

■Features

- Laser heating while measuring the precise temperature of the processing point (2-color method is applied)
- Equipped with temperature-targeted laser power feedback control
- Uniform beam profile (top-hat shape)
- Easy connection with external equipment (robotics, PCs, etc.), high-FA compatibility, best suited for Industry 4.0, etc.
- Laser power lineup: 30 W, 75W , 200 W
- Laser power control programming with up to 5 types, 60000 steps
- Sample app available for linkage with PC



■Applications

- Laser processing
- Plastic welding
- Soldering
- Thermal curing of adhesive
- Sintering of metal nanoinks
- Waterproof seal
- Hardening of metal

■Outline

This is a laser heating system equipped with a temperature measurement function. Since the processing state depends on the temperature of the processing point, it is effective for high precision and high reproducibility of laser heating process, including plastic welding. In addition, the temperature feedback function of the processing point, which is unprecedented in the case of plastic welding, is equipped. This function makes it easier to search for processing conditions and ensures stable processing by preventing overheating, etc. SPOLD® LD irradiation light source, which is used as the laser light source in this system, enables uniform heating with a top-hat shaped beam.

■Application examples

Figure 1: Plastic welding

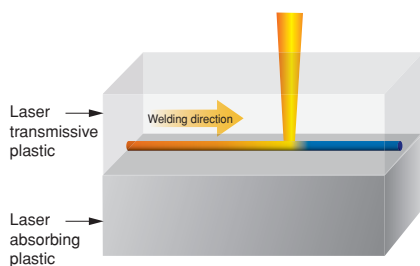


Figure 2: Soldering

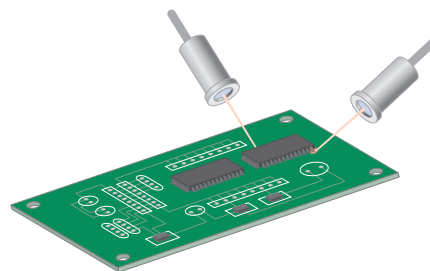


Figure 3: Thermal curing of adhesive

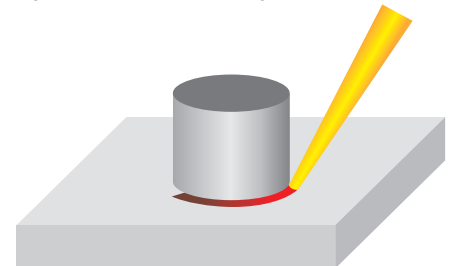


Figure 4: Sintering of metal nanoinks

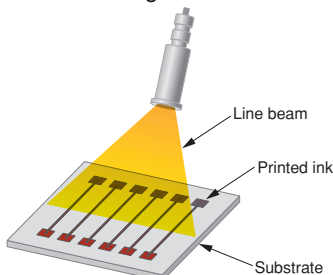


Figure 5: Waterproof seal

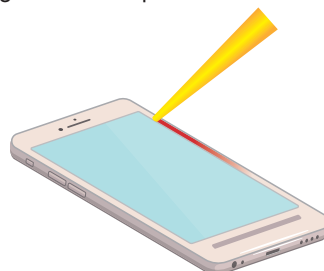
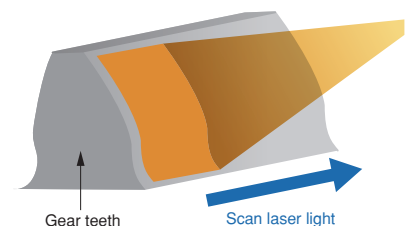


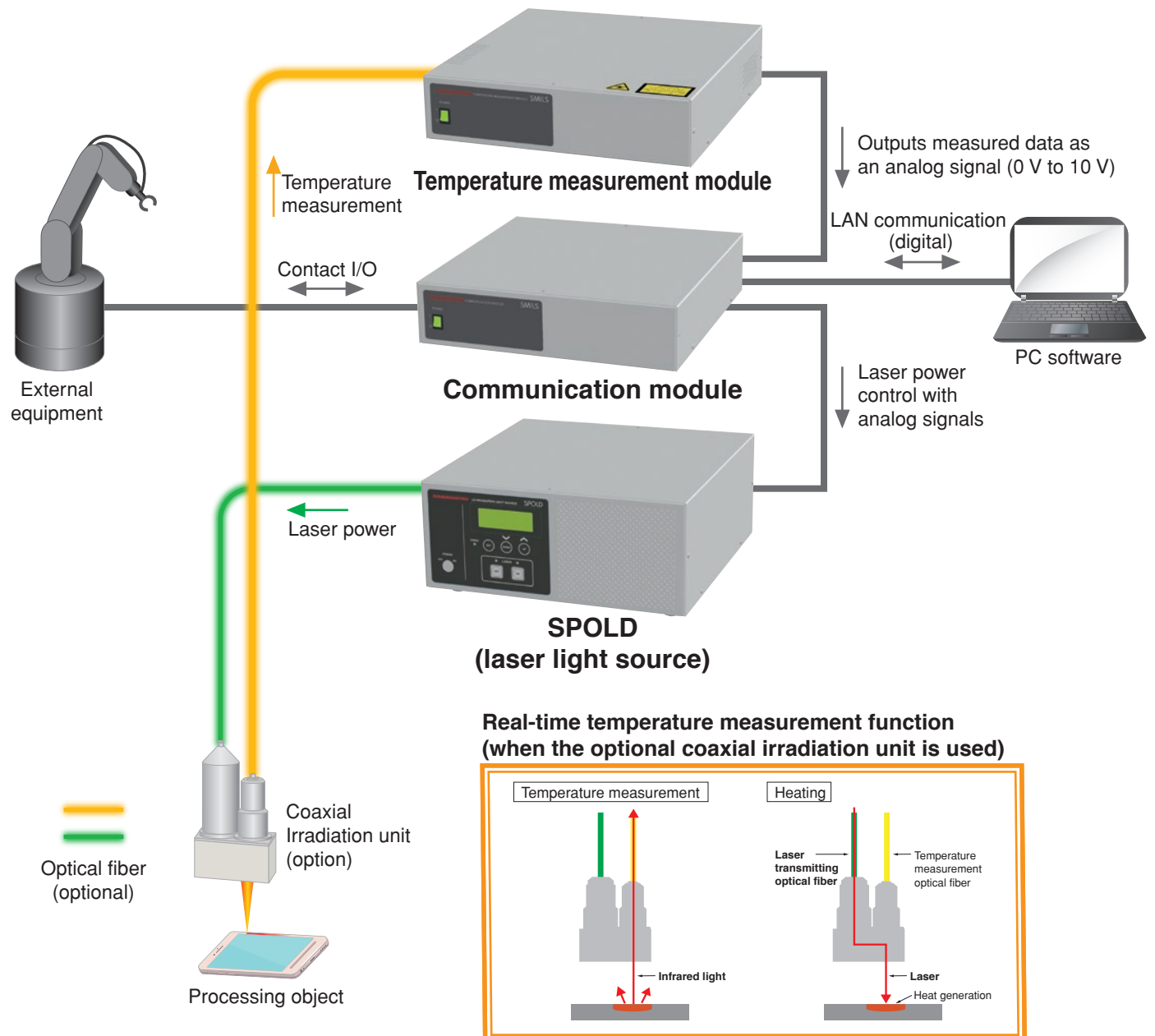
Figure 6: Hardening of metal



■ Configuration



● Details



Function

Item	Function
Temperature measurement module	Radiation thermometer with optical fiber
	Two-color method for low temperature measurement (250 °C or less)
	Continuous measurement and its analog signal output
	Thermal radiation detection (2 channels)
Communication module	Noise reduction without mechanical drive components
	Communication with SPOLD, temperature measurement module and external equipment
	Communication with PC using LAN (Ethernet)
	Laser output program control in 65,535 steps and 1 ms minimum duration (4 settings)
	Temperature-targeted laser power feedback control (1 set)
	Control without PC by using contact I/O
	Sample software especially designed for users unfamiliar with lasers
	Mesurement data storage
SPOLD LD irradiation light source series	Top-hat shaped beam profile
	Three models with different maximum laser power output
	Wide variety of optical accessories

Example of temperature measurement and feedback control

Feedback control in lap welding of plastics

T-SMILS® L15570 series equipped with a PID (proportional-integral-differential) control function with temperature as the target value. We call this control as “temperature feedback control”.

The following example shows the temperature monitoring when laser is irradiated in a rectangle as shown in Figure. 7 on a sample which a transparent plastic plate and a black plastic plate are stacked. This example shows how the laser automatically responds to overheating caused by scanning speed change at each corner when the laser is irradiated with a constant power.

Figure 7: Lap welding

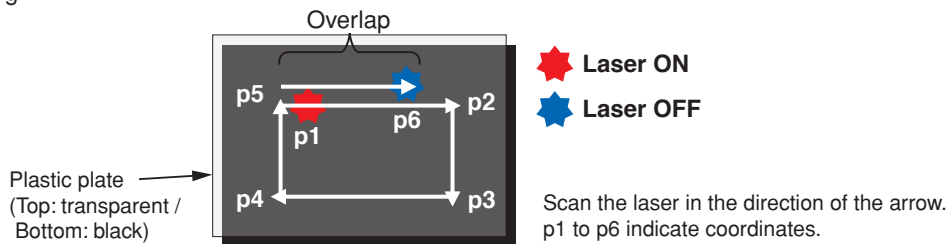


Figure 8: Temperature monitoring

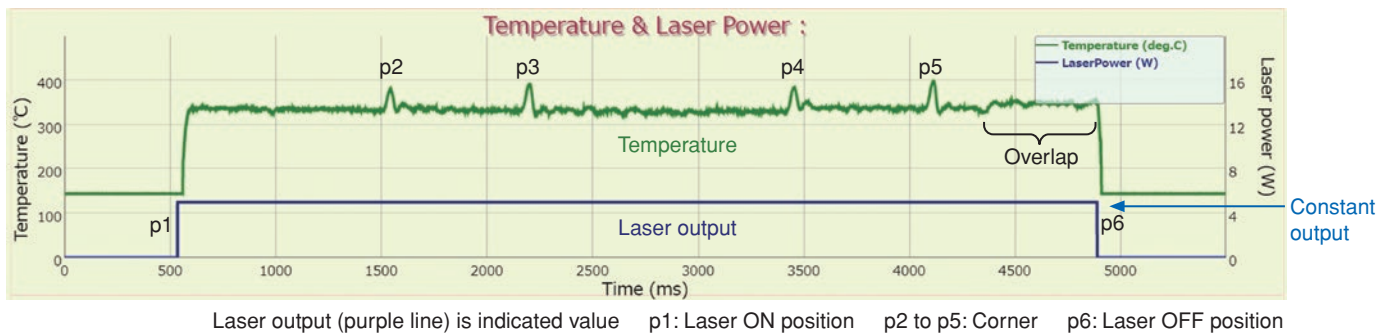
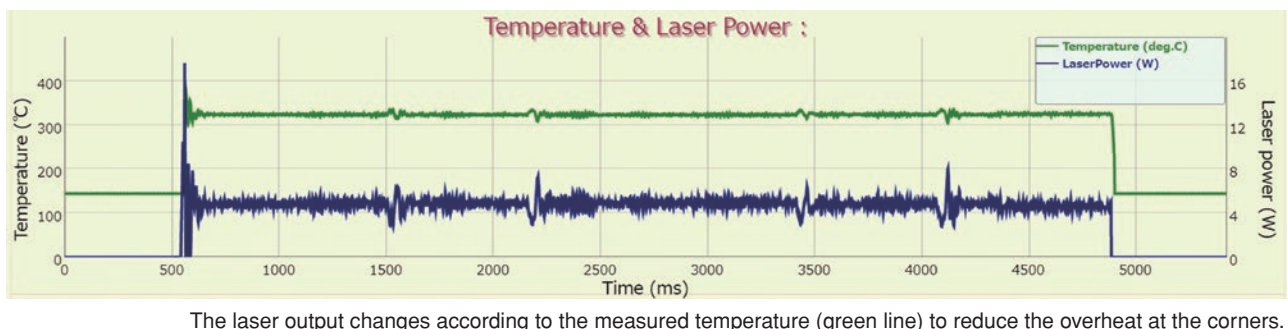


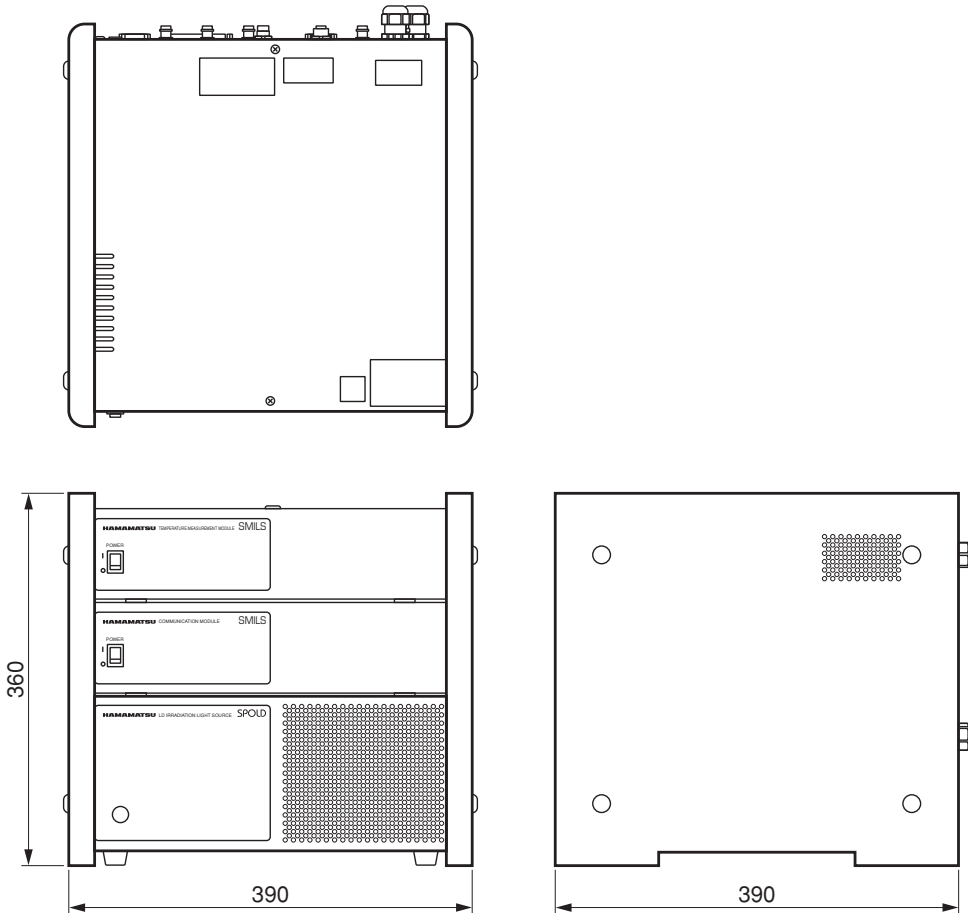
Figure 9: Temperature feedback control (Target 320 °C)



■Specification

Parameter		Specification			Unit
		L15570-111	L15570-211	L15570-311	
Whole laser heating system	Dimensions (W x H x D)	Approx. 390 x Approx. 360 x Approx. 390 (excluding protrusions)			mm
	Weight	≤22			kg
	Guide laser light wavelength	650 ±50			nm
	Guide laser power	≤1			mW
Light source (SPOLD LD irradiation light source)	Laser output power	30 (min)	75 (min)	200 (min)	W
	Oscillation type	CW			—
	Peak emission wavelength (25 °C)	940 ± 20			nm
	Cooling method	Air cooling		Water cooling	—
Laser transmission optical fiber	Fiber length	Approx. 5 (length excluding fiber inside of the laser light source: approx. 4.5)			m
Irradiation unit	Spot size	Diameter 0.8 to 6.4 (depends on irradiation optics)			mm
Temperature measurement	Measurement method	Two-color radiation thermometer with optical fiber			—
	Temperature measurement range	+200 to +650			°C
Communication standard	Protocol	Ethernet: TCP/IP			—

Figure 10: Dimensions (unit: mm)



* Intersection without indication shall be based on JIS B 0405-m (middle class)

Figure 11: Name and Function

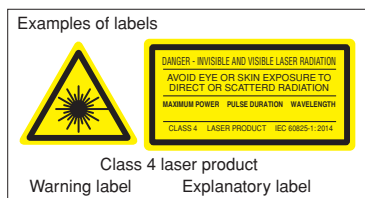


No.	Name	Functions
①	Temperature measurement module	Module that measures the temperature during processing
②	Communication module	Module that transmits data between modules and controls laser light source etc.
③	SPOLD LD irradiation light source	Laser light source unit
④	Power switch	Switching ON/OFF the power supply of the temperature module
⑤	Power switch	Switching ON/OFF the power supply of the communication module
⑥	Power supply switch with key	Switching ON/OFF the power of the laser light source

- * Connect the supplied AC-adaptor power supply (DC24 V, 1 A) to the temperature measurement module and communication module respectively.
- * Connect the supplied power cord to SPOLD main unit and supply power of 100 V to 240 V, max. 15 A.

Danger (Class 4 Laser)
Invisible laser radiation: Avoid eye or skin exposure to direct or scattered radiation

●Laser beam emitted from this product is an invisible laser beam that cannot be seen by the naked eye. This product is a IEC 60825-1 classification of laser products. It corresponds to "Class 4 Laser". To use this product safely, follow IEC 60825-1 regulations, etc.



- T-SMILS, SPOLD is registered trademark of Hamamatsu Photonics K.K..
- Information described in this material current as of December 2021. Specifications are subject to change without notice.

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