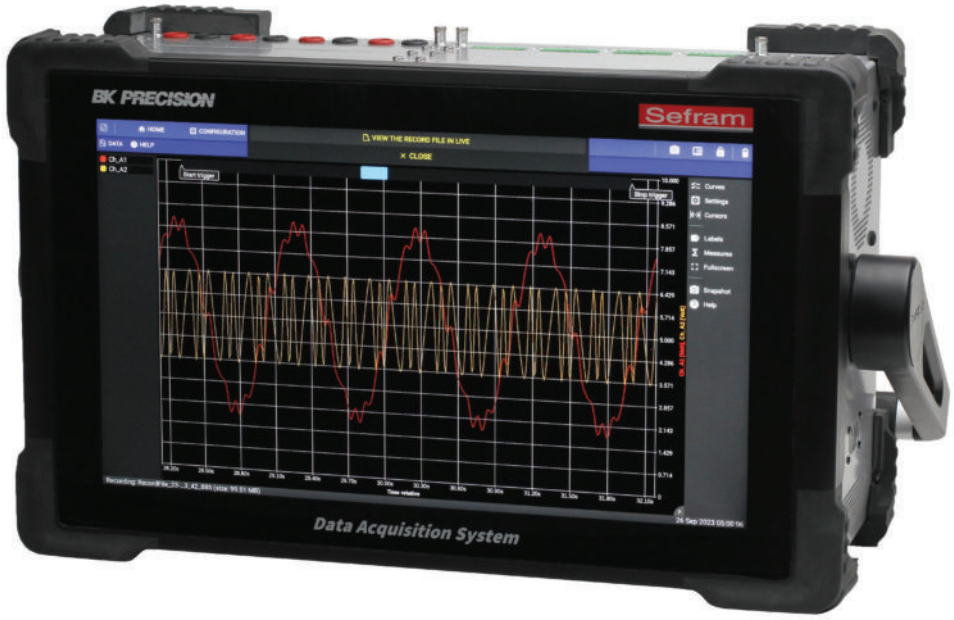
Data Sheet

High Speed Modular Data Acquisition Recorder
DAS1800



With 10 slots for input modules, the DAS1800 can be configured for a wide variety of applications. Choose from 3 input modules with 4 or 8 channels each to achieve the optimal channel configuration. Acquire data from any sensor with a voltage or current output (with shunt), or directly measure voltage, resistance, or temperature using thermocouples or resistance temperature detectors (RTDs).

For capturing rapidly changing signals and transients, the DAS1800 can simultaneously measure and record up to 40 channels at 1 MSa/s/ch and stream the data directly to the solid-state drive. For slow changing parameters, the D18-MUX8 multiplexed module provides 8 inputs per module (up to 80 channels per system).

With four configurable sampling rates and advanced triggering options, the DAS1800 can record trends at low sample rates and transients at higher rates. It also comes with a 2 TB solid-state drive standard, providing the longest recording time of any data acquisition recorder on the market.

To gain portability, you don't have to give up features and performance with the DAS1800. Weighing about 15 lbs (6.8 kg), the battery configured base unit is the lightest all-in-one system in its class. Modules are also lightweight, only adding around 1.2 lbs (0.55 kg) each. The DAS1800 features a large 15.6" Full HD touch screen display for easy setup and visualizing real-time or recorded data, and the optional internal battery provides up to 3.5 hours of battery operation (1.5 hours with 10 D18-UNI4 modules) for testing in the field.

The highly intuitive user interface of the DAS1800 makes it easy to use with a multitude of time saving features such as one finger scrolling, pinch and zoom, and a built-in sensor library. The DAS1800 also provides several options for visualizing your measurement data. View measurements as real-time waveforms and numeric values on customizable dashboards.

For viewing data on a PC, download our free DASpro software. For remote control, the DAS1800 supports web server and VNC connections.

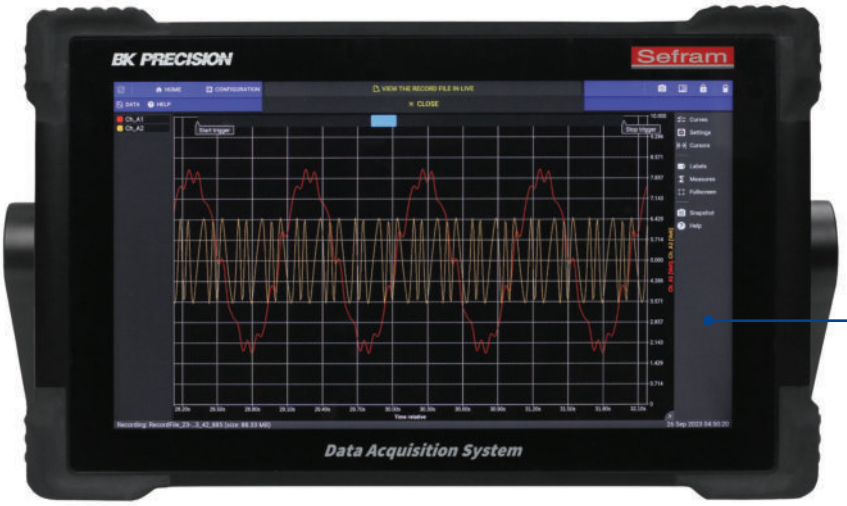
Features and benefits:

- Stream 40 channels at 1 MSa/s/ch
- Up to 80 analog inputs with D18-MUX8 multiplexed module
- Measure up to ± 600 VDC
- 10 slots and 3 measurement modules available
  - Universal (4 ch)
  - Multiplexed (8 ch)
  - High Impedance (4 ch)
- Temperature measurements with thermocouples and RTDs
- Store sensor information and parameters in the sensor library
- Simultaneous recording at multiple sample rates (up to 4)
- Internal signal conditioning with analog and digital filters
- 15.6" Full HD touchscreen display
- 2 TB internal SSD (standard)
- Advanced calculations and automatic measurements
- Battery option (up to 3.5 hours of operation)
- 16 digital input channels (24 V) and 4 digital outputs
- Dedicated power outputs for sensors with +3.3 V, +5 V, +12 V, or +24 V excitation voltages
- Interfaces include USB 3.0 (x2), USB 2.0 (x2), LAN 1 Gbps (x1), and HDMI (x1)
- Rugged carrying case included

Applications

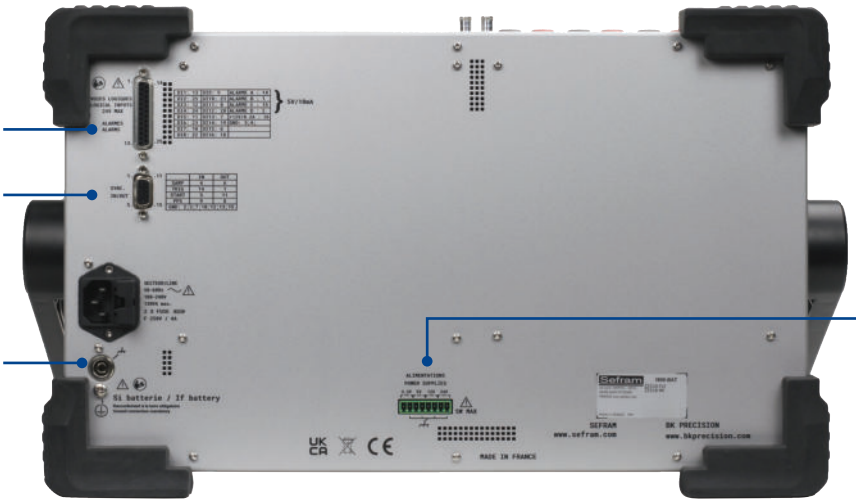
- Measure and record up to 80 analog channels
- Monitoring of processes and equipment
- Product validation and verification

Front panel



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

Rear panel



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

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

Ground terminal

Power supply outputs
Dedicated outputs provide 3.3 V, 5 V, 12 V, and 24 V with maximum 500 mA

Top panel

Standard 10 module slots
Easily configure system with plug & play modules

LAN
Dual LAN ports for remote control and monitoring

HDMI output
Mirror the DAS1800 screen to an external monitor

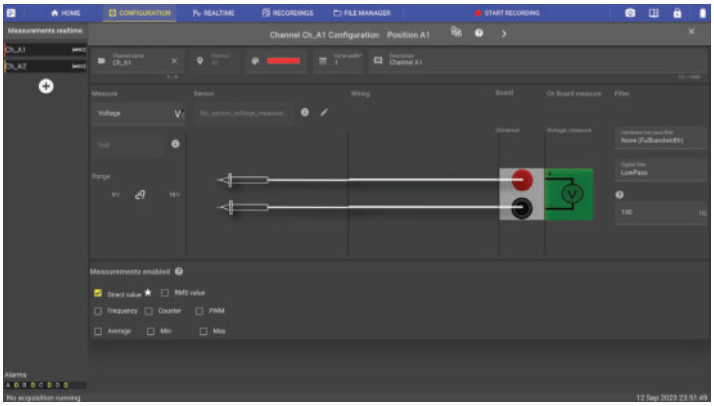
Power button

USB host ports

Image displays a DAS1800 configured with 3 universal modules and 3 multiplexed modules.

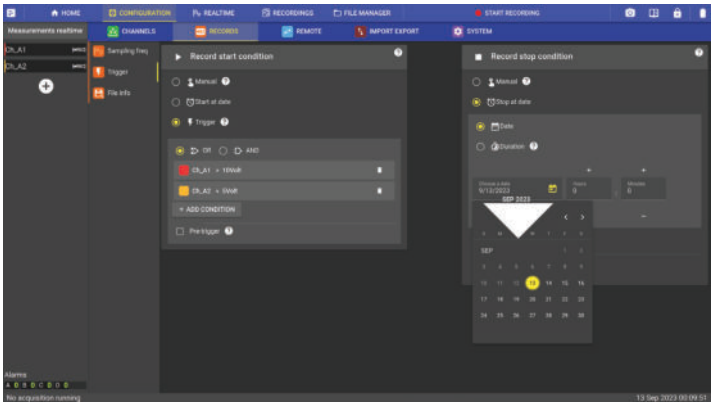
Operation highlights

Channel configuration



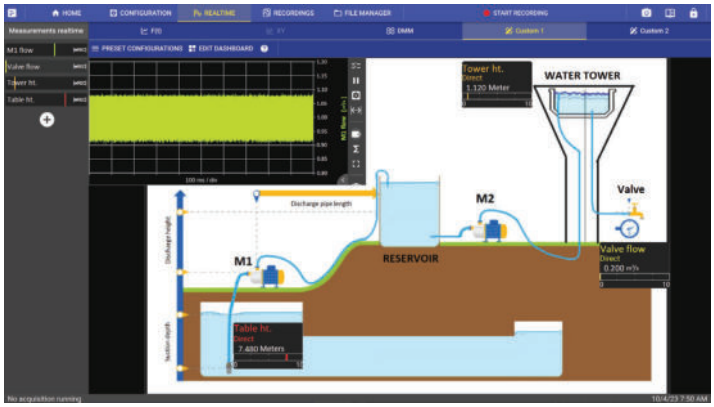
The channel configuration menu offers an intuitive design to ease measurement setup. The connection diagram changes to display wiring information for the measurement type and sensor selected.

Advanced triggering



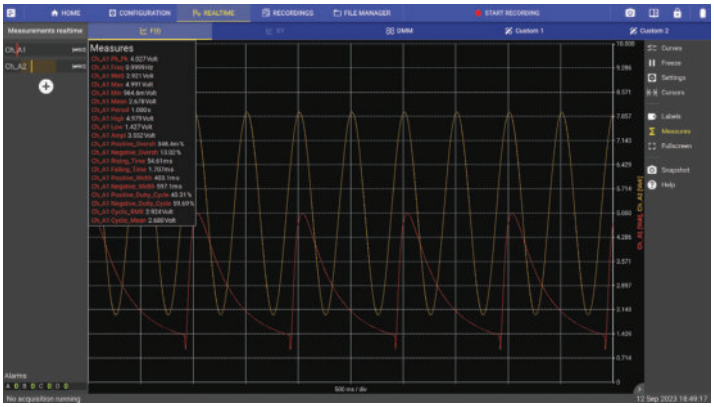
Configure the trigger settings to start and stop acquisition manually, at a specified time, or through a combination of one or multiple channel(s).

Custom dashboards



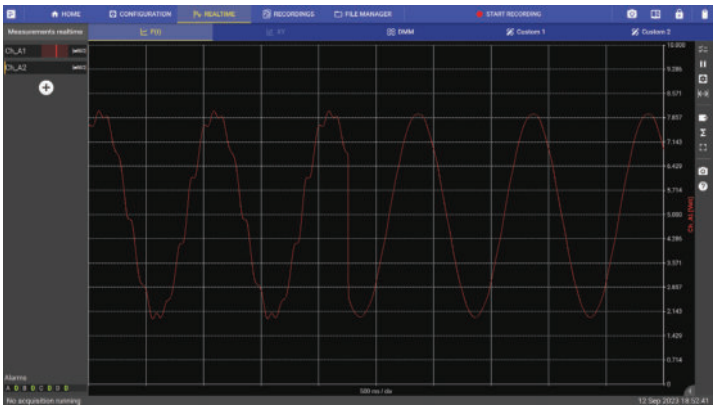
Measure and visualize data as real-time waveforms and numeric values on a customizable dashboard. Import circuit diagrams or system images to display on the dashboard.

Waveform measurements



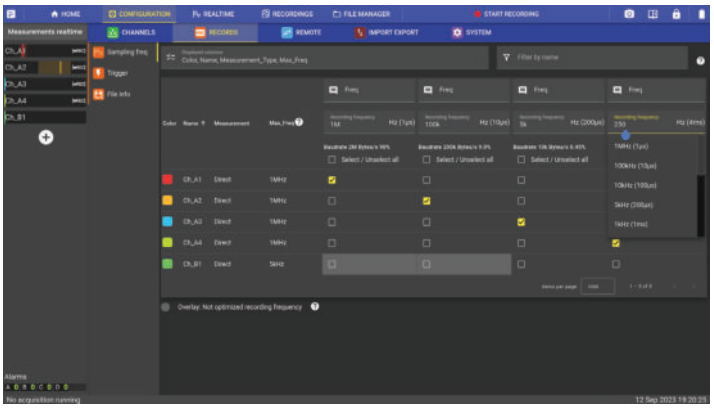
Automatically calculate up to 19 different waveform measurements including, amplitude, RMS, mean, frequency, rise time, and fall time.

Filtering



Reduce unwanted noise with built-in analog and digital filters. Analog filters include 100 Hz, 1 kHz, and 10 kHz low-pass filters. Digital filtering includes a user-definable low pass filter between 10 mHz to 10 kHz.

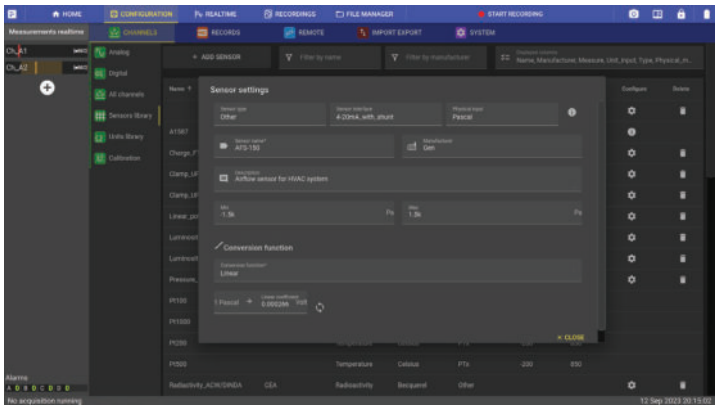
Simultaneous recording



Record data at up to 4 different user configurable sample rates simultaneously. Allocate channels to slower rates or higher rates on a per channel basis for efficient use of hard drive space.

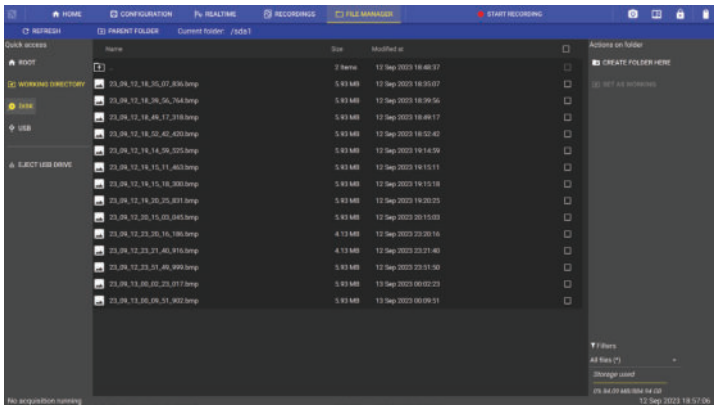
The tools you need

Sensor library



The DASI800 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.

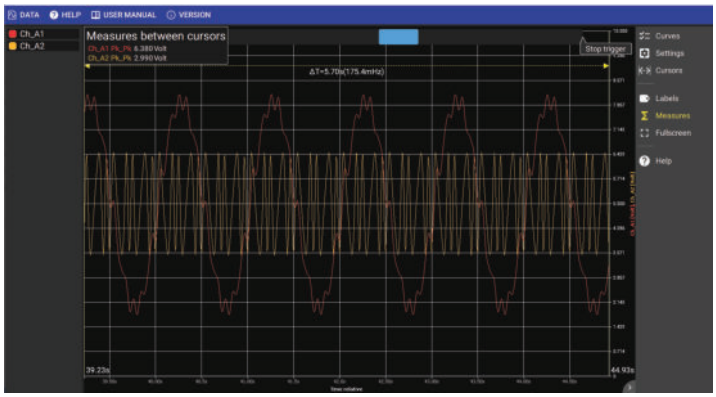
2 TB SSD



The DASI800 provides the longest recording time of any data acquisition on the market with a 2 TB solid state drive that comes standard. Store waveform recordings, configuration files, and screenshots.

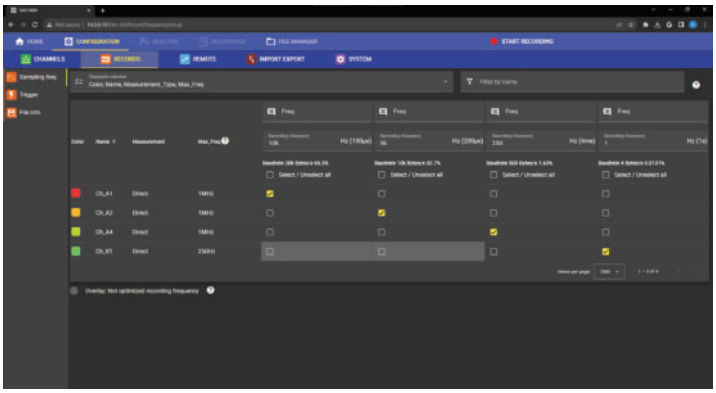
Remote connectivity and PC software

DASpro (PC software)



The DASpro software is a license free software that can be downloaded from bkprecision.com. Using this software, users can open and view the universal ASAM MDF4 file recordings saved by the DASI800. Viewing data and analysis features are similar to the DASI800, making it easy and intuitive to operate.

Web server



The DASI800 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's built-in VNC provides a graphical desktop system to remotely control the instrument from a computer with a full graphical interface that replaces the instrument's front panel using a mouse and keyboard.

File Transfer Protocol (FTP)

Access remotely the internal hard drive of the recorder to drag and drop the recording files into your desktop.

Measurement Modules

Configure the DAS1800 to fit your needs with any combination of modules up to 10.

Universal Module	
High Impedance Module	
Multiplexed Module	

Measurement Modules			
	Universal	**High Impedance**	**Multiplexed**
Channels	4	4	8
Maximum Voltage	± 600 VDC	± 600 VDC	± 48 VDC
RMS Voltage	424 VRMS	424 VRMS	-
Resolution	16 bit	16 bit	18 bit
Sampling Rate	1 MSa/s/ch	1 MSa/s/ch	5 kSa/s
Input Impedance	1 MΩ	10 MΩ	2 MΩ
Input Type	Single ended	Single ended	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

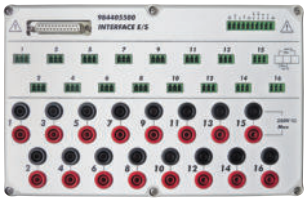
SUB-D 25 pin connector for digital inputs and alarms

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

8 pin screw terminal block for power rail supply

Optional accessories

Digital channel patch cord



Isolated digital channel board

(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 40 channels	
Recording Groups	4	
Write Speed	120 MB/s (7 GB/min)	
File Format	ASAM MDF4 (.mf4)	
File Size Limit	90% of disk capacity	
At End of Acquisition	Notify, rearm trigger	
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)
	Record live view	Typical Refresh period 2s, Zoom Mode
	Custom	2 Customizable Views Widgets: F(t), RecLive F(t), DMM, Picture
File Viewer		
Open File Time (typical)	10 sec per 100 GB of file	
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 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 Msamples	
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[3]	+ 12 V ± 5 %, 200 mA

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

Power Supply Outputs

Maximum Power Consumption	5 W
Output Characteristics	+ 3.3 V ± 5%, 500 mA
	+ 5 V ± 5%, 500 mA
	+ 12 V ± 5%, 400 mA
	+ 24 V ±5 %, 200 mA

Synchronization I/O

On Synchronization Connector (SUB-D 15 HD pin)		
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	TTL 3.3 V
	Trigger	1 ms positive pulse at trig event
	Start/stop	Set when record is launched

Software Feature

Remote Access	VNC for remote monitoring and control	
	Web server	
	File management	FTP, SFTP
	Bench automation	SCPI command port (23 or 5025)
Sensor Library	Predefined sensors and user created	
Date and Time	Manual, NTP	
Software Update	Through web or USB	
Languages	English, French	

General

Internal Solid State Memory	2 TB SSD 3D TLC NAND
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	15.6" TFT LCD full HD 1920x1080
Power Supply	110 VAC to 240 VAC, 50 to 60 Hz (150 VA max)
Interfaces	USB 3.0 (x2), USB 2.0 (x2) , LAN 1 Gbps (x1), HDMI (x1)
Battery (optional)	Non removable, Lithium-ion
Battery Life (typical)	3 ½ hrs - One D18-UNI4 module installed 1 ½ hrs - Ten D18-UNI4 modules installed
Weight	15 lbs (6.8 kg) base unit + battery option 1.21 lbs (550 g) each module
Safety	Low Voltage Directive (LVD) 2014/35/EU EN 61010-2010+A1:2019
Electromagnetic Compatibility	EMC directive 2014/53/EU EN IEC 61326-1 (2021) EN 61000-3-2 (2019+A1/2021) EN 61000-3-3 (2013+A1/2019)
Dimensions (W x H x D)	19.1" x 11" x 7.9" (485 x 280 x 200 mm)
Warranty	3 Years
Supplied Accessories	Power cord, SUB-D 25 pin male connector and back shell, SUB-D 15 HD pin male connector and back shell, 8 pin connector, rugged carrying case

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	
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
	Filter	Butterworth
Data Acquisition		
ADC	16 bit – SAR	
Sampling Interval	1 µs (1 MSa/s) each channel	
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)

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	
TRMS		
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 on Δt	

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	Lowpass
	Filter	Butterworth
Data Acquisition		
ADC	18 bit – SAR	
Sampling Interval	200 µs (5 kSa/s) each channel	

Temperature (RTD)		
Compute Frequency	4 ms	
Current	Pt100	1.0 mA
	Pt200	0.5 mA
	Pt500	0.2 mA
	Pt1000	0.1 mA
Temperature Range	-200 °C to +850 °C (-328 °F to 1562 °F)	
Wiring	2 wires	Max. corrective resistance 50 Ω
	3 wires	Max. 3-wire resistance, 50 Ω
	4 wires	
Measurement Range (7 Ranges)	± 10 °C, ± 25 °C, ± 65 °C, ± 130 °C, ± 200 °C, [-200 °C, +380 °C], [-200 °C, +850 °C]	
Accuracy	3 wires	0.1% of the range ± 0.3 °C
	4 wires	± 0.1% of the range ± 0.2 °C

(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

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)
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	

(3) Only when cold junction adjustment has been performed after installing a new module and after 30 minutes of connection between GCMSP accessory, thermocouple and module terminal. Otherwise accuracy is ±3 °C

Ordering Information

Step 1:Select base unit model and factory options

Models	Description
DASI800 (base unit)	The DASI800 base unit includes the following standard; I0 module slots, 2 TB SSD, I6 digital channels, SUB-D I5 HD pin connector for external triggering and synchronization, 5 W power rail, I5.6" TFT LCD Full HD (I920 x I080), USB 3.0 (x2), USB 2.0 (x2), I Gbps LAN (x2), and HDMI (xI) interfaces
DASI800-BAT	Includes the DASI800 base unit with a non-removeable Lithium-ion battery providing up to 3 ½ hours of continuous use
Factory Options	**Description**
DI8-FLE	Fanless version of the DASI800 base unit

Note: DI8-FLE is not compatible with a DASI800-BAT.

Step 2: Determine the number and type of measurement modules for your application. Select up to 10 modules.

Module	Channels	Measurements
Universal (DI8-UNI4)	4	Voltage, current (shunt), temperature (thermocouple), frequency, PWM, TRMS
High Impedance (DI8-HIZ4)	4	Voltage, current (shunt), temperature thermocouple), frequency, PWM, TRMS
Multiplexed (DI8-MUX8)	8	Voltage, current (shunt), resistance, temperature (RTD), temperature (thermocouple)

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
Replacement DASI800 hard case	LCLDR

Contact:
Industrial Process Measurement, Inc.
3910 Park Ave, Unit #7
Edison, NJ 08820 USA
(732) 632-6400
support@instrumentation2000.com
https://www.instrumentation2000.com/