

I/O Modules

4.1 RTD Input Module

ADAM-5013 3-channel RTD input module

The ADAM-5013 is a 16-bit, 3-channel RTD input module that features programmable input ranges on all channels. This module is an extremely cost-effective solution for industrial measurement and monitoring applications. Its opto-isolated inputs provide 3,000 V_{DC} of isolation between the analog input and the module, protecting the module and peripherals from damage due to high input line voltage.

Note: *Owing to the conversion time required by the A/D converter, the initialization time of each ADAM-5013 module is 5 seconds. Thus the total initialization time will be about 20 seconds if all 4 I/O slots in an ADAM-5000/485 main unit contain ADAM-5013 modules.*

ADAM-5013

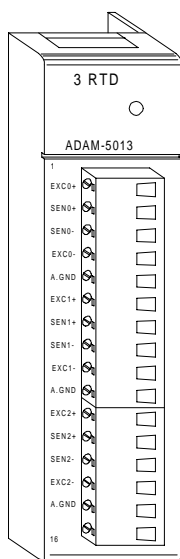


Figure 4-1: ADAM-5013 module frontal view

Application wiring

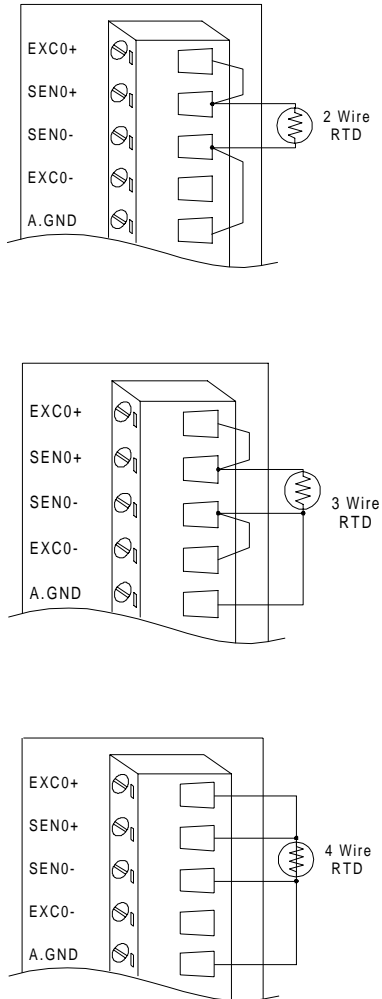


Figure 4-2: RTD inputs

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Technical specifications of ADAM-5013

Analog input channels	three
Input type	Pt or Ni RTD
RTD type and temperature range	Pt -100 to 100 C a=0.00385 Pt 0 to 100 C a=0.00385 Pt 0 to 200 C a=0.00385 Pt 0 to 600 C a=0.00385 Pt -100 to 100 C a=0.00392 Pt 0 to 100 C a=0.00392 Pt 0 to 200 C a=0.00392 Pt 0 to 600 C a=0.00392 Ni -80 to 100 C Ni 0 to 100 C
Isolation voltage	3000 V _{DC}
Sampling rate	10 samples/sec (total)
Input impedance	2 MΩ
Bandwidth	13.1 Hz @ 50 Hz, 15.72 Hz @ 60 Hz
Input connections	2, 3 or 4 wire
Accuracy	– 0.1% or better
Zero drift	– 0.015 C/ C
Span drift	– 0.01 C/ C
CMR@50/60 Hz	150 dB
NMR@50/60 Hz	100 dB
Power consumption	1.2 W

Table 4-1: Technical specifications of ADAM-5013

4.2 ADAM-5013 RTD Input Resistance Calibration

1. Apply power to the module and let it warm up for about 30 minutes.
2. Make sure that the module is correctly installed and is properly configured for the input range you want to calibrate. You can use the ADAM utility software to help in this.
3. Connect the correct reference self resistance between the screw terminals of the ADAM-5013 as shown in the following wiring diagram. Table 4-2 below shows the correct values of the span and zero calibration resistances to be connected. Reference resistances used can be from a precision resistance decade box or from discrete resistors with the values 60 Ω , 140 Ω , 200 Ω and 440 Ω .

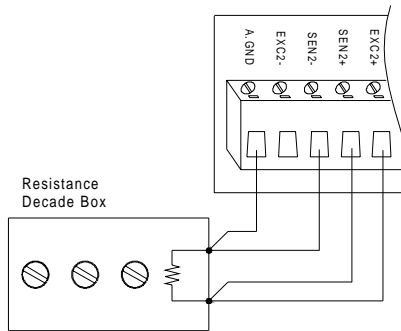


Figure 4-3: Applying calibration resistance

4. First, with the correct zero (offset) calibration resistance connected as shown above, issue a Zero Calibration command to the module using the Calibrate option in the ADAM utility software.
5. Second, with the correct span resistance connected as shown above, issue a Span Calibration command to the module using the Calibrate option in the ADAM utility software. Note that the module zero calibration must be completed prior to the span calibration.

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Note: *If the above procedure is ineffective, the user must first issue an RTD Self Calibration command \$aaSi2 to the module and then complete steps 4 and 5 after self calibration is complete.*

Calibration Resistances (ADAM-5013)

Input Range Code (Hex)	Input Range	Span Calibration Resistance	Zero Calibration Resistance
20	Pt, -100 to 100 C A = 0.00385	140 Ohms	60 Ohms
21	Pt, 0 to 100 C A = 0.00385	140 Ohms	60 Ohms
22	Pt, 0 to 200 C A = 0.00385	200 Ohms	60 Ohms
23	Pt, 0 to 600 C A = 0.00385	440 Ohms	60 Ohms
24	Pt, -100 to 100 C A = 0.00392	140 Ohms	60 Ohms
25	Pt, 0 to 100 C A = 0.00392	140 Ohms	60 Ohms
26	Pt, 0 to 200 C A = 0.00392	200 Ohms	60 Ohms
27	Pt, 0 to 600 C A = 0.00392	440 Ohms	60 Ohms
28	Ni, -80 to 100 C	200 Ohms	60 Ohms
29	Ni, 0 to 100 C	200 Ohms	60 Ohms

Table 4-2: Calibration resistances of ADAM-5013

4.3 Analog Input Modules

Analog input modules use an A/D converter to convert sensor voltage, current, thermocouple or RTD signals into digital data. The digital data is then translated into engineering units. When prompted by the host computer, the data is sent through a standard RS-485 interface. The analog input modules protect your equipment from ground loops and power surges by providing opto-isolation of the A/D input and transformer based isolation up to 3,000 V_{DC}.

ADAM-5017 8-channel Analog Input Module

The ADAM-5017 is a 16-bit, 8-channel analog differential input module that provides programmable input ranges on all channels. It accepts millivolt inputs ($\pm 150\text{mV}$, $\pm 500\text{mV}$), voltage inputs ($\pm 1\text{V}$, $\pm 5\text{V}$ and $\pm 10\text{V}$) and current input ($\pm 20\text{mA}$, requires 125 Ω resistor). The module provides data to the host computer in engineering units (mV, V or mA). This module is an extremely cost-effective solution for industrial measurement and monitoring applications. Its opto-isolated inputs provide 3,000 V_{DC} of isolation between the analog input and the module, protecting the module and peripherals from damage due to high input line voltage. Additionally, the module uses analog multiplexers with active overvoltage protection. The active protection circuitry assures that signal fidelity is maintained even under fault conditions that would destroy other multiplexers. This module can withstand an input voltage surge of 70 Vp-p with $\pm 15\text{V}$ supplies.

ADAM-5017

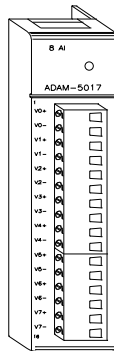


Figure 4-4: ADAM-5017 module frontal view

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Application Wiring

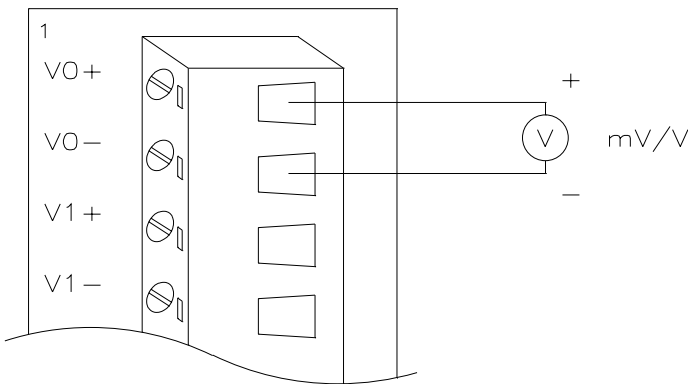


Figure 4-5: Millivolt and volt input

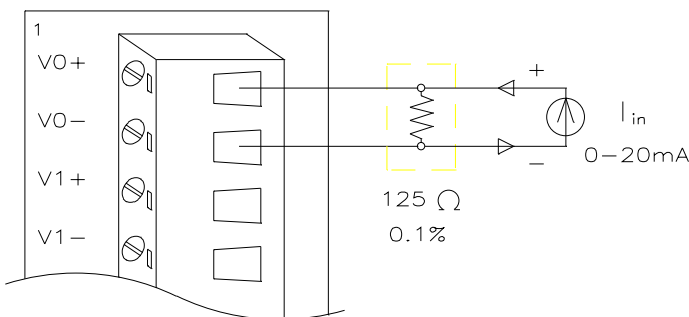


Figure 4-6: Process current input

Note: To keep measurement accuracy please short the channels that are not in use.

Technical Specifications of ADAM-5017

Analog Input Channels	Eight differential
Input Type	mV, V, mA
Input Range	– 150 mV, – 500 mV, – 1 V, – 5 V, – 10 V and – 20 mA
Isolation Voltage	3000 V _{DC}
Sampling Rate	10 samples/sec (total)
Analog Input Signal Limit	15 V max.
Max. allowable voltage difference between two connectors in a module	15 V max.
Input Impedance	2 Mohms
Bandwidth	13.1 Hz @ 50 Hz, 15.72 Hz @ 60 Hz
Accuracy	– 0.1% or better
Zero Drift	– 1.5 μ V/ C
Span Drift	– 25 PPM/ C
CMR @ 50/60 Hz	92 dB min.
Power Requirements	+ 10 to + 30 V _{DC} (non-regulated)
Power Consumption	1.2 W

Table 4-3: Technical specifications of ADAM-5017

ADAM-5017H 8-channel High Speed Analog Input Module

The ADAM-5017H is a 12-bit plus sign bit, 8-channel analog differential input module that provides programmable input ranges on each channel. It accepts millivolt inputs (± 500 mV, 0-500 mV), voltage inputs (± 1 V, 0-1 V, ± 2.5 V, 0-2.5 V, ± 5 V, 0-5 V, ± 10 V and 0-10 V) and current inputs (0-20 mA and 4-20 mA; requires a 125 ohms resistor). The module provides data to the host microprocessor in engineering units (mV, V or mA) or two's complement format. Its sampling rate

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depends on the data format received: up to 1,000 Hz (total) in two's complement or 600 Hz (total) in engineering units. Space is reserved for 125 ohms, 0.1%, 10 ppm resistors (See Figure 4-10). Each input channel has 3000 V_{DC} of optical isolation between the outside analog input line and the module, protecting the module and peripherals from high input line voltages. Additionally, the module uses analog multiplexers with active overvoltage protection. The active protection circuitry assures that signal fidelity is maintained even under fault conditions that would destroy other multiplexers. The analog inputs can withstand a constant 70 Vp-p input with ± 15 V supplies.

ADAM-5017H

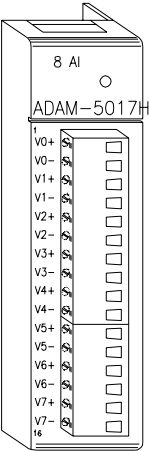


Figure 4-7: ADAM-5017H module frontal view

Application Wiring

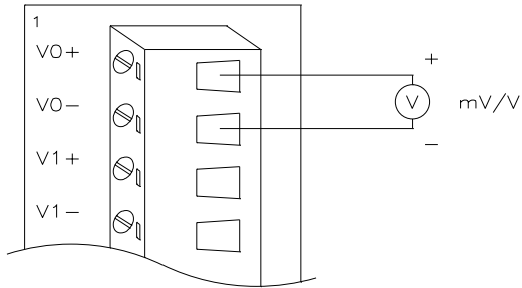


Figure 4-8: Millivolt and volt input

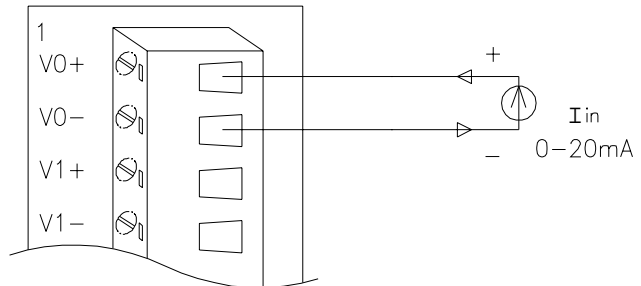


Figure 4-9: Process current input

I/O Modules

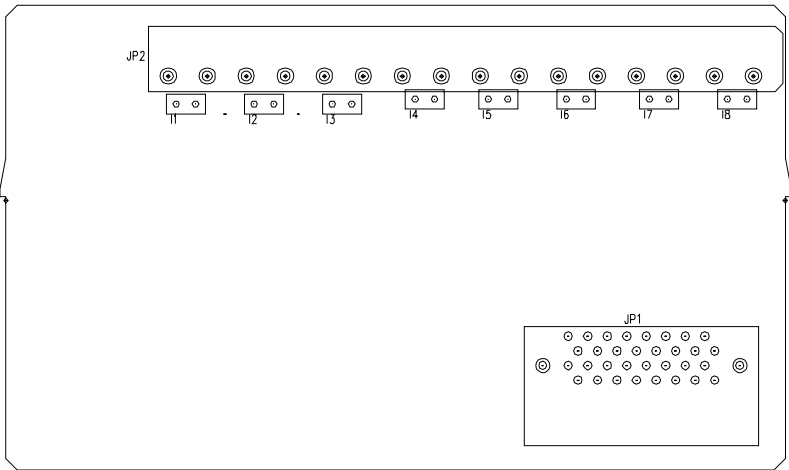


Figure 4-10: The location for 125 Ohms resistors

Note: To maintain measurement accuracy please short channels not in use.

Technical Specifications of ADAM-5017H

Analog Input Channels	8 differential
ADC Resolution	12 bits, plus sign bit
Type of ADC	Successive approximation
Isolation Voltage	3000 V _{DC}
Sampling Rate	1,000 Hz/module no. (total) in two's complement data format; 600 Hz/module no. (total) in engineering unit data format
Input Impedance	20 Mohms (voltage inputs); 125 ohms (current inputs)
Signal Input Bandwidth	1000 Hz for both voltage inputs and current inputs
Analog Signal Range	–15 V max.
Analog Signal Range for any two measured Pins	–15 V max.
Power Requirements	+10 to +30 V _{DC} (non-regulated)
Power Consumption	1.8 W

Table 4-4: Technical specifications of ADAM-5017H

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	Input Range	With Overranging	Offset Error @25 C	Offset Error @ -10 to +70 C	Gain Error @25 C	Gain Error @ -10 to +70 C	Offset Drift	Gain Drift	Display Resolution
Voltage Inputs	0-10 V	0-11 V	-1 LSB	-2 LSB	-1 LSB	-2 LSB	17 μ V/ C	50 ppm/ C	2.7 mV
	0-5 V	0-5.5 V	-1 LSB	-2 LSB	-1.5 LSB	-2 LSB	16 μ V/ C	50 ppm/ C	1.3 mV
	0-2.5 V	0-2.75 V	-1 LSB	-2 LSB	-1.5 LSB	-2 LSB	20 μ V/ C	55 ppm/ C	0.67 mV
	0-1 V	0-1.375 V	-1 LSB	-2.5 LSB	-2 LSB	-2.5 LSB	20 μ V/ C	60 ppm/ C	0.34 mV
	0-500 mV	0-687.5 mV	-2 LSB	-3.5 LSB	-3 LSB	-3.5 LSB	20 μ V/ C	67 ppm/ C	0.16 mV
	- 10 V	-11 V	-1 LSB	-2 LSB	-1 LSB	-2 LSB	17 μ V/ C	50 ppm/ C	2.7 mV
	- 5 V	-0-5.5 V	-1 LSB	-2 LSB	-1.5 LSB	-2 LSB	17 μ V/ C	50 ppm/ C	1.3 mV
	- 2.5 V	-0-2.75 V	-1 LSB	-2 LSB	-1.5 LSB	-2 LSB	20 μ V/ C	55 ppm/ C	0.67 mV
	- 1 V	-0-1.375 V	-1 LSB	-2.5 LSB	-2 LSB	-2.5 LSB	20 μ V/ C	60 ppm/ C	0.34 mV
	- 500 mV	-0-687.5 mV	-2 LSB	-3.5 LSB	-3 LSB	-3.5 LSB	20 μ V/ C	67 ppm/ C	0.16 mV
Current Inputs	0-20 mA	22 mA	-1 LSB	-1 LSB	-1.5 LSB	-2 LSB	nA/ C	ppm/ C	5.3 μ A
	4-20 mA	22 mA	-1 LSB	-1 LSB	-1.5 LSB	-2 LSB	nA/ C	ppm/ C	5.3 μ A

Table 4-5: ADAM-5017H input signal ranges

ADAM-5018 7-channel Thermocouple Input Module

The ADAM-5018 is a 16-bit, 7-channel thermocouple input module that features programmable input ranges on all channels. It accepts millivolt inputs ($\pm 15\text{mV}$, $\pm 50\text{mV}$, $\pm 100\text{mV}$, $\pm 500\text{mV}$), voltage inputs ($\pm 1\text{V}$, $\pm 2.5\text{V}$), current input ($\pm 20\text{mA}$, requires 125W resistor) and thermocouple input (J, K, T, R, S, E, B).

The module forwards the data to the host computer in engineering units (mV, V, mA or temperature $^{\circ}\text{C}$). An external CJC on the plug-in terminal is designed for accurate temperature measurement.

ADAM-5018

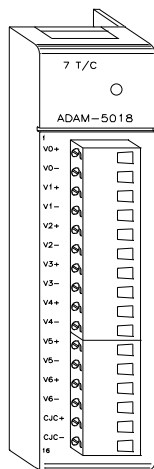


Figure 4-11: ADAM-5018 module frontal view

Application Wiring

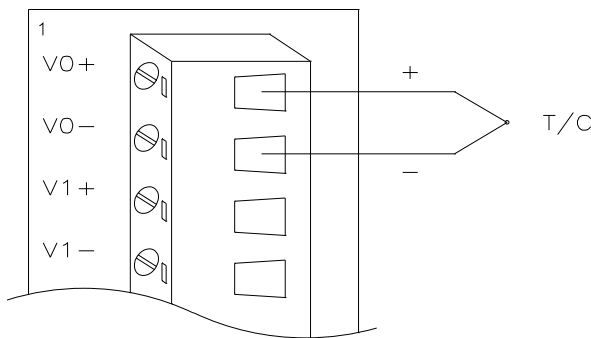


Figure 4-12: Thermocouple input

I/O Modules

Technical Specification for ADAM-5018

Analog Input Channels	Seven differential
Input Type	mV, V, mA, Thermocouple
Input Range	– 15 mV, – 50 mV, – 100 mV, – 500 mV, – 1 V, – 2.5 V and – 20 mA
T/C Type and Temperature Range	J 0 to 760 °C K 0 to 1000 °C T -100 to 400 °C E 0 to 1400 °C R 500 to 1750 °C S 500 to 1750 °C B 500 to 1800 °C
Isolation Voltage	3000 V _{DC}
Sampling Rate	10 samples/sec (total)
Input Impedance	2 Mohms
Bandwidth	13.1 Hz @ 50 Hz, 15.72 Hz @ 60 Hz
Accuracy	– 0.1% or better
Zero Drift	– 0.3 µV/ °C
Span Drift	– 25 PPM/ °C
CMR @ 50/60 Hz	92 dB min.
Power Consumption	1.2 W

Table 4-6: Technical specifications of ADAM-5018

4.4 Analog Output Modules

ADAM-5024 4-Channel Analog Output Module

The ADAM-5024 is a 4-channel analog output module. It receives its digital input through the RS-485 interface of the ADAM-5000 system module from the host computer. The format of the data is engineering units. It then uses the D/A converter controlled by the system module to convert the digital data into output signals.

You can specify slew rates and start up currents through the configuration software. The analog output can also be configured as current

or voltage through the software utility. The module protects your equipment from ground loops and power surges by providing opto-isolation of the D/A output and transformer based isolation up to 500 V_{DC} .

Slew Rate

The slew rate is defined as the slope indicated the ascending or descending rate per second of the analog output from the present to the required.

ADAM-5024

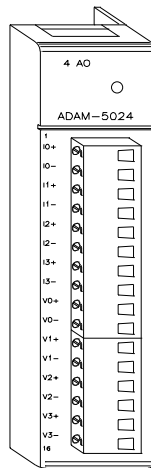


Figure 4-13: ADAM-5024 module frontal view

I/O Modules

Application Wiring

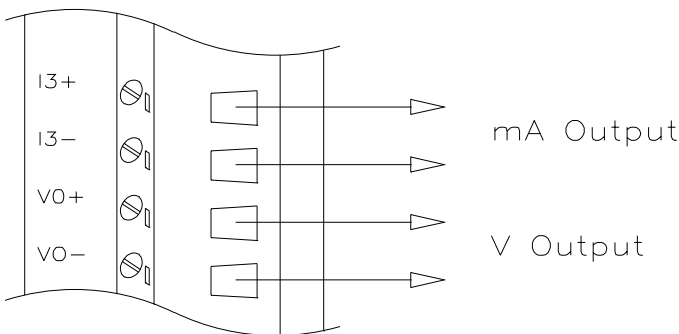


Figure 4-14: Analog output

Technical specifications of ADAM-5024

Analog Output Channels	Four
Output Type	V, mA
Output Range	0-20mA, 4-20mA, 0-10V
Isolation Voltage	3000 Vdc
Output Impedance	0.5 Ohms
Accuracy	±0.1% of FSR for current output ±0.2% of FSR for voltage output
Zero Drift	Voltage output: ±30 μ V/°C Current output: ±0.2 μ A/°C
Resolution	±0.015% of FSR
Span Temperature Coefficient	±25 PPM/°C
Programmable Output Slope	0.125-128.0 mA/sec 0.0625-64.0 V/sec
Current Load Resistor	0-500 Ohms (source)
Power Consumption	2.5W (Max.)

Table 4-7: Technical specifications of ADAM-5024

4.5 Analog I/O Modules Calibration

Analog input/output modules are calibrated when you receive them. However, calibration is sometimes required. No screwdriver is necessary because calibration is done in software with calibration parameters stored in the ADAM-5000 analog I/O module's onboard EEPROM.

The ADAM-5000 system comes with the ADAM utility software that supports calibration of analog input and analog output. Besides the calibration that is carried out through software, the modules incorporate automatic Zero Calibration and automatic Span Calibration at bootup or reset.

Analog Input Module Calibration

Modules: ADAM-5017, 5017H, 5018

1. Apply power to the ADAM-5000 system that the analog input module is plugged into and let it warm up for about 30 minutes
2. Assure that the module is correctly installed and is properly configured for the input range you want to calibrate. You can do this by using the ADAM utility software. (Refer to Chapter 5)
3. Use a precision voltage source to apply a span calibration voltage to the module's V0+ and V0- terminals. (See Tables 4-8 and 4-9 for reference voltages for each range)

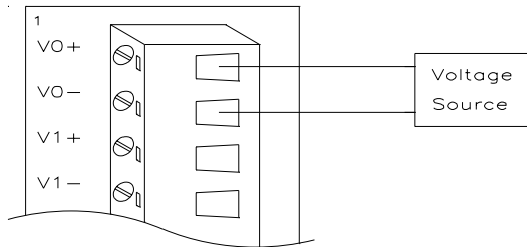


Figure 4-15: Applying calibration voltage

I/O Modules

- 4. Execute the Zero Calibration command (also called the Offset Calibration command). This is also done with the ADAM utility software. (See “Zero Calibration” option in the Calibration sub-menu of the ADAM utility software)

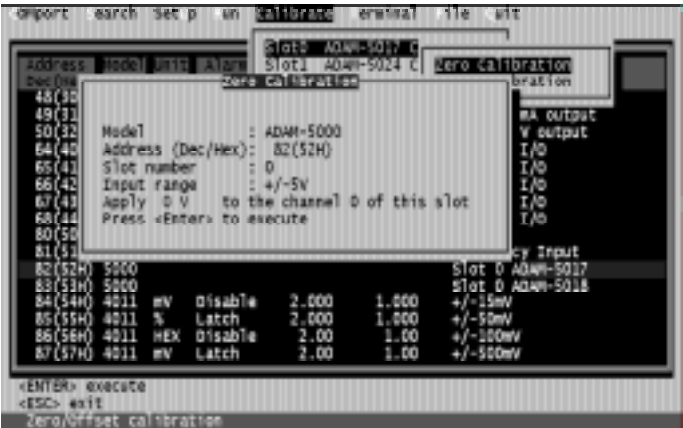


Figure 4-16: Zero Calibration

- 5. Execute the Span Calibration command. This can be done with the ADAM utility software. (See “Span Calibration” option in the Calibration sub-menu of the ADAM utility software)

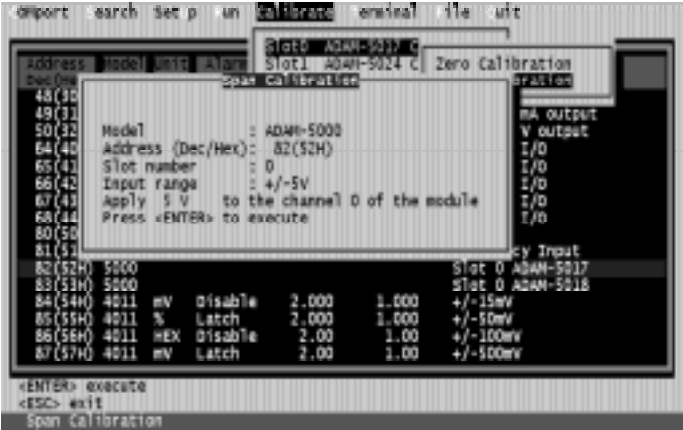


Figure 4-17: Span Calibration

- 6. Only for ADAM-5018: Execute the CJC (cold junction sensor) Calibration command. This can be done with the ADAM utility software. (See “CJC Calibration” option in the Calibration submenu of the ADAM utility software)

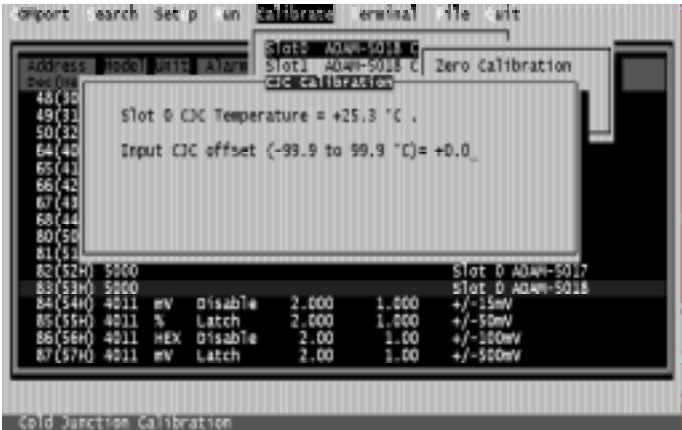


Figure 4-18: Cold Junction Calibration

I/O Modules

Calibration Voltage (ADAM-5017/5018)

Module	Input Range Code (Hex)	Input Range	Span Calibration Voltage
5018	00h	±15 mV	+15 mV
	01h	±50 mV	+50 mV
	02h	±100 mV	+100 mV
	03h	±500 mV	+500 mV
	04h	±1V	+1 V
	05h	±2.5V	+2.5 V
	06h	±20 mA	+20 mA (1)
	0Eh	J thermocouple 0 to 760 °C	+50 mV
	0Fh	K thermocouple 0 to 1000 °C	+50 mV
	10h	T thermocouple -100 to 400 °C	+22 mV
	11h	E thermocouple 0 to 1000 °C	+80 mV
	12h	R thermocouple 500 to 1750 °C	+22 mV
	13h	S thermocouple 500 to 1750 °C	+22 mV
	14h	B thermocouple 500 to 1800 °C	+15 mV
5017	07h	Not used	
	08h	±10 V	+10 V
	09h	±5 V	+5 V
	0Ah	±1 V	+1 V
	0Bh	±500 mV	+500 mV
	0Ch	±150 mV	+150 mV
	0Dh	±20 mA	+20 mV (1)

Table 4-8: Calibration voltage of ADAM-5017/5018

Calibration Voltage (ADAM-5017H)

Module	Input Range Code (Hex)	Input Range	Span Calibration Voltage
5017H	00h	−10 V	+10 V
	01h	0-10 V	+10 V
	02h	−5 V	+5 V
	03h	0-5 V	+5 V
	04h	−2.5 V	+2.5 V
	05h	0-2.5 V	+2.5 V
	06h	−1 V	+1 V
	07h	0-1 V	+1 V
	08h	−500 mV	+500 mV
	09h	0-500 mV	+500 mV
	0ah	4-20 mA	*(1)
	0bh	0-20 mA	*(1)

Table 4-9: Calibration voltage of ADAM-5017H

(1) Note: You can substitute 2.5 V for 20 mA if you remove the current conversion resistor for that channel. However, the calibration accuracy will be limited to 0.1% due to the resistor's tolerance.

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Analog Output Module Calibration

The output current of analog output modules can be calibrated by using a low calibration value and a high calibration value. The analog output modules can be configured for one of two ranges: 0-20 mA and 4-20 mA. Since the low limit of the 0-20 mA range (0 mA) is internally an absolute reference (no power or immeasurably small power), just two levels are needed for calibration: 4 mA and 20 mA.

1. Apply power to the ADAM-5000 system including the analog output module for about 30 minutes.
2. Assure that the module is correctly installed and that its configuration is according to your specifications and that it matches the output range you want to calibrate. You can do this by using the ADAM utility software. (Refer to Chapter 5, Utility Software)
3. Connect either a 5-digit mA meter or voltmeter with a shunt resistor (250 W, .01 % and 10 ppm) to the screw terminals of the module.

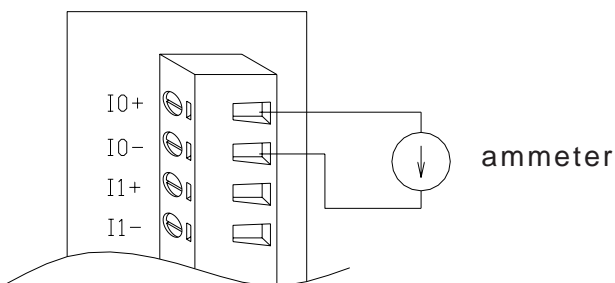


Figure 4-19: Output module calibration

4. Issue the Analog Data Out command to the module with an output value of 4 mA.
5. Check the actual output value at the modules terminals. If this does not equal 4 mA, use the "Trim" option in the "Calibrate" sub-menu to change the actual output. Trim the module until the mA meter indicates exactly **4 mA**, or in case of a voltage meter with shunt resistor, the meter indicates exactly **1 V**. (When calibrating for **20 mA** using a voltage meter and shunt resistor, the correct voltage should be **5 V**.)
6. Issue the 4 mA Calibration command to indicate that the output is calibrated and to store the calibration parameters in the module's EEPROM.
7. Execute an Analog Data Out command with an output value of 20 mA. The module's output will be approximately 20 mA.
8. Execute the Trim Calibration command as often as necessary until the output current is equal to exactly 20 mA.
9. Execute the 20 mA Calibration command to indicate that the present output is exactly 20 mA. The analog output module will store its calibration parameters in the unit's EEPROM.

4.6 Digital Input/Output Modules

ADAM-5050 16-channel universal digital I/O module

The ADAM-5050 features sixteen digital input/output channels. Each channel can be independently configured to be an input or an output channel by the setting of its DIP switch. The digital outputs are open-collector transistor switches that can be controlled from the ADAM-5000/485. The switches can also be used to control solid-state relays, which in turn can control heaters, pumps and power equipment. The ADAM-5000/485 can use the module's digital inputs to determine the state of limit or safety switches, or to receive remote digital signals.

Warning!



A channel may be destroyed if it is subjected to an input signal while it is configured to be an output channel.

I/O Modules

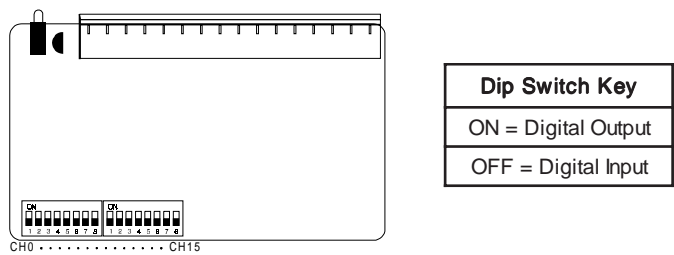


Figure 4-20: Dip switch setting for digital I/O channel

ADAM-5050

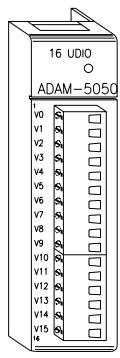


Figure 4-21: ADAM-5050 module frontal view

Application wiring

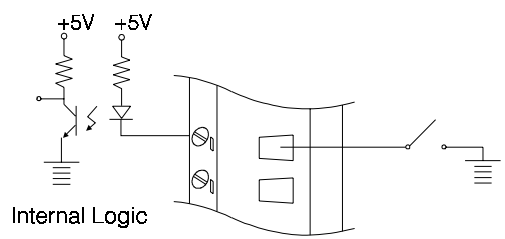


Figure 4-22: Dry contact signal input (ADAM-5050)

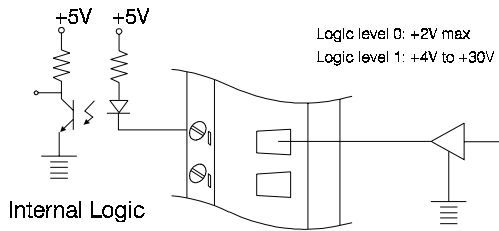


Figure 4-23: Wet contact signal input (ADAM-5050)

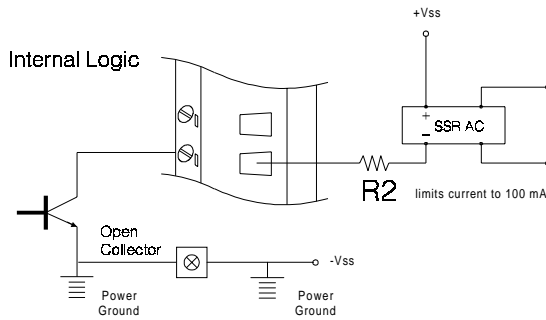


Figure 4-24: Digital output used with SSR (ADAM-5050/5056)

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Technical specifications of ADAM-5050

Points	16
Channel Setting	Bitwise selectable by DIP switch
Digital Input	Dry Contact Logic Level 0: close to GND Logic Level 1: open Wet Contact Logic Level 0: +2V max Logic Level 1: +4V to 30V
Digital Output	Open collector to 30 V, 100mA max load
Power Dissipation	450 mW
Power Consumption	0.4 W

Table 4-10: Technical specifications of ADAM-5050

ADAM-5051 16-channel digital input module

The ADAM-5051 provides sixteen digital input channels. The ADAM-5000/485 can use the module's digital inputs to determine the state of limit or safety switches or to receive remote digital signals.

ADAM-5051

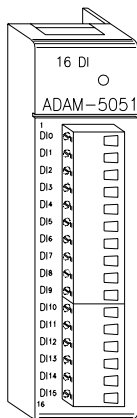


Figure 4-25: ADAM-5051 module frontal view

Application wiring

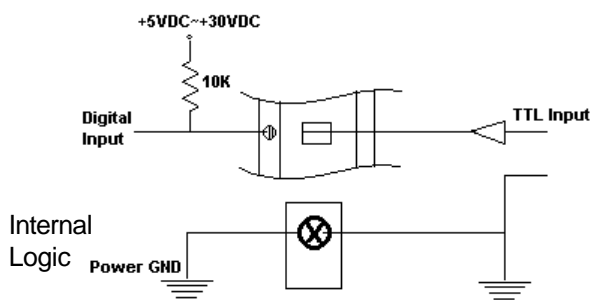


Figure 4-26: TTL input (ADAM-5051)

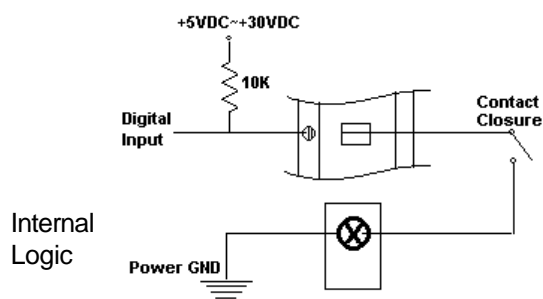


Figure 4-27: Contact closure input (ADAM-5051)

Technical specifications of ADAM-5051

Points	16
Digital input	Logic level 0: + 1 V max Logic level 1: + 3.5 to 30 V Pull up current: 0.5 mA 10 K Ω resistor to + 5 V
Power consumption	0.3 W

Table 4-11: Technical specifications of ADAM-5051

I/O Modules

ADAM-5052 8-channel isolated digital input module

The ADAM-5052 provides eight fully independent isolated channels. All have 5000 V_{RMS} isolation to prevent ground loop effects and to prevent damage from power surges on the input lines.

ADAM-5052

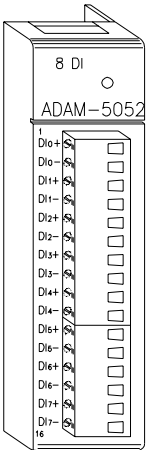


Figure 4-28: ADAM-5052 module frontal view

Application wiring

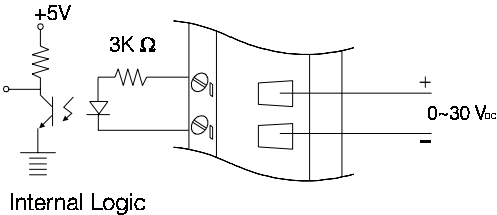


Figure 4-29: Isolation digital input (ADAM-5052)

Technical specifications of ADAM-5052

Points	8 Differential
Digital input	Logic level 0: + 1 V max Logic level 1: + 3.5 to 30 V Isolation voltage: 5000 V _{RMS} Resistance: 3 K Ω / 0.5 W
Power consumption	0.4 W

Table 4-12: Technical specifications of ADAM-5052

ADAM-5056 16-channel digital output module

The ADAM-5056 features sixteen digital output channels. The digital outputs are open-collector transistor switches that you can control from the ADAM-5000/485. You also can use the switches to control solid-state relays.

ADAM-5056

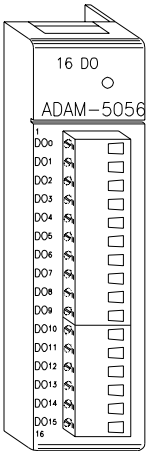


Figure 4-30: ADAM-5056 module frontal view

I/O Modules

Application wiring

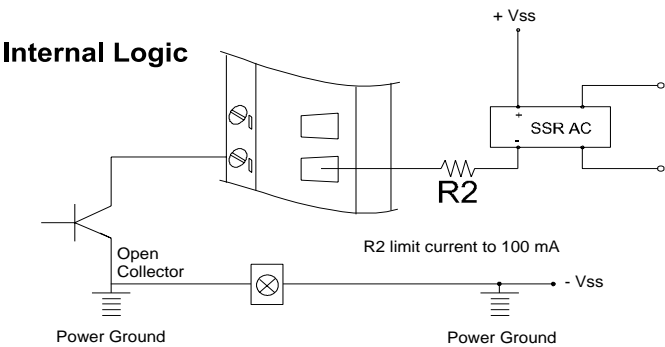


Figure 4-31: Digital output used with SSR (ADAM-5050/5056)

Technical specifications of ADAM-5056

There are 16-point digital input and 16-point digital output modules in the ADAM-5000 system. The addition of these solid state digital I/O devices allows these modules to control or monitor the interfaces between high power DC or AC lines and TTL logic signals. A command from the host converts these signals into logic levels suitable for the solid-state I/O devices.

Points	16
Digital output	Open collector to 30 V 100 mA max load
Power dissipation	450 mW
Power consumption	0.25 W

Table 4-13: Technical specifications of ADAM-5056

4.7 Relay Output Modules

ADAM-5060 Relay output module

The ADAM-5060 relay output module is a low-cost alternative to SSR modules. It provides 6 relay channels, two of Form A and four of Form C.

ADAM-5060

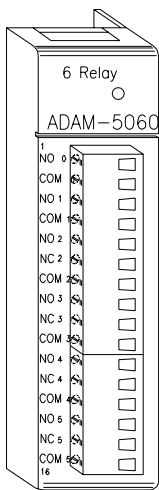


Figure 4-32: ADAM-5060 module frontal view

Application wiring

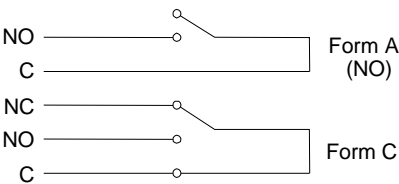


Figure 4-33: Relay output

I/O Modules

Technical specifications of ADAM-5060

Points	6, two Form A and four Form C
Contact rating	AC: 125 V @ 0.6A; 250 V @ 0.3 A, DC: 30 V @ 2 A; 110 V @ 0.6 A
Breakdown voltage	500 V _{AC} (50/60 Hz)
Relay on time (typical)	3 ms
Relay off time (typical)	1 ms
Total switching time	10 ms
Insulation resistance	1000 MΩ min. at 500 V _{DC}
Power consumption	0.7 W

Table 4-14: Technical specifications of ADAM-5060

ADAM-5068 Relay output module

The ADAM-5068 relay output module provides 8 relay channels of Form A. Switches can be used to control the solid-state relays.

ADAM-5068

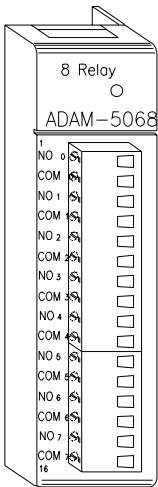


Figure 4-34: ADAM-5068 module frontal view

Application wiring

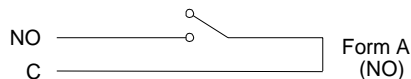


Figure 4-35: Relay output

Technical specifications of ADAM-5068

Points	8 Form A
Contact Rating	AC: 120 V @ 0.5 A DC: 30 V @ 1 A
Breakdown Voltage	500 V _{AC} (50/60 Hz)
Relay On Time (typical)	7 msec.
Relay Off Time (typical)	3 msec.
Total Switching Time	10 msec.
Power Consumption	2.0 W

Table 4-15: Technical specifications of ADAM-5068

