

# TEST REPORT

FROM



FOR

Magna Systems LLC

8-Channels ThermoCouple Monitor

Model: THERMOSPYDER™

TO

47 CFR 15.249 :2007

Test Report Serial No.:  
SL07062101-MSL-001(ThermoSpyder)

This report supersedes None

**Remarks:**      Equipment complied with the specification            Equipment did not comply with the specification     

**This Test Report is Issued Under the Authority of:**

*Kevin Leong*

.....  
Tested by: Snell Leong, Test Engineer

*Snell Leong*

.....  
Reviewed by: Leslie Bai, Reviewer

Issue date: 06 July 2007

Manufacturer: Magna Systems LLC



Registration No. 783147



Industry Canada  
Industrie Canada

Registration No. 4842



Lab Code: KR0032



RTA No. D23/16V



Registration No. 2195



Lab Code: US0160



BSMI Code: SL2-IN-E-1130R

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## **Executive Summary**

The purpose of this test programme was to demonstrate compliance of the Magna Systems LLC, 8-Channels ThermoCouple Monitor, model THERMOSPYDER™ against the current 47 CFR 15.249 :2007. The 8-Channels ThermoCouple Monitor demonstrated compliance with the 47 CFR 15.249 :2007.

Magna Systems LLC is the applicant and claimed manufacturer of this tested product. For the detailed description of this product, please refer to the 8-Channels ThermoCouple Monitor User Manual.

The equipment under test operating frequency is 915MHz.

The test has demonstrated that this unit complies with stipulated standards.





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## **2 Tests Required**

The product was tested in accordance with the following specifications.

The test results recorded in this Test Report are exclusively referred to the tested sample(s).

<b>Test Standard</b>		<b>Description</b>	<b>Pass / Fail</b>
47 CFR Part 15.249: 2007	RSS 210 Issue 7: 2007		
15.203	RSS GEN 7.1.4	Antenna Requirement	Pass
15.207(a)	RSS GEN 7.2.2	Conducted Emissions Voltage	Pass
15.249	RSS 210 A.2.9 (a) 7 (b)	Fundamental & Radiated Spurious Emission Limits	Pass
ANSI C63.4: 2003 / RSS-Gen Issue 2: 2007			

*Notes: Deviations to above standards are outlined in specific test sections if applicable.*

*Cable loss and external attenuation are compensated for in the measurement system when applicable.*



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### **3 Antenna Requirement**

**Requirement(s):** 47 CFR §15.203

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

Antenna requirement must meet at least one of the following:

- a) Antenna must be permanently attached to the device.
- b) Antenna must use a unique type of connector to attach to the device.
- c) Device must be professionally installed. Installer shall be responsible for ensuring that the correct antenna is employed with the device.

1) The EUT antenna is attached permanently to the device which meets the requirement.

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## **4 Measurements, Examinations and Derived Results**

### **4.1 General observations**

Equipment serial number(s)		
EUT:	Model number:	Serial number:
8-Channels ThermoCouple Monitor	THERMOSPYDER™	none



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## **4.2 Test Results**

### **4.2.1 Conducted Emissions Voltage**

**Requirement(s):** 47 CFR §15.207

**Procedures:**

The EUT and supporting equipment were set up in accordance with the requirements of the standard on top of a 1.5m x 1m x 0.8m high, non-metallic table. The power supply for the EUT was fed through a  $50\Omega/50\mu\text{H}$  EUT LISN, connected to filtered mains. The RF OUT of the EUT LISN was connected to the EMI test receiver via a low-loss coaxial cable. All other supporting equipment were powered separately from another mains.

The EUT was switched on and allowed to warm up to its normal operating condition. A scan was made on the NEUTRAL line over the required frequency range using an EMI test receiver. High peaks, relative to the limit line, were then selected. The EMI test receiver was then tuned to the selected frequencies and the necessary measurements made with a receiver bandwidth setting of 10kHz. Quasi-peak and Average measurements were made. The procedure was then repeated for the PHASE line.

**Results:**

**N.A**

**THE UNIT IS POWERED BY 2 x AA BATTERY ONLY**



## 4.2.2 Radiated Fundamental & Spurious Emissions

**Requirement(s):** 47 CFR §15.209; 47 CFR §15.249 (a) & (d)

**Procedures:** Radiated emissions were measured according to ANSI C63.4. The EUT was set to transmit at the highest output power. The EUT was set 3 meter away from the measuring antenna. The loop antenna was positioned 1 meter above the ground from the center of the loop. The measuring bandwidth was set to 10 kHz.

The limit is converted from microvolts/meter to decibel microvolts/meter.

Sample Calculation: Corrected Amplitude = Raw Amplitude(dB $\mu$ V/m) + ACF(dB) + Cable Loss(dB) – Distance Correction Factor

### Results:

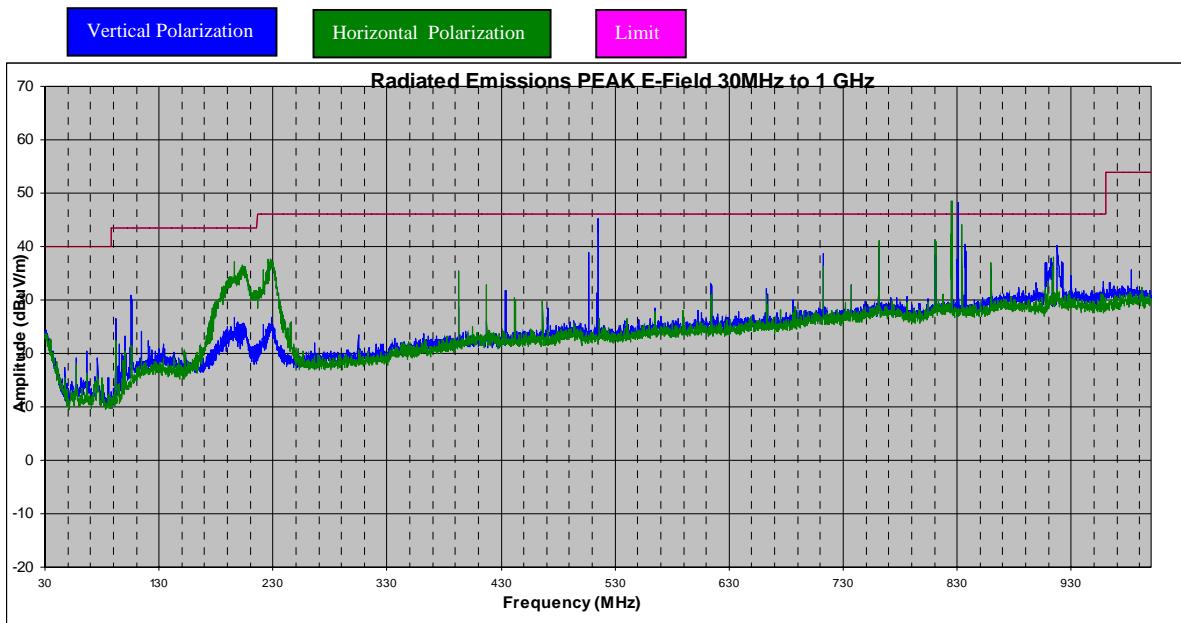
#### 30MHz ~ 10GHz @ 1 Meter (TX Spurious Emission)

#### 3 Meter ( TX Fundamental)

Frequency (GHz)	Azimuth (Degrees)	Antenna Polarity (H/V)	Height (m)	Raw Amp. @ 3m (dB $\mu$ V)	Pre Amp. (dB)	Ant.Corr. Factor (dB)	Cable Loss (dB)	Distance Factor dB	Corrected Field Strength (dB $\mu$ V/m)	Limit @ 3m (dB $\mu$ V/m)	Delta (dB $\mu$ V/m)	Detector (pk/avg)	Remark
									Corrected Field Strength (dB $\mu$ V/m)				
									Corrected Field Strength (dB $\mu$ V/m)				
0.915	180	V	1	58.60	0	22.2	2.4	0	83.3	94	-10.70	QP	Fund
0.915	180	H	1	61.40	0	22.3	2.4	0	86	94	-8.00	QP	Fund
1.83	0	H	1	59.3	32.02	27.96	2.02	10.00	47.27	74	-26.73	PK	2nd
1.83	0	H	1	57.98	32.02	27.96	2.02	10.00	45.95	54	-8.05	AVG	2nd
1.83	90	V	1.5	63.1	32.02	27.59	2.02	10.00	50.70	74	-23.30	PK	2nd
1.83	90	V	1.5	60.2	32.02	27.59	2.02	10.00	47.80	54	-6.20	AVG	2nd
2.745	0	H	1.4	50	32.21	30.69	2.53	10.00	41.02	74	-32.98	PK	3rd
2.745	0	H	1.4	48.8	32.21	30.69	2.53	10.00	39.82	54	-14.18	AVG	3rd
2.745	0	V	1	55.2	32.21	30.26	2.53	10.00	45.79	74	-28.21	PK	3rd
2.745	0	V	1	52.6	32.21	30.26	2.53	10.00	43.19	54	-10.81	AVG	3rd
3.66	90	H	1	46.1	32.37	32.83	3.01	10.00	39.57	74	-34.43	PK	3rd
3.66	312	H	1	44.2	32.37	32.83	3.01	10.00	37.67	54	-16.33	AVG	3rd
3.66	0	V	1	50.4	32.37	32.03	3.01	10.00	43.07	74	-30.93	PK	3rd
3.66	0	V	1	46.3	32.37	32.03	3.01	10.00	38.97	54	-15.03	AVG	3rd
0.902	180	H	1.2	1.10	0	22.3	2.4	0	25.8	46	-20.20	QP	Bandedge
0.902	180	V	1.2	0.80	0	22.3	2.4	0	25.5	46	-20.50	QP	Bandedge
0.928	180	H	1.1	1.20	0	22.5	2.4	0	26.1	46	-19.90	QP	Bandedge
0.928	180	V	1.1	0.70	0	22.5	2.4	0	25.6	46	-20.40	QP	Bandedge



**30MHz ~ 1000MHz @ 3 Meter (RX Spurious Emission)**



Frequency (MHz)	Azimuth (degrees)	Measure (Avg/QP)	Antenna Polarity (H/V)	Antenna Height (m)	Raw Amplitude @ 3m (dBuV/m)	ACF (dBm)	CBL loss (dBm)	Corrected Amplitude @ 3m (dBuV/m)	Limit @3m (dBuV/m)	Delta (dBuV/m)
105.70	180	QP	V	1.5	17.90	11.8	0.9	30.6	43.5	-12.90
230.10	200	QP	H	1	24.00	11.8	1	36.8	46	-9.20
825.00	0	QP	V	1.5	20.00	21.8	2.2	44	46	-2.00
825.00	0	QP	H	1	15.20	21.3	2.2	38.7	46	-7.30
515.40	180	QP	V	1	20.80	17.6	1.8	40.2	46	-5.80
918.50	0	QP	V	1	13.60	22.2	2.4	38.2	46	-7.80

**Dated By: Snell Leong**

**Date Tested: 06 July 2007**



## 5 TEST INSTRUMENTATION

### 5.1 TEST INSTRUMENTATION

Instrument	Manufacturer	Model	CAL Due Date
Spectrum Analyzer	HP	8568B	04/26/2008
Quasi-Peak Adapter	HP	85650A	04/26/2008
RF Pre-Selector	HP	85685A	04/26/2008
Spectrum Analyzer	HP	8564E	05/01/2008
Power Meter	HP	437B	04/26/2008
Power Sensor	HP	8485A	04/26/2008
Antenna	EMCO	JB1	09/11/2007
Pre-Amplifier	HP(1G~26.5G)	8449	05/01/2008
Horn Antenna	COM Power(18G~40G)	AH-840	03/19/2010
Horn Antenna	EMCO(1G~18G)	3115	08/17/2007
DMM	Fluke	73III	05/01/2008
Variac	KRM	AEEC-2090	See Note
DMM	Fluke	51II	See Note
LISN (9k-30MHz)	Chase	MN2050B	4/26/2008

Note: Functional Verification



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## **APPENDIX A: EUT TEST CONDITIONS**

The following is the description of supporting equipment and details of cables used with the EUT.

Equipment Description (Including Brand Name)	Cable Description
8-Channels ThermoCouple Monitor	1. AC Cord

EUT Description : 8-Channels ThermoCouple Monitor
Model No : Magna Systems, L.L.C.
Serial No : none

The following is the description of how the EUT is exercised during testing.

Test	Description Of Operation
All testing	The EUT was set to enter CW mode automatically when powered.



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## **APPENDIX B: EXTERNAL PHOTOS**

See Attachment

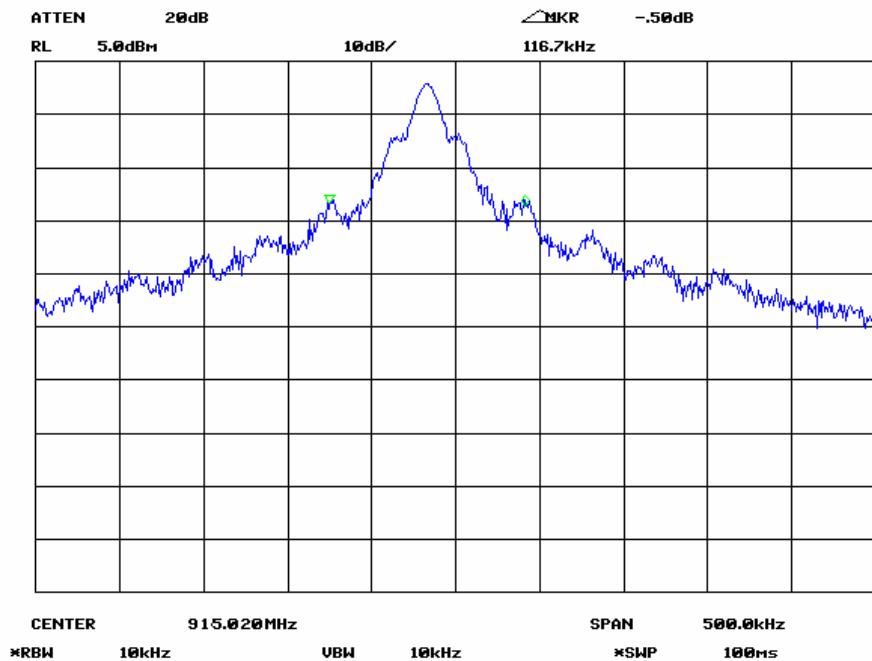


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## APPENDIX C: 99% Bandwidth and Emission Designator



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## **APPENDIX D: INTERNAL PHOTOS**

See Attachment



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## **APPENDIX E: PRODUCT DESCRIPTION**

Detail description of this product is shown in the User's Guide.



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## **APPENDIX F: FCC LABEL LOCATION**

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## **APPENDIX G: USER MANUAL**

See Attachment



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