ADAM-3112

Isolated VAC-Input/VDC-Output Signal Conditioning Module

ADAM-3114

Isolated IAC-Input/VDC-Output Signal Conditioning Module

Packing List

Before installation, please make sure that you have:

- ADAM-3112/3114 module
- ADAM-3112/3114 Startup manual

Declaration of Conformity

FCC Class A

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause interference in which case the user is required to correct interference at his own expense.

CE

This product has passed the CE test for environmental specifications when shielded cables are used for external wiring. We recommend the use of shielded cables. This kind of cable is available from Advantech. Please contact your local supplier for ordering information.

Overview

ADAM-3112 and ADAM-3114 measure AC voltage (ADAM-3112)/ AC current (ADAM-3114) and converts them into DC voltage with excellent accuracy. ADAM-3112 and ADAM-3114 provide 3-way (input/output/power) electrical isolation which can protect processed signals against harmful effects of ground loop, motor noise, and other electrical interference

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Notes

For more information on this and other Advantech products, please visit our websites at:

http://www.advantech.com/eAutomation

For technical support and service:

http://www.advantech.com/support/

This startup manual is for ADAM-3112/ADAM-3114

Part No. 2003311200 1st Edition

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Figure 1 shows internal block diagram of ADAM-3112-A. +24 VDC power supply is converted to ±15 VDC for internal components usage through a DC-DC converter with 1000 VDC electrical isolation.

Block Diagram

The input voltage (ADAM-3112)/ current (ADAM-3114) is first transformed to a smaller signal by a voltage transformer with 2,500 VRMS electrical isolation. Then it is converted to the desired DC voltage output using an RMS-to-DC converter.

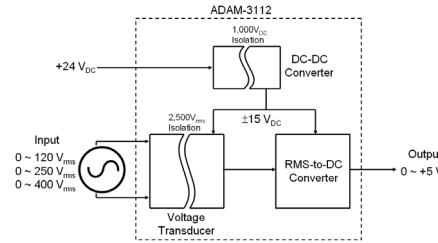


Figure 1: ADAM-3112 Block Diagram

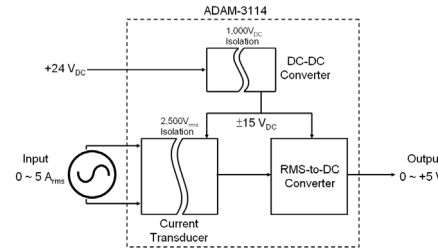


Figure 2: ADAM-3114 Block Diagram

Application

- Power SCADA
- Electric power network monitoring
- Uninterruptible power supplies (UPS)
- Battery chargers and systems
- Motor monitoring

Features

- 3-way electrical isolation
- TRMS measurement
- Excellent accuracy
- +24 VDC power supply
- Flexible DIN rail mounting
- Low power consumption

Specifications

Voltage Input (ADAM-3112)

Full range mode		400 V	250 V	120 V
Input voltage	AC (V_{RMS})	0 ~ 400	0 ~ 250	0 ~ 120
	DC (V)	0 ~ 400	0 ~ 250	0 ~ 120
Input impedance		48 k	30 k	14.4 k

Current Input (ADAM-3114)

- AC current input: 0 ~ 5 A_{RMS}
- DC current input: 0 ~ 5 A

Voltage Output

- Output signal: 0 ~ +5 V_{DC}
- Accuracy: < ±1.0 % for full range
- Output impedance: <10
  (@ operating frequency <60 Hz)
- Load: > 10 k
- Ripple: < 120mV_{p-p}
- Temperature coefficient: 400 ppm
- Output 3dB Bandwidth: 6K Hz

Power Consumption

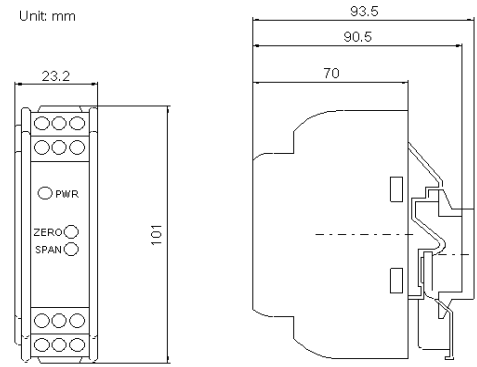
- Supply voltage: +24 V_{DC} ± 10 %
- Current consumption: 40 mA

General

- Isolation protection:
  1,000VDC (Output to power)
  2,500VRMS (input to output, input to power)
- Operating temperature: 0 ~ 60 °C
- Storage temperature: -20 ~ 70 °C
- Storage humidity: 5 ~ 95 %

Specifications

Dimensions



Note: All dimensions without tolerance ±0.2 mm

Configuration

***Caution**: Connect power and ground terminals inversely when operating will cause failure of ADAM-3112/ADAM-3114*

Figure 3 and Figure 4 show the terminal wiring of ADAM-3112/ADAM-3114. ADAM-3112/ADAM-3114 use single +24 VDC power supply. +24 VDC power terminals 7 and 9 are internally connected, as are ground terminals 10 and 12. Power can be connected through adjacent modules, making wiring much easier.

For ADAM-3112 400 V full range usage, the input signal should be connected between terminals 3 and 6; for 250 V, that should be connected between terminals 2 and 5; for 120 V, that should be connected between terminals 1 and 4. The DC voltage output could be obtained between terminals 8 (positive) and 11 (ground).

For ADAM-3114, The input signal should be connected between terminals 2 and 5. The DC voltage output could be obtained between terminals 8 (positive) and 11 (ground).

Specifications

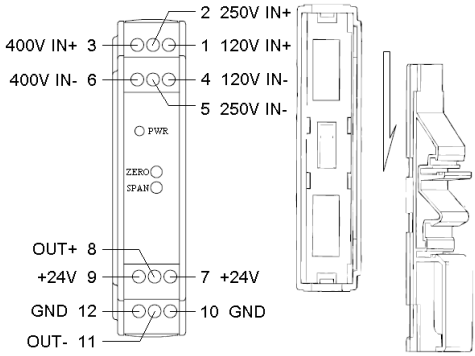


Figure 3: ADAM-3112 Terminal Wiring Diagram

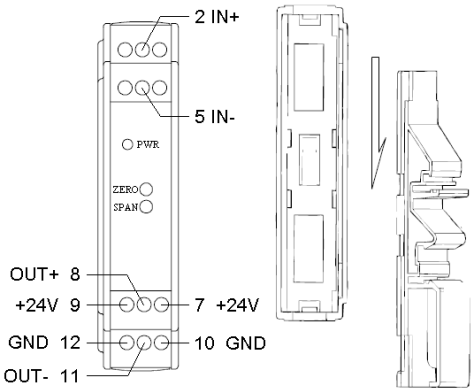


Figure 4: ADAM-3114 Terminal Wiring Diagram

Calibration

ADAM-3112

Two potentiometers (ZERO and SPAN) are available on the front side of the module for adjustment. (Fig. 3)

1. Turn off the power and connect a calibration source between the input terminals, then apply the power.
2. Apply the maximum voltage value of input voltage range between the input terminals. Adjust SPAN potentiometer of until the output voltage reading equals 5 V_{DC}.
3. Apply voltage value of 5% the input voltage range between the input terminals. Adjust ZERO potentiometer until the output voltage reading equals 0.25 V_{DC}. (See the below table for steps 2 and 3.)
4. Apply the maximum voltage value of input voltage range between the input terminals again. If the output reading does not equal 5 V_{DC}, repeat steps 2 and 3 until this requirement is met.

Calibration Voltage Values

Full Range		400 V	250 V	120 V
SPAN	Input	400 V_{RMS}	250 V_{RMS}	120 V_{RMS}
	Target Output	5 V_{DC}	5 V_{DC}	5 V_{DC}
ZERO	Input	20 V_{RMS}	12.5 V_{RMS}	6 V_{RMS}
	Target Output	0.25 V_{DC}	0.25 V_{DC}	0.25 V_{DC}

ADAM-3114

Two potentiometers (ZERO and SPAN) are available on the front side of the module for adjustment. (Fig. 4)

1. Turn off the power and connect a calibration source to the input terminals (terminals 2 and 5), then apply the power.
2. Apply the maximum current value of input current range, i.e. 5 A_{RMS} in subscript, to the input terminals. Adjust SPAN potentiometer of until the output voltage reading equals 5 VDC.
3. Apply current value of 5% the input current range, i.e. 0.25 A_{RMS}, to the input terminals. Adjust ZERO potentiometer until the output voltage reading equals 0.25 VDC.
4. Apply 5 A_{RMS} to the input terminals again. If the output reading does not equal 5 VDC, repeat steps 2 and 3 until this requirement is met.