

**cinetics™**



CineMoco v2.0

# Instruction Manual

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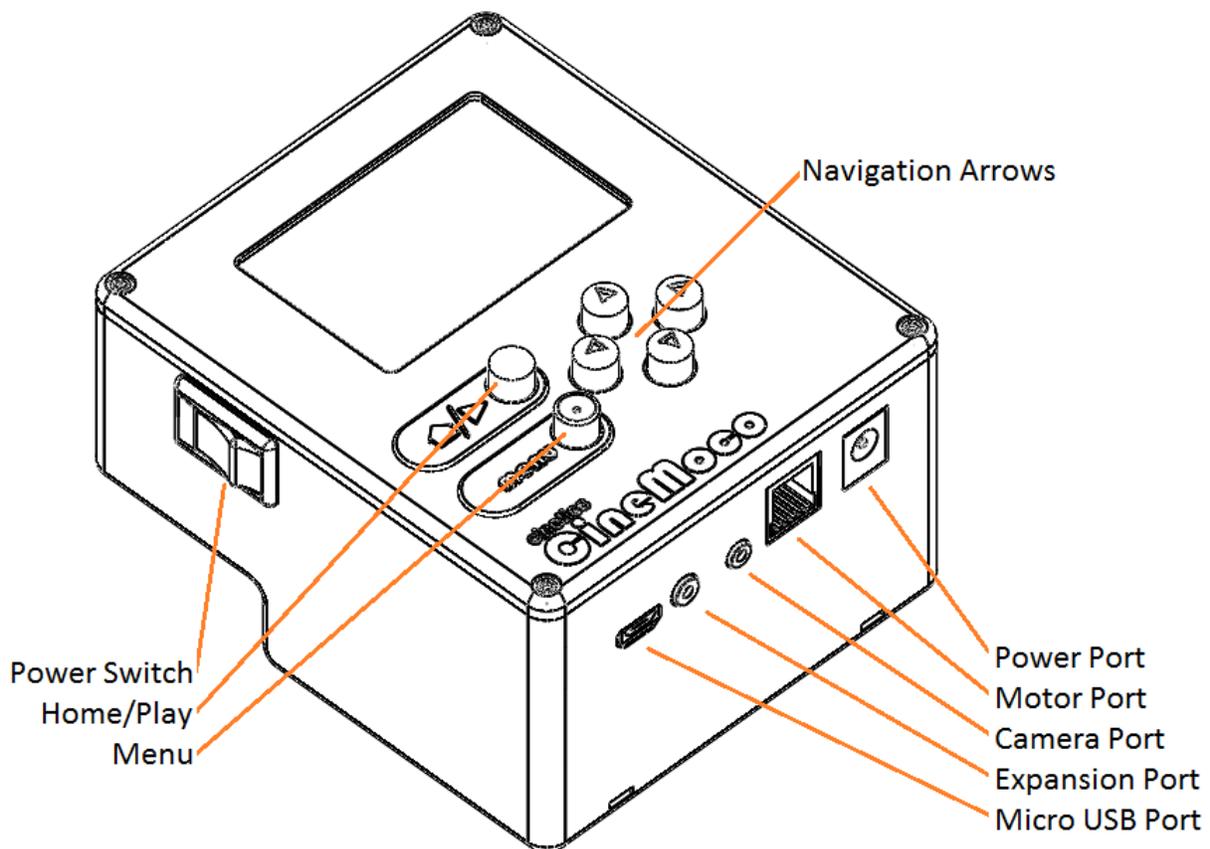
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# 1 | Introduction

CineMoco is a lightweight motion controller designed to drive and power a single stepper motor and camera. The controller provides a compact and powerful solution to programming precise and otherwise impossible movements for time-lapse photography and video.

# 2 | Hardware

The CineMoco controller includes a 128x64 graphic LCD screen and 12v rechargeable Lithium polymer battery enclosed in a durable housing weighing a total of 0.84 lb (0.38 kg). The controller can last up to 5 hours with heavy use, and beyond 36 hours with conservative use to support long time-lapses. It takes 3 hours to fully charge the batteries.

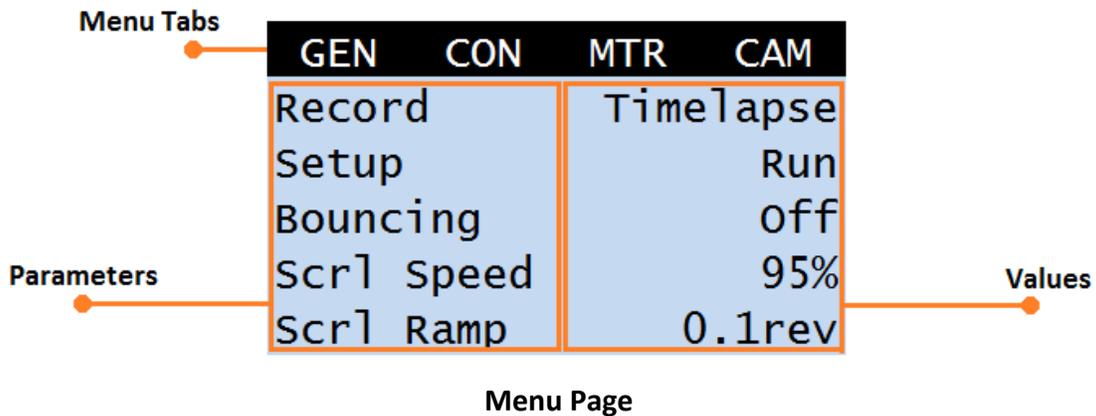
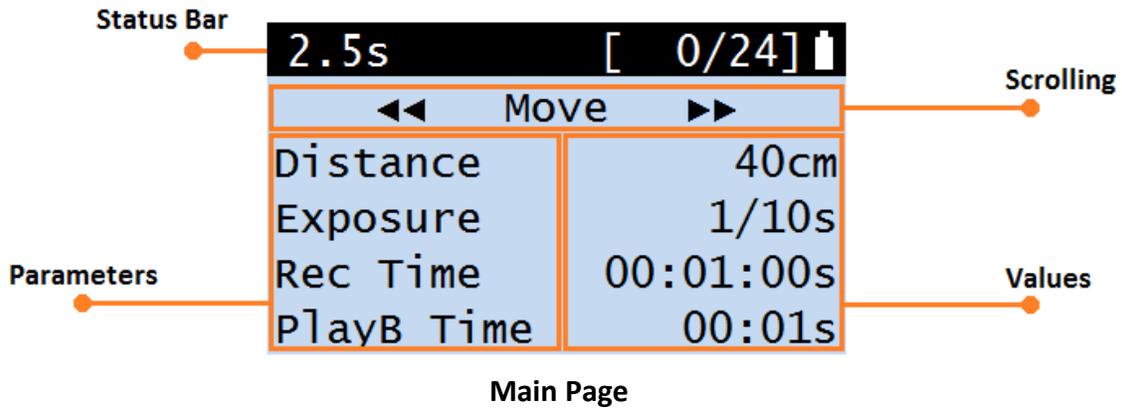


The controller can automate the camera shutter with the included camera cables for most Canon and Nikon cameras. However, it does not require a camera cable to function. Many cameras support time-lapse with a built-in intervalometer. The included cables support the following cameras (cameras not listed require optional cables not included with the controller, but are available for purchase from [www.cinetics.com](http://www.cinetics.com)):

- N3 - Canon 1D Series, 5D Series, 6D Series, 7D, 10D, 20D, 30D, 40D, 50D
- E3 - Canon 60D, 60Da, Rebel (300D), Rebel XT (350D), Rebel XTi (400D), Rebel XSi (450D), Rebel T1i (500D), Rebel T2i (550D), Rebel T3i (600D), Rebel T4i (650D), Rebel XS (1000D), Rebel T3 (1100D), Pentax K series DSLR
- DC0 - Nikon D800, D700, D300s, D300, D200, D4, D3 series, D2 series

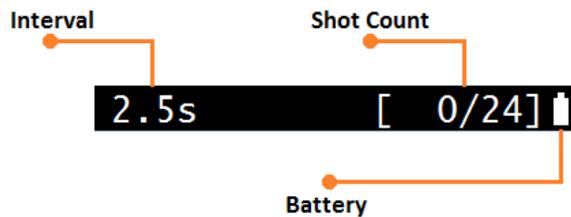
### 3 | User Interface

There are two types of pages in the CineMoco system: the main page and menu pages.



Use the up/down navigation buttons to cycle through parameters and the left/right buttons to adjust the parameter or perform an action. Pressing the home/play button while on the main page executes the current program, or it will return to the main page when viewing the menu page. Pressing the menu button switches to the menu pages; while in the menu, pressing the menu button again will cycle through the different menu tabs.

#### Status Bar



The status bar shows information based on the controller's current settings. When using time-lapse, the status bar will show the interval, shot count, and battery life. When using video, the status bar will only show the battery life.

## 4 | Menu

### General (GEN)

**Record** – Sets the recording mode (See section 5)

**Setup** – Sets the setup style (See section 6)

**Bouncing** – When enabled, the program will repeat in reverse and then repeat again endlessly until the user cancels the program

**Scroll Speed** – Sets the speed of manual scrolling

**Scroll Ramp** – Sets the ramping of manual scrolling

**Information** – Displays version information and developer credits.

GEN	CON	MTR	CAM
Record		Time	lapse
Setup			Run
Bouncing			off
Scr1 Speed			95%
Scr1 Ramp			0.1rev
Information			→

### Controller (CON)

**Brightness** – Sets the brightness of the screen

**System Sleep** – When enabled, the controller will turn off when not in use to conserve power. It is particularly useful for longer time-lapses

**Chain ID** – Sets the identity of the current controller for simultaneous controller use (e.g. pan + tilt)

**Update Chain** – Updates the identities of all daisy-chained controllers

**Start USB Mode** – When enabled, the controller allows the use of auxiliary software

**Reset Settings** – Resets all of the settings to its default setting

GEN	CON	MTR	CAM
Brightness			100%
Syst Sleep			off
Chain ID			Master
Update Chain			→
Start USB Mode			→
Reset Settings			→

## Motor (MTR)

**Motor Type** – Sets the motor type for calibration purposes (Pan/Tilt, Slider, S60, M60)

**Motor Delay** – Sets the motor delay to avoid post-movement vibrations

**Motor Sleep** – When enabled, the motor will not be powered when not in use to conserve power. When disabled, the motor will constantly power to maintain its position

**Speed** – Sets the stepping size of the motor. Increasing the speed allows for faster motor movement at the cost of angular resolution

GEN	CON	MTR	CAM
		Motor Type	M60
		Motor Delay	300ms
		Set Home	→
		Motor Sleep	off
		Keep Powered	off
		Speed	Low

## Camera (CAM)

**Camera Type** – Sets the camera type

**Fire Test Shot** – Test fires the camera

**Camera Delay** – Sets the camera delay to ensure that the camera has enough time to finish an exposure before the motor begins to move

**High Dynamic Range (HDR)** – When enabled, multiple photographs at different exposure values are taken to achieve more detail across lighting ranges (See section 9)

**Bulb Ramping** – When enabled, the exposure will change over the length of a time-lapse to account for changes in lighting conditions (See section 9)

GEN	CON	MTR	CAM
		Cam Type	Canon
		Fire Test Shot	→
		Cam Delay	200ms
		HDR	off
		# of Shots	-----
		Bracket	-----
		Bulb Ramp	off
		First Exp	-----
		Last Exp	-----

## 5 | Recording Modes

The recording mode allows the user to choose what kind of media to record.

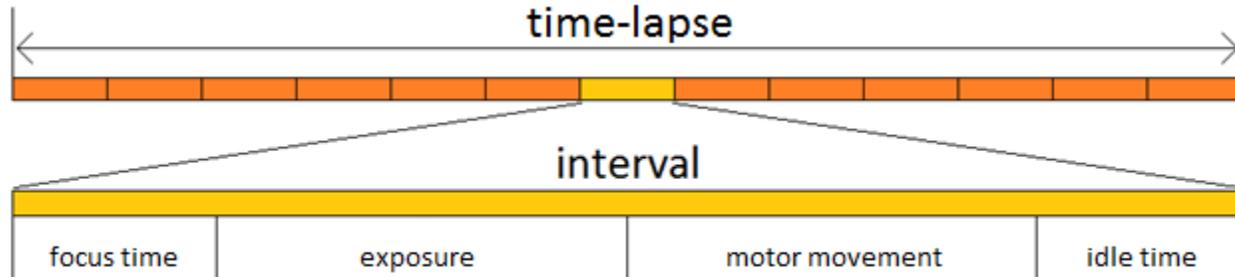
**Video** – A recording mode where the motor will move a distance based on a user-specified speed.

**Time-lapse** – A recording mode where the motor will move a distance in a user-specified amount of time. The motor may move continuously or with a stuttered motion (See section 7, move styles). In this mode, the user must select an exposure time, record time, playback time, and playback FPS to determine the interval and set up a time-lapse.

- **Exposure Time** – The amount of time the motor will pause to allow the camera to take a shot (Note: This parameter does not override the camera's exposure)
- **Record Time** – The time the entire program will take to run
- **Playback Time** – The play time of the compiled time-lapse video
- **Playback FPS** – The frames per second of the compiled time-lapse video

### Time-lapse Interval

An interval is described as a repeated cycle that makes up a time-lapse. The interval includes the focus time, exposure time, exposure post, motor movement, and motor post; if the interval is longer than the sum of these parts, there will be an idling time after the motor post.



## 6 | Setup Styles

The setup style allows the user to define the distance that the motor will travel. It is independent of recording mode. Given the same amount of distance, both setup styles will achieve the exact same effect; however, one may be easier to program than the other for certain shots.

**Keyframes** – The keyframes style allows the user to define a start point and an end point. This requires the user to manually scroll with the motor to define an endpoint, which may be disadvantageous for long distances. This style is best used when the first and last shots are clearly defined.

**Run** – The run style allows the user to input a distance (in cm) that the motor will run. This style is best used for longer distances that may be too difficult to set up with the keyframes style.

## 7| Move Type (Time-lapse only)

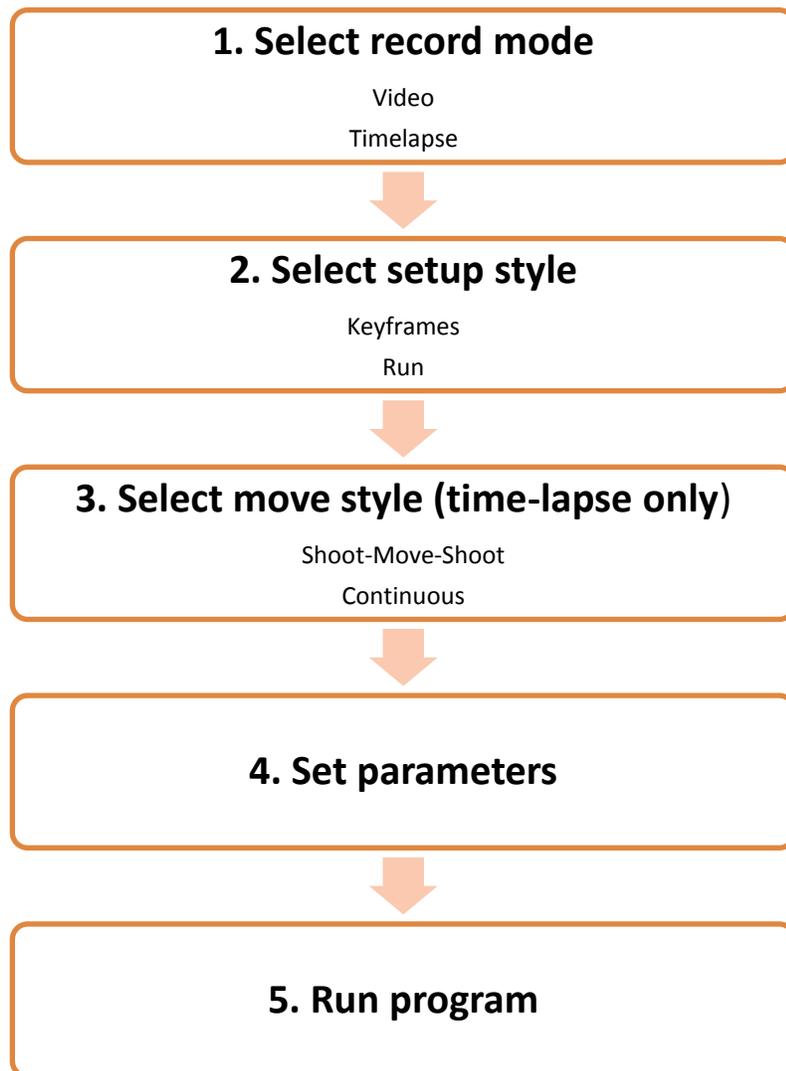
The move style allows the user to select how the motor will run in a time-lapse. The move style can have a significant impact on time-lapses due to its effect on motion blur.

**Shoot-move-shoot** – The SMS style will cause the motor to stop while taking a shot, then move before proceeding to take the next shot. This stuttering minimizes the amount of motion blur in a time-lapse.

**Continuous** – The continuous style will make the motor move non-stop for the entire time-lapse. This will maximize the amount of motion blur in a time-lapse.

## 8| Using CineMoco

Before using CineMoco, the motor type in the motor menu must be set to the appropriate product for calibration purposes. After setting the motor type, using CineMoco is a simple 4-step process for video and 5-step process for time-lapse.



## Video

1. Set the camera to video mode
2. Set the motor type in the motor menu
3. Set the record mode to “Video” in the general menu
4. Set the setup style to the desired style in the general menu
5. Set the travel distance (keyframes or run, depending on setup style) on the main screen
6. Set the speed and ramping parameters
7. Start recording on the camera
8. Press the play button to begin the program

## Time-lapse

1. Connect the appropriate cable between the CineMoco controller and the camera unless the camera intervalometer is being used
2. Set the camera to manual mode and establish parameters such as exposure, aperture, and ISO
3. Use the “Fire Test Shot” command under the camera menu to confirm the connection (optional)
4. Set the motor type in the motor menu
5. Set the record mode to “Timelapse” in the general menu
6. Set the setup style to the desired style in the general menu
7. Set the travel distance (keyframes or run, depending on setup style) on the main screen
8. Set time-lapse parameters (exposure, record time, playback time, playback FPS) on the main screen
9. Set the move type to the desired type on the main screen
10. Press the play button to start the program

## Setting the Exposure (Time-lapse only)

Setting the exposure on the controller is a critical part in creating a functional time-lapse. There are several things to consider when setting the exposure on the controller.

1. The exposure set on the controller has no relation to, or control over the exposure set on the camera (unless the camera exposure is set to bulb). It is simply the time the dolly will be still before it moves when using shoot-move-shoot.
2. The exposure set on the controller must be greater than the **minimum camera shot time**. This is the shutter time in addition to the time it takes for the camera to process an image. For example, if a camera’s exposure is set to 1/10s, the camera will require additional time to process and store the data. After this processing, the total time for one shot may end up being 1/2s. This number is typically not provided by the manufacturer and must be acquired empirically. The camera may have a light that turns on to indicate when this is busy; this can be used to measure the minimum camera shot time.
3. The exposure set on the controller must be equal to, or greater than the exposure set on the camera (or the total time for a shot, e.g. when using HDR). If the exposure on the controller is less than the exposure on the camera, the motor will begin to move during a shot.

# 9| Extra Features

## Chaining

Chaining is a feature that allows multiple CineMoco controllers to be connected and allows multiple motors to be controlled through one controller. Although it is not necessary for multi-axial control, it allows multiple motors to start simultaneously for precise synchronization.

1. Connect multiple controllers by plugging in the expansion cable to the expansion ports
2. Set the chain ID of one controller to “Master” under the controller menu
3. Set the chain IDs of the remaining controllers to unused values until all controllers are identified with a unique value (1, 2, 3, ...)
4. Use the “Update Chain” command under the controller menu with the master controller
5. Select the chain ID on the main page to control and set parameters independently for each device
6. Press the play button to start the multi-axial program

## USB Mode

USB mode enables the controller to interact with auxiliary software such as Dragonframe. This allows for more complex movements that are normally not possible with just the controller.

## High Dynamic Range (HDR)

High dynamic ranging takes multiple photos at varying exposure levels that can be combined into a single image; the result has more detail across lighting ranges than what is normally possible with a single photograph. The camera exposure must be set to bulb for the feature to work properly.

- # of shots – Total number of shots taken at every shot interval
- Bracket – The value the exposure will change per shot

## Bulb Ramping

Bulb ramping allows the exposure value to change over time to account for changes in lighting conditions (e.g. sunsets). The camera exposure must be set to bulb for the feature to work properly. When enabled, the exposure will change linearly between the user-selected first and last exposure values.