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Fakulty elektrotechniky a informatiky STU
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TEST REPORT

No.: 07/16/SL EMK
Year: 2016

Applicant: Barani Design s.r.o.
Dubová 495/11, 031 04 Liptovský Mikuláš, Slovakia

Tested equipment: Anemometer - Meteowind

SLOVENSKÁ TECHNICKÁ UNIVERZITA
BRATISLAVA
FAKULTA ELEKTROTECHNIKY A INFORMATIKY
-Akreditovaná skúšobňa -
Ilkovičova č. 3, 812 19 Bratislava

Approved:
Assoc. Prof. K. Kováč, PhD.
Head of Test house of FEI STU

Bratislava 17. 2. 2016

Notes: All test results are valid only for tested equipment. Publication of test report content is not allowed without customer confirmation. Test report may be copied only as a whole, otherwise only with confirmation of Test house of FEI STU in Bratislava. This test report is issued only in English language.

SFEI STU v BRATISLAVE	SKÚŠOBŇA Fakulty elektrotechniky a informatiky STU	Ilkovičova 3 812 19 BRATISLAVA
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Test subject: Anemometer - Meteowind

Serial number: 574882583

Manufacturer: Barani Design s.r.o., Dubová 495/11, 031 04 Liptovský Mikuláš, Slovakia

Test: Immunity tests according to EN 61000-4-2, EN61000-4-4 and 61000-4-5.

Applicant: Barani Design s.r.o., Dubová 495/11, 031 04 Liptovský Mikuláš, Slovakia

Date of test sample submission: 12. 2. 2016

Number of tested samples: 1

Date of measurement: 12. 2. 2016

Place of measurement: EMC Test Laboratory of SFEI STU Bratislava

Test report contains:

Text pages: 8
Tables: 4
Appendices: 0
Figures: 3

Distribution: Number of pcs

SFEI STU: 1 pc
Applicant: 1 pc

Conditions of measurements and tests:

Identification of test equipment is shown in Fig. 1.

Measured set contained:

- Anemometer connected to module of protection and battery by 4-wire shielded cable, long 4.5 m,
- Module of protection and 12 V lead acid battery connected to RS485/USB convertor by cable 1 m long,
- RS485/USB Convertor connected to notebook by cable 0.5 m long ,
- Notebook with monitoring software.

Explanation: If the measured set was modified due to any measurement or test conditions, it is noticed on the page corresponding to the measurement or test.

Power supply: 12 V AC

Atmospheric conditions: Temperature: 22 - 23 °C
Rel. humidity: 30 - 34 %

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Test results:

Table 1: Results of immunity tests.

No.	Test	Method	Function criterion		Page
			Request	Conclusion	
1	Immunity against electrostatic discharges	EN 61000-4-2	B	complies A, B	4
3	Immunity against EFT/Burst pulses	EN 61000-4-4	B	complies A	5
4	Immunity against SURGE pulses	EN 61000-4-5	B	complies A	6

Selection of tests, their test levels and functional criteria were extended or modified according to applicant requirements. Behaviour of the tested device, in terms of functional criteria, was judged on the basis of specifications of the equipment applicant.

Criterion used for function compatibility (abridged version):

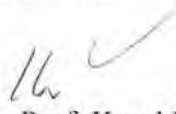
Criterion A: The equipment continues to operate as intended. No degradation of performance or loss of function is allowed below that specified by the manufacturer.

Criterion B: The equipment continues to operate as intended after the test. Degradation of performance or loss of function is allowed during the test, however afterwards this must not be outside manufacturer's specifications.

Criterion C: Temporary loss of function is allowed provided the function is self-recoverable or can be restored.

Conclusion: **Tested device complies with applicant requirements within the range shown in the table 2.**

Test laboratory declares, that measurement results are valid only for measured subject.


 Assoc. Prof. Karol Kováč, PhD.
 Head of EMC Laboratory

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Test: Test of immunity against electrostatic discharge according to EN 61000-4-2:2009

Test subject: Anemometer - Meteowind

Serial number: 574882583

Manufacturer: Barani Design s.r.o., Dubová 495/11, 031 04 Liptovský Mikuláš, Slovakia

Date of measurement: 12. 2. 2016

Test instrumentation:

- a. electrostatic discharge simulator Haefely Trench PESD 1600 – Ser. No. H 606 113,
- b. testing place according to EN 61000-4-2.

Metrological properties:

Testing place was verified according to EN 61000-4-2 on 01.07.2015, measuring report KP-15/04/EMK.

Conditions of test:

Test place was arranged according to EN 61000-4-2 (Fig. 2). During the test the functionality of EUT was monitored by notebook software. The monitoring was realized by employee of applicant.

Test results:

Table 2: Result of electrostatic discharge test.

Discharge type	Test level	Request of standard	Test results
Indirect – contact discharge	±4 kV	B	B
Direct - contact discharge	±4 kV	B	A
Direct - contact discharge	±8 kV	B	B
Direct - contact discharge	±15 kV	B	B
Direct - air (on the plastic part)	±8 kV	B	A
Direct - air (on the plastic part)	±15 kV	B	A

Note: Explanation of criteria is on page 3.

Conclusion: Immunity level of tested device complies with applicant requirements.

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Test: Test of immunity against EFT/Burst pulses according to EN 61000-4-4:2012

Test subject: Anemometer - Meteowind

Serial number: 574882583

Manufacturer: Barani Design s.r.o., Dubová 495/11, 031 04 Liptovský Mikuláš, Slovakia

Date of measurement: 12. 2. 2016

Test instrumentation:

- a. EFT/Burst simulator EFT500N5 – Ser. No. V0947105565,
- b. capacitive clamp according to EN 61000-4-4,
- c. test place for immunity against EFT/Burst testing according to EN 61000-4-4.

Metrological properties:

Testing generator was verified according to EN 61000-4-4 on 15. 12. 2014, measuring report KP-14/06/EMK.

Conditions of test:

Test place was arranged according to EN 61000-4-4 (Fig. 3). During the test the functionality of EUT was monitored by notebook software. The monitoring was realized by employee of applicant.

Test results:

Table 3: Result of immunity test against EFT/Burst: $f = 5$ kHz, 15/300 ms.

Cable	Coupling	Test level	Request of standard	Test results
Sensor side	Capacitive clamp	± 0.5 kV	B	A
Sensor side	Capacitive clamp	± 1 kV	B	A
Protection side	Capacitive clamp	± 0.5 kV	B	A
Protection side	Capacitive clamp	± 1 kV	B	A

Note: Explanation of criteria is on page 3.

Conclusion: Immunity level of tested device with applicant requirements.

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Test: Test of immunity against SURGE pulses according to EN 61000-4-5:2014

Test subject: Anemometer - Meteowind

Serial number: 574882583

Manufacturer: Barani Design s.r.o., Dubová 495/11, 031 04 Liptovský Mikuláš, Slovakia

Date of measurement: 12. 2. 2016

Test instrumentation:

- a. surge simulator VCS 500-M, EM TEST – Ser. No. V0548100910,
- b. test place according to EN 61000-4-5.

Metrological properties:

Test simulator was verified according to EN 61000-4-5 on 15. 12. 2014, measuring report KP-14/05/EMK.

Conditions of measurement:

Test place was arranged according to EN 61000-4-5. Pulses of both polarities were applied with repetition time of 1 minute. During the test the functionality of EUT was monitored by notebook software. The monitoring was realized by employee of applicant.

Test results:

Table 4: Result of immunity test against SURGE.

Tested port	Coupling impedance	Test level	Number of pulses	Request of standard	Test results
Power +/-	42 Ω	± 0.5 kV	10	B	A
Power +/-	42 Ω	± 2 kV	4	B	A
Power +/-	42 Ω	± 4 kV	4	B	A
Data line A	42 Ω	± 1 kV	10	B	A
Data line A	42 Ω	± 2 kV	4	B	A
Data line A	42 Ω	± 4 kV	4	B	A

Note: Explanation of criteria is on page 3.

Conclusion: Immunity level of tested device complies with applicant requirements.



Fig.1: Identification of the equipment.

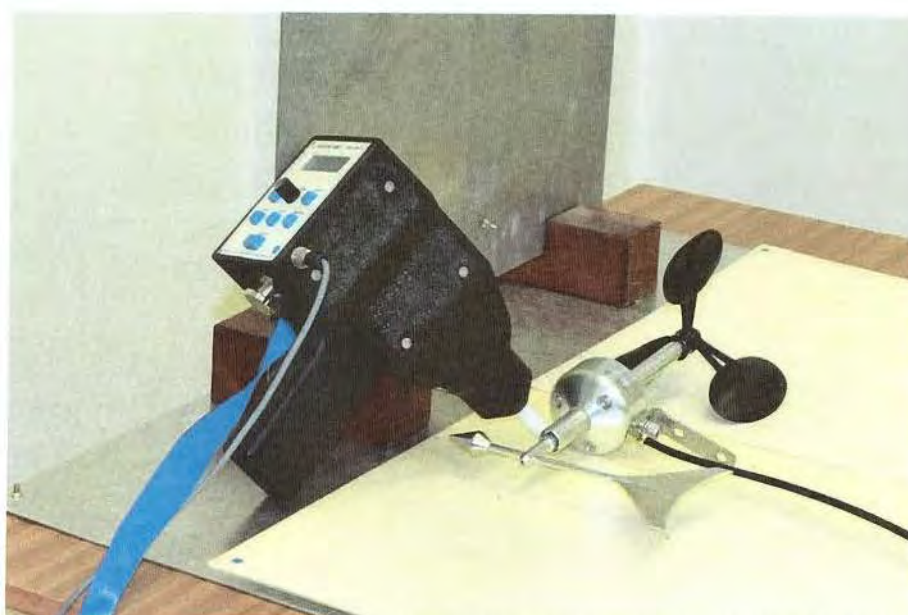


Fig.2: Arrangement of tested sample during the test according to EN 61000-4-2.

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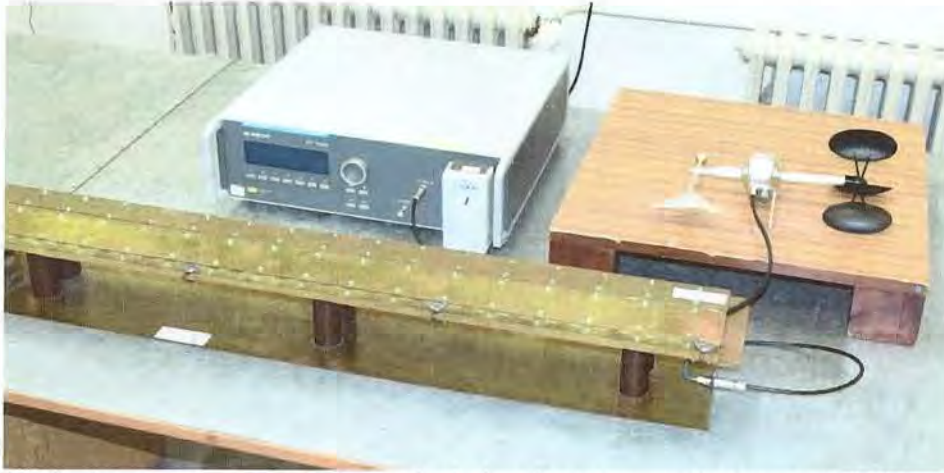


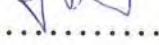
Fig.3: Arrangement of tested sample during the test according to EN 61000-4-4.

Place and date of test report edition: **Bratislava, 17. 2. 2016**

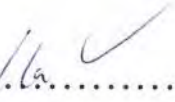
Test executed by: **A. Krammer, MSc.**

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Report created by: **J. Hallon, PhD.**

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Test results verified by: **Assoc. Prof. K. Kováč, PhD.**

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————— **End of test report** —————