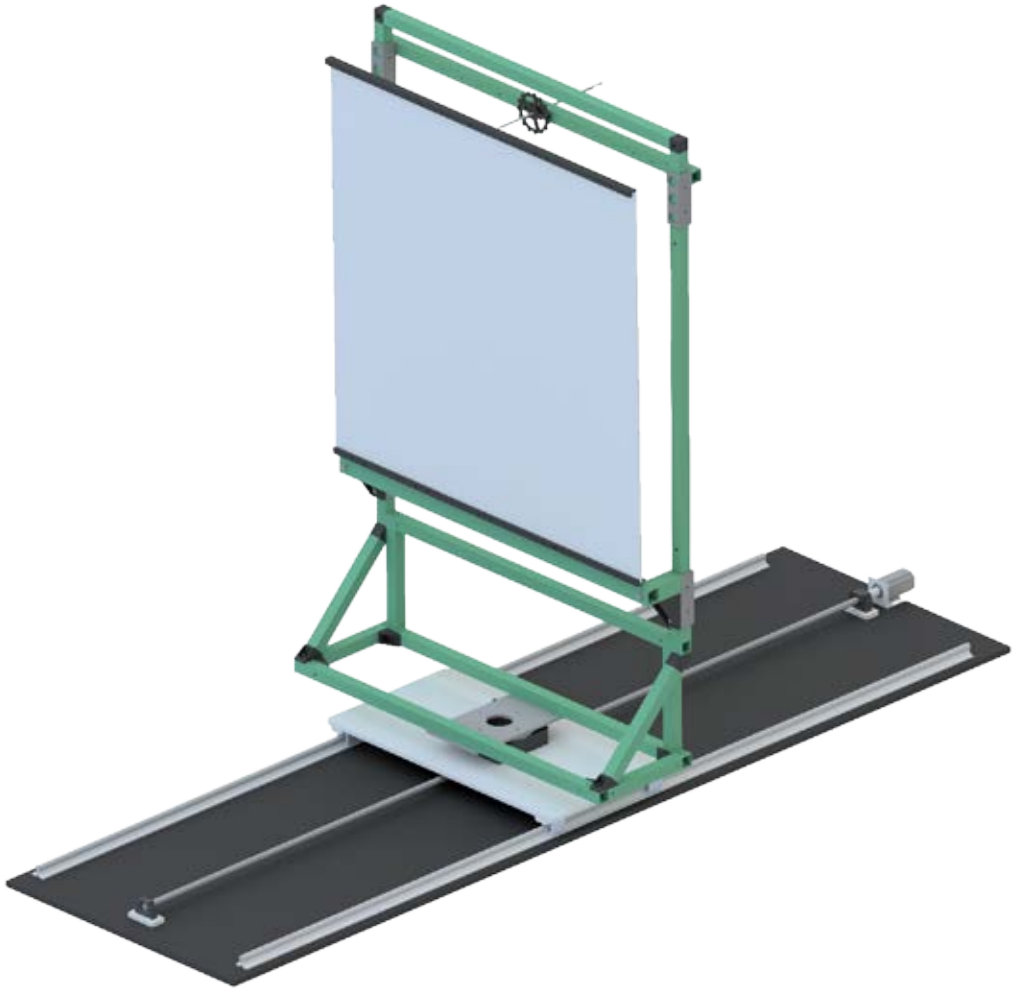
Diamond Engineering

Automated Measurement Systems

DE04-2: Multi-axis Automated Reference Frame



Features and Specifications

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Introduction

Basic Usage

The DE04-2 Reference frame system is designed for mounting a reference antenna, a device under test (DUT) or materials under test (MUT). The frame can be moved on the Z-Axis (horizontal in reference to positioner) or rotated on the azimuth axis a full 360 degrees.

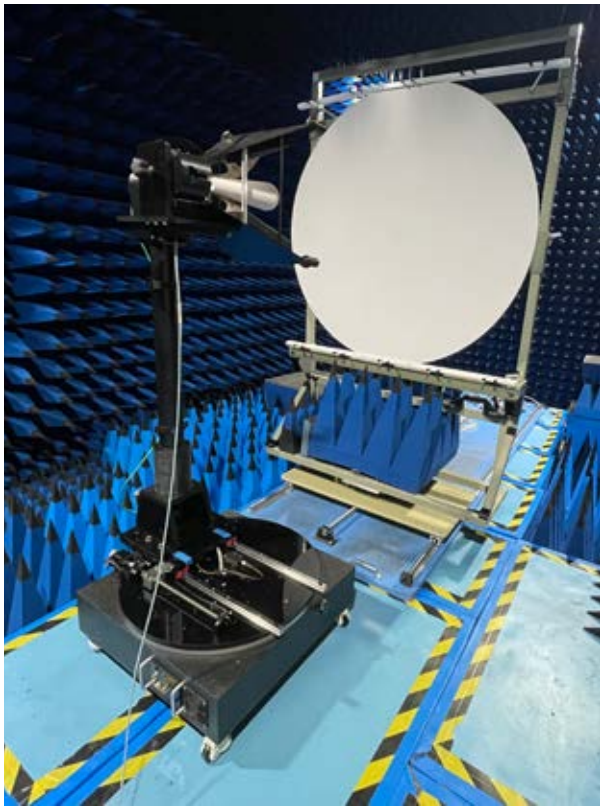
Mirror Method Usage

When the 4-foot reference mirror option is installed, single antenna real-time vector S-Parameter gain measurements may be performed using Diamond Engineering's proprietary software algorithm. This methodology has been shown to be more accurate and much faster than the traditional 3-point method. This method involves simple S11 measurements. Expensive VNAs are not required for this method of antenna calibration (only a low-cost single-port VNA is necessary). 1-meter and 3-meter measurements (or anything between) become trivial.

The mirror plane is made parallel using a laser and an optically flat mirror. Can also accommodate material for measurement from 1 to 4 sq. ft using Diamond Engineering's Material Measurement Software *(as shown below)*.

What's Included?

The standard DE04-2 package features a 2-axis automated reference frame and our powerful DAMS Antenna Measurement Studio, which supports a myriad of different VNAs. All parts and labor are backed by 3-year warranty.



Applications

- Easy single antenna measurements
- Material measurements
- Reference probe positioning
- Phase Center Measurements
- Radar-cross section
- Spherical Near Field

Specifications

Physical

Dimensions

Footprint:	120″ x 36″
Total Height:	84″
Total Width:	48″
Total Weight:	150 lbs (44.9 kg)

Capabilities

Frame payload:	Up to 50 pounds
Positioner payload:	Up to 100 pounds
Minimum MUT / DUT:	12″ x 12″
Maximum MUT / DUT:	48″ x 48″

Composition

Frame:	Fiberglass, PLA, acrylic, garolite, nylon
Linear axis:	Wood base with hardened steel linear rail bearings
Rotary axis:	Aluminum, brass, steel

Motion

Linear Axis

Total travel:	7.25 feet (2.2 m)
Drivetrain:	Linear ball screw with NEMA 23 closed loop stepper motor
Resolution:	2 mm
Maximum speed:	100 cm/sec
Minimum speed:	0.1 cm/sec

Rotary Axis

Range:	Continuous azimuth (limited to +/- 360º with cable pass-through)
Resolution:	0.25º
Pass-through diameter:	3 inches (75 mm)
Drivetrain:	Precision worm gear with NEMA 23 stepper motor
Maximum speed:	60 deg/sec
Minimum speed:	1 deg/sec

Mounting Tilt

Range:	+/- 10º (from 80º to 90º)

External Control Pendant

Cable length:	24 feet (8 meters)
Display type:	2-line LCD
Display monitoring:	Axis position and status
Resolution:	0.5 mm to 10 mm per increment
Power:	Powered via control cable
Weight:	8 oz

System Package Options

Basic Package Options

All basic packages include the reference frame, operation software, tools, documentation and mounting hardware.

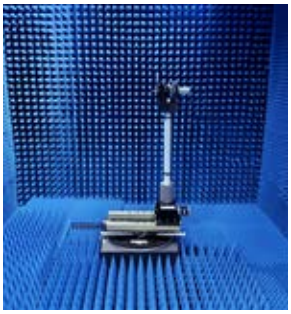
DE04-2	Standard reference frame, no accessories
DE04-2-MIRROR	Mirror kit w DAMS Antenna Measurement Suite
DE04-2-ABS	Absorber kit
DE04-2-FOAM	Foam pedestal w/ delrin mounting rod (user specified specs)

Premium Packages

Packages combine the above package along with a Diamond Engineering positioner. Our most popular positioner is the D6050 although we also have many other options available. Please visit our website at http://www.DiamondEng.net or contact us for more information.

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.



Misc. 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

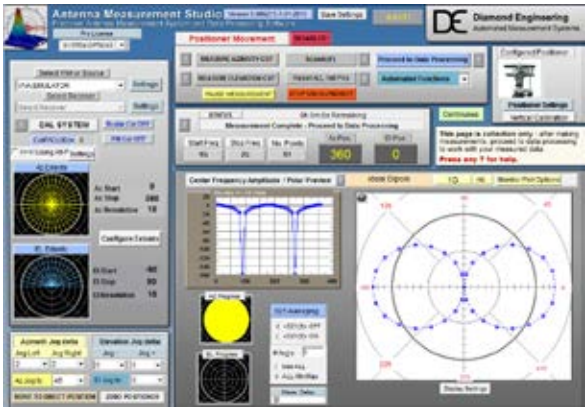
DAMS Antenna Measurement Studio

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.

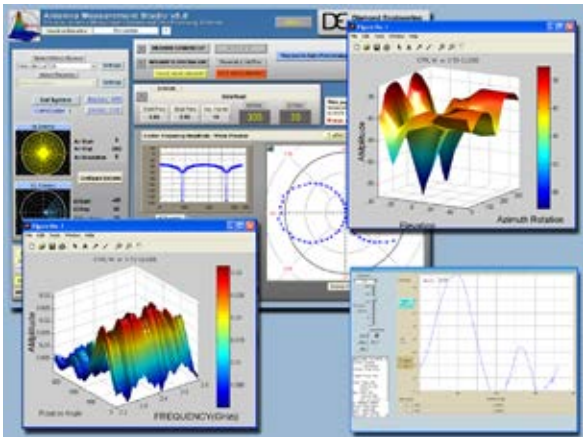
Measurement Features

- 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 frequency
- 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



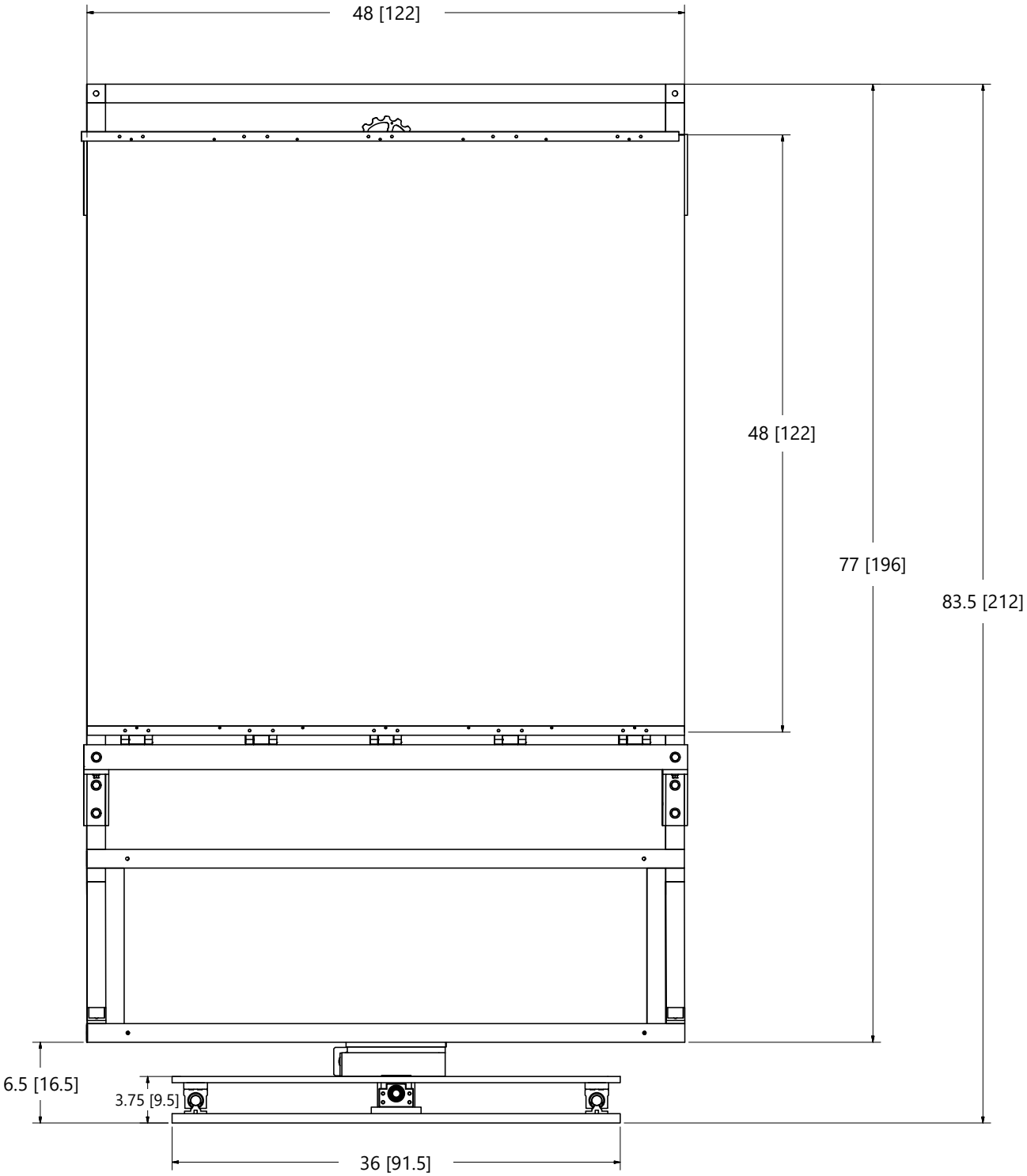
For more information about our software, including screen shots, full specifications of capabilities and the ability to download a demo version, please visit:

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

Product Drawings

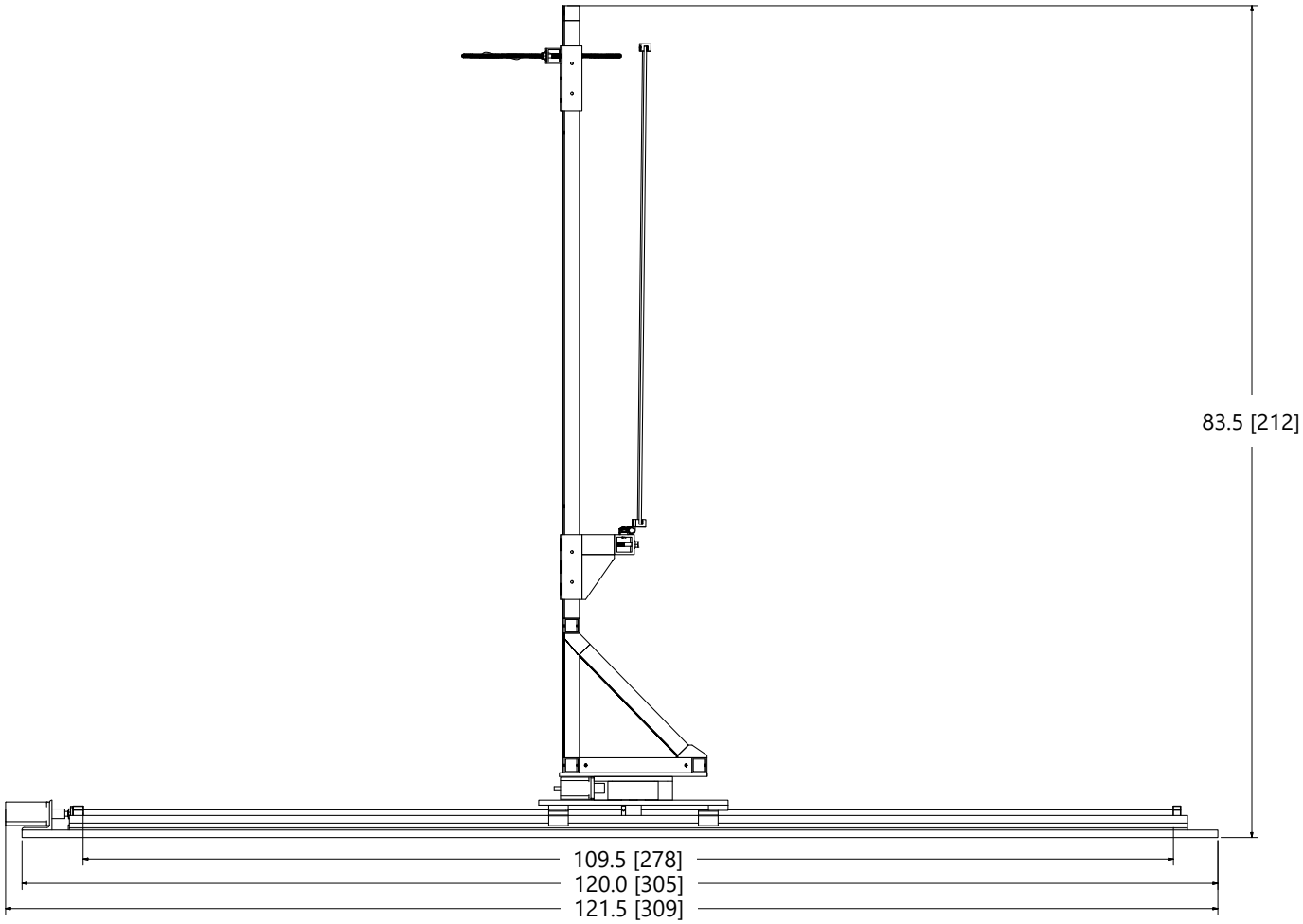
Front View

Units: inches [cm]



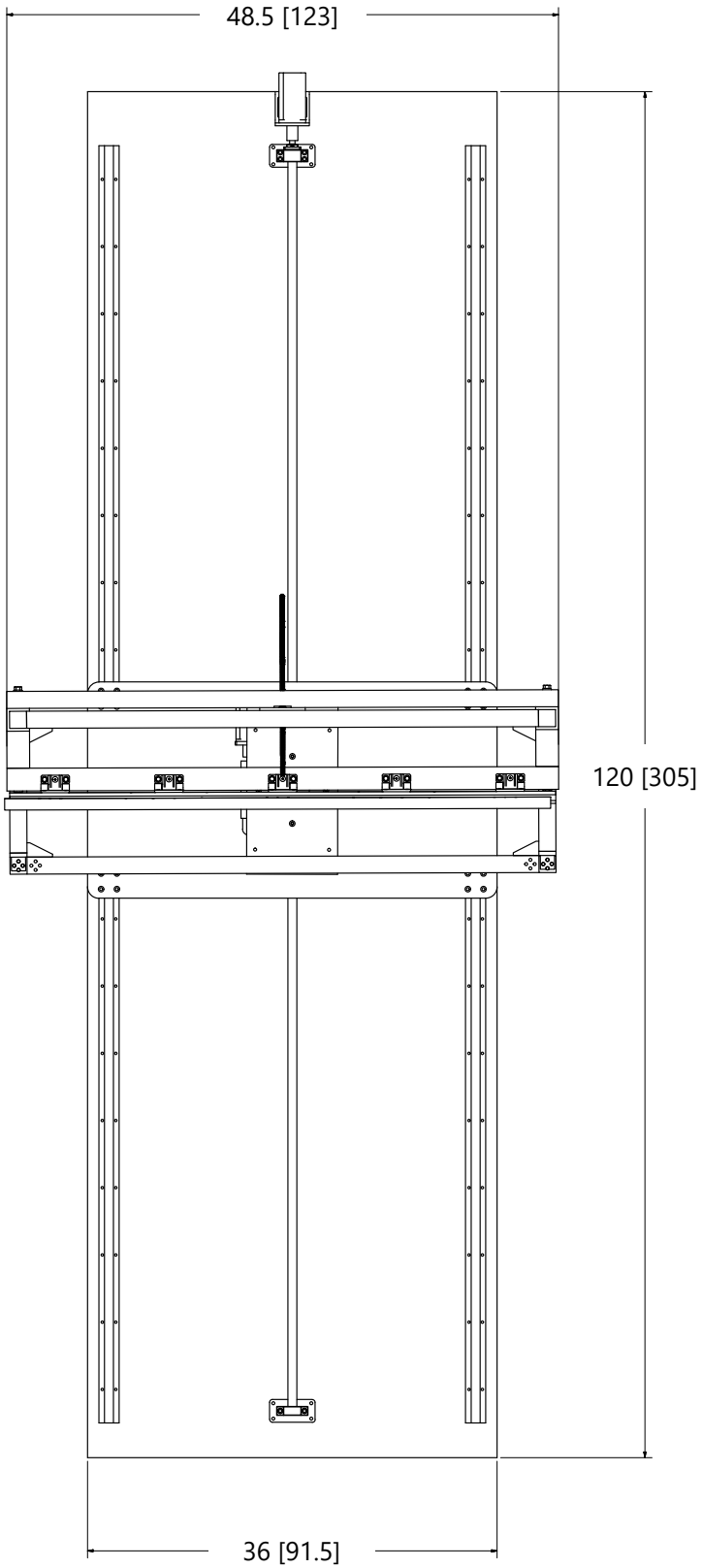
Side View

Units: inches [cm]



Top View

Units: inches [cm]



More Information

Antenna Measurement Positioners

For more information about our vast array of positioners, please visit:

https://www.diamondeng.net/antenna-measurement/

Software

For more information about our software, including screen shots, full specifications of capabilities and (even a downloadable demo version!), please visit:

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

Broadband Reference Horns

For more information about our broadband reference horns, please visit:

http://www.DiamondEng.net/PDF/de0726_datasheet.pdf

Power Amplifiers

For more information about our broadband power amplifiers, please visit:

http://www.DiamondEng.net/power-amplifiers

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