

Abstract

HCTouch VLAB V2.0.0.0 is an auxiliary tool for the development and debugging of touch products of home appliance product line of holychip. With this tool and debugging library, it can automatically debug parameters and watch data changes in real time. This document mainly introduces the use of the tool to help customers improve the speed of product development.

- This document is applicable to hctouch vlab version: hctouch vlab v2.0.0.0.

- Relevant data manuals, tools and technical documents can be downloaded from [www. http://www.holychip.cn/](http://www.holychip.cn/)

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1 Brief Introduction

Hctouch vlab is an auxiliary tool for the development and debugging of Xinsheng touch products. Users can improve the speed of product development through the debugging tool.

- ◆ Hctouch vlab v2.0.0.0 provides three debugging modes: adaptive dynamic debugging, manual dynamic debugging and static debugging
- ◆ Through hc-link (emulator) or ordinary serial port debugging tool to connect user application board to debug
- ◆ The data change of each touch channel can be observed in real time
- ◆ Hc-link power supply or external power supply can be selected
- ◆ With the touch library function provided, users can customize UART data communication port and baud rate
- ◆ Support touch data curve or data display, and save data



Figure 1-1 hctouch vlab operation interface

2 System Establish

2.1 Hardware

The user target board can debug the system through hc-link3.0, hc-link4.0 and common serial port debugging tools.

2.1.1 HC-LINK3.0

The user's target application board is connected with hctouch vlab through hc-link3.0, as shown in the following figure:



Hc-3.1 hardware connection diagram

Communication port connection:

The user target board transmits the touch data to hc-link3.0 through UART, and then the hc-link uploads the touch data to the PC. The TXD port of the UART of the user target board is connected to the RXD port of hc-link3.0, as shown in the red box below. The RXD port of UART of the user target board can be connected to the TXD port of hc-link3.0, as shown in the figure below.



Figure 2-2 hc-link3.0 appearance

2.1.2 HC-LINK4.0

The user's target application board is connected with hctouch vlab through hc-link4.0, as shown in the following figure:



Figure 2-3 hc-link4.0 hardware connection

Communication port connection:

The user target board transmits the touch data to hc-link4.0 through UART, and uploads the touch data to PC by hc-link4.0. The TXD port of UART of user target board is connected to RX of hc-link4.0, and the RXD port of UART of user target board is connected to TX of hc-link4.0.



Figure 2-4 hc-link4.0 appearance

2.1.3 Common Serial Port Tool

The user target board is connected with hetouch vlab through the serial port tool, as shown in the following figure:



Figure 2-5 serial port tool hardware connection

Communication port connection:

The user target board transmits the touch data to the serial port tool through UART, which uploads the touch data to the PC. The TX port of the UART of the user target board is connected to the RX of the serial port tool, and the RX port of the UART of the user target board is connected to the TX end of the serial tool.

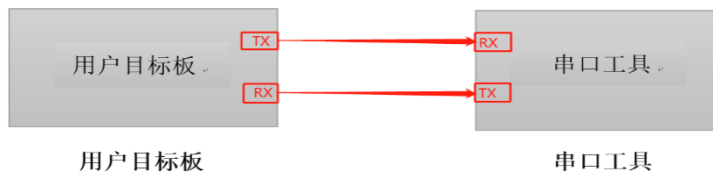


Figure 2-6 connection of serial port tool and user target board

attention:

Static debugging mode: the user target board only needs to send the data to the upper computer, so it only needs to connect the TXD of the user target board with hc-link or RX of the serial port tool.

2.2 Software

Take hc89f3541 as an example: open hc89f3541_Touch_AutoDebug_Code v1.0.5.0 touch library, open to see a project file, hc89f3xx1_TouchUartDebug_Lib_CFG_AutoDebug. H, this file is the UART function library, and the table below is hc89f3xx1_TouchUartDebug_Lib_CFG_Introduction to autoDebug. H configuration:

Function name	TouchUartDebugLib_BAUDRATE	TouchUartDebugLib_TXD_	TouchUartDebugLib_RXD_	TouchUartDebugLib_SW
Adaptive dynamic debugging	The recommended baud rate is 1000000	Format: touchuartdebuglib_TXD_Px_y For example: TouchUartDebugLib_TXD_P2_0	Format: touchuartdebuglib_RXD_Px_y For example: TouchUartDebugLib_RXD_P2_0	Configure 0 to disable debugging Configure to 1 to allow debugging
Manual dynamic debugging	The recommended baud rate is 1000000	Format: touchuartdebuglib_TXD_Px_y For example: TouchUartDebugLib_TXD_P2_0	Format: touchuartdebuglib_RXD_Px_y For example: TouchUartDebugLib_RXD_P2_0	Configure 0 to disable debugging Configure to 1 to allow debugging
Static debugging	The recommended baud rate is 1000000	Format: touchuartdebuglib_TXD_Px_y For example: TouchUartDebugLib_TXD_P2_0	Static debugging does not need to configure RXD receiving pin, static debugging only needs to configure TXD pin	Configure 0 to disable debugging Configure to 1 to allow debugging

Table2-1 HC89F3xx1_TouchUartDebug_Lib_CFG_AutoDebug.h

3 HCTouch VLAB Application

Hctouch vlab touch debugging tool has three debugging modes: adaptive dynamic debugging mode, manual dynamic debugging mode and static debugging mode.

Debug mode	Introduction to debugging mode	Applicable touch Library
Adaptive dynamic debugging	According to the hctouch vlab interface prompt, the user can complete the basic parameter setting of touch application by pressing and leaving the finger. After debugging, the configuration can be exported for user's reference	Touch tools in hcmlab touch Library
Manual dynamic debugging	Users can modify touch related parameters in real time, display touch debugging phenomenon in real time, and export configuration for user's reference after debugging	Hctouch vlab tool with touch Library
Static debugging	If the user wants to configure the relevant settings of touch parameters, they need to modify the touch parameters in the touch library. After modifying the completion parameters, recompile the download and restart debugging.	Hctouch vlab tool has its own touch library and other core Saint touch libraries

Table 3-1 hctouch vlab debug mode

3.1 Key Introduction

1、Power supply mode: 5.0V, 3.3V, external power supply



Figure 3-1 power settings

2、According to the UART baud rate set in the user code, select the corresponding baud rate on hctouch vlab.



Figure 3-2 serial port setting

3、Start debugging

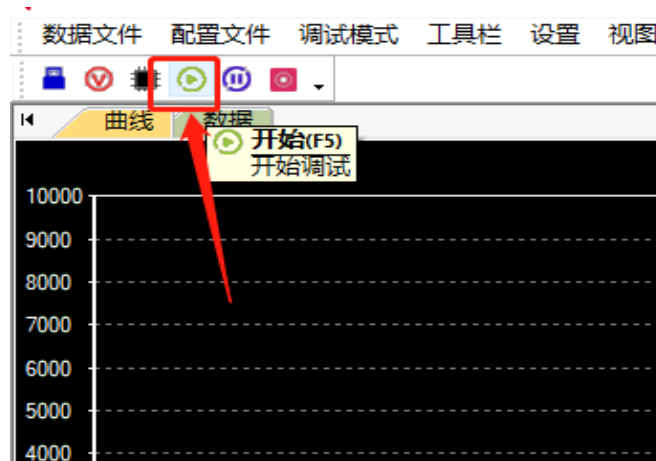


Figure 3-3 start debugging

4、pause / resume debugging



Figure 3-4 pause / resume debugging

5、Stop debugging

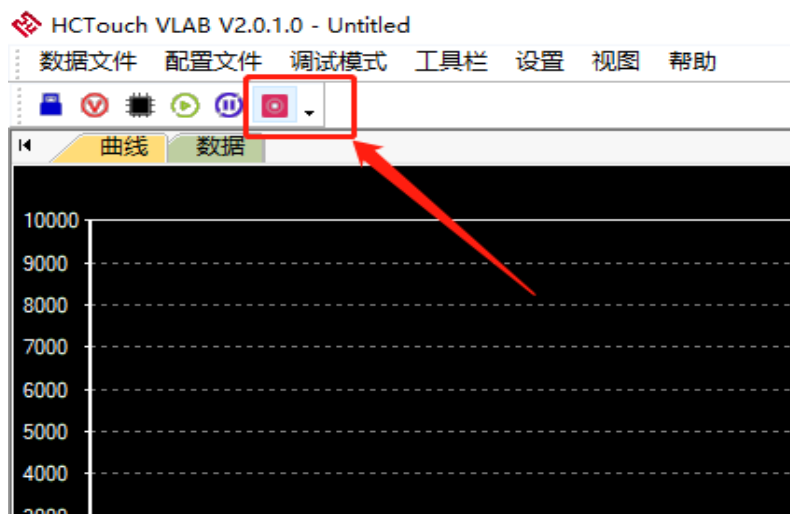


Figure 3-5 stop debugging

6、Debugging mode switch



Figure 3-6 debugging mode switching

7、select the key effective mark position subtitle display or key effective mark sound prompt

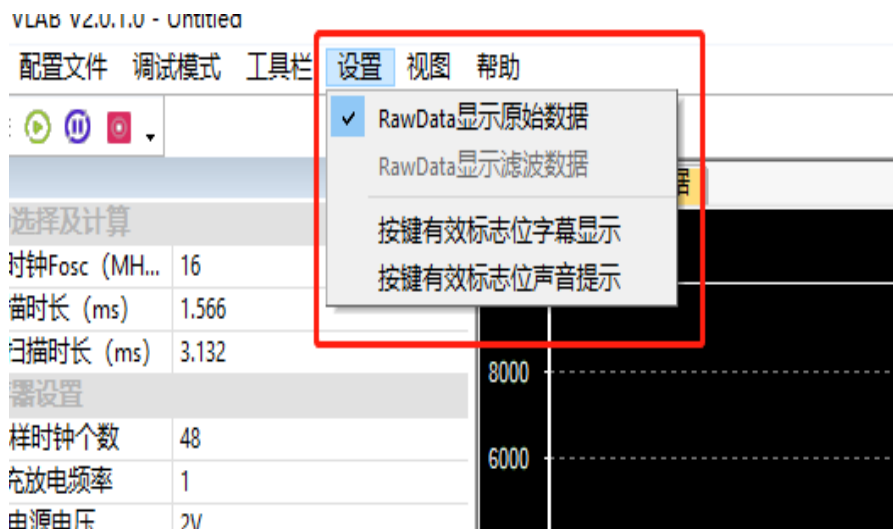


Fig. 3-7 display of key effective flag

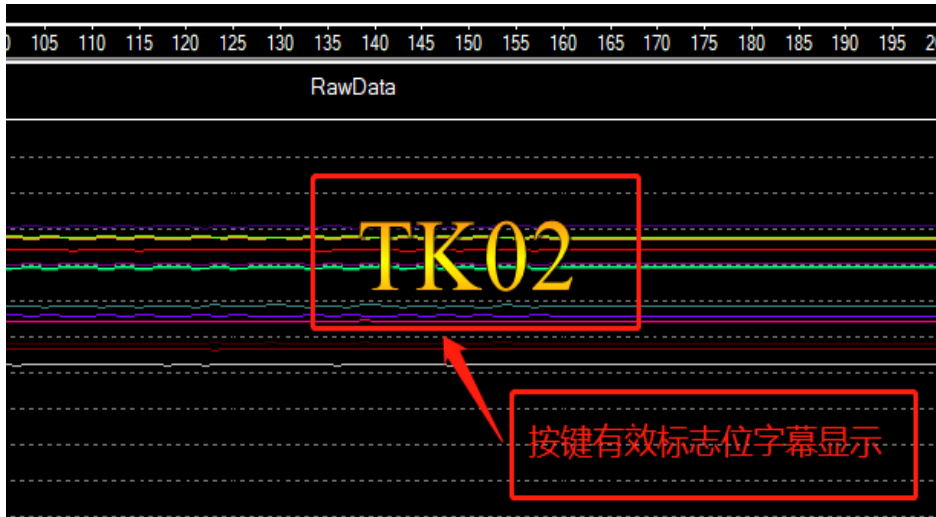


Figure 3-8 subtitle display of key effective flag

7、The user can select curve form or data form to display.

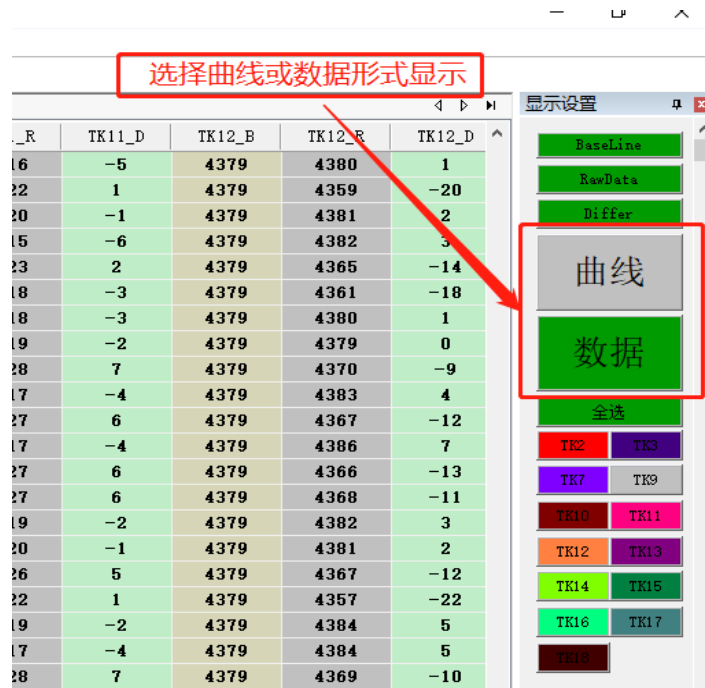


Figure 3-9 data format display

8、To view the touch value, the user can select the data table option as shown in the figure below. Example: tk10_B represents baseline data of touch channel 10, tk10_R represents raw data of touch channel 10, tk10_D represents the difference data of touch channel 10.

TK9_D	TK10_B	TK10_R	TK10_D	TK11_B	TK11_R	TK11_D
-2	2831	2835	4	3221	3216	-5
-3	2831	2829	-2	3221	3222	1
-2	2831	2833	2	3221	3220	-1
-3	2831	2833	2	3221	3215	-6
6	2831	2827	-4	3221	3223	2
2	2831	2831	0	3221	3218	-3
-1	2831	2832	1	3221	3218	-3
-2	2831	2834	3	3221	3219	-2
6	2831	2826	-5	3221	3228	7
0	2831	2842	11	3221	3217	-4
4	2831	2826	-5	3221	3227	6
4	2831	2844	13	3221	3217	-4

Figure 3-10 touch value

9、When the user wants to save the touch data, please select "file" > "save file". When "save file" is selected, hctouch vlab starts to save the current touch data.

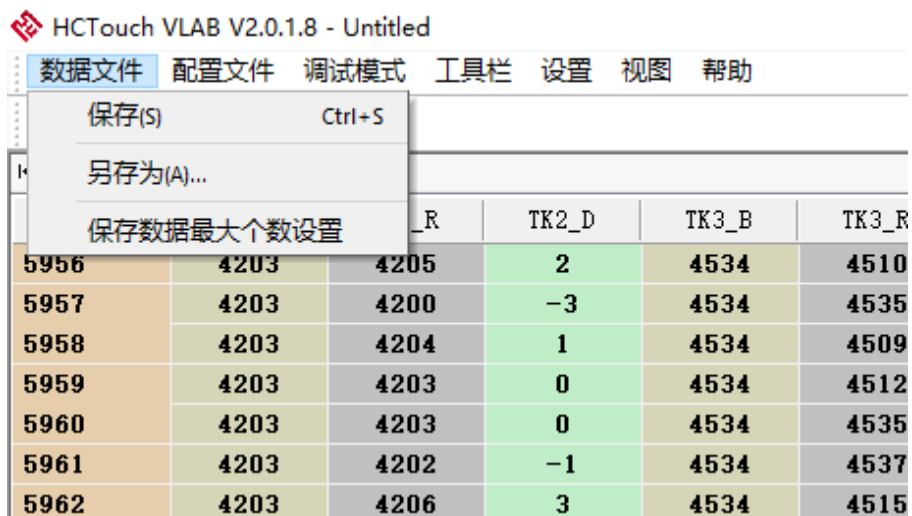


Figure 3-11 save file

10、When the user wants to save the touch related parameters, please select "configuration file" > "export configuration", hctouch vlab will start to save the current touch related parameters and generate the touch parameter configuration file. The user can replace it in the touch library, and the static debugging mode has no such function.



Figure 3-12 export configuration file

11、If the user needs to view the real-time curve of touch channel, the display of the curve can be set. Right click the right mouse button in the curve graph interface to set the curve display type (compression display and rolling display), set the maximum number of points for rolling display, set the coordinate axis, set the color and clear the screen.

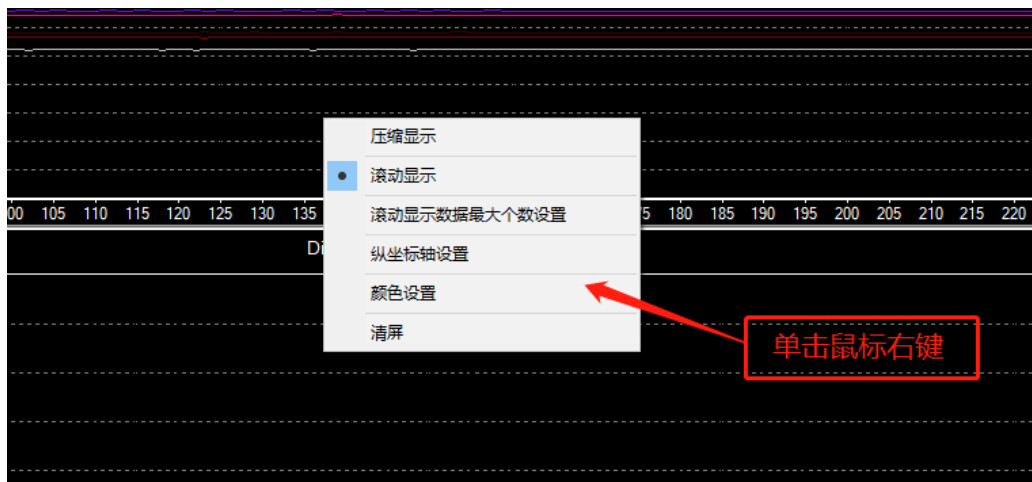


Figure 3-13 display settings



Figure 3-14 coordinate axis setting

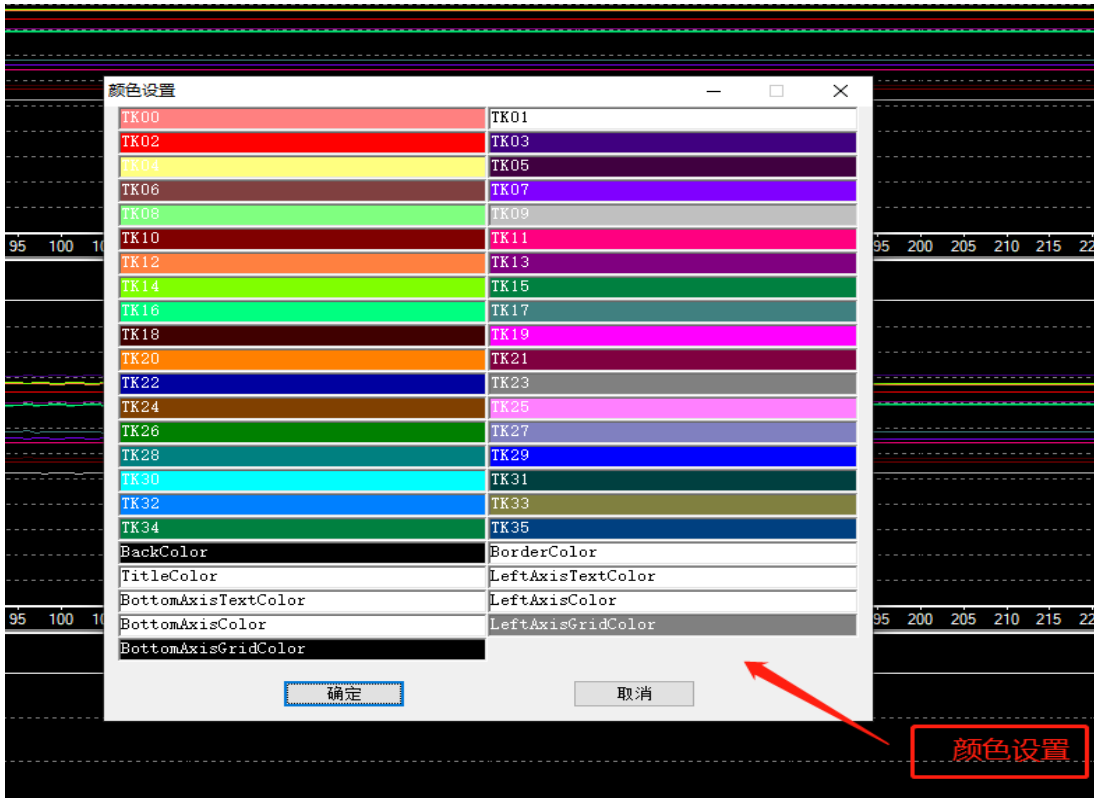


Figure 3-15 color setting

12、Click the channel button on the right to turn off the channel display

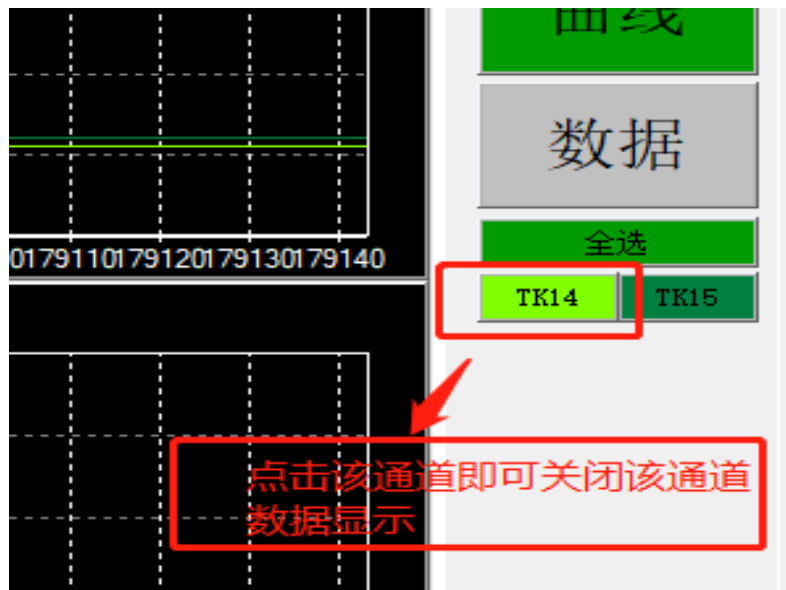


Figure 3-16 channel display off

13、The enabled touch channel (the touch channel for debugging) will be displayed below and to the right of the debugging tool

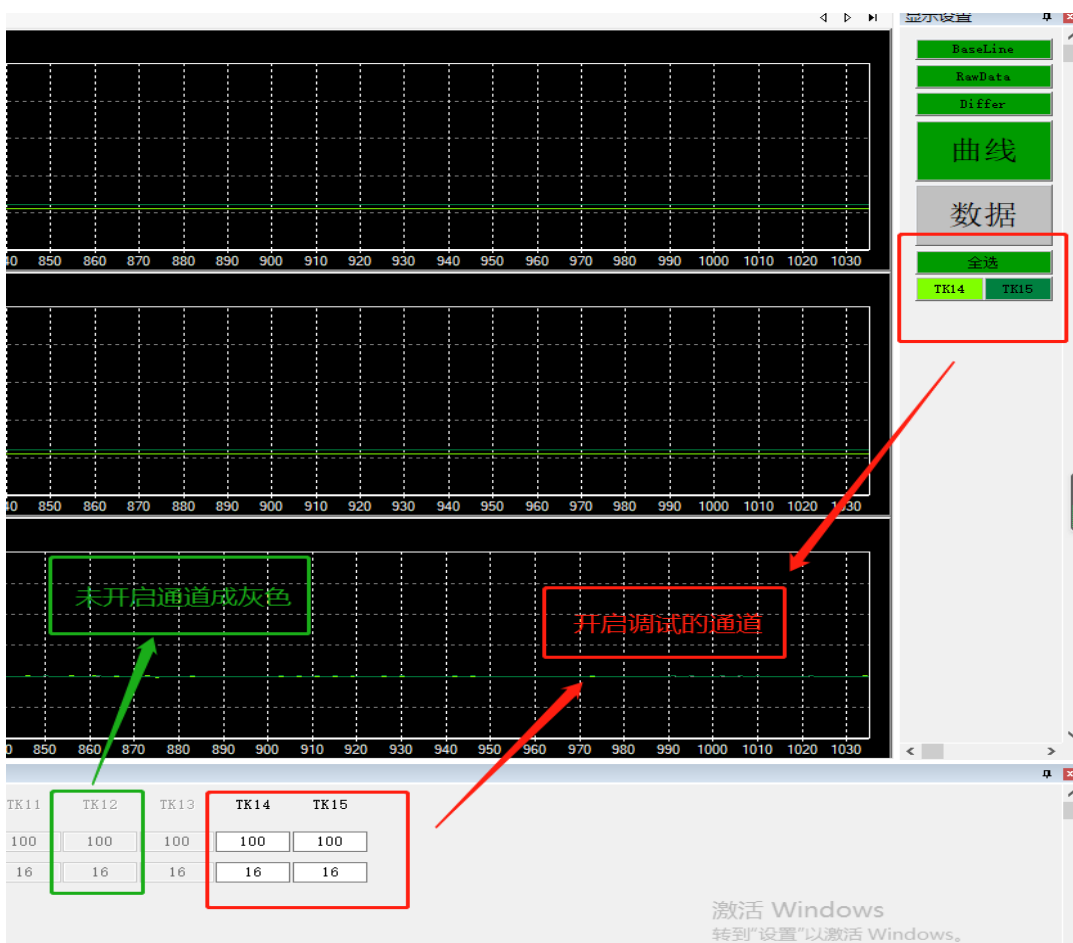


Figure 3-17 display of opened debug channel

3.2 Introduction to Debug Mode

3.2.1 Auto Dynamic Debug

1、After the hardware is ready, the user opens the debugging tool hctouch vlab.

2、select debugging mode



Figure 3-18 select debug mode

3、Click the start debugging button to enter debugging.

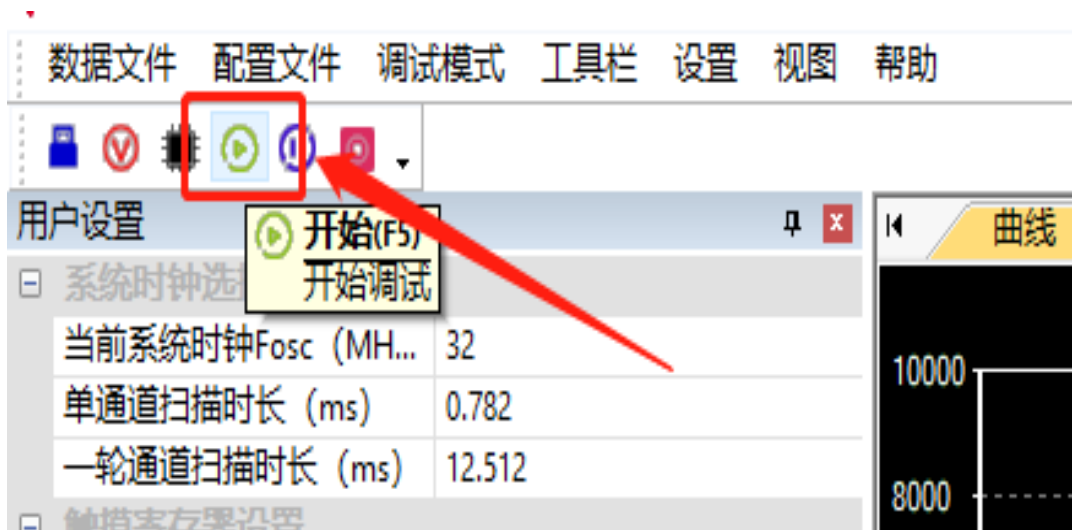


Figure 3-19 start debugging

4、Enter the adaptive dynamic debugging setup wizard step 1

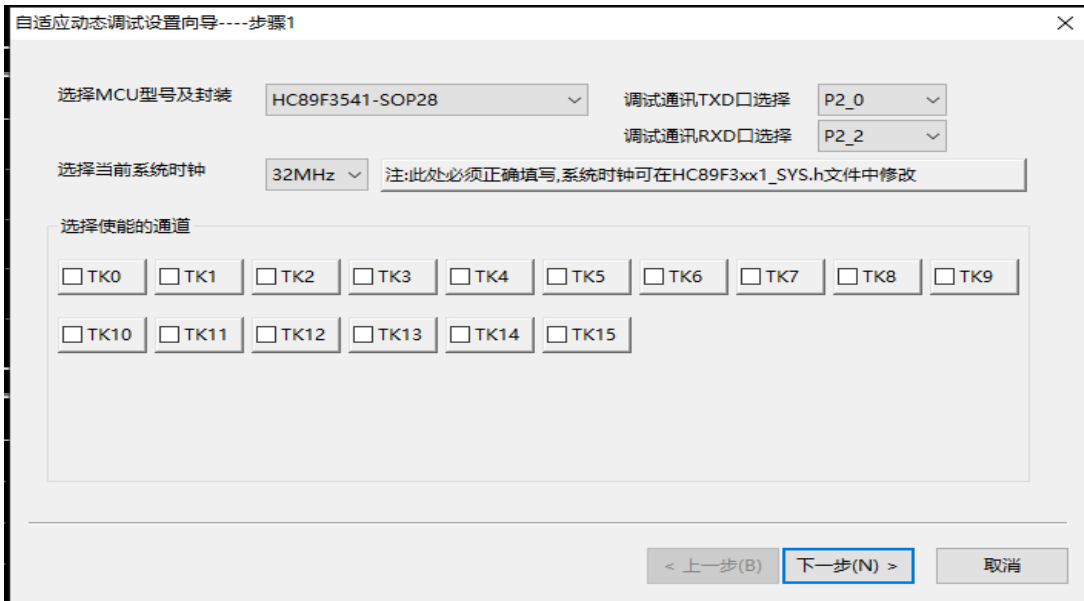


Figure 3-20 step 1

5、Select chip model

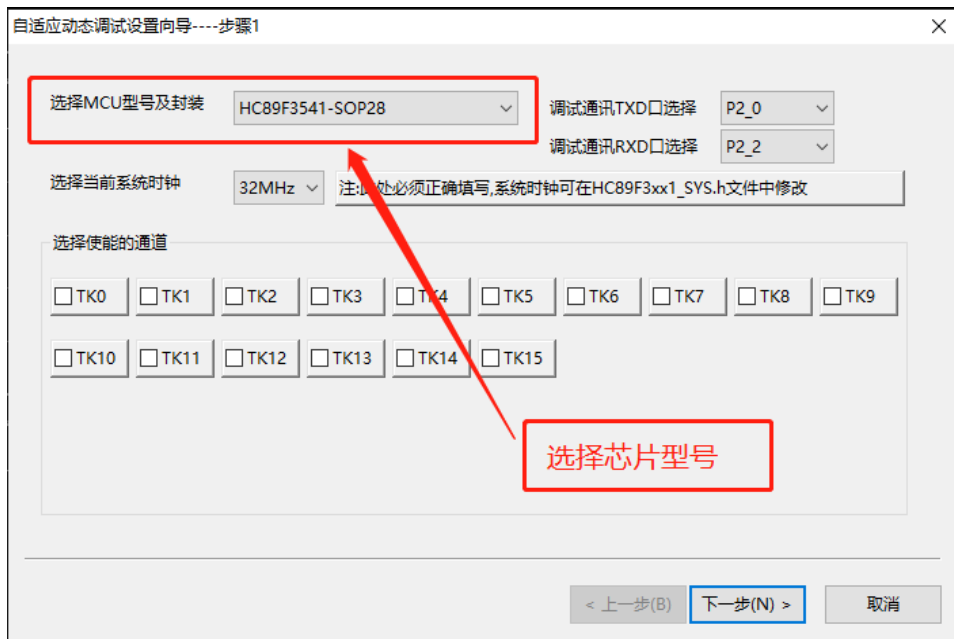


Figure 3-21 chip selection

6、Debugging communication port selection



Figure 3-22 debugging communication port selection

7、System clock selection

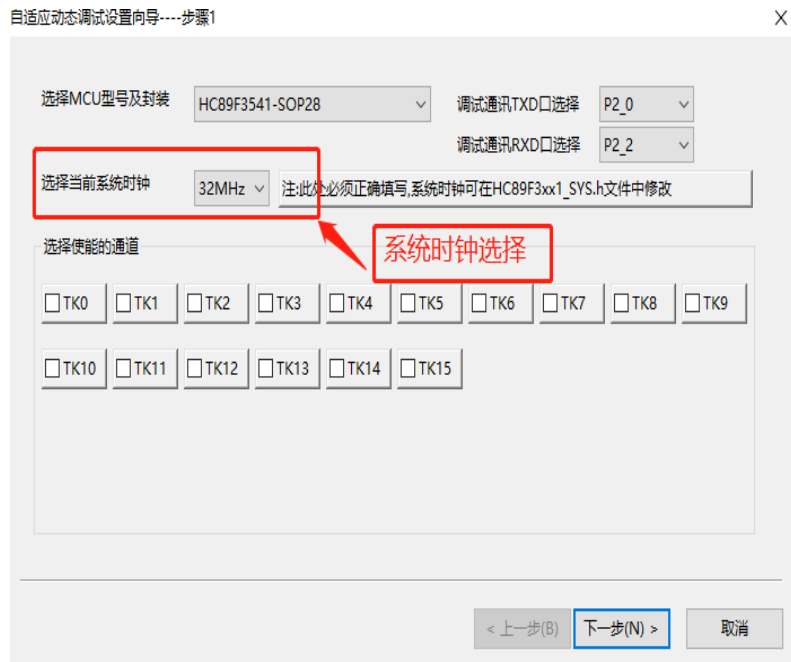


Figure 3-23 system clock selection

8、select the channel to be debugged



Figure 3-24 debugging channel selection

9、Click the yellow button to open keil automatically and load the configuration in step 1 into the program

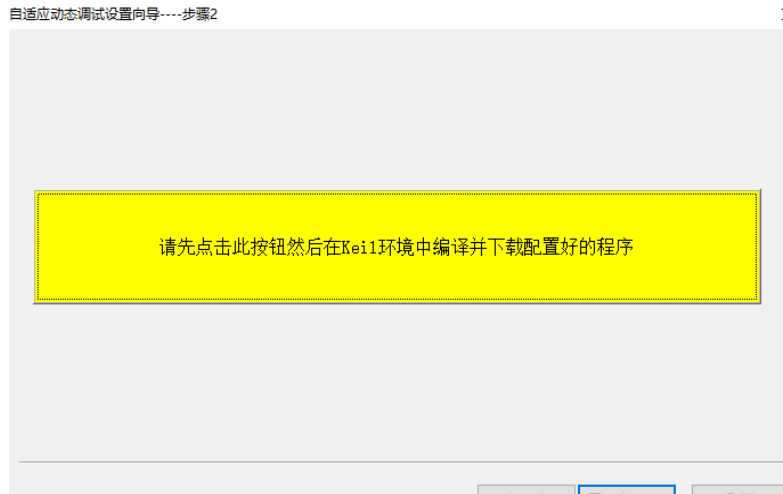


Figure 3-25 click the yellow button

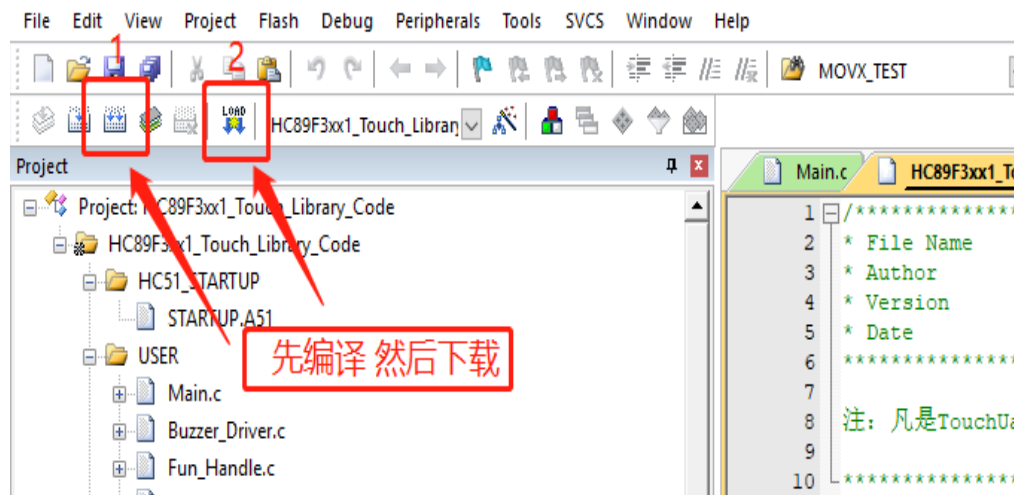


Figure 3-26 automatically open KEIL, compile and download the program configured in step 1

10、After connecting the TXD and RXD ports selected by the user in step 1 with the TXD and RXD in link or serial port tool, click next

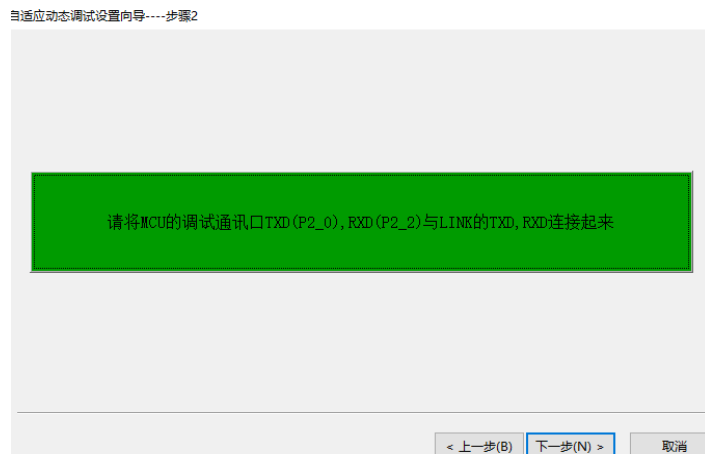


Figure 3-27 establishing serial communication

11、When the communication is successful, the communication normal button will appear in the lower left corner of the interface

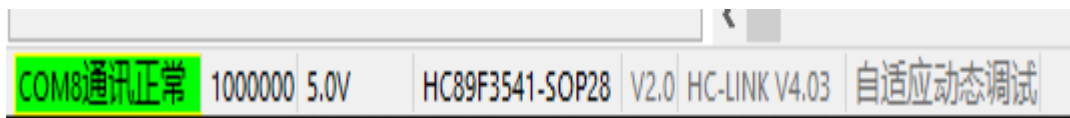


Figure 3-28 normal communication

12、if communication fails, an error prompt as shown in the figure below will appear in the status bar.

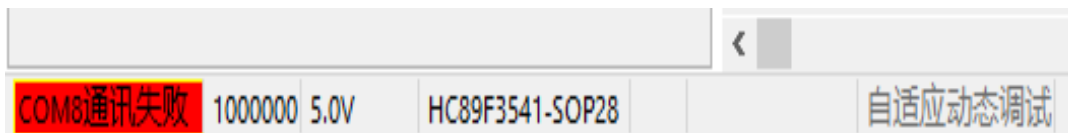


Figure 3-29 communication failure

13、After successful communication, enter the adaptive dynamic debugging setup wizard step 3, and configure the relevant parameters

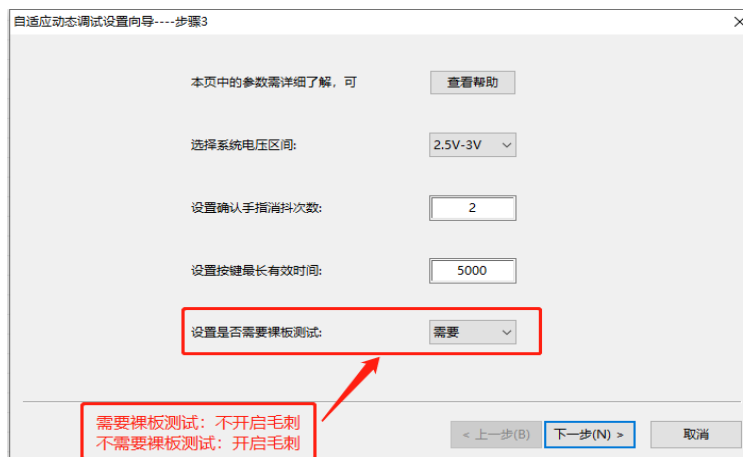


Figure 3-30 adaptive dynamic debugging step 3

14、Collect the data of touch debugging channel and operate according to the prompt steps

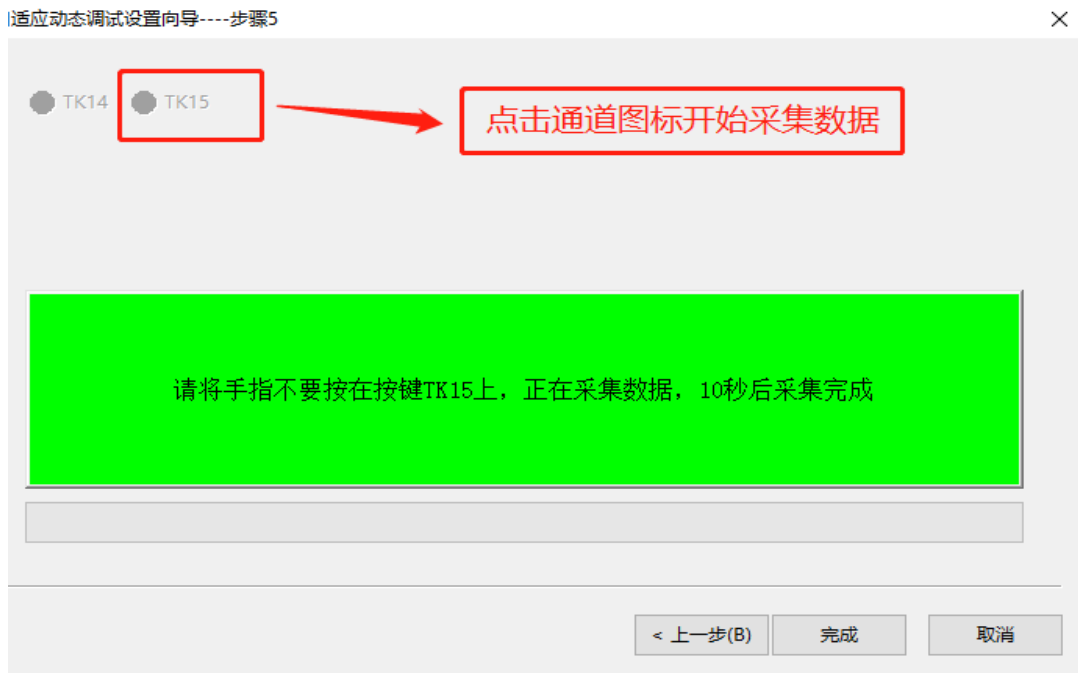


Figure 3-31 data acquisition of touch debugging channel

15、When the channel acquisition is completed, the corresponding channel indicator will turn green

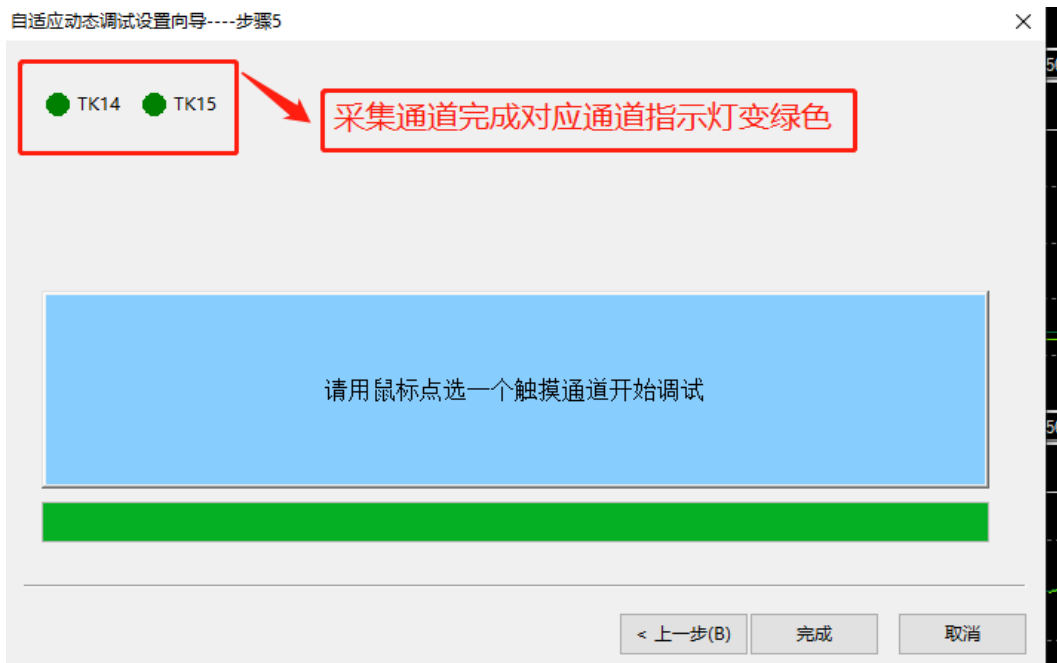


Figure 3-32 data acquisition completed

16、When the acquisition channel is red, it means that the acquisition of the channel is failed. When the mouse moves to the position of the indicator, an error will appear

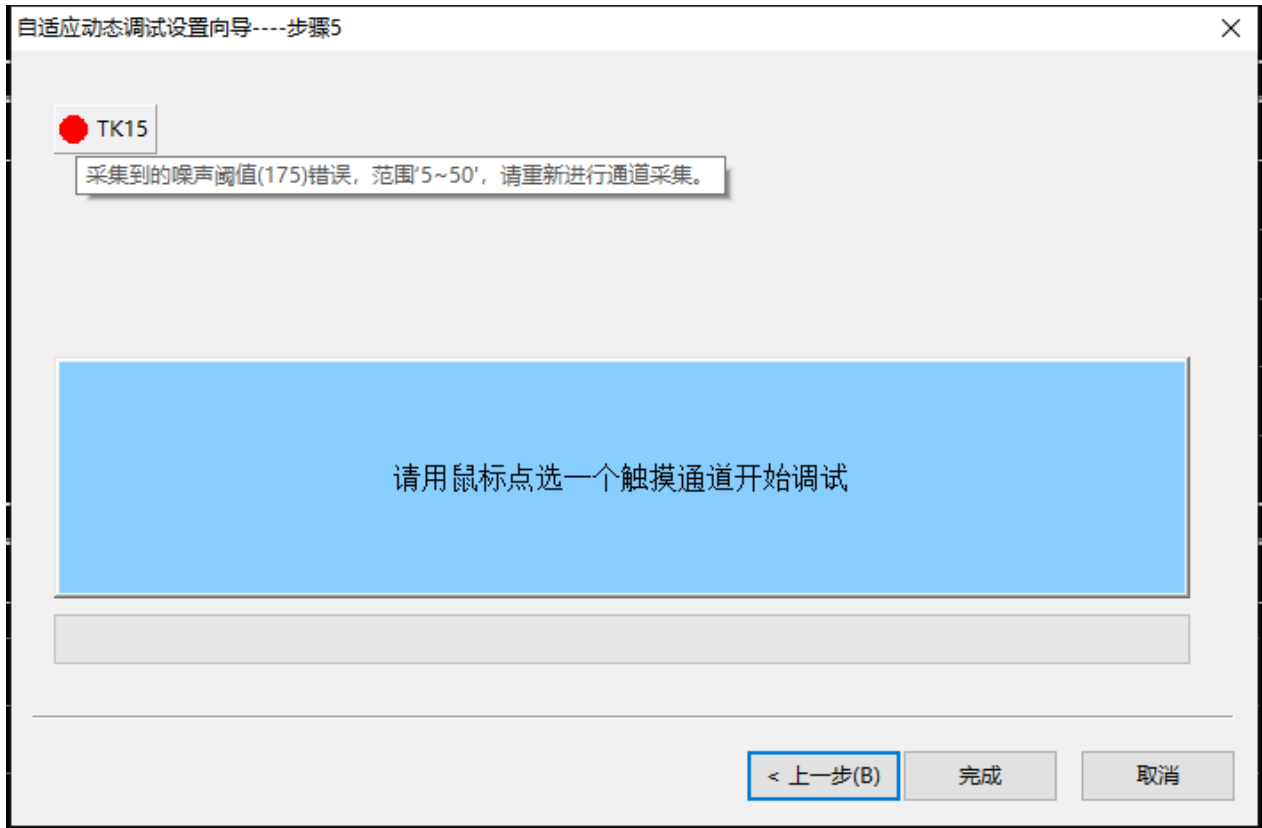


Figure 3-33 data acquisition failure

17、Click finish, and the debugging tool displays that the parameter adjustment is completed

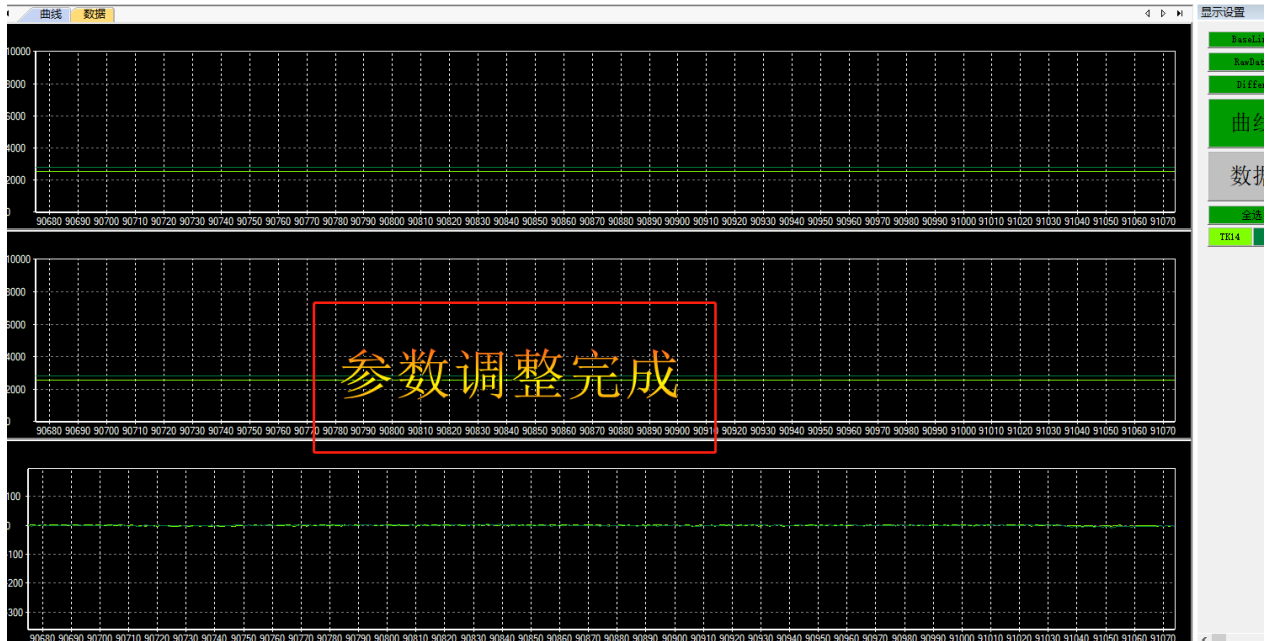


Figure 3-34 parameter adjustment completed

18、After exporting, you can touch the configuration file of your own



Figure 3-35 export configuration file

3.2.2 Manual Dynamic Debug

- 1、The user needs to compile and download the program to the chip, and the user opens the debugging tool hctouch vlab.
- 2、Set the debugging mode to manual dynamic debugging

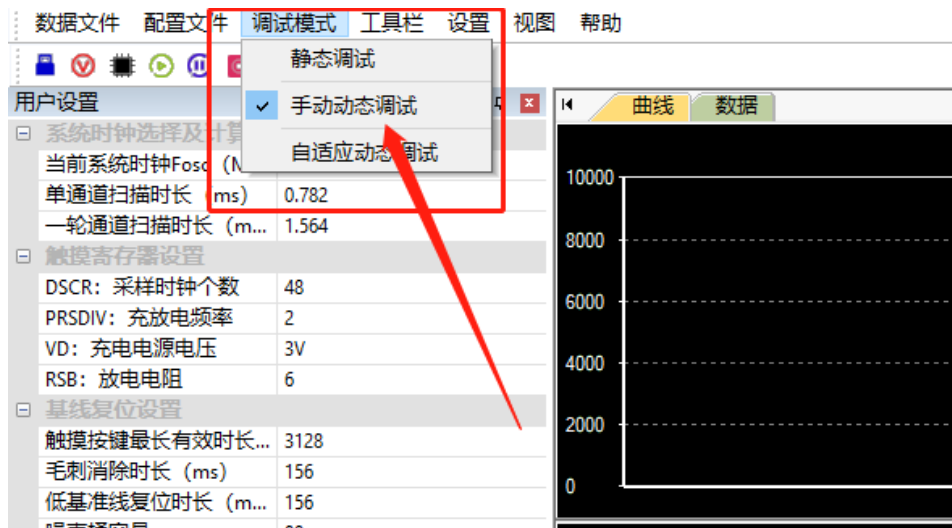


Figure 3-36 manual dynamic debugging

3、select FOSC clock (the FOSC clock in touchvlab should be consistent with that in user code)

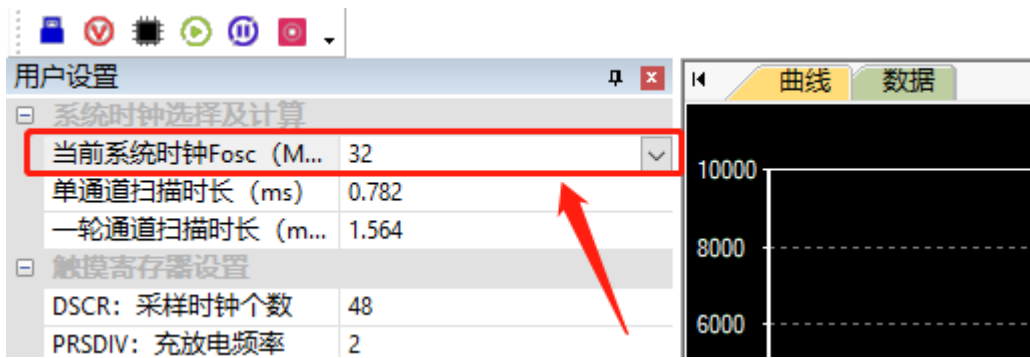


Figure 3-37 select FOSC clock set by user code

4、Set the configuration value of touch parameters



Figure 3-38 setting touch parameter configuration values

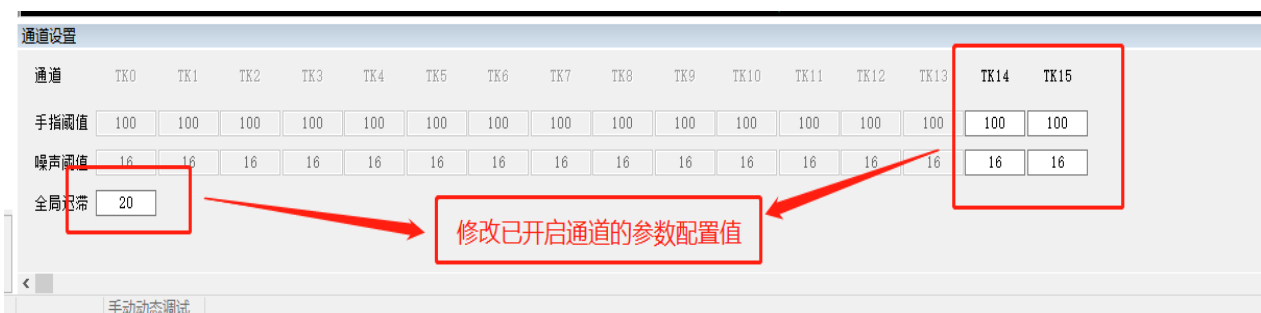


Fig. 3-39 modifying the parameter configuration value of start debug channel

5、Click start debugging

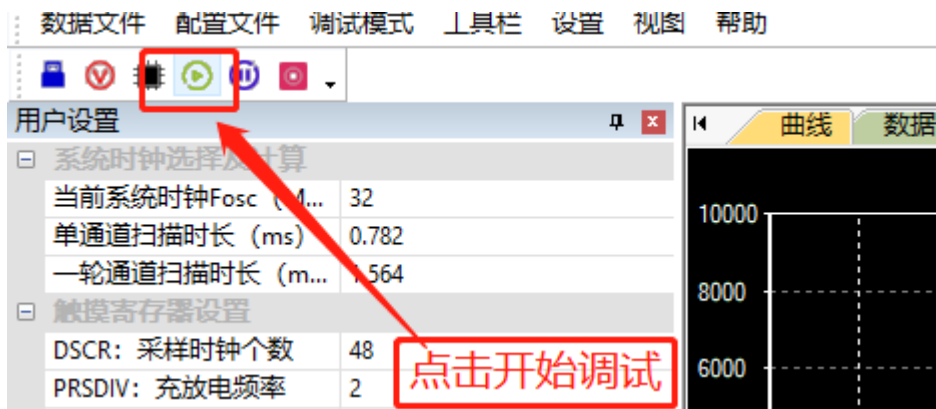


Figure 3-40 Click to start debugging

6、Users can adjust touch parameters in real time

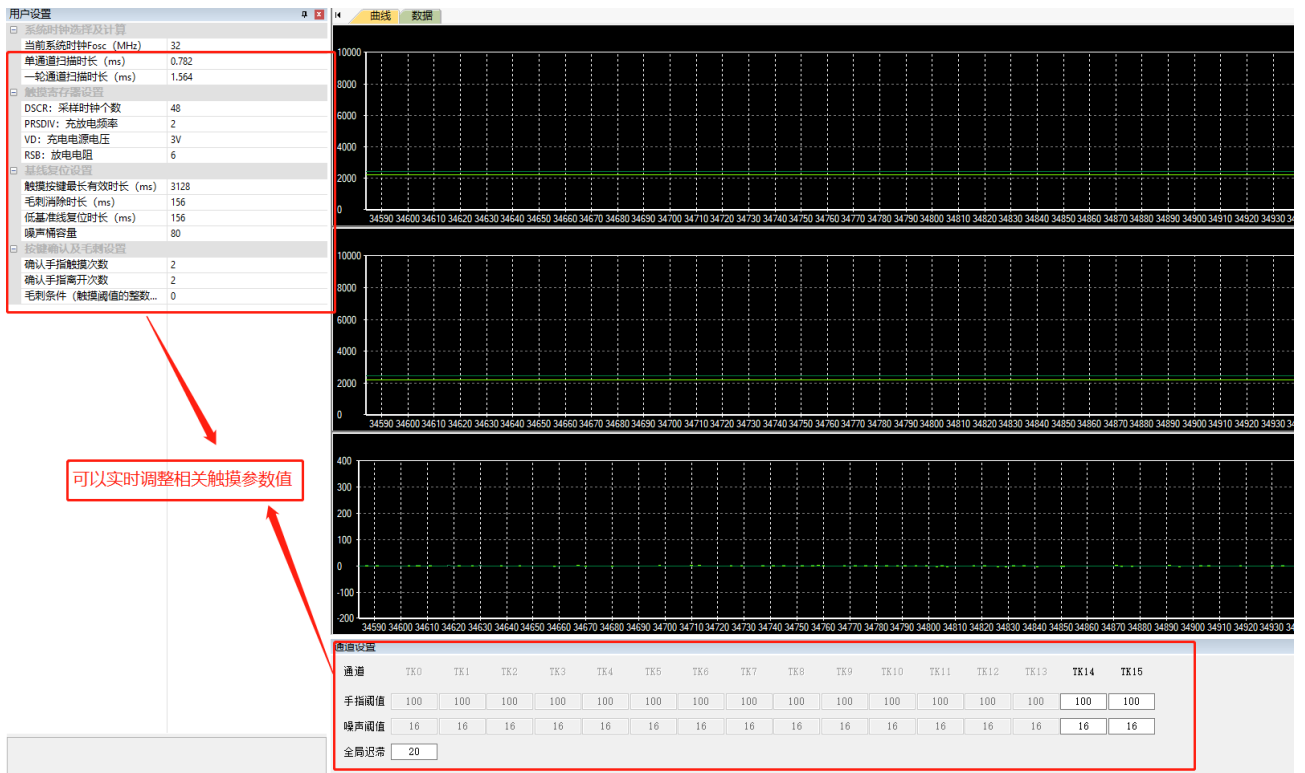


Figure 3-41 touch related parameter adjustment

7、Parameter adjustment is completed

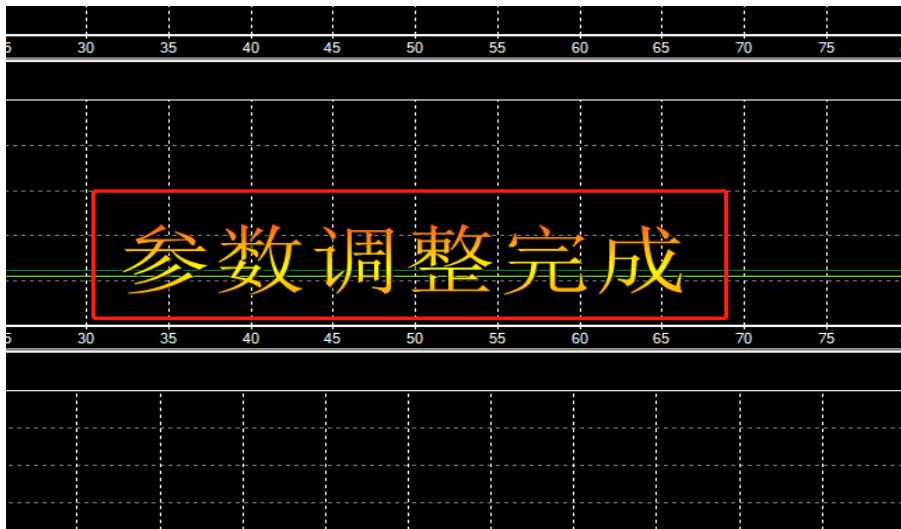


Figure 3-42 parameter adjustment completed

8、After debugging, the user can directly export the configuration file, and replace the touch parameter configuration file in his project with the exported touch parameter configuration file

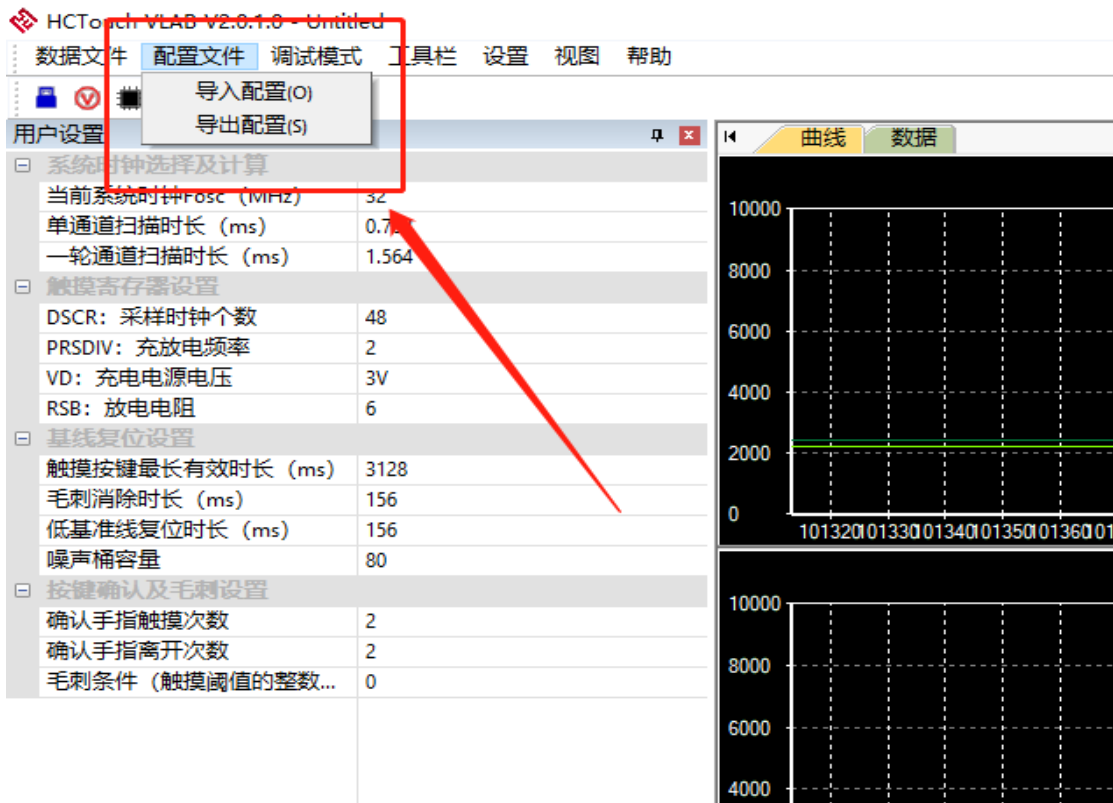


Figure 3-43 export touch parameter configuration

3.2.3 Static Debug

1、The user needs to compile and download the touch program to be debugged, and switch to static debugging mode

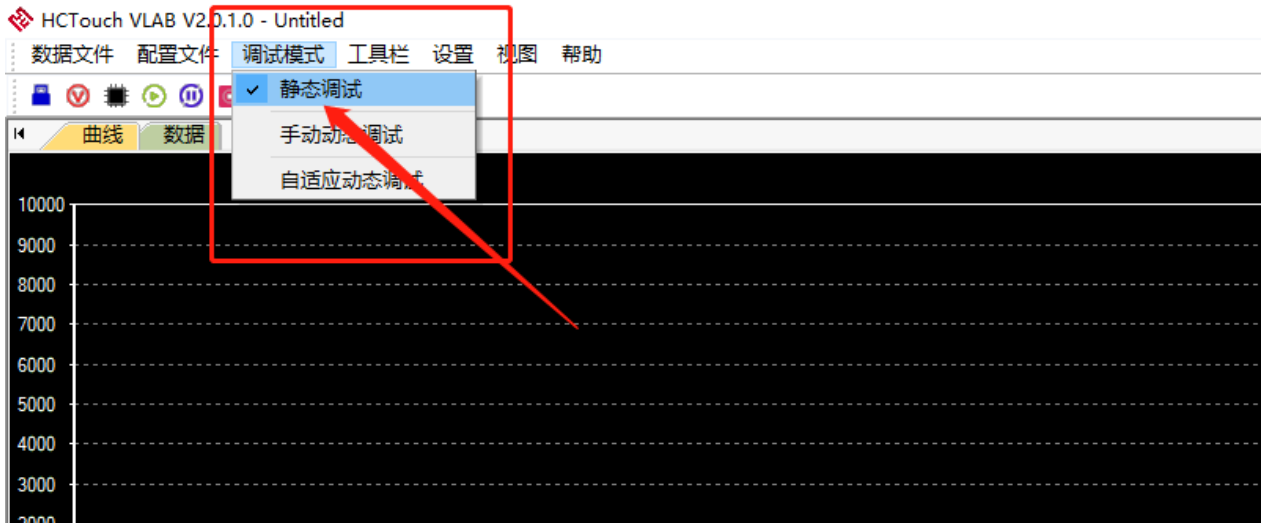


Figure 3-44 switching static debugging mode

2、Click the start debugging button

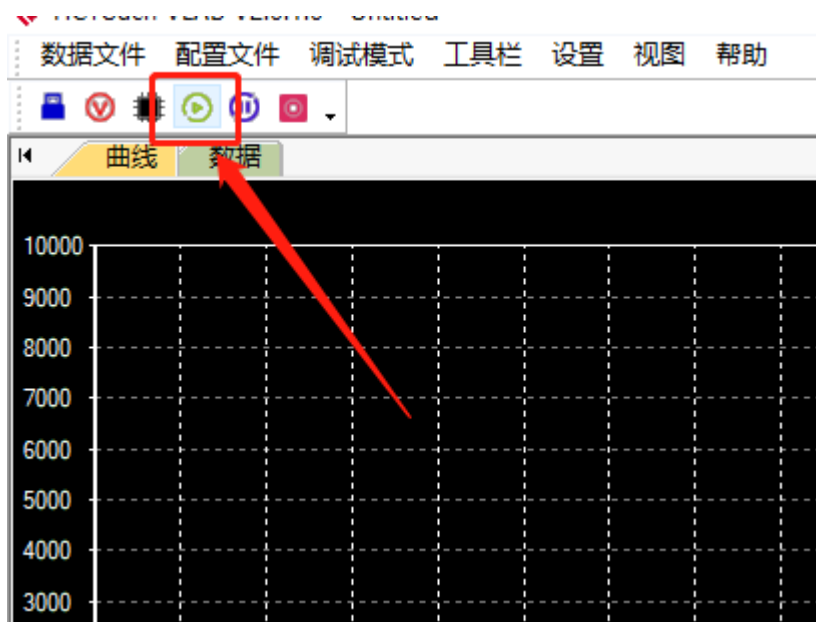


Figure 3-45 Click to start debugging

3、Parameter adjustment is completed



Figure 3-46 parameter adjustment completed

4 Version Description

Version	Date	Describe
Ver1.00	2020/11/6	First edition

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