WTX-610 ILLUMINATOR™

Multi-standard Modulated Transmitter to 6 GHz

User Manual

Ver. 3.2 February 2019

All Rights Reserved

Trademarks

Notice

The information in this manual is subjected to be changed without notice. Every effort has been made in the preparation of this manual to ensure the accuracy of the contents, but all statements, information and recommendations in this manual do not constitute the warranty of any kind, expressed or implied.

Table of Contents

Introduction

Overview

Consultix WTX-610 ILLUMINATOR is a handheld multi-standard modulated transmitter that gets myriad technologies in your hand. Generating CW (Continuous Wave) signals, LTE & WCDMA modulated signals and Arbitrary Waveforms with a maximum output power of 40 dBm. It is compact, portable, lightweight and easy to use for indoor and outdoor coverage test scenarios. ILLUMINATOR covers all 2G/3G/4G cellular frequency bands; 200 MHz, 400MHz, 700 MHz, 850 MHz, 900 MHz, 1.8 GHz, 2.1 GHz, 2.5 GHz, 2.6 GHz and others up to 6 GHz.

ILLUMINATOR Highlights

Key Features

- Handheld & heavy-duty
- Battery operated up to 6 Hours with continuous operation
- CW, LTE & W-CDMA signal modulations
- 200MHz to 6000 MHz in a single device
- 10 Watt built-in Power Amplifier (Optional)
- 2dB Level Accuracy
- 1 KHz frequency resolution
- Lightweight < 1.6 Kg (3.5 lb)
- Ergonomic user interface
- Waveform Storage
- Field upgradable through license keys

Applications

- CW Measurements
- Walk-Tests
- IBS Path Loss Measurements
- DAS Performance Evaluation
- In-Building Coverage Enhancement
- General Purpose Signal Generator

Safety Compliances & Precautions

In order to avoid damage to your ILLUMINATOR and to ensure efficient operation of your test transmitters, please make sure to follow the following recommendations and best practices:

A. To avoid hazard or damage, only use original accessories with the ILLUMINATOR.
B. Don't touch the antenna during operation as it may alter the radiation pattern.
C. The best practice is to connect the antenna before turning-on the RF Power.
D. Do not operate in Wet/Very Damp Conditions.
E. Do not operate near flammable or explosive materials.
F. If you suspect there is damage to this product, have it inspected only by authorized service personnel or service centers.

Getting Started

Package contents

Please unpack and inspect the shipping package to make sure that you have received all the parts without damage; the shipping package is shown in ***table 1***.

WTX-610 ILLUMINATOR	
12 VDC Power Adapter	
28Vdc Power Adapter(*)	
Stylus Pen	
Manual CD	
Carrying Case	

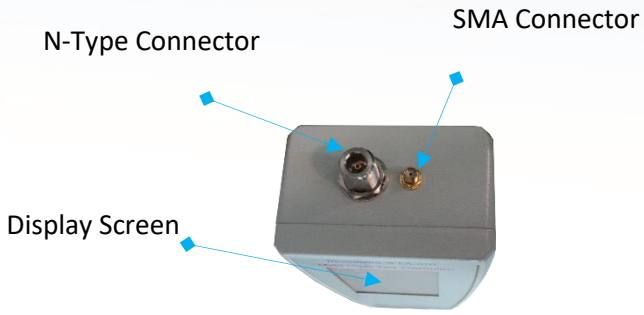
***Table 1**: ILLUMINATOR Packing List*

(*)In Case Power Amplifier is included

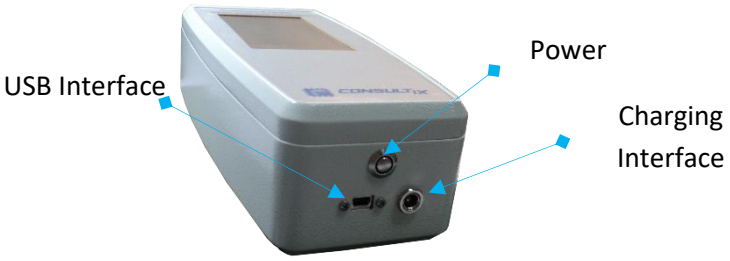
For any issue regarding the shipment package, please contact your nearest Consultix distributor or contact us directly at support@consultixwireless.com

ILLUMINATOR Panels

Figure 1 below depicts the Front Panel of the ILLUMINATOR.



a- Top Panel



b- Bottom Panel

Figure1: *ILLUMINATOR User Interface*

General Operations

Preparations

- Connect the power adapter to the charging interface
- Switch On the device by a one-second press on the power switch
- Before starting RF transmission, please connect the antenna to ILLUMINATOR.

ILLUMINATOR Display Screen

Figure 2, depicts the Consultix ILLUMINATOR Display Screen

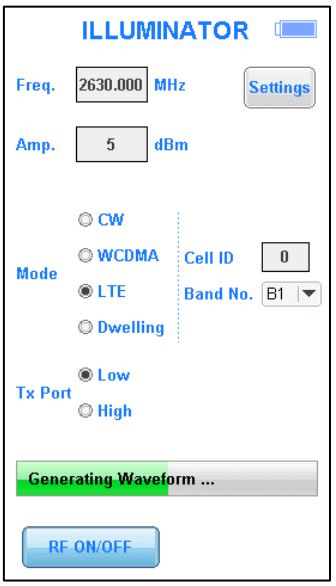


Figure2: Consultix ILLUMINATOR Main Window

1) **Freq.**: Type in the signal frequency in **MHz**
2) **Amp.**: Type in the required signal level in **dBm**
3) **Mode**: Select the required signal generation mode
    - CW: Select the Continuous Wave (CW) Mode
    - WCDMA: Select the WCDMA Mode
        - Scr. Code: Type in the scrambling code from 0 to 51
    - LTE: Select the LTE Mode
        - Cell ID: Type in the LTE Cell ID from 0 to 503
        - Band No.: Type in the required B number as per LTE standard bands.

    Note: User has to choose certain B number to work with Test/commercial phones.

    - Dwelling: Select the Dwelling Mode (Optional mode)

    Note: After setting LTE or WCDMA configurations, The ILLUMINATOR will build the required waveform in its memory, please allow around 10-15 seconds for signal generation after you press "**RF ON/OFF**" button.

4) **TX Port**: Switch between high & low power mode
    - Low: Low power signal generation for indoor applications; -10 dBm to 15 dBm (Standard)
    - High: High Power signal generation for outdoor applications; +20 to +40 dBm (Optional); PA ON/OFF button appears in this mode
5) **RF ON/ OFF**: Start/Stop RF signal generation; **RF ON** status indicator appears on the upper right corner
6) **PA ON/OFF**: Turn on/off built-in power amplifier; **PA ON** status indicator appears on the upper right corner

    Note: Please make sure that a suitable antenna is connected to the high power RF port before turning on the built-in power amplifier module.
7) **Settings**: Enter the device information window where the user can view the device information (Serial Number, HW Version and UI Version) and can activate WCDMA, LTE and Dwelling licenses by typing the license key in the "License Key" text box as shown in Figure 3 below:

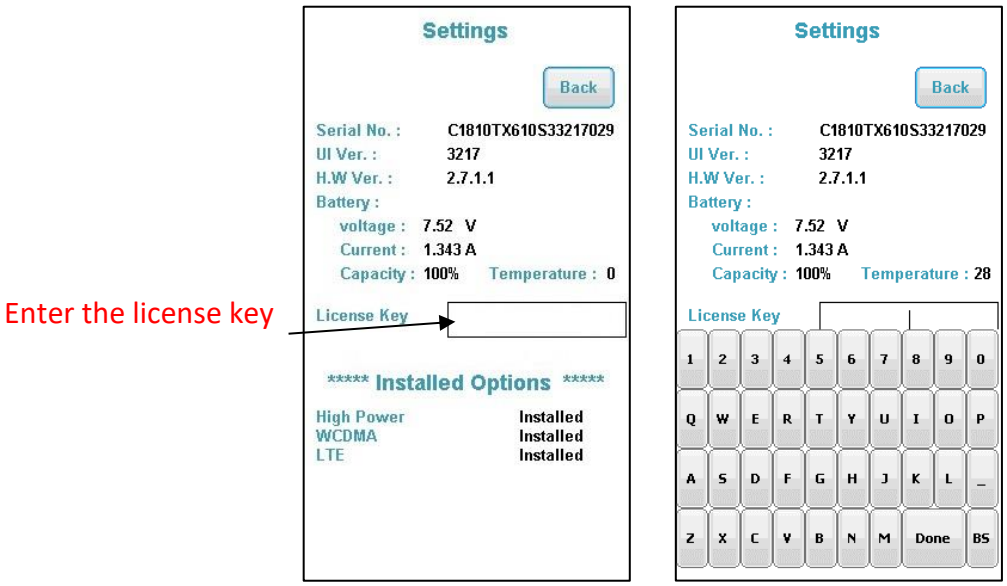


Figure3: Consultix ILLUMINATOR License Activation

Note: In order to obtain Consultix ILLUMINATOR Dwelling mode license or High Power mode upgrade please contact support@consultixwireless.com

Example test setup

Generating LTE signal using low power mode

Figure 4, depicts an example of generating 5dBm LTE signal at 1815.1MHz (EARFCN#1301) with Cell ID = 3 using Consultix ILLUMINATOR.

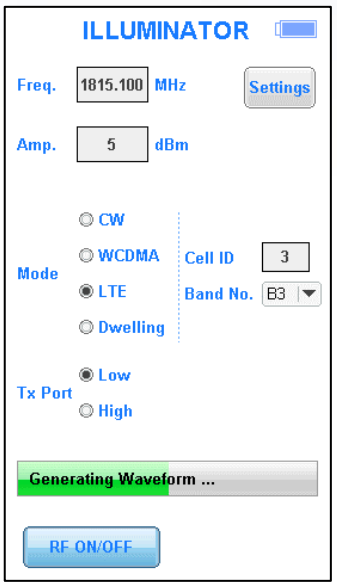


***Figure 4**: 5dBm LTE signal generation at 1815.1MHz*

1- Connect the AC/DC Power Adapter to the charging socket and power on the ILLUMINATOR.

2- On the display screen follow the following steps:

- Set the operation mode to "**LTE**"
- Choose LTE band number "**Band No.**" as per standard LTE bands
- Type in the required **Cell ID** (From 0 to 503)
- Choose the **Tx Port** to be "Low"
- In the "**Freq.**" Textbox, type in the signal frequency = 1815.1 MHz.
- In the "**Amp.**" Textbox, type in the signal level = 5 dBm.

3- Toggle "**RF ON/OFF**" button to start RF Transmission; LTE waveform will be generated.

Note: In order to obtain Consultix ILLUMINATOR LTE mode license any other licenses, please contact support@consultixwireless.com

4- start your drive/walk test by holding your receiver/scanner or test phone and getting signal parameters in different locations at the venue as depicted in Figure 5 below.

Figure 5: A complete Modulated Walk Test using ILLUMINATOR and test phone

Generating CW signal using high power mode

Figure 6 below depicts an example of generating 40dBm CW signal at 2600MHz using ILLUMINATOR.

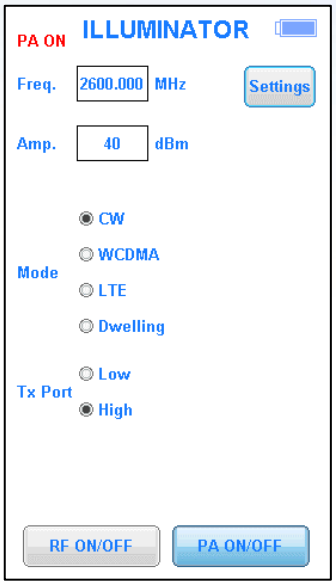


Figure 6: 40dBm CW signal generation at 2600MHz

5- Connect the AC/DC Power Adapter(*) to the charging socket and power on the ILLUMINATOR.

6- On the display screen follow the following steps:

- Set the operation mode to "**CW**"
- Choose the **Tx Port** to be "**High**"; **PA ON/OFF** button will be activated.
- In the "**Freq.**" Textbox, type in the signal frequency = 2600 MHz.
- In the "**Amp.**" Textbox, type in the signal level = 40 dBm.

7- Toggle "**PA ON/OFF**" button to turn on power amplifier module; **PA ON** indicator appears on the upper right corner.

8- Toggle "**RF ON/OFF**" button to start RF Transmission; **RF ON** indicator appears on the upper right corner.

Note: In order to obtain Consultix ILLUMINATOR high power mode license or any other licenses, please contact support@consultixwireless.com

(*)The power amplifier mode working with 28VDC only.

In Figure 7, a 2.6GHz CW signal is generated using ILLUMINATOR

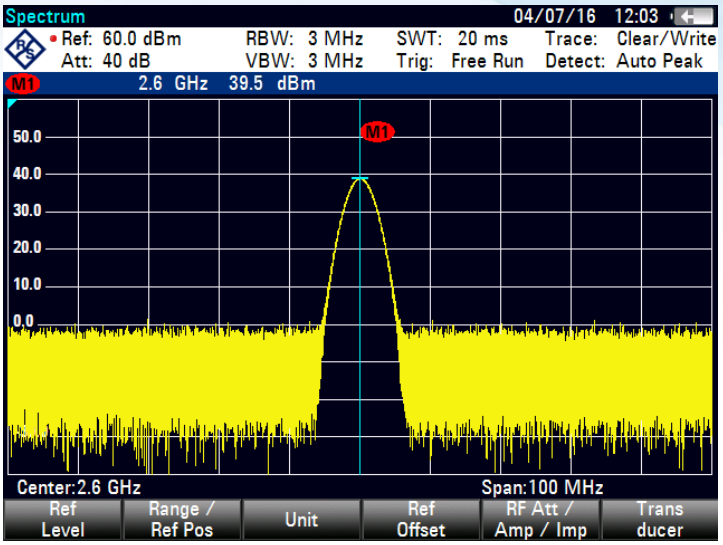


Figure 7: 40 dBm CW signal generation at 2.6GHz

9- Once you have done your test, toggle "**RF ON/OFF**" button to stop RF Transmission then turn off power amplifier module by pressing **"PA ON/OFF"** button.

ILLUMINATOR Upgrades

ILLUMINATOR is upgradeable by boot-loader process for any type of arbitrary waveform generations please contact support@consultixwireless.com to get your appropriate firmware version

Appendix A: Specifications

RF Characteristics		
RF Ports	Port 1 (Standard), Port 2 (Optional)	
Frequency Range	Continuous Wave: 200 MHz to 6 GHz Modulated: 700 MHz to 1000 MHz and 1700 MHz to 2700 MHz	
Internal Frequency Accuracy	1 ppm	
Frequency Step	1 KHz	
Output Power Level Steps	1 dB	
Level Accuracy	± 2 dB (Typ. 1 dB)	
RF Interfaces	50 Ohm	
Modulations	Continuous Wave (CW), LTE-FDD (optional) and WCDMA (optional)	
LTE Settings	Cell ID (Synchronization Reference Signal) and Bandwidth	
LTE BW	5 MHz (10 MHz Optional)	
WCDMA Settings	Scrambling Code	
RF Port 1	**Continuous Wave**	**Modulated (**Requires Modulation License)
Output Power	-10 dBm to 15 dBm at 200 to 4800 MHz -10 dBm to 10 dBm at 4800 to 5500 MHz -10 dBm to 5 dBm at 5500 to 6000 MHz	-10 dBm to 15 dBm at 700 to 1000 MHz and 1700 to 2700 MHz
Harmonics	≤-30 dBc at Maximum Output Power	≤-20 dBc at Maximum Output Power
RF Port 2 (Requires Port 2 Activation)	**Continuous Wave**	**Modulated (**Requires Modulation License)
Output Power	20 dBm to 40 dBm (10 Watt) at 350 to 2700 MHz	30 dBm to 33 dBm (2 Watt) at 700 to 1000 MHz and 1700 to 2700 MHz
Harmonics	≤-20 dBc at 30 dBm Output Power ≤-10 dBc at 40 dBm Output Power	≤-12 dBc (Typ. -16 dBc) at Maximum Output Power
Power Supply		
Input Power	9 to 12 VDC 17 W Max (For Base Unit without Amplifier) 28 VDC 45 W Max (For Base Unit with Amplifier)	
Battery (Requires Internal Battery Option)	Li-ion, 7.4V 10200 mAh	
Battery Operation Time	6 Hours (At Continuous Maximum Output Power)	
Physical Characteristics		
External Dimensions	L220 x W100 x H62 mm	
Weight	1 Kg (2.2 lb) 1.6 Kg (3.5 lb) with Amplifier	
Operating Temperature	-10 to +40 C	
Interfaces	N-Type Female, SMA Female, USB and DC Input	
Standard Package	Transmitter, AC/DC Adapter, Hard Carrying Case, Stylus Pen and User Manual	

Appendix B: FDD LTE Frequency Bands

BAND NUMBER	UPLINK (MHZ)	DOWNLINK (MHZ)	BANDWIDTH (MHZ)	DUPLEX SPACING (MHZ)	BAND GAP (MHZ)
1	1920 - 1980	2110 - 2170	60	190	130
2	1850 - 1910	1930 - 1990	60	80	20
3	1710 - 1785	1805 -1880	75	95	20
4	1710 - 1755	2110 - 2155	45	400	355
5	824 - 849	869 - 894	25	45	20
6	830 - 840	875 - 885	10	35	25
7	2500 - 2570	2620 - 2690	70	120	50
8	880 - 915	925 - 960	35	45	10
9	1749.9 - 1784.9	1844.9 - 1879.9	35	95	60
10	1710 - 1770	2110 - 2170	60	400	340
11	1427.9 - 1452.9	1475.9 - 1500.9	20	48	28
12	698 - 716	728 - 746	18	30	12
13	777 - 787	746 - 756	10	-31	41
14	788 - 798	758 - 768	10	-30	40
15	1900 - 1920	2600 - 2620	20	700	680
16	2010 - 2025	2585 - 2600	15	575	560
17	704 - 716	734 - 746	12	30	18
18	815 - 830	860 - 875	15	45	30
19	830 - 845	875 - 890	15	45	30
20	832 - 862	791 - 821	30	-41	71
21	1447.9 - 1462.9	1495.5 - 1510.9	15	48	33
22	3410 - 3500	3510 - 3600	90	100	10
23	2000 - 2020	2180 - 2200	20	180	160
24	1625.5 - 1660.5	1525 - 1559	34	-101.5	135.5
25	1850 - 1915	1930 - 1995	65	80	15
26	814 - 849	859 - 894	30 / 40		10
27	807 - 824	852 - 869	17	45	28
28	703 - 748	758 - 803	45	55	10
29	n/a	717 - 728	11		
30	2305 - 2315	2350 - 2360	10	45	35
31	452.5 - 457.5	462.5 - 467.5	5	10	5

Appendix C: TDD LTE Frequency Bands

BAND NUMBER	ALLOCATION (MHZ)	BANDWIDTH (MHZ)
33	1900 - 1920	20
34	2010 - 2025	15
35	1850 - 1910	60
36	1930 - 1990	60
37	1910 - 1930	20
38	2570 - 2620	50
39	1880 - 1920	40
40	2300 - 2400	100
41	2496 - 2690	194
42	3400 - 3600	200
43	3600 - 3800	200
44	703 - 803	100

Further Help

- For any support inquiry, kindly contact:

  Support: support@consultixwireless.com

  Or contact our distributor covering your region (check www.consultixwireless.com)

- For any information about prices, specifications, future developments, recommendations, customizations, or general question, kindly contact:

  Sales: sales@consultixwireless.com