Never stop thinking

PMA71xx/PMA51xx

SmartLEWIS™ MCU

IFX Software and Tools Support

Software and Tools Overview

Revision 1.0, 2009-11-19

Wireless Control

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IFX Software and Tools Support

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Previous Revision:

Page	Subjects (major changes since last revision)

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Table of Contents

Table of Contents 4

1 Introduction 5

2 Documentation Links 5

3 PMA Software Organisation 6

3.1 Memory Map 6

3.2 Software Layer and Documentation 7

4 IFX Software and Tools support 8

4.1 Development Tooling and Application Example 8

4.1.1 PMA Starter Kit 8

4.1.2 PMA Evaluation Kit 8

4.1.3 PMAfob - Keyfob Application Example 9

4.2 PMA Software Development Environment 9

4.3 IFX Software and Tools Support 9

References 10

1 Introduction

This document describes the software organisation of the SmartLEWIS™ MCU PMA-family and shows the software and tools support.

2 Documentation Links

Latest versions of all data sheets, application notes and other documents related to this product family may be downloaded from the Infineon Technologies internet web-site.

Detailed information about the SmartLEWIS™ MCU product family members PMA71xx and PMA51xx is available for download at **http://www.infineon.com/pma**. Most important documents are the product data sheets and the PMA function library guide:

- PMA51xx Datasheet
- PMA71xx Datasheet
- PMA51xx Function Library Guide
- PMA71xx Function Library Guide (named PMA71xx ROM Library Guide in earlier versions)

General information about the development tools for this PMA product family is available at **http://www.infineon.com/pma_tooling**.

All the documentation and software for the PMA Starter Kit with the PMA RF USB Stick is available at **http://www.infineon.com/pma_starterkit**.

3 PMA Software Organisation

Chapter 3.1 shows the memory map of the PMA and the location of the Function Library, the application code, the interrupt vectors, the user data sectors, the Flash configuration sector and the organisation of the data memory.

Chapter 3.2 describes the interaction of hardware and software layer and the documentation to each layer.

3.1 Memory Map

The following memory blocks are implemented:

- 12 kbyte ROM
- 6 kbyte FLASH code memory
- 2x128 byte User FLASH code/data memory
- 128 byte read-only FLASH configuration + ID
- 2x128 byte data RAM, of which 128 bytes are optionally battery buffered
- 16 byte battery-buffered XData RAM

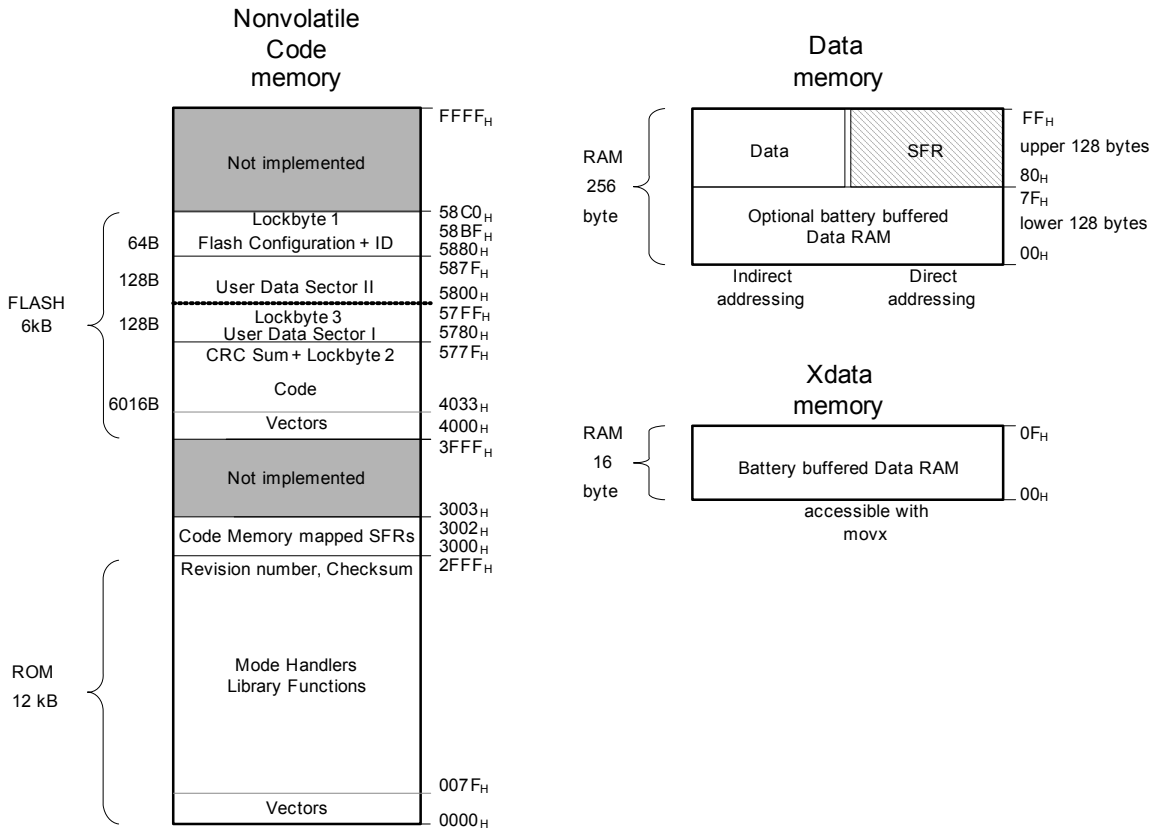


Figure 1 Memory Map

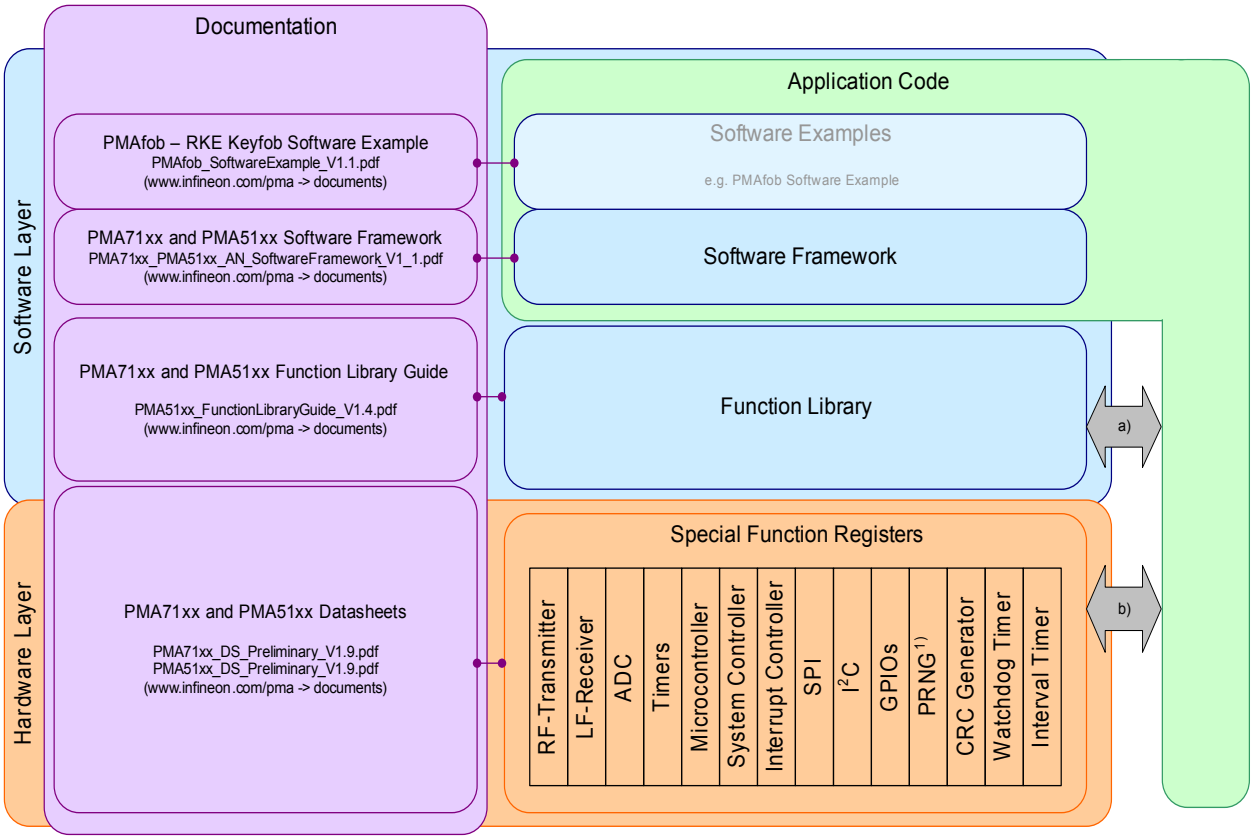
3.2 Software Layer and Documentation

All documents and source codes which are refered to below and the latest documentation can be downloaded from **www.infineon.com\pma**.

All internal hardware modules of the PMA are controlled and monitored by SFRs (Special Function Registers). The modules of the PMA can either be configurated and monitored by direct SFR access or by the usage of the software function library. This comprehensive software function library with high level commands in ROM allows easy and fast time to market development. The library provides many powerful functions like AES-encryption and decryption, initialization of the RF-Transmitter, battery voltage and temperature measurements. Due to the implementation of the software function library in ROM user code size in FLASH memory can be reduced considerably. A detailed documentation of this function library can be found in **[1]**.

Furthermore a software framework can be used as a starting point for software development. This software framework defines a typical structure how a PMA application program is constructed. The software framework includes common software tasks of the PMA e.g. interrupt and wake-up handling, the usage of library functions. A detailed documentation of the software framework and the source code can be found in **[2]**.

Figure 2 gives an overview of the PMA hardware and software layers. The software framework and/or software examples can be used as an initial point for the development of the application specific software program.



1) PRNG .. Pseudo Random Number Generator

a) Interface to Function Library

b) Interface to Special Function Registers

Figure 2 Software Layers and Documentation

4 IFX Software and Tools support

This is a short overview of IFX software and tools support for the SmartLEWIS™ MCU PMA-family.

4.1 Development Tooling and Application Example

IFX offers two different development kits and an application example for the SmartLEWIS™ MCU PMA-family.

- PMA Starter Kit
- PMA Evaluation Kit
- PMAfob - Keyfob Application Example

More information about the development tooling and the PMAfob - Keyfob Application Example can be found at **http://www.infineon.com/pma_tooling**.

4.1.1 PMA Starter Kit

The PMA Starter Kit is an easy to use development tool coming along in a small form factor size and can be directly connected to the PC via the USB interface. This kit is tailored for first evaluation and software programming covering all products of the PMA71xx/PMA51xx family.

Note: The PMA Starter Kit does neither provide full access to all pins nor to the LF receiver and the ADC. If full access to all pins or to the LF receiver or to the ADC is needed, the PMA Evaluation Kit must be used.



Figure 3 PMA Starter Kit

4.1.2 PMA Evaluation Kit

The PMA Evaluation Kit is an enhanced development tool for the SmartLEWIS™ MCU PMA-family and will support developing and debugging of Wireless Control Applications. The PMA Evaluation Kit allows easy access to all pins for detailed measurements and supports the embedded LF receiver and ADC functionality of the SmartLEWIS™ MCU. Furthermore, the PMA Evaluation Kit can be used as interface for programming external prototypes.

Note: The PMA Evaluation Kit has been designed to be connected to be PC via the SmartLEWIS™ System Interface Board (SIB v2.0). Alternatively a PMA Starter Kit may be used as Interface to the PC. Both interface boards, SIB v2.0 or PMA Starter Kit, have to be ordered separately.

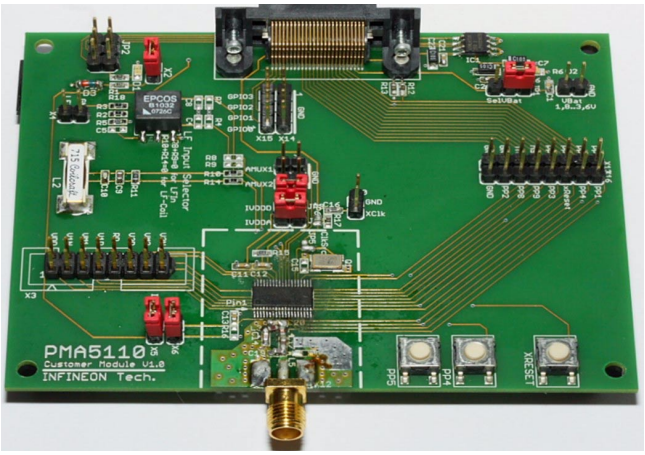


Figure 4 PMA Evaluation Kit

4.1.3 PMAfob - Keyfob Application Example

PMAfob is a typical application design for a wireless remote control transmitter. In addition to the hardware design, PMAfob comprises a demonstration firmware which meets the requirements for an automotive Remote Keyless Entry system, like encryption and rolling codes.

The PMAfob is tailored as a starting point for RKE keyfob and wireless remote control designs enabling fastest time to market.

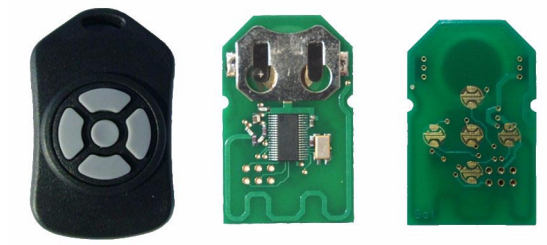


Figure 5 PMAfob

4.2 PMA Software Development Environment

The recommended software development environment for the PMA is KEIL™ development environment. A license free trial version (limited to 2kbyte code size) is available on the KEIL™ website:

http://www.keil.com/c51/demo/eval/c51.htm

4.3 IFX Software and Tools Support

For any further questions regarding SmartLEWIS™ MCU PMA-family software and development tools please get in contact with our application engineering experts at **wirelesscontrol@infineon.com**.

References

This section contains documents used for cross- reference throughout this document.

[1] PMA Function Library Guide

[2] Software Framework

www.infineon.com

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