User Manual

Hardware

Ver.: 4.0.1

Hardware

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DSP Logger Expert

Technical Specifications:

Attributes	DSP Logger Expert
Inputs Channels	6 (SIX) accelerometers 4 (FOUR) AC channels 2 (TWO) DC channels
Measurements from inputs	• Acceleration, velocity, displacement and envelope from installed sensors or portable monitoring systems • AC / DC sensors • Pressure sensors • Temperature sensors • Measurements entries from the keyboard indicators or installed instruments • Input range, universal tachometer: ± 25 V • Visual inspections on text notes
Tachometer input	• TTL/ analogous to ± 25V • RPM range: 1-99.999
Input Overvoltage Protection	Individual in all channels.
Measurement precision	• 1%
Dynamic Range	• Up to 95 dB
Resolution	• Programmable 400, 800, 1600, 3200, 6400, 12800, and 25600 lines
Measurement windows	• Hanning • Flat top • Rectangular

Preprocessing	• gSE and ESP (spike energy ®) Envelop (demodulator) with four filters. • Digital Integration: Velocity and Displacement with • programmable high pass filters 1%, 5% and 10% of Fmax.
Filters, ESP	• 1.25-2.5 kHz • 2.5-5 kHz • 5-10 kHz
Attributes	**DSP Logger Expert**
Frequency response	0,2 a 20 kHz
Low frequencies Cut	0.18-100 Hz
Averages	Programmable from 1-4096 peak hold, continuous
Cursors	• Fixed and sweeping • Simple + harmonics and dynamic
Trigger Modes	• Trigger: External optical or laser • Trigger Level: Fixed and automatic • Setting range and slope
Operative System	Microsoft Windows CE
Processor	533 MHz, Samsung S3C2440A DSP Analog Devices 2191MK
Communication	USB
Internal Memory	128 MB
Additional Memory	Micro SD 16GB
Weight	1450 grams
Enclosure	IP65, Aluminum smelting
Display	LCD, backlit color • VGA (640 x 480) • 5.7 inch Visible area: 115.2 x 86.4 mm
Batteries	Rechargeable lithium ion
Connectors	Connector A and Connector B of 5-pins AMPHENOL CONNECTOR Connector C and Connector D Auxiliaries Input AC Input DC Tachometer Battery Charger (by duplicate)

Use caution with high acceleration hits, display blows and with cutting elements or tips.

High input voltage on the battery charger. It can create a discharge of (100-240) V if makes contact with plug.

Static charges can cause temporary changes in the display or keyboard functions.

When making installations with extensive cables, use extreme caution with all moving parts of the machine and installation of sensors.

DSP Logger Expert can be operated in rain and supports significant water on connectors and keyboard. Grade: IP 65.
(Not suitable for submerging)

Important User Information:

This solid-state equipment has different operating characteristics than electromechanical equipment.

Because of this difference and also of the great variety of uses for solid-state equipment's, all persons responsible for using this device must be aware that all electrical safety measures and bump damage were carried.

SEMAPI will be not responsible for indirect or consequential damages resulting from misuse of this equipment.

Examples and diagrams in this manual are included for illustrative purposes only.

No responsibility is assumed with respect of use of information, circuits, equipment, or software described in this manual.

Throughout this manual we use notes to make you aware of safety considerations when necessary.

Hardware DSP Logger Expert:

Introduction:

DSP Logger Expert is a vibration measurement platform with 6 channel input accelerometer signals, 4 channels of AC, and 2 channels of DC.

It also has tachometer input for phase measurement and headphone output.

Operating system runs on a platform with a 533 MHz microprocessor, Samsung S3C2440A (Maximum 633 MHz), 64 MB RAM, and 16 GB.

Signal processing is done on an Analog Devices DSP 2191MK and 6 channel digital analog converter, which allows simultaneous measurements of 6 entries.

Equipment is full turned on from activation of the power key. Operating system cannot be suspended.

It takes from 30 to 40 seconds to completely initialize operating system main menu and full programs load.

Initialization procedure starts when blue LED in the front of equipment is turned ON.

After initialization, equipment's first screen will show icons for measurement applications menu.

Programs:

DSP Logger Expert contains up to 6 (six) different operating programs. These programs are all independent of each other and are available depending on acquired license.

Each of these programs can be updated without having to physically open the equipment via a USB communication port.

Although these programs are independent, each one responds to the overall calibration of the equipment. Any change in calibration may affect any program.

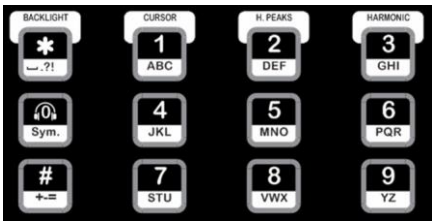
Once the DSP Logger Expert is initialized, it will display a log-in screen to contained programs. Each program can be accessed by using navigation keys and can be confirmed by pressing ENTER directly or by pressing number of the key program 2 (two) times.

Keyboard:

Power key is located to the right of alphanumeric keyboard. Blue indicator will be lit when equipment is active.

Equipment keyboard has:

- 12 alphanumeric keys



- 4 navigational keys, duplicated on both sides

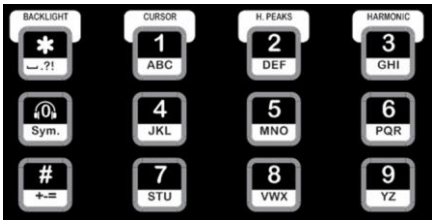
- 4 keys for functions related to screen actions.

Navigation keys:

Navigation keys are located at the sides of the display; with each row that have the same functions: Up Arrow, Down Arrow, Enter, and Escape. The keys respond to menu at the bottom of the display when entering each program and activate the basic functions

Main Keyboard

Alphanumeric keypad is used to enter names, equipment codes, and comments on all modules. In spectrum measurement, pressing appropriate key can activate cursor, maximum peaks, harmonics, and zoom axis.



Main keyboard with direct function:

While measuring vibration, the volume of the earpiece control can be adjusted with the zero (0) key.

Battery charge:

The equipment has a pack of lithium-ion batteries, which do not suffer from memory effect.
These batteries can be recharged at any load condition.

Input connector for battery charge is located at the top panel of the equipment.

This is electronically controlled by the equipment, and load cycles of deeply discharged batteries never exceed 3 hours.

Equipment load indicator, located above the power key, will remain ON during this cycle and will automatically shut off at completion.

If repeated loading is desired after completing the cycle, plug the charger in again. If the pack is sufficiently charged, the cycle will not start and the LED will remain off.

If the equipment did not idle long or the LED indicator is off after the first charge, repeat the operation load; the cycle indicated by the indicator light will be shorter.

It is recommended to maintain good battery charge before extended use, long travel, or machine monitoring.

To verify if data collector load is necessary, disconnect the charger. When the charger is attached to the computer and electrical network, it will always mark full load.

The battery condition indicator is shown in most DSP Logger Expert screens, and battery evolution can be easily observed in stages:

If after a load, indicator does not read as full, disconnect and reconnect the charger to repeat the period. Each charge period is indicated by the LED control.

In addition to a graphical display of battery level, the AD converter delivers the voltage level and can be seen on the computer utilities screen.

Display Control:

Collector has a key command to enable and disable the backlight:

Backlight activation and deactivation can be given after a long period of inactivity, during which the display will dim until it is almost dark.

Recommendation

When using the equipment in bright sunlight, you should enable maximum possible brightness from the utility's module. As this condition generates high energy consumption, it is recommended that you turn off the backlight when not in use, even for short periods; this action will prolong the battery life of the equipment.

Recommendation

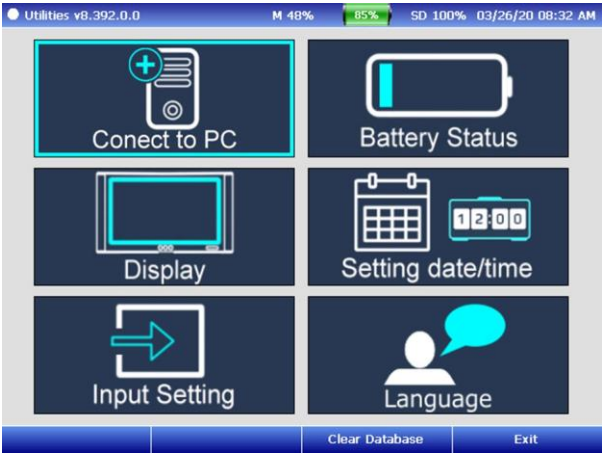
Where the ambient light is not strong or there is no sunlight, it is recommended that you lower the brightness of the screen. This will add up to 2 hours of additional battery life.

Utilities:

Hardware contains a number of utilities applications that allow configuration and status checks of the DSP Expert Logger.

To access these utilities, press 6 key or select the icon: **Utilities**.

When accessed, display will show different icons for each function.



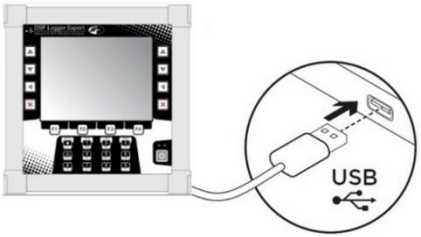
PC Connection:

An option to connect to PC hardware is provided. It is useful for data access of the microSD card.

Connection is activated with the icon:

The hardware will wait for the connection of the USB cable to a port on a PC.

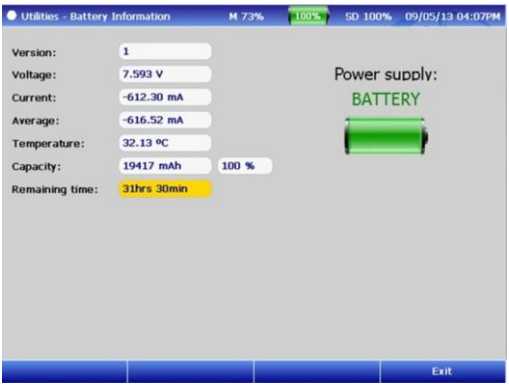
Important: If you connect the USB cable before activating the function, it is possible that you will not access the hardware connection with the software.



Battery

This screen is activated by the icon

It shows the main parameters of the battery, including remaining capacity, temperature of the battery pack controller, and status of power supply



It is important to know these parameters to determine remaining time that the equipment can be operated.

Data is refreshed every 2 seconds, and it is important to make note of remaining time of equipment use, which is expected to take as a final value about 20 seconds.

Consumption changes on equipment are associated with continuous measurement of number of connected sensors and specially to display brightness.

Adjust Date/hour:

This screen is activated by the icon:

Screen has fields enabled for change:

To change values, use the up and down keys to move from field to field, and with number keys add the values

To save set values, press function key F3.

Display:

display brightness adjustment is made from utility's menu with this icon:

Screen has an intensity indicator, which can be adjusted up and down with function keys F1 and F2.

Adjusting brightness of the display will also change equipment's battery capacity, so it is recommended that you adjust this value only in most extreme visibility conditions.

Through the color boxes option, system will allow to select color of the framework that the icon selected indicates

Finally, the dim brightness function allows to configured the time to activate the two levels of dim brightness of the screen

Input Settings

In order that the equipment can perform measurements correctly depending on each sensor that is connected, sensitivity of each sensor should be reported and which channel you are connected to, this is done by activating this option:

First screen shows input configuration of each channel with sensors that have been assigned to it.

From this screen you can also configure measurement units, moving with arrow keys and selecting with enter key

Activating the function F1 can enter to sensor registration screen

Here you can create, edit and delete different sensors that could be connected to equipment.

To register a new sensor, with function key F1, activate parameter input option of the new sensor, where you must load model, serial number, nominal and real sensitivity of sensor and variable unit of measure.

Once the parameter entry is completed, pressing F1 key, information will be saved.

To finish you have to return to configuration screen and assign sensor to channel where it will connect, to do that we will locate in correct channel, we will activate selection list with Enter key, and we will select correct sensor.

Before to exit, you have to activate with function F3, in order to save configuration.

Language

In this option you can select working language of the equipment, you can be access through this icon

The language options are: Spanish, English, Portuguese, and Chinese simplified.

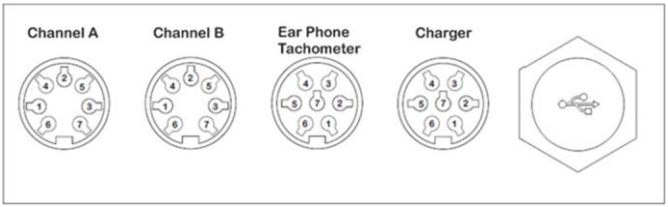
Select the more suitable and then save the configuration with the function F3

Top connection panel

The connection panel for the sensors and accessories is located on top of the equipment.

For most secure connection, it is recommended that you turn a threaded connector until it stops.

Conventional USB connectors are available for data connection and equipment programming.



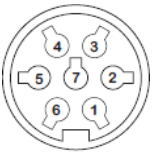
Channel A:

Is Input 1 for vibration sensor, biaxial sensor 1, triaxial 1, dual sensor (vibration and temperature) or proximity probe.

Connector has 7 contacts for different applications

Channel A

1	(+) Accelerometer CH1
2	GND
3	Auxiliary VDC 1
4	(+) Accelerometer CH3
5	(+) Accelerometer CH5
6	Auxiliary VDC 1
7	Vsys



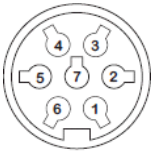
Front View

Channel B:

Is Input 2 for vibration sensor, biaxial sensor 2, triaxial 2, dual sensor (vibration and temperature) or proximity probe.

Connector has 7 contacts for different applications:

Channel B



Front View

1 (+) Accelerometer CH2
2 GND
3 Auxiliary VDC 2
4 (+) Accelerometer CH4
5 (+) Accelerometer CH6
6 Auxiliary VDC 2
7 Vsys

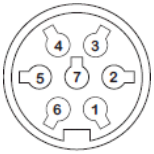
In other two multi-pins connectors are distributed auxiliary inputs for specific measurements.

Earphone/tachometer:

This entry is dedicated to optical sensor for phase measurement and has an output for earphones.

Additionally, it has other auxiliary inputs for connecting amperometric clamp, DC Aux 1, and an additional input battery charger (not specified in the panel).

Earphone / tachometer



Front View

1 Charger (+)
2 Auxiliary Vac 3
3 Earphone (+)
4 Optical (Pulse)
5 Vsys – Optical (+)
6 Earphone (-)
7 GND

Charger

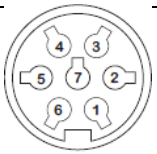
This connector has a main function of connecting equipment battery charger.

Is also presents remaining entries for auxiliary measurements, as well as direct input of a second amperometric clamp

This connector has also a second input of DC 4

Charger

1	Charger (+)
2	Auxiliary Vac 4
3	NC
4	Auxiliary Vcc 2
5	NC
6	Vsys
7	GND



Front View

USB

Access to conventional USB connector, use USB Cable USB A/B.
This can be used to upload and download data to and from a PC and to update different firmware versions.

Input and sensor measurements:

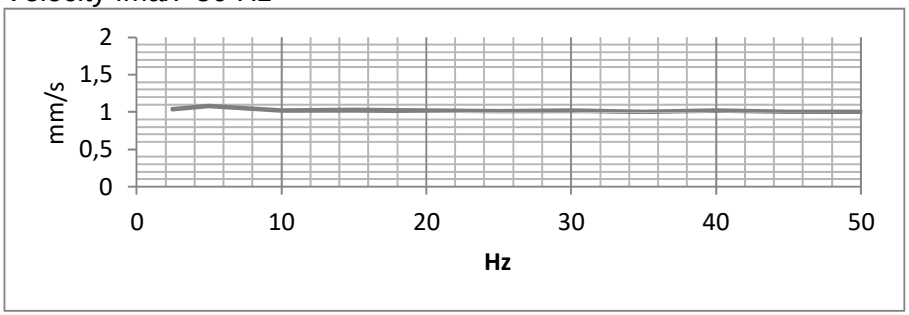
- Accelerometers
  - Channels 1-2-3-4-5-6
    - Acceleration
    - Velocity
    - Displacement
    - Envelope
- Speedometers
  - Channels 1-2-3-4-5-6
    - Velocity
    - Displacement
- Proximiters
  - Channels AC 1-2-3-4
    - Displacement

- Amperometric Clamp
  - Channels AC 1-2-3
    - Current
- Dual Sensors: Vibration and temperature
  - Channels DC 1-2
    - Temperature

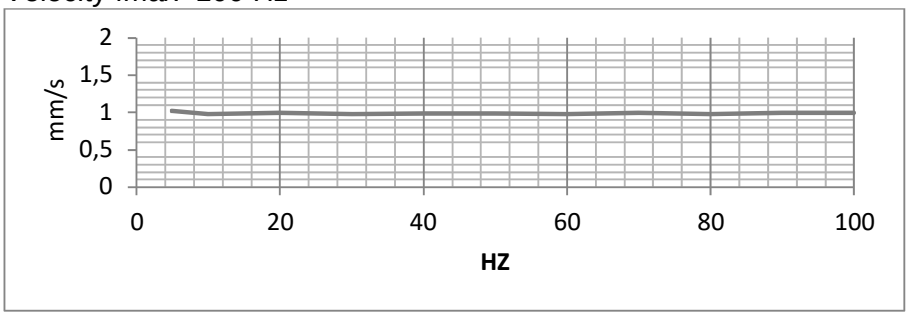
Frequency response measurement of vibration:

Accelerometers Channels ICP - Velocity

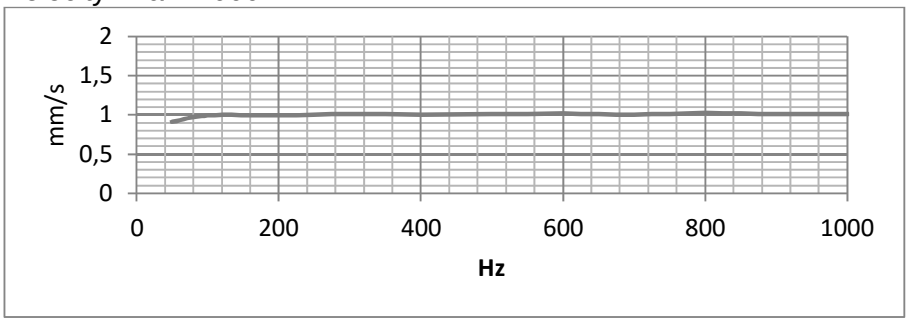
Velocity fmax=50 Hz



Velocity fmax=100 Hz

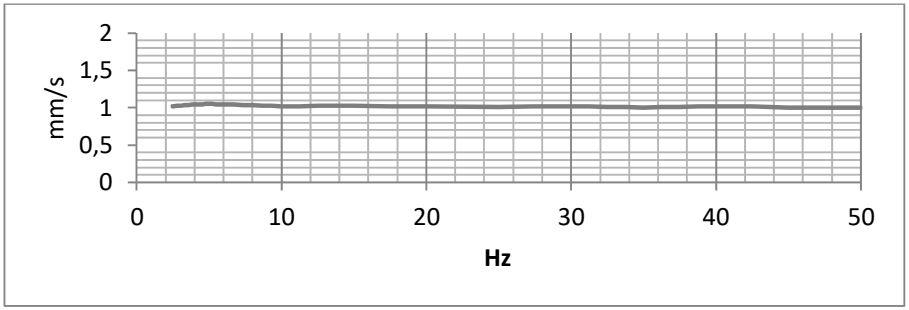


Velocity fmax=1000 Hz

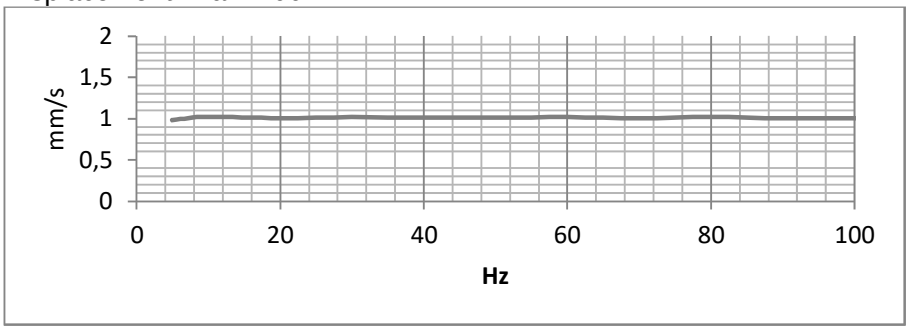


Accelerometers Channels ICP Displacement

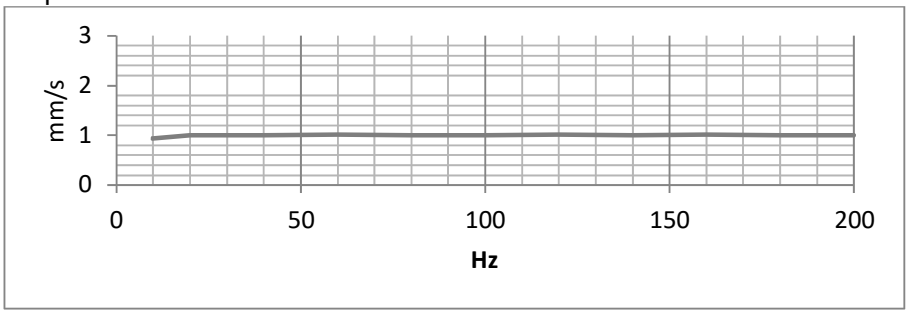
Displacement fmax=50 Hz



Displacement fmax=100 Hz

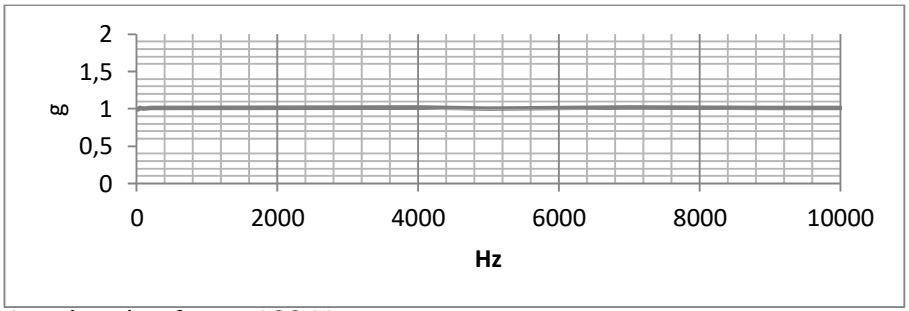


Displacement fmax=200 Hz

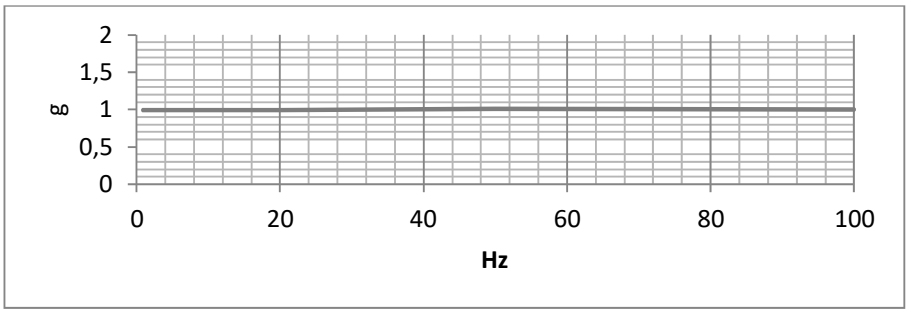


Accelerometers Channels ICP Acceleration

Accelerationfmax=10000 Hz



Acceleration fmax=100 Hz

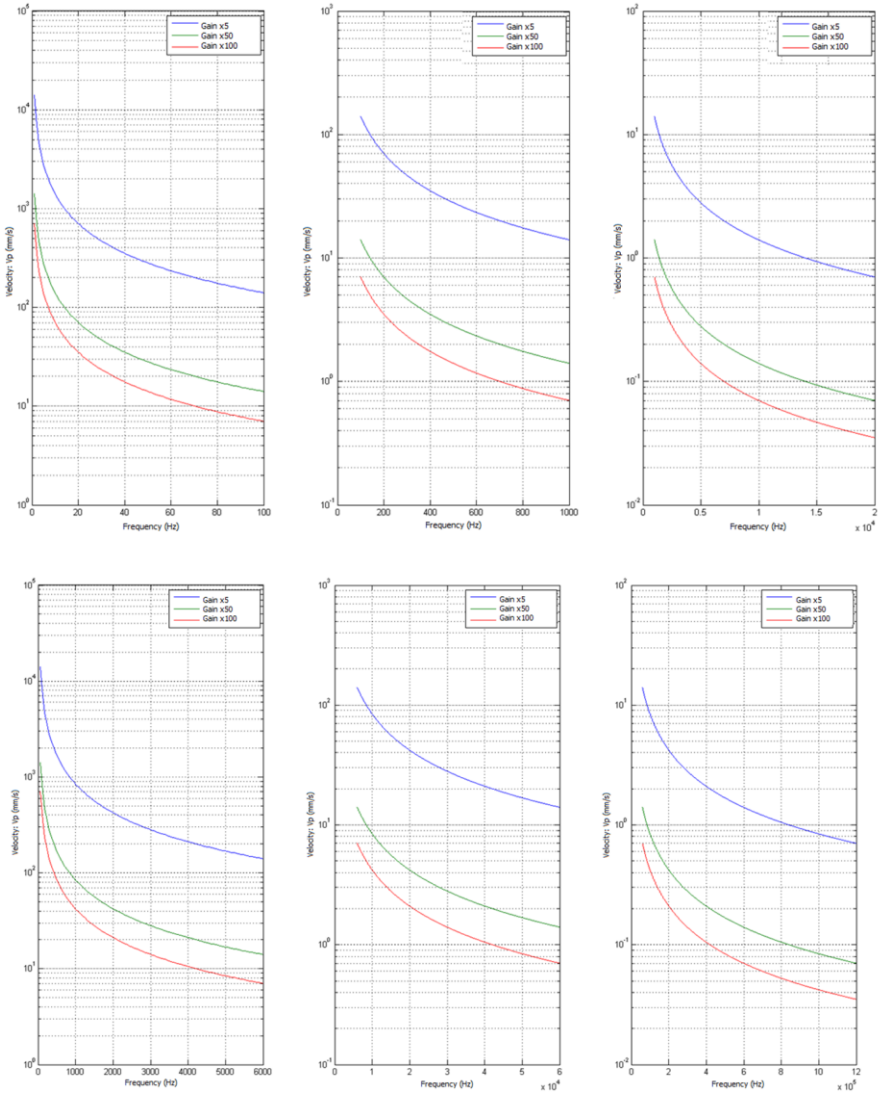


Acceleration and Auxiliaries AC				
fmax [Hz]	**10**	**20**	**50**	**100**
fs virtual [Hz]	25.6	51.2	128	256
T of acq. of 1024p/400l (sec)	40	20	8	4
fmax [Hz]	**200**	**500**	**1000**	**2000**
fs virtual [Hz]	512	1280	2560	5120
T of acq. of 1024p/400l (sec)	2	0.8	0.4	0.2
fmax [Hz]	**5000**	**10000**	**15000**	**20000**
fs virtual [Hz]	12800	25600	38400	51200
T of acq. of 1024p/400l (sec)	0.08	0.04	0.0267	0.02

Velocity				
fmax [Hz]	**10**	**20**	**50**	**100**
fs virtual [Hz]	25,6	51,2	128	256
T of acq. of 1024p/400l (sec)	40	20	8	4
T of transition of Filter 1 % (sec)	40	20	8	4
T of transition of Filter 2,5 % (sec)	20	10	4	2
T of transition of Filter 5 % (sec)	10	5	2	1
T of transition of Filter 10 % (sec)	5	2.5	1	0.5

Velocity			
fmax [Hz]	**200**	**500**	**1000**
fs virtual [Hz]	512	1280	2560
T of acq. of 1024p/400l (sec)	2	0.8	0.4
T of transition of Filter 1 % (sec)	2	0.8	0.4
T of transition of Filter 2,5 % (sec)	1	0.4	0.2
T of transition of Filter 5 % (sec)	0.5	0.2	0.1
T of transition of Filter 10 % (sec)	0.25	0.1	0.05

Curves for gain setting of the converter AD:



Accessories List:

Code	Description
S102	Accelerometer 100 mV/g
S105	Accelerometer 500 mV/g
S115	Accelerometer triaxial 100 mV/g
HT-N18NA	Inductive Sensor of RPM
STA102	Dual Sensor: Vibration and temperature
ROLS-WE	Optical Sensor of RPM
B114-3A	Magnetic base for Triaxial sensor
BS-0001	Magnetic base for Triaxial sensor
DSPE-A002	Winding cable: 1.5 m for accelerometer
DSP-A009	Winding cable: 3.0 m for accelerometer
DSP-A002	Silicone cable: 1.5 m for accelerometer
DSP-A009	Silicone cable: 3.0 m for accelerometer
DSP-A008	Silicone cable: 5.0 m for accelerometer
DSP-A012	Auxiliary connection cable AC
DSP-A013	Input connection of the ultrasound equip.
DSP-A004	Battery Charger 110 V
DSP-E010H	Cabinet for DSP Logger MX 300
DSP-A006	Transport case
CE-009	Mirror tape roll: 1" x 10'
DSP-A007	Hearing protectors with earphones
DSP-P1000B	Amperometric clamp: 0-1000 A
BS350	Digital Balance: 350g
CB105-E3C	Splitter of 3 channels for unidirectional sensor
DSP-CAL-E	Calibration DSP Logger Expert

To order, please visit:

sales@semapi.com

Or the network of authorized distributors:
http://www.dsplogger.com/distribuidores.php

Troubleshooting:

Problem	Possible solution
At power-up, the LED indicator flashes, but the programs do not start.	The equipment may have little power charge. It is recommended that you plug in the charger and turn on the equipment again. In the case that start-up is correct, stop charging the batteries for 3 hours.
The red charging light does not turn on when connecting the battery charger.	This could be due to several factors: Charging may be complete. Verify this by starting the equipment and watching the battery charge indicator. The charger does not have good tension or failed to begin charging. Unplug the charger from the power line and plug it in again. There may be problems with the LED on the front of the equipment. Plug in the charger, start the computer, and check if the battery indicator indicates charging display.

SEMAPI provides technical information on the Internet for help with product use: visit www.dsplogger.com for technical manuals, a database with frequently asked questions, and application notes. You can also find instructional videos about firmware for the DSP Logger Expert at: https://www.youtube.com/user/semapicorp

Official certificate of guarantee

DSP Logger Expert

SEMAPI Corp. and SEMAPI ARGENTINA S.A. guarantee the normal operation of the product and its hardware and accessories for a period of one (1) year if it fails during normal use and operation, from the purchase date as certified by the invoice issued by the signature seller.

The guarantee period begins at the local installation and verification of operation by the staff of the purchasing company.

SEMAPI Corp. and SEMAPI ARGENTINA S.A. reserve the right to void this guarantee under the following conditions:

- Damage caused by blows, falls, misuse, and/or other accidents.
- If the product is operated in a manner inconsistent with the guidelines provided in this manual.
- If the product has been used with non-original inputs or accessories.

Also, if, in the judgment of the authorized distributor; one of more of the following conditions is present:
- Intervention or repair of the product by parties unauthorized by SEMAPI Corp. and S EMAPI ARGENTINA S.A.
- Partial or total destruction due to environmental conditions.

SEMAPI Corp. and SEMAPI ARGENTINA S.A. will not recognize or provide any compensation for downtime due to failures or deficiencies of SEMAPI-owned or other equipment.

Customer Support:

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