ELECTROMAGNETIC EMISSION COMPLIANCE REPORT

Test Report No.	**: OT-195-RWD-071**
AGR No.	**: A194A-150R**
Applicant	**: UNION COMMUNITY**
Address	**: Hyundai Topics Bldg. Bangi 2-dong, Songpa-gu, Seoul, South Korea**
Manufacturer	**: UNION COMMUNITY**
Address	**: Hyundai Topics Bldg. Bangi 2-dong, Songpa-gu, Seoul, South Korea**
Type of Equipment	**: Access controller**
FCC ID	**: XX2-UBIO-XSLIM-SC**
Model Name	**: UBio-X Slim SC**
Multiple Model Name	**: N/A**
Serial number	**: N/A**
Total page of Report	**: 13 pages (including this page)**
Date of Incoming	**: April 29, 2019**
Date of Issuing	**: May 30, 2019**

SUMMARY

The equipment complies with the requirements of ***FCC PART 15 SUBPART C Section 15.247***

This test report contains only the result of a single test of the sample supplied for the examination.

It is not a general valid assessment of the features of the respective products of the mass-production.

Reviewed by: Tae-Ho, Kim / Senior Manager
ONETECH Corp.

Approved by: Ki-Hong, Nam / Chief Engineer
ONETECH Corp.

ONETECH Corp.: 43-14, Jinsaegol-gil, Chowol-eup, Gwangju-si, Gyeonggi-do, 12735, Korea (TEL: 82-31-799-9500, FAX: 82-31-799-9599)

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ONETECH Corp.: 43-14, Jinsaegol-gil, Chowol-eup, Gwangju-si, Gyeonggi-do, 12735, Korea (TEL: 82-31-799-9500, FAX: 82-31-799-9599)

Revision History

Rev. No.	Issue Report No.	Issued Date	Revisions	Section Affected
0	OT-195-RWD-071	May 30, 2019	Initial Release	All

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1. VERIFICATION OF COMPLIANCE

-. APPLICANT : UNION COMMUNITY

-. ADDRESS : Hyundai Topics Bldg. Bangi 2-dong, Songpa-gu, Seoul, South Korea

-. CONTACT PERSON : KyungWook, Han

-. TELEPHONE NO : +82-2-6488-3027

-. FCC ID : XX2-UBIO-XSLIM-SC

-. MODEL NO/NAME : UBio-X Slim SC

-. SERIAL NUMBER : N/A

-. DATE : May 30, 2019

DEVICE TYPE	DTS – DIGITAL TRNSMISSION SYSTEM
E.U.T. DESCRIPTION	Access controller
THIS REPORT CONCERNS	Original Grant
MEASUREMENT PROCEDURES	ANSI C63.10: 2013
TYPE OF EQUIPMENT TESTED	Pre-Production
KIND OF EQUIPMENT AUTHORIZATION REQUESTED	Certification
EQUIPMENT WILL BE OPERATED UNDER FCC RULES PART(S)	FCC PART 15 SUBPART C Section 15.247
MODIFICATIONS ON THE EQUIPMENT TO ACHIEVE COMPLIANCE	None
FINAL TEST WAS CONDUCTED ON	3 m Semi Anechoic Chamber

-. The above equipment was tested by ONETECH Corp. for compliance with the requirement set forth in the FCC Rules and Regulations. This said equipment in the configuration described in this report, shows the maximum emission levels emanating from equipment are within the compliance requirements.

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2. TEST SUMMARY

2.1 Test items and results

SECTION	TEST ITEMS	RESULTS
15.247 (a) (2)	Minimum 6 dB Bandwidth	Note1
15.247 (b) (3)	Maximum Peak Conducted Output Power	Note1
15.247 (d)	100 kHz Bandwidth Outside the Frequency Band	Note1
15.247 (d)	Radiated Emission which fall in the Restricted Band	Note1
15.247 (e)	Peak Power Spectral Density	Note1
15.209	Radiated Emission Limits	Met the Limit / PASS
15.207	Conducted Limits	Met the Limit / PASS
15.203	Antenna Requirement	Met requirement / PASS

Note1 - The EUT have a RF Test already approved.

(Model: PBLN51822m / Report Number: W156R-D001 / FCC ID: 2AEEYPBLN51822M)

2.2 Related Submittal(s) / Grant(s)

Original submittal only

2.3 Purpose of the test

To determine whether the equipment under test fulfills the requirements of the regulation stated in FCC PART 15 SUBPART C Section 15.247.

2.4 Test Methodology

Both conducted and radiated testing was performed according to the procedures in ANSI C63.10: 2013. Radiate

d testing was performed at a distance of 3 m from EUT to the antenna.

2.5 Test Facility

The Onetech Corp. has been designated to perform equipment testing in compliance with ISO/IEC 17025.

The Electromagnetic compatibility measurement facilities are located at 43-14, Jinsaegol-gil, Chowol-eup, Gwangju-si, Gyeonggi-do, 12735, Korea

-. Site Filing:

VCCI (Voluntary Control Council for Interference) – Registration No. R-4112/ C-14617/ G-10666 / T-1842

IC (Industry Canada) – Registration No. Site# 3736A-3

-. Site Accreditation:

KOLAS (Korea Laboratory Accreditation Scheme) - Accreditation NO. KT085

FCC (Federal Communications Commission) - Accreditation No. KR0013

RRA (Radio Research Agency) – Designation No. KR0013

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3. GENERAL INFORMATION

3.1 Product Description

The UNION COMMUNITY, Model UBio-X Slim SC (referred to as the EUT in this report) is an Access controller, Product specification information described herein was obtained from product data sheet or user's manual.

DEVICE TYPE	Access controller
TRANSMITTING FREQUENCY	13.56 MHz , 2 402 MHz ~ 2 480 MHz
MODULATION	GFSK
ANTENNA TYPE	Chip Antenna
LIST OF EACH OSC. OR CRY. FREQ.(FREQ.>= 1MHz)	32.768 kHz, 24 MHz, 25 MHz, 7.327 28 MHz, 13.560 9 MHz, 27.12 MHz
USED AC/DC ADAPTER	OUTPUT: DC 12 V, 3.5 A Model No : DSA-42PFB-12 1 120350 Manufacturer : Dee Van Electronics(Longchuan)Co., Ltd

3.2 Model Differences:

-. None

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4. SYSTEM TEST CONFIGURATION

4.1 Justification

This device was configured for testing in a typical way as a normal customer is supposed to be used. During the test, the following components were installed inside of the EUT.

DEVICE TYPE	MANUFACTURER	MODEL/PART NUMBER	FCC ID
MAIN BOARD	N/A	PFXSMA01 V1.0 RSE20	N/A
FINGERPRINT BOARD	N/A	PFNSSESMA01 V10 RJL16	N/A
SAM BOARD	N/A	PF2200SC01 V11 QFE20	N/A
ANTENNA BOARD	N/A	PFXSSA01 V1.0 RSE20	N/A
LCD	KJC Display Corp	10354-181102-00002	N/A
CAMERA MODULE	N/A	N/A	N/A
Bluetooth LE Module	PROCHILD INC.	PBLN51822m	2AEEY-PBLN51822M
ADAPTER	Dee Van Electronics(Longchuan)Co., Ltd	DSA-42PFB-12 1 120350	N/A

4.2 Peripheral equipment

Defined as equipment needed for correct operation of the EUT, but not considered as tested:

Model	Manufacturer	Description	Connected to
UBio-X Slim SC	UNION COMMUNITY	Access controller (EUT)	-
DSA-42PFB-12 1 120350	Dee Van Electronics(Longchuan)Co., Ltd	ADAPTER	EUT
N/A	N/A	Door Open Switch	EUT
N/A	N/A	Door lock	EUT
N/A	N/A	RFID Card	EUT
N/A	N/A	Smart Phone	-

4.3 Mode of operation during the test

-. The EUT has Bluetooth & RFID continuous transmission mode during the test.

4.4 Equipment Modifications

-. None

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4.5 Configuration of Test System

Line Conducted Test : The EUT was connected to adaptor and the power of adaptor was connected to LISN. All supporting equipments were connected to another LISN. Preliminary Power line Conducted Emission test was performed by using the procedure in ANSI C63.10: 2013 to determine the worse operating conditions.

Radiated Emission Test : Preliminary radiated emissions test were conducted using the procedure in ANSI C63.10: 2013 to determine the worse operating conditions. The radiated emissions measurements were performed on the 10 m Semi Anechoic Chamber.

For frequencies from 150 kHz to 30 MHz measurements were made of the magnetic H field. The measuring antenna is an electrically screened loop antenna.

The frequency spectrum from 30 MHz to 1 000 MHz was scanned and maximum emission levels maximized at each frequency recorded. The system was rotated 360°, and the antenna was varied in the height between 1.0 m and 4.0 m in order to determine the maximum emission levels. This procedure was performed for both horizontal and vertical polarization of the receiving antenna.

4.6 Antenna Requirement

For intentional device, according to section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

Antenna Construction:

The transmitter antenna of the EUT is a Chip Antenna so there is no consideration of replacement by the user.

5. PRELIMINARY TEST

5.1 AC Power line Conducted Emissions Tests

During Preliminary Tests, the following operating mode was investigated

Operation Mode	The Worse operating condition (Please check one only)
Transmitting Mode	X

5.2 Radiated Emissions Tests

During Preliminary Tests, the following operating modes were investigated

Operation Mode	The Worse operating condition (Please check one only)
Transmitting Mode	X

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6. FINAL RESULT OF MEASUREMENT

Preliminary test was done in normal operation mode. And the final measurement was selected for the maximized emission level.

6.1 Conducted Emission Test

6.1.1 Test data for Bluetooth & RFID Transmitting Mode

Humidity Level : (46 ~ 47) % R.H. Temperature: (23 ~ 24) ℃

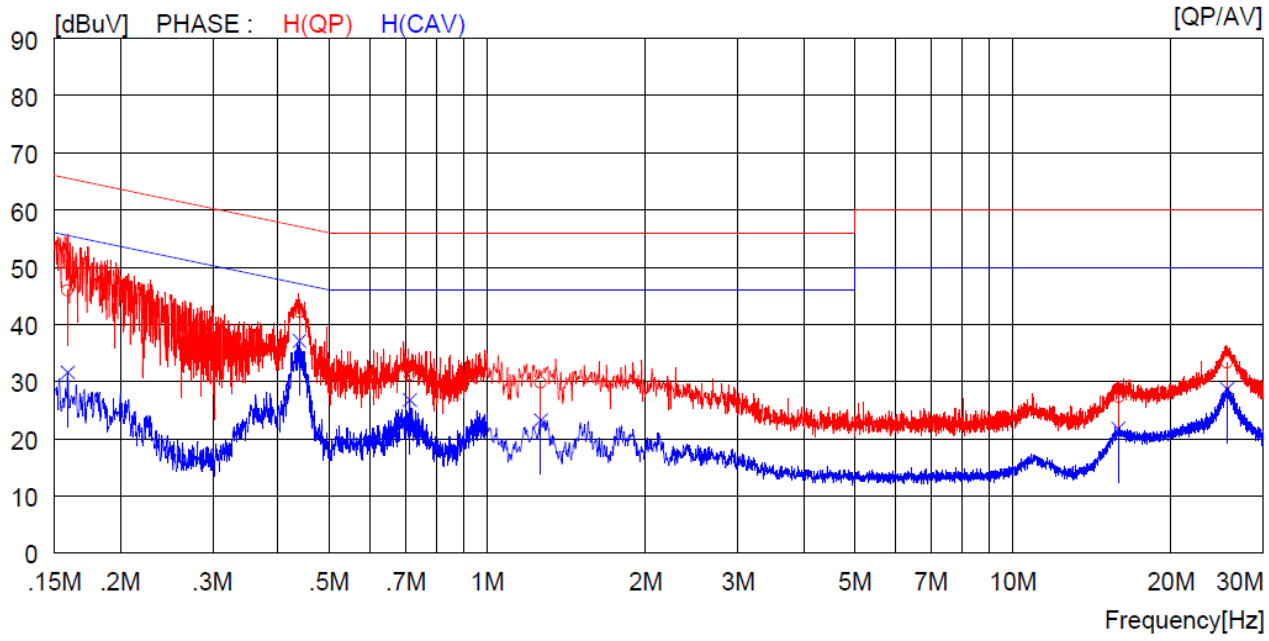
Limits apply to : FCC CFR 47, PART 15, SUBPART B, SECTION 15.207(a)

Result : PASSED

EUT : Access controller Date: May 01, 2019

Detector : CISPR Quasi-Peak (6 dB Bandwidth: 9 kHz)

Tested Line : HOT LINE



NO	FREQ	READING QP	READING AV	C.FACTOR	RESULT QP	RESULT AV	LIMIT QP	LIMIT AV	MARGIN QP	MARGIN AV	PHASE
	[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	
1	0.15900	35.8	----	10.1	45.9	----	65.5	----	19.6	----	H(QP)
2	0.43900	32.1	----	10.1	42.2	----	57.1	----	14.9	----	H(QP)
3	0.71200	21.0	----	10.1	31.1	----	56.0	----	24.9	----	H(QP)
4	1.26400	19.7	----	10.1	29.8	----	56.0	----	26.2	----	H(QP)
5	15.90000	16.9	----	10.4	27.3	----	60.0	----	32.7	----	H(QP)
6	25.60000	22.9	----	10.4	33.3	----	60.0	----	26.7	----	H(QP)
7	0.15900	----	21.5	10.1	----	31.6	----	55.5	----	23.9	H(CAV)
8	0.43900	----	27.0	10.1	----	37.1	----	47.1	----	10.0	H(CAV)
9	0.71200	----	16.7	10.1	----	26.8	----	46.0	----	19.2	H(CAV)
10	1.26400	----	13.2	10.1	----	23.3	----	46.0	----	22.7	H(CAV)
11	15.90000	----	11.4	10.4	----	21.8	----	50.0	----	28.2	H(CAV)
12	25.60000	----	18.3	10.4	----	28.7	----	50.0	----	21.3	H(CAV)

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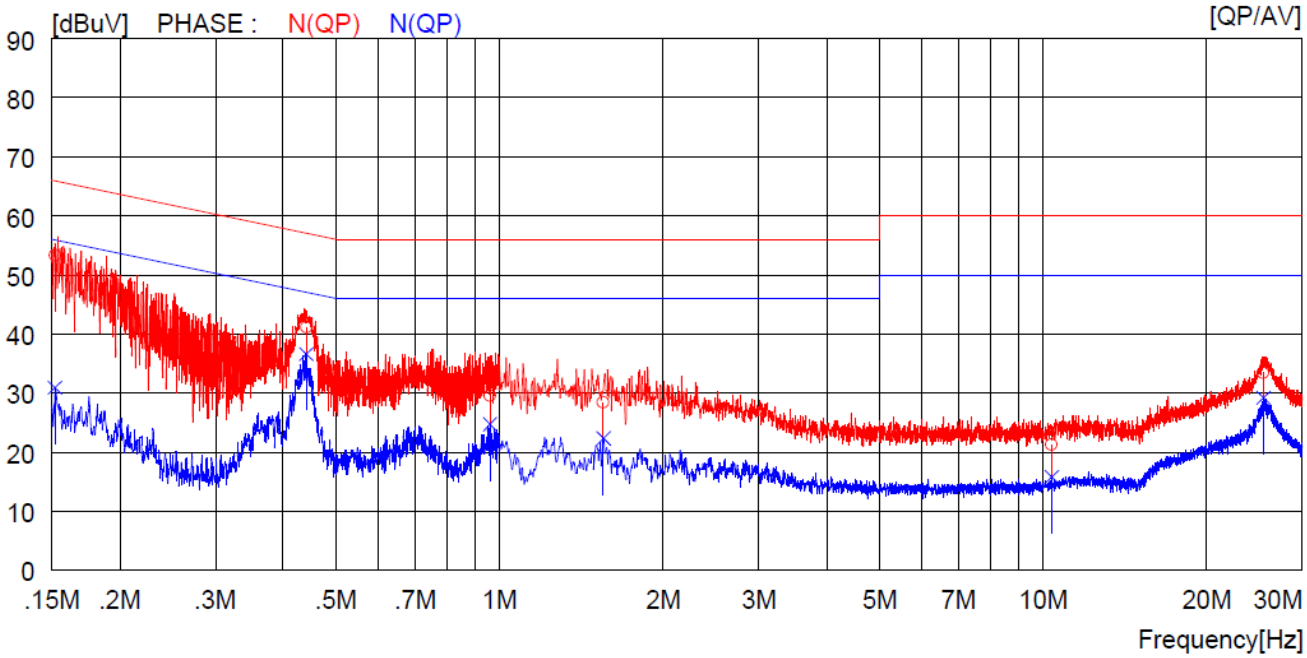
Tested Line : NEUTRAL LINE



NO	FREQ	READING QP	READING AV	C.FACTOR	RESULT QP	RESULT AV	LIMIT QP	LIMIT AV	MARGIN QP	MARGIN AV	PHASE
	[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	
1	0.15200	43.2	----	10.1	53.3	----	65.9	----	12.6	----	N(QP)
2	0.44100	31.0	----	10.1	41.1	----	57.0	----	15.9	----	N(QP)
3	0.96000	19.4	----	10.1	29.5	----	56.0	----	26.5	----	N(QP)
4	1.55200	18.3	----	10.1	28.4	----	56.0	----	27.6	----	N(QP)
5	10.38000	11.0	----	10.3	21.3	----	60.0	----	38.7	----	N(QP)
6	25.43000	23.0	----	10.4	33.4	----	60.0	----	26.6	----	N(QP)
7	0.15200	----	20.8	10.1	----	30.9	----	55.9	----	25.0	NCAV)
8	0.44100	----	26.5	10.1	----	36.6	----	47.0	----	10.4	NCAV)
9	0.96000	----	14.6	10.1	----	24.7	----	46.0	----	21.3	NCAV)
10	1.55200	----	12.2	10.1	----	22.3	----	46.0	----	23.7	NCAV)
11	10.38000	----	5.5	10.3	----	15.8	----	50.0	----	34.2	NCAV)
12	25.43000	----	18.8	10.4	----	29.2	----	50.0	----	20.8	NCAV)

Remark: Margin (dB) = Limit – Level (Result)

The emission level in above table is included the transducer factor that means insertion loss (LISN), cable loss and attenuator.

Tested by: Ju Yun Park / Assistant Manager

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6.2 SPURIOUS EMISSION TEST

6.2.1 Spurious Radiated Emission Below 30 MHz

Humidity Level : 46 % R.H. Temperature: 23 ℃

Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.209

Frequency Range : 9 kHz ~ 30 MHz

Result : PASSED

EUT : Access controller Date: April 29, 2019 ~ May 07, 2019

Operating Condition : Transmitting Mode

Distance : 3 m

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
It was not observed any emissions from the EUT.									

Tested by: Ju Yun Park / Assistant Manager

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6.2.2 Spurious Radiated Emission below 1 GHz

6.2.2.1 Test data for Bluetooth & RFID Transmitting Mode

The following table shows the highest levels of radiated emissions on both polarizations of horizontal and vertical.

Humidity Level : (49 ~ 50) % R.H. Temperature: (22 ~ 23) ℃

Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.209

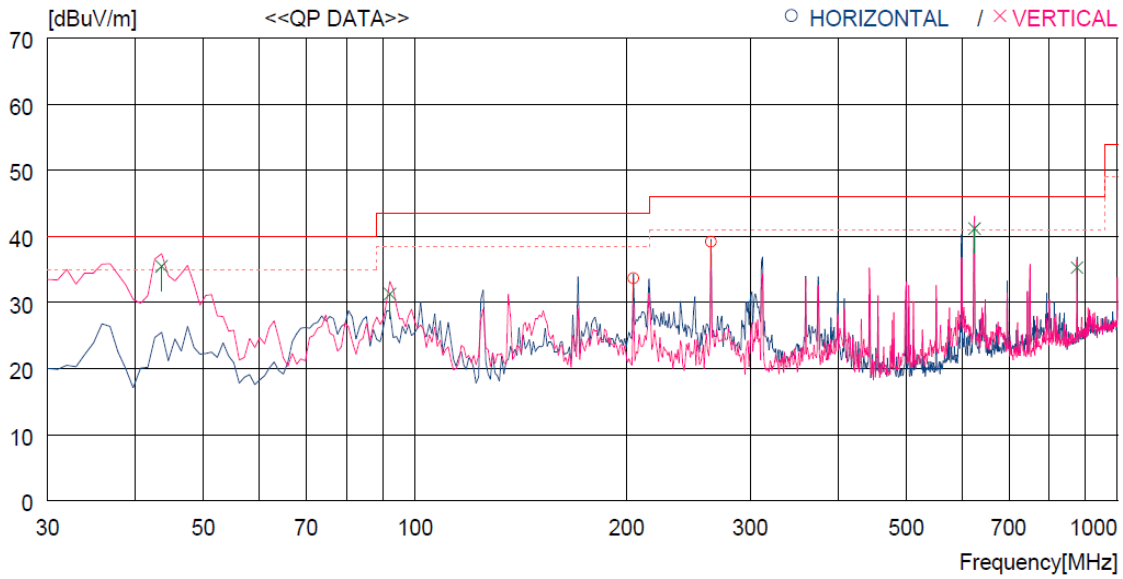
Frequency range : 30 MHz ~ 1 000 MHz

Result : PASSED

EUT : Access controller Date: April 29, 2019 ~ May 07, 2019

Operating Condition : Transmitting Mode

Distance : 3 m



No.	FREQ	READING QP	ANT FACTOR	LOSS	GAIN	RESULT	LIMIT	MARGIN	ANTENNA	TABLE
	[MHz]	[dBuV]	[dB]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[cm]	[DEG]
----- Horizontal ------										
1	204.600	52.6	10.6	3.7	33.2	33.7	43.5	9.8	100	163
2	263.770	55.8	12.3	4.2	33.1	39.2	46.0	6.8	100	359
----- Vertical ------										
3	43.580	53.1	13.8	1.7	33.1	35.5	40.0	4.5	100	0
4	92.080	51.2	10.7	2.4	33.0	31.3	43.5	12.2	100	276
5	625.577	48.7	19.3	6.6	33.4	41.2	46.0	4.8	100	0
6	875.830	38.7	21.5	7.9	32.8	35.3	46.0	10.7	100	172

Tested by: Ju Yun Park / Assistant Manager

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7. LIST OF TEST EQUIPMENT

No.	EQUIPMENTS	MFR.	MODEL	SER. NO.	LAST CAL	DUE CAL	USE
1.	Test receiver	R/S	ESCI	101012	Oct. 22, 2018	One Year	-
2.		R/S	ESR	101470	Oct. 22, 2018	One Year	■
3.		R/S	ESPI	101278	Oct. 20, 2018	One Year	■
4.	Spectrum analyzer	R/S	FSV30	101372	Aug. 23, 2018	One Year	-
5.	Amplifier	Sonoma Instrument	310N	312544	Mar. 18, 2019	One Year	■
6.	Amplifier	Sonoma Instrument	310N	312545	Mar. 18, 2019	One Year	-
7.	TRILOG Broadband Antenna	Schwarzbeck	VULB9163	9163-255	Jun. 05, 2018	Two Year	■
8.	TRILOG Broadband Antenna	Schwarzbeck	VULB9163	9163-419	Aug. 09, 2018	Two Year	-
9.	Controller	Innco System	CO3000	CO3000/904/ 37211215/L	N/A	N/A	■
10.	LISN	EMCO	3825/2	9109-1867	Mar. 27, 2019	One Year	-
				9109-1869	Mar. 19, 2019	One Year	■
		Schwarzbeck	NNLK8121	804	Oct. 22, 2018	One Year	■
		Schwarzbeck	NSLK8128	8128-216	Mar. 20, 2019	One Year	■
11.	Turn Table	Innco System	DT3000	930611	N/A	N/A	■
12.	Antenna Master	Innco System	MA4000-EP	MA4000/332	N/A	N/A	-
13.	Antenna Master	Innco System	MA-4000XPET	MA4000/509	N/A	N/A	■
14.	Loop Antenna	Schwarzbeck	FMZB 1513	1513-235	May 13, 2018	Two Year	-
15.	Frequency Counter	HP	53152A	US39270295	Aug. 23, 2018	One Year	−
16.	Environmental Test Chamber	ESPEC	PSL-2KP	14009407	Feb. 22, 2019	One Year	−
17.	DC Power Supply	Protek	PWS-3003D	4020409	Aug. 24, 2018	One Year	■

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