



## Vibration Controller

**Product Overview** 

Objects undergo vibration effects during operation and transportation. To study these effects, it is necessary to perform vibration tests.

Vibration tests reproduce the vibrations experienced by the object in real life.

During the tests: data are collected from accelerometers; power spectral density, RMS value is determined; information about the reproduced vibration level and setpoint is stored.

Depending on the goals and objectives, electrodynamic and hydraulic shakers are used.



Urartu Systems offers RTC-Vibro controller with software for vibration and shock control. Fixed or mobile design.





Fixed design

Mobile design

#### Features:

- · control of electrodynamic and hydraulic shakers;
- scalability.
- user friendly interface displaying the structure of physical tests;
- reflects the structure and process of the test;
- built-in Pretest mode for Resonance search and inverse model of the shaker;
- "COLA" mode for connecting supplementary devices, for output signals;
- vibration control and analysis;
- wide range of operating frequency, up to 100 kHz;
- modes: pre-test, resonance search, Sine, Sine on Random, Classical Shock, Random, Waveform Replication.



### Vibroacoustic (dynamic) input module

# Vibroacoustic (dynamic) output module

Parameter	Value						
Analog Input	4						
Maximum range of input signals	±10V						
Type of signals	AC/DC						
ADC bit rate	24 bit						
Maximum sampling frequency	100kHz						
ADC type	Delta-Sigma						
Software switch on IEPE	Yes						
Maximum sensor supply current	20mA						
Maximum sensor supply voltage	24V						
Analog Output	2						
Maximum range of output signals	±10V						
Switching scheme	single-ended						
ADC bit rate	24 bit						
Maximum sampling frequency	96 kHZ						
ADC type	Delta-Sigma						

#### Pre-Test

Before conducting the vibration tests it is necessary to make sure that the sensors and the shaker are connected correctly, the tested object is installed and fixed and the test parameters are set.

To control the level of input vibrations on the tested object, the testers use feedback sensors. However, the sensor can only control the vibration level, but is not able to change the resonance behaviour of the system.

In order to improve the quality of tests and control the influence of resonance and antiresonance phenomena on their course, the control system has a pretest mode.

The controller gives a signal at different frequencies and determines the presence of resonances, after their detection it adjusts the transfer coefficients. The result is an inverse model, which is then used in testing.



#### Resonance Search

Resonance search, tracking and holding at resonance is used for fatigue and durability testing at resonance frequency, determination of dynamic properties of the test object.

<ul> <li>Start</li> </ul>	Shaker Limits	Profile	Addit	ional Pa	rameter	s								9 1	н 📈 ч	н 📉 н 📉	10 1010
Stop	Mass Former (Figmas) (M 60 Mass Acceleration (Agnass) (m/5*2) 16	Add I	Row	Del	ete Row				lines from		and findings					/	_
et point reached	Max Speed (V_max) (m/k)	FREQ	AMP	EV.	HE	E H	110	1010	HOLD	EU VEL	EU	REP. CNIT EU	SCAN EN		/		
	Max Deviation (D_main) (mm)	20	-	ineis L	84	14	1.4	1.6	61.	_			100		-		
maining Time	Min Frequency (Fumit) (Hit)	100		ma'z -		14	4				1 Decimin	P coure				/	
00:00:00	10	400	2	mis*2		i.	4	4	3	en [	1 Decimin	0 count	•		/		
filo Allarms	Max Prequency (P_max) (H2)	1000	1	Inter2 u	1	li	3	4	5 4		1 Dec/reis	0 court					A
HUHI	Mar softage (U mar) (V)	1				18	100								-	HAME ST	Hepestil Poleise
H	2															/	
10	Mobile Shekar Mess (M_she (kg)													5	10	cylean II	John
1010	Object Report the objectively													tion			
1010	62														Hukk bis	1	Hata
nel Alarms	Finan / 04 th +M at5 (m/t^2)													29		/	
OUT 1	100														- /		X
OUT 2																	
CH 1	Profile Max Value															/	
CH 2	Mas Acceleration (A_mas) [m/n/2]															/	
CH 3	2														/		
CH 4	Max Speed (V, max) (RUS)														/		
and a	Maximum Deviation @ maxi [mm]																
	0,0433																
	Min Prequency (Full (Ho)																
	20																
	3000 in jance																
														10.00		100	
																100	

#### Random

Random vibration tests are applicable to elements and equipment that may be exposed to random vibrations under operating conditions. The purpose of the test is to identify possible mechanical damage or deterioration of the specified product characteristics.

- Frequency range: 3.2-5000 Hz
- Setting the amplitude in acceleration, speed, and displacement units
- Cycle duration 0.1 ms

	Setting 📓 🗶 Pretest 📓 🗶 Test 📓 Disconnect	State	Connect 1 192.168.70.143 (P
State St	Profile         Additional Paramaturs           Add Row         Dalata Row           Freq. riz         AMP.         EU/sqn/to         HI HI, d0         HI, d0         10, d8         L0           100         41         mr         6         3         3         44           wrst         6         3         3         44         10, d8         L0         48         L0         L0         L0         L0 <t< th=""><th></th><th></th></t<>		

#### Sine on Random

In Sine mode, up to twelve sinusoidal tones can be generated simultaneously on the SOR. You can set individual parameters for each tone.

	EE Profile 📕 🗘 Setting 🔝 🗙 PRETEST 🕺 🗶 TEST 🛙		Connect * 10.10.1 #
State Olicorett	Profile Additional parameters	s Engineering Unit	Selbers 🕅 H H 🔽 H 🔽 10 🖂 1010 🕅
Start	Pasidom parameters:	10-1	
Stop	Add Row Delete Row		
	Freq Hz AMP. BU/sqn10kb Ht HL d& HL d& LO. dB LOLD dB		
O Abort	1 5/1 w/r3 6 2 -1 -4		~
Profile alarms	10 GT 1011 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		
HIN	100 0.01 ev/x*2 = 0 0 - 4		
H	100 81 mW12 = 6 3 -3 -4		$\land$
LO			
LOLO	Sine parameters:		
Charles Inc.	Add Kny Carate Stra		
Channel alarms	1.000 1010		
CHI	FREQ. AMP. EU MIHI HI LO LOLO MILA	9 / / /	
CH 2	10 1 m/rk) - 6 3 J J Vite EU	tos	
CH3	10 10 m//1 5 3 4 d		
CH 4	100 1 6/11 2 6 3 4 6 10 1000		
DUT 1			
000.5			
		0.03-1	tin
			Trequency, Hz

•Frequency range: 3.2–5000 Hz

•Setting the amplitude in acceleration, speed, and displacement units

•Cycle duration 0.1 ms

•Linear scan units: Hz/Min and Min/Sweep, Logarithmic-Oct/Min and Min/Sweep.

#### Classical Shock

In Classical shock the signal of standard form is produced in the time domain. When forming a pulse, compensation methods with the transfer function are used. The compensated signal consists of five parts: pre-pulse, left pause, main pulse, right pause, and post pulse.

Profile Additional parameters		B Continuing (1)	
		E Engriereng Ont	Control of the second s
Vain punar Vain punar Depater	Angebade: Prior charation: stranut.	11.00 -	
He Compensation	Pro palso Provide Technologie 1 N Profession Profession Profession 1 N Profession 1 N Profession 20 N	11.00 15.00 50.00	$\wedge$
10 7 2 Test standort	[User datine	7000	
3 4 П 1 Рысе Gelay П 2	Per palar 2 32 %	1000 1000 1000 1000	
Limit: Main y	dae 12 + % 13 - %	1000	
Paty	dia 20 +5. 20 -5. Per diad seller. Per diad webs	2000	

#### ► Sine

This mode is intended for performing fatigue and resource tests at a frequency that varies in a certain band, as well as for determining the dynamic properties of the test object.

Project Ewt													
AERO	i 🗄 Profile 📕 🤃	Setting	×	Pretest		۲	lest 👖		Wait	St	ate		Connect 192,856,70258
<ul> <li>Stop</li> </ul>	Shaker Limits Max Forre F.maxi D4 80	Profile	Addi	tional Pa	rameters							9	
O Abort	Max Acuteration (A_max) (m/s*2) 16 Max Speed (V_max) (m/s)	Ada	d Row	Del	ete Raw	1			Held Sen	lings	Scening letting		
Set point reached	0.07 Mar Decision /D. main (1999)	FREQ	AMP	EU	нн	н	1.0	1010	TIME	EU	VEL EU ONT EU EN		
and the second second	0.3	2	0	1 ms*2 -	6	3	-3	-6	5	5	in the second		
Remaining Time	Min Frequency (F_min) (Hit)	10	0 3	2 marz -	6	3	-3	-6	3		1 Decimin P court		
00:00:00	10	- 40	0 3	2 m/s*2)-	8.	1	а.	4	3	3	1 Dec/min 0 count		
Profilo Alarms	near Programsy (* Jinac) (*2)	100	0	1 10/2 0	6	3	3	-4	1	4	1 Dec/min 0 count		
HI HI	Max Voltage (U,mail) (V)												HALE ST Hepert I Pacist
н	2												
10	Mobile Shaker Mass (M_she fog)											5	Repeat I Apoint 0
1010	().6 (Thiset Bases the obs first											fight 1	
1010	0.2											- 102m-	Hala St. Hala St.
hannel Alarms	Finax / 04 th +M alth Indt 21											9	
OUT 1	100											S	
OUT 2													
CH 1	Profile Max Value												
CH 2	Max Acceleration (A_max) [m/4/2]												
CH 3	2												
CHA	Max speed (V_max) (#US)												
CITA	Kipimun Devatos /D maio Immi												
	0,0453												
	Min mequancy (F_min; (Hz)												
	29												
	Max Prequency (F_mail) (Hz)												
		-										1010-	
												(B)	Fromuency Hz
												1	a new president of the

- Frequency range: 3.2-5000 Hz
- Setting the amplitude in acceleration, speed, and displacement units
- Setting the rate of frequency rise in linear and logarithmic units
- Cycle duration 0.1 ms

#### Waveform Replication

Random mode is used for producing transport, seismic loadings by means of adaptive filters at 1 KHz. The control system generates signal in the rangy ща specified frequency and amplitude.







+ 41 21 552 12 64

info@urartu.com



www.urartu.com