# Operating Manual

## Chrosziel Universal Zoom Servo Drive for Sony ILME-FR7



Product number: CDM-SFR

https://www.chrosziel.com/The-Sony-ILME-FR7-Universal-Zoom-Servo-Drive/CDM-SFR

Version 1.2

Dear Customer,

Thank you for purchasing a quality product from Chrosziel. We greatly appreciate the trust you placed in us.

This manual provides essential information and instructions to ensure that you will get the most out of your Chrosziel ILME-FR7 Zoom Servo Drive. Before using the device for the first time please read this manual carefully. We kindly ask you to keep the manual handy for quick reference, and keep all documents supplied with the device in a safe place.
Also, refer to quick reference manual as a second source for proper installation and operation.

Although this operating manual was compiled with all care, we reserve the right to optimize it at any time and update it to reflect the state of the art. Images may differ from the original.

We hope you will enjoy your new product!

Sincerely yours,
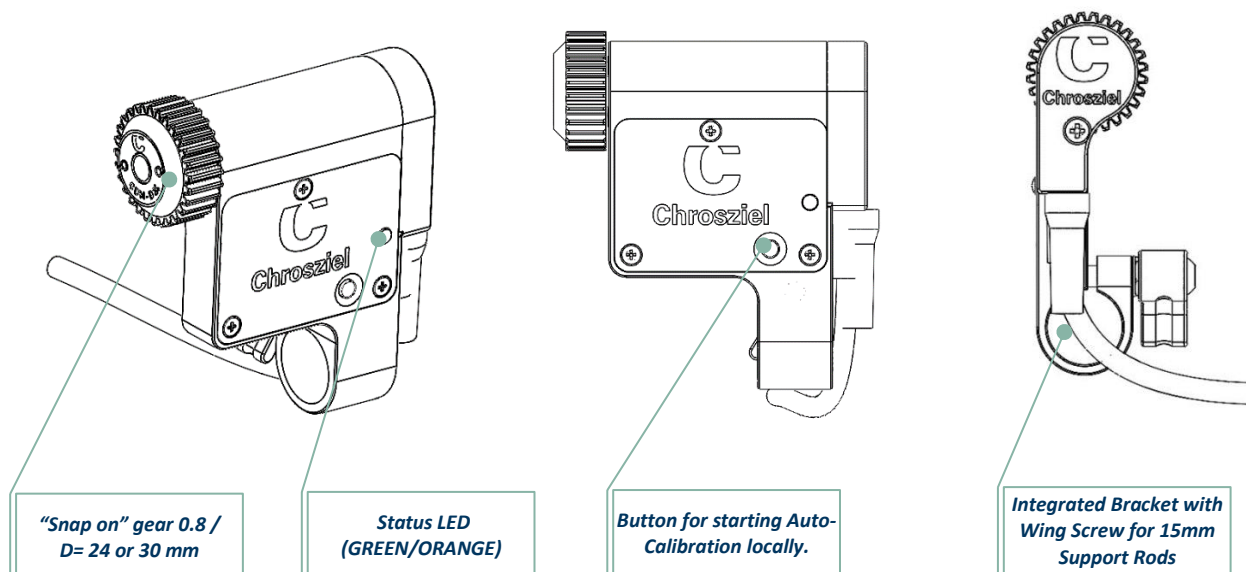Chrosziel GmbH

# 1. Product description

The Chrosziel FR7 zoom servo drive CDM-SFR is intended to motorize the Zoom axis of E-mount Zoom lenses without integrated motorization, which is the largest part of SONY's wide product range of E-mount photo lenses. This opens a completely new range of lenses to cover the creatives needs from wide-angle lenses to long-zoom operation. The drive is deeply integrated to the workflow of the ILME-FR7 and therefore fits seamlessly into its operating functions. It is a compact and universal zoom motor that can be attached to almost any zoom lens by simply mounting it on the 15mm rods of the Sony PTZ head. Due to the included Chrosziel Flexi-Gear-Ring (#206-30), the CDM-SFR can be used with almost any zoom lens without standard cine gearing as well.

The servo drive is controlled through the "Option"- port of the Sony ILME-FR7 with Sony's camera-specific VISCA protocol and therefore can be used with the whole ecosystem of the Sony FR7.

**Feature summary**
-   Compact and universal zoom motor for any Zoom lens with mechanical zoom gear
-   Integrated 15 mm rod mounting bracket.
-   Receives its signal directly from the base unit of the FR7 regardless of the input demand (Web GUI, remote panel, any other third-party equipment)
-   No extra cables nor power supply needed. The CDM-SFR includes all cables and clamps to use it out of the box with the Sony ILME-FR7.

## 1.1 Components



| "Snap on" gear 0.8 / D= 24 or 30 mm | Status LED (GREEN/ORANGE) | Button for starting Auto-Calibration locally. | Integrated Bracket with Wing Screw for 15mm Support Rods |

## 1.2 Status LED Display Patterns

| LED State | | Meaning |
|---|---|---|
| Constantly Off | ⚪ | Not powered |
| Constantly Green | 🟢 | The motor is calibrated against the lens end stops. |
| Slow Blinking Orange | 🟠 | The motor is not calibrated against the lens end stops, press the button for manual initialization, on normal operation motor calibration is initiated by the FR7 on head homing phase and manual trigger not needed |
| Faster Blinking Orange | 🟠 | The motor is calibrating the lens, and its end stops |
| Short orange flash, long green | 🟢 | The motor is in fault condition, try to recalibrate end stops by pressing the button locally or in the WEB-GUI. |

## 1.3 Nameplate

The nameplate located on the back cover of the drive's housing includes part number, serial number & all conformity relevant details.

# 2. Installing the motor drive

## 2.1 Applications / Intended Use

The Chrosziel Zoom Servo Drive is designed to reflect the state of the art and comply with recognized technical safety rules. However, improper use of the device or use of the device for other than the intended purpose may cause damage to the device itself and/or other objects.

Other use, or use beyond this scope, is deemed to be used for other than the intended purpose and is entirely at the user's risk. Intended use also comprises observation of the instructions for use and installation and compliance with maintenance conditions.

## 2.2 Unpacking



Unpack motor drive and check for completeness and damages. If anything is missing, faulty, or damaged, contact your retailer. Do not operate the device if it is or appears to be faulty.
 (1) DC power plug to camera
 (2) RJ45 plug to "option socket" of camera.
 (3) Distribution box DC power and control data
 (4) Lower cable clamp
 (5) Upper cable clamp
 (6) Zoom servo with 15mm rod support bracket.
 (7) Snap-On gear (module 0.8 / D = 24mm / #CDM-D24)
 (8) Chrosziel Flexy Gear to be attached to lenses zoom ring (Ø 60-120mm)
 (9) Rubber straps holding the clamps in position.
 (10) Snap-On gear (module 0.8 / D = 30mm / #CDM-D30)

 *Additional Allen-key (2,5 mm) coming within the package is not shown in this figure.

## 2.3 Mounting procedure

### 2.3.1 General

The FR7 Zoom servo drive unit is slid onto the 15mm rod of the camera. The curly cable ensures safe operation within the full tilt and pan range of the Sony ILME-FR7. The tiny distribution box is mounted to the side of the FR7 base and has a built-in power input which has a loop through connection for the power input to the camera. The original power supply of the FR7 can be used to power the camera and the motor at same the time.

 Do not connect the motor to the Ethernet port!
The motor needs to be activated with-in the Web- GUI of FR7, otherwise it cannot be controlled!

### 2.3.2 Step-by-Step



- Power camera down.
- Mount lens onto camera head and make sure, to tighten EVERY lever for vertical lens support.
- Mount Chrosziel Flexi-Gear-Ring (8) to zoom ring of lens and make sure that ring does not slip. Mount Flexi-Gear-Ring (8) in a way that fixing screw mechanism stays away from the area, the motor drive shall be mounted too.
- Cut off remaining tail of gear, if necessary.



- Slide on the motor drive (6) on the 15mm support rods
- Unlock locking mechanism (L) of camera and slide camera backwards / forwards to balance the entire head.
- Align gear of motor to the Flexi-Gear-Ring (8) and tighten lever of the motor bracket. Do not push motor too hard against the gear, while tighten its lever!
- Turn the zoom ring with the motor engaged on the lens to both end stops and check if it works flawlessly.
- Tighten all remaining levers of the camera slide and lens support mechanism.
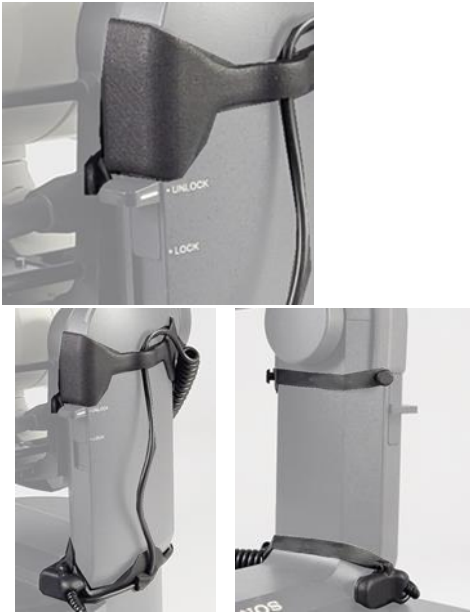
- Attach upper (5), then lower (4) cable clamp to the cameras pan axis as shown in pictures below.
- Rotate camera upwards to gain better access to the pan axis parts.
- Wrist both rubber straps of the cable clamps around the vertical part of the pan axis.



## DO NOT WRIST THE STRAPS OVER PARTS OF THE TILT AXIS!
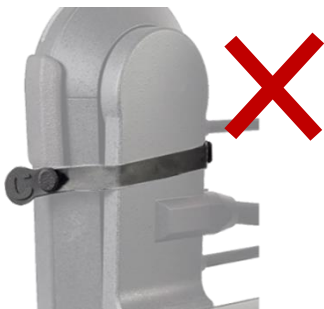




- Screw-on the distribution box (3) of the servos cable to the camera base housing as shown.
- Plug the power cable (1) of the distribution box into the FR7 camera head (on the left side)
- Connect the RJ45 (2) connector to the "OPTION"- port of the FR7.
- Plug the power cable (F) of the original FR7-power supply in the distribution box!
- Camera head AND servo drive will start initialization routine automatically after about 30 seconds.

- Make desired network connections for remote panel and WEB interface via PC/Laptop/MAC
- On Web-GUI of the FR7, activate the external lens controller through menu" technical/lens controller… "
- For manual Zoom Rocker operation select the desired operating mode (0... 5) on same setup page.
- Depending on direction of mounting assign spinning direction of the motor on same page

## 2.4 Auto Calibration

The calibration of the Zoom Servo Drive Motor is an essential part of the setup to guarantee precise, reliable operation of the device. Calibration is a complex procedure where the precise torque resistance of the lens is recorded for each position. The procedure ensures optimum reliability in use. Please ensure there are no obstructions between the zoom gear of the lens and the CDM-SFR. Do not touch the zoom gear of the lens during calibration as this will result in false torque-resistance readings.
As soon as the motor is connected to the ILME-FR7 and the camera head starts the homing procedure, the auto calibration is executed at the same time. While the status LED flashes, auto calibration is in progress and the device identifies the end stops of the zoom lens. Do not touch any moving parts during auto calibration. Calibration is complete when both end stops have been identified and the LED shows steady green.

**Calibration can be repeated with a press off the on-board button.**

## 2.5 Adopting motor torque

In some cases, motor torque needs to be adopted to the used lens. An effortless way to achieve this is to swap snap-on gear accordingly. If motor torque needs to be reduced, use the bigger gear CDM-D30 (10) and vice versa the smaller CDM-D24 to increase the effective torque.

## 2.6 Hints on setting up the camera for the Chrosziel CDM-SFR

The motor needs to be activated with-in the Web-GUI of FR7, otherwise it cannot be controlled!
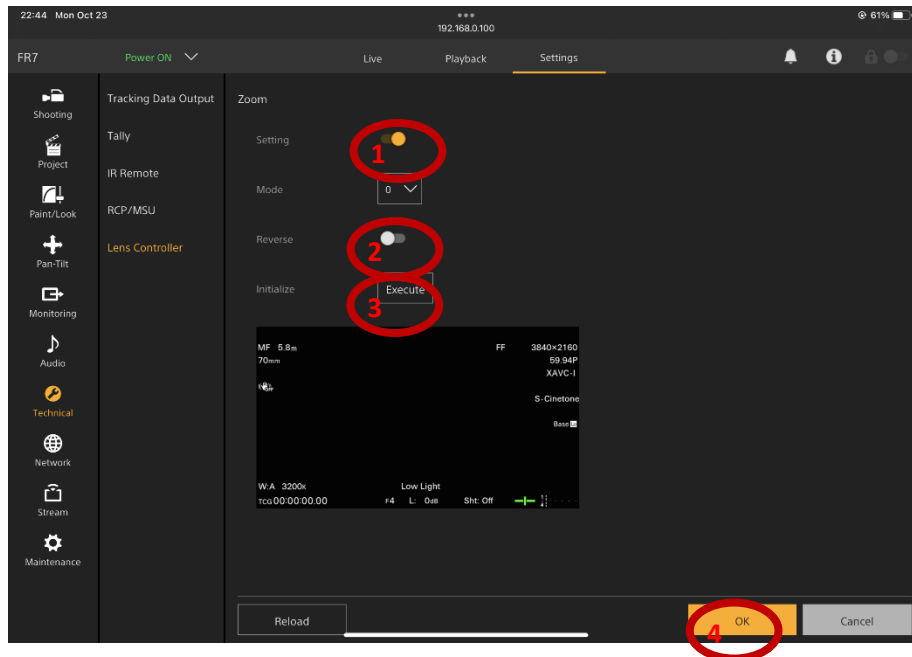


- On Web- GUI go to "Settings/Technical/Lens Controller" and set the "Setting"-switch to "On" (1). After hitting "OK" button (4), camera will restart, perform homing procedure and motor will auto calibrate the lens gear.
- If motor spinning direction needs to be changed, modify switch (2) to adopt it according to user's needs. Default for this switch is "OFF" for standard mounting (on right side of lens). Hit "OK"-button (3) to confirm setting.
- Trigger zoom motor calibration manually by hitting the "Execute"-button (3) of "Initialize" section, if needed.
- With drop-down-box "Mode" select your preferred operating mode for manual Zoom control via remote panel and/or Web-GUI.

## 2.7 Operating modes

On CDM-SFR, there are currently six modes implemented (0…5). The Web-GUI offers more settings from the drop-down-box, where values above 5 are ignored by the motor.
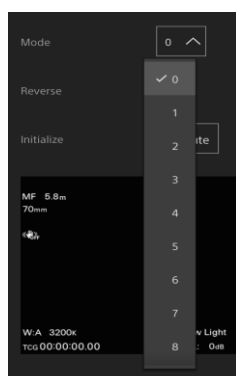


| | |
|---|---|
| *Zoom Mode 0* | Super Slow for TV- Live-Productions, Interviews |
| *Zoom Mode 1* | EB/Documentary |
| *Zoom Mode 2* | Silent |
| *Zoom Mode 3* | Live/Hard cut |
| *Zoom Mode 4* | Direct/Raw |
| *Zoom Mode 5* | Photo Mode for sticky lenses (increased minimum speed) |

## 2.8 Clear Image Zoom

If external zoom motor is used with the ILRM-FR7 (FR7 Firmware 2.0), the Clear Image Zoom functionality is disabled through camera firmware. That is because of synchronized take over from mechanical to electronical Zoom is not seamless and would show a jump in image size as soon as clear image zoom takes over. However, the Clear Image Zoom could be used as a kind of electronic teleconverter, which introduces a static shift of the focal length of the used lens, i.e., a 70-200 mm lens could be shifted to 105-300 mm.

To achieve this, proceed as follows (behavior might change on future firmware versions of the FR7):

- On Web-GUI switch Lens Controller setting to "Off" camera will reboot!
- In the user menu, set the clear image zoom setting to "On" if not active already.
- Zoom in/out, change the clear Image Zoom Magnification according to needed range of focal length (factor range is 1.0 – 1.5.
- On Web-GUI switch Lens Controller setting to "On" camera will reboot!
- OSD will indicate the chosen Zoom factor in the top left corner. Setting stays in non-volatile memory and is still active after re-powering the FR7.
- Zoom factor can be cleared by setting the Clear Image Zoom setting to "Off" (or "Optical Zoom Only") in the user menu, setting gets cleared. If needed again, procedure above needs to be repeated.

Example setup:

Used lens 70 – 200 mm; Clear Image Zoom factor x1.5
Resulting focal length 105 – 300 mm
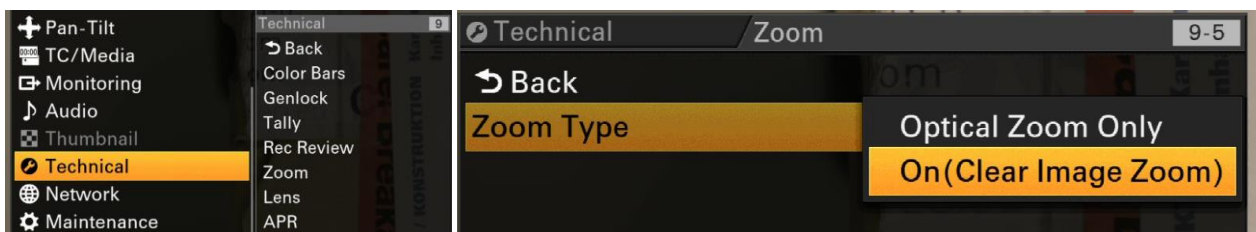
## 2.9 Service Tool for CDM-SFR

Chrosziel provides a service tool, running on MS Windows 10/11/ff…. Please contact Chrosziel via e-mail (info@chrosziel.com ) to obtain a copy of this application. The service tool connects via the RJ45 interface plug. So, a special adaptor cable is needed. Order this cable (#CAB-CDM-SFR-RS232) via your dealer or at Chrosziel directly. If your PC/Laptop does not feature a built-in serial comport with a 9pin- SUBD socket, you will need a USB-RS232 adaptor in addition.

The CDM-SFR service tool allows for updating the firmware of the motor as well as adjusting the backlash compensation value.

- Start the service tool.
- Connect power supply of FR7 to the motor, FR7 not needed for this process.
- Connect the data cable (CAB-CDM-SFR-RS232) to the RJ45 plug of the motor.
- Select the hardware comport available on your PC from drop-down box. If unsure which port to use, check for the desired comport on device manager of your PC as well.
- Hit the "Initialize" button.
- Hit "Version" to read firmware version installed on the motor and make sure, that connection to the motor is working properly.
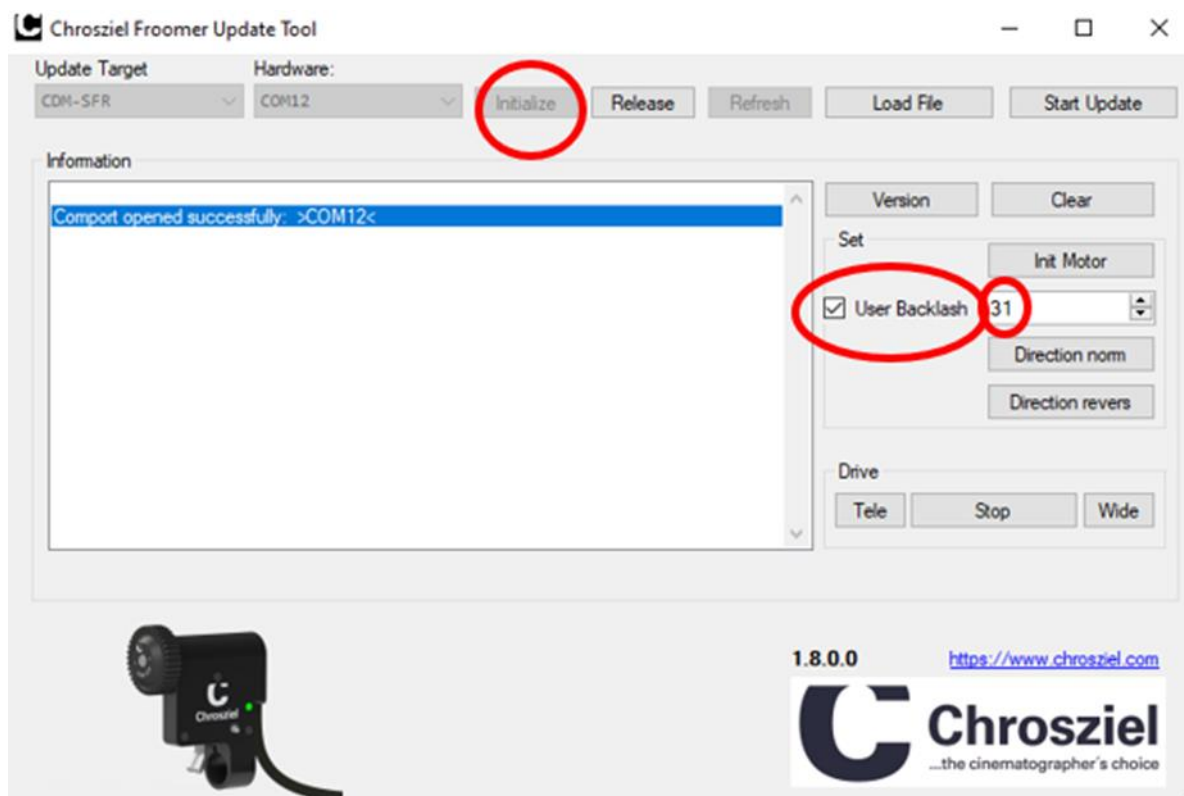


### 2.9.2  Firmware Updates

Chrosziel continuously updates and advances its firmware and incorporates user feedback. Please ensure you always run the latest firmware for smooth and fault-free operation. To make sure to receive firmware updates, please register your CDM-SFR via mail (info@chrosziel.com). Include product serial number, name, company, and email address. We comply with all statutory data protection laws.

The user can do the update by itself using the above-mentioned service tool and adaptor cable.

- Copy the firmware file ("img_fro.hex") to your computer.
- Select the Firmware file, previously copied to your PC.
- Hit "Start Update."
- Observe the "Information" dialogue box, process should finish with a "OK" message!
- If update routine was interrupted accidentally and the motor does not work anymore, restart the bootloader of the motor by pressing the on-board button and repower the motor, repeat the update procedure.

### 2.9.3 What is Backlash Compensation?

This setting compensates the play in the entire mechanical system from inner motor to the glass inside the lens. Every single moving part in this chain introduces some extra gap. The sum of all those gaps finally results in the visible play / backlash. That means marking a specific point on the way from wide to tele and driving the motor from the one or other side to this point will show, that it might not meet 100% to the desired position (slight differences in the range of 1-2%). This is relevant if presets with a specific position shall be recalled. For manual zooming it is less important. If the compensation is adjusted too strong (over-compensation), it might result in a little jump on direction change, when i.e., zooming manually with the rocker.

After connecting the service tool to the motor and hitting the Checkbox "User Backlash", set an amount according to your needs. Default value is 31 (for G-Master 70-200). A substantial value to start with for other lenses could be "10".

## 2.10 Technical Data

### 2.10.1 Pinouts
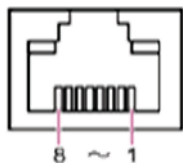


Option-Port on Camera, RJ45 connector (female)

| | |
|---|---|
| 1 | RS-232C TX signal to CDM-SFR. TX-signal send out from ILME-FR7 |
| 2 | RS-232C RX signal for follow-zoom unit. RX signal received by ILME-FR7 |
| 4 | GND (Ground) |
| 5 | GND (Ground) |



DC in/Out
EIAJ RC-5320A/ class 5

| | |
|---|---|
| Inner Pin | + Power (19.5V) |
| Outer Ring | - Power (GND) |

### 2.10.2 Technical Data

Short circuit protection is performed by a protective fuse which insulates the device from power supply in case of over-current events caused by unexpected internal failures. In addition, power input is polarity protected. The device can be used in moderate outdoor conditions.

The nominal input voltage of the Chrosziel CDM-SFR Motor is 19.5V. It is recommended that original power supply of FR7 is used. However, the motor can accept 12- 30V as input voltage. Power consumption is rated up to 10 W max.

At temperatures below -10° Celsius or above 40° Celsius, optimum functioning of the product can no longer be guaranteed. A constant operating temperature of approx. 20° Celsius is recommended.

| Technical Data | Value |
|---|---|
| Chrosziel product code | CDM-SFR |
| EAN/GTIN number | 4250618848648 |
| Power IN | 19.5V (Sony ILME-FR7 power supply used) |
| Power Out | Sony ILME-FR7 power plug, same voltage as power in passed through |
| Operating temperature | -10 to +40°C |
| Torque | 0.5Nm |
| Power consumption max. | 10W |
| Included Rod Mounting Bracket | For 15 mm rods |
| RJ45 plug | control command (RS232, VISCA, OPTION port) |
| Weight (complete including attached cable) Weight (motor without attached cable) | ~230g / 8.1 oz ~100g / 3.5 oz |

# 3. Cleaning and Maintenance Instructions

## 3.1 Safety Warning

- Always disconnect the Zoom Servo Drive Motor from power before undertaking cleaning and maintenance tasks.
- Be careful of sharp edges.

## 3.2 Cleaning

- Only clean the device when it is disconnected from power.
- Use only a soft, dry cloth or compressed air to clean the Zoom Servo Drive Motor.
- Never use harsh or abrasive cleaning agents.

## 3.3 Professional Cleaning and Maintenance

Maintenance tasks not listed in above may only be performed by Chrosziel Customer Service operatives. All warranty claims are voided if maintenance tasks are performed during the warranty period by persons or companies without Chrosziel Customer Service authorization.

## 3.4 Maintenance

The Zoom Servo Drive Motor is usually maintenance-free. In the case of wear and tear to specific parts, please send the device to an authorized Service Department. Wear parts are not included in the Warranty.

## 4. General Safety Information

Improper use of the Chrosziel Zoom Servo Drive may result in serious and extensive damage to health or can cause enormous damage to property. Please ensure you read the following instructions carefully and familiarize yourself with the device before operating it. By doing so, you will ensure safe and smooth operation of your Zoom Servo Drive motor.

**Observe general safety and accident prevention regulations.** In addition to the instructions given in this operating manual, ensure that general safety and accident prevention regulations are observed.

**Provide this operating manual to third parties.** Please ensure that any third parties usingthe Chrosziel Zoom Servo Drive only do so after reading and understanding the instructions.

**Keep away from children and protect against unauthorized use.** Never leave your Chrosziel Zoom Servo Drive unattended in operational condition or during operation. Keep away from children. Children must not be permitted to operate the Zoom Servo Drive Motor. Protect it from unauthorized accessor use. The Zoom Servo Drive is not intended for use by persons (including children) with reduced physical, sensory, or mental capabilities, or lack of experience and knowledge, unless they are supervised by a person responsible for their safety or have received instruction concerning use of the Zoom Servo Drive from that person.

**Never leave in operation unattended.** Never leave the Chrosziel Zoom Servo Drive unattended in operational condition or in operation.

**Take care and always concentrate** when using the device. Do not work with the Chrosziel Zoom Servo Drive while having trouble in concentrating or under the influence of drugs, alcohol, or medication. A single moment of inattention while using the Zoom Servo Drive Motor may result in accident and injury.

**Ensure the unit is firmly affixed to the lens.** When affixing the Chrosziel Zoom Servo Drive to your zoom lens, ensure the unit is mounted securely and properly.

**Watch out for damage.** Check your Chrosziel Zoom Servo Drive for damage before operating, and do not use the unit if there are any signs of damage.

**Use for the intended purpose.** Ensure you use the Chrosziel Zoom Servo Drive for the intended purpose described in this operating manual, only.

**Inspect regularly.** Use of the Chrosziel Zoom Servo Drive may result in wear and tear to some parts. Inspect the device regularly for damage or faults.

**Only use original parts.** For your own safety, only use accessories and add-ons that are specified in this operating manual or recommended by the manufacturer.

# 5. Warranty

## 5.1 Scope

Chrosziel GmbH grants the owner of the product a Standard Warranty of 12 months from the date of invoice. During this period, material or production defects identified on the Zoom Servo Drive Motor will be remedied free of charge by the Chrosziel Customer Service.

The terms of the Warranty exclude faults or defects from causes other than material or production defects, like

- Transport damage of any kind
- Faults caused by improper installation.
- Faults caused by use for other than the intended purpose.
- Faults caused by improper treatment.
- Faults caused by unprofessionally performed repairs or attempts at repair by persons or companies without authorization from Chrosziel GmbH
- Normal wear and tear
- Cleaning of components
- Alignment to nationally diverging technical or safety-relevant requirements if the device is not used in the country for which it was designed and manufactured.

We do not accept liability for devices with serial numbers that are falsified, changed, or removed. All warranty claims are voided if the device is opened.

Warranty claims beyond free repair of faults, e.g., compensation claims, do not fall within the scope of the Warranty.

## 5.2 Customer Service

In case there are operating issues with the Zoom Servo Drive occurring, proceed as follows:

**Contact Customer Service**

Mail: info@chrosziel.com / phone: +49 (0) 89 / 901 091 0 (Mon. – Fri.: 9 am – 5 pm CET)

Please give a detailed description of the issue, include a picture or video, and the invoice.

**Pack the device carefully!**

Pack up your device, making sure the packaging is well padded and protected from impact. N.B.: Warranty does not cover transport damage!

**Ship the device.**

After response from the Chrosziel Customer Service Center, proceed as instructed.

# 6. Troubleshooting

**The Motor does not calibrate successfully.**

| Reason | Suggested solution |
|---|---|
| Stiff lens | Check the lens |
| Obstruction between the gears | Check the Iris gearing and the Zoom Servo Drive Motor gear and remove any obstructions |
| Motor disengages on end stops or stiffer section of the gear travel | e-mount lenses (especially simple photo lenses) tend to bend easier through there weaker mechanical construction. An additional lens support bracket is highly recommended. Chrosziel designed brackets, which stiffen the lens against the support rods. Those are:<br>Sony lenses:<br>**401-LS-70200G**<br>**401-LS-70200GM**<br>**401-LS-100400GM**<br>**401-LS-200600GM**<br>**Sigma lenses:**<br>**401-LS-SI100400**<br><br>Others on request. |

# 7. Disposal

The packaging and all packaging materials used are from environmentally friendly recyclable materials. At the end of its useful life, the Zoom Servo Drive Motor must be taken to a recycling center for appropriate environmentally friendly disposal. Do not discard the Zoom Servo Drive Motor with household waste. Find your nearest recycling center by searchingthe Internet or contacting your city hall.

## 8. Additional Information / Useful Downloads

To receive the up-to-date operating manual contact Chrosziel customer service:

 info@chrosziel.com

Product overviews Zoom Servo Drive Motor for Sony ILME-FR7 (CDM-SFR):

https://www.chrosziel.com/The-Sony-ILME-FR7-Universal-Zoom-Servo-Drive/CDM-SFR

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Twitter: https://twitter.com/Chrosziel

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# EU Declaration of Conformity

1.  Apparatus model/Product                  Universal Zoom Servo Drive for Sony
                                             ILME-FR7 (CDM-SFR)

2.  Name and address of the manufacturer     Chrosziel GmbH
                                             Otto-Hahn-Str. 12-14
                                             85521 Ottobrunn
                                             Germany

3.  This declaration of conformity is issued under the sole responsibility of the manufacturer.

4.  Object of declaration                    Universal Zoom Servo Drive for Sony
                                             ILME-FR7 (CDM-SFR)

5.  The object of the declaration described above is in conformity with the relevant Union
    harmonization legislation.

Herewith we certify that our product mentioned above comply with CE conformity regulations. And is in conformity with the essential requirements and other relevant provisions of the following EC directive including all applicable amendments:

99/5/EC of 9 March 1999
2011/65/EU of 1 July 2011
EN 300 220-2 V2.4.1 (2012-05)
EN 300 328 V1.7.1 (2006-10)
EN 300 440-2 V1.4.1 (2010-08)
EN 301 489-1 V1.9.2 (2011-09)
EN 301 489-3 V1.4.1 (2002-08)
EN 60950 (2006)
EN 62368-1 (2016)
IEC/UL 62368

CDM-SFR has been assessed to the RoHS2 & RoHS3 Directive using the following harmonized standard:

RoHS 2 – (2011/65/EU) + Extension RoHS 3 (EN 50581).

Signed for and on behalf of:   Chrosziel GmbH

Till Vogel, CEO                              Ottobrunn, 28.11.2023