FCC CFR47 PART 15 SUBPART H

DATABASE TEST REPORT

FOR

FIXED TV BAND DEVICE

MODEL NUMBER: ACRS 2.0

REPORT NUMBER: 12605133-E1V2

FCC ID: A2UACRS20F

ISSUE DATE: January 17, 2019

Prepared for
ADAPTRUM
25 E. TRIMBLE ROAD
SAN JOSE, CA 95131

Prepared by
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NVLAP Lab code: 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
V1	1/8/2019	Initial Issue	---
V2	1/17/2019	Updated section 8.9	F. de Anda

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: Adaptrum
25 E. Trimble Road
San Jose, CA 95131

EUT DESCRIPTION: FIXED TV BAND DEVICE

MODEL: ACRS 2.0

SERIAL NUMBER: BASE: A2PXJ331
CLIENT: A2FJ1065

DATE TESTED: JANUARY 13 to14, 2014

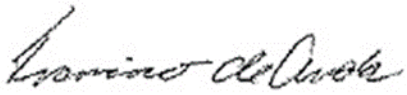
APPLICABLE STANDARDS	
SECTION	**TEST RESULTS**
DATABASE PORTIONS OF FCC PART 15 SUBPART H	Pass

UL Verification Services Inc. tested the above equipment in accordance with the requirements set forth in the above standards. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. All samples tested were in good operating condition throughout the entire test program. Measurement Uncertainties are published for informational purposes only and were not taken into account unless noted otherwise.

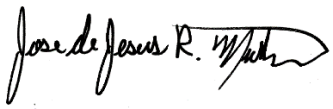
This document may not be altered or revised in any way unless done so by UL Verification Services Inc. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Verification Services Inc. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of the U.S. government.

Approved & Released For
UL Verification Services Inc. By:



FRANCISCO DE ANDA
OPERATIONS LEAD
UL Verification Services Inc.

Prepared By:



Jose Martinez
TEST ENGINEER
UL Verification Services Inc.

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC CFR 47 Part 15 Subpart H and KDB 416271 D01 White Space Test Procedures v03.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 Benicia Street, Fremont, California, USA. The following table identifies which facilities were utilized for radiated emission measurements documented in this report. Specific facilities are also identified in the test results sections.

47173 Benicia Street	47266 Benicia Street	47658 Kato Rd.
☐ Chamber A (ISED:2324B-1)	☐ Chamber D (ISED:22541-1)	☐ Chamber I (ISED: 2324A-5)
☐ Chamber B (ISED:2324B-2)	☐ Chamber E (ISED:22541-2)	☒ Chamber J (ISED: 2324A-6)
☐ Chamber C (ISED:2324B-3)	☐ Chamber F (ISED:22541-3)	☐ Chamber K (ISED: 2324A-1)
	☐ Chamber G (ISED:22541-4)	☐ Chamber L (ISED: 2324A-3)
	☐ Chamber H (ISED:22541-5)	

The above test sites and facilities are covered under FCC Test Firm Registration # 208313. Chambers above are covered under Industry Canada company address and respective code.

UL Verification Services Inc. is accredited by NVLAP, Laboratory Code 200065-0.

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB)
36.5 dBuV + 18.7 dB/m + 0.6 dB – 26.9 dB = 28.9 dBuV/m

4.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	UNCERTAINTY
Worst Case Conducted Disturbance, 9KHz to 0.15 MHz	3.84 dB
Worst Case Conducted Disturbance, 0.15 to 30 MHz	3.65 dB
Worst Case Radiated Disturbance, 9KHz to 30 MHz	3.15 dB
Worst Case Radiated Disturbance, 30 to 1000 MHz	5.36 dB
Worst Case Radiated Disturbance, 1000 to 18000 MHz	4.32 dB
Worst Case Radiated Disturbance, 18000 to 26000 MHz	4.45 dB
Worst Case Radiated Disturbance, 26000 to 40000 MHz	5.24 dB

Uncertainty figures are valid to a confidence level of 95%.

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT are Adaptrum ACRS 2.0 base and client radios operating as Fixed TV Band Devices in compliance with Part 15 Subpart H of Title 47 of the Code of Federal Regulations. Adaptrum ACRS 2.0 radios are broadband wireless communication equipment operating in the UHF TV band with frequency range from 473 Mhz to 695 MHz (Channels 14 – 51 excluding Channels 36 to 38) and modulation modes QPSK, 16QAM and 64QAM.

The ACRS 2.0 radios are Fixed TV Band Devices that require professional installation.

5.2. CLASS II PERMISSIVE CHANGE

This Class 2 Permissive change is to add an alternate database. The new database provider is Nominet. No RF changes are made and power levels remain as originally granted.

5.3. DATABASE information

Nominet is the new alternate TVWS Database provider, referred to as the TVWS Database throughout this report.

5.4. SOFTWARE AND FIRMWARE

The firmware installed in the EUT during testing was version A2.1.3.

5.5. DETAILS OF TESTED SYSTEM

SUPPORT EQUIPMENT & PERIPHERALS

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	**Manufacturer**	**Model**	**S/N**	**FCC ID**
Laptop	Acer	E3-111 series	NXMQVAA001439014FE7600	DoC
Router	HP	J979A	CN20FQ8DNV	DoC
PoE Adapter	LairdTech	PoE-48-i	167015470DRC04	DoC
Laptop	Dell	Lattitude 5480	19034981174	DoC
PoE Adapter	Passive	PSE-480100	175242200301125	DoC
RF Splitter	Mini CirCuits	ZPSCJ-2-1-5+	502001309 S	N/A

I/O CABLES

I/O Cable List						
Cable No	**Port**	**# of identical ports**	**Connector Type**	**Cable Type**	**Cable Length (m)**	**Remarks**
1	AC	2	micro USB	un -Shielded	0.8	
2	LAN	6	RJ45	un -Shielded	1	

TEST SETUP

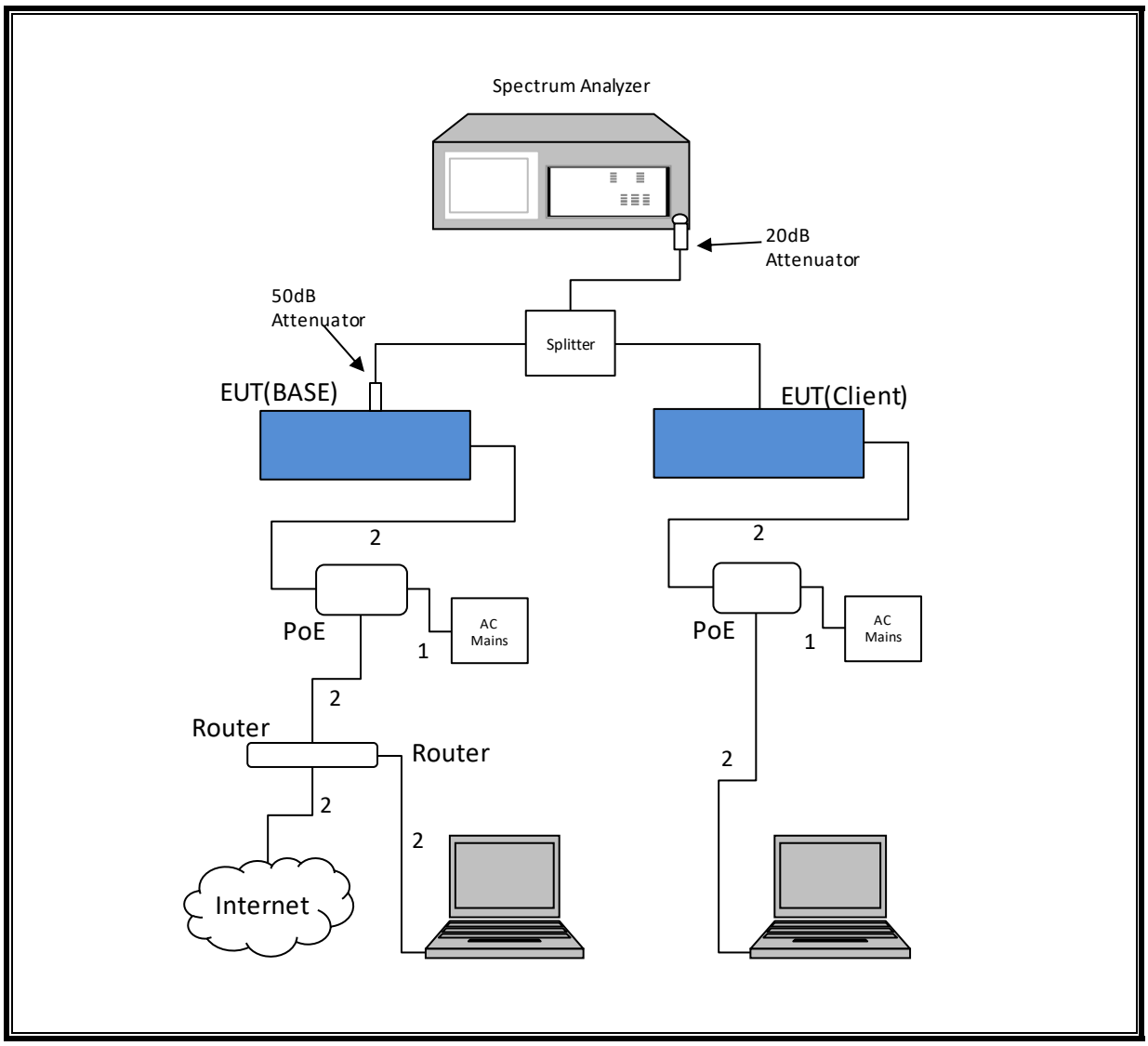
As illustrated in the following setup diagram, the EUT is the Adaptrum ACRS 2.0 base and client radios connected through cable assembly with proper attenuation to form a broadband communications system allowing the client-side PC to connect to the Internet (on the base side) through the TV White Space connection between the client and base radios. The BASE PC and CLIENT PC are used to configure the radio devices and monitor the device-and-database interactions.

The ACRS 2.0 radios are Fixed TV Band Devices that require professional installation. The ACRS 2.0 radio software has a database module that communicates with the TVWS Database and controls the radio operation in accordance with FCC Part 15 Subpart H rules. The EUT radios have been provisioned in the TVWS Database prior to the testing. For the testing conducted in this report, the EUT software was configured in the installer mode to demonstrate the compliance to the Part 15 Subpart H database rules. Once the device registration and location information has been entered into the radio software by the professional installer, the devices will communicate with the TVWS Database to perform device registration and retrieve TVWS channel list. After the installation, the device registration information will be stored in the device firmware and used by the device to automatically perform device registration and channel list request upon power cycling.

As shown in the diagram, the base radio has a direct connection to the Internet and upon power cycling will automatically communicate with the TVWS Database to 1) perform device registration and 2) retrieve TVWS channel list using the device registration information including device type, serial number, location, contact information, etc. The base radio can only operate on a channel that is within the channel list returned from the TVWS Database. Upon power cycling, the client radio will first scan a specified set of channels to look for the base signal. Once the client detects the base signal on a channel, it will send a connection request to the base which contains the client serial number and location information. The base will contact the TVWS Database on behalf of the client to perform device registration and channel list request. Only when the device registration is successful and the returned channel list for the client device contains the channel that the base is currently operating on, the base will grant the connection request from the client.

During normal operation, the base radio will periodically contact the TVWS Database to retrieve the updated channel lists for itself and on behalf of the client radio. The client channel list will be sent over the air to the client. If either the base or the client discovers its current operating channel is no longer in its updated channel list, it will cease operation on the channel immediately.

TEST SETUP DIAGRAM



6. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

TEST EQUIPMENT LIST				
Description	Manufacturer	Model	Asset	Cal Due
Spectrum Analyzer, 44 GHz	Agilent	E4446A	T146	8/13/2019

8. BASE STATION DATABASE CERTIFICATION TESTS

Both base and client software and hardware are identical the only difference is the deployment location. The test requirements were done on the base except for a few scenarios where client was also tested.

8.1. Fixed WSD Registration

CLAUSES

- §15.713(g)(3)

REQUIREMENT

- The Fixed WSD must provide the required information to the database and obtain a successful registration.

- The management software must be able to collect the data listed below. Confirm that the EUT will not operate unless a successful registration notification is received from the database.
  i. FCC ID
  ii. Serial Number
  iii. Location Coordinates
  iv. Location uncertainty with 95% accuracy (covered by section 3.8 in this report)
  v. Antenna Height AGL (must not be > 30 m)
  vi. Contact information (Device owner and device contact)

- For a fixed WSD without a direct connection to the internet, confirm that registration through a registered fixed device takes place only on a channel available to that registered device.

- **PRE-REGISTRATION PROCESS**

- Both the Base and Client Station are registered using an authorized database via the Internet at the depot facility. Following registration a common available channel between each is site is selected as the initial transmitting channel for each site. This channel will be the initial “listening” channel for the Remote Station

8.1.1. SUCCESSFUL REGISTRATION

TEST PROCEDURE

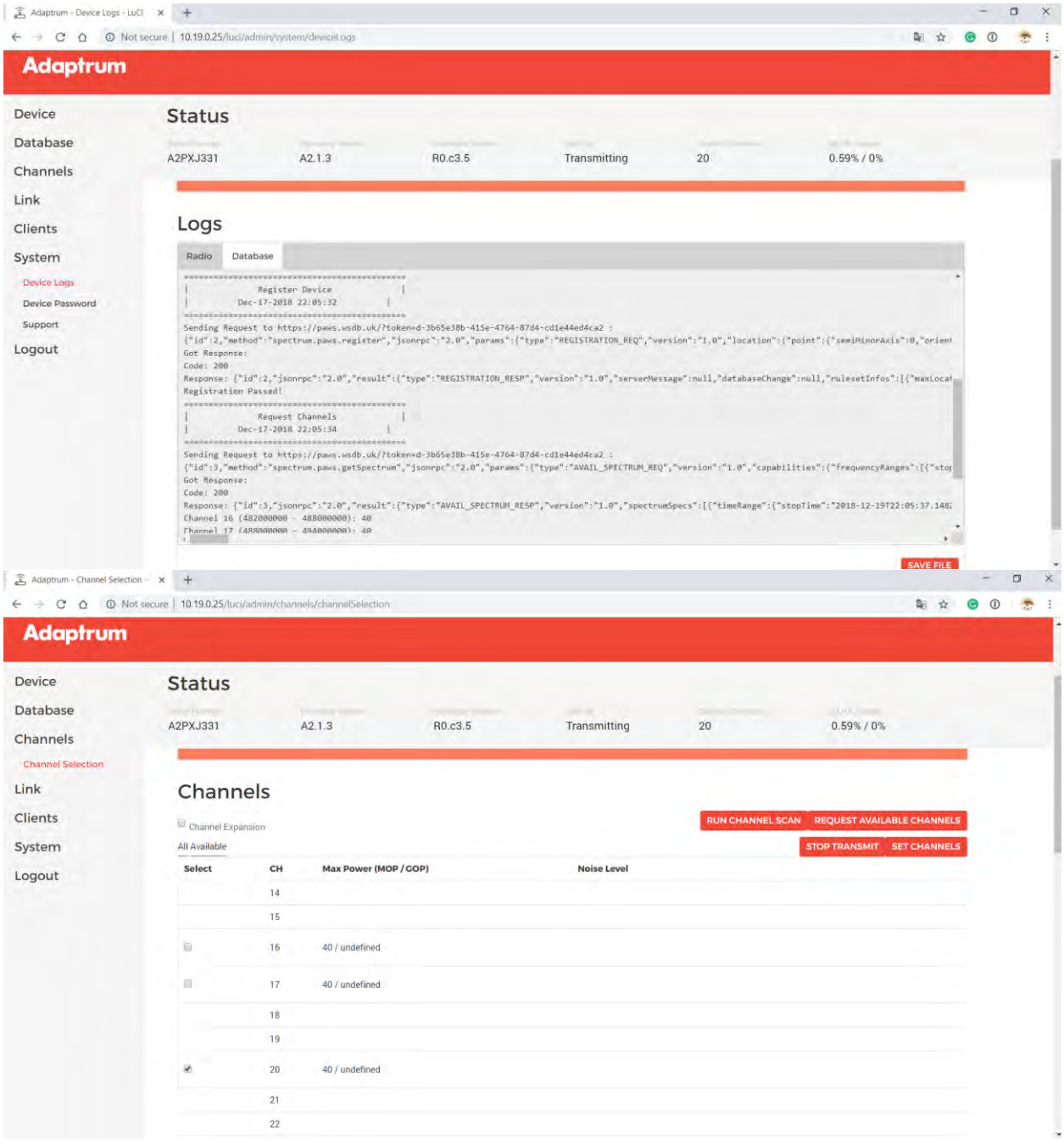
- Configure the base EUT with correct registration information:
    - The FCC ID and serial number are permanently programmed to the device and cannot be modified.
    - Known acceptable geographic coordinates, antenna height AGL and contact information were entered into the EUT.
- The base EUT automatically contacts the TVWS Database to perform device registration.
- Upon successful registration, the base EUT automatically contacts the TVWS Database to retrieve device channel list.
- Selects a channel from the channel list returned from the TVWS Database and start normal radio operation on the selected channel.
- Verify base output signal on the selected channel on the spectrum analyzer.

RESULTS

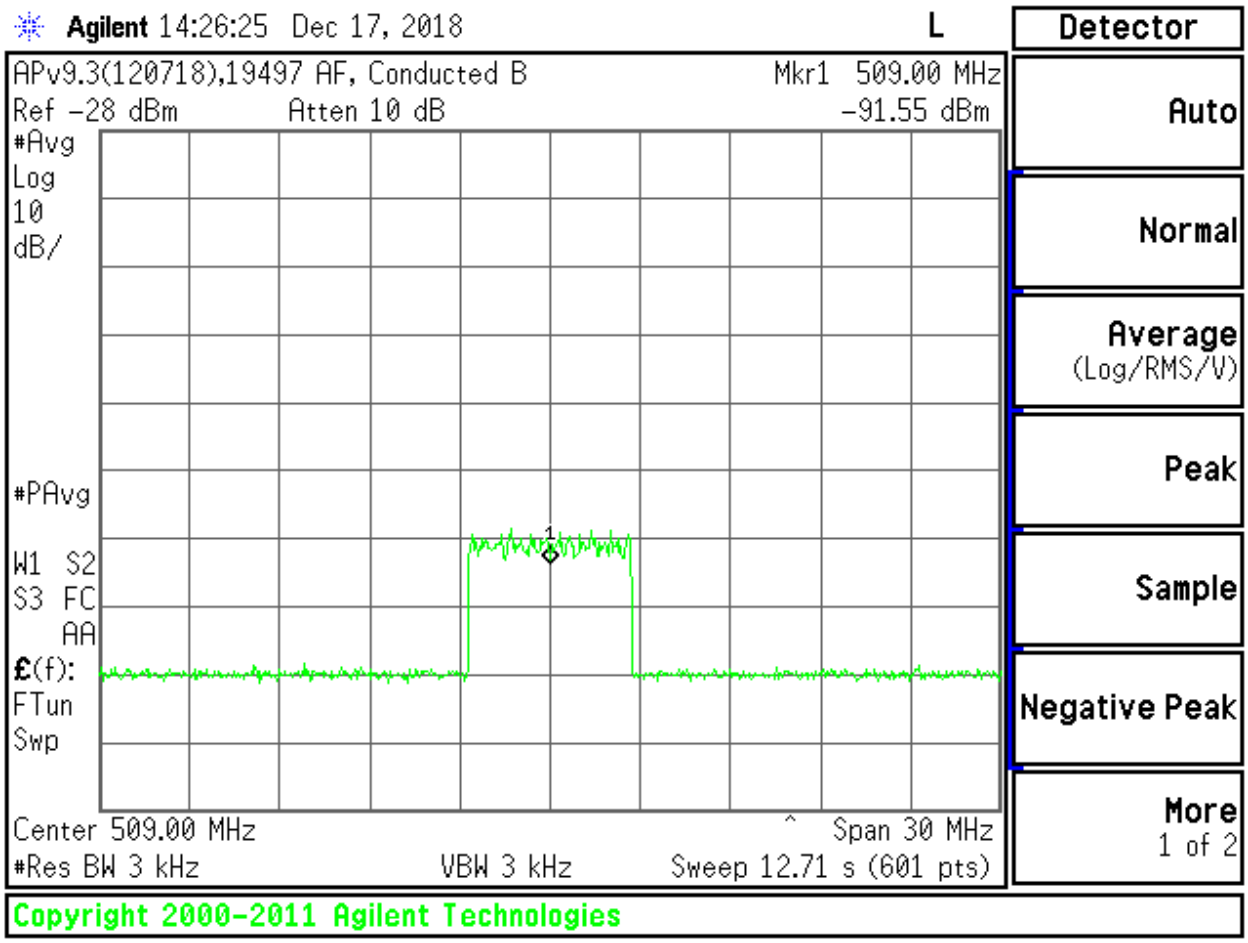
The EUT successfully registered when correct registration information was submitted to the TVWS Database. The EUT transmission was observed on the spectrum analyzer on the selected TV channel from the returned channel list from the TVWS Database.

Test Results		
Pass	**Fail**	**Comment**
☒	☐	

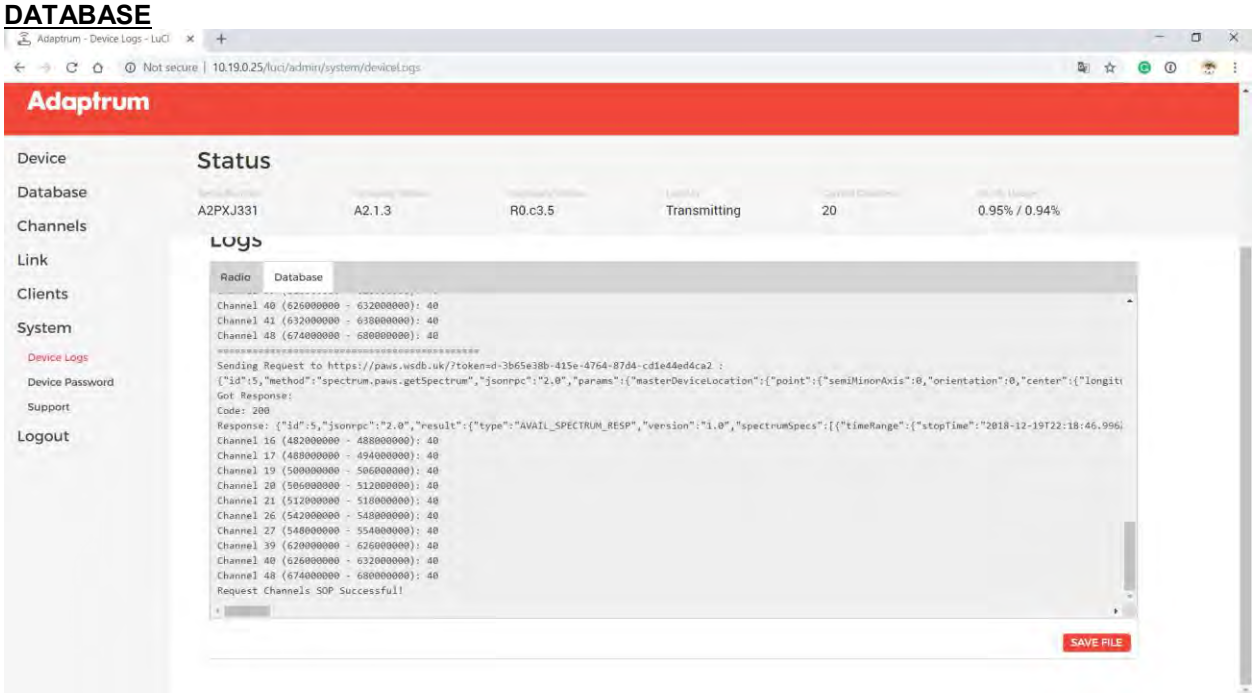
BASE SOFTWARE SHOWING SUCCESSFULDEVICE REGISTRATION WITH THE TVWS DATABASE



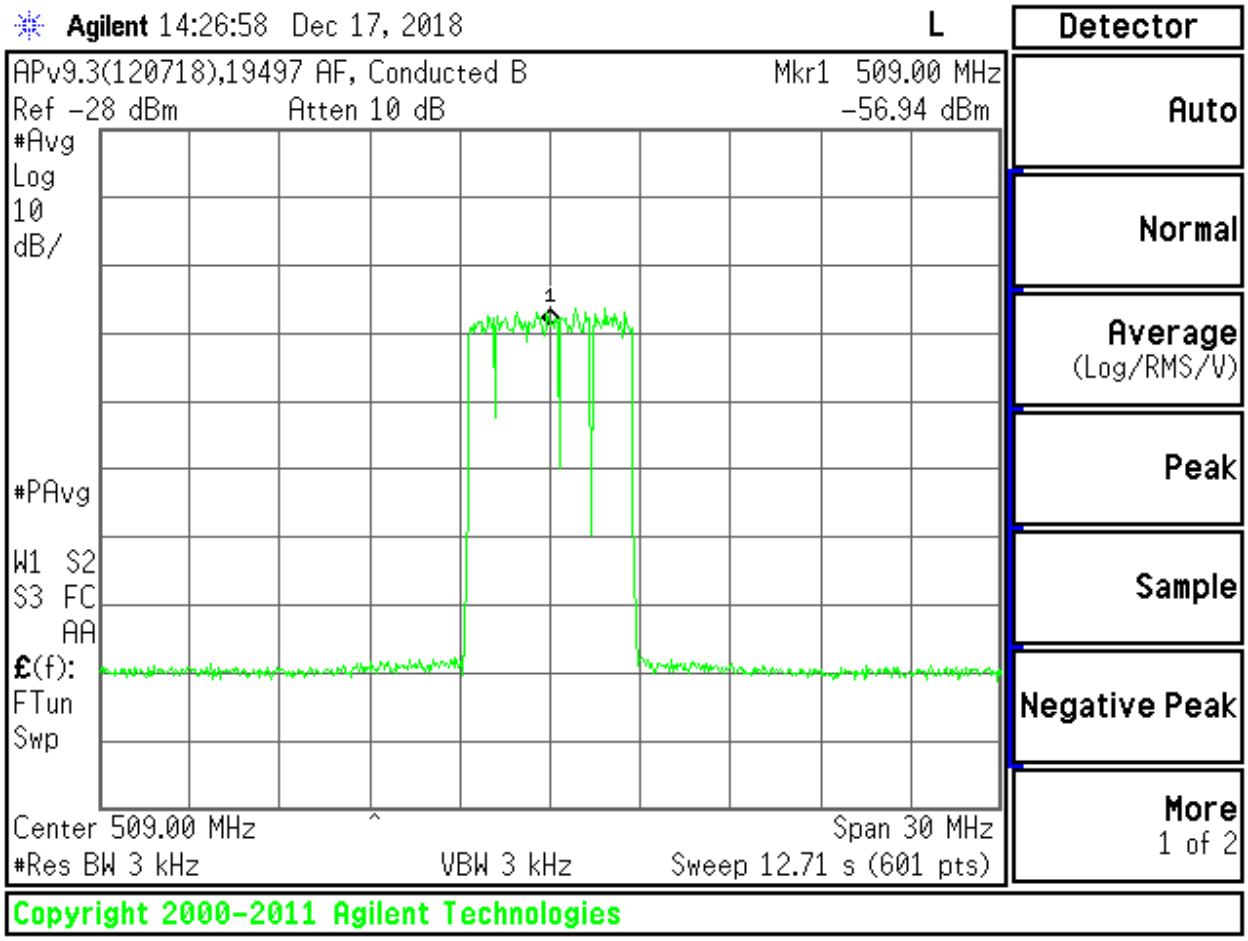
SPECTRUM ANALYZER SHOWING ACTIVE BASE SIGNAL ON THE SELECTED CHANNEL (CHANNEL 20)



BASE SOFTWARE SHOWING SUCCESSFUL CLIENT DEVICE REGISTRATION WITH THE TVWS DATABASE



SPECTRUM ANALYZER SHOWING ACTIVE CLIENT SIGNAL ON THE SELECTED CHANNEL (CHANNEL 20)



8.1.2. FAILED REGISTRATION – Location Coordinates

TEST PROCEDURE

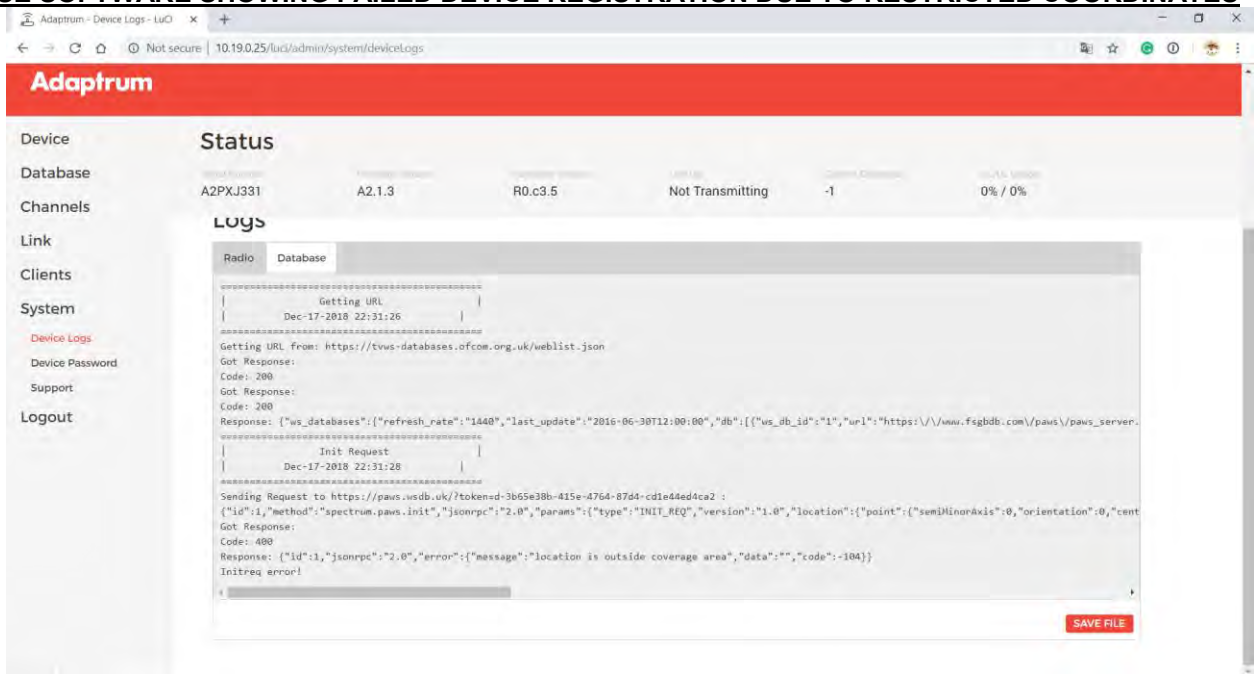
- Configure the EUT with restricted coordinates which is a location that is prohibited to transmit
- Observe the base EUT registration failure indicated by the database message

RESULT

The base EUT failed to register when restricted coordinates information were submitted to the TVWS Database.

Test Results		
Pass	**Fail**	**Comment**
☒	☐	

BASE SOFTWARE SHOWING FAILED DEVICE REGISTRATION DUE TO RESTRICTED COORDINATES



8.1.3. FAILED REGISTRATION – ANTENNA HEIGHT AGL

TEST PROCEDURE

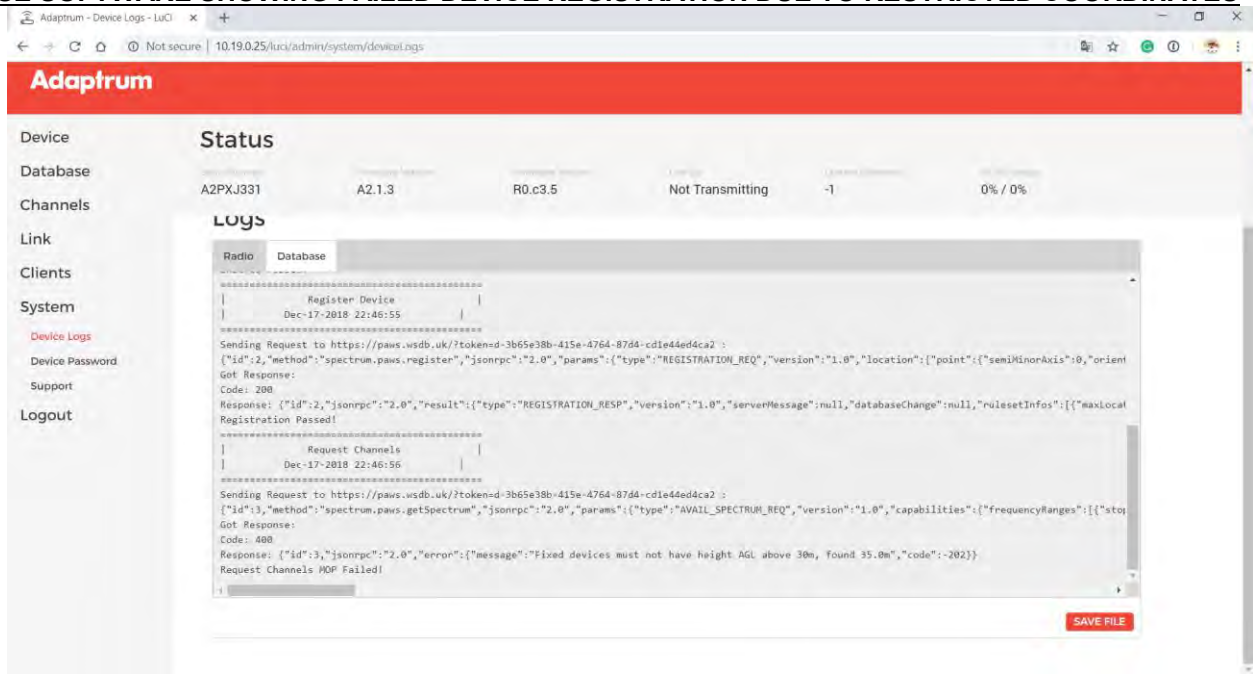
- Configure the EUT with antenna height Above Ground Level (AGL) > 30 meters.
- Observe the base registration failure indicated by the database message.

RESULTS

The base EUT failed to register when it is set to a location with antenna AGL above the limit.

Test Results		
Pass	**Fail**	**Comment**
☒	☐	

BASE SOFTWARE SHOWING FAILED DEVICE REGISTRATION DUE TO RESTRICTED COORDINATES



8.1.4. FAILED REGISTRATION – INCOMPLETE CONTACT INFORMATION

TEST PROCEDURE

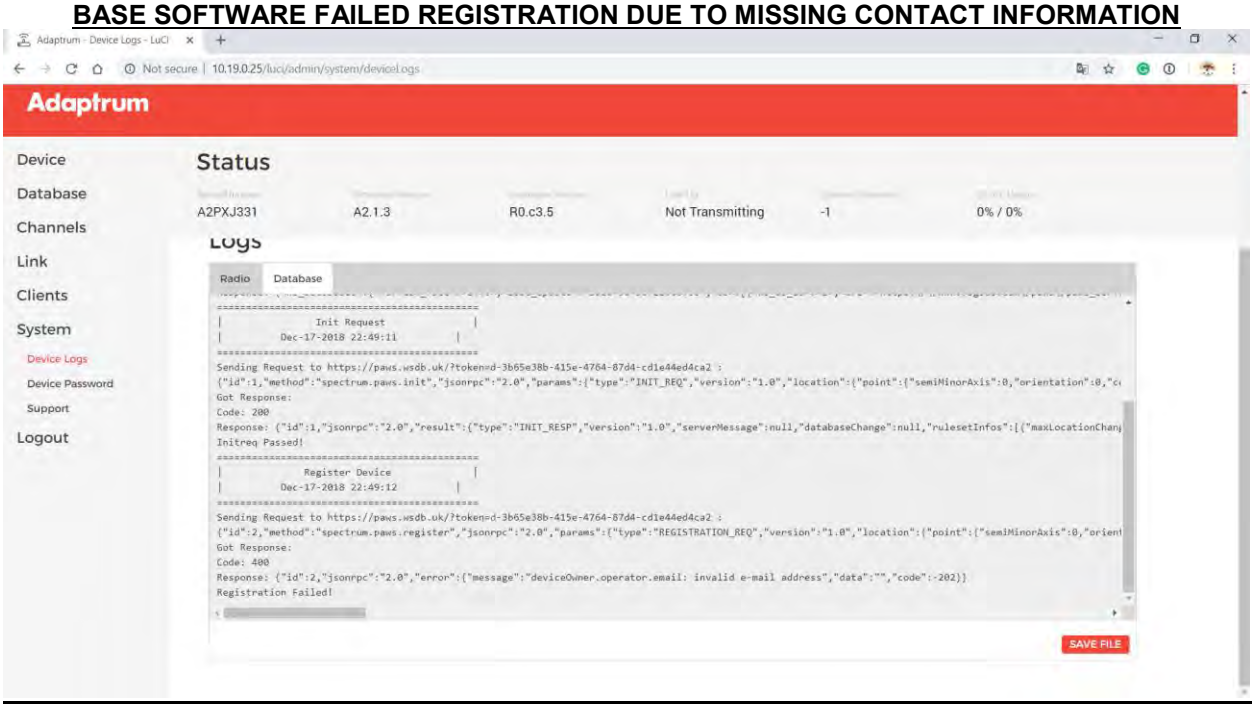
- Configure the base EUT with missing contact information, e.g. email.
- The device software cannot proceed with registration and prompts user to enter the missing information.

RESULTS

Software didn't proceed with registration when contact information fields are missing.

Test Results		
Pass	**Fail**	**Comment**
☒	☐	

BASE SOFTWARE FAILED REGISTRATION DUE TO MISSING CONTACT INFORMATION



8.2. FIXED WSD CHANNELS OF OPERATION

CLAUSES

- §15.711(c)(2)(ii)

REQUIREMENT

Confirm that the device only operates on channels provided by the database

TEST PROCEDURE

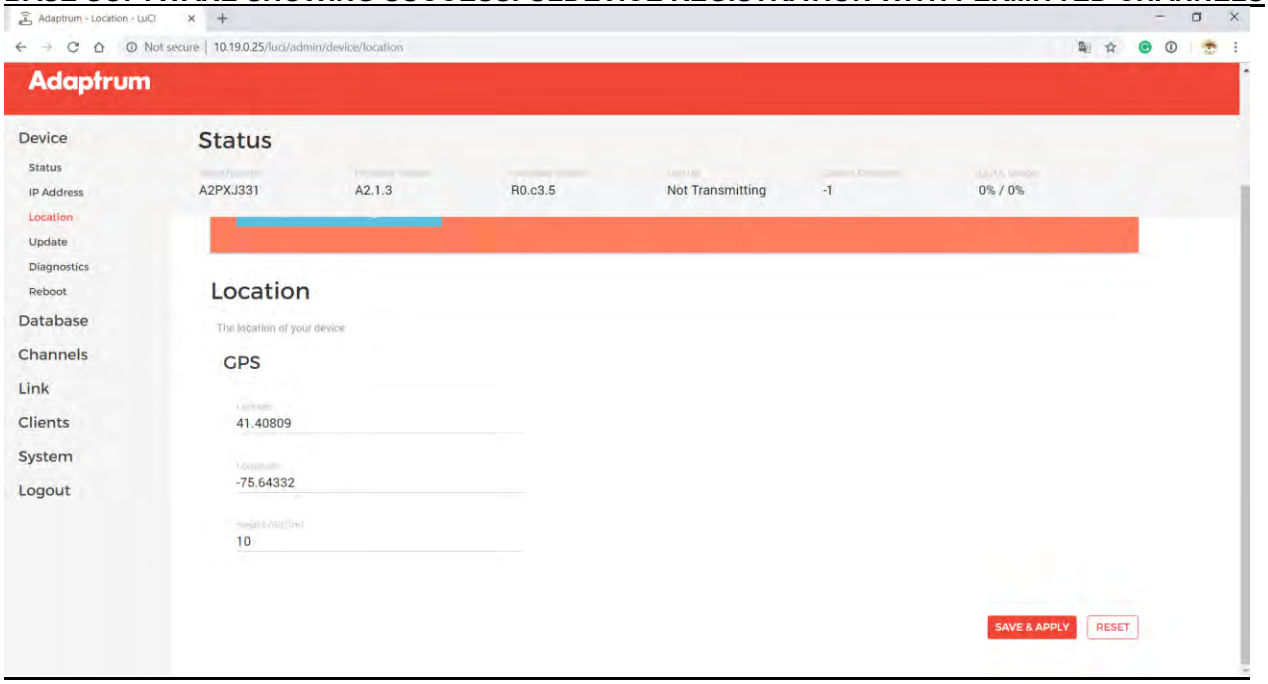
- The base EUT geographic coordinates are entered at registration time and stored in the device. The device channel list request uses the same coordinates established at registration time. No separate coordinates can be entered for channel list request.
- The device requires professional installation and device registration information including device location will be entered by the professional installer.
- Once the registration is complete, upon power cycling the device will use the stored registration location for channel list request.

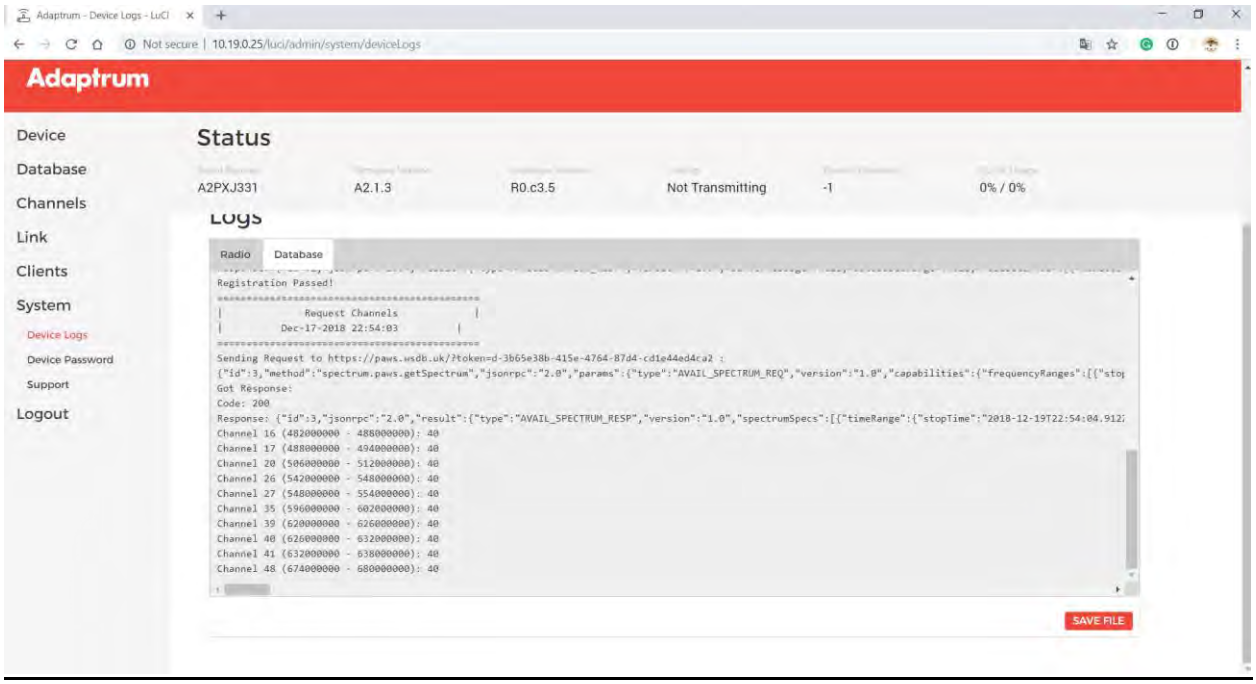
RESULTS

The device only uses its registered location for channel list request. The device registered location will be established at installation time by a professional installer and cannot be altered after installation

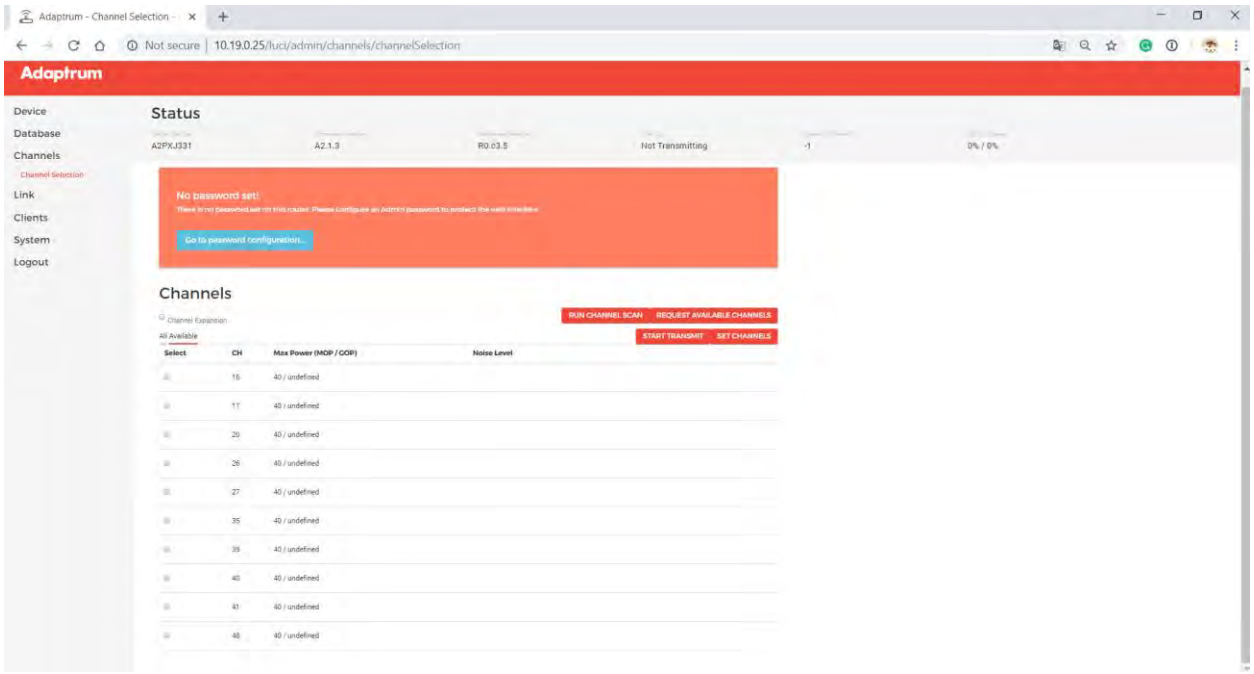
Test Results		
Pass	**Fail**	**Comment**
☒	☐	

BASE SOFTWARE SHOWING SUCCESSFULDEVICE REGISTRATION WITH PERMITTED CHANNELS





BASE SOFTWARE SHOWING SUCCESSFULDEVICE REGISTRATION WITH PERMITTED CHANNELS - CONTINUE



8.3. FIXED TVDB DATABASE UPDATE

CLAUSES

- §15.711(h)

REQUIREMENT

If a fixed or Mode II personal/portable TVBD fails to successfully contact the white space database during any given day, it may continue to operate until 11:59 p.m. of the following day at which time it must cease operations until it re-establishes contact with the white space database and re-verifies its list of available channels.

To simulate that the device fails to successfully contact the database, block access to the database from the WSD by removing connection to the database. All other radio functions, including internet connectivity should be maintained. Confirm that the WSD ceases operation by 11:59PM on the following day

TEST PROCEDURE

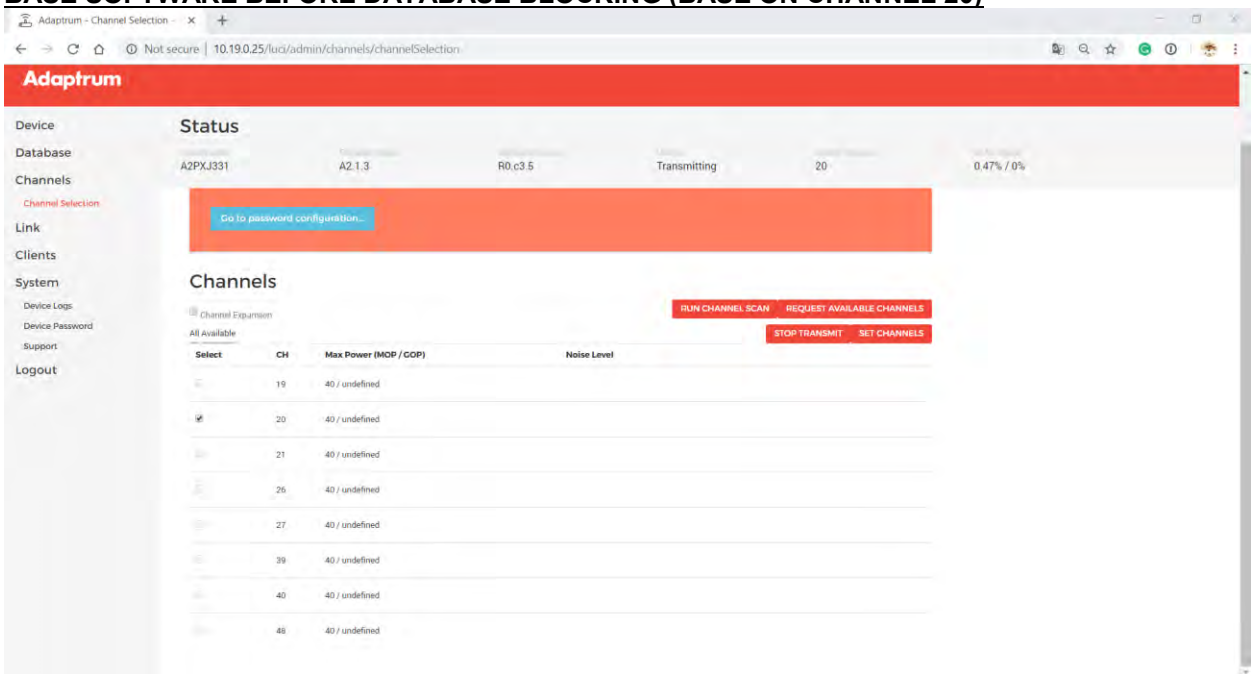
- Set the base EUT to normal operation mode:
  - Enter proper registration information on the base.
  - Base contacts the TVWS to perform registration.
  - Base contacts the TVWS to retrieve channel list.
  - Select an operating channel from returned channel list.
  - Enable base transmission.
- Observe the base EUT output signal on the spectrum analyzer.
- Use a programmable router to block the database URL.
- Observe that there is no output signal from the base after 11:59 PM on the following day.

RESULTS

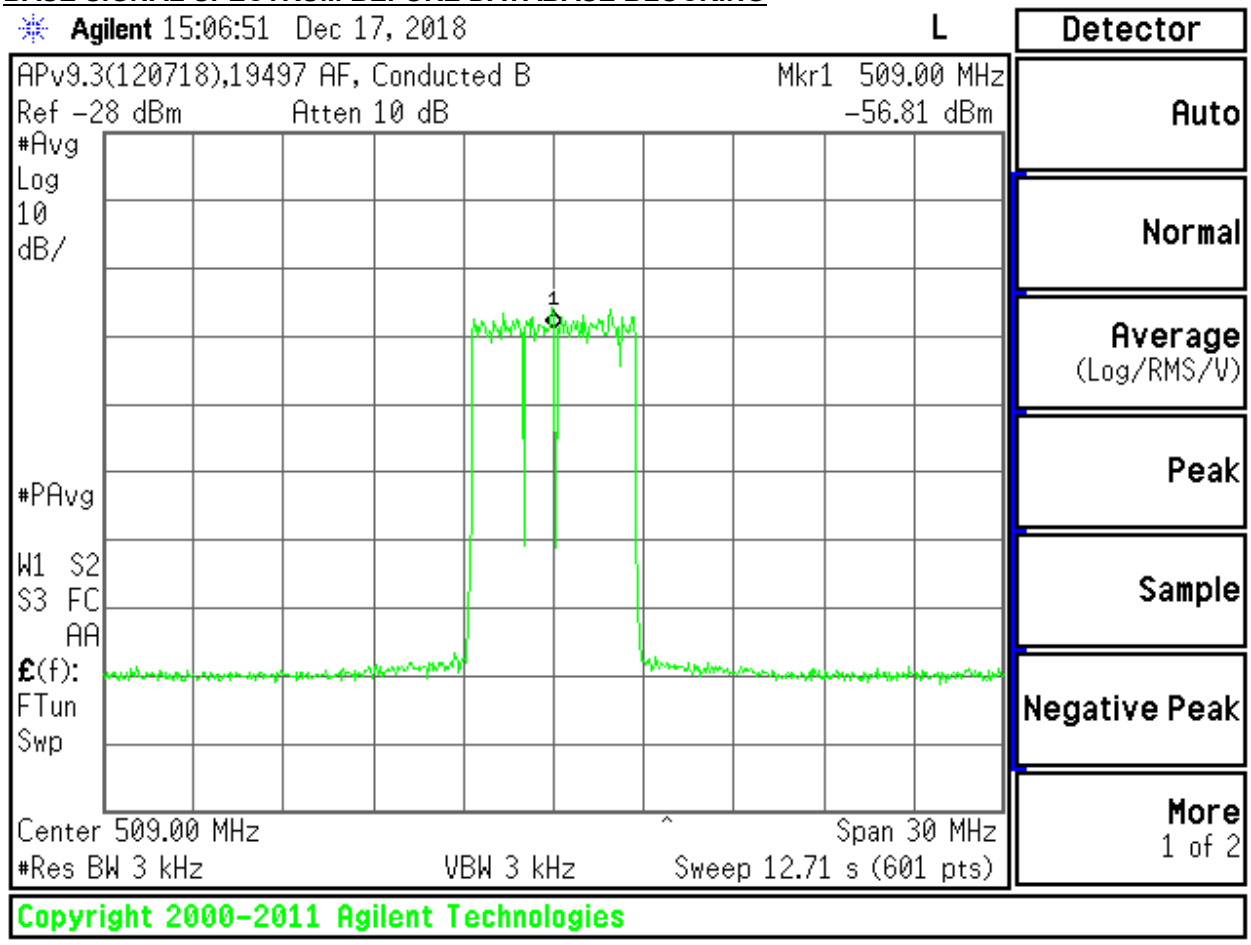
During normal operation, the base and client channel lists are updated periodically by sending channel list requests to the TVWS Database. For test purposes this time period was shortened. After the database access was blocked, the next channel list requests failed and the EUTs stopped transmission immediately.

Test Results		
Pass	**Fail**	**Comment**
☒	☐	

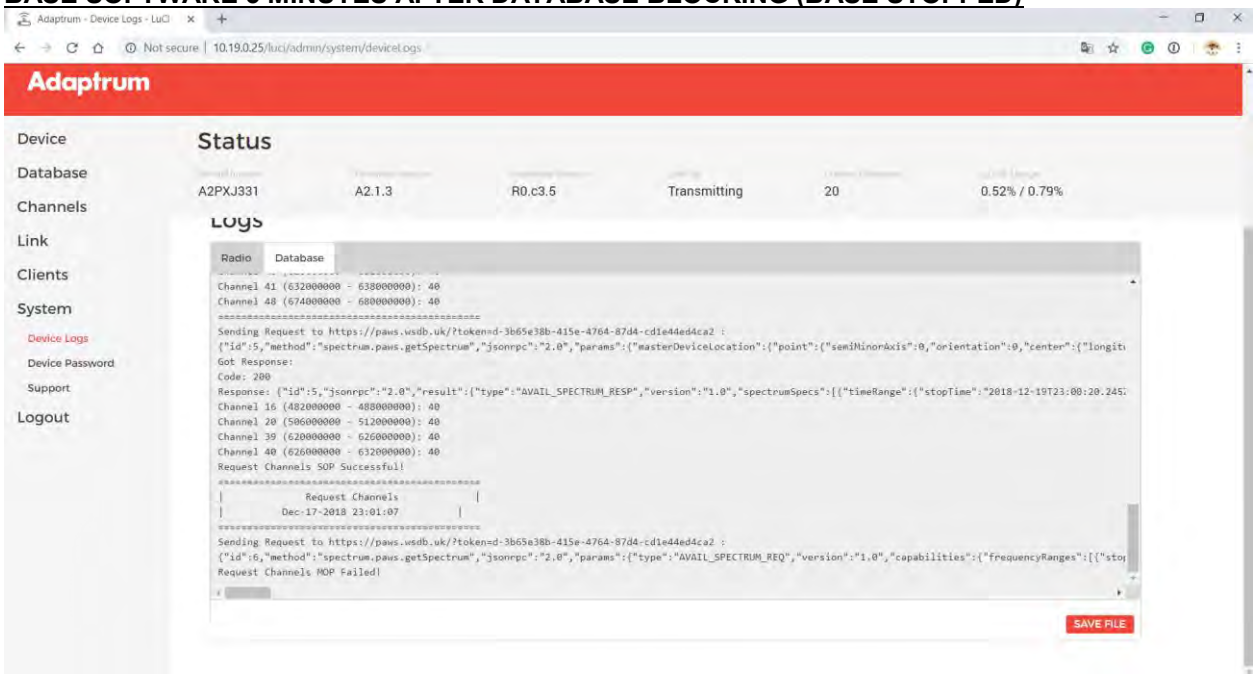
BASE SOFTWARE BEFORE DATABASE BLOCKING (BASE ON CHANNEL 20)



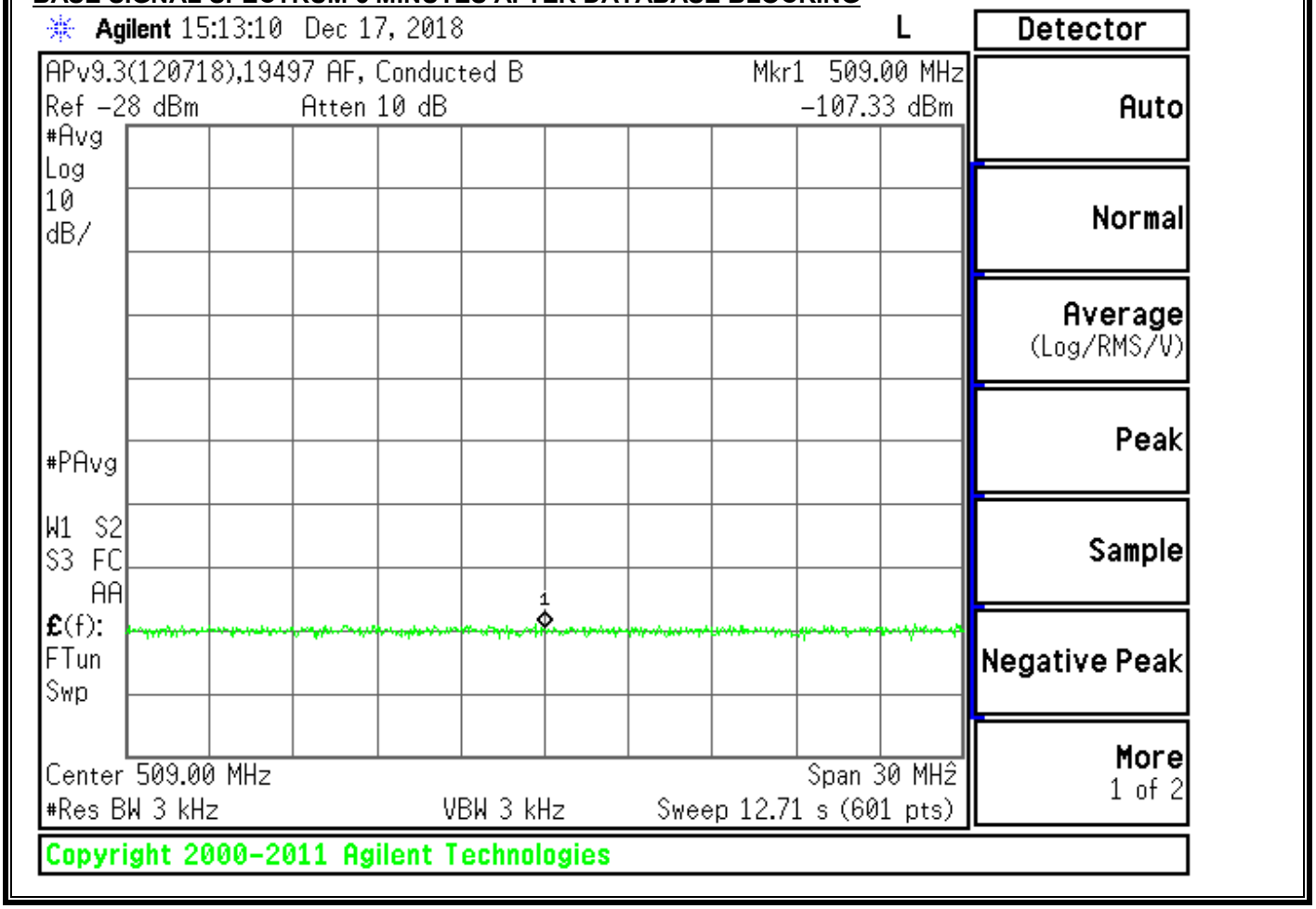
BASE SIGNAL SPECTRUM BEFORE DATABASE BLOCKING



BASE SOFTWARE 5 MINUTES AFTER DATABASE BLOCKING (BASE STOPPED)



BASE SIGNAL SPECTRUM 5 MINUTES AFTER DATABASE BLOCKING



8.4. 48 HOUR CHANNEL SCHEDULING

CLAUSES

- FCC §15.711(c)(2)(iii)
- FCC §15.713(a)(1)

REQUIREMENT

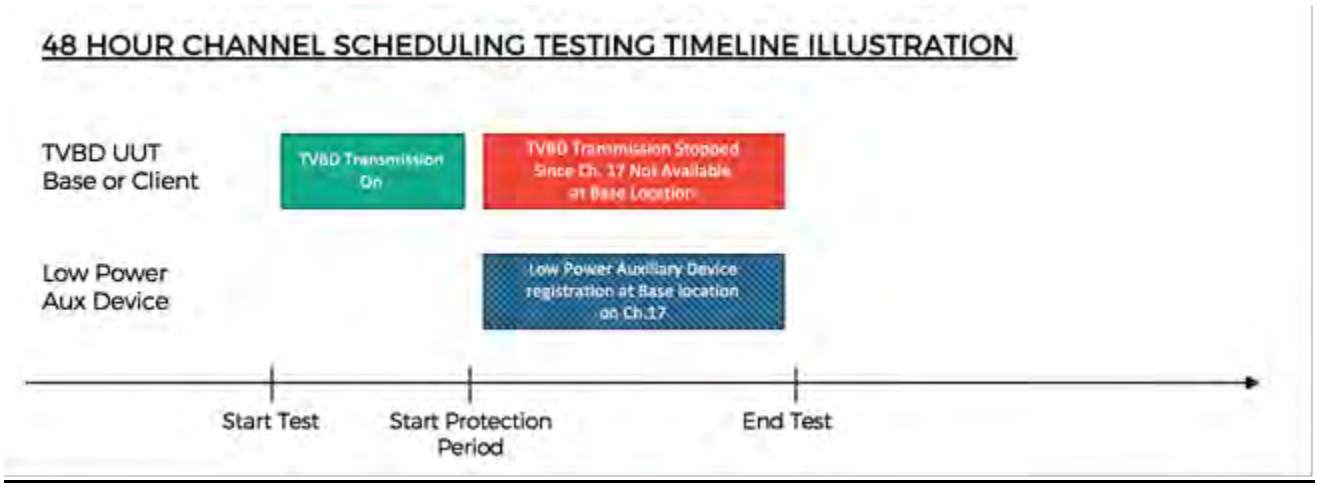
Each fixed whitespace device shall access the database at least once a day to verify that the operating channels continue to remain available. Each fixed white space device must adjust its use of channels in accordance with channel availability schedule information provided by its database for the 48-hour period beginning at the time the device last accessed the database for a list of available channels.

After receiving an available channel list, register a low-power auxiliary device on the WSD operating channel to operate on an available channel and in the upcoming time period when the device will be tested. Repeat the available channel request after the update interval and in the time period when the low-power auxiliary device is scheduled to operate, and confirm that the low-power device is accounted for in the schedule. Using the system management software, confirm that the device changes channels at the scheduled time.

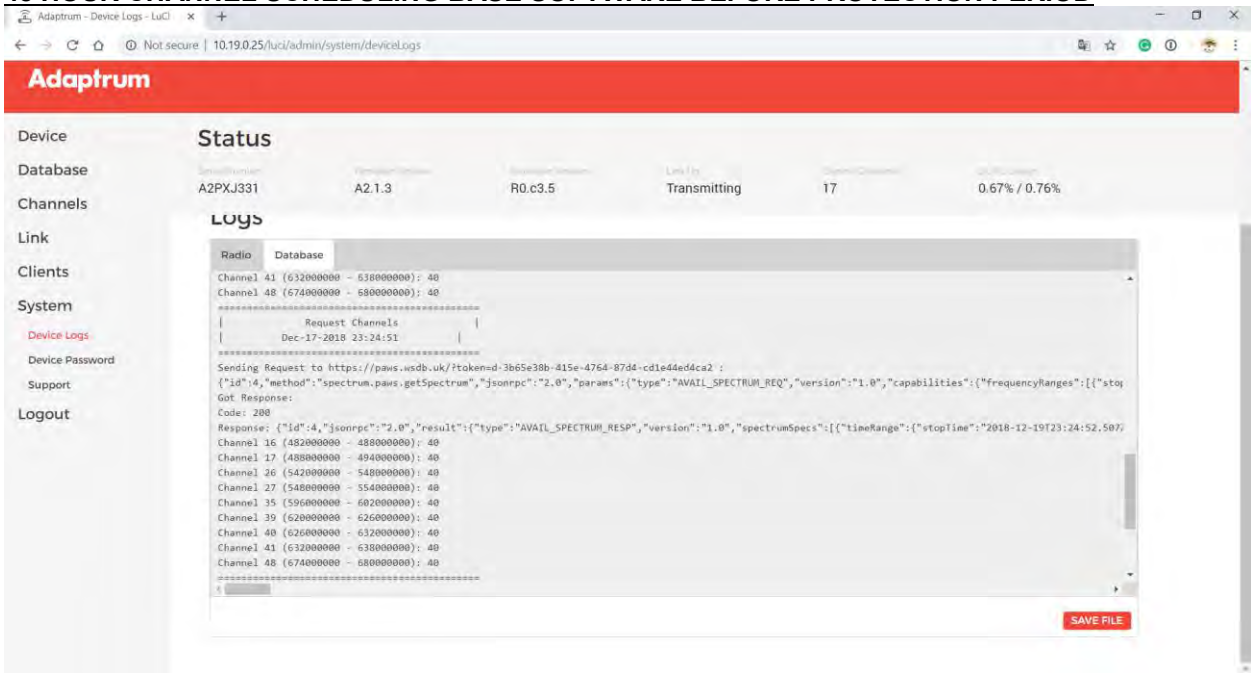
TEST PROCEDURE

1. A lower power auxiliary devices are registered and scheduled for protection at both base and client locations
2. Allow the base and client EUT to enter normal operations prior to testing
3. Upon channel list request to the TVWS Database, the base EUT obtains the channel list expiration time reflecting the low power auxiliary device's registered protection period
4. The base EUT requests new channel list upon the channel list expiration time and the base EUT's current operation channel is no longer in the returned channel list
5. The base EUT ceases transmission on the protected channel immediately
6. Steps 3-5 were repeated for client EUT

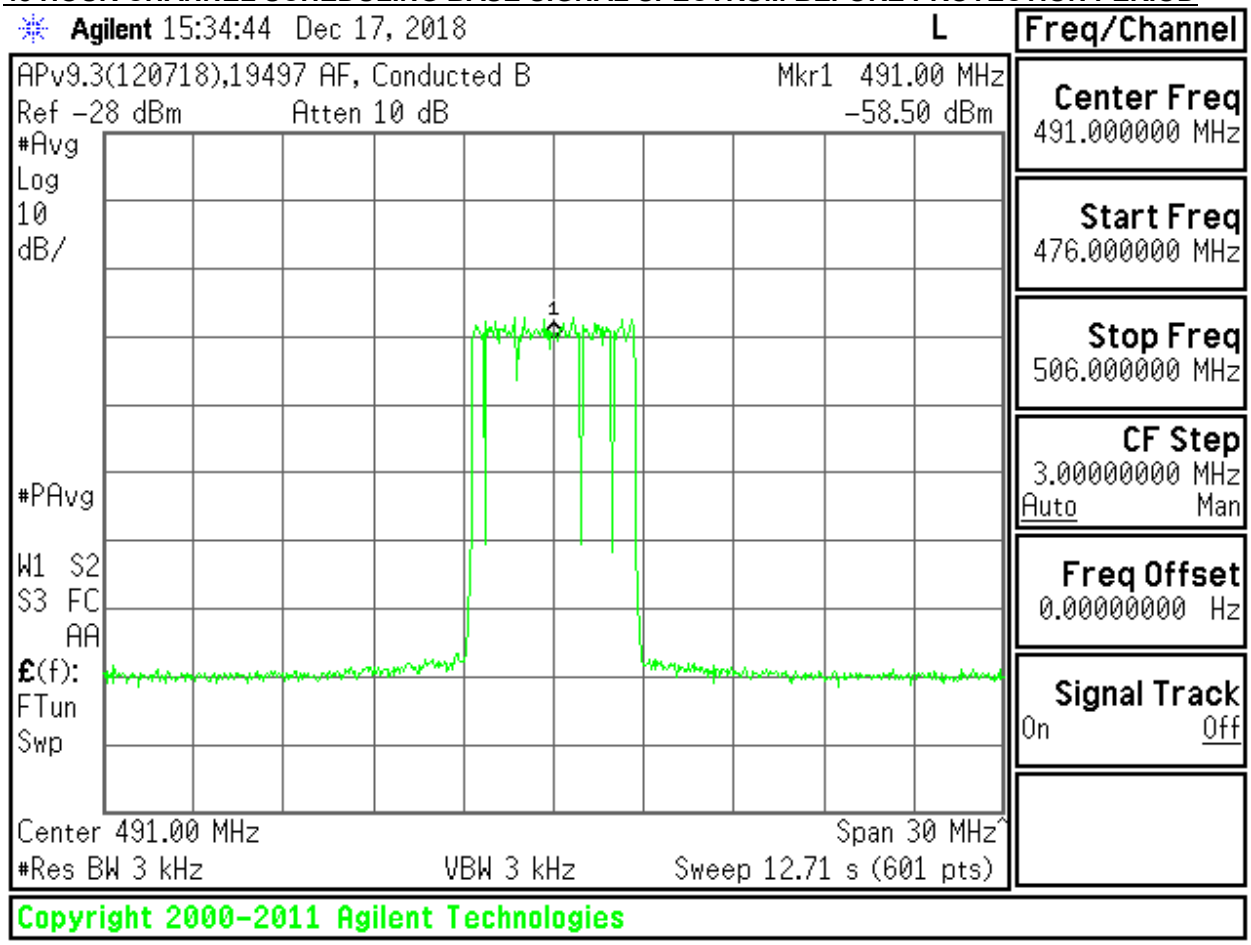
Test Results			
Pass	**Fail**	**Tested By**	**Test Date**
☒	☐	12506	12/19/19



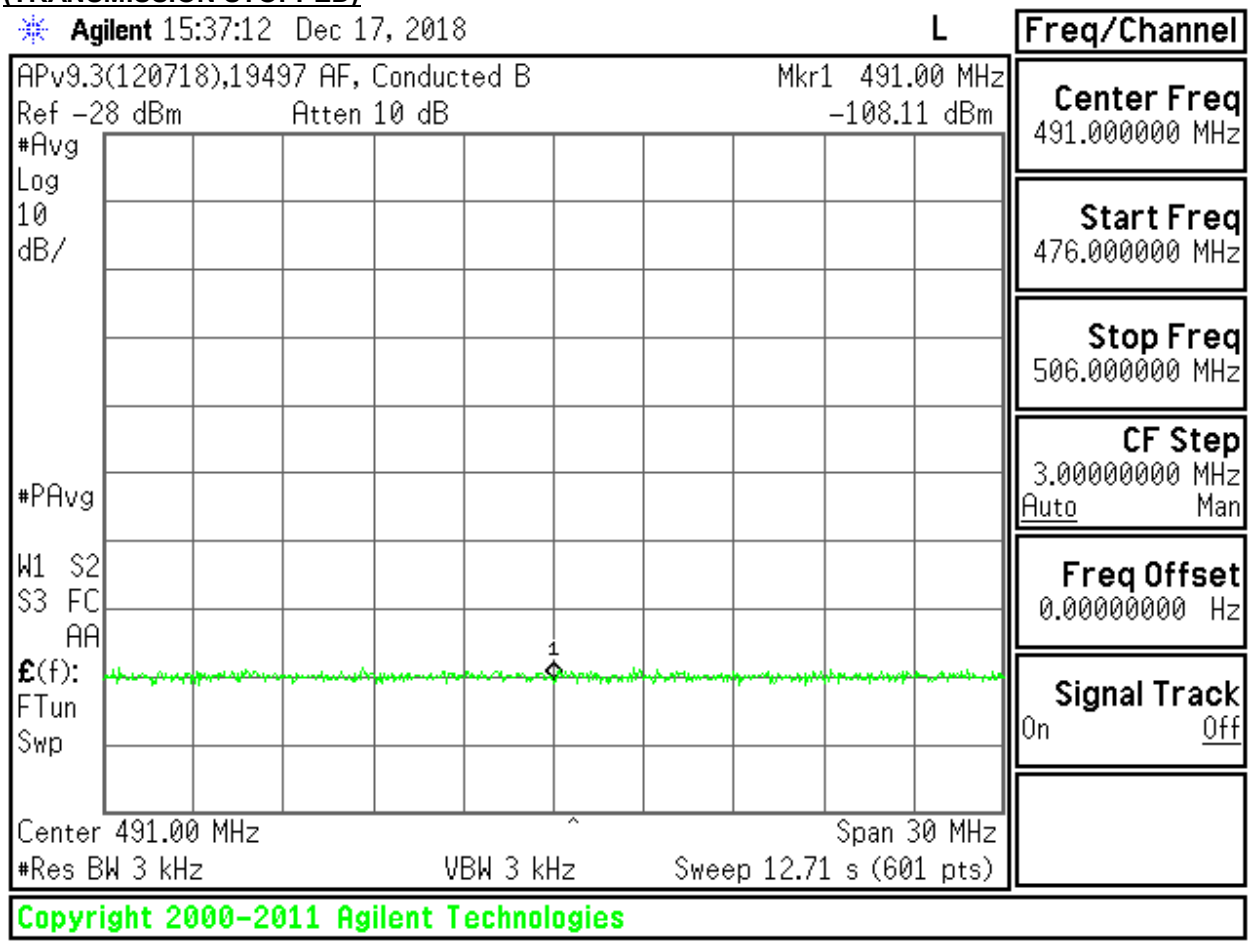
48 HOUR CHANNEL SCHEDULING BASE SOFTWARE BEFORE PROTECTION PERIOD



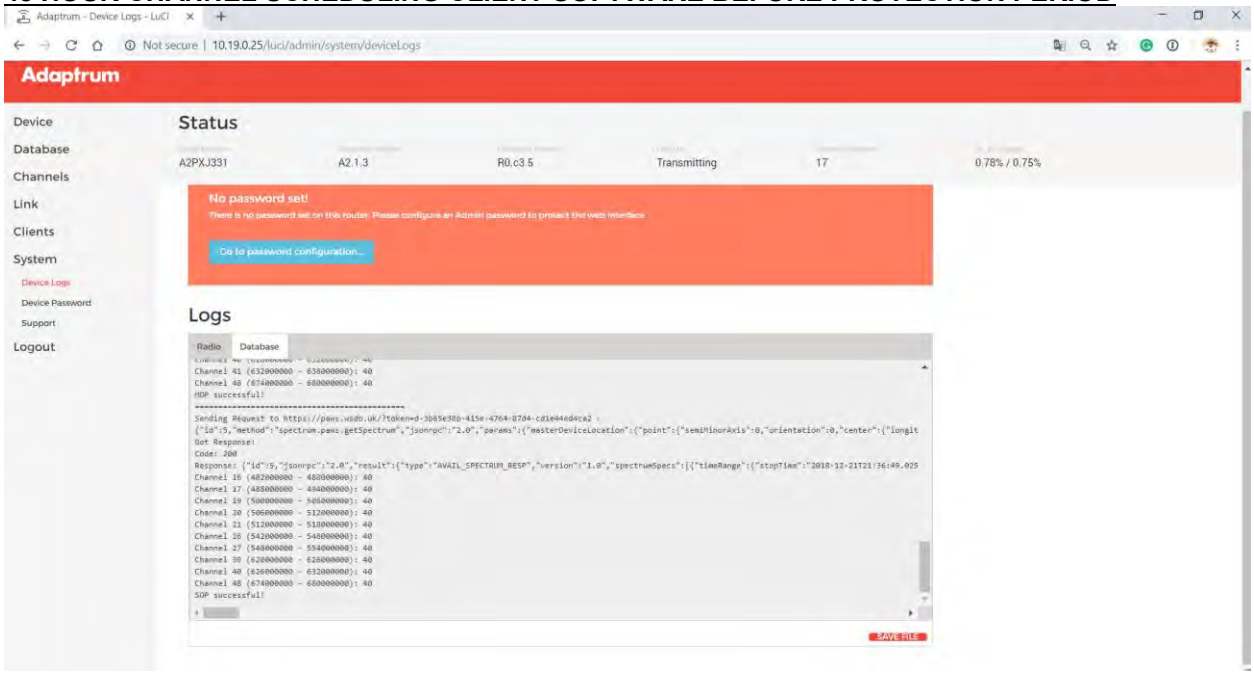
48 HOUR CHANNEL SCHEDULING BASE SIGNAL SPECTRUM BEFORE PROTECTION PERIOD



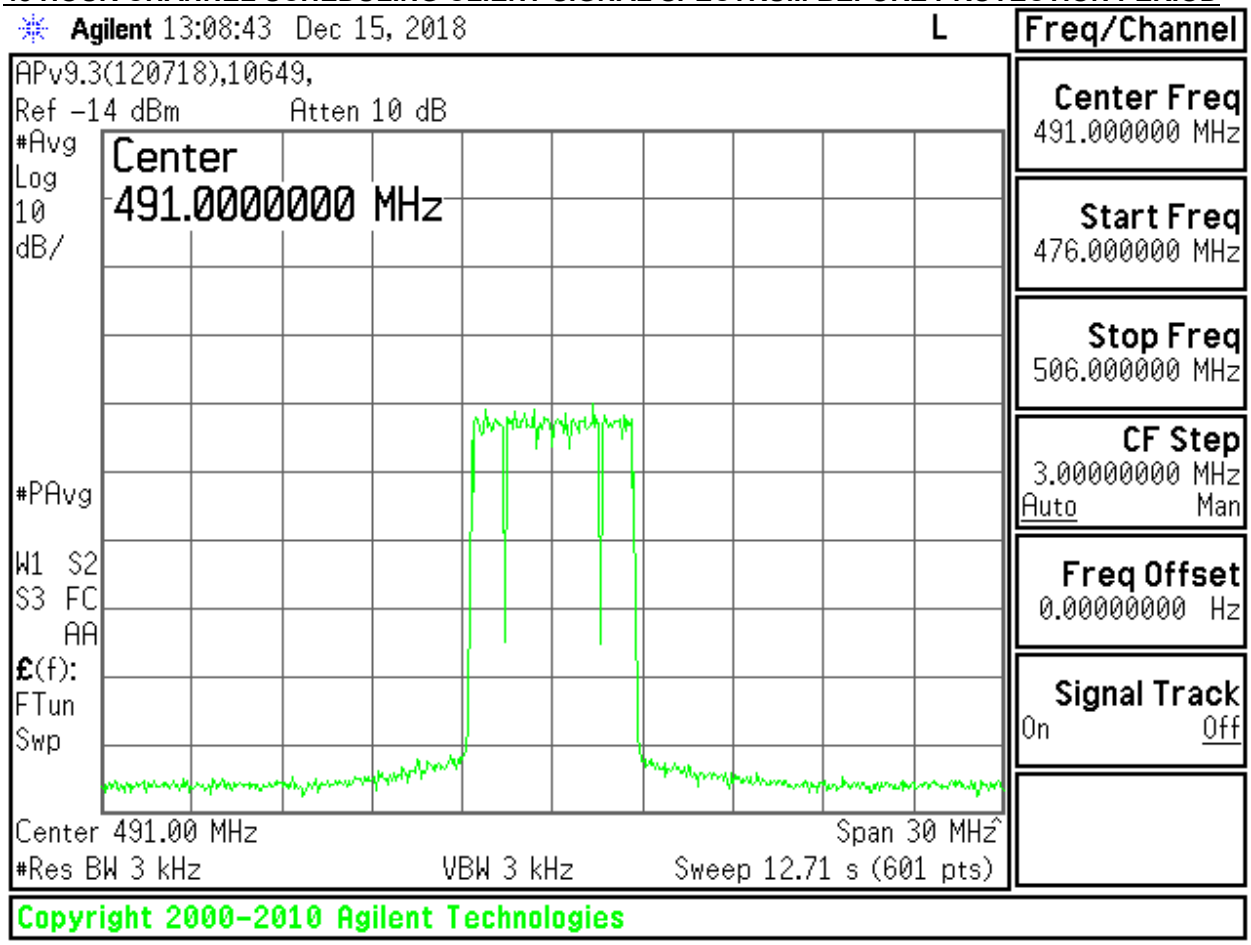
48 HOUR CHANNEL SCHEDULING BASE SIGNAL SPECTRUM DURING PROTECTION PERIOD (TRANSMISSION STOPPED)



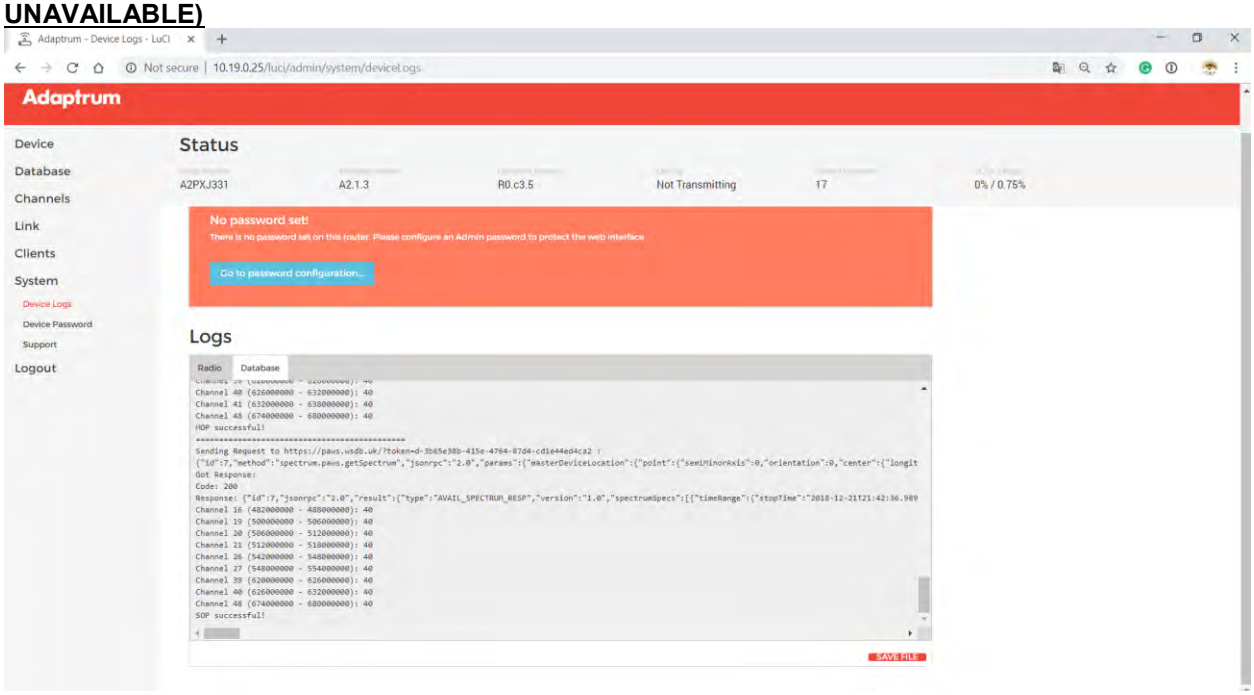
48 HOUR CHANNEL SCHEDULING CLIENT SOFTWARE BEFORE PROTECTION PERIOD



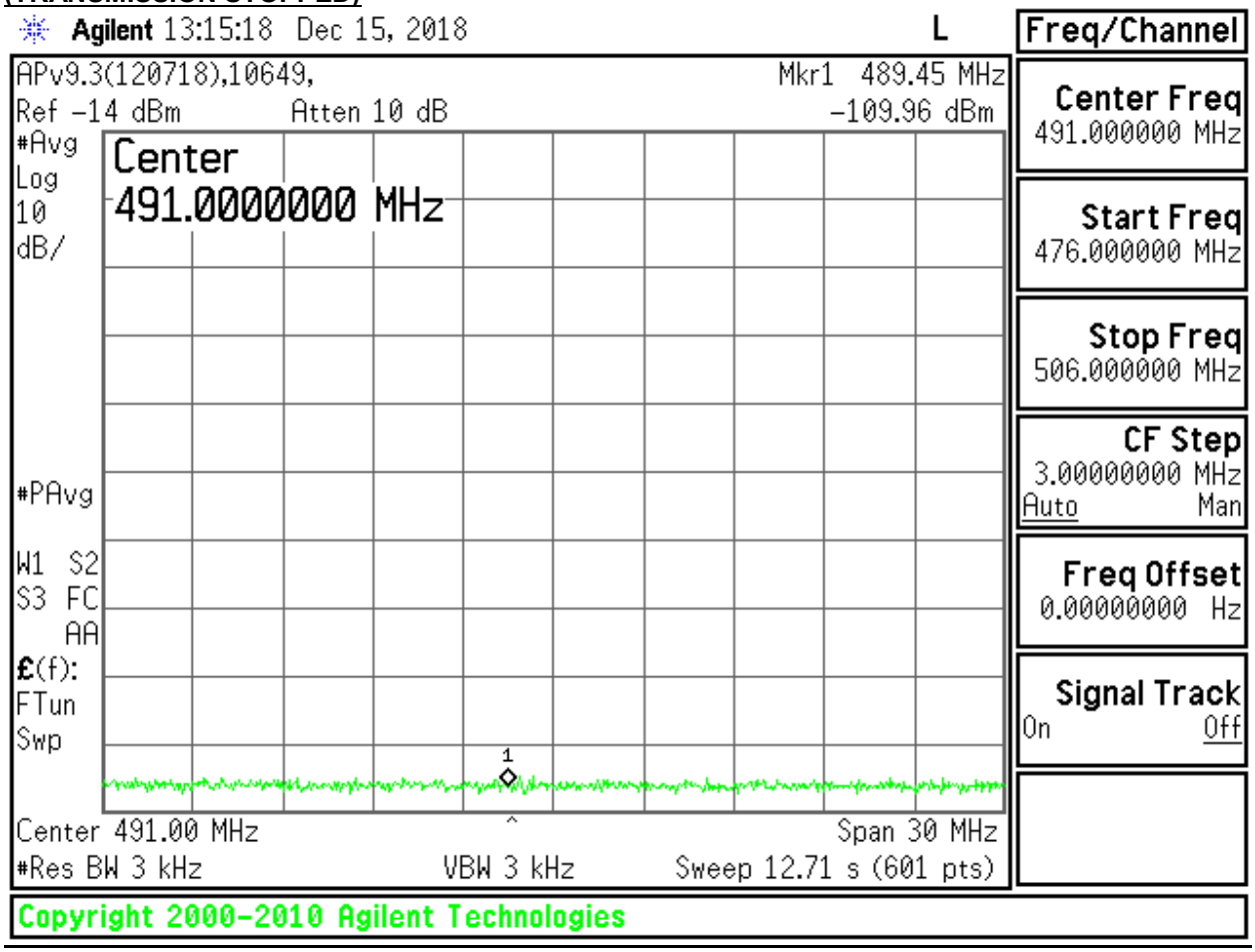
48 HOUR CHANNEL SCHEDULING CLIENT SIGNAL SPECTRUM BEFORE PROTECTION PERIOD



48 HOUR CHANNEL SCHEDULING CLIENT SOFTWARE DURING PROTECTION PERIOD (CHANNEL 17 UNAVAILABLE)



48 HOUR CHANNEL SCHEDULING BASE SIGNAL SPECTRUM DURING PROTECTION PERIOD (TRANSMISSION STOPPED)



8.5. WSD CHANNEL AVAILABILITY

CLAUSES

- FCC §15.707
- FCC §15.711(c)
- FCC §15.712

REQUIREMENT

Confirm that WSD properly identifies itself as fixed or personal/portable to the database by comparing the channel list provided by the database with those allowable to the class of WSD under test. Confirm that the WSD is operating on a channel or channels from the list at the authorized power and cannot be made to operate on an unauthorized channel.

TEST PROCEDURE

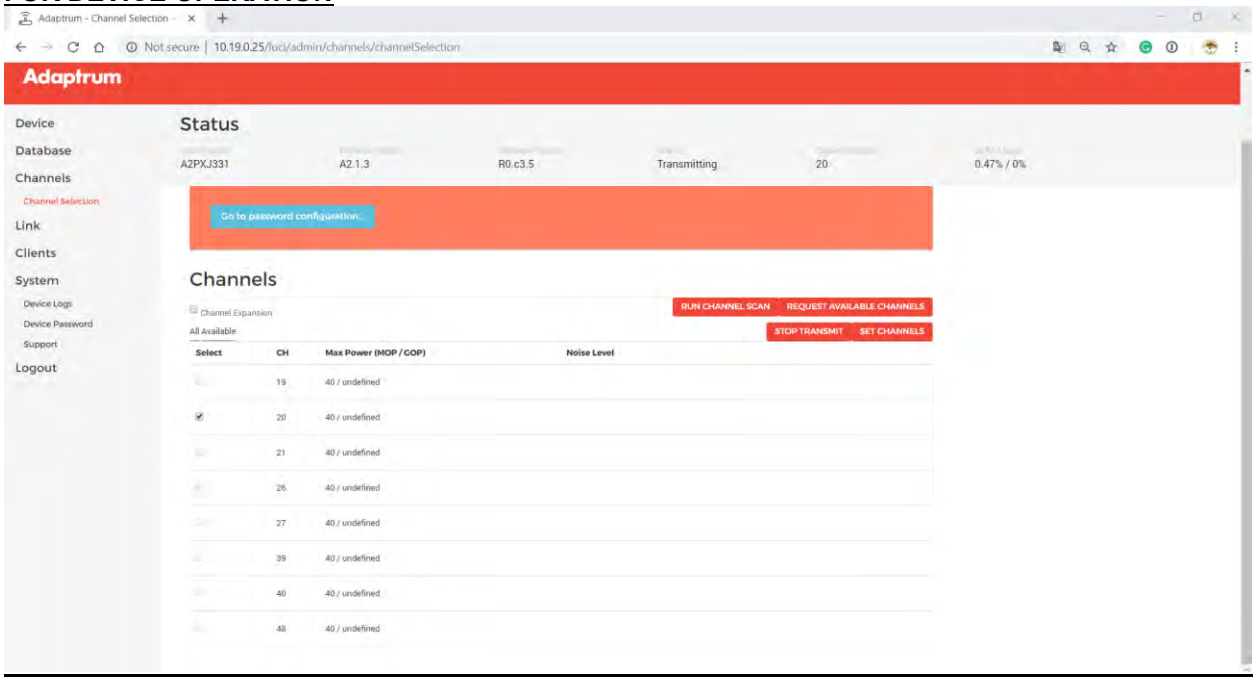
- Configure the base EUT with correct registration information.
- The base EUT automatically contacts the TVWS Database to perform device registration.
- Upon successful registration, base automatically contacts the TVWS Database to retrieve device channels.
- Confirm the base EUT software only allows the user to select a channel from the channel list returned from the database which are within the device operating frequency range
- Upon successful registration the database returns the allowable power according to the device type.
- Verify on the spectrum analyzer that the base EUT is operating on the selected channel

RESULTS

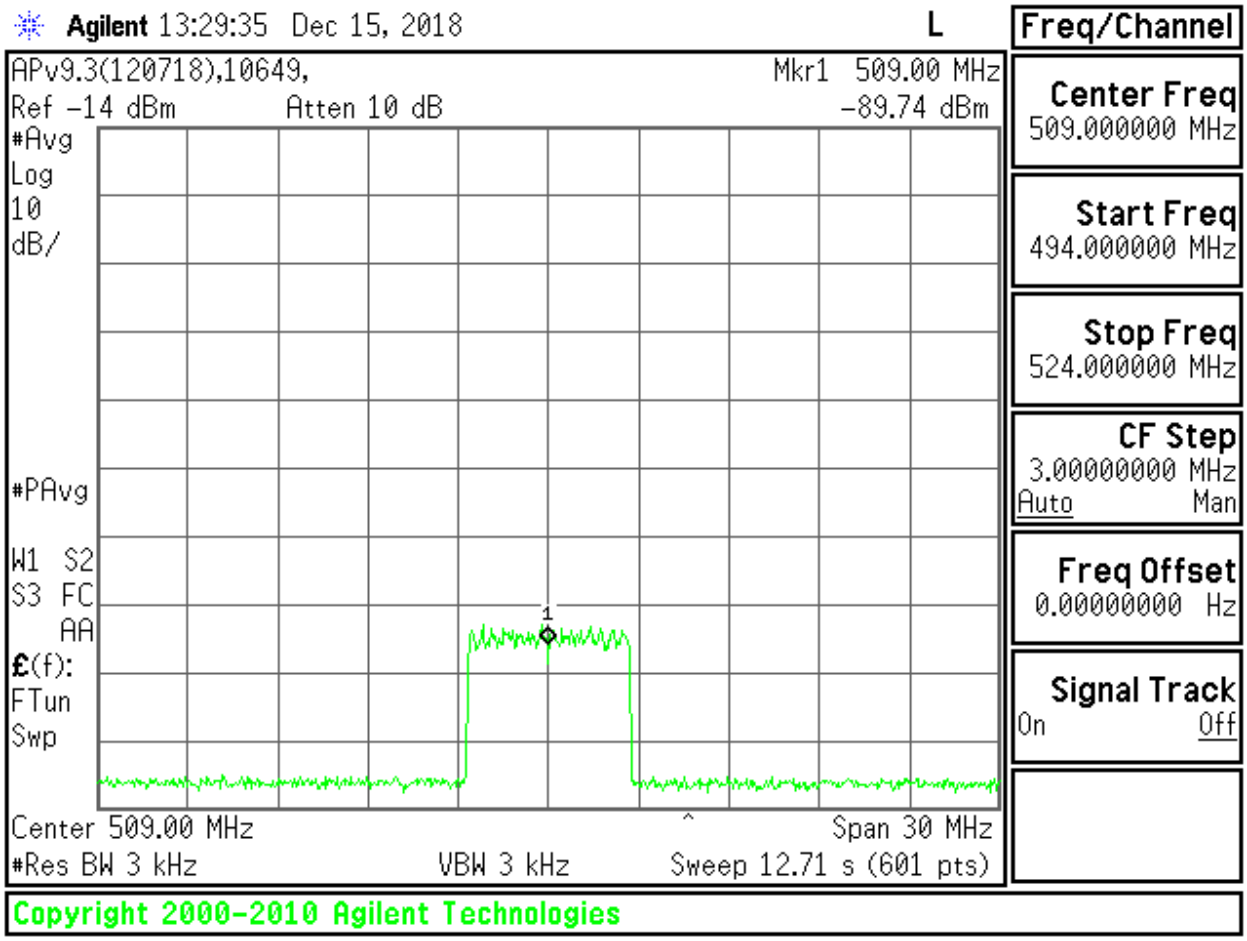
The EUT operates on a channel from the authorized channel list and at the authorized power level.
The EUT cannot select and operate on any channel other than those within the authorized channel list returned from the TVWS Database, which are within the device operating frequency range.

Test Results		
Pass	**Fail**	**Comment**
☒	☐	

BASE SOFTWARE ONLY ALLOWS A CHANNEL FROM AUTHORIZED CHANNEL LISTS TO BE SELECTED FOR DEVICE OPERATION



BASE SIGNAL SPECTRUM ON THE AUTHORIZED CHANNEL



8.6. SECURITY

CLAUSES

- §15.715(f)
- §15.713(i)
- §15.711(j)

REQUIREMENT

The device operations procedures must include documentation with a detailed explanation of the following for each database the device is expected to work with:

i. What communication protocol is used between the database and the WSD?
ii. How are communications initiated?
iii. How does the WSD validate messages from the database?
iv. How does the device handle failure to communicate or authenticate the database?
v. How does the database validate messages from a WSD?
vi. What encryption method is used?
vii. How does the database ensure secure registration of protected devices?

ANSWERS

i. What communication protocol is used between the database and the WSD?

The Fixed WSD (WSD) connects to the Nominet database using HTTP over SSL/TLS. The protocol, as certified by Nominet at the FCC, used over this transport layer is similar to the IETF Protocol to Access White Space (PAWS) Draft-12 specification.

ii. How are communications initiated?

The WSD initiates communication with the Nominet database by initially sending an INIT_REQ message containing a Device Descriptor. The Device Descriptor element contains the device serial number, manufacturer ID, and model ID, which in the US is FCC ID.

iii. How does the WSD validate messages from the database?

The identity of the Nominet database is validated through verification of the Nominet SSL certificate through standard third-party certificate authority mechanisms, ensuring communications are secure and authenticated between the WSD and the database. At the application layer both the WSD and database only handle messages that conform to the PAWS protocol specification. One additional message validation feature included in PAWS is the ability for the WSD to correlate a response with a specific request by comparing the message's ID field with the ID field of the request that was sent.

iv. How does the device handle failure to communicate or authenticate the database?

If the WSD has never communicated with or authenticated the database, it will not allow operations to begin. If the WSD experiences a communication or authentication failure, then it will cease operation by 11:59 PM on the following day.

v. How does the database validate messages from a WSD?

The database validates messages from the WSD by checking a token that must correspond with the provided serial number, manufacturer name, and FCC ID received in the Device Descriptor data element present in every message versus a table of validated client devices that is populated ahead of deployment. The list of valid serial numbers is communicated from device manufacturer to Nominet via a separate web dashboard where authorized (by Nominet) parties can generate tokens for specific devices (one at a time or via bulk method).

vi. What encryption method is used?

SSL/TLS standard encryption is used to encrypt packets sent between WSD and database.

vii. How does the database ensure secure registration of protected devices?

In this document, we interpret "protected devices" to mean entities authorized by the rules for protection from WSD transmissions, e.g., Temporary BAS, MVPD, Licensed and Unlicensed Microphones.

Nominet provides a public interface that is available to entities, authorized for protection under CFR Title 47 Part 15 Subpart H, to create protected contours.

8.7. Push notification to Fixed

CLAUSES

- §15.711(i)

REQUIREMENT

Confirm that the WSD device changes channels (or cease operation) when it receives 'push' notification from the database.

Using system management software, register the device at (specific coordinates) and wait for the database to send a push notification. Confirm that, once the notification is received, the device responds to the new channel availability list provided by the database, which would include ceasing operation on a channel no longer available, or ceases operation.

TEST PROCEDURE

- Obtain a successful registration to the database.
- Transmit on desired channel
- Wait for database to send a push notification to cease operation on desired channel
- Confirm that once the push notification is received, a new channel availability list is provided and the desired channel ceases operation.

RESULTS

Per FCC Order DA-18-983, filing by Office of Engineering in Technology on 9/26/2018, the push notification requirements specified in §15.711(i) are waived through 3/31/2019

8.8. Location accuracy

CLAUSES

- §15.711(b)

REQUIREMENT

For Fixed and Mode II devices, provide details regarding the technologies used by the device to determine its location and how, in case of other than GPS technology, the location uncertainty is calculated with a 95% confidence level

RESULTS

See theory of operations for details on Location accuracy

8.9. Interference protection requirement

CLAUSES

- §15.712

REQUIREMENT

Using system management software or database, provide different location (coordinates) so that compliance with operating channel and power level is shown under each of the scenarios outlines in §15.712. Include a sample scan showing the total channel power and adjacent channel emission settings for test coordinates.

TEST PROCEDURE

For the scenarios listed below confirm there is no allowance of transmission on specific channels according to that particular location

Scenarios

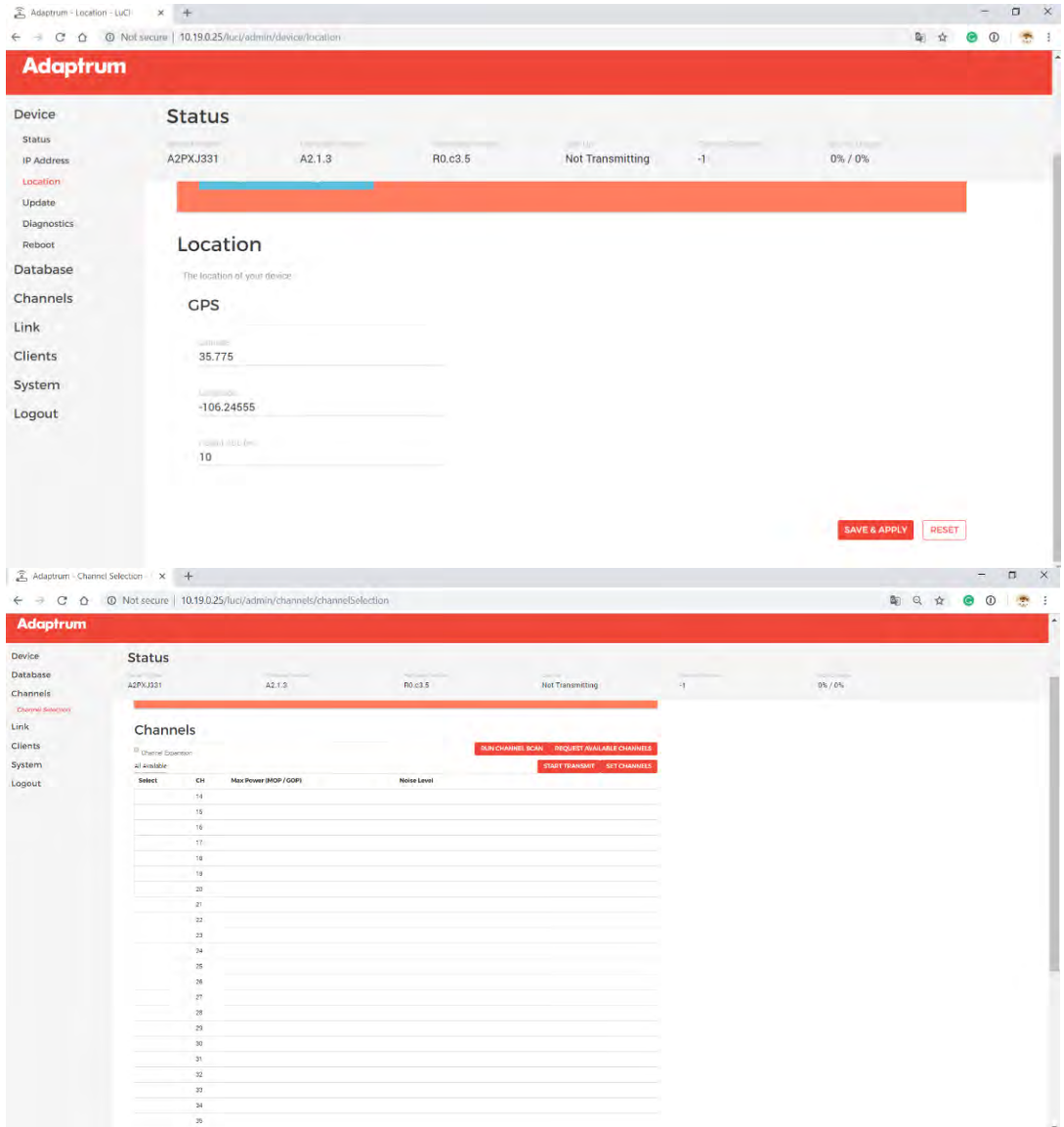
a) Digital television stations, and digital and analog Class A TV, low power TV, TV translator and TV booster stations
b) TV translator, Low power TV(including Class A) and Multi-channel Video Programming Distributor (MVPD)
c) Fixed Broadcast Auxiliary Service (BAS) links
d) PLMR/CMRS operations
e) Offshore Radiotelephone Service
f) Low power auxiliary services including wireless microphones
g) Border areas near Canada and Mexico
h) Radio astronomy services
i) 600 Mhz service band
j) Wireless Medical Telemetry Service
k) 488-494 MHz band in Hawaii

RESULTS

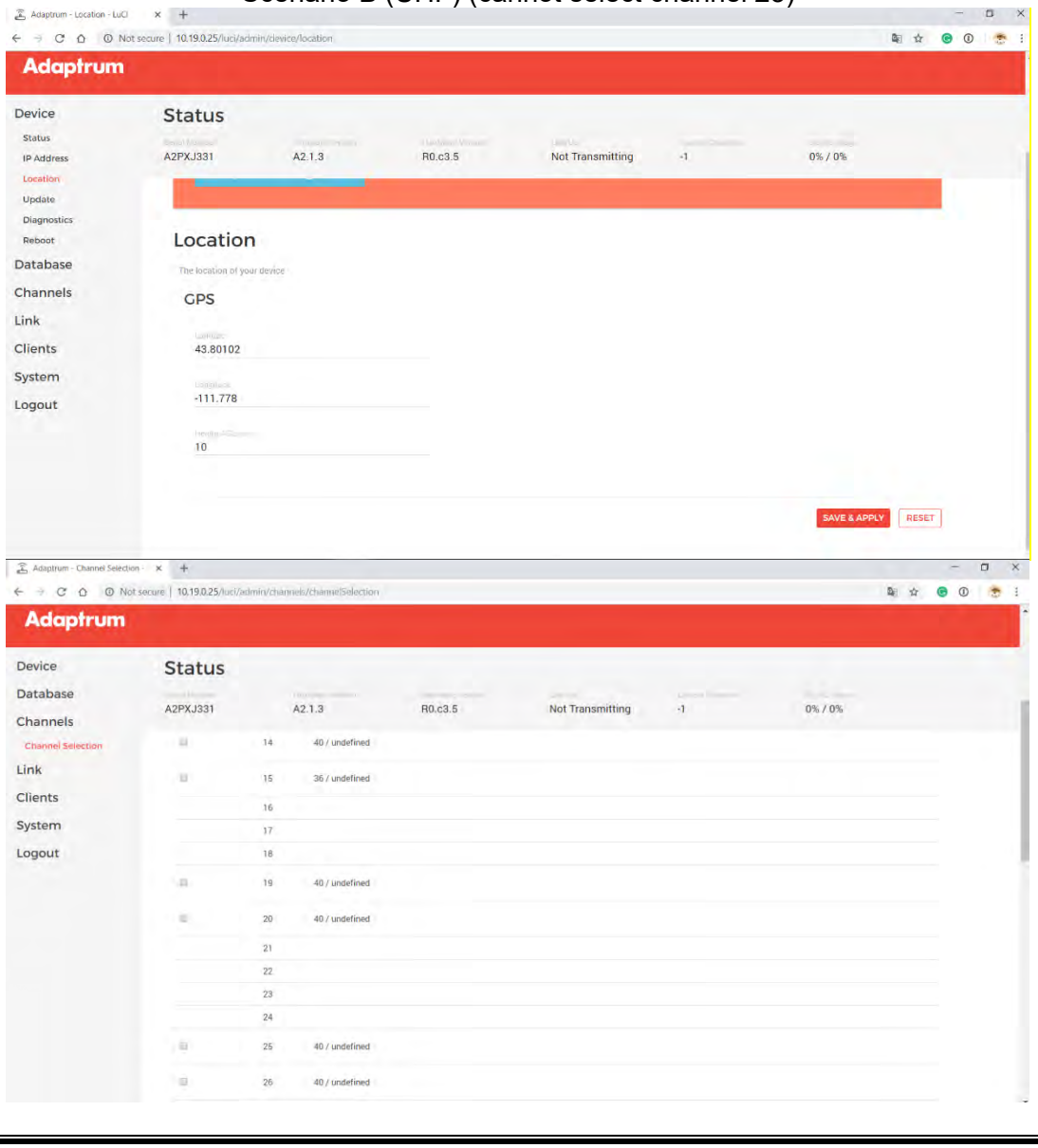
Scenario		Coordinate	Note
a	Digital television stations, and digital and analog Class A TV, low power TV, TV translator and TV booster stations	35.775, -106.24555 (UHF)	UHF No transmission allowed
b	TV translator, Low power TV(including Class A) and Multi-channel Video Programming Distributor (MVPD)	43.80102, -111.778 (UHF)	UHF coordinate cannot transmit Ch. 23
c	Fixed Broadcast Auxiliary Service (BAS) links	41.890417, -87.623694	Cannot transmit on Ch. 28
d	PLMR/CMRS operations	18.954722, -77.004722	Cannot transmit on Ch. 17 and 18
e	Offshore Radio telephone Service	18.954722, -77.004722	Cannot transmit on Ch. 17 and 18
f	Low power auxiliary services including wireless microphones	N/A	48 hour channel scheduling requirement was based off this scenario
g	Border areas near Canada and Mexico	32.608179, -116.969585	Cannot transmit on Ch. 6 and 32
h	Radio astronomy services	35.775, -106.24555	No channels available
i	600 MHz service band	40.78698, -119.206486	Cannot transmit on Ch. 37 and 38
j	Wireless Medical Telemetry Service	N/A	EUT does not support transmission in this frequency band
k	488-494 MHz band in Hawaii	20.88, -156.678611	Cannot transmit on Ch. 17

Test Results			
Pass	Fail	Tested By	Test Date
☒	☐	12506	12/17/19

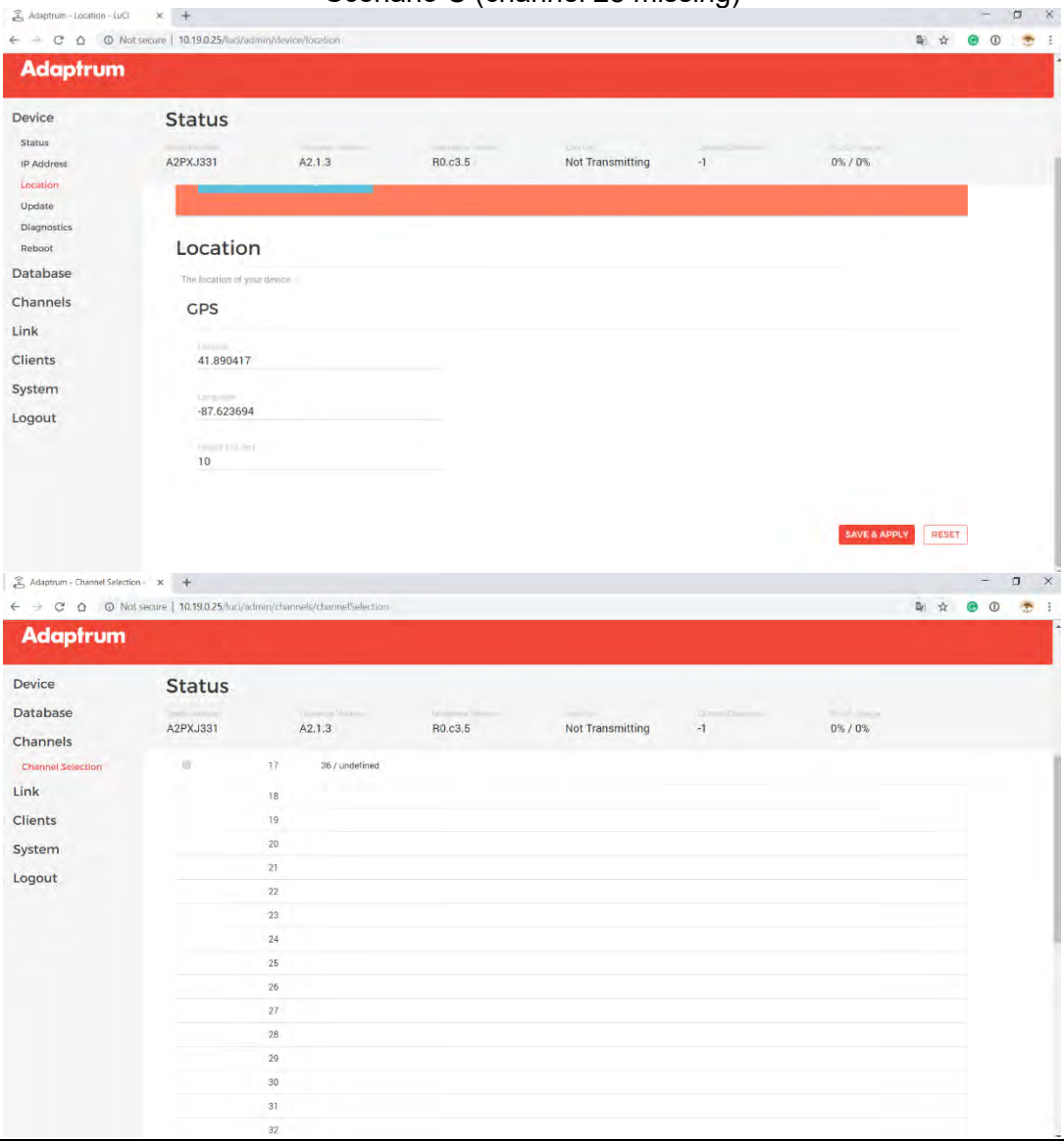
Scenario A UHF



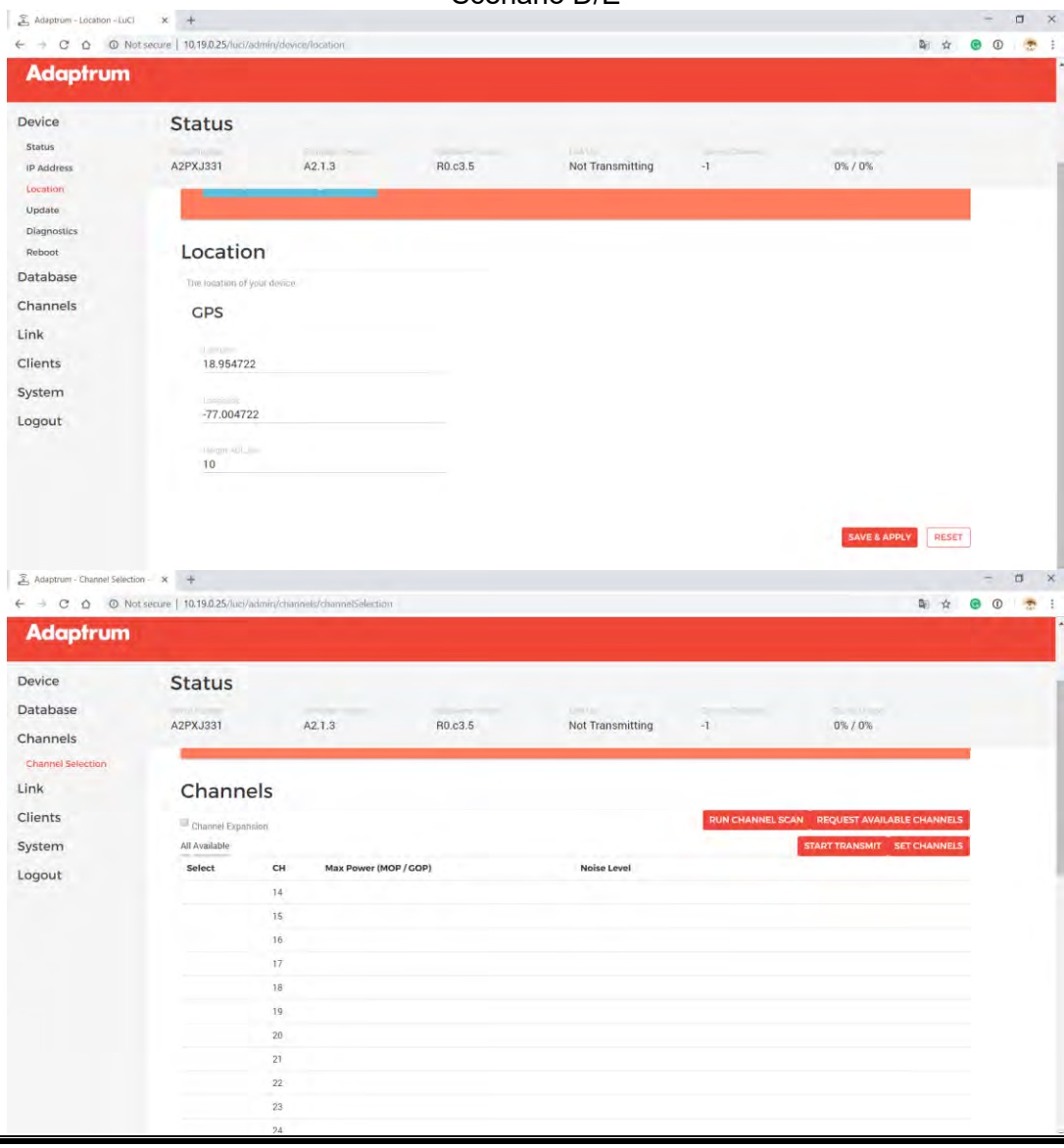
Scenario B (UHF) (cannot select channel 23)



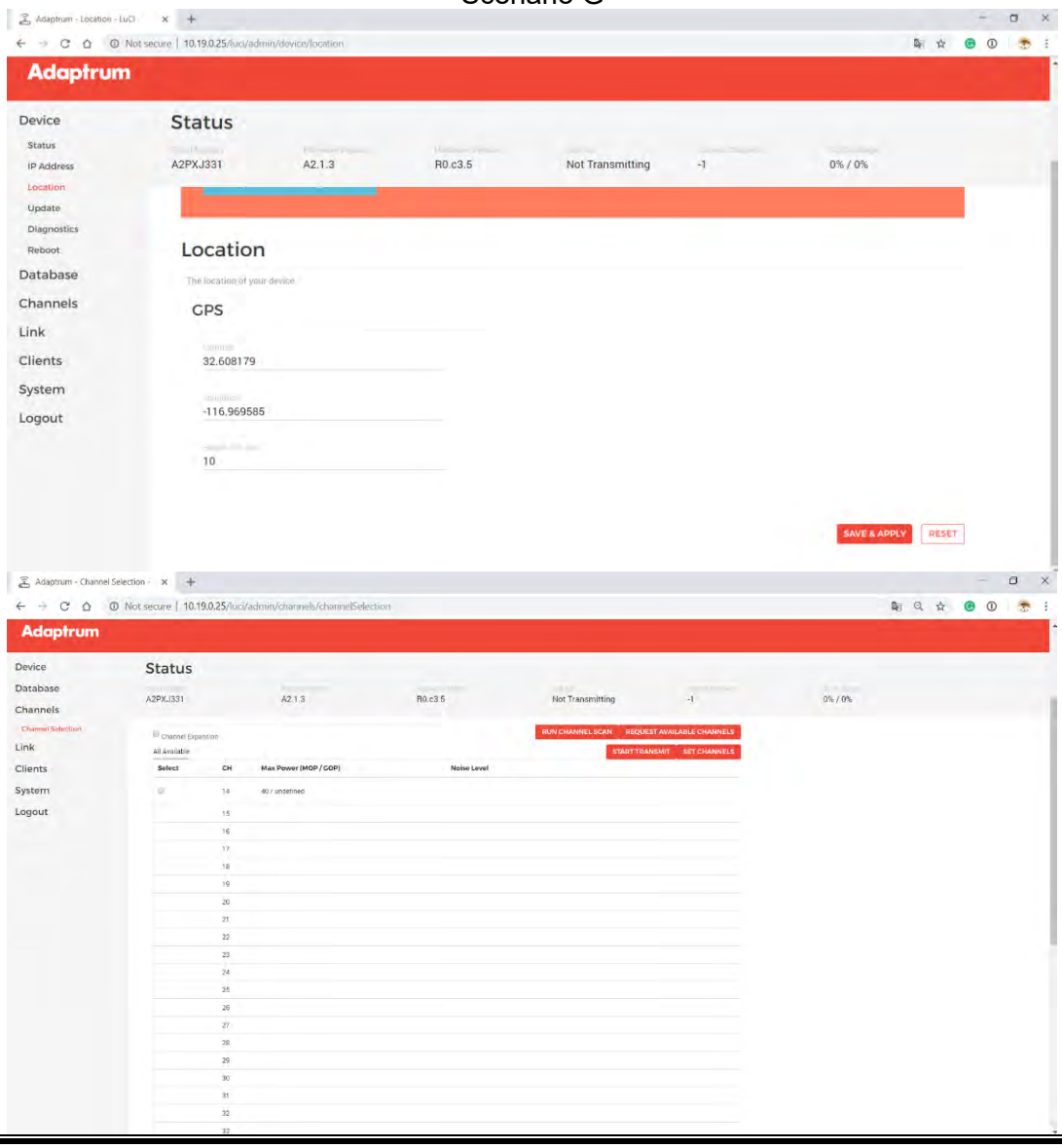
Scenario C (channel 28 missing)



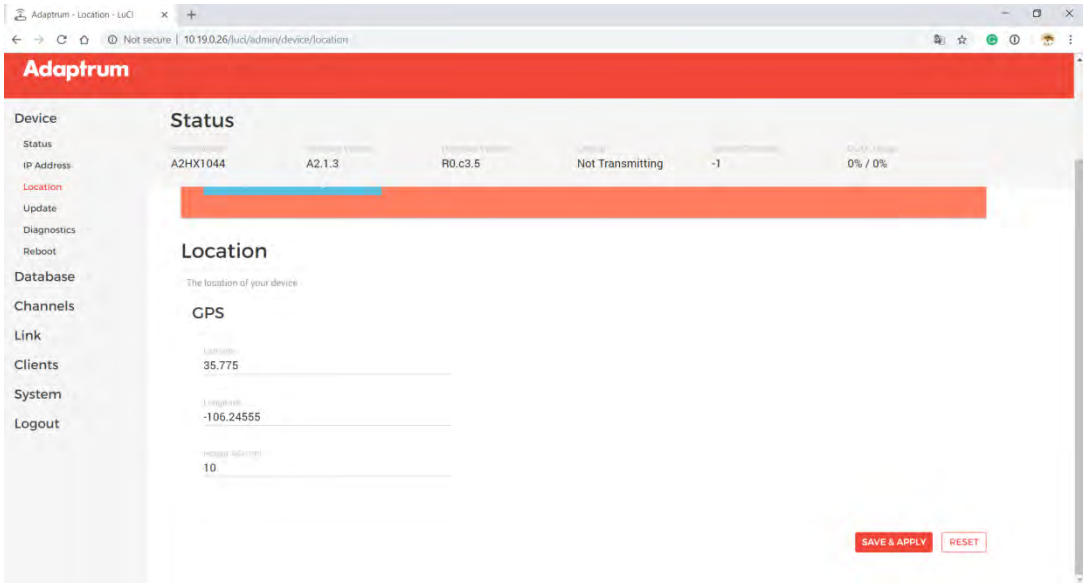
Scenario D/E



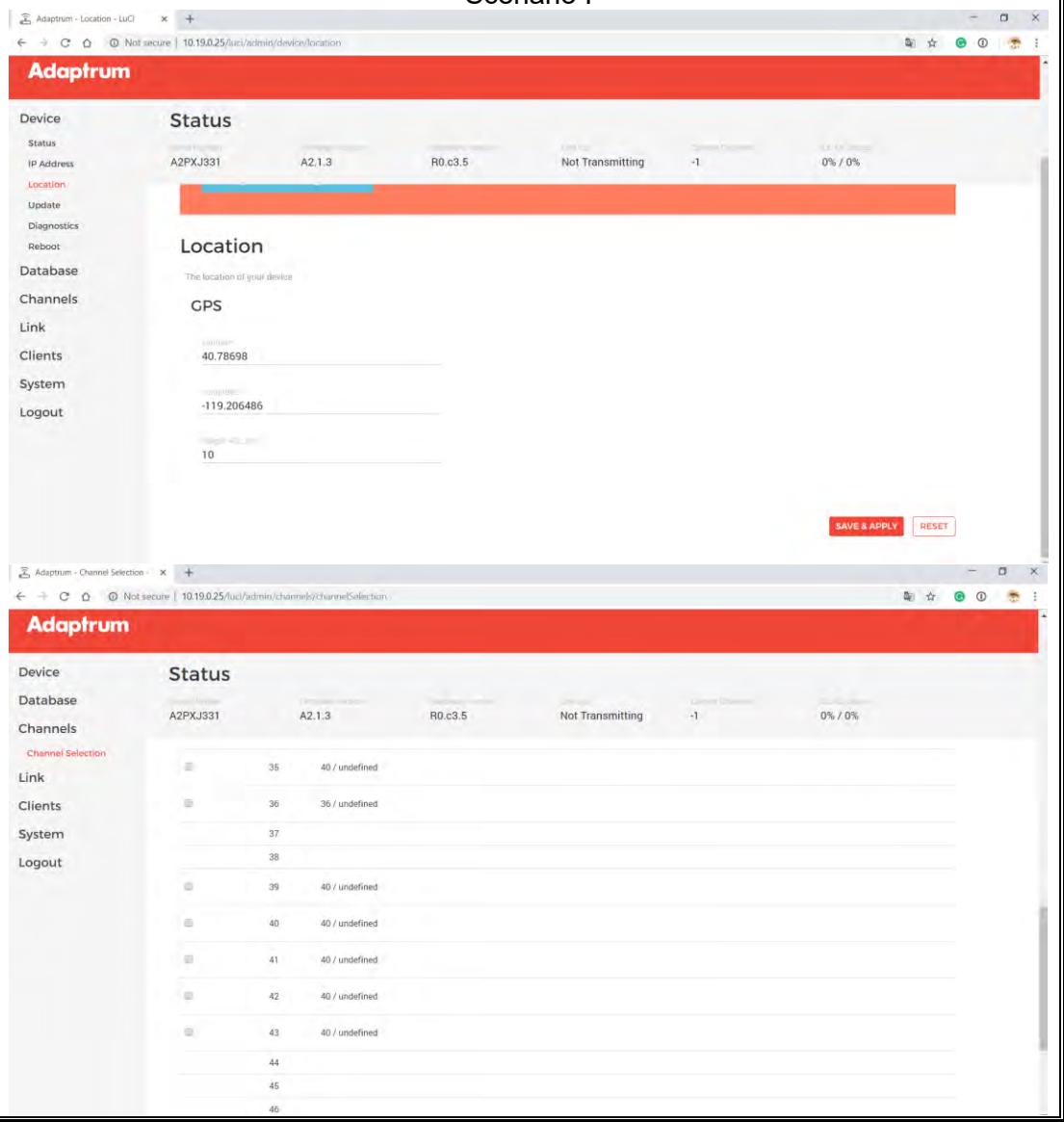
Scenario G



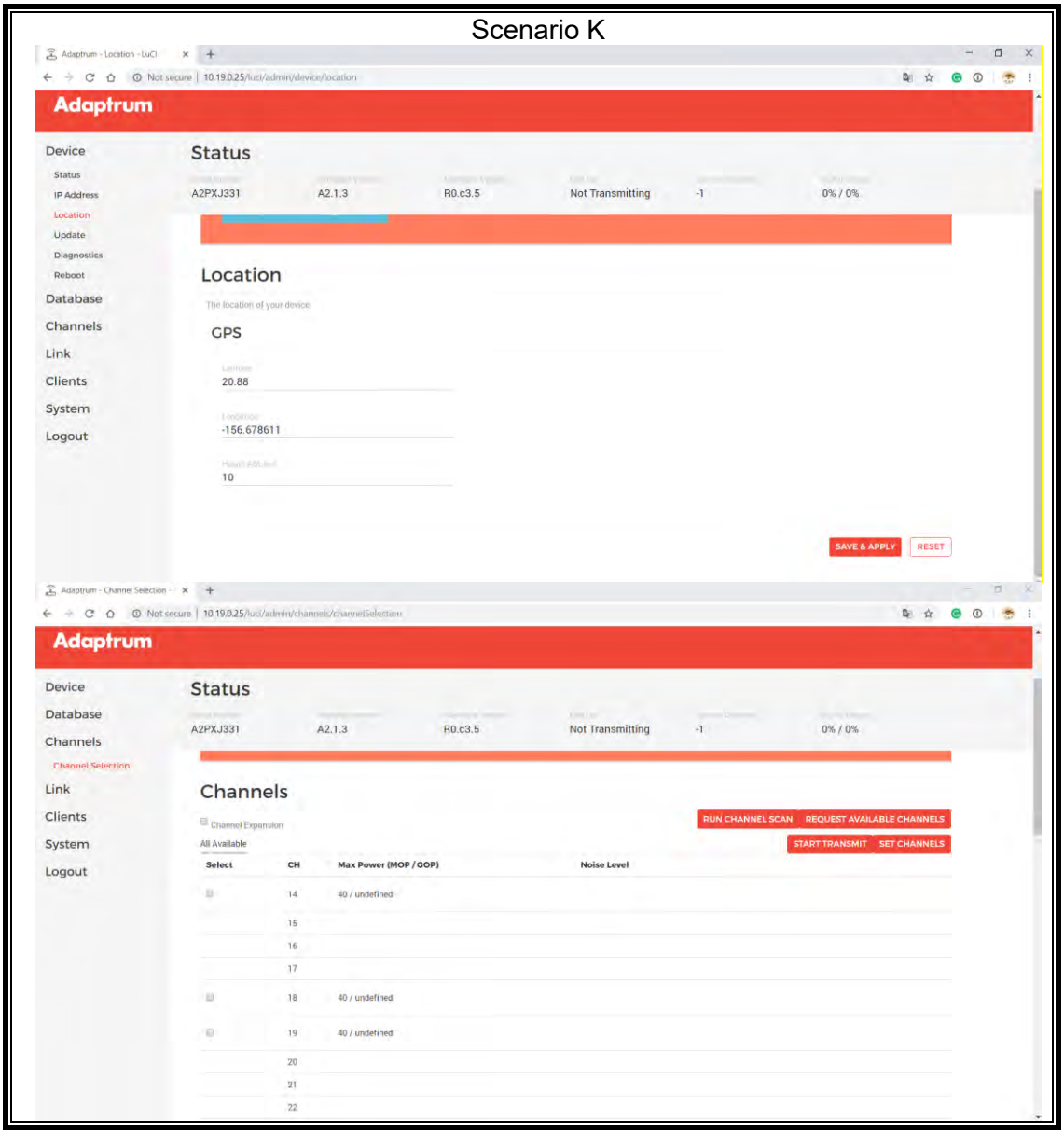
Scenario H



Scenario I



Scenario K



8.10. Fixed Power level reduction

CLAUSES

- §15.711(c)(2)(ii)
- §15.715(e)

REQUIREMENT

Using system management software, make a channel availability request to the database. Using the spectrum analyzer, confirm that the WSD operates at no more than the maximum power level indicated by the database and that the power level cannot be set to a higher level than indicated by the database at that specific location. If the device cannot reduce power, it must cease operation.

TEST PROCEDURE

- Create a successful registration with the database
- Transmit at desired channel
- Confirm with spectrum analyzer that the EUT does not operate more than the max power level indicated by the database.
- Confirm power level cannot be set higher than the level indicated by the database

RESULTS

Test Results			
Pass	**Fail**	**Tested By**	**Test Date**
☒	☐	12506	12/19/19

Successful registration, Channel availability and maximum allowed Power level