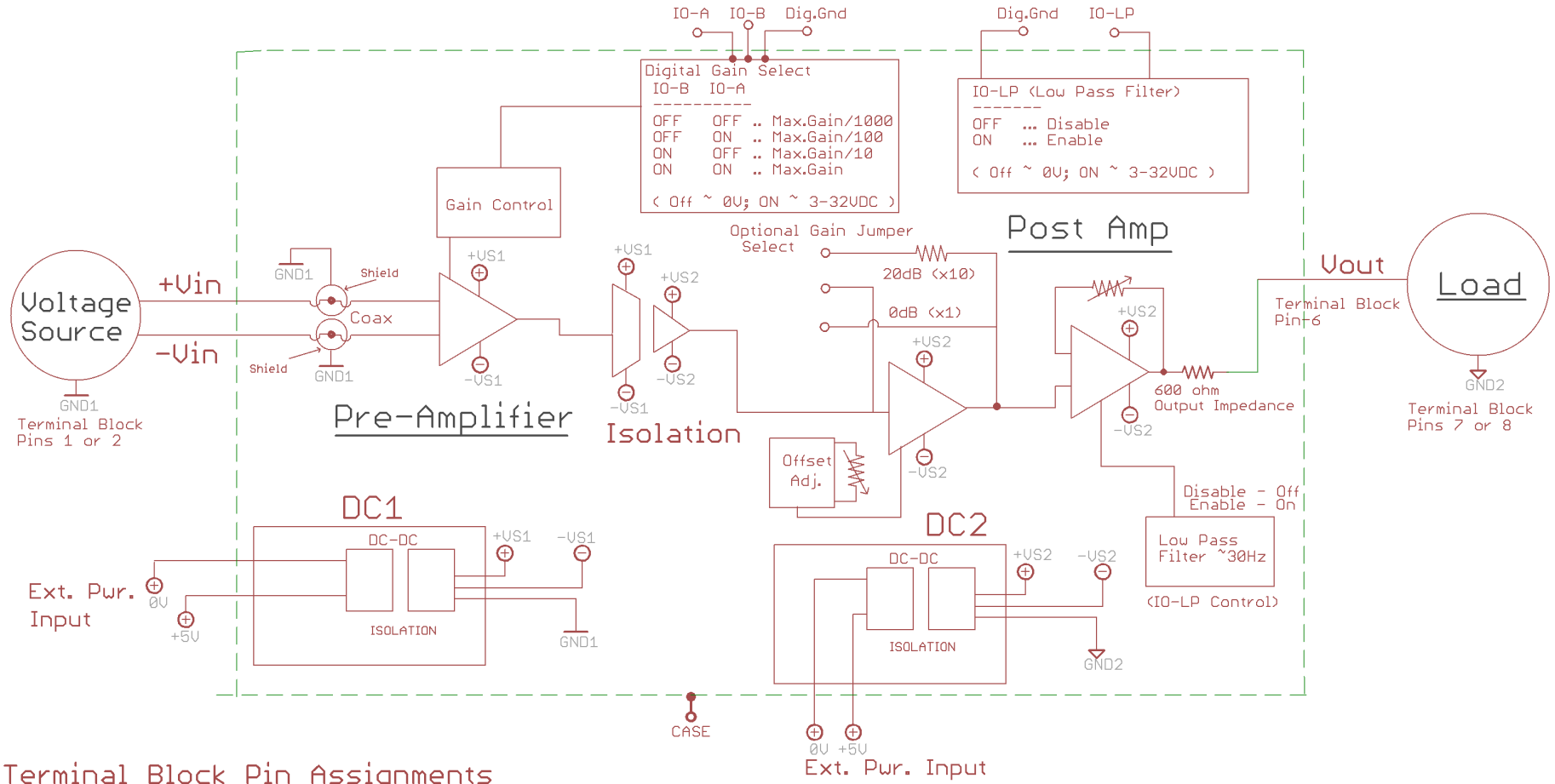
Block Diagram – Precision Multi-Range Isolation Voltage Amplifier – Differential Input



Terminal Block Pin Assignments

1	2	3	4	5	6	7	8	9	10
Gnd1	Gnd1	0V	5V	Case	Vout	Gnd2	Gnd2	0V	5V
Input Signal		Pwr. In			Output Signal			Pwr. In	
Input Side					Output Side				

Available Power Input Options:
5V, 12V, 15V, & 24V

TERM.BLK. Vout: 600 ohm Output Impedance

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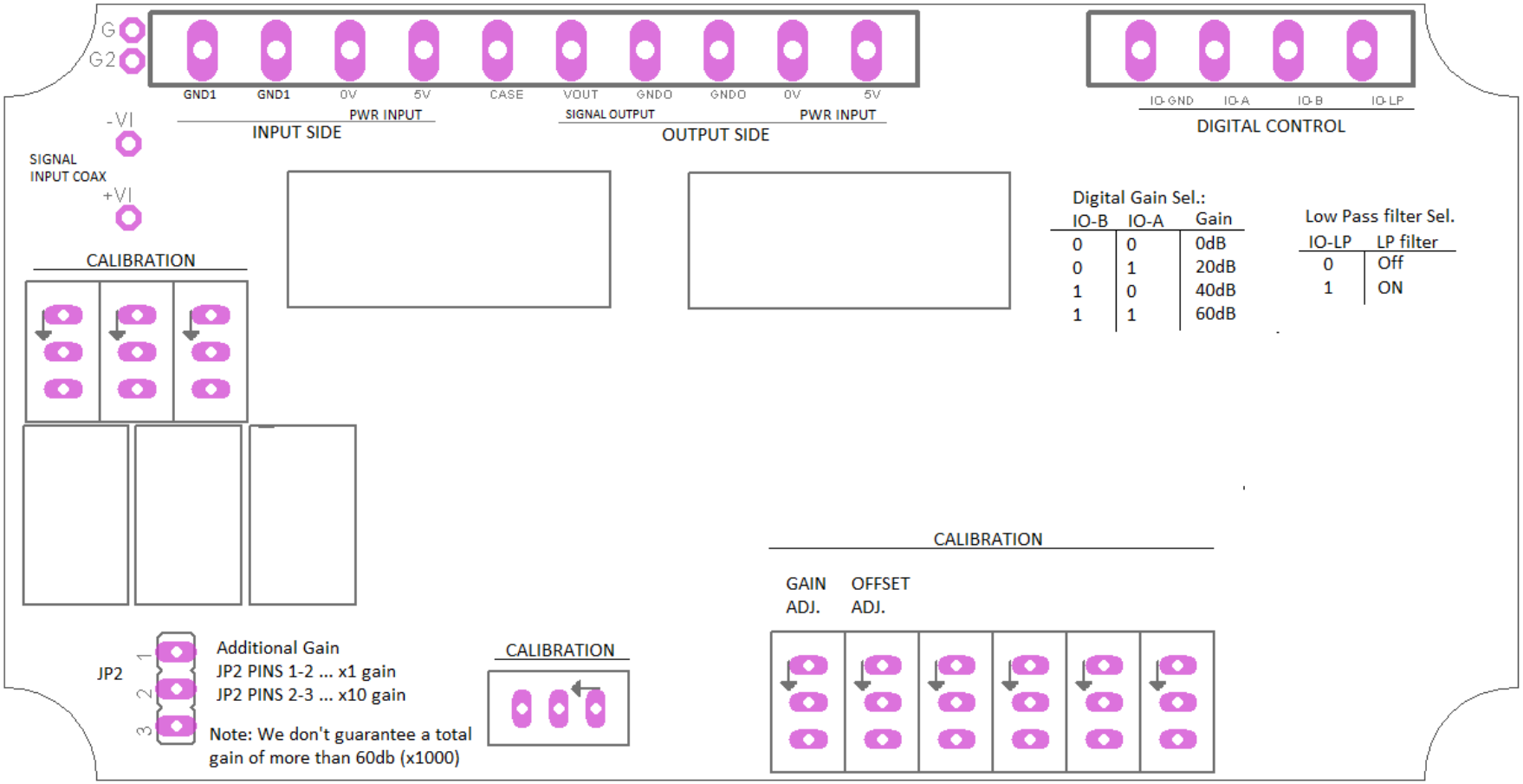
Specifications	Value	Unit	Specifications	Value	Unit
Max. Gain	80	dB			
Min. Gain	0	dB	Power input Isolation	> 1500	V
Input voltage range	±10	V	Input capacitance typ.	1.5	pf
Output voltage range	±10	V	Input Current Noise ... models ... 30G, 1T (@ 1KHz)	< 200, < 2	fA / sqr(Hz)
Output Voltage: Max. Load Current	±10	mA	Input Voltage Noise ... models ... 30G, 1T	< 5, < 20	nV / sqr(Hz)
Output Voltage: Output Impedance	1.0	KΩ	Output Voltage Noise	<1	uV / sqr(Hz)
Max. Output Voltage Drift (0 to 80 deg.C)	< 10	uV / deg.C	Freq. Response ... -3dB	50	KHz
Max. Input Offset Voltage Drift (0 to 80 deg.C)	< 10	uV / deg.C	Operating Temperature	-10 to 80	C
Max. Input Bias Current ... model ... 1T	<10	pA	DC Power connector	0.2" Term. Blk	male
Max. Input Bias Current ... model ... 30G	<500	pA	DC Supply Voltage	4.9 to 6.0	VDC
Input Impedance ... model ... 30G	~30	GΩ			
Input Impedance ... model ... 1T	>1	TΩ			
Input / Output Isolation ... @60Hz.	>1500	V	DC Supply Max. Current	100	mA
Isolation Leakage @240Vac / 60Hz.	> 0.15	uA	Signal In / Out connector	Isolated BNC	female
Isolation Non-Linearity	< 0.01	%			
Isolation diff. capacitive barrier	< 2	pf	Enclosure Details; *(Will scale to application)*		

Continue to next page …

Insufficient input shielding applied to the VTVM-I module could increase the noise-signal ratio which could result in VTVM-I input or output inaccuracy.

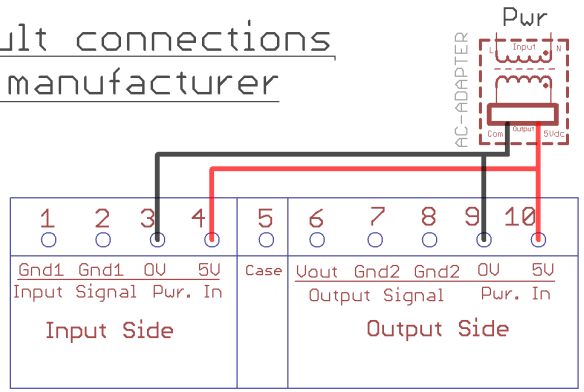
Required VTVM-I power input(s): +4.9VDC to +9VDC

Module PCB diagram:



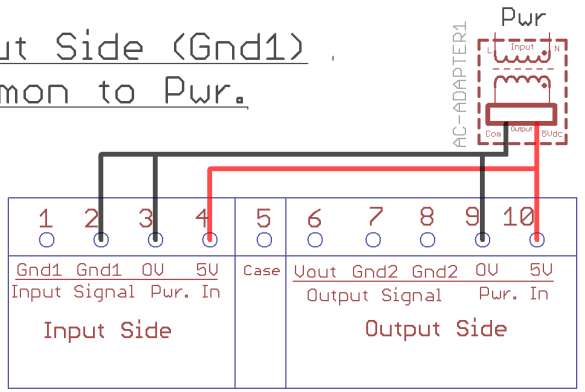
Noise Solution topologies for VTVMI Series Power Input Isolation Amplifiers

Default connections from manufacturer



Terminal Block Pin Assignments

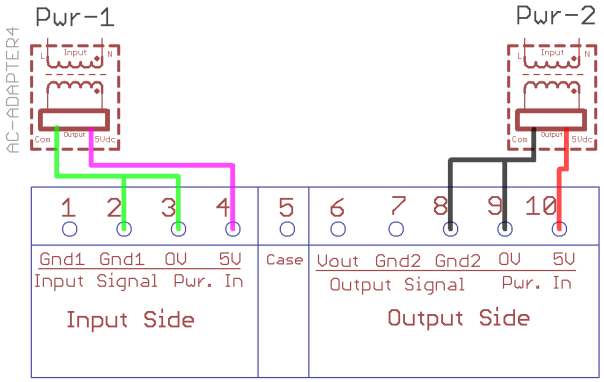
Input Side (Gnd1) Common to Pwr.



Terminal Block Pin Assignments

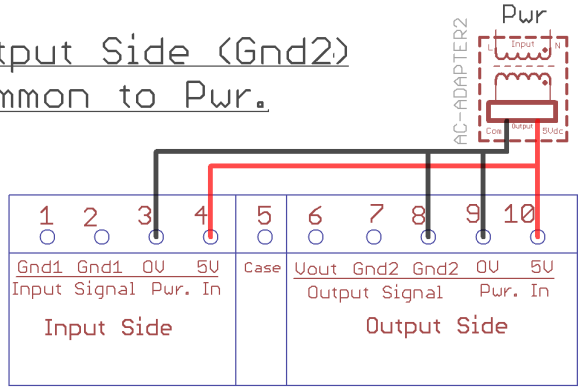
Independent/Isolated Power Soures:

Input side common to Pwr-1 & Output side common to Pwr-2.



Terminal Block Pin Assignments

Output Side (Gnd2) Common to Pwr.



Terminal Block Pin Assignments

Notes:

1.) Not recommended to make Gnd-1 & Gnd-2 common.
2.) Not recommended to make Case common to both Gnd-1 & Gnd-2 .
3.) The input and output of the AC adapter must be completely isolated !

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Differential Input Gain / Offset Adjustment Procedure:

Required Conditions:

1.) Vtvm-I Module must have required DC power applied.
2.) Allow Vtvm-I module to warm up for at least 2-3 mins. Before continuing to the procedure.

Procedure:

1.) Refer to the Gain Selection Settings Table and set the gain closest to your required value.
2.) Depending on your application either short both Vtvm-I inputs to Gnd-1 or set your voltage source to 0.0V and then connect to both Vtvm-I inputs. Adjust the Offset potentiometer until the Vtvm-I output is approximately 0.000V.
3.) With a known voltages applied to the Vtvm-I inputs use the Gain potentiometer to adjust the output voltage to the required value. For example, if you require a gain of 40dB (100x) and the +Vin input is 20mV and the -Vin input is 10mV then adjust the gain until the output is 1V = 100 x (20mV – 10mV) … Vout = Gain x (Difference of the inputs).

Note(s): you will probably have to repeat procedure steps 2 and 3 a couple of times to assure proper calibration. If one of the Gain adjustment potentiometers is set to one of the extreme top or bottom extents extremely high or low gain states can occur which may cause confusion when making sequential offset and gain adjustments. Also, we advise you adjust the gain such that the difference of the input voltages results in a mid-range output value. For example, if the desired gain is 40dB (x100) and the maximum output is 10V and the difference of the Vtvm-I inputs is 50mV then adjust the gain so the Vtvm-I output is 5V. You can conversely do this when the difference of the inputs is -50mV and the output is a corresponding -5V, respectively.

Terminal Block Plug-In:
Part# OSTTJ105153 (Digikey) or
Part# 1757093 (Mouser)

Pluggable Terminal Blocks 10 Pos 5.08mm pitch Plug 24-12 AWG Screw

LINK TO ENCLOSURE DETAILS:

http://www.rdm-apps.com/files/1590BFL.pdf