

Keysight Calibration and Repair Services

Managing Your Test Equipment's  
Total Cost of Ownership

What's your plan?



Measurement Confidence

Lifetime Performance

Shared Expertise



## Keysight Calibration and Repair Services

# It's not just fast repairs or calibration stickers.

When you work with Keysight calibration and repair services, it's a partnership. From ensuring compliance for audits to sharing assets worldwide to planning technology roadmaps, we are the global leader and a partner you can rely on.

Nowhere is that more obvious than in our capability to help you manage total cost of ownership over the lifetime of your equipment. We not only help you control operating expenditures, which you'd expect, but also capital expenditures. No matter where you are in managing total cost of ownership for your equipment, we can help. Keysight proves its commitment to your success by focusing on the following values:

### Measurement Confidence

Tools, processes and new technologies give you confidence in your measurement integrity and ability to pass audits.

### Lifetime Performance

Fast, professional service ensures your instrument meets original functionality and evolving standards over its lifetime.

### Shared Expertise

Our dedicated team shares service and technical knowledge with you to unlock the lowest cost of ownership and greatest productivity gains.



# Lifetime Performance

## Global service consistency

Rely on over 50 service locations and mobile teams worldwide, all using one consistent service network

The instruments used by your production and design teams represent a large investment for your company. Whether your engineers are in Stuttgart or Seoul or San Jose, they can count on the same measurement results when Keysight performs calibration and repair—minimizing measurement discrepancies across working groups. Our globally networked automated test procedures adjust and validate all product specifications to return your equipment to like-new performance. We reduce border issues and turnaround time by being where you need us, when you need us. And wherever you ship your instruments around the globe, you receive premier service and warranty coverage for all your Keysight instruments.

Experience simple service management across sites in a global environment

Save time knowing that you can plan across global entities. Receive the best value by budgeting your worldwide cost of maintenance with annual or multi-year service plans. Combine all your company locations in one plan to receive preferred pricing and service terms. Keysight focuses on coordinated delivery terms and streamlined contract management across sites, leveraging our flexible delivery infrastructure.

Learn more at [www.keysight.com/find/assist](http://www.keysight.com/find/assist)



## Flexible service delivery

Customized delivery solutions maximize uptime and minimize maintenance spend at each of your facilities

The demands of your business require you to speed up design and production to shorten time to market and increase margins. This puts pressure on your test equipment productivity and cost of maintenance. Through Keysight's flexible delivery options, we can minimize downtime and reduce the overall cost of maintenance. We lead the industry with the largest breadth of test-and-measurement instruments and, together with our service partners, the broadest range of service coverage. By applying the following capabilities, we can handle all your service requirements or simply supplement as needed.

We partner with you to create the best plan

How do we manage that? By adapting our consistent, high-quality global service network to ensure high confidence in every measurement your engineers make. Whether you have a few instruments or thousands, we adjust our delivery model to meet your needs. We customize single- or multi-site solutions to work for you, whether you're using a critical instrument that must remain on-site or a non-critical instrument that can be sent to a Keysight service location. And even customers with their own calibration labs can augment their capabilities with ours. That's why we're the best partner when you need to select a services solution.

Learn more at [www.keysight.com/find/KeysightServices](http://www.keysight.com/find/KeysightServices)



**WHAT IF...** changes in design programs and production builds mean you must reallocate 50 instruments with a book value of \$1M from a facility in one country to one in a different country?

- Does your warranty or service agreement change?
- Does your service turnaround time increase?



## Global accreditation bodies

- A2LA - American Association for Laboratory Accreditation
- ACLASS - One brand of ANSI-ASQ National Accreditation Board
- CGCRE - Coordenação Geral de Acreditação
- CNAS - China National Accreditation Service for Conformity Assessment
- COFRAC - Comité Français d'Accréditation
- ENAC - Entidad Nacional de Acreditación
- ISRAC - Israel Laboratory Accreditation Authority
- JCSS - Japan Calibration Service System
- KOLAS - Korea Laboratory Accreditation Scheme
- NABL - National Accreditation Board for Testing and Calibration Laboratories
- NATA - National Association of Testing Authorities
- Rosakkreditatsiya - Russian Federation for Accreditation (Poverka)
- SAC - Singapore Accreditation Council
- SAMM - Malaysian Department of Standards laboratory accreditation program, Skim Akreditasi Makmal Malaysia
- SANAS - South African National Accreditation Service
- TAF - Taiwan Accreditation Foundation
- UKAS - United Kingdom Accreditation Service

## Service delivery options

### Service Center

Send your instruments to your local Keysight Service Center for predictable fast service and expert restoration to full functionality

### Volume On-Site Calibration

Maximize uptime by bringing the same Keysight equipment and processes used at Keysight Service Centers to your site

### System Uptime

Keep your systems, such as precision network analyzers, ParBerts and antenna test systems, up and running without ever moving them

### Resident Professional

Keep your equipment operating almost non-stop with a dedicated service lab and Keysight professional on your site

Total Cost of Ownership Elements	Service Center	Volume On-Site Cal	System Uptime	Resident Professional
Technology roadmap sharing for CapEx planning				•
CapEx optimization for procurement and utilization				•
Maximize system availability			•	•
Dedicated on-site Keysight engineers		•	•	•
Metrology requirements and audit compliance	•	•	•	•
Instrument tracking	•	•	•	•
Logistics management	•	•	•	•
Keysight calibration and/or repair service	•	•	•	•

## WHAT IF...

you're asked to improve your company's cost of maintenance for test equipment?

- Can you reduce your total cost of ownership by optimizing service delivery options across all your locations?
- Can you leverage economies of scale across sites?



# Measurement Confidence



## Keysight quality

Depend on Keysight for measurement quality in your lab and on your factory floor. Here are four reasons to choose Keysight:

1) We strive to be first-to-market with instruments that test new products designed to the latest standards

Keysight actively participates in more than 50 standards groups. When you're ready to design a new product, we're ready to help you test it. We ensure that your instruments meet global standards, so that you can continue to measure accurately over the life of your equipment.

2) We offer high-quality calibration to maximize your instrument productivity

Keysight participates in calibration standards committees supporting ISO/IEC 17025:2005, ILAC-G8, ISO Guide for Expression of Uncertainty and ANSI/NCSLI Z540.3. This allows us to meet the latest standards for your industry and business needs. Your equipment will work with any application, because Keysight tests all specifications, all the time, so you get more utility from your instruments.

Consider six attributes when selecting a calibration provider:

Risks with other service providers		Rewards with Keysight
<b>1) Extent of testing</b>	<b>False pass/fail due to incomplete calibration</b> <ul style="list-style-type: none"><li>- Required instruments not available for range and accuracy of tests</li><li>- Steps avoided because complex tests take too much time</li></ul>	<b>Confidence in measurements and pass/fail with complete calibrations</b> <ul style="list-style-type: none"><li>- Calibrations that meet original factory specifications</li></ul>
<b>2) Information</b>	<b>Lack of data to support analysis and decision-making</b> <ul style="list-style-type: none"><li>- Inconvenience of retrieving data not stored electronically</li><li>- Hand-written reports prone to errors</li></ul>	<b>Historical data to support analysis and decision-making</b> <ul style="list-style-type: none"><li>- Data reports stored online for minimum of 7 years</li><li>- Full data for every calibration (as-received and as-shipped data)</li></ul>
<b>3) Scope of accreditation</b>	<b>Unvalidated ability to make needed measurements</b> <ul style="list-style-type: none"><li>- Calibrations made outside the scope of accreditation (including range and accuracy)</li></ul>	<b>Complete and low uncertainties</b> <ul style="list-style-type: none"><li>- Work within our scope of accreditation (range and accuracy)</li><li>- Measurement uncertainty analysis complete prior to calibration</li></ul>
<b>4) Periodicity</b>	<b>Higher costs due to lack of data access</b> <ul style="list-style-type: none"><li>- Inability to determine whether calibration interval should be extended or shortened</li></ul>	<b>Cost savings due to immediate data access</b> <ul style="list-style-type: none"><li>- Data available to recommend adjusting the calibration interval (extend interval for direct savings and shorten interval for indirect savings)</li></ul>
<b>5) Speed</b>	<b>Decreased uptime/productivity</b> <ul style="list-style-type: none"><li>- Shorter test times with sub-optimum and/or fewer measurement standards that result in larger uncertainty and higher probability of false pass decisions</li></ul>	<b>Increased uptime/productivity</b> <ul style="list-style-type: none"><li>- On-site calibrations that use the same measurement standards and automated procedures as those at service centers with complete measurement uncertainty analysis</li></ul>
<b>6) Packages</b>	<b>Unexpected costs</b> <ul style="list-style-type: none"><li>- Inability to provide adjustments that require OEM procedures</li><li>- Unexpected charges for shipping and repairs when out-of-tolerance conditions occur</li></ul>	<b>Extended instrument life</b> <ul style="list-style-type: none"><li>- Service that includes adjustments, firmware updates, service note updates, preventative maintenance, minor repairs, safety testing</li></ul>

$$u_{Proc} = \sqrt{u_{Rep} + u_{Res} + u_{Other} + u_{CalStd}}$$

$$g(d, e_{Bias}) = \frac{1}{2\pi\sqrt{1-\rho^2}} \exp\left(-\frac{d^2 - 2\rho de_{Bias} + e_{Bias}^2}{2(1-\rho^2)}\right)$$

$$G(h, k, \rho)$$

3) We restore your instrument to full functionality and original factory specifications

When Keysight repairs your instruments, you can be confident in every measurement you make. Our trained technicians have access to factory engineers and OEM replacement parts, service notes and firmware upgrades. Automated diagnostic tools enable fast and accurate fault detection for a speedy repair.

4) We listen and resolve issues quickly

A highly integrated cross-functional Keysight team continually applies Lean and Six Sigma methods to improve our products and services based on customer feedback. The Keysight Customer Issue Resolution Process helps us identify problems, with the goal of contacting customers within one business day to assure fast resolution. Keysight executives actively review the Keysight Customer Satisfaction Survey and take the results seriously; in fact, they're part of the executive score card.

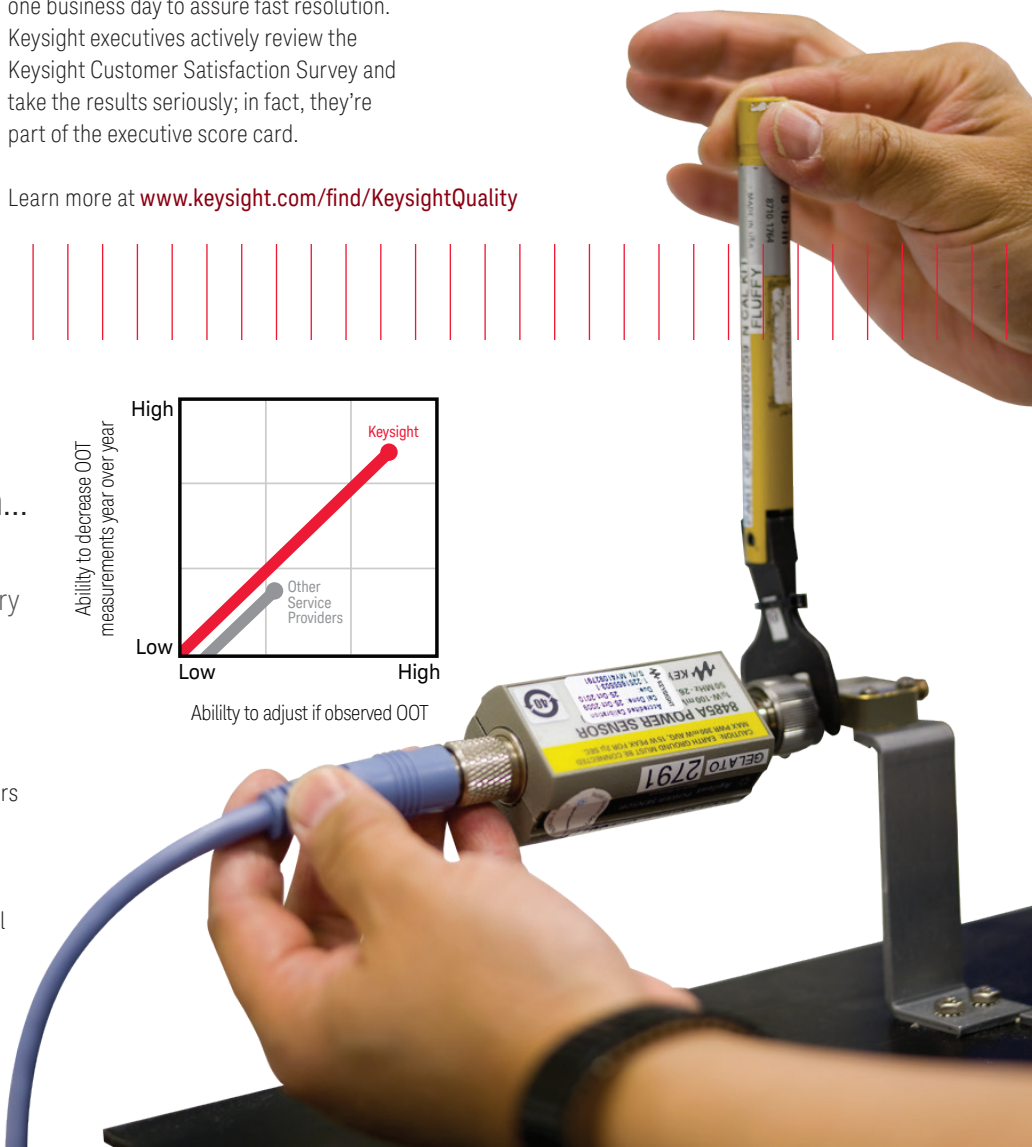
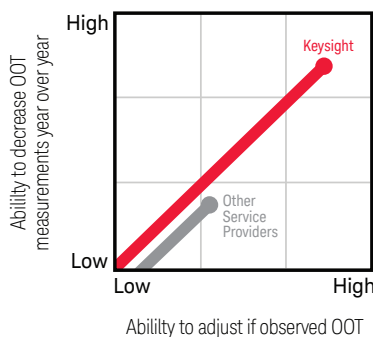
Learn more at [www.keysight.com/find/KeysightQuality](http://www.keysight.com/find/KeysightQuality)

## Calibration quality

Flexible delivery is not enough...

Count on every measurement you make, because we test every specification, every time. If not in spec, we find the problem and make an accurate adjustment.

Returning to Keysight year after year for calibration reduces your risk and exposure to hidden costs. Our data shows that, for customers who return to Keysight for calibration services after using other service providers, 10-15% of instruments are out of tolerance (OOT). By the third year of Keysight calibration, the same pool of instruments exhibit 4-8% OOT.



## WHAT IF...

your engineers are taking measurements with out-of-tolerance instruments?

- Do your engineers take into consideration the costs of false passes or false failures?

- Can your service provider reduce out-of-tolerance conditions year after year?

# Shared Expertise

## Instrument and services management

Manage your instruments and service events online for free

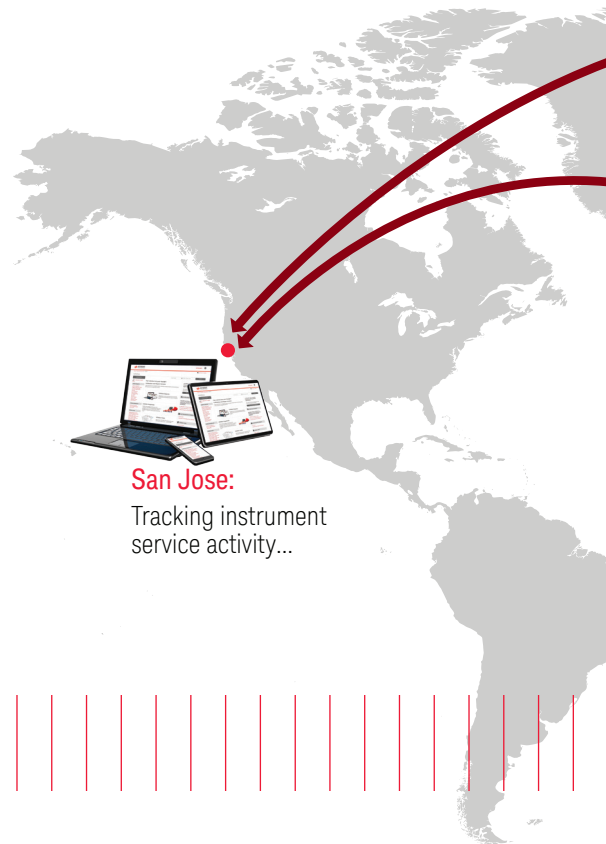
Your business depends on tools and processes to manage up-to-date instrument information and service events. Access instrument information, such as service notes, available hardware and software upgrades, and obsolescence notices, using our easy-to-use online interface. Create inventories, track instrument activity or location, and manage service events.

Meet audit compliance with confidence

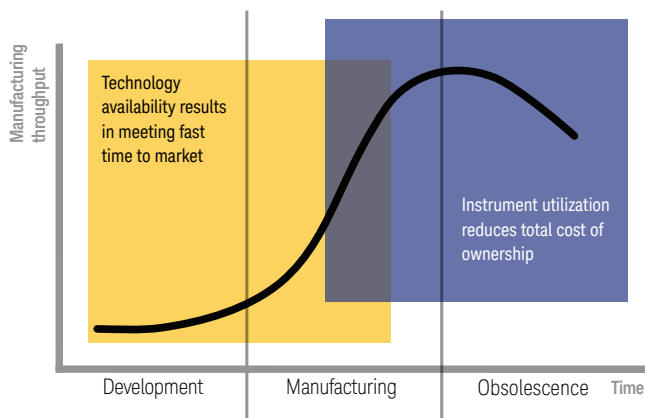
Your instrument managers can prepare easily for audits: All calibration certificates and full test results are available online and can be printed and downloaded to a CD-ROM.

Save time managing your instrument inventory with 24/7 availability

Your engineers can speed through essential tasks by viewing service records loaded automatically for Keysight instruments. Whether they need to know instrument calibration status, out-of-tolerance condition, service history or end-of-warranty date, the information is available on Infoline. They can also quickly access manuals, firmware, software and other useful tools. And your procurement teams can obtain service agreement coverage and pricing for our full range of services.



### Your business lifecycle phases



## WHAT IF...

you want to reduce cost of ownership for a group of instruments?

- Do you lack an accurate view of your inventory of assets, resulting in duplicate instrument purchases across programs?

- Can your service supplier link to the most up-to-date product requirements for each instrument, such as service notes, safety notes and firmware, to extend useful life?



Manage inventory anywhere  
through Infoline's secure database

Stuttgart:

Viewing  
instrument  
location...

Seoul:

Viewing status  
reports...

Reduce cost of ownership with  
valuable information and tools

With Infoline Online Services, your company can rely on a single secure database to manage your instrument inventory across locations from anywhere in the world. View instrument location and status reports to facilitate sharing of idle instruments. Track organization-wide service activity for optimal service budget planning. Manage Keysight and non-Keysight instruments in one place.

Learn more about Infoline Web Services at  
[www.keysight.com/find/service](http://www.keysight.com/find/service)

## Instrument lifecycle management

### Optimize your instrument utilization

Managing instrument utilization transforms your organization by reducing the need for capital expenditures and thus reduces total cost of ownership across your instrument inventory. The use of processes and tools to actively measure cost of maintenance and instrument usage across programs and departments allows you to achieve maximum instrument productivity during development, manufacturing and obsolescence. By tracking your instrument utilization across your business life cycle phases, you can make better decisions on timing to redistribute instruments across programs or departments and to rent, lease and purchase new or used instruments.

### Collaborate with Keysight to manage technology availability

With the right test technology in place, you retain your competitive advantage by developing products that keep up with the market. To help you determine the best test strategies for new product development, we share our future technology roadmaps under non-disclosure agreements. To ensure you have the right test equipment, we help you decide whether to purchase new technology or install hardware and software upgrades. And because the quality of Keysight products means reliable performance for years, we provide service plans for five years after the product is discontinued. If after that you're still not ready to move to new technology, we offer extended service plans for many of our systems and instruments.

### Balancing utilization and technology availability

A balanced approach to managing both utilization and technology availability reduces your total cost of ownership across multiple programs and departments. Whether you are migrating to a new technology, extending the life of an existing system, or developing a new program, Keysight has solutions to assist you in refreshing your existing test and measurement applications with the minimal investment and greatest return. The result is maximized utilization across your instrument inventory to drive down costs while meeting your manufacturing throughput and time-to-market goals.

## WHAT IF...

you could collaborate with test-and-measurement technology experts to maximize the return on investment from your test instruments?

- How would you share test-and-measurement technology investments across multiple projects, sites and teams?

- How can test-and-measurement technology expertise and visioning help speed up design and production?

## What's your plan?

### Improve the total cost of ownership for your instrument inventory

In Keysight's experience, our customers go through stages in managing their equipment's total cost of ownership (TCO). No matter what stage of TCO management your business is in, we can help. Keysight calibration and repair services consist of components of a solution that can grow with you or supplement your current stage of development. Lifetime TCO management consists of the three primary stages at right:

#### Keysight Calibration and Repair Services

Flexible service solutions to minimize downtime and reduce the lifetime cost of ownership  
[www.keysight.com/find/KeysightServices](http://www.keysight.com/find/KeysightServices)

### Stage One: Build your foundation

In the foundation stage, you create a single, accurate list of all instrument assets with service requirements by location to enable audit compliance, logistics management and service-expense tracking. In addition, you can assess the quality level of service and delivery choices you've purchased and how these impact costs. Stage One achieves a reduction in direct costs from service maintenance and indirect costs from changes in quality and service delivery options.

### Stage Two: Manage your current inventory of instruments

With Stage One complete, you can now examine details of your assets to save on capital expenditures. As capital requirements occur, you have the data you need to decide if you should reallocate idle equipment, purchase new equipment, upgrade current equipment, or dispose of excess or idle assets. Stage Two achieves greater financial control by managing equipment availability, allocating critical instruments to prioritized sites or programs, avoiding new instrument purchases and selling excess instruments.

### Stage Three: Plan your future inventory of instruments

With Stage One and Two complete, you now have the ability to measure utilization patterns across locations and programs while planning for future technology rollouts. Stage Three informs short- and long-term instrument purchasing plans, optimizing placement of existing instruments at key locations or programs and evaluating rental or lease options to meet your return-on-investment goals.

Whether you are migrating to a new technology, extending the life of an existing system, or developing a new program, Keysight has solutions to assist you in refreshing your existing test and measurement applications with the minimal investment and greatest return.



Measurement Confidence

Lifetime Performance

Shared Expertise

#### Expert Assistance

View Keysight global service locations and local contacts  
[www.keysight.com/find/Assist](http://www.keysight.com/find/Assist)

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