



EIT[®] ON-LINE PRODUCT OVERVIEW



ON-LINE MONITORING SYSTEMS

EIT's On-Line Systems measure UV intensity to provide continuous, real-time, feedback on a system. The solution is electro-optic based and can be used to monitor the UV in situations where:

- Space is limited and a radiometer will not fit
- Arms, rollers and/or blades are present
- Lamps are enclosed, not easily accessed or high off the ground
- Multiple lamps are used to increase the width across a production line
- Fast production speeds make it hard to use a radiometer
- UV conditions change rapidly due to off-gassing and/or contamination
- High value products are manufactured and undetected changes in the UV can lead to high scrap levels
- The process window is tight
- Validation of the UV conditions is required

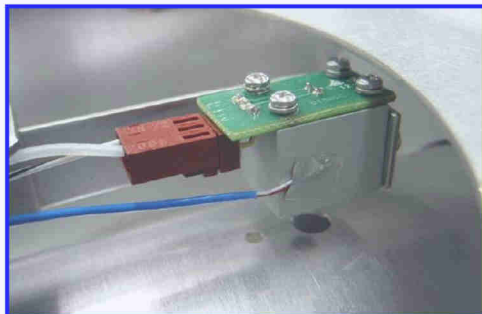


Top: EIT Compact Sensor
Above: EIT DIN Rail Signal Conditioning Unit

Applications include web presses, fiber optic draw towers, hard drive manufacturing, print and medical applications. The intensity measured by the On-Line Monitoring System is a relative intensity versus an absolute (W/cm^2) value. The user is able to track both gradual (e.g. bulbs aging) or sudden (equipment malfunction) changes to the UV intensity to take action before the changes impact product quality and bottom line profitability.

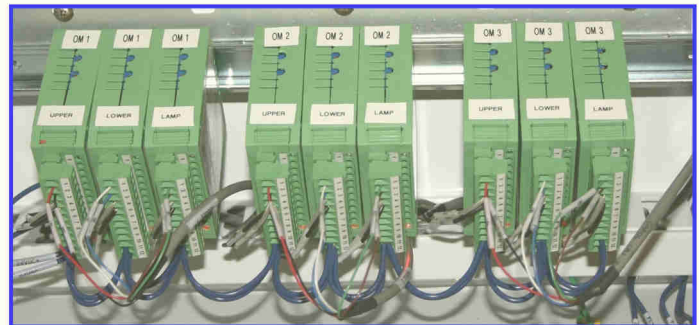
The EIT On-Line System consists of two components: A Compact Sensor and Signal-Conditioning Unit. The system can be used as the sole means of UV process control or in conjunction with an EIT NIST-traceable UV radiometer.

Compact Sensor: An extremely durable sensor with sealed optics designed to withstand harsh UV environments. EIT and our representative/distributor network will assist in selecting the optic response (UVA, UVB, UVC **or** UVV), housing shape, aperture size and mounting location based on the UV source type and application.



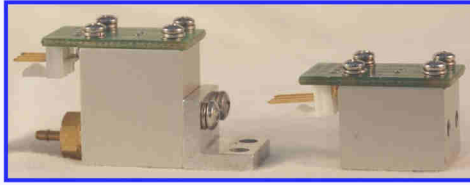
An EIT Compact Sensor Mounted behind a UV reflector can provide continuous data on the lamp condition.

Signal-Conditioning Unit: The Compact Sensor works with either an EIT DIN Rail or UV Intensity Module to provide signal conditioning and feedback to a PLC and/or display. The signal conditioning unit allows the user to track or display the real-time intensity data and set low limit alarms and/or close a relay if the pre-programmed limits are exceeded.



EIT DIN Rail units installed in cabinet to support Compact Sensors to support multiple Compact Sensors used in production.

EIT COMPACT SENSOR



Features

- Optics are extremely resistant to solarization and hermetically sealed to prevent contamination
- Small form factor, squared body for easy installation
 - ◊ The CS-1 (above left) housing has an optional air/ nitrogen purge to keep the optics clean
 - ◊ The CS-2 (above right) housing is height reduced
- Available in EIT UVA, UVB, UVC or UVV bands
- Internal aperture size determined by source type and Sensor mounting location
- Each Compact Sensor is supplied with 10 foot (3m) cable matched to Signal Conditioning unit

EIT DIN RAIL



Features

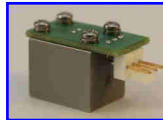
- Signal conditioning unit used with Compact Sensor
- Continuously monitors the output of a single UV lamp
- Provides 0-10 Volt analog output with user-settable alarm points and relay closure output connections
- Snap-in DIN Rail mounting convenience
- Powered by 24 volts AC/DC



ONLINE UV INTENSITY DISPLAY MODULE

Features

- Signal conditioning unit in panel mount convenience
- Continuously monitors the output of a single UV lamp and provides a display (LED, 0-199%, 2½ digit) *and* 0-10 volt analog output
- User-settable alarm points and relay output connections
- Powered by 24 volts AC/DC

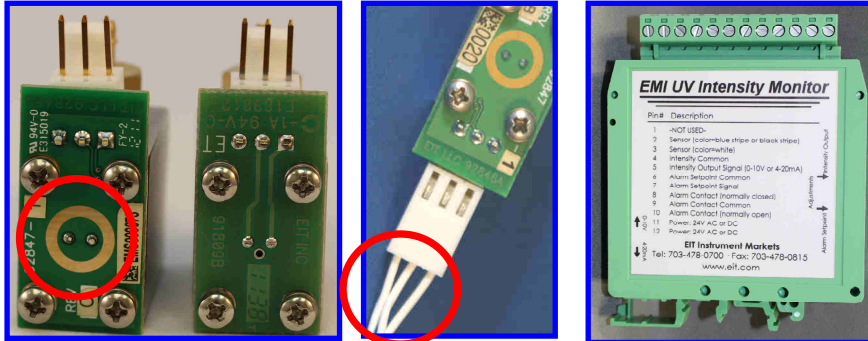


Feature	CS-1 With purge	CS-2 Without Purge	Standard DIN Rail	On-Line UV Intensity Display Module
Size	0.57 x 1.10 x 0.75" (1.45 x 2.78 x 1.91 cm)	0.57 x 0.60 x 0.75" (1.45 x 1.52 x 1.91 cm)	3.56 x 3.11 x 0.98" (9.04 x 7.90 x 2.29 cm)	Front Plate: 6.5 x 5" (16.51 x 12.70 cm)
Weight	0.8 oz (22.68 g)	0.7 oz (19.86 g)	3.6 oz (101 g)	4.60 oz (115 g)
Material	Aluminum Housing	Aluminum Housing	DIN Rail Housing	Front Plate & Metal housing
Connector & Cable Type	2 wire, Teflon Shielded 10' (3 m) standard	2 wire, Teflon Shielded 10' (3 m) standard	Two Wire (Type B)	BNC (Type A)
Operating Temperature Range	0-100°C	0-100°C	0-50°C	0-50°C
UV Bands & Power Source	UVA, UVB, UVC, UVV Specified when ordered	UVA, UVB, UVC, UVV Specified when ordered	20-28 Volts AC or DC 70 mA maximum	20-28 Volts AC or DC 500 mA maximum
Sensor Options / Display, Output & Indicators	Sensors are available in three aperture sizes (0.010, 0.035, 0.0), specified at time of order	Sensors are available in three aperture sizes (0.010, 0.035, 0.0) specified at time of order	No Display 0-10 VDC proportional to UV intensity	Display: 0-199% 2½ digit 0-10 VDC proportional to UV intensity; display indication of 100% = 5V, Green/ Red limit indicator lamps to indicate above or below set point
Acceptance Angle Accuracy	Approximate acceptance angle of 5° degrees	Approximate acceptance angle of 13° degrees	+/- 3% of full scale (10 Volts), Alarm Set Points +/- 5% from threshold setting	+/- 3% of full scale (10 Volts, 200%), Alarm Set Points +/- 5% from threshold setting as compared to 200%

ELECTRO MAGNETIC INTERFERENCE (EMI)

UV equipment (e.g., high-frequency power supply, power supply mounted in with the UV source, microwave source) has the potential to generate Electro Magnetic Interference (EMI) or electrical noise. A Compact Sensor cable, even with its shield, can also pick up electrical noise if it is run alongside a high voltage line. This electrical noise can make it appear that either the sensor or the source is unstable. The EMI Compact Sensor and EMI DIN Rail have been 'hardened' to make them less susceptible to electrical noise or interference.

EMI COMPACT SENSOR & EMI DIN RAIL



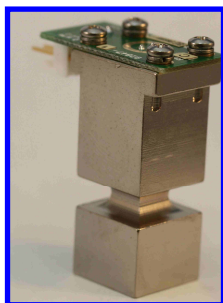
EMI Compact Sensors & EMI DIN Rails have additional circuitry to minimize interference. The EMI Compact Sensor is identified by the "gold" circle on the electronics (left). The EMI Compact Sensor must be grounded and connected to an EMI DIN Rail with a three wire EMI cable.

Note: If the EMI Compact Sensor is used with the Online Intensity Display Module, Standard DIN Rail and/ or two wire cable, there is no added EMI protection.

Above Left: EMI Compact Sensor on the left, Compact Sensor on the right

Above Center: EMI Sensor with 3 wire cable

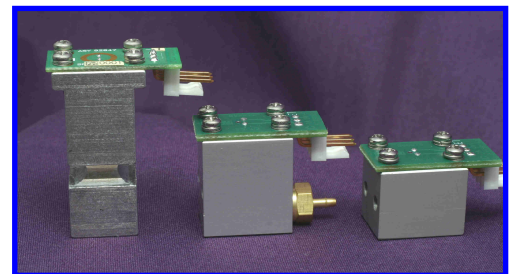
Above Right: EIT EMI DIN Rail



EMI Compact Sensors are available in UVA, UVB, UVC and UVV versions. In addition to the CS-1 and CS-2 housings, the EMI Compact Sensor is also available in a "BTR" (Behind The Reflector) housing (left) which mounts behind the reflector of a lamp.

Internal aperture choices are also specified at the time of order based on lamp intensity and mounting location.

BTR Housing



Housings left to right: BTR , CS-1, CS-2

CABLING

A Compact Sensor is connected to a Signal Conditioning unit with a supplied 10 foot (3 meter) Teflon shielded cable. *Standard* Compact Sensors utilize a two-wire cable while *EMI* Compact Sensors utilize a three-wire cable. The cable from the Compact Sensor carries a low signal level and should be kept as short as possible and away from high voltage power lines. If needed, longer cable runs should be done after the EIT Signal Conditioning unit. Contact EIT to discuss stock/custom cable lengths and bulkhead connector options.

EIT QUARTZ ROD

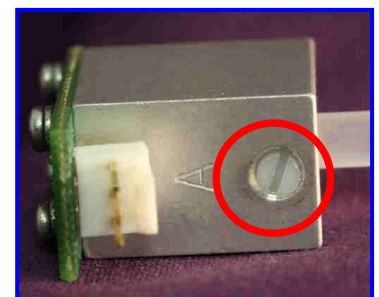
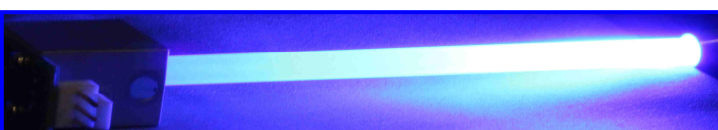
Some UV applications/sources present challenges (limited physical space, high temperature) to finding a suitable location for the Compact Sensor. The EIT Quartz Rod is four inches (10 cm) long, made of high quality quartz with a diffused outer surface and allows access in challenging applications. With a diameter of 0.2" (0.5 cm), the Quartz Rod fits into and is held in the CS-1 housing with a set screw. The Quartz Rod tracks the UV conditions while allowing the Compact Sensor to also stay cool.



Above Left: Compact Sensor with Quartz Rod installed

Bottom Left: Quartz Rod illuminated with UV

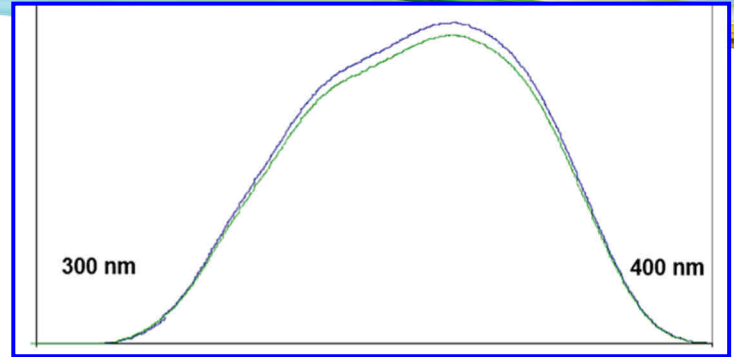
Right: Close up of set screw holding the Quartz Rod into a CS-1 Sensor housing



EIT COMPACT SENSOR DURABILITY

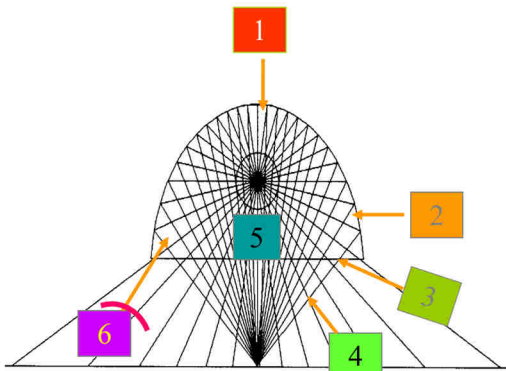
The Compact Sensor uses an innovative optics design to increase durability and reduce solarization (degradation of optical components) caused by intense UV energy. An EIT UVA Compact Sensor was tested for over 6,700 hours in an intense high power microwave UV system. The optics were characterized before and after the test. They showed a very small four percent decrease in optical their transmission characteristics.

The EIT Compact Sensor also has over twenty years of real world monitoring experience, making it the choice to monitor even the lost intense UV sources without perceptible solarization.



Before/after scans of Compact Sensor optics following 6,700 hours of exposure to a high power microwave system showed virtually no significant change

SENSOR INSTALLATION LOCATIONS



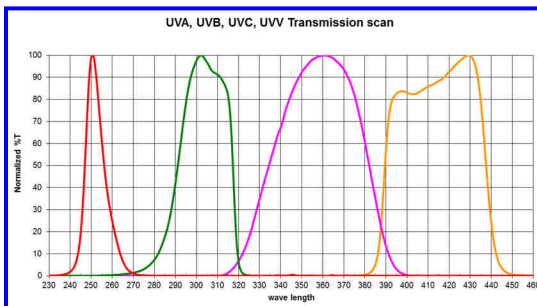
Selecting a location to install your Compact Sensor depends on your application and source. The Compact Sensor needs to remain cool (< 100°C) and clean.

Installing the Compact Sensor where it 'sees' reflected energy is preferred to a location where it only 'sees' direct energy. Consider using the EIT Quartz Rod if physical access or high temperature are a concern.

Suggested Sensor Installation Locations:

- | | |
|-----------------------------------|--|
| 1. Behind the Reflector from top | 4. Under system and/or quartz plate |
| 2. Behind the reflector from side | 5. End of lamp housing |
| 3. Below the reflector looking up | 6. Use of quartz rod or other material |

EIT SENSOR RESPONSE & APERTURE SIZE



The Compact Sensor response is specified at the time of order from one of the following bands shown to the left:

UVA (320-390 nm) UVB (280-320 nm) UVC (250-260 nm) UVV (395-445 nm)

The Compact Sensor internal aperture size (high/0.010, standard/0.035 or low/0.0) is also specified at the time of order. The aperture size is determined by the power of the source **and** the mounting location of the Compact Sensor .

Contact EIT or one of our reps/distributors for assistance in selecting a Compact Sensor housing shape, band response and aperture size

ABOUT EIT LLC

Founded in 1977, EIT provides contract electronic manufacturing & engineering services for medical, industrial, analytical instrument, telecommunications and aerospace customers from multiple facilities in Virginia and New England. EIT LLC designs, manufactures, sells, supports and services EIT radiometers and on-line measurement systems for industrial UV curing applications. EIT UV products have been sold since 1984 and are available for UV LED and UV Broadband (Arc, Microwave and Spot) sources.

For more information contact EIT or one of our authorized representatives or distributors

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EIT Products are designed and manufactured in the USA

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