

# Comlinear® CLC1201

## Instrumentation Amplifier



### FEATURES

- ±2.3V to ±18V supply voltage range
- Gain range of 1 to 10,000
- Gain set with one external resistor
- ±125µV maximum input offset voltage
- 0.1µV/°C input offset drift
- 700kHz bandwidth at G = 1
- 1.2V/µs slew rate
- 90dB minimum CMRR at G = 10
- 2.2mA maximum supply current
- 6.6nV/√Hz input voltage noise
- 70nV/√Hz output voltage noise
- 0.2µV<sub>pp</sub> noise (0.1Hz to 10Hz)
- DIP-8 or Pb-free SOIC-8

### APPLICATIONS

- Bridge amplifier and scales
- Thermocouple amplifier
- ECG and medical instrumentation
- MRI (Magnetic Resonance Imaging)
- Patient Monitors
- Transducer interface
- Data acquisition systems
- Strain gauge amplifier
- Industrial process controls

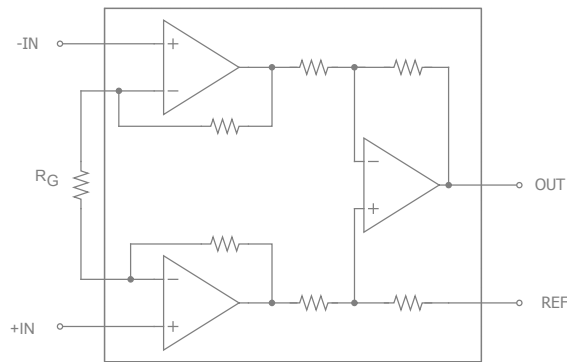
### General Description

The CLC1201 is a low power, general purpose instrumentation amplifier with a gain range of 1 to 10,000. The CLC1201 is offered in 8-lead SOIC or DIP packages and requires only one external gain setting resistor making it smaller and easier to implement than discrete, 3-amp designs.

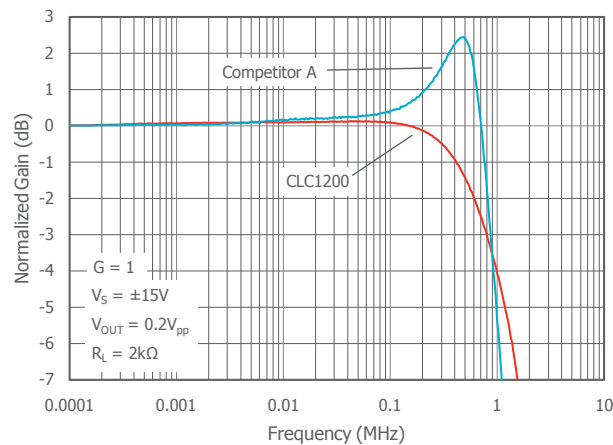
While consuming only 2.2mA of supply current, the CLC1201 offers a low 6.6nV/Hz input voltage noise and 0.2µV<sub>pp</sub> noise from 0.1Hz to 10Hz.

The CLC1201 offers a low input offset voltage of ±125µV that only varies 0.1µV/°C over it's operating temperature range of -40°C to +85°C. The CLC1201 also features 50ppm maximum nonlinearity. These features make it well suited for use in data acquisition systems.

### Functional Block Diagram



### Competitive Comparison Plots (continued in data sheet)



### Ordering Information

Part Number	Package	Pb-Free	RoHS Compliant	Operating Temperature Range	Packaging Method
CLC1201ISO8	SOIC-8	Yes	Yes	-40°C to +85°C	Rail
CLC1201ISO8X	SOIC-8	Yes	Yes	-40°C to +85°C	Reel
CLC1201IDP8	DIP-8	No	No	-40°C to +85°C	Rail

Moisture sensitivity level for all parts is MSL-1.

## Electrical Characteristics

$T_A = 25^\circ\text{C}$ ,  $V_S = \pm 15\text{V}$ ,  $R_L = 2\text{k}\Omega$  to GND; unless otherwise noted.

$G = 1 + (49.4\text{k}\Omega / R_G)$ ; Total RTI Error =  $V_{OSI} + (V_{OSO} / G)$

Parameter	Conditions	Min	Typ	Max	Units
<b>Gain</b>					
Gain Range		1		10,000	
Gain Error	$G = 1, V_{OUT} = \pm 10\text{V}$	-0.1		0.1	%
	$G = 10, V_{OUT} = \pm 10\text{V}$	-0.375		0.375	%
	$G = 100, V_{OUT} = \pm 10\text{V}$	-0.375		0.375	%
	$G = 1,000, V_{OUT} = \pm 10\text{V}$	-0.8		0.8	%
Nonlinearity	$G = 1 - 100, V_{OUT} = -10\text{V to } 10\text{V}$		10	50	ppm
Gain vs. Temperature	$G = 1$		TBD		ppm/ $^\circ\text{C}$
	$G > 1$		TBD		ppm/ $^\circ\text{C}$
Reference Gain Error <sup>(1)</sup>	$V_S = \pm 16.5$	-0.03		0.03	%
<b>Voltage Offset</b>					
Input Offset Voltage	$V_S = \pm 4.5$ to $\pm 16.5$	-125		125	$\mu\text{V}$
	$V_S = \pm 4.5$ to $\pm 16.5, -45^\circ\text{C to } +85^\circ\text{C}$	-225		225	$\mu\text{V}$
Output Offset Voltage	$V_S = \pm 4.5$ to $\pm 16.5, G = 1$	-1500	200	1500	$\mu\text{V}$
Offset Referred to the Input vs. Supply	$G = 1, V_S = \pm 2.3$ to $\pm 18\text{V}$	80	100		dB
	$G = 10, V_S = \pm 2.3$ to $\pm 18\text{V}$	95	120		dB
	$G = 100, V_S = \pm 2.3$ to $\pm 18\text{V}$	110	140		dB
	$G = 1,000, V_S = \pm 2.3$ to $\pm 18\text{V}$	110	140		dB
<b>Input</b>					
Input Bias Current	$V_S = \pm 16.5$	-2	0.5	2	nA
Input Offset Current	$V_S = \pm 16.5$	-1		1	nA
Common Mode Rejection Ratio	$G = 1, V_S = \pm 16.5\text{V}$	70	90		dB
	$G = 1,000, V_S = \pm 16.5\text{V}$	108	130		dB
<b>Output</b>					
Output Swing	$V_S = \pm 2.3\text{V to } \pm 4.5\text{V}$	$-V_S + 1.1$		$+V_S - 1.2$	V
	$V_S = \pm 18, G = 1$	$-V_S + 1.4$		$+V_S - 1.2$	V
Short Circuit Current			$\pm 20$		mA
<b>Dynamic Performance</b>					
Small Signal Bandwidth	$G = 1$		700		kHz
	$G = 10$		400		kHz
	$G = 100$		100		kHz
	$G = 1,000$		12		kHz
Slew Rate	$G = 10, V_S = \pm 15\text{V}$	0.6	1.2		V/ $\mu\text{s}$
Input Voltage Noise	1kHz, $G = 1,000, V_S = \pm 15\text{V}$		6.6	13	nV/ $\sqrt{\text{Hz}}$
Output Voltage Noise	1kHz, $G = 1, V_S = \pm 15\text{V}$		70	100	nV/ $\sqrt{\text{Hz}}$
<b>Power Supply</b>					
Operating Range		$\pm 2.3$		$\pm 18$	V
Supply Current	$V_S = \pm 16.5\text{V}$		1.3	2.2	mA
	$V_S = \pm 15\text{V}, -40^\circ\text{C to } +85^\circ\text{C}$			2.5	mA

## NOTES:

1) Nominal reference voltage gain is 1.0

Refer to the data sheet for complete product specifications

For additional information regarding our products, please visit CADEKA at: [cadeka.com](http://cadeka.com)

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## Available Packages

### SOIC-8, DIP-8

