ECON

AVANT series

Shock Measurement Analyzer

Technical Specifications

Econ Technologies Co., Ltd.

Overview

AVANT series Shock Analyzer is a powerful and tailored instrument for shock events transient capture and analysis. AVANT can meet rigorous criterions in measuring and it is suitable for shock, drop and other kind of impact events. It is generally associated with shock testing machine, shock response spectrum testing machine and packaging drop test machine that used in conjunction to complete shock test or package drop test. It can meet GB, GJB, ISO, MIL-STD-810 and other testing standards. It is the professional tools of shock environmental testing and measurement analysis.

Features

✧ Compatible with ISO, MIL-STD-810 and user-defined standards

✧ Sampling rate up to 1MHz, acceleration range up to 100,000gn

✧ Powerful functions, include: shock measurement and analysis, shock response spectrum, damaged boundary testing, shock data recording and playback, tolerance analysis and Pass / Fail parity, with high and low pass filtering function

✧ Other functions: deformation analysis, time domain Shock Response calculation, FFT analysis

✧ Channel can directly connect Voltage, IEPE, charge, TEDS sensors

✧ USB 2.0 interface for easy connection with PC

✧ Automatic generation of professional test reports WORD or PDF format, and the report can also be printed directly

Applications

✧ Classic shock wave transient capturing and analysis, for example: half-sine, trapezoidal wave, sawtooth wave after the peak measurement and analysis

✧ Shock response spectrum analysis has a dedicated function for shock response spectrum testing analysis, as well as for any wave-shaped shock response spectrum analysis

✧ Pulse waveform recording and playback, enable pulse waveforms record, playback, and analyze offline

✧ Tolerance Analysis and Pass / Fail check, software interface real-time display of tolerance curve situation

✧ Referenced ASTM D3332-99 standard damaged boundary test function, used to find products critical speed change and the critical acceleration, to determine the product's shock friability, ultimately to avoid the products damaged in the long-distance transportation

System Specifications

Model	MI-5202 （Universal）	MI-5204/MI-5208（Universal)	MI-5104/MI-5108 （High-impact）
Input Channel			
Input Channel	2 voltage input channels 2 electric charge input channels	4/8 voltage input channels	
Sampling Frequency	Up to 192kHz		Up to 1MHz
Voltage Range	±10 V$_{PEAK}$		
Coupling	AC, DC, IEPE(Internal IEPE Constant current source), TEDS, Electric charge	AC, DC, IEPE(Internal IEPE Constant current source)	AC, DC, IEPE(Internal IEPE Constant current source), TEDS
ADC Resolution	24-bit		16-bit
Pulse Width	Narrow to 0. 1ms		Narrow to 0. 02ms
Acceleration Range	Up to 100,000gn		
Dynamic Range	>110dB		>80dB
Harmonic Distortion	<-95dB		<-85dB
SNR	>95dB		>70dB
Width Precision	1%		
External Trigger	Support		
Output Channel			
Output Channel	1 voltage output channel, Only for instrument self-calibration		
Voltage Range	±10 VPEAK		
Mechanical Dimensions			
Dimension (mm)	335x255x71		
Weight (kg)	About 2.8		
Electrical Parameters			
Power Supply	AC 88~264V		
Connectivity	USB2.0		
Operating System	Microsoft Windows XP/7		
Environmental Parameters			
Temperature	41 to 113 ℉ / -10 to 50 ℃		
Humidity	20% to 90% RH non-condensing(40℃ / 104℉)		

Measurement Applications

Main Applications

➢ Shock Measuring and Analysis
➢ SRS Analysis
➢ Damage Boundary

Other Options

➢ Playback Analysis
➢ Instrument Calibration
➢ Automatic Word or PDF Report Generation
➢ Data and File Management
➢ MATLAB Interface

Shock Measuring and Analysis

You can capture the shock pulses easily and simultaneously when shock or impact event happens. Besides time domain analysis, you can use shock response spectrum (SRS) to estimate the potential damage due to peak values on different natural frequencies in shock. ISO, MIL-STD-810 and user-defined criterions of tolerance are available.

Shock Measuring and Analysis (SMA) takes ideal time waveform as the standard, for example, ideal half-sine pulse, ideal saw tooth pulse and ideal trapezoidal pulse; it is used for shock equipment which can generate ideal pulse and require the pulse measured from UUT on the table of shock equipment to be in the tolerance band of the ideal pulse according to the test standard.

Detailed specifications are given below.

Transient Capture and SRS analysis

Other Analysis
SRS analysis, SR demo, rotation shock analysis, force & distortion analysis

Test Types
Based on classical shock; contains shock test and Impact test
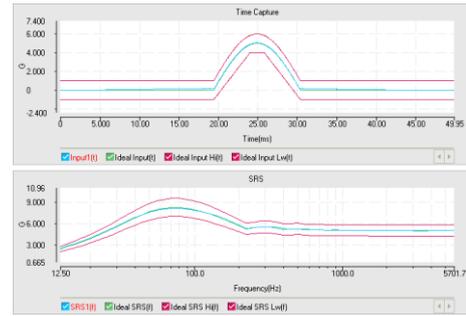
Transient Capture

Sampling frequency	Up to 192kHz(MI-52)
	Up to 1MHz(MI-51)
Acceleration range	Up to 100,000gn
Pulse duration	0.1 to 1000ms(MI-52)
	0.02 to 1000ms(MI-51)
Sampling time	1, 2, 5, 10, 20, 50, 100, 200, 500, 1,000, 2000, 4000, 7000, 10000, 13000, 16000, 20000ms(MI-52)
	0.1, 0.2, 0.5, 1, 2, 5, 10, 20, 50, 100, 200, 500, 1,000, 2000, 4000, 7000, 10000, 13000, 16000, 20000ms(MI-51)
Direction	positive, reverse

Ideal waveform

Waveform	Half-sine, trapezoid, terminal peak saw tooth
Standard	GB, GJB, ISO, MIL810, User defined
Tolerance	According to each standard
Auto-match	the acquired data matches ideal waveform
Comparison	compare acquired data with ideal waveform

RRS

SRS type	Primary, Residual, Composite
Resolution	1/1,1/2,1/3,1/6,1/12,1/24 octave analysis
Parameters	Damp coefficients and Q, lower/upper/reference frequency
SRS definition	Calculate SRS automatically from ideal waveform or set RRS manually, and the tolerance can be set
Comparison	compare measured SRS with RRS

Filtering

Filters	Low-pass and high-pass filters
	Set different filters for each channel
Low-pass filters	Set cutoff frequency or filter rate
High-pass filters	Enable or disable

Triggering

Source	Input channel (Auto Trigger Every Frame)
	no trigger(Free Run)
	Exterior DIO
Slopes	Positive, negative or bi-polar
Level	1 to 99% of ideal waveform
Trigger mode	Pre-trigger or post-trigger
Remove DC	Enable or disable
Remove noise	Enable or disable

Measurement Controls

Controls	Start/stop
Status displays	Running time, frames, running status

Data saving

Save modes	On-line save and auto save
Save contents	Signals and panes
Signal file formats	ECON binary/ASCII, txt or UFF binary/ASCII
Data export	Excel, MATLAB
Data recording	Used for offline analysis
Playback	Replay shock waves manually

Test Report

Content	Customized, contains parameters, panes etc.
Report template	Customized
Report Format	Word, PDF or print
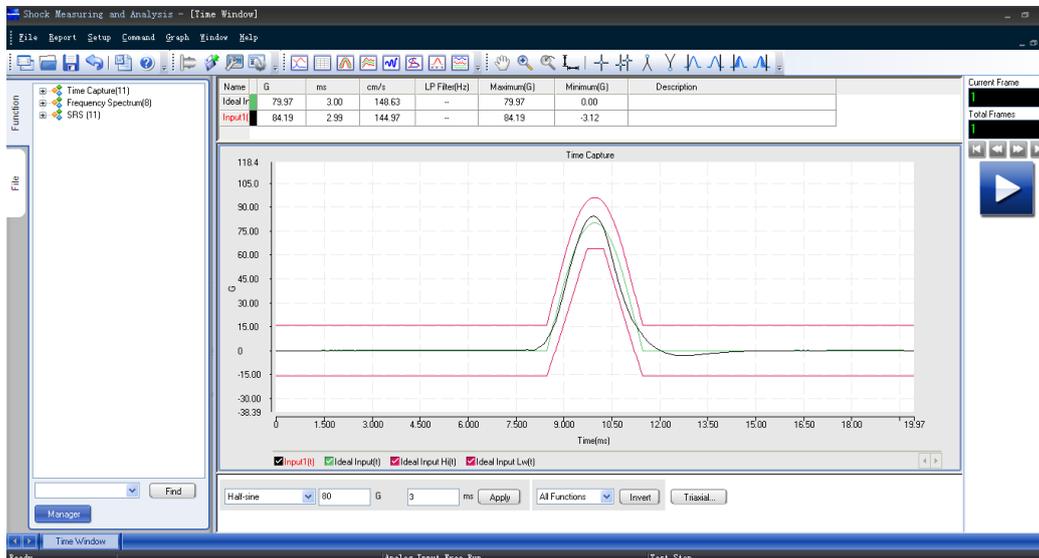
SRS

You can capture the shock pulses easily and simultaneously when shock or impact event happens. Besides time domain analysis, you can use Shock Response Spectrum (SRS) to estimate the potential damage due to peak values on different natural frequencies in shock.

SRS takes reference SRS as the standard; it is used for shock equipment that can generate pulse according to the reference SRS and requires the SRS measured from UUT on the table of shock equipment to be in the tolerance band of the reference SRS. Detailed specifications are given below.

Transient Capture and SRS analysis

Other Analysis
SR demo, rotation shock analysis, force & distortion analysis

### SRS Profile

SRS type	Composite SRS
Resolution	1/1,1/2,1/3,1/6,1/12,1/24 octave analysis
Parameters	Damp coefficients and Q, lower/upper frequency
Profile definition	setup frequency, amplitude, lower/upper tolerance of breakpoints with unlimited in the profile table
Comparison	compare measured SRS with SRS profile

Transient Capture

Sampling frequency	Up to 192kHz(MI-52) Up to 1MHz(MI-51)
Acceleration range	Up to 100,000gn
Sampling time	Customized, limited by SRS profile
Sampling number	Customized
Direction	positive, reverse

Filtering

Filters	Low-pass and high-pass filters Set different filters for each channel
Low-pass filters	Set cutoff frequency or filter rate
High-pass filters	Enable or disable
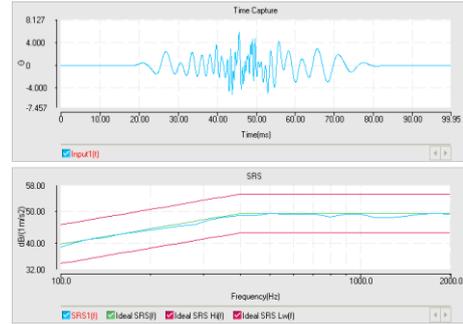
Triggering

Source	Input channel (Auto Trigger Every Frame) no trigger(Free Run)
Slopes	Bi-polar
Level	Acceleration level
Trigger mode	Pre-trigger or post-trigger
Remove DC	Enable or disable

Measurement Controls

Controls	Start/stop
Status displays	Running time, frames, running status

Data saving

Save modes	On-line save and auto save
Save contents	Signals and panes
Signal file formats	ECON binary/ASCII, txt or UFF binary/ASCII
Data export	Excel, MATLAB
Data recording	Used for offline analysis
Playback	Replay shock waves manually

Test Report

Content	Customized, contains parameters, panes etc.
Report template	Customized
Report Format	Word, PDF or Print
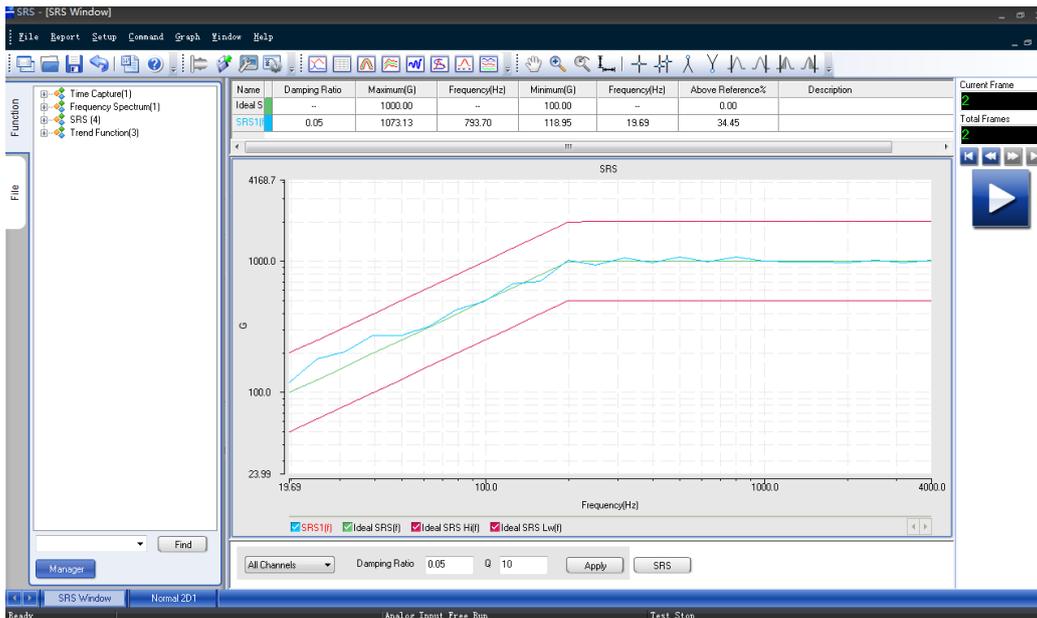
Damage Boundary

Damage Boundary test refers to ASTM D3332-99 standard and the program test critical velocity change shock and critical acceleration shock to determine the damage boundary of the products. Damage Boundary test can determine the shock fragility of the products. This fragility information may be used in designing shipping containers for transporting products and improving product ruggedness. Detailed specifications are given below.

Damage Boundary

Other Analysis
SRS analysis, SR demo, rotation shock analysis, force & distortion analysis

Transient Capture

Sampling frequency	Up to 192kHz(MI-52)
	Up to 1MHz(MI-51)
Acceleration range	Up to 100,000gn
Sampling time	auto-match with test pulse of Critical Velocity Change shock test and Critical Acceleration shock test

Triggering

|	
Source	Input channel (Auto Trigger Every Frame) no trigger(Free Run)
Slopes	Bi-polar
Level	1 to 99% of test pulse of Critical Velocity Change shock test and Critical Acceleration shock test
Trigger mode	Pre-trigger or post-trigger
Remove DC	Enable or disable

SRS Analysis

SRS type	Primary, Residual, Composite
Resolution	1/1,1/2,1/3,1/6,1/12,1/24 octave analysis
Parameters	Damp coefficients

Damage Boundary

Test management	New, Reset, Update
Damage Boundary	Adjustable after the test ends

Critical Velocity Change

Test pulse	Half-sine, trapezoid, saw tooth etc.
Pulse width	Set accord with ASTM D3332-99 standard
Test program	Setup the test starting and increment of Critical Velocity Change shock test
Vc calculation	Setup the ratio of last shock
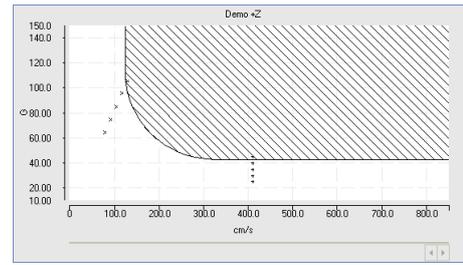
Critical Acceleration

Test pulse	Half-sine, trapezoid, saw tooth etc.
Pulse width	Set accord with ASTM D3332-99 standard
Test program	Setup the test starting and increment of Critical Acceleration shock test
Ac calculation	Setup the ratio of last shock

Filtering

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Filters	Low-pass and high-pass filters Set different filters for each channel
Low-pass filters	Set cutoff frequency or filter rate
High-pass filters	Enable or disable

Measurement Controls

Controls	Start/stop, next shock, damage
Status displays	Running time, frames, running status

Data saving

Save modes	On-line save and auto save
Save contents	Signals and panes
Signal file formats	ECON binary/ASCII, txt or UFF binary/ASCII
Data export	Excel, MATLAB

Test Report

Content	Customized, contains parameters, panes etc.
Report template	Customized
Report Format	Word, PDF or Print
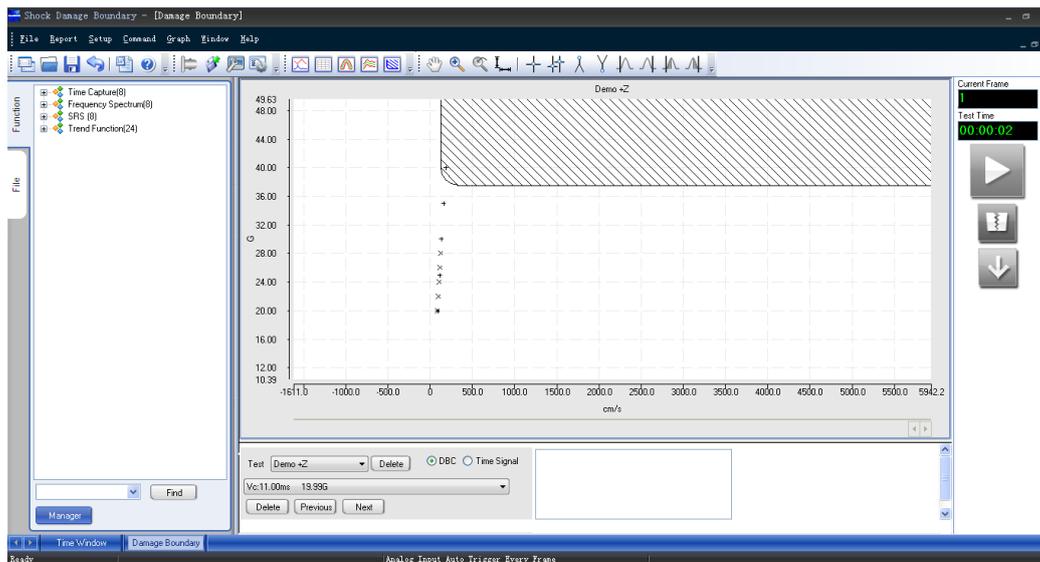
Ordering Guide

AVANT Shock Measurement Analyzer Hardware

Item	Part No.	Description
1	MI-5104	**4-chs High-G Shock Measurement Analyzer**
2	MI-5108	**Shock Measurement Analyzer** 8 voltage/IEPE/TEDS analog input channels
3	MI-5202	**Shock Measurement Analyzer** 2 voltage/IEPE/TEDS/CHARGE analog input channels
4	MI-5204	**Shock Measurement Analyzer** 4 voltage/IEPE/TEDS analog input channels
5	MI-5208	**Shock Measurement Analyzer** 8 voltage/IEPE/TEDS analog input channels
6	MI-50EX01	Rechargeable lithium Battery
7	ACC-7000	Accessories

AVANT Shock Measurement Analyzer Application Software

Item	Part No.	Description
1	7752	Shock Response Spectrum (SRS)
2	7753	Damage Boundary Curve
3	7754	Shock Data Playback And Offline Analysis
4	70CAL	Self-Calibration Software

About Us

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