PI's Advanced Digital Motion Controller; the backbone of Fast Multichannel Photonics Alignment Engine design
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PI PRESS RELEASE

Ultra-Fast Optical Alignment System for SiP Production from PI Named a Prism Award Finalist

January 2016, Auburn, MA – Motion and nanopositioning systems expert PI (Physik Instrumente) LP was named a 2016 Photonics Prism Award finalist for its FMPA Fast Multichannel Photonics Alignment Engine. This advanced alignment system is based on a highly specialized digital motion controller with embedded advanced alignment and tracking functionality and a hybrid precision scanning and tracking mechanism combining the advantages of piezoelectric on servo-motorized drives. The prestigious award – also referred to as the "Oscars of Photonics" – is presented by SPIE & Photonics Media. Winners will be announced on February 17 during the SPIE Photonics West conference, at the Prism Awards for Photonics Innovation gala banquet.

The Silicon Photonics (SiP) Problem
The convergence of silicon based electronics and photonics promises a leap in data throughput, parallelism, and energy efficiency. Design and materials challenges have by now been addressed. Practicalities of testing and packaging have not.

Test and packaging of silicon photonics elements require nanoscale alignments that cannot be performed using visual or mechanical references. Instead, these optimizations must enhance the optical throughput itself. In addition, SiP designs often incorporate multiple parallel optical paths with multiple, interacting inputs and outputs, all needing optimization. Simple economics as well as optical realities dictate that these be optimized simultaneously, yet until now there has been no technology capable of doing this.

Watch the FMPA System Animation
https://www.youtube.com/embed/Skdf8ekrHbU?rel=0

The Solution
With more than three decades of experience in ultra-precision motion control for semiconductor manufacturing and metrology, PI has addressed the need for fast, parallel, nanoscale-accurate, multi-degree-of-freedom global optical alignment optimization required in key SiP production steps from planar test to packaging.

This enabling solution integrates PI's high-throughput piezo nanopositioning technologies and ultraprecision motion control with novel algorithms. Introduced at the SPIE Photonics West 2015 conference, the groundbreaking technology was developed by PI's team that comprises more than a century of photonics alignment automation experience and includes foundational participants in the field. The system is part of PI's broad offering of photonics alignment engines ranging from software-driven stage solutions to integrated 6-axis hexapod micro-robots with built-in alignment functionality.

Specifications, Datasheet, More Information
http://www.pi-usa.us/products/Photonics_Alignment_Solutions/index.php#FMPA

Applications of the FMPA Engine
Fields of applications include automation, seminconductor applications, photonics, bio-nano-technology, metrology, microscopy, micro-manipulation, including cleanroom applications.

Standard and Custom
PI has over 4 decades of experience providing in-house engineered precision motion control solutions, and can quickly modify existing product designs or provide a fully customized OEM part to fit the exact requirements of the customer's application.

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About PI
PI is a leading manufacturer of precision motion control equipment, piezo motors, air bearing stages and hexapod parallel-kinematics for semiconductor applications, photonics, bio-nano-technology and medical engineering. PI has been developing and manufacturing standard & custom precision products with piezoceramic and electromagnetic drives for 4 decades. The company has been ISO 9001 certified since 1994 and provides innovative, high-quality solutions for OEM and research. PI is present worldwide with twelve subsidiaries, R&D / engineering on 3 continents and total staff of 850.

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