

Technical Specifications

A

A.1 ADAM-4011 Thermocouple Input Module

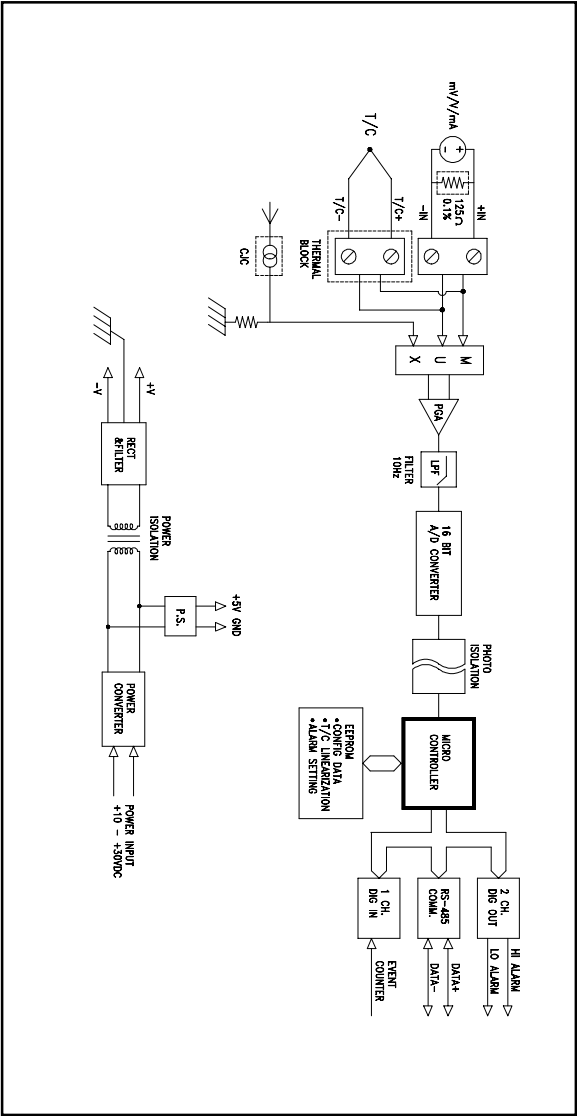
Table A-1 *ADAM-4011 Specifications*

Input range	J, K, T, E, R, S and B Thermocouple $\pm 15\text{ mV}$, $\pm 50\text{ mV}$, $\pm 100\text{ mV}$, $\pm 500\text{mV}$, $\pm 1\text{ V}$, $\pm 2.5\text{ V}$, and $\pm 20\text{mA}$
Output	RS-485 (2-Wire)
speed (in bps)	1200, 2400, 4800, 9600, 19.2K, 38.4K
maximum distance	4000 ft. (1200 m.)
Accuracy	$\pm 0.05\%$ or better
Zero drift	$\pm 0.3\text{ }\mu\text{V/ }^{\circ}\text{C}$
Span drift	$\pm 25\text{ ppm / }^{\circ}\text{C}$
Isolation-rated voltage	500 V _{DC}
CMR @ 50/60 Hz	150 dB
NMR @ 50/60 Hz	100 dB
Bandwidth	4 Hz
Conversion rate	10 samples/sec.
Input impedance	2 M Ω
Digital output	2 channels open collector to 30 V
sink current	30 mA max. load
power dissipation	300 mW
Digital input	1 channel
logic level 0	+1 V max.
logic level 1	+3.5 to +30 V
pull up current	0.5 mA
Event counter	
Max. input frequency	50 Hz
Min. pulse width	1 msec
Watchdog timer	Yes
Power supply	+10 to +30 V _{DC} (non-regulated)
Power consumption	1.2 W

Table A-2 ADAM-4011 Range Accuracy for Thermocouple

0E	J thermocouple 0 to 760 °C	±0.5	±0.75	°C
0F	K thermocouple 0 to 1000 °C	±0.5	±0.75	°C
10	T thermocouple -100 to 400 °C	±0.5	±0.75	°C
11	E thermocouple 0 to 1000 °C	±0.5	±0.75	°C
12	R thermocouple 500 to 1750 °C	±0.6	±1.5	°C
13	S thermocouple 500 to 1750 °C	±0.6	±1.5	°C
14	B thermocouple 500 to 1800 °C	±1.2	±2.0	°C

Figure A-1 ADAM-4011 Function Diagram



A.2 ADAM-4011D Thermocouple Input Module with LED Display

Table A-3 *ADAM-4011D Specifications*

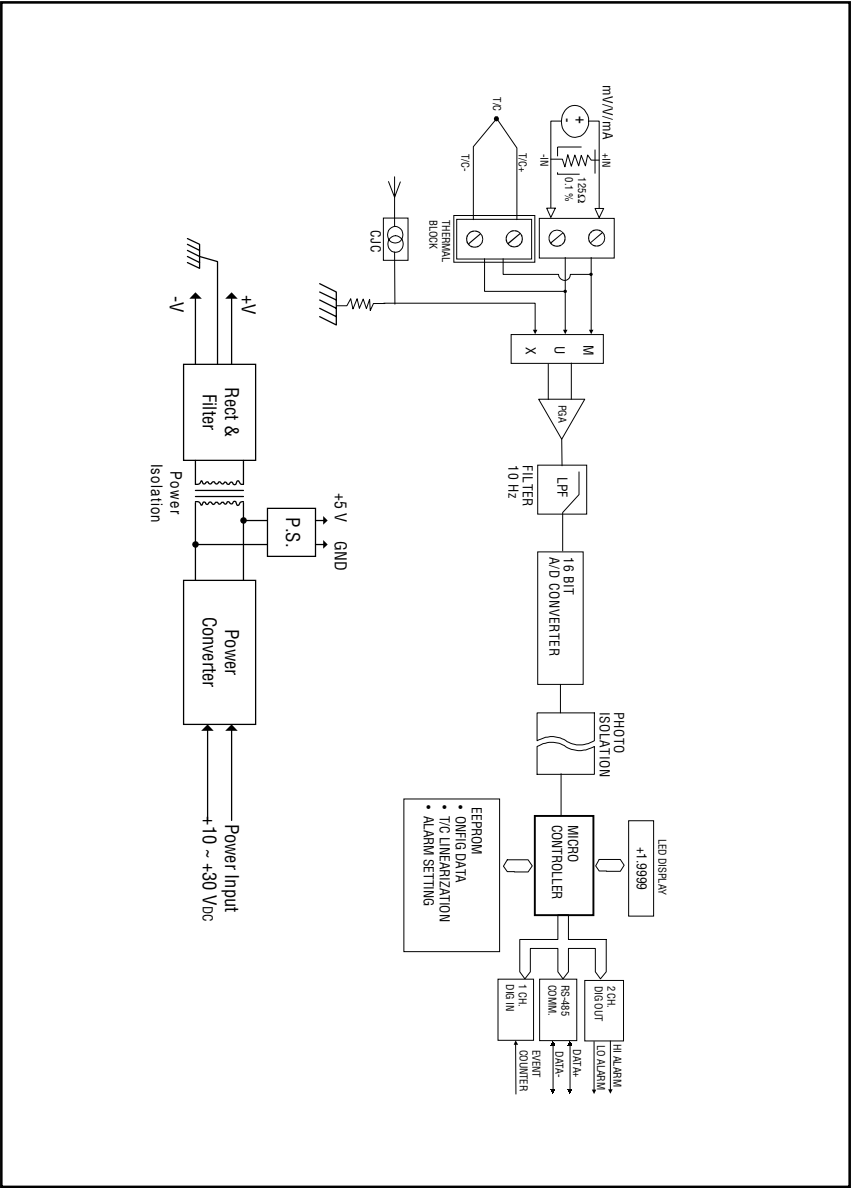
Input range	J, K, T, E, R, S and B Thermocouple ±15 mV, ±50 mV, ±100 mV, ±500mV, ±1 V, ±2.5 V, and ±20mA
Output	RS-485 (2-Wire)
speed (in bps)	1200, 2400, 4800, 9600, 19.2K, 38.4K
maximum distance	4000 ft. (1200 m.)
Accuracy	±0.05% or better
Zero drift	±0.3 μ V / °C
Span drift	±25 ppm / °C
Isolation-rated voltage	3000 V _{DC}
CMR @ 50/60 Hz	150 dB
NMR @ 50/60 Hz	100 dB
Bandwidth	4 Hz
Conversion rate	10 samples/sec.
Input impedance	2 M Ω
LED indicator	4½ digit readout
Digital output	2 channels open collector to 30 V
sink current	30 mA max. load
power dissipation	300 mW
Digital input	1 channel
logic level 0	+1 V max.
logic level 1	+3.5 to +30 V
pull up current	0.5 mA
Event counter	
Max. input frequency	50 Hz
Min. pulse width	1 msec
Watchdog timer	Yes
Power supply	+10 to +30 V _{DC} (non-regulated)
Power consumption	1.4 W

Technical specifications

Table A-4 *ADAM-4011D Range Accuracy for Thermocouple*

Input Range Code (Hex)	Input Range	Typical Accuracy	Maximum Error	Units
0E	J thermocouple 0 to 760 °C	±0.5	±0.75	°C
0F	K thermocouple 0 to 1370 °C	±0.5	±0.75	°C
10	T thermocouple -100 to 400 °C	±0.5	±0.75	°C
11	E thermocouple 0 to 1000 °C	±0.5	±0.75	°C
12	R thermocouple 500 to 1750 °C	±0.6	±1.5	°C
13	S thermocouple 500 to 1750 °C	±0.6	±1.5	°C
14	B thermocouple 500 to 1800 °C	±1.2	±2.0	°C

Figure A-2 ADAM-4011D Function Diagram

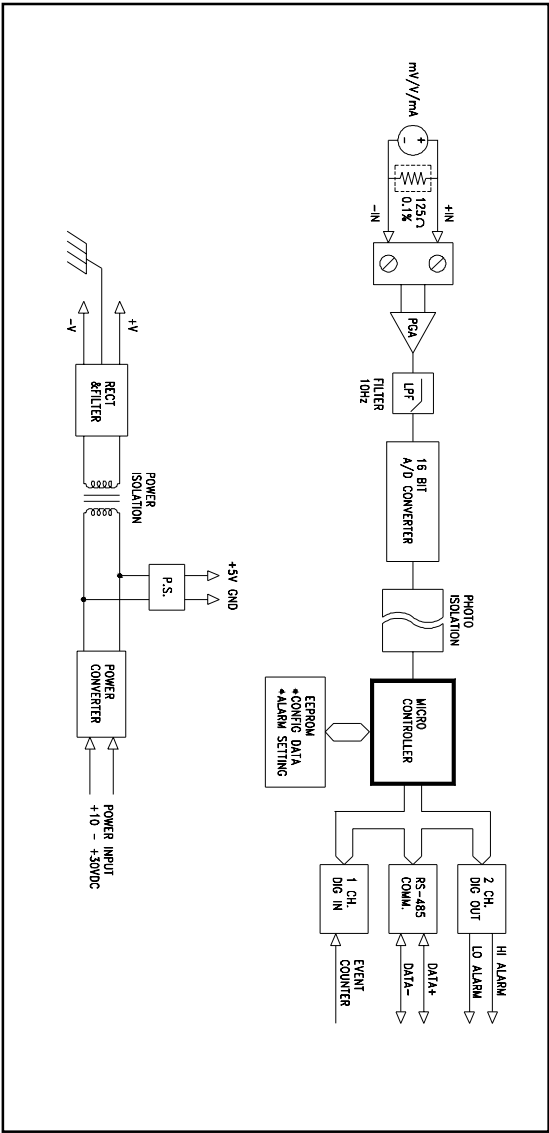


A.3 ADAM-4012 Analog Input Module

Table A-5 *ADAM-4012 Specifications*

Input range	± 150 mV, ± 500 mV, ± 1 V, ± 5 V, ± 10 V and ± 20 mA
Output	RS-485 (2-wire)
speed (in bps)	1200, 2400, 4800, 9600, 19.2K, 38.4K
maximum distance	4000 ft. (1200 m.)
Accuracy	$\pm 0.05\%$ or better
Zero drift	± 6 μ V / $^{\circ}$ C
Span drift	± 25 ppm / $^{\circ}$ C
Isolation-rated voltage	3000 V _{DC}
CMR @ 50/60 Hz	150 dB
NMR @ 50/60 Hz	100 dB
Bandwidth	4 Hz
Conversion rate	10 samples/sec.
Input impedance	20 M Ω
Digital output	2 channels open collector to 30 V
sink current	30 mA max. load
power dissipation	300 mW
Digital input	1 channel
logic level 0	+1 V max.
logic level 1	+3.5 to +30 V
pull up current	0.5 mA
Event counter	
Max. input frequency	50 Hz
Min. pulse width	1 msec
Watchdog timer	Yes
Power supply	+10 to +30 V _{DC} (non-regulated)
Power consumption	1.2 W

Figure A-3 ADAM-4012 Function Diagram

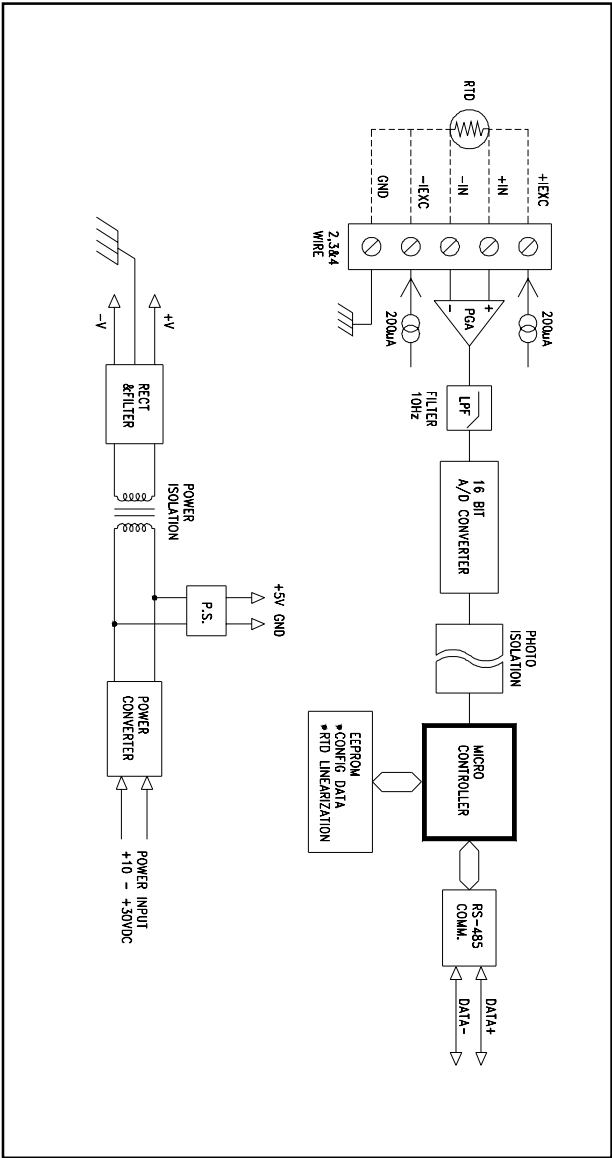


A.4 ADAM-4013 RTD Input Module

Table A-6 *ADAM-4013 Specifications*

Input range	Pt and Ni RTD
Output	RS-485 (2-Wire)
speed (in bps)	1200, 2400, 4800, 9600, 19.2K, 38.4K
maximum distance	4000 ft. (1200 m.)
Accuracy	±0.05% or better
Zero drift	±0.01 °C/ °C
Span drift	±0.01 °C/ °C
Input connections	2, 3, or 4 wires
Isolation-rated voltage	3000 V _{DC}
CMR @ 50/60 Hz	150 dB
NMR @ 50/60 Hz	100 dB
Bandwidth	4 Hz
Conversion rate	10 samples/sec.
Input impedance	2 MΩ
Watchdog timer	Yes
Power supply	+10 to +30 V _{DC} (non-regulated)
Power consumption	0.7 W

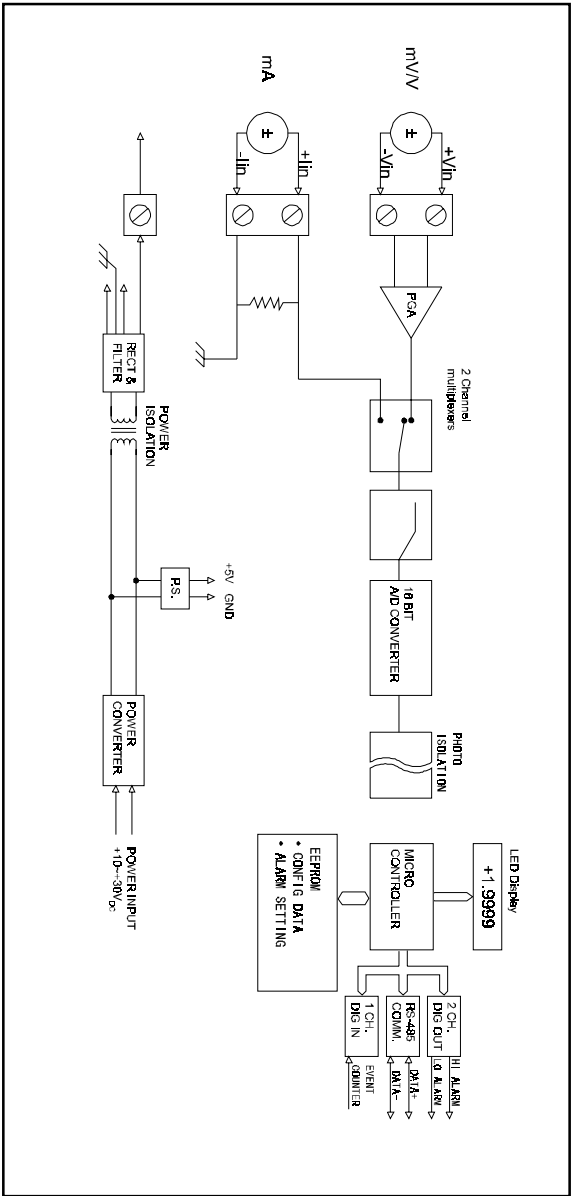
Figure A-4 ADAM-4013 Function Diagram



A.5 ADAM-4014D Analog Input Module with LED Display**Table A-7** *ADAM-4014D Specifications*

Input range	± 150 mV, ± 500 mV, ± 1 V, ± 5 V, ± 10 V and ± 20 mA
Output	RS-485 (2-wire)
Speed (bps)	1200, 2400, 4800, 9600, 19.2K, 38.4K
Maximum distance	4000 ft. (1200 m)
Isolation voltage	500V _{DC}
Sampling rate	10 samples/sec
Bandwidth	4 Hz
Accuracy	$\pm 0.05\%$ or better
Zero drift	± 6 μ V/ $^{\circ}$ C
Span drift	± 25 ppm / $^{\circ}$ C
CMR @ 50/60 Hz	150 dB
NMR @ 50/60 Hz	100 dB
Isolated loop power	+15 VDC @ 30 mA
Input impedance	40 K Ω
LED indicator	4½ -digit readout
Digital input	1 channel
logic level 0	+1 V max.
logic level 1	+3.5 to +30 V
pull up current	0.5 mA, 10 K resistor to +5 V
Event counter	
Max. input frequency	50 Hz
Min. pulse width	0.5 msec
Digital output	2 channels open collector to 30 V
sink current	30 mA max. load
power dissipation	300 mW
Watchdog timer	Yes
Power requirements	+10 to +30 V _{DC} (non-regulated)
Power consumption	1.8 W

Figure A-5 ADAM-4014D Function Diagram

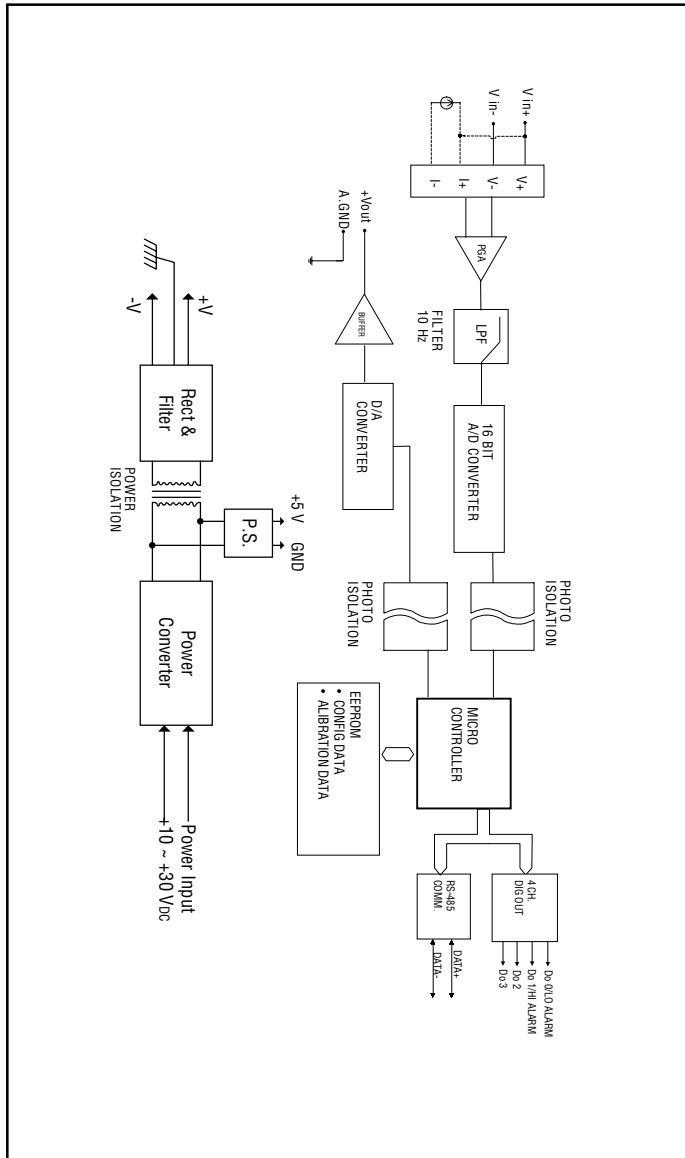


A.6 ADAM-4016 Strain Gauge Input Module

Table A-8 *ADAM-4016 Specifications*

Input range	± 15 mV, ± 50 mV, ± 100 mV, ± 500 mV and ± 20 mA
Output	RS-485 (2-wire)
Speed (bps)	1200, 2400, 4800, 9600, 19.2K, 38.4K
Maximum distance	4000 ft. (1200 m)
Isolation voltage	3000 V _{DC}
Sampling rate	10 samples/sec
Bandwidth	4 Hz
Accuracy	$\pm 0.05\%$ or better
Zero drift	± 6 μ V / °C
Span drift	± 25 ppm / °C
CMR @ 50/60 Hz	150 dB
NMR @ 50/60 Hz	100 dB
Analog output range	0~10 V
Drive current	30 mA
Isolation voltage	3000 V _{DC}
Accuracy	0.05% of FSR
Drift	± 50 ppm/ °C
Input impedance	2 M Ω
Digital output	4 channels open collector to 30 V
sink current	30 mA max. load
power dissipation	300 mW
Watchdog timer	Yes
Power requirements	+10 to +30 V _{DC} (non-regulated)
Power consumption	2.2 W

Figure A-6 ADAM-4016 Function Diagram

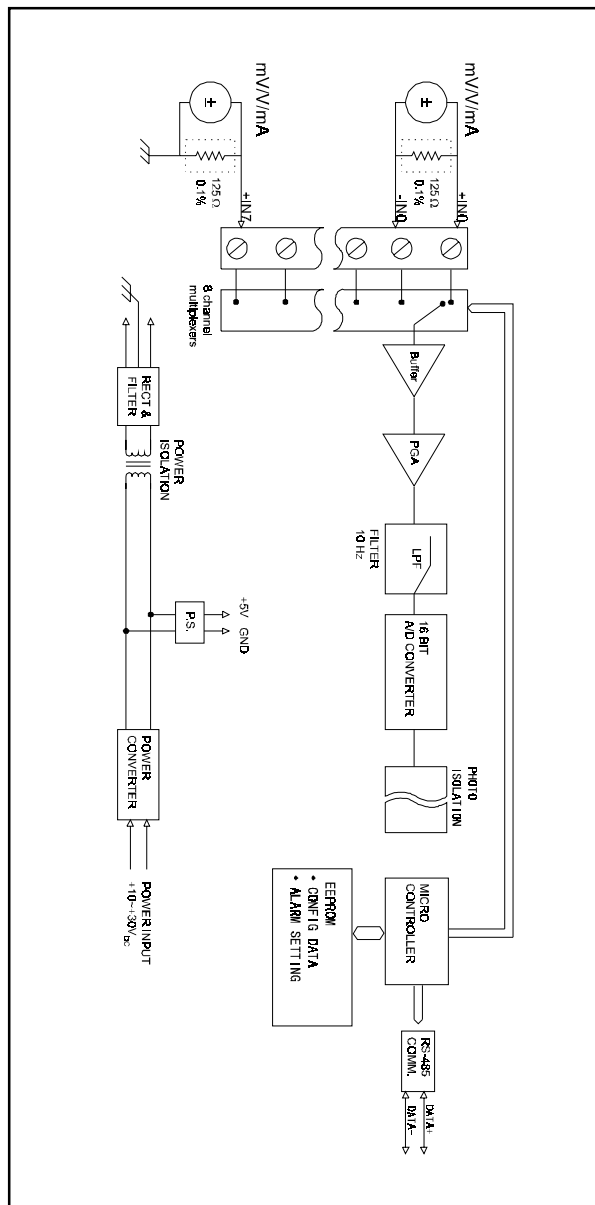


A.7 ADAM-4017 8-Channel Analog Input Module

Table A-9 *ADAM-4017 Specifications*

Analog input channels	Six differential Two single-ended
Input type	mV, V, and mA
Input range	± 150 mV, ± 500 mV, ± 1 V, ± 5 V, ± 10 V and ± 20 mA
Output speed (bps) maximum distance	RS-485 (2-wire) 1200, 2400, 4800, 9600, 19.2K, 38.4K 4000 ft. (1200 m)
Isolation voltage	3000 V _{DC}
Sampling rate	10 samples/sec(total)
Bandwidth	13.1 Hz
Accuracy	$\pm 0.1\%$ or better
Zero drift	± 6 μ V/ $^{\circ}$ C
Span drift	± 25 ppm / $^{\circ}$ C
CMR @ 50/60 Hz	92 dB
Input impedance	2 M Ω
Watchdog timer	Yes
Power requirements	+10 to +30 V _{DC} (non-regulated)
Power consumption	1.2 W

Figure A-7 ADAM-4017 Function Diagram



A.8 ADAM-4018 8-channel Analog Input Module

Table A-10 *ADAM-4018 Specifications*

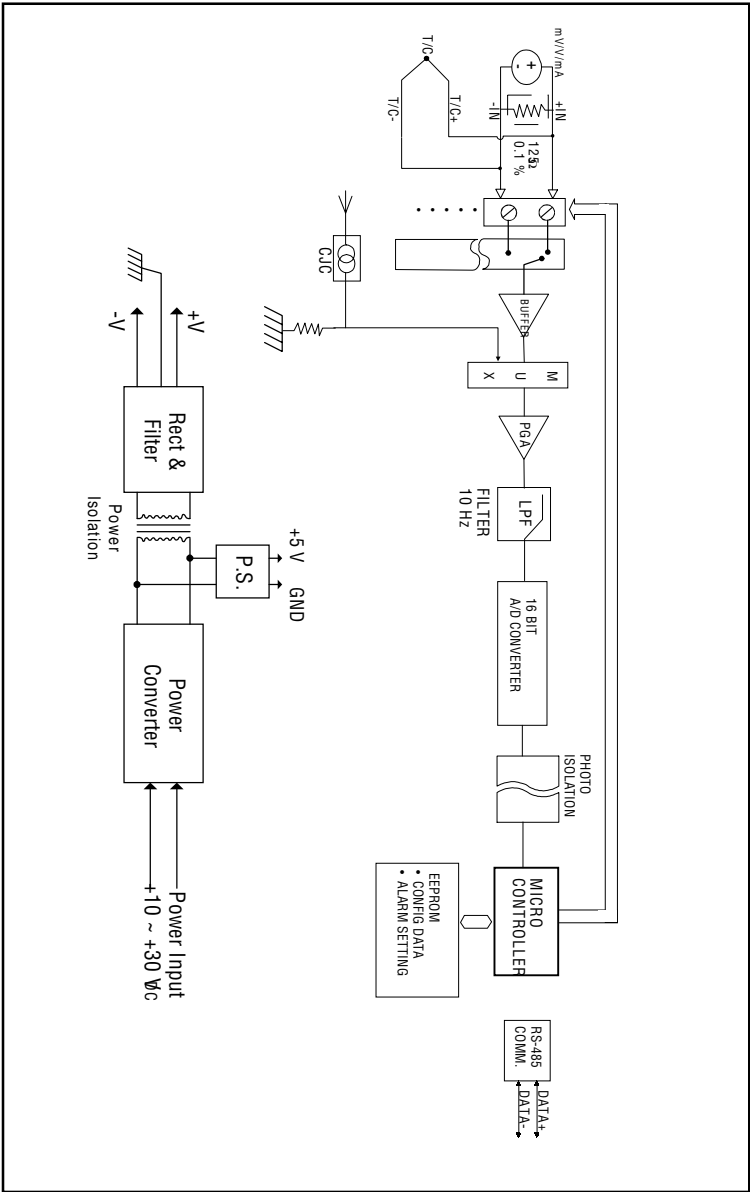
Analog input channels	Six differential Two single-ended
Input type	mV, V, and mA
Input range	J, K, T, E, R, S and B Thermocouple ± 15 mV, ± 50 mV, ± 100 mV, ± 500 mV, ± 1 V, ± 2.5 V, and ± 20 mA
Output speed (bps) maximum distance	RS-485 (2-wire) 1200, 2400, 4800, 9600, 19.2K, 38.4K 4000 ft. (1200 m)
Isolation voltage	3000 V _{DC}
Sampling rate	10 samples/sec(total)
Bandwidth	13.1 Hz
Accuracy	$\pm 0.1\%$ or better
Zero drift	$\pm 0.3 \mu\text{V} / ^\circ\text{C}$
Span drift	± 25 ppm / $^\circ\text{C}$
CMR @ 50/60 Hz	92 dB
Input impedance	1.8 M Ω
Watchdog timer	Yes
Power requirements	+10 to +30 V _{DC} (non-regulated)
Power consumption	0.8 W

Table A-11 ADAM-4018 Range Accuracy for Thermocouple

Input Range Code (Hex)	Input Range	Typical Accuracy	Maximum Error	Units
0E	J thermocouple 0 to 760 °C	±1.0	±1.5	°C
0F	K thermocouple 0 to 1000 °C	±1.0	±1.5	°C
10	T thermocouple -100 to 400 °C	±1.0	±1.5	°C
11	E thermocouple 0 to 1000 °C	±1.0	±1.5	°C
12	R thermocouple 500 to 1750 °C	±1.2	±2.5	°C
13	S thermocouple 500 to 1750 °C	±1.2	±2.5	°C
14	B thermocouple 500 to 1800 °C	±2.0	±3.0	°C

NOTE: Because the CJC sensor of ADAM-4018/4018M is located in the side of channel 0 to 4, the measurement will have the difference ± 1 °C between channel 0 ~ 4 and channel 5 ~ 7.

Figure A-8 ADAM-4018 Function Diagram



A.9 ADAM-4018M 8-channel Analog Input Data Logger

Table A-12 *ADAM-4018M Specifications*

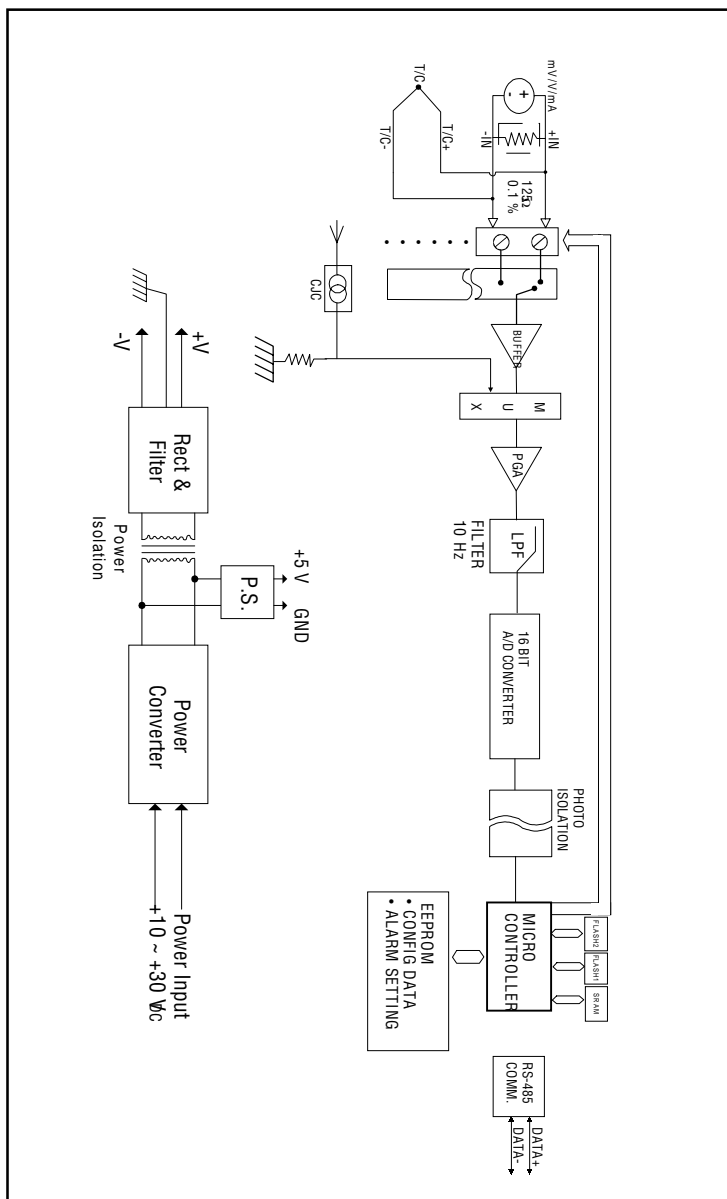
Analog input channels	Six differential Two single-ended
Input type	mV, V, and mA
Input range	J, K, T, E, R, S and B Thermocouple ± 15 mV, ± 50 mV, ± 100 mV, ± 500 mV, and ± 20 mA
Output	RS-485 (2-wire)
speed (bps)	1200, 2400, 4800, 9600, 19.2K, 38.4K
maximum distance	4000 ft. (1200 m)
Isolation voltage	500 V _{DC}
Sampling rate	10 samples/sec(total)
Bandwidth	13.1 Hz
Accuracy	$\pm 0.1\%$ or better
Zero drift	$\pm 0.3 \mu\text{V} / ^\circ\text{C}$
Span drift	± 25 ppm / $^\circ\text{C}$
CMR @ 50/60 Hz	92 dB min
Input impedance	1.8 M Ω
Storage capacity	128 KB Flash memory
Standard log	38,000 samples (total)
Event log	16,300 samples (total)
Mixed log	16,300 data samples and 9,300 event samples (total)
Storage type	Write to end of memory, or circular memory
Logging mode	Standard log, Event log or Mixed log
Sampling interval	2 sec. to 18 hours
Measurement duration	330 minutes to 20 years
Watchdog timer	Yes
Power requirements	+10 to +30 V _{DC} (non-regulated)
Power consumption	1.8 W

Table A-13 *ADAM-4018M Range Accuracy for Thermocouple*

Input Range Code (Hex)	Input Range	Typical Accuracy	Maximum Error	Units
0E	J thermocouple 0 to 760 °C	±1.0	±1.5	°C
0F	K thermocouple 0 to 1000 °C	±1.0	±1.5	°C
10	T thermocouple -100 to 400 °C	±1.0	±1.5	°C
11	E thermocouple 0 to 1000 °C	±1.0	±1.5	°C
12	R thermocouple 500 to 1750 °C	±1.2	±2.5	°C
13	S thermocouple 500 to 1750 °C	±1.2	±2.5	°C
14	B thermocouple 500 to 1800 °C	±2.0	±3.0	°C

NOTE: Because the CJC sensor of ADAM-4018/4018M is located in the side of channel 0 to 4, the measurement will have the difference ± 1 °C between channel 0 ~ 4 and channel 5 ~ 7.

Figure A-9 ADAM-4018M Function Diagram

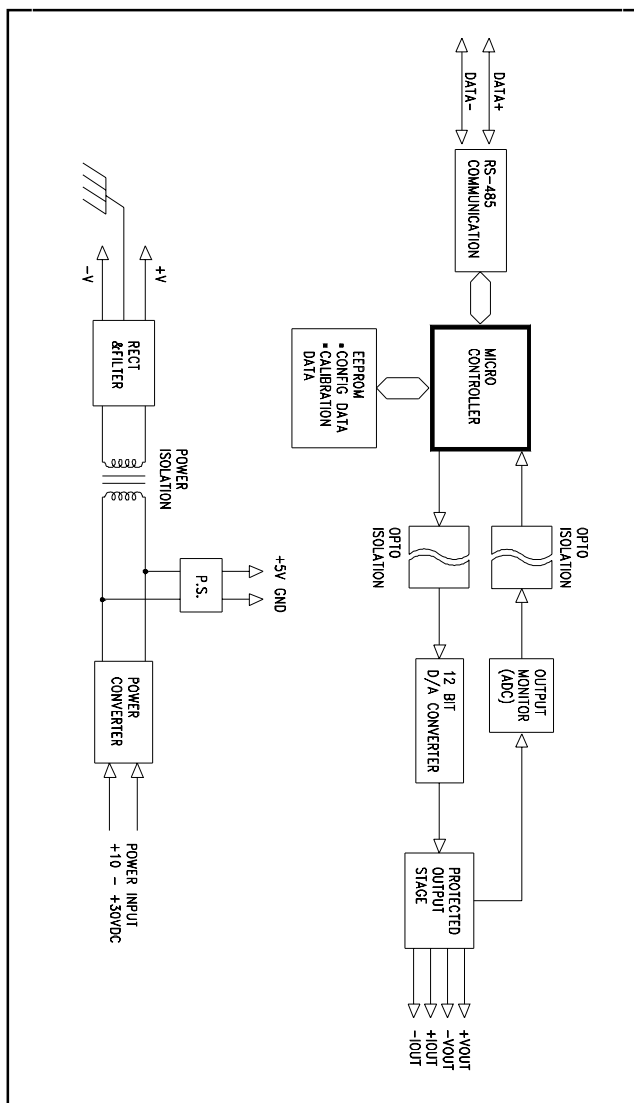


A.10 ADAM-4021 Analog Output Module

Table A-14 *ADAM-4021 Specifications*

Output range	mA, V
Input	RS-485 (2-wire)
speed (bps)	1200, 2400, 4800, 9600, 19.2K, 38.4K
maximum distance	4000 ft. (1200 m)
Accuracy	±0.1% of FSR for current output ±0.2% of FSR for voltage output
Readback accuracy	±0.1% of FSR
Zero drift	
voltage output	±30 μ V/ °C
current output	±0.2 μ A/ °C
Span temperature coefficient	±25 ppm/ °C
Isolation rated voltage	3000 V _{DC}
Programmable output slope	0.125 to 128.0 mA/s 0.0625 to 64 V/s
Current load resistor	0 to 500 Ω (source)
Bandwidth	100 samples per second
Output impedance	0.5 Ω
Watchdog timer	Yes
Power supply	+10 to +30 V _{DC} (non-regulated)
Power consumption	1.4 W

Figure A-10 ADAM-4021 Function Diagram

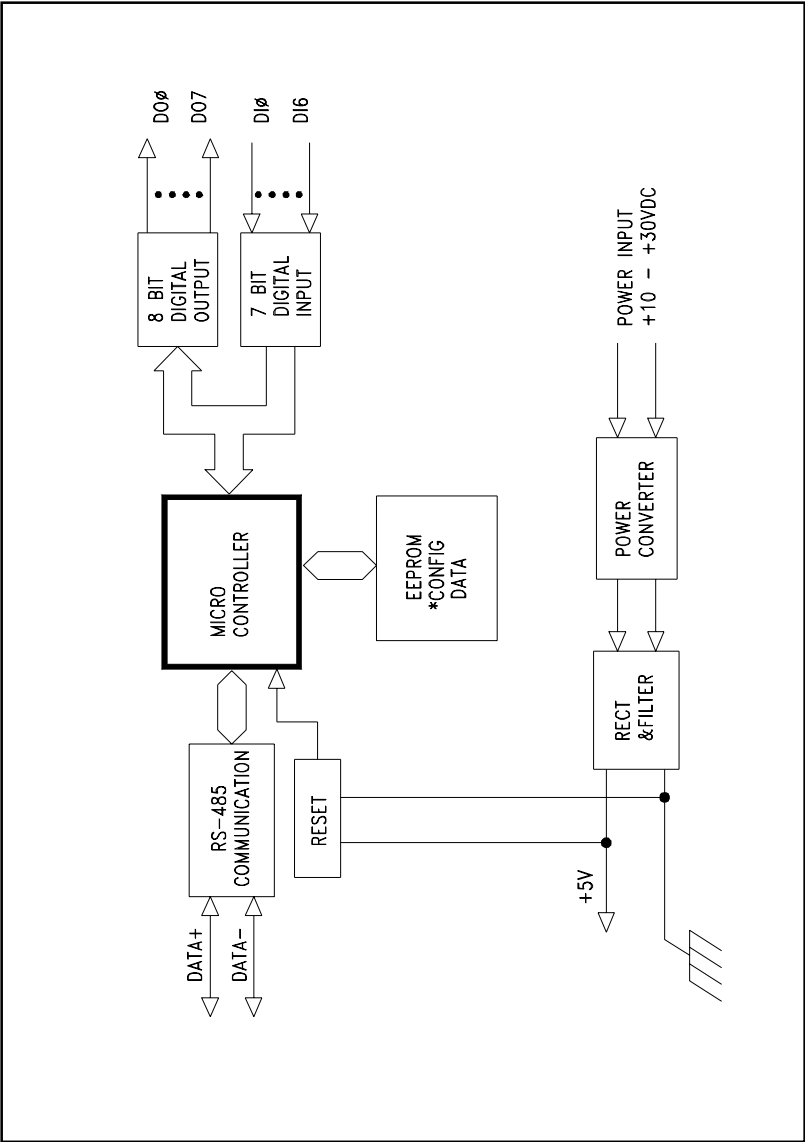


A.11 ADAM-4050 Digital I/O Module

Table A-15 *ADAM-4050 Specifications*

I/ O Channels	7 inputs 8 outputs
Input/Output speed (bps) maximum distance	RS-485 (2-wire) 1200, 2400, 4800, 9600, 19.2K, 38.4K 4000 ft. (1200 m)
Digital Output sink-current power dissipation	8-channel open collector to 30 V 30 mA 300 mW
Digital Input logic level 0 logic level 1 Pull-up current	7-channel +1 V max. +3.5 to +30 V 0.5 mA, 10K resistor to +5 V
Watchdog timer	Yes
Power supply	+10 to +30 V _{DC} (non-regulated)
Power consumption	0.4 W

Figure A-11 ADAM-4050 Function Diagram

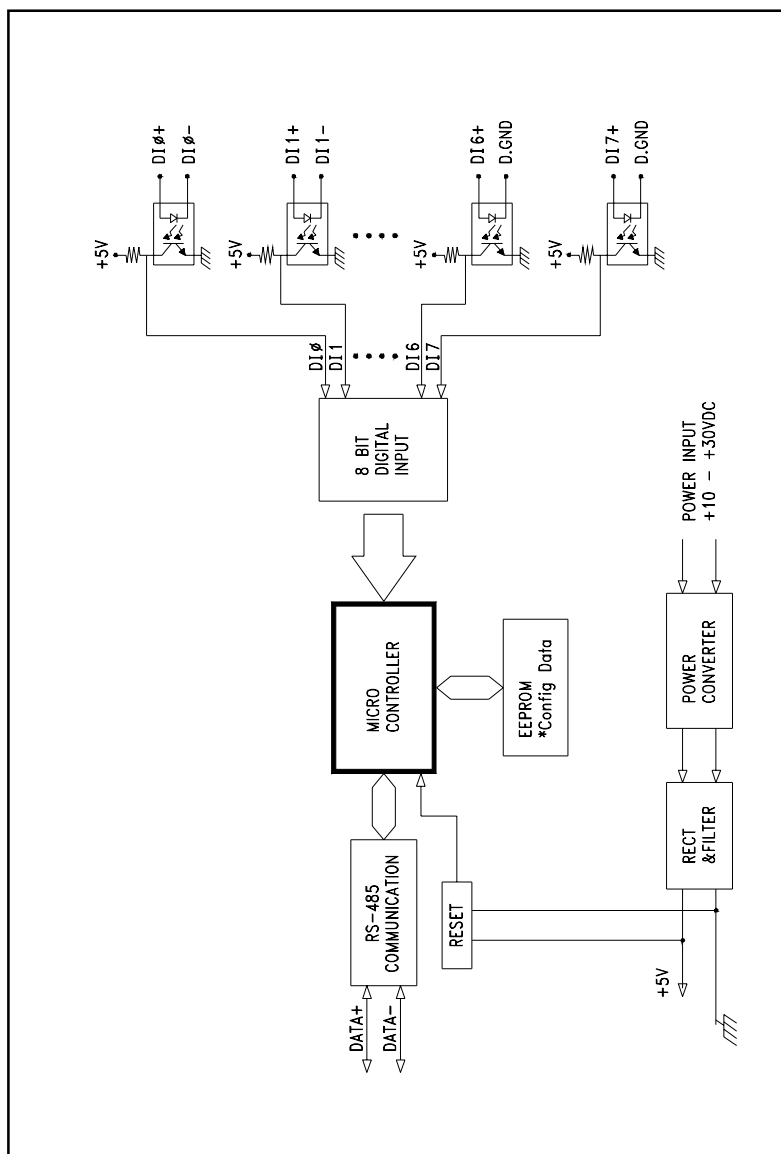


A.12 ADAM-4052 Isolated Digital Input Module

Table A-16 *ADAM-4052 Specifications*

I/ O channels	8 inputs (6 fully independent isolated channels, and 2 isolated channels with common ground)
Input/Output speed (bps) maximum distance	RS-485 (2-wire) 1200, 2400, 4800, 9600, 19.2K, 38.4K 4000 ft. (1200 m)
Digital input	logic level 0: +1V max. logic level 1: +3.5 to +30 V
Input resistance	3 k Ω @ 0.5 W
Isolation voltage	5000 V _{RMS}
Watchdog timer	Yes
Power supply	+10 to +30 V _{DC} (non-regulated)
Power consumption	0.4 W

Figure A-12 ADAM-4052 Function Diagram

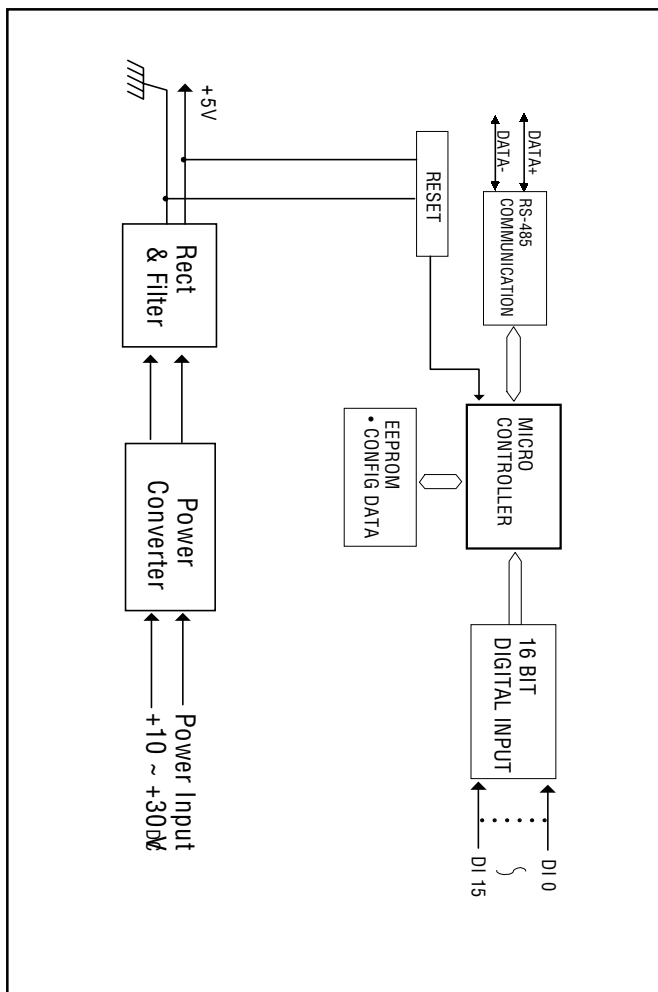


A.13 ADAM-4053 16-channel Digital Input Module

Table A-17 *ADAM-4053 Specifications*

I/ O channels	16 inputs
Input/Output speed (bps) maximum distance	RS-485 (2-wire) 1200, 2400, 4800, 9600, 19.2K, 38.4K 4000 ft. (1200 m)
Digital Input	Dry Contact: logic level 0: close to GND logic level 1: open Wet Contact: logic level 0: +2V max logic level 1: +4 V to +30 V
Effective distance (dry contact only)	500 m max.
Watchdog timer	Yes
Power supply	+10 to +30 V _{DC} (non-regulated)
Power consumption	1.0 W

Figure A-13 ADAM-4053 Function Diagram

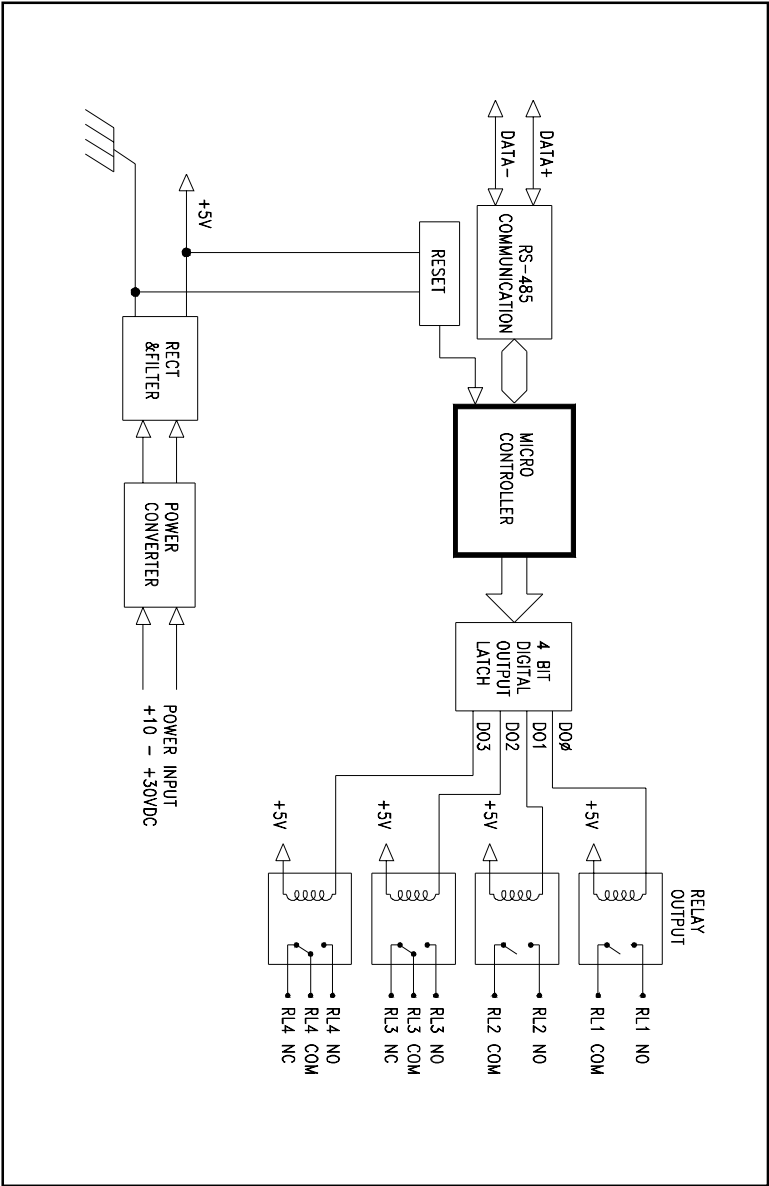


A.14 ADAM-4060 Relay Output Module

Table A-18 *ADAM-4060 Specifications*

Digital output	4-channel relay, 2 form A, 2 form C
Input	RS-485 (2-wire)
speed (bps)	1200, 2400, 4800, 9600, 19.2K, 38.4K
maximum distance	4000 ft. (1200 m)
Contact rating	AC: 0.6 A/125 V; 0.3 A/250 V DC: 2 A/30 V; 0.6 A/ 110 V
Breakdown voltage	500 V _{AC} (50/60 Hz)
Relay on time (typical)	3 msec
Relay off time (typical)	1 msec
Total switching time	10 msec
Insulation resistance	1000 M Ω minimum at 500 V _{DC}
Watchdog timer	Yes
Power supply	+10 to +30 V _{DC} (non-regulated)
Power consumption	0.8 W

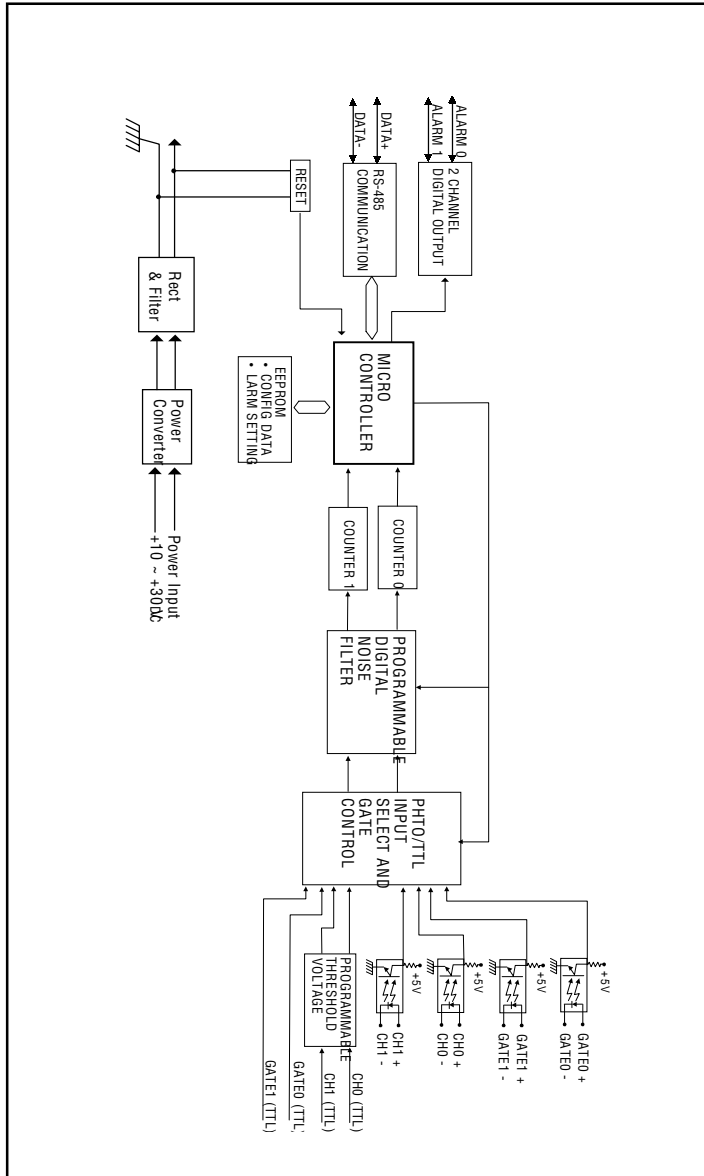
Figure A-14 ADAM-4060 Function Diagram



A.15 ADAM-4080 Counter/Frequency Input Module**Table A-19** *ADAM-4080 Specifications*

Input channels	Two independent 32-bit counters
Input frequency	50 kHz max.
Input mode	Isolated or non-isolated
Isolation input level	
Logic level 0	+1 V max
Logical level 1	+3.5 V to +30 V
Isolation voltage	2500 V _{RMS}
Non-isolation input level	Programmable threshold
Logic level 0	0 to +5 V (default = 0.8 V)
Logic level 1	0 to +5 V (default = 2.4 V)
Input pulse width	>10 μ sec
Maximum count	4,294,967,295 (32 bits)
Programmable digital noise filter	2 μ sec to 65 msec
Alarming	Alarm comparators on each counter
Preset type	Absolute or relative
Frequency measurement	
Range	5 Hz to 50 KHz
Programmable built-in gate time	1.0/0.1 sec
Digital output channels	2 channels open collector to 30 V
Sink current	30 mA max. load
Power dissipation	300 mW
Watchdog timer	Yes
Power requirements	+10 to +30 V _{DC} (non-regulated)
Power consumption	2.0 W

Figure A-15 ADAM-4080 Function Diagram



A.16 ADAM-4080D Counter/Frequency Input Module with LED Display

Table A-20 *ADAM-4080D Specifications*

Input channels	Two independent 32-bit counters
Input frequency	50 kHz max.
Input mode	Isolated or non-isolated
Isolation input level	
Logic level 0	+1 V max
Logical level 1	+3.5 V to +30 V
Isolation voltage	2500 V _{RMS}
Non-isolation input level	Programmable threshold
Logic level 0	0 to +5 V (default = 0.8 V)
Logic level 1	0 to +5 V (default = 2.4 V)
Input pulse width	>10 μ sec
Maximum count	4,294,967,295 (32 bits)
Programmable digital noise filter	2 μ sec to 65 msec
Alarming	High and Low comparators on counter 1
Frequency Measurement	
Range	5 Hz to 50 KHz
Programmable built-in gate time	1.0/0.1 sec
Display	LED indicator 5-digit readout; CH 0 or CH 1 (programmable)
Digital Output Channels	2 channels Open collector to 30 V
Sink current	30 mA max. load
Power dissipation	300 mW
Watchdog timer	Yes
Power requirements	+10 to +30 V _{DC} (non-regulated)
Power consumption	2.0 W

Figure A-16 ADAM-4080D Function Diagram

