

Test Report

Report Number:

F201061E4

Equipment under Test (EUT):

TrackSense LyoPro Reader Station

Applicant:

Ellab A/S

Manufacturer:

Ellab A/S



Deutsche
Akkreditierungsstelle
D-PL-17186-01-01
D-PL-17186-01-02
D-PL-17186-01-03

References

- [1] **ANSI C63.4:2014** American National Standard for Methods of Measuring of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz.
- [2] **FCC 47 CFR Part 2:** General Rules and Regulations
- [3] **FCC 47 CFR Part 15:** Radio Frequency Devices (Subpart B)
- [4] **ICES-003 Issue 6: (January 2016)** Spectrum Management and Telecommunications. Interference-Causing Equipment Standard. Information Technology Equipment (Including Digital Apparatus) —Limits and Methods of Measurement

Test Result

The requirements of the tests performed as shown in the overview (clause 4) were fulfilled by the equipment under test. The complete test results are presented in the following.

Tested and written by:	<u>Bernward ROHDE</u> Name	<u></u> Signature	<u>12.10.2020</u> Date
Reviewed and approved by:	<u>Paul NEUFELD</u> Name	<u></u> Signature	<u>12.10.2020</u> Date

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The test results herein refer only to the tested sample. PHOENIX TESTLAB GmbH is not responsible for any generalisations or conclusions drawn from these test results concerning further samples. Any modification of the tested samples is prohibited and leads to the invalidity of this test report. Each page necessarily contains the PHOENIX TESTLAB Logo and the TEST REPORT NUMBER.

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1 Identification

1.1 Applicant

Name:	Ellab A/S
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Country:	Denmark
Name for contact purposes:	Mr. James Jacobsson
Phone:	+45 4452 0515
Fax:	-
eMail Address:	jja@ellab.com
Applicant represented during the test by the following person:	-

1.2 Manufacturer

Name:	Ellab A/S
Address:	Trollesmindealle 25, 3400 Hilleroed
Country:	Denmark
Name for contact purposes:	Mr. James Jacobsson
Phone:	+45 4452 0515
Fax:	-
eMail Address:	jja@ellab.com
Applicant represented during the test by the following person:	-

1.3 Test Laboratory

The tests were carried out by: **PHOENIX TESTLAB GmbH**
Königswinkel 10
32825 Blomberg
Germany

Accredited by Deutsche Akkreditierungsstelle GmbH (DAkkS) in compliance with DIN EN ISO/IEC 17025 under Reg. No. D-PL-17186-01-06 and D-PL-17186-01-05, FCC Test Firm Designation Number DE0004, FCC Test Firm Registration Number 469623, CAB Identifier DE0003 and ISED# 3469A.

1.4 EUT (Equipment under Test)

EUT	
Test object: *	Wireless Data Logger Reader Station for validation and monitoring
PMN / Model name: *	TrackSense LyoPro Reader Station
FCC ID: *	XUS-LYORS1
IC:	8758A-LYORS1
Serial number: *	558143
PCB identifier: *	610000111
Hardware version: * HVIN: *	66305100
Software version: * FVIN: *	n/a

* Declared by the applicant

Note: PHOENIX TESTLAB GmbH does not take samples. The samples used for tests are provided exclusively by the applicant.

1.5 Technical Data of Equipment

General technical EUT data						
Power supply EUT: *	DC (by AC/DC Power adaptor)					
Supply voltage EUT (USB): *	U _{nom} =	5.0 V _{DC}	U _{min} =	4.0 V _{DC}	U _{max} =	12.0 V _{DC}
Temperature range: *	0 °C to +50 °C					
Lowest / highest internal clock frequency: *	32.768 kHz / 2480 MHz					

Ports / Connectors				
Identification			Length during test	Shielding (Yes / No)
	EUT	Ancillary		
USB	USB-C	USB-A	2.5 m	Yes
Ethernet	RJ45	RJ45	3 m	Yes
DC in	DC jack	-	1.5 m	No

Remark:

USB was used during AC-Powerline emissions testing, Ethernet was not used in that testcase
Ethernet was used for radiated emissions testcase.

1.5.1 802.15.4 Radio mode

IEEE 802.15.4 radio mode		
Fulfills radio specification: *	IEEE 802.15.4	
Radio chip: *	Atmel AT86RF233	
Antenna type: *	Chip-Ceramic	
Antenna name: *	7488910245; Würth	
Antenna gain: *	Peak:	3 dBi (Typical)
Antenna connector: *	-	
Conducted output power: *	IEEE 802.15.4	2.3 dBm (Peak)
		2.1 dBm (Average)
Type of modulation: *	IEEE 802.15.4	O-QPSK (250 kbit/s)
Operating frequency range: *	IEEE 802.15.4	2405 – 2480 MHz
Number of channels: *	IEEE 802.15.4	16 (5 MHz channel spacing)

IEEE 802.15.4 frequencies				
Channel 11	RX	2405 MHz	TX	2405 MHz
Channel 12	RX	2410 MHz	TX	2410 MHz
Channel 13	RX	2415 MHz	TX	2415 MHz
Channel 14	RX	2420 MHz	TX	2420 MHz
Channel 15	RX	2425 MHz	TX	2425 MHz
Channel 16	RX	2430 MHz	TX	2430 MHz
Channel 17	RX	2435 MHz	TX	2435 MHz
Channel 18	RX	2440 MHz	TX	2440 MHz
Channel 19	RX	2445 MHz	TX	2445 MHz
Channel 20	RX	2450 MHz	TX	2450 MHz
Channel 21	RX	2455 MHz	TX	2455 MHz
Channel 22	RX	2460 MHz	TX	2460 MHz
Channel 23	RX	2465 MHz	TX	2465 MHz
Channel 24	RX	2470 MHz	TX	2470 MHz
Channel 25	RX	2475 MHz	TX	2475 MHz
Channel 26	RX	2480 MHz	TX	2480 MHz

1.5.2 Ancillary Equipment / Equipment used for testing

Equipment used for testing	
DC Power supply * ¹	MEAN WELL AC/DC Switching Adaptor, Model No. GE12I05-P1J
Laptop for remote access: * ¹	Lenovo X1 carbon
Data Logger: * ¹	TrackSense LyoPro Data logger

*¹ Provided by the applicant

1.6 Dates

Date of receipt of test sample:	06.08.2020
Start of test:	15.08.2020
End of test:	18.08.2020

2 Operational States

Description of function of the EUT:

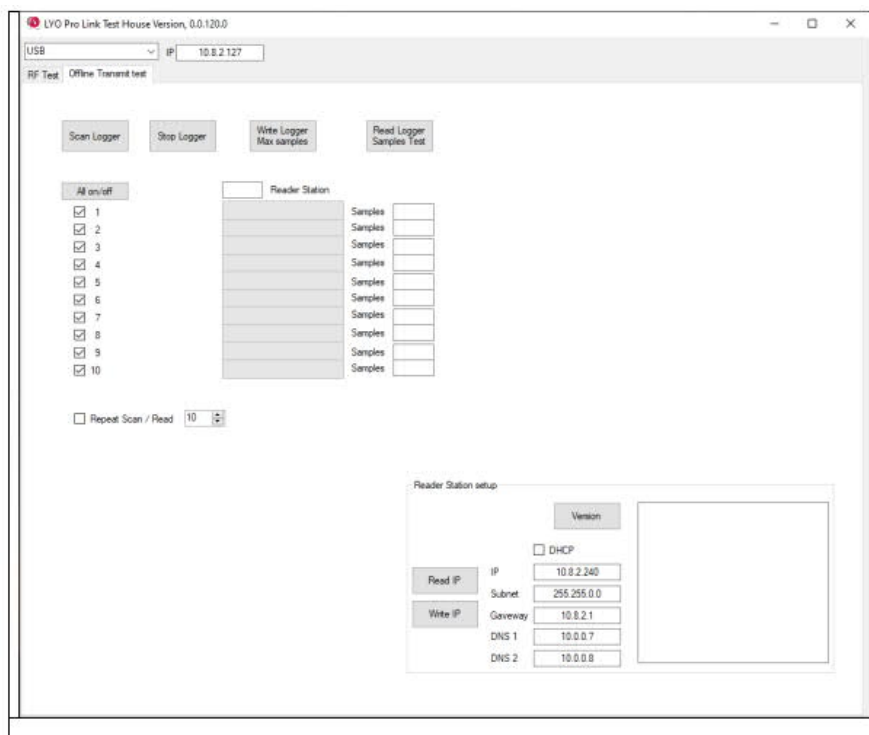
The EUT is intended to be used as reader station for wireless data loggers. Therefore, a data logger was placed on the reader station and a data transfer was started. A constant data stream between the reader station and an ancillary laptop was established.

The following states were defined as the operating conditions:

During the radiated emissions testing the EUT was connected to an ancillary laptop via Ethernet

During the conducted emissions on power supply lines an USB connection was used for the data transfer.

Test modes were applied via a Laptop with a special software as provided by the applicant (LYO Pro Link Test House Version, 0.0.0120.0).



Setup:



The physical boundaries of the EUT are shown above.

3 Additional Information

General information:

- none

Classification of cables:

- none

Maximum length of cables, declared by the manufacturer:

- no maximum length declared

Type of cables, declared by the manufacturer:

- no special type of cable declared

Deviation of the standard or test plan:

none

Special EMC measures, as a result of the tests:

- none

4 Overview

Conducted emissions FCC 47 CFR Part 15 section 15.107 (b) [3] / ICES-003 Issue 6 section 6.1 [4]					
Application	Frequency range	Limits	Reference standard	Remark	Status
AC supply line	0.15 to 0.5 MHz 0.5 to 30 MHz	79 dBμV (QP) 66 dBμV (AV) 73 dBμV (QP) 60 dBμV (AV)	ANSI C63.4	Class A	-
AC supply line	0.15 to 0.5 MHz 0.5 to 5 MHz 5 to 30 MHz	66 to 56 dBμV (QP)* 56 to 46 dBμV (AV)* 56 dBμV (QP) 46 dBμV (AV) 60 dBμV (QP) 50 dBμV (AV)	ANSI C63.4	Class B	Passed
*: Decreases with the logarithm of the frequency					
Radiated emissions FCC 47 CFR Part 15 section 15.109 (b) [3] / ICES-003 Issue 6 section 6.2 [4]					
Application	Frequency range	Limits	Reference standard	Remark	Status
Radiated Emission	30 to 88 MHz 88 to 216 MHz 216 to 960 MHz 960 to 1000 MHz above 1000 MHz	39.0 dBμV /m QP at 10 m 43.5 dBμV /m QP at 10 m 46.5 dBμV /m QP at 10 m 49.5 dBμV /m QP at 10 m 49.5 dBμV /m AV at 10 m and 69.5 dBμV /m PK at 10 m	ANSI C63.4	Class A	-
Radiated Emission	30 to 88 MHz 88 to 216 MHz 216 to 960 MHz 960 to 1000 MHz above 1000 MHz	40.0 dBμV/m QP at 3 m 43.5 dBμV/m QP at 3 m 46.0 dBμV/m QP at 3 m 54.0 dBμV/m QP at 3 m 54.0 dBμV/m AV at 3 m and 74.0 dBμV/m PK at 3 m	ANSI C63.4	Class B	Passed

Remark: As declared by the applicant the highest internal clock frequency is 2.48 GHz.
Therefore the radiated emission measurement must be carried out up to 5th of the highest internal clock frequency in this case 13 GHz.

The EUT was classified by the applicant as CLASS B equipment.

5 Results

5.1 Conducted emissions on power supply lines (150 kHz to 30 MHz)

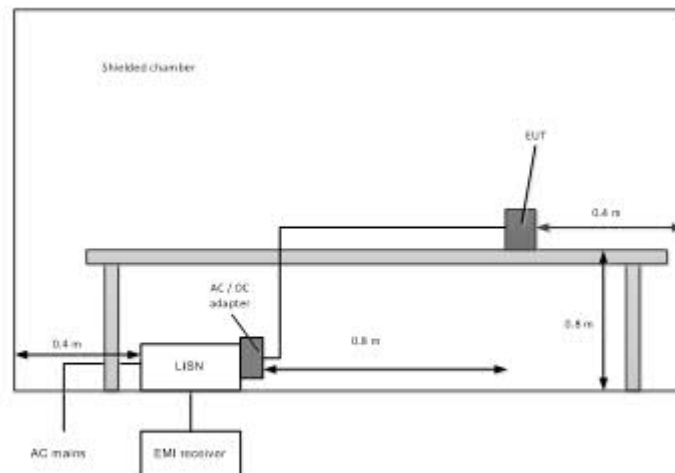
5.1.1 Method of measurement

This test will be carried out in a shielded chamber. Tabletop devices will be set up on a non-conducting support with a size of 1 m by 1.5 m and a height of 80 cm above the ground plane. Floor-standing devices will be placed directly on the ground plane. The setup of the Equipment under test will be in accordance to [1].

The frequency range 150 kHz to 30 MHz will be measured with an EMI Receiver set to MAX Hold mode with peak and average detector and a resolution bandwidth of 9 kHz. A scan will be carried out on the phase (or plus pole in case of DC powered devices) of the AC mains network. If levels detected 10 dB below the appropriate limit, this emission will be measured with the average and quasi-peak detector on all lines.

Frequency range	Resolution bandwidth
150 kHz to 30 MHz	9 kHz

Test setup for measurement with the EUT supplied via AC/DC power adaptor:



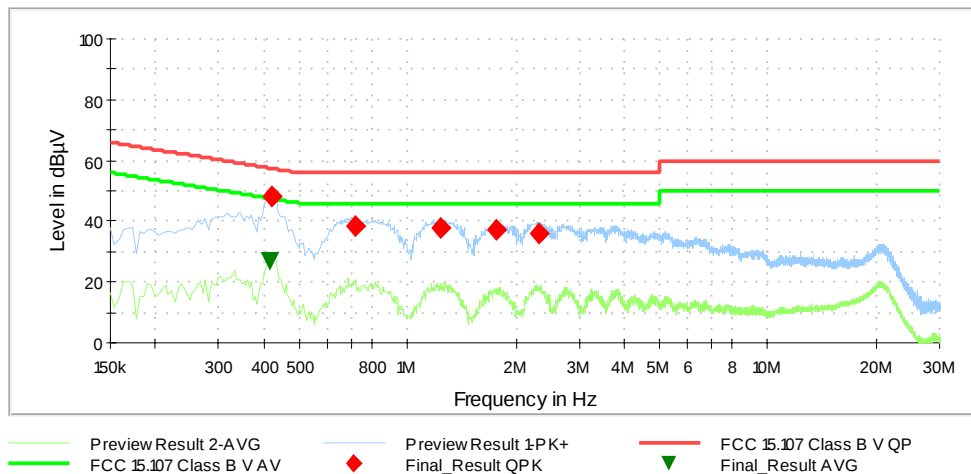
5.1.2 Test results (conducted emissions on power supply lines)

5.1.2.1 Test results with EUT supplied via AC/DC power adaptor

Ambient temperature	23 °C	Date	15.08.2020
Relative humidity	70 %	Tested by	B. ROHDE

Position of EUT:	The EUT was set-up on a non-conducting table of a height of 0.8 m.
Cable guide:	The cables of the EUT were fixed on the non-conducting table. For further information of the cable guide refer to the pictures in annex A of this test report.
Test record:	All results are shown in the following.
Supply voltage:	During this test the EUT was powered with 5.0 V _{DC} by the supplied AC/DC power adaptor (Mean well Model No. GE12105-P1J), which was itself supplied with 120 V _{AC} / 60 Hz.
Remark:	As declared by the applicant, the EUT is to be used with the delivered AC/DC power adaptor, the EUT shall not be powered with USB-AC/DC adaptor, so no emissions on AC power supply lines were tested in that mode.

The curves in the diagram only represent for each frequency point the maximum measured value of all preliminary measurements which were made for each power supply line. The top measured curve represents the peak measurement and the bottom measured curve the average measurement. The quasi-peak measured points are marked by ◆, the average measured points with ▼.



Frequency [MHz]	QuasiPeak [dBμV]	Average [dBμV]	Limit [dBμV]	Margin [dB]	Meas. Time [ms]	Bandwidth [kHz]	Line	PE	Corr. [dB]
0.417300	---	26.53	47.50	20.97	5000.0	9.000	L1	GND	9.9
0.420000	48.34	---	57.45	9.11	5000.0	9.000	L1	GND	9.9
0.717000	38.29	---	56.00	17.71	5000.0	9.000	L1	FLO	9.9
1.242600	37.77	---	56.00	18.23	5000.0	9.000	N	FLO	9.9
1.757400	37.08	---	56.00	18.92	5000.0	9.000	N	FLO	10.0
2.308200	35.69	---	56.00	20.31	5000.0	9.000	N	FLO	10.2
Measurement uncertainty			±2.8 dB						

Test equipment (please refer to chapter 6 for details)

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5.2 Radiated emissions

5.2.1 Test method

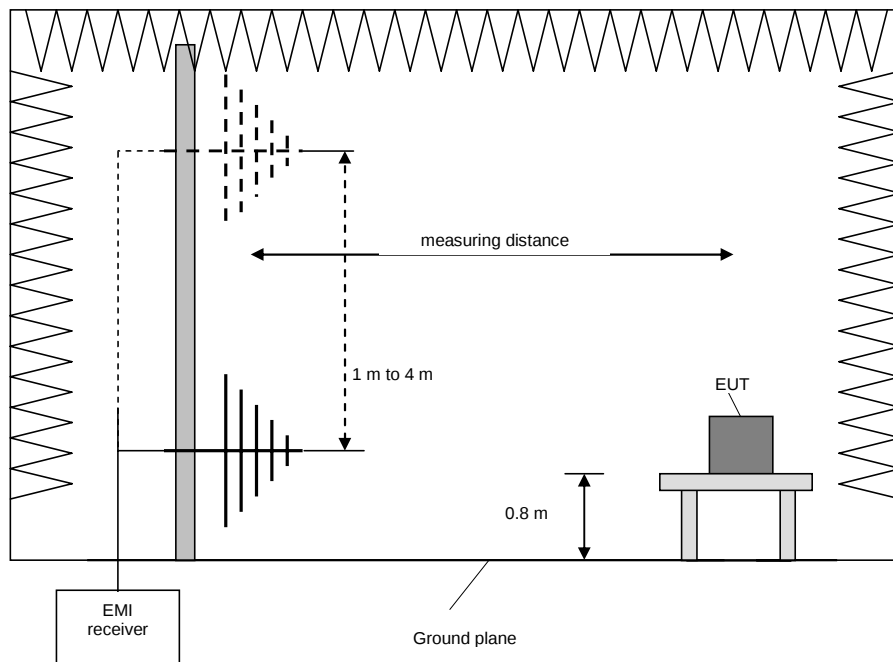
Preliminary and final measurement (30 MHz to 1 GHz)

The preliminary and final measurements were conducted in a semi-anechoic chamber with a metal ground plane in a 3 m distance.

During the test the EUT will be rotated in the range of 0 ° to 360 °, the measuring antenna will be set to horizontal and vertical polarization and raised and lowered in the range from 1 m to 4 m to find the maximum level of emissions.

The resolution bandwidth of the EMI Receiver will be set to the following values:

Test	Frequency range	Resolution bandwidth	Step size	Measurement time
Preliminary measurement	30 MHz to 1 GHz	120 kHz	30 kHz	100 ms
Frequency peak search	3 x RBW	120 kHz	10 kHz	1000 ms
Final measurement	30 MHz to 1 GHz	120 kHz	-	5 x 1000 ms



Procedure preliminary measurement:

The following procedure is used:

1. Set the measurement antenna to 1 m height.
2. Monitor the frequency range at vertical polarisation and a EUT azimuth of 0 °.
3. Rotate the EUT by 360° to maximize the detected signals.
4. Repeat 1) to 2) with the vertical polarisation of the measuring antenna.
5. Increase the height of the antenna for 0.5 m and repeat steps 2 – 4 until the final height of 4 m is reached.
6. The highest values for each frequency will be saved by the software, including the antenna height, measurement antenna polarization and turntable azimuth for that value.

Procedure final measurement:

The following procedure is used:

1. Select the highest frequency peaks to the limit for the final measurement.
2. The software will determine the exact peak frequencies by doing a partial scan with reduced RBW with +/- 10 times the RBW of the pre-scan of the selected peaks.
3. If the EUT is portable or ceiling mounted, find the worst case EUT position (x,y,z) for the final test.
4. The worst measurement antenna height is found by the measurement software by varying the measurement antenna height by +/- 0.5 m from the value obtained in the preliminary measurement, and to monitor the emission level.
5. The worst azimuth turntable position is found by varying the turntable azimuth by +/- 30° from the value obtained in the preliminary measurement, and to monitor the emission level.
6. The final measurement is performed at the worst case antenna height and the worst case turntable azimuth
7. Steps 2 – 6 will be repeated for each frequency peak selected in step 1.

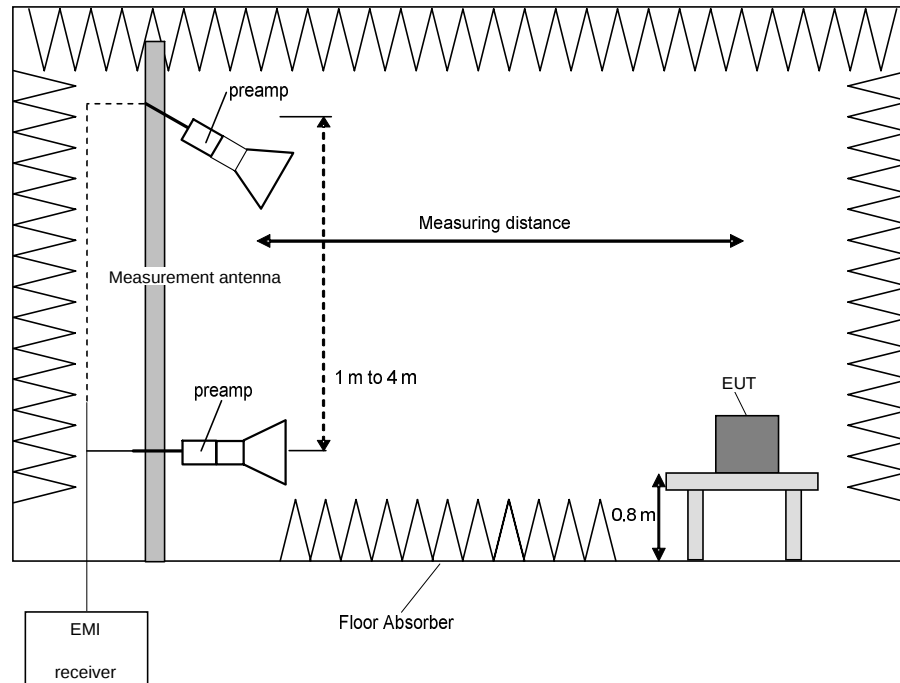
Preliminary and final measurement (1 – 40 GHz)

The preliminary and final measurements were conducted in a semi-anechoic chamber with floor absorbers between EUT and measurement antenna in a 3 m distance.

During the test the EUT will be rotated in the range of 0 ° to 360 °, the measuring antenna will be set to horizontal and vertical polarization and raised and lowered in the range from 1 m to 4 m to find the maximum level of emissions. For each height the angle of the antenna will be tilted so that the measurement antenna is always aiming at the EUT.

The resolution bandwidth of the EMI Receiver will be set to the following values:

Test	Frequency range	Resolution bandwidth	Step size	Measurement time
Preliminary measurement	1 - 40 GHz	1 MHz	250 kHz	10 ms
Frequency peak search	+ / - 1 MHz	1 MHz	50 kHz	100 ms
Final measurement	1 - 40 GHz	1 MHz	-	10 x 100 ms



Procedure preliminary measurement:

The following procedure is used:

1. Set the measurement antenna to 1 m height.
2. Monitor the frequency range at vertical polarisation and a EUT azimuth of 0 °.
3. Rotate the EUT by 360° to maximize the detected signals.
4. Repeat 1) to 2) with the vertical polarisation of the measuring antenna.
5. Increase the height of the antenna for 0.5 m and repeat steps 2 – 4 until the final height of 4 m is reached.
6. The highest values for each frequency will be saved by the software, including the antenna height, measurement antenna polarization and turntable azimuth for the highest value.

Procedure final measurement:

The following procedure is used:

1. Select the highest frequency peaks to the limit for the final measurement.
2. The software will determine the exact peak frequencies by doing a partial scan with reduced RBW with +/- 10 times the RBW of the pre-scan of the selected peaks.
3. If the EUT is portable or ceiling mounted, find the worst case EUT orientation (x,y,z) for the final test.
4. The worst measurement antenna height is found by the measurement software by varying the measurement antenna height by +/- 0.5 m from the worst case value obtained in the preliminary measurement, and to monitor the emission level.
5. The worst azimuth turntable position is found by varying the turntable azimuth by +/- 30° from the worst case value obtained in the preliminary measurement, and to monitor the emission level.
6. The final measurement is performed at the worst case antenna height and the worst case turntable azimuth.
7. Steps 2 – 6 will be repeated for each frequency peak selected in step 1.

5.2.2 Result final measurement from 30 MHz to 1 GHz

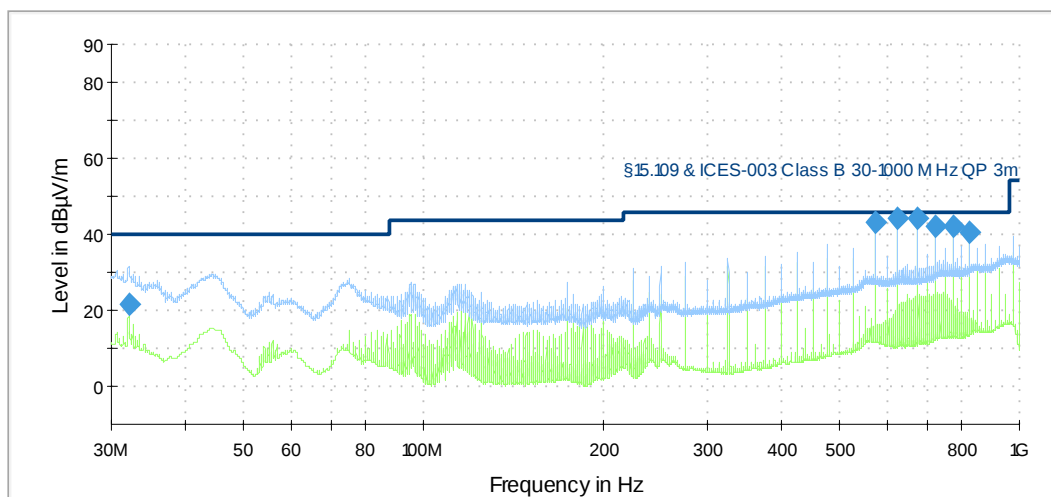
Ambient temperature	24 °C
Relative humidity	70 %

Date	17.08.2020
Tested by	B. ROHDE

Test description: Radiated emission measurement according to FCC PART 15
 EUT: TrackSense LyoPro Reader station
 Manufacturer: Ellab A/S
 Operating conditions: Constantly reading data from data logger on slot 1
 Data connection via Ethernet to ancillary laptop established

Test site: PHOENIX TESTLAB GmbH, semi anechoic chamber M276
 Operator: B. Rohde
 Power supply: 5 V DC via AC/DC power adaptor (Mean well Model No. GE12102)
 Limit FCC: eCFR §15.109 Class B @3m
 Limit IC: ICES-003 Class B @3m
 Remark: As pretests have shown, the data transmission on Ethernet is the worst case

The measured points and the limit line in the following diagram refer to the standard measurement of the emitted interference in compliance with the above-mentioned standard. The measured points marked with "◆" are the measured results of the standard subsequent measurement in a semi anechoic chamber.



The results of the standard subsequent measurement in a semi anechoic chamber are indicated in the table below. The limits as well as the measured results (levels) refer to the above-mentioned standard while taking account of the specified requirements for a 3 m measuring distance.

Result Table

Frequency [MHz]	Result QP [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Readings [dBμV]	Correction [dB/m]	Height [cm]	Azimuth [deg]	Pol.	Result
32.050000	21.78	40.00	18.22	-4.7	26.5	103.0	298.0	V	Passed
575.015000	43.27	46.02	2.75	15.1	28.2	117.0	197.0	H	Passed
625.015000	43.96	46.02	2.06	15.1	28.8	117.0	213.0	H	Passed
675.015000	44.23	46.02	1.79	15.4	28.9	103.0	197.0	H	Passed
725.015000	42.23	46.02	3.79	12.1	30.2	103.0	213.0	H	Passed
775.015000	41.89	46.02	4.13	11.1	30.8	103.0	11.0	V	Passed
825.015000	40.52	46.02	5.50	9.1	31.5	103.0	4.0	V	Passed
Measurement uncertainty				±5.5 dB					

The correction factor was calculated as follows.

Corr. (dB/m) = cable attenuation (dB) + 6 dB attenuator (dB) + antenna factor (dB/m)

Therefore the reading can be calculated as follows:

Reading (dBμV) = result QuasiPeak (dBμV/m) - Corr. (dB/m)

Test equipment (please refer to chapter 6 for details)

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5.2.3 Result final measurement above 1 GHz

Ambient temperature	24 °C
Relative humidity	70 %

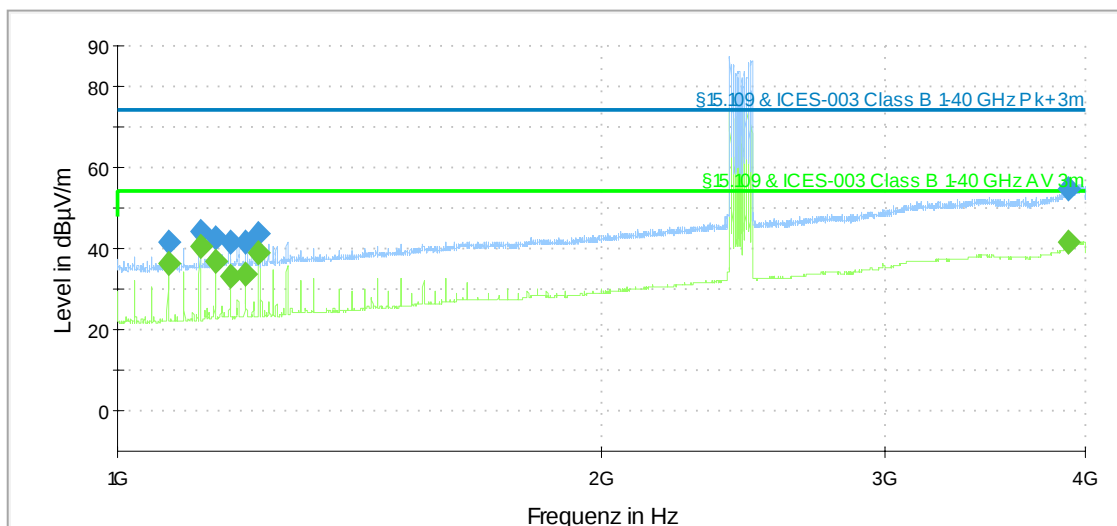
Date	18.08.2020
Tested by	B. ROHDE

Test description: Radiated emission measurement according to FCC PART 15
 Operating conditions: Constantly reading data from Data logger,
 Transferring data via Ethernet to ancillary Laptop

Test site: PHOENIX TESTLAB GmbH, semi anechoic chamber M276
 Operator: B. Rohde
 Power supply: Via AC/DC power adaptor, power adaptor supplied by 120V / 60 Hz
 Limit FCC: eCFR §15.109 Class B @3m
 Limit IC: ICES-003 Class B @3m

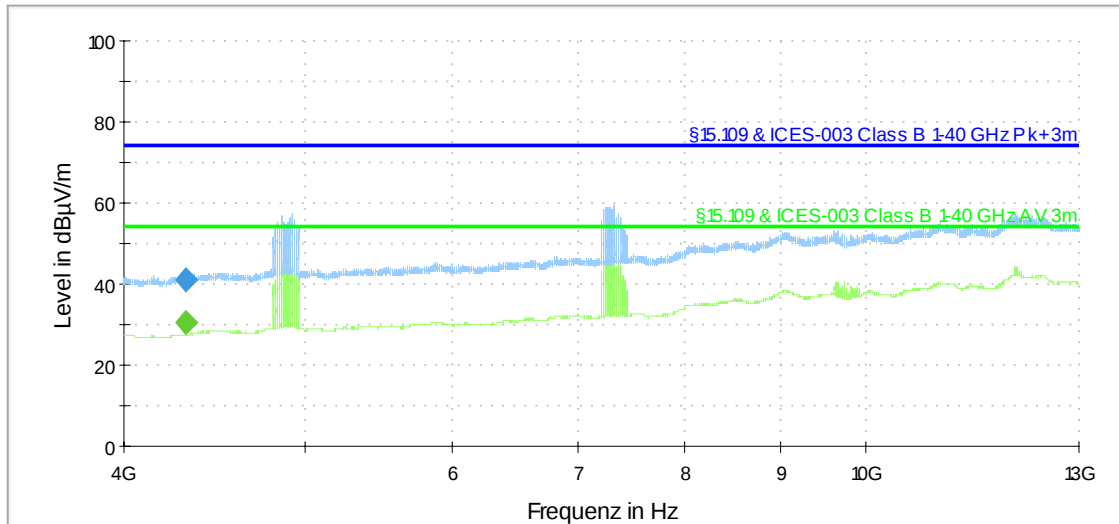
The curves in the diagram only represent the maximum measured value for each frequency point of all preliminary measurements, which were carried out with various EUT and antenna positions.
 The top measured curve represents the peak measurement. The measured points marked with "◆" are frequency points for the final peak detector measurement. These values are indicated in the following table. The bottom measured curve represents the average measurement. The measured points marked with "◆" are frequency points for the final average detector measurement.

Final Plot 1 – 4 GHz



The emissions in the 2.4 GHz-band are wanted radio links, so they were excluded from evaluation.

Final Plot 4 -12 GHz



The emissions @4.8 GHz and @7.2 GHz are from the wanted radio links, so they were excluded from evaluation.

The results of the standard subsequent measurement above 1 GHz in a semi anechoic chamber are indicated in the table below. The limits as well as the measured results (levels) refer to the above-mentioned standard while taking account of the specified requirements for a 3 m measuring distance.

Frequency [MHz]	Result (Pk) [dBμV/m]	Result (Av) [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Reading [dBμV]	Correction [dB/m]	Height [cm]	Azimuth [deg]	Pol.	Result
1075.100000	---	36.14	54.00	17.86	10.4	25.7	138.0	195.0	V	Passed
1075.100000	41.40	---	74.00	32.60	15.7	25.7	138.0	195.0	V	Passed
1124.900000	44.44	---	74.00	29.56	18.5	26.0	378.0	352.0	V	Passed
1124.900000	---	40.78	54.00	13.22	14.8	26.0	378.0	352.0	V	Passed
1150.000000	42.72	---	74.00	31.28	16.3	26.5	354.0	351.0	V	Passed
1150.000000	---	36.62	54.00	17.38	10.2	26.5	354.0	351.0	V	Passed
1174.800000	41.36	---	74.00	32.64	14.6	26.8	166.0	-4.0	H	Passed
1174.800000	---	33.03	54.00	20.97	6.2	26.8	166.0	-4.0	H	Passed
1200.000000	---	33.94	54.00	20.06	7.2	26.8	100.0	144.0	H	Passed
1200.000000	41.59	---	74.00	32.41	14.8	26.8	100.0	144.0	H	Passed
1225.100000	---	38.80	54.00	15.20	12.0	26.8	110.0	136.0	H	Passed
1225.100000	43.86	---	74.00	30.14	17.1	26.8	110.0	136.0	H	Passed
3901.850000	54.76	---	74.00	19.24	15.1	39.6	161.0	42.0	V	Passed
3901.850000	---	41.54	54.00	12.46	1.9	39.6	161.0	42.0	V	Passed
4320.150000	---	30.51	54.00	23.49	24.0	6.6	103.0	13.0	V	Passed
4320.150000	41.15	---	74.00	32.85	34.6	6.6	103.0	13.0	V	Passed
Measurement uncertainty					±5.5 dB					

The correction factor was calculated as follows.

Corr. (dB/m) = cable attenuation (dB) + preamplifier (dB) + antenna factor (dB/m)

Reading (dB μ V) + Corr. (dB/m) = Result (dB μ V/m) [Peak or Average]

Test equipment (please refer to chapter 6 for details)
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6 Test Equipment used for Tests

No.	Test equipment	Type	Manufacturer	Serial No.	PM. No.	Cal. Date	Cal Due
1	Transient Filter Limiter	CFL 9206A	Teseq GmbH	38268	481982	12.02.2020	02.2022
2	LISN	NSLK8128	Schwarzbeck	8128161	480138	11.02.2020	02.2022
3	EMI Receiver / Spectrum Analyser	ESIB 26	Rohde & Schwarz	100292	481182	12.02.2020	02.2022
4	Shielded chamber M4	B83117-S1-X158	Siemens	190075	480088	Calibration not necessary	
5	Software	EMC32	Rohde & Schwarz	100061	481022	Calibration not necessary	
6	AC Power supply	AC6803A AC Quelle 2000VA	Keysight	JPVJ002509	482350	Calibration not necessary	
7	Antenna (Bilog)	CBL6111D	Schaffner Elektrotest GmbH	25761	480984	19.10.2017	10.2020
8	RF Switch Matrix	OSP220	Rohde & Schwarz		482976	Calibration not necessary	
9	Turntable	TT3.0-3t	Maturo	825/2612/.01	483224	Calibration not necessary	
10	Antennasupport	BAM 4.5-P-10kg	Maturo	222/2612.01	483225	Calibration not necessary	
11	Controller	NCD	Maturo	474/2612.01	483226	Calibration not necessary	
12	Semi Anechoic Chamber M276	SAC5-2	Albatross Projects	C62128-A540-A138-10-0006	483227	Calibration not necessary	
13	Measurment software EMC32 M276	EMC32	Rohde & Schwarz	100970	482972	Calibration not necessary	
14	EMI Testreceiver	ESW44	Rohde & Schwarz	101828	482979	14.11.2019	11.2021
15	Low Noise Amplifier 100 MHz - 18 GHz	LNA-30-00101800-25-10P	Narda-Miteq	2110917	482967	18.02.2020	02.2022
16	Log Per Antenna	HL050	Rohde & Schwarz	4062.4063.02-100908	482977	13.08.2019	08.2022

7 Test site Validation

Test equipment	PM. No.	Frequency range	Type of validation	According to	Val. Date	Val Due
Semi anechoic chamber M276	483227	30 – 1000 MHz	NSA	ANSI C63.4a-2017	19.09.2019	18.09.2021
Semi anechoic chamber M276	483227	1 -18 GHz	SVSWR	CISPR 16-1-4 + Cor1:2010 + A1:2012 +A2:2017	19.09.2019	18.09.2021
Shielded chamber M4	480088	9 kHz – 30 MHz	GND-Plane	ANSI C63.4-2014	06.11.2018	05.11.2020

8 Report History

Report Number	Date	Comment
F201061E4	12.10.2020	Initial Test Report
-	-	-
-	-	-

9 List of Annexes

Annex A Test Setup Photos

4 pages