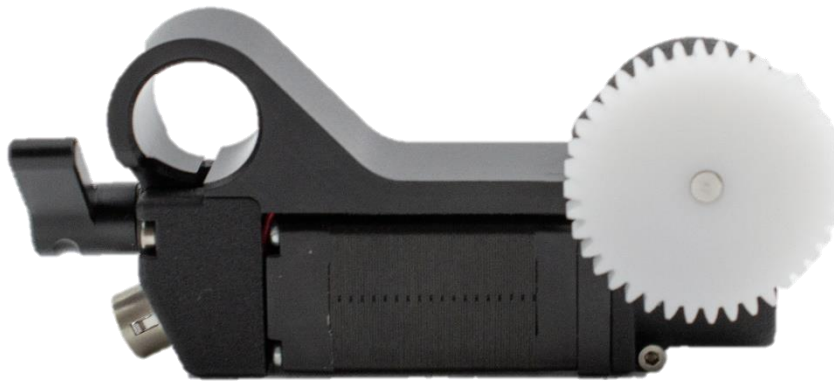


Lens Unit

User Manual



Valid for:

Lens Motor Unit

Release Date:

17. July 2019

Revision:

2

Dear customer,

Thank you for purchasing the Lens Unit from Black Forest Motion. As our customer, you receive our highest attention and we are always there for you, if you have questions or suggestions to our products.

In order to make it as easy as possible for you to start using our product, please read this user manual carefully and familiarize yourself with its safe and efficient operation.

Keep this user manual in a safe place so that it can be accessed at any time if necessary.

The current user manual is also always available for download from our website:

<https://www.blackforestmotion.com/support>

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Content

1. Usage of this Manual.....	4
2. Preface	5
3. Introduction.....	6
4. Safety Instructions	7
5. Technical Specifications	8
6. Mounting of the Lens Gear Belt	9
7. Mounting of the Lens Motor	10
8. Connecting to the Motion Controller	11
9. Troubleshooting: Internal Gear loosened	12
10. Troubleshooting and FAQs.....	15
11. Index.....	16

1. Usage of this Manual

This manual serves as a help and reference document for the end user of the Black Forest Motion Lens Unit. Read this manual thoroughly to familiarize yourself with the function of the device.

In this manual, different info fields are used to clarify important points for the reader. These are listed below.

Important Note



This is an important hint. Please observe it to avoid unexpected behavior of the device.

Tip



This is a useful tip that will be helpful when using the device.

2. Preface

This work is protected by copyright. The rights based thereby, in particular those of the translation, the reprint, the lecture, the removal of illustrations or tables, the radio transmission, the microfilming or the duplication on other ways and the storage in data processing plants, remain reserved, also with only partial utilization.

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3. Introduction

The Lens Motor is a compact unit for the automated control of the focus or zoom setting of camera lenses.

The unit was developed by Nico Engel and is manufactured and distributed by Black Forest Motion in Germany.



4. Safety Instructions

- a) The operation of the unit is at your own risk. The user is liable for damage to property and personal injury caused by the operation of the Lens unit.
- b) The Lens unit is designed for indoor use. When used in damp rooms and outdoors, appropriate safety regulations must be observed, especially when the unit is operated from the mains.
- c) When operating outdoors, the user is required to provide adequate weather protection.
- d) Do not attempt to move the outer white gear by hand. The units contain self-blocking worm gears which prevent direct movement. Always use a connected controller to move the gear.
- e) Do not overload the Lens unit by setting a motor current that is outside the operating specifications. This can overheat and destroy the unit. In addition, overloading and direct contact with the unit can cause burns.



By affixing the CE mark, we declare that our device, in accordance with EU Regulation 765/2008, meets the applicable requirements laid down in the Community harmonization legislation on its affixing.

5. Technical Specifications

Operating temperature	-20° to +45°
Storage Temperature	-30° to +60°
Humidity	10%-90% non-condensing
Connectors	Hirose HR10A-7R-4R(73) 4-pin Male
Mounting Options	15mm Rod compatible
Lens Diameter for optional Lens Gear Belt	65 – 110mm
Gear-Module	0.8
Motor Type	Bipolar Stepper Motor NEMA8
Max. Motor Current	0.4A
Gear Type	Worm Gear
Gear Ratio	1:20
Minimal Step Angle	0.0028125 Degrees (with PINE Controller)
Dimensions	L/W/H: ~10 x 4 x 2.5 cm (without Mounting Rods)
Weight	200g

6. Mounting of the Lens Gear Belt

First, attach the lens gear belt to your camera lens. Depending on the application, you can attach it to the focus or zoom wheel. Make sure that the belt aligns as close to the lens as possible and is **centered** (see pictures below).



7. Mounting of the Lens Motor

Use the 15mm Rod available from Black Forest Motion and mount it to the bottom of an Arca L-Rail (e.g. supplied with the NT Head). The Lens unit can then be pushed onto the mounting rod and fastened with the wing screw. Alternatively, you can use your own Rod System. Then align the lens unit so that the white gear wheel ideally attaches to the lens belt.



It is recommended that the mounting screw of the lens belt is positioned on the opposite side (180 degrees offset) of the lens motor gear, as the lens belt may not be completely in contact with the lens in the area of the mounting screw.



8. Connecting to the Motion Controller

Use the motor cables available from us (Hirose 6-pin male to Hirose 4-pin female) to connect the motor connector of the lens unit to the PINE controller.



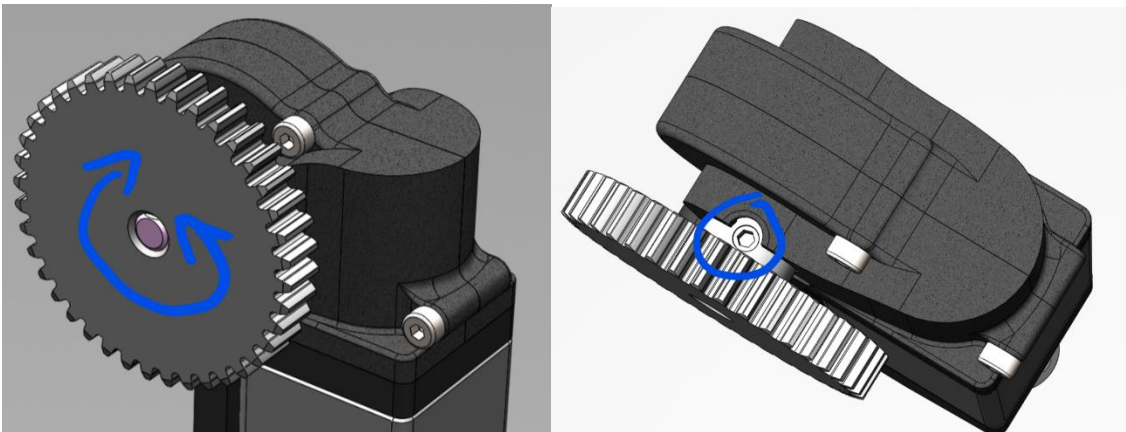
Once the cable is connected to the lens unit, the wing screw cannot be completely rotated 360 degrees. In this case you can pull the wing screw to fix the Lens unit.

Information about the operation of the PINE Controller can be found in our separate manual for PINE.

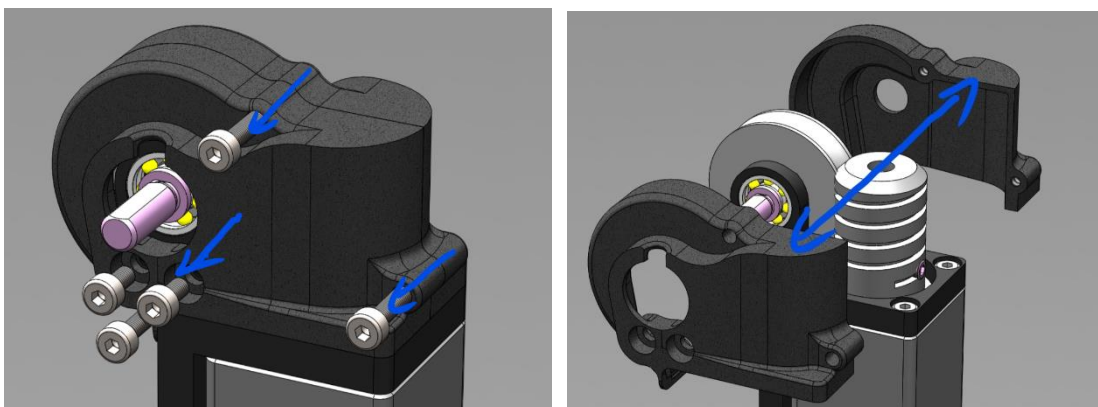
9. Troubleshooting: Internal Gear loosened

If the lens unit is overloaded, the internal gear may come loose from the motor shaft. In this case, the motor unit makes a rotating noise, but the external gear hardly moves or does not move at all. In most cases, however, this defect can be repaired by the user. Please follow the steps below:

1. Connect the lens unit to the PINE Controller and turn the spur gear until the grub screw on the upper side is reachable. If the internal gear is completely detached from the motor shaft, the outer spur gear may be moved manually to the shown position.



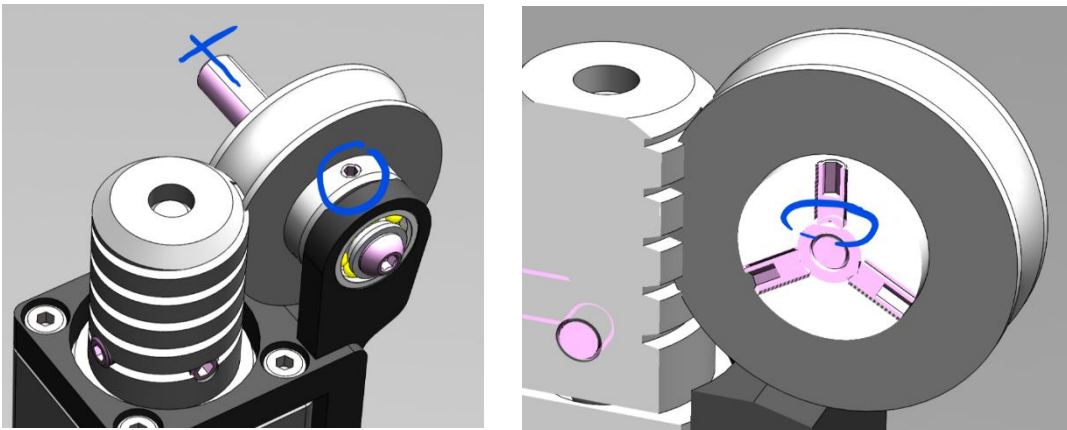
2. Remove the grub screw and pull the spur gear off the shaft in the axial direction.
3. Remove the lateral screw on the gearwheel cover and carefully remove the covers (two-piece).



4. On the large worm wheel, there are three grub screws distributed around the circumference. Check these for tight fit, fix again with screw lock if necessary.

One of the three grub screws must be mounted directly on the flattened spot on the axle.

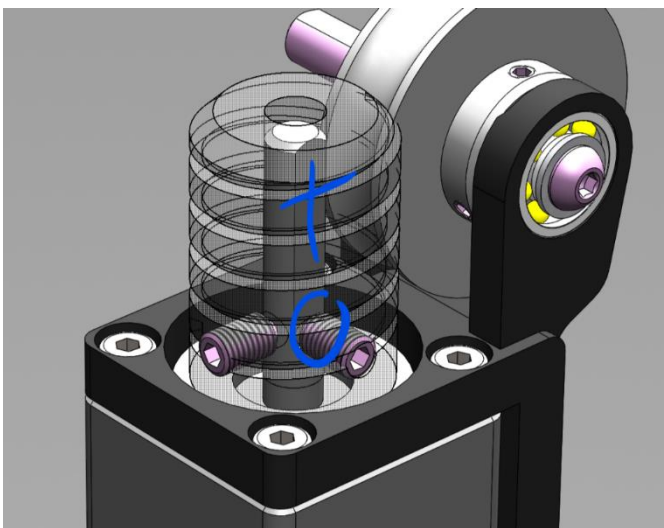
Maximum tightening torque 0.2Nm.



5. Two grub screws are distributed around the circumference of the worm. Check these for tight fit, fix again with screw lock if necessary.

One of the two grub screws must be mounted directly on the flattened spot on the motor axle.

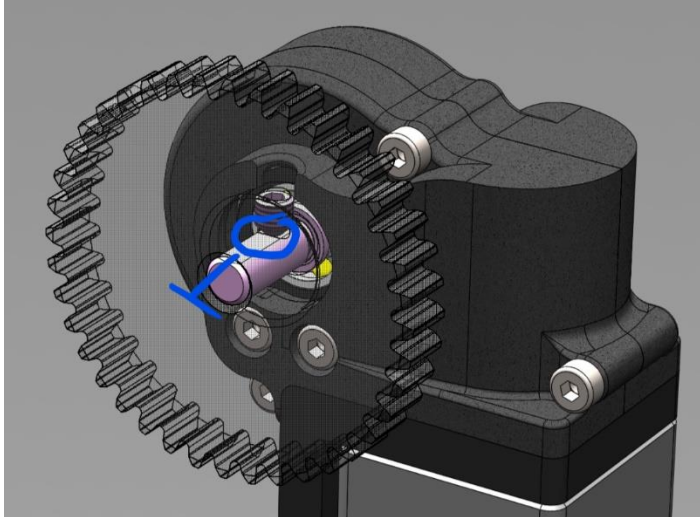
Maximum tightening torque 0.5Nm.



6. In reverse order, carefully put on the covers and tighten the screws by hand.

Maximum tightening torque 0.2Nm.

7. For the spur gear, make sure that the grub screw is mounted directly on the flattened part of the axle.



10. Troubleshooting and FAQs

The unit makes a high pitch sound

Try setting a lower motor current between 0.2A and 0.4A. The absolute maximum current for the lens motor is 0.4A.

We also recommend to set the Energy Saving option between 60-100% for the lens motor. You can set Energy Saving under the Motor Settings section of the PINE Motion App.

The unit gets very hot

Our lens motor unit allows for a maximum motor current of 0.4A only. This is much less current than for our other motor units like the NT Head or Slider motors.

Please never exceed a motor current of 0.4A for our lens unit. You can change the motor currents under the Motor Settings section of the PINE Motion App.

11. Index

I

15mm Rod · 8

D

Dimensions · 8

E

Energy Saving · 15

F

FAQs · 15
focus or zoom wheel · 9

G

Gear Belt · 3, 8, 9
Gear Ratio · 8
Gear-Module · 8

H

high pitch sound · 15

L

L-Rail · 10

M

Motion Controller · 11
motor current · 7, 15
Mounting · 3, 8, 9, 10

O

Operating temperature · 8
overheat · 7

P

PINE Controller · 8

R

Rod System · 10

S

Safety Instructions · 3, 7

W

Weight · 8
wing screw · 10
Worm Gear · 8

