

TEST RESULT SUMMARY

FCC PART 15 Subpart C Section 15.231

| | |
|------------------------|---|
| MANUFACTURER'S NAME | Interactive Technologies Inc |
| NAME OF EQUIPMENT | 55-756 Advent Wireless Transceiver |
| MODEL NUMBER | 60-821-95 |
| MANUFACTURER'S ADDRESS | 2266 N 2nd Street North St Paul MN 55109 USA |
| TEST REPORT NUMBER | W9420 |
| TEST DATE | 22 March & 26 August 1999 |


According to testing performed at TÜV Product Service Inc, the above-mentioned unit is in compliance with the electromagnetic compatibility requirements defined in FCC Part 15 Subpart C Section 15.231.

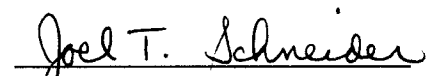
It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical characteristics. Any modifications necessary for compliance made during testing on the above mentioned date(s) must be implemented in all production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

TÜV Product Service Inc, as an independent testing laboratory, declares that the equipment tested as specified above conforms to the requirements of FCC Part 15 Subpart C Section 15.231.

Date: 29 September 1999

Location: Taylors Falls MN
USA


J. C. Sausen
Test Engineer


J. T. Schneider
Wild River Lab

Not Transferable

EMC EMISSION - TEST REPORT

Test Report File No. : **WC1G942001** Date of issue: 29 September 1999

Model / Serial No. : 60-821-95 / s/n X2

Product Type : 55-756 Advent Wireless Transceiver

Applicant : Interactive Technologies Inc

Manufacturer : Interactive Technologies Inc

License holder : Interactive Technologies Inc

Address : 2266 N 2nd Street
: North St Paul MN 55109 USA

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

Test Project Number :
Reference(s) : **W9420**

Total pages including
Appendices : **30**

TÜV Product Service Inc is a subcontractor to TÜV Product Service, GmbH according to the principles outlined in ISO/IEC Guide 25 and EN 45001.

TÜV Product Service 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 Product Service Inc shall have no liability for any deductions, inferences or generalizations drawn by the client or others from TÜV Product Service 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 or any agency of the US government.

TÜV Product Service Inc and its professional staff hold government and professional organization certifications and are members of AAMI, ACIL, AEA, ANSI, IEEE, NVLAP, and VCCI

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EMISSIONS TEST REGULATIONS :

The emissions tests were performed according to following regulations:

- | | | |
|--|---|------------------------------------|
| <input type="checkbox"/> - EN 50081-1 / 1991 | <input type="checkbox"/> - Group 1 | <input type="checkbox"/> - Group 2 |
| <input type="checkbox"/> - EN 55011 / 1991 | <input type="checkbox"/> - Class A | <input type="checkbox"/> - Class B |
| <input type="checkbox"/> - EN 55013 / 1990 | <input type="checkbox"/> - Household appliances and similar | |
| <input type="checkbox"/> - EN 55014 / 1987 | <input type="checkbox"/> - Portable tools | |
| | <input type="checkbox"/> - Semiconductor devices | |
| <input type="checkbox"/> - EN 55014 / A2:1990 | <input type="checkbox"/> - Household appliances and similar | |
| <input type="checkbox"/> - EN 55014 / 1993 | <input type="checkbox"/> - Portable tools | |
| | <input type="checkbox"/> - Semiconductor devices | |
| <input type="checkbox"/> - EN 55015 / 1987 | | |
| <input type="checkbox"/> - EN 55015 / A1:1990 | | |
| <input type="checkbox"/> - EN 55015 / 1993 | | |
| <input type="checkbox"/> - EN 55022 / 1987 | <input type="checkbox"/> - Class A | <input type="checkbox"/> - Class B |
| <input type="checkbox"/> - EN 55022 / 1994 | <input type="checkbox"/> - Class A | <input type="checkbox"/> - Class B |
| <input type="checkbox"/> - BS | | |
| <input type="checkbox"/> - VCCI | <input type="checkbox"/> - Class A | <input type="checkbox"/> - Class B |
| ■ - FCC Part 15 Subpart C Section 15.231 | | |
| <input type="checkbox"/> - AS 3548 (1992) | <input type="checkbox"/> - Class A | <input type="checkbox"/> - Class B |
| <input type="checkbox"/> - CISPR 11 (1990) | <input type="checkbox"/> - Group 1 | <input type="checkbox"/> - Group 2 |
| | <input type="checkbox"/> - Class A | <input type="checkbox"/> - Class B |
| <input type="checkbox"/> - CISPR 22 (1993) | <input type="checkbox"/> - Class A | <input type="checkbox"/> - Class B |
| ■ - RSS-210 Issue 2 Rev. 1 Section 6.1.1 & 7.0 | | |

Environmental conditions in the lab:

| | <u>Actual</u> |
|----------------------|----------------------------|
| Temperature | : 25 °C |
| Relative Humidity | : 65 % |
| Atmospheric pressure | : 98.6 kPa |
| Power supply system | : 1-phase / 60 Hz / 24 VAC |

Sign Explanations:

- ☐ - not applicable
- ☒ - applicable

Emissions Test Conditions: CONDUCTED EMISSIONS (Interference Voltage)

The *CONDUCTED EMISSIONS (INTERFERENCE VOLTAGE)* measurements were performed at the following test location:

☐ - Test not applicable

- ☐ - Wild River Lab Large Test Site (Open Area Test Site)
- ☐ - Wild River Lab Small Test Site (Open Area Test Site)
- ☐ - Oakwood Lab (Open Area Test Site)
- ☒ - Wild River Lab Screen Room
- ☐ - New Brighton Lab Shielded Room

Test equipment used :

| Model Number | Manufacturer | Description | Serial Number | Cal Date |
|--------------|--------------------------|------------------|---------------|----------|
| ■ - 3825/2 | Electro-Mechanics (EMCO) | 50 Ω LISN | 1329 | 5-99 |
| ■ - ESHS-20 | Rohde & Schwarz | EMI Receiver | 837055/003 | 3-99 |

Use of the calibrated equipment on this list ensures traceability to national and international standards.

Emissions Test Conditions: RADIATED EMISSIONS (Magnetic Field)

The *RADIATED EMISSIONS (MAGNETIC FIELD)* measurements were performed at the following test location:

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

at a test distance of :

- ☐ - 3 meters
- ☐ - 30 meters

☒ - Test not applicable

Test equipment used :

| Model Number | Manufacturer | Description | Serial Number | Cal Date |
|--------------|--------------|-------------|---------------|----------|
|--------------|--------------|-------------|---------------|----------|

Emissions Test Conditions: RADIATED EMISSIONS (Electric Field)

The *RADIATED EMISSIONS (ELECTRIC FIELD)* measurements, in the frequency range of 30 MHz-1000 MHz, were tested in a horizontal and vertical polarization at the following test location :

☐ - Test not applicable

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

at a test distance of :

- ☒ - 3 meters
- ☐ - 10 meters
- ☐ - 30 meters

Test equipment used :

| Model Number | Manufacturer | Description | Serial Number | Cal Date |
|---|--------------------------|----------------------|---------------|----------|
| <input checked="" type="checkbox"/> - 3146 | Electro-Mechanics (EMCO) | Log Periodic Antenna | 9103-3075 | 11-98 |
| <input checked="" type="checkbox"/> - 3108 | Electro-Mechanics (EMCO) | Biconical Antenna | 2118 | 11-98 |
| <input checked="" type="checkbox"/> - 8566B | Hewlett-Packard | Spectrum Analyzer | 2221A01596 | 4-99 |
| <input checked="" type="checkbox"/> - 85662A | Hewlett-Packard | Analyzer Display | 2152A03640 | 4-99 |
| <input checked="" type="checkbox"/> - 85650A | Hewlett-Packard | Quasi-Peak Adapter | 2811A01127 | 4-99 |
| <input checked="" type="checkbox"/> - ZHL-1042J | Mini-Circuits | Preamplifier | H072294-11 | 3-99 |

Use of the calibrated equipment on this list ensures traceability to national and international standards.

Emissions Test Conditions: INTERFERENCE POWER

The *INTERFERENCE POWER* measurements were performed by using the absorbing clamp on the mains and interface cables in the frequency range 30 MHz - 300 MHz at the following test location :

☒ - Test not applicable

- ☐ - Wild River Lab Large Test Site (Open Area Test Site)
- ☐ - Wild River Lab Small Test Site (Open Area Test Site)
- ☐ - Oakwood Lab (Open Area Test Site)
- ☐ - Wild River Lab Screen Room
- ☐ - New Brighton Lab Shielded Room

Test equipment used :

| Model Number | Manufacturer | Description | Serial Number | Cal Date |
|--------------|--------------|-------------|---------------|----------|
|--------------|--------------|-------------|---------------|----------|

Emissions Test Conditions: RADIATED EMISSIONS (Electric Field)

The *EQUIVALENT RADIATED EMISSIONS* measurements in the frequency range 1 GHz - 3.2 GHz were performed in a horizontal and vertical polarization at the following test location :

- ☒ - Wild River Lab Large Test Site (Open Area Test Site)
- ☐ - Wild River Lab Small Test Site (Open Area Test Site)
- ☐ - Oakwood Lab (Open Area Test Site)
- ☐ - Wild River Lab Screen Room

at a test distance of:

- ☐ - 1 meters
- ☒ - 3 meters
- ☐ - 10 meters

☐ - Test not applicable

Test equipment used :

| | Model Number | Manufacturer | Description | Serial Number | Cal Date |
|---------------------------------------|--------------|--------------------------|--------------------|---------------|----------|
| <input checked="" type="checkbox"/> - | 3115 | Electro-Mechanics (EMCO) | Horn Antenna | 9001-3275 | 9-98 |
| <input checked="" type="checkbox"/> - | 8566B | Hewlett-Packard | Spectrum Analyzer | 2221A01596 | 4-99 |
| <input checked="" type="checkbox"/> - | 85662A | Hewlett-Packard | Analyzer Display | 2152A03640 | 4-99 |
| <input checked="" type="checkbox"/> - | 85650A | Hewlett-Packard | Quasi-Peak Adapter | 2811A01127 | 4-99 |
| <input checked="" type="checkbox"/> - | ZHL-1042J | Mini-Circuits | Preamplifier | H072294-11 | 3-99 |

Use of the calibrated equipment on this list ensures traceability to national and international standards.

Equipment Under Test (EUT) Test Operation Mode - Emission tests :

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

- ☐ - Standby
- ☐ - Test program (H - Pattern)
- ☐ - Test program (color bar)
- ☐ - Test program (customer specific)
- ☐ - Practice operation
- ☐ - Normal Operating Mode
- ☒ - Transmitter on/receiver on.

Configuration of the device under test:

- ☐ - See Constructional Data Form in Appendix B - Page B2
- ☒ - See Product Information Form in Appendix B - beginning on Page B3

The following peripheral devices and interface cables were connected during the measurement:

- | | |
|---|----------------|
| <input type="checkbox"/> - _____ | Type : _____ |
| <input type="checkbox"/> - _____ | Type : _____ |
| <input type="checkbox"/> - _____ | Type : _____ |
| <input type="checkbox"/> - _____ | Type : _____ |
| <input type="checkbox"/> - _____ | Type : _____ |
| <input type="checkbox"/> - _____ | Type : _____ |
| <input type="checkbox"/> - _____ | Type : _____ |
| <input type="checkbox"/> - _____ | Type : _____ |
| <input type="checkbox"/> - _____ | Type : _____ |
| <input type="checkbox"/> - unshielded power cable | |
| <input checked="" type="checkbox"/> - unshielded cables | |
| <input type="checkbox"/> - shielded cables | MPS.No.: _____ |
| <input type="checkbox"/> - customer specific cables | |
| <input type="checkbox"/> - _____ | |
| <input type="checkbox"/> - _____ | |

Conducted emissions 10/150 kHz - 30 MHz

☐ - NOT MET

1.69 MHz

MHz

☐ - NOT MET

MHz

MHz

Radiated emissions (electric field) 30 MHz - 1000 MHz

☐ - NOT MET

319.5 MHz

212.9 MHz

Remarks: The fundamental was measured to be 82.4 dBuV/m in peak mode, minus 20 dB duty cycle correction factor to give an average reading of 62.4 dBuV/m (1318 uV/m) compared to an average limit of 75.8 dBuV/m (6229 uV/m). The 212.9 MHz signal was measured to be 70.9 dBuV/m in peak mode, minus 20 dB duty cycle correction factor to give an average reading of 50.9 dBuV/m (350 uV/m) compared to an average limit of 55.8 dBuV/m (622 uV/m). The duty cycle correction factor is calculated by $20 \log (8.17/100 \text{ msec})$, with 20 dB being the maximum allowable.

Interference Power at the mains and interface cables 30 MHz - 300 MHz

☐ - NOT MET

MHz

MHz

Equivalent Radiated emissions 1 GHz - 3.2 GHz

☐ - NOT MET

MHz

MHz

Remarks: At 2875.5 MHz, peak analyzer reading of 44 dBuV/m, minus 20 dB duty cycle correction factor to give an average reading of 24 dBuV/m (15 uV/m), compared to an average limit of 54 dBuV/m (500 uV/m).

DEVIATIONS FROM STANDARD:

None.

GENERAL REMARKS:

The bandwidth of the fundamental must be less than 0.25% of the center frequency, or 798 kHz. Page A11 of A11 shows the bandwidth to be less than 100 kHz.

SUMMARY:

The requirements according to the technical regulations are

■ - met

□ - not met.

The device under test does

■ - fulfill the general approval requirements mentioned on page 3.

□ - not fulfill the general approval requirements mentioned on page 3.

Testing Start Date: 22 March 1999

Testing End Date: 26 August 1999

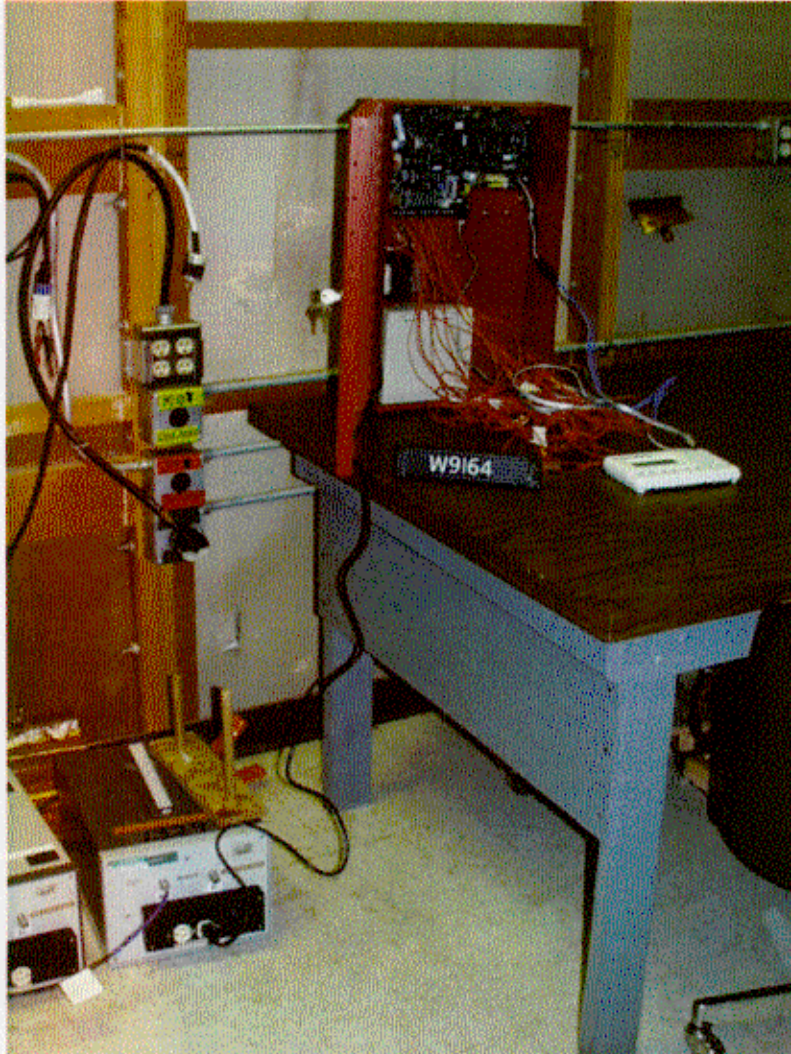
- TÜV PRODUCT SERVICE INC -

Joel T. Schneider
J. T. Schneider
Wild River Lab

J. C. Sausen
Tested By:
J. C. Sausen & R. M. Johnson

Test-setup photo(s):
Conducted emission 10/150 kHz - 30 MHz

The conducted emission measurements were made under test report W9164.



Test-setup photo(s):
Radiated emission 30 MHz - 3.2 GHz

