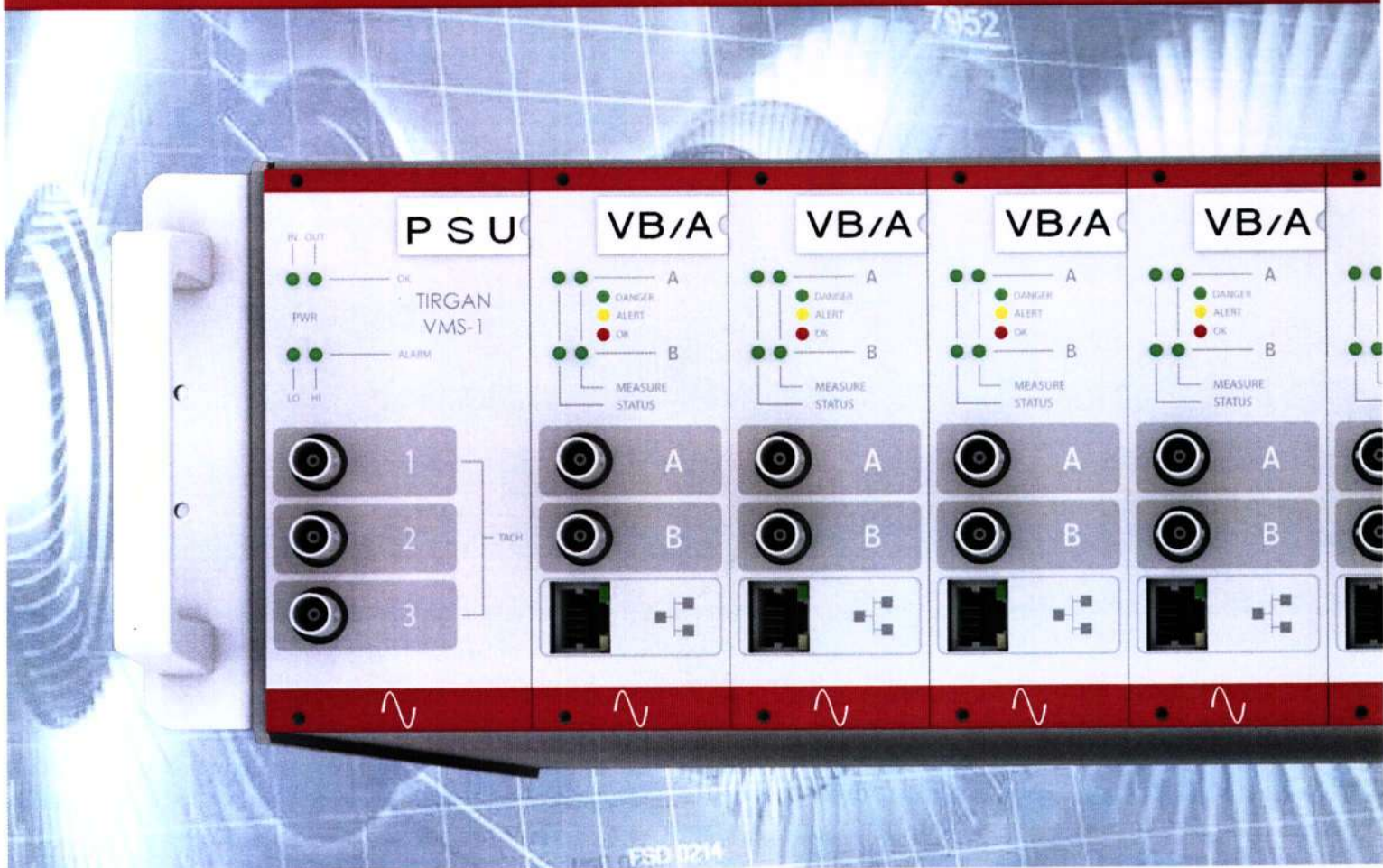


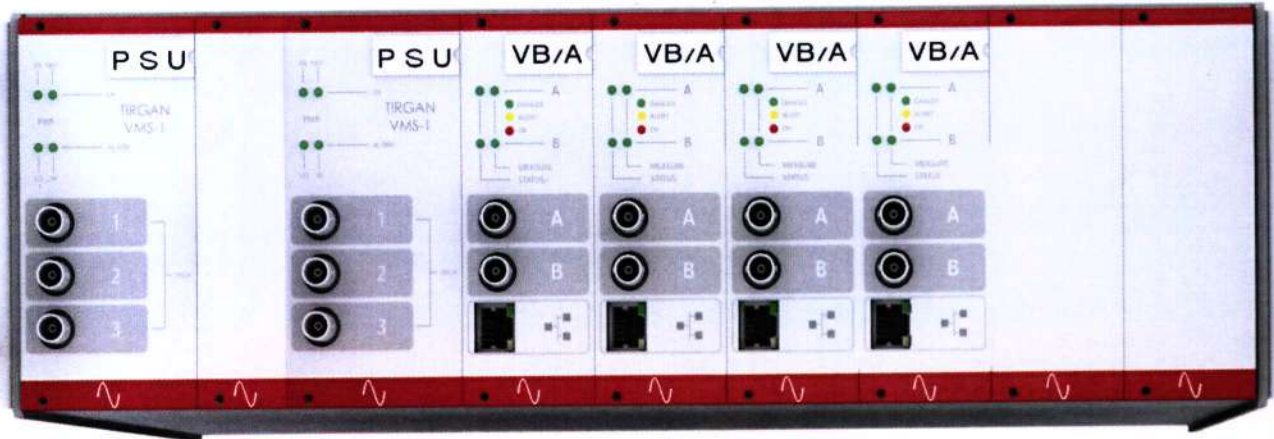
VMS-01

- Machinery protection
- Continuous monitoring
- Analog & digital output
- Ethernet communication
- Multilevel diagnostic software
- Complete modularity and flexibility
- From a single machine to a complete plant



TIRGAN

VIBRATION ANALYSIS & CONDITION MONITORING EQUIPMENT



The instrumentation for monitoring vibrations and diagnostics of machinery using TIRGAN VMS-01 system is based on CEMB's many years experience in the field of vibro-technics and the diagnosis of rotating machinery.

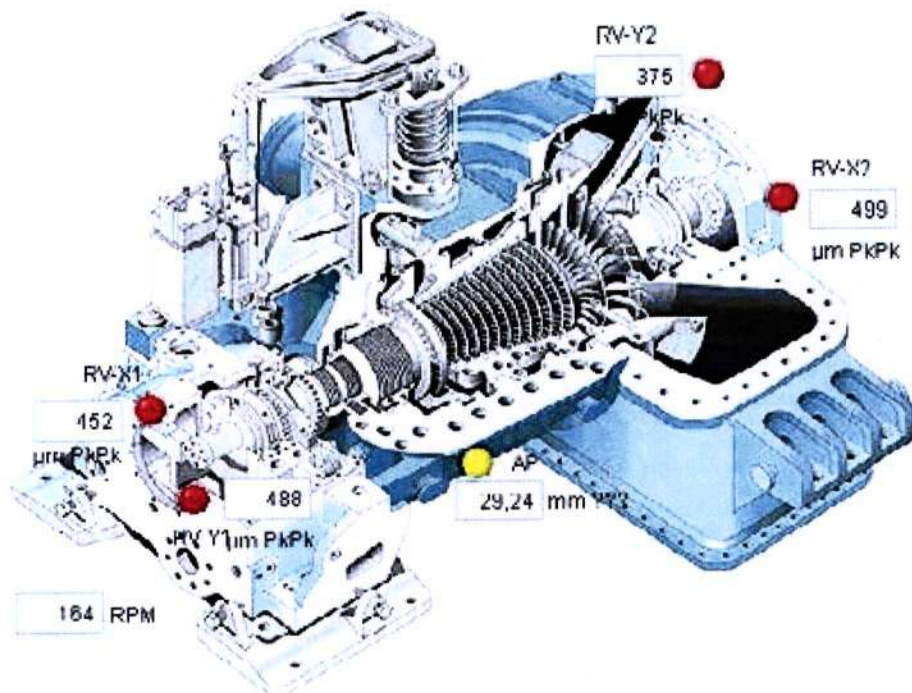
Thousands of CEMB systems have been installed to protect steam / gas / hydraulic turbines, pumps, compressors and fans.

In addition to all the main functions required for monitoring, the VMS-01 system is designed with particular care to the operator interface, in order to simplify the correct management of the equipment.

The new VMS-01 system is designed using modern DSP based architecture to meet the demands for maximum

flexibility and modularity, providing a high performance solution to a wide range of needs. The VMS-01 system can be used either for protecting a single machine that calls for just a few measuring points, monitoring, acquiring and storing typical data for intelligent supervision or as a sophisticated diagnostic system used for machinery in a complete plant.

The system is based on CEMB processing modules, which are dual-channel and can operate on a stand-alone basis. Its terminal board makes it possible to connect to measuring transducers with analogue and digital inputs / outputs. Ethernet port on the front is used for configuring the board and makes it possible to connect to a dedicated PC that can be used for presenting data and for connecting to external diagnostic systems and/or DCS.



sensors



TA18-S Accelerometer



TV22 Velomitor



T1-40 Velocity



TNC8/API No-contact



TNC16 Differential expansion



T5-LVDT Absolute expansion



T7-LVDT Valve position



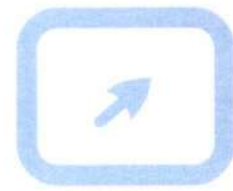
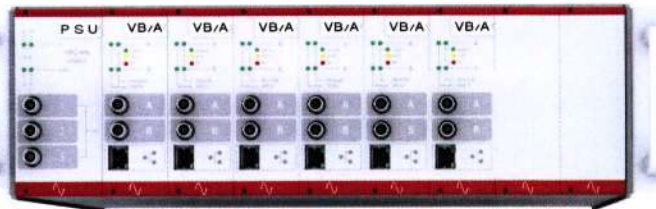
T6-H Speed



ITALIAN HEART:
Engineering and
production of main
parts are in Italy.

transducers

protection & monitoring system



on-line monitor

on-line real time software

portable instruments



Vibrometer



Dual channel
Vibrometer
Balancer



Dual channel
Multipurpose vibrometer



ADS

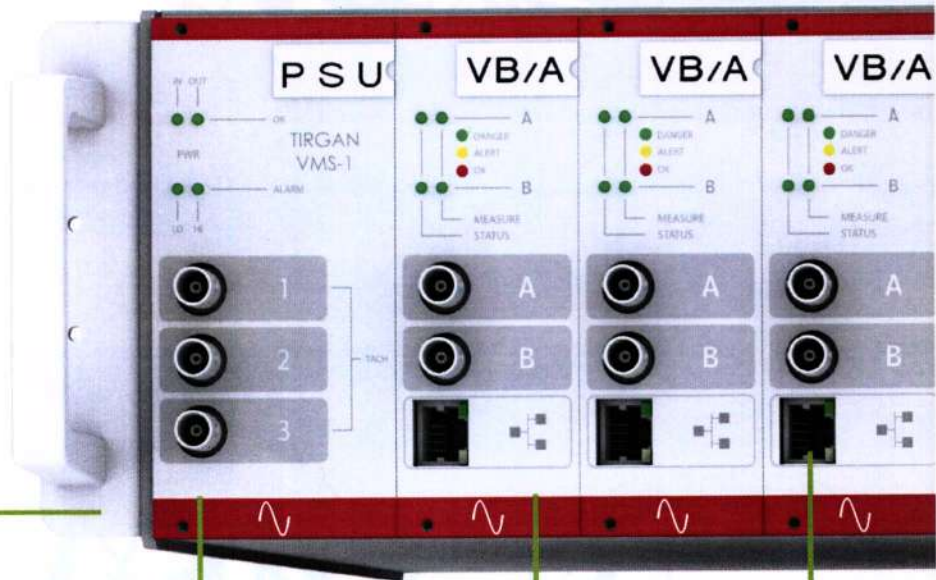
Advanced
Diagnostic
Software

post-processing software

one supplier, global solution

MODULES FEATURES:

- hot swap/plug
- real time & on-line
- high level intelligence on board
- decision making capabilities



19" RACK SIZE 3U

Small and custom for any kind of application

CONFIGURABLE VIA
ETHERNET PORT
100Mbps with SW Set-up

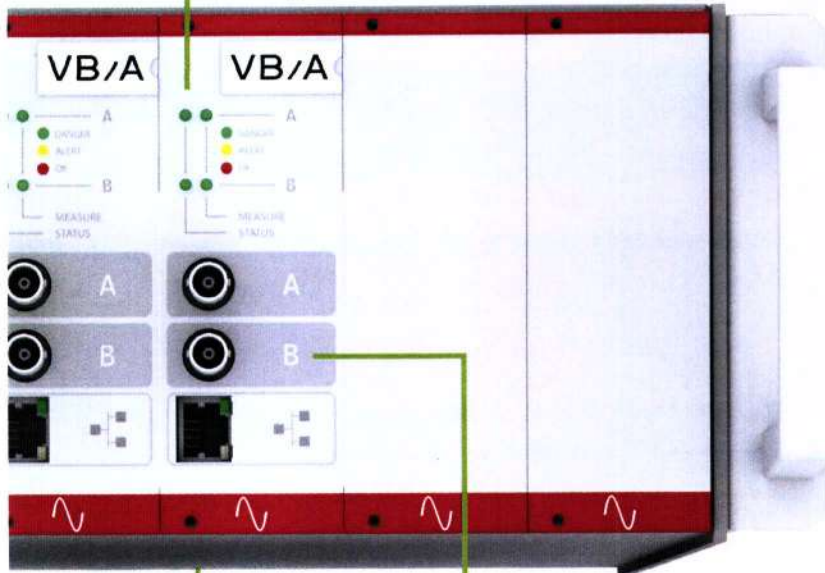
REDUNDANT POWER SUPPLY

- AC/DC power input
- Power relays status
- Led's status display
- 3 independent Phase reference channels
- 3 independent phase signal BNC

MODULE CHARACTERISTICS

- 2 Sensor inputs (including power supply)
- Phase reference
- 2 Analog outputs:
0-10V or 4-20mA opto isolated
- 4 Digital input (by-pass & trip multiplier)
- 6 independent relays with SPDT contact
- Any relay can be set in several way
(eg Overall, 1x, 2x, Gap, non 1x)
- 2 BNC connectors for analysis
- 4 multicolour LED
- Ethernet port 100Mbps

**SMART MULTICOLOR
LED INDICATORS**
For an easy operator analysis



FRONT PANEL BNC
For raw signal analysis

MODULE BASIS FUNCTION

- Protection against short-circuits
- Self diagnosis for anomalous conditions
- Sampling and digital conversion of signal
- LED measurements status indication
- LED indication thresholds

TYPE OF MEASUREMENT

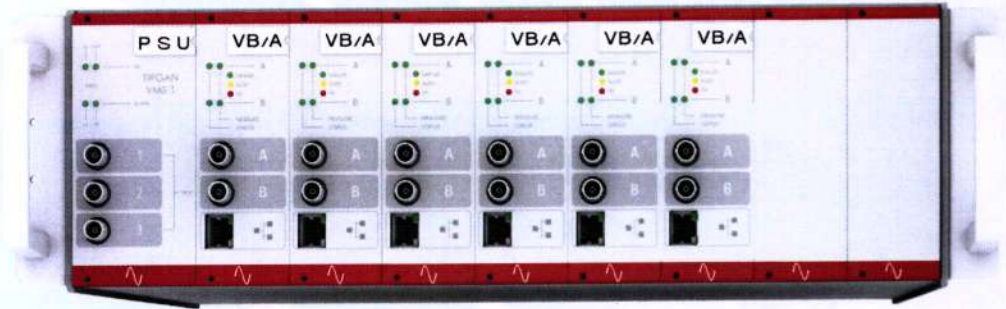
- Vibration
- Differential or absolute expansion
- Axial position
- Eccentricity
- Zero Speed
- Speed
- Over speed
- Reverse rotation
- Valve position
- WTVC (Wind turbine vibration controller)
- HTVC (Hydro turbine vibration controller)
- Generic process input 4-20mA

LEVEL 1 stand alone

► protection

FEATURES:

- Machine protection
- Analogue outputs
- Digital inputs and outputs
- Self diagnostic
- Led status



LEVEL 2 intermediate

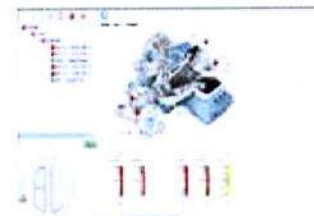
► protection + visual

FEATURES:

- Level 1 plus:
- Industrial PC with SW-On-line monitor
- SW TDSP set-up
- Time domain multitrend
- Global status graphical indicator
- Graphical user interface
- Real time machinery condition trend (Overall, 1x, 2x, non 1x, DC)
- Event history
- Plant organizer
- Remote diagnostic
- DCS integration through modbus TCP/IP communication



Integrated set-up software



Plant overview



Live trend



Live events list

LEVEL 3 complete plant

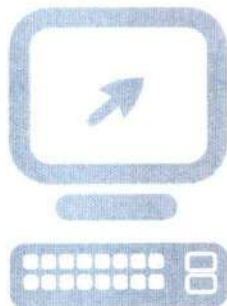
▶ protection + visual + diagnostic

FEATURES:

- Level 1&2 plus:
- Network of TDSP system



REMOTE on site PC with ADS
Advanced Diagnostic Software



REMOTE PC
with
Advanced Diagnostic Software



turbine



feed water
pump



cooling
tower



industrial
fan



compressor



gear box



motor



CEMB presents ADS
the advanced software
for remote condition monitoring

With this powerful tool it is possible to load the data and make different types of analysis in post-processing.
ADS has three different levels for satisfy all the requests coming from the market.

LEVEL 1 - Basic

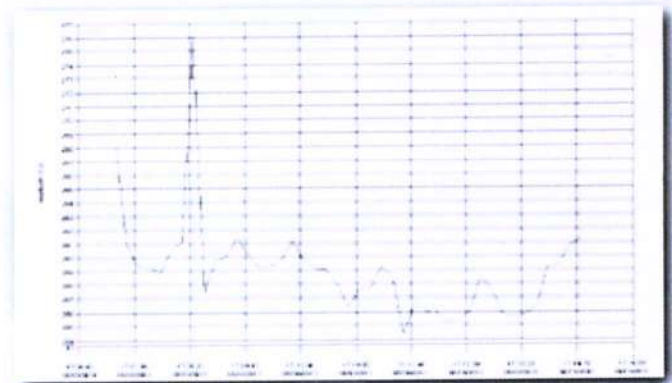
features:

- Multilanguage interface
- Different operator levels
- Analysis time domain
- Trend
- Cursor
- Event list
- Upload data from database MS SQL server for ON-SITE analysis
- Import workspace for post-analysis
- Data export to different format (jpg, xls)
- Zoom

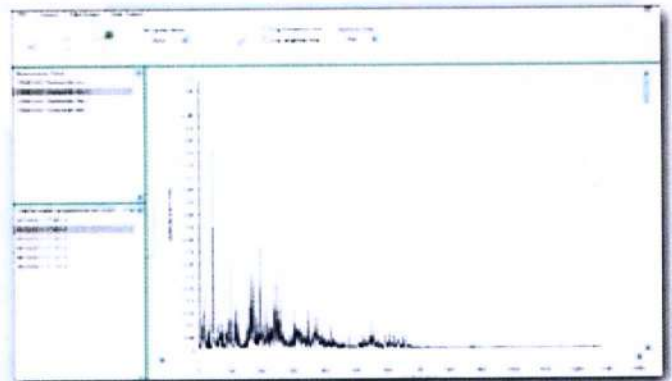
LEVEL 2 - Standard

features:

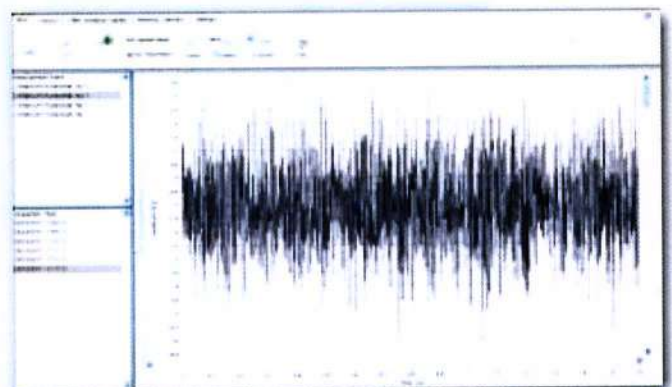
- All the functions level 1 plus
- Time waveform
 - Cursor with extra features (Δt , Δf , pK-pK)
 - Raw or filtered signal
 - Statistic information
 - Spectra
 - Cursor
 - Harmonic Cursor
 - Linear or Log scale
 - Peak list



TREND: Single or multi-graph for an easy side by side comparison of different trends.



SPECTRA: Frequency domain representation of vibration signal for machinery troubleshooting.



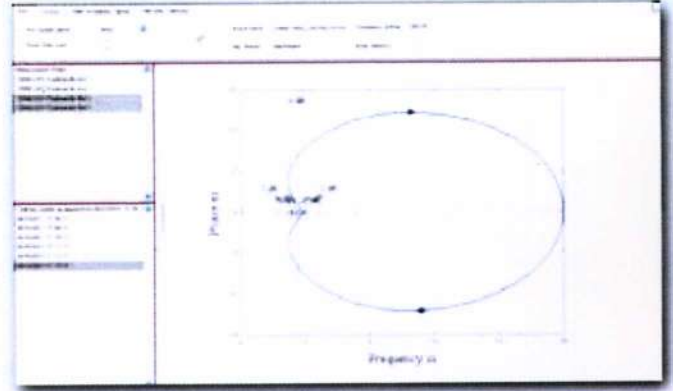
WAVEFORM: Time domain representation of raw or filtered vibration signal.

LEVEL 3 - Expert

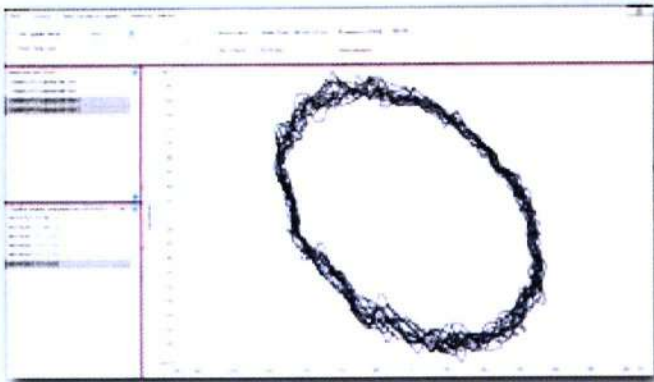
features:

All the functions level 1 and 2 plus

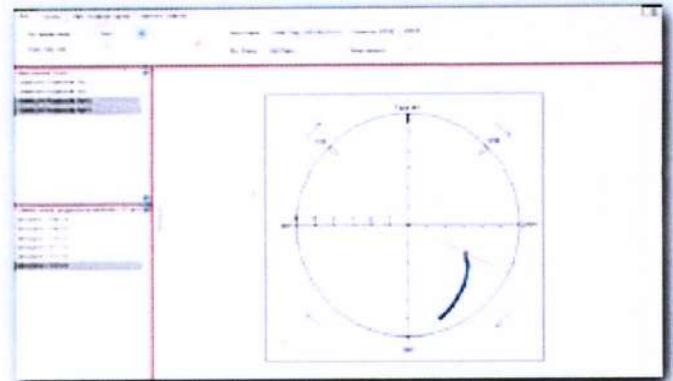
- Orbit
- Waterfall
- Bode
- Nyquist
- Shaft Centerline
- Color mapHz
- Full spectrum



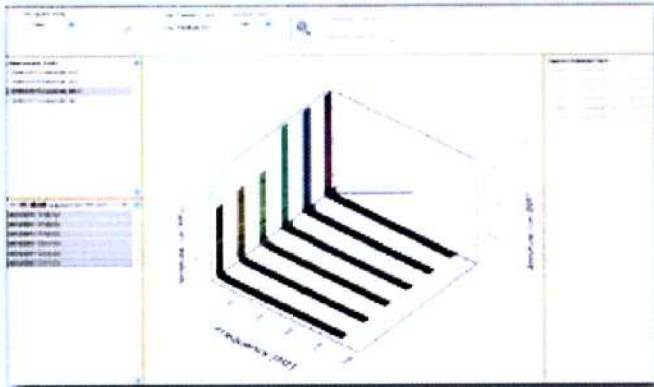
NYQUIST: Nyquist diagram for ramp-up / coast down analysis.



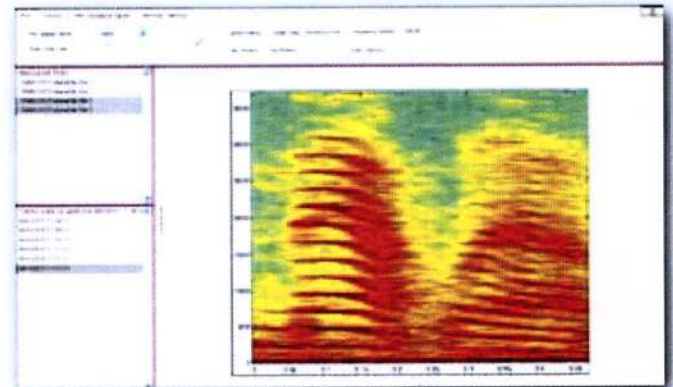
ORBIT: Time domain representation of X-Y vibration for analysis of shaft displacement.



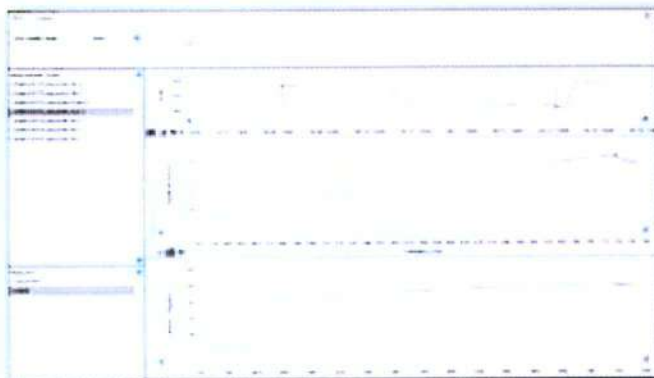
SHAFT CENTERLINE: Graphical representation of shaft displacement during ramp-up / coast down.



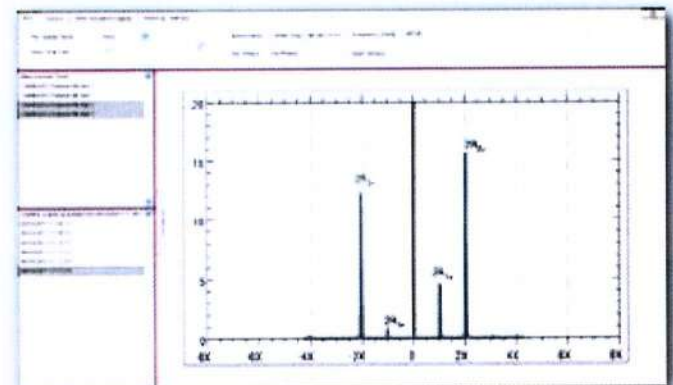
WATERFALL: 3D graph of multispectra data.



COLOR MAPHz: Time - frequency coloured graph for ramp-up / coast down analysis.



BODE: Amplitude and phase graph VS rpm for ramp-up / coast down analysis.



FULL SPECTRUM: Frequency analysis with separation of Forward - Backward components for advanced analysis.



 **TIRGAN**

VIBRATION ANALYSIS & CONDITION MONITORING EQUIPMENT

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