ECON

AVANT series

Shock Measurement Analyzer

Technical Specifications

Econ Technologies Co., Ltd.

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.

Based on USB2.0 connectivity, AVANT is available for two different models: MI-51 and MI-52. MI-52 is used for common application with 2 acquisition channels and MI-51 is used for high level shock events measuring and analysis.

Provides four analysis modules based on different test standards: Shock Measuring and Analysis, SRS, Pulse Analysis and Damage Boundary test.

Features

- ✧ Compatible with ISO, MIL-STD-810 and User defined
- ✧ Sampling rate up to 1MHz
- ✧ Acceleration range up to 100,000gn
- ✧ Shock Response Spectrum (SRS）Analysis
- ✧ Tolerance Analysis and Pass/Fail Judge
- ✧ Multiple Impact Events Recording and Playback
- ✧ Auto Generation of Test Report
- ✧ USB2.0 Connectivity, Plug and Play

Model and Specifications

Model	MI-5202（value）	MI-5204/MI-5208（value）	MI-5104/MI-5108（premier）
Specifications			
Input channel	1~2 analog voltage inputs with 1~2 charge inputs(built-in charge amplifiers: 1mV/pC and 0.1mV/pC)	1~4 analog voltage inputs	
Voltage range	$-10V_{PEAK}$~+10 V_{PEAK}		
Coupling mode	AC, DC, IEPE(built-in IEPE sensor power for each channel) (can be enhanced for compatibility with TEDS transducer)	AC, DC, IEPE(built-in IEPE sensor power for each channel)	AC, DC, IEPE(built-in IEPE sensor power for each channel) (can be enhanced for compatibility with TEDS transducer)
ADC Resolution	24-bit		16-bit
Sampling frequency	Max 192kHz		Max 1MHz
Pulse duration	Min 0.5msec		Min 0.1msec
Acceleration range	Max 100,000g_n		
Dynamic range	>120dB		>80dB
THD	<-95dB		<-70dB
Signal-to-noise	>95dB		>70dB
Frequency accuracy	0.01%		
External Trigger	Enable		
CE compliance	Yes		
Physical			
Dimension (mm)	335x255x63.5		
Weight (kg)	2.8		
Electrical			
Power Supply	AC 88~264V		
Power	40W		
Connectivity	USB2.0		
Operating System	Microsoft Windows XP/ Windows 7		
Environmental			
Temperature	14 to 113 ℉/-10 to 50 ℃		
Humidity	20% to 90% RH non-condensing(40℃)		

Measurement Application
Main Applications
➢ Shock Data Capture
➢ SRS Analysis
➢ Pulse Analysis
➢ Damage Boundary

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

Shock Measuring and Analysis

You can capture the shock pulses easily and simultaneously when shock or impact event happens. And 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 takes ideal time waveform as standard such as ideal half-sine pulse, ideal sawtooth pulse and ideal trapezoidal pulse; it is used for shock equipment that can generate ideal pulse and requires 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
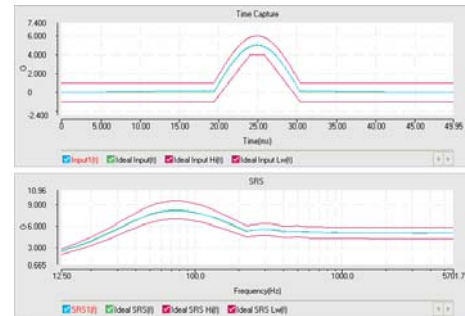
Transient Capture
Sampling frequency	Up to 192kHz(MI-52)
	Up to 1MHz(MI-51)
Acceleration range	Up to 100,000gn
Pulse duration	0.5 to 100ms(MI-52)
	0.1 to 100ms(MI-51)
Sampling time	1, 2, 5, 10, 20, 50, 100, 200, 500, 1,000, 2000, 4000, 7000, 10000, 13000, 16000, 20000ms(MI-52)
	0.1, 0.2, 0.5, 1, 2, 5, 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 sawtooth
Standard	ISO, IEC, ISTA, MIL-STD, 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 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

SRS

You can capture the shock pulses easily and simultaneously when shock or impact event happens. And 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.
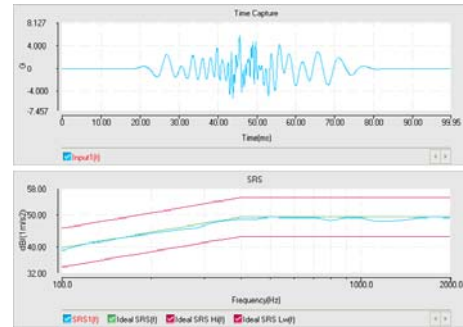
Transient Capture and SRS analysis

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 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

Pulse Analysis

You can capture the shock pulses easily and simultaneously when shock or impact event happens. And 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.

Pulse Analysis is used for shock equipment that generates non-ideal and stochastic pulse.

Detailed specifications are given below.

Transient Capture and SRS analysis

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

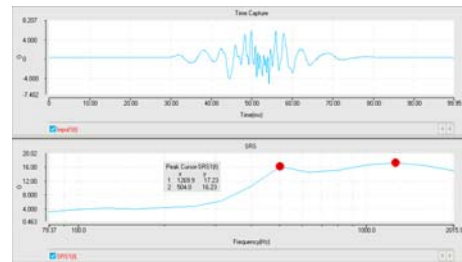### Transient Capture
Sampling frequency	Up to 192kHz(MI-52)
	Up to 1MHz(MI-51)
Acceleration range	Up to 100,000gn
Sampling time	Customized, limited by frequency range of SRS analysis
Sampling number	Customized
Direction	positive, reverse

SRS Analysis
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/reference frequency

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 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

Damage Boundary

Damage Boundary refers to ASTM D3332-99 standard and programs test steps of Critical Velocity Change shock test and Critical Acceleration shock test to determine the damage boundary of the products. Damage Boundary test cover determination of the shock fragility of the products. This fragility information may be used in designing shipping containers for transporting the products. It may also be used to improve product ruggedness. Detailed specifications are given below.
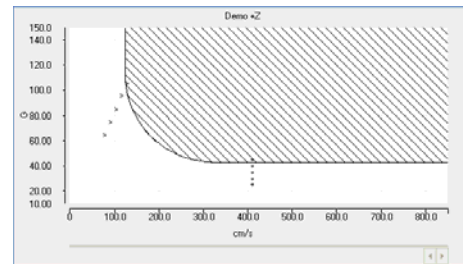
Damage Boundary

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, sawtooth 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, sawtooth 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
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 or UFF binary/ASCII
Data export	Excel, MATLAB

Test Report
Content	Customized, contains parameters, panes etc.
Report template	Customized

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