



**Photonics solutions
For innovative photonics**

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We are proud to present our 2013 catalog

Over the past years we introduced our polarization control technology and saw it used many previously unforeseen applications.

Often we are asked if this or that feature is available or possible, it is what we like about science.

Technically possible, development is often too involved for a single customer to try in an application.

Our answer, the AnyWave Fiberbench!

Engineers and scientists need technology to be a tool, this is the founding idea behind the AnyWave Fiberbench and its first implementation using our Modal Explorer patent pending technology. We offer these technologies in a simple, fun and flexible form factor and innovative ecosystem.

Proprietary technologies we offer are made robust and simple to use, are also complemented by a royalty free, open source array of hardware and software forming an open ecosystem you can adapt to your needs and projects. Parts, bits and piece are reused and kept compatible.

Evolution and change do not mean starting from scratch!

Our Modal Explorer is the first technology implemented using the AnyWave Fiberbench, resulting in all new products for multimode laser scrambling and high resolution polarization control, using many common parts.

We are continuously developing, seeking needs and ideas, looking for partners in our ecosystem.

Your ideas are welcome!

Eric Girard & Vincent Gagné
Associates and developers



Speckle Scrambler

Get the power back!

All Fiber!

Digital Control!



Modal Explorer Speckle Scrambler

- All fiber - Low loss
- MM Mode scrambling
- MM Active mode filling
- Any fiber and wavelength
- No diffusion or divergence
- Choices of USB or TTL control
- C Programmable and flexible scripting
- Open source firmware & electronics

- SM SOP scrambler
- Extensive R&D support

Watch for upcoming functions

ALL FIBER SPECKLE SCRAMBLER

Extensive fiber choices available

Fiber length: Minimum depending on fiber diameter, no maximum

Permissible laser power: Same as fiber

Insertion loss: >0.2 dB

Mechanical scrambling amplitude: 1.125° to 360°

Mechanical scrambling speed: 0 to >200rad/s

Computer Control or Stand Alone Operation, fully customizable

Available as:

OEM Module

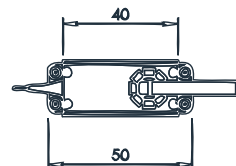
Open Source Reference Design

Compact Instrument with USB Interface

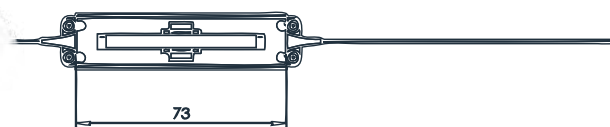
GIG-6102-125

GIG-6101

GIG-6102-220



SINGLE MOTOR
ANY FIBER



DOUBLE MOTOR
125µm FIBER

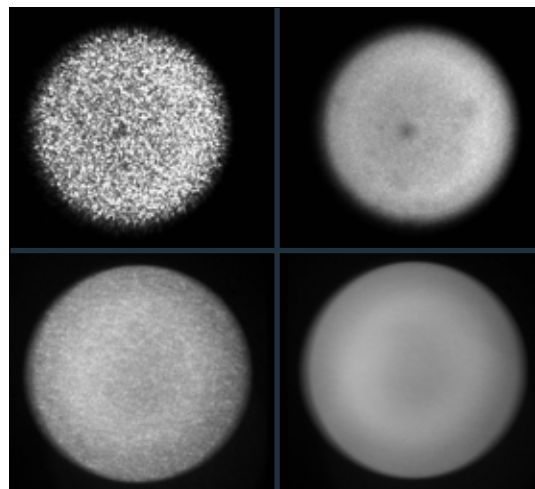


DOUBLE MOTOR
220µm FIBER

OFF scrambling ON

532 nm
4 W

660 nm
1.8 W

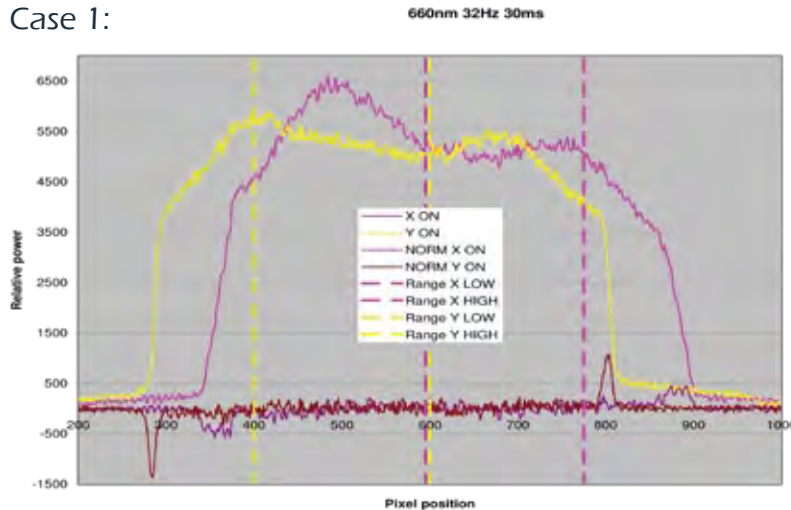


Customer application results using 200/220 fiber
30 ms integration time

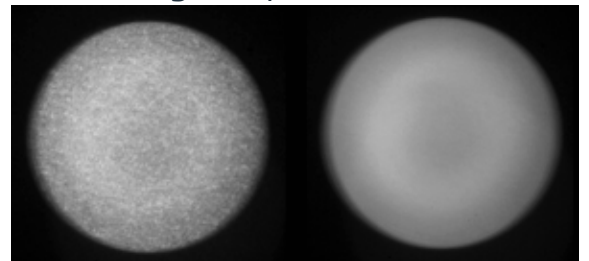
ALL FIBER SPECKLE SCRAMBLER

Performance examples:

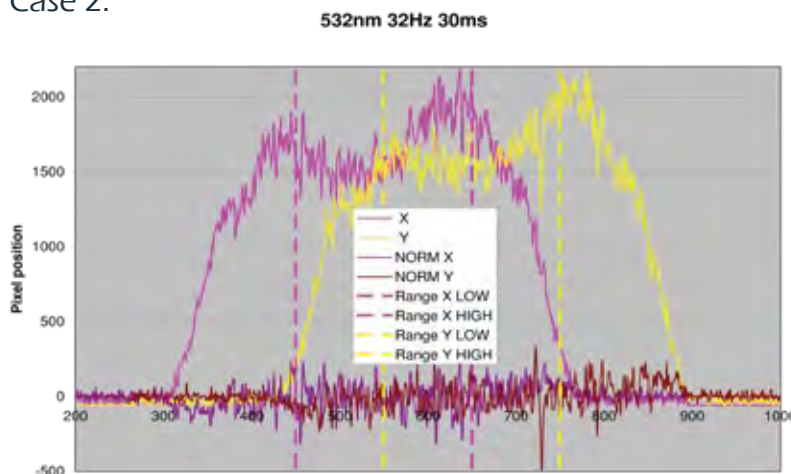
Case 1:



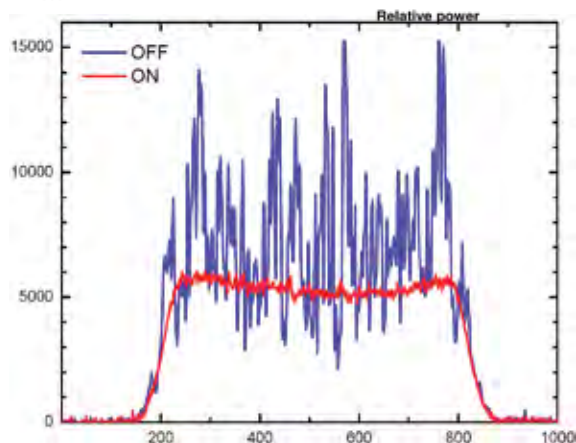
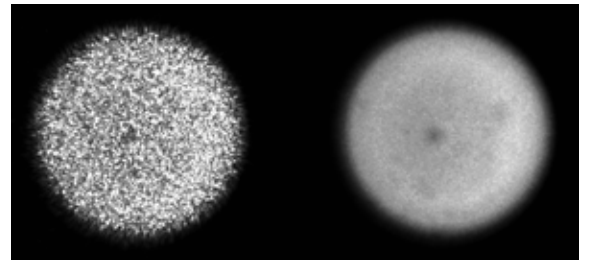
660nm laser in 200 μ m core fiber
30ms integration, 32ms@2 π rad
2 motor counter-rotation
Scrambling OFF speckle noise: 8.25%
Scrambling ON speckle noise: 1.4%



Case 2:



532nm laser in 200 μ m core fiber
30ms integration, 32ms@2 π rad
2 motor counter-rotation
Scrambling OFF speckle noise: 90%
Scrambling ON speckle noise: 6%



The speckle noise is calculated from the normalized standard deviation over the average power for the given range



GIG-6102-225 μ m with USB controller used in tests

Polarization Controller

Loose the paddles

Get motorized!

Get Digital!



**Modal Explorer
Polarization Controller**

**All fiber - Low loss
Any Wavelength**

**Open source firmware
Open source electronics
Choices of motorization
Choices of USB, TTL control
Stand alone operation
Extensive R&D support**

Watch for upcoming functions

ALL FIBER POLARIZATION SCRAMBLER and CONTROLLER

18° resolution, 1.125° resolution with 1/16 microstepping

Fiber type: Operating wavelength from 400nm to 2μm

SM1300-1550, SM800 stocked

Fiber length: Minimum depending on fiber diameter and configuration

No maximum, 1m pigtails standard

Multiple modules daisy chained on a single fiber

Permissible laser power: Same as fiber

Insertion loss: <0.2dB

Activation Loss: Depending on inter-motor fiber length

PMD: <3fs

PDL: Depending on configuration <0.02dB to extremely low

Scrambling amplitude: 1.125° to 360°

Mechanical scrambling speed: 0 to >200rad/s

Fully customizable

Open Source firmware and electronics

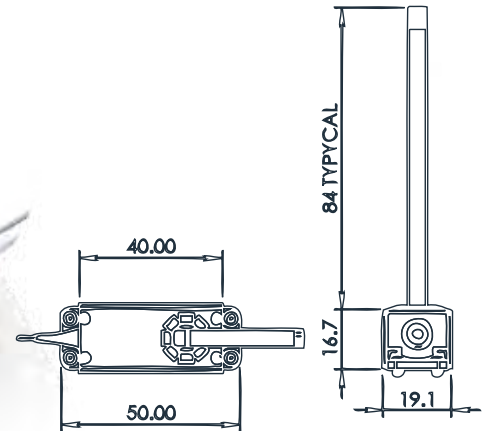
OEM, evaluation kit or instrument versions

Field replaceable fiber with
optionnal tooling

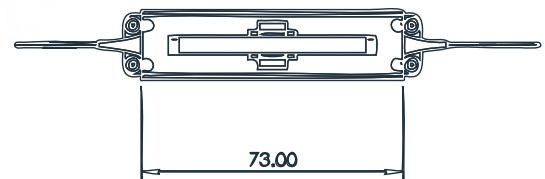
US Patent 8,373,852

MODEL GIG-2102

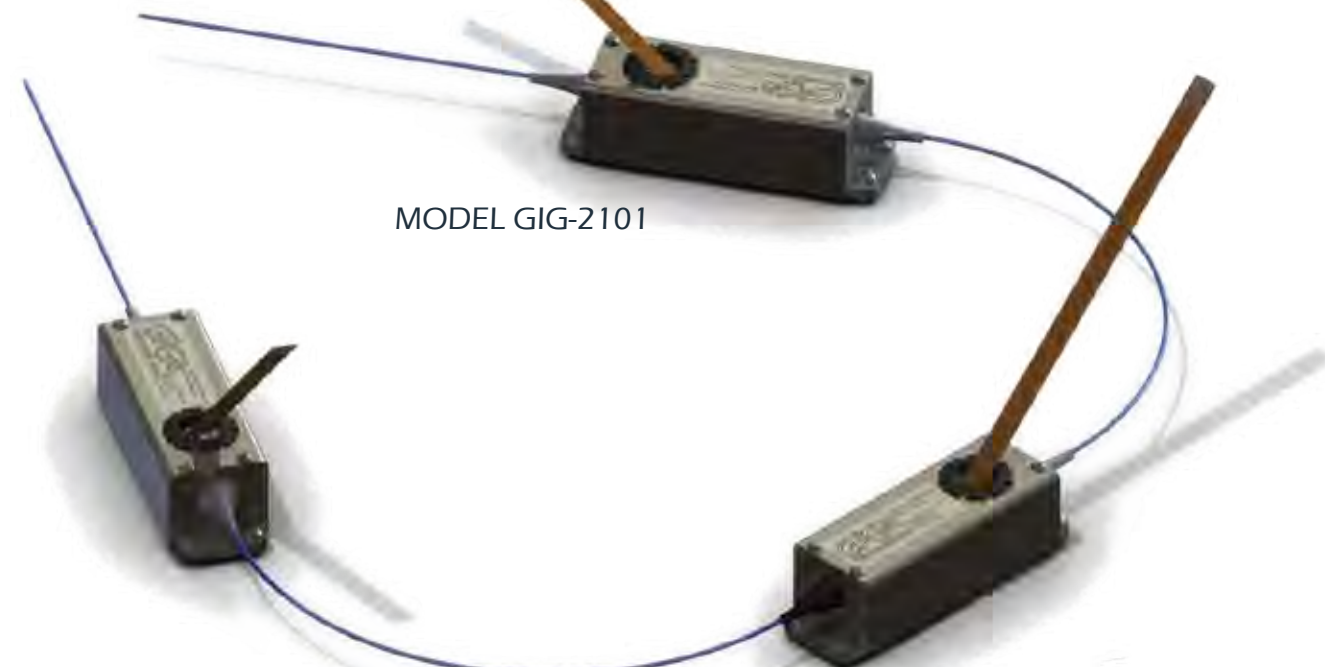
MODEL GIG-2101



SINGLE MOTOR
125μm FIBER



DOUBLE MOTOR
125μm FIBER



ALL FIBER POLARIZATION CONTROLLER and SCRAMBLER HIGH RESOLUTION

All fiber, low loss

0.1125° resolution, stepper motor operation

Wide operating wavelength range: 400 nm to 1550 nm and beyond SM fibers available

Multiple modules can be daisy chained on a single fiber

Insertion loss: <0.2dB

PMD: <3fs

PDL: Depending on configuration <0.02dB to extremely low

Adjustable element retardance

Any number or retardance elements per fiber

Fully customizable

Available as:

OEM Module

Open Source Reference Design

Compact Instrument

USB Interface

Applications:

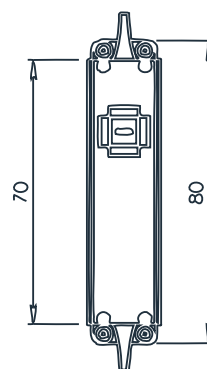
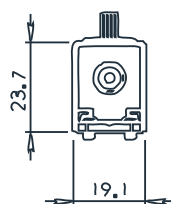
Industrial OCT

Medical OCT

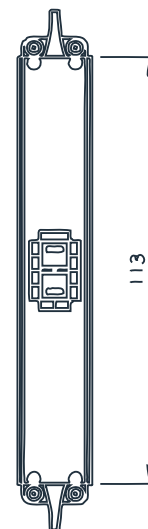
Laser control

Lefebvre Loops replacement

T&M



SINGLE MOTOR
ANY FIBER



DOUBLE MOTOR
125um FIBER

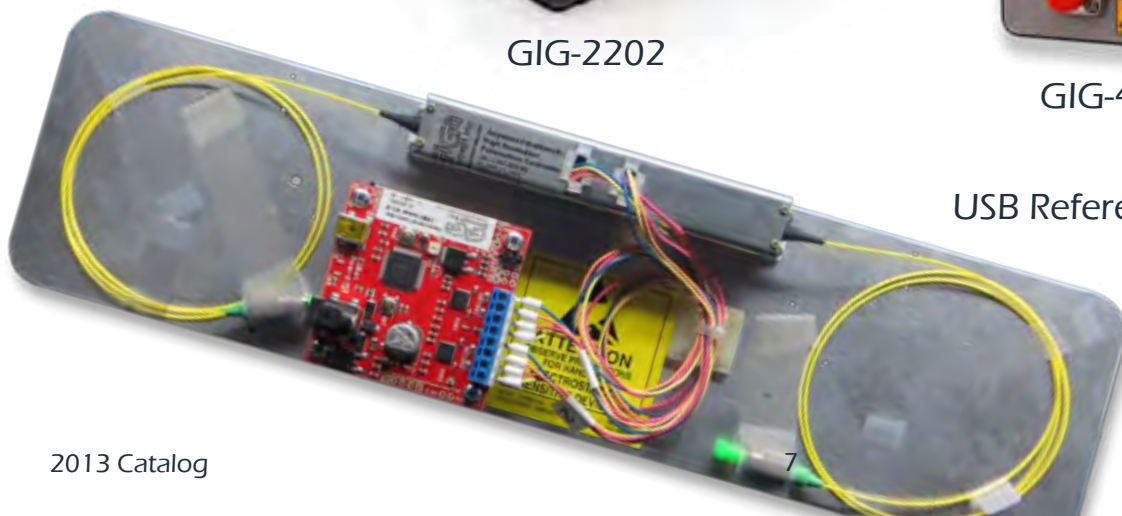
GIG-2201

GIG-2202



GIG-4202

USB Reference Design



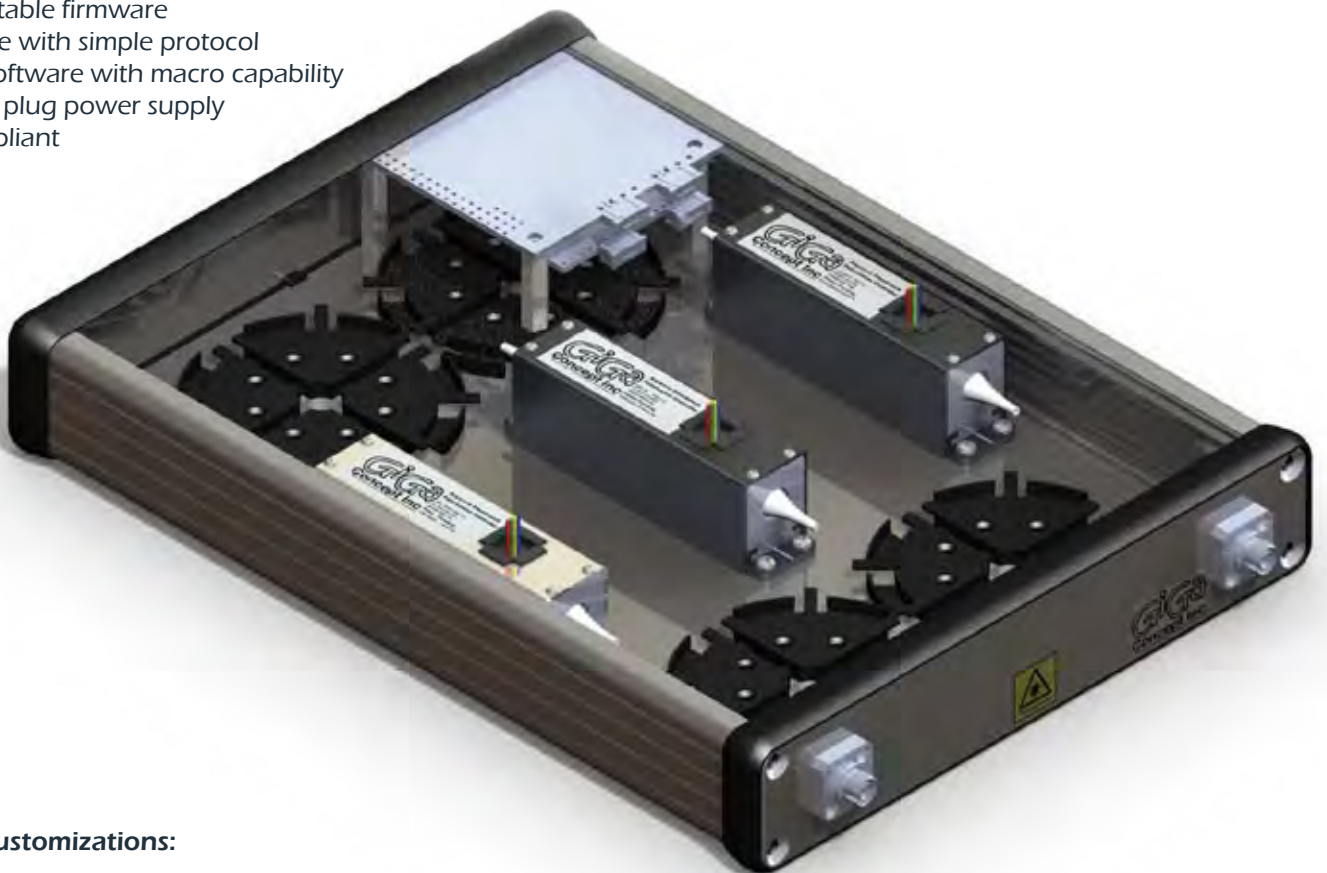
HIGH RESOLUTION INSTRUMENT ALL FIBER POLARIZATION SCRAMBLER and CONTROLLER

Optical specifications:

All fiber Spliceless Optical signal path
Polyimide coated SM fiber
Available wavelengths 400nm to 1610nm
Low Insertion loss: Typ. <0.2dB, 0.5dB Max.
Activation loss: Depending on inter-motor fiber length <0.05dB to <<0.0001dB is possible
PMD: <3fs
FC/APC connectors or custom

Electrical specifications:

Integrated microcomputer control
Field updatable firmware
USB remote with simple protocol
Terminal software with macro capability
9VDC wall plug power supply
RoHS compliant



Possible customizations:

Fiber: User defined operating wavelength
Connectors: User defined
Compensation fiber: equal length patch cord
Custom software functions

MODEL GIG-4203

US Patent 8,373,852

Loose the paddles

Get motorized!

Get Digital!

DIGITAL POLARIZATION
CONTROL



OEM MODULE ALL FIBERPOLARIZATION SCRAMBLER and CONTROLLER

All fiber Spliceless Optical signal path

Polyimide coated SM fiber
Fiber path length 155 mm or more, 1 m standard (approx. 0.5 m pigtails)
Available wavelengths 400nm to 1610nm
Low Insertion loss: Typ. <0.2 dB, 0.5 dB Max.
Activation loss: <0.05 dB
PMD: <3 fs

Low fiber stress compliant to 25 years fiber lifespan
Optical path integrity is preserved in case of electrical or mechanical failure
Open loop control choice of 18 °/step to 1.125 ° per 1/16 step (Evaluation kit)
+/-90 ° Retardance per element

Rotation speed: <0.14 ms/1/16 step, better than 3600 °/s
<1000 °/s in continuous scrambling use
Static or Dynamic control

3 V bipolar stepper motors
RoHS compliant

Options:

Use 2 modules for complete Poincare sphere coverage for any polarization input
Fiber termination FC/APC, bare (polyimide coated) or other
Multimode fiber

USB Controlled evaluation kit, reference design and desktop instruments available

Applications:

Optical Coherence Tomography OCT, PS-OCT
Raman Spectroscopy
Fiber Laser gain control
PMD Analysis

**Pre Qualification tests passed per Telcordia GR-1221-CORE, FOTP-28 by an independent ASQ
Certified Laboratory**



MODEL GIG-2002
US Patent 8,373,852

ALL FIBER POLARIZATION SCRAMBLER and CONTROLLER INSTRUMENT

Optical specifications:

All fiber Spliceless Optical signal path
Polyimide coated SM fiber
Available wavelengths 400 nm to 1610 nm
Low Insertion loss: Typ. <0.2 dB, 0.5 dB Max.
Activation loss: <0.05 dB
PMD: <3 fs
FC/APC connectors or custom

Electrical specifications:

Integrated microcomputer control
Field updatable firmware
USB remote with simple protocol
Terminal software with macro capability
9 VDC wall plug power supply
RoHS compliant

Mechanical specifications:

Dimensions: 226 mm x 105 mm x 33 mm
Weight: 400 g

Possible customizations:

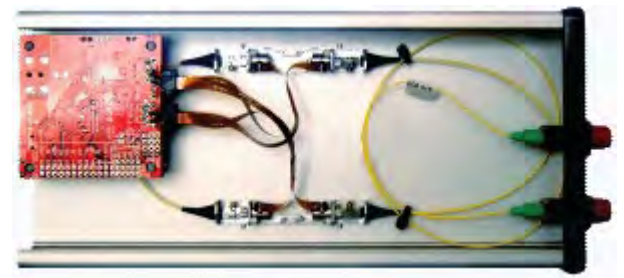
Fiber: User defined operating wavelength
Connectors: User defined
Compensation fiber: equal length patch cord
Custom software functions



US Patent 8,373,852



MODEL GIG-4002



MODEL GIG-4004

PNEUMATIC FIBER CLAMP

Fiber diameters: 155 μm , 250 μm , 400 μm , 600 μm , 1 mm, 3 mm or custom

Fiber coating types: Acrylate, Polyimide, TFE

Fiber interface: Quartz or Steel Groove

Guiding: Single or dual guide pins, adjustable for fiber <600 μm

Kinematic groove insert, interchangeable

Smooth and stable adjustments

Pneumatic Interface: 10-32 port at top rear or custom

Operating pressure: <3 psi (0.2 Bar) to 100 psi (6.9 Bar)

Media: Clean Air

Performances:

Normal force to fiber:

GIG-1112 100 psi (6.9 bar): 10 Lbs (46 N)

GIG-1136 100psi (6.9 bar): 21 Lbs (93 N)

GIG-1150 100 psi (6.9 bar): 61 Lbs (270 N)

Application example:

Manufacturing:

Suitable for automation and manual fiber handling and processing

FBG manufacturing, fiber positioning

R&D:

User adjustable closing time and force to protect even the most fragile specialized fibers.

Proof test:

GIG-1036 can be used to apply tensions to fibers in excess of

Up to 1.5 Kgf tension to polyimide buffered fibers

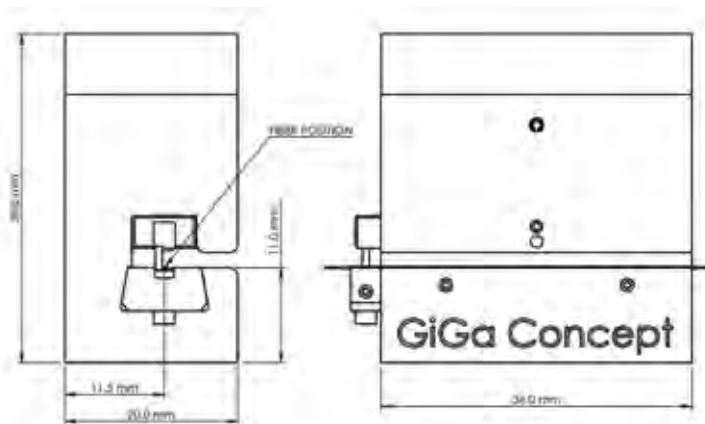
Up to 1 Kgf tension to acrylate buffered fibers (due to acrylate robustness)



MODEL GIG-1112



MODEL GIG-1150



MODEL GIG-1136

Engineered Soultions

Innovative Photonics for Photonics Innovation

Our products are developed to suit customer needs, custom is standard.

Some of our technologies are the result of intimate collaboration with customers resulting in IP Development, Patent application and Licencing.

We also perform studies and elaborate designs to suit a market segment, these are offered as pre-engineered products and solutions.

We help small and large corporations with innovative solutions and performing products.

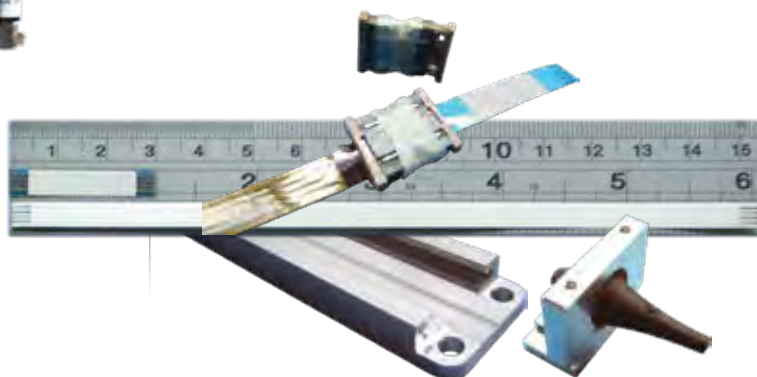
What is our solution for you?



Fiber annealing micro-oven
15mm to 150mm length
up to 650°C



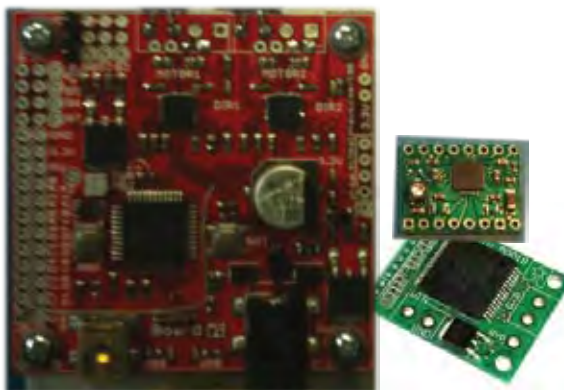
Static or Dynamic
Fiber tensioning system



Flexible and low cost platform
AnyWave Fiberbench
Modal Explorer



Clamp height motorization
with piezo actuator



USB motor controller custom firmware
and hardware for stepper motors
and servo motors