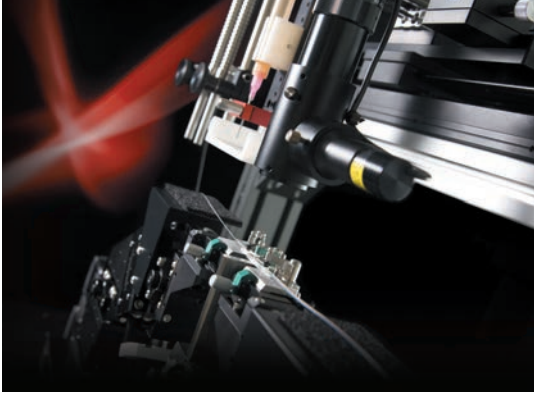
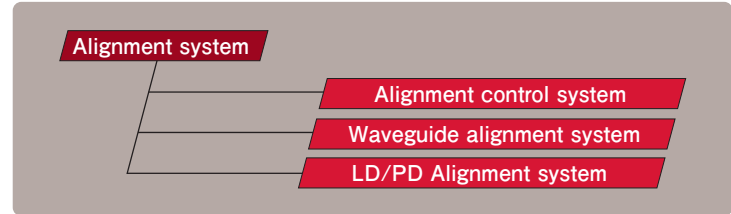


Alignment System

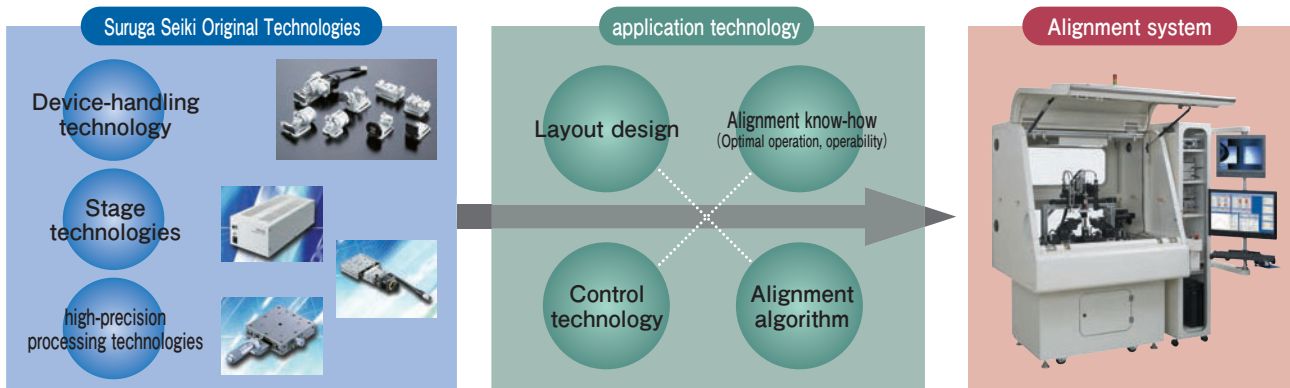


There are various types of alignment system for various devices, passive or active, with multi purpose as Research and Development and Mass Production.



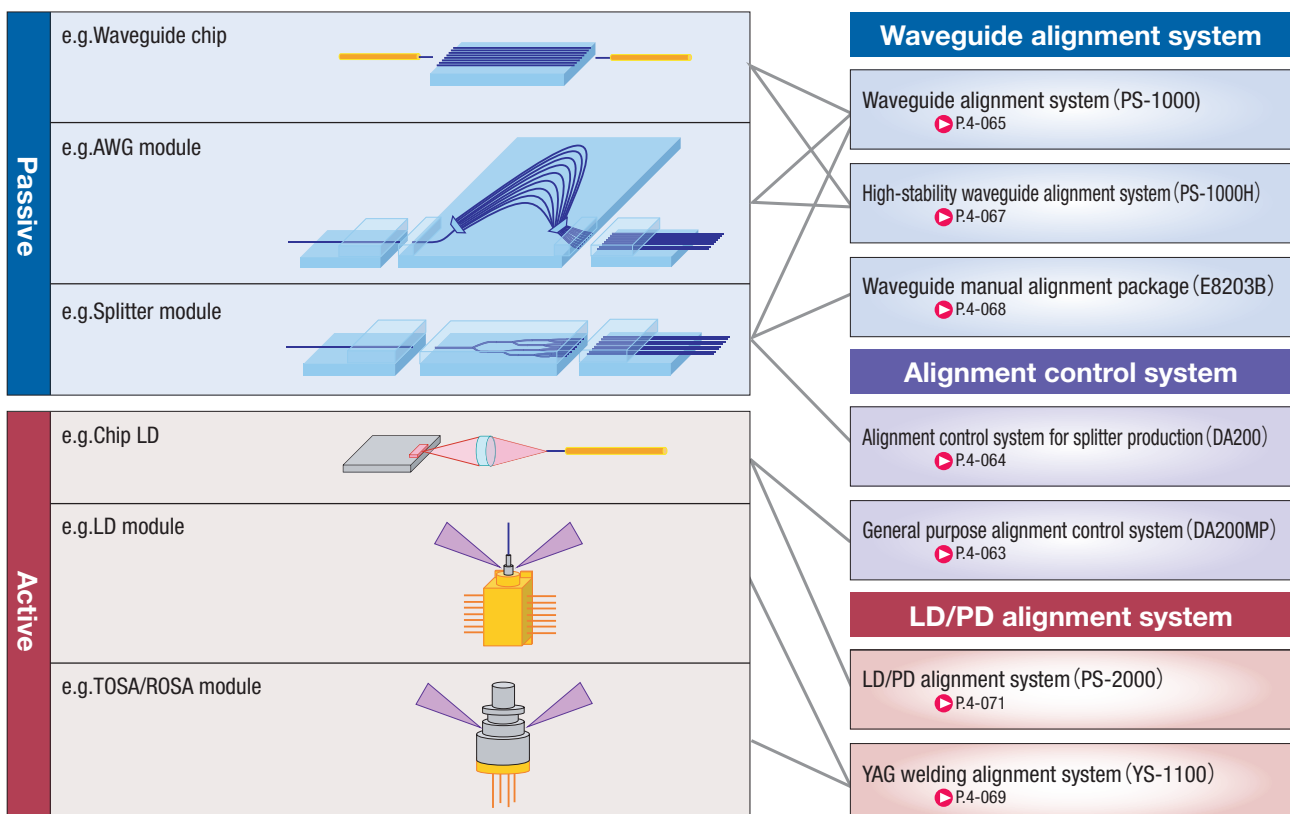
Suruga Unique Technology

Our core competence is precise process technology. Unique technologies which are manufacturing stages, motion control system integration built up based on core competence and long-term experiences.



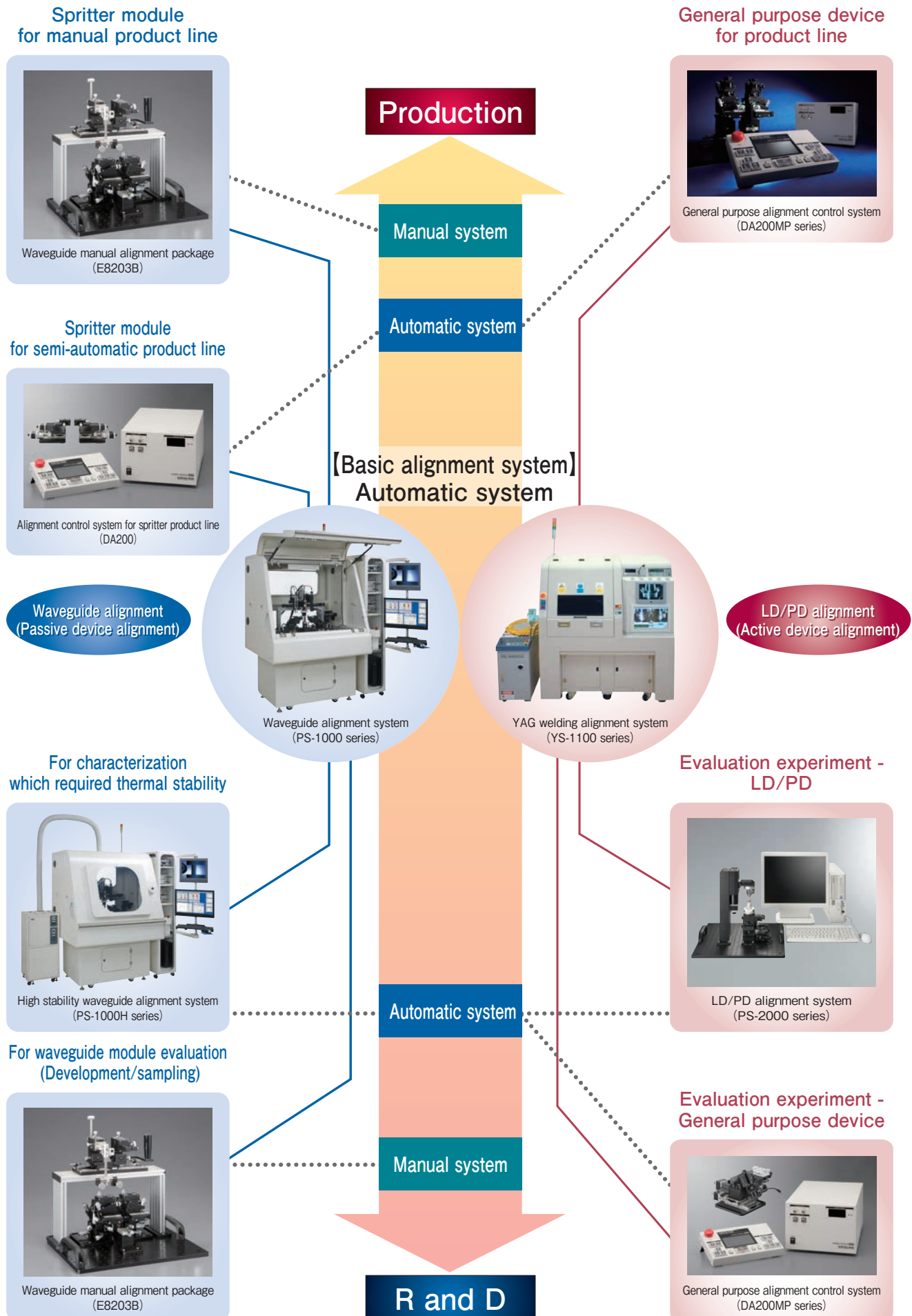
Propose the optimal systems

We integrate the optimal systems and a variety of device alignment systems.



Alignment System Line-up

Selectable alignment system depending on the application as below.



Guidance

WG alignment

LD/PD alignment

Alignment components

Manual alignment unit

Motorized alignment unit

Device unit

Fiber holders

Device holders

Adaptors

Contact sensing meter

Accessories for alignment

Stereomicroscope

Lens tube

Monitoring unit

CCD camera

Monitor

Lighting

UV equipment

Pump

Probe

Alignment system

Alignment controller

WG alignment

LD/PD alignment

General Alignment Controller System: DA200MP Series

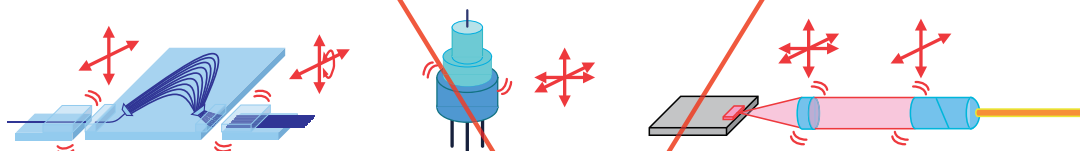
This is alignment controller system with general function for waveguide device, LD/PD module that covered from research development to production use.



■ Features of DA200MP

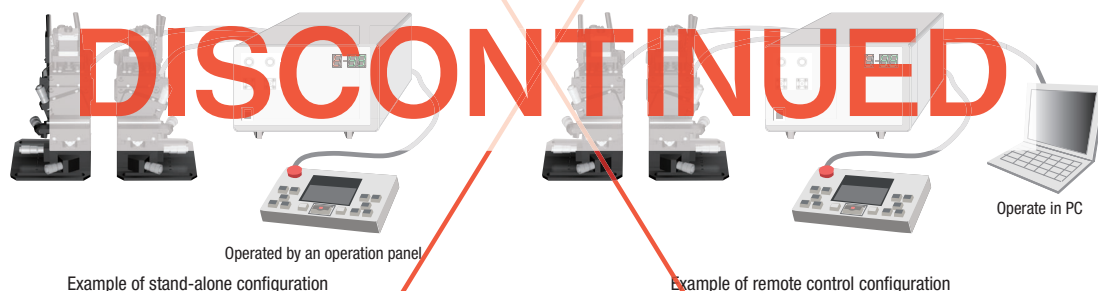
- ◎ Skill-less
Simple, single-button operation for the beginner
- ◎ Effective use of time
The automation offered by DA200MP takes care of the routine tasks, giving engineers more time to be ingenious.
- ◎ For embedded users program
Can be embedded alignment and control system to users program by command communication.

■ **Variety alignment pattern** DA200MP implements various alignment pattern necessary for various device correspondence.
X alignment(ONE), XY alignment(FLAT), XYZ alignment(FOCUS), Xyθz alignment(ROTATE)



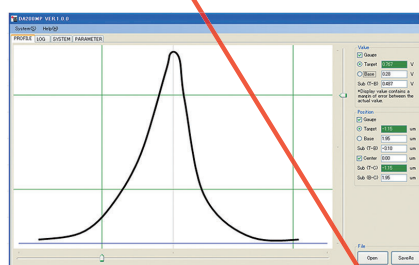
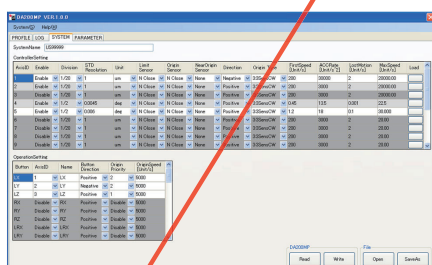
■ Operation method

The alignment controller is a versatile controller has both the stand-alone control that can operate intuitively and remote control by command communications.



■ Application software

Available various parameter change and copy by PC. By displaying the profile, can be analyzed.



SPEC (Main body)

Number of control axis	Four or eight axes (will be 12 or 16 axes when use 2 controllers)
Driver	5 phase stepping motor 0.75A/Phase
Alignment pattern	XY Alignment (FLAT)、XYZ Alignment (FOCUS)、XYθz Alignment (ROTATE)
Optical power meter	1310/1490/1550nm※、2ch (Accuracy is ±5% for our tested parameter)
Analog input	DC0~5V、2ch
Control panel	JOG driving hard key、Touch panel operation
Communication interface	RS232C/USB
Electrical power (1pc.)	AC100~240V±10% 50/60Hz less than 500VA
External dimensions (1pc.)	Main body : 230 (W) × 350 (D) × 160 (H) mm Control panel : 235 (W) × 150 (D) × 30 (H) mm
Weight (1pc.)	Main body : 5.8Kg (8 axis) Control panel : 0.7kg
Applicable stage unit	Suruga's motorized stage with standard stepping motor

※ Available power meter for alignment within the range of built-in PD other than communication wave.

Please contact us about optical sensitivity characteristics.

◀ Applicable Stage Unit P.4-019~

Alignment Controller System for Splitter Production: DA200

This is the alignment system with alignment function that is made for easy on the field.

This dedicated controller makes easy to operate and improved production efficiency.

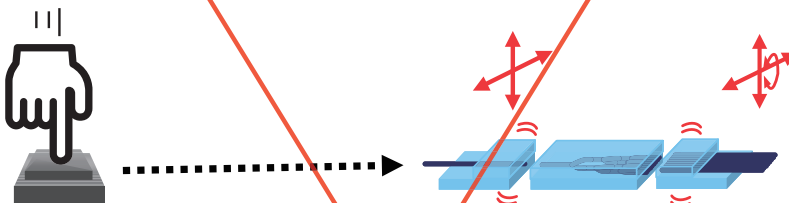


■ Features

- ◎ Skill-less
Simple, single-button operation for the beginner
- ◎ Specialized sequencer for production.
Can be realized by working more efficiently with the monitor design for the splitter production process.
- ◎ Compact design
Meet your needs for flexibility and space savings.

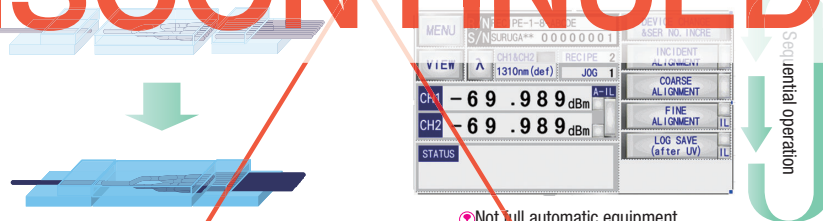
■ Skill-less

Simple, single-button operation for the alignment beginner.
Contact sensing meter (CSM) provides a skill-less for all splitter productions.



■ Sequence operation Available sequence operation by the touch panel display for splitter production line.

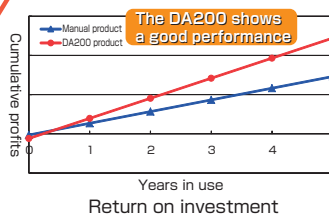
DISCONTINUED



Ⓢ Not full automatic equipment.

■ Overall cost reduction

The automated splitter production allows totally reduction of cost, such as skill-less operation, efficiently and reduced equipment space.



Ⓢ As the effect might be changed do to the condition, this drawing is just for a reference.

SPEC (Main body)

Number of control axis	6-axis
Driver	5 phase stepping motor 0.75A/Phase
Alignment pattern	XY Alignment (FLAT) 、 XYθz Alignment (ROTATE)
Optical power meter	1310/1490/1550nm※、 2ch (Accuracy is ±5% for our tested parameter)
Analog input	DC0~5V、 2ch
Control panel	JOG driving hard key、 Touch panel operation
Communication interface	RS232C/USB
Electrical power (1pc.)	AC100~240V±10% 50/60Hz less than 500VA
External dimensions (1pc.)	Main body : 230 (W) ×350 (D) ×160 (H) mm Control panel : 235 (W) ×150 (D) ×30 (H) mm
Weight (1pc.)	Main body : 5.8kg Control panel : 0.7kg
Applicable stage unit	ES3800—8A/8B (Please contact us for more information.)

※Even other than a communication wavelength, the light receiving range of built-in PD is available as the power meter for alignment.

Please inquire for optical sensitivity characteristic.

Ⓢ Applicable stage Unit ES3800-8A/8B P.4-020

Guidance

WG alignment

LD/PD alignment

Alignment components

Manual alignment unit

Motorized alignment unit

Device unit

Fiber holders

Device holders

Adaptors

Contact sensing meter

Accessories for alignment

Stereomicroscope

Lens tube

Monitoring unit

CCD camera

Monitor

Lighting

UV equipment

Pump

Probe

Alignment system

Alignment controller

WG alignment

LD/PD alignment

Waveguide Alignment System (Passive Device Alignment): PS-1000 Series

We offer the best suited alignment system, which fulfills the needs of customers and characters of devices, covering a wide range of alignment specifications varying from waveguide device evaluation for research and trial use till UV bonding of splitters and AWG devices for production use.



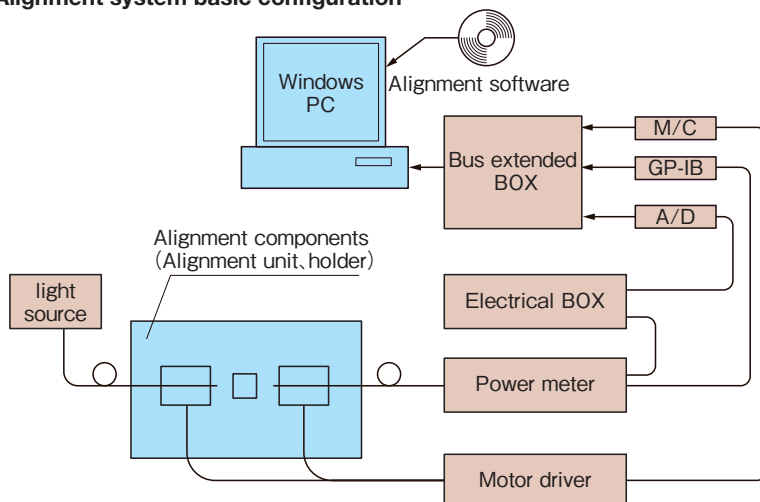
We propose the optimum system with stage unit and software which developed for dedicating alignment system.

- High speed alignment
High speed alignment with our original algorithm.
- Improvement operation
Improve software operation with interactive interface.
- Customized
We can customized for your needs.

Features

- Automatic Alignment
Positioning optical axis of optical fiber and waveguide device in quickly.
- Posture adjustment
Automatically operated an angle control and GAP adjustment between devices by our own facing technique.
- Holders
It is a comprehensive style catalog with the introduction of a range of holders for devices.
- Software
Consisted micro sequence of process by the interactive interface of alignment software.
Also control the device evaluation equipment such as IL and PDL measurement is available.
- Customization
We can provide a solution to meet your requirements.

Alignment system basic configuration



PC specification

CPU	over than Core2Duo
HDD	over than 40GB
Memory	over than 2GB
The bus occupancy number	PCI-Ex (1.0) 1
OS	Windows Professional 7 (32bit)

Optical power meter recommended type

- MT9810A, MT9810B (ANRITSU)
- 8153A, 8163A, 8163B (Agilent Technologies)
- AQ2201 (Yokogawa Electric Corporation)

Guidance

WG alignment

LD/PD alignment

Alignment components

Manual alignment unit

Motorized alignment unit

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Lens tube

Monitoring unit

CCD camera

Monitor

Lighting

UV equipment

Pump

Probe

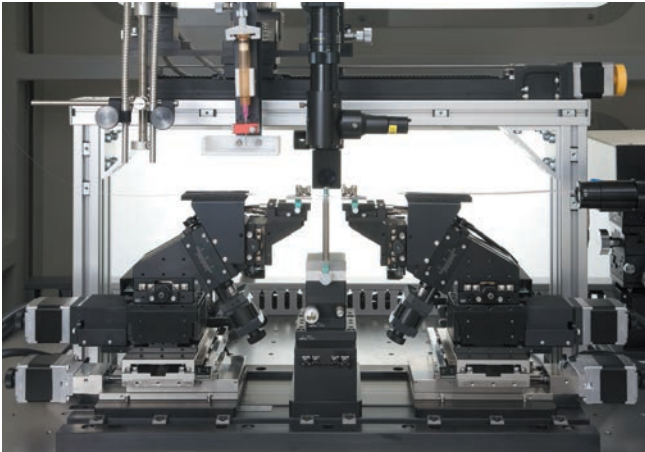
Alignment system

Alignment controller

WG alignment

LD/PD alignment

Motorized stage alignment unit



6-axis stage unit for alignment system

- Available proximity a microscope and probe according to have a space of upper optical axis.
- 30% smaller than former model.
- Available standard holder on the catalog.
- ※ Corresponds to automatic 3 to 5-axis unit

	Axis	Travel distance	Resolution
Alignment unit (6-axis)	X	50mm	0.05um/Pulse (MS1/20)
	Y	10mm	
	Z (Optical axis)	50mm	
	θ_x	$\pm 6^\circ$	0.001233°/Pulse (Half)
	θ_y	$\pm 8^\circ$	0.0015°/Pulse(Half)
	θ_z	$\pm 8^\circ$	0.0016°/Pulse(Half)

▶ Detailed 6axis stage unit P.4-022

Alignment software



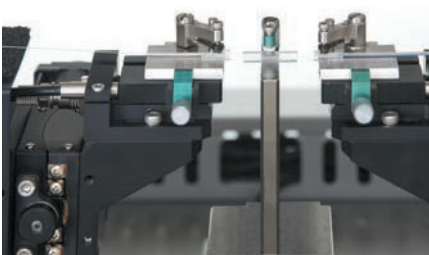
Automatic alignment application "IROHA" is the dedicated software for alignment.

- JOG . . . Stage driving operation by PC mouse-clicked.
- Automatic alignment . . . Automatically controlled alignment (XY alignment, XYZ alignment, XYθz alignment).
- Touch-sensing . . . Control a touch-point and a GAP from devices automatically.
- Automatic facing . . . Automatic facing control from devices.
- External equipment control . . . Communication with an external connection equipment (GP-IB, Serial, I/O).
- Profile display . . . Beam profile measurement and displaying and saving of results.
- Output display . . . Optical power display.
- Program driving . . . Micro sequence programming function.

Alignment pattern

XY Alignment (FLAT)	XYZ Alignment (FOCUS)	XYθz Alignment (ROTATE)
Alignment member of a single axis.	Alignment a device which has a focus. (Lens alignment)	Core alignment which placed on the line (Array alignment)

Contact sensor/facing function

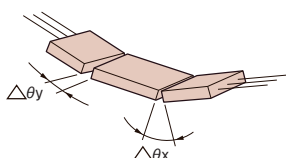


Our original contact sensor/facing function

- Can be automatic recognition by precision positioning and displacement sensor of motorized stage connection point that contacted between devices with any grams.
- Can be positioned parallel between devices automatically by consisted 2-axis goniometer stage controller for connecting sensor during sampling tilt.

Benefit

- Better than use the processing image.
- No deformation such as breakage, tilting.
- As precision positioning and sampling by displacement sensor, it is able to display the tables because of good reproducibility.

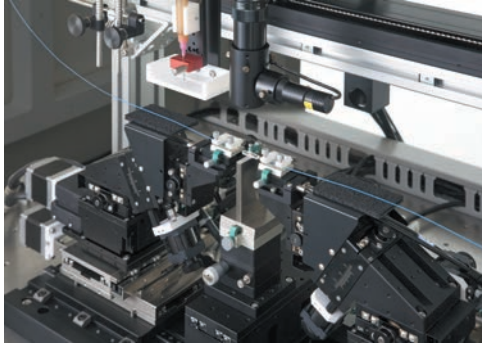


High-Stability Waveguide Alignment System: PS-1000H Series

This is a waveguide alignment system pursued static stability after alignment process, which can offer a system component that is best suited for a long-hour measurement of micro core devices.

Features

- High-Stability is improved by using a motorized thermal management stages.
- Improved product safety through isothermal device.
- Available standard device holder.
- We can customized for your needs.



(heat-suppressing alignment unit)



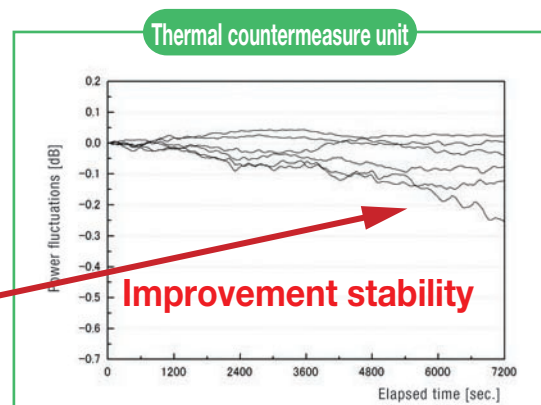
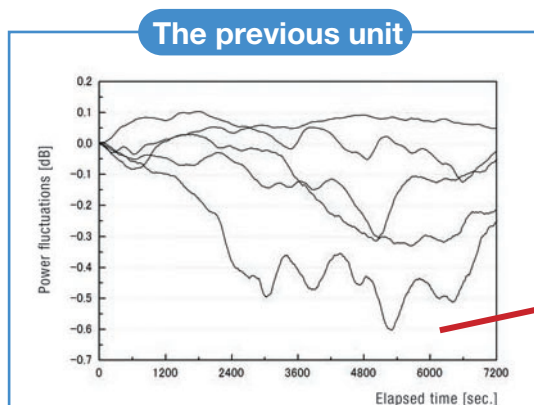
Thermostatic device



Thermal stability data



The following graph shows the fluctuation example, after alignment. The strain stability with thermal control is better than former unit.



(When using the thermostatic device, this is the repeating measurement example for 2 hours stability data after rounded-end optical fiber alignment.)

Guidance

WG alignment

LD/PD alignment

Alignment components

Manual alignment unit

Motorized alignment unit

Device unit

Fiber holders

Device holders

Adaptors

Contact sensing meter

Accessories for alignment

Stereomicroscope

Lens tube

Monitoring unit

CCD camera

Monitor

Lighting

UV equipment

Pump

Probe

Alignment system

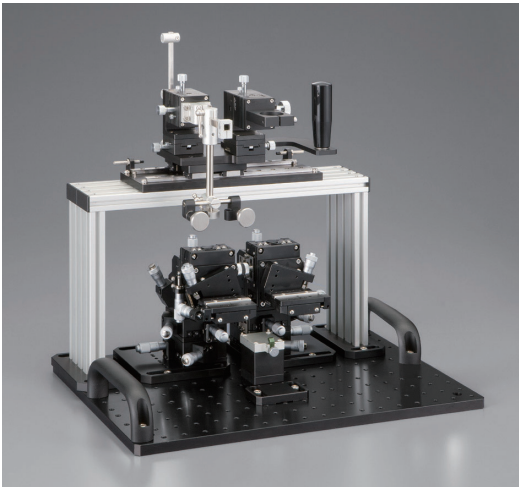
Alignment controller

WG alignment

LD/PD alignment

Waveguide Manual Alignment Package: E8203B

This is a very useful package for manual operation of waveguide device(splitter) alignment and UV bonding. Our long history of producing various alignment units concluded that this is one of the best component alignment packages. With a selection of holders, development/trial purposed evaluations of various waveguide devices are possible.



■ Features

- ◎ Manual stage alignment unit having coarse and fine adjusting device.
- ◎ Standard equipment upper unit with monitoring/UV changeover stage.
- ◎ Available standard device holder.

※ : Accessories: Bracket for V20-501S (P.4-048) , VFGB5F (P.4-058)

SPEC		
Axis	Travel distance	Resolution
X	±6.5mm	Coarse motion:10μm/scale Fine motion:0.5μm/scale
Y	±6.5mm	Coarse motion:10μm/scale Fine motion:0.5μm/scale
Z	±6.5mm	Coarse motion:10μm/scale Fine motion:0.5μm/scale
θx	±2.5°	Approx 29 // /scale
θy	±2.5°	Approx 28 // /scale
θz	±4.0°	Approx 33 // /scale

■ Holder/Accessories

The following goods are not included. (Sold separately)

- Various holders (Fiber, FA and WG)
- Observation equipments (Lens tube, CCD camera, monitor and lighting)
- UV radiation equipment (UV light source)

Configuration example for spritter module alignment



This is the configuration example for spritter module. Please order as necessary.



Guidance

WG alignment

LD/PD alignment

Alignment components

Manual alignment unit

Motorized alignment unit

Device unit

Fiber holders

Device holders

Adaptors

Contact sensing meter

Accessories for alignment

Stereomicroscope

Lens tube

Monitoring unit

CCD camera

Monitor

Lighting

UV equipment

Pump

Probe

Alignment system

Alignment controller

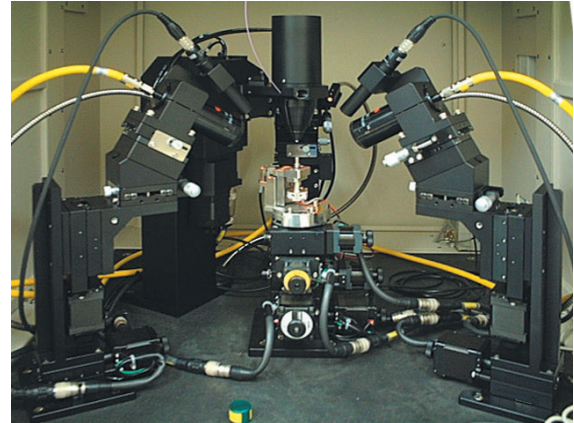
WG alignment

LD/PD alignment

YAG Welding Alignment System: YS-1100 Series

This system can operate fully-automated process from LD/PD module alignment with YAG laser welding work.

With the best-designed micro-positioning mechanism for alignment and our unique software to optimize the use of the mechanism, this welding alignment system can meet a wide range of alignment needs of users.

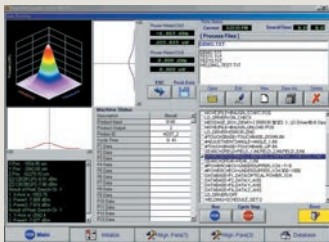


Features

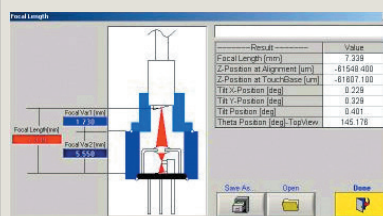
- Excellent operability
Just place the parts, press the button and from the tilt alignment of the device to the YAG welding process will be operated automatically.
- Support the variety of production process.
Available processing management depending on the device. We also have library routine for supporting production.
- Variety of measuring function
Device judgment function is satisfactory such as measuring a focal length, angle and IL characteristic.
- Our original automatic facing function.
Can be adjusted device posture by our original facing function.

Alignment data storage

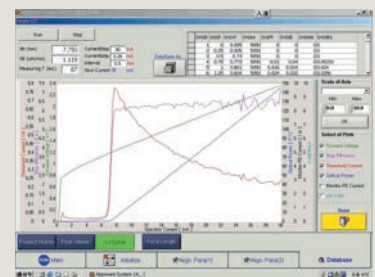
- profile data storage (Excel)



Measurement focal length and angle



IL characteristic measurement



Guidance

WG alignment

LD/PD alignment

Alignment components

Manual alignment unit

Motorized alignment unit

Device unit

Fiber holders

Device holders

Adaptors

Contact sensing meter

Accessories for alignment

Stereomicroscope

Lens tube

Monitoring unit

CCD camera

Monitor

Lighting

UV equipment

Pump

Probe

Alignment system

Alignment controller

WG alignment

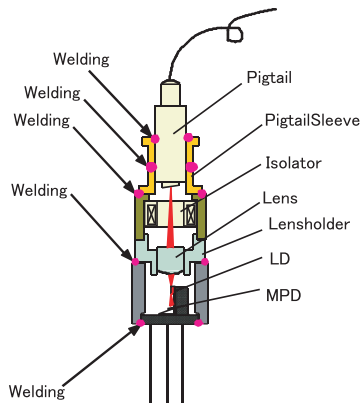
LD/PD alignment

Process example implementation

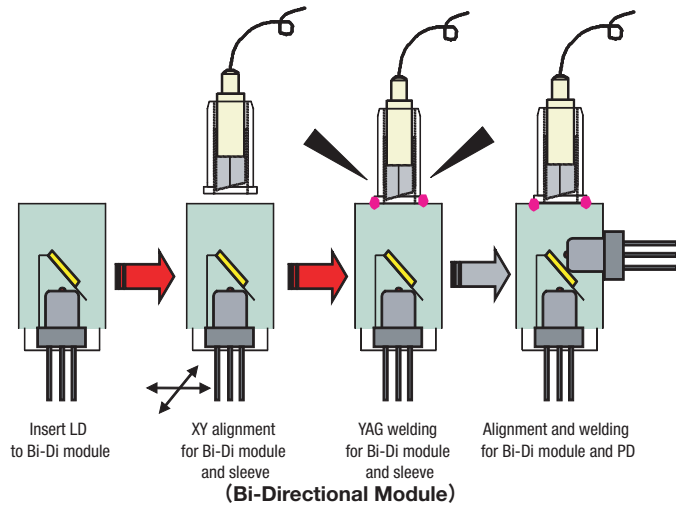
Support the alignment and YAG welding of many active devices.

Correspondence device

- TO-CAN (TOSA, ROSA, Pigtail) Module
- Bi-Directional Module
- Triplexer Module
- MiniDIL Module
- Butterfly Module

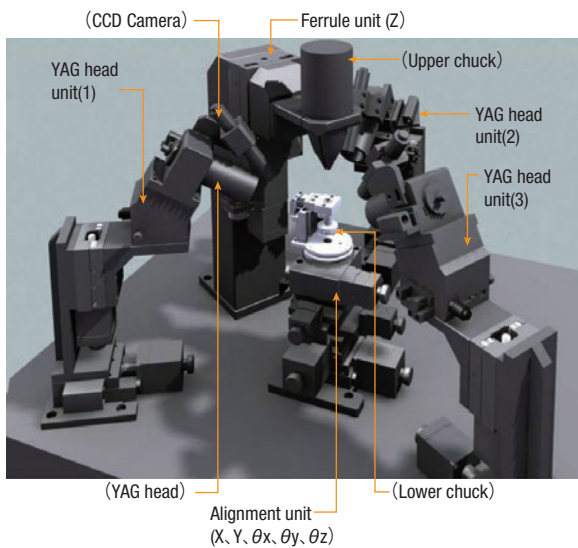


(TO-Can Pigtail Module)



(Bi-Directional Module)

Alignment unit & YAG laser unit



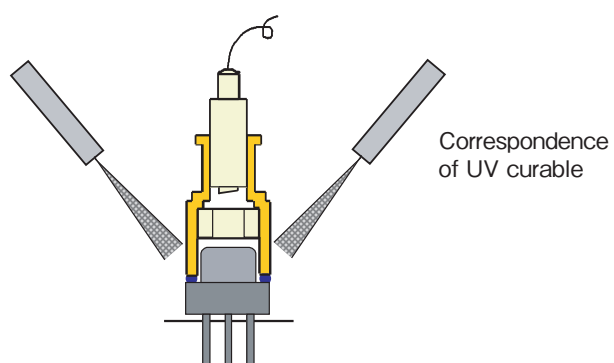
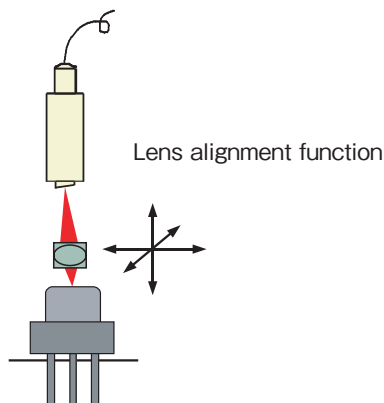
	Axis	Travel distance	Resolution
Alignment unit (Motorized 5 axes)	X	20mm	0.05 μ m/Pulse (MS1/20)
	Y		
	θ_x		
	θ_y		
	θ_z		
Ferrule unit	Z (Optical axis)	70mm	0.05 μ m/Pulse (MS1/20)
YAG head unit (Motorized 2 axes)	Y	20mm	1 μ m/Pulse (Full)
	Z	30mm	



(Butterfly type module chuck example)

Application-process

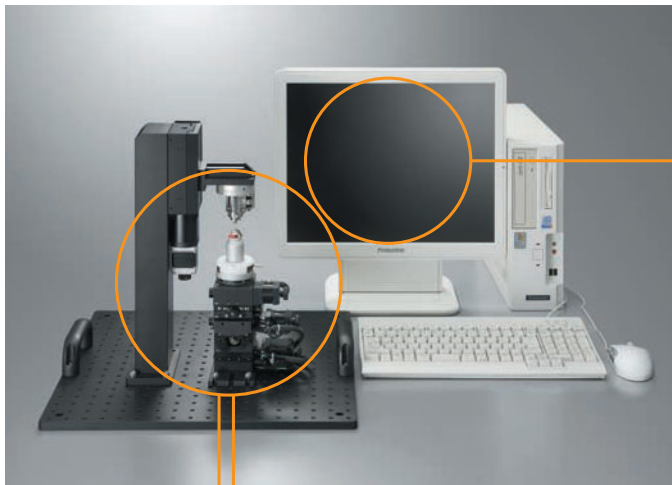
Additional lens alignment function and UV resin hardening are available.



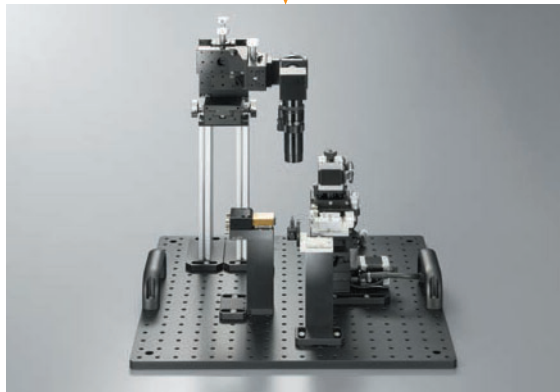
LD/PD Alignment System(Active Device Alignment): PS-2000 Series

We offer the best suited alignment system, which fulfills the needs of customers and characters of devices, covering a wide range of alignment specifications varying from LD/PD device evaluation for research and trial use to UV bonding for production users.

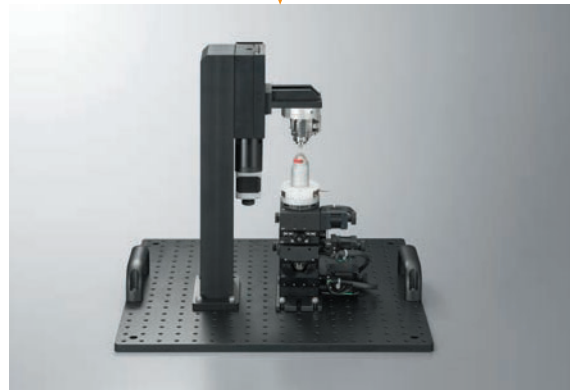
Alignment system configuration example



Alignment software "I · Ro · Ha"



(An example LD/PD-Lens-Fiber)



(An example LD/PD-Sleeve-Fiber)

Features

- Automatic alignment
Precision automatic positioning for measuring optical ber and LD/PD device in quickly.
- Posture adjusting
Can be control an angle and GAP between devices by our original facing function.
- Holders
Available standard device holder.
- Alignment software
Can be combined micro sequence in the process by the interactive interface of alignment software.
- Customized
We can customized for your needs.