

Digital Encoder Head

DEH-1 SUP2.2

USER MANUAL

Date 01.08.2019



Imprint

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Scope

This document describes the components, the setup and programming of the **DEH-1** Digital Encoder Head.

Disclaimer

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

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1 For your safety

Warning

The DEH-1 in combination with 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 DEH-1 and the stabilized remote head read the manual in its entirety prior to use.

NOTICE

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.

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.

2 Functions

2.1 Functions front view



2.2 Functions back view



2.3 Functions bottom view



3 DEH-1 Setup

3.1

Mounting the DEH-1

NOTICE

To ensure safe use of the DEH-1, only suitable heavy duty flat base Tripods should be used.

Place the DEH-1 on an appropriate flat base tripod by loosening the tie-down Screw under the fluid head.

Level the tripod legs using the level bubble.



NOTE

Lock both pan and tilt brakes, turn both tilt drag selector and counterbalance knob to 0.



Connect the pan bar attachment and select your desired operating angle.



Mount the counterweight bars.



Mount both **Handgrip Pan Bar Adapters** K2.0012919 to the pan bars.

The telescopic pan bar length can be adjusted through the clamp lever.



3.2

Mounting the Master Grip

After both handle handgrip bar adapters have been mounted on the pan bars, the the Master Grip / OCU-1 can be added to the pan bars.



The steel rosette allows additional angle adjustments.

Mounting the OCU-1

Remove the standard bracket from the OCU-1 and attach the rosette adapter to the back of the OCU-1 as shown.



3.3

Counterbalance

Open the tilt break and set the friction to 0. Shift the counterweights fore and aft till the pan bar remains in a horizontal position.



4 LBUS Setup

4.1

Introduction

The entire digital communication of the DEH-1 is based on the LBUS.

LBUS is an ARRI/cmotion bus standard designed to allow multiple lens motors and control devices to communicate with each other.

The DEH-1 is equipped with two bi-directional LBUS interfaces providing power and control signals and daisy chain technology.

This allows the use of current LBUS controllers such as the Master Grips or OCU-1. Future LBUS controllers should become usable through according future SUPs.

NOTICE
Visit the ARRI website to verify that the Master Grips, OCU-1, DRW-1 and DEH-1, LBUS controllers you want to use have the latest firmware.

NOTICE
For more information, see the manuals for Master Grips and OCU-1.

4.2 LBUS Sockets



⚠ DANGER

Risk of fire!

Risk of short-circuits and back currents to power supplies/batteries.

Do not connect any external battery or power supply via the LBUS cable to the DEH-1, the Master Grips, the OCU-1 or any other LBUS Controller.

Do not insert objects!

4.3 Master Grips

NOTE

When the Master Grips are connected to the remote control via the DEH-1, the Master Grips switch to the so-called Remote mode. The display shows **Remote**.



NOTE

If **Remote** is **not shown** in the display, the software on the Master Grip / OCU-1 is **out of date** and needs to be updated.

Master Grips are available in four versions: right-side and left-side with either a control rocker or a control wheel. All versions are equipped with a 5-way joystick and a toggle button. Joystick and button are fully customizable and can be assigned to camera functions, as well as Master Grip specific features.

ARRI steel rosette
with angle-adjustment

Customizable
Button

Customizable
5-way joystick

LBUS connectors



ARRI steel rosette
with angle-adjustment

Customizable
Button

Customizable
5-way joystick

LBUS connectors



NOTE

In the remote control, the Master Grips will be shown as:

MASTER GRIP RIGHT ROCKER
MASTER GRIP LEFT WHEEL
MASTER GRIP RIGHT WHEEL
MASTER GRIP LEFT ROCKER

MRR-1
MLW-1
MRW-1
MLR-1

4.4

OCU-1 Operator Control Unit**NOTE**

When the OCU-1 is connected to the remote control via the DEH-1, the OCU-1 switch to the so-called Remote mode. The display shows **Remote**.

NOTE

If **Remote** is **not shown** in the display, the software on the Master Grip / OCU-1 is **out of date!**

NOTE

In the remote control, the OCU-1 will be shown as **OCU**.

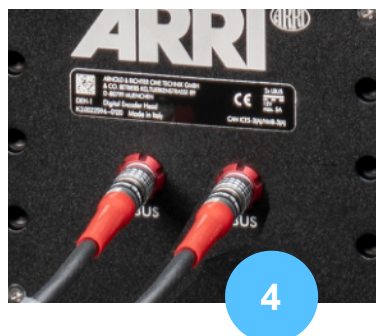
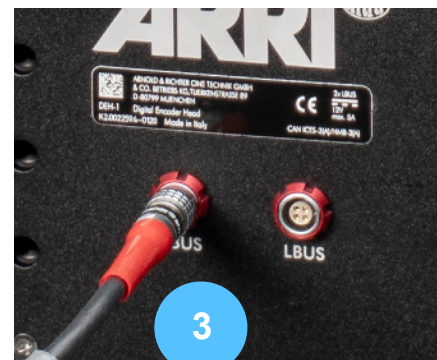


4.5

Connecting LBUS cables

The DEH-1 sets are supplied with the following LBUS cables:

- 1 x K2.0006752 LBUS cable (Le 4p, Le 4p). Length: **0.8m/2.5ft.**
- 2 x K2.0006753 LBUS cable (Le 4p, Le 4p). Length: **1.5m/5ft.**



Connect the **first** LBUS controller (1) to the **second** LBUS controller (2), using the 0,8m LBUS cable.

Connect the **second** LBUS controller to the **DEH-1** (3), using the 1.5m LBUS cable.

Finally connect the **DEH-1** (4) to the **remote control** (5), using the 1.5m LBUS cable.

5 Main Brake

On the back of the DEH-1 facing the operator is the so-called **Main Brake**.

The brake button allows the operator to **enable** or **disable** the encoder head from the pan and tilt motor axes of the remote head.

NOTE

A **disabled** DEH-1 is indicated by a **red** LED.

NOTE

Disabling the DEH-1 may also aid operation.

If you need to reproduce a movement and the position of the remote head and the DEH-1 should be at a certain angle, **disable** the DEH-1 and set the handle bars to the desired angle.

Enable the DEH-1 again and move the remote head back to the starting point. Start the entire movement from the beginning.



6 Remote Control Setup

6.1

Auto Assignment DEH-1

SUP2.2 introducing the so-called Auto Assignment.

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



The Auto Assignment will set:

- DEH-1 Tilt and Pan axes
- SENSITIVITY to **0**
- DEADBAND to **0**
- RAMP to **0**
- MODE to **Angle**

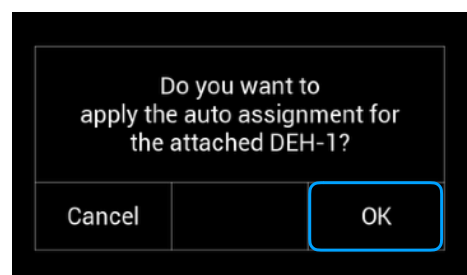
Selecting **OK** automatically sets all required values.

NOTE

Press **Cancel** if the DEH-1 has already been assigned and personal values have already been set.

Press **OK** to overwrite your previous settings.

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



6.1

Selecting the Mode

There are two ways to use the DRW-1: **Angle Mode** (preset) and **Speed Mode**.

Angle Mode the right choice when **extremely precise** movements are needed.

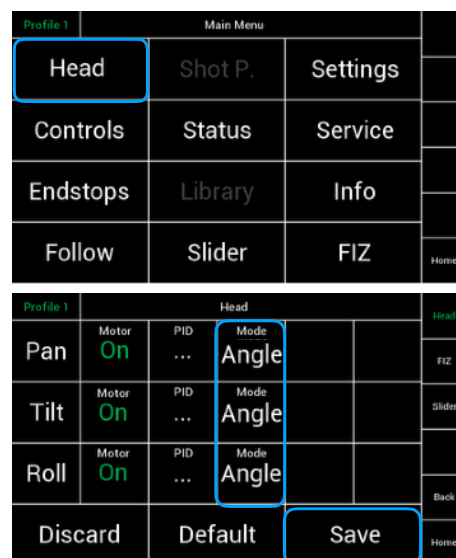
Every movement of the DEH-1 is transferred to the remote head with the exact degree of precision.

Speed Mode is a good mode when high **dynamic** action needs to be covered.

Touch **Menu** at the lower right corner of the home screen to reach the **Main Menu**.

In the **Main Menu** select **Head** to reach the head menu.

Touch **Mode** to toggle between **Angle** and **Speed**. Press **Save** after the Mode is selected.



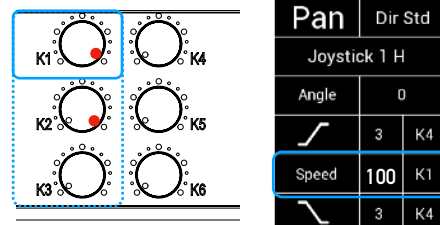
6.3

Speed setup in Angle Mode**NOTE**

In order to operate the DEH-1 correctly in **Angle Mode**, the following settings shall be made:

- **Speed** **100**
- SENSITIVITY set to **0**
- DEADBAND set to **0**
- RAMP set to **0**
- Ratio set to **0**

In the factory preset setup, the **Speed** is assigned to the knobs K1, K2 and K3.

**NOTE**

In order to achieve a faster movement in **Angle Mode**, the **Ratio** values must be adjusted. See page 12.

6.4

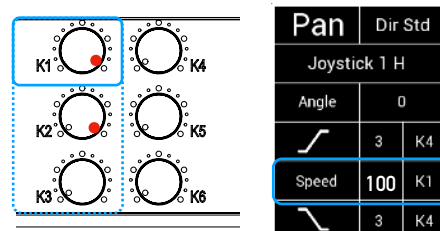
Speed setup in Speed Mode**NOTE**

In order to operate the DEH-1 correctly in **Speed Mode**, the following settings shall be made:

- **Speed** **80**
- SENSITIVITY set to **0**
- DEADBAND set to **0**
- RAMP set to **0**
- Ratio set to **0**

A **lower** Speed value will **under crank** the movement of the remote head.

A **higher** Speed value will **over crank** the movement of the remote head.



6.5

Ramp (K4, K5, K6)

In the factory preset setup, ramp is assigned to the knobs K4, K5 and K6.

Initially, ramp should be set to **0**.

NOTE

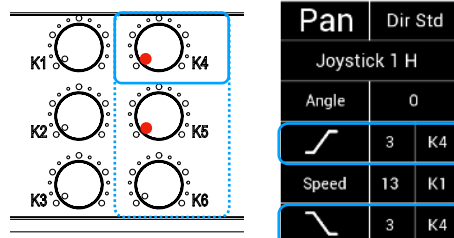
A high positive ramp value will delay the response of the remote head!

The DEH-1 will start and stop progressively softer as the value increases.

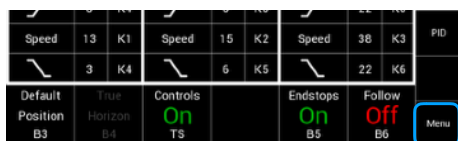
NOTE

By unassigning K4, K5, K6 you can set individual ramp values for start and stop for each axis.

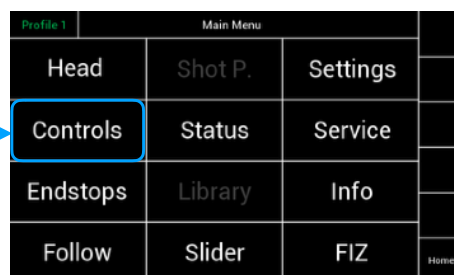
The setting is then made via the touchscreen, by selecting:
Menu, Controls, Position, Ramp Start and Ramp Stop



6.6

Ratio (Angle Mode)

Selecting **Menu**, will open the **Main Menu**.



Selecting **Controls**, will open the controls menu.

Selecting **Ratio** opens a new submenu in which the required speed ratio of the Pan and Tilt axes can be adjusted.

NOTE

For the initial setup, set the **ratio values** to **0**.

NOTE

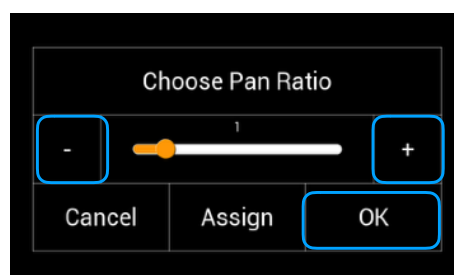
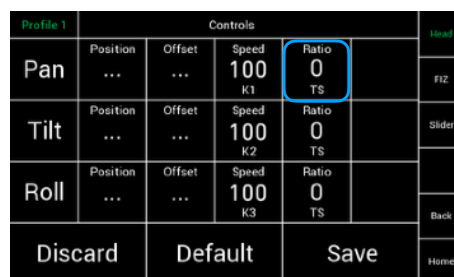
If desired you can use the **Ratio** value to **gear** the DEH-1 **up** or **down**.

A ratio of **30** in **Angle Mode** will move the remote head 180°, while the DEH-1 has been moved only 90°.

NOTE

In **Angle Mode** changing the ratio value will move the remote head to a new position.

Therefore use the **+** and **-** keys to change the ratio value **carefully**.



6.7

Changing Direction

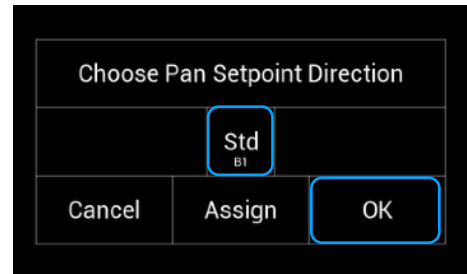
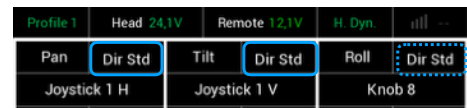
For a fast adjustment, the home screen of the remote control offers a **short cut**.

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**.

Press **OK**



7 Additional Setups

7.1

Assigning the DEH-1**NOTE**

The DEH-1 shall be assigned to the corresponding axes of the remote head.

For a fast selection, the home screen of the remote control offers a **short cut**.

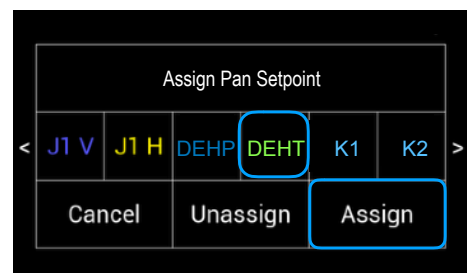
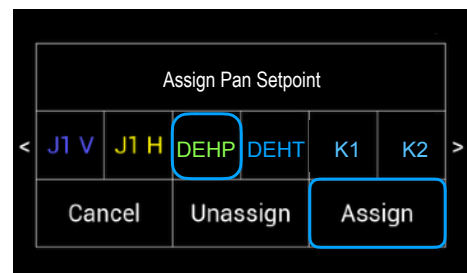
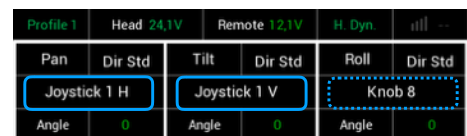
Selecting the indicated area below the single axis will open the assignment submenu.

Select **DEHP** in the submenu to assign the **Pan axis** of the DEH-1 to the **Pan axis** of the remote head.

Press **Assign**.

Select **DEHT** in the submenu to assign the **Tilt axis** of the DEH-1 to the **Tilt axis** of the remote head.

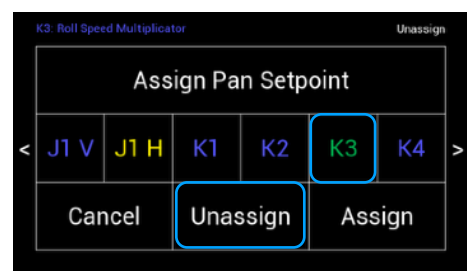
Press **Assign**.

**Unassigning Controllers**

To unassign a selected controller, touch **Unassign**.

NOTE

After the **controller** has been **unassigned**, the **function** is only available via the **touchscreen**.



7.2
Selecting **Position** will open up a submenu for: **Deadband, Sensitivity, Filter, Ramp** and **Ramp Mode**.

Profile 1	Controls					Head
Pan	Position ...	Offset ...	Speed 25 K1	Ratio 0 TS		PtZ
Tilt	Position ...	Offset ...	Speed 25 K2	Ratio 0 TS		
Roll	Position ...	Offset ...	Speed 25 K3	Ratio 0 TS		Back
Discard		Default		Save		Home

7.3
Deadband

Selecting **Deadband** opens a new touchscreen slider that allows to change the **Deadband** values on the selected axis.

Deadband sets the starting point of the control. This value defines when the setpoint will react after the control was changed.

NOTE
If the **DEH-1** encoder head is used as a controller, **Deadband** shall be set to **0 - 3**.

Profile 1	Controls: Position of Pan			Position
Control Joystick 1H	Deadband 0 Touchscreen	Ramp Start 0 Knob 5		Offset
Direction Standard Touchscreen	Sensitivity 0 Touchscreen	Ramp Stop 0 Knob 5		

Choose Pan Deadband

- 2 +

Cancel Assign OK

7.4
Sensitivity

Selecting **Sensitivity** will open a new touchscreen slider that allows you to change the sensitivity of the control device for the selected axis.

NOTE
Redo the procedure for the other axes and press **OK**.

Profile 1	Controls: Position of Pan			Position
Control Joystick 1H	Deadband 0 Touchscreen	Ramp Start 0 Knob 5		Offset
Direction Standard Touchscreen	Sensitivity 0 Touchscreen	Ramp Stop 0 Knob 5		
	Filter 0 Touchscreen	Ramp Mode Dynamic Touchscreen		Back
Discard		Default		Home

7.5
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 **lowpass** these disturbing vibrations.

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

Direction Standard Touchscreen	Sensitivity 0 Touchscreen	Ramp Stop 0 Knob 5	
	Filter 0 Touchscreen	Ramp Mode Dynamic Touchscreen	Back
Discard		Default	
		Save	

Choose Pan Filter

- 19.0 +

Touchscreen

Cancel Assign OK

8 FIZ Setup

NOTE

The Master Grips and the OCU-1 will interact via the DEH-1 and the remote control in the so-called **Remote** mode.

The displays of the Master Grips and OCU-1 will show **REMOTE** as soon these LBUS controllers are connected the remote control via the DEH-1.

NOTE

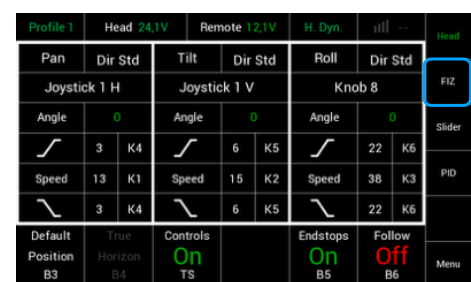
If Remote is not shown in the display, the software on the LBUS controllers is out of date and needs to be updated before use!



8.1

Assigning Focus, Iris and Zoom

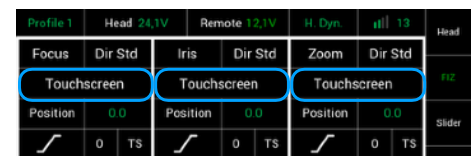
The **FIZ home screen** can be reached by Selecting **FIZ** in the Home Screen.



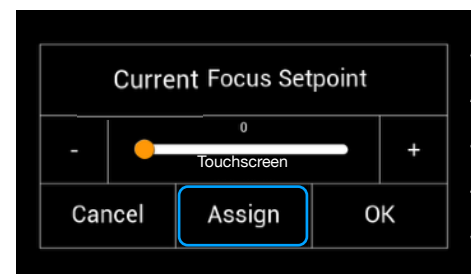
Assigning Focus and Zoom

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

Selecting the **marked area** will open a new submenu, where the desired controllers can be selected and assigned.

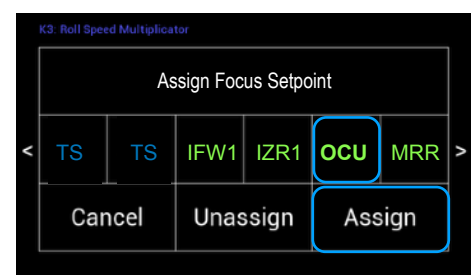


Selecting **Assign** will open the selection.



Select the needed LBUS controller and press **Assign**.

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
OCU	OCU-1	OCU Focus Wheel



Unassigning Controllers

To unassign a selected controller, touch **Unassign**.

NOTE

After a controller was unassigned, the function will be **only** available through the **touchscreen**.



8.2 FIZ Controllers Adjustments

Speed	13	K1	Speed	15	K2	Speed	38	K3	PID
	3	K4		6	K5		22	K6	
Default	True	Controls	Endstops	Follow	Menu				
Position	Horizon	On	On	Off					
B3	B4	TS	B5	B6					

Selecting **Menu**, will open the **Main Menu**.

Selecting **FIZ**, will open the **FIZ Menu**

Profile 1	Main Menu		
Head	Shot P.	Settings	
Controls	Status	Service	
Endstops	Library	Info	
Follow	Slider	FIZ	Home

		Motors On/Off	Torque	Mode	Motor Calibration	
Profile 1	FIZ					
Focus Motor	Focus	Motor On TS	Torque 2 TS	Mode Pos. TS	Calibration Focus	
Iris Motor	Iris	Motor On TS	Torque 2 TS	Mode Pos. TS	Calibration Iris	
Zoom Motor	Zoom	Motor Off TS	Torque 2 TS	Mode Speed TS	Calibration Zoom	
	Discard	Default		Save		
				Back	Home	

Back to the previous screen

Back to the Home Screen

8.3 Calibration

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

NOTE

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

NOTE

When using the LCUBE CUB-2 with broadcast lenses, calibration is not required.

Profile 1	FIZ				
Focus	Motor On TS	Torque 2 TS	Mode Pos. TS	Calibration Focus	
Iris	Motor On TS	Torque 2 TS	Mode Pos. TS	Calibration Iris	
Zoom	Motor Off TS	Torque 2 TS	Mode Speed TS	Calibration Zoom	
	Discard	Default		Save	
				Back	Home

8.4 Torque

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

Profile 1	FIZ				
Focus	Motor On TS	Torque 2 TS	Mode Pos. TS	Calibration Focus	
Iris	Motor On TS	Torque 2 TS	Mode Pos. TS	Calibration Iris	
Zoom	Motor Off TS	Torque 2 TS	Mode Speed TS	Calibration Zoom	
				Speed 25 TS	Back

Choose Focus Torque		
-	2	+
Touchscreen		
Cancel	Assign	OK

8.5 Mode

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

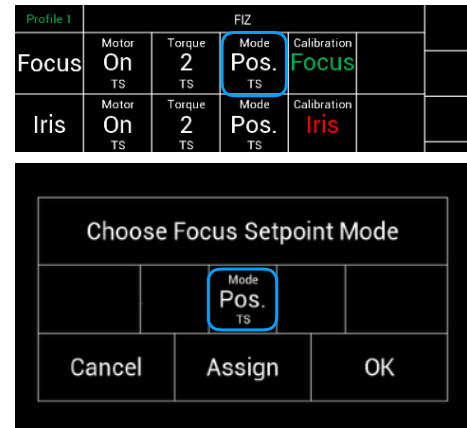
NOTE

Focus Wheel must be set to **Position**.

Iris Slider must be set to **Position**.

Zoom Rocker must be set to **Speed**.

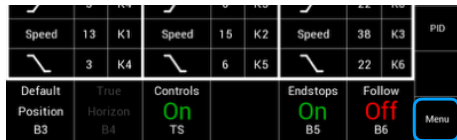
Selecting the **marked area** will toggle between **Position** and **Speed**.



8.6 Speed (FIZ motors in Speed Mode)

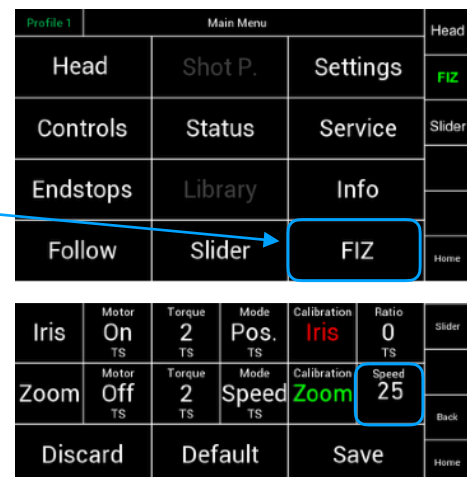
NOTE

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



To adjust the speed of the cforce mini motors, 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.



8.7 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 range of a broadcast lens, the **Ratio** should be set to **+20** for a **360°** rotation of the OCU-1.



8.8
Fine trimming the FIZ controller

Beside Speed you can also adjust:
Deadband, Sensitivity, Ramp and Ramp Mode.



Selecting **Position** will open a submenu for each controller.

NOTE

To ensure direct response of the focus controller ensure that:

- Deadband set to **0**
- Ramp Start set to **0**
- Ramp Stop set to **0**
- Ramp Mode set to **Constant**

For a smooth Zoom movement you can try following settings:



9 LCUBE CUB-2 Setup

9.1

LCUBE CUB-2 KK.0024836 (Not included in any DEH-1 set)

NOTICE

To control *selected* broadcast lenses with the Master Grips, OCU-1 or the internal controls of the remote control, you need the LCUBE CUB-2 (not older than Q1 2019) version with the latest SUP installed.

Introduction:

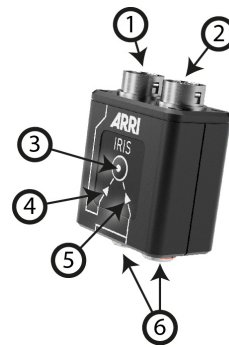
The LCUBE CUB-2 adapts servo-zoom lenses (Hirose 12 pin) to LBUS (Lemo 4 pin). Enables Master Grips and the OCU-1 to directly control focus, iris and zoom of a servo-zoom lens. Provides a switch to select between iris control from camera (auto-iris via camera Hirose 12 pin interface) or Master Grips or the OCU-1 (via LBUS).



9.1

Functions

- 1 ENG IN - camera
- 2 ENG OUT - lens
- 3 Setup button
- 4 Indicator: Iris control via camera
- 5 Indicator: Iris control via LBUS
- 6 LBUS connectors



9.2

LED Status

The LED of the SETUP button indicates the current status.

- Solid green..... Device is ready, no warnings
- Green/red flashing..... No LBUS master device connected
- Solid red.....Power supply is below 11V
- Red flashing.....No LBUS data is available
- Blue flashing..... Device is executing the boot- loader



9.3

Setup button / IRIS source

The source of iris control can be either set to camera or LBUS. The currently active iris source is indicated by two arrows underneath the **Setup** button.

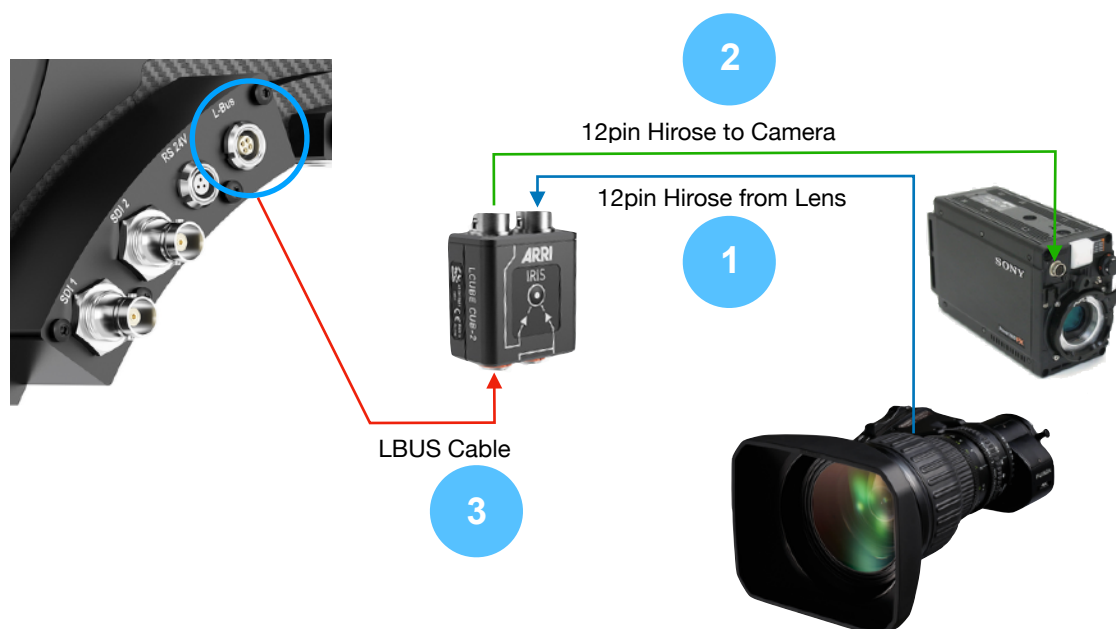
Press the **Setup** button momentarily to indicate the current iris source. Press the **Setup** button momentarily again to change the assignment. Toggle through until you reach the desired setting.



9.4

Quick setup

1.
Connect the ENG input of LCUBE CUB-2 to the camera Hirose 12 pin lens interface.
2.
Connect the ENG output of LCUBE CUB-2 with the ENG lens cable.
3.
Connect the LCUBE CUB-2 via LBUS with the remote head.
4.
Select the source of the iris on the LCUBE CUB-2 (RCP Camera or LBUS Controller)
5.
Assign the focus and zoom at the remote control to the used LBUS controllers, like the Master Grips or OCU-1.

**NOTE**

If there is a problem with the LBUS communication, turn off the power of the remote head and turn it on again to restart the LBUS communication. It may also be helpful to restart the remote control when powered externally.

10 Power Disconnection

⚠ CAUTION

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

11 Sets

DEH-1 Pro Set, Left Wheel, Right Rocker

K0.0033400

contains

Master Grip Left Wheel MLW-1	K2.0009363
Master Grip Right Rocker MRR-1	K2.0009493
Handgrip Pan Bar Adapter 20 mm	K2.0012919
Handgrip Pan Bar Adapter 20 mm	K2.0012919
LBUS cable (Le 4p, Le 4p). Length: 0.8m/2.5ft.	K2.0006752
LBUS cable (Le 4p, Le 4p). Length: 1.5m/5ft. (2x)	K2.0006753



DEH-1 Pro Set, Right Wheel, Left Rocker

K0.0033402

contains

Master Grip Left Wheel MLW-1	K2.0009363
Master Grip Right Rocker MRR-1	K2.0009493
Handgrip Pan Bar Adapter 20 mm	K2.0012919
Handgrip Pan Bar Adapter 20 mm	K2.0012919
LBUS cable (Le 4p, Le 4p). Length: 0.8m/2.5ft.	K2.0006752
LBUS cable (Le 4p, Le 4p). Length: 1.5m/5ft. (2x)	K2.0006753

DEH-1 Pro Set, OCU-1, Left Rocker

K0.0033403

contains

Operator Control Unit OCU-1 Basic Set	K2.0020002
OCU-1 Rosette Bracket	K2.0020003
Master Grip Left Rocker MLR-1	K2.0009490
Handgrip Pan Bar Adapter 20 mm	K2.0012919
Handgrip Pan Bar Adapter 20 mm	K2.0012919
LBUS cable (Le 4p, Le 4p). Length: 0.8m/2.5ft.	K2.0006752
LBUS cable (Le 4p, Le 4p). Length: 1.5m/5ft. (2x)	K2.0006753



DEH-1 Pro Set, OCU-1, Right Rocker

K0.0033404

contains

Operator Control Unit OCU-1 Basic Set	K2.0020002
OCU-1 Rosette Bracket	K2.0020003
Master Grip Right Rocker MRR-1	K2.0009493
Handgrip Pan Bar Adapter 20 mm	K2.0012919
Handgrip Pan Bar Adapter 20 mm	K2.0012919
LBUS cable (Le 4p, Le 4p). Length: 0.8m/2.5ft.	K2.0006752
LBUS cable (Le 4p, Le 4p). Length: 1.5m/5ft. (2x)	K2.0006753

12 Technical Data

Electrical Data

Temperature range:	-20 to +50° C (-4 to +122° F)
Supply voltage:	10.5 - 34 V
Power consumption:	max. 6A – 2A

Head Data

Maximum Payload Capacity	25 kg (DEH-1)
Minimum Payload Capacity	0 kg (DEH-1)
Bowl Diameter	Flat base
Pan Range	360° without end stop
Tilt Range	360° without end stop
Fluid Drag	7 steps + 0
Encoder Transmission	Direct, no gears
Temperature Range -	25°/+60°

Dimensions:

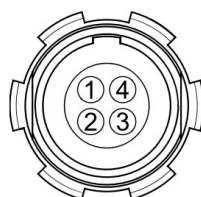
H / W / D	32cm / 38cm / 48cm
-----------	--------------------

Weight

6,5 kg (DEH-1 head only)

13 Pinout

LBUS Connector



1	GND	Ground
2	CAN-L	CAN bus
3	V-BAT	Power supply in-/output
4	CAN-H	CAN bus

14 International Declarations

13.1



Arnold & Richter Cine Technik GmbH & Co. Betriebs KG • Türkenstr. 89 • D-80799 Munich

To
 - Product Management - Camera Systems
 - Sales Management - Camera Systems
 - Supply Chain Management - Camera Systems

**Arnold & Richter Cine Technik
 GmbH & Co. Betriebs KG**

Dr. Sebastian Lange
 Head of Quality Management
 Tel.: +49 (0)89 3809 1908
 Fax: +49 (0)89 3809 11 1908
 Email: slange@arri.de

Munich, 17.05.2019
 PA/NK/SL

Concern: Wording to inform customers regarding approval status of electric and electronic ARRI products.

Dear colleagues,

The products offered by ARRI are approved for use in a number of countries, including Canada, the European Union, Japan, and the USA. Product-specific information on approval can be found in the respective operating instruction manuals. Import and use in countries other than those mentioned in the respective operating instructions may be subject to legal, regulatory, or official requirements and regulations. Before the products are imported into these countries or used in these countries, compliance with the existing legal, regulatory, and administrative requirements and regulations must be ensured.

It is the importer's or the user's responsibility, prior to importation or use, to inform themselves of the applicable legal, regulatory, and administrative requirements and regulations and to ensure compliance with these requirements and regulations, including applying for and obtaining any necessary approvals or registrations. As far as reasonable and legally possible, ARRI will support requests in relation to such applications by providing technical documents or declarations.

As an importer or user, you confirm that you are familiar with and comply with the legal, regulatory, and administrative requirements and regulations that apply in the countries to which you ship or use the products. You further confirm that you will arrange for any necessary registrations, enrolments, or authorizations that are required in such countries.

You release ARRI from all obligations resulting from any legislative, regulatory, or administrative requirements regarding import or use of the products, except in countries where ARRI has obtained a registration or certification. You agree to indemnify, defend, and hold ARRI harmless from any and all claims, damages, losses, liabilities, costs, and expenses (including reasonable fees of attorneys and other professionals) that may arise out of a demand on ARRI in connection with your obligations mentioned above.

We have to ensure that this is known to all customers effected. Hence, the statement above must be included in all manuals and the following sales documents provided by SAP-System offer, order conformation, invoice and delivery note. Any adaption of the presented wording must be approved by Quality and Legal department.

Dr. Sebastian Lange
 Head of Quality Management

Arnold & Richter Cine Technik GmbH & Co. Betriebs KG
 Türkenstr. 89
 D-80799 Munich
 Tax No.: 143/502/20276
 VAT No.: DE129725260 WEEE-Reg.-No. DE 48968492
 Bayern LB: KTO: 1 114 388 BLZ: 700 500 00
 HypoVereinsbank: KTO: 7 940 009 BLZ: 700 202 70

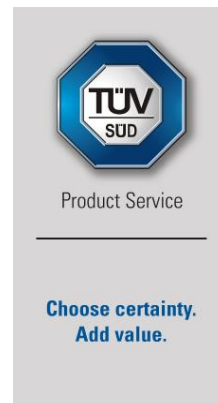
Court of registry: Local Court Munich, HRA-Nr. 57918
 Personally liable partner: Arnold & Richter Cine Technik GmbH
 Court of registry: Local Court Munich, HRB-Nr. 54477
 Managing Directors: Dr. Michael Neuhäuser • Dr. Jörg Pohlman
 Stephan Schenk • Walter Trauninger
 Swift/BIC: BYLADEMM IBAN: DE64 7005 0000 0001 1143 68
 Swift/BIC: HYVEDEMMXXX IBAN: DE63 7002 0270 0007 9400 09

Tel.: +49 (89) 3809 0
 Fax: +49 (89) 3809 1244
 www.arri.com

**Report on the FCC and IC Testing of the
ARRI Cine & Video Geräte GmbH
Digital Encoder Head. Model: DEH-1
In accordance with FCC 47 CFR Part 15B and
ICES-003**

Prepared for: ARRI Cine & Video Geräte GmbH
Pottendorfer Str. 23-25/3/2
1120 Wien
Österreich

FCC ID: ---
ICES: ---



COMMERCIAL-IN-CONFIDENCE

Date: 2018-11-28
Document Number: TR-80986-45376-02 | Issue: 01

RESPONSIBLE FOR	NAME	DATE	SIGNATURE
Project Management	Thomas Winterberger	2018-11-28	
Authorised Signatory	Hannes Adelsberger	2018-11-28	

Signatures in this approval box have checked this document in line with the requirements of TÜV SÜD Product Service document control rules.

ENGINEERING STATEMENT

The measurements shown in this report were made in accordance with the procedures described on test pages. All reported testing was carried out on a sample equipment to demonstrate limited compliance with FCC 47 CFR Part 15B and ICES-003. The sample tested was found to comply with the requirements defined in the applied rules.

RESPONSIBLE FOR	NAME	DATE	SIGNATURE
Testing	Thomas Winterberger	2018-11-28	

Laboratory Accreditation

DAkkS Reg. No. D-PL-11321-11-02

Laboratory recognition

Registration No. BNetzA-CAB-16/21-15

Industry Canada test site registration

3050A-2

EXECUTIVE SUMMARY

A sample of this product was tested and found to be compliant with FCC 47 CFR Part 15B and ICES-003:2017 and 2016.

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Managing Directors:
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TÜV SÜD Product Service

TÜV®

Document Number: TR-80986-80986-45376-02 | Issue: 01
COMMERCIAL-IN-CONFIDENCE



Product Service

1 Report Summary

1.1 Report Modification Record

Alterations and additions to this report will be issued to the holders of each copy in the form of a complete document.

Issue	Description of Change	Date of Issue
1	First Issue	2018-11-28

Table 1

1.2 Introduction

Applicant	ARRI Cine & Video Geräte GmbH
Manufacturer	ARRI Cine & Video Geräte GmbH
Model Number(s)	DEH-1
Serial Number(s)	Prototype
Hardware Version(s)	---
Software Version(s)	---
Number of Samples Tested	1
Test Specification/Issue/Date	FCC 47 CFR Part 15B and ICES-003:2017 and 2016
Test Plan/Issue/Date	---
Order Number	25468/OS/0133-00-12
Date	2018-10-24
Date of Receipt of EUT	2018-11-05
Start of Test	2018-11-27
Finish of Test	2018-11-27
Name of Engineer(s)	Thomas Winterberger
Related Document(s)	ANSI C63.4: 2014

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Product Service

TEST REPORT	
IEC 60950-1: 2005 (2nd Edition) and/or EN 60950-1:2006 Information technology equipment – Safety – Part 1: General requirements	
Report Reference No.....:	TR-80986-44626-01
Date of issue.....:	December 12, 2018
Total number of pages.....:	34
Testing Laboratory	TÜV SÜD Product Service GmbH
Address.....:	Äußere Frühlingstr. 45, D-94315 Straubing, Germany
Applicant's name	Arnold & Richter Cine Technik GmbH & Co Betriebs KG
Address.....:	Türkenstr. 89, D-80799 München Germany
Test specification:	
Standard	☐ IEC 60950-1:2005 (2nd Edition) and/or ☒ EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011 + A2:2013 + AC:2011
Test procedure	Standard
Non-standard test method.....:	N/A
Test Report Form No.....:	IECEN60950_1C
Test Report Form(s) Originator	SGS Fimko Ltd
Master TRF	Dated 2007-06
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If this Test Report Form is used by non-CCA members, the CIG logo and the reference to the CCA Procedure shall be removed.	
This report is not valid as a CCA Test Report unless signed by an approved CCA Testing Laboratory and appended to a CCA Test Certificate issued by an NCB in accordance with CCA	
Test item description	Digital Encoder Head
Manufacturer	ARRI Cine + Video Geräte GmbH Pottendorferstraße 23-25 3/1/1, A-1120 Wien
Model/Type reference.....:	DEH-1, K2.0022594
Ratings.....:	External power supply 12 V DC max. operating temperature of EUT: -20 °C to +50°C

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 Fax: +49 9421 5522-99
 Web: www.tuev-sued.de



Product Service

Testing procedure and testing location:

☒ Testing Laboratory: TÜV SÜD Product Service GmbH
 Testing location/ address: Äußere Frühlingsstr. 45, D-94315 Straubing, Germany
 Tested by (name+ signature) : Stefan Weiherer
 Approved by (name + signature) . : Stefan Moser

Summary of testing:

The equipment under test in accordance with the conditions of acceptability complies with the requirements.

Conditions of Acceptability:

- In order to verify, if a component is already tested according to the applicable standard (IEC) following information-sources are accepted, in agreement with the customer: Copies of the type approval test certificate, markings on a component, brochures and prospectus from the manufacturer of the component, declarations of conformity from the manufacturer of the component, and information from the customer; all information the test-laboratory receives will not be verified.
- All safety instructions and equipment marking has to be in the language which is acceptable in the country in which the equipment is to be installed. Documentation, intended for service persons only, is permitted to be in English language only, except Germany where also this information has to be in the German language, too. The safety instructions are not evaluated in this report.
- The evaluation of the EUT is based on the fact, that the EUT is used inside a building / house, only.
- This safety test was performed without radiation test (clause 4.3.13). Please refer to separate test report for EN 62479.
- This safety test was performed without evaluation of mechanical parts of the system.
- All marking shall meet the requirements of durability according to clause 1.7.11.
- The power supply, shall meet the requirements according to clause 2.5 (LPS).

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Product Service

Summary

Prüfergebnisse / Test Results		Auftragsnummer / Order No. 25468/OS/0133-00-12
Die Prüfungen wurden nach folgenden Vorschriften durchgeführt: Tests were performed according to: EN 55032:2012 (KN32); EN 55035:2017 (KN35); CISPR 32: 2015		
Durchgeführte Prüfung Test performed		Prüfergebnis Test result
Radiated Emissions (Class A limits)		Pass
Enclosure Port - Power-frequency magnetic field		Pass
Enclosure Port - Radio-frequency electromagnetic field Amplitude modulated		Pass
Enclosure Port - Electrostatic discharge		Pass
Signal Port - Radio-frequency continuous conducted		Pass
Signal Port - Electrical fast transient		Pass
DC Power Port - Radio-frequency continuous conducted		N/A
DC Power Port - Electrical fast transient		N/A

Bemerkungen / Remarks:

The EuT is Battery powered. Therefore a test of the DC line is not necessary according the used standard.

Die Prüfergebnisse beziehen sich ausschließlich auf das zur Prüfung vorgestellte Prüfmuster. Ohne schriftliche Genehmigung des Prüflabors darf der Prüfbericht auszugsweise nicht vervielfältigt werden. The test results relate only to the individual item which has been tested. Without the written approval of the test laboratory this report may not be reproduced in extracts.

Datum / Date	Geprüft von / Tested by	Freigabe durch / Checked by	Prüfergebnis / Test Result
2018-11-27	Thomas Winterberger Responsible for testing	Hannes Adelsberger Reviewer	Pass

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 94315 Straubing
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Product Service

TEST REPORT	
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Report Reference No.....	TR-80986-44626-01
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Total number of pages.....	34
Testing Laboratory	TÜV SÜD Product Service GmbH
Address.....	Äußere Frühlingsstr. 45, D-94315 Straubing, Germany
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Address.....	Türkenstr. 89, D-80799 München Germany
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Standard	☐ IEC 60950-1:2005 (2nd Edition) and/or ☒ EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011 + A2:2013 + AC:2011
Test procedure	Standard
Non-standard test method.....	N/A
Test Report Form No.....	IECEN60950_1C
Test Report Form(s) Originator	SGS Fimko Ltd
Master TRF.....	Dated 2007-06
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Test item description.....	Digital Encoder Head
Manufacturer	ARRI Cine + Video Geräte GmbH Pottendorferstraße 23-25 3/1/1, A-1120 Wien
Model/Type reference.....	DEH-1, K2.0022594
Ratings.....	External power supply 12 V DC max. operating temperature of EUT: -20 °C to +50°C

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Product Service

Testing procedure and testing location:

☒ Testing Laboratory: TÜV SÜD Product Service GmbH
Testing location/ address: Äußere Frühlingsstr. 45, D-94315 Straubing, Germany

Tested by (name+ signature): Stefan Weiherer

Approved by (name + signature) .: Stefan Moser

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Arnold & Richter Cine Technik GmbH & Co. Betriebs KG

Business Unit Camera Systems, Türkenstr.89, D-80799 München

EU-Konformitätserklärung EU-Declaration of Conformity

Markenname / Brand Name: ARRI

Produktbezeichnung / Product Description:

Kamerastabilisierungssystem / 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**
 - + Europa Setting der Software 01.14.00 oder höher und Antenne Proant 333 Ex-IT 2400, Zubehör gemäß Appendix I
 - + Europe Setting for Software 01.14.00 or later and Antenna Proant 333 Ex-It 2400 Foldable, Accessories regarding Appendix I

Die bezeichneten Produkte stimmen mit den Vorschriften folgender Europäischer Richtlinien überein:
The designated products conform to the specifications of the following European directives:

1. Richtlinie 2014/53/EU des Europäischen Parlaments und des Rates vom 16. April 2014 zur Harmonisierung der Rechtsvorschriften der Mitgliedstaaten über die Bereitstellung von Funkanlagen auf dem Markt - OJ L 153, 22.5.2014, S. 62–106
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. Richtlinie 2011/65/EU des Europäischen Parlaments und des Rates vom 8. Juni 2011 zur Beschränkung der Verwendung bestimmter gefährlicher Stoffe in Elektro- und Elektronikgeräten - OJ L 174, 1.7.2011, S. 88–110
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

Die Übereinstimmung mit den Richtlinien erfolgte unter Anwendung nachfolgend genannter Normen:
The compliance with the requirements of the European Directives was proved by the application of the following standards:

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

- Art. 3.1 a nach 2014/35/EU –following 2014/35/EU
 - 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 nach 2014/30/EU –following 2014/30/EU
 - 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, CISPR 32 :2015, EN 55035 :2017
- Art. 3.2
 - EN 300 328 V2.1.1;

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:
To evaluate the respective information, we used:

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

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

München, den 15.07.2019

gez/sig

Dr. Michael Neuhäuser

Geschäftsführer / Managing Director

gez/sig

Dr. Sebastian Lange

Leiter Qualitätsmanagement / Head of Quality Management

Arnold & Richter Cine Technik GmbH & Co. Betriebs KG
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Ust-ID: DE 129725260 WEEE-Reg.-Nr. DE 48968492

Bay Landesbank: KTO: 111 43 68 BLZ: 700 500 00
HypoVereinsbank: KTO: 7 940 009 BLZ: 700 202 70

Sitz: München, Register: Amtsgericht München, HRA-Nr. 57918
Persönlich haftende Gesellschaften: Arnold & Richter Cine Technik GmbH
Sitz: München, Register: Amtsgericht München, HRB-Nr. 54477
Geschäftsführung: Dr. Michael Neuhäuser; Dr. Jörg Pohlman;
Stephan Schenk; Walter Trauringer

Swift/BIC: BYLADEMM IBAN: DE64 7005 0000 0001 1143 68
Swift/BIC: HYVEDEMMXXX IBAN: DE63 7002 0270 0007 9400 09

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