



Product Service

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Technical Report No.

713011116

dated

2012-12-11

Client: Schroff GmbH
Langenalber Straße 96- 100
75334 Straubenhardt

Manufacturer and / or location of manufacturing: see client

Unit/s under test (UUT): Sub-rack

Test specification: Vibration test (random) in accordance to MIL-STD-810G
METHOD 514.8 ANNEX C Table 514.6C-VII, Category 7, C-5
Vibration test (endurance) and shock test in accordance to
IEC 61587-1 DL2
Resonance search in accordance to IEC 61587-1

Test scope: Verification of suitability for intended application according the
under position 3 detailed test specification.

Test result: The unit under test was not opened. The visual inspection showed
no deficiencies or damages.
A detailed test will be carried out by the customer at his location.

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Integrated documentation

none



1 Unit/s under test (UUT)

The unit under test was a sub-rack.

Type: europac Pro R (Rugged) 6 U 84 HP235D

Test setup for sub-racks in accordance to IEC 60297, sample 2.
In accordance to sample 2, setup with 14 assemblies of width 4HP with each ca. 500 g, evenly spread, remaining gaps were sealed with dummy plates.

2 Order

2.1 Date of order, initial of client

Company Schroff GmbH ordered from TÜV SÜD Product Service GmbH with order sheet dated 2012-07-18, order No. 320197047OP to test the a.m. UUT.

2.2 Receipt of UUT

The sample was delivered by the client on 2012-08-23.

2.3 Reconsignment of UUT

The sample was taken by the client on 2012-08-24.

3 Test specification

3.1 Vibration test, sine

3.1.1 Resonance search (IEC 61587-1)

Frequency range: 4 Hz - 200 Hz
Amplitude: 4 Hz - 9,2 Hz; 3 mm
9,2 Hz - 200 Hz; 1 g
Sweep rate: 1 Oct./min
Test duration: 1 sweep / axis, in 3 axes



3.1.2 Vibration test, endurance (IEC 61587-1 DL2)

Frequency range: 4 Hz - 200 Hz
Amplitude: 4 Hz - 9,2 Hz; 3 mm
9,2 Hz - 200 Hz; 1 g
Sweep rate: 1 Oct./min
Test duration: 20 sweeps / axis, in 3 axes

3.2 Vibration test, random (MIL-STD 810G)

Frequency range: 15 Hz - 2000 Hz
Acceleration: 15 Hz, 0,003 g²/Hz
1000 Hz, 0,003 g²/Hz
2000 Hz, 0,00075 g²/Hz
Acceleration: 2,11 g_{rms}
Test duration: 1 h / axis, in 3 axes

3.3 Shock test (IEC 61587-1 DL2)

Type of shock: half sine
Acceleration: 10 g
Shock duration: 18 ms
Number of shocks: 3 shocks each in both directions on three mutually perpendicular axes

4 Test equipment

Equipment	Type	Ser.-No.	Manufacturer
Shaker:	TV 594 10/AIT-440-3 TGT MOH 36 XXL-3		Tira GmbH
Vibration control system:	V Win		Unholtz-Dickie
Signal conditioner:	133	AG 94 BR 09	Endevco



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Accelerometer:	2224C 4514-B-001 4500 A	20205 54456 54454 30285 30286 30287 30288	Endevco Brüel & Kjaer
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The measuring equipment is calibrated regularly according to the calibration instructions of TÜV SÜD PRODUCT SERVICE GmbH. All calibrations are traced back to national standards.

5 Test sequence

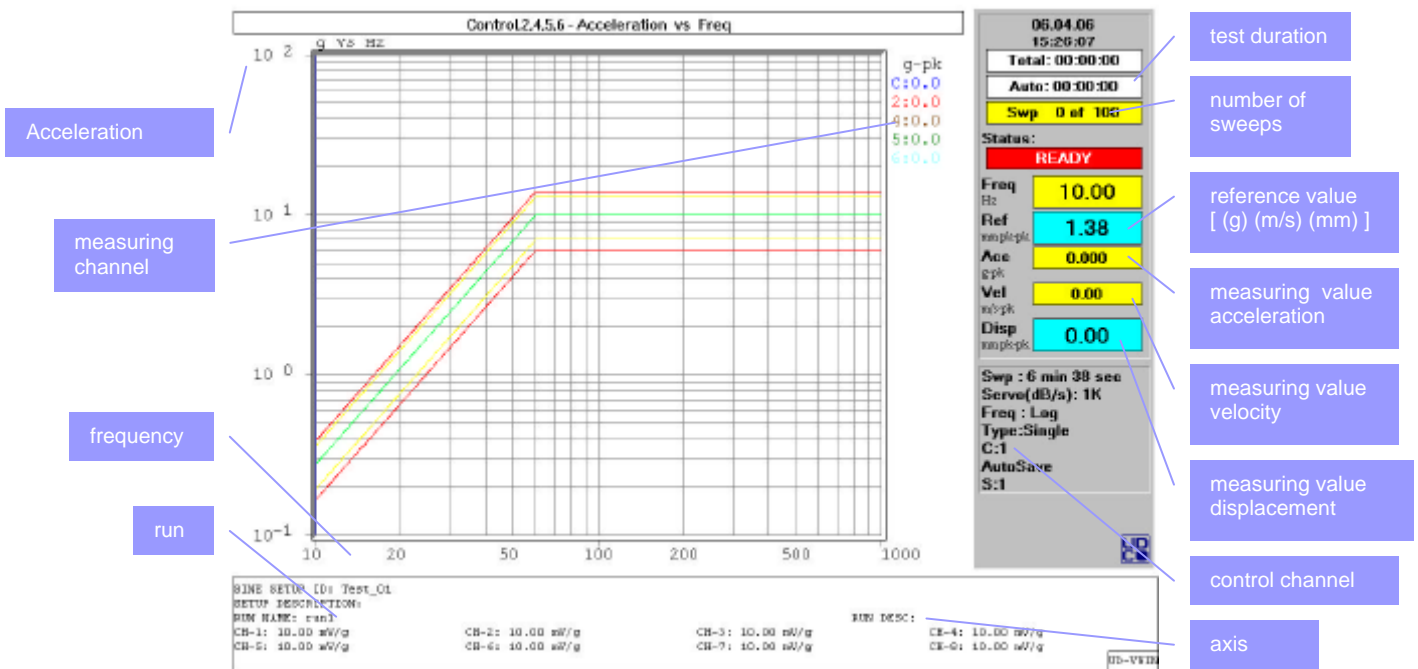
Test date: from 2012-08-23 to 2012-08-24

No.	Test	Run	Axis	Notes	
1	Vibration, sine Vibration, endurance with resonance search	001	Y	measuring channel No. 3: module rail front, top, center measuring channel No. 4: module rail, back, top, center measuring channel No. 5: right side panel, top measuring channel No. 6: back plane control problem Shaker, test was several times restarted. 20 sweeps were tested, diagramm 001, Y-axis documents only 14 sweeps.	
2	Vibration, random	2	Y		
3	Shocks	3 positive 3 negative	3	Y	
4	Vibration, sine Vibration, endurance with resonance search	4	X	measuring channels see run 001	
5	Vibration, random	5	X		

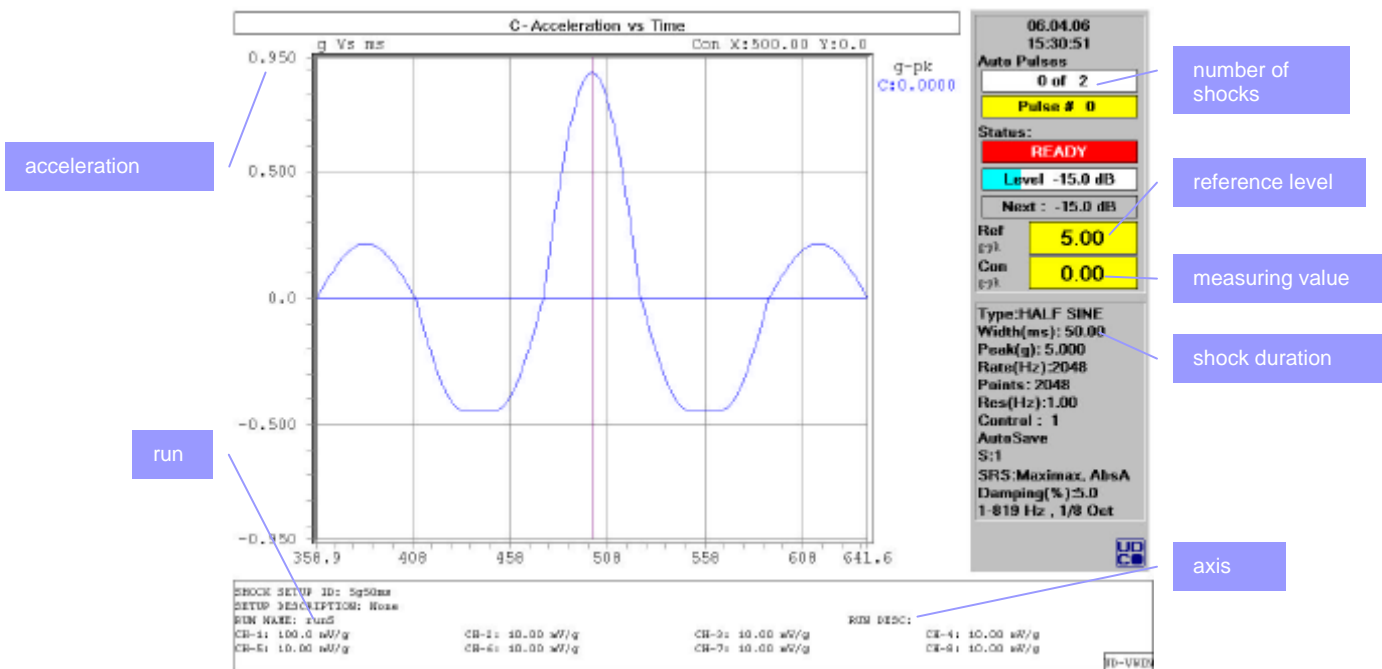
6	Shocks	3 positive 3 negative	6	X	
7	Vibration, sine Vibration, endurance with resonance search		7	Z	measuring channels see run 001
8	Vibration, random		8	Z	
9	Shocks	3 positive 3 negative	9	Z	

6 Legend of measuring diagrams

6.1 Vibration test, sine



6.4 Shock test



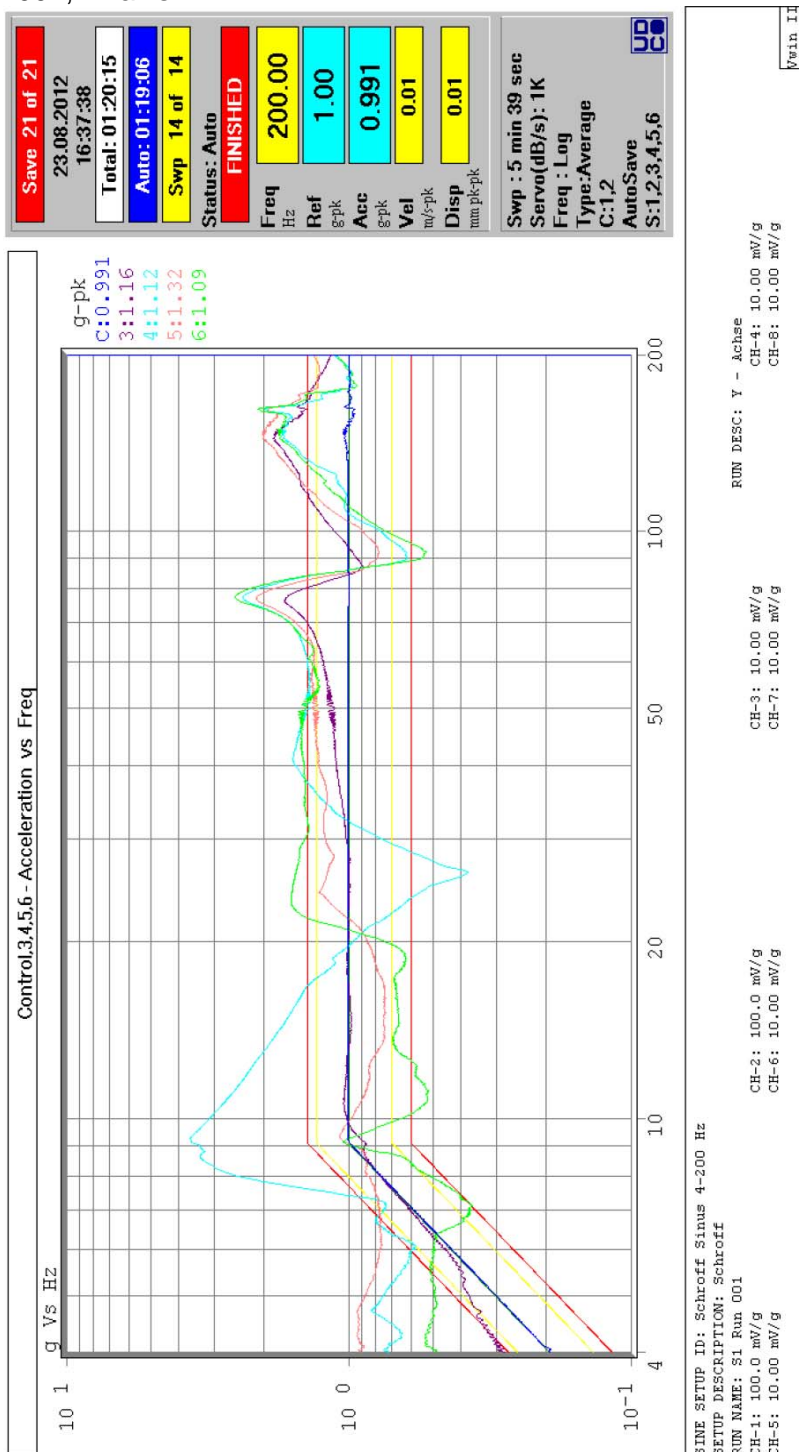


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7 Test documentation

7.1 Measuring diagrams of the vibration test, sine

Run 001, Y- axis



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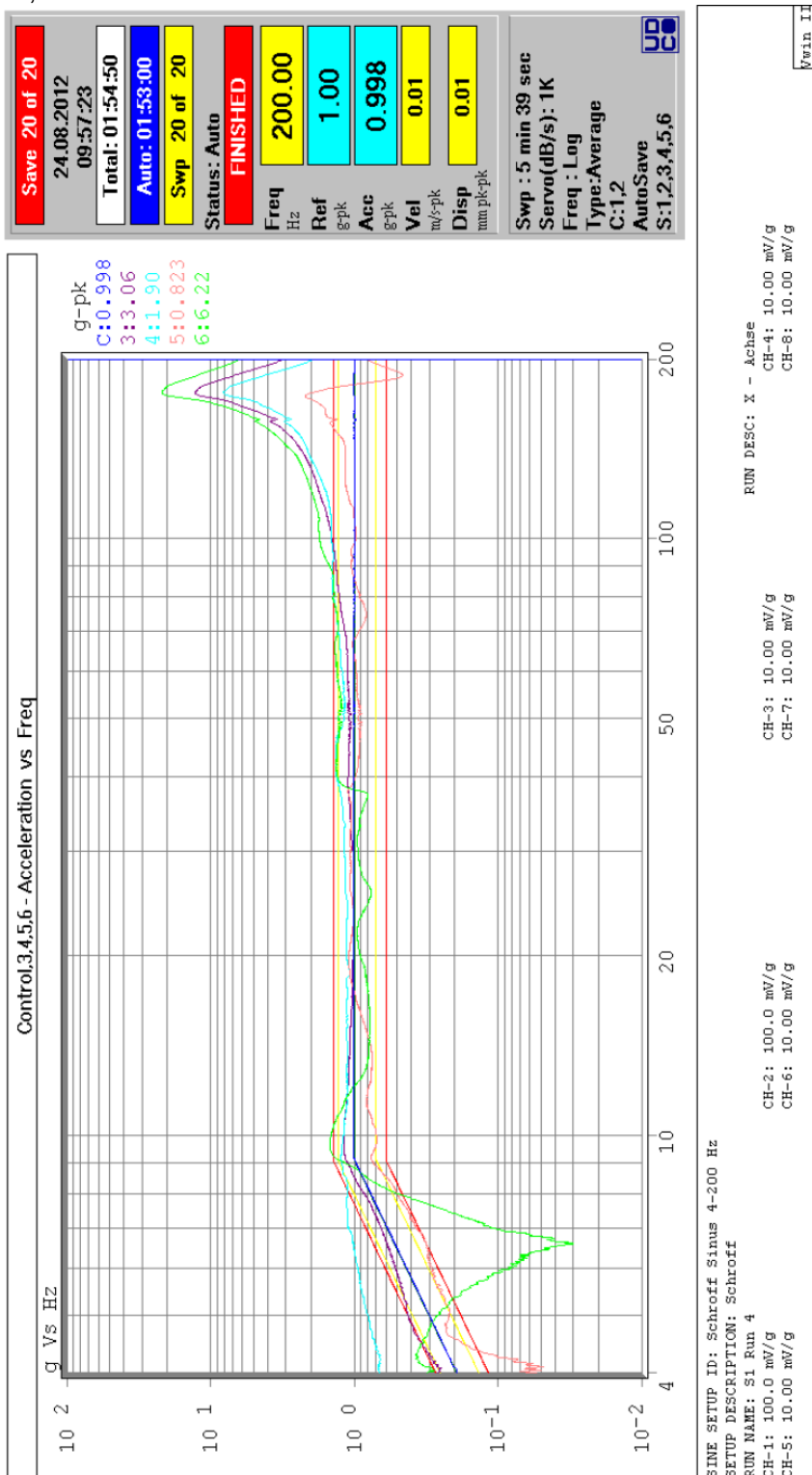
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Run 4, X- axis



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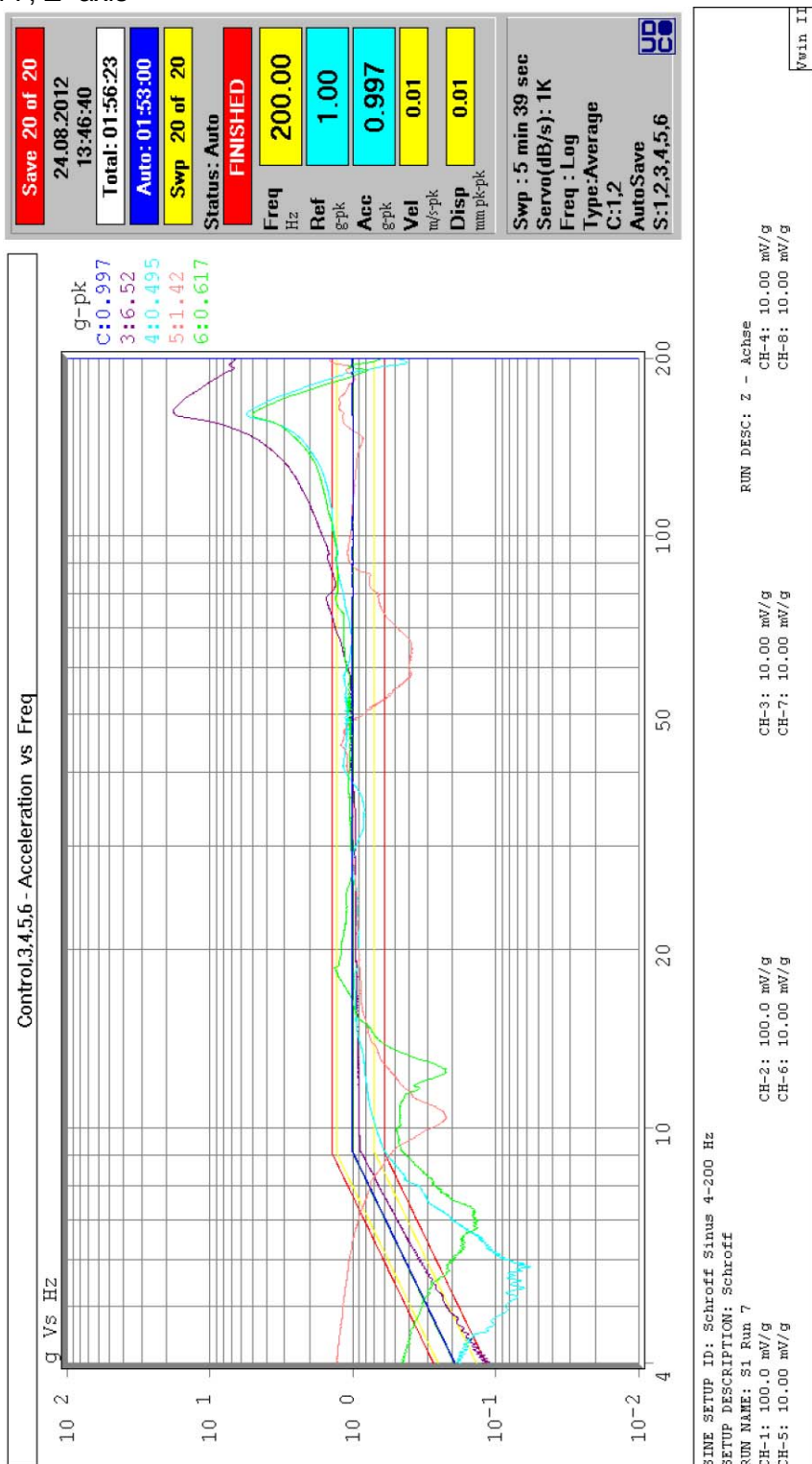


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Run 7, Z- axis



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7.2 Resonance list

List of Resonances: Sweeping UP
SINE SETUP ID: Schroff Sinus 4-200 Hz
SETUP DESCRIPTION: Schroff
RUN NAME: S1 Run 001
RUN DESC: Y - Achse
Ratio Limit Entered(g/g): 3.00

Chan	Freq(Hz)	g/g	CON (g)	CH (g)	Q	Phase
3	Not found					
4	4.037	3.91	0.19	0.75	N/A	-0.36
4	4.701	3.13	0.26	0.83	N/A	-14.08
4	8.529	3.79	0.87	3.3	2.21	-38.44
5	4.037	4.78	0.19	0.92	N/A	150.69
6	Not found					

List of Resonances: Sweeping UP
SINE SETUP ID: Schroff Sinus 4-200 Hz
SETUP DESCRIPTION: Schroff
RUN NAME: S1 Run 4
RUN DESC: X - Achse
Ratio Limit Entered(g/g): 3.00

Chan	Freq(Hz)	g/g	CON (g)	CH (g)	Q	Phase
3	175.444	12.58	1.0	12.7	13.80	79.16
4	4.046	3.51	0.19	0.67	N/A	113.92
4	4.317	3.07	0.22	0.69	N/A	124.22
4	175.444	7.99	1.0	8.1	13.83	-88.43
5	Not found					
6	175.850	21.42	1.0	21.7	13.80	75.70



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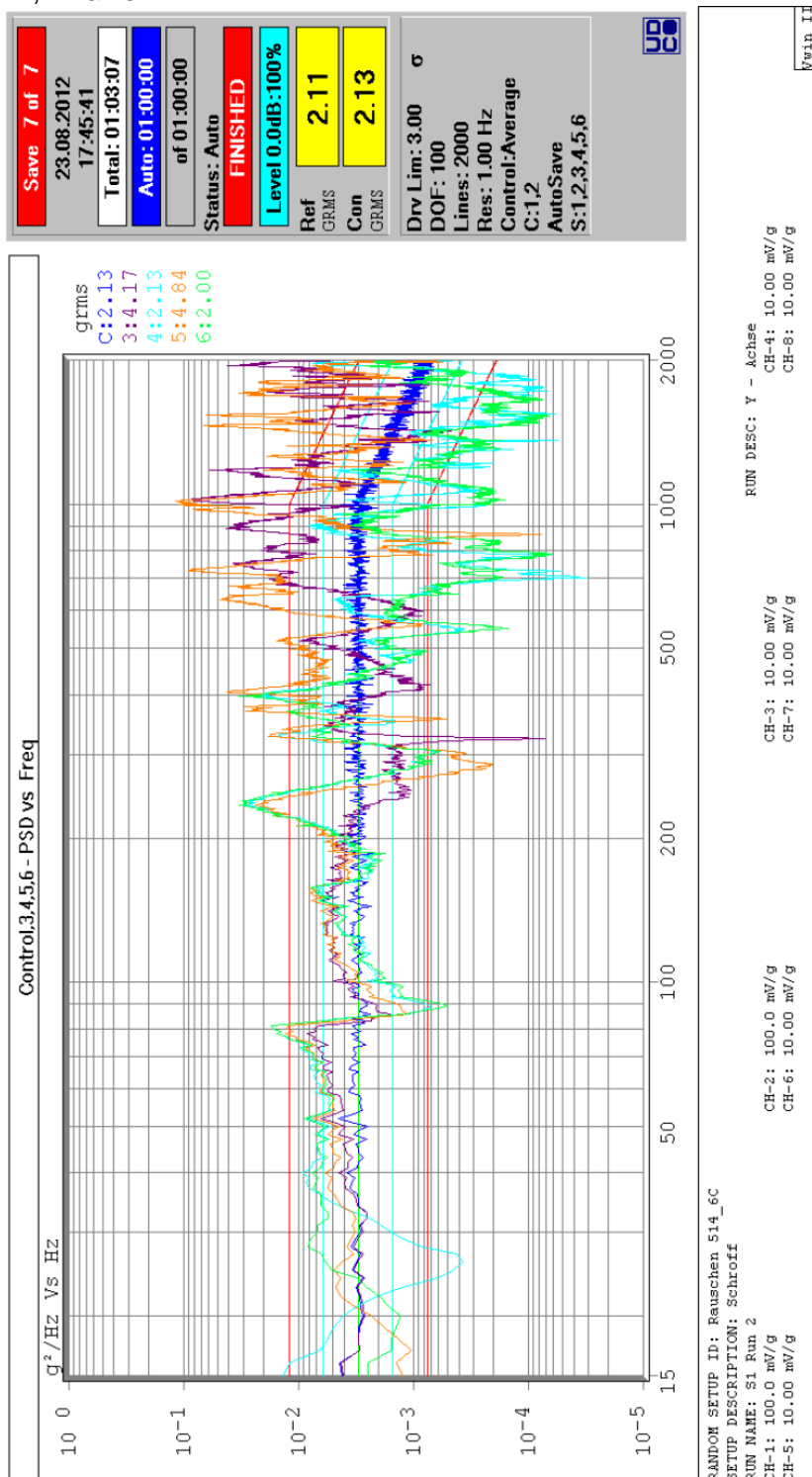
List of Resonances: Sweeping UP
SINE SETUP ID: Schroff Sinus 4-200 Hz
SETUP DESCRIPTION: Schroff
RUN NAME: S1 Run 7
RUN DESC: Z - Achse
Ratio Limit Entered(g/g): 3.00

Chan	Freq(Hz)	g/g	CON (g)	CH (g)	Q	Phase
3	161.827	17.84	1.0	18.0	9.37	-86.44
4	160.340	5.46	1.0	5.5	12.19	-64.32
5	4.009	6.66	0.19	1.3	N/A	-59.83
6	159.970	5.00	1.00	5.0	12.25	-67.10



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7.3 measuring diagrams of the vibration test, random Run 2, Y- axis



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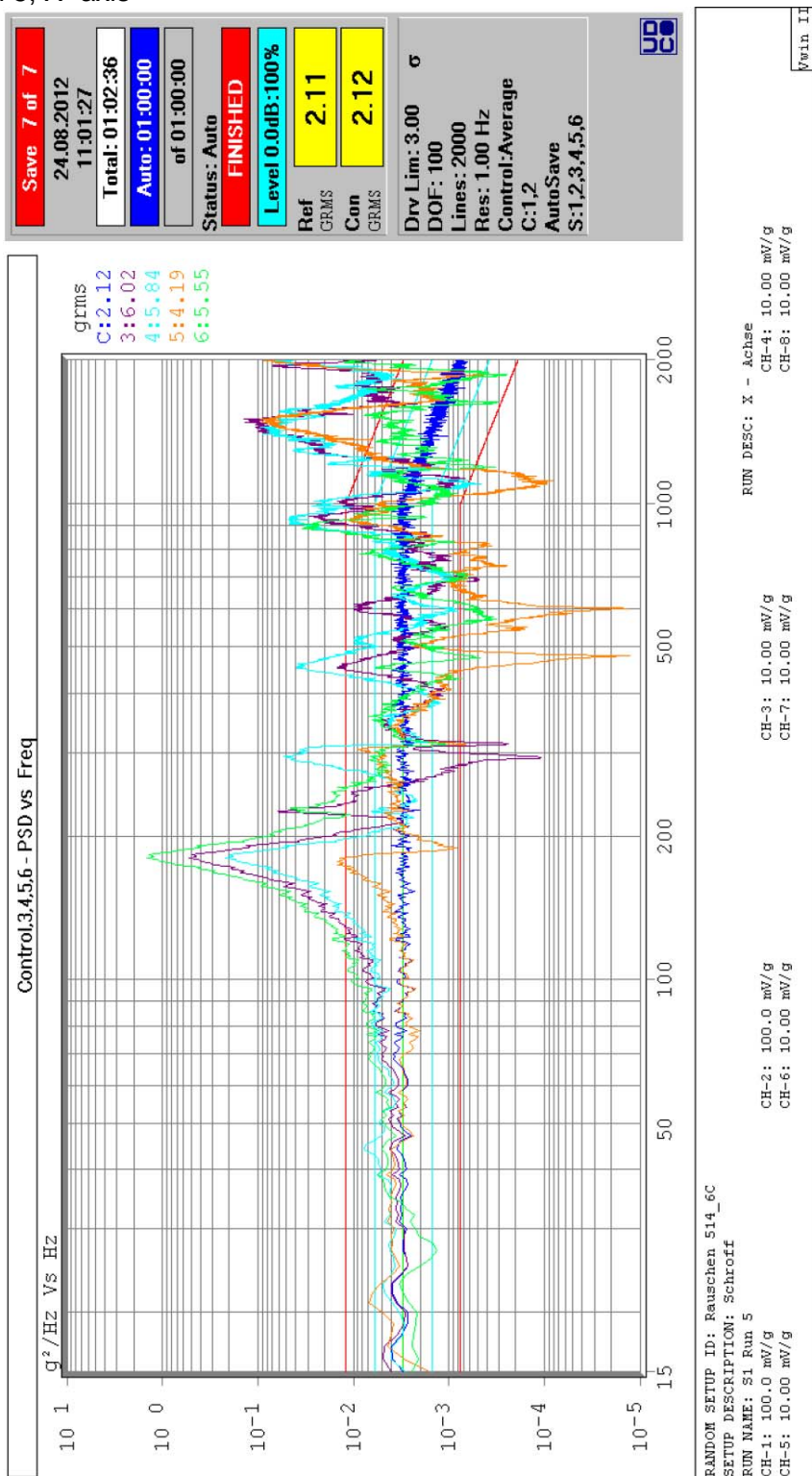
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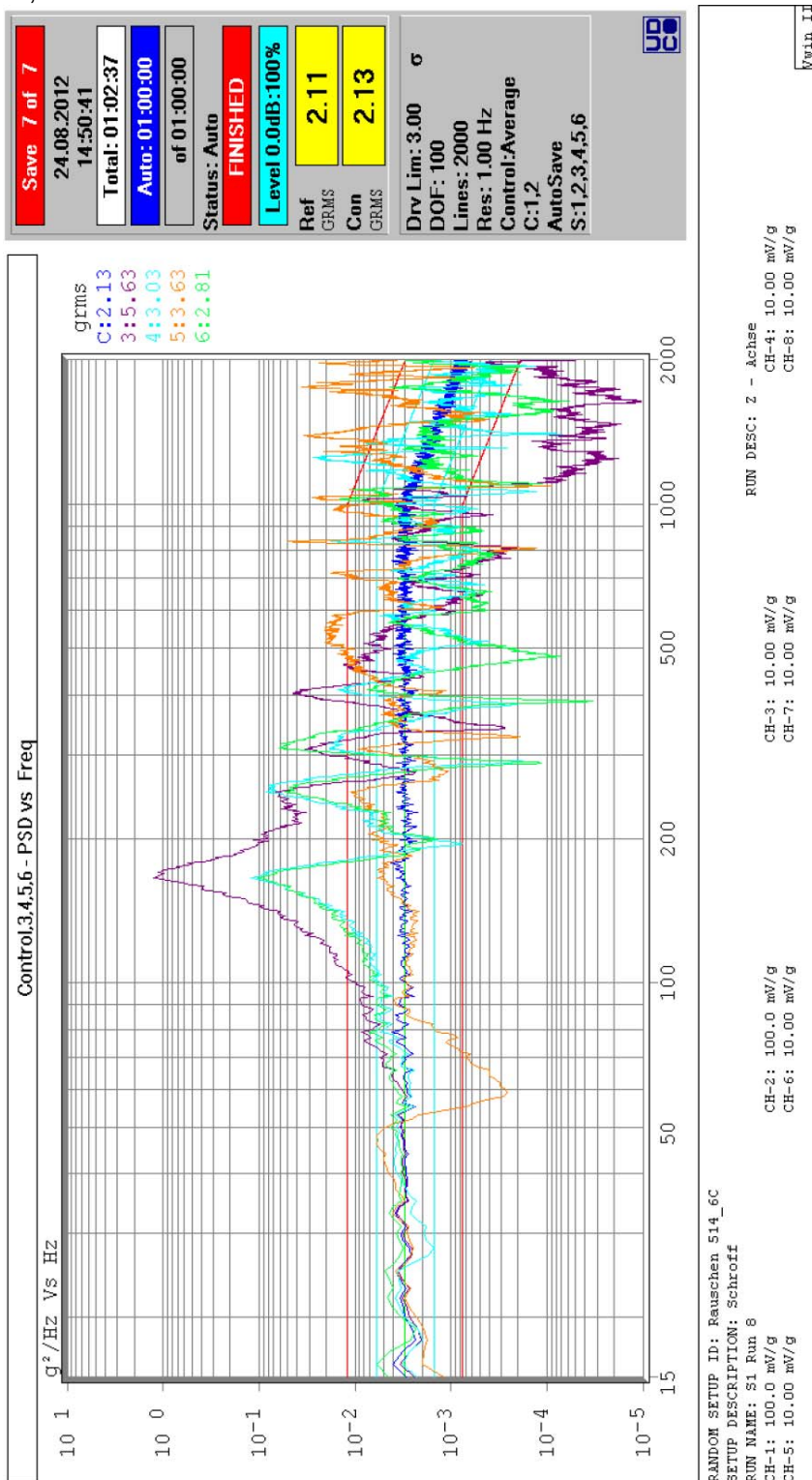
Run 5, X- axis





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Run 8, Z- axis



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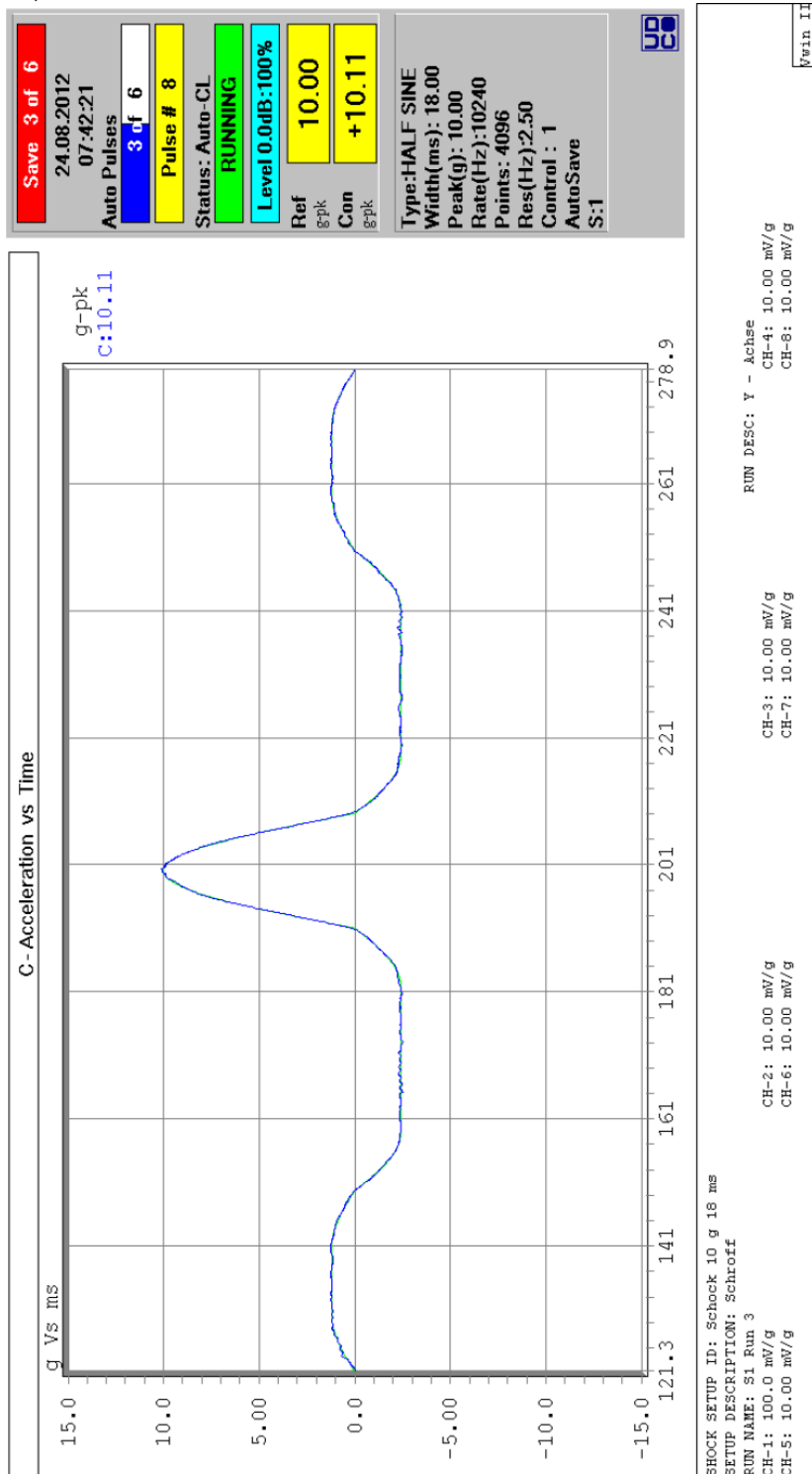


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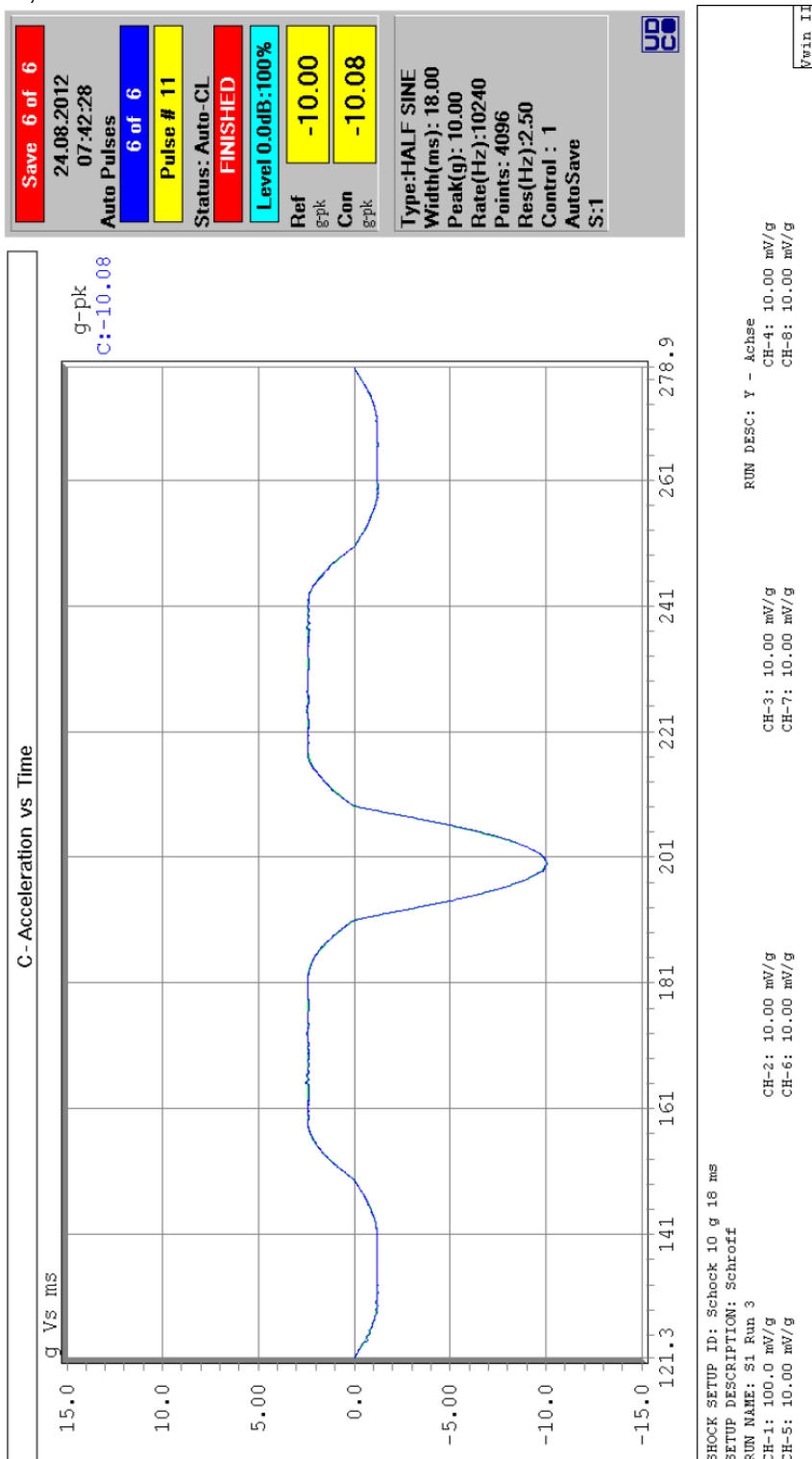
7.4 Measuring diagrams of the shock test Run 3, Y- axis





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Run 3, Y- axis



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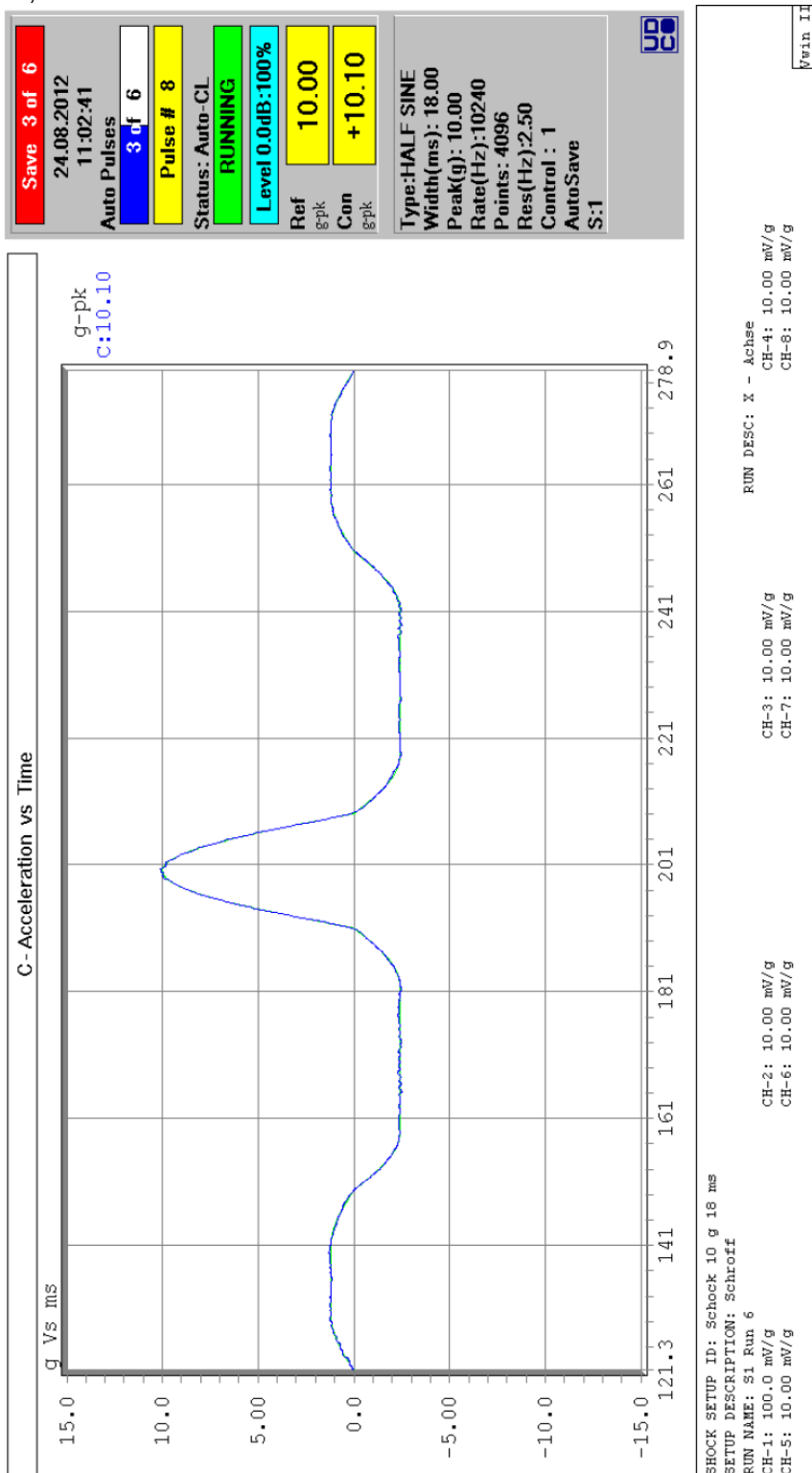
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Run 6, X- axis



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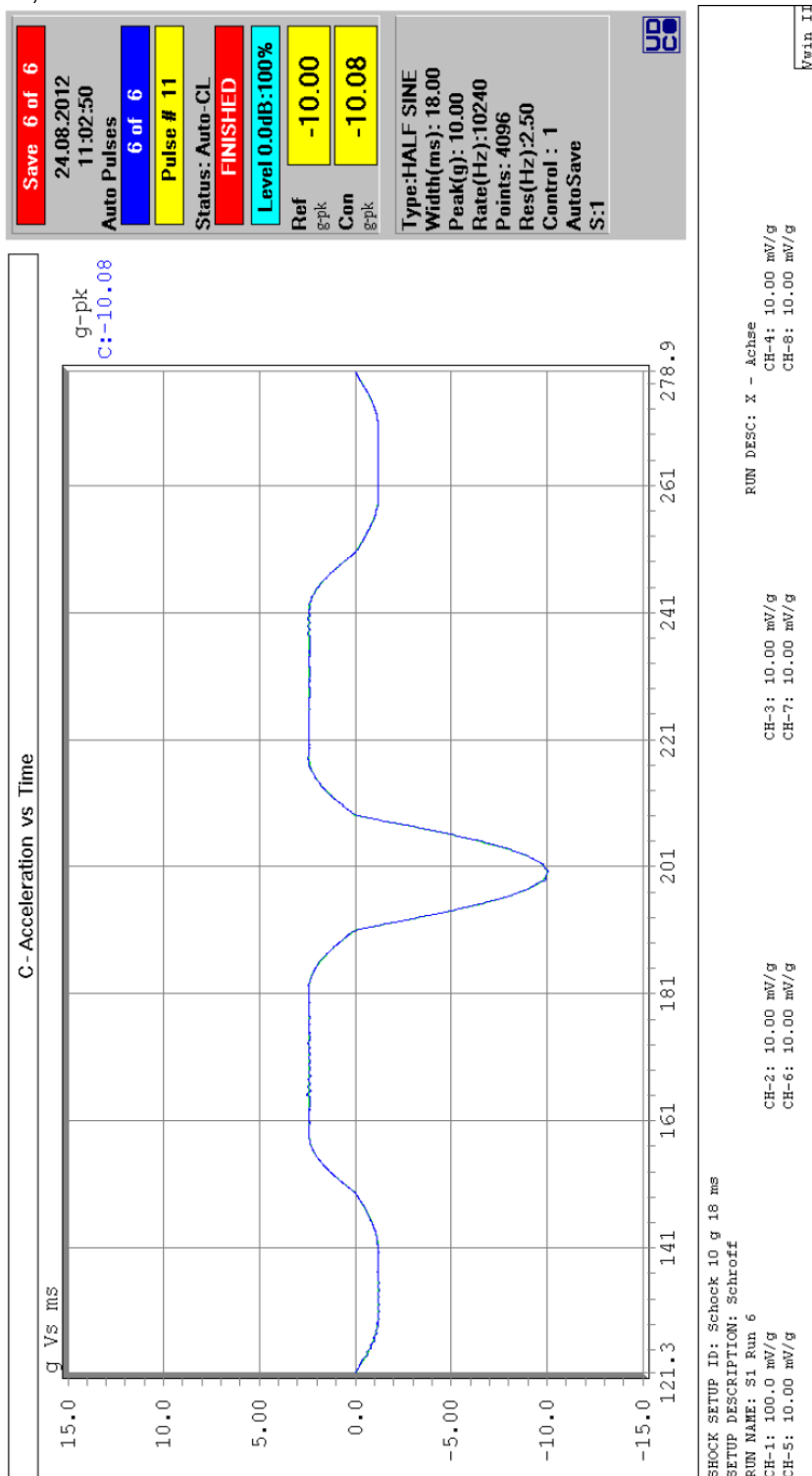
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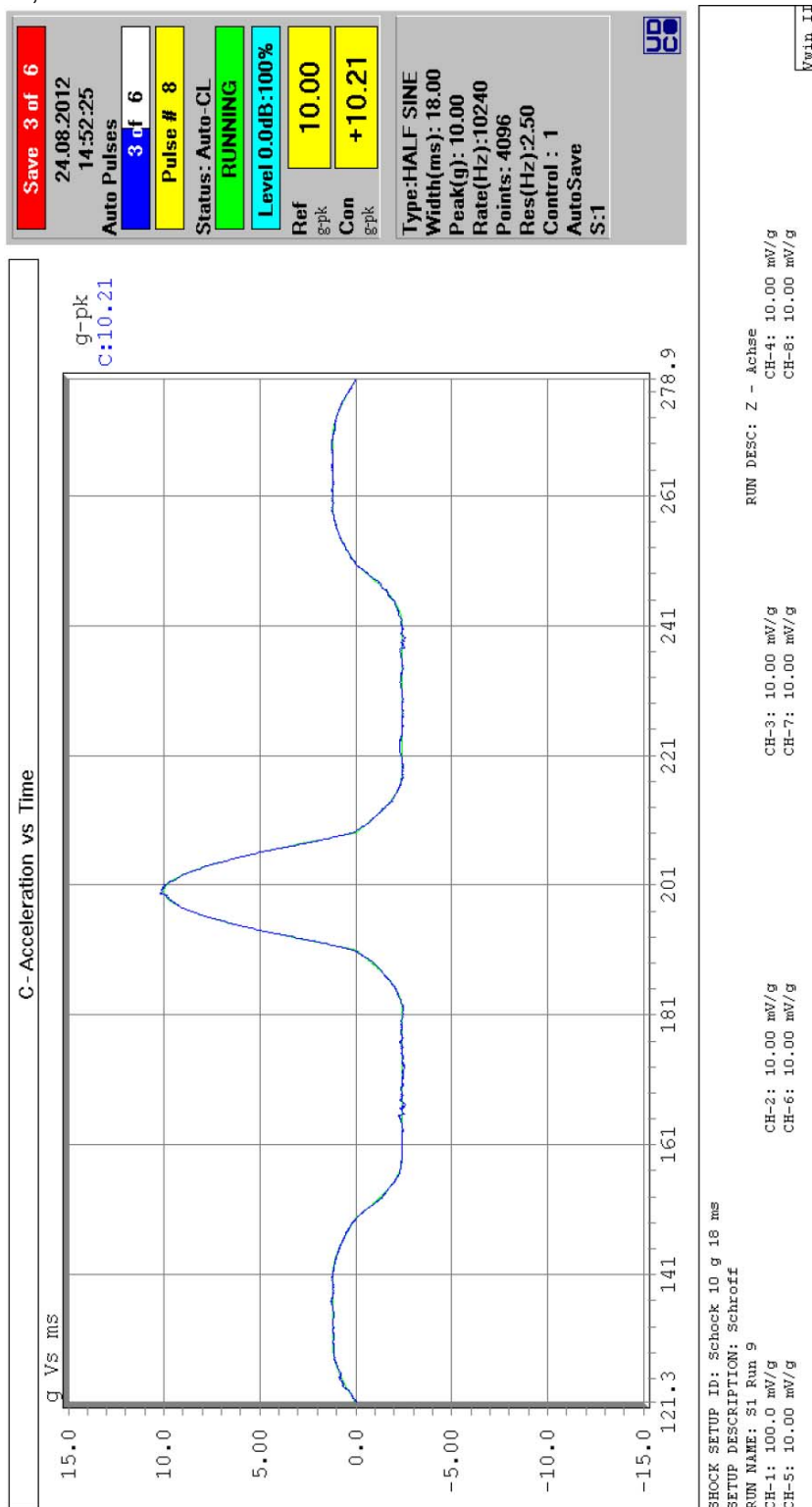
Run 6, X- axis





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Run 9, Z- axis



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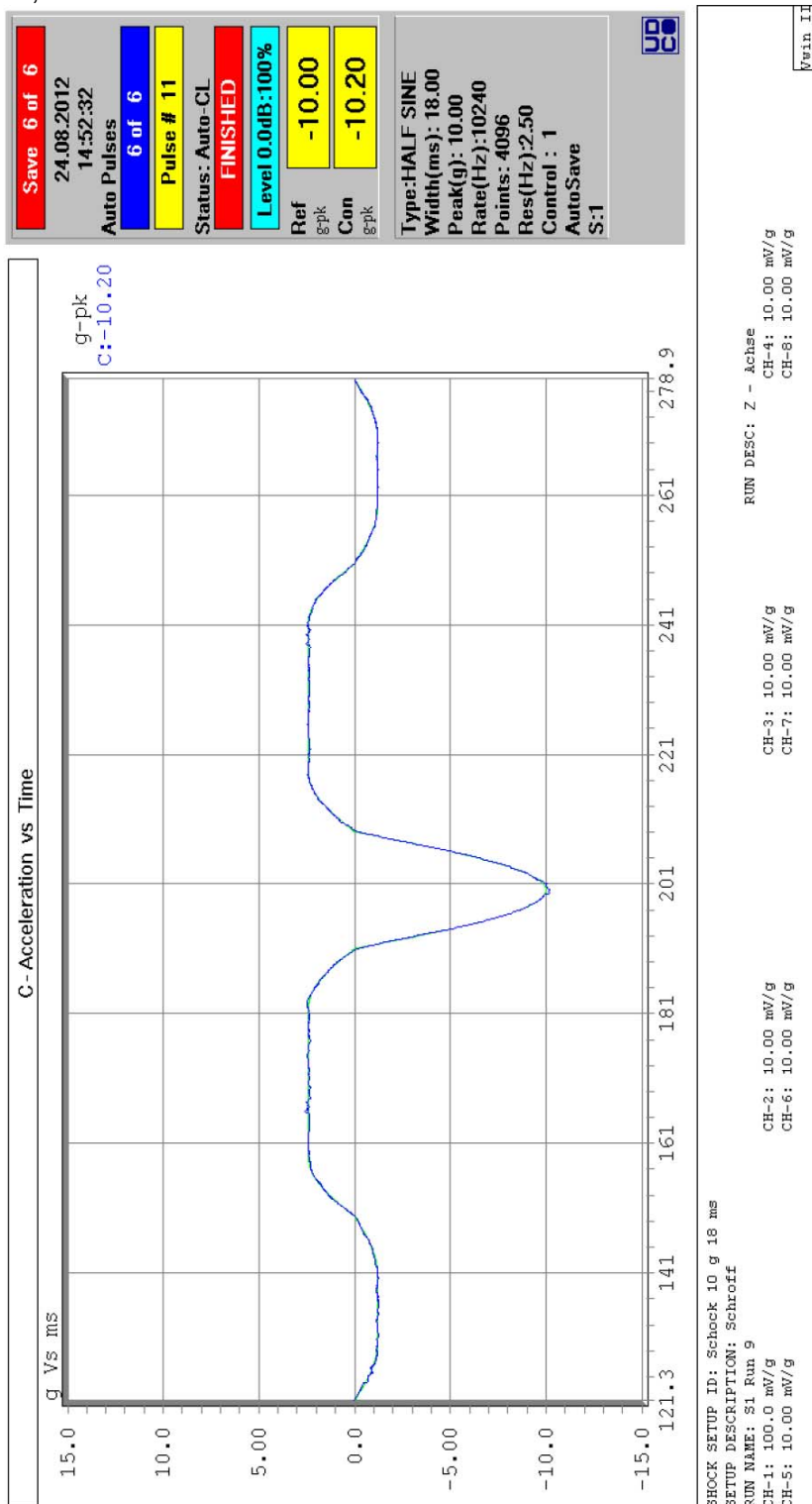
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Run 9, Z- axis



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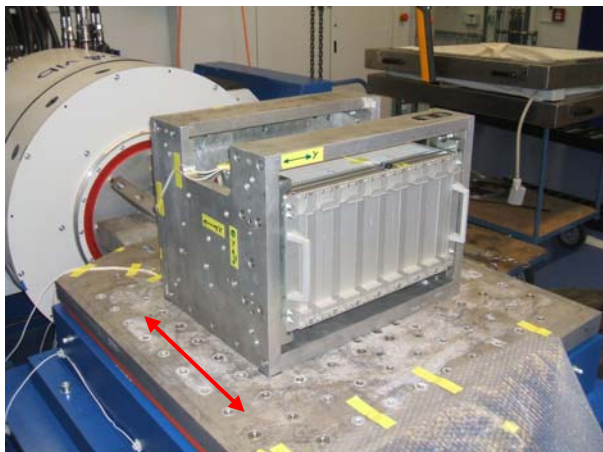
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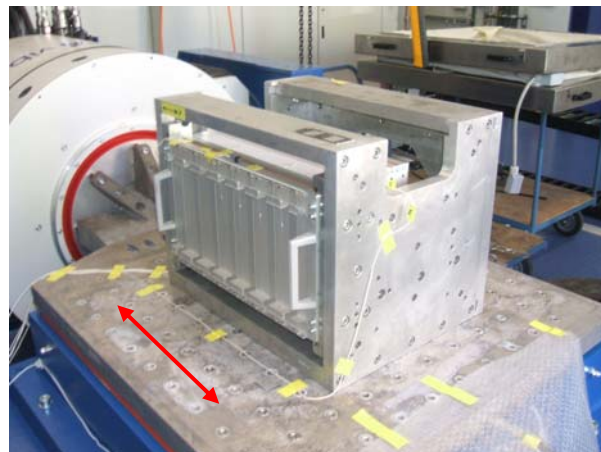
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8 Photo documentation



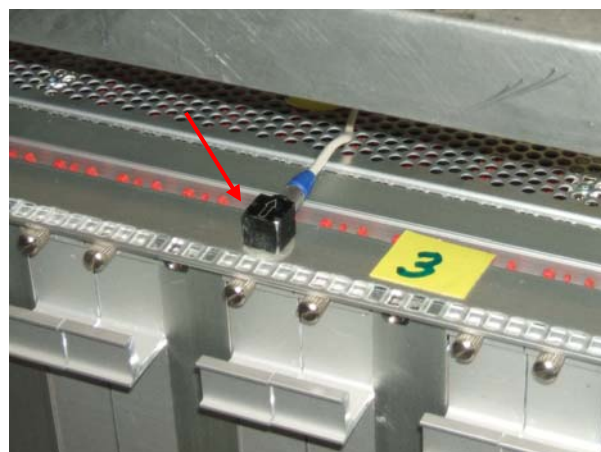
1. X- axis



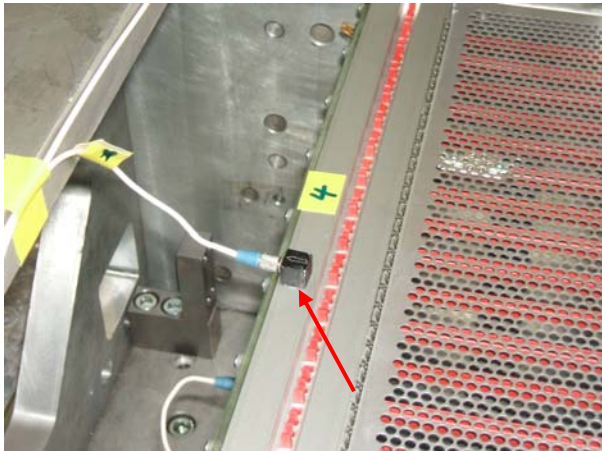
2. Y- axis



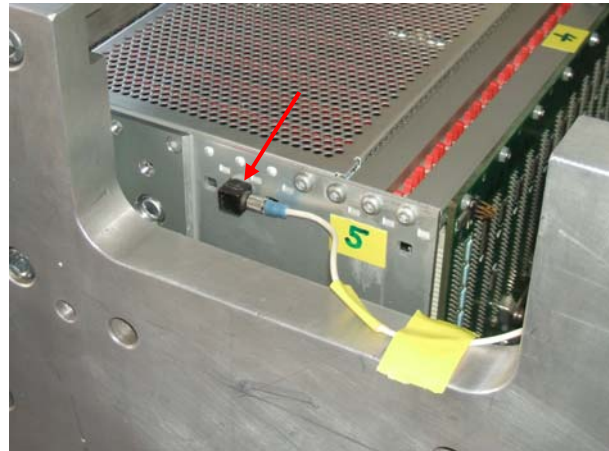
3. Z- axis



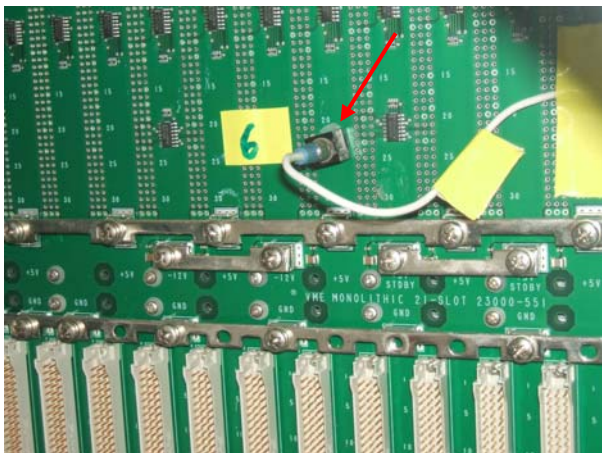
4. Measuring channel No. 3: module rail front, top, center



5. Measuring channel No. 4: module rail back, top, center



6. Measuring channel No. 5: right side panel, top



7. Measuring channel No. 6: backplane

Verified
Signature

Hari Mountogianakis
Dept. Vice-Manager

Edited
Signature

Herbert Lang
Test Engineer