**Adc Software Design**

***SteerTurnIllum***



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# Glossary

This section contains a glossary of all the important terms and acronyms used inside the document.

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| **Term / Acronym** | **Description** |
| AUTOSAR | AUTomotive Open System ARchitecture |
| VFB | Virtual Functional Bus |
| SWC | Software Component |
| RTE | Runtime Environment |
| BSW | Basic Software |
| OS | Operating System |
| S/R | Sender / Receiver |
| C/S | Client / Server |
| ECU | Electronic Control Unit |
| uC | Microcontroller |
| ADC | Analog Digital Converter |
| DIO | Digital Input / Output |
| PWM | Pulse Width Modulation |

Table 1 - Glossary.

# Introduction

## Purpose of the Document

The purpose of the document is to define the software design of the ***Adc*** driver for the ***SteerTurnIllum*** embedded academy project.

## Overview

While the AUTOSAR ***Adc*** module is complex and is usually configured via generators, in this project it is manually implemented and its features are limited to:

* Groups consists of a single channel.
* Only supports single shot conversions.

# Design Requirements

1. The Adc driver shall be implemented according to AUTOSAR 4.3.1 specifications.
2. The Adc driver shall implement the following interfaces and all their required data types for a fixed channel, single conversion, software trigger, synchronous implementation (see page 92, “9.3 Software triggered One-Shot conversion without notification” from the AUTOSAR ADC specifications).

* *Adc\_Init();*
* *Adc\_StartGroupConversion();*
* *Adc\_GetGroupStatus();*
* *Adc\_ReadGroup();*

1. The Adc driver shall include *Init.h* and directly use the *Init\_gv\_Full\*Bits()* and / or *Init\_gv\_Masked\*Bits()* functions for loading registers.
2. The Adc driver shall consist of the following files:

* *Adc.c*: Implements all the required interfaces in a generic way.
* *Adc*.*h*: Exports all the required interfaces, data types and the post-build configuration.
* *Adc\_PBcfg.*c: Defines the list of registers and values to be written for setting the ADC HW units in single-shot mode and selecting the ADC channels to be used.
* *Adc\_Cfg.h:* Defines and exports the number of configured ADC channels, through the *ADC\_NUMBER\_OF\_GROUPS* macro, and the zero based IDs of all the channels through the *ADC\_<Port\_ID>\_<Port\_Pin\_ID>* macros.

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## Version Index

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Table 2 - Version Index.