TIMCO ENGINEERING, Inc.

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# COMPLIANCE TESTING REPORT

# PER FCC PART 15 B SUBPART B

# AND IC RSS-210

| | |
|---|---|
| Applicant | DELTA SYSTEMS INC. |
| Address | 10036 AURORA - HUDSON ROAD<br>1734 FROST ROAD<br>STREETSBORO OH 44241 USA |
| FCC ID | R932060500 |
| IC Label | 6268A-2060500 |
| Model Number | 2060-500 |
| Product Description | 915 MHz Remote Control Receiver |
| Date Sample Received | 7/2/2009 |
| Date Tested | 7/13/2009 |
| Tested By | John A. Day |
| Approved By | Mario de Aranzeta |
| Report Number | 1567AUT9TestReport.pdf |
| Test Results | ☒ PASS ☐ FAIL |



ACCREDITED
Testing Certificate 0955-01

## TABLE OF CONTENTS

**ATTESTATIONS**

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

All instrumentation and accessories used to test products for compliance to the indicated standards are calibrated regularly in accordance with ISO 17025 requirements.

Testing Certificate # 0955-01

I attest that the necessary measurements were made, under my supervision, at:

Timco Engineering Inc.
849 NW State Road 45
Newberry, Fl 32669

**Authorized Signatory Name:** *Mario de Aranzeta*

Mario de Aranzeta C.E.T.
Compliance Engineer/ Lab. Supervisor

**Date:** July 14, 2009

## REPORT SUMMARY

| | |
|---|---|
| Disclaimer | The test results only relate to the item tested. |
| Applicable Rule(s) | Pt 15.109, Pt 15.107, ANSI C63.4: 2003, RSS-210, RSS-GEN |
| Related Report | No other report |

## TEST ENVIRONMENT

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

## TEST SETUP SUMMARY

| | |
|---|---|
| Test Setup Diagram/ Description | The DUT was placed on the turntable per setup per ANSI C63.4: 2003. A test set up photo is provided for clarification. |
| Deviation from the standard/procedure | No deviation |
| Modification of DUT | No modification |

## DUT SPECIFICATION

| | |
|---|---|
| DUT Description | 915 MHz REMOTE CONTROL RECEIVER |
| FCC ID | FCC ID: R932060500 |
| Model Number | 2060-500 |
| IC Cert. | IC: 6268A-2060500 |
| Trade Name | Delta Systems |
| DUT Power Source | ☒ 110–120Vac/50– 60Hz |
| | ☐ DC Power |
| | ☐ Battery Operated Exclusively |
| Test Item | ☐ Prototype |
| | ☒ Pre-Production |
| | ☐ Production |
| Type of Equipment | ☒ Fixed |
| | ☐ Mobile |
| | ☐ Portable |

## TEST EQUIPMENT LIST

| Device | Manufacturer | Model | Serial Number | Cal/Char Date | Due Date |
|---|---|---|---|---|---|
| 3/10-Meter OATS | TEI | N/A | N/A | Listed 3/20/07 | 3/19/10 |
| 3-Meter OATS | TEI | N/A | N/A | Listed 1/11/09 | 1/10/12 |
| Antenna: Biconnical | Eaton | 94455-1 | 1057 | CAL 12/12/07 | 12/12/09 |
| Antenna: Biconnical | Eaton | 94455-1 | 1096 | CAL 10/11/08 | 10/11/10 |
| Antenna: Biconnical | Electro-Metrics | BIA-25 | 1171 | CAL 4/29/09 | 4/29/11 |
| Analyzer Blue Tower Quasi-Peak Adapter | HP | 85650A | 2811A01279 | CAL 4/13/09 | 4/13/11 |
| Analyzer Blue Tower RF Preselector | HP | 85685A | 2926A00983 | CAL 9/5/07 | 9/5/09 |
| Analyzer Blue Tower Spectrum Analyzer | HP | 8568B | 2928A04729 2848A18049 | CAL 4/13/09 | 4/13/11 |
| LISN | Electro-Metrics | ANS-25/2 | 2604 | CAL 10/5/08 | 10/5/10 |
| LISN | Electro-Metrics | EM-7820 | 2682 | CAL 4/28/09 | 4/28/11 |
| Antenna: Log-Periodic | Eaton | 96005 | 1243 | CAL 12/14/07 | 12/14/09 |

## TEST PROCEDURES

**Power line conducted Emission:** The test procedure used was ANSI C63.4-2003.
The spectrum was scanned from 0.15 to 30 MHz.

**Radiation Interference:** The test procedure used was ANSI C63.4-2003 using a spectrum analyzer with a preselector. The bandwidth 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 video bandwidth was always greater than or equal to the RBW.

The frequency was scanned from 30 MHz 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 when necessary.

**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 dBµV) to the antenna correction factor supplied by the antenna manufacturer plus the coax loss. The antenna correction factors are stated in terms of dB. The gain of the preselector was accounted for in the spectrum analyzer meter reading.

**Example:**

| Freq (MHz) | Meter Reading | + ACF | +CL | = FS |
|---|---|---|---|---|
| 33 | 20 dBµV | + 10.36 dB/m | +0.40 dB | =30.36 dBµV/m @ 3m |

**ANSI C63.4-2003 Measurement Procedures:** The unit under test was placed on a table 80 cm high and with dimensions of 1m by 1.5m. The table used for radiated measurements is capable of continuous rotation. When an emission was found, the table was rotated to produce the maximum signal strength. At this point, the antenna was raised and lowered from 1m to 4m. The antenna was placed in both the horizontal and verticals planes.

## RADIATED SPURIOUS EMISSIONS

**Rules Part No.:** FCC Pt 15.109, IC RSS-210, IC RSS_GEN

**Requirements:**

| Frequency MHz | Limits |
|---|---|
| 30 – 88 | 40.0 dBµV/m measured @ 3 meters |
| 88 – 216 | 43.5 dBµV/m measured @ 3 meters |
| 216 – 960 | 46.0 dBµV/m measured @ 3 meters |
| Above 960 | 54.0 dBµV/m measured @ 3 meters |

**Test Data:**

| Tuned Frequency MHz | Emission Frequency MHz | Meter Reading dBµV | Ant. Polarity V/H | Coax Loss dB/m | Correction Factor dB/m | Field Strength dBµV/m | Margin dB |
|---|---|---|---|---|---|---|---|
| 915.0 | 66.73 | 6.9 | V | 0.56 | 8.72 | 16.18 | 23.82 |
| 915.0 | 925.66 | 6.1 | V | 1.99 | 22.66 | 30.75 | 15.25 |
| 915.0 | 925.66 | 6.9 | H | 1.99 | 23.41 | 32.30 | 13.70 |
| 915.0 | 1,851.30 | 13.5 | H | 2.78 | 30.25 | 46.53 | 7.47 |
| 915.0 | 1,851.30 | 15.9 | V | 2.78 | 30.25 | 48.93 | 5.07 |
| 915.0 | 2,776.90 | 5.2 | H | 3.44 | 32.56 | 41.20 | 12.80 |
| 915.0 | 2,776.90 | 6.0 | V | 3.44 | 32.56 | 42.00 | 12.00 |
| 915.0 | 3,702.00 | 4.9 | V | 4.23 | 33.12 | 42.25 | 11.75 |
| 915.0 | 3,702.00 | 5.9 | H | 4.23 | 33.12 | 43.25 | 10.75 |
| 915.0 | 4,628.00 | 4.7 | V | 4.81 | 34.10 | 43.61 | 10.39 |
| 915.0 | 4,628.00 | 5.2 | H | 4.81 | 34.10 | 44.11 | 9.89 |

## POWER LINE CONDUCTED INTERFERENCE

**Rules Part No.:** FCC Pt 15.107, IC RSS-210, IC RSS-GEN

**Requirements:**

| Frequency (MHz) | Quasi Peak Limits (dBµV) | Average Limits (dBµV) |
|---|---|---|
| 0.15 – 0.5 | 66 – 56 * | 56 – 46 * |
| 0.5 – 5.0 | 56 | 46 |
| 5.0 – 30 | 60 | 50 |
| * Decrease with logarithm of frequency | | |

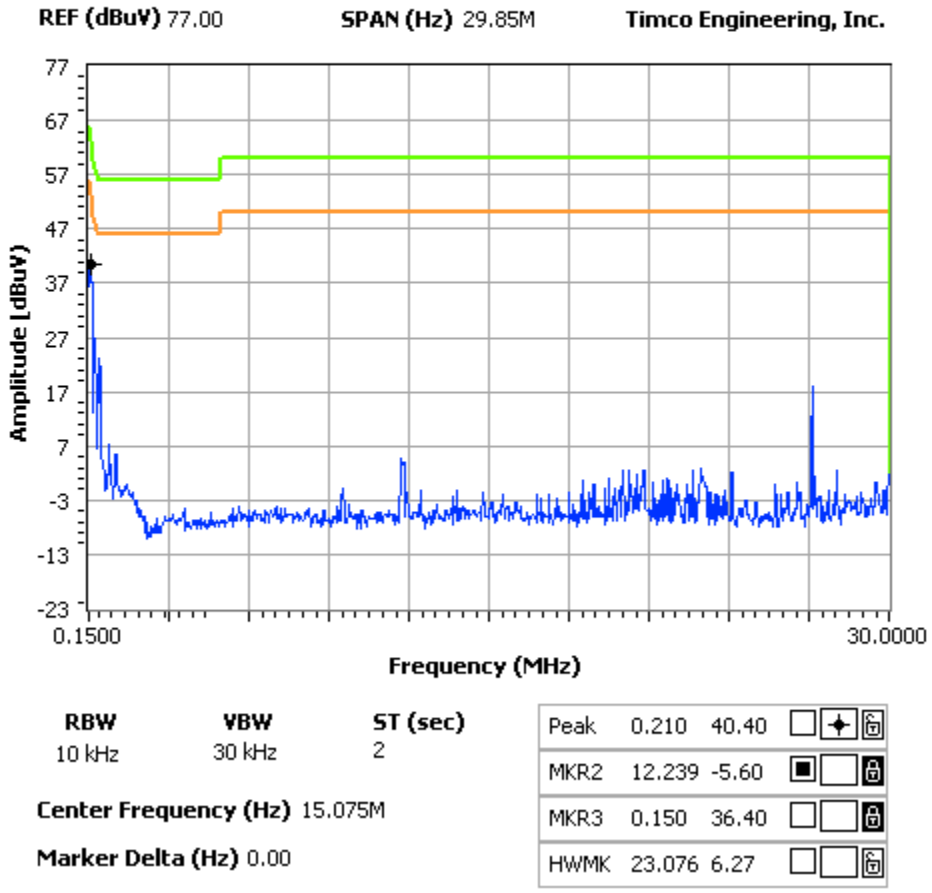
**Test Data:** The following plots represent the emissions for power line conducted. Both lines were observed.

## POWERLINE CONDUCTED EMISSIONS – LINE 1

**NOTES:**

POWERLINE CONDUCTED -- LINE 1
DELTA SYSTEMS INC. -- FCC ID: R93 2060500

**FCC 15.107 Mask Class B**



POWERLINE CONDUCTED EMISSIONS – LINE 2

**NOTES:**

POWERLINE CONDUCTED -- LINE 2
DELTA SYSTEMS INC. -- FCC ID: R93 2060500

**FCC 15.107 Mask Class B**