

**EMISSION MEASUREMENTS IN ACCORDANCE
WITH FCC PART 15 AND ANSI C63.4-1992 OF A
DECODING RECEIVER, INTENDED FOR USE IN AN
INDUCTIVE LAPTIMGING SYSTEM, BRAND AMB,
TYPE AMBrC DECODER.**

FCC ID: NXYAMBG4

FCC report layout endorsed by the FCC by
Public Notice of March 11, 1992.

Accredited by	:STERLAB accreditation number L029 D.A.R., TTI-P-G.127/96-00
Competent body	:Article 10-2 EMC Directive
Notified body nr. 0122	:Article 10-5 EMC Directive Low Voltage Directive TTE Directive
Certification body	:Electrical Products Safety regulation, Hong Kong
Designated laboratory	:TTE Directive
Notified test service	:Automotive Directive
FCC listed	:31040/SIT
VCCI registered	:R-592 C-607

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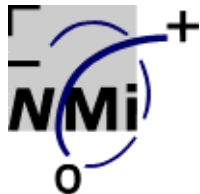
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Subsidiary companies:
NMI Certin B.V. (27233418)
NMI Van Swinden Laboratorium B.V. (27228703)
NMI International B.V. (27239176)



Description of EUT: Decoding 5.0 MHz receiver
Manufacturer: AMB i.t. Holding B.V.
Brand mark: AMB
Type: AMBrc Decoder
FCC ID: NXYAMBGP4

MEASUREMENT/TECHNICAL REPORT

AMB i.t. Holding B.V.

FCC ID: NXYAMBGP4

Date: July 25, 2000

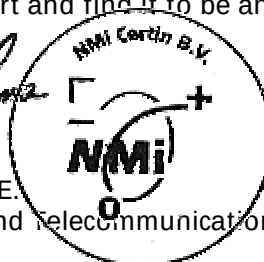
This report concerns: Verification / Notification / Certification																												
Equipment type: unintentional radiator, receiver																												
Deferred grant requested per 47 CFR 0.457(d)(1)(ii) No																												
If yes defer until: not applicable																												
Transition Rules Request per 15.37: No																												
Report prepared by:	<table><tr><td>Name</td><td>:</td><td>D.S. Sariredjo, B.Sc.E.E.</td></tr><tr><td>Company name</td><td>:</td><td>NMi Certin B.V.</td></tr><tr><td>Address</td><td>:</td><td>Smidshornerweg 18</td></tr><tr><td>Telephone number</td><td>:</td><td>+ 31 594 505005</td></tr><tr><td>Telefax number</td><td>:</td><td>+ 31 594 504804</td></tr><tr><td>Mailing address</td><td>:</td><td>P.O. Box 15</td></tr><tr><td>City/Place/Postal cd.</td><td>:</td><td>9822 ZG NIEKERK</td></tr><tr><td>Country</td><td>:</td><td>The Netherlands</td></tr><tr><td>Email</td><td>:</td><td>et-desk@nmi.nl</td></tr></table>	Name	:	D.S. Sariredjo, B.Sc.E.E.	Company name	:	NMi Certin B.V.	Address	:	Smidshornerweg 18	Telephone number	:	+ 31 594 505005	Telefax number	:	+ 31 594 504804	Mailing address	:	P.O. Box 15	City/Place/Postal cd.	:	9822 ZG NIEKERK	Country	:	The Netherlands	Email	:	et-desk@nmi.nl
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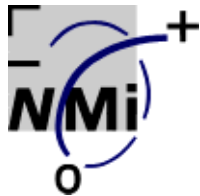
The data taken for this test and report herein was done in accordance with FCC Part 15 and ANSI C63.4-1992 measurements. NMi Certin B.V., location Niekerk, The Netherlands, certifies that the data is accurate and contains a true representation of the emission-profile of the Equipment Under Test (EUT) on the date of the test noted in the test report. I have reviewed the test report and find it to be an accurate description of the test(s) performed and the EUT so tested.

Date: July 25, 2000

Signature:

J.S. Sikkema, B.Sc.E.E.
Department EMC and Telecommunication

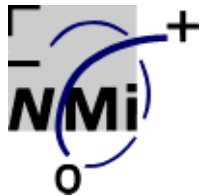




Description of EUT: Decoding 5.0 MHz receiver
Manufacturer: AMB i.t. Holding B.V.
Brand mark: AMB
Type: AMBrc Decoder
FCC ID: NXYAMBGP4

Table of contents

1	General Information.....	4
1.1	Product description.	4
1.2	Related Submittal(s)/grant(s).	4
1.3	Test Methodology.	4
1.4	Test facility.	4
1.5	List of measurement equipment.....	4
1.6	Bandwidth and antenna factors.	5
2	Product labelling.....	5
3	System test configuration.	6
3.1	Justification.....	6
3.2	Equipment modifications.	6
3.3	Description of tested EUT.....	7
3.3.1	AMBrc decoder	7
4	Conducted and radiated measurement photos.	8
	Conducted emission data.	12
6	Radiated emission data.	14
6.1	Radiated field strength measurement (30 MHz - 1000 MHz, E-field).....	14
7	Photos of tested EUT.	15



Description of EUT: Decoding 5.0 MHz receiver
Manufacturer: AMB i.t. Holding B.V.
Brand mark: AMB
Type: AMBrc Decoder
FCC ID: NXYAMBGP4

1 General Information.

1.1 Product description.

The product tested is part of an inductive laptiming system. The inductive laptiming system may include transponders, brand AMB, model number AMBrc Transponder, AMBrc_DP, AMBrc F102-RP5, a receiver model AMBrc Decoder and a battery charger, brand AMB, model number Charge Rack.

1.2 Related Submittal(s)/grant(s).

The related similar submittals are: FCC ID: NXYAMBGP1 (transponder type AMBrc Transponder) and NXYAMBGP2 (transponder type AMBrc_DP), NXYAMBGP3 (Transponder type AMBrc F102RP-5) NXYAMBGP4 (receiver type AMBrc Decoder).

1.3 Test Methodology.

The Test methodology of ANSI C63.4-1992 has been applied to provide adequate measuring data.

Complete data of the tested model has been recorded.

According to FCC Part 15, § 101 the EUT shall be classified as an unintentional radiator (receiver).

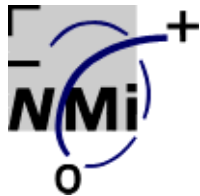
1.4 Test facility.

The FCC has per Public Notice declared that the measurement facilities located at the NMI Certin B.V. testsite Niekerk, Smidshornerweg 18, The Netherlands, have been reviewed and found to be in compliance with the requirements of section 2.948 (previously section 15.38) of the FCC rules per August 4, 1994.

The description of the measuring facilities have been filed with reference 31040/SIT, 1300B3 at the FCC's Offices.

1.5 List of measurement equipment.

NMI number	Description	Marketing name	Type
14277	Antennamast 4m	Heinrich Deisel	HD100
14278	Controller OATS	Heinrich Deisel	MA240
14340	Biconilog antenna 20MHz - 1100MHz	EMCO	3143
12473	Log-per antenna 200MHz - 1000MHz	Eaton	96005
12471	Biconical antenna 20MHz - 200MHz	Eaton	94455-1
12636	Plastic measurement room	Polyforce	-
13886	Open Area Test Site	Comtest	-
99108	Turntable OATS	Heinrich Deisel	HD050
15667	Measuring receiver 9kHz - 2750MHz	Rohde & Schwarz	ESCS30
12507	Artificial mains network 3-phase	Rohde & Schwarz	ESH2-Z5
13313	Impuls limiter	Rohde & Schwarz	ESH3Z2.357...
99115	Voltage probe	Schwarzbeck	TK9416
12470	Magnetic loop antenna 1kHz - 30MHz	Emco	model 6507
12510	FCC LISN	Emco	model 3725/2



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Manufacturer:	AMB i.t. Holding B.V.
Brand mark:	AMB
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FCC ID:	NXYAMBG4

1.6 Bandwidth and antenna factors.

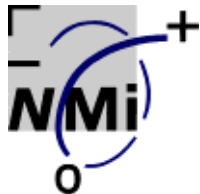
The utilized measuring equipment is stated in § 1.5. The bandwidth of the receiver switches automatically to the right bandwidth in accordance with CISPR 16. This is implemented in the receiver. Also the antenna factors are included in the testreceiver. The receiver automatically calculates the appropriate correction factor for the utilized antenna and also the appropriate correction factor for the cable loss. The total correction is automatically added to the measured value.

2 Product labelling.

The following text shall be attached to the EUT, by means of a label, or -in case the enclosure is too small- on a prominent location in the users manual.

**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.**

The dimensions of the label, the location of the label and the type of font can be found in the FCC regulation book CFR 47, parts 0 to 19, revised as per October 1, 1997.



Description of EUT:	Decoding 5.0 MHz receiver
Manufacturer:	AMB i.t. Holding B.V.
Brand mark:	AMB
Type:	AMBrC Decoder
FCC ID:	NXYAMBP4

3 System test configuration.

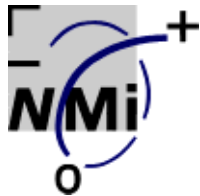
3.1 Justification.

The measurements on the AMBrC decoder were carried out in combination with the AMBrC Transponder in order to simulate a real-life application. The AMBrC decoder was constantly active during all measurements. During radiated emission measurements the turntable was rotated in order to find the maximum radiated emission on each frequency.

In accordance with § 11.2.4. of ANSI C63.4-1992 the placing and manipulation of interface cables has been carried out.

3.2 Equipment modifications.

Not applicable.



Description of EUT: Decoding 5.0 MHz receiver
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3.3 Description of tested EUT.

3.3.1 AMBrc decoder

Unit title : Decoder receiver for laptiming system

Model number : AMBrc Decoder

Part number : n.a.

FCC ID number : NXYAMBGP4

Frequency range : 5.0 MHz

Description/details : see section 3.1 of this report and the exhibits to the application

Clock Oscillator(s) : 12, 16, 40MHz (xtal clocks for digital part of receiver)

Cabinet & Screening : Metal enclosure (Decoder).

Interface Cable(s) : Shielded antenna cable, headphone, +12 VDC, RS-232 and USB

Method of screening : Not applicable

Method of grounding : Not applicable

Operating configuration : Decoding received signal from transponder type AMBrc Transponder

Applicant's representative : F. Hin

Company : AMB i.t. Holding B.V.

Address : Herenweg 29A

Postal code and city : 2105 MB HEEMSTEDE

Country : The Netherlands

Telephone number : +31 (0)23 5291893

Telefax number : +31 (0)23 5290156

Configuration information including details on interconnecting cable is given below:

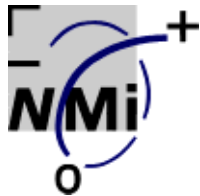
Brand / Modelnumber	Description	Inter connecting cables
AMBrc Decoder FCC ID: NXYAMBGP4	5.0 MHz Decoder receiver	-1.5m unshielded cable to power adapter -2.0m shielded cable to headphone -2.0m shielded aux cable to suitable termination -2.0m shielded USB cable to suitable termination -1.5m shielded RS232 serial cable to laptop PC -1.5m coax cable for antenna
Toshiba 230CX	Laptop PC	-1.5m shielded RS232 cable to decoder receiver -1.5m unshielded cable to power adapter
SW115-12-B1	12v power adapter	-1.5m unshielded cable to decoder receiver
Sony	headphone	-2.0m shielded cable to decoder receiver

4 Conducted and radiated measurement photos.

On pages 8 to 11 the conducted and radiated emission measurements photos are given:

Page 8: AMBrC decoder (radiated emission, front)

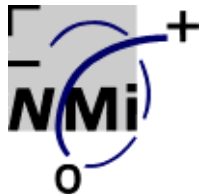




Description of EUT:	Decoding 5.0 MHz receiver
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Brand mark:	AMB
Type:	AMBrC Decoder
FCC ID:	NXYAMBG4

Page 9: AMBrC decoder (radiated emission, back)

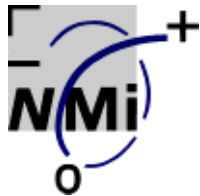




Description of EUT: Decoding 5.0 MHz receiver
Manufacturer: AMB i.t. Holding B.V.
Brand mark: AMB
Type: AMBrc Decoder
FCC ID: NXYAMBG4

Page 10: AMBrc decoder (conducted emission, front)

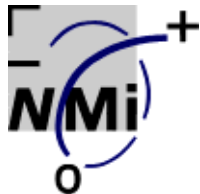




Description of EUT:	Decoding 5.0 MHz receiver
Manufacturer:	AMB i.t. Holding B.V.
Brand mark:	AMB
Type:	AMBrC Decoder
FCC ID:	NXYAMBP4

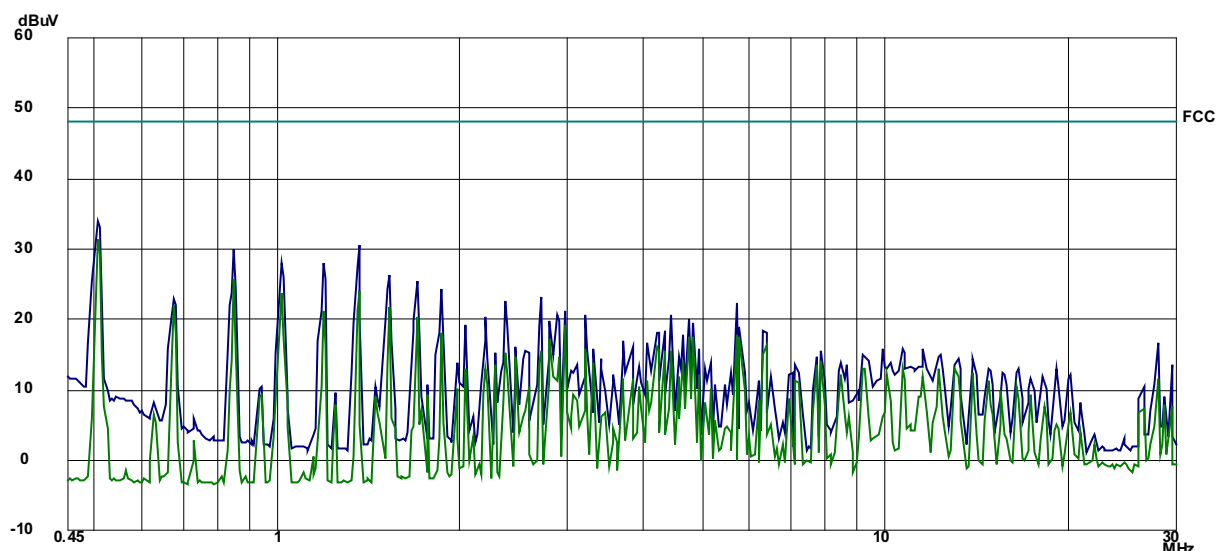
Page 11: AMBrC decoder (conducted emission, back)





Description of EUT: Decoding 5.0 MHz receiver
 Manufacturer: AMB i.t. Holding B.V.
 Brand mark: AMB
 Type: AMBrc Decoder
 FCC ID: NXYAMBG4

5 Conducted emission data.



L1: blue trace is QP, green trace is AVG

Frequency (MHz)	Measurement results dB(μV) L1	Limits dB(μV) section 207	Result
	QP	QP	
0.505	34.1	48.0	PASS
0.675	23.0	48.0	PASS
0.850	30.0	48.0	PASS
1.020	28.0	48.0	PASS
1.190	28.0	48.0	PASS
1.360	30.6	48.0	PASS
1.530	26.4	48.0	PASS
1.695	25.6	48.0	PASS
1.870	24.2	48.0	PASS
2.370	22.7	48.0	PASS
2.715	23.1	48.0	PASS

QP = Quasi-peak

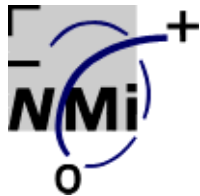
Measured levels on frequencies not stated in this report have been measured more than 20 dB below the applicable limit.

Table 1

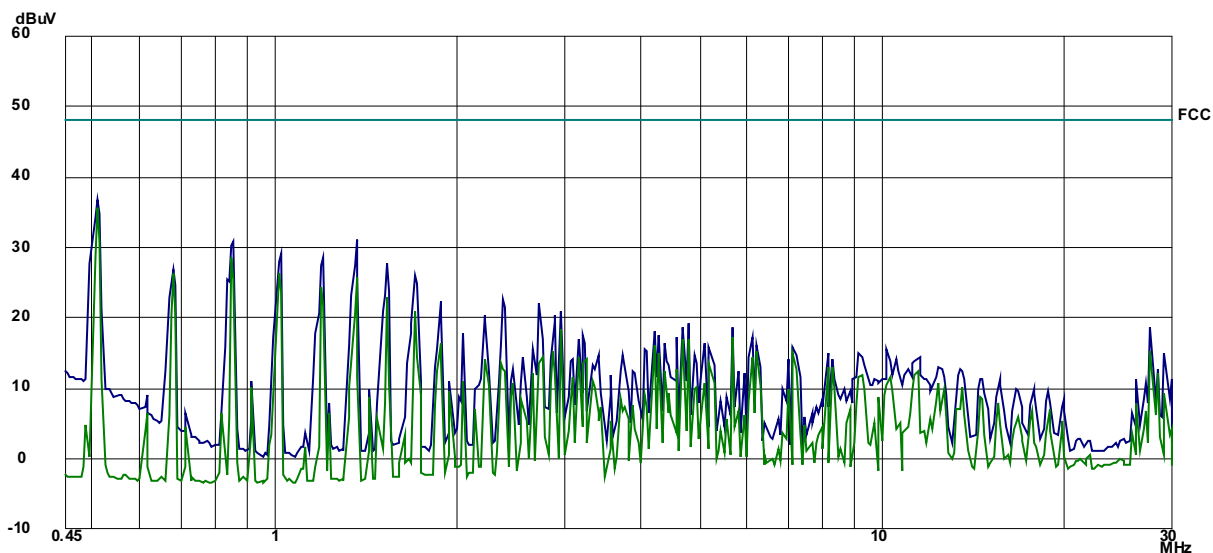
The results of the disturbance voltage level measurements at the AC mains connection terminal **L1** of the receiver/decoder, brand AMB, type AMBrc decoder, carried out in accordance with FCC Part 15, section 107 and ANSI C63.4-1992, are depicted in table 1. Measurement results are quasi-peak results.

Test engineer : O. H. Hoekstra Date: June 8, 2000

Tester signature :



Description of EUT: Decoding 5.0 MHz receiver
 Manufacturer: AMB i.t. Holding B.V.
 Brand mark: AMB
 Type: AMBrc Decoder
 FCC ID: NXYAMBP4



L2: blue trace is QP, green trace is AVG

Frequency (MHz)	Measurement results dB(μV) L2	Limits dB(μV) section 207	Result
	QP	QP	
0.505	36.8	48.0	PASS
0.675	27.0	48.0	PASS
0.850	30.3	48.0	PASS
1.020	28.1	48.0	PASS
1.190	28.6	48.0	PASS
1.360	31.1	48.0	PASS
1.530	27.9	48.0	PASS
1.695	26.0	48.0	PASS
1.870	22.3	48.0	PASS
2.370	22.7	48.0	PASS
2.715	22.3	48.0	PASS

QP = Quasi-peak

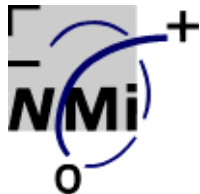
Measured levels on frequencies not stated in this report have been measured more than 20 dB below the applicable limit.

Table 1a

The results of the disturbance voltage level measurements at the AC mains connection terminal **L2** of the receiver/decoder, brand AMB, type AMBrc decoder, carried out in accordance with FCC Part 15, section 107 and ANSI C63.4-1992, are depicted in table 1a. Measurement results are quasi-peak results.

Test engineer : O. H. Hoekstra Date: June 8, 2000

Tester signature :



Description of EUT: Decoding 5.0 MHz receiver
Manufacturer: AMB i.t. Holding B.V.
Brand mark: AMB
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FCC ID: NXYAMBGP4

6 Radiated emission data.

6.1 Radiated field strength measurement (30 MHz - 1000 MHz, E-field).

Frequency (MHz)	Measurement results dB(μV)/m 3 metres QP		Limits dB(μV)/m @ 3 metres QP section 209
	Vertical	Horizontal	
30.0 – 54.3	< 20.0	< 20.0	40,0
54.3	22.6	18.3	40,0
54.3 – 72.2	< 20.0	< 20.0	40,0
72.2	23.2	25.3	40,0
72.2-88.0	<20.0	< 20.0	40.5
88.0-216.0	<20.0	< 20.0	43,5
216.0 - 425.0	< 20.0	< 20.0	46.0
425.0 - 630.0	< 25.0	< 25.0	46.0
630.0 - 960.0	< 30.0	< 30.0	46.0
960.0 - 1000.0	< 31.0	< 31.0	54.0

QP = Quasi-peak

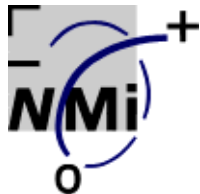
Measured levels on frequencies not stated in this report have been measured more than 20 dB below the applicable limit.

Table 2

Results of the radiated field strength (E-field) measurements on the receiver/decoder, brand AMB, type AMBrc decoder, carried out in accordance with FCC Part 15, section 109 and ANSI C63.4-1992 in the configuration and operation mode(s) as stated in this testreport, are depicted in table 2. Measurement results are quasi-peak results.

Test engineer : O. H. Hoekstra Date: June 8, 2000

Tester signature :



Description of EUT:	Decoding 5.0 MHz receiver
Manufacturer:	AMB i.t. Holding B.V.
Brand mark:	AMB
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7 Photos of tested EUT.

Photo's of exterior and interior are included in separate annex.