

CE EMC Test Certification

according to

**European Standard EN 61000-6-4:2007,
EN 61000-3-2:2006/A1:2009/A2:2009, EN 61000-3-3:2008 and
EN 61000-6-2:2005 (IEC 61000-4-2:2008,
IEC 61000-4-3:2006/A1:2007/A2:2010, IEC 61000-4-4:2004/A1:2010,
IEC 61000-4-5:2005, IEC 61000-4-6:2008,
IEC 61000-4-8:2009, IEC 61000-4-11:2004)**

EQUIPMENT : Digital Panel Meter

MODEL NO. : GA4, GA5, GA6, GR4, GR5, GR6, GC6, GTA,
GTR, GRVA, GPVA, APM, CPM-60, GA19, GR19,
GC19, GBMA, GBMR, GBMC, GBMS, GAH, LM5,
LZM, GA5H-A

APPLICANT : **Song Yih Technology Co., Ltd.**
1F, No. 38, Lane 214, Yu-Min Road, Tu-Cheng Dsitrict,
New Taipei City, Taiwan, 236

I HEREBY CERTIFY THAT :

The measurements shown in this test report were made in accordance with the procedures given in **EUROPEAN COUNCIL DIRECTIVE 2004/108/EC**. The equipment was **passed** the test performed according to **European Standard EN 61000-6-4:2007, EN 61000-3-2:2006/A1:2009/A2:2009, EN 61000-3-3:2008 and EN 61000-6-2:2005 (IEC 61000-4-2:2008, IEC 61000-4-3:2006/A1:2007/A2:2010, IEC 61000-4-4:2004/A1:2010, IEC 61000-4-5:2005, IEC 61000-4-6:2008, IEC 61000-4-8:2009, IEC 61000-4-11:2004).**

The test was carried out on **Dec. 21, 2010** at **SPORTON International Inc. LAB.**

Reviewed by:



Jack Deng
Engineering Manager

Approved by:



Alex Chen
Q.A Dept. Director

SPORTON INTERNATIONAL INC..

6F, No. 106, Sec. 1, Hsin Tai Wu Rd.,
Hsi Chih, Taipei Hsien, Taiwan, R.O.C.
TEL:886-2-2696-2468
Fax:886-2-2696-2255

ISSUED DATE: Dec. 20, 2012

APPENDIX A. GENERAL DESCRIPTION OF EQUIPMENT UNDER TEST

A.1. Applicant

Song Yih Technology Co., Ltd.

1F, No. 38, Lane 214, Yu-Min Road, Tu-Cheng District, New Taipei City, Taiwan, 236

A.2. Applicant

Same as 1.1

A.3. Basic Description of Equipment under Test

Equipment	: Digital Panel Meter
Model No.	: GA4, GA5, GA6, GR4, GR5, GR6, GC6, GTA, GTR, GRVA, GPVA, APM, CPM-60, GA19, GR19, GC19, GBMA, GBMR, GBMC, GBMS, GAH, LM5, LZM, GA5H-A
Trade Name	: DCbox
Data Cable Type	: Please see section 2.2 of this test report for details
Power Supply Type	: Switching
AC Power Cord	: Non-Shielded, 1.8m, 2 pin

A.4. Feature of Equipment under Test

Please refer to user manual.

APPENDIX B. GENERAL INFORMATION OF TEST

B.1. Test Facility

<EMI>

Test Site Location : No. 3, Lane 238, Kang Lo Street, Nei Hwu District, Taipei 11424, Taiwan, R.O.C.

TEL : 886-2-2631-4739

FAX : 886-2-2631-9740

Test Site No. : CO01-NH, OS02-NH

<EMS>

Test Site Location : 3F, No.587, Tanmeu St., Neihu District, Taipei, Taiwan, R.O.C.

TEL : 886-2-2794-8886

FAX : 886-2-2794-9777

B.2. Test Voltage

AC 230V / 50Hz

B.3. Measurement Procedure

EMI Test (conduction and radiation) : European Standard EN 61000-6-4

Harmonics Test : European Standard EN 61000-3-2

Voltage Fluctuations Test : European Standard EN 61000-3-3

EMS Test : European Standard EN 61000-6-2

(ESD: IEC 61000-4-2, RS: IEC 61000-4-3, EFT: IEC 61000-4-4, SURGE: IEC 61000-4-5,

CS: IEC 61000-4-6, Power Frequency Magnetic Field: IEC 61000-4-8, DIPS: IEC 61000-4-11)

B.4. Test in Compliance with

EMI Test (conduction and radiation) : European Standard EN 61000-6-4

Harmonics Test : European Standard EN 61000-3-2

Voltage Fluctuations Test : European Standard EN 61000-3-3

EMS Test : European Standard EN 61000-6-2

(ESD: IEC 61000-4-2, RS: IEC 61000-4-3, EFT: IEC 61000-4-4, SURGE: IEC 61000-4-5,

CS: IEC 61000-4-6, Power Frequency Magnetic Field: IEC 61000-4-8, DIPS: IEC 61000-4-11)

B.5. Frequency Range Investigated

a. Conducted emission test: from 150 kHz to 30 MHz

b. Radiated emission test: from 30 MHz to 1,000 MHz

c. Radio frequency electromagnetic field immunity test: 80-2700 MHz

B.6. Test Distance

a. The test distance of radiated emission test from antenna to EUT is 10 M.

b. The test distance of radio frequency electromagnetic field immunity test from antenna to EUT is 3 M.

APPENDIX C. TEST RESULT

C.1. Test Result of AC Powerline Conducted Emission

The Conducted EMISSION test was passed at

Frequency (MHz)	Test Phase	Margin (dB)	Limits (dBuV/m)	Emission (dBuV/m)	LISN Factor	Cable Loss	Remark
16.055	LINE	-18.94	50.00	31.06	10.23	0.22	AVERAGE

Note: Margin Level = Emission Level + LISN Factor + Cable Loss – Limits

C.2. TEST OF RADIATED EMISSION

The RADIATED EMISSION test was passed at

Frequency (MHz)	Polarity	Margin (dB)	Limits (dBuV/m)	Emission (dBuV/m)	Antenna High	TurnTable Degree	Remark
45.570	Vertical	-12.79	40.00	27.21	1.00m	0°	PEAK

Note: Margin Level = Antenna Factor + Cable Loss + Emission Level – Preamp Factor – Limits

C.3. HARMONICS

Final Test Result : **PASS**
Temperature : 24 °C
Relative Humidity : 48 %
Atmospheric Pressure : 103 kPa
Test Date : Dec. 21, 2010
Test Engineer : Yen-Liang

Urms = 230.1V Freq = 49.987 Range: 0.25 A
 Irms = 0.024A Ipk = 0.041A cf = 1.719
 P = 3.454W S = 5.506VA pf = 0.627
 THDu = 0.10 % Class A

Test - Time : 10min (100 %)

Test completed, Result: PASSED

Order	Freq. [Hz]	Iavg [A]	Iavg% [%]	I _{max} [A]	I _{max} % [%]	Limit [A]	Limits in Ampere			
							90%	100%	150%	200%
1	50	0.0216	90.471	0.0214	269.64					
2	100	0.0000	0.0000	0.0001	0.2551	1.0800				
3	150	0.0086	35.899	0.0085	36.097	2.3000				
4	200	0.0000	0.0000	0.0001	0.3189	0.4300				
5	250	0.0054	22.716	0.0054	22.832	1.1400				
6	300	0.0000	0.0000	0.0000	0.1913	0.3000				
7	350	0.0000	0.0000	0.0005	2.2959	0.7700				
8	400	0.0000	0.0000	0.0000	0.0638	0.2300	0.2070	0.2300	0.3450	0.4600
9	450	0.0000	0.0000	0.0008	3.3163	0.4000				
10	500	0.0000	0.0000	0.0000	0.0638	0.1840	0.1656	0.1840	0.2760	0.3680
11	550	0.0000	0.0000	0.0005	2.2959	0.3300				
12	600	0.0000	0.0000	0.0000	0.0638	0.1533	0.1380	0.1533	0.2300	0.3067
13	650	0.0000	0.0000	0.0002	0.8929	0.2100	0.1890	0.2100	0.3150	0.4200
14	700	0.0000	0.0000	0.0000	0.0638	0.1314	0.1183	0.1314	0.1971	0.2628
15	750	0.0000	0.0000	0.0002	1.0842	0.1500	0.1350	0.1500	0.2250	0.3000
16	800	0.0000	0.0000	0.0000	0.0638	0.1150	0.1035	0.1150	0.1725	0.2300
17	850	0.0000	0.0000	0.0001	0.3827	0.1324	0.1191	0.1324	0.1985	0.2647
18	900	0.0000	0.0000	0.0000	0.0000	0.1022	0.0920	0.1022	0.1533	0.2044
19	950	0.0000	0.0000	0.0001	0.4464	0.1184	0.1066	0.1184	0.1776	0.2368
20	1000	0.0000	0.0000	0.0000	0.0000	0.0920	0.0828	0.0920	0.1380	0.1840
21	1050	0.0000	0.0000	0.0000	0.1913	0.1071	0.0964	0.1071	0.1607	0.2143
22	1100	0.0000	0.0000	0.0000	0.0000	0.0836	0.0753	0.0836	0.1255	0.1673
23	1150	0.0000	0.0000	0.0001	0.3189	0.0978	0.0880	0.0978	0.1467	0.1956
24	1200	0.0000	0.0000	0.0000	0.0000	0.0767	0.0690	0.0767	0.1150	0.1533
25	1250	0.0000	0.0000	0.0000	0.1913	0.0900	0.0810	0.0900	0.1350	0.1800
26	1300	0.0000	0.0000	0.0000	0.0000	0.0708	0.0637	0.0708	0.1062	0.1415
27	1350	0.0000	0.0000	0.0000	0.1913	0.0833	0.0750	0.0833	0.1250	0.1667
28	1400	0.0000	0.0000	0.0000	0.0000	0.0657	0.0591	0.0657	0.0986	0.1314
29	1450	0.0000	0.0000	0.0000	0.1276	0.0776	0.0698	0.0776	0.1164	0.1552
30	1500	0.0000	0.0000	0.0000	0.0000	0.0613	0.0552	0.0613	0.0920	0.1227
31	1550	0.0000	0.0000	0.0000	0.1276	0.0726	0.0653	0.0726	0.1089	0.1452
32	1600	0.0000	0.0000	0.0000	0.0000	0.0575	0.0517	0.0575	0.0862	0.1150
33	1650	0.0000	0.0000	0.0000	0.1276	0.0682	0.0614	0.0682	0.1023	0.1364
34	1700	0.0000	0.0000	0.0000	0.0638	0.0541	0.0487	0.0541	0.0812	0.1082
35	1750	0.0000	0.0000	0.0000	0.1276	0.0643	0.0579	0.0643	0.0964	0.1286
36	1800	0.0000	0.0000	0.0000	0.0638	0.0511	0.0460	0.0511	0.0767	0.1022
37	1850	0.0000	0.0000	0.0000	0.1276	0.0608	0.0547	0.0608	0.0912	0.1216
38	1900	0.0000	0.0000	0.0000	0.0638	0.0484	0.0436	0.0484	0.0726	0.0968
39	1950	0.0000	0.0000	0.0000	0.0638	0.0577	0.0519	0.0577	0.0865	0.1154
40	2000	0.0000	0.0000	0.0000	0.0638	0.0460	0.0414	0.0460	0.0690	0.0920

C.4. VOLTAGE FLUCTUATIONS AND FLICKER

Final Test Result : **PASS**
Temperature : 24 °C
Relative Humidity : 48 %
Atmospheric Pressure : 103 kPa
Test Date : Dec. 21, 2010
Test Engineer : Yen-Liang

Urms = 230.1V Freq = 50.000 Range: 0.25 A
 Irms = 0.024A Ipk = 0.041A cf = 1.697
 P = 3.510W S = 5.562VA pf = 0.631

Test - Time : 1 x 10min = 10min (100 %)

LIN (Line Impedance Network) : SLIN 0.24ohm +j0.15ohm N:0.16ohm +j0.10ohm

Limits : Plt : 0.65 Pst : 1.00
 dmax : 4.00 % dc : 3.30 %
 dtLim : 3.30 % dt>Lim: 500ms

Test completed, Result: PASSED

	Pst	P50s	P10s	P3s	P1s	P0.1s	dmax	dc	dt>Lim
1	0.072	0.010	0.010	0.010	0.010	0.010	0.000	0.000	0.000

C.5. Electrostatic Discharge Immunity Test (ESD)

- Final Test Result : **PASS**
- Pass Performance Criteria : A
- Required Performance Criteria : B
- Level :
 - : 3 for air discharge
 - : 2 for contact discharge
- Test Voltage :
 - : ±2 / ±4 / ±8 KV for air discharge
 - : ±2 / ±4 KV for contact discharge
- Observation : Normal.

C.6. Radio Frequency Electromagnetic Field Immunity Test (RS)

- Final Test Result : **PASS**
- Pass Performance Criteria : A
- Required Performance Criteria : A
- Level : 3
- Frequency Range : 80-1000 MHz, 1400-2700 MHz
- Field Strength : 10 V/m (unmodulated, r.m.s) 80% AM (1 kHz) – for 80-1000 MHz
: 3 V/m (unmodulated, r.m.s) 80% AM (1 kHz) – for 1400-2000 MHz
: | 1 V/m (unmodulated, r.m.s) 80% AM (1 kHz) – for 2000-2700 MHz
- Observation : Normal.

C.7. Electrical Fast Transient/Burst Immunity Test (EFT/BURST)

- Final Test Result : **PASS**
- Pass Performance Criteria : B
- Required Performance Criteria : B
- Level : on Input power ports -- 3
- Test Voltage : on Input power ports -- $\pm 0.5 / \pm 1.0 / \pm 2.0$ kV
- Observation : During the test at ± 2 kV on the L1, L2 and PE Line, the EUT was interfered. After the test, the equipment continued to operate as intended without operator intervention.

C.8. Surge Immunity Test

- Final Test Result : **PASS**
- Pass Performance Criteria : A
- Required Performance Criteria : B
- Level : on Input power ports -- 3
: on signal port and telecommunication ports – N/A
- Test Voltage : on Input power ports -- $\pm 0.5 / \pm 1.0 / \pm 2.0$ kV
: on signal port and telecommunication ports – N/A
- Observation : Normal.

C.9. Conducted Disturbances Induced by Radio-Frequency Field Immunity Test (CS)

- Final Test Result : **PASS**
- Pass Performance Criteria : A
- Required Performance Criteria : A
- Level : 3
- Test Voltage : 10 V (unmodulated, r.m.s) 80% AM (1 kHz)
- Observation : Normal.

C.10. Power Frequency Magnetic Field immunity tests

- Final Test Result : **PASS**
- Pass Performance Criteria : A
- Required Performance Criteria : A
- Power Frequency Magnetic Field : 50/60Hz, 30A/m
- Observation : Normal.

C.11. Voltage Dips and Voltage Interruptions Immunity Tests

- Final Test Result : **PASS**
- Pass Performance Criteria : C for voltage interruption, A/C/C for voltage dips for 198V
C for voltage interruption, A/C/A for voltage dips for 242V
- Required Performance Criteria : C for voltage interruption, B/C/C for voltage dips
- Observation : After the interruption, the power of EUT reset automatically.

APPENDIX D. TEST INSTRUMENT

D.1. EMI

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Receiver	R&S	ESCS 30	100357	9 kHz - 2.75 GHz	Nov. 16, 2010	Conduction (CO01-NH)
LISN	SCHAFFNER	NNB41	04/10153	9kHz – 30MHz	Nov. 16, 2010	Conduction (CO01-NH)
Power Filter	CORCOM	MR12030	N/A	30A*2	N/A	Conduction (CO01-NH)
RF Cable-CON	Suhner Switzerland	RG223/U	CB004	9kHz – 30MHz	Dec. 14, 2010	Conduction (CO01-NH)
Open Area Test Site	SPORTON	OATS-10	OS02-NH	30 MHz - 1 GHz 10m, 3m	Jan. 04, 2010	Radiation (OS02-NH)
Amplifier	BURGEON	BPA-530	100203	0.01 MHz - 3 GHz	May 10, 2010	Radiation (OS02-NH)
Receiver	R&S	ESCI	100497	9 kHz – 3 GHz	Mar. 02, 2010	Radiation (OS02-NH)
Bilog Antenna	CHASE	CBL6122B	2884	30 MHz - 2 GHz	Jan. 17, 2010	Radiation (OS02-NH)
Turn Table	EMCO	2080	9508-1805	0 - 360 degree	N/A	Radiation (OS02-NH)
Antenna Mast	ETS	2075-2	2385	1 m - 4 m	N/A	Radiation (OS02-NH)
RF Cable-R10m	MIYAZAKI	5DFB	CB044	30 MHz - 1 GHz	Sep. 17, 2010	Radiation (OS02-NH)

Calibration Interval of instruments listed above is one year.

D.2. EMS

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
ESD Generator	TESEQ AG	NSG 437	102	Air: 0 ~ 30 KV Contact: 0 ~15KV	Sep. 15, 2010	ESD
RS immunity Test system	ROHDE& SCHWARZ	RSF	RS-02	80M~3GHz	May 03. 2010	RS
Probe	ETS-LINDGREN	HI-6005	00052473	0.1 MHz - 5 GHz	Sep. 03. 2010	RS
Amplifier	AR	250W 1000AM1	320482	80 MHz - 1 GHz	Sep. 24, 2010	RS
Amplifier	AMPLIFIER& RESEARCH	30S1G3	312505	80M~3GHz	Sep. 24, 2010	RS
DUAL DIRECTIONAL COUPLER	AMPLIFIER& RESEARCH	DC6180A	312453	0.8-4.2GHz	Sep. 23, 2010	RS
DUAL DIRECTIONAL COUPLER	AMPLIFIER& RESEARCH	DC7144A	312782	80-1GHz	Sep. 23, 2010	RS
Antenna	FRANKONIA	BTA-L	02002L	26 MHz - 1 GHz	May 03. 2010	RS
Antenna	ETS	3115	6744	1GHz - 18 GHz	May 03. 2010	RS
EFT Generator	EMC -PARTNER	TRANSIENT -2000	TRA2000-376	0 kV - 4.4 kV	Apr. 07, 2010	EFT
SURGE Generator	EMC -PARTNER	TRANSIENT -2000	TRA2000-376	0 kV - 6 kV/2Ω 0 kV - 500 kV/12Ω	Apr. 07, 2010	SURGE
Conducted Immunity Test System	SCHAFFNER	NSG2070	1091	100KHz ~ 250MHz FM 1KHZ 80%	Jun. 11, 2010	CS
Attenuator	EM TEST	75W-DC-250 MHz 06	0004166A	150 kHz – 230 MHz	Jun. 11, 2010	CS
Koppel-Eutkoppelnetzwerk	FRANKONIA	CDN M2+M3	A3011018	150k~230MHz	Jun. 11, 2010	CS
Magnetic Field Antenna	FCC	F-1000-4-8/9/10-L-1M	9830	0~125A	Apr. 12, 2010	Magnetic
Magnetic Generator	FCC	F-1000-4-8-G-125A	05004	0~125A	Apr. 12, 2010	Magnetic
PQF Generator	EMC -PARTNER	TRANSIENT -2000	TRA2000-376	230VA/50Hz/60Hz 0%Open/5S 0%Short/5S 40%/0.10S 70%/0.01S	Apr. 07, 2010	DIP
Harmonic/Flicker Test System	EMC PARTNER	Harmonics -1000	088	4000VA 16A PEAK	Sep. 02, 2010	Harmonics, Flicker

Calibration Interval of instruments listed above is one year.