

iOptron's CEM60 mount tested

iOptron's CEM60 equatorial mount can carry a 60-pound (27 kilograms) load with high-precision accuracy for visual observing or astroimaging.

ALL PHOTOS: ASTRONOMY: JAMES FORBES



Most of today's amateurs are familiar with fork and German equatorial mounts. Both have their pros and cons, but a common problem with each is that the mounted telescope's position is offset from the center of the tripod or pier it sits on. As a result, torque can cause stability issues that adversely affect both visual and photographic use.

iOptron, an innovative company in Woburn, Massachusetts, has devised a new

approach to this old problem by introducing what they call the center-balanced equatorial mount (CEM). A hybrid design mating the German equatorial with the old-style cross-axis mount, the Z-shaped CEM puts the mount's balance point directly over the tripod. The result is a mount that features greater stability.

Initial impressions

The first mount to use the CEM design was the company's ZEQ25, designed for

Accurate tracking, lack of backlash, and the ability to handle large loads make the CEM60 mount a serious contender to carry your scope.

by Phil Harrington

relatively small instruments. Building on the success of that mount, iOptron now offers the CEM60.

The CEM60 is intended for medium-sized instruments, with a stated weight limit of 60 pounds (27 kilograms). Online reports testify that the CEM60 supports instruments as large as 11-inch catadioptrics without a problem.

The test mount came shipped in three boxes, one for the mount itself, one for the 21-pound (9.5kg) counterweight, and a third for the optional tripod. The mount and all its accessories, save for the counterweight, come in a custom-fit aluminum carrying case.

Let's look at the optional tripod first. Like many others sold on the astronomy market today, iOptron's tripod (#8021ACC) features 2-inch stainless steel tubular legs. You can adjust the tripod's height from 30 to 52 inches (76 to 132 centimeters), allowing seated or standing viewing. A central shelf presses outward against the legs for better stability while also offering a convenient place for eyepieces.

Moving onto the mount, the CEM60's design takes a little getting used to. For starters, the axis locks are quite different from what most observers would expect to find. Each is "engaged" and "disengaged," to use iOptron's words, by turning a small knob secreted away on the mount.

They took some hunting to find at first because the *Quick Start Guide* doesn't label them as such. But it is critical that both locks be engaged (locked) before putting the mount on the tripod, or it could swing

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and possibly jam fingers. I'll say more about the *Quick Start Guide* later.

Getting ready

Once set up, the CEM60 impresses by its design, stability, and finish. The powder-coated, cream-colored matte finish is uniform and gives it a sophisticated look.

Knowing that users conceivably could attach many different telescopes to the CEM60, iOptron cleverly designed the mounting cradle to accept both Vixen and Losmandy dovetail mounting plates, the two most common in use today. My scope's Vixen plate fit perfectly.

I also like the CEM60's approach to internal cabling. Rather than having cables running externally to each axis drive motor, as is common practice for most manufacturers, iOptron routes all cables inside the mount itself. That's a big plus because it's easy to snag dangling cables accidentally in the dark. The only two cables exposed during operation are for the Go2Nova 8407 hand controller and the polar scope's illuminating LED.

The built-in 32-channel GPS positioning algorithm quickly achieves satellite lock. It took me less than a minute, but the documentation states it could take several depending on your location.

Built into the CEM60's polar axis is a well-designed alignment scope that makes setting the mount parallel to Earth's rotational axis easy. You can use two methods to polar align: "Quick Polar Alignment" or "BrightStar Polar Alignment." The latter is especially useful if a tree or other obstruction blocks your view of the celestial pole.

By selecting the "Quick" option on the hand controller, its screen graphically



iOptron includes an easy-to-read latitude scale that lets you get pretty close to your northern location. The polar alignment scope then will help you fine-tune this setting.

shows where Polaris is with respect to the celestial axis. Move the mount up/down and back/forth using the fine-adjustment knobs until the view through the alignment scope's eyepiece matches the diagram on the hand controller. At that point, you have aligned the mount.

As with other go-to equatorial mounts, you can enhance calibration by using one or more additional alignment stars as well as solar system objects. Choose the object from the hand controller's menu, and tell the mount to slew in its direction. After using the controller's arrows to center the target, scroll to the menu's "Sync to Target" command and press "Enter."

Calibrating the mount's computer was not as intuitive as I had hoped, especially given my long experience with go-to German equatorial mounts. The problem actually lies not with the mount itself, but rather with the documentation.

Being a typical man, I loathe instructions, especially lengthy treatises. So, rather than peruse the 55-page instruction manual, which I had earlier downloaded and printed from the company's website, I went with the six-page *Quick Start Guide* that came with the mount.

A word of caution to new owners whether or not this is your first telescope: Read the full manual! The *Quick Start Guide* may be fine as a refresher, but it leaves out a few key steps in the initialization process without which the mount will not function correctly. Even the full manual's organization leaves something to be desired, but the information is in there if you look hard enough.

Results

Once I had successfully calibrated the mount, it worked exceptionally well. Tracking accuracy was excellent. And that brings up one of the mount's true strengths. The drive uses a non-contact magnetically loaded system to hold the worm and worm gear together.

The net result is that, unlike many traditional spring-loaded systems, no gear backlash exists. Astroimagers especially will appreciate this.

During my test, go-to accuracy was nearly spot-on even after I purposely instructed the mount to go fully across the sky from one target to the next. Each time, the target was within the field of view of my 85x eyepiece.

Another nice feature is that the mount automatically will flip when tracking an object across the meridian to prevent it



When the view through the included polar alignment scope matches the one "Quick Polar Alignment" shows you, the drive is aligned to our planet's rotational axis.

from colliding with itself. You can lock this feature out, in which case the mount will stop prior to collision.

For serious astrophotographers, the CEM60's power panel includes four USB 2.0 sockets, two 12-volt power sockets, an ST-4 compatible autoguider port, and a 6P6C port that can be used to bridge the guiding port or for accessories having a 6P6C/6P4C plug.

I came away from testing iOptron's CEM60 equatorial mount impressed with its engineering. The whisper-quiet drive system aimed and tracked accurately and effortlessly once I set it up correctly. All in all, especially considering the price, this is one mount that's tough to beat. ☛

PRODUCT INFORMATION

iOptron CEM60

- Type:** Equatorial mount
- Mounting plate:** Spring-loaded Vixen or Losmandy types
- Payload:** 60 pounds (27 kilograms)
- Slew speeds:** 1x, 2x, 8x, 16x, 64x, 128x, 256x, 512x; max is 3.75° per second
- Power requirement:** 12-volt DC, 2 amps
- Weight:** 27 pounds (12kg); counterweight weighs 21 pounds (9.5kg)
- Included:** Polar scope, aluminum hard carrying case
- Price:** \$2,499
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