fpga\_base

Data Sheet

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# Introduction

This component implements basic FPGA functionality for firmware and embedded software version, compilation date, control of eight GPIO and end LEDs.

## Purpose

The document here describes this very generic firmware developed for all kinds of projects.

## Scope

This document provides a detailed overview of the firmware interface and specifies the user interface.

## Definitions, acronyms, and abbreviations

This document is based on the “IEEE Recommended Practice for Software Requirements Specifications” [1].

|  |  |
| --- | --- |
| BSP | Board Support Package. Collection of software drivers adding functionality to easily accessing the components used in a System On Chip. |
| FPGA | Field Programmable Gate Array. Programmable logic device. |

## References

[1] IEEE Std 830-1998, Recommended Practice for Software Requirements Specifications.

## Overview

Chapter 2 provides an overview and how the firmware is related to the other firmware used.

Chapter 3 contains all the detail information on the interfaces.

Chapter 4 is meant for developers working on the core.

# Overall description

The fpga\_base is loaded into a System On Chip (SOC) as an AXI slave component.

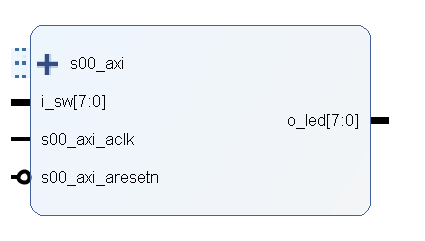


Figure 1: Component Overview

The version number is configurable through GUI, as well as device name and project name. The firmware compilation date is automatically updated by a pre TCL script during system assembly in Vivado. The software compilation date and time registers are updated by the embedded software itself in the initialization phase.

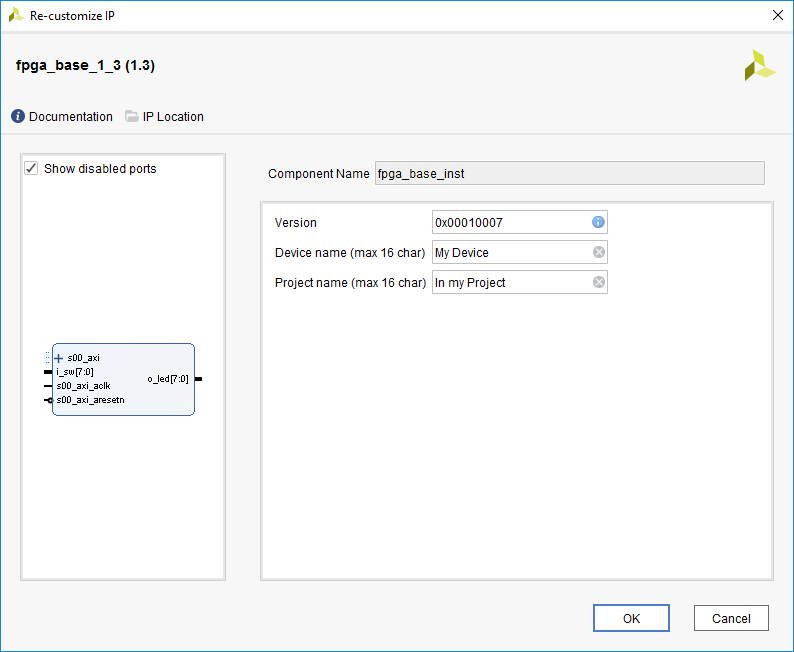


Figure 2: Component Configuration GUI

# Request composition

## Configuration

The following short notations for component parameters are used:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Address offset** | **R/W** | **Bit** | **Name** | **Description** |
| 0x00 | R | 31:0 | VERSION | Firmware version set manually from GUI |
| 0x04 | R | 31:0 | FW\_YEAR | FW compilation year |
| 0x08 | R | 31:0 | FW\_MONTH | FW compilation month |
| 0x0C | R | 31:0 | FW\_DAY | FW compilation day |
| 0x10 | R | 31:0 | FW\_HOUR | FW compilation hour |
| 0x14 | R | 31:0 | FW\_MINUTE | FW compilation minute |
| 0x18 | R/W | 31:0 | SW\_YEAR | SW compilation year |
| 0x1C | R/W | 31:0 | SW\_MONTH | SW compilation month |
| 0x20 | R/W | 31:0 | SW\_DAY | SW compilation day |
| 0x24 | R/W | 31:0 | SW\_HOUR | SW compilation hour |
| 0x28 | R/W | 31:0 | SW\_MINUTE | SW compilation minute |
| 0x40 | R | char[16] | DEV\_STRING | Device string characters |
| 0x50 | R | char[16] | PROJ\_STRING | Project string characters |
| 0x60 | R/W | 7:0 | LED | LED control register |
| 0x64 | R | 7:0 | DIP | DIP switch read register |

Table 1: Registers

# Developer Information

## Tools

To work on this core, the following tools are required:

* Vivado

## Packaging

To simplify re-packaging of the IP-Core after changes and avoid trouble with the Vivado GUI, a packaging script was written. To re-package the IP-Core, follow the steps below:

1. Open Vivado
2. In the TCL console, navigate to the “scripts” directory (using “cd <path>”)
3. Execute “source ./package.tcl”