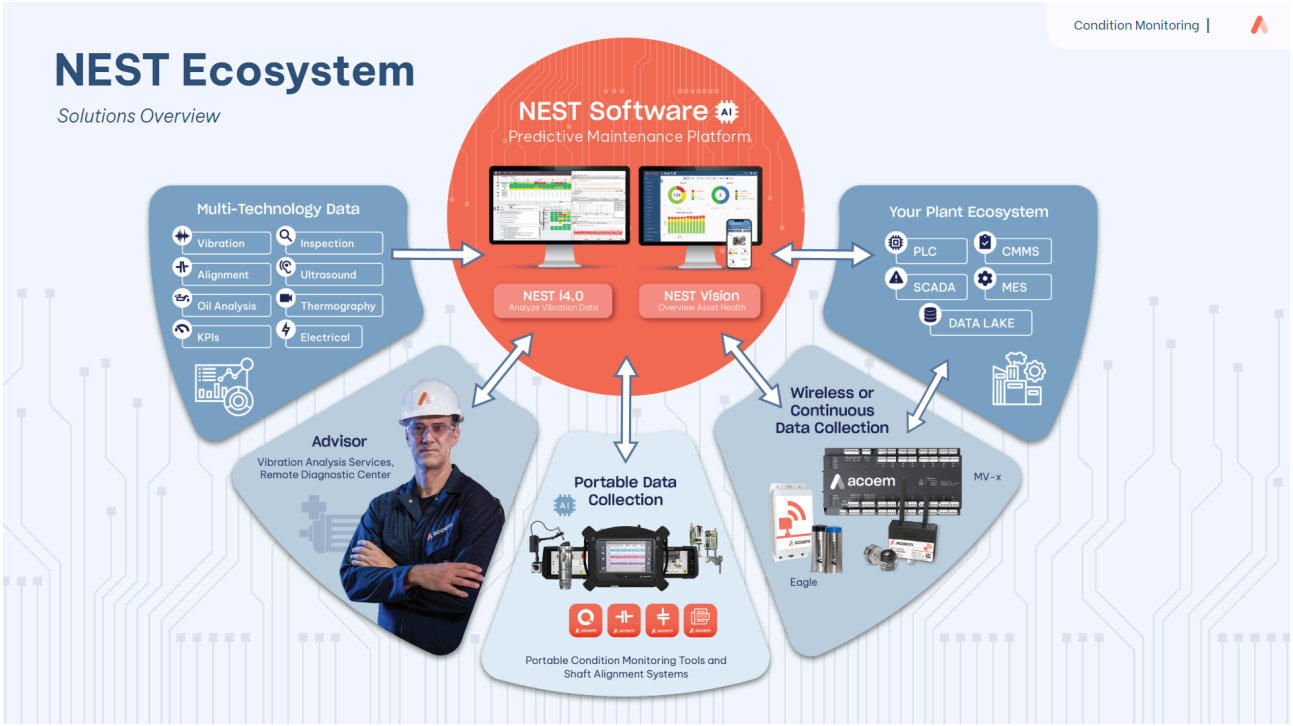
NEST Product Datasheet

Advanced Monitoring & Diagnostics for Rotating Machinery

Predictive maintenance drives industrial competitiveness. The NEST ecosystem provides a high-performance, unified platform that enables stakeholders across the organization to collaborate on shared data, streamlining the entire maintenance workflow. The NEST ecosystem delivers a powerful and productive solution to master predictive maintenance.



Deploy NEST immediately without advanced vibration expertise using Accurex™. This system automates setup through kinematic descriptions and provides instant diagnostic capabilities. Vibration specialists maximize their productivity by focusing exclusively on critical machinery identified by the system. The innovation embedded: Health Matrix, Accurex™ automatic diagnostics, Accurex™ SE prediction, SFx and HMx indexes, Merged Spectrum, Shock Finder Filter…



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Main modules



MACHINE SETUP Organize assets by location and sub-location. Define machines rapidly using the drag-and-drop tool in two optimized modes:

- Template mode: Accelerate configuration using standard or user-defined templates.
- Accurex™ mode: Automatically generate the precise measurement suite required for autonomous diagnostics via FALCON portable collectors, MVX on-line systems and EAGLE or SPARROW wireless sensors.



ANALYST Powerful module, with several tools to speed up your analysis and recommendations:

- The ACCUREX Matrix display
- SFx and HMx indexes
- Merged spectrum
- Shock finder filter



ROUTE SETUP Manages lists of machines used as routes to load the data collector or as filter in Analyst. Reorder machines to optimize data collection.



COLLECT Transfer route data to or from the data collector:

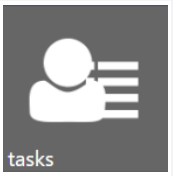
- direct link (USB, Ethernet, Wi-Fi)
- via Internet using intermediate files



INSTRUMENT Manage the communication with EAGLE and MV-x online monitoring system.



- ADMINISTRATION Manage the databases and users



TASKS Centralize your requests for internal expert reviews and speed up decision-making with the expert approval workflow.

General Specifications

Centralized database	• **Multi source:** FALCON portable device, MV-x on-line monitoring system and SPARROW or EAGLE wireless Online sensor • **Multi technical***: Vibration, Process, Oil, Ultrasound, Electrical, Thermography, Inspections ** can require some optional modules (NEST Vision, MVX, …)*
Architecture	The software is offered in two distinct editions: • **DESKTOP**: a single installation is done on each computer with access to local data • **NETWORK**: data is hosted on an application server connected to the network. All users are directly working on the same data through a network (LAN or WAN) or Internet. It includes user management with access profiles.
International application	• **Languages:** English, French, Simplified Chinese, Korean, Russian, Portuguese, Spanish, German, Dutch, Vietnamese, Indonesian, Japanese, Thai, Turkish, Italian, Traditional Chinese, Swedish • **Units:** Management of metric and imperial units. Can be adjusted at any time with user preference
User assistance	• **Contextual Help:** Access instant information for every function and button across all modules to ensure operational efficiency.

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- **Online Help:** The help menu is accessible at any time to present to the user the detailed description of functions as referred in the user manual

Data exchange

NEST integrates with third-party industrial systems through a wide range of standard protocols and file formats.

Inputs (external data sources)

- Process data from PLC, DCS, SCADA, historians: OPC UA Client (boolean and numeric tags, synchronous, asynchronous and high-resolution modes with dead-band)
- Process data from PLC and field devices: Modbus TCP (via on-premise instrument)
- Enterprise user authentication: LDAP (only on-premise deployment)
- Manual data entry: keyboard input, CSV import
- Legacy database migration: ZIP file import from XPR / NEST3 legacy systems

Outputs (external data destinations)

- SCADA, historians, CMMS, analytics platforms: OPC UA Server (live values, alarms, thresholds, parameters)
- PLC and control systems: Modbus TCP (via on-premise instrument, limited to instrument data)
- Data lakes, BI tools, custom integrations: REST API (RESTful, Bearer JWT authentication; machine health, expert advice, reports)
- Automated data export: CSV (scheduled, incremental)
- Reports: DOCX, PDF
- Notifications: SMTP email (alarm changes, expert advice approval, instrument faults)
- Web visualization: HTTPS browser access

Security & transport

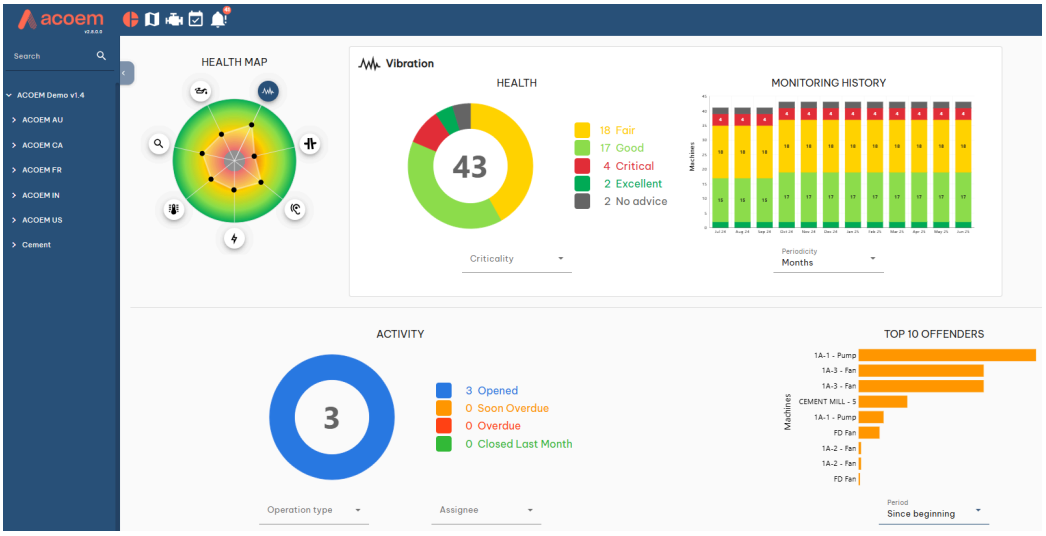
- All TCP-based interfaces (OPC UA, SMTP, LDAP, REST API) support SSL/TLS 1.3 encryption.

NEST Vision

Optional feature and only with Network edition

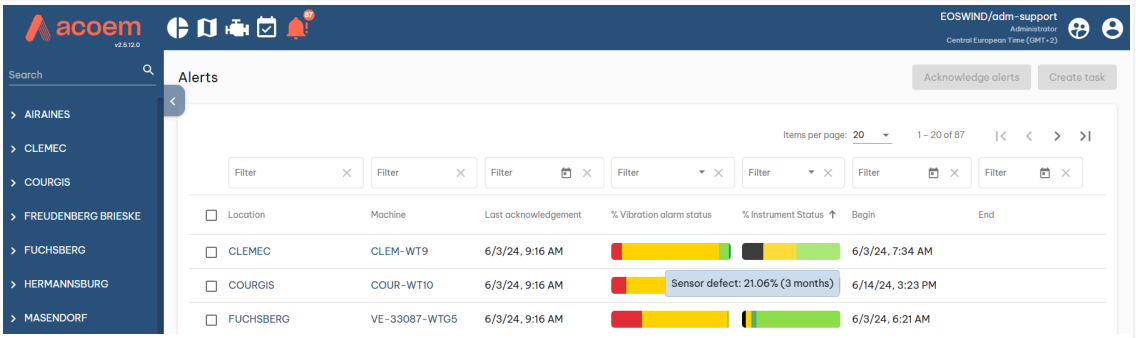
Full web supervision module for a multi database overview with

- Cross databases displays (Enterprise, Plant, Machine) with advanced filters capabilities
- Global KPI presentation

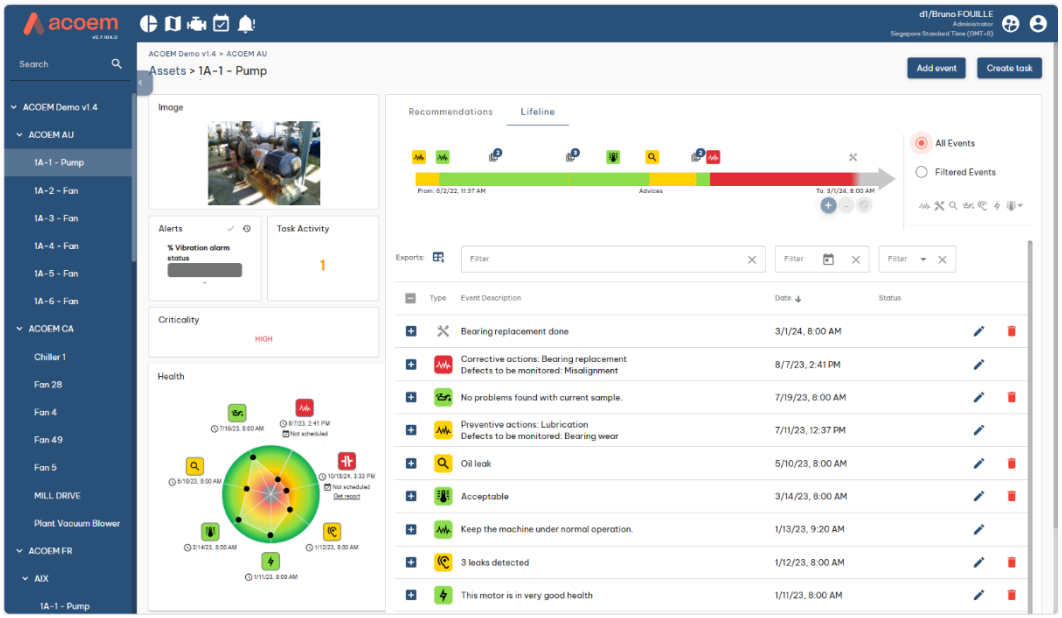


- Multi-mode (alarm, expert advice and live data) and multi-view (hierarchical, flat and map)
- Interface with Machine Defender (inbox, work orders)
- Advanced trending with alarm area for vibration, alignment and process parameters
- Alerts management with acknowledgment for machine alarms and instrument defects

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- Live data display with short term trend capabilities for machines with real time monitoring (MVX)
- Multi technical data management (vibration, alignment, oil, electrical, ultrasound, thermography, inspection, maintenance action, note) with attachments
- Machine Radar view (multi technical)



Automatic reporting capabilities

To improve maintenance planning and operations, one needs to be able to display in a very easy way:

- what has been detected through predictive maintenance technologies
- what has to be done
- when it should be done



NEST provides reporting capabilities, automatically illustrated and easily accessible.

Analysis reports	• **Automatic reporting**: reports are automatically generated just in a touch of a button. They are available at any time, for a single machine or group of machines with an active table of contents. • **Selectable content**: Synthesis Information, Diagnosis & Recommendation, Analysis. • **ACCUREX matrix**: machine defects and their location visible at a glance

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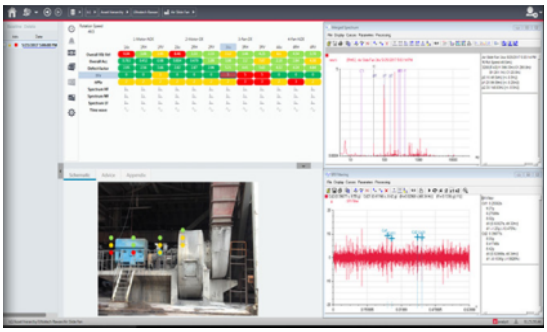
- **Hide / display parameter**: Advanced parameters can be hidden automatically and not be printed out in the reports. They remain fully available in the ANALYST module for the expert users.
- **Filtering and sorting**; machines can be easily filtered and sorted according to their name, status, advice, measurement date.
- **Format**: DOCX and PDF
- **Automatic picture insertion**: machine pictures, pictures attached in appendix (analysis, thermographic) or taken with FALCON data collector, are automatically printed out in the reports
- **Template customization**: templates of prelisted report types can be modified to adjust the content automatically extracted from the database. It manages the layout, including the possibility to add your own logo.



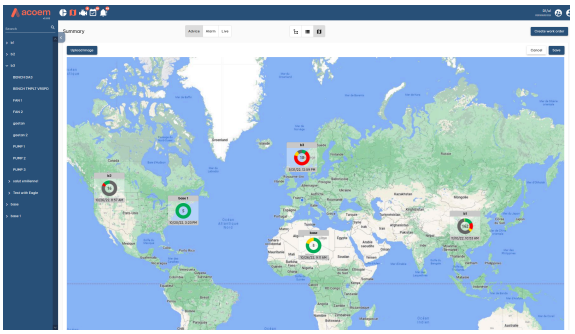
Data Presentation

NEST offers a user-friendly interface, providing an easy access to relevant information, whatever the number of machines monitored is, and whoever is using the software

Rich applicative client with advanced tools for expert analysis – NEST Analyst



Easy to use web client to consult data from any web browser – NEST Vision



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Structure	• **Data structure**: within a single database, it is possible to organize machines into several locations and sub locations to have them displayed in a quick and easy format. • **Data browsing tools**: the navigation from the top site view to the detailed analysis view and reports can be made through different ways. One or several tools are available according to the NEST module in use: Classic drill-in, Navigation toolbar or Tree structure.
Presentation	• **Location picture**: pictures can be added to locations and sub locations • **Machine position**: the machine can be positioned on the location picture to provide an easy access to the machine monitoring data • **Machine picture**: picture of the machine can be added for a better presentation of the results. If none is available, a schematic view can automatically be generated from the MACHINE SETUP module. • **Measurement point position**: measurement points can be positioned on the machine picture or schematics to provide a very visual presentation of the results.
Display modes	• **Map mode**: display on a map or image for a navigation that is as visual and intuitive as possible • **Icons**: Visualize health status with intuitive icons to balance data depth and rapid assessment. • **List**: display as a list, for maximum details and multiple sorting possibilities for the available information • **Tree structure**: A tree structure is also available in all NEST modules



Machine information	• **Bearing reference**: the machine bearings can be selected from the bearing database. Bearing characteristics are then automatically imported and frequencies of interests automatically displayed in the graphic tool • **Custom. Bearing**: the bearing database can be completed by the end user, if the bearing reference cannot be found. • **File attachment**: documents such as drawings or other document that might be useful at the analysis step can be attached to each machine • **User notes:** one can input written description notes associated to each machine.

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Data mining	• **Type of information displayed**: the machines can be displayed according to several types of information in order to help the user quickly finding machines of interest:
	  ○ The ADVICE view presents the machines according to the last expert advice. The 3 previous advices are also displayed
	  ○ The ALARM view presents the machines according to their alarm status. This view also shows the number of alerts and the number of days of measurement delay.
	• **FLAT view**: the FLAT view corresponds to the powerful capability of displaying a whole factory into a single view. It is then possible to sort and filter the machines displayed according to several criteria: name, measurement date, status, advice, …
	• **Filter on machines**: filters can be applied on machines from the ANALYST modules to only display given machines, with selectable filter options: alarm status, expert advice, not measured, route, machine name
	• **Filter on measurement history**: filters can be automatically applied on the measurement history of a given machine to enable productive analysis. The applicable filters are declined according the data filters tags available: Expert advice, Measurement with or without signal, Operating condition, measurement trigger, N last days, from D1 to D2.
	• **Measurement history tag display**: to find easily an event in the history, it listed with machine alarm status, the expert advice, the operating condition, the presence of signals or not, trig. Information, …
	• **Export in csv format**: general information of selected machines, overall value histories of selected machines

Portable data collection

NEST provides all features required to organize the assets into data collection routes.



The routes contain all information required to make productive and easy measurements: location pictures, machines pictures, machines and measurement points' position on the pictures...

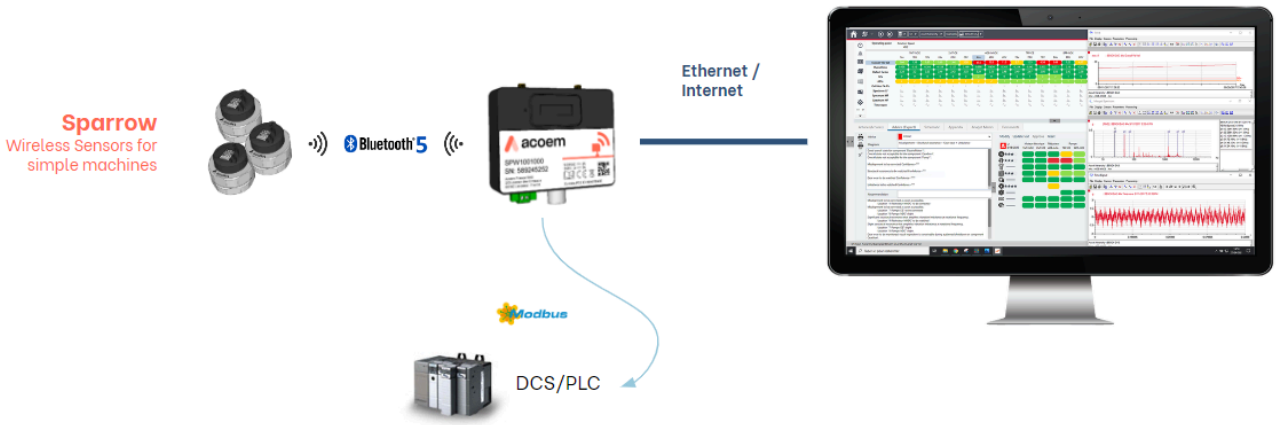
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Route creation	• **Definition of the list of machines**: selection of the machines contained in a route • **Modification of the order of the measurement points**: It is possible to rearrange the order of the measurement points so that they are presented automatically in the most productive way once the operator is in front of the machine. • **Smart reorder**: organise the route in the order it has been measured during the previous collect. • **Split machines**: As the focus is given to the measurement points, it is possible to split machines in the data collection process (e.g. measuring machine A and B on the left side, before measuring machine A and B on the right side…)
Quick launch	• **Single machine**: a quick launch feature is provided to send a machine to a FALCON portable data collector by touching a button, without pre-creating a route. It makes it very convenient for quick testing. • **Multiple machines**: it is possible to send several machines at once in this mode. The machines are displayed as individual machines and not as part of the same route.
Transfer mode	• **Direct USB connection**: the files are transferred to a FALCON connected directly to the computer with its USB cable • **Local network**: the files are transferred to a FALCON connected to the network with an Ethernet plug or through a Wi-Fi connection. • **Transfer through intermediate files**: the use of intermediate files allows for transferring routes through a USB stick, and, for example, after a transfer by e-mail
Route setup pictures	• **Automatic insertion of pictures taken with FALCON**: FALCON offers the unique possibility to add route related pictures to the machine setup. Once a picture of a machine or location is taken on the field with FALCON, it is automatically uploaded and stored into the NEST software when the measurement data are uploaded.
Route related information	• **Audio note**: audio notes recorded on the field while measuring with FALCON are automatically uploaded to the NEST database and available to any user at the analysis step • **Written note**: notes typed in the field while measuring with FALCON are automatically uploaded to the NEST database and available to any user at the analysis step. Written notes can be automatically printed in the data collection reports. • **Predefined notes**: loaded in the data collector to make the input easier and faster. • **Inspection picture**: inspection pictures taken in the field while measuring with FALCON are automatically uploaded to the NEST database, available to any user at the analysis step, and printed out automatically in the reports.
Off-Route management	• **Machines downloading from FALCON Off-Route mode**: machines are automatically created in NEST database. • **Merge** Off-Route measurements with existing machines.

Wireless Sensors monitoring with SPARROW system

The NEST Network Edition manages high-volume monitoring for **SPARROW** wireless systems. This entry-level solution monitors simple machines (non-geared) and integrates Accurex™ Smart Exception on the ACOEM Cloud to detect machine behavioral shifts automatically and Accurex™ to diagnose faults automatically.

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It provides vibration (1 or 3 axis) and temperature measurement. Sensors are easy-to-deploy as it eliminates the wiring for each sensor. Monitored data can be supplied to third party system through Modbus TCP.

Machine setup	• Measurement strategy
	  ○ Distinct periodicity for overall levels and time wave or spectrum
	  ○ Measurement stored on aggravating alarm status change
	• Managed measurements
	  ○ 1 temperature + 1 time wave (acceleration) per axis / sensor
	  ○ All post processings
	• Sensor connection ; smart 3-axis sensor management based on sensor positioning

Instrument setup	• Connection with gateways • Modbus output address settings
Analyst	• Alert counter: this counter shows if some changes have occurred on a machine since last Advice. It is automatically reset if an expert approves a diagnosis on the latest measurement.

Wireless Sensors monitoring with EAGLE System

Manage critical assets with the **EAGLE** wireless system. NEST provides advanced monitoring features and leverages Accurex™ for automated defect detection.

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It provides vibration (1 or 3 axis) and temperature measurement. Sensors are easy-to-deploy as it eliminates the wiring for each sensor. Monitored data can be supplied to third party system through Modbus TCP.

Machine setup	• Variable speed machine compatible
	  ○ Management of operating conditions: 6 operating parameters (speed, power…) can be used to define up to 20 operating conditions.
	  ○ Indicators and alarm thresholds can be adjusted for each operating condition
	• Reading of operating parameters continuously
	  ○ Modbus TCP inputs (via gateway)
	• Monitoring strategy can be defined for each operating condition
	  ○ Trigger mode: Periodical, On Condition or On Alarm (aggravating only)
	  ○ Data reduction per data type – ie: Overall levels, Time signals or Spectrums
	• Measurement types per sensor (1 or 3-axis) compatible with all post processing
	  ○ 1 Temperature + Overall (velocity, acceleration), spectrum (velocity, acceleration), envelope spectrum (acceleration), time wave (acceleration) per axis
	• Sensor connection ; smart 3-axis sensor management based on sensor positioning

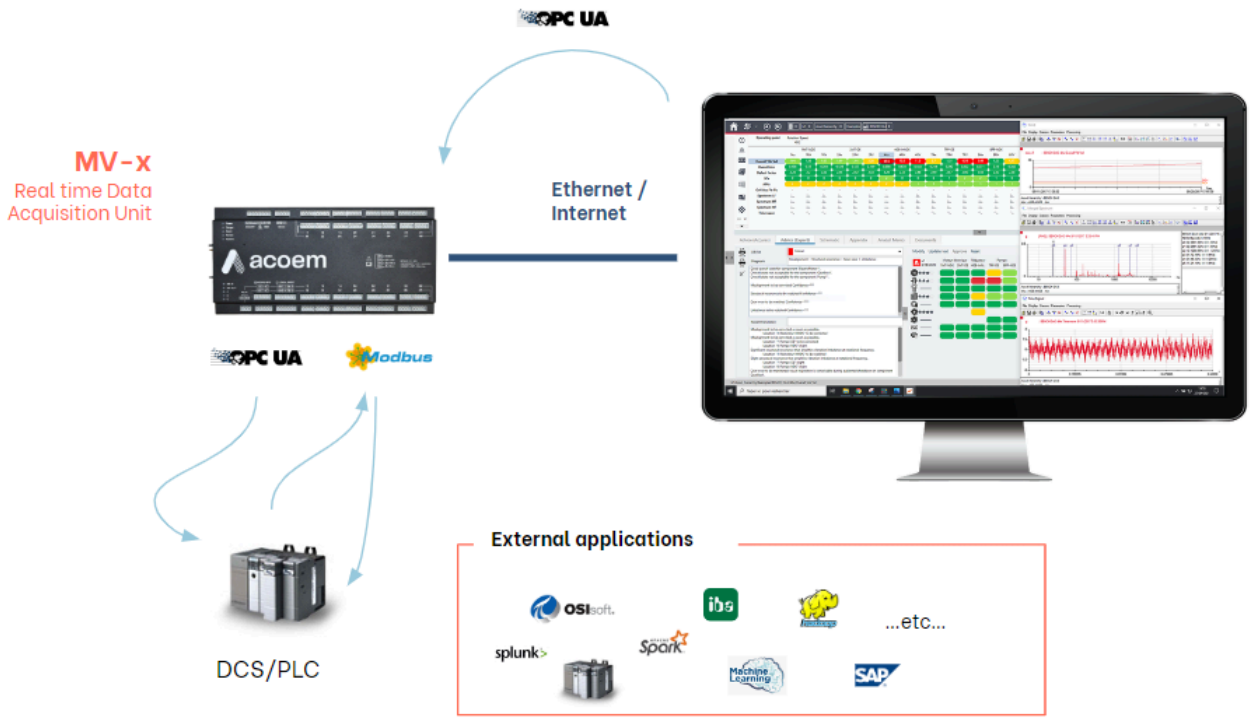
Instrument setup	• Connection with gateways + status monitoring • Modbus inputs & output address settings • Automatic tracking of sensor DC offset (earth gravity) to identify potential sensor detachment
Analyst	• Alert counter shows if some new alarms occurred on machines since last expert approvals

High-performance real-time monitoring with MVX

Take Control of Your Data with an Adaptive Strategy

Enjoy robust real-time data acquisition with intelligent trigger modes (periodic, conditional, or on-alarm). MVX optimizes your monitoring by automatically adjusting your measurement lists and alarm thresholds based on the machine's current operating conditions, ensuring complete accuracy.

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Monitored data can also be supplied to third party system through Modbus TCP.

Machine setup	• Variable speed machine compatible
	  ○ Management of operating conditions: 6 operating parameters (speed, power…) can be used to define up to 20 operating conditions.
	  ○ Indicators and alarm thresholds can be adjusted for each operating condition
	• Order tracking (RSS) compatible
	  ○ Detect all repetitive phenomena related to machine kinematics and can be used for a continuous monitoring - i.e. bearing fault detection
	  ○ Revolution Synchronous Sampling for variable low speed machine
	  ▪ Dedicated to machine monitored with MVX
	  ▪ Identify rotational synchronous phenomena despite speed fluctuations.
	  ○ Need a tachometer to measure rotational speed continuously
	• Reading of operating parameters continuously
	  ○ From Modbus TCP (via MVX) and/or OPC UA (via NEST) protocols
	  ○ From MV-x analogic or logical inputs
	  ○ Smart ON-OFF vibration parameter to detect when the machine is operating
	• Monitoring strategy can be defined for each operating condition
	  ○ Intelligent triggering: Execute measurements periodically, upon conditional changes, or during alarm states (aggravating only).
	  ○ Data reduction per data type – ie: Overall levels, Time signals or Spectrums
	• Measurement types per channel compatible with all post processing
	  ○ Input types: IEPE, AC/DC,4-20mA, tachometer, logical I/O, Modbus I/O
	  ○ Output types: Modbus I/O, relay
	• Sensor connection

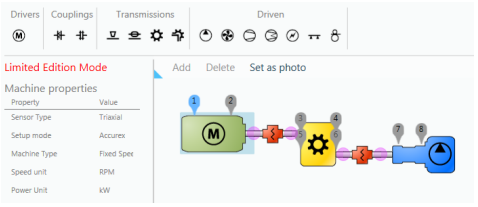
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Instrument setup	• Connection with MVX device + status monitoring • Modbus inputs & output address settings
Analyst	• Alert counter shows if some new alarms occurred on machines since last expert approvals

Unmatched productivity for monitoring your machines

NEST offers all tools required to perform fast and easy measurement setup.

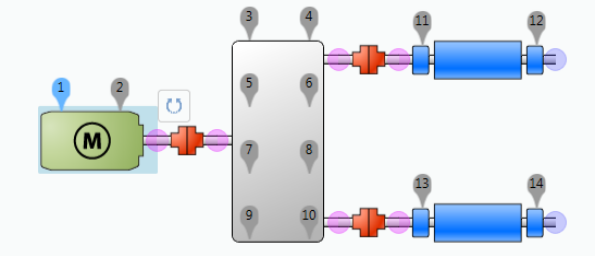
The power of Accurex™ diagnostics makes vibration analysis accessible to everyone, while providing experts with advanced productivity tools.



Automatic setup	**Accurex mode** (automatic diagnosis): The drag & drop tool allows for an easy graphic description of the machine. The measurements required to perform FALCON automatic diagnosis are then automatically generated. It is also available with SPARROW, EAGLE and MV-x monitoring instruments. **Accurex Smart Exception***: Monitor without complex or unreliable alarm thresholds. Get instant alerts for every change in machine behavior with our SPARROW sensors. **Machine Schematic**: The drag & drop tool allows for an easy graphic description of the machine. • Visual Health Matrix based manual setup • The measurement generated can be generated from one or several templates. Templates are supplied by ACOEM and can be fully adjusted by the user. • Modification on multiple selection of parameters on a machine • Management of measurement for accelerometer, velocimeter or proximity probes **Triaxial / uniaxial sensor**: automatic management of the type of sensor * Requires an ACOEM Cloud subscription.
Available components in the drag & drop tool	**Driver**: Motor **Coupling**: Flexible coupling, Rigid coupling **Transmission**: Belt/pulley transmission , Chain transmission, Gearbox, Angular or bevel gearbox, Planetary gearbox

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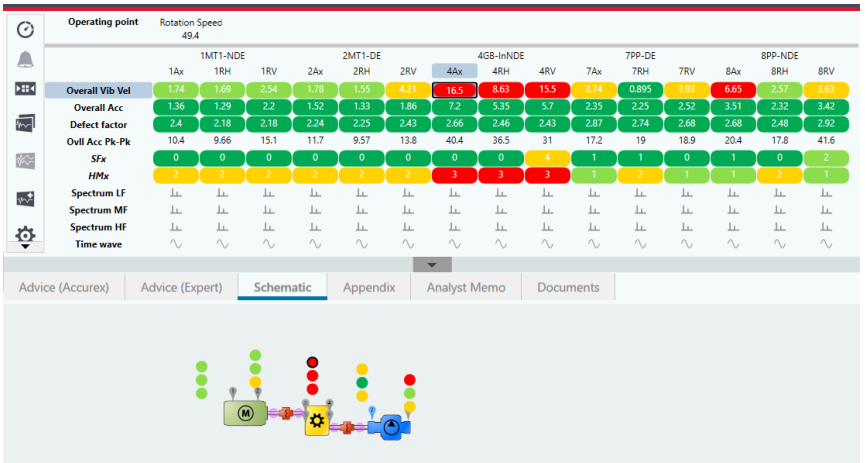
	Driven component: Pump, Fan, Centrifugal compressor, Lobe compressor, Alternator or Generator, Shaft, Roller
Custom component	This type of component is used to create any machines which are not listed above: custom labelling, 1 to 8 bearings, 1 or 2 outputs to connect it to other components.
Machine management	**Machine copy / paste**: it is very easy to create one or several machines at a time just by simple copy/paste of other machines **Import / Export**: Easily share data between several NEST databases within the same or different factories



Augmented Analysis & Diagnosis

NEST is redefining diagnostic standards with its exclusive features: Health Matrix, Defect Matrix, Accurex™, and more…

Health Matrix	• The **most productive** data presentation available on the market for diagnosis purposes. All monitoring and diagnosis indicators are presented into a single matrix view: Measurement locations are presented in columns and parameters in rows with their alarm status. Once alarm thresholds are adjusted, the user can know at a glance if there is a defect and where it is located on the machine.

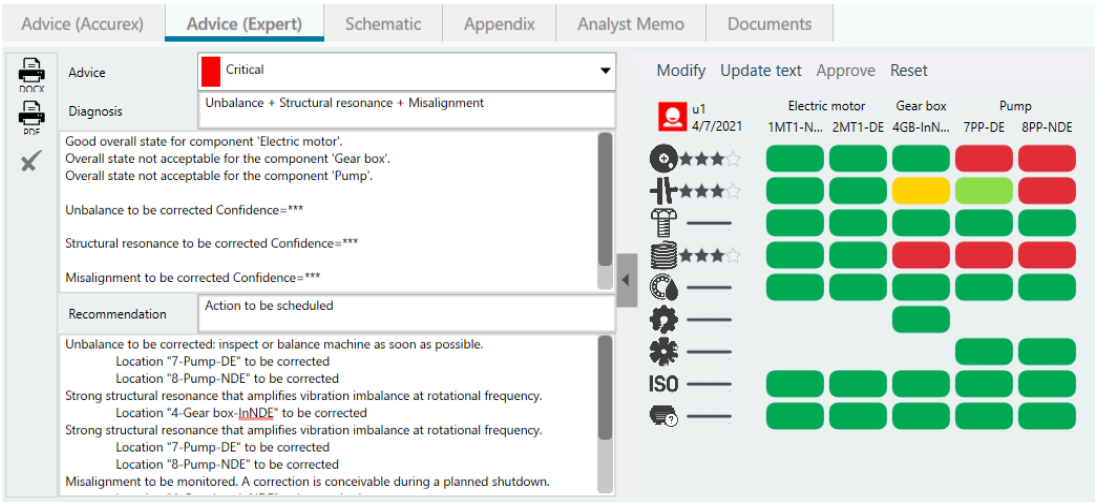


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Accurex Matrix

Accurex™ technology automatically pre-fills your defect matrix for an immediate and reliable assessment of your assets' condition. Designed for experts, this tool speeds up your diagnostic process:

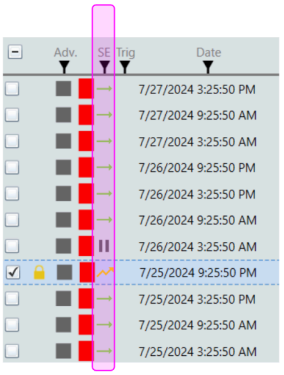
- **Instant analysis**: Get a defect matrix automatically populated by Accurex™ algorithms.
- **Total flexibility**: The expert retains final control: easily adjust the matrix to refine the diagnosis based on your field observations.
- **One-click reporting**: Once validated, instantly generate comprehensive reports including precise diagnoses and corrective recommendations.

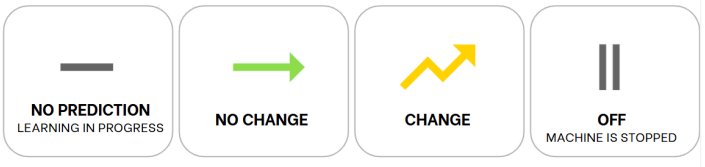


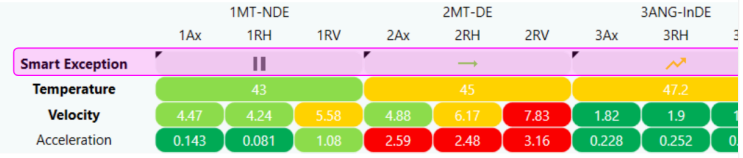
Accurex SE Prediction

available only for Sparrow machines on the ACOEM Cloud

- **Accurex SE prediction** is based on a digital model of the machine based on a field learning phase (unsupervised learning)
  - Provide reliable fault detection based on machine behavior
  - No false alarms due to bad thresholds values
  - Deliver a smart ON /OFF information on machine







- Expert can input feedbacks to **reinforce** the digital model of the machine and improve prediction

Trending

- **Trending capabilities**: trends can be displayed on the whole measurement history for each parameter or on the filtered measurement history.
- **Trend per operating condition**: trends of each parameter can be filtered on measurement history based on the operating condition of the machine.

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	• **Filter from trend**: data can be filtered from a simple trend: select the dates to display from the trend and simply filter in one click. • **Several plots** can be added on a trend and information related to each plot is displayed.
Standard Parameters	• **Scalar data**: Running speed, Overall vibration level (acceleration, velocity, displacement), bearing defect factor, Kurtosis, process data (temperature, load, pressure or any other type of data from a DC voltage or keyboard input) • **Dynamic data**: vibration data accessible in the health matrix or any other dynamic data (current, pressure, torque, …) displayed in the process data area • **Tri-axial accelerometer**: Management of tri-axial measurements for FALCON portable data collector
Signals	Spectrum, Zoom, Envelope spectrum, Time waveform, Phased spectrum, Synchronous time waveform
ACCUREX Automatic Diagnosis	• **Machine and components types**: Electric motors (synchronous, asynchronous, DC), Pump, Fan, Compressors (Centrifuge, Lobed), Gearbox with up to 4 stages, Bevel gearbox, Roller, Shaft • **Main analysed defects**: Unbalance, Misalignment, Bearing and lubrication, Mounting, clearance, friction, Gear defects, Cavitation • **Expert feedback**: keep the last expert assessment if the vibration behaviour is similar. • **Limitations**: machines with roller bearings with running speed from 120 to 12000 RPM
ACOEM Technology	• **Defect factor**: Indicator embedding ACOEM expertise and representative of the bearing health condition of the machine • **SFx**: Shock Finder index is based on the ACOEM Shock Finder technology. You can see at a glance the location on the machine generating shocks without the need to analyse in detail every time waves • **HMx**: Harmonic index indicates if low or medium frequency spectra include significant harmonic families. You can see at a glance the location on the machine generating high level of harmonics without the need to analyse in detail every spectra
Post-Processing	Post processings can be calculated automatically and/or manually on any measurement coming from FALCON, EAGLE, SPARROW or MVX: • **On FFT**: Peak amplitude value; Broadband energy calculation • **On Envelope spectrum**: Peak amplitude value; Broadband energy calculation • **On phased spectrum**: Peak amplitude and phase values • **On time waveforms**: Kurtosis, Statistics. • **Parameter combination**: +, -, *, /, quadratic sum and difference, AND, OR • **On measurement history**: Post-processing indicators can be defined at any time. NEST offers the possibility to calculate the value of this indicator on the whole measurement history, thus providing you the ability to trend it over time, even if it has never been measured before. • **Modification of the rotation speed**: If the rotation speed was not measured, it can be modified by the expert. All post-processing can be automatically recalculated for the given measurement date, taking into account the adequate rotation speed.

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	It is also possible to run manually the Accurex diagnosis to reprocess machines measured with FALCON, EAGLE or MVX in case of rotation speed adjustment. • **Relative alarms**: Automatic advanced alarms can be post-processed: evolution compared to the previous date, evolution compared to baseline.
Diagnosis-Related Features	• **Expert Recommendation**: Summary and free description text to be filled in by the expert, associated to a measurement control date of the machine. • **Expert full diagnosis**: Summary and free description text to be filled in by the expert, associated to a measurement control date of the machine. • **Automatic screenshot attachment**: Measurement and diagnosis can be illustrated by adding screenshots of the graphic tool by a touch of a button. These pictures are automatically printed out in the reports • **Inspection picture attachment**: Inspection pictures can be attached to a control date, either manually by the user or automatically if the measurement is coming from FALCON portable data collector. These pictures are printed out automatically in the reports • **Audio comment**: Listen to the FALCON audio comment recorded in situ • **Expert advice tag**: Once the analysis is done, the expert can tag the measurement control with his/her advice, which will prevail on the alarm status of the machine according to the type of display selected in NEST: EXCELLENT, GOOD, FAIR, CRITICAL. Each advice tag is represented by a different colour code (GREEN, LIGHT GREEN, ORANGE, RED)

Graphical accuracy analysis

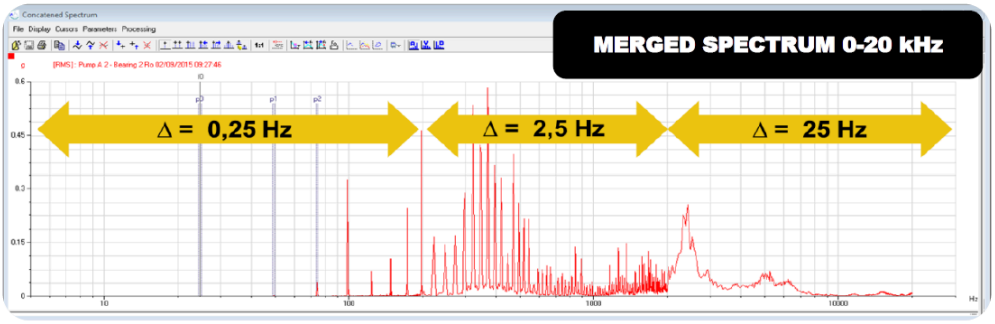
NEST graphic analysis tool offers powerful diagnosis capabilities, leaving the experts with the certainty to have all they need at hand to issue the most accurate diagnosis.

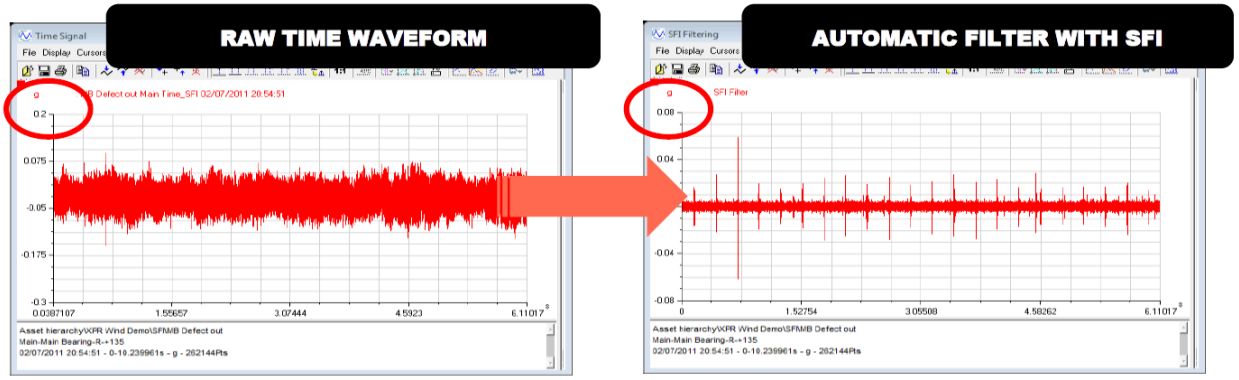
In addition to standard tools, NEST users also benefit from dedicated technology relying on years of experience in the field of vibration analysis of rotating machines.

ACOEM dedicated technology	• **Merged spectrum**: displays for the analysis of a single plot including all spectra from a point with the best resolution (e.g., merging low frequency, middle frequency and high frequency spectra that were basically measured separately). • **Shock Finder Filter**: it can be applied manually by post-processing in the NEST graphic tool. It embeds ACOEM expertise to highlight the presence of abnormal periodic shocks and reveals mechanical faults at a very early stage. • **Bode Ellipse spectrum**: Patented display allowing for reliable critical speed characterization when measuring the run-up / coast-down phase with FALCON
Data comparison	• **Baseline**: The baseline date can be defined by the user to facilitate the comparison with other data. It can be modified at any time, e.g., after each maintenance operation • **Superposition**: ○ Manual superposition of signals from the same measurement (different measurement location) or from different measurement controls in the history

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	○ Automatic superposition with the baseline measurement control date ○ Automatic superposition with the previous measurement control date ○ Automatic 3D waterfall view on the measurement history ○ Quick display of single spectrum from the waterfall view
General display option	• **Multiple windows**: Each signal is opened in a new window. Superposition is done manually • **Frequency unit**: Hz, RPM or Order • **Vibration unit preferences**: IS or Imperial • **Cursor customization**: Colour, thickness, texture, number of harmonics, number of sidebands, elementary displacement step • **Other settings**: Background colour, X and Y gradation grid, gradation numerical format, printer margins • **User notes area**: Possibility to add comments on any graph to be printed.



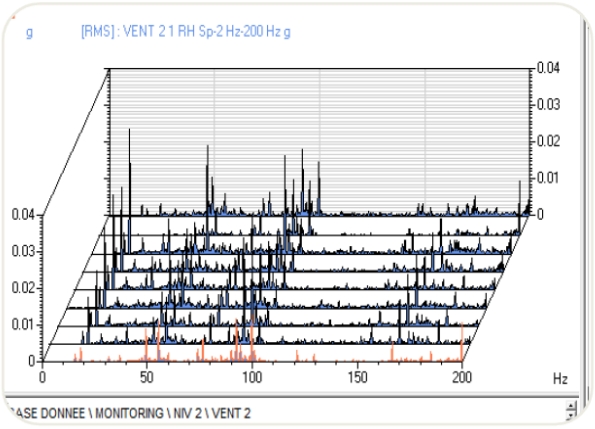


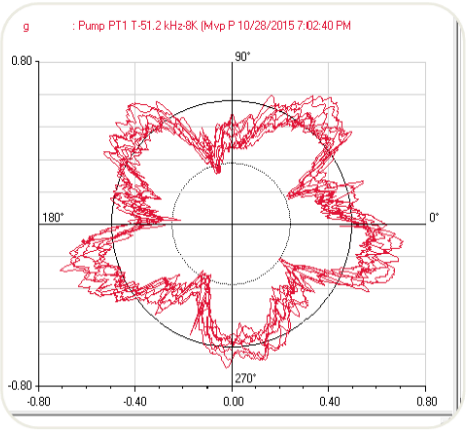
FFT	• **Cursors**: ○ Simple cursor with indication of frequency and amplitude in 3 units (acceleration, velocity and displacement). ○ Double cursor with indication of frequency and amplitude of each pointer and their distance. Indication of RMS value between cursors. ○ Copy/paste function to position other double cursors with the same distance. ○ Sideband cursor with adjustment of the number of lines ○ Copy/paste function to position other cursors with the same distance ○ Multi-cursor mode (several independent single cursors on the same graph) • **FFT Display options**:

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	○ Switch button to select the amplitude of the signal to display (automatic integration or derivation of the signal): acceleration, velocity or displacement ○ Linear or logarithmic X and Y scales ○ Frequency in Hz, RPM or Order ○ Scales: automatic, fixed, zoom ○ Amplitude in dB, EU or spectral density ○ Amplitude RMS / Peak / Peak-to-Peak • **Post-processing**: Cepstrum • **Fault frequencies**: Automatic prepositioning of expected frequencies of the point or the whole machine. Automatic adjustment by post-processing if the rotation speed is modified. • **Bearing frequencies**: Automatic prepositioning of bearing characteristic frequencies. Automatic adjustment by post-processing if the rotation speed is modified
Time waveform	• **Display options**: Standard view, Circular view • **Orbit post-processing**: ○ 3 modes: unfiltered, harmonic (H1, H2, H3), low pass ○ Selection of time limits: manual or automatic (number of cycles) • **Filter post-processing**: High pass, low pass, band pass, band cut, Shock Finder • **Auto spectrum** post-processing: Automatic spectrum post-processing from the stored time waveform.
Order analysis display*	• **Bode diagram**: Selection of harmonic 1 to 10 with possible superimposition • **Nyquist diagram**: Selection of harmonic 1 to 10 with possible superimposition • **FFT display**: Simple or waterfall • **Other type of display**: Position (t), Position (RPM), Polar position, Orbit (filtered or not, with or without position), Ellipse spectrum, Ellipse Bode diagram, Waterfall Emax, rotation speed over time * on measurements coming from FALCON Run Up Coast Down
Cross channel analysis*	• Amplitude spectrum • Power spectrum • Coherence function • 2/1 and 1/2 transfer functions, Cross-spectrum in modulus, phase, real part, imaginary part • Display on one or two plots • UFF export for structure analysis software * On measurements coming from FALCON FRF module

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Data management

Compatibility

- Portable data collectors: FALCON
- Online systems: SPARROW, EAGLE and MV-x monitoring system
- External applications : OPC UA server, SFTP server (for MVX machine only)

Backup & Archiving

- **Backup** database to secure data
  - **Manual**: A database backup makes a full copy of all data within the database
  - **Automatic**: Database backups can be programmed, performed at a given periodicity and time and automatically exported to a selected location on the network
- **Archiving** machine signals (spectrum and/or timewave) to reduce database size
  - **Manual**: select one or more machine, a time range to extract a ZPA file per machine

Data volume limitation

- **Manual deletion**: Measurement dates can be manually deleted from the history
- **Automatic data clean-up** per data type and based on a rolling schedule
- **Data protection**: Measurement dates of interest are automatically protected to avoid any hazardous deletion

System administration (Network edition)

Authentication

- 5 default user profiles
- Dedicated profile for instruments connection (sparrow, eagle, mvx) and for API external users
- Configurable additional profiles
- Access level can be defined per user for each database
- Possibility to use LDAP directory (only for user accounts)

Encryption

- Possibility to encrypt communication ; need to use a SSL certificate – not provided by ACOEM
  - between NEST clients and server
  - between ACOEM online acquisition devices and NEST server

NEST Editions options

	DESKTOP	NETWORK

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Multi users Collaborative solution	No	Yes
FALCON	Yes	Option
EAGLE	No	Option “Activation”: 10 sensors maxi. Option “Extension”: unlimited sensors Option “Accurex mode”
MV-x	No	Option “Activation”: 1 device maxi. Option “Extension”: unlimited device Option “Accurex mode”
SPARROW	No	Quantity of sparrow sensor (0 to …) Option “Accurex mode” (including Smart Exception in Cloud mode)
Interoperability OPC UA client & server, CSV file export & API REST	No	Option “Activation”: Overall & diagnostics Option “Extension”: Overall & diagnostics + signals + quantity of external OPC UA tags
NEST Vision	No	Option “Activation”, and number of Named User access

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