Data Sheet

Portable High-Speed Data Acquisition System

DAS1820



The DAS1820 is a portable high-speed data acquisition system with a dual-slot chassis. It utilizes the same module ecosystem and hardware architecture as the DAS1800, providing near-identical performance in a smaller compact solution. This shared platform ensures the DAS1820 maintains the same plug-and-play functionality and signal conditioning capabilities as the larger system, enabling reconfiguration without requiring factory recalibration.

For high-speed measurements, the D18-UNI4, D18-HVM4, and D18-HIZ4 modules offer 4 channels per module, sampling rates up to 1 MSa/s, and simultaneous sampling. The D18-HVM4 module is capable of measuring high voltage signals up to ±1500 VDC or 1000 Vrms with safety ratings for CAT III 1500 V and CATIV1000 V. For measuring low voltage and slow changing trends, the D18-MUX8 provides 8 channels per module, sampling rates up to 5 kSa/s, and multiplexed sampling.

Optimized data recording features ensure efficient memory usage when capturing trends and transients simultaneously. Configure up to 3 different sampling rates per recording and assign channels accordingly to avoid oversampling or under sampling signals. Record data in a single MDF4 file or in multiple, up to 3. With separate files, users can create independent start and stop trigger conditions to capture high-speed signals, while continuously recording long term trends in a separate file. Coupled with an internal 500 GB solid-state drive, the DAS1820 provides the longest recording time in its class.

Delivering exceptional price-performance, the DAS1820 integrates advanced power analysis and scripting capabilities directly into the system. The power analysis supports DC, single-phase, and 3-phase systems operating in 50 Hz, 60 Hz, and 400 Hz. Additionally, custom script channels enable real-time scaling and linearization for non-linear sensors, supporting single and multichannel calculations.

To gain portability, you don't have to give up features and performance with the DAS1820. The battery-configured base unit weighs about 8.6 lbs (3.9 kg), and modules only add around 1.2 lbs (0.55 kg) each. The internal battery option provides up to 4 hours of field operation (3.5 hours with two D18-UNI4 modules) and the 12" HD touchscreen allows for easy setup and data visualization.

The easy to use interface offers intuitive features like one-finger scrolling and pinch-to-zoom, along with a built-in sensor library and visualization options including real-time waveforms, numeric values, Phasor diagrams, and histogram charts. The DAS1820 supports remote control via web server and VNC, and offers free DASpro software for PC-based data viewing.

Features and benefits:

- 2 slots and 4 measurement modules available
  - Universal (4 ch)
  - Multiplexed (8 ch)
  - High Impedance (4 ch)
  - High Voltage (4 ch)
- Measure up to ± 1500 VDC
- Up to 16 analog inputs with D18-MUX8 multiplexed module
- Temperature measurements with thermocouples and RTDs
- Onboard scripting for real-time single or multichannel calculations
- Max sampling rate of 1 MSa/s/ch (up to 8 channels)
- Memory efficient acquisition with simultaneous sampling at different rates (up to 3) and independent file recording (up to 3)
- Synchronize timing with IRIG, GPS, and PTP (DAS1820-SYNC model)
- Dedicated power analysis supports DC, single-phase, and 3-phase networks operating in 50 Hz, 60 Hz, or 400 Hz
- Dedicated sensor library to store and recall sensor information
- 12" HD touchscreen display
- Data visuals include real-time waveforms, numeric values, Phasor diagrams, and histogram charts
- 500 GB internal SSD (standard)
- Battery option (D1820-BAT) provides up to 4 hours of operation
- Interfaces include USB 3.0 (x2), and LAN 1 Gbps
- 16 digital input channels
- Rugged carrying case included

Applications

- Monitoring and verifying power systems
- Monitoring of processes and equipment
- Product validation and verification

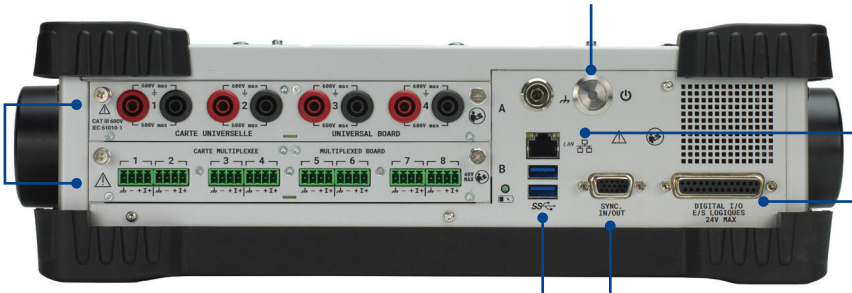
Technical data subject to change
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Front panel



12" touchscreen
HD touchscreen display with multi-touch features such as one finger scrolling and pinch-to-zoom

Top panel



Power button

Standard 2 module slots
With a plug & play design, users can easily swap between modules to meet new application requirements

LAN
1 Gbps LAN port for remote control, monitoring, and file transfers

Digital inputs & outputs
Provides 16 digital input channels and 4 digital outputs

Image displays a DAS1820 configured with 1 high voltage module and 1 multiplexed module

USB host ports

Synchronization input
SUB-D 15 HD pin terminal provides start/stop, trigger, and sampling outputs

Rear panel

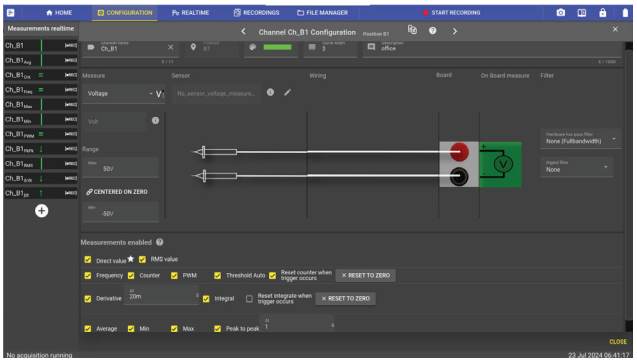


VESA-compatible mounting pattern
Allows the instrument to be securely mounted using standard VESA brackets, arms, or stands for flexible installation and positioning

Removable Li-Ion battery
Battery option provides up to 4 hours of continuous use

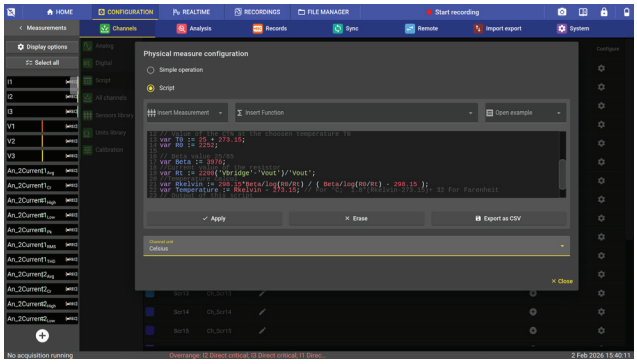
Operation highlights

Channel Configuration



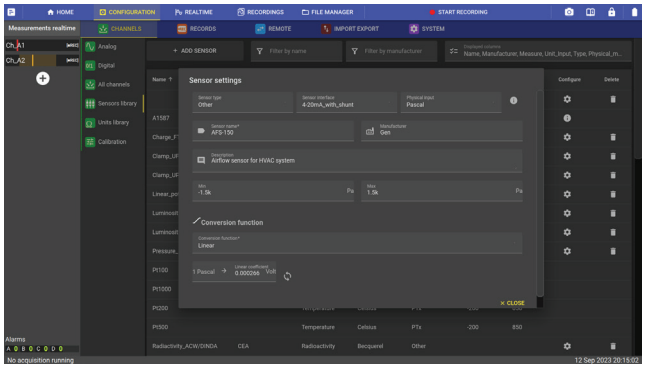
From a single input channel, the DAS1820 can be configured to perform real-time calculations such as RMS, frequency, PWM, and time-domain analysis. Sensor outputs can be converted in real time to the original measure and using the appropriate sensor parameters and conversion functions, while built-in analog and digital filters are available to condition the signal.

Programmable Scripting Channels



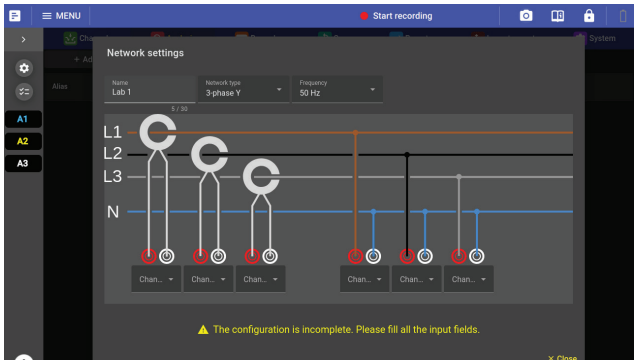
The DAS1820 provides scripting channel capabilities to reduce reliance on complex calibration curves and time-consuming post-processing. Script channels enable real-time scaling and linearization of non-linear sensors, supporting the use of custom voltage divider networks and multichannel calculations.

Sensor Library



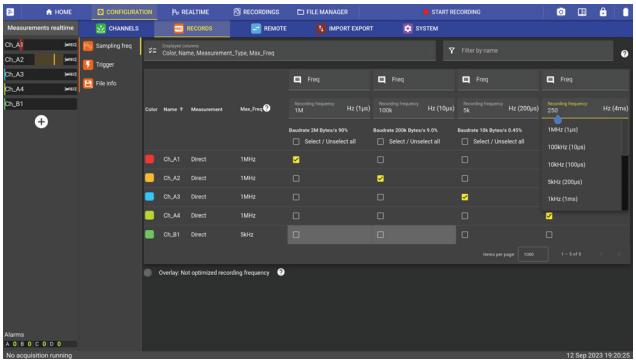
The DAS1820 provides a library of common sensor configurations to facilitate channel setup. Users can also add to the library by creating a new sensor with user-defined parameters including, name, units, and conversion function.

Power Analysis



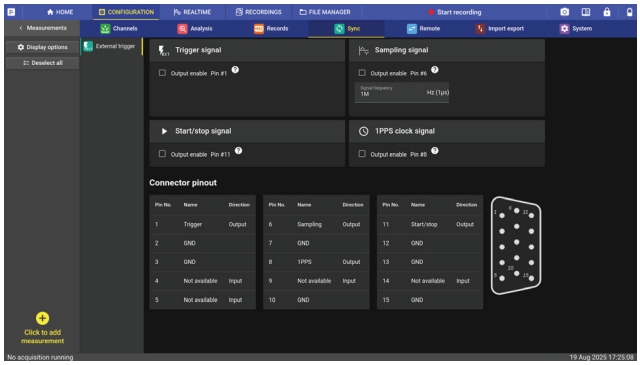
The power analysis function supports DC, single-phase, and 3-phase systems operating at 50 Hz, 60 Hz, and 400 Hz. Users can record power, energy, voltage, current, power quality, and harmonic measurements up to the 50th order, with real-time visualization using phasor diagrams and harmonic histograms.

Advanced Sampling and Recording



Sample channels at differing sample speeds (up to 3) to avoid over sampling trends or under sampling transients. Record data into separate files (up to 3) to record long term trends while triggering separate file recordings for high speed intermittent events.

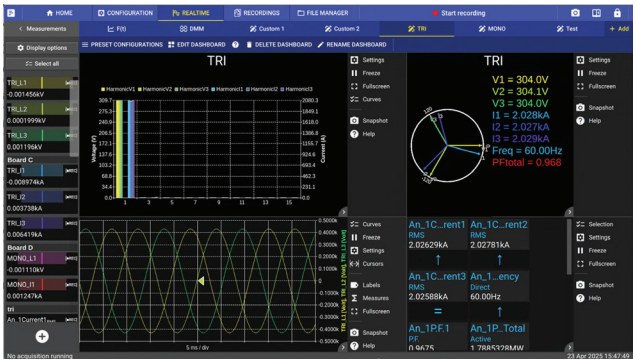
Synchronization and Triggering



The DAS1820 combines advanced synchronization and triggering features for precise measurements. Use a variety of timing sources, including optional PTP, IRIG, and GPS, to ensure your data is perfectly synchronized across multiple systems. Trigger from external signals via the 15-pin SUB-D connector or internal software settings to start and stop manually, at a specified time, or based on channel combinations.

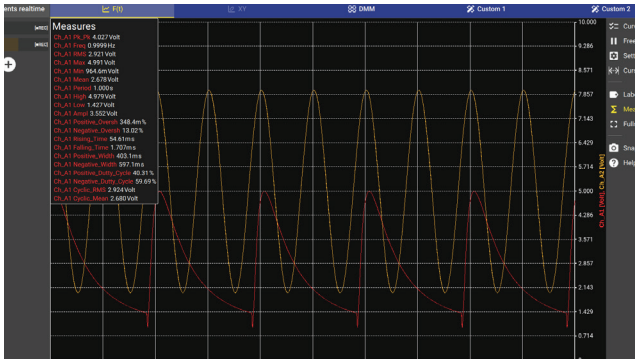
The tools you need

Custom Dashboards



Display and monitor data through highly customizable dashboards. Generate up to 25 widgets to display images and channel data in any combination of real-time waveforms, numeric meters, Phasor diagrams, and harmonic histograms. Create and save up to 10 custom dashboards to easily swap between.

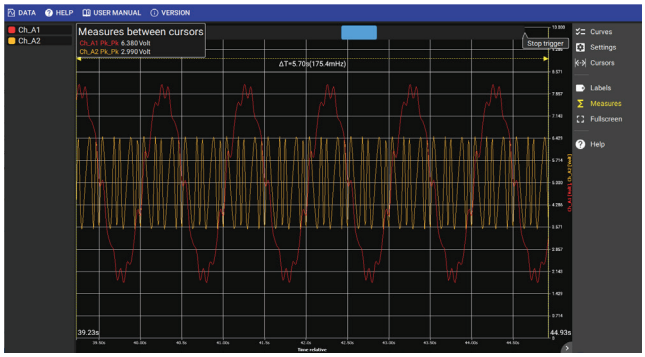
Built-in MDF4 File Viewer



Analyze recordings instantly with the built-in MDF4 viewer. Quickly navigate through data with intuitive touch gestures like one-finger scrolling and pinch-to-zoom. When recording in multiple files, markers are automatically placed at triggered events and link to the corresponding data file.

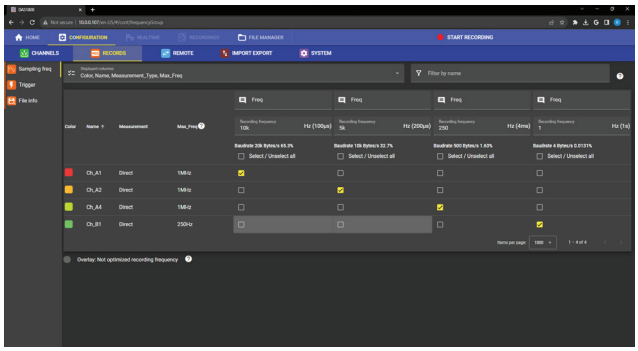
Remote connectivity and PC software

DASpro (PC software)



DASpro is a license free software that can be downloaded from bkprecision.com. Through this software, users can open and view the universal ASAM MDF4 file recordings saved by the DAS1820. Viewing data and analysis features are similar to the instrument, making it easy and intuitive to operate.

Web Server



The DAS1820 provides an internal web server for remote access through any device on the same network. Configure instrument channels and trigger parameters, initialize acquisition, and easily save and transfer files to a local storage system.

Virtual Network Computing (VNC) capability

The recorder includes a built-in VNC server that enables remote operation from a computer over a network connection. When accessed using a standard VNC client, the instrument's front panel is mirrored as a full graphical desktop on the computer, allowing users to monitor measurements and control all functions using a mouse and keyboard as if operating the unit locally.

File Transfer Protocol (FTP) and Network-Attached Storage (NAS)

Integrated FTP and NAS support allows measurement data to be automatically transferred from the recorder to a remote server or network-attached storage. This enables easy file access from multiple computers and simplified data backup without manual file handling.

Measurement Modules

Configure the DAS1820 to fit your needs with any combination of modules up to 2.



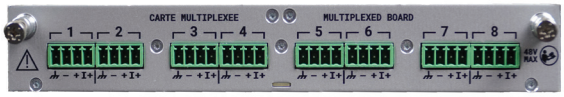
Universal Module



High Voltage Module



High Impedance Module



Multiplexed Module

Measurement Modules

	Universal	High Impedance	High Voltage	Multiplexed
Channels	4	4	4	8
Maximum Voltage	± 600 VDC	± 600 VDC	± 1500 VDC	± 48 VDC
RMS Voltage	424 VRMS	424 VRMS	1000 VRMS	-
Resolution	16 bit	16 bit	16 bit	18 bit
Sampling Rate	1 MSa/s/ch	1 MSa/s/ch	1 MSa/s/ch	5 kSa/s
Input Impedance	1 MΩ	10 MΩ	10 MΩ	2 MΩ
Input Type	Single ended	Single ended	Differential	Differential
Isolation	√	√	√	-
Voltage	√	√	√	√
Current	√	√	√	√
Thermocouples	√	√	-	√
RTDs	-	-	-	√
Frequency	√	√	√	-
Counter	√	√	√	√
PWM	√	√	√	-

Included accessories



Bare wire to banana adapter[1]
(Set of 4 pairs)



4 pin screw terminal block[2]
(Set of 8),



Rugged case



SUB-D 25 pin connector for
digital inputs and alarms



SUB-D 15 HD pin connector for
timing and synchronization I/O

Optional accessories



D18-MZ250



D18-UZ001

Current shunts available for banana and 4-pin inputs



D18-UZ50 accessory

(1) A set of bare wire to banana adapters is provided with every universal and high impedance module purchased.
(2) A set of 4 pin screw terminal blocks is provided with every multiplexed module purchased.

Specifications, base unit

Note: All specifications apply to the unit after a temperature stabilization time of 60 minutes over an ambient temperature range of 23 °C ± 5 °C.

Data Acquisition System		
Recording (files written to SSD)		
Max Sampling Rate[1]	1 MSa/s up to 8 channels	
Recording Groups	3	
Write Speed	50 MB/s	
File Format	ASAM MDF4 (.mf4)	
File Size Limit	90% of disk capacity	
At End of Acquisition	Notify, rearm trigger	
Markers	On user action, On event	
Real Time Measure		
Display Mode	F(t)	Roll mode: 100 ms/div to 10 min/div Scope mode: 10 µs/div to 50 ms/div
	DMM	Acquisition time: 200ms (10 NPLC[2] at 50Hz), 2s (100 NPLC[2] at 50Hz)
		Display mode: Bargraph, reduce, MIN/MAX
	Record live view	Typical Refresh period 2s, Zoom Mode
	Phasor Diagram	Data sampled at 10 kHz Vector amplitude based on RMS value
	Histogram	50 Hz to 60 Hz: 1 to 50 harmonics 400 Hz: 1 to 10 harmonics
	Custom	Customize up to 10 dashboards with unique widget arrangements Widgets: F(t), Record Live F(t), DMM, Phasor diagrams, Histogram, Images
File Viewer		
Open File Time (typical)	10 sec per 100 GB of file[3]	
Subplot	16	
Cursors	Horizontal, vertical	
Measurements	On the data displayed or between cursors	
	Min, Max, Pk to Pk, Frequency, RMS, Rising time	
Trigger System		
Compute Period	1 µs	
Source	Analog and logic channel, external source, manual, date/time, delay (on start), duration (on stop), AND/OR combination of channels (128 max)	
On Analog Channel	Edge (rising, falling, both), Threshold (above, below), windows (in, out)	
Pre-trigger	128 M samples	
Post-trigger	1000 s maximum	

Digital I/O	
Input	
Number of Channels	16
Max Voltage	24 V
Threshold	1.2 V to 2.8 V
Sampling Interval	1 µs (1 MSa/s) each channel
Output	
Number of Channels	4
Output Characteristics	TTL 5 V, 10 mA
Trigger Source	Analog/Digital channels, acquisition start/stop, disk full
Power Supply[4]	+ 12 V ± 5 %, 200 mA

Synchronization		
Sync and Trigger I/O (SUB-D 15 HD Connector)		
Input	Signal level	TTL 3.3 V
	External trigger	Pull-up resistor: 10 kΩ, Rising edge sensitive Minimum pulse width: 100 µs
	External start/stop	Pull-up resistor: 10 kΩ, Rising edge sensitive for start Falling edge sensitive for stop Minimum pulse width: 500 ms
Output	Signal level	TTL 3.3 V
	Trigger	1 ms positive pulse at trig event
	Start/stop	Set when record is launched
	Sampling	Clock with 50%duty cycle at the frequency of the fastest record group
	PPS	100ms pulse each second base on the main clock of the unit
IRIG and GPS (option)		
IRIG/GPS Input	IRIG format B122/B126 Time error between reference clock and acquisition clock, < ± 10 µs	
PTP (option)		
Ethernet PTPV2 IEEE1588	Time error between reference clock and acquisition clock, < ± 10 µs	

Software Feature		
Remote Access	VNC for remote monitoring and control	
	Web server	
	Event notify	Email
	File management	FTP NAS (Network storage for file backup)
	Bench automation	SCPI command port (23 or 5025)
Storage Management	Cleaning policy option for automatically removing old files after exceeding a specific number of files or a date	
Sensor Library	Predefined sensors and user created	
Date and Time	Manual, NTP	
Software Update	Through web or USB	

(1) For D18-UNI4 and D18-HIZ4 Module
(2) NPLC: Number of power line cycles
(3) Time with only the 1st frequency group used
(4) Used to power the isolated digital input board

Specifications, base unit

Note: All specifications apply to the unit after a temperature stabilization time of 30 minutes over an ambient temperature range of 23 °C ± 5 °C.

Power Analysis

General					
Network Type	DC; AC: Single-phase (1U/1I), 3-phase delta (3U/3I), 3-phase Wye in 3-wire (3U/3I) and 4-wire (4U/4I)				
Network Frequency	DC, 50Hz, 60Hz, 400Hz				
Sampling Rate	10 kHz				
Number of Networks	5				
Compatible Modules	D18-UNIV4 & D18-HVM4 & D18-HIZ4				
Record File	MDF4				
Calculation Interval					
Network Frequency	**1st Interval**	**2nd Interval**	**3rd Interval**	**4th Interval**	**5th Interval (custom)**
DC	200 ms	3 s	10 min	2 h	1 ms to 100 ms
50 Hz	10 periods	150 periods	10 min	2 h	1-2-5 period
60 Hz	12 periods	180 periods	10 min	2 h	1-2-5 period
400 Hz	80 periods	1200 periods	10 min	2 h	1-2-5-10-20-40 period
DC Measurements					
Voltage	Mean, Max, Min, peak-to-peak				0.1% Udin (1)
Current	Mean, Max, Min, peak-to-peak				0.1% Idin (2)
Power	Active				0.1% Pdin (3)
Energy	Active				-
AC Measurements					
Voltage	Mean, True RMS, Max, Min, peak-to-peak, Crest factor				0.1% Udin (1)
	Phase to ref channel				± 0.5°
Current	Mean, True RMS, Max, Min, peak-to-peak, Crest factor				0.1% Idin (2)
	Phase				± 0.5°
	K factor				1%
Power	Active, Reactive, Apparent				0.1% Pdin (3)
Power Quality	cos (Φ)				± 0.01
	tan (Φ)				-
	Φ				± 0.5°
	PF				0.002 in 50/60 Hz 0.004 in 400 Hz
	THD				1.0%
Energy	Active, Reactive				-
Frequency	±50 mHz				
Voltage Harmonics	50 Hz, 60 Hz: 1 to 50 harmonics				0.1% Udin (1)
	400 Hz: 1 to 10 harmonics				
Current Harmonics	50 Hz, 60 Hz: 1 to 50 harmonics				0.1% Idin (2)
	400 Hz: 1 to 10 harmonics				
Frequency					
50 Hz	18 Hz to 95 Hz				
60 Hz	22 Hz to 100 Hz				
400 Hz	150 Hz to 750 Hz				

General

Internal Solid State Memory	SSD 3D NAND Flash - 500GB
Operating Temperature	0 °C to 40 °C (32 °F to 104 °F)
Storage Temperature	-20 °C to 60 °C (-4 °F to 140 °F)
Display	12" HD touchscreen (1200 x 800)
Power Supply	110 VAC to 240 VAC, 50 - 60 Hz (75VA max)
Interfaces	USB3.0 (x2) and LAN 1Gbps (x1)
Battery (optional)	Removable, Lithium-ion - 10.8 V, 75 Wh
Battery Life (typical)	4 hrs - One Module D18-UNI4 installed 3.5 hrs - Two Module D18-UNI4 installed
Weight	11 lbs (5 kg) - Two Module installed + Battery option 9.9 lbs (4.5 kg) - One Module installed + Battery option
Safety	Low Voltage Directive (LVD) 2014/35/EU EN 61010-2010+A1:2019, EN 61010-2-030 (2021+A11/2021)
Electromagnetic Compatibility	EMC directive 2014/53/EU, EN IEC 61326-2-1 (2021) EN IEC 61326-1 (2021), EN 61000-3-2 (2019+A1/2021) EN 61000-3-3 (2013+A1/2019)
Dimensions (WxHxD)	15.7" x 9.6" x 4.7" (400 x 245 x 120 mm)
Warranty	Base unit and modules: 3 years Battery (D1820-BAT): 1 year
Supplied Accessories	Power cord, SUB-D 25 pin male connector and back shell, SUB-D 15 pin male connector and back shell, rugged carrying case
Languages	English, French, Portuguese, German, Spanish, Italian, Traditional Chinese, and Simplified Chinese

(1): Udin— Nominal network voltage
(2): Idin— Nominal network current
(3): Pdin— Nominal network power (Udin*Idin)

Specifications, measurement Modules

Note: All specifications apply to the unit after a temperature stabilization time of 30 minutes over an ambient temperature range of 23 °C ± 5 °C.

Universal Module (D18-UNI4)		
Number of Channels	4	
Input Type	Isolated single ended input - 4mm Banana Plug	
Voltage		
Max. Input Voltage	± 600 VDC or 424 Vrms	
Common-mode Voltage	600 V between track and ground	
Range (19 ranges)	± 500 µV / 1 mV / 2.5 mV / 5 mV / 10 mV / 25 mV / 50 mV / 100 mV / 250 mV / 500 mV / 1 V / 2.5 V / 5 V / 10 V / 25 V / 50 V / 100 V / 250 V / 600 V	
DC Accuracy[1]	≤ ± 25 mV	± 0.1% of full range + 10 µV[2]
	± 25 mV to ± 500 mV	± 0.1% of full range + 10 µV
	≥ ± 1 V	± 0.06% of full range
Offset Drift	± 50 ppm/°C ± 1 µV/°C	
Input Impedance	1 MΩ for ranges ≥ ± 1 V, 25 MΩ for ranges ≤ ± 0.5 V	
Input Capacitance	150 pF	
Intrinsic Noise[3] (standard deviation in % of the span)	≤ ± 1 mV	< 0.2%
	± 2.5 mV to ± 10 mV	< 0.1%
	± 25 mV to ± 500 mV	< 0.05%
	≥ ± 1 V	< 0.02%
CMRR	≤ ± 500 mV	> 85 dB
	≥ ± 1 V	> 70 dB
Crosstalk	> -90 dB	
Isolation	CH to CH and CH to GND, > 100 MΩ at 650 VDC	
Safety	CAT III 600 V	
Bandwidth and Filters		
Bandwidth (-3 dB)	≤ ± 2.5 mV	1 kHz
	± 5 mV to ± 25 mV	10 kHz
	± 50 mV to ± 500 mV	60 kHz
	≥ ± 1 V	100 kHz
Analog Filter	2nd Order(-20 dB/dec)	100 Hz, 1 kHz, 10 kHz
Digital Filter	IIR 4th order (-80 dB/dec)	0.01 Hz to 10 kHz
	Type	Low pass, high pass, band pass, band stop
	Filter response	Butterworth, Bessel, Chebyshev, Inverse Chebyshev, elliptic, Papoulis, Gaussian
Temperature (Thermocouple)		
Compute Frequency	4 ms	
Cold Junction	Uncompensated, internal, external (other channel)	
	Accuracy[4]: ± 1.25°C	
Type	J	-210 °C to 1200 °C (-346 °F to 2192 °F)
	K	-250 °C to 1370 °C (-418 °F to 2498 °F)
	T	-200 °C to 400 °C (-328 °F to 752 °F)
	S	-50 °C to 1760 °C (-58 °F to 3200 °F)
	B	200 °C to 1820 °C (392 °F to 3308 °F)
	E	-250 °C to 1000 °C (-418 °F to 1832 °F)
	N	-250 °C to 1300 °C (-418 °F to 2372 °F)
	R	-50°C to 1768°C (-58 °F to 3214 °F)

Data Acquisition		
ADC	16 bit – SAR	
Sampling Interval	1 µs (1 MSa/s) each channel	
Time and Counting		
Threshold	Set by user, auto	
Duty Cycle	10% minimum – (minimum pulse width, 20 µs)	
Counter	48 bits	
Frequency	0.1 Hz to 100 kHz	
	Accuracy: 0.01% reading, 0.1 Hz to 10 Hz 0.05% reading, 10 Hz to 100 kHz	
PWM	Absolute error: 0.1% from 0.1 Hz to 1 kHz 0.5% from 1 kHz to 5 kHz	
True RMS		
Compute Period	Compute on the 1 Ms/s data flow Each period until 100 Hz 10 ms between 100 Hz and 10 kHz	
Accuracy (Sine wave ≥ 1 V)	10 Hz to 2 kHz	± 0.1% of full range
	2 kHz to 10 kHz	± 0.3% of full range
Other		
Current	Through shunt or clamp	
Sensor	0 to 10 V, 4 to 20 mA (with external shunt), duty cycle or frequency sensor, other user defined settings	
Calculations	Min - max - avg - pk to pk on Δt, integral, and derivative	

High Impedance Module[5] (D18-HIZ4)		
Voltage		
Input Impedance	10 MΩ for ranges ≥ ± 1 V, 25 MΩ for ranges ≤ ± 0.5 mV	
Intrinsic Noise[3] (standard deviation in % of the span)	≤ ± 1 mV	< 0.2%
	± 2.5 mV to ± 10 mV	< 0.1%
	± 25 mV to ± 500 mV	< 0.05%
	≥ ± 1 V	< 0.05%
Bandwidth and Filters		
Bandwidth	≤ ± 2.5 mV	1 kHz
	± 5 mV to ± 25 mV	10 kHz
	± 50 mV to ± 500 mV	60 kHz
	≥ ± 1 V to ± 10 V	20 kHz
	≥ ± 25 V	80 kHz

(1) Direct measure taken on DMM at 10 (50 Hz) / 12 (60 Hz) NLPC (200 ms) and full bandwidth
(2) Only when offset adjustment has been performed after installing a new module. Otherwise accuracy is ± 0.1% of full range (max. range - min. range) + 20 µV
(3) Measure ± short circuit termination to 50 Ω on chassis during 1 sec at the fastest acquisition speed and full bandwidth
(4) Only when cold junction adjustment has been performed after installing a new module and after 30 minutes of connection between TLK2B accessory, thermocouple and module terminal. Otherwise accuracy is ±3 °C
(5) For all other specs, refer to the universal module specifications

Specifications, measurement Modules

Note: All specifications apply to the unit after a temperature stabilization time of 30 minutes over an ambient temperature range of 23 °C ± 5 °C.

Multiplexed Module (D18-MUX8)		
Number of Channels	8	
Input Type	Non-isolated differential input – 4 pin terminal block, Part: Phoenix Contact MC 1.5/ 4-ST-3.5	
Voltage		
Maximum Input Voltage	± 48 VDC between CH to GND and between 2 poles on a channel	
Range (16 ranges)	± 500 µV / 1 mV / 2.5 mV / 5 mV / 10 mV / 25 mV / 50 mV / 100 mV / 250 mV / 500 mV / 1 V / 2.5 V / 5 V / 10 V / 25 V / 48 V	
Admissible Common Mode	≤ ± 1 V	± 3 V
	≥ ± 2.5 V	± 48 V
DC Accuracy[1]	≤ ± 10 mV	± 0.1% of full range + 5µV
	≥ ± 25 mV	± 0.04% of full range
Offset Drift	± 50 ppm/°C ± 0.5 µV/°C	
Input Impedance	2 MΩ for ranges ≥ ± 1 V, 25 MΩ for ranges ≤ ± 0.5 V	
Input Capacitance	150 pF	
Intrinsic Noise[2] (standard deviation in% of the span)	≤ ± 1 mV	< 0.15%
	± 2.5 mV to ± 10 mV	< 0.05%
	≥ ± 25 mV	< 0.01%
CMRR	> 70 dB	
Crosstalk	> -90 dB	
Bandwidth and Filters		
Bandwidth (-3 dB)	1 kHz	
Digital Filter	IIR 4th order (-80 dB/dec)	0.01 Hz to 500 Hz
	Type	Low pass, high pass, band pass, band stop
	Filter	Butterworth, Bessel, Chebyshev, Inverse Chebyshev, elliptic, Papoulis, Gaussian
Data Acquisition		
ADC	18 bit – SAR	
Sampling Interval	200 µs (5 kSa/s) each channel	

Temperature (Thermocouple)		
Compute Frequency	4 ms	
Cold Junction	Uncompensated, internal, external (other channel)	
	Accuracy[3]: ± 1.25 °C	
Type	J	-210 °C to 1200 °C (-346 °F to 2192 °F)
	K	-250 °C to 1370 °C (-418 °F to 2498 °F)
	T	-200 °C to 400 °C (-328 °F to 752 °F)
	S	-50 °C to 1760 °C (-58 °F to 3200 °F)
	B	200 °C to 1820 °C (392 °F to 3308 °F)
	E	-250 °C to 1000 °C (-418 °F to 1832 °F)
	N	-250 °C to 1300 °C (-418 °F to 2372 °F)
	R	-50°C to 1768°C (-58 °F to 3214 °F)

Temperature (RTD)		
Compute Frequency	4 ms	
Wiring	2 wires	Max. corrective resistance 50 Ω
	3 wires	Max. 3-wire resistance, 50 Ω
	4 wires	
Type	Pt50(α = 3851), Pt100(α = 3851),Pt200(α = 3851), Pt500(α = 3851), Pt1000(α = 3851): from IEC 60751/1995 Pt100(α = 3926): from ITS-90 Ni100(α = 618), Ni120(α = 672), Ni1000(α = 618): from Minco NA/NB	
Excitation Current	Pt50, Pt100, Ni100, Ni120, Cu10, Cu50	1.0 mA
	Pt200	0.5 mA
	Pt500	0.2 mA
	Pt1000, Ni1000	0.1 mA
Temperature Range	Pt50/100/200/500/1000	-200 °C to 850 °C (-328 °F to 1562 °F)
	Ni100/1000	-60 °C to 180 °C (-76 °F to 356 °F)
	Ni120	-40 °C to 205 °C (-40 °F to 401 °F)
	Cu10/50	-50 °C to 150 °C (-58 °F to 302 °F)
Measurement Range	Pt50/100/200/500/1000 (7 ranges)	± 10 °C, ± 25 °C, ± 65 °C, ± 130 °C, ± 200 °C, [-220 °C, 380 °C], [-220 °C, 850 °C]
	Ni100 (5 ranges)	± 9 °C, ± 15 °C, ± 40 °C, [-60 °C, 80 °C], [-60 °C, 180 °C]
	Ni120 (3 ranges)	± 40 °C, [-40 °C, 100 °C], [-40 °C, 205 °C]
	Cu50 (2 ranges)	[0 °C, 150 °C], [-50 °C, 150 °C]
	Cu10 (2 ranges)	[-50 °C, 25 °C], [-50 °C, 150 °C]
Measurement Accuracy (4 Wire)	Pt50/Pt100/200/500/1000	± 0.04% of the range ± 0.2 °C
	Ni100/120	± 0.04% of the range ± 0.1 °C
	Cu10/50	± 0.1% of the range ± 0.3 °C
Accuracy (3 Wire)	± ([4 Wire accuracy] + 0.1°C)	

Resistance		
Compute Frequency	4 ms	
Wiring	2 wires	Max. corrective resistance 50 Ω
	3 wires	Max. 3-wire resistance, 50 Ω
	4 wires	
Measurement Range (4 Ranges)	300 Ω (1 mA), 1500 Ω (0.5 mA), 5k Ω (0.2 mA), 10 kΩ (0.1 mA)	
Accuracy	± 0.1% of the range ± 0.1 Ω	
Time and Counting		
Threshold	Set by user, auto	
Minimum Pulse Width	1 ms	
Counter	32 bits	
Other		
Current	Through shunt or clamp	
Sensor	0 to 10 V, 4 to 20 mA (with external shunt), other user defined settings	

(1) Direct measure taken on DMM at 10 (50 Hz) / 12 (60 Hz) NLPC (200 ms) and full bandwidth
(2) Measure ± short circuit termination to 50 Ω on chassis during 1 sec at the fastest acquisition speed and full bandwidth
(3) Only when cold junction adjustment has been performed after installing a new module and after 30 minutes of connection between GCM5P accessory, thermocouple and module terminal. Otherwise accuracy is ±3 °C

Specifications, measurement Modules

Note: All specifications apply to the unit after a temperature stabilization time of 30 minutes over an ambient temperature range of 23 °C ± 5 °C.

High Voltage Module (D18-HVM4)		
Number of Channels	4	
Input Type	Isolated differential input - 4mm Banana Plug	
Voltage		
Max. Input Voltage	± 1500 VDC or 1000 Vrms	
Overvoltage Protection	± 2000 VDC or 1414 Vrms (3)	
Range (9 ranges)	± 5 V / 10 V / 25 V ± 50 V / 100 V / 250 V ± 500 V / 1000 V / 2000 V	
DC Accuracy (1)	± 0.06% of full range	
Offset Drift	± 50 ppm/°C ± 1 µV/°C	
Input Impedance (DC)	10 MΩ	
Input Capacitance	10 pF	
Intrinsic Noise (2) (standard deviation in % of the span)	< 0.02%	
CMRR (Common mode rejection range)	> -120 dB	
Crosstalk	> -120 dB	
Channel Isolation	CH to CH and CH to GND, > 100 MΩ at 2000 VDC	
Safety	CAT III 1500 VDC, CAT IV 1000 V	
Bandwidth and Filters		
Bandwidth (-3 dB)	Ranges ≤ ± 2.5 V	30 kHz
	Ranges ≥ ± 50 V	100 kHz
Analog Filter	3rd order(-60 dB/dec)	100 Hz, 1 kHz, 10 kHz
Digital Filter	IIR 4th order (-80 dB/dec)	0.01 Hz to 10 kHz
	Type	Low pass, high pass, band pass, band stop
	Filter response	Butterworth, Bessel, Chebyshev, Inverse Chebyshev, elliptic, Papoulis, Gaussian

Data Acquisition		
ADC	16 bit - SAR	
Sampling Interval	1 µs (1 MSa/s) each channel	
Time and Counting		
Threshold	Set by user, auto	
Duty Cycle	10% minimum - minimum pulse width 20 µs	
Counter	48 bits	
Frequency	0.1 Hz to 50 kHz	
	Accuracy: 0.01% from 0.1 Hz to 10 Hz 0.05% of the value from 10 Hz to 50 kHz	
PWM	Absolute error: 0.1% - 0.1 Hz to 1 kHz 0.5% ≥ 1 kHz to 5 kHz	
True RMS		
Compute Period	Compute on the 1 Ms/s data flow Each period until 100 Hz 10 ms between 100 Hz and 10 kHz	
Accuracy (on a Sine wave for range ≥ 10 V)	10 Hz to 2 kHz	± 0.1% of full range
	2 kHz to 10 kHz	± 0.3% of full range
Other		
Current	Through shunt or clamp	
Sensor	0 to 10 V, 4 to 20 mA (with external shunt), duty cycle or frequency sensor, and other user defined settings	
Calculations	Derivative, integral, min - max - avg - pk to pk on Δt	

(1) Direct measure,full bandwidth, value taken on DMM display at 10 (50 Hz) / 12 (60 Hz) NLPC (200 ms)
(2) Measure ± short circuit terminate to 50 Ω on chassis during 1 sec at the fastest acquisition speed and full bandwidth
(3) CH to Earth GND withstand voltage 6.6 kV AC for 5 seconds

Ordering Information

Step 1: Select base unit model and options

Models	Description
DAS1820 (base unit)	The DAS1820 base unit includes the following standard; 2 module slots, 500 GB SSD, 16 digital channels, SUB-D 15 HD pin connector for external triggering and synchronization, 12" TFT LCD Full HD (1280 x 800), USB 3.0 (x2), and 1 Gbps LAN interfaces
DAS1820-SYNC	Includes the DAS1820 base unit with PTP enabled and additional hardware to support IRIG and GPS synchronization
Options	**Description**
D1820-BAT	Removable Lithium-ion battery providing up to 4 hours of continuous use
D18-PTP	Software license to enable PTPv2 (IEEE1588) time synchronization through Ethernet

Step 2: Determine the number and type of measurement modules for your application.

Module	Channels	Measurements
Universal (D18-UNI4)	4	Voltage, current (shunt), temperature (thermocouple), frequency, PWM, True RMS
High Impedance (D18-HIZ4)	4	Voltage, current (shunt), temperature thermocouple), frequency, PWM, True RMS
Multiplexed (D18-MUX8)	8	Voltage, current (shunt), resistance, temperature (RTD), temperature (thermocouple)
High Voltage (D18-HVM4)	4	Voltage (± 1500 VDC), current (shunt), frequency, PWM, True RMS

Note: Refer to the measurement modules and specifications sections for additional information.

Step 3: Select your accessories

Accessory	Part Number
Isolated digital channel board	917008000
Digital channels patch cord	902407000
Replacement 4 pin terminal block, pack of 8	GCM5P
Replacement quick-connect banana plug, 4 pairs	TLQ2B
4-pin 250 Ω shunt, 0.1%, 0.03 A max	D18-MZ250
Banana 50 Ω shunt, 0.1%, 0.05 A max	D18-UZ50
Banana 0.01 Ω shunt, 1%, 5 A max	D18-UZ001

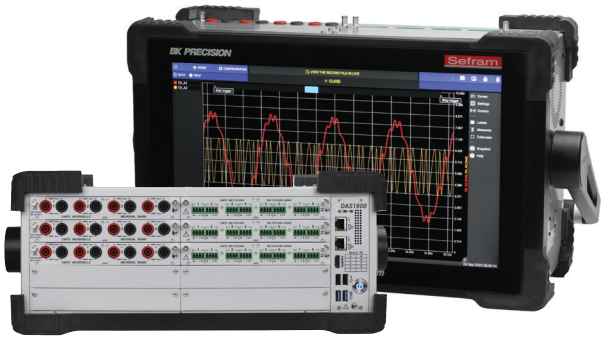
Step 4: Contact us

For inquiries and assistance configuring your DAS1820, please fill out the DAS1820 Order Request Form.

Or, visit our Where to Buy page at bkprecision.com to view a list of authorized vendors.

Need More Acquisition Capabilities?

For applications requiring higher signal density and extended data retention, the DAS1800 features a 10-slot chassis and 2 TB SSD standard. This system supports a maximum of 40 simultaneous or 80 multiplexed channels, providing the necessary scale for complex, multi-parameter testing environments.



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Our headquarters in Yorba Linda, California houses our administrative and executive functions as well as sales and marketing, design, service, and repair. Our European customers are most familiar with B&K through our French subsidiary, Sefram. Engineers in Asia know us through our B+K Precision Taiwan operation. The independent service centers in Singapore and Brasil service customers in Singapore, Malaysia, Vietnam, Indonesia and South America, respectively.



B&K Precision group member Independent service center Service center location

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Established in 1947, Sefram has been designing and manufacturing data recorders for more than 70 years. Sefram joined the test and measurement division of Schlumberger in 1978, and has been a subsidiary of B&K Precision since 2004. Certified ISO 9001, Sefram's strategy is to provide innovative and high-quality test and measurement products for electronic and electrical applications.

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