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Report On

Limited FCC and Industry Canada Testing of the
SRT Marine Technology Ltd Chronos
In accordance with FCC 47 CFR Part 15B and ICES-003

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FCC ID: UYW-4180051
IC: 7075A-4180051

Document 75929064 Report 01 Issue 1

March 2015



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TÜV SÜD Product Service, Octagon House, Concorde Way, Segensworth North,
Fareham, Hampshire, United Kingdom, PO15 5RL
Tel: +44 (0) 1489 558100. Website: www.tuv-sud.co.uk

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PREPARED FOR

SRT Marine Technology Ltd
Wireless House
Westfield Industrial Estate
Midsomer Norton
Bath
BA3 4BS

PREPARED BY

Natalie Bennett
Senior Administrator, Project Support

APPROVED BY

Ryan Henley
Authorised Signatory

DATED

04 March 2015

ENGINEERING STATEMENT

The measurements shown in this report were made in accordance with the procedures described on test pages. All reported testing was carried out on a sample equipment to demonstrate limited compliance with FCC 47 CFR Part 15B and ICES-003. The sample tested was found to comply with the requirements defined in the applied rules.

Test Engineer(s);

G Lawler



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SECTION 1

REPORT SUMMARY

Limited FCC and Industry Canada Testing of the
SRT Marine Technology Ltd Chronos
In accordance with FCC 47 CFR Part 15B and ICES-003



1.1 INTRODUCTION

The information contained in this report is intended to show the verification of Limited FCC and Industry Canada Testing of the SRT Marine Technology Ltd Chronos to the requirements of FCC 47 CFR Part 15B and ICES-003.

| | |
|--------------------------------|---|
| Objective | To perform Limited FCC and Industry Canada Testing to determine the Equipment Under Test's (EUT's) compliance with the Test Specification, for the series of tests carried out. |
| Manufacturer | SRT Marine Technology Ltd |
| Model Number(s) | Chronos |
| Serial Number(s) | 41800500150001 |
| Number of Samples Tested | 1 |
| Test Specification/Issue/Date | FCC 47 CFR Part 15B (2014) ICES-003 (2012) |
| Incoming Release Date | Declaration of Build Status 3 March 2015 |
| Disposal Reference Number Date | Held Pending Disposal Not Applicable Not Applicable |
| Order Number Date | POR005046 16 January 2015 |
| Start of Test | 23 February 2015 |
| Finish of Test | 25 February 2015 |
| Name of Engineer(s) | G Lawler |
| Related Document(s) | ANSI C63.4 (2009) |



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1.2 BRIEF SUMMARY OF RESULTS

A brief summary of the tests carried out in accordance with FCC 47 CFR Part 15B and ICES-003 is shown below.

| Section | Spec Clause | | Test Description | Result | Comments/Base Standard |
|---------|-------------|------|--------------------|--------|------------------------|
| | FCC | ICES | | | |
| Idle | | | | | |
| 2.1 | 15.109 | 6.2 | Radiated Emissions | Pass | |



1.3 DECLARATION OF BUILD STATUS

| MAIN EUT | | | |
|---|---|--|--|
| MANUFACTURING DESCRIPTION | AIS AtoN Type 3 | | |
| MANUFACTURER | SRT-Marine Technology Ltd | | |
| TYPE | Chronos | | |
| PART NUMBER | 418-0051 | | |
| SERIAL NUMBER | - | | |
| HARDWARE VERSION | V1 | | |
| SOFTWARE VERSION | Transceiver: 080200.03.04.** Sensor: 080400.02.08.** | | |
| TRANSMITTER FREQUENCY OPERATING RANGE (MHz) | 156.025MHz-162.025MHz | | |
| RECEIVER FREQUENCY OPERATING RANGE (MHz) | 156.025MHz-162.025MHz | | |
| COUNTRY OF ORIGIN | Hungary | | |
| INTERMEDIATE FREQUENCIES | 19.655 MHz + 29.255MHz | | |
| EMISSION DESIGNATOR(S): (I.e. G1D, GXW) | 16K0GXW | | |
| MODULATION TYPES: (I.e. GMSK, QPSK) | GMSK | | |
| HIGHEST INTERNALLY GENERATED FREQUENCY | 191.28MHz | | |
| OUTPUT POWER (W or dBm) | 12.5W | | |
| FCC ID | UYW-4180051 | | |
| INDUSTRY CANADA ID | 7075A-4180051 | | |
| TECHNICAL DESCRIPTION (a brief description of the intended use and operation) | AIS AtoN with optional sensor | | |
| BATTERY/POWER SUPPLY | | | |
| MANUFACTURING DESCRIPTION | | | |
| MANUFACTURER | | | |
| TYPE | | | |
| PART NUMBER | | | |
| VOLTAGE | 12-24V | | |
| COUNTRY OF ORIGIN | | | |
| MODULES (if applicable) | | | |
| MANUFACTURING DESCRIPTION | | | |
| MANUFACTURER | | | |
| TYPE | | | |
| POWER | | | |
| FCC ID | | | |
| COUNTRY OF ORIGIN | | | |
| INDUSTRY CANADA ID | | | |
| EMISSION DESIGNATOR | | | |
| DHSS/FHSS/COMBINED OR OTHER | | | |
| ANCILLARIES (if applicable) | | | |
| MANUFACTURING DESCRIPTION | | | |
| MANUFACTURER | | | |
| TYPE | | | |
| PART NUMBER | | | |
| SERIAL NUMBER | | | |
| COUNTRY OF ORIGIN | | | |


 Signature

Date 03.03.15

Declaration of Build Status Serial Number 418-0051



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1.4 PRODUCT INFORMATION

1.4.1 Technical Description

The Equipment Under Test (EUT) was a SRT Marine Technology Ltd Chronos. A full technical description can be found in the manufacturer's documentation.

1.5 TEST CONDITIONS

For all tests the EUT was set up in accordance with the relevant test standard and to represent typical operating conditions. Tests were applied with the EUT situated in a shielded enclosure.

The EUT was powered from a 12 V DC supply.

FCC Measurement Facility Registration Number
90987 Octagon House, Fareham Test Laboratory

Industry Canada Company Address Code
IC2932B-1 Octagon House, Fareham Test Laboratory

1.6 DEVIATIONS FROM THE STANDARD

No deviations from the applicable test standard were made during testing.

1.7 MODIFICATION RECORD

Modification 0 - No modifications were made to the test sample during testing.



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SECTION 2

TEST DETAILS

Limited FCC and Industry Canada Testing of the
SRT Marine Technology Ltd Chronos
In accordance with FCC 47 CFR Part 15B and ICES-003



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2.1 RADIATED EMISSIONS**2.1.1 Specification Reference**

FCC 47 CFR Part 15B, Clause 15.109
ICES-003, Clause 6.2

2.1.2 Equipment Under Test and Modification State

Chronos S/N: 41800500150001 - Modification State 0

2.1.3 Date of Test

23 February 2015 & 25 February 2015

2.1.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.1.5 Test Procedure

The test was performed in accordance with ANSI C63.4 (2009), Clause 8.

Remarks

All final measurements were assessed against the Class A emission limits in FCC 47 CFR Part 15, Clause 15.109.

2.1.6 Environmental Conditions

| | |
|---------------------|---------------|
| Ambient Temperature | 20.7 - 21.1°C |
| Relative Humidity | 27.0 - 30.0% |

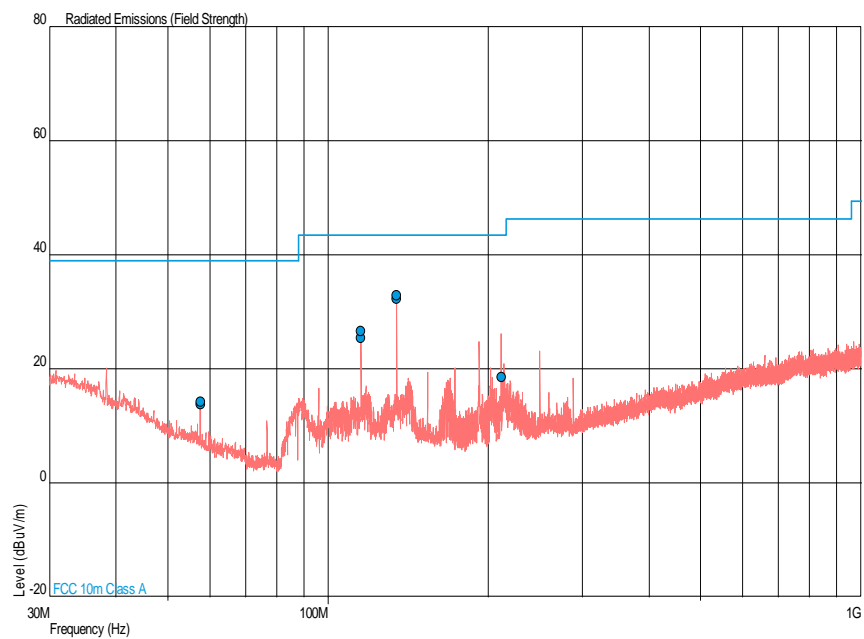


2.1.7 Test Results

Idle, 30 MHz to 1 GHz

| Frequency (MHz) | QP Level (dBuV/m) | QP Margin (dBuV/m) | QP Level (uV/m) | QP Margin (uV/m) | Angle(Deg) | Height(m) | Polarity |
|-----------------|-------------------|--------------------|-----------------|------------------|------------|-----------|----------|
| 57.599 | 13.8 | -25.3 | 4.9 | -85.1 | 95 | 1.00 | Vertical |
| 57.605 | 14.2 | -24.9 | 5.1 | -84.9 | 360 | 1.00 | Vertical |
| 115.198 | 26.7 | -16.8 | 21.6 | -128.4 | 96 | 1.00 | Vertical |
| 115.204 | 25.5 | -18.0 | 18.8 | -131.2 | 268 | 1.00 | Vertical |
| 134.401 | 32.4 | -11.1 | 41.7 | -108.3 | 288 | 1.00 | Vertical |
| 134.404 | 33.0 | -10.5 | 44.7 | -105.3 | 301 | 1.02 | Vertical |
| 211.204 | 18.6 | -24.9 | 8.5 | -141.5 | 352 | 1.00 | Vertical |

Idle, 30 MHz to 1 GHz





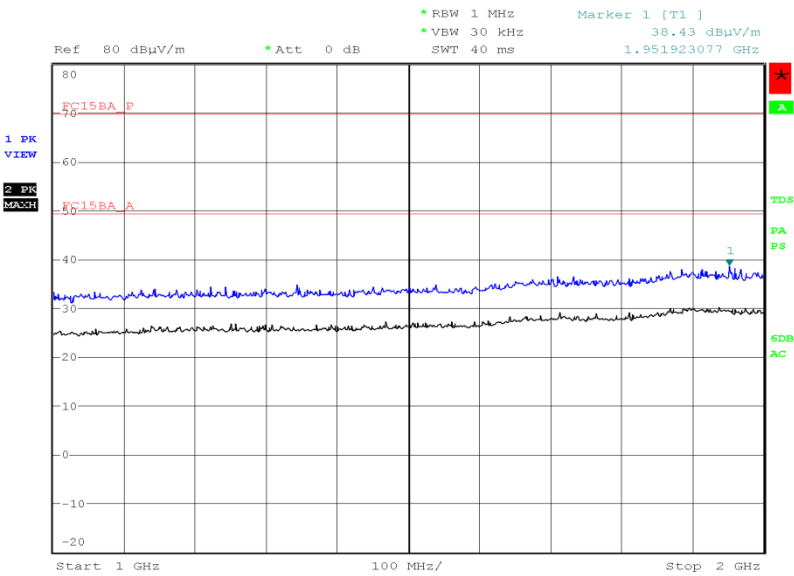
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Idle, 1 GHz to 13 GHz

| Frequency (MHz) | Average Level (dBμV/m) | Peak Level (dBμV/m) | Average Level (μV/m) | Peak Level (μV/m) | Angle (deg) | Height (m) | Polarisation |
|-----------------|------------------------|---------------------|----------------------|-------------------|-------------|------------|--------------|
| * | | | | | | | |

*No emissions were detected within 10 dB of the limit.

Idle, 1 GHz to 2 GHz



Date: 25.FEB.2015 18:08:23

FCC 47 CFR Part 15, Limit Clause 15.109

Class A

| Frequency of Emission (MHz) | Field Strength (μV/m) |
|-----------------------------|-----------------------|
| 30 to 88 | 90.0 |
| 88 to 216 | 150.0 |
| 216 to 960 | 210.0 |
| Above 960 | 300.0 |



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ICES-003, Limit Clause 6.2Class A

| Frequency of Emission (MHz) | Quasi-Peak (dB μ V/m) |
|-----------------------------|---------------------------|
| 30 to 88 | 39.0 |
| 88 to 216 | 43.5 |
| 216 to 960 | 46.4 |
| 960 to 1000 | 49.5 |

| Frequency of Emission (MHz) | Field Strength (dB μ V/m) | |
|-----------------------------|-------------------------------|---------------|
| | Linear Average Detector | Peak Detector |
| Above 1000 | 49.5 | 69.5 |



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SECTION 3

TEST EQUIPMENT USED



3.1 TEST EQUIPMENT USED

List of absolute measuring and other principal items of test equipment.

| Instrument | Manufacturer | Type No. | TE No. | Calibration Period (months) | Calibration Due |
|--|-----------------|-------------------|--------|-----------------------------|-----------------|
| Section 2.1 - Radiated Emissions | | | | | |
| Antenna (Double Ridge Guide, 1GHz-18GHz) | EMCO | 3115 | 234 | 12 | 2-May-2015 |
| Power Supply Unit | Farnell | D302T | 609 | - | O/P Mon |
| Power Supply Unit | Farnell | H60-25 | 1092 | - | O/P Mon |
| Screened Room (5) | Rainford | Rainford | 1545 | 24 | 26-Jun-2015 |
| Turntable Controller | Inn-Co GmbH | CO 1000 | 1606 | - | TU |
| Power Supply Unit | Farnell | TSV-70 | 2043 | - | O/P Mon |
| Hygrometer | Rotronic | A1 | 2138 | 12 | 3-Dec-2015 |
| Multimeter | Iso-tech | IDM101 | 2417 | 12 | 26-Sep-2015 |
| Multimeter | Iso-tech | IDM101 | 2422 | 12 | 22-Jan-2016 |
| Antenna (Bilog) | Chase | CBL6143 | 2904 | 24 | 10-Jun-2015 |
| Comb Generator | Schaffner | RSG1000 | 3034 | - | TU |
| EMI Test Receiver | Rohde & Schwarz | ESU40 | 3506 | 12 | 27-Oct-2015 |
| 9m RF Cable (N Type) | Rhophase | NPS-2303-9000-NPS | 3791 | - | TU |
| Tilt Antenna Mast | maturo GmbH | TAM 4.0-P | 3916 | - | TU |
| Mast Controller | maturo GmbH | NCD | 3917 | - | TU |
| 2m K-Type Cable (Rx) | Scott Cables | KPS-1501-2000-KPS | 4527 | 6 | 29-Jul-2015 |

TU – Traceability Unscheduled

O/P MON – Output Monitored with Calibrated Equipment



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3.2 MEASUREMENT UNCERTAINTY

For a 95% confidence level, the measurement uncertainties for defined systems are:-

| | |
|--------------------|--|
| Test Discipline | MU |
| Radiated Emissions | 30 MHz to 1 GHz: ± 5.1 dB 1 GHz to 40 GHz: ± 6.3 dB |



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SECTION 4

ACCREDITATION, DISCLAIMERS AND COPYRIGHT



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4.1 ACCREDITATION, DISCLAIMERS AND COPYRIGHT



This report relates only to the actual item/items tested.

Our UKAS Accreditation does not cover opinions and interpretations and any expressed are outside the scope of our UKAS Accreditation.

Results of tests not covered by our UKAS Accreditation Schedule are marked NUA
(Not UKAS Accredited).

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