

Langmuir Probe System™

RF Compensated Electrostatic Probe

The most advanced Langmuir Probe on the market

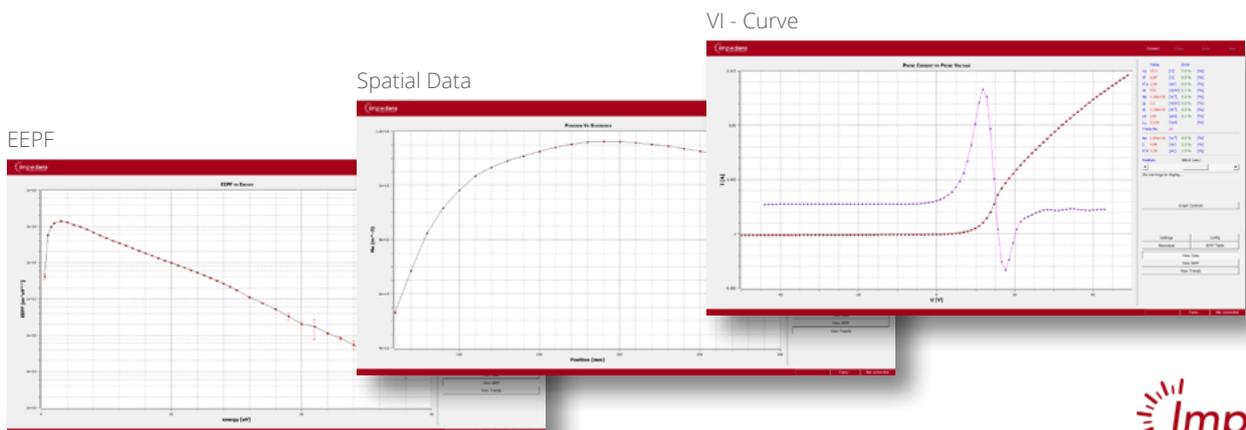
The Langmuir Probe is one of the most widely used plasma measurement instruments. It is used to measure the characteristics of the bulk plasma region. The Impedans Langmuir Probe System measures the key plasma parameters such as plasma potential, charged particle density (electron & ion) and the electron temperature using the most advanced theoretical models available. Langmuir probe measurements provide the user with fundamental insights into the physical phenomena that govern plasma behaviour. With an 80 MS/s sampling rate, pulse profiling and single shot plasmas can be measured with unrivaled time resolution.

Key Features

-  Interchangeable single, double, spherical, planar and Mach probe head options.
-  Time averaged, time trend, synchronised pulse profile and triggered fast-sweep modes.
-  Automated tip cleaning function using plasma electron bombardment to remove oxides and insulating layers.
-  Integrated linear drive mechanism available to automatically profile spatial plasma uniformity.
-  Up to 5 integrated RF compensation filters in the one probe with a DC reference probe as standard.
-  Compatible with DC, Pulsed DC, RF, Pulsed RF, Microwave and other plasma excitation methods.
-  There are over 100 publications using this system.

Key Benefits & Applications

-  Multiple, interchangeable probe head types in a single system, lowering the cost of ownership.
-  State of the art plasma models built into the software for automatic data analysis.
-  Intuitive and user-friendly interface, with an API for remote control.
-  Saves time and improves productivity through sophisticated automation features. Batch scripts can be input for automation of measurements.
-  Robust and durable design to survive in extreme plasma environments.
-  Custom probe options including right angle elbows and flexible probe shafts to fit any chamber.
-  Provides measurements for fundamental research, process development and model benchmarking.



Model Specifications

Model #	Product Name	Description
02-0144-02	Fixed Probe 10 mm	10 mm OD, rigid, Alumina Shaft (<1m length)
02-0463-01	Fixed Probe 6.5 mm	6.5 mm OD, rigid, ceramic coated stainless steel shaft (<1 m length)
02-0265-01	Feed-through for flexible shaft models	Feed-through for flexible Langmuir Probes
02-0466-01	Flexible 10 mm Shaft	Rigid tip section with flexible ceramic beaded cable
02-0467-01	Flexible 6.5 mm Shaft	Rigid tip section with flexible ceramic beaded cable

Model #	Product Name	Current Range
02-0241-01	Langmuir Probe Electronics Unit	1.5 μ A - 1 A
02-0045-01	Langmuir Probe Electronics Unit	15 nA - 150 mA
02-0460-01	Langmuir Probe Electronics Unit	1.5 nA - 15 mA

General Specifications

Probe Length	150 mm to 1400* mm
Probe Tip Length	10 mm, Customisable
Probe Tip Diameter	0.38 mm for Tungsten, Customisable
Probe Tip Material Options	W, Ta, Ni, Pt
Max. Operating Temperature	Model #02-1444-02: Air Cooled 230 °C Model #02-1444-02: No Cooling 125 °C Model #02-0463-01: 900 °C Model #02-0501-01: 125 °C
RF Compensation Frequencies	Max. 5
Typical RF Frequency Compensation Options	400 kHz, 2 MHz, 13.56 MHz, 27.12 MHz, 40.68 MHz, 60 MHz
Plasma Reactor Types	DC, Pulsed DC, MF, RF, Pulsed RF, Microwave, Atmospheric Plasmas
Linear Drive Options	150, 300, 450, 600 & 900 mm
Time Resolved Step Resolution	12.5 ns
Air Cooling Inlet	4 mm tube push fit
Max. Compressed Air Pressure	4 bar
Voltage Scan Range	-150 to +150 V
Sensor Pulse Synchronisation	External sync: TTL input trigger (1 Hz to 1 MHz)

Langmuir Probe System Plasma Parameter Ranges

Floating Potential	-145 V to +145 V
Plasma Potential	-100 V to +145 V
Plasma Density	10^6 to 10^{13} cm ⁻³
Ion Current Density	1 μ A/cm ² to 300 mA/cm ²
Electron Temperature	0.1 eV to 15 eV
Electron Energy Probability Function (EPPF)	0 eV to 100 eV

* if length is greater than 1 m 9.5 mm OD shaft used

Publication list available at: impedans.com/langmuir-publications



02-0144-02
02-0463-01



02-0265-01
02-0466-01



02-0241-01
02-0045-01
02-0460-01



02-0033-04



Single Probe Attachment



Double Probe Attachment



Spherical Probe Attachment