FREEFLY

PILOT + MIMIC

OPERATION MANUAL

770-00052 | REVISION A | 07.30.2017

To download the most current user manual for the Pilot and all other Freefly products, please visit http://freeflysystems.com/software-manuals

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REVISION HISTORY

REVISION	DATE	DESCRIPTION
A	July 2017	Initial Manual Release

CONTENTS

TERMINOLOGY

2.4 GHz	An industrial, scientific, and medical (ISM) radio band (2.4-2.5GHz) that is used for radio control.
BLE	Bluetooth Low Energy (BLE) is a low power and application friendly version of Bluetooth.
FIZ	An acronym referring to a lens's Focus, Iris, and Zoom.
Function Side	The side of the connector that interfaces with another connector.
GCU	Gimbal Control Unit (GCU) refers to the MōVI's central processor and housing, which is attached to the pan arm.
GPS	Global Positioning System (GPS) is a satellite-based navigation system made up of a network of 31 satellites that can be used to determine global position.
INS	An inertial navigation system (INS) is an electronic device that measures and reports a body's specific force, position, angular rate, and sometimes the magnetic field, using a combination of accelerometers, compasses, magnetometers, gyroscopes, and GPS.
LOS	Loss of Signal (LOS) refers to a condition where radio control inputs or telemetry are not present.
Module	Pilot consists of various "modules" which represent standalone components which can be added/removed to configure Pilot
RCP	REDLINK® Command Protocol (RCP) is the unified command protocol used for the RED EPIC and SCARLET cameras, regardless of sensor type.
RX	RX is an acronym for receive, receiver, or reception.
Solder Side	This is the side of the connector where the wires are soldered to the connector.
TX	TX is an acronym for transmit or transmitter.
UART	A Universal Asynchronous Receiver/Transmitter (UART) is a block of circuitry responsible for implementing serial communication.

OVERVIEW

DISCLAIMER AND WARNING

IMPORTANT - Please read this disclaimer and warning carefully and review the Pilot Operation Manual prior to use. If you have any questions, please contact support@freeflysystems.com prior to using Pilot Controller. You can review the most current version of this Operation Manual at www.freeflysystems.com/software-manuals.

By using Pilot Controller, you acknowledge that you have read, understand, and agree to this disclaimer. You agree that you are solely responsible for your conduct while using Pilot Controller and for any direct or indirect consequences that may result from its use.

Freefly Systems reserves the right to revise this Operation Manual and make changes from time to time without obligation to notify any persons of such revisions or changes. In no event shall Freefly Systems, its employees or authorized agents be liable for any damages or losses, direct or indirect, arising from the use of any technical or operational information contained in this document.

- Always check Pilot Controller, MōVI products and all Freefly hardware prior to operation.
- Always maintain awareness of your surroundings when operating Freefly products.
- It is your responsibility to perform a full system check prior to every use.
- It is your responsibility to learn how to safely operate Pilot Controller and MōVI products.
- Pilot Controller is a tuned system with custom components selected for each application. Modification to, removal, or substitution of Pilot Controller components will void the warranty.
- It is your responsibility to create shots that amaze the world.

BATTERIES AND CHARGING

The Pilot Controller includes MIMIC, which contains a non-removable internal battery. You must read these safety instructions and warnings carefully before charging or using your MIMIC. Failure to exercise caution while using MIMIC or failure to comply with the following warnings can result in battery malfunction, electrical issues, excessive heat, fire, personal injury, and/or property damage. For information specific to MōVI Batteries/Chargers please reference the applicable MōVI manual.

BATTERY SAFETY AND WARNINGS

You must read these safety instructions and warnings carefully before charging or using Pilot Controller. Improper use may result in damage to the batteries, severe personal injury, and even fire.

- Do not leave the MIMIC and charger unattended during use.
- Stop using or charging the MIMIC immediately if the MIMIC appears damaged, starts to

balloon or swell, leaks, becomes deformed or gives off an odor, exceeds a temperature of 140°F (60°C), or if anything else abnormal occurs. Disconnect the MIMIC (USB) and observe in a safe area outside of any building or vehicle for at least 45 minutes, as a damaged battery can experience a delayed chemical reaction that could possibly result in fire.

» Never disassemble, modify, puncture, shock, crash, short circuit, and/or expose the MIMIC to a flame. Leakage, smoke emission, ignition, explosion or fire can occur, which may result in personal injury or property damage.

» Never allow MIMIC or Pilot Modules to come in contact with moisture at any time.

» Never charge or store MIMIC in extreme heat (40°C) or cold (0°C). Recommended temperatures for storage are between 10°-26°C. High temperatures may cause fire, even with undamaged MIMICs.

» Never leave MIMIC or any Pilot Modules in an automobile or direct sunlight.

» In purchasing a Freefly product or system, the buyer agrees to bear all responsibilities of the risks and not hold Freefly Systems, its owners and employees, its distributors, and/or its retailers responsible for any accidents, injury to persons, and property damage. If you do not agree to these conditions, please return Freefly product(s) to the place of purchase in a new and unused condition.

CAUTION

All instructions and warnings must be followed exactly. Mishandling of MIMIC and its internal battery can result in fire. By handling, charging, or using the included MIMIC internal battery , you assume all risks associated with MIMIC. If you are not prepared to accept complete liability for the purchase and/or use of the batteries, you are advised to return them in new and unused condition to the place of purchase immediately.

CHARGING PROCEDURE SAFETY AND WARNINGS

You must read these safety instructions and warnings carefully before charging your MIMIC.

- Freefly Systems is not responsible for any personal injury or property damage incurred when using external power to power Freefly products.
- Never charge or use a MIMIC or Pilot Module that shows any damage or disfigurement of any kind, as this may be a sign of internal damage. Any damage to the protective cover or connector is also reason to discontinue use.
- Never charge a MIMIC unattended.
- Always inspect MIMIC and Pilot Modules before charging.
- Never charge near moisture, extreme temperatures, flammable or combustible materials.
- Always monitor the temperature of the MIMIC while charging. If the MIMIC becomes hot to the touch or begins to deform, discontinue charging immediately. Disconnect the battery from the charger and observe it in a safe place for at least 45 minutes.

LIMITATIONS OF LIABILITY

IN NO EVENT SHALL FREEFLY SYSTEMS BE LIABLE TO THE BUYER FOR ANY INDIRECT, CONSEQUENTIAL, PUNITIVE, INCIDENTAL, OR SPECIAL DAMAGES, OR ANY DAMAGES WHATSOEVER RESULTING FROM THE USE OF PRODUCT OR FROM LOSS OF USE, DATA OR PROFITS (HOWEVER CAUSED AND UNDER ANY THEORY OF LIABILITY), EVEN IF FREEFLY HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. IN NO EVENT SHALL FREEFLY'S LIABILITY FOR A PRODUCT (WHETHER ASSERTED AS A TORT CLAIM, A CONTRACT CLAIM OR OTHERWISE) EXCEED THE AMOUNTS PAID TO FREEFLY FOR SUCH PRODUCT. NOTWITHSTANDING ANYTHING HEREIN, IN NO EVENT SHALL FREEFLY'S LIABILITY FOR ALL CLAIMS ARISING OUT OF OR RELATING TO THIS AGREEMENT EXCEED THE AMOUNTS PAID BY BUYER TO FREEFLY FOR PRODUCT IN THE LAST TWELVE (12) MONTHS. IN NO EVENT WILL FREEFLY OR ITS LICENSORS BE LIABLE FOR COSTS OF PROCUREMENT OF SUBSTITUTE GOODS BY BUYER. IN NO EVENT WILL FREEFLY OR ITS LICENSORS BE LIABLE FOR DAMAGES ARISING OUT OF ANY LATE DELIVERY. THE LIMITATIONS SET FORTH HEREIN SHALL APPLY TO ALL LIABILITIES THAT MAY ARISE OUT OF THIRD-PARTY CLAIMS AGAINST BUYER. THESE LIMITATIONS SHALL APPLY NOTWITHSTANDING ANY FAILURE OF ESSENTIAL PURPOSE OF ANY LIMITED REMEDY. THE LIMITATION SET FORTH IN THIS SECTION SHALL APPLY WHERE THE DAMAGES ARISE OUT OF OR RELATED TO THIS AGREEMENT.

Freefly shall not be liable for damages or injuries incurred directly or indirectly from the use of Pilot Controller including, but not limited to, the following situations:

- Failure of operator to follow proper instructions and safety warnings found at www.freeflysystems.com.
- Failure of the operator to understand and operate Pilot Controller within the operating limitations described in this manual.
- Failure of the operator to follow on-board safety warnings while using Pilot Controller or Freefly products.
- Failure of the operator to inspect Pilot Controller and its components prior to operation.
- Failure of the operator to properly maintain and/or service Pilot Controller through an authorized Freefly Service Center with genuine Pilot Controller parts.
- Use of third-party products on Pilot Controller.
- Use of Pilot Controller in unsafe conditions, including but not limited to, bad or severe weather, such as rain, wind, snow, lightning, dust storms, etc.
- Improper operation, misjudgment or risky behavior while using Pilot Controller or Freefly products.
- Infringement of third party data, audio or video rights recorded when using Pilot Controller or Freefly products.

WARRANTY

SPECIFICATIONS

Freefly warrants all products will be of good quality and workmanship and free from material defects. Upon the expiration of the time periods below, all liabilities of Freefly will terminate. In no event shall Freefly be liable for consequential damages. Freefly may use refurbished parts for repairs or replacements. Certain products may be subject to a separate software license agreement.

STANDARD WARRANTY

A Standard Warranty is granted to the original purchaser by Freefly for a period of one (1) year, parts and labor. The Standard Warranty covers parts and labor charges for Product that has been returned with shipment to an Authorized Service Center by the Buyer. Service or replacement decisions are at the sole discretion of Freefly. Proof of purchase is required for warranty claims. All warranty returns shall be done in accordance with Freefly's warranty Return Merchandise Authorization ("RMA") policy. Any repaired or replaced Product shall be warranted as set forth in this section for a period the greater of (a) the balance of the applicable warranty period relating to such Product or (b) ninety (90) days after it is received by Buyer. Only the components that were repaired or replaced will be eligible for the 90-day period as set forth above. The Standard Warranty effective date is the date of "ex works" from Woodinville, Washington.

WARRANTY LIMITATIONS

All Freefly warranties do not cover (a) maintenance, repair or replacement necessitated by loss or damage resulting from any cause other than normal use and operation of the Product in accordance with Freefly's specifications and owner's manual, including but not limited to: theft, exposure to weather conditions, operator negligence, misuse, abuse, improper electrical/ power supply; (b) alterations, modifications, or repairs by Buyer or unauthorized third parties; (c) accident, disaster, improper handling or storage, drop, modification, opening sealed components, use of third party accessories or acts of nature or any other peril originating from outside the Product; (d) transportation damage, lack of or improper maintenance, defective batteries, battery leakage; and (e) cosmetic damage or other non-operating parts. Removal or modification of sealed components, including but not limited to, motors or electronics, voids any and all warranties. Breaking the seal on any sealed components, including but not limited to motors or electronics, is prohibited and voids any and all warranties unless otherwise approved by Freefly. Any parts replaced by Freefly during warranty repair are the property of Freefly and will not be returned to Buyer. Freefly may use refurbished parts for repairs or replacements.

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THIRD PARTY WARRANTY

Freefly does not honor warranty agreements extended by third parties. Only warranty agreements granted by Freefly will be honored by Freefly.

NON-WARRANTY REPAIR

Product that no longer qualifies for Warranty Repair may be sent to an Authorized Freefly Service Center subject to an evaluation fee. Freefly will provide a quotation for the repair of the Product. The Customer is responsible for all costs associated with such refurbishment, such as troubleshooting, diagnosis, repair, test, calibration, storage, and shipping costs. The evaluation fee will be applied to the cost of the refurbishment if the cost of the refurbishment is greater than the evaluation fee. Any repaired or replaced product shall be warranted for ninety (90) days after it is received by Buyer. Only the components that were repaired or replaced will be eligible for the 90-day period. Any parts replaced by Freefly during non-warranty repair are the property of Freefly and will not be returned to Buyer. Freefly may use refurbished parts for non-warranty repair.

LAW GOVERNING

These terms are governed by Washington State law (without regard to conflict of law principles or the United Nations Convention on Contracts for the International Sale of Goods.) Freefly reserves the right to change or modify this warranty at any time without notice. For up-to-date warranty information, visit www.freeflysystems.com.

INTRODUCTION

The Freefly Pilot 3-Axis Focus/Iris/Zoom Controller is the latest addition to Freefly's expansive product offering, bringing you precise control over Focus/Iris/Zoom, MōVI pointing and MōVI settings wirelessly. By combining industry standard inputs for Focus/Iris/Zoom controls such as a 2-axis force joystick, an adjustable Focus knob damping and Freefly's patented MIMIC technology, the Pilot provides filmmakers direct and intuitive control of the camera and gimbal. In addition to its technology, the Pilot offers a compact, modular design which accommodates a wide variety of setups. Whether using the Pilot as a single operator or multiple, the Pilot can adapt. With the introduction of Pilot into the Freefly ecosystem, the Pilot works seamlessly with other MIMIC and MōVI Controllers.

This manual will provide information on how to setup, bind, and use your Pilot Controller. It will also provide more examples into how Pilot can be used in single or multi-operator modes as well as a few scenarios to help illustrate this.

WARNINGS, CAUTIONS AND NOTES

Throughout the manual, warnings, cautions and notes are used to highlight various important procedures. These are defined as follows:

WARNING

Warnings are used to highlight procedures which, if not strictly observed, may result in personal injury or loss of life.

CAUTION

Cautions are used to highlight procedures which, if not strictly observed, may cause damage to equipment.

NOTE

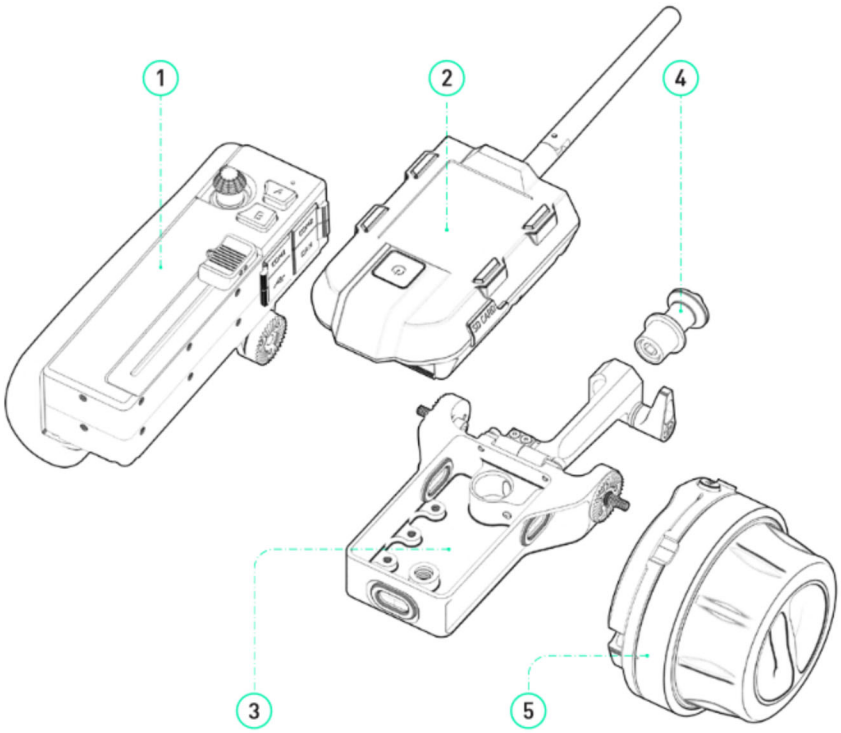
Notes are used to highlight specific operating conditions or steps of a procedure.

PILOT MODULES

OVERVIEW

The Pilot 3-Axis FIZ Controller is a compact, modular handheld controller providing filmmakers with ultimate flexibility of setups. Each Pilot Module has been designed and customized with specific functionality in mind, but can be easily reconfigured to support a wide variety of lens, gimbal and camera controls.

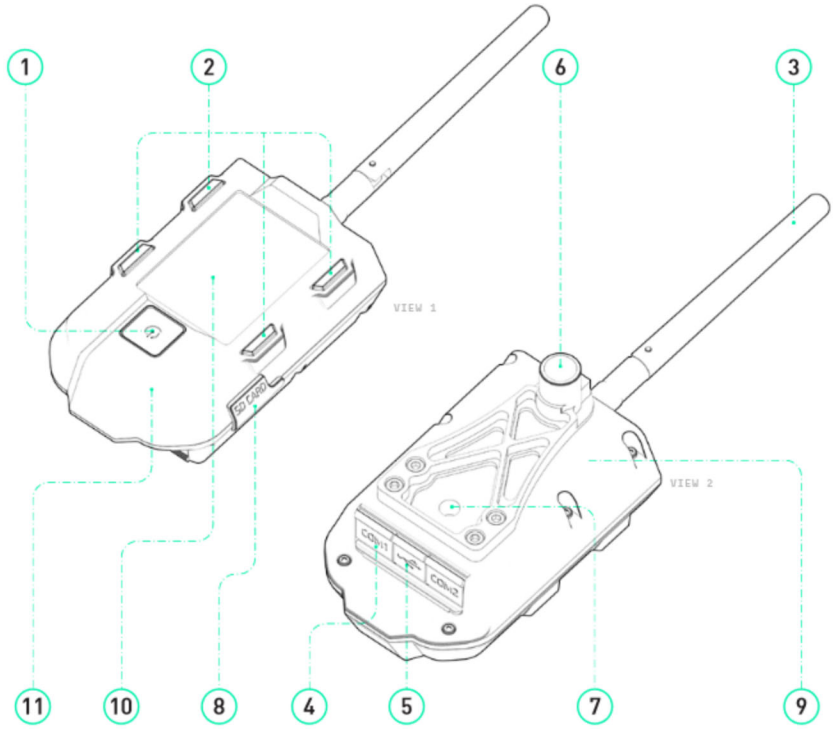
Freefly's MIMIC is at the center of the system, providing power to each Module and acting as the primary user interface to quickly navigate through display options. Any Freefly MIMIC can be used to work with your Pilot, just be sure to download v1.3 firmware or later onto your MIMIC (see "Using Your Pilot" for more details on how and where to download). This section is aimed at familiarizing you with each Module and how it is used within the Pilot 3-Axis F/IZ Controller.



1. Pilot Iris/Zoom Module
2. MIMIC
3. Pilot Backbone
4. 13mm Quick Release Plug
5. Pilot Focus Module

MIMIC

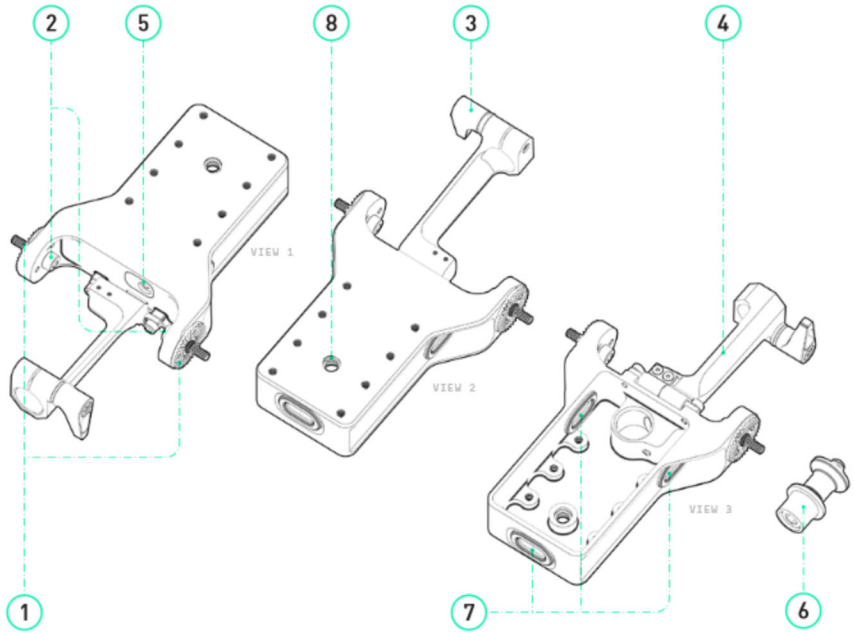
MIMIC has re-shaped the way people capture movement by providing long range bidirectional control of MōVI orientation, settings, camera controls, and real time telemetry. Pilot leverages this technology and expands its features to provide control of FIZ and P/T/R and additional camera controls. Your MIMIC will come equipped with a quick release mount (13mm) rigidly attached to the bottom and a ¼"-20 to accommodate additional mounting options. All MIMIC's with version 1.3 firmware are compatible with Pilot Modules.



1. On/Off Button
2. 4 Display Button
3. 2.4Ghz Antenna (long range wireless)
4. COM1 (UART), COM2 (UART)
5. USB C
6. Quick Release Mount
7. 1/4 - 20
8. SD Card Slot
9. Integrated Battery with up to 6 Hour Run-Time
10. Integrated LCD
11. BLE Connectivity

PILOT BACKBONE

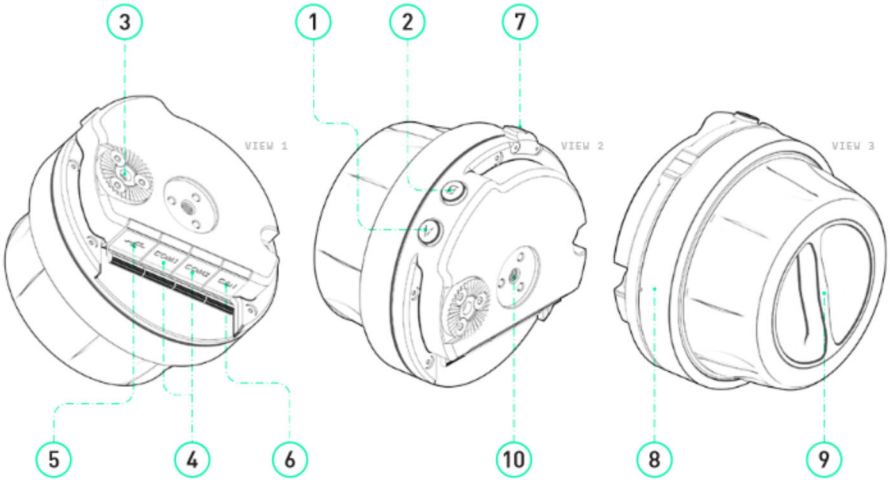
The Pilot Backbone features a quick release mechanism to insert/remove your MIMIC, Freefly rosettes to mount modules and a monitor mount with friction hinge mechanism.



1. (2x) 20mm Rosettes
2. (2x) M4 x 16 Socket Head Cap Screw
3. (1x) M4 Quick Release Lever
4. (1x) 13mm Monitor Mount/Integrated Friction Hinge
5. M3 Integrated Quick Release Clamp
6. (1x) 13mm Quick Release Plug
7. (3x) Rubber Gaskets
8. Mounting Options
   - M3 x 16 bolt pattern
   - 1/4"-20

PILOT FOCUS MODULE

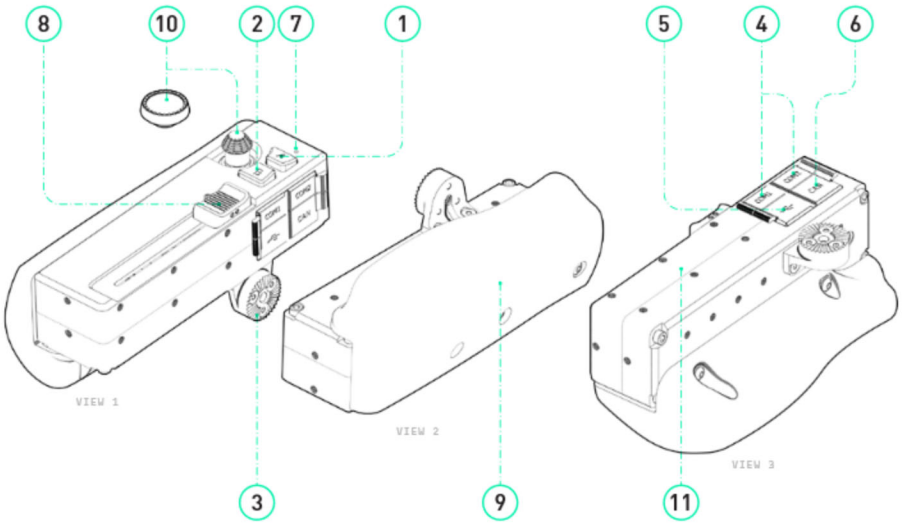
Smooth, precise Focus/Iris/Zoom control with adjustable viscous damping. The Pilot Focus Module features an ergonomic soft-grip knob and a rotary dial to vary stiffness, a removable marking ring, status LED, indicator dial, 20mm rosette and A/B buttons. This Module can be connected through COM1 or COM2 to your MIMIC.



1. A Button
2. B Button
3. (1x) 20mm Rosette
4. COM1 (UART), COM2 (UART)
5. USB C
6. CANbus (Microfit 4-pin)- for expandability
7. Status LED
8. Removable Marking Ring
9. Adjustable Stiffness Dial
10. Mounting Options
    - Rosettes attached with (3x) M3 x 8 flat head cap screws
    - (2x) Rosette mount options for M4, spaced 25.55mm apart (center to center)

PILOT IRIS/ZOOM MODULE

The Pilot Iris/Zoom Module can be mapped to Focus/Iris/Zoom as well as Pan/Tilt/Roll functions. This Module features an industry standard precision 2-Axis force joystick, linear slide potentiometer, removable walnut handle, 20mm rosette mount and A/B buttons, and an extra (removable) joystick knob. The Pilot Iris/Zoom Module can be connected through COM1 or COM2 to your MIMIC.

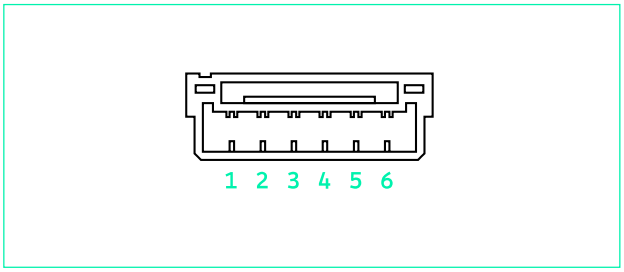


1. A Button
2. B Button
3. (1x) 20mm Rosette Mount
4. COM1 (UART), COM2 (UART)
5. USB C
6. CANbus (Microfit 4-pin)- for expandability
7. Status LED
8. Slide Potentiometer (linear slider)
9. Removable Walnut Handle
10. (2x) Force Joystick
    - Fighter Pilot
    - Thumb Pad
11. Mounting Options
    - M3 x 16 Bolt Pattern
    - M3 x 8 or M3 x 16 Bolt Pattern on Bottom Surface

I/O CONNECTOR PINOUTS

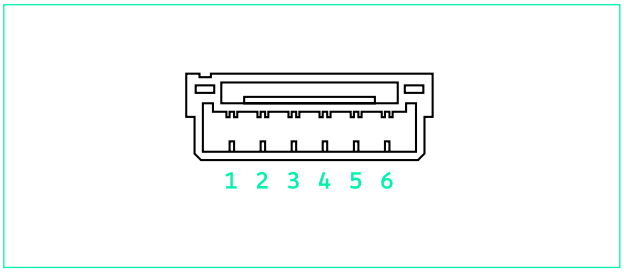
All connector pinouts are shown looking into the function side of the connectors on the MIMIC and Pilot Modules, unless otherwise noted.

CONNECTOR: **COM 1**
TYPE: **JST GH 6-PIN**



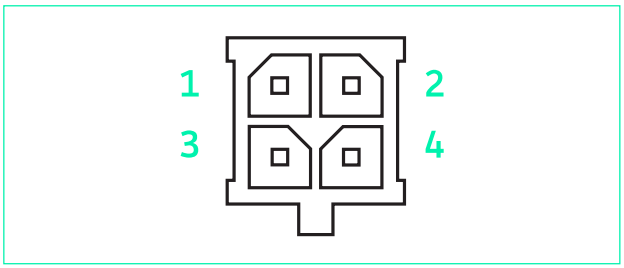
1. GND
2. +5V
3. UARTn_TX
4. UARTn_RX
5. UARTn_CTS
6. UARTn_RTS

CONNECTOR: **COM 2**
TYPE: **JST GH 6-PIN**



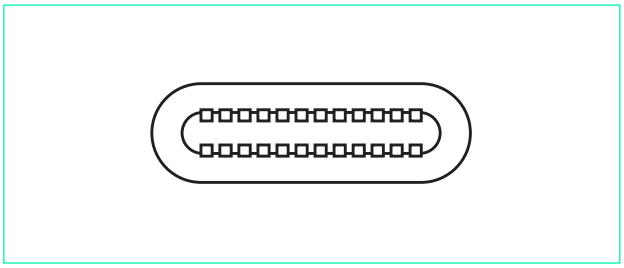
1. GND
2. +5V
3. UARTn_TX
4. UARTn_RX
5. UARTn_CTS
6. UARTn_RTS

CONNECTOR: **CAN (CANBUS)**
TYPE: **MOLEX MICROFIT RA 4 PIN**



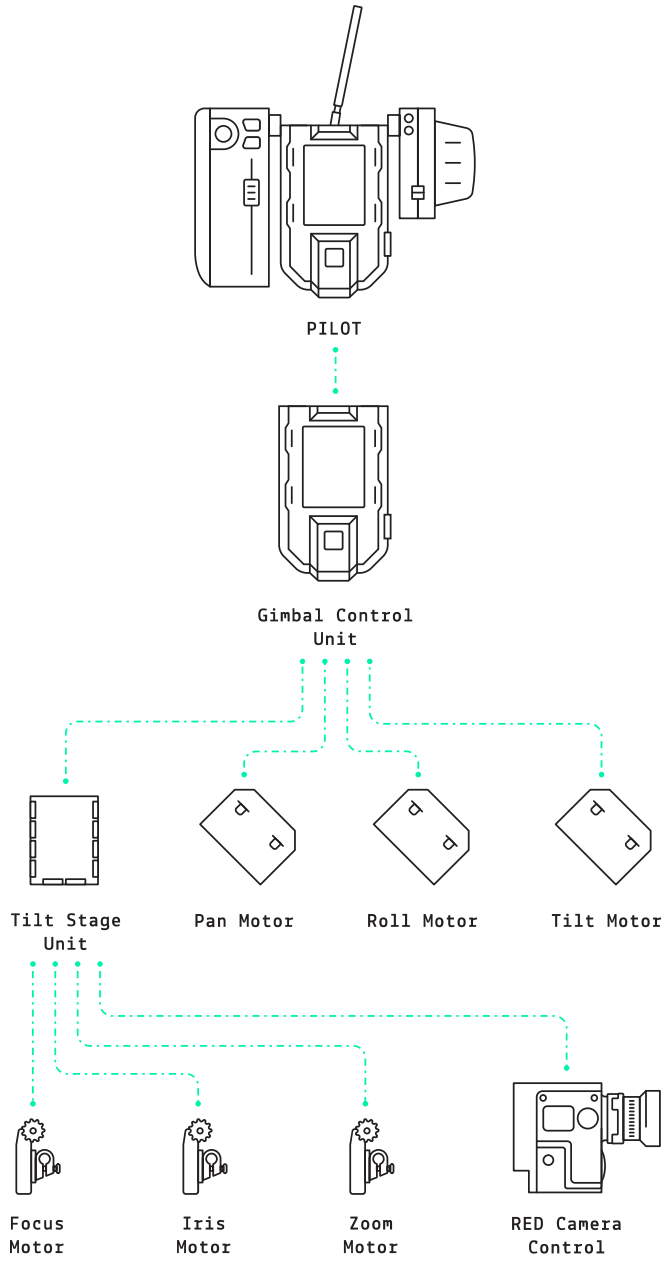
1. GND
2. +V Ba
3. CAN H
4. CAN L

CONNECTOR: **USB PORT**
TYPE: **USB TYPE C DRP (SOURCE AND SINK 5V)**



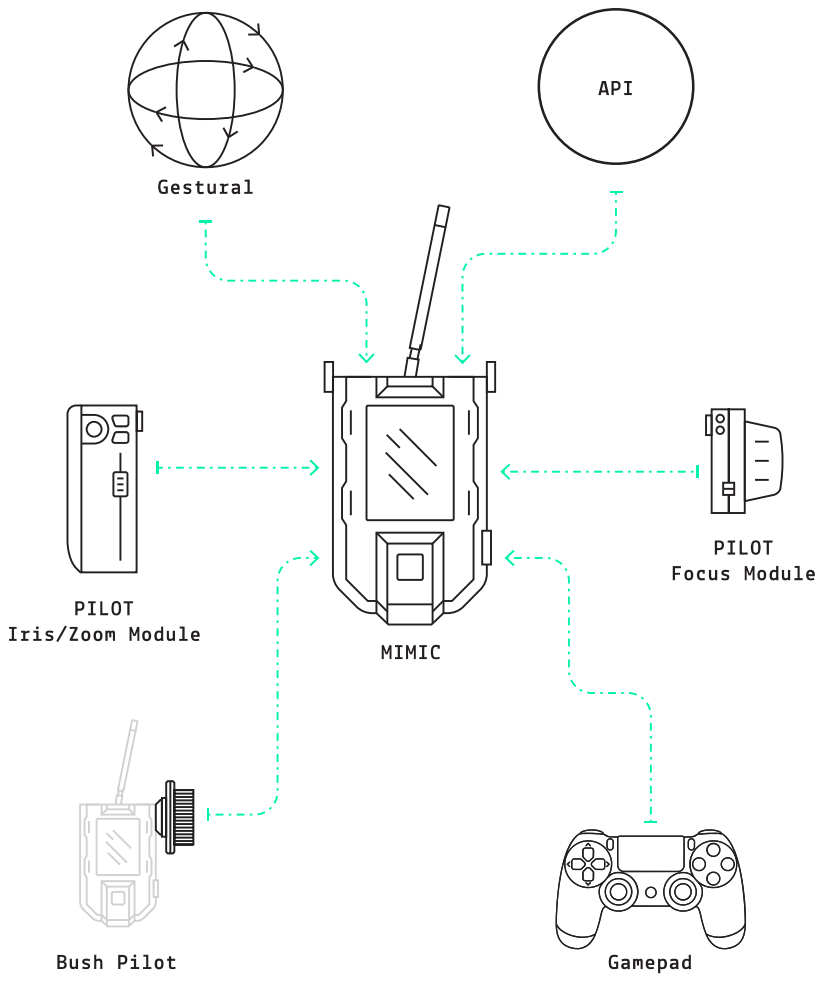
SYSTEM DIAGRAMS

PILOT + MōVI



MIMIC INPUT PATHS

Illustration of available inputs to MIMIC.



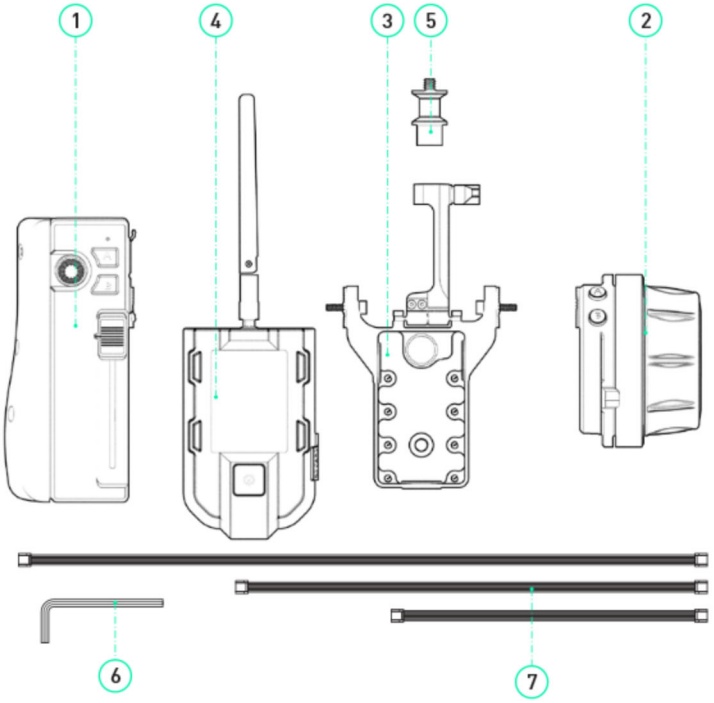
SETTING UP PILOT

GETTING STARTED

When your Pilot 3-Axis FIZ Controller arrives it will be securely packed along with other contents shown below. This section will guide you through setup, from out of the box to setting up with your MōVI system.

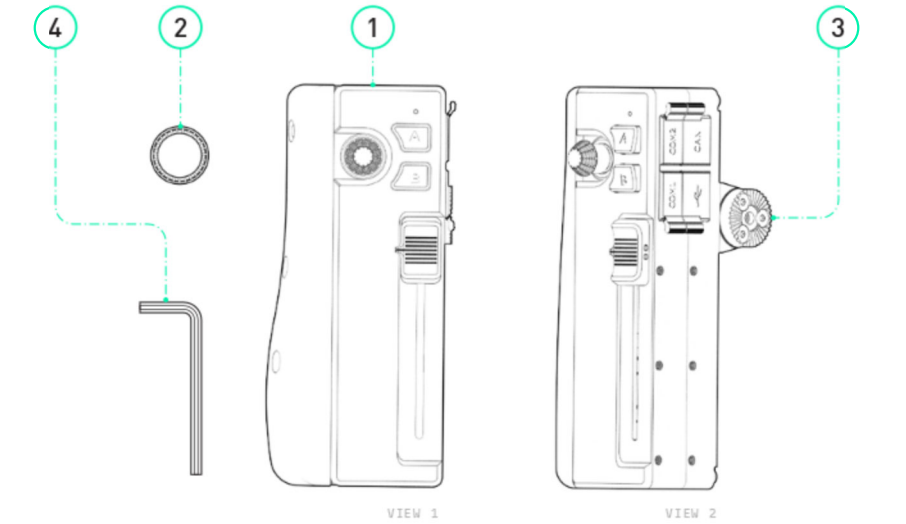
PACKAGE CONTENTS

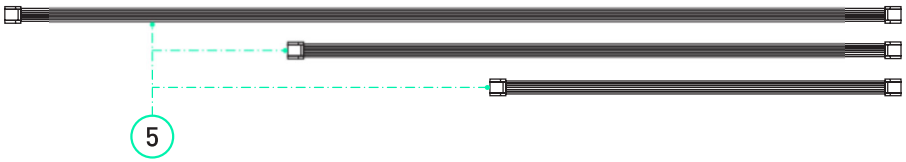
PILOT 3-AXIS FIZ CONTROLLER



1. Pilot Iris/Zoom Module
2. Pilot Focus Module
3. Pilot Backbone
4. MIMIC + 13mm Quick Release Mount
5. Quick Release Plug 13mm
6. L-Key (Hex Key)
7. Cables
   - a. (4x) Pilot COM to COM cable - 200mm
   - b. (2x) Pilot COM to COM cable - 300mm
   - c. (2x) Pilot COM to COM cable - 500mm
   - d. (1x) USB 2.0 Type C to Micro B
   - e. (1x) USB Type C to Type A Cable- 1m
   - f. (1x) Jumper Reset Mimic Pro

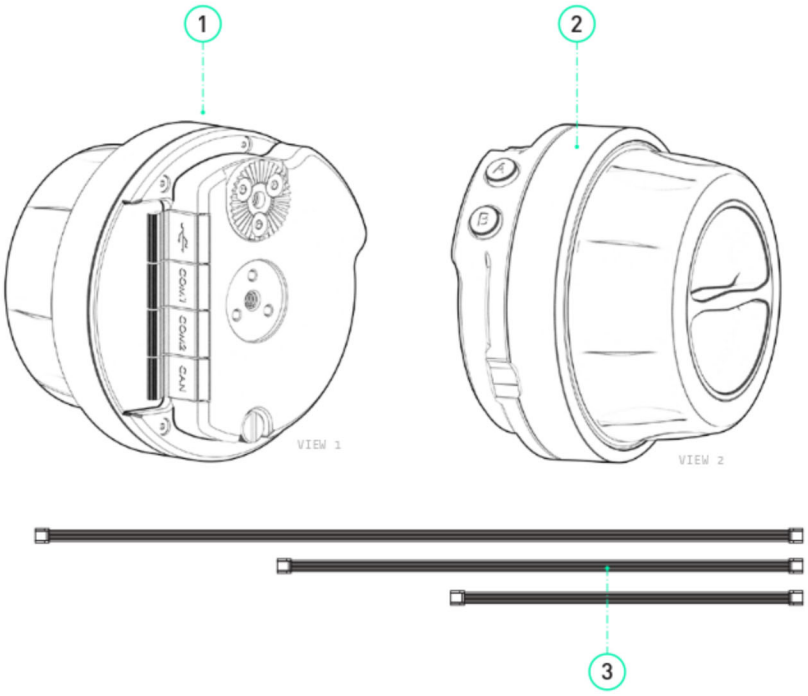
PILOT IRIS/ZOOM MODULE





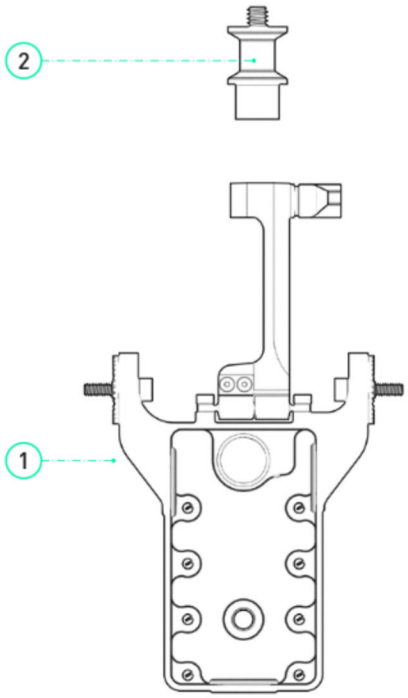
1. Pilot Iris/Zoom Module
2. Extra joystick knob
3. Rosette Mount
4. L-Key (Hex Tool)
5. Cables
   a. (2x) Pilot COM to COM cable - 200mm
   b. (2x) Pilot COM to COM cable - 300mm
   c. (2x) Pilot COM to COM cable - 500mm

PILOT FOCUS MODULE



1. Pilot Focus Module
2. Marking Ring
3. Cables
   a. (2x) Pilot COM to COM cable - 200mm
   b. (2x) Pilot COM to COM cable - 300mm
   c. (2x) Pilot COM to COM cable - 500mm

PILOT BACKBONE



1. Pilot Backbone
2. Quick Release Plug 13mm

ADDITIONAL ACCESSORIES

1. 25mm Tube to Rosette Adapter
2. Offset 25mm Tube to Rosette Adapter
3. 30mm Tube to Rosette Adapter
4. Offset 30mm Tube to Rosette Adapter
5. Pilot Marking Ring
6. Rosette Mount
7. Dual 13mm Quick Release Mount

These accessories are not included in any of the above but can be ordered separately to be used with Pilot Controller.

OUT OF THE BOX

When your Pilot 3-Axis FIZ Controller arrives, it will be fully assembled with all cables routed and secured to MIMIC and respective Modules. All inputs will be mapped to factory default configuration, but can be customized to control various axes. This section will serve as a quick start guide, walking you through some of the basics such as starting with out of the box instructions, firmware updates, binding to MōVI and brief instructions on setting up FIZ motors.

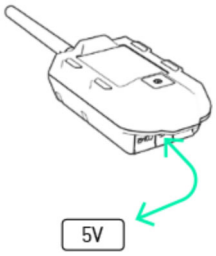
BASIC SETUP

- Items Needed
- M4 Hex Driver
- M3 Hex Driver
- ¼" Hex Driver

OUT OF THE BOX

WAKE MIMIC FROM TRAVEL MODE

1. To wake your MIMIC from travel mode simply plug it into a 5V power source and push the 'On' button. If your MIMIC has already been taken out of travel mode continue to step 2.



2. Turn on the MIMIC by pushing the Power button. Use the display controls to move to the Radio Screen.

UPDATING MIMIC + MōVI

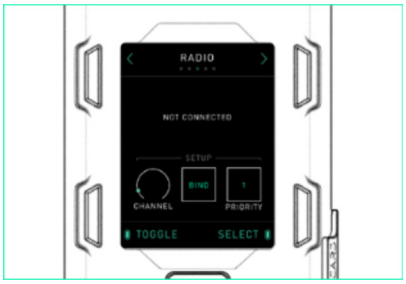
The MIMIC will come with the latest software already installed. The MōVI will require the latest firmware (v1.3 or later) to be installed for Pilot functionality to be enabled. To update firmware on each Pilot Module, please refer to "Appendix- Pilot Module Firmware Updates" for more information.

PLEASE REFER TO THE MōVI PRO MANUAL FOR INSTRUCTIONS ON UPDATING YOUR MōVI PRO.

BINDING MIMIC TO MōVI

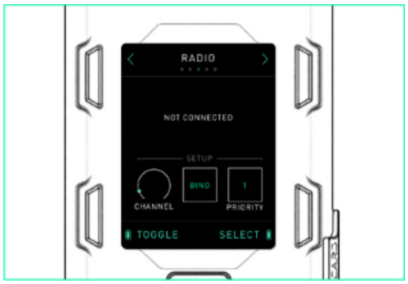
MIMIC has been packed with functionality to support Pilot and integrate seamlessly within the Freefly ecosystem. The top level screens enable efficient navigation of frequent interactions, giving you control of Focus/Iris/Zoom or gimbal (Pan/Tilt/Roll). Multi-controller (two or more operators) modes are also possible with Pilot- for more information reference "Using Your Pilot- Freefly Controller Ecosystem".

1. Select "Select Channel" and choose the channel you wish to use to pair the MIMIC with your MōVI Pro/MōVI XL.



2. Turn on the MōVI and proceed to the Radio Screen. Use "Select Channel" to set the MōVI to the same channel as the MIMIC. Press the Bind button on the MōVI; a progress bar will appear showing the amount of time remaining to pair the device to a MIMIC.

3. Press the Bind button on the MIMIC within 5 seconds of pressing the Bind button on the MōVI Pro/MōVI XL. The devices will pair automatically.



NOTE

MIMIC uses a very powerful wireless transmitter to control a MōVI; when this transmitter is in close proximity (less than 5-10ft.) to its receiver, the receiver can be oversaturated with input causing unwanted movements or binding issues. This is normal behavior for power wireless transmitters.

NOTE

Priority must be set to "1" on MIMIC Radio screen for successful binding to MōVI. If binding multiple MIMICs to the same MōVI, each MIMIC must be bound separately with Priority set to "1." In other words, bind first MIMIC and turn off, then bind a second MIMIC (with priority set to 1) to MōVI. Once both have been bound to MōVI, one of the MIMIC's can now be set to Priority "2" for system to function properly. For more specifics on Priority and Multi-controller modes, see section "Using Your Pilot- Multiple Controller Priorities."

DEFAULT SETUPS/CONTROLS

MIMIC and Pilot Modules can be mapped (configured) through the MIMIC user interface to control a variety of outputs/functions. Refer to the "Primary Control" column in the chart below, for default axes configurations.

AXIS	PRIMARY CONTROL	SECONDARY CONTROL	AUX CONTROL	GESTURAL CONTROL
Pan	MIMIC	Joystick	Focus Knob	Yes
Tilt	MIMIC	Joystick	Focus Knob	Yes
Roll	MIMIC	Joystick	Focus Knob	Yes
Focus	Focus Knob	Joystick	Slider	Yes
Iris	Slider	Joystick	Focus Knob	Yes
Zoom	Joystick	Slider	Focus Knob	Yes

DEFAULT SETUPS/INPUTS

As indicated above, a variety of user inputs can be mapped to each axis. This table summarizes each Pilot Module inputs and their respective default mapping. For more information on specific input devices and respective mapping options, reference "MIMIC Input Configuration" in Using Your Pilot section.

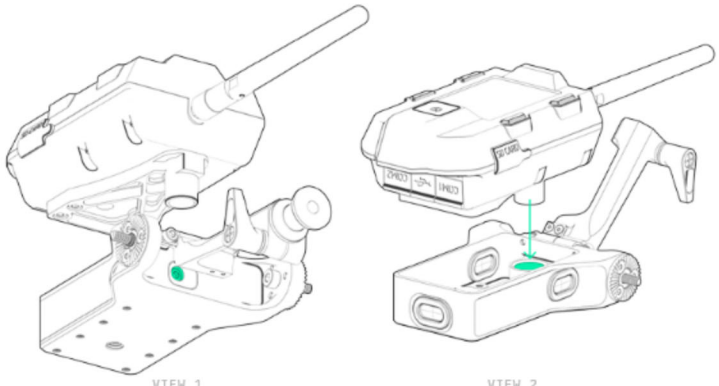
If it is desirable to reset your MIMIC to defaults, this can be loaded from Mobile Apps. Go to **Monitor>Open Terminal>Default Configuration.**

PILOT IRIS/ZOOM MODULE	A	"A" button toggles record start/stop
	B	"B" button locks/unlocks Iris and Zoom on MIMIC.
	Joystick	Zoom for Joystick Y, Defer for Joystick X
	Slider	Iris
PILOT FOCUS MODULE	A	Directly toggle through Pilot Focus Module mapping between Defer, Focus, Iris and Zoom, without the need of going to Inputs screen
	B	Used to set digital marks for the active axis for the Pilot Focus Module while at the FIZ Main screen. Up to 10 marks can be added. Press and hold for 3 seconds to clear all marks.
	Knob	Focus

PILOT ADJUSTMENTS

Pilot gives you the ability to fine tune your setup. Whether using as a full FIZ controller or split between FIZ and gimbal, you are able to adjust, add or remove Modules as desired.

ATTACHING MIMIC TO PILOT BACKBONE

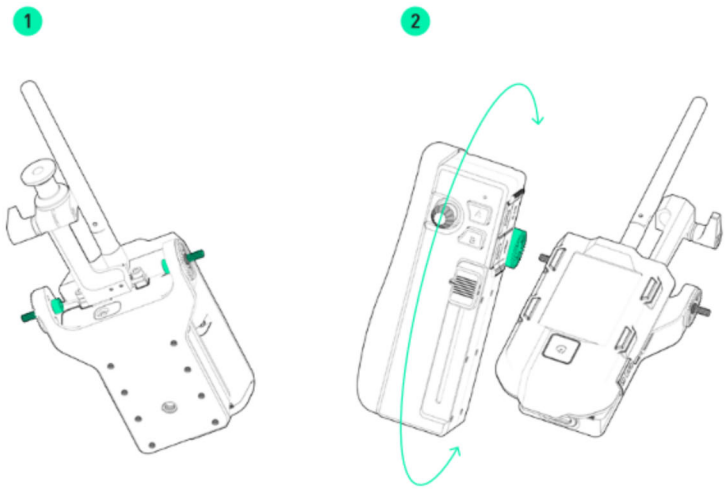


VIEW 1 VIEW 2

1. Using an M3 hex driver, tighten or loosen the integrated quick release clamp and drop in MIMIC into 13mm pocket in Pilot Backbone

The MIMIC quick release mount is compatible with all Freefly 13mm quick release accessories

ADJUSTING ANGLE OF PILOT MODULES



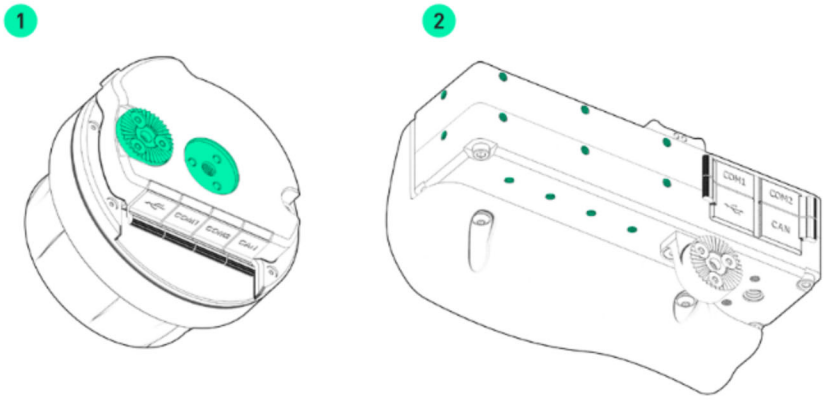
1. Using an M4 hex driver, loosen the M4x16 bolt on either side of the Pilot Backbone

   It is not necessary to fully remove bolt

2. Rotate Module to desired angle and re-tighten M4x16 bolt

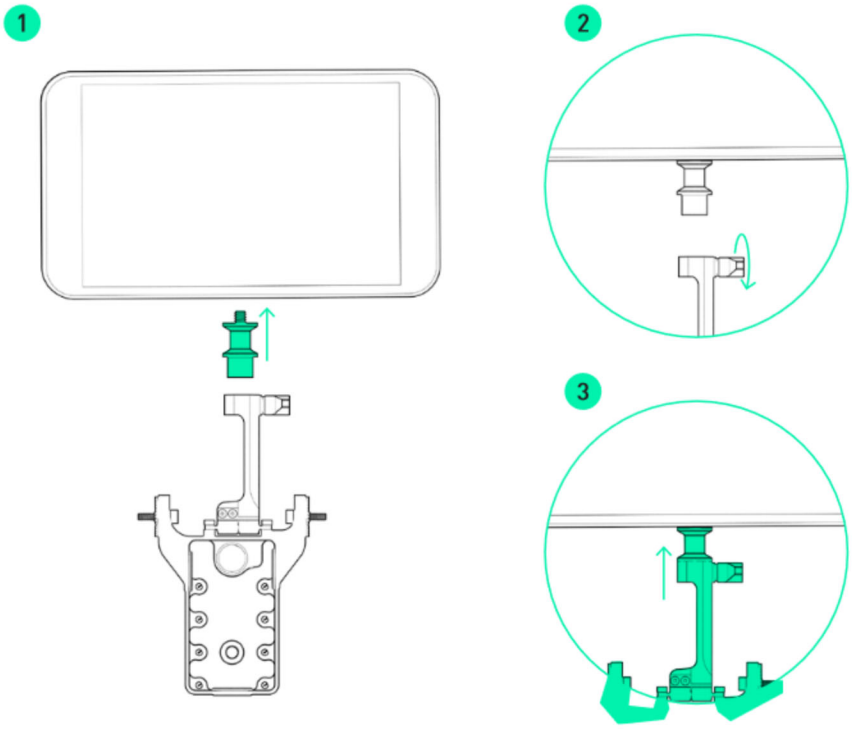
   Be sure 20mm rosettes are fully seated while tightening M4 bolt

ADJUSTING VERTICAL POSITION OF PILOT MODULES



1. The Focus Module has 2 discrete positions for mounting the included 20mm rosette, spaced 25.5mm apart.
2. The Iris/Zoom Module includes provisions for M3 x 8 or M3 x 16 bolt pattern mounting of the included Rosette mount.

ADJUSTING A MONITOR TO PILOT BACKBONE



1. Using the provided 13mm Quick Release Plug, attach to a monitor with ¼"-20 hex
2. Loosen the M4 Quick Release Lever on the Integrated monitor mount
3. Insert the 13mm Quick Release Plug, attached to monitor,
   and secure by tightening M4 Quick Release Lever

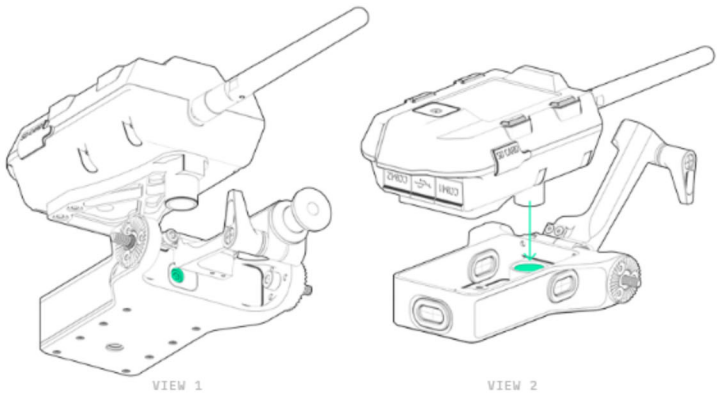
CONNECTING MIMIC TO MODULES

The Pilot 3-Axis FIZ Controller will already have connections made between the MIMIC and Module(s). In case it is necessary to re-attach or remove cables:

1. Plug in UART cable into COM1 or COM2 port on Pilot Module
2. Plug other UART cable end to either COM1 or COM2 port on MIMIC
3. You should see Pilot Module LED startup sequence: One long (half second) and two shorter blinks.

WIRE ROUTING

Cables to connect your MIMIC to each Module will arrive fully installed with the Pilot 3-Axis FIZ Controller. Cables can easily be accessed or re-routed by removing the MIMIC from the Pilot Backbone using an M3 hex driver to loosen the quick release clamp feature as shown above under "Attaching MIMIC to Pilot Backbone."



VIEW 1 VIEW 2

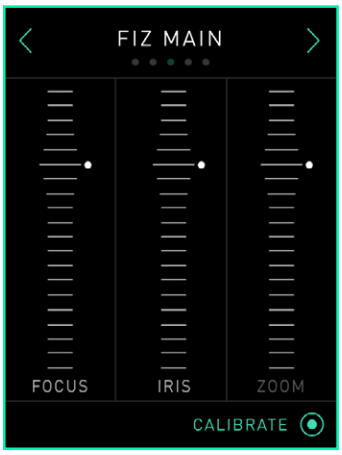
AUTO-CALIBRATING YOUR FIZ MOTORS

Be sure to check that all lens motors, rails, hardware and adjustments have been properly verified. If anything is loose or misaligned, auto-calibration will not work properly. The FIZ motor model needs to be configured prior to calibrating.

1. Navigate to FIZ Main Screen on MIMIC UI.
2. Select "Calibrate" by pressing lower right display button to begin auto-calibration of all FIZ axes.

FIZ MAIN SCREEN

This screen displays the current status and position of focus, iris, and zoom axes, and allows users to auto calibrate all lens motors simultaneously. Digital marks set by the Pilot Focus Module are overlaid on its mapped axis.



NOTE

FIZ motors must have proper settings before calibration, otherwise they may be damaged. Lenses with electronic rings or without hard stops must be calibrated manually. See FIZ Axis Screen, page 44, for more information on manual calibration. During automatic calibration, all motors rotate continuously until their torque limit is hit, setting their maximum limit, then rotated backwards to set their minimum limit.

USING PILOT

INTRO

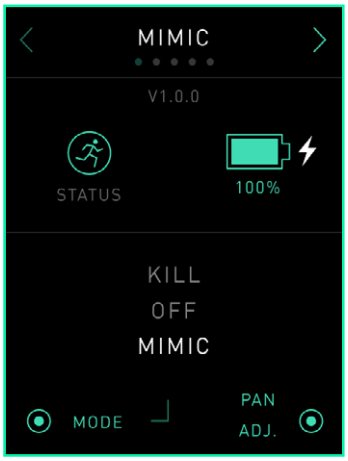
With MIMIC powering the Pilot Modules, an integrated display guides you through each of the top level screens for quick access to frequent controls and options. Coupled with a mobile app that can assume complete control over the MōVI settings, you can adjust tuning values, FIZ settings, and switch modes on the fly. The following section walks through how to use the MIMIC with Pilot Modules and how to be used either on their own or with other controllers.

MIMIC USER INTERFACE

The Pilot 3-Axis FIZ Controller relies on MIMIC technology as the central user interface. The MIMIC is equipped with an integrated display and navigation system which allows a user to check the system status, make quick adjustments to FIZ controls, MōVI tuning, radio options, and more.

MIMIC SCREEN

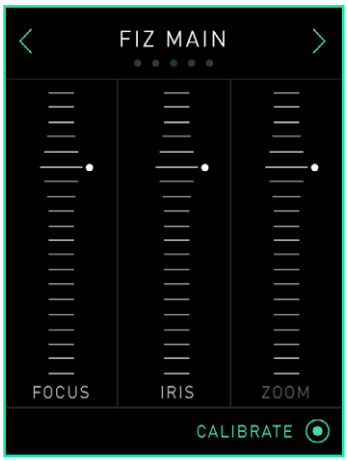
This screen displays the MIMIC's battery levels and system details including device status and device mode.



OPTIONS	DESCRIPTION
1. Status Icon	Displays whether the MIMIC is booting or has initialized.
2. Internal Battery Power (%)	Displays the voltage remaining in the internal MIMIC battery as a percentage.
3. Next Screen Button	Takes users to the next screen.
4. Mode	Toggles between the three displayed MIMIC modes.
5. Pan Adjust	Allows users to change the MIMIC pan orientation in reference to the connected MōVI while button is depressed.

FIZ MAIN SCREEN

This screen displays the current status and position of Focus, Iris, and Zoom axes. With both Pilot Modules connected, you will see all 3 axes highlighted on screen with outputs displayed as you toggle any of the inputs. Digital marks set by the Pilot Focus Module ("B" button) are overlaid on its mapped axis. Up to 10 marks can be added to correspond to various focal lengths by pressing "B" Button. Pressing and holding "B" Button will clear the marks.



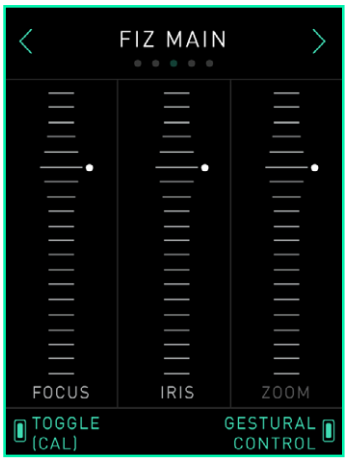
OPTIONS	DESCRIPTION
1. Focus, Iris and Zoom Visuals	Displays the current status and position of FIZ axes.
2. Calibrate	Auto-calibrates all FIZ motors simultaneously.
3. Next Screen Button	Takes users to the next screen.
4. Previous Screen Button	Takes users to the previous screen.

NOTE

FIZ motors must have proper settings before calibration, otherwise they may be damaged. Lenses with electronic rings or without hard stops must be calibrated manually. See FIZ Axis Screen, page 44, for more information on manual calibration. During automatic calibration, all motors rotate continuously until their torque limit is hit, setting their maximum limit, then rotated backwards to set their minimum limit.

FIZ MAIN SCREEN - WITHOUT PILOT MODULES CONNECTED

This screen displays the current status and position of Focus, Iris, and Zoom axes. As detailed in the "MIMIC Input Devices" section below, a variety of inputs can be connected to MIMIC to control any of these axes. When using MIMIC only, MIMIC has an internal sensor which allows Gestural Control of any FIZ axis.



OPTIONS	DESCRIPTION
1. Activate / Gesture Control / Calibrate	Activate Gesture Control without any modules connected, and use Gesture Control while the button is depressed. With Bush Pilot it gives the option to Calibrate either the FIZ axis or Bush Pilot itself.
2. Toggle / Calibrate	Toggle through axes when Gesture Control is activated, and when held for 3 seconds auto-calibrate all FIZ motors simultaneously.
3. Next Screen Button	Takes users to the next screen.
4. Previous Screen Button	Takes users to the previous screen.

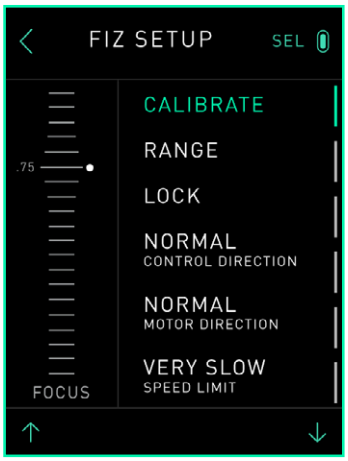
FIZ AXIS SCREEN

This screen displays an individual FIZ axis and gives access to its Setup screen.

OPTIONS	DESCRIPTION
1. FIZ Axis Visual	Displays the position of the selected FIZ axis.
2. Select Axis	Toggles between FIZ axes.
3. Setup	Opens the FIZ Setup Screen to adjust all settings for selected axis.
4. Next Screen Button	Takes users to the next screen.
5. Previous Screen Button	Takes users to the previous screen.

FIZ SETUP SCREEN

This screen displays the position and all settings that can be adjusted for the individual axis that has been selected on the FIZ Axis screen. All settings pertaining to the individual lens motor can be modified here including Motor Model, Motor Direction, Range, and Manual Calibration.



OPTIONS	DESCRIPTION
1. FIZ Axis Visual	Displays the position of the selected FIZ axis.
2. Select	Selects the highlighted setting and gives options to modify the setting.
3. Up Arrow Button	Highlights the setting above the current setting.
4. Down Arrow Button	Highlights the setting below the current setting.
5. Previous Screen Button	Takes users to the previous screen.

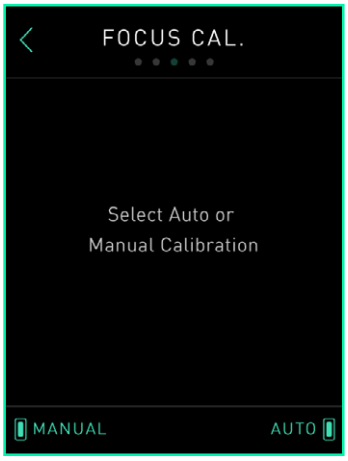
FIZ SETTINGS

The FIZ Setup Screen contains 10 different settings. Refer to this table for a description of each setting.

OPTIONS	DESCRIPTION
1. Calibrate	Gives users the option to do manual or auto FIZ motor calibration on selected axis and guides the calibration procedure. See “Calibrate Screen” below for more information.
2. Range	Set up temporary motor range limits for finer axis control. See “Range Screen” below for more information.
3. Lock	Lock position movement on the axis.
4. Control Direction	Reverse input direction.
5. Motor Direction	Reverse motor direction for when lens motor is mounted on the opposite side of the lens.
6. Speed Limit	Limit the max rotational speed of the FIZ motor.
7. Torque Limit	Limit the max amount of current allowed to the FIZ motor. Lower torque may be better for calibration and for smaller lenses.
8. Damping	Change the smoothness of the FIZ motor. Light is more responsive and heavy is less responsive. By default damping is Medium, which works for most setups.
9. Motor Model	Select motor model to adjust control loop. Setting the wrong model may allow the motor to be damaged. “Custom” models are only placeholders and are not user definable.
10. Load Defaults	Reset all settings to default for the selected axis. It is recommended to load defaults before setting up a FIZ motor.

CALIBRATE SCREEN

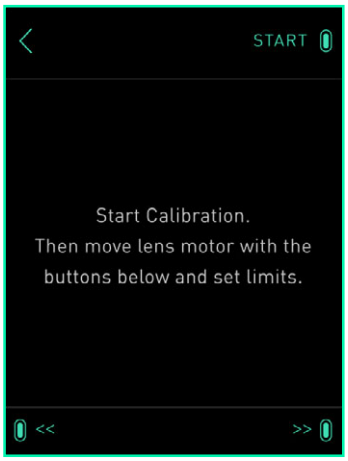
This screen allows you to choose between manual or auto FIZ motor calibration.



OPTIONS	DESCRIPTION
1. Previous Screen Button	Takes users to the previous screen.
2. Manual	Takes users to manual FIZ motor calibration screen.
3. Auto	Begins auto-calibrating the FIZ motor for the current axis.

MANUAL CALIBRATION SCREEN

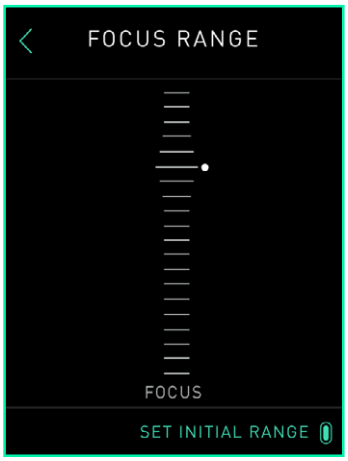
This screen allows users to perform manual FIZ motor calibration. Users are prompted to start calibration, rotate motors forward with the arrows, set maximum limit, then rotate the motor backward to set the minimum limit. The motor can be stopped by actuating it in the opposite direction.



OPTIONS	DESCRIPTION
1. Previous Screen Button	Takes users to the previous screen.
2. Start / Set Max Limit / Set Min Limit	Start the calibration process, set the maximum limit, and set the minimum limit.
3. Motor Forward	Add forward motor speed.
4. Motor Backward	Add reverse motor speed.

RANGE SCREEN

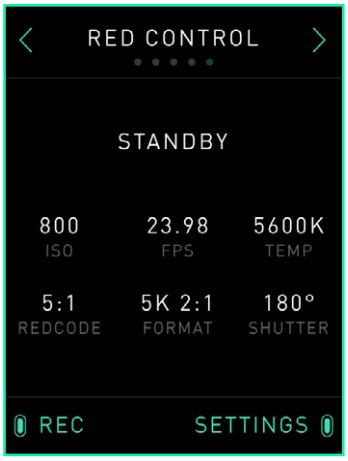
This screen allows you to set a tighter range of each axis, providing finer axis control. Follow the prompts on MIMIC screen to define initial/final motor range.



OPTIONS	DESCRIPTION
1. FIZ Axis Visual	Displays the position of the selected FIZ axis.
2. Previous Screen Button	Takes users to the previous screen.
3. Set Initial Range / Set Last Range	Sets the initial or final range limits of the current FIZ axis position.

CAMERA CONTROL SCREEN

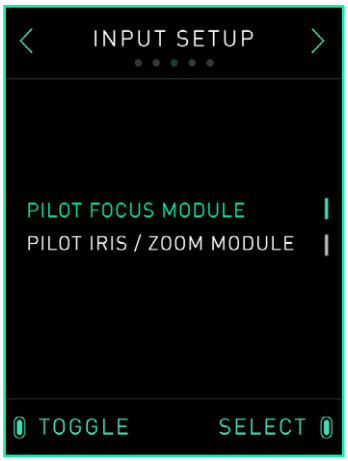
This screen allows you to start/stop recording and change camera settings. Any camera with RED RCP is supported for changing camera settings on the fly via MIMIC display.



OPTIONS	DESCRIPTION
1. Camera Status Display	Displays the current status of the connected camera.
2. Camera Settings Display	Displays the current settings of the connected camera.
3. Record	Toggles camera recording.
4. Settings	Allows users to toggle through each configurable camera setting and increase or decrease the value.
5. Next Screen Button	Takes users to the next screen.
6. Previous Screen Button	Takes users to the previous screen.

INPUT SETUP SCREEN

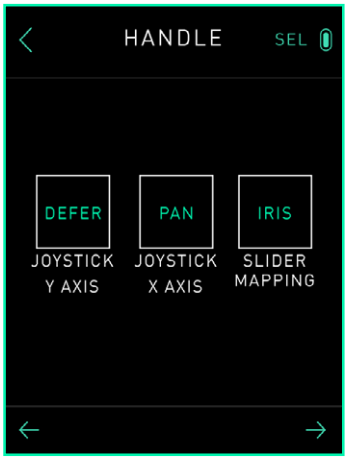
This screen allows you to map inputs on the Pilot Iris / Zoom Module and Pilot Focus Module to different outputs. When a device is connected to MIMIC, it will automatically determine which outputs are acceptable for that specific Module/device. For more details on which devices can be plugged into MIMIC as well as a full list of output options for each device, see Freefly Controller Ecosystem (page 61).



OPTIONS	DESCRIPTION
1. Toggle	Toggles between highlighting the available input devices.
2. Select	Selects the highlighted module and takes users to its input mapping screen.
3. Next Screen Button	Takes users to the next screen.
4. Previous Screen Button	Takes users to the previous screen.

PILOT MODULE SCREEN

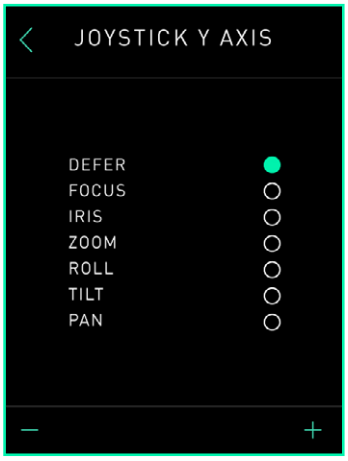
This screen allows you to choose an input to configure for each Module.



OPTIONS	DESCRIPTION
1. Toggle	Toggles between highlighting the available input devices.
2. Select	Selects the highlighted module and takes users to its input mapping screen.
3. Next Screen Button	Takes users to the next screen.
4. Previous Screen Button	Takes users to the previous screen.

INPUT MAPPING SCREEN

This screen allows you to choose the output that the selected input will be mapped to.



OPTIONS	DESCRIPTION
1. Output Visual	Displays the current output that the selected input is mapped to.
2. "+" Button	Sets the output to be the one below the current output.
3. "-" Button	Sets the output to be the one above the current output.
4. Previous Screen Button	Takes users to the previous screen.

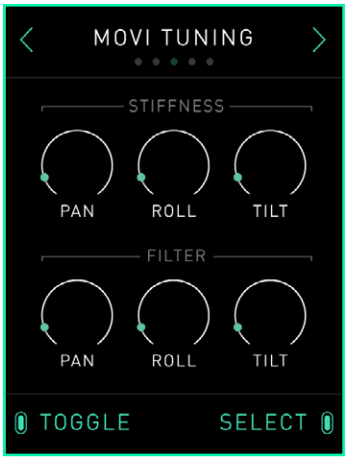
GAMEPAD SCREEN

This screen allows you to connect and control the MIMIC Module with the Gamepad.

OPTIONS	DESCRIPTION
1. Turn On/Turn Off	Enables or disables Gamepad control through USB. See Freefly Controller Ecosystem, page 64, for Gamepad setup.
2. Next Screen Button	Takes users to the next screen.
3. Previous Screen Button	Takes users to the previous screen.

MōVI TUNING SCREEN

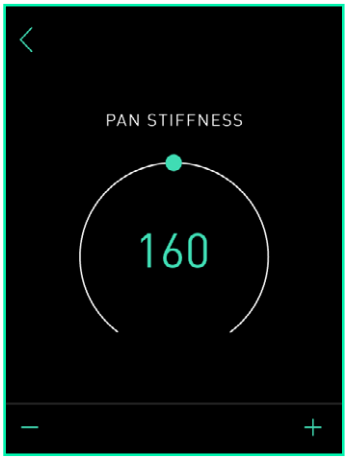
This screen allows you to perform manual tuning adjustments to the connected MōVI.



OPTIONS	DESCRIPTION
1. Toggle	Toggles through the stiffness and filter parameters for each axis.
2. Select	Selects the highlighted parameter and moves to the respective parameter adjustment screen.
3. Stiffness Values (Pan, Roll, Tilt)	Displays a visual of the Pan, Roll, and Tilt stiffness values.
4. Filter Values (Pan, Roll, Tilt)	Displays a visual of the Pan, Roll, and Tilt filter values.
5. Next Screen Button	Takes users to the next screen.
6. Previous Screen Button	Takes users to the previous screen.

PARAMETER ADJUSTMENT SCREEN

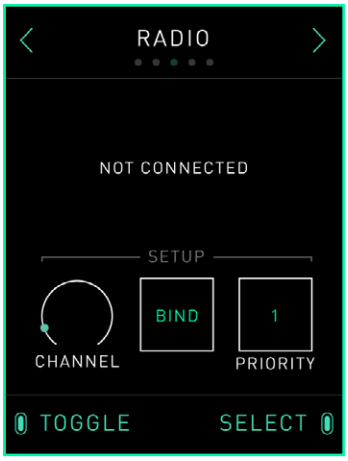
This screen allows you to adjust the selected parameter.



OPTIONS	DESCRIPTION
1. Previous Screen Button	Takes users to the previous screen.
2. "+" Button	Increases the value of the parameter by (1) if pressed and (5) if held.
3. "-" Button	Decreases the value of the parameter by (1) if pressed and (5) if held.

RADIO SCREEN

This screen allows you to select the MōVI's receiver channel, bind the MIMIC to a MōVI, and set the MIMIC's output priority.



OPTIONS	DESCRIPTION
1. Radio Status	Displays the signal status and strength.
2. Toggle	Toggles through Channel, Bind, and Priority parameters.
3. Select	Selects the highlighted parameter and moves to the respective parameter adjustment screen.
4. Channel	Allows the user to select the MIMIC's radio channel.
5. Bind	Allows the user to bind the MIMIC to a Dual-Op device.
6. Priority	Allows the user to set the priority of the MIMIC's outputs. See Freefly Controller Ecosystem, page 61, for more information
7. Previous Screen Button	Takes users to the previous screen.

USING THE MOBILE APP

The Freefly MōVI Pro App grants users additional control over the MIMIC and its settings. The app is designed to be intuitive and easy to use while not limiting MIMIC's versatility.

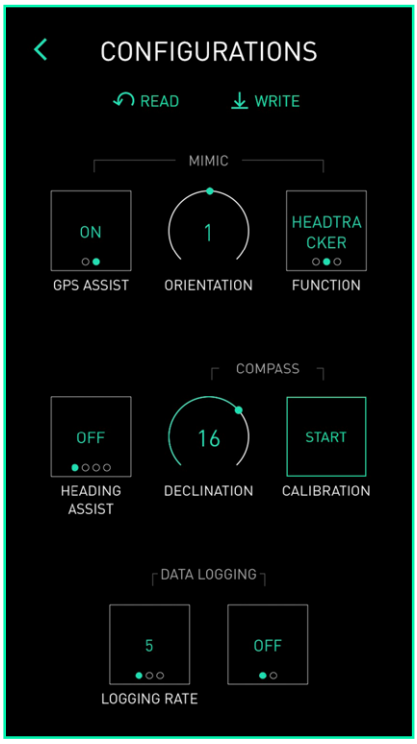
CONNECTING TO THE MIMIC USING BLE

Before you can use a mobile device to configure your MIMIC you must first connect the two devices using BLE. The following instructions will help you connect your MIMIC to any compatible iOS or Android device.

1. Turn on the MIMIC by pushing the power button and allow it to fully initialize.
2. Open the Freefly MōVI app on an iOS or Android mobile device; you may have to download the app from the respective devices' app market. Connect to the MIMIC by selecting "Connect" on the app's home screen and then choosing the MIMIC you are using.

CONFIGURATIONS MENU

MIMIC's settings are accessible through the Configurations menu on the Freefly MōVI Pro App.



OPTIONS	DESCRIPTION
1. GPS Assist	Use this setting when using the MIMIC as a target
2. Orientation	Use to change the MIMIC tilt orientation in reference to the connected MōVI (Pro or later) while button is depressed.
3. Function	Use this to change the function of the the MIMIC. Normal (Headtracker) operates the MIMIC as standard. Target mode will make the the MōVI point at the MIMIC, and None will disable the MIMIC.
4. Heading Assist	Use to orient the MIMIC under different circumstances; " OFF" is default, "GPS" should be used in high acceleration situations, and "Compass" can be used for general MIMIC use. A Declination value should be set when in Compass.

OPTIONS	DESCRIPTION
5. Declination	Set the declination angle when using the "Compass" Heading Assist mode. A declination angle is used to adjust for the Earth's magnetic variance due to global position.
6. Calibration	Calibrate the compass on the MIMIC to increase the performance of the Compass Heading Assist mode. Follow the instructions provided by the app when initializing a compass calibration.
7. Logging Rate	Select MIMIC's data logging rate.
8. Data Logging	Enable the MIMIC's data logging function via a MicroSD card.
9. Motion Booting	Enable "Motion Booting" to allow MIMIC to boot in situations where there is significant movement during the initialization process of the gimbal. For optimum performance in normal use, motion booting should be turned off.

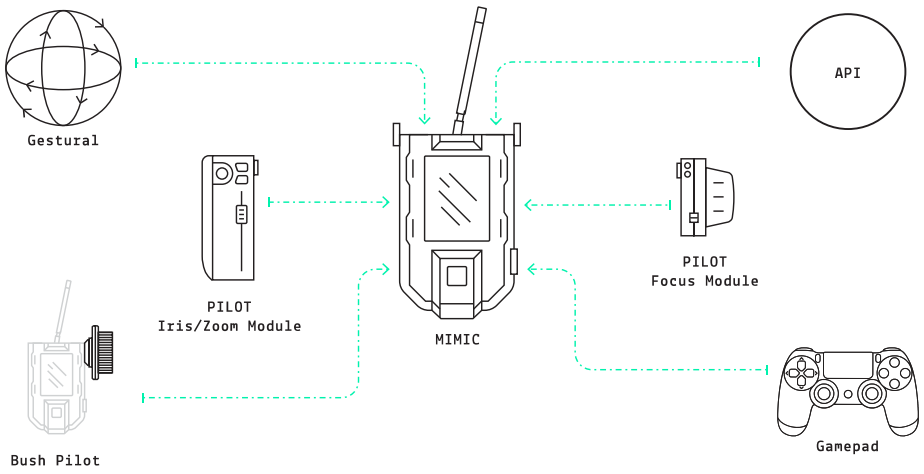
FREEFLY CONTROLLER ECOSYSTEM

Freefly offers a wide variety of handheld controllers suited to aerial, cinema and RC professionals. With the introduction of MIMIC and Pilot Modules, Freefly now offers a more compact, modular controller that works seamlessly with existing controllers such as the MōVI Controller.

As MIMIC is at the heart of Pilot control, this section discusses in depth MIMIC input devices and multi-controller priorities. It will break down all of the different devices which can be connected to MIMIC (physically or BLE) and MōVI, as well as why each device is assigned a "priority" when multiple devices are connected to a single MōVI. For more information on other Freefly controllers, please refer to respective user manuals.

MIMIC INPUT DEVICES

MIMIC can be used on its own or expanded with a wide range of input devices. These devices allow for enhanced control and creative flexibility over the six different axes of Pan,Tilt, Roll, Focus, Iris, and Zoom. The following section will provide more detail on which axes which can be mapped to each device.



INPUT DEVICE	DESCRIPTION
1. MIMIC IMU	MIMIC's internal IMU can be used to control any axis with Gestural Control
2. PILOT-Iris/Zoom Module	The Pilot Iris/Zoom Module has a precision linear slider, aircraft-grade two-axis joystick and tactile buttons for advanced control of any axis.
3. Bush Pilot	Bush Pilot is a compact rotary encoder knob that allows for exact control of any FIZ axis.
4. API	Freefly's Application Programming Interface allows anyone to control all axes with a DIY or 3rd party device.
5. PILOT Focus Module	The Pilot Focus Module has a 16 bit (65,535 point resolution) rotary encoder knob and tactile buttons for advanced control of any FIZ axis.
6. Gamepad	Gamepad is a simple option to add tactile control over all axes.

CONFIGURING INPUT DEVICES

Inputs on the MIMIC can be mapped to control different axis in real-time (Pan/Tilt/Roll, Focus/Iris/Zoom). The table below illustrates some of the different mapping options for different input devices to MIMIC.

INPUT DEVICE	DESCRIPTION
MIMIC IMU	In MIMIC Main screen, MIMIC mode can be activated to control Pan/Tilt/Roll if Gamepad mode is not enabled. Additionally if there are no devices connected to MIMIC, FIZ Main screen automatically adjusts to enable using the internal MIMIC sensors to control Focus, Iris or Zoom via gestures. Mapping can be changed with "Toggle" button on MIMIC.
Bush Pilot	If Gamepad mode is not ON, or there aren't any Pilot Modules connected to MIMIC, FIZ Main screen will display an option to "Toggle" mapping of Bush Pilot. Options are Defer, Focus, Iris, Zoom
Pilot Focus Module	Go to Inputs screen on MIMIC and select Pilot Focus Module. Mapping of the Pilot Focus Module can be set to Defer, Focus, Iris, or Zoom. Additionally if Pilot Handle is not present, the "A" button on the Pilot Focus Module can be used to directly toggle through these mapping options on the go. The Default output is Focus.
Pilot Iris/Zoom Module	Go to Inputs screen on MIMIC and select Pilot Iris / Zoom Module. Joystick Y (vertical) and X (horizontal) axis can be set to Defer, Focus, Iris, Zoom, Roll, Tilt or Pan. Slider input can also be set to Speed Adj. for controlling speed of the Joystick Y and X inputs. The Defaults are Zoom for Joystick Y, Defer for Joystick X, Iris for Slider.

INPUT DEVICE	DESCRIPTION
Gamepad	Go to Gamepad screen and turn on Gamepad mode. Mapping is done via the gamepad buttons. Triangle: Toggle between Dual Op mode where MIMIC controls both Pan and Tilt, and Majestic mode where MIMIC defers control of MōVI axes but still can assist with Tilt. Toggling also resets the roll angle back to zero. X: Puts MōVI motors in Kill state. O: Start/Stop Record Right Joystick: Controls pan and tilt Arrows: Increase/decrease pan and tilt speed adjustment applied to right joystick. Negative values represent flipped control direction. Left Joystick: Vertical movement controls the value for the assigned axis. Assignment can be Focus, Iris, Zoom or Roll and can be toggled by pressing the joystick itself. L2 R2: Increase/decrease value for the assigned axis. Assignment can be Focus, Iris, Zoom or Roll and can be toggled by pressing options button. Options: Toggles the mapping for L2 R2. Note: When Gamepad mode is ON, DualShock controller will charge itself from MIMIC's internal battery. It is recommended to turn the mode OFF when not in use to save power.
API	The Freefly API is an application programming interface that allows control of the MIMIC. By including the library in your software project, you can control core features such as gimbal pointing, FIZ motor control, and camera start/stop. No configuration is available on the MIMIC. When an API enabled device is connected to the MIMIC, communication will begin automatically. For more documentation and examples, visit the MōVI Pro Support page at freeflysystems.com/support/MōVI-pro-support

MULTI CONTROLLER PRIORITIES

Multiple controllers can be connected to a single MōVI at the same time, so the MōVI must determine which controllers have 'priority' over the next. By doing this, it prevents multiple controllers fighting to execute control over a given task, such as Focus, Iris or Zoom axes. Two connected devices may not control the same axis; when multiple devices are connected (mapped) to control the same setting, only the one with the highest priority will be given control.

MōVI accepts the highest available priority input and ignores the lower priority inputs for each individual axis.

Similarly, MIMIC can have simultaneous inputs and follows its own set of priorities to automatically determine which device has control of each task.

MōVI PRIORITIES

This table lists the order of priority for each device capable of sending an input to a MōVI.

PRIORITY	CONTROLLER
1	MIMIC 1
2	MIMIC 2
3	COM 2
4	COM 1
5	Mobile App

MIMIC PRIORITIES

This table lists the order of priority for each device capable of sending an input to a MIMIC.

PRIORITY	CONTROLLER
1	COM 2 API
2	COM 1 API
3	Pilot Focus Module
4	Pilot Iris/Zoom Module
5	Gamepad
6	Bush Pilot
7	MIMIC IMU

MōVI INPUT AXIS

This table displays which axes the MōVI inputs are capable of controlling.

CONTROLLER / AXIS	PAN	TILT	ROLL	KILL	FOCUS	IRIS	ZOOM
MIMIC 1	•	•	•	•	•	•	•
MIMIC 2	•	•	•	•	•	•	•
COM 2	•	•	•	•			
COM 1	•	•	•	•	•	•	•
Mobile App	•	•					

MIMIC INPUT AXES

This table displays which axes the MIMIC inputs are capable of controlling.

CONTROLLER / AXIS	PAN	TILT	ROLL	KILL	FOCUS	IRIS	ZOOM
COM 2 API	•	•	•	•	•	•	•
COM 1 API	•	•	•	•	•	•	•
Pilot Focus Module					•	•	•
Pilot Iris / Zoom Module	•	•	•		•	•	•
Gamepad	•	•	•	•	•	•	•
Bush Pilot					•	•	•
MIMIC Sensor	•	•	•	•	•	•	•

TROUBLESHOOTING

SYMPTOMS	POSSIBLE CAUSE	POSSIBLE SOLUTION
MIMIC will not turn on	Battery is not charged Battery is damaged MIMIC is in shipping mode	Plug USB into charger and MIMIC
MIMIC radio will not successfully bind to MōVI. It is shown as “not connected” on radio screen of MIMIC	Radio interference due to high power antennas being too close together Priority is not set to “1” on MIMIC Software incompatibility	Try moving further away from MōVI when binding Set priority to “1” and try to bind again Make sure you have downloaded v1.3 or later
FIZ Axis range is not working correctly- full range not shown on MIMIC	Calibration issue Cable damaged or loose	Repeat calibration on modules shown in Appendix section Ensure cables do not have any loose connections
Focus Module Knob- Axis not starting from “0 %”	Calibration issue	Repeat calibration of Focus Module. See Appendix section
MIMIC is turned ON but no response on screen when using the module	Cable damaged or loose Inputs are mapped to outputs other than FIZ	Ensure cables do not have any loose connections Replace cable and try again Verify inputs are mapped to FIZ (FIZ Config MIMIC screen). Only FIZ axes values will be represented
Unable to change lens motor settings (damping, range, etc.)in FIZ Setup screen	FIZ setup requires MIMIC to be bound to MōVI (TSU) for proper functionality	Bind/Connect to MōVI and try again
Iris/Zoom Module Joystick direction is reversed	Calibration directions were flipped	Perform calibration again with MIN then MAX sequence
Iris/Zoom Module Joystick axes not responding	Calibration issue	Perform calibration sequence (Reference Appendix for more details)
Iris/Zoom joystick is drifting very slowly	Startup zero calibration was not accurate	Restart the unit, if it’s still drifting then perform calibration sequence again (Reference Appendix for more details)
Single magenta blink when calibrating Knob module but no activity	You pressed button A for 10 seconds instead of B. Click A again to get back to normal mode and use button B to enter knob calibration.	Use button B to enter knob calibration
LED color (other than blue) when engaging bootloader mode	You are not in bootloader mode	Enter bootloader mode again by holding down button A while plugging in the USB cable

SYMPTOMS	POSSIBLE CAUSE	POSSIBLE SOLUTION
After copying the firmware file and rebooting, green LED blink followed by a red blink then the module booted up again	Invalid firmware copied to module storage drive. Module firmware was not updated	Repeat bootloader process again and make sure you copy the correct firmware file
After copying the firmware file and rebooting,green LED blink then a solid red (or any other color)	Firmware update was not successful	Repeat bootloader process again. (press A while plugging into USB port)

APPENDIX

CALIBRATION OF PILOT MODULE INPUTS

Your Pilot will arrive fully tuned, calibrated and configured to work with your setup right out of the box. That said, it is possible for any precise system to slightly drift or change over time so it may be necessary to calibrate inputs.

KNOB CALIBRATION (FOCUS MODULE)

1. Press button **B** until you see double magenta blink (it will take 10 seconds).
2. Move knob to minimum position.
3. Click button **B** once
4. Move knob to maximum position
5. Click button **B** once. You will see another double magenta blink, which means you exited calibration mode.

SLIDER CALIBRATION (IRIS/ZOOM MODULE)

1. Press button **B** until you see double magenta blink (it will take 10 seconds).
2. Move slider all the way to minimum (down) position.
3. Click button **B**, you will see a single magenta blink.
4. Move slider all the way to maximum (up) position.
5. Click button **B** again, you will see a double magenta blink, which means you exited calibration mode.

NOTE

If you see different LED sequence that means calibration was not successful, repeat again.

JOYSTICK CALIBRATION (IRIS/ZOOM MODULE)

1. Press button **A** until you see double magenta blink (it will take 10 seconds).
2. Move joystick all the way to **Y** minimum (down) position and hold in this position.
3. Click button **A**, you will see a single magenta blink.
4. Leave joystick centered and click button **A** again, you will see a single magenta blink.
5. Move joystick all the way to **Y** maximum (up) position and hold in this position.
6. Click button **A**, you will see a single magenta blink.
7. Move joystick all the way to **X** minimum (left) position and hold in this position.
8. Click button **A**, you will see a single magenta blink.
9. Leave joystick centered and click button **A** again, you will see a single magenta blink.
10. Move joystick all the way to **X** maximum (right) position and hold in this position.
11. Click button **A** again, you will see a double magenta blink, which means you exited calibration mode.

NOTE

If you see different LED sequence that means calibration was not successful, repeat again.

NOTE

If you want to physically disable one axis, click through its calibration routine without moving the joystick knob.

FACTORY RESET (BOTH MODULES)

In case it is desirable to “reset” your module to factory default settings, the below procedure can be followed. This will reset to factory settings, clearing any custom calibration that has been done on modules.

1. Press both buttons simultaneously. You will see a magenta blink after 10 seconds.
2. If factory reset is successful and EEPROM is erased you will see green LED blink and then the module will restart automatically.

NOTE

You need to redo factory calibration after each factory reset.

3. If factory reset failed, you will see a red LED blink. Just reset and try again.

UPDATING FIRMWARE (BOTH MODULES)

When new firmware versions are released, they will be accessible for download on the Freefly Support page on the website. Simply navigate to Pilot Controller→ Software→ Firmware release. More information can be found here: http://freeflysystems.com/support.

1. Hold down button **A** and plug in your Pilot module USB cable into a PC or MAC.
2. The module pops up as a mass storage drive and LED turns blue.
3. Copy the appropriate firmware file to the drive.
4. Power-cycle the module (unplug and plug again) - without pressing any key.
5. The module LED turns green and blinks three times if firmware was updated successfully. It will reboot automatically to normal application.

NOTE

If you don't see the three green blinks or if you see any other color, repeat the process again.

To download the most current user manual for the PILOT and all other Freefly products, please visit http://freeflysystems.com/software-manuals

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