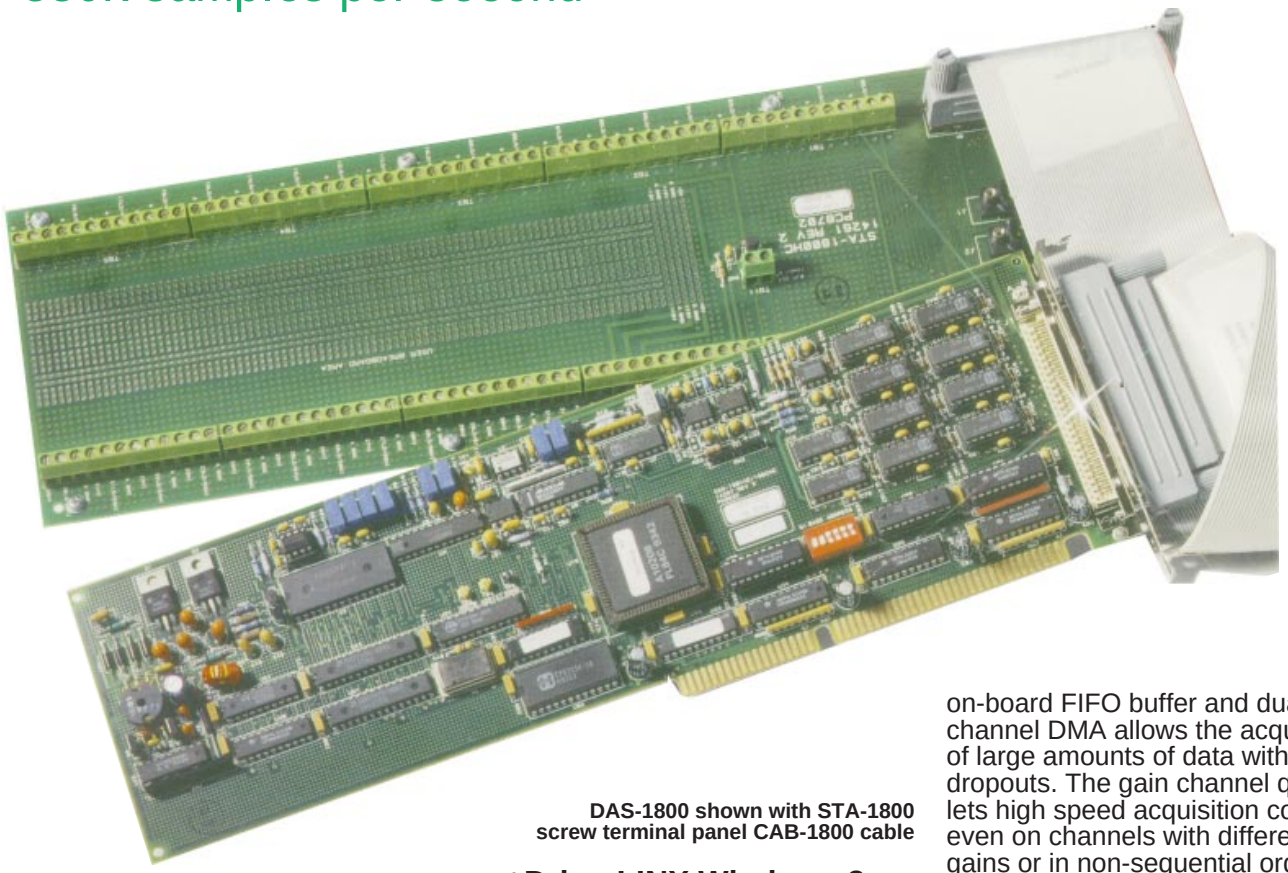
High Performance Analog and Digital I/O Boards

330k Samples per Second

DAS-1800 Series

$1199

Basic Unit



DAS-1800 shown with STA-1800 screw terminal panel CAB-1800 cable

- **Continuous, Gap-Free, High Speed Acquisition under DOS and Windows**
- **12 or 16-Bit Resolution**
- **Up to 333 ksamples/sec Max Single Channel Input Rate, Up to 312.5 ksamples/sec Multiple Channel Input Rate**
- **64 Single-Ended/32 Differential Inputs with DAS-1800HC**
- **16 Single-Ended/ 8 Differential Inputs with DAS-1800HR or DAS-1800ST**
- **Channel-Gain Queue for High Speed Acquisition at Different Gains**
- **DriverLINX Windows 3.x and Windows 95 Drivers Included**
- **1 kWord FIFO Buffer**
- **16-Bit DMA Transfers with Single and Dual Channel Modes**
- **Programmable Burst Mode Sampling Emulates Simultaneous Sample and Hold (SSH)**
- **Pre-, Post, and About-Triggering**
- **Analog Outputs and Digital I/O Available**

The DAS-1800 Series is a family of high performance data acquisition boards for the IBM PC/AT and compatible computers. These boards features continuous, high speed, gap-free data acquisition under both DOS and Windows environments. An on-board FIFO buffer and dual channel DMA allows the acquisition of large amounts of data without dropouts. The gain channel queue lets high speed acquisition continue even on channels with different gains or in non-sequential order. All boards are register compatible, so applications running on one board version can be ported to another board without changing software.

The DAS-1800HC models feature 64 single-ended or 32 differential inputs at up to 333 ksamples/sec. The DAS-1800ST models have 16 single-ended or 8 differential inputs with the ability to externally expand to 256 differential inputs at 333 ksamples/sec. The DAS-1800HR is a 16-bit version of the DAS-1800ST, with a maximum acquisition rate of 100 ksamples/sec. The DAS-1800AO has the same analog input and discrete I/O specifications as the DAS-1800ST with the addition of 2 wave form-quality 12-bit analog outputs. These outputs include a 2048 location FIFO and de-glitching circuitry. Outputs may be updated through DMA, interrupt, or programmed I/O, or the outputs can operate independently of the computer through the use of the FIFO.

Feature Comparison

Model	DAS-1800HC	DAS-1800HR	DAS-1800ST	DAS-1800AO
Inputs	64 S. E. 32 diff.	16 S. E. 8 diff.	16 S. E. 8 diff.	16 S. E. 8 diff.
Speed	333 ks/s	100 ks/s	333 ks/s	333 ks/s
Resolution	12-bit	16-bit	12-bit	12-bit
External Expansion at Speed	–	up to 256 inputs	up to 256 inputs	up to 256 inputs
Gain-Channel Queue Length	64	256	256	256
D/A Converters	2	–	–	2
Digital Output	8	4	4	4
Digital Inputs	4	4	4	4

Input Ranges
Model DAS-1801HC

Gain	Unipolar	Throughput	Bipolar	Throughput*
1	0 to 5 V	312.5 ks/s	±5 V	312.5 ks/s
5	0 to 1 V	312.5 ks/s	±1 V	312.5 ks/s
50	0 to 100 mV	200 ks/s	±100 mV	312.5 ks/s
250	0 to 20 mV	60 ks/s	±20 mV	75 ks/s

Model DAS-1801ST and DAS-1801AO

Gain	Unipolar	Throughput	Bipolar	Throughput*
1	0 to 5 V	312.5 ks/s	±5 V	312.5 ks/s
5	0 to 1 V	312.5 ks/s	±1 V	312.5 ks/s
50	0 to 100 mV	200 ks/s	±100 mV	312.5 ks/s
250	0 to 20 mV	70 ks/s	±20 mV	70 ks/s

Models DAS-1802HC, DAS-1802ST and DAS-1802AO

Gain	Unipolar	Bipolar	Throughput*
1	0 to 10 V	±10 V	312.5 ks/s
2	0 to 5 V	±5 V	312.5 ks/s
4	0 to 2.5 V	±2.5 V	312.5 ks/s
8	0 to 1.25 V	±1.25 V	312.5 ks/s

Model DAS-1802HR

Gain	Unipolar	Bipolar	Throughput
1	0 to 10 V	±10 V	100 ks/s
2	0 to 5 V	±5 V	100 ks/s
4	0 to 2.5 V	±2.5 V	100 ks/s
8	0 to 1.25 V	±1.25 V	100 ks/s

** throughput-no gain change, multiple channels.*

Analog inputs are multiplexed into a high-speed 12-bit or 16-bit analog-to-digital converter. All inputs are software configurable for single-ended or differential inputs and unipolar or bipolar input ranges. Single channel inputs can be acquired at any gain up to 333 ksamples/sec, and multiple channels at rates to 312.5 ksamples/sec, depending on the model used.

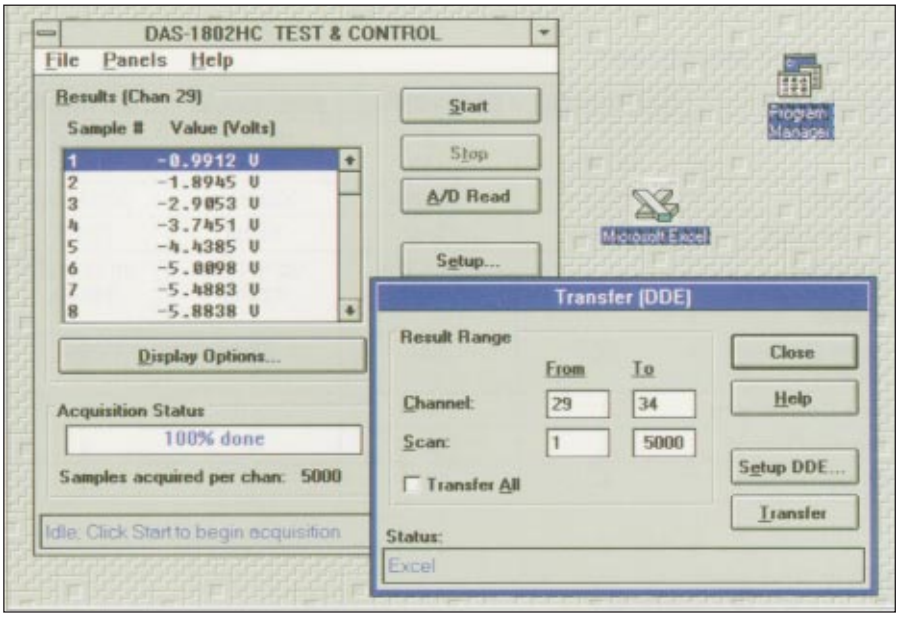
A 256 location channel-gain queue on the DAS-1800HR and DAS-1800ST (64 locations on the DAS-1800HC) allows high speed acquisition with channels at different gains and in non-sequential order using DMA or interrupt-based data transfer. The on-board 1024 location FIFO buffer assures reliable acquisition under both DOS and Windows. Data transfer may be accomplished with single-channel 16-bit DMA, dual-channel 16-bit DMA, interrupt or programmed I/O.

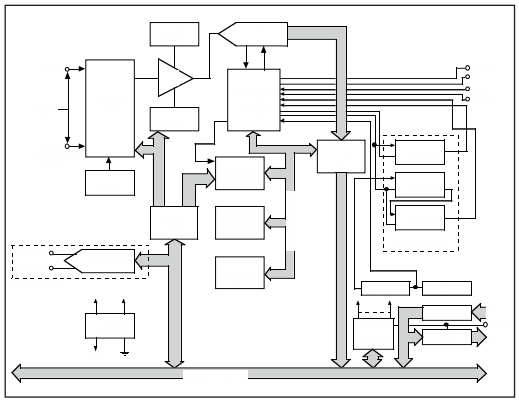
The DAS-1800 Series features flexible clocking, triggering and gating modes. The board may be configured to accept an external pacer clock input, or use the on-board timebase to provide a conversion rate from 4.32 samples/hour to 333 ksamples/s. The programmable burst mode capability allows acquisition from a series of channel scans at high speed with a programmed interval between scans. This mode emulates a simultaneous sample and hold (SSH) function.

Driver Software

DriverLINX software is also included, at no additional charge, with every DAS-1200 series board. Supporting your programming requirements in Windows 3.x/95 environments, DriverLINX provides application developers a standardized interface to over 100 services for creating foreground and background tasks to perform analog input and output, digital input and output, time and frequency measurement, event counting, pulse output and period measurement. In addition to basic I/O support, DriverLINX also provides sophisticated built-in capabilities to handle memory and data buffer management, a rich selection of starting and stopping trigger events including pre-, mid-point, and post triggering protocols, extensive error

checking and reporting capabilities, and a context-sensitive on-line help system. There are two versions included: DriverLINX and DriverLINX/VB. DriverLINX provides the C/C++interfaces. DriverLINX/VB provides custom control interfaces (VBX and ActiveX) that can be accessed from the palette of built-in tools included in Microsoft's Visual Basic and Visual C environments. Software is supplied on CD-Rom.





SPECIFICATIONS

ANALOG INPUTS – DAS-1800HC

Channels: 32 differential or 64 single-ended; software configurable

A/D FIFO Buffer: 1024 locations

Channel/Gain Queue Length: 64 locations

Accuracy: ±0.01% rdg ±1 LSB typical; ±0.02% rdg ±1 LSB for gain <250, max @ 25°C; ±0.03% rdg ±1 LSB for gain=250, max @ 25°C

Input Range Selection: software programmable

Input Overvoltage: ±15 V continuous powered/unpowered

Input Bias Current: ±40 nA max @ 25°C, ±60 nA max over operating temperature

Resolution: 12-bit

Linearity: integral: ±1/2 LSB typical, ±1 LSB max.; differential: ±1 LSB

Temperature Coefficients: offset-unipolar: ±10 µV/°C ±(14 µV°C ÷ gain) max; offset-bipolar: ±10 µV/°C ±(12 µV°C ÷ gain) max; gain<50: ±20 ppm/°C of FS max; gain=50: ±30 ppm/°C of FS max; gain=250: ±35 ppm/°C of FS max

Acquisition and Conversion Time: 3.0 µs max

Throughput, Single Channel: 333 ks/s for any gain or range

Common Mode Rejection Ratio: 74 dB @ gain=1; 80 dB @ gain= 2, 4 or 5; 86 dB @ gain=8; 100 dB @ gain=50 or 250

Data Transfer Modes: DMA (single or dual channel), interrupt or programmed I/O

ANALOG INPUTS – DAS-1800HR

Channels: 8 differential or 16 single-ended; software configurable

A/D FIFO Buffer: 1024 locations

Channel/Gain Queue Length: 256 locations

Resolution: 16-bit

Accuracy: ±0.003% rdg ±1 LSB typical; ±0.006% rdg ±1 LSB max @ 25°C

Input Range Selection: software programmable

Input Overvoltage: ±15 V continuous powered/unpowered

Input Bias Current: ±40 nA max @ 25°C, ±60 nA max over operating temperature

Linearity: integral: ±1/2 LSB typical, ±1 LSB max.; differential: ±1 LSB

Temperature Coefficients: offset-unipolar: ±10 µV/°C ±(14 µV°C ÷ gain) max; offset-bipolar: ±10 µV/°C ±(12 µV°C ÷ gain) max; gain: ±10 ppm/°C of FS max

Acquisition and Conversion Time: 8 µs max

Throughput: 100 ks/s for any gain or range, single channel, multiple channels with same gain, or multiple channels with gain change

Common Mode Rejection Ratio: 74 dB @ gain=1; 80 dB @ gain= 2 or 4; 86 dB @ gain=8

Data Transfer Modes: DMA (single or dual channel), interrupt or programmed I/O

ANALOG INPUTS – DAS-1800ST/AO

Channels: 8 differential or 16 single-ended; software configurable

A/D FIFO Buffer: 1024 locations

Channel/Gain Queue Length: 256 locations

Accuracy: ±0.01% rdg ±1 LSB typical; ±0.02% rdg ±1 LSB for gain <250, max @ 25°C; ±0.03% rdg ±1 LSB for gain=250, max @ 25°C

Input Range Selection: software programmable

Input Overvoltage: ±15 V continuous powered/unpowered

Input Bias Current: ±40 nA max @ 25°C, ±60 nA max over operating temperature

Resolution: 12-bit

Linearity: integral: ±1/2 LSB typical,

±1 LSB max.; differential: ±1 LSB

Temperature Coefficients: offset-unipolar: ±20 µV/°C ±(14 µV°C ÷ gain) max; offset-bipolar: ±20 µV/°C ±(12µV°C ÷ gain) max; gain<50: ±20 ppm/°C of FS max; gain=50: ±30 ppm/°C of FS max; gain=250: ±35 ppm/°C of FS max

Acquisition and Conversion Time: 3.0 µs max

Throughput, Single Channel: 333 ks/s for any gain or range

Common Mode Rejection Ratio: 74 dB @ gain=1; 80 dB @ gain= 2, 4 or 5; 86 dB @ gain=8; 100 dB @ gain=50 or 250

Data Transfer Modes: DMA (single or dual channel), interrupt or programmed I/O

ANALOG OUTPUT – DAS-1800HC ONLY

Channels: 2

Resolution: 12-bit

Range: ±10 V

Accuracy: 1 LSB max

Output Drive Current: ±5 mA max

Capacitive Load Drive: 100 µF

Linearity: integral: ±1/4 LSB typ; ±1/2 LSB max

Power-Up State: 0.0 V

Glitch Energy: 300 nV* seconds

Data Transfer Modes: interrupt or programmed I/O

DIGITAL I/O (ALL DAS-1800 SERIES)

Input Bits: 4

Input Low: VIL = 0.8 V max; IIL = -0.2 mA max

Input High: VIH = 2.0 V min; IIH = 20 µA max

Output Bits: 8, DAS-1800HC; 4, DAS-1800HR, DAS-1800ST

Output Low: VOL = 0.5 V max @ IOL = 8 mA

Output High: VOH = 2.7 V min @ IOH = -400 µA

Digital Output Strobe Pulse Width: 300 ns typ; data is latched on rising edge

Data Transfer Modes: interrupt or programmed I/O

CLOCK/TIMER

Max Pacer Clock Rate: 333 kHz; 100 kHz for HR models

Min Pacer Clock Rate: 0.0012 Hz

External Pacer Clock Rate: 333 kHz; 100 kHz for HR models

External Pacer Clock Pulse Width: 10 ns min

Hardware Trigger Pulse Width: 10 ns min

GENERAL

DMA Levels: 5, 6, 7; software configurable for 1 or 2 channels

Interrupt Levels: 3, 5, 7, 10, 11, 15; software configurable

Max Current at ±15 V Outputs: 30 mA

Max Current at +5 V Output: 1.0 A

Power Requirements: +5 V @ 430 mA typ, 870 mA max; +12 V @ 400 mA typ, 550 mA max

Operating Ambient: 0 to 50°C (32 to 122°F); 0 to 90% RH, non-condensing

Dimensions: 108 H x 338 W x 19 mm D (4.25" x 13.3" x 0.75")

To Order *(Specify Model Number)*

Model No.	Price	Description
DAS-1801HC	**$1499**	64/32 channel 12-bit 333 ks/s analog/digital I/O board with gains of 1, 5, 50, 250
DAS-1802HC	**1499**	64/32 channel 12-bit 333 ks/s analog/digital I/O board with gains of 1, 2, 4, 8
DAS-1802HR	**1299**	16/8 channel 16-bit 100 ks/s analog/digital I/O board with gains of 1, 2, 4, 8
DAS-1801ST	**999**	16/8 channel 12-bit 333 ks/s analog/digital I/O board with gains of 1, 5, 50, 250
DAS-1802ST	**999**	16/8 channel 12-bit 333 ks/s analog/digital I/O board with gains of 1, 2, 4, 8
DAS-1801AO	**1499**	16/8 channel 12-bit 333KS/S analog/digital I/O board with gains of 1, 5, 50, 250, and 2 analog outputs
DAS-1802AO	**1499**	16/8 channel 12-bit 33ks/s analog/digital I/O board with gains of 1, 2, 4, 8 and 2 analog outputs

Each board supplied with DriverLINX driver software for Windows 3.x and Windows 95 and complete operators manual.

Accessories/Options

Model No.	Price	Description
ASO-1800	**$99**	Advanced software package with C and Pascal support for DOS and Windows
STA-1800HC	**170**	Screw terminal accessory for DAS-1800HC models; requires CAB-1800 cable
STA-1800U	**120**	Screw terminal accessory for DAS-1800AO, DAS-1800ST and DAS-1800HR models; requires CDAS-2000 cable
STP-100	**100**	100-pin screw terminal panel for DAS-1800HC models; requires CAB-1800 cable
STP-50	**80**	50-pin screw terminal panel for DAS-1800AO, DAS-1800ST and DAS-1800HR models; requires CDAS-2000 cable
CAB-1800	**110**	100-pin, 18" cable for DAS-1800HC to STA-1800HC
CAB-1801	**120**	100-pin, 36" cable for DAS-1800HC to STA-1800HC
CAB-1800/S	**150**	100-pin, 18" shielded cable for DAS-1800HC to STA-1800HC
CAB-1801/S	**160**	100-pin, 36" shielded cable for DAS-1800HC to STA-1800HC
CDAS-2000	**30**	50-pin cable for DAS-1800AO, DAS-1800HR or DAS-1800ST to STA-1800U
SDAS-2000	**45**	50-pin shielded cable for DAS-1800AO, DAS-1800HR or DAS-1800ST to STA-1800U

Ordering Example: *DAS-1802HR 16-bit analog and digital I/O board with STA-1800U screw terminal accessory and CDAS-2000 cable, $1299 + 120 + 30 =* ***$1449.***