OtO Photonics

Light Source Product sheet

Description

OtO Photonics provides light sources designed to meet our customer's needs with stable and wide-band spectral output for UV, visible and NIR measurements.

These light sources are designed for transmittance and absorbance measurement with color information, and are suited for scientific applications, research and development, production line and quality control fields.

All light sources are designed to be used in the spectral measurement package (PKG) developed by OtO. The package contains a robust measurement platform, making it easy for users to perform measurements.

All models come with an external I/O which can be controlled by the spectrometer or other host devices. When ON/OFF control is applied, the user should consider the warm-up condition of the light source in order to get accurate measurement.

Several different lamps and optical filtering techniques are available, as shown below.

Balance Light
LS-BA

Halogen Light
LS-HA

Deuterium-Halogen Light
LS-DH-4

Deuterium Light
LS-D2

Wideband Light
LS-WB

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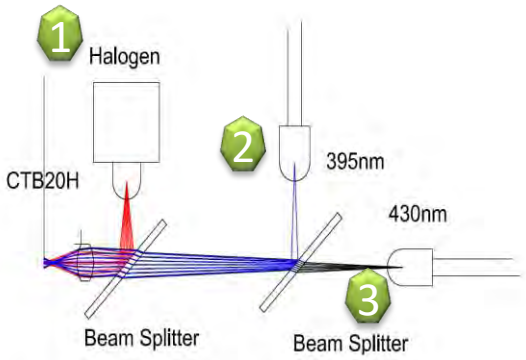
Balance Light LS-BA

The balance light source is designed for transmittance and absorbance measurement with color information in the visible and NIR.

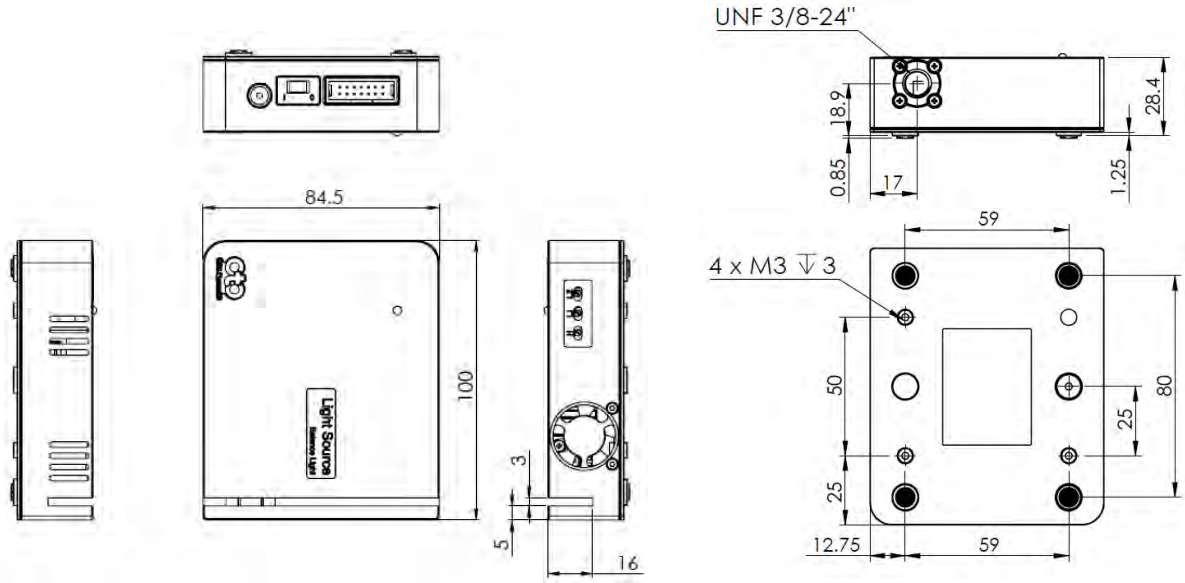
The Halogen source provides a stable and smooth wide-band spectral output which is enhanced by the integration of 395nm and 430nm LEDs to increase the UVA and blue output.



In order to align these three light spots well, the light sources are adjusted accurately. Besides the light spots are optimized, the intensity of each light source is adjusted in balance. It can provide the better measurement result. In some applications, the light source provides the flexibility to compensate the efficiency of the spectrometer.

Model		LS-BA
Halogen Lamp	Rated Voltage(V)	5
	Current(A)	0.97
	Life(hr)	10000
	Color Temperature (k)	2800
LED1 (395 nm)	Forward Voltage(V)	3.5
	Forward Current(mA)	50
LED2 (430 nm)	Forward Voltage(V)	3.8
	Forward Current(mA)	30
Power Adapter	AC input range(V)	100~240
	DC output voltage(V)	5 (max. 2A)

Drawing



Spectrum

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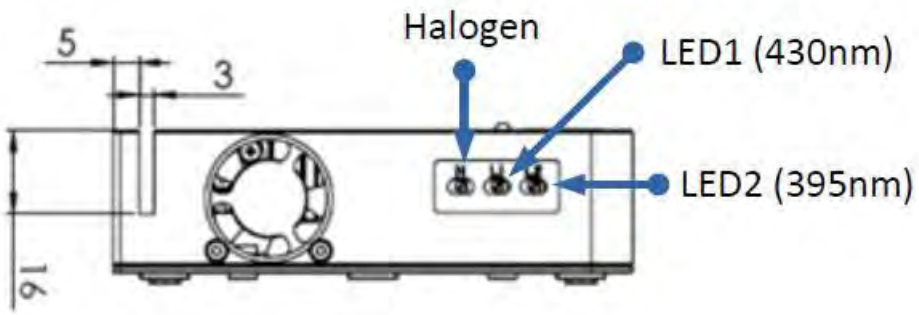
Features

➢ Potentiometer Adjustment

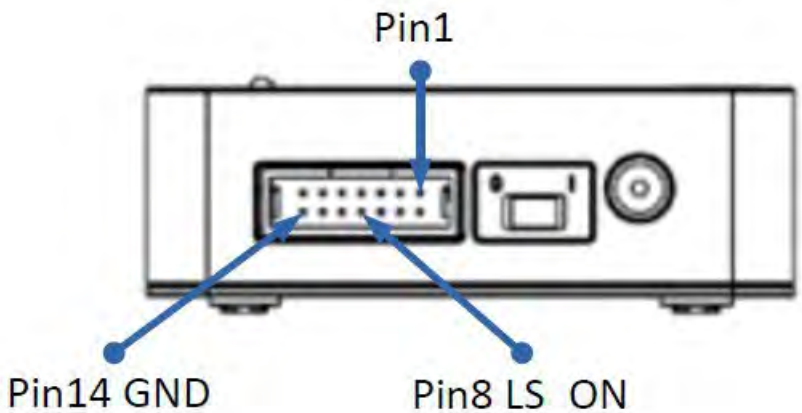
The potentiometers are adjusted in OtO production line to provide a balanced spectrum. The spectrum is related to the measured spectrometer. But if the user needs to adjust it to get another spectrum response, this function is still flexible.



Intensity Adjustment：Halogen、LED1(430nm)、LED2(395nm)

➢ I/O Extension Port

There is one 14pin 2.54mm pitch connector in the balanced light source. This 14pin connector can be connected to SD1220 directly through the 14pin cable. For other spectrometer models, the user can use two pin cable to link the spectrometer and this light source. (Pin8&Pin14) Through the SpectraSmart software or SDK, the user can turn on/off the light source. But the user needs to consider the halogen lamp warm up and stable time.

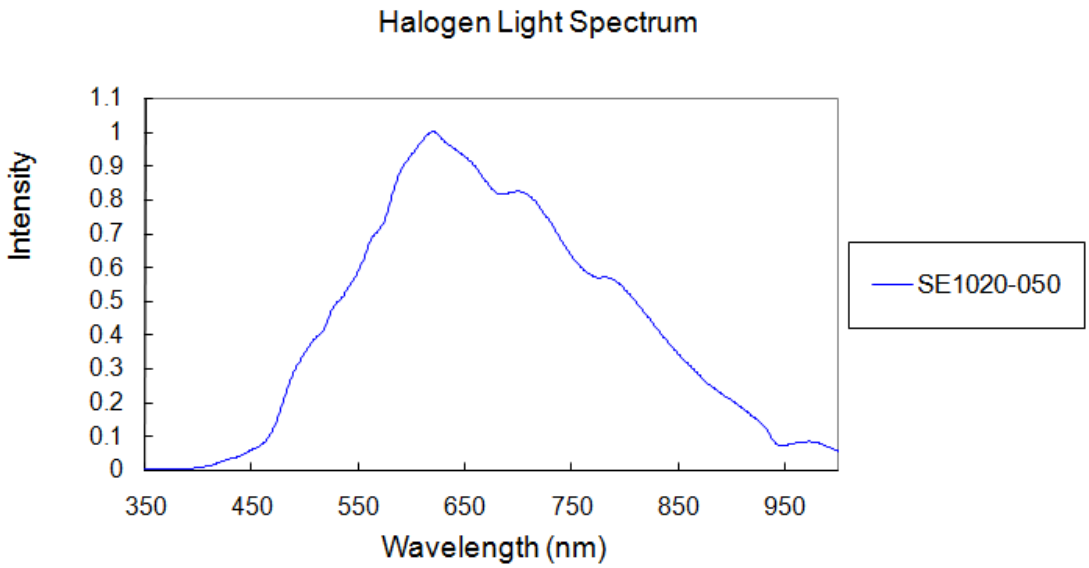


Halogen Light LS-HA

OtO Photonics' Halogen Light source provides a stable and smooth wide-band spectral output suitable for most visible to near-infrared measurements. This light source is designed to be used in OtO's PKG spectral measurement package.

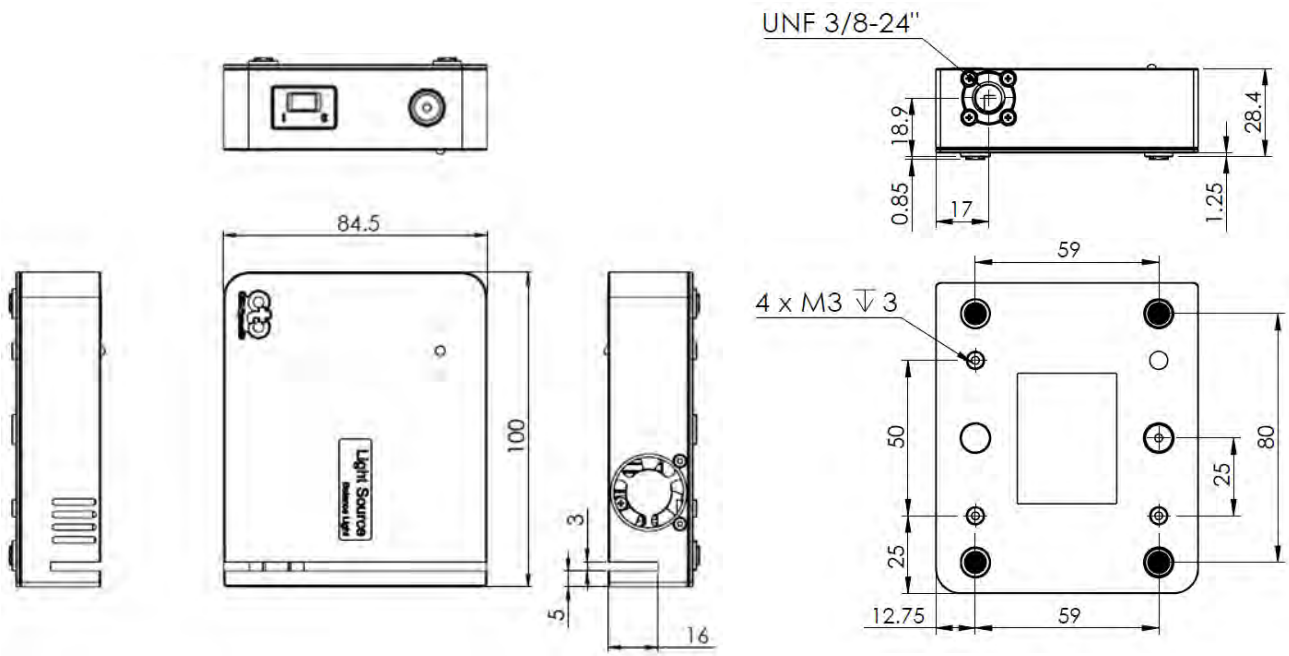
Model	Halogen Lamp			
	Wavelength Range (nm)	Stability (AU)	Drift (%/hour)	Rated Voltage (V)
LS-HA	350-2500	0.5%	<0.3	5
	Current (A)	Life (hr)	Color Temperature (k)	Warming-up time
	0.97	10000	2800	0.5 hr

Spectrum



The spectrum is measured by OtO SE1020-50-VNIR (350-1020nm) spectrometer. Electrical Dark and Linearity Calibration are enabled. Intensity Calibration is disabled.

Drawing



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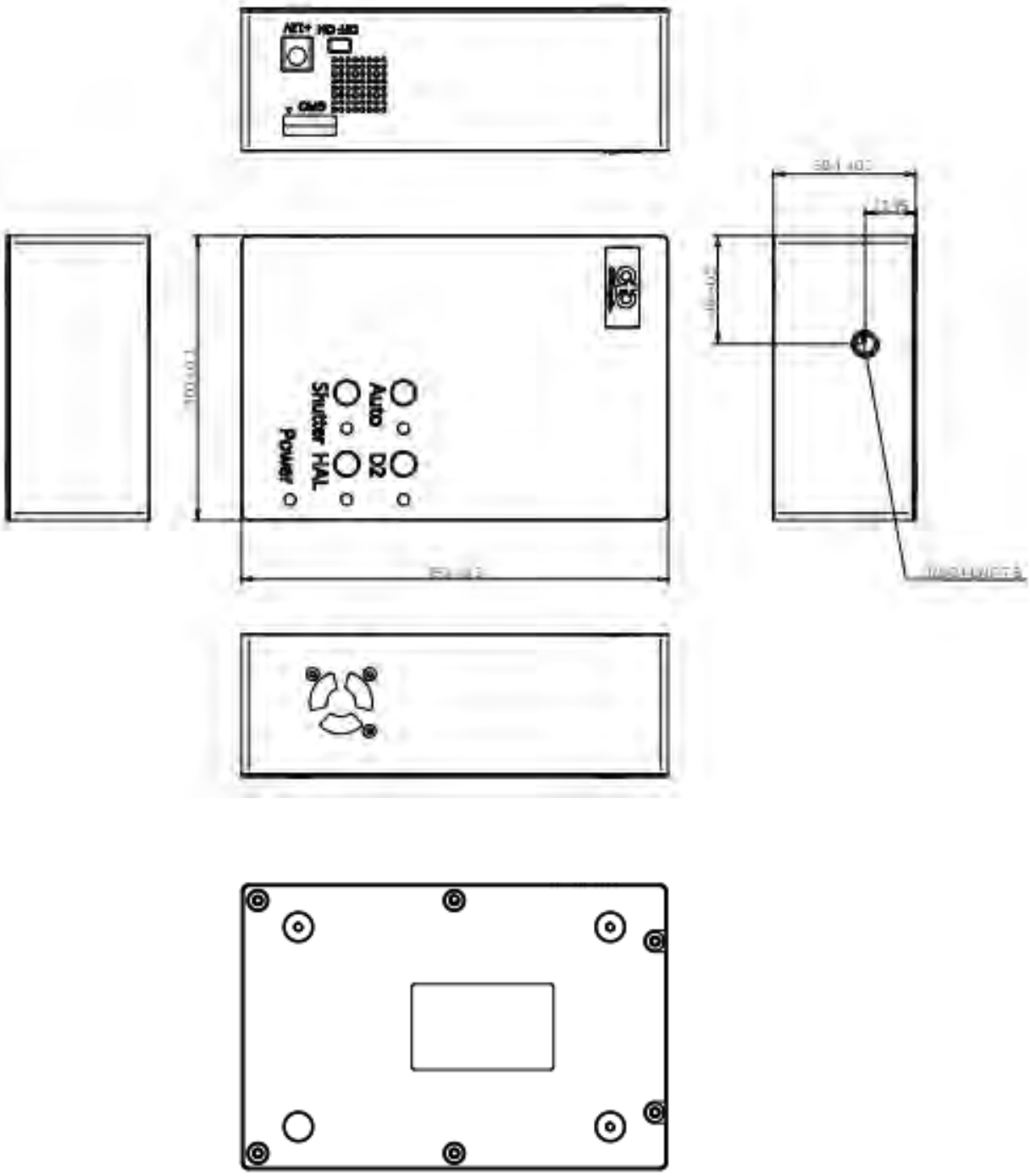
Deuterium-Halogen Light LS-DH-4

The LS-DH-4 deuterium-halogen light source module is an upgraded version of the LS-DH-2, combining both deuterium and halogen lamps. It features more stable deuterium output with longer lifetime, and adopts long-life halogen lamps for the visible to near-IR range. The collimated output port supports direct use as a collimated light source, SMA905 fiber coupling, or optional collimators. With flexible mechanical and software control, each lamp can be switched on/off independently. The design ensures improved UV/visible output uniformity and stability, while maintaining easy integration and servicing for high-precision optical measurements.

Model		LS-DH-4
D2 Wavelength Range		185-400
HAL Wavelength Range		400-2500
Deuterium Lamp	Drift(%/hour)	<0.25 % /hour (50% optical intensity decay)
	Power consumption (W)	5.8
	Stability (AU)	0.15%
	Life (hr)	>1000
Halogen Lamp	Rated Voltage (V)	5
	Current (mA)	45
	Life (hr)	>2000
Power Adapter	AC input range(V)	100~240
	DC output voltage(V)	12 (max. 3.34A)

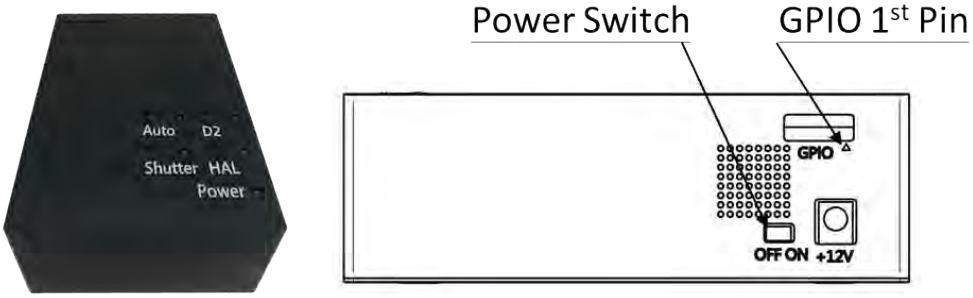
- **Drawing**



- **Features**

➢ Operation Mode Selection

When the LS-DH-4 is connected to a 12V power supply and the Power Switch is set to ON, the Power indicator will light up. The user can then press the Auto button (Auto/Manual Switch) to select the operation mode: Auto Mode (Auto indicator ON):The SpectraSmart software can control the Shutter, D2 deuterium lamp, and HAL halogen lamp. Each function's indicator lights up when activated (Shutter indicator ON = shutter closed).Manual Mode (Auto indicator OFF):The user can manually control the D2, HAL, and Shutter by pressing their respective buttons.

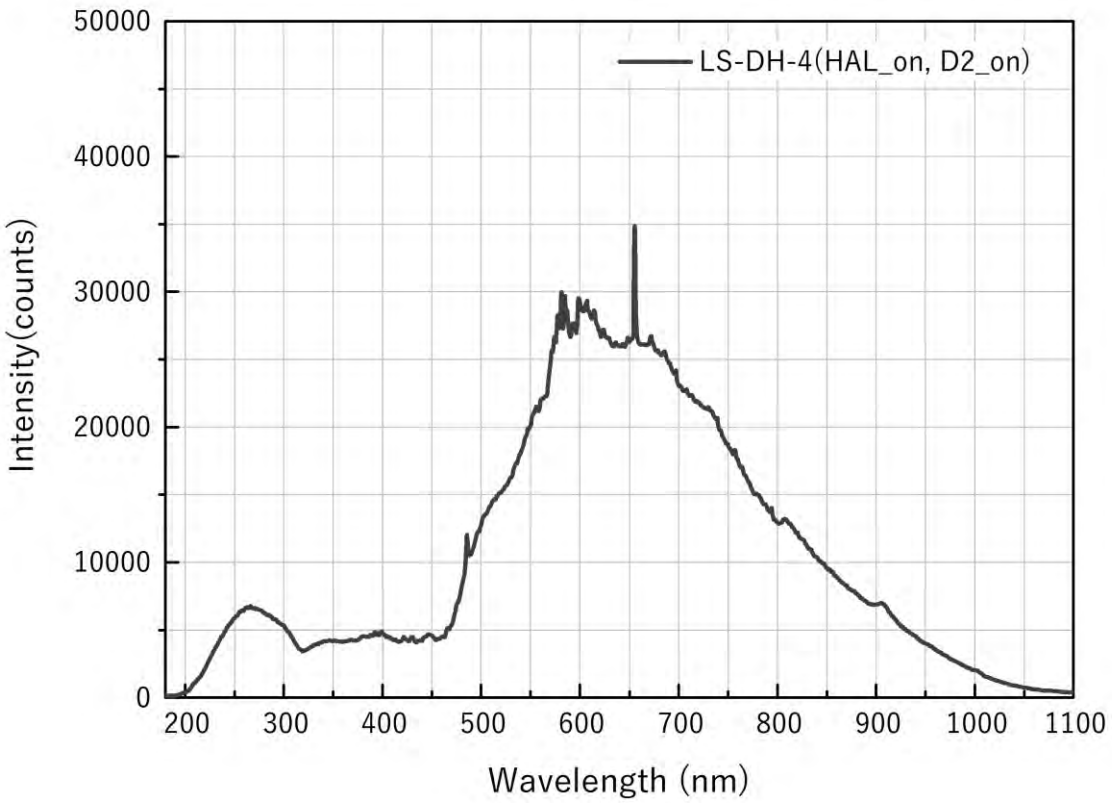


➢ GPIO Control Interface

The LS-DH-4 includes an 8-pin GPIO connector with a 2.0 mm pitch. This GPIO can be connected to a spectrometer using an 8-pin cable. Once connected and the Auto switch is set to automatic mode, the control of D2 lamp, Halogen lamp, and Shutter will be managed by the spectrometer software SpectraSmart or through the SDK via I/O levels (3.3 V / 5 V or 0 V).Users can switch the light sources on and off via SpectraSmart or the SDK; however, they should always pay attention to the warm-up condition and stabilization time of the light sources.

Pin No.	Direction	Pin Name	Function Description
1	NC	NC	NA
2	NC	NC	NA
3	NC	NC	NA
4	Input	Shutter	High: Open Shutter Low: Close Shutter
5	Input	D2_ON	High: Turn on D2 LS. Low: Turn off.
6	Input	HAL_ON	High: Turn on Halogen LS. Low: Turn off.
7	NC	NC	NA
8	GND	GND	Ground

- Spectrum

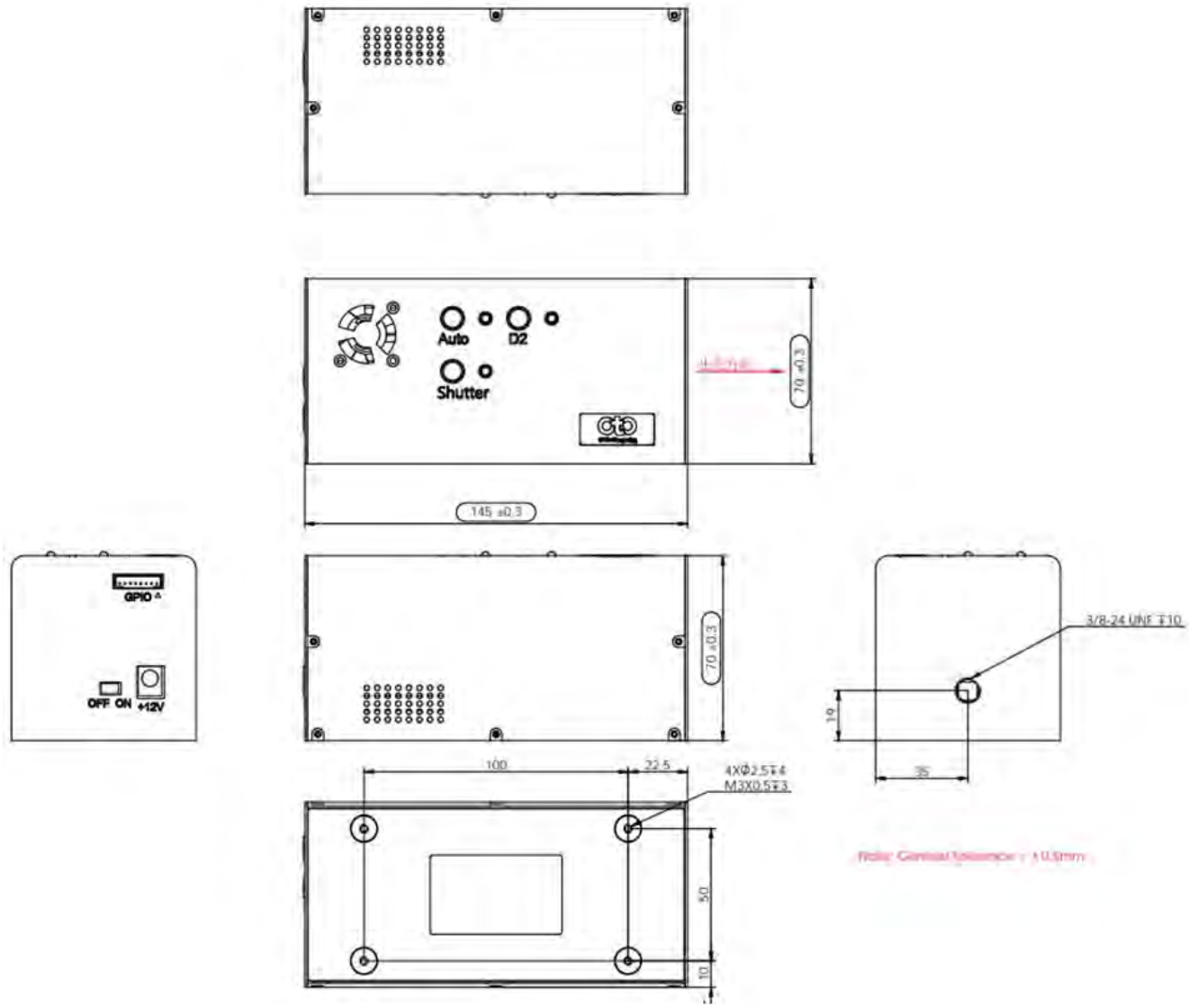


Deuterium Light LS-D2

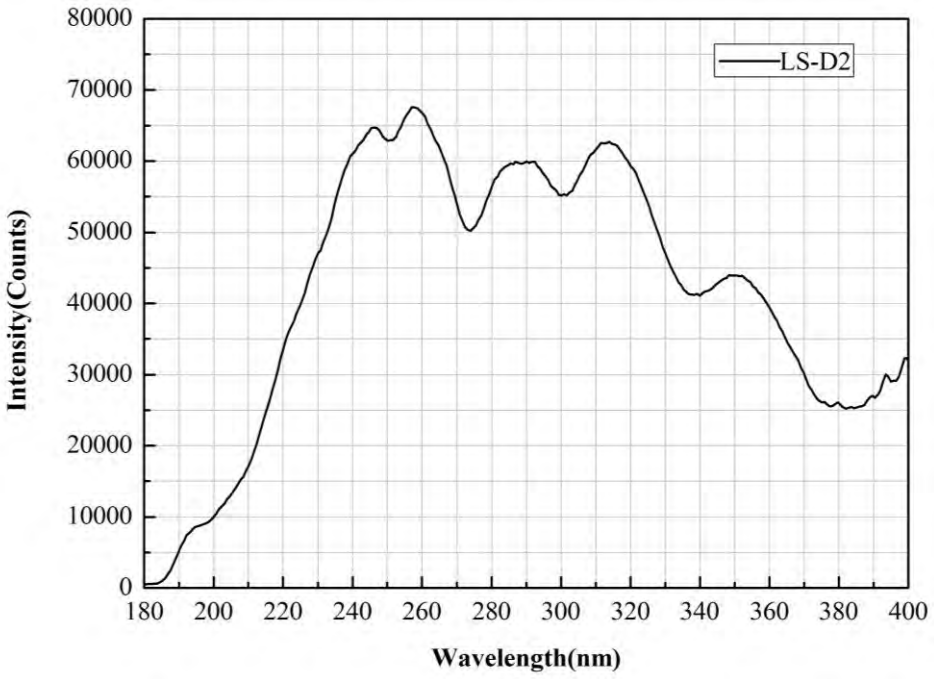
The LS-D2 deuterium light source provides UV-VIS output from 185–400 nm, suitable for ultraviolet testing applications. The output is internally collimated, allowing direct use, or it can be coupled with an SMA905 fiber connector or optional collimator/fiber collimator, depending on measurement needs. The LS-D2 offers stable output and an extended lifetime of 1,500 hours—a 50% increase compared to the previous generation—ensuring reliable performance for users. This light source can also be used with a shutter controller, standard measurement kits, and reference white boards to meet various environmental measurement requirements.

Model		LS-D2
D2 Wavelength Range(nm)		185-400
Deuterium Lamp	Drift(%/hour)	<±0.25 %
	Power consumption (W)	5.8W
	Stability (AU)	0.15%
	Life (hr)	1500@230nm (50% optical intensity decay)
	Startup Time(s)	30
Power Supply	AC Input Range (V)	100~240
	DC Output Voltage(V)	12 (max. 3.34A)

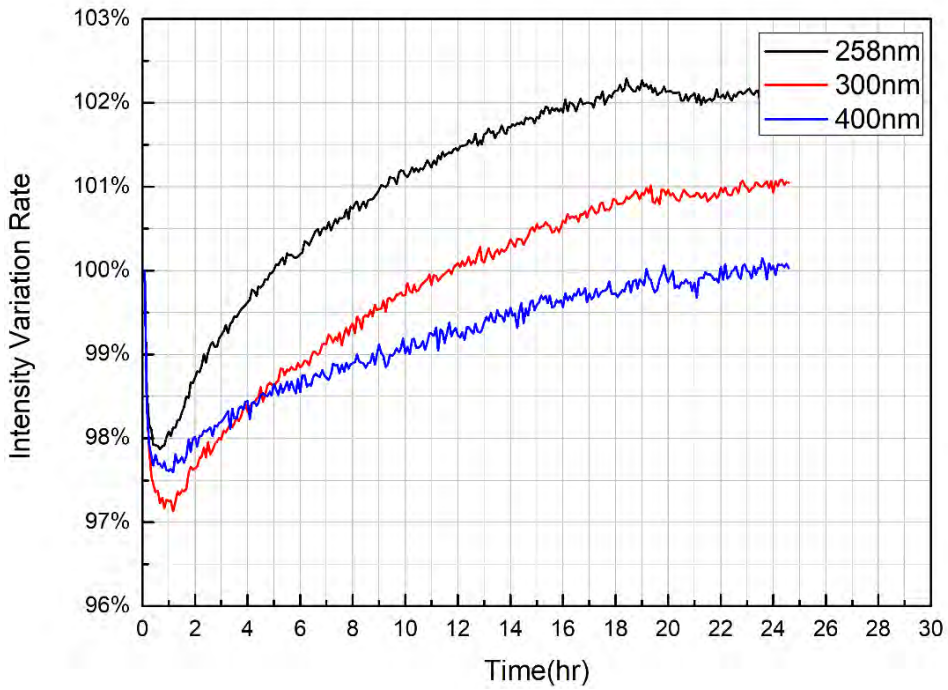
- **Drawing**



- **Spectrum**



- **LS-D2 Variation Rate of Light Intensity**



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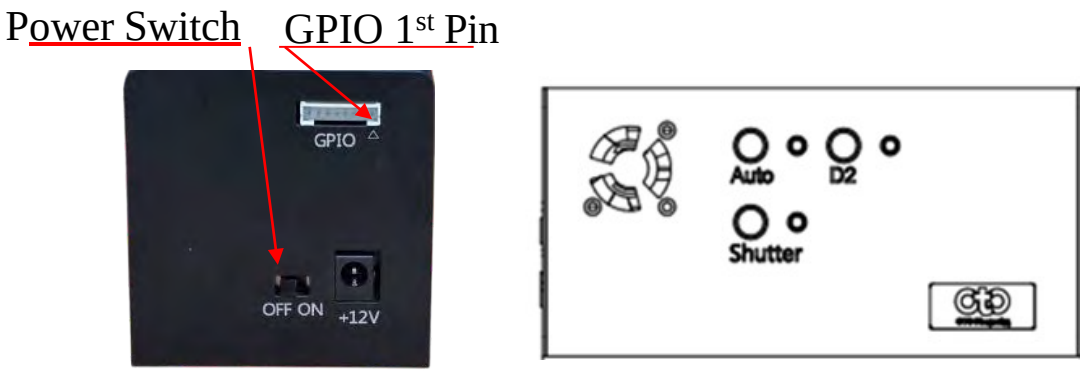
➢ Operation Mode Selection

When the LS-D2 is connected to a 12V power supply and the Power Switch is set to ON, the Power indicator will light up. The user can then press the Auto button (Auto/Manual Switch) to select the operation mode:Auto Mode: (Auto indicator ON) Control of the Shutter and D2 lamp is done via SpectraSmart software. The corresponding indicator lights will turn on when each function is active (Shutter indicator ON means shutter is blocking the light).Manual Mode: (Auto indicator OFF) The user can control the D2 lamp and Shutter directly using the front-panel buttons.



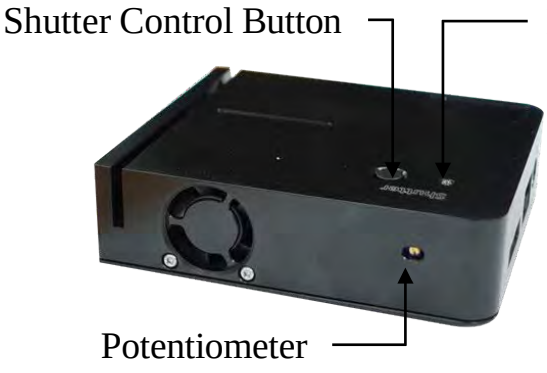
The LS-D2 is equipped with an 8-pin, 2.0 mm pitch connector. This connector can be directly connected to an SE series spectrometer via an 8-pin cable. When the LS-D2 is connected to the SE series spectrometer and the Auto/Manual switch is set to Auto mode, the control of the D2 lamp and Shutter is managed by the spectrometer software SpectraSmart or through the SDK I/O level (3.3V/5V or 0V).Users can operate the light source via SpectraSmart or SDK, but should still be mindful of the lamp warm-up and stabilization time.

Pin No.	Direction	Pin Name	Function Description
1	NC	NC	NA
2	NC	NC	NA
3	NC	NC	NA
4	Input	Shutter	High: Open Shutter Low: Close Shutter
5	Input	D2_ON	High: Turn on D2 LS. Low: Turn off.
6	NC	NC	High: Turn on Halogen LS. Low: Turn off.
7	NC	NC	NA
8	GND	GND	Ground

Wideband Light LS-WB

- The wideband light source provides stable light output within the range of 400 to 1000nm. It includes a built-in shutter, allowing for manual switching of the shutter or control through the GPIO port using SpectraSmart.
- The LED indicator above the light source serves as the shutter status indicator. The red light indicates that the shutter is closed and light is blocked, while the green light indicates that the shutter is open and light is allowed to pass through.
- The intensity of the light source can be manually adjusted using the Potentiometer or controlled via the GPIO port using PWM. Counterclockwise rotation of the Potentiometer increases the light source intensity, while clockwise rotation decreases the light source intensity.
- The light source exhibits rapid stability and response, making it suitable for use as a flash light source.

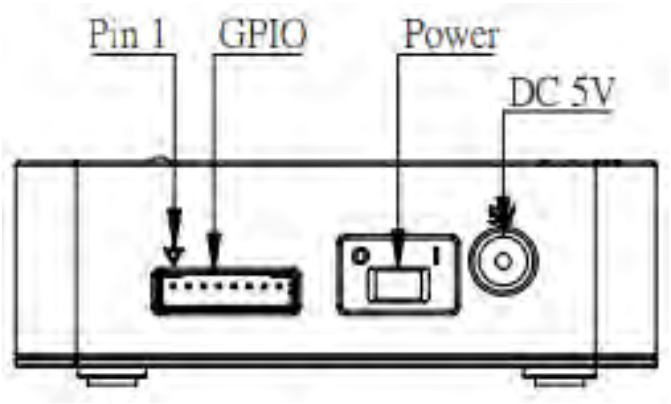
Model	Wideband Light				Power Adapter	
	Rated Voltage (V)	Current (A)	Life(hr)	Warming-up time (min)	AC input range(V)	DC output voltage(V)
LS-WB	5	Max 0.5	30,000	15	100~240	5 (max. 2A)



- **Features**

➢ **I/O Expansion Port**

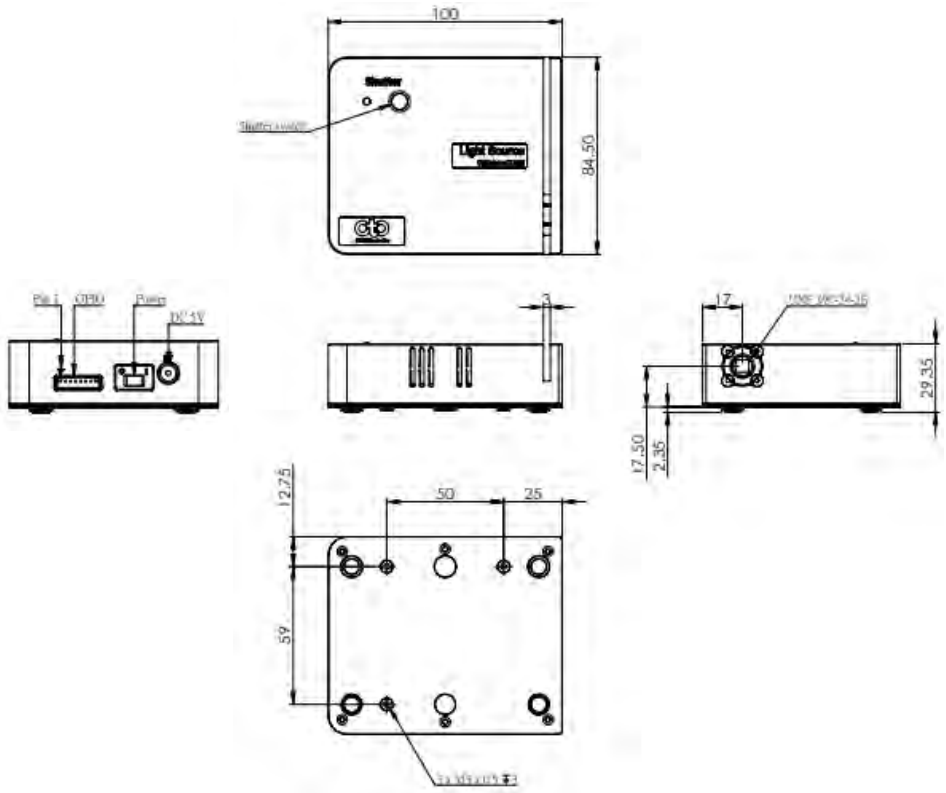
The light source also offers additional control ports for user's applications. Users can connect using an 8-pin 2.0mm pitch female connector and link it to the 8-pin 2.0mm pitch port shown in the diagram below. This connection can be used to control the shutter switch via OtO's software SpectraSmart or SDK. Additionally, PWM function is provided to control the power of the light source.



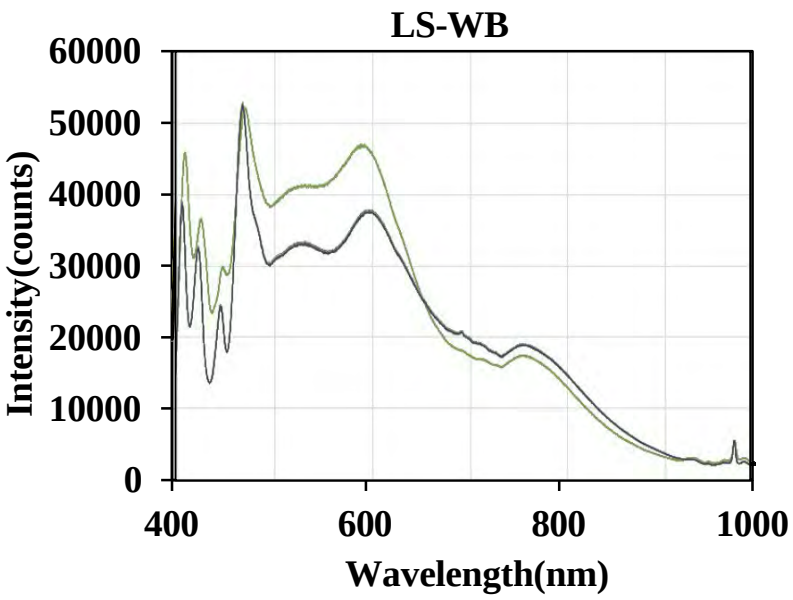
Pin No.	Direct	Pin Name	Description
1	NC	NC	no connection
2	NC	NC	no connection
3	NC	NC	no connection
4	Input	Shutter	Shutter control
5	Input	PWM	5kHz~100kHz; 3.3V or 5V
6	NC	NC	no connection
7	NC	NC	no connection
8	GND	GND	Ground

Light Source

- **Drawing**



- **Spectrum**



LS-WB Spectrum Measured with OtO SE2030-050-VNIR spectrometer.

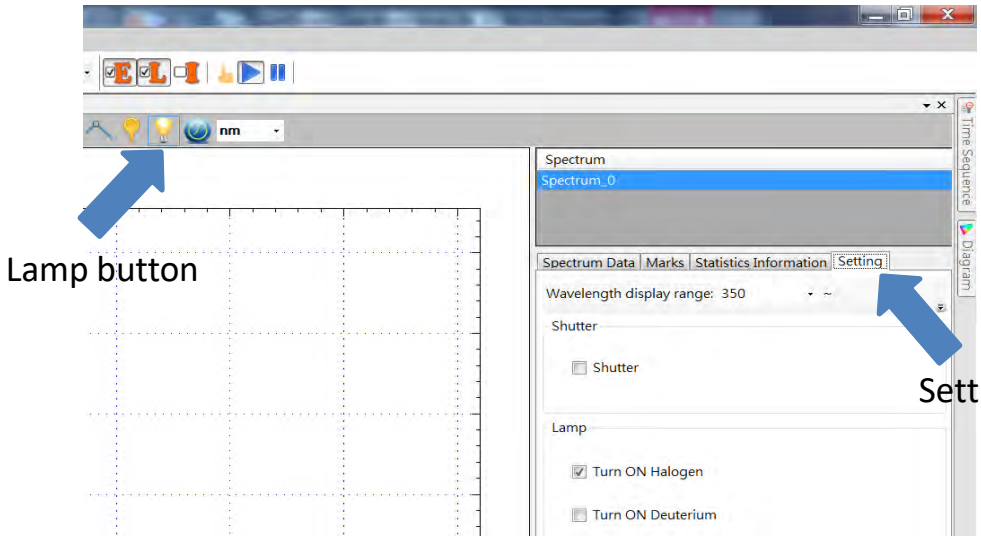
Software Operation Features

SpectraSmart

Spectrasmart provides Setting function at the right column window:

1. Enable / Disable shutter of each scan.
2. Turn on Halogen if lamp button as 
3. Turn on Deuterium if lamp button as 

(Halogen and Deuterium lamp can be controlled independently)



- Software development commands UAI_SpectrometerSetExternalPort and UAI_SpectrometerGetExternalPort can set the operation status of shutter, halogen and deuterium lamp.

GPIO	Item
GPIO 3	Shutter
GPIO 4	Deuterium
GPIO 5	Halogen

Appended description_
To reduce the amount of light with pinhole

We offer 3 kinds of pinhole for users to reduce the amount of light. As the picture below, please put the pinhole into the sma905 before assemble the optic fiber.

Pinhole SPEC.
φ0.81mm
φ0.54mm
φ0.27mm