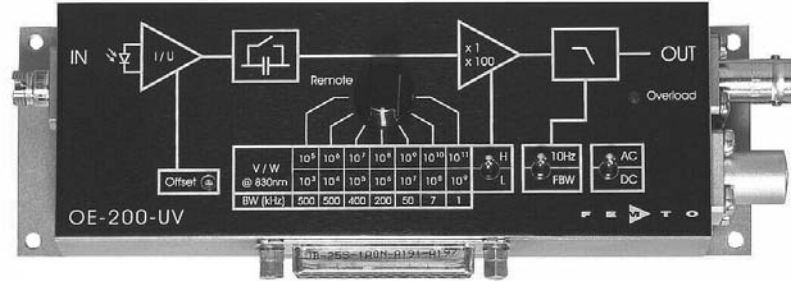


Variable-Gain Photoreceiver - Fast Optical Power Meter



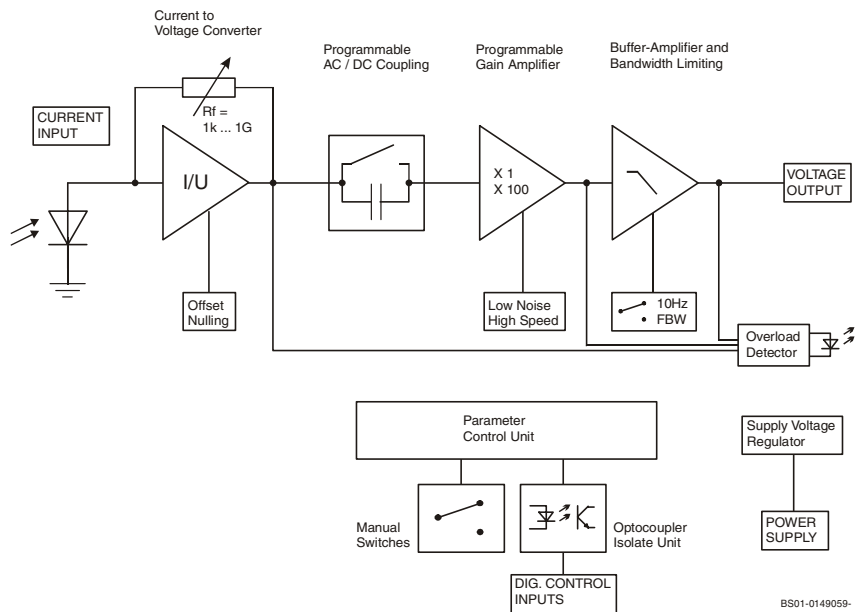
Features

- Si Detector, 1.1 x 1.1 mm² Active Area, FC, ST or SMA Fiber Receptacle
- Spectral Range 190 - 1000 nm, UV-Enhanced
- Conversion Gain Switchable from 1 x 10³ to 1 x 10¹¹ V/W
- Calibrated at 830 nm, Traceable to NIST Standards
- Bandwidth up to 500 kHz
- Local and Remote Control

Applications

- Fast Optical Power Meter
- Spectroscopy
- General-Purpose Opto-Electronical Measurements
- Optical Receiver for Use with Lock-In Amplifiers

Block Diagram



BS01-0149059-

Variable-Gain Photoreceiver - Fast Optical Power Meter

Specifications	<i>Test Conditions</i>	<i>V_s = ± 15 V, T_a = 25°C</i>						
Gain	Conversion Gain	1 x 10 ³ ... 1 x 10 ¹¹ V/W (@ 830 nm)						
	Gain Accuracy	± 5 % electro-optical (P _{opt} ≤ 1 mW), traceable to NIST						
	Gain Drift	see table below						
Frequency Response	Lower Cut-Off Frequency	DC / 1 Hz, switchable						
	Upper Cut-Off Frequency	up to 500 kHz (See Table), switchable to 10 Hz						
	Gain Flatness	± 0.1 dB						
	Gain Accuracy	± 1 % electrical, between settings						
Input	NEP	see table						
	Max. cw-Saturation Power	see table						
	Dark Current Compensation	± 2 nW, adjustable by offset trimpot and external control voltage						
Detector	Detector	Si photodiode in FC, ST or SMA fiber receptacle						
	Active Area	1.1 x 1.1 mm ²						
	Spectral Response	190 – 1000 nm, UV-enhanced						
	Sensitivity	0.3 A/W (@ 830 nm) 0.1 A/W (@ 200 nm)						
	Dark Current	2 pA typ.						
Performance Depending on Gain Setting	Gain Setting (Low Noise) (V/W)	10 ³	10 ⁴	10 ⁵	10 ⁶	10 ⁷	10 ⁸	10 ⁹
	Upper Cut-Off Frequency (- 3 dB)	500 kHz	500 kHz	400 kHz	200 kHz	45 kHz	7 kHz	1.2 kHz
	Rise / Fall Time (10% - 90%)	700 ns	700 ns	900 ns	1.8 μs	8 μs	50 μs	300 μs
	NEP (√Hz, @100 Hz)	69 pW	7.9 pW	1.6 pW	450 fW	150 fW	48 fW	17 fW
	Offset Current Drift (°C)	100 nW	10 nW	1 nW	85 pW	8.5 pW	1.3 pW	1 pW
	Gain Drift (°C)	0.008%	0.008%	0.008%	0.01%	0.01%	0.01%	0.02%
	cw-Saturation Power	2 mW	1 mW	0.1 mW	10 μW	1 μW	0.1 μW	10 nW
	Gain Setting (High Speed) (V/W)	10 ⁵	10 ⁶	10 ⁷	10 ⁸	10 ⁹	10 ¹⁰	10 ¹¹
	Upper Cut-Off Frequency (- 3 dB)	500 kHz	500 kHz	400 kHz	200 kHz	45 kHz	7 kHz	1.2 kHz
	Rise / Fall Time (10% - 90%)	700 ns	700 ns	900 ns	1.8 μs	8 μs	50 μs	300 μs
	Min. NEP (√Hz, @100 Hz)	45 pW	6.2 pW	1.5 pW	450 fW	150 fW	48 fW	17 fW
	Offset Current Drift (°C)	100 nW	10 nW	1 nW	85 pW	8.5 pW	1.3 pW	1 pW
	Gain Drift (°C)	0.008%	0.008%	0.008%	0.01%	0.01%	0.01%	0.02%
	cw-Saturation Power	0.1 mW	10 μW	1 μW	0.1 μW	10 nW	1 nW	0.1 nW
	Output	Output Voltage	± 10 V (@ > 10 kΩ load)					
Output Impedance		50 Ω (terminate with > 10 kΩ load for best performance)						
Max. Output Current		± 30 mA						
Indicator LED	Function	Overload						
Digital Control	Control Input Voltage Range	Low: - 0.8 ... + 1.2 V, High: 2.3 ... + 12 V						
	Control Input Current	0 mA @ 0V, 1.5 mA @ + 5 V, 4.5 mA @ + 12V						
	Overload Output	non active: 0 V , max. -1 mA, active: 5.1 V, max. 7 mA						
Ext. Offset Control	Control Voltage Range	± 10 V						
	Offset Control Input Impedance	20 kΩ						

Variable-Gain Photoreceiver - Fast Optical Power Meter

Specifications (continued)	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;">Power Supply</td> <td style="width: 30%;">Supply Voltage</td> <td style="width: 40%;">± 15 V</td> </tr> <tr> <td></td> <td>Supply Current</td> <td>+ 150 / -100 mA (depends on operating conditions, recommended power supply capability minimum 250 mA)</td> </tr> <tr> <td></td> <td>Stabilized Power Supply Output</td> <td>± 12 V, max. 150 mA, + 5V, max. 50 mA</td> </tr> <tr> <td>Case</td> <td>Weight</td> <td>320 g (0.74 lbs)</td> </tr> <tr> <td></td> <td>Material</td> <td>AlMg4.5Mn, nickel-plated</td> </tr> <tr> <td>Temperature Range</td> <td>Storage Temperature</td> <td>-40 ... +80 °C</td> </tr> <tr> <td></td> <td>Operating Temperature</td> <td>0 ... +60 °C</td> </tr> </table>	Power Supply	Supply Voltage	± 15 V		Supply Current	+ 150 / -100 mA (depends on operating conditions, recommended power supply capability minimum 250 mA)		Stabilized Power Supply Output	± 12 V, max. 150 mA, + 5V, max. 50 mA	Case	Weight	320 g (0.74 lbs)		Material	AlMg4.5Mn, nickel-plated	Temperature Range	Storage Temperature	-40 ... +80 °C		Operating Temperature	0 ... +60 °C
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Variable-Gain Photoreceiver - Fast Optical Power Meter

Remote Control Operation

General

Remote control input bits are opto-isolated and connected by a logical OR function to the local switch settings. For remote control set the corresponding local switches to "Remote", "AC" and "H" and select the desired setting via a bit-code at the corresponding digital inputs. Mixed operation, e.g. local AC/DC setting and remote controlled gain setting, is also possible.

The switch setting "FBW / 10 Hz" of the lowpass signal filter is not remote controllable.

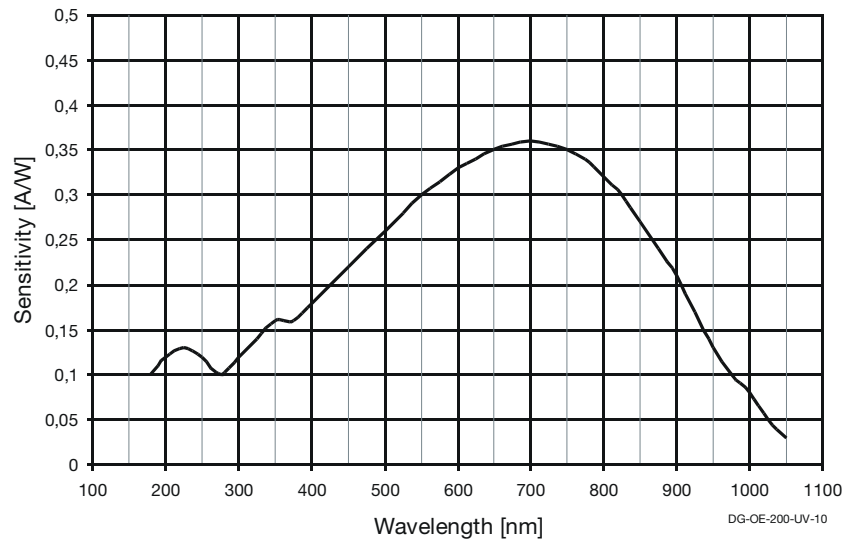
Gain Setting

Low Noise Gain (V/W) Pin 14=High	High Speed Gain (V/W) Pin 14=Low	Pin 10 LSB	Pin 11	Pin 12 MSB
10^3	10^5	Low	Low	Low
10^4	10^6	High	Low	Low
10^5	10^7	Low	High	Low
10^6	10^8	High	High	Low
10^7	10^9	Low	Low	High
10^8	10^{10}	High	Low	High
10^9	10^{11}	Low	High	High

AC/DC Setting

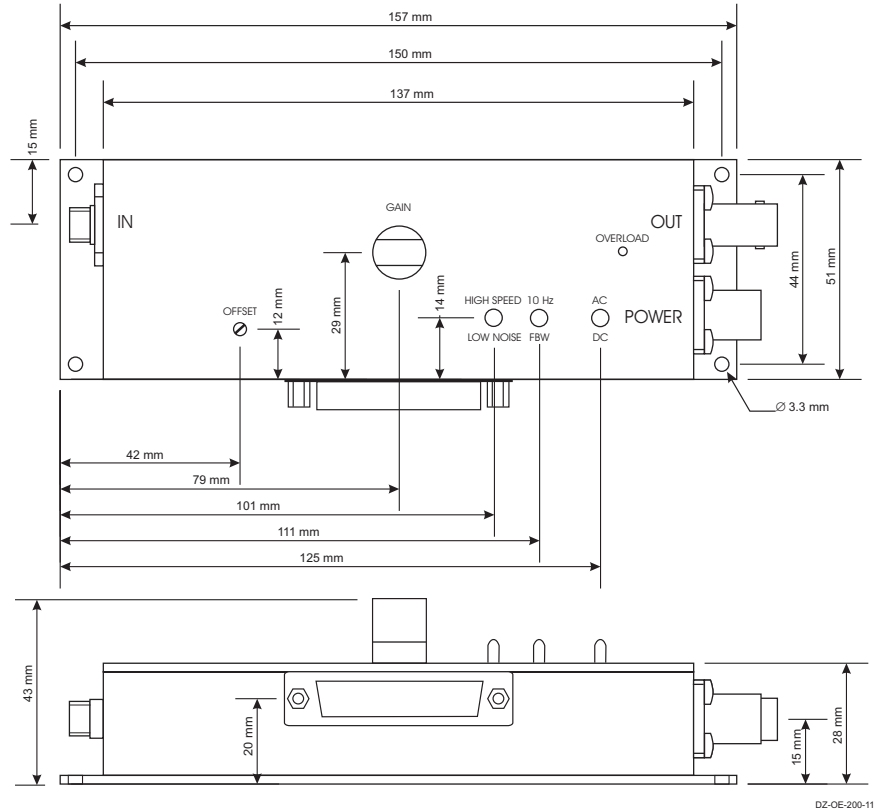
Coupling	Pin 13
AC	Low
DC	High

Spectral Response



Variable-Gain Photoreceiver - Fast Optical Power Meter

Dimensions



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