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ProberBench®

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Ultimate Probe System Control

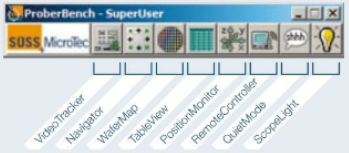
The SUSS ProberBench® is a powerful tool which uses optimally matched hardware and software to provide fast and accurate probe system control with an easy-to-use human interface. It consists of an independent electronics rack, a color LCD Joystick Controller for full prober control with or without a PC and a truly flexible Graphical User Interface (GUI) for when PC-use is desired.

Aiding both the occasional user and the experienced operator, the SUSS ProberBench interfaces with test equipment from all leading vendors, totally integrating them within the prober set-up.
The system is compatible with all SUSS probing products including the complete range of semi and fully automatic probers, manual probers with programmable microscopes and the SUSS line of programmable ProbeHeads. Especially designed Programmer Tools enable test engineers to write their own programs for a truly customized solution.

Features and Benefits

- Modular construction with upgradeable control system for maximum flexibility (Chuck, Probes, Scope, IEEE Interface)
- Joystick Controller with color LCD
- Optional control PC
- Additional software tools: LoaderModule, VisionModule, SussCal and MicroAlign
- Interfacing options to leading test software and hardware
- Programmer Tools for customized probing solutions

Main Menu ProberBench® Software



The ProberBench® Joystick Controller

For a quick and safe command transfer, the Joystick Controller is directly connected to the ProberBench Electronics using an Ethernet interface. The exponential joystick works at four different speeds depending on the intensity with which it is operated by the engineer: the more the joystick controller is pressed, the faster the chuck will move. It is therefore ideal for coarse and fine chuck movements.

The new ergonomic design of the Joystick Controller includes soft keys for easy adjustment of, e.g., the chuck and microscope. Keypads can be customized to ensure full functionality even in turnkey probe systems. The graphical display of these customized function keys is visible for the operator on the bottom row of the LCD. The new color display is also capable of showing the stage position in different measurement units (µm/ms/Index). For easy viewing, the display of the X, Y, and Z axis coordinates has been highlighted.



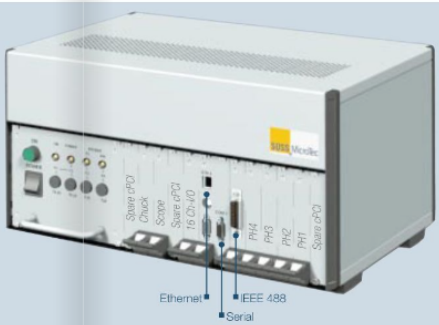
The Joystick Controller uniquely commands all prober functions including 2 Point Alignment: This works with two alignment marks which can easily be selected by using the Joystick Controller. A conversion algorithm is used to calculate the rotational offset of the two points from a trained position. The selected points can either be in either horizontal or vertical.

In addition, new contact function keys on the Joystick Controller include a response LED for each key and an alphanumeric set of input keys for easy entering of such commands as: Set Home, Quiet, Dark, and Set Index. Just like the ProberBench Electronics, the Joystick Controller is also based on Linux and can be upgraded easily.

The ProberBench® Electronics

ProberBench Electronics is the robust independent controller of all SUSS Probe Stations. Its modern system is based on a Compact-PCI, extendable bus platform that has been built around a Linux based Kernel. The unit construction gives the ProberBench Electronics a high degree of modularity and flexibility to meet all customer requirements such as the differentiation between motorized/ non motorized microscope and user-specified numbers of ProbeHeads depending on application requirements.

The open architecture incorporates Ethernet, Serial and IEEE488 (GPIB) interfaces as standard. Due to this seperate electronics system, the prober can also be used without a PC.



The SUSS ProberBench Electronics has a power supply that cannot be interrupted. Similar to UPS, it uses a battery buffer for a controlled shut down thus avoiding the loss of positions and data in case of sudden power failures – an essential requirement of automated applications.

Ideal for low noise and other sensitive measurements, the SUSS QuietMode switches off all power during measurements thus minimizing electromagnetic interference. After each measurement the ProberBench powers up again to step to the next die.

ProberBench® Software: CorePackage

Should a PC GUI be desired, the ProberBench® offers exceptionally easy-to-use software which runs on Windows 2000 or XP® including ultra fast command handling and, as always with SUSS, an open architecture with all common interfaces.

WaferMap

The graphical WaferMap is used for probing evenly-spaced die arrays on a substrate. Easily configured for a particular wafer layout, WaferMap moves the chuck to any given die on the wafer. The WaferMap provides three levels of navigation in order to organize, visualize, and step through the wafer:

- Die Probing
- Cluster Die Probing (rectangular fixed cluster of dies)
- SubDie Probing

These can be used in a mix individually defined by each user. Its integrated DieMap component is used for intra-die, or sub-site probing. After teaching a set of sub-sites, the engineer can quickly visit them by simply clicking the target die in the WaferMap window then clicking the target subsite in the DieMap window. The WaferMap is also used to store and display die bin test results.

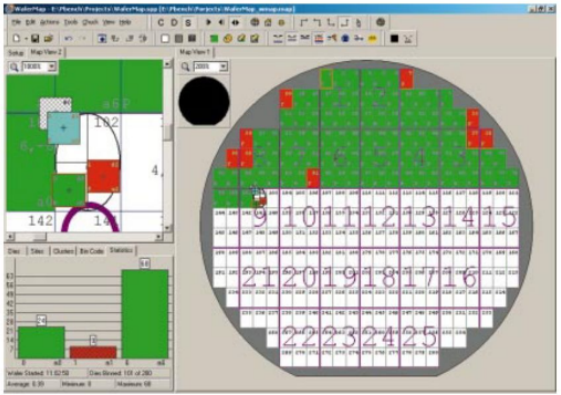
Navigator

This is the software equivalent of the Joystick Controller and is based on a directional-arrow keypad. The Navigator is most useful for setting Z heights, X-Y index sizes, and wafer rotational alignment. It can be used instead of, or in conjunction with, the Joystick Controller.



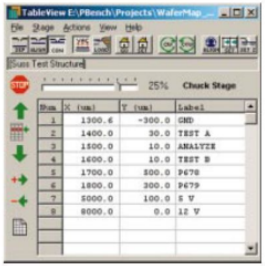
PositionMonitor

The PositionMonitor is a highly effective tool to control the positioning of the chuck, scope and ProbeHeads. It may be used during operation to locate specific coordinates or to note coordinates for later reference. They can be displayed in three different measurement units: µm, ms, and number of index steps. For extra convenience, multiple PositionMonitors can be opened simultaneously.



TableView

This offers a spreadsheet-format table for saving the locations of a group of sites, enabling the engineer to easily revisit the same sites on different chips or wafers.



CorePackage Features

SUSS Remote Communicator
This application makes it simple to send any ProberBench® command with the correct name and parameter sequence. Its built-in scripting feature is the easiest way to integrate the probe system and ProberBench applications with testers and other equipment. The central message server enables the option to track the stream of commands sent by the customer's application software which additionally allows SUSS to help the customer with debugging.

Help Files
These are comprehensive, easy to use, up-to-date and fully integrated with all ProberBench® applications. The information you need is always only a few clicks away.

Project Management
This feature allows users to save and restore the state of the ProberBench® workspace, including open applications, their configuration and current data files. It also offers three password-protected access levels (User, Super-user, Service) to protect critical projects and files.

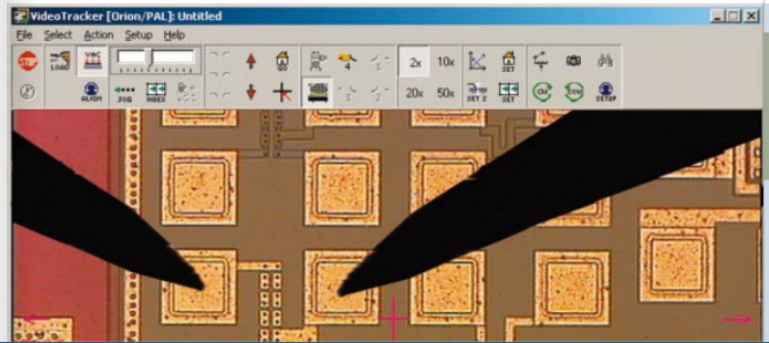
Additional Tools for the CorePackage

VideoWindow

VideoWindow is the basic SUSS software tool for visualizing the wafer during the probing process. It enables the operator of the system to see a real-time video of the test area and to save single screen shots.

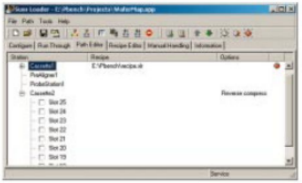
VideoTracker

VideoTracker is the most powerful navigation tool available. Like Navigator, it emulates the Joystick Controller yet its interface is superimposed on a live video image fed from the scope via a frame grabber board. This enables ultra-smooth point-and-shoot navigation across complex chip topographies.



LoaderModule

The LoaderModule integrates the probe system with a robot and prealigner for automated wafer or device handling. For initial project configuration, it gives the engineer a simple but powerful interface for teaching cassette, prealigner, and prober positions. For project operation, it presents a very simple operator interface to control batch wafer processing. Wafer path and station recipes for processing are integrated.



VisionModule

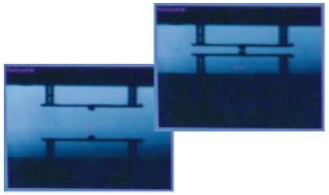
The VisionModule integrates the probe system with a pattern recognition board. It automates the process of device rotational correction, pin to pad alignment, and location of home and test positions. Features include: Find Focus, Optical Character Recognition, Bar Code Reader, Data Matrix Reader, Ink Dot Recognition, Probecard Alignment, Probecard Optical Contact Search and easy 2 Point Alignment which can be saved for all following wafers.
Like the LoaderModule, it features a project configuration interface for the engineer to train patterns and a simple operator interface for automated use. When combined with the LoaderModule, it provides SUSS' highest level of system automation.



ProberBench®: Additional Software Packages

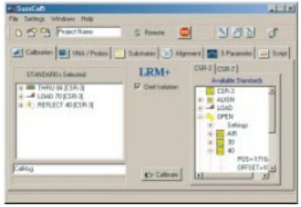
MicroAlign®

Consisting of software and corresponding hardware, MicroAlign is uniquely able to undertake probe to pad alignment for vertical probecards. The patented ContactView feature allows a constant side view of the substrate and probecard to ensure excellent visualization of probe contact at any time. Ideal for a multitude of complex test applications, SUSS probers equipped with MicroAlign are the only analytical wafer probe systems which are capable of the automated testing of very small pads down to 30 µm x 30 µm or electrical tests of bumped wafers. MicroAlign can also be used with standard cantilever type probecards.



SussCal®

SussCal is a calibration program for integrating SUSS' line of High Frequency Probe Systems with Vector Network Analyzers. SussCal extends the function of the VNA by performing unique advanced wafer-level LRM+ and SOLR calibrations, as well as all industry standard calibrations like SOLT, TRL and LRM. Its Wizard guides the user through a simple process to align the wafer and calibration substrates.



During testing, re-calibration can be completed in seconds, after which the chuck will automatically return to its previous position on the wafer to resume testing.

Interfacing Options for ProberBench®

A very important component of the ProberBench® is the interfaces to test instrumentation and third party software.

Programmer Tools:	Microsoft Visual C++6 · Microsoft Visual C# Microsoft Visual Basic 6 · Microsoft Visual C++.NET Microsoft Visual BASIC.NET Borland Delphi 8 · Borland C# Builder Borland C++ Builder 6 National Instruments LabVIEW 6/7 National Instruments Lab Windows/CVI 7 Agilent VEE 6/7 · CEC TestPoint 5 Mathlab Windows Perl SUN Java
Hardware controlled by ProberBench:	Keithley 4200 Agilent ATT · ERS · Temptronic New Wave
Measurement Equipment with Control Software:	Keithley 4200 MOSAID · Hypervision Hamamatsu · Zeiss
Measurement Control Software:	Knights Technology™ Merlin's Framework™ Raith ESCOSY Plus UTMOST · METRICS ICV Agilent IC-CAP Schlumberger · Cadence
Hardware Interfaces:	ProberBench Electronics: GPIB ProberBench PC: GPIB · RS232 · Ethernet



Test Process Automation Options with ProberBench®



Windows PC with SUSS Software and Hardware Interfaces

Data Acquisition Software: (automatic test process)	TestPoint	LabView	LabWindows	Agilent-VEE	Special Customer Main Test Software	Metrics ICV	IC-CAP
SUSS Programmer Tools:	TestPoint Interface	LabView Interface	LabWindows Interface	Agilent-VEE Interface	C++, Delphi, .NET BASIC-Interfaces	Metrics ICV Interface	IC-CAP Interface

SUSS ProberBench® Core Package

TableView | Navigator | WaferMap

Application Server

Message Server
Common Command Handler

GPIB Driver
RS232 Driver
Ethernet

Serial Driver | Network Driver

Additional Software: MicroAlign, SussCal

Additional Tools: VideoTracker, VideoWindow, VisionModule, LoaderModule

ProberBench® Electronics



Embedded Linux

Ethernet or RS232 | Ethernet | GPIB

Joystick Controller



Embedded Linux

Ethernet

GPIB Card Master | GPIB Card Slave | RS232 | Ethernet | RS232 or Ethernet

IC-CAP

Measurement Instruments



Any Customer PC or Unix Stations

(e. g. IC-CAP, CAD Navigation Software)



Legend of Colors

- ProberBench® CorePackage
- SUSS Software Interfaces
- Additional Tools/Software for CorePackage
- Connections between SUSS Equipment
- Customer Software
- Measurement Instruments
- Customer Hardware
- Connections to non-SUSS Equipment

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