Industrial Automation with PCs

ADVANTECH®

ADAM-3016

Strain Gauge Input Module

User's Manual

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Introduction

ADAM-3016 is a DIN rail-mounted strain gauge input signal conditioning module with 1000 V_{DC} 3-way isolation between input, output and power. The switch configurable input and output offers flexible, wide ranging capability for strain gauge.

ADAM-3016 is equipped with a power LED to monitor the line power and a DC-to-DC converter status and 3 VR (ZERO, SPAN, EXCI) to calibrate input/output range and excitation voltage.

The ADAM-3016 features three-way isolation. The power supply that drives the module's input circuitry and output circuitry is internally isolated, enabling ADAM-3016 to offer true channel-to-channel isolation.

ADAM-3016's input bandwidth is typically 2.4 kHz. The ADAM-3016 is powered by a single +24V_{DC} input. Power can be easily connected from the adjacent modules, making the wiring simple and easy to maintain. The ADAM-3016 can be mounted on a DIN rail and operate in environments with high humidity and wide temperature variation.

Features

- 1000 V_{DC} (fully-isolated)
- Easy input/output range configuration
- Flexible DIN-rail mounting
- Low power consumption:
  - £ 1.85 W (voltage output)
  - £ 2.15 W (current output)
- –10° to 70° C operating temperature range
- Operates from a single +24 V_{DC} input

Specifications

Voltage specifications

- Electrical input: ± 10 mV, ± 20 mV, ± 30 mV, ±50 mV, ±100 mV
- Excitation voltage: 1 ~ 10 V_{DC} (60 mA max) (factory default 10 V)

Output

- Voltage output

  Bipolar: ±5 V, ±10 V
  Unipolar: 0 ~ 10 V
  Impedance: < 50 W

- Current output

  Current: 0 ~ 20 mA
  Current load resistor: 0 ~ 500 W (source)

Specifications

General

- Three-way isolation: 1000 V_{DC}
- Accuracy: ±0.1% of full range
- Bandwidth: 2.4 kHz (typical)
- Stability (temperature drift): 150 ppm (typical)
- Isolation mode rejection: >100 dB @ 50 Hz/60 Hz
- Operation temperature range: -10° to 70° C

Power

- Range: 24 V_{DC} ±10%
- Consumption: £ 1.85 W (voltage output)
  £ 2.15 W (current output)

Ordering Information

- **ADAM-3016**: Isolated strain gauge signal conditioning module
- **ADAM-3920**: 20-pin wiring adapter
- **ADAM-3937**: 37-pin wiring adapter
- **ADAM-4350**: Intelligent calibrator
- **PWR-242**: Switching power supply for DIN rail mounting

Configuration

Figure 1 shows the terminal wiring of ADAM-3016. Positive power terminals 9 and 7 are internally connected, as are negative terminals 12 and 10. Power can be connected through the adjacent modules, making wiring much easier. ADAM-3016 uses single +24 V_{DC}. Table 1 and table 2 show the switch positions to configure input and output range. The I/O configuration switches are located inside the module. To reach the switches, you need to remove the DIN-rail bracket by sliding it down.

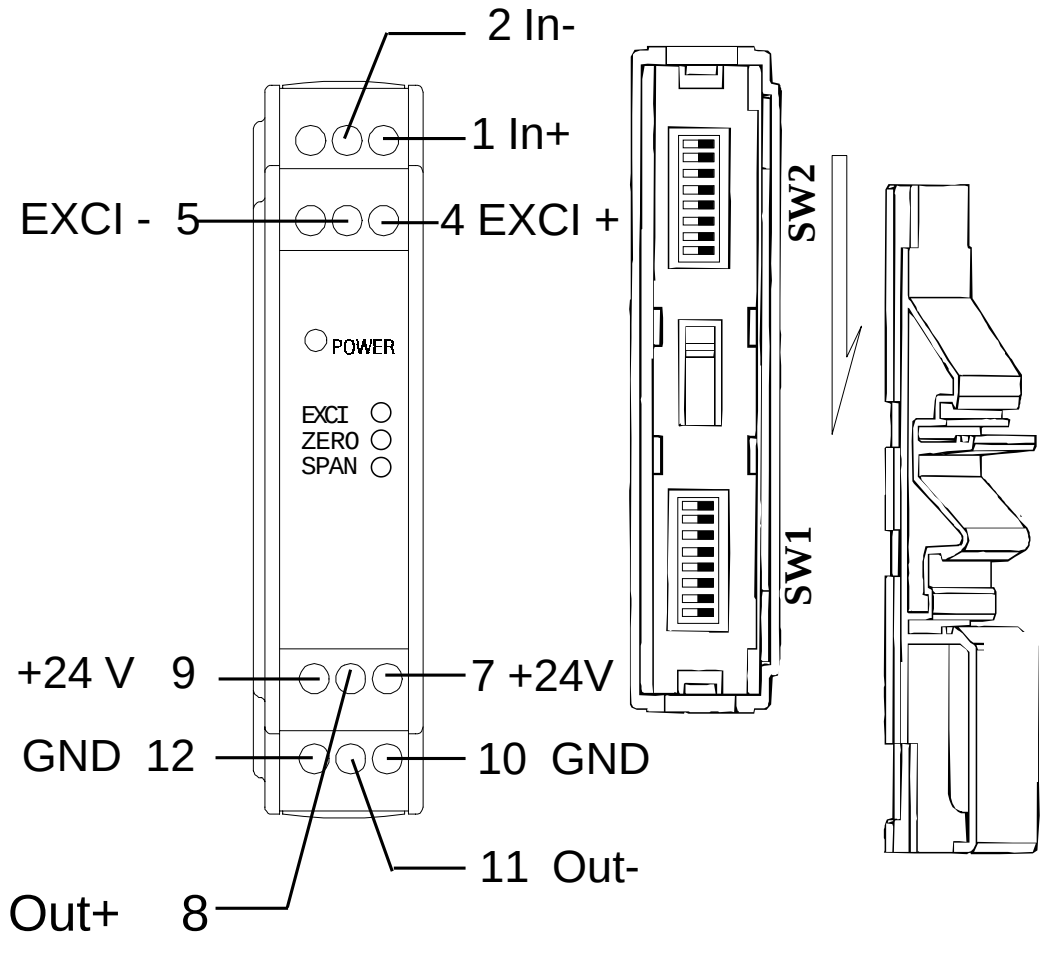


***Figure 1**: Terminal wiring diagram*

Input Range Setting (SW2)

Input Range (SW2)					
Range	1	2	3	4	5
+/- 10mV	On				
+/- 20mV		On			
+/- 30mV			On		
+/-50mV				On	
+/- 100mV					On

***Table 1**: Input range setting (SW2)*

Output range setting (SW1)

	Output Range (SW1)								
	Range	1	2	3	4	5	6	7	8
*	±5 V	n		n					n
	±10 V	n		n					
	0 ~ 10 V	n		n				n	
	0 ~ 20 mA		n		n			n	

■: ON

***Table 2**: Output range setting (SW1)*

****** Factory default setting*

Calibration for input/output

1. Disconnect power and set the input range (SW2) and output range (SW1) to the desired setting, then apply the power.

**Define the following variables for calibration use.

--Low_cali_input = Min_input + Full Scalar Input * 0.05;

--High_cali_input = Max_input - Full Scalar Input * 0.05;

--Low_cali_output = Min_output + Full Scalar Output * 0.05;

--High_cali_output = Max_output - Full Scalar Output * 0.05;

2. Input the Low_cali_input signal;read the Low_real_output signal;
3. Input the High_cali_input signal;read the High_real_output signal;
4. Adjust variable resistor of SPAN and repeat step 2 & 3 to meet the following condition

(High_cali_output + Low_cali_output) = (Low_real_output + High_real_output)----eq1

5. Adjust variable resistor of ZERO and repeat step 2 & 3 to meet the following condition

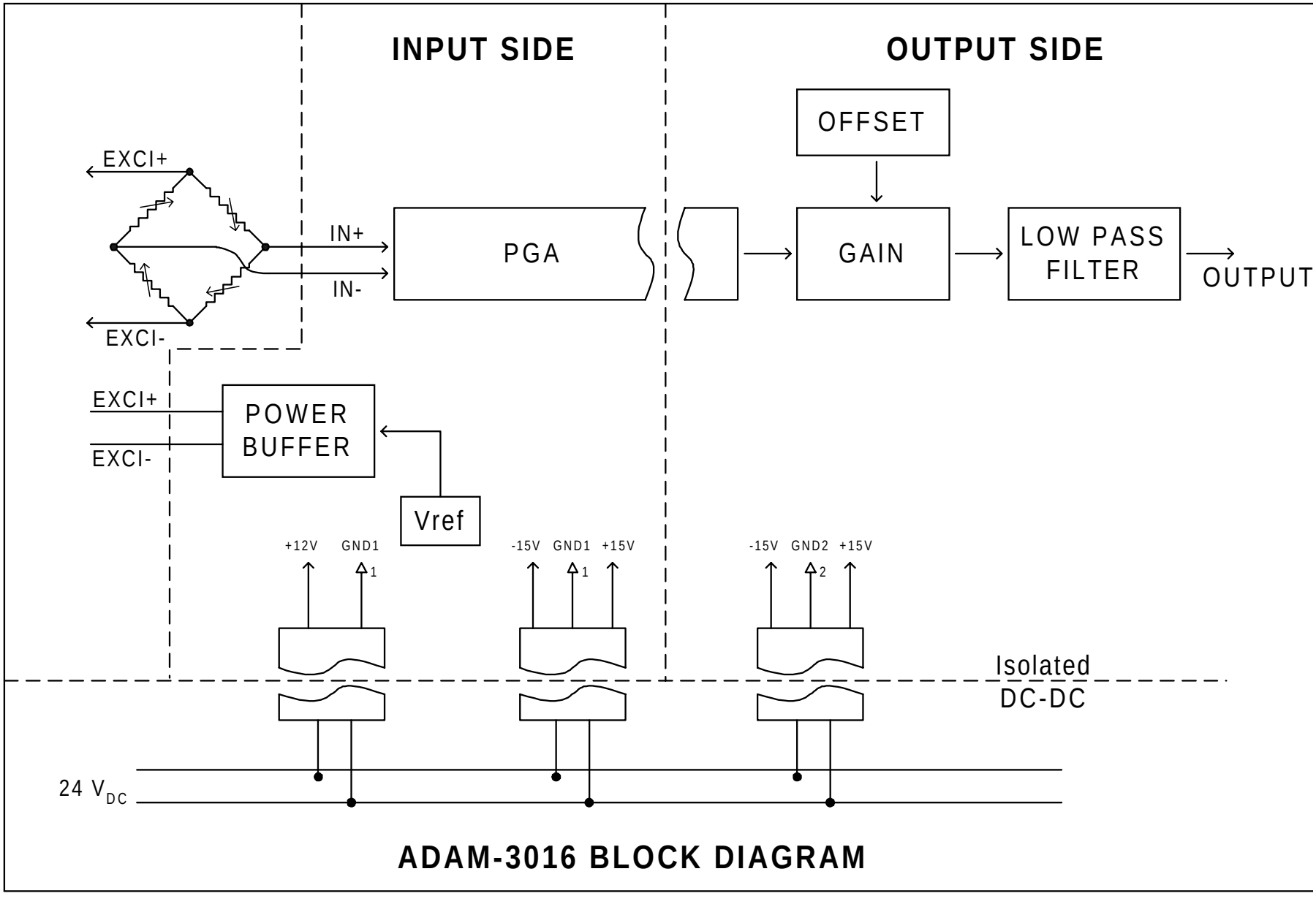
   Low_real_output = Low_cali_output----eq2

   High_real_output = High_cali_output----eq3

6. If eq2, eq3 fail to meet your requirements, repeat step 4,5 until success in step 5

Calibration for excitation voltage

1. Disconnect excitation voltage from gauge (for safety)
2. Adjust variable resistor of EXCI according to your needs
3. Disconnect power and apply excitation voltage to gauge, then apply the power.
4. Finely tune excitation voltage according to your needs as in step 2



ADAM-3016 BLOCK DIAGRAM

Dimensions