



## GTOP User Guide

This document explains how to use the GTOP support tool for Noritake itron GT-CP series modules. GTOP (GT Operator Packer) consists of two primary tools, a **screen designer** and **memory tool**. The **screen designer** can prototype one or more “screens” to be used in an application. An Arduino sketch file can also be generated and used on Arduino Uno boards. The **memory tool** is used to save images and files to GT-CP modules.

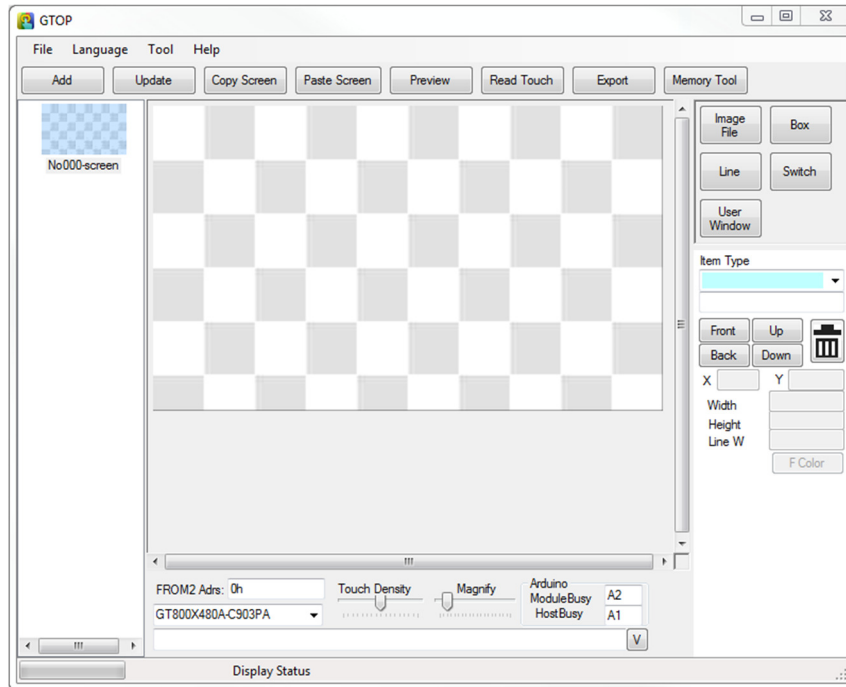


Figure 1: GTOP Screen Designer

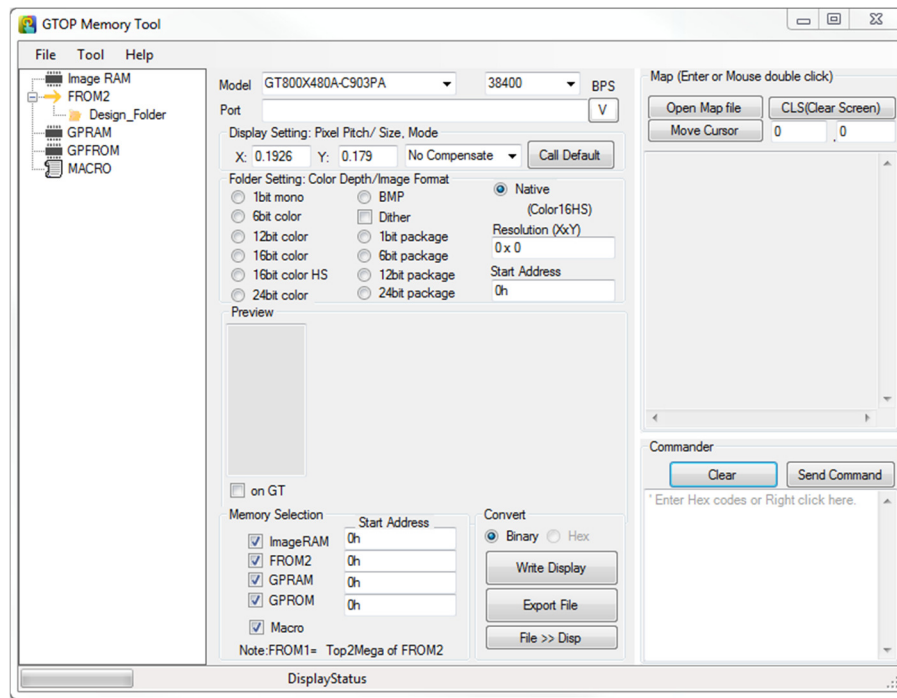


Figure 2: GTOP Memory Tool

## 1. Environment for Using GTOP

### 1.1. Operating System

Microsoft Windows 7 or later

### 1.2. Environment

Required: .Net Framework 4.5

A WinUSB or VCOM driver is required to connect to a GT-CP module.

The VCOM driver is provided for compatibility with existing software.

We recommend using the WinUSB driver.

**Note 1:** The WinUSB driver is already installed on Windows 8.1 and later.

For Windows 7, you can download the installer from Microsoft's website.

**Note 2:** The VCOM driver is provided by Noritake itron.

### 1.3. Installation

This tool does not require any software installation.

### 1.4. Connection

This software is created to use a USB I/F. However, it can also be connected with a UART port. In this case, it spends more time because the transfer speed is decreased.

### 1.5. Language

English and Japanese are available. When starting up the tool, the software refers to the language that the OS is using. If needed, you can choose a different language from the Language toolbar.

## **2. Operation Overview**

### **2.1. Display Screen Design**

The GTOP Screen Designer GUI is intended to help users design one or more “screens” with images, rectangles, lines, characters, and touch switches. Multiple objects can be placed on a single screen and multiple screens can be created. Screen designs can be converted and exported to an Arduino IDE sketch file. This file works on Arduino Uno and will sequentially display the created screens like a slideshow. If any screen design has touch switches, the Sketch program will display touch information via ASCII characters (more on this below). This Sketch program can be used as a starting point for a customer’s application. Since the Arduino language is an extension of C/C++, we believe that it is relatively easy to port this project to the customer’s development environment. The program also includes GT module commands that can be ported over as well.

### **2.2. Write Images to Memory**

The memory tool can write images and other files to specific points in GT module memory. You can call and display saved images directly, or combine with the various commands and character options to achieve other actions and display options. This tool can be accessed by clicking the “Memory Tool” button on the screen designer window. When this tool is closed, the image data set to FROM2 will be transferred to the screen designer.

### 3. Tips

#### How to test the touch function – 2 methods

##### **Method 1: With the Screen Designer**

1. Add a “Switch” to the current design screen.
2. Select the desired switch mode (coordinate, custom switch, or switch matrix).
3. Click the preview button. (Images and settings will be sent to the GT module.)
4. Clicking the “Read Touch” button opens the Touch Monitor dialog box. This new window will display the module’s touch data in real time.

##### **Method 2: With the Memory Tool**

1. Find the commander box at the lower right of the memory tool screen.
2. Right click in the text area and select "Touch Panel Data Transmit ON / OFF → ON" from the menu, the byte string of the corresponding command will appear in the text box.
3. Click “Send Command”. The command will be sent to the GT module.
4. The “Read out” text box will appear and display GT module transmission data.

*Note that in either of the 2 methods above, the touch settings are not changed, so the module will use the default touch mode setting (coordinate mode).*

#### **Changing Touch Panel Sensitivity**

1. Choose “Tool > Change Touch Threshold” from the screen designer tool.
2. When the setting dialog opens, change the threshold value and click the “OK” button.
3. Select “Tool > Memory Switches” from the screen designer tool.
4. Click on “Read Module” to read the connected GT module’s touch data.
5. Memory switch #59 is the sensitivity (threshold) setting, please change this. Do not change memory switch #58 (gain).
6. Click on “Write Module” to save the changes to the connected GT module.

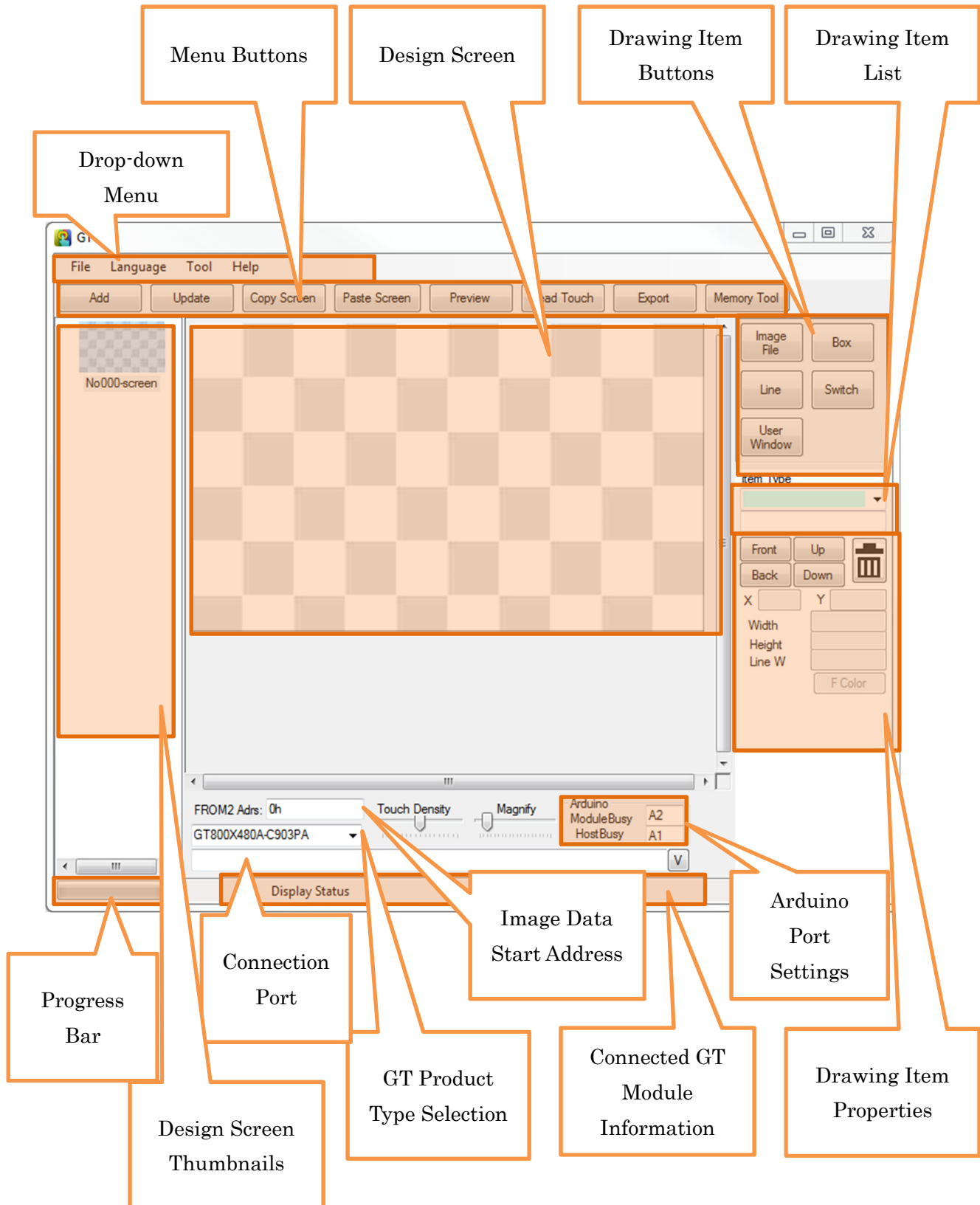
#### **Memory Switch Change**

- There are various configuration parameters that are saved in memory. These can be found on the respective module’s hardware spec. You can read and write all memory switch settings with the “Tool > Memory Switch” dialog in the screen designer tool.

## 4. Operation: Screen Designer

### Screen Designer Menu

**Figure 3: Design Window**



## Menu Description

### Drop-down Menu

- File operation,
- Language - Menu language selection
- Tool version display.
- Reset VCOM - USB Mapping (VCOM driver support function.)
- Change Touch Threshold (Touch panel sensitivity adjustment function.)
- Make Image Files (Copy image files used in the design to a user-designated location.)
- Load Map File (Read Map files created with GT-Packer.)
- View Map/FROM2 Usage (Display FROM2 usage summary.)
- GT Screen Capture (Capture the data currently on the GT module and copy it to the clipboard.)
- Memory Switches (Open the GT module memory switch editing tool.)
- Dither Tool (Perform dither conversions on user images.)

### Menu Buttons

These eight menu buttons provide quick access to frequently used functions:

- Add (Add a new screen.)
- Update (Saves the current screen design.)
- Copy Screen (Copy screen.)
- Paste Screen (Paste the copied screen to the selected screen.)
- Preview (temporarily display the current design on the connected GT module.)
- Read Touch (Monitor the connected GT module's touch activity.)
- Export (Create an Arduino Sketch to display all designs in a slideshow.)
- Memory Tool (Switch to the Memory Tool.)

### Design Screen

Add items such as images and rectangles here to create the display design.

**Select Item:** When you move the mouse cursor over an item, the selection outline is displayed as a blinking green frame. Right click to switch items. Left click confirms selection and will change the frame color to light blue. The position and size of the selected item can be changed by clicking and dragging the mouse operation or changing the item's coordinate properties. Note that there is a delay in processing the click operations.

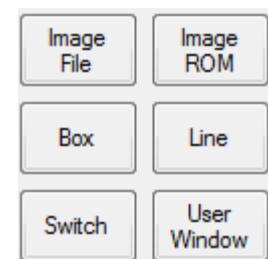
### Drawing Item Buttons

Select a drawing item to add to the screen. Click on the desired item and place the item onto the screen by clicking and drawing a square with the mouse on the design screen. The item's properties can be changed once it is placed on the screen.

Items that can be added are as follows:

- **Image File:** Select an image file from the host PC.
- **Image ROM:** Select an image that was registered in FROM2 with

Figure 1: Drawing Items



the memory tool. When an image is added to FROM2, it will be added to this list.

- **Box:** Draw a rectangle of any size. You can select whether the rectangle is filled or not.
- **Line:** Draw a line. The line thickness can be changed.
- **Switch:** Draw a touch area. Various touch settings can be configured within a switch object.
- **User Window:** Display characters.

### **Drawing Item List**

This drop-down menu lists all items in the current screen design.

### **Progress Bar**

When performing time-consuming processing, the progress bar is displayed. Please wait until this processing is complete.

### **Design Screen Thumbnail**

You can switch between screens by clicking on a screen thumbnail. You can add a blank screen by clicking the “Add” button.

### **Connection Port Selection**

Specify the GT module’s connection port. On Windows 8.1 or later, you can select a WinUSB connected module’s name and ID.

If you select "Noritake Display", you will connect to the first GT module found via WinUSB connection. By selecting a COM port number, you can select a GT module connected via Virtual COM.

### **GT Product Type Selection**

Typically, the GT product type is automatically selected when a module is connected. If this is not the case, please select the connected module’s product type. This selection is used to obtain available commands and the number of pixels of the screen.

### **Image Data Storage Start Address**

The start address value is used to specify the image address when writing to FROM2.

### **Information on Connected GT**

When a port is selected, the tool attempts to connect to that port. If it succeeds, it reads the display’s information and presents it here. If it is unsuccessful, a failed connection message will be displayed.

### **Arduino Port Setting**

Specify the connection port between the Arduino board and GT module. These port assignments will be referenced when exporting the Arduino Sketch. If necessary, please specify the desired Arduino I/O name.

### **Display Item Properties**

You can refer to and change various display item settings.

Items can be layered on top of each other. New items are placed on top and will hide the items below. By selecting items and clicking "Front", "Back", “Up”, and “Down” you can change the layering order.

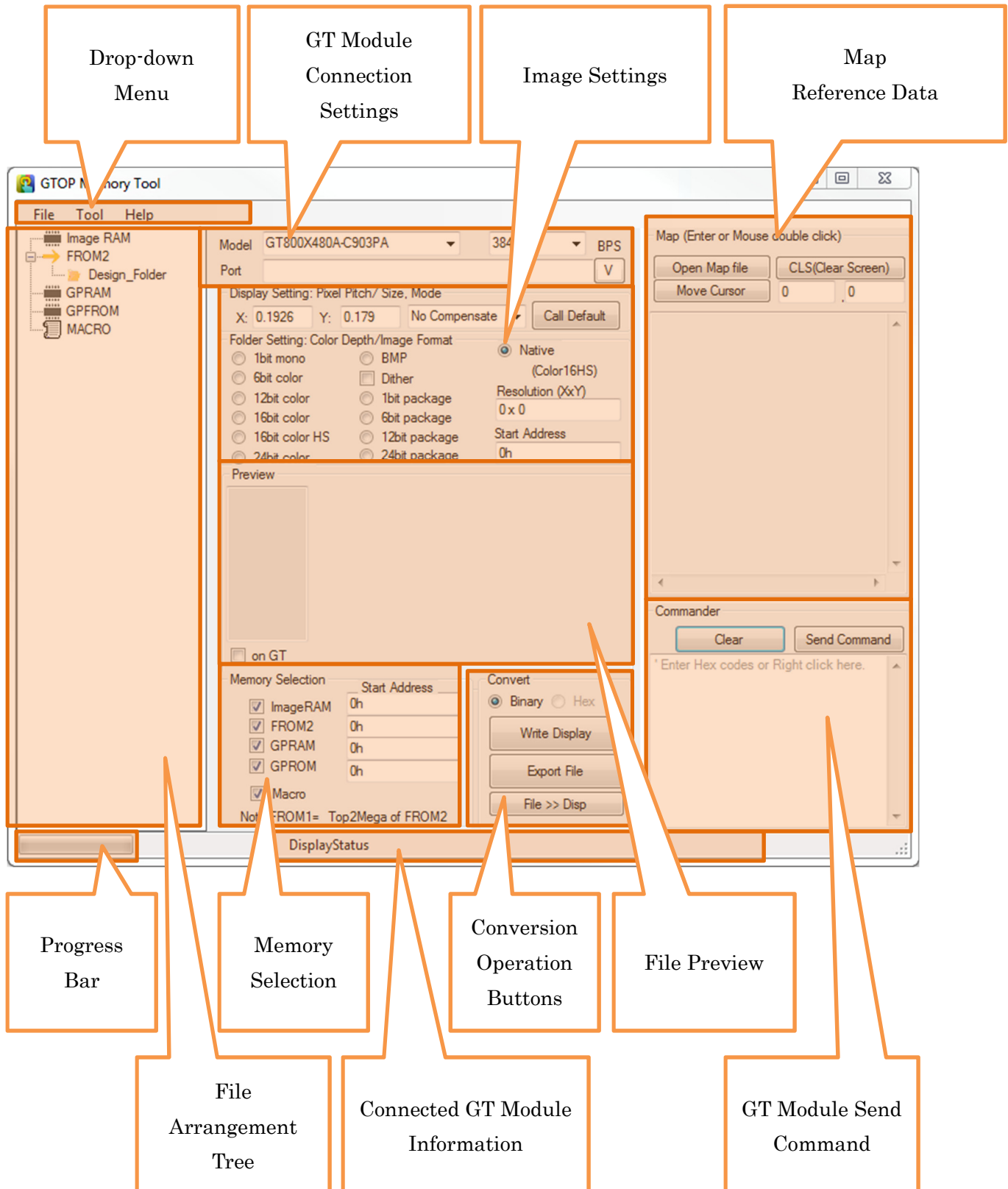
The trash button will delete the selected item.

X and Y are the item’s upper-left corner positional coordinates. An item’s height and width (in pixels) can be set as well.

## 5. Operation: Memory Tool

### 8.1. Memory Tool Menu

Figure 2: Memory Tool Window





## 8.2. Menu Description

### Drop-down Menu

- File
  - New (Create new tree.)
  - Open Tree (Open saved tree.)
  - Save Tree (Save current tree.)
  - Save Tree as (Save the tree with a name.)
  - Import Map (Load Map file)
  - Add File(s) (Add files to selected tree nodes.)
  - Exit Memory Tool (Exits the memory tool and returns to the design tool.)
- Tool
  - Create Test Images (Generate color test image on the PC's desktop)
  - Slideshow by Map File (Play a slideshow with map file images)
  - Language Selection (English and Japanese)
  - Rom Erase (Erase the connected GT module's ROM)
  - Reset VCOM USB Mapping
  - Touch Setting Package Data (Save/Select touch package data)
  - Collect Files (Save all current tree files to one location)
  - Memory Switches (Edit the connected module's memory switches)
- Help
  - About (See the tools version number)

### GT Module Connection Settings

Specify the GT module type and connection port. The tool knows the number of pixels and pixel pitch for each GT module.

Click the "V" button on the right side and select the appropriate port. When selected, the tool will perform a connection attempt, and on success it displays the module's information at the bottom of the window.

### Image Settings

Different image settings can be applied to different folders within the file tree. If a single image is selected, the image settings cannot be changed.

**Pixel Pitch:** Specifies the pixel pitch correction being used. Some GT-CP modules have TFT panels that contain rectangular pixels. This tool will compensate for rectangular pixels to make the resulting TFT image 1:1 compared to a display with square pixels. The pixel pitch setting is global for all images.

**Color Depth:** Specifies the number of bits per pixel. The smaller the number of bits per pixel, the lower the resulting image size and quality. When Dither is checked, color reduction is performed using a dither conversion with the error diffusion method.

**Internal Format:** This will be the maximum number of colors to display for the applicable

images. Even if it saves with more number of colors, the number of display colors will not increase. If the new format has more colors than the original format, the new image will look exactly like the original image.

The post-conversion image size depends on the original image size.

**Note:** Please be aware that transparent color backgrounds cannot be used in the 16-bit color high speed format.

**Resolution (XxY):** Change the image size. When set to “0 x 0”, the file’s original size is used.

**Start Address:** This designates the associated file’s start address. If this is left blank, it will default to the start of the related memory.

## Map Reference Data

When converting image data to the FROM2 writing format with the buttons in the “Convert” section, a list of command codes and address for calling and displaying the converted image data are also created and displayed in the text box. This information can be used for checking FROM2 image data and programming macros onto the GT module controller. Double-clicking the command code sends the code to the GT module.

The “Open Map” button reads in a saved map file.

The “CLS (Clear Screen)” button sends a screen clear command to the GT module.

Specify the desired x and y coordinates and click the “Move Cursor” button to move the cursor. Images are drawn on the display relative to the cursor position. If an image is not properly drawn onto the display, set the cursor to position 0, 0 and try again.

## Progress Bar

When performing time-consuming processing, the progress bar is displayed. Please wait until this processing is complete.

## File Arrangement Tree

The top nodes (Image RAM, FROM2, GPRAM, and GPFROM) indicate sections of memory on the GT module.

Folders can be placed in each memory node, and image files can be set in each folder.

To add files, use the right-click menu on the file tree or drag-and-drop from the PC’s file explorer. To add files, left-click on the desired memory section, and then right-click and select “Add File”. For drag-and-drop, if a folder is dropped into the tree, a corresponding folder is created and registered in the tree.

You can place images (.bmp, .jpg, etc.), text (.txt), and outline font (.otf, .ttf) files in FROM2, In addition to macros and program macro codes, the MACRO node can also contain setting and registration files such as touch package files (please contact us for these types of files). The Design\_Folder will contain any design screen images from the screen designer tool.

Figure 3: Tree Example



## Memory Selection

This section indicates the sections of GT module memory that will be written to. The checkbox by each memory name indicates if that node's information will be written. The hexadecimal address on the right side of each memory name is the data's FROM2 start address.

## Connected GT Module Information

If a successful connection has been established with a GT module, then the connected module's information will be shown here.

## Conversion Operation Buttons

The "Write Display" button will write the selected tree data to the connected GT module.

The "Export File" button will export the selected tree data as two files:

- A binary file that contains all data to be written to the display.
- A text file that contains the resulting Map file information.

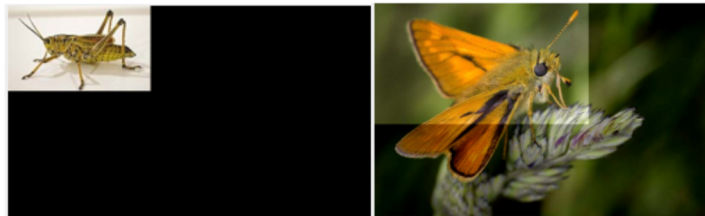
The "File >> Disp" button will ask the user to select a binary file. This file should have been generated by the "Export File" button. Once the file is selected, the data will be written to the connected GT module. After data is written to the module, Map file information will appear in the Map text box on the right side of the memory tool.

## File Preview

This area will preview the currently selected file.

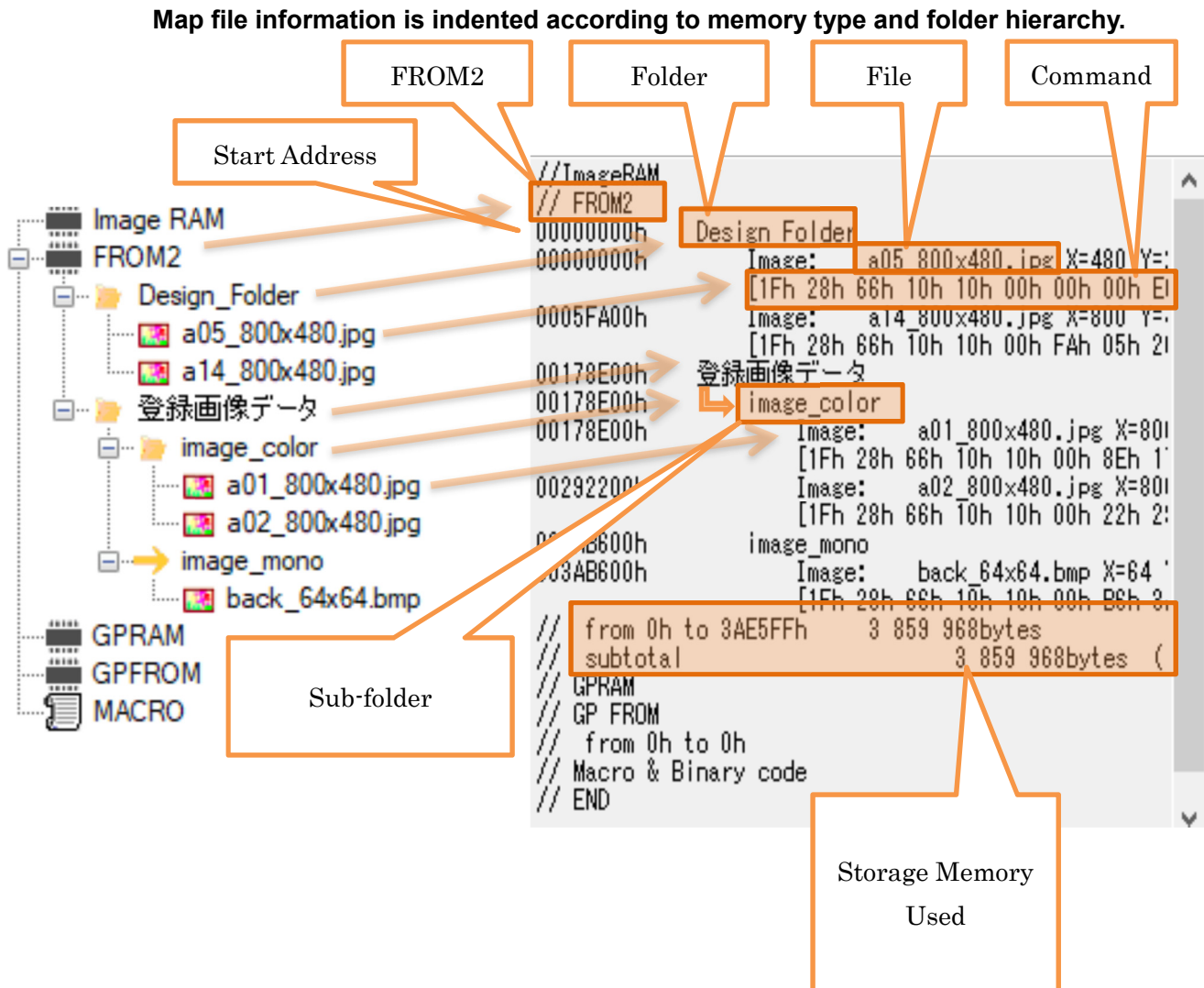
If the image file size is smaller than the connected display, the image will be displayed in the upper-left corner of the preview area. If an image is larger than the display area, the excess image data will become discolored. This allows the user to compare the image size with the display size.

**Figure 4: Preview Small Image and Large Image**



### 8.3. Map Display

When data is written to the connected GT module, the associated Map information is displayed in the Map text box. The Map information includes each file's start addresses and related command byte code. This is the same information contained in the exported .txt map file.



## Send GT Module Commands

You can send commands to the GT module using hexadecimal code.

In order to send byte data to the module, write hexadecimal code in the commander text box (like 31h 32h) and click the “Send Command” button.

Spaces or commas can be used to separate each hex byte.

In the following example, the hex bytes are separated by both spaces and commas.

### Code Example:

```
//      Cursor (0,0)
        {1fh 24h 00h 00h 00h 00h}
//      Outline Font Type Select
        {1Fh,28h,67h,08h,00h}
//      Font Size Select
        {1Fh 28h,67h 01h,00h}
‘      Character Table Type
        {1Bh 74h FEh}
’      Outline Font Size
        {1Fh 28h 67h 06h 00h 00h 00h 00h 00h 00h}

"ABCDEF 日本語"
```

Comment

Brackets are ignored.

Use text within quotes.

Right-clicking in the commander text box will bring up a list of pre-defined display commands. When a command is chosen, the command byte code will appear in the commander text box. This code can be changed as necessary.

Please note the commander’s special characters:

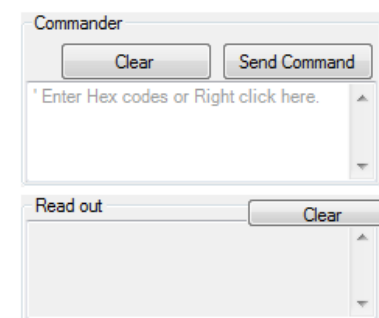
- ' (Apostrophe), // (two slashes): the text to the right of these characters are seen as a comment.
- " (Double quotation): sends text to a GT module as a string, ignoring {} (brackets).

Clicking on the “Send Command” button will open the “Read out” text box. This will display any data (in hexadecimal and ASCII) being transmitted from the GT module. It can be used to verify module responses and touch data.

Commands can be copy-pasted from the Map text box and sent to the connected GT module. (Ctrl+V must be used to paste text)

The size of these boxes can also be adjusted.

**Figure 5: Commander Boxes**



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