

TM1638 library for Arduino

1.0.0

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Contents

1	TM1638 library for Arduino	1
2	Class Index	3
2.1	Class List	3
3	File Index	5
3.1	File List	5
4	Class Documentation	7
4.1	TM1638 Class Reference	7
4.1.1	Detailed Description	8
4.1.2	Constructor & Destructor Documentation	8
4.1.2.1	TM1638()	8
4.1.3	Member Function Documentation	8
4.1.3.1	clear()	8
4.1.3.2	getKeyScan()	8
4.1.3.3	readByte()	9
4.1.3.4	setBrightness()	9
4.1.3.5	writeByte()	9
4.1.3.6	writeCommand()	9
4.1.3.7	writeDisplayRegister()	10
5	File Documentation	11
5.1	src/TM1638.cpp File Reference	11
5.1.1	Detailed Description	11
5.2	src/TM1638.h File Reference	11
5.2.1	Detailed Description	12
	Index	13

Chapter 1

TM1638 library for Arduino

This is a 3-pin serial [TM1638](#) chip library for Arduino. It supports a combined LED driver controller and key-scan interface.

Hardware

Connect power and 3 data pins to an Arduino board DIGITAL pins:

- VDD (Power 5V +/- 10%)
- GND (Ground)
- DIO (Bi-directional data input/output)
- STB (Chip select)
- CLK (Clock)

The following [TM1638](#) pins should be connected to LED's and buttons in a matrix:

* K1~K3 (Key-scan data input)

- SEG/GRID (Output for LED matrix)

Documentation

[TM1638 Datasheet](#)

Example

Examples | [TM1638](#) | [Example](#)

Usage

Initialization

```
{c++}  
// Include TM1638 library  
#include "TM1638.h"  
  
// Connect display pins to the Arduino DIGITAL pins  
#define DIO_PIN 2  
#define SCL_PIN 3  
#define STB_PIN 4  
  
// Create TM1638 object  
TM1638 tm1638(DIO_PIN, SCL_PIN, STB_PIN);
```

Display on/off

```
{c++}  
// Turn display off  
tm1638.displayOff();  
  
// Turn display on  
tm1638.displayOn();
```

Turn all LED's off

```
{c++}  
// Turn all LED's off  
tm1638.clear();
```

Get key-scan

```
{c++}  
// Get 32-bit key-scan  
uint32_t keys = tm1638.getKeyScan();
```

Write display register

```
{c++}  
// Write segment LED's to the first display register  
// The LED's turned on depends on your hardware SEG/GRID connections  
// Experiment with the registers 0x00..0x0F value 0x00..0xff to display numbers  
// and characters, for example:  
tm1638.writeDisplayRegister(0x01, 0x01);
```

Library dependencies

- None

Chapter 2

Class Index

2.1 Class List

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

TM1638	
TM1638 class	7

Chapter 3

File Index

3.1 File List

Here is a list of all documented files with brief descriptions:

src/ TM1638.cpp	
TM1638 library for Arduino	11
src/ TM1638.h	
TM1638 library for Arduino	11

Chapter 4

Class Documentation

4.1 TM1638 Class Reference

TM1638 class.

```
#include <TM1638.h>
```

Public Member Functions

- [TM1638](#) (uint8_t dioPin, uint8_t sclPin, uint8_t stbPin)
TM1638 constructor.
- virtual void [displayOn](#) ()
Turn Display on.
- virtual void [displayOff](#) ()
Turn display off.
- virtual void [setBrightness](#) (uint8_t brightness)
Set brightness LED's.
- virtual void [clear](#) ()
- virtual uint32_t [getKeyScan](#) ()
Get key states.
- virtual void [writeDisplayRegister](#) (uint8_t address, uint8_t data)
Write display register.

Protected Member Functions

- virtual void [writeCommand](#) (uint8_t cmd)
Write command.
- virtual void [writeDisplayControl](#) ()
Write display control.
- virtual uint8_t [readByte](#) ()
Read byte from TM1638.
- virtual void [writeByte](#) (uint8_t data)
Write byte to TM1638.

4.1.1 Detailed Description

[TM1638](#) class.

Definition at line 91 of file TM1638.h.

4.1.2 Constructor & Destructor Documentation

4.1.2.1 TM1638()

```
TM1638::TM1638 (
    uint8_t dioPin,
    uint8_t sclPin,
    uint8_t stbPin )
```

[TM1638](#) constructor.

Parameters

<i>dioPin</i>	TM1638 DIO pin.
<i>sclPin</i>	TM1638 SCL pin.
<i>stbPin</i>	TM1638 STB pin.

Definition at line 39 of file TM1638.cpp.

4.1.3 Member Function Documentation

4.1.3.1 clear()

```
void TM1638::clear ( ) [virtual]
```

Turn all LED's off.

Definition at line 96 of file TM1638.cpp.

4.1.3.2 getKeyScan()

```
uint32_t TM1638::getKeyScan ( ) [virtual]
```

Get key states.

Returns

One or more buttons. One bit per button.

Definition at line 115 of file TM1638.cpp.

4.1.3.3 readByte()

```
uint8_t TM1638::readByte ( ) [protected], [virtual]
```

Read byte from [TM1638](#).

Returns

8-bit value.

Definition at line 178 of file TM1638.cpp.

4.1.3.4 setBrightness()

```
void TM1638::setBrightness (
    uint8_t brightness ) [virtual]
```

Set brightness LED's.

Parameters

<i>brightness</i>	
-------------------	--

Definition at line 84 of file TM1638.cpp.

4.1.3.5 writeByte()

```
void TM1638::writeByte (
    uint8_t data ) [protected], [virtual]
```

Write byte to [TM1638](#).

Parameters

<i>data</i>	8-bit value.
-------------	--------------

Definition at line 205 of file TM1638.cpp.

4.1.3.6 writeCommand()

```
void TM1638::writeCommand (
    uint8_t cmd ) [protected], [virtual]
```

Write command.

Parameters

<i>cmd</i>	Please refer to the datasheet for a list with supported commands.
------------	---

Definition at line 166 of file TM1638.cpp.

4.1.3.7 writeDisplayRegister()

```
void TM1638::writeDisplayRegister (
    uint8_t address,
    uint8_t data ) [virtual]
```

Write display register.

Parameters

<i>address</i>	Display address 0x00..0x0F
<i>data</i>	Value 0x00..0xFF

Definition at line 148 of file TM1638.cpp.

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

- [src/TM1638.h](#)
- [src/TM1638.cpp](#)

Chapter 5

File Documentation

5.1 src/TM1638.cpp File Reference

TM1638 library for Arduino.

```
#include "TM1638.h"
```

5.1.1 Detailed Description

TM1638 library for Arduino.

Source: <https://github.com/Erriez/ErriezTM1638>

5.2 src/TM1638.h File Reference

TM1638 library for Arduino.

```
#include <Arduino.h>
```

Classes

- class [TM1638](#)
TM1638 class.

Macros

- #define [TM1638_WRITE_DISPLAY_ADDR_INC](#) 0x40
Write address with auto increment.
- #define [TM1638_WRITE_DISPLAY_ADDR_FIX](#) 0x44
Write fixed address.
- #define [TM1638_READ_KEYS](#) 0x42
Address increment.
- #define [TM1638_WRITE_DISPLAY_CTRL](#) 0x80
Display control address write.
- #define [TM1638_DISPLAY_ADDR](#) 0xc0
Display address.

5.2.1 Detailed Description

[TM1638](#) library for Arduino.

Source: <https://github.com/Erriez/ErriezTM1638>

Command / register definitions

```

MSB                      LSB
 7 6 5 4 3 2 1 0
-----
0 1 - - - - - Data command
1 0 - - - - - Display control command
1 1 - - - - - Address command

```

7.1 Data Command Set

```

MSB                      LSB
 7 6 5 4 3 2 1 0
-----
0 1 0 0 0 - 0 0 Write display data
0 1 0 0 0 - 1 0 Read key scan data
0 1 0 0 0 0 - - Auto address increment
0 1 0 0 0 1 - - Fixed address

```

7.2 Address command set

```

MSB                      LSB
 7 6 5 4 3 2 1 0
-----
1 1 0 - A A A A Address 0x00..0x0F

```

7.3 Display Control

```

MSB                      LSB
 7 6 5 4 3 2 1 0
-----
1 0 0 0 - 0 0 0 Set the pulse width of 1 / 16
1 0 0 0 - 0 0 1 Set the pulse width of 2 / 16
1 0 0 0 - 0 1 0 Set the pulse width of 4 / 16
1 0 0 0 - 0 1 1 Set the pulse width of 10 / 16
1 0 0 0 - 1 0 0 Set the pulse width of 11 / 16
1 0 0 0 - 1 0 1 Set the pulse width of 12 / 16
1 0 0 0 - 1 1 0 Set the pulse width of 13 / 16
1 0 0 0 - 1 1 1 Set the pulse width of 14 / 16
1 0 0 0 0 - - - Display off
1 0 0 0 1 - - - Display on

```


Index

- clear
 - TM1638, [8](#)
- getKeyScan
 - TM1638, [8](#)
- readByte
 - TM1638, [8](#)
- setBrightness
 - TM1638, [9](#)
- src/TM1638.cpp, [11](#)
- src/TM1638.h, [11](#)
- TM1638, [7](#)
 - clear, [8](#)
 - getKeyScan, [8](#)
 - readByte, [8](#)
 - setBrightness, [9](#)
 - TM1638, [8](#)
 - writeByte, [9](#)
 - writeCommand, [9](#)
 - writeDisplayRegister, [10](#)
- writeByte
 - TM1638, [9](#)
- writeCommand
 - TM1638, [9](#)
- writeDisplayRegister
 - TM1638, [10](#)