Deutscher Akkreditierungs Rat

Reg.-Nr.: TTI-P-G010/98-01

FCC ID: OWUOK622-7

MEASUREMENT/TECHNICAL REPORT No. 16034-1-EFE

Microsport
In-Line Skate Speedometer

March 27, 2001

This report concerns (check one): Original grant **X** Class II change

Equipment type: In-Line Skate Speedometer

Deferred grant requested per 47 CFR 0.457(d)(1)(ii)? yes__ no **X**

If yes, defer until:

(date)

Microsport GmbH & Co. KG agrees to notify the Commission by

(date)

of the intended date of announcement of the product so that the grant can be issued on that date.

Transition Rules Request per 15.37? yes__ no **X**

If no, assumed Part 15, Subpart C for Intentional radiators - the new 47 CFR (10-01-99 Edition) provision.

Verification Status:
The MICROSPORT In-Line Skate Speedometer has been verified as being compliant with the Class B limits of the FCC Radio Frequency Devices Rules (FCC Part 15 Subpart C - revised as of October 1, 1999).

Report prepared by: **ELMAC GmbH**
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(FCC registered Test Site; 31040/SIT)

Tested by: U. Schmidt

Engineer in charge: J. Bühne

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ENGINEERING STATEMENT

I am an Electromagnetic Compatibility Engineer for ELMAC GmbH, Bondorf, Germany.

The tests documented in this test report were made by me or under my supervision at our Bondorf Laboratory which is registered with the FCC under Paragraph 15.38 of the FCC Rules.

Test data required by the FCC for Verification is included in this report.

It is submitted that the above equipment meets FCC requirements.

Bühne

J. Bühne
Engineer in Charge
ELMAC GmbH

Dated: March 27, 2001

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1. General Information

1.1. Product Description

The Microsport In-Line Skate Speedometer (refered to as the EUT in this report) is a wireless In-Line Skate that transmitt the speed data to an controll receiver placed in a wrist watch, whred it is displayed.

1.2. Related Submittals/Grants

None.

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1.3. Tested System Details

1.3.1. Devices

Description	Model	Serial-No	Manufacturer	FCC ID
EUT:				
In-Line Skate Speedometer		none	Microsport	OWUOK622-7

1.3.2. Connected cables and lines

Terminal	Type/Kind	Length	Remarks
none			

1.4. Test Methodology

1.4.1. References

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4-1992.

1.4.2. Line Conducted Emission Testing Procedure

The measurements of line conducted emission at first were done in the PEAK(P) mode in each tested operation mode of the EUT by using the LISN connected to the EUT and a spectrum analyzer. The measurement was done at both lines (L1 and N).

If the Delta to FCC limit was less than 10 dB, the measurement at these frequencies was repeated in the QUASI-PEAK mode.

1.4.3. Radiated Emission Testing Procedure

At first the radiated emission of the electromagnetic field (electrical component) was tested in the shielded room in the frequency range of 30 MHz to 1000 MHz with a distance of 3 m between the receiving antenna and the EUT. All frequencies emitted by the EUT were recorded in the measurement system.

In the second step the test was performed on the Open Area Test Site (OATS) with an antenna distance of 3 m. The maximum emission level was measured for each recorded frequency by changing the polarisation of the antenna and the antenna height as well as by rotating the turntable.

Only emission levels less than 10 dB to the FCC Class B limit were recorded.

All radiated emission measurements were done in the Quasi-Peak-Mode.

The results are given in the diagrams/tables 5.2.x.

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1.5. Test Facility

The open area test site and line conducted measurement facility of ELMAC GmbH used to collect the radiated and conducted emission data are located at the Boschstraße 2 in Bondorf/Germany. This test site has been fully described in a calibration report from November 20, 1997 submitted to the FCC office and accepted in a letter dated January 29, 2001 (Registration number 90550).

Test equipment used:

Name	Model	Manufacturer	Serial Number	ELMAC Inventory Number
Spectrum Analyzer Set	HP 8566B	HP	2311A02223	INV32
Biconilog Antenna	3142	EMCO	9705-1153	INV282
V-LISN	3825-2	EMCO	9010-1707	INV82
V-LISN	3825-2	EMCO	8912-1571	INV83
V-LISN	MN2050D	Schaffner	1403	INV251
EMI Receiver	ESHS 10	R&S	862970/012	INV35
Transient limiter	CFL9206	Schaffner	1563	INV215

2. Product Labeling

2.1 FCC Label

The FCC label contains the following text:

> This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
> (1) This device may not cause harmful interference, and
> (2) this device must accept any interference received, including interference that may cause undesired operation.

2.2. Location of Label on EUT

3. System Test Configuration

3.1. Justification

The EUT was configured for testing in a typical fashion. Details see paragraf 1.3 and 3.5.

3.1.1. Modes of operation

Tested Operation modes:

- Normal operating (transmitting data)

Tested Operating Speeds:

CPU-Clock: 13,56 MHz

3.1.2. Power supply of the EUT

3 V DC (battery)

3.1.3. Climatic conditions during the tests

Temperature:	19 ... 26 ◦C
Humidity:	45 ... 73 %
Atm. pressure:	980 hPa ... 1030 hPa

3.2. EUT Exercise Software

None

3.3. Special Accessories

None.

3.4. Equipment Modifications

None.

4. Block Diagram of EUT

4.1. Block Diagram Description and EMC-specific characteristics of EUT

The block diagram(s) of EUT see figures 4.1.x.

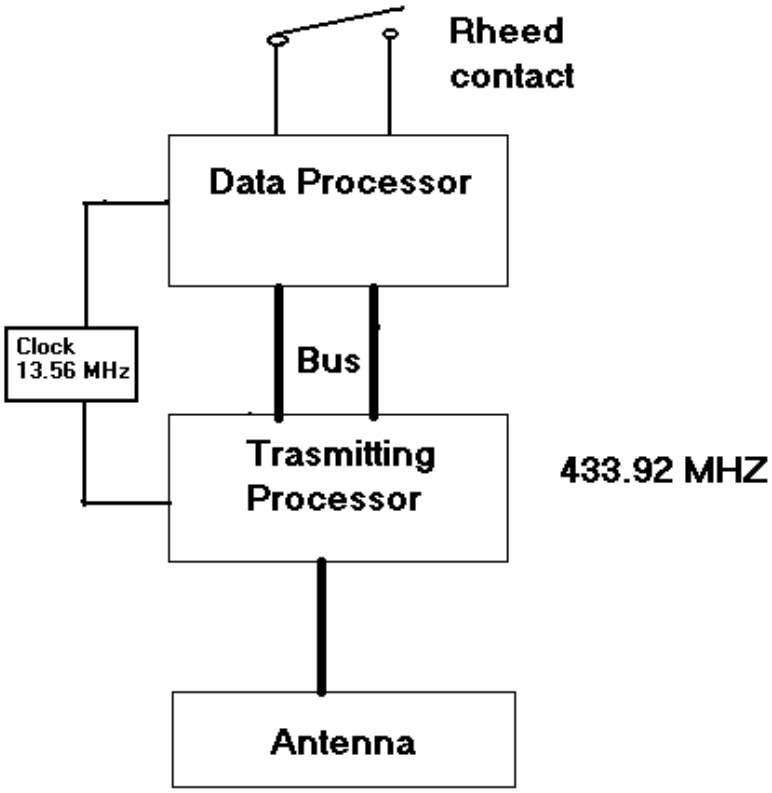
EMC-specific characteristics of the EUT according to manufacturer information:

Oscillator Frequencies:

Unit	Oscillator frequencies
Clock	13.56 MHz
Wireless controller	433.92 MHz
Highest frequency generated or used in the EUT:	433.92 MHz

Sources of broadband noise: none

Figure 4.1: In-Line Speedometer
Block Diagram



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5. Radiated Emission Data

5.1. Resolution Bandwidthes and Field Strength Calculation

Resolution bandwidthes used:

Frequency Range	Resolution Bandwidth	
	PEAK-Mode	QUASI-PEAK-Mode
30 MHz - 1000 MHz	100 kHz	120 kHz

The final level, expressed in dBµV/m, is the reading (Level/dBµV) from the spectrum analyzer, corrected by the antenna factor and the cable loss (Factor/dB). The deviation to the FCC limit is shown in table 5.2. as Delta FCC.

Example:

Frequency (MHz)	Level ($dB_\mu V$)	+	Factor (dB)	=	Final ($dB_\mu V/m$)	-	FCC A Limit ($dB_\mu V/m$)	=	Delta FCC A (dB)
37.19	10.2	+	12.0	=	22.2	-	39.1	=	-16.9

To convert the measuring results and FCC limits between dBµV/m and µV/m, the following conversion applies:

$$dB\mu V/m = 20 \log \mu V/m$$

5.2. Radiated Emission Test Results

Radiated emission test results see diagram/table 5.2.x.

Test passed: **YES**

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Diagram 5.2.1:
In-Line Skate Speedometer
S/N: none

Radiated Emission Test Results (QUASI-PEAK-Detection)
Operation mode: Normal operating

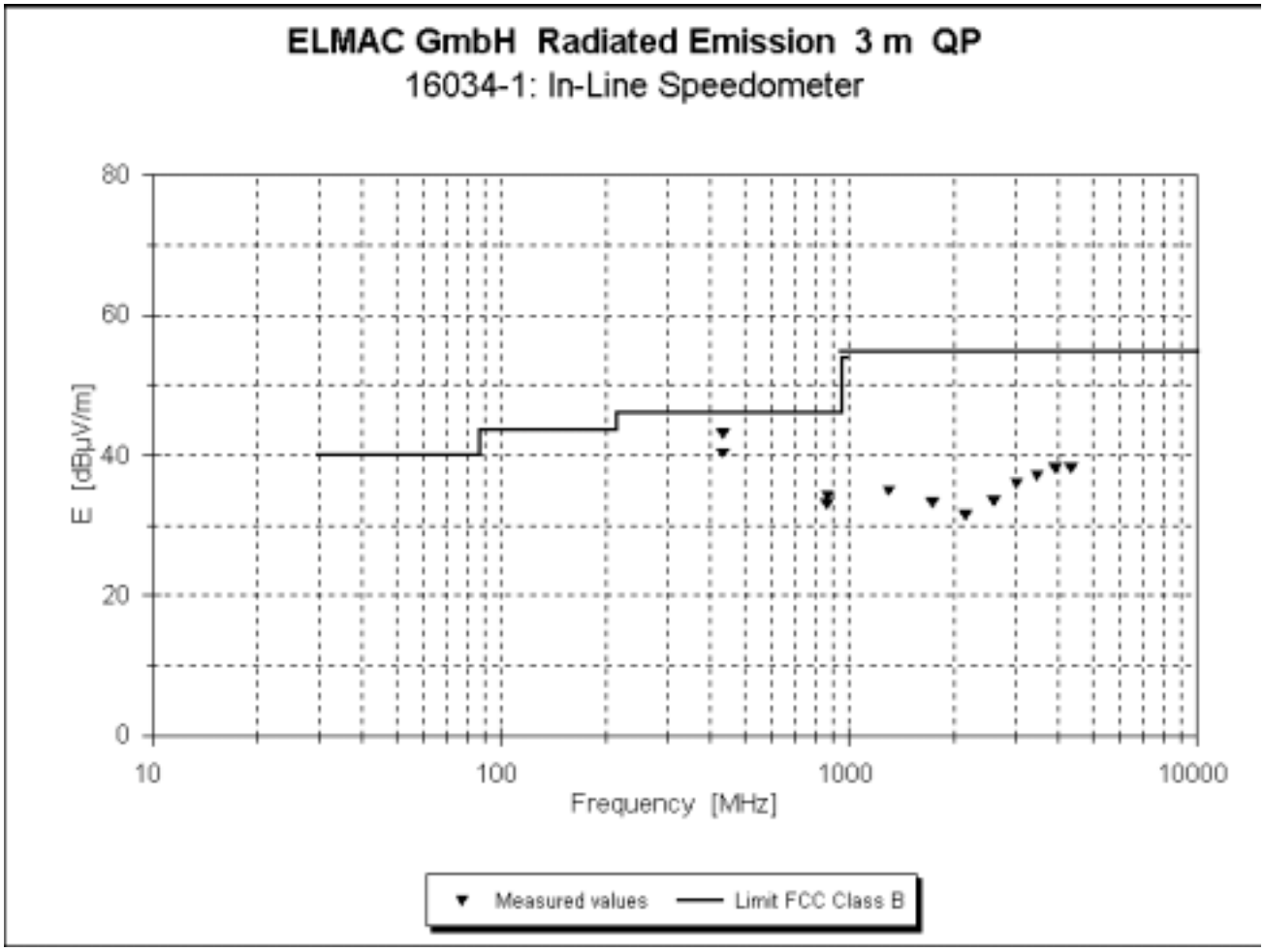

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Table 5.2.1:
In-Line Skate Speedometer
S/N: none

Radiated Emission Test Results (QUASI-PEAK-Detection)
Operation mode: Normal operating

Frequency	Field Strength Level	Limit FCC Class B	DELTA	Remarks
MHz	$dB_{\mu}V/m$	$dB_{\mu}V/m$	dB	
433.10	40.36	46.00	-5.64	
433.41	43.22	46.00	-2.78	
866.20	33.19	46.00	-12.81	
866.75	34.20	46.00	-11.80	
1300.14	35.00	54.00	-19.00	
1733.52	33.40	54.00	-20.60	
2166.28	31.50	54.00	-22.50	
2600.28	33.60	54.00	-20.40	
3033.66	36.00	54.00	-18.00	
3467.04	37.10	54.00	-16.90	
3900.42	38.20	54.00	-15.80	
4333.80	38.20	54.00	-15.80	

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6. Photos of Tested EUT

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7. Notices for Technical Documentation

The technical documentation includes the following text:

Attention!

Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.

WARNING

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. Only perypherals certified to comply with the Class B limits may be attached to this equipment.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by tuning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.