Recorder
Product Guide

2010/2011

HANDHELD RECORDER

DAS1400

Data aquisition and solutions for all applications

PEFC/10-31-231
Forêt gérée durablement et certifiée

Sefram
INSTRUMENTS & SYSTEMES

The DAS 1400

family of paperless recorders offers up to 36 analogue inputs to cover all your applications

The DAS1400 are the latest generation of portable paperless recorders, ideal to measure, record and analyse signals up to 100 kHz.

The wide bandwidth, internal hard disk (80Gb) and large LCD screen, together with a new user interface under Linux© offers excellent performance with ease-of-use. Comprehensive interfaces (USB and Ethernet) are built into each recorder.

2 YEARS WARANTY

DAS 1400 : New design

- Power Energy/Analysis
- Strain Gauge board

Capabilities

- 6 to 36 analogue channels
- Universal input
- DC, AC+DC RMS voltage measurement
- Strain Gauge measurement (option)
- Frequency, thermocouple and PT100 measurement
- 16 logical channels
- 16-bit resolution
- 1Mega sample/s sampling rate
- 100 kHz bandwidth
- 20 automatic measurements
- Power Analysis function
- 12" TFT LCD screen
- 32Mword memory
- 80 Gb internal hard disk
- Interfaces: USB, Ethernet, XGA
- IEC 1010 – Cat III 600V

Ease of use

DAS1400 are the easiest to use recorders on the market today. The concept of previous families has been maintained, but now backed by the Linux operating system.

All parameters are displayed on the screen. With the mouse, you can access and change functions and parameters. A help screen is provided for each function..
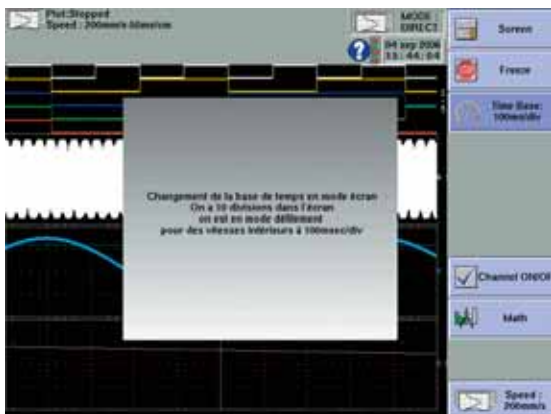
Panoramic LCD screen

The high resolution LCD screen provides excellent quality real-time graphical display, even in difficult conditions.
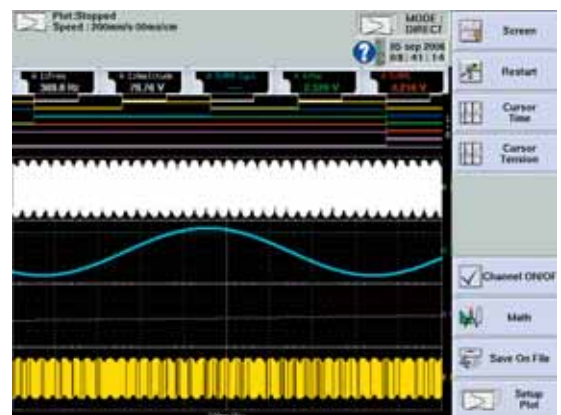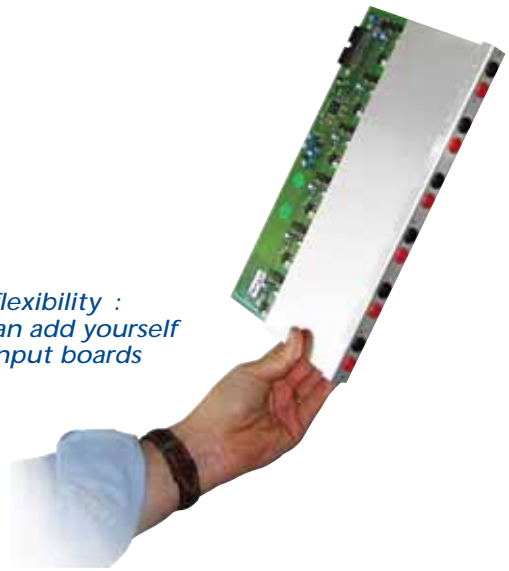
DAS 1400

6 to 36 analogue channels

The DAS1400 can be configured with 6, 12, 18, 24, 30 or 36 analogue channels and 16 logical channels. You can choose between two types of input modules :
- 6 universal inputs: Designed for high speed and high voltage applications
- 6 isolated strain gauge input
- 12 multiplexed inputs : designed for temperature and low voltage applications
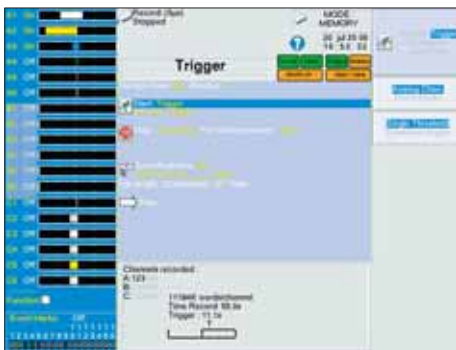
The DAS1400 is very flexible. The user can configure or upgrade the recorder for particular applications with up to three modules. Modules can be added or exchanged without return to the factory.

*High flexibility :
you can add yourself
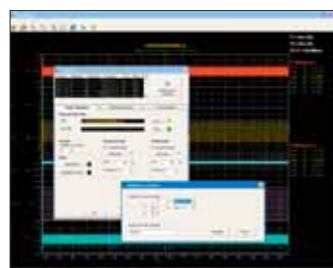new input boards*

Data analysis

The DAS1400 provides 20 automatic measurements that can be setup to suit your application. The DAS1400 includes a power analysis function (see page 10) that can be used for single phase, dual phases and three phases networks. Cursors can be associated to zoom mode (zoom in and out) to get the best analysis of your graphs, with exceptional accuracy.
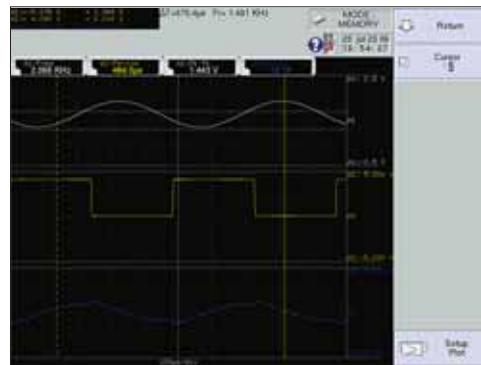
Data storage and interface

The DAS1400 offers various storage options: internal hard disk (80Gb), external USB flash memory (USB key), USB storage devices (CD/DVD writer, external hard disk,…). You can save your records and the recorder parameters (setup).
The Ethernet interface provides fast and efficient remote control of the recorder and will allow very fast transfer of data files to personal computers.

Real time acquisitionon hard disk

For long recording, the DAS1400 provides direct acquisition onto the internal hard disk – up to 100kHz for 6 channels simultaneously.
Various trigger modes simplify the capture of complex signals: edge, date, alarms, Go-No-Go,…

Complete software

SEFRAM VIEW and SEFRAM PILOT are supplied with your recorder. SEFRAM VIEW displays graphs on your personal computer as well as export to a spreadsheet (Excel©) or word processor (Word©). SEFRAM PILOT allows you the remote control and the setup of the recorder.

DAS1400

Specifications - Universal input board

Channels :	6 per board

Voltage

DC voltage ranges:	1mV to 1000 V
Max offset:	± 5 ranges (except 1000V)
Accuracy:	± 0,1% ± 10 µV ± 0,2% offset
TRMS AC+DC :	200 mV to 500 V
Bandwidth (-3dB):	5Hz to 500Hz
Crest factor :	2,2

Frequency

Sensitivity	300mV rms min.
Duty cycle	10%
Frequency range	10Hz to 100 kHz
Basic accuracy	0,2% of full scale
Maximum input voltage	± 500VDC or 440V AC (sine)

Temperature

Sensor	Using environnement	Ranges
J	-20°C to 1200°C	20°C to 2000°C
K	-250°C to 1370°C	20°C to 2000°C
T	-200°C to 400°C	20°C to 500°C
S	-50°C to 1760°C	50°C to 2000°C
B	-200°C to 1820°C	50°C to 2000°C
E	-250°Cto 1000°C	20°C to 1000°C
N	-250°C to 1300°C	20°C to 1000°C
W5	0 à 2320°C	50°C to 2000°C
Accuracy	Cold junction compensation : ±1,25°C	

Sampling

Resolution	14 bits
Sampling rate	1M sample/sec per channel
Memory length	32M word in segments of up to 128 Blocks
Triggering	Positive edge, negative edge, on logical input, delay, Go No Go.
Pre trigger	-100% à +100%

Bandwidth

Analog input bandwidth (-3dB)	range ≥ 1V: 100kHz range ≤ 50mV : 20kHz min
Programmable digital filters	10Hz, 100Hz,1kHz,10kHz
Input impedance (DC)	>25MΩ for range <1V 1MΩ for upper ranges
Input capacitance	150pF typ.
Maximum input voltage	between one channel and the frame ground ± 500V between 2 terminals of one channel ± 500V
Isolation between frame ground and channel	>100MΩ at 500VDC

Logic input

Channels	16
TTL - Max voltage	24V
Available functions	triggering acquisition on alarm triggering on logical words acquisition in memory mode 4, 8, 16 channels paper trace
Sensor supply	12 V DC
Alarms	3 (2 TTL , 1 relay)

Strain gauge board

See detailed specifications page 10

Power/Energy Analysis

See detailed specifications page 11

Specifications - Multiplexed board

Channels :	12 per board

Voltage

DC voltage ranges:	1mV to 50 V
Max offset:	± 5 ranges
Accuracy:	± 0,1% ± 10µV ± 0,1% offset
TRMS AC+DC :	200mV to 50V.
Bandwidth (-3dB):	5Hz to 100Hz
Crest factor :	2,2

Temperature

Sensor	Using environnement	Ranges
PT100 (2,3,4 Fils)	-200°C to 850°C	20°C to1000°C
J	-20°C to 1200°C	20°C to 2000°C
K	-250°C to 1370°C	20°C to 2000°C
T	-200°C à 400°C	20°C to 500°C
S	-50°C to1760°C	50°C to 2000°C
B	-200°C to 1820°C	50°C to 2000°C
E	-250°Cto1000°C	20°C to 1000°C
N	-250°C to 1300°C	20°C to 1000°C
W5	0 to 2320°C	50°C to 2000°C
Accuracy	Cold junction compensation: ±1,25°C	

Sampling

Resolution	16 Bits
Sampling rate	200µs maxi. (5K sample/s)
Memory length	32M word in segments of up to 128 Blocks
Triggering	Positive edge, negative edge, on logical input, delay, Go No Go
Pre trigger	-100% à +100%

Bandwidth

Analog input bandwidth (-3dB)	1kHz à -3dB
Programmable digital filters	0,1Hz, 1Hz,10Hz,100Hz
Input impedance (DC)	2 MΩ ranges >5V
Input capacitance	10MΩ (150pF) for other ranges
Maximum input voltage	between one channel and the frame ground ± 50V between 2 terminals of one channel ± 50V all input are differential, non isolated
Common mode voltage (max.)	± 5V for ranges < 5V ± 50V for ranges > 5V

General Specifications

Display

Display	TFT LCD coloured screnn 12 inches f(t) and XY functions Zoom, cursors, dV,dT and zoom between cursors
Calculation functions :	$y=ax+b$, $y=/x/+b$, $y=a\sqrt{x}+b+c$, $y=ax^2+b$, $y=(\log x)+b$, $yae^{(x+b)}+c$ +, - , x , / between channels
Automatic measurements	20 automatic measurements (F, T, Vpp, Tm…)
Power analysis function	see detailed description page 11

Storage

Setup backup :	16 named in RAM, unlimited on the hard disk
Internal hard disk	80 Gb.
IInterfaces	4 USB ports, VGA, Ethernet

Miscellaneous

|	
Power supply	85VAC to 264 VAC, 47Hz to 63 Hz
Max. consumption :	60W
Dimensions & weight	384 x 445 x 195 , 7,5 kg
Operating temperature range	0°C to 40°C
Storage temperature range :	-20°C to 60°C
Max. RH	80% (without condensation)
Warranty period	1 year
Safety	IEC1010 CAT III , 600V

More productivity with the software

Flexpro® sofware* :

Powerful analysis software
with more than 100 functions.

* option
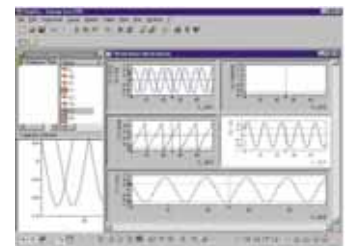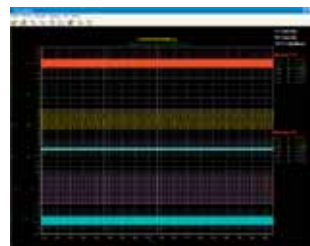
DAS600 / DAS 600SV

Compact, light weight and easy to use, the DAS600 is designed for users requiring a very simple handheld recorder, but without compromising on features. The DAS600 can be your partner for many measurement applications.

Capabilities

- 6 analogue channels
- Universal isolated input
- DC, AC+DC RMS voltage measurement
- Frequency, thermocouple
- Energy / Power analysis function
- 16 logical channels
- 14-bit resolution
- 1Mega sample/s sampling rate
- 100kHz bandwidth
- 20 automatic measurements
- 12" TFT LCD screen
- 32 Mword memory
- 80 Gb internal hard disk
- Interfaces: USB, Ethernet, XGA
- IEC 1010 – Cat III 600V

DAS 600SV : same specifications as DAS600.

This model has no fan and can be used in special polluted environment.

Power/Energy Analysis

DAS 600 : Design and ergonomy

SPECIFICATIONS - UNIVERSAL INPUT BOARD

Channels :	6

VOLTAGE

DC voltage ranges:	1mV to 1000 V
Max offset:	± 5 ranges (except 1000V)
Accuracy:	± 0,1% ± 10 µV ± 0,2% offset
TRMS AC+DC :	200 mV to 500 V
Bandwidth (-3dB):	5Hz to 500Hz
Crest factor :	2,2

FREQUENCY

Sensitivity	300mV rms min.
Duty cycle	10%
Frequency range	10Hz to 100kHz
Basic accuracy	0,2% of full scale
Maximum input voltage	± 500VDC or 440V AC (sine)

TEMPERATURE

Sensor	Using environnement	Ranges
J	-20°C to 1200°C	20°C to 2000°C
K	-250°C to 1370°C	20°C to 2000°C
T	-200°C to 400°C	20°C to 500°C
S	-50°C to 1760°C	50°C to 2000°C
B	-200°C to 1820°C	50°C to 2000°C
E	-250°Cto 1000°C	20°C to 1000°C
N	-250°C to 1300°C	20°C to 1000°C
W5	0 à 2320°C	50°C to 2000°C
Accuracy	Cold junction compensation : ±1,25°C	

SAMPLING

Resolution	14 bits
Sampling rate	1M sample/sec per channel
Memory length	32M word in segments of up to 128 Blocks
Triggering	Positive edge, negative edge, on logical input, delay, Go No Go.
Pre trigger	-100% à +100%

BANDWIDTH

Analog input bandwidth (-3dB)	range ≥ 1V: 100kHz
	range ≤ 50mV-1V : 50kHz
Programmable digital filters	10Hz, 100Hz,1kHz,10kHz
Input impedance (DC)	>25MΩ for range <1V
	1MΩ for upper ranges
Input capacitance	150pF typ.
Maximum input voltage	between one channel and the frame ground ± 500V
	between 2 terminals of one channel ± 500V
Isolation between frame ground and channel	>100MΩ at 500VDC

POWER/ENERGY ANALYSIS

See detailed specifications page 11

GENERAL SPECIFICATIONS

DISPLAY

Display	TFT LCD coloured screnn 12 inches
	f(t) and XY functions
	Zoom, cursors, dV,dT and zoom between cursors
Calculation functions :	$y=ax+b$, $y=/x/+b$, $y=a\sqrt{x}+b+c$, $y=ax^2+b$, $y=(\log x)+b$, $yae^{(x+b)}+c$
	+, - , x , / between channels
Automatic measurements	20 automatic measurements (F, T, Vpp, Tm…)

STORAGE

Setup backup :	16 named in RAM, unlimited on the hard disk
Internal hard disk	80 Gb.
IInterfaces	4 USB ports, VGA, Ethernet

MISCEILLANEOUS

Power supply	85VAC to 264 VAC, 47Hz to 63 Hz
Max. consumption :	60W
Dimensions & weight	384 x 445 x 195 , 5 kg
Operating temperature range	0°C to 40°C
Storage temperature range :	-20°C to 60°C
Max. RH	80% (without condensation)
Warranty period	1 year
Safety	IEC1010 CAT III , 600V

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DAS 20 & DAS 40
Multifunction recorders

DAS 20/40

NEW PRODUCT 2010 ▲

Capabilities

- 2 or 4 analogue channels
- 16 logical channels
- 14 bit resolution
- 10 hours autonomy (recording)
- Internal 8Gb hard disk
- Sampling rate: 1Ms/s per channel
- USB and Ethernet interface
- Math functions
- 7 inches TFT LCD
- IEC 1010: 600V - CAT III

Universal inputs for all type of measurements

Bandwidth	100 kHz
Sampling rate	1 Ms /s
Voltage	-500 V / +500 V 425 V RMS
Temperature	Thermocouple
Counter	From 10 Hz à 100 kHz
Current	AC+DC current (With external shunt or clamp)
Logical channels	16 logical channels 2 alarms output 0-5 V

	DAS 20	DAS 40
Channels	2	4
Voltage input	VDC: ± 1mV to ±500V VAC: 425VRMS	
Current input	with external shunt or accessory clamps	
Temperature input	Thermocouples : J, K, T, S, B, E, N, C, L Pt100/Pt1000: with optional module (factory option)	
Power analysis function	Single phase	Single/Three phases
Resolution	14 bit	
Bandwidth	100 kHz	
Filters	Programmable	
Memory	8 Gb hard disk	
Interfaces	USB, Ethernet	
General specifications		
Display	7 inches TFT LCD, with backlight	
Power supply	100/240VAC to 15V/5A adapter	
Battery	Lithium Ion 10.8V/6.5Ah	
Autonomy	10 hours (recording)	
Dimensions, weight	265 x 185 x 85mm, 2kg	
Safety	IEC1010 - 600V CAT III	
Warranty	1 year	

Supplied with : One carrying pouch, a set of red and black accessory per channel (test load, alligator clip, banana plug). SeframViewer and Sefram Pilot software, one main adaptor/charger, user manual (CD-ROM)

DAS 20 & DAS 40
Multifunction recorders

Optional printer mode

It possible to install on Sefram DAS 20 & DAS 40 recorders a thermal printer module (110mm with, 10 meters thermal paper roll.)

Very easy to use

DAS 20 and DAS 40 have been designed for intuitive use and for saving your time. They can be used in maintenance departments, for failure diagnostic, for the monitoring of electrical parameters or for temperature measurements.

All the acquisition parameters are displayed in a very simple way. User can define triggers and functions according to his application
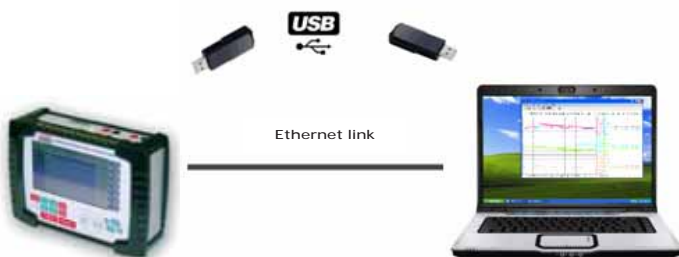
Flexible recorders

DAS 20 and DAS 40 are very flexible : analogue inputs, logical inputs, calculation between channels, filters, triggers, graphical display or text display. Everything is done to simplify your measurements.
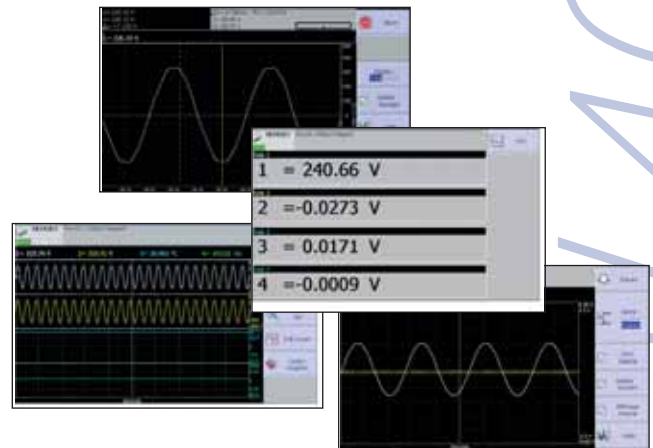
Application softwares

With the USB or Ethernet interfaces, you can transfer your records to a computer and analyse them with SEFRAM Viewer. Many export functions and types are available (Excel™, text or BMP). SEFRAM Pilot is used to remote control your recorder.

Power analysis function

This function provides all the necessary measurements:
- RMS, mean and peak values
- Active, reactive, apparent power and DF
- Fresnel diagram
- Harmonics up to rank 50
- Oscilloscope mode

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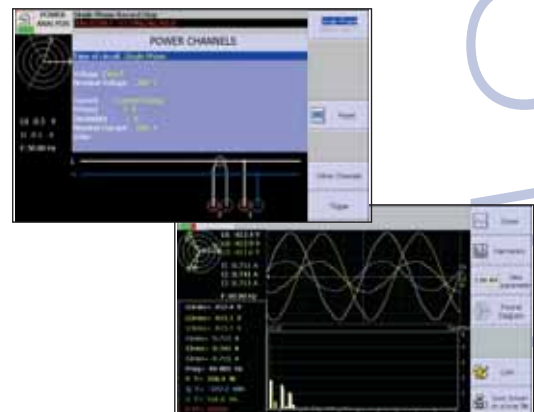
Sefram 8440

8440 SERIES : Thermal recorders with 270 mm paper width and up to 36 analogue channels.

- Power/Energy Analysis
- Strain Gauge board

8440 : new design

2 WARANTY YEARS

- 6 to 36 analogue channels
- Universal input
- DC, AC+DC RMS voltage measurement
- Frequency, thermocouple and PT100 measurement
- Strain Gauge board (option)
- Energy / Power analysis
- 16 logical channels
- 16-bit resolution
- 1Mega sample/s sampling rate
- 100kHz bandwidth
- 270mm paper width
- 20 automatic measurements
- 12" TFT LCD screen
- 32Mword memory
- 80 Gb internal hard disk
- Go-No-Go mode
- Interfaces: USB, Ethernet, XGA
- IEC 1010 – Cat III 600V

Highly flexible printing

The SEFRAM 8440 series built-in printer uses thermal recording paper with 270mm width. To suit your specific and various applications, you can configure and select all printing's parameters, like plotting mode (f(t) or text), paper speed (1mm/h to 200mm/s), number of traces or grid pattern.

For all channels, you can add annotations, specifying the date, the time, the paper speed, the channel names,… It makes your chart more complete and useful, and eases the analysis.

You can plot in real time and memorise simultaneously data and trigger information.

The choice of analogue input

The 8440 series can be configured with 3 input boards :
- a universal isolated input board with 6 channels (AC and DC voltages with AC+DC RMS capability and temperature measurement)
- a 6 channels strain gauge board with 6 fully isolated channels
- a universal multiplexed board with 12 channels dedicated to temperature using thermocouples or PT100 resistor and DC voltages up to 50V.

With the new plug-in system for input boards, you can install your channel extension without factory return of the recorder.

Covenient data stockage and off-line analysis

For long recording, the 8440 series provides direct acquisition onto the internal hard disk up to 100 kHz for 6 channels simultaneously.

Several USB ports are provided for external memory devices (USB memory,…)

The Ethernet interface will allow very fast and easy transfer of your records.

Flexpro© software (optional) offers many possibilities for off-line data analysis and report.

The SeframView software - provided with the recorder - displays graphs on your personal computer as well as export to a spreadsheet (Excel©) or word processor (Word©).

Sefram 8440

SPECIFICATIONS - UNIVERSAL INPUT BOARD

Channels :	6 per board

VOLTAGE

Direct mode bandwidth :	100kHz
DC voltage ranges:	1mV to 1000 V
Max offset:	± 5 ranges (except 1000V)
Accuracy:	± 0,1% ± 10 µV ± 0,2% offset
TRMS AC+DC :	200 mV to 500 V
Bandwidth (-3dB):	5Hz to 500Hz
Crest factor :	2,2

FREQUENCY

Sensitivity	300mV rms min.
Duty cycle	10%
Frequency range	10Hz to 100kHz
Basic accuracy	0,2% of full scale
Maximum input voltage	± 500VDC or 440V AC (sine)

TEMPERATURE

Sensor	Using environnement	Ranges
J	-20°C to 1200°C	20°C to 2000°C
K	-250°C to 1370°C	20°C to 2000°C
T	-200°C to 400°C	20°C to 500°C
S	-50°C to 1760°C	50°C to 2000°C
B	-200°C to 1820°C	50°C to 2000°C
E	-250°C to 1000°C	20°C to 1000°C
N	-250°C to 1300°C	20°C to 1000°C
W5	0 à 2320°C	50°C to 2000°C
Accuracy	Cold junction compensation : ±1,25°C	

SAMPLING

Resolution	14 bits
Sampling rate	1M sample/sec per channel
Memory length	32M word in segments of up to 128 Blocks
Triggering	Positive edge, negative edge, on logical input, delay, Go No Go.
Pre trigger	-100% à +100%

BANDWIDTH

Analog input bandwidth (-3dB)	range ≥ 1V: 100kHz
	range 50mV-1V : 50kHz
	range < 50mV : 20kHz min
Programmable digital filters	10Hz, 100Hz,1kHz,10kHz
Input impedance (DC)	>25MΩ for range <1V
	1MΩ for upper ranges
Input capacitance	150pF typ.
Maximum input voltage	between one channel and the frame ground ± 500V
	between 2 terminals of one channel ± 500V
Isolation between frame ground and channel	>100MΩ at 500VDC

GENERAL SPECIFICATIONS

LOGIC INPUT

Channels	16
TTL - Max voltage	24V
Available functions	triggering acquisition on alarm
	triggering on logical words
	acquisition in memory mode
	4, 8, 16 channels paper trace
Sensor supply	12 V DC
Alarms	3 (2 TTL , 1 relay)

RECORDING AND TRACES

Paper width	270 mm
Paper speed	direct mode : 1mm/h up to 200 mm/s
	mixed mode: 1mm/h up to 50 mm/s
	memory transcription: 10mm/s max
	quick advance :100 mm/s
	external control : 50 mm/s
	text mode : from 1 line/s to 1line /hour
Resolution and accuracy	Y axis: 8 dots per mm
	X axis: 16 dots per mm up to 50 mm/s
	and 8 dots for higher speed
	XY mode: 8 dots per mm
	Accuracy in relation to graticule: 0,01%
Graticule	5 pre-programmed graticules

STRAIN GAUGE BOARD (SEE DETAILED SPECIFICATION PAGE 10)

Channels	6 isolated channels
Strain Measurement	Full bridge, half-bridge
Voltage	1mV to 50V
Sampling rate	100ks/s
Resolution	16 bit
Filters	analogue and digital

POWER/ENERGY ANALYSIS

	See detailed specifications page 11

SPECIFICATIONS - MULTIPLEXED BOARD

Channels :	12 per board

VOLTAGE

DC voltage ranges:	1mV to 50 V
Max offset:	± 5 ranges
Accuracy:	± 0,1% ± 10µV ± 0,1% offset
TRMS AC+DC :	200mV to 50V.
Bandwidth (-3dB):	5Hz to 100Hz
Crest factor :	2,2

TEMPERATURE

Sensor	Using environnement	Ranges
PT100 (2,3,4 Fils)	-200°C to 850°C	20°C to1000°C
J	-20°C to 1200°C	20°C to 2000°C
K	-250°C to 1370°C	20°C to 2000°C
T	-200°C à 400°C	20°C to 500°C
S	-50°C to1760°C	50°C to 2000°C
B	-200°C to 1820°C	50°C to 2000°C
E	-250°Cto1000°C	20°C to 1000°C
N	-250°C to 1300°C	20°C to 1000°C
W5	0 to 2320°C	50°C to 2000°C
Accuracy	Cold junction compensation: ±1,25°C	

SAMPLING

Resolution	16 Bits
Sampling rate	200µs maxi.
Memory length	32M word in segments of up to 128 Blocks
Triggering	Positive edge, negative edge, on logical input, delay, Go No Go.
Pre trigger	-100% à +100%

BANDWIDTH

Analog input bandwidth (-3dB)	1kHz à -3dB
Programmable digital filters	0,1Hz, 1Hz,10Hz,100Hz
Input impedance (DC)	2 MΩ calibres >5V
	10MΩ for other ranges
Input capacitance	150pF
Maximum input voltage	between one channel and the frame ground ± 50V
	between 2 terminals of one channel ± 50V
	all input are differential, non isolated
Common mode voltage (max.)	± 5V for ranges < 5V
	± 50V for ranges > 5V

GENERAL SPECIFICATIONS

DISPLAY

Display	TFT LCD coloured scren 12 inches
	f(t) and XY functions
	Zoom, cursors, dV,dT and zoom
	between cursors
Calculation functions :	y=ax+b , y=/x/+b, y=a√x+b+c,
	y=ax²+b, y=(log x)+b, yae^{(x+b)}+c
	+, - , x , / between channels
Automatic measurements	20 automatic measurements (F, T, Vpp, Tm…)

STORAGE

Setup backup :	16 named in RAM, unlimited on the hard disk
Internal hard disk	80 Gb.
IInterfaces	4 USB ports, VGA, Ethernet

MISCELLANEAUS

Power supply	85VAC to 264 VAC, 47Hz to 63 Hz
Max. consumption :	60W (non plotting), 230W max.
Dimensions & weight	384 x 445 x 195 , 11 kg
Operating temperature range	0°C to 40°C
Storage temperature range :	-20°C to 60°C
Max. RH	80% (without condensation)
Warranty period	2 years
Safety	IEC1010 CAT III , 600V

Complete software

- SEFRAM VIEW displays graphs on your computer as well as export to a spreadsheet or word processor.
- SEFRAM PILOT allows the remote setup and control of the recorder.
- FLEXPRO ™ software (option) : powerfull software with more than 100 analysis functions.

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Strain Gauge board
for DAS1400 and 8440

- 6 isolated channels
- Full bridge and half bridge
- Input : 1mV to 50V
- Sampling rate : 100ks/s
- Resolution : 16 bit
- Analogue and digital filters
- Temperature measurement

strain gauge board

Capabilities

Channels	6 (fully isolated)
Measurements	Strain jauge, voltage, thermocouple and current with optional external shunt
Input	differential, fully isolated
Input impedance	2 MΩ for ranges < 1 Volt 1 MΩ for ranges >= 1 Volt
Maximum input voltage (Between one input and ground, or between ground and mechanical chassis)	200V DC
Input voltage	± 50V
Isolation (between channels and mechanical chassis)	>100 MΩ under 500V
Input connectors	Fast plug-in / plug-out, 6 contacts per channel

All accuracies are given with 1Hz filter

Voltage measurement

Maximum range	50 V
Lowest range	1 mV
Maximum offset	±50V limited at ± 5 ranges
Accuracy	± 0.1% of full scale ± 10µV ± 0.1% of offset
Resolution	16 bit
Offset drift	100ppm/°C ±1 µV/°C
Sampling rate	100kHz (or 10µs)
Noise	<30µV without filter

Strain Gauge measurements
The unit is µSTR (micro strain) - 2000µSTR = 1 mV/V

Bridge	Full bridge (4 and 6 wires), half bridge
Automatic balancing range	±25000 µSTR
Bridge supply voltages	2V and 5V (symetrical ±1V and ±2.5V)
Gauge rate	2 (ajustable between 1.8 and 2.2)
Maximum range	50 000 µSTR
Minimum range	1000 µSTR
Maximum offset	±50000µSTR
Accuracy	± 0.1% of full scale ± 5µSTR ± 0.1% of offset
Resolution	16 bit
Sampling rate	100kHz (or 10µs)
Offset drift	100ppm/°C ±1 µV/°C

Bandwidth

3 dB bandwidth	>18 KHz
Analogue filter (low pass 60dB/decade)	1KHz,100Hz, 10Hz
Low pass (digital)	1 Hz, 0.1 Hz, 0.01 Hz, 0.001 Hz

Temperature measurement
Cold junction compensation for J,K,T,S,N,E,W5 thermocouples : ± 1.25 °C

| Sensor	Maximum possible range	Range
COUPLE J	-210°C to 1200 °C	20 °C to 2000 °C
COUPLE K	-250°C to 1370 °C	20 °C to 2000 °C
COUPLE T	-200°C to 400 °C	20 °C to 500 °C
COUPLE S	-50°C to 1760 °C	50 °C to 2000 °C
COUPLE B	200°C to 1820 °C	50 °C to 2000 °C
COUPLE E	-250°C to 1000 °C	20 °C to 1000 °C
COUPLE N	-250°C to 1300 °C	20 °C to 1000 °C
COUPLE W5	0°C to 2320 °C	50 °C to 2000 °C

To order
984402500

This optional board can be added to your DAS1400 or 8440 without factory return.
Your recorder must have an updated firmware. The firmware update is free of charge from our website. If assistance is needed, please contact our technical support.

Sefram
INSTRUMENTS & SYSTEMES

Please contact us for more information +33 (0)4 77 59 36 81 - Visit our web site : **www.sefram.fr** - E-mail : sales@sefram.fr

Energy / Power Analysis
for DAS600 / DAS1400 and 8440

- Single phase, dual phases, three phases networks
- Fresnel Diagram
- Oscilloscope mode
- Harmonics up to rank 50
- Memorization of harmonics
- Calculated values : mean value, RMS value, peak value, crest factor, THD, DF, active power, apparent power, reactive power, power factor (cos Φ).
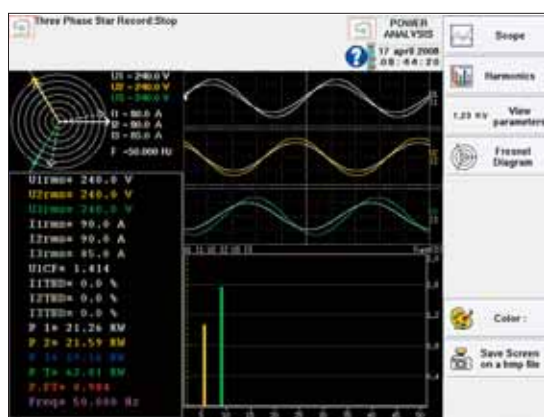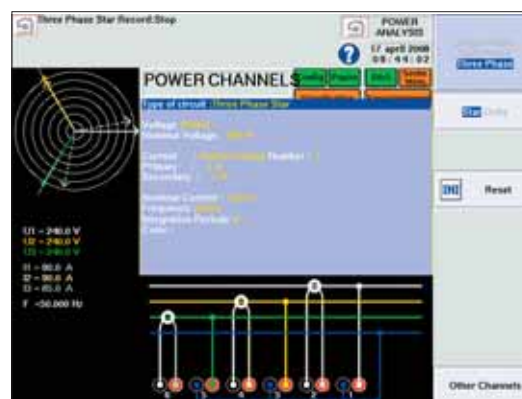
New applications for your recorder

The new Power /Energy analysis function allows new applications for your SEFRAM recorder. Graphical display will ease the diagnostic and trouble shooting of your electrical networks: you will save time and energy !
This feature can be added by upgrading the embedded software. The new software release is free of charge and can be downloaded from our website. Please contact our technical support if assistance is needed.

Performance and simplicity
to suit numerous applications.

These graphical recorders aresimple to configure and easyto use. The 8210 & 8211 two channel models feature :single function per key, rapidacquisition and display on thegraphic screen (8211), recall of the zero position,... For portable applications, either model can be suppliedwith a carrying case and protective cover. Also available as rack

- 2 synchronised universal input channels
- Colour pen plotting
- Selectable paper speed or external clock control
- Adjustable trace offset
- Selectable noise filters
- RS 232 Interface
- Portable or rack mounting
  SEFRAM 8211 features :
- Portable or rack mounting
- XY Mode
- Transient Signal capture
- Parameter printout
- Alarms (2 relays)
- Back lit display

SEFRAM	8210	8211
Channels	2 synchronised	
Voltage Inputs	1 mV to 100 V (0.25% FS ±10 µV)	
Current Inputs	with shunts*	
Temperature	thermocouples(J, K, T, S, B, E, N, W5)and Pt 100 sensors	
Resolution	12 bits	
Resolution	-	2 x 7 kwords
Bandwidth	5 Hz	
Input Impedance	> 25 MΩ (range.≤ 2V) /2Ω (range.> 2V)	
Transient Sampling Period	-	50µs À 1s
Filters	0,02/ 0,07/ 0,25 /0,5 /1Hz	
Paper width	250 mm	
Paper Speed	1cm/h à 5cm/s + horloge externe	
Pen Speed	1,5 m/s maxi	
f(t) and XY Modes	-	yes
Digital plotting	-	yes
Interface	RS 232	
Power supply	85 à 264 VAC	
Dimensions & weight	450 (L) X 220 (P) X 150 (H) mm ; 5 kg	
Warranty	1 year	

Supplied with a paper roll, two pens, a power cord and a user's manual
Add value to your recorder by using our accessories.

* optional

For protection during transportation or storage, we recommend the use of the rigid shock-resistant transport case.

Technical support

Our technical support team will provide all necessary information for getting the best performance from our products.

Please contact us : +33 4 77 59 36 97

E-mail : support@sefram.fr

Product updates

Software revisions can be downloaded free from our website. Do not hesitate to visit it frequently to check for available updates. **www.sefram.fr**

Product service

Our service department can provide the best support for your products: periodic maintenance, product upgrades and repair.

Please do not hesitate to contact us for :

- periodic maintenance
- warranty extension
- traceable calibration reports
- spare parts
- repair

ACCESSORIES FOR RECORDER

DIFFERENTIAL PROBES KITS

ELD.1052 700 V Kit, 3 phases

Contains : 3 probes (GE.8100); 3 BNC/Ban. adapters; 3 test leads ; 3 power supplies and a carrying pouch

ELD.1053 1500 V Kit, 3 phases

Contains : 3 probes (GE.8115); 3 adapters BNC/Ban.; 3 test leads; 3 power supplies and a carrying pouch

ELD.1054 700 V Kit, 1 phase

Contains : 1 probe (GE.8100); 1 adapter BNC/Ban.; 1 test lead; 1 power supply and a carrying pouch

ELD.1055 1500 V Kit, 1 phase

Contains : 1 probe (GE.8115); 1 adapter BNC/Ban.; 1 test lead; 1 power supply and a carrying pouch

CURRENT CLAMPS

SP 201 Current clamp (200 AAC, 10 mV/1A, ø 15 mm)
SP 221 Current clamp (100 AAC, 100 mV/1A, ø 15 mm)
SP 230 Current clamp (1200 AAC, 10 mV/1A, ø 50 mm)
SP 261 Current clamp (1200 AAC+DC, 1 mV/1A, ø 50 mm)
SP 270 Current clamp (2000 AAC, 1 mV/1A, ø 70 mm)

CONNECTION KITS

ELD.1060 6 channels connection Kit

Contains : 12 Test leads/stack. ban. plugs with retractable sleeve (2 m), 12 mini-clip leads and a carrying pouch

ELD.1061 Universal 6 channels connection Kit

Contains: 12 Test leads/ Ban./Ban. (2 m), 12 mini-clip leads, 12 flexible Grabbers, 12 Alligator clips and a carrying pouch

ELD.1062 12 channels low voltage connection Kit

Contains : 12 mini-clip leads (one end open) and a carrying pouch

ELD.1063 Coaxial Kit

Contains : 6 cables BNC/ 2 x ban.-(50 Ω-2 m) and a carrying pouch

ELD.1057 Connection Kit for Power and Energy Analysis

Contains : 10 test leads/ stack. ban. plugs (3 m); 1 test lead/ stack. ban. plugs. (25 cm); 5 Alligator clips.; 4 Maxigrabbers; 2 Test tips and a carrying pouch

SHUNTS

910007100 0,01Ω, 1%, 10 Amax., safety banana plugs
910007200 0,01Ω, 1%, 3 Amax., safety banana plugs
989007000 50Ω, 0,5% 50 Amax., safety banana plugs
207030301 0,01Ω, 0,5%, 30 Amax., screw terminals
207030500 0,01Ω, 0,5%, 50 Amax., screw terminals
989006000 1Ω, 0,5%, 0,5 Amax., safety banana plugs

Specifications subject to change without notice.

photos non-contractuelles

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AFAQ ISO 9001 AFAQ N°1997/7001

For assistance and ordering