TFT Touch Shield

2.4 inch, 2.8 inch and 3.2 inch LCD with touch library

Manual

PREFACE:

This library is the communication of my shield 2.4 UTFT LCD shield,2.8 UTFT LCD shield and 3.2 UTFT LCD shield.

This library supports a number of 8 bit and 16 bit LCD shield, and it will work with arduino Leonardo, arduino atmega 328 , arduino ADK and 2560.

When using 8 bit and 16 bit display shield these are some requirements you must adhere to. The requirements can be found in the document LCDTouch_requirements.

DEFINED LITERALS:

Choose the size of LCD

LCDUTFT():

Parameters:

LCD2_4: 2.4 inch LCD

LCD2_8: 2.8 inch LCD

LCD3_2: 3.2 inch LCD

Initialise the LCD

Lcd_Init();

Parameters:NULL

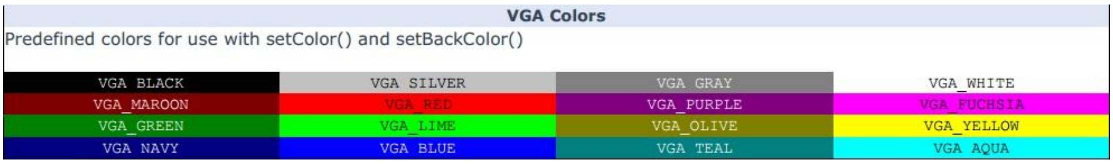
Set VGA Colors

setColor() and setBackColor();

Parameters: r: Red component of an RGB value (0-255)

g: Green component of an RGB value (0-255)

b: Blue component of an RGB value (0-255)

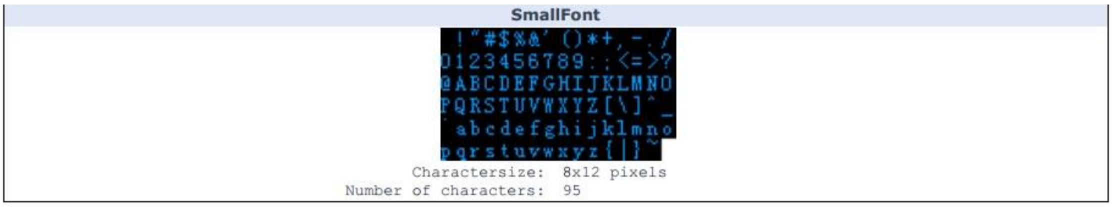


VGA Colors

Predefined colors for use with setColor() and setBackColor()

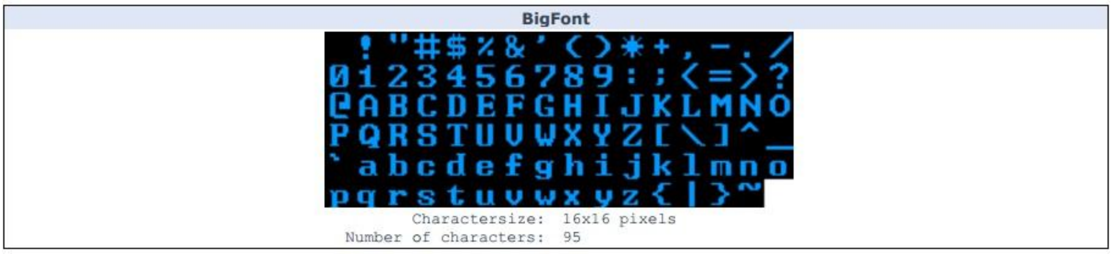
VGA_BLACK	VGA_SILVER	VGA_GRAY	VGA_WHITE
VGA_MAROON	VGA_RED	VGA_PURPLE	VGA_FUCHSIA
VGA_GREEN	VGA_LIME	VGA_OLIVE	VGA_YELLOW
VGA_NAVY	VGA_BLUE	VGA_TEAL	VGA_AQUA

INCLUDED FONTS:



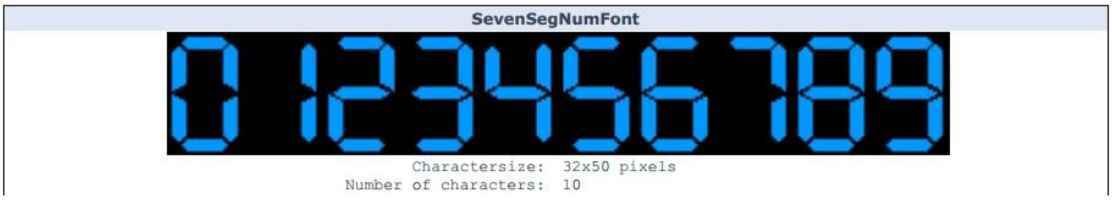
SmallFont

```
   Charactersize:  8x12 pixels
Number of characters:  95
```



BigFont

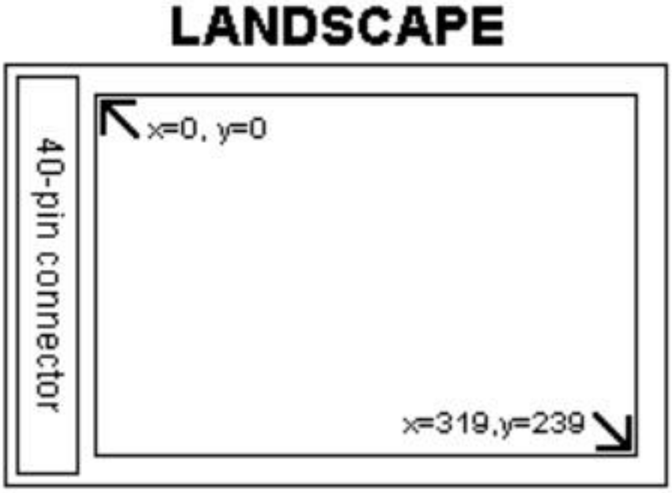
```
   Charactersize:  16x16 pixels
Number of characters:  95
```



SevenSegNumFont

```
   Charactersize:  32x50 pixels
Number of characters:  10
```

Display orientarion:



FUNCTIONS:

LCDUTFT();

Set the size of the LCD.

Parameters: LCD2_4(for 2.4 inch LCD);

LCD2_8(for 2.8 inch LCD);

LCD3_2(for 3.2 inch LCD);

Usage: TouchPPP.LCDTouch (LCD2_8); // Start an instance of the 2.8 inch LCD;

Lcd_Init ();

Initialize the LCD.

Parameters: NULL

Usage: TouchPPP.Lcd_Init (); // Initialize the display

getDisplayXSize();

Get the width of the screen.

Parameters: None

Returns: Width of the screen in pixels

Usage: Xsize = TouchPPP.getDisplayXSize(); // Get the width

getDisplayYSize();

Get the height of the screen.

Parameters: None

Returns: Height of the screen in pixels

Usage: Ysize = TouchPPP.getDisplayYSize(); // Get the height

clrScr();

Clear the screen. The background-color will be set to black.

Parameters: None

Usage: TouchPPP.clrScr(); // Clear the screen to black.

fillScr(r, g, b);

Fill the screen with a specified color.

Parameters:

r: Red component of an RGB value (0-255)

g: Green component of an RGB value (0-255) b: Blue component of an RGB value (0-255)

Usage: TouchPPP.fillScr(255,127,0); // Fill the screen with orange

fillScr(color);

Fill the screen with a specified pre-calculated RGB565 color.

Parameters: color: RGB565 color value

Usage: TouchPPP.fillScr(0x0000); // Fill the screen with black

setColor(r, g, b);

Set the color to use for all draw*, fill* and print commands.

Parameters:

r: Red component of an RGB value (0-255);

g: Green component of an RGB value (0-255);

b: Blue component of an RGB value (0-255);

Usage: TouchPPP.setColor(0,255,255); // Set the color to cyan.

setColor(color);

Parameters:

color: RGB565 color value

Usage: TouchPPP.setColor(0x0000); // Set the color to black

getColor();

Get the currently selected color.

Parameters: None

Returns: Currently selected color as a RGB565 value (word)

Usage:Color = TouchPPP.getColor(); // Get the current color

setBackColor(r, g, b);

Set the background color to use for all print commands.

Parameters:

r: Red component of an RGB value (0-255)

g: Green component of an RGB value (0-255)

b: Blue component of an RGB value (0-255)

Usage: TouchPPP.setBackColor(255,255,255); // Set the background color to white

setBackColor(color);

Set the specified pre-calculated RGB565 background color to use for all print commands.

Parameters:

color: RGB565 color value

Usage: TouchPPP.setBackColor(0xffff); // Set the background color to white

getBackColor();

Get the currently selected background color.

Parameters: None

Returns: Currently selected background color as a RGB565 value (word)

Usage: BackColor = TouchPPP.getBackColor(); // Get the current background color

drawPixel(x, y);

Draw a single pixel.

Parameters:

x: x-coordinate of the pixel

y: y-coordinate of the pixel

Usage: TouchPPP.drawPixel(119,159); // Draw a single pixel

drawLine(x1, y1, x2, y2);

Draw a line between two points.

Parameters:

x1: x-coordinate of the start-point

y1: y-coordinate of the start-point

x2: x-coordinate of the end-point

y2: y-coordinate of the end-point

Usage: TouchPPP.drawLine(0,0,239,319); // Draw a diagonal line

drawRect(x1, y1, x2, y2);

Draw a rectangle between two points.

Parameters:

x1: x-coordinate of the start-corner

y1: y-coordinate of the start-corner

x2: x-coordinate of the end-corner

y2: y-coordinate of the end-corner

Usage: TouchPPP.drawRect(119,159,239,319); // Draw a rectangle

drawRoundRect(x1, y1, x2, y2);

Draw a rectangle with slightly rounded corners between two points. The minimum size is 5 pixels in both directions. If a smaller size is requested the rectangle will not be drawn.

Parameters:

x1: x-coordinate of the start-corner

y1: y-coordinate of the start-corner

x2: x-coordinate of the end-corner

y2: y-coordinate of the end-corner

Usage: TouchPPP.drawRoundRect(0,0,119,159); // Draw a rounded rectangle

fillRect(x1, y1, x2, y2);

Draw a filled rectangle between two points.

Parameters:

x1: x-coordinate of the start-corner

y1: y-coordinate of the start-corner

x2: x-coordinate of the end-corner

y2: y-coordinate of the end-corner

Usage: TouchPPP.fillRect(119,0,239,159); // Draw a filled rectangle

fillRoundRect(x1, y1, x2, y2);

Draw a filled rectangle with slightly rounded corners between two points. The minimum size is 5 pixels in both directions. If a smaller size is requested the rectangle will not be drawn.

Parameters:

x1: x-coordinate of the start-corner

y1: y-coordinate of the start-corner

x2: x-coordinate of the end-corner

y2: y-coordinate of the end-corner

Usage: TouchPPP.fillRoundRect(0,159,119,319); // Draw a filled, rounded rectangle

drawCircle(x, y, radius);

Draw a circle with a specified radius.

Parameters:

x: x-coordinate of the center of the circle

y: y-coordinate of the center of the circle

radius: radius of the circle in pixels

Usage: TouchPPP.drawCircle(119,159,20); // Draw a circle with a radius of 20 pixels

fillCircle(x, y, radius);

Draw a filled circle with a specified radius.

Parameters:

x: x-coordinate of the center of the circle

y: y-coordinate of the center of the circle

radius: radius of the circle in pixels

Usage: TouchPPP.fillCircle(119,159,10); // Draw a filled circle with a radius of 10 pixels

print(st, x, y, [deg]);

Print a string at the specified coordinates. An optional background color can be specified. Default background is black. You can use the literals LEFT, CENTER and RIGHT as the x-coordinate to align the string on the screen.

Parameters:

st: the string to print

x: x-coordinate of the upper, left corner of the first character

y: y-coordinate of the upper, left corner of the first character

deg: <optional>Degrees to rotate text (0-359). Text will be rotated around the upper left corner.

Usage: TouchPPP.print(“Hello, World!”,CENTER,0); // Print “Hello, World!”

printNumI(num, x, y[, length[, filler]]);

Print an integer number at the specified coordinates. An optional background color can be specified. Default background is black. You can use the literals LEFT, CENTER and RIGHT as the x-coordinate to align the string on the screen.

Parameters:

num: the value to print (-2,147,483,648 to 2,147,483,647) integers only;

x: x-coordinate of the upper, left corner of the first digit/sign

y: y-coordinate of the upper, left corner of the first digit/sign length: <optional>minimum number of digits/characters (including sign) to display

filler: <optional>filler character to use to get the minimum length. The character will be inserted in front of the number, but after the sign. Default is ' ' (space).

Usage: TouchPPP.printNumI(num,CENTER,0,0); // Print the value of “num”

printNumF(num, dec, x, y[, divider[, length[, filler]]]);

Print a floating-point number at the specified coordinates. An optional background color can be specified. Default background is black. You can use the literals LEFT, CENTER and RIGHT as the x-coordinate to align the string on the screen.

WARNING: Floating point numbers are not exact, and may yield strange results when compared. Use at your own discretion.

Parameters:

num: the value to print (See note)

dec: digits in the fractional part (1-5) 0 is not supported. Use printNumI() instead.

x: x-coordinate of the upper, left corner of the first digit/sign

y: y-coordinate of the upper, left corner of the first digit/sign

divider: <Optional>Single character to use as decimal point. Default is '.'

length:<optional>minimum number of digits/characters (including sign) to display

filler:<optional>filler character to use to get the minimum length. The character will be inserted in front of the number, but after the sign. Default is ' ' (space).

Usage: TouchPPP.printNumF(num, 3, CENTER,0,0); // Print the value of “num” with 3 fractional digits

Notes:Supported range depends on the number of fractional digits used. Approx range is +/- 2*(10^(9-dec))

setFont(x,y,offset);

Select font to use with print(), printNumI() and printNumF().

Parameters:

X: The x seize of the Font;

Y: The Y size of the Font;

Offset: We set it to 32;

Usage: TouchPPP.setFont(16,16,32); // Select the font called BigFont

getFont();

Get the currently selected font.

Parameters: None

Returns: Currently selected font

Usage: CurrentFont = TouchPPP.getFont(); // Get the current font

getFontXsize();

Get the width of the currently selected font.

Parameters: None

Returns: Width of the currently selected font in pixels

Usage: Xsize = TouchPPP.getFontXsize (); // Get font width

getFontYsize();

Get the height of the currently selected font.

Parameters: None

Returns: Height of the currently selected font in pixels

Usage: Ysize = TouchPPP.getFontYsize (); // Get font height

drawBitmap (x, y, sx, sy, data[scale]);

Draw a bitmap on the screen.

Parameters:

x: x-coordinate of the upper, left corner of the bitmap

y: y-coordinate of the upper, left corner of the bitmap

sx: width of the bitmap in pixels

sy: height of the bitmap in pixels

data: array containing the bitmap-data

scale: <optional>Scaling factor. Each pixel in the bitmap will be drawn as <scale>x<scale> pixels on screen.

Usage: TouchPPP.drawBitmap(0, 0, 32, 32, bitmap); // Draw a 32x32 pixel bitmap

drawBitmap (x, y, sx, sy, data, deg, rox, roy);

Draw a bitmap on the screen with rotation.

Parameters:

x: x-coordinate of the upper, left corner of the bitmap y: y-coordinate of the upper, left corner of the bitmap

sx: width of the bitmap in pixels

sy: height of the bitmap in pixels

data: array containing the bitmap-data

deg: Degrees to rotate bitmap (0-359)

rox: x-coordinate of the pixel to use as rotational center relative to bitmaps upper left corner

roy: y-coordinate of the pixel to use as rotational center relative to bitmaps upper left corner

Usage: TouchPPP.drawBitmap(50, 50, 32, 32, bitmap, 45, 16, 16); // Draw a bitmap rotated 45 degrees around its center

For Touch:

Touch_Init ();

Initialize the touch screen.

Parameters:NULL

Returns: Nothing

Usage: myTouch.Touch_Init ();// Initialize the touch screen

Touch_DataAvailable();

Check to see if new data from the touch screen is waiting.

Parameters: None

Returns:NULL

Boolean: true means data is waiting, otherwise false

Usage: check = myTouch.Touch_DataAvailable() // See if data is waiting

Touch_Read();

Read waiting data from the touch screen. This function should be called if dataAvailable() is true. Use Touch_GetX() and Touch_GetY() to get the coordinates.

Parameters: None

Returns: Touch read data;

Usage: myTouch.Touch_Read(); // Read data from touch screen

Notes: After calling read(), raw data from the touch screen is available in the variables TP_X and TP_Y. Do not use these if you do not know how to handle the raw data. Use Touch_GetX() and

Touch_GetY() instead.

Touch_GetX();

Get the x-coordinate of the last position read from the touch screen.

Parameters: None

Returns: Integer

Usage: x = myTouch.Touch_GetX(); // Get the x-coordinate

Touch_GetY();

Get the y-coordinate of the last position read from the touch screen.

Parameters: None

Returns: Integer

Usage: y = myTouch.Touch_GetY(); // Get the y-coordinate

Touch_SetPrecision(precision);

Set the precision of the touch screen.

Parameters: precision: PREC_LOW, PREC_MEDIUM, PREC_HI, PREC_EXTREME

Returns: Nothing

Usage: myTouch.Touch_SetPrecision(PREC_MEDIUM); // Set precision to medium