Cambridge Technology

Moving Light, Years Ahead.™

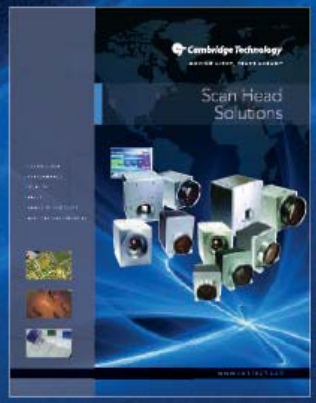
Scanning Components | Scan Heads | 3-Axis and High Power Scanning Systems
Lightning II Digital Scanning Platform | Scan Controllers and Application Software

Moving Light...Since 1970...As the original inventor, committed innovator, and market leader for optical scanning Galvo technology, CTI can provide you with the broadest range of optical scanning solutions.

Cambridge Technology
Moving Light, Years Ahead.™

Five Product Lines that Focus Our Technology on Your Application Needs

Components



2-Axis
Scan Heads

Scan Control

3-Axis
Scanning Systems

Lightning II Digital
Scanning Platform

From the Best Scanning Components...
To the Best Integrated Solutions

Mission Statement

Cambridge Technology
Moving Light, Years Ahead.™

To develop and supply the most
Cost-effective,
Highest Performance
& Highest Quality
scanning components and subsystems
that enable the continued advance and growth
of our customers' system applications.

Worldwide Presence

Cambridge Technology
Moving Light, Years Ahead.™

★ Headquarters and Manufacturing
★ Regional Support (Sales & Application)

Industry Leading Manufacturing

Cambridge Technology
Moving Light, Years Ahead.™

- High Volume / High Mix Flexibility
- Efficiency-Focused Procedures
- Database-Driven Operation
- Comprehensive Supplier Management
- Extensive Inspection (Incoming, In-Process and Burn-in)
- Well-Trained Experienced Workforce (No Turnover)
- Automated Testing (at component and system level)
- Ongoing Process Development

Industry Leading R&D

Cambridge Technology
Moving Light, Years Ahead.™

- Accuracy — Position Detection Technology
- Speed — Actuator Technology
- Cost — Product Design & Mfg Processes
- Reliability — Bearing Technology & Mfg Processes
- Control — Servo & Controller Technology
- Integration — Components, Heads, Scanning Systems & Custom Solutions
- Applications — Material Processing, Biomedical, …

From The Best Scanning Components…
…To The Best Integrated Solutions

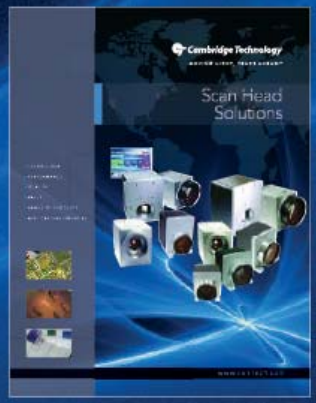
- The Best Technology
- The Best Performance
- The Best Quality
- The Best Value
- The Best Range of Products
- The Best Application Expertise

Moving Light, Years Ahead™

Cambridge Technology
Moving Light, Years Ahead.™

Five Product Lines that Focus Our Technology on Your Application Needs

Components



2-Axis
Scan Heads

Scan Control

3-Axis
Scanning Systems

Lightning II Digital
Scanning Platform

From the Best Scanning Components...
To the Best Integrated Solutions

Applications Served

Material Processing

Laser Marking, Drilling, Welding, Treating…

BioMedical

DNA analysis, OCT, Ophthalmology, Confocal Microscopy

MicroMachining

Semiconductor Trimming, Memory Repair, LCD...

Film Printing & Digitization

3D Profiling, Imaging & Inspection

Dermatology

Skin resurfacing, Hair removal...

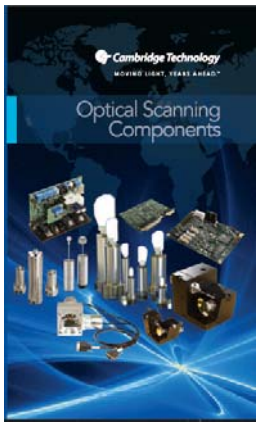
Rapid Prototyping

Laser Projection

Industrial & Entertainment

Military

Applications by Product Lines



- Laser Marking
- BioMedical
- Dermatology
- MicroMachining
- Laser Projection
- 3D Imaging
- Semiconductor
- Film Printing & Digitization
- Military

- Laser Marking
- MicroMachining
- PV Scribing
- Stent Welding
- Converting

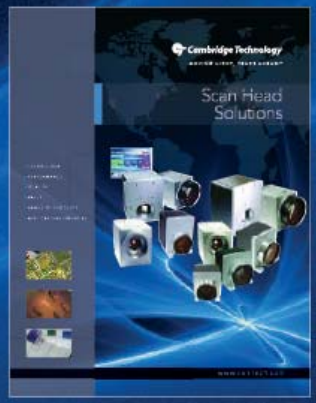
- Converting
- High-Speed Cutting
- Rapid Prototyping
- Surface Treatment
- Textile

- Via-Hole Drilling
- PV Scribing
- Trimming
- High-Accuracy Marking
- LIDAR
- Terabyte Mapping

Cambridge Technology
Moving Light, Years Ahead.™

Five Product Lines that Focus Our Technology on Your Application Needs

Components



2-Axis
Scan Heads

Scan Control

3-Axis
Scanning Systems

Lightning II Digital
Scanning Platform

From the Best Scanning Components...
To the Best Integrated Solutions

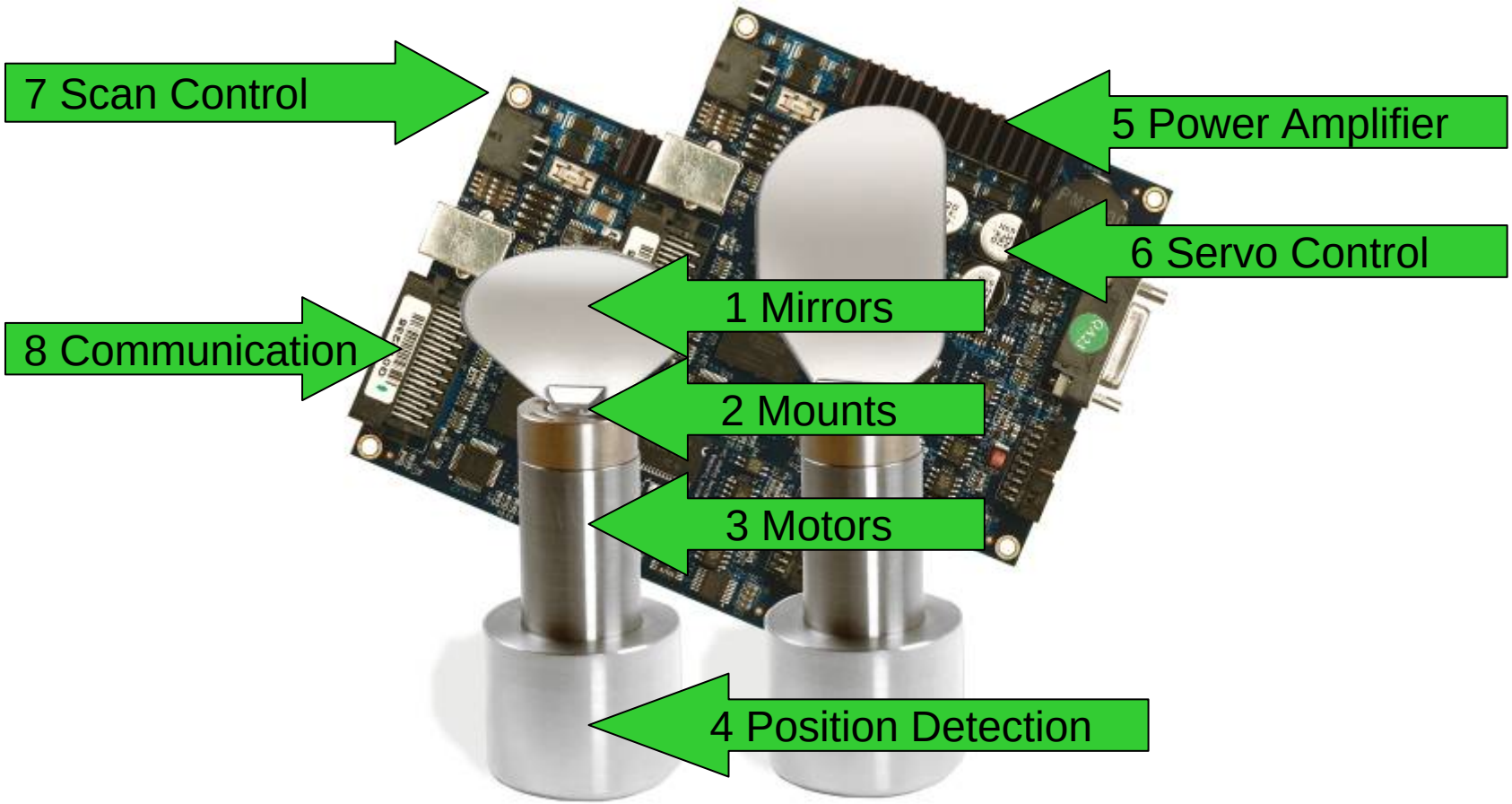
Technology & Market Leader

Cambridge Technology
Moving Light, Years Ahead.™

- Invented Galvo Technology Over 40 Years Ago
- Largest & Most Experienced Optical Scanning R&D Team
- Over 80 Patents On Scanning Technology
- The World Largest & Smallest Galvos (1-100mm Aperture)
- Broadest Range Of Scanning Products
- Highest Performance – Speed, Accuracy & Stability
- Best Field-proven Reliability and Life-Time
- Worldwide Sales and Application Support
- Greater Than 75% Galvo Market Share
- Over 1,000,000 Galvo Motors In Operation

Innovations in Scanner Technology

Cambridge Technology
Moving Light, Years Ahead.™



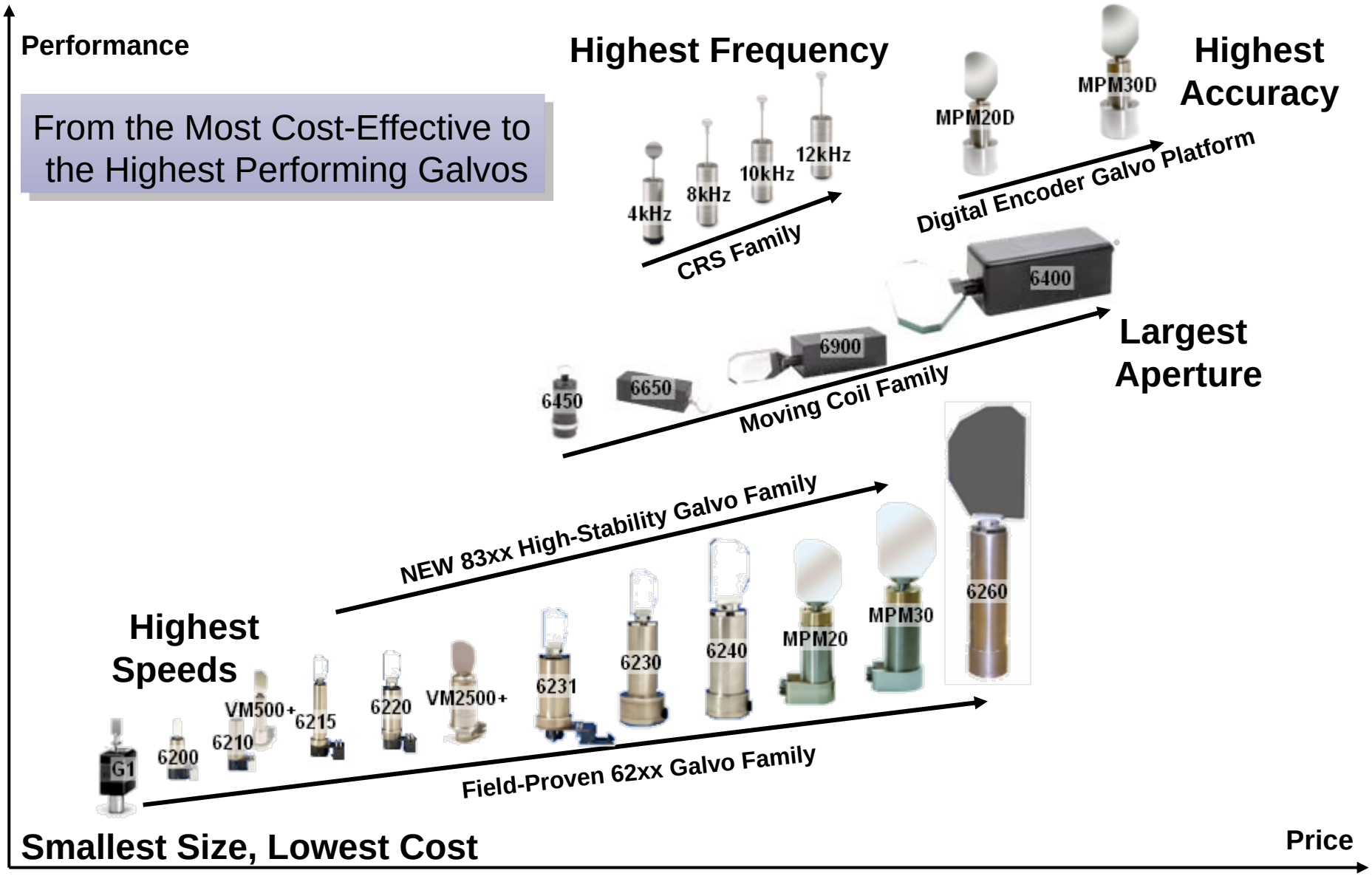
Industry Leading R&D

Cambridge Technology
Moving Light, Years Ahead.™

- Accuracy — Position Detection Technology
- Speed — Actuator Technology
- Cost — Product Design & Mfg Processes
- Reliability — Bearing Technology & Mfg Processes
- Control — Servo & Controller Technology
- Integration — Components, Heads, Scanning Systems & Custom Solutions
- Applications — Material Processing, Biomedical, …

Broad Range of Galvo Motors

Cambridge Technology
Moving Light, Years Ahead.™



Broad Range of Servo Drivers

Cambridge Technology
Moving Light, Years Ahead.™

Performance

Highest Speeds

From the Most Cost-Effective to the Highest Performing Servos

Advantages of CTI Analog Servos:

- Higher Accuracy
- Smaller Size
- Lower Cost

659
Lowest Cost
Single-Axis
Analog
PID

677 / ASD
Smallest Size
Single-Axis
Analog
PID

673-2
Cost Effective
Dual-Axis
Analog
PID

671-2/HP
High Power
& Stability
Single-Axis
Analog
PID

Analog Technology

Digital Technology

Lightning
AutoTune
High Speed
Dual-Axis
Digital
PID

DC2000/3000
Self Tune
Higher Speed
Dual-Axis
Digital
State Space

Lightning II Platform
Integrated Scanner
& Laser Control
Single-Axis
Digital
State Space
& PWM

Advantages of CTI Digital Servos:

- Higher Speed
- Automated Tuning
- Digital Feedback
- Ease of Use

Smallest Size, Lowest Cost

Price

Broad Range of Scan Controllers

Cambridge Technology
Moving Light, Years Ahead.™

From the Most Cost-Effective to the Highest Performing Controllers

SC500

- Lowest Cost
- Compact
- PC-driven
- USB-based
- 3 Axis Analog / XY2
- Laser Control
- MOTF
- Aux I/Os

EC1000/SM1000

- Full-featured
- Stand-alone
- Ethernet-based
- µVector Generation
- 3 Axis Analog / XY2
- Laser Control
- Hi Perf MOTF
- Aux I/Os

Lightning II Platform

- Integrated Controller/Servo
- 24 bit GSBus Communication
- Velocity-Modulated Laser Control
- SkyWriting Optimization
- High Level Programming
- MOTF
- Aux I/Os

Broad Range of Scan Heads

Cambridge Technology
Moving Light, Years Ahead.™

From the Most Cost-Effective to the Highest Performing Heads

ProSeries1

- 7, 10 & 14mm
- 62xx Galvo Technology
- Highest Analog Speed
- Low Noise and High Accuracy
- Very Good Temperature Stability
- Lowest Cost
- MicroMax Analog Servo

ProSeries2

- 7, 10 & 14mm
- 83xx Galvo Technology
- Highest Accuracy
- Lowest Noise
- Best Temperature Stability
- Customization Available
- MicroMax Analog Servo

LightningXP

- 7, 10 & 14mm
- 62xx Galvo Technology
- Highest Speed
- Flexible Tuning Parameters
- Self-Tuning and Remote Access
- “Zero” Tracking Error
- State Space Digital Servo

ProSeries2

Large Aperture

- 20 & 25mm
- 83xx Galvo Technology
- Highest Accuracy
- Lowest Noise
- Best Temperature Stability
- Customization Available
- MicroMax Analog Servo

Broad Range of 3-Axis Systems

Cambridge Technology
Moving Light, Years Ahead.™

From the Most Cost-Effective to the Highest Performing 3X Systems

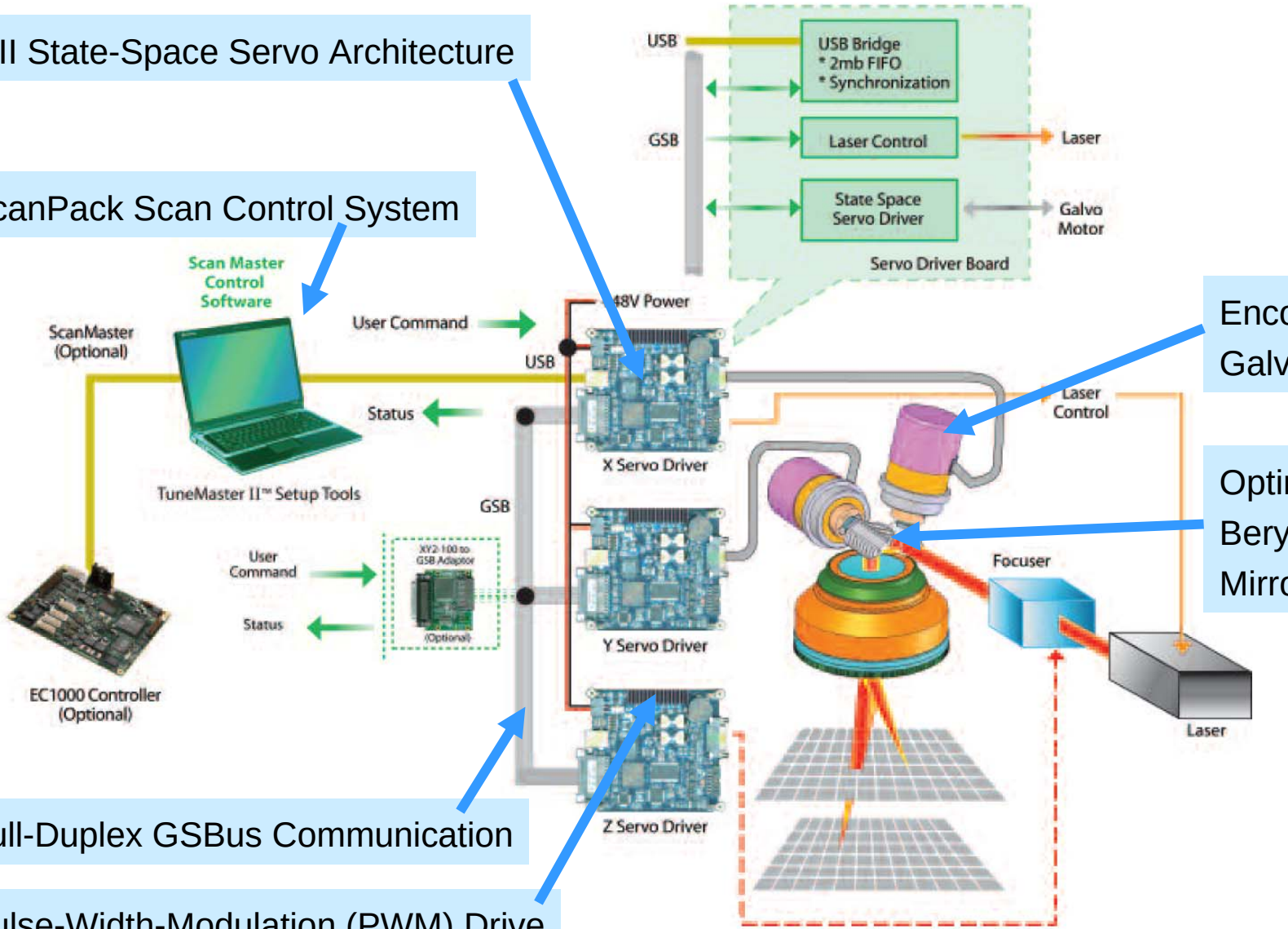
Lightning II 3-Axis
Ultimate Control & Speed

ProSeries2 3-Axis
Improved Optics,
Motors & Electronics

HPLK
Field-Proven Veteran

L-II State-Space Servo Architecture

ScanPack Scan Control System



Encoder
Galvo Motors

Optimized
Beryllium
Mirrors

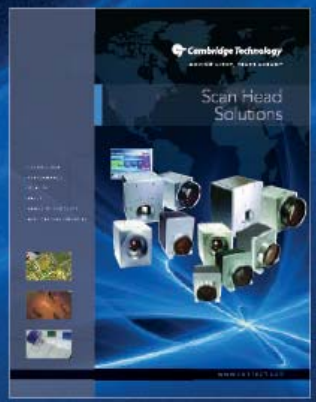
Full-Duplex GSBus Communication

Pulse-Width-Modulation (PWM) Drive

Cambridge Technology
Moving Light, Years Ahead.™

Five Product Lines that Focus Our Technology on Your Application Needs

Components



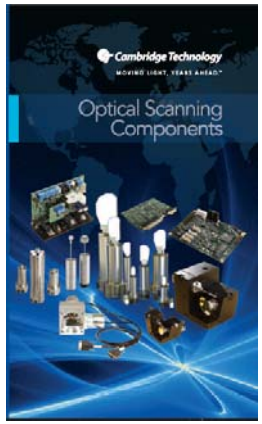
2-Axis
Scan Heads

Scan Control

3-Axis
Scanning Systems

Lightning II Digital
Scanning Platform

From the Best Scanning Components...
To the Best Integrated Solutions

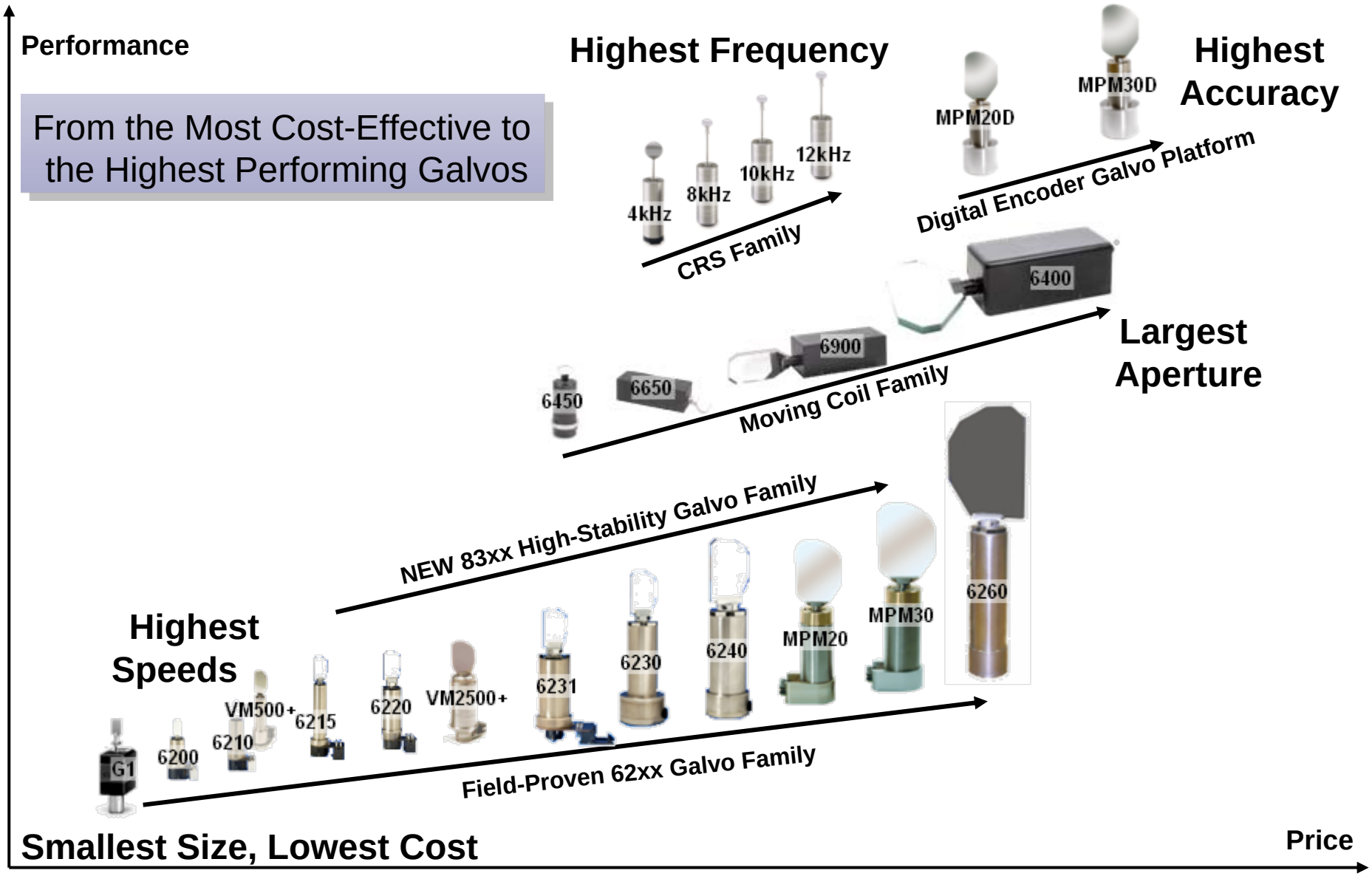


From the Most Cost-Effective to the Highest Performance:

- Broadest Range of Closed Loop Galvos (*For 1mm to 100mm apertures)*
  - The Most Popular (62xx) & High-Stability (83xx) Motors
- Analog and Digital Servos
- Scan Controllers
- Z-Axis Focuser
- Resonant Scanners (up to 12 kHz)
- Ultra-Accurate Digital Models (MPM-xxD)
- Specialty Motors
  - Flexure-based
  - Moving coil
  - Open-loop

Broad Range of Galvo Motors

Cambridge Technology
Moving Light, Years Ahead.™



83xx Family of High-Stability Galvos

Cambridge Technology
Moving Light, Years Ahead.™

- Galvos for Apertures from 1mm to 100mm
- Patented Optical PD Design:
  - Better Angular Resolution
  - Ideal for developing applications such as:
    - Photovoltaic (Solar) Cells
    - Emerging UV Laser Applications
- One-Third The Drift Of Similar 62xx Galvos
  - 5 µrad/ºc Zero (Offset), 15 PPM/ºc Scale (Gain)
  - Comparable to Digital Encoder Galvos
- Half the Dither of Industry-Leading 62xx Galvos
- Slightly Higher Price than Similar 62xx Galvos
- Available with High Stability Servo Driver

Laser Scanning Mirrors

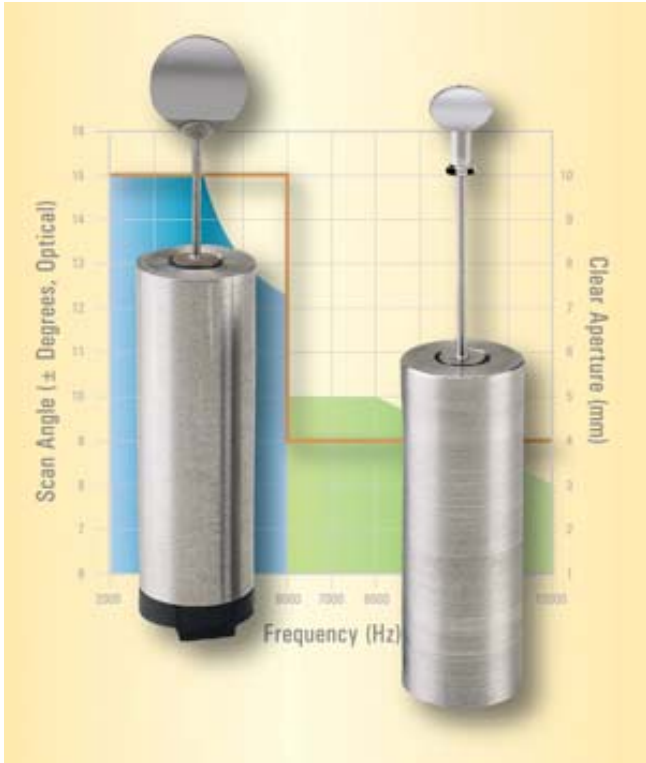
Cambridge Technology
Moving Light, Years Ahead.™

- In-House Design, Simulation and Manufacturing
- From 3mm to 100mm (and larger)
- Variety of Substrate Materials
- Reflective Coatings from UV to IR
  (Broadband and Wavelength-specific)
- High-Power Options

Family of Resonant Scanners

Cambridge Technology
Moving Light, Years Ahead.™

- 4kHz, 8kHz, 10kHz & 12kHz
- 9mm or 4mm Clear Aperture
- 15 Deg (Optical) Line Scan Range
- Ideal Solution for Applications that Require:
  - High Speed Line Scans Over Large Scan Angles (such as Raster Scanning and Imaging)
  - Long Life in Various Environments
  - Small Size and Weight
  - No Mechanical Vibrations
  - No Lubrication or Particulate Generation
  - Low Power Consumption and Heat Dissipation



Variety of Specialty Galvos

Cambridge Technology
Moving Light, Years Ahead.™

- Moving-Coil Galvos
  - 6400, 6450, 6650 & 6900
  - High Torque
  - High Efficiency
  - High Accuracy

- Open-Loop Galvos
  - G100 for 5-10mm Aperture
  - G300 for 20-30mm Aperture
  - For Low Accuracy / Cost-Sensitive Applications

Broad Range of Servo Drivers

Cambridge Technology
Moving Light, Years Ahead.™

Performance

Highest Speeds

From the Most Cost-Effective to the Highest Performing Servos

Advantages of CTI Analog Servos:

- Higher Accuracy
- Smaller Size
- Lower Cost

659
Lowest Cost
Single-Axis
Analog
PID

677 / ASD
Smallest Size
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Analog
PID

673-2
Cost Effective
Dual-Axis
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PID

671-2/HP
High Power
& Stability
Single-Axis
Analog
PID

Analog Technology

Digital Technology

Lightning
AutoTune
High Speed
Dual-Axis
Digital
PID

DC2000/3000
Self Tune
Higher Speed
Dual-Axis
Digital
State Space

Lightning II Platform
Integrated Scanner
& Laser Control
Single-Axis
Digital
State Space
& PWM

Advantages of CTI Digital Servos:

- Higher Speed
- Automated Tuning
- Digital Feedback
- Ease of Use

Smallest Size, Lowest Cost

Price

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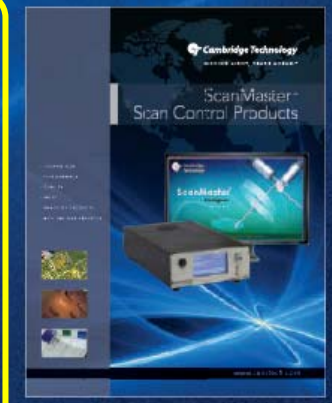
Moving Light, Years Ahead.™

Five Product Lines that Focus Our Technology on Your Application Needs

Components

2-Axis Scan Heads



Scan Control

3-Axis Scanning Systems

Lightning II Digital Scanning Platform

From the Best Scanning Components...
To the Best Integrated Solutions

Scan Heads Solutions

Cambridge Technology
Moving Light, Years Ahead.™

- Best In Class Performance:
  - Speed
  - Accuracy
  - Value
- For Beam Apertures from 7mm to 25mm
- ProSeries™ Analog and Lightning™ Digital Families
- Enclosed and Open Designs
- Easy “Plug and Play” with CTI’s Controllers and Software

Scan Heads Families

- LightningXP Scan Head Family - Highest Speeds
  - Digital, State-Space Servo Technology
  - 7, 10 & 14mm Clear Apertures
- ProSeries2 Scan Head Family - Highest Accuracy
  - Analog Servo Technology
  - 7, 10 & 14mm Clear Apertures
- ProSeries1 Scan Head Family – High Speed & Value
  - Analog Servo Technology
  - 7, 10 & 14mm Clear Apertures
- ProSeries2 Scan Head Family – Large Aperture
  - Analog Servo Technology
  - 20 & 25mm Clear Apertures

Scan Heads – Side-By-Side

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		ProSeries1™ Scan Heads			LXP™ Digital Servo Scan Heads			ProSeries2™ Scan Heads			ProSeries2™–Large Aperture	
ENTRANCE APERTURE		7mm	10mm	14mm	7mm	10mm	14mm	7mm	10mm	14mm	20mm	25mm
MAX LASER POWER***	Nd:YAG	100W	150W	250W	100W	150W	250W	100W	150W	250W	500	600
	CO2	50W	100W	200W	50W	100W	200W	50W	100W	200W	400W	450W
MARKING SPEED (m/s)		4 m/s	3.1 m/s	2.6m/s	6.5 m/s	5 m/s	4 m/s	3.5 m/s	2.9 m/s	1.7 m/s	0.9 m/s	0.9 m/s
POSITIONING SPEED (m/s)		24 m/s	17 m/s	12 m/s	36 m/s	26 m/s	18 m/s	12 m/s	11 m/s	7 m/s	10 m/s	10 m/s
WRITING SPEED*	Precision	700 cps	550 cps	470 cps	1100 cps	870 cps	550 cps	550 cps	400 cps	300 cps	170 cps	170 cps
	High Quality	1100 cps	1000 cps	750 cps	1350 cps	1100 cps	950 cps	1000 cps	650 cps	550 cps	300 cps	300 cps
TRACKING ERROR (msec)		0.10 ms	0.13 ms	0.14 ms	0.0 ms	0.0 ms	0.0 ms	0.12 ms	0.17 ms	0.18 ms	0.45 ms	0.45 ms
RESOLUTION (mrad)		0.012 mrad	0.012 mrad	0.012 mrad	0.02 mrad	0.02 mrad	0.02 mrad	0.012 mrad	0.012 mrad	0.012 mrad	0.012 mrad	0.012 mrad
LONG TERM STABILITY**	Baseline	Offset < 0.20mrad Scale < 200ppm			Offset < 0.20mrad Scale < 200ppm			Offset < 0.10mrad Scale < 100ppm			Offset < 0.10mrad, Scale < 100ppm	
LONG TERM STABILITY**	Optional							Offset < 0.05mrad Scale < 70ppm			Offset < 0.05mrad Scale < 70ppm	
TEMPERATURE STABILITY**		Offset < 0.25mrad/K, Scale < 50ppm/K			Offset < 0.25mrad/K, Scale < 50ppm/K			Offset < 0.20mrad/K, Scale < 50ppm/K			Offset < 0.20mrad/K, Scale < 50ppm/K	
COMMUNICATION		XY2-100 or Analog ±5V, ±10V			XY2-100			XY2-100 or Analog ±5V, ±10V			XY2-100 or Analog ±5V, ±10V	
POWER INPUT		±15V (±24V Optional)			±15V (±24V Recommended for 14mm)			±15V (±24V Optional)			±15V (±24V Optional)	

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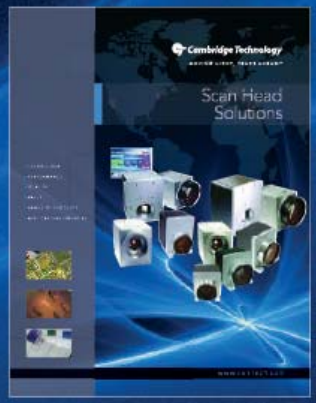
Moving Light, Years Ahead.™

Five Product Lines that Focus Our Technology on Your Application Needs

Components



2-Axis Scan Heads

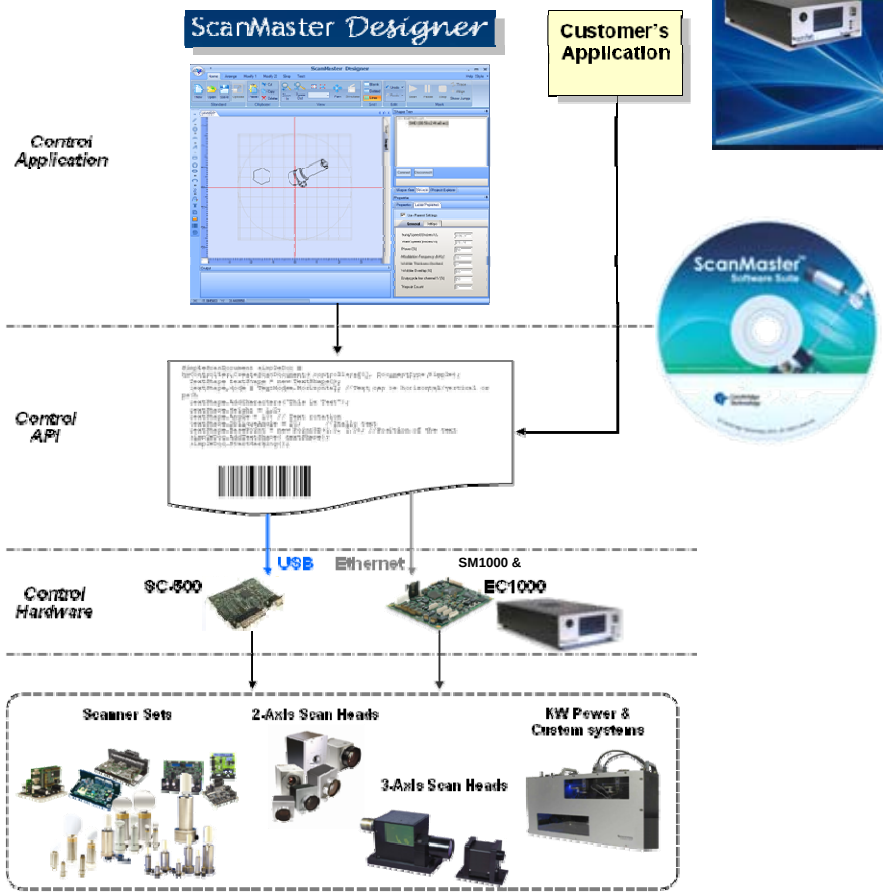
Scan Control

3-Axis Scanning Systems

Lightning II Digital Scanning Platform

From the Best Scanning Components...
To the Best Integrated Solutions

- **One Software Environment**
  - ScanMaster™ Control Software
    (System Setup, Job Design, …)
  - Object Oriented High-Level API
    (Circle, Arc, Fonts, Barcode...)
  - Board-Level DLL API
    (Jump, Mark, Delay, ...)
- **Two Hardware Platforms**
  - SM1000
  - EC1000
  - SC500
- **Many Scanning Solutions**
  - All our heads and components



ScanMaster™ Designer

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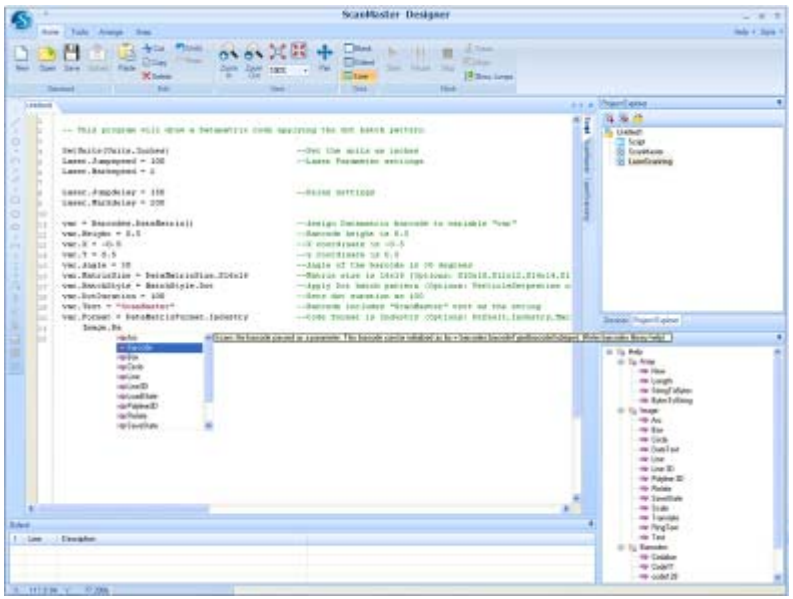
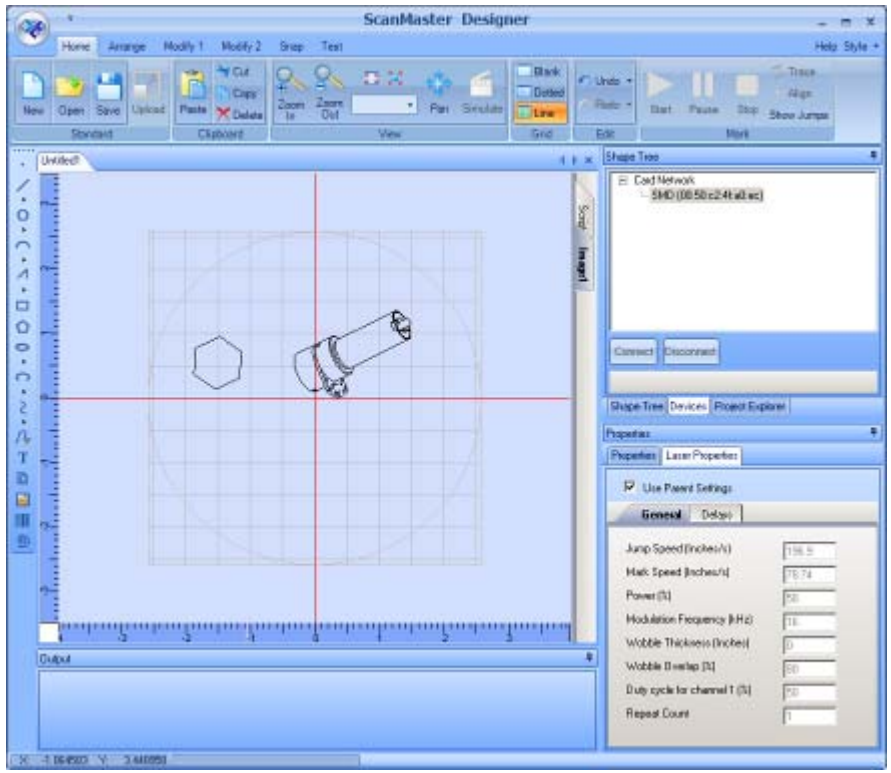
- Standard type import filters (DXF, PLT, CDR)
- Graphic entry creation and editing
- Two-Axis or Three-Axis Job entry
- Marking parameter selection and assignment
- Job sequence specification
- Laser system control





- Standard type import filters (DXF, PLT, CDR) Option
- Graphic entry rendering (Barcode, text, etc.)
- Script-based job flow control
- Object-Oriented Approach

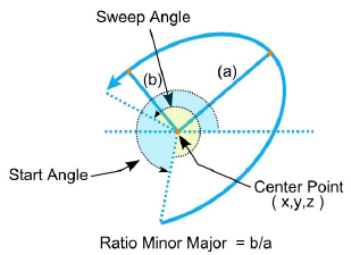
A Barcode and the code that will generate it

```
SimpleScanDocument simpleDoc =
hwController.CreateScanDocument( controllers[0], DocumentType.Simple);
  BarcodeCode128 barcode128 = new BarcodeCode128();
  barcode128.Height = 0.4; //Height of the barcode
  barcode128.NarrowBarWidth = 0.01;
  barcode128.FillMethod = BarcodeFillMethod.Vertical;
  barcode128.BeamDiameter = 0.02;
  barcode128.BeamOverlap = 50;
  barcode128.EnableHumanReadableText = true;
  simpleDoc.AddBarcodeShape( barcode128);
  simpleDoc.StartMarking();
```

A text string and the code that will generate it:


```
SimpleScanDocument simpleDoc =
hwController.CreateScanDocument( controllers[0], DocumentType.Simple);
  TextShape textShape = new TextShape();
  textShape.Mode = TextModes.Horizontal; //Text can be horizontal/vertical or
path
  textShape.AddCharacters("This is Text");
  textShape.Height = 1.0;
  textShape.Angle = 10; // Text rotation
  textShape.ObliqueAngle = 20;      //Italic text
  textShape.BasePoint = new Point3D(1.0, 2.0); //Position of the text
  simpleDoc.AddTextShape( textShape);
  simpleDoc.StartMarking();
```

A Definition of an Elliptical Arc element

Command	AddEllipticalArc
Purpose	Adds an elliptical arc to the SimpleScanDocument
Usage	AddEllipticalArc(float centerX, float centerY, float centerZ, float majorAxisLength, float majorAxisAngle, float ratioMinorMajor, float startAngle, float sweepAngle)
Explanation	
Returns	

Board-Level API

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- Hardware-specific extensions for advanced feature access
- 3rd Party DLL Software Compatibility

A code excerpt that draws a square:

```
//Set the mark speed
const float mark_speed = .1F;
rc = UA_set_mark_speed(sdh, mark_speed);

//Set the laser parameters
const float laser_period = 100e-6F;
const float laser_on_width = 50e-6F;
const float laser_standby_width = 1e-6F;
const float pump_power = 100.0;
rc = UA_set_laser_on(sdh, laser_period, laser_on_width, pump_power);
rc = UA_set_laser_standby(sdh, laser_period, laser_standby_width, pump_power);


const float jump_delay = 250e-6F;
const float mark_delay = 260e-6F;
const float polygon_delay = 80e-6F;
rc = UA_set_scanner_delays(sdh, jump_delay, mark_delay, polygon_delay);

//Define a box.
const float a = 0.001F;
Point_3d_t bottom_left =  {a, 0, 0};
Point_3d_t bottom_right = {0, 0, 0};
Point_3d_t top_left =     {a, a, 0};
Point_3d_t top_right =    {0, a, 0};

//Rotate
float theta = 1.0F;
```

Cambridge Technology
Moving Light, Years Ahead.™

From the Most Cost-Effective to the Highest Performing Controllers

SC500

- Lowest Cost
- Compact
- PC-driven
- USB-based
- 3 Axis Analog / XY2
- Laser Control
- MOTF
- Aux I/Os

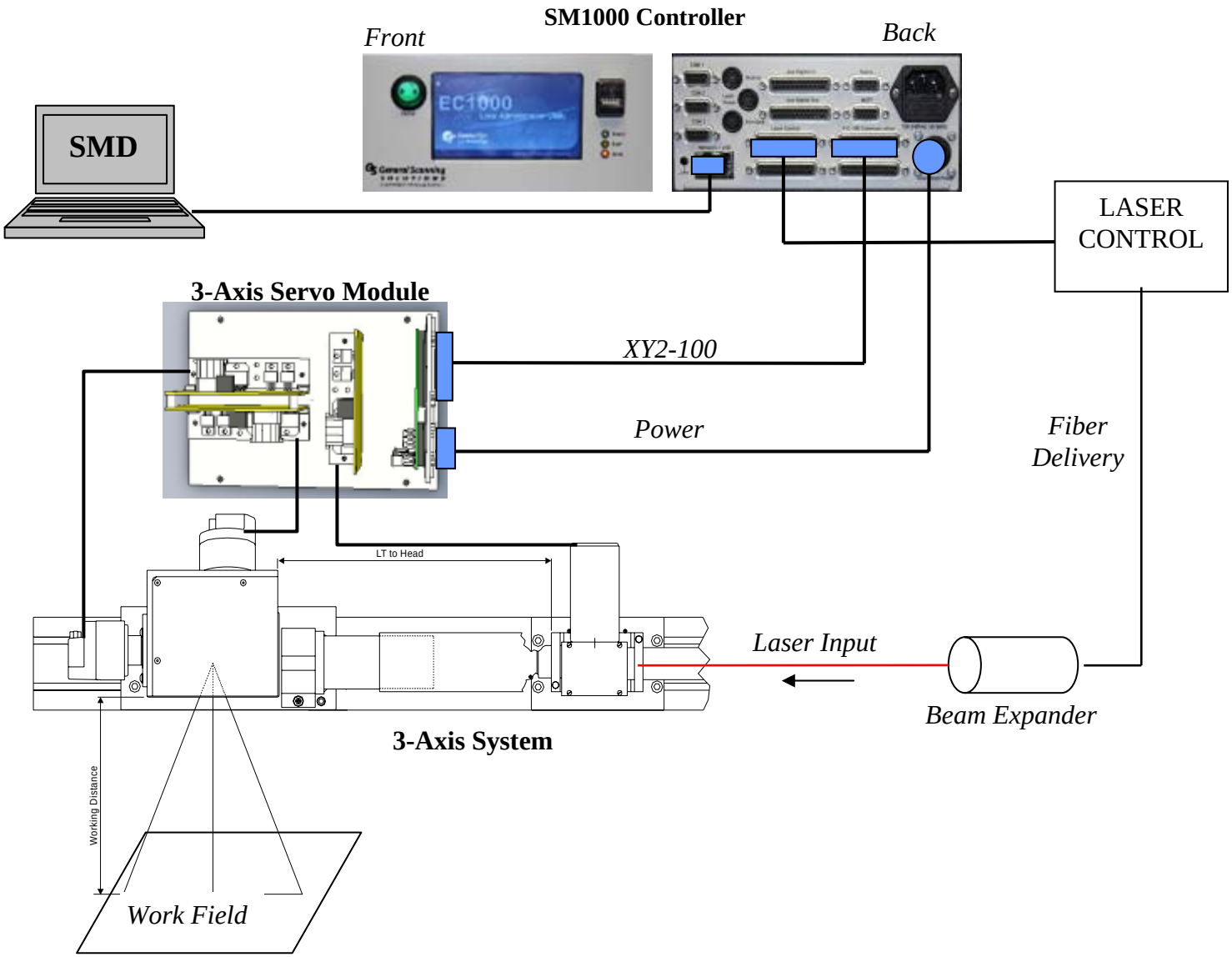
EC1000/SM1000

- Full-featured
- Stand-alone
- Ethernet-based
- µVector Generation
- 3 Axis Analog / XY2
- Laser Control
- Hi Perf MOTF
- Aux I/Os

Lightning II Platform

- Integrated Controller/Servo
- 24 bit GSBus Communication
- Velocity-Modulated Laser Control
- SkyWriting Optimization
- High Level Programming
- MOTF
- Aux I/Os

Ease of Control Integration



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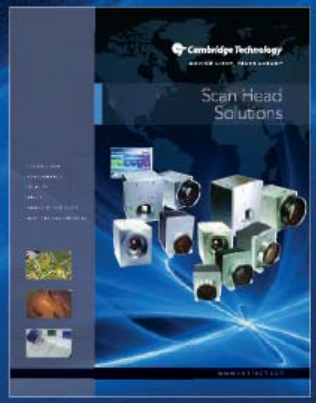
Five Product Lines that Focus Our Technology on Your Application Needs

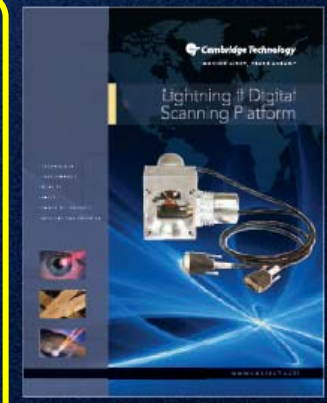
Components



2-Axis
Scan Heads

Scan Control

3-Axis
Scanning Systems



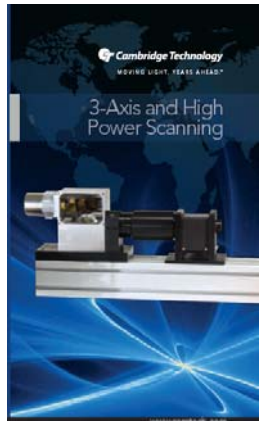
Lightning II Digital
Scanning Platform

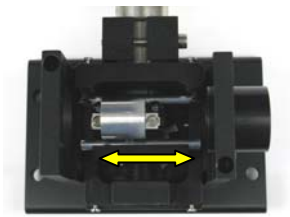
From the Best Scanning Components...
To the Best Integrated Solutions

3-Axis and High-Power Scanning

Cambridge Technology
Moving Light, Years Ahead.™

- Broadest Range of 3-Axis Heads (*For 20mm to 100mm apertures)*
- Best Price / Performance
- Advanced High-Speed Design
- Superior Accuracy & Stability
- Dynamic Z-Axis Focuser
- For Applications that Require:
  - Larger Field-of-View
  - Smaller Spot-Size
  - Higher Laser Power
  - Higher Linear Speeds
  - 3D Scanning





3-Axis Available Configurations

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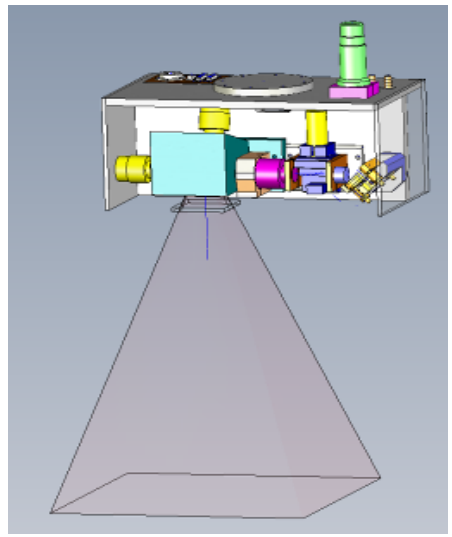
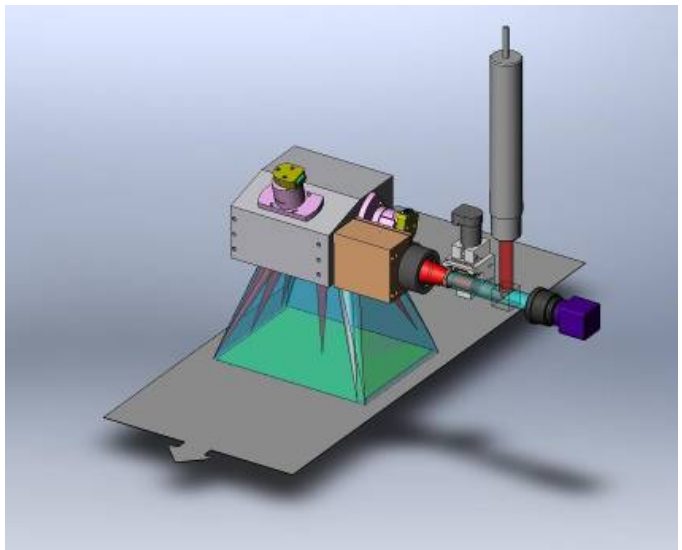
- High speed and accuracy with a large FOV
- Adjustable focal length for 3D applications
- Multi-KW power for 1064nm applications
- For 355nm through CO_2 laser applications
- Apertures of 14, 20, 25, 30, 50 & 100mm





- ProSeries2 or Lightning II Technology
- Available as Modular or Enclosed Box
- Multi-head configurations possible
- Custom configurations Possible

3D Optics Considerations

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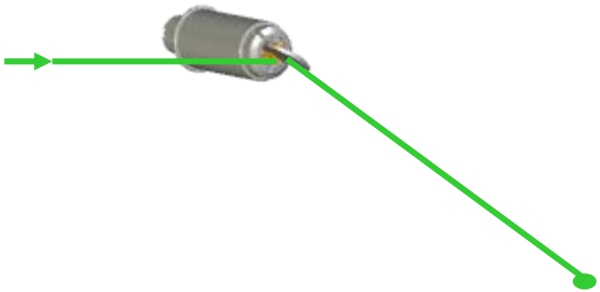
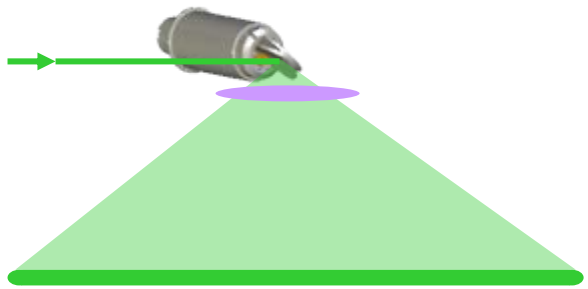
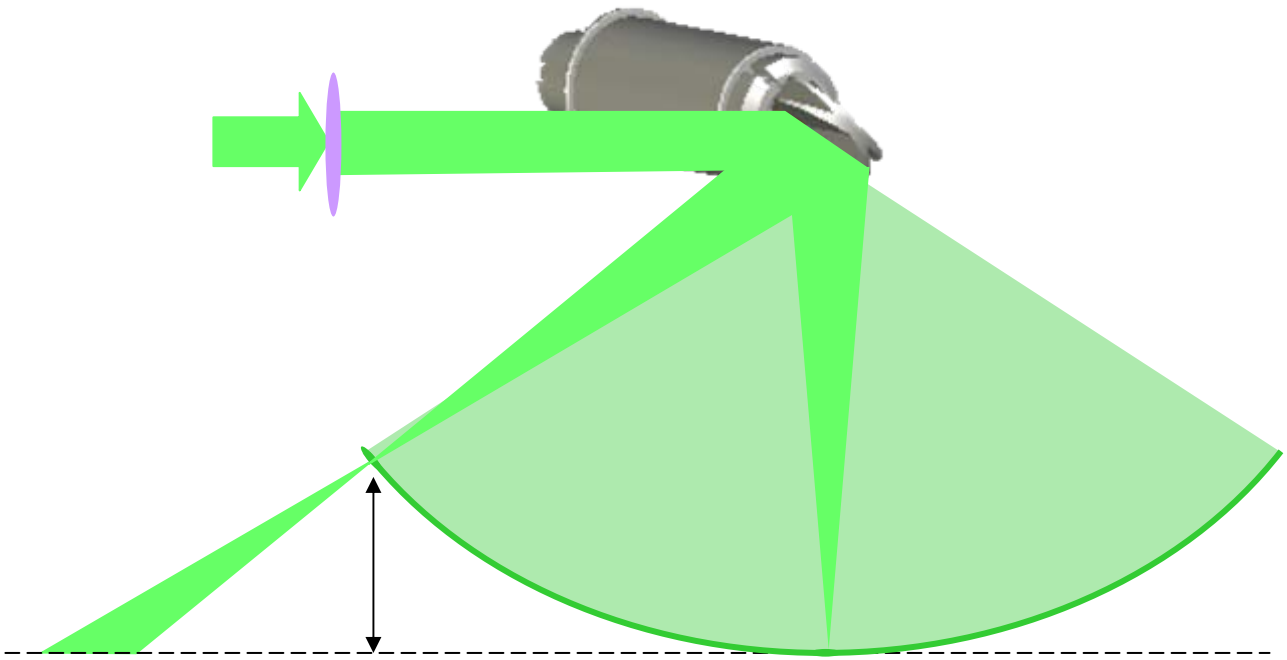
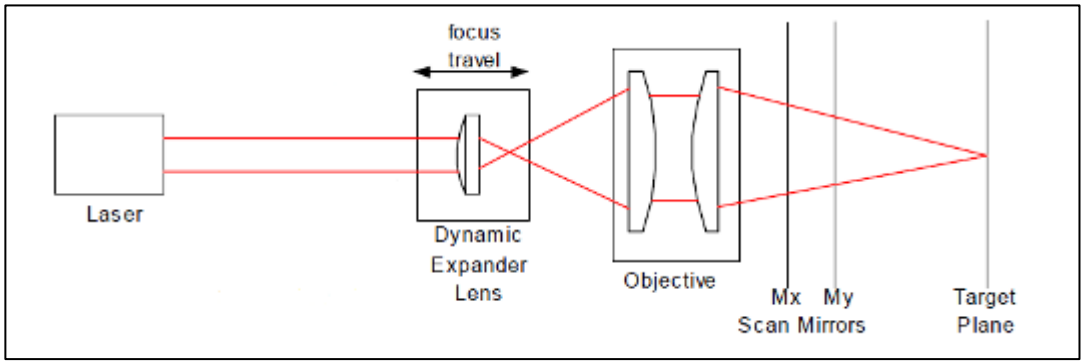
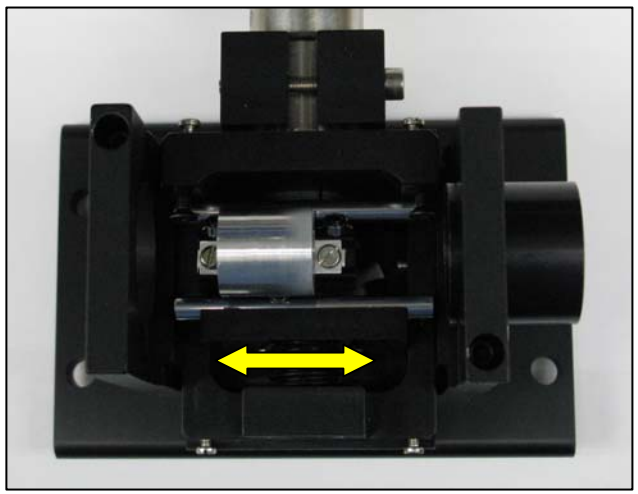




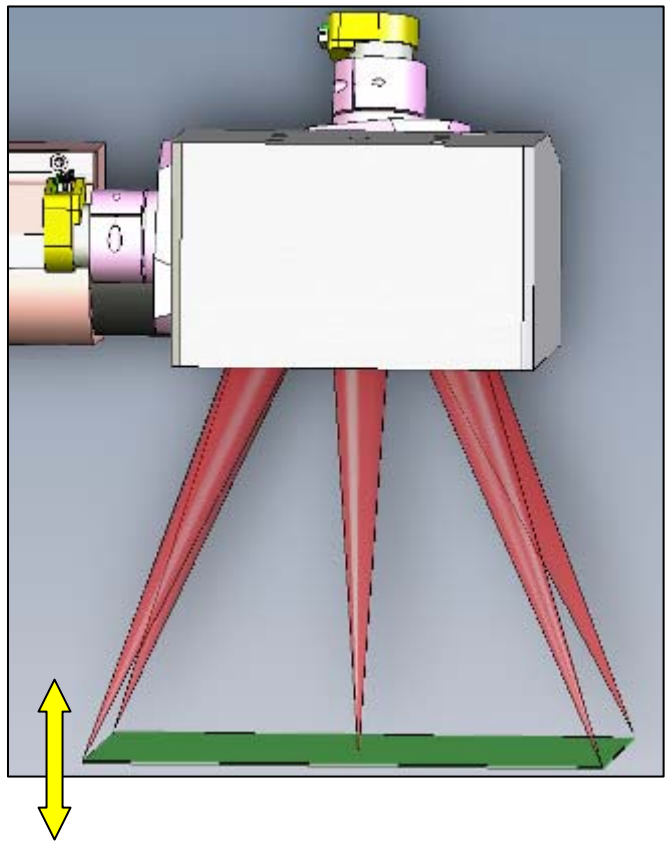


DFM – Dynamic Focusing Module





…provides…



3-Axis Integrated Systems

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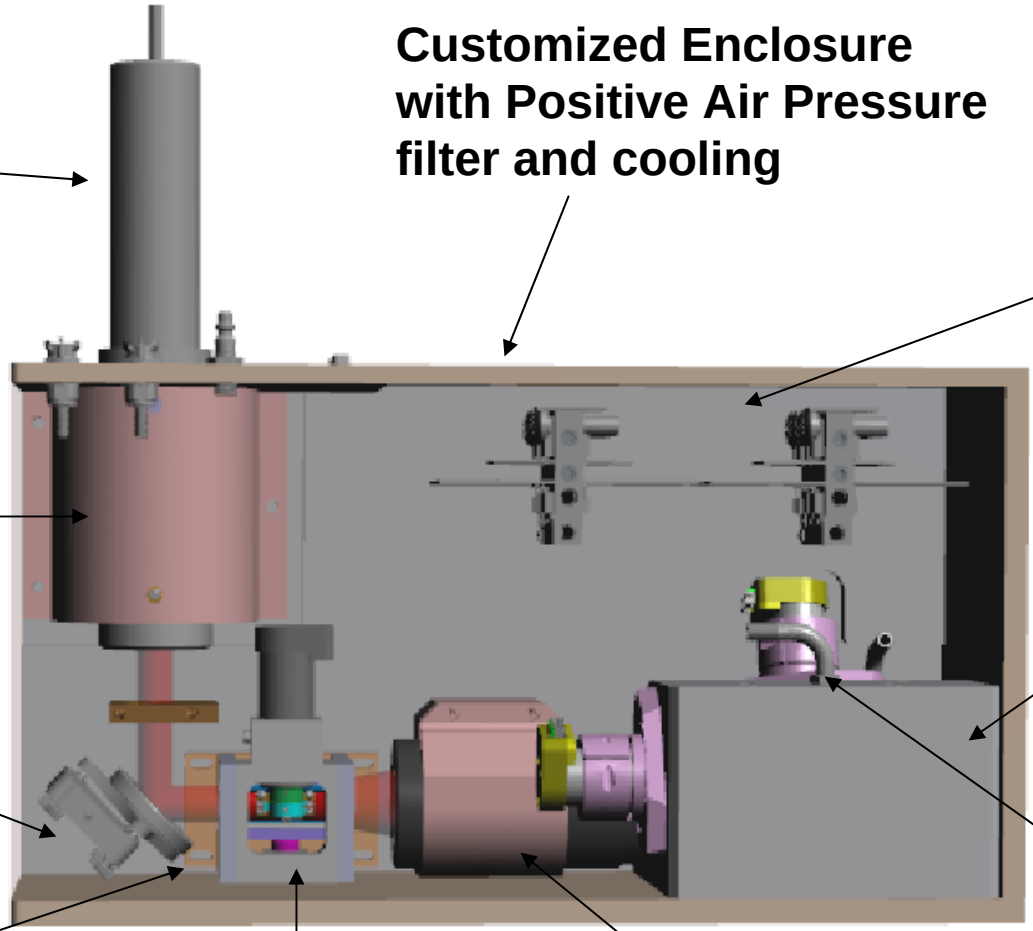
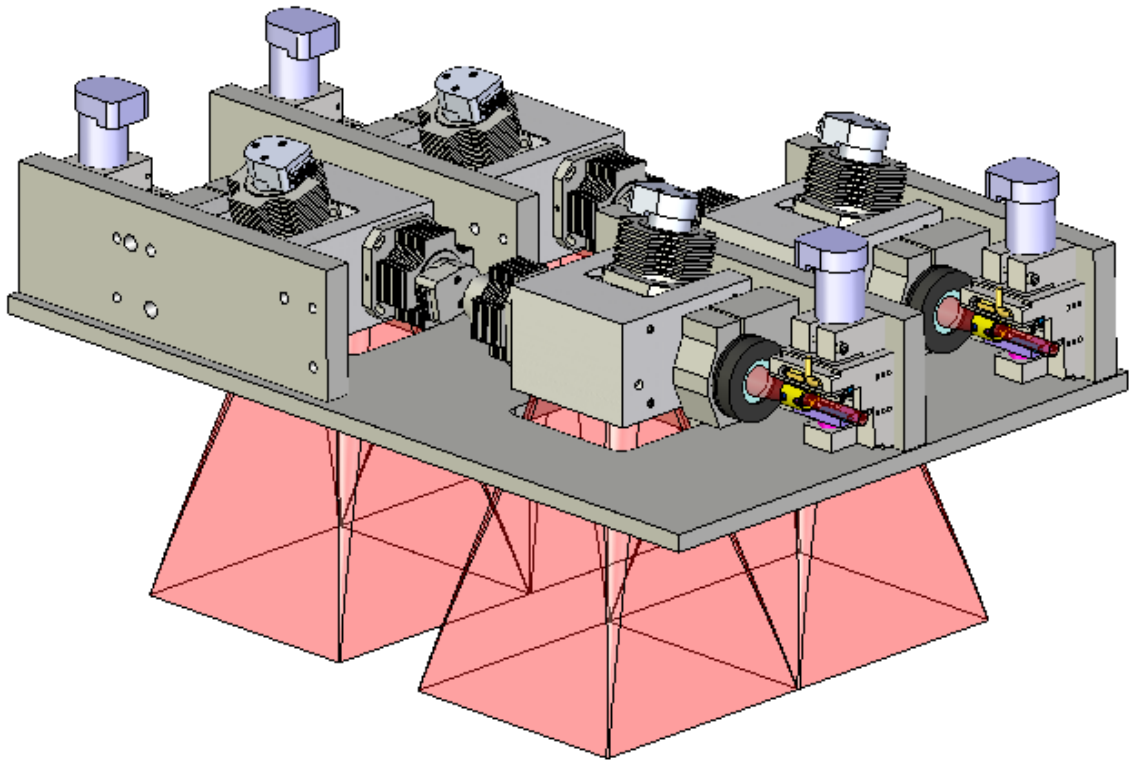


20 um spot size @ 200 x 200mm FOV



Four 3-Axis Heads Configuration

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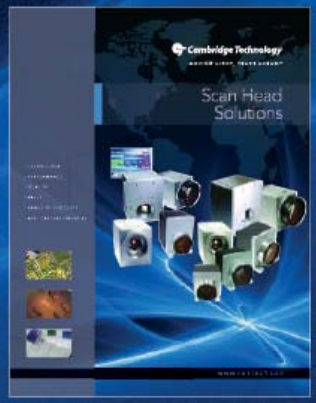
Five Product Lines that Focus Our Technology on Your Application Needs

Components



2-Axis
Scan Heads

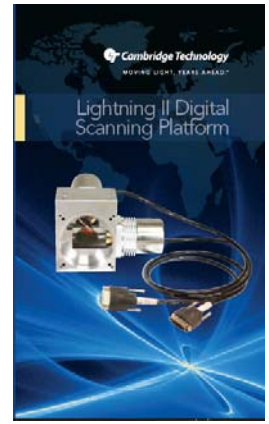
Scan Control

3-Axis
Scanning Systems

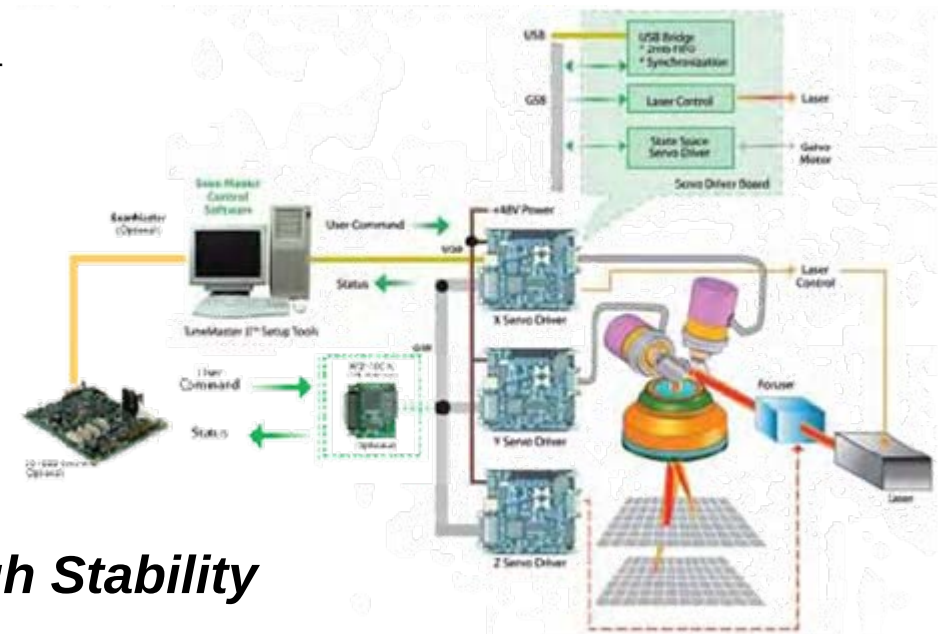
Lightning II Digital
Scanning Platform

From the Best Scanning Components...
To the Best Integrated Solutions

Six new elements that redefine the state of the art in optical scanning systems:

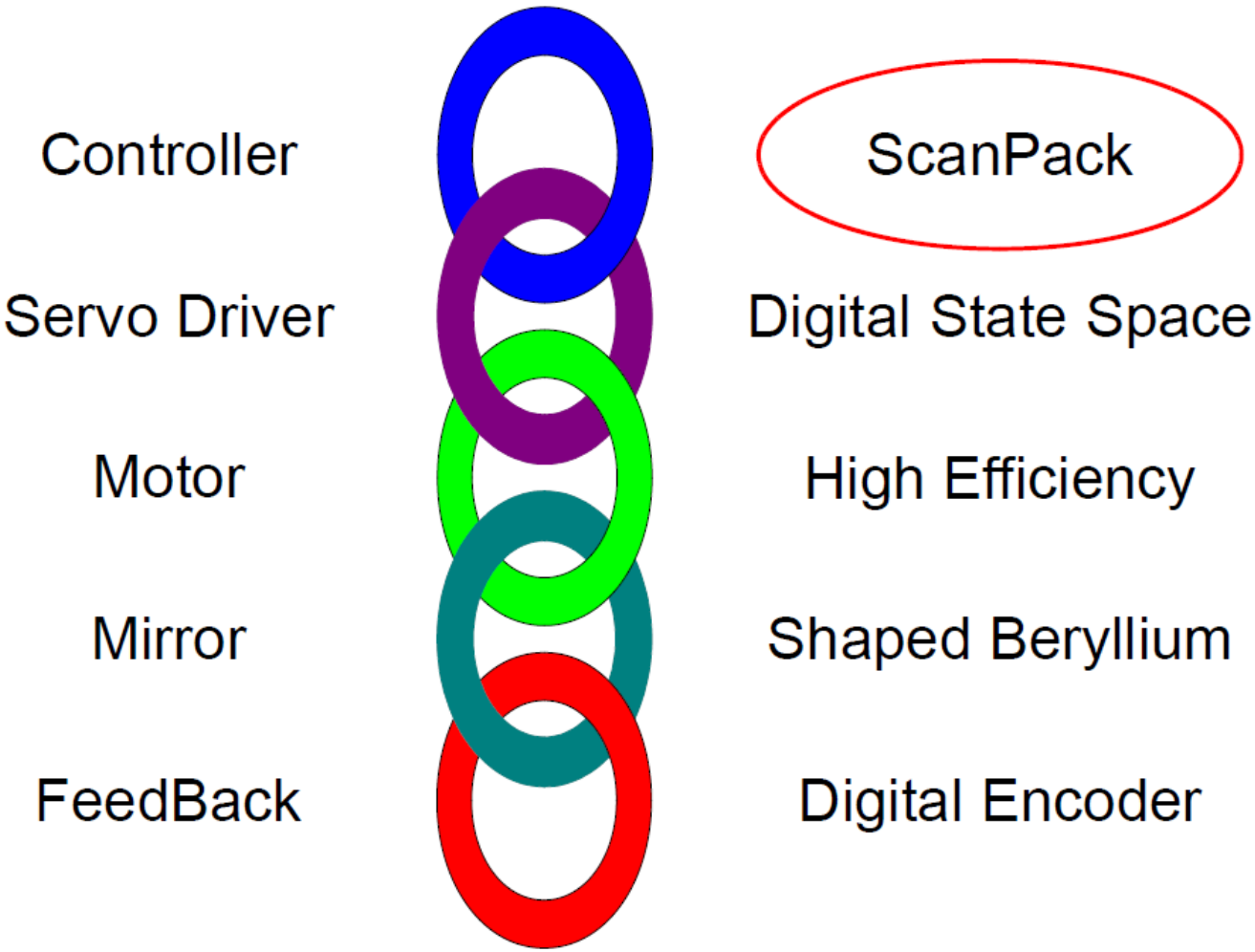


- ScanPack Scan Control System
  For the ultimate in synchronous modulated laser control
- Full-Duplex GSBus Communication
  24 bit bi-directional command and data bus
- L-II State-Space Servo Architecture
  Anticipates laser beam position, faster than any feedback
- L-II Pulse-Width-Modulation (PWM) Drive
  Generates power instead of heat; >90% efficient amplifier
- L-II Encoder Galvo Motors
  Custom 24-bit encoder technology in a
  state of the art galvo for breakthrough accuracy
- Optimized Beryllium Mirrors



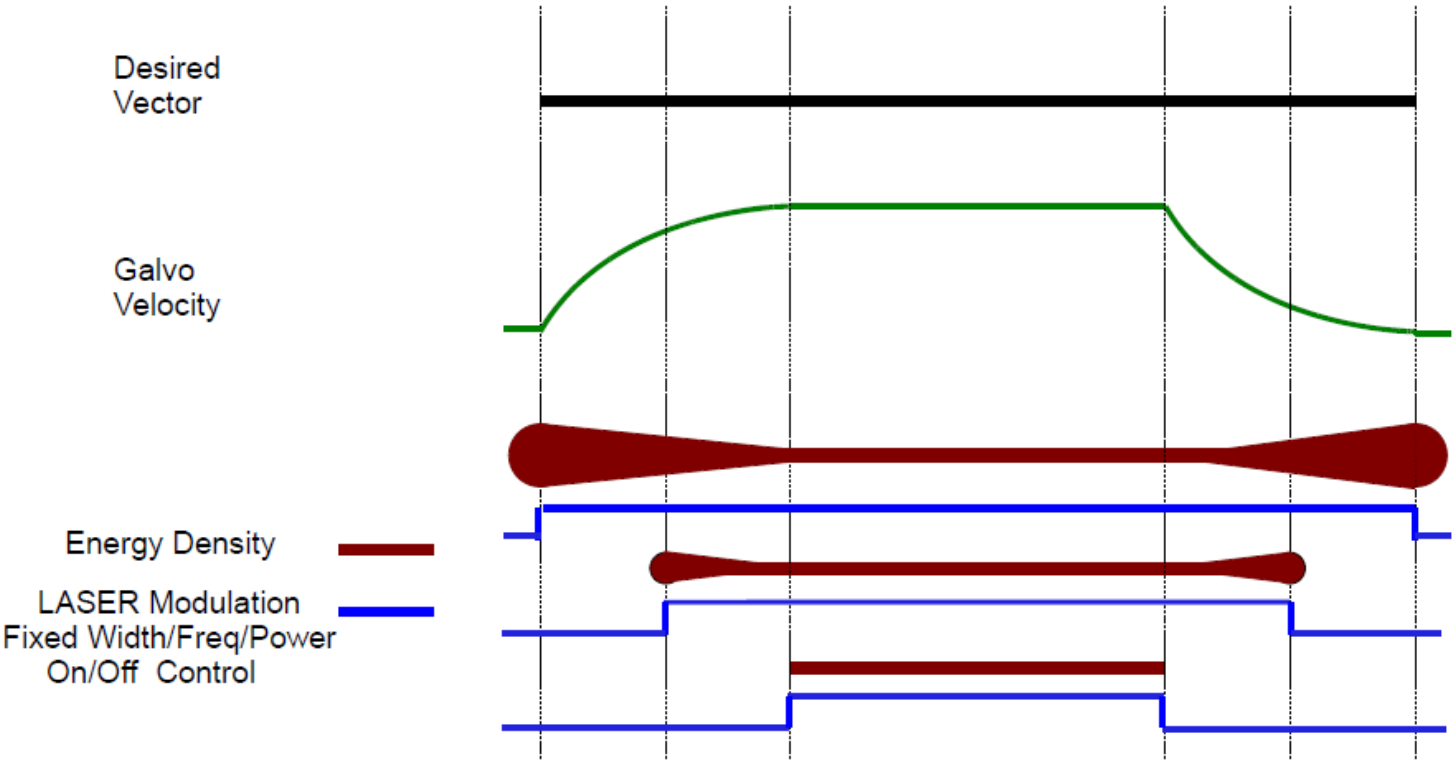
For applications that require

Ultra-High Speed and / or Ultra-High Stability

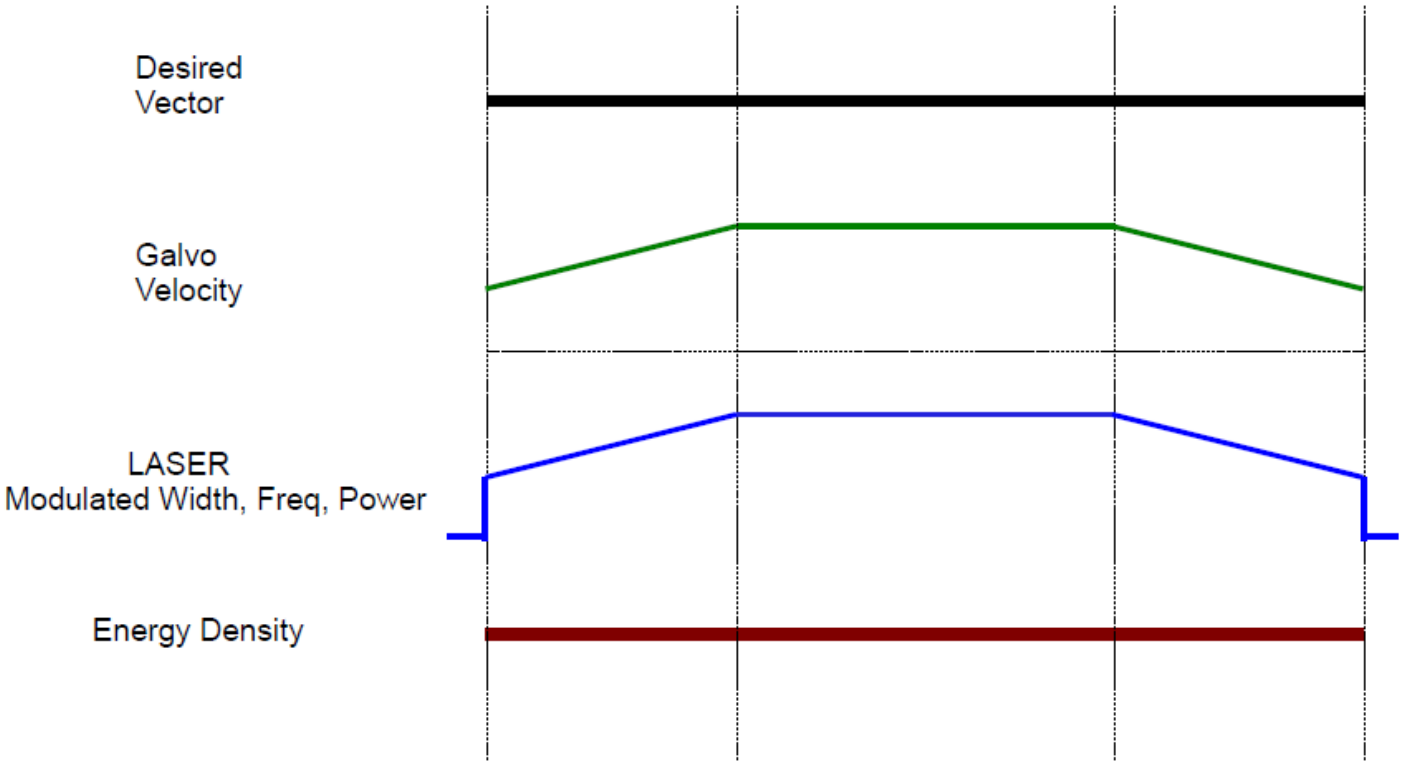


Traditional Vector Control

- Laser On / Off at fixed Freq / Width / Power
- All Vectors Start / End at Zero Velocity due to Bandwidth of Galvo
- Choice between Energy Density and Position Error

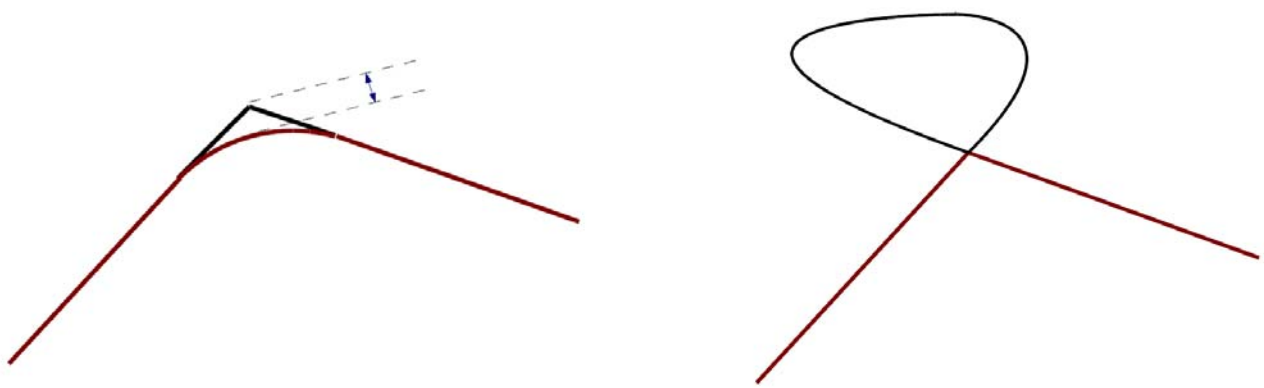


- Velocity Modulated Laser
- Controlled Velocity and Acceleration
- Consistent Energy Density



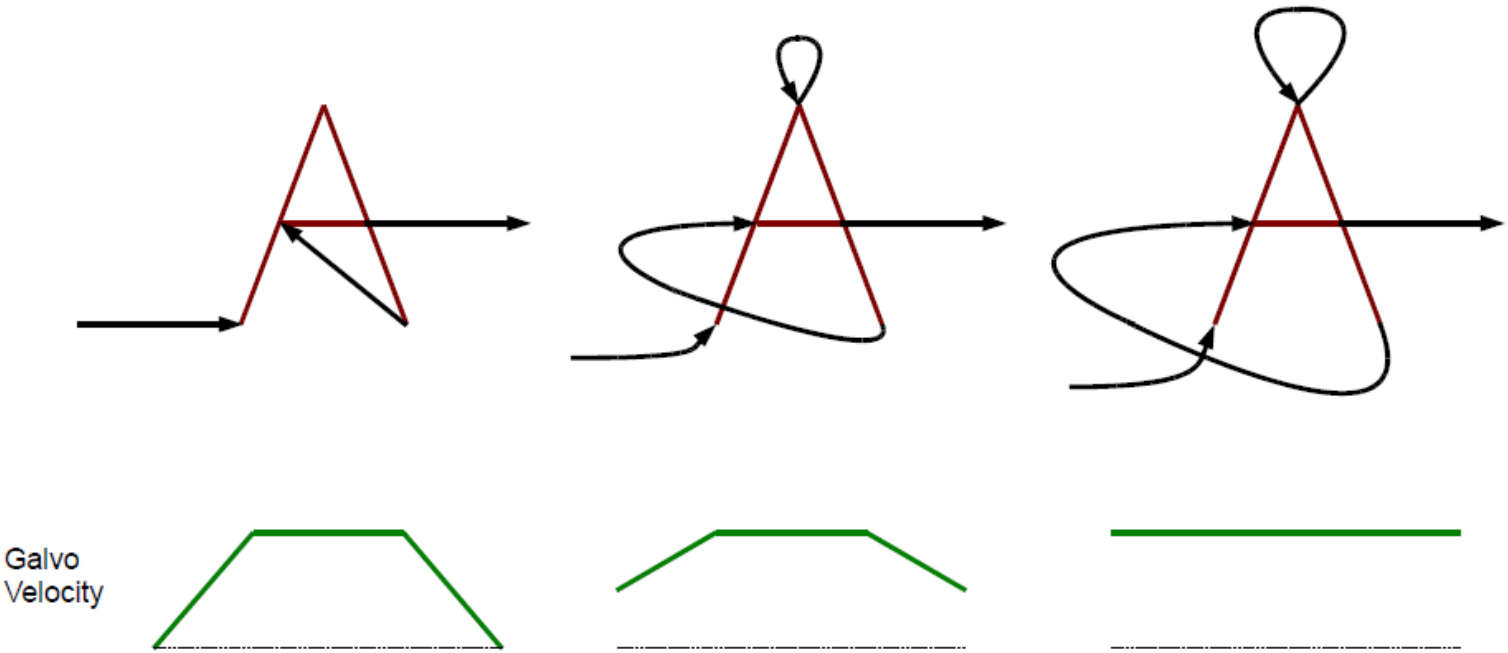
ScanPack Vector Linking

- Automatically determines if vector can be rounded at vertex or if it needs to Sky-Written
- Automatic per-vertex decision based on acceleration and positional error constraints.

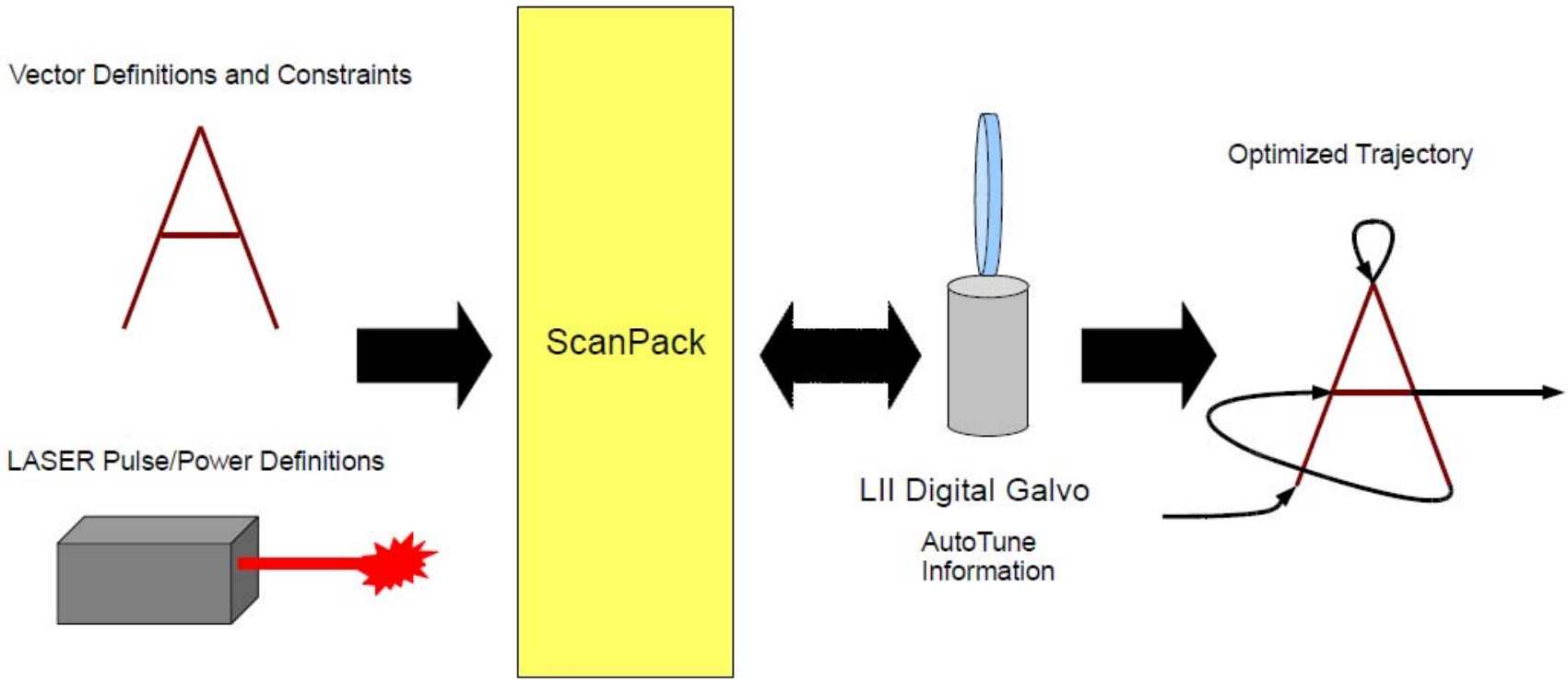


ScanPack Trajectories

- Skywriting
- Programmable End Velocity



ScanPack Approach



Vector Applications

Specification	LII
Offset Drift*	< 1μrad mech/°C
Long Term Drift	< 5μrad mech/8hrs
Absolute Gain Error	< 50ppm
Interpolation Error	< 4μrad mech RMS
Dither	< 2μrad mech RMS
Repeatability (short term)	< 1urad mech RMS

*** Operating Temperatures = 20-50°C**