

Vojenský technický ústav, s.p. with the certified quality system according to ČSN EN ISO 9001		Task /Order No.: 25-19-5-93-3074/Z03 Test Report No.: 194300-022/2025
  L 1103	Testing Laboratory No. 1103 accredited by CAI according to ČSN EN ISO/IEC 17025:2018 EMC TESTING LABORATORY	
TEST REPORT electromagnetic compatibility – immunity		
Applicant name and address: SEC Technologies, s.r.o. 1. Mája 4269, 031 01 Liptovský Mikuláš, Slovakia		
Identification of EUT: MTU-1A2 Pan Tilt Positioner, P/N: A050107, NSN: 5855160089788		
Serial Number.: MU0101		
Manufacturer: SEC Technologies, s.r.o. 1. Mája 4269, 031 01 Liptovský Mikuláš, Slovakia		
Technical documentation: Not delivered		
Test method¹⁾: MIL-STD-461F, met. RS101, RS103		
Sample received: 7. 2. 2025	Test leader: Ing. Jan Šot  Test Engineer	
Date and place of test: 7. – 12. 2. 2025 EMS test room, VTÚPV	Test carried out by: Ing. Jan Šot  Test Engineer	
Date of Issue: 13. 2. 2025	Authorized by technical manager: Ing. Petr Kupka EMC Laboratory Manager 	
Test Results: Test results are on next pages of the test report. <i>The expanded measurement uncertainty is a product of standard measurement uncertainty and extension factor of $k = 2$, which corresponds to a coverage probability of approximately 95 % for a normal distribution.</i>		
Address: Vojenský technický ústav, s.p. odštěpný závod VTÚPV Equipment Testing Centre - Testing Laboratory No. 1103 Víta Nejedlého 691 682 01 Vyškov, CZ		Notes: This test report is translation of Czech version of test report No. 194300-022/2025. In the case of difference is valid Czech version of this test report.
Tel.: +420 910 105 619 E-mail: Jan.Sot@vtusp.cz		

The test results contained in this report relate to the tested item as received. This report shall not be reproduced other than in its entirety and only with written approval of the Testing Laboratory. The Testing Laboratory is not responsible for the data and information provided by the customer, which may affect the validity of the results.

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1 LIST OF THE TEST INSTRUMENTS

Tab. 1 List of the test instruments

Metrology database number	Instrument Name	Calibration Validity
41k-60841	Generator Marconi 2024	01-2027
41k-60092	Generator R&S SMB 100A (40GHz)	04-2026
41k-61183	Generator Tektronix AFG2021	11-2027
97E011	Amplifier ELMET ESA-155	exempt from calibration
0325633	Amplifier AR 500A250	exempt from calibration
44b-61251	Amplifier AR 500W1000A	exempt from calibration
44b-61022	Amplifier R&S BBA150-D400E200	exempt from calibration
7183	Amplifier Varian VZM6991K3	exempt from calibration
00134448	Antenna EMCO 3303	exempt from calibration
00139099	Antenna ETS Lindgren 3109	exempt from calibration
980018L	Antenna BTA-L	exempt from calibration
170607A370	Antenna RFspin DRH370	exempt from calibration
00104521	Antenna ETS Lindgren 3117	exempt from calibration
00125645	Injection coil ETS Lindgren 7605	exempt from calibration
42b-60185	Electromagnetic field monitor Microrad NHT3DL	08-2025
41e-61837	Clamp multimeter FLUKE 325	03-2027
43b-61002	Oscilloscope Tektronix TDS7704B	11-2027

2 CLIMATIC CONDITIONS DURING THE TESTS

- atmospheric pressure: $(98,0 \pm 0,2)$ kPa
- ambient temperature: (20 ± 2) °C
- relative humidity: (42 ± 8) %



3 TESTED EQUIPMENT

3.1 Name and Type

- MTU-1A2 Pan Tilt Positioner, P/N: A050107, NSN: 5855160089788
- serial number: MU0101

3.2 Configuration

Tested equipment:

- MTU-1A2 Pan Tilt Positioner, P/N: A050107, NSN: 5855160089788

Auxiliary equipment:

- Laptop Getac, SN:020/23
- Joystick, type APEM 100350 USB DESKTOP JOYSTICK, NSN: 7025-99-9590600
- Battery F4G-BAT 1, S/N:020/23
- Communication unit FIU MOXA, NSN:5935-40-001-7820

3.3 Activity mode

Work mode:

The tested device (Pan Tilt Positioner) is connected to the battery and communication unit with the cable "EVPÚ DEFENCE PN:A191178, SNK9524". The communication unit is connected to the laptop. The program "Falcon4GVR64 version 05.01" is used for communication, information reading and Pan Tilt Positioner control via joystick. During the tests, the Pan Tilt Positioner is moved randomly.

3.4 Arrangement

- the device under test is connected to a cable "EVPÚ DEFENCE PN:A191178, SNK9524" 5 m long - during the RS103 test, a ferrite clamp FTC 101 is connected to the cable directly to the battery
- supply by a battery F4G-BAT 1, S/N:020/23
- the device under test was grounded by contact with the ground plate

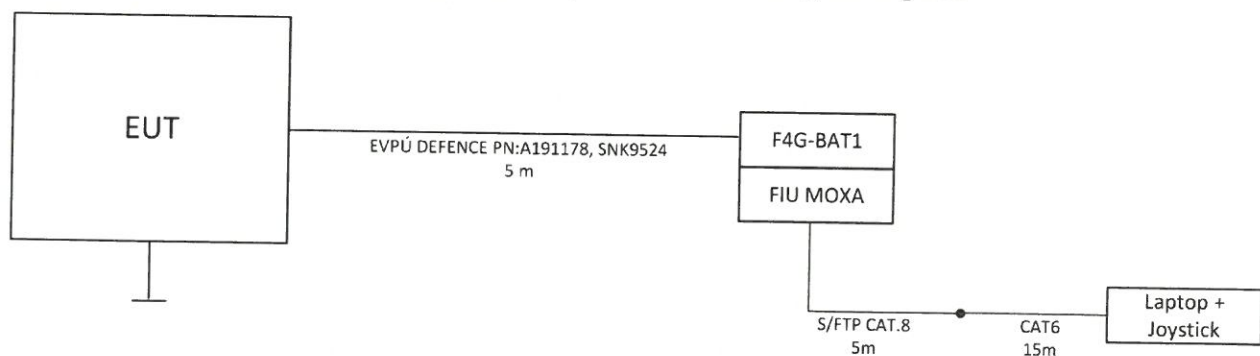


Fig. 1 Arrangement of the EUT



3.5 Checking the function of the equipment under test and functional criteria

The function of the tested device was checked during the test based on the Pan Tilt Positioner's communication with the control software, informations about azimuth, elevation, current movement and battery voltage. Furthermore, the response of Pan Tilt Positioner control with the joystick is checked.

Tab. 2 Functional criteria set by the test provider

ACCEPTED (A)	FAILED (F)
Constant communication of the Pan Tilt Positioner with the software and reading of correct information.	Communication failure or interruption, reading incorrect information about the Pan Tilt Positioner.
The Pan Tilt Positioner responds to joystick control.	The Pan Tilt Positioner does not respond to joystick control or moves on its own.



Fig. 2 EUT



Fig. 3 Serial label



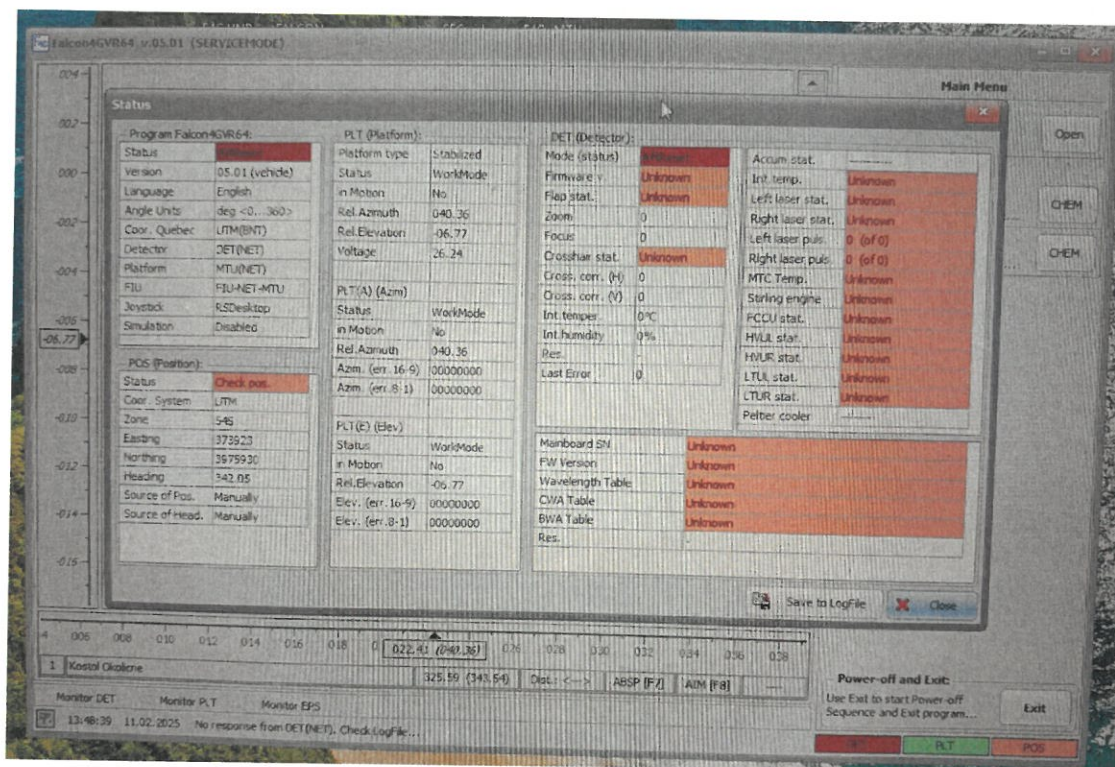


Fig. 4 Software Falcon4GVR64 version 05.01



4 TEST RESULTS

4.1 RS101, radiated susceptibility, magnetic field MIL-STD-461F, met. RS101

This part of the standard is concerned with immunity of electric and electronic equipment to magnetic field.

4.1.1 Parameters of test signal

Tab. 3 Parameters of test signal - Army application limit

Band	B_{rms} [dBpT]	Tuning velocity	Calibrated B_{rms} level accuracy
30 Hz – 60 Hz	180	0.05 f / 3 s	0 to + 3 dB
60 Hz – 100 kHz	180 – 116 ¹⁾		

¹⁾ – the level decreases with increasing frequency

B_{rms} – effective value of magnetic flux density during calibration

f – signal frequency

4.1.2 Test course and response of EUT

Tab. 4 Test RS101 results - Army application limit

Radiating loop position	Test result
1	A
2	A
3	A
4	A
5	A

Radiating loop position showed on Fig. 2

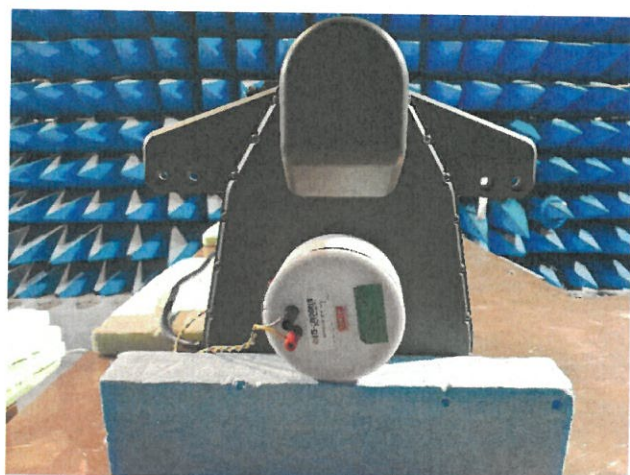




Position 1



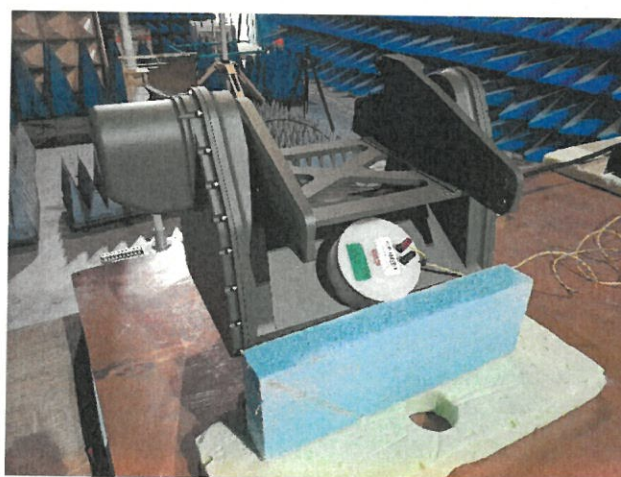
Position 2



Position 3



Position 4



Position 5

Fig. 5 Radiating loop position during RS101 test



4.2 RS103, radiated susceptibility, electric field MIL-STD-461F, met. RS103

This part of the standard is concerned with immunity of electric and electronic equipment to radiated energy. Specifies test levels and test method.

4.2.1 Parameters of test signal

Tab. 5 Parameters of test signal

Band	E_{rms} [V/m]	Modulation	Tuning velocity	Accuracy of calibrated field
2 MHz – 30 MHz	50	pulse 1 kHz, 50 %	$0.01 f / 3 \text{ s}$	0 to + 3 dB
30 MHz – 1 GHz			$0.005 f / 3 \text{ s}$	
1 GHz – 18 GHz			$0.0025 f / 3 \text{ s}$	

E_{rms} – effective value of electric field intensity - not modulated signal

f – signal frequency

4.2.1 Course of the test and response of the EUT

Tab. 6 Test RS103 results

The direction of the effects of electromagnetic field to EUT ¹⁾	Band	E_{rms} [V/m]	Polarisation ²⁾	Test result
See on Fig.	2 MHz – 30 MHz	50	VP	A
	30 MHz – 1 GHz		HP / VP	A / A
	1 GHz – 18 GHz		HP / VP	A / A

¹⁾ – antenna distance from EUT: 1 m

²⁾ – polarisation: HP - horizontal, VP - vertical

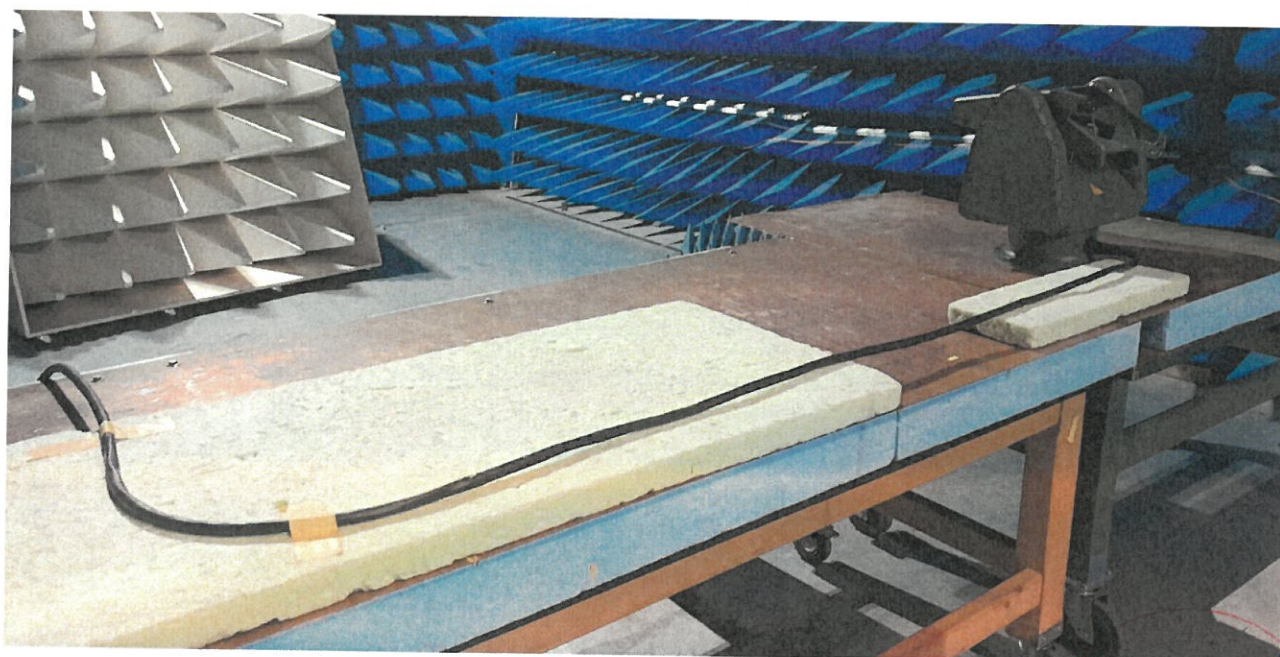
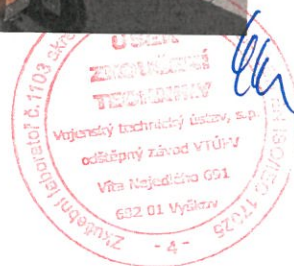


Fig. 6 Test setup during the RS103 test

END OF THE TEST REPORT



TECHNICAL COMMENTARY

on test results - test report No. 194300-022/2025

Tested equipment: **MTU-1A2 Pan Tilt Positioner, P/N: A050107, NSN: 5855160089788**
Serial number: **MU0101**

COMPLIED

with requirements of standard:

MIL-STD-461F, met. RS101, RS103

Technical commentary on tests results has an information character and is beyond scope of testing centre accreditation.

In Vyškov 13. 2. 2025

Responsible person: Ing. Jan Šot


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signature