

 bigtreetech / BIGTREETECH-TouchScreenFirmware

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support TFT35 V1.0/V1.1/V1.2/V2.0/V3.0, TFT28, TFT24 V1.1, TFT43, TFT50, TFT70

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 bigtreetech  Update prebuilt binaries and config 07b119f · 2 weeks ago 

File	Commit Message	Time Ago
.devcontainer	Create Devcontainer for VSCode (#1447)	4 years ago
.github	 Update Actions versions (#2918)	3 months ago
Bootloaders	Add support for MKS GB boards. (#2886)	4 months ago
Copy to SD Card root directory to update	 Update prebuilt binaries and config	2 weeks ago
TFT/src	 Update Marlin Mode defaults (#2924)	2 weeks ago
buildroot	code reduction & cleanup (#2920)	3 months ago
images	Add support for settings update through config...	4 years ago
include	first commit	5 years ago
readme	update customize fonts doc	3 years ago
.editorconfig	Use LF line endings (#911)	4 years ago
.gitignore	Updated extruder tuning, max brightness on me...	4 years ago
LICENSE	Create LICENSE	4 years ago
README.md	Buzzer based on HW Event (#2897)	4 months ago
coding_standard.md	code reduction & cleanup (#2920)	3 months ago
config_instructions.md	Spelling fixes (#811)	4 years ago
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## BigTreeTech TFT Touchscreen

license [GPL-3.0](#) contributors [112](#) release date [may](#)  Build Binaries  passing

Important information related to BigTreeTech's TFT touchscreen 3D printer controllers



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## Supported Screens

Only the TFTs listed below are currently supported. Trying to install the firmware on a TFT which is not supported can harm the hardware.

### BTT TFT

```
BTT_TFT24_V1.1
BTT_TFT28_V1.0 and V3.0
BTT_TFT35_V1.0, V1.1, V1.2, V2.0, V3.0, E3_V3.0 and B1_V3.0
BTT_TFT43_V3.0
BTT_TFT50_V3.0
BTT_TFT70_V3.0
```

### BTT GD TFT

```
BTT_GD_TFT24_V1.1
BTT_GD_TFT35_V2.0, V3.0, E3_V3.0 and B1_V3.0
BTT_GD_TFT43_V3.0
BTT_GD_TFT50_V3.0
BTT_GD_TFT70_V3.0
```

### MKS TFT

```
MKS_TFT28_V3.0 and V4.0
MKS_TFT28_NEW_GENIUS
MKS_TFT32_V1.3 and V1.4
MKS_TFT32L_V3.0
MKS_TFT35_V1.0
```

### MKS GD TFT

```
MKS_GD_TFT28_V1.2-4 (V1.2 and V1.4)
```

**WARNING:** BTT does not officially provide MKS TFT hardware support. MKS TFT is maintained by open source contributors and BTT does not bear any risk of MKS TFT hardware using this firmware.

## Software Repository

Firmware source: <https://github.com/bigtreeTech/BIGTREETECH-TouchScreenFirmware>

Main branch: **Master**

In the **Master** branch you will find:

- The most recent source code updates
- The most recent resources such as precompiled firmwares, themes, configuration and language files

**IMPORTANT NOTE:** The **Master** branch is currently the **ONLY** branch in the project to be used. The other currently existing branches **develop** and **release-xx.27** are outdated and **MUST NOT** be used.

## Marlin Dependencies

Minimum Marlin firmware version: 2.1.1

Distribution date: 2022-09-22

Firmware source: <https://github.com/MarlinFirmware/Marlin/releases>

To use all the features and functionalities supported by the TFT, the following options must be enabled in Marlin firmware.

**General options which MUST be always activated:**

EEPROM\_SETTINGS (in Configuration.h)  
BABYSTEPPING (in Configuration\_adv.h)  
AUTO\_REPORT\_TEMPERATURES (in Configuration\_adv.h)  
AUTO\_REPORT\_POSITION (in Configuration\_adv.h)  
EXTENDED\_CAPABILITIES\_REPORT (in Configuration\_adv.h)  
M115\_GEOMETRY\_REPORT (in Configuration\_adv.h)  
M114\_DETAIL (in Configuration\_adv.h)  
REPORT\_FAN\_CHANGE (in Configuration\_adv.h)

**Options to support printing from onboard media:**

SDSUPORT (in Configuration.h)  
LONG\_FILENAME\_HOST\_SUPPORT (in Configuration\_adv.h)  
AUTO\_REPORT\_SD\_STATUS (in Configuration\_adv.h)  
SDCARD\_CONNECTION\_ONBOARD (in Configuration\_adv.h)

**Options to support dialog with host:**

EMERGENCY\_PARSER (in Configuration\_adv.h)  
SERIAL\_FLOAT\_PRECISION 4 (in Configuration\_adv.h)  
HOST\_ACTION\_COMMANDS (in Configuration\_adv.h)

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**Options to support M73 with host:**

Options to support dialog with host (as pre requisite)  
SET\_PROGRESS\_MANUALLY (in Configuration\_adv.h)  
M73\_REPORT (in Configuration\_adv.h)

**Options to support ADVANCED\_OK with host:**

ADVANCED\_OK (in Configuration\_adv.h)

**Options to support M600 with host & (Un)Load menu:**

Options to support dialog with host (as pre requisite)  
NOZZLE\_PARK\_FEATURE (in Configuration.h)  
ADVANCED\_PAUSE\_FEATURE (in Configuration\_adv.h)  
PARK\_HEAD\_ON\_PAUSE (in Configuration\_adv.h)  
FILAMENT\_LOAD\_UNLOAD\_GCODES (in Configuration\_adv.h)

**Options to fully support Bed Leveling menu:**

Z\_MIN\_PROBE\_REPEATABILITY\_TEST (in Configuration.h)

G26\_MESH\_VALIDATION (in Configuration.h)

Z\_STEPPER\_AUTO\_ALIGN (in Configuration\_adv.h)

## Connecting the TFT to the Mainboard

### Touch Mode Setup

In order to use the Touch Mode on your screen:

1. Connect the 5pin serial cable according to the manual of your mainboard
2. Define a serial port in Marlin, to activate the port used by the TFT
3. Make sure the same BAUDRATE is defined on both the Marlin and TFT firmwares

In case one of the three points above is not properly done, the message:

No printer attached!

will be shown at the top of the screen. This is because the TFT can not "see" the mainboard through the serial cable.

### Setting the Baudrate on the TFT Firmware

On TFT firmware, the baudrate can be changed in two ways:

- by menu: After the firmware is installed, the baudrate can be changed from **Menu->Settings->Connection->S. Ports** menu
- by configuration file: Set the parameter `serial_port` in `config.ini` file with the proper baudrate (e.g. `serial_port:P1:6` for baudrate 115200). Please, see [Configuration](#) section for configuring `config.ini` file

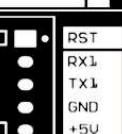
### Marlin Mode Setup

In order to use the Marlin Mode (emulation mode) on your screen:

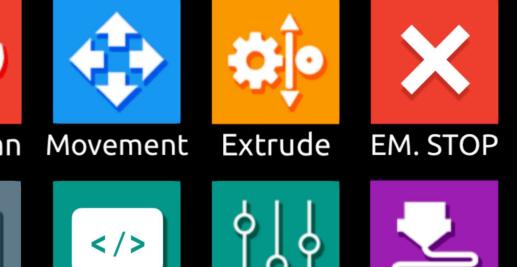
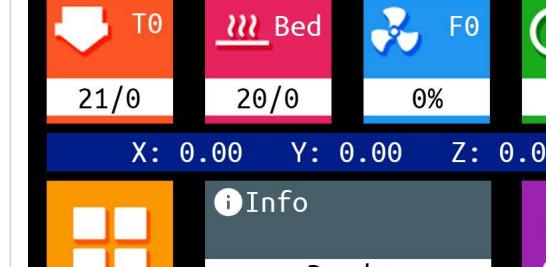
1. In case your TFT does **not** have an EXP connector at all (TFT28 v1 for example), you can not use the Marlin emulator mode.
2. In case your mainboard provides **EXP1 and EXP2**, you have to connect 2 ribbon cables connecting EXP1 and EXP2 of the mainboard to EXP1 and EXP2 of the TFT. In the Marlin firmware of your mainboard, make sure that **ONLY REPRAP\_DISCOUNT\_FULL\_GRAPHIC\_SMART\_CONTROLLER** is activated in `Configuration.h` and that all other controllers are **Deactivated** (especially `CR10_STOCKDISPLAY`).
3. In case you have an "**E3**" mainboard which provides a **single EXP connector**, you have to connect 1 ribbon cable connecting EXP of the mainboard to EXP3 of the TFT. In case your TFT does **not** provide an EXP3 connector but only two 10pin connectors (TFT24 v1.1 for example) you will need a "Y-split" cable with one 10pin connector on one side (for the mainboard) and two 10pin connectors on the other side (for the TFT). In the Marlin firmware of your mainboard, make sure that **ONLY CR10\_STOCKDISPLAY** is activated in `Configuration.h` and that all other controllers are **Deactivated** (especially `REPRAP_DISCOUNT_FULL_GRAPHIC_SMART_CONTROLLER`).

CONNECTIONS					
BTT TFT2.8	RS232				<i>Touchscreen support only</i>
BTT TFT24 V1.1	RS232	EXP1	EXP2		<i>Touchscreen support only</i>
BTT TFT35 V1.2	RS232				<i>Touchscreen support only</i>
BTT TFT35 V2.0	RS232				<i>Only supports Marlin Mode</i>
BTT MINI 12864 V1.0		EXP1	EXP2		
BTT TFT35 V3.0	RS232	EXP1	EXP2	EXP3	
BTT TFT35 E3 V3.0	RS232	EXP1	EXP2	EXP3	
BTT TFT35 MZ V3.0	RS232	EXP1	EXP2	EXP3	
BTT TFT43 V3.0	RS232	EXP1	EXP2	EXP3	
BTT TFT50 V3.0	RS232	EXP1	EXP2	EXP3	
BTT TFT70 V3.0	RS232	EXP1	EXP2	EXP3	
<b>Note the single wire RST</b>					
		TFT   0	EXP1	EXP2	MAINBOARD
		TFT   2			SKR Mini V1.1
		TFT   2			SKR Mini E3 V1.0
		TFT   2			SKR Mini E3 V1.2
		TFT   2			SKR Mini E3 V2.0
		TFT   2			SKR Mini MZ V1.0
		TFT   2			SKR-E3-DIP-V1.0
		TFT   0	EXP1	EXP2	SKR-V1.1
		TFT   0	EXP1	EXP2	SKR-V1.3
		TFT   0	EXP1	EXP2	SKR-V1.4
Marlin configuration.h #define SERIAL_PORT_X // change X to the number in the TFT box #define SERIAL_PORT_2 -1 #define BAUDRATE 115200 // this is the default for the TFT's currently					

CONNECTIONS						
BTT TFT2.8	RS232				<i>Touchscreen support only</i>	
BTT TFT24 V1.1	RS232	EXP1	EXP2		<i>Touchscreen support only</i>	
BTT TFT35 V1.2	RS232				<i>Touchscreen support only</i>	
BTT TFT35 V2.0	RS232				<i>Only supports Marlin Mode</i>	
BTT MINI 12864 V1.0		EXP1	EXP2			
BTT TFT35 V3.0	RS232	EXP1	EXP2	EXP3		
BTT TFT35 E3 V3.0	RS232	EXP1	EXP2	EXP3		
BTT TFT35 MZ V3.0	RS232	EXP1	EXP2	EXP3		
BTT TFT43 V3.0	RS232	EXP1	EXP2	EXP3		
BTT TFT50 V3.0	RS232	EXP1	EXP2	EXP3		
BTT TFT70 V3.0	RS232	EXP1	EXP2	EXP3		
<b>Note the single wire RST</b>				MAINBOARD	<b>Marlin configuration.h ONLY DISPLAY UNCOMMENTED FOR MARLIN MODE</b>	
	TFT   0	EXP1	EXP2	SKR-V1.4 Turbo	#define REPRAP_DISCOUNT_FULL_GRAPHIC_SMART_CONTROLLER	
	TFT   1	EXP1	EXP2	SKR 2	#define REPRAP_DISCOUNT_FULL_GRAPHIC_SMART_CONTROLLER	
	TFT   0			EXP1	SKR E3 Turbo	#define CR10_STOCKDISPLAY
	TFT   2			EXP3	SKR CR6	#define CR10_STOCKDISPLAY
	TFT   3	EXP1	EXP2	BTT002 V1.0	#define REPRAP_DISCOUNT_FULL_GRAPHIC_SMART_CONTROLLER	
	TFT   1	EXP1	EXP2	SKR-PRO-V1.1	#define REPRAP_DISCOUNT_FULL_GRAPHIC_SMART_CONTROLLER	
	TFT   1	EXP1	EXP2	SKR-PRO-V1.2	#define REPRAP_DISCOUNT_FULL_GRAPHIC_SMART_CONTROLLER	
	TFT   3	EXP1	EXP2	GTR-V1.0	#define REPRAP_DISCOUNT_FULL_GRAPHIC_SMART_CONTROLLER	
Marlin configuration.h #define SERIAL_PORT X // change X to the number in the TFT box #define SERIAL_PORT_2 -1 #define BAUDRATE 115200 // this is the default for the TFT's currently						

CONNECTIONS				
	RS232	EXP1	EXP2	
BTT TFT2.8	RS232			<i>Touchscreen support only</i>
BTT TFT24 V1.1	RS232	EXP1	EXP2	<i>Touchscreen support only</i>
BTT TFT35 V1.2	RS232			<i>Touchscreen support only</i>
BTT TFT35 V2.0	RS232			<i>Only supports Marlin Mode</i>
BTT MINI 12864 V1.0		EXP1	EXP2	
BTT TFT35 V3.0	RS232	EXP1	EXP2	EXP3
BTT TFT35 E3 V3.0	RS232	EXP1	EXP2	EXP3
BTT TFT35 MZ V3.0	RS232	EXP1	EXP2	EXP3
BTT TFT43 V3.0	RS232	EXP1	EXP2	EXP3
BTT TFT50 V3.0	RS232	EXP1	EXP2	EXP3
BTT TFT70 V3.0	RS232	EXP1	EXP2	EXP3
<hr/>				
<b>Note the single wire RST</b>				<b>Marlin configuration.h ONLY DISPLAY UNCOMMENTED FOR MARLIN MODE</b>
	TFT   1	?	?	MAINBOARD
	TFT   1	EXP1	EXP2	SKR SE BX V1.0
				?
				Octopus V1.0
				#define REPRAP_DISCOUNT_FULL_GRAPHIC_SMART_CONTROLLER
<b>This chart has been provided by user Thomas White</b>	<b>Marlin configuration.h</b> <b>#define SERIAL_PORT X // change X to the number in the TFT box</b> <b>#define SERIAL_PORT_2 -1</b> <b>#define BAUDRATE 115200 // this is the default for the TFT's currently</b>			

## Menus

Status Screen DISABLED	Status Screen ENABLED
 <p>Menu Heat/Fan Movement Extrude EM. STOP Terminal Custom Settings Print</p>	 <p>Ready T0 21/0 20/0 0% X: 0.00 Y: 0.00 Z: 0.00 Bed F0 Sp. Info Ready Menu Print</p>

## Themes

Unified Menu Theme	The Round Miracle Theme by <a href="#">Acenotass</a>
<p>Ready</p> <p>21/0    20/0    0%    100%</p> <p>X: 0.00    Y: 0.00    Z: 0.00</p> <p>Info    Ready    Print</p> <p>Menu</p>	<p>Ready</p> <p>21/0    20/0    0%    100%</p> <p>X: 0.00    Y: 0.00    Z: 0.00</p> <p>Info    Ready    Print</p> <p>Menu</p>
<p>Use firmware, icons, and fonts from the <a href="#">Copy to SD Card root directory to update - Unified Menu Material theme</a> folder</p>	<p>Use firmware, icons, and fonts from the <a href="#">Copy to SD Card root directory to update - The Round Miracle theme</a> folder</p>
Hybrid Red Material Theme by <a href="#">AntoszHUN</a>	Hybrid Mono Material Theme by <a href="#">bepstein111</a>
<p>Ready</p> <p>21/0    20/0    0%    100%</p> <p>X: 0.00    Y: 0.00    Z: 0.00</p> <p>Info    Ready    Print</p> <p>Menu</p>	<p>Ready</p> <p>21/0    20/0    0%    100%</p> <p>X: 0.00    Y: 0.00    Z: 0.00</p> <p>Info    Ready    Print</p> <p>Menu</p>
<p>Use firmware, icons, and fonts from the <a href="#">Copy to SD Card root directory to update - Hybrid Red Menu Material theme</a> folder</p>	<p>Use firmware, icons, and fonts from the <a href="#">Copy to SD Card root directory to update - Hybrid Mono Menu Material theme</a> folder</p>
Rep Rap Firmware Dark Theme by <a href="#">xPew</a>	
<p>Ready</p> <p>21/0    20/0    0%    100%</p> <p>X: 0.00    Y: 0.00    Z: 0.00</p> <p>Info    Ready    Print</p> <p>Menu</p>	
<p>Use firmware, icons, and fonts from the <a href="#">Copy to SD Card root directory to update - Rep Rap Firmware Dark theme</a> folder</p>	

## Firmware Update

The TFT firmware update process is based on the following stages:

1. [Deployment Files](#): All the resources needed for the firmware update (up to four kinds of resources)

2. [Configuration](#): All the changes needed on configuration file before the firmware installation
3. [Installation](#): All the steps needed in order to install the firmware
4. [Post Installation](#): Post installation process in case of major changes applied by the installed firmware

## Deployment Files

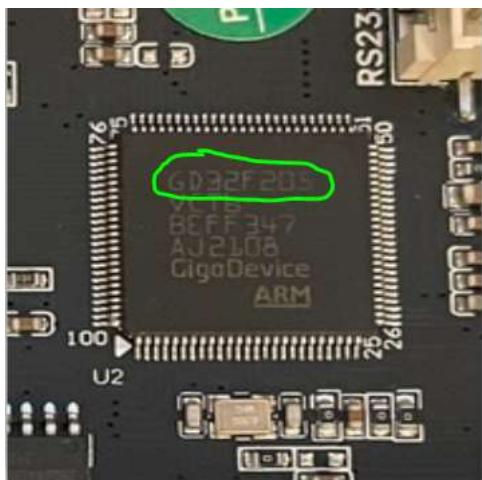
The following sections provide all the resources needed for the firmware update (up to four kinds of resources).

### Firmware Binary

Precompiled firmwares are available on [Copy to SD Card root directory to update](#) folder.

For **BTT TFTs**, the firmwares use the naming convention `BIGTREE_TFT*_V*.*.*.x.bin`.

For **BTT GD TFTs**, the firmwares use the naming convention `BIGTREE_GD_TFT*_V*.*.*.x.bin`



For **MKS TFTs**:

1. The firmwares use the naming convention `MKS_TFT*_V*.*.*.x.bin`
2. Any binary file for an MKS firmware (e.g. `MKS_TFT28_V4.0.27.x.bin`) **MUST** be renamed to `MKSTFT*.bin` (e.g. `MKSTFT28.bin`, `MKSTFT35.bin` etc.) in order it can be recognized and installed by the TFT

For **MKS GD TFTs**:

For MKS TFT28 mounting GD32 MCU (GigaDevice MCU) (like the newest version of Genious Pro), you need to:

1. Rename the right binary (e.g. `MKS_GD_TFT28_V1_2_4.27.x.bin`) to `MKSTFT28EVO.bin`
2. Create an empty file named `MKSTFT28.bin`
3. Create two empty directories named `MKS_FONT` and `MKS_PIC`

For example, for BTT TFT35 V3 select:

`BIGTREE_TFT35_V3.0.27.x.bin`

where:

- `BIGTREE_TFT35` : Model
- `V3.0` : Hardware version
- `27.x` : Software version

NOTE:

For BTT TFT35, there are currently three different kinds of firmware available:

- `V3.0`
- `E3_V3.0`
- `B1_V3.0`

So, make sure to use the firmware matching your TFT screen.

### Fonts and Icons

Themes are available on [Copy to SD Card root directory to update](#) folder.

The root folder for fonts and icons is `TFT*`, where `*` is the size of the TFT (e.g. `TFT24`, `TFT35`, `TFT50` etc). Fonts and icons folder structure:

- `TFT*/font` : Includes the fonts in .fon format and a `readme.md`
- `TFT*/bmp` : Includes the icons in .bmp format and a `readme.md`

For MKS TFT32, the `TFT28` folder has to be used and **MUST** be renamed to `TFT32` in order it can be recognized and installed by the TFT.

## Configuration File

Templates for configuration file are available on [Copy to SD Card root directory to update](#) folder.

The configuration file is named `config.ini`.

**NOTE:** RepRap firmware users have to make their changes using the `config_rrf.ini` template file and renaming it to `config.ini`.

## Optional - Language Files

Optional language files are available on [Copy to SD Card root directory to update/Language Packs](#) folder.

Language files use the naming convention `language_*.ini` (e.g. `language_it.ini`).

## Configuration

The firmware configuration can be modified by changing the `config.ini` (or the renamed `config_rrf.ini`) file using a simple text editor (make sure to use UTF encoding).

A configuration can be uploaded without the need to upload the firmware or the TFT folder again, as long as the firmware and the configuration file are from the same version (see [Configuration Update](#)).

## Editing the Configuration File

**NOTE:** RepRap firmware users have to make their changes using the `config_rrf.ini` template file and renaming it to `config.ini`.

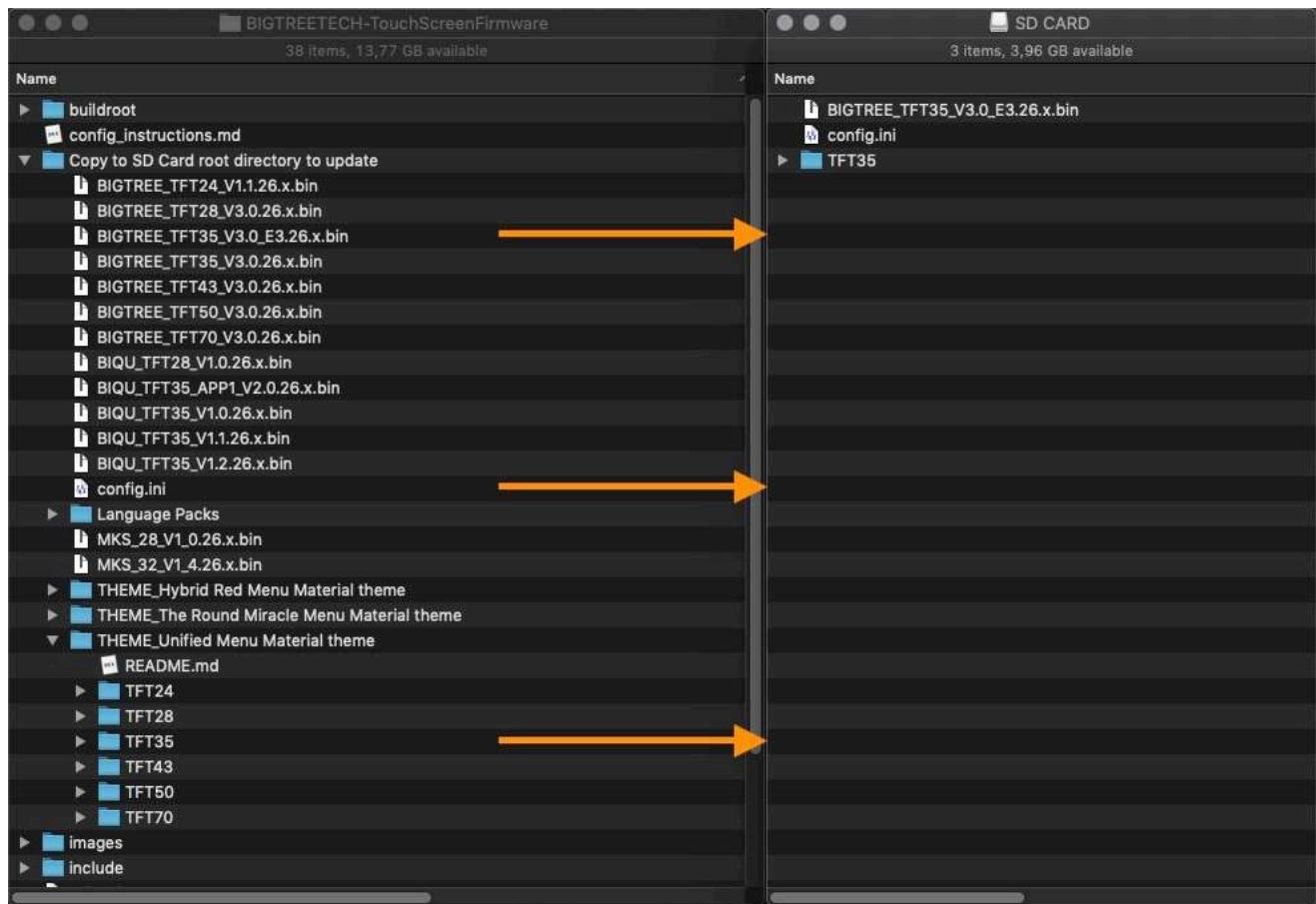
To edit the `config.ini` file, follow the instructions here: [Detailed Instructions](#).

## Installation

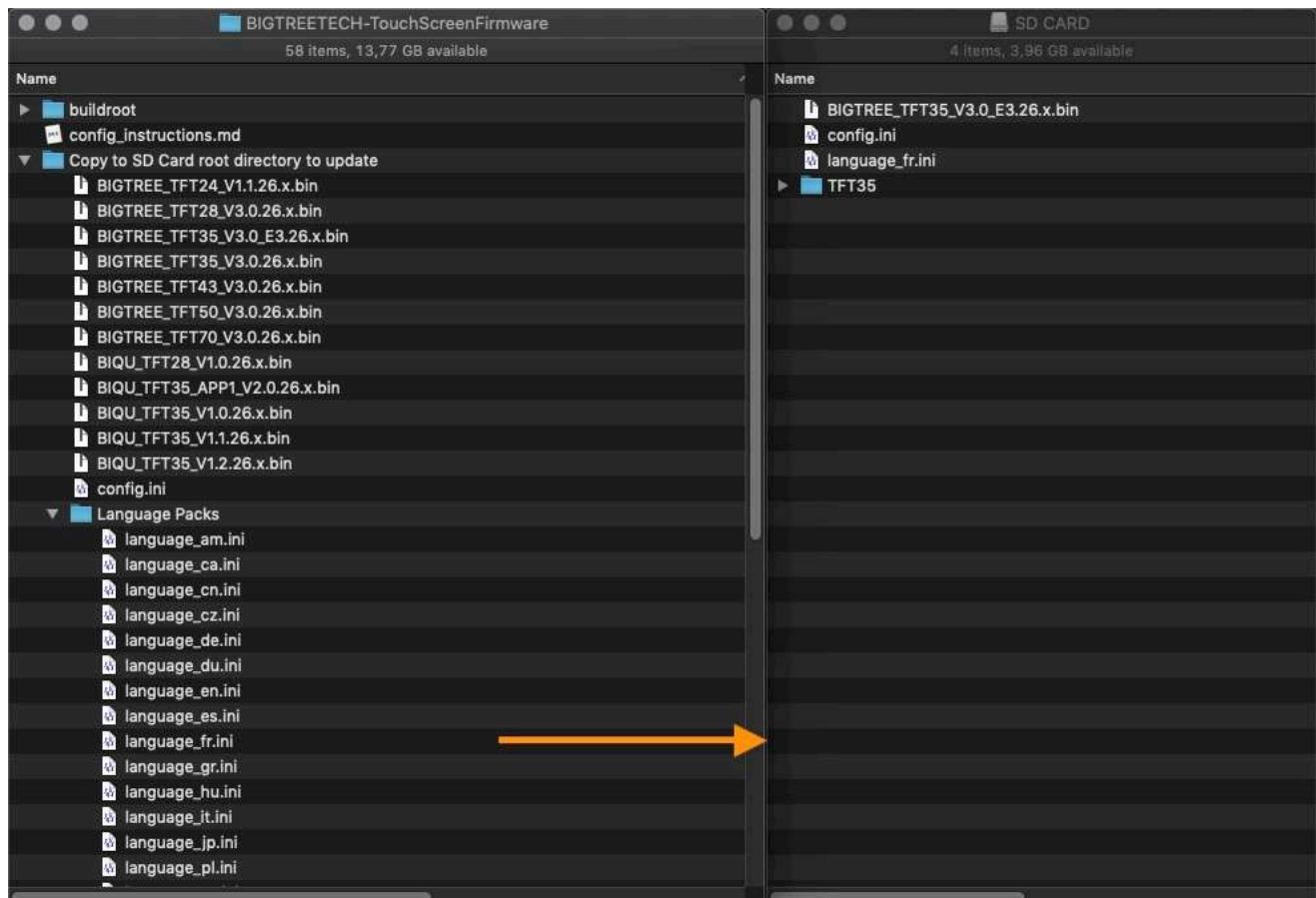
**NOTE:** For devices with USB flash drive support, it is possible to update the **icons**, **fonts**, **config** and the **language** files from a USB flash drive in the same way it is done through an SD card. However, the firmware can only be updated using an SD card.

The following steps are needed in order to install the firmware:

1. Copy the precompiled `BIGTREE_TFT*_V*.*.*.bin` or your self compiled **firmware**, plus the `TFT*` folder of your preferred theme along with `config.ini` to the root of a blank SD card not greater than 8GB and formatted as FAT32:



2. Optionally, copy one or more `language_*.ini` file(s) onto the SD card. Doing so, it will allow you to switch between English and the uploaded language(s) from the Language menu present in the TFT firmware. We recommend to upload the minimum amount of languages to keep the memory usage low. The `language_*.ini` file can be edited to change the text shown on the TFT:

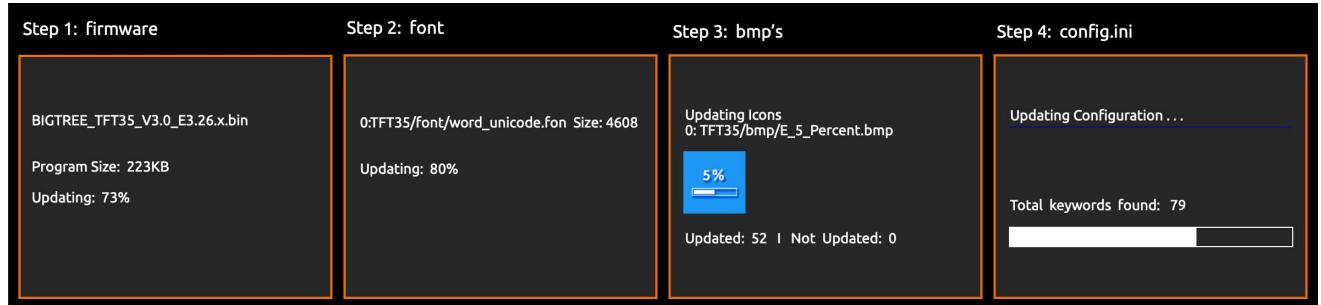


3. Place the SD card with `BIGTREE_TFT*_V**.*.*.bin`, the `TFT*` folder, `config.ini` and the optional `language_*.ini` file(s) into the TFT's SD card reader and reset your TFT (or optionally - power cycle your printer) to start the update process:

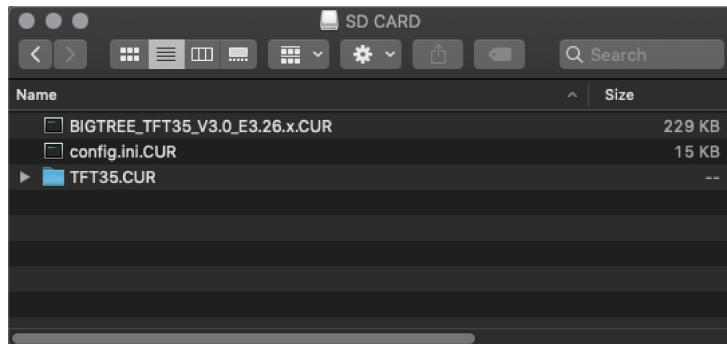
**⚠️** Failing to update your icons & fonts will result in missing icons and/or unreadable text **⚠️**

### Update process shown on TFT screen:

A successful update looks like this on the screen:



... and the name of the elements on the SD card changes to this:



In case one or several parts of the update failed, an error will be shown. Follow the information on the screen to update the missing or outdated elements:



⚠ Errors during the update can not be ignored and must be solved before using the TFT ⚠

After the update is done and the files are renamed, it is possible to reuse them again. To do so, change the name of the element(s) to the pre-update name and start the update process again.

4. After a successful update, the TFT will switch to one of the following menus:

- Main menu: The update is completed and you can use the TFT
- Touch Screen Calibration menu: A post installation process is needed before switching to Main menu. Please, see [Post Installation](#) section for completing the post installation process

**TIP:** Format the SD card after the firmware update in case you would like to print from it.

## Post Installation

In case major changes have been applied by the installed firmware, a post installation process consisting on touch screen calibration is automatically started.

Please, see [Touch Screen Calibration](#) section for completing the process.

## Configuration Update

Please, see [Configuration](#) section for configuring `config.ini` file.

### NOTES:

- For devices with USB flash drive support, it is possible to update the icons, fonts, config and the language files from a USB flash drive in the same way it is done through an SD card. However, the firmware can only be updated using an SD card
- The following procedure can be also applied to any combination of resources (e.g. only icons, icons + fonts, config + language files etc.)

In order to update the firmware configuration:

1. Copy your edited `config.ini` file to the root of the SD card. The SD card capacity should be less than or equal to 8GB and formatted as FAT32
2. Insert the SD card into the TFT's SD card slot and press the reset button of the TFT (or power cycle your printer)
3. The TFT's configuration will update from the configuration file on reboot
4. The `config.ini` file will be renamed to `config.ini.CUR` after updating the configuration

## Touch Screen Calibration

The touch screen calibration process begins showing a white screen with a red dot in the upper right corner and the following text:

Touch Screen Calibration - Please click on the red dot 

Once the process is started, to calibrate the touch screen press (with your finger or a stylus):

1. the red dot in the upper left corner
2. then the red dot in the upper right corner
3. then the red dot in the lower right corner
4. and finally, the black dot in the middle of the screen to finish the calibration

Repeat the process in case the following message is shown:

Adjustment failed, please try again. 

## Forcing the Touch Screen Calibration

The touch screen calibration process can be forced in two ways:

- by menu: The calibration can be started from **Menu->Settings->Screen->TSC Adjust** menu
- by hard reset: The calibration is started at the end of the hard reset process (see [Hard Reset](#))

## Hard Reset

### NOTES:

- The hard reset process is typically used as the last chance when the firmware is not properly working (e.g. in case of freezes, errors on screen etc.)
- Unless the default hard coded settings have been properly configured (e.g. a self compiled firmware was installed), after an hard reset the TFT typically needs to be reconfigured with the proper `config.ini` file (see [Configuration Update](#))

The hard reset process consists in:

1. resetting the TFT's configuration to the TFT's default hard coded settings
2. starting the touch screen calibration process (see [Touch Screen Calibration](#)) at startup before moving to **Main** menu

In order to hard reset the firmware:

1. Create a blank file named `reset.txt`
2. Copy the `reset.txt` file to the root of the SD card. The SD card capacity should be less than or equal to 8GB and formatted as FAT32
3. Insert the SD card into the TFT's SD card slot and press the reset button of the TFT (or power cycle your printer)
4. The TFT's configuration will be reset to the TFT's default hard coded settings and the touch screen calibration process will start on reboot
5. The `reset.txt` file will be renamed to `reset.txt.DONE` after the touch screen calibration process is completed

## Resetting to Default Settings

When the default hard coded settings are properly configured for a TFT and the TFT's basic function such as surfing on the menus is working, in case of issues the user can opt to apply only a configuration reset (soft reset) instead of an hard reset.

In order to reset to default settings:

- Enter on **Menu->Settings->Feature** menu
- Select and press on **Reset default settings** item
- Press on **Ok** button to confirm the reset
- Leave the menu

## Customization

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### Bootscreen and Icons

Please, see [Customization Guides](#) section for detailed information.

### Firmware

► [View full instructions](#)

**TIP:** In case there is a problem compiling the TFT firmware try to restart VSC. If this does not help and you are using macOS, delete the **packages** and **platforms** folders usually present under the folder `/users/**username**/.platformio/`.

### Vertical Screen Orientation - Portrait Mode

All the precompiled firmwares available on [Copy to SD Card root directory to update](#) folder are compiled to support the standard (horizontal) screen orientation.

In case the TFT needs to be placed with a vertical orientation (e.g. 90°), the firmware needs to be compiled with the portrait mode support and installed following the procedure below:

- Start VSC
- Open `platformio.ini`
- Uncomment (remove the leading `;` character) the following line:  
`; -DPORTRAIT_MODE="__portrait" ; uncomment here to enable Portrait Mode .bin firmware generation`
- Compile the firmware
- The binary file named `BIGTREE_TFT*_V*.*.*.x_portrait.bin` is created (see the presence of the `_portrait` suffix)
- Rename the binary file to the standard name `BIGTREE_TFT*_V*.*.*.x.bin`
- Copy `BIGTREE_TFT*_V*.*.*.x.bin`, the `TFT*` folder, `config.ini` and also `reset.txt` (needed to force the screen calibration) into the SD card
- Proceed with the firmware update (following the usual procedure)

## Troubleshooting

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### Firmware Update Failed

In case the firmware update process failed:

1. Verify that you have been using the firmware matching your TFT
2. Try to upload the firmware, the `TFT*` folder and `config.ini` again (like described above) using a **new** SD card - 8GB or smaller, FAT32 formatted

**NOTE:** Some uploads worked fine after executing a low level format of the SD card and not a quick format.

### Worst Case Scenario

In case:

- The screen remains black or the brightness is not stable
- The screen does not react after pressing a button or executes clicks by itself or does something similar

and the reset described above did not help, try the following:

- Remove the TFT from the enclosure and disconnect everything from the TFT, including the cable to the mainboard
- Cut a USB cable you do not need anymore and connect the red and black wire to 5V and GND of the TFT
- Do not use the unshielded wires directly but use a 2 pin connector instead

- Power up the TFT and try to reset the TFT or to instal a new firmware like described in this document

**NOTE:** With only power supplied, you should be able to navigate through the menus using the touchscreen and even to switch to Marlin Mode (if available). Marlin Mode will not show any interface without a proper EXP connection (see [Marlin Mode Setup](#)).

## Version History

Please, see [BIGTREETECH-TouchScreenFirmware/releases](#) section for a complete version history.

## Appendix

### Printing from Host

OctoPrint, ESP3D, Pronterface etc, connected to a TFT's serial port, can browse files on both the TFT's and mainboard's media devices and start a print that will be handled by the host (TFT or mainboard). The following actions and the related triggering G-codes are currently supported by the TFT fw:

	TFT SD	TFT USB	onboard media
ACTION	G-CODE	G-CODE	G-CODE
init media device			M21 <S> <U>
release media device			M22
list files	M20 SD:<folder path> or M20 S <folder path>  Examples: M20 SD: M20 SD:/test M20 S /test	M20 U:<folder path> or M20 U <folder path>	M20
select file	M23 SD:<file path> or M23 S <file path>  Examples: M23 SD:cap.gcode M23 SD:/test/cap2.gcode M23 S /test/cap2.gcode	M23 U:<file path> or M23 U <file path>	M23 <file path>
start/resume print	M24	M24	M24
pause print	M25	M25	M25
pause print and park head	M125	M125	M125
abort print	M524	M524	M524
report print status	M27 [C]	M27 [C]	M27 [C] [S<seconds>]
start file write	M28 SD:<file path> or M28 S <file path>  Examples: M28 SD:cap.gcode M28 SD:/test/cap2.gcode M28 S /test/cap2.gcode	M28 U:<file path> or M28 U <file path>	M28 [B1] <file path>
stop file write	M29	M29	M29
delete file	M30 SD:<file path> or M30 S <file path>  Examples: M30 SD:cap.gcode	M30 U:<file path> or M30 U <file path>	M30 <file path>

	TFT SD	TFT USB	onboard media
	M30 SD:/test/cap2.gcode M30 S /test/cap2.gcode		
firmware info	M115 TFT	M115 TFT	M115
play tone	M300 TFT [P<ms>] [S<Hz>]	M300 TFT [P<ms>] [S<Hz>]	M300 [P<ms>] [S<Hz>]

**NOTES:**

- TFT's media devices, if any, does not need to be initialized/released
- When present, the G-code's options (e.g. M27 c ) have the same meaning like in Marlin fw
- G-code M300 TFT P0 (with a duration of 0 ms) will mute (with the exception of touch type sound, if enabled) the TFT if not already muted while a duration different than 0 will unmute the TFT if not already unmuted

**Printing from Remote Host**

OctoPrint, ESP3D, Pronterface etc, connected to a TFT's or mainboard's serial port, can host a print (print handled by the host) and optionally can trigger some actions to the TFT sending specific G-codes. The following actions and the related triggering G-codes are currently supported by the TFT fw:

ACTION	G-CODE
start	M118 P0 A1 action:print_start
end	M118 P0 A1 action:print_end
cancel	M118 P0 A1 action:cancel
pause	M118 P0 A1 action:pause
resume	M118 P0 A1 action:resume
remaining time progress	M118 P0 A1 action:notification Time Left <XX>h<YY>m<ZZ>s or M117 Time Left <XX>h<YY>m<ZZ>s  Examples: M118 P0 A1 action:notification Time Left 02h04m06s M117 Time Left 02h04m06s
print layer progress	M118 P0 A1 action:notification Layer Left <XXXX>/<YYYY> or M117 Layer Left <XXXX>/<YYYY>  Examples: M118 P0 A1 action:notification Layer Left 51/940 M117 Layer Left 51/940
file data progress	M118 P0 A1 action:notification Data Left <XXXX>/<YYYY> or M117 Data Left <XXXX>/<YYYY>  Examples: M118 P0 A1 action:notification Data Left 123/12345 M117 Data Left 123/12345

When the trigger `print_start` is received, the TFT switches to **Printing** menu. When the trigger `print_end` or `cancel` is received, the TFT Printing menu is finalized (statistics available etc.). When on Printing menu, pressing on the `pause`, `resume` and `stop` buttons will trigger to the remote host the following notifications, respectively:

NOTIFICATION	ACK MESSAGE
pause	//action:notification remote pause
resume	//action:notification remote resume
cancel	//action:notification remote cancel

The remote host must properly handle the received notifications. For example, if `//action:notification remote pause` is received then the remote host must effectively pause the print and send `M118 P0 A1 action:pause` in order to trigger the pause action to the TFT.

## NOTES:

- A new plugin on OctoPrint implementing the above protocol should be the preferable way (available to everyone)
- With the exception of TFT70, the maximum number of displayable layer count is 999 (there's no space to display layer number and count if the layer count is above 999)

## Adding Gcode Thumbnails

The TFT can display embedded G-code thumbnails in the file viewer using two different flavors:

- Bigtreetech-style
- PrusaSlicer-style



The first type is to store the thumbnails at a specific location in the G-code file using a dedicated Cura plugin or external post-processing script. The thumbnail's image data is raw encoded in a format which can be displayed on the TFT without any complex image transformation. Displaying these embedded thumbnails at the TFT is the fastest approach and suitable for all different BigTreeTech's TFT variants. Downside is that you either need a dedicated plugin, for example the [BTT 3D Plug-In Suit](#), or you have to use the post-processing script.

The other type is to store the thumbnails using dedicated comments (`thumbnail begin...` and `thumbnail end`) which is implemented in stock by some slicers like Prusa-Slicer. The thumbnail's image data is a PNG file encoded in Base64 which cannot be displayed directly on the TFT: A base64 decoding and png decoding needs to be performed which is quite complex for the TFT. Displaying these thumbnails is slower but more flexible. Due to the memory requirements it is not suitable for all the different TFT variants (only for those with `RAM_SIZE > 96`).

Thumbnail generation needs to be specifically enabled in Prusa-Slicer. Under *Printer Settings* at the *G-code thumbnails* settings you have to enter the specific required thumbnail image size for your TFT.

Thumbnail image sizes are:

- 70x70 : TFT24 / TFT28
- 95x80 : TFT43 / TFT50
- 95x95 : TFT35
- 160x140 : TFT70

If this setting is not visible within the Prusa-Slicer you need to enable *Expert Settings Mode*:

## TFT Screen Configuration and Support for RRF

### Overview

The most recent version of the standard bigtreetech TFT firmware has built in support for RepRap firmware. The pre-built images have this enabled by default.

### Loading the Firmware

There is now an RRF config file. It needs to be renamed from `config_rrf.ini` to `config.ini` for updating the configuration of the TFT for RRF.

### Configuration Changes

Add the following line to your `config.g` to enable the screen: `M575 P1 S2 B57600`.

## Implemented Features

- Auto detect fw type + separate config.ini for easier setup
- Temperature/movement/cooling status monitoring and control
- Print status monitoring with mid-print tuning/pausing
- Macro support

## Releases 6

 [Vx.x.27](#) Latest

on Apr 10, 2021

+ 5 releases

## Packages

No packages published

## Contributors 115



[+ 101 contributors](#)

## Languages



● C 98.6% ● HTML 0.6% ● Assembly 0.4% ● C++ 0.2% ● Pawn 0.1% ● Python 0.1%