



FastTracer

The Triaxial Portable USB Vibration Analyzer



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- Advanced Feature: PA (Open Protocol)

FastTracer the portable USB analyser

FastTracer thanks to:

- High Performance*
- Extreme reliability*
- Simplicity to use*



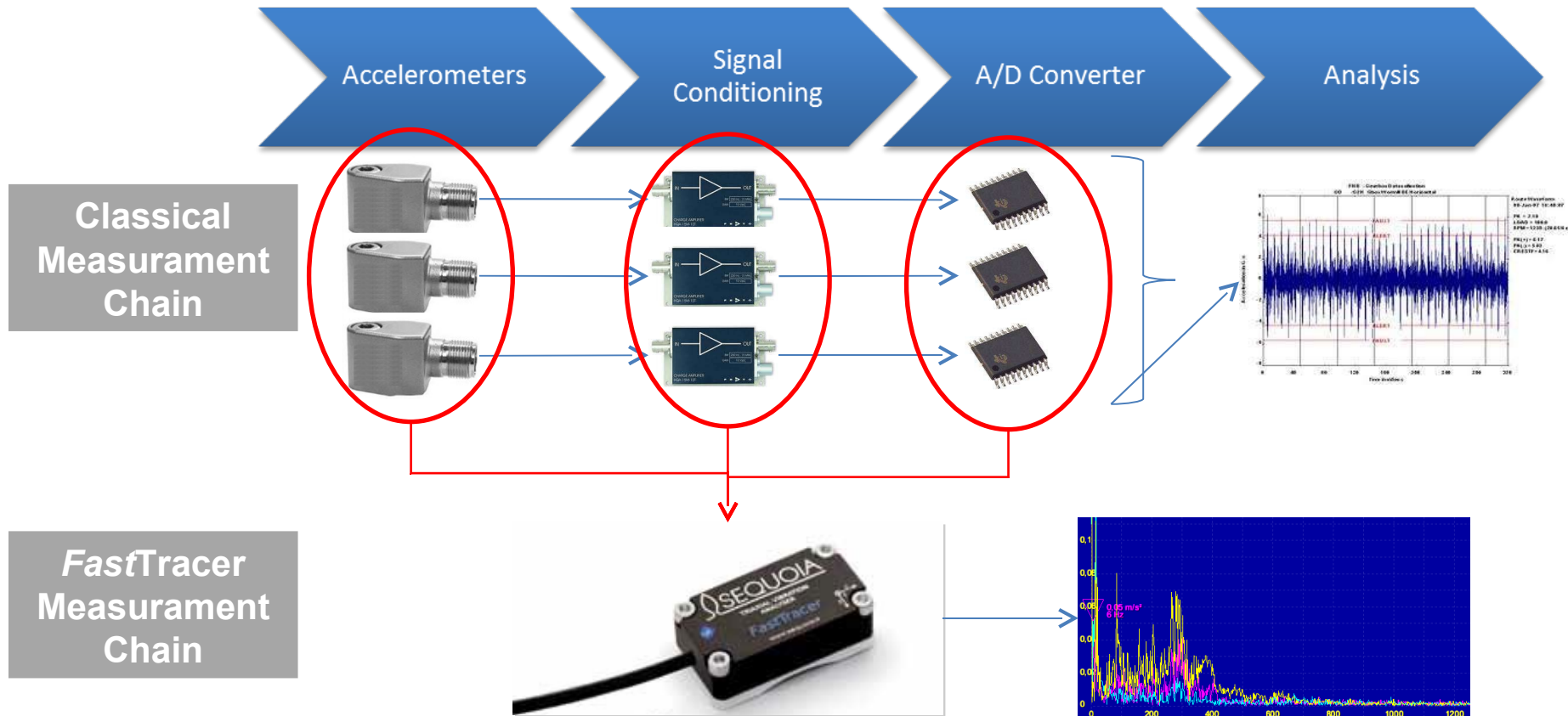
make vibration analysis a simple task also for non expert operators.

Simply connect **FastTracer** to your PC via the USB port to turn it into a powerful Triaxial Vibration Analyser.

With **FastTracer** you can easy handle several vibration problem within maintenance program, troubleshooting, quality control, R&D and design activities.

What is *FastTracer* ?

FastTracer it's an "all in one" solution that include within a single transducer all you require from a powerful Triaxial Vibration Analyser:



FastTracer Features (1)

Sensor Specification:

| | |
|-----------------------|------------------------------|
| Full scale | 5g (or optional 2g and 18g)* |
| Bandwidth | 0 – 2500 Hz |
| Communication | USB 2.0 or WiFi** |
| Protection Index | IP67 |
| Shock resistance | 10.000 g |
| Operating Temperature | -20 / 70°C |



**the 18g option is suited for high vibration level while the 2 g option with low noise is suitable for very low level (eg. Building Vibration)*

*** Using the FASTWI Option*

FastTracer Features (2)

The compact solution it's possible thanks to the sensing elements realized with **MEMS** (Micro Electro-Mechanical Systems) technology. This leads to several advantages compare to other classical solution such as:

**Long Term stability
of MEMS and
DC Reaing**

Technically no periodical calibration it's required. You can further be sure of the correct reading by comparing measurement against gravity acceleration of 9,81 g. No portable calibration required !!

**Digitalization
within Trasducer**

Signal are digitized directly within the transducer. This imply that the signal transmitted it's not effected by cable triboelectric noise. Your data are therefore more reliable and precise.

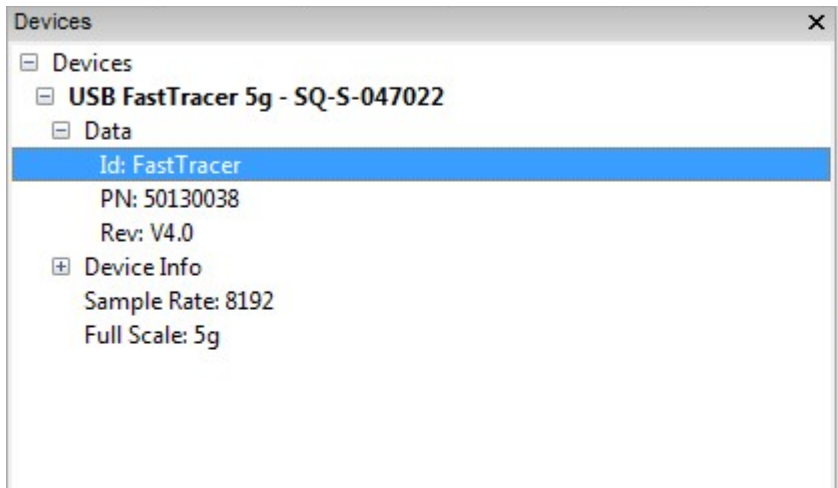
**High Shock
(10.000 g) and IP67**



Drop it or even lunch against hard surface. You would not break it. This, together with the high protection level, allow the usage of the FastTracer in the most demanding environmental condition

FastTracer Features (3)

FastTracer it's high precision measuring system. Each unit it's delivered with it's own individual calibration certificate fully traceable to **INRIM**, the primary Italian metrological institute.

Each **FastTracer** is internally fully «balanced». When you connect the unit to the PC, the software automatically detect it and you can start measurement without any further setup:



Calibration Certificate

FastTracer: S.N. SQ-S-140004 Full Range $\pm 5\text{ g}$

has been individually calibrated in the internationally recognized metrological institute **INRIM**.

Calibration results¹:

| | | |
|-------------------|---|---|
| Axis X: <u>3%</u> | } | $\pm 2\%$, @ 159,16 Hz and signal amplitude of 10 m/s ² |
| Axis Y: <u>2%</u> | | |
| Axis Z: <u>4%</u> | | |

The whole set of measurements realized in **INRIM** laboratories is loaded into the Sequoia IT USB Flash Memory contained in the **FastTracer** case.

Date 25/11/11 Sign DG

¹ Calibration is traceable to INRIM, Italy. Results are expressed as relative error between measured and reference value.


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| Units |
|-----------------------|
| % |
| % |
| m/s ² |
| m/s ² |
| m/s ² |
| m/s ² /√Hz |

| | Density | $1,2 \times 10^{-3}$ | |
|---------------------------|--------------------|----------------------|----------------------|
| Change due to temperature | Amplitude | 0,01 | %/°C |
| | On full temp range | 0,5 | % |
| | Offset | 6×10^{-2} | m/s ² /°C |
| | On full temp range | 0,27 | m/s ² |
| Minimum mounting diameter | Magnetic fixture | 200 | mm |

² To=25°C, Signal amplitude: 0,1 + 50 m/s², FastTracer mounted with 4 screws unless otherwise noted

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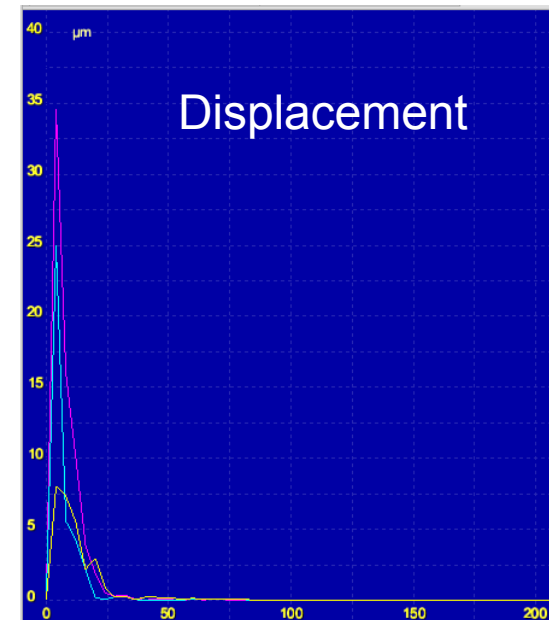
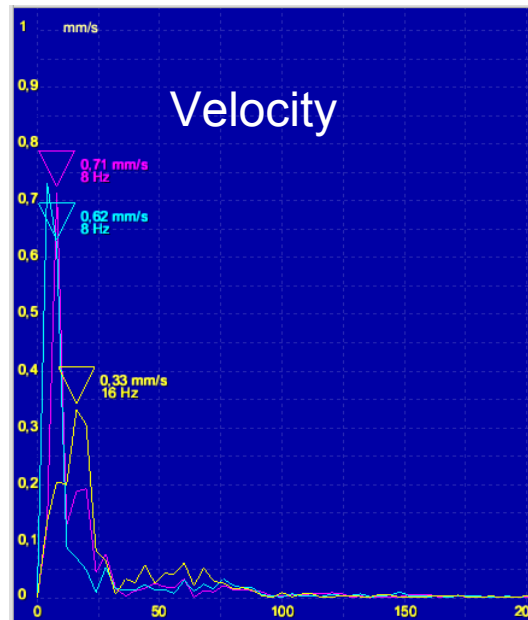
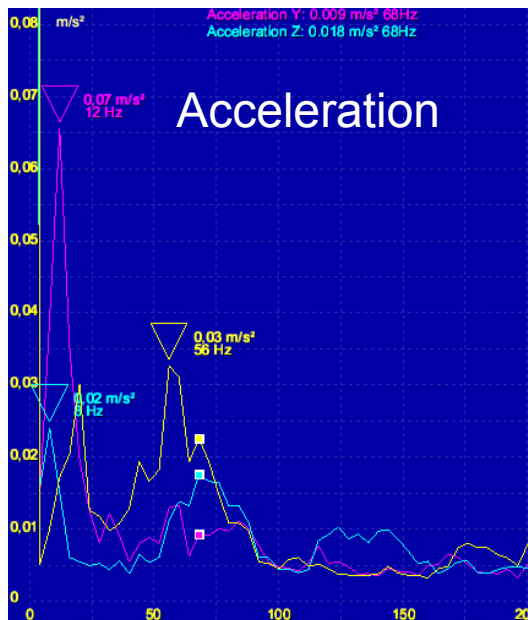


FastTracer Software

FFT analysis

FFT Analysis:

- Bandwidth : DC – 2500 Hz
- Point: up to 524288 (*High Frequency Resolution*)
- Acceleration, Velocity and Displacement result
- Automatic Peak Cursor

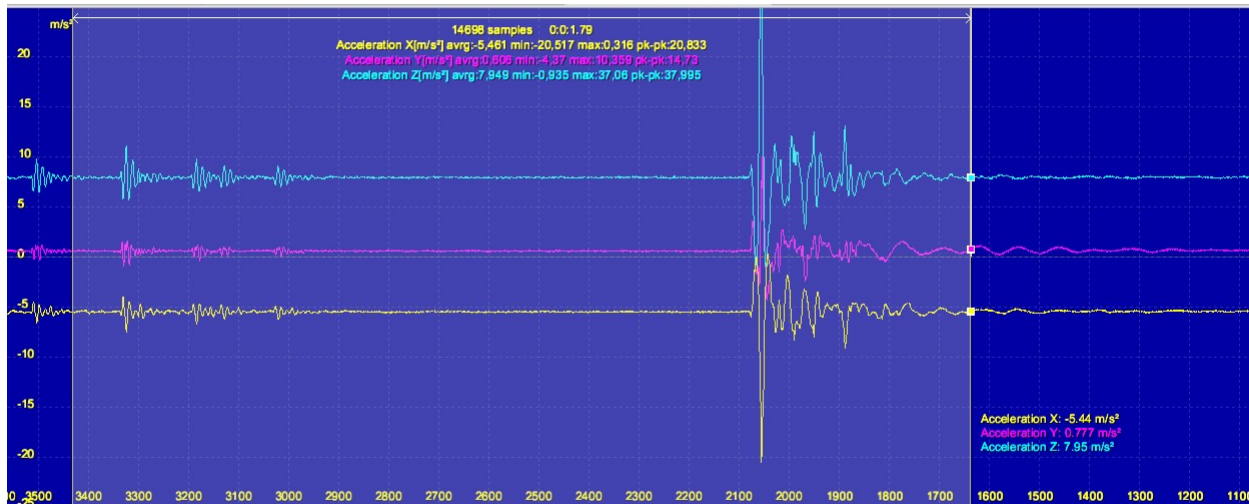


FastTracer Software

Time Analysis

Time Analysis:

Whenever you are measuring long time data it's always «stored» within RAM of you PC so you would not lost any data along with your measure. You can select any portion of the time signal for investigation purpose or the export it to Excel for automatic reporting.

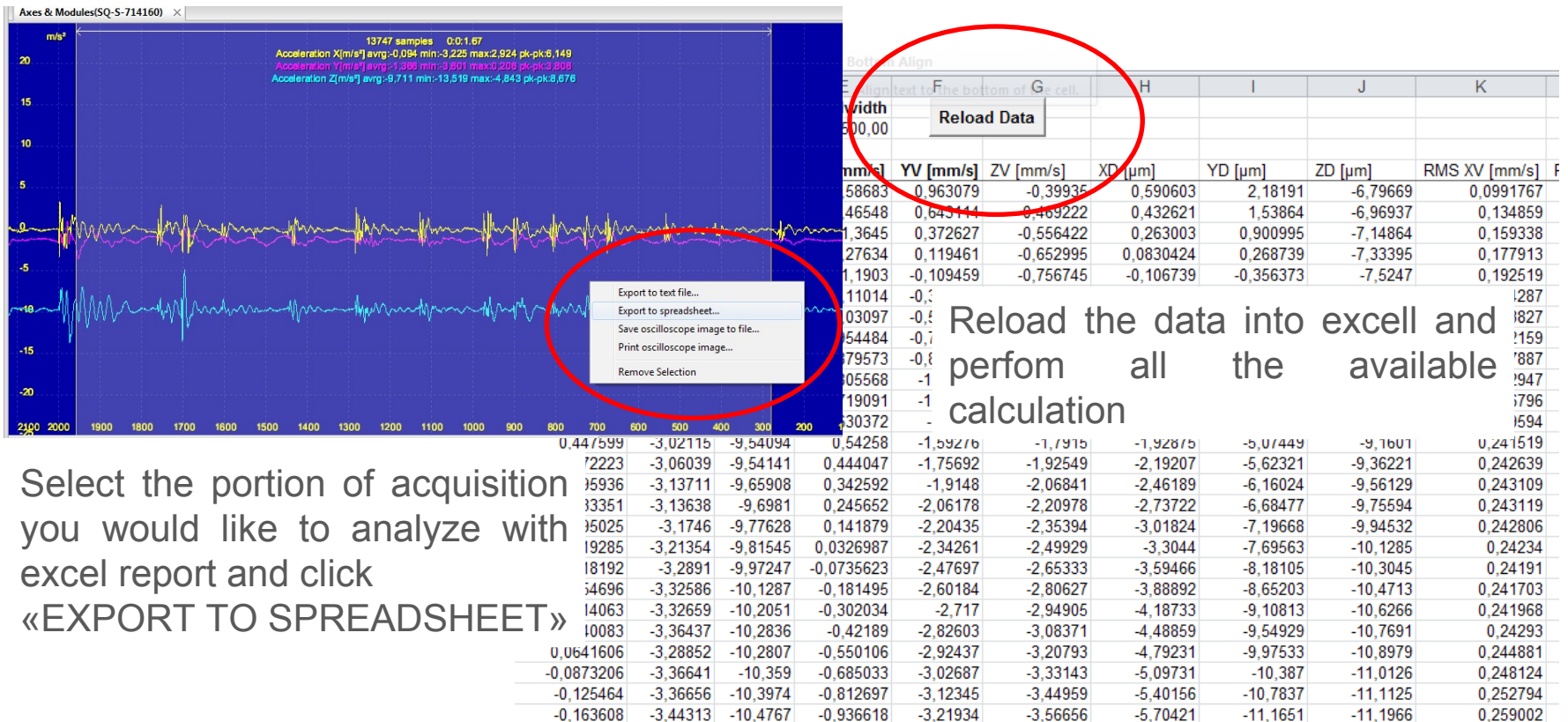


FastTracer Software

Excel Reporting (1)

Excel Reporting

The automatic excel reporting its an advanced tool. Trough exel reporting, in a a matter of few seconds data are not only transfered to excel but several calculation are performed:



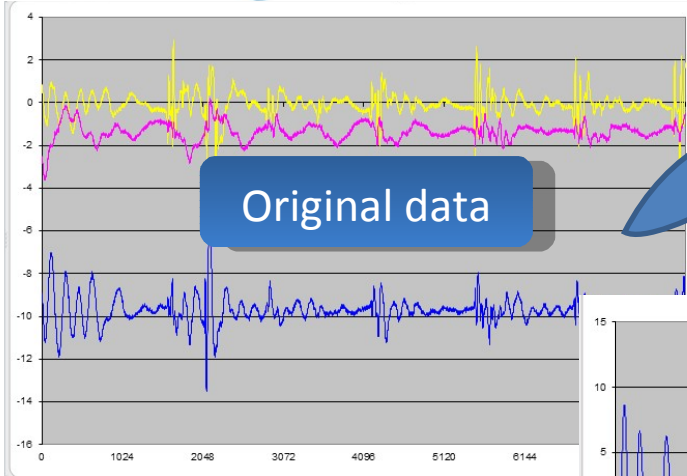
Select the portion of acquisition you would like to analyze with excel report and click «EXPORT TO SPREADSHEET»

Reload the data into excel and perform all the available calculation

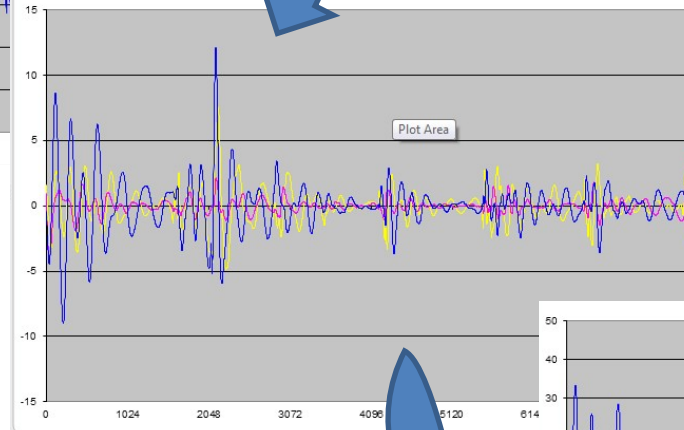
FastTracer Software

Excel Reporting (2) - Calculation

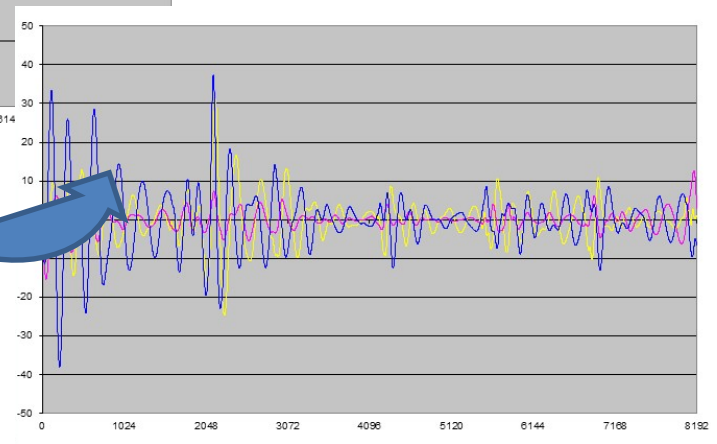
Original data



First Integration
(From Acceleration to Velocity)

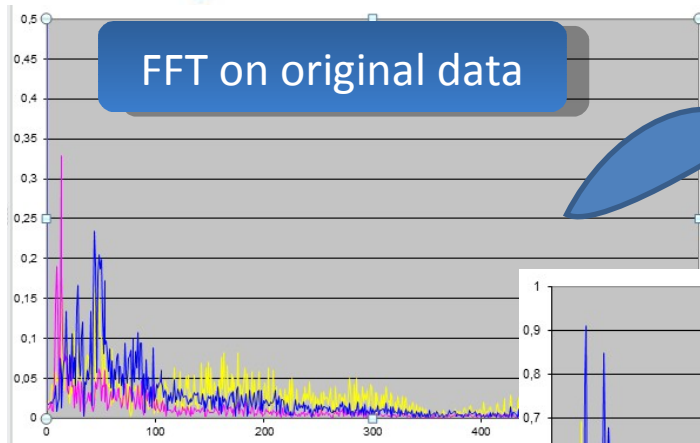


Second Integration
(From Velocity to Displacement)

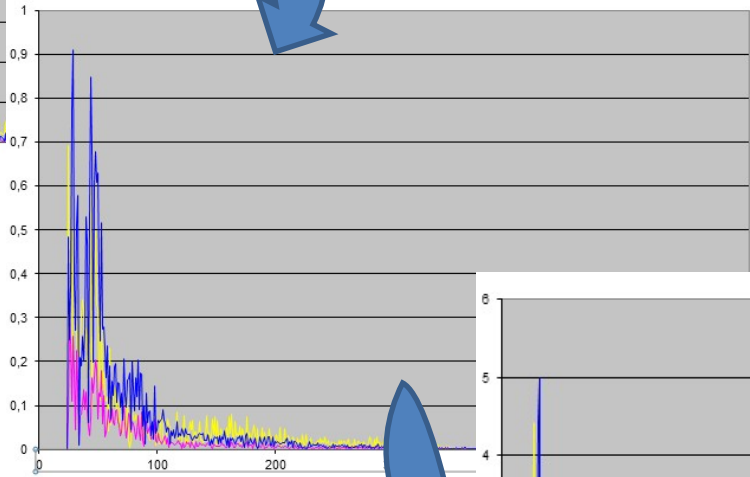


FastTracer Software

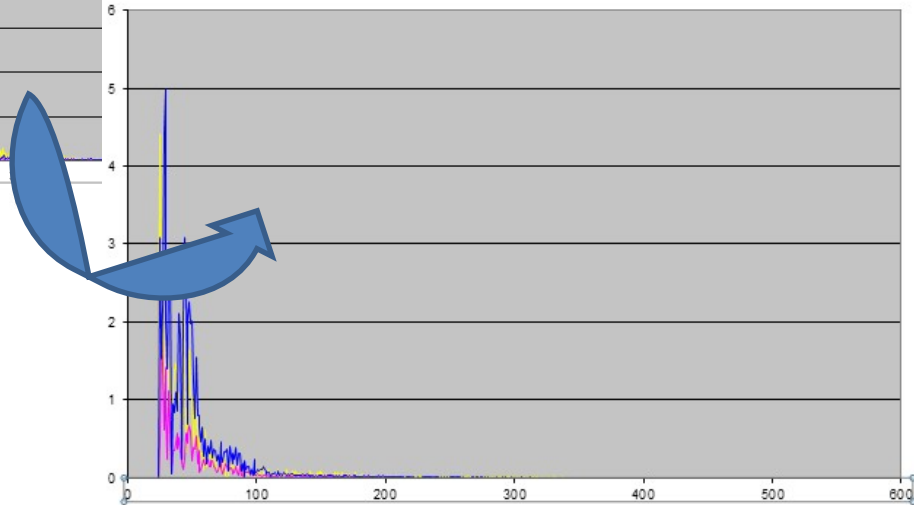
Excel Reporting (3) - Caluclation



FFT First Integration
(From Acceleration to Velocity)

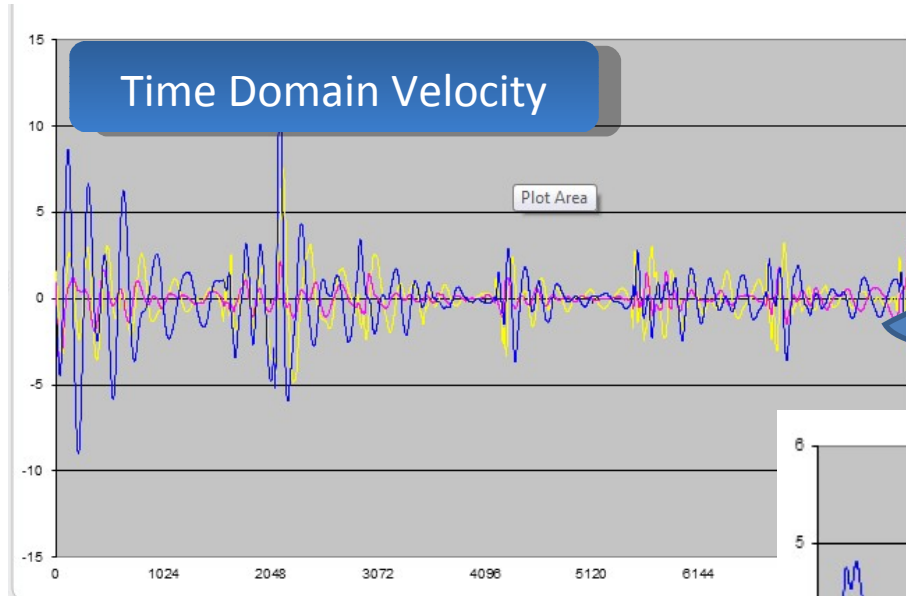


FFT Second Integration
(From Velocity to Displacment)

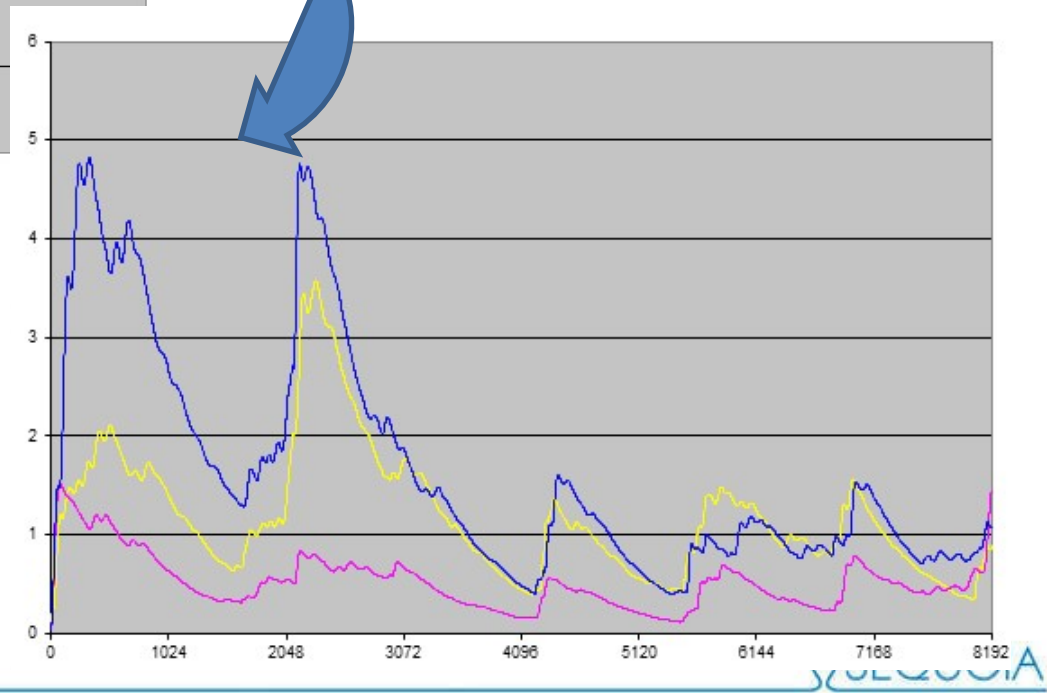


FastTracer Software

Excel Reporting (4) - Caluclation

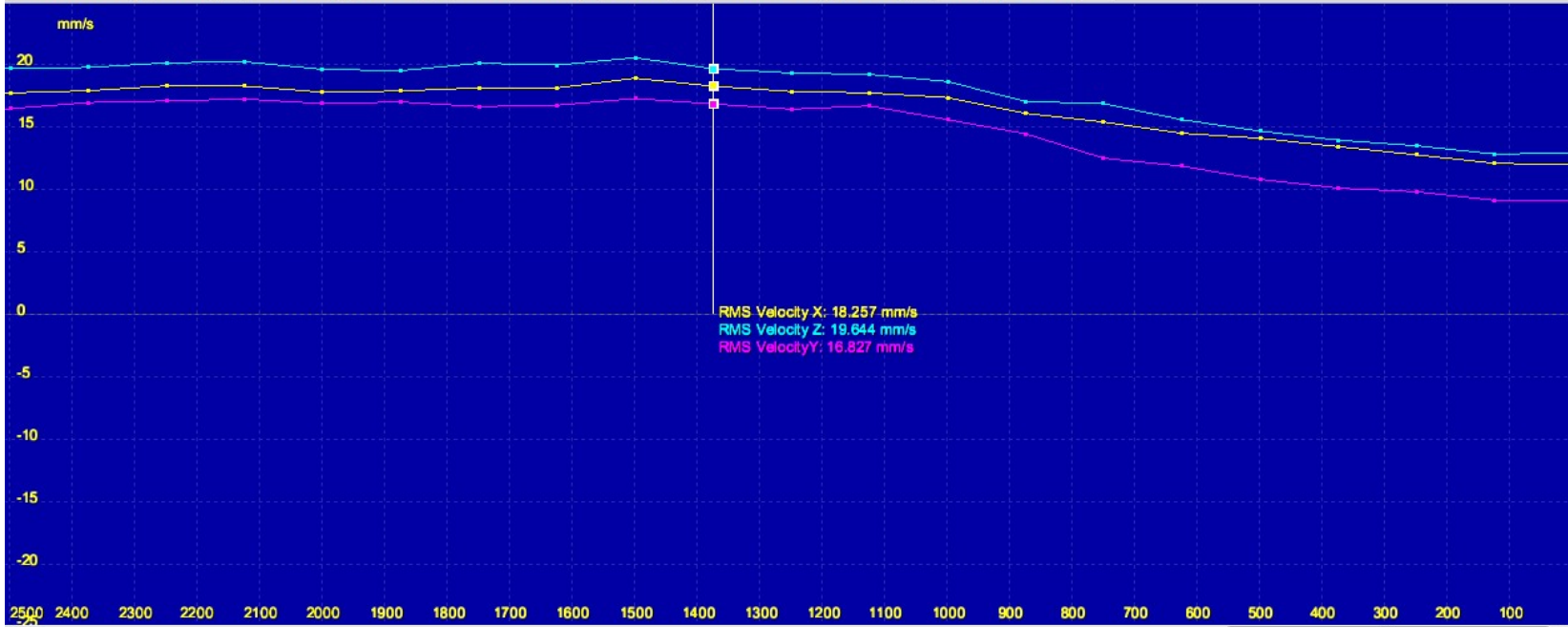


RMS Calculation
According to ISO 10816



FastTracer Software

RMS ISO10816

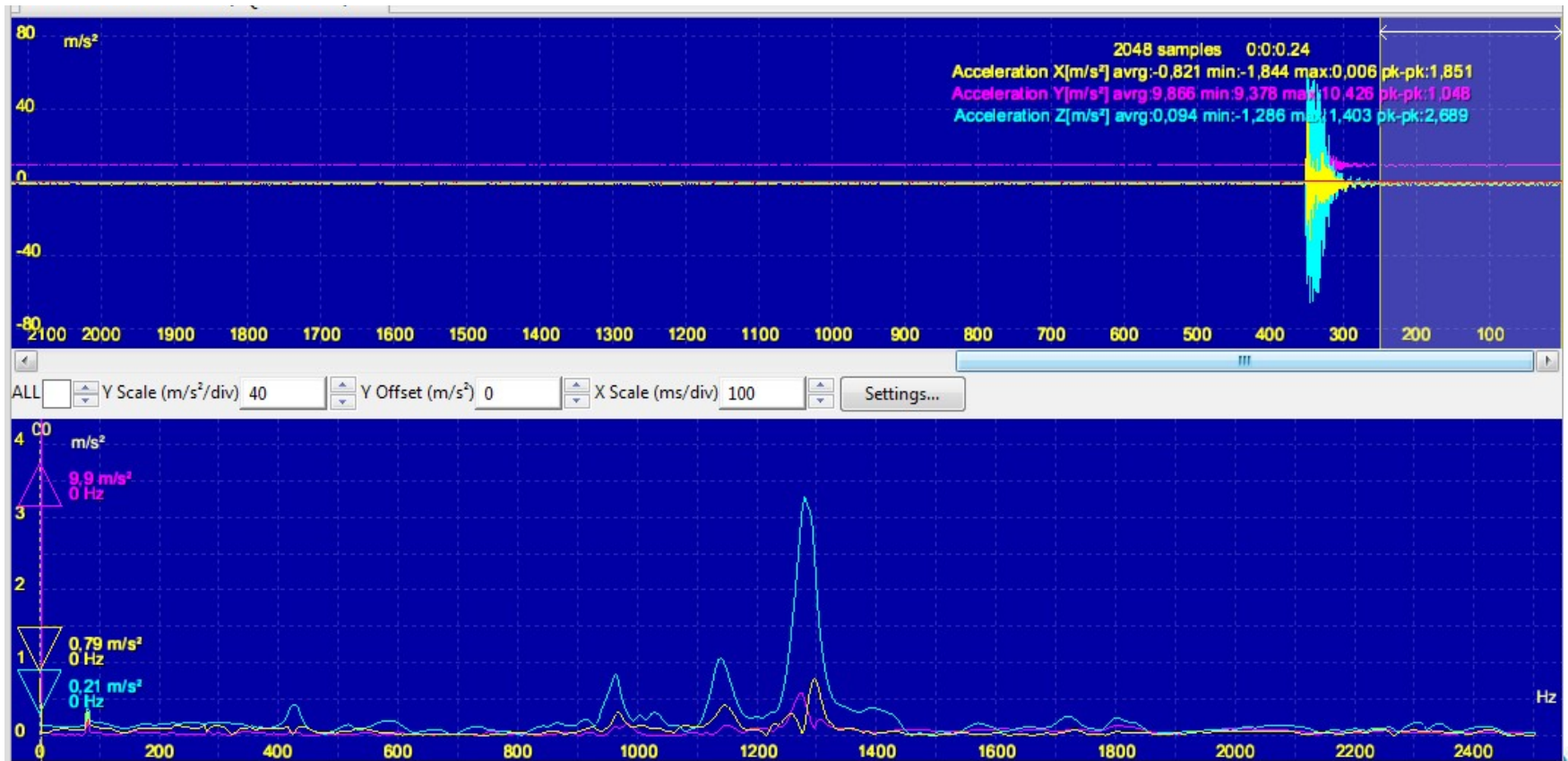


Within the software RMS of velocity is calculate in compliance with ISO 10816, the standard to asses vibration level on machinery

FastTracer Software

Trigger View

In order to explore the resonance frequency of a structure the trigger view analysis is provided within FastTracer. With this analysis it's immediate to perform «Bump» test. Since FT it's a triaxial accelerometer, resonance along all the X,Y and Z direction could be explored with a single measure.



FastTracer Software

Time data recording

All the analysis options are available in real time and at the same time within the software. Furthermore it's possible to register the data and analyze them off-line in post processing.

The screenshot displays the FTAnalyzer software interface. The main window shows a toolbar with options like 'New View', 'New File Device', and 'Recording Off'. Below the toolbar, there are controls for 'Trigger', 'Level (m/s²)', 'Slope', and 'Start time (ms)'. A 'Devices' panel on the left lists two devices: 'USB FastTracer 5g - SQ-S-047022' and 'File FastTracer 5g - SQ-S-047022'. The 'File FastTracer 5g - SQ-S-047022' device is circled in red. A text box with the text 'Recorded data loaded as «virtual sensor» on which we can use all the SW functionality' has two red arrows pointing to the circled device and the main plot area. The main plot area shows a graph with a blue background and a red line representing the recorded data. The graph has a vertical axis ranging from -8 to 8 and a horizontal axis ranging from 0.0 to 0.30. The plot shows a sharp peak at approximately 0.0392 seconds, reaching a maximum value of 8.1 m/s². The plot also shows a minimum value of -3.7 m/s². The SEQUOIA logo is visible in the background of the plot area.

Recorded data loaded as «virtual sensor» on which we can use all the SW functionality

Serial number: SQ-S-047022 Path: C:\Users\Tfor\Desktop\Piacenza\Recorded_2011_Dec_05_154242 Time duration: 0:0:31.8 Size: 1.242 MiB

max 8.1m/s²

min -3.7m/s²

0.0392

0.0 0.2 0.4 0.6 0.8 0.10 0.12 0.14 0.16 0.18 0.20 0.22 0.24 0.26 0.28 0.30

APPLICATION FIELD

Vibration problems may arise into different industrial area such as civil industry, railways and train, naval industry, automotive, aerospace, wind energy, pumps, generators.



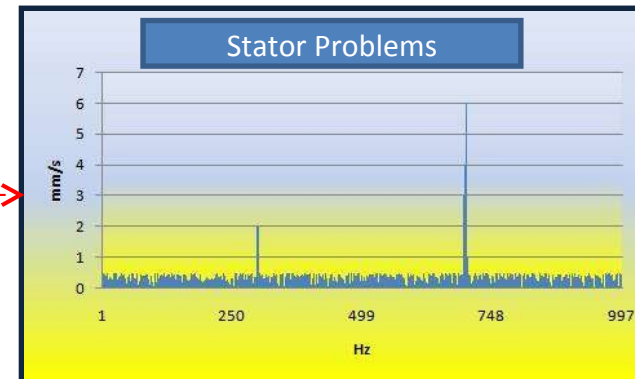
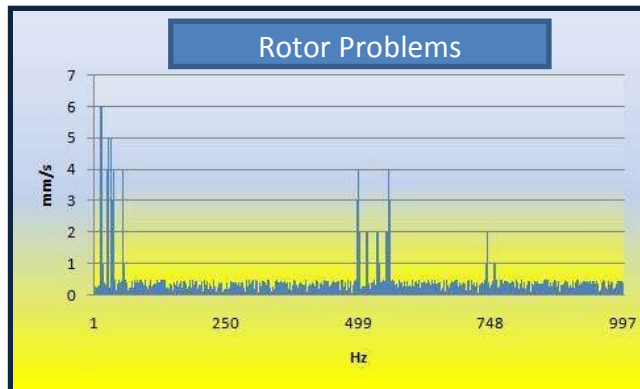
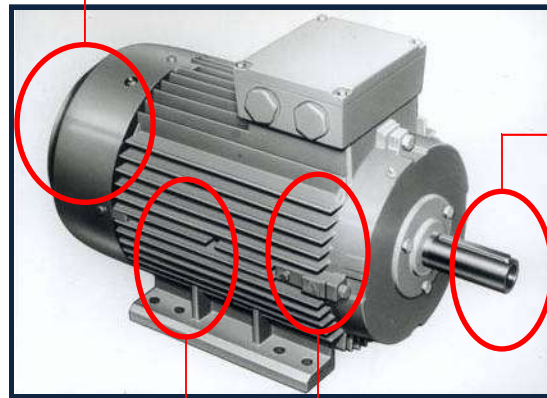
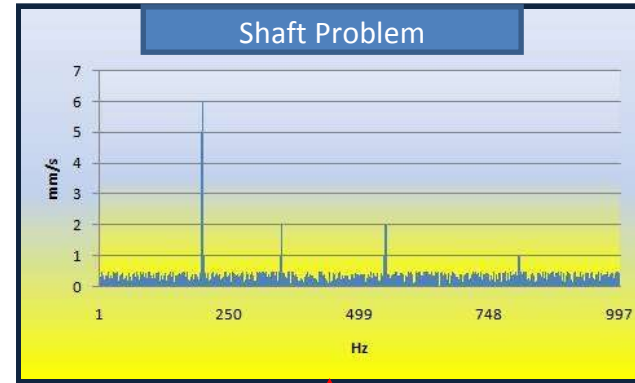
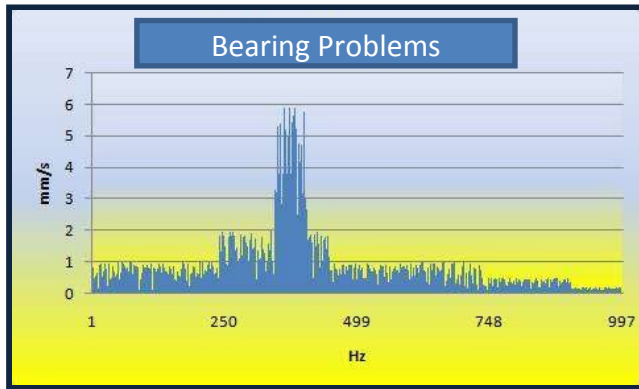
FastTracer represent the ideal solution whenever:

- Portability, reliability and semplicity of use are a must
- Expert operators are not required
- Cost of solution it's an issue
- Data exchange it's vital

Predictive maintenance of machinery, first troubleshooting of vibrations problems, simple conditiont monitoring system rappresent the ideal field where FastTracer should be used

VIBRATION TROUBLESHOOTING AND MAINTENANCE WITH FASTTRACER

AC/DC Motor / Generator



VIBRATION TROUBLESHOOTING AND MAINTENANCE WITH FASTTRACER

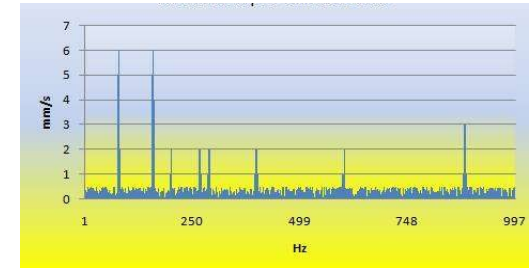
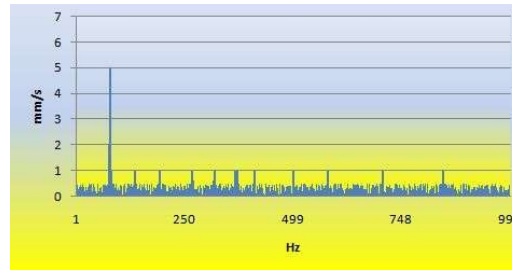
Problems

Normal condition

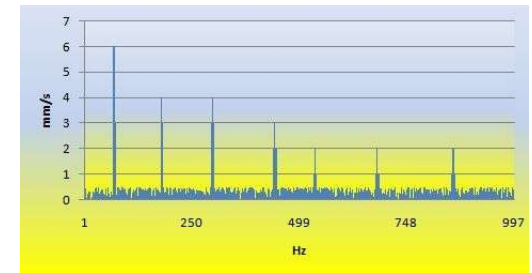
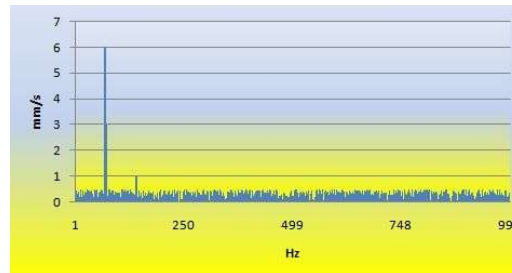
Problem Identification



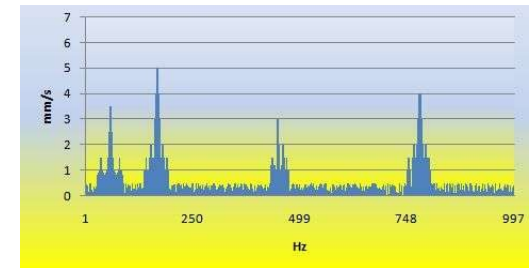
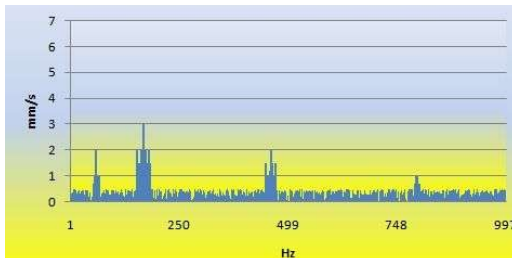
Shaft Misalignemnt



Loose Pulley



Gear Eccentricity



CUMMINS POWER STATION DIAGNOSTIC

Cummins Generator Technologies is the manufacturer of the world's broadest range of ac generators from 0.6 to 20,000 kVA

CUMMINS Customer Issue

- ☒ Needs of vibration measurement on the field
- ☒ Traditional systems can be difficult for use and transport
- ☒ Requirements of a quick idea of machine status before to perform and invest in detailed investigations



SEQUOIA Solution: *FastTracer*

- ☑ Portable and compact vibration analyser
- ☑ User Friendly software adapted for not expert people
- ☑ PC interface doesn't require additional training
- ☑ Immediate FFT analysis and machine status knowledge

CUMMINS Customer Benefits

- ☑ Reducing costs of service and diagnostics operations
- ☑ Historical data archiving and comparisons

"...the capability to get basic vibration data during any visit our service team attends."

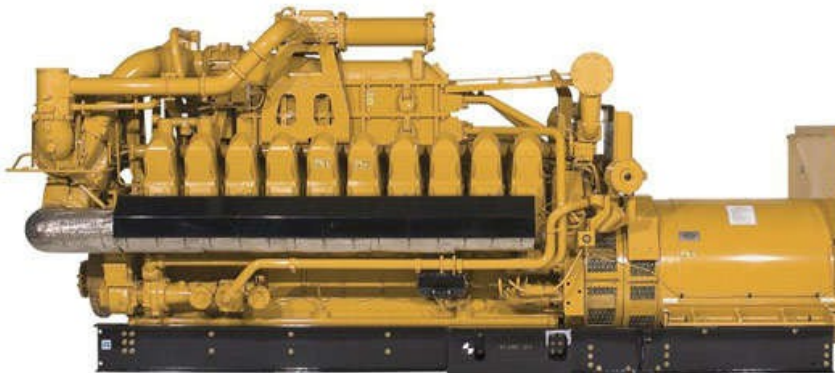
Scott Whiteside
Cummins Generator Technologies
Global Mechanical & Vibration Specialist

SERVICE & MAINTENANCE

One of the world's leading manufacturer of construction and mining equipment, diesel and natural gas engines and industrial gas turbines.

Customer Issue

- ☒ Needs of High Temperature analysis for predictive maintenance operations on steam turbines
- ☒ Portable and compact device for service people
- ☒ Saving periodical calibration costs



SEQUOIA Solution: *FastTracer*

- ☑ Triaxial portable USB solution
- ☑ Internal thresholds database adapted for customer machines
- ☑ No needs of periodical calibrations
- ☑ Simple procedure adapted for not expert users

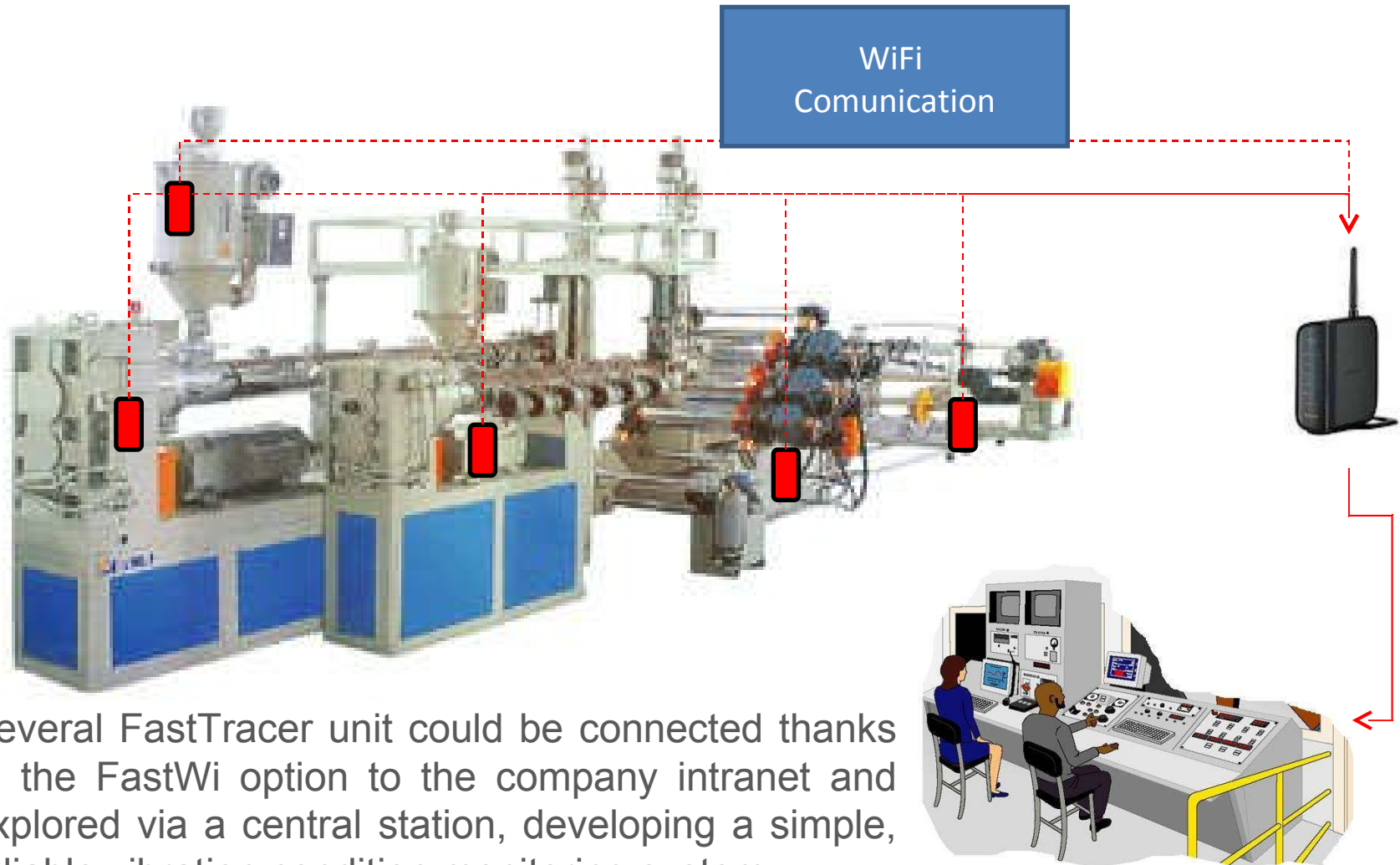
Customer Benefits

- ☑ Predictive maintenance information
- ☑ Downtime reducing
- ☑ The chance to permit not expert people to perform accurate and repeatable analysis

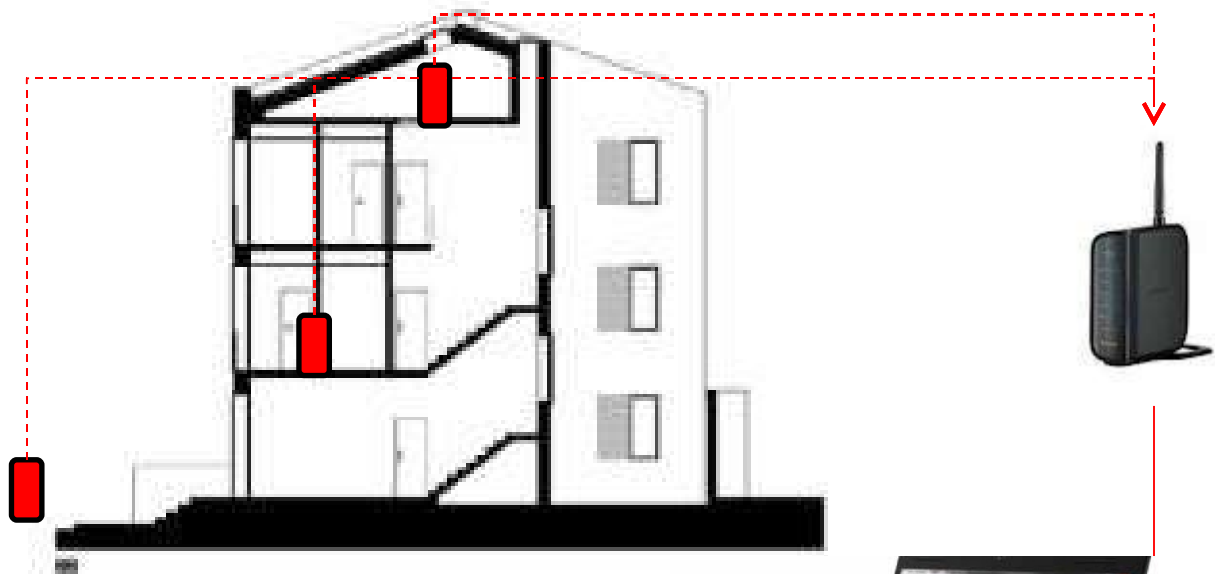
A unique features of **FastTracer** it's the possibility to be connected wireless to the PC thanks to the **FastWi** option.

This feature, allowing communication up to 100 m, allows, especially with fixed installation, to measure point hardly accessible and where long cabling installation could be difficult.





Several FastTracer unit could be connected thanks to the FastWi option to the company intranet and explored via a central station, developing a simple, reliable vibration condition monitoring system



Traffic induced vibration application

FastTracer 2g is particularly suited for civil industry vibration measurement

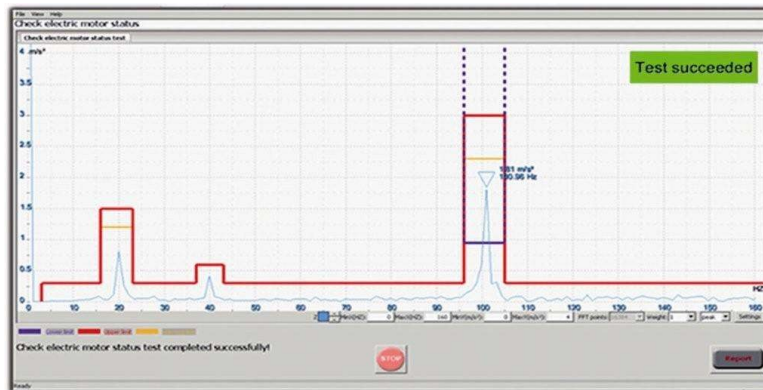


Explora3D (Beta Version)

One of the major issues within vibration maintenance is the possibility of fast identifying defects of measured machines and equipment.

With Explora 3D (Beta version) Sequoia provides an interesting database-free tool able to associate data to every machine:

- Measurement Point(s) – Graphical
- Measurement Condition and operator instruction
- Reference curves for fast comparison of measurement
- Automatic identification of the defects



FastTracer PA

FastTracer is delivered with a complete set of library and example for full integration within NI LabVIEW and Microsoft programming tools (C++) allowing:

FT integration in Customized Test System

Integration into End-of Line Vib. Quality Control

Education Purpose



thank you for the attention