Transimpedance Amplifier, 1/10/100 kV/A

AMP102



Description

The AMP102 switchable transimpedance amplifier amplifies low output current from a photodiode, photodetector, or other device with a switchable gain of 1/10/100 kV/A. This amplifier has an in-line box design with two female BNC connectors that is intended to be used between two BNC cables. An included external power supply connects via Micro-B USB on the INPUT end of the amplifier. An LED next to the USB connector indicates active power supply.

At the OUTPUT end of the amplifier, a small switch allows users to choose the polarity: AG (anode grounding) or CG (cathode grounding). Dark current can be eliminated by changing the offset with the ZERO ADJ. screw on the OUTPUT end. After the gain setting is changed, the offset should be readjusted.

Specifications

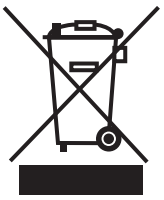
AC Performance	
Bandwidth (3 dB, C_{in} ≤ 10 nF)[a]	DC to 100 kHz
Rise/Fall Time (10% to 90%)	<3.5 µs

Specifications				
	Conditions	**Min**	**Mid**	**Max**
Transimpedance Gain	-	1 kV/A	10 kV/A	100 kV/A
Input Current Limits[b]	-	±2 mA	±200 µA	±20 µA
Input Impedance[c]	-	100 Ω		
Input Current Noise (NEP)[a]	DC to 100 kHz	0.45 pA/√Hz		
Quiescent Current	-	45 mA		
Output Voltage Range	50 Ω Load	-1.0 V to 1.0 V		
	Hi-Z Load	-2.0 V to 2.0 V		
Output Impedance	-	50 Ω		
Power Supply Voltage	-	5 V		
Power Supply Current	-	2 A		

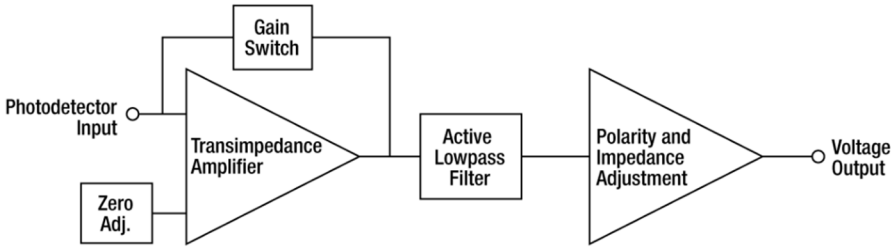
a. Bandwidth and input current noise are typical values that depend on the source capacitance. Keep the source capacitance as low as possible by using short cables at the input to achieve the best possible bandwidth and noise performance.

b. Exceeding these limits saturates the amplifier. There is a chance of damaging the amplifier if operating outside of this specification.

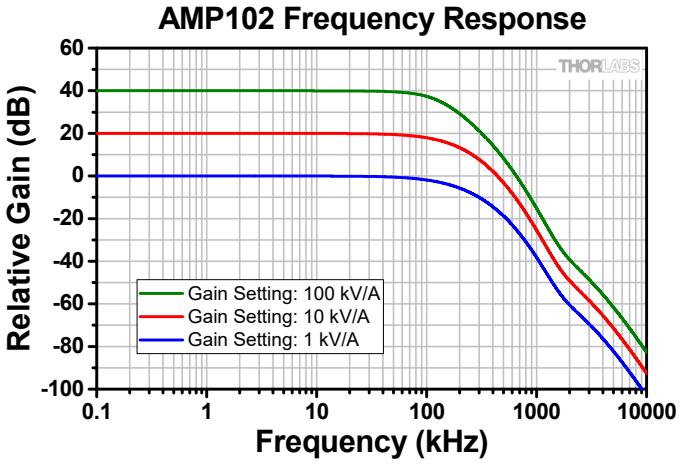
c. Virtually Grounded



Electrical Schematic



Typical Performance Plot



This graph represents calculated data using an input source with capacitance up to 10 nF.

Certificates and Safety

The safety of any system incorporating the equipment is the responsibility of the assembler of the system. All statements regarding safety of operation and technical data in this instruction manual will only apply when the unit is operated correctly as it was designed for.

This item must not be operated in explosion endangered environments!

Do not remove covers or open the cabinet. There are no parts serviceable by the operator inside. Refer servicing to qualified personnel. This precision device is only serviceable if properly packed into the complete original packaging including the plastic foam sleeves. If necessary, ask for replacement packaging. Only with written consent from Thorlabs may changes to single components be made or components not supplied by Thorlabs be used.

Prior to applying power to this item, make sure that the protective conductor of the 3 conductor mains power cord is correctly connected to the protective earth ground contact of the socket outlet! Improper grounding can cause electric shock resulting in damage to your health or even death!

All modules must only be operated with duly shielded connection cables.

Users that change or modify the product described in this manual in a way not expressly approved by Thorlabs (party responsible for compliance) could void the user's authority to operate the equipment.

Thorlabs GmbH is not responsible for any radio television interference caused by modifications of this equipment or the substitution or attachment of connecting cables and equipment other than those specified by Thorlabs. The correction of interference caused by such unauthorized modification, substitution or attachment will be the responsibility of the user.

Mobile telephones, cellular phones or other radio transmitters are not to be used within the range of three meters of this unit since the electromagnetic field intensity may then exceed the maximum allowed disturbance values according to IEC 61326-1.

This product has been tested and found to comply with the limits according to IEC 61326-1 for using connection cables shorter than 3 meters (9.8 feet).

Herewith Thorlabs declares that this product complies with all relevant EU-Directives. The full text of the EU Declaration of Conformity can be found on the following page:

EU Declaration of Conformity

in accordance with EN ISO 17050-1:2010

We: Thorlabs GmbH

Of: Münchner Weg 1, 85232 Bergkirchen, Deutschland

in accordance with the following Directive(s):

2014/35/EU	Low Voltage Directive (LVD)
2014/30/EU	Electromagnetic Compatibility (EMC) Directive
2011/65/EU	Restriction of Use of Certain Hazardous Substances (RoHS)

hereby declare that:

Model: ***AMP1/2xx***

Equipment: ***Photocurrent-/ Voltage-Amplifier Series***

is/are in conformity with the applicable requirements of the following documents:

EN 61010-1	Safety Requirements for Electrical Equipment for Measurement, Control and Laboratory Use.	2010 + A1:2019 + AC:2019.
EN 61326-1	Electrical Equipment for Measurement, Control and Laboratory Use - EMC Requirements	2013

and which, issued under the sole responsibility of Thorlabs, is/are in conformity with Directive 2011/65/EU of the European Parliament and of the Council of 8th June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment, for the reason stated below:

does not contain substances in excess of the maximum concentration values tolerated by weight in homogenous materials as listed in Annex II of the Directive

I hereby declare that the equipment named has been designed to comply with the relevant sections of the above referenced specifications, and complies with all applicable Essential Requirements of the Directives.

Signed: 

On: 15 November 2019

Name: Bruno Gross

Position: General Manager

EDC - AMP1/2xx -2019-11-15

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