

IAA300 Product Manual



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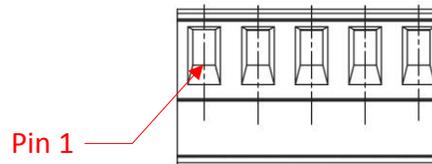
Default Settings

- Input Range: +/-2 mV/V
- Excitation Voltage: 10 VDC
- Output Range: +/-10 VDC
- Shunt: 60.4 kΩ

Connections

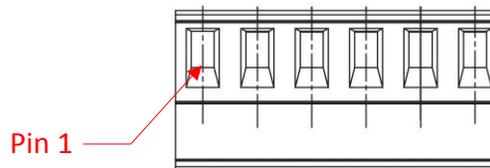
Sensor Side	
Pin	Wiring Code
1	Shield
2	+Excitation ¹
3	+Signal
4	-Signal
5	-Excitation ¹

5 Position Screw Terminal



Power Side	
Pin	Wiring Code
1	+Vin
2	Ground
3	Shunt
4	+Vout
5	-Vout
6	Shield

6 Position Screw Terminal



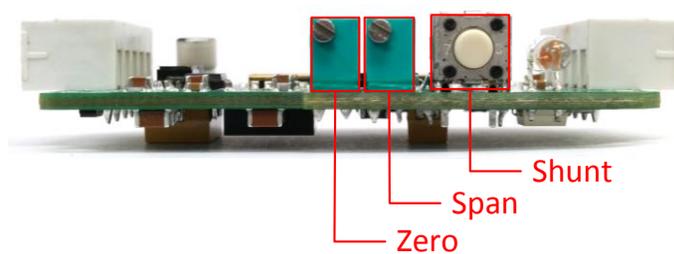
WARNING:

Do not connect the device to the power supply when the power supply is already on!

¹ For 6 wire sensors connect +Sense to +Excitation and -Sense to -Excitation

Standard Span & Zero Adjustment

Once all of the connections are complete, you can begin to set up the sensor/amplifier system. You will need to have the output from the IAA300 connected to a device so you can read the voltage.



To set up the system, follow the steps below:

1. Remove any loads on the sensor.
2. Adjust the zero.
3. Apply a known load to the sensor.
4. Allow the sensor to settle.
5. Adjust the span that correlates with that load.
6. Remove the load.
7. Allow the sensor to settle.
8. Readjust the zero if needed.

Ex. If you are applying a full load to the sensor with an excitation voltage of 10 VDC, then you would want to adjust the output (span) to 10VDC. If you are applying half of the full load then you would want to adjust the span to exactly half of the maximum. Once your span is set, check the zero. With no load applied to the sensor, adjust the zero.

Note: Adjusting the zero and span is done by using a screwdriver to turn the potentiometers (pots).

Shunt Readings

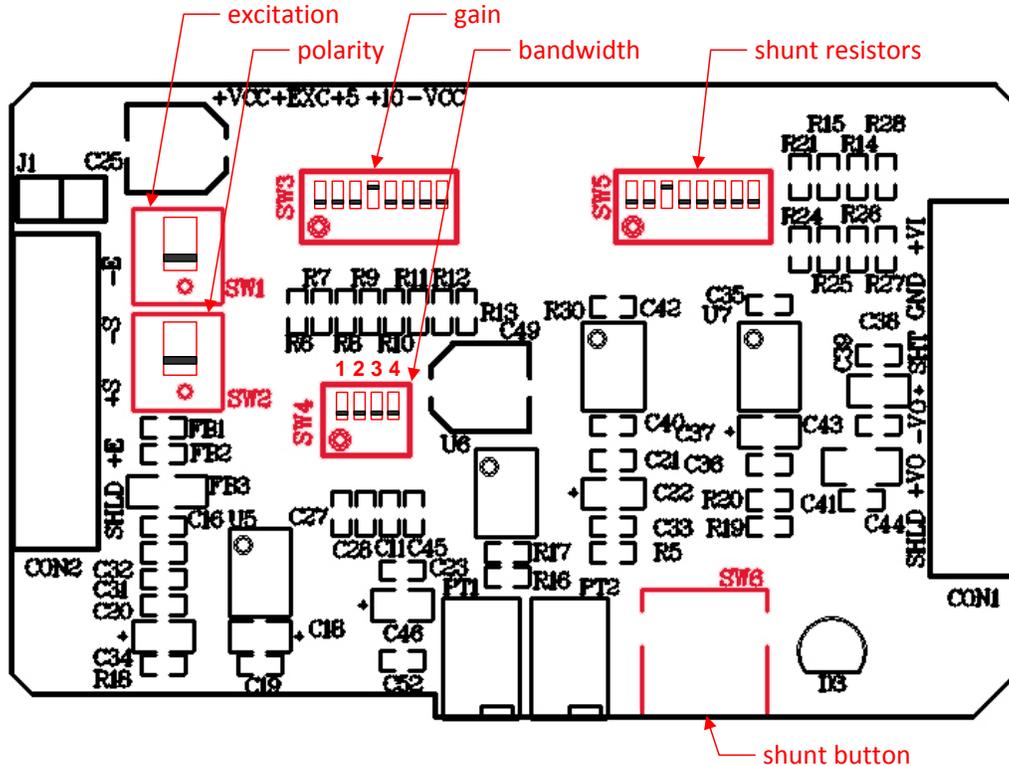
Shunt resistors simulate a load on the load cell; thus, allowing for calibration. Follow the steps below in order to utilize the shunt feature.

1. Determine the value of the shunt resistor needed by using the Shunt Settings spreadsheet
2. Flip the correct DIP switches to attain the corresponding value
3. Press the Shunt pushbutton
4. While the shunt is enabled and the IAA300 is reading the simulated load, adjust the span (described above) to the correct output.

Ex. If you are using a 2 mV/V sensor with a 350 Ω bridge and the default 60.4 k Ω resistor on the IAA300, then the simulated load would be approximately 72% of R.O. You can then adjust the span to 7.2 VDC to correlate with this simulated load.

Switch Configurations

To change any of the switch configurations from the default settings, follow the tables in the next few sections to set your desired configuration. The figure below shows the default configuration.



Excitation

There are two excitation values available on the IAA300: 10 VDC (default), and 5 VDC. To select the excitation, simply flip the DIP switch to the appropriate configuration. The excitation voltage controls the maximum output of the amplifier.

Ex. If your application requires a lower output voltage than 10 VDC, then the 5 VDC option is available to use. All you have to do is flip the DIP switch from the DOWN position to the UP position.

SW1: Excitation (VDC)	
UP	5
DOWN	10

Polarity

There are two polarities available on the IAA300: reverse, and straight (default). To select the polarity, simply flip the DIP switch to the appropriate configuration.

Ex. If you are using your IAA300 with a tension and compression load cell and you have tension setup as the positive direction, but now you would like to have compression as the positive direction, all you have to do is flip the DIP switch from the default polarity position (straight) to the reverse polarity position.

SW2: Polarity	
UP	reverse
DOWN	straight

Gain

There are eight gain DIP switches available on the IAA300, ranging from 0.5 mV/V to 10 mV/V. The default setting is configured to 2 mV/V. Select the value closest to your input range by flipping the DIP switches to the appropriate configuration. Use the Gain Settings spreadsheet to help you determine which switches to flip.

Ex. If you are using a 2 mV/V sensor with a 5 VDC excitation, then you would want to use configuration 2 for 1 mV/V. If you are using a 2mV/V sensor with a 10 VDC excitation then you would want to use configuration 4 for 2 mV/V.

SW3: Sensitivity (mV/V)					
1	UP	0.5	5	UP	2.5
	DOWN	N/ A		DOWN	N/ A
2	UP	1	6	UP	3
	DOWN	N/ A		DOWN	N/ A
3	UP	1.5	7	UP	4
	DOWN	N/ A		DOWN	N/ A
4	UP	2	8	UP	10
	DOWN	N/ A		DOWN	N/ A

Bandwidth

There are five bandwidth settings available on the IAA300: 100 Hz, 1 kHz (default), 10 kHz, 25 kHz, and 50 kHz. To select the bandwidth, simply flip the DIP switches to the appropriate configuration.

Ex. If your application requires a higher bandwidth in order to account for the higher frequency signals, such as those from dynamic applications, then you would want to use the 25 kHz or 50 kHz bandwidths.

SW4: Bandwidth ²				
1	2	3	4	Bandwidth (Hz)
UP	DOWN	DOWN	DOWN	100
DOWN	UP	DOWN	DOWN	1,000
DOWN	DOWN	UP	DOWN	10,000
DOWN	DOWN	DOWN	UP	25,000
DOWN	DOWN	DOWN	DOWN	50,000

Shunt

There are eight shunt DIP switches available on the IAA300, ranging from 30 kΩ to 432 kΩ. The default setting is configured to 60.4 kΩ. Use the online Shunt Settings spreadsheet to help you determine which switches to flip in order to obtain a desired output.

SW5: Shunt (kΩ)					
1	UP	30	5	UP	100
	DOWN	N/A		DOWN	N/A
2	UP	43.7	6	UP	150
	DOWN	N/A		DOWN	N/A
3	UP	60.4	7	UP	300
	DOWN	N/A		DOWN	N/A
4	UP	87.6	8	UP	432
	DOWN	N/A		DOWN	N/A

² Refer to page 6 for the switch number

Advanced Span and Zero Adjustment

Adjusting the Zero

At times, when using a signal conditioner, it is necessary to offset the zero. The IAA300 makes this simple. The zero can be adjusted approximately $\pm 10\%$ of R.O. by using the potentiometer on board.

Adjusting the Span

The input jumpers vary from 0.5 mV/V to 10.0 mV/V. This allows for a large variety of input ranges. However, it sometimes happens that the rated output from the sensor is not exactly 2.0 mV/V or 3.0 mV/V. The IAA300 has a $\pm 10\%$ of R.O. adjustment range so a sensor with an output close to one of the input ranges will work fine.

Appendix A (Specifications)

Electrical Specifications				
Parameter	Min	Typical	Max	Unit
Power Supply	12.5		26	VDC
Current Consumption		100		mA
Output Impedance		10		Ohms
Sensor Impedance	350		5000	Ohms
Bandwidth (Setting 1)		100		Hz
Bandwidth (Setting 2)		1000		Hz
Bandwidth (Setting 3)		10000 ⁽¹⁾		Hz
Bandwidth (Setting 4)		25000 ⁽²⁾		Hz
Bandwidth (Setting 5)		50000 ⁽³⁾		Hz
Common Mode Rejection Ratio	120			dB
Noise		2		mV _{p-p}
Output Span Range	-10		10	% of FSR
Output Zero Range	-10		10	% of FSR
Gain Drift with Temperature	-25	X	25	PPM of FSR
Internal Non-Linearity	-0.01	X	0.01	% of FSR
Zero Drift with Temperature	-25	X	25	PPM of FSR

¹ Only for Sensitivity of 1.0 mV/V or Greater

² Only for Sensitivity of 1.5 mV/V or Greater

³ Only for Sensitivity of 1.5 mV/V or Greater