Hight perfomance and Expand measurement application
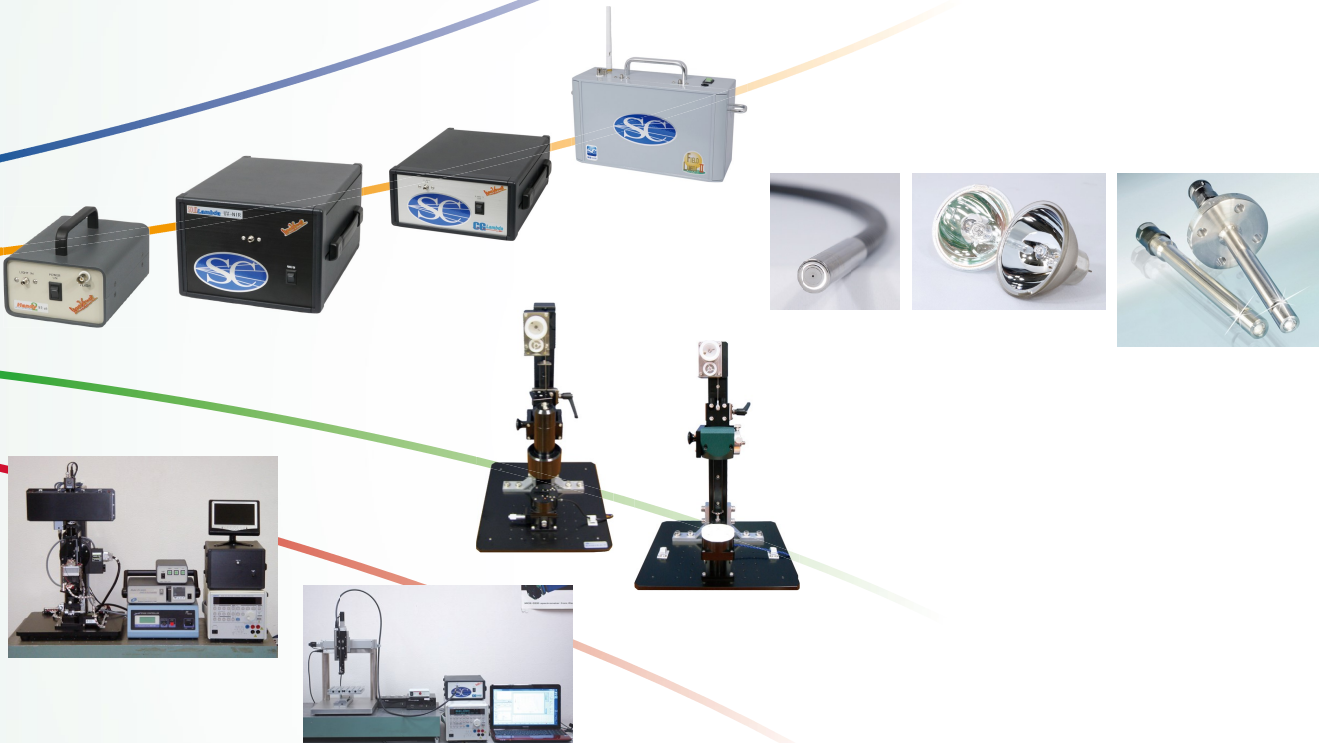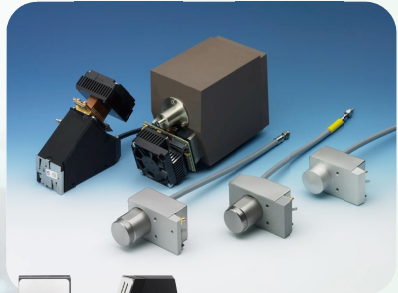
ZEISS

Carl Zeiss spectrometer series has optical technology is that Carl Zeiss has cultivated more than 170 years. There is a sales achievement of more than 20 years in Japan. And the hight perfomance has received a support from off-line use of laboratory to in-line use of factory.

Currently typical measurement applications, inspection section at the production line, chemical analysis and environment measurement, detect of spectrum peak, color measurement etc... it has been used in many places.

Carl Friedrich Zeiss (1816-1888)   Ernst Abbe (1840-1905)   Otto Schott (1851-1935)

ZEISS TELESCOPES
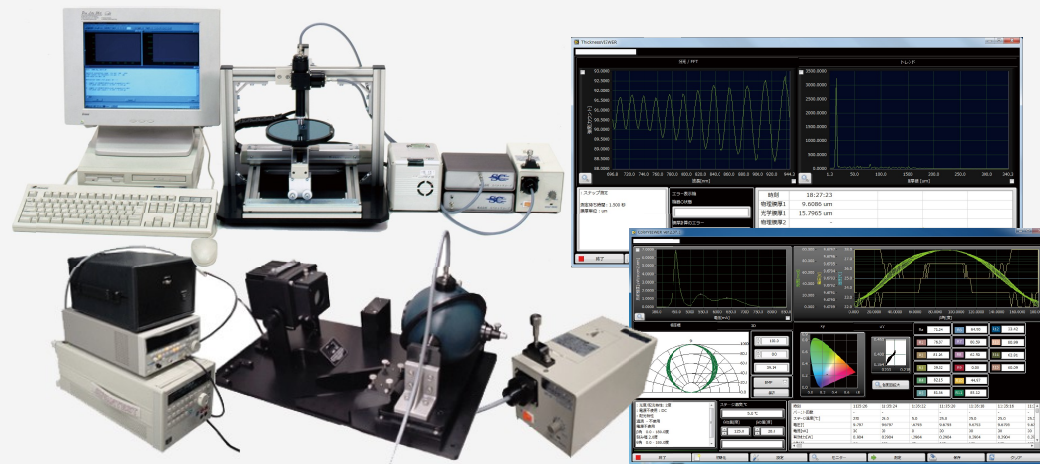
Development along the Japanese market needs

Spectra Co-op is Japanese distributer of Carl Zeiss and Tec 5. In addition, we are also a manufacture to develop a device using these Germany product to Japanese customers.

Japanese market demand does not same as Germany. Rather, most are cases which has Japan unique requests and problems. Here is our original work. Optical measurement is variety applications, wide wavelength range from UV to NIR and variable fields from laboratory use as Off-line to factory use as On-line.

We take these difficult development for each customer.

Spectrometer series with built in Carl Zeiss module

- Handy LambdaⅡ
- Solid Lambda
- Solid Lambda CCD
- CG Lambda
- Field LambdaⅡ
- Process Lambda
- Spectra Master

"Handy LambdaⅡ" series are compact and robst body, it has been designed so that it can be easily connected to PC. Multi-languege software "WaveVIEWER" can be conveniently used in any country of the operator or researcher. Interface is USB 2.0 and measurement mode has various items "Refrection / Transmission / Absorbance / Relative Intensity". Save data format is CSV text. This useful spectrometer is received a number of echo until.
In addition, This is compact size (120mm x 140mm x 40mm) and S/N ratio (5000:1).
There are other high specification spectrometer models. "Solid Lambda" series has hight wavelwength resolution. And "Solid Lambda CCD" series has hight wavelwength resolution, high sensitivity, hight S/N ratio 10000:1. Furthermore, "Spectra Master" for process line and "Fild Lambda" for fild use.
We can be the best offer corresponding to various applications.

High-resolution spectrometer

Solid Lambda

Type:

UV-NIR	190 - 1015nm
UV-VIS	200 - 620nm
VIS	360 - 720nm
NIR	695 - 1100nm
NIR 1.7 t 1	960 - 1690nm
NIR 2.2 t 2	1000 - 2150nm

■ SolidLambda series

Feature

"Solid Lambda" can be high-resolution spectroscopic measurement without cumbersome maintenance. NIR 1.7 t1 (2.2 t2) type is clear the effect of temperture drift at Ninfrared range by internal cooling peltier. It show the high perfomance in application that high-resolution is requied. Measurement data is output stored in CSV text format.

Application

● Plasma monitor   ● Thin-film thickness on grass or wafer   ● NIR Non-destructive measurement

● Specification

Bulit in module	Carl Zeiss MCS / PGS series
S/N ratio	5000:1 / 1000:1 (NIR1.7t1) / 500:1 (NIR2.2t2)
Standard size	210mm(W) x 280mm(D) x 155mm(H)
	210mm(W) x 305mm(D) x 155mm(H) (NIR1.7t1 / NIR2.2t2)
Standard weight	< 7kg / < 6kg (NIR1.7t1 / NIR2.2t2)

Mobile spectrometer

Handy LambdaⅡ

Type:

UV-VIS enh.	310 - 1100nm
NIR enh.	310 - 1100nm
UV-VIS	190 - 720nm
UV-VIS 2	250 - 785nm
UV	190 - 400nm

Temperature stabilizer type

■ HandyLambdaⅡ series

Feature

Robust, lightness, simply user interface... Mobile spectrometer "Handy LambdaⅡ" can be a spectral analysis of the lab level at any location. With USB connection to a notebook PC or Windows tablet, you can get the refrection, transmission and absorption spectrum of the measurement sample. Measurement data is output stored in CSV text format. Spectrometer miodule can be added up to 8 channels.

Application

● Suguar or acidity contentof fruit / food
● Soil analysis
● Light intensity of display or LED
● Measurement with fiber connection to vacuum tank
● Absorbance of liquid material
● Film thickness
● Color measurement of print , cosmetics, paint etc...

● Specification

Bulit in module	Carl Zeiss MMS1 / MMS series
S/N ratio	5000:1
Standard size	120mm(W) x 140mm(D) x 40mm(H)
Standard weight	< 1kg

High-sensitivity high-resolution spectrometer

Solid Lambda CCD

Type:

UV-NIR	200 - 960nm
UV	200 - 600nm

Ultra high-sensitivity type

■ SolidLambda CCD series

Feature

"SolidLambda CCD" can be advanced measurement such as microscope raman measurement. High-sensitivity characteristics have a reputation for precision measurement such as Radiance for LED or display. It is a combination of back side incident type two-dimensional CCD(Hamamatsu) and spectroscopic optical system(Carl Zeiss). The highly sensitive CCD is attached peltier cooling, it ensure high S/N ration(10000:1).

Application

● Microscope spectroscopy (Through a C-mount adapter)
● Raman
● Precision LED measuremtn (Light distribution or radiance etc...)
● Precision display measurement
● Precision absorbance measurement
● Other precision spectroscopy measurement

● Specification

Bulit in module	Carl Zeiss MCS CCD series
S/N ratio	10000:1
Standard size	210mm(W) x 280mm(D) x 155mm(H)
Standard weight	< 7kg

Spectrometer series

Hybrid spectrometer

CG Lambda

Type:

UV-NIR CCD   190 - 1000nm

■ CG Lambda

Feature

"CG Lambda" is low cost spectrometer with built-in Carl Zeiss CGS module. The light receiving sensor array is adapted a back-illuminated CCD which has charactaristic of high-resolution and high-sensitivity. In addition, a wide range of wavelength. It is suitable such as UV-LED or plasma measurement applications.

Application

● Plasma or laser which has narrow FWHM
● UV range measurement such as UV-LED intensity
● Transmittance or Refrectance measurement using microscope

● Specification

Bulit in module	Carl Zeiss CGS UV-NIR CCD
S/N ratio	3000:1
Standard size	210mm(W) x 280mm(D) x 105mm(H)
Standard weight	< 2kg

Field use spectrometer

Field Lambda II (1ch / 2ch)

Type:

UV-VIS enh.   310 - 1100nm
NIR enh.   310 - 1100nm

Other MMS series can also be built-in

Shoulder belt is included

■ Field Lambda II

Feature

"Field Lambda II " is robust spectrometer for field use with built-in Carl Zeiss MMS1 module. It have wireless LAN and included battery. Device control can be done from note(tablets) PC by cable less.
In addition, there is also 2 chnnel models for environmental applications.

Application

● Refrectance or transmittance measurement of leaves while monitoring the sunlight.
● Spectral irradiance and PPFD(photosynthetic photon flux density) at outdoor.
● Soil analysis

● Specification

Bulit in module	Carl Zeiss MMS1 series
S/N ratio	5000:1
Standard size	260mm(W) x 20mm(D) x 150mm(H)
Standard weight	< 4kg (2ch model)

Liquid process control spectrometer

Process Lambda (1- 8ch)

Type:

UV-VIS   190 - 720nm

Other MMS series can also be built-in

Absobance measurement system

■ Process Lambda

Feature

"Process Lambda" is a spectroscopic device for lisuid process control measurement with bulit-in Carl Zeiss MMS module. Using an immersion probe can perform absorbance measurements of liquids in seconds. It has been designed in applications to monitor mainly the solubility of the dissolution test and the medicine formulations in real time. Immersion probe and spectrometer modules can be expanded to up to 8 channels.

Application

● Dissolution test of formulation or medicine (Real time monitoring of solubility)
● Accurate monitoring of the rise of dissolution curve by taking advantage of a short period of time measurement,
● Multiple spatulation monitor with up to 8 channels

● Specification

Bulit in module	Carl Zeiss MMS series
S/N ratio	5000:1
Standard size	220mm(W) x 450mm(D) x 370mm(H)
Standard weight	< 12kg (1ch model)

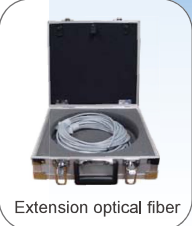## In-line spectroscopic unit

SPECTRA MASTER

Type:

UV-VIS enh.   310 - 1100nm
NIR enh.   310 - 1100nm

Other MMS series can also be built-in

Extension optical fiber

■ SPECTRA MASTER

Feature

"SPECTRA MASTER" is a spectoscopic unit for in-lune use. I t is bulit-in Carl Zeiss MMS module. This unit is designed for the purpose of in-line installation. So all equipments such as spectrometer and light source and OS is bulit in this unit body. Data output is possible to correspond to he format of your choise, such an Analog output or LAN output.
We will customize as an inspection system that is optimized to use environment.

Application

● Stand-Alone Absorption measurement system.
● PLC communication measurement system for in-line use.

● Specification

Bulit in module	Carl Zeiss MMS1 series
S/N ratio	5000:1
Standard size	420mm(W) x 320mm(D) x 470mm(H)
Standard weight	depend on specification

Specification chart

Spectrometer series

Handy2 Lambda

	UV-VIS enh. NIR enh.	UV-VIS	UV-VIS 2	UV
Size	120mm(W) × 140mm(D) × 40mm(H)			
I/F	USB2.0 / Ethernet			
Fiber connector	SMA			
Built in module	MMS1 UV-VIS enh. / NIR enh.	MMS UV-VIS	MMS UV-VIS 2	MMS UV
Wavelength range	310 - 1100nm	190 - 720nm	250 - 780nm	195 - 390nm
Wavelength accuracy	0.3nm	0.5nm	0.5nm	0.2nm
Wavelength pixel pitch	3.3nm / pixel (typ.)	2.2nm / pixel (typ.)	2.2nm / pixel (typ.)	0.8nm / pixel (typ.)
Temperture drift	< 0.01nm / K	< 0.006nm / K	< 0.006nm / K	< 0.005nm / K
FWHM	10nm	7nm	7nm	3nm
S/N ratio	5000:1			
Internal auto shutter	enable			
Software	Standard spectroscopic analysis softrware, WaveVIEWER			

SOLID Lambda

	UV-NIR	UV-VIS	VIS	NIR
Size	210mm(W) × 280mm(D) × 155mm(H)			
I/F	USB2.0 / Ethernet			
Fiber connector	SMA			
Built in module	MCS UV-NIR	MCS UV-VIS	MCS VIS	MCS NIR
Wavelength range	190 - 1015nm	200 - 620nm	360 - 780nm	680 - 1100nm
Wavelength accuracy	0.3nm			
Wavelength pixel pitch	0.8nm / pixel (typ.)			
Temperture drift	< 0.005nm / K			
FWHM	3nm			
S/N ratio	5000:1			
Internal auto shutter	enable			
Software	Standard spectroscopic analysis softrware, WaveVIEWER			

SOLID Lambda

	NIR 1.7t1	NIR 2.2t2
Size	210mm(W) × 280mm(D) × 155mm(H)	
I/F	USB2.0	
Fiber connector	SMA	
Built in module	PGS NIR 1.7t1	PGS NIR 2.2t2
Wavelength range	960 - 1690nm	1000 - 2150nm
Wavelength accuracy	0.6nm	0.6nm
Wavelength pixel pitch	1.5nm / pixel (typ.)	5nm / pixel (typ.)
Temperture drift	< 0.012nm / ℃	< 0.012nm / ℃
FWHM	5nm	16nm
S/N ratio	1000:1	500:1
Internal auto shutter	enable	
Software	Standard spectroscopic analysis softrware, WaveVIEWER	

SOLID Lambda CCD

	CCD UV-NIR	CCD UV
Size	210mm(W) × 280mm(D) × 155mm(H)	
I/F	USB2.0 / Ethernet	
Fiber connector	SMA	
Built in module	MCS CCD UV-NIR	MCS CCD UV
Wavelength range	200 - 980nm	200 - 600nm
Wavelength accuracy	0.5nm	
Wavelength pixel pitch	0.8nm / pixel (typ.)	
Temperture drift	< 0.01nm / K	
FWHM	3nm	
S/N ratio	10000:1	
Internal auto shutter	enable	
Software	Standard spectroscopic analysis softrware, WaveVIEWER	

CG Lambda

	UV-NIR CCD
Size	210mm × 280mm × 99mm
I/F	USB2.0
Fiber connector	SMA
Built in module	CGS UV-NIR CCD
Wavelength range	190 - 1000nm
Wavelength accuracy	0.3nm
Wavelength pixel pitch	0.4nm / pixel (typ.)
Pixel number	2048 pixel
FWHM	2.2nm
S/N ratio	3000:1
Internal auto shutter	enable
Software	WaveVIEWeR

FIELD LAMBDA Ⅱ

		Standards type (UV-VIS enh. / NIR enh.)
Size		260mm(W) × 20mm(D) × 150mm(H)
I/F		Wireless LAN
Fiber connector		SMA
Spectrometer		MMS1 UV-VIS enh. / NIR enh.
		310 - 1100nm
		0.3nm
		10nm
		5000:1
		Max. 2ch
Internal auto shutter		enable
Power supply,		DC24V 1.5A
Internal battery		35Wh battery, Driving time 6h (typ.)
Measurement probe		Irradiance probe, Refrection probe, Light source monitor probe, etc...
Light source monitor		Cnstantly monitor of 2ch model

* Spectrometer parts: Other MMS series can also be built-in.

Process Lambda

		Standards type (UV-VIS)
Size		220mm(W) × 450mm(D) × 370mm(H)
I/F		USB2.0 / Ethernet
Fiber connector		SMA
Spectrometer	Module	MMS UV-VIS
	WL range	190 - 720nm
	WL accuracy	0.5nm
	FWHM	7nm
	S/N ratio	5000:1
	Multi channel	Max. 8ch
Internal auto shutter		enable
Internal lamp		Conbination of D2 lamp, Halogen lamp
Immersion probe	Method	Refrection type
	Window	Quartz SUPRASIL® 300
	Mirror	Aluminum coat on Quartz SUPRASIL® 300
	Body material	SUS 1.4404 (316L)
	Sealing	Epoxy glue
	Outer dia.	6mm
	Immersion depth	Max. 175mm
	Path length	1, 2, 5, 10, 20mm (Removable)
	Optical Fiber	Quartz fiber 2m (Solarization resistance)

* Spectrometer parts: Other MMS series can also be built-in.
* Immersion probe and optical fiber can be custom.

SPECTRA MASTER

		Standards type (UV-VIS enh. / NIR enh.)
Size		300mm(W) × 210mm(D) × 150mm(H)
I/F		USB2.0 / Ethernet
Fiber connector		SMA
Spectrometer	Module	MMS1 UV-VIS enh. / NIR enh.
	WL range	310 - 1100nm
	WL accuracy	0.3nm
	FWHM	10nm
	S/N ratio	5000:1
	Multi channel	2ch
External I/F		Trigger input TTL or Short circuit signal
Data output		RS-232C / Ethernet / Parallel IO / Analog output
Internal lamp		Halogen lamp

* Spectrometer parts: Other MMS series can also be built-in.

Installed spectral measuring instrument to the in-line environment

In the application the use of a small spectrometer, we have gotten a lot of consultation of the equipment development for in-line use. Cooperation for the development we also believe that our important mission.
Optical film thickness measurement and liquid density (absorbance) measurement, such as reflection / transmission measurement are known that can precisely measured using a spectroscopic.
Applying control to other parts of in-line system based on the result of high-speed continuous measurement is bothering the customer as difficult projects.
In addition, the surrounding environment, such as clean-room and explosion-proof are also wide-ranging.
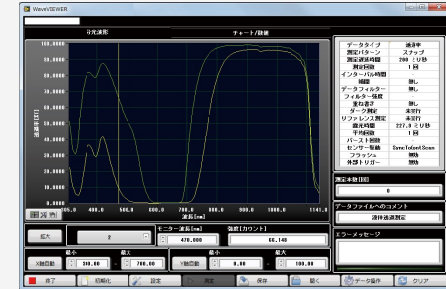Such consultation is also available at all times.

Spectroscopic analysis Software

Wave Viewer

Color Viewer

Thickness Viewer

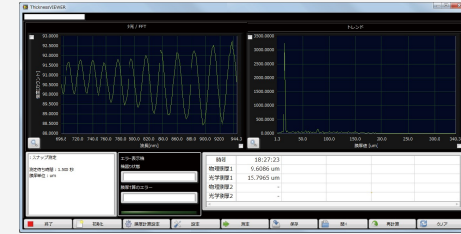| Standards software | Color measurement software | Thickness software |

Our spectrometer is included with a standards software "WaveVIEWER", its functionality has gotten popular.
It can be easily measured and data storage and data output, and has a structure that was divided in the window tab to make it easier to watch each graph.
In addition, color measurement by the reflection and light emission is "ColorVIEWER", is the thickness measurement of transparenet film offers is "ThicknessVIEWER".

Color measurement software

COLOR Viewer

Color Viewer

Light emmision intensity or color such as LED in addition to the color measurement by the reflection also intended.

"ColorVIEWER" can measure intensity or color measurement of LED and display in addition to color measurement such as paper and printing.
Wavelength accuracy is with in +/-0.3nm, repeatability accuracy of the chromaticity is with in +/-0.0002. In the case of light emission measurements such as LED, can be VF / IF / VR / IR measurement by the connection of the constant-current and constant-voltage power supply.
Intensity measurement include Radiance / Irradiance / Radiant intensity / Radiant flux.
Measured various data, it is CSV format and it has become to be handle anyone conveniently.
In addition, wavelength range cover from 200 to 1000nm.

Spectroscopic analysis software

WAVEVIEWER

Wave Viewer

It has all of the standards function in the spectral measurement

"WaveVIEWER" is the standards software that can control with all our spectrometer. Perform the measurement of reflection / transmission / relative intensity after select the average number and the exposure time and dark measurement. The output data format is possible to correspond also to any database in CSV. Measurement sequence is alone mode by manual control and continuous measurement according to set time interval. Dark measurement is auto operation by internal auto shutter.
There are wavelength interpolation and differential and smoothing as data processing function.
In addition, it can overwrite the spectrum graph and wavelength peak detection.
This standards software have the all of the function required in the spectroscopic measurement.

Support the multivariate analysis software "Unscrambler®" calibration model !!

In the liquid measurement application, it is possible to output concentration data according to calibration model.

The Unscrambler X   CAMO

* Unscrambler® is a registered trademark of CAMO software.

Thickness software

Thickness Viewer
SPECTRA CO-OP

Thickness Viewer

Target thickness: 300nm - 100μm
Simply measuring various thickness at high speed

In thickness measurement by the optical method, the thickness was calculated from the interference that appear by irradiating halogen light.
The repeatability accuracy is with in +/-0.002um.
Further, in the case of using the XY automatic stage and traverse such as the measurement stage is also the ability to visualize the non-uniformity of thickness as a 3D graph.

Spectroscopic Software

Application products

Solid Lambda LED monitor PLUS

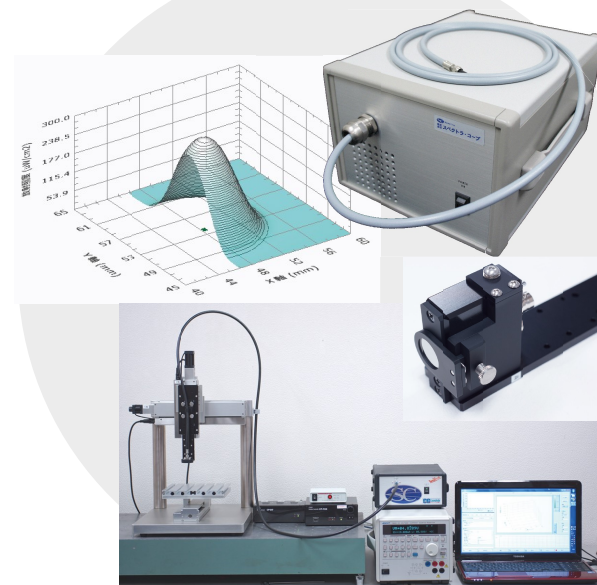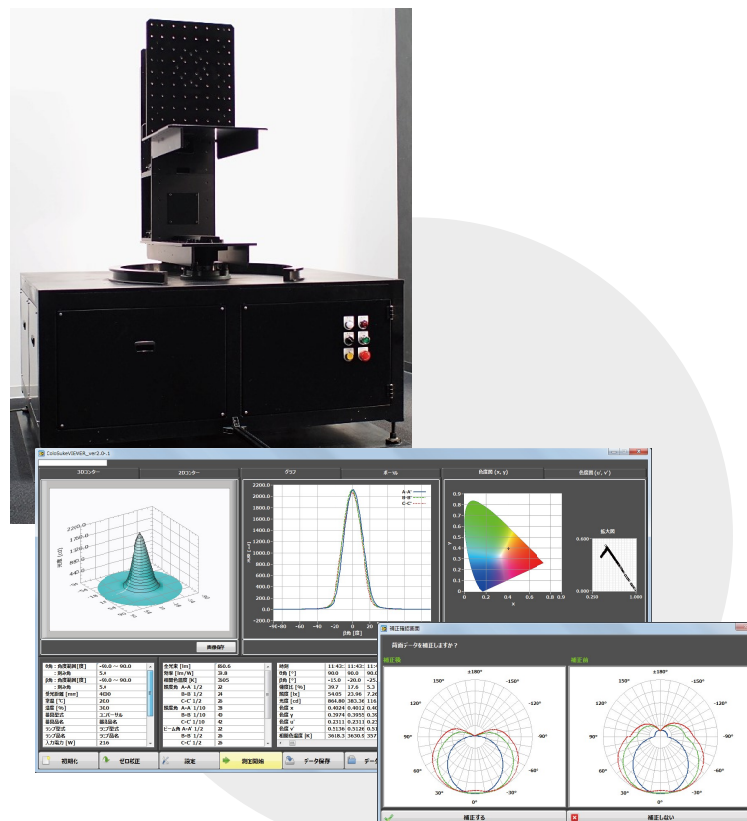**Handy Lambda LED monitor**

Handy Lambda Ⅱ Thickness

Solid Lambda Thickness

KU-XY series

Emprunner BTR -11

As an application of our spectrometer, Here are some of the system example. Intensity and color measurement system for LED or light emitting display, Thickness measurement system for film on semiconductor wafer, etc...
In addition to the off-line applications, such as spectroscopy inspection system in-line applications, there are many achievements of customized products according to the customer's desired specifications.

High-resolution multi-spectral system for LED measurement

Solid Lambda LED monitor PLUS

"Solid Lambda LED monitor Plus" is a customized systemu using a high-resolution hi-sensitivity spectrometer "Solid Lambda CCD".
This is highly expansibility sysytem that has been optimized for the measurement items of customer desired.
It can be custom according to customer's buget and purpose. Further, there is a cusmized holder for special LED shape.

[Meas item exalmple]
Radiant intensity / Radiance / Radiant flux / Irradiance /
Light distribution characteristics / Peak wavelength / FWHM /
Electrical characteristics / Junction temperature / Pluse
We accept consultation like UV measurement, wide range tempera-ture control, pulse synchronous.

■ Solid Lambda LED monitor PLUS

F e a t u r e

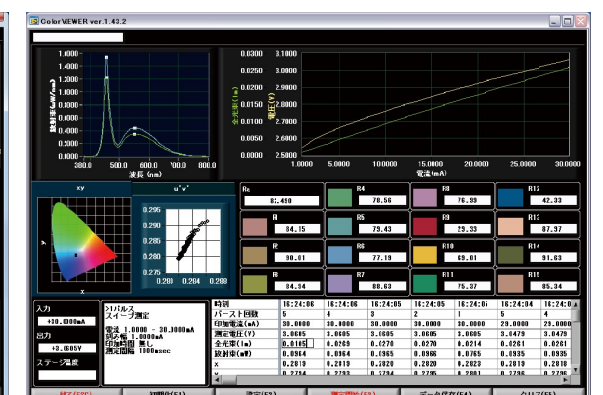Scalability for High precision and Multifunctional, Various development.

● Specification

Wavelength range	200 - 900nm		LED luminance mapping stroke length	50mm(X axis) x 50mm(Y axis)
Calibrated Wavelength	380 - 950nm (VIS-NIR) 220 - 800nm (UV-NIR)		2-axis distribution stage	Beta axis: -10 ~ 90 deg / Theta axis: 0 ~ 180 deg Rotation axis pulse minimum movement: 0.005 deg (full step) / 0.0025 deg (half step)
Integration time	7 - 6,500ms			
Intensiy range	0.05mcd - 200cd		Display luminance mapping stroke length	600mm(X axis) x 400mm(Y axis)
Luminance range	0.1 - 10,000 cd/m^2			
Flux range	1mlm - 1,000lm (6inch sphere)		Integrating sphere for luminous flux	6 inch (standards size, changeable) Material: BaSO4 / PTFE
Chroma repetablity	±0.0002			
Wavelength accuracy	±0.5nm		Traceability	NIST (300 - 1100nm, Halogen std light) JCSS (200 - 800nm, Xenon std light)
FWHM	3nm			
Diode array	Back side incident type two-dimensional CCD		Temperature control range	Room temperature ~ 80 deg C (standard) -20 ~ 80 deg C (with utility)
S/N ratio	10,000:1			
LED control source meter range	0 - ±110V / 0 - ±2A (Voltage type) 0 - ±20V / 0 - ±10A (Current type)			
DUTY range	0 - 100%			
Pluse width	1ms (min.)			

(*) LED control power supply is changeable depending on the required specifications

(*) Stage stroke is changeable depending on the required specifications

Application products

| Solid Lambda LED monitor PLUS | Handy Lambda LED monitor | Handy Lambda Ⅱ Thickness | Solod Lambda Thickness | *KU-XY series* | *Emprunner BTR-11* |

High-resolution multi-spectral system for LED measurement

Handy Lambda LED Monitor

Along with the market expansion of LED measurement applications, LED size and shape is diversified.
Therefore, their support is difficult with existing equipment.
In addition, many cuustomers hesitate to prepare a large amount of budget for the new LED appication.
"Handy Lambda LED Monitor" assumes the initial stages of such a LED measurement, also has expansibility in accordance with the next theme change.
It is the original custom systems and support various measurement items.

[Meas item exalmple]
Radiant intensity / Radiance / Radiant flux / Irradiance /
Light distribution characteristics / Peak wavelength / FWHM /
Electrical characteristics /   Junction temperature / Pluse
Dedicated sample holder is manufactured in every LED shape.
And Dedicated software "ColorVIEWER" can change depending on the hardware configuration.

■ Handy Lambda LED Monitor

F e a t u r e

For initial stages of LED measurement. Scalability for Various development. Low cost.

● Specification

Wavelength range	310 - 1100nm	LED control	0 - ±110V / 0 - ±2A (Voltage type)
Calibrated Wavelength	380 - 1000nm	source meter range	0 - ±20V / 0 - ±10A (Current type)
Integration time	1.5 - 6,500ms	DUTY range	0 - 100%
Intensisy range	1mcd - 2000cd	Pluse width	1ms (min.)
Luminance range	20 - 100,000 cd/m^2	LED luminance	20mm(X axis) x 20mm(Y axis)
Flux range	20mlm - 5,000lm (6inch sphere)	mapping stroke length	
Chroma repeatability	±0.0002	Illuminance matrix	1200mm x 800mm
Wavelength accuracy	±0.3nm	measurement stage	
FWHM	10nm	Integrating sphere	2 inch (standards size, changeable)
Diode array	MOS type, 256 pixel, 3.3nm/pixel	for luminous flux	Material: BaSO4 / PTFE
S/N ratio	5,000:1	Traceability	NIST (300 - 1100nm, Halogen std light)
		Temperature control range	Room temperature ~ 80 deg C (standard)

(*) LED control source meter is changeable depending on the required specifications
(*) Stage stroke is changeable depending on the required specifications

Simple type measurement stage for LED radiant intensity
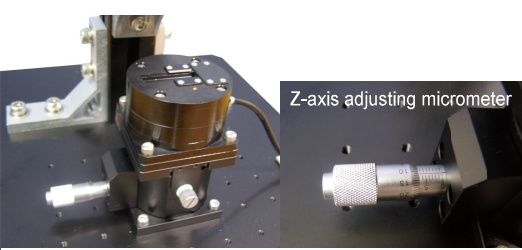
MAS-L 0702 [CIE condition B]

"MAS-L 0702" is simple type LED measurement stage that is connecttable to our spectrometer.
There are customers request as like that want to measure many LED samples in short time at laboratory or factory.
This stage respond to such a request.
If you connect to our spectrometer, you can set LED sample exactly in short time and can get intensity and accurate various measurement values.
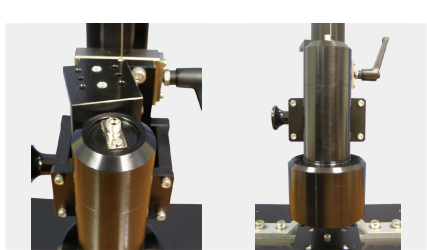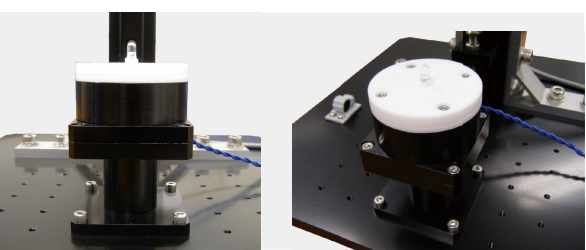
■ MAS-L 0702

F e a t u r e

Simple operability. The exact position repeatability.
Improvement of inspection efficiency. Low cost.

Sample stage

Z-axis adjusting micrometer

Measurement probe: CIE condition B

Simple type measurement stage for LED radiant flux

MAS-L 0802

"MAS-L 0802" is simple type LED measurement stage that is connecttable to our spectrometer.
There are customers request as like that want to measure many LED samples in short time at laboratory or factory.
This stage respond to such a request.
If you connect to our spectrometer, you can set LED sample exactly in short time and can get accurate fulx and other various measurement values.
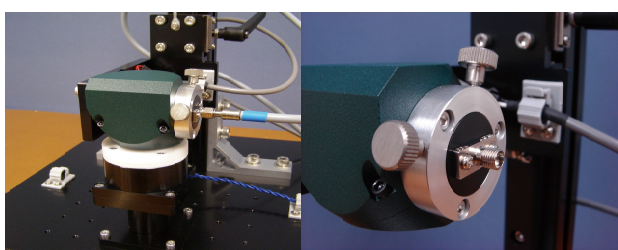
■ MAS-L 0802

F e a t u r e

Simple operability. The exact position repeatability.
Improvement of inspection efficiency. Low cost.

Sample stage

Measurement probe

Mobile thickness measurement spectrometer

Handy Lambda Ⅱ Thickness
Solid Lambda Thickness

The thickness measurement of optical method is calculate the thickness from the interference spectrum of the reflected light (or transmitted light). This method is attracted as efficient method to measure with repeatability without damaging the sample in a non-contact.

It can be installed anywhere because irradiated by using the optical fiber. Diversion to the in-line environment is also available. Mapping thickness measurement in combination with the actuator will also be realized.

If measured by the dedicated software "ThicknessVIEWER", the thickness 0.3 ~ 100um (Handy Lambda? Thickness is 0.3 ~ 20um) can be measured.
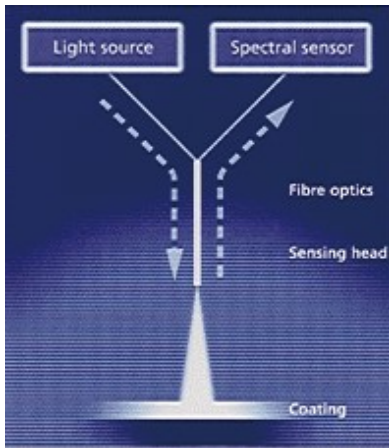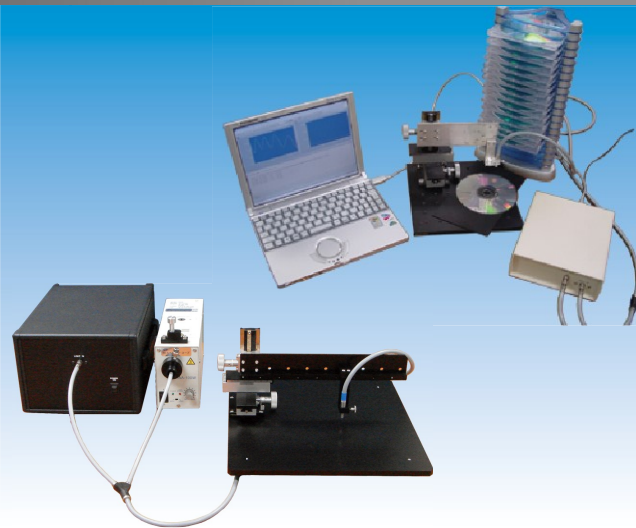
Excellent repeatability than other thickness measurement method, we have gotten many customers confidence.

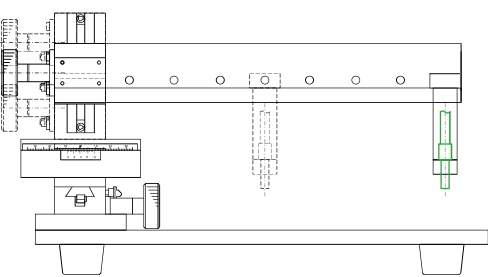### ■ Handy Lambda Ⅱ Thickness / Solid Lambda Thickness

F e a t u r e

For initial stages of LED measurement. Scalability for Various development. Low cost.
Installation to off-line evaluation and the existing in-line.

● Specification

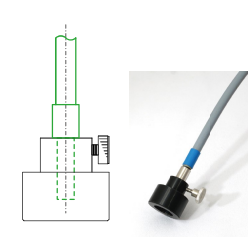|		
Wavelength range	310 - 1100nm	Handy LambdaⅡThickness
	190 - 1015nm	Solid Lambda Thickness
Effective Wavelength	380 - 950nm	(Combination with Halogen light)
Integration time	1.5 - 6,500ms	Handy LambdaⅡThickness
	6.0 - 6,500ms	Solid Lambda Thickness
Thickness range	300nm - 20um	Handy LambdaⅡThickness
	300nm - 100um	Solid Lambda Thickness
Diaplay resolution	0.001um	
Repeatability	< 0.01um (Depending on the sample diffusion)	
Measurable sample	Silicon oxide, silicon, gallium arsenide, Silicon nitride, titanium oxide, photoresist, Film, color filter film, dye film, Oil film, polymer, UV curable resins, adhesives, The air layer, the coating material, a metal oxide film, a dielectric film, CD, MD, DVD, etc.	
Unmeasurable sample	Paint film, metal film	

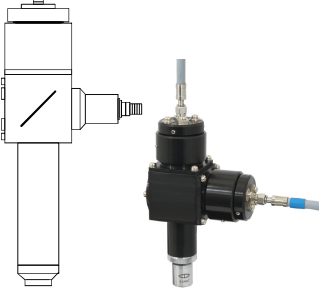Measurment stage and probe

XYZ rack-and-pinion manual stage   Curved surface contact probe   Microscopic optical probe

Automation stage for thickness measurement

KU-XY series

In Thickness auto measurement application, there is mapping request for surface of sample.
"KU-XY series" can moves the measurement probe to X/Y axis. The moving ability is very useful to inspect the difference in each point.
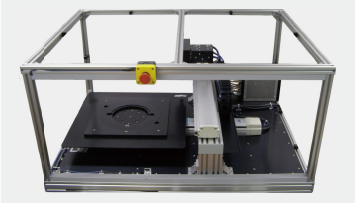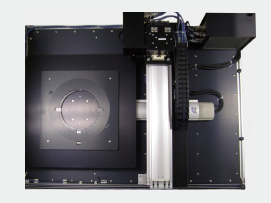It is compatible with dedicated software "ThicknessVIEWER". It can control, measurement and data storage from software.

■ KU-KY series

F e a t u r e

Automatic movement on a plane sample.
Ideal for precision mapping measurement.

● Specification (stage part)

Stroke length	150mm x 150mm - 600mm x 600mm (changeable by 50mmstep)
Motor output	60W
Positioning accuracy	±0.02mm
Drive system	Ball screw (φ12mm) method
Backlash	< 0.05mm
Weight	3.1kg (150mm×150mm) - 5.8kg (600mm×600mm)
Guide	Based integrated
Base	Aluminum material
Cable	Specified length
Temperature, humidity	0 - 40 deg C, 85% RH (non-condensing)

In-line thickness measurement system

Emprunner BTR-11

The thickness of the applied film to film, and then measured with a light interference method in halogen light (400nm ~ 900nm). In addition, it performs automatic management and outlier detection and external signal output, etc. of the film thickness data.
In addition, the transmittance measurement can also be performed at the same time, also simultaneous control area sensor encoder.
Emprunner BTR-11 beyond the spectroscopic measurement concept far is to realize a new film inspection.
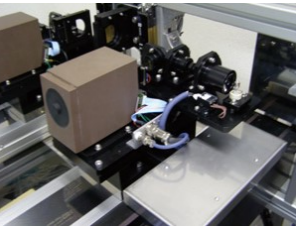It is also possible to produce the form of the BTR-12 plus the reflectance measured by the options.

■ Emprunner BTR-11

F e a t u r e

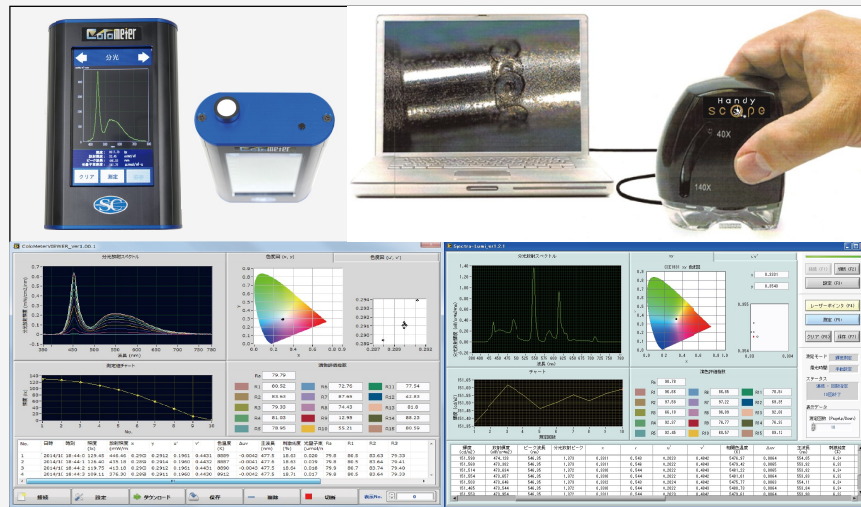Film thickness measurement on the film and glass production line.
High speed response. Light source monitor to correct the unstable of light source intensity.

● Specification

Effective Wavelength	400 - 900nm
Thickness range	300nm - 100um
Thickness Repeatability	< 0.01um (Depending on the sample diffusion)
Transmittance Repeatability	< ±0.1%
Absorbance range	0 - 3 abs
Actuator	1.8m (standard)
Moving speed	> 300nm/sec
Position resolution	< 0.2mm
Area sensor	9mm
Area number of sensors	26
Rotary encoder	256 pulse/rotation
Temperature, humidity	0 - 40 deg C, 85% RH (non-condensing)

Aplicatoin products

Other optical products

Colometer
ColoSuke
ColoSuke -SA
NIR Meter

We are dealing with various measurement devices other than the CarlZeiss's products.

Colometer

Portable spectrometer "Colometer" is the spectral irradiance meter to measure the spectral irradiance, illuminance, and a variety of color information to target the visible range. For the battery drive, available in a variety of environments without regard to location.

Measurement data can be stored in Colometer device, you can also transfer the data to PC using the attached Windows software "ColometerVIEWER".

Irradiance probe

Touch panel screen

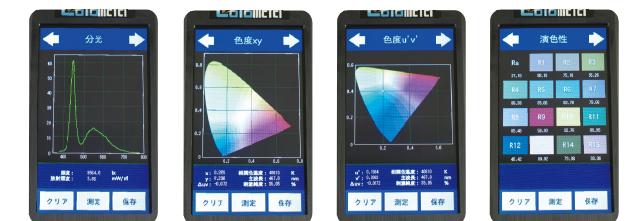| Spectrum | Chroma xy | Chroma u'v' | Color rendering |

■ Colometer

F e a t u r e

- Measurement by touch panel operation
- Synchronous measurement of the external device by trigger I/O function
- Irradiance measurement using NIST calibrated irradiance probe
- Optical fiber can be connected to SMA connector

A p p l i c a t i o n

- Irradiance and color rendering measurement of lighting equipment
- Ambient light measurement of the outdoors
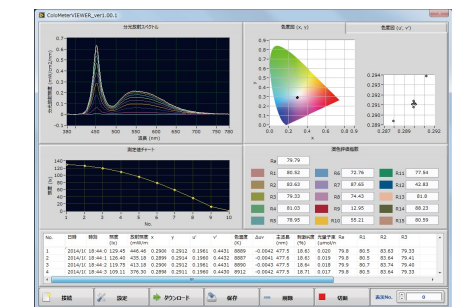- Evaluation of various display devices

Data transfer software, ColometerVIEWER

● Specification

Diode array	3000 pixel Linear array CCD sensor
Wavelength range	380 - 780 nm
FWHM	5.5 - 10 nm
Integration time	> 1ms
Connector	SMA905
Meas value	Illuminance (lx), Irradiance (uW/cm^2), Chromaticity, delata uv, Color temperature, Color rendering
Data storage	Internal flash memory
Storage data number	Max. 256
Interface	USB

USB connector type	mini-B
Display	4.3 inch, 480 x 272 dot TFT LCD
Touch panel	electrostatic capacity type
Eternal trigger	Input x 1, Output x 1
Battery drive time	2.5 hour (depend on usage or battery abrasion)
Power supply	Internal rechargeable battery, DC12V 2A
Size	95mm x 145mm x 40mm
Weight	550g
Accessories	Irradiance probe, USB cable, Windows application CD-R

Carry case (optional)

Chromatic Luminance Meter

ColoSuke

The display will include color difference caused by each of the model as a known problem.
The customers has some questions. How close to the camera detected color... How to know the actual color gamut of the display... etc. And the existing instrument is not convinced by the price and the accuracy. To clear such a requirement is "ColoSuke".

Chromatic luminance meter "ColoSuke" will be optimized dedicated device to display evaluation by the use of a standard software "ColoSukeVIEWER". It can be conveniently measured items such as the color gamut and contrast ratio, gammam curve.
And the accuracy of measurement data is improved by calibrate using NIST traceable Carl Zeiss spectrometer.

■ ColoSuke

F e a t u r e

- high reproducibility accuracy (intensity: 0.8%, chromaticity: 0.001)
- wide dynamic range
- High-speed measurement of the integration time 0.5msec - 1sec
- it can also be calibrated by the customers reference spectrometer
- Calibration by Carl Zeiss Spectrometer "SolidLambda CCD UV-NIR" with NIST traceability. (at the factory shipment)
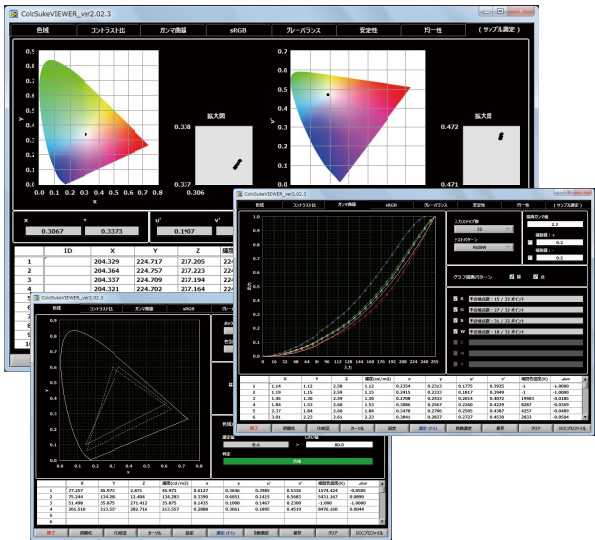
A p p l i c a t i o n

- Lighting Instrument
- Automobile component
- Display Measurement (LED back light LCD etc)
- Road traffic signs (LED) and Electrical scoreboards (LED and LCD)

● Specification

Integration time		0.5 - 1000msec
Measurement range		0.02 - 30,000 cd/m^2 (typ.)
Accuracy	Luminance	±4% + 1digit
	Chroma xy	0.02 - 0.09 cd/m^2:±0.009 5.00 - 39.99 cd/m^2:±0.005
		0.10 - 4.99 cd/m^2:±0.008 40.00 cd/m^2:±0.003
Repeatability	Luminance	0.02 - 0.99 cd/m^2 :0.8% +1digit(2σ)
		1.00 cd/m^2 以上 :0.5% +1digit(2σ)
	Chroma xy	0.02 - 0.09 cd/m^2:0.018(2σ) 0.50 - 1.99 cd/m^2:0.003(2σ)
		0.10 - 0.19 cd/m^2:0.015(2σ) 2.00 cd/m^{2}以上:0.001(2σ)
		0.20 - 0.49 cd/m^2:0.006(2σ)
Measurement diameter		8mm (approx.)
Interface		USB
OS		Windows Vista, 7, 8, 10
Size		71mm(W) × 111mm(H) × 35(D)mm
Weight		100g

Standards software, ColoSukeVIEWER

Display evaluation item

- Color gamut
- Cntrast ratio
- Gamma curve
- sRGB
- Gray balance
- Luminance stability
- Uniformity

Chromatic Luminance/Illuminance Meter [Stand-Alone]

ColoSuke-SA [Stand-Alone]

This Unique design named "ColoSuke-SA" has it owns control unit with LCD display, it makes the "Stand-Alone Measurement" without PC.
Both Sensor part and Control unit are hand carried weight, and it is very convenient feature using anywhere, such as laboratory, factory, field work site...and so on.

This ColoSuke-SA is selectable between the Luminance Type and the Illuminance Type, And of course both type have measurement function for Chromaticity (x,y) and Correlated Colour Temperature (K).
Internal sensor is German made, this remarkable XYZ filter technology achieve the great repeatability. It also calibrated by NIST traceable light source and Carl Zeiss Spectrometer, to inject the real spectroscopy for the visible wavelength.

■ ColoSuke-SA [Stand-Alone]

F e a t u r e

- AA size battery drive
- Wide dynamic range
- Mobility to use, no use PC
- Measurement time is from 0.5ms to 1s
- High repeatability (Intensity: 0.8%, Chromaticity: 0.001)
- Incident angle characteristic in conformity to JIS AA class (Irradiance type)
- Spectrometer calibration when it ship out (by Carl Zeiss MCS CCD UV-NIR)
- Capable to be calibrated by any spectrometer as each standard

A p p l i c a t i o n

- Lighting Instrument
- Automobile component
- Display Measurement (LED back light LCD etc)
- Road traffic signs (LED) and Electrical scoreboards (LED and LCD)

● Specification

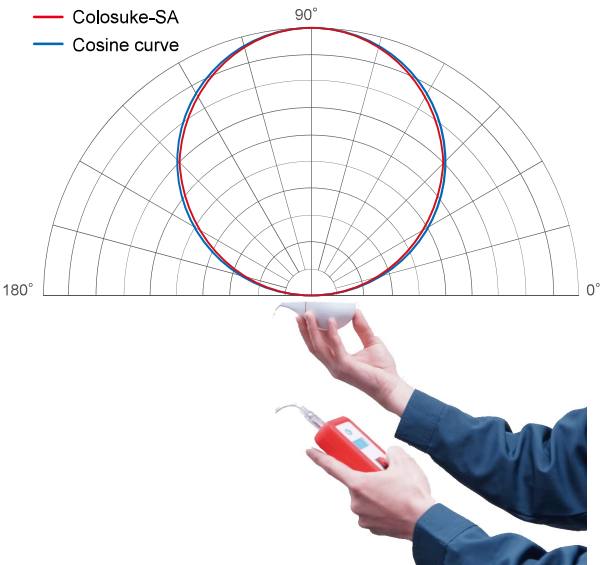| Measurement	Item	Luminance(cd/m^2), Illuminance(lx)
		Chromaticity xy/u'v', CCT(K)
	Range	0.02 - 30,000 cd/m^2 (typ.)
	Diameter	8mm (approx.)
Integration time		0.5 - 1000 msec
Accuracy	Intensity	±4%
	Chroma xy	0.02 - 0.09 cd/m^2:±0.009 5.00 - 39.99 cd/m^2:±0.005
		0.10 - 4.99 cd/m^2:±0.008 40.00 cd/m^2:±0.003
Repeatability	Intensity	0.8% +1digit(2σ)
	Chroma xy	0.02 - 0.09 cd/m^2:0.018(2σ) 0.50 - 1.99 cd/m^2:0.003(2σ)
		0.10 - 0.19 cd/m^2:0.015(2σ) 2.00 cd/m^{2}以上:0.001(2σ)
		0.20 - 0.49 cd/m^2:0.006(2σ)
Display		LCD
Interface		USB
Power supply		AA size battery
Size		Sensor part: 71mm(W) × 111mm(H) × 35(D)mm
		Control unit: 81mm(W) × 158mm(H) × 32(D)mm
Weight		Sensor part: 100g, Control unit: 230g

Sensor type

Sensor part

Control unit

Window

Luminance type

Diffuser

Illuminance type

Cosine correct characteristic

— Colosuke-SA
— Cosine curve

90°

180°   0°

Compact NIR spectrum sensor

NIR Meter

Compact NIR spectrum sensor "NIR Meter" is spectrometer to measure the spectrum using US T.I's DLP® technologies to target NIR range 900-1700nm.
Entrance is sapphire window that incident sample light directly. In addition, the optical fiber connection is also possible by attaching the SMA connector.

Standard software is possible to measure the relative intensity [count] / reflectance [%] / transmittance [%] / absorbance [Abs] as a data type. And it has data processing function such as secondary differential, smoothing, wavelength interpolation.
In addition, it has a built-in lamp for reflection measurements on both sides of the light-receiving window.

■ NIR Meter

F e a t u r e

● Using DLP® technology, realize a low price !!
● Wavelength range 900 - 1700nm
● Detector is Hamamatsu InGaAs
● Hight S/N ratio 6000:1
● Power supply USB bus power
● Bulit-in Tungsten lamp for reflection measurement
● Entrance is switchable between Sapphire window and SMA connector
● Built-in 885nm long-pass filter for stray light removal

A p p l i c a t i o n

● Diffuse reflectance measurement
● Various NIR spectroscopic measurements via an optical fiber

● Specification

Spectroscopic method	Grating / DLP® technology
Detector	InGaAs
Wavelength range	380 - 780 nm
FWHM	10 nm (typ.)
S/N ratio	6000:1
Internal lamp	Tungsten, 1.4W (typ.)
Entrance	Sapphire Window / SMA connector
Interface	USB
Power supply	USB bus power
Size	100mm(W) x 50mm(H) x 77mm(D)
Weight	300g

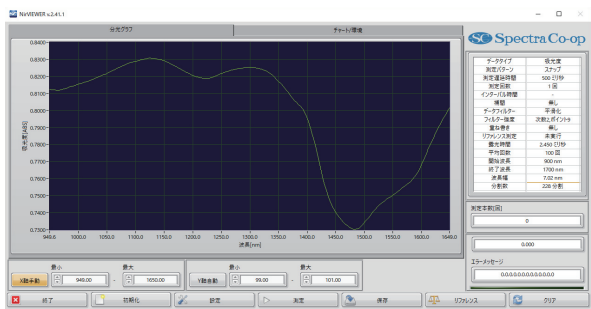* DLP® is a registered trademark of Texas Instruments.

Entrance

Sapphire Window

SMA connector

Software

Grating / DLP® technology

Tungsten Lamps   Colluminating Lens

Sample

Diffrection Grating

Focusing Lens

Collection Lens   InGaAs Detector

A/D

DLP
Micromirror Array