CUSTOMLINE
Flexible, multi-purpose ‘align-&-attach’ platform

A highly capable development and/or batch processing platform, uniquely combining high-precision optical alignment capability with a multiplicity of bonding technologies. Designed for all optical, fiber and die/chip/PIC connection and hybridization tasks.

Highlights
✓ Flexible and highly capable photonic device assembly platform
✓ For all optical, fiber and die/chip/PIC connection and hybridization tasks
✓ Designed for collaborative R&D and low-volume/jobshop environments
✓ For sensors & lidar, co-packaging, SiPh process development and more...
Flexible, multi-purpose ‘align-&-attach’ platform

CUSTOMLINE is a highly capable development and/or batch processing platform for customers in the semiconductor and photonics packaging market. More than any other ficonTEC product, these systems combine high-precision optical alignment capability with a multiplicity of assembly technologies – including epoxy-based attachment, eutectic die bonding and laser soldering.

Available as a versatile and stand-alone assembly cell, and with the broadest array of installable modules for any ficonTEC platform, CUSTOMLINE can be configured – and re-configured – to the widest range of R&D, process development and batch manufacturing tasks. Extensively utilized in academic and collaborative research as well as in photonics jobshop environments, CUSTOMLINE is an industry-proven design.

Importantly for any development process, CUSTOMLINE systems can be operated manually, semi automatically or fully automatically. Optional modules extend functionality even further, including automatic tool changing, wafer handling capability and TESTLINE (test-&-qualify) functionality.

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.
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Modular & (re-)configurable
• State-of-the-art die and carrier handling options
• Highest number of diverse module types available
• Add or swap modules to re-configure & re-purpose
• Processes directly transferable to production systems
• ficonTEC’s most versatile platform for development needs

Key features
• High-precision motion and alignment (µm/sub-µm)
• Pick-&-place from/to standard/custom carrier formats
• Epoxy and eutectic bonding, laser soldering
• Heating plate, bond force and flip-chip modules
• Exploratory R&D through to batch production

General tasks & applications
• All optical element & die/chip/PIC ‘align-&-attach’ tasks
• Fiber & waveguide pigtailing & connectorization
• Transceiver, co-packaging & hybrid development
• Flexibly configurable with TESTLINE capabilities
• Development and batch manufacturing for sensors and lidar, communications, transport & IoT, and 3D scanning

CUSTOMLINE in collaborative R&D
CUSTOMLINE systems are used extensively and successfully within collaborative funded research throughout Europe and at other locations around the globe. The combination of flexible automation, capability diversity and large working space make CUSTOMLINE ideal for highly exploratory and innovative development.
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**

<table>
<thead>
<tr>
<th>Core system specifications</th>
<th>C2000</th>
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<tbody>
<tr>
<td><strong>Motion system</strong></td>
<td>minimum 4-axis (3+1) high-precision alignment*</td>
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<tr>
<td><strong>Device handling</strong></td>
<td>pick-&amp;-place from/to Gel-Pak, Waffle Pack, blue tape, custom</td>
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<tr>
<td><strong>Temperature control</strong></td>
<td>temperature-controlled chuck, +15 to +80 (+/- 0.1) °C</td>
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<td><strong>Load options</strong></td>
<td>any combination of manual and/or automated loading (with single or dual conveyor)</td>
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<tr>
<td><strong>Feed options</strong></td>
<td>suitable for Jedec or Auer boats, or for customer trays</td>
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<tr>
<td><strong>Machine vision</strong></td>
<td>system referencing and observation camera options</td>
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<tr>
<td><strong>Software features</strong></td>
<td>flexible and powerful process programming</td>
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<tr>
<td><strong>Minimum connections</strong></td>
<td>120 VAC (or country specific)</td>
</tr>
<tr>
<td><strong>Cleanroom compliance</strong></td>
<td>ISO 6**</td>
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<tr>
<td><strong>Physical features</strong></td>
<td>rugged steel base production cell</td>
</tr>
<tr>
<td><strong>Dimensions (w x b x h, mm)</strong></td>
<td>1800 x 1200 x 2000</td>
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<tr>
<td><strong>Weight (typ., kg)</strong></td>
<td>2500</td>
</tr>
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</table>

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

**CUSTOMLINE** systems are primarily intended as a powerful and flexible ‘align-&-attach’ platform for R&D and process development. They are also suitable for single and batch production tasks for optical, fiber-optical, optoelectronic and PIC device integration. Special purpose cells, robotic systems as well as some TESTLINE functionality can be flexibly incorporated to suit customer needs.