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# Introduction and functional overview

## Objective

It’s used for calculating time to measure distance through signal coming at echo pin.

## Context Diagram



## Acronyms and abbreviations

Acronyms and abbreviations that have a local scope.

|  |  |
| --- | --- |
| ***Abbreviation / Acronym:*** | ***Description:*** |
| ICU | Input capture unit |

# External interfaces

## Std\_Types.h

### Types

|  |  |
| --- | --- |
| Name | Description |
| U8 | Unsigned char. |
| U16 | Unsigned short Int. |
| U32 | Unsigned long Int. |
| f32 | Float. |
| S8 | Short char. |
| S16 | Signed short Int. |
| S32 | Signed long Int. |

### Interfaces

None, because ICU in MCAL layer which interact directly with the hardware (Timer\_1)

### Constants

None.

### Variables

None.

# Static Design

## File structure

### Used Files

|  |  |
| --- | --- |
| ***File*** | ***Description*** |
| ICU\_MCAL.h | This file includes all prototype of function, #defines, extern constant, types which will be accessible to the other modules. |
| ICU\_MCAL.c | Contains the implementation of all the interfaces of the ICU interfaces. |
|  |  |
|  |  |

### File inclusion



## Types

### Imported types

|  |  |
| --- | --- |
| ***Module*** | ***Imported Type*** |
|  |  |
|  |

### Types Definitions

#### 

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name:*** |  | | |
| ***Type:*** |  | | |
| ***Range:*** |  |  |  |
| ***Description:*** |  | | |

## Symbol Definition

|  |  |
| --- | --- |
| ***Name:*** |  |
| ***Type:*** |  |
| ***Value:*** |  |
| ***Description:*** |  |

## Function definitions

This is a list of functions provided for upper layer modules.

### 

|  |  |  |
| --- | --- | --- |
| ***Service name:*** | **ICU\_Init** | |
| ***Syntax:*** | **VoidICU\_voidInitialize(void);** | |
| ***Service ID[hex]:*** | ICU-001 | |
| ***Sync/Async:*** | Sync | |
| ***Reentrancy:*** | None | |
| ***Parameters (in):*** | None |  |
| ***Parameters***  ***(in/out):*** | None | |
| ***Parameters (out):*** | None | |
| ***Return value:*** | None |  |
| ***Description:*** | This function initiates all register which related to the ICU module | |

|  |  |  |
| --- | --- | --- |
| ***Service name:*** | **ICU\_Enable** | |
| ***Syntax:*** | Void ICU\_\_voidEnableINT1(void); | |
| ***Service ID[hex]:*** | ICU-002 | |
| ***Sync/Async:*** | Sync | |
| ***Reentrancy:*** | None | |
| ***Parameters (in):*** | None |  |
| ***Parameters***  ***(in/out):*** | None | |
| ***Parameters (out):*** | None | |
| ***Return value:*** | None |  |
| ***Description:*** | This function shall enable the ICU module to start calculate time of received signal | |

|  |  |  |
| --- | --- | --- |
| ***Service name:*** | **ICU\_Disable** | |
| ***Syntax:*** | Void ICU\_\_voidDisableINT1(void); | |
| ***Service ID[hex]:*** | ICU-003 | |
| ***Sync/Async:*** | Sync | |
| ***Reentrancy:*** | None | |
| ***Parameters (in):*** | None |  |
| ***Parameters***  ***(in/out):*** | None. | |
| ***Parameters (out):*** | None, | |
| ***Return value:*** | None. |  |
| ***Description:*** | This function shall disable the ICU module from receiving signal | |

|  |  |  |
| --- | --- | --- |
| ***Service name:*** | **ICU\_CallBackFunction** | |
| ***Syntax:*** | Void ICU\_voidSetCallBack1 (void (\*ptrCpy)(void)); | |
| ***Service ID[hex]:*** | ICU-004 | |
| ***Sync/Async:*** | Async | |
| ***Reentrancy:*** | None | |
| ***Parameters (in):*** | (\*ptrCpy)(void) | Pointer to function |
| ***Parameters***  ***(in/out):*** | None | |
| ***Parameters (out):*** | None | |
| ***Return value:*** | None |  |
| ***Description:*** | This function shall run the function that should run when an interrupt occurs | |

## Call-back notifications

This chapter lists all functions provided by the ICU module to lower layers.

The ICU module does not provide any callback notifications.

## Scheduled functions

This chapter lists all functions called directly by the Basic Software Module Scheduler.

The ICU module has no scheduled functions.

# Dynamic Design

## Mode Management

None

## Sequence Diagram



# Shared Resources

There are no shared resources between ICU module and other modules.

# Configuration specification

This chapter defines configuration parameters and their clustering into containers.

## Containers and configuration parameters

The following chapters summarize all configuration parameters.

### Variants

Configuration variants describe sets of configuration parameters:

* VARIANT-PRE-COMPILE (PC)

Only parameters with "Pre-compile time" configuration are allowed in this variant.

* VARIANT-LINK-TIME (LT)

Only parameters with "Pre-compile time" and "Link time" are allowed in this variant.

* VARIANT-POST-BUILD (PB)

Parameters with "Pre-compile time", "Link time" and "Post-build time" are allowed in this variant.

Parameters

### 

### Parameters

#### 

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** |  | | |
| ***Description*** |  | | |
| ***Multiplicity*** | 1 | | |
| ***Type*** |  | | |
| ***Default value*** | -- | | |
| ***Configuration Class*** | ***Pre-compile time*** | | |
| ***Configuration Class***  ***Scope / Dependency*** | ***Link time*** | X | All Variants |
| ***Post-build time*** | -- |  |
| scope: local | -- |  |
|  |  | | |

# Configuration Constraints

There is no configuration need for ICU module until any update.

# Integration Constraints

Initialization function is required to use the ICU module.

# History

## Initial version

## Any update for ICU\_CDD will determine in this section.