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FCC PART 15.209 LOW POWER FCC PART 15 SUBPART B DIGITAL INTERFACE UNLICENSED INTENTIONAL RADIATOR TEST REPORT

Applicant	Icon Time Systems		
Address	15201 New Greenbrier Pkwy, Suite A1		
	Beaverton, OR 97006		
FCC ID	VRW09101		
Model Number	N/A		
Product Description	Employee Time Clock		
Date Sample Received	June 19, 2008		
Date Tested	July 2, 2008		
Tested By	Joe Scoglio		
Approved By	Mario de Aranzeta		
Report Number	1295UT8TestRepot.pdf		
Test Results			

THE ATTACHED REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT THE WRITTEN APPROVAL OF TIMCO ENGINEERING, INC.





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Applicant: Icon Time Systems FCC ID: VRW09101



ATTESTATION



This equipment has been tested in accordance with the standards identified in the referenced test report. To the best of my knowledge and belief, these tests were performed using the measurement procedures described in this report and demonstrate that the equipment does comply with the appropriate standards.

I attest that the necessary measurements were made by me or under my supervision, at TIMCO ENGINEERING, INC. located at 849 N.W. State Road 45, Newberry, Florida 32669 USA.

Authorized by: Mario de Aranzeta

Signature: On File

Function: Lab Supervisor / Test Engineer

Date: July 15, 2008

Applicant: Icon Time Systems

FCC ID: VRW09101



REPORT SUMMARY

Disclaimer	The test results only relate to the item tested.
Applicable Rule(s)	Pt 15.209, Pt 15.107, ANSI C63.4: 2003
Related Report	1295ZUT8Testreport.pdf (digital interface portion verified)

TEST ENVIRONMENT

Test Facility	Timco Engineering, Inc. 849 NW State Road 45 Newberry, FL 32669 USA.
Test Condition in the laboratory	Temperature: 26°C Relative humidity: 50%

TEST SETUP SUMMARY

Test Exercise/Software	The DUT was placed in continuous transmit mode of operation per applicant's instruction.
Supporting Equipment	N/A. The DUT is a stand-alone transmitter
Deviation from the standard/procedure	No deviation
Modification of DUT	No modification

Applicant: Icon Time Systems FCC ID: VRW09101



PRODUCT SPECIFICATION

DUT Description	Employee Time Clock				
FCC ID	VRW09101				
IC Label	N/A				
Model Number	N/A				
Serial Number	N/A				
Trade Name	ICON				
Operating Frequency	125 kHz				
No. of Channels	1	1			
Max. Output Power	N/A				
Modulation	None				
DUT Power Source	☐ 110-120Vac/	50- 60Hz			
	DC Power – A	C/DC Power Adapter	:9V/500mA		
	☐ Battery Operated Exclusively				
Test Item	☐ Prototype	☐ Pre-Production	☐ Production		
Type of Equipment	☐ Fixed ☐ Mobile ☐ Portable				
Antenna Specification	N/A				

Applicant: Icon Time Systems FCC ID: VRW09101



EMC EQUIPMENT LIST

N/A	Device	Manufacturer	Model	Serial Number	Cal/Char	Due Date
OATS 3/27/07 3-Meter OATS TEI N/A N/A Listed 1/10/09 1/11/06 Antenna: Biconnical Biconnical Antenna: Biconnical Biconnical Metrics Electro-BIA-25 1171 CAL 4/29/09 4/29/07 Analyzer Blue Tower Quasi-Peak Adapter Analyzer Blue Tower RF Preselector HP 85650A 2811A01279 284A18049 CAL 4/13/09 9/5/09 Blue Tower Spectrum Analyzer Blue Tower Spectrum Analyzer LISN Electro-Metrics HP 8568B 2928A04729 2848A18049 27/06 CAL 4/13/09 2848A18049 4/13/07 LISN Electro-Metrics Electro-Metrics ANS-25/2 2604 2682 26AL 4/28/07 26AL 4/28/07 CAL 4/28/09 26AL 4/28/07 Antenna: Log-Periodic Eaton P6005 1243 2AL 21/14/07 26AL 4/27/08 Antenna: EMC Test Passive Systems EMCO 6512 9706-1211 2AL 4/27/08	0/10 35	mp.	37/4		Date	0.106.110
S-Meter OATS	,	TEI	N/A	N/A		3/26/10
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Applicant: Icon Time Systems

FCC ID: VRW09101



TEST PROCEDURES

Power Line Conducted Interference: The procedure used was ANSI C63.4-2003 using a 50uH LISN. The spectrum was scanned from .15 to 30 MHz. The bandwidth of the spectrum analyzer was 10 kHz with an appropriate sweep speed.

Radiation Interference: The test procedure used was ANSI C63.4-2003 using an Agilent spectrum analyzer with a pre-selector. In the frequency range 10 kHz to 30 MHz the RBW was 10 kHz and from 30-1000 MHz the RBW of the spectrum analyzer was 100 kHz with an appropriate sweep speed. The analyzer was calibrated in dB above a microvolt at the output of the antenna. The resolution bandwidth was 100 kHz and the video bandwidth was 300 kHz.

Occupied Bandwidth: The measurements were made with the spectrum analyzer's resolution bandwidth (RBW) = 100kHz and the video bandwidth (VBW) = 3 MHz and the span set as shown on plot.

Formula Of Conversion Factors: The Field Strength at 3m was established by adding the meter reading of the spectrum analyzer (which is set to read in units of dBuV) to the antenna correction factor supplied by the antenna manufacturer. The antenna correction factors are stated in terms of dB. The gain of the Pre-selector was accounted for in the Spectrum Analyzer Meter Reading.

Example:

Freq (MHz) Meter Reading + ACF +CL = FS 33 20 dBuV + 10.36 dB/m +0.40 dB = 30.76 dBuV/m @ 3m

ANSI C63.4-2003 Section 8.2.1 Measurement Procedures: The DUT was placed on a non-conducting table 80 cm above the ground plane with the DUT located in the center of the table. With the antenna vertical a preliminary scan was done at 1 meters distance, the DUT was moved to a 3.0-meter distance and the antenna height varied and also placed in a horizontal position. The frequency was scanned from 9.0 kHz to 1.0 GHz. When an emission was found, the table was rotated to produce the maximum signal strength. The DUT was measured in three (3) orthogonal planes.

Applicant: Icon Time Systems

FCC ID: VRW09101



RADIATION INTERFERENCE

Rules Part No.: 15.209

Requirements: Out-of-band emissions shall not exceed the level of the

fundamental.

Frequency	Limits
9 to 490 kHz	2400/F (kHz) μV/m measured @ 300 meters
490 to 1705 kHz	24000/F (kHz) μV/m measured @ 30 meters
1705 kHz to 30 MHz	29.54 dBμV/m measured @ 30 meters
30 – 88 MHz	40.0 dBμV/m measured @ 3 meters
80 – 216 MHz	43.5 dBμV/m measured @ 3 meters
216 - 960 MHz	46.0 dBμV/m measured @ 3 meters
Above 960 MHz	54.0 dBμV/m measured @ 3 meters

Fundamental Limit:

2400/125= 19.2 uV/m @ 300 meters= 20 log(19.2) dBuV/m= 25.66 40 dB/ decade correction factor on the distance 65.66 dBuV/m @ 30 meters 105.66 dBuV/m @ 3 meters

Applicant: Icon Time Systems

FCC ID: VRW09101



Test Data:

Tuned	Emission	Meter	Ant.	Coax	Correction	Field	Margin
Frequency	Frequency	Reading	Polarity	Loss	Factor	Strength	dB
MHz	MHz	dBuV	V/H	dB	dB/m	dBuV/m	
0.125	0.13	44.6	V	0.00	10.95	55.55	50.15
0.125	0.13	45.4	Н	0.00	10.95	56.35	49.35

30 - 1000 MHz

Emission	Meter	Ant.	Coax	Correction	Field	Margin
Frequency	Reading	Polarity	Loss	Factor	Strength	dB
MHz	dBuV	V/H	dB	dB/m	dBuV/m	
92.10	11.0	Н	0.63	8.65	20.28	23.22
92.10	14.0	V	0.63	9.69	24.32	19.18
93.90	11.0	Н	0.63	9.11	20.74	22.76
93.90	13.6	V	0.63	10.19	24.42	19.08
99.50	12.1	V	0.65	11.58	24.33	19.17
99.50	16.8	Н	0.65	11.11	28.56	14.94
110.50	14.5	Н	0.66	13.16	28.32	15.18
110.50	15.0	V	0.66	13.72	29.38	14.12
116.10	13.2	Н	0.67	14.29	28.16	15.34
116.10	15.1	V	0.67	14.47	30.24	13.26
121.60	16.5	Н	0.67	13.10	30.27	13.23
121.60	16.9	V	0.67	13.17	30.74	12.76
127.20	15.0	V	0.68	12.86	28.54	14.96
127.20	21.8	Н	0.68	12.90	35.38	8.12
132.70	20.6	V	0.68	12.75	34.03	9.47
132.70	21.2	Н	0.68	12.90	34.78	8.72
138.30	15.4	V	0.69	12.90	28.99	14.51
138.30	16.9	Н	0.69	12.97	30.56	12.94
141.90	13.2	Н	0.69	13.19	27.08	16.42
141.90	18.5	V	0.69	13.23	32.42	11.08
145.60	14.6	Н	0.70	13.55	28.85	14.65
145.60	16.1	V	0.70	13.68	30.48	13.02

Note: No significant emissions were found after 146 MHz.

Applicant: Icon Time Systems

FCC ID: VRW09101

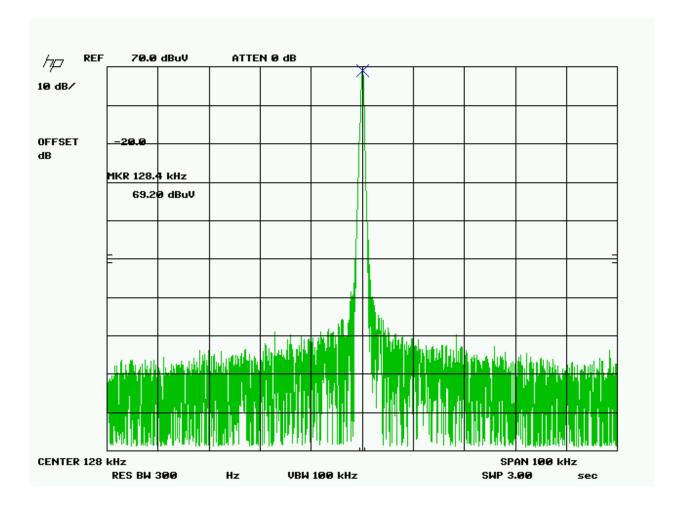


OCCUPIED BANDWIDTH

Rules Part No.: FCC Part 2.1049

Requirements: The field strength of any emissions appearing between the band edges below the level of the un-modulated carrier or to the general limits of 15.209, whichever permits the higher emission levels.

Test Data:



Applicant: Icon Time Systems

FCC ID: VRW09101



POWER LINE CONDUCTED INTERFERENCE

Rules Part No.: Part 15.207 Class B

Requirements:

Frequency (MHz)	Quasi Peak Limits (dBuV)	Average Limits (dBuV)
0.15 - 0.5	66 – 56	56 – 46
0.5 - 5.0	56	46
5.0 – 30	60	50

The attached plots represent the power line conducted emissions. Both sides of the line were observed. **Test Data:**

POWERLINE CONDUCTED EMISSIONS – LINE 1

Applicant: Icon Time Systems

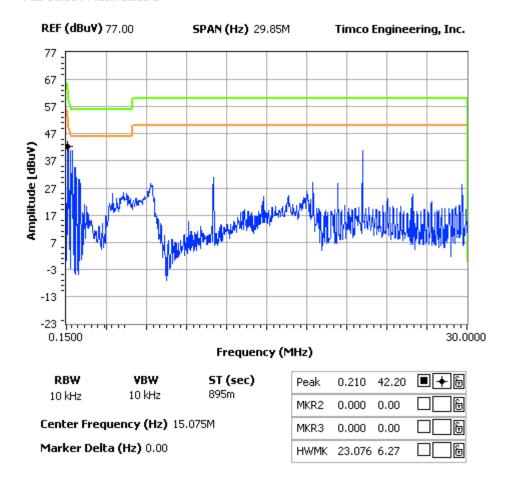
FCC ID: VRW09101



NOTES:

ac line conducted line 1

FCC 15.107 Mask Class B



Applicant: Icon Time Systems

FCC ID: VRW09101

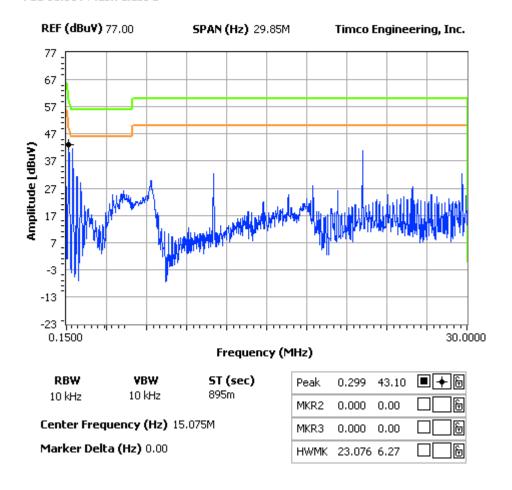


POWERLINE CONDUCTED EMISSIONS – LINE 2

NOTES:

ac line conducted line 2

FCC 15.107 Mask Class B



Applicant: Icon Time Systems

FCC ID: VRW09101