



## STC Test Report

Date : 2007-07-20

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No. : HM159082

**Applicant (DAI001):**

Dayton Industrial Co., Ltd.  
2-12 Kwai Fat Road, 11-A Kwai Chung, N.T., Hong Kong.

**Manufacturer:**

Dayton Industrial Co., Ltd.  
2-12 Kwai Fat Road, 11-A Kwai Chung, N.T., Hong Kong.

**Description of Samples:**

Product: Fork Sensor  
Brand Name: Trek  
Model Number: Speedtrap  
FCC ID: O4G-TK BKSP-A

**Date Samples Received:**

2007-06-12

**Date Tested:**

2007-07-17

**Investigation Requested:**

Perform ElectroMagnetic Interference measurement in accordance with FCC 47CFR [Codes of Federal Regulations] Part 15: 2006 and ANSI C63.4:2003 for FCC Certification.

**Conclusions:**

The submitted product COMPLIED with the requirements of Federal Communications Commission [FCC] Rules and Regulations Part 15. The tests were performed in accordance with the standards described above and on Section 2.2 in this Test Report.

**Remarks:**

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Dr. LEE Kam Chuen,  
ElectroMagnetic Compatibility Department  
For and on behalf of  
The Hong Kong Standards and Testing Centre Ltd.

**The Hong Kong Standards and Testing Centre Ltd.**

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### **1.0 General Details**

#### **1.1 Test Laboratory**

The Hong Kong Standards and Testing Centre Ltd.  
EMC Laboratory  
10 Dai Wang Street, Taipo Industrial Estate  
New Territories, Hong Kong

#### **1.2 Applicant Details Applicant**

Dayton Industrial Co., Ltd.  
2-12 Kwai Fat Road, 11-A Kwai Chung, N.T., Hong Kong.

#### **Manufacturer**

Dayton Industrial Co., Ltd.  
2-12 Kwai Fat Road, 11-A Kwai Chung, N.T., Hong Kong.

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### **1.3 Equipment Under Test [EUT]**

#### **Description of Sample**

Model Name: Fork Sensor  
Manufacturer: Dayton Industrial Co., Ltd.  
Brand Name: Trek  
Model Number: Speedtrap  
Input Voltage: 3Vd.c. ("LR44" size battery x 2)

#### **1.3.1 Description of EUT Operation**

The Equipment Under Test (EUT) is a Dayton Industrial Co., Ltd. Fork Sensor, the transmission signal is frequency hopping with channel frequency range 2.410-2.470 GHz.

### **1.4 Date of Order**

2007-06-12

### **1.5 Submitted Sample(s):**

1 Sample

### **1.6 Test Duration**

2007-07-17

### **1.7 Country of Origin**

China

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### **2.0 Technical Details**

#### **2.1 Investigations Requested**

Perform Electromagnetic Interference measurements in accordance with FCC 47CFR [Codes of Federal Regulations] Part 15 Regulations and ANSI C63.4:2003 for FCC Certification.

#### **2.2 Test Standards and Results Summary Tables**

<b>EMISSION</b>						
<b>Results Summary</b>						
Test Condition	Test Requirement	Test Method	Class / Severity	Test Result		
				Pass	Fail	N/A
Field Strength of Fundamental & Harmonics Emissions	FCC 47CFR 15.249	ANSI C63.4:2003	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Radiated Emissions	FCC 47CFR 15.209	ANSI C63.4:2003	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Note: N/A - Not Applicable

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### **3.0 Test Results**

#### **3.1 Emission**

##### **3.1.1 Radiated Emissions**

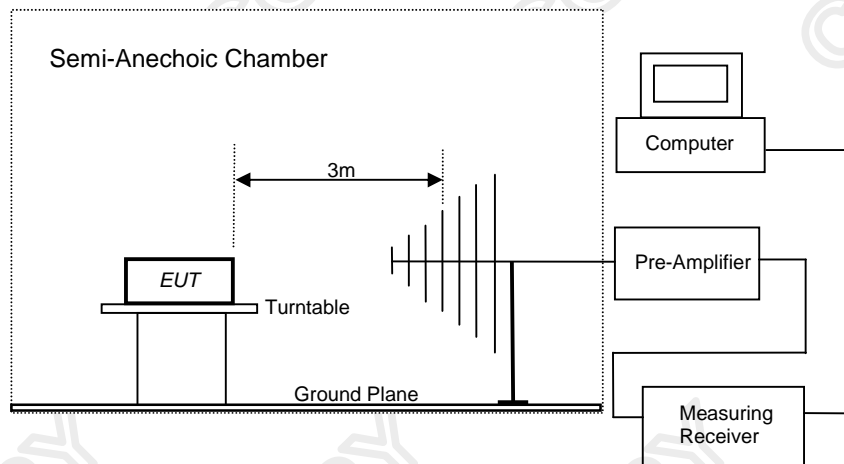
Test Requirement: FCC 47CFR 15.249  
Test Method: ANSI C63.4:2003  
Test Date: 2007-07-17  
Mode of Operation: Tx mode

#### **Test Method:**

The sample was placed 0.8m above the ground plane of semi-anechoic Chamber\*. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages.

\* Semi-anechoic chamber located on the G/F of HKSTC with a metal ground plane filed with the FCC pursuant to section 2.948 of the FCC rules, with Registration Number: 607756.

#### **Test Setup:**



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### Limits for Field Strength of Fundamental & Harmonics Emissions [FCC 47CFR 15.249]:

Frequency Range of Fundamental [MHz]	Field Strength of Fundamental Emission [microvolts/meter]	Field Strength of Harmonics Emission [microvolts/meter]
902-928	50,000 [Average]	500 [Average]
2400-2483.5	50,000 [Average]	500 [Average]

### Results of Tx: Pass

Field Strength of Fundamental Emissions Peak Value						
Frequency MHz	Measured Level @3m dB $\mu$ V/m	Correction Factor dB $\mu$ V/m	Field Strength dB $\mu$ V/m	Field Strength $\mu$ V/m	Limit @3m $\mu$ V/m	E-Field Polarity
2457.1	41.1	30.0	71.1	3,589.2	50,000	Horizontal
* 4914.1	<b>Emissions detected are more than 20 dB below the FCC Limits</b>				500	Horizontal
7371.2					500	Vertical
9828.2					500	Vertical
* 12285.3					500	Vertical
14742.3					500	Vertical
17199.4					500	Vertical
* 19656.4					500	Vertical
22113.5					500	Vertical
24570.5					500	Vertical

Field Strength of Fundamental Emissions Average Value						
Frequency MHz	Measured Level @3m dB $\mu$ V/m	Correction Factor dB $\mu$ V/m	Field Strength dB $\mu$ V/m	Field Strength $\mu$ V/m	Limit @3m $\mu$ V/m	E-Field Polarity
2457.1	22.8	30.0	52.8	436.5	50,000	Horizontal

### Remarks:

- \*: Denotes restricted band of operation.  
Measurements were made using a peak detector. Any emission less than 1000 MHz and falling within the restricted bands of FCC Rules Part 15 Section 15.205 and the limits of FCC Rules Part 15 Section 15.209 were applied.

Calculated measurement uncertainty : 30MHz to 1GHz 5.2dB  
1GHz to 18GHz 5.1dB

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## STC Test Report

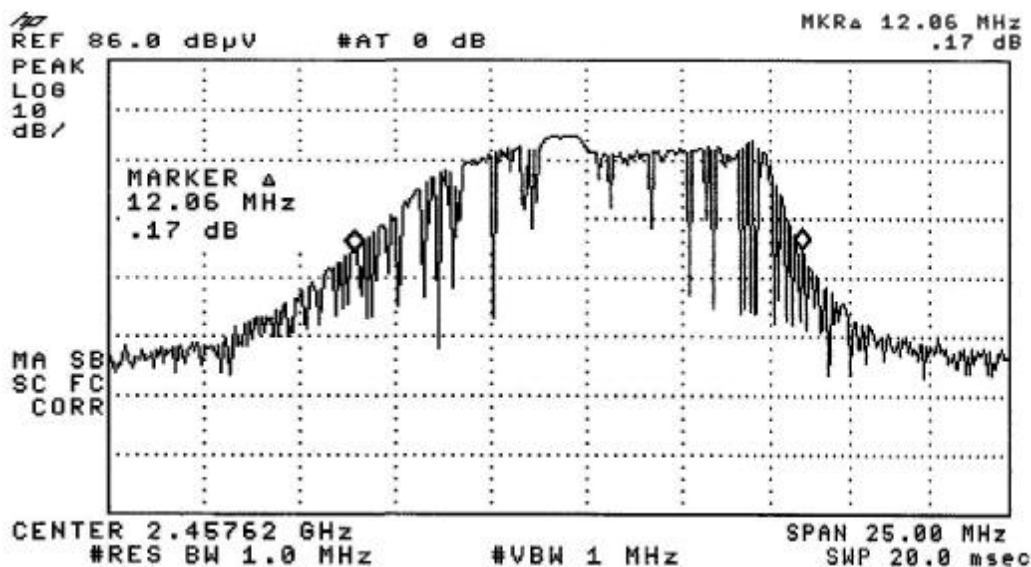
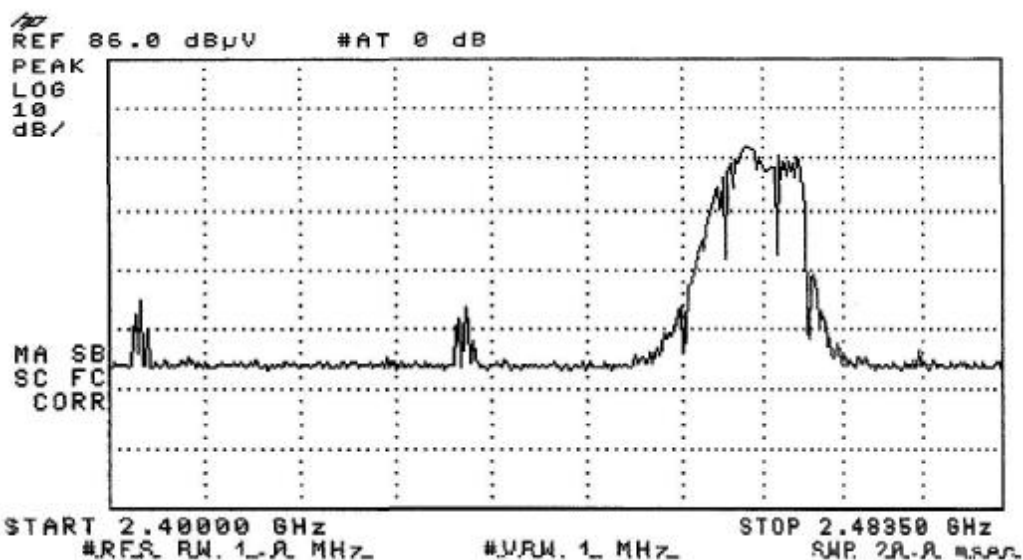
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Frequency Range [MHz]	20dB Bandwidth [MHz]
2457.05	12.06

### Bandwidth of Fundamental Emission



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### Limits for Radiated Emissions [FCC 47 CFR 15.209 Class B]:

Frequency Range [MHz]	Quasi-Peak Limits [ $\mu\text{V}/\text{m}$ ]
30-88	100
88-216	150
216-960	200
Above960	500

The emission limits shown in the above table are based on measurement employing a CISPR quasi-peak detector and above 1000MHz are based on measurements employing an average detector.

Radiated Emissions Peak					
Emission Frequency MHz	E-Field Polarity	Level @3m $\text{dB}\mu\text{V}/\text{m}$	Limit @3m $\text{dB}\mu\text{V}/\text{m}$	Level @3m @3m $\mu\text{V}/\text{m}$	Limit @3m $\mu\text{V}/\text{m}$
<b>Emissions detected are more than 20 dB below the FCC Limits</b>					

Remarks:

Correction Factor included Antenna Factor and Cable Attenuation.

Calculated measurement uncertainty : 30MHz to 1GHz 5.2dB  
1GHz to 18GHz 5.1dB

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### Appendix A

#### List of Measurement Equipment

##### Radiated Emission

EQP NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	LAST CAL	DUE CAL
EM007	SPECTRUM ANALYZER	HEWLETT PACKARD	HP85660B	3144A21192	2006/12/29	2007/12/29
EM008	SPECTRUM ANALYZER DISPLAY	HEWLETT PACKARD	HP85662A	3144A20514	2006/12/29	2007/12/29
EM009	QUASISPEAK ADAPTOR	HEWLETT PACKARD	HP85650A	3303A01702	2006/12/29	2007/12/29
EM010	RF PRESELECTOR	HEWLETT PACKARD	HP85685A	3221A01410	2006/12/29	2007/12/29
EM011	ATTENUATOR/SWITCH	HEWLETT PACKARD	HP11713A	2508A10595	2006/12/29	2007/12/29
EM012	PRE-AMPLIFIER	HEWLETT PACKARD	HP8449B	3008A00262	2006/12/29	2007/12/29
EM020	HORN ANTENNA	ETS-LINGGREN	3115	4032	2006/07/11	2008/07/11
EM022	LOOP ANTENNA	ETS-LINGGREN	6502	1189-2424	2006/07/26	2008/07/26
EM181	EMI TEST RECEIVER	ROHDE & SCHWARZ	ESIB 7	100072	22007/06/08	2008/06/08
EM215	MULTIDEVICE CONTROLLER	ETS-LINGGREN	2090	00024676	N/A	N/A
EM216	MINI MAST SYSTEM	ETS-LINGGREN	2075	00026842	N/A	N/A
EM217	ELECTRIC POWERED TURNTABLE	ETS-LINGGREN	2088	00029144	N/A	N/A
EM218	ANECHOIC CHAMBER	ETS-LINGGREN	FACT-3	--	2007/05/02	2008/05/02
EM219	BICONILOG ANTENNA	ETS-LINGGREN	3142C	00029071	2006/02/01	2008/02/01
EM229	EMI TEST RECEIVER	ROHDE & SCHWARZ	ESIB 40	100248	2007/07/11	2008/07/11

##### Line Conducted

EQP NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	LAST CAL	DUE CAL
EM119	LISN	ROHDE & SCHWARZ	ESH3-Z5	0831.5518.52	2006/07/15	2007/07/15
EM181	EMI TEST RECEIVER	ROHDE & SCHWARZ	ESIB 7	100072	22007/06/08	2008/06/08
EM197	LISN	ETS-LINGGREN	4825/3	1193	2006/09/25	2007/09/25
EM154	SHIELDING ROOM	SIEMENA MATSUSHITA COMPONENTS	N/A	803-740-057- 99A	2006/01/12	2008/01/12

Remarks:-

CM Corrective Maintenance  
N/A Not Applicable or Not Available  
TBD To Be Determined

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### Appendix B

#### Duty Cycle Correction During 100msec

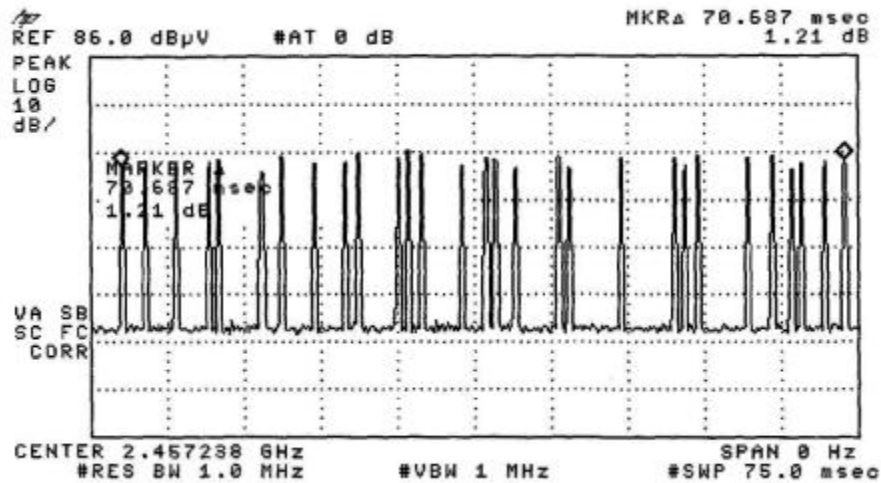
Each function key sends a different series of characters, but each pulse period (70.7msec) never exceeds a series of 29 long (200µsec) or 29 short (150µsec) pulses. Assuming any combination of short and long pulses may be obtained due to encoding the worst case transmit duty cycle would be considered  $29 \times 200 \mu\text{sec} \text{ per } 70.7 \text{ msec} = 8.2\%$  duty cycle. Figure A through C show the characteristics of the pulse train for one of these functions.

Remarks:

Duty Cycle Correction =  $20 \text{Log} (8.2) = -18.3 \text{ dB}$

The following figures [Figure A to Figure C] showed the characteristics of the pulse train for one of these functions.

Figure A [Pulse Train]



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Figure B [Long Pulse]

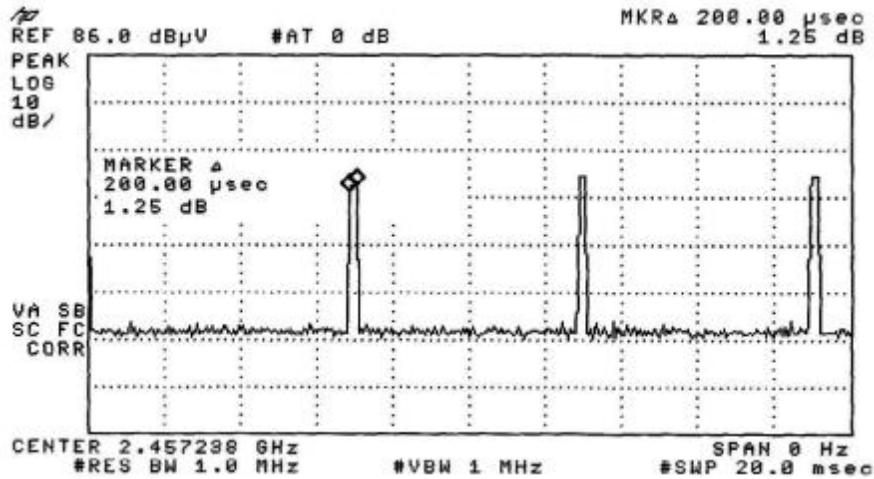
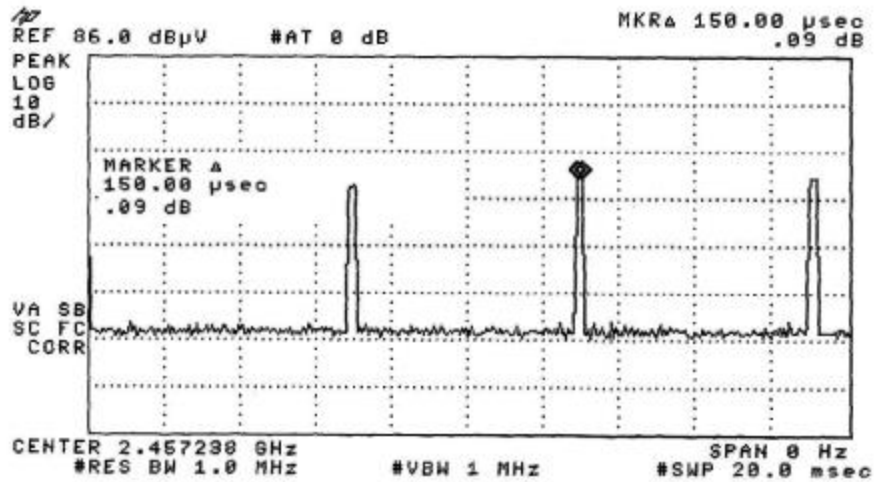


Figure C [Short Pulse]



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### Appendix C

#### Photographs of EUT

Front View of the product



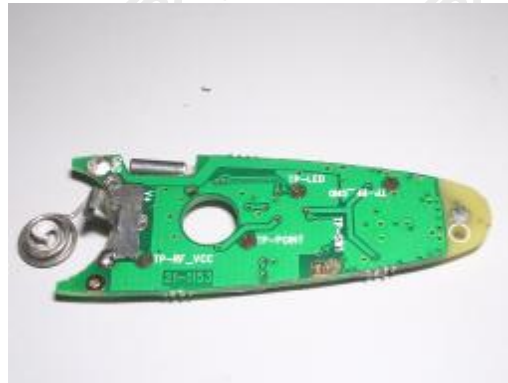
Rear View of the product



Inner Circuit Top View



Inner Circuit Bottom View



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### Photographs of EUT

Measurement of Radiated Emission Test Set Up



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