

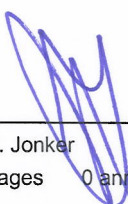
2127666.0503-QUA/EMC

**FCC emission measurements for an
electronic reader, model DR800XX.**

Arnhem, November 2, 2009

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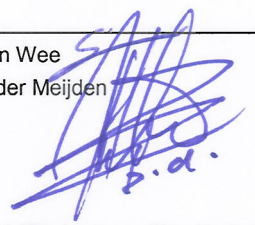
By order of iREX Technologies B.V. at Eindhoven, The Netherlands.

A handwritten signature in blue ink, appearing to be "H.T. Jonker", is written over the author information.

author : H.T. Jonker
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CONCLUSION

The Device under Test (DUT) as mentioned in this report complies with the stated requirements.

This test report 2127666.0503-QUA/EMC replaces test report 2127666.0502-QUA/EMC.

This report presents the results of FCC emission measurements performed on an electronic reader, model DR800XX, manufactured by iREX Technologies, the Netherlands.

The DUT as supplied by the applicant was not provided with an active RADIO-module and is for that reason, in this test report, classified as a digital device class B. Its intended user environment is residential.

The conclusion and results stated in this test report are based on a non-recurrent examination of sample(s) provided by the applicant.

The tests described in this report do not result in the right to use any approval mark as conferred by KEMA. As far as the tests were based on certain specifications, these are mentioned in the report.

1 CLASSIFICATION

This chapter presents an overview of the applicable classification and procedure.

The following procedure has been selected to confirm the compliance of the device under test:

	Verification procedure: The Device under Test (DUT) is subjected to the Verification procedure. The Verification procedure is defined in 47CFR Part 2 section 2.902 and described in section 2.951 through 2.957 of the FCC rules.
X	Declaration of Conformity (DoC) procedure: The Device under Test (DUT) is subjected to the Declaration of Conformity procedure. The DoC procedure is defined in 47CFR Part 2 section 2.906 and described in section 2.1071 through 2.1077 of the FCC rules.

The DUT is a computer peripheral intended for residential environments. It is for that reason subjected to DoC and the applicable class is:

	Class A : The intended user environment of the device under test is limited to industrial, commercial or laboratory environments and the DUT has been classified as a digital device class A.
X	Class B : The intended user environment of the device under tests is a residential environment and the DUT has been classified as a digital device class B.

For the device under test the following measurement clauses are applicable:

X	47CFR Part 15 Subpart B Unintentional radiators.
	Section 15.107(b) Conducted emissions – Class A
X	Section 15.107(a) Conducted emissions – Class B
	Section 15.109(b) Radiated emissions – Class A
X	Section 15.109(a) Radiated emissions – Class B

2 GENERAL INFORMATION

2.1 Product description

The apparatus as supplied for the test is an electronic reader, model DR 800, used in residential environments.

2.2 Product information

Device under test	Electronic reader
Trade mark	iREX
Manufacturer	iREX Technologies B.V.
Model	DR800XX
Serial number	Sample
U nominal	110 V _{AC} , 60 Hz
Highest clock frequency	400 MHz

2.3 Client information

Applicant	iREX Technologies B.V.
Contact person	Mr. H. van Veghel
Telephone	+ 31 (0)40 851 4666
Telefax	+ 31 (0)40 851 4669
Address	High Tech Campus, Building 9
Postal Code	5656 AE
Place	Eindhoven
Country	The Netherlands

2.4 Product labeling

According to section 15.19, the DUT shall have the following statement labeled to its housing on a conspicuous location:



2.5 User information

The user- or instruction manual shall:

- Caution the user that changes or modifications not expressly approved by the responsible party for compliance could void the user's authority to operate the equipment.
- Inform the user about special RF emission protection measures, which are delivered with the product, for example shielded cables.
- Contain the following statement in case of a Class B digital device:

"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. 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 turning 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 the 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 "

3 TEST INFORMATION

3.1 Test facility

The open area test site and conducted emission measurement facility are located at the premises of KEMA N.V. at Arnhem, The Netherlands.

The KEMA-QUA EMC laboratory has been designated by the “Radio communications Agency of the Netherlands” as a Conformity Assessment Body for all products addressed by Parts 15 and Part 18 of the FCC rules per designation AT-EZ/EU-USA/MRA002 dated December 1, 2005. FCC has confirmed this designation with their number NL0002 on February 07, 2006.

3.2 Measurement procedure and configuration

The DUT was not provided with an active RADIO module.

The DUT as provided by the applicant was operating in a stand alone configuration, a running pattern was showed on the display. During all tests, the adapter was connected. The running pattern mode turned out to be the worst case emission mode for the DUT as provided by the applicant.

3.3 Test data

Location	KEMA Quality B.V., The Netherlands
Date	July 2009
Engineer	R.W.T. Meulenbeek

3.4 Environmental conditions

Tests have been performed in a controlled laboratory environment, where the environmental conditions are maintained within the applicable ranges.

Ambient temperature	15 °C – 35 °C
Relative Humidity air	30% - 60%

4 CONDUCTED EMISSIONS

4.1 Measurement procedure

In accordance with section 15.107.a the conducted radio frequency disturbance voltages between each of the power lines (live and neutral) and the ground terminal are determined over the frequency range from 150 kHz to 30 MHz. The test set-up is in accordance with the requirements of ANSI C63.4:2003.

The AC power line conducted emission measurements were performed at the line voltage of 110 V_{AC} and at the power frequency of 60 Hz.

The initial step in collecting conducted data is a peak scan measurement over the frequency range of interest. Significant peaks are marked, and these peaks are re-measured using a quasi peak and average detector. This procedure is implemented in the utilized test receiver by the incorporated EMI firmware. The test receiver used also meets the requirement as mentioned in section 15.35 "measurement detector functions and bandwidths". The test receiver employs a CISPR quasi-peak detector function with a bandwidth of 9-10 kHz.

4.2 Measurement equipment

Instrumentation	Model	Serial no.	Cal interval
LISN (single-phase)	R&S ESH3-Z5	ORS 117864	Annual
Pulse limiter	R&S ESH3-Z2	ORS 127017	-
EMI receiver; 9kHz - 30 MHz	R&S ESHS10	ORS 117863	Annual

4.3 Measurement data

Port	AC mains input power
Test method	LISN, refer to section 6 of this report
Test-mode	Test program running (running pattern, was found to be the worst case emission test mode)

Limits

Standard	47CFR subpart B clause 15.107.a (Class B)	
Frequency (MHz)	Limit QP (dB μ V)	Limit AV (dB μ V)
0,15 – 0,50	66 – 56 *)	56 – 46 *)
0,50 – 5	56	46
5 – 30	60	50

*) Limits decreasing linearly with the logarithm of the frequency

Results Line and Neutral

Frequency (MHz)	Level QP (dB μ V)	Limit QP (dB μ V)	Margin (dB)	Level AV (dB μ V)	Limit AV (dB μ V)	Margin (dB)
0,195	43,6	63,9	20,3	<30	53,9	>23,9
0,420	39,7	57,5	17,8	<30	47,5	>17,5
0,600	36,6	56,0	19,4	<30	46,0	>16
1,223	34,3	56,0	21,7	<30	46,0	>16

The maximum levels found over line and neutral are mentioned in the table above. The highest levels found are mentioned.

Conclusion

PASS

5 RADIATED EMISSIONS

5.1 Measurement procedure

In accordance with section 15.109.a the field strength levels of radiated emissions from this digital device class B at a measurement distance of 10 meters were determined.

The highest oscillator in the DUT is 400 MHz. For that reason the frequency range of interest is 2 GHz. The measurements are conducted in accordance with the methodology as described in ANSI C63.4:2003, as required by sections 15.31 and 15.33 of 47CFR.

Preliminary radiation measurements are performed in a semi anechoic room at a 3 meter measurement distance. The measurement receiver calculates the resulting field strength using the correction factors for cable loss and antenna. The final measurements are performed at the Open Area Test Site (OATS). At those frequencies where relevant significant levels were detected during the pre-scan the actual field strength level is measured at the OATS using the CISPR quasi-peak detector with bandwidth of 120 kHz. The highest levels measured with horizontal or vertical polarization are mentioned on the next page.

5.2 Measurement equipment

Instrumentation	Model	Serial no.	Cal interval
EMI receiver; 20 MHz - 1 GHz	R&S ESVS10	ORS 078086	Annual
Biconical antenna 30 – 200 MHz	R&S HK116	ORS 117862	Annual
Logperiodic antenna 200-1300 MHz	R&S HL223	ORS 116540	Annual

5.3 Measurement data

Port	Enclosure with cabling
Test set-up	Refer to section 6 of this report
Test mode	Test program running (running pattern was found to be the worst case test mode)

Limits

Standard	47CFR subpart B clause 15.109.a (Class B)	
Measuring distance	3 meters	
Frequency (MHz)	QP (dB μ V/m)	QP (μ V)
30 – 88	40,0	100
88 – 216	43,5	150
216 – 960	46,0	200
> 960	54,0	500

Results

Frequency (MHz)	Pol. H/V	Level QP @10 meter (dB μ V/m)	Limit QP @10 meter (dB μ V/m)	Margin (dB)
80,000	H	28,0	30,0	2,0
159,900	H	28,0	33,5	5,5
221,310	H	<20	36	>16
269,490	H	<20	36	>16
485,790	H	24,2	36	11,8
490,380	H	23,3	36	12,7
498,750	H	33,5	36	2,5
537,600	H	28,9	36	7,1
542,730	H	25,1	36	10,9

No other significant emissions were measured from 80 MHz up and to including 2 GHz.

Conclusion

PASS

6 CONFIGURATION OF THE DUT



DUT during RF conducted emission test



DUT during OATS measurements