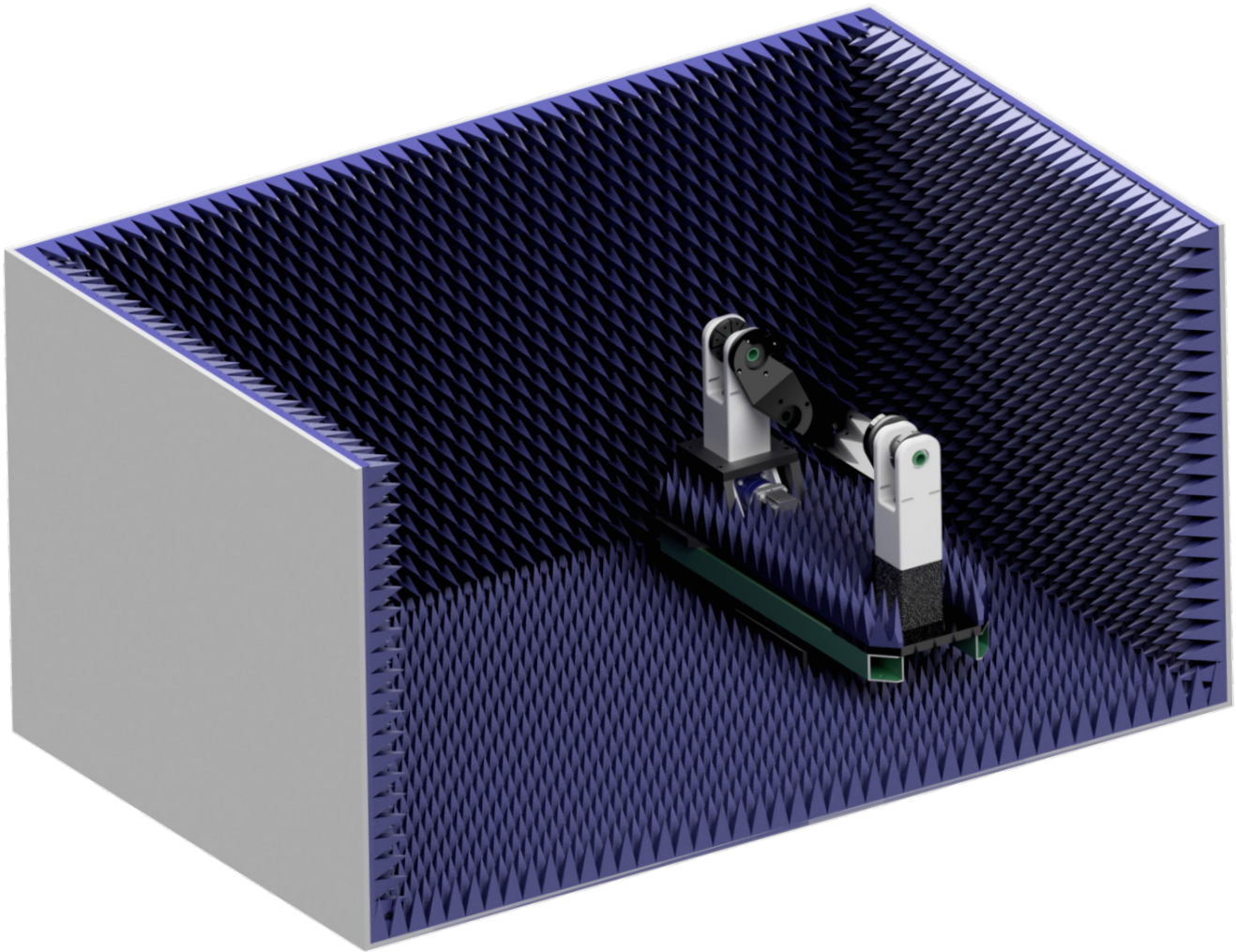# DC402

Precision Dual-Axis Compact Positioner

Features and Specifications

Introduction and Features

Introduction

The DC402 is a compact positioner using both worm and belt drive components to offer high precision with low reflectivity for loads up to 40 pounds. This positioner is specifically designed for compact test ranges and enclosures for testing 5G, mmW and radar components and assemblies.

Features

Compact Turntable Stage
At only 4" thick, the base turntable features a 100-pound capacity with 0.02 degree resolution.
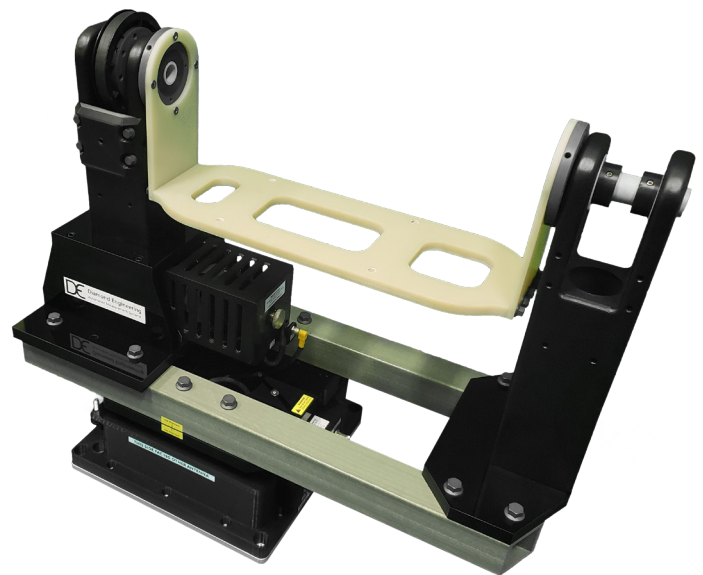
Non-Metallic Gimbal
The upper gimbal assembly is engineered from non-metallic components for reduced reflections and better transparency.

Programmable
Includes a python module and full documentation for controlling positioner from within a custom software application such as LabView, Matlab, C, VB.

Expandable
The included controller can be expanded to control a third axis such as polarization or a precision linear stage for mechanized phase centering.

What's included?

- DC402 base turntable with encoder
- Non-metallic gimbal with encoder
- 3 axis controller
- Control cables
- Mounting hardware
- Power supply
- Users manual / software CD
- Programming manual

System Package Options

Standard Models

All standard model packages include the positioner, software, all RF components, tools and documentation and AUT mounting hardware.

DC402-00	No RF Components
DC402-06	6 GHz SMA RF Components
DC402-18	18 GHz SMA RF Components
DC402-40	40 GHz 2.92 mm RF Components
DC402-50	50 GHz 2.4 mm RF Components
DC402-67	67 GHz 1.85 mm RF Components
DC402-75	50 to 75 GHz mmW V-Band RF Components
DC402-90	60 to 90 GHz mmW E-Band RF Components
DC402-110	75 to 110 GHz mmW W-Band RF Components
DC402-MMW-CFX	No RF components; configured with mounts for Copper Mountain FX series mmW adapters (up to 110 GHz)

Full Turnkey Solutions

We offer **complete** turnkey measurement systems including anechoic chamber, VNA, positioner, reference antenna, and laptop with DAMS Antenna Measurement Studio. Packages can be tailored to meet your specific needs. From MHz to mmW, we can deliver a complete solution. Our chambers are custom designed and feature double-knife-edge doors with high quality absorber and honeycomb vents to ensure proper shielding. We also provide a comprehensive system training session following the installation process.
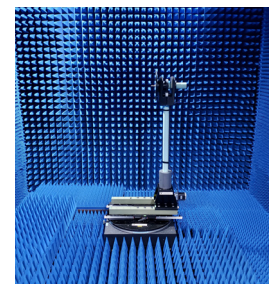
Additional Options

OPT-SR	No slip ring (for limited ± 180º rotations only, not for 360º)
OPT-WGDH	Worm-gear driven head
OPT-AZ	Automated linear Z-axis
OPT-AZXY	Automated linear Z- and X-axis with pseudo Y-axis
OPT-ENC	Encoder feedback capability
DPA-PDK	DAMS Platform Development Kit
OPT-SMA	Software maintenance agreement

Accessories

|	
DEPC-D	Pre-configured PC (desktop)
DEPC-L	Pre-configured PC (laptop)
DE-SIM	DAMS Antenna & Network Simulator software add-on
DPA-SW-N2F	Spherical nearfield processing
DPA-AUTOPOL	18 GHz SPDT RF switch auto-polarizer with cables/adapters
DPA-AUTOPOL-40	40 GHz SPDT RF switch auto-polarizer with cables/adapters
DE-05xx	Broadband reference horn 500 MHz to 18, 26, 30 or 40 GHz
DE-07xx	Broadband reference horn 700 MHz to 18, 26, 30 or 40 GHz

DAMS Antenna Measurement Studio *(included!)*

Overview

The DAMS Antenna Measurement Studio is an advanced data collection platform for both passive and active measurements. Includes several built-in semi-automatic modules for post-processing DUT data. The DAMS Studio is also capable of generating various reports and visual data representations ranging from 3D spherical plots, gain over frequency plots, Smith charts and more. The unlimited viewing license permits installation on multiple computers for post-processing or data-analysis.

Measurement Features

- Support for vector network analyzers (VNA/PNA/ENA), spectrum analyzers, signal generators, power meters and even voltmeters.
- Extensive post-processing modules
- Export data with variable formatting options
- Measure up to 1600 frequency points @ every position
- Variable speed
- Move to max signal position
- Vertical / horizontal scan measurements
- CW/CCW antenna rotation
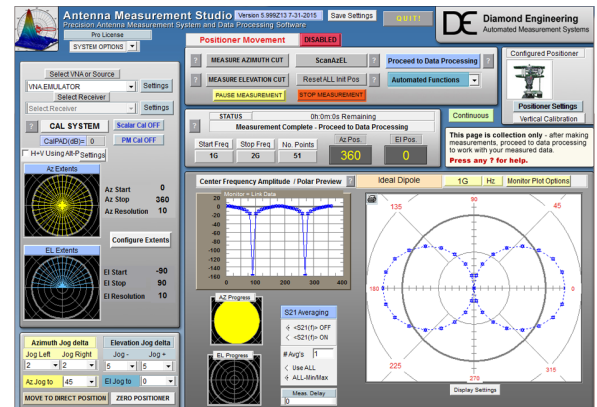
Data Processing and Visualization

- **Process 500,000 data points** under normal operation
- Quad-trace polar plots
- Dual-trace amplitude plots
- Compliance overlay
- 3D AZ/EL over freq
- 3D AZ over El
- Spherical plots
- Calibrated ref antenna import
- Path loss calculator
- Excel or .TXT export
- Complete data manipulation
- Multiple storage registers for convenience
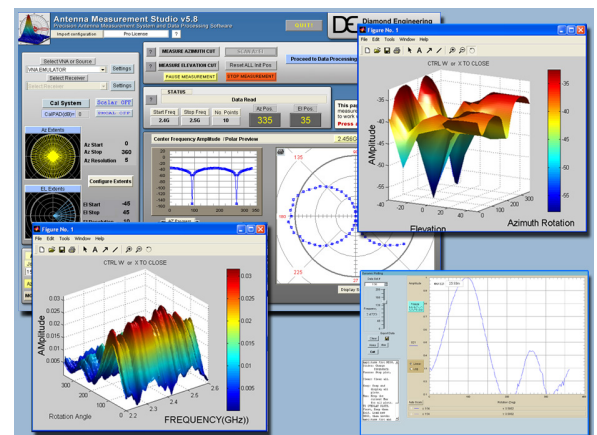
For more information about our software, including screen shots, full specifications of capabilities and the ability to download a demo version, please visit:

http://www.DiamondEng.net/PDF/software_specs.pdf

Specifications

General

Dimensions

Footprint:	12" x 12" (304 mm x 304 mm)
Total Height:	22.5" (571.5 mm)
Clearance Radius:	18" (914 mm) clearance radius required for full 360° rotation
Total Weight:	42 lbs (19 kg)

Positioner

Turntable (theta)

Frequency Ranges (GHz):	n/a
Resolution:	0.02° full step
	0.00125° microstep
Drivetrain:	3.0A/phase bipolar stepper motor with worm drive
Holding Torque:	25 ft-lb
Movement Range:	360° continuous or indexed
Position Feedback:	800-line encoder
Limits:	Home & Limit (hardware & software)
Weight (positioner only):	16 lbs (7.27 kg)
Positioner Max Speed:	24° per second
AUT Mounting Options: [1]	3/8"-16 or M6 4-hole pattern for general mounting
Composition:	Acrylic turntable with aluminum base
Weight Capacity:	100 lbs (45 kg)
RF Rotary Joint:	Optional (SMA, 2.92 mm, 2.4 mm, 1.85 mm or waveguide)

Gimbal (elevation)

Frequency Ranges:	n/a
Resolution:	0.05° full step
	0.00250° microstep
Drivetrain:	2.0A/phase bipolar stepper motor with belt drive
Holding Torque:	20 ft-lb
Movement Range:	360° continuous or indexed
Position Feedback:	800-line Encoder
Limits:	Home (hardware & software)
Weight (gimbal only):	26 lbs (11.7 kg)
Gimbal Max Speed:	24° per second
AUT Mounting Options: [1]	3.625" (92 mm) diameter PVC mounting plate with 10-32 hole array
Composition:	Delrin, ABS, PLA+, fiberglass
Weight Capacity:	40 lbs (18 kg)
RF Rotary Joint:	Optional (SMA, 2.92 mm, 2.4 mm, 1.85 mm or waveguide)

[1] = Custom mounting solutions available upon request

Controller

Controller type:	3 axis microprocessor based controller
Resolution:	Full step through 1/32 microstep
Motor Current:	3.125A per motor phase max
Cooling:	Dual 40mm 24V fans
Motor Connector:	M12 axial 5-pin connector + 5-pin encoder connector
Communication Interface:	DB9 RS232 serial port with external USB adapter
Communication cable length:	1 meter
Input Voltage:	24VDC 3A
Power Supply (included):	24VDC 5A - 110/220v input
Motor cable length:	1 meter

Software Specifications

Pattern Measurement Modes
- Time or Frequency Domain
- Gated Frequency domain (RCS, multi-path elimination)
- Index and Measure
- Simultaneous axis movement support (Conical scan)
- Any supported S-Parameter (S21, S11, S12, S22, etc.)

Calculated Antenna Parameters
- Gain
- Peak gain and position
- Beamwidth
- Front to Back Ratio
- Efficiency / TRP
- Dual Linear to Circular Transform (RHCP/LHCP)
- Nearfield to Farfield Translation Module

Data Export
- TXT / .S1P
- DAT export
- Export data and report to Excel
- Trace Data only to Excel
- MatLab Compatible .TXT Format

Plots
- Multi-Trace polar and XY plots
- Efficiency and TRP
- Beamwidth vs. Frequency
- Spherical 3D Radiation Plots with Overlays
- 3D Amplitude Plot / 3D Color Map Plot
- Built In Matlab Plots (does not require MatLab)

Calibration and Correction
- Gain Substitution, Gain Transfer, and 3-Point gain modules
- Calibration Profiles for gains or losses
- Table Based Correction
- Calibration Interpolation
- Phase Correction
- Data Normalization
- Data/Register Math - Add/ Subtract

Automated / Batch Functions
- File Trigger Mode
- Position from list
- Batch plot export

Dimensions - Units (mm)
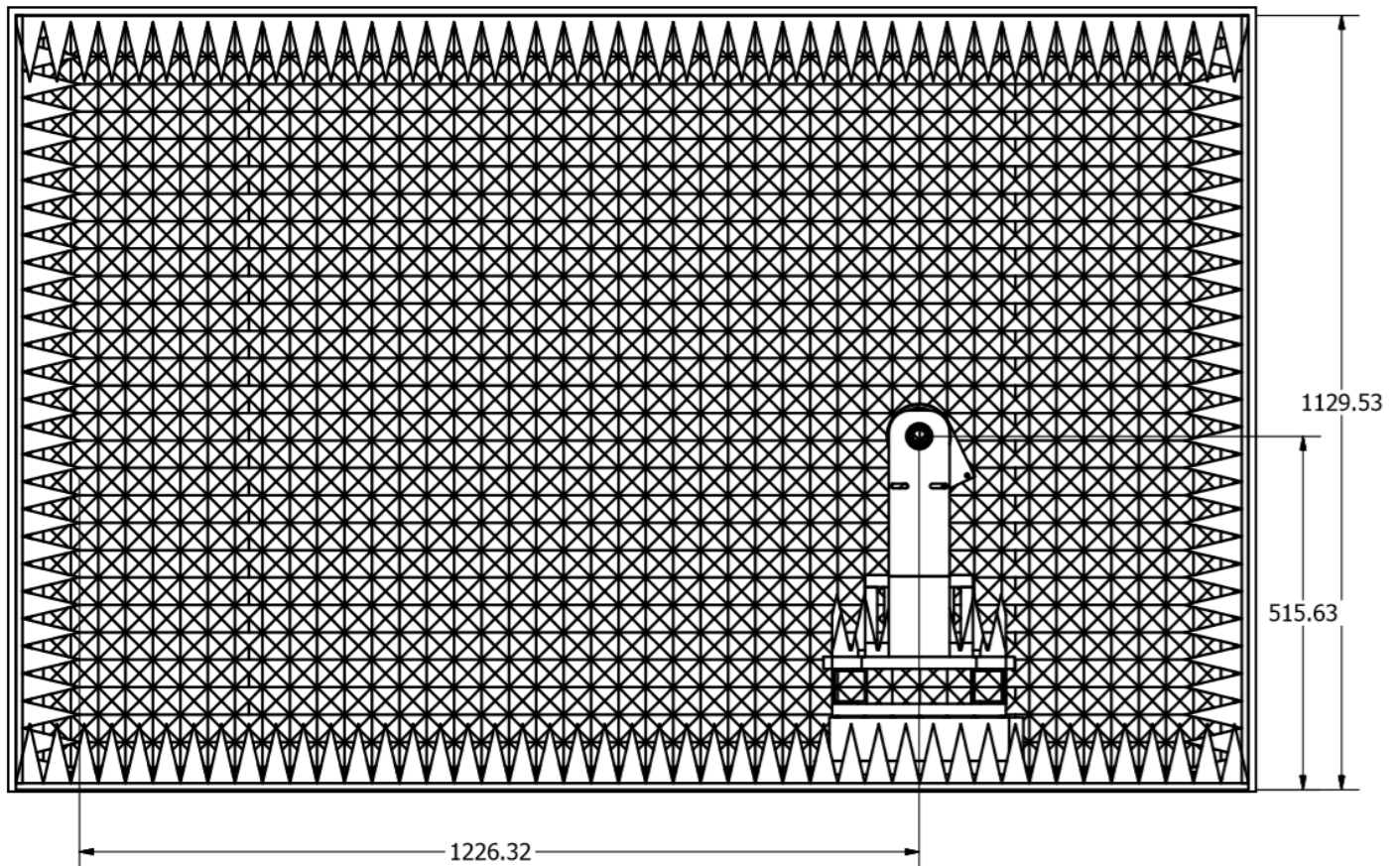
Diamond Engineering
Automated Measurement Systems

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