

FT8xx Display Controller Board.	
Part Number:	MCIB-18
Version:	1
Date:	23/05/2017
Revision History	
Date	Description of change
23/05/2017	First draft

MCIB-18 FT8xx Display Controller Board

Overview & Features

The MCIB-18 is a display controller board based on the FT8xx IC. Designed to enable complex graphics solutions to be achieved via a simple serial interface, the board is ideal for connecting a range of Midas TFT displays.



Features

- FT8xx Display controller IC.
- Built in display memory, character fonts and dynamic widgets.
- 40 way 0.5mm pitch FFC TFT display connector.
- Resistive or Capacitive touch interface.
- Serial SPI or I2C interface selectable via solder jumpers.
- On board programmable constant current LED backlight driver.
- Integrated PWM control of backlight brightness.
- Mechanical dimensions 31 x 33.5 x 5 mm.
- Pin compatible with the following Midas displays:

MCT035S	3.5"	320 x 240
MCT043J	4.3"	480 x 272
MCT050	5.0"	800 x 480
MCT070	7.0"	800 x 480

Other Midas TFT displays can be connected using a simple interface board.

Connections

J1 12 POSITION 0.1" PITCH SOLDER PADS	Symbol	Description
1	5V	5.0V Supply for LED Backlight circuit
2	3.3V	3.3V Supply to FT8xx circuit
3	GND	0V / ground
4	SCLK/SCL	Serial Clock
5	MISO/SDA	Serial Data
6	MOSI/SAO	Serial Data / I2C Address
7	#CS/SA1	Chip select / I2C address
8	GPIO0/SA2/IO2	GPIO / I2C address
9	GPIO1/IO3	GPIO
10	#INT	FT8xx interrupt output
11	U3 (SCL)	Serial Clock Programmable BL
12	U3 (SDA)	Serial Data Programmable BL

J2 40Pin 0.5mm pitch Display Connector (Top contact)	Symbol	Description
1	K	LED Backlight -
2	A	LED Backlight +
3	#CS	Chip Select (NC)
4	VDD	+3.3V supply
5	R0	Red Data 0
6	R1	Red Data 1
7	R2	Red Data 2
8	R3	Red Data 3
9	R4	Red Data 4
10	R5	Red Data 5
11	R6	Red Data 6
12	R7	Red Data 7
13	G0	Green Data 0
14	G1	Green Data 1
15	G2	Green Data 2
16	G3	Green Data 3
17	G4	Green Data 4
18	G5	Green Data 5
19	G6	Green Data 6
20	G7	Green Data 7
21	B0	Blue Data 0
22	B1	Blue Data 1
23	B2	Blue Data 2
24	B3	Blue Data 3
25	B4	Blue Data 4
26	B5	Blue Data 5
27	B6	Blue Data 6
28	B7	Blue Data 7
29	GND	Ground
30	PCLK	Pixel Clock
31	DISP	Display On
32	HSYNC	Horizontal Sync
33	VSYNC	Vertical Sync
34	DEN	Display Enable
35	SCL	Serial Clock (NC)
36	SDA	Serial Data (NC)
37	XR	Touch XR
38	YD	Touch YD
39	XL	Touch XL
40	YU	Touch YU

Electrical Specifications

Absolute Maximum Ratings		
Operating temperature	-20 to +85	°C
Storage temperature	-40 to +125	°C
3.3V input	4.0	V
5.0V input	6.0	V
CN2 inputs and outputs w.r.t VSS	-0.3 to VIN+0.3	V

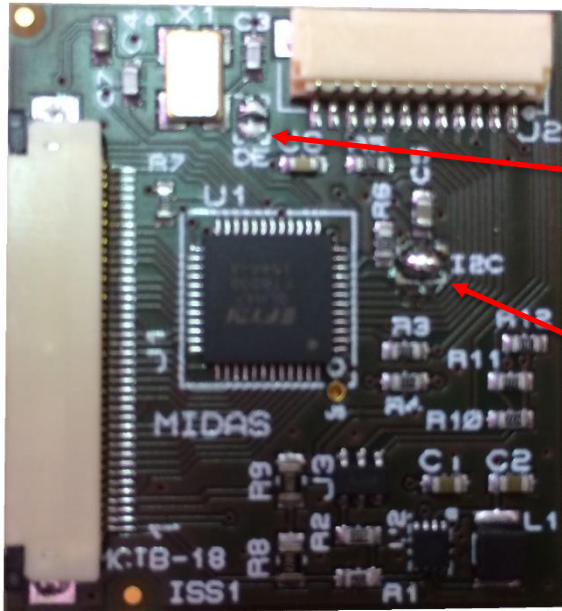
Typical Electrical Characteristics				
Parameter	Min	Typ	Max	Unit
Supply Voltage 3.3V	3.0	3.3	3.6	V
Supply Voltage 5.0V	4.75	5.0	5.5	V
Supply Current 3.3V (board only)	-	24	-	mA
Supply Current 5.0V (Backlight current set to 20mA at 19V)	-	95	-	mA
LED Backlight voltage	-	-	34	V
LED Backlight current	-	-	180	mA

LED Backlight Current

The LED Backlight is driven by a constant current circuit which can be set for various currents via an I2C interface, once programmed the output will remain at the programmed setting. Contact Midas for more details.

Solder Links on PCB

There are 2 solder links on the PCB to set various options.



Link for DE, open for DE --> 100K --> GND.

Link for I2C, open for SPI.

Raspberry Pi Application

Below is an example of a two C functions for writing text and numbers .

Please Visit FTDI's web site for further information on the FT800.

<http://www.ftdichip.com/Products/ICs/FT800.html>

Note: I2C address = 0,0,1,0,0,A2,A1,A0 default = 0x22.

```
/* Send CMD TEXT routine 19/1/16
```

```
* Enter with STRING, X position, Y position, OPTION, FONT, colour
```

```
* OPTION: CenteredX=512, CenteredY=1024, CenteredXY=1536, RightX=2048.
```

```
* FONT: 0 to 14 = UDF, 15 = Reserved for buttons etc, 16 to 31 = Font.
```

```
* Assumes cmdOffset already defined.
```

```
*/
```

```
//Enter with STRING, X position, Y position, OPTION, FONT, Colour
```

```
send_cmd_text(char *text, int x, int y, int opt, int font, long colour)
```

```
{
    int p;
    int l=strlen(text);

    ft800memWrite32(RAM_CMD + cmdOffset, (DL_COLOR_RGB | colour));
    cmdOffset = incCMDOffset(cmdOffset, 4); // Update the command pointer

    ft800memWrite32(RAM_CMD + cmdOffset, (CMD_TEXT)); //Send TEXT command.
    cmdOffset = incCMDOffset(cmdOffset,4);
    ft800memWrite32(RAM_CMD + cmdOffset, (y<<16)+x); //As little endian send yyyxxxxx.
    cmdOffset = incCMDOffset(cmdOffset,4);
    ft800memWrite32(RAM_CMD + cmdOffset, (opt<<16)+font); //option then font
    cmdOffset = incCMDOffset(cmdOffset,4);

    for(p=0;p<l;p++)
    {
        ft800memWrite8(RAM_CMD + cmdOffset,text[p]); //output string
        cmdOffset = incCMDOffset(cmdOffset,1);
    }
    switch(l%4)
    {
        case 1: ft800memWrite8(RAM_CMD + cmdOffset,0x00); //Pack zeros into remaining memory
                cmdOffset = incCMDOffset(cmdOffset,1);
        case 2: ft800memWrite8(RAM_CMD + cmdOffset,0x00); //to fill up to a 4 byte boundary
                cmdOffset = incCMDOffset(cmdOffset,1);
        case 3: ft800memWrite8(RAM_CMD + cmdOffset,0x00);
                cmdOffset = incCMDOffset(cmdOffset,1);
                break;
        case 0: ft800memWrite32(RAM_CMD + cmdOffset,0x00); //Then send a 4 byte null to terminate string.
                cmdOffset = incCMDOffset(cmdOffset,4);
        default: break;
    }
}
```



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```

/* Send CMD NUMBER routine 19/1/16
* Enter with NUMBER, X position, Y position, OPTION, FONT, colour
* OPTION: CenteredX=512, CenteredY=1024, CenteredXY=1536, RightX=2048.
* FONT: 0 to 14 = UDF, 15 = Reserved for buttons etc, 16 to 31 = Font.
* Assumes cmdOffset already defined.
*/
//Enter with STRING, X position, Y position, OPTION, FONT, Colour

send_cmd_number(long num, int x, int y, int opt, int font, long colour)
{
    ft800memWrite32(RAM_CMD + cmdOffset, (DL_COLOR_RGB | colour));
    cmdOffset = incCMDOffset(cmdOffset, 4); // Update the command pointer

    ft800memWrite32(RAM_CMD + cmdOffset, (CMD_NUMBER)); //Send TEXT command.
    cmdOffset = incCMDOffset(cmdOffset,4);
    ft800memWrite32(RAM_CMD + cmdOffset, (y<<16)+x); //As little endian send yyyyxxx.
    cmdOffset = incCMDOffset(cmdOffset,4);
    ft800memWrite32(RAM_CMD + cmdOffset, (opt<<16)+font); //option then font
    cmdOffset = incCMDOffset(cmdOffset,4);
    ft800memWrite32(RAM_CMD + cmdOffset, num); //number
    cmdOffset = incCMDOffset(cmdOffset,4);
}

```

4.3" TFT Connection Example

