PC104-30F/G

12-bit A/D with Digital I/O & Output

Embedded PCI Data Acquisition

DESCRIPTION

The PC104-30F/G is a high performance multi-function I/O board for embedded systems.

All the low noise A/D, D/A and DIO functions needed for any control or monitoring application are fitted. It includes 16 analog input channels with 12-bit resolution and 100kHz or 330kHz sampling rate. Software programmable gains of 1,10,100,1000 or 1,2,4,8 are selectable for measuring low-level signals. As an option, the PC104-30F/G boards can be ordered with four 12-bit D/A outputs with current sensing outputs.

All boards feature a channel list which allows the automatic scanning of analog input channels. Jumperless operation means interrupts and DMA are configured via software. Flexible digital I/O capabilities consisting of 24 lines in three ports can be configured as inputs or outputs. Also included, is one 16-bit user counter/timer used to generate or measure frequency and count events or speed.

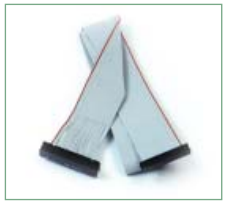
Although designed to be full PC/104 rev 2.3 compliant this board will work with any PC-based PC/104-expandable embedded controllers. It is compatible with the ISA based PC-30F/G boards allowing easy migration from ISA to the PC/104 Based PC104-30F/G.

With the PC104-30F/G we provide support for both our 16-bit (EDR) and 32-bit (EDRE) Software Developer's Kit. Under EDRE, the board can be used with our WaveView for Windows DAQ software package.

For ease of use, ribbon cables terminated with standard 2.54mm IDC connectors are provided with every board.

FEATURES

- 8 Differential or 16 Single-Ended A/D inputs
- 330kHz or 100kHz sampling rate
- Dual Channel DMA
- Software programmable input ranges: ±5V, ±10V, 0 to 10V
- 12-bit Resolution
- Outband noise filtering
- Optional four 12-bit D/A Outputs
- Software programmable output ranges: ±5V, ±10V, 0 to 10, 0 to 13V
- 24 Digital I/O lines (3 ports)
- 1 User Counter-timer
- Small Dimensions 90x96 mm
- 5VDC only operation
- Windows98/ME/2000/XP/NT OS Support
- Linux OS Support



Supplied with PC/104 Mounting Kit, IDC26-1 and IDC40-1 Ribbon Cables

Specifications

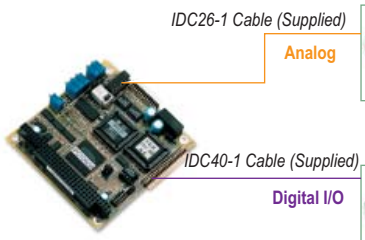
ANALOG INPUTS (A/D)		
Input Characteristics		
Input channels:		16 Single-Ended or 8 Differential
Overvoltage Protection:		± 35V (powered on); ± 25V (powered off)
Resolution:		12-bit (1 in 4096)
Input Ranges:		± 5V, ± 10V, 0 to 10V (G Models)
		± 5V, ± 10V (F models)
Input Coupling:		DC
A/D TRANSFER CHARACTERISTICS		
System Accuracy:		± 1 LSB depending on environment
A/D Linearity		
	Differential:	± ¾ LSB max
	Integral:	± 0.05% FS
	SNR:	84dB typ
	Full BW:	1MHz
	Total Harm Dist:	-98dB
System Accuracy:		± 2 LSB depending on environment
Acquisition Rate:		100 or 330kHz max
A/D FIFO buffer:		16 samples
Acquisition Modes:		Polled I/O, Interrupts, DMA (single/dual)
Amplifier Characteristics		
Input Impedance:		10G Ohm/20pF (On chan)
		10G Ohm/100pF (Off chan)
Offset voltage:		Adjustable to zero
Input Gains		
	Ranges:	1; 10; 100; 1000 (or 1; 2; 4; 8)
	Error:	Adjustable to 0
	Non-linearity:	0.002% (typ), 0.015% (max) [G<1000]
		0.02% (typ), 0.06% (max) [G=1000]
	Gain Accuracy:	0.25% max, 0.05% typ
	CMRR:	100dB typ, 80dB max for G=1
	Monotonicity:	0 to 70°C
Temperature drift:		6ppm/°C (Full Scale)
		1ppm/°C (Bipolar zero)
		± 30ppm/°C (Gain typ)
DYNAMIC CHARACTERISTICS		
Bandwidth (small signal):		1.0MHz (G<1000)
		250kHz (G=1000)
Full Power Bandwidth:		1MHz for G<1000, 100kHz for G=1000
Crosstalk:		-85dB, DC to 100kHz
System Noise:		± 1LSB (G=1)
		± 2LSB (G=10)
		± 4LSB (G=100)
ANALOG OUTPUTS		
No of Channels:		4x 12-bit
Accuracy:		± 1 LSB
DNL:		½ LSB max
Output Ranges:		± 5V, ± 10V, 0 to 10V, 0 to 13V
Thruput Rate:		100kHz
Offset Error:		Unipolar: ¼ LSB typ, 1 LSB (max)
		Bipolar: ½ LSB typ, 2 LSB (max)
Gain Ranges:		x1, x2
Settling Time:		10µs max in load 500pF, 2k Ohm
Max Current Output:		5mA
DIGITAL I/O		
No of TTL I/O lines:		24 in 3 ports (8255 PPI)
Digital Logic Levels:		High: 2.0V (min), 5.0V max
		Low: 0.0V (min), 0.8V (max)
Current Output:		± 3mA (source/sink)
Interrupt support:		Mode 0, Mode 1, Mode 2
External Interface		
Connector Types:		2mm IDC26 Header for A/D & D/A
		2mm IDC40 Header for digital I/O
Counter Timers		
Resolution:		16-bit
Clock Frequency:		2 or 8 MHz (for A/D)
A/D Frequency:		DC to 330kHz
No of counters:		3 (2 used for A/D conversion)
User Pins:		1 Input CLK, 1 Gate & 1 Output
Compatibility:		TTL
PC104 Interface		
Base Address:		0 to 1FFFh
No of registers:		16 32-bit
Interrupts:		Auto selected
DMA:		Auto selected
Environmental / Physical		
Rel. Humidity:		0% to 90% (non-condensing)
Operating Temp:		0°C to 70°C
Board Dimensions:		90.2 mm x 95.9 mm
Weight:		84 g
Power Requirements		
+5V:		750mA max

PCI104-30F/G

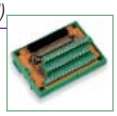
Ordering Information

Supplied with EDR & EDRE Software, PC/104 Mounting Kit and Ribbon Cable (IDC26-1 and IDC40-1)	
All boards have A/D Inputs, 24 DIO lines and a 16-bit Counter Timer	
PC104-30G	100kHz 16 Channel A/D
PC104-30GA	100kHz 16 Channel A/D and (4x) 12-bit DACs
PC104-30F	330kHz 16 Channel A/D
PC104-30FA	330kHz 16 Channel A/D and (4x) 12-bit DACs

Optional Accessories Diagram



ADPT-2526
DB25 (F) & IDC26 (M) to 27way Scr. Term. Adaptor



ADPT-3740
DB37 (M) & IDC40 (M) to 41way Scr. Term. Adaptor

Optional Accessories

OPTION 1:	
ADPT-2526	DB25 (F) & IDC26 (M) to 27way Screw Terminal Adaptor
IDC26-1 (Analog)	26way Ribbon Cable (Supplied)
OPTION 2:	
ADPT-3740	DB37 (M) & IDC40 (M) to 41way Screw Terminal Adaptor
IDC40-1 (Digital I/O)	40way Ribbon Cable (Supplied)

IDC-26M

CHAN1	1	2	CHAN0
CHAN3	3	4	CHAN2
CHAN5	5	6	CHAN4
CHAN7	7	8	CHAN6
CHAN9	9	10	CHAN8
CHAN11	11	12	CHAN10
CHAN13	13	14	CHAN12
CHAN15	15	16	CHAN14
AGND	17	18	AGND
SENS0	19	20	DAC0
SENSE1	21	22	DAC1
SENSE2	23	24	DAC2
SENSE3	25	26	DAC3

(2.0mm Pitch)

IDC-40M

PA1	1	2	PA0
PA3	3	4	PA2
PA5	5	6	PA4
PA7	7	8	PA6
PB1	9	10	PB0
PB3	11	12	PB2
PB5	13	14	PB4
PB7	15	16	PB6
PC1	17	18	PC0
PC3	19	20	PC2
PC5	21	22	PC4
PC7	23	24	PC6
DGND	25	26	DGND
GATE2	27	28	CLK0
OUT2	29	30	GATE1
OUT1	31	32	DGND
CLK2	33	34	DGND
EXT_TRIG	35	36	DGND
EXT_CLK	37	38	DGND
+5V	39	40	DGND

(2.0mm Pitch)