

# Sensor Monitor 5.0 connect double



UV Intensity and Dose Monitor/Controller

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The **Sensor Monitor 5.0** (SM5) is designed to monitor up to eight channels equipped with different types of sensors including photodiodes, temperature probes and many more.

It features high precision input amplifiers, customizable range, offset and linearity correction via display and keys, large LCD with backlight, energy efficient DC power supply and standardized mounting fixtures.

This module can be easily mounted to panels of any width requiring just a rectangular mounting hole according to DIN 43700. It will be fixed with supplied screw clamps.

## ***Features of SM5 connect double***

- UV intensity monitor
- UV dose monitor
- Two channel 0 - 2.5V (e.g. amplified photodiodes, probes) or photodiode input
- Supply voltage range 12 V - 24 V DC with surge and polarity protection
- Low power consumption
- RS232 output for online data analysis
- Various configurable dose or intensity controlled relay functions
- Measurement ranges: UV index 0 - 40, intensity 0...1000 mW/cm<sup>2</sup>, dose 0 -10<sup>9</sup> GJ/cm<sup>2</sup>, photo current 0...490 nA, relative monitoring 0 - 100%
- Configurable units for intensity measurement  $\mu\text{W}/\text{cm}^2$ ,  $\mu\text{W}/\text{m}^2$ , mW/cm<sup>2</sup>, mW/m<sup>2</sup>, W/cm<sup>2</sup>, W/m<sup>2</sup>, kW/cm<sup>2</sup>, kW/m<sup>2</sup>, MW/cm<sup>2</sup>, MW/m<sup>2</sup>
- Configurable units for dose measurement  $\mu\text{J}/\text{cm}^2$ ,  $\mu\text{J}/\text{m}^2$ , mJ/cm<sup>2</sup>, mJ/m<sup>2</sup>, J/cm<sup>2</sup>, J/m<sup>2</sup>, kJ/cm<sup>2</sup>, kJ/m<sup>2</sup>, MJ/cm<sup>2</sup>, MJ/m<sup>2</sup>, GJ/cm<sup>2</sup>, GJ/m<sup>2</sup>
- Backlit LC display
- 3 keys to change display values and to set up customizable parameters
- User defined parameters are stored in non-volatile memory

## ***Important Notes***

**Please consider any possible action to protect the sensitive photodiode input against electrostatic discharge (ESD).**

**Not to do so may damage the appliance and voids warranty.**

**Please also care that there is no ground loop on the photodiode input connection as this may give wrong measurements.**

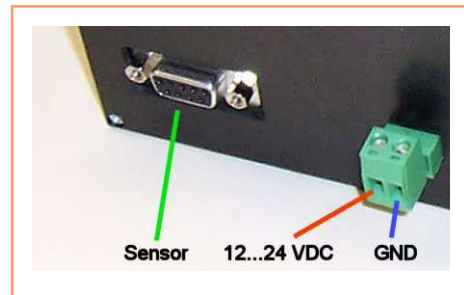
# Sensor Monitor 5.0 connect double



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## Installation

- Put the Sensor Monitor 5.0 into the rectangular front panel cut-out, slip the screw clamps into opposing dovetail guides and fix the screw.
- Connect the supplied sensor probes sub-D plug to the mating socket on the backside and fix it with screws.
- Connect a DC supply voltage of 12 to 24 Volts to the 2-terminal screw clamp as shown in figure.
- Connect supplied cable plug to the sub-D (RS232) socket on the back side and fix it with screws. Connect the other side of the cable with a COM port of your computer. Adjust port to 19200 baud, 8 databit, no parity, 1 stopbit (8N1)



## Normal operation

The Sensor Monitor 5.0 will be calibrated and pre-configured for your application. To change the settings please read the following chapter.

## Configuration

By pressing the **ENTER** switch you can cycle through all configuration options. Press **UP** or **DOWN** to increment or decrement the displayed parameter. Use **ENTER** to accept value and advance to next.

### Einstellbare Parameter:

Name	Range	Description
CH1 scale raw value	$1e^{-15} - 1e^{15}$	Calibration of the raw value (nA or V), =(maximum displayed value or range-endvalue)/1023, max. 3.5 significant digits, reasonable between 1.999...1999 <b>We recommend not to change this value!</b>
CH2 scale raw value	$1e^{-15} - 1e^{15}$	Calibration of the raw value (nA or V), =(maximum displayed value or range-endvalue)/1023, max. 3.5 significant digits, reasonable between 1.999...1999 <b>We recommend not to change this value!</b>
CH1 scale user value	$1e^{-15} - 1e^{15}$	Calibration of the user value, =(maximum displayed value or range- endvalue)/maximum raw value, max. 3.5 significant digits <b>We recommend not to change this value!</b>
CH2 scale user value	$1e^{-15} - 1e^{15}$	Calibration of the user value, =(maximum displayed value or range-

# Sensor Monitor 5.0 connect double



## UV Intensity and Dose Monitor/Controller

Name	Range	Description
		endvalue)/maximum raw value, max. 3.5 significant digits <b>We recommend not to change this value!</b>
CH1 scale power value	$1e^{-15} - 1e^{15}$	Calibration of the power (intensity) value, =(maximum displayed value or range-endvalue)/maximum raw value, max. 3.5 significant digits <b>We recommend not to change this value!</b>
CH2 scale power value	$1e^{-15} - 1e^{15}$	Calibration of the power (intensity) value, =(maximum displayed value or range-endvalue)/maximum raw value, max. 3.5 significant digits <b>We recommend not to change this value!</b>
CH1 scale dose reading	$1e^{-15} - 1e^{15}$	Calibration of the dose value, standard: $0.25 \cdot 10^x$ , with $x=Z \cdot 3$ (-6, -3, 0, 3, 6, ...) <b>We recommend not to change this value!</b>
CH2 scale dose reading	$1e^{-15} - 1e^{15}$	Calibration of the dose value, standard: $0.25 \cdot 10^x$ , with $x=Z \cdot 3$ (-6, -3, 0, 3, 6, ...) <b>We recommend not to change this value!</b>
CH1 upper dose limit	$50e^{-3}$	<b>Relevant if relay1 function=3</b> dose limit, where dose controlled relay activates
CH2 upper dose limit	$50e^{-3}$	<b>Relevant if relay1 function=3</b> dose limit, where dose controlled relay activates
Input configuration	0-4	Input configuration: 2x current, 2x voltage, 1x current, 1x voltage, 1x current + 1x voltage
CH1 1 raw units	0-4	units: nA, $\mu$ A, mA, mV, V
CH2 1 raw units	0-4	units: nA, $\mu$ A, mA, mV, V
CH1 user units	0-7	units: nA, $\mu$ A, mA, mV, V, UVI, %
CH2 user units	0-7	units: nA, $\mu$ A, mA, mV, V, UVI, %
CH1 power units	0-8	units: $\mu$ W/cm <sup>2</sup> , $\mu$ W/m <sup>2</sup> , mW/cm <sup>2</sup> , mW/m <sup>2</sup> , W/cm <sup>2</sup> , W/m <sup>2</sup> , kW/cm <sup>2</sup> , kW/m <sup>2</sup> , MW/cm <sup>2</sup> , MW/m <sup>2</sup> <b>changes only the displayed unit (not the value) recommended only to change with the power calibration</b>
CH2 power units	0-8	units: $\mu$ W/cm <sup>2</sup> , $\mu$ W/m <sup>2</sup> , mW/cm <sup>2</sup> , mW/m <sup>2</sup> , W/cm <sup>2</sup> , W/m <sup>2</sup> , kW/cm <sup>2</sup> , kW/m <sup>2</sup> , MW/cm <sup>2</sup> , MW/m <sup>2</sup> <b>changes only the displayed unit (not the value) recommended only to change with the power calibration</b>
CH1 dose units	0-9	units: $\mu$ J/cm <sup>2</sup> , $\mu$ J/m <sup>2</sup> , mJ/cm <sup>2</sup> , mJ/m <sup>2</sup> , J/cm <sup>2</sup> , J/m <sup>2</sup> , kJ/cm <sup>2</sup> , kJ/m <sup>2</sup> , MJ/cm <sup>2</sup> , MJ/m <sup>2</sup> , GJ/cm <sup>2</sup> , GJ/m <sup>2</sup> <b>changes only the displayed unit (not the value) recommended only to change with the dose calibration</b>

# Sensor Monitor 5.0 connect double



## UV Intensity and Dose Monitor/Controller

Name	Range	Description
CH2 dose units	0-9	units: $\mu\text{J}/\text{cm}^2$ , $\mu\text{J}/\text{m}^2$ , $\text{mJ}/\text{cm}^2$ , $\text{mJ}/\text{m}^2$ , $\text{J}/\text{cm}^2$ , $\text{J}/\text{m}^2$ , $\text{kJ}/\text{cm}^2$ , $\text{kJ}/\text{m}^2$ , $\text{MJ}/\text{cm}^2$ , $\text{MJ}/\text{m}^2$ , $\text{GJ}/\text{cm}^2$ , $\text{GJ}/\text{m}^2$ <b>changes only the displayed unit (not the value)</b> <b>recommended only to change with the dose calibration</b>
Relay1 function	0-3	0= relay activation if intensity (power ) high limit is exceeded 1= relay activation if intensity (power ) low limit is exceeded 2= relay activation when dose measurement is running 3= relay activation if dose limit is reached set the dose limit value with "CH1 upper dose limit"
Relay1 threshold	0-100	Limit for relay 1 in % of measurement range <b>Special internal trigger function if relay1 function=3</b> : Set value to % of maximum intensity where dose measurement starts automatically Set 0 for no intensity conditioned dose start
Relay1 trsh time	0-240	time delay of relay activation after threshold is exceeded set 0 for immediate reaction (no delay)
Relay2 function	0-2	0= relay activation if intensity (power ) high limit is exceeded 1= relay activation if intensity (power ) low limit is exceeded 2= relay activation when dose measurement is running 3= relay activation if dose limit is reached set the dose limit value with "CH1 upper dose limit"
Relay2 threshold	0-100	Limit for relay 2 in % of measurement range <b>Special internal trigger function if relay1 function=3</b> : Set value to % of maximum intensity where dose measurement starts automatically Set 0 for no intensity conditioned dose start
Relay2 trsh time	0-240	time delay of relay activation after threshold is exceeded set 0 for immediate reaction (no delay)
Default display mode	1-5	Display mode after power-on.
RS232 interval	0-240	Interval in s in which data is sent over RS232 Set 0 for no data.

# Sensor Monitor 5.0 connect double



UV Intensity and Dose Monitor/Controller

Name	Range	Description
Dose start condition	0-2	0 = manual start with button 1= automatic start after power-on. 2= measurement begins with exceeding of an minimal intensity threshold (adjustable at relay x Threshold) and ends with exceeding an adjusted dose value (upper dose limit). Chose dose conditioned relays in "relay x function"

## Physical Dimensions

Parameter	Unit	Value
Panel width x height	mm	144 x 144
Module depth	mm	85
Mounting hole width x height	mm	137 x 137

## Absolute Maximum Ratings

Exceeding these limits may decrease lifetime or destroy the module or parts of it immediately.

Parameter	Unit	Value
Operation Temperature range *	°C	0 - +70
Storage Temperature range *	°C	-25 - +85
Supply voltage (DC)	V	+30

\*in non condensing environment only

## Electrical Characteristics

(at 25 °C unless otherwise noted)

Parameter	Unit	Value		
		min	typ.	max
Supply voltage	V	11	24	30
Power dissipation (at 24 V supply voltage)	W	0.1	0.4	0.5

# Sensor Monitor 5.0 connect double



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