ONE WORLD ○ OUR APPROVAL

Wireless test report – 358506-1TRFWL

Applicant:

Redline Communications

Product name:

RDL-3000-RMH

Model:

RDL-3000 Ellipse

Model variant:

RDL-3000 Enterprise

FCC ID:

QC8-RDL3000RMH

Specifications:

- FCC 47 CFR Part 15 Subpart H, §15.713

  White Space devices; White space database.

Date of issue: January 18, 2019

Test engineer(s):	Andrey Adelberg, Senior Wireless/EMC Specialist	Signature:	
Reviewed by:	Kevin Rose, Wireless/EMC Specialist	Signature:	

Test location

Company name	Nemko Canada Inc.
Address	303 River Road
City	Ottawa
Province	Ontario
Postal code	K1V 1H2
Country	Canada
Telephone	+1 613 737 9680
Facsimile	+1 613 737 9691
Toll free	+1 800 563 6336
Website	www.nemko.com
Site number	FCC: CA2040; (3 m semi anechoic chamber)

Limits of responsibility

Note that the results contained in this report relate only to the items tested and were obtained in the period between the date of initial receipt of samples and the date of issue of the report.
This test report has been completed in accordance with the requirements of ISO/IEC 17025. All results contain in this report are within Nemko Canada's ISO/IEC 17025 accreditation.

Copyright notification

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Section 1. Report summary

1.1 Applicant and manufacturer

Company name	Redline Communications
Address	302 Town Centre Blvd
City	Markham
Province/State	ON
Postal/Zip code	L3R 0E8
Country	Canada

1.2 Test specifications

FCC 47 CFR Part 15, Subpart H	White Space Devices

1.3 Test methods

KDB 416721 D01 v03	White Space Test Procedures

1.4 Statement of compliance

In the configuration tested, the EUT was found compliant.

Testing was completed against all relevant requirements of the test standard. Results obtained indicate that the product under test complies in full with the requirements tested. The test results relate only to the items tested.

See “Summary of test results” for full details.

1.5 Exclusions

None

1.6 Test report revision history

Revision #	Details of changes made to test report
TRF	Original report issued

Section 2. Summary of test results

2.1 FCC Part 15 Subpart H test results

Part	Test description	Verdict
§15.713(g)(3)	Fixed white space device registration	Pass
§15.713(g)(3)(iii)	Unsuccessful registration – restricted coordinates	Pass
§15.713(g)(3)(v)	Unsuccessful registration due to incomplete information – missing owner	Pass
§15.713(g)(3)(vi)	Unsuccessful registration due to incomplete information – contact name	Pass
§15.713(g)(3)(vii)	Unsuccessful registration due to incomplete information – contact address	Pass
§15.713(g)(3)(vii)	Unsuccessful registration due to incomplete information – contact state (province)	Pass
§15.713(g)(3)(vii)	Unsuccessful registration due to incomplete information – contact zip (postal) code	Pass
§15.713(g)(3)(vii)	Unsuccessful registration due to incomplete information – contact city	Pass
§15.713(g)(3)(vii)	Unsuccessful registration due to incomplete information – contact country	Pass
§15.713(g)(3)(viii)	Unsuccessful registration due to incomplete information – contact email	Pass
§15.713(g)(3)(ix)	Unsuccessful registration due to incomplete information – contact telephone	Pass
§15.713(e)(6)	Unsuccessful registration due to HAAT > 250 m	Pass
§15.713(e)(6)	Unsuccessful registration due to antenna height that exceeds 30 m	Pass
§15.713(g)(3)(i) and (ii)	Unsuccessful registration due to incomplete information – FCC ID and Serial number	Pass
§15.713(a)(1)	48 hour channel scheduling	Pass
§15.713(a)(3)	Relocation of fixed TVBD	Pass
§15.711(c)(2)(i)	Fixed & Mode II TVDB database update	Pass
§15.711(c)(2)(iii)	Low-power auxiliary device protection	Pass
§15.712	Interference protection requirements (Fixed and personal/portable)	Pass
§15.711(c)(2)(ii)	Fixed and Mode II Power level reduction	Pass
§15.711(j)	Security	Pass

Section 3. Equipment under test (EUT) details

3.1 Sample information

Receipt date	October 15, 2018
Nemko sample ID number	1 and 2

3.2 EUT information

Product name	RDL-3000-RMH
Model of Base station device	RDL-3000 Ellipse
Model of Subscriber device	RDL-3000 Enterprise
Serial number	400SC18350005 (Base station), 399RM18390005 (Subscriber)

3.3 Technical information

Frequency band	470–614 MHz
Channel BW	6, 12, 18, 24 MHz
Type of modulation	BPSK to 264-QAM
Power requirements	120 VAC 60 Hz or 48 V_{DC} via PoE

3.4 Product description and theory of operation

The RDL-3000-RMH is a 2x2 MIMO broadband radio that provides high capacity, long range communications link. Operating in 470-698MHz band, RDL-3000-RMH is configured via firmware options and electronic product keys.
RDL-3000-RMH is a Fixed WSD that supports PAWS Protocol to Access White Space Database. It operates with Nominet, FCC approved database provider. It fully complies with WSDB channel availability and EIRP information that includes scheduled changes in channel availability by making a re-check contact with DB every 20 minutes.

3.5 Database information

Nominet White Space Data Base and Data base sandbox were used for devices registration and testing.

Section 4. Engineering considerations

4.1 Modifications incorporated in the EUT

There were no modifications performed to the EUT during this assessment.

4.2 Technical judgment

FCC ID:QC8-RDL3000RMF was used for testing purposes and database access.

4.3 Deviations from laboratory tests procedures

No deviations were made from laboratory procedures.

Section 5. Test conditions

5.1 Atmospheric conditions

Temperature	15–30 °C
Relative humidity	20–75 %
Air pressure	860–1060 mbar

When it is impracticable to carry out tests under these conditions, a note to this effect stating the ambient temperature and relative humidity during the tests shall be recorded and stated.

5.2 Power supply range

The normal test voltage for equipment to be connected to the mains shall be the nominal mains voltage. For the purpose of the present document, the nominal voltage shall be the declared voltage, or any of the declared voltages ±5 %, for which the equipment was designed.

Section 6. Measurement uncertainty

6.1 Uncertainty of measurement

UKAS Lab 34 and TIA-603-B have been used as guidance for measurement uncertainty reasonable estimations with regards to previous experience and validation of data. Nemko Canada, Inc. follows these test methods in order to satisfy ISO/IEC 17025 requirements for estimation of uncertainty of measurement for wireless products.

Measurement uncertainty budgets for the tests are detailed below. Measurement uncertainty calculations assume a coverage factor of K = 2 with 95% certainty.

Table 6.1-1: *Measurement uncertainty*

Test name	Measurement uncertainty, dB
All antenna port measurements	0.55

Section 7. Test equipment

7.1 Test equipment list

Table 7.1-1: *Equipment list*

Equipment	Manufacturer	Model no.	Asset no.	Cal cycle	Next cal.
Spectrum analyzer	Rohde & Schwarz	FSP	FA001920	1 year	Sep.30/19

Section 8. Testing data

8.1 FCC 15.713(g)(3) Fixed white space device registration

8.1.1 Definitions and limits

Prior to operating for the first time or after changing location, a fixed white space device must register with the white space database by providing the information listed in paragraph (g)(3) of §15.713. Testing in accordance with KDB 416721 D01, III (2)(a)

8.1.2 Test summary

Test date	October 16, 2018

8.1.3 Observations, settings and special notes

EUT was configured with the with proper registration information. Successful registration with all required fields and as a Fixed device type was verified by showing on the GUI page.

8.1.4 Test data

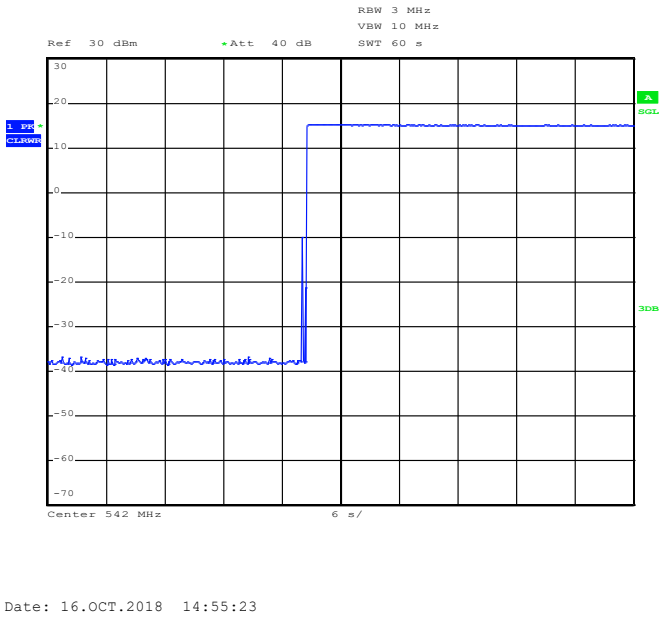

Figure 8.1-1: *Successful registration of Base station device. Spectrum plot shows that prior to the registration of the EUT there is no transmission and the transmission started right after the successful registration.*

Note: there were no emissions from the Base station Device detected, on any channels, until it has successfully registered.

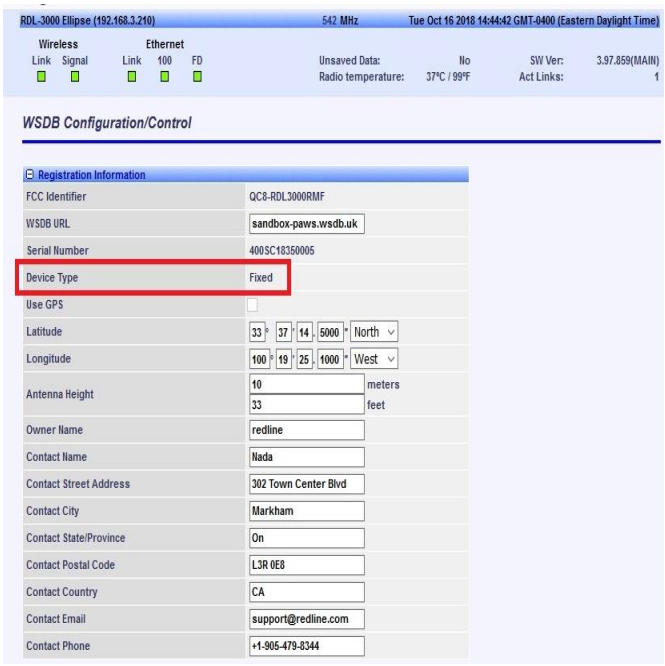

Figure 8.1-2: *Data log of successful registration and identification as Fixed Device Type of Base station device*

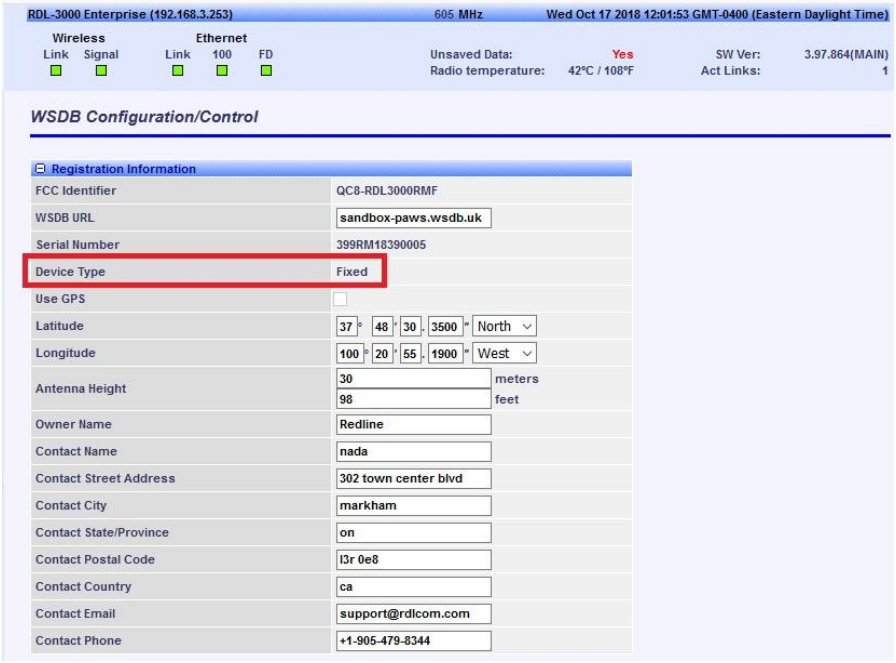

Figure 8.1-3: *Data log of successful registration and identification as Fixed Device Type of subscriber device*

8.2 FCC 15.713(a)(1), FCC 15.711(c)(2)(iii) 48 hour channel scheduling

8.2.1 Definitions and limits

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 an 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. Testing in accordance with KDB 416721 D01, III (2)(h)

8.2.2 Test summary

Test date	October 16, 2018

8.2.3 Observations, settings and special notes

EUT implements a refresh time of 20 minutes instead of 48-hour push notification wait. Information is sent to database 3 times an hour.

8.2.4 Test data

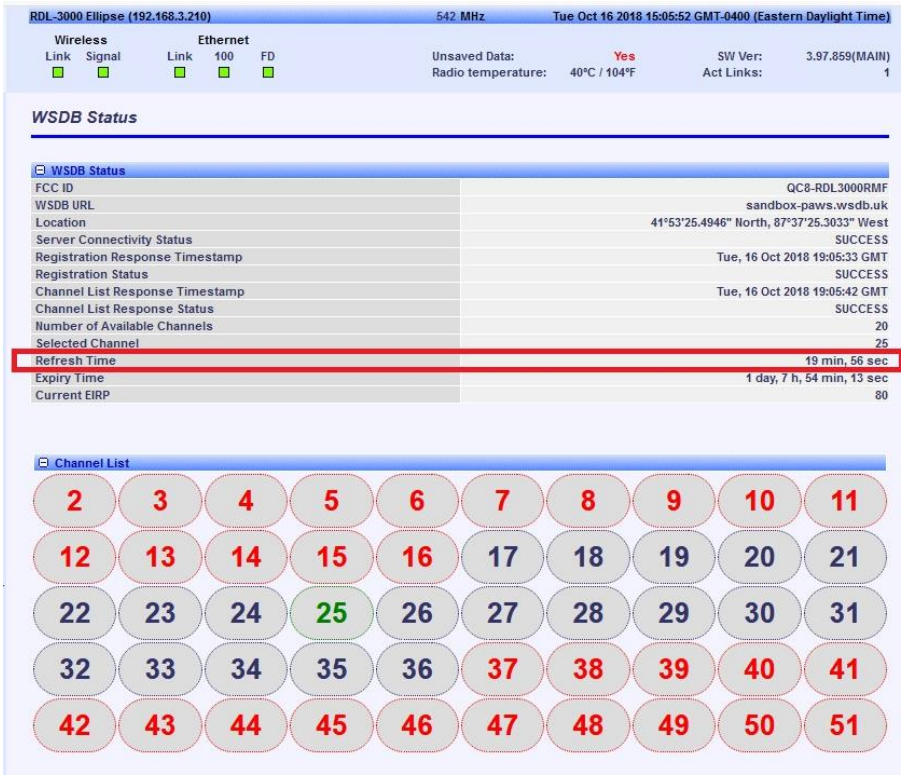

Figure 8.2-1: *Refresh time instead of 48-hour push notification wait of Base station device*

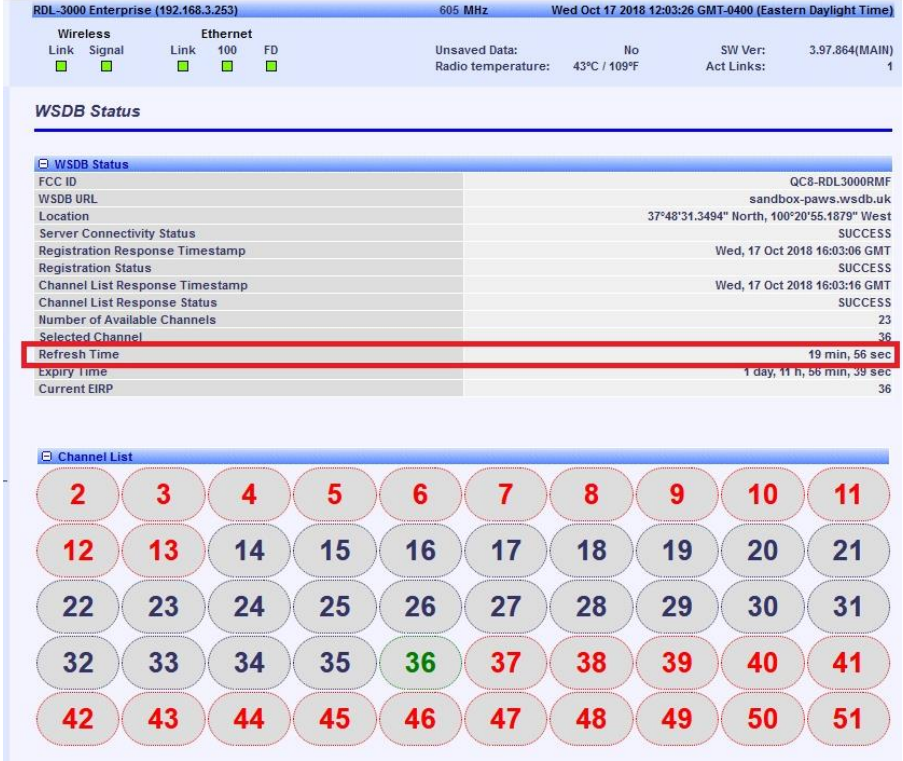

Figure 8.2-2: *Refresh time instead of 48-hour push notification wait of subscriber device*

8.3 FCC 15.713(g)(3)(iii) Unsuccessful registration – restricted coordinates

8.3.1 Definitions and limits

(3) The white space device registration database shall contain the following information for fixed white space devices:
(iii) Device's geographic coordinates (latitude and longitude (NAD 83));

8.3.2 Test summary

Test date	October 16, 2018

8.3.3 Observations, settings and special notes

The device was initially configured with a valid registration such that the device will begin to transmit on a given channel. Once the device was transmitting and the link was established, the registration data was modified to incorporate restricted coordinates. EUT was configured with restricted coordinated: outside US regulatory boundaries with latitude: 45° 14`17.7``N and longitude: 75° 19`09.2``W (within Canada). The registration process was re-initiated with the invalid coordinates. After database rejection, the EUT stopped the transmission.

8.3.4 Test data

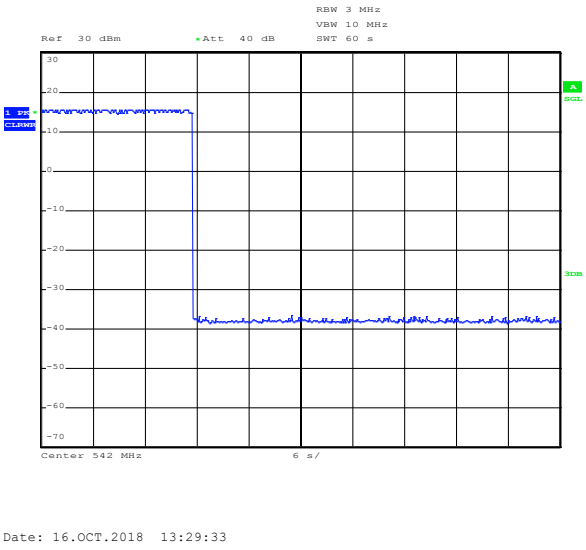

Figure 8.3-1: *Unsuccessful registration with restricted coordinates. Spectrum plot shows that prior to the unsuccessful registration the EUT was transmitting and the transmission stopped right after the EUT detected missing information in the registration form.*

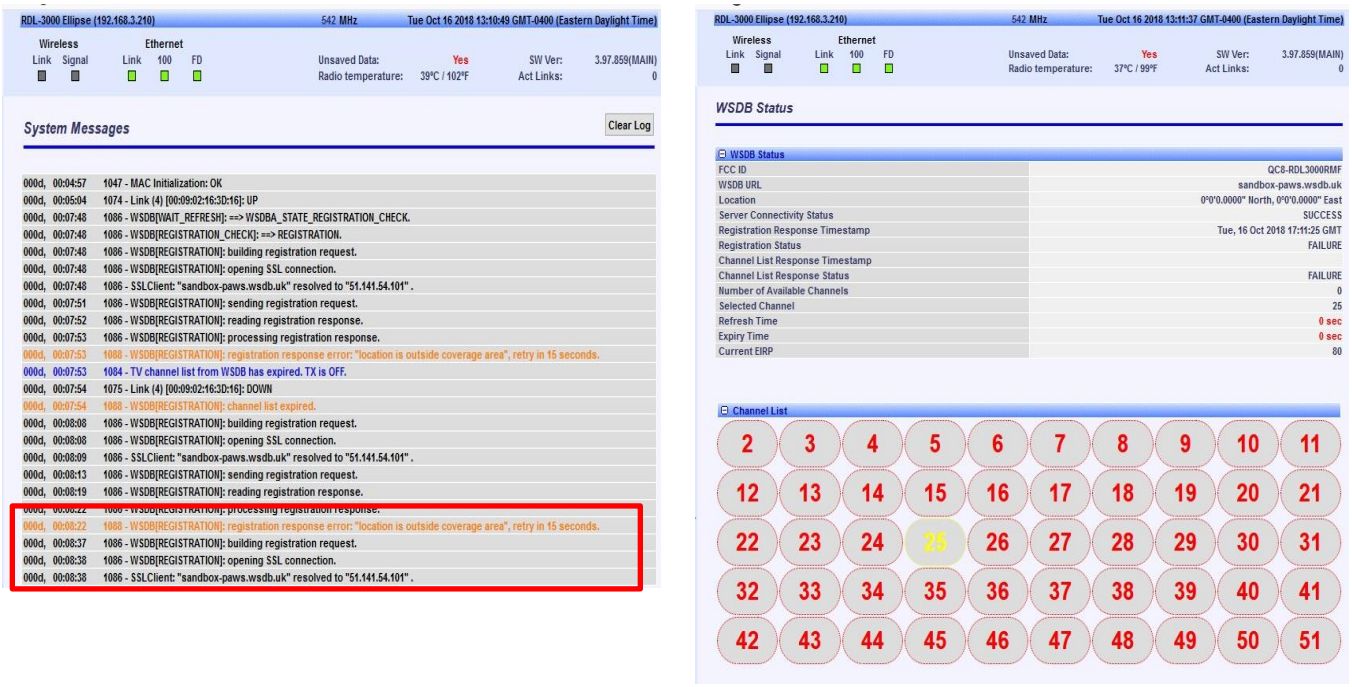

Figure 8.3-2: *Data log of unsuccessful registration with restricted coordinates of Base station device and reception of empty channel list*

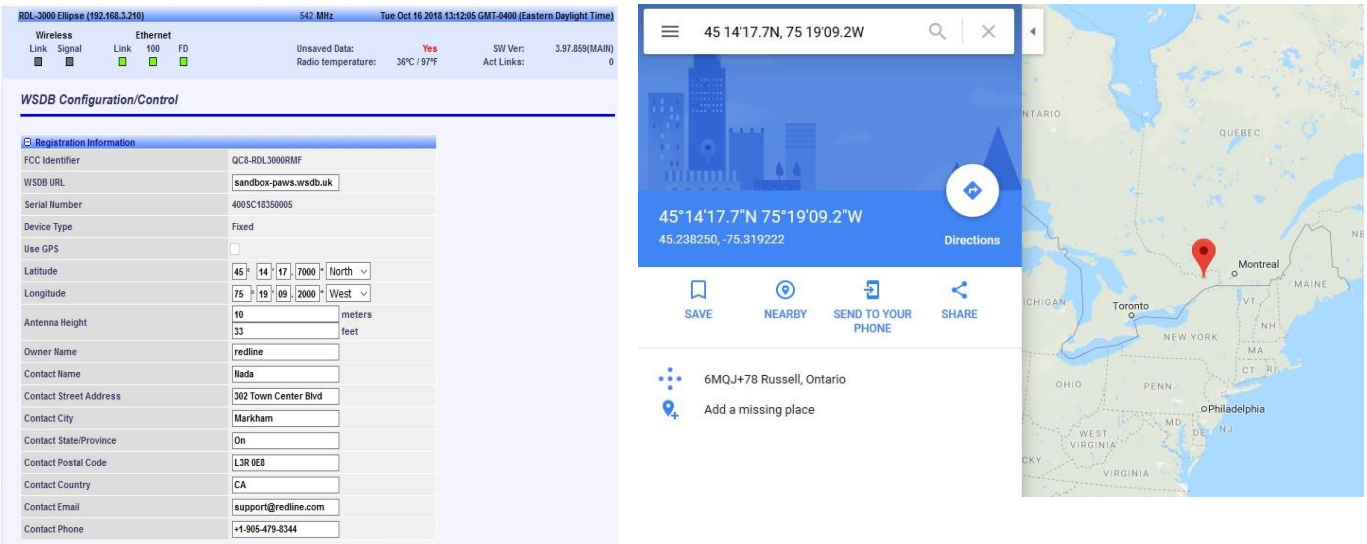

Figure 8.3-3: *Settings of the restricted coordinates of Base station device and location of these coordinates on map*

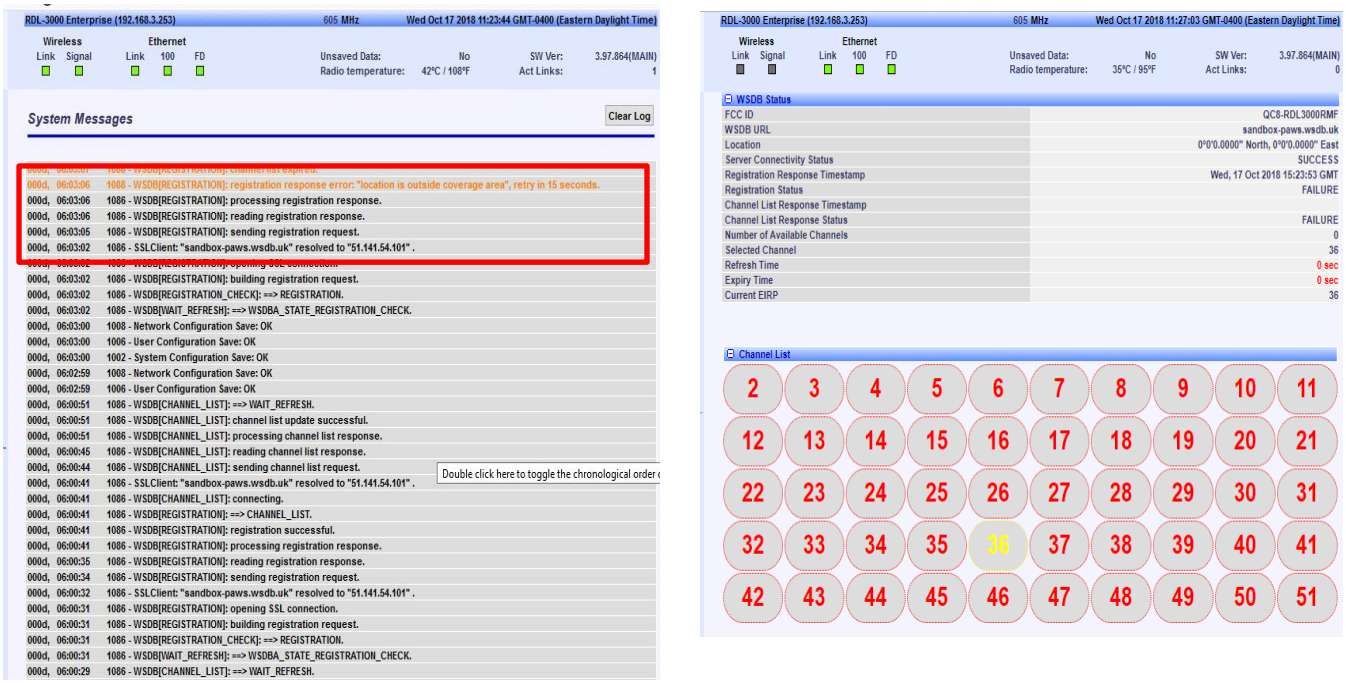

Figure 8.3-4: *Data log of unsuccessful registration with restricted coordinates of Subscriber device and reception of empty channel list*

8.4 FCC 15.713(g)(3)(v) Unsuccessful registration due to incomplete information – missing owner

8.4.1 Definitions and limits

(3) The white space device registration database shall contain the following information for fixed white space devices:
(v) Name of the individual or business that owns the device

8.4.2 Test summary

Test date	October 16, 2018

8.4.3 Observations, settings and special notes

EUT was configured with incomplete information: owner field was left intentionally blank (instead of *Redline*). It was verified, that after detecting missing contact information, EUT did not send any form request to database.
To test this feature the device was initially configured with valid information and allowed to transmit on the channel. The registration information was then modified to render it invalid and a registration request was not re-initiated. Once the device detects an invalid registration field, the device flagged the error in the GUI.

8.4.4 Test data

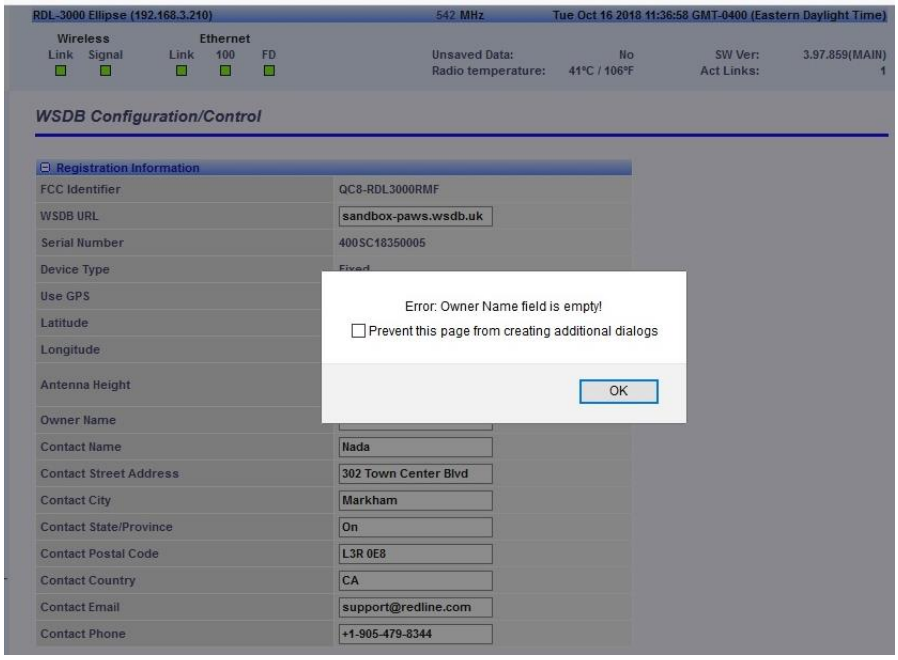

Figure 8.4-1: *Data log of unsuccessful registration with missing owner information of Base station device*

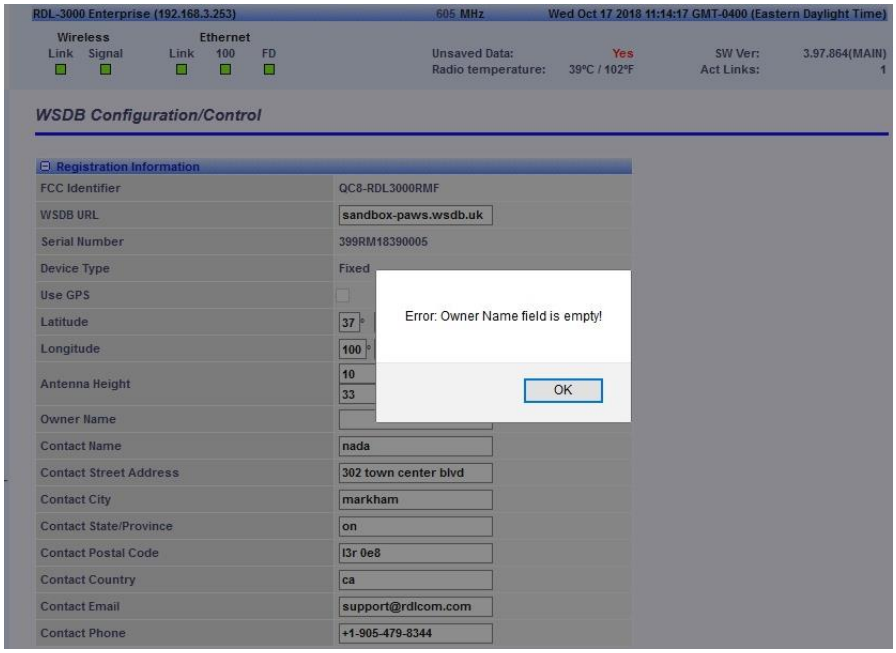

Figure 8.4-2: *Data log of unsuccessful registration with missing owner information of subscriber device*

8.5 FCC 15.713(g)(3)(vi) Unsuccessful registration due to incomplete information – contact name

8.5.1 Definitions and limits

(3) The white space device registration database shall contain the following information for fixed white space devices:
(vi) Name of a contact person responsible for the device's operation

8.5.2 Test summary

Test date	October 16, 2018

8.5.3 Observations, settings and special notes

EUT was configured with incomplete information: contact name field was left intentionally blank (instead of *Nada*). It was verified, that after detecting missing contact information, EUT did not send any form request to database.
To test this feature the device was initially configured with valid information and allowed to transmit on the channel. The registration information was then modified to render it invalid and a registration request was not re-initiated. Once the device detects an invalid registration field, the device flagged the error in the GUI.

8.5.4 Test data

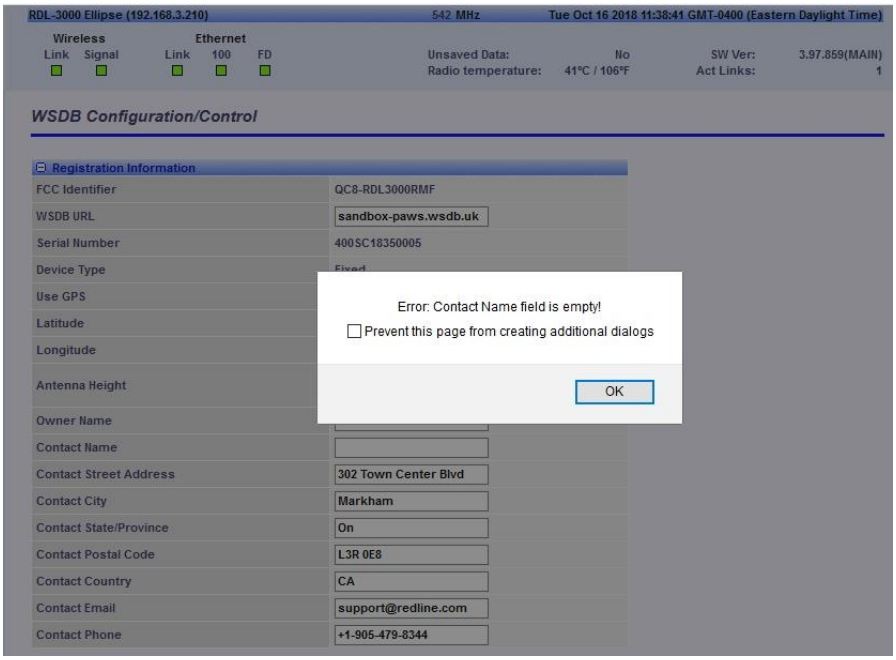

Figure 8.5-1: *Data log of unsuccessful registration with missing contact name of Base station device*

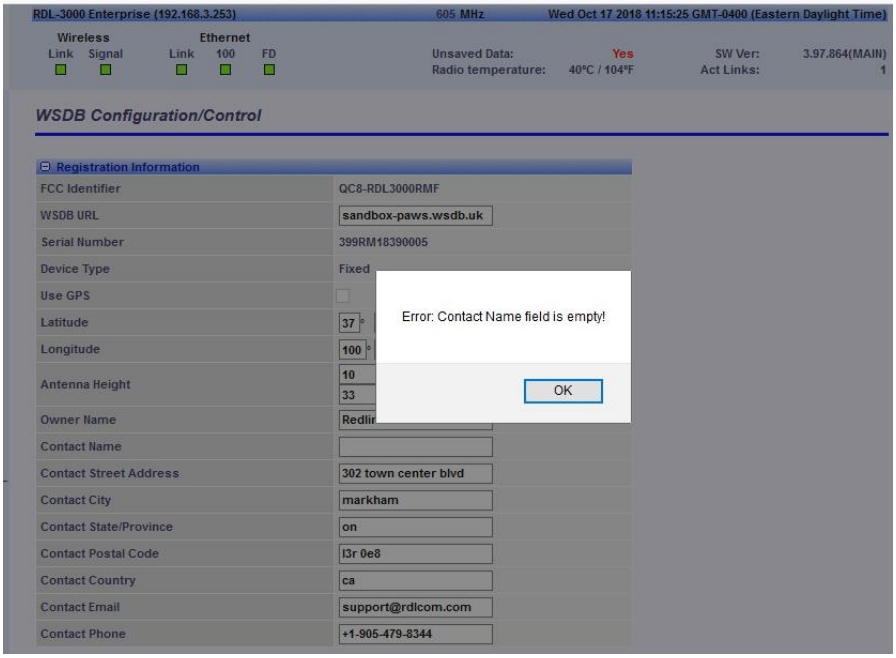

Figure 8.5-2: *Data log of unsuccessful registration with missing contact name of Subscriber device*

8.6 FCC 15.713(g)(3)(vii) Unsuccessful registration due to incomplete information – contact address

8.6.1 Definitions and limits

(3) The white space device registration database shall contain the following information for fixed white space devices:
(vii) Address for the contact person

8.6.2 Test summary

Test date	October 16, 2018

8.6.3 Observations, settings and special notes

EUT was configured with incomplete information: contact address field was left intentionally blank (instead of *302 Town center blvd*). It was verified, that after detecting missing contact information, EUT did not send any form request to database.
To test this feature the device was initially configured with valid information and allowed to transmit on the channel. The registration information was then modified to render it invalid and a registration request was not re-initiated. Once the device detects an invalid registration field, the device flagged the error in the GUI.

8.6.4 Test data

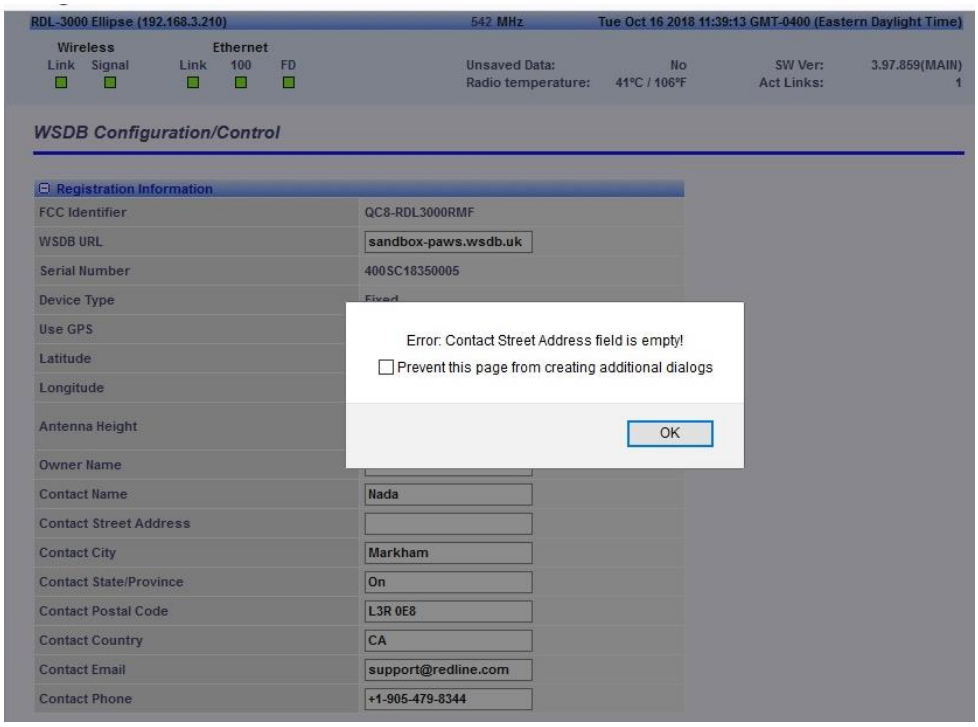

Figure 8.6-1: *Data log of unsuccessful registration with missing contact address of Base station device*

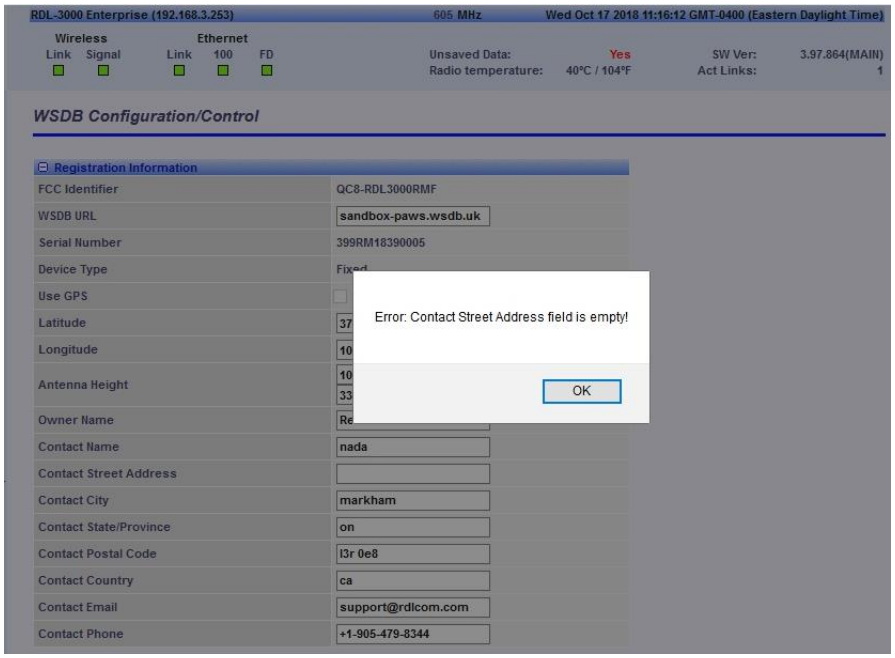

Figure 8.6-2: *Data log of unsuccessful registration with missing contact address of Subscriber device*

8.7 FCC 15.713(g)(3)(vii) Unsuccessful registration due to incomplete information – contact state (province)

8.7.1 Definitions and limits

(3) The white space device registration database shall contain the following information for fixed white space devices:
(vii) Address for the contact person

8.7.2 Test summary

Test date	October 16, 2018

8.7.3 Observations, settings and special notes

EUT was configured with incomplete information: contact state field was left intentionally blank (instead of *ON*). It was verified, that after detecting missing contact information, EUT did not send any form request to database.
To test this feature the device was initially configured with valid information and allowed to transmit on the channel. The registration information was then modified to render it invalid and a registration request was not re-initiated. Once the device detects an invalid registration field, the device flagged the error in the GUI.

8.7.4 Test data

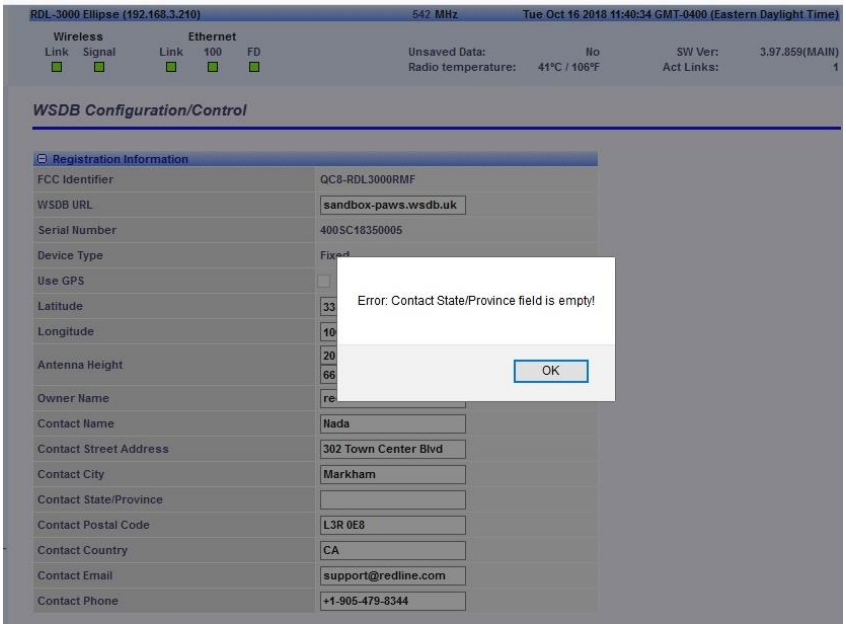

Figure 8.7-1: *Data log of unsuccessful registration with missing contact state of Base station device*

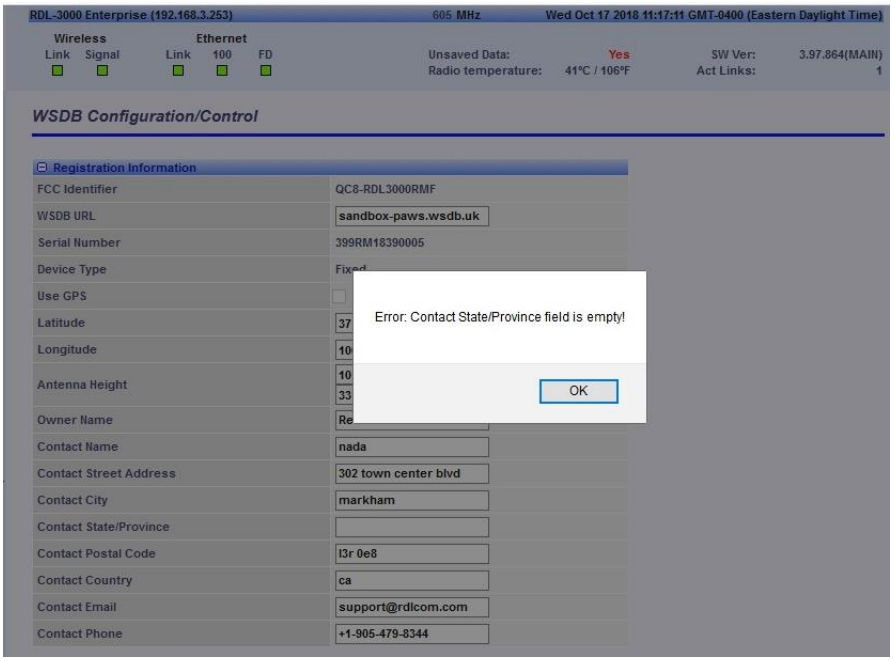

Figure 8.7-2: *Data log of unsuccessful registration with missing contact state of Subscriber device*

8.8 FCC 15.713(g)(3)(vii) Unsuccessful registration due to incomplete information – contact zip (postal) code

8.8.1 Definitions and limits

(3) The white space device registration database shall contain the following information for fixed white space devices:
(vii) Address for the contact person

8.8.2 Test summary

Test date	October 16, 2018

8.8.3 Observations, settings and special notes

EUT was configured with incomplete information: contact zip (postal) code field was left intentionally blank (instead of *L3R 0E8*). It was verified, that after detecting missing contact information, EUT did not send any form request to database, the EUT stopped the transmission.
To test this feature the device was initially configured with valid information and allowed to transmit on the channel. The registration information was then modified to render it invalid and a registration request was not re-initiated. Once the device detects an invalid registration field, the device flagged the error in the GUI.

8.8.4 Test data

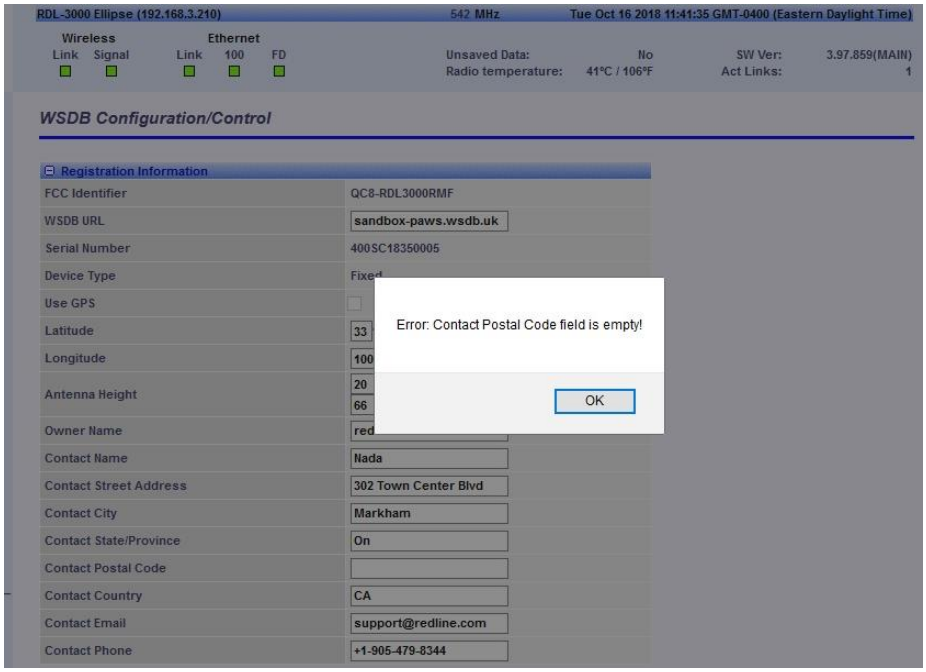

Figure 8.8-1: *Data log of unsuccessful registration with missing contact zip (postal) code of Base station device*

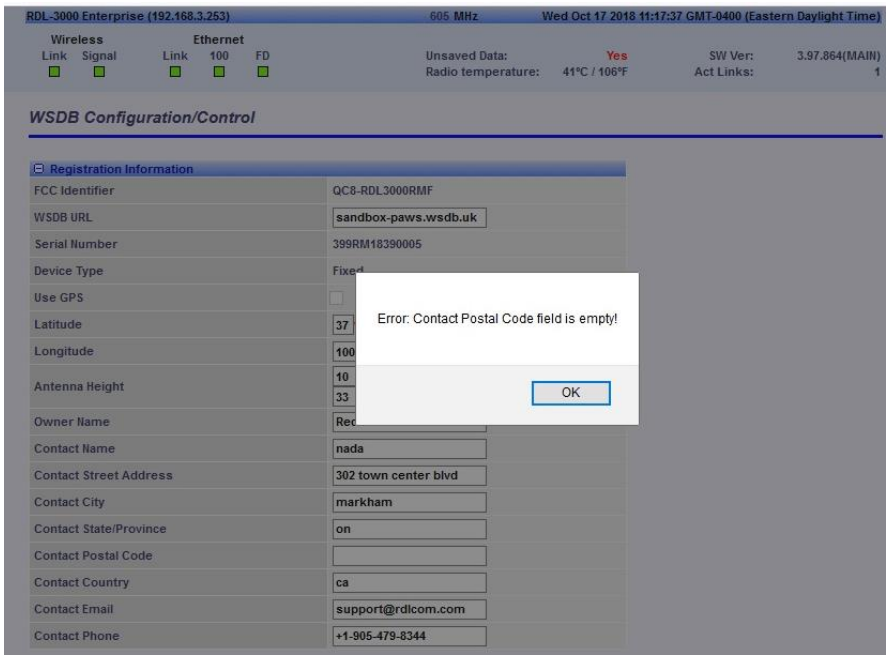

Figure 8.8-2: *Data log of unsuccessful registration with missing contact zip (postal) code of Subscriber device*

8.9 FCC 15.713(g)(3)(vii) Unsuccessful registration due to incomplete information – contact city

8.9.1 Definitions and limits

(3) The white space device registration database shall contain the following information for fixed white space devices:
(vii) Address for the contact person

8.9.2 Test summary

Test date	October 16, 2018

8.9.3 Observations, settings and special notes

EUT was configured with incomplete information: contact city field was left intentionally blank (instead of *Markham*). It was verified, that after detecting missing contact information, EUT did not send any form request to database.
To test this feature the device was initially configured with valid information and allowed to transmit on the channel. The registration information was then modified to render it invalid and a registration request was not re-initiated. Once the device detects an invalid registration field, the device flagged the error in the GUI.

8.9.4 Test data

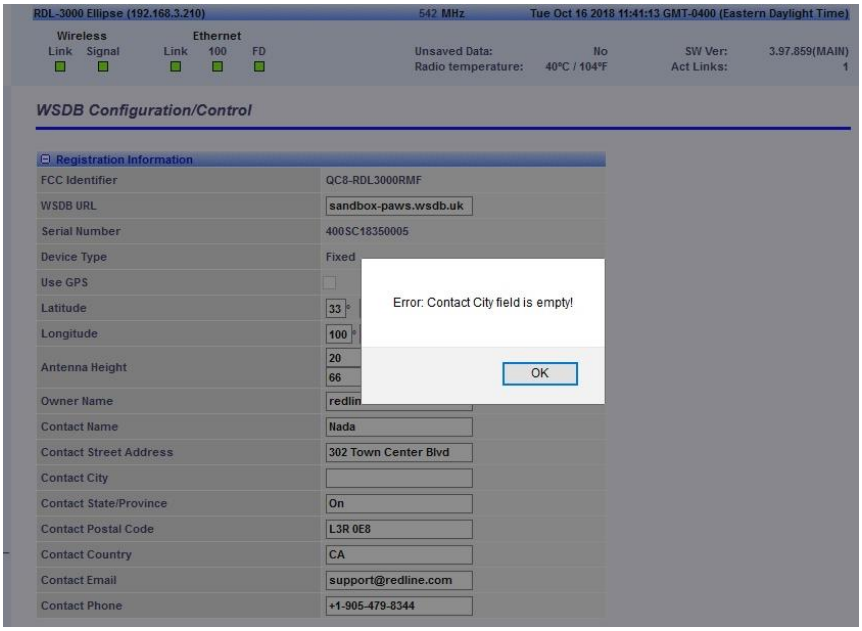

Figure 8.9-1: *Data log of unsuccessful registration with missing contact city of Base station device*

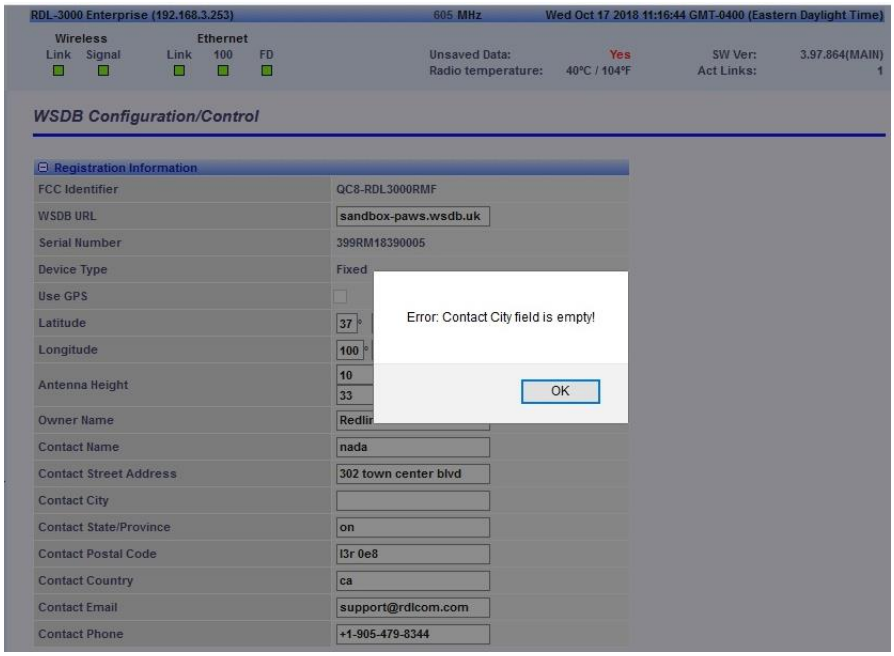

Figure 8.9-2: *Data log of unsuccessful registration with missing contact city of Subscriber device*

8.10 FCC 15.713(g)(3)(vii) Unsuccessful registration due to incomplete information – contact country

8.10.1 Definitions and limits

(3) The white space device registration database shall contain the following information for fixed white space devices:
(vii) Address for the contact person

8.10.2 Test summary

Test date	October 16, 2018

8.10.3 Observations, settings and special notes

EUT was configured with incomplete information: contact country field was left intentionally blank (instead of *CA*). It was verified, that after detecting missing contact information, EUT did not send any form request to database.
To test this feature the device was initially configured with valid information and allowed to transmit on the channel. The registration information was then modified to render it invalid and a registration request was not re-initiated. Once the device detects an invalid registration field, the device flagged the error in the GUI.

8.10.4 Test data

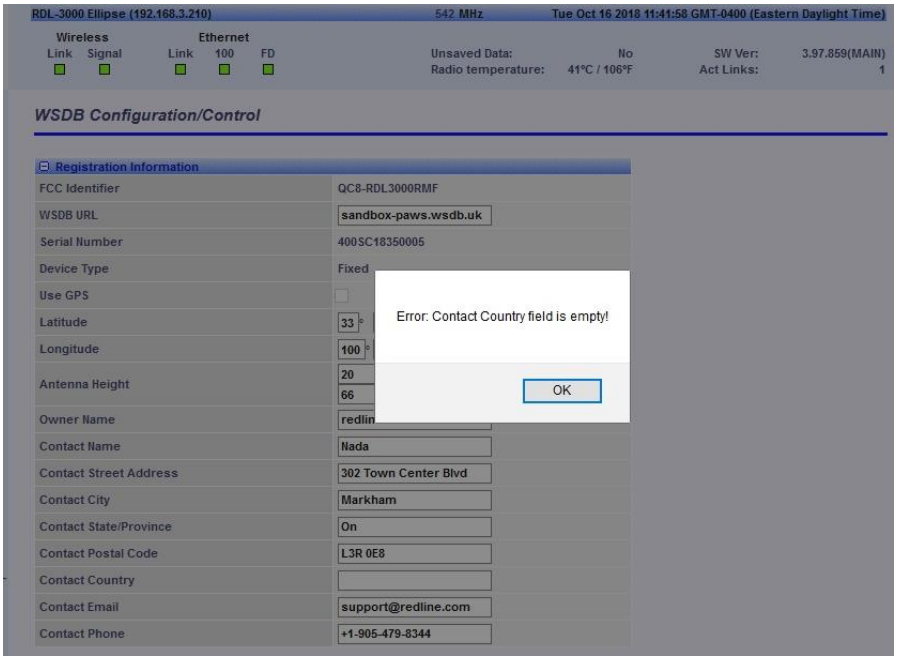

Figure 8.10-1: *Data log of unsuccessful registration with missing contact country of Base station device*

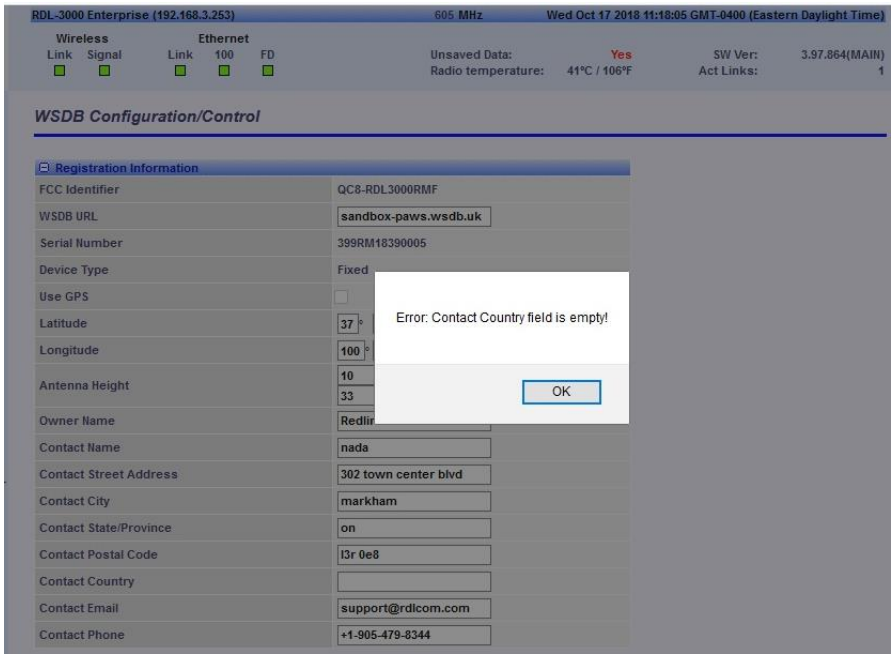

Figure 8.10-2: *Data log of unsuccessful registration with missing contact country of Subscriber device*

8.11 FCC 15.713(g)(3)(viii) Unsuccessful registration due to incomplete information – contact email

8.11.1 Definitions and limits

(3) The white space device registration database shall contain the following information for fixed white space devices:
(viii) Email address for the contact person

8.11.2 Test summary

Test date	October 16, 2018

8.11.3 Observations, settings and special notes

EUT was configured with incomplete information: contact email field was left intentionally blank (instead of *support@rdlcom.com*). It was verified, that after detecting missing contact information, EUT did not send any form request to database.
To test this feature the device was initially configured with valid information and allowed to transmit on the channel. The registration information was then modified to render it invalid and a registration request was not re-initiated. Once the device detects an invalid registration field, the device flagged the error in the GUI.

8.11.4 Test data

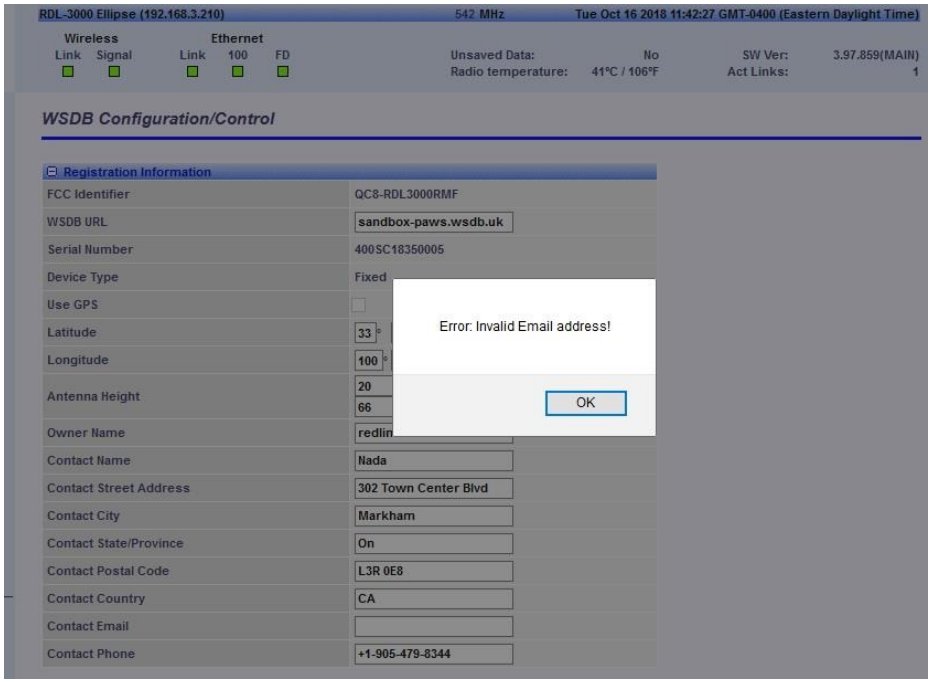

Figure 8.11-1: *Data log of unsuccessful registration with missing contact email of Base station device*

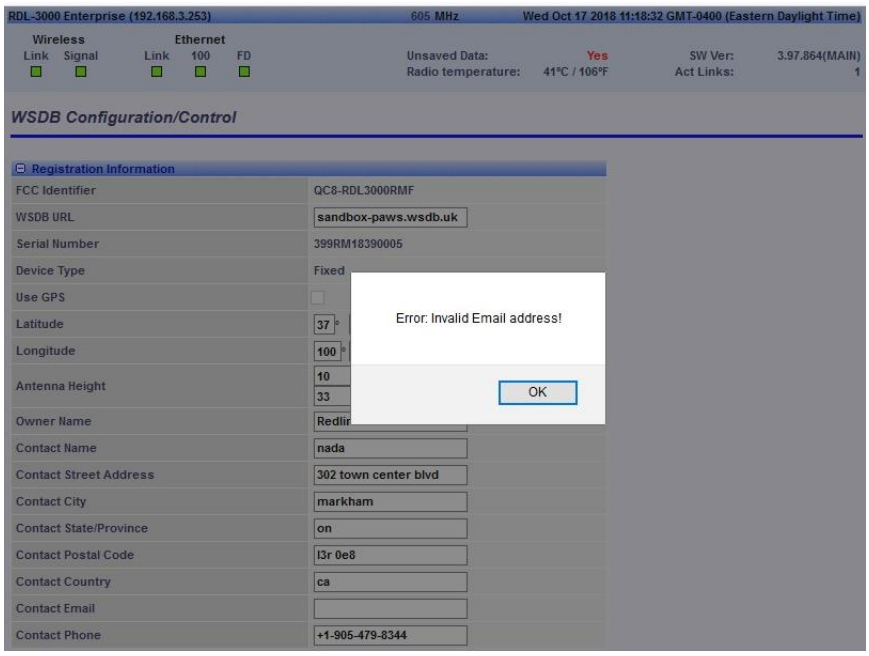

Figure 8.11-2: *Data log of unsuccessful registration with missing contact email of Subscriber device*

8.12 FCC 15.713(g)(3)(ix) Unsuccessful registration due to incomplete information – contact telephone

8.12.1 Definitions and limits

(3) The white space device registration database shall contain the following information for fixed white space devices:
(xi) Phone number for the contact person

8.12.2 Test summary

Test date	October 16, 2018

8.12.3 Observations, settings and special notes

EUT was configured with incomplete information: contact telephone field was left intentionally blank (instead of *+1 905-479-8344*). It was verified, that after detecting missing contact information, EUT did not send any form request to database.
To test this feature the device was initially configured with valid information and allowed to transmit on the channel. The registration information was then modified to render it invalid and a registration request was not re-initiated. Once the device detects an invalid registration field, the device flagged the error in the GUI.

8.12.4 Test data

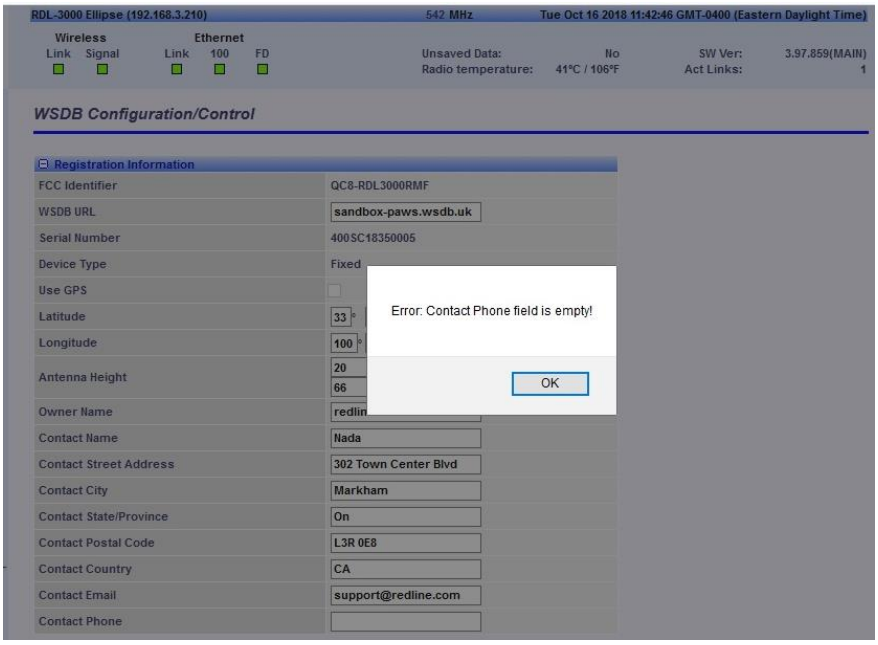

Figure 8.12-1: *Data log of unsuccessful registration with missing contact telephone of Base station device*

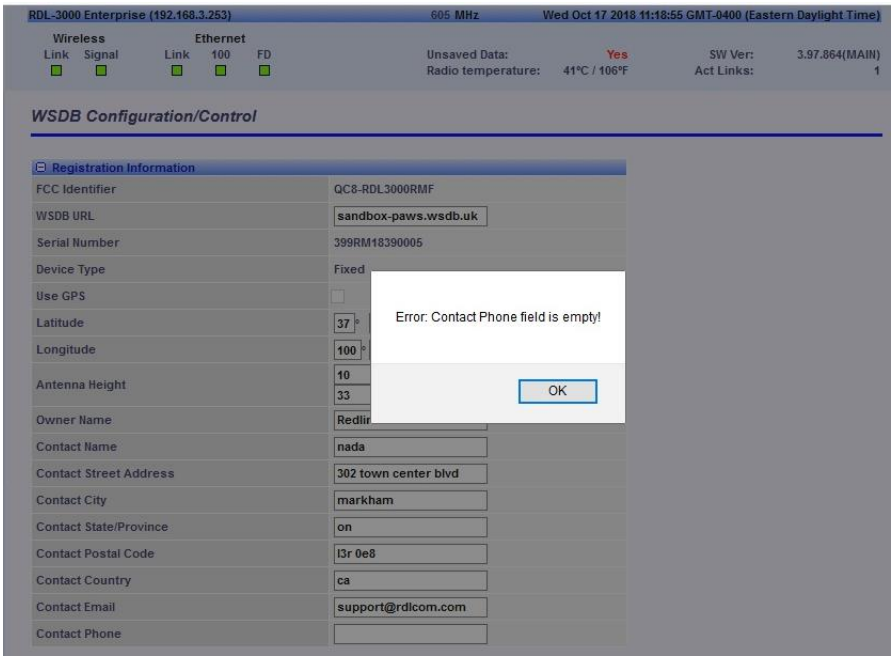

Figure 8.12-2: *Data log of unsuccessful registration with missing contact telephone of Subscriber device*

8.13 FCC 15.713(e)(6) Unsuccessful registration due to HAAT > 250 m

8.13.1 Definitions and limits

A fixed device with an antenna height above ground that exceeds 30 meters or an antenna height above average terrain (HAAT) that exceeds 250 meters shall not be provided a list of available channels.

8.13.2 Test summary

Test date	October 17, 2018

8.13.3 Observations, settings and special notes

EUT was configured with information that included a location with HAAT of more than 250 m (Mt. Hood at latitude45.3648N and longitude 121.6732W). It was verified, that after database rejection, the EUT didn't start the transmission.
To test this feature the device was configured with invalid information and requested to transmit on the channel. Once the database responded with an empty channel list as a result of the antenna height above ground, or excessive HAAT, the EUT didn't start to transmit. Subscriber unit was waiting for the information from Base station and didn't start transmission as well.

8.13.4 Test data

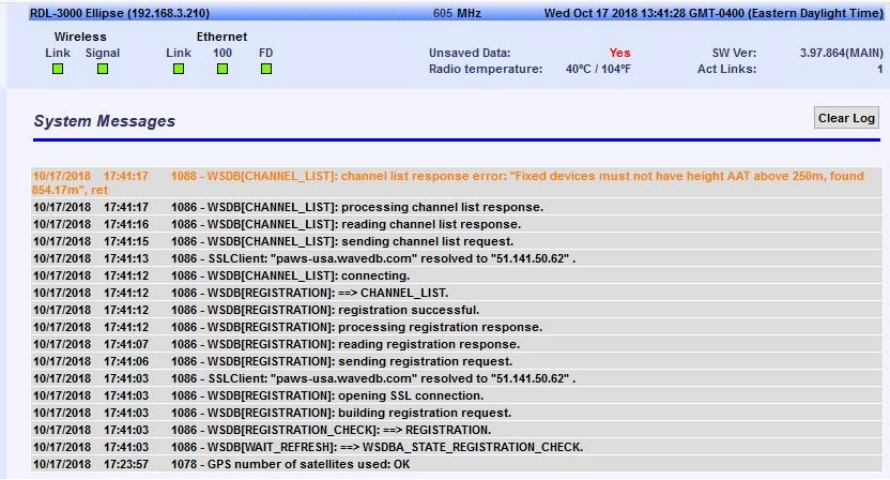

Figure 8.13-1: *Data log of unsuccessful registration with restricted HAAT location of Base station device*

8.14 FCC 15.713(e)(6) Unsuccessful registration due to antenna height that exceeds 30 m

8.14.1 Definitions and limits

A fixed device with an antenna height above ground that exceeds 30 meters or an antenna height above average terrain (HAAT) that exceeds 250 meters shall not be provided a list of available channels.

8.14.2 Test summary

Test date	October 17, 2018

8.14.3 Observations, settings and special notes

EUT was configured with information that included an antenna height that exceeded 30 m limit (input was 31 m). It was verified, that after database rejection, the EUT stopped the transmission.
To test this feature the device was initially configured with valid information and allowed to transmit on the channel. The registration information was then modified to render it invalid and a registration request was re-initiated. Once the database responded with an empty channel list as a result of the antenna height above ground, the EUT stopped to transmit. For the Base station device, during the initial power up and registration, if the database returns an empty channel list, it will not turn on the transmitter. For the Subscriber device, the EUT will perform a passive scan and will attempt to connect to a Base station device on a channel where it detects a beacon. If the database responds with an empty channel list, or the device is unable to connect to the database, it will cease to transmit on the channel.

8.14.4 Test data

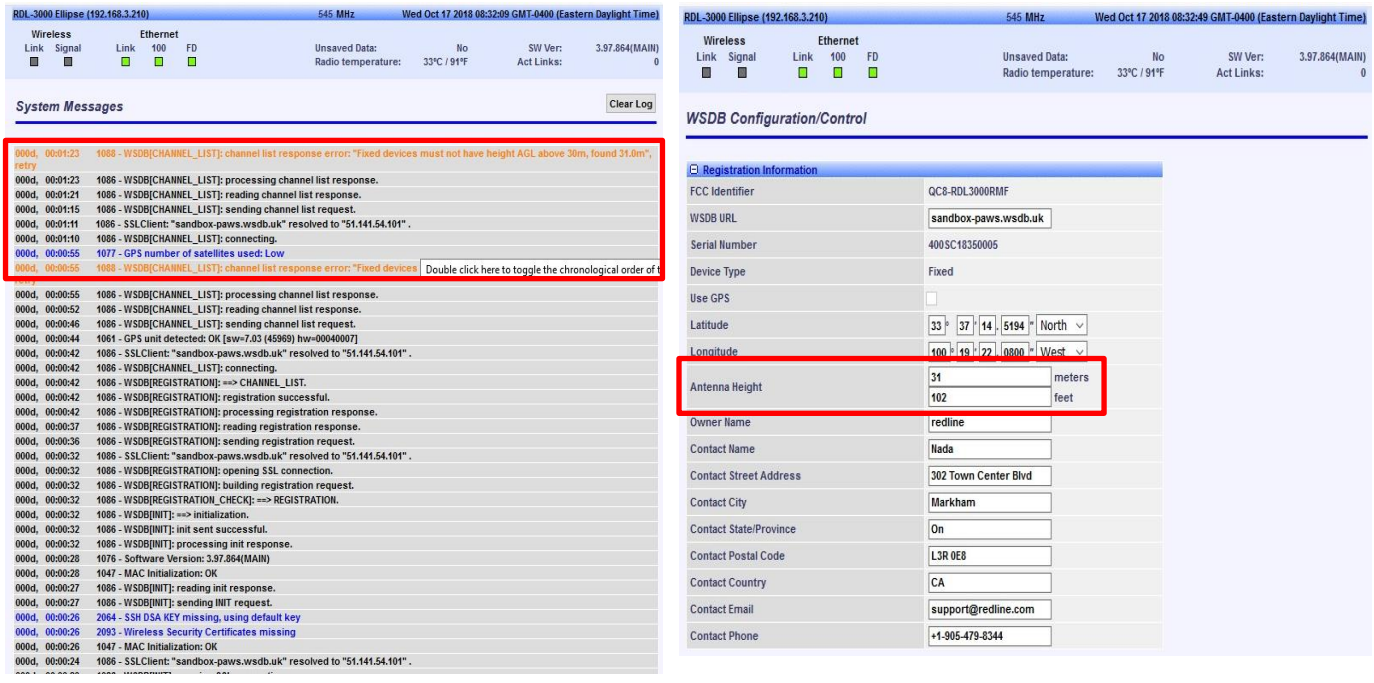

Figure 8.14-1: *Data log of unsuccessful registration with restricted antenna height of Base station device*

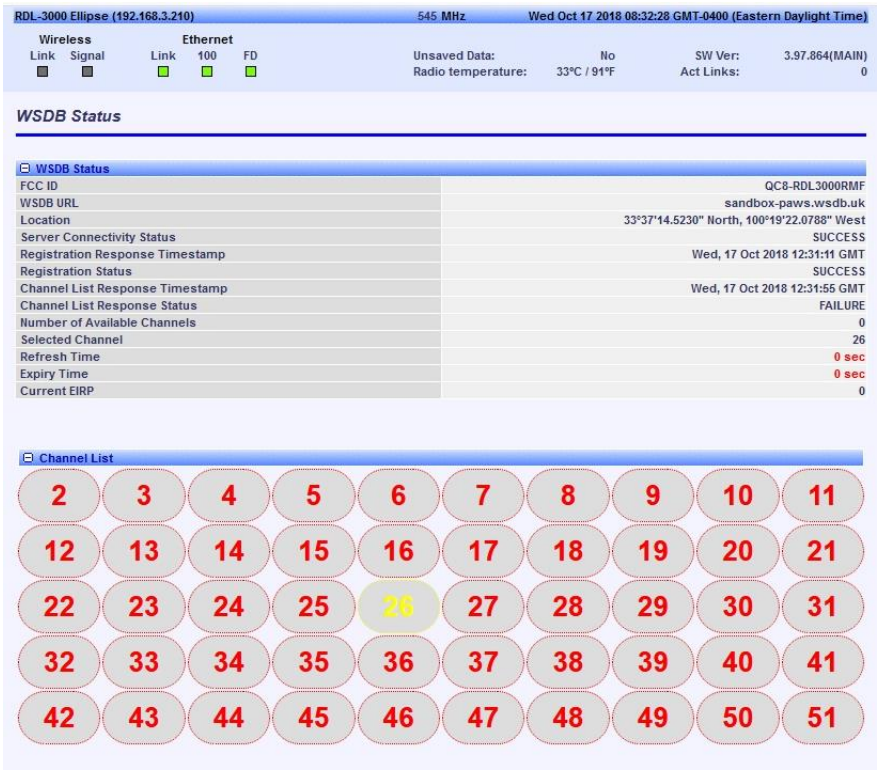

Figure 8.14-2: *Data log of unsuccessful registration with restricted antenna height empty channel list*

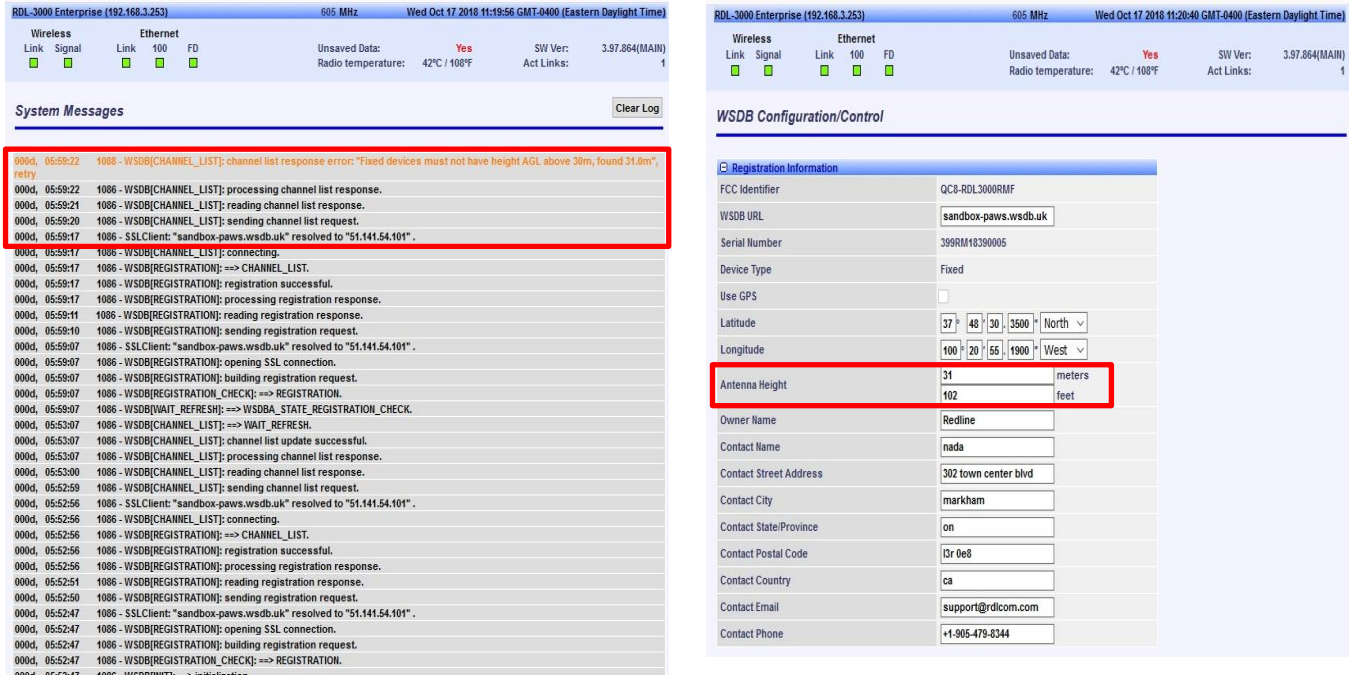

Figure 8.14-3: *Data log of unsuccessful registration with restricted antenna height of Subscriber device*

8.15 FCC 15.713(g)(3)(i) and (ii) Unsuccessful registration due to incomplete information – FCC ID and Serial number

8.15.1 Definitions and limits

(3) The white space device registration database shall contain the following information for fixed white space devices:
(i) FCC identifier (FCC ID) of the device;
(ii) Manufacturer's serial number of the device

8.15.2 Test summary

Test date	October 16, 2018

8.15.3 Observations, settings and special notes

The registration interface does not contain a mechanism by which the serial number or the FCC ID of the radio can be changed. The FCC ID and serial number are flash-programmed during the manufacturing process and could not be changed without being returned to the manufacturer.

8.16 FCC 15.713(a)(3) Relocation of fixed TVBD

8.16.1 Definitions and limits

The white space database serves the following function:
(3) To register the identification information and location of fixed white space devices and unlicensed wireless microphone users.
The Data base will not provide a channel list for a fixed TVBD at a location other than that registered.

8.16.2 Test summary

Test date	October 16, 2018

8.16.3 Observations, settings and special notes

The implementation of the location input prevents the radio from requesting channels from another location other than the last successful registration. It is not possible for the user to input location information into the radio that would result in a channel request from a different location other than the current registration location. In the event of a change in the input location information, a new registration and channel request are sent using the same entered registration location information.

8.17 FCC 15.711(c)(2)(i), FCC 15.711(h) Fixed & Mode II TVDB database update

8.17.1 Definitions and limits

Each fixed white space device must access a white space database over the Internet to determine the available channels and the corresponding maximum permitted power for each available channel that is available at its geographic coordinates, taking into consideration the fixed device's antenna height above ground level and geo-location uncertainty, prior to its initial service transmission at a given location. Testing in accordance with KDB 416721 D01, III (2)(e)

8.17.2 Test summary

Test date	October 16, 2018

8.17.3 Observations, settings and special notes

EUT was configured with proper registration information and the successful registration was verified. Database URL was modified from *sandbox-paws.wsdb.**uk*** to *sandbox-paws.wsdb.**ca***. After the time of channel allocation has passed it was verified that without the proper database access the EUT received empty channel list and stopped the transmission. Then the URL was changed back to and it was verified that with the proper database access the EUT received a channel list and started the transmission. Testing was repeated with Base station disconnected from the internet and it was verified, that after refresh time of 20 minutes both EUTs ceased transmission.

8.17.4 Test data

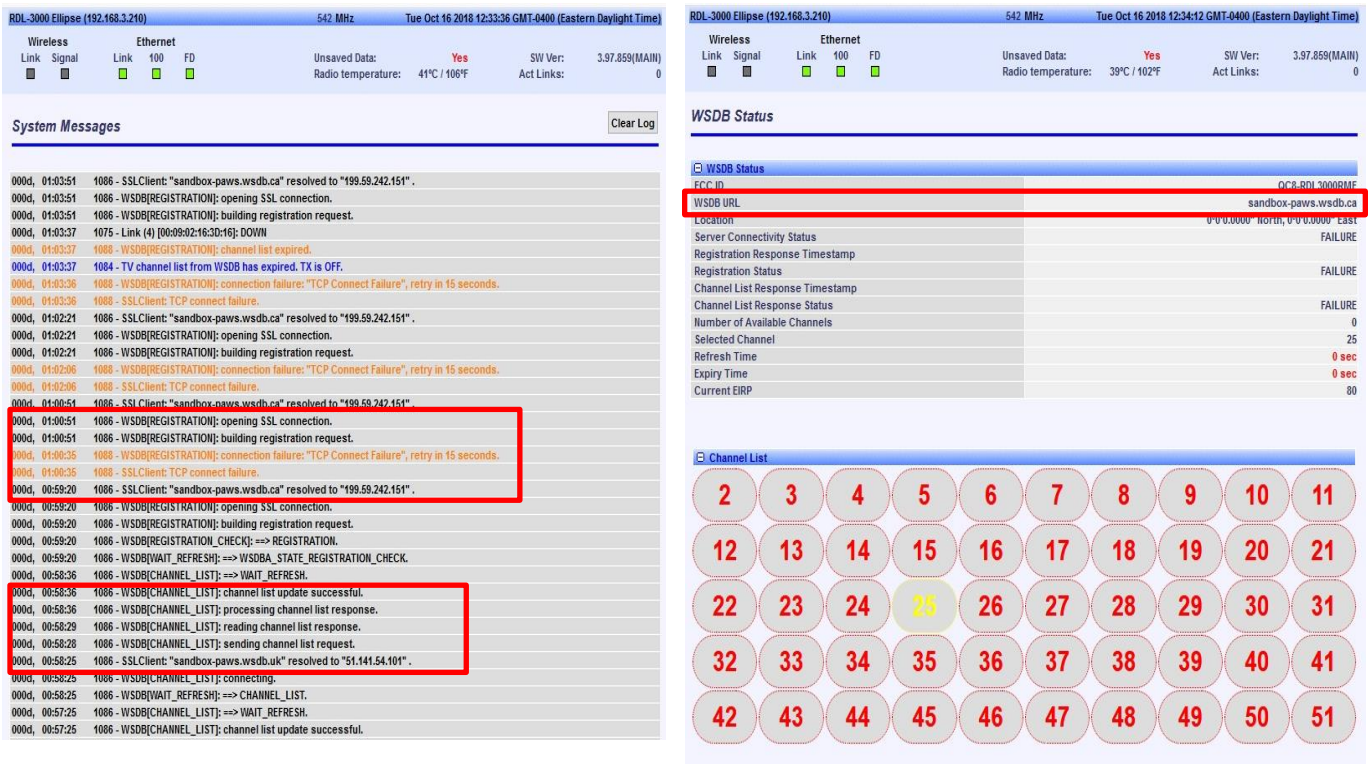

Figure 8.17-1: *Data log of successful and then unsuccessful registration due to wrong database URL of Base station device*

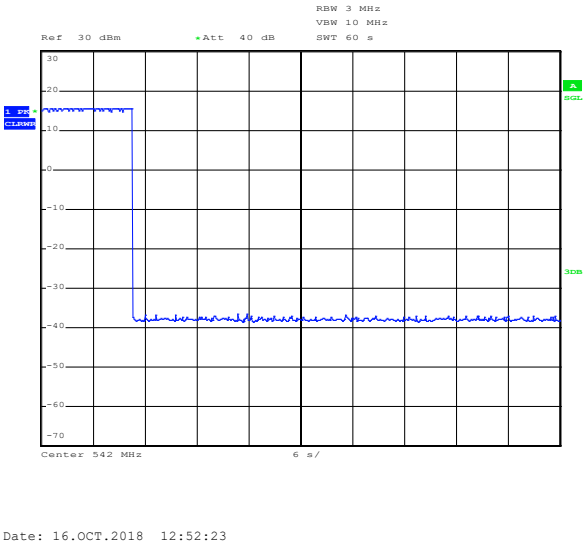

Figure 8.17-2: *Transmission termination after wrong database URL of Base station device*

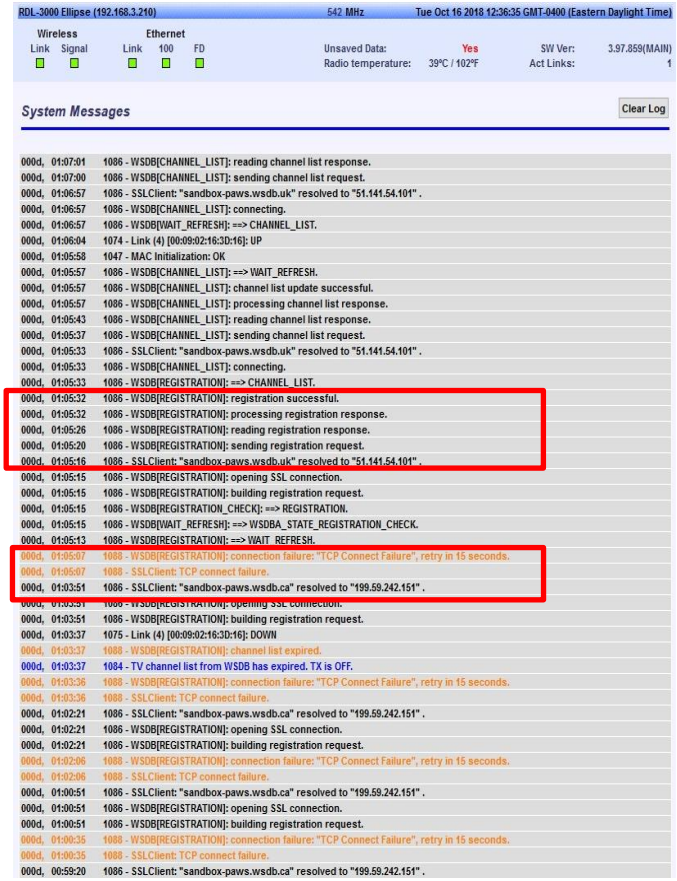

Figure 8.17-3: *Data log of unsuccessful registration and then successful registration with proper database URL of Base station device*

Subscriber device stopped transmission when Base station device received unsuccessful registration with the database due to wrong URL. The following logs are from the master device:

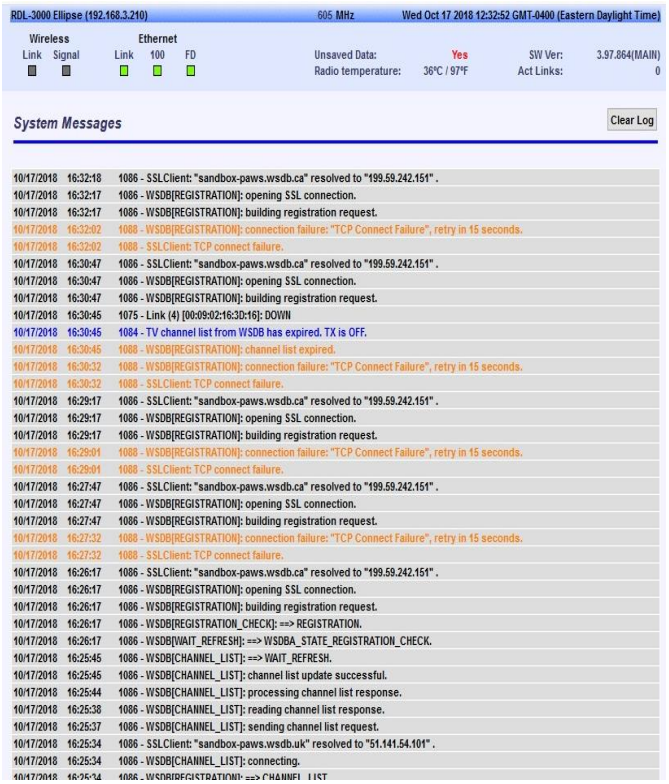

Figure 8.17-4: *Data log of Base station successful registration and then transmission within the allocated time with internet access of Subscriber device*

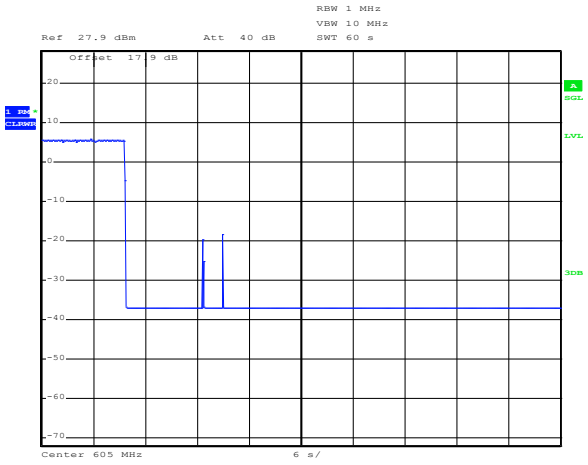

Figure 8.17-5: *Transmission termination of Subscriber device after unsuccessful registration of Base station device due to wrong database URL*

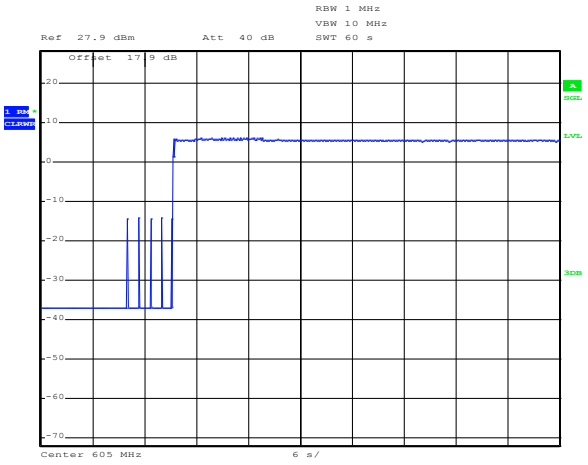

Figure 8.17-6: *Transmission started of Subscriber device after successful registration of Base station device with proper database URL*

8.18 FCC 15.711(c)(2)(iii) Low-power auxiliary device protection

8.18.1 Definitions and limits

Each fixed white space devices 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.

Use of database protected entity interface to register protection for a low-power auxiliary device in the same location and channel which EUT has selected and operating. The registered protection for the low-power auxiliary device should be scheduled within the next 48-hour period. Testing in accordance with KDB 416721 D01, III (2)(I).

8.18.2 Test summary

Test date	October 17, 2018

8.18.3 Observations, settings and special notes

EUT was configured with proper registration information and the successful registration was verified. The channel expiration time for testing purposes was reduced to 5 minutes. Meantime it was scheduled with WSDB that channel 30 would be registered for low-power device. After the time of channel allocation of the EUT has passed it was verified that the EUT stopped the transmission on the temporary restricted and removed from the channel list. Since EUT is not waiting 48 hours for the push notification but rather following refresh rate of 20 minues.

8.18.4 Test data

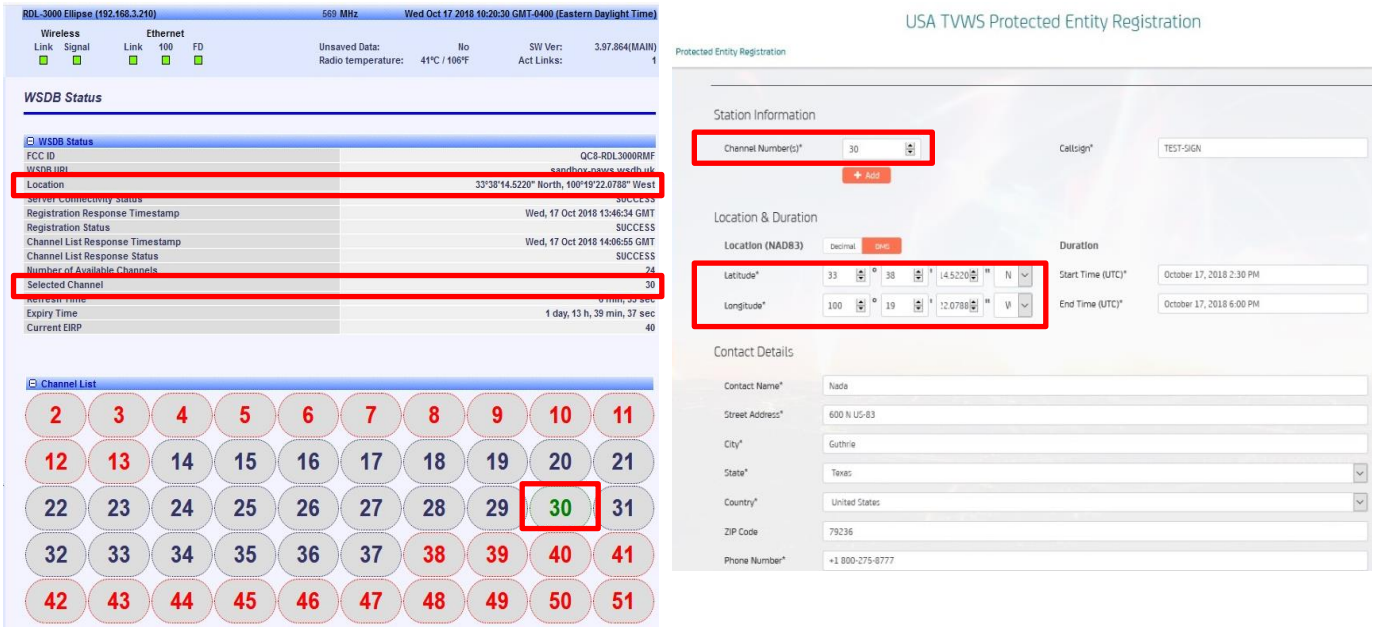

Figure 8.18-1: *Data log of successful registration and transmission of Base station device within the allocated time at the channel 30. Registration of LP device on the channel 30 on the same coordinates in the database.*

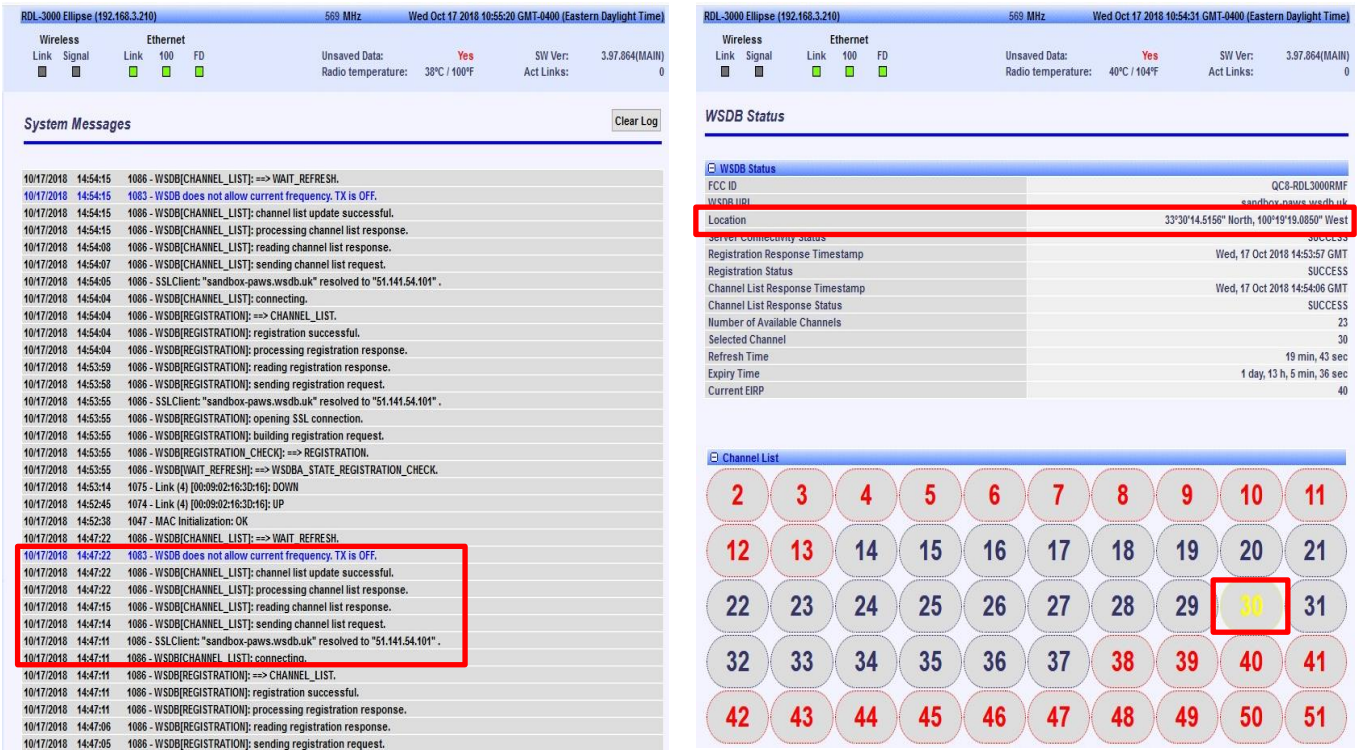

Figure 8.18-2: *Data log of reply from database and stopped transmission of Base station device on the channel 30 after registration of the channel 30 for low-power device in the database. Channel 30 was excluded from the newly accepted channel list.*

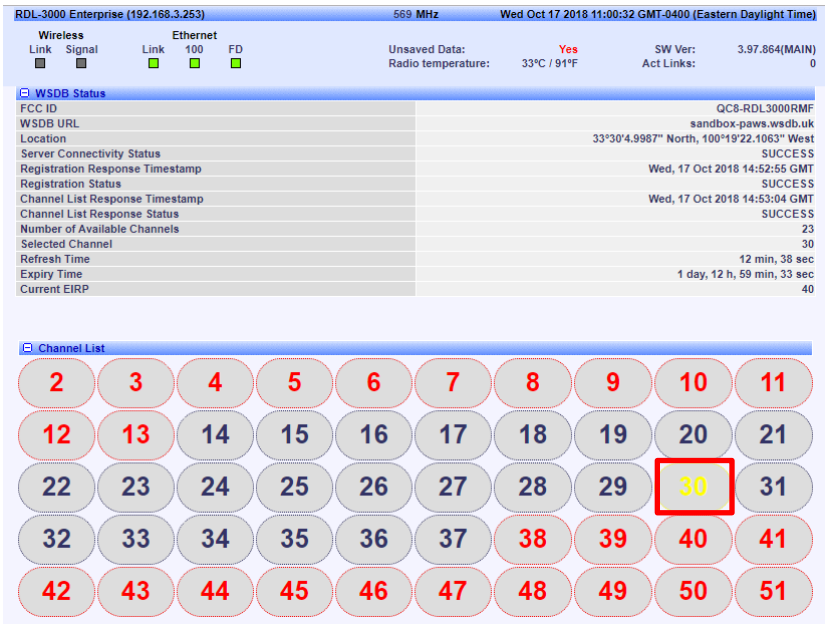

Figure 8.18-3: *Subscriber device displaying the newly accepted channel list with channel 30 excluded from it.*

8.19 FCC 15.712 Interference protection requirements (Fixed and personal/portable)

8.19.1 Definitions and limits

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 outlined in §15.712. Include a sample scan showing the total channel power and adjacent channel emission settings for test coordinates.

8.19.2 Test summary

Test date	October 17, 2018

8.19.3 Observations, settings and special notes

EUT was configured with proper registration information and the successful registration was verified. The coordinates then were changed in accordance with FCC 15.712 test scenarios. Updated channel list with unavailable channels was verified. Once the device gets updated channel list, the device flagged the error in the GUI when trying to set the restricted channel.
Test scenarios were as follows:
(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) receive sites.
(c) Fixed Broadcast Auxiliary Service (BAS) links.
(d) PLMRS/CMRS operations.
(e) Offshore Radiotelephone Service.
(f) Low power auxiliary services, including wireless microphones - Duplicate of earlier tests
(g) Border areas near Canada and Mexico.
(h) Radio astronomy services.
(i) 600 MHz service band. - No existing examples
(j) Wireless Medical Telemetry Service. - No existing examples
(k) 488-494 MHz band in Hawaii.

8.19.4 Test data

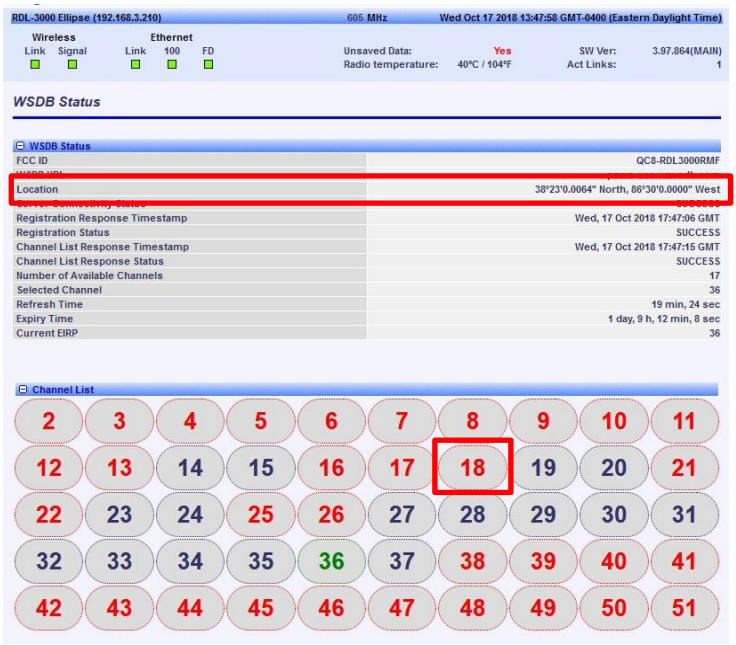

Figure 8.19-1: *Received channel list for coordinates set in scenarios (a) and (b). DCA channel 18 at location coordinates 38.4N, 86.5W*

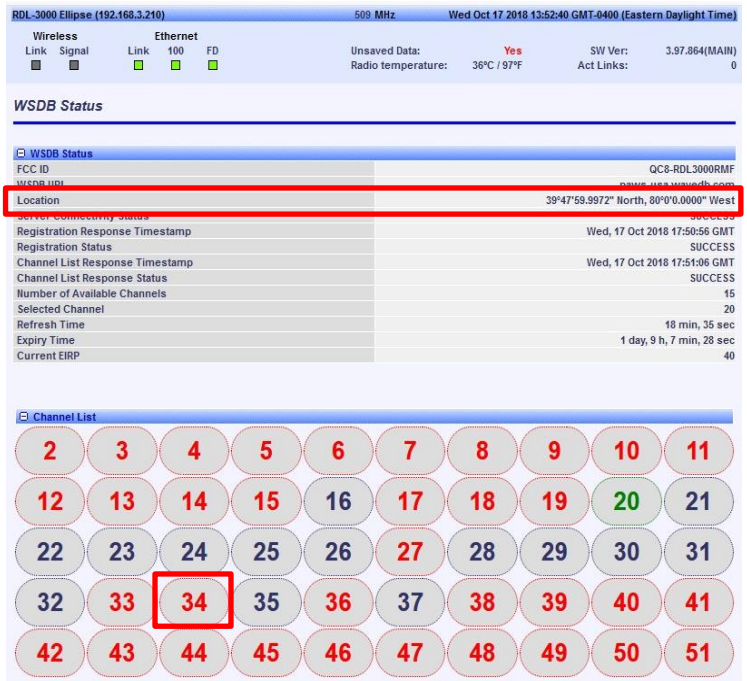

Figure 8.19-2: *Received channel list for coordinates set in scenarios (a) and (b). DRT channel 34 at location coordinates 39.8N, 80.0W*

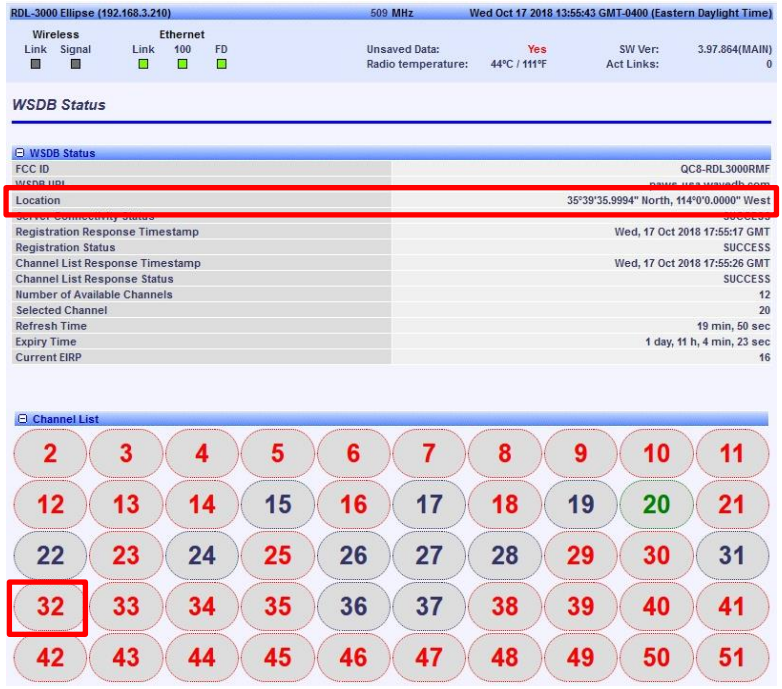

Figure 8.19-3: *Received channel list for coordinates set in scenarios (a) and (b). DTS channel 32 at location coordinates 35.66N, 114.0W*

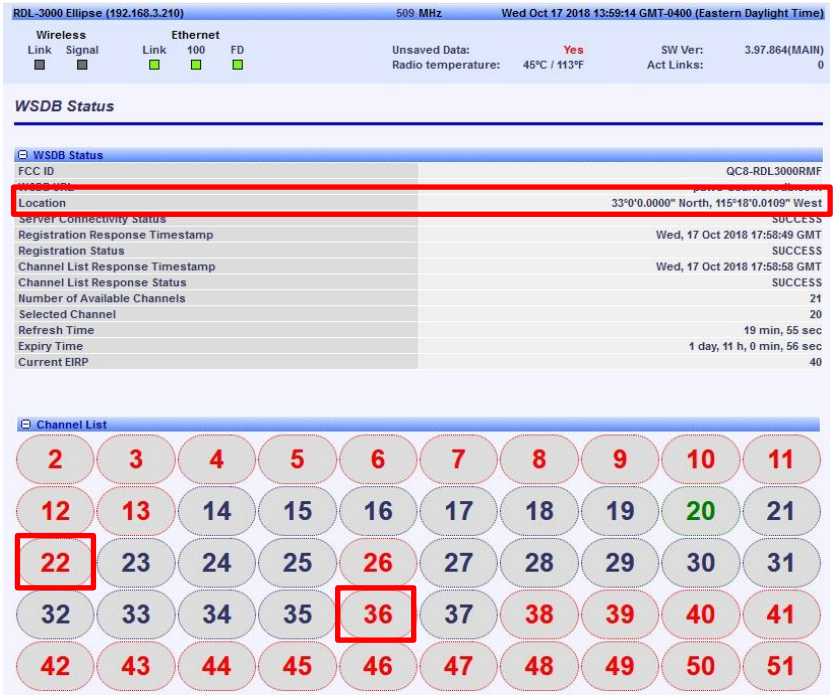

Figure 8.19-4: *Received channel list for coordinates set in scenarios (a) and (b). DTV channels 22 and 36 at location coordinate 33.0N, 115.3W*