



SCS9002W

**End of Production Quality Control System
based on acoustic and vibration measurements**

**AN IDEAL SOLUTION
FOR MECHANICAL
INDUSTRY IN TERMS
OF PRODUCTION
RELIABILITY AND
FLEXIBILITY.**



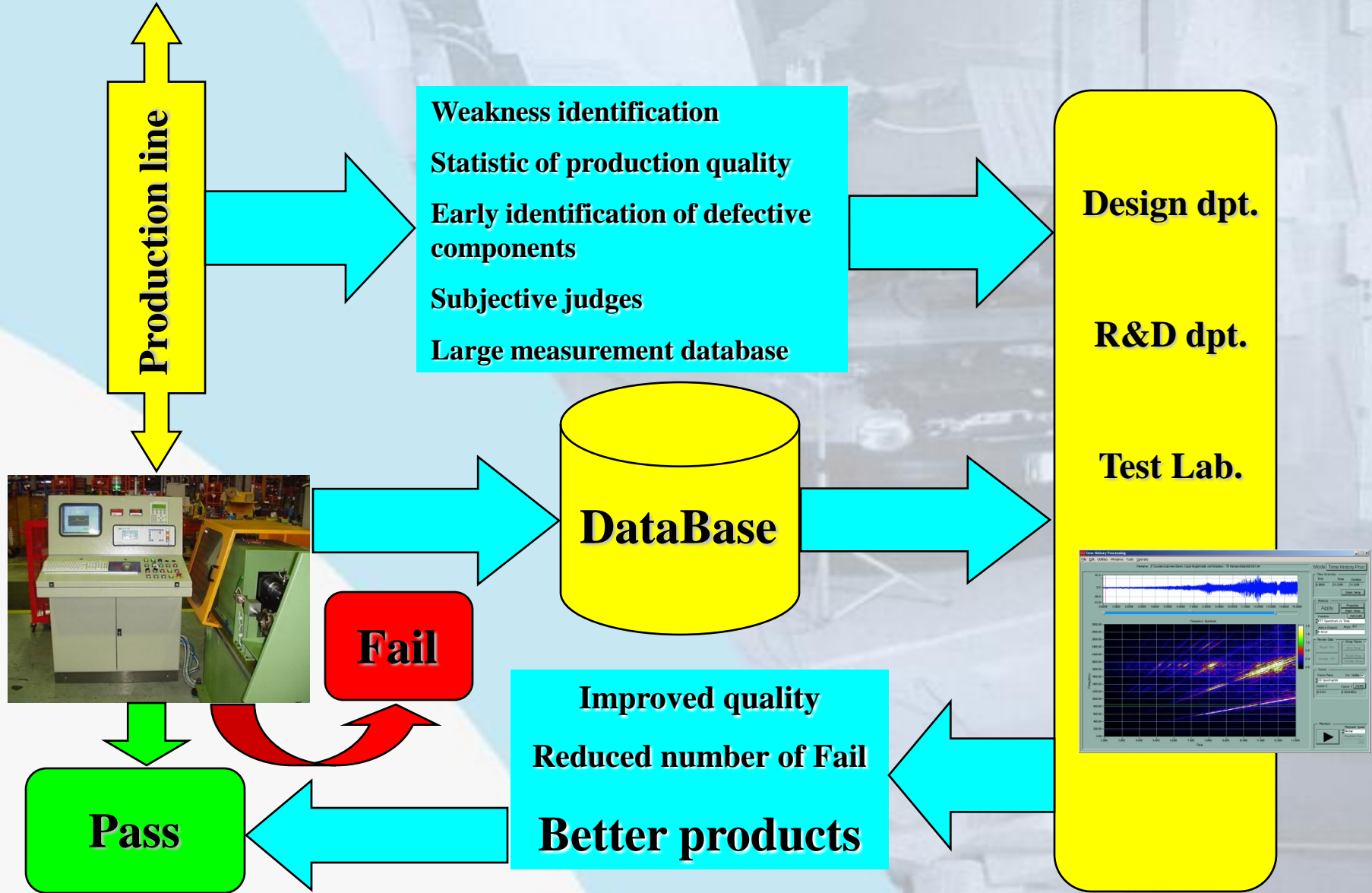
SCS9002W

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
-

SCS9002W – Philosophy





SCS9002W – Philosophy

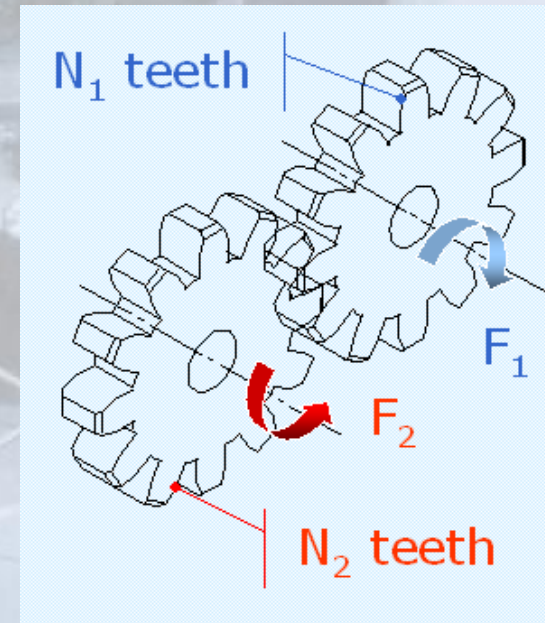
- Measure emitted noise or vibration (a noisier component is very often defective ...).
- Extract significant noise features (tones, frequency bands, time structures, armonic components, etc.).
- Compare the actual result with specific thresholds.
- Identify defects.
- “Pass” – “Fail” end of test result.
- Store in database.

SCS9002W – Key features

Total measurement flexibility:

Many different multichannel measurement and analysis mode available, in parallel or in sequence:

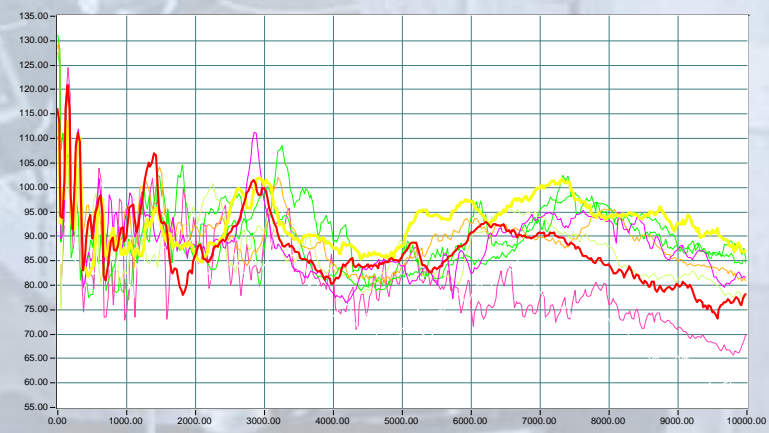
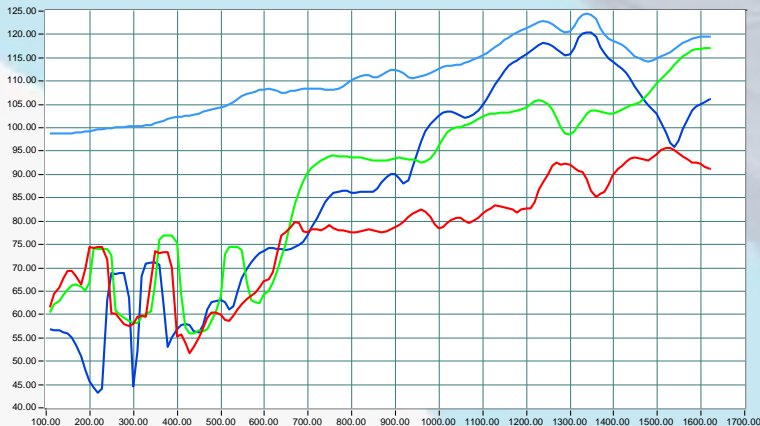
- 1/n octave analysis with digital filters
- FFT Autospectrum
- Transfer Function
- Order spectrum (RPM related) }
 - Order Tracking (RPM related) }
- Levels
- Cepstrum, Envelope.
- Sound Quality indexes (Loudness, FAV, tick detection, modulation, etc.)
- Custom algorithms



SCS9002W – Key features

Total measurement flexibility.

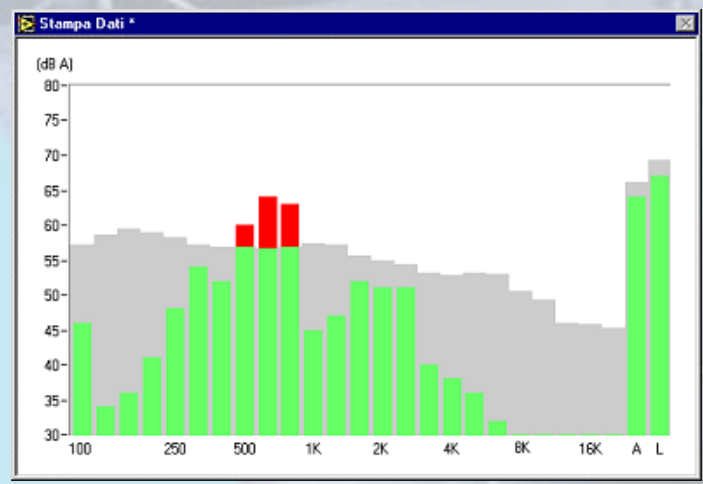
FFT/Order Spectrum



Order Tracking

Examples

1/n Octave Analysis



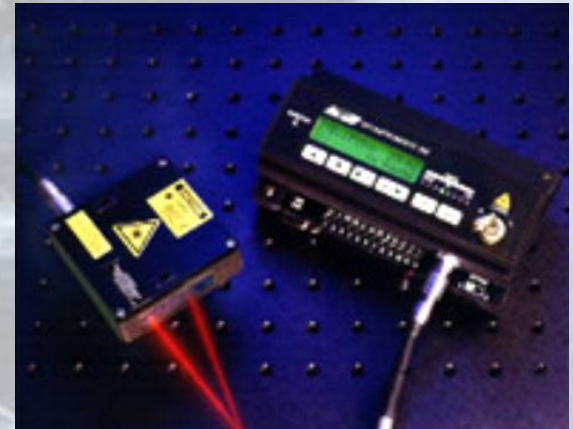
SCS9002W – Key features

Multiple sensors supported.



Microphones and Binaural Heads

Laser Sensors



Accelerometers and Proximitors

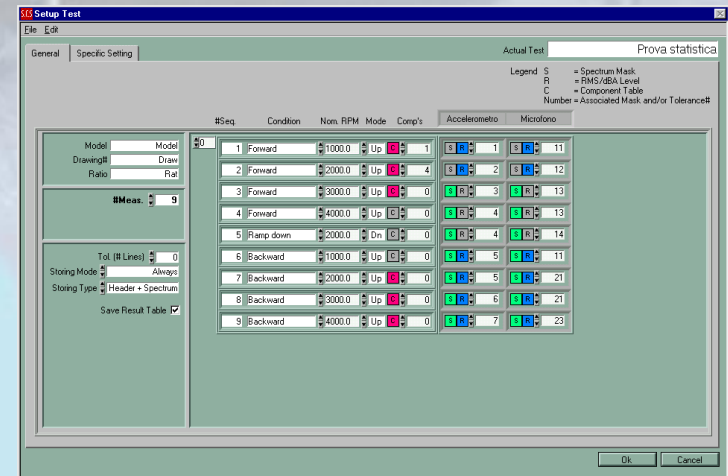
Tachometers, pressure transducers.

And other ...

SCS9002W – Key features

Automation:

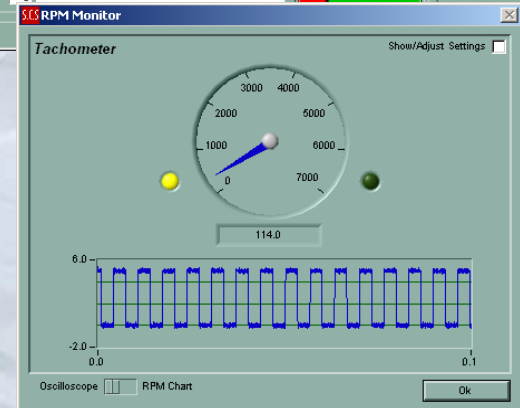
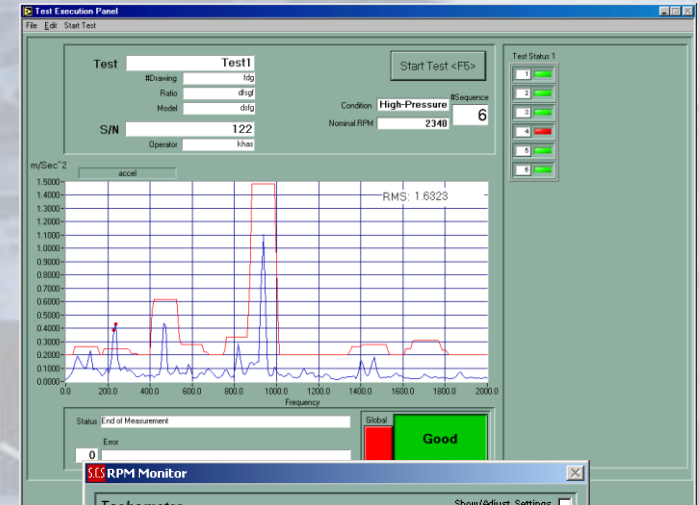
- Configurable for manual, semi-automated or completely automated quality control tests.
- PLC Communication (digital lines, serial, etc.)
- Bar code interface (serial) with lot and S/N management.
- Semaphores, emergency buttons, etc.
- User configurable communication protocols.
- Multiple tests sequences.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



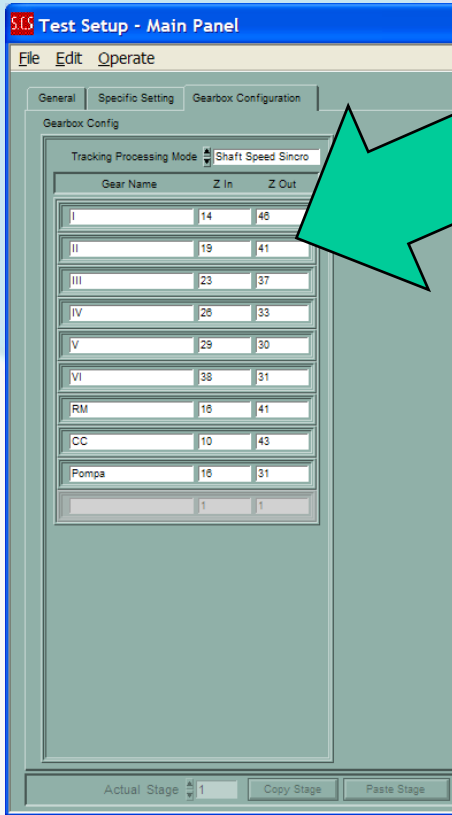
SCS9002 - Typical Test Procedure

Manual, semi-automatic, automatic execution

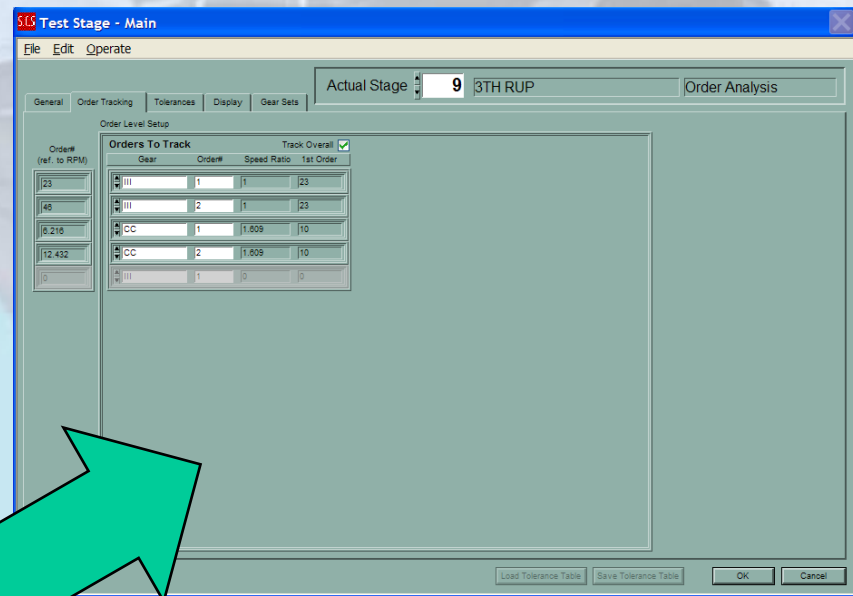
- 1) Load specific test configuration.
- 2) Identify actual component (Bar Code, S/N autoincrement, manual).
- 3) Start measurement (manual, from PLC, on condition - RPM).
- 4) Perform single or multiple measurements (varying speed, varying loads, etc.)
- 5) Process data (FFT, 1/3 octave, etc.) and compare 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



SCS9002 – Transmission Setup

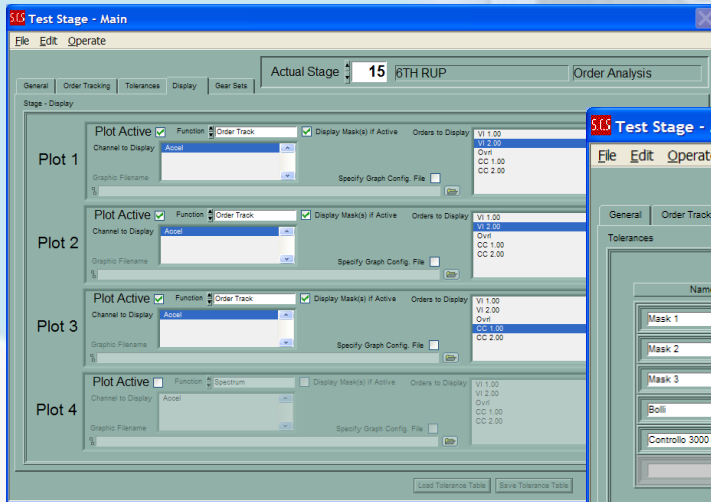


Gears setup



Orders of interest

SCS9002 – Tolerance Analysis



SCS Test Stage - Main
File Edit Operate
Actual Stage: 15 6TH RUP
Order Analysis

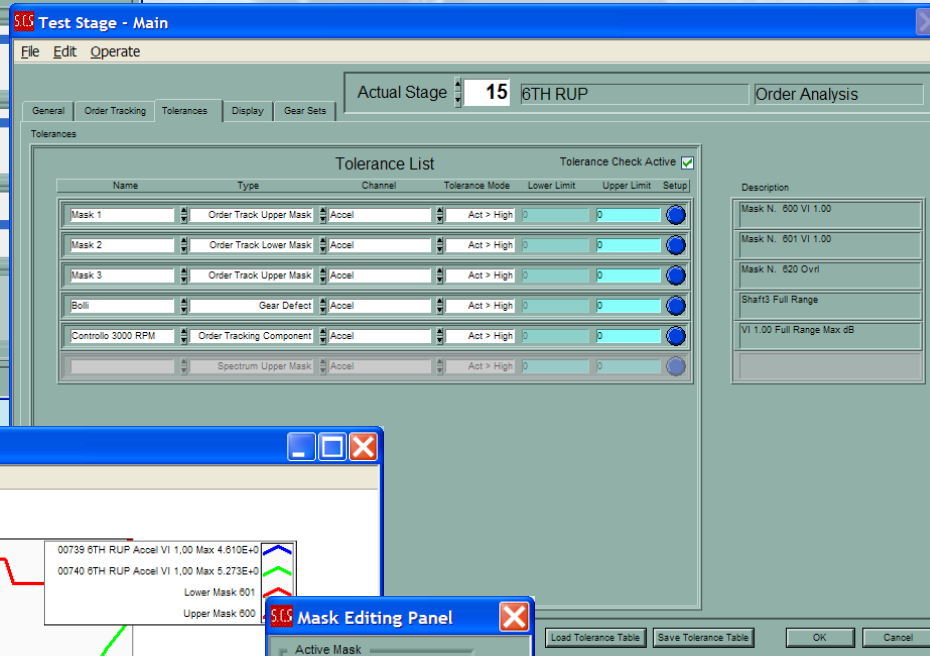
Stage - Display

Plot 1: Plot Active Function: Order Track Display Mask(s) if Active Orders to Display: VI 1.00, VI 2.00, Ovr, CC 1.00, CC 2.00

Plot 2: Plot Active Function: Order Track Display Mask(s) if Active Orders to Display: VI 1.00, VI 2.00, Ovr, CC 1.00, CC 2.00

Plot 3: Plot Active Function: Order Track Display Mask(s) if Active Orders to Display: VI 1.00, VI 2.00, Ovr, CC 1.00, CC 2.00

Plot 4: Plot Active Function: Spectrum Display Mask(s) if Active Orders to Display: VI 1.00, VI 2.00, Ovr, CC 1.00, CC 2.00



SCS Test Stage - Main
File Edit Operate
Actual Stage: 15 6TH RUP
Order Analysis

Tolerances

Tolerance Check Active

Name	Type	Channel	Tolerance Mode	Lower Limit	Upper Limit	Setup
Mask 1	Order Track Upper Mask	Acel	Act > High	0	0	
Mask 2	Order Track Lower Mask	Acel	Act > High	0	0	
Mask 3	Order Track Upper Mask	Acel	Act > High	0	0	
Boli	Gear Defect	Acel	Act > High	0	0	
Controllo 3000 RPM	Order Tracking Component	Acel	Act > High	0	0	
	Spectrum Upper Mask	Acel	Act > High	0	0	

Description

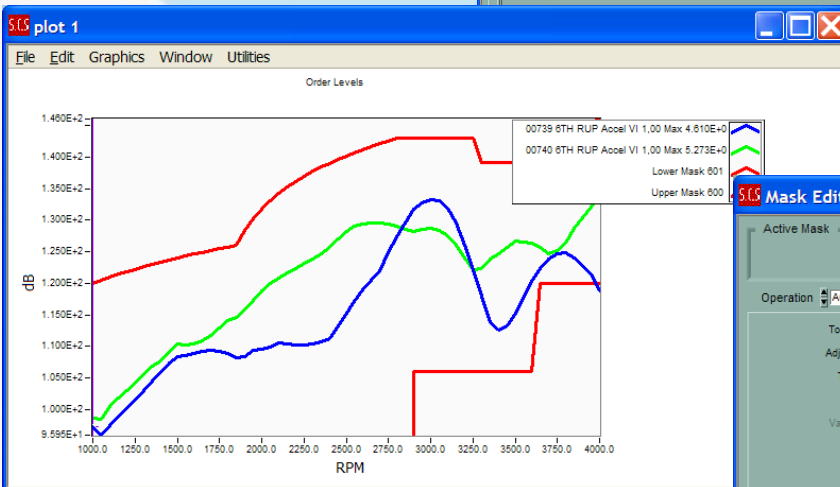
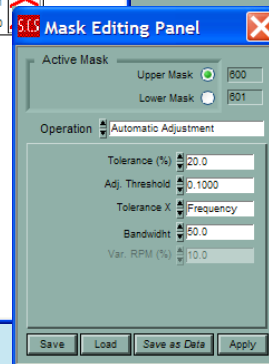
- Mask N. 800 VI 1.00
- Mask N. 801 VI 1.00
- Mask N. 820 Ovr
- Shaft3 Full Range
- VI 1.00 Full Range Max dB

Mask Editing Panel

Active Mask: Upper Mask 800, Lower Mask 801

Operation: Automatic Adjustment

Tolerance (%): 20.0
Adj. Threshold: 0.1000
Tolerance X: Frequency
Bandwidth: 50.0
Var. RPM (%): 10.0

SCS Mask Editing Panel

Active Mask: Upper Mask 800, Lower Mask 801

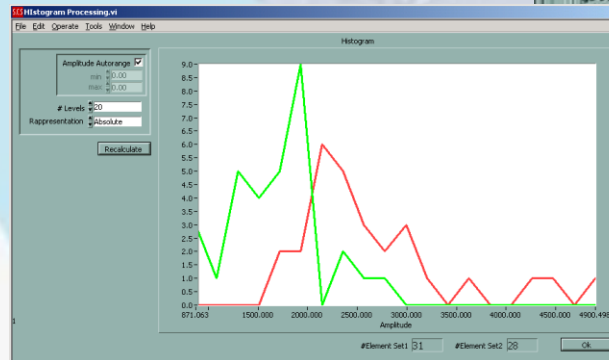
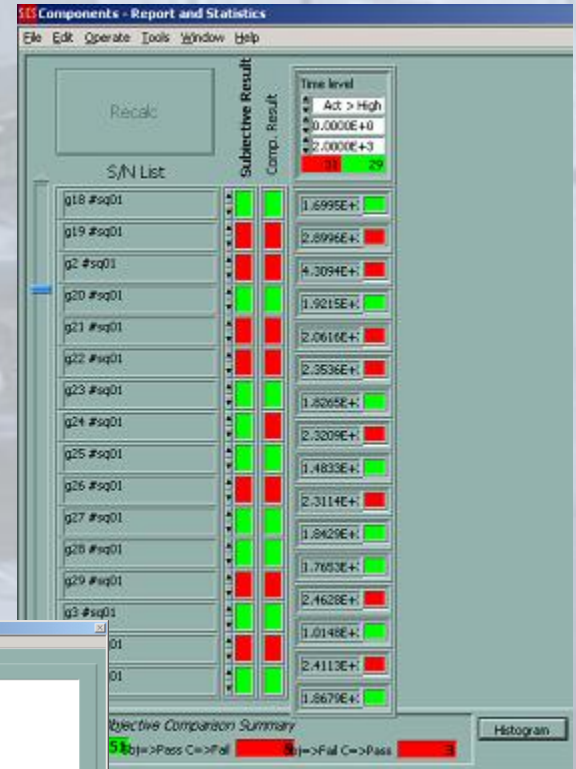
Operation: Automatic Adjustment

Tolerance (%): 20.0
Adj. Threshold: 0.1000
Tolerance X: Frequency
Bandwidth: 50.0
Var. RPM (%): 10.0

SCS9002 – Database features

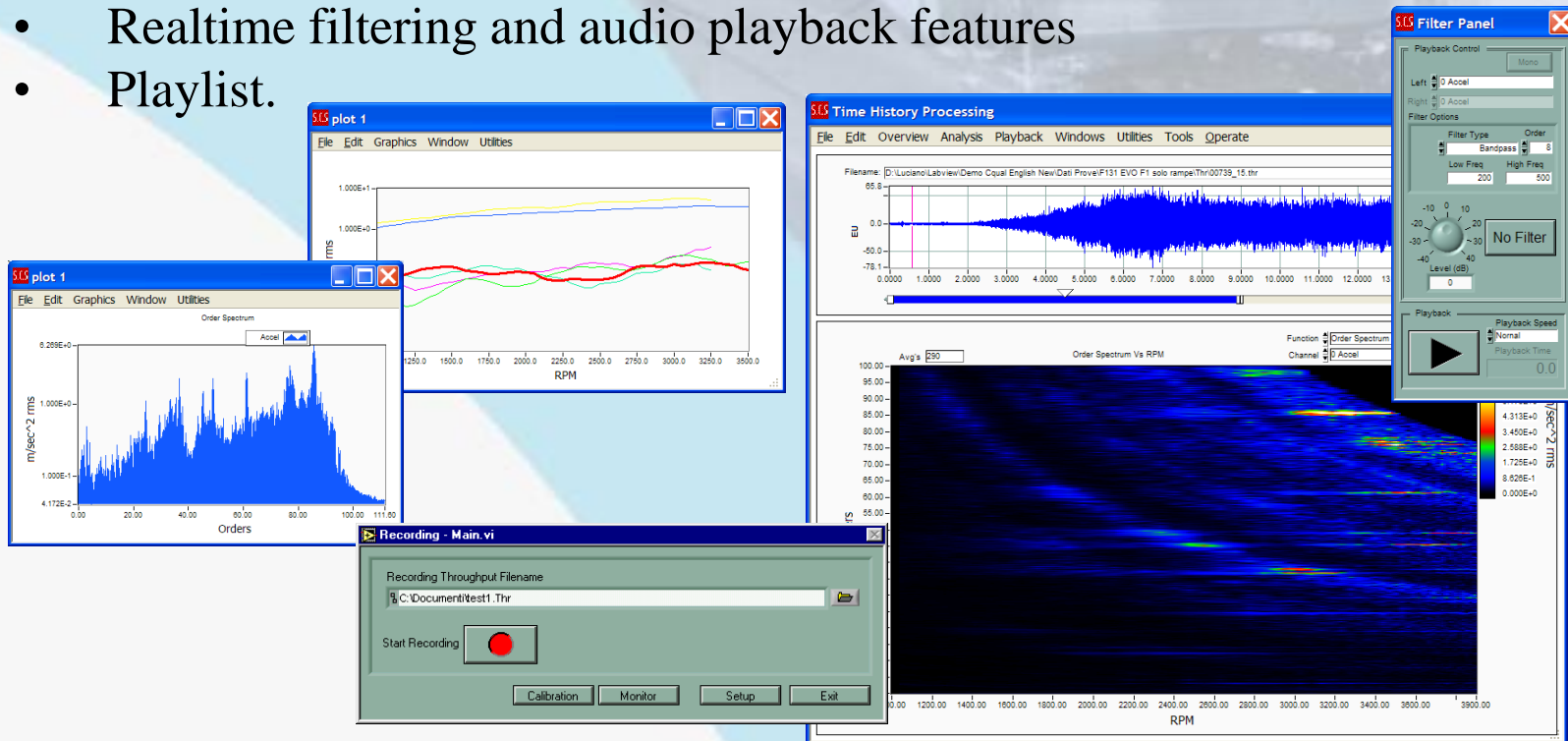
Database:

- Customizable data storing (Spectra, Time histories, test result only, etc.)
- Customizable data header
- Friendly data review, comparisons, and analysis.
- Automatic mask and threshold creation
- Data Statistics (Min, Max, Avg, Std Dev, etc.)
- Histogramming
- Variance Analysis
- Data Export (Ascii, Excel, Wav, XML, etc.)



SCS9002 – 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.



SCS9002 – 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

SCS9002 – 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 synchronized 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 ...

