

IAA200 Product Manual



Table of Contents

Default Settings	3
Connections	3
Standard Span & Zero Adjustment	4
Shunt Readings.....	5
Digitally Controlled Remote Shunt.....	5
Switch Configurations.....	6
Excitation.....	6
Polarity	7
Gain.....	7
Bandwidth.....	8
Shunt	8
Offset.....	9
Advanced Span and Zero Adjustment	10
Adjusting the Zero	10
Adjusting the Span.....	10
Appendix A (Specifications).....	11

Default Settings

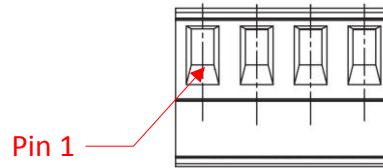
- Input Range: +/-2 mV/V
- Excitation Voltage: 10 VDC
- Output Range: 4-20 mA
- Shunt: 60.4 kΩ

Connections

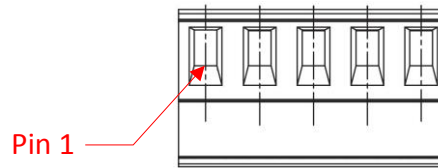
Sensor Side	
Pin	Wiring Code
1	+Excitation ¹
2	+Signal
3	-Signal
4	-Excitation ¹

Power Side	
Pin	Wiring Code
1	+Vin
2	Ground
3	Shunt
4	Ground
5	Iout

4 Position Screw Terminal



5 Position Screw Terminal



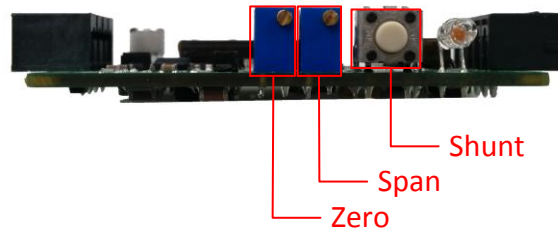
WARNING:

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

¹For 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 IAA200 connected to a device so you can read the current.



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 20 mA. If you are applying half of the full load then you would want to adjust the span to exactly half of the range. 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 IAA200 is reading the simulated load, adjust the span (described above) to the correct output.

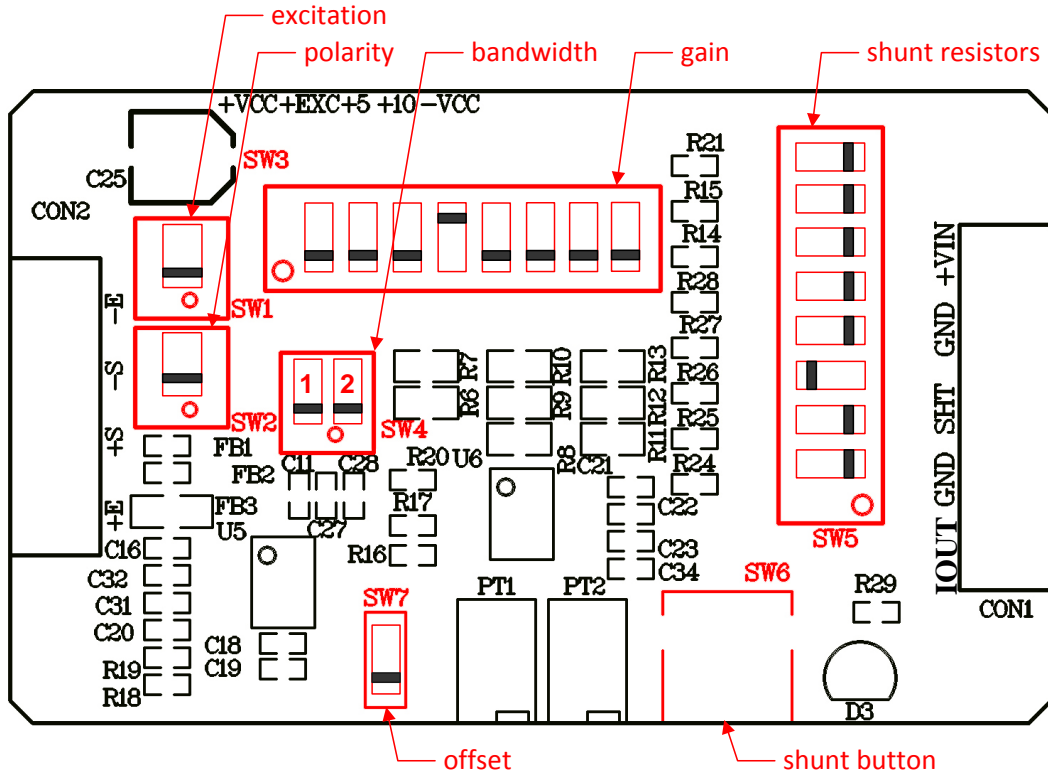
Ex. If you are using a 2 mV/V sensor with a 350 Ω bridge and the default 60.4 k Ω resistor on the IAA200, then the simulated load would be approximately 72% of R.O. You can then adjust the span to 15.52 mA to correlate with this simulated load.

Digitally Controlled Remote Shunt

There are two methods of enabling the shunt on the IAA200. The first method is to use the pushbutton in front of the instrument, as shown on page 4. The second method is to digitally control it, remotely. What this means is that a voltage from 5-26 VDC can be applied to the shunt pin (see page 3) and it will be enabled. Removing this voltage will disable the shunt.

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 IAA200: 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 IAA200: reverse, and straight (default). To select the polarity, simply flip the DIP switch to the appropriate configuration.²

Ex. If you are using your IAA200 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 IAA200, 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

² This option is only available if the offset switch is in the UP position. See page 9.

Bandwidth

There are three bandwidth settings available on the IAA200: 1 kHz (default), 10 kHz, and 25 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 10 kHz or 25 kHz bandwidths.

SW4: Bandwidth		
1 ²	2 ²	Bandwidth (kHz)
UP	UP	25
DOWN	UP	10
UP	DOWN	1
DOWN	DOWN	1

Shunt

There are eight shunt DIP switches available on the IAA200, 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

Offset

There is a switch available on the IAA200 that allows the instrument to offset the zero. This means that if the zero is normally at 4 mA, it is now at 12 mA if this switch is enabled. To set the offset, simply flip the DIP switch to the appropriate configuration. Note that once the offset is enabled the gain settings will need to be halved as well.

Ex. If you are using a sensor with the IAA200 in the range of 4-20 mA for one direction, the offset can be enabled in order to use the sensor in both directions. The new zero would be 12 mA. One direction of the sensor would be from 12-20 mA, and the other would be from 12-4 mA. The system will need to be recalibrated if this is done.

SW7: Offset	
UP	offset
DOWN	normal

Advanced Span and Zero Adjustment

Adjusting the Zero

At times, when using a signal conditioner, it is necessary to offset the zero. The IAA200 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 IAA200 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		30		mA
Output Impedance		500		Ohms
Sensor Impedance	350		5000	Ohms
Bandwidth (Setting 1)		1000		Hz
Bandwidth (Setting 2)		10000 ⁽¹⁾		Hz
Bandwidth (Setting 3)		25000 ⁽²⁾		Hz
Common Mode Rejection Ratio	120			dB
Noise		20		$\mu\text{A}_{\text{p-p}}$
Output Span Range	-10		10	% of FSR
Output Zero Range	-10		10	% of FSR
Gain Drift with Temperature	-25	X	25	PPM of FSR
Total Error (Nonlinearity + Accuracy)	-0.005	X	0.005	% 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