Detailed Design of RTC Driver

Team X

Contents

Introduction and functional overview

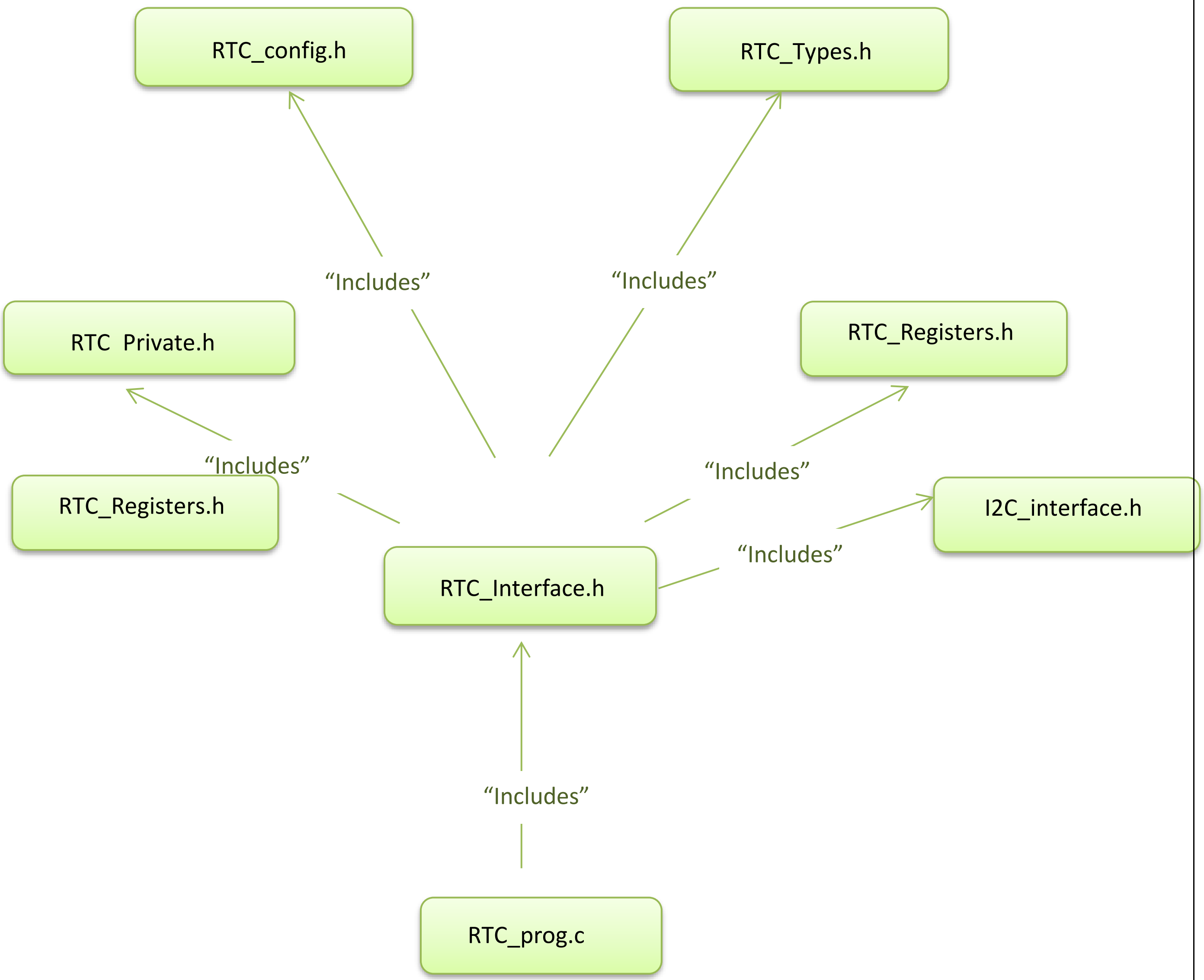
This document specifies the detailed design of RTC module.

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	[DD_RTC_5600]
[SRS_RTC_4501]	The RTC Driver shall support symbolic names of RTC Date	[DD_RTC_5601]
[SRS_RTC_4502]	The RTC Driver shall provide a service to initialize the RTC Modue	[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]
[SRS_RTC_4505]	The RTC Driver shall provide a service to set Time	[DD_RTC_5605]
[SRS_RTC_4506]	The RTC Driver shall provide a service to set Calendar	[DD_RTC_5606]
[SRS_RTC_4507]	The RTC Driver shall provide a service to check if it’s pm or am	[DD_RTC_5607]

API specification

Type definitions:

1- [DD_RTC_5600]

Name	S_Time
type	Structure
Range	--
Description	It contains the RTC Time such as hours, mins, seconds
Covered requirements	--

2-[DD_RTC_5601]

Name	S_Date
type	Structure
Range	--
Description	It contains the RTC data such as day, month, year
Covered requirements	--

Function definitions:

1-[DD_RTC_5602]

Service name:	RTC Init
Syntax:	E_ErrorType HAL_RTC_Init(void)
Sync/Async:	Synchronous
Re-entrancy:	Re-enterant
Parameters (in):	--
Parameters (out):	--
Parameters (inout):	--
Return type:	E_ErrorType
Description:	It changes the status of RTC to be Initialized
Covered requirements:	Displays Date and time for user

2-[DD_RTC_5603]

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

3-[DD_RTC_5604]

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

4-[DD_RTC_5605]

Service name:	RTC_Set_Time
Syntax:	E_ErrorType HAL_RTC_SetTime(void)

Sync/Async:	Synchronous
Re-entrancy:	Re-enterant
Parameters (in):	--
Parameters (out):	--
Parameters (inout):	--
Return type:	E_ErrorType
Description:	It sets the Time based on the user requirements
Covered requirements:	Set the Date

5-[DD_RTC_5606]

Service name:	RTC_Set_Date
Syntax:	E_ErrorType HAL_RTC_SetDate(void)
Sync/Async:	Synchronous
Re-entrancy:	Re-enterant
Parameters (in):	--
Parameters (out):	--
Parameters (inout):	--
Return type:	E_ErrorType
Description:	It sets the Date based on the user requirements
Covered requirements:	Set the Date

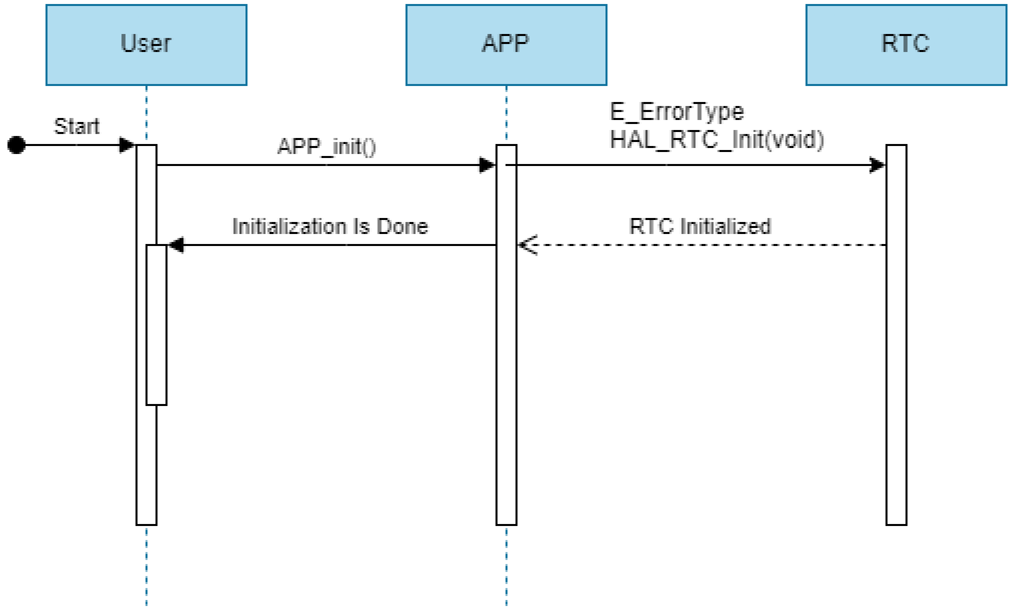
6-[DD_RTC_5607]

Service name:	RTC_Check
Syntax:	E_ErrorType HAL_RTC_Check(Boolean check)
Sync/Async:	Synchronous
Re-entrancy:	Re-enterant
Parameters (in):	Boolean flag
Parameters (out):	--
Parameters (inout):	--

Return type:	E_ErrorType
Description:	It checks if the current moment PM or AM
Covered requirements:	--

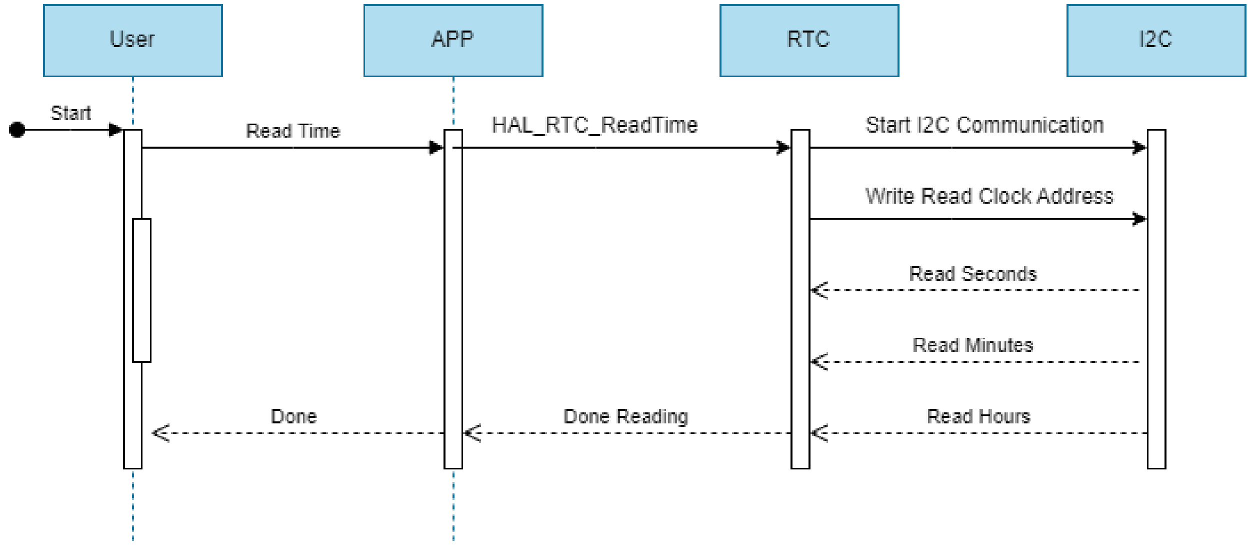
Sequence Diagrams

RTC Initialization



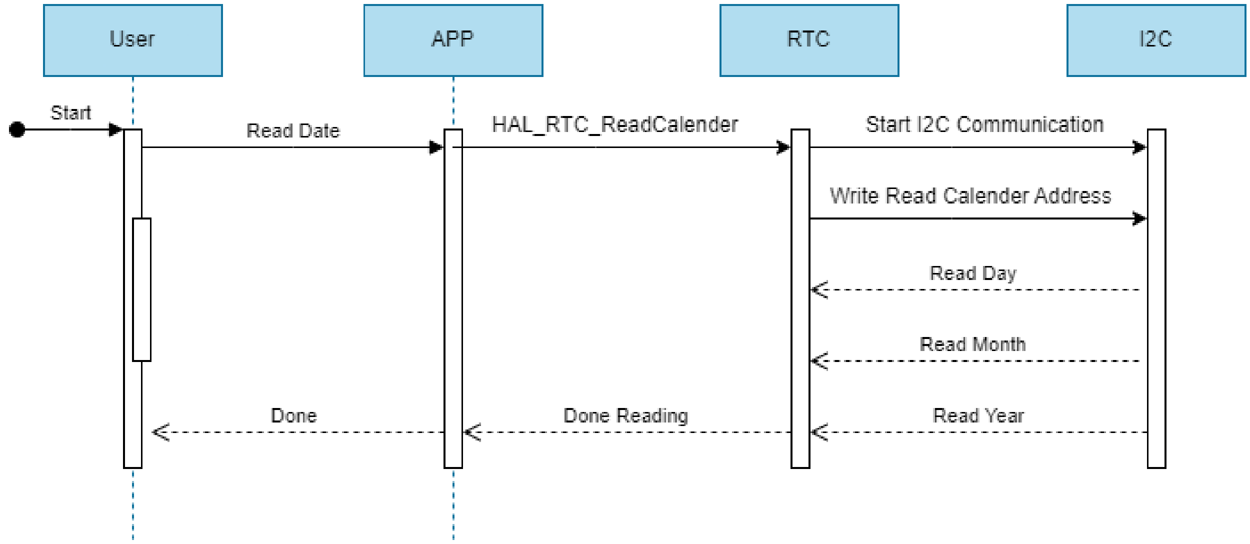
When user initialize the application, it initializes the RTC module by change its status to initialized as indication to start the module.

RTC_Read_Time



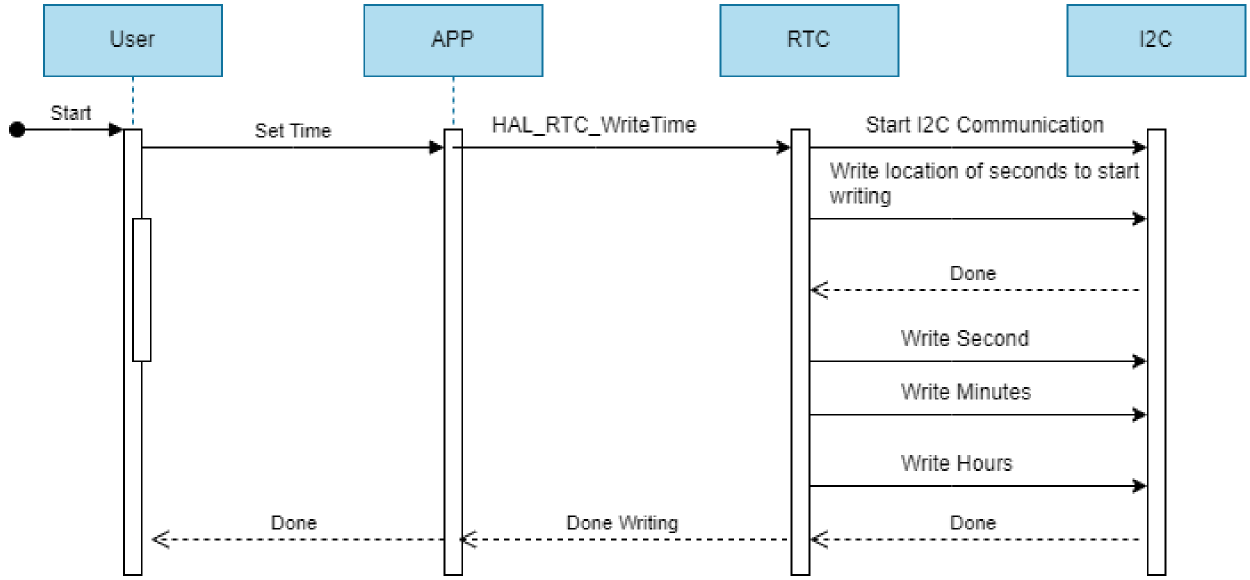
When user want to get the current time, the application calls the RTC module to get its time data then it communicates with the I2C with the read clock address then fetch seconds, minutes, hours simultaneously.

RTC_Read_Date



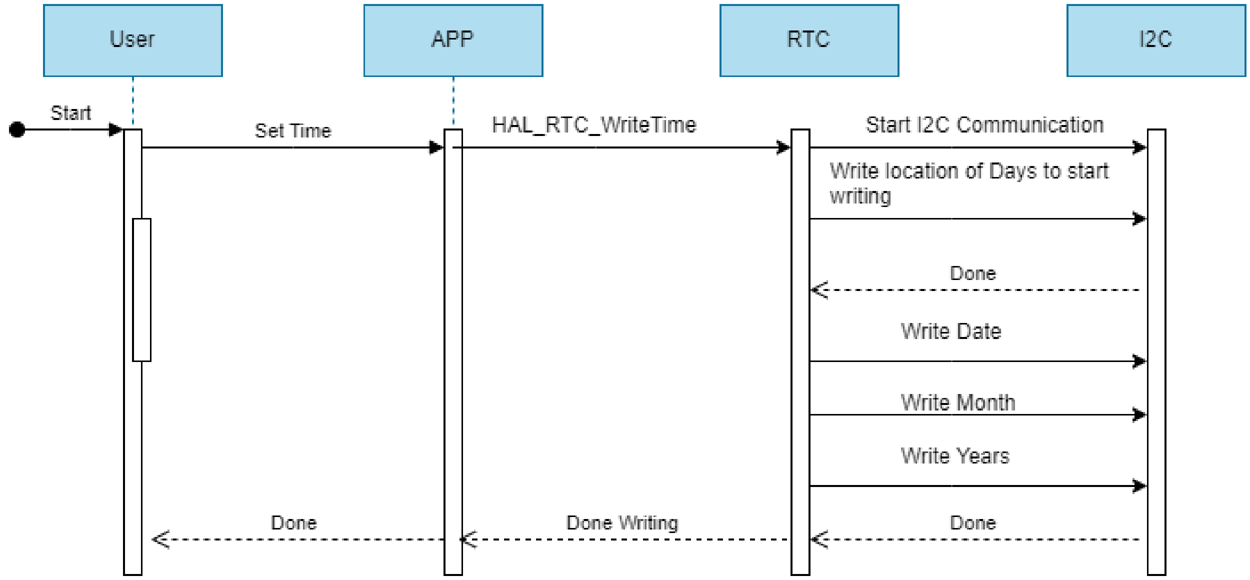
When user wants to get the current date, the application calls the RTC module to get its date by communicating the I2C bus with the specific address then fetch day, month, year simultaneously.

RTC_Set_Time



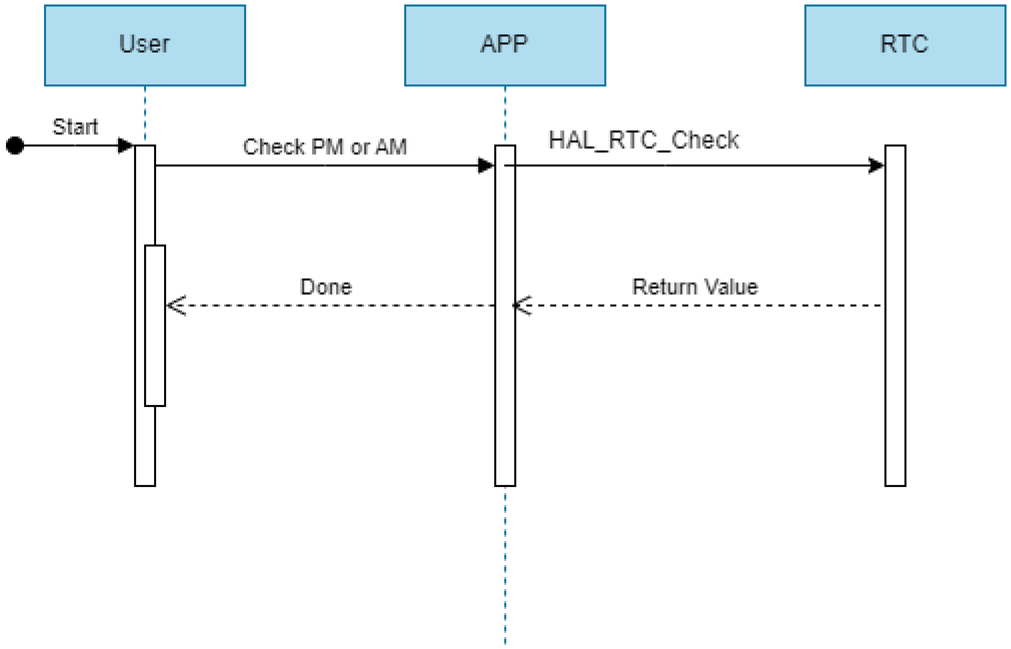
When user wants to sets the time, the application calls RTC module with the desired data, then it communicates using I2C bus to write these Data.

RTC_Set_Date



When user wants to sets the date, the application calls RTC module with the desired data, then it communicates using I2C bus to write these Data.

RTC_Check



When user wants to check weather if it’s PM or AM, the application calls the RTC module to give him the check