Focus and Zoom

The FIZ home screen allows to assign the wanted controllers by Selecting the marked areas.

Selecting the marked area will open a new touchscreen display menu, where the desired controllers can be selected and assigned.

Step 2

Available Controllers

| IFW1 | Focus Wheel 1 | Internal Focus Wheel 1 |
| IFW2 | Focus Wheel 2 | Internal Focus Wheel 2 |
| IZR1 | Zoom Rocker 1 | Internal Zoom Rocker 1 |
| IZR2 | Zoom Rocker 2 | Internal Zoom Rocker 2 |
| MLW | Left Wheel | Master Grip Left Focus Wheel |
| MRW | Right Wheel | Master Grip Right Focus Wheel |
| MLR | Left Rocker | Master Grip Left Zoom Rocker |
| MRR | Right Rocker | Master Grip Right Zoom Rocker |
| MLRB | MLR Button | Master Grip Left Rocker, Red Button |
| MRRB | MRR Button | Master Grip Right Rocker, Red Button |
| MLWB | MLW Button | Master Grip Left Wheel, Red Button |
| MRWB | MRW Button | Master Grip Right Wheel, Red Button |
| OCU | OCU-1 | OCU Focus Wheel |
| VF | VCW Focus | PLC VCW, Focus Knob |
| VI | VCW Iris | PLC VCW, Iris Knob |
| VZ | VCW Zoom | PLC VCW, Zoom Knob |

Step 3

To unassign a selected controller, touch Unassign.

NOTE

After a controller was unassigned, the function will be only available through the touchscreen.
14.2
FIZ Controllers Adjustments

- Calibration
- Torque
- Mode
- Speed

Select Menu  Select FIZ

14.3
Calibration

By Selecting Calibrate, every single cforce mini motor will be calibrated.

**NOTE**
Green indicates that the motor is calibrated. Red means that the motor needs to be calibrated.

**NOTE**
When using the LCUBE CUB-2 and Broadcast lenses, calibration is not required.

14.4
Torque

Torque selection opens a new touch screen display with a slider that adjusts the torque required for the selected lens motor.

14.5
Mode

In the Motor Mode column, the motors can be adjusted from Position to Speed mode.

**NOTE**
Focus Wheel should be set to Position.
Iris Slider should be set to Position.
Zoom Rocker should be set to Speed.

Selecting the marked area will toggle between Position and Speed.
14.6 Speed (FIZ motor in Speed Mode)

**NOTE**
In general, the speed of FIZ motors can only be adjusted while the motor is operating in **Speed mode**.

For example, to adjust the speed of the **Zoom** motor touch: **Menu - FIZ**

Selecting **Speed** selection will open a new touchscreen display with a slider to allow the operator to set the needed **Speed** for the selected lens motor.

14.7 Speed (FIZ motors in Position Mode)

**NOTE**
In **Position** mode, the speed cannot be changed in general.

Alternatively, you can change the **Ratio** between the controller and the **Focus** motor.

**For example**
To cover the entire focus area of a broadcast lens with the OCU-1, set the **Ratio** for a 1:1 rotation of the OCU-1 and lens 360° to +20.

14.8 Fine trimming the FIZ controller

In addition to speed and ratio, the following parameters can also be set: **Deadband**, **Sensitivity**, **Ramp** and **Ramp Mode**.

Selecting **Position** will open a sub menu for each controller.

**NOTE**
To ensure direct response of the FIZ controller ensure that:
- Deadband set to 0 or max 3
- Ramp Start set to 0 or max 4
- Ramp Stop set to 0 or max 4
- Ramp Mode set to **Constant**
15  
Info / Service

15.1  
Info Menu Remote / Head

Selecting Remote will provide information about the Mainboard, LBUS, and Expander.

The Mainboard Info Screen will show the actual SUP version.

The LBUS Info Screen will show the actual SUP version of the connected LBUS controller.

The Expander Info Screen will show the actual SUP version of the connected Expanders, like the Joystick or the internal Focus and Zoom controllers.

Selecting Head will provide information about the Mainboard, LBUS, and Expander for the remote head.

15.2  
Service / Remote Control

Selecting Service opens a new submenu. The service menu allows you to restore the factory defaults of the remote control and remote control head and to calibrate the sensors and the internal joystick.

If Factory Defaults is selected, all user profiles will be reset to the factory defaults.

NOTE
All settings will be deleted!

Selecting Current Profile will only restore the currently selected profile.
15.3 Joystick Calibration

Selecting **Calibrate** Joystick 1 opens a new submenu in which the **internal joystick** can be calibrated.

15.4 Service / Remote head

Selecting **Head** will open the head service menu.

If **Factory Defaults** is selected, all memory settings in the remote head will be reset to factory defaults.

**NOTE**

Don’t worry - your settings are all retained.

15.5 Sensor Calibration

Selecting **Sensor Calibration** opens a new submenu in which the sensors of the remote head can be calibrated.

**NOTICE**

If the remote head has been transported to a distant location since the last Sensor Calibration, it is recommended to perform a sensor calibration.

**NOTICE**

Since the motors are switched off during the sensor calibration, it may be that the camera tilts over the tilt axis.

Please secure the camera.
16 Profile Management

16.1 Selecting Profiles

During use, all values, assignments and settings are permanently written to the selected profile. In this case in Profile 1.

Selecting Profile opens a new window where another profile can be selected.

16.2 Startup Settings

To ensure that the remote head works properly when it is switched on even when the remote control is not connected, you can save the current profile in the remote head.

In this way, the remote head starts with working PID values and LBUS settings until the remote control is connected.

Selecting Startup Settings Apply will save the actual profile in the remote head.

16.3 Profiles Backup

As a backup all nine profiles of the remote control can be stored in the remote head.

If the remote control needs to be swapped, you can write your existing profiles back to the new remote control.

Selecting Save Settings to Head will save the all profiles in the remote head.

Selecting Read Settings from Head will write back all profiles in the remote control.
17  **Power Disconnection**

**CAUTION**

To disconnect the device safely from the power source, remove both cables from the SRH-3 remote control. Mount and operate the device in an orientation to ensure easy access to the connectors.

18  **Dimensions**

18.1  **Remote Head**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stabilized Axis</td>
<td>3 (Pan, Tilt, Roll)</td>
</tr>
<tr>
<td>Max. Payload</td>
<td>up to 30 Kg / 66 lbs.</td>
</tr>
<tr>
<td>Height</td>
<td>60,8 cm / 23.93”</td>
</tr>
<tr>
<td>Width</td>
<td>41,2 cm / 16.22”</td>
</tr>
<tr>
<td>Depth Head</td>
<td>13 cm / 5.12”</td>
</tr>
<tr>
<td>Death Base</td>
<td>16,5 cm / 6.49”</td>
</tr>
<tr>
<td>Ring Diameter</td>
<td>26 cm / 10.23”</td>
</tr>
<tr>
<td>Ring Height centre</td>
<td>20,9 cm / 8.23”</td>
</tr>
<tr>
<td>Weight</td>
<td>9.0 Kg / 19.8 lbs.</td>
</tr>
</tbody>
</table>

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

18.2  **Dimensions Baseplate**

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Pinout Remote Head / Remote Control

12V/24V / FS-CAN IN
- Fischer DBP 103 A053 - 140
  1 = GND
  2 = CAN L
  3 = CAN2 H
  4 = 12V OUT

FS-CAN
- Fischer DBP 102 A051 - 140
  1 = GND
  2 = CAN L
  3 = CAN2 H
  4 = 12V

FF-CAN
- Fischer DBP 102 A053 - 140
  1 = GND
  2 = CAN L
  3 = CAN2 H
  4 = 12V

HD BNC 6G-SDI
- AMPHENOL 112522
  6, 7, 12, 13

FF-CAN: 4 POL
- Fischer DBP 102 A053 - 140
  1 = GND
  2 = CAN1 L
  3 = CAN2 H
  4 = 12V

AUX Pwr 12V
- LEMO ECG.08.302.CLN
  1 = GND
  2 = 12V OUT

CAM PWR 12V/ 24V
- LEMO ECG.08.304.CLN
  1 = 12V
  2 = GND
  3 = 24V

12V HiCap
- LEMO ECG.1B.304.CLN
  1 = 12V
  2 = GND
  3 = 12V
  4 = 12V

LIBUS
- LEMO ECG.08.304.CLN
  1 = GND
  2 = CAN L
  3 = 12V
  4 = CAN H

RS 24V
- FISCHER DGP 102 A052 - 130
  1 = GND
  2 = 12V/24V
## Assignable Controllers and Functions

<table>
<thead>
<tr>
<th>ID</th>
<th>Description</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>J1 V</td>
<td>Joystick 1 V</td>
<td>Joystick 1, up/down</td>
</tr>
<tr>
<td>J1 H</td>
<td>Joystick 1 H</td>
<td>Joystick 1, left/right</td>
</tr>
<tr>
<td>J2 V</td>
<td>Joystick 2 V</td>
<td>Joystick 2, up/down</td>
</tr>
<tr>
<td>J2 H</td>
<td>Joystick 2 H</td>
<td>Joystick 2, left/right</td>
</tr>
<tr>
<td>DRWP</td>
<td>DRW Pan</td>
<td>DRW-1, ARRI Wheels, Pan</td>
</tr>
<tr>
<td>DRWT</td>
<td>DRW Tilt</td>
<td>DRW-1, ARRI Wheels, Tilt</td>
</tr>
<tr>
<td>DRWR</td>
<td>DRW Roll</td>
<td>DRW-1, ARRI Wheels, Roll</td>
</tr>
<tr>
<td>V R</td>
<td>VCW Roll</td>
<td>PLC VCW Wheels, Roll</td>
</tr>
<tr>
<td>V T</td>
<td>VCW Tilt</td>
<td>PLC VCW Wheels, Tilt</td>
</tr>
<tr>
<td>V P</td>
<td>VCW Pan</td>
<td>PLC VCW Wheels, Pan</td>
</tr>
<tr>
<td>DEHP</td>
<td>DEH Pan</td>
<td>DEH-1, ARRI Encoder Head, Pan</td>
</tr>
<tr>
<td>DEHT</td>
<td>DEH Tilt</td>
<td>DEH-1, ARRI Encoder Head, Tilt</td>
</tr>
<tr>
<td>TS</td>
<td>Touchscreen</td>
<td>Control through RCP</td>
</tr>
<tr>
<td>K1 ... K8</td>
<td>Knob 1 ... Knob 8</td>
<td>Knobs</td>
</tr>
<tr>
<td>B1 ... B6</td>
<td>Button 1 ... Button 6</td>
<td>Buttons</td>
</tr>
<tr>
<td>V SR</td>
<td>VCW Speed Roll</td>
<td>PLC VCW, Speed Roll Poti</td>
</tr>
<tr>
<td>V ST</td>
<td>VCW Speed Tilt</td>
<td>PLC VCW, Speed Tilt Poti</td>
</tr>
<tr>
<td>V SP</td>
<td>VCW Speed Pan</td>
<td>PLC VCW, Speed Pan Poti</td>
</tr>
<tr>
<td>V DR</td>
<td>VCW Direction Roll</td>
<td>PLC VCW, Direction Roll Switch</td>
</tr>
<tr>
<td>V DT</td>
<td>VCW Direction Tilt</td>
<td>PLC VCW, Direction Tilt Switch</td>
</tr>
<tr>
<td>V DP</td>
<td>VCW Direction Pan</td>
<td>PLC VCW, Direction Pan Switch</td>
</tr>
<tr>
<td>V A1</td>
<td>VCW Aux1</td>
<td>PLC VCW, Aux1 Switch</td>
</tr>
<tr>
<td>V A2</td>
<td>VCW Aux2</td>
<td>PLC VCW, Aux2 Switch</td>
</tr>
<tr>
<td>V C</td>
<td>VCW Camera</td>
<td>PLC VCW, Camera Switch</td>
</tr>
<tr>
<td>IFW1</td>
<td>Focus Wheel 1</td>
<td>Wheel 1</td>
</tr>
<tr>
<td>IFW2</td>
<td>Focus Wheel 2</td>
<td>Wheel 2</td>
</tr>
<tr>
<td>IZR1</td>
<td>Zoom Rocker 1</td>
<td>Rocker 1</td>
</tr>
<tr>
<td>IZR2</td>
<td>Zoom Rocker 2</td>
<td>Rocker 2</td>
</tr>
<tr>
<td>MLW</td>
<td>Left Wheel</td>
<td>Master Grip Left Focus Wheel</td>
</tr>
<tr>
<td>MRW</td>
<td>Right Wheel</td>
<td>Master Grip Right Focus Wheel</td>
</tr>
<tr>
<td>MLR</td>
<td>Left Rocker</td>
<td>Master Grip Left Zoom Rocker</td>
</tr>
<tr>
<td>MRR</td>
<td>Right Rocker</td>
<td>Master Grip Right Zoom Rocker</td>
</tr>
<tr>
<td>MLRB</td>
<td>MLR Button</td>
<td>Master Grip Left Rocker, Red Button</td>
</tr>
<tr>
<td>MRRB</td>
<td>MRR Button</td>
<td>Master Grip Right Rocker, Red Button</td>
</tr>
<tr>
<td>MLWB</td>
<td>MLW Button</td>
<td>Master Grip Left Wheel, Red Button</td>
</tr>
<tr>
<td>MRRB</td>
<td>MRR Button</td>
<td>Master Grip Right Wheel, Red Button</td>
</tr>
<tr>
<td>OCU</td>
<td>OCU Wheel</td>
<td>OCU-1 Wheel</td>
</tr>
<tr>
<td>OCUL</td>
<td>OCU Left</td>
<td>OCU-1 Left Button</td>
</tr>
<tr>
<td>OCUM</td>
<td>OCU Middle</td>
<td>OCU-1 Middle Button</td>
</tr>
<tr>
<td>OCUR</td>
<td>OCU Right</td>
<td>OCU-1 Right Button</td>
</tr>
<tr>
<td>V F</td>
<td>VCW Focus</td>
<td>PLC VCW, Focus Knob</td>
</tr>
<tr>
<td>V I</td>
<td>VCW Iris</td>
<td>PLC VCW, Iris Knob</td>
</tr>
<tr>
<td>V Z</td>
<td>VCW Zoom</td>
<td>PLC VCW, Zoom Knob</td>
</tr>
<tr>
<td>MLRJ</td>
<td>MLR Joystick center</td>
<td>Master Grip Left Rocker Joystick center</td>
</tr>
<tr>
<td>MLRL</td>
<td>MLR Joystick left</td>
<td>Master Grip Left Rocker Joystick, left</td>
</tr>
<tr>
<td>MLRR</td>
<td>MLR Joystick right</td>
<td>Master Grip Left Rocker Joystick, right</td>
</tr>
<tr>
<td>MLRU</td>
<td>MLR Joystick up</td>
<td>Master Grip Left Rocker Joystick, up</td>
</tr>
<tr>
<td>MLRD</td>
<td>MLR Joystick down</td>
<td>Master Grip Left Rocker Joystick, down</td>
</tr>
<tr>
<td>MLRH</td>
<td>MLR Joystick horizontal (left &amp; right)</td>
<td>Master Grip Left Rocker Joystick, horizontal (left &amp; right)</td>
</tr>
<tr>
<td>MLRV</td>
<td>MLR Joystick vertical (up &amp; down)</td>
<td>Master Grip Left Rocker Joystick, vertical (up &amp; down)</td>
</tr>
<tr>
<td>MRRJ</td>
<td>MRR Joystick center</td>
<td>Master Grip Left Rocker Joystick center</td>
</tr>
<tr>
<td>MRRL</td>
<td>MRR Joystick left</td>
<td>Master Grip Left Rocker Joystick left</td>
</tr>
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<td>MRRR</td>
<td>MRR Joystick right</td>
<td>Master Grip Left Rocker Joystick right</td>
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<td>MRRU</td>
<td>MRR Joystick up</td>
<td>Master Grip Left Rocker Joystick up</td>
</tr>
<tr>
<td>MRRD</td>
<td>MRR Joystick down</td>
<td>Master Grip Left Rocker Joystick down</td>
</tr>
<tr>
<td>MRRH</td>
<td>MRR Joystick horizontal (left &amp; right)</td>
<td>Master Grip Left Rocker Joystick horizontal (left &amp; right)</td>
</tr>
<tr>
<td>MRRV</td>
<td>MRR Joystick vertical (up &amp; down)</td>
<td>Master Grip Left Rocker Joystick vertical (up &amp; down)</td>
</tr>
</tbody>
</table>
21  Declaration of Conformity

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 – Remote Control-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:


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

- Art. 3.1 b following 2014/30/EU

- 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:

Year of affixed CE-marking: 2018

Munich 13.12.2018

Sign         Sign

Walter Trauninger       Dr. Sebastian Lange
Managing Director       Head of Quality Management

APENDIX-I

List of additional accessories:

<table>
<thead>
<tr>
<th>Item</th>
<th>Model name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>ARRI Digital Remote Wheels - DRW-1</td>
</tr>
</tbody>
</table>


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

TRA

REGISTERED No:
SRH-3: ER72306/19
RDP-1: ER72308/19

DEALER No:
DA68290/17

China

- ECS transceiver module:
  CMIIT ID: 2017DJ7865 (M)
  CMIIT ID: 2017DJ7863 (M)

- SRH-3 Pro Set
  CMIIT ID: 2018DP6608

... 的无线电发射模块。
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
  CCAH18LP0660TO

低功率電波輻射性電機管理辦法

警告一

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、加大功率或变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.

警告二

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。
（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
München
Jahr

To evaluate the respective Grundlegende Anforderungen zu

Grundlegende Anforderungen zu

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

Die Übereinstimmung der Ermittlung der entsprechenden Normen haben wir die folgende Quelle verwendet:

Die bezeichneten Produkte stimmen mit den Vorschriften folgender Europäischer Richtlinien überein:


Die Übereinstimmung mit den Richtlinien erfolgte unter Anwendung nachfolgend genannter Normen:

Grundlegende Anforderungen zu Nr. 1. Essential Requirements regarding No 1

- Art. 3.1 a nach 2014/35/EU –following 2014/35/EU
- Art. 3.1 b nach 2014/30/EU –following 2014/30/EU
  o EN 301 489 V2.1.1; EN 301 489

Grundlegende Anforderungen zu Nr. 2. - Essential Requirements regarding No 2

- EN 50581: 2012;

Für die Ermittlung der entsprechenden Normen haben wir die folgende Quelle verwendet:


Jahr der Anbringung des CE-Zeichens / Year of affixed CE-marking: 2018

München, den 15.07.2019

gez/sig          gez/sig

Dr. Michael Neuhäuser       Dr. Sebastian Lange
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