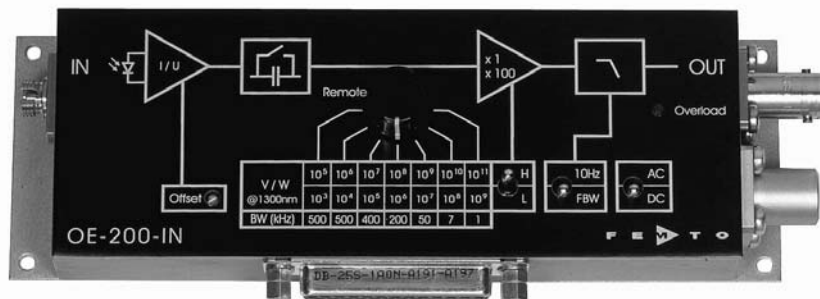


Variable-Gain Photoreceiver - Fast Optical Power Meter



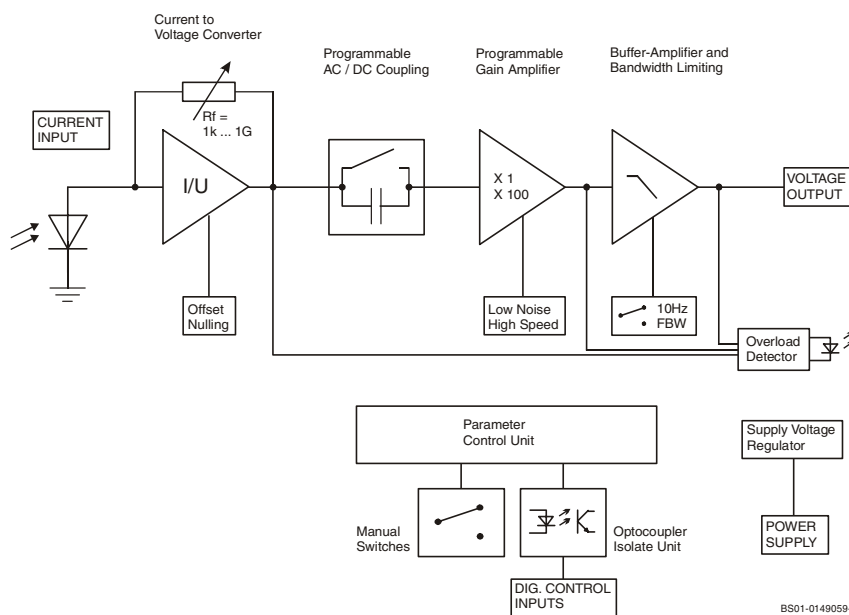
Features

- InGaAs PIN Detector, \varnothing 100 μ m Active Diameter, FC or ST Fiber Receptacle
- Spectral Range 900 - 1700 nm
- Conversion Gain Switchable from 1×10^3 to 1×10^{11} V/W
- Calibrated at 1300 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 (@ 1300 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	± 500 pW, adjustable by offset trimpot and external control voltage							
Detector	Detector	InGaAs PIN photodiode in FC or ST Fiber receptacle							
	Active Area	Ø 100 µm							
	Spectral Response	900 – 1700 nm							
	Sensitivity	0.85 A/W (@ 1300 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)	25 pW	2.9 pW	580 fW	160 fW	58 fW	23 fW	11 fW	
	Offset Current Drift (°C)	40 nW	4 nW	0.4 nW	34 pW	3.4 pW	0.5 pW	0.4 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)	16 pW	2.3 pW	560 fW	160 fW	58 fW	23 fW	11 fW	
	Offset Current Drift (°C)	40 nW	4 nW	0.4 nW	34 pW	3.4 pW	0.5 pW	0.4 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.

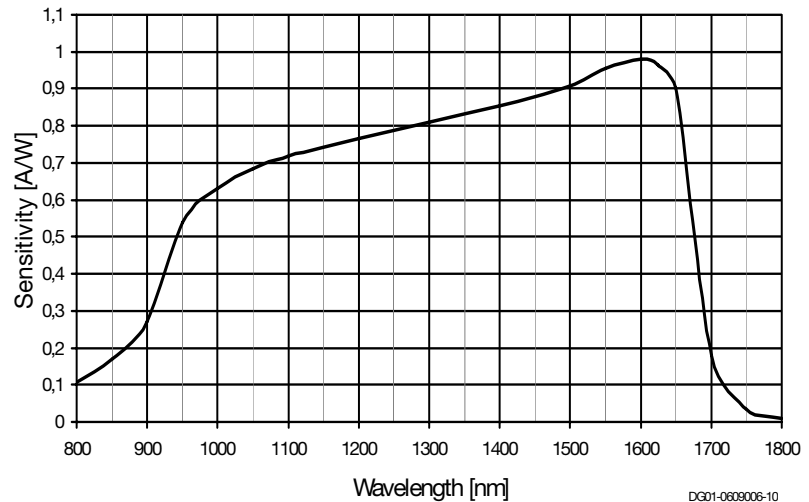
Gain Setting

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

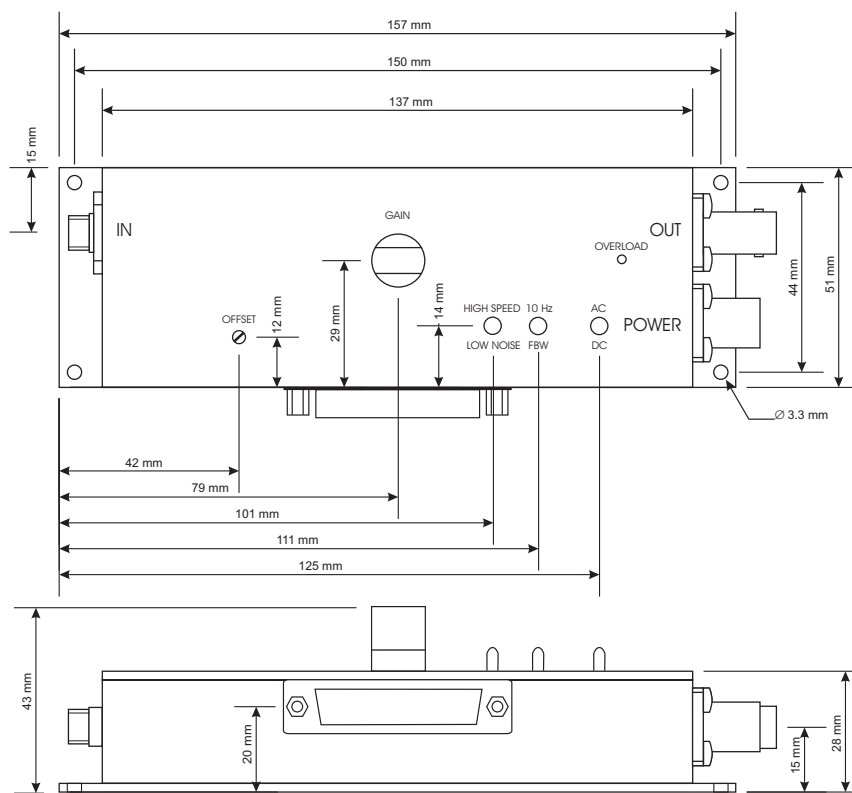
Coupling	Pin 13
AC	Low
DC	High

Spectral Response



Variable-Gain Photoreceiver - Fast Optical Power Meter

Dimensions



DZ-OE-200-11

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