



USER'S MANUAL

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1. Getting started

Thank You very much for purchasing DitoGear™ motion control equipment. We hope that the devices will meet your expectations bringing a great value to your productions.

This manual includes hardware instructions for using the DitoGear™ LensDrive. Depending on the bundle you purchased and the configuration of you setup, the unit may be controlled by different controllers, such as:

1. A DitoGear™ OmniController
2. A DitoGear™ SmoothWheel
3. A DitoGear™ Trito
4. DitoGear™ DragonBridge Interface
5. DitoGear™ Evolution software package and multi-axis motion control interface

Detailed instructions related to these devices has been delivered to you electronically with purchase of the device. In case you can't find them, download all manuals from: www.ditogear.com/user-manuals

Please follow the instructions in this manual to learn how to get the most of the DitoGear™ LensDrive and DitoGear™ motion control devices.

Please ensure to carefully read the safety instructions and precautions contained in this manual and corresponding controllers manuals prior to the first use of the device.

Should you need any assistance or support do not hesitate to contact us at support@ditogear.com.

Product version information

This manual refers to DitoGear™ LensDrive V2 hardware version dated May 2013.

Latest product manuals can always be found at: www.ditogear.com/user-manuals

2. The kit contents

The DitoGear™ LensDrive comes in a range of bundles and configurations. Check the following website to learn about the kit contents:

<http://ditogear.com/products/lensdrive/bundles/>

3. Precautions for safe use and optimal LensDrive performance

Please read and follow the guidelines below to use the LensDrive safely and ensure its best performance.

Caution!
The LensDrive gear should not be turned manually. Use the appropriate DitoGear™ controller to avoid damage.

Caution!
Incautious use of the device may cause serious injuries to your body. Never put your hands or fingers near the gears during operation!

Caution!
DitoGear is not responsible for any damage to the LensDrive, camera or other equipment caused by improper use of the device.

Motor warning signals and behaviors.

The DitoGear™ OmniSlider Servo, OmniHead and LensDrive are equipped with an internal low-level servo motor controller protecting the motor and your equipment from damage in result of overload or physical blockage of the moving parts.

When the axis motor approaches the performance limit you will hear a short repeating beep from the motor box. It indicates that the motor is working under high payload and is close to its performance limit.

When an excessive load is put on the axis motor or the device is not properly calibrated and the motor tries to work against physical limit, the motor controller will prevent the damage to the motor by cutting the power off. You will hear the continuous beep sound coming from the motor box. It indicates the motor stall.

In this situation you need to press the reset button on the motor housing (OmniSlider, LensDrive) or reconnect signal cable (OmniHead) and probably re-calibrate the device.

Taking the above into account, calibrate and operate the device carefully.

4. Getting to know the LensDrive

The DitoGear™ LensDrive is a motorized zoom/focus/iris drive unit based on precise and power-efficient, digitally-controlled servo motors and has been designed for timelapse, stop motion animation and real time operation with various devices.

In addition to controlling the lens gears it may be used creatively to drive light adjustment knobs or numerous other devices of your choice.

The LensDrive is a precisely machined unit consisting of highest quality hardware and electronics housed in a sealed enclosure. It is weather resistant meaning that it may work under standard conditions including light rain or light show and low temperatures. However, it is not fully water resistant and should not be used under extreme conditions.

The LensDrive gear is capable of unlimited rotation around its axis which may be only limited by the type of controller used and calibration settings.

The LensDrive is compatible with MOD 0.8 gear standard which is common across the film industry and with 15mm rods support systems and accessories. It may be used with the geared cine lenses or with DSLR lenses provided that they have been geared using 3rd party geared rings or the gear rings coming with the DitoGear™ LensDrive Professional Bundles.

Please note that there may exist some camera and lens configurations where it is not be possible to physically connect the LensDrive to your lens because the LensDrive body would collide with the lens or camera body. It is rare, but in such case you should opt for a traction belt based mounting option instead of direct gear-to-gear solution.

The LensDrive unit consists of the following elements:

- 1 main body
- 2 15mm rods hole with a lock knob
- 3 internal controller reset button
- 4 external gear unit
- 5 RJ45 type signal cable connector

In addition, the following elements are supplied or need to be sourced:

- 1 Unit controller
- 2 RJ45 type signal cable
- 3 Power source
- 4 Lens gears
- 5 Support rig

5. Setting up the LensDrive

Follow the instructions below to setup the device for basic operation.

Using the device for the first time

- 1 Unpack the LensDrive and remove all bubble wraps. Be careful not to use any sharp device in order not to scratch the surface of the equipment.
- 2 Check the package contents with the equipment list included in the package or with the website.
- 3 Prepare your camera and lens rig and the supports system.
- 4 Lock your lens to the rig on the camera end and on the front end to avoid lens relocation during operation.
- 5 Mount the LensDrive on the OmniHead or on a rig of your choice. LensDrive is ready to mount on the OmniHead unit which comes with 15mm rods adapter plate and rods. For other configurations you'll need a 3rd party 15mm-standard support rods accessories.
- 6 Depending on your camera and lens configuration you may need to orient the LensDrive either in motor-to-front or motor-to-back configuration. Use whatever configuration that works best for you.

- 7 Connect an RJ45 type signal cable to the LensDrive and to the Output channel of a DitoGear™ Breakout Box A recommended cable length is 1m.
- 8 Connect an RJ45 type signal cable to the OmniController or SmoothWheel or other controller of your choice. Connect the other end to Input 1 port of the Breakout Box.
- 9 If you're planning on using shutter release cable to trigger the DSLR camera shutter, connect a shutter release cable to Sync 1 port (2.5mm micro jack) of the Breakout Box. Connect the other end to your camera.
- 10 Move the lens gear and lens ring to the movement limit position or to a desired starting position in case of lenses that support continuous rotation of control rings.
- 11 Engage the LensDrive gear to the lens ring gear and lock it with the knob to the support rods.
- 12 Connect the power source - a DitoGear™ Power Pack 7Ah/14Ah, a DitoGear™ AC/DC power adapter or a 3rd party compatible power source to a Power port of the Breakout Box.
- 13 Proceed with calibration procedures as described in controllers systems manuals. After calibration the LensDrive is ready to work.

6. Using the LensDrive with DitoGear™ DragonBridge

Use the following values in the configuration of the Dragonframe controlled device to ensure proper operation.

- 1 Impulses per degree: 154
- 2 Steps per second max: 100 000
- 3 Backlash 0

Steps per second and backlash may be overridden by the values of your choice if needed. Measure the backlash manually or try to estimate it to obtain the best performance.

7. Conservation Guidelines

- 1 While not in use LensDrive should be stored in a dry and dust-free place, preferably the Aluminum Transport Case from DitoGear™.
- 2 After use in humid or wet conditions make sure to clean the unit with a soft fabric. your lens to the rig.

8. Technical specifications

Technical specifications table

Dimensions	160mm x 125mm x 80mm (6.3" x 4.92" x 3.15")
Weight	460g (1 lbs)
Lens gear standard	MOD 0.8, compatible with the industry standard
Electronic backlash compensation	Yes, w/ DitoGear™ SmoothWheel, DitoGear™ Evolution and Dragonframe software
Angular positioning precision	0.045°
Real time operation speed	360°/1.25s - 360°/35s (with OmniController)
Current draw	0.1A - 0.2A @ 12V DC
Power supply	10.5V - 14.4V DC
Operating temperature	-25°C to 50°C
Operating humidity	20% to 80%

Disposal and recycling information

The device and all batteries included with it must be disposed of properly according to local laws and regulations. The product must be disposed of separately from the household waste. When your product reaches its end of life, contact DitoGear or your local authorities to learn about recycling options.

9. Using 3rd Party Power Adapters

DitoGear recommends using original DitoGear™ AC/DC power adapters and batteries.

While using a 3rd party adapter make sure it meets the requirements detailed in technical specifications table.

Caution!

DitoGear is not responsible for any damage or failures caused by the use of a 3rd party power supply adapter.

10. Precautions for Safe Use of DitoGear™ Power Cables

Power cables cannot be looped during operation due to insufficient heat rejection that can cause melting of the cable insulation and ultimately its failure. Remember to disconnect all power cables after use, especially during transportation.

11. Using DitoGear™ Power Packs

DitoGear™ Power Pack 7Ah/14Ah and DitoGear™ PowerBox include gel type lead acid batteries, that have a low voltage operating limit. When you discharge the battery below that limit, the irreversible chemical processes occur and the recharging performance can be affected. It is recommended not to fully discharge the battery.

The lead acid battery will self-discharge slowly over time. Leaving the battery for more than 3 months without recharging may result in damage. Remember to recharge the battery at least every 3 months.

12. Obtaining Support

In case of any technical issues that can't be solved by carefully reading the manuals do not hesitate to contact us at support@ditogear.com

13. Limited Warranty

DitoGear One (1) Year Limited Warranty
For DitoGear Products Only

Consumer rights and restrictions.

For consumers, who are covered by consumer protection laws or regulations in their country of purchase or, if different, their country of residence, the benefits conferred by this warranty are in addition to all rights and remedies conveyed by such consumer protection laws and regulations. This warranty does not exclude, limit or suspend any rights of consumers arising out of non-conformity with a sales contract. However, as described below, DitoGear disclaims statutory and implied warranties to the extent permitted by law, and in so far as such warranties cannot be disclaimed, all such warranties shall to the extent permitted by law be limited in duration to the duration of the express warranty described below and to the repair or replacement service as determined by DitoGear in its sole discretion. Some states (countries and provinces) do not allow limitations on how long an implied warranty or condition may last, so the limitations described above may not apply to you. This warranty gives you specific legal rights, and you may also have other rights that vary from state to state (or by country or province). This limited warranty is governed by and construed under the laws of the country in which the product purchase took place. DitoGear, the warrantor, under this limited warranty stands for DitoGear™ Robert Paluch, ul.Krańcowa 30, 62-002 Suchy Las, Poland.

Warranty.

DitoGear's warranty obligations for this hardware product are limited to the terms set forth herein. DitoGear warrants this DitoGear-branded hardware product against defects in materials and workmanship under normal use for a period of one (1) year from the date of retail purchase by the original end-user purchaser ("Warranty Period"). If a hardware defect arises and a valid claim is received within the Warranty Period, at its option and to the extent permitted by law, DitoGear will either (1) repair the hardware defect at no charge, using new or refurbished parts that are equivalent to new in performance and reliability, (2) exchange the product with a product that is new or refurbished that is equivalent to new in performance and reliability and is at least functionally equivalent to the original product, or (3) refund the purchase price of the product. DitoGear may request that you replace defective parts with user-installable new or refurbished parts that DitoGear provides in fulfillment of its warranty obligation.

A replacement product or part, including a user-installable part that has been installed in accordance with instructions provided by DitoGear, assumes the remaining warranty of the original product or ninety (90) days from the date of replacement or repair, whichever provides longer coverage for you.

When a product or part is exchanged, any replacement item becomes your property and the replaced item becomes DitoGear's property. Parts provided by DitoGear in fulfillment of its warranty obligation must be used in products for which warranty service is claimed. When a refund is given, the product for which the refund is provided must be returned to DitoGear and becomes DitoGear's property.

Exclusions and limitations.

To the extent permitted by law, this warranty and the remedies set forth above are exclusive and in lieu of all other warranties, remedies and conditions, whether oral, written, statutory, express or implied. As permitted by applicable law, DitoGear specifically disclaims any and all statutory or implied warranties, including, without limitation, warranties of merchantability and fitness for a particular purpose and warranties against hidden or latent defects. If DitoGear cannot lawfully disclaim statutory or implied warranties then to the extent permitted by law, all such warranties shall be limited in duration to the duration of the express warranty and to the repair or replacement service as determined by DitoGear in its sole discretion. Some states (countries and provinces) do not allow limitations on how long an implied warranty or condition may last, so the limitations described above may not apply to you. No DitoGear reseller, agent, or employee is authorized to make any modification, extension, or addition to this warranty. If any term is held to be illegal or unenforceable, the legality or enforceability of the remaining terms shall not be affected or impaired.

This Limited Warranty applies only to hardware products manufactured by or for DitoGear. The Limited Warranty does not apply to any non-DitoGear hardware products even if packaged or sold with DitoGear hardware. Manufacturers or suppliers, other than DitoGear, may provide their own warranties to the end user purchaser, but DitoGear, in so far as permitted by law, provides their products "as is".

DitoGear does not warrant that the operation of the product will be uninterrupted or error-free. DitoGear is not responsible for damage arising from failure to follow instructions relating to the product's use.

This warranty does not apply: (a) to consumable parts, such as batteries, unless damage has occurred due to a defect in materials or workmanship; (b) to cosmetic damage, including but not limited to scratches, dents and broken elements on ports; (c) to damage caused by use with non-DitoGear products; (d) to damage caused by accident, abuse, misuse, liquid contact, fire, earthquake or other external causes; (e) to damage caused by operating the product outside the permitted or intended uses described by DitoGear; (f) to damage caused by service (including upgrades and expansions) performed by anyone who is not a representative of DitoGear; (g) to a product or part that has been modified to alter functionality or capability without the written permission of DitoGear; (h) to defects caused by normal wear and tear or otherwise due to the normal aging of the product.

Except as provided in this warranty and to the extent permitted by law, DitoGear is not responsible for direct, special, incidental or consequential damages resulting from any breach of warranty or condition, or under any other legal theory, including but not limited to loss of use; loss of revenue; loss of actual or anticipated profits (including loss of profits on contracts); loss of the use of money; loss of anticipated savings; loss of business; loss of Opportunity; loss of goodwill; loss of reputation; loss of, damage to or any indirect or consequential loss or damage howsoever caused including the replacement of equipment and property. The foregoing limitation shall not apply to death or personal injury claims, or any statutory liability for intentional and gross negligent acts and/or omissions. Some states (countries and provinces) do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

Obtaining warranty service.

DitoGear will provide warranty service either (i) at an DitoGear Retail or DitoGear Authorized Service Provider (“ASP”) location, where service is performed at the location, or the DitoGear Retail or ASP may send the product to an DitoGear repair service location for service, (ii) by sending you prepaid way bills (and if you no longer have the original packaging, DitoGear may send you packaging material) to enable you to ship the product to DitoGear’s repair service location for service, or (iii) by sending you customer installable new or refurbished replacement product or parts to enable you to service or exchange your own product (“DIY Service”). Upon receipt of the replacement product or part, the original product or part becomes the property of DitoGear and you agree to follow instructions, including, if required, arranging the return of original product or part to DitoGear in a timely manner. When providing DIY Service requiring the return of the original product or part, DitoGear may require a credit card authorization as security for the retail price of the replacement product or part and applicable shipping costs. If you follow instructions, DitoGear will cancel the credit card authorization, so you will not be charged for the product or part and shipping costs.

If you fail to return the replaced product or part as instructed or the replaced product or part is not eligible for warranty service, DitoGear will charge the credit card for the authorized amount.

Please access and review the online help resources at the DitoGear website (www.ditogear.com) and contained in the product manual before requesting warranty service. If the product is still not functioning properly after making use of these resources, please contact DitoGear at support@ditogear.com.

Service options, parts availability and response times may vary according to the country in which service is requested. Service options are subject to change at any time. You may be responsible for shipping and handling charges if the product cannot be serviced in the country in which service is requested. If you seek service in a country that is not the country of purchase, you will comply with all applicable import and export laws and regulations and be responsible for all custom duties, VAT, and other associated taxes and charges. For international service, DitoGear may repair or exchange defective products and parts with comparable products and parts that comply with local standards. In accordance with applicable law, DitoGear may require that you furnish proof of purchase details before receiving warranty service.

14. Privacy

DitoGear will maintain and use customer information in accordance with the DitoGear Customer Privacy Policy available at ditogear.com/legal/privacy-policy/.

15. Miscellaneous

Trademarks and copyrights

DitoGear™, DitoGear™ OmniController, DitoGear™ Evolution, DitoGear™ Trito , DitoGear™ OmniSlider, DitoGear™ OmniHead and DitoGear™ LensDrive, DitoGear™ Modulo are trademarks of Dito Gear Robert Paluch ul.Krańcowa 30, 62-002 Suchy Las, Poland. Unauthorised use is strictly prohibited. All other trademarks referenced in this manual are used only for informative purposes and are property of their respective owners.

Disposal and recycling information

The device and all batteries included with it must be disposed of properly according to local laws and regulations. The product must be disposed of separately from the household waste. When your product reaches its end of life, contact DitoGear or your local authorities to learn about recycling options.





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