**SPECIFICATIONS**

- CNC machined components (3D printed dustcap)
- 16 pole permanent magnet rotor
- Skewed slot stator design for low cogging torque
- 210mm (OD) precision cross-roller bearing
- > 20,000 lb axial load capacity
- 5,000 N-m static moment
- 11 Newton - meter continuous torque (D11)
- 21 N-m continuous torque (D21)
- 34 N-m peak torque (D11)
- 64 N-m peak torque (D21)
- 200mm absolute Renishaw encoder, 26 bit
- Sub arc-second position control
- Industry-standard CANopen drive control
- Easy interface for custom SW via UDP datagrams
- 50ms outer control loop rate
- 2.5 KHz inner servo loop rate (typical)
- Copley Controls CME drive tuning SW package
- 5A max continuous, 15A peak
- Operation down to 24VDC with DC drive unit
- 240mm diameter x 150mm height
- Weight: 45 lb (D11) to 54 lb (D21)

**D11 & D21 Modular Drive Units**

The D11 and D21 are high performance digital direct drive (DDR) motor / encoder units designed for astronomical telescopes. The two units share a common housing and interface design but differ only in their torque rating as the D21 contains a longer internal motor stack than the D11. A typical telescope mount design will incorporate two drive modules, a bracket kit which can be custom-tailored for the customer’s optical tube and installation preference, and an electronics cabinet containing two industrial servo drives and support electronics, powered off of 115VAC. The D11 and D21 drives can also be powered from the new A6 portable drive controller via an external DC power source.

Xerxes Scientific’s drive control software features full variable rate tracking control to support commercial mount modeling software packages, and also supports standard ASCOM pulse guiding interface commands as well as the normal ASCOM drive control commands. The interface is ethernet based and uses a straightforward datagram protocol which is customer-accessible.
Why direct Drive?

A direct drive telescope mount has no gears, simply a very high performance electric motor and encoder, driven from a powerful servo drive electronic unit. The drive has the following advantages:

- No backlash
- High breakaway torque
- Automatically compensates for upset / wind gusts
- High stiffness
- High slew rates
- Can’t be damaged by applying excessive torque
- Nearly silent operation
- No gear mesh adjustment
- One moving part, one permanently lubricated bearing
- No “jog” on startup
- Safe-Torque-off compatibility
- Encoder maintains position even with drive off

Easy tuning is provided via the Copley Controls CME2 servo drive tuning application. This application provides both auto-tune and manual tuning functions, automatic phase sensing, Flash memory storage and recovery, drive status indication and diagnostics, as well as a convenient graphical interface. Your investment is protected from future obsolescence via the use of industry standard servo drive controls and control protocol.

Design Your Own

Xerxes Scientific Modular drive components make it easy to create your own custom mount design. Provide your own base, arms, or brackets. Use our P240 “P” style dovetail saddle or saddles from other manufacturers. Control your mount with our Windows-based drive software, ASCOM control, or with your custom code based on our easy-to-use Ethernet based control protocol.

CANopen

All our mounts are controlled using the CANopen control protocol. A Windows program provides a GUI interface, basic control functionality, and our Ethernet-based ASCOM control protocol. CANopen is an open industry standard using CAN (Controller Area Network) as the physical layer.

Astrometica plate solve of M27 (narrowband) showing 40 and 30 mas residual, 2.0” FWHM star images, five minute unguided exposure.