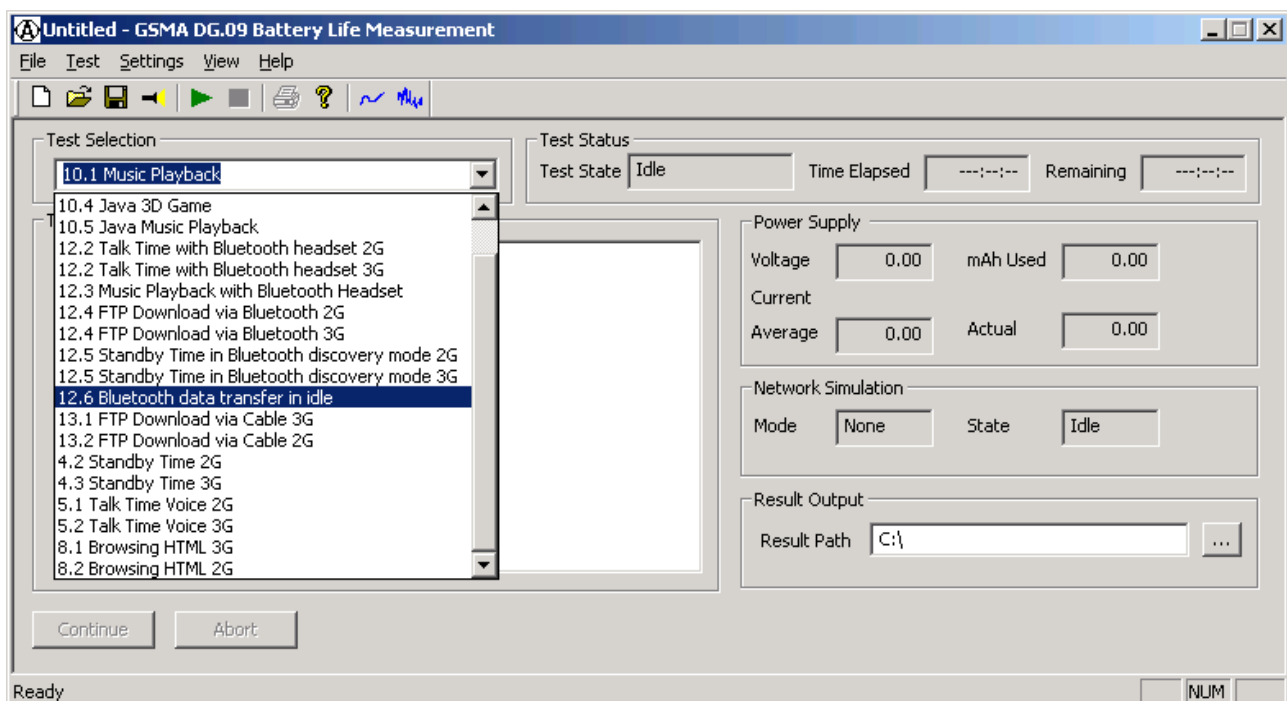# Battery Life Measurement

Having problems with your battery performance? Need to supply customer's more than one battery? Do you know what applications and configurations are causing the battery to drain?

Characterising the battery life of a mobile phone used to be simple. Talk time and Standby time were the only measurements of interest as the device had only two states. It was either in standby camped on a network, or it was in a speech call. Even though network configuration and signal conditions still had a significant bearing on the battery lifetime, these simple parameters have served to characterise battery life well.

Modern mobiles have grown in complexity and we have to consider many more functions of the mobile in order to get a full picture of battery life. The increasing popularity of Applications, Web Browsing and messaging applications means that the phone gets interrupted from idle mode more frequently. Mobile phones are often used as music players when idle, playing media from a storage card or streaming media over the air interface. Mobile phones are now frequently used as cameras, with battery energy sometimes being employed to illuminate the subject. In addition, the inclusion of Bluetooth has had a significant impact along with interoperability settings for GSM, WCDMA and LTE.

All of the above functions utilise processing power, radio interface traffic and additional hardware on the mobile phone, and this all translates into additional load for the battery. To fully characterise the battery performance of a mobile phone now it is necessary to evaluate the battery performance under each of these conditions and identify how these fit the profile of the average user. For example, if the average user spends a large proportion of their "standby time" playing MP3 media, the battery consumption in this mode is critically important.


The GSM Association provide the Technique to quote Battery Life in the Permanent Reference Document TS.09. This document provides a standard technique to measure battery life in various modes of operation. This document sets the standard for the Current Drain Measurement Software.

The Current Drain measurement software is a simple, easy to use application designed to evaluate the battery performance of a mobile phone in a large number of usage scenarios. The software employs a controlled network simulation, either a CMU200 or CMW500 for GSM, (E)GPRS, WCDMA or HSPA or a CMW500 for LTE. An NGMO2 is used to supply power to the mobile under test, and to accurately measure the current consumed by the mobile, in accordance with the requirements of TS.09.

Each scenario is controlled by a script, allowing easy customisation of the tests. The mobile is brought into the correct state for the measurement, the NGMO begins a cycle of average current measurement over a user defined measurement period and, after the measurement, the estimated battery life for the selected scenario is calculated based on the declared battery capacity.

Pre-configured servers are used to supply the infrastructure necessary for applications such as web browsing and media streaming.

For detailed analysis, the software displays graphically the current consumption over the full duration of the test as well as over the last 500ms.
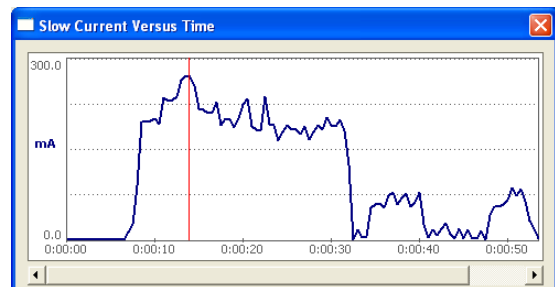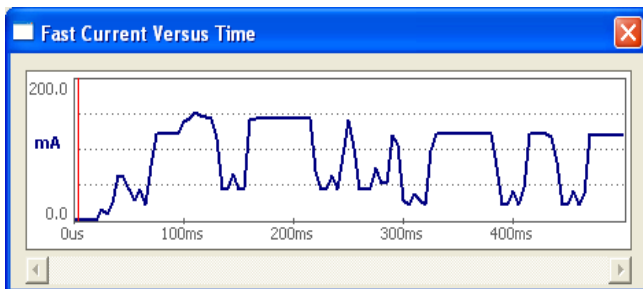
Features

o Support for GSM, (E)GPRS, WCDMA and HSPA using R&S CMU200 or CMW500 and NGMO2 (with B5 option)

o Support for LTE using CMW500

o Easy to use Windows application

o Scripted scenarios allowing customisation

o Result output in CSV spreadsheet and HTML report formats

o Support for CDMA

o Standby and Talk time

o File download/uploads

o Browsing (WAP / HTTP)

o Audio / Video Streaming

o Video Telephony

o Application Software test

o VoLTE

Requirements

o R&S CMU200 or CMW500

   o All options necessary to support WCDMA Application Testing option CMU-K96 on CMU200

   o All options necessary necessary to support the DAU on CMW500

   o Options covering all bands supported by DUT

o R&S NGMO2

   o NGMO2-B5 Switchbox option

o PC

   o Windows 2000, XP or Win7

   o National Instruments GPIB card