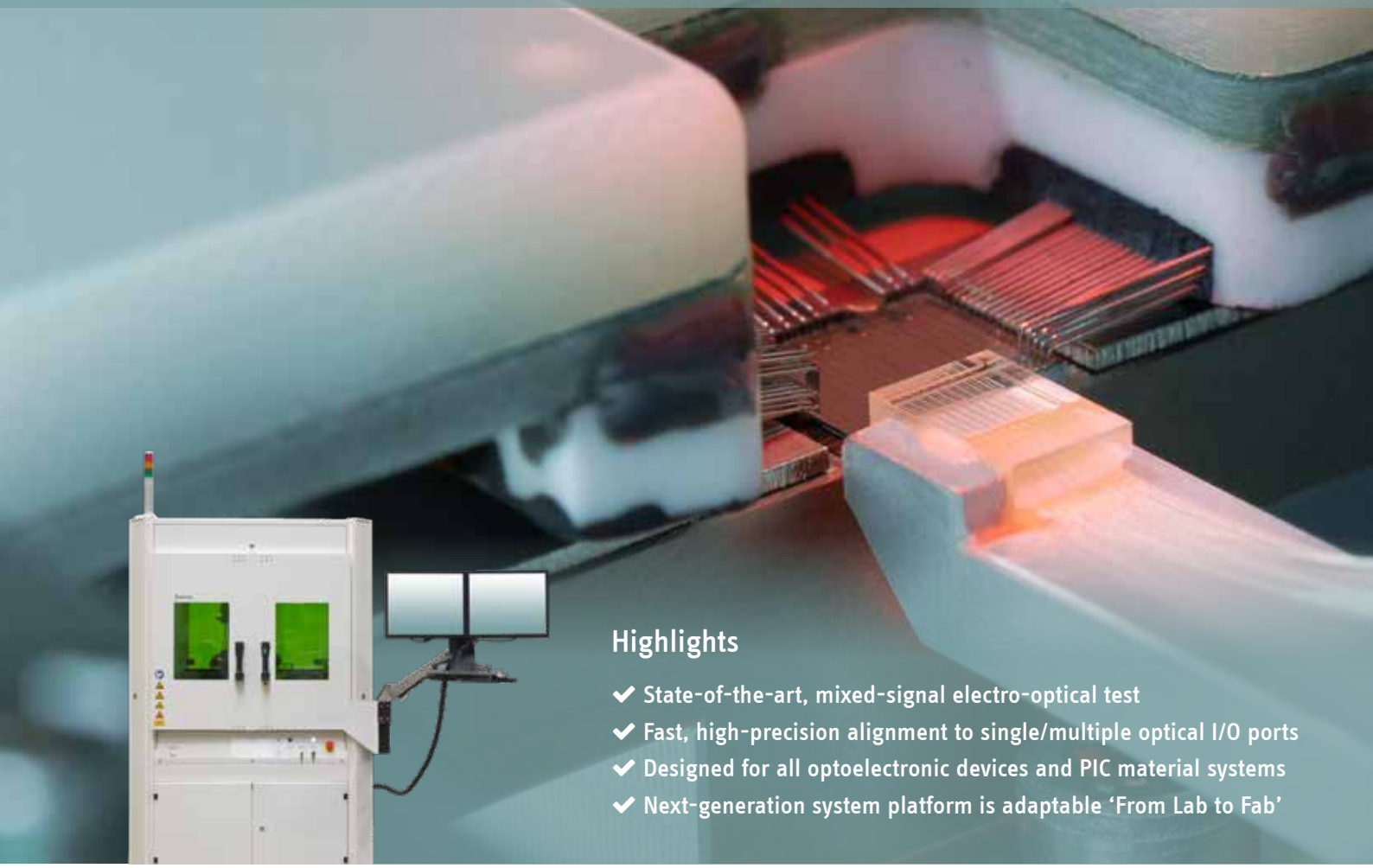
MANUFACTURING MADE LIGHT
Solutions for integrated photonics. Built to scale.

TESTLINE
Die-level photonic device test

Fully automated, mixed-signal electro-optical test systems for optoelectronics and singulated photonic devices. Featuring DC, RF and optical measurements in a production-optimized modular layout, and targeted at R&D, volume manufacturing, and anything in between.



Highlights

- State-of-the-art, mixed-signal electro-optical test
- Fast, high-precision alignment to single/multiple optical I/O ports
- Designed for all optoelectronic devices and PIC material systems
- Next-generation system platform is adaptable 'From Lab to Fab'

PHOTONICS AUTOMATED ASSEMBLY AND TESTING FROM LAB TO FAB

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photonics assembly & testing

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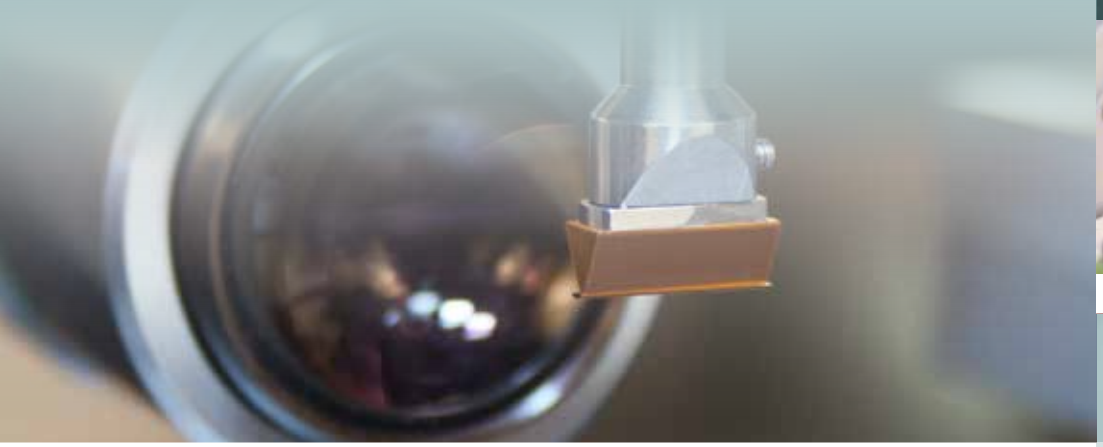
Fully automated single device electro-optical test

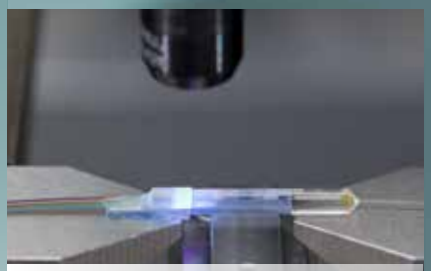
ficonTEC's Testline production systems are fully automated solutions for electro-optical testing of optoelectronic devices and of singulated PICs (passive/active). Other complex tasks include LIV, spectral and near/far-field beam characterization of single laser chips (incl. VCSELs), unmounted laser diode bars and chip-on-submount (CoS) sources. Lastly, Testline systems can be routinely equipped to also perform detailed optical facet inspection using Deep Learning for defect recognition.

Stand-alone systems are designed to provide as much multi-functional test-&-qualify capability as possible and are best suited to complex testing requirements requiring multiple capabilities within a single machine. This makes the stand-alone systems ideal for test development and for batch processing requirements.

ficonTEC's next-generation in-line system architecture is designed to be production-line-capable from the ground up. By utilizing state-of-the-art component handling and feed in/out options, Testline and Assemblyline systems can be combined in a task-optimized production line configuration to provide volume-capable manufacturing.



Active device e/o testing



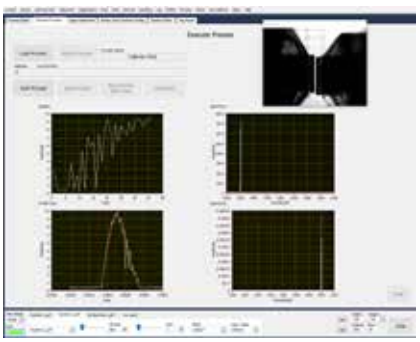
Dual fiber array alignment (active test)

LIV characterization

Software Control

Process Control Master (PCM) is ficonTEC's unified process-oriented control interface that ships with all turn-key stand-alone systems and multiple machine configurations. PCM features an intuitive UI that includes all machine vision, high-resolution positioning and system management software routines required to reliably and repeatably drive test process hardware.

PCM is fully enabled for automated mixed-signal electro-optical test and characterization tasks, as well as providing machine vision support for I/O probe-to-port alignment. An up-to-date feature set includes AI-based Deep Learning defect recognition capability, ML-oriented monitoring of production performance data, and the possibility to direct call functions in Python files.



Spectral and beam characterization functions displayed in real time

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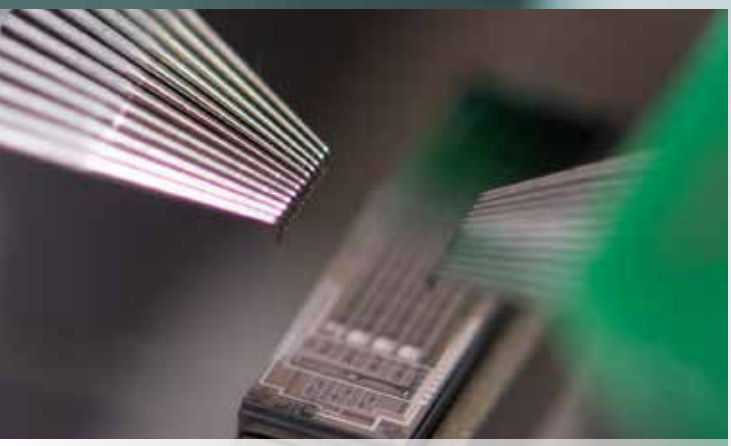

Multi-channel device testing

Modular & (re-)configurable platforms

- State-of-the-art die and carrier handling options
- FAB & HVM-ready – scalable and parallelizable
- Performance Services options for ML-based operation
- Operate, monitor and sync parallel lines remotely
- Add and/or swap modules to re-configure & re-purpose

TESTLINE is PXI-capable

Compatible with PXI-based e/o instrumentation modules and leveraging NI's LabVIEWTM. Integration with PCM is seamless, enabling sophisticated e/o test solutions to match individual requirements. Non-LabVIEW and alternative instrumentation environments are also compatible.

Key features

- High-precision motion referencing and alignment
- Pick-&-place from/to standard/custom carrier formats
- Die-level handling, testing and sorting as required
- Fiber alignment to I/O ports (arrays) in max. 4s
- Low-loss I/O port coupling with >0.4 dB repeatability

General tasks & applications

- Rapid R&D, in-line & end-of-line device testing
- Optical facet inspection with AI defect recognition
- Test-&-qualify of chips, single emitters, laser bars, PICs, silicon photonics, hybrid devices
- Applications in telecom/datacom/5G, sensors and lidar, transport & IoT, 3D scanning & healthcare

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Solutions for integrated photonics. Built to scale.

ficonTEC is the global market leader for automated assembly and test systems for modern optoelectronics and integrated photonic devices. An unequalled breadth in process capability has been developed in serving the needs of a broad range of applications, including telecom/datacom and 5G, sensors and lidar, IoT and mobility, high-power diode laser assembly, and many more.

A unique and modular approach to production equipment design means that each system delivered is the automated and optimized embodiment of a customer-defined process.

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Core system specifications	 T800	 T1200	 T1600	 T2000
Motion system	single optical probing with 6-axis high-precision alignment* electrical probing with 3-axis alignment	multiple optical probing with 6-axis high-precision alignment* electrical probing with 3-axis alignment		
Device handling	pick-&-place from/to Gel-Pak, Waffle Pack & custom		pick-&-place from/to Gel-Pak, Waffle Pack, blue tape & custom	
Temperature control	temperature-controlled chuck, +15 to +80 (+/- 0.1) °C			
Handling options	manual loading and/or single conveyor	automated loading with single or dual conveyor		
Machine vision	system referencing and observation camera options | device and I/O port referencing			
Software features	flexible and powerful process programming | extended operator-less control | Windows 10 PC			
Minimum connections	120 VAC (or country specific) | air/vacuum | 100 Mbit/s network			
Cleanroom compliance	ISO 6**			
Physical features	rugged steel base production cell			
Dimensions (w x b x h, mm)	800 x 1200 x 1600/2000	1200 x 1200 x 2000	1600 x 1200 x 2000	1800 x 1200 x 2000
Weight (typ., kg)	1300	1800	2300	2500

* alternative multi-axis configurations optional ** others available on request

TESTLINE systems are suitable for single, batch and volume testing of optoelectronics and singulated PIC devices. Multiple systems can be remotely controlled and operated in parallel and in sync. Custom systems, special purpose cells and robotic systems can be flexibly incorporated to suit customer requirements. Some TESTLINE functionality is available in ASSEMBLYLINE systems.

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