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

ASSEMBLYLINE
Die-level photonic device assembly

Fully automated, industry-qualified assembly for optoelectronics and singulated photonic devices and PICs. Featuring high-precision 'align-&-attach' bonding capability for all optical elements, fibers and arrays, as well as for die, chip or PIC integration and hybridization.

Highlights

- ✔ Fully automated passive/active photonic device assembly
- ✔ Designed for all optical element, fiber and chip assembly tasks
- ✔ Applications in sensors & lidar, HPLDs, co-packaging, PIC assembly
- ✔ Next-generation system platform is scalable 'From Lab to Fab'

PHOTONICS AUTOMATED ASSEMBLY AND TESTING
FROM LAB TO FAB

ficontec
photonics assembly & testing

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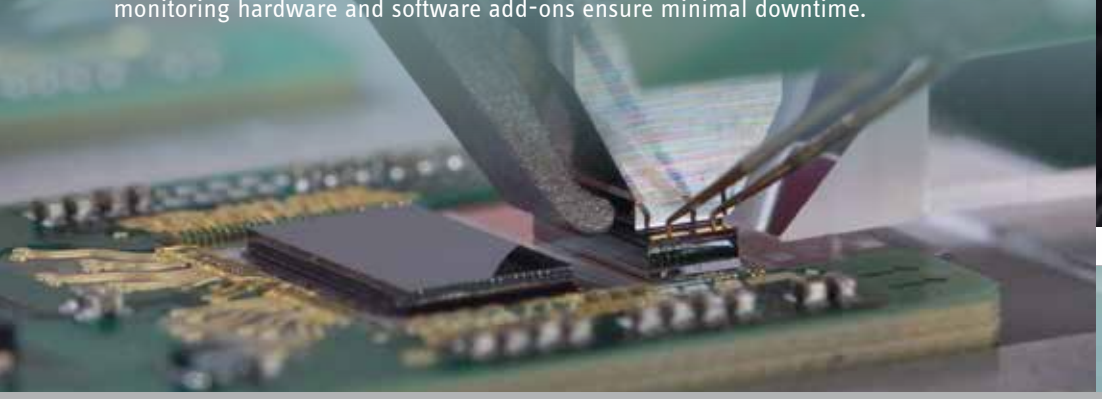
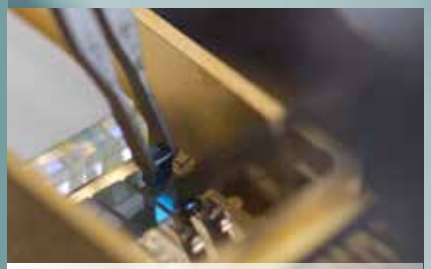
Fully automated photonic device assembly

Assemblyline systems are fully automated 'align-&-attach' assembly systems for the production of optoelectronics and photonic devices. They uniquely combine high-precision optical alignment capability with epoxy-based attachment, eutectic die bonding and/or laser soldering for all optical elements, waveguides, fiber types and PIC/chip hybridization tasks – all in an industry-proven design.

These assembly systems are available as individual, versatile, and highly capable stand-alone cells, or as highly specific in-line process cells for insertion into existing production lines. Optional modules provide additional features, including automatic tool changing, wafer handling capability and Testline (test-&-qualify) functionality.

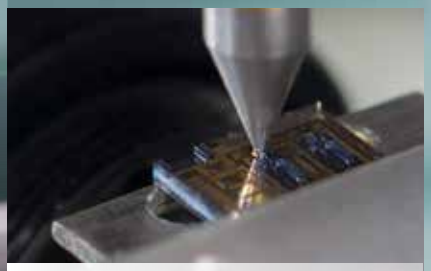
ficonTEC's next-generation system architecture is designed to be production-line-capable from the ground up. By utilizing state-of-the-art handling and feed in/out options, task-optimized Assemblyline and Testline systems can be combined in an extended line configuration for volume manufacturing. Optional, ML-based process monitoring hardware and software add-ons ensure minimal downtime.





Optical element align-&-attach

Active fiber (array) alignment



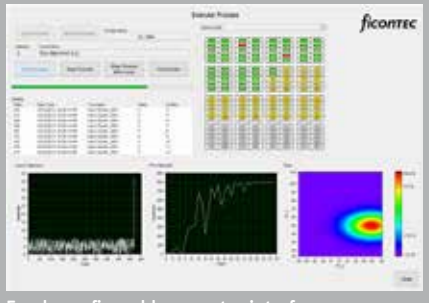
Chip-on-submount bonding

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 passive/active alignment and attachment/bonding process hardware.

PCM is fully enabled for automated mixed-signal electro-optical test and characterization tasks. An up-to-date feature set includes AI-based Deep Learning defect recognition capability, ML-oriented production data monitoring for reduced downtime, and the possibility to direct call functions in Python files.

High-level function interface



Freely configurable operator interface

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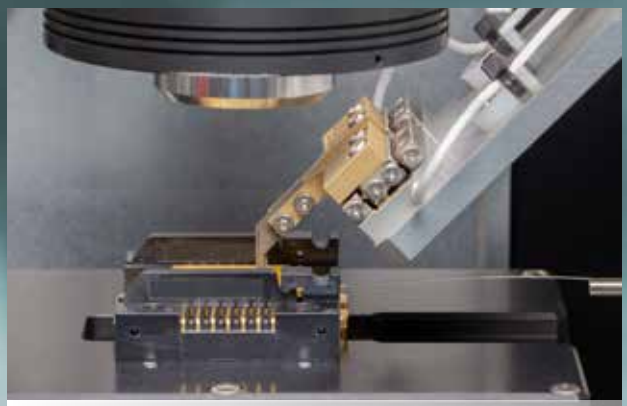


Package assembly & fiber pigtailing

Key features

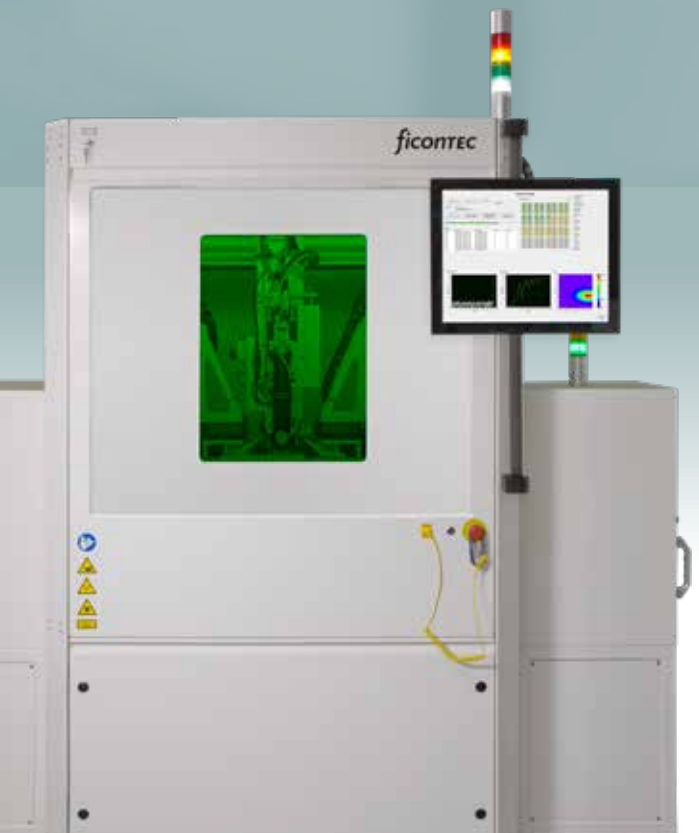
- High-precision motion referencing and alignment
- Pick-&-place from/to standard/custom carrier formats
- Fully automated passive & fast-active ‘align-&-attach’
- Epoxy and eutectic bonding, laser soldering
- OCR-compatible for component traceability

Modular & (re-)configurable

- 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 or swap modules to re-configure & re-purpose

General tasks & applications

- All optical element & chip-on-XXX ‘align-&-attach’ tasks
- Fiber & waveguide assembly/pigtailing/connectorization
- Adaptable to high-complexity co-packaged applications
- For FTTX transceivers, HPLD modules, hybrid integration, MOEMS, PICs, silicon photonics, co-packaged devices sensors and lidar, transport, IoT and 3D scanning



ASSEMBLYLINE is PXI-capable

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

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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.

Contact us

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Core system specifications	 A800	 A1200	 A1600	 A2000
Motion system	minimum 6-axis high-precision 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			
Load options	manual loading and/or single conveyor	automated loading with single or dual conveyor		
Feed options	suitable for Jedec or Auer boats, or for customer trays			
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

ASSEMBLYLINE systems are suitable for single, batch or high-volume 'align-&-attach' tasks for all optical and fiber-optical component assembly, optoelectronics and PIC device integration. Multiple systems and lines can be remotely controlled and operated in parallel and in sync. Special purpose cells, robotic systems as well as some TESTLINE functionality can be flexibly incorporated to suit customer needs.

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