

RACAL INSTRUMENTS



Broadband Photonics Solutions

The only test system you want

is the one that's made for you.

RACAL



About Us

Racal Instruments produced the world's first compact electronic frequency counter in the late 1950's launching a broad line of instrument products for which Racal is still renowned. Since then Racal has led the way in several product areas: general purpose test equipment, automatic test equipment, VXIbus modules, communication test sets, laser diode and photonics test systems and burn-in stations, chassis, switching, and, most recently, turnkey system integration.

The global Automatic Test Equipment (ATE) market continues to grow at an accelerating rate, and Racal Instruments remains at the forefront with the technology, engineering, products and system integration services to support the industry's most demanding customer needs. We are the leading integrators of test systems for communications, broadband, military and industrial customers. Some of the numerous application solutions developed by Racal include laser diode burn-in, jet engine testers, automotive testing, digital communications and radar simulators.

The backbone of Racal Instruments' success relies heavily on the strength of our Engineering resources. Our company is committed to Engineering innovation and continues to apply the appropriate technology in our customer-centric system solutions. We back up our Engineering resources with a corporate-wide concern for quality that begins with design and continues through the manufacturing process to the actual field installation and support processes.

Our excellence in quality was recently recognized by Intel as we earned the coveted Intel SCQI (Supplier Continuous Quality Improvement) award for the second consecutive year, a first for any test instrument company. We did it for Intel, let us prove what we can do for you.

Why Racal Instruments

Racal, the only test instrument company with a Broadband Group, is the first and best choice for your laser diode burn-in, characterization, and Broadband functional test system requirements. Our wide range of standard and customized instrumentation products — from counters, waveform generators, Optical/RF/Microwave switching, signal generators, and LMDS, to chassis — provide us with a solid foundation for creating your test solution. Our strength in Mechanical engineering provides laser diode test systems specific to your device, whether it is CoS, Butterfly or Proprietary Packaging.

We provide the true final step with a team of test program software engineers that will partner with you to provide a complete turnkey solution: hardware, software, installation, and on-going support.

Anatomy of a Laser Diode Functional Test Solution

Modes of Operation

- ACC, APC, or MPD Control Mode
- Linear or PWM TEC drive
- TEC or environmental chamber-based operation current (with or without DC bias) device temperature

Device Fixturing

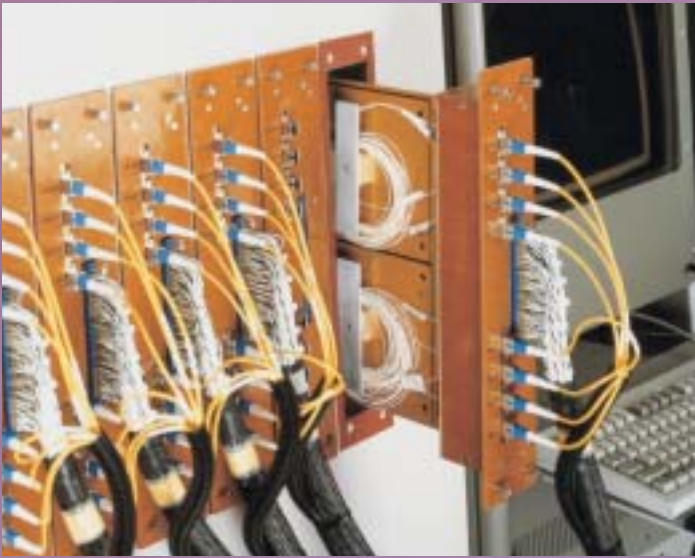
- Custom fixture design for packaged devices or chip-on-substrate
- Easy access to devices under test
- Modular design provides the ability to easily change device fixtures
- Multiple safety interlocks
- Multilevel probe fixtures available

Available Measurement Parameters

- Drive current
- Device voltage
- Optical output power
- Monitor photodiode current
- Device temperature
- Flange temperature
- Device TEC current
- Device TEC voltage



Chamber-based Photonics Test Stations



Our Photonics ET-48 laser diode test systems allow you to subject complete packaged laser diode assemblies, including output fibers and connectors, to a wide range of test temperatures while monitoring key electronic and optical parameters.

The Photonics ET-48 offers individual control of device drive currents and TEC temperatures and provides monitoring of forward current and voltage, front facet optical output, photodiode output, TEC voltage and current, and device thermistor temperatures.

The computer-controlled environmental chamber combines specialized modular fixtures designed for packaged devices (Chip on Submount [CoS] and other packages available upon request) with high-volume airflow to ensure uniform temperature

distribution within the test environment. Cooling options include closed-cycle refrigeration as well as liquid-nitrogen-based operation, which offers rapid thermal slew rates over an operating range spanning -60°C to $+200^{\circ}\text{C}$.

Each laser diode test system utilizes an intuitive Graphical User Interface, with source code provided to the end user to ensure long-term maintainability. A key feature of each system is device fixturing designed to integrate with multiple workstations in manufacturing process flows. With custom interfaces to manufacturing and corporate databases, these new systems are ideal for manufacturing burn-in, Bellcore reliability, and characterization uses.

Key Features

- Easy-to-use Graphical User Interface
- Test parameters programmable on a group or individual device basis
- Current drive from milliamps to over 100 amps
- Output power ranging from milliwatts up to 150 watts
- Up to 512 channels
- Ability to drive on-board TECs
- Thermoelectric or chamber-based environmental control
- High slew-rate operation available
- Over-temperature protection
- Open circuit protection
- Protection against AC line transients and power failure
- Architecture to meet your specific requirements



Photonics Drawer-based Test Stations

Demand for laser diodes has reached previously unimagined levels. With the thirst for product exceeding even the most optimistic forecasts, manufacturers of these diamonds of light find themselves faced with the need to ramp throughput levels, while meeting the stringent quality demands of the communications industries. At Racal

Instruments, a leading supplier of production and burn-in test

solutions to the optoelectronic and telecom industries, we focus on providing test solutions, which ensure your optoelectronics product(s) will meet and/or exceed all Bellcore/Telcordia specifications necessary for deployment.

The turnkey test solution we engineer may provide you with the following data, as a function of time, for your devices: device current, device voltage, and device relative optical output power; monitor photodiode current; temperature as measured by device-mounted thermistor; baseplate temperature; device TEC voltage, and device TEC current. These parameters, along with LIV measurements and data, will be measured periodically, with the interval between successive measurements set by the user.

Additional features include:

- User-definable pass/fail criteria for test parameters
- User-definable criteria for marginal devices
- Ability to set the operating parameters (drive current and temperatures) for each device, or a user-defined group of devices
- Fast-acting over current and over-temperature shutdown for each device
- Laser-quality drive current circuitry and AC filtering to ensure against AC mains-transient-induced failures
- Uninterruptible Power Supply (UPS) supplies power to the system control PC, maintains computer operations, enables recording of final data points for devices under test, and annotates the test event log in the event of an AC mains power failure
- One-button group re-start in the event of an AC mains power failure
- Simple-to-use, intuitive Graphical User Interface to set test parameters and control system operation
- VisualBASIC-based software. *Each system comes complete with source code*, allowing you the freedom to either contract with Racal to execute system upgrades or upgrade the test software in-house.
- System installation and training at your facility



Drawer Design

Features of the Drawers Include:

- Custom-tailored device carriers and test heads (CoS, To-Can, C-Mount, etc.)
- Patent-pending ButterflyNet™ to secure butterfly package firmly to heat distribution block
- Unique quick-release butterfly latches for easy device insertion and removal
- User-option for up to 16 devices simultaneously clamped per drawer
- Modular design to maximize system up-time and permit replacement of drawers during system operation for maintenance or calibration
- Optical Safety Key-lock shuts down lasers when drawer is unlocked
- Additional Optical Safety Backup to shut down lasers when a drawer is open
- Water-cooled Drawers avoid overextending HVAC systems while providing increased accuracy to strict temperature requirements



Laser Diode Characterizat

A laser diode characterization turnkey test solution from Racal will provide you with the following measurement capabilities:

- LIV Measurement
- Spectral Characterization
- Far-field Beam Characterization

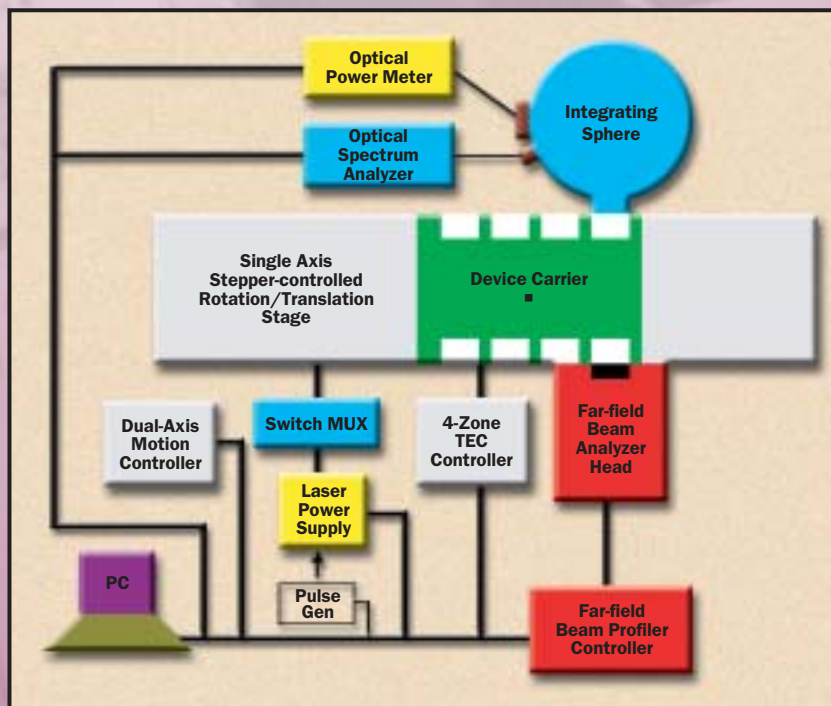
System Components

The system includes temperature-controlled device fixturing together with automatic motion control to perform all of the measurements listed above for multiple devices. Additional features may include:

- A simple-to-use, intuitive Graphical User Interface to set test parameters and control system operation
- User-definable criteria to define pass, fail, and marginal device performance criteria
- Our “common carrier” approach can minimize handling while increasing yield and throughput
- An ergonomic, integrated workstation design
- An Uninterruptible Power Supply (UPS), which supplies power to the system control PC in the event of an AC mains power failure. The UPS keeps the computer “alive”, enabling it to record final data points for the devices under test, and annotate the test event log to note that an AC mains power failure has occurred
- Installation of the system and training of your personnel at your facility
- The source code, which permits you the freedom to either contract with Racal to perform system upgrades or upgrade the test software in-house

System Design

Racal's Characterization Station utilizes an innovative dual-sided common carrier or single-sided carrier technology. While gathering far-field measurements on one side of the dual-sided carrier, optical power measurements and spectrum analysis are being taken simultaneously on the other, allowing for increased throughput. Racal automates the process via dual axis motion control, linear and rotary. The system provides a complete turnkey, safety conscious (laser shield not shown), hands-off approach, once test is started.



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System Design Continued

LIV Characterization

- Threshold current
- Device forward voltage
- Resistance
- Efficiency
- Kink
- Rollover Current

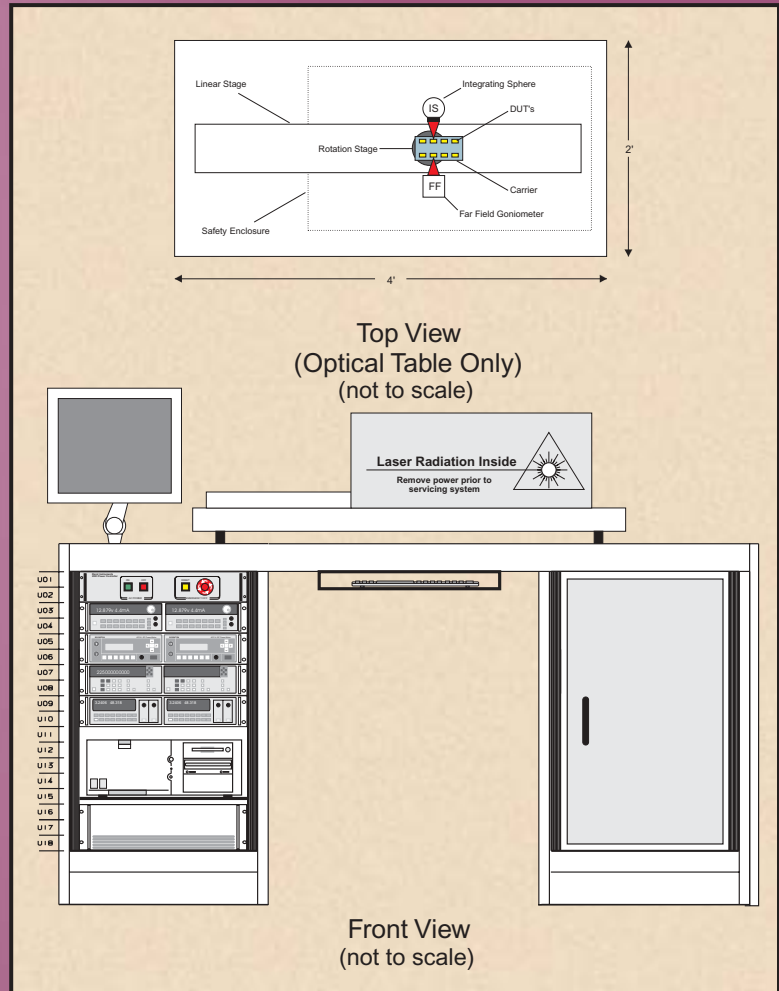
Far-Field Beam Profiling

- Orthogonal dual-axis profiling with scanning
- Beam profiles of fast and slow axes
- Calculated FWHM for both axes

Spectral Characterization

- Spectral characterization through grating spectrometer
- Calculated median wavelength
- Calculated FWHM spectral width

Additional measurements and/or derived parameters may be included as part of the system.



For additional information on how we can provide your Broadband Photonics Test Solution, please contact us at +1 800.722.2528, +1 949.859.8999, or e-mail: Sales@RacalATE.com



Racal Instruments Sales and Service spans the globe.

Racal Instruments' products are built to world-class standards and are backed by world-class service. We provide you with the assurance of global, 24 x 7 service support through our extensive network of factory and field-based engineers and service technicians, as well as our integrated network of support centers that have ready access to locally stocked parts. When you purchase any of our products, you have access to a flexible range of services that provide total-solution coverage and ensure minimum life-cycle costs and maximum productivity.

We offer a 24-hour helpdesk line for after-sales support. The helpdesk can be reached at helpdesk@racalstruments.com or by telephone at +1 800.722.3262, +44 (0) 8706.080134 or +852 2405.5500.

For additional information on our wide variety of service programs including calibration, extended warranties, preventive maintenance, installation, and training programs, visit our website at www.racalstruments.com, or contact our professional service team.

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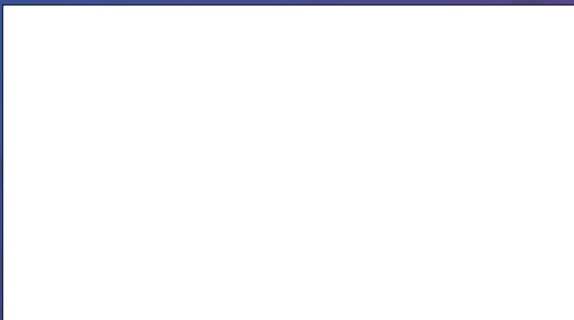
Racal Instruments, Inc.
4 Goodyear Street
Irvine, CA 92618
USA
Tel: +1 800.722.2528
+1 949.859.8999
Fax: +1 949.859.7139
info@racalstruments.com

Racal Instruments, Ltd.
480 Bath Road
Slough
Berkshire SL1 6BE
United Kingdom
Tel: +44 (0) 1628.604455
Fax: +44 (0) 1628.662017
info@racalstruments.co.uk



*Racal Instruments has a policy of continuous development.
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RACAL



Intel SCQI Award Winner
We did it for Intel...
We can do it for you!