

Features

- ◆ 8 Differential or 16 Single-Ended A/D inputs
- ◆ 330kHz or 100kHz sampling rate
- ◆ Dual Channel DMA
- ◆ Software programmable input ranges: $\pm 5V$, $\pm 10V$, 0 to 10V
- ◆ 12-bit Resolution
- ◆ Outband noise filtering
- ◆ Optional four 12-bit D/A Outputs
- ◆ Software programmable output ranges: $\pm 5V$, $\pm 10V$, 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

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.



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: | $\pm 35V$ (powered on); $\pm 25V$ (powered off) |
| Resolution: | 12-bit (1 in 4096) |
| Input Ranges: | $\pm 5V$, $\pm 10V$, 0 to 10V (G Models) $\pm 5V$, $\pm 10V$ (F models) |
| Input Coupling: | DC |
| A/D Transfer Characteristics | |
| System Accuracy: | ± 1 LSB depending on environment |
| A/D Linearity | |
| Differential: | $\pm 3/4$ LSB max |
| Integral: | $\pm 0.05\%$ 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) ± 30 ppm/°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: | ± 1 LSB (G=1) ± 2 LSB (G=10) ± 4 LSB (G=100) |
| ANALOG OUTPUTS | |
| No of Channels: | 4x 12-bit |
| Accuracy: | ± 1 LSB |
| DNL: | $1/2$ LSB max |
| Output Ranges: | $\pm 5V$, $\pm 10V$, 0 to 10V, 0 to 13V |
| Thruput Rate: | 100kHz |
| Offset Error: | Unipolar: $1/4$ LSB typ, 1 LSB (max) Bipolar: $1/2$ LSB typ, 2 LSB (max) |
| Gain Ranges: | x1, x2 |
| Settling Time: | 10 s 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: | ± 3 mA (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: | 90.2mm x 95.9mm |
| Power Requirements | |
| +5V: | 750mA max |

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

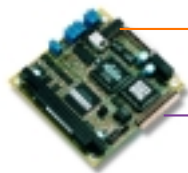
OPTION 1:

| | |
|------------------|--|
| 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) |

Optional Accessory Diagram



IDC26-1 Cable (Supplied)

Analog



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

IDC40-1 Cable (Supplied)

Digital I/O



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

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 |
| SEN50 | 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)