ME910C1 Quick Start Guide

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APPLICABILITY TABLE

PRODUCTS

- ME910 SERIES

CONTENTS

1 Introduction

1.1 Scope

Scope of this document is to give an overview and basic instructions of how to start using the ME910C1 module.

1.2 Audience

This document is intended for customers who want to use and test the NE866 product.

1.3 Contact Information, Support

For general contact, technical support services, technical questions and report documentation errors contact Telit Technical Support at:

TS-EMEA@telit.com

For detailed information about where you can buy the Telit modules or for recommendations on accessories and components visit:

http://www.telit.com

Our aim is to make this guide as helpful as possible. Keep us informed of your comments and suggestions for improvements.
Telit appreciates feedback from the users of our information.

1.4 Related Documents

- 1VV0301351 ME910 HW user guide r5
- 80529ST10815A ME910 _AT_Commands_Reference_Guide_r2
- 80529NT11643A ME910 PSM AppNote r0

2 General Description

2.1 ME910C1 Main Features

The ME910C1 is the Category M1/NB1 evolution of the Telit LE910 Series of LTE modules. Specified in the approved Release 13 of the 3GPP standard, Cat M1/NB1 devices are specifically tailored for IoT applications, offering optimized power consumption and enhanced coverage. This model further enriches the widely deployed Telit xE910 family of 28 x 28 mm LGA modulesBasic Set Up

- LTE UE Category M1/NB1 3GPP release 13 compliant
- Half Duplex FDD
- Single Rx, single antenna
- 3GPP Rel. 12 Power Saving Mode (PSM)
- 3GPP Rel. 13 Extended Discontinuous Reception (eDRX)
- 3GPP Rel. 13 Extended coverage
- Control via AT commands according to 3GPP TS27.005, 27.007 and customized AT commands
- SIM application Tool Kit 3GPP TS 51.01
- SMS
- IPv4/IPv6 stack with TCP and UDP protocol
- OMA Lightweight M2M (LWM2M)
- Over-the-Air firmware update (for future release)
- Telit Application Development Environment: AppZone C (for future release)
- SSL
- Optional embedded GNSS (GPS, GLONASS, Beidou, Galileo)

2.2 USB/UART port configuration

The ME910C1 is provided by 2 asynchronous serial port (CMOS 1.8) and one integrated universal serial bus (USB 2.0 HS) transceiver with the following composition:

- 2 x Telti USB Modem ports
- 1 x Telit HS-USB WWAN
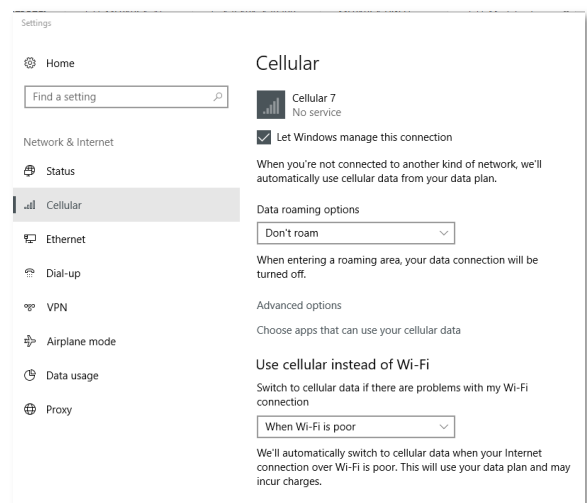- 1 x Telit Serial Diagnostic Interface

The screenshot below reports an example of the port composition listed on Windows 10 Device Manager.
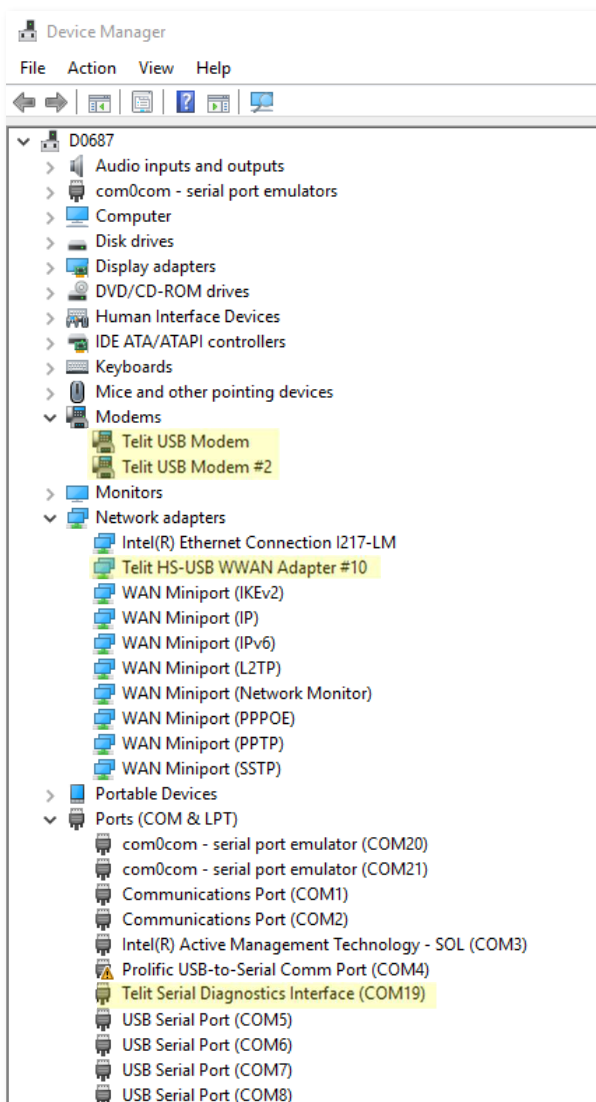
USB Modem ports are ACM devices and can be used as AT Command interface.

Telit HS-USB WWAN is a RMNET adapter that can be used with Linux ModemManager and NetworkManager.

On Windows 10 WWAN Adapter should be automatically loaded as Cellular Connection in Network & Internet settings (see image below).

Telit Serial Diagnostic Interface is used for debug purposes and for firmware upgrade.

3　Application Main Flow
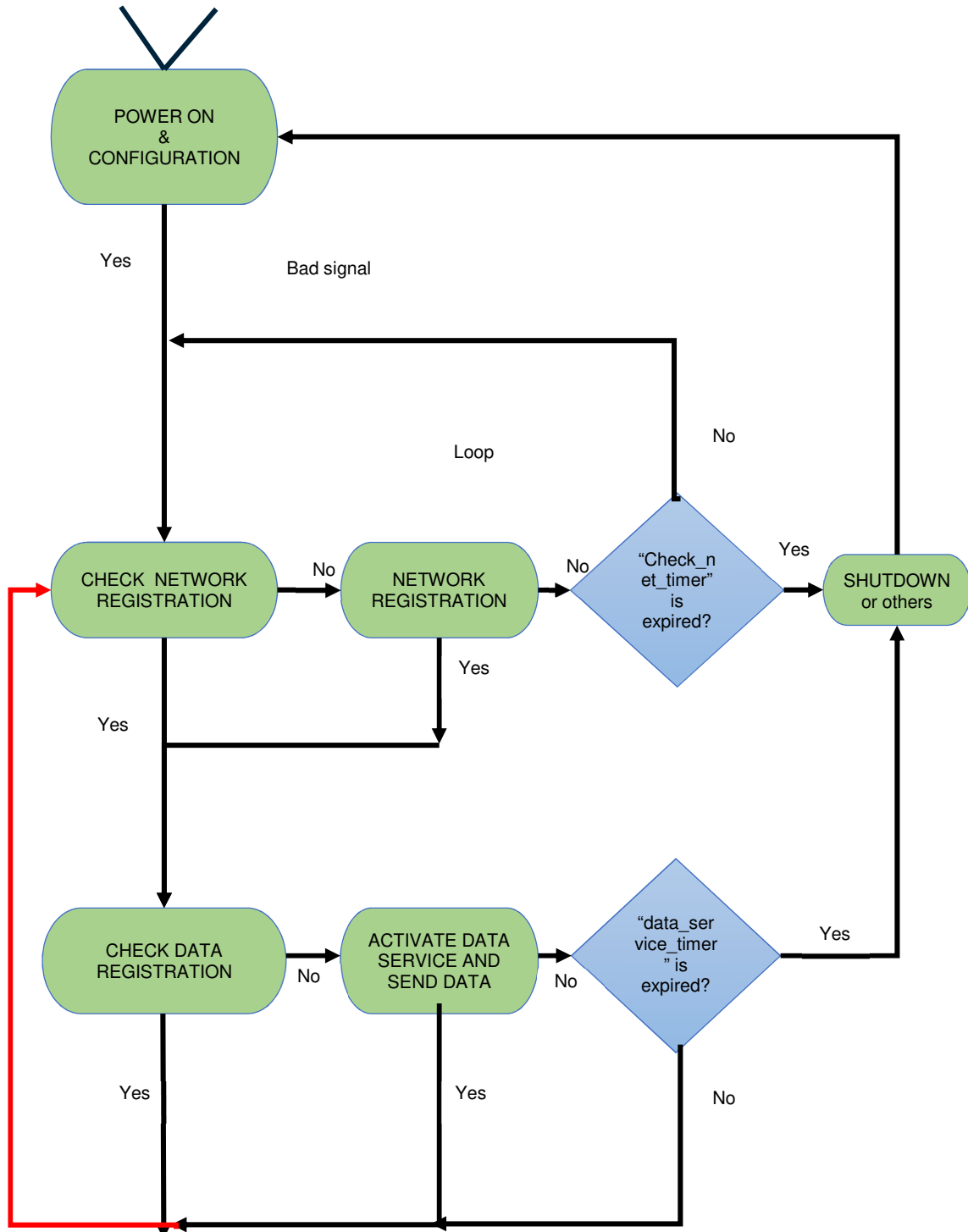
In the following paragraphs different registration states will be described and finally on the paragraphs UDP and TCP script, you will find the full script to have an UDP or TCP connection.

4   Check Network Registration

By default the device perform auto attach and receive an IP from the network.

In this case the active <cid> is 1 and APN will be filled automatically from the network.

If different APN is required an new <cid> should be defined with

AT+CGDCONT=<cid>,APN.

This behaviour can be seen with

Command syntax: AT+CGCONTRDP=

Possible response(s):
+CGSCONTRDP:<cid>,<p_cid>,<bearer_id>[<CR><LF>
+CGSCONTRDP: <cid>, <p_cid>,<bearer_id> [...]]

Example:

AT+CGCONTRDP=
+CGCONTRDP:
1,5,"lte.tim.it.mnc001.mcc222.gprs","10.0.105.40.255.0.0.0","10.0.105.41","213.230.130.222","213.230.130.222","0.0.0.0","0.0.0.0"

OK

Command syntax:: AT+CGPADDR=

+CGPADDR: <cid>,<PDP_addr>[<CR><LF>+CGPADDR: <cid>, <PDP_addr>[…]]

Example

AT+CGPADDR=
+CGPADDR: 1,"10.0.105.40"
+CGPADDR: 2,""

OK

This APN lte.tim.it.xxx has been set by the network.

If you need to use a different APN you can set it with the command described before

AT+CGDCONT=1,ibox.tim.it

In order to activate this new APN you need to send AT+CGATT=0
and after AT+CGATT=1, that means detach and attach to the network.

4.1   Registration AT script example

Without setting APN

AT+CGCONTRDP=
+CGCONTRDP:
1,5,"lte.tim.it.mnc001.mcc222.gprs","10.0.105.40.255.0.0.0","10.0.105.41","213.230.130.222"
,"213.230.130.222","0.0.0.0","0.0.0.0"

OK
AT+CGPADDR=
+CGPADDR: 1,"10.0.105.40"
+CGPADDR: 2,""

OK

After setting the new APN

AT+CGDCONT=1,"IP",ibox.tim.it
OK
AT+CGATT=0

OK
AT+CGATT=1

OK
AT+CGCONTRDP=
+CGCONTRDP:
1,5,"ibox.tim.it.mnc001.mcc222.gprs","10.69.26.6.255.0.0.0","10.69.26.7","213.230.134.107",
"213.230.134.107","0.0.0.0","0.0.0.0"

OK
AT+CGPADDR=
+CGPADDR: 1,"10.69.26.6"
+CGPADDR: 2,""

OK

You can also check the registration with:

AT+CEREG?
+CEREG: 0,1

OK

4.2   Network selection

AT#WS46 is the command that allows to set access technology on the module. Description of the command here below:

AT#WS46=<n> set command selects the IoT technology to operate with.

Parameter:
<n> - integer type, it is the technology to be used:
0 – CAT-M1
1 – NB-IoT
2 – CAT-M1 and NB-IoT

The parameter is stored in NVM and the settings is available at next reboot.

If AT#WS46=2 (CAT M1 and NB IoT) the module starts to search for CAT M1 networks first, if it doesn't find any it starts searching for NB IoT networks.

5   Check/Set data service

When registration has been executed you can activate the context with the AT#SGACT command:

AT#SGACT=<cid>,<status>

e.g. if we want to activate context 1, AT#SGACT=1,1

in case we want to use the <cid> 3 (e.g. Verizon in US) AT#SGACT=3,1.

See in the next paragraph a full example.

6 Full UDP script

Below the full script for UDP communication, including APN setting and using <cid> 1:

AT+CFUN=1	// Full functionality
AT+CGDCONT=1,"IP","<APN>"	// Set <cid>=1 with APN (setting can be done only one time)
AT+CGATT=0	// Network deactivation
AT+CGATT=1	// Network ativation
AT+CEREG?	// Check Network Registration
AT+CGPADDR=1	// Check IP address <cid> 1
AT#SCFG=1,1,300,90,600,50	// Socket Configuration (see AT command manual for the details of the command)
AT#SGACT=1,1	// Internal modem process (expect to receive: ERROR)
AT#SGACT?	// Confirm Context activated
AT#SD=1,1,<Dest. Port>,<"IP address">,0,1234,1	// Open a UDP socket to remote server
AT#SSEND=1	// After that command you will recieve a prompt > and you // can send the data just typing it and end them with Crtl^Z
➢	//Transmit the data and end the string with Crtl^Z to send it
SRING: 1	// message sent
AT#SH=1	// Close the socket

6.1 UDP script example

AT+CFUN=1
OK

AT+CGPADDR=
+CGPADDR: 1,"10.0.50.204"

OK
AT+CGCONTRDP=
+CGCONTRDP:
1,5,"lte.tim.it.mnc001.mcc222.gprs","10.0.50.204.255.0.0.0","10.0.50.205","213.230.130.222"
,"213.230.130.222","0.0.0.0","0.0.0.0"

OK

```
AT+CGDCONT=1,"IP",ibox.tim.it
OK
AT+CGATT=0

OK
AT+CGATT=1

OK
AT+CGCONTRDP=
+CGCONTRDP:
1,5,"ibox.tim.it.mnc001.mcc222.gprs","10.69.211.11.255.0.0.0","10.69.211.12","213.230.134.
107","213.230.134.107","0.0.0.0","0.0.0.0"

OK
AT+CGPADDR=
+CGPADDR: 1,"10.69.211.11"

OK
AT+CEREG?
+CEREG: 0,1

OK
AT#SCFG=1,1,300,90,600,50
OK
AT#SGACT=1,1
#SGACT: 10.69.211.11

OK
AT#SGACT?
#SGACT: 1,1

OK
AT#SD=1,1,10510,modules.telit.com,0,0,1

OK
AT#SSEND=1
> data sent_
OK

SRING: 1
AT#SH=1

OK
```

7 Full TCP script

AT+CFUN=1   // Full functionality

AT+COPS=2   // Disable networkj registration

AT+CGDCONT=1,"IP","<APN>" // Set <cid>=1 with APN

AT+COPS=0   // Enable network registration with automatic selection

AT#SCFG=1,1,300,90,600,50 // Socket Configuration (see AT command manual for the details of the command)

AT#SGACT=1,1   // Internal modem process (expect to receive: ERROR)

AT+CEREG?   // Check Network registration , 2 or 5 is the positive answer
                                          // for that.

AT#SGACT?   // Confirm Context activated

AT+CGPADDR=1   // Read IP address

AT#SD=1,0,<Dest. Port>,<"IP address">,0,1234,1 // Open a TCP socket to remote server

AT#SSEND=1   // After that command you will recieve a prompt > and you
                                          // can send the data just typing it and end them with Crtl^Z

➢   // Transmit the data and end the string with Crtl^Z to send it

SRING: 1   // message sent

AT#SH=1   // Close the socket

7.1 TCP script example

AT+CFUN=1
OK

AT+CGPADDR=
+CGPADDR: 1,"10.0.50.204"

OK
AT+CGCONTRDP=
+CGCONTRDP:
1,5,"lte.tim.it.mnc001.mcc222.gprs","10.0.50.204.255.0.0.0","10.0.50.205","213.230.130.222","213.230.130.222","0.0.0.0","0.0.0.0"

OK
AT+CGDCONT=1,"IP",ibox.tim.it
OK
AT+CGATT=0

OK
AT+CGATT=1

OK
AT+CGCONTRDP=
+CGCONTRDP:
1,5,"ibox.tim.it.mnc001.mcc222.gprs","10.69.211.11.255.0.0.0","10.69.211.12","213.230.134.107","213.230.134.107","0.0.0.0","0.0.0.0"

OK
AT+CGPADDR=
+CGPADDR: 1,"10.69.211.11"

OK
AT+CEREG?
+CEREG: 0,1

OK
AT#SCFG=1,1,300,90,600,50
OK
AT#SGACT=1,1
#SGACT: 10.69.211.11

OK
AT#SGACT?
#SGACT: 1,1

OK

AT#SD=1,0,10510,"modules.telit.com",0,0,1

OK
AT#SSEND=1
> data sent_
OK

SRING: 1

AT#SH=1

For detailed description how PSM works, refer to the dedicate Applicatone Note.

Below there is a simple script that shows how to enter and exit from the PSM mode.

AT+COPS?

+COPS: 0,0,"Telstra Mobile",8

OK

AT+CPSMS?

+CPSMS: 0,,,"01100000","00000000"   // PSM disabled

OK

AT+CPSMS=1,,,"10100011","00100100"   // power saving proposed values:

                                                       // T3412 = 3 min (<Requested_Periodic-TAU>),

                                                       // T3324 = 4 min (<Requested_Active-Time>)

OK   // consider that T3412 is always greater than

                                                       // T3324 by definition so the first parameter

                                                       // will be probably changed by the network

// the PSM request is sent to the network during the attach procedure or a TAU

// after +CPSMS command is issued the module triggers automatically a TAU in order

// to transfer the PSM request to the network

AT+CPSMS?

+CPSMS: 1,,,"00000001","00100100"   // power saving parameters accepted/defined by

                                                       // the network: T3412 = 28 min, T3324 = 4 min

another example:

AT+CPSMS=1,,,"00000001","00100100"   // power saving proposed values:

                                                       // T3412 = 10 min (<Requested_Periodic-TAU>),

                                                       // T3324 = 4 min (<Requested_Active-Time>)

OK

```
AT#RFSTS
#RFSTS: "505 01",9410,-103,-72,-
13.0,20c6,A8,,64,3,0,"7F0D40B","505013421612017","Telstra Mobile",3,28,720,3240

OK
AT#MONI
#MONI: Telstra Mobile RSRP:-103 RSRQ:-11 TAC:20C6 Id:7F0D40B EARFCN:9410 PWR:-
78dbm DRX:64

OK
```

// T3412 and T3324 values will be exchanged
// and negotiated during attach or TAU procedure
// to "force negotiation" with the network you can
// de-register and register the module or
// de-attach - attach

```
AT+CGATT=0 // or COPS=2
OK

AT+CGREG?
+CGREG: 0,0

OK

AT+CGATT=1
OK

AT+CGREG?
+CGREG: 0,1
```

This is a simple script that shows how enable the use of eDRX:

```
AT+CPIN?
+CPIN: READY


+CEREG: 1,,"0000",8        // network registration unsolicited result code: module is EPS
                          // registered and connected to CAT M1 network


AT+CEDRXS=2,4,"0001"      // enable the use of eDRX and enable the unsolicited result code
OK                        // in this example the proposal is to have eDRX set to 10,24 sec.
                          // ("0001")



// the eDRX request is sent to the network during the attach procedure or a TAU

// after +CEDRXS command is issued the module triggers automatically a TAU in order
// to transfer the eDRX request to the network



CEDRXP: 4,"0001","0010","0011"

// network has processed the eDRX request, unsolicited reports the following values:
// <AcT-type>[,<Requested_eDRX_value>[,<NWprovided_eDRX_value>[,<Paging_time_window>]]]
// see Table 10.5.5.32/3GPP TS 24.008 to decode binary values



AT+CEDRXRDP

CEDRXP: 4,"0001","0010","0011"

// if the network doesn't support eDRX AT+CEDRXRDP should answer CEDRXP: 0
```

8.1   PSM/eDRX Timer
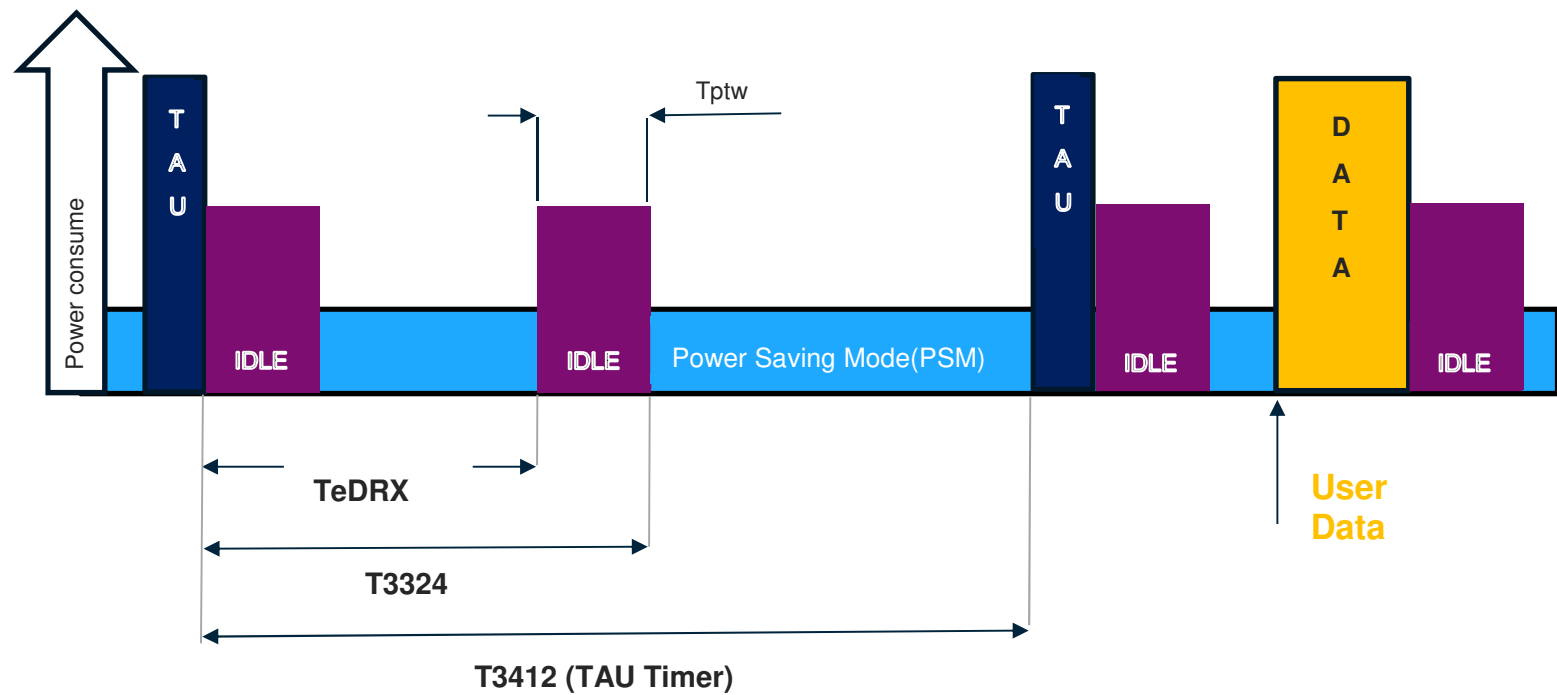
9 Document History

Revision	Date	Changes
0	2018-02-14	First registered issue
1	2018-03-01	Updated Applicability Table Document restyling §4: updated PSM and added new eDRX script

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