Ultrasonic Sensor Component Design Document

(04)

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# **Introduction**

## **Document Scope**

This Document aims to demonstrate the Ultrasonic APIs and configurations

## **Goals and Objectives**

* Define each API in Ultrasonic
* Explain the configuration file and how the user should use it

## **API Description**

|  |  |  |  |
| --- | --- | --- | --- |
| ***API*** | ***Description*** | ***Inputs*** | ***Return Value*** |
| **UltraSonic\_voidInit** | This function initializes the Ultrasonic module and also it is a call back function for timer 1 | None | None |
| ULT\_TIM1\_ISR\_Main | ISR function to be executed when overflow happen | None | None |
| UltraSoinc\_U8ReadDistance  (**ultra\_00\_04\_01**) | The main function the return distance | u16\*Copy\_U16DisanceVal | Local\_U8ErrorFlag |

Table 1: API description

## **Reference Documents**

|  |  |  |
| --- | --- | --- |
| **ID** | **Reference** | **Title** |
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# **Design Constraints**

## **Constraints on Initialization**

N/A

## **Constraints on Inputs**

N/A

## **Constraints on Outputs**

N/A

## **Communication/Network Constraints**

N/A

## **Diagnostic Constraints**

N/A

# **Real Time Analysis**

## **Processes Identification**

N/A

## **Timing Bases Identification**

The Response time is shown for CPU core setting at 16Mhz.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Process** | **Description** | **Design consideration** | **Period** | **Maximum Response Time** | **Jitter** |
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Table 3: Hardware Shared Resources

## **Shared Resources**

### **Hardware Resources**

|  |  |
| --- | --- |
| **Resource Name** | **Description** |
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|  |  |
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Table 4: Hardware Shared Resources

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Shared Resource** | **API1** | **API2** | **API3** | **API4** | **API5** |
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*R: read, W: write, RW: read/write*

Table 5 : Shared HW resources access type by system APIs.

### **Software Resources**

|  |  |
| --- | --- |
| **Resource Name** | **Description** |
|  |  |
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Table 6: Software Shared Resources

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| --- | --- | --- | --- | --- | --- |
| **Shared Resource** | **API1** | **API2** | **API3** | **API4** | **API5** |
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*R: read, W: write, RW: read/write*

Table 7 : Shared SW resources access type by system APIs.

# **Architectural Design**

## **Real Time Architecture**

### **Components/Modules Design**

#### **<Ultrasonic Driver>**

##### **Offered Services**

###### **APIs**

Describe the use of interrupts and the CPU load because of them.

###### **Tasks**

Describe the use of interrupts and the CPU load because of them.

###### **Interrupts**

Describe the use of interrupts and the CPU load because of them.

##### **Configuration of the Component**

###### **Generic Configuration of the Component**

|  |  |  |  |
| --- | --- | --- | --- |
| **Configuration Parameters** | **Description** | **Configuration Class** | **Comment** |
|  |  |  |  |
|  |  |  |  |
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|  |  |  |  |
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Table 8 : Static and dynamic configurations of the System

###### **Target Specific Configuration**

## **Static Architecture**

Figure 3 : The Files Structure

### **File Description**

|  |  |
| --- | --- |
| **File Name** | **Description** |
|  |  |
|  |  |

# **Design Alternatives and Justification**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Alternatives** | **Description** | **Criteria 1** | **Criteria 2** | **Criteria 3** |  |  |
|  |  |  |  |  |  |  |
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Table 9 : design alternatives and comparison