

HYUNDAI CALIBRATION & CERTIFICATION TECH. CO., LTD.

Product Compliance Division, Product Compliance Team
SAN 136-1, AMI-RI, BUBAL-EUP, ICHEON-SI, KYOUNKI-DO, 467-701, KOREA
TEL : +82 31 639 8518 FAX : +82 31 639 8525 www.hctec.co.kr

CERTIFICATION

Manufacture;
CAS Corporation
#19 Ganap-ri Gwangjuk-myeon Yangju-gun
Gyeonggi-do, Korea
FRN : 0007-1276-16

Date of Issue: AUGUST 20, 2002
Test Report No.: HCT-F02-0706
Test Site: HYUNDAI CALIBRATION & CERTIFICATION
TECHNOLOGIES CO., LTD.
FRN : 0005-8664-21

FCC ID :

QD8NB-1

MODEL :

NB-1(EX)

FCC Rule Part(s): Part 15 & 2; ET Docket 95-19
Classification: FCC Class B Peripheral Device (JBP)
Standard(s): FCC Class B: 1998 (CISPR 22)
Equipment(EUT) Type: Electric Scales
Measurable range: 11 lbs ~ 330 lbs
Interface: USB Spec. based on 1.1, 2.0

The device bearing the trade name and model specified above, has been shown to comply with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.4-1992.(See Test Report if any modifications were made for compliance)

I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

HYUNDAI C-Tech. certifies that no party to application has been denied the FCC benefits pursuant to Section 5301 of the Anti-Drug Abuse of 1988,21 U.S.C.853(a).

Ki-soo Kim

Report prepared by : Ki-
Manager of EMC Tech. E



HYUNDAI CALIBRATION & CERTIFICATION TECH. CO., LTD. EMC LAB.

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1. GENERAL INFORMATION

1.1 Product Description

CAS Corporation Model NB-1(EX) (referred to as the EUT in this report) is a Electronic scale. Product specification information described herein was obtained from product data sheet or user's manual.

Item	Description
Available PC	IBM Compatible DeskTop PC, Notebook & Sub Notebook
Operating system	Windows 98SE, Windows ME, Windows 2000, Windows XP
Interface	USB Spec. is based on 1.1, 2.0
Measurable range	11 lbs ~ 330 lbs
Unit	0.11 lbs
Weight	4.18 lbs
Size	10.24*8.98*2.13(1.18) (W*D*H) inch
Consuming current	30mA Maximum
Power	Powered through USB BUS (BUS-Powered, separate Power is unnecessary)
Feature	Equipped with Multiple precision load cell Auto-start function Auto-reset to initial zero position Connect with computer using USB Interface Access to internet Weight assistant for entire family Data save function (Storable up to 10 persons)

1.2 Related Submittal(s) / Grant(s)

ORIGINAL SUBMITTAL ONLY

1.3 Tested System Details

The Model names for all equipment, plus descriptions used in the tested system (including inserted cards) are:

DEVICE TYPE	MANUFACTURER	MODEL NAME	FCC ID / DoC	CONNECTED TO
Electronic scale (EUT)	CAS Corporation	NB-1(EX)	QD8NB-1(EX)	PC
PC	H.P	Pavilion 730K	DOC	EUT
MONITOR	IQT	L550B	DOC	PC
PRINTER	H.P	C6410A	DOC	PC
MODEM	3COM	56FAX MODEM	DOC	PC

1.4 Test Methodology

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4/1992. Radiated testing was performed at an antenna to EUT distance of 10 meters.

1.5 Test Facility

The open area test site and conducted measurement facility used to collect the radiated data are located at the 254-1,MAEKOK-RI,HOBUP-MYUN,ICHON-SI,KYOUNGKI-DO, 467-701,KOREA. The site is constructed in conformance with the requirements of ANSI C63.4 and CISPR Publication 22. Detailed description of test facility was submitted to the Commission and accepted dated July 24,2000(Confirmation Number: EA90661)

2.SYSTEM TEST CONFIGURATION

2.1 Justification

The device was configured for testing in a typical fashion (as a customer would normally use it). During the tests, the following components and I/O cards inside the E.U.T were used.

DEVICE TYPE	MANUFACTURE	MODEL/PART NUMBER
MAIN BOARD	CAS Corporation	S1
INTERFACE BOARD	CAS Corporation	6155-PNB-0000-A

2.2 EUT exercise Software

The EUT was tested on the Link mode during the radiated and conducted emission testing.

2.3 Cable Description

The marked "(D)" means the Data Cable and "(P)" means the Power Cable.

	Power Cord Shielded (Y/N)	I/O Cable Shielded (Y/N)	Length (M)
Electronic scale (EUT)	N/A	Y	3.0(D)
PC	N	N/A	1.8(P)
MONITOR	N	Y	1.8(P),1.5(D)
PRINTER	N	Y	1.8(P), 2.0(D)
MODEM	N	N	1.5(P), 1.2(D)

2.4 Noise Suppression Parts on Cable. (I/O CABLE)

	Ferrite Bead (Y/N)	Location	Metal Hood (Y/N)	Location
Electronic scale (EUT)	Y	EUT END	Y	BOTH END
PC	N	N/A	N	N/A
MONITOR	Y	BOTH END	Y	BOTH END
PRINTER	N	N/A	Y	BOTH END
MODEM	N	N/A	N	N/A

2.5 Equipment Modifications

N/A

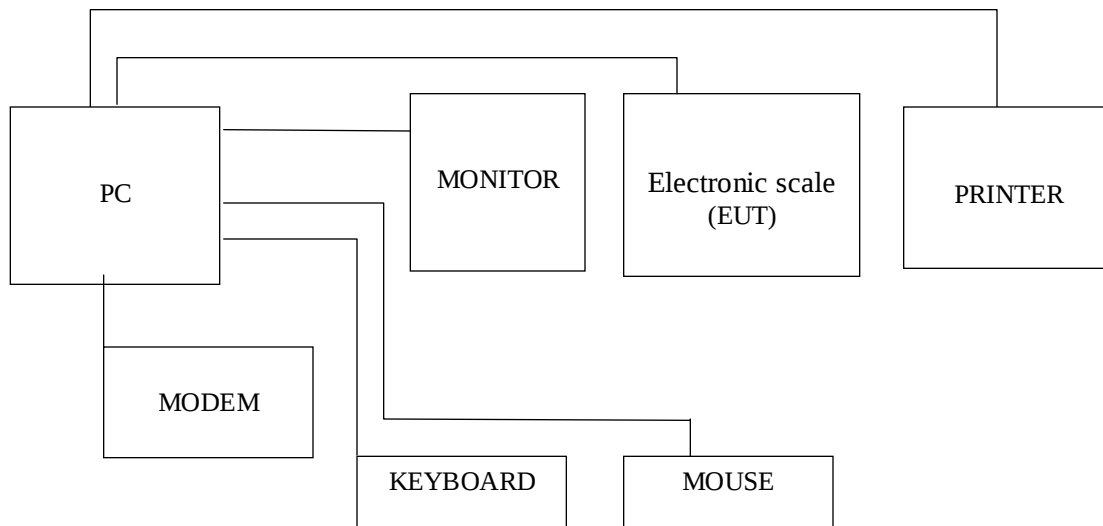
2.6 Configuration of Test system

Line Conducted Test : EUT was connected to LISN, all other supporting equipment were connected to another LISN.

Preliminary Power line Conducted Emission tests were performed by using the procedure in ANSI C63.4/1992 7.2.3 to determine the worse operating conditions.

Radiated Emission Test : Preliminary Radiated Emissions tests were conducted using the procedure in ANSI C63.4/1992 8.3.1.1 to determine the worse operating condition. Final Radiated Emission tests were conducted at 10 meter open area test site.

[Configuration of Tested System]



3. PRELIMINARY TESTS

3.1 AC Power line Conducted Emission Tests

During Preliminary Tests, Measure Mode were investigated and USB interface cable was connected to the EUT

3.2 Radiated Emission Tests

During Preliminary Tests, Measure Mode were investigated and USB interface cable was connected to the EUT

Tested by Byung Ki Ham / Engineer

Date : AUGUST 8, 2002

4. FINAL CONDUCTED AND RADIATED EMISSION TESTS SUMMARY

4.1 Conducted Emission Test

The following table shows the highest levels of conducted emissions on both polarization of hot and neutral line.

Humidity Level : 43 % Temperature : 26
 Limit apply to : CISPR 22
 Type of Tests : CLASS B
 Date : AUGUST 19, 2002
 Result : PASSED BY 21.2dB
 EUT : Electronic scale

Operating Condition : MEASURE MODE
 Detector : CISPR Quasi-Peak (6 dB Bandwidth : 9 KHz)
 CISPR Average (6 dB Bandwidth : 9 KHz)

Line Conducted Emission Tabulated Data

Power Line Conducted Emissions			CISPR 22		
Frequency (MHz)	Amplitude (dBuV)	Conductor	Limit (dBuV)	Margin (dB)	Detector Mode
0.190	42.80	HOT	64.0	21.2	Quasi-Peak
2.730	32.0	HOT	56.0	24.0	Quasi-Peak
0.190	40.0	HOT	54.0	14.0	Average
2.730	30.3	HOT	46.0	15.7	Average

Byung Ki Ham

Measured by : BYUNG KI HAM / Engineer

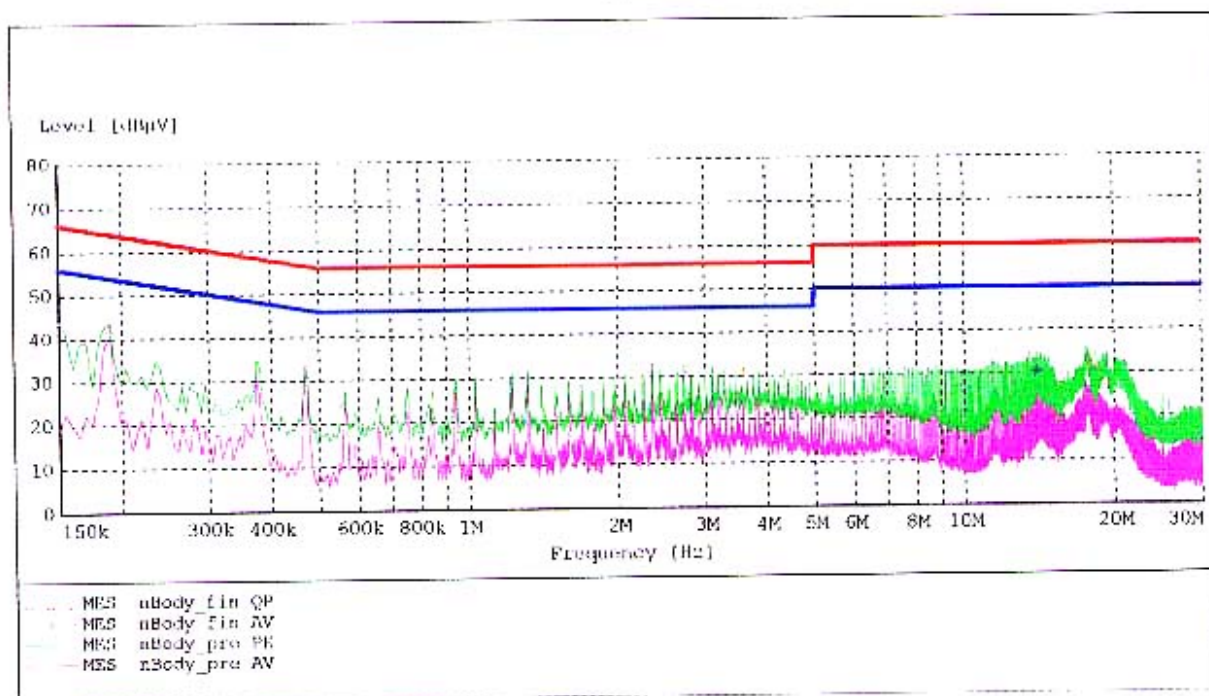
Date : AUGUST 19, 2002

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EUT: NB-1(EX)
 Manufacturer: CAS
 Operating Condition: NORMAL
 Test Site: SHIELD ROOM
 Operator: BK,HAM
 Test Specification: CISPER 22 CLASS B
 Comment: H
 Start of Test: 8/19/02 / 3:46:49PM

SCAN TABLE: "EN 55022 Voltage"

Short Description:		EN 55022 Voltage		Detector	Meas. Time	IF Bandw.	Transducer
Start Frequency	Stop Frequency	Step Width					
150.0 kHz	500.0 kHz	5.0 kHz	MaxPeak	10.0 ms	9 kHz	old-C/E FACTOR	
			Average				
500.0 kHz	5.0 MHz	5.0 kHz	MaxPeak	10.0 ms	9 kHz	old-C/E FACTOR	
			Average				


MEASUREMENT RESULT: "nBody_fin QP"

8/19/02 3:50PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.150000	34.90	0.1	66	31.1	1	---
0.190000	42.80	0.2	64	21.2	1	---
0.470000	33.10	0.2	57	23.4	1	---
2.355000	32.20	0.3	56	23.8	1	---
2.730000	32.00	0.3	56	24.0	1	---
3.580000	31.30	0.4	56	24.7	1	---
17.615000	33.20	1.0	60	26.8	1	---
18.435000	31.80	1.0	60	28.2	1	---
19.340000	27.40	1.1	60	32.6	1	---

MEASUREMENT RESULT: "nBody_fin AV"

8/19/02 3:50PM

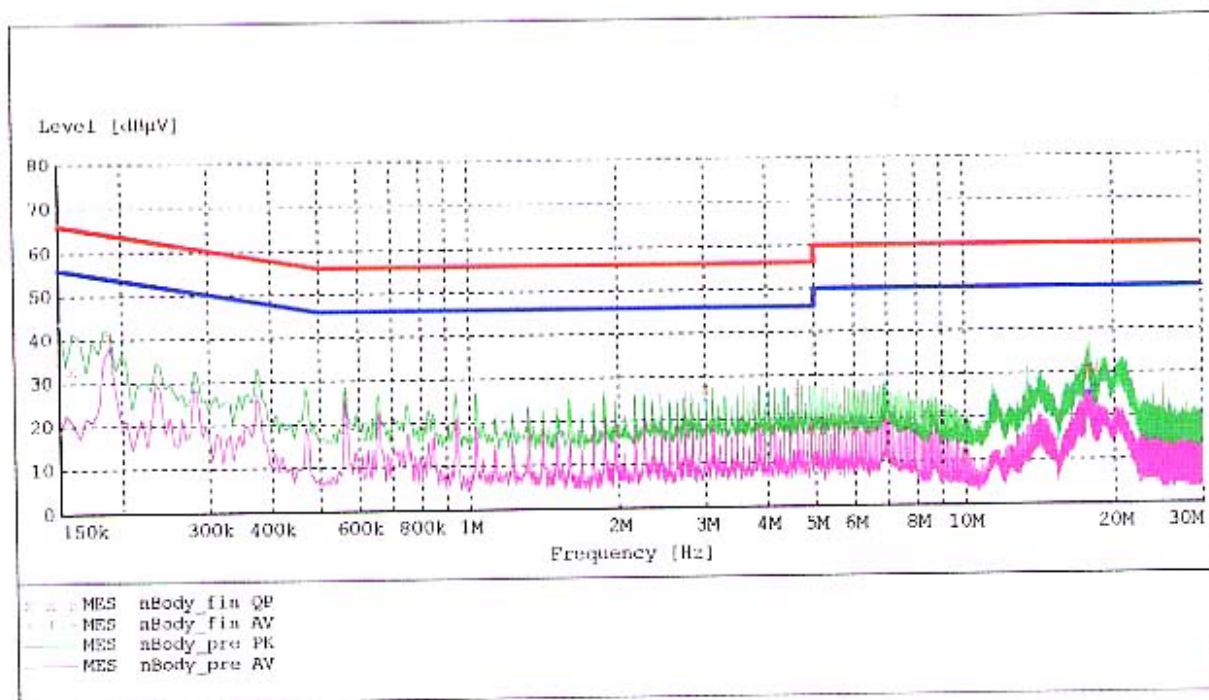
Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.190000	40.00	0.2	54	14.0	1	---
0.375000	30.00	0.2	48	18.4	1	---
0.470000	30.90	0.2	47	15.6	1	---
1.225000	29.10	0.3	46	16.9	1	---
2.355000	30.60	0.3	46	15.4	1	---
2.730000	30.30	0.3	46	15.7	1	---
13.940000	30.50	0.8	50	19.5	1	---
14.035000	30.80	0.8	50	19.2	1	---
14.130000	30.40	0.8	50	19.6	1	---

HYUNDAI C TECH
EMC Testing Laboratory

EUT: NB-1(EX)
 Manufacturer: CAS
 Operating Condition: NORMAL
 Test Site: SHIELD ROOM
 Operator: BK,HAM
 Test Specification: CISPER 22 CLASS B
 Comment: N
 Start of Test: 8/19/02 / 3:51:18PM

SCAN TABLE: "EN 55022 Voltage"

Short Description:			EN 55022 Voltage			
Start	Stop	Step	Detector	Meas. Time	IF Bandw.	Transducer
150.0 kHz	500.0 kHz	5.0 kHz	MaxPeak	10.0 ms	9 kHz	old-C/E FACTOR
			Average			
500.0 kHz	5.0 MHz	5.0 kHz	MaxPeak	10.0 ms	9 kHz	old-C/E FACTOR
			Average			


MEASUREMENT RESULT: "nBody_fin QP"

8/19/02 3:54PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.150000	34.70	0.1	66	31.3	1	---
0.160000	33.10	0.1	66	32.4	1	---
0.190000	40.80	0.2	64	23.3	1	---
0.565000	27.00	0.2	56	29.0	1	---
3.015000	27.30	0.3	56	28.7	1	---
4.615000	26.80	0.4	56	29.2	1	---
17.845000	30.70	1.0	60	29.3	1	---
17.895000	31.00	1.0	60	29.0	1	---
18.435000	31.30	1.0	60	28.7	1	---

MEASUREMENT RESULT: "nBody_fin AV"

8/19/02 3:54PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.190000	38.10	0.2	54	16.0	1	---
0.280000	28.20	0.2	51	22.7	1	---
0.375000	27.00	0.2	48	21.4	1	---
0.565000	24.90	0.2	46	21.1	1	---
2.730000	24.80	0.3	46	21.2	1	---
3.015000	24.70	0.3	46	21.3	1	---
17.805000	25.60	1.0	50	24.4	1	---
17.895000	25.30	1.0	50	24.7	1	---
18.435000	27.10	1.0	50	22.9	1	---

4.2 Radiated Emissions Tests

The following table shows the highest levels of Radiated Emissions on both polarization of horizontal and vertical.

Humidity Level : 48 % Temperature : 37
 Limit apply to : CISPR 22
 Type of Tests : CLASS B
 Date : AUGUST 14, 2002
 Result : PASSED BY -3.6 dB
 EUT : Electronic scale

Operating Condition : MEASURE MODE

Detector : CISPR Quasi-Peak (6 dB Bandwidth : 120 KHz)

Frequency MHz	Reading dBuV	Ant. Factor dB	Cable Loss dB	ANT POL (H/V)	Total dBuV/m	Limit dB	Margin dB
88.2	9.84	7.66	1.90	H	19.4	30.0	-10.6
95.1	14.98	9.42	2.00	V	26.4	30.0	-3.6
99.3	14.23	9.87	2.00	V	26.1	30.0	-3.9
164.4	3.85	14.85	2.70	V	21.4	30.0	-8.6
201.8	6.07	15.83	3.00	H	24.9	30.0	-5.1
221.2	2.48	17.02	3.30	H	22.8	30.0	-7.2
498.4	8.47	18.23	4.90	V	31.6	37.0	-5.4
585.7	2.57	20.13	5.60	H	28.3	37.0	-8.7
623.1	4.99	21.21	5.90	V	32.1	37.0	-4.9
666.0	2.69	22.21	6.00	V	30.9	37.0	-6.1
746.4	3.76	22.54	6.40	V	32.7	37.0	-4.3
765.8	3.70	22.70	6.50	H	32.9	37.0	-4.1

Byung Ki Ham

Measured by : Jin Pyo Hong / Engineer

Date : JULY 29, 2002

5. 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:

$$FS = RA + AF + CF$$

where FS = Field Strength

RA = Receiver Amplitude

AF = Antenna Factor

CF = Cable Attenuation Factor

Assume a receiver reading of 21.5 dBuV is obtained. The Antenna Factor of 7.4 and a Cable Factor of 1.1 is added. The 30 dBuV/m value was mathematically converted to its corresponding level in uV/m.

$$FS = 21.5 + 7.4 + 1.1 = 30 \text{ dBuV/m}$$

$$\text{Level in uV/m} = \text{Common Antilogarithm} [(30 \text{ dBuV/m})/20] = 31.6 \text{ uV/m}$$

6. LIST OF TEST EQUIPMENT

TYPE	MANUFACTURE	MODEL	CAL. DATE
EMI Test Receiver	Rohde & Schwarz	ESH3	2001.6.29
EMI Test Receiver	Rohde & Schwarz	ESVP	2002.2.14
EMI Test Receiver	Rohde & Schwarz	ESI40	2002.1.18
EMI Test Receiver	Rohde & Schwarz	ESVS30	2001.6.26
Spectrum Monitor	Rohde & Schwarz	EZM	N.A
Graphic Plotter	Rohde & Schwarz	DOP2	N.A
Printer	Rohde & Schwarz	PDN	N.A
Spectrum Analyzer	H.P	8591EM	2001.7.11
LISN	EMCO	3825/2	2001.7.13
LISN	Rohde & Schwarz	ESH2-Z5	2001.7.14
Amplifier	Hewlett-Packard	8447E	2002.3.2
Dipole Antennas	Rohde & Schwarz	VHAP	2001.6.28
Dipole Antennas	Rohde & Schwarz	UHAP	2001.6.28
Biconical Antenna	Rohde & Schwarz	BBA-9106	2001.6.28
Log-Periodic Antenna	Rohde & Schwarz	UHALP-9107	2001.6.26
Antenna Position Tower	EMCO	1051-12	N.A
Turn Table	EMCO	1060-06	N.A
Line Filter	KEENE	ULW 2X30-60	N.A
Power Analyzer	Voltech	PM 3300	2002.2.20
Reference Network Impedance	Voltech	IEC 555	N.A
AC Power Source	PACIFIC	Magnetic Module	N.A
AC Power Source	PACIFIC	360AMX	N.A