

# ANYLOAD<sup>®</sup>

## A2P-D2

### Load Cell Amplifier

Product Manual (v1704)



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## 1. Introduction

Thank you for choosing Anyload A2P-D2 load cell amplifier. The A2P-D2 strain gage amplifier provides load cell and transducer signal conditioning. It is designed for industrial signal conversion that amplifies the mV signal from load cell output into a 4 to 20mA or 0 to 10V signal. The A2P-D2 strain gage amplifier is a DC powered amplifier and can drive up to 2 x 350Ω load cells connected directly. It can also drive up to 4x350Ω load cells or 8 X 350Ω load cells through a junction box. This amplifier is equipped with individual adjustable resistors. It is housed in a PVC enclosure and can be installed on a standard rail channel. The manual here provides the installation, operation and calibration procedures of the product.

## 2. Installation and Warnings

To avoid damaging the input interface, it is recommended to complete the wirings especially in the input terminals prior in applying or switching on the power supply. The energized power supply may destroy the input terminal slots once it sparks.

For safety purpose, connect first the positive power terminal from your power supply then the negative terminal. In this way, you may avoid to accidentally short your power supply.

Only simple tools like small size slotted screw driver and Philips screwdriver are required for connecting cables during installation and calibration.

## 3. Connection Diagram

Red: EXC+

Black: EXC-

Green: SIG+

White: SIG-

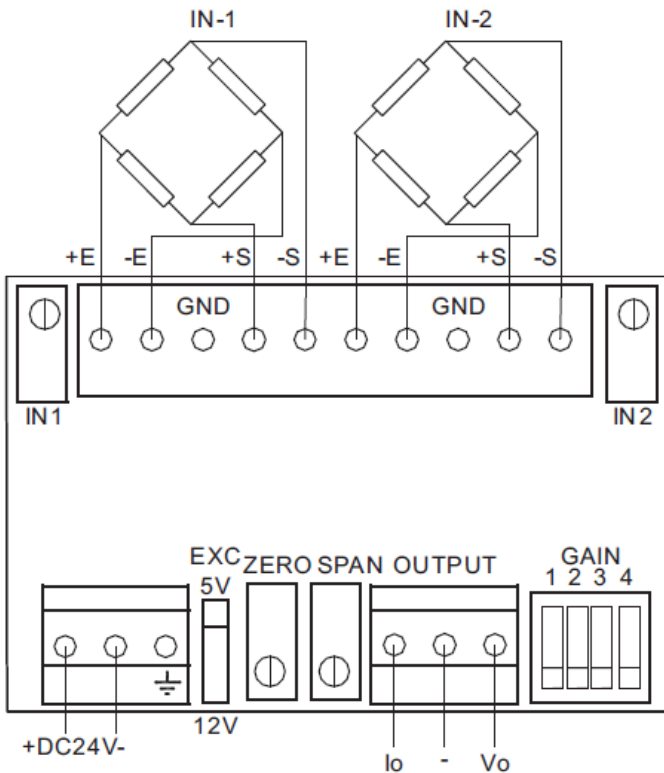


Figure 1.Connection Diagram

## 4. Specifications

Power Supply: 24V DC

Input Signal:  $0 \pm 36\text{mV}$

Output Signal: 4 to 20mA or  $0 \pm 10\text{V}$

Maximum Power Consumption: 3.6W

Operating Temperature:  $-10^{\circ}\text{C} - 50^{\circ}\text{C} / 14^{\circ}\text{F} - 122^{\circ}\text{F}$

## 5. Output Ports

As shown in the Figure 1 (Connection Diagram), the left terminal ( $I_o$ ), outputs positive current and the right terminal ( $V_o$ ), outputs positive voltage. The middle terminal (-) is the common connection for negative current or negative voltage.

Only voltage terminal output can provide complementary signal like negative voltage or positive voltage output.

## 6. Excitation Output

Refer on Figure 1, you may slide the switch for (EXC) from either 5V or 12V. The A2P-D2 amplifier can drive a load cells of either 5V or 12V excitation.

## 7. Gain

The A2P-D2 is applicable for load cells with different sensitivity. It supports 4 ranges of Gain. The user can select suitable gain for different load cell sensitivity, excitation voltage and output signal by setting the 4-bit DIP switch, by adjusting the Zero and Span potentiometer and by configuring the slide switch (EXC), respectively ( refer on Figure 1 ).

Table 1 below shows the suggested A2P-D2 settings and Table 2 shows the DIP switch and Gain Range.

Table 1. Suggested A2P-D2 Settings

Output Signal	Sensitivity Range ( mV/V)	Excitation Voltage (V)	Gain Switch Number
0-10V ( 0±10V)	1.30-4.20	5	4
	1.35-2.60	12	1
	2.68-3.90		2
	0.54-1.89		4
4-20mA	1.51-2.91	5	1
	2.96-4.31	12	2
	0.61-2.02		4
	0.66-1.26		1
	1.30-1.89	2	
	1.67-2.25	3	
0-5V ( 0±5V)	1.56-3.02	5	1
	3.09-4.54	12	2
	0.64-2.13		4
	0.68-1.32		1
	1.35-1.97	2	
	1.74-2.36	3	

Note 1: When applicable, it is recommended to choose 12V excitation voltage and configure on the Gain switch either number 1, 2 or 3.

Table 2. Gain Switch Settings

4-bit DIP Switch	DIP Switch Number	Gain Range
<b>GAIN</b>	<b>1</b>	153-303
	<b>2</b>	103-153
	<b>3</b>	86-118
	<b>4</b>	217-753

Note 2: If the Gain setting is no achieved during calibration, change the Gain switch settings as shown in Table 2 and recalibrate.

## 8. Operations

- **Gain Selection**

1. Connect the load cell , set the slide switch EXC and select load cell excitation voltage
2. Set the suggested excitation voltage according to the load cell's sensitivity. Set Gain switch to select Gain range, refer to Table 2

- **Zero Calibration**

1. Remove weight from load cell or scale. If having a tare, keep the tare device like hook or plate
2. If Current Signal Output is required, set the output current to 4.00mA by adjusting the ZERO potentiometer ( refer to Figure 1).
3. If Voltage Signal Output is required, set the output voltage to 0.00V by adjusting the ZERO potentiometer ( refer to Figure 1 ).

Note 1: When adjusting the potentiometer to set zero, carefully rotate the potentiometer's screw. For high accuracy, it is recommended to set zero to 4.00mA or 0.00V.

Note 2: The tare weight shall not exceed 20%F.S ( full scale ) of load cell or scale.

Note 3: When it generates a complementary voltage signal output, remove the load first then perform Zero calibration

- **Span Calibration**

1. Put a load on the load cell or scale to at least 80% of its maximum capacity. It is highly recommended to put a load of 100% of its maximum capacity.
2. If Current Signal Output is required, set the output current to 20.00mA (for 100% of max. capacity load ) by adjusting the SPAN potentiometer ( refer to Figure 1 )
3. If Voltage Signal Output is required, set the output voltage to 10.00V ( -10.00V ) for 100% of max. capacity load or 5.00V ( -5.00V ) by adjusting the SPAN potentiometer ( refer to Figure 1 ).

If the gain range is not suitable after the Span calibration ( steps above ). Change the Gain range settings ( 4-bit DIP switch ), and recalibrate

Note 1: For high accuracy of Span output, it is recommended to repeat the process from Gain Selection up to Span Calibration.

Note 2: Potentiometer IN1 & IN2 are used to adjust in multiple load cells application. When multiple load cells are connected, the maximum difference in sensitivity between each load cell shall not exceed 3%.

## 9. Maintenance

- For long term usage, accurate and stable output, use reliable DC power supply
- Do not adjust the SPAN potentiometer ( of calibrated amplifier ) by an inexperienced personnel
- It supports maximum of 8 load cells of 350 Ohms resistance or multiple load cells with equivalent power consumption

## 10. Troubleshooting

For long term usage, accurate and stable output, use reliable DC power supply

No output from the amplifier: Check all wire connections and the DC power supply.

Output signal is abnormal: Re-calibrate according to Section 5, Calibration.

Problem cannot be resolved: Contact supplier

## 11. Illustrations

Marks on this manual are defined as below:

Mark	Definition	Mark	Definition
+DC24	Positive 24V DC supply	DC24-	Negative 24V DC supply
GND	Ground	EXC	Switch of Excitation
ZERO	Zero Potentiometer	SPAN	Span Potentiometer
Io	Positive Current Output	-	Common negative
Vo	Positive Voltage Output	GAIN	Gain Selection
IN-1	Load cell 1 connection	IN-2	Load cell 2 connection
+E	Positive excitation	-E	Negative excitation
+S	Positive signal output	-S	Negative signal output
IN1	Potentiometer for load cell 1	IN2	Potentiometer for load cell 2



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