Detailed Design of RTC Driver

Team X

Contents

Introduction and functional overview

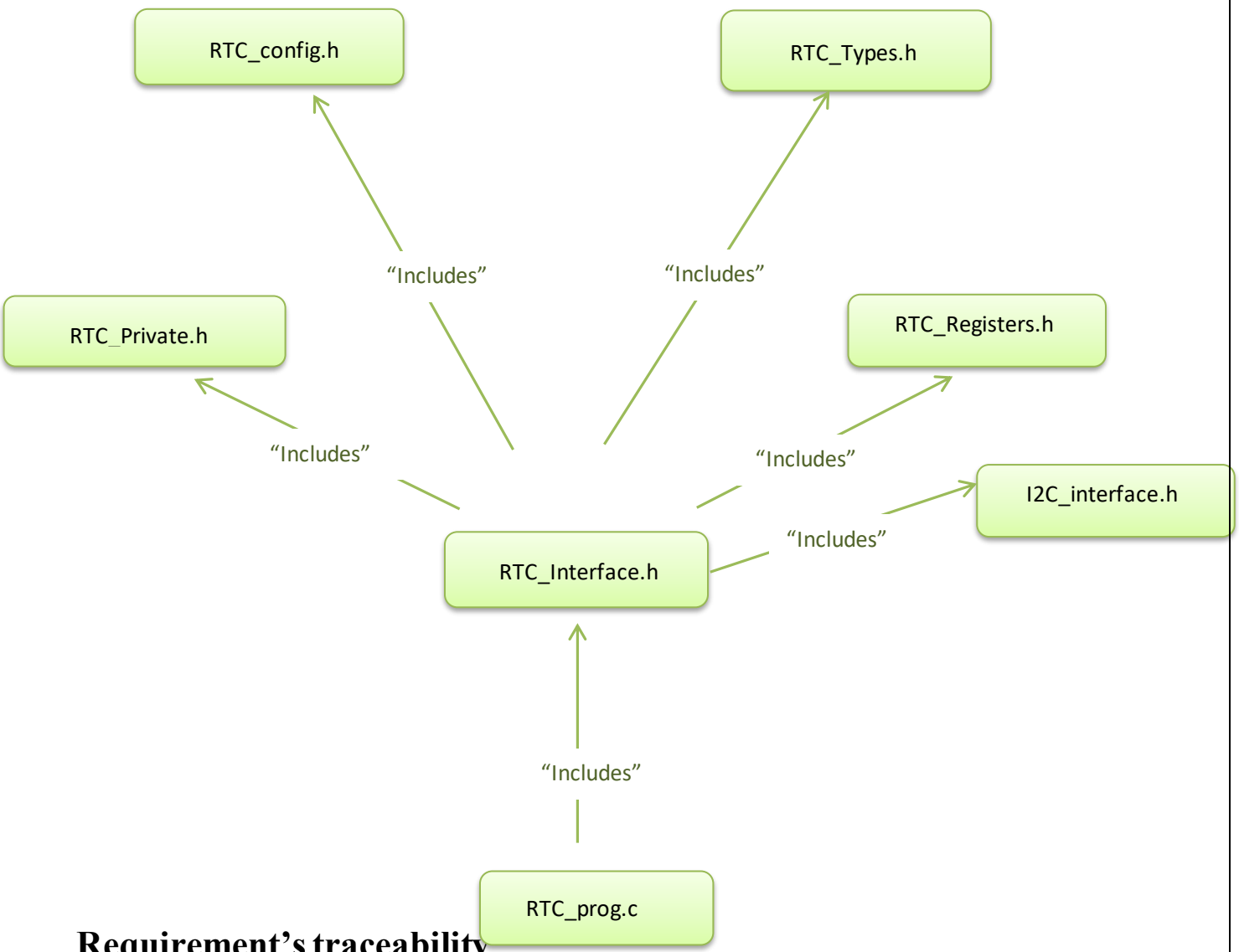
This document specifies the detailed design of RTC module.

The RTC driver controls clock & calendar.

Dependencies to other modules

I2C driver as the RTC communicate with the microcontroller through I2C bus

File Structure



Requirement's traceability

Requirement	Description	Satisfied by

[SRS_RTC_4500]	The RTC Driver shall support symbolic names of RTC Time & Date	[DD_RTC_5600]
[SRS_RTC_4501]	The RTC Driver shall support symbolic names of RTC Error Type	[DD_RTC_5601]
[SRS_RTC_4502]	The RTC Driver shall provide a service to initialize the RTC Module	[DD_RTC_5602]
[SRS_RTC_4503]	The RTC Driver shall provide a service to read Time	[DD_RTC_5603]
[SRS_RTC_4504]	The RTC Driver shall provide a service to read calendar	[DD_RTC_5604]

API specification

Type definitions:

1- [DD_RTC_5600]

Name	S_RTCData
type	Structure
Range	--
Description	It contains the RTC Time & Date to be adjusted
Covered requirements	--

2-[DD_RTC_5601]

Name	E_RTC_ErrorType
type	Enum
Range	• RTC_E_OK • RTC_E_NOT_OK • RTC_E_DATE_FORMAT
Description	It contains the RTC Errors
Covered requirements	--

Function definitions:

1-[DD_RTC_5602]

Service name:	RTC Init
Syntax:	E_RTC_ErrorType HAL_RTC_Init(S_RTCData *RTCData)
Sync/Async:	Synchronous
Re-entrancy:	Re-enterant
Parameters (in):	S_RTCData
Parameters (out):	--
Parameters (inout):	--
Return type:	E_RTC_ErrorType
Description:	It Sets the RTC Date and Time to the desired data
Covered requirements:	--

2-[DD_RTC_5603]

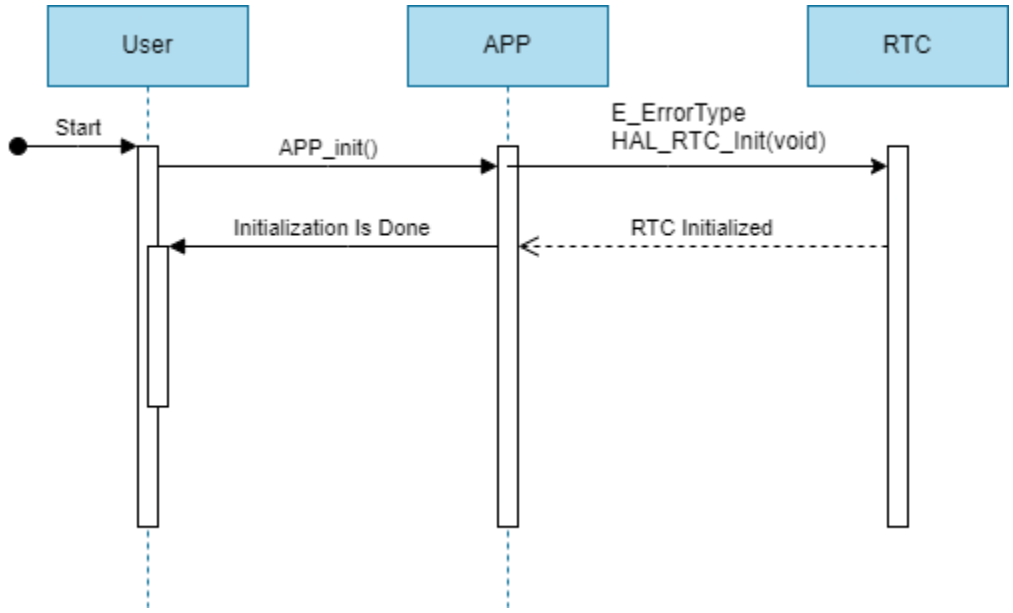
Service name:	RTC_Read_Time
Syntax:	E_RTC_ErrorType HAL_RTC_ReadDate(S_RTCData *RTCData)
Sync/Async:	Synchronous
Re-entrancy:	Re-enterant
Parameters (in):	Pointer to array of characters
Parameters (out):	Time
Parameters (inout):	--
Return type:	E_RTC_ErrorType
Description:	It read the real time and store it in the RTC struct
Covered requirements:	Get the Time

3-[DD_RTC_5604]

Service name:	RTC_Read_Calender
Syntax:	E_RTC_ErrorType HAL_RTC_ReadTime(S_RTCData *RTCData)
Sync/Async:	Synchronous
Re-entrancy:	Re-enterant
Parameters (in):	Pointer to array of characters
Parameters (out):	Date
Parameters (inout):	--
Return type:	E_RTC_ErrorType
Description:	It read the current and store it in the parameter in
Covered requirements:	Get the Date

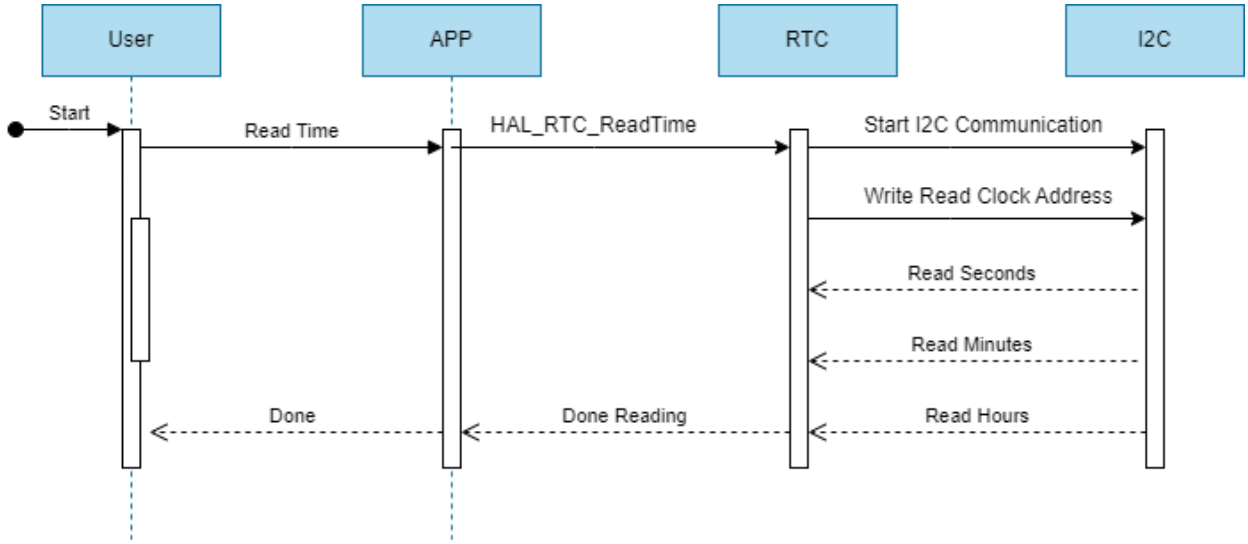
Sequence Diagrams

RTC Initialization



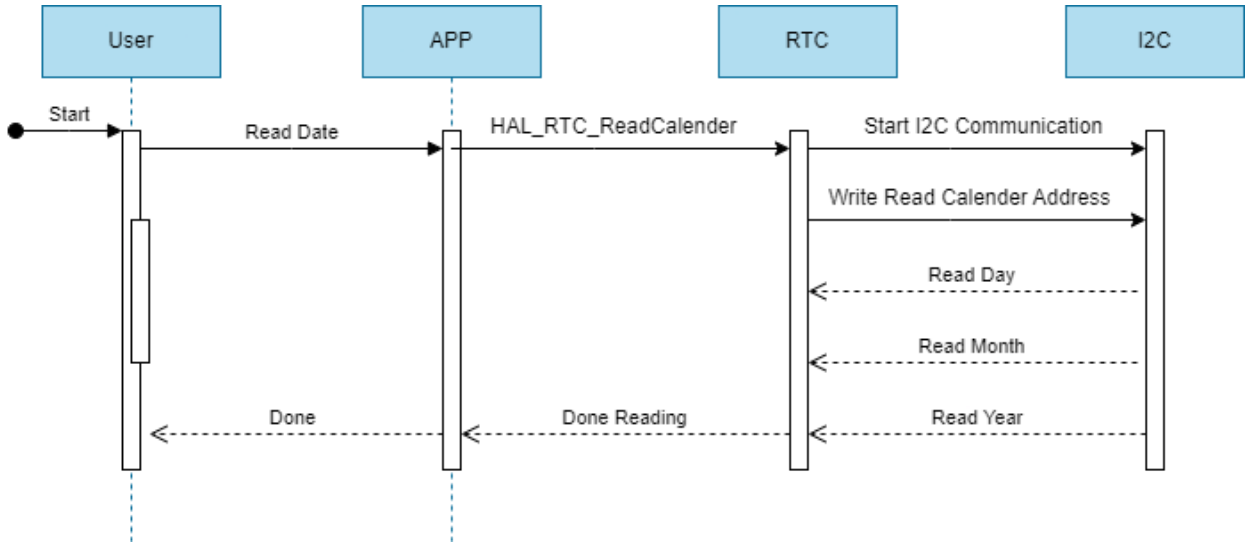
When user initialize the application, it initializes the RTC module by change its status to initialized as indication to start the module.

RTC_Read_Time



When user want to get the current time, the application calls the RTC module to get its time data then it communicates with the I2C with the read clock address then fetch seconds, minutes, hours simultaneously.

RTC_Read_Date



When user wants to get the current date, the application calls the RTC module to get its date by communicating the I2C bus with the specific address then fetch day, month, year simultaneously.