**Sefram**

SEFRAM
DAS 1600

A new family of paperless recorders
6 to 72 channels,
to cover all your applications

Capabilities

- 6 to 72 analogue channels
- Measurement boards :
  - 6 isolated channels universal input, 500V AC or 1000VDC
  - 12 channels multiplexed board (voltage, temperature, pt100)
  - 6 isolated channels for strain gauge, with voltage, pt100 and thermocouples
  - 6 isolated channels 1000V AC* or 2000V DC*
  - 4 differential channels high speed board (5MHz) *
- 16 logical channels
- 15.4 inches panoramic TFT touch screen
- 500Gb hard disk, with fast transfer
- Interface: Ethernet, 6 x USB, VGA
- Power analysis (50Hz, 60Hz, 400Hz, 1kHz)
- Internal battery option
- IRIG board option
- WiFi option
- MID-STD-810G option (shock and vibration)
- IEC1010 : CAT III - 600V

2 YEARS WARRANTY
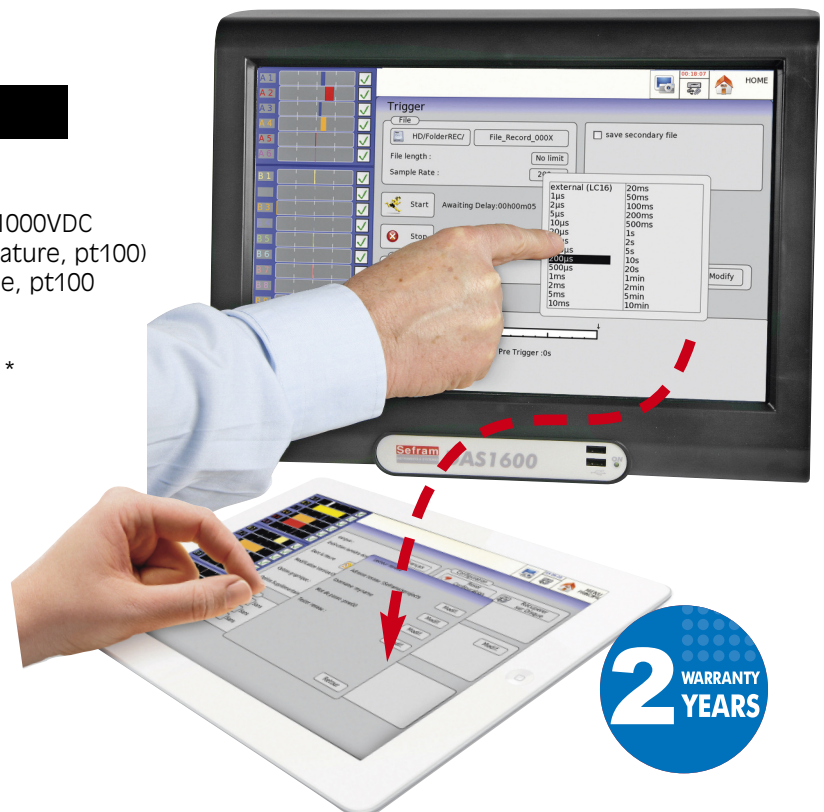
A modular system

The new DAS1600 family is designed to match all your applications in the future. If your applications change, your DAS1600 can be upgraded with an extension chassis. The extension chassis will add 3 slots and then you can have up to 72 analogue channels or mix various measurement boards.

A panoramic touch screen to ease the operation

With its 15.4 inches touch screen, using the DAS1600 is like a game: the man-machine interface has been designed to be intuitive, all menus are clear and simple and the user's manual can be displayed on the recorder if needed.

Various analysis functions

The new DAS1600 will provide many automatic measurements, various triggers, the power analysis mode,… All is done to simplify the analysis of complex signals.

A connected instrument

With its 6 USB interfaces, the LAN interface or through WiFi communication, you can remote control your recorder or download your records. With Virtual Network Computing software (not included), view and control your DAS1600 from your computer or your tablet…. Just like if you have the recorder in front of you!
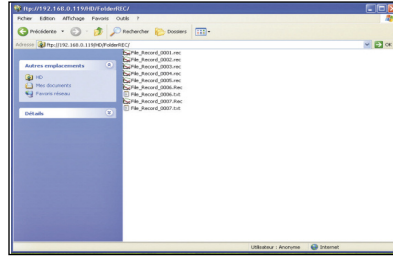
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▶ A modular concept for all your applications

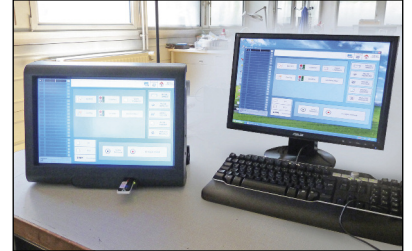## Communication and simplified data export:

With Virtual Network Computing software, you remote control your DAS1600 from a computer or a tablet.

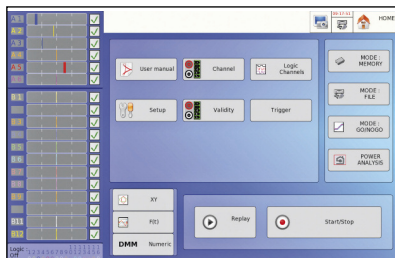## FTP : easy transfer of records

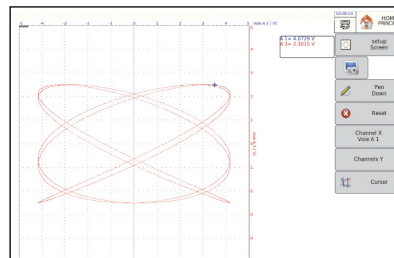FTP or TCP-IP transfer of files and recorded data display.

WiFi

With the WiFi interface (option) you can take the best benefit of remote control of your recorder.
All functions, all modes can be remote controled.
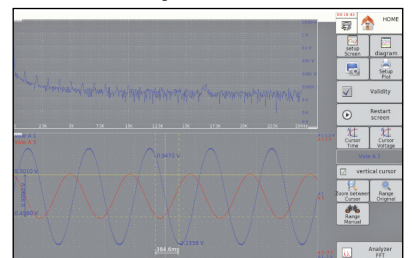
Several operating modes

Expert mode: user will access to all parameters of the setup.
User mode: restricted access.

XY mode with pen-up and pen-down.

With an efficient XY mode, your DAS1600 will replace your old analogue XY plotter.

FFT Analysis

Real time FFT analysis.

▶ Energy / Power Analysis

A very powerful analysis for single phase, dual phases or three phases networks. Analysis is provided with Fresnel diagram or oscilloscope mode.

Capabilities

- Single phase, dual phases, three phases networks
- Up to 24 parameters memorized (U, I, W, Wh, ...)
- Network frequency: 40, 50, 60, 400, 1000 Hz
- Fresnel Diagram
- Oscilloscope mode
- Harmonics up to rank 50
- Memorization of harmonics
- 16 calculated values : mean value, RMS value, peak value, crest factor, THD, DF, active power, apparent power, reactive power, power factor (cos), energy,...
- Real time word file of calculated values

Harmonics up to rank 50 (calculation and memorization)
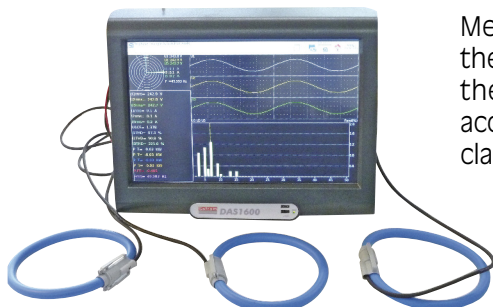
Measurements are done with the voltage input (direct) of the universal board and accessories clamps (standard clamps or flexible clamps)
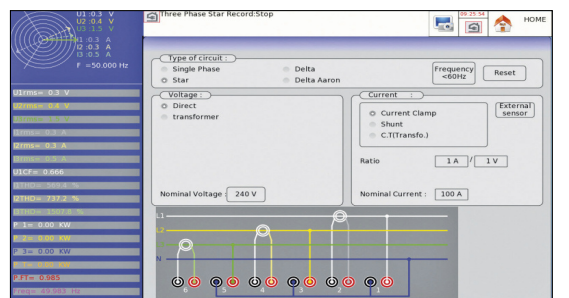
▶ Sefram Viewer

This licence free software is supplied with each recorder. It allows the visualization of the recordings and the data transfer to other applications. SEFRAM Viewer makes the acquired signal analysis easier.

Capabilities

- Curve printing
- Display of values (text)
- Cursors and zoom
- File concatenation
- 8 math calculations
- Up to 120 characters text notes
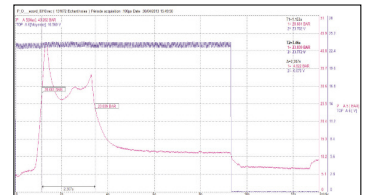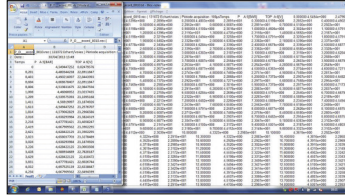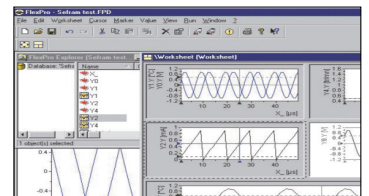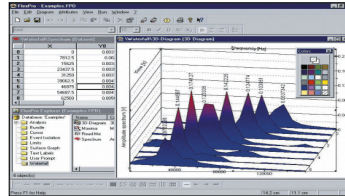- Bitmap, Excel®, txt, csv export
- Easy setup of curves display

▶ FLEXPRO™: a powerful software for your data analysis.

With Flexpro® :
- More than 100 functions of statistical and math analysis
- Powerful graphical display
- Measurement report editing

COMMON FEATURES (FOR ALL MODELS OF THE FAMILY)

DISPLAY

15,4 inches TFT touch screen, with backlight
Resolution 1280 x 800 dots
f(t) and XY display capability
Functions: zoom, cursors, zoom between cursors
Math and scaling functions (Y = aX + B)
20 automatic measurements available

MEMORY

Memorization of setup	
Memory	128 Mwords, in segments
Internal hard disk	500Gb, with fast transfer (6Ms/s)

INTERFACES AND I/O

Interfaces	6 x USB (2 on the front panel, 4 on the rear panel), VGA, Ethernet
Logical channels	16 logical channels (V max: 24V, Zin = 4,7kohms)
Sensor supply	12V / 0,2A max (non floating)
Alarm output	3 output, with 1 relay (24V/100mA) and 2 x TTL 5V

POWER ANALYSIS FUNCTION

(this function can be used with one universal board and accessories for current measurements)

Networks	single phase, dual phases, three phases
Frequency	50-60Hz, 400Hz and 1000Hz
Display	oscilloscope, Fresnel diagram
Harmonics	calculated up to rank 50, with recording capabilities
Measurements	24 measurements: U and I (mean values, RMS, peak), crest factor, power (active, reactive, apparent), power factor, harmonics, THD, DF, frequency, energy,…

GENERAL AND ENVIRONMENT

Power supply	95VAC to 264VAC, 47Hz to 63Hz
Consumption	47 VA max
Operating temperature	0°C to +40°C
Storage temperature	-20°C to +60°C
Maximum operating RH	80% max.
Dimensions (without add. chassis)	298 x 394 x 218 mm
Dimensions with add. Chassis	298 x 394 x 295 mm
Weight (with one board installed)	8kg (10kg with add. chassis)

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

Analogue 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

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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 at -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

MEASUREMENT BOARDS AND OPTIONS (*= FACTORY OPTION)

984405500	16 isolated logical channels module
910007000	Logical channels cords
984402000	12 channels multiplexed board
984401000	6 isolated channels universal board
984402500	6 isolated channels strain gauge / temperature board
916005000	Additionnal chassis with 3 slots*
916006000	6 isolated channels high voltage board
916003000	IRIG board*
916001000	Battery option*
916004500	Wifi communication option
916007000	Rack mounting kit for DAS1600/800
916009500	MIL-STD-810G option

CURRENT CLAMPS

A1257	Kit with 3 flexible clamps 30A/300A/3000A AC for three phases measurements
A1287	Flexible clamp 30A/300A/3000A AC
SP201	Current clamp 200A AC, 10mV/1A, D 15mm
SP221	Current clamp 10A AC, 100mV/1A, D 15mm
SP230	Current clamp 1200A AC, 10mV/1A, D 50mm
SP261	Current clamp 1200A AC+DC, 1mV/1A, D 50mm
SP270	Current clamp 2000A AC, 1mV/1A, D 70mm

SHUNTS

910007100	Shunt 0,01 ohm 3A max
910007200	Shunt 0,1 ohm 1A max
989006000	Shunt 1 ohm 0,5A max
912008000	Shunt 10 ohms 0,15A max
989007000	Shunt 50 ohms 0,05A max
207030301	Shunt 0,01 ohm 30A max
207030500	Shunt 0,001 ohm 50A max

TRANSPORTATION CASE (TROLLEY)

914007500	For DAS1600 without additional chassis

FLEXPRO® ANALYSIS SOFTWARE

100081	Flexpro® View (basic version)
100082	Flexpro® Full

STRAIN GAUGE BOARD - SPECIFICATIONS

Channels	6 (fully isolated)
Measurements	Strain gauge, voltage, thermocouple and current with optional external shunt
Input	differential, fully isolated
IInput impedance	2 MΩ for ranges < 1 Volt
	1 MΩ for ranges >= 1 Volt
Maximum input voltage	200V DC
(Between one input and ground, or between ground and mechanical chassis)	
Input voltage	± 50V
Isolation	>100 MΩ under 500V
(between channels and mechanical chassis)	
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 MEASUREMENT

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

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afaq
ISO 9001
Qualité
AFNOR CERTIFICATION
1997/7001

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