

DUAL AXIS CG-4 MOTOR DRIVE (#93522)

The Dual Axis CG-4 Motor Drive is designed to be used with the CG-4 Equatorial Mount (#91510). In addition to tracking the stars as they move across the sky, this accessory allows you to make small adjustments to the R.A. and DEC axis from a hand controller so you do not have to physically touch the telescope. This is very important in long exposure prime focus astrophotography where an inadvertent bump could ruin a picture. The unit is powered by a battery pack using 4 D-cell batteries (not included) which operates the motors for up to 20 hours. This motor drive is used for tracking and guiding only—there is no slewing function. The kit comes with the following:

- R.A. Motor
- DEC Motor (with gear attached)
- One Slip Clutch Gear Assembly (for DEC)
- Dual Axis Drive Hand Controller
- Battery Pack
- Mounting Hardware and Allen Wrenches

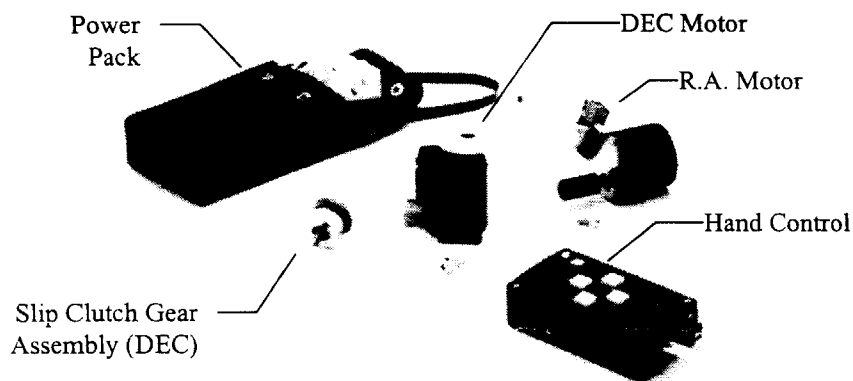


Figure 1

Read the instructions through once carefully before beginning the installation process. The telescope tube should be removed from the mount while installing the motors for ease of installation.

INSTALLING THE DEC MOTOR TO THE MOUNT

1. Install the slip clutch gear assembly onto the DEC shaft on the left side of the mounting platform. Tighten the set screw on the side of the DEC shaft gear with a 2mm Allen wrench. If, when using the motor drive, there is no response when pressing the buttons, check to make sure this screw is tight.
2. Next, locate the DEC motor. The DEC motor is the one with the large gear attached. On the top of the motor bracket is a threaded hole to accept the mounting screw.
3. Place the portion of the motor bracket with the threaded hole just below the square extrusion on the side of the telescope mounting platform. (See Figure 3). (NOTE: some older models may not have the square extrusion on the mounting platform. If not, contact Celestron technical support for upgrade options).
4. Insert the 1/4-20 screw through the top of the mounting platform and thread it into the DEC bracket.
5. Adjust the clutch gear along the DEC shaft so that the gears mesh properly. Tighten all screws securely.

INSTALLING THE R.A. MOTOR TO THE MOUNT

The R.A. motor will only install on the right side of the mount (i.e., when standing behind the mount where the R.A. setting circle is located).

1. Locate the flexible motor coupling at the end of the R.A. motor.

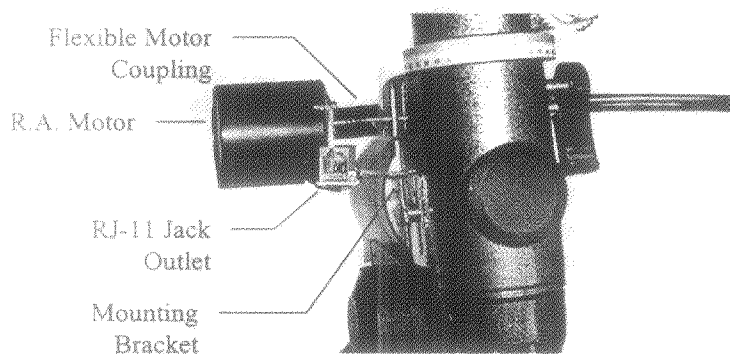


Figure 2

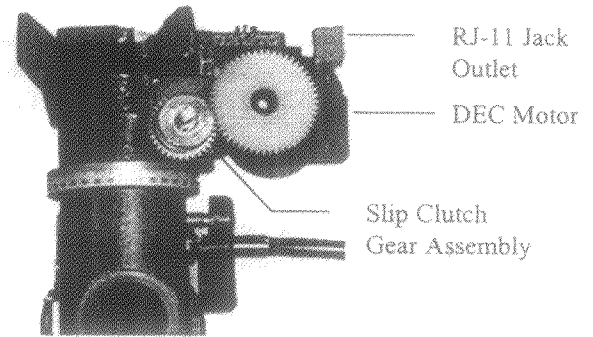


Figure 3

2. Attach the R.A. motor to the mount by placing the end of the motor coupling over the R.A. slow motion shaft. Make sure the flat side of the shaft is positioned under the coupling thumb screw before tightening.
3. Use the R.A. slow motion knob to rotate the motor until the slotted hole on the metal bracket aligns with hole on the side of the polar housing. (See Figure 2).
4. Insert the socket head screw through the slotted bracket and into the hole on the polar housing. Tighten down with an Allen wrench.

POWERING THE DRIVE

The DA-CG-4 motor drive is powered by 4 D-cell size batteries (not included). This can operate the motor drive for up to 20 hours or more depending on the ambient temperature. To power the drive system:

1. First, remove the battery compartment from its vinyl case.
2. Insert batteries into the compartment so that they snap firmly into place.
3. Put the battery compartment back inside its vinyl case.

The DA-CG-4 Motor Drive has three cables that must be plugged in. Two cables attach to the drive motors and the other attaches to the hand control. To install the cables:

1. Locate the phone jack cable coming from the hand control unit (marked "DEC") and plug it into the jack outlet on the DEC motor. Likewise, plug the cable marked R.A. into the jack outlet on the R.A. motor.
2. Plug the battery pack cable (stereo jack type) into the outlet on the hand control labeled "DC Power".

USING THE DRIVE

The hand control consists of two switches and four control buttons.

- The switch marked "N/Off/S" turns the power to the motor on and off as well as changing the direction of the motors. Turn the switch to "N" to begin tracking for the northern hemisphere. Changing the switch to "S" will reverse the polarity of the motor to track stars in the southern hemisphere.
- The switch marked "2X/4X/8X" determines the rate at which the motor will move when the hand controller buttons are pressed. 2X, twice the sidereal rate, is used for guiding on a star when doing long exposure astrophotography. 4X, four times sidereal, is used for centering objects in the eyepiece; and 8X, eight times sidereal, can be used for centering objects in the finderscope as well as the eyepiece.
- The four push buttons control the motor drive direction. The "Up" and "Down" buttons control the telescope in declination (DEC). The "Left" and "Right" buttons control the telescope in Right Ascension (RA). The direction for each button will be reversed when switched to the southern hemisphere position.

The Declination motor can be disengaged in order to manually move the mount via the slow motion control knob. To override the motor, the lock on the clutch gear assembly must be loosened. This will allow the gear hub to rotate independently from the actual gear. For Declination, loosen the clutch wheel on the gear assembly and turn the slow motion control knob attached to the shaft of the clutch gear assembly. Tighten the clutch wheel to re-engage the tracking.

Troubleshooting?

A common problem with the DA-CG-4 motor drive on the CG-4 mount is the worm gears are sometimes fitted too tightly to the helical gears. This causes the motors to bind up. Conversely, the worm gear may fit too loosely, causing excess backlash in the motors. In either case the worm may need to be adjusted. The procedure and the assemblies are the same for the DEC and the R.A. The only difference is the location. The DEC worm assembly is located on the top of the mount. It is the box to which the DEC slow motion knob is attached. To recognize if the gears are meshing too tightly, turn the R.A. manual slow motion control. If it is noticeably hard to turn then it should be loosened. If you cannot tell, then the motor will let you know. It will either run or it won't.

To Adjust the Worm Gears:

1. Remove the motor drive assembly.
2. Locate the worm assembly on either the R.A. or Dec axis. This is the box to which the slow motion knobs are attached.
3. Locate the 4 Allen head cap screws that hold the worm gear assembly in place. Two are located underneath the box with a set screw located in between. Two are located on the backside of the mount.
4. Slightly loosen all four screws.
5. Turn the center set screw on the underside about a quarter turn clockwise (to loosen the R.A. worm assembly) or a quarter turn counter-clockwise (to tighten the worm gear assembly if the backlash is too great).
6. Tighten the four cap screws and try the worm gear.

Note that if worm is loosened too much, then backlash between the gears can become a problem. You may need to tighten the worm assembly. This process of loosening then tightening the worm takes some trial and error, but once it is adjusted correctly, it won't need any further adjustments.