



# High Accuracy Analog and Digital I/O for PC/104 non-DMA Systems MPC565



The MPC565 enables high accuracy analog and digital I/O for the growing number of non-DMA processors in the embedded Intel family. It provides a 1024 word deep FIFO to store readings from up to 32 single-ended 16-bit analog inputs that are fault protected to  $\pm 40V$ . The analog input section offers individual channel selection of single-ended or differential modes in any combination. The MPC565 also features basic and autoscan modes. Basic mode directly controls all modes, gains, channel selection, and filters. With autoscan mode, a user can preset individual channel attributes—channel on/off, mode, gain, and low pass filter in on-board RAM.

In autoscan mode, a pacer clock automatically moves samples to an on-board FIFO.

## Features

- ✓ 32 channels of 16-bit analog input
- ✓ Fault protection on analog/digital
- ✓ Ultra-low noise design
- ✓ DSP and noise analysis software
- ✓ Low-pass filtering
- ✓ 14-bit, 4-channel DAC
- ✓ 1024 word FIFO
- ✓ 5V only operation from PC/104
- ✓  $-40^{\circ}$  to  $+85^{\circ}C$  operation available

FIFO flags can trigger a system IRQ to allow efficient simultaneous read/write servicing by the program. The analog input includes a low-drift reference, noise-protected by a faraday shield. Optional 14-bit analog outputs have full-scale output of  $\pm 10.1V$ . The digital-to-analog converter is noise-protected by a faraday shield. Each output has a 1-pole lowpass filter.

Twelve digital I/O lines can be individually set for input or output, with fault protection against power sequencing and static discharge.

All analog power supplies are generated from the 5V input. The on-board analog supplies include input and output filtering and post-regulation of the initial converters providing low-noise and stable power.

### Software Support

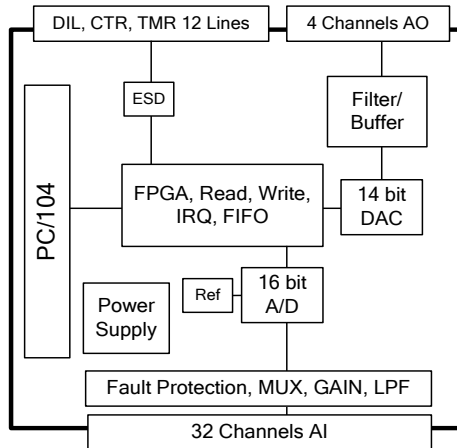
Example code for all functions  
C-code/Mathcad™ for advanced  
algorithms

### Compatible Hardware

Any Micro/sys CPU with PC/104  
expansion connector

### Mounting/Packaging

PC/104 standard



## Specifications:

### Mechanical:

- PC/104 standard
- 3.55" (plus I/O region) x 3.775"

### Power Requirements:

- +5V  $\pm$  5% at 500mA

### Environmental:

- 0° - +70°C operating
- 40° - +85°C operating, -ET version
- 5%-95% relative humidity, non-condensing

### PC/104 Interface:

- 16-bit transfers
- IRQ 3, 4, 5, 6, 7, 9, 10, 11, 12, 14, 15 supported

### FIFO:

- 16bit FIFO data count register
- 1024 word deep
- Status flag capable of generating interrupt include:
  - FIFO empty
  - FIFO almost empty
  - FIFO full
  - FIFO almost full
  - FIFO over flow

- FIFO under flow
- FIFO data count register.

### Analog Inputs:

- 16-bit, 32-channels individually selected for single/differential
- ADC conversion time of 5usec
- 3dB typical full-power response of input circuitry: 20Vpp @ 35kHz, 5Vpp @ 100kHz
- Each channel can be set by software for the following attributes: on/off, single/differential, input range of  $\pm 5.05V$  or  $\pm 10.1V$ , Lowpass filter (1kHz or 100kHz)
- Default Basic Mode from reset allows readings of individual channels from software directly with EOC being Polled/IRQ.
- Auto-scan Mode waits for an ext-trigger or software to start the pacer-clock to systematically run through each channel with its preset values and store the data into 1024 word deep FIFO

### Analog Outputs:

- 14-bit, 4-channels
- 10usec DAC settling time
- Each channel has a 1-pole reconstruction filter and output buffer
- $\pm 10.1V$  output

**Digital I/O:**

- 12 Multi-function TTL-level bit selectable I/O at 8mA sink/source
- Ext-trigger, Ext-pacer clock, User I/O
- Any/all inputs can generate an IRQ
- Read-back function on outputs

**Counter/Timer:**

- 1Mhz 16-bit timer for pacer-clock  
16C550-compatible

**External Connections:**

- 10/100BASE-T Ethernet port
- 50-pin header for analog input
- 16-pin header for digital/counter/timer I/O
- 10-pin header for analog output

## Ordering Information:

**OEM Single Board Computers:**

MPC565	16-bit, 16-channel analog input, digital I/O, non-DMA systems
MPC565-ET	16-bit, 16-channel analog input, digital I/O, non-DMA systems, -40°C to +85°C operating temp
565OPT11(ET)	Additional 16-bit, 32-channel analog input, digital I/O
565OPT12(ET)	14-bit, 4-channel analog output

**Related Products:**

CA5049	50-pin to 50-pin ribbon cable
CA4002	16-pin to 16-pin ribbon cable
CA5052	10-pin to 10-pin ribbon cable
TB5001	Breakout board, 50-point terminal strip

*Cables nominally 15", other lengths available*

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