



Product Service

---

**Choose certainty.  
Add value.**

# 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

COMMERCIAL-IN-CONFIDENCE

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

Document 75929064 Report 01 Issue 1

March 2015



Product Service

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](http://www.tuv-sud.co.uk)

COMMERCIAL-IN-CONFIDENCE

**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

Document 75929064 Report 01 Issue 1

March 2015

**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



**CONTENTS**

<b>Section</b>		<b>Page No</b>
<b>1</b>	<b>REPORT SUMMARY .....</b>	<b>3</b>
1.1	Introduction .....	4
1.2	Brief Summary of Results .....	5
1.3	Declaration of Build Status .....	6
1.4	Product Information .....	7
1.5	Test Conditions .....	7
1.6	Deviations from the Standard .....	7
1.7	Modification Record .....	7
<b>2</b>	<b>TEST DETAILS .....</b>	<b>8</b>
2.1	Radiated Emissions .....	9
<b>3</b>	<b>TEST EQUIPMENT USED .....</b>	<b>13</b>
3.1	Test Equipment Used .....	14
3.2	Measurement Uncertainty .....	15
<b>4</b>	<b>ACCREDITATION, DISCLAIMERS AND COPYRIGHT .....</b>	<b>16</b>
4.1	Accreditation, Disclaimers and Copyright .....	17



Product Service

## **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



Product Service

## 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)



Product Service

## 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)	15K0GXW		
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



Product Service

## **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.





Product Service

## **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



Product Service

**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%

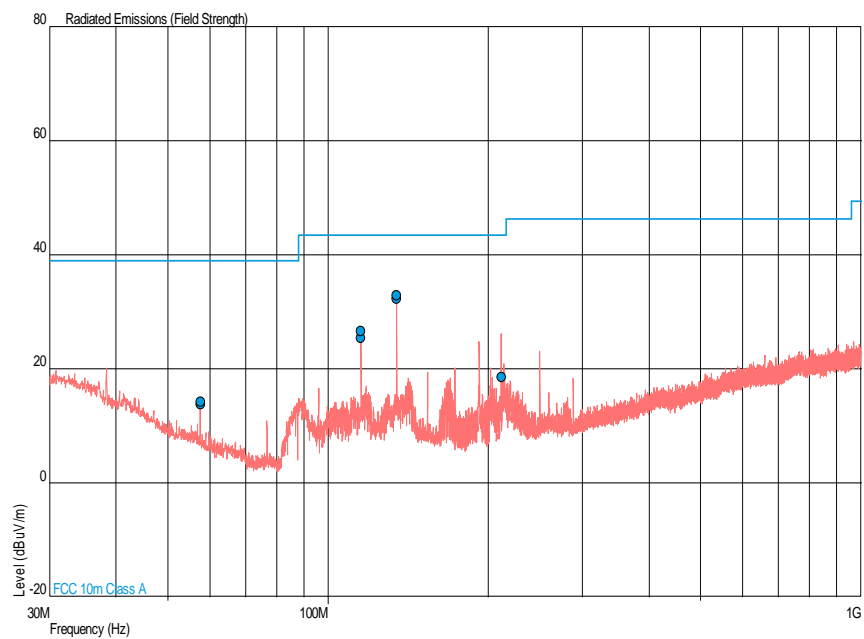


## 2.1.7 Test Results

### 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





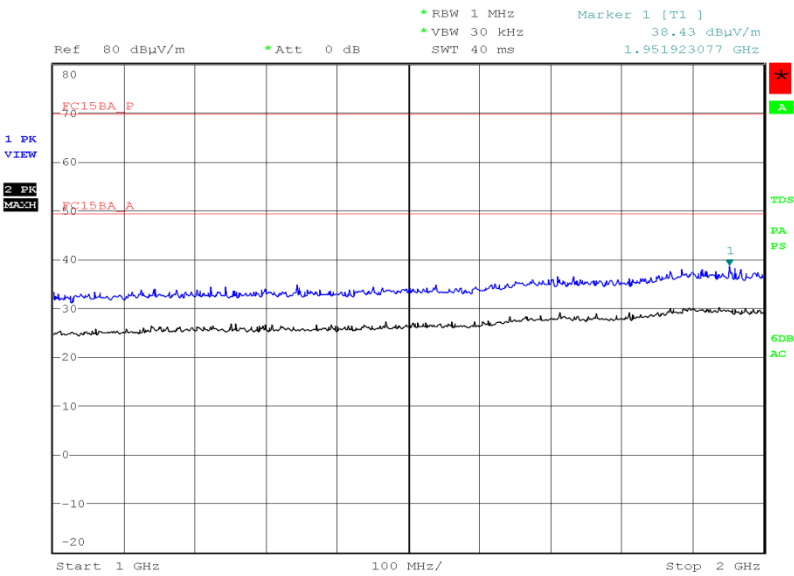
Product Service

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



Product Service

ICES-003, Limit Clause 6.2Class A

Frequency of Emission (MHz)	Quasi-Peak (dB $\mu$ 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 $\mu$ V/m)	
	Linear Average Detector	Peak Detector
Above 1000	49.5	69.5



Product Service

### **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
<b>Section 2.1 - Radiated Emissions</b>					
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



Product Service

### 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: $\pm 5.1$ dB 1 GHz to 40 GHz: $\pm 6.3$ dB





Product Service

## **SECTION 4**

### **ACCREDITATION, DISCLAIMERS AND COPYRIGHT**



Product Service

#### 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).

This report must not be reproduced, except in its entirety, without the written permission of  
TÜV SÜD Product Service

© 2015 TÜV SÜD Product Service