Efficient Analysis of Power Consumption Behaviour of Embedded Wireless IoT Systems

ABSTRACT

From wearables to smart appliances, the Internet of Things (IoT) is developing at a rapid pace. The challenge is to find the best fitting solution within a range of different technologies that all may be appropriate at the first sight to realize a specific embedded device. A single tool for measuring power consumption of various wireless technologies and low power modes helps to optimize the development process of modern IoT systems. In this paper, we present an accurate but still cost-effective measurement solution for tracking the highly dynamic power consumption of wireless embedded systems. We extended the conventional measurement of a single shunt resistor's voltage drop by using a dual shunt resistor stage with an automatic switch-over between two stages, which leads to a large dynamic measurement range from µ**A** up to several hundreds mA. To demonstrate the usability of our simple-to-use power measurement system different use cases are presented. Using two independent current measurement channels allows to evaluate the timing relation of proprietary RF communication. Furthermore a forecast is given on the expected battery lifetime of a Wifi-based data acquisition system using measurement results of the presented tool.

EXISTING SYSTEM

In existing if we need to know power consumption of various wireless technologies**.** We have to use many tools. They may or may not get correct results. Engineer has to select an appropriate measurement range when the wireless device changes from ultra low power sleep mode to full power operation. They have to calculate individual power consumption.

DRAWBACKS

- Engineer has to select an appropriate measurement range when the wireless device changes from ultra low power sleep mode to full power operation
- It doesn't provide accuracy.

PROPOSED SYSTEM

In this paper, we present an accurate but still cost-effective measurement solution for tracking the highly dynamic power consumption of wireless embedded systems. We extended the conventional measurement of a single shunt resistor's voltage drop by using a dual shunt resistor stage with an automatic switch-over between two stages, which leads to a large dynamic measurement range from μ**A** up to several hundreds mA. To demonstrate the usability of our simple-to-use power measurement system different use cases are presented. Using two independent current measurement channels allows to evaluate the timing relation of proprietary RF communication. Furthermore a forecast is given on the expected battery lifetime of a Wi-Fi based data acquisition system using measurement results of the presented tool.

ADVANTAGES

- It relieves the engineer from selecting an appropriate measurement range when the wireless device changes from ultra low power sleep mode to full power operation
- It is easier to analyze the individual current consumption.

SYSTEM EQUIREMENTS

H/W System Configuration:-

- Processor - Pentium –IV
- RAM - 4 GB (min)
- Hard Disk - 20 GB
- Key Board - Standard Windows Keyboard
- Mouse - Two or Three Button Mouse
- Monitor - SVGA

S/W System Configuration:-

- Operating System : Windows 7 or 8 32 bit
- Application Server : Tomcat5.0/6.X
- Programming Language : Java
- Java Version : JDK 1.6 and above