MarvinShield

# Présentation du projet :

# Architecture matériel du Shield :

J3

J4

J1

J2

Interface

FPGA/Servo

**FPGA**

J3

J4

J1

J2

J1

J2

ADC

(SPI)

Driver CAN

J5

EEPROM CFG BB

# Organisation interne du FPGA

# Mapping mémoire

## FPGA Servo motor :

### Register Mapping :

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Offset** | **Register** | **Name** | **Access** | **Reset** |
| 0x0000 | FPGA Device Magic ID | FPGA\_MAGIC | Read-Only | 0x00361542 |
| 0x0004 | FPGA Firmware Version | FPGA\_VERSION | Read-Only | - |
| 0x0006 | FPGA Desc | FPGA\_DESC | Read-Only |  |
| 0x0016 | FPGA Capabilities | FPGA\_CAPA | Read-Only |  |
| 0x0040 |  |  |  |  |
| 0x0008 | Servo Motor Enable Register | SER\_SER | Write-Only | - |
| 0x000C | Servo Motor Disable Register | SER\_SDR | Write -Only | - |
| 0x0010 | Servo Motor Status Register | SER\_SSR | Read-Only | 0x00000000 |
| 0x0014 | Servo Motor set-point Register Base Address | SER\_RCBA | Read-Only | 0x00000028 |
| 0x0018 | Reserved | - | - | - |
| 0x001C | Reserved | - | - | - |
| 0x0020 | Reserved | - | - | - |
| 0x0024 | Reserved | - | - | - |
| 0x0028 | Servo Motor 0 Position Set-Point | SER\_SP0 | Read/Write | 0x00000000 |
| 0x002C | Servo Motor 1 Position Set-Point | SER\_SP1 | Read/Write | 0x00000000 |
| 0x0030 | Servo Motor 2 Position Set-Point | SER\_SP2 | Read/Write | 0x00000000 |
| 0x0034 | Servo Motor 3 Position Set-Point | SER\_SP3 | Read/Write | 0x00000000 |

**FPGA Device Magic ID**

**Name:** FPGA\_MAGIC

**Address:** 0x0000

**Access:** Read-Only

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 31 | 30 | 29 | 28 | 27 | 26 | 25 | 24 |
|  |  |  |  |  |  |  |  |
| 23 | 22 | 21 | 20 | 19 | 18 | 17 | 16 |
| MAGIC ID | | | | | | | |
| 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 |
|  |  |  |  |  |  |  |  |
| 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|  |  |  |  |  |  |  |  |

**• MAGIC ID [31 : 0] : FPGA Magic ID**

Set to 0x00361542

**FPGA Firmware Version**

**Name:** FPGA\_VERSION

**Address:** 0x0004

**Access:** Read-Only

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |  |
| 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 |
|  |  |  |  | MAJOR | | | |
| 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| MINOR | | | | REVISION | | | |

**• Firmware Major version [11 : 8]**

**• Firmware Minor version [7 : 4]**

**• Firmware Revision version [3 : 0]**

**FPGA Desc**

**Name:** FPGA\_DESC

**Address:** 0x0006

**Access:** Read-Only

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 63 | 62 | 61 | 60 | 59 | 58 | 57 | 56 |
| . | . | . | . | . | . | . | . |
| 55 | 54 | 53 | 52 | 51 | 50 | 49 | 48 |
| . | . | . | . | . | . | . | . |
| 47 | 46 | 45 | 44 | 43 | 42 | 41 | 40 |
| . | . | . | . | . | . | . | . |
| 39 | 38 | 37 | 36 | 35 | 34 | 33 | 32 |
| . | . | . | . | . | . | . | . |
| 31 | 30 | 29 | 28 | 27 | 26 | 25 | 24 |
| . | . | . | . | . | . | . | . |
| 23 | 22 | 21 | 20 | 19 | 18 | 17 | 16 |
| . | . | . | . | . | . | . | . |
| 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 |
| . | . | . | . | . | N | O | I |
| 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| T | P | I | R | C | S | E | D |

**• MAGIC ID [31 : 0] : FPGA Magic ID**

Set to 0x00361542

**FPGA Capabilities**

**Name:** FPGA\_CAPA

**Address:** 0x0040

**Access:** Read-Only

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 |
|  |  |  |  |  |  |  |  |
| 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| Reserved | | | | Nb controlers | | | |

**Servo Motor Enable Register**

**Name:** SER\_SER

**Address:** 0x0008

**Access:** Write-Only

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 31 | 30 | 29 | 28 | 27 | 26 | 25 | 24 |
|  | | | | | | | |
| 23 | 22 | 21 | 20 | 19 | 18 | 17 | 16 |
|  | | | | | | | |
| 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 |
|  |  |  |  |  | | | |
| 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|  | | | | CH3 | CH2 | CH1 | CH0 |

**CH0–CH3: Servo motor channel Enable**

0: No effect.

1: Enables the Servo motor channel.

**Servo Motor Disable Register**

**Name:** SER\_SDR

**Address:** 0x000C

**Access:** Write-Only

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 31 | 30 | 29 | 28 | 27 | 26 | 25 | 24 |
|  | | | | | | | |
| 23 | 22 | 21 | 20 | 19 | 18 | 17 | 16 |
|  | | | | | | | |
| 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 |
|  |  |  |  |  | | | |
| 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|  | | | | CH3 | CH2 | CH1 | CH0 |

**CH0–CH3: Servo motor channel Disable**

0: No effect.

1: Disables the Servo motor channel.