RANATEC
High performance measurement solutions

RI 1601
PXI Differential Instrumentation Amplifier

RI 1601 Diff. Instrumentation Amplifier, 2 ch

Fast and accurate differential instrumentation amplifier in PXI format

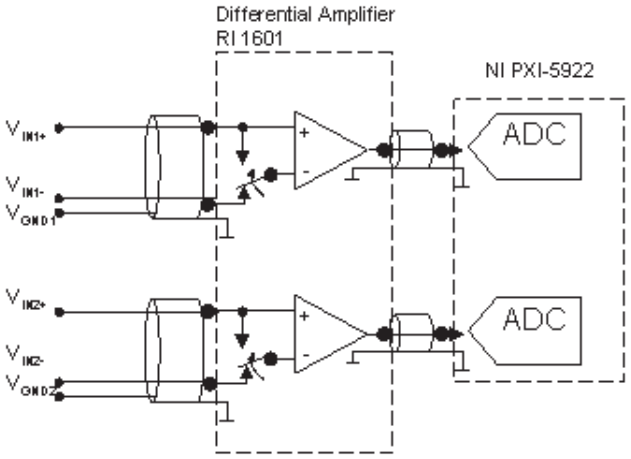
Features:
- 2 independent amplifier channels
- Software selectable voltage gain (1, 5, 25 and 100)
- >5 MHz 0.5 dB bandwidth
- 0~+6.5 V input common mode range
- 0~+6.5 V output voltage swing
- 250 ns 0.1% settling time
- ± (0.025% + 2.5 µV) calibrated DC gain accuracy
- >100 dB CMRR @ 1 kHz, Gain 5-100
- 1.7 nV/√Hz input noise voltage
- 1-slot, 3HU PXI module
- LabView drivers
- Windows and Linux support

Ranatec RI 1601 is a low-noise differential instrumentation amplifier with extreme DC gain accuracy and low settling time.

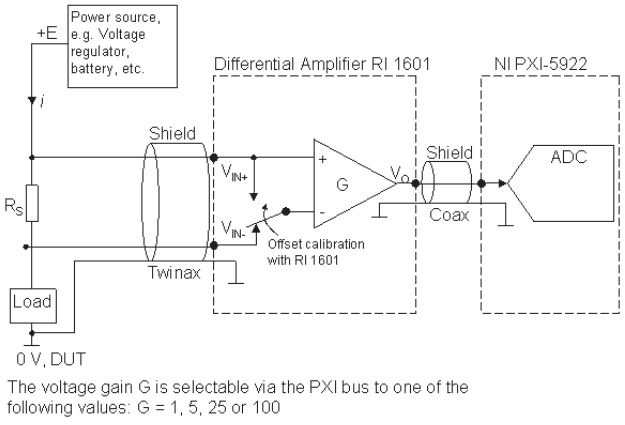
Overview
The Ranatec RI 1601 is a low-noise differential instrumentation amplifier with extreme DC accuracy and low settling time.
It was specifically designed to operate together with the NI PXI-5922 digitizer. By using RI 1601 together with NI PXI-5922, two differential inputs can be measured simultaneously.

Applications
Current transients can be accurately measured using a shunt resistor, differential instrumentation amplifier and a fast high-resolution digitizer. The shunt resistor needs to be small in order to affect the measurement as little possible.
This differential instrumentation amplifier is optimized for low noise, high DC gain accuracy and short settling time, making it an ideal choice for accurate current transient measurements.

Typical applications are:
- Analysis of current transients using shunt resistor
- Differential voltage analysis



2 differential channels could be digitized simultaneously using RI 1601 together with NI PXI-5922.



1 channel current transient measurement setup.

RANATEC INSTRUMENT AB Flöjelbergsgatan 1c, SE-431 35 Mölndal, SWEDEN
Telephone: +46 (0)31 706 16 60, Telefax: +46 (0)31 706 16 61,
Email: info@ranatec.com, Internet: www.ranatec.com

Revision G

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PXI Differential amplifier

Electrical Specifications

Number of channels	2
Voltage gain	1, 5, 25 and 100
0.5 dB bandwidth	>5 MHz
DC output impedance	<40 Ω
Output voltage swing	0~+6.5 V
Input bias current	<2.5 μA
Input offset current	<0.1 μA
Diff. mode input resistance	4 M Ω @ DC
	130 k Ω @ 1 MHz
Comm. mode input resistance	7 M Ω
Input common mode range	0~+6.5 V
0.1 % Settling time	250 ns
Residual input offset error	2.5 μV after offset cal.
CMRR @ 1 kHz	>90 dB @ G=1*
	>100 dB @ G=5-100*
CMRR @ 100 kHz	>70 dB @ G=1*
	>75 dB @ G=5-100*
CMRR @ 5 MHz	>42 dB @ G=1*
	>50 dB @ G=5-100*
DC Gain accuracy	±(0.025% + 2.5 μV)**
Input noise voltage, G=1	3.3 nV/√Hz
Input noise voltage, G=5	1.9 nV/√Hz
Input noise voltage, G=25-100	1.7 nV/√Hz
Current consumption	<250 mA @ +3.3 VDC
	<2500 mA @ +5 VDC
	<300 mA @ +12 VDC
	<300 mA @ -12 VDC

Mechanical Specifications

Width	20 mm
	(1-slot PXI module)
Input connectors	Twin BNC
Output connectors	SMC

Environmental Specifications

Operating temperature	18 to 35 °C
Storage temperature	0 to 70 °C
Relative humidity	10 to 90 %

* Typical values at common mode voltage 3 V.
** Calibrated Gain value is stored in the module's non-volatile memory and can be read out for exact calculation of the input differential voltage.

Ordering

RI 1601

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