

DT Analog Camera Screen Development Guide

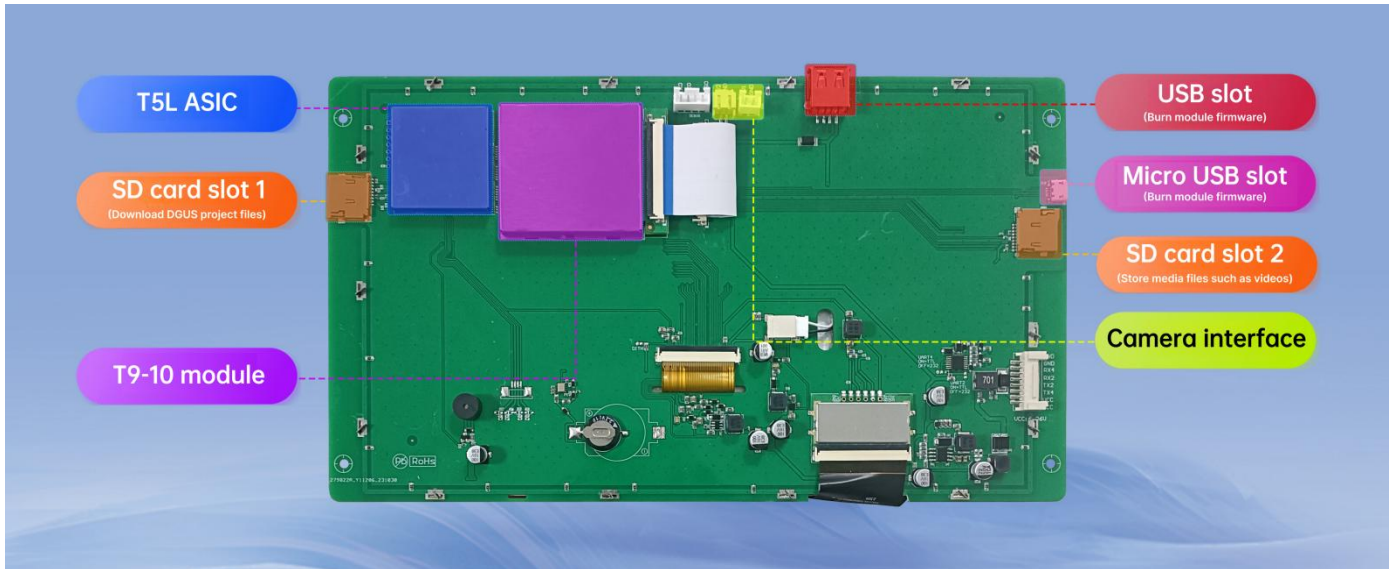
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1. Product Overview

1.1 Application Introduction

DT series analog camera screen products use T5L ASIC as the main control chip, combined with T9-10 video decoding module as the co processor, to achieve efficient video signal decoding and processing, suitable for AHD and CVBS high-definition analog cameras. Meet the needs of different industries for high-definition video display.



Hardware interface diagram

1.2 Product Features

- (1) Supports single channel 1080P high-definition AHD camera display, or dual channel 720P AHD cameras display on the same screen.
- (2) Supports two CVBS cameras switching display.
- (3) Supports full screen, picture in picture, floating icon, and floating character display effects.
- (4) Support camera zooming, screenshot saving, rotating mirror and other functions.
- (5) The frame rate for image transmission is 24 frames/s, resulting in smooth and high-definition images.
- (6) Support customized video recording function.

2. Product Selection

2.1 Analog camera screen selection table

Model	Size	Resolution	LCD Type	Touch Type	Color	Operating Voltage (V)	Operating Temperature (°C)
DT322X220034 Z240201A	4.3	800*480	IPS	No touch	24 bit, 16.7M	9~36	-20~70
DT322X220034 Z240201B	4.3	800*480	IPS	Resistive touch	24 bit, 16.7M	9~36	-20~70
DT322X220034 Z240201C	4.3	800*480	IPS	Capacitive touch	24 bit, 16.7M	9~36	-20~70
DT322X220034 Z240201D	7.0	1024*600	IPS	No touch	24 bit, 16.7M	9~36	-20~70
DT322X220034 Z240201E	7.0	1024*600	IPS	Resistive touch	24 bit, 16.7M	9~36	-20~70
DT322X220034 Z240201F	7.0	1024*600	IPS	Capacitive touch	24 bit, 16.7M	9~36	-20~70
DT322X220034 Z240201G	7.0	800*480	TN	No touch	24 bit, 16.7M	9~36	-20~70
DT322X220034 Z240201H	7.0	800*480	TN	Resistive touch	24 bit, 16.7M	9~36	-20~70
DT322X220034 Z240201I	7.0	800*480	TN	Capacitive touch	24 bit, 16.7M	9~36	-20~70
DT322X220034 Z240201J	10.1	1024*600	IPS	No touch	24 bit, 16.7M	9~36	-20~70
DT322X220034 Z240201K	10.1	1024*600	IPS	Resistive touch	24 bit, 16.7M	9~36	-20~70
DT322X220034 Z240201L	10.1	1024*600	IPS	Capacitive touch	24 bit, 16.7M	9~36	-20~70
DT322X220034 Z240201M	7.0	1280*800	IPS	No touch	24 bit, 16.7M	9~36	-20~70
DT322X220034 Z240201N	7.0	1280*800	IPS	Resistive touch	24 bit, 16.7M	9~36	-20~70
DT322X220034 Z240201O	7.0	1280*800	IPS	Capacitive touch	24 bit, 16.7M	9~36	-20~70

3. System Variable Interface Description

DT series analog camera screen is controlled through the system variable interface (0x0500~0x05BF) reserved by the DGUS system.

3.1 System Variable Interface Definition

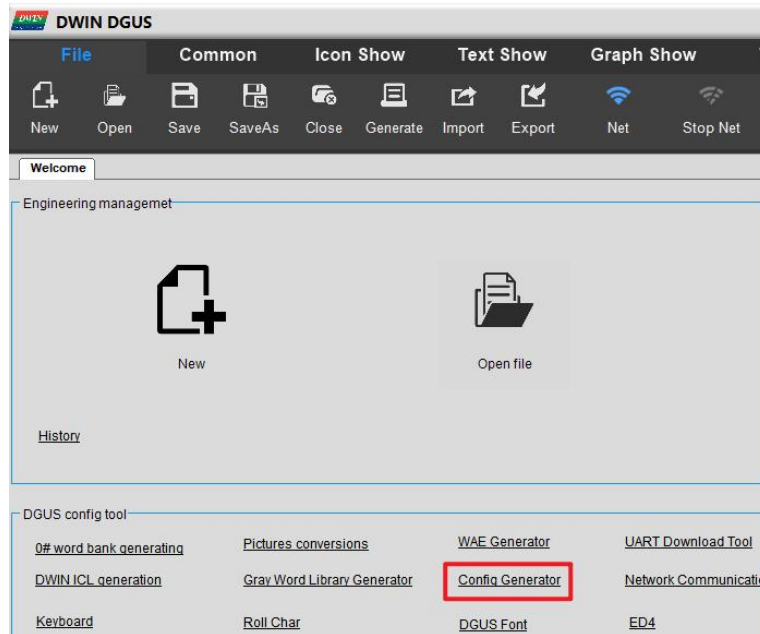
The functions corresponding to each system variable address used by the analog camera are shown in the following table.

Variable space first address	Definition	Length (word)	Description
0x0500	camera_resolution	3	D5:4: 0x5AA5, start configuration. Clear it to zero after execution. D3:2: Represents the resolution in the X direction. D1:0: Represents the resolution in the Y direction.
0x0503	camera_mirror	1	D1: 0x5A, set the image. Clear it to zero after execution. D0: 0=not mirrored, 1=mirrored.
0x0504	camera_rotate	1	D1: 0x5A, start configuration. Clear it to zero after execution. D0: Rotation angle, 0=0°, 1=90°, 2=180°, 3=270°.
0x0505	camera_set	1	D1: 0x5A, start configuration. Clear it to zero after execution. D0: 0x00, close all; 0x01, open channel 1; 0x02, open channel 2; 0x03, open all channels.
0x0506	camera_screenshot	1	D1: 0x5A, start screenshot saving. Clear it to zero after execution. D0: 0x01, channel 1. 0x02, channel 2.
0x0507	get_screenshot	1	D1: 0x5A=View the image of channel 1. 0xAA=View the image of channel 1, and send it via serial port. 0x5B=View the image of channel 2. 0xAB=View the image of channel 2 and send it via serial port. Clear it to zero after execution. D0: 00=view in reverse order, 01=view in order.
0x0508	set_camera_type	1	D1: 0x5A=Start setting, clear it to zero after execution (if N5 cannot automatically recognize the camera, it can be manually set by changing the interface). D0: Corresponding setting data. 0x01=N-mode of CVBS. 0x02=P-mode of CVBS. 0x0A=AHD 720P. 0x10= AHD_1080P. Please note that setting up the camera may cause the kernel to restart. The factory default of camera is AHD_1080P mode, which can be set only once when powered on.

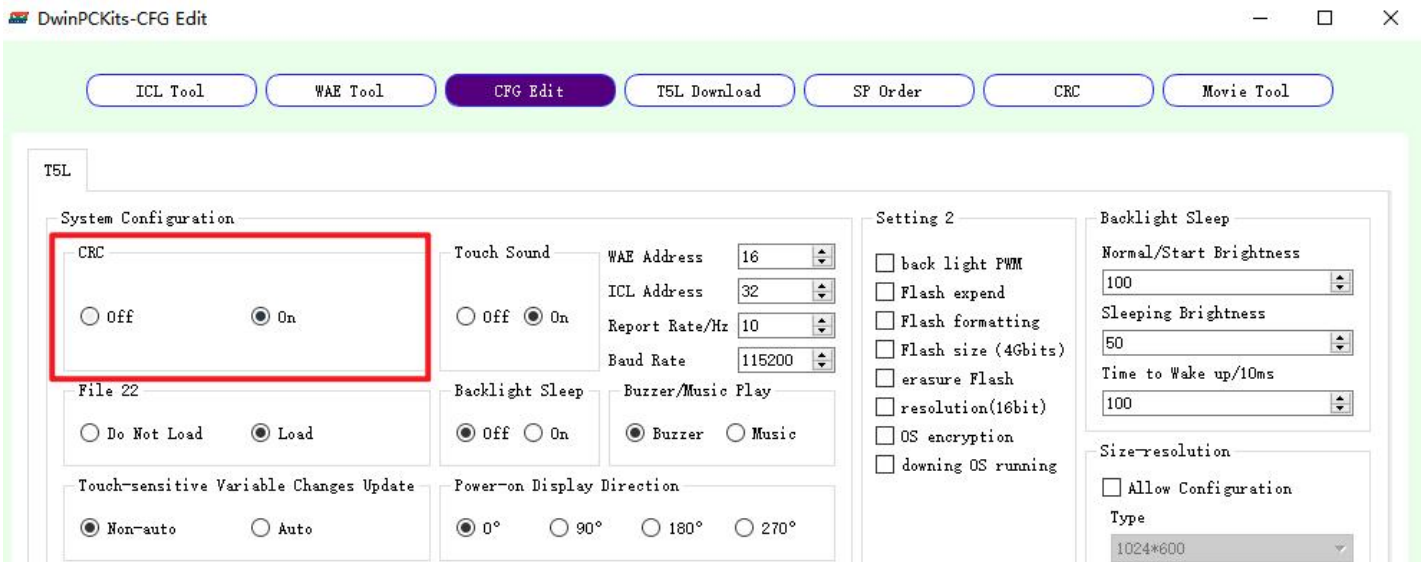
Variable space first address	Definition	Length (word)	Description
0x0509	set_n5_reg	3	D5: 0x5A=Start setting, clear it to zero after execution. D4: Command type. 0xFF =Query the N5 register, and output via R11 UART 0, D3 is valid. 0xEE =Set the N5 register, D3-D0 are valid. 0x5A=Set the actual position, D3-D0 are valid. D3: 0xEE=Register address 0. 0xFF=Return of the query, 0-255. 0x5A= X high byte of the screenshot. D2: 0xEE=Set value 0. 0x5A=X low byte of the screenshot. D1: 0xEE=Register address 1. 0x5A=Y high byte of the screenshot. D0: 0xEE=Set value 1. 0x5A=Y low byte of the screenshot.
0x050C	camera_auto_config	1	D1: 0x5A=When the camera is turned on, the image resolution is automatically set according to the size of the interface controls. Other value is invalid. D0: 0x5A=The function of automatically opening the camera is not processed when switching pages. Other value=The function of automatically opening the camera is processed.
0x050D	reserved	21	Undefined.
0x051E	camera_state	1	D1:0: 0x00=Close all, 0x01=Open channel 1, 0x02=Open channel 2, 0x03=Open all channels. Read only.
0x051F	R11_state	1	D1: 5A= R11 is started. Other value=Not started. At this time, the 0x500-0x51D settings will not be processed. Read only. D0: The camera mode activated by R11, with the same type as 0x508, which is only valid when D1 is 5A. Read only.
0x0520-0x053F	camera_driver_info	32	The mapping location of the memory used by the camera driver. Read only.
0x0540-0x055F	camera1_display_size	32	Data transmit control. Its size is the same as the control of camera 1.
0x0560-0x057F	camera2_display_size	32	Data transmit control. Its size is the same as the control of camera 2.
0x0580-0x059F	camera1_display_sp	32	Icon overlay, SP of display control for camera 1, VP:FF00.
0x05A0-0x05BF	camera2_display_sp	32	Icon overlay, SP of display control for camera 2, VP:FF00.

Note:

1. If you need to view the saved pictures, turn off all cameras.
2. Save the screenshot to the SD card. Create folders "1" and "2" in the root directory to save the screenshots of channel 1 and channel 2 respectively.
3. Please use the CFG file to enable the verification function of UART 2 and UART 4. CFG file can be modified by using the DGUS tool, as shown in the following figure.



DGUS configuration file generation tool



In CFG file, enable CRC verification

3.2 Application Instance

For example, adjusting the resolution through the system variable interface 0x0500 can be achieved by sending commands through the serial port or using DGUS "Return Key Code" control.

(1). Serial port command.

82/83 command: 5AA5 09 82 0500 5AA5 0320 01E0

Command meaning: Frame header Command length 82 (write variable space) System variable address Start resolution processing once Resolution in X and Y direction

Note: After the serial port command is issued, the camera screen will be adjusted to 800 * 480.

(2). DGUS control

1.The resolution in the X and Y directions can be modified through the "Variables Input" control, and the parameter settings refer to the following figure.

X-direction resolution input

Y-direction resolution input

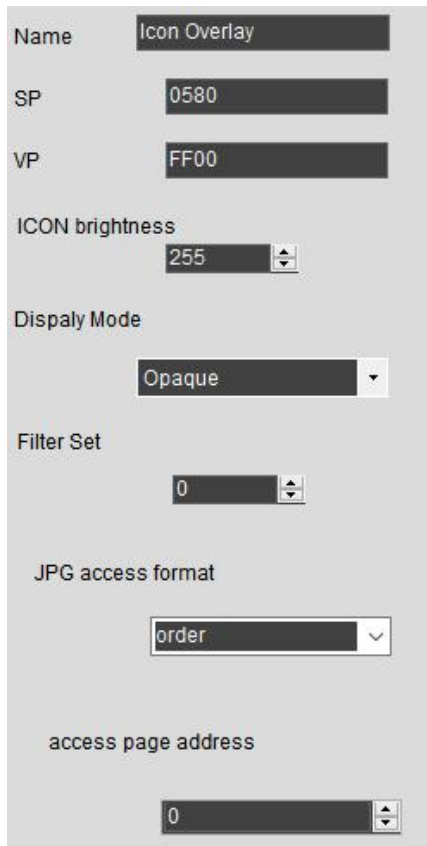
2.Making the resolution effective can be achieved through the "Return Key Code" control, with parameter settings as shown in the following figure.

4. Camera Interface DGUS Development

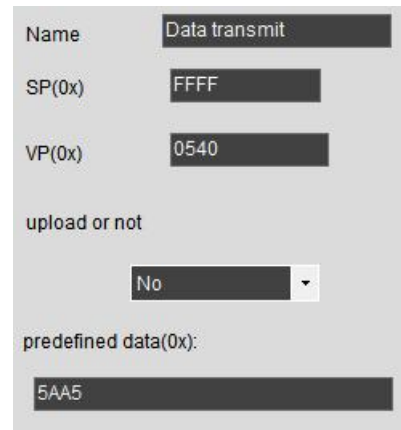
The DGUS project for simulating camera interface requires the use of two controls: "Data transmit" and "Icon Overlay".



Taking camera 1 setting as an example, Overlay and place **Icon Overlay** and **Data transmit** together, and refer to the following content to set the control parameters. The predefined data "5AA5" in "Data transmit" control means that the camera will automatically open upon entering the page, while the rest of the values are not automatically turned on. It is noted that the display area size of the two controls should be consistent.

A screenshot of a control configuration panel for 'Icon Overlay'. It features several input fields and dropdown menus: 'Name' (Icon Overlay), 'SP' (0580), 'VP' (FF00), 'ICON brightness' (255), 'Display Mode' (Opaque), 'Filter Set' (0), 'JPG access format' (order), and 'access page address' (0).

Icon overlay

A screenshot of a control configuration panel for 'Data transmit'. It features several input fields and dropdown menus: 'Name' (Data transmit), 'SP(0x)' (FFFF), 'VP(0x)' (0540), 'upload or not' (No), and 'predefined data(0x)' (5AA5).

Data transmit

5. Revision Records

Version	Revise Date	Content	Editor
V1.0	2024-07-15	First Edition	Xu Ying
V1.1	2024-08-19	Add the description about CVBS camera	Xu Ying

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