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

Process Control Master

Software Control Interface

ficonTEC's user-friendly and process-oriented application software control interface that ships with all stand-alone and multiple machine configurations. Making machines that are much more than just the sum of their parts.

Highlights

- Universal software control suite and optional add-ons
- Powerful library of pre-engineered assembly & test control functions
- Pre-loaded with routines & algorithms for machine vision
- NEW – ficonEDGE, ficonTEC's new Edge computing platform

PHOTONICS AUTOMATED ASSEMBLY AND TESTING
FROM LAB TO FAB

ficonTEC
photonics assembly & testing

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Software Control, PCM

Probably our most important product feature, Process Control Master (PCM) is our user-friendly and process-oriented software control interface. Flexible and agile process control, scalability and an open access architecture enable customized assembly & test solutions suitable for early device development, for new product introduction, and for high-volume manufacturing (HVM) – no knowledge of programming is needed.

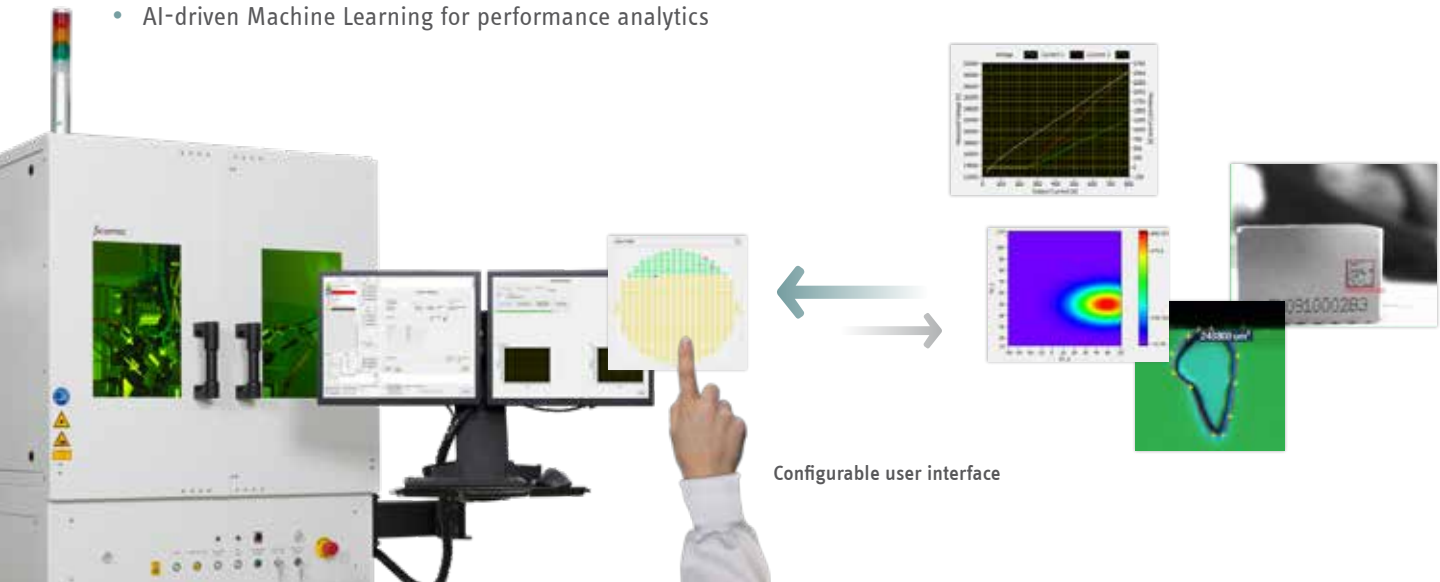
PCM features an intuitive machine/process interface that includes all referencing, positioning, handling, system control & management as well as machine vision routines required to reliably and repeatably drive all available processes and hardware. It comes already fully enabled for automated electro-optical test and characterization tasks, including routine tests such as optical power insertion losses, spectral measurements, electrical/optical bandwidth and temperature dependence measurements. More complex modular instrumentation such as tunable laser sources, multi-channel power meters, optical switches, etc. are also included.

PCM drives not only our single stand-alone systems but is also already tried-&-tested for multiple (in-line) machine installations employed in HVM environments. For traceability requirements, testing protocols and automated testing sequences gain benefit from direct interfacing to an SQL database, also providing the user with access to statistical analysis of the data. Data visualization and operational analysis can be further enhanced through optional Performance Services.

Key features

- Expansive, powerful library of assembly & test functions
- Process Editor for fully configurable process sequencing
- Pre-loaded with machine vision routines & algorithms
- Recipe-based management of process steps & parameters
- Development tools: de-bug, position/jog panel, camera view, etc.
- Interface adaptable to show real-time operational data
- For stand-alone systems and multiple machine configurations
- ‘Crash protection’ boundaries for motion system
- Logging of operation-critical process steps & performance data
- Deep Learning tools for optical inspection
- AI-driven Machine Learning for performance analytics

Process editor



Configurable user interface

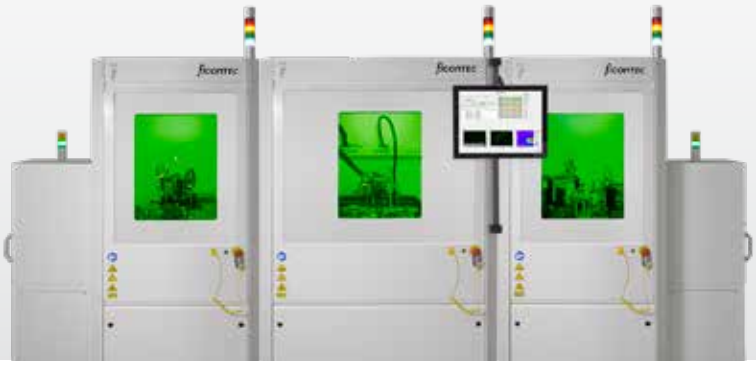
Process Control Master
Software Control Interface

Process development & optimization

ficonTEC can help customers with their process optimization at all stages of development and realization. By working to understanding the customer needs, we can combine our technical expertise in the production process design – including those aspects relating to software control. This is of particular importance in translating manual assembly and testing protocols during the migration from prototyping/development to volume production.

PCM provides powerful and adaptable process tuning and sequencing that can be further optimized by leveraging the statistical data logged in the SQL database. Yield, cycle time, uptime, device performance and cost per part can all be optimized within the available parameter space allowed by the production process, within a single cell machine or across entire production lines comprising multiple in-line machines.

By optimizing each step right from the design phase, introducing innovative processes, utilizing high levels of advanced automation for even the most demanding assembly tasks, and holding it all together with our tried-&-tested software control, ficonTEC provides a reliable route to high-volume manufacture.



Compatibility

- LabVIEW-based, SQL database, PXI-compatible
- Open interface for integration of customer software routines
- USB 2.x and higher, IEEE 1394 (FireWire), GigE, CameraLink
- Pre-loaded with drivers for direct interfacing to a huge range of commercial instrumentation: Agilent, DILAS, Keithley, Keyence, Lumentum, ThorLabs, Yokogawa and many more.

Services

- 'Remote monitor & sync' of multiple installations
- 'Autonomy at the Edge' via the new ficonEDGE performance add-on

Remote Services

Remote sync & monitor

A Revision Control Server (RCS) can be implemented locally or remotely to monitor and synchronize process parameters across multiple lines, thus enabling maximum repeatability and consistency of performance and yield, even across global activities.

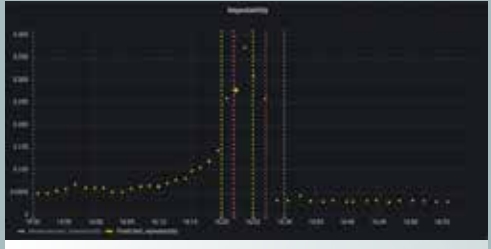
Self-adaptive production workflow

NEW – ficonEDGE

Machine Learning for process optimization

PCM already logs a wealth of real-time physical and optical production data of all process steps. ficonEDGE allows streaming of several additional data sources & leverages this data to open the door to data-driven optimization of production KPIs using cutting-edge machine learning. Use cases include:

- Self-adaptive production: By integrating model outputs directly into the process, a closed loop is formed between machine and edge platform. No human interaction is required, thereby saving resources.
- Yield & process control: Review and analyze data locally with a well documented dashboard solution. Alerts can be easily distributed via common messenger systems and even configured for direct interaction with the machine.
- Predictive maintenance: Monitor the status of critical machine components in real time, identify potential hardware issues and efficiently manage and minimize any downtime.



Dashboard with integrated alerting

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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

ficonTEC Service GmbH
Achim, Germany

T +49 4202 51160-0
info@ficontec.com

For ficonTEC subsidiaries
and distributors around the globe:

www.ficontec.com/locations

Process Control Master v2.x

Primary features	powerful library of pre-engineered assembly & test control functions process editor for fully configurable process sequencing pre-loaded with routines & algorithms for machine vision recipe-based management of process steps & parameters
Motion system	compatible with all available ficonTEC motion systems, including: 1. passive referencing via machine vision system using multiple cameras 2. high-precision 3 – 12 axis positioning system (more axes on request)
Machine vision	standard/multiple positioning and observation camera options
Component handling	pick-&-place, feed systems, single/dual conveyor
Component tracking	OCR-based component recognition, die sorting, wafer mapping, etc.
Wafer capable	wafer handling and wafer-level processing in qualified machine systems
Expansion	open interface for integration of customer software routines
User management	Admin/Service/User/Operator & customer defined
Remote operability	remote monitor & sync via RCS / autonomous operation via Performance Services
Min. requirements	Windows 10 x64 OS (min.100 Mbit/s network connection required)
Connectivity	USB 2.x and higher, IEEE 1394 (FireWire), GigE, CameraLink, TCPIP

ISO 9001 Certification
ficonTEC Service GmbH is licensed to
ISO 9001:2008 certification, by DNV GL/Hamburg, Germany

Vers. PC/23-06en