

User Manual

ORION

Smart Vibration Monitoring Terminal



About Acoem

Creating environments of possibility

At Acoem, we create environments of possibility - helping organisations find the right balance between progress and preservation - safeguarding businesses and assets, and maximising opportunities while conserving the planet's resources. We deliver unrivalled, interoperable AI-powered sensors and ecosystems that empower our customers to make enlightened decisions based on accurate information.

Together with 1220+ distributors, our 850+ employees work across 28 offices, 8 manufacturing facilities and 5 R&D centres in 11 countries- to provide trusted, holistic data solutions for customers worldwide.

Acoem links possibilities with protection.

For more information, please visit **acoem.com**

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Welcome to the world of Acoem

ACOEM would like to thank you for purchasing this product and invites you to refer to this user manual. For more information on ACOEM's products and services, please visit www.acoem.com.

Receipt of your equipment

This product was carefully inspected and tested prior to shipping. Nevertheless, you are requested to check when opening the packaging that there is no sign of damage and that all the accessories are included. If this is not the case, please notify ACOEM or its approved representative without further delay. You are advised to keep the packaging in case you need to return your equipment for maintenance at ACOEM's premises.



Warning

Before using the product, read the safety instructions carefully. This document is available in the ORION Carrying case and our 01dB Customer services website <http://support.01dB.acoemgroup.com>.

The safety instructions described in this manual should be adhered to and the instruments should always be used within the limits specified hereafter.

Instrument and operator safety are at risk when the instrument is used in conditions that are not intended by ACOEM.

This User Manual, the Installation and Safety Instruction Manual (computer and paper versions) provided with ORION must be read by the operator before installation or starting to operate. Print this document or use a computer or a tablet to keep them available, especially during installation.

Warranty

For this 01dB product, ACOEM offers a 24-month warranty for parts and labour, against all manufacturing defects, with free shipment to return the equipment to ACOEM. Any defects or damage caused by normal wear or resulting from negligence (poor supervision, maintenance or storage conditions, misuse of product, etc.) or arising from modifications that are not allowed for nor specified by ACOEM are excluded from the warranty. Up to the expiry date of the warranty period, ACOEM undertakes to rectify any defect that adversely affects the normal operation of the product and that fails within the scope of this warranty. If such a defect should arise, you should inform ACOEM in writing without delay, including any information liable to be useful in diagnosing the nature of the defect and providing all supporting data as to the existence of the defect.

Customer's services

- Contact our Customer Service Department by e-mail at 01db.support@acoemgroup.com
- Download all 01dB technical documents (manual, release note...) and 01dB software, follow your tickets (technical requests) at <http://support.01dB.acoemgroup.com>

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CHAPTER 1

GENERAL PRESENTATION

1.1 INTRODUCTION



ORION is a new generation upgradeable vibration measuring instrument, integrating innovative technology. The programming of all available functions (Input / Output / Storage...) allows meeting best the user's requirements.

The data measured with the instrument are displayed on a remote screen, such as a tablet, smartphone or laptop, using an off-the-shelf networked device equipped with Wi-Fi or 3G connectivity and a web browser, in conjunction with the web interface, the web server built into the instrument. This function offers access to all the functions of the instrument (measurement and system configuration, real-time display...).

A status bar visible on the web interface gives the operator a quick overview of the device status and the current measurement. At any time, the user can access more detailed information looking at the different menus available. For instance, the user is informed about the remaining battery lifetime (depending on parameters of the selected configuration), disk space available etc.

The integrated Ethernet, Wi-Fi and 3G communication features give the user complete control of the instrument (configuration, real-time values, stored data...), with equal ease adjacent to the measurement point (a few dozen meters away using point-to-point Wi-Fi) and at a distance (3G). Hence, the interest for simultaneous measurement in several points and as a result getting fully synchronised and geo-referenced results using several instruments with built-in GPS component and external antenna or patch.

1.2 MEASUREMENT DOMAINS

- Vibrations on buildings: e.g. damage caused on a building site by a neighbour.
- Vibrations on occupants: e.g. vibrations near a railway.

- Vibrations on sensitive equipment: e.g. work in the museum neighbourhood or sensitive computers.

The evaluation of vibration is based on velocity or acceleration acquisition on three axes X, Y, Z in the frequency bands 0.4Hz-150 Hz or 315 Hz. According to the standards of different countries, the measured quantities are compared to values or tolerance curves whose values may differ depending on the frequency.

1.3 OVERVIEW



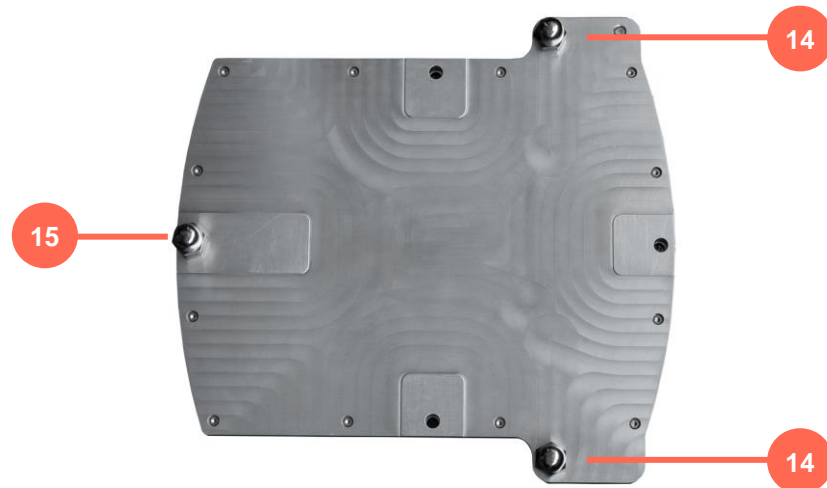
Front view

- 01 – Hatch access to connectors SD, USB, SIM and service
- 02 – Keyboard
- 03 – Bubble level for horizontal adjustment
- 04 – Wi-Fi antenna
- 05 – GPS antenna (optional)
- 06 – 3G antenna
- 07 – Internal sensor directions
- 08 – QR code



Back view

- 09 - C1 - External sensors
- 10 - C2 - TTL Output
- 11 - Breathing valve
- 12 - C3 - External Power
- 13 - C4 - LAN/External Power over Ethernet (PoE)



Bottom view

- 14 - Adjustable screws
- 15 - Not adjustable screw

1.4 ACCESS HATCH (DETAILS)

The waterproof access hatch must be screwed using the knurled head screws with the torque allowing the user to unscrew them with fingers.



It gives access to several slots:

16 – SD card slot

17 – Micro USB connector for USB host connexion (allows for reading the SD card content).

18 – Sim card slot.

19 – Micro USB connector for service (only manufacturer use)



1.5 BREATHING VALVE (DETAILS)

The instrument has a breathing valve with a membrane which allows respiration but stop humidity.



Breathing valve must not be obstructed or blocked

1.6 GPS (OPTIONAL)

In option, two antennas types can be used:

- GPS patch (ACE1094) to be able to mount the patch at a different location from where ORION is for better satellites reception; 3 meters cable.
- Antenna (ACE1105) mounted directly on ORION if satellites reception is satisfactory at ORION location.



ACE1094



ACE1105

1.6.1 Inputs and Outputs (Details)

All external circuits connected to ORION should be non-hazardous voltage and energy sources be limited within the meaning of the IEC61010-1 standard.

Do not exceed the maximum input voltage on the connectors.

Connector #	Symbol	description	Maximum voltage and current
C1	Ext. sensors 24V \equiv 4mA	External sensors	DC input Max +24 volts.
C2	TTL out 0/3.3V \equiv 30mA	TTL output	Output Max 3,3 Volts input Output 3,3V/30 mA
C3	Power 12V \equiv 1.3A	External Power; Respect tension and current. Refer to section external supply	Input Nominal 12V/1.3A Min 9V Max 15V
C4	LAN PoE 48V \equiv 0.3A	LAN Network Power over Ethernet; Respect tension and current. Refer to section PoE	Input Nominal 48V/0.3A Min 46 V Max 50 V

1.7 INPUTS SENSORS DESCRIPTION

1.7.1 Triaxle internal Accelerometer

The device internally has a triaxle internal accelerometer to perform most of the measurements.

1.7.2 Triaxle external transducer (optional)

It is also possible to connect on External sensors connector (C1) in place of or in parallel to the internal sensor an external triaxle accelerometer sensor or triaxle velocity meter sensor.

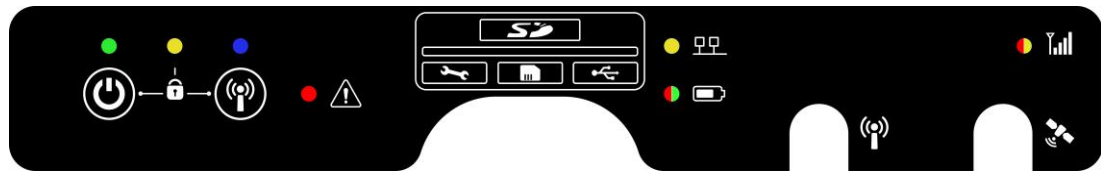
This external sensor allows to evaluate vibration in other measuring ranges or be positioned on a specific place.

1.7.3 *Microphone external sensor (optional)*

it is also possible to connect on External sensors connector (C1) a microphone to measure the noise associated with the vibration (blast).

Please consult us about this feature.

1.7.4 Markings on the keyboard



Symbol	description
	Power button Power LED
	Lock LED
	Sensor error LED
	Wi-Fi button Wi-Fi LED
	Memory SD (solid disk) card slot (Behind the hatch)
	Micro-USB Factory service only (Behind the hatch)
	SIM card slot (Behind the hatch)
	Micro-USB Connector (Behind the hatch)
	Ethernet LED
	Battery LED for charge level indication
	Wi-Fi antenna connector
	GPS Connector



GSM antenna connector
LED for quality signal

CHAPTER 2

INSTALLATION

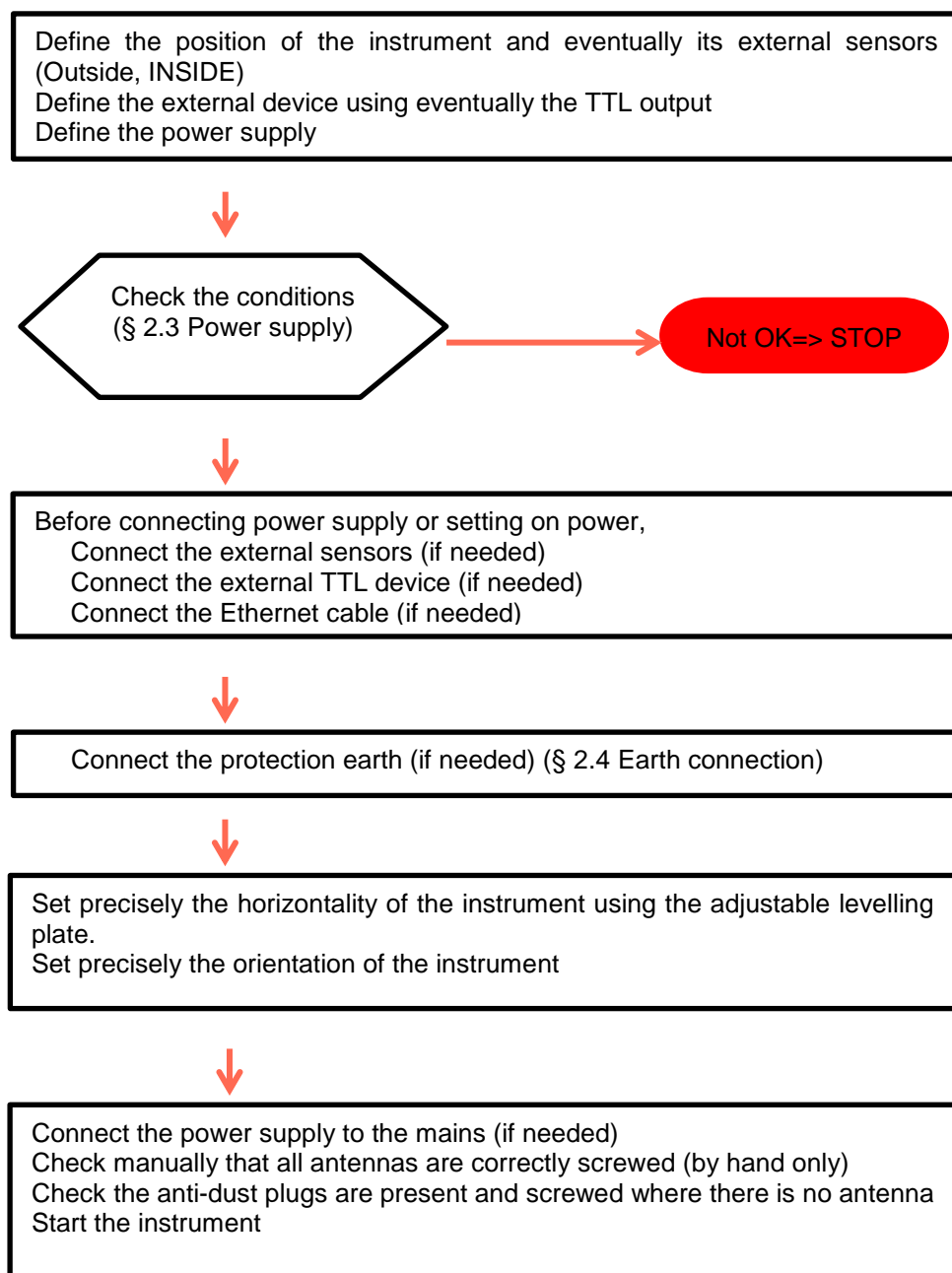


The equipment can be deployed in different configurations. All configurations are not allowed according to the environment. It is essential to observe the deployment and safety rules that apply to each use case.

2.1 USE CASES PREREQUISITE

Use cases are exhaustively described; therefore, the instrument should never be with a use case neither described nor allowed in this user manual.

2.2 FLOWCHART FOR THE INSTALLATION



2.3 POWER SUPPLY

Table

	Power supply position	instrument position	Earth Protection*
Internal battery	Indoor or Outdoor	Indoor: Allowed	recommended
		Outdoor: Allowed	Strictly necessary
Standard power supply	Indoor Only	Indoor: Allowed	recommended
		Outdoor: Allowed	Strictly necessary
Waterproof power supply*	Indoor or Outdoor	Indoor: Allowed	recommended
		Outdoor: Allowed	Strictly necessary
PoE from PoE power supply	Indoor Only	Indoor: Allowed	recommended
		Outdoor: Not Allowed	
PoE on an existing PoE network	Indoor Only	Indoor Allowed	recommended
		Outdoor: Not Allowed	

*: only waterproof power supply can be connected from the outside

All external circuits connected to ORION should be non-hazardous voltage and energy sources be limited within the meaning of the IEC61010-1 standard.

The earth protection is strictly necessary for every case below listed:

- Instrument ORION is outside of a building.
- One or more Sensors of ORION are outside of a building.
- One or more cables are outside of a building.
- One or more cables use paths where there are other cables.
- The TTL output is connected to a device that's powered by the mains

However, for the other cases, the earth protection is recommended for a better security

If the instrument ORION is connected to an existing PoE Network, this PoE should be non-hazardous voltage and energy source be limited within the meaning of the IEC61010-1 standard.

If the TTL output of the instrument ORION is connected to a device, this device should be non-hazardous voltage and energy source be limited within the meaning of the IEC61010-1 standard

The radio device (WIFI, GSM-3G, GPS) may be used anywhere. (Respecting national regulations, RED, FCC, IC).

2.4 EARTH CONNECTION

The protective Earth connexion is possible on the screw terminal using the cable as shown on the picture. The recommended tightening torque is 3N.m



The other side of the earth cable must be connected to a good quality protective earth.

The Integrity of protective bonding must be in respect of the IEC61010-1 (refer to 6.5.2 Protective bonding).

For outside situation, the protective earth may use a solid ground rod galvanized steel. The rod must be should be buried at least 60 cm. The ground must be wet permanently. If necessary, spray water at periodical time to maintain humidity.



An existing protective ground may either be used in replacement of the ground rod. Anyhow, it must compliant to the IEC61010-1 standard.

CHAPTER 3

MAINTENANCE

3.1 GENERALITIES

The device does not need maintenance or adjustment excluding cleaning and battery replacement.

- The internal battery is not replaceable by the User.
- The battery pack must be replaced at factory only by authorized personnel

3.2 REPLACEMENT PARTS

The parts of the device ORION that could be replaced by the owner are:

- The three feet, spherical or sharp end
- The antennas
- The cables or accessories
- The power supplies
- The access hatch

The replacement part must be provided only by the manufacturer.

The power supply and their cord must be provided only by the manufacturer

The device ORION must never be opened for any operation

The battery replacement must only be done at factory par a competent personal.

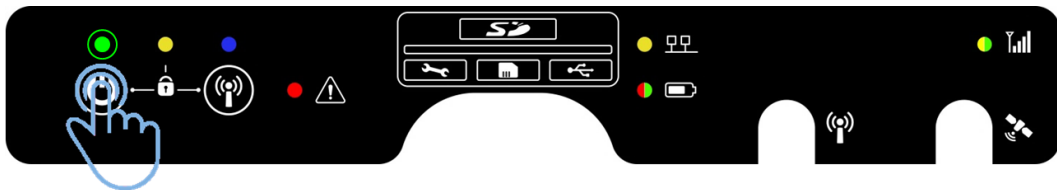
CHAPTER 4

Use

4.1 KEYBOARD USE

See chapter 1.7.4 Markings on the keyboard about the description of the keyboard

4.1.1 Power button



If instrument is off and you want to turn on

- Press the power button to turn on
- The unit state is now in Ready Mode if not programmed to auto start log.
- Power Led is on (green)

If instrument in Ready mode and you want to start the measurement

- Short press the power button to start Logging mode
- Power Led is flashing 5 times (green)

If instrument in Logging mode and you want to stop the measurement

- Short press the power button to stop Logging mode
- The unit is back to Ready mode.

If instrument in Ready mode and you want to turn off

- Long press the power button to turn off

PREVIOUS STATE		Action	FOLLOWING STATE	
ORION	Led		ORION	Led
OFF	OFF	Short press	ON READY	ON
ON READY	ON	2 sec press	OFF	OFF
ON READY	ON	Short press	ON LOGGING	FLASHES
ON LOGGING	FLASHES	Short press	ON READY	ON

4.1.2 Wi-Fi button



If Wi-Fi is off and you want to turn on

- Short Press the Wi-Fi button to turn on
- The Wi-Fi SSID is the previous SSID
- Wi-Fi Led is on (Blue)

If Wi-Fi is off or on and you want to reset the Wi-Fi with the default Wi-Fi setup

- Press 5 seconds the Wi-Fi button to reset
- Wi-Fi Led is flashing 2 seconds and turn on (Blue)
- Wi-Fi setup is now factory parameters
 - Access point mode.
 - SSID = ORION_[S/N], no encryption.

If Wi-Fi is on and you want to reset the Wi-Fi with the default Wi-Fi setup

- Press 5 seconds the Wi-Fi button to reset
- Wi-Fi Led is flashing 2 seconds and turn on (Blue)
- Wi-Fi setup is now factory parameters

When a SSID connection is established with ORION

- Wi-Fi Led change from on to flashes continuously

When a SSID connection is established with ORION

- Wi-Fi Led change from flashes continuously to on

PREVIOUS STATE		Action	FOLLOWING STATE	
Wi-Fi	Led		Wi-Fi	Led
OFF	OFF	Short press	ON*	ON
ALL	ALL	5 sec press	ON**	2 sec Fast Flashes Then ON
ON	ON	SSID Connection	ON	FLASHES
ON	FLASHES	SSID disconnection	ON	ON

* Turn on Wi-Fi with previous SSID

**Reset Wi-Fi with default Wi-Fi setup:

NB: If the Wi-Fi button is held down during start up then the device goes into “production“ mode.

4.1.3 Locked/Unlocked keyboard

To lock your instrument

- Simultaneous short press the 2 buttons POWER & Wi-Fi

- Lock LED is on.

To unlock your instrument

- Simultaneous short press the 2 buttons POWER & Wi-Fi
- Lock LED is off.

4.1.4 Reset factory

To hard reset and return to factory settings

- Simultaneous long press (5 seconds)
- The consideration of this action is highlighted by rapid flashing of all LEDs for 2 seconds.

4.2 INSTRUMENT'S LEDs

The flashing information is as following:

- Standard flashing
 - period 1 sec
 - ratio 50% on, 50% off.
- Fast flashing
 - period 0.5 sec
 - ratio 50% on, 50% off.

4.2.1 LED ON (green)

- In Ready mode and Production mode.
 - Green Led is on
- in Logging mode
 - Green led flashes
- Green Led is Fast flashing if:
 - Stabilization in progress (start up, change of configuration).
 - Diagnostic on SD card in Ready mode (read only, no more space, wrong format, missing SD card, USB host).
 - While update in progress.

4.2.2 LED Wi-Fi (blue)

- if Wi-Fi enabled.
 - Blue LED on
- if the connection is established.
 - Blue LED flashes
- if no Wi-Fi
 - Blue LED off

4.2.3 LED Lock (yellow):

- If keyboard locked
 - yellow LED on
- If keyboard unlocked
 - yellow LED off

4.2.4 LED Ethernet (yellow):

Operation corresponding to a standard Ethernet connection (on when connected and flashes while data exchange).

4.2.5 **LED warning (red):**

If overload on at least 1 channel, then:

- In Logging mode: LED on during Tj,
- In Ready mode: LED on during 1 sec. (display refresh speed)

If sensor error due to either short circuit on at least 1 channel or open circuit on at least 1 channel, then:

- In Logging mode, LED fast flashes during Tj
- In Ready mode, LED fast flashes during 1 sec. (display refresh speed)

If both overload and sensor error occur at the same time, then:

- In Logging mode, LED fast flashes during Tj
- In Ready mode, LED fast flashes during 1 sec. (display refresh speed)

In addition:

LED flashes on Production mode

LED fast flashes during update process.

4.2.6 **LED Battery (2 colours red/green):**

- If ORION turned on and connected on charger (including POE)
 - Green LED on
- If ORION turned on and powered by battery only
 - Green LED flashes if Battery charge is between 66% and 100%
 - Green LED fast flashes if Battery charge is between 33% and 66%
 - Red LED flashes if Battery charge is between 10% and 33%
 - Red LED flashes if Battery charge is less than 10%
- If ORION turned off:
 - Green LED on while charging
 - Green and red LEDs off when battery fully charged
 - Green and red LEDs flashes if an anomaly is detected (information sent by the charger component)

4.2.7 **LED GSM (2 colours green/yellow)**

- Yellow LED on when modem powered on but no connection to network. Else:
- Green LED on (and yellow LED off) if modem registered to a provider (but no IP address)
- Green LED flashes if connection to supplier established and IP address obtained.

4.3 ABOUT OPTIONS

This manual describes all the functions of the instrument, for all options. Some functions presented here are available only if the instrument has the corresponding licence. Refer to § 10.2 Table of options for more information.

4.4 STARTING THE INSTRUMENT AND ITS REMOTE WEB INTERFACE

4.4.1 QR code on top of the instrument



ORION is delivered with a unique QR code providing the following information:

- Model type: ORION
- Manufacturer internal code: VMT1002000
- Serial #: 10025
- Hardware version: lis005a

The result of the QR code scan is:

ORION@VMT1002000@10025@lis005a

QR code is used in 01dB Connect App (Android OS version) to read the default SSID (corresponds to ORION_[S/N])

CHAPTER 5

CHAPTER 5

MEASURED AND STORED DATA

5.1 POSSIBLE SIMULTANEOUS ACTIVATION OF UP TO 2 STANDARDS

Application 1: Construction : DIN 4150-3, Circ, BS 5228-4 or BS 5228-2

Application 2: Construction : Arrêté

Application 3: Occupants: DIN 4150-2

Application 4: Occupants: ISO 2631_1989

Application 5: Occupants: ISO2631_2003

Application 6: Occupants: BS 6472-1

Application 7: Sensitive equipment (under development)

It is possible to select 1 or 2 applications described above for all the sensors.

For example, if for internal sensor BS 5228-4 and BS 6472-1 are selected, then one can only select an application standard 1 or 6 on the external sensor.

5.2 DATA TYPES VALUES

Data are measured and stored at 2 different logging periods Tt:

T=i: Ti (fast logging period); i=1, 2 or 5 sec.

T=j: Tj (logging period); j=5, 10 or 30 sec.

and simultaneously on 3 axes:

k: X, Y and Z axis

5.2.1 Construction

PPVtk: Peak Particle Velocity: greatest instantaneous Particle Velocity on k axis during a given time interval t

Vpmaxtk: Peak Particle Velocity according to “Arrêté du 2/09/1994” corresponds to PPV calculated on frequency weighted signal on axis k during a given time interval t:

Frequency	1 Hz	5 Hz	30 Hz	80 Hz
Weighting	5	1	1	0.375

PCPvt: Peak Component Particle Velocity: greatest instantaneous Particle Velocity on all axes during a given time interval t

PVSt: Peak Vector Sum: square root of the sum of the squares of the PPV time data in all three directions X, Y and Z measured

DFj: Dominant Frequency: frequency corresponding to the maximum of an FFT spectrum centred at the particle velocity time of the max

▲: number of exceedances

5.2.2 Occupants

5.2.2.1 DIN 4150-2

VDV_{tk}: Vibration dose value: cumulative measurement of the vibration level received from start of the measured period.

L_{ptk}: « ground borne noise »: estimated structure borne noise based on the measurement of the RMS vibration velocity measured on a radiating surface (A weighted).

KBFT_{tk}: maximum weighted vibration severity

KBFT_{mjk}: RMS weighted vibration severity

$$KBFT_{mjk} = \sqrt{\frac{1}{N} * \sum_{j=1}^N KBFT_{jk}^2}$$

N number of T_j cycles since the beginning of the day or night period

KBFT_{jk} is replaced by 0 if the measured value KBFT_{jk} ≤ 0.1

KBFT_{trk}: evaluation vibration severity

Day period:

- No rest: $KBFT_{trk_no\ rest} = KBFT_{mk} * \sqrt{Te/Tr}$
- Rest: $KBFT_{trk_rest} = \sqrt{(Te1 * KBFT_{mk1}^2 + 2 * Te2 * KBFT_{mk2}^2)/Tr}$
 - Tr [s]: evaluation period (16 hours a day)
 - Te1 [s]: exposure period outside rest periods
 - Te2 [s]: exposure period during rest periods
 - KBFT_{mk1}: RMS-weighted oscillatory amplitude over time Te1 on the k axis
 - KBFT_{mk2}: RMS-weighted oscillatory amplitude over time Te2 on the k axis

Night period

- $KBFT_{trk} = KBFT_{mk} * \sqrt{Te/Tr}$
 - Tr [s]: evaluation period of (8 hours)
 - Te [s]: exposure period from 22:00 to T_j.

5.2.2.2 ISO 2631-2003

W_m frequency weighting is applied to the acceleration signal.

Note: it is recommended to use an accelerometer for external input. In case of use of a velocimeter, the input signal will be derived.

Note: the data types for both ISO 2631 have the same name but do not have the same frequency weighting, therefore the user will have to take care if both standards are activated.

A_{wk}: weighted RMS acceleration on the k axis

A_{wpeakk}: weighted peak acceleration on the k axis

VDV_{tk}: fourth power vibration dose actualized every T_j since the beginning of the measurement campaign on the k axis

MTVVT_{jk}: maximum transient vibration values actualized every T_j since the beginning of the measurement campaign on the k axis.

5.2.2.3 ISO 2631-1989

Global values (not spectrum) are filtered with a high pass filter:

$$Attenuation = \sqrt{1 + \left(\frac{f}{5.6}\right)^2} \text{ with } f \text{ frequency in Hz.}$$

Note: this frequency weighting is called WBc (W.B. combined) in dBtrait.

Note: the data types for both ISO 2631 have the same name but do not have the same frequency weighting, therefore the user will have to take care if both standards are activated.

Awk: weighted RMS acceleration on the k axis

Awpeakk: weighted peak acceleration on the k axis

Av: combined acceleration with:

$$Av = \sqrt{kx^2 * Awx^2 + ky^2 * Awy^2 + kz^2 * Awz^2}$$

Kx, ky and kz can be user defined

AnTjk: RMS acceleration 1/3 oct n during Tj k axis (n = 1; 315)

AnTj: RMS combined acceleration 1/3 oct n during Tj (n = 1; 315)

$$AnTj = \sqrt{kx^2 * AnTjx^2 + ky^2 * AnTjy^2 + kz^2 * AnTjz^2}$$

A*Tjk: RMS recomposed acceleration 1/3 oct F1 and 1/3 oct F2

5.2.2.4 BS 6472-1 2008

Specific data type:

Lpk: « ground borne noise »: calculation based on Lvk (RMS vibration velocity level)

5.2.3 Summary of all data stored in ORION

Data type	Period	Storage	Display
PPVik	Ti	Value (not stored if « Arrêté » only is selected)	Table Time history
Vpmaxik	Ti	Value Only if « arreté » is selected	Table Time history
PCPVi	Ti	Value Axis corresponding to the max (PPVik) (not stored if « Arrêté » only is selected)	Table Time history
PVSi	Ti	Value (data not stored if « Arrêté » only is selected)	Table Time history
VDVik	Ti	Value	Table Time history
Lpik	Ti	Value	Table Time history
KBFTik	Ti	Value	Table

Data type	Period	Storage	Display
			Time history
AwTik	Ti	Value	Table Time history
AwpeakTik	Ti	Value	Table Time history
PPVjk/DFjk	Tj	Value Frequency Type (transient or continuous) Threshold exceeded (yes/no) Kurtosis (data not stored if « Arrêté » only is selected)	Table Time history Threshold template
Vpmaxjk	Tj	Value Only if « Arrêté » is selected Threshold exceeded (yes/no)	Table Time history
PCPVj/DFj	Tj	Value Frequency Type (transient or continuous) Threshold exceeded (yes/no) Kurtosis Axis corresponding to the max (PPVjk) (data not stored if « Arrêté » only is selected)	Table Time history Threshold template
PVSj	Tj	Value (data not stored if « Arrêté » only is selected)	Table Time history
VDVTjk	Tj	Value	Table Time history
MTVVjTjk	Tj	Value	Table Time history
Lpjk	Tj	Value	Table Time history
KBFTjk	Tj	Value	Table Time history
KBFTmjk	Tj	Value	Table Time history
KBFTrjk	Tj	Value	Table Time history
AwTjk	Tj	Value	Table Time history
AwpeakTjk	Tj	Value	Table Time history
AvTj	Tj	Value	Table Time history
AnTjk	Tj	Value	Table

Data type	Period	Storage	Display
			Spectrum
AnTj	Tj	Value	Table Spectrum
A*Tj	Tj	Value	Table Spectrum
# ▲ PPVjk/Fdjk	Global	# exceedance Only if « DIN » or « Circulaire » selected	table ▲
# ▲ PCPVj/Fdj	Global	# exceedance Only if « BS » selected	table ▲
# ▲ Vpmaxjk	Global	# exceedance Only if « Arrêté » selected	table ▲
Overload	Ti	Specific marker	
Under range	Ti	.xml file containing thresholds per data type and per axis	
Sensor error	Ti	Specific marker	

Note: Vpmax corresponds to specific PPV in conformance to « PrFDS30-014 : Indicateurs physiques acoustiques et vibratoires adaptés au ressenti des riverains ».

5.3 DATA TYPES SIGNALS

Signal recorded by the instrument are of 2 different types:

- Raw signals coming from the sensor after conditioning
- Samples used for dominant frequency calculation (refer to § 6.3 Method applied to determine Dominant Frequency DF:).

If the sensor used is an accelerometer (which is the case for internal sensor and for external accelerometer), raw signal is acceleration.

Sensor	Raw signal			Samples for DF calculation		
	Type	Sampling frequency [Hz]	Length	Type	Sampling frequency [Hz]	Length
Accelerometer	Acceleration	3200	$T_j + 6\text{sec.}$ *	Velocity	400**	5.12 sec
Velocimeter	Velocity				800**	

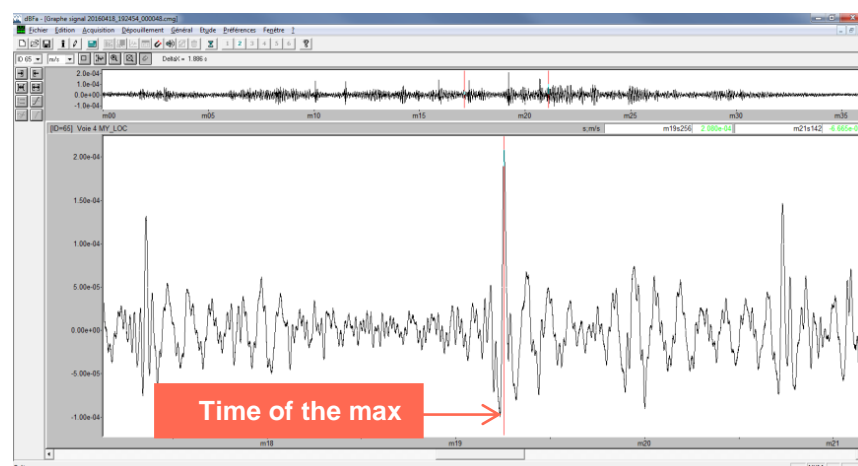
*: Raw signals are stored with a duration of T_j and include a pre-trigger of 3 sec. and a post-trigger of 3 sec.

**: Depends on the resolution selected; refer to § 6.4.2.2 Param. sub-menu

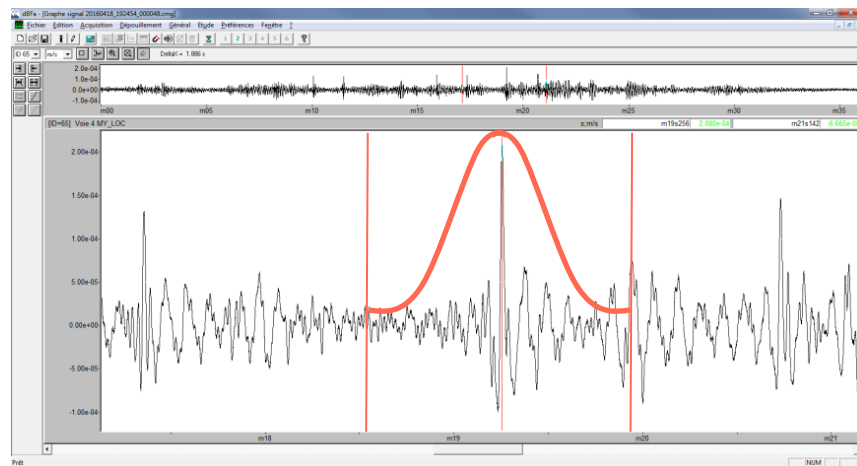
5.4 METHOD APPLIED TO DETERMINE DOMINANT FREQUENCY DF:

Dominant frequency DF is calculated using the maximum frequency of the FFT analysis centred on PPVmax:

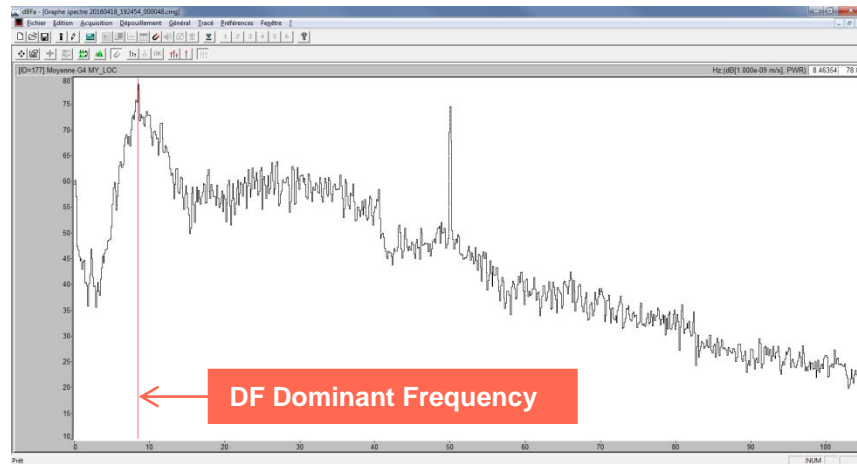
1. Particle velocity time signal during $T_j \rightarrow$ determination of the time of max



2. Time window centred on time of the max (1024 for 400 lines FFT or 2048 samples for 800 lines FFT @400 Hz)

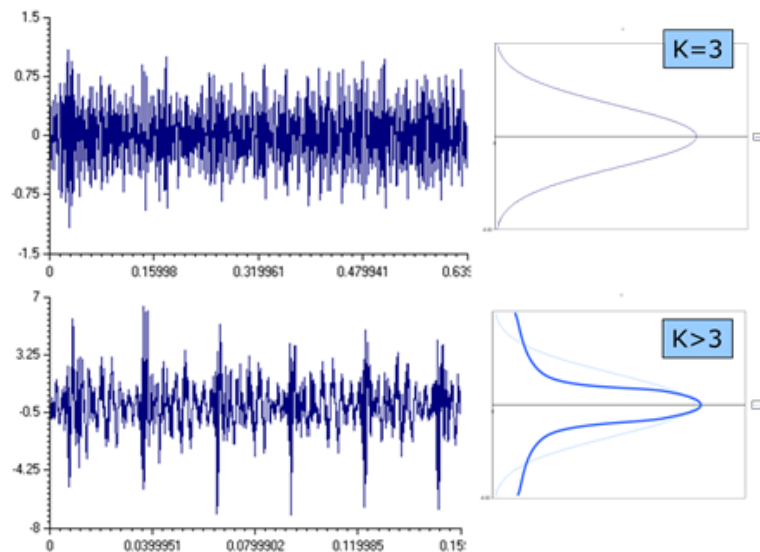


3. determination of DF Dominant Frequency

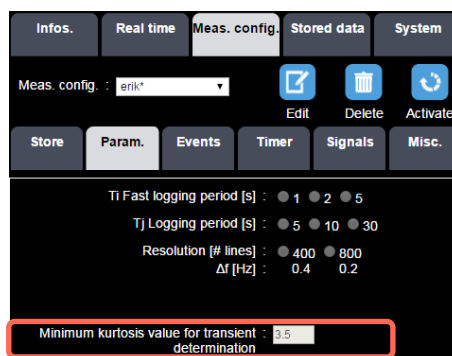


5.5 METHOD APPLIED TO DETERMINE THE TYPE OF SIGNAL (CONTINUOUS OR TRANSIENT)

The instrument calculates the Kurtosis value K of the vibration signal and determines whether the signal is continuous or transient. The Kurtosis K is defined as the 4th-order centred moment of the random variable: it characterizes the flattening of the probability density curve. As examples: Square $K=1$; Sine $K=1.5$; Triangle $K=1.75$; Noise (Gauss) $K=3$. For vibration waveform with shocks, $K>3.5$.



Default value is set to 3.5 in the web interface:



CHAPTER 6

WEB INTERFACE

6.1 DESCRIPTION OF THE WEB INTERFACE

The web interface (Instrument's embedded application) has been designed for access through the Internet. The instrument embeds a Web server. The application firmware is then embedded in the instrument as HTML pages. Remote access to the instrument can be achieved using an Internet navigator on all types of remote control (PC / Pocket PC / Tablet PC / Internet Tablet / Netbook or Smartphone).

Important note: no application needs to be installed to access to the web interface.

The Web interface works with the following navigators:

- Windows™ Internet Explorer from version 11 on PC.
- Safari from version 5 on MAC OS and Mobile Safari on IOS, iPod touch, iPhone, iPad.
- Firefox from version 5.0. Firefox is a Web navigator developed and distributed by the Mozilla Foundation. It is compatible with various versions of Microsoft Windows, Mac OS X and GNU/Linux.
- Opera from version 10.61 on PC.
- Chrome from version 8.0 and Chrome under Android from version 2.2.

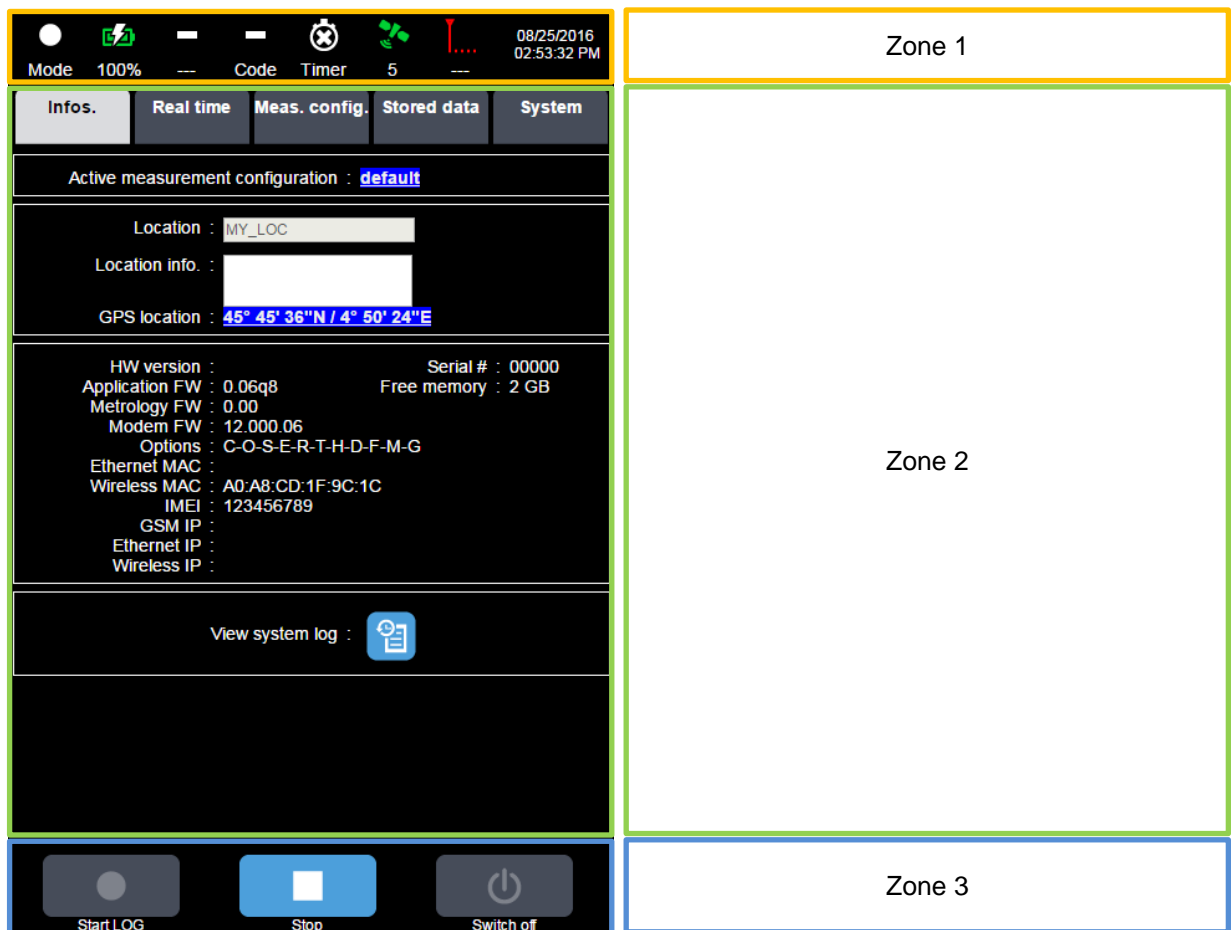
Note: due to compatibility issues, the use of Windows™ IE (Internet Explorer) versions < 11 is not recommended and will not display correctly real-time graphs and status bar.

Note: With a slow connection (3G with small bandwidth), many tests have shown that the Opera navigator is the most performing one to refresh the display of the web interface, on Real-time pages. Thus, it is highly recommended using this navigator to communicate with the Web server.

Note: Due to some compatibility issues between navigators some pages might not be correctly displayed or refreshed → another navigator must then be used. We recommended using CHROME or OPERA.

The typical screen for the Web interface has standard dimensions of 480*800 pixels. It allows, with its black background, for easy reading of the information in full sun exposure and at night with little light. The display includes 3 zones:

- Zone 1: status bar.
- Zone 2: working zone (menus, sub-menus, results, graphs...).
- Zone 3: context command zone for command keys.



The status bar contains different icons and informs the user on the status of the instrument.

The working zone allows displaying the main and secondary menus (as HTML page tabs), measured levels and associated graphs.
Context commands of the keys are shown as text and icons.

6.1.1 Web interface screens

6.1.1.1 Start-up screen

When opening the Web interface, the following screen is displayed:



Start-up screen

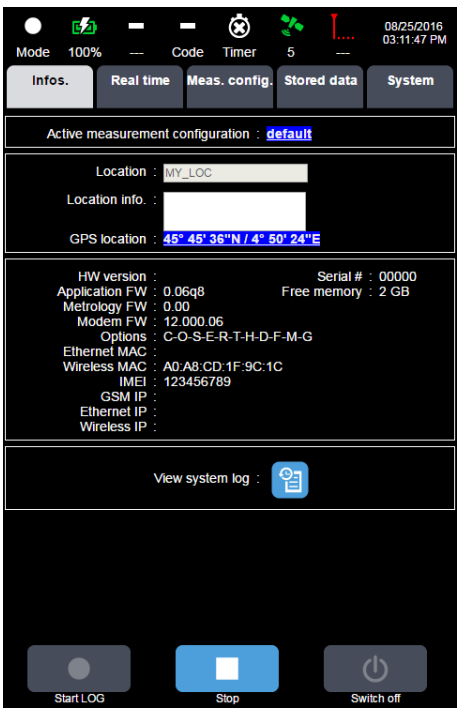
The operator must enter the production output IP address of the instrument (http://192.168.0.1 if Ethernet connection, http://192.168.1.1 if Wi-Fi connection) in the Web browser in order to access the web interface, after configuration of the network (refer to § CHAPTER 7 Communication and connections).

The screen shown below is returned by the instrument and displayed on the interface:

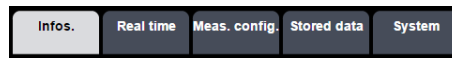
The password (if set by the user) is required to connect the interface to the instrument.

6.1.1.2 Infos screen

Once the connection is set up, the generic “Infos.” screen is displayed:



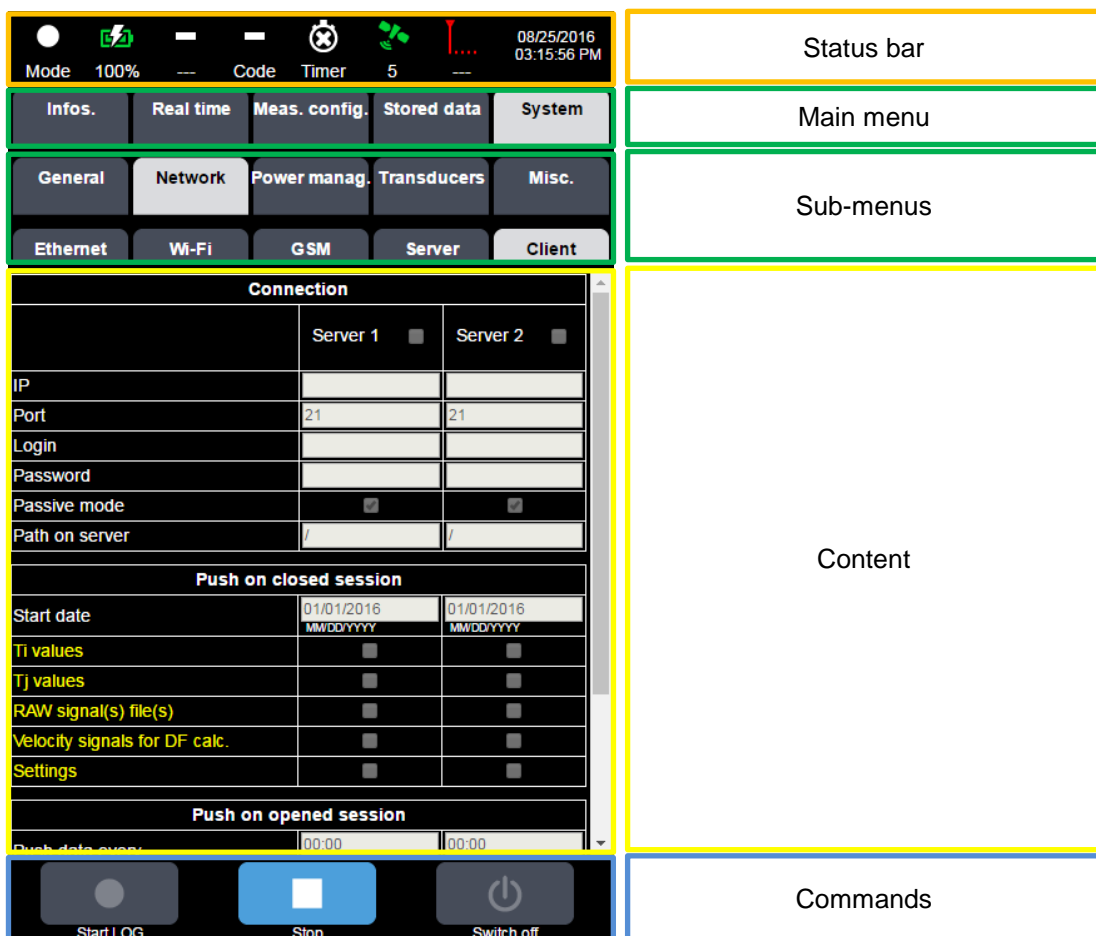
6.1.1.3 Main menu



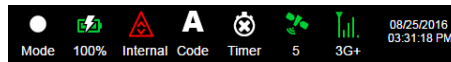
The main menu of the web interface is made up of several tabs. The selected tab is displayed in a light colour (grey background):

- **Infos.** tab: it contains man information. This menu is displayed by default when the application is opened.
- **Real time** tab: this menu is used during the measurements. It is used to:
 - During the measurement in simple sound level meter mode, access back erase and comment.
 - During the measurement in storage mode, code 5 different manual codes, access audio recording, time-stamped comments and weather data.
- **Meas. config.** tab: it is used to configure the measurements.
- **Stored data** tab: this menu is used to access the data stored in the instrument.
- **System** tab: this menu is devoted to system configuration.




6.1.1.4 Sample screen



6.1.2 The status bar



Various icons are displayed, depending on the status of the instrument:

- **Current mode:** Ready, Logging and Stabilisation.
- **Battery level** (charged or discharged): charge symbol icon and % charge when charging, battery symbol icon and % charge remaining off charging time. When the charge is < 10%, the battery icon turns red. The instrument automatically checks the state of battery charge for its operation within the specifications of the standard (minimum charge level should be 4%: when the load is equal or less than 4%, the instrument stops the current measurement, stores the latest information, closes the current files and turns off)
- **Error** during the measurement in progress on internal & external sensors:
 - Overload 
 - under range 
 - open circuit or short circuit (external transducer only) 
- **Code** indicates whether the instrument is in automatic, manual coding mode or not.
- The corresponding icon then displays 1, 2, 3, 4 or 5 in manual coding and A for automatic coding. In case of multiple coding, the icons are scrolled with a period of 1 second.
- Furthermore, if a signal recording is in progress, the signal icon scrolls with the code icons.
- **Timer** indicates whether the instrument is in automatic timer mode or not. The green icon indicates that the timer is programmed or that the measurement is in progress. The orange icon indicates that the measurement is going to start soon. The white icon indicates that no timer is programmed, in which case the instrument starts instantly upon request of the user.
- **GPS** shows the number of satellites. A green icon corresponds to 4 satellites and more. The icon becomes red if less than 4 satellites are detected. The number of detected satellites is displayed.
- **GPRS/EDGE/3G/3G+** indicates the type and intensity of the connection. A green icon corresponds to 3 or more communication bars. The icon turns red if less than 3 bars are detected. A “R” appears on the icon if the connection is roaming.
- **Cadence status:** Indicates if the device is setup to be use with Cadence and steatus of the links with Cadence. A green cloud means the link with Cadence is in function. A red cloud means the device is setup but the link with Cadence is not working. No cloud means the device is not setup to be used in Cadence (See network part)
- **Current date and time:** this display mode depends on the selected language.

6.1.3 Command zone

The measurement command bar contains 3 command buttons. It is accessible from all screens.



Buttons are blue if they can be activated, otherwise they are grey. The Switch off command can be used to turn off the instrument. Beware: once switched off remotely, the only way to turn it on again is to press the button ON/OFF on the instrument.

Note: In order to simplify data storage, pressing the Stop button will automatically record the finalised measurement on the SD card.

6.3 COLOUR RULES

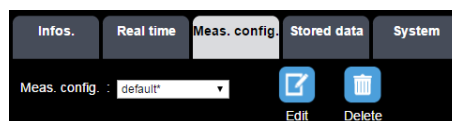
To distinguish between instant values (stored at the logging interval T_i and T_j) and overall values, the following colour rule is applied.

- Instant values are displayed in green and yellow.
- Overall values integrated since the beginning of the measurement session are in white colour.

6.4 SETTING UP THE MEASUREMENT PARAMETERS

6.4.1 Managing a measurement configuration (Meas. Config. tab)

When the **Meas. Config.** tab is opened, the following items are displayed on top of the interface:



If the name of the active configuration is **CADENCE***, it means the configuration is imposed by Cadence. You will be able to consult and edit it. But if you want to apply it, you will need to do it from Cadence.

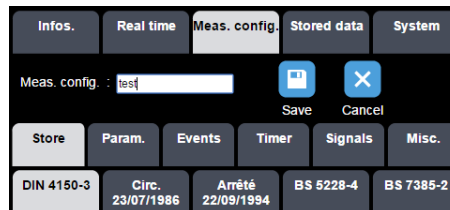
In the pull-down menu, the user selects the measurement configuration to apply. After adequate selection of the configuration short name from the list, the user can Edit, Delete or Activate the selected configuration.

All parameters are updated on the display to correspond to this configuration. If the user has not clicked on the Edit button, the interface remains in a viewing mode: no parameter change is possible.

Note: the active measurement configuration is tagged with a star (here, default*).

6.4.1.1 Edit a configuration

In Edit mode, the pull-down menu becomes an input field where the name of a new configuration can be entered.



Once new parameters have been properly entered, press Save to save the edited configuration.

After deleting the selected configuration, the default configuration (default) is displayed again: this is the only one that cannot be modified or deleted.

Note: in case of incompatible or erroneous data input, clicking on Save will automatically display in red the related parameter.

Note: The active configuration (marked with an asterisk) cannot be deleted.

6.4.1.2 Activate a configuration

Press the activation button to activate the measurement configuration. An hourglass is displayed on the status bar until the settling time is ended.

6.4.2 Setting up the acquisition

6.4.2.1 Store sub-menu

6.4.2.1.1 Principles

Store sub-menu consists in the configuration of standards and transducers used with

- For Construction: 5 tabs describing the 5 standards



- For Occupants: 3 tabs describing the standards (only BS 6462-1 and DIN 4150-2 in FW version 1.60)



Each of the tabs gives access to the activation of a transducer for a selected standard (internal or external):

Store	Param.	Events	Timer	Signals	Misc.
Construction			Occupants		
DIN 4150-3	Circ. 23/07/1986	Arrêté 22/09/1994	BS 5228-4	BS 5228-2 (BS 7385-2)	
Activate internal accelerometer : <input checked="" type="checkbox"/> Activate external transducer : <input type="checkbox"/>					

Except for “arrêté du 22 septembre 1994” that can be selected together with “circulaire du 23 juillet 1986”, once a sensor is activated for one standard, it cannot be activated for another one.

All tolerance curves or values can be edited for customized setups. If one or several changes have been made on the default, the corresponding tab is represented with a yellow tag and the changed values are with yellow background (appearing once the modified setup is stored). Back to default values is done by clicking on [DEFAULT](#):

Store	Param.	Events	Timer	Signals	Misc.																																								
DIN 4150-3	Circ. 23/07/1986	Arrêté 22/09/1994	BS 5228-4	BS 7385-2																																									
Foundation : <input type="radio"/> Highest floor : <input type="radio"/> Pipe network : <input type="radio"/> Short term : <input type="radio"/> Long term : <input type="radio"/>																																													
<table border="1"> <thead> <tr> <th>LimitsPPVl (mm/s)</th> <th>1 Hz</th> <th>10 Hz</th> <th>50 Hz</th> <th>100 Hz</th> </tr> </thead> <tbody> <tr> <td>DEFAULT</td> <td>></td> <td>≤</td> <td>></td> <td>≤</td> </tr> <tr> <td>X, Y</td> <td>20</td> <td>20</td> <td>40</td> <td>50</td> </tr> <tr> <td>Line1 Z</td> <td>20</td> <td>20</td> <td>40</td> <td>50</td> </tr> <tr> <td>X, Y</td> <td>5</td> <td>5</td> <td>15</td> <td>20</td> </tr> <tr> <td>Line2 Z</td> <td>5</td> <td>5</td> <td>15</td> <td>20</td> </tr> <tr> <td>X, Y</td> <td>3</td> <td>3</td> <td>3</td> <td>3</td> </tr> <tr> <td>Line3 Z</td> <td>3</td> <td>3</td> <td>3</td> <td>3</td> </tr> </tbody> </table>						LimitsPPVl (mm/s)	1 Hz	10 Hz	50 Hz	100 Hz	DEFAULT	>	≤	>	≤	X, Y	20	20	40	50	Line1 Z	20	20	40	50	X, Y	5	5	15	20	Line2 Z	5	5	15	20	X, Y	3	3	3	3	Line3 Z	3	3	3	3
LimitsPPVl (mm/s)	1 Hz	10 Hz	50 Hz	100 Hz																																									
DEFAULT	>	≤	>	≤																																									
X, Y	20	20	40	50																																									
Line1 Z	20	20	40	50																																									
X, Y	5	5	15	20																																									
Line2 Z	5	5	15	20																																									
X, Y	3	3	3	3																																									
Line3 Z	3	3	3	3																																									

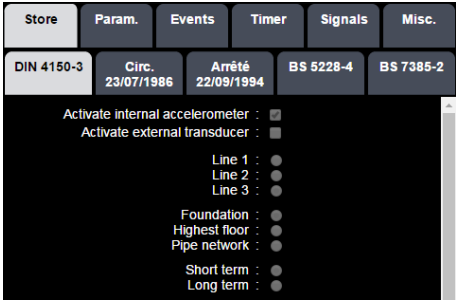
6.4.2.1.2 Construction

6.4.2.1.2.1 DIN 4150-3

The user can select the configuration to use between lines 1 to 3 for Foundation, Highest floor or Pipe network in short or long-term conditions.

Criteria for trigger are based on PPVjk/DFjk.

Refer to DIN 4150-3 standard for more information).



Tolerance tables for PPVjk/DFjk are updated accordingly.

LimitsPPVj [mm/s]		1 Hz		10 Hz		50 Hz		100 Hz	
DEFAULT		≤	>	≤	>	≤	>	≤	>
Line1	X, Y	20	20	20	20	40	40	50	50
	Z	20	20	20	20	40	40	50	50
Line2	X, Y	5	5	5	5	15	15	20	20
	Z	5	5	5	5	15	15	20	20
Line3	X, Y	3	3	3	3	8	8	10	10
	Z	3	3	3	3	8	8	10	10

Foundation/short term
(Long term not defined in the standard)

LimitsPPVj [mm/s]		1 Hz		10 Hz		50 Hz		100 Hz	
DEFAULT		≤	>	≤	>	≤	>	≤	>
Line1	X, Y	40	40	40	40	40	40	40	40
	Z	20	20	20	20	20	20	20	20
Line2	X, Y	15	15	15	15	15	15	15	15
	Z	20	20	20	20	20	20	20	20
Line3	X, Y	8	8	8	8	8	8	8	8
	Z	8	8	8	8	8	8	8	8

Highest floor/short term

Foundation : ☐
Highest floor : ☐
Pipe network : ☐
Short term : ☐
Long term : ☐

LimitsPPVj [mm/s] DEFAULT	≤ 1 Hz	> 1 Hz	≤ 10 Hz	> 10 Hz	≤ 50 Hz	> 50 Hz	≤ 100 Hz	> 100 Hz
Line1	X, Y	10	10	10	10	10	10	10
	Z	10	10	10	10	10	10	10
Line2	X, Y	5	5	5	5	5	5	5
	Z	10	10	10	10	10	10	10
Line3	X, Y	2.5	2.5	2.5	2.5	2.5	2.5	2.5
	Z	2.5	2.5	2.5	2.5	2.5	2.5	2.5

Highest floor/long term

Foundation : ☐
Highest floor : ☐
Pipe network : ☐
Short term : ☐
Long term : ☐

LimitsPPVj [mm/s] DEFAULT	≤ 1 Hz	> 1 Hz	≤ 10 Hz	> 10 Hz	≤ 50 Hz	> 50 Hz	≤ 100 Hz	> 100 Hz
Line1	X, Y	100	100	100	100	100	100	100
	Z	100	100	100	100	100	100	100
Line2	X, Y	80	80	80	80	80	80	80
	Z	80	80	80	80	80	80	80
Line3	X, Y	50	50	50	50	50	50	50
	Z	50	50	50	50	50	50	50

Pipe network/short term

Foundation : ☐
Highest floor : ☐
Pipe network : ☐
Short term : ☐
Long term : ☐

LimitsPPVj [mm/s] DEFAULT	≤ 1 Hz	> 1 Hz	≤ 10 Hz	> 10 Hz	≤ 50 Hz	> 50 Hz	≤ 100 Hz	> 100 Hz
Line1	X, Y	5	5	5	5	5	5	5
	Z	5	5	5	5	5	5	5
Line2	X, Y	2.5	2.5	2.5	2.5	2.5	2.5	2.5
	Z	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Line3	X, Y	1.25	1.25	1.25	1.25	1.25	1.25	1.25
	Z	1.25	1.25	1.25	1.25	1.25	1.25	1.25

Pipe network/long term

6.4.2.1.2.2 Circulaire du 23 juillet 1986

The user can select the configuration to use between Resistant constructions, Sensitive constructions and Very sensitive constructions.

The type of signal (continuous or transient) can be automatically detected or manually selected.

Criteria for trigger are based on PPVjk/DFjk.

For more information, refer to circulaire du 23 juillet 1986:

<https://www.legifrance.gouv.fr/affichTexte.do?cidTexte=JORFTEXT000000866509>

Store	Param.	Events	Timer	Signals	Misc.																																			
DIN 4150-3	Circ. 23/07/1986	Arrêté 22/09/1994	BS 5228-4	BS 7385-2																																				
Activate internal accelerometer : <input type="checkbox"/> Activate external transducer : <input type="checkbox"/> Resistant constructions : <input checked="" type="radio"/> Sensitive constructions : <input type="radio"/> Very sensitive constructions : <input type="radio"/> Automatic detection of signal type : <input type="radio"/> Continuous signal : <input type="radio"/> Transient signal : <input type="radio"/>																																								
<table border="1"> <thead> <tr> <th>Limits PPVj continuous [mm/s]</th> <th>4 Hz</th> <th>8 Hz</th> <th>30 Hz</th> <th>100 Hz</th> </tr> </thead> <tbody> <tr> <td>Resistant X, Y</td> <td>5</td> <td>6</td> <td>8</td> <td>8</td> </tr> <tr> <td>Resistant Z</td> <td>5</td> <td>6</td> <td>8</td> <td>8</td> </tr> <tr> <td>Sensitive X, Y</td> <td>3</td> <td>5</td> <td>6</td> <td>6</td> </tr> <tr> <td>Sensitive Z</td> <td>3</td> <td>5</td> <td>6</td> <td>6</td> </tr> <tr> <td>Very sensitive X, Y</td> <td>2</td> <td>3</td> <td>4</td> <td>4</td> </tr> <tr> <td>Very sensitive Z</td> <td>2</td> <td>3</td> <td>4</td> <td>4</td> </tr> </tbody> </table>						Limits PPVj continuous [mm/s]	4 Hz	8 Hz	30 Hz	100 Hz	Resistant X, Y	5	6	8	8	Resistant Z	5	6	8	8	Sensitive X, Y	3	5	6	6	Sensitive Z	3	5	6	6	Very sensitive X, Y	2	3	4	4	Very sensitive Z	2	3	4	4
Limits PPVj continuous [mm/s]	4 Hz	8 Hz	30 Hz	100 Hz																																				
Resistant X, Y	5	6	8	8																																				
Resistant Z	5	6	8	8																																				
Sensitive X, Y	3	5	6	6																																				
Sensitive Z	3	5	6	6																																				
Very sensitive X, Y	2	3	4	4																																				
Very sensitive Z	2	3	4	4																																				
<table border="1"> <thead> <tr> <th>Limits PPVj transient [mm/s]</th> <th>4 Hz</th> <th>8 Hz</th> <th>30 Hz</th> <th>100 Hz</th> </tr> </thead> <tbody> <tr> <td>Resistant X, Y</td> <td>8</td> <td>12</td> <td>15</td> <td>15</td> </tr> <tr> <td>Resistant Z</td> <td>8</td> <td>12</td> <td>15</td> <td>15</td> </tr> <tr> <td>Sensitive X, Y</td> <td>6</td> <td>9</td> <td>12</td> <td>12</td> </tr> <tr> <td>Sensitive Z</td> <td>6</td> <td>9</td> <td>12</td> <td>12</td> </tr> <tr> <td>Very sensitive X, Y</td> <td>4</td> <td>6</td> <td>9</td> <td>9</td> </tr> <tr> <td>Very sensitive Z</td> <td>4</td> <td>6</td> <td>9</td> <td>9</td> </tr> </tbody> </table>						Limits PPVj transient [mm/s]	4 Hz	8 Hz	30 Hz	100 Hz	Resistant X, Y	8	12	15	15	Resistant Z	8	12	15	15	Sensitive X, Y	6	9	12	12	Sensitive Z	6	9	12	12	Very sensitive X, Y	4	6	9	9	Very sensitive Z	4	6	9	9
Limits PPVj transient [mm/s]	4 Hz	8 Hz	30 Hz	100 Hz																																				
Resistant X, Y	8	12	15	15																																				
Resistant Z	8	12	15	15																																				
Sensitive X, Y	6	9	12	12																																				
Sensitive Z	6	9	12	12																																				
Very sensitive X, Y	4	6	9	9																																				
Very sensitive Z	4	6	9	9																																				

Tolerance tables for PPVjk/DFjk for the various cases for continuous and transient signals

6.4.2.1.2.3 Arreté du 22 septembre 1994

Opposite to the other 4 standards implemented, the criteria for trigger is related only to a tolerance limit on a specific weighted Peak Particle Velocity signal designated V_{pmaxjk} .

StoreParam.EventsTimerSignalsMisc.


DIN 4150-3Circ. 23/07/1986Arrêté 22/09/1994BS 5228-4BS 7385-2

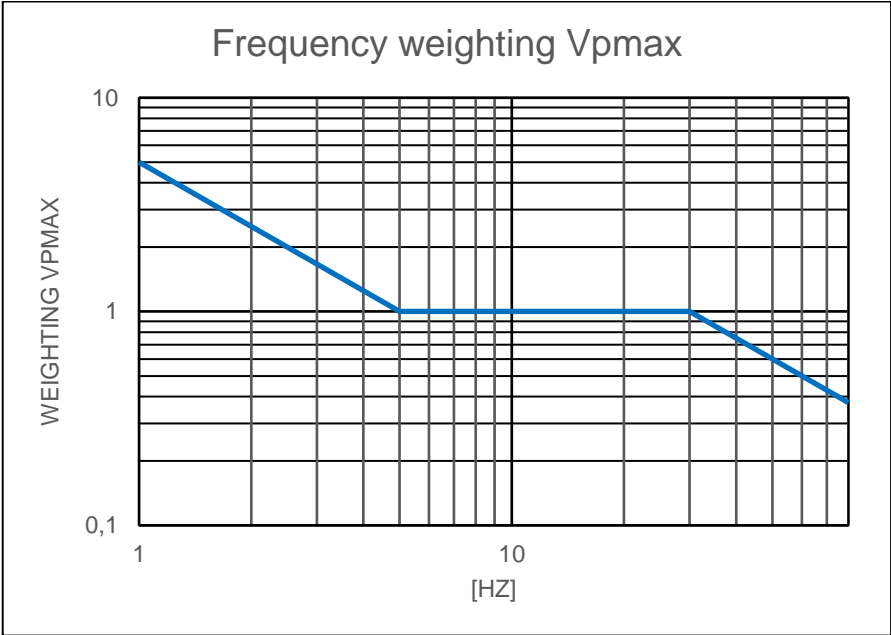
Activate internal accelerometer : ☐
Activate external transducer : ☐


Applied frequency weighting

Frequency	1 Hz	5 Hz	30 Hz	80 Hz
Weighting	5	1	1	0.375

Vpmaxj x,y limit level [mm/s] :
Vpmaxj z limit level [mm/s] :

Download arrêté : 



The regulation can be downloaded directly from the web interface by pressing  .

	<div>Le 4 septembre 2015</div> <div>ARRETE</div> <div>Arrêté du 22 septembre 1984 relatif aux exploitations de carrières et aux installations de premier traitement des matériaux de carrières</div> <div>NOR: ENVV43348A</div> <div>Version consolidée au 4 septembre 2015</div> <div>Le ministre de l'environnement,</div> <div>Vu la loi n° 79-662 du 10 juillet 1976 modifiée relative aux installations classées pour la protection de l'environnement, et notamment son article 7 ;</div> <div>Vu la loi n° 92-3 du 3 janvier 1992 sur l'eau ;</div> <div>Vu le décret n° 77-123 du 21 septembre 1977 relatif pour l'application de la loi n° 79-662 du 10 juillet 1976 relative aux installations classées ;</div> <div>Vu l'avis du Conseil supérieur des installations classées ;</div> <div>Vu les avis des organisations professionnelles concernées,</div> <div>Arrête :</div> <div>Article 1</div> <div>1. Modifié par Arrêté du 5 mai 2010 - art. 1</div> <div>Le présent arrêté fixe les prescriptions applicables :</div> <div>- aux exploitations de carrières qui relèvent du régime d'autorisation (publique 2010 de la nomenclature des installations classées), à l'exception des affoulements du sol ;</div> <div>- aux installations de premier traitement des matériaux de carrières (broyage, concassage, criblage, mélange, etc., opérations correspondant à la rubrique 2515 de la nomenclature des installations classées) qui sont implantées dans une carrière ou en dehors et qui relèvent du régime de l'autorisation ;</div> <div>- aux installations de stockage de déchets inertes et des terres non polluées issues de l'exploitation de la carrière et des installations de traitement.</div> <div>On entend par "installation de stockage" un endroit choisi pour y déposer des déchets d'origine solide ou liquide, en solution ou en suspension, pendant une période soumise à une loi, à la condition que cet endroit soit équipé d'une digue, d'une structure de retenue, de confinement ou de toute autre structure utile ; ces installations comprennent également les bords, les versants et les fondes.</div> <div>Les déchets inertes et les terres non polluées, lorsqu'ils sont déposés dans les lieux d'autorisation à des fins de remise en état ou à des fins de construction liées au processus d'entretien des matériaux (graves, voies de circulation, murs, ...), ne sont pas visés par les dispositions applicables aux installations de stockage de déchets inertes et de terres non polluées du présent arrêté, à l'exception de celles du deuxième alinéa du paragraphe 11.5 du son article 6.</div> <div>Les terres de décharge, les sables et les matériaux inertes, issus du traitement des matériaux extraits des carrières sont considérés comme des déchets inertes et des terres non polluées, au sens du présent arrêté, s'ils satisfont aux critères fixés à l'annexe I du présent arrêté.</div> <div>L'entité d'autorisation peut être, en tant que de besoin, des dispositions plus contraignantes que celles prévues ci-dessus.</div> <div>Sauf mention expresse, sont soumises aux dispositions qui suivent, en ce qui concerne les carrières, les exploitations à ciel ouvert et les exploitations souterraines.</div>
--	--

6.4.2.1.2.4 BS 5228-4

The user can select the configuration to use between 4 different cases. Criteria for trigger are based on PCPVj/DFj.

The type of signal (continuous or transient) can be automatically detected or manually selected.

Refer to BS 5228-4 standard for more information.

Store	Param.	Events	Timer	Signals	Misc.																																																															
DIN 4150-3	Circ. 23/07/1986	Arrêté 22/09/1994	BS 5228-4	BS 7385-2																																																																
Activate internal accelerometer : <input type="checkbox"/> Activate external transducer : <input type="checkbox"/> Residential good repair (Case 1) : <input type="radio"/> Residential significant defects (Case 2) : <input type="radio"/> Industrial light and flexible (Case 3) : <input type="radio"/> Industrial heavy and stiff (Case 4) : <input type="radio"/> Automatic detection of signal type : <input type="radio"/> Continuous signal : <input type="radio"/> Transient signal : <input type="radio"/>																																																																				
<table border="1"> <thead> <tr> <th>Limits PCPVj [mm/s]</th> <th colspan="2">1 Hz</th> <th colspan="2">10 Hz</th> <th colspan="2">50 Hz</th> <th colspan="2">100 Hz</th> </tr> <tr> <th>continuous</th> <th>≤</th> <th>></th> <th>≤</th> <th>></th> <th>≤</th> <th>></th> <th>≤</th> <th>></th> </tr> </thead> <tbody> <tr> <td>DEFAULT</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Case 1</td> <td>2.5</td> <td>2.5</td> <td>2.5</td> <td>5</td> <td>5</td> <td>5</td> <td>5</td> <td>5</td> </tr> <tr> <td>Case 2</td> <td>1.25</td> <td>1.25</td> <td>1.25</td> <td>2.5</td> <td>2.5</td> <td>5</td> <td>5</td> <td>5</td> </tr> <tr> <td>Case 3</td> <td>5</td> <td>5</td> <td>5</td> <td>10</td> <td>10</td> <td>20</td> <td>20</td> <td>20</td> </tr> <tr> <td>Case 4</td> <td>7.5</td> <td>7.5</td> <td>7.5</td> <td>15</td> <td>15</td> <td>30</td> <td>30</td> <td>30</td> </tr> </tbody> </table>						Limits PCPVj [mm/s]	1 Hz		10 Hz		50 Hz		100 Hz		continuous	≤	>	≤	>	≤	>	≤	>	DEFAULT									Case 1	2.5	2.5	2.5	5	5	5	5	5	Case 2	1.25	1.25	1.25	2.5	2.5	5	5	5	Case 3	5	5	5	10	10	20	20	20	Case 4	7.5	7.5	7.5	15	15	30	30	30
Limits PCPVj [mm/s]	1 Hz		10 Hz		50 Hz		100 Hz																																																													
continuous	≤	>	≤	>	≤	>	≤	>																																																												
DEFAULT																																																																				
Case 1	2.5	2.5	2.5	5	5	5	5	5																																																												
Case 2	1.25	1.25	1.25	2.5	2.5	5	5	5																																																												
Case 3	5	5	5	10	10	20	20	20																																																												
Case 4	7.5	7.5	7.5	15	15	30	30	30																																																												
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Limits PCPVj [mm/s]	1 Hz		10 Hz		50 Hz		100 Hz																																																													
transient	≤	>	≤	>	≤	>	≤	>																																																												
DEFAULT																																																																				
Case 1	5	5	5	10	10	20	20	20																																																												
Case 2	2.5	2.5	2.5	5	5	10	10	10																																																												
Case 3	10	10	10	20	20	40	40	40																																																												
Case 4	15	15	15	30	30	60	60	60																																																												

Tolerance tables for PCPVj/DFj for continuous and transient signals

6.4.2.1.2.5 BS 7385-2

The user can select the configuration to use between 4 different lines. Criteria for trigger are based on PCPVj/DFj.

The type of signal (continuous or transient) can be automatically detected or manually selected.

Refer to BS 7385-2 standard for more information.

Store	Param.	Events	Timer	Signals	Misc.																																													
DIN 4150-3	Circ. 23/07/1986	Arrêté 22/09/1994	BS 5228-4	BS 7385-2																																														
Activate internal accelerometer : <input type="checkbox"/> Activate external transducer : <input type="checkbox"/> Line 1 : <input type="radio"/> Line 2 : <input type="radio"/> Automatic detection of signal type : <input type="radio"/> Continuous signal : <input type="radio"/> Transient signal : <input type="radio"/>																																																		
<table border="1"> <thead> <tr> <th>Limits PCPVj [mm/s]</th> <th colspan="2">1 Hz</th> <th colspan="2">4 Hz</th> <th colspan="2">15 Hz</th> <th colspan="2">40 Hz</th> </tr> <tr> <th>continuous</th> <th>≤</th> <th>></th> <th>≤</th> <th>></th> <th>≤</th> <th>></th> <th>≤</th> <th>></th> </tr> </thead> <tbody> <tr> <td>DEFAULT</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Line 1</td> <td>25</td> <td>25</td> <td>25</td> <td>25</td> <td>25</td> <td>25</td> <td>25</td> <td>25</td> </tr> <tr> <td>Line 2</td> <td>1.87</td> <td>1.87</td> <td>7.5</td> <td>7.5</td> <td>10</td> <td>10</td> <td>25</td> <td>25</td> </tr> </tbody> </table>						Limits PCPVj [mm/s]	1 Hz		4 Hz		15 Hz		40 Hz		continuous	≤	>	≤	>	≤	>	≤	>	DEFAULT									Line 1	25	25	25	25	25	25	25	25	Line 2	1.87	1.87	7.5	7.5	10	10	25	25
Limits PCPVj [mm/s]	1 Hz		4 Hz		15 Hz		40 Hz																																											
continuous	≤	>	≤	>	≤	>	≤	>																																										
DEFAULT																																																		
Line 1	25	25	25	25	25	25	25	25																																										
Line 2	1.87	1.87	7.5	7.5	10	10	25	25																																										

Limits PCPVj [mm/s] transient DEFAULT	1 Hz	4 Hz	15 Hz	40 Hz
Line 1	50	50	50	50
Line 2	3.75	3.75	15	15

Tolerance tables for PCPVj/DFj for continuous and transient signals

6.4.2.1.3 Occupants

6.4.2.1.3.1 DIN 4150-2

The user can select the line# corresponding to the user case.

Depending on the user case (infrequent short term, road traffic, rail traffic, construction work, ...) the user must select the type of KBFT calculation: either considering rest periods or not. The selected data will be stored for further post-processing.

ORION can compare real time KBFT measured to the limit determined in the table and alarm on exceedance.

Store	Param.	Events	Timer	Signals	Misc.
Construction			Occupants		
DIN 4150-2		ISO 2631-2		BS 6472-1	
Activate internal accelerometer : <input type="checkbox"/> Activate external transducer : <input type="checkbox"/> KBFTjk limit for Line # : Line5 KBFTjk day period calculation : Including rest period : <input type="radio"/> Excluding rest period : <input type="radio"/>					
DEFAULT	Location of building area	Day (06:00-22:00) A ₀	Night (22:00-06:00) A ₀		
1	Industrial	6	0.6		
2	Commercial	5	0.4		
3	Neither commercial nor residential	5	0.3		
4	Residential	3	0.2		
5	Protected	3	0.15		

6.4.2.1.3.2 ISO 2631-2 2003

AwTjk is between 0.005 and 10 m / s² (empty by default → no associated event)

AwpeakTjk is between 0.005 and 10 m / s² (0.015 by default)

MTVV is between 0.005 and 10 m / s² (empty by default → no associated event)

The definable periods are of 3 maximum and are contiguous (the change of period to 00:00 is not allowed).

Since VDV is a dose, this value is reset at the beginning of each period.

VDV threshold value is between 0.1 and 20 m / s^{1.75}; by default, this threshold is at 2.

StoreParam.EventsTimerSignalsMisc.


ConstructionOccupants

DIN 4150-2ISO 2631-2 2003ISO 2631-2 1989BS 6472-1

Activate internal accelerometer :
Activate external transducer :

AwTjk [m/s²] :
AwpeakTjk [m/s²] : 0.015
MTVVTjk [m/s²] :
VDVTjk [m/s^{1.75}]
Time interval # : 1
Start time : 08:00 AM
End Time : 08:00 AM
Threshold level [m/s^{1.75}] : 2

Start LOGStopSwitch off

 acoem

6.4.2.1.3.3 ISO 2631-2 1989

Mode 100% — Code Timer 5 — 04/10/2019 05:48:02 PM

Infos. Real time Meas. config. Stored data System

Meas. config. : default Save Cancel

Store Param. Events Timer Signals Misc.

Construction Occupants

DIN 4150-2 ISO 2631-2 2003 ISO 2631-2 1989 BS 6472-1

Activate internal accelerometer : ☐
 Activate external transducer : ☐
 Location critical : ☐
 Location residential : ☒
 Location office : ☐
 Location workshop : ☐
 Automatic detection of signal type : ☐
 Continuous signal : ☐
 Transient signal : ☐
 Reference base curves known axes : ☐
 Reference base curves unknown axes : ☐
 User defined base curves : ☐
 Recomposed 1/3 octaves A*Tjk : ☐
 F1 [Hz] : 1
 F2 [Hz] : 6.3
 Combined levels AvTj and AnTj : ☐
 Kx : 1
 Ky : 1
 Kz : 1
 Night time start [hh] : 22
 Day time start [hh] : 7
 Multiplication factor for base curves :

Location	Period	Continuous Intermittent	Transient
Default			
Critical	Day / Night	1	1
Residential	Day	2	30
	Night	1.4	1.4
Office	Day / Night	4	60
Workshop	Day / Night	8	90

Start LOG Stop Switch off

- Default Location: Residential
- Default type signal: Automatic
- Base curves selection by default: known axes
- If User defined base curves are selected, then the bandwidth for all measured values is defined up to 315 Hz
- The user has the choice to calculate or not the recomposed values $A \cdot T_{jk}$ and the combined value AvT_{jk}
- F1 and F2: choice among centre frequencies [Hz]:

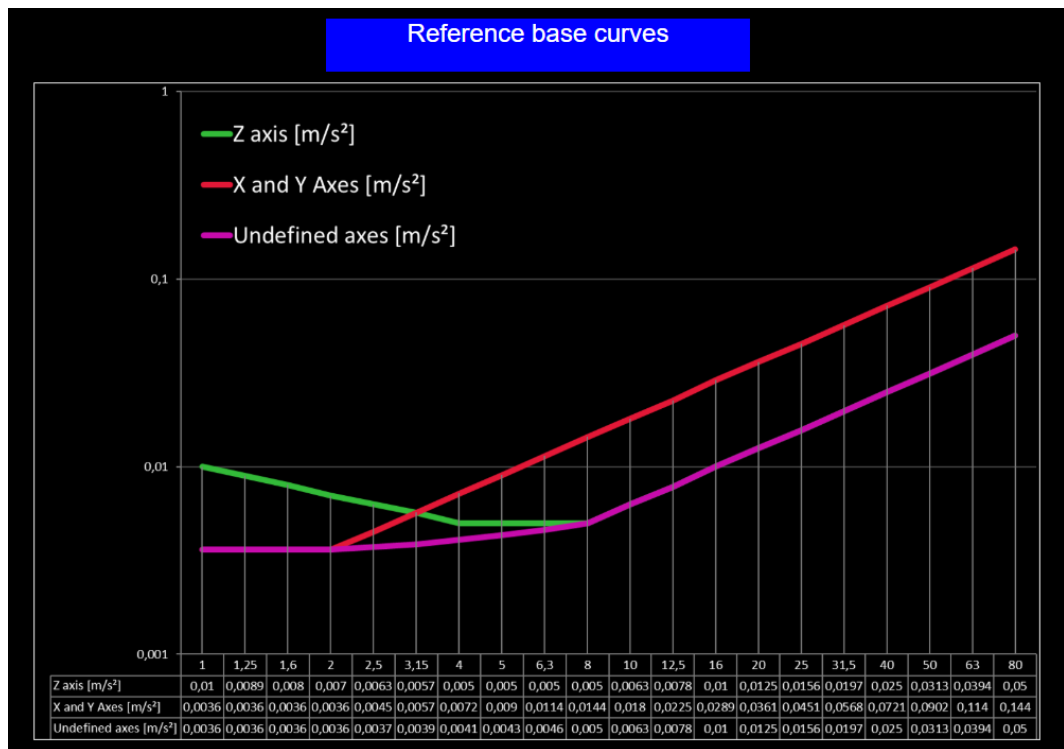
1	1.2	1.	2	2.	3.1	4	5	6.	8	1	12.	1	2	2	31.	4	5	6	8
	5	6		5	5			3		0	5	6	0	5	5	0	0	3	0

- and if user defined base curves are selected, then added 1/3 oct

100	125	160	200	250	315
-----	-----	-----	-----	-----	-----

-
- F1: possible choice between 1 and 63 Hz
- F2: possible choice between 1.25 and 80 (or 315) Hz; $F2 > F1$
- Rem: if User define base curves then we have the choice of F1 / F2 up to 315Hz
- Kk between 1 and 2

- New campaign starts at night time and day time
 - Night time start ≤ 23 h
 - Day time start < night time
- The Multiplication factor table is editable; default values the specified min value. possible values between 1 and 128
- The [reference base curves](#) hyperlink allows the following curves to be displayed:



- The [user defined base curves](#) hyperlink opens a new window with an editable table defining the use defined base curves (the multiplication factor is applied the same way as reference base curves). Default values correspond to respective reference base curves up to 80 Hz and are extrapolated from 100 to 315 Hz:

Frequency [Hz]	X and Y Axes [m/s²]	Z axis [m/s²]
1	0,0036	0,01
1,25	0,0036	0,0089
1,6	0,0036	0,008
2	0,0036	0,007
2,5	0,00451	0,0063
3,15	0,00568	0,0057
4	0,00721	0,005
5	0,00902	0,005
6,3	0,0114	0,005
8	0,0144	0,005
10	0,018	0,0063
12,5	0,0225	0,00781
16	0,0289	0,01
20	0,0361	0,0125
25	0,0451	0,0156
31,5	0,0568	0,0197

40	0,0721	0,025
50	0,0902	0,0313
63	0,114	0,0394
80	0,144	0,05
100	0,1803	0,0626
125	0,2252	0,0782
160	0,2882	0,1001
200	0,3601	0,1250
250	0,4501	0,1563
315	0,5670	0,1969



Button allows for storing the modifications

By pressing **DEFAULT**, the values are restored to the original ones.

6.4.2.1.3.4 BS 6472-1

The user can select different time intervals to start VDV dose calculation. Threshold level for event triggering is set by default to $2 \text{ m/s}^{1.75}$.

Moreover, the user can select different time intervals for ground borne noise threshold levels, set by default to 45 dBA

6.4.2.2 Param. sub-menu

The Param. sub-menu allows to adjust acquisition parameters:

Tj, logging period, corresponds to the analysis period determining peak particle velocity and associated dominant frequency

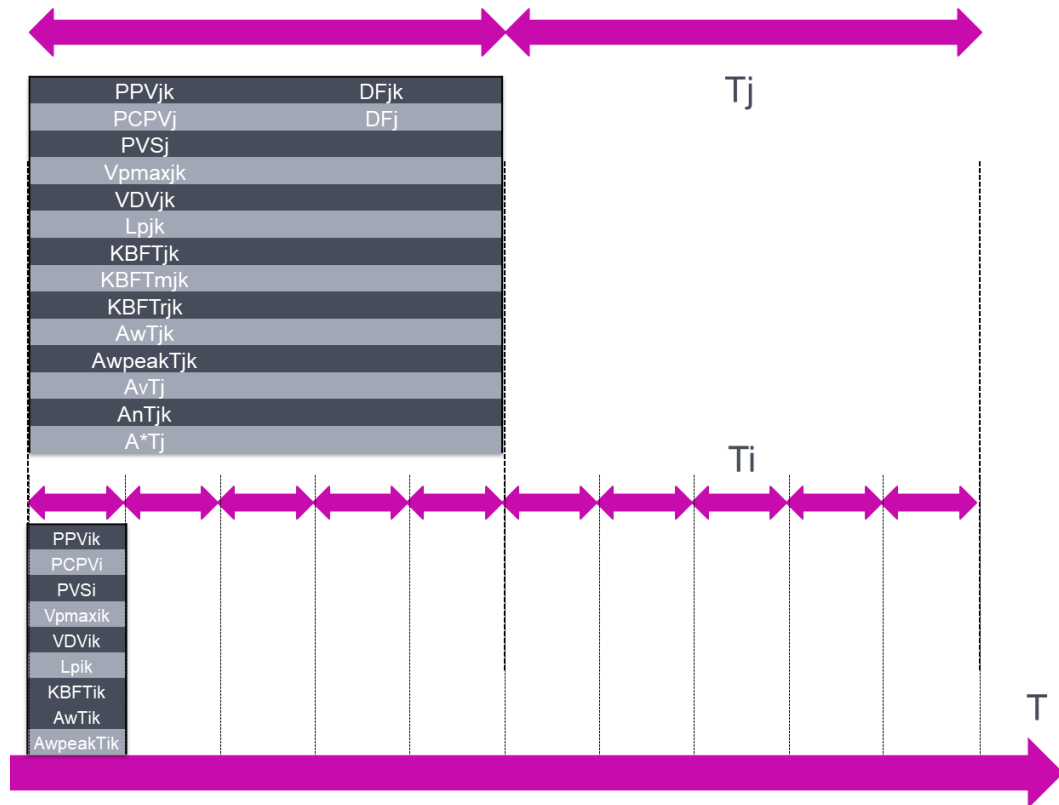
Ti, fast logging period, corresponds to additional information on Peak Particle velocity for a high-resolution time history.

Tj (default 30 sec.) can be selected among 5, 10 or 30 sec.

Ti (default 1 sec) can be selected among 1, 2 or 5 sec

Tj must be a multiple of Ti and different from Ti, therefore the following combinations are not allowed:

- Ti=5 sec. and Tj=5 sec.
- Ti=2 sec. and Tj=5 sec.



For Kurtosis parameter, please refer to § 6.4 Method applied to determine the type of signal (continuous or transient).

Store	Param.	Events	Timer	Signals	Misc.
Ti Fast logging period [s] : <input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 5 Tj Logging period [s] : <input type="radio"/> 5 <input type="radio"/> 10 <input type="radio"/> 30 Resolution [# lines] : <input type="radio"/> 400 <input type="radio"/> 800 Δf [Hz] : 0.4 0.2 Minimum kurtosis value for transient determination : <input type="text" value="3.5"/>					

6.4.2.3 Events sub-menu

6.4.2.3.1 Prerequisite

- Trigger conditions are based on Tj measured values
- Pre-trigger and post-trigger are fixed, and their value is 3 sec.
- Standard based and user defined events are setup using the radio button
- Standard based and user defined events can cohabit (it is possible to select standard based events together with up to 5 user defined events)

6.4.2.3.2 Common menu for standard based and user defined events:

Signal(s) recording : ☐ No ☒ Yes

SMS tel. # :

SMS text :

Header and values in SMS : ☐ No ☒ Yes

TTL output :

TTL duration [Sec] : ☐ Event duration

TTL output cycle [Sec] :

Send HTTP trigger # :

To device IP:Port : :

Alarm # :

Number of occurrences :

Warning before event : ☒ No ☐ Yes

Level [%] :

SMS text :

Alarm # :

Number of occurrences :

Warning before event : ☒ No ☐ Yes

Level [%] :

SMS text :

Alarm # :

Number of occurrences :

Days of the week :

Mon	Tue	Wed	Thu	Fri	Sat	Sun
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

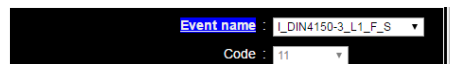
- **Signal (s) recording:** if yes selected, the instrument stores the raw signal while an event is ongoing (default No)
- **SMS tel. #:** if a mobile phone # is entered, the instrument sends an SMS at every occurrence of an event:
- **SMS text:** text sent by the instrument once an event has occurred
- **SMS header and values:** select whether header and values are part of the SMS or not
- **TTL output:** none, 0 or 1 (default none): while an event occurs, the TL output will follow the rule defined
- **TTL duration:** can be programmed from 1 sec. to 3600 sec. (default 10 sec.) or Event duration
- **TTL output cycle:** can be selected between None, 1, 2, 4 or 8 sec. (default None). This function will enable the TTL output to cycle between 0 and 1; ratio is 50%.
- **Send HTTP trigger #:** sends an http command to another device on the same network (DUO, FUSION , CUBE, ORION) allowing the creation of a trigger by HTTP command; # [from 1 to 5 or None], by default None
- **To device IP:PORT:** IP:PORT of the device that receives the HTTP trigger
- **Alarm #:** for internal use (01dBWebMonitoring)
- **Number of occurrences:** for internal use (01dBWebMonitoring)
- **Warning before event:** possibility to receive a warning SMS corresponding to:
- **Level [%]:** % of the event level for warning, between 10 and 99%

- **SMS text:** text sent by the instrument once a warning has occurred
- **Alarm #:** for internal use (01dBWebMonitoring)
- **Number of occurrences:** for internal use (01dBWebMonitoring)
- **Days of the week:** select the day(s) of the week when the event will apply (default all days)

6.4.2.3.3 Standard based events parameters



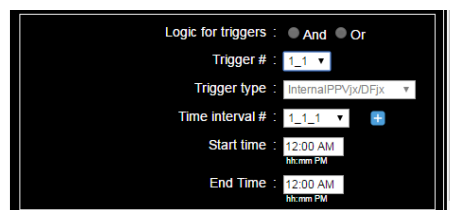
Standard based events cannot be modified unless the standard referring to has been modified by the user using the sub-menus of the Store tab (refer to § 7.3.2.1.1 Principles)



Event name is a hyperlink opening a new window with the tables describing the various selected standard user cases (refer to § 11.1 Annex 1: tables of standard based events names).

For trigger conditions on $k = x, y$ or z , then 3 triggers are created automatically in the event, with a condition “or”.

When a user activates a standard by selecting the sensor (internal or external), the events are automatically created, named and incremented. The number (code starting at 11, up to 14) and the event name are greyed out.



- **Logic for triggers:** greyed out forced on « or » (informative and corresponds to the condition “or” on each of the 3 axes X, Y and Z)
- **Trigger #:** informative and corresponds to the axes measured (X, Y and Z)
- **Trigger type:** indicative value NOT selectable among the values described below depending on the setup:

Variable	k=	condition
InternalVpmaxjk	x and y, or z	Trigger on the level indicated in Store tab
InternalPPVjk/DFjk	x and y, or z	Trigger on the tolerance table indicated in Store tab
InternalPCPVj/DFj	N/A	Trigger on the tolerance table indicated in Store tab
InternalVDVjk	x and y, or z	Trigger on the level indicated in Store tab
InternalLpjk	x and y, or z	Trigger on the level indicated in Store tab
InternalKBFjk	x and y, or z	Trigger on the level indicated

Variable	k=	condition
		in Store tab
InternalAwjk	x and y, or z	Trigger on the level indicated in Store tab
InternalAwpeakjk	x and y, or z	Trigger on the level indicated in Store tab
InternalMTVVjk	x and y, or z	Trigger on the level indicated in Store tab
ExternalVpmaxjk	x and y, or z	Trigger on the level indicated in Store tab
ExternalPPVjk/DFjk	x and y, or z	Trigger on the tolerance table indicated in Store tab
ExternalPCPVj/DFj	N/A	Trigger on the tolerance table indicated in Store tab
ExternalVDVjk	x and y, or z	Trigger on the level indicated in Store tab
ExternalLpjk	x and y, or z	Trigger on the level indicated in Store tab
ExternalKBFjk	x and y, or z	Trigger on the level indicated in Store tab
ExternalAwjk	x and y, or z	Trigger on the level indicated in Store tab
ExternalAwpeakjk	x and y, or z	Trigger on the level indicated in Store tab
ExternalMTVVjk	x and y, or z	Trigger on the level indicated in Store tab

- **Time interval #:** possibility to create, edit and modify up to 24 periods.
- **Start time:** start time of the period
- **End time:** end time of the period.

6.4.2.3.4 User defined events parameters

The screenshot shows a software interface with several tabs: 'Store', 'Param.', 'Events', 'Timer', 'Signals', and 'Misc.'. The 'Events' tab is active. Below the tabs, there are two radio buttons: 'Standard based' (selected) and 'User defined'. Below these, there are two input fields: 'Event #' with a dropdown menu showing '1' and a '+' button, and 'Code' with a dropdown menu showing 'None'.

- **Event #:** Select from none, 1, 2, 3, 4 and 5. Default: empty box (no icon “-.”). Press “+” creates event 1; press “-.” Removes event 1.
- **Code:** allows for marking the event with a code #; selectable value between 6 and 10. Selecting a code # activates the following fields:

Code : 6

Signal(s) recording : ☐ No ☒ Yes

SMS tel. # :

SMS text :

Logic for triggers : ☒ And ☐ Or

Trigger # :

Trigger type : Internal(PCPV)

Time interval # :

Start time : hh:mm PM

End Time : hh:mm PM

Trigger threshold [mm/s] :

- **Logic for triggers:** controls whether the combination of triggers is with the logic “and” or “or”
- **trigger #:** selection of the trigger. Possible selection between i_1 and i_5. press « + » creates trigger i_2; press « - » deletes trigger i_2. The following actions are applied to the selected trigger:
- **Trigger type:** variable selectable value among the values described below depending on the standards and data types activated:

Variable	k=	condition
InternalPPVjk	x and y, or z	Exceeded trigger level
InternalPCPVj	N/A	Exceeded trigger level
InternalPVSj	N/A	Exceeded trigger level
InternalKBFTmjk	x and y, or z	Exceeded trigger level
Internal KBFTrjk	x and y, or z	Exceeded trigger level
InternalAvj	N/A	Exceeded trigger level
InternalA*jk	x and y, or z	Exceeded trigger level
InternalAwjk	x and y, or z	Exceeded trigger level
InternalAwpeakjk	x and y, or z	Exceeded trigger level
ExternalPPVjk	x and y, or z	Exceeded trigger level
ExternalPCPVj	N/A	Exceeded trigger level
ExternalPVSj	N/A	Exceeded trigger level
ExternalKBFTmjk	x and y, or z	Exceeded trigger level
External KBFTrjk	x and y, or z	Exceeded trigger level
ExternalAvj	N/A	Exceeded trigger level
ExternalA*jk	x and y, or z	Exceeded trigger level
ExternalAwjk	x and y, or z	Exceeded trigger level
ExternalAwpeakj k	x and y, or z	Exceeded trigger level
HTTP Trigger	N/A	Trigger receive # 1 to 5

- **Time interval #:** possibility to create, edit and modify up to 24 periods.
- **Start time:** start time of the period
- **End time:** end time of the period.
- Trigger threshold: trigger level.

Note: If the variable used to trigger is no longer measured after a standard selection change in Store tab, the trigger value line turns red and the user must select a different value type measured with the selected configuration.

6.4.2.4 Timer sub-menu

Timer sub menu allows to program timers.

The Timer mode can be exit by changing the configuration or by selecting a configuration where the timer is not active

Types of timer

- **Immediate:** corresponds to the manual mode with no timer (immediate start of the measurement after indication of the measurement duration, the ending date and time depend on the battery life and on the memory capacity or the programmed duration. The next fields are then disabled since they are not relevant in this timer mode.
- **Delayed:** corresponds to the case where the user wants to schedule a starting date & time for storage (after 5 min the instrument stops and waits for the starting date & time to wake-up and start the measurement). The measurement automatically starts on the programmed date and time or manually upon the user's choice. The measurement stops either automatically after the programmed duration, or when the memory capacity is full, or manually by action from the user.
- **Periodic (daily):** corresponds to the situation where the user wants to program 1, 2, 3 or 4 (consecutive or not) storage periods per day (until the battery is empty or the memory capacity is full). Typically, this mode allows triggering a measurement that stores every day during period(s) 1, 2, 3 or (and) 4.

Note: Start and end times of periods 1, 2, 3 or 4 can be programmed, but adjacent, meaning full 24-h coverage. The programming of the periods is done in the Meas. Config. /Misc. tab. The beginning of the 1st period stored is a time selected to correspond to the end of the 4th period, the beginning of the 2nd period corresponds to the end of the 1st period, the beginning of the 3rd period corresponds to the end of the 2nd period, the beginning of the 4th period corresponds to the end of the 3rd period and this until the battery is empty, or the memory is full or by choice of the user.

- **Start date & time:** programming of the starting date and time. If the configuration is activated after schedule, then an error message is displayed, and the trigger becomes inactive. The user must then re-assign a correct starting date.
- **Duration:** programmed duration per storage. This function is active only in delayed timer mode. The maximum value is 99 days 23 hours 59 minutes and 59 seconds.

- **# of cycles:** number of programmed starts. “No limit” corresponds to a mode where the instrument keeps running until the battery is empty or until the memory is full. Value ranging from 1 to 9999.
- **Periodicity:** corresponds to the time period between each timer. This function is active only in delayed timer mode. The maximum value is 99 days 23 hours 59 minutes. The value for Periodicity must be equal to or longer than the measurement time.
- **Period (s) for periodic timers:** allows selecting the storage period(s) according to the definition given in the Note above. This function is active only in periodic timer mode.

6.4.2.5 Signals sub-menu

Store	Param.	Events	Timer	Signals	Misc.
In situ axis signal recording	X	Y	Z	Microphone	
Internal	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
External	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Simultaneous signals recording during coding		<input checked="" type="checkbox"/> Code 1 <input checked="" type="checkbox"/> Code 2 <input checked="" type="checkbox"/> Code 3 <input checked="" type="checkbox"/> Code 4 <input checked="" type="checkbox"/> Code 5			
Max. duration per record :		<input type="text" value="00d 00:15"/> <input type="checkbox"/> No limit <small>DDd hh:mm</small>			
Signals timer : <input type="radio"/> No <input checked="" type="radio"/> Yes					
Start date & time signals timer :		<input type="text" value="01/01/2015 12:00 AM"/> <small>MM/DD/YYYY hh:mm PM</small>			
Period signals timer :		<input type="text" value="00d 00:15"/> <small>DDd hh:mm</small>			
Duration signals timer :		<input type="text" value="00d 00:01"/> <small>DDd hh:mm</small>			

The table on top of the tab allows for selecting which raw signals channels are recorded.

- **Simultaneous signals recording during coding:** allows to start a signal recording during manual coding or not
- **Maximum recording duration per record:** allows limiting the maximum recording time of a raw signal during a coding. No limit corresponds to a signal recording with no time limit. The maximum value is 7 days; the minimum value is 5 seconds. No limit corresponds to an audio recording with no time limit.
- **Signals timer:** allows setting up a signal timer independently of coding. If this option is selected by the user, the instrument will automatically launch raw signals recordings according to the parameters below.
- **Start date & time signals timer:** allows selecting the starting date and time for the signal timer. If the configuration is activated after the scheduled date, then the error will be notified to the user and the audio timer will be triggered at the next calculated occurrence
- **Period signals timer:** this is the time period between each start of raw signal recording (in days, hours, minutes). The maximum value is 99 days 23 hours 59 minutes.
- **Duration signals timer:** duration of each raw signal recording. The maximum value is 99 days 23 hours 59 minutes.
- Note: the signal is divided in contiguous blocks of 2 hours.

6.4.2.6 Misc. sub menu

Store	Param.	Events	Timer	Signals	Misc.
# active periods : 4 ▼					
Period 1 start time : 06:00 AM hh:mm PM					
Period 2 start time : 12:00 PM hh:mm PM					
Period 3 start time : 06:00 PM hh:mm PM					
Period 4 start time : 10:00 PM hh:mm PM					
Delete oldest measurement sessions : <input checked="" type="radio"/> Yes <input type="radio"/> No					
if disk space below : 5 %					

- **# active periods:** the number of active periods is selectable between 2 and 4; inactive periods are greyed.
- **Delete oldest measurement sessions:** allows for automatic deletion of oldest measurement sessions
- **If disk space below:** value compared to disk space every time a measurement session is closed.

6.5 INFOS MENU

6.5.1 Measurement configuration

Active measurement configuration : [default](#)

The name of the active configuration is a hypertext link that allows opening a new tab describing the entire active measurement configuration:

- Stored indicators
- Storage parameters
- Type of coding
- Time parameters
- Signals recording parameters...

CONFIGURATION : DEFAULT

StoreDIN 4150-3

Activate internal accelerometer : ☐
 Activate external transducer : ☐
 Line 1 : ☐
 Line 2 : ☐
 Line 3 : ☐
 Foundation : ☐
 Highest floor : ☐
 Pipe network : ☐
 Short term : ☐
 Long term : ☐

LimitsPPV [mm/s]		1 Hz		10 Hz		50 Hz		100 Hz	
		≤	>	≤	>	≤	>	≤	>
Line1	X, Y	20	20	20	20	40	40	50	50
	Z	20	20	20	20	40	40	50	50
Line2	X, Y	5	5	5	5	15	15	20	20
	Z	5	5	5	5	15	15	20	20
Line3	X, Y	3	3	3	3	8	8	10	10
	Z	3	3	3	3	8	8	10	10

Param.

T1 Fast logging period [s] : 1
 Tj Logging period [s] : 30
 Resolution [# lines] : 400
 Δf [Hz] : 0.4
 Minimum peak velocity for dominant frequency calculation [mm/s] : 1
 Minimum kurtosis value for transient determination : 3.5

EventsStandard based

Event name : L_DIN4150-3_L1_F_S
 Code : 11
 Signal(s) recording : No
 SMS tel. # :
 SMS text :
 TTL output : None
 TTL duration [Sec] : 10
 Event duration : No
 TTL output cycle [Sec] : None
 Days of the week :

Mon	Tue	Wed	Thu	Fri	Sat	Sun
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Logic for triggers : Or
 Trigger # : 1.1
 Trigger type : InternalPPVix_DFjx
 Time interval # : 1.1.1
 Start time : 00:00
 End Time : 00:00
 Trigger # : 1.2
 Trigger type : InternalPPViy_DFjy
 Time interval # : 1.2.1
 Start time : 00:00
 End Time : 00:00
 Trigger # : 1.3
 Trigger type : InternalPPViz_DFjz
 Time interval # : 1.3.1
 Start time : 00:00
 End Time : 00:00

Timer

Logging periods timer type : IMMEDIATE
 Duration : No limit

Signals

In situ axis signal recording	X	Y	Z	Microphone
Internal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
External	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Simultaneous signals recording during coding : ☐ Code 1 ☐ Code 2 ☐ Code 3 ☐ Code 4 ☐ Code 5
 Max. duration per record : 00d 00:15


Signals timer : No

Misc.

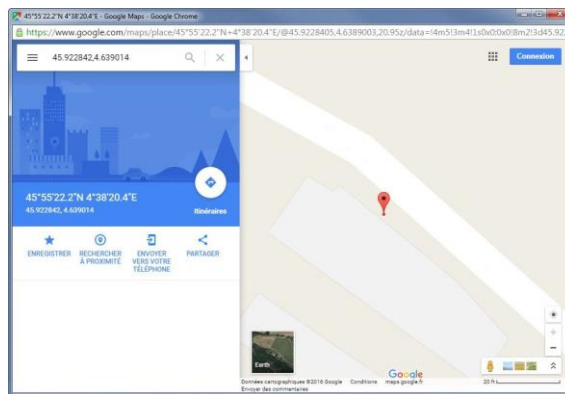
active periods : 4
 Period 1 start time : 06:00 AM
 Period 2 start time : 12:00 PM
 Period 3 start time : 06:00 PM
 Period 4 start time : 10:00 PM
 Delete oldest measurement sessions : Yes
 If disk space below : 5 %


Default configuration

6.5.2 Location

Location :	MY_LOC	
Location info. :	Example of comment	
GPS location :	45° 55' 22.12"N / 4° 38' 20.24"E	

- **Location:** in this field the user inputs the name of the test site. This name then defines the name of the directory used to store the measurement sessions. This text field is accessible only if the instrument is in Ready mode and contains a maximum of 12 characters.
- **Location info:** this larger text field (256 characters maximum) offers the possibility to enter more details relative to the current session.
- **GPS location:** displays the GPS coordinates of the instrument in hypertext. This information is stored with each measurement session. If you are connected to the Internet, one click on the hypertext link will open an additional tab in Google Maps™:



When changing a field relative to the location, the validation icon  is displayed. The change must be validated to be considered for the next session. The validation icon disappears after validation.

6.5.3 Additional information

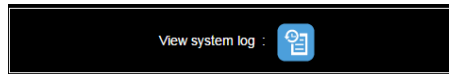
```

HW version : LST001A          Serial # : 10022
Application FW : 0.06q9       Free memory : 1.7 GB
Metrology FW : 0.38
Modem FW : 12.00.006
Options : C-E-R-T-H-D-F-M-G
Ethernet MAC : 70-02-58-01-40-16
Wireless MAC : 00-11-F6-F2-0E-FB
IMEI : 357164042696768
GSM IP : 90.117.139.1
Ethernet IP : 192.168.0.1
Wireless IP : 192.168.1.1
  
```

- **HW version:** hardware version number
- **Application FW:** application firmware number
- **Metrology FW:** metrology firmware number
- **Modem FW:** modem firmware number.
- **Options:** available options
- **Ethernet MAC:** Ethernet MAC identifier
- **Wireless MAC:** Wi-Fi MAC identifier
- **IMEI:** International Mobile Equipment Identity: unique number for mobile phone identifier

- **GSM IP:** public IP address on cellular network
- **Ethernet IP:** IP address for Ethernet link connection.
- **Wireless IP:** IP address for wireless infrastructure connection
- **Serial #:** serial number of the instrument
- **Free memory:** memory capacity remaining on SD card.

6.5.3.1 System log



Pressing the System log icon opens a new tab listing all events, with 3 levels:

- CRITICAL: critical events are listed in red.
- WARNING: events requiring attention are displayed in orange.
- INFORMATION: informative events are listed in green.

Up to 500 events are stored in non-volatile memory. Beyond 500 events, the oldest event will be deleted upon occurrence of a new event.

System log			
			Refresh
Date	Time	Level	Event description
09/02/2016	02:08:05 PM	DEBUG	Measure err 1 : NumWarning_1
09/02/2016	01:55:43 PM	INFORMATION	Begin web connection.
09/02/2016	01:53:15 PM	INFORMATION	Begin web connection.
09/02/2016	12:27:30 PM	INFORMATION	Begin web connection.
09/02/2016	12:24:57 PM	INFORMATION	Begin web connection.
09/02/2016	12:24:43 PM	INFORMATION	End LOG measure (user).
09/02/2016	12:23:48 PM	INFORMATION	Begin web connection.
09/02/2016	11:45:37 AM	INFORMATION	Dynamic DNS update done.
09/02/2016	11:45:34 AM	INFORMATION	GSM module now connected with IP 90.117.139.1.
09/02/2016	11:44:54 AM	INFORMATION	Wifi module now connected with IP 192.168.1.1.
09/02/2016	11:44:54 AM	INFORMATION	Begin LOG measure (automatic).
09/02/2016	11:44:34 AM	INFORMATION	Ethernet module now connected with IP 192.168.0.1.
09/02/2016	11:44:28 AM	INFORMATION	Power on (0.06q9).

6.6 REAL TIME MENU

6.6.1 Selection of the data to be displayed

The available data are shown on the upper table. A click on the interactive zone will update the graph under the table with the selected data and the corresponding part of the table is highlighted in green.

The table is displayed for the selected sensor by pressing **Internal** or **External**.

Infos.		Real time	Meas. config.	Stored data	System
Internal	PPVx [mm/s]	PPVy [mm/s]	PPVz [mm/s]	PCPV [mm/s]	PVS [mm/s]
Vpmax: <div></div>	0.083	0.104	0.185	0.185	0.194
T1s					

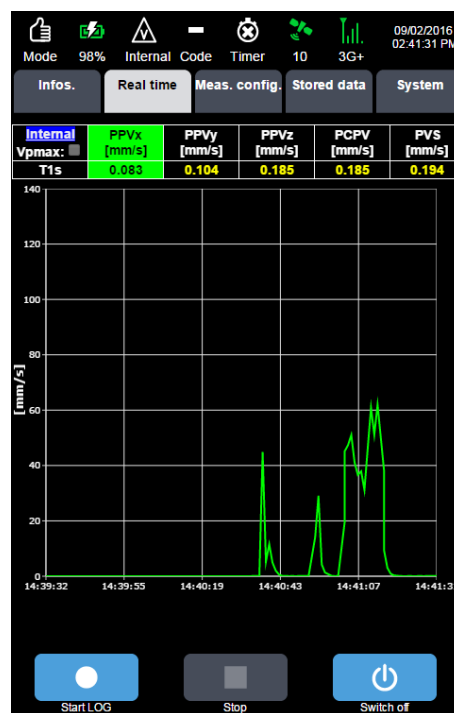
Interactive zone of the table in ready mode

Infos.	Real time	Meas. config.	Stored data	System
1	2	3	4	5
Code 1	Code 2	Code 3	Code 4	Code 5
Signals	Notes			
Internal	PPVx	DFx	PPVy	DFy
Vpmax:	[mm/s]	[Hz]	[mm/s]	[Hz]
Ti (1s)	0.067		0.087	
Tj (30s)	0.139	---	0.214	---
Tjmax	0.139	---	0.214	---
# ▲	0	0	0	---

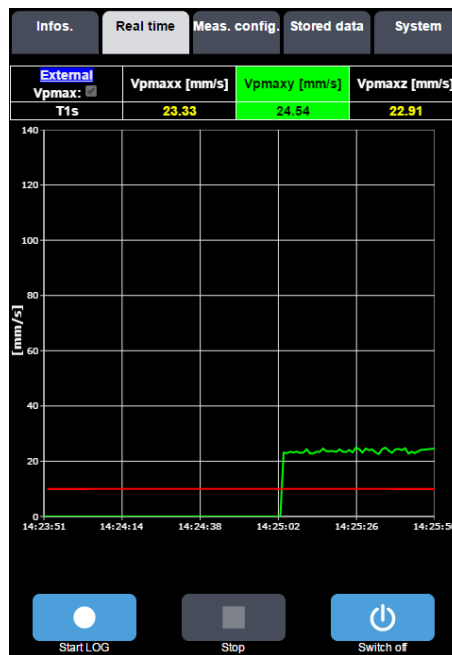
Interactive zone of the table in Log mode

6.6.2 Real time displays in Ready mode

6.6.2.1 Construction standards

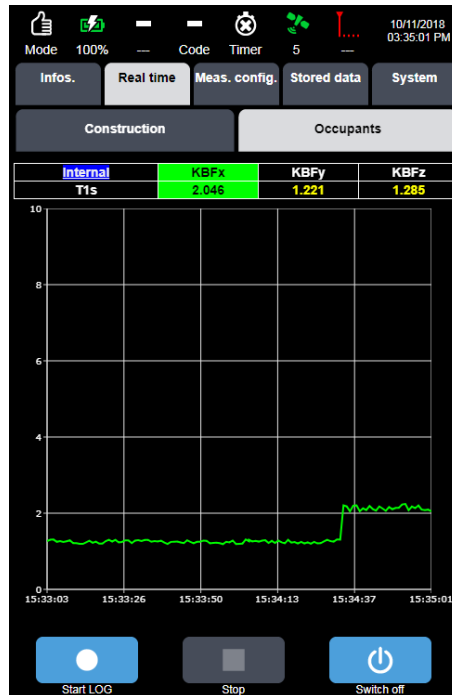


The time history display shows data at a 1 sec. resolution with an X axis of 2 minutes.



If the “Arrêté” is the only selected standard, then Vpmax is checked systematically activated and unchangeable. If “Arrêté” is not selected, then the Vpmax box is greyed out:

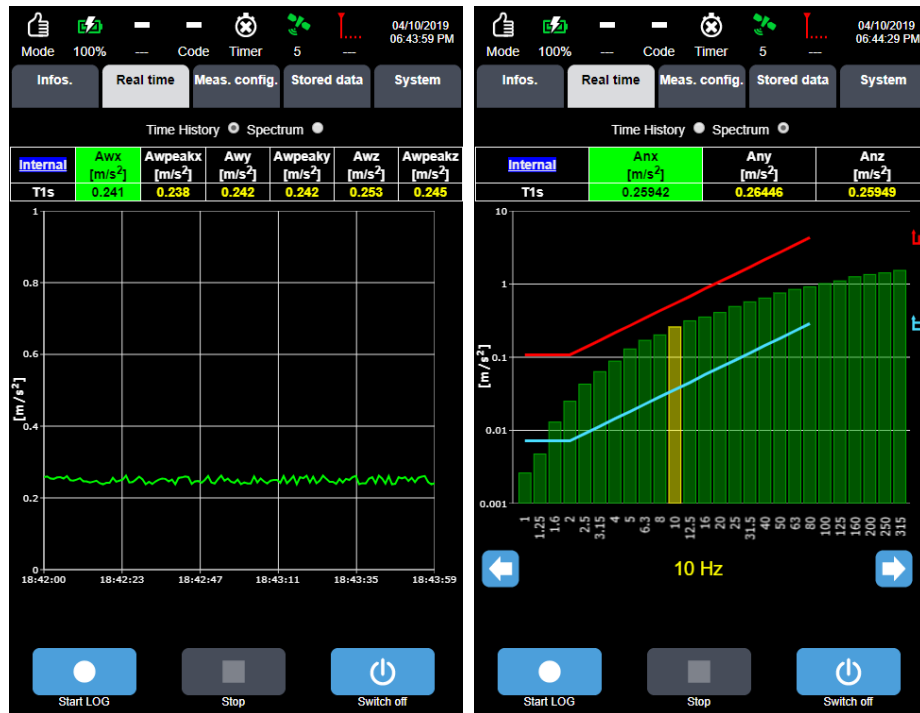
6.6.2.2 Occupants standards



In DIN 4150-2 standard, KBFT is updated every second;



In ISO 2631 2003 standard the different data types are displayed and updated every second. VDV is reset every time a display is initialised.



In ISO 2631 1989 standard it is possible to select either time history of Aw or Awpeak, or spectrum, updated every second. In case of spectrum selected, the interface displays the continuous and transient tolerance curves. By using the arrows, the cursor moves accordingly.



Clicking on the spectrum zone allows for displaying spectrum values



In BS 6472-1 standard, VDV and Lp are updated every second; VDV is reset every time a display is initialised.

6.6.3 Real time displays in Log mode

6.6.3.1 Prerequisite

For all display types, the following is applicable:

Manual coding is done pressing one of the 5 code buttons:



Once code is activated, the button becomes green:



. By pressing again, the code is deactivated, and the button becomes blue again

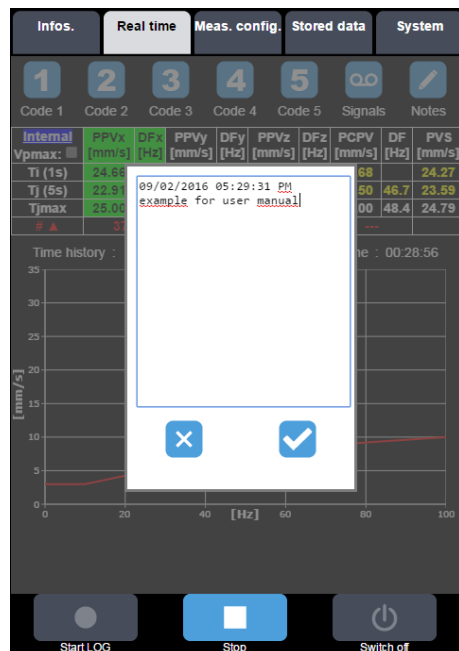
Manual signals recording is activated pressing the button:





and becomes green



. By pressing the button again, the recording is deactivated, and the button becomes blue again.



Notes functionality is done by pressing the button . A pop-up window appears with the date and time of the note.

Pressing  validates the note (it will be accessible in post-processing using dBTrait).

Pressing  button cancels the action.

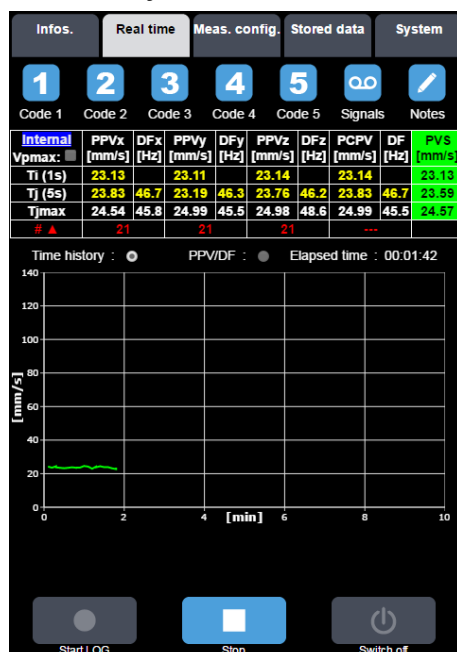
6.6.3.2 Possible displays function of the selected Construction standard

The following table synthesizes the different possibilities for displaying data and tolerance curves:

		DIN4150-3	Circulaire	Arrêté	BS-5228	BS-7385
PPV	Stored					
	Time History					
	PPV/FD	TC	TCCT			
Vpmax	Stored					
	Time History			TCV		
	PPV/FD					
PCPV	Stored					
	Time History					
	PPV/FD				TCCT	TCCT
PVS	Stored					
	Time History					
	PPV/FD					
#PPV						
#PCPV						
#Vp						

	Available
TCCT	Tolerance Curve Continuous and transient
TC	Tolerance Curve Not qualified as continuous or transient
TCV	Tolerance Curve Trigger value

6.6.3.3 Time history mode



PVS is selected by default display, then Time history is active and PPV / DF button is greyed out (no calculation of DF for PVSj).

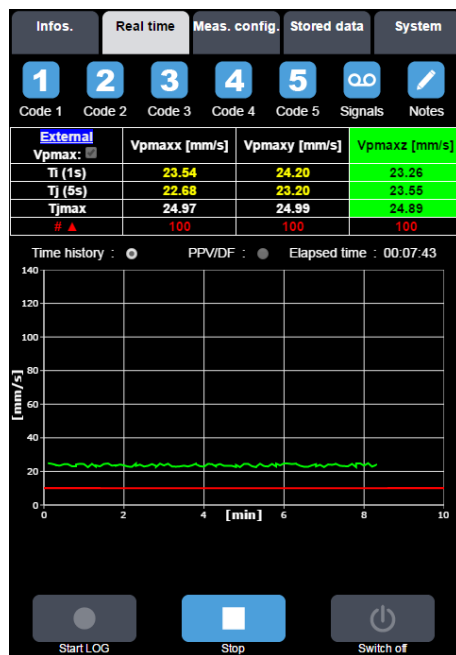
The Tj max values are the maximum since the beginning of the current session.

Real time value of current data is displayed in the table at Ti and Tj logging periods

▲ line (#exceedance) shows “---” for the columns corresponding to unselected standard.

Time history mode shows the data set at Tj logging period of the current measurement session.

6.6.3.4 Particular case: Arrêté du 22 septembre 1994 (French Regulation)



If “Arrêté” is the only selected standard, then the Vpmax box is systematically checked and unchangeable. If the order is not selected, then the Vpmax box is empty and greyed out.

If Vpmax is selected, the values displayed become those calculated for PPV.

If only “Arrêté” is selected, then the time history is selected and locked to Vpmax. The limit value is indicated by a red horizontal segment and PVS (which remains measured and stored) is not displayed.

6.6.3.5 PPV/DF mode

6.6.3.5.1 Prerequisite

PPV/DF modes are active for the standards based on PPV/DF or PCPV/DF tolerance tables only (this display mode is not activated if Arrêté only selected).

To distinguish transient signal detection from continuous signal detection, the form of the pictogram is different

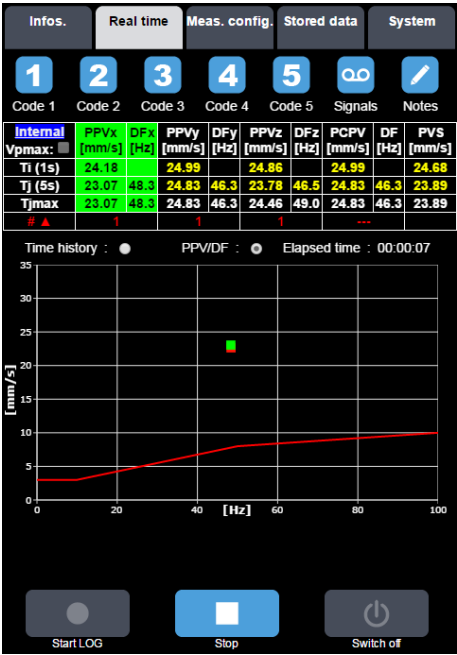
Pictogram form	meaning
●	Continuous signal detected
×	Transient signal detected
■	No detection required

The real time couple of data acquired is a pictogram in green colour: ■, × and ●

Note: for easy reading, X-axis is between 0 and 100 Hz, therefore couples with DF > 100 Hz are not shown; However, these couples are counted in the number of exceedances.

To improve readability, only 50 couples of values are shown, they are selected as being the 50 highest values above the tolerance curve. In the case where 2 tolerance curves are applied (transient and continuous), up to 25 couples of values for each signal type are displayed.

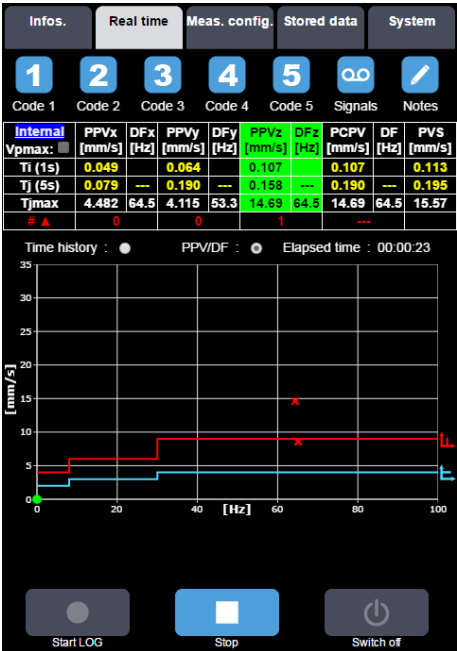
6.6.3.5.2 DIN 4150-3 standard



The tolerance curve is displayed in red.
The couples of data measured are red squares (except for the ongoing acquisition: green square).

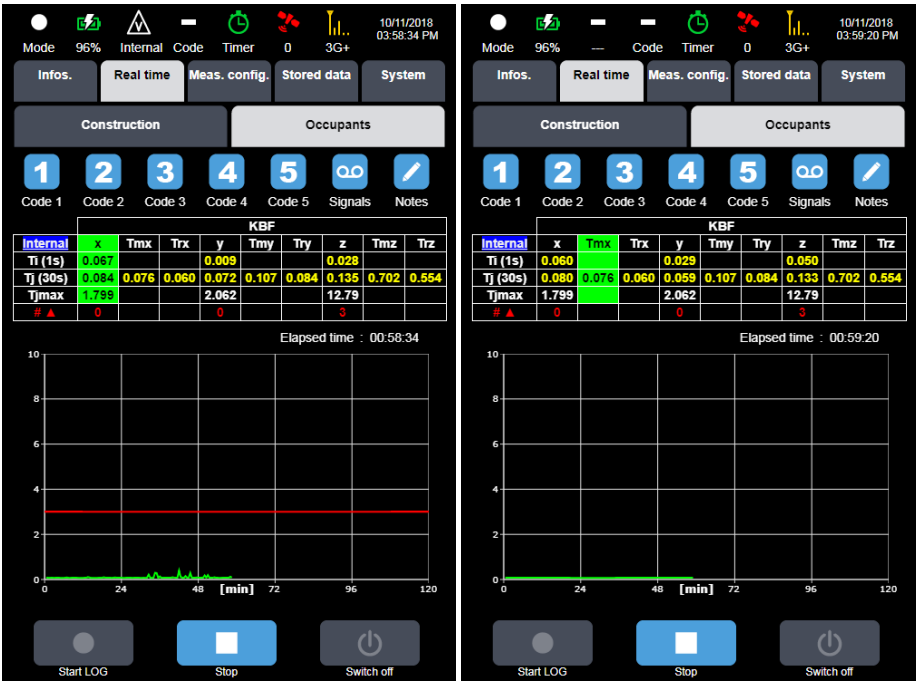
6.6.3.5.3 Circulaire du 23 juillet 1986 (French Regulation)

The following description applies for “Circulaire” (criteria on PPV).



Tolerances curves are of 2 types:
Transient signal type exceedance in red with following pictogram:
Continuous signal type exceedance in blue with following pictogram:
Same colours apply for couples of values displayed:
Continuous signal indicated with a blue circle
Transient signal indicated with a red cross

6.6.3.6 DIN 4150-2



KBF

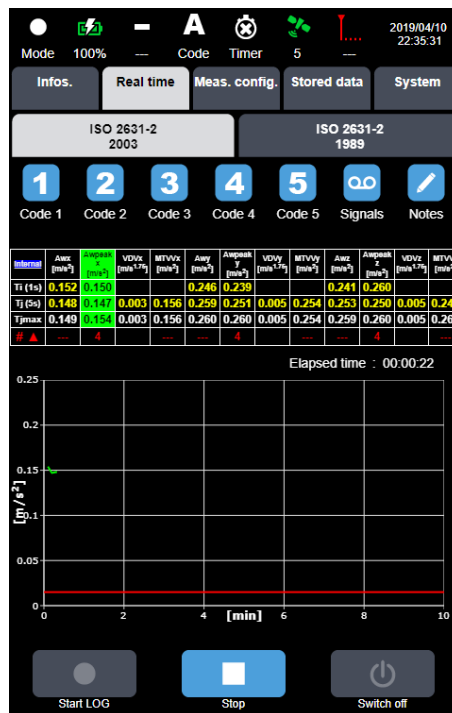
KBFTm



KBFTr

When KBF is selected, the tolerance curve in red is displayed together with the time history

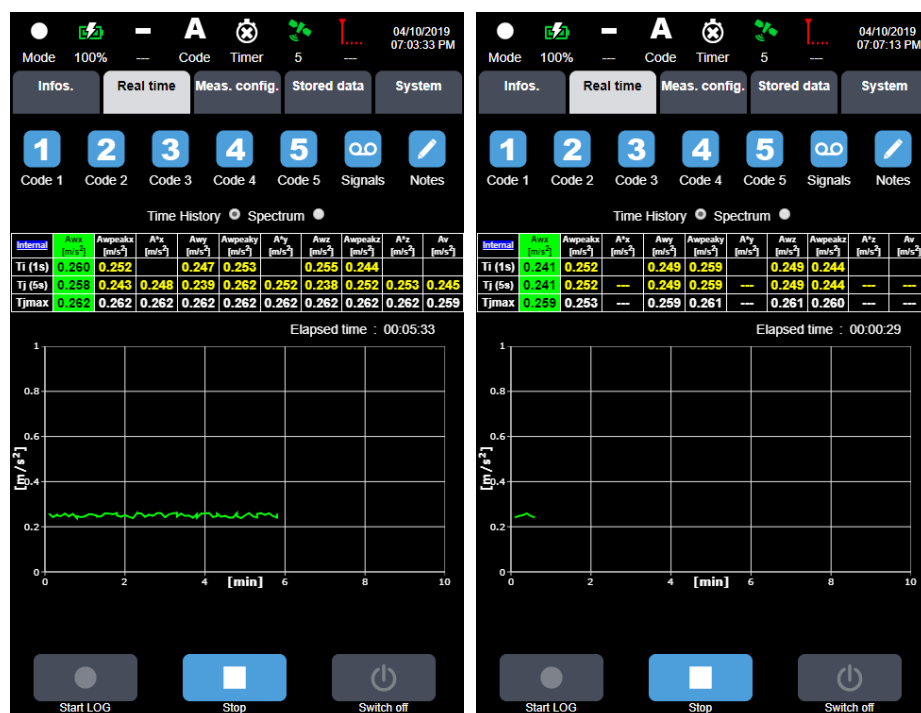
6.6.3.7 ISO 2631-2 2003



In this mode the trigger level appears on the displayed data type, if programmed in the Store tab.

6.6.3.8 ISO 2631-2 1989

6.6.3.8.1 Time history mode



The active data types are displayed. If a data type is not activated (as for instance A* or Av), then the table remains with “--”

6.6.3.8.2 Spectrum mode



In case of automatic detection of signal type, the colour of the spectrum depends on the type of signal (blue for continuous, red for transient, similar to the colours of the base curves).

6.6.3.9 BS 6472-1

6.6.3.9.1 VDV/Lp mode



VDV and Lp can be displayed for each axis

6.6.3.9.2 Graph scaling

For better readability, scaling is fixed and related to the tolerance curves applied: the ordinate max value is calculated as follows:

- For VDV: smallest value among (50 ; 25 ; 10 ; 5 ; 2.5 ; 1 ; 0.5 m/s^{1.75}) above: $2.3 \times [\text{max value of the trigger values corresponding to the displayed periods}]$
- For Lp: smallest value from (140 ; 105 ; 70 dB) above: $2.3 \times [\text{max value of the trigger values corresponding to the displayed periods}]$.

6.7 STORED DATA MENU

6.7.1 Main page

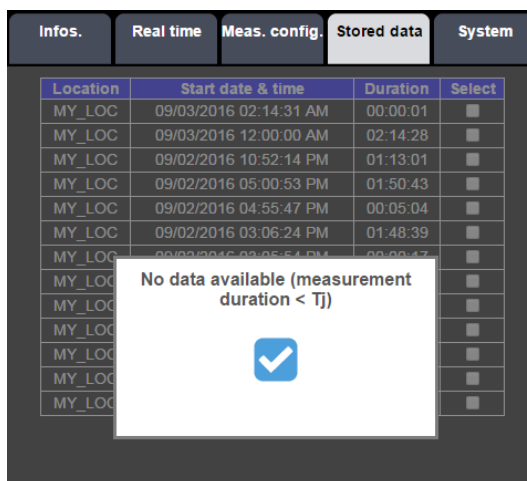
The main page of the Stored data tab is shown below:

Location	Start date & time	Duration	Select
MY_LOC	09/02/2016 05:00:53 PM	01:50:43	<input type="checkbox"/>
MY_LOC	09/02/2016 04:55:47 PM	00:05:04	<input type="checkbox"/>
MY_LOC	09/02/2016 03:06:24 PM	01:48:39	<input type="checkbox"/>
MY_LOC	09/02/2016 03:05:54 PM	00:00:17	<input type="checkbox"/>
MY_LOC	09/02/2016 02:20:12 PM	00:00:04	<input type="checkbox"/>
MY_LOC	08/31/2016 07:43:45 PM	00:05:49	<input type="checkbox"/>
MY_LOC	08/29/2016 03:52:31 PM	02:46:41	<input type="checkbox"/>
MY_LOC	08/29/2016 03:51:56 PM	00:00:25	<input type="checkbox"/>
MY_LOC	08/29/2016 03:48:36 PM	00:03:19	<input type="checkbox"/>
MY_LOC	08/29/2016 03:48:15 PM	00:00:10	<input type="checkbox"/>

Unselect all Select all Delete

The Stored data tab includes 2 zones:

- List zone lists all measurement sessions. For each session, the following information is displayed: name of site, starting date and time, duration, possibility to select for the user.
- Commands zone is used to manage measurement sessions: quick select/unselect, with dedicated keys to select all or unselect all. It also allows deleting selected measurement session(s).
- If a measurement session is with a duration $< T_j$, then no data is available, and a popup window shows:

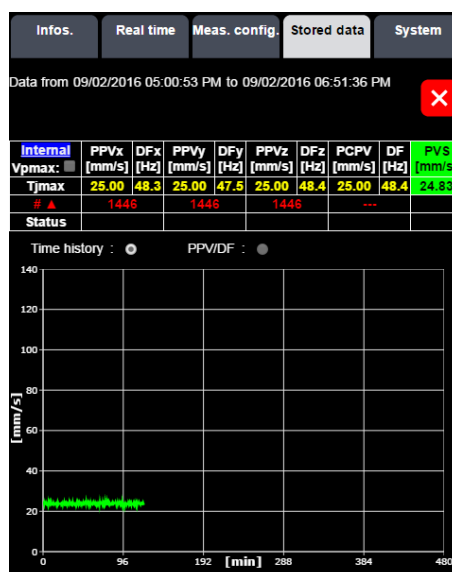


6.7.2 Selection of a measurement session for the display of data values

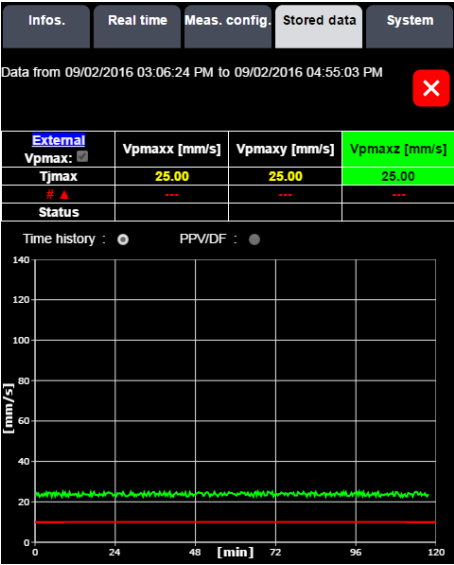
To view a measurement session, the operator must select the corresponding line in the list of measurements by clicking on one of the lines to open the interface showing the stored data:

Location	Start date & time	Duration	Select
MY_LOC	09/02/2016 05:00:53 PM	01:50:43	<input type="checkbox"/>
MY_LOC	09/02/2016 04:55:47 PM	00:05:04	<input type="checkbox"/>
MY_LOC	09/02/2016 03:06:24 PM	01:48:39	<input type="checkbox"/>
MY_LOC	09/02/2016 03:05:54 PM	00:00:17	<input type="checkbox"/>
MY_LOC	09/02/2016 02:20:12 PM	00:00:04	<input type="checkbox"/>
MY_LOC	08/31/2016 07:43:45 PM	00:05:49	<input type="checkbox"/>
MY_LOC	08/29/2016 03:52:31 PM	02:46:41	<input type="checkbox"/>
MY_LOC	08/29/2016 03:51:56 PM	00:00:25	<input type="checkbox"/>
MY_LOC	08/29/2016 03:48:36 PM	00:03:19	<input type="checkbox"/>
MY_LOC	08/29/2016 03:48:15 PM	00:00:10	<input type="checkbox"/>

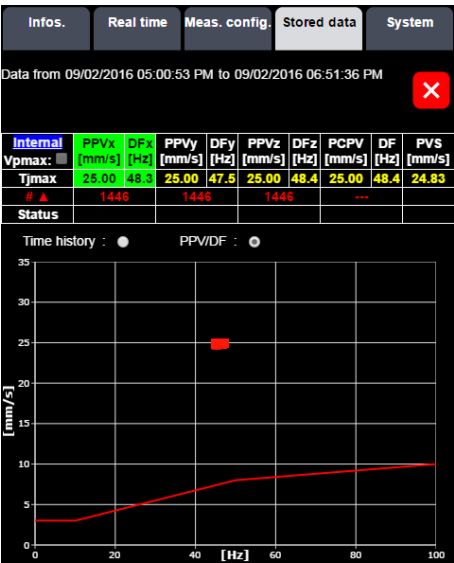
Hyperlink



Default view is PVSj time history except if “Arrêté” only selected (in that case, Vpmaxjk as well as the tolerance value in red are shown):



As for real time display, if the standard is compatible (all except “Arrêté”) the user can select the different data view with couples of data PPVjk/DFjk and PCPVj/DFj using the selection inside the table:



Note: Quality status displayed by axis, by sensor. Short circuit / open circuit (?), Overload (^), under load (only displayed if active during any the measurement time) (v)

6.8 SYSTEM MENU

6.8.1 General tab

- **Date & time:** allows for manual input of date and time parameters.
- **Time zone:** allows selecting the relevant time zone.
- **Automatic daylight savings:** allows for automatic considering of Summer time/Winter time.
- **Auto. GPS time synchronisation:** allows for automatic synchronisation of the clock with the GPS clock. This option is operational if at least four GPS satellites are detected.
- **Auto NTP time synchronisation:** (default selection) allows for automatic synchronisation of the clock on the instrument using NTP (Network Time Protocol). The NTP clock synchronization can only be enabled if GPS clock synchronisation is disabled. It is operational if the instrument is connected to the Internet.

Note: automatic clock synchronisation, by GPS or NTP, does not occur during measurement. If a clock offset is detected during a measurement, it is corrected at the end of the measurement. For continuous measurements, the clock can be corrected at midnight, as measurements are systematically closed and restarted at midnight.

For example, if the clock is found to be 2 minutes slow during a measurement, the measurement will be stopped at 23:58 (actually midnight). A new measurement will immediately be started. The clock correction will be recorded in the event log.

If the clock is found to be 2 minutes fast during a measurement, the measurement will be stopped at 00:02 (actually midnight). A new measurement will immediately be started. The clock correction will be recorded in the event log. When processing the measurements using dBTrait, there will be overlapping data for the period from 0:00 to 0:02. dBTrait software includes an automatic function to handle this overlap, whereby the measurements from 0:00 to 0:02 corresponding to the clock reset are automatically retained.

- **Priority to synchronization:** allows resynchronization to be authorized during measurement; the campaign is closed and then restarted at the new time (only if GPS enabled).
- **NTP server:** used to define the NTP server; default: time.windows.com

- **Language:** possible selection among the list.
- **Metric units (μm ; mm/s; g):** (default) displacement in μm ; velocity in mm/sec; acceleration in m/s^2 (Resolution 3 significant digits)
- **Imperial units (mils; inch/s; g):** displacement in inch; velocity in inch/sec; acceleration in inch/s^2 (Resolution 3 significant digits)
- **Max. deviation for position [m]:** this is used for an alert if the instrument is moved unexpectedly. The function defines the maximum movement (in metres) allowed before an alert is issued. The unit's movement is calculated from the GPS coordinates stored in the current measurement and the current GPS coordinates. If there are fewer than four GPS satellites visible, this trigger is automatically disabled. Set this value to 0 to disable this function (default).
- **Tel. number for SMS alarm:** used to define a telephone number to which a text message is sent if the instrument is moved unexpectedly. This function requires the unit to have a SIM card installed and correctly configured for sending SMS text messages.
- **Data format storage type:** choice between CMG or CMG & .CSV. If storage in CSV is activated, the .CSV file created will contain information relating to the quantities measured at Tj.

6.8.2 Network tab

6.8.2.1 Ethernet sub-menu

Infos.	Real time	Meas. config.	Stored data	System
General	Network	Power manag.	Transducers	Misc.
Ethernet	Wi-Fi	GSM	Server	Client

DHCP : ☐

 IP address :

 Subnet mask :

 Default gateway :

 DNS :

The following parameters can be configured by the user:

- **DHCP:** this option enables the IP address to be configured automatically when it is connected to a network that has a DHCP server (e.g. a corporate network). Once DHCP field is selected, a private IP address and related subnet mask are automatically assigned.
- **IP address:** Ethernet IP address
- **Subnet mask**
- **Default gateway**
- **DNS**

6.8.2.2 Wi-Fi sub-menu

ORION has the possibility to be setup either as a WAP (Wireless Access Point) or as a station (Infrastructure).

6.8.2.2.1 Access point mode

In this mode, ORION acts as a wireless router. Therefore, to connect to ORION,

1. select in the list of wireless networks the SSID corresponding to ORION (default is ORION_[S/N])
2. type in your web browser the IP address of the instrument (default 192.168.1.1). the instrument will be directly connected to your device and displays the web interface

Note: when using a Smartphone with Android OS, in that mode, once you have selected ORION SSID, you will be disconnected from the Internet.

The following parameters can be configured by the user:

- **SSID name:** Name of the Wi-Fi network created by ORION.
- **Authentication:** choice between WEP, WPA_PSK, WPA2_PSK or inactive
- **Encryption:** active only if an authentication is activated; if WEP is selected, the encryption type is WEP; if WPA_PSK or WPA2_PSK is selected, the encryption type AES or TKIP are active
- **Encryption key:** Wi-Fi encryption key
- **DHCP:** Dynamic Host Configuration Protocol greyed out not selectable in that mode
- **Wi-Fi IP address**
- **Subnet mask**
- **Default gateway**
- **DNS:** Domain name system

6.8.2.2.2 Station mode

In this mode ORION can connect to a WAP (Wireless Access Point).

The screenshot shows the ORION configuration interface with the following settings:

- Access point :** ☐ (selected)
- Station :** ☐
- SSID name :** MY_ORION
- Authentication :** Disable
- Encryption :** Disable
- Encryption key :**
- DHCP :** ☒
- IP address :** 192.168.1.1
- Subnet mask :** 255.255.255.0
- Default gateway :**
- DNS :**

The following parameters can be configured by the user:

- **SSID name:** Name of the Wi-Fi Access point to which the instrument connects to.
- **Authentication:** choice between WEP, WPA_PSK, WPA2_PSK or inactive.
- **Encryption:** active only if an authentication is activated; if WEP is selected, the encryption type is WEP; if WPA_PSK or WPA2_PSK is selected, the encryption type AES or TKIP are active.
- **Encryption key:** Wi-Fi encryption key.
- **DHCP:** Dynamic Host Configuration Protocol; this option enables the IP address to be configured automatically when it is connected to a network that has a DHCP server (e.g. a corporate network). Once DHCP field is selected, a private IP address and related subnet mask are automatically assigned.
- **Wi-Fi IP address.**
- **Subnet mask.**
- **Default gateway.**
- **DNS:** Domain name system.

6.8.2.3 GSM sub-menu

Infos.	Real time	Meas. config.	Stored data	System
General	Network	Power manag.	Transducers	Misc.
Ethernet	Wi-Fi	GSM	Server	Client

SIM pin code :	<input type="text"/>
Access Point Name (APN) :	<input type="text"/>
SIM user name :	<input type="text"/>
SIM password :	<input type="text"/>
DNS provider :	<input type="text" value="DtDNS.com"/>
DNS host name :	<input type="text"/>
DNS login :	<input type="text"/>
DNS account password :	<input type="text"/>
Priority to GSM network for Internet connection :	<input checked="" type="checkbox"/>

The following parameters can be configured by the user:

- SIM PIN code.
- Access point name (APN).
- SIM user name: required by some operators in some countries.
- SIM password: required by some operators in some countries.
- DNS provider: DtDNS or DynDNS.
- DNS host name: host name of the DNS.
- DNS login: active only if DynDNS is selected.
- DNS account password: active only if DynDNS is selected.
- Priority to GSM network for Internet connection: in scenarios where two modes of communication to the Internet are active at the same time (via Ethernet / ADSL and 3G network), this option allows you to prioritize one of two modes. If preferred mode selected is defective, the other mode is automatically activated.

6.8.2.4 Server sub-menu

Server sub menu sets up the parameters to be used for connection to access stored data in the SD card using an FTP client

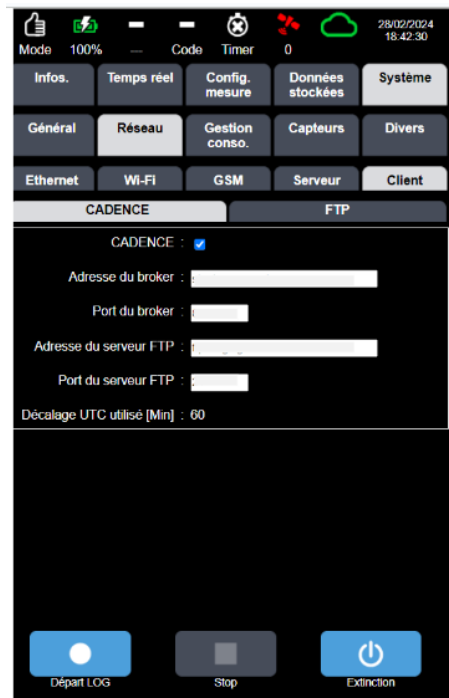
Infos.	Real time	Meas. config.	Stored data	System
General	Network	Power manag.	Transducers	Misc.
Ethernet	Wi-Fi	GSM	Server	Client

HTTP listen port :	<input type="text" value="80"/>
FTP listen port :	<input type="text" value="21"/>
FTP login :	<input type="text" value="01db"/>
FTP password :	<input type="text" value="...."/>

The following parameters can be configured by the user:

- HTTP listen port.
- FTP listen port.
- FTP login: for file transfer.
- FTP password: for file transfer.

6.8.2.5 Client sub-menu



6.8.2.5.1 Cadence

On this screen, users choose to associate their device with Cadence.

They must also enter the broker's address:

cadence.acoem.com

The broker port: **8883**

The FTP server address **ftp.cadence.acoem.com**

The FTP server port: **21**

The cadence box must be ticked and click on the validation button once done.

These parameters are set by default.

Once these settings have been made, and if your device is authorised to connect to Cadence, the cloud will appear in the status bar and will be green if everything is working. It will remain red if there are typing errors, or if your device is not authorised to connect to Cadence. In this case, you can contact your Acoem representative.

Please note that connecting to Cadence monopolises the FTP 1 server, even if you have entered information. Please use FTP 2 if you want the ORION to send information to Cadence and to another server in parallel.



Client sub menu sets up the parameters and data stored in the SD card sent by ORION to an FTP server. Up to 2 different servers can receive data from the instrument by selecting server 1 and/or server 2. There is no distinction on the selected sensor(s): if internal and/or external sensor(s) is(are) selected, data from all active sensors will be sent.

6.8.2.5.2 FTP

Infos.	Real time	Meas. config.	Stored data	System
General	Network	Power manag.	Transducers	Misc.
Ethernet	Wi-Fi	GSM	Server	Client

Connection		
	Server 1 <input type="checkbox"/>	Server 2 <input type="checkbox"/>
IP		
Port	21	21
Login		
Password		
Passive mode	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Path on server	/	/

The following parameters can be configured by the user:

- **IP:** IP address of the server.
- **Port:** Port of the server.
- **Login:** login for server access.
- **Password:** password for server access.
- **Passive mode:** communication is initiated by the client; when Passive mode is selected, data transfer is done using passive mode (default).
- **Path on server:** sub-directory on the server where data will be uploaded (facultative).

6.8.2.5.3 Push on closed session

Push on closed session		
Start date	01/01/2016 MM/DD/YYYY	01/01/2016 MM/DD/YYYY
Ti values	<input type="checkbox"/>	<input type="checkbox"/>
Tj values	<input type="checkbox"/>	<input type="checkbox"/>
RAW signal(s) file(s)	<input type="checkbox"/>	<input type="checkbox"/>
Velocity signals for DF calc.	<input type="checkbox"/>	<input type="checkbox"/>
Settings	<input type="checkbox"/>	<input type="checkbox"/>

The following parameters can be configured by the user:

- **Start date:** on activation of the server, existing data on the SD card will be pushed from that date (active with Push on open session as well).
- **Ti values:** values stored at logging period Ti.
- **Tj values:** values stored at logging period Tj.
- **RAW signal(s) file(s):** raw signal(s) stored during acquisition (refer to § 6.2 Data types signals).

- **Velocity signals for DF calc.:** signals used for DF calculation (refer to § 6.2 Data types signals).

6.8.2.5.4 Push on open session

In this mode, the data are pushed in append mode while the measurement session is open.

Push on opened session		
Push data every	00:00 hh:mm	00:00 hh:mm
Push data on event	<input type="checkbox"/>	<input type="checkbox"/>
Tj values	<input type="checkbox"/>	<input type="checkbox"/>
Velocity signals for DF calc.	<input type="checkbox"/>	<input type="checkbox"/>

The following parameters can be configured by the user:

- **Push data every:** ability to push data in append mode at each period defined in this field HH: mm (default 00:00: open session push mode disabled).
- **Push data on event:** if selected, when an event occurs, the data of the event selectable below will be pushed at each and of Tj.
- **Tj values:** values stored at logging period Tj.
- **Velocity signals for DF calc.:** signals used for DF calculation (refer to § 6.2 Data types signals).

6.8.2.5.5 Push every minute

This functionality allows ORION to send every minute the most important information for State Of Health (SOH)

Push every minute		
State of health	<input type="checkbox"/>	<input type="checkbox"/>

State of Health data (in .XML format) contains the following information:

```
<StateOfHealth version="1">
  <LocalTime>x</LocalTime>
  <Model>x</Model>
  <SerialNumber>x</SerialNumber>
  <Device>x</Device>
  <TimeZone>x</TimeZone>
  <Bias>x</Bias>
  <ModeState>x</ModeState>
  <BatteryCapacity>x</BatteryCapacity>
  <BatteryState>x</BatteryState>
  <ChargerPresent>x</ChargerPresent>
  <FreeMemoryKb>x</FreeMemoryKb>
  <NbSatellites>x</NbSatellites>
  <Latitude>x</Latitude>
  <Longitude>x</Longitude>
  <GSMStrength>x</GSMStrength>
  <GSMNetwork>x</GSMNetwork>
  <GSMIP>x</GSMIP>
  <InternalSensorState>x;y;z</InternalSensorState>
```

```

<ExternalSensorState>x;y;z</ExternalSensorState>
<MicrophoneState>x</MicrophoneState>
<NewHistory>x</NewHistory>
<EventAlarm Code="x">x</EventAlarm>
<EventAlarm Code="x">x</EventAlarm>
</StateOfHealth>

```

« LocalTime » Tag: Date in local time (YYYY-MM-DDTHH:MM:SS)
 « Model » Tag: commercial name of the device
 « SerialNumber » Tag: Serial number (typically 5 numbers)
 « Device » Tag: 01dB/CMG device type (ORION=1800)
 « TimeZone » Tag: Official name of the time zone (ex: « Romance Standard Time » for Paris)
 « Bias » Tag: Time difference in minutes compared to the UTC time (bias = UTC-local)
 « ModeState » Tag: Running mode state 0: STABILIZATION, 1:READY, 2:BASIC_RMS, 3:LOGGING, 4:MASS_STORAGE_DEVICE, 5:AUTOTEST_RUNNING, 6:FORMATTING
 « BatteryCapacity » Tag: remaining battery %
 « BatteryState » Tag: 0: BATTERY_LOW, 1: BATTERY_GOOD
 « ChargerPresent » Tag: 1 if present, else 0
 « FreeMemoryKb » Tag: remaining SD memory in ko
 « NbSatellites » Tag: Number of viewed satellites
 « Latitude » Tag: Latitude in decimal value
 « Longitude » Tag: Longitude in decimal value
 « GSMStrength » Tag: GSM power level 0 to 4 bars
 « GSMNetwork » Tag: GSM network registered 0=none, 1=GPRS, 2=EDGE, 3=3G, 4=3G+
 « GSMIP » Tag: GSM PI adress
 Tags « InternalSensorState », « ExternalSensorState », « MicrophoneState »: Status of the sensor channels 0=not used, 1=no default, 2=short-circuit, 3= open circuit
 « NewHistory » Tag: 1 if events are available in eventhistory.xml (cf GetEventHistory.asp), else 0
 « EventAlarm » Tag: Status of the dBSurv alarms (useful for its initialization) : 0=inactive 1 active, « Code » being the alarm reference number. Up to 9 tags like this can be obtained (5 user events and 4 standard events)

Remark: if no log, then Return <StateOfHealth version="1"/>

Example:

```

<Status version="1">
  <LocalTime>2015-01-01T12:00:00</LocalTime>
  <Model>ORION</Model>
  <SerialNumber>10002</SerialNumber>
  <Device>1800</Device>
  <TimeZone>Romance Standard Time</TimeZone>
  <Bias>60</Bias>
  <ModeState>1</ModeState>
  <BatteryCapacity>73</BatteryCapacity>
  <BatteryState>0</BatteryState>
  <ChargerPresent>1</ChargerPresent>

```

```

<FreeMemoryKb>520000</FreeMemoryKb>
<NbSatellites>6</NbSatellites>
<Latitude>45.76</Latitude>
<Longitude>4.84</Longitude>
<GSMStrength>3</GSMStrength>
<GSMNetwork>3</GSMNetwork>
<GSMIP>90.52.36.21</GSMIP>
<InternalSensorState>1;1</InternalSensorState>
<ExternalSensorState>0;0</ExternalSensorState>
<MicrophoneState>0</MicrophoneState>
<NewHistory>0</NewHistory>
<EventAlarm Code="1">0</EventAlarm>
<EventAlarm Code="2">1</EventAlarm>
</Status>

```

6.8.3 Power manag. tab

In order to increase the operating lifetime of the instrument, the user can activate/deactivate elements that are not required for the measurement, such as Wi-Fi and GSM modules.

Infos.	Real time	Meas. config.	Stored data	System
General	Network	Power manag.	Transducers	Misc.
Stand-by Wi-Fi after : 01:00 <input type="checkbox"/> Never <small>hh:mm</small> Stand-by GSM modem after : 01:00 <input type="checkbox"/> Never <small>hh:mm</small> Telephone # for SMS alarm on battery low : <input type="text"/> Battery level [%] for SMS alarm : 10				

The following parameters can be configured by the user:

- **Stand-by Wi-Fi after:** allows managing the shutdown of the Wi-Fi module after an inactive period. Turning this module on again is done either by pressing the Wi-Fi key or by sending an SMS (with string "IP") to the GSM modem.
- **Stand-by GSM modem after:** allows the GSM modem connection to be in stan-by mode after an inactive period, which frees the line and reduces power consumption. The modem is waked up by sending an SMS. It answers the SMS with an SMS containing its IP address, its http port, its serial number and the name of the location directory where the current measurements are stored once connected to the network.
- **Telephone # for SMS alarm on battery low:** used to define a telephone number to which the instrument will send an SMS when the remaining battery charge is equal or less than the battery % setup by the user. This function requires the unit to have a SIM card installed and correctly configured for sending SMS text messages.
- **Battery level [%] for SMS alarm:** sets up the trigger level for battery charge under which an SMS will be sent (default 10%, can be changed between 6 % and 80 %).

6.8.4 Transducers tab

The transducers tab allows to setup all characteristics of the sensors used. The instrument is delivered with an internal accelerometer whose characteristics are entered during the production process.

Infos.	Real time	Meas. config.	Stored data	System
General	Network	Power manag.	Transducers	Misc.

Integrated accelerometer :

Sensitivity X axis [mV/g] : 500

Sensitivity Y axis [mV/g] : 500

Sensitivity Z axis [mV/g] : 500

Instrument orientation : Horizontal

Serial# : 000000

External velocimeter :

Sensitivity X axis [V/m/s] : 30

Sensitivity Y axis [V/m/s] : 30

Sensitivity Z axis [V/m/s] : 30

Full scale X axis [mm/s] : 250

Full scale Y axis [mm/s] : 250

Full scale Z axis [mm/s] : 250

Serial# : 000000

External accelerometer :

Sensitivity X axis [mV/g] : 1000

Sensitivity Y axis [mV/g] : 1000

Sensitivity Z axis [mV/g] : 1000

Full scale X axis [g] : 5

Full scale Y axis [g] : 5

Full scale Z axis [g] : 5

In situ vertical axis : Z sensor

Serial# : 000000

Blast microphone :

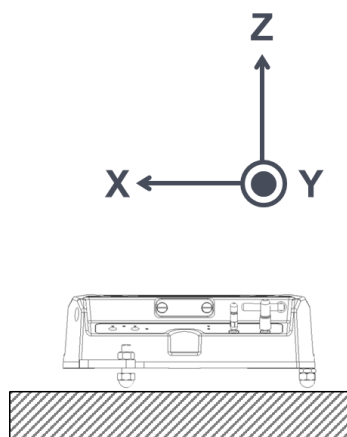
Sensitivity [mV/Pa] : 10

Full scale [dB] : 150

Serial# : 000000

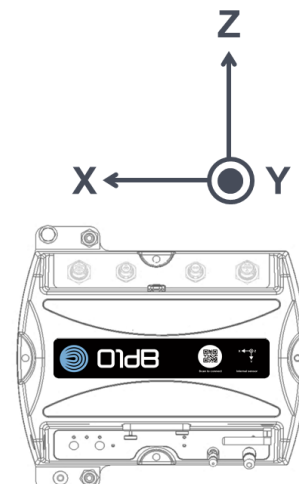
6.8.4.1 Integrated accelerometer:

- **Sensitivity X, Y and Z axis [mV/g]**. it is possible to manually edit the sensitivities entered during the production process for a later adjustment after new calibration
- **Instrument orientation**: allows to setup the instrument so that the vertical axis for analysis will always be Z axis.



Placed on the floor

Note: Serial# is greyed out



mounted on a wall

6.8.4.2 External velocimeter

- **Sensitivity X, Y and Z axis [V/m/s]**: it is possible to manually edit the sensitivities corresponding to the calibration chart provided with the transducer.
- **Full scale X, Y and Z axis [mm/s]**: the full scale of the input channel is 7.78 V. the user can adjust with precision the full dynamic with exact indication of overload by entering manually the result of the formula: $7.78 / \text{sensitivity [V/m/s]} * 1000$. If the full dynamic of the sensor is less than 7.78 V, then the value to use is the one from the sensor.
- **Serial#**: enter the serial# of the sensor used.

Note: for a velocimeter, due to its design, it is not possible to modify its orientation. This is the reason why the Z axis cannot be user defined.

6.8.4.3 External accelerometer

- **Sensitivity X, Y and Z axis [mV/g]**: it is possible to manually edit the sensitivities corresponding to the calibration chart provided with the transducer.
- **Full scale X, Y and Z axis [g]**: the full scale of the input channel is 7.78 V. the user can adjust with precision the full dynamic with exact indication of overload by entering manually the result of the formula: $7.78 / \text{sensitivity [V/g]}$. If the full dynamic of the sensor is less than 7.78 V, then the value to use is the one from the sensor.
- **In-situ vertical axis**: allows to setup the sensor so that the vertical axis for analysis will always be Z axis.
- **Serial#**: enter the serial# of the sensor used.

6.8.4.4 Blast microphone (for further Blast application, under implementation)

- **Sensitivity [mV/Pa]**: between 0.0145 and 15 mV/Pa.
- **Full scale [dB]**: adjust this value according to the microphone used.
- **Serial#**: enter the serial# of the sensor used.

6.8.5 Misc. tab

The screenshot shows the 'Misc.' tab interface. At the top, there is a navigation bar with tabs: 'Infos.', 'Real time', 'Meas. config.', 'Stored data', and 'System'. Below this, a secondary navigation bar has 'General', 'Network', 'Power manag.', 'Transducers', and 'Misc.'. The 'Misc.' tab is active. The main content area includes three input fields for 'Old password', 'New password', and 'Confirm new password'. Below these are five icons with labels: 'Auto-test', 'Update FW', 'Format SD', 'Export config', and 'Import config'. There are two checkboxes: 'Lock keyboard' and 'Automatic start logging at power on'. At the bottom, there is a 'License code' field.

In this screen the user can manage finer functionalities of the system, such as:

- Change of password
- Check of the system components
- Update of firmware
- Formatting of the SD card
- Export and import of measurement and setup configurations (excepted Ethernet/Fi-Fi/GSM network configuration)
- Lock keyboard
- Automatically start a measurement logging when the unit is powered up
- Management of license

Password management:

- **Old password:** to change the password, one must first enter the current password. *When the instrument is initialised, no password is set.* The user can choose to use the password functionality or not.
- **New password:** allows entering the new password.
- **Confirm new password:** allows for confirmation of the new password.

Auto test: performs an automatic test of the instrument's functions when pressing



:

Infos.	Real time	Meas. config.	Stored data	System																										
General	Network	Power manag.	Transducers	Misc.																										
<table><tr><th>Test</th><th>Result</th></tr><tr><td>RAM</td><td>OK</td></tr><tr><td>Internal memory</td><td>OK</td></tr><tr><td>Power supply</td><td>OK</td></tr><tr><td>Power</td><td>OK</td></tr><tr><td>Ethernet</td><td>OK</td></tr><tr><td>Wi-Fi module</td><td>OK</td></tr><tr><td>GSM module</td><td>OK</td></tr><tr><td>GPS</td><td>OK</td></tr><tr><td>Internal channels</td><td>OK</td></tr><tr><td>External vibration channels</td><td>OK</td></tr><tr><td>External pressure channel</td><td>OK</td></tr><tr><td>SDCARD</td><td>OK</td></tr></table>					Test	Result	RAM	OK	Internal memory	OK	Power supply	OK	Power	OK	Ethernet	OK	Wi-Fi module	OK	GSM module	OK	GPS	OK	Internal channels	OK	External vibration channels	OK	External pressure channel	OK	SDCARD	OK
Test	Result																													
RAM	OK																													
Internal memory	OK																													
Power supply	OK																													
Power	OK																													
Ethernet	OK																													
Wi-Fi module	OK																													
GSM module	OK																													
GPS	OK																													
Internal channels	OK																													
External vibration channels	OK																													
External pressure channel	OK																													
SDCARD	OK																													

If one at least of the test is not ok, please contact your representative.

Update FW: allows to update the firmware with an updated version. The.czip file provided by 01dB must be copied at the root of the SD card.

	Current version	Version to install
Application FW	1.00	1.01
<div> </div>		
<div> Cancel Update </div>		

Note: the update button appears ONLY if the instrument is powered using a charger.

Note: in case of corrupted file during upload, the Update button will not appear (there is a test in FW .czip file integrity). It is therefore necessary to delete the uploaded .czip file and upload it again.

CHAPTER 7

COMMUNICATION AND CONNECTIONS

7.1 COMMUNICATION USING A WI-FI TYPE NETWORK

7.1.1 *General*

Wi-Fi (short for Wireless Fidelity) is a set of wireless communication protocols meeting the standards of group IEEE 802.11 (ISO/CEI 8802-11). A Wi-Fi network allows connecting wirelessly several computers. Using Wi-Fi, a broad-band wireless local network can be created over a range of several dozen meters indoors. In an open environment, the range can reach several dozen metres. The wireless communication indicator (blue LED) on the unit flashes during communication.

7.1.2 *Wireless Access Point (WAP) connection mode*

With the instrument setup in access point mode, it is possible to connect to the instrument wireless using the SSID that it generates and its IP address, as if you were connecting to an ADSL router for setting it in admin mode. This mode is used to connect ORION to various Apple products (iPhone, iPad).

7.1.3 *“Station” connection mode*

Infrastructure mode is an operating mode that allows connecting computers equipped with a Wi-Fi card through one or several Wireless Access points (WAP). With the instrument setup in “station” mode, it is possible to connect to an existing WAP using the SSID generated by the WAP. This mode is used for connecting ORION with Android devices and private wireless network.

7.2 COMMUNICATION USING A 3G-TYPE NETWORK

7.2.1 *General*

In 3G wireless communication mode, the strength of the communication signal with the instrument is indicated on the status bar of the web interface.

The third generation (3G) refers to a standard relative to mobile phone technology. Accessible to the general public, it relies on the Universal Mobile Telecommunications System (UMTS) standard that allows for much faster baud rates (2Mbps expected when the network is mature) than with the previous generation (GSM).

3G communication with the instrument makes it directly available from the internet (via the World Wide Web). To benefit from this feature, you must insert within the

instrument a SIM card having the option “public IP address”. The instrument becomes then accessible on the Internet. Be aware that the use of a public IP address often comes along with using the adequate APN (Access Point Name).

APN (Access Point Name): this is the identifier related to the internet connection hub (this parameter is specific to the use of internet with a mobile phone).

DNS (Domain Name System): this service allows establishing the link between an IP address and a domain name.

Good to know

Depending on countries and service providers, you may find different options, specific points or limitations in using 3G communications.

Some examples are listed below. Please contact your service provider for more information.

- APN: many APN may be used in some cases:
 - an APN code dedicated to surfing on the internet (local IP address)
 - an APN code dedicated to make the instrument accessible through the internet using a public IP address

This choice may depend on the options of your internet service package.

 - Examples of public IP addresses:
 - 80.xxx.xxx.xxx or 90.xxx.xxx.xxx
 - Examples of private IP addresses:
 - 10.xxx.xxx.xxx
- Using the public IP option, the choice may be offered among several transfer rates, as a function of the options within your internet service package.
- Fixed or dynamic public IP: most often your public IP address will be a dynamic one, i.e. it will change after each access to the 3G modem within the instrument, or on a periodic basis. In some cases, your internet provider may propose a fixed public IP address, linked with your SIM card. This address remains unchanged.
- Port number. Limitations may exist on port numbers.
Please contact your service provider for more information on this topic.

Specific case: the instrument might return a private IP address although the inserted SIM card has been delivered with the public IP option.

Please contact your service provider in order to get the correct public IP identifier linked to the provided SIM card

Connection examples

- with limitation on port number: (example: with Orange France, port number above 1024 are authorized)
 - 90.94.104.189 :1050
- without limitation on port number:
 - 93.93.238.197

Note: The required subscription must include the Data and public IP address option.

Note: In most cases, the operators do not provide fixed IP addresses. The user must then use a dynamic DNS server of DTDNS type or equivalent. Then, in order to know the IP address of the instrument, the user can send it an SMS (with or without text); the instrument will then reply by sending another SMS containing its IP address, its http port, its serial number and the name of the folder where measurement sessions are stored.

Note: in some countries, France for instance with Orange provider, in order to set up a 3G connection, the following ports must be opened:

- HTTP listening port: >1023
- FTP listening port: >1023

Thus, the address to enter in the navigator must be: `http://XXX.XXX.XXX.XXX :1050` for instance.

Note: in case of instable connection, e.g. due to poor network coverage, sending an SMS with the string “REBOOT” allows restarting the device and so initiating a new connection. The instrument responds with an SMS giving its serial number, the directory of current sessions and a new IP address. If the instrument is in measurement mode (LOG mode), the “REBOOT” action stops the measurement, stores the corresponding data on the SD card, sets the instrument off and then restarts the instrument which will automatically open a new measurement session.

Note: in case of bad connection due to poor GSM network coverage, the modem of the instrument will try automatically to reconnect to the network. If it fails (error “can’t register network in the system log of the instrument”), the instrument will try again during 15 minutes. After 15 minutes, the modem will stop (modem power off) during 45 minutes. During this period, the instrument will not manage any SMS. Each hour, the modem will try again during 15 minutes following of 45 minutes break (if the standby GSM modem option is “Never”).

Note: The instrument can generate a large quantity of measured data. When a 3G connection is used to upload data, 01dB recommends checking with the provider if the size of the files to upload is in line with the subscription. 01dB cannot be responsible for any excessive billing.

7.2.2 *Setting up 3G communication*

The connection between the instrument and the web interface through 3G is set up simply by knowing the IP address of the instrument connected to the network.

To know this IP address, generally a non-fixed address, send an SMS (with string “IP”) so that the instrument sends a reply with its current IP address

7.3 WIRELESS COMMUNICATION AND POWER MANAGEMENT

The management of wireless communication on the instrument allows optimising power consumption through relevant switch to standby mode and efficient “wake up” procedure.

Note: In case of a combined use of basic Wi-Fi or 3G connections, the user is advised to select the protocol to use depending on the service quality.

The quantity and types of transferred data can be selected, for instance:

- Use of web interface and any file transfer with direct connection through a cable (LAN).
- Use of web interface and file transfer on 3G-type protocol. In this case, precautions are required regarding the quantity of data transferred and the values of the ftp and http ports.
- Use of web interface on short-distance broad-band protocol, of Wi-Fi type.

7.4 COMMUNICATION USING AN ETHERNET (LAN) TYPE NETWORK

7.4.1 General

The Ethernet complies with an international standard: ISO/IEC 8802-3

The connection of the instrument to the Ethernet is achieved through its fixed IP address.

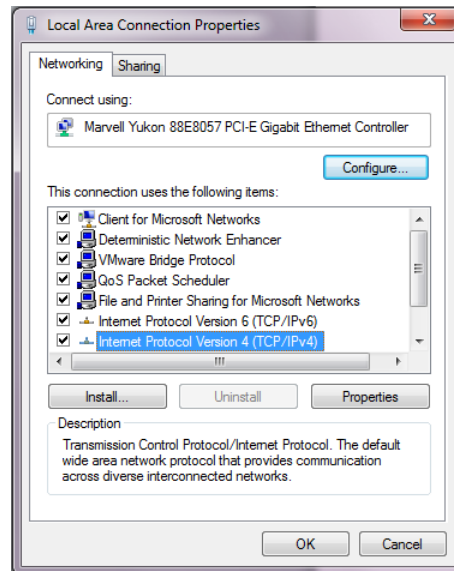
The address to enter in the navigator is: <http://XXX.XXX.XXX.XXX> with XXX.XXX.XXX.XXX the IP address declared in the Network system configuration menu, if the http port is 80 (by default) or <http://XXX.XXX.XXX.XXX:YYYY> if a listening port is declared: with YYYY the HTTP listening port if different from 80.

Note: If the DHCP option is enabled, the instrument’s address is displayed on the web interface information page and in the unit’s information menu.

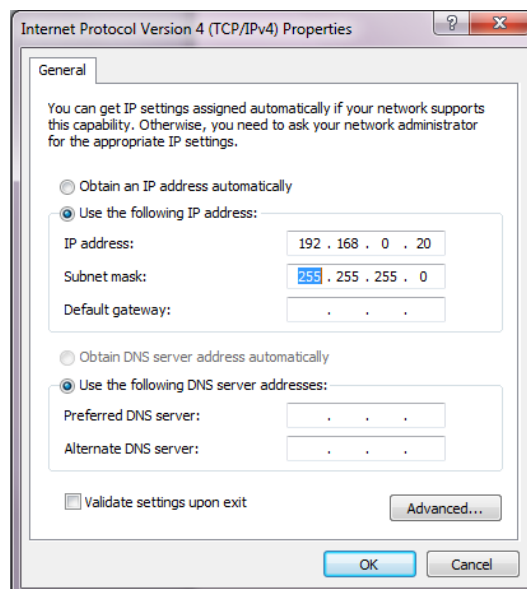
7.4.2 Setting up Ethernet network communication

Configure the connection to the local network with a fixed IP address:

For instance, for Windows 7, open the “Local network connection properties” window:



Select Internet Protocol (TCP/IP) and click on Properties:



Enter the following values:

- Select Use a fixed IP address
- IP address: 192.168.0.X with X ranging from 1 to 255 and different of the instrument value (which must be 192.168.0.Y, with Y from 1 to 255, different of X)
- Sub-network mask: 255.255.255.0

By default, the instrument is defined as follows:

- Ethernet IP address 192.168.0.1
- Wi-Fi sub-network mask: 255.255.255.0

7.5 CONNECTION VIA AN ADSL ROUTER (ETHERNET AND WI-FI)

The link between the instrument and the web interface via an ADSL router (or ADSL “box”) is set up simply by knowing the public IP address of the ADSL router to which the instrument is connected.

The router must be configured beforehand.

The example below is for a Bouygues Telecom ADSL box (Bbox):

1-Enable the DHCP service

The screenshot shows the 'Configuration du routeur' page for a Bbox router. The 'DHCP' tab is selected. A message explains that this page allows modifying DHCP parameters or deactivating the service. Below, it states 'Le service DHCP est activé' with a 'DÉSACTIVER LE SERVICE' button. Configuration fields include: 'Adresse IP du routeur' (192.168.1.254), 'Masque de sous-réseau' (255.255.255.0), 'Plage d'adresses IP' (début: 192.168.1.1, fin: 192.168.1.100), and 'Bail' (1440 minutes).

2-Assign a fixed private IP address to the instrument (here 192.168.1.42) and enter its MAC address

The screenshot shows the 'Attribution d'une adresse IP privée fixe à un ordinateur du réseau local' page. It features a table with two columns: 'IP assignée' and 'Adresse MAC ou nom de l'ordinateur'. The first row is highlighted with a red box, showing IP 192.168.1.42 and MAC 70:02:58:00:00:8e. Other rows show sequential IP addresses and MAC addresses. At the bottom, there are buttons for 'ANNULER LES MODIFICATIONS' and 'VALIDER'.

IP assignée	Adresse MAC ou nom de l'ordinateur
192.168.1.42	70:02:58:00:00:8e
192.168.1.51	70:02:58:00:00:11
192.168.1.60	70:02:58:00:00:7e
192.168.1.38	70:02:58:00:00:26

3-Create NAT/PAT rules for the instrument's HTTP and FTP ports: see the settings below

(the example uses “DUO” for the HTTP port, and “DUO_ftp” for the FTP port):

Configuration du routeur

Le service NAT/PAT vous offre la possibilité d'appliquer des règles de redirection d'adresses et de ports vers certains équipements de votre foyer. Cela peut s'avérer nécessaire pour l'utilisation de certains jeux ou applications.

Une ou plusieurs règles de NAT/PAT sont définies

Nom de la règle	Protocole	Port / Plage de ports	Port(s) source	@ IP de destination ou nom de l'ordinateur	Port(s) de destination	Toujours attribuer cette règle à cet ordinateur	
DVD	TCP	Port	1050	192.168.1.42	80	<input type="checkbox"/>	
dup_ftp	TCP	Port	1060	192.168.1.42	21	<input type="checkbox"/>	
ICS356	UDP	Port	5356	192.168.1.1	5353	<input checked="" type="checkbox"/>	

ANNULER LES MODIFICATIONS VALIDER

4-Enable the DMZ service and redirect traffic from the Internet to the instrument's IP address:

Configuration du routeur

Le service DMZ permet de rediriger tous les flux venant d'Internet vers l'un de vos équipements du foyer.

Le service DMZ est activé [DÉSACTIVER LE SERVICE](#)

Adresse IP ou nom de l'ordinateur : 192.168.1.42

ANNULER LES MODIFICATIONS VALIDER

5-Configure the Ethernet network on the instrument:

- enter the IP address configured on the router (see point 2 above; here 192.168.1.42)
- enter the router's subnet mask (see point 1 above; here 255.255.255.0)
- enter the default gateway (see router IP address in point 1 above; here 192.168.1.254)

Infos. Real time Meas. config. Stored data System

General Network Power manag. Transducers Misc.

Ethernet Wi-Fi GSM Server Client

DHCP : ☐

IP address : 192.168.1.42

Subnet mask : 255.255.255.0

Default gateway : 192.168.1.254


DNS :

6-For Wi-Fi Infrastructure communication, configure the Wi-Fi network for the instrument:

- enable Station mode
- enter the configured IP address on the router (see 2-; here 192.168.2.9)
- enter the subnetwork mask of the router (see 1-; here 255.255.255.0)
- enter the default gateway (here 192.168.2.1)

Infos.	Real time	Meas. config.	Stored data	System
General	Network	Power manag.	Transducers	Misc.
Ethernet	Wi-Fi	GSM	Server	Client

Access point : ☐

Station : ☒ 

SSID name : MY_ORION

Authentication : Disable

Encryption : Disable

Encryption key :

DHCP : ☐

IP address : 192.168.2.9

Subnet mask : 255.255.255.0

Default gateway : 192.168.2.1

DNS :

Note: This case of connection using an ADSL router is interesting since it avoids 3G subscription fees, while benefiting from ADSL and unlimited quantity of transferred data. Thus, in the case of a measurement point located at a position covered by a Wi-Fi router ADSL modem (with Administrator's rights), a instrument can be accessible at no cost from anywhere.

7.6 TRANSFER OF STORED DATA

The access to stored data is available in two ways:

- By FTP, through a LAN network connection, a 3G long-range wireless connection or a Wi-Fi short-range wireless connection.
- Through a direct USB connection using the adequate cable supplied with each instrument.
- Through extraction from the SD card and reading from an external peripheral device.

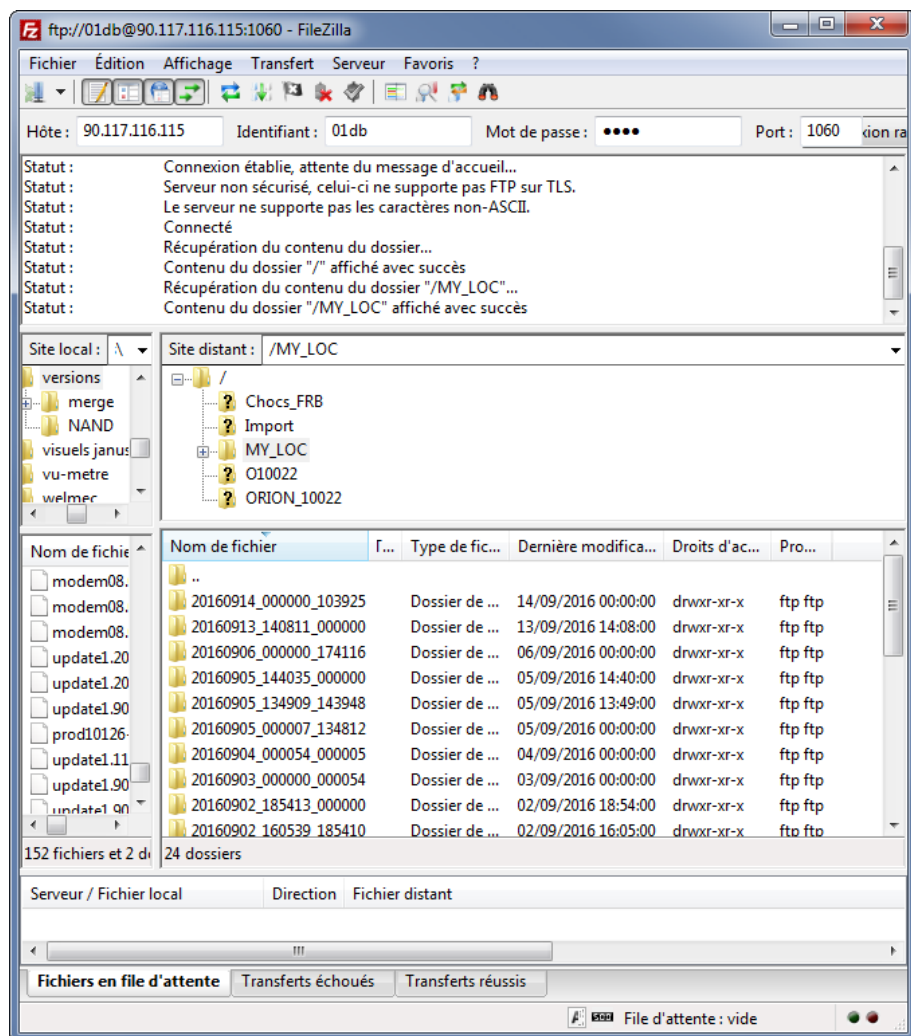
7.6.1 *FTP transfer through LAN, 3G or Wi-Fi connection*

Data transfer is achieved using Ethernet, 3G connection or Wi-Fi connection from the instrument to the network.

Some FTP client must be used (e.g. the dedicated software dBFileManager, or the generic FileZilla® software).

The files are copied from the FTP server of the instrument, to the user's computer (or a dedicated ftp site).

Signal analysis is then achieved “off-line” using dBTrait.



In the above example (FileZilla),

- the IP address is 90.117.116.115
- the user ID (FTP user) is 01db
- the password is 01db (●●●●●)
- the listening port is 1060.

Folders containing measurement files are identified by: [date]_[start time]_[end time].

Note: In order to keep the instrument's FTP server operational, it is reset every day at midnight for prevention purposes. Thus, all transfers in progress at midnight will be interrupted.

7.6.2 *USB connection and extraction of the SD card*

Connecting the instrument through USB using the supplied mini USB/USB cable allows viewing the data stored on the memory card as an external drive.

Note: No driver installation is required on the first connection.

Note: The USB connection is possible only when the instrument is in Ready mode. In SLM or LOG mode, access to storage is restricted to measurement only.

The transfer is achieved either using a cable connected between the instrument and a PC with a high baud rate, or by extracting SD card and inserting it into the corresponding drive of your PC.

In the first case, one just needs to connect the suitable transfer cable (delivered with the instrument) between the instrument and the computer and to turn the instrument on in Ready mode. The user can then copy the measurement sessions onto the PC to save them and launch dBTrait. The opening of the measurement session files is immediate within dBTrait.

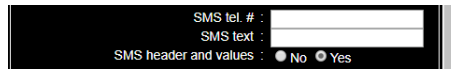
In the second case, the SD card is removed from the instrument when the instrument is off, and then inserted in the PC in the dedicated "SD card" drive (or into any relevant SD card reader device connected to your PC). Measurement sessions are stored as .CMG files in a folder that the user can copy onto the PC for storage purpose. dBTrait is then launched, from which the session files can be opened. It is highly recommended that the instrument be turned off before extracting the SD card, otherwise it might be irreversibly damaged.

7.7 SMS FUNCTIONALITIES

7.7.1 SMS events content

7.7.1.1 On event

The user can select to send systematically header and values or not when an event occurs:



SMS tel. # :
 SMS text :
 SMS header and values : ☐ No ☒ Yes

With header and values, SMS content is:

```

YYYY/MM/DD hh :mm :ss
ORION_[S/N]
[location]
[Event name if standard based] or [trigger type name if user defined]
PPVx [mm/s]:XXX/Xtolerance_continuous or transient
DFx [Hz]:
PPVy [mm/s]:YYY/ Ytolerance_continuous or transient
DFy [Hz]:
PPVz [mm/s]:ZZZ/ Ztolerance_continuous or transient
DFz [Hz]:
PCPV [mm/s]:XYZ/ XYZtolerance_continuous or transient
DF [Hz]:
PVS [mm/s]:
VDVx [mm/s1.75]: XXX
VDVy [mm/s1.75]: YYY
VDVz [mm/s1.75]: ZZZ
Lpx[dB]: XXX
Lpy[dB]: YYY
Lpz[dB]: ZZZ
KBFx: XXX
KBfy: YYY
KBfz: ZZZ
KBFTmx: XXX
KBFTmy: YYY
KBFTmz: ZZZ
KBFTrx: XXX
KBFTry: YYY
KBFTrz: ZZZ
[ SMS text ]

```

Values are sent only if they exist; for instance:

DIN4150-3 :

2017/05/26 12:55:50
 ORION_1017
 MY_LOC
 I_DIN4150-3_L1_F_S
 PPVx [mm/s]:30.2/20.0
 DFx [Hz]:8.1
 PPVy [mm/s]:10.2/20.0
 DFy [Hz]:8.1
 PPVz [mm/s]:19.2/20.0
 DFz [Hz]:8.1
 PCPV [mm/s]:30.2
 DF [Hz]:8.1
 PVS [mm/s]:30.5

Text sample

Circ :

2017/05/26 12:55:50
 ORION_1017
 MY_LOC
 I_CIRC_R_A
 PPVx [mm/s]:30.2/20.0 cont
 DFx [Hz]:8.1
 PPVy [mm/s]:10.2/20.0 cont
 DFy [Hz]:8.1
 PPVz [mm/s]:19.2/20.0 cont
 DFz [Hz]:8.1
 PCPV [mm/s]:30.2
 DF [Hz]:8.1
 PVS [mm/s]:30.5

Text sample

Arrêté :

2017/05/26 12:55:50
 ORION_1017
 MY_LOC
 I_ARR
 Vpmaxx [mm/s]:30.2/10.0
 Vpmaxy [mm/s]:10.2/10.0
 Vpmaxz [mm/s]:19.2/10.0

Text sample

User defined :

2017/05/26 12:55:50

ORION_1017

MY_LOC

User defined

InternalPPVx [mm/s]:30.2/20.0

InternalPPVy [mm/s]:10.2/20.0

InternalPPVz [mm/s]:19.2/20.0

InternalPCPV [mm/s]:30.2/20

InternalPVS [mm/s]:30.5/25

Text sample

...

7.7.1.2 Warning before in %

2017/05/26 12:55:50

identical to the effective event +

Warning before: 80 %

Text sample

7.7.2 SMS system alarms

- On low battery (default 10%) → message content: instrument serial #, location, date and time, % remaining battery
- On movement: → message content: instrument serial #, location, date and time, GPS coordinates, distance from previous location, IP address: http port (the alarm trigs if the instrument has moved more than the user defined distance)

Note: Phone numbers can be entered using the international format with codes “00” or “+”. Depending on the countries, one or the other code shall be preferred. Examples: +33 for France, +61 for Australia.

7.7.3 Automatic SMS actions:

- Sending “IP” by SMS to the instrument makes it reply by sending an SMS with the instrument serial #, location, date and time, IP:port address and automatically sends a new SMS at every new IP address in case of floating IP.

7.7.4 Actions on SMS sent to the instrument:

- On SMS sent “IP”, the instrument replies by sending an SMS with instrument serial #, location, date and time, IP:port address.
- On SMS sent “stop”, the instrument stops replying new SMS if IP has changed.
- On SMS sent “reboot”, the instrument reboots to establish a new connection and replies with an SMS with the instrument serial #, location, date and time, IP:port address.

7.8 HTTP COMMAND LINES (NO NEED FOR H OPTION)

- The instrument FTP server management (in case FTP server is disconnected):
<http://ip:port/priv/FTPserver.asp?Action=x>
 - x = 0 → stop server
 - x = 1 → start server
 - x = 2 → restart server
- Reboot the instrument through Internet:
<http://ip:port/pub/Reboot.asp>
Note: same behaviour as when a “reboot” SMS is sent
- Forced SMS (to obtain SIM card phone #):
<http://ip:port/pub/SendSMS.asp?Number=x>
x = SMS mobile #
- Stop measurement (equivalent to “Stop” button):
<http://ip:port/pub/stoplog.asp>

- Start log (equivalent to “Start Log” button):
<http://ip:port/pub/startlog.asp>
- Measurement configuration activation:
[http://ip:port/pub/activateconfiguration.asp?config=\[measurement____setup name\]](http://ip:port/pub/activateconfiguration.asp?config=[measurement____setup name])
 measurement setup name is the name of the configuration in memory to activate.
- Activate traces
<http://ip:port/priv/Trace.asp?flag=x>
 x is a bit field
 bit 1 = DEBUG_TRACE
 bit 2 = BATTERY_TRACE
 bit 3 = RAM_TRACE
 bit 4 = PUSHDATA_TRACE
 bit 5 = GSM_TRACE
 bit 6 = GPS_TRACE
 Example x=5 gives 101 (DEBUG_TRACE, RAM_TRACE)
- Retrieval of the full log (formatted):
<http://ip:port/log.asp?f=1>

7.9 HTTP COMMANDS

These commands are activated with the option “H” and allow to interface the instrument with your own web portal.

7.9.1 *GetConfiguration*

7.9.1.1 Format description

HTTP request: /pub/GetConfiguration.asp

Parameters: none

Return: values in XML format:

```
<Configuration version="1">
  <Name>x</Name>
  <TjPeriod>x</TjPeriod>
  <LimitsConfiguration version="1">
    <Limits Value="x" Standard="x" ActiveOnInternal="x" ActiveOnExternal="x" LineType="x"
BuildingType="x" DurationType="x" DetectionType="x">
      <Limit Type="x" Modified="x" ModifiedXY="x" ModifiedZ="x">
        <Frequency Value="x" InferiorXY="x" SuperiorXY="x" InferiorZ="x" SuperiorZ="x"
Inferior="x" Superior="x" />
        <Frequency Value="x" InferiorXY="x" SuperiorXY="x" InferiorZ="x" SuperiorZ="x"
Inferior="x" Superior="x" />
        <Frequency Value="x" InferiorXY="x" SuperiorXY="x" InferiorZ="x" SuperiorZ="x"
Inferior="x" Superior="x" />
```

```

    <Frequency Value="x" InferiorXY="x" SuperiorXY="x" InferiorZ="x" SuperiorZ="x"
Inferior="x" Superior="x" />
  </Limit>
</Limits>
<Limits Value="x" Standard="x" ActiveOnInternal="x" ActiveOnExternal="x">
  <Period>
    <Begin>x</Begin>
    <End>x</End>
    <Threshold>x</Threshold >
  </Period>
</Limits>
</LimitsConfiguration>
</Configuration>

```

« Name » Tag : name of the configuration

« TjPeriod » Tag : Tj value in seconds

Case building configuration

« Limits » Tag : description of the tolerance curves associated to a standard (active for one or two sensors)

« Value » attribute: type of tolerance curve (PPVj_DFj, PCPVj_DFj, Vpmaxj)

« Standard » attribute: selected standard (DIN4150-3, CIR23071986, ARR22091994, BS5228-4, BS7385-2)

« ActiveOnInternal » attribute: 1 if standard active for internal sensor, else 0

« ActiveOnExternal » attribute: 1 if standard active for external sensor, else 0

« LineType » attribute: configuration parameter for certain standards (LINE_1, LINE_2, LINE_3)

« BuildingType » attribute: configuration parameter for certain standards (FOUNDATION, HIGHEST_FLOOR, PIPE_NETWORK, CONSTRUCTION_STRONG, CONSTRUCTION_SENSIBLE, CONSTRUCTION_VERY_SENSIBLE, RESIDENTIAL_GOOD_REPAIR, RESIDENTIAL_SIGNIFICANT_DEFECT, INDUSTRIAL_LIGHT_FLEXIBLE, INDUSTRIAL_HEAVY_STIFF)

« DurationType » attribute: configuration parameter for certain standards (SHORT_TERM, LONG_TERM)

« DetectionType » attribute: configuration parameter for certain standards (AUTOMATIC, CONTINUOUS, IMPULSIVE)

« Limit » Tag: values of a tolerance curve

« Type » attribute: used only for standards with « DetectionType » (CONTINUOUS, IMPULSIVE)

« Modified » attribute : =1 if the tolerance curve, on non-separated axis (BS standards), has been modified vs. the original tolerance curve from the standard

« ModifiedXY » attribute : = 1 if the tolerance curve, on separated axis, has been modified on X or Y vs. the original tolerance curve from the standard

« ModifiedZ » attribute : = 1 if the tolerance curve, on separated axis, has been modified on Z vs. the original tolerance curve from the standard

« Frequency » Tag: points values for a given frequency

« Value » attribute: frequency in Hz

« InferiorXY » attribute: level (m/s) below or equal of the frequency for axis X and XY

« InferiorZ » attribute: level (m/s) below or equal of the frequency for axis Z

« SuperiorXY » attribute: level (m/s) above or equal of the frequency for axis X and XY
 « SuperiorZ » attribute: level (m/s) above or equal of the frequency for axis Z
 « Inferior » attribute: level (m/s) below or equal of the frequency for all axis
 « Superior » attribute: level (m/s) above or equal of the frequency for all axis
Rem: certain standards distinguish XY and Z, and others don't. The attributes are present depending on the kind of standard

Case occupants configuration

« Limits » Tag : description of the period associated to a standard (active for one or two sensors)
 « Value » attribute: type of period (VDV, Lp)
 « Standard » attribute: selected standard (BS6472-1)
 « ActiveOnInternal » attribute: 1 if standard active for internal sensor, else 0
 « ActiveOnExternal » attribute: 1 if standard active for external sensor, else 0
 « Period » Tag: Description of period
 « Begin » tag: date begin period
 « End » tag : date end period
 « Threshold » tag : level (m/s^{1.75}-VDV dB-Lp)

7.9.1.2 Example

```
<Configuration version="1">
  <Name>default2</Name>
  <TjPeriod>5</TjPeriod>
  <LimitsConfiguration version="1">
    <Limits Value="PPVj_DFj" Standard="DIN4150-3" ActiveOnInternal="1" ActiveOnExternal="0" LineType="LINE_1"
    BuildingType="FOUNDATION" DurationType="SHORT_TERM">
      <Limit ModifiedXY="0" ModifiedZ="0">
        <Frequency Value="1" InferiorXY="0.02" SuperiorXY="0.02" InferiorZ="0.02" SuperiorZ="0.02" />
        <Frequency Value="10" InferiorXY="0.02" SuperiorXY="0.02" InferiorZ="0.02" SuperiorZ="0.02" />
        <Frequency Value="50" InferiorXY="0.04" SuperiorXY="0.04" InferiorZ="0.04" SuperiorZ="0.04" />
        <Frequency Value="100" InferiorXY="0.05" SuperiorXY="0.05" InferiorZ="0.05" SuperiorZ="0.05" />
      </Limit>
    </Limits>
    <Limits Value="PPVj_DFj" Standard="CIR23071986" ActiveOnInternal="0" ActiveOnExternal="1"
    BuildingType="CONSTRUCTION_STRONG" DetectionType="AUTOMATIC">
      <Limit Type="IMPULSIVE" ModifiedXY="0" ModifiedZ="0">
        <Frequency Value="1" InferiorXY="0.008" SuperiorXY="0.008" InferiorZ="0.008" SuperiorZ="0.008" />
        <Frequency Value="10" InferiorXY="0.008" SuperiorXY="0.012" InferiorZ="0.008" SuperiorZ="0.012" />
        <Frequency Value="50" InferiorXY="0.012" SuperiorXY="0.015" InferiorZ="0.012" SuperiorZ="0.015" />
        <Frequency Value="100" InferiorXY="0.015" SuperiorXY="0.015" InferiorZ="0.015" SuperiorZ="0.015" />
      </Limit>
      <Limit Type="CONTINUOUS" ModifiedXY="0" ModifiedZ="0">
        <Frequency Value="1" InferiorXY="0.005" SuperiorXY="0.005" InferiorZ="0.005" SuperiorZ="0.005" />
        <Frequency Value="10" InferiorXY="0.005" SuperiorXY="0.006" InferiorZ="0.005" SuperiorZ="0.006" />
        <Frequency Value="50" InferiorXY="0.006" SuperiorXY="0.008" InferiorZ="0.006" SuperiorZ="0.008" />
        <Frequency Value="100" InferiorXY="0.008" SuperiorXY="0.008" InferiorZ="0.008" SuperiorZ="0.008" />
      </Limit>
    </Limits>
    <Limits Value="Vpmaxj" Standard="ARR22091994" ActiveOnInternal="0" ActiveOnExternal="1" LimitXY="2.539999E-
    02" LimitZ="2.539999E-02" ModifiedXY="0" ModifiedZ="0"/>
    <Limits Value="PCPVj_DFj" Standard="BS5228-4" ActiveOnInternal="1" ActiveOnExternal="0"
    BuildingType="RESIDENTIAL_GOOD_REPAIR" DetectionType="AUTOMATIC">
      <Limit Type="IMPULSIVE" Modified="0">
        <Frequency Value="1" Inferior="0.05" Superior="0.05" />
        <Frequency Value="4" Inferior="0.05" Superior="0.05" />
        <Frequency Value="15" Inferior="0.05" Superior="0.05" />
        <Frequency Value="40" Inferior="0.05" Superior="0.05" />
      </Limit>
```

```

<Limit Type="CONTINUOUS" Modified="0">
  <Frequency Value="1" Inferior="0.025" Superior="0.025" />
  <Frequency Value="4" Inferior="0.025" Superior="0.025" />
  <Frequency Value="15" Inferior="0.025" Superior="0.025" />
  <Frequency Value="40" Inferior="0.025" Superior="0.025" />
</Limit>
</Limits>
<Limits Value="VDV" Standard="BS6472-1" ActiveOnInternal="0" ActiveOnExternal="1">
  <Period>
    <Begin>00:00:00</Begin>
    <End>00:00:00</End>
    <Threshold>0.2</Threshold>
  </Period>
</Limits>
<Limits Value="Lp" Standard="BS6472-1" ActiveOnInternal="0" ActiveOnExternal="1">
  <Period>
    <Begin>00:00:00</Begin>
    <End>00:00:00</End>
    <Threshold>45</Threshold>
  </Period>
</Limits>
</LimitsConfiguration>
</Configuration>

```

7.9.2 GetRealTimeTjValues

7.9.2.1 Format description

HTTP request: /pub/GetBuildingsRealTimeTjValues.asp

Parameters: None

Return: values in XML format:

```

<RealTimeTjValues version="1">
  <LocalTime>x</LocalTime>
  <TjLocalTime>x</TjLocalTime>
  <Internal>
    <PPVjx_DFjx>ppv;df;type;date;kurt;over</PPVjx_DFjx>
    <PPVjy_DFjy>ppv;df;type;date;kurt;over</PPVjy_DFjy>
    <PPVjz_DFjz>ppv;df;type;date;kurt;over</PPVjz_DFjz>
    <PCPVj_DFj>pcpv;df;type,axis;date;kurt;over</PCPVj_DFj>
    <PVSj>x</PVSj>
    <Vpmaxjx>x;over</Vpmaxjx>
    <Vpmaxjy>x;over</Vpmaxjy>
    <Vpmaxjz>x;over</Vpmaxjz>
    <VDVjx>x;over</VDVjx>
    <VDVjy>x;over</VDVjy>
    <VDVjz>x;over</VDVjz>
    <VDVjkmax>x;over</VDVjkmax>
    <Lpjx>x;over</Lpjx>
    <Lpjy>x;over</Lpjy>
    <Lpjz>x;over</Lpjz>
    <Lpjkmx>x;over</Lpjkmx>
  </Internal>
  <External>
    Idem Internal
  </External>
</RealTimeTjValues>

```

« LocalTime » Tag: Date in local time (YYYY-MM-DDTHH:MM:SS)

« TjLocalTime » Tag: Date in local time (YYYY-MM-DDTHH:MM:SS) for the selected Tj (5/10/30 sec), no Tag if sensor not used or no Tj data received yet.

« Internal » Tag: Measured values on the internal sensor, no Tag if sensor not used or no Tj data received yet

« PPVjx_DFjx » Tag: PPV value on X axis. df=dominant frequency in Hz (0 if none), ppv=value in mm/s, type=0 (CONTINUOUS), 1 (IMPULSIVE). *(if no type, then 0)*, date = date in sec of ppv in the Tj, kurt = kurtosis value (-1 if none), over = 1 if over limit value

« PPVjy_DFjy » Tag: PPV value in mm/s on y axis, + idem x.

« PPVjz_DFjz » Tag: PPV value in mm/s on z axis, + idem x.

« PCPVj_DFj » Tag: PCPV value. df= dominant frequency in Hz (0 if none), pcpv=value in mm/s, axis=used axis for the PCPV (X,Y,Z), type=0 (CONTINUOUS), 1 (IMPULSIVE) *(if no type, then 0)*, date = date in sec of pcpv in the Tj, kurt = kurtosis value (-1 if none), over = 1 if over limit value

« PVSj » Tag: PVS value in mm/s

« Vpmaxjx » Tag: Vpmax value in mm/s on x axis, over = 1 if over limit value.

« Vpmaxjy » Tag: Vpmax value en mm/s on y axis, over = 1 if over limit value.

« Vpmaxjz » Tag: Vpmax value en mm/s on z axis, over = 1 if over limit value.

« VDVjx » Tag: VDV value in m/s1.75 on x axis, over = 1 if over threshold value.

« VDVjy » Tag: VDV value in m/s1.75 on y axis, over = 1 if over threshold value.

« VDVjz » Tag: VDV value in m/s1.75 on z axis, over = 1 if over threshold value.

« VDVjxmax » Tag: VDV max value in m/s1.75 on all axis, over = 1 if over threshold value on any axis.

« Lpjx » Tag: Lp value in dB on x axis, over = 1 if over threshold value.

« Lpjy » Tag: Lp value in dB on y axis, over = 1 if over threshold value.

« Lpjz » Tag: Lp value in dB on z axis, over = 1 if over threshold value.

« Lpjxmax » Tag: Lpkmax max value in dB on all axis, over = 1 if over threshold value on any axis.

Remark : if one of the quantities is not computed, its Tag is not present

« External » Tag: Measured values on the external sensor, no Tag if sensor not used or no Tj data received yet

The content is identical to the « Internal » Tag.

7.9.2.2 Example

```
<RealTimeTjValues version="1">
  <LocalTime>2016-01-01T12:00:00</LocalTime>
  <TjLocalTime>2016-01-01T12:00:00</TjLocalTime>
  <Internal>
    <PPVjx_DFjx>5.2;12.3;1;5.9;3.2;1</PPVjx_DFjx>
    <PPVjy_DFjy>4.2;12.1;1;5.9;3.2;1</PPVjy_DFjy>
    <PPVjz_DFjz>3.2;12.0;1;5.9;3.2;1</PPVjz_DFjz>
    <PCPVj_DFj>3.2;12.0;1;Z;5.9;3.2;1</PCPVj_DFj>
    <PVSj>7.7</PVSj>
    <Vpmaxjx>5.3;1</Vpmaxjx>
    <Vpmaxjy>2.1;1</Vpmaxjy>
    <Vpmaxjz>4.1;1</Vpmaxjz>
    <VDVjx>9.3;1</VDVjx>
    <VDVjy>9.1;1</VDVjy>
    <VDVjz>8.1;1</VDVjz>
    <VDVjxmax>9.3;1</VDVjxmax>
    <Lpjx>18.3;1</Lpjx>
    <Lpjy>18.1;1</Lpjy>
    <Lpjz>18.1;1</Lpjz>
    <Lpjxmax>18.3;1</Lpjxmax>
  </Internal>
  <External>
```

```

<PPVjx_DFjx>5.2;12.3;1;5.9;3.2;0</PPVjx_DFjx>
<PPVjy_DFjy>4.2;12.1;1;5.9;3.2;0</PPVjy_DFjy>
<PPVjz_DFjz>3.2;12.0;1;5.9;3.2;0</PPVjz_DFjz>
<PCPVj_DFj>3.2;12.0;1;Z;5.9;3.2;0</PCPVj_DFj>
<PVSj>7.7</PVSj>
<Vpmaxjx>5.3;0</Vpmaxjx>
<Vpmaxjy>2.1;0</Vpmaxjy>
<Vpmaxjz>4.1;0</Vpmaxjz>
<VDVjx>9.3;0</VDVjx>
<VDVjy>9.1;0</VDVjy>
<VDVjz>8.1;0</VDVjz>
<VDVjkmax>9.3;1</VDVjkmax>
<Lpjx>18.3;0</Lpjx>
<Lpjy>18.1;0</Lpjy>
<Lpjz>18.1;0</Lpjz>
<Lpjkmx>18.3;1</Lpjkmx>
</External>
</RealTimeTjValues>

```

7.9.3 GetStateOfHealth

7.9.3.1 Format description

HTTP request: /pub/GetStateOfHealth.asp (Remark: duplicated as well in GetStatus.asp)

Parameters: None

Return: values in XML format:

```

<StateOfHealth version="1">
  <LocalTime>x</LocalTime>
  <Model>x</Model>
  <SerialNumber>x</SerialNumber>
  <Device>x</Device>
  <TimeZone>x</TimeZone>
  <Bias>x</Bias>
  <ModeState>x</ModeState>
  <LicenseEndDate>x</LicenseEndDate>
  <BatteryCapacity>x</BatteryCapacity>
  <BatteryState>x</BatteryState>
  <ChargerPresent>x</ChargerPresent>
  <FreeMemoryMb>x</FreeMemoryMb>
  <StorageState>x</StorageState>
  <NbSatellites>x</NbSatellites>
  <Latitude>x</Latitude>
  <Longitude>x</Longitude>
  <GSMStrength>x</GSMStrength>
  <GSMNetwork>x</GSMNetwork>
  <GSMIP>x</GSMIP>
  <HTTPPort>x</HTTPPort>
  <HTTPPort>x</HTTPPort>
  <InternalSensorState>x;y;z</InternalSensorState>
  <ExternalSensorState>x;y;z</ExternalSensorState>
  <MicrophoneState>x</MicrophoneState>
  <NewHistory>x</NewHistory>
  <EventAlarm Code="x">x</EventAlarm>
  <EventAlarm Code="x">x</EventAlarm>

```

</StateOfHealth>

« LocalTime » Tag: Date in local time (YYYY-MM-DDTHH:MM:SS)
 « Model » Tag: commercial name of the device
 « SerialNumber » Tag: Serial number (typically 5 numbers)
 « Device » Tag: 01dB/CMG device type (ORION=1800, DUO=1100, FUSION=1500, CUBE=1600)
 « TimeZone » Tag: Official name of the time zone (ex : « Romance Standard Time » for Paris)
 « Bias » Tag: Time difference in minutes compared to the UTC time (bias = UTC-local)
 « ModeState » Tag: Running mode state 0 :STABILIZATION, 1 :READY, 2 :BASIC_RMS, 3 :LOGGING, 4 :MASS_STORAGE_DEVICE, 5 :AUTOTEST_RUNNING, 6 :FORMATTING
 « LicenseEndDate » Tag : Expiration date of the license in local time (YYYY-MM-DD). Empty if no temporary license.
 « BatteryCapacity » Tag: remaining battery %
 « BatteryState » Tag: 0 : BATTERY_LOW, 1 : BATTERY_GOOD
 « ChargerPresent » Tag: 1 if present, else 0
 « FreeMemoryMb » Tag: remaining SD memory in Mo
 « StorageState » Tag : SD card state (0=card missing, 1=bad format, 2=very low level, 3=low level, 4=good level)
 « NbSatellites » Tag: Number of viewed satellites
 « Latitude » Tag: Latitude in decimal value
 « Longitude » Tag: Longitude in decimal value
 « GSMStrength » Tag: GSM power level 0 to 4 bars
 « GSMNetwork » Tag: GSM network registered 0=none, 1=GPRS, 2=EDGE, 3=3G, 4=3G+
 « GSMIP » Tag: GSM PI adress
 « HTTPPort » Tag : HTTP port configured
 Tags « InternalSensorState », « ExternalSensorState », « MicrophoneState » : Status of the sensor channels 0=not used, 1=no default, 2= open circuit, 3= short-circuit
 « NewHistory » Tag: 1 if events are available in eventhistory.xml (cf GetEventHistory.asp), else 0
 « EventAlarm » Tag: Status of the dBSurv alarms (useful for its initialization) : 0=inactive 1 active, « Code » being the alarm reference number. Up to 9 tags like this can be obtained (5 user events and 4 standard events)

Remark: if no log, then Return <StateOfHealth version="1"/>

7.9.3.2 Example

```
<Status version="1">
  <LocalTime>2015-01-01T12:00:00</LocalTime>
  <Model>ORION</Model>
  <SerialNumber>10002</SerialNumber>
  <Device>1800</Device>
  <TimeZone>Romance Standard Time</TimeZone>
  <Bias>60</Bias>
  <ModeState>1</ModeState>
  <LicenseEndDate>2016-01-01</LicenseEndDate>
```



```

<BatteryCapacity>73</BatteryCapacity>
<BatteryState>0</BatteryState>
<ChargerPresent>1</ChargerPresent>
<FreeMemoryMb>5200</FreeMemoryMb>
<StorageState>0</StorageState>
<NbSatellites>6</NbSatellites>
<Latitude>45.76</Latitude>
<Longitude>4.84</Longitude>
<GSMStrength>3</GSMStrength>
<GSMNetwork>3</GSMNetwork>
<GSMIP>90.52.36.21</GSMIP>
<HTTPPort>1050</HTTPPort>
<InternalSensorState>1;1;1</InternalSensorState>
<ExternalSensorState>0;0;0</ExternalSensorState>
<MicrophoneState>0</MicrophoneState>
<NewHistory>0</NewHistory>
<EventAlarm Code="1">0</EventAlarm>
<EventAlarm Code="2">1</EventAlarm>
</Status>

```

7.9.4 *GetDeviceType*

HTTP request: /pub/GetDeviceType.asp

Parameters: None

Return: values in XML format :

```

<DeviceType version="1">
  <Device>x</Device>
</DeviceType>

```

« Device » Tag: 01dB/CMG device type (ORION=1800)

7.9.5 *GetEventHistory*

HTTP request: /pub/GetEventHistory.asp

Parameters: Delete=1 (optional)

Return:

ResponseXML><Error>ERROR</Error></ResponseXML> if error

- else values in XML format :

```

<EventHistory version="1">
  <Event type="POWER_SUPPLY_PRESENT">
    <LocalTime>2015-01-01T00:00:00</LocalTime>
    <UTCTime>2015-01-01T00:00:00</UTCTime>
  </Event>
  <Event type="POWER_SUPPLY_ABSENT">
    <LocalTime>2015-01-01T00:00:00</LocalTime>
    <UTCTime>2015-01-01T00:00:00</UTCTime>
  </Event>
  <Event type="CAMPAIGN_AUTO_DELETE">
    <LocalTime>2015-01-01T00:00:00</LocalTime>
    <UTCTime>2015-01-01T00:00:00</UTCTime>
  </Event>

```

```

</Event>
<Event type="LOW_BATTERY">
  <LocalTime>2015-01-01T00:00:00</LocalTime>
  <UTCTime>2015-01-01T00:00:00</UTCTime>
</Event>
<Event type="ALARM_BEGIN">
  <LocalTime>2015-01-01T00:00:00</LocalTime>
  <UTCTime>2015-01-01T00:00:00</UTCTime>
  <Code>12014</Code>
  <RedLevel>50</RedLevel>
</Event>
<Event type="ALARM_END">
  <LocalTime>2015-01-01T00:00:00</LocalTime>
  <UTCTime>2015-01-01T00:00:00</UTCTime>
  <Code>12014</Code>
  <RedLevel>50</RedLevel>
</Event>
<Event type="MOVEMENT">
  <LocalTime>2015-01-01T00:00:00</LocalTime>
  <UTCTime>2015-01-01T00:00:00</UTCTime>
  <Latitude>0</Latitude>
  <Longitude>0</Longitude>
  <Distance>0</Distance>
</Event>
<Event type="LOGGING_BEGIN">
  <LocalTime>2015-01-01T00:00:00</LocalTime>
  <UTCTime>2015-01-01T00:00:00</UTCTime>
</Event>
<Event type="LOGGING_END">
  <LocalTime>2015-01-01T00:00:00</LocalTime>
  <UTCTime>2015-01-01T00:00:00</UTCTime>
  <Error>0</Error>
</Event>
<Event type="STORAGE_CARD_INSERTED">
  <LocalTime>2015-01-01T00:00:00</LocalTime>
  <UTCTime>2015-01-01T00:00:00</UTCTime>
</Event>
<Event type="STORAGE_CARD_REMOVED">
  <LocalTime>2015-01-01T00:00:00</LocalTime>
  <UTCTime>2015-01-01T00:00:00</UTCTime>
</Event>
<Event type="TIME_RESYNCHRO">
  <LocalTime>2015-01-01T00:00:00</LocalTime>
  <UTCTime>2015-01-01T00:00:00</UTCTime>
  <Seconds>10</Seconds>
</Event>
<Event type="STORAGE_SPACE_LOW">
  <LocalTime>2015-01-01T00:00:00</LocalTime>
  <UTCTime>2015-01-01T00:00:00</UTCTime>
</Event>
<Event type="STORAGE_SPACE_VERY_LOW">
  <LocalTime>2015-01-01T00:00:00</LocalTime>
  <UTCTime>2015-01-01T00:00:00</UTCTime>

```

```
</Event>
</EventHistory>
```

Each event is distinguished by its type attribute. If the parameter « Delete » = 1, then the log is deleted after sending.

More about LOGGING_END: the Error tag = 1 if stop on SD writing error occurred, else 0

More about STORAGE_SPACE_LOW: corresponds to 50Mo

More about STORAGE_SPACE_VERY_LOW: corresponds to 3Mo

7.9.6 DeleteEventHistory

HTTP request: /pub/DeleteEventHistory.asp

Parameters: None

Return: <ResponseXML><Error>OK</Error></ResponseXML>

This command deletes the events log.

7.9.7 StartLog

HTTP request: /pub/StartLog.asp

Parameters: None

Return: <ResponseXML><Error>ERROR</Error></ResponseXML> if error
or <ResponseXML><Error>OK</Error></ResponseXML> if OK

The device must be in READY mode.

7.9.8 StopLog

HTTP request: /pub/StopLog.asp

Parameters: None

Return: <ResponseXML><Error>ERROR</Error></ResponseXML> if error
or <ResponseXML><Error>OK</Error></ResponseXML> if OK

7.9.9 ActivateConfiguration

HTTP request: /pub/ActivateConfiguration.asp

Parameters: Config = name of the configuration

Return: <ResponseXML><Error>LOAD_FILE</Error></ResponseXML> if file cannot be found
or <ResponseXML><Error>OK</Error></ResponseXML> if OK
or <ResponseXML><Error>ERROR</Error></ResponseXML> if other error

The device must be in READY mode or STABILIZATION mode.

7.9.10 *GSMPriority*

HTTP request: /pub/GSMPriority.asp

Parameters: Action = 1 (on) or 0 (off)

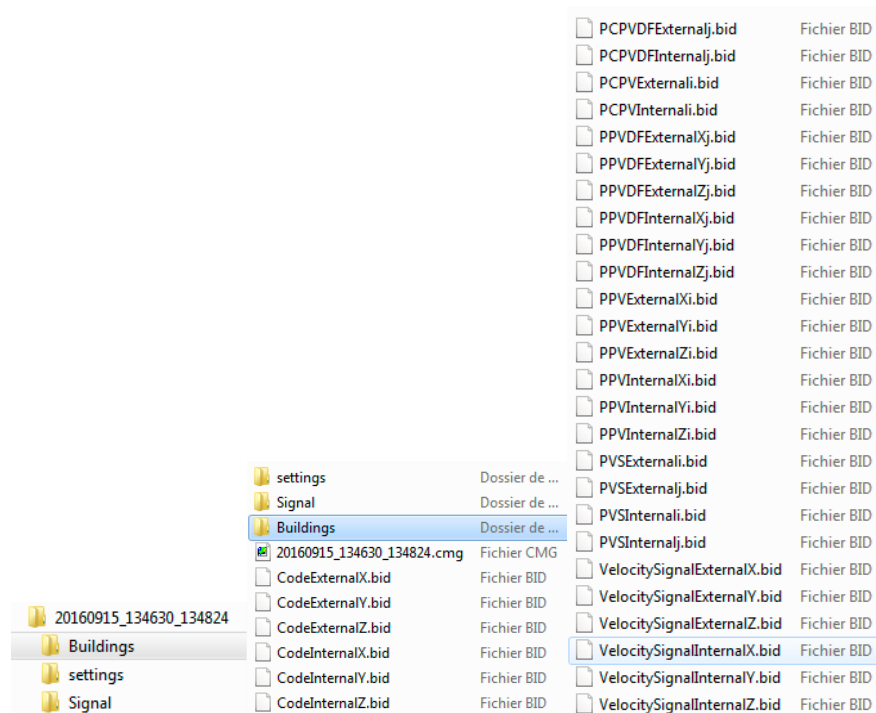
Return: `<ResponseXML><Error>OK</Error></ResponseXML>` if ok
or `<ResponseXML><Error>ERROR</Error></ResponseXML>` if error

CHAPTER 8

GENERAL INFORMATION

8.1 DATA FORMAT

Measurement sessions are stored as .CMG files with associated files and subdirectories. All files are stored in a directory corresponding to the measurement date and time. During a measurement, a .CMG measurement session is systematically closed at midnight and a new one starts without data loss at 00:00:00 (with possibly an NTP or GPS clock re-synchronization) this open/close process is also done every time an electric check is automatically performed. In that case some seconds corresponding to the test duration are not stored.



The example above shows the contents of the measurement session on 15th September 2016 between 13:46:30 and 13:48:24:

- The **.cmg file**, containing all rules for reading the files from the associated session.
- **.bid files** containing the binary values of each instant value measured.

8.2 STORAGE MEMORY

8.2.1 *Memory capacity and data storage size*

The instrument includes a slot for the SD card. The capacity of this memory allows storing all selected indicators.

Every T_i :

$PCPVi = 10 \text{ byte} / T_i$

$PPVik = 8 \text{ byte} / T_i$

$PVSi = 4 \text{ byte} / T_i$

$Vpmaxik = 4 \text{ byte} / T_i$

Every T_j :

$PCPVDFj = 20 \text{ byte} / T_j$

$PPVDFj = 18 \text{ byte} / T_j$

$PVSj = 4 \text{ byte} / T_j$

$Vpmaxj = 5 \text{ byte} / T_j$

Velocity Signal = 5120 byte / T_j

Example: $T_i=1 \text{ sec}$; $T_j= 5 \text{ sec}$ → data size for one transducer 3 axes:

Without velocity signal: 247 KB/hour

Velocity signal on 3 axes (1 every 10 min): 92 KB/hour

8.2.2 *Storage of the raw signal*

The time signal is a metrological signal sampled at 3.2kHz. It represents 12.8 KB/sec for each channel.

CHAPTER 9

TECHNICAL SPECIFICATIONS

9.1 STANDARDS

Metrologic reference standard

- DIN 45669-1 class 1

Embedded standards

- DIN 4150-3
- Circulaire du 23 juillet 1986
- Arrêté du 22 septembre 1989
- BS 5228-4
- BS 7385-2
- BS 6472-1
- DIN 4150-2
- ISO 2631-2 2003
- ISO 2631-2 1989

9.2 INPUTS

Internal Sensor

- Type: triaxle piezoelectric
- Typical sensitivity: 500 mV/g
- Transverse sensitivity: < 5%
- Frequency response: 0.4 – 1600 Hz \pm 10%
- Typical resonant frequency: 16 kHz
- Residual noise: 35 μ g RMS
- Spectral noise
 - 3 μ g/ $\sqrt{\text{Hz}}$ @10 Hz
 - 0.7 μ g/ $\sqrt{\text{Hz}}$ @100 Hz
 - 0.5 μ g/ $\sqrt{\text{Hz}}$ @1000 Hz

External Sensors

- Type: IEPE sensors
- Vibration channels: 3 axes available for Accelerometer or velocimeter
- Noise channel: 1 axis available for pressure microphone (blast applications)

Note: Selecting an accelerometer leads to the integration of the time signal for analysis of vibration velocity

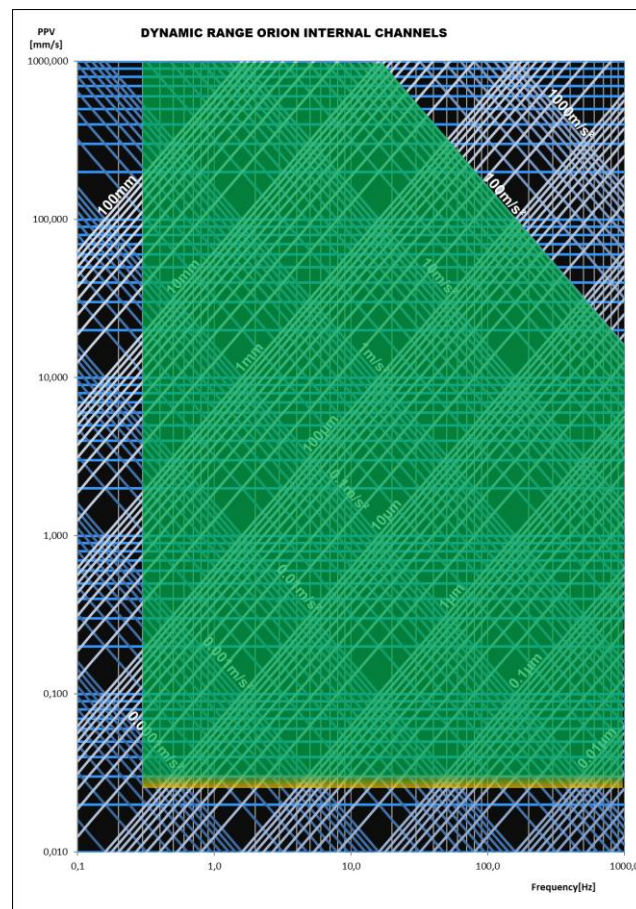
9.3 DYNAMIC RANGE INTERNAL INPUT

Under range

- Acceleration RMS: 0.5 mm/s^2 (1Hz – 80 Hz)
- Acceleration peak: 2 mm/s^2 (1Hz – 80 Hz)
- Velocity RMS: 0.04 mm/s (1Hz – 80 Hz)
- Velocity peak: 0.35 mm/s (1Hz – 80 Hz)
- Re-radiated noise L_p : $13 + (27-X)$ where X is the correction factor

Overload

- Acceleration: 100 m/s^2



9.4 DYNAMIC RANGE EXTERNAL INPUT

9.4.1 Accelerometer 500 mV/g

Under range

- Acceleration RMS: 0.5 mm/s^2 (1Hz – 80 Hz)
- Acceleration peak: 2 mm/s^2 (1Hz – 80 Hz)
- Velocity RMS: 0.04 mm/s (1Hz – 80 Hz)
- Velocity peak: 0.35 mm/s (1Hz – 80 Hz)
- Reradiated noise L_p : $13 + (27-X)$ where X is the correction factor

Overload

- Acceleration: 100 m/s²

9.4.2 Velocimeter 30 V/m/s

Under range

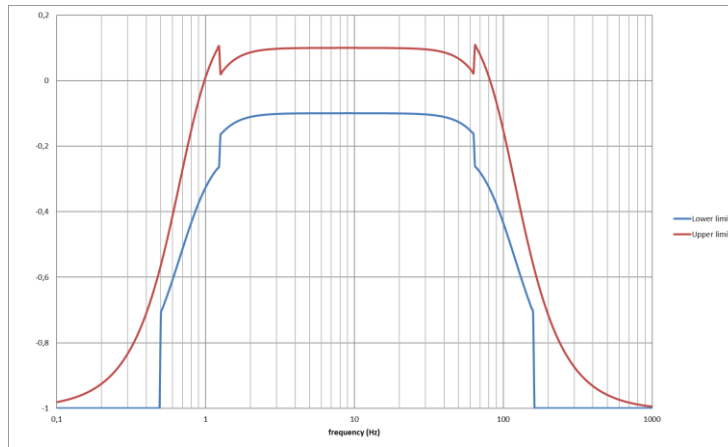
- Velocity RMS: 0.002 mm/s
- Velocity peak: 0.004 mm/s

Overload

- Displacement: 4 mm peak to peak
- Velocity: 100 mm/s

9.5 FREQUENCY RESPONSE

Conforms to DIN 45669:



9.6 ACQUISITION AND POST PROCESSING

7 Measurement channels in parallel

- 3 channels X, Y and Z axes for internal accelerometer
- 3 channels X, Y and Z axes for external sensor
- 1 channel acoustic pressure for blast

Sampling frequency

- 3200 Hz for each channel, up to 7 channels simultaneously

High pass filter

- Butterworth 2nd order @ 1.2 Hz

Low pass filter

- Butterworth 8th order @ 156.25 Hz

Velocity signal

- Obtained by numerical integration of signals if the input sensor is an accelerometer

Automatic detection of signal type

- Kurtosis method applied to automatically determine the tolerance curves to apply (circulaire du 23 juillet 1986, BS 5228-4 et BS 7385-2)

Logging period Tj for Dominant Frequency calculation

- 5, 10 or 30 sec

Fast logging period Ti

- 1, 2 or 5 sec

Dominant frequency calculation

- Maximum frequency of the FFT centred on PPVj_kmax sample at each T_j; resolution 0.2 or 0.4 Hz

Signals recording

- For each channel $F_e = 3200$ Hz
- Duration: $nT_j + 6$ sec, n corresponding to the consecutive numbers of T_j with event detection
- Velocity signal: 5 seconds within T_j if an event is occurring; $F_e = 400$ or 800 Hz centred on PPV_{jkMax}

Triggers on signal recording

- Simultaneous with codes and / or manual via the web interface

Standardised events detection

On values or couple of values exceeding the tolerance curves:

- PPV_{jk}/FD_{jk} (DIN 4150-3 and “Circulaire”)
- $PCPV_j/FD_j$ (BS5228-4 and BS 7385-2)
- V_{pMaxjk} (arrêté)
- VDV_{jk}
- L_{pjk}

User defined events detection

- By logical combination “and” or “or” triggers on PPV_{jk} , $PCPV_j$ and PVS
- Minimum value for trigger: 0.1 mm/s

Manual coding

On the web interface from the real time menu:

- 5 codes: codes from 1 to 5

Timers

- Immediate
- Delayed
- Periodic daily

9.7 INTERFACES AND COMMUNICATION

2 Buttons keyboard

- Power on/off
- Wi-Fi management

7 LED's

- Power (green): flashes if logging measurement in progress
- Wi-Fi (Blue)
- Lock (yellow)
- Ethernet (yellow)
- Warnings (red): overload, open circuit
- Battery (green and red)
- GSM (green and yellow)

Memory

- SD, SDHC or SDXC card, 2 GB or higher (2GB standard delivery) for measured data and signals. Minimum recommended requirement: \geq class 10. Please note only SD cards provided by 01dB should be used.
- 01dB cannot be held responsible for data loss if the SD card used is not delivered by 01dB.
- Measured data stored on the SD card every 10 seconds.
- Non-volatile memory for configurations, system log (500), calibration data (500) and electrical checks (500).
- For continuous use (fixed point), it is strongly recommended to change the SD card considered a consumable every 6 months during the site visit, as it can be highly stressed and has a limited life.

USB connection

- Type 2.0; mass storage
- Charge voltage 5V ($\pm 5\%$) @ 0.5 A.

Ethernet connection:

- Connector RJ45 (shielded cable maximum length 3m)
- Speed: 100 MBits/s

Wi-Fi Connection:

- IEEE 801.11b, g
- Wireless Access point and infrastructure modes

Cellular network connection

Embedded modem 3.5G compatible with

- 4-band GSM/GPRS/EDGE
- 3-band UMTS/HSDPA

Data connectivity

- Integrated Network protected http server for web interface
- Integrated FTP server for data access
- Integrated FTP client for automatic data upload to server

SMS alarms

- On event \rightarrow message content: instrument serial #, location, date and time, user defined text, IP address:http port, header and values (if selected)
- On low battery (user defined %) \rightarrow message content: instrument serial #, location, date and time, % remaining battery
- On movement: \rightarrow message content: instrument serial #, location, date and time, GPS coordinates, distance from previous location, IP address:http port (the alarm trigs if the instrument has moved more than the user defined distance)

Automatic SMS actions

- Sending “IP” by SMS to instrument makes it reply by sending an SMS with instrument serial #, location, date and time, IP:port address and automatically sends a new SMS at every new IP address in case of floating IP

Actions on SMS sent to the instrument

- On SMS sent “IP”, the instrument replies by sending an SMS with the instrument serial #, location, date and time, IP:port address
- On SMS sent “stop”, the instrument stops sending new SMS every time IP has changed
- On SMS “reboot”, the instrument reboots to establish a new connection and replies with an SMS with instrument serial #, location, date and time, IP :port address

Web interface refresh rate webpages

- once per second

TTL output

- $R = 100 \text{ Ohms} / 0 / 3.7V$

Clock

- GPS PPS, error < Ti
- Internal clock, error < 0.5 s/24 hours

Localization

- Automatic with GPS
- Information stored in measurement session

9.8 POWER

Battery

- Type lithium Ion
- Voltage: 3.7V
- Capacity 20 Ah
- Non removable,
- charging time (@ 20 °C):
 - Instrument off: < 8 h with standard charger, < 18 h with PoE
 - Instrument on in logging mode: < 11 h with standard charger; <35 h with PoE
- For higher T°, charging time will increase
- For T° > 36 °C, for safety reasons battery charge process will be stopped; nevertheless, the instrument power supply remains active

Power consumption

Measuring	Off	On int + ext	On int + ext	On int + ext	On int + ext	On int + ext	On int + ext
Wi-Fi	Off	Off	On not connected	On connected	On not connected	Off	On not connected
GSM	Off	Off	Off	Off	On connected	On connected	On connected and downloading data
Power consumption [W]	2.87	2.93	3.23	3.81	3.94	3.63	3.96

Operating battery lifetime

- @ 20 °C, logging active and signals recording on threshold during 10% of the measurement time. > 28 h hours without Wi-Fi and 3G connection
- @ -20 °C, logging active and signals recording on threshold during 10% of the measurement time: > 12 h

External power supply

- 12V DC ± 3V on charger input
- PoE

Warmup time

- Duration < 30 sec

9.9 ENVIRONMENT AND CONFORMANCE TO STANDARDS

Operating range T°

- -10°C +55 °C without charging
- -10°C +36°C while charging

Humidity

- 95% no condensation

Altitude

- Up to 2000 m

Pollution degree 4

- Outdoor and indoor use

Protection

- IP65

Directive low voltage 2014/35/UE

- NF EN 61010-1

Directive CEM 2014/30/UE

- EN55011 class B
- NF EN 61000-3-2
- 61000-3-3
- 61000-4-2
- 61000-4-2
- 61000-4-3
- 61000-4-4
- 61000-4-5
- 61000-4-6
- 61000-4-8
- 61000-4-11

Directive RED 2014/53/UE

- Radio 3G: ETSI EN 301 908-2 V5.2.1
- Wi-Fi: ETSI EN 301 908-2 v 5.2.1

Vibration endurance

- EI 60068-2-6 – 50m/s² – 10 cycles – 10Hz à 500Hz

Resistance to jerking

- CEI 60068-2-29 – severity 10g

Resistance to shocks

- CEI 60068-2-27 – severity 30g

Weight and dimensions

- 5300 g
- H x L x P: 82.5*281*240 mm (without feet)

9.10 ACCESSORIES**Included**

- Standard power supply VMT100400

Optional

- Waterproof power supply for outdoor use IP67 VMT1007000
- PoE (Power over Ethernet) for indoor use VMT1007000
- Weatherproof carrying case

Connecting these accessories has no influence on the measurement.

CHAPTER 10

ANNEXES

10.1 ANNEX 1: TABLES OF STANDARD BASED EVENTS NAMES

10.1.1 Buildings

INT/EXT	Standard	Line Type	Building type	Duration type or detection type	Name
INT	DIN4150-3	Line 1	Foundation	short term	I_DIN4150-3_L1_F_S
		Line 2			I_DIN4150-3_L2_F_S
		Line 3			I_DIN4150-3_L3_F_S
		Line 1	Highest floor	short term	I_DIN4150-3_L1_H_S
		Line 2			I_DIN4150-3_L2_H_S
		Line 3			I_DIN4150-3_L3_H_S
		Line 1		long term	I_DIN4150-3_L1_H_L
		Line 2			I_DIN4150-3_L2_H_L
		Line 3			I_DIN4150-3_L3_H_L
		Line 1	pipe network	short term	I_DIN4150-3_L1_P_S
		Line 2			I_DIN4150-3_L2_P_S
		Line 3			I_DIN4150-3_L3_P_S
		Line 1		long term	I_DIN4150-3_L1_P_L
		Line 2			I_DIN4150-3_L2_P_L
		Line 3			I_DIN4150-3_L3_P_L
	Circ.		Resistant constructions	automatic detection of signal type	I_CIRC_R_A
				Continuous signal	I_CIRC_R_C
				Transient signal	I_CIRC_R_T
			Sensitive constructions	automatic detection of signal type	I_CIRC_S_A
				Continuous signal	I_CIRC_S_C
				Transient signal	I_CIRC_S_T

INT/EXT	Standard	Line Type	Building type	Duration type or detection type	Name
			Very sensitive constructions	automatic detection of signal type	I_CIRC_V_A
				Continuous signal	I_CIRC_V_C
				Transient signal	I_CIRC_V_T
	Arrêté				I_ARR
	BS 5228-4		Res. good repair (Case 1)	automatic detection of signal type	I_BS5228-4_C1_A
				Continuous signal	I_BS5228-4_C1_C
				Transient signal	I_BS5228-4_C1_T
			Res. significant defects (Case 2)	automatic detection of signal type	I_BS5228-4_C2_A
				Continuous signal	I_BS5228-4_C2_C
				Transient signal	I_BS5228-4_C2_T
			Industrial light and flexible (Case 3)	automatic detection of signal type	I_BS5228-4_C3_A
				Continuous signal	I_BS5228-4_C3_C
				Transient signal	I_BS5228-4_C3_T
			Industrial heavy and stiff (Case 4)	automatic detection of signal type	I_BS5228-4_C4_A
				Continuous signal	I_BS5228-4_C4_C
				Transient signal	I_BS5228-4_C4_T
	BS 7385-2	Line 1		automatic detection of signal type	I_BS7385-2_L1_A
				Continuous signal	I_BS7385-2_L1_C
				Transient signal	I_BS7385-2_L1_T
		Line 2		automatic detection of signal type	I_BS7385-2_L2_A
				Continuous signal	I_BS7385-2_L2_C
				Transient signal	I_BS7385-2_L2_T
EXT	DIN4150-3	Line 1	Foundation	short term	E_DIN4150-3_L1_F_S
		Line 2			E_DIN4150-3_L2_F_S
		Line 3			E_DIN4150-3_L3_F_S
		Line 1	Highest floor	short term	E_DIN4150-3_L1_H_S
		Line 2			E_DIN4150-3_L2_H_S
		Line 3			E_DIN4150-3_L3_H_S
		Line 1		long term	E_DIN4150-3_L1_H_L

INT/EXT	Standard	Line Type	Building type	Duration type or detection type	Name	
		Line 2			E_DIN4150-3_L2_H_L	
		Line 3			E_DIN4150-3_L3_H_L	
		Line 1	pipe network	short term	E_DIN4150-3_L1_P_S	
		Line 2			I_DIN4150-3_L2_P_S	
		Line 3			E_DIN4150-3_L3_P_S	
		Line 1		long term	E_DIN4150-3_L1_P_L	
		Line 2			E_DIN4150-3_L2_P_L	
		Line 3			E_DIN4150-3_L3_P_L	
	Circ.		Resistant constructions	automatic detection of signal type	E_CIRC_R_A	
				Continuous signal	E_CIRC_R_C	
				Transient signal	E_CIRC_R_T	
			Sensitive constructions	automatic detection of signal type	E_CIRC_S_A	
				Continuous signal	E_CIRC_S_C	
				Transient signal	E_CIRC_S_T	
			Very sensitive constructions	automatic detection of signal type	E_CIRC_V_A	
				Continuous signal	E_CIRC_V_C	
				Transient signal	E_CIRC_V_T	
	Arrêté					E_ARR
	BS 5228-4		Res. good repair (Case 1)	automatic detection of signal type	E_BS5228-4_C1_A	
				Continuous signal	E_BS5228-4_C1_C	
				Transient signal	E_BS5228-4_C1_T	
			Res. significant defects (Case 2)	automatic detection of signal type	E_BS5228-4_C2_A	
				Continuous signal	E_BS5228-4_C2_C	
				Transient signal	E_BS5228-4_C2_T	
			Industrial light and flexible (Case 3)	automatic detection of signal type	E_BS5228-4_C3_A	
				Continuous signal	E_BS5228-4_C3_C	
				Transient signal	E_BS5228-4_C3_T	
			Industrial heavy and stiff (Case 4)	automatic detection of signal type	E_BS5228-4_C4_A	
				Continuous signal	E_BS5228-4_C4_C	

INT/EXT	Standard	Line Type	Building type	Duration type or detection type	Name
	BS 7385-2		Line 1	Transient signal	E_BS5228-4_C4_T
				automatic detection of signal type	E_BS7385-2_L1_A
				Continuous signal	E_BS7385-2_L1_C
			Line 2	Transient signal	E_BS7385-2_L1_T
				automatic detection of signal type	E_BS7385-2_L2_A
				Continuous signal	E_BS7385-2_L2_C
				Transient signal	E_BS7385-2_L2_T

10.1.2 Occupants

INT/EXT	Standard	selection 1	selection 2	selection 3	Name
INT	BS 6472-1				I_BS6472-1_VDV
					I_BS6472-1_Lp
	DIN 4150-2			1	I_DIN4150-2_L1
				2	I_DIN4150-2_L2
				3	I_DIN4150-2_L3
				4	I_DIN4150-2_L4
				5	I_DIN4150-2_L5
	ISO 2631 2003				I_ISO2631-03_Aw
					I_ISO2631-03_Awpeak
					I_ISO2631-03_VDV
					I_ISO2631-03_MTVV
	ISO 2631 1989	Critical	automatic detection of signal type		I_ISO2631-89_C_A
			Continuous signal		I_ISO2631-89_C_C
			Transient signal		I_ISO2631-89_C_T
		Residential	automatic detection of signal type		I_ISO2631-89_R_A
			Continuous signal		I_ISO2631-89_R_C
			Transient signal		I_ISO2631-89_R_T
		Office	automatic detection of signal type		I_ISO2631-89_O_A
			Continuous signal		I_ISO2631-89_O_C
			Transient signal		I_ISO2631-89_O_T
		Workshop	automatic detection of signal type		I_ISO2631-89_W_A

INT/EXT	Standard	selection 1	selection 2	selection 3	Name
EXT			Continuous signal		I_ISO2631-89_W_C
			Transient signal		I_ISO2631-89_W_T
	BS 6472-1				E_BS6472-1_VDV
					E_BS6472-1_Lp
	DIN 4150-2			1	E_DIN4150-2_L1
				2	E_DIN4150-2_L2
				3	E_DIN4150-2_L3
				4	E_DIN4150-2_L4
				5	E_DIN4150-2_L5
	ISO 2631 2003				E_ISO2631-03_Aw
					E_ISO2631-03_Awpeak
					E_ISO2631-03_VDV
					E_ISO2631-03_MTVV
	ISO 2631 1989	Critical	automatic detection of signal type		E_ISO2631-89_C_A
			Continuous signal		E_ISO2631-89_C_C
			Transient signal		E_ISO2631-89_C_T
		Residential	automatic detection of signal type		E_ISO2631-89_R_A
			Continuous signal		E_ISO2631-89_R_C
			Transient signal		E_ISO2631-89_R_T
		Office	automatic detection of signal type		E_ISO2631-89_O_A
			Continuous signal		E_ISO2631-89_O_C
			Transient signal		E_ISO2631-89_O_T
		Workshop	automatic detection of signal type		E_ISO2631-89_W_A
			Continuous signal		E_ISO2631-89_W_C
			Transient signal		E_ISO2631-89_W_T

10.2 TABLE OF OPTIONS

Name	Code	Tab	Field	If inactive	Comments
Construction	C	DIN 4150-3 Circ... Arrêté... BS5228-4 BS7385-2	Possible to select Internal transducer	Transducers selection greyed out	
Occupants	O	DIN 4150-2 ISO 2631-2 2003 ISO 2631-2 1989 BS 6472-1	Possible to select Internal transducer	Transducers selection greyed out	
Sensitive equipments	S	Not Available	Not Available	Not Available	
External transducer	E	DIN 4150-3 Circ... Arrêté... BS5228-4 BS7385-2 DIN 4150-2 ISO 2631-2 2003 ISO 2631-2 1989 BS 6472-1	Possible to select External transducer	External transducer selection greyed out	
Signal Recording	R	Signal	Table Signal recording activation	Not possible to recorded raw signals	Not possible to record velocity signals
Trigger	T	Trigger	Button +	Button + hidden	Only for manual triggers
http	H	--	--	return « NOT IMPL »	
Push Data	D	System config/network/Client	Server 1 and 2	Servers activation greyed out	
FTP	F	System config/network/server	All	Greyed out except HTTP listen port	
Modem	M	System config/Network	All	GSM tab greyed out	
GPS	G	System config/general	GPS time	No information on status	No GPS position on Info page



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