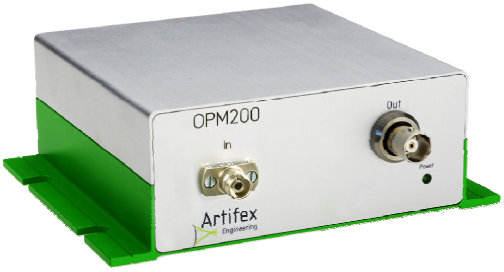
Artifex Engineering



OPM200

Fast Optical Power Monitor

HIGHLIGHTS

- Maximum input power: 7 mW
- Noise equivalent power (NEP_{RMS}): 300 nW
- Small signal rise time (10-90%): 70 ns
- Bandwidth: 5 MHz
- Wide selection of photodiodes: 200-2490 nm

APPLICATIONS

- Fast signal analysis
- Component testing
- Quality control
- OEM (eg: laser noise monitoring)

MEASUREMENT PRINCIPLE

The OPM200 amplifier employs high quality photodiodes and precision transimpedance input stages to provide for low offset and high linearity throughout the full dynamic range.

FIELDS OF APPLICATION

These optical power monitors are particularly useful for the measurement of rapidly changing optical signals. These units have a particularly high bandwidth of 5MHz allowing monitoring of high frequency noise components of many light sources. The output is a voltage linearly proportional to input power. The fast response time at high signal-noise-ratio makes the OPM200 series particularly useful in systems control feedback loops.

The OPM200 series is insensitive to electromagnetic interference by design, an important factor when working in „dirty“ industrial environments. These units are provided in OEM-style enclosures. The case wings provide for mounting on standard 25mm and 1“ optical table tops and for OEM applications.

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ABSOLUTE MAXIMUM RATINGS

Average Current	7mW (Si, InGaAs) or 50mW (Ge)
Temperature Range	0 – 60 °C

ORDERING INFORMATION

Full order code: OPM 200 d r n

	Options	Description
Diode material (d):	UVS	200-1000nm
	G	800-1550nm
	VIGA	400-1600nm
	X2.0IGA	700-2000nm
	X2.5IGA	700-2490nm
Fibre receptacle	F	FC
	S	SMA
Number of channels (n):	1 to 4	

For example, a 2 channel, FC receptacle unit with a silicon (Si) photodiode input would be ordered as:

OPM200UVSF2

For customized systems, please contact us.

SPECIFICATIONS

PARAMETER	CONDITIONS	Si, InGaAs			Ge			UNITS
		MIN	TYP	MAX	MIN	TYP	MAX	
INPUT								
Wavelength range	UV-Si VIS-InGaAs X2.0 InGaAs X2.5 InGaAs	200 400 700 700		1000 1600 2000 2490	800		1550	nm
Power ranges (full scale)			4.5[1]			45[2]		mW
Noise equivalent power (NEP_{RMS})				0.3			3	µW
Polarization Dependant Loss (PDL)			0.02	0.1		*	*	dB
Fibre type		single mode, multi-mode (ϕ core ≤ 62.5 µm; NA ≤ 0.275)			*			
Receptacles		FC, FSMA, free beam			*			
OUTPUT								
Function		Linear analogue V_{out} = scale x P_{in}			*			
Output scale			1			0.1		V/mW
Output range (full scale)		4.4	4.5[3]	4.6	*	*	*	V
Connectors		BNC[4] and DB9			*			
Rise / Fall time (10% - 90%)				70			*	ns
Settling time (1%)				100			*	ns
Accuracy		± 5			*			%
Reproducibility		± 0.5			*			%
Linearity			± 0.1	± 0.2		*	*	dB
Output impedance				50			*	Ω
POWER SUPPLY								
Type		Wall plug (supplied)			*			
Dimensions		30 x 50 x 60			*			mm
DIMENSIONS								
	1 channel	105[5] x 45 x 116 mm (w x h x l)			*			mm
	2 channels	105[5] x 66 x 116 mm (w x h x l)			*			mm
	4 channels	105[5] x 106 x 116 mm (w x h x l)			*			mm

APPLICATIONS EXAMPLES

Typical applications may be found in laser power control, fluorescence lifetime measurements, etc.

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[1] linearity guaranteed to 1mW (0dBm) for Si and 7mW (8.5dBm) for InGaAs.

[2] linearity guaranteed to 5mW (7dBm).

[3] linearity guaranteed to 1mW (0dBm) for Si and 7mW (8.5dBm) for InGaAs.

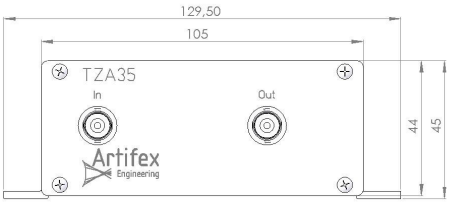
[4] Adapters for other connector systems available.

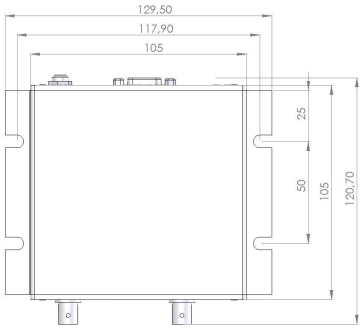
[5] 130 mm including case wings.

CASE STYLE

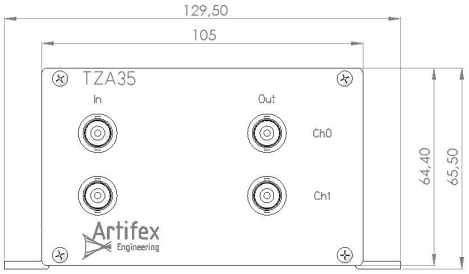
(OEM style)

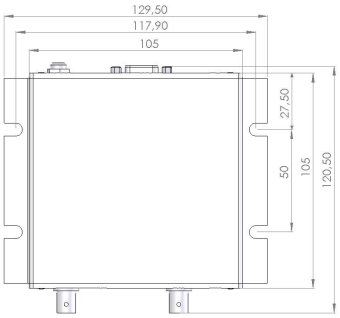
1 CHANNEL



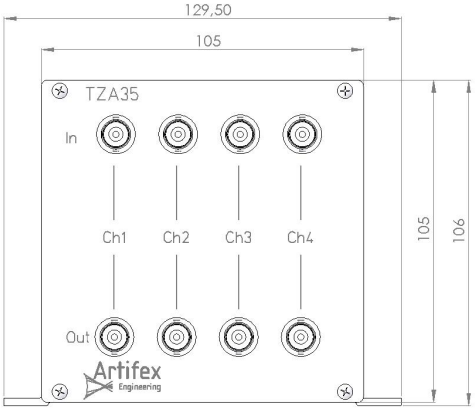


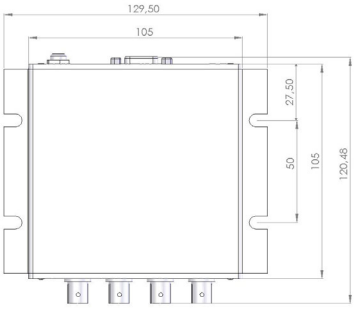
2 CHANNEL





4 CHANNEL



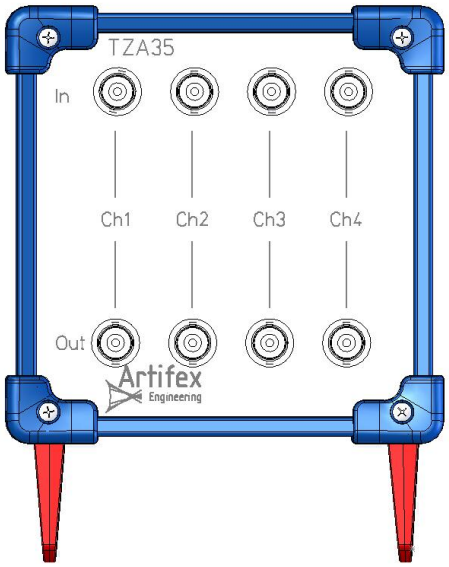


THE FRONT AND BACK PANELS

The front panel contains the input and output BNC connectors.

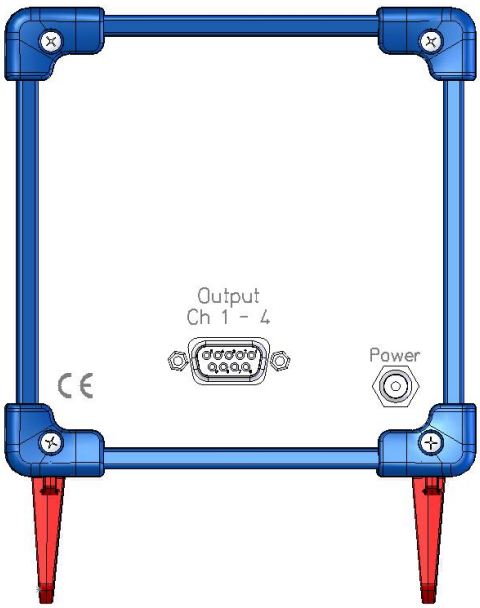
The upper row of BNC connectors is for the current inputs. The channel count begins at the left. If the current source is a photodiode then the cathode is to be connected to the centre pin of the BNC. If a current source other than a photodiode is to be used, then the current drain is to be connected to the centre pin.

The lower row of BNC connectors is for the amplifier outputs. The output is 0-4.5V, linearly proportional to the current input. The channel count begins at the left.



The back panel contains the interface connector for the channel outputs (DB9, female). These outputs are the same as the BNC outputs on the front panel, buffered from another. Thus, the front panel outputs are useful for monitoring (an oscilloscope for example) whereas the back panel outputs are useful for I/O card inputs.

The power input socket is also found here.



INSTRUCTIONS FOR MEASUREMENT

The OPM200 optial power monitor comprises one to four independent measurement channels, depending on the model chosen. Each channel consists of a receptacled optical input and a BNC-output. These two user interfaces are arranged in logical groups (see „The Front and Back Panels“).

To make a measurement, proceed as follows:

1. Turn the unit on. For the most accurate measurement, please allow for a 15 minute warm up before using.
2. Connect an optical source to the desired channel via the corresponding receptacle. Ensure that the lug of the fibre connector is correctly inserted in the slot in the receptacle and that the connector is securely screw-fastened.
3. Connect a BNC-cable from the BNC-socket directly underneath the chosen receptacle to a suitable measurement instrument (voltmeter, oscilloscope, I/O card, etc.). Alternatively, the output may be taken from the interface receptacle on the back panel.
4. Turn on the optical source to be measured.
5. Read the voltage output and convert to power using the appropriate conversion factor given under “Absolute Maximum Ratings”.

OUTPUT INTERFACE

The pinning of the output interface (DB9-female) is as follows:

Pin No.	Function
1	AGND (analogue ground)
2	Ch. 1 output
3	AGND
4	Ch. 2 output
5	AGND

Pin No.	Function
6	Ch. 3 output
7	AGND
8	Ch. 4 output
9	AGND

DAMAGE

The unit may be damaged by exceeding the maximum average input power. Please read „Absolute Maximum Ratings“ for these maximum values before working with the instrument.

Use only the power supply and power supply cable provided with the unit.

TROUBLESHOOTING

In the event that a measurement is not successful, the following possibilities should be analysed:

Symptom	Possible Errors	Correction
No output	• System is not switched on • Fuse blown[6]	• Ensure the power cord is connected at both ends and switch the system on.
No output	• Input power too low	• Increase input power
	• Input or output connection not correct	• Ensure that the connectors are inserted correctly and locked. In multichannel units, ensure that the channel being monitored corresponds to the input channel. Ensure that the interface plug is securely seated and the screws fastened.
Output at full scale, independant of input current	• Input power too high	• Reduce input power.

In the unlikely event that you are not able to obtain a measurement in spite of these troubleshooting measures, please contact us. We will be pleased to help you solve your problem.

[6] Secondary, internal self resetting fuses, only. In the event that a secondary fuse „blows“, shut off the power, correct the fault and wait a few minutes before switching the power back on.

NOTICE

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Attention: The OPM series of power meters is designed for use with lasers. Personnel who use this instrument must, therefore, be instructed in the safe use of lasers and laser beams.

Always wear the proper laser safety glasses designed for the laser in use!

Never allow the direct or reflected laser beam to impinge on the eyeball or to come into contact with the skin!

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