

# **SWC\_ANA**

Version v1.0  
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# Data Structure Index

## Data Structures

Here are the data structures with brief descriptions:

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# File Index

## File List

Here is a list of all files with brief descriptions:

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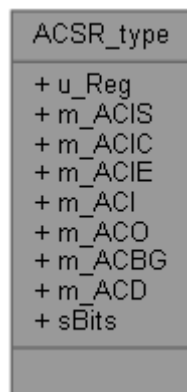
# Data Structure Documentation

## ACSR\_type Union Reference

: Type define of Union bit field of "Analog Comparator Control and Status"

```
#include <ANA_priv.h>
```

Collaboration diagram for ACSR\_type:



### Data Fields

- [u8 u\\_Reg](#)
- struct {
- [\\_\\_IO u8 m\\_ACIS](#): 2
- [\\_\\_IO u8 m\\_ACIC](#): 1
- [\\_\\_IO u8 m\\_ACIE](#): 1
- [\\_\\_IO u8 m\\_ACI](#): 1
- [\\_\\_IO u8 m\\_ACO](#): 1
- [\\_\\_IO u8 m\\_ACBG](#): 1
- [\\_\\_IO u8 m\\_ACD](#): 1
- } [sBits](#)

---

### Detailed Description

: Type define of Union bit field of "Analog Comparator Control and Status"

**Type** : Union **Unit** : None

---

### Field Documentation

#### [\\_\\_IO u8 m\\_ACBG](#)

Analog Comparator Bandgap Select

#### [\\_\\_IO u8 m\\_ACD](#)

Analog Comparator Disable

**IO u8 m\_ACI**

Analog Comparator Interrupt Flag

**IO u8 m\_ACIC**

Analog Comparator Input Capture Enable

**IO u8 m\_ACIE**

Analog Comparator Interrupt Enable

**IO u8 m\_ACIS**

Analog Comparator Interrupt Mode Select

**IO u8 m\_ACO**

Analog Comparator Output

**struct { ... } sBits**

**u8 u\_Reg**

Byte

---

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

[ANA\\_priv.h](#)

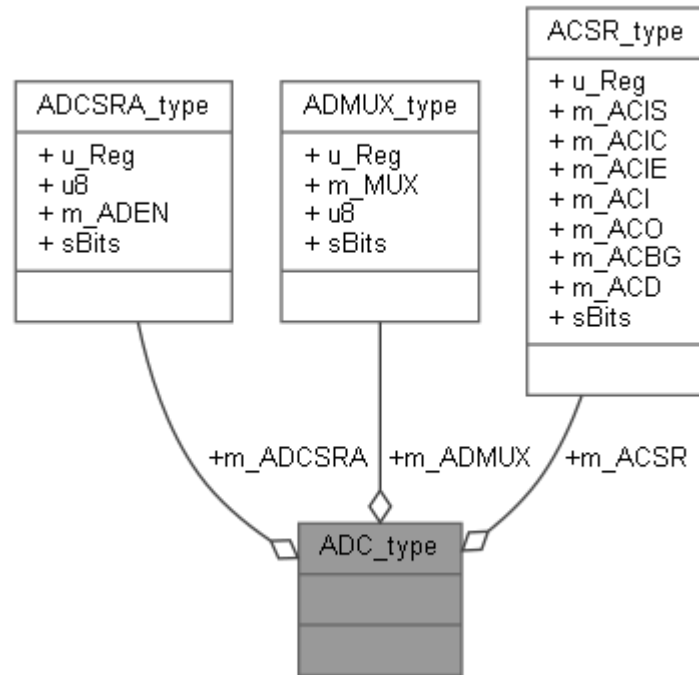


## ADC\_type Struct Reference

: Analog Comparator Registers

```
#include <ANA_priv.h>
```

Collaboration diagram for ADC\_type:



### Data Fields

- [\\_IO ADCSRA\\_type m\\_ADCSRA](#)
- [\\_IO ADMUX\\_type m\\_ADMUX](#)
- [\\_IO ACSR\\_type m\\_ACSR](#)

### Detailed Description

: Analog Comparator Registers

**Type** : Struct **Unit** : None

### Field Documentation

[\\_IO ACSR\\_type m\\_ACSR](#)

Analog Comparator Control and Status Reg

[\\_IO ADCSRA\\_type m\\_ADCSRA](#)

ADC Control and Status Reg A

[IO ADMUX\\_type](#) m\_ADMUX  
ADC Multiplexer Selection Reg

---

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

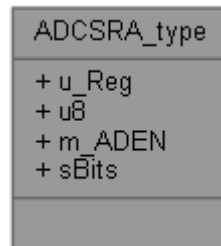
[ANA\\_priv.h](#)

## ADCSRA\_type Union Reference

: Type define of Union bit field of "ADC Control and Status Reg A"

```
#include <ANA_priv.h>
```

Collaboration diagram for ADCSRA\_type:



### Data Fields

- [u8 u\\_Reg](#)
- struct {
- [\\_\\_I u8: 7](#)
- [\\_\\_IO u8 m\\_ADEN: 1](#)
- } [sBits](#)

---

### Detailed Description

: Type define of Union bit field of "ADC Control and Status Reg A"

**Type** : Union **Unit** : None

---

### Field Documentation

[\\_\\_IO u8 m\\_ADEN](#)

ADC Enable

**struct { ... } sBits**

[\\_\\_I u8](#)

Reversed

[u8 u\\_Reg](#)

Byte

---

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

[ANA\\_priv.h](#)

## ADMUX\_type Union Reference

: Type define of Union bit field of "ADC Multiplexer Selection Reg"

```
#include <ANA_priv.h>
```

Collaboration diagram for ADMUX\_type:



### Data Fields

- [u8 u\\_Reg](#)
- struct {
- [\\_\\_IO u8 m\\_MUX](#): 5
- [\\_\\_IO u8](#): 3
- } [sBits](#)

---

### Detailed Description

: Type define of Union bit field of "ADC Multiplexer Selection Reg"

**Type** : Union **Unit** : None

---

### Field Documentation

#### [\\_\\_IO u8 m\\_MUX](#)

Analog Channel and Gain Selection Bits

**struct { ... } sBits**

#### [\\_\\_IO u8](#)

Reversed

#### [u8 u\\_Reg](#)

Byte

---

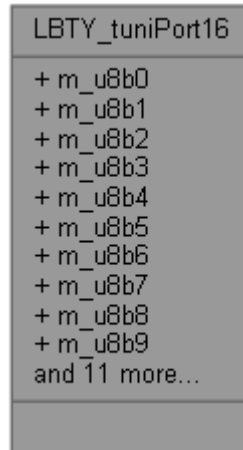
The documentation for this union was generated from the following file:

[ANA\\_priv.h](#)

## LBTY\_tuniPort16 Union Reference

#include <LBTY\_int.h>

Collaboration diagram for LBTY\_tuniPort16:



### Data Fields

- struct {
  - [u8 m\\_u8b0](#):1
  - [u8 m\\_u8b1](#):1
  - [u8 m\\_u8b2](#):1
  - [u8 m\\_u8b3](#):1
  - [u8 m\\_u8b4](#):1
  - [u8 m\\_u8b5](#):1
  - [u8 m\\_u8b6](#):1
  - [u8 m\\_u8b7](#):1
  - [u8 m\\_u8b8](#):1
  - [u8 m\\_u8b9](#):1
  - [u8 m\\_u8b10](#):1
  - [u8 m\\_u8b11](#):1
  - [u8 m\\_u8b12](#):1
  - [u8 m\\_u8b13](#):1
  - [u8 m\\_u8b14](#):1
  - [u8 m\\_u8b15](#):1
  - } [sBits](#)
  - struct {
  - [u8 m\\_u8low](#)
  - [u8 m\\_u8high](#)
  - } [sBytes](#)
  - [u16 u\\_u16Word](#)
-

## Field Documentation

[u8](#) m\_u8b0

[u8](#) m\_u8b1

[u8](#) m\_u8b10

[u8](#) m\_u8b11

[u8](#) m\_u8b12

[u8](#) m\_u8b13

[u8](#) m\_u8b14

[u8](#) m\_u8b15

[u8](#) m\_u8b2

[u8](#) m\_u8b3

[u8](#) m\_u8b4

[u8](#) m\_u8b5

[u8](#) m\_u8b6

[u8](#) m\_u8b7

[u8](#) m\_u8b8

[u8](#) m\_u8b9

[u8](#) m\_u8high

[u8](#) m\_u8low

struct { ... } sBits

struct { ... } sBytes

[u16](#) u\_u16Word

---

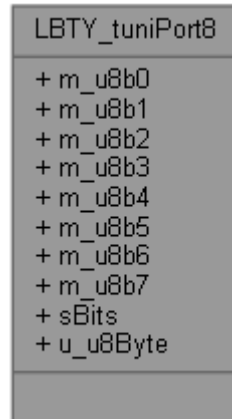
The documentation for this union was generated from the following file:

- H:/0/Workspaces/MCU Drivers/ATmega32/MCAL/SWC\_BSW/[LBTY\\_int.h](#)

## LBTY\_tuniPort8 Union Reference

```
#include <LBTY_int.h>
```

Collaboration diagram for LBTY\_tuniPort8:



### Data Fields

- struct {
- [u8 m\\_u8b0](#):1
- [u8 m\\_u8b1](#):1
- [u8 m\\_u8b2](#):1
- [u8 m\\_u8b3](#):1
- [u8 m\\_u8b4](#):1
- [u8 m\\_u8b5](#):1
- [u8 m\\_u8b6](#):1
- [u8 m\\_u8b7](#):1
- } [sBits](#)
- [u8 u\\_u8Byte](#)

---

### Detailed Description

Union Byte bit by bit

---

## Field Documentation

[u8](#) m\_u8b0

[u8](#) m\_u8b1

[u8](#) m\_u8b2

[u8](#) m\_u8b3

[u8](#) m\_u8b4

[u8](#) m\_u8b5

[u8](#) m\_u8b6

[u8](#) m\_u8b7

struct { ... } sBits

[u8](#) u\_u8Byte

---

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

- H:/0/Workspaces/MCU Drivers/ATmega32/MCAL/SWC\_BSW/[LBTY\\_int.h](#)

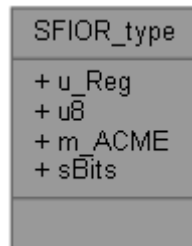


## SFIOR\_type Union Reference

: Type define of Union bit field of "Special Function I/O Register"

```
#include <ANA_priv.h>
```

Collaboration diagram for SFIOR\_type:



### Data Fields

- [u8 u\\_Reg](#)
- struct {
- [\\_\\_IO u8](#): 3
- [\\_\\_IO u8 m\\_ACME](#): 1
- } [sBits](#)

---

### Detailed Description

: Type define of Union bit field of "Special Function I/O Register"

**Type** : Union **Unit** : None

---

### Field Documentation

#### [\\_\\_IO u8 m\\_ACME](#)

Analog Comparator Multiplexer Enable

**struct { ... } sBits**

#### [\\_\\_IO u8](#)

Reversed

#### [u8 u\\_Reg](#)

Byte

---

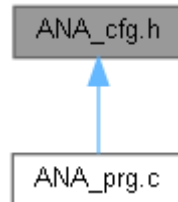
The documentation for this union was generated from the following file:

[ANA\\_priv.h](#)

# File Documentation

## ANA\_cfg.h File Reference

This graph shows which files directly or indirectly include this file:



## Macros

- #define [ANA\\_INTERRUPT\\_STATE](#) [LBTY RESET](#)
  - #define [ANA\\_INTERRUPT\\_MODE](#) [ANA\\_OutputToggle](#)
  - #define [ANA\\_NEG\\_INPUT](#) [ANA\\_ADC0](#)
  - #define [ANA\\_POS\\_INPUT](#) [ANA\\_AIN0](#)
- 

## Macro Definition Documentation

#define ANA\_INTERRUPT\_MODE [ANA\\_OutputToggle](#)

#define ANA\_INTERRUPT\_STATE [LBTY RESET](#)

#define ANA\_NEG\_INPUT [ANA\\_ADC0](#)

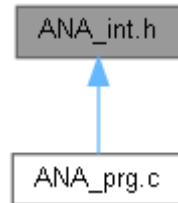
#define ANA\_POS\_INPUT [ANA\\_AIN0](#)

## ANA\_cfg.h

```
Go to the documentation of this file.1 /*
*****
2 /* ***** FILE DEFINITION SECTION ***** */
3 /* ***** */
4 /* File Name      : ANA_cfg.h */
5 /* Author         : MAAM */
6 /* Version        : v01.2 */
7 /* date           : May 3, 2023 */
8 /* ***** */
9 /* ***** HEADER FILES INCLUDES ***** */
10 /* ***** */
11
12 #ifndef ANA_CFG_H_
13 #define ANA_CFG_H_
14
15 /* ***** */
16 /* ***** TYPE_DEF/STRUCT/ENUM SECTION ***** */
17 /* ***** */
18
19 /* ***** */
20 /* ***** MACRO/DEFINE SECTION ***** */
21 /* ***** */
22
23 #define ANA_INTERRUPT_STATE          LBTY_RESET
24 #define ANA_INTERRUPT_MODE          ANA_OutputToggle
25
26 #define ANA_NEG_INPUT                ANA_ADC0
27 #define ANA_POS_INPUT                ANA_AIN0
28
29 /* ***** */
30 /* ***** CONST SECTION ***** */
31 /* ***** */
32
33 /* ***** */
34 /* ***** VARIABLE SECTION ***** */
35 /* ***** */
36
37 /* ***** */
38 /* ***** FUNCTION SECTION ***** */
39 /* ***** */
40
41
42 #endif /* ANA_CFG_H_ */
43 /***** E N D (ANA_cfg.h) *****/
```

## ANA\_int.h File Reference

This graph shows which files directly or indirectly include this file:



## Enumerations

- enum [ANA\\_tenuModeSelect](#) { [ANA\\_OutputToggle](#) = (u8)0u, [Reversed](#), [ANA\\_OutputFallingEdge](#), [ANA\\_OutputRisingEdge](#) }
- enum [ANA\\_tenuNegativeInput](#) { [ANA\\_ADC0](#) = (u8)0u, [ANA\\_ADC1](#), [ANA\\_ADC2](#), [ANA\\_ADC3](#), [ANA\\_ADC4](#), [ANA\\_ADC5](#), [ANA\\_ADC6](#), [ANA\\_ADC7](#), [ANA\\_AIN1](#) }
- enum [ANA\\_tenuPositiveInput](#) { [ANA\\_AIN0](#) = (u8)0u, [ANA\\_BANDGAP](#) }

## Functions

- void [ANA\\_vidInit](#) (void)
- void [ANA\\_vidEnable](#) (void)
- void [ANA\\_vidDisable](#) (void)
- void [ANA\\_vidGetOutput](#) (u8 \*pu8Output)
- [LBTY\\_tenuErrorStatus](#) [ANA\\_u8SetNegativeInput](#) ([ANA\\_tenuNegativeInput](#) u8Input)
- [LBTY\\_tenuErrorStatus](#) [ANA\\_u8SetPositiveInput](#) ([ANA\\_tenuPositiveInput](#) u8Input)
- [LBTY\\_tenuErrorStatus](#) [ANA\\_u8SetMode](#) ([ANA\\_tenuModeSelect](#) u8Mode)
- void [ANA\\_vidEnableINT](#) (void)
- void [ANA\\_vidDisableINT](#) (void)
- void [ANA\\_vidClrFlagINT](#) (void)
- void [ANA\\_vidSetCallBack](#) (void(\*pvidCallBack)(void))

## Enumeration Type Documentation

enum [ANA\\_tenuModeSelect](#)

Enumerator:

ANA_OutputToggle	
Reversed	
ANA_OutputFallingEdge	
ANA_OutputRisingEdge	

```

19 {
20     ANA\_OutputToggle = (u8)0u,
21     Reversed,
22     ANA\_OutputFallingEdge,
23     ANA\_OutputRisingEdge
24 } ANA\_tenuModeSelect;
  
```

enum [ANA\\_tenuNegativeInput](#)

#### Enumerator:

ANA_ADC0	
ANA_ADC1	
ANA_ADC2	
ANA_ADC3	
ANA_ADC4	
ANA_ADC5	
ANA_ADC6	
ANA_ADC7	
ANA_AIN1	

```
26 {
27     ANA_ADC0 = (u8)0u,
28     ANA_ADC1,
29     ANA_ADC2,
30     ANA_ADC3,
31     ANA_ADC4,
32     ANA_ADC5,
33     ANA_ADC6,
34     ANA_ADC7,
35     ANA_AIN1
36 } ANA_tenuNegativeInput;
```

enum [ANA\\_tenuPositiveInput](#)

#### Enumerator:

ANA_AIN0	
ANA_BANDGAP	

```
38 {
39     ANA_AIN0 = (u8)0u,
40     ANA_BANDGAP
41 } ANA_tenuPositiveInput;
```

## Function Documentation

[LBTY\\_tenuErrorStatus](#) [ANA\\_u8SetMode](#) ([ANA\\_tenuModeSelect](#) *u8Mode*)

```
154 {
155     LBTY_tenuErrorStatus u8RetErrorState = LBTY_OK;
156
157     switch(u8Mode) {
158         case ANA_OutputToggle:
159         case ANA_OutputFallingEdge:
160         case ANA_OutputRisingEdge:
161             S_ADC->m_ACSR.sBits.m_ACIS = u8Mode;
162             break;
163         default: u8RetErrorState = LBTY_NOK;
164     }
165     return u8RetErrorState;
166 }
```

[LBTY\\_tenuErrorStatus](#) [ANA\\_u8SetNegativeInput](#) ([ANA\\_tenuNegativeInput](#) *u8Input*)

```
98 {
99     LBTY_tenuErrorStatus u8RetErrorState = LBTY_OK;
100
101     switch(u8Input) {
102         case ANA_ADC0:
103         case ANA_ADC1:
104         case ANA_ADC2:
105         case ANA_ADC3:
106         case ANA_ADC4:
107         case ANA_ADC5:
108         case ANA_ADC6:
109         case ANA_ADC7:
110             S_SFIO->sBits.m_ACME = LBTY_SET;
111             S_ADC->m_ADSCRA.sBits.m_ADEN = LBTY_RESET;
112             S_ADC->m_ADMUX.sBits.m_MUX = u8Input;
```

```

113
114     GPIO_u8SetPinDirection(ADC\_PORT, u8Input, PIN_INPUT);
115     break;
116     case ANA\_AIN1:
117         S\_ADC->sBits.m_ACME = LBTY\_SET;
118         S\_ADC->m_ADCSRA.sBits.m_ADEN = LBTY\_SET;
119
120     GPIO_u8SetPinDirection(ANA\_PORT, ANA\_PIN\_AIN1, PIN_INPUT);
121     break;
122     default:    u8RetErrorState = LBTY\_NOK;
123 }
124 return u8RetErrorState;
125 }

```

Here is the caller graph for this function:



### [LBTY\\_tenuErrorStatus](#) [ANA\\_u8SetPositiveInput](#) ([ANA\\_tenuPositiveInput](#) *u8Input*)

```

132 {
133     LBTY\_tenuErrorStatus u8RetErrorState = LBTY\_OK;
134
135     switch(u8Input) {
136     case ANA\_AIN0:
137         GPIO_u8SetPinDirection(ANA\_PORT, ANA\_PIN\_AIN0, PIN_INPUT);
138         S\_ADC->m_ACSR.sBits.m_ACBG = u8Input;
139         break;
140     case ANA\_BANDGAP:
141         //GPIO_u8SetPinDirection(ADC\_PORT, u8PosChannel, PIN_INPUT);
142         S\_ADC->m_ACSR.sBits.m_ACBG = u8Input;
143         break;
144     default:    u8RetErrorState = LBTY\_NOK;
145     }
146     return u8RetErrorState;
147 }

```

Here is the caller graph for this function:



### void [ANA\\_vidClrFlagINT](#) (void )

```

193 {
194     S\_ADC->m_ACSR.sBits.m_ACI = LBTY\_RESET;
195 }

```

### void [ANA\\_vidDisable](#) (void )

Analog Comparator Disable

```

80 {
81     S\_ADC->m_ACSR.sBits.m_ACD = LBTY\_SET;
82 }

```

### void [ANA\\_vidDisableINT](#) (void )

```

184 {
185     S\_ADC->m_ACSR.sBits.m_ACIE = LBTY\_RESET;
186 }

```

### void [ANA\\_vidEnable](#) (void )

Analog Comparator Disable

```

71 {
72     S\_ADC->m_ACSR.sBits.m_ACD = LBTY\_RESET;
73 }

```

### void [ANA\\_vidEnableINT](#) (void )

```

175 {
176     S\_ADC->m_ACSR.sBits.m_ACIE = LBTY\_SET;

```

```
177 }
```

**void ANA\_vidGetOutput ([u8](#) \* *pu8Output*)**

```
89 {  
90     *pu8Output = S\_ADC->m_ACSR.sBits.m_ACO;  
91 }
```

**void ANA\_vidInit (void )**

Analog Comparator Disable

```
49 {  
50  
51     ANA\_u8SetPositiveInput(ANA\_POS\_INPUT);  
52     ANA\_u8SetNegativeInput(ANA\_NEG\_INPUT);  
53  
54     S\_ADC->m_ACSR.sBits.m_ACD = LBTY\_RESET;  
55  
56     S\_ADC->m_ACSR.sBits.m_ACIC = LBTY\_RESET;  
57  
58     S\_ADC->m_ACSR.sBits.m_ACIS = ANA\_INTERRUPT\_MODE;  
59     S\_ADC->m_ACSR.sBits.m_ACIE = ANA\_INTERRUPT\_STATE;  
60     S\_ADC->m_ACSR.sBits.m_ACI = LBTY\_RESET;  
61  
62 }
```

Here is the call graph for this function:



**void ANA\_vidSetCallBack (void(\*)*(void)*) *pvidCallBack***

```
202 {  
203     pvidfunctionCallBack = pvidCallBack;  
204 }
```

## ANA\_int.h

```
Go to the documentation of this file.1 /*
*****
2 /* ***** FILE DEFINITION SECTION ***** */
3 /* ***** */
4 /* File Name : ANA_int.h */
5 /* Author : MAAM */
6 /* Version : v01.2 */
7 /* date : May 3, 2023 */
8 /* ***** */
9 /* ***** HEADER FILES INCLUDES ***** */
10 /* ***** */
11
12 #ifndef ANA_INT_H_
13 #define ANA_INT_H_
14
15 /* ***** */
16 /* ***** TYPE_DEF/STRUCT/ENUM SECTION ***** */
17 /* ***** */
18
19 typedef enum{
20     ANA_OutputToggle = (u8)0u,
21     Reversed,
22     ANA_OutputFallingEdge,
23     ANA_OutputRisingEdge
24 }ANA_tenuModeSelect;
25
26 typedef enum{
27     ANA_ADC0 = (u8)0u,
28     ANA_ADC1,
29     ANA_ADC2,
30     ANA_ADC3,
31     ANA_ADC4,
32     ANA_ADC5,
33     ANA_ADC6,
34     ANA_ADC7,
35     ANA_AIN1
36 }ANA_tenuNegativeInput;
37
38 typedef enum{
39     ANA_AIN0 = (u8)0u,
40     ANA_BANDGAP
41 }ANA_tenuPositiveInput;
42
43 /* ***** */
44 /* ***** MACRO/DEFINE SECTION ***** */
45 /* ***** */
46
47 /* ***** */
48 /* ***** CONST SECTION ***** */
49 /* ***** */
50
51 /* ***** */
52 /* ***** VARIABLE SECTION ***** */
53 /* ***** */
54
55 /* ***** */
56 /* ***** FUNCTION SECTION ***** */
57 /* ***** */
58
59 /* ***** */
60 /* Description : Initialization of the ANA */
61 /* Input : void */
62 /* Return : void */
63 /* ***** */
64 extern void ANA_vidInit(void);
65
66 /* ***** */
67 /* Description : Enable ANA to be ready for conversion */
68 /* Input : void */
69 /* Return : void */
70 /* ***** */
71 void ANA_vidEnable(void);
72
```



```

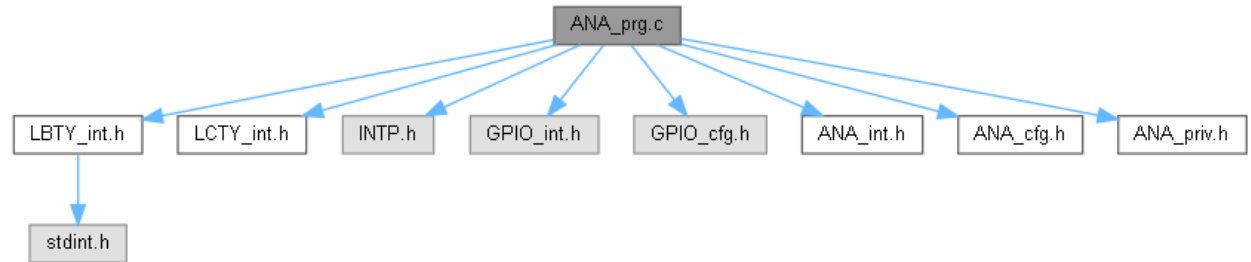
73 /* ***** */
74 /* Description : Disable ANA to be wont make further conversions */
75 /* Input : void */
76 /* Return : void */
77 /* ***** */
78 void ANA_vidDisable(void);
79
80 /* ***** */
81 /* Description : Get the Output of Comparator */
82 /* Input : pu8Output */
83 /* Return : void */
84 /* ***** */
85 extern void ANA_vidGetOutput(u8* pu8Output);
86
87 /* ***** */
88 /* Description : Set negative Input */
89 /* Input : u8Input */
90 /* Return : LBTY_tenuErrorStatus */
91 /* ***** */
92 extern LBTY_tenuErrorStatus ANA_u8SetNegativeInput(ANA_tenuNegativeInput u8Input);
93
94 /* ***** */
95 /* Description : Set positive Input */
96 /* Input : u8Input */
97 /* Return : LBTY_tenuErrorStatus */
98 /* ***** */
99 extern LBTY_tenuErrorStatus ANA_u8SetPositiveInput(ANA_tenuPositiveInput u8Input);
100
101 /* ***** */
102 /* Description : Set Interrupt Mode */
103 /* Input : u8Mode */
104 /* Return : LBTY_tenuErrorStatus */
105 /* ***** */
106 extern LBTY_tenuErrorStatus ANA_u8SetMode(ANA_tenuModeSelect u8Mode);
107
108
109 /*****
110 /*****
111 /* Description : Enable ANA Interrupt */
112 /* Input : void */
113 /* Return : void */
114 /* ***** */
115 extern void ANA_vidEnableINT(void);
116
117 /* ***** */
118 /* Description : Disable ANA Interrupt */
119 /* Input : void */
120 /* Return : void */
121 /* ***** */
122 extern void ANA_vidDisableINT(void);
123
124 /* ***** */
125 /* Description : Clear ANA interrupt Flag */
126 /* Input : void */
127 /* Return : void */
128 /* ***** */
129 extern void ANA_vidClrFlagINT(void);
130
131 /* ***** */
132 /* Description : Pass the CallBack function to ANA ISR to execute */
133 /* Input : void */
134 /* Return : LBTY_tenuErrorStatus */
135 /* ***** */
136 extern void ANA_vidSetCallBack(void (*pvidCallBack)(void));
137
138 #endif /* ANA_INT_H */
139 /***** E N D (ANA_int.h) *****/

```

## ANA\_prg.c File Reference

```
#include "LBTY_int.h"
#include "LCTY_int.h"
#include "INTP.h"
#include "GPIO_int.h"
#include "GPIO_cfg.h"
#include "ANA_int.h"
#include "ANA_cfg.h"
#include "ANA_priv.h"
```

Include dependency graph for ANA\_prg.c:



## Functions

- void [ANA\\_vidInit](#) (void)
- void [ANA\\_vidEnable](#) (void)
- void [ANA\\_vidDisable](#) (void)
- void [ANA\\_vidGetOutput](#) (u8 \*pu8Output)
- [LBTY\\_tenuErrorStatus](#) [ANA\\_u8SetNegativeInput](#) ([ANA\\_tenuNegativeInput](#) u8Input)
- [LBTY\\_tenuErrorStatus](#) [ANA\\_u8SetPositiveInput](#) ([ANA\\_tenuPositiveInput](#) u8Input)
- [LBTY\\_tenuErrorStatus](#) [ANA\\_u8SetMode](#) ([ANA\\_tenuModeSelect](#) u8Mode)
- void [ANA\\_vidEnableINT](#) (void)
- void [ANA\\_vidDisableINT](#) (void)
- void [ANA\\_vidClrFlagINT](#) (void)
- void [ANA\\_vidSetCallBack](#) (void(\*pvidCallBack)(void))
- [ISR](#) (ANA\_COMP\_vect)

## Variables

- void(\* [pvidfunctionCallBack](#) )(void)

## Function Documentation

### [LBTY\\_tenuErrorStatus](#) [ANA\\_u8SetMode](#) ([ANA\\_tenuModeSelect](#) u8Mode)

```
154 {
155     LBTY\_tenuErrorStatus u8RetErrorState = LBTY\_OK;
156
157     switch(u8Mode) {
158         case ANA\_OutputToggle:
159         case ANA\_OutputFallingEdge:
160         case ANA\_OutputRisingEdge:
161             S_ADC->m_ACSR.sBits.m_ACIS = u8Mode;
162             break;
163         default: u8RetErrorState = LBTY\_NOK;
164     }
165     return u8RetErrorState;
166 }
```

### LBTY\_tenuErrorStatus ANA\_u8SetNegativeInput (ANA\_tenuNegativeInput u8Input)

```
98 {
99     LBTY_tenuErrorStatus u8RetErrorState = LBTY_OK;
100
101     switch(u8Input) {
102     case ANA_ADC0:
103     case ANA_ADC1:
104     case ANA_ADC2:
105     case ANA_ADC3:
106     case ANA_ADC4:
107     case ANA_ADC5:
108     case ANA_ADC6:
109     case ANA_ADC7:
110         S_SFIO->sBits.m_ACME = LBTY_SET;
111         S_ADC->m_ADCSRA.sBits.m_ADEN = LBTY_RESET;
112         S_ADC->m_ADMUX.sBits.m_MUX = u8Input;
113
114         GPIO_u8SetPinDirection(ADC_PORT, u8Input, PIN_INPUT);
115         break;
116     case ANA_AIN1:
117         S_SFIO->sBits.m_ACME = LBTY_SET;
118         S_ADC->m_ADCSRA.sBits.m_ADEN = LBTY_SET;
119
120         GPIO_u8SetPinDirection(ANA_PORT, ANA_PIN_AIN1, PIN_INPUT);
121         break;
122     default:    u8RetErrorState = LBTY_NOK;
123     }
124     return u8RetErrorState;
125 }
```

Here is the caller graph for this function:



### LBTY\_tenuErrorStatus ANA\_u8SetPositiveInput (ANA\_tenuPositiveInput u8Input)

```
132 {
133     LBTY_tenuErrorStatus u8RetErrorState = LBTY_OK;
134
135     switch(u8Input) {
136     case ANA_AIN0:
137         GPIO_u8SetPinDirection(ANA_PORT, ANA_PIN_AIN0, PIN_INPUT);
138         S_ADC->m_ACSR.sBits.m_ACBG = u8Input;
139         break;
140     case ANA_BANDGAP:
141         //GPIO_u8SetPinDirection(ADC_PORT, u8PosChannel, PIN_INPUT);
142         S_ADC->m_ACSR.sBits.m_ACBG = u8Input;
143         break;
144     default:    u8RetErrorState = LBTY_NOK;
145     }
146     return u8RetErrorState;
147 }
```

Here is the caller graph for this function:



### void ANA\_vidClrFlagINT (void )

```
193 {
194     S_ADC->m_ACSR.sBits.m_ACI = LBTY_RESET;
195 }
```

### void ANA\_vidDisable (void )

Analog Comparator Disable

```
80 {
81     S_ADC->m_ACSR.sBits.m_ACD = LBTY_SET;
82 }
```

### void ANA\_vidDisableINT (void )

```
184 {
```

```

185     S_ADC->m_ACSR.sBits.m_ACIE = LBTY RESET;
186 }

```

**void ANA\_vidEnable (void )**

Analog Comparator Disable

```

71     {
72     S_ADC->m_ACSR.sBits.m_ACD = LBTY_RESET;
73 }

```

**void ANA\_vidEnableINT (void )**

```

175     {
176     S_ADC->m_ACSR.sBits.m_ACIE = LBTY SET;
177 }

```

**void ANA\_vidGetOutput (u8 \* pu8Output)**

```

89     {
90     *pu8Output = S_ADC->m_ACSR.sBits.m_ACO;
91 }

```

**void ANA\_vidInit (void )**

Analog Comparator Disable

```

49     {
50
51     ANA_u8SetPositiveInput(ANA_POS_INPUT);
52     ANA_u8SetNegativeInput(ANA_NEG_INPUT);
53
54     S_ADC->m_ACSR.sBits.m_ACD = LBTY_RESET;
55
56     S_ADC->m_ACSR.sBits.m_ACIC = LBTY_RESET;
57
58     S_ADC->m_ACSR.sBits.m_ACIS = ANA_INTERRUPT_MODE;
59     S_ADC->m_ACSR.sBits.m_ACIE = ANA_INTERRUPT_STATE;
60     S_ADC->m_ACSR.sBits.m_ACI = LBTY_RESET;
61
62 }

```

Here is the call graph for this function:



**void ANA\_vidSetCallBack (void(\*) (void) pvidCallBack)**

```

202     {
203     pvidfunctionCallBack = pvidCallBack;
204 }

```

**ISR (ANA\_COMP\_vect )**

```

211     {
212     pvidfunctionCallBack();
213 }

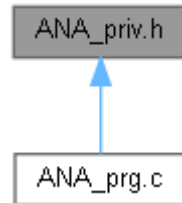
```

## Variable Documentation

**void(\* pvidfunctionCallBack) (void) (void )**

## ANA\_priv.h File Reference

This graph shows which files directly or indirectly include this file:



## Data Structures

union [ADCSRA\\_type](#): *Type define of Union bit field of "ADC Control and Status Reg A"*  
union [ADMUX\\_type](#): *Type define of Union bit field of "ADC Multiplexer Selection Reg"*  
union [ACSR\\_type](#): *Type define of Union bit field of "Analog Comparator Control and Status"*  
struct [ADC\\_type](#): *Analog Comparator Registers*

union [SFIO\\_type](#): *Type define of Union bit field of "Special Function I/O Register"*

## Macros

- `#define ADC\_PORT A`
- `#define ANA\_PORT B`
- `#define ANA\_PIN\_AIN0 GPIO_AIN0`
- `#define ANA\_PIN\_AIN1 GPIO_AIN1`
- `#define S\_ADC ((ADC\_type* const)0x26U)`
- `#define ADCSRA (*(volatile u8* const)0x26U)`
- `#define ADMUX (*(volatile u8* const)0x27U)`
- `#define ACSR (*(volatile u8* const)0x28U)`
- `#define S\_SFIO ((SFIO\_type* const)0x50U)`
- `#define SFIO (*(volatile u8* const)0x50U)`

---

## Macro Definition Documentation

**`#define ACSR`**  `(*(volatile u8* const)0x28U)`

**`#define ADC_PORT`**  `A`

**`#define ADCSRA`**  `(*(volatile u8* const)0x26U)`

**`#define ADMUX`**  `(*(volatile u8* const)0x27U)`

**`#define ANA_PIN_AIN0`**  `GPIO_AIN0`

**`#define ANA_PIN_AIN1`**  `GPIO_AIN1`

**`#define ANA_PORT`**  `B`

**`#define S_ADC`**  `((ADC\_type* const)0x26U)`

Analog Digital Converter

```
#define S_SFIOR ((SFIO type* const)0x50U)
```

Special Function I/O Register

```
#define SFIOR (*(volatile u8* const)0x50U)
```

## ANA\_priv.h

```
Go to the documentation of this file.1 /*
*****
2 /* ***** FILE DEFINITION SECTION ***** */
3 /* ***** */
4 /* File Name      : ANA_priv.h */
5 /* Author         : MAAM */
6 /* Version        : v01.2 */
7 /* date           : May 3, 2023 */
8 /* ***** */
9 /* ***** HEADER FILES INCLUDES ***** */
10 /* ***** */
11
12 #ifndef ANA_PRIV_H_
13 #define ANA_PRIV_H_
14
15 /* ***** */
16 /* ***** TYPE_DEF/STRUCT/ENUM SECTION ***** */
17 /* ***** */
18
21 typedef union{
22     u8 u_Reg;
23     struct {
24         I u8 : 7;
25         IO u8 m ADEN : 1;
26     }sBits;
27 }ADCSRA_type;
28
29 /*****
30
33 typedef union{
34     u8 u_Reg;
35     struct {
36         IO u8 m MUX : 5;
37         IO u8 : 3;
38     }sBits;
39 }ADMUX_type;
40
41 /*****
42
45 typedef union{
46     u8 u_Reg;
47     struct {
48         IO u8 m ACIS : 2;
49         IO u8 m ACIC : 1;
50         IO u8 m ACIE : 1;
51         IO u8 m ACI : 1;
52         I u8 m ACO : 1;
53         IO u8 m ACBG : 1;
54         IO u8 m ACD : 1;
55     }sBits;
56 }ACSR_type;
57
58 /*****
59
62 typedef struct{
63     IO ADCSRA_type m ADCSRA;
64     IO ADMUX_type m ADMUX;
65     IO ACSR_type m ACSR;
66 }ADC_type;
67
68 /*****
69
72 typedef union{
73     u8 u_Reg;
74     struct {
75         IO u8 : 3;
76         IO u8 m ACME : 1;
77         IO u8 : 4;
78     }sBits;
79 }SFIO type;
80
81 /* ***** */
82 /* ***** MACRO/DEFINE SECTION ***** */
```

```

83 /* ***** */
84
85 #define ADC_PORT          A
86 #define ANA_PORT          B
87 #define ANA_PIN_AIN0      GPIO_AIN0
88 #define ANA_PIN_AIN1      GPIO_AIN1
89
90
91 #define S_ADC              ((ADC_type* const)0x26U)
92 #define ADCSRA              (*(volatile u8* const)0x26U)
93 #define ADMUX              (*(volatile u8* const)0x27U)
94 #define ACSR               (*(volatile u8* const)0x28U)
95
96
97 #define S_SFIO              ((SFIO_type* const)0x50U)
98 #define SFIO               (*(volatile u8* const)0x50U)
99
100 /* ***** */
101 /* ***** CONST SECTION ***** */
102 /* ***** */
103
104 /* ***** */
105 /* ***** VARIABLE SECTION ***** */
106 /* ***** */
107
108 /* ***** */
109 /* ***** FUNCTION SECTION ***** */
110 /* ***** */
111
112
113 #endif /* ANA_PRIV_H_ */
114 /****** E N D (ANA_priv.h) ******/

```



## **main.c File Reference**

# H:/0/Workspaces/MCU

## Drivers/ATmega32/MCAL/SWC\_BSW/LBIT\_int.h File

### Reference

#### Macros

- #define [BV](#)(bit) (1u<<(bit))
  - #define [SET\\_BIT](#)(REG, bit) ((REG) |= (1u<<(bit)))
  - #define [CLR\\_BIT](#)(REG, bit) ((REG) &= ~(1u<<(bit)))
  - #define [TOG\\_BIT](#)(REG, bit) ((REG) ^= (1u<<(bit)))
  - #define [SET\\_BYTE](#)(REG, bit) ((REG) |= (0xFFu<<(bit)))
  - #define [CLR\\_BYTE](#)(REG, bit) ((REG) &= ~(0xFFu<<(bit)))
  - #define [TOG\\_BYTE](#)(REG, bit) ((REG) ^= (0xFFu<<(bit)))
  - #define [SET\\_MASK](#)(REG, MASK) ((REG) |= (MASK))
  - #define [CLR\\_MASK](#)(REG, MASK) ((REG) &= ~(MASK))
  - #define [TOG\\_MASK](#)(REG, MASK) ((REG) ^= (MASK))
  - #define [GET\\_MASK](#)(REG, MASK) ((REG) & (MASK))
  - #define [SET\\_REG](#)(REG) ((REG) = ~(0u))
  - #define [CLR\\_REG](#)(REG) ((REG) = (0u))
  - #define [TOG\\_REG](#)(REG) ((REG) ^= ~(0u))
  - #define [GET\\_BIT](#)(REG, bit) (((REG)>>(bit)) & 0x01u)
  - #define [GET\\_NIB](#)(REG, bit) (((REG)>>(bit)) & 0x0Fu)
  - #define [GET\\_BYTE](#)(REG, bit) (((REG)>>(bit)) & 0xFFu)
  - #define [ASSIGN\\_BIT](#)(REG, bit, value) ((REG) = ((REG) & ~(0x01u<<(bit))) | (((value) & 0x01u)<<(bit)))
  - #define [ASSIGN\\_NIB](#)(REG, bit, value) ((REG) = ((REG) & ~(0x0Fu<<(bit))) | (((value) & 0x0Fu)<<(bit)))
  - #define [ASSIGN\\_BYTE](#)(REG, bit, value) ((REG) = ((REG) & ~(0xFFu<<(bit))) | (((value) & 0xFFu)<<(bit)))
  - #define [CON\\_u8Bits](#)(b7, b6, b5, b4, b3, b2, b1, b0)  
  
(0b##b7##b6##b5##b4##b3##b2##b1##b0)
  - #define [CON\\_u16Bits](#)(b15, b14, b13, b12, b11, b10, b9, b8, b7, b6, b5, b4, b3, b2, b1, b0)  
  
(0b##b15##b14##b13##b12##b11##b10##b9##b8##b7##b6##b5##b4##b3##b2##b1##b0)
-

## Macro Definition Documentation

**#define \_BV( bit) (1u<<(bit))**

**#define ASSIGN\_BIT( REG, bit, value) ((REG) = ((REG) & ~(0x01u<<(bit))) |  
(((value) & 0x01u)<<(bit)))**

**#define ASSIGN\_BYTE( REG, bit, value) ((REG) = ((REG) & ~(0xFFu<<(bit))) |  
(((value) & 0xFFu)<<(bit)))**

**#define ASSIGN\_NIB( REG, bit, value) ((REG) = ((REG) & ~(0x0Fu<<(bit))) |  
(((value) & 0x0Fu)<<(bit)))**

**#define CLR\_BIT( REG, bit) ((REG) &= ~(1u<<(bit)))**

**#define CLR\_BYTE( REG, bit) ((REG) &= ~(0xFFu<<(bit)))**

**#define CLR\_MASK( REG, MASK) ((REG) &= ~(MASK))**

**#define CLR\_REG( REG) ((REG) = (0u))**

**#define CON\_u16Bits( b15, b14, b13, b12, b11, b10, b9, b8, b7, b6, b5,  
b4, b3, b2, b1, b0)**

**(0b##b15##b14##b13##b12##b11##b10##b9##b8##b7##b6##b5##b4##b3##b2##  
b1##b0)**

**#define CON\_u8Bits( b7, b6, b5, b4, b3, b2, b1, b0)**

**(0b##b7##b6##b5##b4##b3##b2##b1##b0)**

**#define GET\_BIT( REG, bit) (((REG)>>(bit)) & 0x01u)**

**#define GET\_BYTE( REG, bit) (((REG)>>(bit)) & 0xFFu)**

**#define GET\_MASK( REG, MASK) ((REG) & (MASK))**

**#define GET\_NIB( REG, bit) (((REG)>>(bit)) & 0x0Fu)**

**#define SET\_BIT( REG, bit) ((REG) |= (1u<<(bit)))**

Bitwise Operation

```
#define SET_BYTE( REG, bit) ((REG) |= (0xFFu<<(bit)))  
  
#define SET_MASK( REG, MASK) ((REG) |= (MASK))  
  
#define SET_REG( REG) ((REG) = ~(0u))  
  
#define TOG_BIT( REG, bit) ((REG) ^= (1u<<(bit)))  
  
#define TOG_BYTE( REG, bit) ((REG) ^= (0xFFu<<(bit)))  
  
#define TOG_MASK( REG, MASK) ((REG) ^= (MASK))  
  
#define TOG_REG( REG) ((REG) ^= ~(0u))
```

```

Go to the documentation of this file.1 /*
***** */
2 /* ***** FILE DEFINITION SECTION ***** */
3 /* ***** */
4 /* File Name      : LBIT_int.h */
5 /* Author         : MAAM */
6 /* Version        : v01 */
7 /* date           : Mar 24, 2023 */
8 /* description    : Bitwise Library */
9 /* ***** */
10 /* ***** HEADER FILES INCLUDES ***** */
11 /* ***** */
12
13 #ifndef LBIT_INT_H_
14 #define LBIT_INT_H_
15
16 /* ***** */
17 /* ***** TYPE_DEF/STRUCT/ENUM SECTION ***** */
18 /* ***** */
19
20 /* ***** */
21 /* ***** MACRO/DEFINE SECTION ***** */
22 /* ***** */
23
24 #define _BV(bit) (1u<<(bit))
25
26 #define SET_BIT(REG, bit) ((REG) |= (1u<<(bit)))
27 #define CLR_BIT(REG, bit) ((REG) &= ~(1u<<(bit)))
28 #define TOG_BIT(REG, bit) ((REG) ^= (1u<<(bit)))
29
30 #define SET_BYTE(REG, bit) ((REG) |= (0xFFu<<(bit)))
31 #define CLR_BYTE(REG, bit) ((REG) &= ~(0xFFu<<(bit)))
32 #define TOG_BYTE(REG, bit) ((REG) ^= (0xFFu<<(bit)))
33
34 #define SET_MASK(REG, MASK) ((REG) |= (MASK))
35 #define CLR_MASK(REG, MASK) ((REG) &= ~(MASK))
36 #define TOG_MASK(REG, MASK) ((REG) ^= (MASK))
37 #define GET_MASK(REG, MASK) ((REG) & (MASK))
38
39 #define SET_REG(REG) ((REG) = ~(0u))
40 #define CLR_REG(REG) ((REG) = (0u))
41 #define TOG_REG(REG) ((REG) ^= ~(0u))
42
43 #define GET_BIT(REG, bit) (((REG)>>(bit)) & 0x01u)
44 #define GET_NIB(REG, bit) (((REG)>>(bit)) & 0x0Fu)
45 #define GET_BYTE(REG, bit) (((REG)>>(bit)) & 0xFFu)
46
47 #define ASSIGN_BIT(REG, bit, value) ((REG) = ((REG) & ~(0x01u<<(bit))) | ((value) & 0x01u)<<(bit)))
48 #define ASSIGN_NIB(REG, bit, value) ((REG) = ((REG) & ~(0x0Fu<<(bit))) | ((value) & 0x0Fu)<<(bit)))
49 #define ASSIGN_BYTE(REG, bit, value) ((REG) = ((REG) & ~(0xFFu<<(bit))) | ((value) & 0xFFu)<<(bit)))
50
51 #define ASSIGN_BIT(REG,bit,value) do{
52 \
53 \
54 \
55 \
56 \
57 \
58 \
59 \
60 \
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66 \
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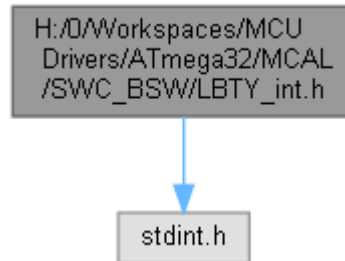
65 (0b##b15##b14##b13##b12##b11##b10##b9##b8##b7##b6##b5##b4##b3##b2##b1##b0)
66
67 /* ***** */
68 /* ***** CONST SECTION ***** */
69 /* ***** */
70
71 /* ***** */
72 /* ***** VARIABLE SECTION ***** */
73 /* ***** */
74
75 /* ***** */
76 /* ***** FUNCTION SECTION ***** */
77 /* ***** */
78
79
80 #endif /* LBIT_INT_H_ */
81 /***** E N D (LBIT_int.h) *****/

```

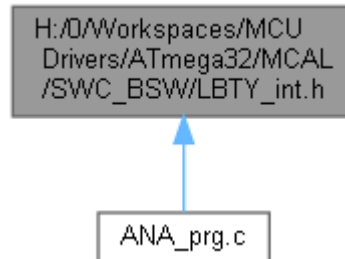
## H:/0/Workspaces/MCU Drivers/ATmega32/MCAL/SWC\_BSW/LBTY\_int.h File Reference

#include <stdint.h>

Include dependency graph for LBTY\_int.h:



This graph shows which files directly or indirectly include this file:



## Data Structures

- union [LBTY\\_tuniPort8](#) union [LBTY\\_tuniPort16](#)

## Macros

- #define [\\_\\_IO](#) volatile
- #define [\\_\\_O](#) volatile
- #define [\\_\\_I](#) volatile const
- #define [LBTY\\_u8vidNOP](#)()
- #define [LBTY\\_NULL](#) ((void \*) 0U)
- #define [LBTY\\_u8ZERO](#) ((u8)0x00U)
- #define [LBTY\\_u8MAX](#) ((u8)0xFFU)
- #define [LBTY\\_s8MAX](#) ((s8)0x7F)
- #define [LBTY\\_s8MIN](#) ((s8)0x80)
- #define [LBTY\\_u16ZERO](#) ((u16)0x0000U)
- #define [LBTY\\_u16MAX](#) ((u16)0xFFFFU)
- #define [LBTY\\_s16MAX](#) ((u16)0x7FFF)
- #define [LBTY\\_s16MIN](#) ((u16)0x8000)
- #define [LBTY\\_u32ZERO](#) ((u32)0x00000000UL)
- #define [LBTY\\_u32MAX](#) ((u32)0xFFFFFFFFFUL)
- #define [LBTY\\_s32MAX](#) ((u32)0x7FFFFFFFL)
- #define [LBTY\\_s32MIN](#) ((u32)0x80000000L)
- #define [LBTY\\_u64ZERO](#) ((u64)0x0000000000000000ULL)
- #define [LBTY\\_u64MAX](#) ((u64)0xFFFFFFFFFFFFFFFFFULL)
- #define [LBTY\\_s64MAX](#) ((u64)0x7FFFFFFFFFFFFFFFL)
- #define [LBTY\\_s64MIN](#) ((u64)0x8000000000000000LL)

## Typedefs

- typedef uint8\_t [u8](#)
- typedef uint16\_t [u16](#)
- typedef uint32\_t [u32](#)
- typedef uint64\_t [u64](#)
- typedef int8\_t [s8](#)
- typedef int16\_t [s16](#)
- typedef int32\_t [s32](#)
- typedef int64\_t [s64](#)
- typedef float [f32](#)
- typedef double [f64](#)
- typedef [u8](#) \* [pu8](#)
- typedef [u16](#) \* [pu16](#)
- typedef [u32](#) \* [pu32](#)
- typedef [u64](#) \* [pu64](#)
- typedef [s8](#) \* [ps8](#)
- typedef [s16](#) \* [ps16](#)
- typedef [s32](#) \* [ps32](#)
- typedef [s64](#) \* [ps64](#)

## Enumerations

- enum [LBTY\\_tenuFlagStatus](#) { [LBTY\\_RESET](#) = 0, [LBTY\\_SET](#) = ![LBTY\\_RESET](#) }
  - enum [LBTY\\_tenuBoolean](#) { [LBTY\\_TRUE](#) = 0x55, [LBTY\\_FALSE](#) = 0xAA }
  - enum [LBTY\\_tenuErrorStatus](#) { [LBTY\\_OK](#) = (u16)0, [LBTY\\_NOK](#), [LBTY\\_NULL\\_POINTER](#), [LBTY\\_INDEX\\_OUT\\_OF\\_RANGE](#), [LBTY\\_NO\\_MASTER\\_CHANNEL](#), [LBTY\\_READ\\_ERROR](#), [LBTY\\_WRITE\\_ERROR](#), [LBTY\\_UNDEFINED\\_ERROR](#), [LBTY\\_IN\\_PROGRESS](#) }
-



## Macro Definition Documentation

**#define** `__I` `volatile const`

**#define** `__IO` `volatile`

**#define** `__O` `volatile`

**#define** `LBTY_NULL` `((void *) 0U)`

**#define** `LBTY_s16MAX` `((u16)0x7FFF )`

**#define** `LBTY_s16MIN` `((u16)0x8000 )`

**#define** `LBTY_s32MAX` `((u32)0x7FFFFFFFL )`

**#define** `LBTY_s32MIN` `((u32)0x80000000L )`

**#define** `LBTY_s64MAX` `((u64)0x7FFFFFFFFFFFFFFFL )`

**#define** `LBTY_s64MIN` `((u64)0x8000000000000000LL )`

**#define** `LBTY_s8MAX` `((s8)0x7F )`

**#define** `LBTY_s8MIN` `((s8)0x80 )`

**#define** `LBTY_u16MAX` `((u16)0xFFFFU)`

**#define** `LBTY_u16ZERO` `((u16)0x0000U)`

**#define** `LBTY_u32MAX` `((u32)0xFFFFFFFFUL)`

**#define** `LBTY_u32ZERO` `((u32)0x00000000UL)`

**#define** `LBTY_u64MAX` `((u64)0xFFFFFFFFFFFFFFFFULL)`

**#define** `LBTY_u64ZERO` `((u64)0x0000000000000000ULL)`

**#define** `LBTY_u8MAX` `((u8)0xFFU)`

**#define** `LBTY_u8vidNOP()`

**#define** `LBTY_u8ZERO` `((u8)0x00U)`

Data Types Limitation

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## Typedef Documentation

**typedef** `float` [f32](#)

Standard Real Decimal number

**typedef double [f64](#)**

**typedef [s16](#)\* [ps16](#)**

**typedef [s32](#)\* [ps32](#)**

**typedef [s64](#)\* [ps64](#)**

**typedef [s8](#)\* [ps8](#)**

Standard Pointer to Signed Byte/Word/Long\_Word

**typedef [u16](#)\* [pu16](#)**

**typedef [u32](#)\* [pu32](#)**

**typedef [u64](#)\* [pu64](#)**

**typedef [u8](#)\* [pu8](#)**

Standard Pointer to Unsigned Byte/Word/Long\_Word

**typedef int16\_t [s16](#)**

**typedef int32\_t [s32](#)**

**typedef int64\_t [s64](#)**

**typedef int8\_t [s8](#)**

Standard Signed Byte/Word/Long\_Word

**typedef uint16\_t [u16](#)**

**typedef uint32\_t [u32](#)**

**typedef uint64\_t [u64](#)**

**typedef uint8\_t [u8](#)**

Data Types New Definitions Standard Unsigned Byte/Word/Long\_Word

---

## Enumeration Type Documentation

**enum [LBTY\\_tenuBoolean](#)**

Boolean type

**Enumerator:**

	LBTY_TRUE	
	LBTY_FALSE	

```
96 {  
97     LBTY\_TRUE = 0x55,  
98     LBTY\_FALSE = 0xAA  
99 } LBTY\_tenuBoolean;
```

**enum [LBTY\\_tenuErrorStatus](#)**

Error Return type

**Enumerator:**

LBTY_OK	
LBTY_NOK	
LBTY_NULL_POINTER	
LBTY_INDEX_OUT_OF_RANGE	
LBTY_NO_MASTER_CHANNEL	
LBTY_READ_ERROR	
LBTY_WRITE_ERROR	
LBTY_UNDEFINED_ERROR	
LBTY_IN_PROGRESS	

```
102 {
103     LBTY_OK = (u16)0,
104     LBTY_NOK,
105     LBTY_NULL_POINTER,
106     LBTY_INDEX_OUT_OF_RANGE,
107     LBTY_NO_MASTER_CHANNEL,
108     LBTY_READ_ERROR,
109     LBTY_WRITE_ERROR,
110     LBTY_UNDEFINED_ERROR,
111     LBTY_IN_PROGRESS /* Error is not available, wait for availability */
112 } LBTY_tenuErrorStatus;
```

**enum [LBTY\\_tenuFlagStatus](#)**

Flag Status type

**Enumerator:**

LBTY_RESET	
LBTY_SET	

```
90 {
91     LBTY_RESET = 0,
92     LBTY_SET = !LBTY_RESET
93 } LBTY_tenuFlagStatus;
```

## LBTY\_int.h

```
Go to the documentation of this file.1 /*
*****
2 /* ***** FILE DEFINITION SECTION ***** */
3 /* ***** */
4 /* File Name : LBTY_int.h */
5 /* Author : MAAM */
6 /* Version : v01 */
7 /* date : Mar 23, 2023 */
8 /* description : Basic Library */
9 /* ***** */
10 /* ***** HEADER FILES INCLUDES ***** */
11 /* ***** */
12
13 #ifndef _LBTY_INT_H_
14 #define _LBTY_INT_H_
15
16 #include <stdint.h>
17
18 /* ***** */
19 /* ***** TYPE_DEF SECTION ***** */
20 /* ***** */
21
22 typedef uint8_t u8 ;
23
24 typedef uint16_t u16;
25
26 typedef uint32_t u32;
27
28 typedef uint64_t u64;
29
30
31 typedef int8_t s8 ;
32
33 typedef int16_t s16;
34
35 typedef int32_t s32;
36
37 typedef int64_t s64;
38
39
40 typedef float f32;
41
42 typedef double f64;
43
44
45 typedef u8* pu8 ;
46
47 typedef u16* pu16;
48
49 typedef u32* pu32;
50
51 typedef u64* pu64;
52
53
54 typedef s8* ps8 ;
55
56 typedef s16* ps16;
57
58 typedef s32* ps32;
59
60 typedef s64* ps64;
61
62
63 /* ***** */
64 /* ***** MACRO/DEFINE SECTION ***** */
65 /* ***** */
66
67 /***** */
68 #define __IO volatile
69 #define __O volatile
70 #define __I volatile const
71 /***** */
72
73 #define LBTY_u8vidNOP()
74 #define LBTY_NULL ((void *) 0U)
75
76 #define LBTY_u8ZERO ((u8)0x00U)
77 #define LBTY_u8MAX ((u8)0xFFU)
78 #define LBTY_s8MAX ((s8)0x7F )
79 #define LBTY_s8MIN ((s8)0x80 )
80
81 #define LBTY_u16ZERO ((u16)0x0000U)
82 #define LBTY_u16MAX ((u16)0xFFFFU)
83 #define LBTY_s16MAX ((u16)0x7FFF )
84 #define LBTY_s16MIN ((u16)0x8000 )
85
86 #define LBTY_u32ZERO ((u32)0x00000000UL)
87 #define LBTY_u32MAX ((u32)0xFFFFFFFFUL)
88 #define LBTY_s32MAX ((u32)0x7FFFFFFF )
89 #define LBTY_s32MIN ((u32)0x80000000L )
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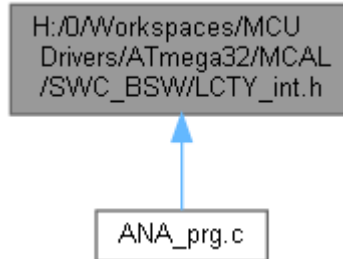
80 #define LBTY_u64ZERO      ((u64)0x0000000000000000ULL)
81 #define LBTY_u64MAX       ((u64)0xFFFFFFFFFFFFFFFFULL)
82 #define LBTY_s64MAX       ((u64)0x7FFFFFFFFFFFFFFFLL )
83 #define LBTY_s64MIN       ((u64)0x8000000000000000LL )
84
85 /* ***** */
86 /* ***** ENUM SECTION ***** */
87 /* ***** */
88
89 typedef enum {
90     LBTY_RESET = 0,
91     LBTY_SET = !LBTY_RESET
92 } LBTY_tenuFlagStatus;
93
94
95 typedef enum {
96     LBTY_TRUE = 0x55,
97     LBTY_FALSE = 0xAA
98 } LBTY_tenuBoolean;
99
100
101 typedef enum {
102     LBTY_OK = (u16)0,
103     LBTY_NOK,
104     LBTY_NULL_POINTER,
105     LBTY_INDEX_OUT_OF_RANGE,
106     LBTY_NO_MASTER_CHANNEL,
107     LBTY_READ_ERROR,
108     LBTY_WRITE_ERROR,
109     LBTY_UNDEFINED_ERROR,
110     LBTY_IN_PROGRESS /* Error is not available, wait for availability */
111 } LBTY_tenuErrorStatus;
112
113
114 /* ***** */
115 /* ***** STRUCT SECTION ***** */
116 /* ***** */
117
118 typedef union {
119     struct {
120         u8 m u8b0 :1; // LSB
121         u8 m u8b1 :1;
122         u8 m u8b2 :1;
123         u8 m u8b3 :1;
124         u8 m u8b4 :1;
125         u8 m u8b5 :1;
126         u8 m u8b6 :1;
127         u8 m u8b7 :1; // MSB
128     } sBits;
129     u8 u u8Byte;
130 } LBTY_tuniPort8;
131
132
133 typedef union {
134     struct {
135         u8 m u8b0 :1; // LSB
136         u8 m u8b1 :1;
137         u8 m u8b2 :1;
138         u8 m u8b3 :1;
139         u8 m u8b4 :1;
140         u8 m u8b5 :1;
141         u8 m u8b6 :1;
142         u8 m u8b7 :1;
143         u8 m u8b8 :1;
144         u8 m u8b9 :1;
145         u8 m u8b10 :1;
146         u8 m u8b11 :1;
147         u8 m u8b12 :1;
148         u8 m u8b13 :1;
149         u8 m u8b14 :1;
150         u8 m u8b15 :1; // MSB
151     } sBits;
152     struct {
153         u8 m u8low;
154         u8 m u8high;
155     } sBytes;
156     u16 u u16Word;
157 } LBTY_tuniPort16;
158
159 /* ***** */
160 /* ***** FUNCTION SECTION ***** */

```

```
161 /* ***** */
162
163
164 #endif /* _LBTY_INT_H_ */
165 /***** E N D (LBTY_int.h) *****/
```

## H:/0/Workspaces/MCU Drivers/ATmega32/MCAL/SWC\_BSW/LCTY\_int.h File Reference

This graph shows which files directly or indirectly include this file:



### Macros

- #define [LCTY\\_PROGMEM](#) \_\_attribute\_\_((\_\_progmem\_\_))
- #define [LCTY\\_PURE](#) \_\_attribute\_\_((\_\_pure\_\_))
- #define [LCTY\\_INLINE](#) \_\_attribute\_\_((always\_inline)) static inline
- #define [LCTY\\_INTERRUPT](#) \_\_attribute\_\_((interrupt))
- #define [CTY\\_PACKED](#) \_\_attribute\_\_((packed))
- #define [LCTY\\_CONST](#) \_\_attribute\_\_((\_\_const\_\_))
- #define [LCTY\\_DPAGE](#) \_\_attribute\_\_((dp))
- #define [LCTY\\_NODPAGE](#) \_\_attribute\_\_((nodp))
- #define [LCTY\\_SECTION](#)(section) \_\_attribute\_\_((section( # section)))
- #define [LCTY\\_ASM](#)(cmd) \_\_asm\_\_ \_\_volatile\_\_ ( # cmd ::)

---

### Macro Definition Documentation

**#define CTY\_PACKED \_\_attribute\_\_((packed))**

**#define LCTY\_ASM( cmd) \_\_asm\_\_ \_\_volatile\_\_ ( # cmd ::)**

**#define LCTY\_CONST \_\_attribute\_\_((\_\_const\_\_))**

**#define LCTY\_DPAGE \_\_attribute\_\_((dp))**

**#define LCTY\_INLINE \_\_attribute\_\_((always\_inline)) static inline**

**#define LCTY\_INTERRUPT \_\_attribute\_\_((interrupt))**

**#define LCTY\_NODPAGE \_\_attribute\_\_((nodp))**

**#define LCTY\_PROGMEM \_\_attribute\_\_((\_\_progmem\_\_))**

**#define LCTY\_PURE \_\_attribute\_\_((\_\_pure\_\_))**

**#define LCTY\_SECTION( section) \_\_attribute\_\_((section( # section)))**

## LCTY\_int.h

```
Go to the documentation of this file.1 /*
*****
2 /* ***** FILE DEFINITION SECTION ***** */
3 /* ***** */
4 /* File Name : LCTY_int.h */
5 /* Author : MAAM */
6 /* Version : v00 */
7 /* date : Apr 26, 2023 */
8 /* description : Compiler Library */
9 /* ***** */
10 /* ***** HEADER FILES INCLUDES ***** */
11 /* ***** */
12
13 #ifndef LCTY_INT_H_
14 #define LCTY_INT_H_
15
16 /* ***** */
17 /* ***** TYPE_DEF/STRUCT/ENUM SECTION ***** */
18 /* ***** */
19
20 /* ***** */
21 /* ***** MACRO/DEFINE SECTION ***** */
22 /* ***** */
23
24 /* prog memory attribute */
25 #define LCTY_PROGMEM __attribute__((__progmem__))
26
27 /* pure attribute */
28 #define LCTY_PURE __attribute__((__pure__))
29
30 /* Abstraction for inlining */
31 // #define LCTY_INLINE static inline
32 #define LCTY_INLINE __attribute__((always_inline)) static inline
33
34 /* define function as interrupt handler */
35 #define LCTY_INTERRUPT __attribute__((interrupt))
36
37 /* Memory packed to pass Memory padding */
38 #define CTY_PACKED __attribute__((__packed__))
39
40 /* Const attribute */
41 #define LCTY_CONST __attribute__((__const__))
42
43 /* place variable in direct page */
44 #define LCTY_DPAGE __attribute__((dp))
45
46 /* do not place variable in direct page */
47 #define LCTY_NODPAGE __attribute__((nodp))
48
49 /* Sections */
50 #define LCTY_SECTION(section) __attribute__((section( # section)))
51
52 /* Abstraction for assembly command */
53 #define LCTY_ASM(cmd) __asm__ __volatile__ ( # cmd ::)
54
55 /* ***** */
56 /* ***** CONST SECTION ***** */
57 /* ***** */
58
59 /* ***** */
60 /* ***** VARIABLE SECTION ***** */
61 /* ***** */
62
63 /* ***** */
64 /* ***** FUNCTION SECTION ***** */
65 /* ***** */
66
67
68 #endif /* LCTY_INT_H_ */
69 /***** E N D (LCTY_int.h) *****/
```