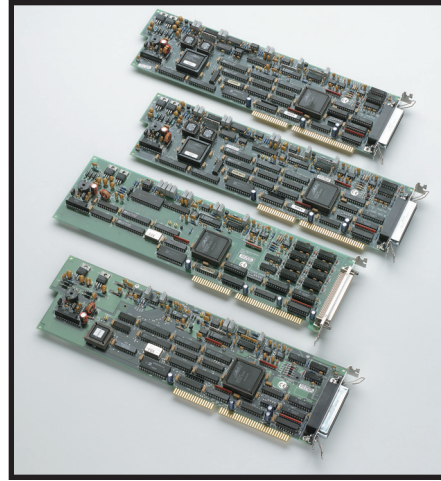


DAS-1800

- Up to 333 kSamples/s maximum input rate
- Channel-gain queue for high-speed acquisition at different gains
- 1K word FIFO
- Programmable burst mode sampling emulates simultaneous sample-and-hold
- Pre-, post- and about-triggering
- 2 waveform-quality analog outputs (DAS-1800AO)
- 2 DC analog outputs (DAS-1800 HC and DAS-1800HR-DA)
- 32-bit DriverLINX drivers plus a suite of bundled software including ExceLINX, VisualSCOPE, TestPoint, and LabVIEW drivers

46–333kHz, 12/16-Bit Multifunction Boards



This family of high-performance boards provides analog and digital I/O, optimal performance with Windows, and continuous, gap-free data acquisition on up to 64 channels. With these boards you can sample a few high-speed signals, or you can sample a large number of medium-speed signals and monitor various sources and sensors at different voltage levels. Even when you use channels with different gains or in nonsequential order, these boards maintain their high-speed acquisition.

APPLICATIONS

- Product test
- Process monitoring
- Data logging



DAS-1800 SERIES SELECTOR GUIDE

	DAS-1800AO	DAS-1800HC	DAS-1800HR	DAS-1800ST
Analog Inputs	16 single-ended or 8 differential	64 single-ended or 32 differential	16 single-ended or 8 differential	16 single-ended or 8 differential
Maximum Sampling Rate	333 kS/s	333 kS/s	100 kS/s	333 kS/s
Multiple Channel Aggregate Sampling Rate	312.5 kS/s	312.5 kS/s	98 kS/s	312.5 kS/s
Resolution	12-bits	12-bits	16-bits	12-bits
FIFO	1024 locations	1024 locations	1024 locations	1024 locations
External Expansion at Speed	Up to 256 inputs	N/A	Up to 256 inputs	Up to 256 inputs
Gain-Channel Queue Length	256	64	256	256
Gains				
Model 01	1, 5, 50, 250	1, 5, 50, 250	N/A	1, 5, 50, 250
Model 02	1, 2, 4, 8	1, 2, 4, 8	1, 2, 4, 8	1, 2, 4, 8
Input Ranges—Model 01	±5 V, ±1 V, ±100 mV, ±20 mV 0–5 V, 0–1 V, 0–100 mV, 0–20 mV	±5 V, ±1 V, ±100 mV, ±20 mV 0–5 V, 0–1 V, 0–100 mV, 0–20 mV	N/A	±5 V, ±1 V, ±100 mV, ±20 mV 0–5 V, 0–1 V, 0–100 mV, 0–20 mV
Input Ranges—Model 02	±10 V, ±5 V, ±2.5 V, ±1.25 V 0–10 V, 0–5 V, 0–2.5 V, 0–1.25 V	±10 V, ±5 V, ±2.5 V, ±1.25 V 0–10 V, 0–5 V, 0–2.5 V, 0–1.25 V	±10 V, ±5 V, ±2.5 V, ±1.25 V 0–10 V, 0–5 V, 0–2.5 V, 0–1.25 V	±10 V, ±5 V, ±2.5 V, ±1.25 V 0–10 V, 0–5 V, 0–2.5 V, 0–1.25 V
D/A Outputs	2 Waveform quality	2	2 optional	4 optional
D/A Update Speed	500 kS/s	10k typical, CPU dependent	10k typical, CPU dependent	10k typical, CPU dependent
D/A FIFO Size	2048 Locations	1 Location	1 Location	1 Location
Digital Inputs	4	4	4	4
Digital Outputs	4	8	4	4

1.888.KEITHLEY (U.S. only)

www.keithley.com

KEITHLEY

A GREATER MEASURE OF CONFIDENCE

High speed data acquisition

PCI/ISA/PCMCIA

DAS-1800

46–333kHz, 12/16-Bit Multifunction Boards

Bank A	Pin	Bank B	Pin
AGND	1	AGND	1
CH16 HI	2	CH00 HI	2
CH16 LO / CH48 HI	3	CH00 LO / CH32 HI	3
CH17 HI	4	CH01 HI	4
CH17 LO / CH49 HI	5	CH01 LO / CH33 HI	5
CH18 HI	6	CH02 HI	6
CH18 LO / CH50 HI	7	CH02 LO / CH34 HI	7
CH19 HI	8	CH03 HI	8
CH19 LO / CH51 HI	9	CH03 LO / CH35 HI	9
CH20 HI	10	CH04 HI	10
CH20 LO / CH52 HI	11	CH04 LO / CH36 HI	11
CH21 HI	12	CH05 HI	12
CH21 LO / CH53 HI	13	CH05 LO / CH37 HI	13
CH22 HI	14	CH06 HI	14
CH22 LO / CH54 HI	15	CH06 LO / CH38 HI	15
CH23 HI	16	CH07 HI	16
CH23 LO / CH55 HI	17	CH07 LO / CH39 HI	17
AGND	18	AGND	18
CH24 HI	19	CH08 HI	19
CH24 LO / CH56 HI	20	CH08 LO / CH40 HI	20
CH25 HI	21	CH09 HI	21
CH25 LO / CH57 HI	22	CH09 LO / CH41 HI	22
CH26 HI	23	CH10 HI	23
CH26 LO / CH58 HI	24	CH10 LO / CH42 HI	24
CH27 HI	25	CH11 HI	25
CH27 LO / CH59 HI	26	CH11 LO / CH43 HI	26
CH28 HI	27	CH12 HI	27
CH28 LO / CH60 HI	28	CH12 LO / CH44 HI	28
CH29 HI	29	CH13 HI	29
CH29 LO / CH61 HI	30	CH13 LO / CH45 HI	30
CH30 HI	31	CH14 HI	31
CH30 LO / CH62 HI	32	CH14 LO / CH46 HI	32
CH31 HI	33	CH15 HI	33
H31 LO / CH63 HI	34	CH15 LO / CH47 HI	34
AGND	35	AGND	35
DAC1 OUT	36	DAC0 OUT	36
-15 V	37	+15 V	37
DGND	38	DGND	38
NC	39	DI0 / XPCLK	39
SSHO	40	DI1 / TGIN	40
TGOUT	41	DI2	41
DOSTB	42	DI3	42
DO4	43	DO0	43
DO5	44	DO1	44
DO6	45	DO2	45
DO7	46	DO3	46
+5 V	47	+5 V	47
+5 V	48	+5 V	48
DGND	49	DGND	49
DGND	50	DGND	50

DAS-1800HC

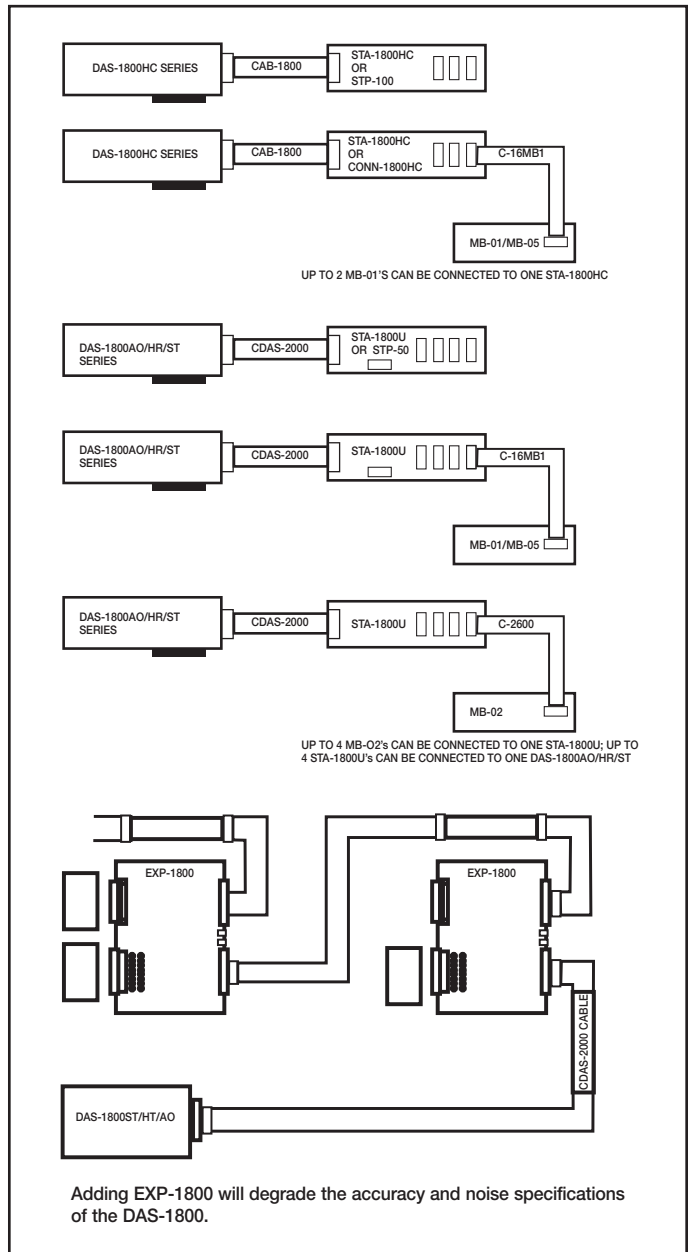
Pin	Pin
(User Common Mode) U _{CM} MD	1
CH00 LO or CH08 HI	2
CH01 LO or CH09 HI	3
CH02 LO or CH10 HI	4
CH03 LO or CH11 HI	5
CH04 LO or CH12 HI	6
CH05 LO or CH13 HI	7
CH06 LO or CH14 HI	8
CH07 LO or CH15 HI	9
(DAS-1800ST-DA) ODAC 2	10
(DAS-1800ST-DA) ODAC 3	11
+15V	12
LLGND	13
DGND	14
DI1	15
DI3	16
DO1	17
DO3	18
DOSTB	19
TGOUT	20
MUX03	21
MUX05	22
MUX07	23
+5V	24
DGND	25
CH00 HI	26
CH01 HI	27
CH02 HI	28
CH03 HI	29
CH04 HI	30
CH05 HI	31
CH06 HI	32
CH07 HI	33
LLGND	34
ODAC 0 (DAS-1800AO/HR-DA/ST-DA)	35
ODAC 1 (DAS-1800AO/HR-DA/ST-DA)	36
-15V	37
LLGND	38
GEXT	39
DI0	40
DI2	41
DO0	42
DO2	43
XPCLK	44
SSHO	45
TGIN	46
MUX04	47
MUX06	48
+5V	49
DGND	50

DAS-1800HR/ST

Connector Pin Assignments

The analog input, analog output, and digital input and output connections of the DAS-1800AO, DAS-1800HR, and DAS-1800ST are made with a 50-pin D-type connector at the rear of the computer. The analog input, analog output, and digital input and output connections of the DAS-1800HC are made with a 100-pin D-type connector at the rear of the computer.

Configuration Guide



1.888.KEITHLEY (U.S. only)

www.keithley.com

KEITHLEY

DAS-1800

46–333kHz, 12/16-Bit Multifunction Boards

Analog Inputs (DAS-1800AO/HC/ST)

NUMBER OF CHANNELS:

8 differential or 16 single-ended; software-configurable with software selectable remote sense (DAS-1800AO/ST).

32 differential or 64 single-ended; software-configurable (DAS-1800HC).

A/D FIFO BUFFER SIZE: 1024 words.

CHANNEL/GAIN QUEUE LENGTH:

256 locations (DAS-1800AO/ST); 64 locations (DAS-1800HC).

RESOLUTION: 12 bits.

INPUT GAINS: DAS-1801AO/HC/ST: 1, 5, 50, 250. DAS-1702AO/ST, DAS-1802AO/HC/ST: 1, 2, 4, 8.

INPUT RANGES:	BIPOLAR	UNIPOLAR
DAS-1801AO/HC/ST	±20 mV	0–100 mV, 0–20 mV
DAS-1802AO/HC/ST	±1.25 V	0–2.5 V, 0–1.25 V

INPUT RANGE SELECTION: Software programmable.

INPUT OVERVOLTAGE: ±15V continuous, powered; ±15V continuous, unpowered.

INPUT BIAS CURRENT: ±40nA max. @ 25°C; ±60nA max. over operating temperature.

INPUT IMPEDANCE: >100MΩ in parallel with 90pF.

THROUGHPUT—SINGLE CHANNEL: 333kS/s for any gain or range.

THROUGHPUT—DAS-1701AO/ST, DAS-1801AO/HC/ST (multiple channels, at the same gain):

GAIN	BIPOLAR INPUTS	UNIPOLAR INPUTS
1	312.5 kS/s	312.5 kS/s
5	312.5 kS/s	312.5 kS/s
50	312.5 kS/s	200 kS/s
250	75 kS/s	60 kS/s

THROUGHPUT—DAS-1802AO/HC/ST (multiple channels, at the same gain): 312.5kS/s for all ranges.

LINEARITY: Integral: ±½ LSB typical, ±1 LSB max. Differential: ±1 LSB.

ABSOLUTE ACCURACY:

±0.01% of reading ±1 LSB for all ranges, typical.

±0.02% of reading ±1 LSB for gain < 250, max. @ 25°C.

±0.03% of reading ±1 LSB for gain = 250, max. @ 25°C.

TEMPERATURE COEFFICIENTS:

Offset - unipolar: ±10μV/°C ± (14μV/°C ÷ gain) max.

Offset - bipolar: ±10μV/°C ± (12μV/°C ÷ gain) max.

GAIN: Gain < 50: ±20ppm/°C of FS max.

Gain = 50: ±30ppm/°C of FS max.

Gain = 250: ±35ppm/°C of FS max.

CONVERSION TIME: 3.0μs max.

NOISE (DAS-1801AO/HC/ST):

Gain	Bipolar (counts)	Unipolar (counts)
1	p-p = 1; rms = 0.1	p-p = 1; rms = 0.1
5	p-p = 1; rms = 0.1	p-p = 1; rms = 0.1
50	p-p = 4; rms = 0.5	p-p = 6; rms = 0.9
250	p-p = 8; rms = 1.0	p-p = 9; rms = 1.4

NOISE (DAS-1802AO/HC/ST): p-p = 1; rms = 0.1, for all gains and ranges.

COMMON MODE REJECTION RATIO:	Gain = 1:	74dB.
	Gain = 2, 4, 5:	80dB.
	Gain = 8:	86dB.
	Gain = 1 50, 250:	100dB.

DATA TRANSFER MODES: DMA (single or dual channel), interrupt, or programmed I/O.

Analog Inputs (DAS-1800HR)

NUMBER OF CHANNELS: 8 differential or 16 single-ended; software-configurable with software selectable remote sense.

A/D FIFO BUFFER SIZE: 1024 locations.

CHANNEL/GAIN QUEUE LENGTH: 256 locations.

RESOLUTION: 16 bits.

INPUT GAINS: 1, 2, 4, 8.

INPUT RANGES:

Bipolar: ±10V ±5V ±2.5V ±1.25V

Unipolar: 0 to +10V 0 to +5V 0 to +2.5V 0 to +1.25V

INPUT RANGE SELECTION: Software programmable.

INPUT OVERVOLTAGE: ±15V continuous, powered; ±15V continuous, unpowered.

INPUT BIAS CURRENT: ±40nA max. @ 25°C; ±60nA max. over operating temperature.

INPUT IMPEDANCE: >100MΩ in parallel with 90pF.

THROUGHPUT, SINGLE CHANNEL: 100kS/s for any gain or range.

THROUGHPUT, MULTIPLE CHANNELS: 98kS/s, at the same gain, all ranges.

THROUGHPUT, MULTIPLE CHANNELS: 60kS/s, with gain change.

LINEARITY DIFFERENTIAL: ±1 LSB. Monotonicity guaranteed over operating range.

ABSOLUTE ACCURACY:

Typical, all ranges: ±0.005% of reading ±1 LSB.

Maximum for gain = 1: ±0.005% of reading ±1.5 LSB.

Maximum for gain > 1: ±0.001% of reading ±1.5 LSB.

RELATIVE ACCURACY:

Typical: ±0.001% of reading ±1 LSB.

Maximum for 0–70°C: ±0.001% of reading ±1.5 LSB.

TEMPERATURE COEFFICIENTS:

Offset: ±5μV/°C max.

Gain: ±7.5ppm/°C of FS max.

Conversion time: 8μs max.

NOISE:

Gain	Bipolar (counts)	Unipolar (counts)
1	p-p = ±2; rms = 0.5	p-p = ±2; rms = 0.6
2	p-p = ±2; rms = 0.5	p-p = ±2; rms = 0.6
4	p-p = ±2.5; rms = 0.6	p-p = ±2.5; rms = 0.7
8	p-p = ±2.5; rms = 0.7	p-p = ±3; rms = 0.8

COMMON MODE REJECTION RATIO:	Gain = 1:	74dB.
	Gain = 2, 4:	80dB.
	Gain = 8:	86dB.

DATA TRANSFER MODES: DMA (single or dual channel), interrupt, or programmed I/O.

1.888.KEITHLEY (U.S. only)

www.keithley.com

KEITHLEY

A GREATER MEASURE OF CONFIDENCE

DAS-1800

46–333kHz, 12/16-Bit Multifunction Boards

Analog Outputs

(DAS-1800AO only)

NUMBER OF CHANNELS: 2.
RESOLUTION: 12 bits.
RANGE: $\pm 5V \pm 10V$ software programmable.
FIFO: 2048 words.
OUTPUT DRIVE CURRENT: $\pm 15mA$ max.
CAPACITIVE LOAD DRIVE: $100\mu F$ max.
GAIN ACCURACY: Adjustable to zero.
OFFSET ACCURACY: Adjustable to zero.
LINEARITY: **Integral:** ± 0.25 LSB typical, ± 0.75 LSB max.
Differential: ± 0.75 LSB max.
POWER-UP STATE: 0.0V
SAMPLE CLOCK: Internal clock, 75/s to 500k/s, A/D clock or external clock.
SETTLING TIME: $3\mu s$ for 20V step, typical; $1.8\mu s$ for LSB of major carry, typical.
THROUGHPUT: 500k/s max., per channel in recycle mode.
GLITCH ENERGY: Zero glitch feedthrough.
TRIGGER SOURCES: Internal, external trigger, or external gate.
DATA TRANSFER MODES: DMA, interrupt, or programmed I/O.

ANALOG OUTPUTS (DAS-1800HC ONLY)

NUMBER OF CHANNELS: 2.
RESOLUTION: 12 bits.
RANGE: $\pm 10V$
ABSOLUTE ACCURACY: ± 1 LSB max.
OUTPUT DRIVE CURRENT: $\pm 5mA$ max.
CAPACITIVE LOAD DRIVE: $100\mu F$.
LINEARITY: **Integral:** $\pm \frac{1}{4}$ LSB typ.; $\pm \frac{1}{2}$ LSB max.
POWER-UP STATE: 0.0V
GLITCH ENERGY: 300nV-seconds.
DATA TRANSFER MODES: Interrupt or programmed I/O.

ENVIRONMENTAL

OPERATING TEMPERATURE: $^{\circ}C$ to $+50^{\circ}C$
STORAGE TEMPERATURE: $-20^{\circ}C$ to $+70^{\circ}C$
HUMIDITY: 0 to 95% (non-condensing)
EMC: Conforms to European Union Directive 89/336/EEC.
SAFETY: Meets EN61010-1/IEC 1010.
DIMENSIONS: 13.3in L \times 4.25in H \times 0.75in D (33.8cm \times 10.8cm \times 1.9cm).

ACCESSORIES AVAILABLE

C2600	26-inch ribbon cable for the MB Series signal conditioning rack
C-16MB1	MB-01 backplane to STA-1800HC or STA-1800U cable
CAB-1800	DAS-1800HC to STA-1800HC 100-pin, 18-inch cable
CAB-1800/S	DAS-1800HC to STA-1800HC 100-pin, 18-inch shielded cable
CAB-1801/S	DAS-1800HC to STA-1800HC 100-pin, 36-inch shielded cable
CAB-1802/S	DAS-1800HC to STA-1800HC 100-pin, 72-inch shielded cable
CAB-1803/S	120 inch shielded cable
CDAS-2000	DAS-1800AO, DAS-1800HR, or DAS-1800ST to STA-1800U cable
CONN-1800HC	Connector Accessory for the DAS-1800HC
EXP-1800	Signal Conditioning and Expansion Accessory Board
MB-01*	16-Channel Direct-Connection Module Mounting Rack
MB-02*	16-Channel Multiplexed Module Mounting Rack
MB-05*	8-Channel Direct-Connection Module Mounting Rack
STA-1800HC	Screw Terminal Accessory for the DAS-1800HC Series w/CJC for Thermocouples
STA-1800U	Universal Screw Terminal Accessory for the DAS-1800AO, DAS-1800HR, and DAS-1800ST
STP-100	Screw Terminal Panel for 100-pin connectors
STP-50	Screw Terminal Panel for 50-pin connectors
TESTPOINT	TestPoint Software Package

*Signal conditioning modules for the MB-01, MB-02, and MB-05 can be found in the Signal Conditioning and Accessories section.

Ordering Information

DAS-1801AO
333 kS/s Analog and Digital I/O Board with gains of 1, 5, 50, 250 and two waveform quality analog outputs

DAS-1802AO
333 kS/s Analog and Digital I/O Board with gains of 1, 2, 4, 8 and two waveform quality analog outputs

DAS-1801HC
High Channel Count 333 kS/s Analog and Digital I/O Board with gains of 1, 5, 50, 250

DAS-1802HC
High Channel Count 333 kS/s Analog and Digital I/O Board with gains of 1, 2, 4, 8

DAS-1802HR
High Resolution 100 kS/s Analog and Digital I/O Board with gains of 1, 2, 4, and 8

DAS-1802HR-DA
High Resolution 100 kS/s Analog and Digital I/O Board with gains of 1, 2, 4, and 8 and two analog outputs

DAS-1801ST
Standard 333 kS/s Analog and Digital I/O Board with gains of 1, 5, 50, 250

DAS-1801ST-DA
Standard 333 kS/s Analog and Digital I/O Board with gains of 1, 5, 50, 250 and four analog outputs

DAS-1802ST
Standard 333 kS/s Analog and Digital I/O Board with gains of 1, 2, 4, 8

DAS-1802ST-DA
Standard 333 kS/s Analog and Digital I/O Board with gains of 1, 2, 4, 8 and 4 analog outputs

1.888.KEITHLEY (U.S. only)

www.keithley.com

KEITHLEY