CANDrv

Generated by Doxygen 1.8.12

Contents

1	Clas	s Index			1
	1.1	Class I	∟ist		 1
2	File	Index			3
	2.1	File Lis	st		 3
3	Clas	s Docu	mentation		5
	3.1	CANPA	AGEHandl	r Class Reference	 5
		3.1.1	Detailed	escription	 5
		3.1.2	Construc	or & Destructor Documentation	 5
			3.1.2.1	CANPAGEHandler()	 5
			3.1.2.2	~CANPAGEHandler()	 6
	3.2	mob_s	ettings Str	ct Reference	 6
		3.2.1	Detailed	escription	 6
		3.2.2	Member	ata Documentation	 6
			3.2.2.1	can_id	 6
			3.2.2.2	can_msk	 7
			3.2.2.3	data	 7
			3.2.2.4	dlc	 7
			3.2.2.5	ide	 7
	3.3	MobCo	onfigEleme	t Struct Reference	 7
		3.3.1	Detailed	escription	 7
		3.3.2	Member	ata Documentation	 8
			3.3.2.1	additionalData	 8
			3.3.2.2	f	 8
			3.3.2.3	ms	 8
			3.3.2.4	op	 8
			3.3.2.5	timestamp	 8

ii CONTENTS

4	File	Docum	entation		9
	4.1	CAND	rv.cpp File	Reference	9
		4.1.1	Detailed	Description	10
		4.1.2	Function	Documentation	10
			4.1.2.1	CANDrv_ClearAll_MOB()	10
			4.1.2.2	CANDrv_FRMMan_Get_Msg() [1/2]	10
			4.1.2.3	CANDrv_FRMMan_Get_Msg() [2/2]	10
			4.1.2.4	CANDrv_FRMMan_Init()	11
			4.1.2.5	CANDrv_FRMMan_Send_Msg()	12
			4.1.2.6	CANDrv_Init()	12
			4.1.2.7	CANDrv_Set_bt()	12
			4.1.2.8	CLEAR_RXOK()	14
			4.1.2.9	getMOBsetup()	14
			4.1.2.10	ISR()	14
			4.1.2.11	receiveData_generic()	14
			4.1.2.12	receiveData_generic_restart()	15
			4.1.2.13	setupMOB()	15
		4.1.3	Variable I	Documentation	15
			4.1.3.1	internal_CAN_Config	15
	4.2	CAND	rv.h File Re	eference	15
		4.2.1	Detailed	Description	16
		4.2.2	Enumera	tion Type Documentation	17
			4.2.2.1	CanBaudrate	17
			4.2.2.2	mob_operation	17
			4.2.2.3	mob_purpose	17
		4.2.3	Function	Documentation	17
			4.2.3.1	CANDrv_ClearAll_MOB()	17
			4.2.3.2	CANDrv_FRMMan_Get_Msg()	18
			4.2.3.3	CANDrv_FRMMan_Init()	18
			4.2.3.4	CANDrv_FRMMan_Send_Msg()	19
			4.2.3.5	CANDrv_Init()	19
			4.2.3.6	getMOBsetup()	20
			4.2.3.7	receiveData_generic()	20
			4.2.3.8	receiveData_generic_restart()	20
			4.2.3.9	setMOB_Operation()	20
Ind	dex				23

Chapter 1

Class Index

1.1 Class List

Here are the classes, structs, unions and interfaces with brief descriptions:

CANPAGEHandler	
Class for safe handling of the CANPAGE register	5
mob_settings	
Settings for a MOB can_id will be output if can_msk not fully set.	
can_msk is the bit masking for the acceptance Filter of the MOB	
The Member are described as Follows:	
RX TX DESCRIPTION	6
MobConfigElement	
Configuration object for the FRMMan Settings	7

2 Class Index

Chapter 2

File Index

2.1 File List

Here is a list of all files with brief descriptions:

CANDrv.cpp	
CANDrv cpp file	 9
CANDrv.h	
CANDry header File	 15

File Index

Chapter 3

Class Documentation

3.1 CANPAGEHandler Class Reference

Class for safe handling of the CANPAGE register.

```
#include <CANDrv.h>
```

Public Member Functions

- CANPAGEHandler (uint8_t mob_nr)
 set CANPAGE to the supplied NR
- ∼CANPAGEHandler ()

recovers the previously saved CANPAGE

3.1.1 Detailed Description

Class for safe handling of the CANPAGE register.

This class is initialized with the mob_nr to switch to. The current CANPAGE is saved an will be restored after destruction of the context

3.1.2 Constructor & Destructor Documentation

3.1.2.1 CANPAGEHandler()

set CANPAGE to the supplied NR

6 Class Documentation

Parameters

mob⊷	the Number of the MOB to switch to
_nr	

3.1.2.2 \sim CANPAGEHandler()

```
CANPAGEHandler::\simCANPAGEHandler ( )
```

recovers the previously saved CANPAGE

The documentation for this class was generated from the following files:

- CANDrv.h
- CANDrv.cpp

3.2 mob_settings Struct Reference

Settings for a MOB can_id will be output if can_msk not fully set. can_msk is the bit masking for the acceptance Filter of the MOB The Member are described as Follows:

RX TX DESCRIPTION.

```
#include <CANDrv.h>
```

Public Attributes

- uint16_t can_id
- uint16_t can_msk
- uint8_t ide
- uint8_t dlc
- uint8_t * data

3.2.1 Detailed Description

Settings for a MOB can_id will be output if can_msk not fully set. can_msk is the bit masking for the acceptance Filter of the MOB The Member are described as Follows:

RX TX DESCRIPTION.

3.2.2 Member Data Documentation

```
3.2.2.1 can_id
```

uint16_t mob_settings::can_id

IO IN ID of the CAN Message

```
3.2.2.2 can_msk
uint16_t mob_settings::can_msk
```

IN XX Mask of the CAN ID for RX

3.2.2.3 data

uint8_t* mob_settings::data

OUT IN Pointer to the Data array

3.2.2.4 dlc

uint8_t mob_settings::dlc

IO IN Data Length of the Message

3.2.2.5 ide

uint8_t mob_settings::ide

IN IN Extended Message Format

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

• CANDrv.h

3.3 MobConfigElement Struct Reference

configuration object for the FRMMan Settings

```
#include <CANDrv.h>
```

Public Attributes

- mob_purpose op
- mob_settings ms
- void(* f)(uint8_t)
- uint32_t timestamp
- void * additionalData

3.3.1 Detailed Description

configuration object for the FRMMan Settings

8 Class Documentation

3.3.2 Member Data Documentation

```
3.3.2.1 additionalData

void* MobConfigElement::additionalData

additional Data for usage in an custom ISR

3.3.2.2 f

void(* MobConfigElement::f) (uint8_t)

ISR routine

3.3.2.3 ms

mob_settings MobConfigElement::ms

settings struct

3.3.2.4 op

mob_purpose MobConfigElement::op
```

purpose of the MOB

3.3.2.5 timestamp

uint32_t MobConfigElement::timestamp

 $\ensuremath{\mathsf{OUT}}\xspace$ timestamp of the Last Interrupt

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

• CANDrv.h

Chapter 4

File Documentation

4.1 CANDrv.cpp File Reference

CANDrv cpp file.

```
#include <avr/io.h>
#include "CANDrv.h"
#include "Arduino.h"
```

Functions

```
    uint8_t CANDrv_Set_bt (CanBaudrate baudrate)
    set the Timing Parameters for the CAN.
```

void CLEAR_RXOK ()

Clears the interrupt FLAG.

void CANDrv_ClearAll_MOB (void)

advanced Function not needed for normal operation

• uint8_t CANDrv_Init (CanBaudrate baudrate)

Initialize the CAN Driver.

void getMOBsetup (mob_settings *ms)

advanced Function not needed for normal operation

void setupMOB (mob_settings *ms)

advanced Function not needed for normal operation

void receiveData_generic (uint8_t mob_NR)

generic Receive funtion for an Interrupt Driven MOB.

void receiveData_generic_restart (uint8_t mob_NR)

generic Receive funtion for an Interrupt Driven MOB.

uint8_t CANDrv_FRMMan_Init (MobConfigElement *CAN_Config)

Initialize the FRMMan.

uint8_t CANDrv_FRMMan_Send_Msg (uint8_t index)

sends a configured Message

- uint8_t CANDrv_FRMMan_Get_Msg (uint8_t index, mob_settings *ms, uint8_t iteration=0)
 get a received Can Message.
- uint8_t CANDrv_FRMMan_Get_Msg (uint8_t index, mob_settings *ms) get a received Can Message.
- ISR (CAN_INT_vect)

Variables

• MobConfigElement * __internal_CAN_Config

4.1.1 Detailed Description

CANDrv cpp file.

This File contains the Implementation of the CANDrv and the FRMMan

4.1.2 Function Documentation

4.1.2.1 CANDrv_ClearAll_MOB()

advanced Function not needed for normal operation

This function clear all MOB registers. This is used in INI.

4.1.2.2 CANDrv_FRMMan_Get_Msg() [1/2]

get a received Can Message.

This function reads a received Can Message from the internal Buffer.

It also retries to read if there were any Changes, because of an Interrupt, receiving a new Message. In this case the read operation is retried.

!ONLY USED INTERNALLY!

Parameters

index	the index of the mob to read
ms	OUTPUT Pointer to a message settings object, where the data is written.
iteration	Helper argument to limit the number of tries

Returns

1 on success. 0 in case of an error.

4.1.2.3 CANDrv_FRMMan_Get_Msg() [2/2]

```
CANDrv_FRMMan_Get_Msg (
```

```
uint8_t index,
mob_settings * ms )
```

get a received Can Message.

This function reads a received Can Message from the internal Buffer.

It also retries to read if there were any Changes, because of an Interrupt, receiving a new Message. In this case the read operation is retried.

Parameters

index	the index of the mob to read
ms	OUTPUT Pointer to a message settings object, where the data is written.

Returns

1 on success. 0 in case of an error.

4.1.2.4 CANDrv_FRMMan_Init()

Initialize the FRMMan.

This function initializes the FRMMan with the given CAN_Config.

Example configuration:

```
//Make sure all these variables are global an not in a scoped context, like a funtion.
uint8_t data_130[8];
uint8_t data_7e8[8];
uint8_t data_7e0[8];
MobConfigElement CAN_Config[] =
       \label{tx_DATA_SW_DRIVEN, \{0x7e0,0x000,0,8, (uint8_t*)\&data_7e0\}\}, //This \; Messsage \; can \; be \; sent \; for the large of the large o
       with CANDry_FRMMan_Send_Msg(0); 
{RX_DATA_INTERRUPT_DRIVEN, {0x130,0x3FF,0,8, (uint8_t*)&data_130},&
             receiveData_generic_restart,0,0},//inis Message will be received with an Interrupt. It will be directly enabled again
       {RX_DATA_INTERRUPT_DRIVEN, {0x7e8, 0x3FF, 0, 8, (uint8_t*) &data_7e8}, &
              receiveData_generic,0,0},//This Message will be received with an Interrupt. It will be
                only received once!
       {UNUSED},//unused MOBs
       {UNUSED},
       {UNUSED}
void setup() {
data_7e0[0] = 0x02; //Initialize the Message to send. data_7e0[1] = 0x01;
data_7e0[2] = 0x05;
data_7e0[3] = 0x33;
data_7e0[4] = 0x44;
data_7e0[5] = 0x55;

data_7e0[6] = 0x66;
data_7e0[7] = 0x77;
CANDrv_Init(CAN_500k); //init CANDrv
CANDrv_FRMMan_Init(CAN_Config);//init FRMMan
sei();//enable interrupts. This is neccessary for the Interrupt driven receives
```

Parameters

CAN Confia	The CAN_Config to use. For examples see funtion description.

Returns

1 on success. 0 in case of an error.

4.1.2.5 CANDrv_FRMMan_Send_Msg()

sends a configured Message

This function sends a predefined Message.

Parameters

index	the index of the Message to send
-------	----------------------------------

Returns

1 on success. 0 in case of an error.

4.1.2.6 CANDrv_Init()

Initialize the CAN Driver.

Parameters

baudrate	the baudrate to set

Returns

1 on success. 0 in case of an error.

4.1.2.7 CANDrv_Set_bt()

set the Timing Parameters for the CAN.

the Values of the Registers CANBT1-3 are also defined in this file.

!ONLY USED INTERNALLY!

Parameters

baudrate the baudrate to set.	set.
-------------------------------	------

Returns

1 on success. 0 in case of an error.

4.1.2.8 CLEAR_RXOK()

```
void CLEAR_RXOK ( ) [inline]
```

Clears the interrupt FLAG.

4.1.2.9 getMOBsetup()

advanced Function not needed for normal operation

This function reads the Settings from the currently selected MOB. To select a MOB see CANPAGEHandler

See also

CANPAGEHandler

Parameters

ms pointer to the MOB settings

4.1.2.10 ISR()

4.1.2.11 receiveData_generic()

generic Receive funtion for an Interrupt Driven MOB.

This function only receives this Message once!

Parameters

mob_NR the MOB Number given by the ISR
--

4.1.2.12 receiveData_generic_restart()

generic Receive funtion for an Interrupt Driven MOB.

This function will activate the Interrupt again.

Parameters

то	b_NR	the MOB Number given by the ISR
----	------	---------------------------------

4.1.2.13 setupMOB()

```
setupMOB (
    mob_settings * ms )
```

advanced Function not needed for normal operation

This function writes the given Settings to the currently selected MOB. To select a MOB see CANPAGEHandler

See also

CANPAGEHandler

Parameters

```
ms pointer to the MOB settings
```

4.1.3 Variable Documentation

```
4.1.3.1 __internal_CAN_Config
```

```
MobConfigElement* __internal_CAN_Config
```

4.2 CANDrv.h File Reference

CANDrv header File.

Classes

struct mob settings

Settings for a MOB can_id will be output if can_msk not fully set. can_msk is the bit masking for the acceptance Filter of the MOB The Member are described as Follows:

RX TX DESCRIPTION.

struct MobConfigElement

configuration object for the FRMMan Settings

class CANPAGEHandler

Class for safe handling of the CANPAGE register.

Enumerations

• enum CanBaudrate { CAN 500k, CAN 800k }

Baudrate Enumerator for the Baudrate.

enum mob operation { TX DATA = 0x01, RX DATA = 0x02, DISABLED = 0x00 }

MOB Operation Enumerator for the operation while manually using a MOB.

enum mob purpose {

TX_DATA_SW_DRIVEN = 0x10, RX_DATA_SW_DRIVEN = 0x20, MULTIPURPOSE = 0x30, RX_DATA_
INTERRUPT_DRIVEN = 0x62,

RX_DATA_INTERRUPT_DRIVEN_INACTIVE = 0x60, TX_DATA_INTERRUPT_ACTIVE = 0x50, UNUSED = 0x00 }

MOB Purpose Enumerator for the Purpose of the MOB when configuring the FRMMan.

Functions

• uint8_t CANDrv_Init (CanBaudrate baudrate)

Initialize the CAN Driver.

uint8_t CANDrv_FRMMan_Get_Msg (uint8_t index, mob_settings *ms)

get a received Can Message.

uint8_t CANDrv_FRMMan_Send_Msg (uint8_t index)

sends a configured Message

uint8_t CANDrv_FRMMan_Init (MobConfigElement *CAN_Config)

Initialize the FRMMan.

void receiveData_generic (uint8_t mob_NR)

generic Receive funtion for an Interrupt Driven MOB.

void receiveData_generic_restart (uint8_t mob_NR)

generic Receive funtion for an Interrupt Driven MOB.

• void CANDrv_ClearAll_MOB (void)

advanced Function not needed for normal operation

void getMOBsetup (mob_settings *ms)

advanced Function not needed for normal operation

void setMOB_Operation (mob_operation mo)

set the Operation of the current MOB

4.2.1 Detailed Description

CANDrv header File.

This File describes the Interface of the CANDrv and the FRMMan

4.2.2 Enumeration Type Documentation

4.2.2.1 CanBaudrate

enum CanBaudrate

Baudrate Enumerator for the Baudrate.

Enumerator

CAN_500k	500 Kbaud
CAN 800k	800 Kbaud

4.2.2.2 mob_operation

enum mob_operation

MOB Operation Enumerator for the operation while manually using a MOB.

Enumerator

TX_DATA	Transmit DATA	
RX_DATA	Receive DATA	
DISABLED	DISABLED	

4.2.2.3 mob_purpose

enum mob_purpose

MOB Purpose Enumerator for the Purpose of the MOB when configuring the FRMMan.

Enumerator

TX_DATA_SW_DRIVEN	TX triggered by SW
RX_DATA_SW_DRIVEN	RX triggered by SW
MULTIPURPOSE	RX and TX triggered by SW
RX_DATA_INTERRUPT_DRIVEN	RX triggered by Interrupt. Automatically activated at Startup
RX_DATA_INTERRUPT_DRIVEN_INACTIVE	RX triggered by Interrupt. Automatically deactivated at Startup
TX_DATA_INTERRUPT_ACTIVE	TX triggered by SW. Will cause an Interrupt on completion
UNUSED	MOB is unused

4.2.3 Function Documentation

4.2.3.1 CANDrv_ClearAll_MOB()

advanced Function not needed for normal operation

This function clear all MOB registers. This is used in INI.

4.2.3.2 CANDrv_FRMMan_Get_Msg()

get a received Can Message.

This function reads a received Can Message from the internal Buffer.

It also retries to read if there were any Changes, because of an Interrupt, receiving a new Message. In this case the read operation is retried.

Parameters

index	the index of the mob to read	
ms	OUTPUT Pointer to a message settings object, where the data is writte	

Returns

1 on success. 0 in case of an error.

4.2.3.3 CANDry FRMMan Init()

Initialize the FRMMan.

This function initializes the FRMMan with the given CAN Config.

Example configuration:

```
//Make sure all these variables are global an not in a scoped context, like a funtion.
 uint8_t data_130[8];
 uint8_t data_7e8[8];
 uint8_t data_7e0[8];
MobConfigElement CAN_Config[] =
             \{TX\_DATA\_SW\_DRIVEN, \{0x7e0,0x000,0,8, (uint8\_t*)&data\_7e0\}\}, //This Messsage can be sent the sent of the sent of
                              with CANDrv_FRMMan_Send_Msg(0);
             {RX_DATA_INTERRUPT_DRIVEN, {0x130,0x3FF,0,8, (uint8_t*)&data_130},&
                         receiveData_generic_restart,0,0},//This Message will be received with an
                               Interrupt. It will be directly enabled again
             {RX_DATA_INTERRUPT_DRIVEN, {0x7e8,0x3FF,0,8, (uint8_t*)&data_7e8},&
                         {\tt receiveData\_generic,0,0}{\tt ,//This\ Message\ will\ be\ received\ with\ an\ Interrupt.\ It\ will\ will\ will\ be\ received\ with\ an\ Interrupt.\ It\ will\ be\ received\ with\ an\ Interrupt.\ It\ will\ be\ received\ with\ an\ Interrupt.\ It\ will\ be\ received\ with\ an\ Interrupt.\ will\ will
                              only received once!
              {UNUSED}, //unused MOBs
               {UNUSED},
              {UNUSED}
 void setup() {
data_{7e0}[0] = 0x02; //Initialize the Message to send.
data_7e0[1] = 0x01;
```

```
data_7e0[2] = 0x05;
data_7e0[3] = 0x33;
data_7e0[4] = 0x44;
data_7e0[5] = 0x55;
data_7e0[6] = 0x66;
data_7e0[7] = 0x77;
CANDrv_Init(CAN_500k); //init CANDrv
CANDrv_FRMMan_Init(CAN_Config);//init FRMMan
sei();//enable interrupts. This is neccessary for the Interrupt driven receives
```

Parameters

CAN_Config | The CAN_Config to use. For examples see funtion description.

Returns

1 on success. 0 in case of an error.

4.2.3.4 CANDrv_FRMMan_Send_Msg()

sends a configured Message

This function sends a predefined Message.

Parameters

index the index of the Message to send

Returns

1 on success. 0 in case of an error.

4.2.3.5 CANDrv_Init()

Initialize the CAN Driver.

Parameters

baudrate the baudrate to set

Returns

1 on success. 0 in case of an error.

4.2.3.6 getMOBsetup()

```
void getMOBsetup ( {\tt mob\_settings} \ * \ {\tt ms} \ )
```

advanced Function not needed for normal operation

This function reads the Settings from the currently selected MOB. To select a MOB see CANPAGEHandler

See also

CANPAGEHandler

Parameters

ms pointer to the MOB settings

4.2.3.7 receiveData_generic()

generic Receive funtion for an Interrupt Driven MOB.

This function only receives this Message once!

Parameters

mob_NR	the MOB Number given by the ISR

4.2.3.8 receiveData_generic_restart()

generic Receive funtion for an Interrupt Driven MOB.

This function will activate the Interrupt again.

Parameters

```
mob_NR the MOB Number given by the ISR
```

4.2.3.9 setMOB_Operation()

set the Operation of the current MOB

This function sets the Operation of the currently selected MOB To select a MOB see CANPAGEHandler

See also

CANPAGEHandler

Parameters

mo the operation mode to set the MOB to

Index

internal_CAN_Config	CANDrv_Set_bt
CANDrv.cpp, 15	CANDrv.cpp, 12
~CANPAGEHandler	CANPAGEHandler, 5
CANPAGEHandler, 6	\sim CANPAGEHandler, 6
2 2 2 2 7 2	CANPAGEHandler, 5
additionalData	CLEAR_RXOK
MobConfigElement, 8	CANDrv.cpp, 14
g, •	can_id
CANDrv.cpp, 9	mob settings, 6
internal_CAN_Config, 15	
CANDry ClearAll MOB, 10	can_msk
CANDrv_FRMMan_Get_Msg, 10	mob_settings, 6
CANDry FRMMan Init, 11	CanBaudrate
CANDrv_FRMMan_Send_Msg, 12	CANDrv.h, 17
CANDry Init, 12	data
CANDrv_Set_bt, 12	
	mob_settings, 7
CLEAR_RXOK, 14	dlc
getMOBsetup, 14	mob_settings, 7
ISR, 14	f
receiveData_generic, 14	
receiveData_generic_restart, 15	MobConfigElement, 8
setupMOB, 15	getMOBsetup
CANDrv.h, 15	CANDrv.cpp, 14
CANDrv_ClearAll_MOB, 17	CANDrv.cpp, 14
CANDrv_FRMMan_Get_Msg, 18	OANDIV.II, 19
CANDrv_FRMMan_Init, 18	ISR
CANDrv_FRMMan_Send_Msg, 19	CANDrv.cpp, 14
CANDrv_Init, 19	ide
CanBaudrate, 17	mob_settings, 7
getMOBsetup, 19	mob_settings, 7
mob_operation, 17	mob_operation
mob_purpose, 17	CANDrv.h, 17
receiveData_generic, 20	mob_purpose
receiveData_generic_restart, 20	CANDrv.h, 17
setMOB Operation, 20	mob_settings, 6
CANDrv_ClearAll_MOB	can_id, 6
CANDrv.cpp, 10	can msk, 6
CANDrv.h, 17	data, 7
CANDrv_FRMMan_Get_Msg	
CANDrv.cpp, 10	dlc, 7
CANDrv.h, 18	ide, 7
CANDry FRMMan Init	MobConfigElement, 7
CANDrv.cpp, 11	additionalData, 8
CANDIV.6pp, 11 CANDIV.h, 18	f, 8
CANDry_FRMMan_Send_Msg	ms, 8
-	op, 8
CANDryb 10	timestamp, 8
CANDry Joint	ms
CANDry on 12	MobConfigElement, 8
CANDry.lp., 12	
CANDrv.h. 19	QD

24 INDEX

MobConfigElement, 8 receiveData_generic CANDrv.cpp, 14 CANDrv.h, 20 receiveData_generic_restart CANDrv.cpp, 15 CANDrv.h, 20 setMOB_Operation CANDrv.h, 20 setupMOB CANDrv.cpp, 15 timestamp MobConfigElement, 8