Application for FCC Identifier

On Behalf of

Shanghai 21st Century Electronic Equipment Co., Ltd.

(FCC ID QTC3001-1001)

Summary

The equipment comply with the requirements according to the following standard(s):

47CFR Part 15: Radio Frequency Device

ANSI C63.4 (2000): Interim Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9kHz to 40GHz.

Description

The appliances were tested by *Shanghai Institute of Process Automation Instr.* and found compliance with relevant requirements described in FCC Part 15 Radio frequency Device.

Test results are contained in this test report and Intertek Testing Services ETL SEMKO Shanghai Limited is assumed full responsibility for the accuracy and completeness of these measurements.

The test report applies to tested samples only and shall not be reproduced in part without written approval of Intertek Testing Services ETL SEMKO Shanghai Limited.

Date of Test: January 28, 2003

Date of Issue: January 29, 2003

Prepared by:

Tino Pan *(Engineer)*

Report Approved by:

Ole Stiling *(Chief Engineer)*

Description of Test Facility

Name of Firm	:	Shanghai Institute of Process Automation Instr.
Site Location	:	103 Cao Bao Road, Shanghai 200233, China
Name of contact	:	Miss. Ying (first name) Wang (last name)
Phone	:	86-21-64368180 ext. 574
Fax	:	86-21-64847454
E-mail address	:	emclab@sipai.com
FCC Registration number:		96504

CONTENTS

1.Applicant Information

FCC ID holder :	**For models GC-1001** and **MD-3001** Shanghai 21st Century Electronic Equipment Co., Ltd. 19 A Zhong You Bld., No.1040 Cao Yang Rd. Shanghai, P.R. China.
Manufacturer:	Shanghai 21st Century Electronic Equiopment Co., Ltd. 19 A Zhong You Bld., No.1040 Cao Yang Rd. Shanghai, P.R. China.
Difference between models:	There are two models mentioned in this test report which are the same in electronic diagrams, and the difference between them are the appearances of them and their trade mark. Therefore, the model GC 1001 was chosen as representative and data is listed in this test report.
Country of origin:	P.R. China
Name of contact:	Mr. Mingyue (first name) Cao (last name)
Telephone:	86-21-64567422
Telefax:	86-21-62167677

2.Information of Equipment Under Test (EUT)

2.1 Identification of the EUT

Equipment:	Hand-Held Security Detector
Type of EUT:	☑ Production ☐ Pre-product ☐ Pro-type
Type/model:	GC-1001, MD-3001
Serial number:	02*1930-001, 02*1930-002
Date of sample receipt	2003-01-28
Date of test	2003-01-28
Rating:	DC 9V*1

2.2 Additional information about the EUT

Frequency range :	52KHz
FCC Rule part(s):	Part 15 subpart C section 15.209
Test procedure:	ANSI C63.4 – 2000
FCC classification:	Part15 Low Power Transmitter below 1705kHz (DCD)
Power consumption:	DC 9V*1

2.3 Peripheral equipment

Name	Brand	Model Number	FCC ID	Serial Number
Earphone	SONY	MDR-W14	None	None

3. Radiated emission measurement

3.1 Radiated emission limit

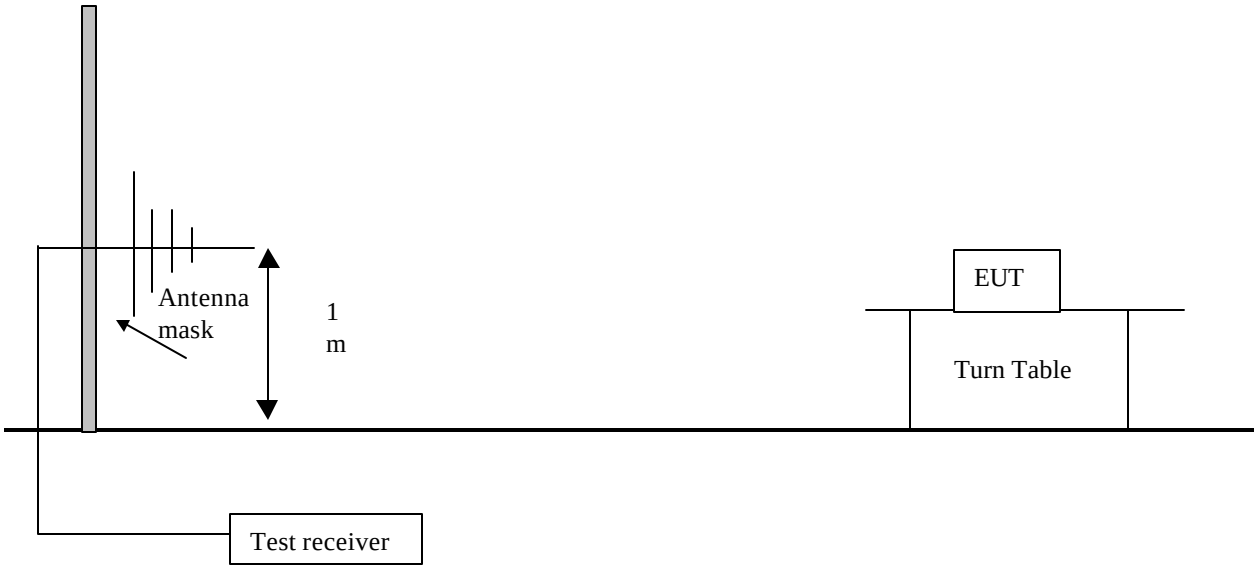
Frequency of emission (MHz)	Field strength (mircovolts/meter)	Measurement Distance (meter)	Field strength measured at 3m distance (dBuV/m)
0.009-0.490	2400/F(kHz)	300	128.52-93.8*
0.490-1.705	24000/F(kHz)	30	73.8-62.97*
1.705-30.0	30	30	39.54
30-88	100	3	40
88-216	150	3	43.52
216-960	200	3	46.02
Above 960	500	3	53.98

Radiated emission in dBuv/m = 20lg (mircovolts/meter)
At frequencies below 30MHz, the limit shall be extrapolated to the specified distance by using the square of an inverse linear distance extrapolation factor (40dB/decade).
At frequencies at or above 30MHz, the limit shall be extrapolated to the specified distance by using an extrapolation factor of 20 dB/decade (inverse linear distance for field strength measurements; inverse-linear-distance-squared for power density measurements).

3.2 Instruments list

Instrument	Type/model	Manufacturer	Series no.	Last Cal.	Cal Interval
Loop antenna	FMZB1516	Rohde & Schwarz	9182	2002-3-5	1 Year
EMI test receiver	ESCS 30	Rohde & Schwarz	828985/026	2002-2-8	1 Year

3.3 Test setup



3.4 Test configuration

The radiated emission measurement was measured in a 3 meters semi-anechoic chamber.

The EUT, support equipment was configured to the set-up producing the maximum emission for the frequency and was placed on top of a 0.8 meter high wooden 1m×1.5m table.

Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition.

During the test, the turntable containing the system was rotated and the antenna height was 1 meter

The frequency from 9kHz to 1.705MHz was checked for EUT. So the bandwidth of the test receiver was set to 200Hz from 9kHz to 150kHz and 10kHz from 150kHz to 1.705MHz.

The Hand-Held Security Detector was set to operation mode during the test. And it was rotate through three orthogonal axes (X, Y, Z). The antenna was placed two polarizations (Horizontal & Vertical).

3.5 Test procedure

3.5.1 Establish the test setup as sec. 3.3.
3.5.2 Set the Hand-Held Security Detector r to operation mode.
3.5.3 Proceed the measurement

3.6Test Results

■ Pass □ Fail

3.6.1 Measurement environment

Temperature : 23 °C Relative Humidity : 68 %

3.6.2 Test Personnel

Name: Ying Wang Title: Engineer
Tel: 86-21-64368180 ext. 574
Fax: 86-21-64847454
E-mail address: emclab@sipai.com

3.6.3 Data table

All emissions not listed below are too low against the prescribed limits.

Emission level = Reading level + Insertion loss + Cable loss + Antenna factor

Fundamental Emission

Orthogonal axe: X, Antenna Polarization: Horizontal

Frequency (MHz)	Reading (dBuV)	Polarization (H/V)	Ant. Factor (dB)	Cable Loss (dB)	Emission Level (dBuv/m)	Limit (dBuV/m)	Margin (dB)
0.0518	55.05	H	20	0.15	75.2	113.32	38.12

Orthogonal axe: Y, Antenna Polarization: Horizontal

Frequency (MHz)	Reading (dBuV)	Polarization (H/V)	Ant. Factor (dB)	Cable Loss (dB)	Emission Level (dBuv/m)	Limit (dBuV/m)	Margin (dB)
0.0518	55.05	H	20	0.15	75.2	113.32	38.12

Orthogonal axe: Z, Antenna Polarization: Horizontal

Frequency (MHz)	Reading (dBuV)	Polarization (H/V)	Ant. Factor (dB)	Cable Loss (dB)	Emission Level (dBuv/m)	Limit (dBuV/m)	Margin (dB)
0.0518	55.05	H	20	0.15	75.2	113.32	38.12

Note:
1. all data listed above are read employing an average detector.
2. "H" means Horizontal polarization, "V" means Vertical polarization
3. Emission level = Reading level + Antenna factor + Cable loss
4. Margin = Limit – Emission level

Test Engineer: Wang ying (Wang Ying) Date of test: 2003-01-28

Orthogonal axe: X, Antenna Polarization: Vertical

Frequency (MHz)	Reading (dBuV)	Polarization (H/V)	Ant. Factor (dB)	Cable Loss (dB)	Emission Level (dBuv/m)	Limit (dBuV/m)	Margin (dB)
0.0518	56.05	V	20	0.15	76.20	113.3	37.1

Orthogonal axe: Y, Antenna Polarization: Vertical

Frequency (MHz)	Reading (dBuV)	Polarization (H/V)	Ant. Factor (dB)	Cable Loss (dB)	Emission Level (dBuv/m)	Limit (dBuV/m)	Margin (dB)
0.0518	56.05	V	20	0.15	76.20	113.3	37.1

Orthogonal axe: Y, Antenna Polarization: Vertical

Frequency (MHz)	Reading (dBuV)	Polarization (H/V)	Ant. Factor (dB)	Cable Loss (dB)	Emission Level (dBuv/m)	Limit (dBuV/m)	Margin (dB)
0.0518	56.05	V	20	0.15	76.20	113.3	37.1

Note:
1. all data listed above are read employing an average detector.
2. "H" means Horizontal polarization, "V" means Vertical polarization
3. Emission level = Reading level + Antenna factor + Cable loss
4. Margin = Limit – Emission level

Test Engineer: Wang ying (Wang Ying) Date of test: 2003-01-28

Harmonics Emission

Orthogonal axe: X, Antenna Polarization: Horizontal

Frequency (MHz)	Reading (dBuV)	Polarization (H/V)	Ant. Factor (dB)	Cable Loss (dB)	Emission Level (dBuv/m)	Limit (dBuV/m)	Margin (dB)
0.1055	11.23	H	19.7	0.17	31.10	107.2	76.1

Orthogonal axe: Y, Antenna Polarization: Horizontal

Frequency (MHz)	Reading (dBuV)	Polarization (H/V)	Ant. Factor (dB)	Cable Loss (dB)	Emission Level (dBuv/m)	Limit (dBuV/m)	Margin (dB)
0.1055	11.23	H	19.7	0.17	31.4	107.2	75.8

Orthogonal axe: Z, Antenna Polarization: Horizontal

Frequency (MHz)	Reading (dBuV)	Polarization (H/V)	Ant. Factor (dB)	Cable Loss (dB)	Emission Level (dBuv/m)	Limit (dBuV/m)	Margin (dB)
0.1055	11.23	H	19.7	0.17	31.10	107.2	76.1

Note:
1. all data listed above are read employing an average detector.
2. "H" means Horizontal polarization, "V" means Vertical polarization
3. Emission level = Reading level + Antenna factor + Cable loss
4. Margin = Limit – Emission level

Test Engineer: Wang ying (Wang Ying) Date of test: 2003-01-28

Orthogonal axe: X, Antenna Polarization: Vertical

Frequency (MHz)	Reading (dBuV)	Polarization (H/V)	Ant. Factor (dB)	Cable Loss (dB)	Emission Level (dBuv/m)	Limit (dBuV/m)	Margin (dB)
0.1055	10.83	V	19.7	0.17	30.70	107.2	76.5

Orthogonal axe: Y, Antenna Polarization: Vertical

Frequency (MHz)	Reading (dBuV)	Polarization (H/V)	Ant. Factor (dB)	Cable Loss (dB)	Emission Level (dBuv/m)	Limit (dBuV/m)	Margin (dB)
0.1055	12.73	V	19.7	0.17	32.6	107.2	74.6

Orthogonal axe: Z, Antenna Polarization: Vertical

Frequency (MHz)	Reading (dBuV)	Polarization (H/V)	Ant. Factor (dB)	Cable Loss (dB)	Emission Level (dBuv/m)	Limit (dBuV/m)	Margin (dB)
0.1055	12.43	V	19.7	0.17	32.30	107.2	74.9

Note:

4. all data listed above are read employing an average detector.
5. "H" means Horizontal polarization, "V" means Vertical polarization
6. Emission level = Reading level + Antenna factor + Cable loss
4. Margin = Limit – Emission level

Test Engineer: Wang ying (Wang Ying) Date of test: 2003-01-28

3.7 Measurement Uncertainty

Measurement uncertainty of conducted power line test is 3.92dB
The measurement uncertainty is given with a confidence of 95%

4. Sample field strength calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor.

The basic equation with a sample calculation is as follows:

FS = RA + AF + CL

Where FS = Field strength
RA= Receiver Amplitude
AF = Antenna factor
CL = Cable loss

dB(μV/m) = 20lg(μV/m)
dBμV = dBm + 107

Example 1: @ 0.0518 MHz

Part 15 subpart C limit = 113.32 dBμV/m
Reading level = 55.05 dB
Cable loss = 0.15 dB
Antenna factor = 20 dB

So FS (Emission level) = 55.05+0.15+20 = 75.2 dBμV/m
Margin = 113.32 – 75.2 = 38.12dB

Emission level 38.12dB below the limit.

.