

# CP Micro User Manual

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Remote Motion Control Head for Digital Cinema  
DSLR and Pro Video Cameras up to 12 pounds



Manufactured in Austin, TX by VariZoom USA

Thanks for purchasing the CP Micro, our next-generation remote head. We worked long and hard to make this the very best affordable motion control head on Earth, using trickle-down performance and design cues from our bigger, more expensive heads, but also taking novel approaches firmly anchored in proven mechanical design. No corners were cut in the design - rather, we chose to omit expensive but non-essential features like slip rings, standard lens control and exotic gearing elements, as well as scaling the whole thing down to a more appropriate size for compact camera packages, thereby greatly reducing the complexity and volume of the machining and material.

The tricky part was executing a cost-effective drive system worthy of the CP name while shrinking its financial and mechanical dimensions to fit the market. The CP Micro is indeed small . . . and lightweight . . . the manufacturing cost is another matter entirely. Seeing no cheap way out, we bit the bullet and incorporated the best available technology for the task, resulting in less profit margin for us and more awesomeness for you. As our industry-renowned designer proudly noted, *“This may be the best product I have ever worked on.”*

One of the coolest things about the CP Micro is that it works with all our other CP controllers and control accessories, so whether you already own a CP/CPJR or you plan to expand down the line, your investment is flexible. Anyway, enough with the blabbering and on to the gear!

*Note the new instructional format is modular, so this document only applies to the CP Micro head and included accessories, NOT the controllers, wheels, pan bars or optional accessories. For the sake of brevity, from this point forward we will refer to the CP Micro as the CPM.*

### **CPM Specifications:**

VZCPM includes head, power supply, cables, case, choice of Mitchell or 100mm ball mount

Recommended max load – 12 lbs

Power requirements – 24VDC regulated, 4A minimum

Rotational limits – unlimited except for cable twist

Camera clearance (standard) - Vertical (camera pointing straight down/up): 7" from center of cam plate to base. Horizontal (camera pointing level horizon, underslung): 8.25"-10.5"

Camera clearance w/ optional 3" head extension - Vertical 10", Horizontal 11.25"-13.5"

Maximum Rotation Speed – 100 degrees/second

Maximum Operating Distance – 300 feet cabled, up to 1 mile w/ optional wireless

Environmental – the CPM is not waterproof and should be used very cautiously in sub-freezing temperatures due to the potential for ice formation within the structure

Dimensions - 14.25" x 8.25" x 4.5" (w/ Mitchell spud & nut)

Weight - 7.3 lbs (w/ Mitchell spud & nut)

Construction - Aluminum, delrin, stainless steel, brass

Mount type - choice of interchangeable Mitchell or 100mm ball (customer specified)

Cable pass-thru port I.D. - 1.35" pan axis, 1.2" tilt axis

Tilt platform vertical adjustment range - 2.25"

Power Connector – 4-pin 1B Lemo, pin 1 (-), pin 2 (+)

Control Connector – 7-pin 1B Lemo

### **CPM Accessories**

**VZCPM-HE3** - 3" head extension for additional camera clearance when pointing camera straight up/down

**VZCPM-C50** - 50' control male/male cable (M/M green 7-pin Lemo)

**VZCPM-EXTC50** – 50' control female/male extender cable (F/M, green 7-pin Lemo)

**VZCPM-C100** – 100' control male/male cable (M/M, green 7pin Lemo)

**VZCPM-EXTC100** – 100' control female/male extender cable (F/M, green 7-pin Lemo)

**VZCPM-EXTP50** – 50' power extension cable (F/M, red 4-pin Lemo)

**VZCPM-EXTP100** – 100' power extension cable (F/M, red 4-pin Lemo)

**VZCPM-BMM** – extra Mitchell Base Mount w/ spud/nut

**VZCPM-BMMK** – Mitchell key block for CPM base (prevents spinning on std. Mitchell plate)

**VZCPM-BMW** - Mitchell wrench

**VZCPM-BMCN** – Standard castle nut

**VZCPM-BM100** – extra 100mm ball mount w/ offset plate & tie-down knob

**VZTOC-24VR** – 24VDC regulator module allows powering head from 14.4VDC batteries or higher voltage sources up to 36VDC

**VZCPM-CW** – lateral counterweight for balancing pan inertia when used on lightweight jibs

**VZCP-T30** – wireless system for head control

### **Compatible Control Units**

**VZCPRVR** – “River” elite console w/ touchscreen for multi-head + track drive control

**VZCP-T04** – standard console controller w/ repeat playback functions

**VZCP-T11** – handwheels for use w/ River or standard consoles

**VZCP-T12** – pan bars for use w/ River or standard consoles

**VZCP-T05** – Jibstick Pro controller

**VZJIBSTICKJR** – Jibstick Jr controller

## General Tips

- 1) If using a power source other than the one included, make sure to consult the documentation and ask us before risking damage to the equipment. We do not warranty against damage caused by incorrect power application.
- 2) The maximum recommended payload of 12 pounds is based on a balanced camera package. Although the head will hold position with any camera package in that range, if the load isn't balanced it will cause the servo system to work constantly to hold position and it can also affect the dynamics of the system unfavorably in both mechanical and electronic terms. The horizontal and vertical balancing doesn't have to be perfect, but it should be close.
- 3) Don't open the unit. There's nothing to adjust and it's not all that interesting. Opening the enclosure may void your warranty.
- 4) The CPM isn't waterproof. Treat it like any non-waterproof camera – with great care.
- 5) If your camera package is so long that it will strike the base of the CPM when pointing straight up or down, you may need to purchase the VZCPM-HE3 extension. All of the controllers have programmable motion limits except the VZJIBSTICKJR (incl. with VZCPM-K5) – nevertheless, better safe than sorry!

## Mounting the CPM

The CPM is available with either a Mitchell spud/nut or a 100mm ball/offset-plate/tie-down knob system. The customer chooses the mount type when ordering the unit.

The CPM's Mitchell spud/nut is a unique design optimized for jib use and allows cables to feed directly through the pan axis while keeping the head directly above the mounting point. The nut is a modified hand-friendly version of the castle nut that requires no wrench, and the CPM base includes 2 thumbscrews that act as anti-spin keys when used on the VariZoom QuickJib or SnapCrane series. If desired, a Mitchell wrench is available for additional tightening, as well as a standard lower-profile castle nut. Also available is an optional anti-spin Mitchell key block for using the CPM with traditional Mitchell plates.

The CPM's 100mm ball is fairly standard other than the fact it includes an offset plate that allows cables to directly feed through the pan axis. Included is an easy-to-tighten hand knob with integrated socket cup washer for secure mounting to the 100mm bowl.

## Cables and Power

The green 7-pin Lemo control cable connects the CPM head to your controller, while the power supply plugs into the CPM head using a red 4-pin Lemo connector. The controller receives power from the CPM head – it's backfed through the green 7-pin Lemo cable. Extension cables are available through VariZoom for both control and power.

With our oversized cable ports, you can also run video and audio cables through the tilt and pan rotators to minimize tangling. Under the majority of real-world operations, cable twist

shouldn't be a problem, but if you are using the head in such a way that continuous single-direction rotation is required, keep in mind that after several complete turns the cables may twist up and require unwinding.

Please use only the power supply that comes with the CPM unless otherwise guided by a VariZoom tech. The CPM can certainly be run from battery power, but it needs to be from a regulated 24VDC output. If the voltage is too low, the head and/or controller will respond sluggishly or simply not function, and if the voltage is too high – BOOM!!! (**NOT** covered by warranty). We offer a cost effective 24VDC power converter (VZTOC-24VR) that will let you use common 14.4VDC batteries or other ones up to a max of 36VDC, without any change in performance, and we can provide cabling accessories and assistance, because you don't want to get creative and make power pinout mistakes or - BOOM!!! (you guessed, no warranty). There are other battery solutions on the market, as well, but please check with us first!

### Mounting/Balancing the Camera

With no power connected to the head, place the fully-dressed camera package on the CPM platform and make a quick estimate of the front-to-back balancing point of the camera, aka the center of gravity. You can quickly identify the center of gravity by balancing the camera on a pen or pencil.

Also assess where the vertical center of gravity for the camera package is located. You'll want to adjust the camera platform so that the camera package's vertical center of gravity is on the center of rotation, aka the cable pass-thru port. The 3-arm knob can be loosened to adjust the platform – once adjusted, tighten the 3-arm knob.



Go ahead and mount the camera with its center of gravity at the middle of the platform and tighten the camera screw(s). Now rotate the camera so it points straight up or down. If your camera/lens is long enough that you're concerned about it striking the CPM base when tilting straight up or down, you may either **a) set soft limits on your controller (when available), or b) purchase the VZCPM-HE3 head extension**

If the platform stays in position, you should be balanced enough. If the platform drifts downward, you need to adjust the platform position slightly, upward. Conversely, if the platform drifts upward, you need to adjust the platform position slightly downward.

Although the CPM will hold position even if the camera isn't balanced, but it will operate more efficiently with a balanced load, and particularly when used on a jib a balanced camera leads to smoother overall operation. The balance doesn't have to be perfect, but it should be close.

### Operating the CPM Head

First, make sure you disable OIS (optical image stabilization) if present on your camera/lens. OIS can respond badly to the head's motion, resulting in odd and unwanted visual effects, almost like the image is drifting off slightly to the side. Mount your camera securely - with multiple screws whenever possible. Also make sure the head is securely mounted and there is some slack in the cabling so that the head's servos aren't fighting cable drag.

The controls at your disposal will depend on the controller model you purchased. As a baseline, you will always have speed, direction, smoothing and deadband control. Refer to the controller manual for further instruction on setup and options.

Here are a few universal rules of thumb:

- 1) When operating on a jib, balance is essential. Even though the head will hold position, if the camera's center of gravity isn't right on the center of the tilt axis, you may feel some swaying in the jib arm. Think of an ice skater spinning with one arm straight out and one tucked in – he/she would go flying off to the side, slip and fall, no medal!
- 2) With a lighter jib, the same principle applies in regard to the pan action. Because the CPM's balance is offset to one side a bit, when panning at any significant speed, you may feel the tug of offset rotational inertia. This is easily resolved by adding the optional VZCPM-CW, a lateral counterweight that perfectly balances the rotational pan inertia of the head. This counterweight could also prove useful if you're operating on a lightweight slider.
- 3) Be extremely careful and consult us before using your own power source – our warranty does not cover damage cause by non-VariZoom power sources.
- 4) Make sure your camera package clears the base of the head when tilting – if it doesn't, set motion limits (when available), and/or add the VZCPM-HE3 extension. **We can't be held responsible for damage caused by improper setup.**
- 5) Practice your shots before rolling live to make sure you have the right speed, smoothing, and deadband parameters to accomplish your shot. The CPM is a great head, but it's only as good as the operator!

Thanks, and enjoy!

Team VariZoom