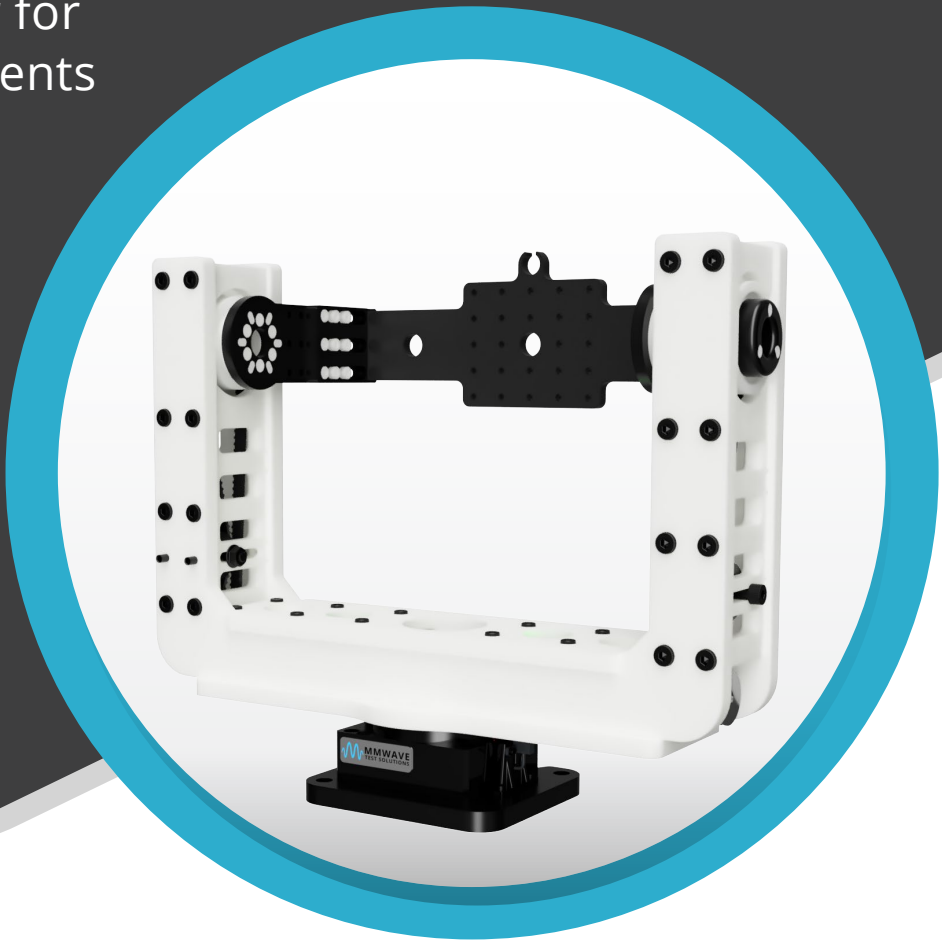
# DUO3.5

Precision Positioner for
Antenna Measurements



## FEATURES

### Designed to Fit Desktop-Sized Chambers

DUT size up to 29 cm width (11.5”) and 8 kg (18 lb.)

### Unique Depth-Adjustable DUT Arm

Easy adaptation to different AUT/DUT depths

### High-Quality Components

Heavy-duty instrument turntable, high-torque motors, and precision gears

### Control Software

Clear structured Python and MATLAB reference source code

### Closed-Loop Drive System

Closed-loop motor control system to guarantee positioning accuracy

MMWAVE TEST SOLUTIONS

# INTRODUCTION

The DUO3.5 is a compact positioner in the DUO series. Being capable of holding a DUT up to 8 kg and 29 cm width, 5 cm more than the DUO3, it's a highly effective, yet compact positioner.

A unique feature of the DUO3.5 is a sliding DUT arm, making it easy to adjust to AUT's /DUT's with the depth ranging from 12 cm up to zero cm (lined up with the elevation axis.)

The DUO3.5 is metal-free in the upper section to perform well in sensitive communication and radar tests. Quality components are used throughout the design, and secures performance and mechanical stability in any test.

The DUO3.5 does not cut any corners on quality or accuracy. It is a rigid design delivering consistent performance.

# HARDWARE

The DUO3.5 uses over-specified components in all aspects of the design. Components have been carefully selected for precision, gear ratios chosen to eliminate rounding errors, and all three motors are running in an autonomous closed loop.

The azimuth turntable is instrument-grade quality, and milled from a single aluminum block. The 1:180 gearing offers both high resolution and high torque, while guaranteeing precision in the most demanding applications.

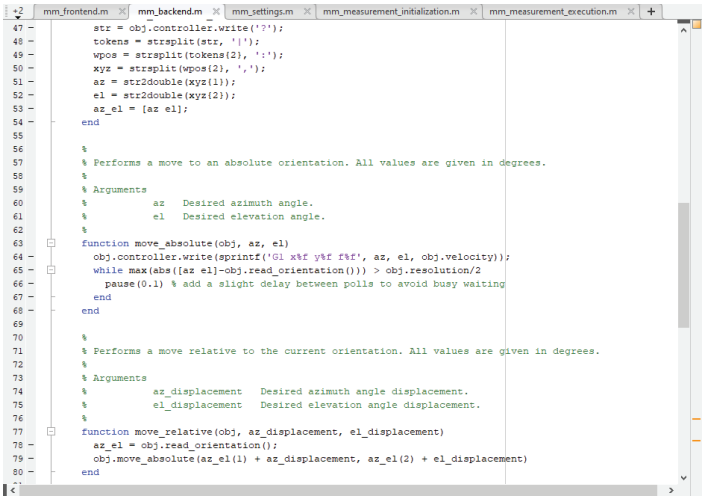
The full arm design is CNC-machined for maximum strength and rigidity. It uses Polyoxymethylene (POM/Acetal/Delrin™), Polyethylene terephthalate (PET) with low dielectric constants to limit stray reflections. The upper arm is metal free with four bearings made of POM/glass and all bolts and nuts made from nylon and fiber-reenforced plastics.

The dual-motor setup, one for each side of the arm, is combined with quality single-stage gears for high precision and low backlash to secure positioning precision under all loads.

A USB-connected controller controls the motor system (Serial-over-USB), the DUO3.5 ship with reference application software in both Python and MATLAB. The controller's clean native instruction set makes it easy to develop a new application in any language.

# SOFTWARE

Control application reference code for MATLAB and Python are included with the system. Both implementations utilize a clean structure of a frontend with UI setup and manual control, a backend controlling the control board and instruments, and a settings file with default values for instruments, communication, and positioner range and velocity.




The applications are delivered in source code, and provided with in-line documentation to allow easy adaptation to your software environment.

The hardware controller system is chosen for its simplicity and clean native instruction set designed for controlling multi-axis positioners. The structure and integration makes it uncomplicated to develop a new application in your preferred software language.

python™

MATLAB

# DUO3.5 SPECIFICATIONS

| | |
|---|---|
| **AUT/ DUT dimensions** | Up to 29 cm width (11.5”) and 8 kg (18 lb) load. |
| **Positioner dimensions** | W 39 x H 36 x D 15 cm, weight 7.5 kg (16 lb.) |
| **Horizontal / Azimuth platform** | Resolution 0.01° full step (1:180)<br>Holding torque 44.5 N-m (32.8 lb-ft)<br>Max rotation velocity 25° / sec<br>CNC milled from brass and aluminum, black anodized |
| **Vertical / Elevation** | Resolution 0.1° full step (1:18)<br>Holding torque 21.6 N-m (15.9 lb-ft)<br>Max rotation speed 100° / sec<br>Dual motor to avoid torque twisting<br>Built from Delrin/POM, and nylon, metal free upper arm<br>Dual POM bearings in each of the two arms |
| **Controller system** | Multi-axis microprocessor-based stepper controller<br>Controlled via Serial-over-USB<br>Python and MATLAB control UI<br>USB 1.1 connected (Type A connector)<br>Closed-loop drive for each of the three motors |
| **Power supply** | Fanless 24 Volt 260W – 100-240V mains voltage |

**Contact us at info@mmwavetest.com for more information**

Mmwave Test Solutions is a company specializing in positioners, anechoic chambers, and similar technologies for mmWave and microwave measurements. We design and manufacture own anechoic chambers and positioner systems as well as represent other suppliers.

We provide standard products, modified standard products, and full-custom designs.