

Detailed Design of LM35 Driver

Team X

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Introduction and functional overview:

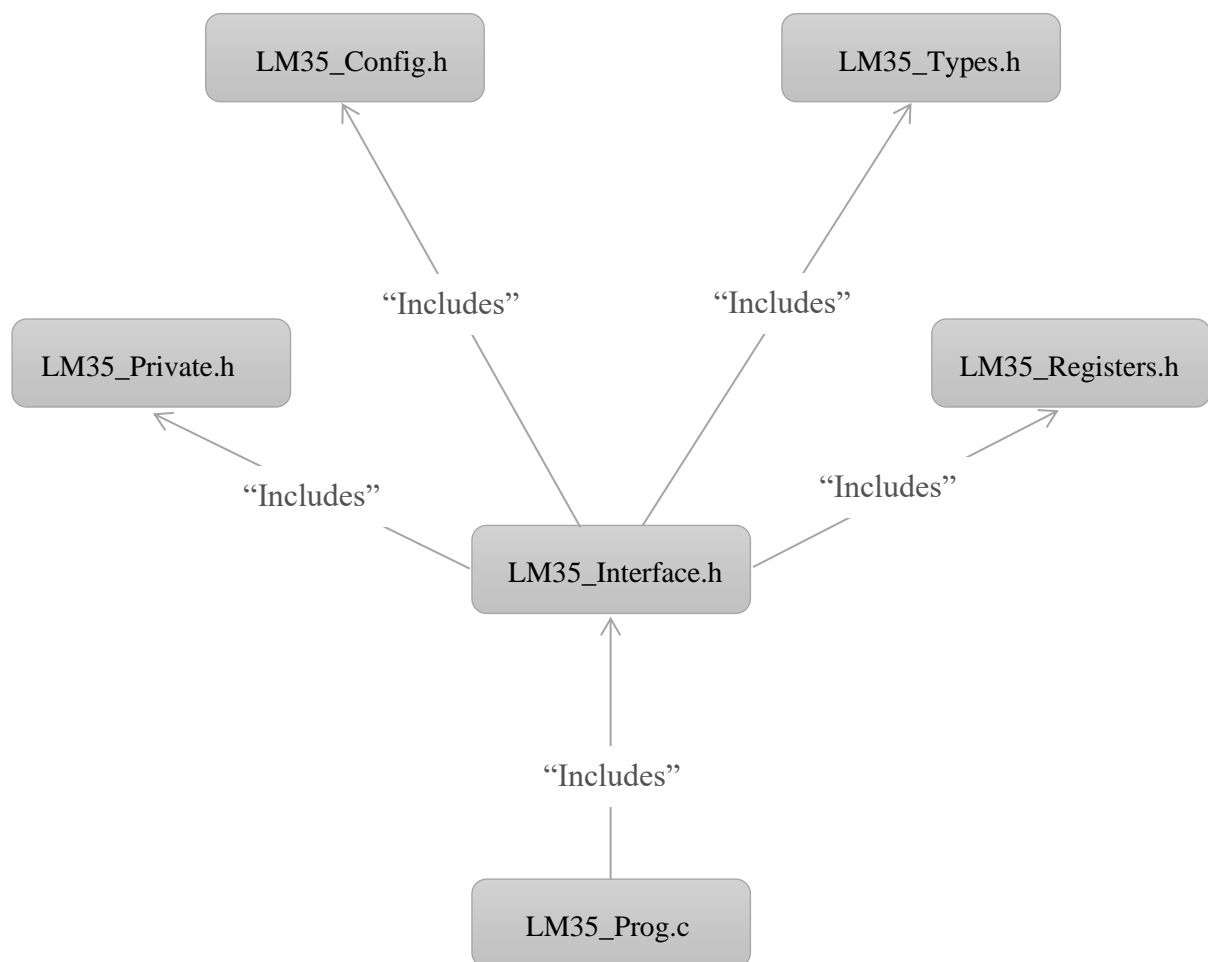
This document specifies detailed design of the module LM35 Driver. The LM35 driver is targeting LM35 temperature sensor Hardware.

The LM35 driver provides service for calculating the temperature value.

The behaviour of those services is synchronous.

File structure:

The LM35 module shall comply with the following file structure:



Requirements traceability:

Requirement	Description	Satisfied by
[SRS_LM35_6701]	The LM35 Driver shall support symbolic names for LM35 channels.	[DD_LM35_6701] [DD_LM35_6702] [DD_LM35_6703]
[SRS_LM35_6702]	The LM35 driver shall provide a service that calculates the temperature value.	[DD_LM35_6705]

API specification:

Type definitions:

1- [DD_LM35_6701]

Name:	LM35_CHANNEL
Type	Macro
Range:	ADC_CH0 ... ADC_CH7
Description:	The ADC channel that the sensor is connected to
Covered requirements:	[SRS_LM35_6701]

2- [DD_LM35_6702]

Name:	LM35_TempValue
Type	Unsigned char
Range:	0...255
Description:	The temperature value read from the sensor
Covered requirements:	[SRS_LM35_6701]

3- [DD_LM35_6703]

Name:	LM35_ADC_val
Type	unsigned long int
Range:	--
Description:	The ADC value on the channel
Covered requirements:	[SRS_LM35_6701]

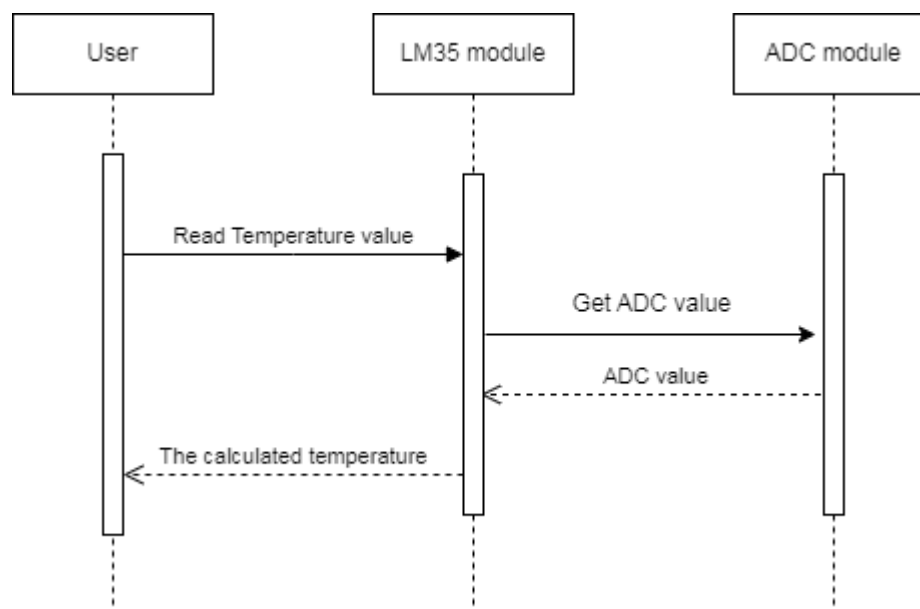
Function definitions:

1- [DD_LM35_6705]

Service name:	LM35 read temperature
Syntax:	LM35_TempValue HAL_LM35_readTemp(LM35_ADC_val);
Sync/Async:	Synchronous
Re-entrancy:	Re-entrant
Parameters (in):	LM35_ADC_val ... Value read on the ADC channel
Parameters (out):	none
Parameters (inout):	none
Return type:	LM35_TempValue ... Temperature value calculated
Description:	Function that reads the temperature value
Covered requirements:	[SRS_LM35_6702]

Sequence diagrams:

1- HAL_LM35_readTemp:



User will call the function to read the temperature value which will get the ADC value on the channel then calculate the temperature and send it back to the user.