

DGUS QUICK START

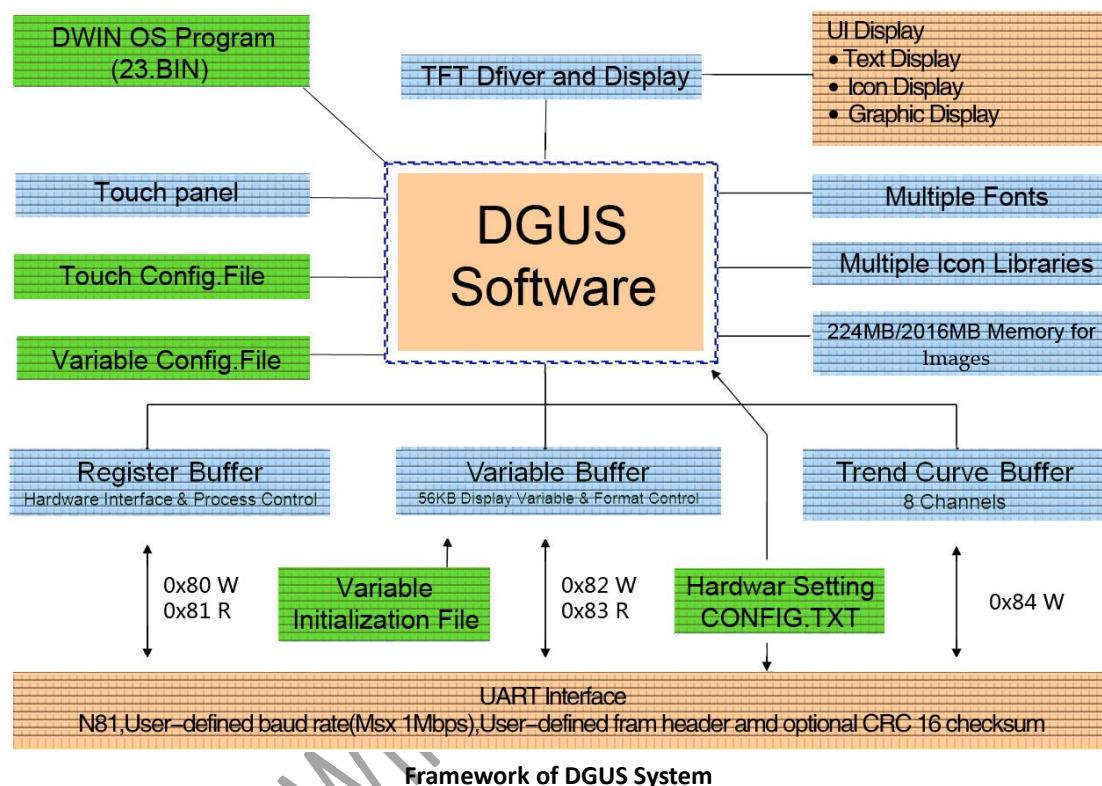
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1. Introduction

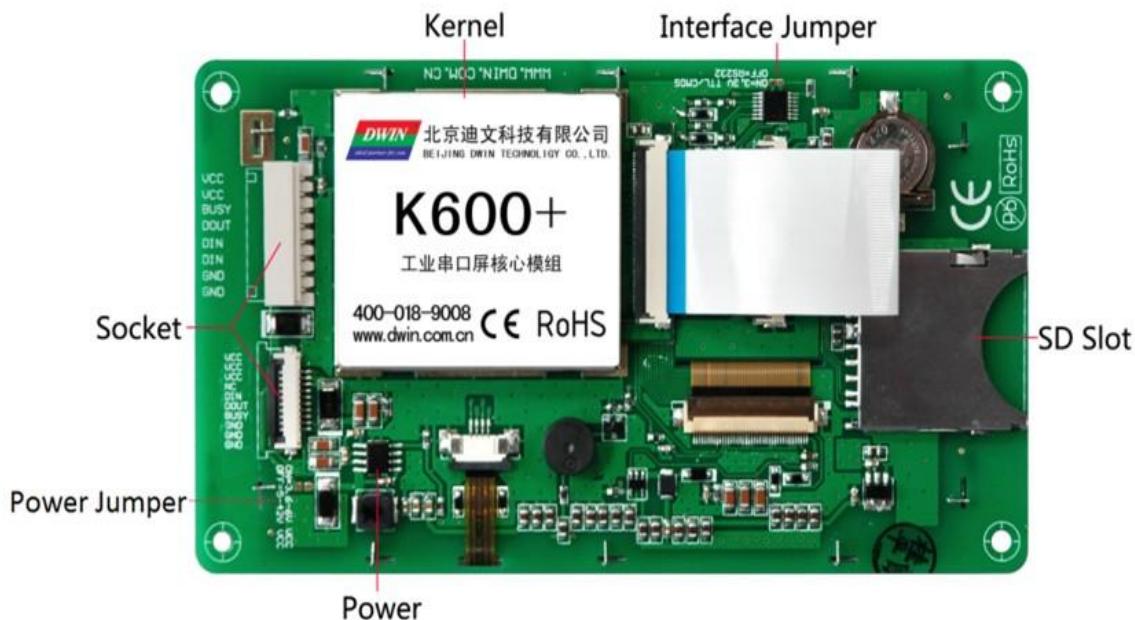
DGUS (DWIN Graphic User System) is a new GUI software platform developed by DWIN Technology. Based on the K600+ Kernel hardware platform, GUI design, combined with a simple command interface, can be achieved quickly, eliminating the need for complicated programming and expensive development environments.



Comparing with DGUS solution, traditional LCMs adopted commands-oriented or timing sequence to manage GUI while real-time variables used in DGUS. The operation and display features are defined in preinstalled programmable configuration files with variable oriented. Software flow chart of different development methods for temperature controller is shown as below.

2. What's it in the Sample Kit?

2.1 DWIN DGUS LCM



2.2 Peripherals

Connection cables, connector, downloading board, SD card



2.3 Download DGUS Materials

2.3.1 Software:



04_DGUS_SDK Software V3.4

: Software to create interface configuration files.

(Refer to  05_DGUS_SDK Software User Guide_V3.4)Link:http://www.ampdisplay.com/documents/pdf/03_DGUS_SDK%20Software%20V3.4.zip

2.3.2 Documents:



A. 01_DGUS Quick Start : For customer who first use DWIN LCM.

Link: http://www.ampdisplay.com/documents/pdf/00_DGUS%20Quick%20Start.pdf

B.  06_DGUS Development Guide_V3.2.1 : It is essential document for R&D section. It introduces codes, DGUS principles, variables etc in order to programming usage.

Link: http://www.ampdisplay.com/documents/pdf/06_DGUS%20Development%20Guide_V3.2.1.pdf

C. Tutorial video for DGUS_SDK software that is the operation introduction of each function.

Link: <http://www.ampdisplay.com/download.php>

D. More DGUS materials can be downloaded from AMPDISPLAY website.

Link: <http://www.ampdisplay.com/download.php>

3 DGUS Quick Start

3.1 Hardware Requirements

You must have a PC to run DGUS_SDK and DWIN Toolbox and other developing software. To run the software, .Net Framework 2.0 is needed.

Note: DGUS_SDK can run on Windows XP/7.

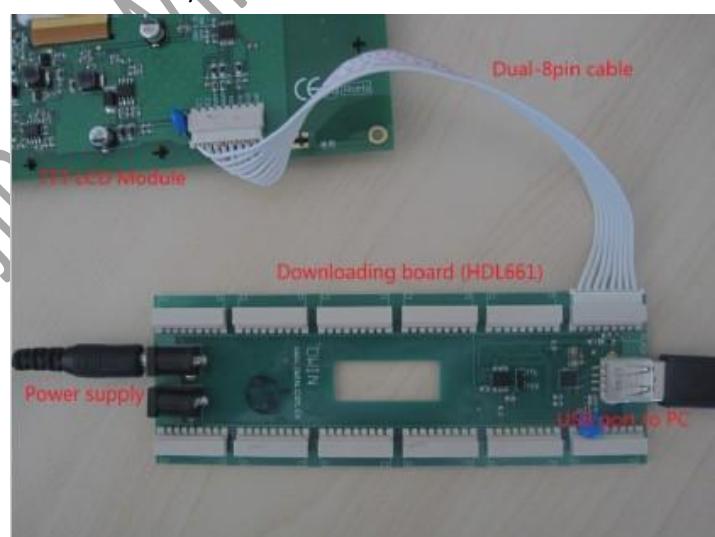
3.2 Connections

3.2.1 Connect PC and DGUS LCM (for LCMs without enclosure)

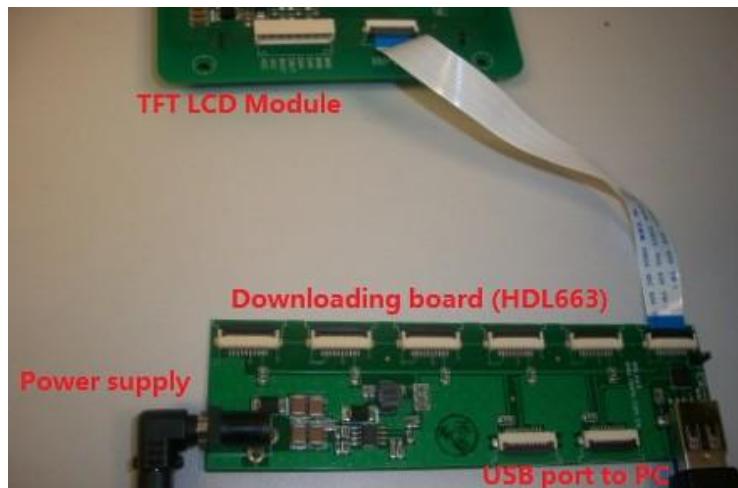
- 1) Connecting DGUS LCM to PC via DB9 serial port by 8Pin cable.



- 2) Connecting DGUS LCM to PC by HDL661 and 8Pin cable.



3) Connecting DGUS LCM to PC by HDL663 and 10Pin cable.



3.2.2 Connect DGUS LCM and PC by Phoenix Connector (only for _18WT enclosure series)



3.3 Power

As shown in the product specification, please supply the power in right range.

3.4 Run-time Environment and USB Driver

3.4.1 Run-time Environment

.Net Framework 2.0 is needed for run DGUS_SDK software and you can download it on our website. Please notice your OS Type and choose the right Type of package.

Link: <http://www.ampdisplay.com/documents/pdf/Net%20Frame%20work%204.0.exe>

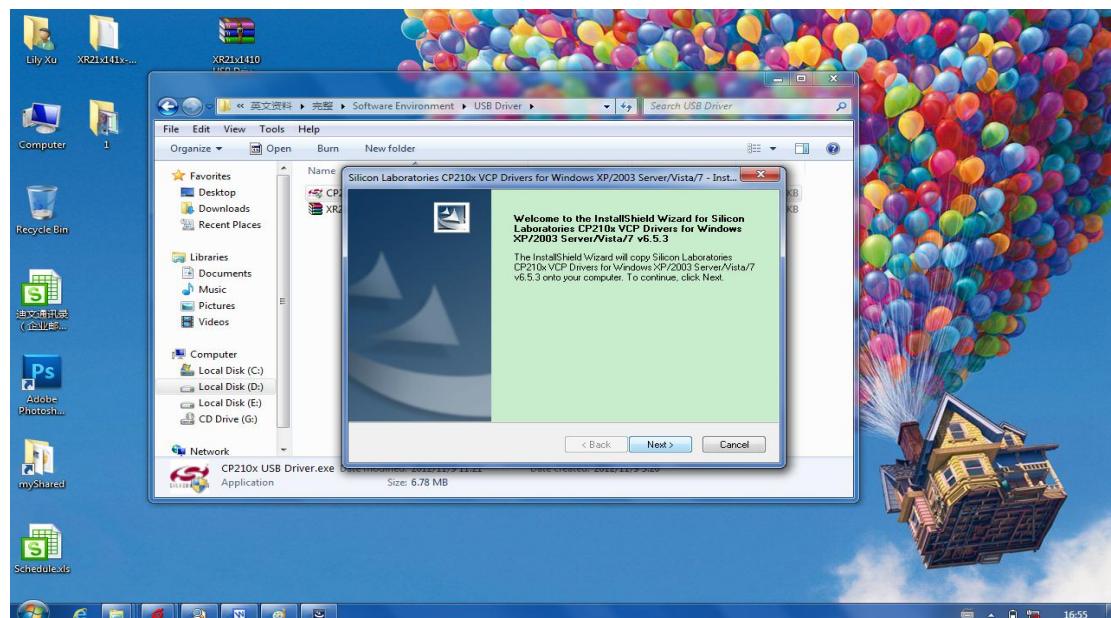
3.4.2 USB Driver

Install USB driver to make sure you can debug the communication between DGUS LCM and PC via HDL661 and HDL663.

Steps to install CP210x driver (for HDL661 and HDL663):

Download the driver file and click 'Next' to install.

Link:http://www.ampdisplay.com/documents/pdf/CP210x_VCP_Win_XP_S2K3_Vista_7.exe



3.5 Install DGUS_SDK

Unzip DGUS_SDK_V34.rar, and click DGUS ToolV3.4.exe to run it.

(.net Framework 2.0 is required to run the software.)



3.6 Create a New Project



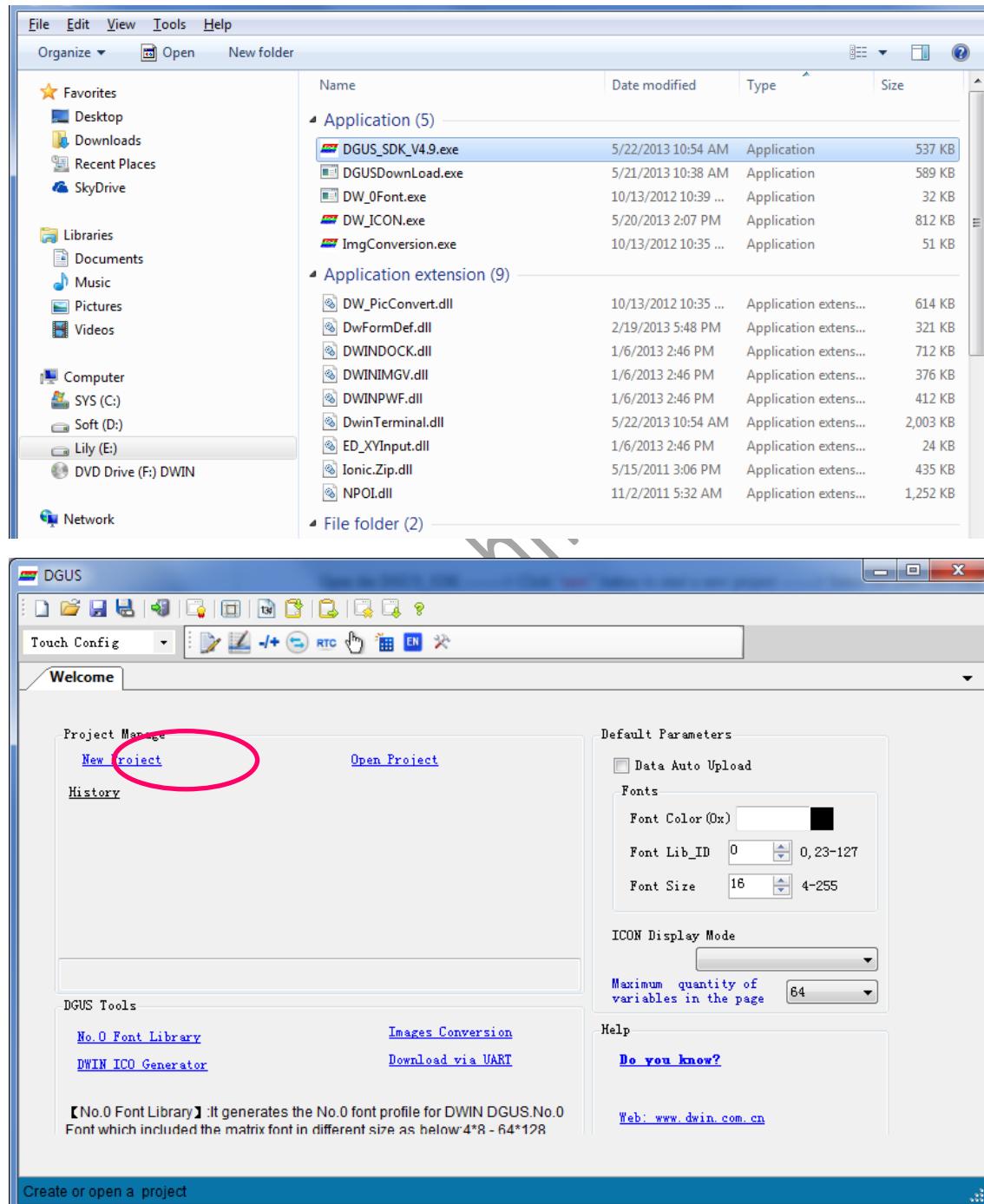
DGUS_SDK is for generating configuration files (13Touch_Control_Config / 14Variable_Config). The files should be placed into <DWIN_SET> folder in SD card then downloaded into DWIN DGUS LCM.

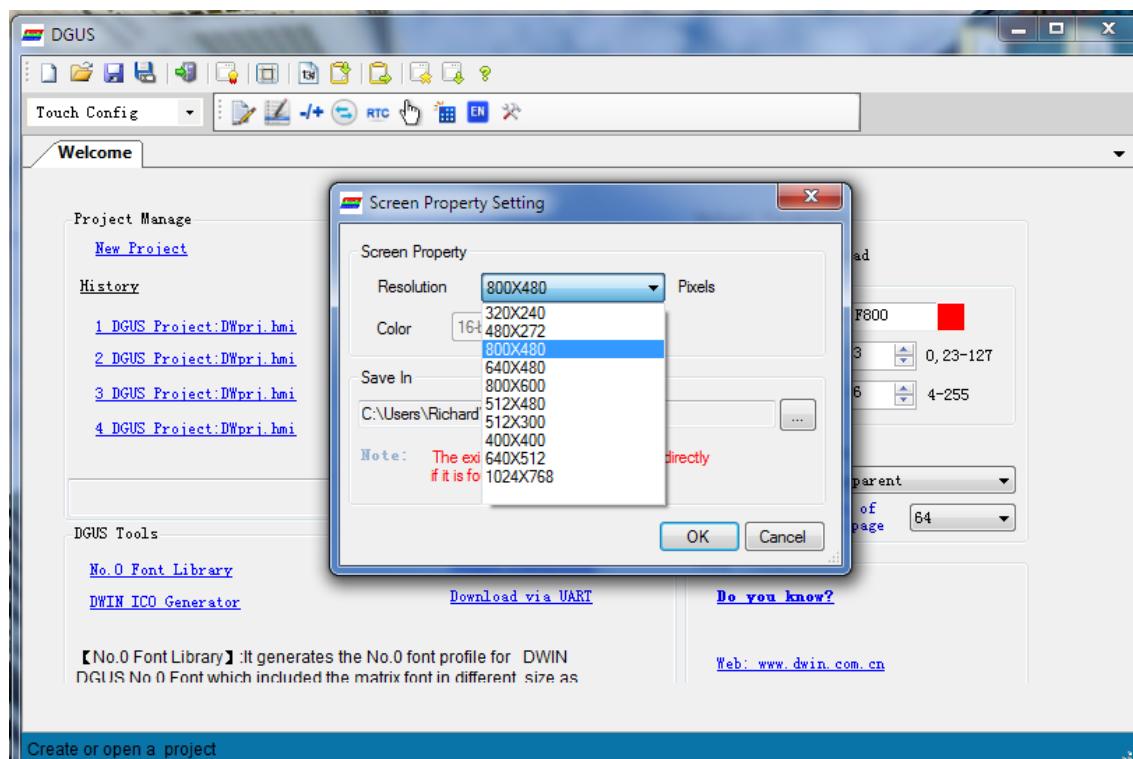
User may use any third-party Serial Connection Debugging Programs (e.g.: SSCom32 or Docklight Scripting) to debug the communication between DGUS LCMs and PCs.

3.6.1 Create a new project

Step1: Start a new project

Open the DGUS_SDK -----> Click “New Project” button to start a new project



Step2: Select the matched resolution and save path**Step3: Add images**

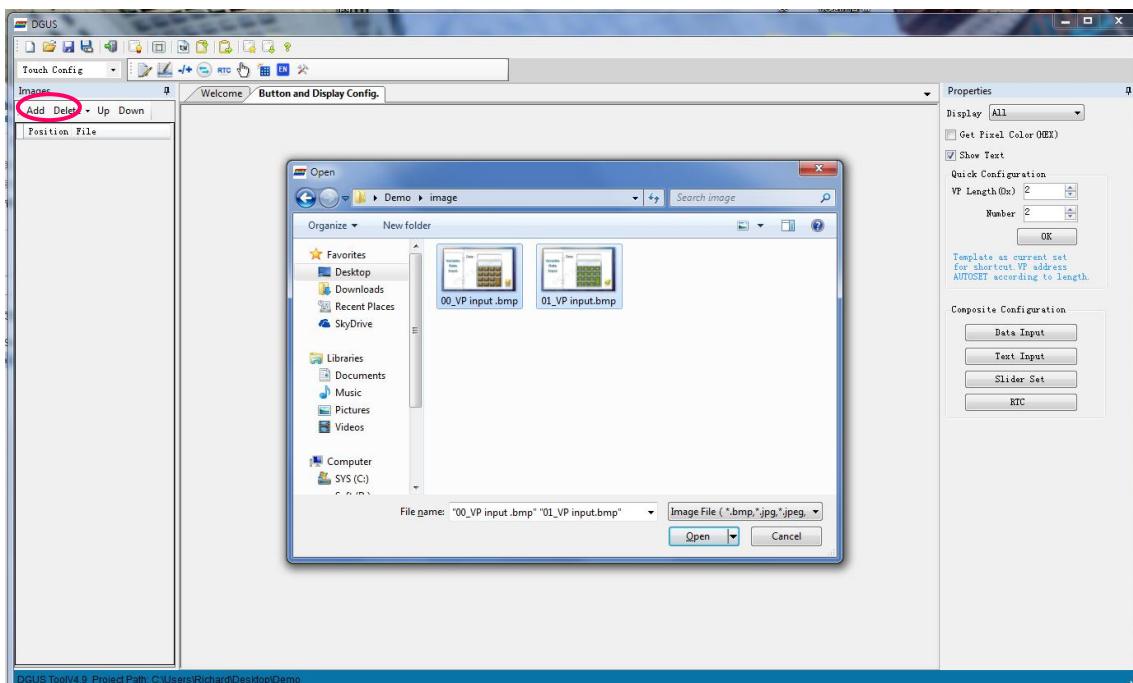
Images are the backgrounds of all displayed contents, the format should be “.bmp” & 24 bit.

Image naming rules: ID + Name. bmp (name is optional)

For example, “0_Data Input.bmp” or “0.bmp”

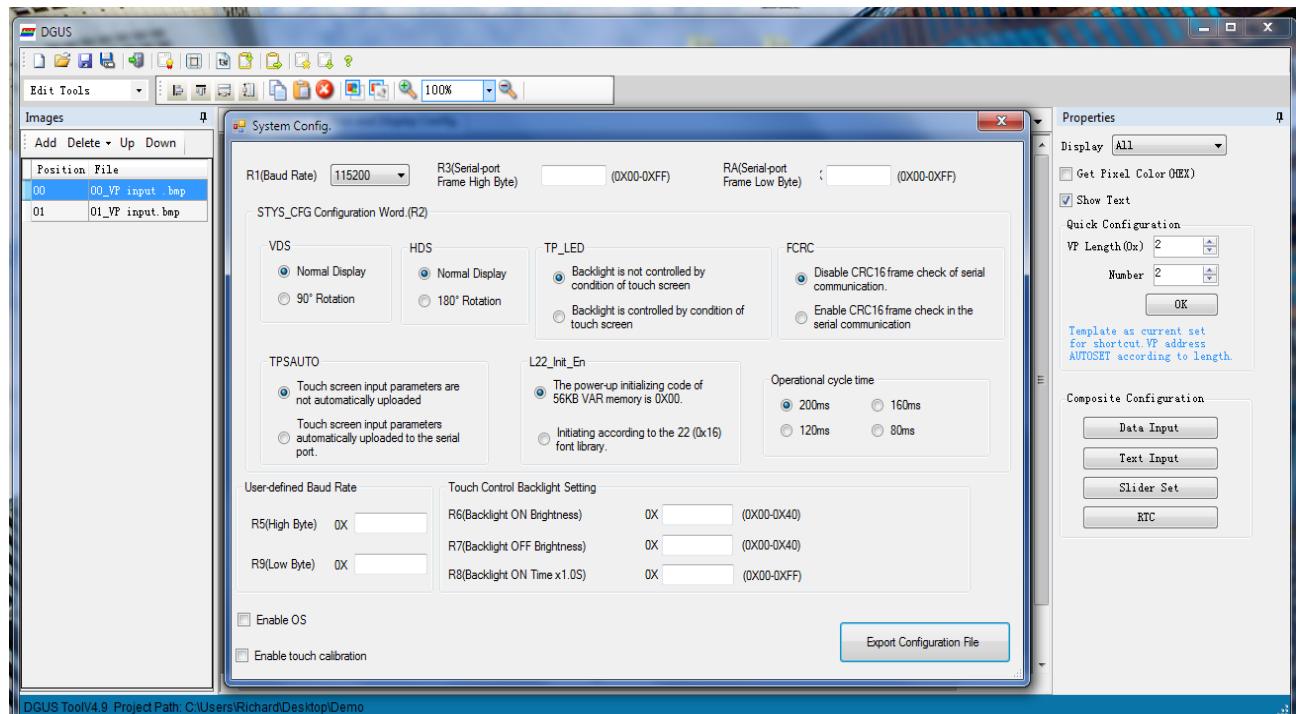
Make sure that the SD card is formatted to FAT32, and the images are formatted to

24 bit BMP with numbering sequence from zero (for example: 00.bmp, 01.bmp, 02.bmp, etc.)

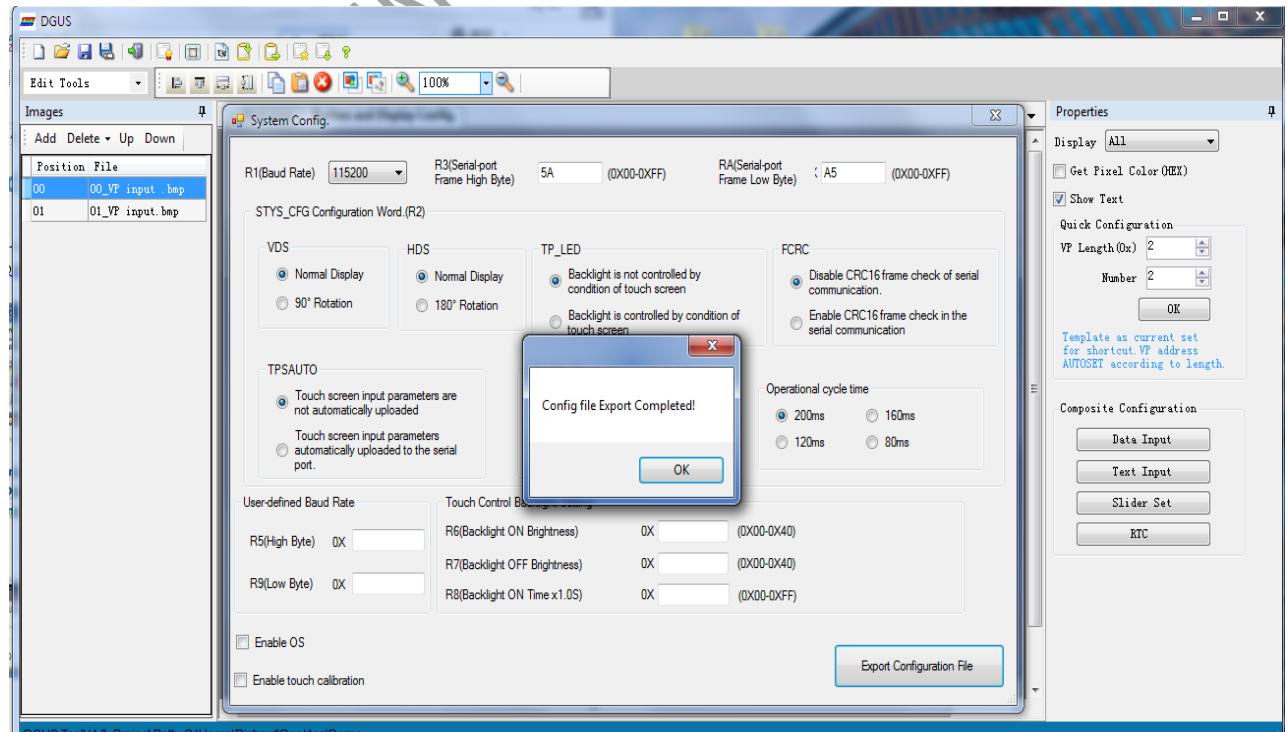


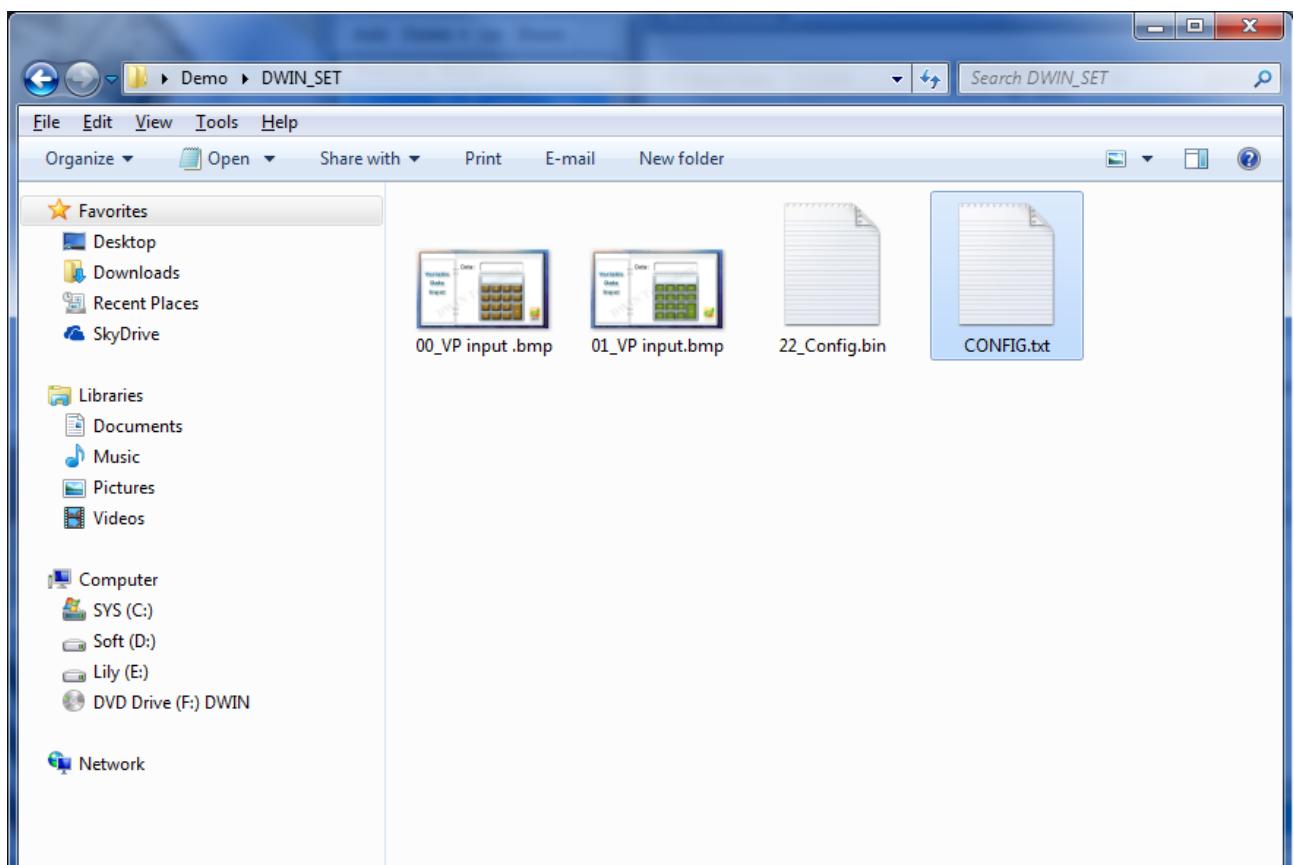
Step4: Create a CONFIG.TXT file for setting system parameters

Setting system parameters which include baud rate, backlight and operational cycle time, etc.



Automatically export Configuration File – “CONFIG. txt”





The value and the functions of each parameters, please refer to the chapter 1.2 of the [DGUS Development Guide—CONFIG. TXT](#)

Name of Parameter Register	Range	Description																																								
R0	Depends	Module driver mode, unnecessary for modification which may cause errors. Do not configure it.																																								
R1	0x00-0x11	Baud rate setting, 0x00-0x10 matchup with 1200bps — 921600bps. <table border="1" style="margin-left: auto; margin-right: auto;"> <tr><td>R1</td><td>0x00</td><td>0x01</td><td>0x02</td><td>0x03</td><td>0x04</td><td>0x05</td><td>0x06</td><td>0x07</td><td>0x08</td></tr> <tr><td>Baud rate</td><td>1.2K</td><td>2.4K</td><td>4.8K</td><td>9.6K</td><td>19.2K</td><td>38.4K</td><td>76.8K</td><td>153.6K</td><td>28.8K</td></tr> <tr><td>R1</td><td>0x09</td><td>0x0A</td><td>0x0B</td><td>0x0C</td><td>0x0D</td><td>0x0E</td><td>0x0F</td><td>0x10</td><td>0x11</td></tr> <tr><td>Baud rate</td><td>76.8K</td><td>62.5K</td><td>125K</td><td>250K</td><td>230.4K</td><td>345.6K</td><td>691.2K</td><td>921.6K</td><td>Defined</td></tr> </table>	R1	0x00	0x01	0x02	0x03	0x04	0x05	0x06	0x07	0x08	Baud rate	1.2K	2.4K	4.8K	9.6K	19.2K	38.4K	76.8K	153.6K	28.8K	R1	0x09	0x0A	0x0B	0x0C	0x0D	0x0E	0x0F	0x10	0x11	Baud rate	76.8K	62.5K	125K	250K	230.4K	345.6K	691.2K	921.6K	Defined
R1	0x00	0x01	0x02	0x03	0x04	0x05	0x06	0x07	0x08																																	
Baud rate	1.2K	2.4K	4.8K	9.6K	19.2K	38.4K	76.8K	153.6K	28.8K																																	
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Baud rate	76.8K	62.5K	125K	250K	230.4K	345.6K	691.2K	921.6K	Defined																																	
R2	0x00-0xFF	SYS_CFG configuration byte. Refer to the following table.																																								
R3	0x00-0xFF	UART_SYNC_H, High byte of frame header.																																								
R4		Module driver mode, unnecessary for modification which may cause errors. Do not configure it.																																								
R5	0x00-0xFF	When R1=0x11, high byte of baud rate configuration. R5:R9=625000/user-defined baud rate. E.g.: set baud rate as 10000bps, R5:R9=6250000/10000=625=0x0271, R5=0x02, R9=0x71.																																								
R6	0x00-0x40	Brightness of backlight.																																								
R7	0x00-0x40	Brightness of backlight in sleep mode.																																								
R8	0x01-0xFF	Time before sleep mode. activation																																								
R9	In Flux	When R1=0x11, low byte of baud rate configuration.																																								
RA	0x00-0xFF	UART_SYNC_L, Low byte of frame header.																																								
RC	In Flux	AUX_CFG Configuration. Refer to the following table.																																								

All parameters should be 2-digit hexadecimal numbers, for example 0A indicates 10 in decimal base.
Two bytes are must, for example 00 is not allowed to write as 0

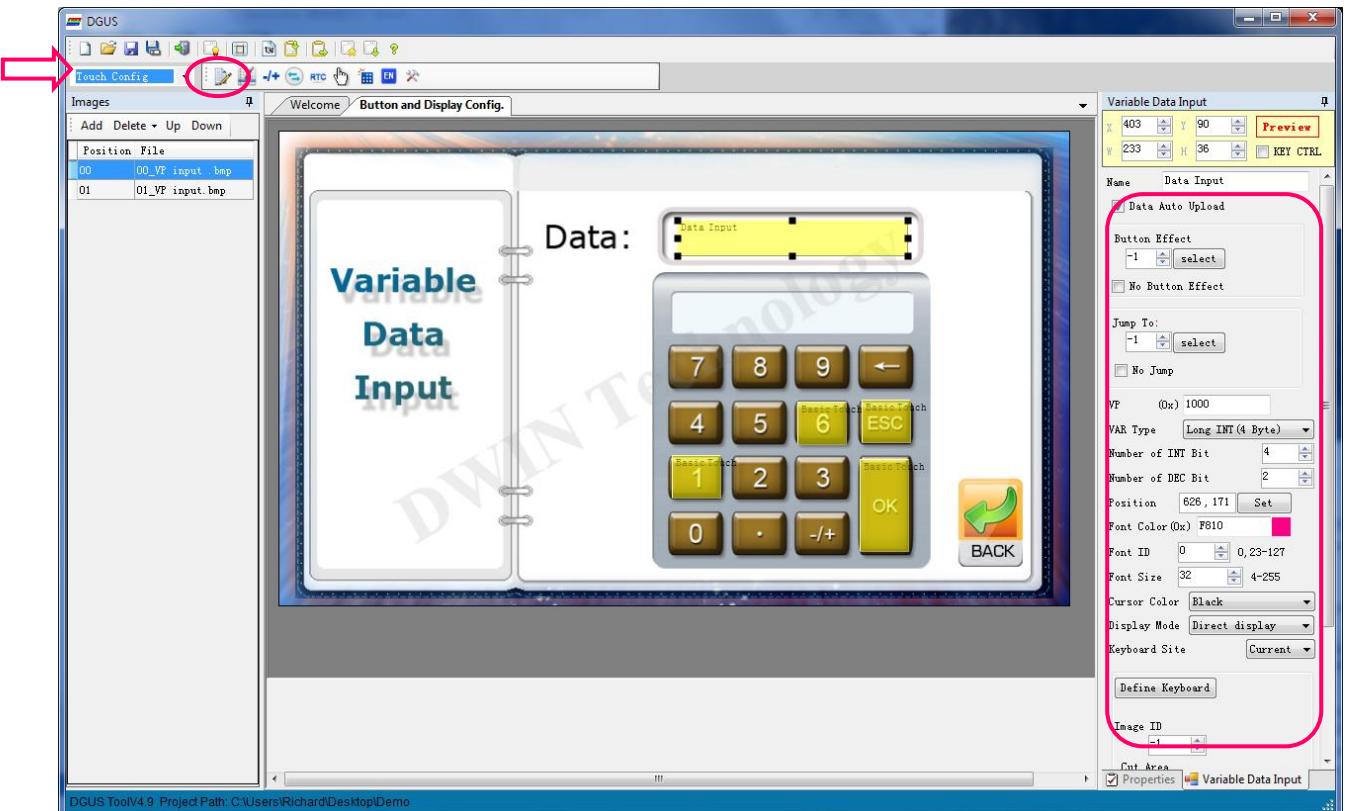
➤ **R2 (SYS_CFG configuration Byte)**

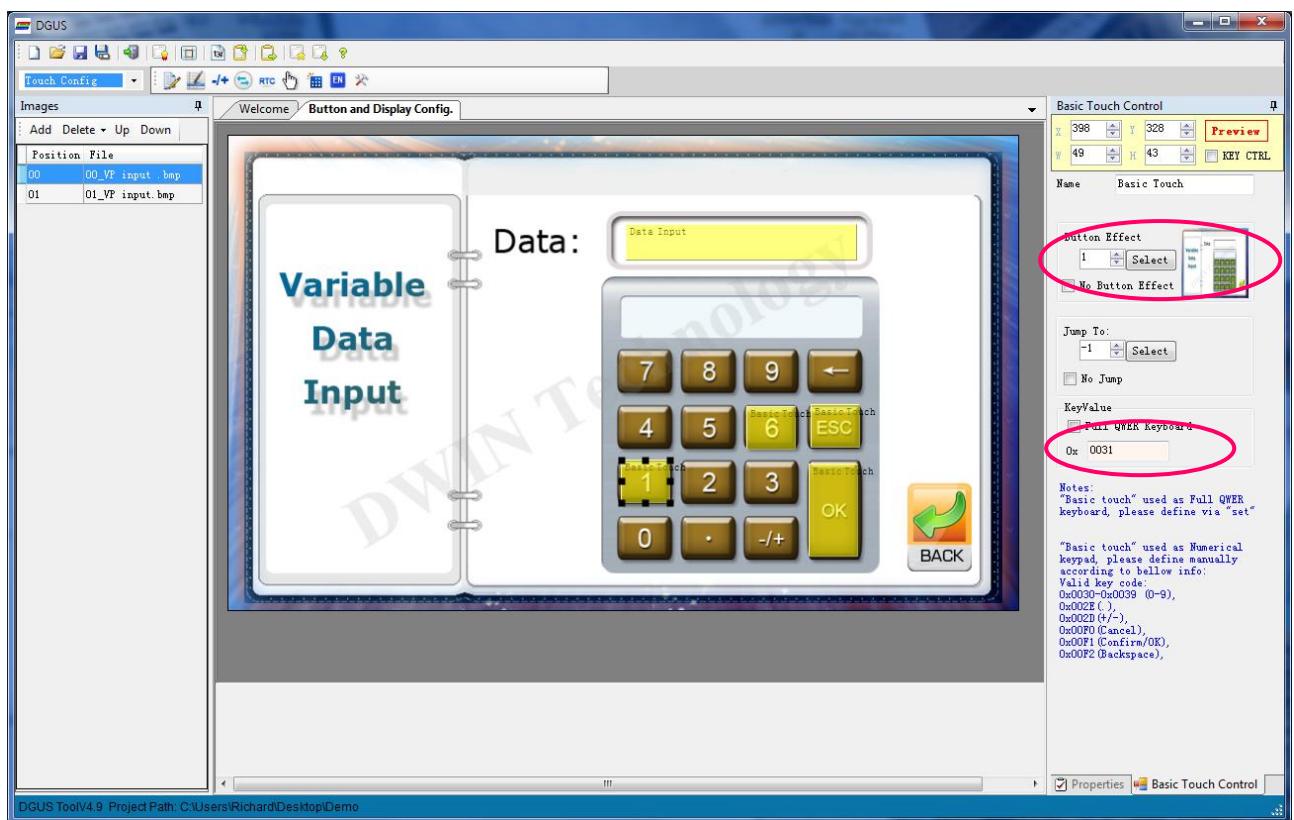
Bit	Ratio	Definition	Description																			
.7	0x80	VDS	0=Normal display. 1=90° Rotation.																			
.6	0x40	HDS	0=Normal Display. 1=180° Rotation (upside down).																			
.5	0x20	TP_LED	0=Brightness can't be changed via screen clicking 1=Brightness can be changed via screen clicking, the parameters set up in R6, R7, R8																			
.4	0x10	FCRC	0=Disable CRC16 checksum in the serial communication. 1= Enable CRC16 checksum in the serial communication																			
.3	0x08	TPSAUTO	0=Disable auto-upload of key code or data. 1=Enable auto-upload of key code or data.																			
.2	0x04	L22_Init_En	0=Initialize 56KB access variable data to 0x00. 1=Initialize 56KB access variable data from 22*.bin.																			
.1	0x02	FRS1	Set the cycle of DGUS, the smaller number will shorten response time for variable display, but reduce the efficiency of data processing. <table border="1"><thead><tr><th>Cycle</th><th>80mS</th><th>120mS</th><th>160mS</th><th>200mS</th></tr></thead><tbody><tr><td>FRS1</td><td>1</td><td>1</td><td>0</td><td>0</td></tr><tr><td>FRS0</td><td>1</td><td>0</td><td>1</td><td>0</td></tr></tbody></table>					Cycle	80mS	120mS	160mS	200mS	FRS1	1	1	0	0	FRS0	1	0	1	0
Cycle	80mS	120mS	160mS	200mS																		
FRS1	1	1	0	0																		
FRS0	1	0	1	0																		
.0	0x01	FRS0	For the resolution 1024*768, recommended set the cycle upon 120mS. The cycle influence the speed of Animation Icon display.																			

3.6.2 Configure touch functions

Select the “Touch Config” in the pull-down menu-----> Add the touch function, as “Data Input”

-----> Drag a square on your button as follow yellow area -----> Set the properties, such as button effect, key value, etc.

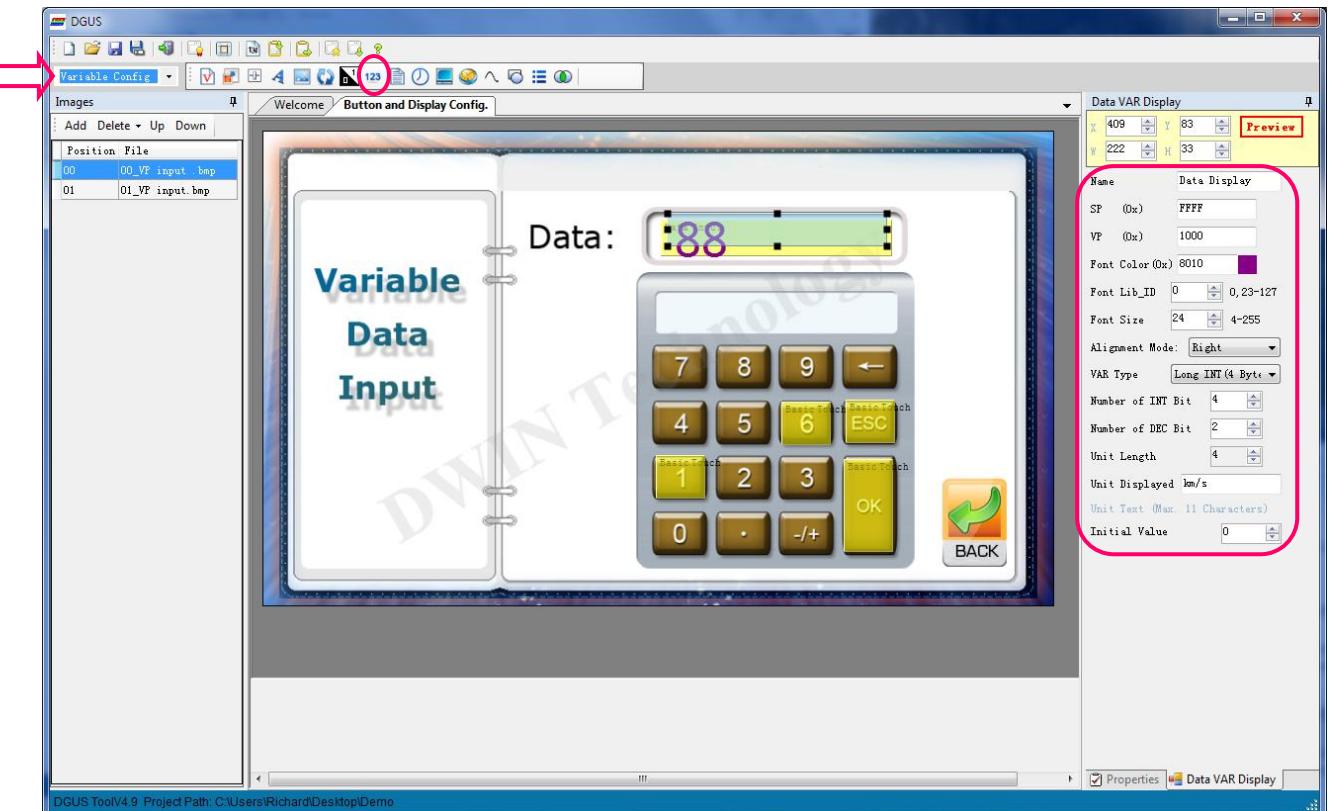




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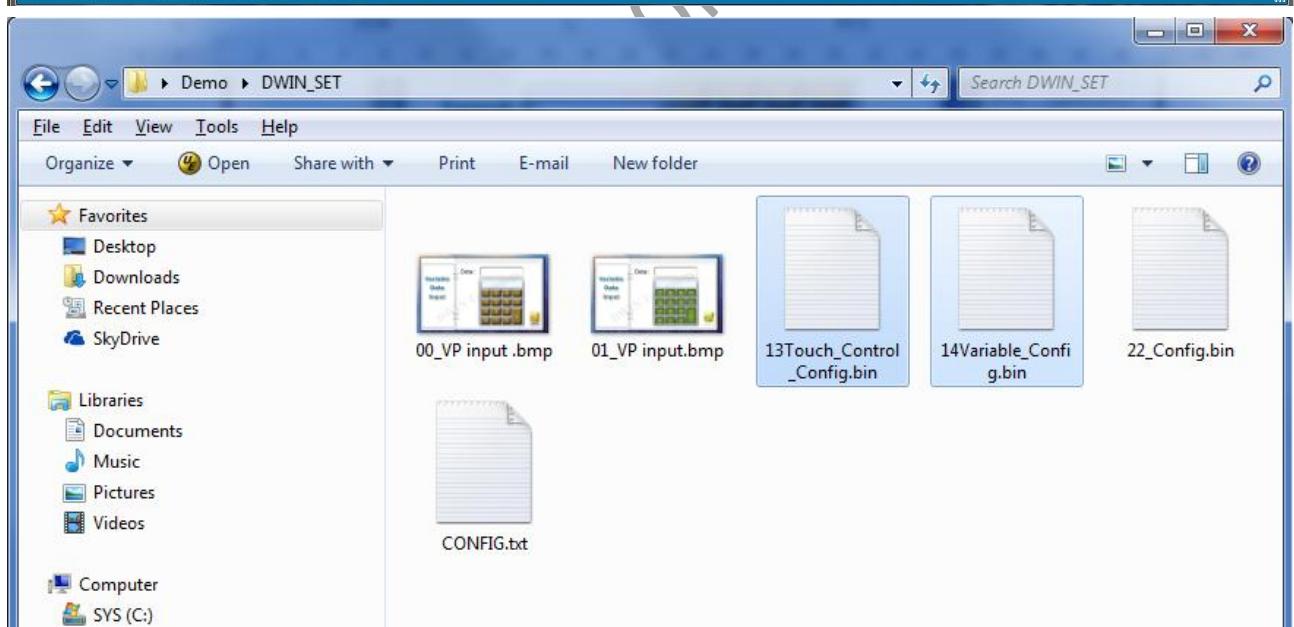
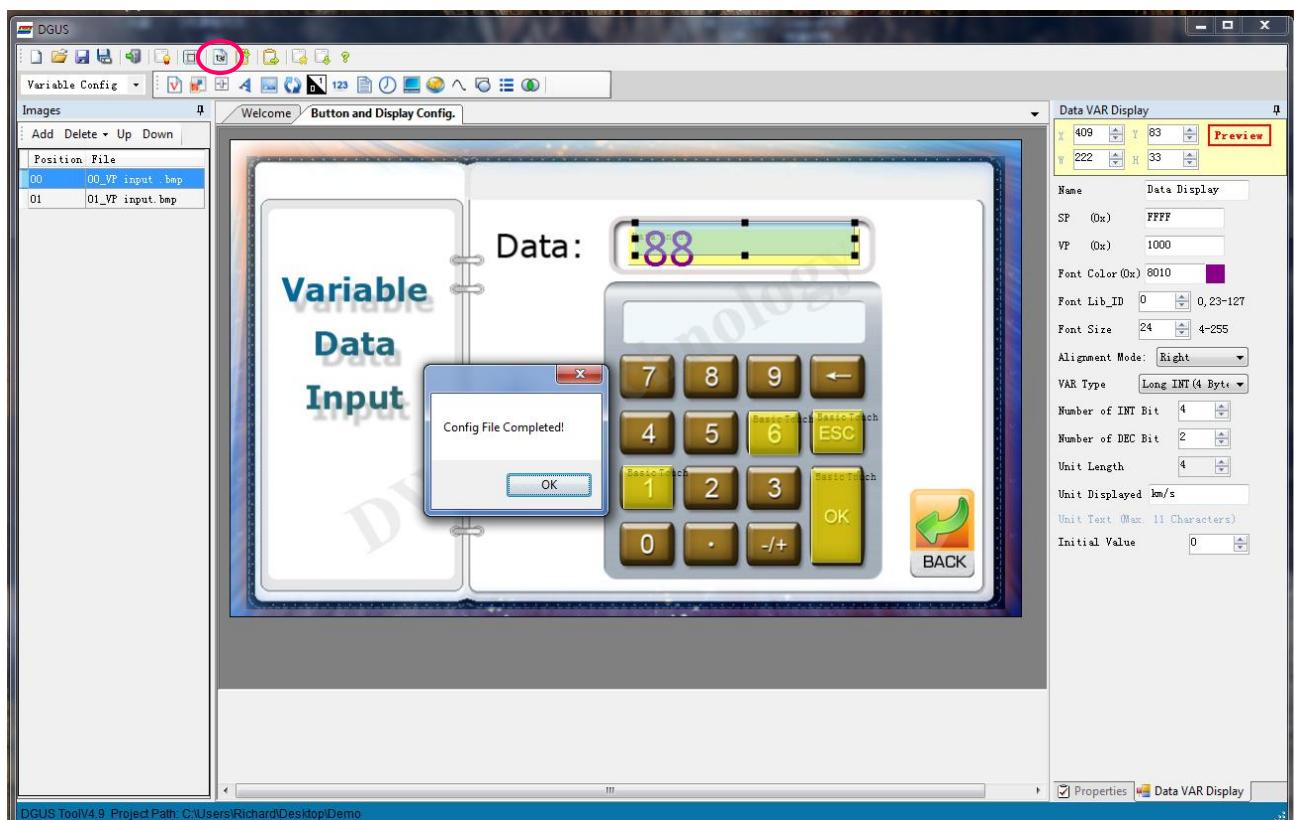
3.6.3 Configure variable display

Select the “Variable Config” in the pull-down menu -----> add the display function, as “Data Variable” -----> Drag a blue square on area, the variable will be displayed based on the upper-right coordinates.-----> Set the properties of variable as font color, font ID



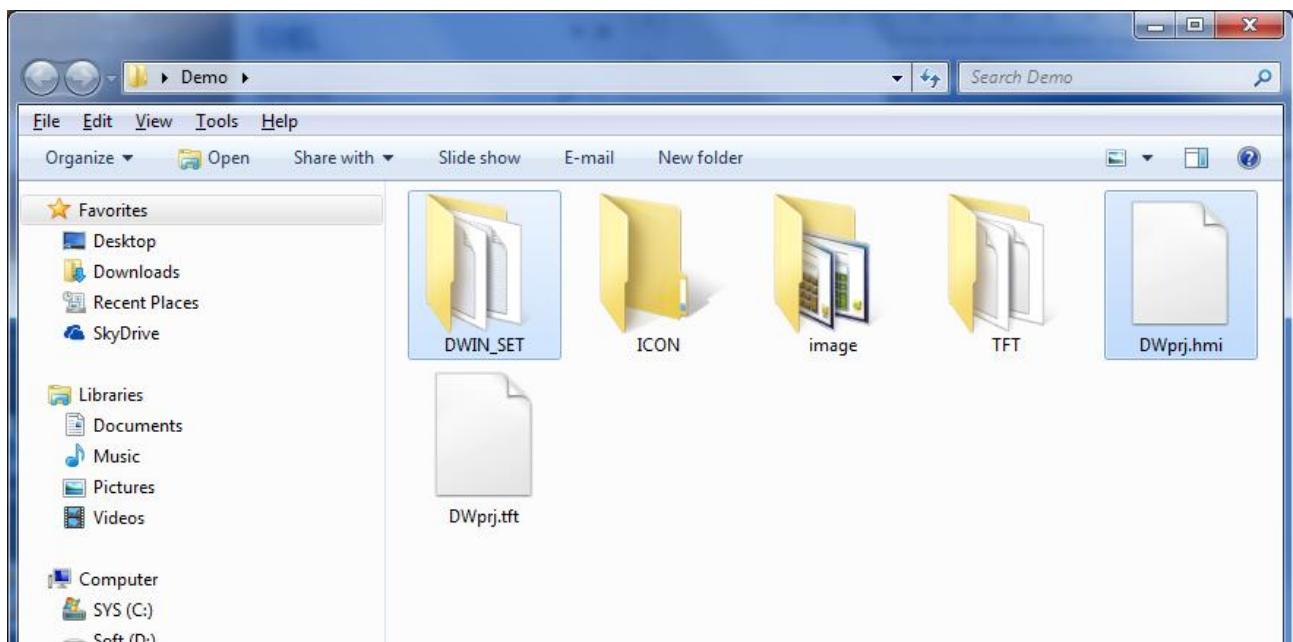
3.6.4 Create configuration files

Click the “Generating Configuration File” button, it will create a touch control configuration file and a variable configuration file. Their default file names are “[13Touch_Control_Config.bin](#)” and “[14Variable_Config.bin](#)” which cannot be renamed. Or the project can’t be opened properly.



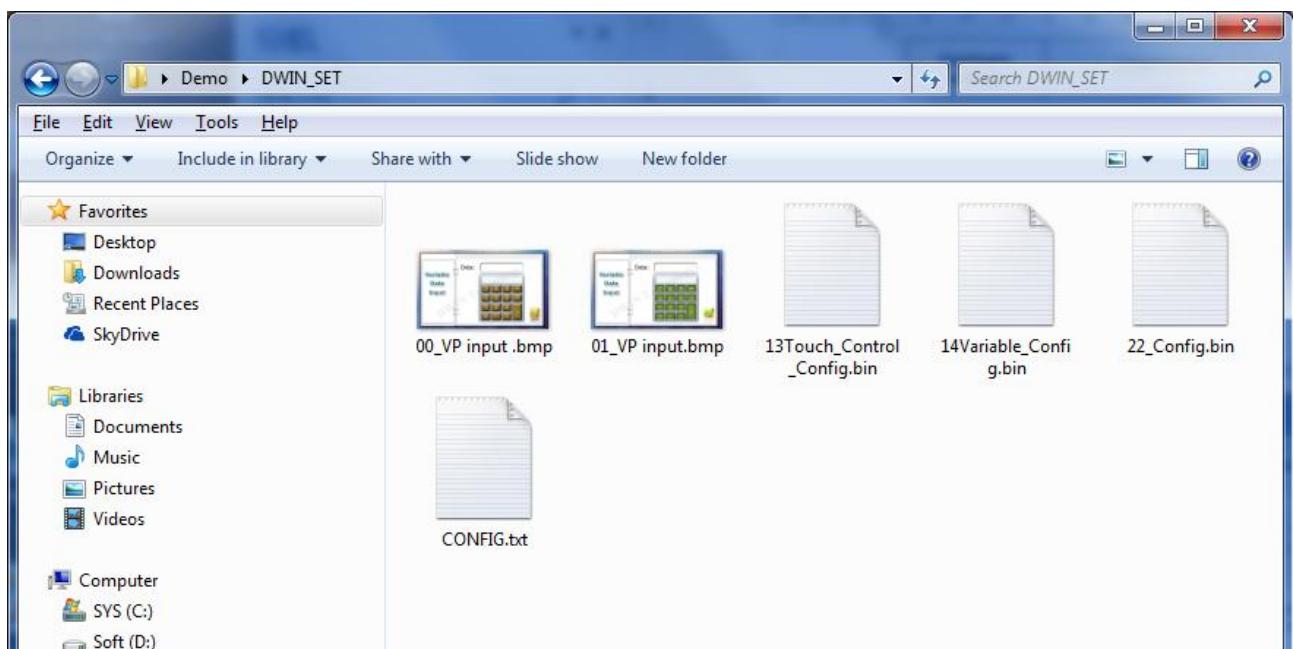
3.6.5 Download the configuration files into DWIN DGUS LCM

When you finished above steps, it will create a **DWIN_SET** folder and a project named **DWprj.hmi** in the path you selected before.



The DWIN_SET folder includes as follow:

File Type	Naming Rule	Example	Description
Pictures	Picture ID+ (optional) file name.BMP	00_starting page.BMP	24-bit BMP pictures with same resolution of DWIN module are required
Fonts	Font ID+ (optional) file name.BIN/DZK/HZK	32_ASCII.DZK	Generated by the Font Generator
Icon Library	Icon file ID+ (optional) file name.ICO	41_iconlibrary.ICO	Generated by DWIN Toolbox "DWICON"
Default ASCII	0*.HZK	0_DWIN_ASC.HZK	Generated by DWIN Toolbox "No.0 font library".
Touch configuration	13*.BIN	13_touch configuration file.BIN	Generated by DWIN DGUS software
Variable configuration	14*.BIN	14_variables configuration file.BIN	Generated by DWIN DGUS software
Variables Initialization	22*.BIN	22_Initialization.BIN	
User Code	23*.BIN	23_Water_Treatment.BIN	
Hardware settings	CONFIG.TXT	CONFIG.TXT	



Copy the **DWIN_SET** folder into the SD card root directory -----> Powered on DGUS LCM----->Insert SD card into the slot of LCM, the configuration files will be downloaded automatically.

Note: During downloading, don't power off the LCM. When it finished the screen will blink to blue then back to the first image.

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3.7 Development Steps

Step 1: Planning of Variables

- ✧ VP should be arranged in continuous addresses for convenience to write and read.
- ✧ Overlap of VP and SP addresses should be avoided.



Variable behavior	VP	Length(byte)
Voltage	0000	2
Current	0001	2
Power	0002	2
Operating power	0003	2
Operating speed	0004	2
Output torque	0005	2

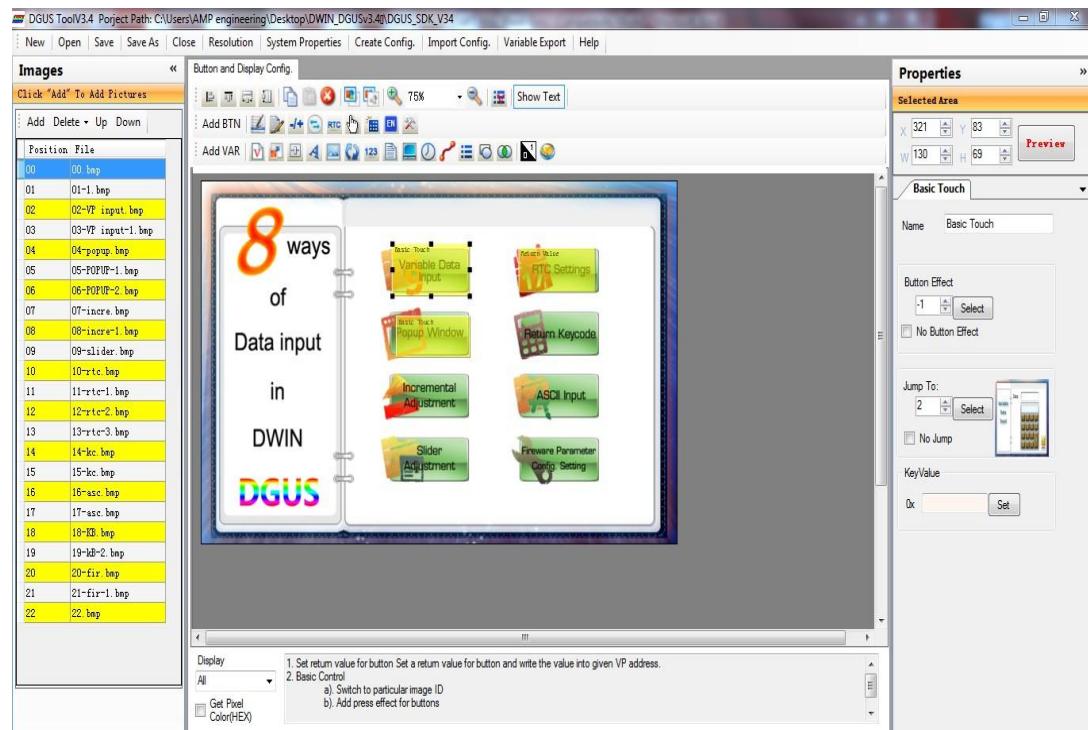
Step 2: Interface Design

- ✧ Pictures, icons and fonts are generated by image processing software.
- ✧ The picture must be exported in bmp format, 16-bit of color and resolution of visual effect



Step 3: Configuration of User Interface

- ❖ Config.file for the touch logic and variable display are generated by DGUS_SDK.



Step 4: Debugging & Modification

- ❖ Testing and revising the interface by viewing effects on DGUS LCM. (Step 2 - 3)
- ❖ Connect serial port of DGUS LCM and user's MCU, debugging.

Step5: Confirm & Filing

- ❖ Config.files, fonts, icon files, pictures and other files can be stored in SD cards for filing and mass production.
- ❖ There is only one way to upgrade the data into DGUS LCM and export the data that is by SD card. So for intellectual property of products, lock the SD port after downloading the data.

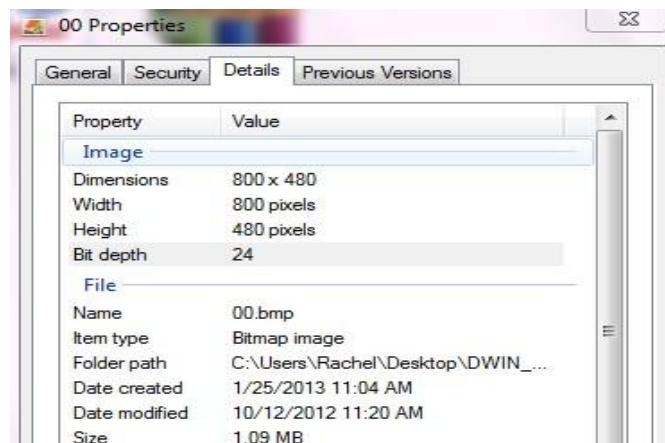
Please remember the password or DGUS LCM will be locked permanently.



4 FAQ

4.1 Display Abnormally

- A. power supply is wrong (lower than minimum voltage, the LCM doesn't work), refer to product specification and supply the right power.
- B. initial image is empty. Please download a 00.bmp (24-bit BMP, your module's resolution) image and **MUST be** saved in "**DWIN_SET**" folder. Download the folder to modules via SD card.
- C. Incorrect COM port number which can be found from Device Manger of PC
- D. wrong format of pictures, it should be **24-bit BMP**.



4.2 Touch screen Calibration

Method 1: tap touch screen 20 times in 4 seconds in none-button area to activate calibration mode.

- Quickly tap the touch screen more than 20 times in 4 seconds.
Note: do not click button area.
- Click until a long beep from the buzzer.
For the models without buzzer, user can time for 4 seconds or judge by if the variables are refreshed.
- Click particular position on touch screen to calibrate.
- Calibration finished and back to the starting page.

Method 2 (for V4.5 and higher version): write "TP_CORRECT" in CONFIG.TXT in root directory of SD card to activate calibration mode once.

For V4.3 and higher version, touch screen calibration will be disabled when SD card is disabled.

4.3 Name Rules of Images and Font Files

SD Card File Format			
File Type	Naming Rule	Example	Description
Pictures	Picture ID+ (optional) file name.BMP	00_starting page.BMP	24-bit BMP pictures with same resolution of DWIN module are required
Fonts	Font ID+ (optional) file name.BIN/DZK/HZK	32_ASCII.DZK	Generated by the Font Generator
Icon Library	Icon file ID+ (optional) file name.ICO	41_iconlibrary.ICO	Generated by DWIN Toolbox "DWICON"
Default ASCII	0*.HZK	0_DWIN_ASC.HZK	Generated by DWIN Toolbox "No.0 font library".
Touch configuration	13*.BIN	13_touch configuration file.BIN	Generated by DGUS_SDK.
Variable configuration	14*.BIN	14_variables configuration file.BIN	Generated by DGUS_SDK.
Variables Initialization	22*.BIN	22_Initialization.BIN	
User Code	23*.BIN	23_Water_Treatment.BIN	Base on DWIN OS.
Hardware settings	CONFIG.TXT	CONFIG.TXT	

It MUST be following the naming rules as shown above.

4.4 How to do with Icon Files?

Use the DW ICON to generate icon library. Copy the icon library into the folder DWIN_SET of the project, and then you can call the icons directly when running the DGUS_SDK.

4.5 Rotation 180°Display

If users set the LCM 180°rotation, please calibrate the touch screen once after download.

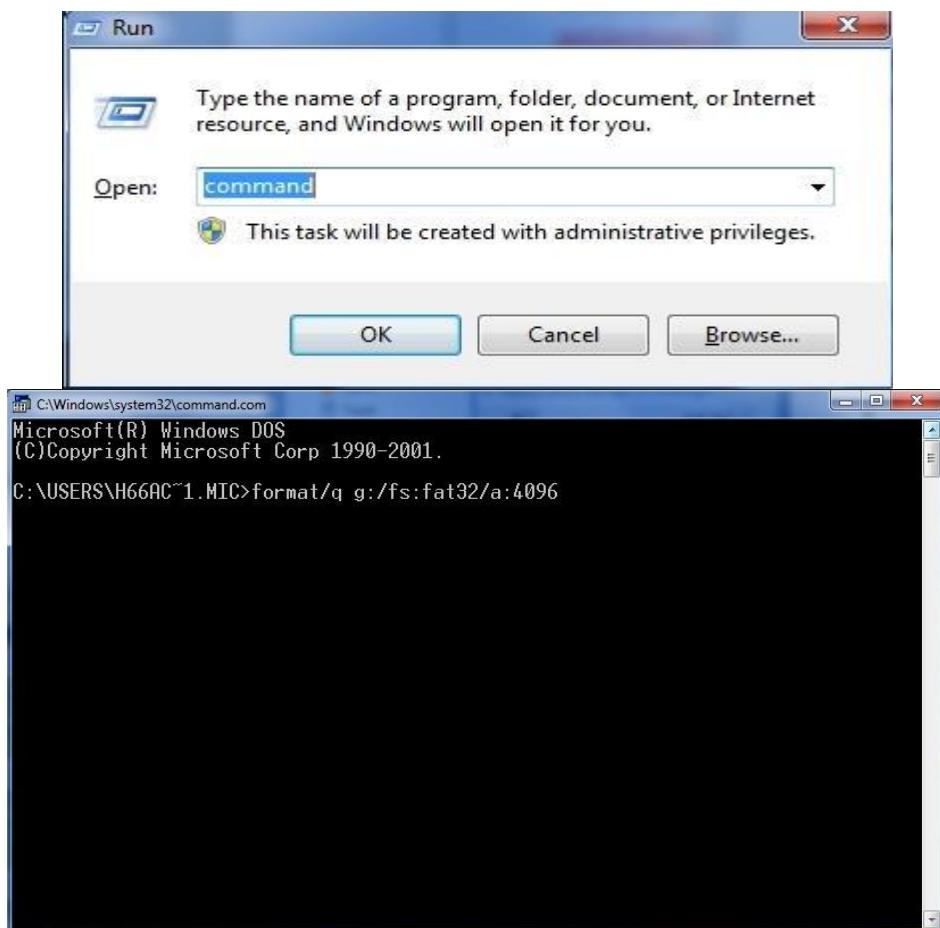
4.6 SD Card Format

Format your SD card: if part of your data in SD card is not downloaded into LCM, please format your SD card as the instruction below.

Step 1: open RUN function in Windows and run DOS using "command".

Step 2: type command to format: "format/q **g:**/fs:fat32/a:4096", and click <enter> to finish formatting.

The letter in red is the your disk number of SD card.



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5 Maintenance and Service

5.1 Maintenance

As high-precision device, LCM should be operated carefully when in storage, transporting and installing, avoiding strong pressure on the LCM and scratching by sharp objects.

LCD surface, CF and coatings, and touch panel are made of organic high polymer material, use LCD cleaners to do cleaning, avoiding organic solvents, such as alcohol, Alkali materials, chemicals contacting the LCM.

5.2 Service

The service extends only to the original purchaser.

After purchase our products, services shown below are offered to our clients, except **artificial damage**.

Free repairing if your DGUS LCM breaks within 1 year is achieved.

We'll maintain the product throughout its life.

If you need your product repaired but not satisfy the conditions above, the fee will be paid at the next order.

The following shows the artificial damage.

LCD: scratch, crush, corroded by organic solvents.

Touch screen: scratch, crush, corroded by organic solvents, cable breaks.

LCM: burn out by reverse polarity, broken by force etc.

Technology support

You can contact us by emails or phones to get help when you get any questions with our product.

Also you can download DEMOs and other technology documents on our website to help you developing your DGUS LCM.

Also please contact us for the latest firmware, other software, documents, and product information and so on.