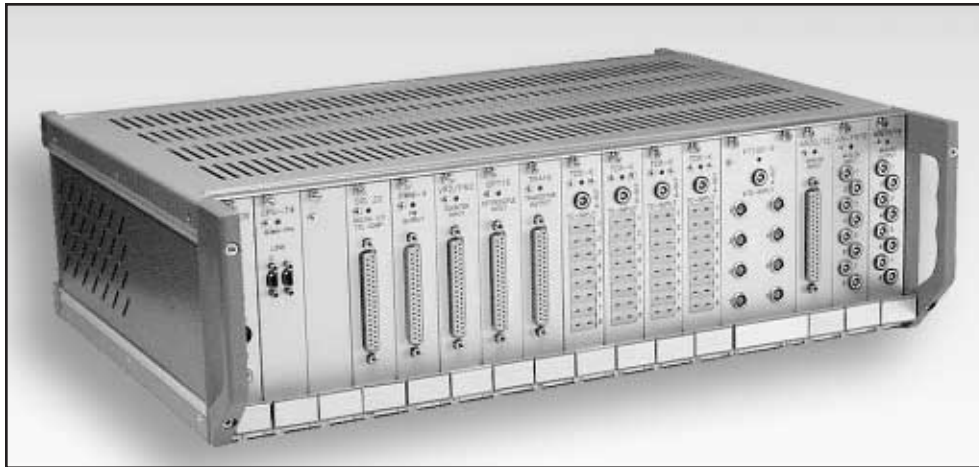


ADwin-Pro

Industrial External
19-inch System for
Control and Data Acquisition



FEATURES

- Control of several processes in real-time under Windows
- Modular and flexible design
- Analog input and output modules
- Analog inputs with parallel ADCs
- Digital input and output modules
- Counter and PWM-modules
- Filters
- Isolation amplifier
- Amplifiers for thermocouples and RTDs
- CAN-bus; Profibus
- RS-232, RS-485
- Boot loader for stand alone applications
- USB
- Ethernet
- SHARC DSP gives real-time capabilities
- ADbasic real-time development tool
- All drivers included

Functional Description

ADwin-PRO is an industrial, external 19-inch system for control and data acquisition. It is a modular, expandable system for fast data acquisition and control in real time under Windows. It is particularly suitable for complex, time-critical industrial applications.

As with all ADwin systems, the processor module with a SHARC DSP by Analog Devices is the core element. It controls acquisition of measurement data, online processing, and output of new values. A wide range of I/O modules, enclosures, microprocessors, and memory sizes allow customization of the system for universal use, especially in industrial applications.

- Like ADwin-Gold, a fast (10Mbit/s) link connects the ADwin-PRO system to a PC or notebook. A PC board or a PCMCIA adapter can be used for interfacing. Optionally, it is possible to connect an ADwin-PRO system via USB or Ethernet.
- The program loading and monitoring module Pro-FlashBoot allows operation without a PC.

The system's modular design allows up to 480 analog inputs, 120 analog outputs, 480 digital I/O lines, etc. Each system can be equipped with up to four microprocessors for data acquisition and on-line evaluation. Memory expansion is available for acquisition of large amounts of data.

CE Compliance

Electromagnetic compatibility has played a major role in the design of ADwin-PRO. Each I/O module complies with the CE standard. Therefore, an ADwin-PRO system can be reconfigured retroactively, and the overall system will always comply with the CE standard.

Software

Like all ADwin products, the real-time development tool ADbasic is used to program ADwin-PRO. Windows drivers are available for TestPoint, LabVIEW, DIAdem, Visual Basic, C/C++, Delphi, Matlab, etc.

The ADwin-PRO Utility Software, which is included with every ADwin-PRO system, is an interactive configuration and test program that runs in Windows 95/98/NT/2000. With this program, it is

QUESTIONS?

1-800-552-1115 (U.S. only)

Call toll free for technical assistance, product support or ordering information, or visit our website at www.keithley.com.

ADwin-Pro

**Industrial External
19-inch System for
Control and Data Acquisition**

easy to check the address settings and functionality of each module in the ADwin-PRO system. This utility also shows every module that is installed in the system by module type, function, and address. Each CPU module (up to 4) in an ADwin-PRO system can handle up to 15 I/O modules of each type.

Options and Accessories for ADwin-PRO

ADwin-PRO Enclosure

The ADwin-PRO enclosure is 19" wide and 5¼" high and will fit into a 19" system rack. It has a 60W power supply (115/230VAC at 50/60Hz). The power supply is a series regulator type. The ADwin-PRO enclosure contains a 16-slot backplane which connects the processor module with the ADwin-PRO I/O modules.

ADwin-PRO-DC Enclosure

The ADwin-PRO-DC enclosure is the same as the ADwin-PRO enclosure except that it contains a 10–35VDC power supply.

ADwin-PRO-Light

The ADwin-PRO-Light enclosure is 9" wide and 5¼" high. It has a 30W power supply (115/230VAC at 50/60Hz). The ADwin-PRO-Light enclosure contains a 7-slot backplane which connects the processor module with the ADwin-PRO I/O modules.

ADwin-PRO-mini

The ADwin-PRO-mini enclosure has four slots for ADwin-PRO modules and a processor module. The modules need an external regulated power supply (5V/3A max).

ADwin-PRO-mini-2

The ADwin-PRO-mini-2 is the same as the ADwin-PRO-mini except it needs a different power supply (10-18V DC).

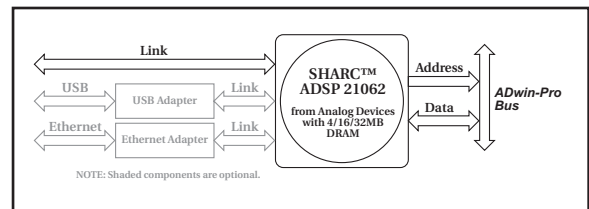
ADwin-PRO-mini-3

The ADwin-PRO-mini-3 is the same as the ADwin-PRO-mini except it needs a different power supply (20–35V DC).

CPU Modules

All ADwin-PRO systems have their own microprocessor, local memory and a variety of inputs and outputs. The SHARC DSP (digital signal processor) is from Analog Devices. This processor handles system management, data acquisition, on-line processing, and control of outputs. Using a dedicated processor, processing of each measurement can occur immediately after acquisition. The real-time development tool ADbasic allows programming of mathematical operations and functions, which are executed on the DSP immediately after each sampling step.

The ADwin-PRO processor module also handles the communication between the ADwin system and a PC or a notebook. For this purpose the processor module is equipped with a serial link (10Mbit/s). Linking to the PC is done with a PC plug-in board (ADlink) or with a PCMCIA adapter (ADpcmcia) for notebook computers. Distances of up to 20m are supported, the included cable has a length of 2m. Another ADwin-PRO to PC or notebook connection can be realized via USB or Ethernet.



Processor Modules	PRO-CPU-T4	PRO-CPU-T9
Processor	T400	ADSP21062
Type	RISC	DSP
Float / Integer	- / Yes	Yes / Yes
Bits	32	32
Clock	20MHz	40MHz
Performance for calculations: PRO-CPU-T9 approx. 20x faster than PRO-CPU-T4 because of the different CPU structure		
RAM	1MB	4MB
RAM optional	4MB (PRO-MEM-t4-4M)	16MB (PRO-MEM-t9-16M), 32MB (PRO-MEM-t4-8M) (PRO-MEM-t9-32M)

PRO-USB*

To run an ADwin-PRO system via an USB interface, use the PRO-USB module. This module converts the link interface to a standard USB interface. PRO-USB supports standard USB functionality such as hot plug and play. The maximum cable length is up to 5m (USB specification, expandable with hubs). The USB interface can be used under Windows 98 and 2000, also in the OSR2 version of Windows 95 (with USB supply pack).

All ADwin systems support a USB driver. Software written for USB can also be used for the standard link adapter (ADlink) and vice versa. The driver converts the communication flow automatically. There is absolutely no need to adapt existing PC programs.

QUESTIONS?

1-800-552-1115 (U.S. only)

Call toll free for technical assistance, product support or ordering information, or visit our website at www.keithley.com.

ADwin-Pro

Industrial External
19-inch System for
Control and Data Acquisition

PRO-ETHERNET*

To run an ADwin-PRO system via Ethernet (TCP/IP protocol), use the PRO-ETHERNET module. The Ethernet interface can be used with all network devices which support a TCP/IP protocol, such as Windows PCs, MACs, Linux PCs, workstations, etc.

PC and PCMCIA Link Adapter

The ADwin-Pro system boards require the use of either ADlink or ADpcmcia link adapters. A single PC can control different external ADwin-Pro systems at the same time.

- ADlink: 2 Link channels 10Mbit/s
- ADpcmcia: 1 Link channel 10Mbit/s
- Differential TTL

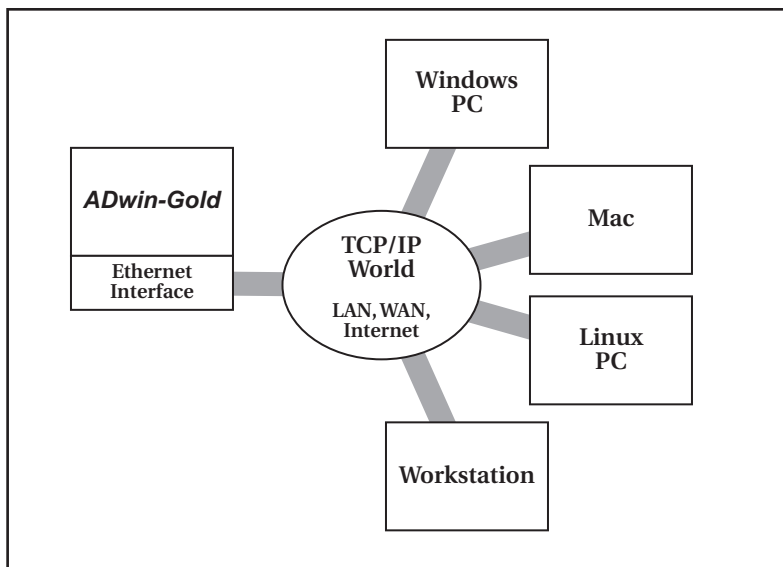
- ADlink** PC (ISA) link adapter board for connecting up to 2 ADwin boards, 2m cable included
- ADpcmcia** Link adapter board for connecting a notebook, 2m cable included
- Pro-Link-5** Length of the link adapter cable: 5m
- Pro-Link-10** Length of the link adapter cable: 10m
- Pro-Link-15** Length of the link adapter cable: 15m
- Pro-Link-20** Length of the link adapter cable: 20m

Lemo Cable Sets for ADwin PRO Systems

SET	COUNT	DIMENSION	CONNECTOR
Pro-CS-1	4 cables	200mm (7.8")	male LEMO
	4 cables	400 mm (15.7")	male LEMO
Pro-CS-2	4 cables	400mm (15.7")	male LEMO
	4 cables	800mm (31.5")	male LEMO
Pro-CS-3	4 cables	1000mm (39.4")	male LEMO
	4 cables	1500mm (59")	male LEMO
Pro-CS-4	4 cables	5000mm (196.8")	male LEMO
Pro-CS-5	8 cables	400mm (15.7")	male LEMO
Pro-CS-6	8 cables	1000mm (39.4")	male LEMO
Pro-CS-7	8 cables	2000mm (79.2")	male LEMO

Lemo Adapter Sets for ADwin PRO Systems

SETS	TYPE	DESCRIPTION
Pro-AS-1	4 adapters	LEMO socket to BNC connector
Pro-AS-2	4 adapters	LEMO connector to BNC connector
Pro-AS-3	4 T pieces	1 LEMO connector, 2 LEMO adapter
Pro-AS-4	4 adapters	LEMO connector to LEMO-connector
Pro-AS-5	4 50Ω termination	LEMO socket
Pro-AS-6	4 adapter cables	LEMO connector ↔ cable (100mm) ↔ BNC socket
Pro-AS-7	4 adapter cables	LEMO connector ↔ cable (1000mm) ↔ BNC socket
Pro-AS-8	4 adapter cables	LEMO connector ↔ cable (2000mm) ↔ BNC socket



Analog Input Modules

Pro-AIn-8/12

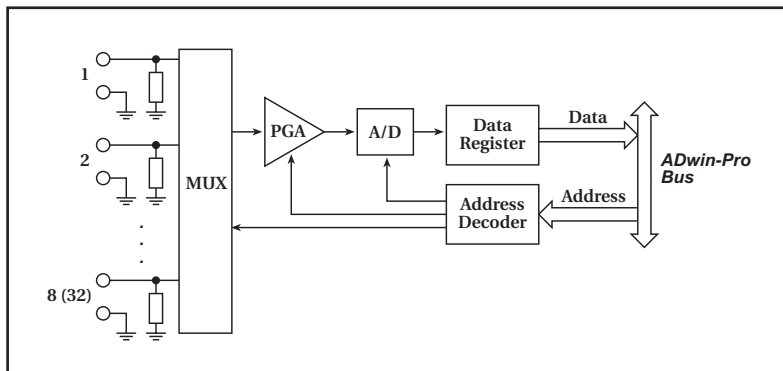
The analog input module Pro-AIn-8/12 has 8 multiplexed differential inputs, a programmable amplifier (PGA), and one 12-bit ADC. The inputs are equipped with shielded LEMO sockets (CAMAC European norm). A D-type version is also available.

Pro-AIn-32/12

The analog input module Pro-AIn-32/12 is equipped with a 12-bit ADC and a programmable amplifier. It has 32 single-ended or 16 differential inputs (software selectable). The inputs are connected to a 37-pin D-type socket.

Pro-AIn-8/16

The analog input module Pro-AIn-8/16 has 8 multiplexed differential inputs and one 16-bit ADC. The inputs are equipped with shielded LEMO sockets (CAMAC European norm). A D-type version is available.



Block diagram of multiplexed analog input modules

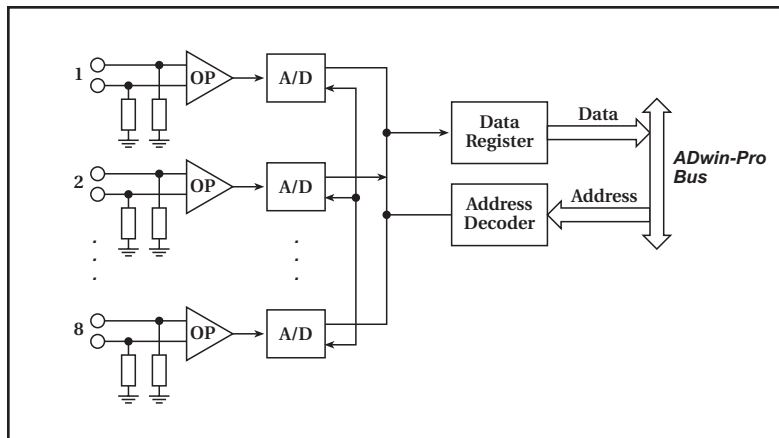
QUESTIONS?

1-800-552-1115 (U.S. only)

Call toll free for technical assistance, product support or ordering information, or visit our website at www.keithley.com.

ADwin-Pro

**Industrial External
19-inch System for
Control and Data Acquisition**



Block diagram of Pro-AIn-F-8/16 and Pro-AIn-F-8/12 analog input modules

**Pro-AIn-F-4/16, Pro-AIn-F-8/16, Pro-AIn-F-4/12,
Pro-AIn-F-8/12**

The analog input modules Pro-AIn-F-4/16 and Pro-AIn-F-8/16 provide 4 or 8 parallel 16-bit ADCs with differential inputs. The analog input modules Pro-AIn-F-4/12 and Pro-AIn-F-8/12 provide 4 or 8 parallel 12-bit ADCs with differential inputs.

On all analog input modules of this type, it is possible to start the conversion with all channels synchronized or at different channels individually.

In the standard version, the inputs are equipped with shielded LEMO sockets (CAMAC European norm). As an option these modules are also available with D-type inputs.

Module	Pro-AIn-8/12-RB	Pro-AIn-32/12-RB	Pro-AIn-8/16-RB	Pro-AIn-F-4/16	Pro-AIn-F-8/16	Pro-AIn-F-4/12	Pro-AIn-F-8/12
Input Channels	8	16 diff / 32 SE	8	4	8	4	8
No. of ADC	1	1	1	4	8	4	8
Resolution	12	12	16	16	16	12	12
ADC Conversion Time	0.8µs	0.8µs	10µs	10µs	10µs	0.8µs	0.8µs
Voltage Range	±10V	±10V	±10V	±10V	±10V	±10V	±10V
Gain	1, 2, 4, 8	1, 2, 4, 8	1, 2, 4, 8	1	1	1	1
Input Type	Diff and SE	Diff and SE	Diff and SE	Diff and SE	Diff and SE	Diff and SE	Diff and SE
Accuracy (for PGA =1)							
Typ. integral nonlinearity	±1	±1	±2	±2	±2	±1	±1
Typ. differential nonlinearity	±1	±1	±2	±2	±2	±1	±1
Standard Connector	8 Lemo	37 pin D-type	8 Lemo	4 Lemo	8 Lemo	4 Lemo	8 Lemo
Order No. for	Pro-AIn-	Pro-AIn-	Pro-AIn-	Pro-AIn-	Pro-AIn-	Pro-AIn-	Pro-AIn-
D-type version	8/12-RD	32/12-RB	8/16-RD	F-4/16-D	F-8/16-D	F-4/12-D	F-8/12-D

INPUT RESISTANCE: 100kΩ.

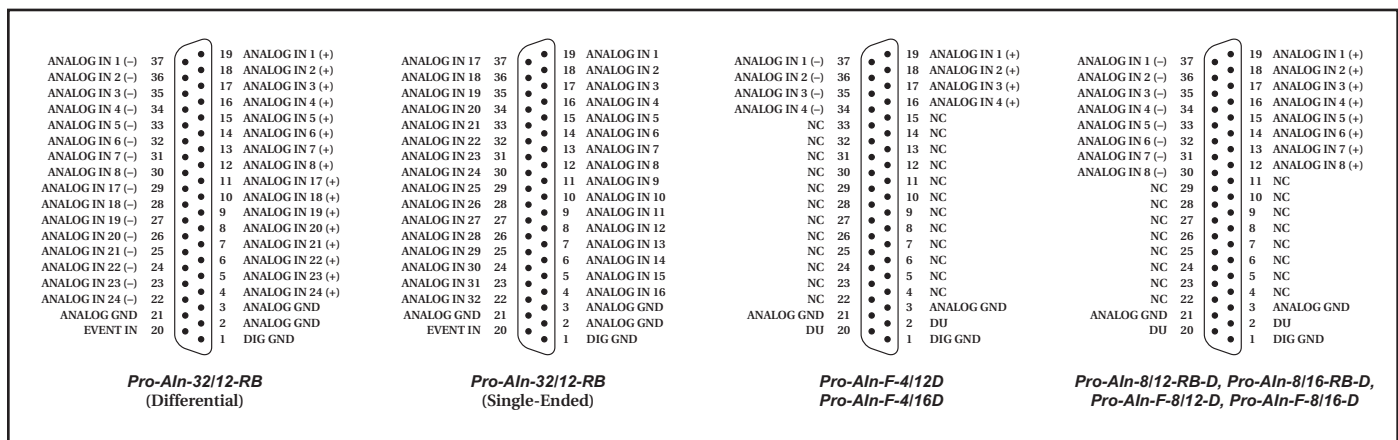
OVERVOLTAGE: ±35V.

OFFSET ERROR: Adjustable.

OFFSET DRIFT: ±30ppm/°C of full scale range.

Connector Pin Assignments

Analog Input Modules



QUESTIONS?

1-800-552-1115 (U.S. only)

Call toll free for technical assistance,
product support or ordering information, or
visit our website at www.keithley.com.

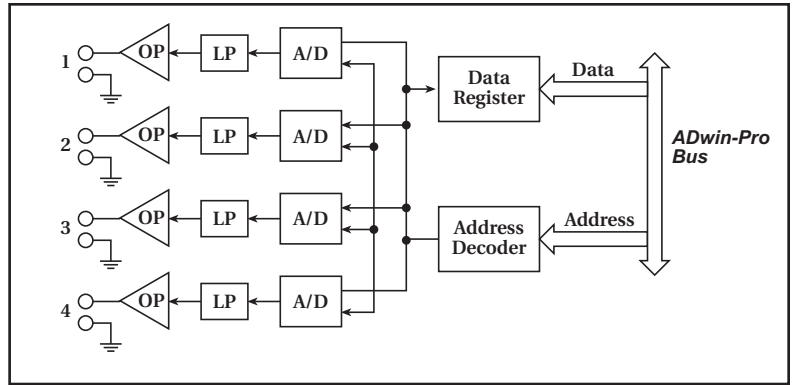
ADwin-Pro

Industrial External
19-inch System for
Control and Data Acquisition

Analog Output Modules

Pro-AOut-4/16 and Pro-AOut-8/16

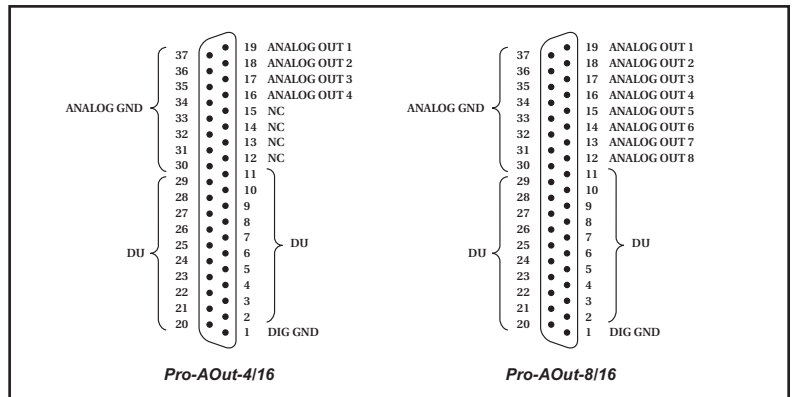
The analog output modules Pro-AOut-4/16 and Pro-AOut-8/16 has four/eight 16-bit DACs with fixed first-order low-pass filters ($f_c = 100\text{kHz}$) to cut off glitches. The DACs are equipped with an input register, so that all DACs can be loaded with new values first, then a single ADbasic command starts the conversion of the DACs simultaneously. It is also possible to start conversions on single DACs or groups of DACs. The outputs are equipped with shielded LEMO sockets (CAMAC European norm). A D-type version is also available. Jumpers are used to set the output voltage range of the DACs.



Block diagram of Pro-AOut-4/16 analog output modules

	Pro-AOut-4/16	Pro-AOut-8/16
Output Channels	4 single-ended	8 single-ended
Resolution	16 bits	
Settling Time to 0.01%	10 μ s	
Output Ranges	0–10V, ± 5 V, ± 10 V	
Output Current (max.)	5mA per channel	
Accuracy:		
Integral Nonlinearity	± 2 LSB typ.	
Differential Nonlinearity	± 2 LSB typ.	
Offset Error	Adjustable	
Gain Error	Adjustable	
Offset Drift	$\pm 10\mu\text{V}/^\circ\text{C}$	
Connector	4 LEMO	8 LEMO
Order No. for optional D-type connector	Pro-AOut-4/16-D	Pro-AOut-8/16-D

NOTE: All specifications are for analog output modules of revision series "B."

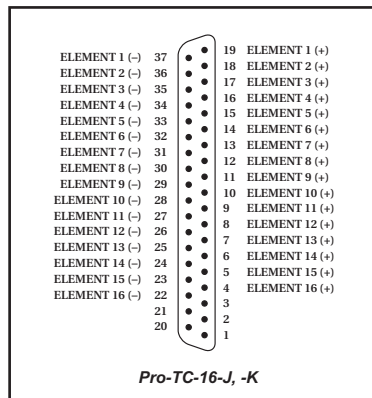


Amplifiers

Thermocouple Amplifiers

Pro-TC-4, Pro-TC-8, Pro-TC-16

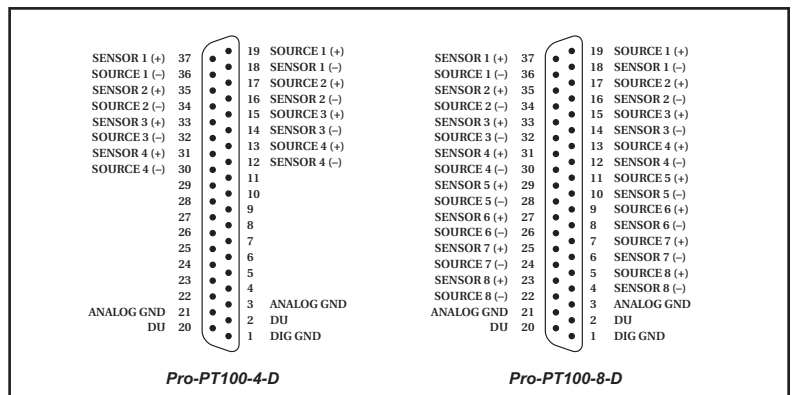
Select a module with 4 (Pro-TC-4), 8 (Pro-TC-8), or 16 (Pro-TC-16) thermocouple amplifiers. Each input channel is connected with a thermocouple amplifier with a cold junction reference. The amplifier outputs are connected to LEMO sockets via a multiplexer. The multiplexer can be set by an ADbasic command. The output must be connected to an additional analog input module such as the PRO-Ain-8/12.



RTD Amplifier Modules

Pro-PT100-4 and Pro-PT100-8

Select a module with 4 (Pro-PT100-4) or 8 (Pro-PT100-8) RTD amplifiers for PT100 resistors. Each input channel is connected to an RTD amplifier. The amplifier outputs are connected to LEMO sockets via a multiplexer. The multiplexer can be set with an ADbasic command. The output must be connected to an additional analog input module such as the PRO-Ain-8/12.



ADwin-Pro

Industrial External
19-inch System for
Control and Data Acquisition

Modules	Pro-TC-4-J, Pro-TC-4-K	Pro-TC-8-J, Pro-TC-8-K	Pro-TC-16-J, Pro-TC-16-K	Pro-PT100-4	Pro-PT100-8
Type	Thermocouple	Thermocouple	Thermocouple	RTD amplifier	RTD amplifier
Version	K (-200°C to 950°C), J (0°C to 750°C), other types optionally on request	K (-200°C to 950°C), J (0°C to 750°C), other types optionally on request	K (-200°C to 950°C), J (0°C to 750°C), other types optionally on request	2, 3, or 4 wires, -50°C to 250°C (other ranges on request)	2, 3, or 4 wires, -50°C to 250°C (other ranges on request)
Accuracy	±1°C	±1°C	±1°C	±0.2°C	±0.2°C
Channels	4	8	16	4	8
Slots	1	1	1	1	2 (version PT100-8-D one slot only)
Connector	Omega Subminiature Connector, Type: SMP-K-F	Omega Subminiature Connector, Type: SMP-K-F	Omega Subminiature Connector, Type: SMTC-37E, 37-pin D-type socket	4-pin LEMO socket	4-pin LEMO socket
Connector Optional	Omega Subminiature Connector, Type: SMTC-37E, 37-pin D-type socket, Order No.: Pro-TC-4-J-D, Pro-TC-4-K-D, Pro-TC-8-J-D and Pro-TC-8-K-D	Omega Subminiature Connector, Type: SMTC-37E, 37-pin D-type socket, Order No.: Pro-TC-4-J-D, Pro-TC-4-K-D, Pro-TC-8-J-D and Pro-TC-8-K-D		37-pin D-type socket, Order No.: Pro-PT100-4-D or Pro-PT100-8-D	37-pin D-type socket, Order No.: Pro-PT100-4-D or Pro-PT100-8-D

OUTPUT: ±10V to LEMO socket, 1 cable with LEMO/LEMO connectors are included, i.e. for connection to **PRO-Ain-8/12-RB**.

Digital I/O Modules

Pro-DIO-32

The digital input/output module Pro-DIO-32 provides 32 programmable digital I/O channels at TTL levels. The channels can be individually selected for input or output by ADbasic commands. The channels are configured as inputs after power up.

Pro-OPT-16

The Pro-OPT-16 isolated input module provides 16 channels of optically isolated digital inputs. The input voltage range can be set by jumpers (5V, 12V, 24V). The default setting of the input voltage range is 24V. The 200ns switching time allows for the sampling of high-speed digital inputs. Each channel is optically isolated from the system circuitry and from the other inputs. The event input is optically isolated from the system as well.

Pro-REL-16

The Pro-REL-16 output module provides 16 isolated relay outputs (SPST). Each channel is isolated from system circuitry and other output channels. The event output is optically isolated from the system circuitry. The standard module is equipped with normally open contacts with optional normally closed contacts also available.

Pro-TRA-16

The Pro-TRA-16 output module provides 16 channels of isolated transistor outputs. The supply voltage (VCC) must be provided by an external power supply. The channels are isolated from system circuitry. The event input is optically isolated from system circuitry.

Module	Pro-DIO-32	Pro-TRA-16	Pro-OPT-16	Pro-REL-16
Channels	32	16	16	16
Type	Digital I/O modules	Digital output modules	Digital input modules	Digital output modules
Input Voltage	TTL	-	5V, 12V, 24V	5V, 12V, 24V
Isolation	-	OK	500V ch-to-ch/ ch-to-GND	500V ch-to-ch/ ch-to-GND
Switch Voltage	5V	5-30V DC with external power supply, 0.5V voltage drop	5V, 12V, 24V	30V AC/DC maximum
Switch Current	6mA per channel max. (output short- circuit protected)	200mA max. per channel	Typ. 7mA/ max. 15mA	500mA maximum per channel
Switching Time	—	10µs	200ns	Operate time: 4ms; Release time: 3ms; Bounce time: 2ms
Connector	D-type	D-type	D-type	D-type
Trigger Input	pos TTL	5V, 12V, 24V	5V, 12V, 24V	5V, 12V, 24V
Trigger Signal Pulse Width	min 50ns	min 50ns	min 50ns	min 50ns
Comment	Power up status: all channels as inputs			Contact: 1 normally open per channel, (optional: normally closed)

TTL INPUTS:

Pull down resistors = 10kΩ; $V_{ICH} = 2.4V$ min; $V_{IL} = 0.8V$ max; $I_{CH} = 0.5mA$ max; $I_{IL} = 0.01mA$ max; Voltage range abs. = -0.3V to 7V;

ISOLATED INPUT MODULES:

Input Range: Jumper selectable.

Switching Thresholds: 0-low/1-high: 5V = 0 to 0.8V/4.5 to 5V; 12V = 0 to 1.6V/10 to 12V; 24V = 0 to 3.2V/20 to 24V.

Input Current: Typ. 7mA/max. 15mA.

Switching Time: 200ns.

Overvoltage: 5V range = 8V; 12V range = 16V; 24V range = 30V; Negative voltage: -5V for all ranges.

Isolation: 500V CH-CH/CH-GND.

QUESTIONS?

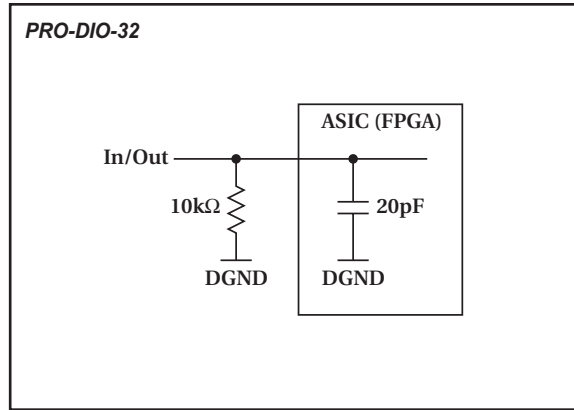
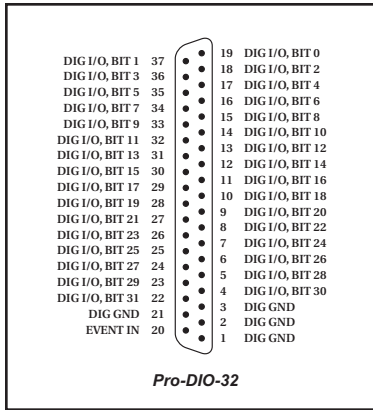
1-800-552-1115 (U.S. only)

Call toll free for technical assistance,
product support or ordering information, or
visit our website at www.keithley.com.

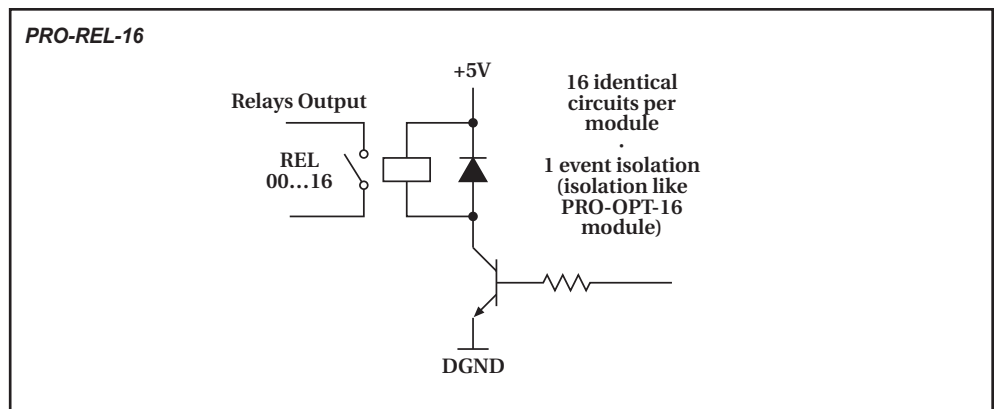
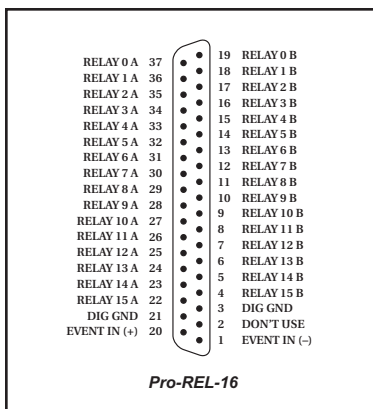
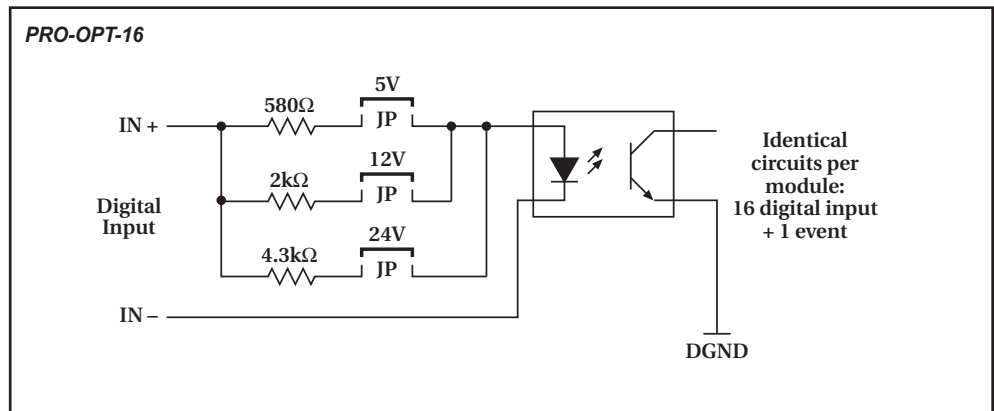
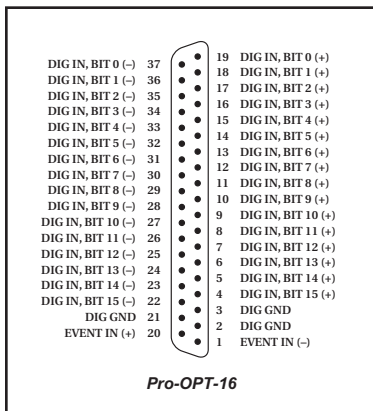
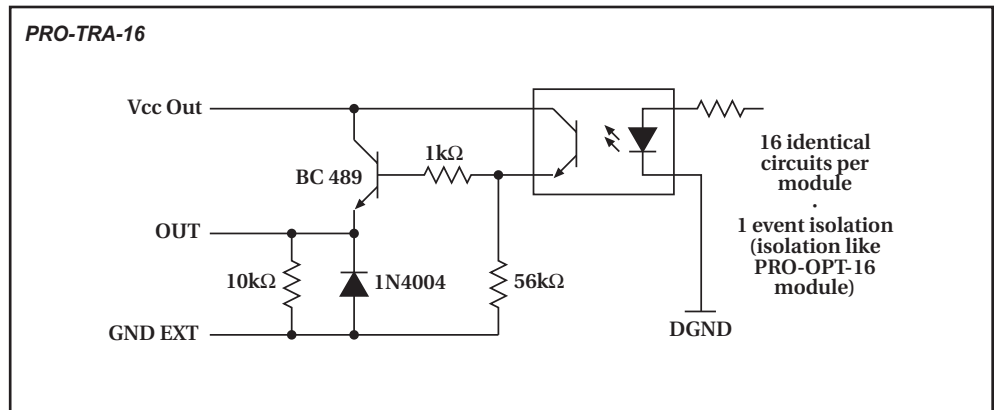
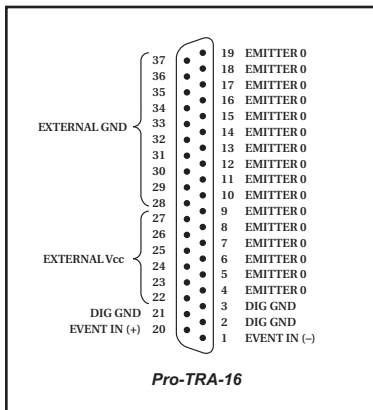
ADwin-Pro

Industrial External
19-inch System for
Control and Data Acquisition

Digital I/O Modules



Refer to the Pro-OPT-16 for a block diagram of trigger input.



Counter and PWM Modules

Pro-CNT-16/16, Pro-CNT-8/32 Up Counters

The Pro-CNT-16/16 counter module has sixteen 16-bit counters. The Pro-CNT-8/32 module has eight 32-bit counters. With a rising edge of a TTL pulse, the counter increments by one. All count rates can be loaded into the register with a single ADbasic command so that all counter values can be latched simultaneously. It is also possible to latch counters individually. Counters can be cleared by a software command.

Pro-CNT-VR4 Up/Down Counter and Encoder Interface

The Pro-CNT-VR4 counter module has four 32-bit up/down counters, a quadrature evaluation circuit, and a register to latch counter values. All counter values can be simultaneously or individually latched into the registers with a single ADbasic command. Each counter has two inputs. The input mode is selectable by software (each counter individually) for quadrature evaluation or clock/direction.

Pro-CNT-PW4 PWM Input

The Pro-CNT-PW4 module has four inputs for PWM (pulse width modulated) signal acquisition. This module determines the positive and negative pulse widths, duty cycle, period time, and frequency of a TTL signal. Four 32-bit counters are clocked with a fixed 5MHz clock signal. At the rising and falling edges of the PWM-input signal, the counter value will be stored into two separate latches.

Pro-PWM-4 PWM Output

The Pro-PWM-4 output module generates pulse width modulated signals (PWM signals) at four outputs. Each PWM signal can be configured individually via software. The resolution of the PWM signal is 16-bit. The output frequency is settable via software.

Isolation

There are also counter modules with optically isolated I/O lines. The input voltage range of the counter inputs can be selected individually by jumpers to +5V, 12V or 24V. For output range, see PRO-TRA-16.

Counter and PWM Modules	Pro-CNT-16/16	Pro-CNT-16/16-I	Pro-CNT-8/32	Pro-CNT-8/32-I	Pro-CNT-VR4	Pro-CNT-VR4-I	Pro-CNT-PW4	Pro-CNT-PW4-I	Pro-PWM-4	Pro-PWM-4-I
Channels	16	16	8	8	4	4	4	4	4	4
	Up counter		Up counter		Up/down counter, encoder input, quadrature evaluation		Period measurement, PWM input		PWM output	
Resolution	16 bit		32 bit		32 bit		32 bit		16 bit	
Input Voltage (PWM output range)	5V TTL	5V, 12V, 24V	5V TTL	5V, 12V, 24V	5V TTL	5V, 12V, 24V	5V TTL	5V, 12V, 24V	5V TTL	5–30V DC with external power supply
Isolation	—	Yes	—	Yes	—	Yes	—	Yes	—	Yes
Connector	D-type		D-type		D-type		D-type		D-type	
Clock Rate	10MHz max		10MHz max		1.25MHz on channel A or B before quadr. evaluation, clock/dir 10MHz		5MHz measurement clock		Clock 5MHz, divider 1 to 128	
Signal Pulse Width	min 50ns		min 50ns		min 400ns/50ns		—		output 0 to 100%	
Trigger Input	pos. TTL	5V, 12V, 24V	pos. TTL	5V, 12V, 24V	pos. TTL	5V, 12V, 24V	pos. TTL	5V, 12V, 24V	pos. TTL	5V, 12V, 24V

TYPICALLY FOR TTL INPUTS:

Pull down resistors = 10k Ω ; V_{IC1} = 2.4V min; V_{IL} = 0.8V max; I_{IC1} = 0.55mA max; I_{IL} = 0.01mA max; Voltage range abs. = -0.3V to 7V.

TYPICALLY FOR ISOLATED INPUT MODULES:

Switching Thresholds 0-low/1-high: 5V = 0 to 0.8V / 4.5 to 5V; 12V = 0 to 1.6V/10 to 12V; 24V = 0 to 3.2V/20 to 24V; Input current: typ. 7mA / max. 15mA;

Overvoltage: 5V range = 8V; 12V range = 16V; 24V range = 30V.

Negative Voltage: -5V for all ranges.

Isolation: 500V CH-CH/CH-GND.

QUESTIONS ?

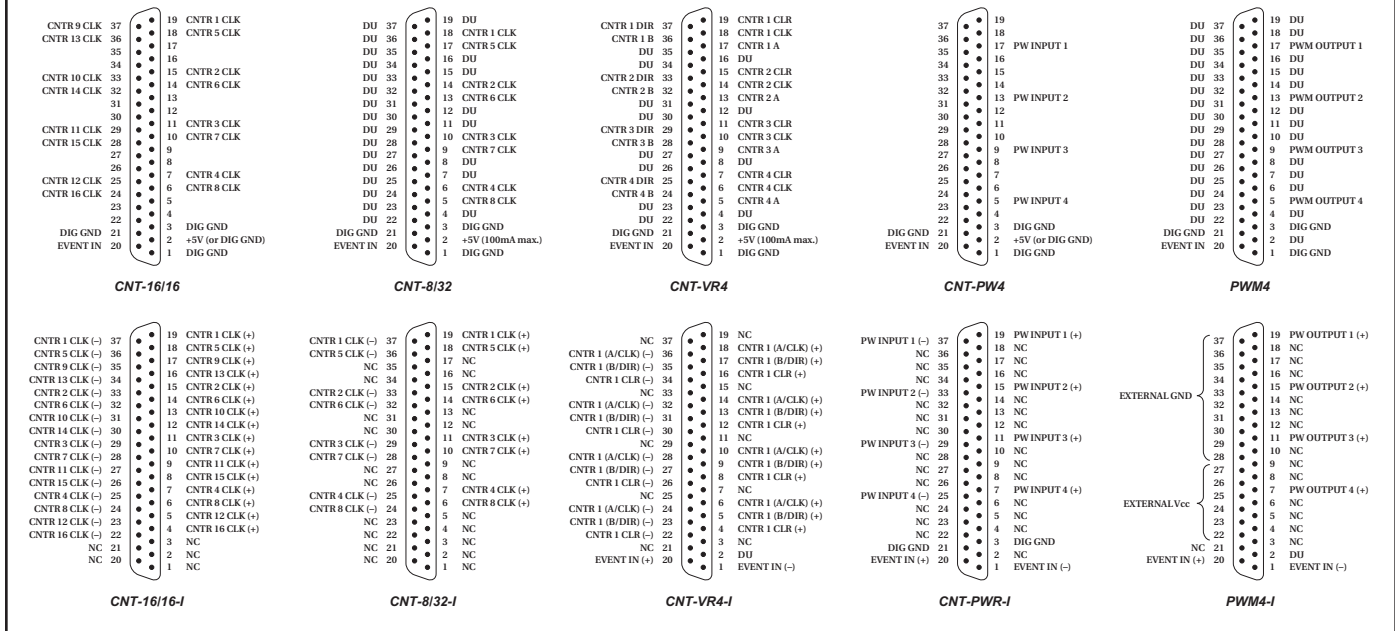
1-800-552-1115 (U.S. only)

Call toll free for technical assistance, product support or ordering information, or visit our website at www.keithley.com.

ADwin-Pro

Industrial External
19-inch System for
Control and Data Acquisition

Counter and PWM Modules Connector Pin Assignments



Serial and Fieldbus Modules RS-232, RS-485, CAN, Profibus

Serial Interface Modules

Pro-RS-232-2, Pro-RS-232-4, Pro-RS-485-2,
Pro-RS-485-4

The Pro-RS serial interface modules provide 2 or 4 serial interfaces for RS-232 or RS-485. Each interface channel is equipped with a 64 byte receive FIFO and a 64-byte transmit FIFO. Programmable features include number of data bits, number of stop bits, baud rate, handshake, and parity.

CAN-bus Interface Modules

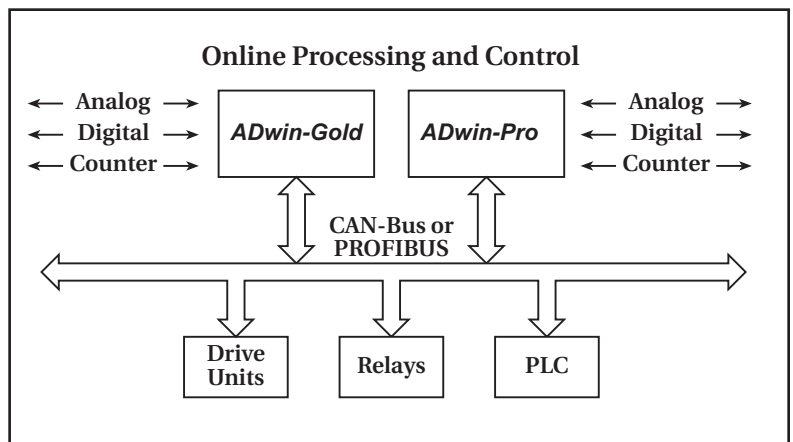
Pro-CAN-1, Pro-CAN-2

The CAN interface module Pro-CAN-1 provides one CAN interface channel, and the Pro-CAN-2 module provides two CAN interface channels. Each interface has 14 Full-CAN mailboxes and one BASIC-CAN mailbox per CAN Specification 2.0 Part A and Part B. These modules provide standard CAN and extended CAN. The signals conform to standard ISO 11898.

PROFIBUS-DP Interface Modules - Slave

Pro-PROFI-DP-SL

With the Profibus slave module Pro-PROFI-DP-SL, the ADwin System can be used as a Profibus-DP slave. The module supports the following functions: cyclic data exchange, freeze, unfreeze, sync, unsync, and clear. The module supports all bit rates from 9600 bit/s to 12Mbit/s. The module can transmit and receive up to 200 bytes of data each bus cycle.



PROFIBUS-DP Interface Modules - Master

Pro-PROFI-DP-MA

With the Profibus master module Pro-PROFI-DP-Master, the ADwin System can act as a Profibus-DP master. The module supports the following functions: cyclic data exchange, freeze, unfreeze, sync, unsync, and clear. The module supports all bit rates from 9600 bit/s to 12Mbit/s. The bus configuration is done with a PC-based configuration tool, which loads the configuration to the Master module via a COM port of the PC. Address assignments for Slaves over the bus is possible.

QUESTIONS?

1-800-552-1115 (U.S. only)

Call toll free for technical assistance,
product support or ordering information, or
visit our website at www.keithley.com.

ADwin-Pro

Industrial External
19-inch System for
Control and Data Acquisition

Serial and FIELDBUS Modules	Pro-RS-232-2, Pro-RS-232-4	Pro-RS-485-2, Pro-RS-485-4	Pro-CAN-1	Pro-CAN-2	Pro-PROFI-DP-SL	Pro-PROFI-DP-MA
Number of Interfaces	2 (Pro-RS-232-2) 4 (Pro-RS-232-4)	2 (Pro-RS-485-2) 4 (Pro-RS-485-4)	1	2	1	1
Physical Specification	RS-232	RS-485	ISO 11898	ISO 11898	RS-485	RS-485
Protocol Specification	—	—	CAN specification Part A + Part B	CAN specification Part A + Part B	EN 50 170 Vol. 2	EN 50 170 Vol. 2
Max. Bit Rate	115200 bit/s	1500 kbit/s	1 Mbit/s	1 Mbit/s	12 Mbit/s	12 Mbit/s
Galvanic Isolated	No	No	Yes	Yes	Yes	Yes
Bus Termination	—	—	Jumper	Jumper	Switch	Switch
Connector	9-pole D-type (female)	9-pole D-type (female)	9-pole D-type (male)	9-pole D-type (male)	9-pole D-type (female)	Bus: 9-pole D-type (female) Configuration: 9-pole D-type (male)
Addresses	—	—	0 to (2 ¹¹) – 1 or 0 to (229) – 1	0 to (211) – 1 or 0 to (229) – 1	0 to 99	0 to 125
Supported Protocol	—	—	—	—	DP	DP
Internal Memory	128 byte each channel	128 byte each channel	256 byte	2 * 256 byte	1 kbyte	2 kbyte
Bus Controller	Texas Instruments TL16C754	Texas Instruments TL16C754	Intel AN82527	Intel AN82527	Siemens SPC3	Siemens ASPC2
Transceiver	Linear Technology LT1137	Linear Technology LTC485	Philips PCA 82C250	Philips PCA 82C250	Texas Instruments 75A176	Texas Instruments 75A176

Ordering Information for ADwin-PRO

ADwin-PRO 19" Standard Enclosure

ADwin-PRO	Full-size enclosure, 19"W, 5¼"H, 60W power supply, 115/230VAC at 50/60Hz, 16 slots
ADwin-PRO-light	Half-size enclosure, 9"W, 5¼"H, 30W power supply 115/230VAC at 50/60Hz, 7 slots

ADwin-PRO 19" Optional Enclosure

ADwin-PRO-DC	Full-size enclosure, 19"W, 5°H, 80W power supply, 8-35VDC, 16 slots
ADwin-PRO-mini	Mini enclosure, 4 slots, to be supplied with regulated 5VDC @ 4A max
ADwin-PRO-mini-2	Mini enclosure, 4 slots, to be supplied with regulated 10-18VDC @ 4A max
ADwin-PRO-mini-3	Mini enclosure, 4 slots, to be supplied with regulated 20-35VDC @ 4A max

Processors

Pro-CPU-T4	Processor module T400 (20MHz), 1MB RAM, ADwin-PRO Interface module
Pro-CPU-T9	Processor module ADSP21062 (40MHz), 4MB DRAM, 256kB local RAM, ADwin-PRO Interface module

Ordering Information for ADwin-PRO (cont'd)

Memory Expansions

Pro-MEM-T4-4M	Memory expansion from 1MB to 4MB
Pro-MEM-T4-8M	Memory expansion from 1MB to 8MB
Pro-MEM-T9-16M	Memory expansion from 4MB to 16MB
Pro-MEM-T9-32M	Memory expansion from 4MB to 32MB
Pro-FlashBoot	Flash-EPROM bootloader for Pro-CPU-T9

PC Link Adapter Boards

ADlink	Link adapter board for connecting up to two ADwin systems with a PC, 2m cable included
ADpcmcia	Link adapter board for connecting a notebook, 2m cable included
Pro-Link-5*	Length of the link adapter cable: 5m (optional)
Pro-Link-10*	Length of the link adapter cable: 10m (optional)
Pro-Link-15*	Length of the link adapter cable: 15m (optional)
Pro-Link-20*	Length of the link adapter cable: 20m (optional)

* This option is valid only in combination with a link adapter.

QUESTIONS?

1-800-552-1115 (U.S. only)

Call toll free for technical assistance,
product support or ordering information, or
visit our website at www.keithley.com.

ADwin-Pro

Industrial External
19-inch System for
Control and Data Acquisition

Ordering Information for ADwin-PRO (cont'd)

USB, Ethernet*

PRO-USB*	USB interface module for ADwin-PRO
USENET*	Ethernet interface module for ADwin-PRO

Analog Input Modules

Pro-Aln-8/12-RB	8 differential inputs, multiplexed, conversion time 0.8µs, LEMO socket
Pro-Aln-8/12-RB-D	8 differential inputs, multiplexed, conversion time 0.8µs, D-type socket
Pro-Aln-32/12-RB	32 single-ended or 16 differential inputs, multiplexed, 12 bit, conversion time of 0.8µs, D-type socket
Pro-Aln-8/16-RB	8 differential inputs, multiplexed, 16 bit, conversion time of 10µs, LEMO socket
Pro-Aln-8/16-RB-D	8 differential inputs, multiplexed, 16 bit, conversion time of 10µs D-type socket
Pro-Aln-F-4/16	4 analog inputs, 16 bit, conversion time of 10µs per ADC, one ADC per channel, LEMO socket
Pro-Aln-F-4/16-D	4 analog inputs, 16 bit, conversion time of 10µs per ADC, one ADC per channel, D-type socket
Pro-Aln-F-8/16	8 analog inputs, 16 bit, conversion time of 10µs per ADC, one ADC per channel, LEMO socket
Pro-Aln-F-8/16-D	8 analog inputs, 16 bit, conversion time of 10µs per ADC, one ADC per channel, D-type socket
Pro-Aln-F-4/12	4 analog inputs, 12 bit, conversion time of 0.8µs per ADC, one ADC per channel, LEMO socket
Pro-Aln-F-4/12-D	4 analog inputs, 12 bit, conversion time of 0.8µs per ADC, one ADC per channel, D-type socket
Pro-Aln-F-8/12	8 analog inputs, 12 bit, conversion time of 0.8µs per ADC, one ADC per channel, LEMO socket
Pro-Aln-F-8/12-D	8 analog inputs, 12 bit, conversion time of 0.8µs per ADC, one ADC per channel, D-type socket

Analog Output Modules

Pro-AOut-4/16	4 analog outputs, 16 bit, LEMO socket
Pro-AOut-4/16-D	4 analog outputs, 16 bit, D-type socket
Pro-AOut-8/16	8 analog outputs, 16 bit, LEMO socket
Pro-AOut-8/16-D	8 analog outputs, 16 bit, D-type socket

Thermocouples

Pro-TC-4-K	Inputs for 4 thermocouples, type K
Pro-TC-4-K-D	Inputs for 4 thermocouples, type K, D-type socket
Pro-TC-8-K	Inputs for 8 thermocouples, type K
Pro-TC-8-K-D	Inputs for 8 thermocouples, type K, D-type socket
Pro-TC-16-K	Inputs for 16 thermocouples, type K
Pro-TC-4-J	Inputs for 4 thermocouples, type J
Pro-TC-4-J-D	Inputs for 4 thermocouples, type J, D-type socket
Pro-TC-8-J	Inputs for 8 thermocouples, type J
Pro-TC-8-J-D	Inputs for 8 thermocouples, type J, D-type socket
Pro-TC-16-J	Inputs for 16 thermocouples, type J

RTD / PT100 modules

Pro-PT100-4	Inputs for 4 PT100 elements
Pro-PT100-4-D	Inputs for 4 PT100 elements, D-type socket
Pro-PT100-8	Inputs for 8 PT100 elements
Pro-PT100-8-D	Inputs for 8 PT100 elements, D-type socket
Pro-MB8	Carrier module for up to 8MB modules

Digital I/O modules

Pro-DIO-32	32 TTL I/O, software selectable as input or output channels
Pro-OPT-16	16 digital inputs with opto couplers. Input voltage of 5V, 12V or 24V
Pro-REL-16	16 relay outputs
Pro-TRA-16	16 isolated transistor outputs, max. 100mA per channel

Ordering Information for ADwin-PRO (cont'd)

Counters, PWM-Modules

Pro-CNT-16/16	Counter, 16 16-bit impulse counters
Pro-CNT-8/32	Counter, 8 32-bit impulse counters
Pro-CNT-VR4	Counter, 4 32-bit up/down counters
Pro-CNT-PW4	Module for the acquisition of pulse width modulated signals, 4 channels
Pro-PWM-4	Module for the output of pulse width modulated signals, 4 channels
Pro-CNT-16/16-I	Counter, 16 16-bit impulse counters, signal voltage 5V, 12V or 24V
Pro-CNT-8/32-I	Counter, 8 32-bit impulse counters, signal voltage 5V, 12V or 24V
Pro-CNT-VR4-I	Counter, 4 32-bit up/down counters, signal voltage 5V, 12V or 24V
Pro-CNT-PW4-I	Module for the acquisition of pulse width modulated signals, 4 channels, signal voltage 5V, 12V or 24V
Pro-PWM-4-I	Module for the output of pulse width modulated signals, 4 channels

Serial and Fieldbus modules

Pro-RS232-2	For connecting 2 devices with RS232 interface
Pro-RS232-4	For connecting 4 devices with RS232 interface
Pro-RS485-2	For connecting 2 devices with RS485 interface
Pro-RS485-4	For connecting 4 devices with RS485 interface
Pro-CAN-1	CAN bus interface module, 1 channel
Pro-CAN-2	CAN bus interface module, 2 channel
Pro-PROFI-DP-SL	PROFIBUS-DP Interface modules - Slave
Pro-PROFI-DP-MA	PROFIBUS-DP Interface modules - Master

Cable Sets

Pro-CS-1	Two 20cm cables (7.8 inch) + four 40cm cables (15.7 inch) with LEMO connectors on each end
Pro-CS-2	Four 40cm cables (15.7 inch) + four 80cm cables (31.5 inch) with LEMO connectors on each end
Pro-CS-3	Four 100m cables (39.4 inch) + four 150cm cables (59 inch) with LEMO connectors on each end
Pro-CS-4	Four 500cm cables (196.8 inch) with LEMO connectors on each end
Pro-CS-5	Four 40cm cables (15.7 inch) + four 80cm cables (31.5 inch) with LEMO connectors on each end
Pro-CS-6	Eight 100cm cables (39.4 inch) with LEMO connectors on each end
Pro-CS-7	Eight 200cm cables (79.2 inch) with LEMO connectors on each end

Adapter Sets

Pro-AS-1	4 adapters: LEMO-socket ↔ BNC-connector
Pro-AS-2	4 adapters: LEMO-connector ↔ BNC-connector
Pro-AS-3	4 LEMO-sockets T-pieces (1 connector, 2 adapters)
Pro-AS-4	4 adapters: LEMO-socket ↔ LEMO-socket
Pro-AS-5	4 LEMO-sockets with 50W-termination
Pro-AS-6	4 adapters: LEMO-connector ↔ cable ↔ BNC-socket (length: 10cm)
Pro-AS-7	4 adapters: LEMO-connector ↔ cable ↔ BNC-socket (length: 100cm)
Pro-AS-8	4 adapters: LEMO-connector ↔ cable ↔ BNC-socket (length: 200cm)

Software

ADbasic	Fast real-time development tool for the ADwin boards
ADlab	Driver for measuring, control and monitoring with ADwin boards from MATLAB5

*Call for availability.

QUESTIONS?

1-800-552-1115 (U.S. only)

Call toll free for technical assistance,
product support or ordering information, or
visit our website at www.keithley.com.