Extreme Energy Saving Strategy for FICM - DAB Radio

1 Overview

1.1 Background

From the eletrical-battery-power-train vehicle perspective, any consumption of low-voltage-system eletrical components might produce the non-essentional waste of battery power, which could has impact to vehicle users' real capable mileage.

Therefore, this solution is trying to save low-voltage-system eletrical components consumption while users are not using. In addition, the applied energy saving solution would not cause any obvious unhappy exerperience from user standpoint.

1.2 Requirements Brief

Regarding to the external DAB radio module which has approximately 6W power consumption.

If an eletrical vehicle's power efficiency is 9km/1kwh, saving 6W power consumption could contribute approximately extra 6 multiplies 9 equals 54m of moving range per hour.

Therefore it is valuable to design and apply an "extreme" energy saving strategy for this extra 54m moving range from user usage perspective.

1.3 Acronyms

- FICM: Front Infortainment Control Module
- DAB: Digital Audio Broadcasting
- FM/AM Radio: Frequency Modulation/Analog Modulation Radio

2 Scope

2.1 Functional Scope

This documentation is **ONLY** applicable for the "extreme" energy saving strategy of *FICM* radio functions:

- DAB
- FM/AM

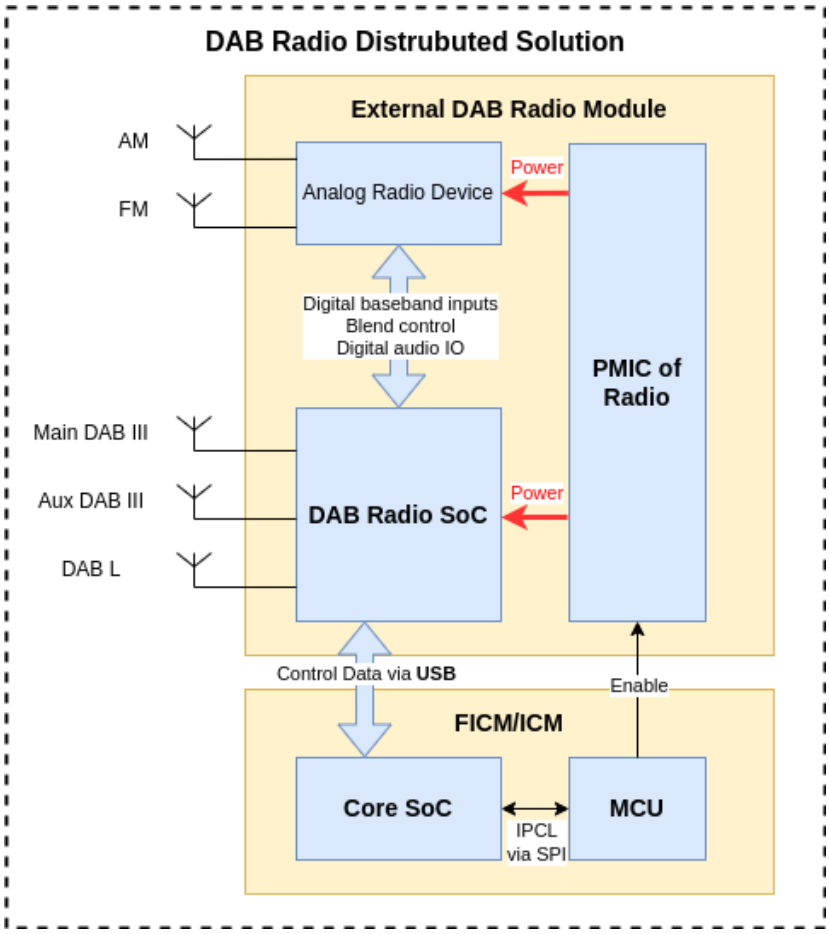
2.2 Vehicle Program Scope

This documentation is **ONLY** applicable for SAIC international MG brand vehicles which installed the particular *FICM* with *external DAB radio module*, or *independent DAB radio module*.

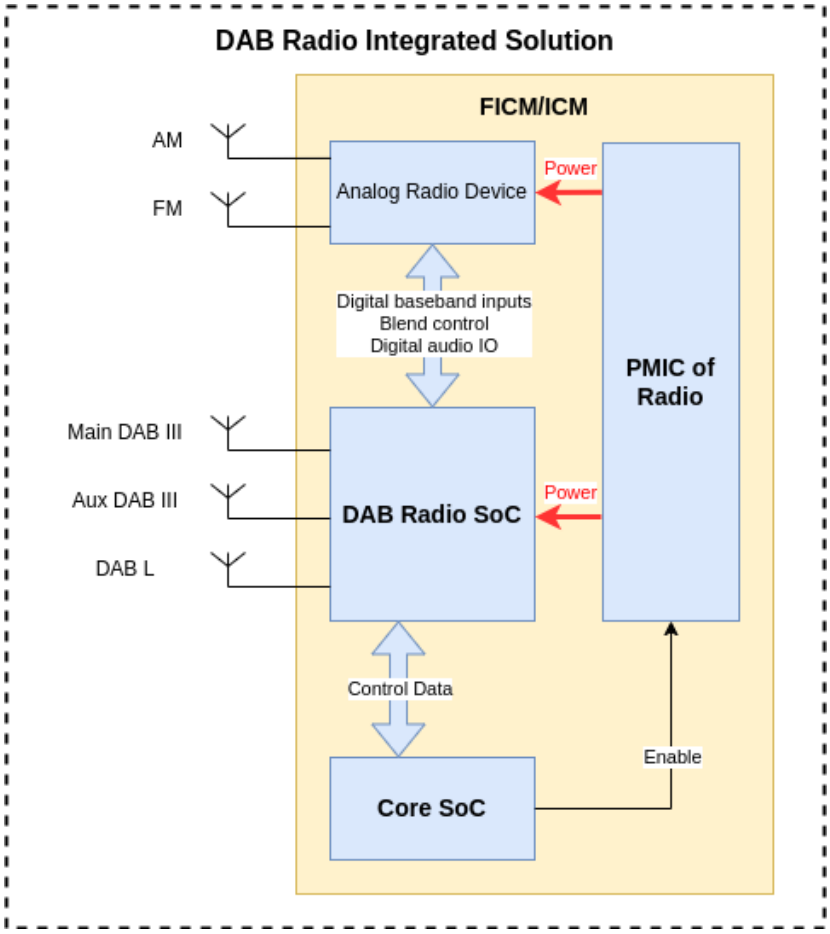
2.3 FICM Hardware Platform Scope

This documentation is **ONLY** applicable for *SAIC FICM2712 Platform with external DAB radio module*. From the *DAB radio module* perspective, it is so-called "DAB Radio Distrubuted Solution" on the left side as bellow diagram.

2.3.1 DAB Radio Hardware Block Diagram - Distribution



2.3.2 DAB Radio Hardware Block Diagram - Integration



2.4 Regulation

- EN50067
- IEC62106
- UKSI 2017 / 1206 for radio equipment 2017 and all its amendments
- OFCOM standards
- etc.

Accessment: If the customer has physically and purposefullyswitched the radio unit off. Then should be ok for no broadcastfunctionality. The unit should not switch itself off whiledriving. It must be a customer intervention.

3 Entities

3.1 REQ_EES_ENT_000_DABRadioShutdownButton


```
{
  "EntityID": "REQ_EES_ENT_000",
  "EntityName": "DABRadioShutdownButton",
  "DataType": "Enumeration",
  "ValueRange": { "open": 0, "shutdown": 1, "disabled": 2 },
  "InitialValue": 0,
  "Comments": ""
}
```


4 Functional Requirements

4.1 REQ_EES_DABRADIO_000

4.1.1 Description

User is allowed to shutdown DAB radio module while any radio feature not being running.

4.1.2 Pre-conditions

- FICM head unit power mode is at running
- [DABRadioShutdownButton] button has been in *open* status
- Radio feature is not running, included:
  - Audio output channel is not occupied by **DAB/FM/AM**
  - Media source is not selected for **DAB/FM/AM**

4.1.3 Use Cases

- EES_UC_000: User shutdown DAB Radio module

4.1.4 Post-conditions

- [DABRadioShutdownButton] button has been in *shutdwon* status

4.1.5 Dependecies

N/A

4.2 REQ_EES_DABRADIO_001

4.2.1 Description

User is **NOT** allowed to shutdown DAB radio module while any radio feature not being running.

4.2.2 Pre-conditions

- FICM head unit power mode is at running
- [DABRadioShutdownButton] button has been in *open* or *disabled* status
- Radio feature is running, included:
  - Audio output channel is occupied by **DAB/FM/AM**
  - Media source is selected for **DAB/FM/AM**

4.2.3 Use Cases

- EES_UC_000: User shutdown DAB Radio module

4.2.4 Post-conditions

- [DABRadioShutdownButton] button has been in *disabled* status

4.3 REQ_EES_DABRADIO_002

4.3.1 Description

User is **ALWAYS** to have radio feature.

4.3.2 Pre-conditions

5 Use Cases

5.1 EES_UC_000: User shutdown DAB Radio module