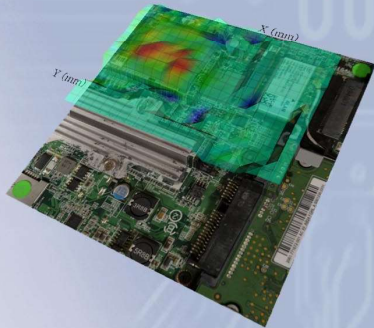


Sensitivity in Frequency



APREL

EM-ISight System Introduction & Options

APREL Inc



Kanata, Ontario,
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Mail: arthur.fu@sglplus.com
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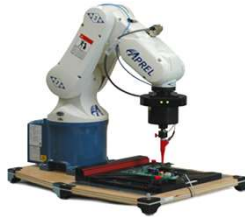
Introduction

- APREL Inc. was formed in 1981 in Ottawa Canada with over 35 years experience in communications technology
- Based in Kanata, Ontario Canada with a support office in Taipei Taiwan, Seoul South Korea and Penang Malaysia
- Hold key positions on international standards development committees including IEC
- First automated system shipped to Panasonic in 2001, first EM-ISight system shipped to Intel in 2010
- Over 60 installation sites globally operating in automotive, aviation, electronics, enterprise solutions and mobile communications
- APREL are a Keysight solutions partner
- Ability to create custom solutions for customers
- All systems developed and manufactured in Canada



Sensitivity in Frequency

Standard EM-ISight Systems



EM-ISight-SR



EM-ISight-ER

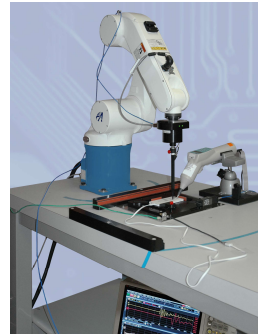


EM-ISight-LR

Frequency Range	9kHz – 6GHz 9kHz – 20GHz 9kHz – 44GHz 50GHz – 67GHz	9kHz – 6GHz 9kHz – 20GHz 9kHz – 44GHz 50GHz – 67GHz	9kHz – 6GHz 9kHz – 20GHz 9kHz – 44GHz 50GHz – 67GHz
Scan Size mm (X/Y/Z range)	300 x 300 x 250 484 x 369 x 250 Cartesian and Vertical	450 x 500 x 450 615 x 963 x 450 Cartesian and Vertical	650 x 750 x 500 1405 x 1813 x 500 Cartesian and Vertical
Probe Options	Ez Probes - 0.18mm, 1mm, 2mm Exy Probes – 1mm, 2mm Hz/Hxy Probes – 2mm, 4mm Low Frequency Hxy/Hz DC-10MHz	Ez Probes - 0.18mm, 1mm, 2mm Exy Probes – 1mm, 2mm Hz/Hxy Probes – 2mm, 4mm Low Frequency Hxy/Hz DC-10MHz	Ez Probes - 0.18mm, 1mm, 2mm Exy Probes – 1mm, 2mm Hz/Hxy Probes – 2mm, 4mm Low Frequency Hxy/Hz DC-10MHz
Standard Features	Automated Operating System 6 Axis Automation, touch detection Vision System 110/220V Optional Single Phase	Automated Operating System 6 Axis Automation, touch detection Vision System 220V Single Phase	Automated Operating System 6 Axis Automation, touch detection Vision System 220V 3 Phase
Upgrade Options	Ubiquitous Server Application Far Field Approximation RF De-Sense Test MPE, Power Density, Antenna Backscatter & Phase	Ubiquitous Server Application Far Field Approximation RF De-Sense Test ESD and Current Mapping MPE, Power Density, Antenna Backscatter & Phase	Ubiquitous Server Application Far Field Approximation RF De-Sense Test ESD and Current Mapping MPE, Power Density Antenna Backscatter & Phase

Sensitivity in Frequency

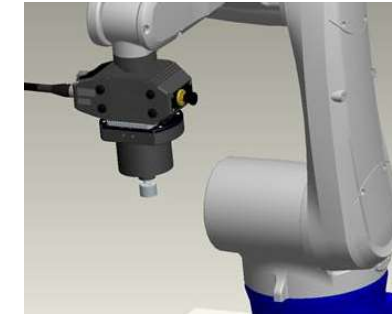
Advanced Measurement Systems



EM-ISight-ESD



EM-ISight-mmWave



EM-ISight-AMS*

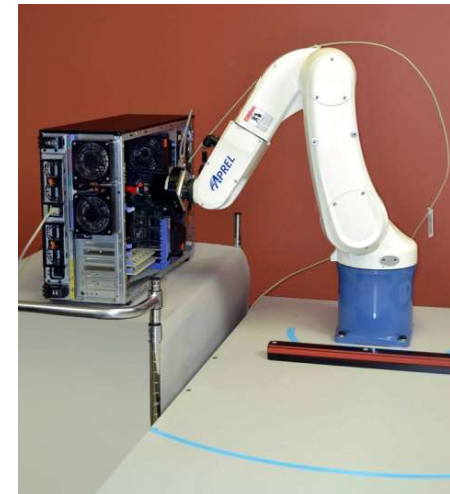
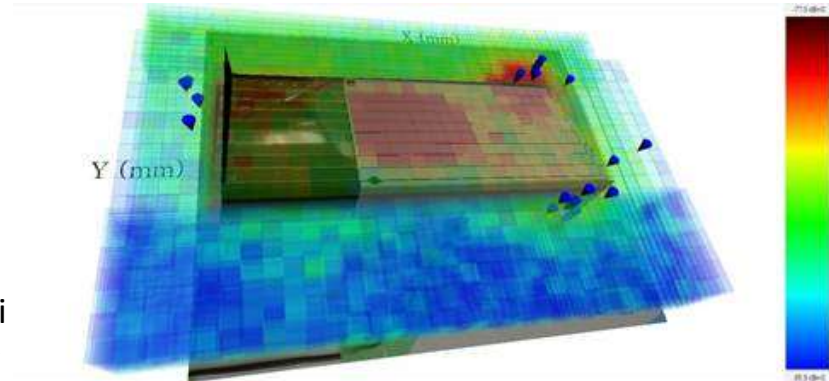
Frequency Range	DC – 6GHz ESD 9kHz – 6GHz EMC	50GHz – 67GHz 1.85mm Connector	50GHz – 110GHz 1mm Connector
Scan Size mm (X/Y/Z range)	450 x 500 x 450 615 x 963 x 450 Cartesian and Vertical	300 x 300 x 250 484 x 369 x 250 Cartesian and Vertical	650 x 750 x 500 1405 x 1813 x 500 Cartesian and Vertical
Probe Options	ESD Hxy DC – 6GHz Probe Ez Probes - 0.18mm, 1mm, 2mm Exy Probes – 1mm, 2mm Hz/Hxy Probes – 2mm, 4mm Low Frequency Hxy/Hz DC-10MHz	Ez Probes - 0.18mm, 1mm, 2mm Exy Probes – 1mm, 2mm Hz/Hxy Probes – 2mm, 4mm All 1.85mm Connector Type	Ez Probes - 0.18mm, 1mm, 2mm Exy Probes – 1mm, 2mm Hz/Hxy Probes – 2mm All 1.0mm Connector Type
Standard Features	ESD/EMC Operating System 6 Axis Automation, touch detection Vision System 220V Single Phase	RF-ISight – EM-ISight OS 6 Axis Automation, touch detection Vision System 110/220V Single Phase	Antenna Measurement System RF-ISight – EM-ISight OS 6 Axis Automation, touch detection Vision System 220V 3 Phase
Upgrade Options	Ubiquitous Server Application Far Field Approximation RF De-Sense Test MPE, Power Density, Antenna Backscatter & Phase	Ubiquitous Server Application Far Field Approximation RF De-Sense Test	Ubiquitous Server Application Far Field Approximation RF De-Sense Test



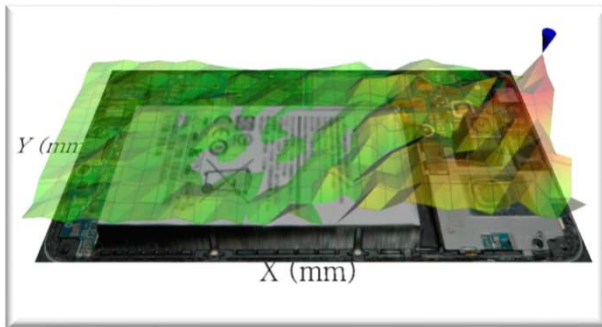
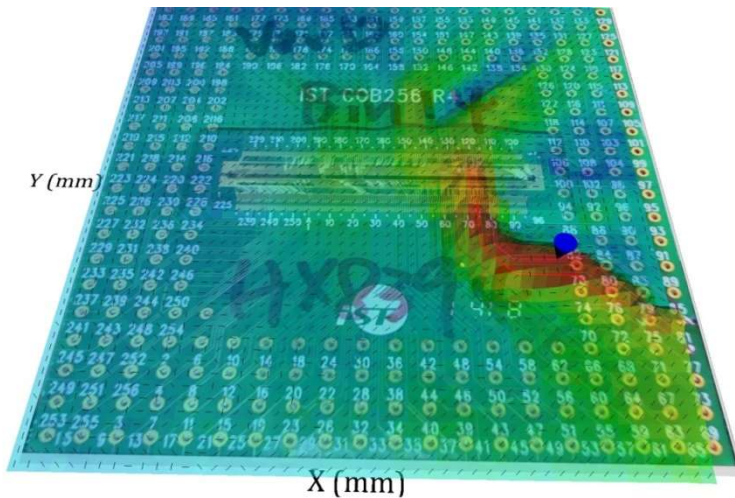
***Final Specification Available April 2018, Built on Keysight PXA-B**

EM-ISight Standard Features

- Single probe solution from 9kHz to 40GHz
- High resolution scan (>0.02/0.07 mm) based on system
- Coarse fast scan function with dynamic peak search function
- Real-time topology analysis using vision and dynamic touch detection (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
- Source direction plots (vector and phase)
- Customizable reports based on user requirements automatically exported to MS Word
- 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, channel average/sum, and point delta plot measurement function (compare before/after measurements)



EM-ISight-ESD Standard Features



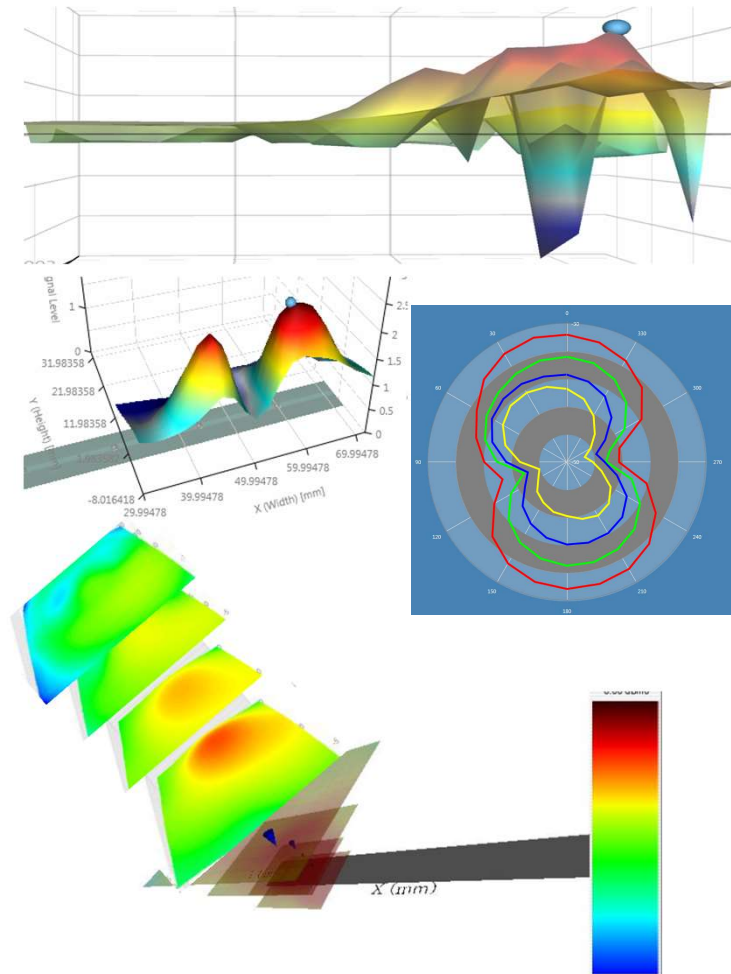
- Single ESD probe solution from DC to 4GHz with built in spark isolation
- Measure near field coupling of an ESD event conducted/air
- Plot ESD event conducted/air in frequency time and space
- Export frequency or time domain data into real-time movie format for advanced visualization
- ESD validation and calibration for event normalization
- Full suite of standard near-field software and hardware
- Coarse fast scan function with dynamic peak search function
- Real-time topology analysis using dynamic touch detection (Cartesian or Horizontal)
- 4D Measurements of DUT by integrating X/Y/Z & Phi
- Field distribution presented in 2D, 3D or 4D plotting with quick snap image processing @ 30 μ m
- Source direction plots and current tracing for contact and air discharge
- 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

Sensitivity in Frequency

RF-ISight-AMS Standard Features

- E and H field vector distribution
- Phase shift between E and H fields
- Power density
- MPE (Maximum Permissible Power)
- Radial signal patterns
- Emitted power
- Spatial orientation of wave propagation
- Poynting vector directivity
- Beam formation and propagation directivity
- Directivity diagram
- Stochastic histogram
- Standing wave ratio
- Backscattering effect
- ***Antenna measurements**

***RF-ISight Antenna Measurement System >50GHz**



Software Upgrades

- **FFA (Far Field Approximation)**
 - EMC tool for RSE and CISPR
- **USA (Ubiquitous Server Application)**
 - Programming tool for user defined applications
- **RF-ISight (Comprehensive analysis tool)**
 - Antenna measurement, MPE, Power Density
- **RF De-Sense Test (Receiver sensitivity and BER analysis)**
 - Test receiver sensitivity and determine weak spots on a system design

Please speak to your representative for more detailed information!!!

Sensitivity in Frequency

Available H-Field Probe Options

Probe Type	Application	Frequency Range	Detector Dimension X - Detection	Nominal Sensitivity
H-Field X/Y	Low Frequency	10Hz to 300KHz	5mm / 1mm	-78dBm @ 1 A/m
H-Field Z	Low Frequency	10Hz to 300KHz	5mm / 1mm	-78dBm @ 1 A/m
H-Field X/Y	Low Frequency	300KHz to 100MHz	5mm / 1mm	-68dBm @ 1 A/m
H-Field Z	Low Frequency	300KHz to 100MHz	5mm / 1mm	-68dBm @ 1 A/m
H-Field X/Y	Standard EMC	9kHz to 6GHz	4mm / 0.075mm	-40dBm to -135dBm
H-Field Z	Standard EMC	9kHz to 6GHz	4mm / 0.075mm	-40dBm to -135dBm
H-Field X/Y	High Frequency EMC	9kHz to 20GHz	4mm / 0.075mm	-40dBm to -135dBm
H-Field Z	High Frequency EMC	9kHz to 20GHz	4mm / 0.075mm	-40dBm to -135dBm
H-Field X/Y	5G / AMS / EMC	9kHz to 40GHz	4mm / 0.075mm	-40dBm to -135dBm
H-Field Z	5G / AMS / EMC	9kHz to 40GHz	4mm / 0.075mm	-40dBm to -135dBm
H-Field X/Y	5G / AMS / EMC	500MHz to 40GHz	2mm / 0.025mm	-40dBm to -135dBm
H-Field Z	5G / AMS / EMC	500MHz to 40GHz	2mm / 0.025mm	-40dBm to -135dBm
H-Field X/Y	5G / AMS / EMC	50GHz to 67GHz	4mm / 0.075mm	-40dBm to -110dBm
*H-Field Z	5G / AMS / EMC	50GHz to 67GHz	4mm / 0.075mm	-40dBm to -110dBm
*H-Field X/Y	5G / AMS / EMC	50GHz to 67GHz	2mm / 0.025mm	-30dBm to -110dBm
*H-Field Z	5G / AMS / EMC	50GHz to 67GHz	2mm / 0.025	-30dBm to -110dBm
**H-Field X/Y	5G / AMS / EMC	50GHz to 110GHz	2mm / 0.025	-30dBm to -110dBm
**H-Field Z	5G / AMS / EMC	50GHz to 110GHz	2mm / 0.025	-30dBm to -110dBm
H-Field X/Y	ESD	9KHz to 6GHz	4mm / 0.075	200V to 8kV Contact @ 0.4nS

***Only available for EM-ISight-mmWave and **EM-ISight-AMS**



Sensitivity in Frequency

Available E-Field Probe Options

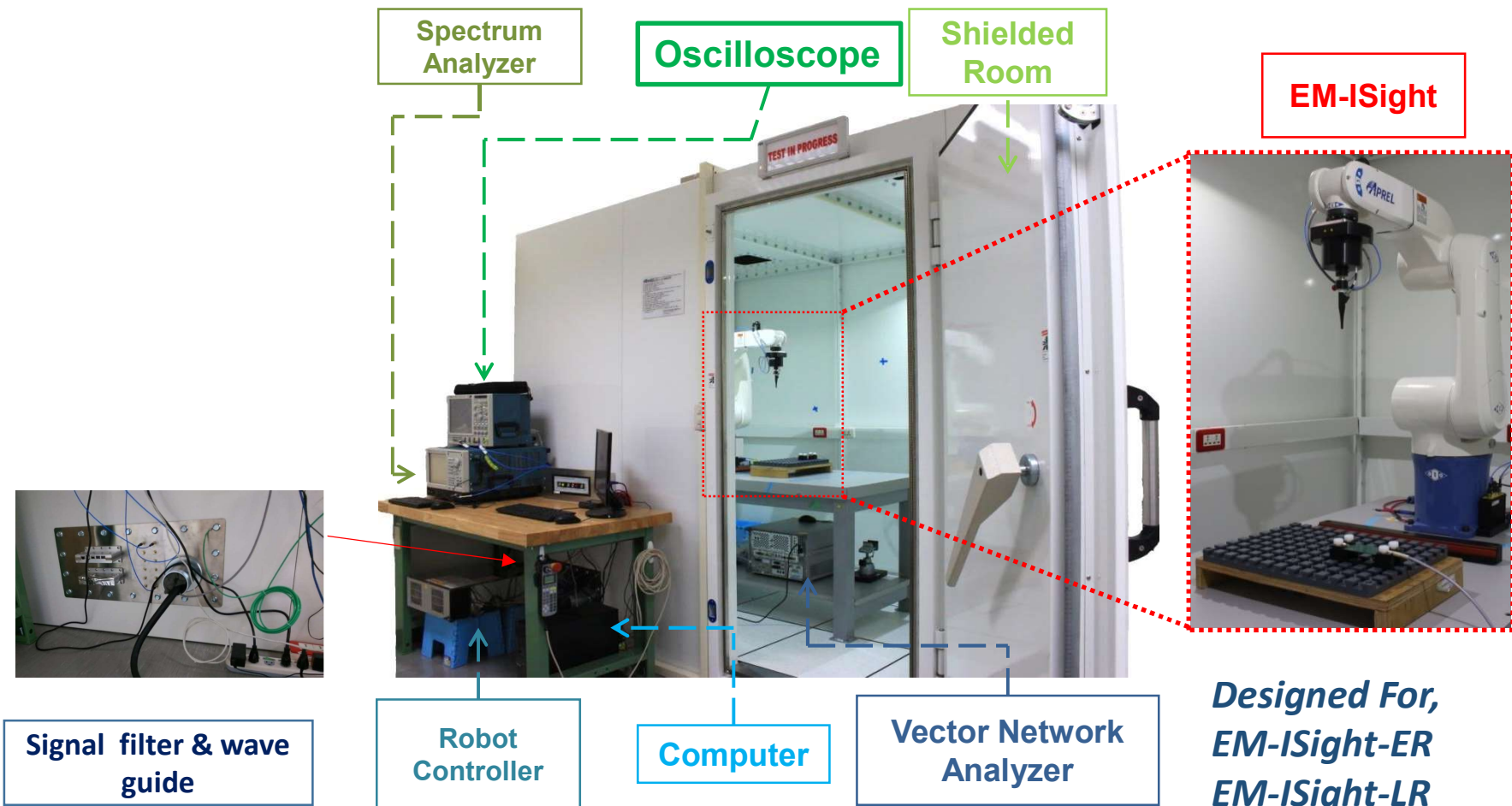
Probe Type	Application	Frequency Range	Detector Dimension X-Detection	Nominal Sensitivity
E-Field X/Y	Standard EMC	9kHz to 6GHz	2mm / 0.075mm	-30dBm to -135dBm
E-Field Z	Standard EMC	9kHz to 6GHz	2mm / 0.075mm	-30dBm to -135dBm
E-Field X/Y	High Frequency EMC	9kHz to 20GHz	2mm / 0.025mm	-30dBm to -135dBm
E-Field Z	High Frequency EMC	9kHz to 20GHz	2mm / 0.025mm	-30dBm to -135dBm
E-Field X/Y	5G / EMC / AMS	9kHz to 44GHz	2mm / 0.025mm	-30dBm to -135dBm
E-Field Z	5G / EMC / AMS	9kHz to 44GHz	2mm / 0.025mm	-30dBm to -135dBm
E-Field Z	5G / EMC / AMS	9kHz to 44GHz	1mm / 0.025mm	-30dBm to -135dBm
E-Field Z	5G / EMC / AMS	9kHz to 44GHz	0.18mm / 0.025mm	-30dBm to -135dBm
*E-Field X/Y	5G / EMC / AMS	50GHz to 67GHz	0.18mm / 0.025mm	-35dBm to -110dBm
*E-Field Z	5G / EMC / AMS	50GHz to 67GHz	0.18mm / 0.025mm	-35dBm to -110dBm
**E-Field X/Y	5G / EMC / AMS	50GHz to 110GHz	0.18mm / 0.025mm	-45dBm to -110dBm
**E-Field Z	5G / EMC / AMS	50GHz to 110GHz	0.18mm / 0.025mm	-45dBm to -110dBm

***Only available for EM-ISight-mmWave and **EM-ISight-AMS**



Sensitivity in Frequency

Turnkey Solutions



*Designed For,
EM-ISight-ER
EM-ISight-LR
EM-ISight-ESD
EM-ISight-AMS*



APREL use Keysight Test equipment!!

Sensitivity in Frequency

Turnkey Solutions



*Designed for,
EM-ISight-SR
EM-ISight-mmWave*



APREL use Keysight Test equipment!!

Sensitivity in Frequency

Questions?

We have comprehensive information
for all topics covered in this presentation?



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