Seica

PILOT

PILOT line is the Seica solution for flying probers with a sleek, modern look and the most innovative technology around.

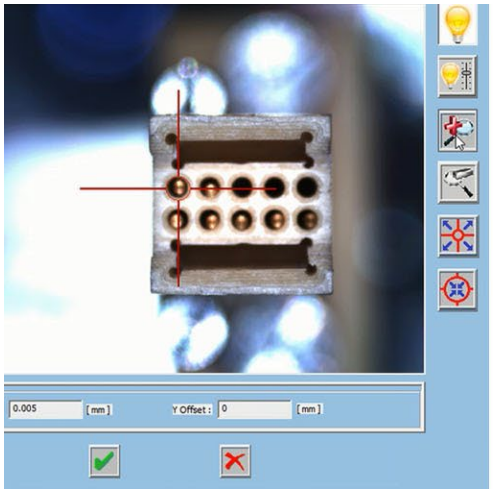
Following the winning philosophy that has characterised its testing business for four decades, based on the constant and rapid innovation of its testing solutions, Seica continues to enrich and improve the PILOT line with new, higher-performance products.

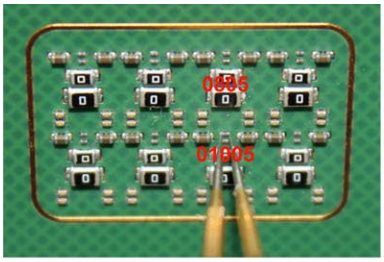
This is the **generation of flying probers** featuring a renovated and sleek look thanks to the premium materials of the chassis, and innovative electrical worth discovering performances, undoubtedly the most complete flying probing test platform on the market.

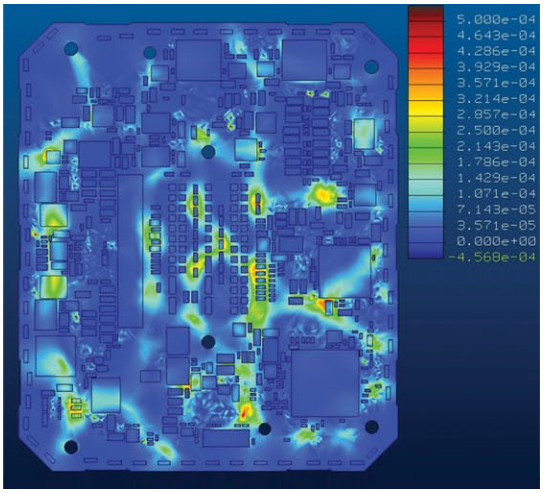
Moreover, all the **PILOT** testers feature the **Industrial Monitoring solution "4.0 compliant"** by Seica, to monitor current absorption, supply voltage, temperature, light indicators and other parameters useful to indicate the correct operation, to ensure predictive maintenance and make the systems compatible with the new standards of the fourth industrial revolution ongoing nowadays.

Industry 4.0 – Information and the technology needed to collect and analyze data, is key to the successful digitalization of the manufacturing process, which is at the heart of **the Industry 4.0 concept**. The **PILOT line** has all of the capabilities needed for implementation in any Factory 4.0 scenario, providing the possibility to plug in any proprietary or third party information system to achieve the desired goals.

ADVANTAGES OF FLYING PROBE TEST

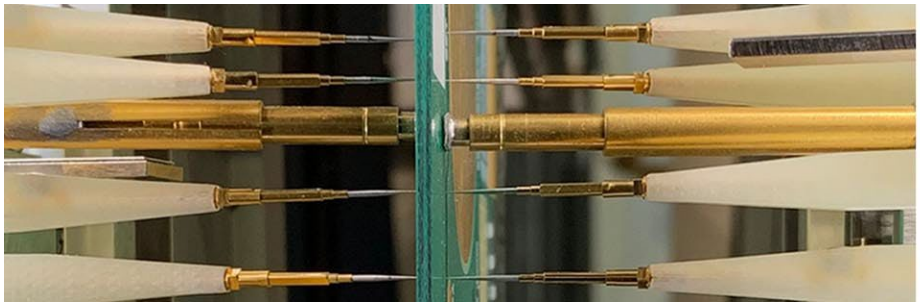






- Eliminates fixturing costs and time
- Fast test program development, easy integration of design changes
- Process flexibility
- Circuit access, even in the absence of test points
- Controlled probe contact, programmable for any type of board
- Different test solutions and approaches integrated in a single test system
- Intrinsic positioning and measurement precision

THE DIMENSION OF TIME IN FLYING PROBE



The dimension of time in the test of electronic boards and modules has a **multi-faceted effect** on the efficiency of the test process. It is fundamental in determining the added value it brings to the final product, which is paramount in today's extremely competitive global market.

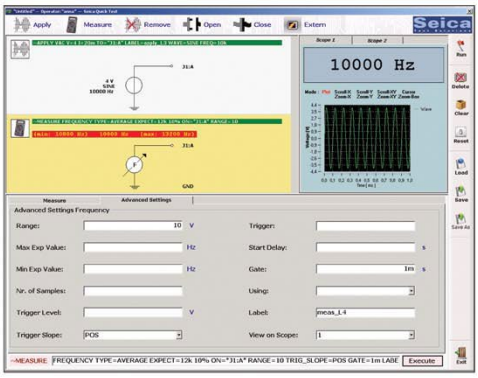
Consider test program development time, test execution time, digital component programming time, handling time and, last but not least, the time required to repair boards when the process has not been sufficiently monitored. Put all of this together with the challenges presented by the increasingly faster technological evolution of electronic products in terms of **performance** and **cycle times**, and it is easy to see that the dimension of time is an essential factor in the equation.

DIFFERENT ARCHITECTURES FOR DIVERSE SOLUTIONS IN FLYING PROBE

The **PILOT** line offers architectural solutions, each one optimized for a specific type of application scenario, equipped with excellent new performances for faster testing and higher fault coverage on even the most technologically advanced and complex boards of the latest generation electronic products and devices.

PILOT VX - THE NEW GOLD STANDARD IN TERMS OF FLYING PROBE TEST

PILOT VX rises the bar in terms of speed and performance, state-of-the-art mechanical performance and motion control enables a reduction of up to 50% in test time, 12 multi-function test heads provide the capability to contact up to 60 points simultaneously, technologically advanced measurement hardware and a new microwave-based measurement technique provide unrivaled test performance, optimized **VIVA software** management enables the parallelization of different types of tests, saving even more time, and smart analysis capabilities together with algorithms based on the principles of artificial intelligence can automatically optimize the test flow in run-time, while maintaining test coverage targets.

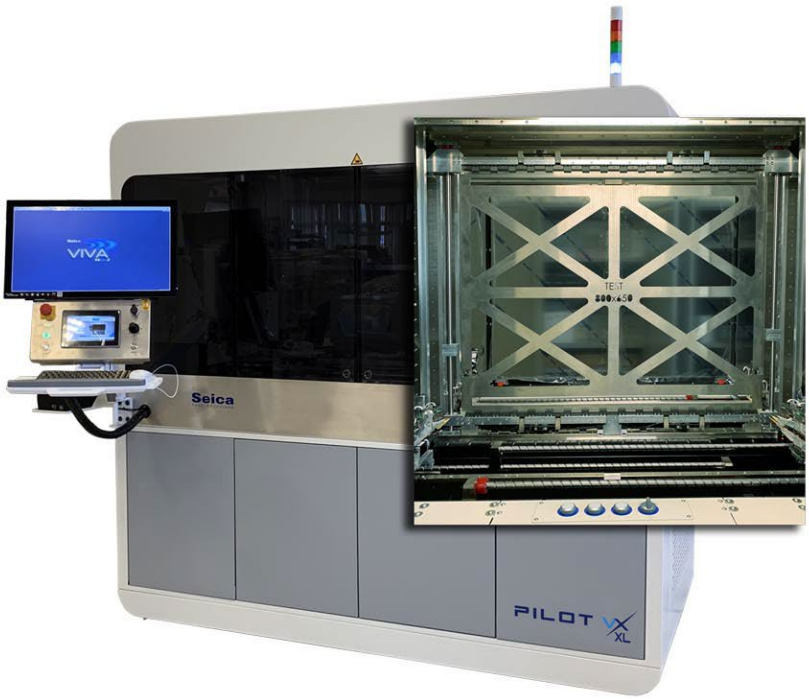


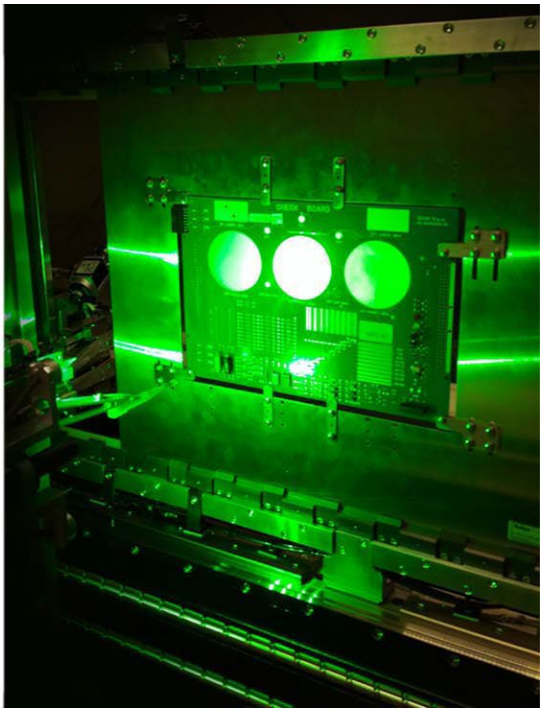
- Maximum measurement precision
- Maximum positioning precision
- Test down to 01005
- Suitable for testing all types of boards
- Extremely fast test times
- Highest clearance (up to 60mm)
- Parallel test: two systems in one
- High level of traceability (integrated barcode reading)
- Industry 5.0 ready: easy remote monitoring and connection to information systems
- Automatic loading/unloading
- Single Rack / MultiRack handling
- Automatic selection of test program
- Manual/Automatic solution

PERFORMANCE: In-Circuit test, Functional test, Power on functional test, OTPN (One Touch Per Net) with Fnode to detect shorts open & Nodal Impedance, OPENFIX, On-Board Programming, Boundary Scan, Thermal Test, LED Test, Probe pressure trace (Real time), LASER warpage compensation.

PILOT VX XL - ACCOMODATE BOARD WITH BIG DIMENSION

PILOT VX XL This is the flying prober designed for larger boards, offering all the advantages of the Pilot VX. The conventional flying probe test areas can pose limitations for those handling extremely large boards, such as probe cards that may not even fit within the test area. To address the need for testing very large boards, Seica has introduced an “XL" version. This version can accommodate boards with dimensions of up to 900 mm x 630 mm (35.43" x 24.80")..





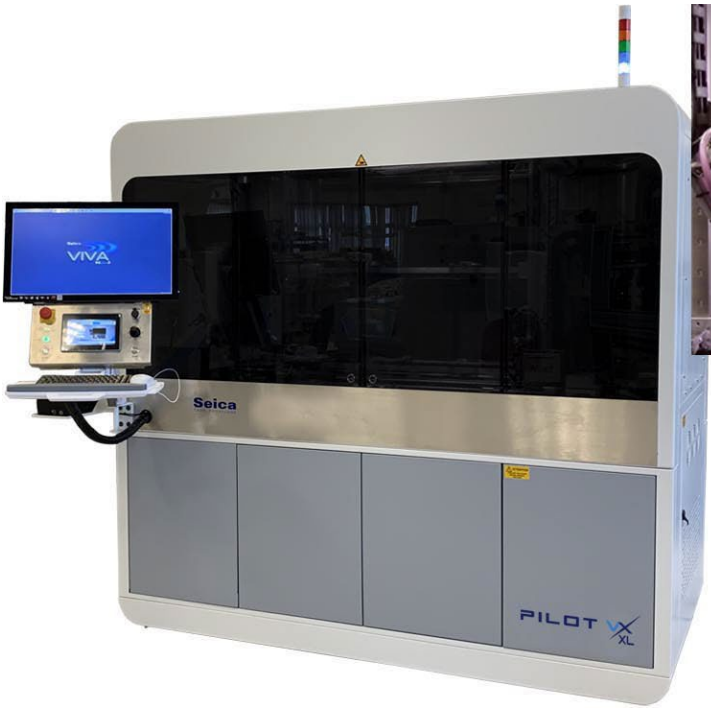
Starting with the basics and the mechanical designs associated with probe cards and their construction, the very first constraint a user may notice is the size of the cards themselves. Traditional flying probe test area sizes can be a limiting factor, so much so, the probe cards don’t even fit in the test area. To accommodate this market requirement, **Seica** developed this flying prober, to accommodate boards **with sizes up to 900 mm x 630 mm (35.43" x 24.80")**. However, the area of the board may not be the only limiting factor, as board thickness and weight are also a concern. Board construction easily exceeds 50 layers in most cases, and the boards will not meet traditional thicknesses. One benefit of **Seica**’s architecture is the vertical nature of mounting the unit under test. If this was a horizontal flying probe system and as the board size/span increases, the weight would increase in a corresponding fashion resulting in bow and deflection of the UUT. The vertical architecture of the **Pilot VX testers** reduces significantly the bow and deflection, allowing for faster speed and accuracy of the probing needles on the very small test points. The vertical architecture does not require the use of bottom side flying probe supports, or expensive jigs and shuttles that ultimately could inhibit test area for bottom side testing. With the enhanced vertical clamping design, probe cards that exceed 15 pounds have been tested in this configuration. The physical size of these probe and interface cards are not only large in some cases but their CAD data and component counts can be extensive. With very large CAD files and component counts exceeding 10,000 parts, the flying probe provider needs to have the latest personal computers and robust upfront easy to use CAD processing software.

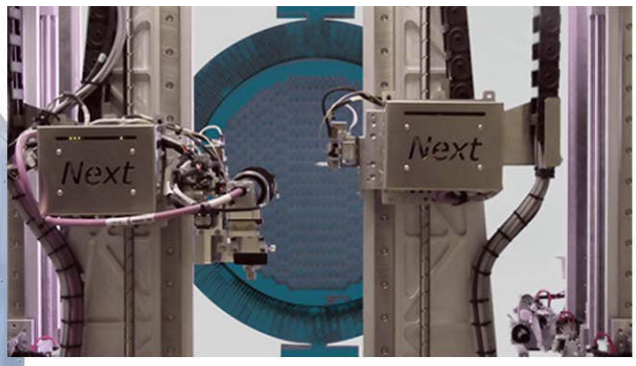
PERFORMANCE: In-Circuit test, Functional test, Power on functional test, OTPN (One Touch Per Net) with Fnode to detect shorts open & Nodal Impedance, OPENFIX, On-Board Programming, Boundary Scan, Thermal Test, LED Test, LASER warpage compensation.

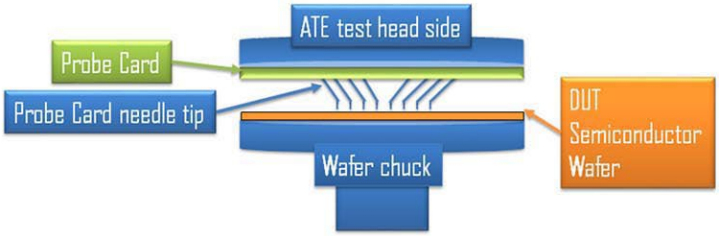
PILOT VX XL HR - THE LATEST FIXTURELESS TECHNOLOGY AVAILABLE FOR WAFER & PROBE CARD TEST

Pilot VX HR (available in the XL version), is designed to offer a full turnkey solution for even the most challenging Probe Card test.

The Probe Card is a part of the wafer test system, but it is mandatory to test it before integrating it into the wafer test system. Since the device I/O bandwidth and the power demands increase, it is necessary to meet the requirement for high performance power and signal delivery during the electrical test.





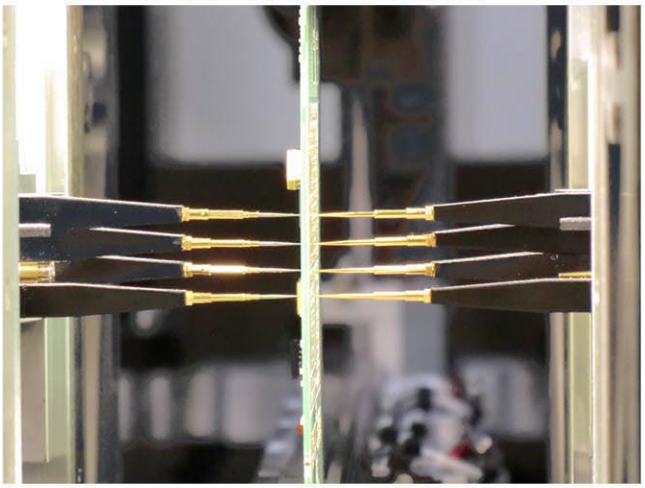


These requirements drive the challenges for the test of the probe cards. Thanks to many years of experience in testing probe cards, Seica has designed the **Pilot VX HR**, which is the **only flying Probe** that can offer a full turnkey solution for the Probe Card test.

The **Pilot VX HR** series brings together in a unique system three different tools to perform:
- Bare Board Test for single MLO™ & PCB Test
- ICT & Functional Test for assembled PCB Test
- Probe Card Test for PCB+MLO™
- ICCT (Integrity Connection Certification Test): it is required as certification for the integrity of the connections between the MLO and PCB.

PILOT V8 - THE COMPLETE SOLUTIONS FOR DOUBLE SIDE FLYING PROBE TEST

PILOT V8 optimizes the test of “double-side” electronic boards, which require stimulus and measurement on both sides of the UUT simultaneously. The use of 8 probes distributed on both sides of the Unit Under Test, enables full test coverage as well as fast test time, and the vertical architecture minimize vibrations during testing, ensuring maximum test precision and measurement stability.

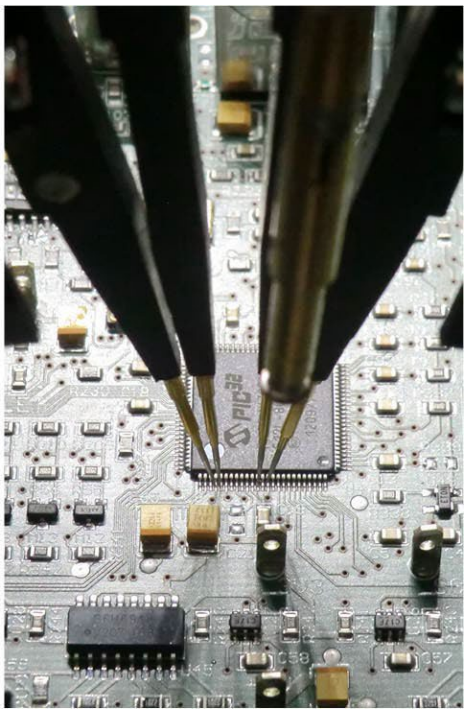


- Measurement precision
- High positioning precision
- Test down to 01005
- Suitable for testing all types of boards
- Fast test times
- Parallel test: two systems in one
- High level of traceability (integrated barcode reading)
- Industry 5.0 ready: easy remote monitoring and connection to information systems
- Automatic loading/unloading
- Single Rack / MultiRack handling
- Automatic selection of test program
- Manual/Automatic solution

PERFORMANCE: In-Circuit test, Functional test, Power on functional test, OTPN (One Touch Per Net) with Fnode to detect shorts open & Nodal Impedance, OPENFIX, On-Board Programming, Boundary Scan, Thermal Test, LED Test, LASER warpage compensation.

PILOT H4 - THE HORIZONTAL FLYING PROBE SOLUTIONS

PILOT H4 is a horizontal solution, available in manual or automatic version. Completely compliant with the SMEMA protocol, ensuring complete automation of the in-line test process. It has an architecture which permits the integration of additional pins and jigs to augment test coverage or to integrate other processes, such as on-board programming (OBP) of digital devices.



The **PILOT H4** represents the best solution for those looking for an economic flying probe system. Equipped with 4 mobile electrical probes, 1 mobile openfix probe and 2 CCD colour cameras (1 in the manual version), the **PILOT H4** provides the user with a total of 7 mobile test resources applicable to any point on the UUT. In addition, there are 8 fixed analog channels (optional), 16 openfix sensor channels and power resources available, which can be applied to the UUT via fixed probes positioned on the mobile, bottom-side plate.

Automatic solution

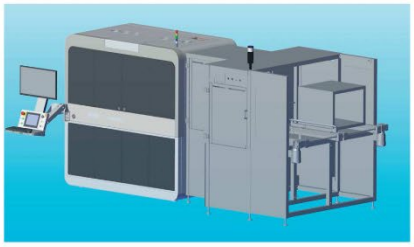
- Easy connection to loader/unloader modules
- Allows the integration of dedicated frames and/or dedicated jigs
- Best for boards with single-side test access

Manual solution

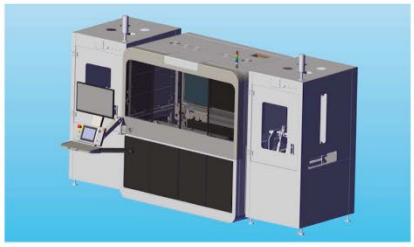
- Allows the integration of dedicated frames and/or dedicated jigs
- Best for boards with single-side test access.

THE AUTOMATED SOLUTIONS

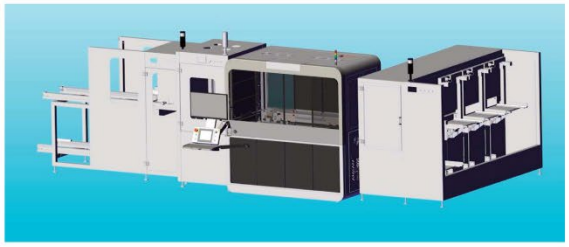
THE AUTOMATED SOLUTION in the vision of the **factory of the future**, the implementation of a highly automated, technologically advanced and reliable production line is essential. The PILOT Line is part of the vision.



INDIPENDENT ISLAND
Multi rack stand alone loader/unloader

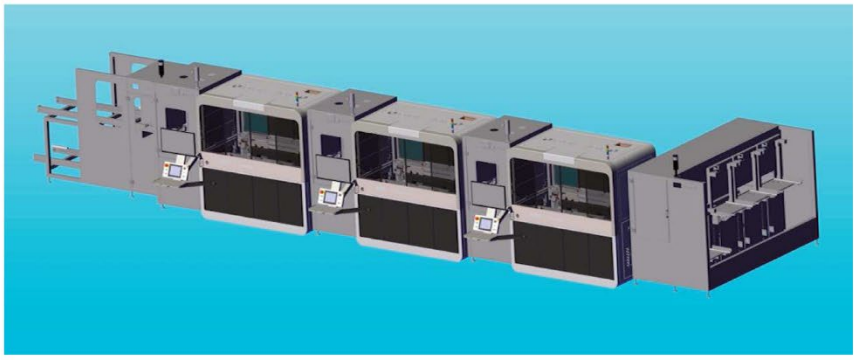


SIMPLE INLINE CONFIGURATION
with tilter



ISLAND
with pass/fail sorter

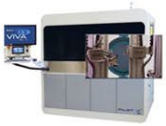
INLINE MULTISTATION
with rototilters



COMPLETE LINE - DISTRIBUTED TEST
with multi rack loader/unloader, pass/fail sorter

Automation is pervasive in today's factories and in most production lines, solutions presented are all ready for deployment in completely automated lines. **Seica Group** includes **Seica Automation**, which designs and manufactures board handling systems and other automation equipment for the electronics manufacturing industry.

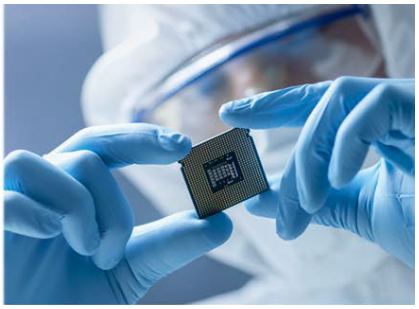
DIFFERENT ARCHITECTURES FOR DIVERSE SOLUTIONS IN FLYING PROBE

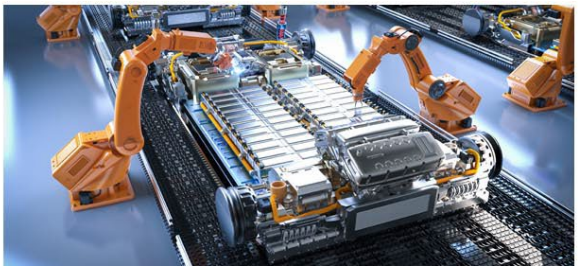
NEXT›	 PILOT VX, VX XL	 PILOT VX HA, VX XL HA	 PILOT V8	 PILOT H4, H4 A
ARCHITECTURE	Vertical	Vertical	Vertical	Horizontal
PCB LOAD/UNLOAD	Automatic	Automatic	Manual	Automatic/Manual
MAX MOBILE RESOURCES	88	47	34	16
ELECTRICAL PROBES	60 (30 front, 30 rear)	36	22	4
POWER PROBES (PRBOOST)	8 (4 front, 4 rear)	8 (4 front, 4 rear)	8 (4 front, 4 rear)	4
FLYPOD	4 (2 front, 2 rear)	2 (rear)		
OPENFIX PROBES	2 (1 front, 1 rear)	1 (1 rear)	2(1 front, 1 rear)	1
MARKER TOOL	2 (1 front, 1 rear)	1 (rear)	2(1 front, 1 rear)	1
THERMAL SCAN SENSOR	2 (1 front, 1 rear)	1 (rear)	2(1 front, 1 rear)	1
LED SENSOR	4 (2 front, 2 rear)	2 (rear)	4 (2 front, 2 rear)	2
LASER SENSOR	2 (1 front, 1 rear)	2(1 front, 1 rear)	2 (1 front, 1 rear)	1
HD COLOR CAMERA	4 (2 front, 2 rear)	4 (2 front, 2 rear)	4 (2 front, 2 rear)	1 manual / 2 automatic
LIGHTING UNIT (RGB)	❍	❍	2(1 front, 1 rear)	1
BARCODE READING	●	●	●	●
ICT TEST	●	●	●	●
FUNCTIONAL TEST	●	●	●	●
OBP	●	●	●	●
PARALLEL TEST	●	●	●	❍
FNODE	●	●	●	●
AUTIC	●	●	●	●
PWMON	●	●	●	●
FLYSCAN	●	●	●	●
QUICK TEST	●	●	●	●

●= available ❍= not possible

TEST ENVIRONMENTS








MANUFACTURING, REPAIR, REVERSE ENGINEERING, PROTOTYPING, NEW PRODUCT INTRODUCTION (NPI), are the environments where the PILOT NEXT> olutions are implemented.

MANUFACTURING: the evolution of the test algorithms and strategies present in the VIVA NEXT> software mean that the PILOT NEXT> testers provide fast, high performance production testing. The diverse, integrated test technologies allow the user to streamline the various production phases, optimizing process time.

REPAIR: there are different types of requirements for diagnosing faulty boards, depending on the characteristics of the boards themselves. The PILOT line has an extensive tool set developed to address all of the repair scenarios, and the intrinsic flexibility of the flying probe test approach allows the user to implement from one to all of the test techniques available.

PROTOTYPING AND NPI: by exploiting the versatility of the PILOT NEXT> hardware and software, it is possible to obtain immediate data from the testing of prototypes, avoiding costs and time for building preliminary fixtures or test benches, ensuring maximum fault coverage in the minimum time.

REVERSE ENGINEERING (RE): the necessity of managing field returns is a constant in today's industry, the repair returns are often older boards which do not have complete documentation, schematics or construction data. The double-side solutions offered in the PILOT line are ideally suited to carry out RE operations, and include all of the necessary software tools to enable the reconstruction of the electrical schematics and the CAD data of the board under repair.

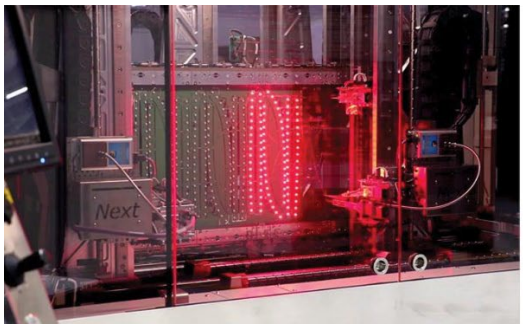
PILOT OPTIONS

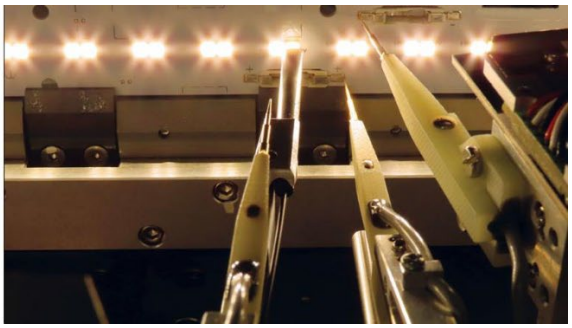
PILOT line has a series of options that make it effective and performing for every customer needs.

HD Cameras
High definition color cameras which, sophisticated software algorithms complementing the electrical tests with the verification of presence/absence, polarity. Used also for automatic centering of fiducials, reading barcodes and for the acquisition of the board image for offline programming.

Marker
UUT test marker for visual test traceability and subsequent identification purposes.

LED Test
The LED sensor option is used for testing the LEDs present on the UUT. The UUT is powered on, and the LED sensor measures luminosity, color, saturation and frequency spectrums.





Thermal scan
The thermal Scan module verifies the operating temperatures of the circuits and components on the UUT, comparing them to the temperature profile acquired on a powered on sample board.

Traceability
Full traceability of the test results of each single UUT: the cameras automatically read 2D barcodes allowing test results to be stored for each board

Special Test Sequences and OBP
VIVA software can call, during test program execution, functional test sequences written using third party languages: for example, Labview™, VBScript, Python, and C, allowing the user maximum test flexibility. The PILOT systems also offer fully integrated On Board Programming solutions.

AOI and RGB Lighting
The PILOT systems integrate improved RGB lighting.

Vectorless Techniques
There are two vectorless test techniques available on the PILOT: Autic - based on clamp diode measurements and Openfix - performed via a capacitive sensor which measures the response of all of the pins of the IC under test.

Parallel Test
The architecture of the PILOT offers the possibility to execute parallel testing of two single or double-side boards.

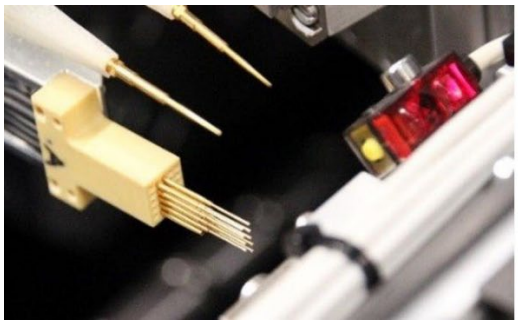
Quick test
This simple and intuitive software interface enables the user to create customized functional tests by simply clicking on the various system resources displayed to connect them to the UUT.

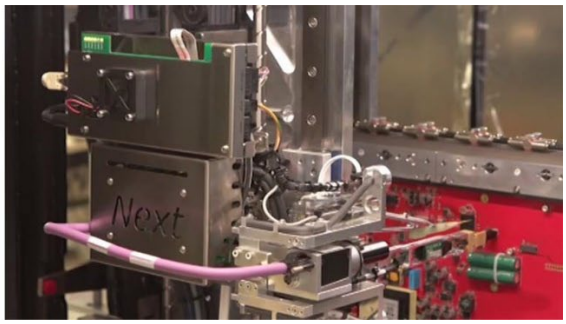
Prboost
The Prboost option will bring to each of the eight electrical probes up to 2A to give the maximum flexibility to power up the UUT.

Net-oriented Test: Fnode-PWmon
The net-oriented test techniques reduce the number of measurements required, therefore test time, without sacrificing fault coverage.

Automated Laser Inspection
This option provides an accurate measure of the height of objects providing an additional test for presence/absence of component bodies, PCB thickness and warpage measurement.

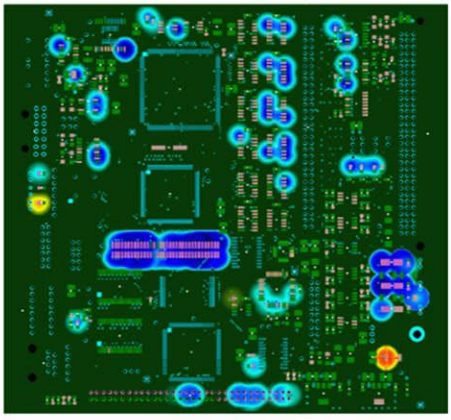
FlyPod
The FlyPod is a special single probe that can carry up to 14 channels to supply Jtag and OBP programming without any external FIXED cables.

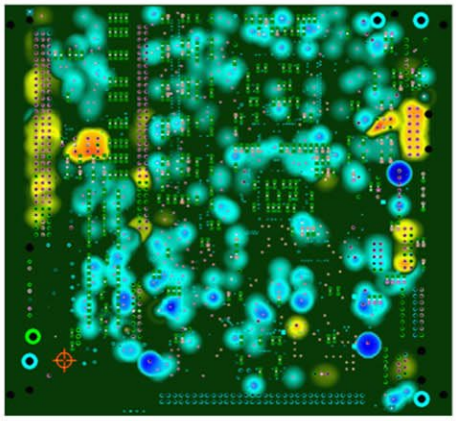


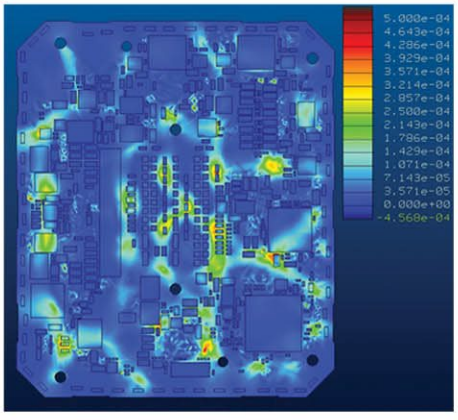


FlyScan
This option brings a fully integrated solution for flying probe boundary scan testing. The boundary scan tests are generated automatically along with the other electrical tests by the VIVA software, and are executed as part of the complete test program. The “extended test” feature also enables the jtag-type test of non jtag nets, eliminating the need to create manual cluster tests reducing programming time and increasing fault coverage.

FlyStrain
This feature is a programmer's tool designed to verifying the mechanical stress on the UUT (Unit under test), exclusively available on Pilot VX Next>. FlyStrain generates a graphical interface for swift analysis and log files for statistical assessments. It operates in real-time, measuring force as soon as electrical contact stabilizes. Ensues continuous monitoring of contact, and, when the probe reaches the contact height, the software reports the contact pressure for each individual test point. The ultimate outcome is represented by a color-coded map, with a spectrum from blue (indicating low-stress points) to red (signifying highly stressed points).







Thanks to the global extension of Seica and its subsidiaries, Seica can ensure local service support wherever the customer needs it, in addition to 24-hour telephone assistance.

Seica SPA
via Kennedy 24
10019 Strambino - TO - ITALIA
Tel: +39 0125 6368.11
Fax: +39 0125 6368.99
E-mail: sales@seica.com

Proxima
E-mail: info@proximasrl.eu

Seica USA
E-mail: DavidSigillo@seicausa.com

Seica FRANCE
E-mail: dupoux@seica.fr

Seica DEUTSCHLAND
E-mail: sales@seica-de.com

Seica ELECTRONICS
(Suzhou)
E-mail: seicachina@seica.com

Seica ISRAEL
E-mail: seicaisraelltd@seica.com