Detailed Design of Solenoid Driver

Team X

Contents

Introduction and functional overview:

This document specifies requirements on the module Solenoid Driver.

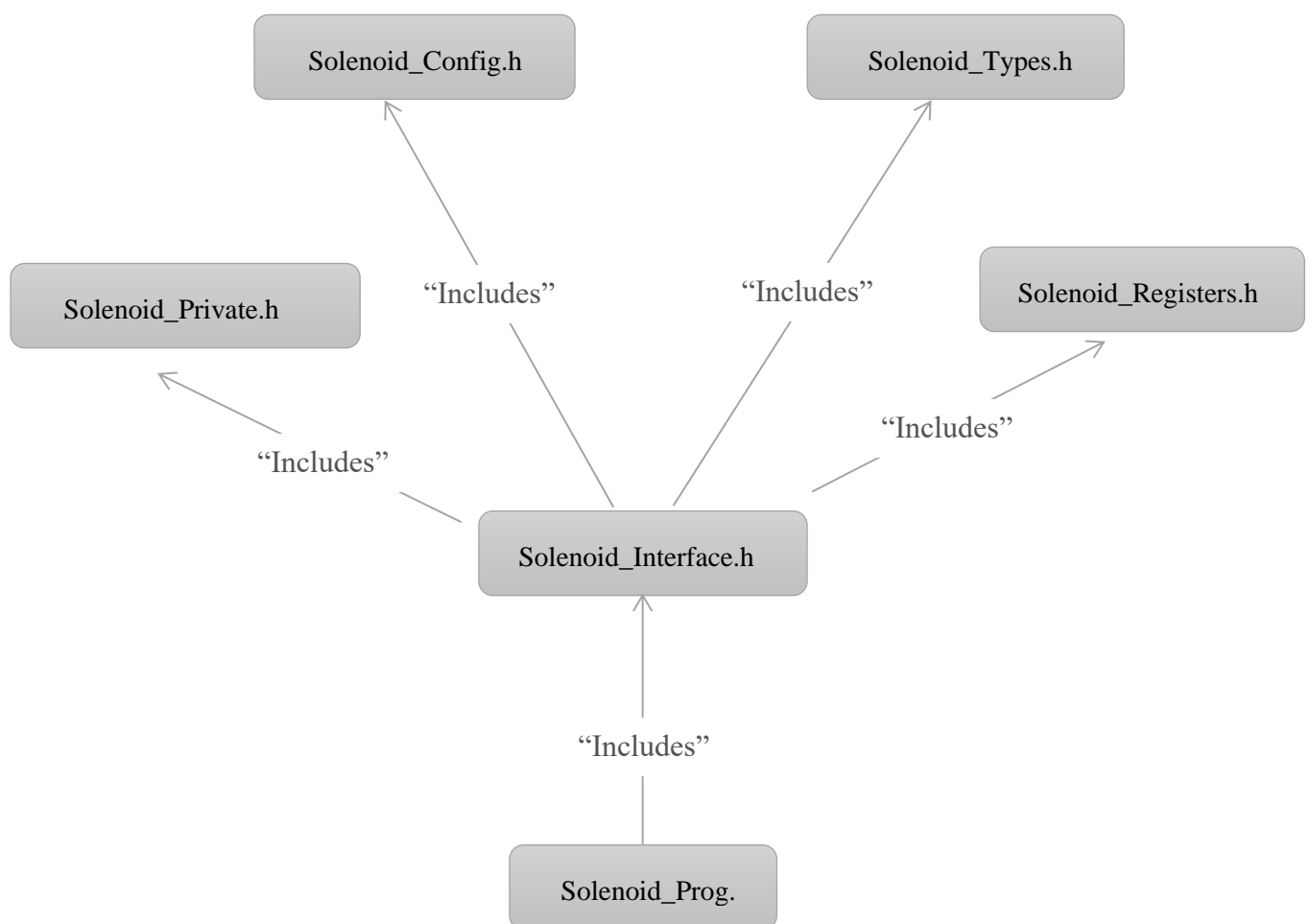The Solenoid driver initializes the Solenoid, Opens the solenoids and closes the solenoids.

Dependencies to other modules:

DIO driver module
Solenoid port and pin are initialized and written on using DIO driver module.

File structure:

The Solenoid module shall comply with the following file structure:

Requirement's traceability:

Requirement	Description	Satisfied by
[SRS_Solenoid_4301]	The Solenoid Driver shall support symbolic names for Solenoid pin..	[DD_Solenoid_4301] [DD_Solenoid_4302] [DD_Solenoid_4303] [DD_Solenoid_4304] [DD_Solenoid_4305] [DD_Solenoid_4306]
[SRS_Solenoid_4302]	The Solenoid driver shall provide a service that initializes the solenoid.	[DD_Solenoid_4304]
[SRS_Solenoid_4303]	The Solenoid driver shall provide a service that opens the solenoid.	[DD_Solenoid_4305]
[SRS_Solenoid_4304]	The Solenoid driver shall provide a service that closes the solenoid.	[DD_Solenoid_4306]

API specification:
Imported types:
   1- **[DD_Solenoid_4301]**

Module	Imported Type
DIO module: **DIO_Types.h**	E_DioPort E_dioPin

Type definitions:
   1- **[DD_Solenoid_4302]**

Name:	SOLENOID_PORT
Type	E_DioPort
Range:	0…<number of ports>
Description:	Port ID that contains solenoid pin
Covered requirements:	[SRS_Soleniod_4301]

   2- **[DD_Soleniod_4303]**

Name:	SOLENOID_PIN
Type	E_DioPin
Range:	0…<number of ports>
Description:	Solenoid pin
Covered requirements:	[SRS_Solenoid_4301]

Function definitions:

1- [DD_Solenoid_4304]

Service name:	Solenoid initialization
Syntax:	E_ErrorType HAL_Solenoid_init()
Sync/Async:	Synchronous
Re-entrancy:	Re-entrant
Parameters (in):	none
Parameters (out):	none
Parameters (inout):	none
Return type:	E_ErrorType
Description:	Function that initializes the Solenoid
Covered requirements:	[SRS_Solenoid_4302]

2- [DD_Solenoid_4305]

| Service name:	Open solenoid
Syntax:	E_ErrorType HAL_Solenoid_Open()
Sync/Async:	Synchronous
Re-entrancy:	Re-entrant
Parameters (in):	none
Parameters (out):	none
Parameters (inout):	none
Return type:	E_ErrorType
Description:	Function that opens the solenoid
Covered requirements:	[SRS_Solenoid_4303]

3- [DD_Solenoid_4306]

Service name:	Close the solenoid
Syntax:	E_ErrorType HAL_Solenoid_Close( )
Sync/Async:	Synchronous
Re-entrancy:	Re-entrant
Parameters (in):	none
Parameters (out):	none
Parameters (inout):	none
Return type:	E_ErrorType

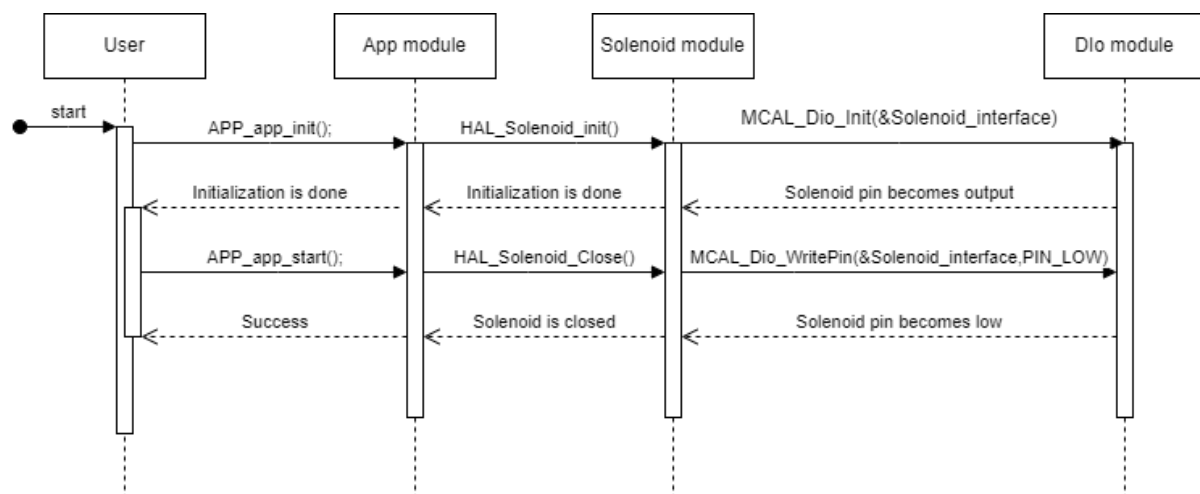| Description:	Function that closes the solenoid
Covered requirements:	[SRS_Solenoid_4304]

Sequence Diagram:

1. Open Solenoid:
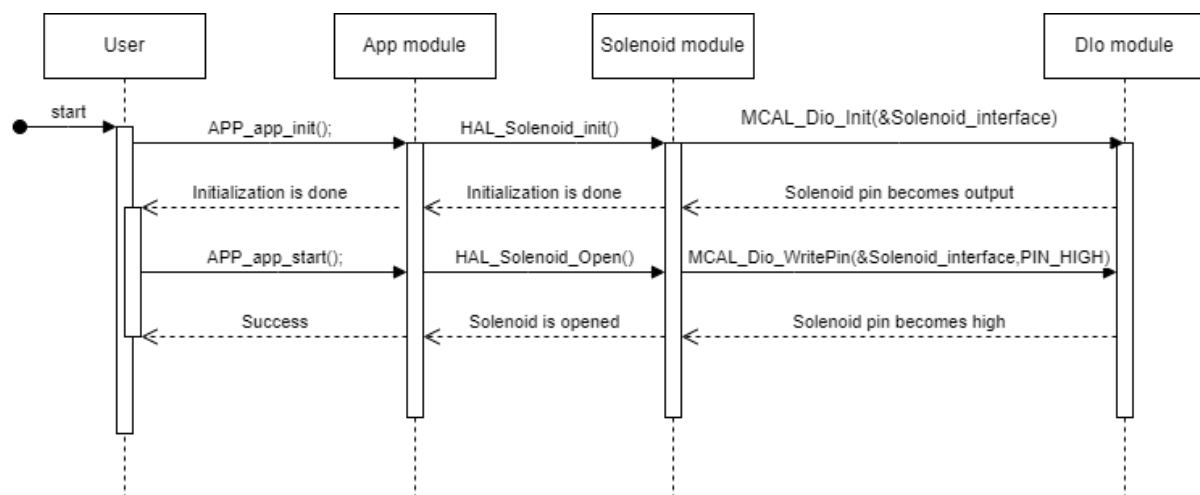
User wants to open solenoid so when app is initialized the solenoid will be initialized and when the app is started the solenoid will be opened when write in its pin high.

2. Close Solenoid:

User wants to close solenoid so when app is initialized the solenoid will be initialized and when the app is started the solenoid will be closed when write in its pin low.