



PATEL
MACHINERY

Pioneer in Designing Antenna Positioners & Motion Controllers

T : +91 98240 73668 • E : machine@patelmachinery.com

Prestigious Projects Completed

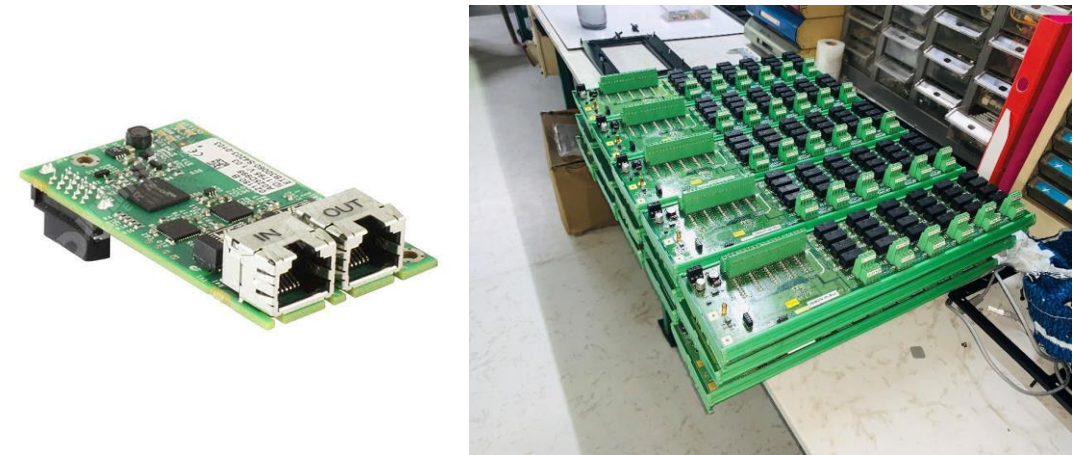
by

Patel Machinery

Plot 632/B, Phase-4 GIDC, Next to CIPET Engineering College, Vatva Ahmedabad-382445 Gujarat
Mobile: +91-98240-73668 | Email: satcom@patelmachinery.com, machine@patelmachinery.com

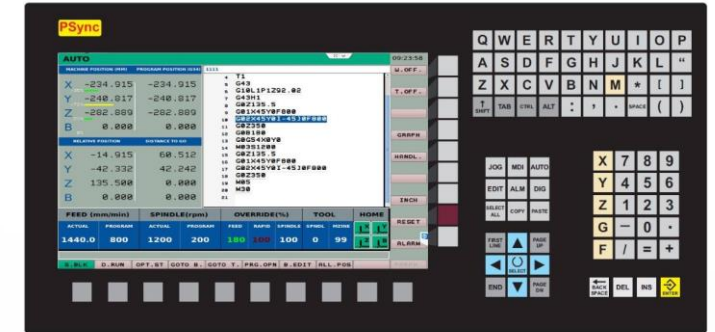
In Year – 2000

- We design and developed PLC with Modbus Communication Protocol.
- Started Developing Stepper Motor Design work.
- Start importing Refurbished CNC machines from Europe, USA and Japan.
- Become dealer for FAGOR automation Spain for linear and rotary encoders and CNC systems.



In Year – 2005

- ❑ We Become Member for Japanese Popular communication protocol called “Mecatrolink”.
- ❑ Opened branch office in Germany named “Patel Machinery GmbH”.
- ❑ In year 2006 we become Ether CAT Technology Group member.
- ❑ First motion controller developed with Digital Protocol EtherCAT in support with German company “Modusoft GmbH”.



Patel Machinery www.patelmachinery.com

Specialized in the business of conveying technologies in the form of metal cutting control system (cnc controller) servo, inverter and remote digital I/O. Patel Machinery provides customized automation solution to customers who produce automated machinery.



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In Year – 2010

- ❑ Started manufacturing of Special purpose customized machineries.
- ❑ Supply Custom Design machinery for SS Seamless pipe manufacturer for “Jindal Saw Limited” & “Ratnamani Metals And Tubes”.
- ❑ Developed Involute Generation Program Using Our Designed CNC controller for Gear Teeth Grinding machine and successfully Installed In India.

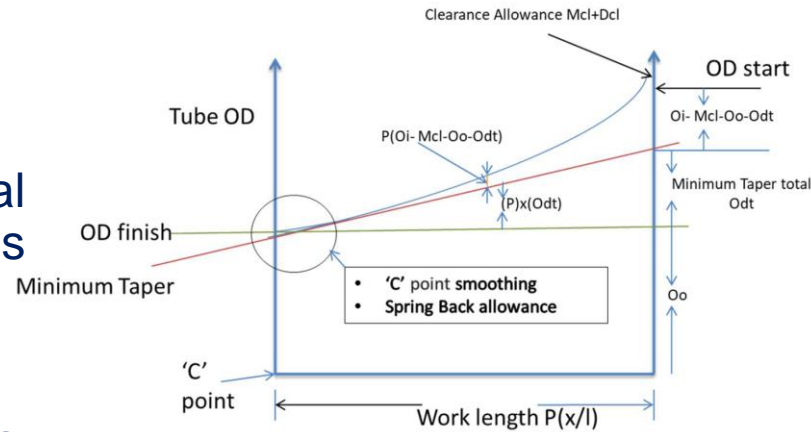
Prestigious Projects Completed by Patel Machinery



In Year – 2015

- ❑ Started working in the field of metallurgical science and developed different processes in-house for material treatment.
- ❑ Started design and development of SERVO Frequency drive in support with “GRANITE Devices” Finland.
- ❑ Release First Open Frame servo drive and start using in house projects.
- ❑ Started training for Pilger Tooling design with Korean and British Company.

Promet Consulting **MPC**
For Process Metallurgy



ARGON DRIVE TECHNOLOGY FAMILY LICENSE AGREEMENT

between

Granite Devices Oy, Tampikkujä 5 B 50, FI-33720 Tampere Finland

("Licensor")

and

Patel Machinery, Plot 87/2-A, Phase-1, GIDC, Vatva, Ahmedabad-382445, Gujarat, India

("Licensee")

Preamble

Whereas, Licensor is the owner of all intellectual property rights pertaining to the Argon Drive Technology,

Whereas, Licensee intends to create and/or sell or otherwise distribute a product incorporating the Argon Drive Technology;

Whereas, Licensor is willing to permit Licensee to create and/or sell or otherwise distribute a product incorporating the Argon Drive Technology;



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In Year – 2018

- ❑ Manufacture Special purpose Taper parabolic Shaft machining without rotation (first time in India) we achieve accuracy of 0.01 mm in full length of 1000 mm.
- ❑ Its one of the pioneer development in India through Indigenous efforts.

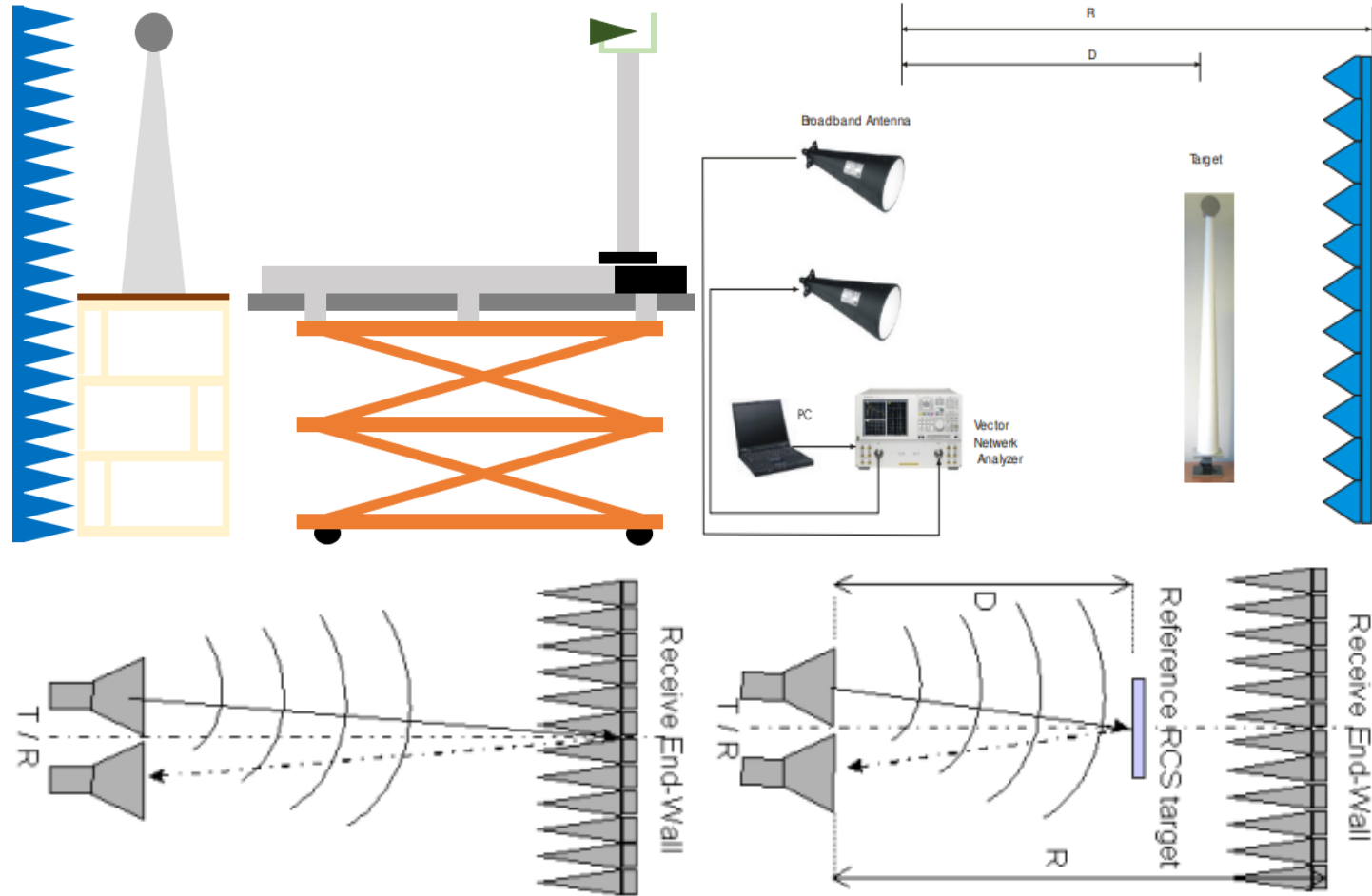


In Year-2019

Chamber Reflectivity Measurement using RCS Method

Radar Cross Section is defined as the area that can be perfectly detected back when electromagnetic waves were transmitted from its source to its target place. RCS measurement method techniques is used to define the reflection loss performance of pyramidal microwave absorbers mounted on a wall.

From the linear “Emp” and “Ref” measured data, one computes the RCS of the receive wall which is also the anechoic Chamber RCS. And the Absorbers reflectivity from the following formulas.



$$RCS_{chamber} = RCS_{ref} \left(\frac{Emp}{Ref} \right)^2 \cdot \left(\frac{D}{R} \right)^4$$

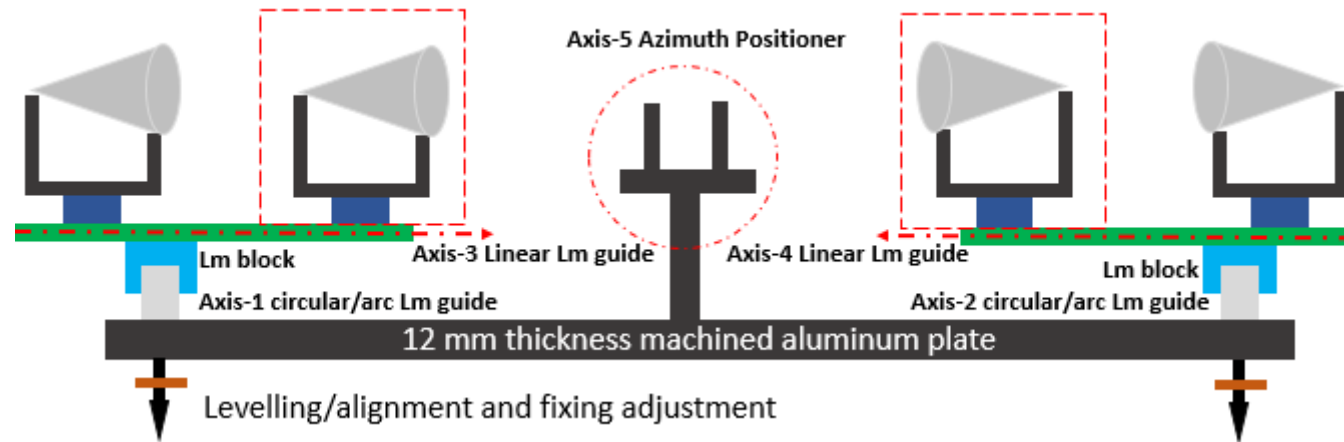
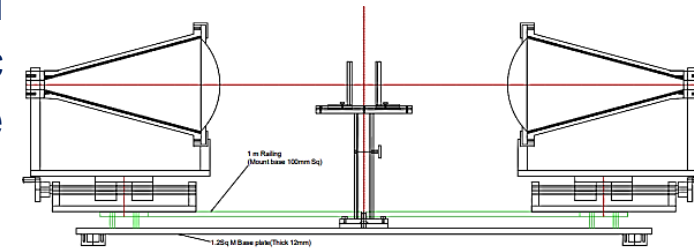
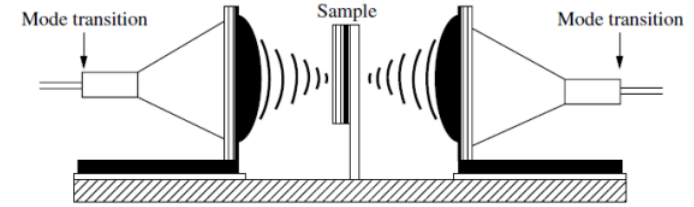
$$Reflectivity (dB) = RCS_{chamber} (dBm^2) - 10 \cdot \log(\pi \cdot R^2) (dBm^2)$$

In Year-2019

Spot Focusing Antenna Free Space Test Setup

The electromagnetic characterization of composite sheet is required in order to find its effectiveness as the electromagnetic absorber. The electromagnetic characterization is facilitated here by measuring the complex permittivity of the fabricated absorber sheet using free-space measurement setup.

The experimental free-space measurement setup consists of a pair of focusing horn lens transmitting and receiving antenna which are mounted on a large aluminum turntable. The spot focusing horn lens antennas, consist of two equal planoconvex dielectric lens mounted back to back in a conical horn antenna, with one planoconvex lens giving an electromagnetic plane wave and the other planoconvex lens focusing the electromagnetic radiation at the focus.



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In Year-2020

Precision Multi-axis Heavy Duty Antenna Positioner

We offer an expanded line of positioning systems designed to satisfy the most demanding applications in antenna measurement and tracking of satellite. Our closed loop feedback system provides precise speed and positioning capability. Digital controllers and positioners have been following the military standards for environmental testing.

The positioning system will be used in military and civilian systems and it will be successfully installed in ground-based, shipboard and airborne applications.

The 4-axes DUT Positioner is designed to satisfy the most demanding applications in antenna measurement and tracking of satellite. The closed loop feedback system provides precise speed and positioning capability.



Features –

- Precise Positioning System
- Precision Slewing Bearing and Drive
- Standard Absolute Encoders
- Multi-level Electro-Mechanical Braking System
- Limit Switches to Limit the Range of Motion with Speed Control.
- Controller and PC based Measurement Workstation
- Integration of Motion Controller with Automated

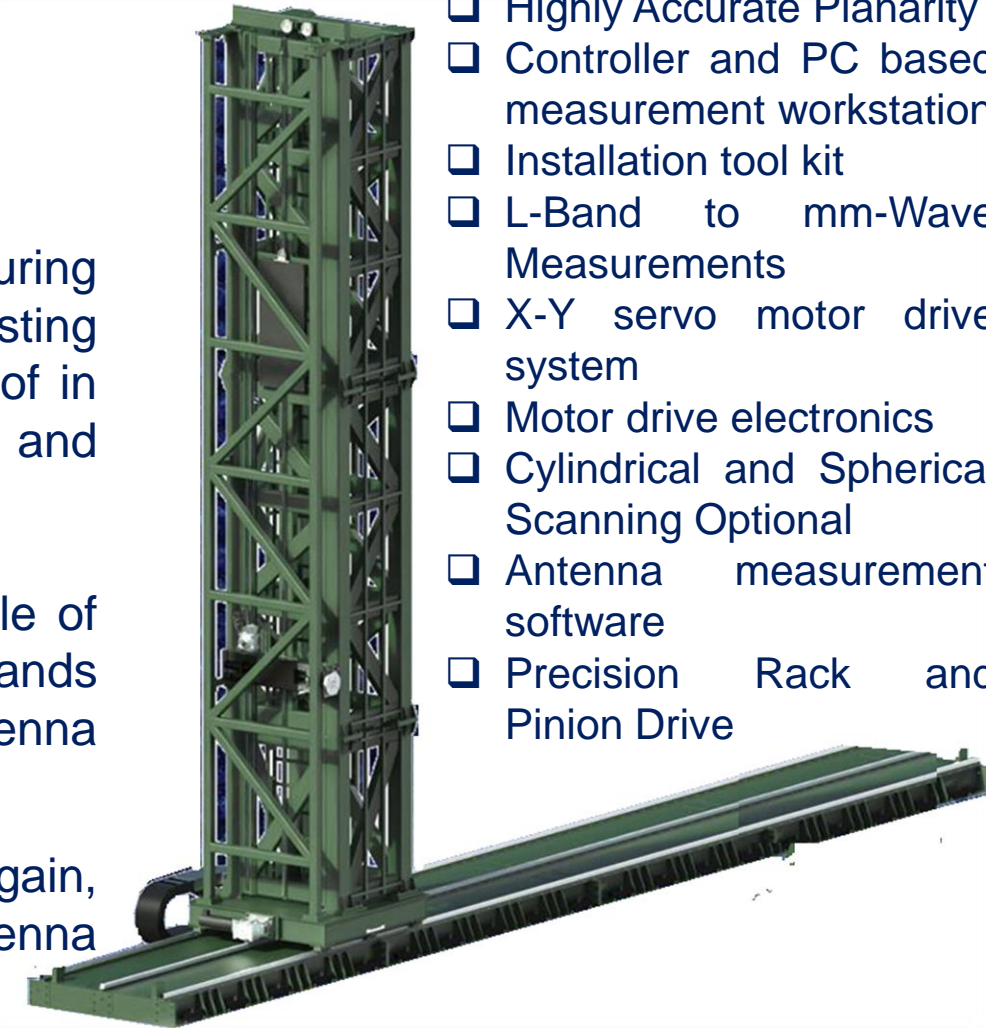
In Year-2021

Inverted T-Scanner for Near-Field Antenna Measurement

Planar near-field measurement scanner is an ideal system for measuring medium and high gain antennas (>15 dBi), making it suitable for testing feeds and arrays or reflector antennas. The Scanner is constructed of in such a way so that it can be easy to assemble and align, accurately, and can be quickly dismantled for relocation or storage.

The system interfaces with a wide variety of RF instruments, capable of measuring amplitude and phase patterns from L-band to mm-Wave bands (1 - 200 GHz). Measured data can be processed for far-field antenna radiation pattern or holographic aperture distribution.

A single data set provides complete characterization of the antenna's gain, side lobes structure, beam pointing, cross polarization and other antenna parameters.



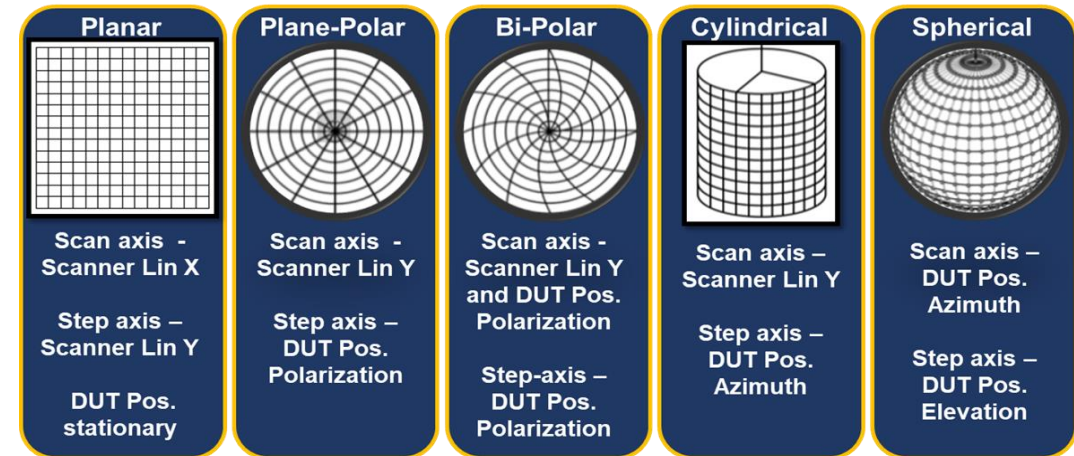
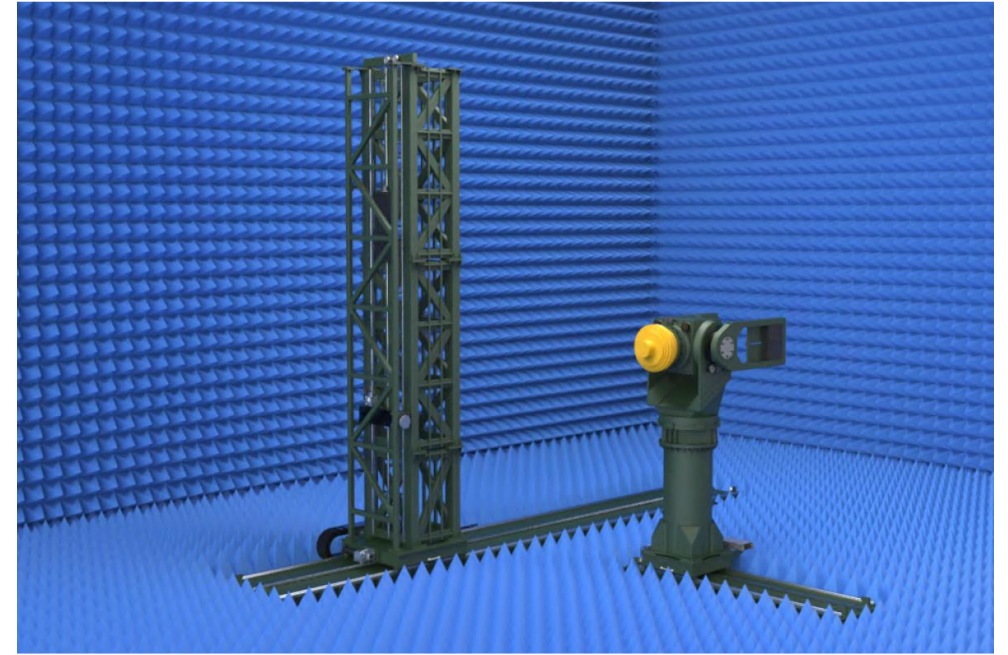
Features –

- ❑ Highly Accurate Planarity
- ❑ Controller and PC based measurement workstation
- ❑ Installation tool kit
- ❑ L-Band to mm-Wave Measurements
- ❑ X-Y servo motor drive system
- ❑ Motor drive electronics
- ❑ Cylindrical and Spherical Scanning Optional
- ❑ Antenna measurement software
- ❑ Precision Rack and Pinion Drive

In Year-2022

Near-Field Antenna Measurement –

Space & Defence Engineering Section of Patel Machinery developed a most accurate Planar Near-Field scanner systems to cater the high frequency measurement upto 200 GHz. It can also be configured in horizontal scan plane to cater the characterization of large size, bulky in weight & gravitational sensitive antennas. We have a wide range of NF scanners available in sizes with a travel range from 0.5m to 30m. The developed scanners are four axes assembly having Polarization positioner to support waveguide probe, linear Z-slide to manage distance between DUT and probe, linear Y-slide (vertical axis in case of vertical scanner) and precision linear X-slide (floor slide). it's a lightweight vertical structure with high rigidity travels and load balancing mechanism to avoid the deflection due to gravity. The scanners are fitted with drive system based on customer applications.



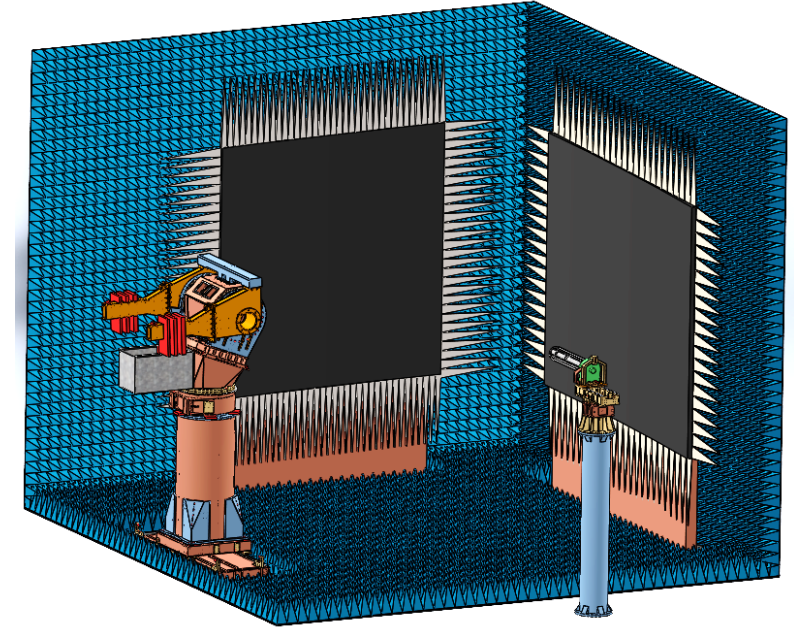
In Year-2023 (planning)

Dual Reflector Compact Antenna Test Range

The far-field antenna measurement offers a quick estimation of antenna performance. The traditional far-field concept demands a large separation between transmit and receive side, which is practically impossible for large size of antenna at higher frequencies. The reflector-based compact antenna range offers all the advantages of far-field and simulate a far-field equivalent environment in a very compact indoor test chamber.

The additional advantages offered by Compact range are control temperature, no wind deflection, avoided rain, 24x7 operation ability and also reduces the maintenance costs. Patel Machinery offers Custom models of different sizes can also be manufactured to meet specific customer requirements upto 220GHz.

Patel Machinery have capability to deliver high planarity (<30 micron RMS) reflectors panels upto size of 7.0 m X 3.0 m to construct the range reflector optics.



	QZ: 1.0 m	QZ: 2.0 m	QZ: 3.0 m	QZ: 4.0 m	QZ: 5.0 m	QZ: 8.0 m
Type	Reflector Optics					
Freq Range (GHz)	FL: 3.5	FL: 2.4	FL: 1.4	FL: 1.0	FL: 1.0	FL: 1.0
	FH: 110	FH: 220	FH: 220	FH: 220	FH: 220	FH: 220
Edge Treatment	Serrated Edges					
Range Feed	Corrugated Horn Dual Linear Polarized (1-40 GHz)					
Chamber Size (m ³)	8 x 7 x 6	14 x 12 x 10	19 x 16 x 13	24 x 18 x 14	30 x 20 x 15	48 x 32 x 19
Quiet Zone Size	1.0 m	2.0 m	3.0 m	4.0 m	5.0 m	8.0 m
QZ Amplitude Taper	≤ 1.0 dB					
QZ Phase Taper	≤ 6.0 deg					

& many more

HENTSCHEL
SYSTEM GMBH
MESSELEKTRONIK

IKS Associates, Inc.

20-Dec-2022
Ref: SAC/KKa-35-30



DS INSTRUMENTS

Date: 10/10/2022

Authorization Letter



EVEREST Metals Germany e. K.
Rolshover Kirchweg 42
51105 Köln
Phone: +49 221 54816169
Fax: +49 221 82824173
info@everestmetals.de

Reference No. EM/231/2022

Date: 28.11.2022

GLOBAL PARTNERSHIP LETTER

We hereby declare that we authorize our global technology partner and promoter,

Patel Machinery
Plot No. 632/B Phase-4 GIDC,
Next to CIPET Engineering College,
Vatva, Ahmedabad
Gujarat (India)

to promote, negotiate, tender, sell, exhibit and responsible for all the after sale service of Reflector Optics for Establishing Compact Antenna Test Range and established multiple Compact Antenna Test Ranges. We are inventor, developer and manufacturer of above products since 15+ years and delivered similar precise accuracy products.

Furthermore, we are extending our supports to Patel Machinery for the following stages :

- Stage-1: Selection of reflector material
- We provide the selection of reflector materials based on our experience and offer the detailed advantages and disadvantages of cast iron vs. aluminum reflectors?
 - We also guide the specific make or grade of material to be selected, while considering minimum maintenance cost and long life of the system.
- Stage-2: Process finalization during machining of reflectors
- We provide the constraints details for dividing the big size reflector into panels (2 or 3 or 5 or more based on required quiet zone size and selected optics).
 - We provide the detailed plan for calibration of a 5-axis milling machine, before and after machining of the panels.
 - We provide the details related to what type of special care will be taken during stress relieving of the reflector panel after machining of surface.
- Stage-3: Mechanical stability and thermal analysis
- To boost the confidence about proposed system stability, we will guide you about the required assessment through mechanical analysis of structure including variable thickness of panels and backup support structure to ensure thermal stability, rigidity, stress free condition, effect of 1g, total deformation/deflection while mounting in vertical condition.

Name and contact details of person from EVEREST Metals Germany eK

Mr. Dhiraj Pradhan
Rolshover Kirchweg 42,
Köln, Germany

Stamp and Seal of Signatory Authority




We – the company DS Instruments, developer and manufacturer of compact RF Test Equipment for test and measurement solutions having office at 788 Rubio Way, Gardnerville, NV (USA) - herewith authorize

Patel Machinery - Ahmedabad
Plot 632/B GIDC Vatva Phase-4, Next to CIPET Engineering College,
Ahmedabad - 382445, Gujarat (India)

As our agent to promote, negotiate, tender, sell, exhibit and responsible for all the aftersale service on behalf of our DS Instruments in the whole territory of India for sale of our products.

This Certification commences on the date of signing and is valid for 5 years from 10th October 2022 to 09th October of 2027.

This Certification will become null and void unless it is agreed between both parties to mark an extension.

Signed by authority:

Will Samuels

Founder, DS Instruments



To Whom It May Concern:

IKS Associates, Inc (Space Labs.), developer and manufacturer of RF/mmW components and devices (hereinafter referred to as System Provider), having its office located at 6620 Corina Ct., Columbia, Maryland, USA- hereby authorize Patel Machinery – Ahmedabad, located at Plot 632/B GIDC Vatva Phase-4, Next to CIPET Engineering College, Ahmedabad - 382445, Gujarat, (hereinafter referred to as Vendor) to market, quote, and sell as an independent supplier, to Space Application Center (SAC), Ahmedabad, Gujrat-India, following product:

Ka Band Amplifier model no. SPKKA-35-30.

Above amplifier shall carry a manufacturer's new product warranty for a period of one (1) year from the date of shipment. Test data (FAT) and CoC shall be provided with the shipment.

Yours truly,



President
For IKS Associates, Inc.

6620 CORINA COURT, COLUMBIA, MARYLAND 21044 | TEL: (443) 535-8021 | FAX: (443) 535-8022 | EMAIL: INFO@IKSASSOCIATES.COM | WEB: WWW.IKSASSOCIATES.COM | PAGE: 1 OF 1

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BIC DEUTDE33HAN
Postbank Hannover
IBAN DE73 2501 0030 0327 7383 00
BIC PBNKDE33HAN
US-IDNr: DE 115 646 189

Ihr Zeichen	Ihre Nachricht vom	Unser Zeichen/Durchwahl	Datum
		MAH / -26	2022-08-31

Authorization

Hereby,
we confirm that the company,

Patel Machinery
Plot 632/B GIDC Vatva Phase-4,
Ahmedabad-382445
Gujarat,
India

is the legitimate distributor for our measurement systems in India.

HENTSCHEL
MESSELEKTRONIK
Dr.-Ing. Matthias Hentschel
CEO

Geschäftsführer: Dr.-Ing. Matthias Hentschel
Sitz der Gesellschaft: Hannover • Register: Amtsgericht Hannover HRB 8110

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