AESSE MISURE s.r.l.

AS-smart

Comprehensive system for end-of-line quality control, based on acoustic and vibration data.

Already applied on many different products:

- Gearboxes
- Reducers
- Axles
- Pumps
- Air collectors
- Electrical motors
- Household Appliances
- Brake pads
- Injectors
- Security Belts
- Valves Seats
- Turbine blades
- Automotive electronic devices
- Vibration absorbers
- Fans
- …..

AESSE MISURE s.r.l.

AS-Smart Philosophy

Production line

Weakness identification

Statistic of production quality

Early identification of defective components

Subjective judges

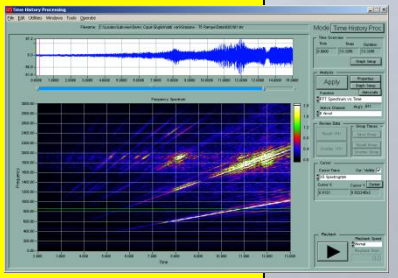
Large measurement database

Design dpt.

R&D dpt.

Test Lab.

DataBase



Fail

Improved quality

Reduced number of Fail

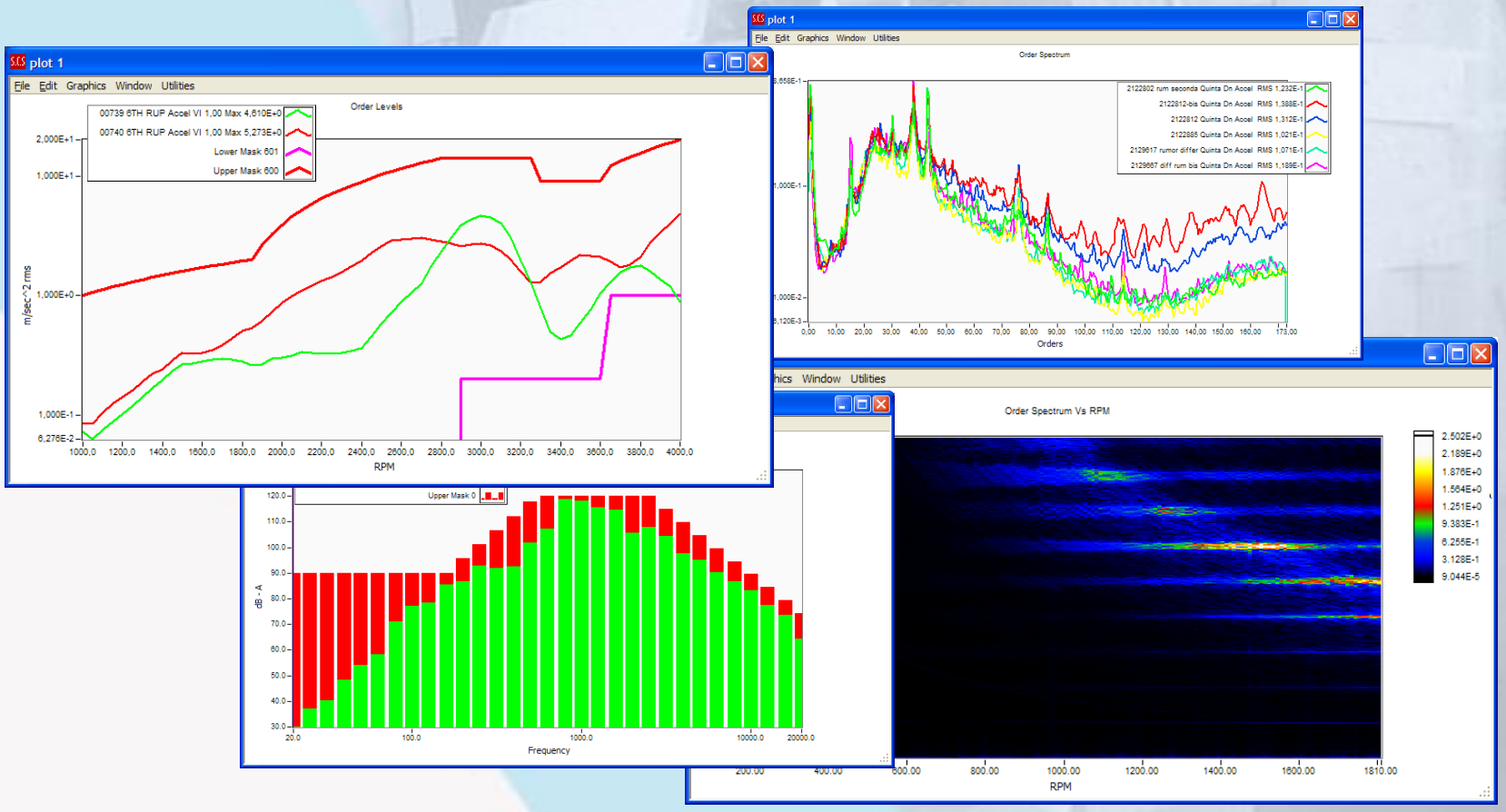
Better products

Pass

AESSE MISURE s.r.l.

AS-Smart Key features

Total measurement flexibility



AESSE MISURE s.r.l.

AS-Smart Key features

Hardware

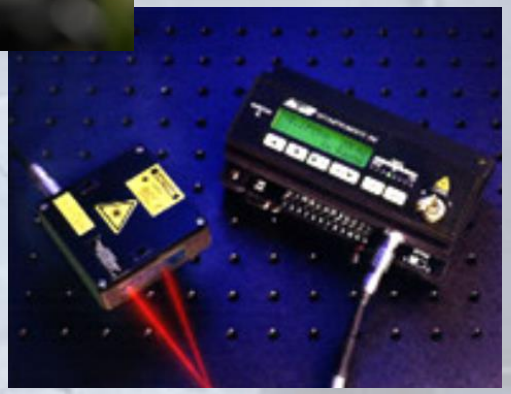
- Several National Instruments devices supported: Multi-channels dynamic boards (i.e, PCI447x)
- Single Slot USB or Ethernet modules (i.e. USB9234)
- Modular CompaqDaq chassis, with analog and digital I/O modules.
- Standard National Instruments (support, spares, scalability, compatibility, etc.).
- Other solutions available on request.

AESSE MISURE s.r.l.

AS-Smart– Key features

Several sensor types and versions supported:

- Accelerometer
- Velocimeters
- Proximity probes
- Microphones
- Laser sensors
- DC measuments (Pressure, Temperature, etc.)

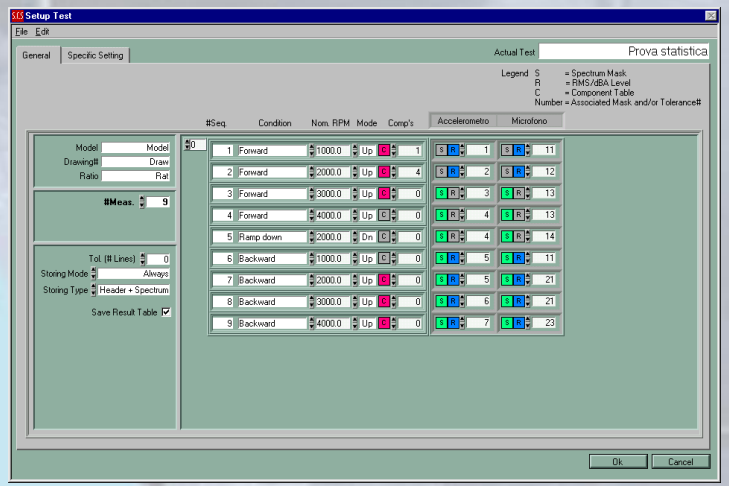


AESSE MISURE s.r.l.

AS-Smart Key features

Automation:

- Configurable for manual, semi-automated or completely automated quality control tests.
- PLC Communication (Digital lines, Serial, Profibus, Ethernet-TPC)
- Bar code interface (serial) with lot and S/N management.
- Semaphores, emergency buttons, etc.
- User configurable communication protocols.
- Multiple tests sequences.
- Multiple components (parallel) testing.
- Multiple measuring sequences.

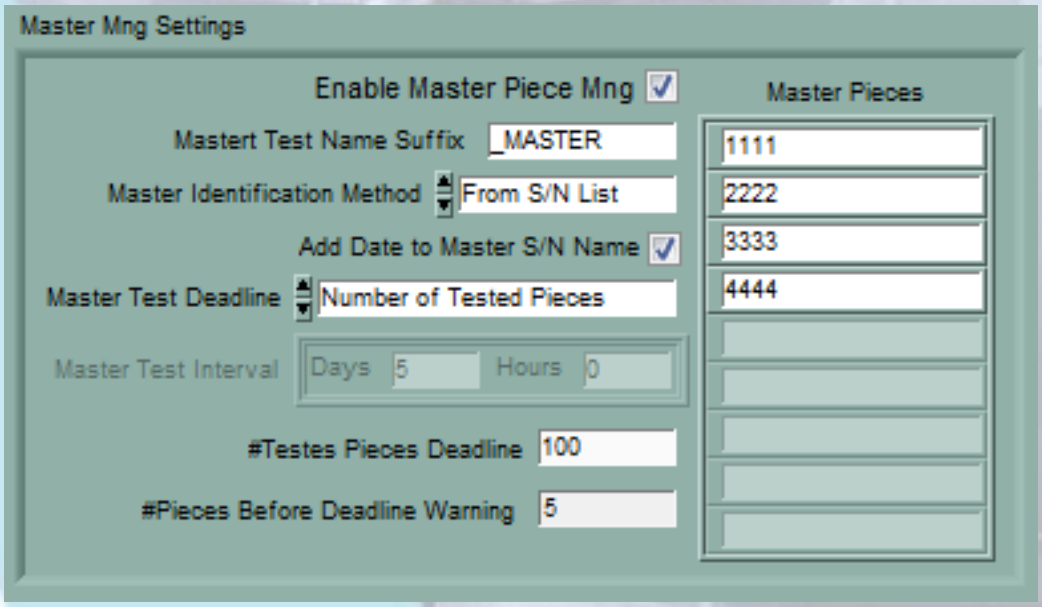


AESSE MISURE s.r.l.

AS-Smart Key features

Master Piece Management:

- One or more “Master Pieces” can be automatically identified for periodic “stability check” of the quality control.
- Manual of automatic Master Pieces Deadline (elapsed time and/or number of tested pieces).
- Dedicated test procedure and tolerances for Master Pieces.

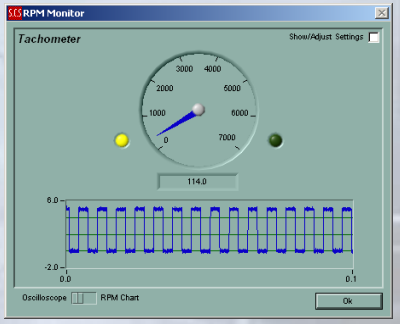


AESSE MISURE s.r.l.

AS-Smart Typical Test Procedure

Manual, semi-automatic, automatic execution

1) Load specific test configuration.
2) Identify actual component (Bar Code, S/N autoincrement, manual).
3) Start measurement (manual, from PLC, on condition - RPM).
4) Perform single or multiple measurements (varying speed, varying loads, etc.)
5) Process data (FFT, 1/3 octave, etc.) and compare with thresholds, masks, etc.
6) Test result (to monitor, to semaphore, to PCL)
7) Store data and result to database
8) Return to step 2

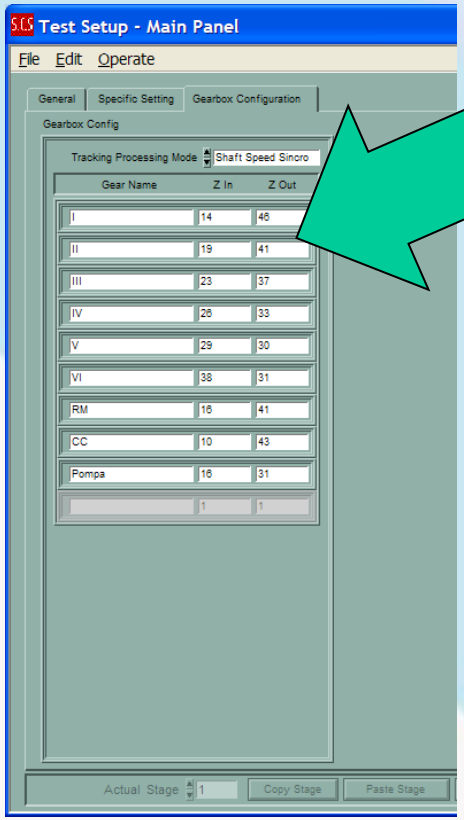


AS-Smart Specific features for Gearboxes Analysis

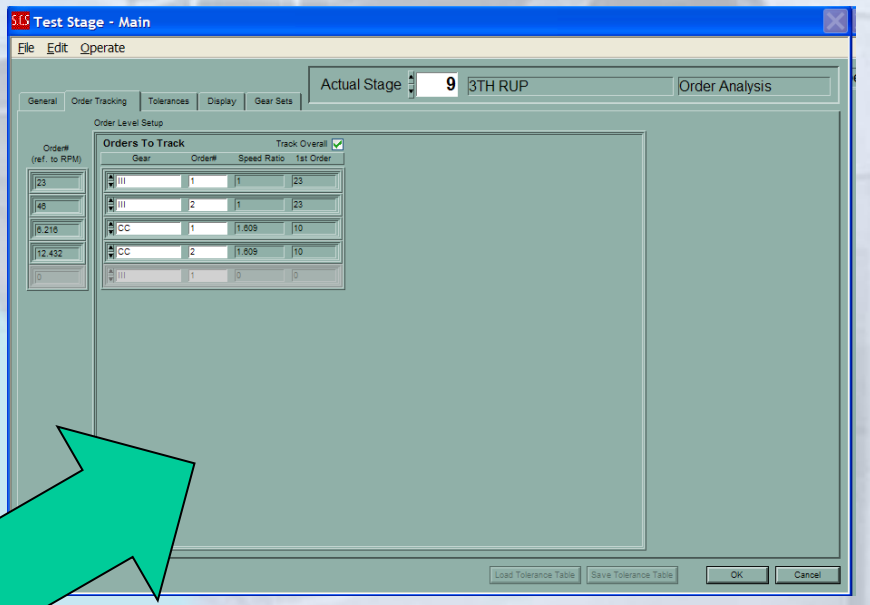
1) Definition of the kinematics of transmissions.
2) Automatic calculations of speed for all shafts.
3) Synchonization of armonics for all the gear sets.
4) Specific algorithms for gear defects identifications (i.e. single tooth defects causing impulsive noise).
5) *Epicycloidal gearboxes management (under development)*

AESSE MISURE s.r.l.

AS Smart– Gearboxes Setup



Gears setup



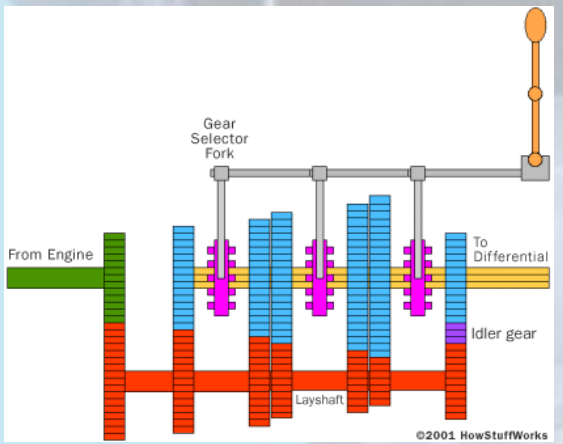
Orders of interest

AESSE MISURE s.r.l.

AS Smart– Definition of the Test Sequence

For each step of the Testing Sequence, a kinematic configuration is defined, and a speed ratio automatically calculated. Then, all the processing algorithms are syncronized with the actual speed (Syncronouos processing).

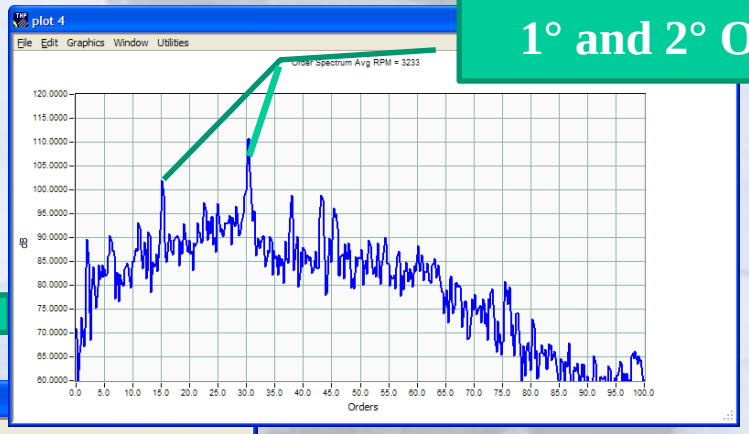
Gear	Speed Ratio	First Order
VI	1,00	38
CC	0,862	11
Pump	0,342	18



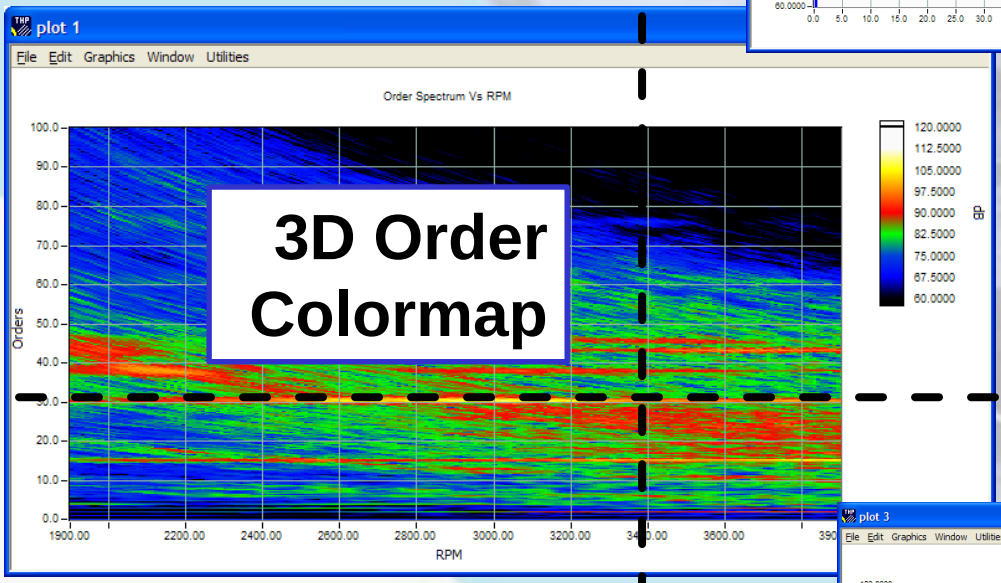
- AS Smart– Measurement techniques
- Mulichannel recording
  - Time domain proc. (i.e. gear fault) –> Extracted Levels
- Post-Processing
  - Order Tracking (vs RPM)
    - Tolerance Mask –> Extracted Levels
  - Order Spectrum (vs. Frequency)
    - Tolerance Masks –> Extracted Levels
- 3D Order Colormap

AESSE MISURE s.r.l.

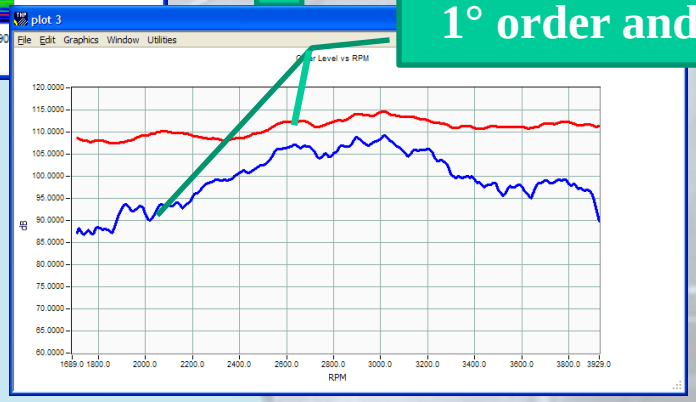
Order Spectrum



1° and 2° Order



3D Order Colormap

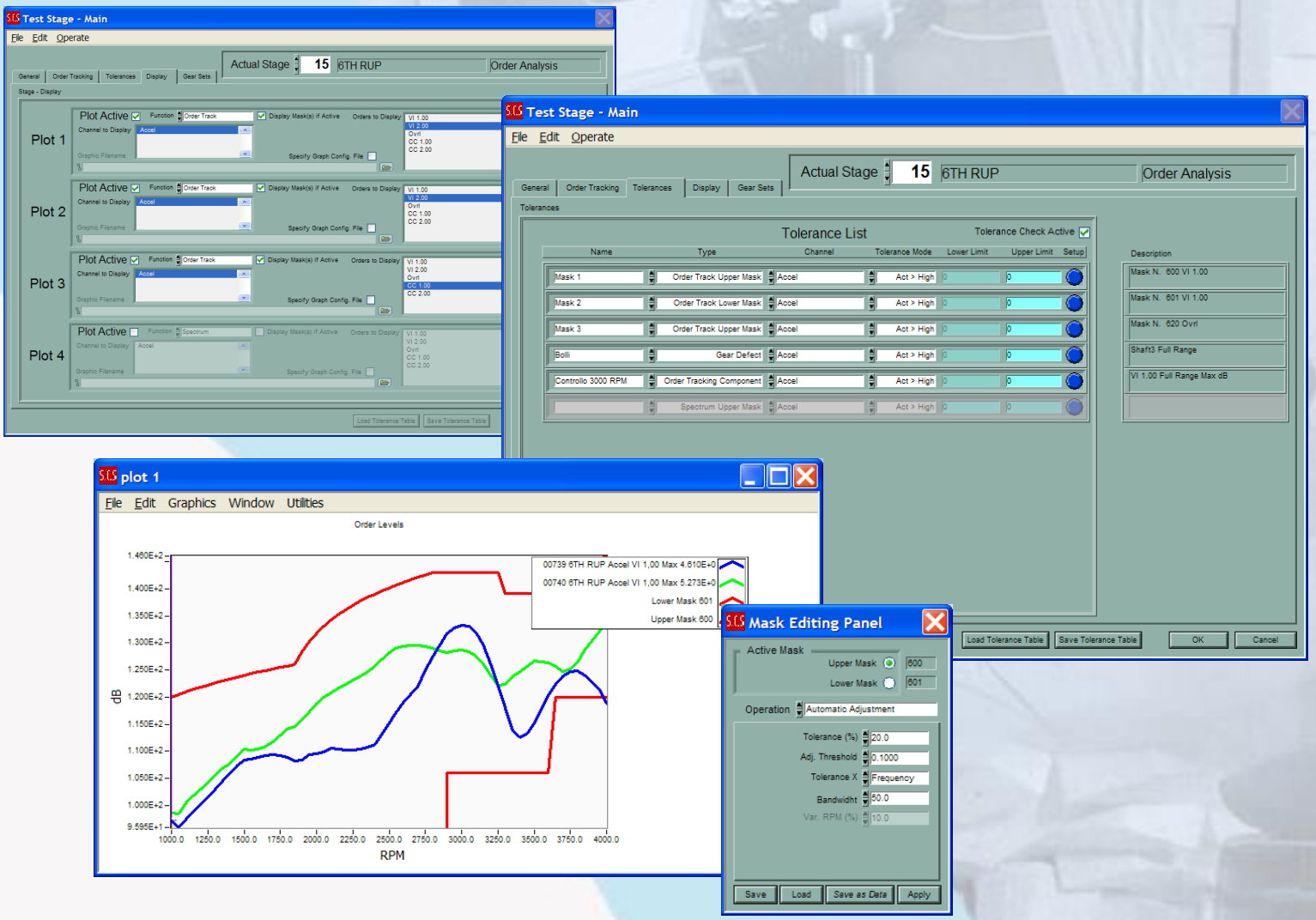


1° order and Ovrl

Order Tracking (Orders vs RPM)

AESSE MISURE s.r.l.

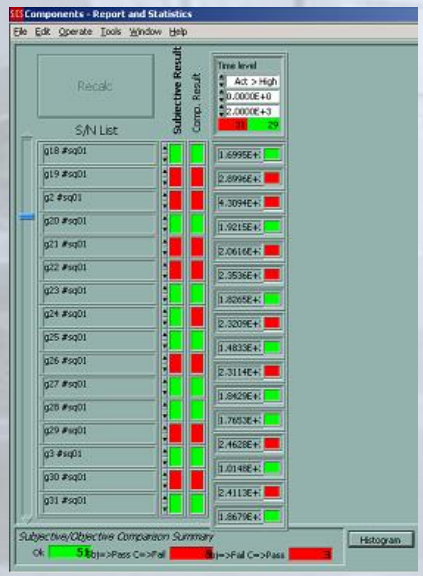
AS Smart – Tolerance Analysis



AESSE MISURE s.r.l.

AS Smart – Database features

- Local and Remote Stations
- Customizable data storing (Spectra, Time histories, test result only, etc.)
- Friendly data review, comparison and analysis.
- Automatic mask and threshold creation
- Data Statistics
- Plant Management (multi station statistic, trends, data access, etc.)
- Histogramming and Variance Analysis
- Data Export (Ascii, Excel, Wav, XML, etc.)
- Database Utilities (backup, copy, merge, etc.)

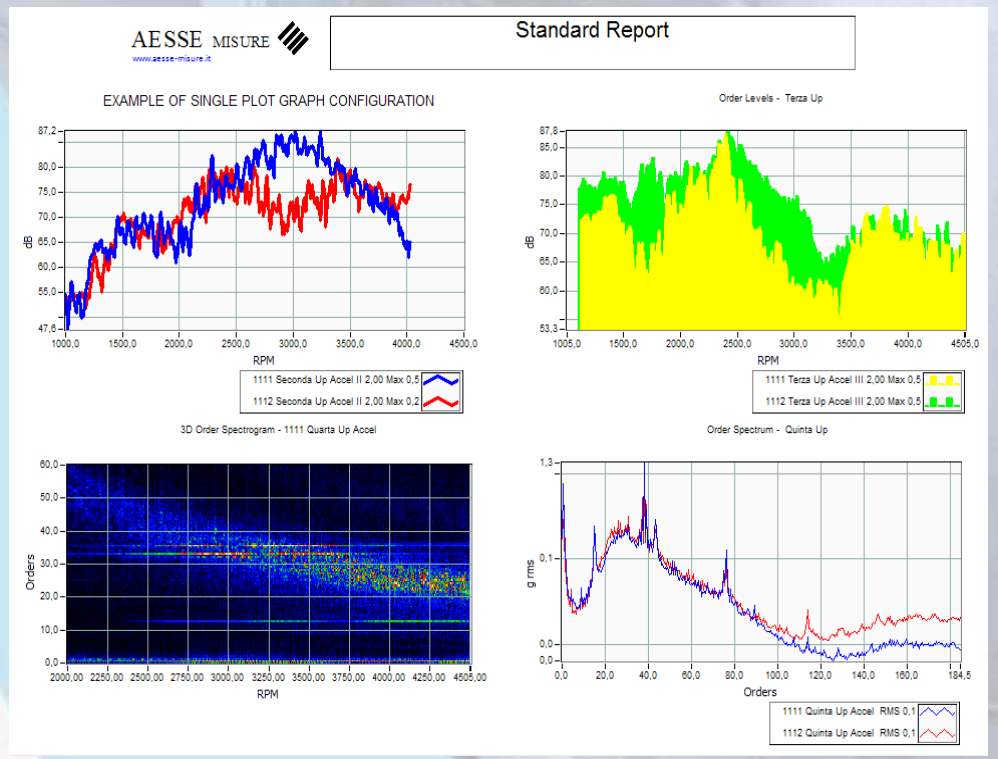


AESSE MISURE s.r.l.

AS Smart– Reporting

Reporting:

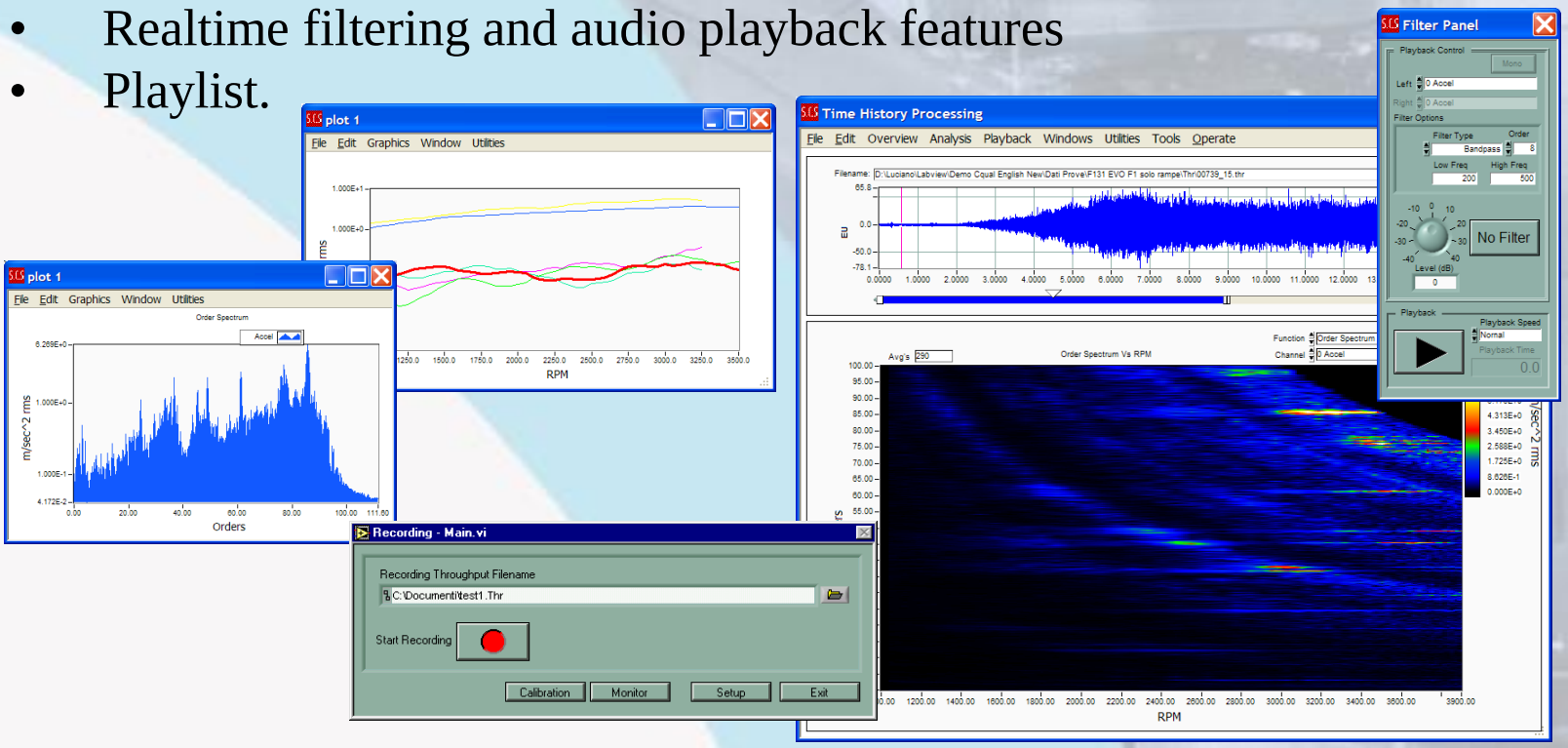
- Completely customizable reporting templates.
- One Test/Report or Overlay Tests in a single report.
- Up to 10 plots/page, with independent graph configuration.
- Multi Page/Multi Test
- 2D and 3D plots.
- Interactive or Auto-printing.
- Company Logo.



AESSE MISURE s.r.l.

AS-Smart Time History Processing

- Advanced tool for data acquisition and analysis, integrated with the SCS9002W database.
- Multichannel data recording and acquisition.
- Complete set of analysis functions
- Realtime filtering and audio playback features
- Playlist.



AESSE MISURE s.r.l.

AS-Smart Time History Processing
Main functions

- FFT Spectrum (averaged and vs time)
- 1/3 Octave Spectrum (averaged and vs time) with digital filter according to IEC1260 e ANSI
- Order Tracking and Order Spectrum (averaged or vs RPM)
- FRF, Coherence, Auto and Cross-Correlation, ecc.)
- Cepstrum
- Envelope
- Time-Frequency Analysis
- RPM vs time and RPM editing
- Derivation - Integration (single and double)
- Filtering and Decimation

AESSE MISURE s.r.l.

AS-Smart Time History Processing
Additional features

- Multichannel acquisition and recording (with RPM Monitor) and Real Time displays.
- Voltage and ICP input (Hardware dependend)
- Up to 8 syncronized input channels
- External or internal trigger.
- Multiple Scalable analysis Windows (multi-traces).
- Real Time Playback and filtering (to Sound Card)
- WAV import/export with re-calibration features
- Data Import/export (ASCII, EXCEL)
- And many more …