NVIC Driver for M3 Guide

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Data Structure Documentation

3.1 NVIC_t Struct Reference

Data Fields

- uint_32t **ISER** [8]
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- uint_32t **ICER** [8]
- uint_32t **Reserved1** [24]
- uint_32t **ISPR** [8]
- uint_32t **Reserved2** [24]
- uint_32t **ICPR** [8]
- uint_32t **Reserved3** [24]
- uint_32t **IABR** [8]
- uint_32t **Reserved4** [56]
- uint_8t **IPR** [240]

The documentation for this struct was generated from the following file:

- DNVIC/DNVIC.c

Chapter 4

File Documentation

4.1 DNVIC/DNVIC.c File Reference

This file is the Implementation for NVIC Driver for Cortex M3.

```
#include "STD_TYPES.h"
#include "DNVIC.h"
```

Data Structures

- struct NVIC_t

Macros

- #define NVIC_BASE_ADDRESS ((NVIC_t∗) 0XE000E100)

  NVIC peripheral base address.
- #define SCB_AIRCR ∗((volatile uint_32t∗) 0XE000ED0C)

  NVIC Application Interrupt and Reset Control Register.
- #define SCB_VTOR ∗((volatile uint_32t∗) 0xE000ED08)

  Vector Table Offset register.
- #define PASSWORD_MASK 0X05FA0000

  Password to make Software reset.
- #define FLASH_BASE_ADDRESS 0x08000000

  Base Address of Flash.
- #define OFFSET_POSITION 0x08

  used in shifting offest value to be corresponding for offest bits in Regsiter
- #define RESET_MASK 0x04

  Base Address of Flash.

Functions

- uint_8t DNVIC_EnableIRQ (uint_8t IRQn)

  Function to Enable peripheral Interrupt.
- uint_8t DNVIC_DisableIRQ (uint_8t IRQn)

  Function to Disable peripheral Interrupt.
- uint_8t DNVIC_SetPendingIRQ (uint_8t IRQn)

  Function to Set Peripheral Pending Interrupt Flag By Software.
- uint_8t DNVIC_ClearPendingIRQ (uint_8t IRQn)

  Function to Reset Peripheral Pending Interrupt Flag By Software.
- uint_8t DNVIC_GetPendingIRQ (uint_8t IRQn, uint_8t ∗Val)

  Function to get Pending Flag Value.
- uint_8t DNVIC_GetActive (uint_8t IRQn, uint_8t ∗Val)

  Function to get Active Flag Value.
- uint_8t DNVIC_SetPriorityGrouping (uint_32t priority_grouping)

  Function provides priority grouping control for the exception model.
- uint_8t DNVIC_SetPriority (uint_8t IRQn, uint_8t priority)

  Function to Set Interrupt Priority.
- uint_8t DNVIC_GetPriority (uint_8t IRQn, uint_8t ∗priority)

  Function to Read peripheral Priority.
- void DNVIC_voidDisableAllPeripherals (void)

  Function to Disable All peripherals interrupt.
- void DNVIC_voidEnableAllPeripherals (void)

  Function to Enable All peripherals Interrupt.
- void DNVIC_voidDisableAllFaults (void)

  Function to Disable all faults Interrupts.
- void DNVIC_voidEnableAllFaults (void)

  Function to Enable all faults Interrupts.
- void DNVIC_voidSetBASEPRI (uint_8t priority)

  Function to disable interrupts only with priority lower than certain level.
- void DNVIC_voidChangeVectorOffset (uint_32t offset)

  Function to change vector Table offest
- void DNVIC_voidSysReset (void)

  Function to make Software reset.

Variables

- NVIC_t ∗ NV =NVIC_BASE_ADDRESS

  NV pointer to struct NVIC_t.

4.1.1 Detailed Description

This file is the Implementation for NVIC Driver for Cortex M3.

Author

Ahmed Qandeel (`Ahmed.qandeel96@gmail.com`)

Version

0.1

Date

2020-06-05

Copyright

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4.1.2 Function Documentation

4.1.2.1 DNVIC_ClearPendingIRQ()

```
uint_8t DNVIC_ClearPendingIRQ (
            uint_8t IRQn )
```

Function to Reset Peripheral Pending Interrupt Flag By Software.

Parameters

IRQn	Variable of uint_8t , Interrupt Request Number is number assigned to peripheral as it is offest of them in vector table array ex (WWDG , TIM2)

Returns

OK | NOT_OK

4.1.2.2 DNVIC_DisableIRQ()

```
uint_8t DNVIC_DisableIRQ (
            uint_8t IRQn )
```

Function to Disable peripheral Interrupt.

Parameters

IRQn	Variable of uint_8t , Interrupt Request Number is number assigned to peripheral as it is offest of them in vector table array ex (WWDG , TIM2)

Returns

OK | NOT_OK

4.1.2.3 DNVIC_EnableIRQ()

```
uint_8t DNVIC_EnableIRQ (
            uint_8t IRQn )
```

Function to Enable peripheral Interrupt.

Parameters

IRQn	Variable of uint_8t , Interrupt Request Number is number assigned to peripheral as it is offest of them in vector table array ex (WWDG , TIM2)

Returns

OK | NOT_OK

4.1.2.4 DNVIC_GetActive()

```
uint_8t DNVIC_GetActive (
            uint_8t IRQn,
            uint_8t * Val )
```

Function to get Active Flag Value.

Parameters

IRQn	Variable of uint_8t , Interrupt Request Number is number assigned to peripheral as it is offest of them in vector table array ex (WWDG , TIM2)
Val	pointer of uint_8t , Active Flag which to be read assigned to pointer

Returns

OK | NOT_OK

4.1.2.5 DNVIC_GetPendingIRQ()

```
uint_8t DNVIC_GetPendingIRQ (
            uint_8t IRQn,
            uint_8t * Val )
```

Function to get Pending Flag Value.

Parameters

IRQn	Variable of uint_8t , Interrupt Request Number is number assigned to peripheral as it is offest of them in vector table array ex (WWDG , TIM2)
Val	pointer of uint_8t , Pending Flag which to be read assigned to pointer

Returns

OK | NOT_OK

4.1.2.6 DNVIC_GetPriority()

```
uint_8t DNVIC_GetPriority (
            uint_8t IRQn,
            uint_8t * priority )
```

Function to Read peripheral Priority.

Parameters

IRQn	Variable of uint_8t , Interrupt Request Number is number assigned to peripheral as it is offest of them in vector table array ex (WWDG , TIM2)
priority	Pointer to uint_8t , Priority which to be read

Returns

OK | NOT_OK

4.1.2.7 DNVIC_SetPendingIRQ()

```
uint_8t DNVIC_SetPendingIRQ (
            uint_8t IRQn )
```

Function to Set Peripheral Pending Interrupt Flag By Software.

Parameters

IRQn	Variable of uint_8t , Interrupt Request Number is number assigned to peripheral as it is offest of them in vector table array ex (WWDG , TIM2)

Returns

OK | NOT_OK

4.1.2.8 DNVIC_SetPriority()

```
uint_8t DNVIC_SetPriority (
            uint_8t IRQn,
            uint_8t priority )
```

Function to Set Interrupt Priority.

Parameters

IRQn	Variable of uint_8t , Interrupt Request Number is number assigned to peripheral as it is offest of them in vector table array ex (WWDG , TIM2)
priority	Variable of uint_8t , Priority (0..16)

Returns

OK | NOT_OK

4.1.2.9 DNVIC_SetPriorityGrouping()

```
uint_8t DNVIC_SetPriorityGrouping (
            uint_32t priority_grouping )
```

Function provides priority grouping control for the exception model.

Parameters

priority_grouping	Variable of uint_32t , Priority Type (ALL_PREEMPTION , THREE_PREEMPTION_ONE_SUBGROUP)

Returns

OK | NOT_OK

4.1.2.10 DNVIC_voidChangeVectorOffset()

```
void DNVIC_voidChangeVectorOffset (
            uint_32t offset )
```

Function to change vector Table offest

Parameters

offset	Variable of uint_32t , Change vector Table offest

Returns

NA

4.1.2.11 DNVIC_voidDisableAllFaults()

```
void DNVIC_voidDisableAllFaults (
            void  )
```

Function to Disable all faults Interrupts.

Parameters

NA	

Returns

NA

4.1.2.12 DNVIC_voidDisableAllPeripherals()

```
void DNVIC_voidDisableAllPeripherals (
            void  )
```

Function to Disable All peripherals interrupt.

Parameters

NA	

Returns

NA

4.1.2.13 DNVIC_voidEnableAllFaults()

```
void DNVIC_voidEnableAllFaults (
            void  )
```

Function to Enable all faults Interrupts.

Parameters

NA	

Returns

NA

4.1.2.14 DNVIC_voidEnableAllPeripherals()

```
void DNVIC_voidEnableAllPeripherals (
             void  )
```

Function to Enable All peripherals Interrupt.

Parameters

NA	

Returns

NA

4.1.2.15 DNVIC_voidSetBASEPRI()

```
void DNVIC_voidSetBASEPRI (
             uint_8t priority )
```

Function to disable interrupts only with priority lower than certain level.

Parameters

priority	Variable of uint_8t , Priority (0..16)

Returns

NA

4.1.2.16 DNVIC_voidSysReset()

```
void DNVIC_voidSysReset (
             void  )
```

Function to make Software reset.

Parameters

NA	

Returns

NA

4.2 DNVIC/DNVIC.h File Reference

This file is the user interface for NVIC Driver for Cortex M3.

Macros

- #define **WWDG** 0
- #define **PVD** 1
- #define **TAMPER** 2
- #define **RTC** 3
- #define **FLASH** 4
- #define **RCCINT** 5
- #define **EXTI0** 6
- #define **EXTI1** 7
- #define **EXTI2** 8
- #define **EXTI3** 9
- #define **EXTI4** 10
- #define **DMA1_CHANNEL1** 11
- #define **DMA1_CHANNEL2** 12
- #define **DMA1_CHANNEL3** 13
- #define **DMA1_CHANNEL4** 14
- #define **DMA1_CHANNEL5** 15
- #define **DMA1_CHANNEL6** 16
- #define **DMA1_CHANNEL7** 17
- #define **ADC1_2** 18
- #define **USB_HP_CAN_TX** 19
- #define **USB_LP_CAN_RX0** 20
- #define **CAN_RX1** 21
- #define **CAN_SCE** 22
- #define **EXTI9_5** 23
- #define **TIM1_BRK** 24
- #define **TIM1_UP** 25
- #define **TIM1_TRG_COM** 26
- #define **TIM1_CC** 27
- #define **TIM2** 28
- #define **TIM3** 29
- #define **TIM4** 30
- #define **I2C1_EV** 31
- #define **I2C1_ER** 32
- #define **I2C2_EV** 33
- #define **I2C2_ER** 34
- #define **SPI1** 35
- #define **SPI2** 36

- #define **USART1** 37
- #define **USART2** 38
- #define **USART3** 39
- #define **EXTI15_10** 40
- #define **RTCALARM** 41
- #define **USBWAKEUP** 42
- #define **TIM8_BRK** 43
- #define **TIM8_UP** 44
- #define **TIM8_TRG_COM** 45
- #define **TIM8_CC** 46
- #define **ADC3** 47
- #define **FSMC** 48
- #define **SDIO** 49
- #define **TIM5** 50
- #define **SPI3** 51
- #define **UART4** 52
- #define **UART5** 53
- #define **TIM6** 54
- #define **TIM7** 55
- #define **DMA2_CHANNEL1** 56
- #define **DMA2_CHANNEL2** 57
- #define **DMA2_CHANNEL3** 58
- #define **DMA2_CHANNEL4_5** 59
- #define **ALL_PREEMPTION** 0X00000300
- #define **THREE_PREEMPTION_ONE_SUBGROUP** 0X00000400
- #define **TWO_PREEMPTION_TWO_SUBGROUP** 0X00000500
- #define **ONE_PREEMPTION_THREE_SUBGROUP** 0X00000600
- #define **ALL_SUBGROUP** 0X00000700

Functions

- uint_8t DNVIC_EnableIRQ (uint_8t IRQn)

  Function to Enable peripheral Interrupt.
- uint_8t DNVIC_DisableIRQ (uint_8t IRQn)

  Function to Disable peripheral Interrupt.
- uint_8t DNVIC_SetPendingIRQ (uint_8t IRQn)

  Function to Set Peripheral Pending Interrupt Flag By Software.
- uint_8t DNVIC_ClearPendingIRQ (uint_8t IRQn)

  Function to Reset Peripheral Pending Interrupt Flag By Software.
- uint_8t DNVIC_GetPendingIRQ (uint_8t IRQn, uint_8t ∗Val)

  Function to get Pending Flag Value.
- uint_8t DNVIC_GetActive (uint_8t IRQn, uint_8t ∗Val)

  Function to get Active Flag Value.
- uint_8t DNVIC_SetPriorityGrouping (uint_32t priority_grouping)

  Function provides priority grouping control for the exception model.
- uint_8t DNVIC_SetPriority (uint_8t IRQn, uint_8t priority)

  Function to Set Interrupt Priority.
- uint_8t DNVIC_GetPriority (uint_8t IRQn, uint_8t ∗priority)

  Function to Read peripheral Priority.
- void DNVIC_voidDisableAllPeripherals (void)

  Function to Disable All peripherals interrupt.
- void DNVIC_voidEnableAllPeripherals (void)

Function to Enable All peripherals Interrupt.

- void DNVIC_voidDisableAllFaults (void)

  Function to Disable all faults Interrupts.
- void DNVIC_voidEnableAllFaults (void)

  Function to Enable all faults Interrupts.
- void DNVIC_voidSetBASEPRI (uint_8t priority)

  Function to disable interrupts only with priority lower than certain level.
- void DNVIC_voidChangeVectorOffset (uint_32t offset)

  Function to change vector Table offest
- void DNVIC_voidSysReset (void)

  Function to make Software reset.

4.2.1 Detailed Description

This file is the user interface for NVIC Driver for Cortex M3.

Author

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Version

0.1

Date

2020-06-05

Copyright

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4.2.2 Function Documentation

4.2.2.1 DNVIC_ClearPendingIRQ()

```
uint_8t DNVIC_ClearPendingIRQ (
            uint_8t IRQn )
```

Function to Reset Peripheral Pending Interrupt Flag By Software.

Parameters

IRQn	Variable of uint_8t , Interrupt Request Number is number assigned to peripheral as it is offest of them in vector table array ex (WWDG , TIM2)

Returns

OK | NOT_OK

4.2.2.2 DNVIC_DisableIRQ()

```
uint_8t DNVIC_DisableIRQ (
            uint_8t IRQn )
```

Function to Disable peripheral Interrupt.

Parameters

IRQn	Variable of uint_8t , Interrupt Request Number is number assigned to peripheral as it is offest of them in vector table array ex (WWDG , TIM2)

Returns

OK | NOT_OK

4.2.2.3 DNVIC_EnableIRQ()

```
uint_8t DNVIC_EnableIRQ (
            uint_8t IRQn )
```

Function to Enable peripheral Interrupt.

Parameters

IRQn	Variable of uint_8t , Interrupt Request Number is number assigned to peripheral as it is offest of them in vector table array ex (WWDG , TIM2)

Returns

OK | NOT_OK

4.2.2.4 DNVIC_GetActive()

```
uint_8t DNVIC_GetActive (
            uint_8t IRQn,
            uint_8t * Val )
```

Function to get Active Flag Value.

Parameters

IRQn	Variable of uint_8t , Interrupt Request Number is number assigned to peripheral as it is offest of them in vector table array ex (WWDG , TIM2)
Val	pointer of uint_8t , Active Flag which to be read assigned to pointer

Returns

OK | NOT_OK

4.2.2.5 DNVIC_GetPendingIRQ()

```
uint_8t DNVIC_GetPendingIRQ (
            uint_8t IRQn,
            uint_8t * Val )
```

Function to get Pending Flag Value.

Parameters

IRQn	Variable of uint_8t , Interrupt Request Number is number assigned to peripheral as it is offest of them in vector table array ex (WWDG , TIM2)
Val	pointer of uint_8t , Pending Flag which to be read assigned to pointer

Returns

OK | NOT_OK

4.2.2.6 DNVIC_GetPriority()

```
uint_8t DNVIC_GetPriority (
            uint_8t IRQn,
            uint_8t * priority )
```

Function to Read peripheral Priority.

Parameters

IRQn	Variable of uint_8t , Interrupt Request Number is number assigned to peripheral as it is offest of them in vector table array ex (WWDG , TIM2)
priority	Pointer to uint_8t , Priority which to be read

Returns

OK | NOT_OK

4.2.2.7 DNVIC_SetPendingIRQ()

```
uint_8t DNVIC_SetPendingIRQ (
            uint_8t IRQn )
```

Function to Set Peripheral Pending Interrupt Flag By Software.

Parameters

IRQn	Variable of uint_8t , Interrupt Request Number is number assigned to peripheral as it is offest of them in vector table array ex (WWDG , TIM2)

Returns

OK | NOT_OK

4.2.2.8 DNVIC_SetPriority()

```
uint_8t DNVIC_SetPriority (
            uint_8t IRQn,
            uint_8t priority )
```

Function to Set Interrupt Priority.

Parameters

IRQn	Variable of uint_8t , Interrupt Request Number is number assigned to peripheral as it is offest of them in vector table array ex (WWDG , TIM2)
priority	Variable of uint_8t , Priority (0..16)

Returns

OK | NOT_OK

4.2.2.9 DNVIC_SetPriorityGrouping()

```
uint_8t DNVIC_SetPriorityGrouping (
            uint_32t priority_grouping )
```

Function provides priority grouping control for the exception model.

Parameters

priority_grouping	Variable of uint_32t , Priority Type (ALL_PREEMPTION , THREE_PREEMPTION_ONE_SUBGROUP)

Returns

OK | NOT_OK

4.2.2.10 DNVIC_voidChangeVectorOffset()

```
void DNVIC_voidChangeVectorOffset (
             uint_32t offset )
```

Function to change vector Table offest

Parameters

offset	Variable of uint_32t , Change vector Table offest

Returns

NA

4.2.2.11 DNVIC_voidDisableAllFaults()

```
void DNVIC_voidDisableAllFaults (
             void  )
```

Function to Disable all faults Interrupts.

Parameters

NA	

Returns

NA

4.2.2.12 DNVIC_voidDisableAllPeripherals()

```
void DNVIC_voidDisableAllPeripherals (
            void  )
```

Function to Disable All peripherals interrupt.

Parameters

NA	

Returns

NA

4.2.2.13 DNVIC_voidEnableAllFaults()

```
void DNVIC_voidEnableAllFaults (
            void  )
```

Function to Enable all faults Interrupts.

Parameters

NA	

Returns

NA

4.2.2.14 DNVIC_voidEnableAllPeripherals()

```
void DNVIC_voidEnableAllPeripherals (
            void  )
```

Function to Enable All peripherals Interrupt.

Parameters

NA	

Returns

NA

4.2.2.15 DNVIC_voidSetBASEPRI()

```
void DNVIC_voidSetBASEPRI (
             uint_8t priority )
```

Function to disable interrupts only with priority lower than certain level.

Parameters

priority	Variable of uint_8t , Priority (0..16)

Returns

NA

4.2.2.16 DNVIC_voidSysReset()

```
void DNVIC_voidSysReset (
             void )
```

Function to make Software reset.

Parameters

NA	

Returns

NA

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