

Hosted Mode Low Power User Guide

PinnacleTM 100 Modem

Version 1.0

REVISION HISTORY

Version	Date	Notes	Contributors	Approver
0.1	02/12/2020	Initial Release	Mike Richter	Matt Stergiou

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1 OVERVIEW

This guide is to aid more rapid development of embedded applications using the Pinnacle™ 100 modem using the Hosted-Mode firmware. This guide will describe the setup and operation of eDRX and PSM, as well as, providing current measurements of the modem, for both LTE Cat-M1 and Cat-NB1 with the use of a R&S CMW500 and a Amarisoft Callbox mini.

- PSM is intended for applications that seldom send data (once a day, for instance), and does not need to be reachable or reachable with long latency (several hours, for instance).
- eDRX is intended for applications that need to be reachable but tolerate latency in an order of magnitude of 10 seconds or more.

2 MEASUREMENT SETUP & REQUIREMENTS

2.1 Reference Material

- AirPrime_HL7800_Low_Power_Modes_Application_Note_Rev2_0.pdf
- AirPrime_HL78xx_AT_Commands_Interface_Guide_Rev9_3.pdf
- CS-GUIDE-PINNACLE-100-DVK HW v1_0.pdf
- Schematic-Pinnacle100 DVK
- CS-GUIDE-ATInterface-Pinnacle-100-Module v1_11.pdf

The AirPrime HL7800 provides advanced and efficient low power modes in addition to 3GPP advanced power saving features like PSM (Power Saving Mode) and eDRX (extended DRX).

This document provides a detailed description of the AirPrime HL7800's low power modes while it is configured in PSM or eDRX.

2.2 UwTerminalX

In this document, UwTerminalX, is used to communicate with the Host UART of the Pinnacle™ 100 modem, and can be downloaded by visiting the Following link: <https://github.com/LairdCP/UwTerminalX>

2.3 R&S CMW500 Block Diagram

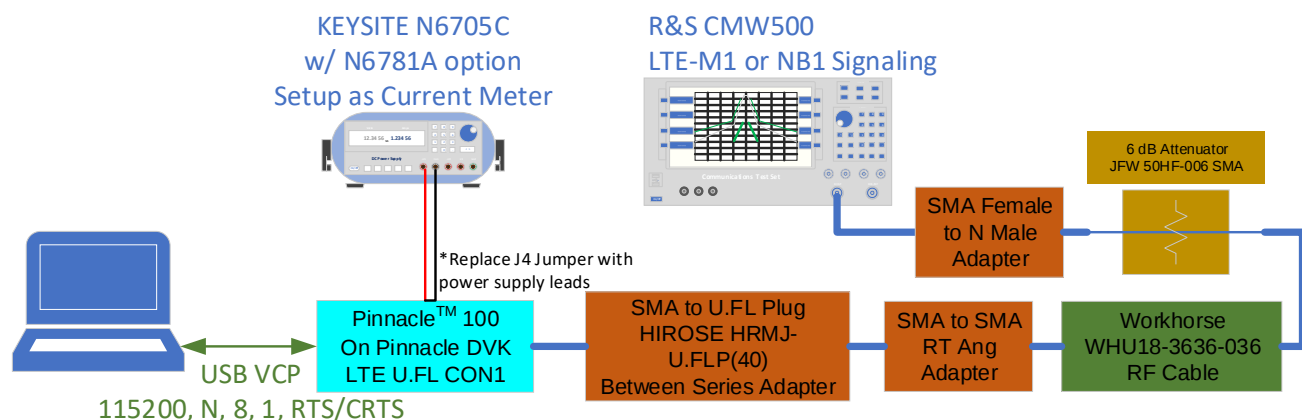


Figure 1: R&S CMW500 Test Configuration

2.4 Amarisoft Block Diagram

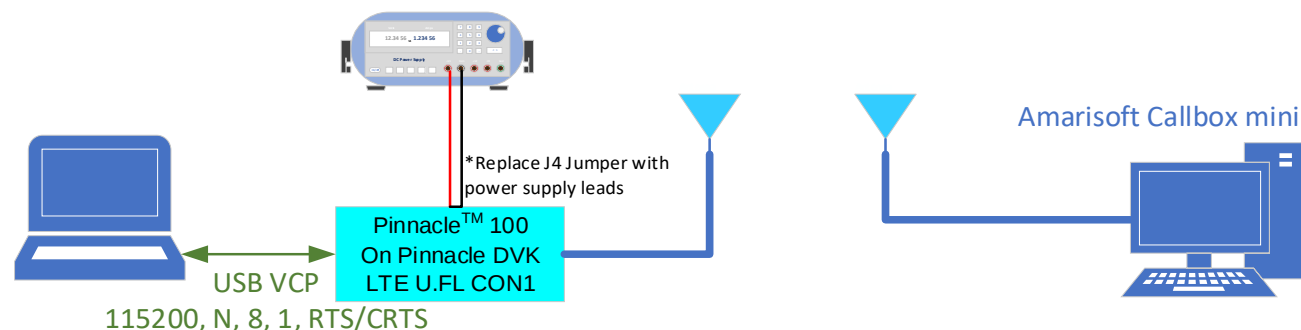


Figure 2: Amarisoft Test Configuration

2.5 DVK Setup

Setup the DVK's IO switches as shown in Figure 3. Place a Jumper Wire on IO M2.59 and connect to J9 Pin 11 (1.8V). The N6705C DC Power Analyzer setup as the Current Meter is connect using J4.

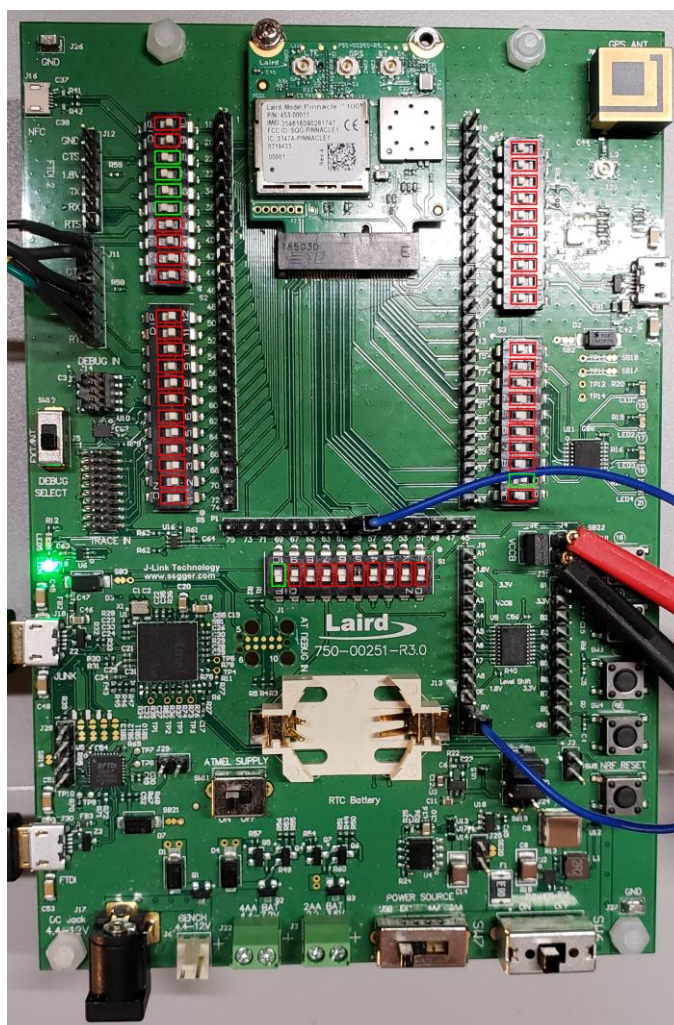


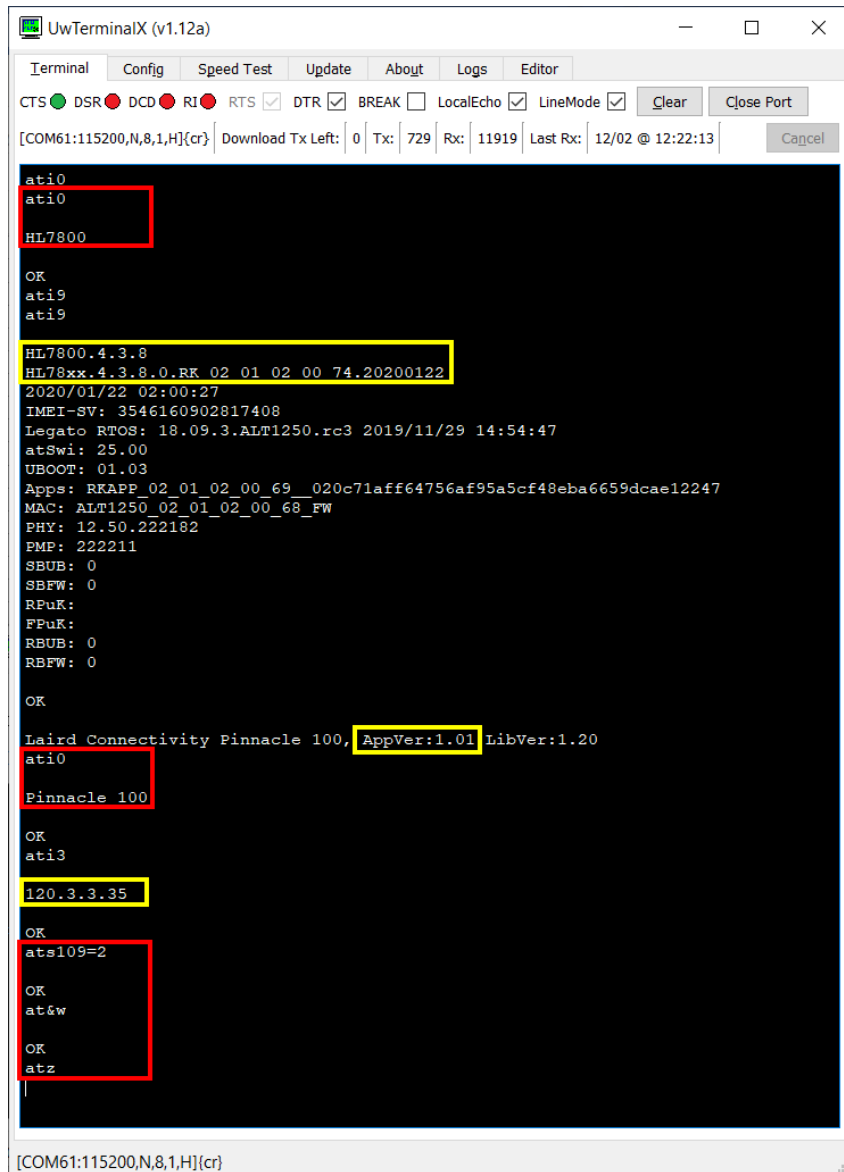
Figure 3: DVK Configuration

3 MODEM CONFIGURATION

3.1 Pinnacle™ 100 Firmware and Application

The modem's NRF chip is loaded with **120.3.3.35**, running Application: **1.01**, and the HL7800 is loaded with **4.3.8.0**.

Figure 4 shows the Firmware settings (highlight in **Yellow**)



```
UwTerminalX (v1.12a)
Terminal Config Speed Test Update About Logs Editor
CTS DSR DCD RI RTS DTR BREAK LocalEcho LineMode Clear Close Port
[COM61:115200,N,8,1,H]{cr} Download Tx Left: 0 Tx: 729 Rx: 11919 Last Rx: 12/02 @ 12:22:13 Cancel

ati0
ati0
HL7800

OK
ati9
ati9

HL7800.4.3.8
HL78xx.4.3.8.0.RK 02 01 02 00 74.20200122
2020/01/22 02:00:27
IMEI-SV: 3546160902817408
Legato RTOS: 18.09.3.ALT1250.rc3 2019/11/29 14:54:47
atSwi: 25.00
UBOOT: 01.03
Apps: RRAPP_02_01_02_00_69_020c71aff64756af95a5cf48eba6659dcae12247
MAC: ALT1250_02_01_02_00_68_FW
PHY: 12.50.222182
PMP: 222211
SBUB: 0
SBFW: 0
RPuK:
FPuK:
RBUB: 0
RBFw: 0

OK

Laird Connectivity Pinnacle 100, AppVer:1.01 LibVer:1.20
ati0
Pinnacle 100

OK
ati3

120.3.3.35

OK
ats109=2

OK
at&w

OK
atz

[COM61:115200,N,8,1,H]{cr}
```

Figure 4: Query Firmware settings, configuring the NRF low power operation.

3.2 Configure M2.59 for nRF Low Power Operation

nRF Low Power Operation functionality is enabled by S Register 109.

Make sure the UART is communicating with the nRF by sending the **ati0** command; **Pinnacle 100 =nRF & HL7800 = HL7800**

*By default, the nRF will be communicating with HL7800 upon boot, to switch to communicate with the nRF, toggle the DTR check box, on and off, the console should now be switched, but check with **ati0**. By toggling the DTR signal, the UART will switch between radios.*

Send the following commands to the nRF, to enable the nRF low power operation, save the setting, and reboot. Connect a jumper from Pin M2.59 to J9 Pin 11. The jumper can be connected to either 1.8V (Low power disabled) [J9 Pin 11] or GND (Low Power enabled) [J9 Pin 12] depend on the desired operation. See Figure 3

ATS109=2

AT&W

ATZ

Figure 4 shows setting S Register 109 (highlight in **RED**)

3.3 Configure Radio Technology (M1 vs NB1) and Band

The Radio Technology must be configured and the supported bands: For this Guide, Band 20 is used.

To set the Radio Technology for Cat-M1:

at+ksrat=0

at+kbndcfg=0,80000

To set the Radio Technology for Cat-NB1:

at+ksrat=1

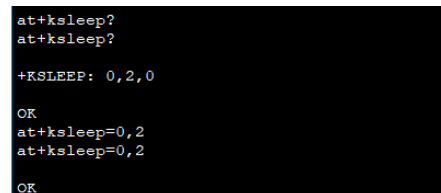
at+kbndcfg=1,80000

Note: changing the radio technology will automatically reboot the modem. The kbndcfg should be set after rebooting.

3.4 Configure at+ksleep

Connect to the HL7800 and set at+ksleep.

at+ksleep=0,2



```
at+ksleep?
at+ksleep?
+KSLEEP: 0,2,0
OK
at+ksleep=0,2
at+ksleep=0,2
OK
```

Figure 5: Query and set +ksleep

4 LTE CAT-M1 LOW POWER OPERATION, R&S CMW500

4.1 Cat-M1 eDRX

Follow the steps below to configure the Pinnacle™ 100 modem for low power operation. Figure 6, shows the commands sent.

at+cedrxs=1,4,5 (Note 1& 2)

Toggle DTR to change from HL7800 to nRF radio comm

at+aslp 1

Toggle DTR to change from nRF to HL7800 radio comm

Move M2.59 Jumper from J9 Pin 11 (1.8V) to J9 Pin12 (GND)

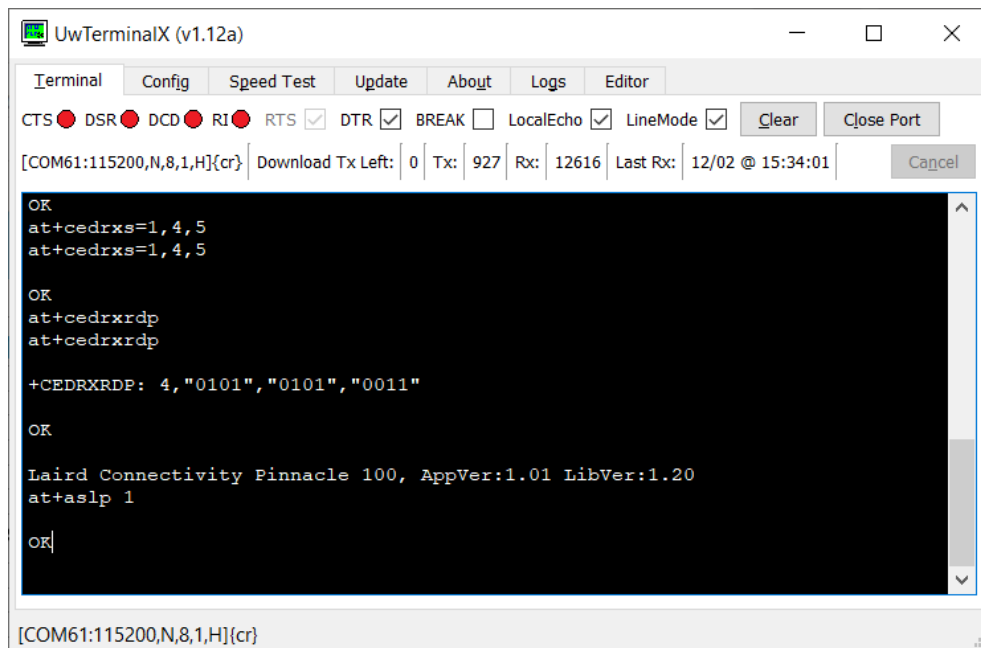
Should see CTS Turn from Green to Red On UwTerminalX

Note 1: Per Sierra Wireless recommendations: Use eDRX cycle 81.92 sec, a PTW of 5.12 sec was selected, both parameters are controlled by the CMW500 setup

Note 2: That same sequence of commands is used to put the modem into PSM, except at+cedrx is replace by at+cpmsms.

Note 3: The Current is observed using the Keysight N6705C DC Power Analyzer with ranges set to Auto to get wide dynamic current range from uA to A.

Figure 7 shows the PTW and eDRX cycle, and Figure 8 shows the Avg Current per hour is 1.064 mA.



```
UwTerminalX (v1.12a)
Terminal Config Speed Test Update About Logs Editor
CTS DSR DCD RI RTS DTR BREAK LocalEcho LineMode Clear Close Port
[COM61:115200,N,8,1,H]{cr} Download Tx Left: 0 Tx: 927 Rx: 12616 Last Rx: 12/02 @ 15:34:01 Cancel

OK
at+cedrxs=1,4,5
at+cedrxs=1,4,5

OK
at+cedrxrdp
at+cedrxrdp

+CEDRXRDP: 4,"0101","0101","0011"

OK

Laird Connectivity Pinnacle 100, AppVer:1.01 LibVer:1.20
at+aslp 1

OK|

[COM61:115200,N,8,1,H]{cr}
```

Figure 6: Cat-M1 Low Power Mode Command Sequence



Figure 7: Cat-M1, PSM, PTW and Cycle Time



Figure 8: Cat-M1, eDRX, Cycle Time 81.92 secs

4.2 Cat-M1 PSM — Once every Min

at+cpsms=1,,,"10100001","00001010" T3412 = "10100001" = 1 min; T3324 = "00001010" = 20 sec



Figure 9: Cat-M1, PSM, Once every 10 mins

4.3 Cat-M1 PSM — Once every 10 Min

at+cpsms=1,,,"00000001","00001010"



Figure 10: Cat-M1, PSM, Once every 10 mins

4.4 Cat-M1 PSM — Once every Hour

at+cpsms=1,,,"00100001","00001010"



Figure 11: Cat-M1, PSM, Once every hour

4.5 Cat-M1 PSM — Once every 8 Hours

at+cpsms=1,,,"00101000","00001010"



Figure 12: Cat-M1, PSM, Once every 8 hrs

4.6 Cat-M1 PSM — Once a Day

```
at+cpsms=1,,,"00111000","00001010"
```

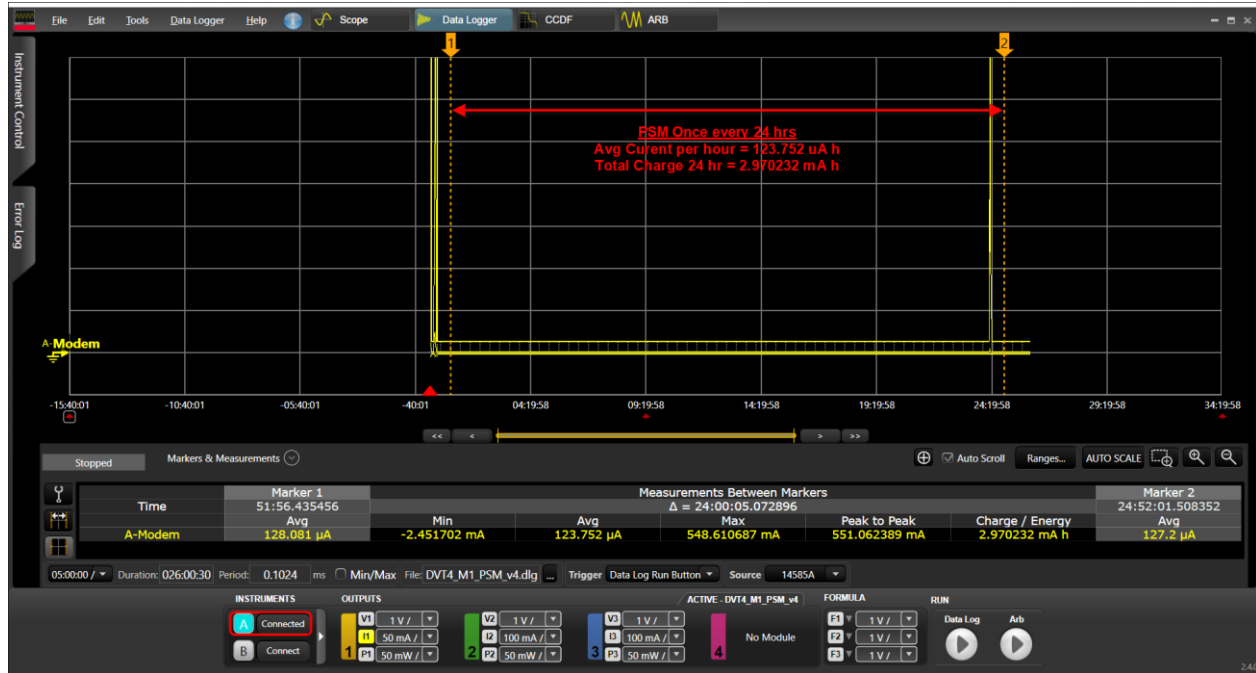


Figure 13: Cat-M1, PSM, Once every Day

4.7 Cat-M1 eDRX & PSM Summary

Table 1 is a Summary of the current measurements of eDRX and PSM modes for LTE Cat-M1.

Table 1: Cat-M1 eDRX and PSM Modem currents

Low Power Mode	Timers		Avg Current/Hour mA H	Charge/Day mA H
	Cycle	PTW/cDRX		
eDRX	81.92 sec	5.12 sec	1.063773	25.530552
PSM	1 min	20 sec	4.874448	116.986752
	10 min	20 sec	0.614072	14.737728
	1 hr	20 sec	0.274957	6.598968
	8 hr	20 sec	0.135433	3.250392
	24 hr	20 sec	0.123752	2.970232

4.8 Exiting the Low Power Mode

Move M2.59 Jumper from J9 Pin 12 (1.8V) to J9 Pin11 (GND)

Should see CTS Turn from Red to Green On UwTerminalX

Toggle DTR to change from HL7800 to nRF radio comm

at+aslp 0

Toggle DTR to change from HL7800 to nRF radio comm

For eDRX: at+cedrxs=0

For PSM: at+cpsms=0

Low power mode has been exited.

5 LTE CAT-NB1 LOW POWER OPERATION, R&S CMW500

5.1 Uplink Subcarrier Spacing: 15 kHz with 12 subcarriers

5.1.1 Cat-NB1 15KHz eDRX

Follow the steps below to configure the Pinnacle™ 100 modem for low power operation. Figure 14, shows the commands sent.

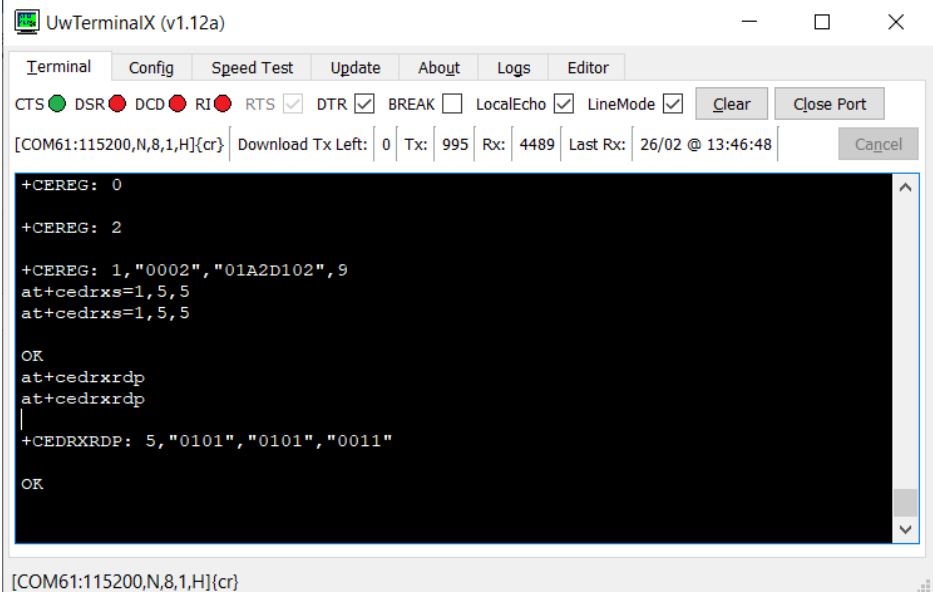
```
at+cedrxs=1,5,5 (Note 1 & 2)
Toggle DTR to change from HL7800 to nRF radio comm
at+aslp 1
Toggle DTR to change from nRF to HL7800 radio comm
Move M2.59 Jumper from J9 Pin 11 (1.8V) to J9 Pin12 (GND)
Should see CTS Turn from Green to Red On UwTerminalX
```

Note 1: Per Sierra Wireless recommendations: Use eDRX cycle 81.92 sec, a PTW of 10.24 sec was selected, both parameters are controlled by the CMW500 setup

Note 2: That same sequence of commands is used to put the modem into PSM, except at+cedrx is replace by at+cpsms.

Note 3: The Current is observed using the Keysight N6705C DC Power Analyzer with ranges set to Auto to get wide dynamic current range from uA to A.

Figure 15, shows the PTW and eDRX cycle, and Figure 16, shows the Avg Current per hour is 0.729 mA/H.



```
UwTerminalX (v1.12a)
Terminal Config Speed Test Update About Logs Editor
CTS DSR DCD RI RTS DTR BREAK LocalEcho LineMode Clear Close Port
[COM61:115200,N,8,1,H]{cr} Download Tx Left: 0 Tx: 995 Rx: 4489 Last Rx: 26/02 @ 13:46:48 Cancel
+CEREG: 0
+CEREG: 2
+CEREG: 1, "0002", "01A2D102", 9
at+cedrxs=1,5,5
at+cedrxs=1,5,5
OK
at+cedrxrdp
at+cedrxrdp
+CEDRXRDP: 5, "0101", "0101", "0011"
OK
[COM61:115200,N,8,1,H]{cr}
```

Figure 14: eDRX Cat-NB1, Low Power Mode Command Sequence

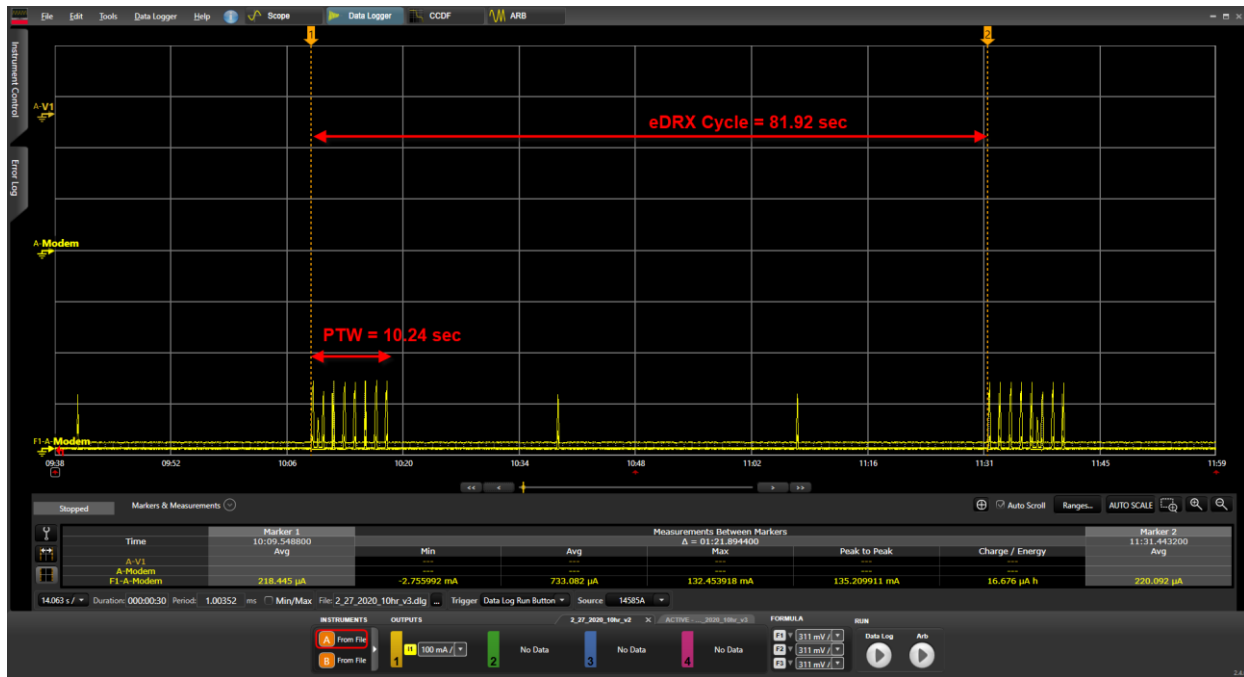


Figure 15: eDRX Cat-NB1 15KHz, PTW and Cycle Time

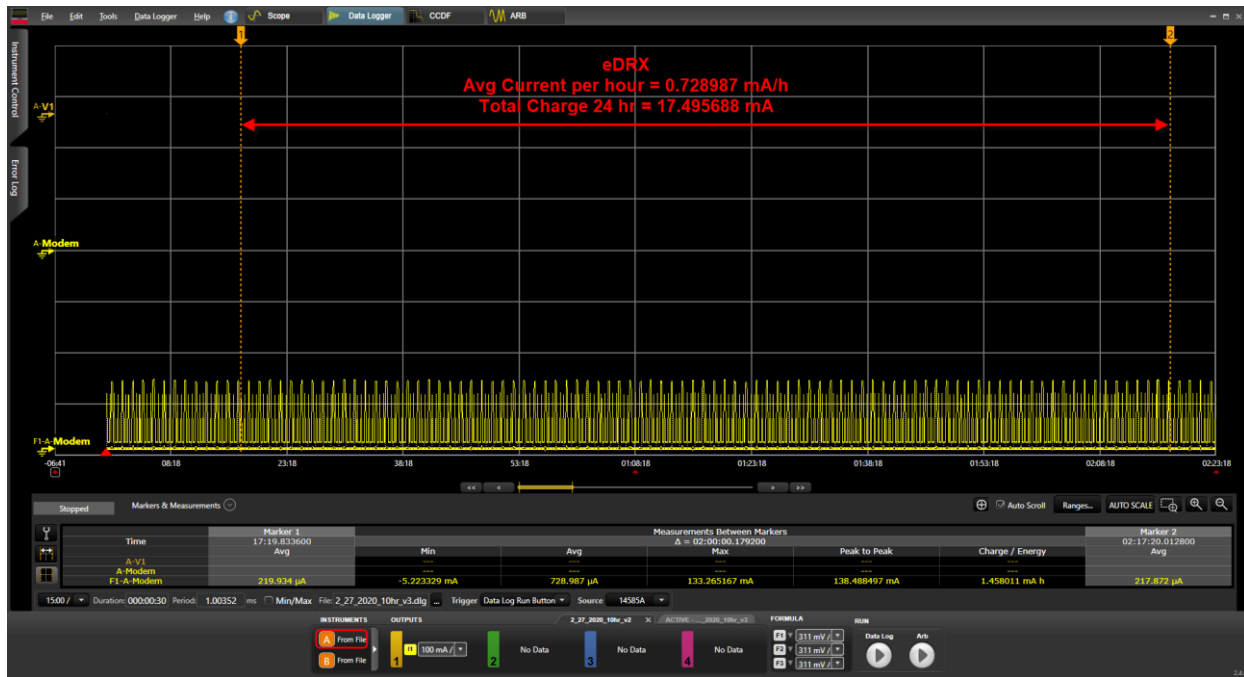


Figure 16: eDRX Cat-NB1 15KHz, Cycle Time 81.92 sec

5.1.2 Cat-NB1 15KHz PSM — Once every Min

at+cpsms=1,,,"10100001","00001010" T3412 = "10100001" = 1 min; T3324 = "00001010" = 20 sec



Figure 17: PSM Cat-NB1 15KHz, Once every min

5.1.3 Cat-NB1 15KHz PSM — Once every 10 Min

at+cpsms=1,,,"00000001","00001010"

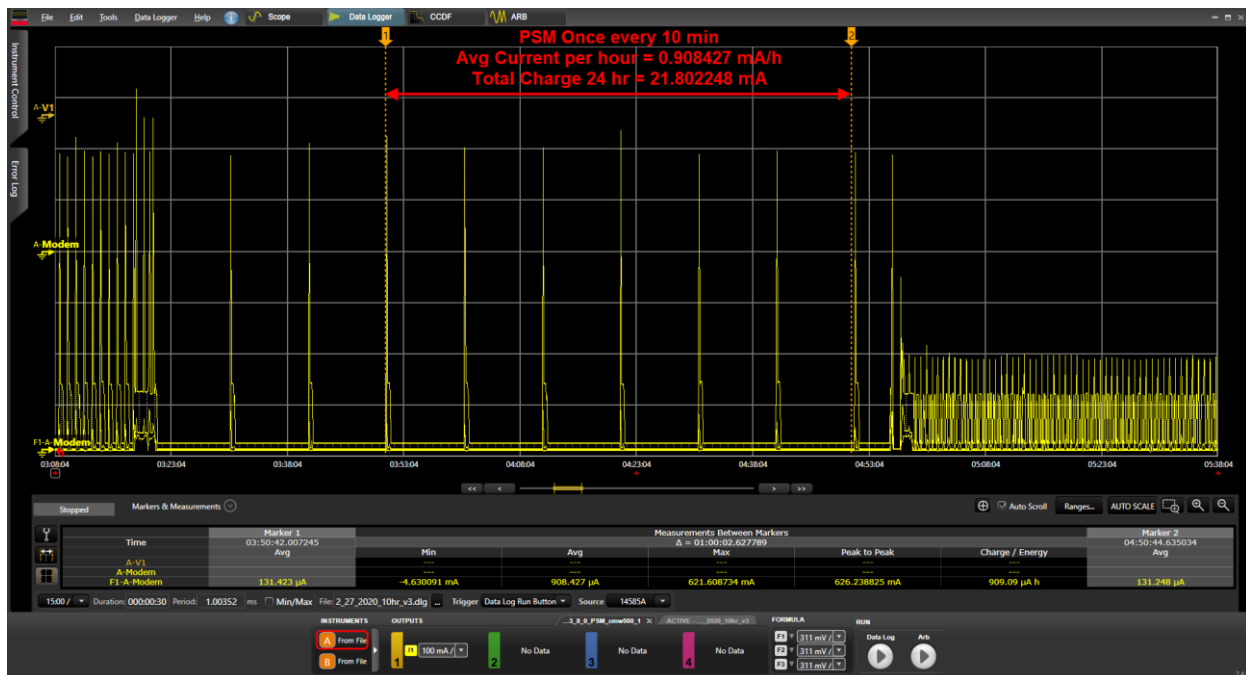


Figure 18: PSM Cat-NB1 3.75KHz, Once every 10 mins

5.1.4 Cat-NB1 15KHz PSM — Once every Hour

at+cpsms=1,,,"00100001","00001010"



Figure 19: PSM Cat-NB1 3.75KHz, Once every hour

5.2 Uplink Subcarrier Spacing: 3.75 kHz with MCS3

5.2.1 Cat-NB1 3.75KHz eDRX

Same commands as 5.1.1 Cat-NB1 15KHz eDRX on page 14.

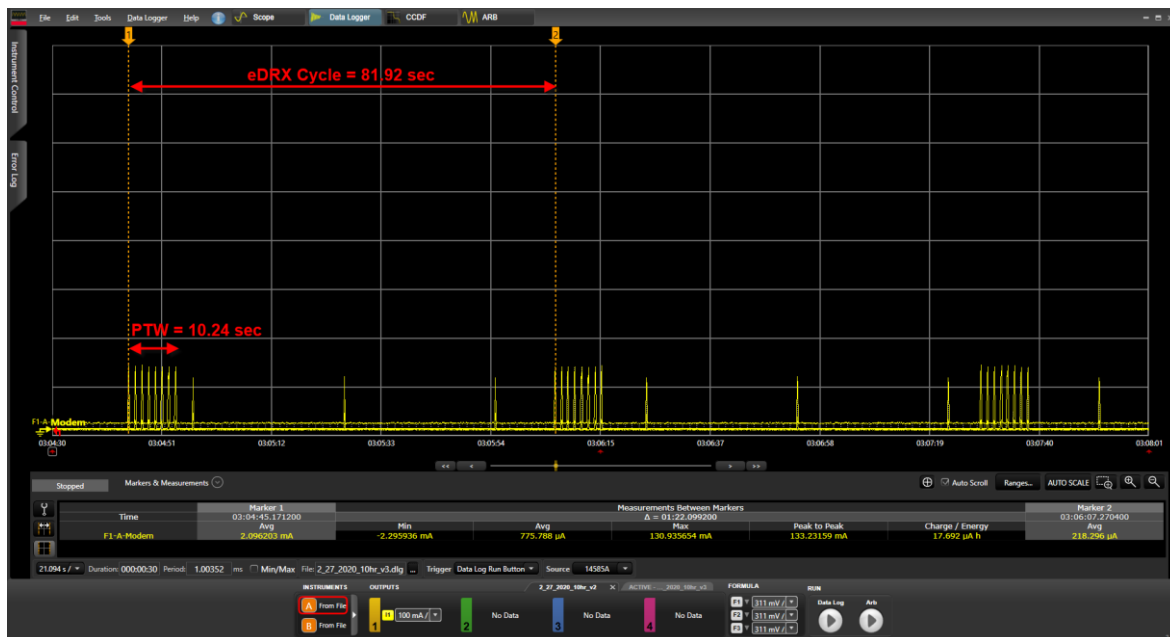


Figure 20: eDRX Cat-NB1 3.75KHz, PTW and Cycle Time

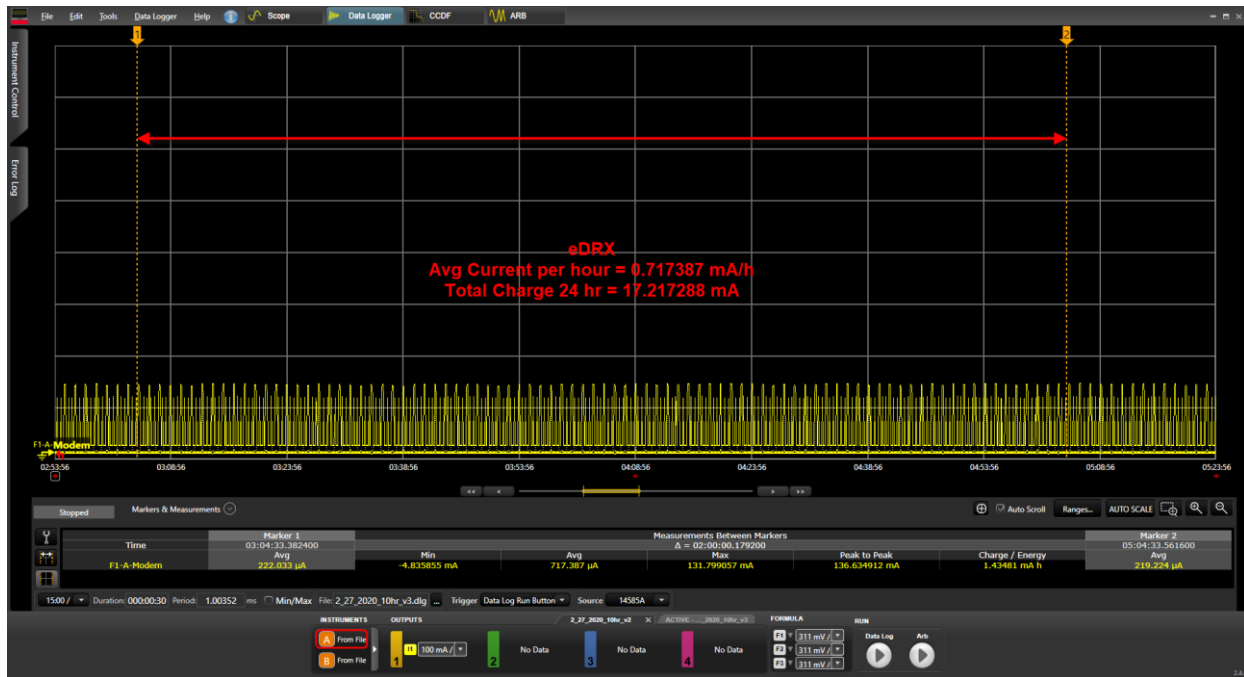


Figure 21: eDRX Cat-NB1 3.75KHz, Cycle Time 81.92 sec

5.2.2 Cat-NB1 3.75KHz PSM — Once every Min

at+cpsms=1,,,"10100001","00001010" T3412 = "10100001" = 1 min; T3324 = "00001010" = 20 sec



Figure 22: PSM Cat-NB1 3.75KHz, Once every min

5.2.3 Cat-NB1 3.75KHz PSM — Once every 10 Min

at+cpsms=1,,,"00000001","00001010"



Figure 23: PSM Cat-NB1 3.75KHz, PSM, Once every 10 min

5.2.4 Cat-NB1 3.75KHz PSM — Once every Hour

at+cpsms=1,,,"00100001","00001010"



Figure 24: PSM Cat-NB1 3.75KHz, Once every hour

5.3 Cat-NB1 eDRX & PSM Summary

Table 2 is a summary of the current measurements of eDRX and PSM modes for LTE Cat-NB1 15KHz.

Table 3 is a summary of the current measurements of eDRX and PSM modes for LTE Cat-NB1 3.75KHz.

Table 2: Cat-NB1 15KHz eDRX and PSM Modem currents

Low Power Mode	Timers		Avg Current/Hour mA H	Charge/Day mA H
	Cycle	PTW/cDRX		
eDRX	81.92 sec	10.24 sec	0.728987	17.495688
PSM	1 min	20 sec	7.758774	186.210576
	10 min	20 sec	0.908427	21.802248
	1 hr	20 sec	0.329765	7.914360

Table 3: Cat-NB1 3.75KHz eDRX and PSM Modem currents

Low Power Mode	Timers		Avg Current/Hour mA H	Charge/Day mA H
	Cycle	PTW/cDRX		
eDRX	81.92 sec	10.24 sec	0.717387	17.217288
PSM	1 min	20 sec	14.701911	352.845864
	10 min	20 sec	1.697441	40.738584
	1 hr	20 sec	0.445537	10.692888

5.4 Exiting the Low Power Mode

See 4.8 on page 13 Exiting the Low Power Mode

6 LTE CAT-M1 LOW POWER OPERATION, AMARISOFT CALLBOX MINI

6.1 Cat-M1 eDRX

Same commands used as section 4.1 on page 9 4.1Cat-M1 eDRX.



Figure 25: Cat-M1 eDRX; PTW and Cycle Time

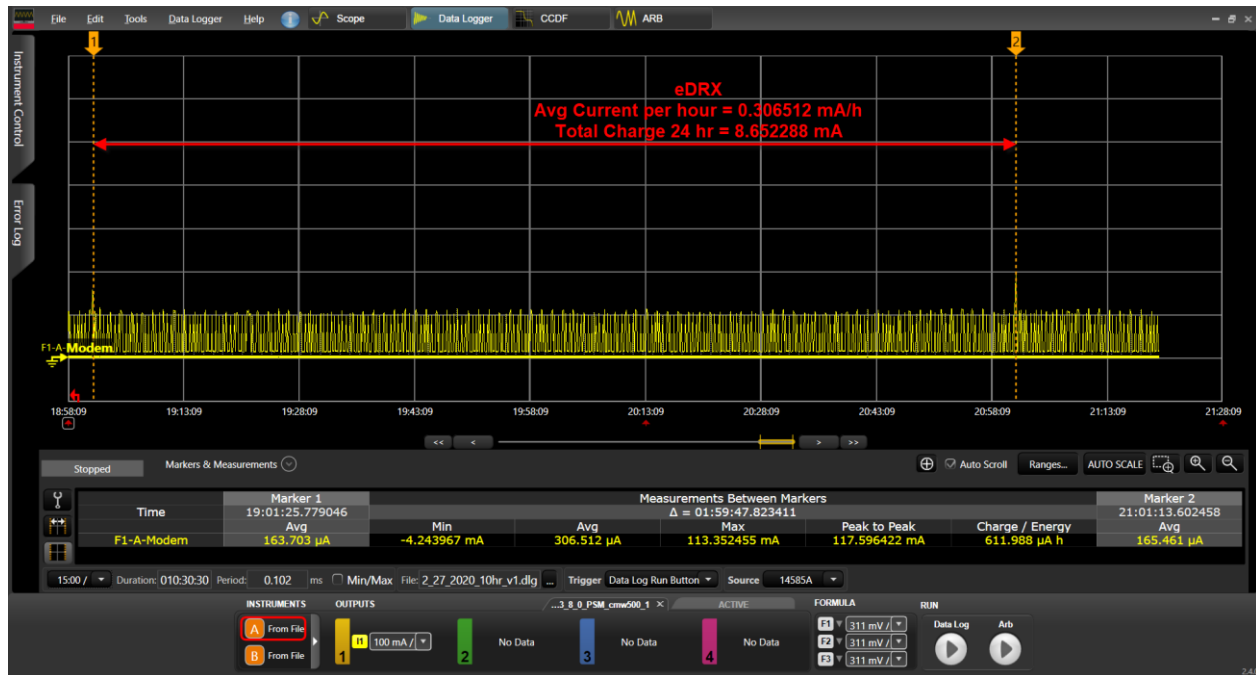


Figure 26: Cat-M1, eDRX, Cycle Time 81.92 secs

6.2 Cat-M1 PSM — Once every Min

at+cpsms=1,,,"10100001","00001010" T3412 = "10100001" = 1 min; T3324 = "00001010" = 20 sec



Figure 27: Cat-M1, PSM, Once every 10 mins

6.3 Cat-M1 PSM — Once every 10 Min

at+cpsms=1,,,"00000001","00001010"

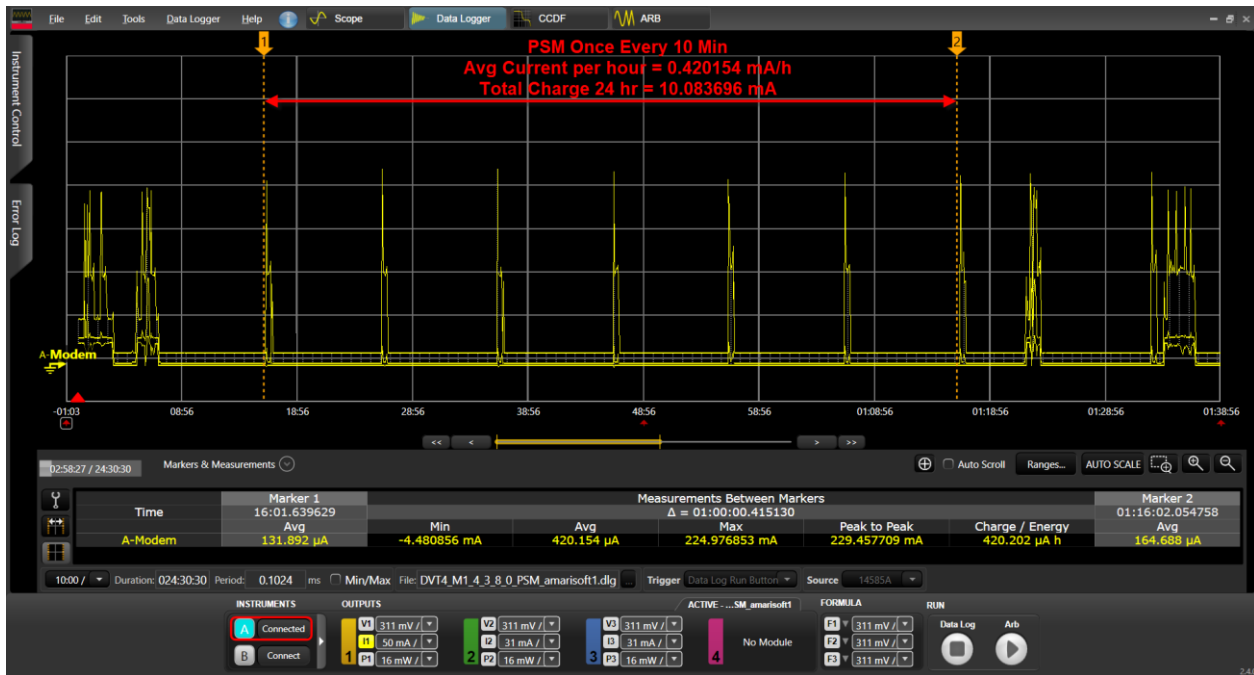


Figure 28: Cat-M1, PSM, Once every 10 mins

6.4 Cat-M1 PSM — Once every Hour

at+cpsms=1,,,"00100001","00001010"

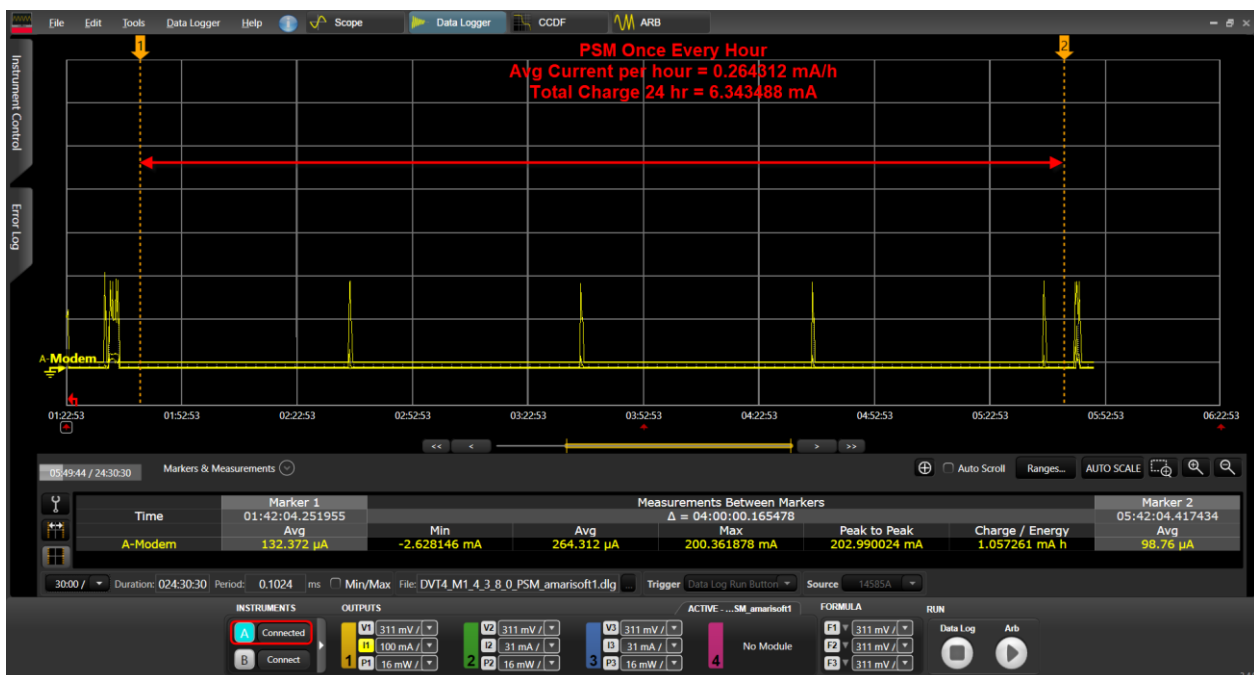


Figure 29: Cat-M1, PSM, Once every hour

6.5 Cat-M1 eDRX & PSM Summary

Table 4 is a Summary of the current measurements of eDRX and PSM modes for LTE Cat-M1.

Table 4: Cat-M1 eDRX and PSM Modem currents

Low Power Mode	Timers		Avg Current/Hour mA H	Charge/Day mA H
	Cycle	PTW/cDRX		
eDRX	81.92 sec	10.24 sec	0.360512	8.652288
PSM	1 min	20 sec	2.994226	71.861424
	10 min	20 sec	0.420154	10.083696
	1 hr	20 sec	0.264312	6.343488

6.6 Exiting the Low Power Mode

See 4.8 on page 13 Exiting the Low Power Mode

7 LTE CAT-NB1 LOW POWER OPERATION, AMARISOFT CALLBOX MINI

7.1 Uplink Subcarrier Spacing: 15 kHz with 12 subcarriers

7.1.1 Cat-NB1 15KHz eDRX

Same commands used as section 5.1.1 on page 14 4.1Cat-NB1 15KHz eDRX.

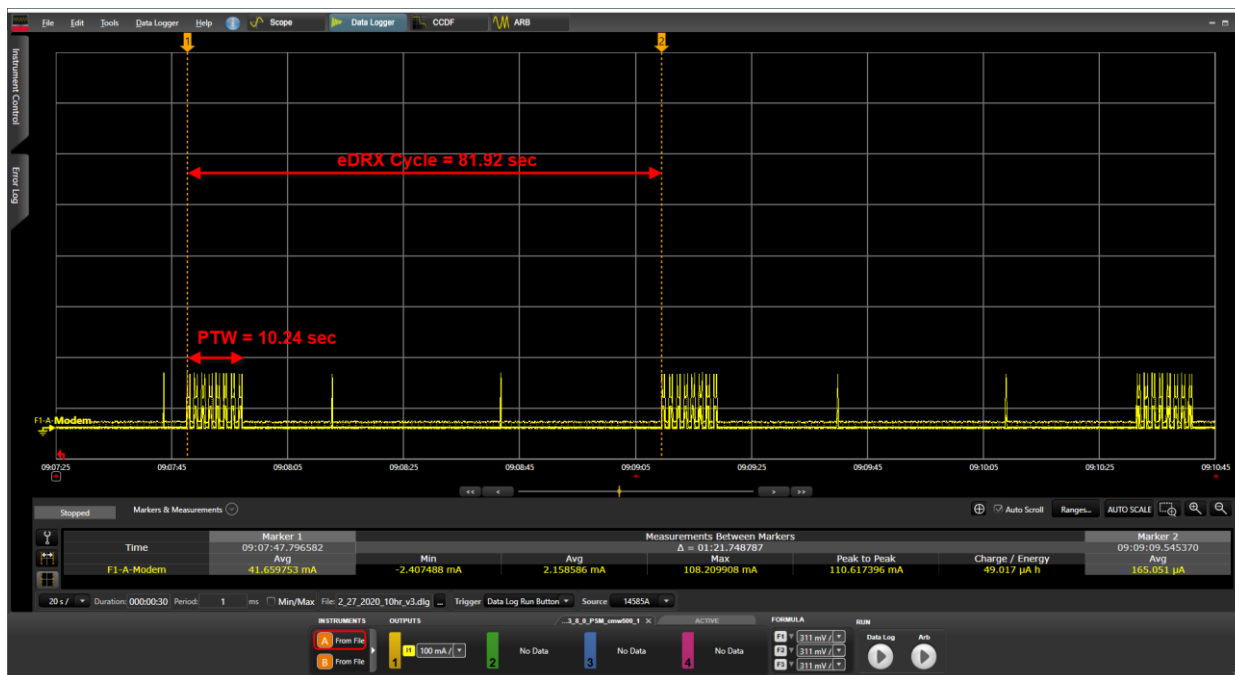


Figure 30: eDRX Cat-NB1 15KHz, PTW and Cycle Time

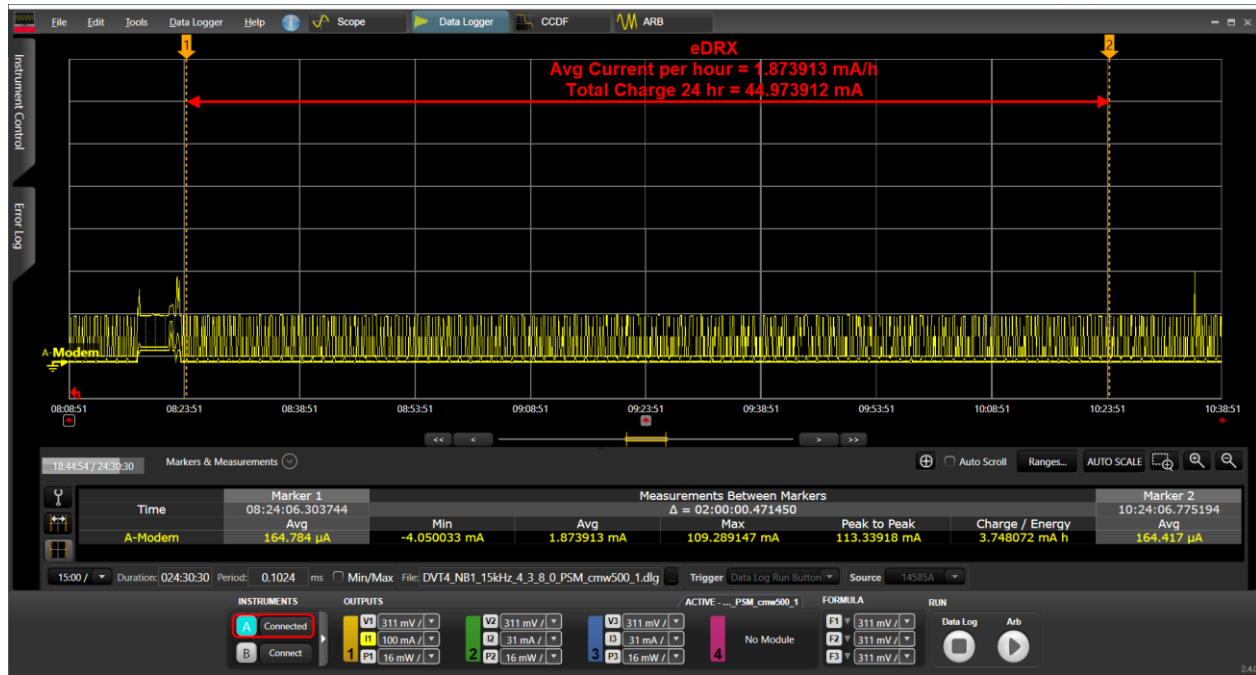


Figure 31: eDRX Cat-NB1 15KHz, Cycle Time 81.92 sec

7.1.2 Cat-NB1 15KHz PSM — Once every Min

at+cpsms=1,,,"10100001","00001010" T3412 = "10100001" = 1 min; T3324 = "00001010" = 20 sec



Figure 32: PSM Cat-NB1 15KHz, Once every min

7.1.3 Cat-NB1 15KHz PSM — Once every 10 Min

at+cpsms=1,,,"00000001","00001010"

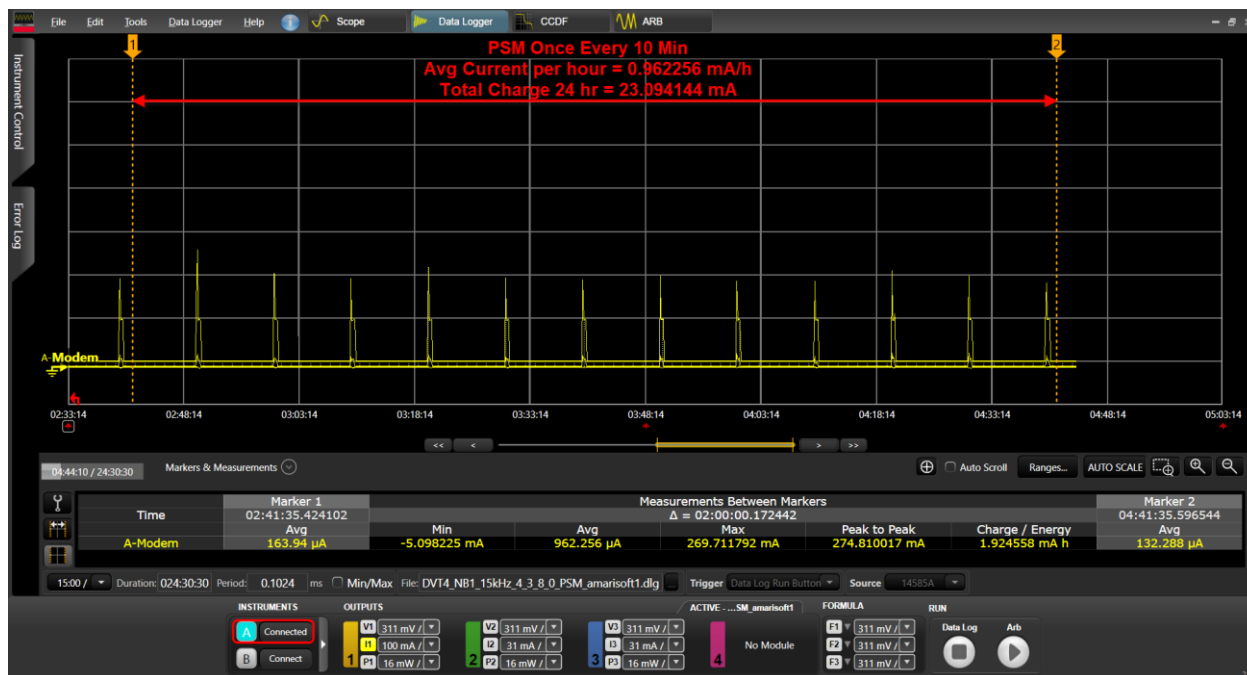


Figure 33: PSM Cat-NB1 3.75KHz, Once every 10 mins

7.1.4 Cat-NB1 15KHz PSM — Once every Hour

at+cpsms=1,,,"00100001","00001010"



Figure 34: PSM Cat-NB1 3.75KHz, Once every hour

7.2 Uplink Subcarrier Spacing: 3.75 kHz with MCS3

7.2.1 Cat-NB1 3.75KHz eDRX

Same commands used as section 5.1.1 on page 14 4.1Cat-NB1 15KHz eDRX.



Figure 35: eDRX Cat-NB1 3.75KHz, PTW and Cycle Time

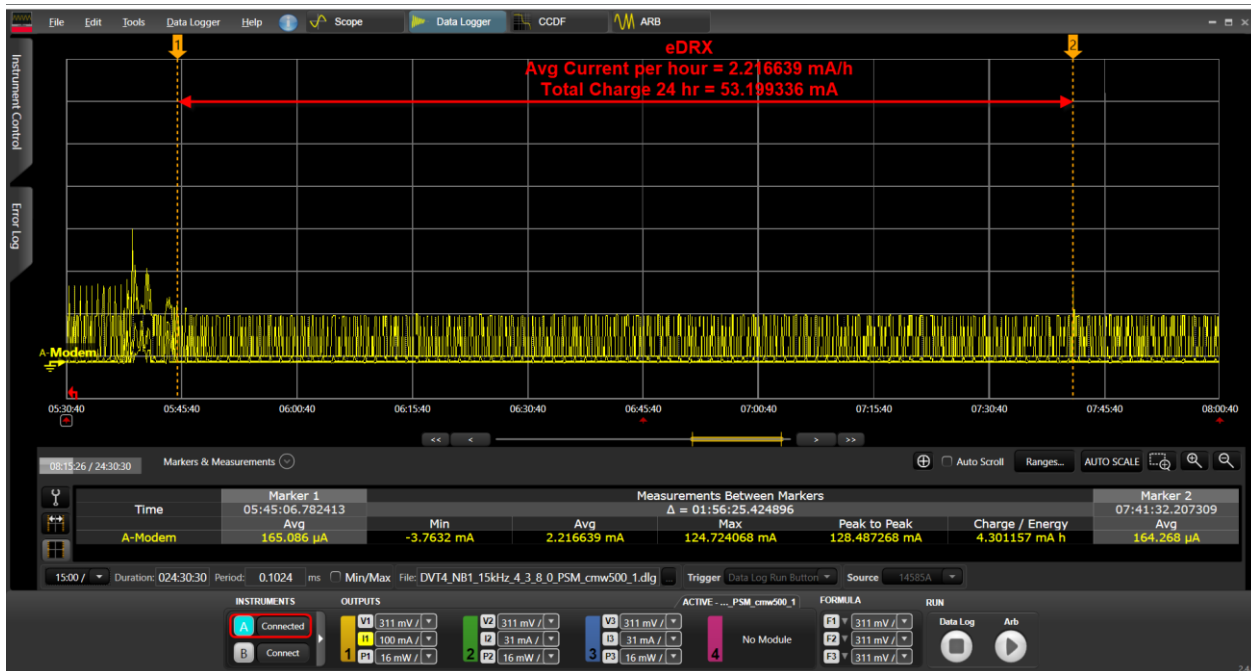


Figure 36: eDRX Cat-NB1 3.75KHz, Cycle Time 81.92 sec

7.2.2 Cat-NB1 3.75KHz PSM — Once every Min

at+cpsms=1,,,"10100001","00001010" T3412 = "10100001" = 1 min; T3324 = "00001010" = 20 sec

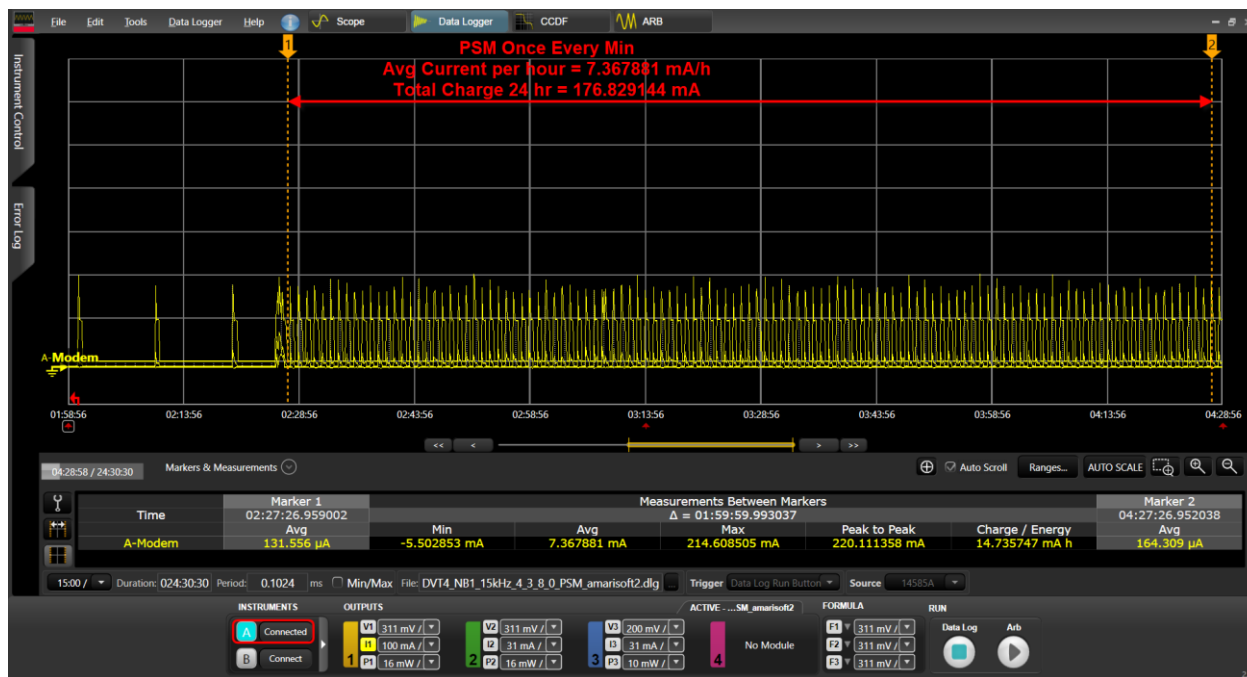


Figure 37: PSM Cat-NB1 3.75KHz, Once every min

7.2.3 Cat-NB1 3.75KHz PSM — Once every 10 Min

at+cpsms=1,,,"00000001","00001010"

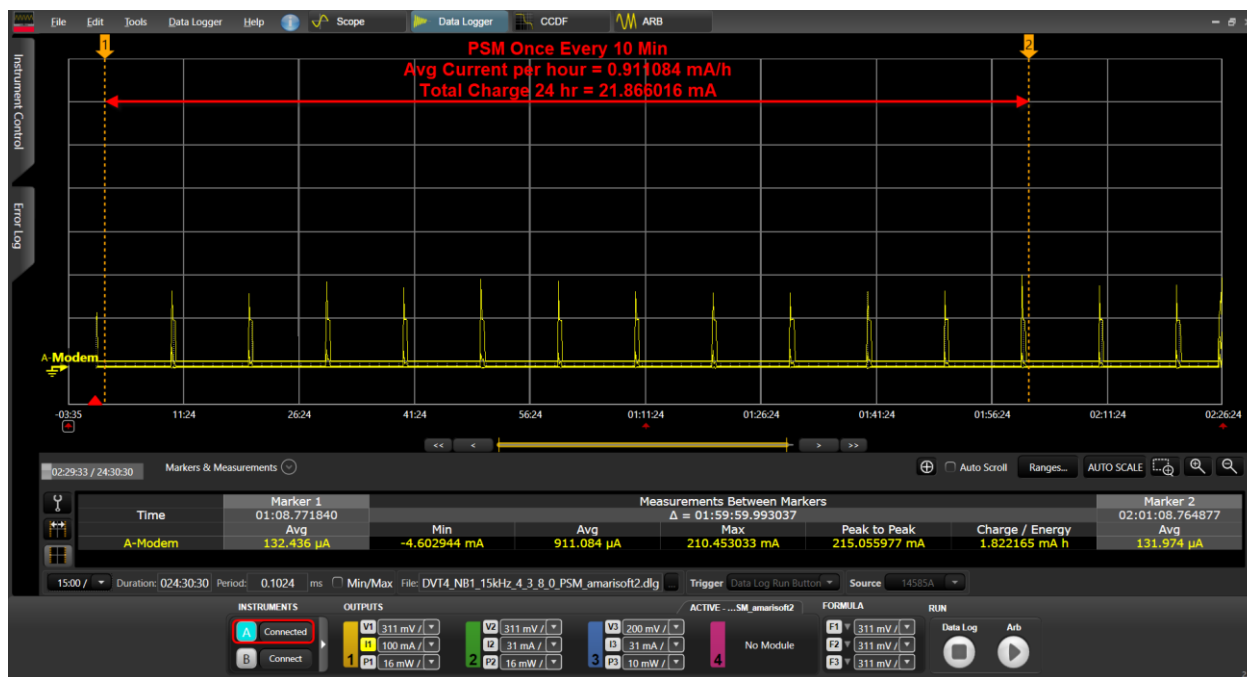


Figure 38: PSM Cat-NB1 3.75KHz, PSM, Once every 10 mins

7.2.4 Cat-NB1 3.75KHz PSM — Once every Hour

at+cpsms=1,,,"00100001","00001010"

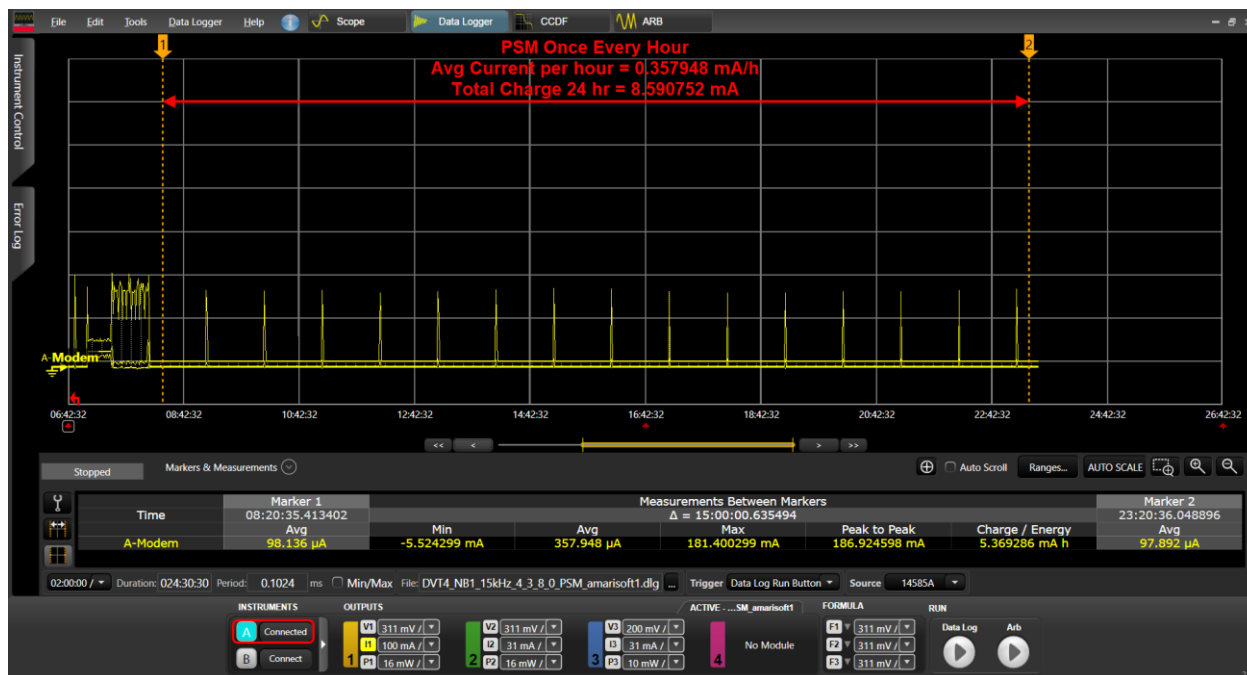


Figure 39: PSM Cat-NB1 3.75KHz, Once every hour

7.3 Cat-NB1 eDRX & PSM Summary

Table 5 is a summary of the current measurements of eDRX and PSM modes for LTE Cat-NB1 15KHz.

Table 6 is a summary of the current measurements of eDRX and PSM modes for LTE Cat-NB1 3.75KHz.

Table 5: Cat-NB1 15KHz eDRX and PSM Modem currents

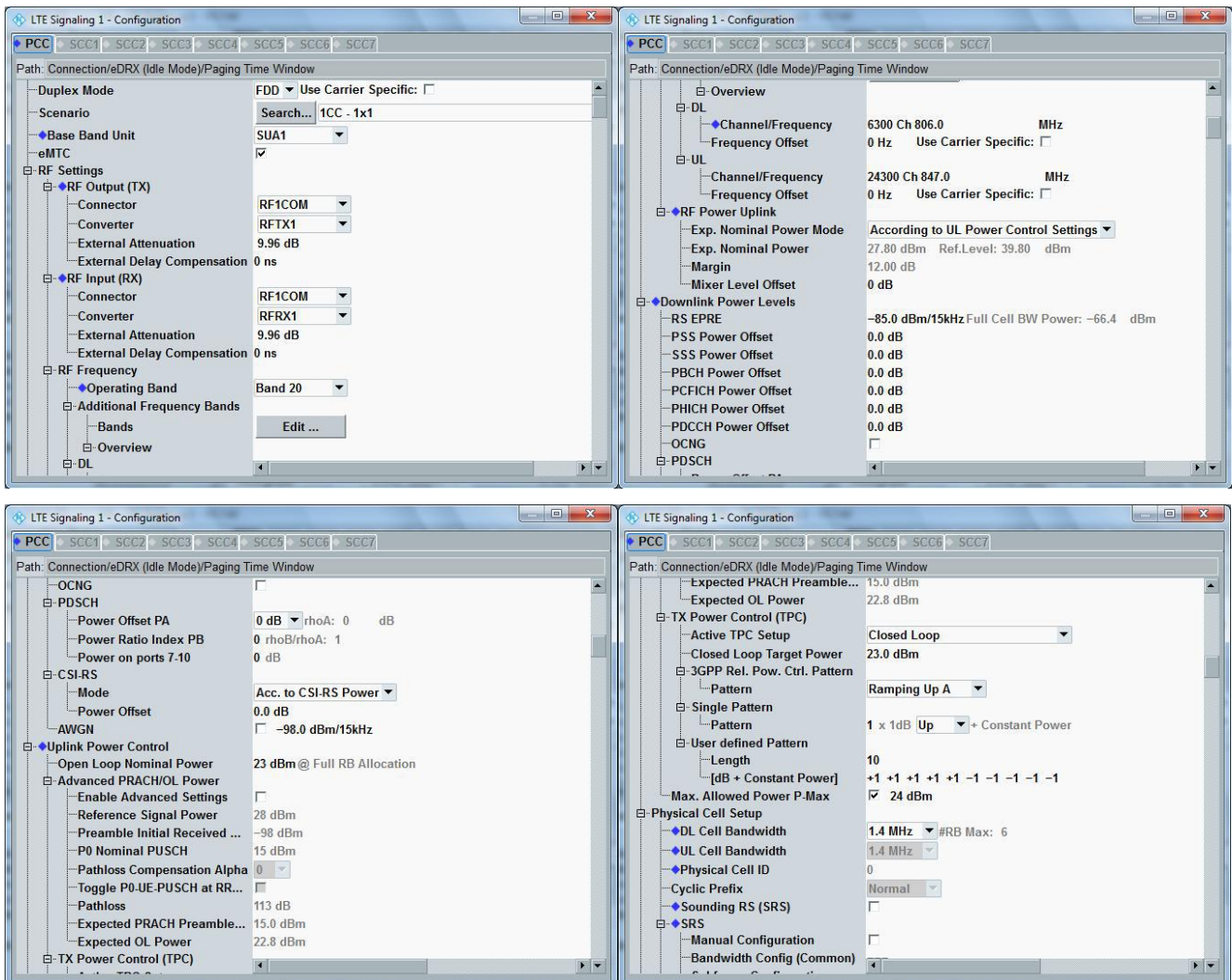
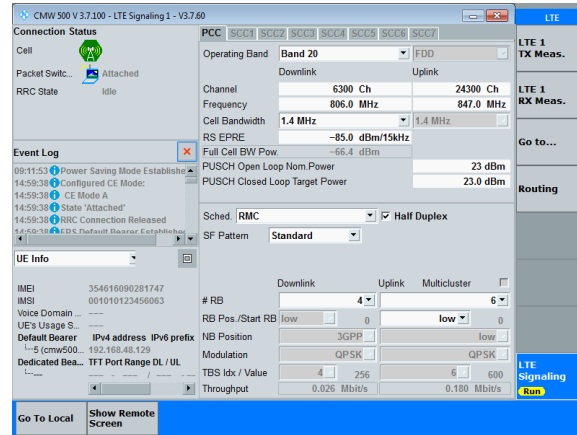
Low Power Mode	Timers		Avg Current/Hour mA H	Charge/Day mA H
	Cycle	PTW/cDRX		
eDRX	81.92 sec	10.24 sec	1.873913	44.973912
PSM	1 min	20 sec	10.004246	240.101904
	10 min	20 sec	0.962256	23.094144
	1 hr	20 sec	0.342722	8.225328

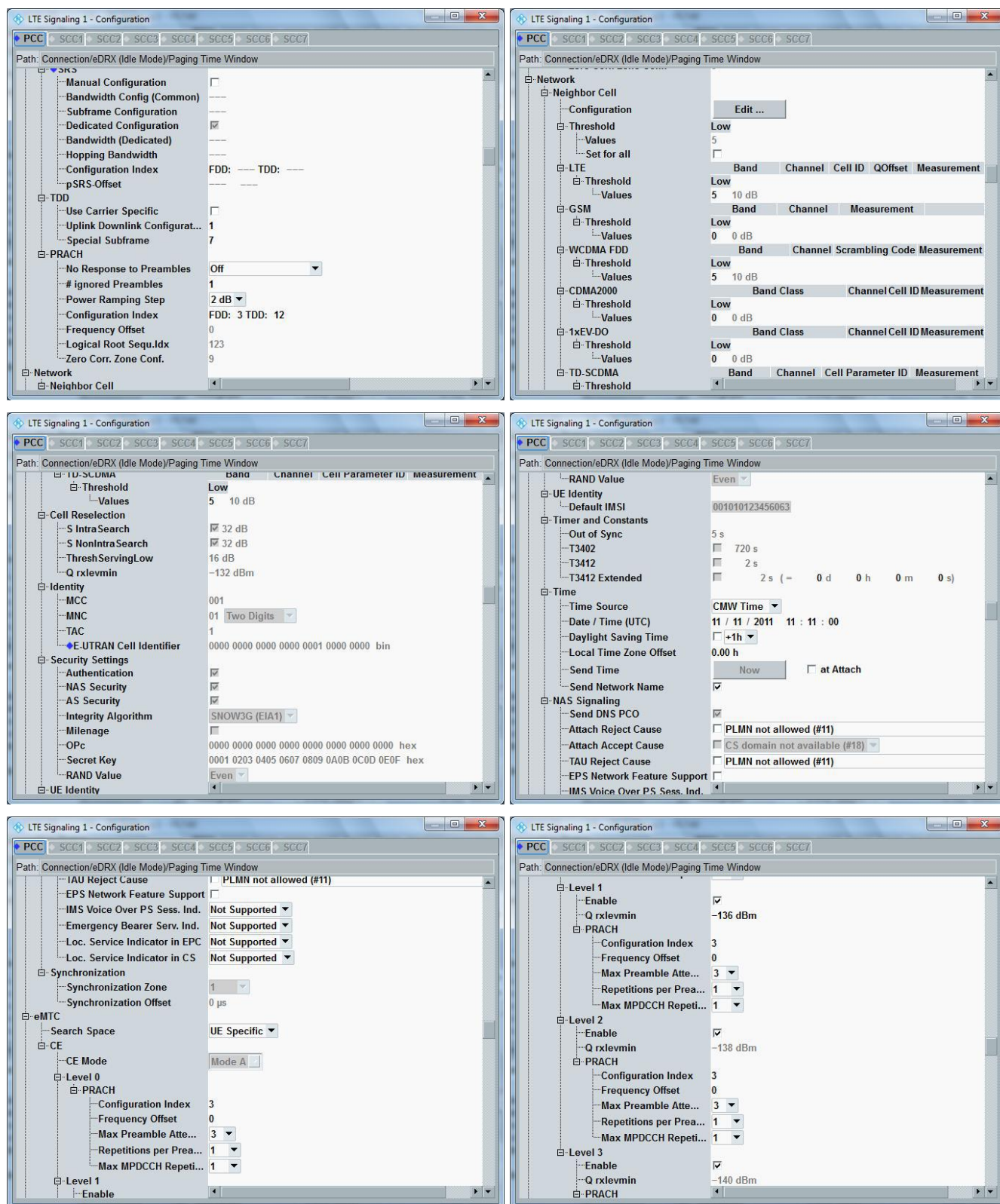
Table 6: Cat-NB1 3.75KHz eDRX and PSM Modem currents

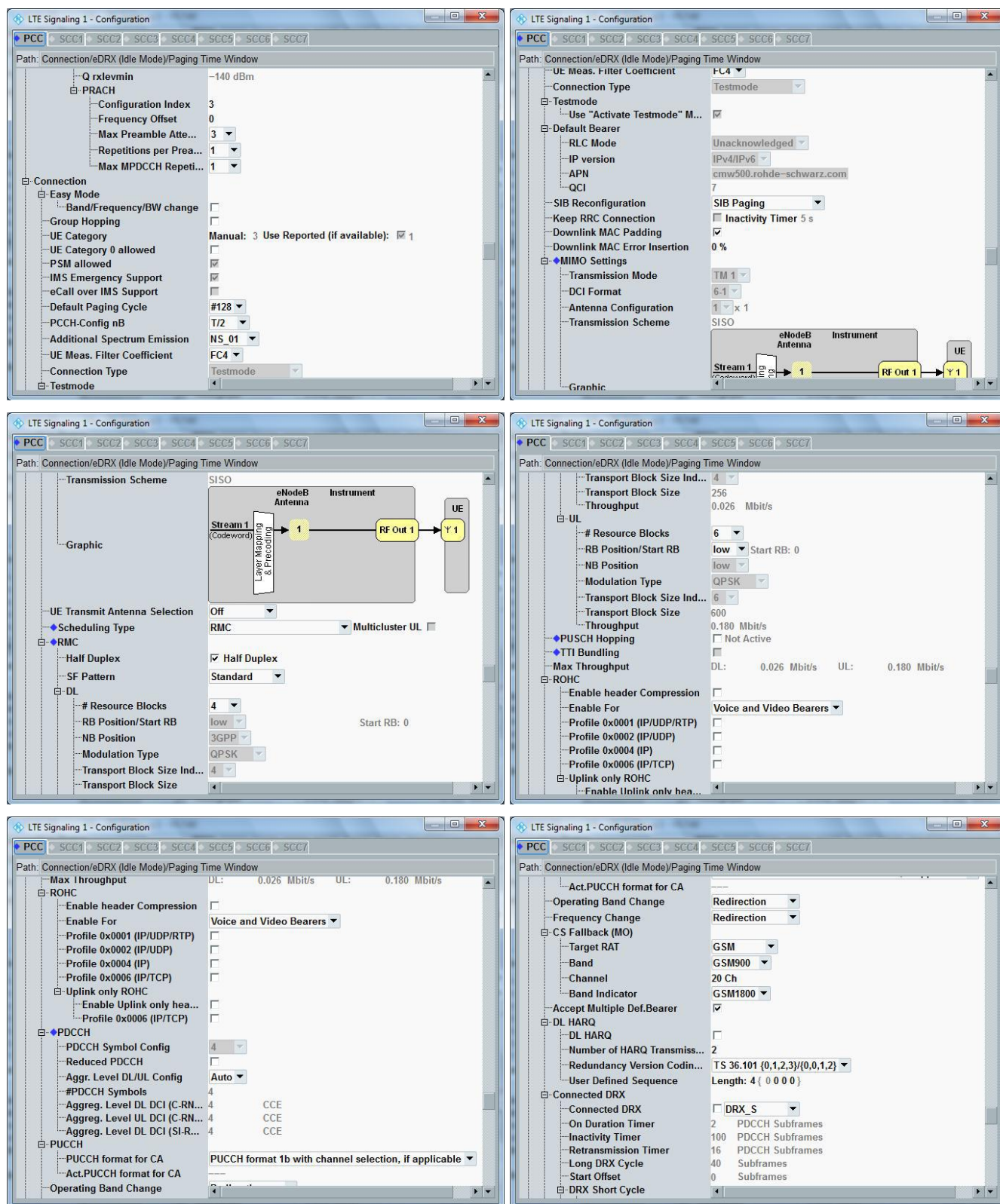
Low Power Mode	Timers		Avg Current/Hour mA H	Charge/Day mA H
	Cycle	PTW/cDRX		
eDRX	81.92 sec	10.24 sec	2.216639	53.199336
PSM	1 min	20 sec	7.367881	176.829144
	10 min	20 sec	0.911084	21.866016
	1 hr	20 sec	0.357948	8.590752

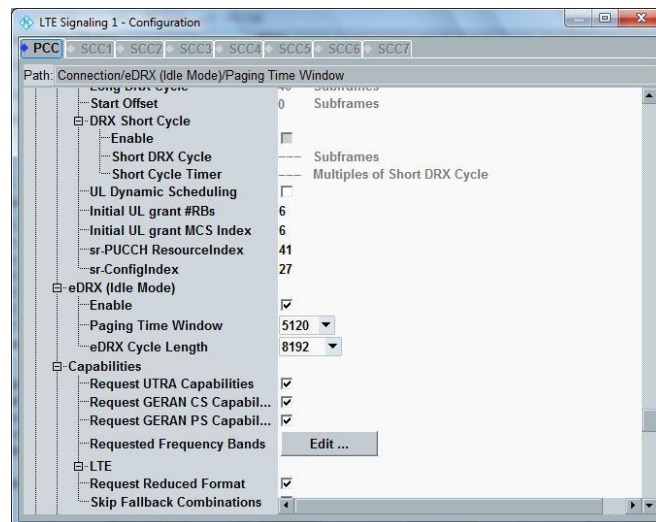
8 APPENDIX

8.1 CMW500 Cat-M1 Configuration

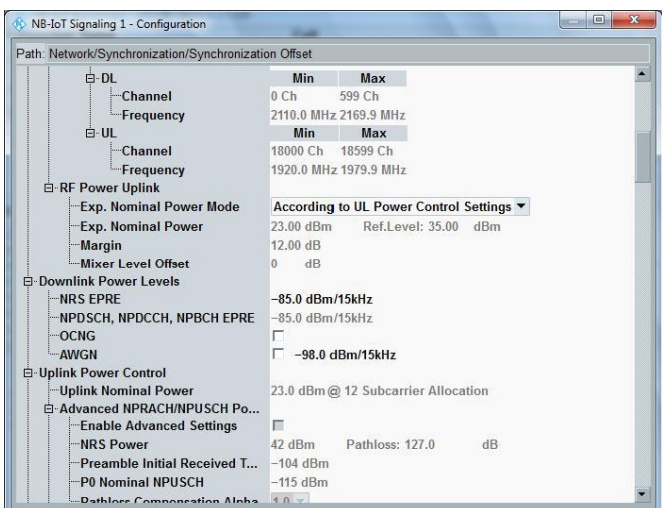
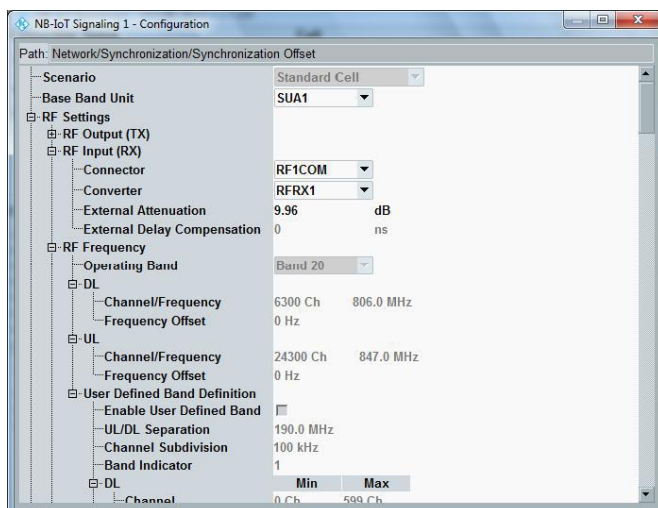
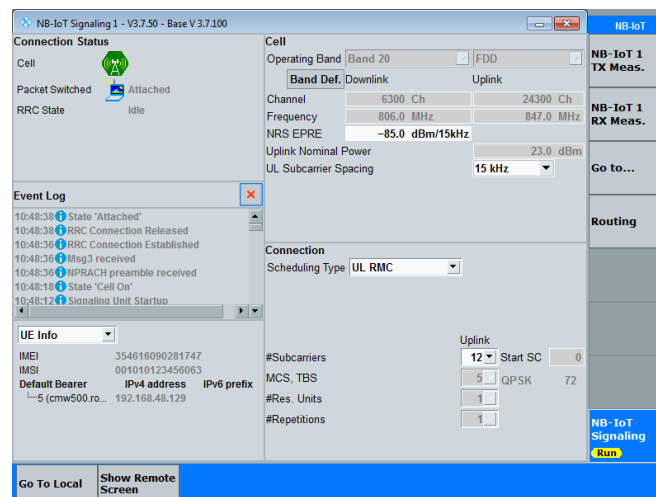


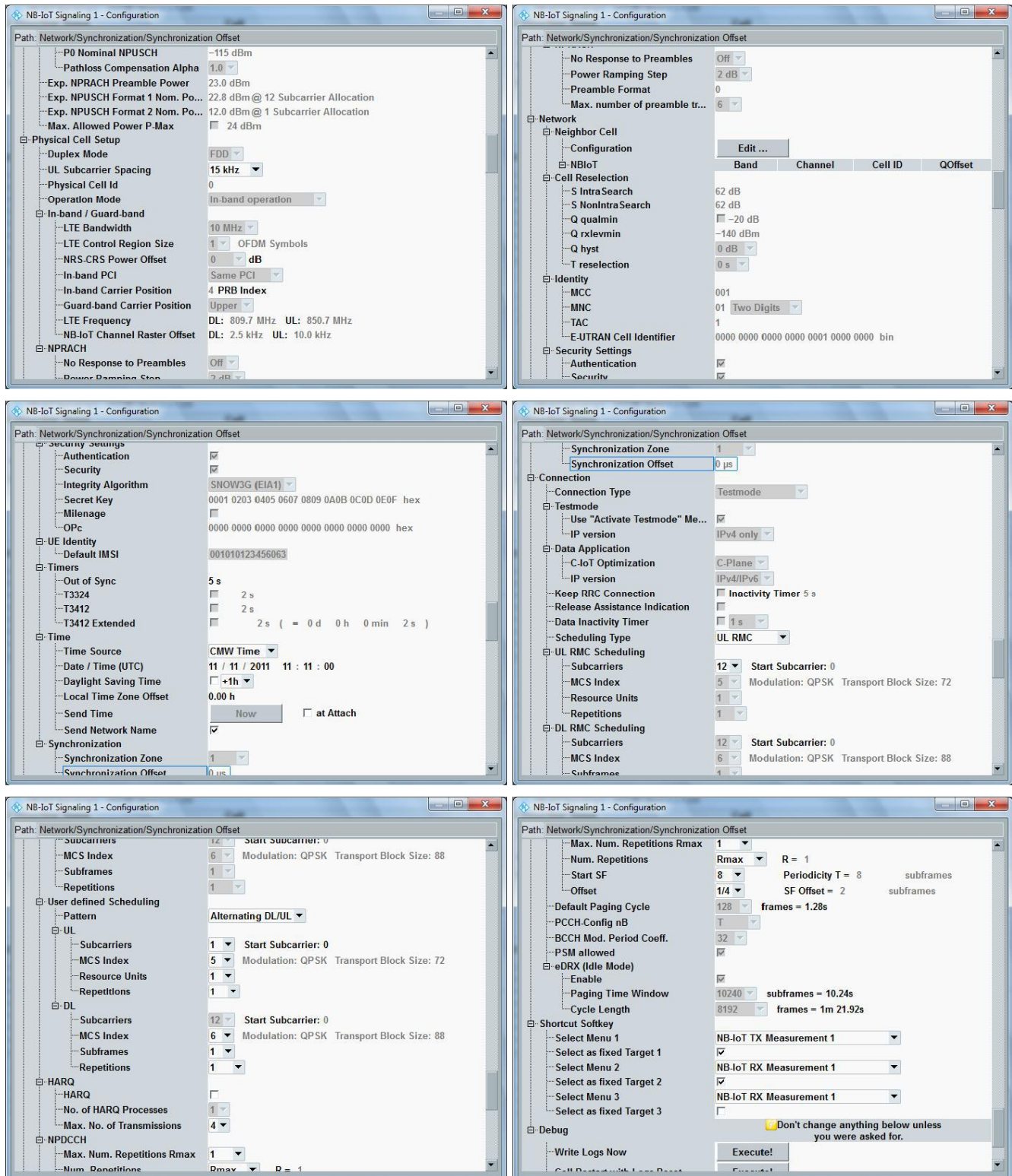


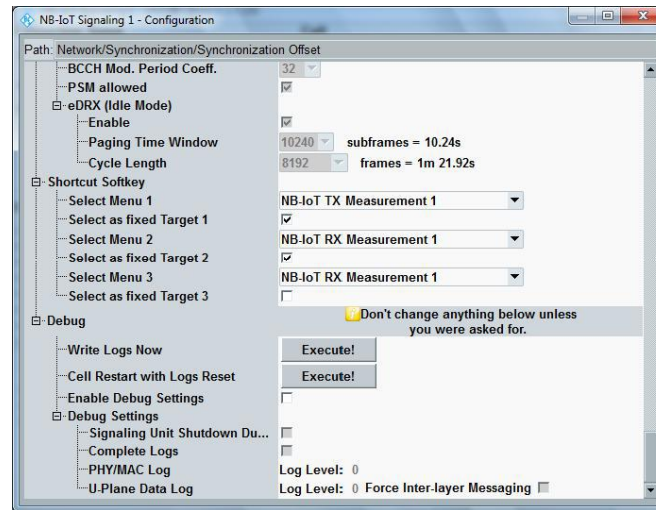




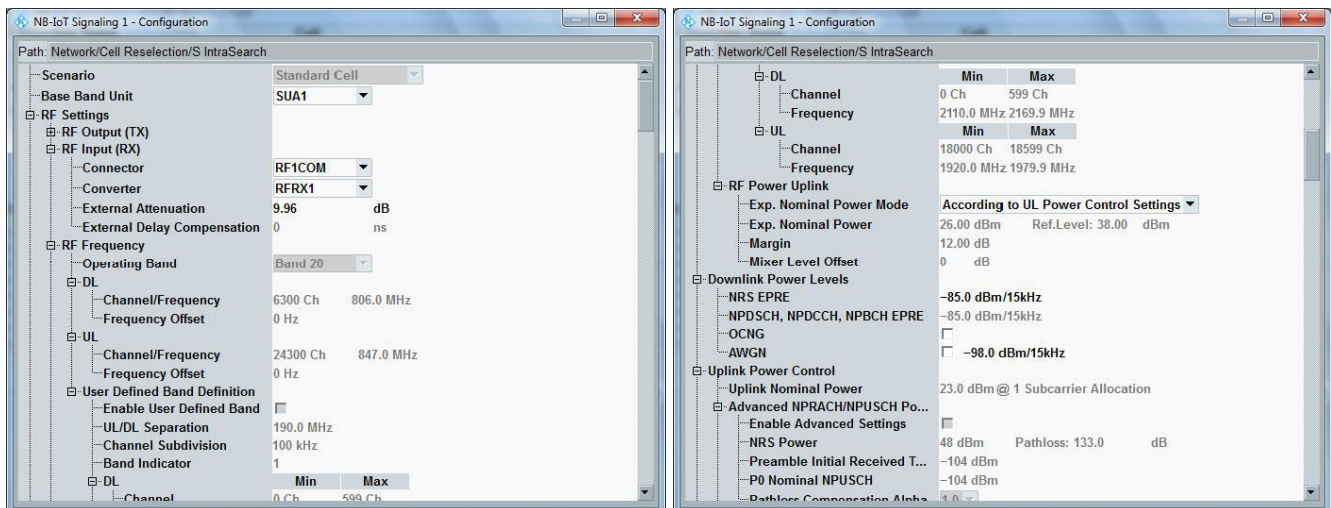
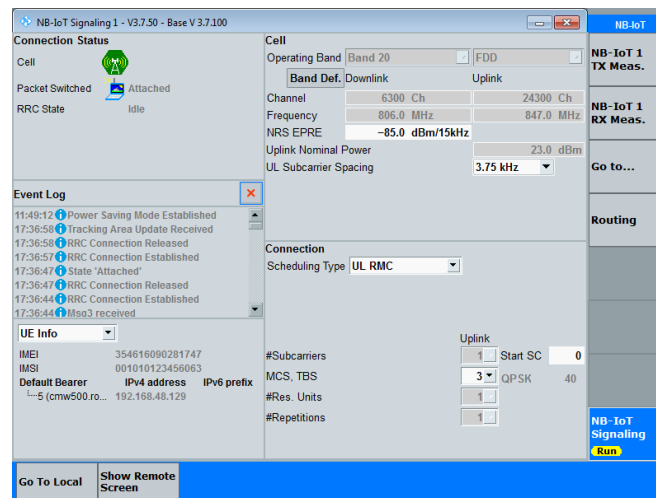
8.2 CMW500 Cat-NB1 15KHz Sub Carrier spacing Configuration

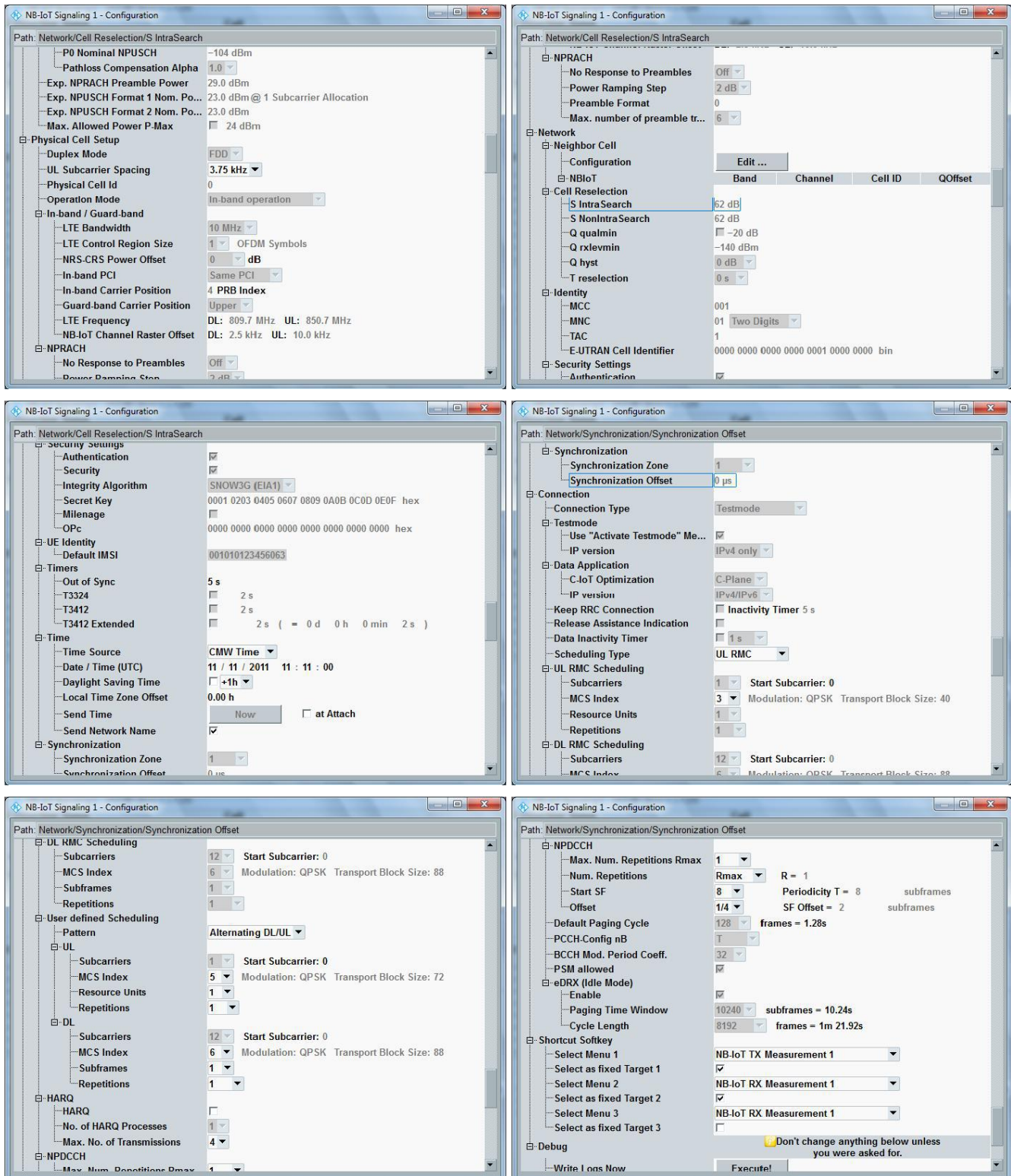


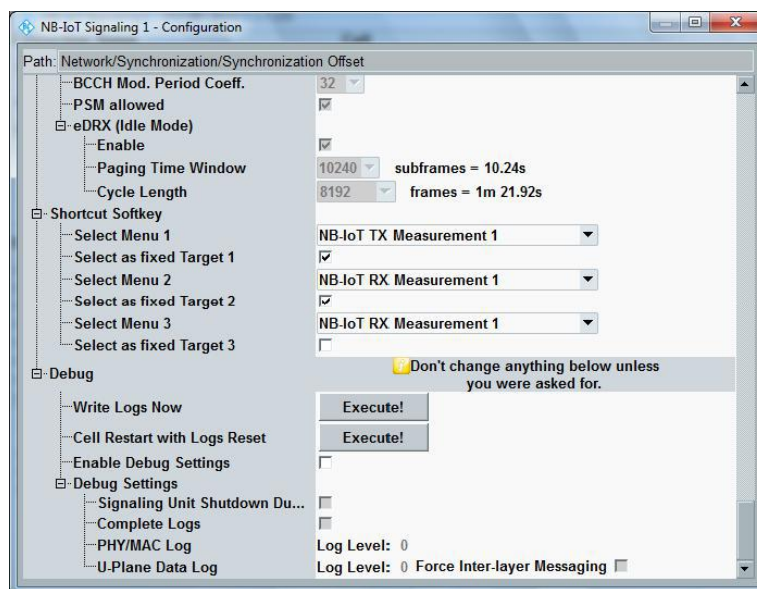




8.3 CMW500 Cat-NB1 3.75KHz Sub Carrier spacing Configuration







8.4 at+ksleep

at+ksleep=0,2

- 0 – Sleep mode permission is driven by a HW signal (DTR).
- 2 – Hibernate

8.5 at+cpsms

at+cpsms=0

- at+cpsms=1,,,"10100001","00001010" (Enable,,,"T3412","T3324")
- 0 – Disable the use of PSM
- 1 – Enable the use of PSM

T3412 Timer

Bit							
8	7	6	5	4	3	2	1
Unit			Timer value				

*Bits 5 to 1 represent the binary coded timer value and unit is coded by bits 8, 7, & 6 as below:

Bit			
8	7	6	
0	0	0	value is incremented in multiples of 10 minutes
0	0	1	value is incremented in multiples of 1 hour
0	1	0	value is incremented in multiples of 10 hours
0	1	1	value is incremented in multiples of 2 seconds
1	0	0	value is incremented in multiples of 30 seconds
1	0	1	value is incremented in multiples of 1 minute
1	1	0	value is incremented in multiples of 320 hours
1	1	1	value indicates that the timer is deactivated

T3412 = "10100001"
101 = 1 min
00001 = 1
T3412 = 1 min x 1 = 1 min

T3324 Timer

Bits 8, 7 & 6 represent the Time Increment Unit per Table

Bits 5 to 1 represent the binary coded timer value and unit is coded as below:

Bit			
8	7	6	
0	0	0	value is incremented in multiples of 2 seconds
0	0	1	value is incremented in multiples of 1 minute
0	1	0	value is incremented in multiples of 10 hours
1	1	1	value indicates that the timer is deactivated

T3324 = "00001010"
000 = 2 sec
01010 = 10
T3324 = 2 sec x 10 = 20 sec

8.6 at+cedrxs

at+cedrxs=0 (Disable)
at+cedrxs=1,4,5 (Enable,Cat-M1,81.92 sec)
at+cedrxs=1,5,5 (Enable,Cat-NB1,81.92 sec)

8.7 at+kbndcfg

at+kbndcfg=1,80000 (RAT,BAND)

- 0 – Radio Access Technology (Cat-M1)
- 1 – Radio Access Technology (Cat-NB1)
- 80000 – Band 20

If multiple bands are required, add the bit masks together, Ex: Bands 1 ,2, 3, & 4 => at+kbndcfg=0,f

0000 00000000 00000000	Not available
0000 00000000 00000001	LTE Band 1 (2000MHz)
0000 00000000 00000002	LTE Band 2 (1900MHz)
0000 00000000 00000004	LTE Band 3 (1800MHz)
0000 00000000 00000008	LTE Band 4 (1700MHz)
0000 00000000 00000010	LTE Band 5 (850MHz)
0000 00000000 00000080	LTE Band 8 (900MHz)
0000 00000000 00000100	LTE Band 9 (1900MHz)
0000 00000000 00000200	LTE Band 10 (2100MHz)
0000 00000000 00000800	LTE Band 12 (700MHz)
0000 00000000 00001000	LTE Band 13 (700MHz)
0000 00000000 00002000	LTE Band 14 (700MHz)
0000 00000000 00010000	LTE Band 17 (700MHz)
0000 00000000 00020000	LTE Band 18 (800MHz)
0000 00000000 00040000	LTE Band 19 (800MHz)
0000 00000000 00080000	LTE Band 20 (800MHz)
0000 00000000 01000000	LTE Band 25 (1900MHz)
0000 00000000 02000000	LTE Band 26 (800MHz)
0000 00000000 04000000	LTE Band 27 (800MHz)
0000 00000000 08000000	LTE Band 28 (700MHz)
0002 00000000 00000000	LTE Band 66 (1800MHz)

8.8 Amarisoft Callbox mini MME configuration

To set T3412 on the Amarisoft callbox mini add the following TAU timer to the mme configuration (mme-ims.cfg)

/* TAU update timer in secs */

t3412: 300, /*Here T3412 is now set to 5 minutes*/