



ADI40 - 40 Pin Analogue Interface Unit

Analogue Inputs and Outputs

Monitor Temperature

Analyze Thermocouple signals and DC Voltage

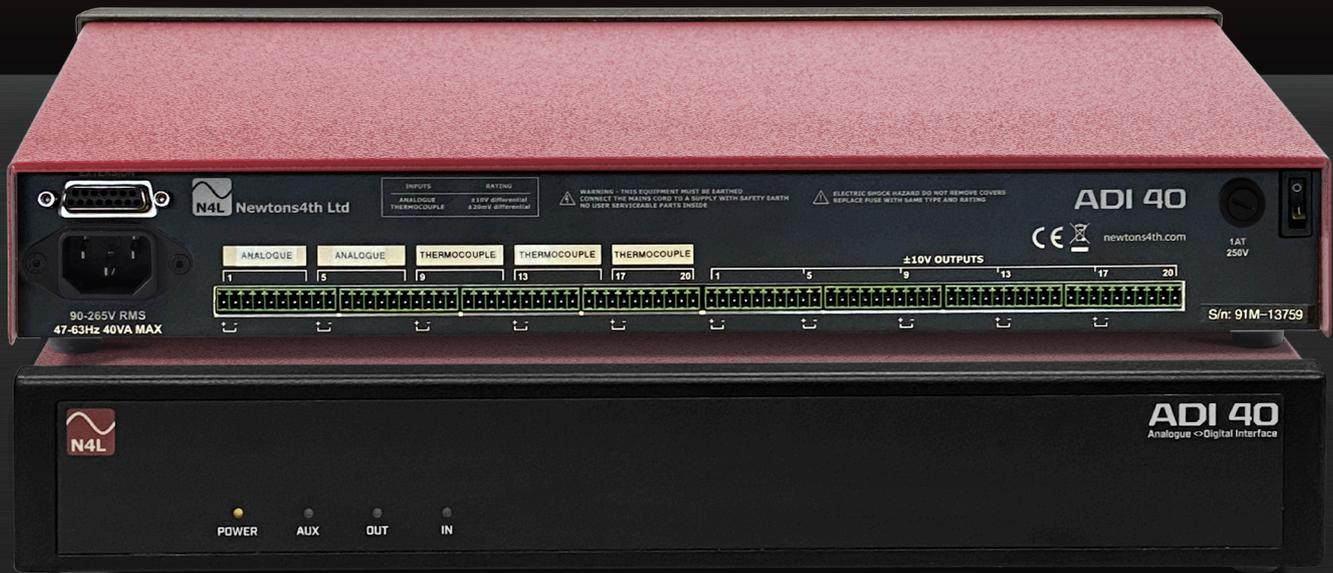
Output DC voltage levels proportional to measured parameters

Typical Applications

Data Logging External Sensors

Output to Chart Recorders

DC Signal Data Acquisition

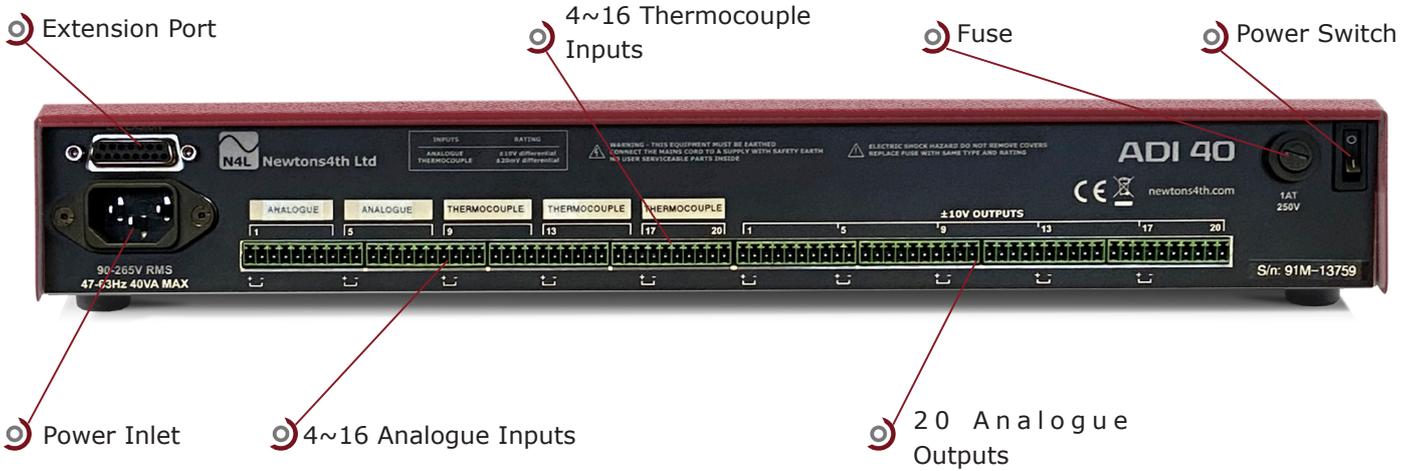


Product Overview

Inputs (20 Total)	Up to 16 DC Inputs +/- 10V Differential, Up to 16 Thermocouple inputs
Outputs (20 Total)	20 Outputs +/- 10V Differential
Thermocouple Inputs	Up to 16 Thermocouple Inputs (J or K Type - Factory Set)
Interface	Direct Digital Interface with PPA35/PPA45/5500 Power Analyzer
Data Logging	All Input Parameters Available Via "MULTILOG" Command
Chart Recording	Power Analyzer + ADI40 parameters available on output Pins
Measurement Speed	10ms
Output Signal Slew Rate	0.1V/us
Versatile	Log data from various sensors including speed, torque and pressure
Compact Design	Rack mountable - Ideal for system integration

■ Product Overview **ADI40**

The ADI40 Analogue<>Digital Interface unit is a powerful multi-channel measurement system for use in conjunction with the PPA3500, PPA4500 and PPA5500 Power Analyzers. The ADI40 offers a seamless interface between the Power Analyzer, Analogue Signals and Software. The ADI40 also interfaces with chart recorders via 20 DC output channels, any of the internally computed/logged measurements can be output as a DC voltage level and scaled accordingly. The 20 inputs can be configured as 4, 8, 12 or 16 thermocouples and 16, 12, 8 or 4 DC inputs respectively upon order.



■ Key Technical Details **ADI40**

Featuring a sample rate of 2ks/s, it is possible to obtain data rates of 10ms with all input/outputs active. The Power Analyzer communicates with the ADI40 via the Extension Port on the rear of the unit. Digital data is sent to the Power Analyzer via the extension port and is available via the "Multilog" command, communication to the Power Analyzer is made via USB, LAN, RS232 or GPIB. The Input impedance of the DC Input Channels is 1MΩ between positive and negative as well as 1MΩ to ground, providing fully differential inputs. All 20 outputs are fully differential, featuring 12 bit resolution, an output impedance of 10Ω and the ability to drive up to 50mA of current.

■ Example Configuration **ADI40**

An example configuration is shown below, a pressure transducer is connected to the ADI40-4 (4 Thermocouple inputs) which is in turn connected to the PPA5530 via the extension port. The commands required to query CH1 Input of the ADI40 are also illustrated.

Configuring Inputs



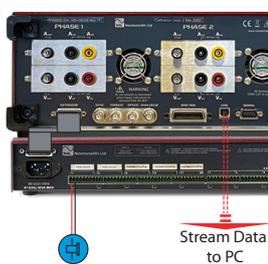
Send Command via PPA5500 to configure ADI40 Eg: <code>analog,1</code>	Retrieve data via PPA5500 as a Voltage Eg: Command : <code>multil,1,1,1? +8.9432</code>	Convert Voltage to desired parameter in software Eg: <code>1psi/V = 8.9432psi</code>
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Configuring Outputs



Send Command via PPA5500 to configure ADI40 Output CH1 to Vrms PH1 Eg: <code>xxxx,xxx</code>	Connect Chart Recorder to ADI40 CH1 Output	Perform Measurement, ADI40 output = <code>xxV/Vrms</code>
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Retrieving Data Via Communication Port

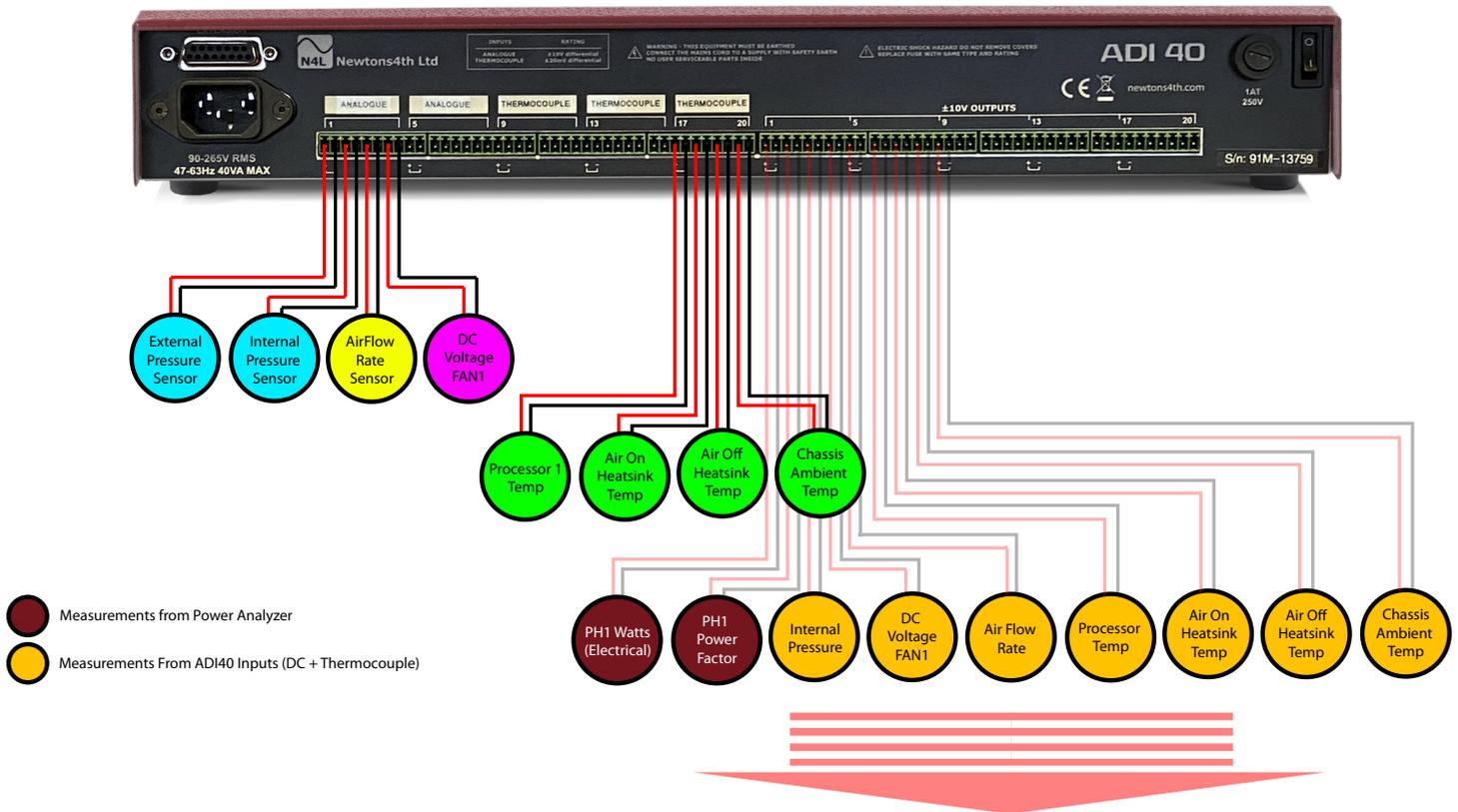


Send Command via PPA5500 to configure ADI40 Input using MULTIL command Eg: <code>analog,1</code>	Query PPA+ADI40 using MULTIL command or N4L PPA LoG Software Eg: <code>MULTIL,1,1,1</code>	Export Data from PPA LoG directly to Excel
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■ Example Application : Desktop PC ADI40

The schematic below illustrates how the ADI40-4 can be used to analyse various signal types. The ADI40 is used to monitor the performance of a desktop PC, where Internal Chassis Pressure, External Atmospheric Pressure, Airflow through the ventilation holes in the PC case and DC Fan Voltage are monitored via the ADI40 Inputs. The Thermocouple inputs are used to monitor various components including the main CPU temperature, Air On + Air Off Heatsink temperatures as well as Chassis Ambient temperature.

ADI40 Typical Application : Desktop PC Performance Analysis



DC Output Signals Sent to Chart Recorder, updated every 100ms (Maximum Update Rate 10ms)

■ Output to Chart Recorders ADI40

All Data collected, including the data recorded by the Power Analyzer (PPA3500/PPA4500/PPA5500) such as Watts, VA, Vrms, Irms, Power Factor etc, are available via the communication port (LAN, USB, RS232 or GPIB) or can be mapped to any of the DC Output Channels.

In the Desktop PC application above, measurements from the Power Analyzer are combined with measurements from the ADI40 and sent to a chart recorder via Output Channels 1 ~ 9. Up to 20 parameters can be mapped to the analogue outputs with update rates down to 10ms. The ADI40 offers the engineer a central measurement system combining accurate mechanical and electrical analysis.

■ Product Summary ADI40

The ADI40 can be used in many applications, from home electronics to the aerospace industry and defence. It supplements the N4L Precision Power Analyzer range and offers great versatility. The simple command structure and convenient connection method enable the engineer to reduce installation and configuration times without compromising flexibility. Inputs are differential with fast response times to transient events of the measured parameters, enabling analysis of rapidly changing conditions such as compressor start sequences where speed, pressure and temperature change quickly.

Product Compatibility

Power analyzer	ADI40
PPA5500	○
PPA4500	○
PPA3500	○
PPA1500	—
PPA500	—

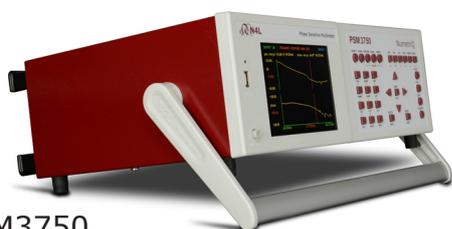
— Not Compatible ○ Compatible

SPECIFICATION

		ADI40		
Inputs				
		Model	Thermocouples	DC Inputs
No. of Inputs		ADI40-4	4	16
		ADI40-8	8	12
		ADI40-12	12	8
		ADI40-16	16	4
Thermocouple Types supported	Type J or Type K - Factory set			
Input Voltage Range (CH 1 ~ 16)	Bipolar +/- 10V			
Input Thermocouple Range (* ¹ Factory set option)	+/- 200°C with 0.1°C resolution standard or +/- 500°C with 0.25°C resolution (* ¹)			
Sampling rate	2ks/s			
Input Impedance	1MΩ			
Input Impedance to Ground	1MΩ			
Update data rate	minimum 10ms			
Accuracy	Voltage +/- 0.1% FS Temperature +/- 1°C * ²			
Resolution	12 bit			
Maximum Common Mode Voltage	-1V ~ +14V			
Maximum Input Voltage	+/- 30V			
Outputs				
No. of Outputs (DC)	20			
Output Voltage Range	Bipolar +/- 10V			
Output Slew Rate	0.1V/uS			
Maximum Source Current	50mA			
Output Impedance	10Ω			
Accuracy	0.1% FS			
Resolution	12 bit			
General				
Operating Coinditions	5 to 40°C Ambient Temperature (or air intake temperature when rack mounted) 20-90% Relative Humidity non condensing * ² Junction compensation ≤ 3°C across inputs subject to ambient stability			
Weight	Approximately 3.5kg			
Size	Size H: 62.37mm, W: 395mm, L: 280mm			
Warranty	3 Years			
Power Supply	90 ~ 265Vrms, 50 ~ 60Hz, 40VAmx			

All specifications at 23°C ± 5°C . These specifications are quoted in good faith but Newtons4th Ltd reserves the right to amend any specification at any time without notice

The N4L product range also includes Power, Frequency Response and Impedance Analyzers, Selective Level Meters and Laboratory Power Amplifiers



PSM3750
10μHz ~ 50MHz Frequency Response Analysis



PPA5500
10mHz ~ 2MHz Power Analysis



Newtons4th

Newtons4th Ltd (abbreviated to N4L) was established in 1997 to design, manufacture and support innovative electronic equipment to a world-wide market, specialising in sophisticated test equipment particularly related to phase measurement. The company was founded on the principle of using the latest technology and sophisticated analysis techniques in order to provide our customers with accurate, easy to use instruments at a lower price than has been traditionally associated with these types of measurements. Flexibility in our products and an attitude to providing the solutions that our customers really want has allowed us to develop many innovative functions in our ever increasing product range.

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