

KP Technology

Company Profile



KP Technology is an award-winning company that designs and manufactures Kelvin Probe systems for work function and surface potential measurements. We supply state-of-the-art equipment and consultancy services to innovative companies and research institutes throughout the world. Our in house teaching laboratories ensure you get the best out of your system

The company was founded with the aim of bringing to the market new surface research tools that would allow specialists to investigate surface phenomena, provide equipment pathways for non-specialists and lastly to educate scientists, engineers and technologists in the capabilities of these emerging technologies.

Since inception in 2000 KP Technology has experienced rapid growth and now services over 100 companies and research institutes worldwide in their materials research and characterization requirements. Our team consists of electronic and software engineers, materials research associates, training, sales and administrative staff.

Prof. Iain D. Baikie is the CEO and company founder. He began developing Kelvin Probes for surface analysis in the early 1980's and has over 25 years experience with development and applications. Prof. Baikie is the inventor of the Off-Null, Height Regulated (ONHR) Kelvin Probe system.

Prof. Baikie has held tenure's at Universities and Research Institutes in Europe and USA and has previously been Chairman of a UK University Physics Group. He has published extensively in the fields of surface science and materials research and has pioneered introduction of modern educational tools in Physics Education.

The Baikie System

KP Technology systems are based upon unique features developed by Prof. Baikie, we are currently in our 7th Generation of design, with features unsurpassed by any other company:

- * Highest work function/surface potential resolution.
- * Off null and height regulation features invented by Prof. Baikie.
- * Full digital control of all Kelvin probe parameters.
- * High signal levels, patented signal processing.
- * Excellent system stability and repeatability.
- * Very high rejection of driver talkover noise compared with piezoelectric systems.
- * World's first commercial absolute Kelvin Probe system.
- * Quick change probe tip allowing user selectable spatial resolution.
- * Versatile equipment upgrade paths.
- * Our Signal-to-Noise (S/N) features remain unsurpassed in the field.
- * No expensive lock-in amplifier (LIA) is required.

Corrosion/ Environmental Housing Kelvin Probe System (RHC)



The RHC range offer complete Kelvin Probe solution for researchers investigating Environmentally Sensitive or Corrosive Materials. The range of chambers combined with our standard Kelvin Probe packages include everything the investigator needs to produce reliable accurate and repeatable data in a controlled atmosphere.

We offer three Relative Humidity Chamber/Environmental Housing options:

RHC010: 300x300x500 mm (45 litres)

Relative Humidity chamber with control of RH to 1% (range 10-100%), automatic recording of RH and work function. Manual operation of RH.

RHC020: 400x400x500 mm (80 litres)

Relative Humidity chamber with automatic control of RH to 1% (range 10-100%) and automatic sample temperature control from room temperature to 90 C. Quick access door.

GBC030: 500x400x500 mm (100 litres)

Glovebox type SKP system with Nitrogen Flow-through, Quick Access Door and magnetic sample holder.

All Chambers are mounted on a 600x900 mm stainless steel (optical) base.



The RHC020 System Package includes the following components: Kelvin Probe Head Unit with Integral Amplifier and a range of Tips, Optical Grade Breadboard, Optical Kelvin Probe Mount with 25.4mm Manual Translator, Sample Mount with Aluminium Sample, 3-Axis Motorised Translation Stage, Digital Control Unit, Dell PC with 19" Monitor, Data Acquisition System, Scanning Kelvin Probe Software, NI-DAQ Software, Faraday Screen, Spare Tip Amplifier, Power Supply Unit, Optical Camera Arrangement with 7" Monitor and Optical Mounts & Digital Oscilloscope

Corrosion/ Environmental Housing Kelvin Probe System (RHC020)



Tip Diameter:	20mm, 10mm, 2mm or 0.05 mm options available
Work Function Resolution:	<1mV (>10mm Tip), 1-3mV (2mm Tip), 5-10mV (0.05 mm Tip)
Relative Humidity:	Control of 1% Humidity over range from 10% to 100%
Humidity Chamber:	400mm by 400mm by 500mm with Quick Access Door
Temperature Control:	Automatic Sample Temperature Control to 90 °C
Scanning System:	50mm by 50mm
Height Control:	50mm (Manual and Automatic Control)
Position Resolution:	0.3175 microns
Tracking System:	Automatic hold of Tip to Sample distance to 0.3175 microns
Visualisation:	3D Maps of Surface Potential and Sample Topography
PC:	Dell PC with 19" Monitor and Pre-installed Software
Optical System:	Colour Camera with Zoom Lens and 7" TFT Display
Digital Oscilloscope:	Included
System Mounting:	600mm by 900mm Optical Breadboard
Reference Sample:	Aluminium / Gold Reference Sample with SKP Topography
Digital Control:	Tip Amplitude, Frequency, Mean Spacing, Potential, Humidity
Averaging:	Signal and Work Function Averaging
Detection System:	Off-Null with Parasitic Capacity Rejection
Data Acquisition System:	National Instruments (PCI-Card which is Pre-installed in PC)
Warranty:	24 Months



Common Features

All our Kelvin Probe systems are controlled by a 7th Generation Hardware-Software combination termed the 'Baikie System'. This system, featuring digital control of all probe and detection parameter permits the operator to concentrate on sample analysis rather than technical issues. Our systems come complete with a Frequency Characteristic, Sample Measurements and Quick-Setup Parameter File.

Corrosion/ Environmental Housing Kelvin Probe System (RHC)



Off-null (ON): the KP Technology ON signal detection system works on high signal levels and has an inherently higher resolution compared to null-based (LIA) systems. Null-based systems are prone to noise because the signal height is zero!

Height Regulation (HR): The KP Technology HR system controls the tip height during measurements and scans. Without this feature Work Function measurements will be affected by sample topography, be difficult to reproduce and prone to drift.

Fast Response Time: KP Technology systems are capable of measuring at a rate of 0.1 - 10 seconds. LIA systems typically use 10-30 second time constants to reduce noise.

Versatile Drives: KP Technology Voice-coil (VC) drives are highly stable in frequency, (unlike piezoelectric driving systems) and they are capable of much larger tip amplitudes, ideal parallel plate operation and supporting a range of tip sizes.



Sample Platform - X,Y,Z Control

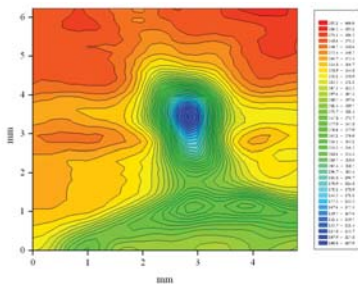


Figure 1a. - 2D Topographical Sample

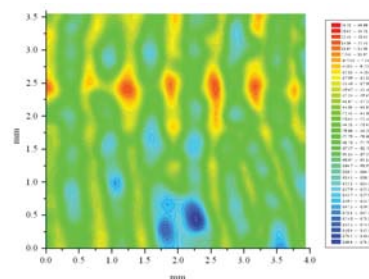


Figure 2a. - 2D Topographical Sample

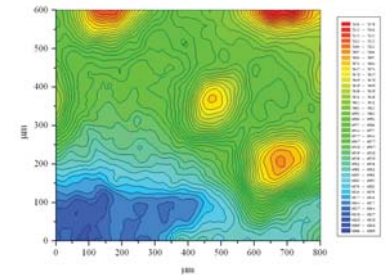


Figure 3a. - 2D Topographical Sample

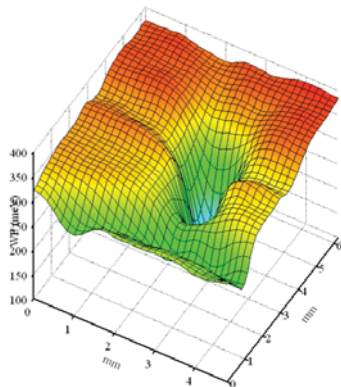


Figure 1b. - 3D Topographical Sample

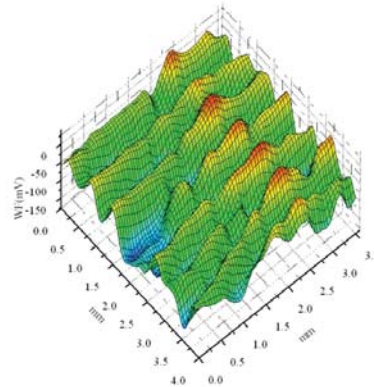


Figure 2b. - 3D Topographical Sample

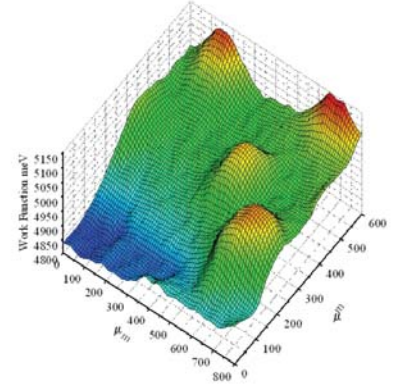


Figure 3b. - 3D Topographical Sample

