

# **ADAM-3016**

**Strain Gauge Input Module**

***User's Manual***

ADAM and the ADAM logo are trademarks of Advantech

Part no. 2000016000

Printed in Taiwan

1st Edition

August 1997

## ***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<sub>DC</sub> (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<sub>DC</sub> input

## ***Specifications***

### **Voltage specifications**

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

### **Output**

- Voltage output
  - Bipolar:  $\pm 5$  V,  $\pm 10$  V
  - Unipolar:  $0 \sim 10$  V
  - Impedance:  $< 50 \ \Omega$
- Current output
  - Current:  $0 \sim 20$  mA
  - Current load resistor:  $0 \sim 500 \ \Omega$  (source)

## ***Specifications***

### **General**

- Three-way isolation:  $1000 V_{DC}$
- Accuracy:  $\pm 0.1\%$  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:  $-10^{\circ}$  to  $70^{\circ}$  C

### **Power**

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

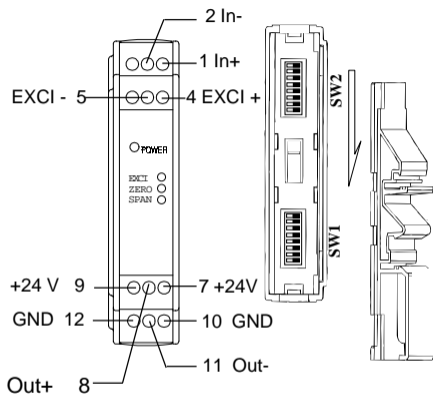
## ***Ordering Information***

- **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<sub>DC</sub>. 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
-10 mV	n				
-20 mV		n			
* -30 mV			n		
-50 mV				n	
-100 mV					n

■: ON

*Table 1: Input range setting (SW2)*

## Output range setting (SW1)

Output Range (SW1)								
Range	1	2	3	4	5	6	7	8
* $\pm 5$ V	n		n					n
$\pm 10$ 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

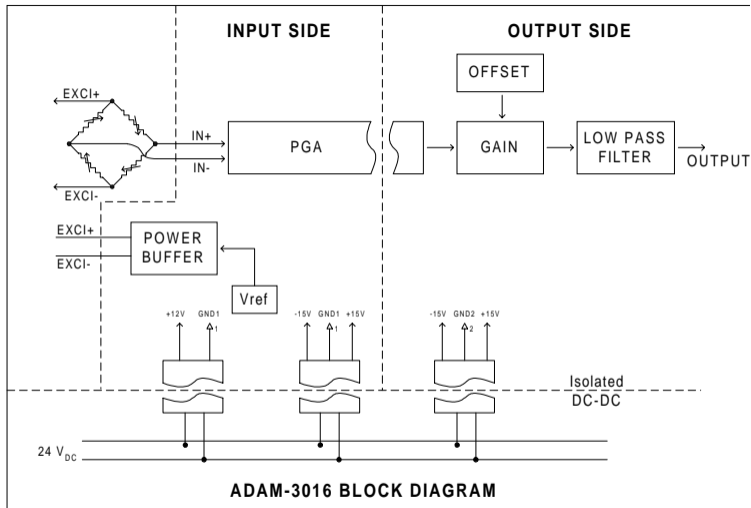
$$\text{Low\_real\_output} = \text{Low\_cali\_output} \text{---eq2}$$

$$\text{High\_real\_output} = \text{High\_cali\_output} \text{---eq3}$$

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



## Dimensions

