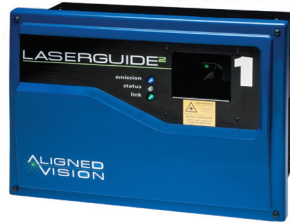
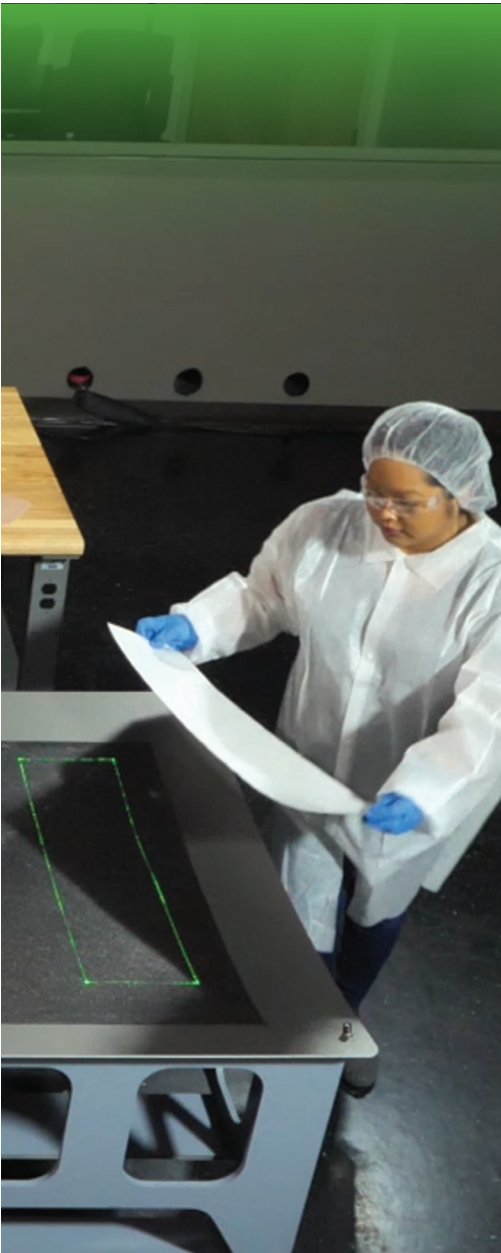


ALIGNED VISION

- LASER PROJECTION
- 3D AUTOMATIC INSPECTION
- AS-BUILT DIGITAL TWIN
- MOBILE PROCESS CONTROL



LASERGUIDE²



MICROLASERGUIDE



LASERVISION



BUILDGUIDE

ALIGNED VISION

Lowest Cost
Quality Management
Tools for the
Manufacturing
Shop Floor

OUR CUSTOMERS ENJOY

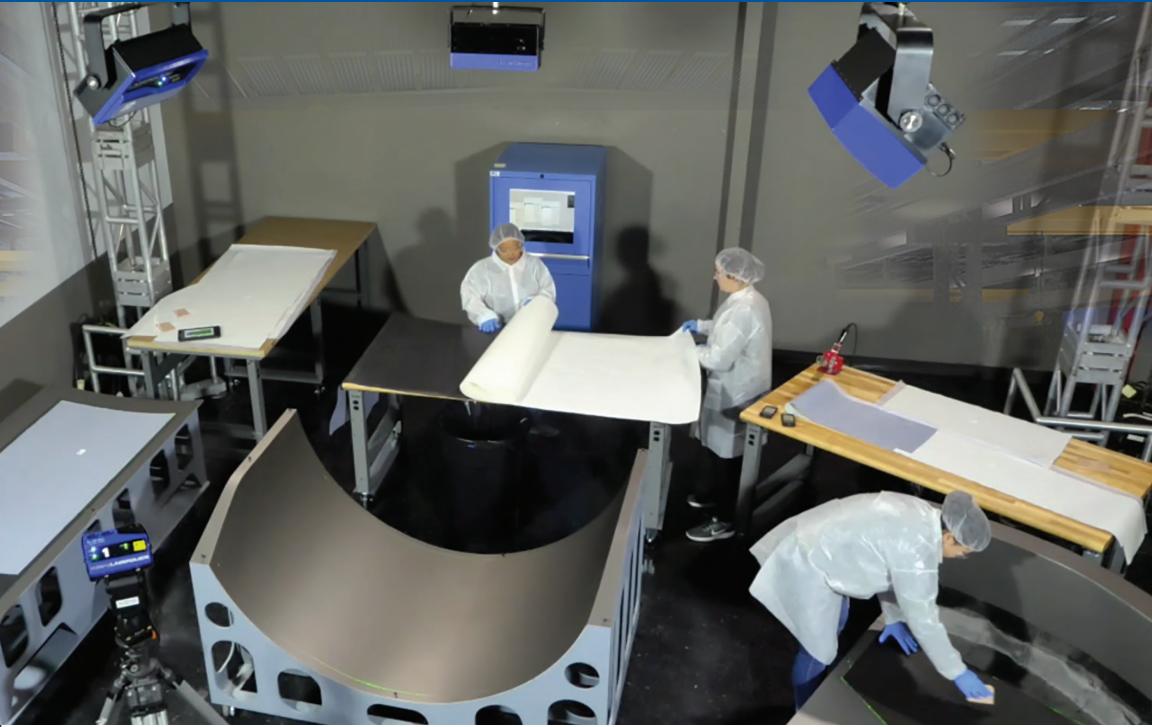
- Lowest Cost, Highest Performance Laser Systems
- Greatest Savings in Operating Costs
- Accelerated Quality Manufacturing
- Full Scalability and Extensibility into Industry 4.0 Platforms



BUILD WHAT YOU DESIGN
AND VERIFY WHAT YOU BUILD
- AUTOMATICALLY

NO ANNUAL FEES

for best-in-class laser projection, automatic inspection, mobile process control and control software



Aligned Vision technologies directly communicate design intent to the manufacturing floor, then automatically verify as-planned and as-built components match. Our systems join virtual design and engineering data with real production, helping you:

- Reduce operating costs
- Optimize manufacturing quality and speed
- Automatically verify and document that your products meet customer requirements
- Feed closed-loop continuous improvements across your operations

Aligned Vision systems operate as digital point solutions with immediate out-of-the-box standalone benefits, and as Industry 4.0 building blocks for tomorrow's digital factory.

LOWEST TOTAL COST OF OWNERSHIP

Spend the Least

- No annual fees
- Multitasking your team will actually use
- Rugged, durable equipment = low maintenance costs
- 2-year warranty
- Low-cost service with rapid turnaround (global support centers)
- FREE lifetime email/phone support
- Legacy equipment still fully supported

Save the Most

- Align 4.0 minimizes cycle time
- Fast registration and automated realignment with AutoAlign and SystemAlign
- Full-function touchscreen remote controls eliminate step-away time
- Electronic work instructions accelerate tasks
- Automatically populated electronic reports eliminate error-prone paper travelers



LASERGUIDE²

LASER PROJECTION SYSTEM

microLASERGUIDE

3D industrial laser projection has never been as cost efficient, accurate, reliable and versatile as it is today with LASERGUIDE².

WITH ANY LASERGUIDE² SYSTEM, YOU WILL:

- Save money by meeting your needs with the fewest projectors, controllers and setup activities
- Reduce setup time with a full suite of functions that align projectors automatically
- Keep up to 4 teams adding value by projecting 4 jobs per projector with our multitasking feature
- Keep operators working on fabrication – instead of projectors – with our industry-leading reliability

THE ONLY company with a projector for every application

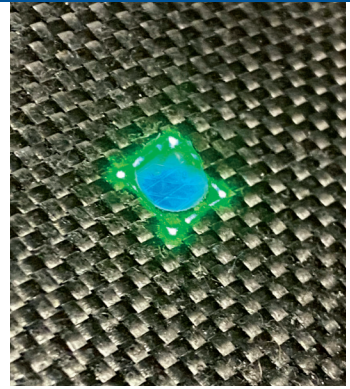
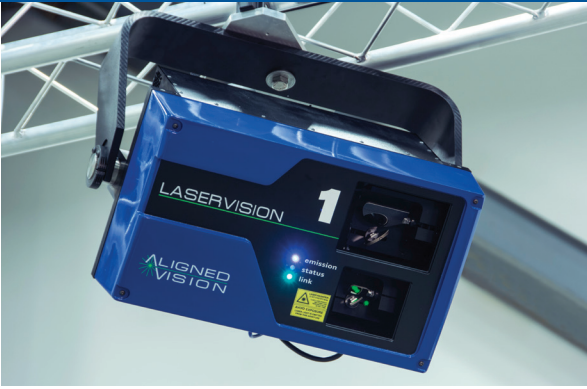
<p>LASERGUIDE²</p>	<p>Industry's foremost standard system</p> <p>Best-in-class range and functionality</p> <p>Designed for projection range of 3 to 20 ft</p>
<p>LASERGUIDE² Long Throw (LT)</p>	<p>Same outstanding features as LASERGUIDE²</p> <p>Designed for projection range of 3 to 40 ft</p>
<p>LASERGUIDE² Long Throw Extended (LTE)</p>	<p>Same outstanding features as LASERGUIDE²</p> <p>Designed for projection range of 3 to 50 ft</p> <p>Proven Boeing-qualified projection at 50 ft every time</p>
<p>microLASERGUIDE</p>	<p>Only 8 lb in an 8½" x 4" x 5½" housing</p> <p>Greatest accuracy in an ultra-portable package</p> <p>Easy handling, mounting and relocating by a single operator</p>

PROVEN PROGRAMS

START DATES

LASERGUIDE: Eurofighter Typhoon (1990), Boeing 777 (1990), Sikorsky Blackhawk (1991), Falcon 9 (2010)

MicroLASERGUIDE: F1 McLaren (2000), Renault (2002)

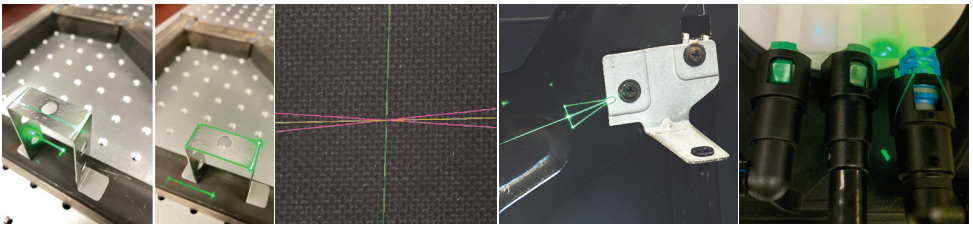


LASERVISION

3D PROJECTION AND AUTOMATIC INSPECTION SYSTEM

Integrating machine vision with proven industrial laser projection, LASERVISION brings large-field 3D automatic inspection to your shop floor. **Automatically verify ANY visible attribute with AI-enabled, large field inspection (6-25m²) and laser guidance.**

BOOSTING QUALITY AND SPEED, LASERVISION:



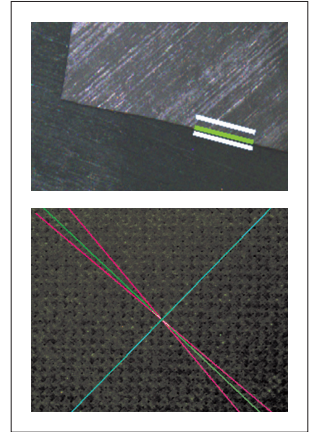
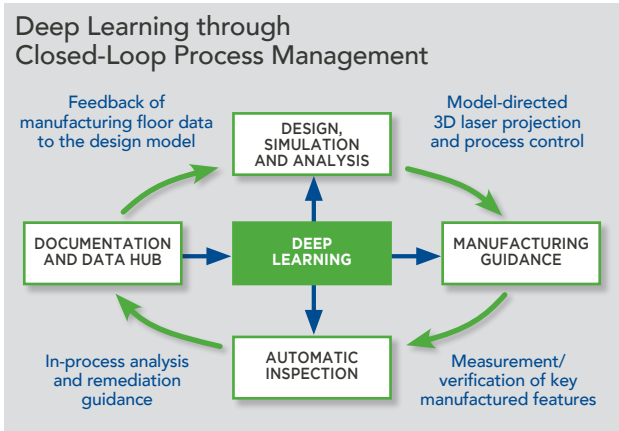
Provides robust, automatic inspections that cannot be performed by smart cameras, metrology or human inspectors

- Minimizes idle time – automatically performs an inspection when the electronic work instructions call for it
- Eliminates inspector wait time – conducts inspections in seconds with no operator intervention
- Captures ultra-high resolution images anywhere in a giant field of view (up to 25m²)
- Markedly reduces rework and scrap – verifies attributes in real time and flags FOD, misaligned materials, missing fasteners or other flaws for immediate correction
- Automatically populates electronic documentation and generates the as-built digital twin, including:
 - Calibrated images of every inspected surface
 - Any nonconformances
 - Any corrective actions
- Feeds deep learning and closed-loop process improvements
 - Quantifies uncertainty
 - Enables tighter allowables and less overdesign



LASERVISION: Boeing 777-X (2017), Sikorsky Blackhawk (2019)

AS-BUILT DIGITAL TWIN



With Industry 4.0 on the near horizon – or already here – for many manufacturers, Aligned Vision products stand at the ready. The manufacturing intelligence generated by our BUILDGUIDE, LASERVISION and other systems – both images and data – automatically populates the as-built digital twin, a virtual representation of each individual component's specific attributes.

WITH THE AS-BUILT DIGITAL TWIN, YOU WILL:

- Aggregate and contextualize component-specific data, including:
 - Material lot, out-time and other critical attributes
 - Team members involved in the build, and their roles
 - Duration of each manufacturing task
 - Debulk times and vacuum levels
 - Nonconformances and corrective actions
- Capture and save calibrated images from every automatic inspection
- Automatically combine calibrated images into a single image of each manufactured surface
- Enable direct comparison of as-designed and as-built digital twins
- Feed manufacturing intelligence to deep learning systems that generate closed-loop manufacturing improvements
- Quantify uncertainty, enabling tighter allowables and less overdesign



ALIGN 4.0 CONTROL SOFTWARE SOLUTION

ALIGN 4.0 is an open-platform system that helps accelerate operator value-added tasks and enables Industry 4.0 connectivity for 3D laser projection and automatic inspection processes. Only one control computer is needed to run up to 8 jobs simultaneously, minimizing equipment and maintenance costs as well as shop floor footprint, and making file management easy.



ALIGN 4.0 MULTITASKING SOFTWARE:

Up to 8 remotes
per controller

Supporting
Industry 4.0
productivity
and quality

WITH ALIGN 4.0, YOU WILL:

- Support full control of each fabrication job both at the controller and on smart mobile devices
- Support AutoAlign to automatically locate targets for any projector, and SystemAlign to automatically register all projectors when the first is registered
- Make operators more efficient by giving them 3D CAD images, 3D ply viewer window and other improvements
- Improve Industry 4.0 connectivity with:
 - Support of master csv
 - Multiple file formats
 - Full integration both upstream and downstream of projection/inspection operations
 - Plug-and-play PLC interface

**PROVEN
PROGRAMS**

START DATES

Multitasking Software: F-22 (1995); C-17 (1998)



BUILDGUIDE

PROCESS CONTROL SUITE

Put your product work instructions literally in the palm of your operator's hand. BUILDGUIDE process control suite provides step-by-step guidance to your operator electronically via familiar mobile devices – smartphone or tablet.

REDUCING COSTS AND RAISING QUALITY AND SPEED, BUILDGUIDE:

- Ensures that parts are built as designed
 - Complete graphic work instructions and ply book pages on each operator's mobile device
 - Non-projected steps included in instructions
 - Debulk management on device ensures correct sequence, vacuum pressure and duration
- Tracks all work steps and build progress electronically, including:
 - User logins, work orders, part selection and ply confirmation
 - Electronic buyoffs from each operator and inspector
- Generates a complete electronic report of each build, including:
 - Process parameters (e.g. debulk vacuum and duration)
 - Process sequence/timing
 - Buyoffs



BUILDGUIDE: F-35 (2015), GE (2015), Janicki (2017)



SMART MOBILE DEVICES

Keep your team at the tool, adding value. Familiar smart mobile devices replace paper work instructions and travelers with electronic work instructions and travelers with electronic buyoffs – all at the tool.

LOWERING OPERATING COSTS

A SMART MOBILE DEVICE IN EACH OPERATOR'S HAND:

- Provides full control of the fabrication steps
 - Full support of electronic work instructions with color graphics
 - Operator advances through steps via “Next” button on device
 - “Next” button automatically initiates LASERVISION inspections (when called for in the electronic work instructions)
- Replaces tedious interaction with control computer
 - Support of multiple jobs and up to 8 mobile devices on a single computer
 - Step-away time from tool eliminated
 - Real cycle time reductions generated

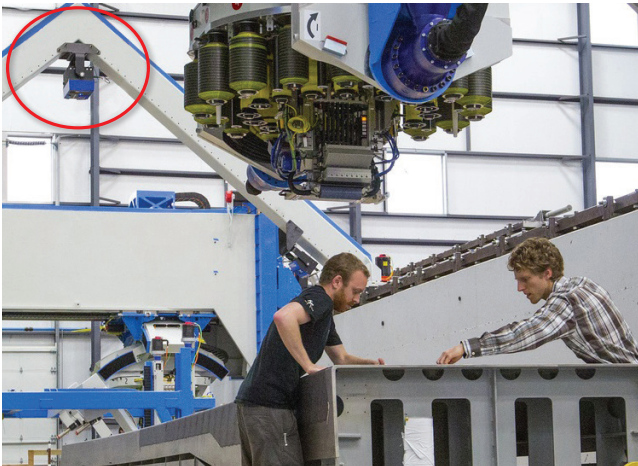
AUXILIARY COMPONENTS

- Targets: Repairable, NIST traceable certification
- Stands: Portable, stock, custom
- Wireless label printers
- Barcode readers
- LED matrix billboards
- Certification tools



SDK

SOFTWARE DEVELOPMENT KIT



Aligned Vision systems are ready for digitalization and automation of the shop floor. Our SDK is proven on production floors to enable integration with automated manufacturing systems, including automated fiber placement (AFP) and automated tape laying (ATL).

SDK INCLUDES:

- Automatic maintenance of common coordinate system
- Complete SDK: API, DLL, manual, sample code
- Instant display of any defect location, tow, course, boundary, lap or gap

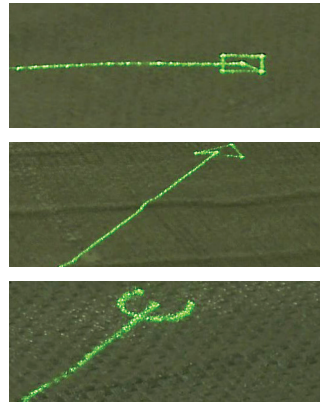
PROVEN PROGRAMS

START DATES

SDK: 787 (2012), 777-X (2017)

KITGUIDE

NEST SORTING



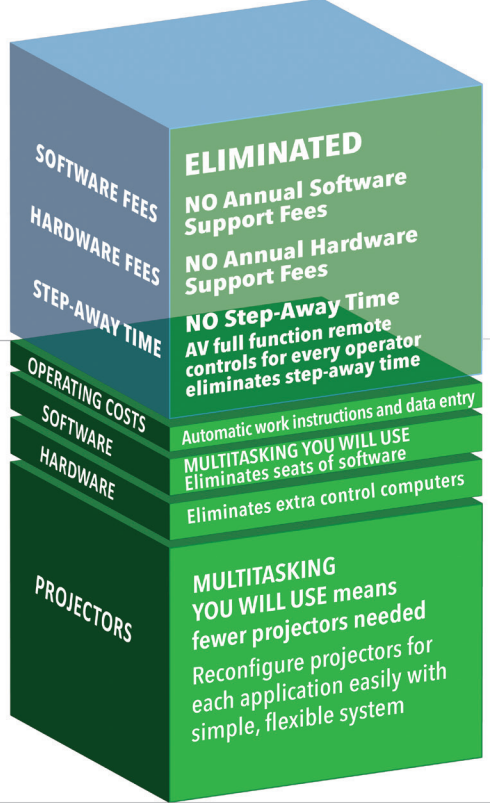
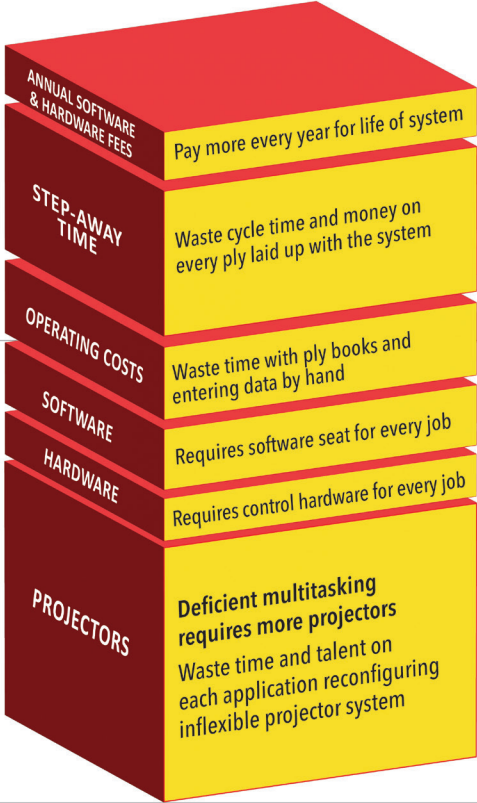
Reducing operating costs considerably, KITGUIDE uses accurate laser pinpointing to identify the next component to be unloaded from a cutting table during kitting procedures.

INCREASING KITTING EFFICIENCY, KITGUIDE:

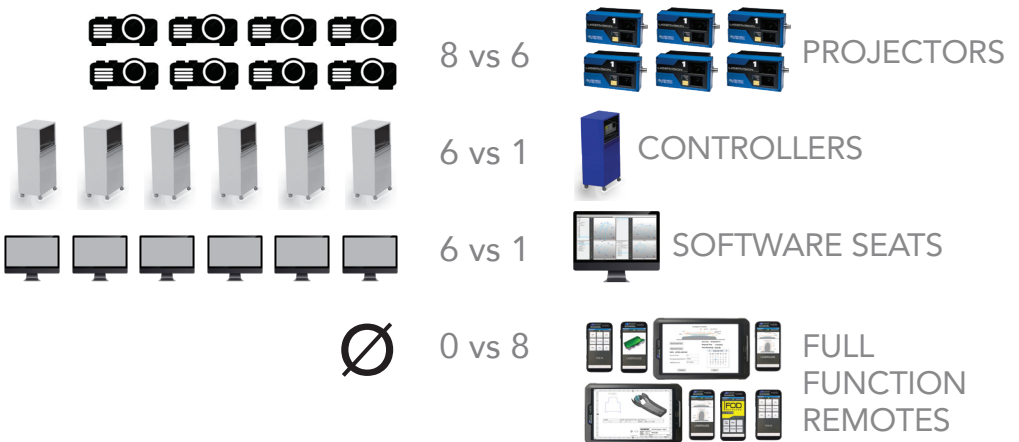
- Speeds sorting and eliminates kitting errors
 - Eliminates ply maps and label-based sorting
 - Supports simultaneous unloading from both sides of table
- Simultaneously guides unloading for up to 4 kits
- Generates barcode labels with optional wireless printers
- Supports up to 4 mobile devices and 4 printers
- Compatible with all nesting and cutter software

LOWEST COST LASER SYSTEM

Other Laser Systems

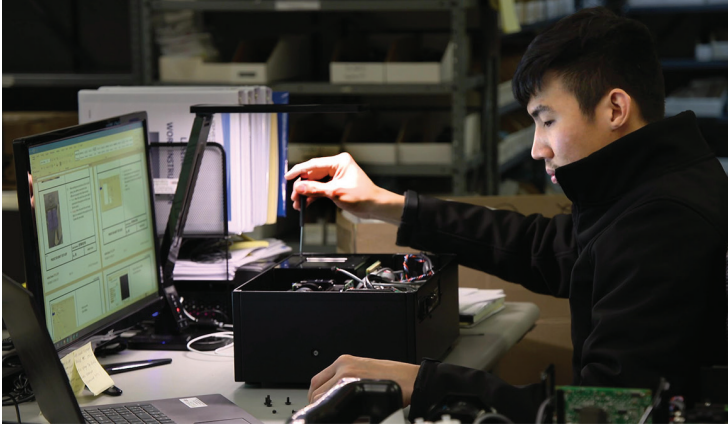


Results of a detailed cost analysis show that Aligned Vision offers the lowest cost laser systems on the market today. A low projector price doesn't mean much if you have to pay additional upfront and annual costs. Consider, for example, what it takes to perform six jobs simultaneously.





EXPERIENCE SUPERIOR CUSTOMER SERVICE



- No annual fees
- Immediate technical support
- Unlimited free phone/email support
- Artificial Intelligence-enabled rapid application development
- Quick service turnaround: 2-3 days
- Lowest cost cal/cert and overhaul
- Loaner units provided during servicing
- Field-replaceable laser and galvos
- 2-year warranty



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