



Nemko Test Report: 2014 04244501 FCC

Applicant: Holatron Systems
833 Ilaniwai St., Ste 2
Honolulu HI 96813
United States

**Equipment Under Test:
(E.U.T.)** XMTR12B

FCC Identifier: OI4XMTR12B
IC: 11556A-XMTR12B

In Accordance With: **FCC Part 15, Subpart C and
Industry Canada RSS-210, Issue 8**
For Low Power Transmitters Operating Periodically
In The Band 40.66 - 40.77 MHz And Above 70 MHz

Tested By: Nemko USA Inc.
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TESTED BY:


David Light, Wireless Engineer

DATE: 1 April 2014

APPROVED BY:


Alan Laudani
Senior RF/EMC Engineer

DATE: 15 April 2014

Total Number of Pages: 14

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Section 1. Summary of Test Results

Manufacturer: Holatron Systems

Model No.: XMTR12B

Serial No.: None

General: **All measurements are traceable to national standards.**

These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with CFR47 Part 15, Subpart C, Paragraph 15.231 and Industry Canada RSS-210, Issue 8. All tests were conducted using measurement procedure ANSI C63.4-2003. Radiated emissions are made on an open area test site. A description of the test facility is on file with the FCC and Industry Canada.



New Submission



Production Unit



Class II Permissive Change



Pre-Production Unit

THIS TEST REPORT RELATES ONLY TO THE ITEM(S) TESTED.

THE FOLLOWING DEVIATIONS FROM, ADDITIONS TO, OR EXCLUSIONS FROM THE TEST SPECIFICATIONS HAVE BEEN MADE.

See "Summary of Test Data".



NVLAP Lab Code 200116-0

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Summary of Test Data

Name of Test	Paragraph No.	Results
Transmission Requirements	FCC 15.231(a) RSS-210 A1.1.1	Complies
Radiated Emissions	FCC 15.231(b) RSS-210 A1.1.2	Complies
Occupied Bandwidth	FCC15.231(c) RSS-210 A1.1.3	Complies
Frequency Tolerance	FCC 15.231(d) RSS-210 A1.1.4	NA
Alternate Field Strength Requirements	FCC 15.231(e) RSS-210 A1.1.5	NA
Powerline Conducted Emissions	FCC 15.207 RSS-Gen 7.2.4	NA

Footnotes:

- 1) The device does not operate between 40.66 to 40.70 MHz
- 2) The device does not operate at a periodic rate.
- 3) The device is battery powered.

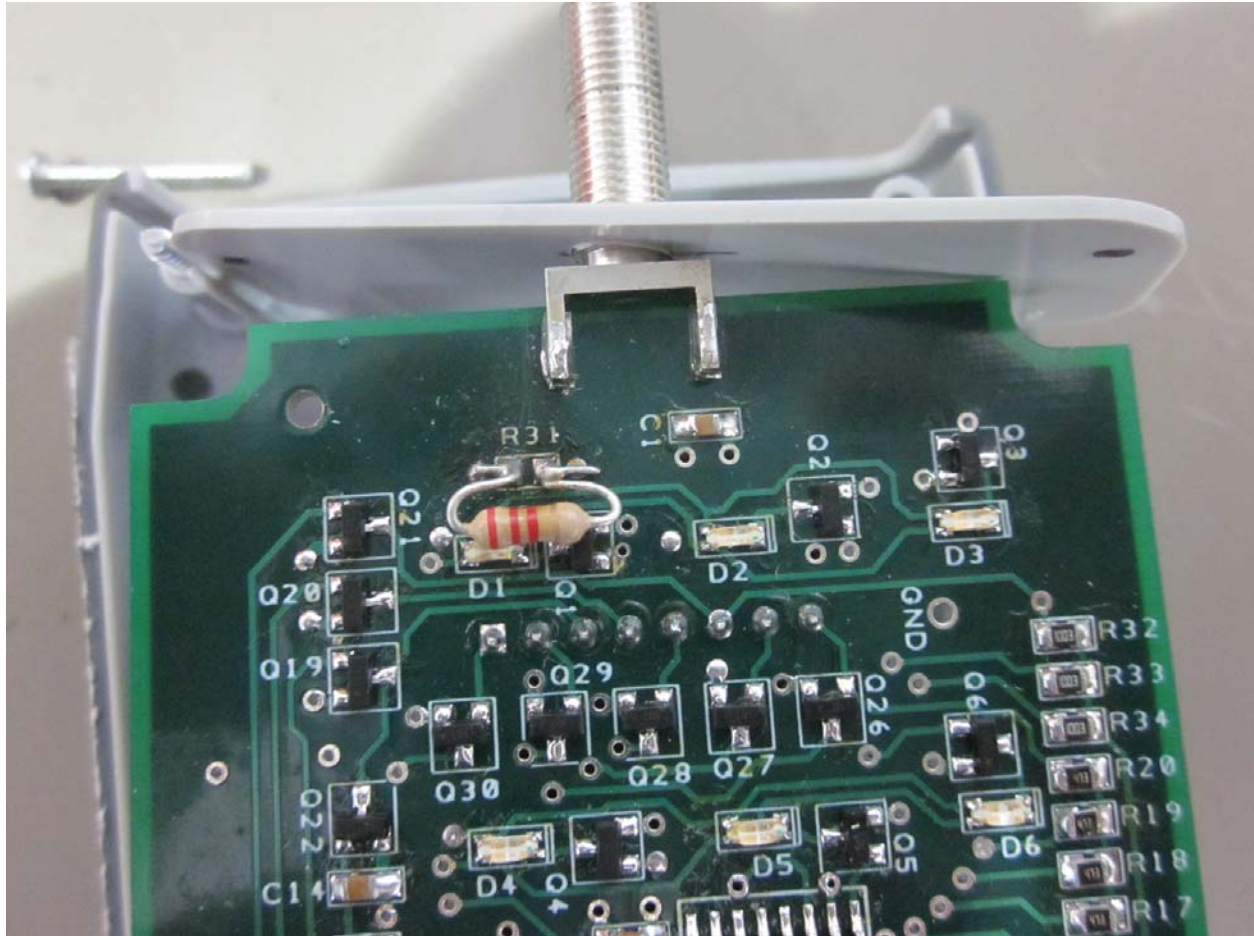
Section 2. Equipment Under Test (E.U.T.)

General Equipment Information

Frequency Range:	418 MHz
Operating Frequency(ies) of Sample:	418 MHz
Type of Emission:	ASK
Supply Power Requirement:	3 Vdc (2 AAA batteries)
Integral Antenna:	No
Antenna Connector:	R-SMA

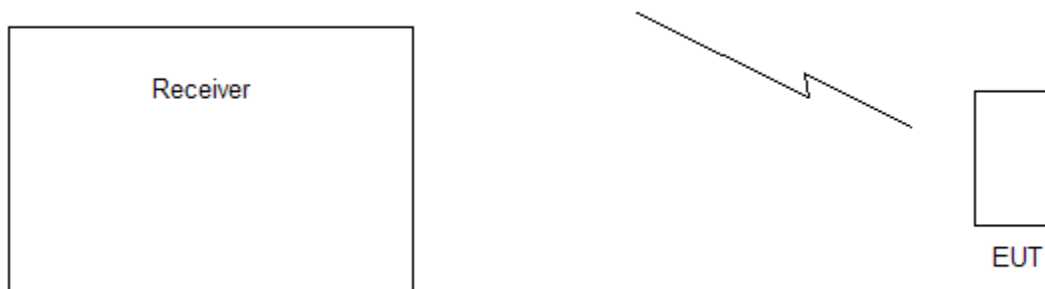
Modifications

A 2.2k Ω resistor was substituted for the 750 Ω resistor at R31 to reduce power output for compliance.



Description of E.U.T.

The model XMTR12B high-speed 12-shot controller is a low power hand-held remote control transmitter which can transmit commands over any of twelve different digital channels. Each transmitter's channel setting is fixed in software at time of manufacture and cannot be changed. A label displaying the channel setting is affixed to the top of the transmitter next to the antenna. Transmitters fixed to separate digital channel numbers can transmit simultaneously without interfering with each other. This permits up to twelve different receivers or groups of receivers to be controlled by separate transmitters simultaneously. The transmitter will only actuate receivers whose digital channel switches are set to select the same channel as the transmitter.

System Diagram

Section 3. Transmission Requirements

NAME OF TEST: Transmission Requirements	PARA. NO.: FCC 15.231(a) RSS-210 A1.1.1
TESTED BY: David Light	DATE: 01 April 2014

- Minimum Standard:** 15.231(a) Continuous transmissions such as voice, video or data transmissions are not permitted.
- 15.231(a)(1) A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds after being released.
- 15.231(a)(2) A transmitter activated automatically shall cease transmission within 5 seconds of activation.
- 15.231(a)(3) Periodic transmissions at regular pre-determined intervals are not permitted. However polling or supervisory transmissions to determine system integrity of transmitters used in security or safety applications are allowed if the periodic rate of transmission does not exceed one transmission of not more than one second duration per hour for each transmitter.
- 15.231(a)(4) Intentional radiators which are employed for radio control purposes during emergencies involving fire, security, and safety of life, when activated to signal an alarm, may operate during the pendency of the alarm.

Test Results: [Complies.](#)

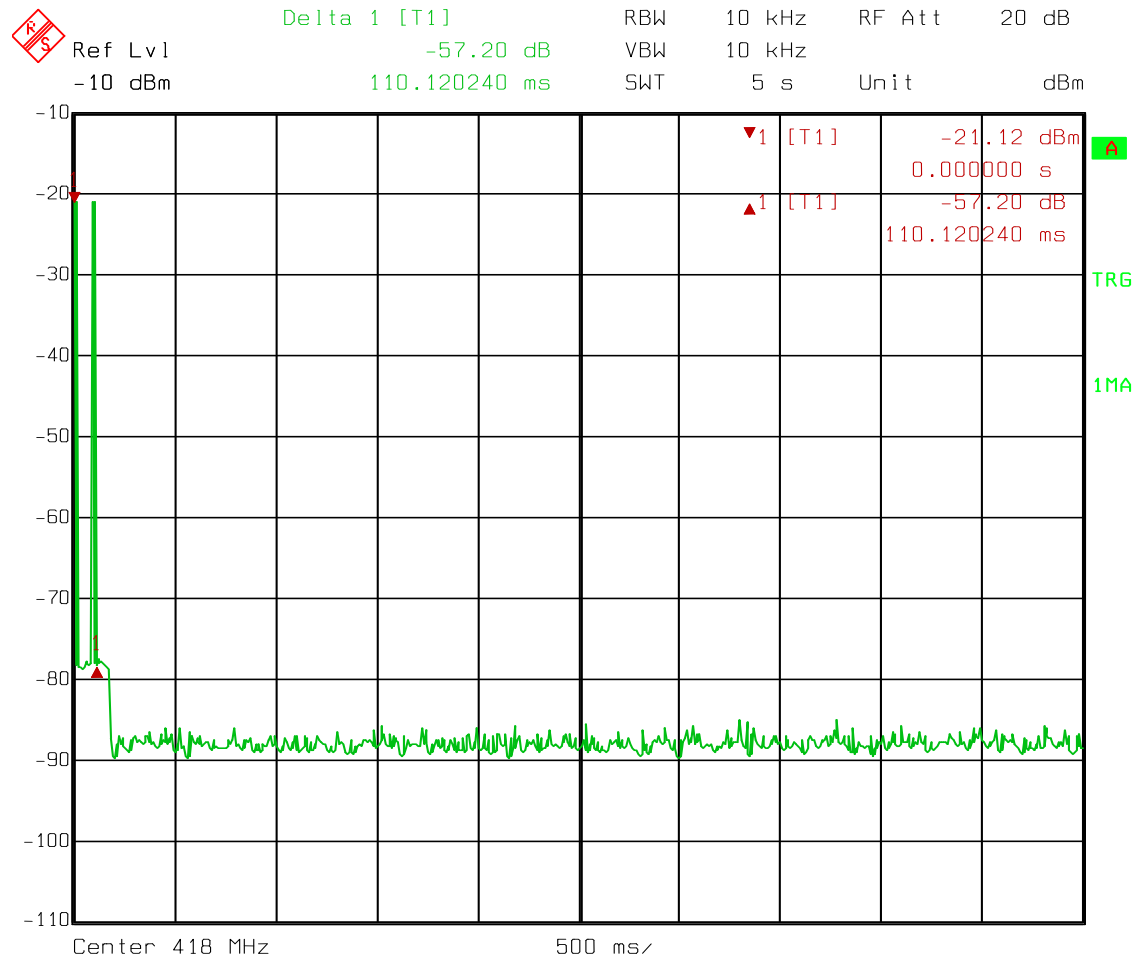
Test Data: [Compliance was determined by verification of technical specifications and a functional test on the equipment.](#)

Rationale for Compliance with Transmission Requirements

15.231(a)(1)	☒ Manual activation	TX deactivation time: 110 msec.
15.231(a)(2) :	☐ Automatic activation	
15.231(a)(3) :	☐ Regular, predetermined transmissions ☐ Polling or supervisory transmissions	TX rate and duration:
15.231(a)(4) :	☐ Alarm device operating during the pendency of alarm condition	
	☒ Non-alarm device	

Test Data – Transmission Requirements

Deactivation time



Date: 01.APR.2014 14:13:29

Section 4. Radiated Emissions

NAME OF TEST: Radiated Emissions	PARA. NO.: FCC 15.231(b) RSS-210 A1.1.2
TESTED BY: David Light	DATE: 01 April 2014

Minimum Standard:

Permissible Field Strength Limits (Momentarily Operated Devices)

Fundamental Frequency (MHz)	Field Strength of Fundamental Microvolts/Meter at 3 meters; (watts)	Field Strength of Unwanted Emissions Microvolts/Meter at 3 meters; (watts)
40.66 - 40.70	2,250	225
70-130	1, 250	125
130-174	1,250 to 3,750*	125 to 375
174-260 (note 1)	3,750	375
260-470 (note 1)	3,750 to 12,500*	375 to 1,250
Above 470	12,500	1,250

Notes:

# Use quasi-peak or averaging meter.	For 130 - 174 MHz: $FS \text{ (microvolts/m)} = (56.82 \times F) - 6136$
* Linear interpolation with frequency F in MHz	For 260 - 470 MHz: $FS \text{ (microvolts/m)} = (41.67 \times F) - 7083$

Any emissions that fall within the restricted bands of 15.205 shall not exceed the following limits:

Frequency (MHz)	Field Strength ($\mu\text{V/m}$ @ 3m)	Field Strength (dB @ 3m)
30 - 88	100	40.0
88 - 216	150	43.5
216 - 960	200	46.0
Above 960	500	54.0

Test Results: Complies. The worst-case emission level is 78.8 dB $\mu\text{V/m}$ @ 3m at 418 MHz. This is 1.5 dB below the specification limit.

Test Data: See attached table.

Above 1 GHz a spectrum analyzer and low noise amplifier are used to measure emission levels. The spectrum analyzer resolution bandwidth was set to 1 MHz and video bandwidth was 1 MHz.

The spectrum was searched up to the 10th harmonic of the fundamental frequency of operation.

Test Data - Radiated Emissions

Peak Data

Meas. Freq. (MHz)	Ant. Pol. (H/V)	Duty Cycle (dB)	Meter Reading (dBuV)	Antenna Factor (dB)	Path Loss (dB)	RF Gain (dB)	Corrected Reading (dBuV/m)	Spec. limit (dBuV/m)	CR/SL Diff. (dB)	Pass Fail Unc.	Comment
											2.2 k ohm resistor
418	H	0.0	54.0	17.2	3.1	0.0	74.3	100.3	-26.0	Pass	
418	V	0.0	71.4	17.2	3.1	0.0	91.7	100.3	-8.6	Pass	
836	H	0.0	55.0	22.3	4.7	32.1	49.9	80.3	-30.4	Pass	
836	V	0	59.9	22.3	4.7	32.1	54.8	80.3	-25.5	Pass	
1254	H	0.0	43.3	25.8	5.9	30.3	44.7	80.3	-35.6	Pass	
1254	V	0.0	49.9	25.8	5.9	30.3	51.3	80.3	-29.0	Pass	
1672	H	0.0	42.0	25.7	7.3	31.2	43.8	74.0	-30.2	Pass	Noise floor
1672	V	0.0	44.7	25.7	7.3	31.2	46.5	74.0	-27.5	Pass	
2090	H	0.0	43.0	27.6	8.3	31.5	47.4	80.3	-32.9	Pass	Noise floor
2090	V	0.0	45.7	27.6	8.3	31.5	50.1	80.3	-30.2	Pass	
2508	H	0.0	40.0	28.4	9.2	31.8	45.8	80.3	-34.5	Pass	Noise floor
2508	V	0.0	40.8	28.4	9.2	31.8	46.6	80.3	-33.7	Pass	
2926	H	0.0	40.0	29.5	10.2	31.8	47.9	80.3	-32.4	Pass	Noise floor
2926	V	0.0	43.6	29.5	10.2	31.8	51.5	80.3	-28.8	Pass	
3344	H	0.0	40.0	30.9	10.5	31.3	50.1	80.3	-30.2	Pass	Noise floor
3344	V	0.0	44.5	30.9	10.5	31.3	54.6	80.3	-25.7	Pass	
3762	H	0.0	39.6	34.9	10.6	31.7	53.4	74.0	-20.6	Pass	Noise floor
3762	V	0.0	39.6	31.9	10.6	31.7	50.4	74.0	-23.6	Pass	Noise floor
4180	H	0.0	40.0	31.9	11.0	32.2	50.7	74.0	-23.3	Pass	Noise floor
4180	V	0.0	40.0	31.9	11.0	32.2	50.7	74.0	-23.3	Pass	Noise floor

Test Data - Radiated Emissions

Average Data

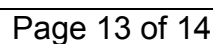
Meas. Freq. (MHz)	Ant. Pol. (H/V)	Duty Cycle (dB)	Meter Reading (dBuV)	Antenna Factor (dB)	Path Loss (dB)	RF Gain (dB)	Corrected Reading (dBuV/m)	Spec. limit (dBuV/m)	CR/SL Diff. (dB)	Pass Fail Unc.	Comment
418	H	-12.9	54.0	17.2	3.1	0.0	61.4	80.3	-18.9	Pass	
418	V	-12.9	71.4	17.2	3.1	0.0	78.8	80.3	-1.5	Unc.	
836	H	-12.9	55.0	22.3	4.7	32.1	37.0	60.3	-23.3	Pass	
836	V	-12.9	59.9	22.3	4.7	32.1	41.9	60.3	-18.4	Pass	
1254	H	-12.9	43.3	25.8	5.9	30.3	31.8	60.3	-28.5	Pass	
1254	V	-12.9	49.9	25.8	5.9	30.3	38.4	60.3	-21.9	Pass	
1672	H	-12.9	42.0	25.7	7.3	31.2	30.9	54.0	-23.1	Pass	Noise floor
1672	V	-12.9	44.7	25.7	7.3	31.2	33.6	54.0	-20.4	Pass	
2090	H	-12.9	43.0	27.6	8.3	31.5	34.5	60.3	-25.8	Pass	Noise floor
2090	V	-12.9	45.7	27.6	8.3	31.5	37.2	60.3	-23.1	Pass	
2508	H	-12.9	40.0	28.4	9.2	31.8	32.9	60.3	-27.4	Pass	Noise floor
2508	V	-12.9	40.8	28.4	9.2	31.8	33.7	60.3	-26.6	Pass	
2926	H	-12.9	40.0	29.5	10.2	31.8	35.0	60.3	-25.3	Pass	Noise floor
2926	V	-12.9	43.6	29.5	10.2	31.8	38.6	60.3	-21.7	Pass	
3344	H	-12.9	40.0	30.9	10.5	31.3	37.2	60.3	-23.1	Pass	Noise floor
3344	V	-12.9	44.5	30.9	10.5	31.3	41.7	60.3	-18.6	Pass	
3762	H	-12.9	39.6	34.9	10.6	31.7	40.5	54.0	-13.5	Pass	Noise floor
3762	V	-12.9	39.6	31.9	10.6	31.7	37.5	54.0	-16.5	Pass	Noise floor
4180	H	-12.9	40.0	31.9	11.0	32.2	37.8	54.0	-16.2	Pass	Noise floor
4180	V	-12.9	40.0	31.9	11.0	32.2	37.8	54.0	-16.2	Pass	Noise floor

The spectrum was searched from 30 MHz to 5 GHz.

Asset Tag	Description	Manufacturer	Model	Serial #	Last Cal	Next Cal
110	Antenna, LPA	Electrometric s	LPA-25	1217	30-Apr-2013	30-Apr-2014
529	Antenna, DRWG	EMCO	3115	2505	31-Oct-2012	31-Oct-2014
901	Preamplifier	Sonoma	310 N	130607	21-Nov-2013	21-Nov-2014
911	Spectrum Analyzer	Agilent	E4440A	US41421266	21-Jan-2014	21-Jan-2015
E1046	Biconical Antenna	A.H. Systems Inc.	SAS-540	736	22-Apr-2013	22-Apr-2014
1016	Preamplifier	Hewlett Packard	8449A	2749A00159	20-Aug-2013	20-Aug-2014

NAME OF TEST: Occupied Bandwidth	PARA. NO.: FCC 15.231(c) RSS-210 A1.1.3
TESTED BY: David Light	DATE: 01 April 2014

Limit = 1.045 MHz



ANNEX A - RESTRICTED BANDS**Annex A Restricted Bands of Operation**

(a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42-16.423	399.9-410	4.5-5.15
0.49 - 0.51	16.69475-16.69525	608-614	5.35-5.46
2.1735 - 2.1905	16.80425-16.80475	960-1240	7.25-7.75
3.020 - 3.026	25.5-25.67	1300-1427	8.025-8.5
4.125 - 4.128	37.5-38.25	1435-1626.6	9.0-9.2
4.17725 - 4.17775	73-74.6	1645.5-1646.5	9.3-9.5
4.20725 - 4.20775	74.8-75.2	1660-1710	10.6-12.7
6.215 - 6.218	108-121.94	1718.8-1722.2	13.25-13.4
6.31175 - 6.31225	123-138	2220-2300	14.47-14.5
8.291 - 8.294	149.9-150.05	2310-2390	15.35-16.2
8.362 - 8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625 - 8.38675	156.7-156.9	2655-2900	22.01-23.12
8.41425 - 8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29 - 12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975 - 12.52025	240-285	3345.8-3358	36.43-36.5
12.57675 - 12.57725	322-335.4	3600-4400	Above 38.6
13.36 - 13.41			