

**Submittal For Certification
R93 2036-010**

A remote control transmitter
From
Delta Systems Inc.
1734 Frost Ave
Streetsboro, Ohio 44241
FRN # 0011099124

By
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RF Engineer
Phone (330) 422-5142
Test Date: Nov 6,2005

Guidelines for this document were derived from the following sections:

| | |
|--------|--|
| 2.1033 | Application for certification |
| 15.19 | Labeling requirements |
| 15.21 | Information to the user is shown in the instruction manual. |
| 15.31 | Measurement standards |
| 15.33 | Frequency range for radiated measurements Subpart C – Intentional Radiators |
| 15.203 | Antenna Requirement |
| 15.205 | Restricted bands of operation |
| 15.209 | Radiated emission limits, general requirements |
| 15.231 | Periodic operation within the band 40.66 – 40.70 and above 70Mhz. |

I certify the enclosed data is an accurate and truthful representation of the product tested using ANSI 63.4-2003.

This device meets all the requirements of 15.205,15.209,15.231.



Test Equipment List

| <u>Device</u> | <u>Model</u> | <u>Serial</u> | <u>Last Cal Date</u> |
|-------------------|--------------|---------------|----------------------|
| Spectrum Analyzer | HP E4405B | | 2/05 |
| Preamplifier | HP 8447D | 2443A03986 | 2/05 |
| Preamplifier | HP 8449B | 3008A00576 | 2/05 |
| Dipole Ant set | CD "Roberts" | 01296 | 11/29/04 |
| Coax (100') | Belden 8214 | NA | NA |
| Horn Ant | EMCO3115 | 2268 | 11/29/04 |
| Log Periodic Ant | A-H 2563 | 259 | 11/29/04 |

All above equipment to be within manufactures specifications Nov 2005. All equipment is calibrated on a yearly basis.

Site Description

Located at 22790 Lake Park Blvd. Alliance, Ohio. A complete description is on file with the FCC and IC.

Registration #s

FCC: 91010

IC: 1837

Measurement Procedure

Testing was performed according to ANSI C63.4 specifications. A fresh battery was placed in the transmitter before it was taken to the 3 meter OATS. The transmitter was activated and placed on the rotating table. Dipole antennas were used to measure the fundamental and second harmonic of the transmitter. A horn antenna was used to take data above 1Mhz. A Log Periodic and Horn antennas were used to scan the transmitter from 30Mhz to 5Ghz for spurious emissions. The transmitter emissions were taken at each required frequency in three different orientations flat, side and end positions. Measurements were taken with antenna vertical and horizontal polarizations. The table was rotated 360 deg and the antenna's raised and lowered from 1m to 4m to find the highest peak. The highest peak was found and recorded. The battery was replaced several times throughout the testing to ensure accurate results. The fundamental frequency at 433.92Mhz, spurious emissions and harmonics were investigated from 30Mhz – 5000Mhz. Measurement bandwidth were reduced when ambient signals were encountered. Since this device uses a 12volt A23 battery to supply power no conducted emissions tests were performed. There was no cable placement on the device under test.

Test Personnel

All testing was performed on the Genie Company 3 meter OATS Nov 6, 2005 by L.Chop Kramer RF Engineer Delta Systems Inc.

Technical Report

Manufactures
Delta Systems Inc.
1734 Frost Road
Streetsboro, Ohio 44241
Model # 2036-010
SN Test sample 1
Output power under 11,000uV/M at 3 M
Frequency Tolerance +/- 75Khz
RF Power not adjustable.
RF Modulation type OOK
Emission designator (47 CFR 2.201, 2.202) KHz

Expository Statement

The transmitter consists of two buttons it will be used with Delta Systems 2036-100 receiver.. The transmission continues as long as the button is depressed. The transmitter data is determined by a algorithm programmed in the microprocessor. The duty cycle of the transmitter is a function of the data transmission. The following table describes the data transmission.

| Preamble | | Header | | 59 bit code | | Null | |
|----------|------------|--------|------------|-------------|------------|--------|------------|
| Time | Duty Cycle | Time | Duty cycle | Time | Duty Cycle | Time | Duty Cycle |
| 8.96ms | 50% | 4.0ms | 0% | 101.6ms | 35% | 30.4ms | 0% |

The circuit consists of the following.

- 1) Microprocessor
- 2) Push button for each channel of encoded data.
- 3) RF oscillator (Loop antenna is integral part of oscillator circuit)
- 4) 12 volt battery.

When the user turns the transmitter on and activates one of the buttons, the code data modulates an RF carrier that is tuned to a frequency of 433.92Mhz by a SAW resonator. The RF circuitry consists of a Colpitts oscillator.

See accompanying schematic and block diagrams. The transmitter ceases operation immediately after the button is released.

The FCC identifier and IC identifier and model number will be molded into the plastic case of the transmitter. The Part 15 text appears in the instruction manual.

Power Measurements for
R93 2036-010
Button 2

| Scan /Div Mhz | Res. Bandwidth Khz | DUT Frequency (Mhz) | Meter Frequency (Mhz) | Meter Reading (dBm) | Antenna Factor (dB) | Coax Factor (dB) | Amplifier Gain (dB) | Measurement Distance (Meters) | Duty Cycle Correction (dB) | 3 Meter Limit (uV/M) | Field Strength (uV/M) | Delta Limit (dB) |
|------------------|--------------------------|---------------------------|-----------------------------|---------------------------|---------------------------|------------------------|---------------------------|-------------------------------------|----------------------------------|----------------------------|-----------------------------|------------------------|
| 0.5 | 100 | 433.92 | 433.92 | -18.7 | 20.5 | 4 | 25.67 | 3 | -9.1 | 10996.7 | 7970.76 | -2.80 |
| 0.5 | 100 | 433.92 | 867.84 | -52.1 | 28.3 | 5.8 | 25.5 | 3 | -9.1 | 1096 | 524.81 | -6.40 |
| 0.5 | 1000 | 433.92 | 1301.76 | -51.4 | 24 | 7.9 | 32.5 | 3 | -9.1 | 500 | 197.24 | -8.08 |
| 0.5 | 1000 | 433.92 | 1735.68 | -59.3 | 25.7 | 9.42 | 32.5 | 3 | -9.1 | 1096 | 115.08 | -19.58 |
| 0.5 | 1000 | 433.92 | 2169.6 | -59 | 28 | 10.78 | 32.2 | 3 | -9.1 | 1096 | 187.93 | -15.32 |
| 0.5 | 1000 | 433.92 | 2603.52 | -60.4 | 29 | 12 | 30.7 | 3 | -9.1 | 1096 | 245.47 | -13.00 |
| 0.5 | 1000 | 433.92 | 3037.44 | -62 | 30.8 | 13.2 | 30 | 3 | -9.1 | 1096 | 312.61 | -10.90 |
| 0.5 | 1000 | 433.92 | 3471.36 | -62.2 | 31.5 | 14.3 | 29.9 | 3 | -9.1 | 1096 | 380.19 | -9.20 |
| 0.5 | 1000 | 433.92 | 3905.28 | -62.3 | 33.3 | 15.4 | 29.85 | 3 | -9.1 | 1096 | 527.84 | -6.35 |
| 0.5 | 1000 | 433.92 | 4339.2 | -61.5 | 33.1 | 16.4 | 29.8 | 3 | -9.1 | 1096 | 638.26 | -4.70 |