APREL

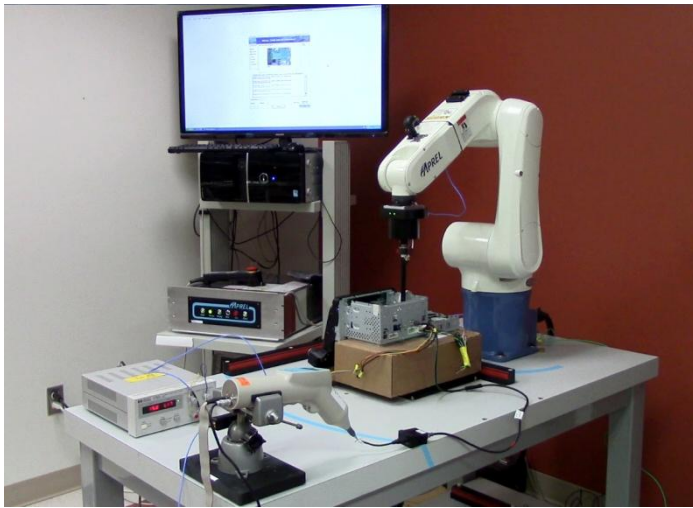**EM-ISight ESD**
Electromagnetic Scanning System
Single Probe Solution 10kHz – 6GHz

APREL **EM-ISight - ESD** is a fully integrated test system designed to measure a test subject exposed to an ESD source. This system is an industry first where certified ESD events can be measured in real-time for Frequency, Time and Spatial Location on a device exposed to a controlled ESD event. APREL support third party ESD source generators to ensure that the end user has confidence in the event being generated is the event being measured. Through developing the measurement methodologies needed to capture an ESD event in a spatial location the time and frequency can be resolv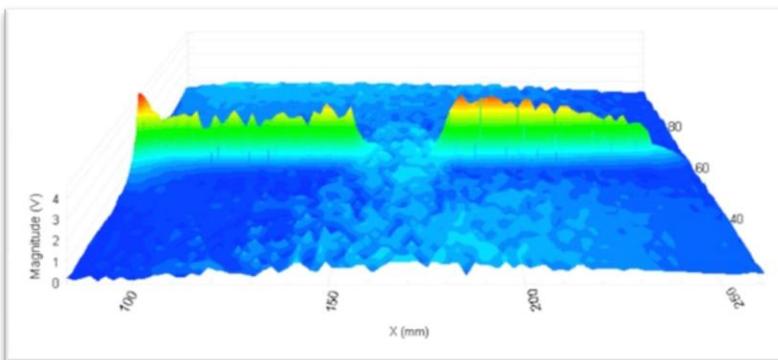ed through the integration of a Real-Time Spectrum Analyzer and Oscilloscope. By combining measurement functions in to one single capture the EM-ISight-ESD system will re-define how EMC engineers measure and determine the best practice for ESD measurement and subsequent circuit design. Developed to support multiple test applications the EM-ISight-ESD is the complete system solution for near-field analysis.
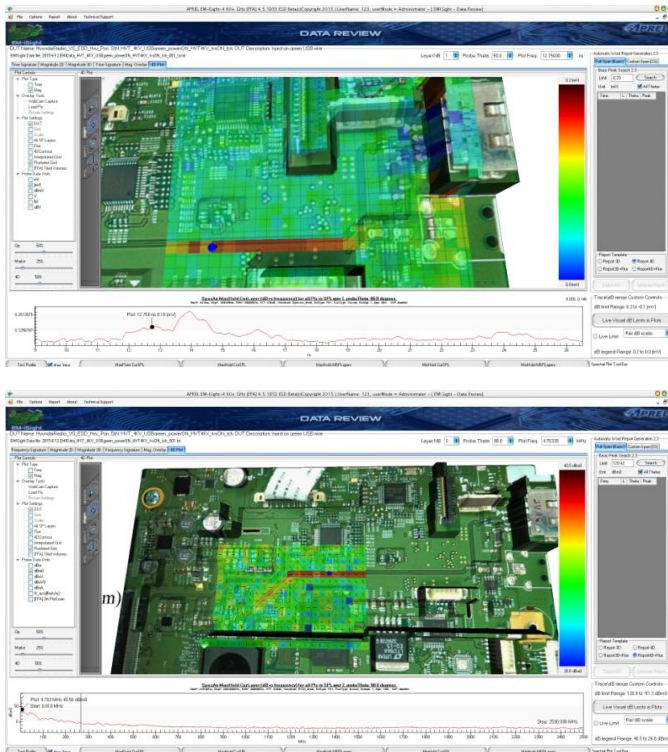
APREL's magnetic H-Field probes employ an advanced design; these highly shielded magnetic probes set the standard for electric field rejection capturing ESD events in line with IEC-61000-4 standard. Magnetic probes used on the EM-ISight-ESD incorporate our proprietary substrate technology. This allows for extremely high spatial accuracy in X, Y and Z allowing for a clean transition of the signal to the acquisition unit.

Through the use of the APREL ESD Validation Device a unique method for verification of the source is achieved allowing users to easily validate the ESD event to ensure proper gun setting prior to injection to the device under test. The APREL ESD Validation Device has been fully modeled using simulation software and validated through experimental measurements. By using the APREL Validation device the user does not need to employ the use of an ESD target for validation of the ESD event for relative ESD analysis. EM-ISight-ESD will evaluate the ESD event injected to the APREL ESD Validation Device to allow the user to validate the measurement set up and quantify the ESD event prior to exposing the electronic device. Magnetic ESD-Probes are tested and calibrated to measure events up to +/- 8kV conducted. This allows for unparalleled measurements of an ESD event to provide spatially sound results for the frequency and time domain.

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Time (top scan plot) and frequency domain data representation

EM-ISight-ESD is controlled by APREL software, directing the robot position, ESD source generator and acquisition equipment allowing users greater flexibility and depth of analysis when reviewing the results of a measurement process. Each measurement space captures the real ESD event for viewing in time or frequency and viewing the automatically generated animation video means the event can be observed from the initial pulse all the way to the end of the event; using our proprietary mapping software, results can be viewed in either frequency or time steps. In addition the user can select specific periods in time or frequency to map where the physical field has formed, this coupled with a spatial accuracy of less than 30 µm allows for greater understanding of an ESD event and the effect it may have on a circuit design. Using the software is easy and by employing the EM-ISight-ESD repetition of testing can be solved easily and conveniently without positioning errors or user fatigue.

The utilisation of 6 axis robots allow for precision positioning of the probe used to capture the ESD event and return spatial data relevant to the location where the event has been recorded on the device under test. Options for the robot are available to support the volume and size of scans needed by the user with a reach from 850mm up to 1.29 meters (robot dependent). The robot is supported using a custom workstation, which allows for complete flexibility of use and deployment. Workstation options allow for the removal of a ground plane (user selected) and routing of ground, optimising the measurement profile executed by the user. All robots used on EM-ISight-ESD have been tested in the most extreme electromagnetic environments. APREL offer the option for further expansion by allowing multiple robots to be configured to support additional test operations, further details on how APREL can customise a solution are available on request.
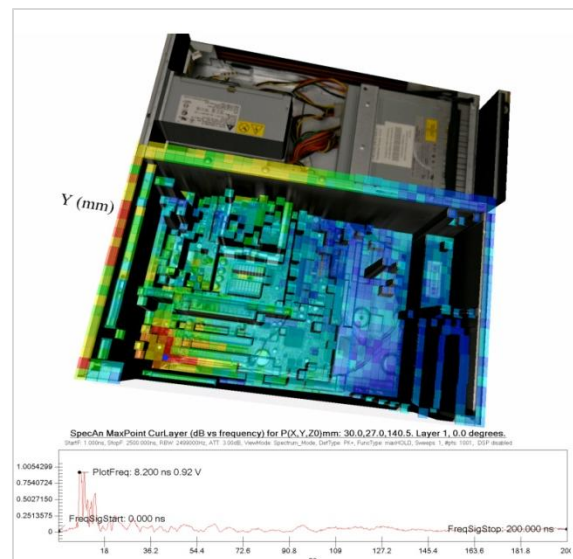
Synchronisation of the ESD event to the acquisition of the resultant data is achieved by implementing a broadband trigger probe; the ESD event is captured from the very start and recorded throughout the time period in which the event occurs. Triggering on the event independently from the ESD source allows more flexibility in how the engineer defines his measurement process and allows for greater freedom of measurement. This external trigger probe can also be used for future upgrades of the EM-ISight-ESD solution where a triggered event can be used for measuring the potential for **Surge**.
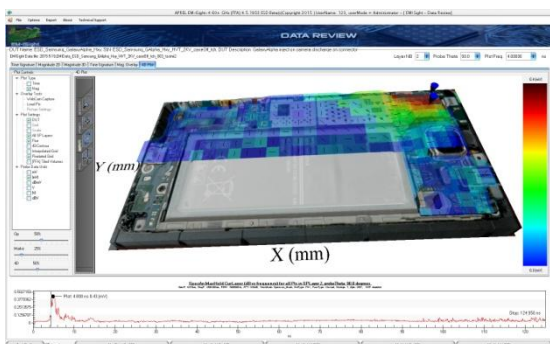
EM-ISight-ESD is a total solution built on the industry leading EM-ISight platform allowing engineers to integrate external ESD sources to determine the impact on a circuit design. Used as a standalone ESD test solution or as an EMI measurement system the EM-ISight-ESD test solution offers unparalleled flexibility and measurement capability.
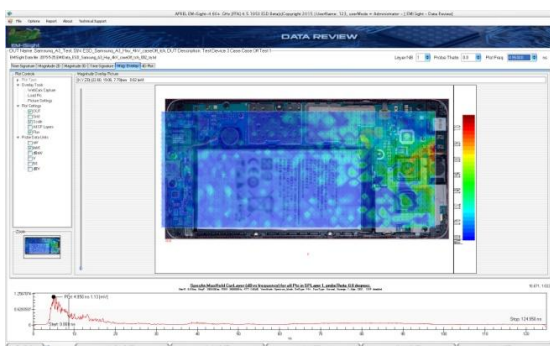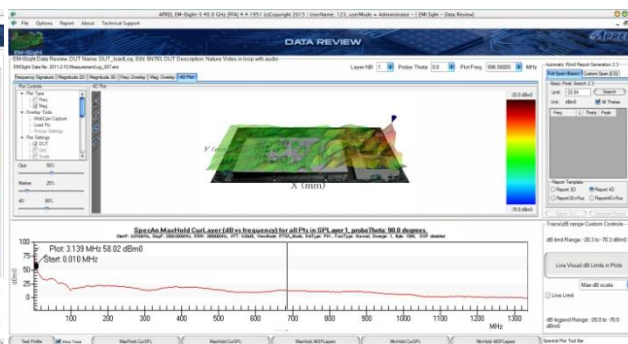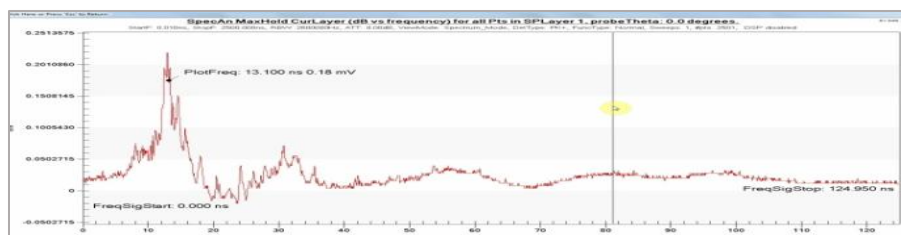

2D
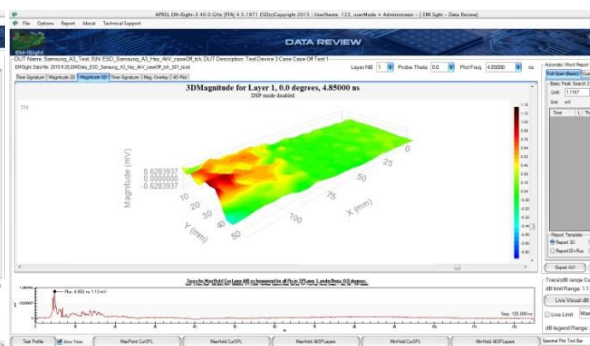
3D

4D - Time domain

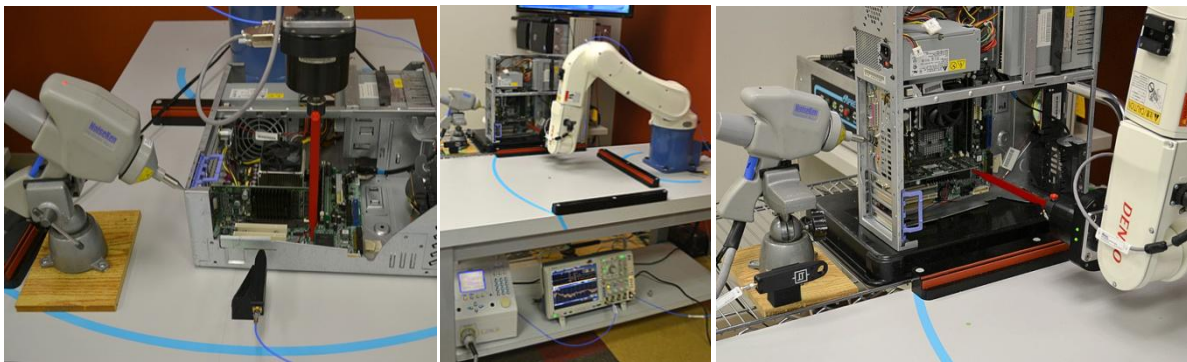4D – Frequency domain

Trace window

Data review options

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System Highlights

- Single probe solution from 10kHz to 6GHz
- Measure near field coupling of an ESD event
- Plot ESD event in frequency
- Plot ESD event in time and space
- Export frequency or time domain data into real-time movie format for advanced visualization
- Universal ESD gun positioner with multiple circuit discharge options
- ESD validation target for event normalization
- Full suite of standard near-field software and hardware
- X/Y/Z scan areas of 600mm (Cartesian)
- High resolution scan (>0.02mm)
- Coarse scan with dynamic peak search function
- Real-time topology analysis using dynamic touch detection (Cartesian or Horizontal)
- Z height distance from 0.05mm up to 600mm (Cartesian)
- 4D Measurements of DUT by integrating X/Y/Z & Phi
- Field distribution presented in 2D, 3D or 4D plotting with quick snap image processing @ 2.2µm
- Source direction plots (vector)
- Customizable reports based on user requirements automatically exported to MS Word
- Delta plot measurement function (compare before/after measurements)
- Frequency distribution plots based on span and trace with added limit lines
- AVI export function for real-time visualization of field and frequency distribution
- Advanced measurement functions, single point analysis, quick check, free move and point delta
- Micro Strip Line 10kHz to 6GHz
- Quick scan setup using Optional robot mounted vision camera with 2.2µm pixel size and auto zoom

EM-ISight-ESD is an affordable and easy to use system with great return on investment when compared to traditional measurement solutions. The system is a complete package with ESD and Near-Field assessment tools included in the one fully automated measurement system. Using the optional Far Field Approximation (FFA) module is an alternative to costly pre-compliance EMC chambers which have high maintenance costs and use significant floor space. Integration of high end Low Noise Amplifiers at the core of the transmission line yields low insertion loss and high-unwanted field rejection of better than 25dBm (NF). Easy setup for measurement profiles (less than 60 seconds) using the optional camera and touch detection allow complex topologies of a PCB to be taught in real time.

Measurements can be conducted in traditional Cartesian and off axis Horizontal scan configurations.

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Description	Perform EM Near-field scanning on a PCB, IC, LCD, system chassis or complete assembly to determine the effect of an ESD source on the design.	
	Perform EM Near-field scanning on a PCB, IC, LCD, system chassis or complete assembly to identify noise source	
Software	EM-ISight Operating System works with Windows 7, 8 and MAC Boot Camp	
	User friendly GUI that allows for easy setup and data retrieval	
	Automatic control of ESD generator, acquisition system and antenna probe movement control	
	Automatic system control or user definable parametric setup incorporating optional vision camera	
	Visual display including storage and retrieval of measured results in full 3/4D	
	Data tracking for project improvement/quality control	
	Importation of previous measurement profiles to track design/quality improvements	
Analytical Tools	Perform EM Test - measurements of (near-field) magnetic fields resultant from an ESD event and near field emissions	
	Record and plot time domain of and ESD event	
	Record and plot frequency domain of an ESD event	
	Record and plot spatial data of and ESD event	
	Visualize in either time or frequency through AVI movie	
Typical Measuring Units	H-Field Probe:	High E-Field rejection Magnetic Field Probe (Hxy) or (Hz)
	Probe frequency range:	Frequency sweep, in band discreet value from 10KHz to 6GHz/40GHz
	Sensitivity ESD:	200V – 8kV contact, 200V – 16kV air, BODE in Fx 20dB decade
	Pulse:	0.6nS – 1.0nS Typical (optional of >0.4nS with scope upgrade)
	Time Domain:	Sample rate 20GSs, 4GHz analog BW, min time step 0.05pS
	Frequency & Time:	Simultaneous time capture = 0-200nS, Frequency = 1MHz – 4GHz
	Trigger:	Air event up to 30cm
	ESD Capture:	Speed = 2 seconds per point
	Spatial Resolution:	20um X,Y 50um Z with Dynamic Touch Detection
	Measurement Uc:	0.05dBm @ 0.05mm Z and 0.1dBm @ 0.2mm X & Y
	Optional probes:	E and H standard Near Field Probes
Measuring Reach and Movement	NO. of axes:	6 (X, Y, Z and θ) 3 Horizontal and 3 Vertical Workspaces
	Typical reach*:	
	Along X & Y axes:	600 x 600 mm (factory set) option to change on installation
	Along Z axis:	700mm
	Rotation θ axis:	360°
	Resolution:	
	X and Y axes:	0.02mm
	Z axis:	0.02mm
	θ axis:	0.1°
	Voltage 220 single phase	
DUT Orientation	Typical:	Horizontal(off axis)
		Vertical (Cartesian)
		Custom
System Control	Controller for overall control:	PC compatible machine, Intel i5 or better and 8GB RAM
	Motion controller:	Denso
	Measuring interface:	GPIB/LAN/Serial port
General	Custom drivers to support Keysight and other test equipment manufacturers	
	APREL ESD Validation Device (supports 8kV direct)	
	ESD gun holder, 360 degree PHY positioning with 180 degree YAW	
	Broadband ESD event trigger probe	
	Multiple Workstation options to suit specific customer needs	
Additional Features SW	Multiple plots recorded in single report	
	Multiple layers on single measurement process	
	Automated peak search	
	Dynamic touch detection and vision control	
	User defined plotting for multiple scan locations	
	Limit exceed search function & User defined limit function	
	Optional Far Field Approximation for EMC test equivalent sites of 3M and 10M	
	Ubiquitous Server Application for custom development of test applications	
	Automated data summary reporting	
	AVI plotting over device or in 3/4D mode	