

# TEST RESULT SUMMARY

**FCC Part 15 Subpart C Section 15.209**

**Industry Canada RSS-210 Issue 6 Section 2.6**

**Industry Canada RSS-Gen Issue 1 Section 4.4**

MANUFACTURER'S NAME	Digital Angel Corporation
NAME OF EQUIPMENT	Cattle Paddle DTR
MODEL NUMBER(S) TESTED	DTR1 P/N 800.8001.00
MANUFACTURER'S ADDRESS	490 Villaume Avenue South Saint Paul, MN 55075-2443
TEST REPORT NUMBER	WC500240.1 Rev A
TEST DATE(S)	08 February, 15 March, 23 September, 2005

According to testing performed at TÜV America Inc, the above-mentioned unit is in compliance with the applicable electromagnetic compatibility (EMC) portions of the requirements defined in FCC Part 15 Subpart C Sections 15.209 and IC RSS-210 Issue 6 and RSS-Gen Section 4.4.

It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical characteristics. Any modifications necessary for compliance made during testing on the above mentioned date(s) must be implemented in all production units for compliance to be maintained.

TÜV America Inc, as an independent testing laboratory, declares that the equipment tested as specified above conforms to the applicable EMC requirements of FCC Part 15 Subpart C "Intentional radiators" Sections 15.209 "Radiated emission limits; General requirements." and IC RSS-210 Issue 6 "Low-power Licence-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment" Section 2.6 "General Field Strength Limits" and RSS-Gen Issue 1 "General Requirements and Information for the Certification of Radiocommunication Equipment" Section 4.4 "Bandwidth".

Date: 30 April 2007

Location: Taylors Falls MN  
USA



Joe Sausen  
EMC Senior Technician



JT Schneider  
Senior EMC Engineer

Not Transferable

# EMC TEST REPORT

Test Report File No. : **WC500240.1 Rev A** Date of issue: 30 April 2007

Model / Serial No(s) Tested : 800800100 / 0305, 002

Product Type : Cattle Paddle DTR, Hand-Held Wireless ISO Reader

Applicant : Digital Angel Corporation

Manufacturer : Digital Angel Corporation

License holder : Digital Angel Corporation

Address : 490 Villaume Avenue  
South Saint Paul, MN 55075-2443

Test Result : ☒ **Positive** ☐ **Negative**

Test Project Number  
References : **WC500240.1 Rev A**

Total pages including  
Appendices : **23**

*TÜV America Inc reports apply only to the specific samples tested under stated test conditions. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. TÜV America Inc shall have no liability for any deductions, inferences or generalizations drawn by the client or others from TÜV America Inc issued reports.*

*This report is the confidential property of the client. As a mutual protection to our clients, the public and ourselves, extracts from the test report shall not be reproduced except in full without our written approval. This report shall not be used by the client to claim product endorsement by NVLAP, NIST, or any agency of the US government.*

*TÜV America Inc and its professional staff hold government and professional organization certifications and are members of AAMI, ACIL, AEA, ANSI, IEEE, NARTE, and VCCI.*

## D I R E C T O R Y

### Documentation

### Page(s)

Directory			<u>2</u>
Test Regulations, Environmental conditions, Power supply			<u>3</u>
Test Data and Results:	FCC	IC	
General Field Strength Limits 0.009 – 30 MHz	15.209(a)	RSS-210, 2.6	<u>4</u>
Radiated Emissions 30 - 1000 MHz	15.209(f)	RSS-210, 2.6	<u>5 - 8</u>
Occupied Bandwidth	n/a	RSS-Gen, 4.4.1	<u>9</u>
Test area diagram			<u>10</u>
Test setup photo(s)			<u>11</u>
Test Operation Mode, Configuration of the device under test			<u>12</u>
Deviations From Standard, General Remarks, Summary			<u>13</u>

### Appendix A

Constructional Data Form	<u>14 - 21</u>
--------------------------	----------------

### Appendix B

Measurement Protocol	<u>22 - 23</u>
----------------------	----------------

### Sign Explanations:

- ☐ - not applicable
- ☒ - applicable

## R E V I S I O N   R E C O R D

REVISION	TOTAL NUMBER OF PAGES	DATE	DESCRIPTION
	23	17 July 2006	Initial Release
A	23	30 April 2007	Revisions include: <ul style="list-style-type: none"> <li>TRS and Page 1: Corrected typo in Model number to DTR1 P/N 800.8001.00</li> </ul>

## EMC TEST REGULATIONS:

The tests were performed according to the following regulations :

- ☐ - EN 55014-2: 1997 + Amendment A1: 2001 - Category \_\_\_\_
- ☐ - EN 55024: 1998 + Amendments A1: 2001 + A2: 2003
- ☐ - EN 60601-1-2: 2001
- ☐ - EN 61000-6-1: 2001
- ☐ - EN 61000-6-2: 2001
- ☐ - EN 61326: 1997 + Amendments A1: 1998 + A2: 2001 + A3: 2003
- ☐ - EN 61800-3: 1996 + Amendment A11: 2000
- ☐ - ETS 300 683: 1997
- ☐ - ETSI EN 301 489-3 V1.4.1: 2002
- ☐ - EN 300 330-2 V1.1.1 (2001-06)
- - FCC Part 15 Subpart C Section 15.209
- - IC RSS-210 Issue 6
- - IC RSS-Gen Issue 1

## ENVIRONMENTAL CONDITIONS IN THE LAB

Temperature:	<u>Actual</u> : 12 - 23 °C
Atmospheric pressure	: 98.0 - 99.0 kPa
Relative Humidity	: 25 - 45 %

## POWER SUPPLY UTILIZED

Power supply system : 6 VDC

## General field strength limits 0.009 – 30 MHz

FCC 15.209(a), IC RSS-210 2.6

### Test summary

The requirements are: ■ - MET □ - NOT MET

Minimum margin of compliance of the fundamental is 31 dB at 134 kHz

Minimum margin of compliance of the spurious / harmonic emissions is 34 dB at 536 kHz

Peak measurements are within 20 dB of average

### Test location

□ - Wild River Lab Large Test Site (Open Area Test Site)

■ - Wild River Lab Small Test Site (Open Area Test Site)

■ - Parking lot

### Test equipment

TUV ID	Model Number	Manufacturer	Description	Serial Number	Cal Due
3800	ESCS 30	Rhode & Schwarz	EMI Receiver	100312	18-Jan-06
2517	HFH2-Z2	Polorad	Loop Antenna	879285/036	27-Apr-05

### Test limits

Frequency (MHz)	Field strength (μV/m)	Measurement distance (m)
0.009-0.490	2400/F(kHz)	300
0.490 - 1.705	24000/F(kHz)	30

### Test data - Average & peak emission measurements (dBμV/m), 9 - 90kHz & 110 - 490 kHz

(kHz)	3 m		10 m		30 m		300 m		Limt	Delta
	Avg	Pk	Avg	Pk	Avg	Pk	Avg			
134	110	119	80	89	52	54	-6*	25		-31
268	65	80	35	48	nf	nf	-51*	19		-70
402	50	69	nf	nf	-	-	-66*	15.5		-81.5
536	40	57	nf	nf	n/a	-1*	n/a	33**		-34**

\* Extrapolated using 58 dB / decade

\*\* Peak measurements against a quasi peak limit

nf Noise floor

## Radiated Emissions 30 - 1000 MHz

FCC 15.209(f), IC RSS-210 2.6

### Test summary

The requirements are: ☒ - MET ☐ - NOT MET

Minimum margin of compliance is 14 dB below the limit at 38.47 MHz

### Test location

☐ - Wild River Lab Large Test Site (Open Area Test Site)

☒ - Wild River Lab Small Test Site (Open Area Test Site)

### Test Equipment

TUV ID	Model Number	Manufacturer	Description	Serial Number	Cal Due
3203	EM-6917B	Electro-Metrics	Biconicalog Periodic	106	30-Mar-05
2680	85650A	Hewlett-Packard	Quasi-Peak Adapter (Unit B)	2043A00343	10-May-05
3809	8566B	Hewlett-Packard	Spectrum Analyzer	3026A19165	09-Sept-05
3810	85662A	Hewlett-Packard	Analyzer Display	3014A06698	09-Sept-05
2668	8447D	Electro-Mechanics (EMCO)	Preamplifier	1937A02209	Code B

Cal Code B = Calibration verification performed internally.

### Test limits

Frequency (MHz)	Field strength ( $\mu\text{V/m}$ )	Measurement distance (m)
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Test data on following pages

# RADIATED EMISSIONS



Test Report #: WC501242 Run 3 Test Area: STS

EUT Model #: DTR Handheld Date: 3/15/2005

EUT Serial #: \_\_\_\_\_ EUT Power: battery Temperature: 12.0 °C

Test Method: FCC B Air Pressure: 98.0 kPa

Customer: Digital Angel Rel. Humidity: 25.0 %

EUT Description: Self contained handheld transceiver.

Notes: with Blue Tooth link.

Data File Name: 1242.dat

Page: 1 of 3

## List of measurements for run #: 3

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV / m)	POL / HGT / AZ (m)(DEG)	DELTA1 FCC-B <1GHz 3m	DELTA2
223 MHz maxed:						
223.992 MHz	45.3 Qp	2.2 / 10.8 / 28.12 / 0.0	30.18	H / 1.00 / 238	-15.82	n/a
227.604 MHz	36.4 Qp	2.2 / 10.8 / 28.11 / 0.0	21.29	H / 1.00 / 238	-24.71	n/a
238.339 MHz	34.95 Qp	2.25 / 11.3 / 28.17 / 0.0	20.33	H / 1.00 / 238	-25.67	n/a
199.686 MHz	38.1 Qp	2.1 / 11.0 / 28.28 / 0.0	22.92	H / 1.00 / 238	-20.58	n/a
195.39 MHz	37.4 Qp	2.07 / 10.91 / 28.3 / 0.0	22.07	H / 1.00 / 238	-21.43	n/a
191.094 MHz	38.6 Qp	2.03 / 10.26 / 28.3 / 0.0	22.59	H / 1.00 / 238	-20.91	n/a
137.214 MHz	33.7 Qp	1.74 / 8.48 / 28.2 / 0.0	15.73	H / 1.00 / 238	-27.77	n/a
199.686 MHz	37.55 Qp	2.1 / 11.0 / 28.28 / 0.0	22.37	H / 1.00 / 238	-21.13	n/a
38.471 MHz	35.8 Qp	1.04 / 17.27 / 28.2 / 0.0	25.91	V / 1.00 / 0	-14.09	n/a
881.02 MHz	29.15 Pk	4.6 / 21.85 / 27.8 / 0.0	27.8	V / 1.00 / 0	-18.2*	n/a
137.652 MHz	34.1 Qp	1.74 / 8.53 / 28.2 / 0.0	16.17	V / 1.00 / 90	-27.33	n/a
137.238 MHz	35.9 Qp	1.74 / 8.48 / 28.2 / 0.0	17.93	V / 1.00 / 180	-25.57	n/a
46.529 MHz	34.85 Qp	1.08 / 14.9 / 28.2 / 0.0	22.63	V / 1.00 / 270	-17.37	n/a
197.538 MHz	31.85 Qp	2.08 / 11.0 / 28.3 / 0.0	16.63	V / 3.00 / 180	-26.87	n/a
124.523 MHz	35.75 Qp	1.63 / 8.88 / 28.26 / 0.0	17.99	V / 3.00 / 270	-25.51	n/a
130.973 MHz	31.5 Qp	1.78 / 8.28 / 28.2 / 0.0	13.36	V / 3.00 / 270	-30.14	n/a

No further significant EUT emissions detected 30 MHz to 1000 MHz, vert and hor ant.

\* Denotes a peak measurement compared to average limit.

Tested by: J. C. Sausen

Printed

Signature

Reviewed by: T. K. Swanson

Printed

Signature

# RADIATED EMISSIONS



Test Report #: WC501242 Run 3 Test Area: STS

EUT Model #: DTR Handheld Date: 3/15/2005

EUT Serial #: \_\_\_\_\_ EUT Power: battery Temperature: 12.0 °C

Test Method: FCC B Air Pressure: 98.0 kPa

Customer: Digital Angel Rel. Humidity: 25.0 %

EUT Description: Self contained handheld transceiver.

Notes: with Blue Tooth link.

Data File Name: 1242.dat

Page: 2 of 3

## Measurement summary for limit1: FCC-B <1GHz 3m (Qp)

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV / m)	POL / HGT / AZ (m)(DEG)	DELTA1 FCC-B <1GHz 3m
38.471 MHz	35.8 Qp	1.04 / 17.27 / 28.2 / 0.0	25.91	V / 1.00 / 0	-14.09
223.992 MHz	45.3 Qp	2.2 / 10.8 / 28.12 / 0.0	30.18	H / 1.00 / 238	-15.82
46.529 MHz	34.85 Qp	1.08 / 14.9 / 28.2 / 0.0	22.63	V / 1.00 / 270	-17.37
199.686 MHz	38.1 Qp	2.1 / 11.0 / 28.28 / 0.0	22.92	H / 1.00 / 238	-20.58
191.094 MHz	38.6 Qp	2.03 / 10.26 / 28.3 / 0.0	22.59	H / 1.00 / 238	-20.91
195.39 MHz	37.4 Qp	2.07 / 10.91 / 28.3 / 0.0	22.07	H / 1.00 / 238	-21.43
227.604 MHz	36.4 Qp	2.2 / 10.8 / 28.11 / 0.0	21.29	H / 1.00 / 238	-24.71
124.523 MHz	35.75 Qp	1.63 / 8.88 / 28.26 / 0.0	17.99	V / 3.00 / 270	-25.51
137.238 MHz	35.9 Qp	1.74 / 8.48 / 28.2 / 0.0	17.93	V / 1.00 / 180	-25.57
238.339 MHz	34.95 Qp	2.25 / 11.3 / 28.17 / 0.0	20.33	H / 1.00 / 238	-25.67
197.538 MHz	31.85 Qp	2.08 / 11.0 / 28.3 / 0.0	16.63	V / 3.00 / 180	-26.87
137.652 MHz	34.1 Qp	1.74 / 8.53 / 28.2 / 0.0	16.17	V / 1.00 / 90	-27.33
130.973 MHz	31.5 Qp	1.78 / 8.28 / 28.2 / 0.0	13.36	V / 3.00 / 270	-30.14
881.02 MHz	29.15 Pk	4.6 / 21.85 / 27.8 / 0.0	27.8	V / 1.00 / 0	-18.2*

\* Denotes a peak measurement compared to average limit.

Tested by: J. C. Sausen

Printed

Signature

Reviewed by: T. K. Swanson

Printed

Signature



# RADIATED EMISSIONS



Test Report #: WC501242 Run 3 Test Area: STS

EUT Model #: DTR Handheld Date: 3/15/2005

EUT Serial #: \_\_\_\_\_ EUT Power: battery Temperature: 12.0 °C

Test Method: FCC B Air Pressure: 98.0 kPa

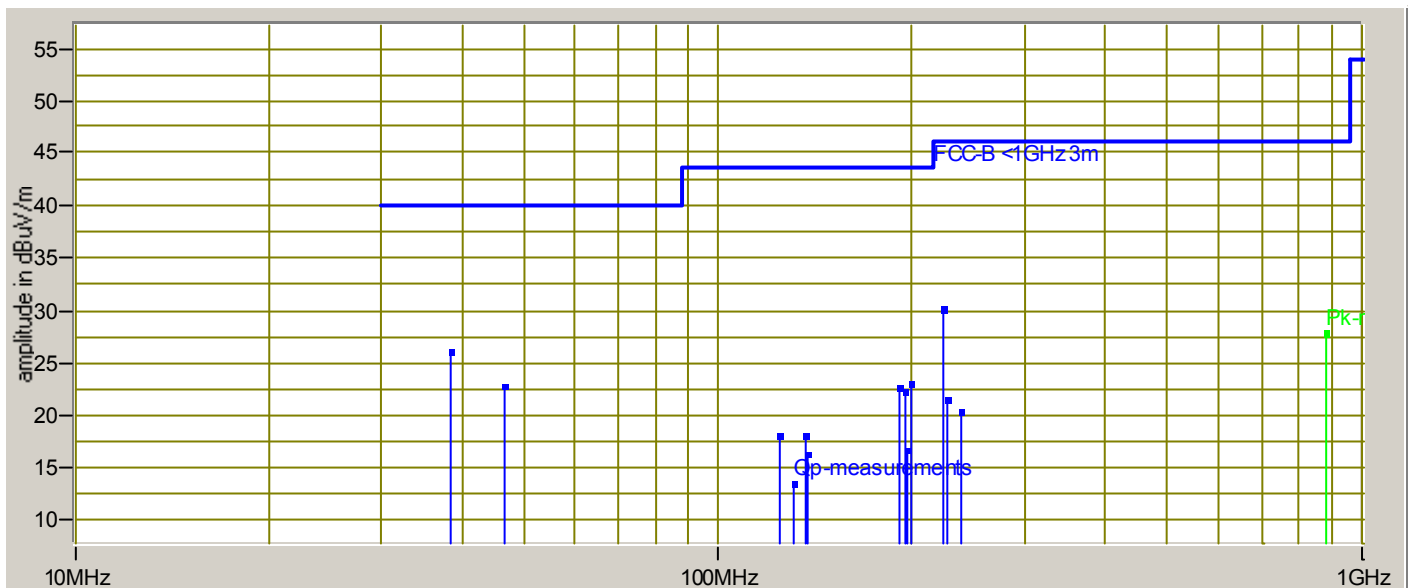
Customer: Digital Angel Rel. Humidity: 25.0 %

EUT Description: Self contained handheld transceiver.

Notes: with Blue Tooth link.

Data File Name: 1242.dat Page: 3 of 3

## Graph:



Tested by: J. C. Sausen

Printed

Signature

Reviewed by: T. K. Swanson

Printed

Signature

## Occupied bandwidth IC RSS-Gen 4.4.1

### Test summary

The requirements are: ☒ - MET ☐ - NOT MET

The 99% occupied bandwidth = 1.6 kHz

### Test location

☐ - Wild River Lab Large Test Site (Open Area Test Site)

☐ - Wild River Lab Small Test Site (Open Area Test Site)

☒ - Digital Angel facility

### Test equipment

TUV ID	Model Number	Manufacturer	Description	Serial Number	Cal Due
3367	E4440A	Agilent	Spectrum Analyzer	MY43362222	02-Sep-06
	7405-901	EMCO	Near field probe	na	Code Y

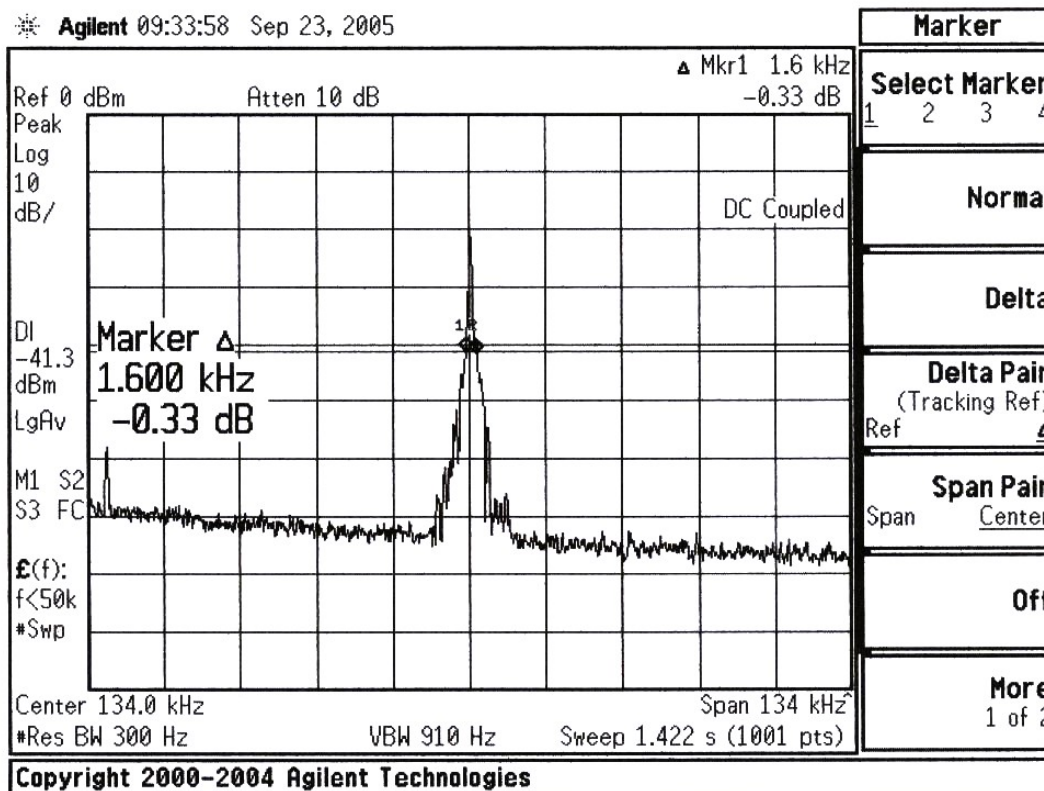
Cal Code Y = Calibration not required when used with other calibrated equipment

### Test limits

n/a

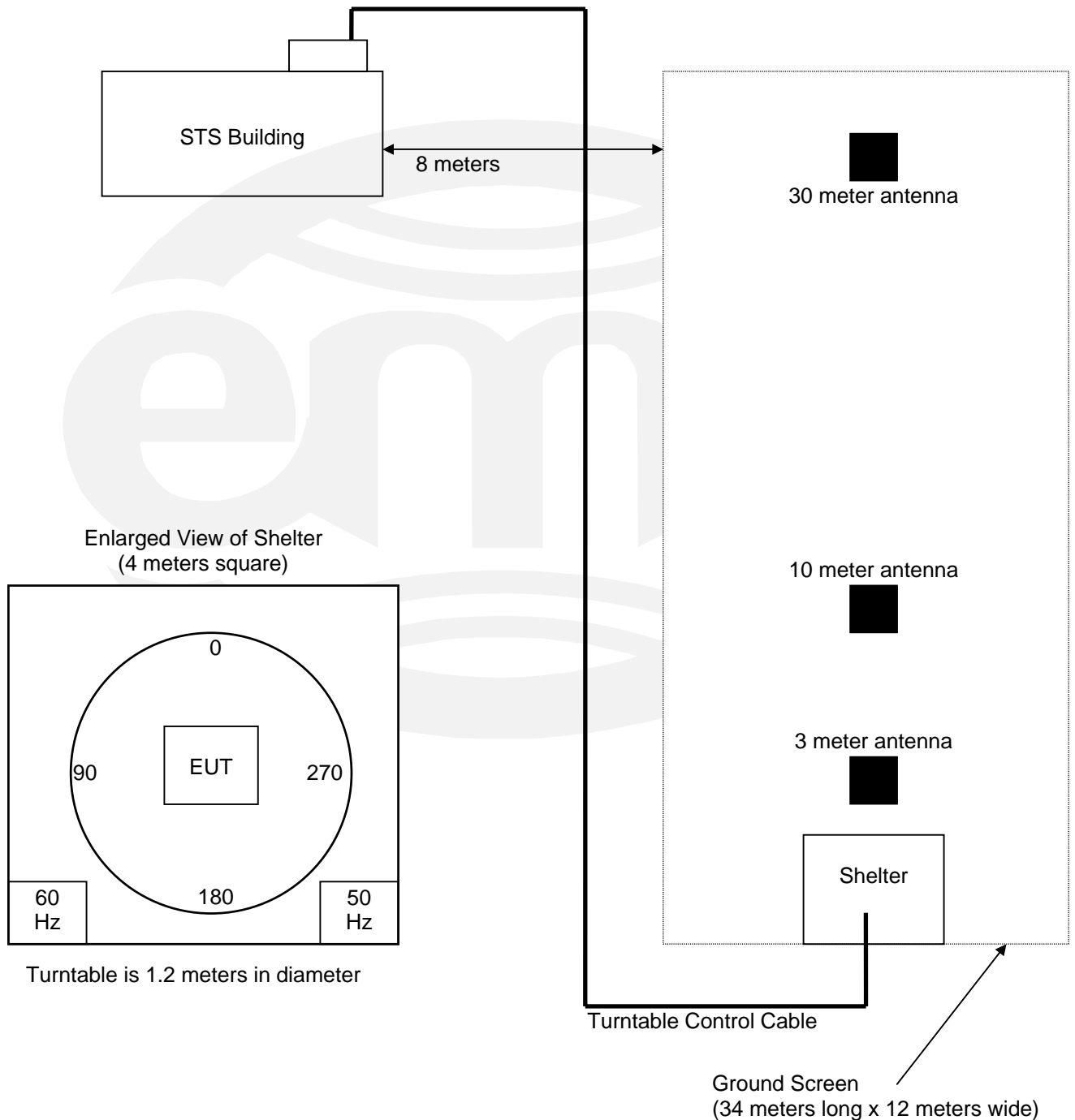
### Test data

99% Bandwidth



## TEST SETUP FOR EMISSIONS TESTING

WILD RIVER LAB  
Small Test Site (STS)



Test-setup photo(s):  
General Field Strength Limits 0.009 – 30 MHz  
Radiated Emissions 30 - 1000 MHz

Measurements also made with RS232 cable attached. No photo available



## Equipment Under Test (EUT) Test Operation Mode:

The device under test was operated under the following conditions during immunity testing :

- ☐ - Standby
- ☐ - Test program (H - Pattern)
- ☐ - Test program (color bar)
- ☐ - Test program (customer specific)
- ☐ - Practice operation
- ☒ - Normal operating mode
- ☐ - \_\_\_\_\_

## Configuration of the device under test:

- ☒ - See Appendix A & Test setup photos
- ☐ - See Product Information Form(s) in Appendix B



## DEVIATIONS FROM STANDARD:

None.

## GENERAL REMARKS:

Some data taken under test report number WC501242

Radiated emissions measurements were taken with and without the RS232 cable attached. No significant difference in emission levels detected.

At the time of test, the EUT was identified as Model Number 800800100. Notification of a change in equipment identification to Model Number DTR1 P/N 800.8001.00 was received from the manufacturer and is on file with TÜV America.

### Modifications required to pass:

- ☒ None
- ☐ As indicated on the data sheet(s)

### Test Specification Deviations: Additions to or Exclusions from:

- ☒ None
- ☐ As indicated in the Test Plan
- ☐

## SUMMARY:

The requirements according to the technical regulations are

- ☒ - met and the device under test does fulfill the general approval requirements.
- ☐ - **not** met and the device under test does **not** fulfill the general approval requirements..

EUT Received Date: 08 February 2005

Condition of EUT: Normal

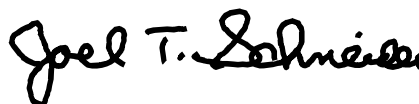
Testing Start Date: 08 February 2005

Testing End Date: 23 September 2005

TÜV AMERICA INC



Joe Sausen  
EMC Senior Technician



Joel Schneider  
Senior EMC Engineer

## Appendix A

### Constructional Data Form



## EMC Test Plan and Constructional Data Form



PLEASE COMPLETE THIS DOCUMENT IN FULL, ENTERING N/A IF THE FIELD IS NOT APPLICABLE.

**Applicant -- NOTE: This information will be input into your test report as shown below.**  
**Press the F1 key at any time to get HELP for the current field selected.**

Company: DIGITAL ANGEL CORP.

Address: 490 Villaume Avenue  
South Saint Paul, MN 55075-2443

Contact: Corey Punt Position: Electrical Engineer

Phone: (651) 552-6313 Fax: (651) 455-0413

E-mail Address: cpunt@digitalangelcorp.com

**General Equipment Description -- NOTE: This information will be input into your test report as shown below.**

EUT Description Hand-Held Wireless ISO Reader

EUT Name Cattle Paddle DTR

Model No.: DTR1 P/N 800.8001.00 Serial No.: 0305,002

Product Options: none

Configurations to be tested: \_\_\_\_\_

**Test Objective**

- |  |  |
|--|--|
| <input type="checkbox"/> EMC Directive 89/336/EEC (EMC)                                      | <input checked="" type="checkbox"/> FCC: Class <input type="checkbox"/> A <input checked="" type="checkbox"/> B Part <u>15</u> |
| Std: _____   | <input type="checkbox"/> VCCI: Class <input type="checkbox"/> A <input type="checkbox"/> B                                     |
| <input type="checkbox"/> Machinery Directive 89/392/EEC (EMC)                                | <input type="checkbox"/> BCIC: Class <input type="checkbox"/> A <input type="checkbox"/> B                                     |
| Std: _____   | <input type="checkbox"/> Canada: Class <input type="checkbox"/> A <input type="checkbox"/> B                                   |
| <input type="checkbox"/> Medical Device Directive 93/42/EEC (EMC)                            | <input type="checkbox"/> Australia: Class <input type="checkbox"/> A <input type="checkbox"/> B                                |
| Std: _____   | <input type="checkbox"/> Other: _____  |
| <input type="checkbox"/> Vehicle Directive 72/245/EEC (EMC)                                  |  |
| Std: _____   |  |
| <input type="checkbox"/> FDA Reviewers Guidance for Premarket Notification Submissions (EMC) |  |

**TÜV Product Service Certification Requested**

- |   |   |
|---|---|
| <input type="checkbox"/> Attestation of Conformity (AoC)            | <input type="checkbox"/> International EMC Mark (IEM)   |
| <input checked="" type="checkbox"/> Certificate of Conformity (CoC) | <input type="checkbox"/> Compliance Document  |
| Protection Class (N/A for vehicles)                                 | <input type="checkbox"/> Class I <input type="checkbox"/> Class II <input type="checkbox"/> Class III |



## EMC Test Plan and Constructional Data Form



(Press **F1** when field is selected to show additional information on Protection Class.)

**Attendance**

Test will be: ☒ Attended by the customer ☐ Unattended by the customer

**Failure - Complete this section if testing will not be attended by the customer.**

If a failure occurs, TÜV Product Service should:

- ☐ Call contact listed above, if not available then stop testing. (After hrs phone): \_\_\_\_\_
- ☐ Continue testing to complete test series.
- ☐ Continue testing to define corrective action.
- ☐ Stop testing.

**EUT Specifications and Requirements**

Length: 19.5 in Width: 3.0 in Height: 2.875 in Weight: 1.6 lbs.  
: \_\_\_\_\_

**Power Requirements**

*Regulations require testing to be performed at typical power ratings in the countries of intended use. (i.e., European power is typically 230 VAC 50 Hz or 400 VAC 50 Hz, single and three phase, respectively)*

Voltage: 6 VDC (If battery powered, make sure battery life is sufficient to complete testing.)

# of Phases: \_\_\_\_\_

Current (Amps/phase(max)): \_\_\_\_\_ Current (Amps/phase(nominal)): \_\_\_\_\_

Other Battery Powered.

**Other Special Requirements**

Battery is charged using AVT charging unit.

**Typical Installation and/or Operating Environment**

(ie. Hospital, Small Business, Industrial/Factory, etc.)  
Industrial/Factory

## EMC Test Plan and Constructional Data Form



### EUT Power Cable

<input type="checkbox"/> Permanent	OR	<input type="checkbox"/> Removable	Length (in meters):	_____
<input type="checkbox"/> Shielded	OR	<input type="checkbox"/> Unshielded		
<input checked="" type="checkbox"/> Not Applicable				

## EMC Test Plan and Constructional Data Form

EUT Interface Ports and Cables												
Interface			Shielding									
Type	Analog	Digital	Qty	Yes	No	Type	Termination	Connector Type	Port Termination	Length (in meters)	Removable	Permanent
<b>EXAMPLE:</b> RS232	<input type="checkbox"/>	<input checked="" type="checkbox"/>	2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Foil over braid	Coaxial	Metallized 9-pin D-Sub	Characteristic Impedance	6	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>

## EMC Test Plan and Constructional Data Form

**EUT Software.**

Revision Level:

Description:

**EUT Operating Modes to be Tested** -- list the operating modes to be used during test. It is recommended the equipment be tested while operating in a typical operation mode. FCC testing of personal computers and/or peripherals requires that a simple program generate a complete line of upper case H's. Provide a general description of all software, firmware, and PLD algorithms used in the equipment. List all code modules as described above, with the revision level used during testing. Consult with your TÜV Product Service Representative if additional assistance is required.

1. Handheld unit is used by itself.
- 2.
- 3.

**EUT System Components** -- List and describe all components which are part of the EUT. For FCC testing a minimum configuration is required. (ie. Mouse, Printer, Monitor, External Disk Drive, Motherboard, etc.)

Description	Model #	Serial #	FCC ID #

## EMC Test Plan and Constructional Data Form

**Support Equipment** -- List and describe all support equipment which is not part of the EUT. (i.e. peripherals, simulators, etc)

<i>Description</i>	<i>Model #</i>	<i>Serial #</i>	<i>FCC ID #</i>

**Oscillator Frequencies**

<i>Frequency</i>	<i>Derived Frequency</i>	<i>Component # / Location</i>	<i>Description of Use</i>
54.294 MHz		Decoder Board	Main Clock

**Power Supply**

<i>Manufacturer</i>	<i>Model #</i>	<i>Serial #</i>	<i>Type</i>
AVT	C3H205210N AU	2504	<input checked="" type="checkbox"/> Switched-mode: (Frequency) _____ <input type="checkbox"/> Linear <input type="checkbox"/> Other: _____
			<input type="checkbox"/> Switched-mode: (Frequency) _____ <input type="checkbox"/> Linear <input type="checkbox"/> Other: _____

**Power Line Filters**

<i>Manufacturer</i>	<i>Model #</i>	<i>Location in EUT</i>

## EMC Test Plan and Constructional Data Form

**Critical EMI Components (Capacitors, ferrites, etc.)**

<i>Description</i>	<i>Manufacturer</i>	<i>Part # or Value</i>	<i>Qty</i>	<i>Component # / Location</i>

**EMC Critical Detail --** Describe other EMC Design details used to reduce high frequency noise.

(PLEASE INSERT "ELECTRONIC SIGNATURE" BELOW IF POSSIBLE)

**Authorization Signatures**

Corey Punt

3/11/05

Customer authorization to perform tests  
according to this test plan.

Date

Corey Punt

3/08/05

Test Plan/CDF Prepared By (please print)

Date

Reviewed by TÜV Product Service Associate

Date

## Appendix B

### Measurement Protocol



# MEASUREMENT PROTOCOL

## GENERAL INFORMATION

### Test Methodology

Emissions testing is performed according to the procedures in ANSI C63.4-2003.

### Measurement Uncertainty

The test system for conducted emissions is defined as the LISN, tuned receiver or spectrum analyzer, and coaxial cable. The test system has a measurement uncertainty of  $\pm 1.8$  dB. The test system for radiated emissions is defined as the antenna, the pre-amplifier, the spectrum analyzer and the coaxial cable. The test system has a measurement uncertainty of  $\pm 4.8$  dB. The equipment comprising the test systems is calibrated on an annual basis.

### Justification

The Equipment Under Test (EUT) is configured in a typical user arrangement in accordance with the manufacturer's instructions. A cable is connected to each available port and either terminated with a peripheral into its characteristic impedance or left unterminated. When appropriate, the cables are manually manipulated with respect to each other to obtain maximum emissions from the unit.

### Conducted Emissions

The final level, in dB $\mu$ V, equals the EMI receiver level plus the cable loss and LISN factor.

### Radiated Emissions

The final level, in dB $\mu$ V/m, equals the reading from the spectrum analyzer (Level dB $\mu$ V), adding the antenna correction factor and cable loss factor (Factor dB) to it, and subtracting the preamp gain (and duty cycle correction factor, if applicable). This result then has the limit subtracted from it to provide the Delta, which gives the tabular data as shown in the data sheets in Attachment A.

Example:

FREQ (MHz)	LEVEL (dB $\mu$ V)	CABLE/ANT/PREAMP (dB) (dB/m) (dB)	FINAL (dB $\mu$ V/m)	POL/HGT/AZ (m) (deg)	DELTA1
60.80	42.5Qp +	1.2 + 10.9 - 25.5 =	29.1	V 1.0 0.0	-10.9

### Test Equipment

All measurement instrumentation is traceable to the National Institute of Standards and Technology and is calibrated according to internal procedure.