The 104-AIO12-8 is a low-cost 12-channel analog multifunction I/O board which features an excellent price/performance value for PC/104-based data acquisition. The inherent “selectability” of the card’s onboard features allows the depopulation of unnecessary functionality. This keeps costs down by allowing the user to more precisely specify the board to the application’s unique requirements. The 104-AI12-8 has no outputs while the 104-AO12-4 has no inputs.

The 104-AIO12-8 provides eight single-ended or eight true differential analog input channels with 12-bit resolution. 200V common-mode rejection, high input impedance (2MegOhms, typical) and factory pre-settable gain to accommodate low-level sensor inputs are also included. Analog inputs are software programmable for 0-5V, 0-10V, ±5V and ±10V, and optionally factory configurable for 4-20mA. The same ranges are jumper-selected for the four channels of 12-bit analog output. 24 parallel lines of digital I/O, eight of which also provide change-of-state detection, are also provided for a complete, low cost, multifunction data acquisition solution.

SOFTWARE

The 104-AIO12-8 Series are supported for use in most operating systems and include a free DOS, Linux and Windows 95/98/Me/NT/2000/XP/2003 compatible software package. This includes sample programs and source code in “C” and Pascal for DOS, and Visual Basic, Delphi, C++ Builder, and Visual C++ for Windows. Also included is a graphical setup program in Windows. Linux support includes installation files and basic samples for programming from any user level via an open source kernel driver.
### Specifications

#### A/D
- **Number of inputs**: 8 single-ended or 8 true differential
- **Resolution**: 12-bit
- **Bipolar ranges**: ±5V, ±10V (4-20mA factory option)
- **Unipolar ranges**: 0-5V, 0-10V
- **Sampling rate**: 100 KHz
- **Type**: Successive Approximation
- **Nonlinearity**: ±1 LSB max, monotonic
- **Common mode voltage**: ±200V
- **Trigger source**: Software selectable: programmable timer, program command

#### D/A
- **Number of outputs**: 4
- **Resolution**: 12-bit resolution
- **Bipolar ranges**: ±5V, ±10V
- **Unipolar ranges**: 0-5V, 0-10V
- **Conversion rate**: 100 KHz
- **Relative accuracy**: ±2 LSB
- **Output current**: 3mA per channel

#### Counter/Timer
- **Type**: 82C54
- **Counters/timers**: 3 x 16-bit
- **Clock Frequency**: 1MHz
- **Software support**: Event counter, frequency output, frequency pulse and measurement

#### Digital I/O
- **Number of I/O**: 24, pulled up to +5V
- **Type**: 82C55A
- **Input voltage**: Logic low: -0.3V min, 0.8V max; Logic high: 2.2V min, 5.8V max
- **Input current**: ±1μA max
- **Outputs**: Logic low: 0.0V min, 0.4V max; Logic high: 3.7V min, 5.0V max
- **Output current (Ports A & B)**: Logic low: 64mA max sink; Logic high: 32mA max source
- **Output current (Ports C)**: Logic low: 2.5mA max sink; Logic high: 2.5mA max source
- **Change of state**: Port C enabled with change of state detection

### Ordering Guide
- **104-AIO12-8**: 12-bit, 8-channel A/D, 4 analog outputs and 24 digital I/O
- **104-AI12-8**: 12-bit, 8-channel A/D and 24 digital I/O (no outputs)
- **104-AO12-4**: 12-bit, 4 analog outputs and 24 digital I/O (no inputs)