**DRV8316 ControlReg\_2 Problem**

We are seeing a problem with the DRV8316 SPI motor driver. The issue seems to be centered around the SPI ControlReg\_2 settings. Here is everything I know so far:

1. Background info: We are using the TI F28377s as our MCU. We are NOT using InstaSpin.
2. The default values for SPI ControlRg\_2 are:

|  |  |  |  |
| --- | --- | --- | --- |
| **Bit** | **Name** | **Reset Value** | **Description** |
| b0 | Clear fault | 0h | No Clear nFAULT |
| b2-b1 | Device mode selection | 0h | PWM mode – 6x |
| b4-b3 | Slew | 0h | Select 25V/µs |
| b5 | SDO mode | 1h | Push/Pull |
| b7-b6 | Reserved | 1h |  |

The setting for the default value is 0x60 or 01100000b. We have verified this by a SPI read.

1. We use different settings for our system and set ControlReg\_2 ~1ms after setting up the SPI on our MCU. A TI forum posting said that there should be a delay of ~1ms after power-up before trying to access the DRV8316 over SPI. Here are our settings.

|  |  |  |  |
| --- | --- | --- | --- |
| **Bit** | **Name** | **Reset Value** | **Description** |
| b0 | Clear fault | 1h | Clear nFAULT |
| b2-b1 | Device mode selection | 2h | PWM mode – 3X |
| b4-b3 | Slew | 1h | Select 50V/µs |
| b5 | SDO mode | 0h | Open Drain |
| b7-b6 | Reserved | 1h |  |

The setting for our value is 0x4D or 01001101b.

Using our ControlReg\_2 setting, we were never able to get our motor to move or nFAULT to clear. nFault could not be cleared by either sending a SPI command with CLR\_FAULT or by pulsing the nSLEEP pin.

1. I was looking around the TI forum and found a post concerning a reserved bit on ControlReg\_3. That bit was not a reserved bit but a SPI fault reporting bit. The post gave me the idea of changing bit 6 in ControlReg\_2 to 0 on power-up. Our ControlReg\_2 value then became 0x0D or 00001101b. Using my new register setting, our motor moved and behaved as expected.

Question: What are ControlReg\_2, bits 6 and 7? And what are the values and defaults?

1. The next thing I tried was increasing the time between power-up and SPI communication with the DRV8316. I used a 0.1 second delay as opposed to the 1 ms delay I used previously. I set ControlReg\_2, bit 6 to 1 at power-up. After power-up, nFAULT was set. But the big difference is that the fault was clearable. I could send in SPI commands and send a nSLEEP pulse and the fault would clear. Then, I could reset ControlReg\_2 b6 to 0 and was able to move the motor.

I also tried setting ControlReg\_2, bit 6 to 0 at power up with the longer delay. I was able to send subsequent SPI register commands. The motor moved as expected. I could toggle ContolReg\_2, bit 6. The nFAULT line would set or clear depending on the toggle setting.

Question: What is the time between power-up and SPI communication with the DRV8316? It is not 1 ms.