

Energy requirements for functions

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Overview

- What is a function?
- What is a mode?
- Why is this important for standby policy?
- What are some typical functions
- Why do we want to know how much power is required for functions?
- Work on functions and modes
- Proposed 4E project on power for functions



What is a function?

According to IEC 62301 Edition 2 (CDV), a function is:

a predetermined operation undertaken by the energy using product. Functions may be controlled by an interaction of the user, of other technical systems, of the system itself, from measurable inputs from the environment and/or time



What is a function?

Functions are normally spilt into:

- Primary function: intended purpose – the main energy service of the product
- Secondary function: other functions which can enhance the primary function or can assist with the use and operation
- There may be several primary functions in a product (although often there is only one), may be none or more secondary functions



Examples of functions

- Secondary functions can include remote controls, timers, memory related functions, safety related functions and sensing functions
- In most products, network functions are a secondary function (but a very important one)
- For network equipment (eg switches, routers, and modems), network related functions are the primary function



Mode Categories

Modes can be split into 3 main categories:

1. Active modes – where the main function is being provided and it is connected to mains power
2. Low power modes (no main function is active and connected to mains power)
3. Disconnected from mains power (the product may still in any mode and may be connected to a network via use of battery power).



What is a low power mode?

- IEC62301 splits low power modes into 3 categories:
 - Off mode – no user oriented function present
 - Standby mode – one or more user oriented functions present
 - Network mode – at least one network function present such as network presence or reactivation
- None to many of each mode may exist
- Should be these mutually exclusive?



What power is really required for functions?

- Looking at the total product power in low power modes provides us with some information but is not clear cut:
 - There may be many functions present in a low power mode
 - It can be difficult to tell what functions are present and what state they are in
 - There are other confounding factors like power supply configuration that are important



Power allowances for functions?

- The concept of an allowance for a function has been used for many years
- It is common is widely used specifications like Energy Star (e.g. small network equipment specification) and EU Code of Conducts (Set Top Boxes and Broadband)
- In effect, Korea also uses adders (indirectly) by permitting different power levels for different products and modes



Power allowances for functions?

- It is very useful, from a policy perspective, to know just how much power is used to provide a specific function
- Power allowances help us to craft policies to more closely match the real variations in energy needs for real products
- If we apply a uniform power limit across a mode (or group of modes), the limit will be too weak for some or too strict for others (depending on the functions present)



4E Activities in this space

- Over the past 6 months, 4E Standby Annex commissioned a study to examine the types of functions that are typically present in modes in common appliances
- Undertaken by Ecova for 4E
- Gives detailed documentation on all common modes for similar product groupings
- Report should be out in the next month or two



4E Activities in this space

- 4E are looking to commission the second phase of this project to quantify the primary power requirements for many of the most common functions present in low power modes
- This study will look at the electronics and attempt to quantify the input power for the circuits that provides the function
- This provides a basis for estimating the total power envelope for many common modes



Project considerations

- This is a desk study and information will be sought from function suppliers as well as appliance manufacturers who deploy the functions in real products
- A critical issue will power supply configuration, especially for functions with very low primary power input requirements



Project tenders

- It is expected that a call for tenders will be issued in March 2013
- Interested parties should contact me or Melissa Damnics, Operating Agent of the 4E Standby Annex



What will be learnt

- It will help inform policy makers of realistic incremental power penalties for a range of common functions based on product design
- But these results will not be fixed in time
- By revealing the power requirements of function and focusing attention on this element we can:
 - make better policy decisions in the short term
 - drive innovation for low power solutions
 - make our study findings quickly redundant



The End

- thank you