

LCD DRIVER WITH TIMER2

MCD APPLICATION LAB
Version 1.0
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Icd File Documentation

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Icd Module Documentation

CLK:

Functions

- void **CLK_Init** (void)
- void **CLK_Switch** (char clock, char previous_clock)

Function Documentation

void CLK_Init (void)

All Clock Controller settings have to be put in this function clock master, clock switch if any, HSI prescaler, CCO, clock gating system... No parameter

Definition of the function at line 35 of file clk.c:

- ⇒ References CLK_Switch()
- ⇒ Referenced by main()

Here is the call graph for this function:



void CLK_Switch (char *clock*, char *previous_clock*)

Allow to switch from one clock to another and to switch off the previous one or not.

Clock to switch ON (value put in CLK_SWR), values available in CLK_reg.h if previous clock has to be kept: write 0 as parameter otherwise take predefined value in CLK_reg.h (value put in CLK_ICKR or CLK_ECKR)

Definition of the function at line 54 of file clk.c:

- ⇒ Referenced by CLK_Init().

Io_port :

Functions

- void **IOport_Init** (void)
- interrupt void **ITC_PortA** (void)

Function Documentation

void IOport_Init (void)

IOport_Init: Initialization of the I/Os (COMs + SEGs) + 2 ext ITs on PA4/PA5. No parameter

Definition of the file at line 38 of file io_port.c:

- ⇒ Referenced by LCD_On()

interrupt void ITC_PortA (void)

I/Os Interrupt function: used to control the contrast by software (PA4: down, PA5: up). No parameter

Definition of the function at line 123 of file io_port.c:

- ⇒ References counter_down, and counter_up.

LCD

Functions

- void **Clr_LCDRAM** (void)
- void **LCD_On** (void)
- void **Convert** (char *c)
- void **Write_char** (char car, u8 pos)
- void **LCD_Display** (char *str)

Function Documentation

void Clr_LCDRAM (void)

Clear the LCD RAM. No parameter

Definition at line 105 of file lcd.c:

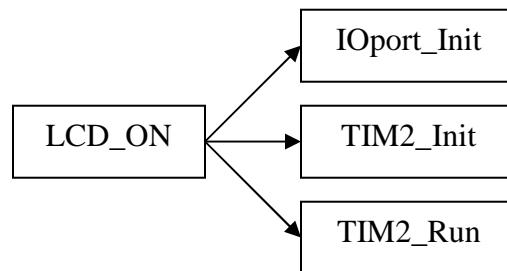
void LCD_On (void)

Switch LCD ON (takes TIM2 and I/Os resources), enable the interrupts. No parameter

Definition at line 116 of file lcd.c:

- ⇒ References IOport_Init(), TIM2_Init(), and TIM2_Run().
- ⇒ Referenced by main()

Here is the call graph for this function:



void Convert (char * c)

Convert an ASCII char to a LCD coding contained in letter or number table.

Character Definition at line 126 of file lcd.c:

- ⇒ References digit, letter, and number

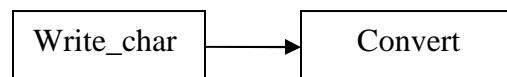
void Write_char (char car, u8 pos)

Write a char in the LCD frame buffer. ASCII value of the character LCDRAM index [0:3] where to write the LCD coding value.

Definition at line 152 of file lcd.c:

- ⇒ References Convert(), digit, and LCDRAM.
- ⇒ Referenced by LCD_Display().

Here is the call graph for this function:



void LCD_Display (char * str):

Allow to display a string of 8 characters on the LCD, this function only has to be called from the main.

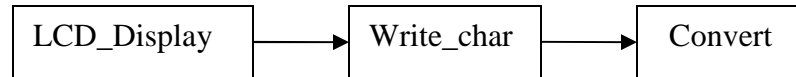
String of 8 characters display.

Definition at line 199 of file lcd.c:

⇒ References Write_char().

⇒ Referenced by main()

Here is the call graph for this function



Main

Functions

- void **main** (void)
- interrupt void **dummy** ()

Function Documentation

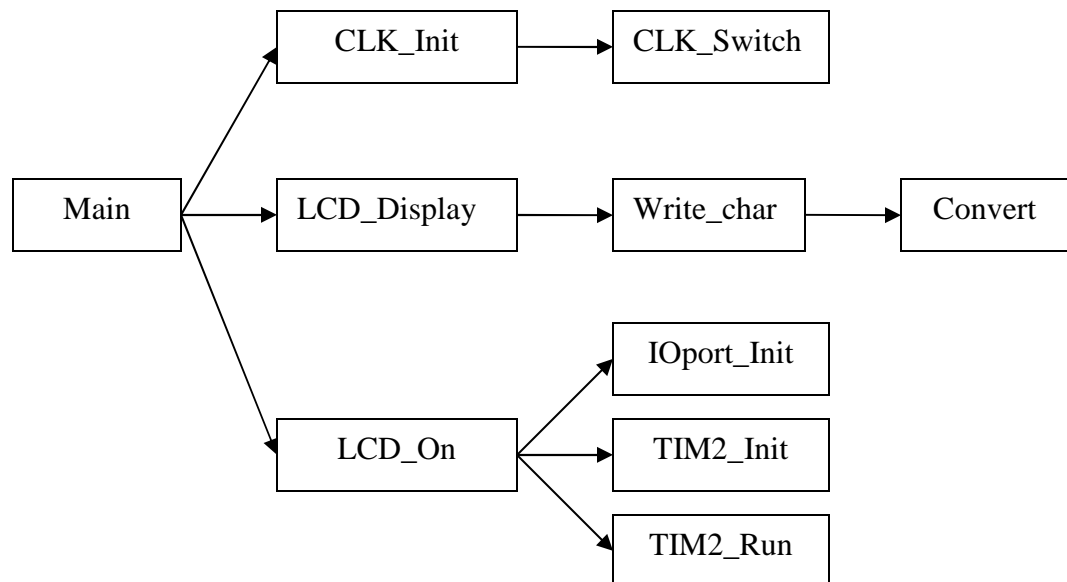
void main (void)

Main routine. No parameter

Definition at line 37 of file main.c:

⇒ References CLK_Init(), LCD_Display(), and LCD_On().

Here is the call graph for this function:



Timer2

Functions

- void **TIM2_Init** (void)
- void **TIM2_Run** (void)
- interrupt void **TIM2_It_CC1** (void)
- interrupt void **TIM2_It_OVF** (void)

Function Documentation

void TIM2_Init (void) :

Configuration of the timer in PWM edge aligned mode to generate 2 RTC (one at compare, one at overflow). No parameter

Definition at line 43 of file timer2.c:

⇒ Referenced by LCD_On().

void TIM2_Run (void):

Launch the counter. No parameter

Definition at line 77 of file timer2.c:

⇒ Referenced by LCD_On().

interrupt void TIM2_It_CC1 (void):

Timer2 Compare Interrupt function: applies once Vdd to segments which have to be ON and Vss to segments which have to be OFF with COM line of this phase set to low level and other set at Vdd/2, and once voltage inverted to the ones applied previously on segments with COM line of this phase set to high level and other set at Vdd/2; If clock master is LSI, there is a switch on HSI during the interrupt to speed up the processing. No parameter.

Definition at line 91 of file timer2.c:

⇒ References first_CC1, index, and LCDRAM.

interrupt void TIM2_It_OVF (void):

Timer2 Overflow Interrupt function: to decrease the contrast, COM and SEG lines are set low, to increase it, COM lines are once set low, once set high and segments are once set high once set low. This is handle through the timing modification of the compare interrupt; If clock master is LSI, there is a switch on HSI during the interrupt to speed up the processing. No parameter.

Definition at line 210 of file timer2.c:

⇒ References counter_down, counter_up, and index.

Lcd File Documentation

../lcd driver/sources/clk.c File Reference

```
#include "clk_reg.h"
```

```
#include "generic.h"
```

Include dependency graph for clk.c:



Functions:

- void **CLK_Init** (void)
- void **CLK_Switch** (char clock, char previous_clock)

Detailed Description:

Clock Controller settings

Definition in file **clk.c**.

../lcd driver/sources/stp7_interrupt_vector.c File Reference

```
#include "generic.h"
```

Include dependency graph for stp7_interrupt_vector.c:



Functions:

- void **NonHandledInterrupt** ()
- void **TIM2_It_CC1** ()
- void **TIM2_It_OVF** ()
- void **ITC_PortA** ()

Variables:

- void(*const **_vectab** [])()

Detailed Description:

Interrupt vectors table mapping

Definition in file **stp7_interrupt_vector.c**

../lcd driver/sources/io_port.c File Reference

```
#include "generic.h"
#include "io_port_reg.h"
#include "io_port.h"
```

Include dependency graph for io_port.c:



Functions:

- void **IOport_Init** (void)
- interrupt void **ITC_PortA** (void)

Variables:

- u8 **counter_up**
- u8 **counter_down**

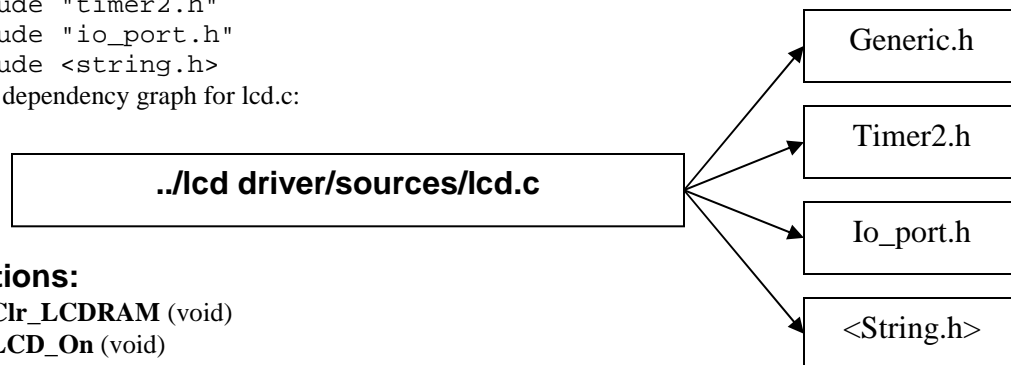
Detailed Description:

IOs configuration depending on the number of COM/SEG defined in generic.h
Definition in file **io_port.c**.

../lcd driver/sources/lcd.c File Reference

```
#include "generic.h"
#include "timer2.h"
#include "io_port.h"
#include <string.h>
```

Include dependency graph for lcd.c:



Functions:

- void **Clr_LCDRAM** (void)
- void **LCD_On** (void)
- void **Convert** (char *c)
- void **Write_char** (char car, u8 pos)
- void **LCD_Display** (char *str)

Variables:

- u8 **LCDRAM** [COM *(SEG/8)]
- const unsigned int **number** [10] = {0xA665, 0x0320, 0x2A54, 0x2A34, 0x0E30, 0x2C34, 0x2C74, 0x2990, 0x2E74, 0x2E34}
- const unsigned int **letter** [29] = {0x2E70, 0x323C, 0x2444, 0x322C, 0x2C54, 0x2C50, 0x2474, 0x0E70, 0x300C, 0x0264, 0x1109, 0x0444, 0x8760, 0x8661, 0x2664, 0x2E50, 0x2665, 0x2E51, 0x2C34, 0x3008, 0x0664, 0x05C0, 0x06E1, 0x8181, 0x8180, 0x2184, 0x4000, 0x0002, 0x0000}
- u8 **digit** [(SEG/8)]

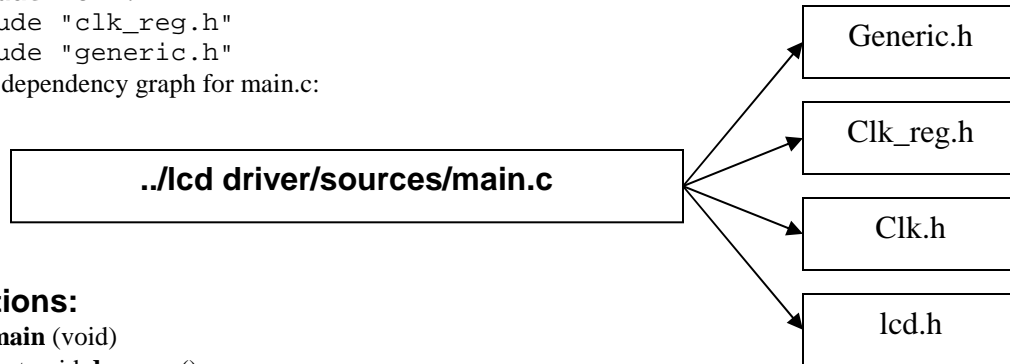
Detailed Description:

All the LCD functions: LCD RAM clear, LCD ON, LCD Display its purpose.
Definition in file **lcd.c**

../lcd driver/sources/main.c File Reference

```
#include "lcd.h"
#include "clk.h"
#include "clk_reg.h"
#include "generic.h"
```

Include dependency graph for main.c:



Functions:

- void **main** (void)
- interrupt void **dummy** ()

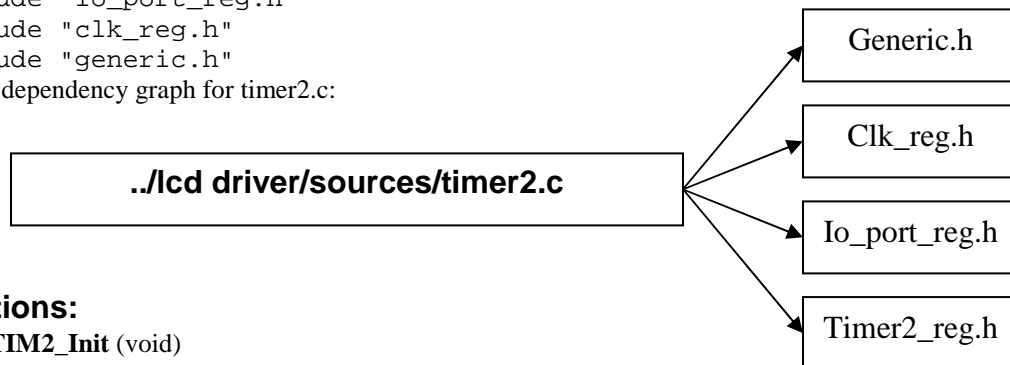
Detailed Description:

Main file using the LCD driver
Definition in file **main.c**

../lcd driver/sources/timer2.c File Reference

```
#include "timer2_reg.h"
#include "io_port_reg.h"
#include "clk_reg.h"
#include "generic.h"
```

Include dependency graph for timer2.c:



Functions:

- void **TIM2_Init** (void)
- void **TIM2_Run** (void)
- interrupt void **TIM2_It_CC1** (void)
- interrupt void **TIM2_It_OVF** (void)

Variables:

- u8 **index** = 0
- u8 **first_CC1** = 0
- volatile u8 **counter_up** = FALSE
- volatile u8 **counter_down** = FALSE
- u8 **LCDRAM** []

Detailed Description:

Timer 2 settings and compare + overflow interrupt functions
Definition in file **timer2.c**

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