

# DAS-20

Compatible with Existing Applications.  
For New Applications see the DAS-1800 Series

100 Kilosample/s Analog I/O Board  
with Giant/Channel Queue

## Functional Description

The DAS-20 board is a high-performance Analog and Digital I/O board for IBM PC/XT/AT and compatible computers. The DAS-20 is a full-length board that plugs directly into an expansion slot within the computer.

The DAS-20 has 16 single-ended or 8 differential inputs (switch-selectable). It also has 7 software-selectable input ranges including both unipolar and bipolar configurations. The gains range from 0.5 to 100. The DAS-20 performs A/D conversions at just over 100kSamples/s. It also has an onboard 2kByte channel/gain queuing RAM.

The DAS-20 has two 12-bit analog output channels that are switch-selectable for 0 to 10V,  $\pm 5V$ , or  $\pm 10V$  output ranges. The maximum update rate is 130kSamples/s for one DAC and 65kSamples/s for both DACs.

The DAS-20 includes an onboard five-channel counter/timer (AMD9513). Three of these counters are connected to a 5MHz crystal-controlled oscillator to control A/D and D/A converter sample timing. The remaining two counters can be connected to external signals and used as frequency or pulse generators, or to measure frequency, pulse widths, or count events.

Digital I/O consists of 16 TTL-compatible lines, divided into one 8-bit output port and one 8-bit input port. These digital I/O lines can be used to control the EXP-20 and MB-02 accessory boards.

## Software

The DAS-20 is supported by a comprehensive set of drivers and programming tools. This software is provided in three levels — the standard software package for BASIC programming included with each board, the optional PCF-20 drivers for Pascal, C, and FORTRAN languages, and DAS-DLL-20. DASDLL-20 is available for programming the DAS-20 using a Windows 3.X based language. The DASDLL-20 provides high-level functions for use in Visual Basic for Windows or C/C++. The driver handles all data acquisition functions, memory and buffer allocation, and multiple board management. Example programs are provided.

## FEATURES

- 100 kSamples/s sampling rate
- 16 single-ended or 8 differential input channels
- 12-bit resolution
- Expandable to 128 input channels using EXP-20 accessories
- 2 kByte channel/gain RAM
- 2 analog output channels with 130 kSample/s max output rate
- 16 digital I/O channels
- 2 counter/timer channels
- Compatible with SSH-4, four-channel Simultaneous Sample and Hold accessory board
- Basic drivers and utilities included
- Optional C, Pascal, FORTRAN and Windows 3.1 drivers

## APPLICATIONS

- Signal analysis
- Process control/monitoring
- Laboratory measurements/automation
- Frequency analysis
- Waveform generation

## SPECIFICATIONS

### ANALOG INPUT

**CHANNELS:** 8 differential or 16 single-ended, switch-selectable with software-readable status.

**RESOLUTION:** 12 bits.

**ACCURACY:** 0.01% of reading  $\pm 1$  LSB.

**INPUT RANGES AND THROUGHPUT:**

GAIN	UNIPOLAR	BIPOLAR	THROUGHPUT
.5	—	$\pm 10V$	100kS/s
1	0 to +10V	$\pm 5V$	100kS/s
10	0 to +1V	$\pm 0.5V$	100kS/s
100	0 to +100mV	$\pm 50mV$	50kS/s

**A/D TYPE:** Successive approximation.

**TRIGGER SOURCES:** Software command, timer generated, or external with programmable edge.

**GATE SOURCES:** Internal or external with programmable level.

### ANALOG OUTPUTS

**CHANNELS:** 2 independent.

**TYPE:** 12-bit non-multiplying double-buffered.

**LINEARITY:**  $\pm \frac{1}{4}$  LSB (typ),  $\pm \frac{1}{2}$  (max.).

**MONOTONICITY:** Guaranteed over temperature range.

**OUTPUT RANGES:** 0 to +10V,  $\pm 5V$ ,  $\pm 10V$ .

**DATA TRANSFER:** Software write or DMA to either or both.

### DIGITAL I/O

**OUTPUT PORT:** 8-bit latched with readback; low = 0.5V max,  $I_{sink} = 8mA$ ; high = 2.4V min,  $I_{source} = -2.6mA$ .

**INPUT PORT:** 8-bit transparent latch; low = 0.8V max, -0.4mA max; high = 2.0V min, 20 $\mu A$  max.

### INTERRUPT CAPABILITIES

**LEVELS:** IRQ2 thru IRQ7, software-programmable.

### DMA CAPABILITIES

**LEVELS:** 1 or 3, software-programmable.

### POWER REQUIREMENTS

**+5V:** 1.6A typ, 1.8A (max.).

### GENERAL ENVIRONMENTAL

**OPERATING TEMP:** 0 to 50°C.

**STORAGE TEMP:** -20 to +70 °C.

**HUMIDITY:** 0 to 90%, non-condensing.

**DIMENSIONS:** 13.3in W  $\times$  4.25in H  $\times$  0.75in D; (33.8cm  $\times$  10.8cm  $\times$  1.9cm).

ORDER	DESCRIPTION
DAS-20*	100 kSample/s Analog and Digital I/O Board
<b>OPTIONS</b> See page 479 for descriptions of all accessories.	
STA-20	Screw Terminal Accessory
STP-50	Screw Terminal Panel
CDAS-2000	DAS-20 to STA-20, STP-50 or EXP-20 Cable (24 in)
PCF-20*	Pascal, C, and FORTRAN drivers for DAS-20
STREAMER*	High-Speed Data Acquisition Streaming-to-Disk Software
DASDLL-20*	Window 3.1 DLL for DAS-20
MS-DAS-20*	Additional Hardware and Software Manual and BASIC Software
EXP-20	16-Channel Expansion Accessory
SSH-4	4-Channel Simultaneous Sample and Hold Accessory

\* Software is available on 3.5 inch disks