

Report on the FCC and IC Testing of the LARS THRANE A/S Communications System, Model: LT3100

In accordance with FCC 47 CFR Part 15B and
ICES-003

Prepared for: Lars Thrane A/S
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Product Service

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COMMERCIAL-IN-CONFIDENCE

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RESPONSIBLE FOR	NAME	DATE	SIGNATURE
Project Management	Adam Porteous	04 July 2018	
Authorised Signatory	Kim Archer	04 July 2018	

Signatures in this approval box have checked this document in line with the requirements of TÜV SÜD Product Service document control rules.

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.

RESPONSIBLE FOR	NAME	DATE	SIGNATURE
Testing	Jack Tuckwell	04 July 2018	

FCC Accreditation

90987 Octagon House, Fareham Test Laboratory

Industry Canada Accreditation

IC2932B-1 Octagon House, Fareham Test Laboratory

EXECUTIVE SUMMARY

A sample of this product was tested and found to be compliant with FCC 47 CFR Part 15B:2017 and ICES-003: 2016.



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1 Report Summary

1.1 Report Modification Record

Alterations and additions to this report will be issued to the holders of each copy in the form of a complete document.

Issue	Description of Change	Date of Issue
1	First Issue	04 July 2018

Table 1

1.2 Introduction

Applicant	LARS THRANE A/S
Manufacturer	LARS THRANE A/S
Model Number(s)	LT3100
Serial Number(s)	00001731
Hardware Version(s)	1.00
Software Version(s)	1.01R
Number of Samples Tested	1
Test Specification/Issue/Date	FCC 47 CFR Part 15B: 2017 ICES-003: 2016
Order Number	QAF
Date	08-March-2018
Date of Receipt of EUT	16-March-2018
Start of Test	24-April-2018
Finish of Test	24-April-2018
Name of Engineer(s)	Jack Tuckwell
Related Document(s)	ANSI C63.4: 2014



1.3 Brief Summary of Results

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

Section	Specification Clause		Test Description	Result	Comments/Base Standard
	Part 15B	ICES-003			
Configuration and Mode: Idle					
2.1	15.109	6.2	Radiated Disturbance	Pass	ANSI C63.4

Table 2



1.4 Declaration of Build Status

Build State Declaration (Part 1)

Manufacturer	Lars Thrane A/S	
Country of Origin	Denmark	
UK Agent	TÜV SÜD Product Service	
Description	LT-3100 Communications System	
Model Number	LT-3110 Control Unit, LT-3120 Handset Unit, LT-3121 Cradle, LT-3130 Antenna Unit,	PN: 51-100987 PN: 51-100988 PN: 51-101181 PN: 51-100989
Part Number	See Model Number	
Serial Number	Printed on the unit label for each EUT	
Drawing Number		
Build Status	1.00	
Software Issue	1.01R	
Firmware Issue	Included in the Application software	
Highest Frequency Generated or used within EUT	1626.5 MHz	
Signature Representatives of Customer	Carsten Thomsen <i>Carsten Thomsen</i> CTO	
Date	24-04-2018	
BSD Serial Number		

Note: This document has been prepared to enable manufacturers with no mechanism for producing their own Build State Declaration, to declare the build state of the equipment submitted for test.

No responsibility will be accepted by TÜV Product Service as to the accuracy of the information declared on this Build State Declaration by the manufacturer.

1.5 Product Information

1.5.1 Technical Description

LT-3100 Communications System.

1.6 Deviations from the Standard

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

1.7 EUT Modification Record

The table below details modifications made to the EUT during the test programme.
The modifications incorporated during each test are recorded on the appropriate test pages.

Modification State	Description of Modification still fitted to EUT	Modification Fitted By	Date Modification Fitted
Serial Number: 00001731			
0	As supplied by the customer	Not Applicable	Not Applicable

Table 3

1.8 Test Location

TÜV SÜD Product Service conducted the following tests at our Fareham Test Laboratory.

Test Name	Name of Engineer(s)	Accreditation
Configuration and Mode: Idle		
Radiated Disturbance	Jack Tuckwell	UKAS

Table 4

Office Address:

Octagon House
Concorde Way
Segensworth North
Fareham
Hampshire
PO15 5RL
United Kingdom



2 Test Details

2.1 Radiated Disturbance

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

LT-3110, S/N: 00001731 - Modification State 0

2.1.3 Date of Test

24-April-2018

2.1.4 Test Method

The EUT was set up in a semi-anechoic chamber on a remotely controlled turntable and placed on a non-conductive table 0.8m above a reference ground plane

A pre-scan of the EUT emissions profile was made while varying the antenna-to-EUT azimuth and antenna-to-EUT polarisation using a peak detector; measurements were taken at a 3m distance. Using the pre-scan list of the highest emissions detected, their bearing and associated antenna polarisation, the EUT was then formally measured using a Quasi-Peak, Peak, Average detector as appropriate. The readings were maximised by adjusting the antenna height, polarisation and turntable azimuth, in accordance with the specification.

2.1.5 Environmental Conditions

Ambient Temperature 18.9 °C
Relative Humidity 43.0 %

2.1.6 Specification Limits

Required Specification Limits, Field Strength (Class B @ 3m)		
Frequency Range (MHz)	(μ V/m)	(dB μ V/m)
30 to 88	90	39.1
88 to 216	150	43.5
216 to 960	210	46.4
Above 960	300	49.5
Supplementary information: Quasi-peak detector to be used for measurements < 1GHz Average detector to be used for measurements > 1GHz		

Table 5

2.1.7 Test Results

Results for Configuration and Mode: Idle

Performance assessment of the EUT made during this test: Pass.

Detailed results are shown below.

Highest frequency generated or used within the EUT: 2480 MHz
Which necessitates an upper frequency test limit of: 12.5 GHz

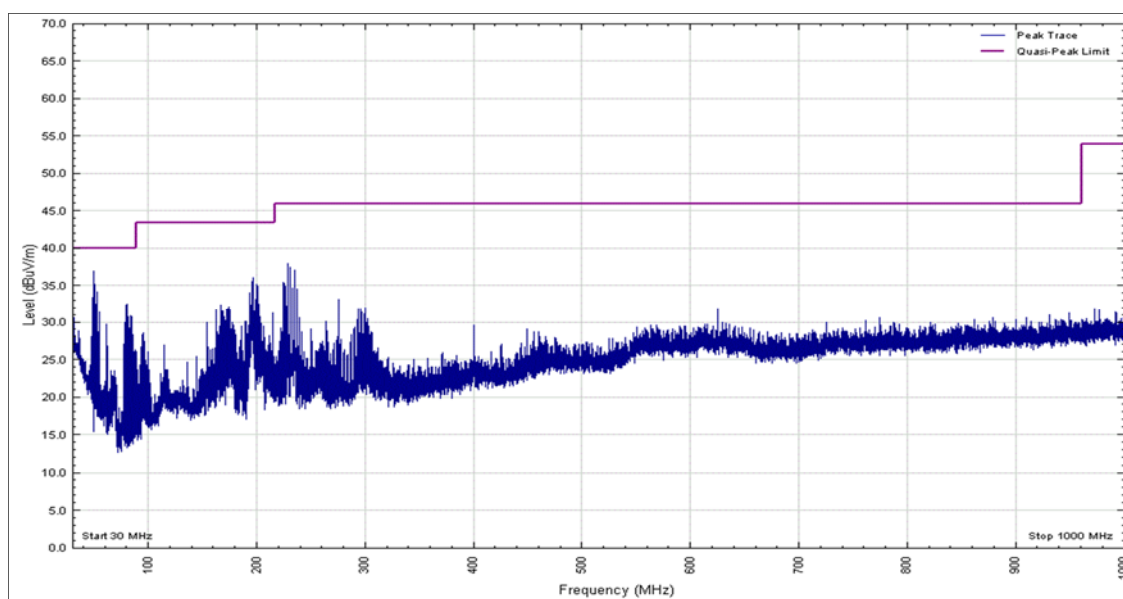


Figure 1 - Graphical Results – 30 MHz to 1 GHz - Vertical Polarity

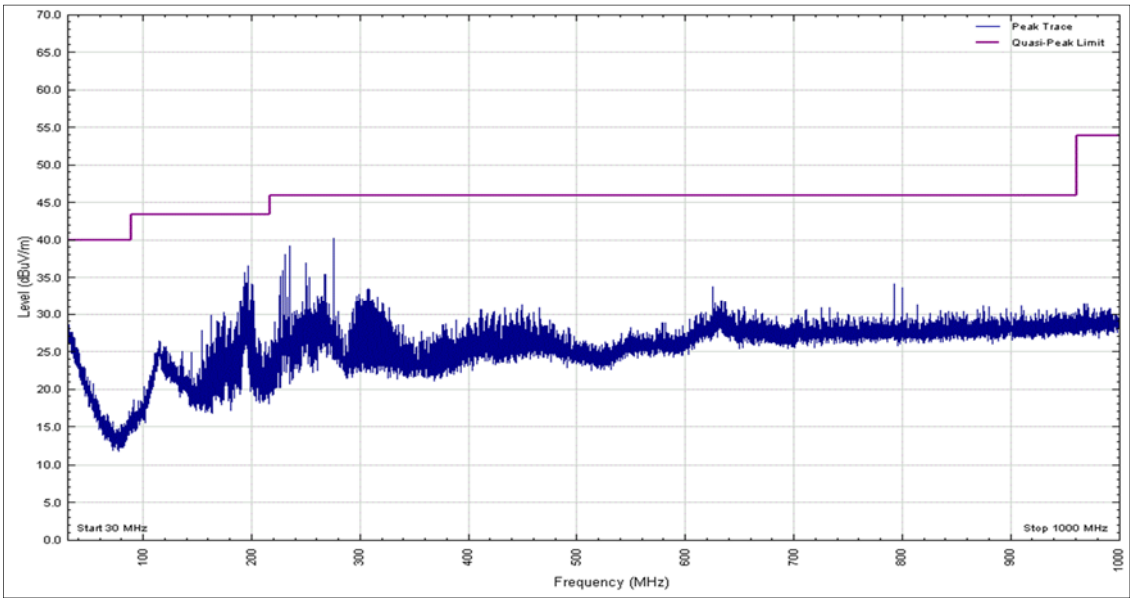


Figure 2 - Graphical Results – 30 MHz to 1 GHz – Horizontal Polarity

Frequency (GHz)	Result (µV/m)		Limit (µV/m)		Margin (µV/m)		Angle (°)	Height (m)	Polarisation
	Peak	Average	Peak	Average	Peak	Average			
*									

Table 6

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

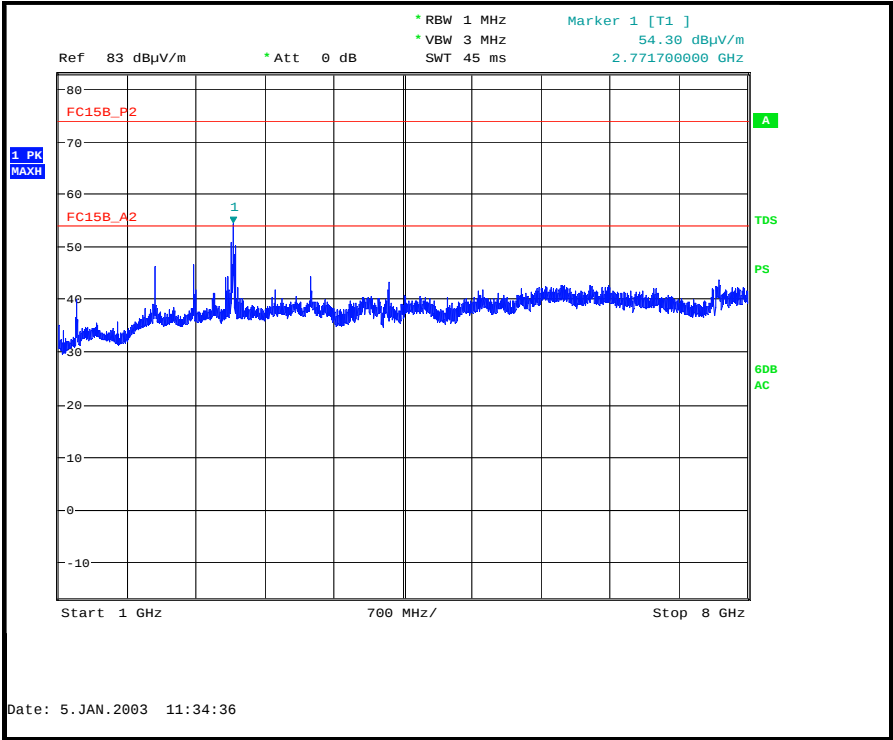


Figure 3 - Graphical Results – 1 GHz to 8 GHz - Horizontal and Vertical Polarity

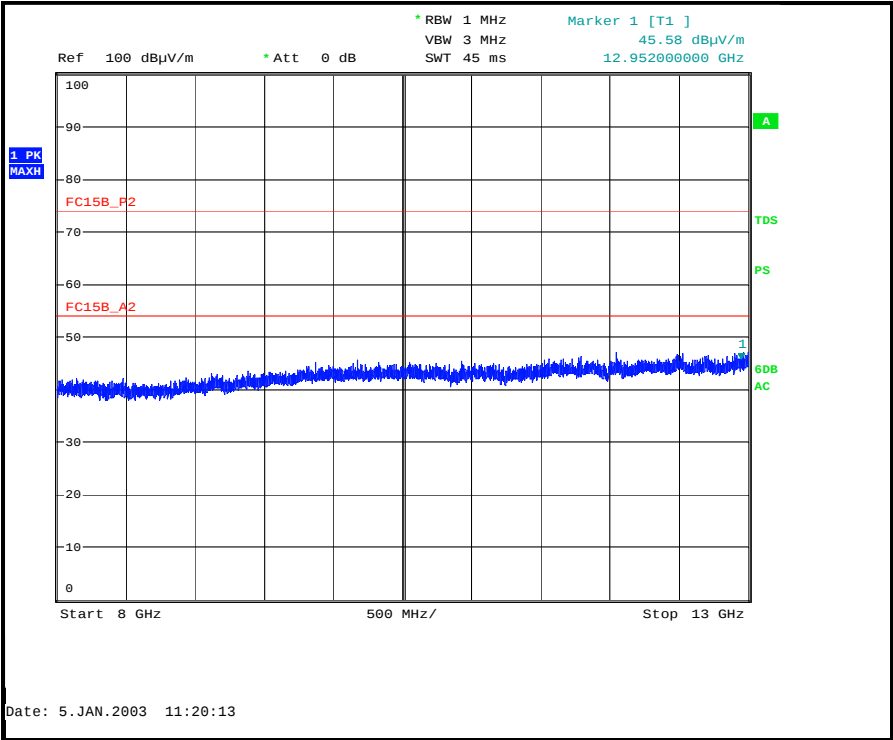


Figure 4 - Graphical Results – 8 GHz to 13 GHz - Horizontal and Vertical Polarity



Frequency (GHz)	Result (µV/m)		Limit (µV/m)		Margin (µV/m)		Angle (°)	Height (m)	Polarisation
	Peak	Average	Peak	Average	Peak	Average			
2.7717	61.59	36.67	74	54	12.41	17.33	360	100	Vertical

Table 7

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

2.1.8 Test Location and Test Equipment Used

This test was carried out in EMC Chamber 5.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Due
Pre-Amplifier	Phase One	PS04-0086	1533	12	12-Jan-2019
Screened Room (5)	Rainford	Rainford	1545	36	9-Jun-2018
Turntable Controller	Inn-Co GmbH	CO 1000	1606	-	TU
Antenna (Bilog)	Chase	CBL6143	2904	24	8-Aug-2019
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	22-Nov-2018
Tilt Antenna Mast	Maturo GmbH	TAM 4.0-P	3916	-	TU
Mast Controller	Maturo GmbH	NCD	3917	-	TU
1GHz to 8GHz Low Noise Amplifier	Wright Technologies	APS04-0085	4365	12	18-Oct-2018
EMI Receiver	Keysight Technologies	N9038A MXE	4628	12	22-Jun-2018
Double Ridged Waveguide Horn Antenna	ETS-Lindgren	3117	4722	12	1-Mar-2019
Double Ridge Broadband Horn Antenna	Schwarzbeck	BBHA 9120 B	4848	12	12-Feb-2019

Table 8

TU - Traceability Unscheduled



3 Measurement Uncertainty

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

Test Name	Measurement Uncertainty
Radiated Disturbance	30 MHz to 1 GHz, Bilog Antenna, ±5.2 dB
	1 GHz to 40 GHz, Horn Antenna, ±6.3 dB

Table 9

Worst case error for both Time and Frequency measurement 12 parts in 10⁶.

*In accordance with CISPR 16-4

†In accordance with UKAS Lab 34