

Chapter 1 Introduction

In this chapter, TSINGLI control system and products are introduced. From this chapter, user will make an explicit understanding of equipment composition of TSINGLI control system, control method, protocol resolution, applications, technical parameters and basic functions of TL-1000 wireless touch panel.

TSINGLI control system

TSINGLI control system is designed for centralized control system under multi-media circumstance. The system includes control touch panel, control host, control interface and supporting software, etc. The controlled device are mainly multimedia audio-visual equipment, but not limited to these devices. In theory, TSINGLI control system can switch in and achieve centralized management and control of devices that opens control interface to

third-party device. Control interface includes programmable RS-232/RS-422/RS-485 interface, programmable TCP/IP, UDP/IP interface, programmable I/O interface, relay interface, Infrared (IR) control interface, etc.

TSINGLI control system is designed by 32-bit/64-bit computer platform with Linux operating system. It supports Ethernet and transfer control information in real time in dedicated or common Ethernet. The various control protocols in TSINGLI control system may be designed independently or completely opened to the user to support access to other systems, such as BMS or IBMS systems' distributed and dispersed control management requirements to all levels of intelligent building.

TSINGLI control system is powerful, reliable, easy to expand and able to integrate with other systems seamlessly. TSINGLI control system can work reliably for continuous 24-hour. It's widely used in meeting room, multiple-function hall, training center, monitoring and commanding center, exhibition center, studio center, industrial automation, building automation, hotel and

household automation and other fields.

Product Information



TL-1000 is designed for military, industrial, commercial or civilian control system environment. It's a programmable, multi-purpose wireless two-way control touch panel equipped with various configurations such as infrared, and RF. Used cooperatively with wireless AP or

the configured wireless transceiver (TL-1000DR or TL-1000DRT), it can work as human-machine control interface or terminal of various systems.

TL-1000 wireless touch panel uses 32-bit high performance processor, so it has a strong display and driver capability. Its real-time, Preemptible, multitasking, multithreaded application program structure supports complex application.

TL-1000 wireless touch panel has features of high-speed, low power consumption, high-capacity storage and high reliability. It's very suitable for the following application areas: meeting room, training center, exhibition center, industrial automation, building automation, hotel and household automation and other fields.

Basic function

Used cooperatively with TL-1000DR or TL-1000DRT wireless transceiver, TL-1000 wireless touch panel can work as an independent system. It also can be used as human-computer control interface or terminal of various systems.

TL-1000 wireless touch panel has powerful programmable capability. Program for this device with the matching integrated development software "Vision Master" (referred to as VM) and "Logic Master" (abbreviated LM) software in WINDOWS environment can meet different various applications needs. VM software is used for designing of TL-1000 wireless touch panel display interface. You can make human-computer interfaces with different functions, languages or styles according to application requirements. By programming various control protocol orders for TL-1000 wireless touch panel with LM software at the same time, you can connect to TSINGLI host in manner of RF (need TL-1000DR or TL-1000DRT), also can control the third-party equipment directly in manner of RF (need TL-1000DR or TL-1000DRT).

TL-1000 wireless touch panel has infrared control output function. It can control infrared devices directly by itself.

TL-1000 wireless touch panel communicates with TL-1000DR or TL-1000DRT wireless transceiver by wireless radio frequency mode. It can set 16 different frequency points near common frequency range 416MHz.

TL-1000 wireless touch panel and TL-1000DR or TL-1000DRT wireless transceiver can achieve multi-machine interconnection. At the same frequency, TL-1000 wireless touch panel and TL-1000DR or TL-1000DRT wireless transceiver can set different host numeric ID addresses and multiple (up to 15) destination numeric ID addresses. By setting host numeric ID addresses and destination numeric ID addresses correspond with each other, multi-machine on one panel, multi-panel for one machine, multi-panel on multi-machine and other multi-machine interconnections can be easily achieved. Namely, at the same frequency, TL-1000 wireless touch panel and TL-1000DR or TL-1000DRT wireless transceiver can form a wireless RF communication network including any combination of 16 devices.

Technical parameter

Item	Description
CPU	32 Bit JZ4740 Processor 330MIPS

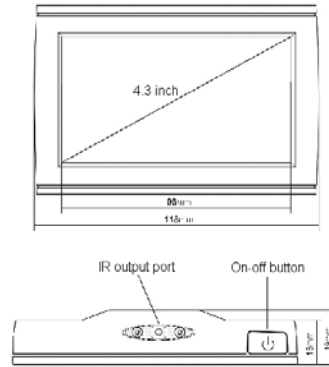
Memory	1GB NAND Flash , 64MB SDRAM
Touch membrane	4-wire resistance induction type
RF frequency range	416MHz
RF wireless communication	two-way , Automatic error correction coding
RF wireless communication distance	70m for exposure , 30m for indoor
infrared output	Programmable infrared control output
Animation effects	programmable GIF animation effect
AC97 audio	programmable audio (MP3) output
wireless serial port output	programmable wireless serial port control output (use with TL-1000DR or TL-1000DRT)
wireless network control	Programmable wireless network control output (use with wireless AP)

Display Size	4.3 inch
Resolution	480*272
Brightness	400 cd/m ²
color	18-bit color or 260 000 color True-color 18-bit, 260 000 color
contrast ratio	500 : 1
visual angle	horizontally 70°、70°; vertically 70°、50°
power	5VDC 500mA MINI USB power interface
apparent color	Red, black, silver, blue, white
Power consumption	2.5W (max)
Working Temperature	0 to 45
Working relative humidity	0% to 90% (45)

Chapter 2 Ports and configuration

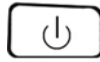
This chapter includes ports and dimensions, RF radio frequency wireless connection, battery and charge, wall charger, cradle and temperature and humidity monitoring.

Ports and dimensions



TL-1000 ports and dimensions view

On-off button



Do start, close, sleep, wake up and other activities to the equipment.

IR output port



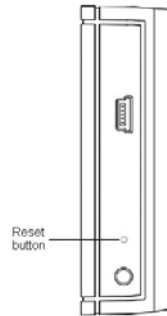
TL-1000 wireless touch panel comes with IR control output function. Write the infrared control software code document into control program through Logic Master in advance, press touch panel button directly to complete the infrared control signal output. The distance of the infrared control is 15 meters (the infrared output window aims at infrared receiver window of the controlled device in using).

MINI USB port



This port can be used as power input of the machine. The factory provides an external charging power supply 5VDC 500mA. This power supply can charge built-in rechargeable lithium batteries. In the case of complete discharge, full charge takes about eight hours.

Reset button



Reset button is in this small hole. If the equipment can not function properly, you may reset it with this reset button.

3.5mm debug port

The port is factory reserved port. Please do not use.

Charge port and guide rail

There is charge port for charging on cradle or wall charger with guide rail on both sides.

Battery parameter

battery type : lithium polymer battery

battery capacity : 1350mAh

rated input : DC 5V

rated output : DC 3.7V

Security: fine quality battery, safe and reliable, stable performance, high capacity, long standby time; built-in current-limiting protection, no mercury, lead, cadmium and other hazardous substances, complies with environmental requirements.

Charging

TL-1000 wireless touch panel has a built-in battery which can not be changed by user. To obtain the best

performance of the battery, it should be charged continuously for more than 8 hours in its first use to ensure it's full charged. The battery may need to be re-charged if TL-1000 wireless touch panel hasn't been used for a long time.

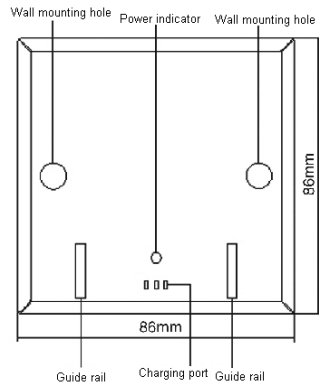
Once fully charged, TL-1000 wireless touch panel can work continuously for more than 4 hours at least. (Specific time depends on usage mode)

Battery status

TL-1000 wireless touch panel can show real-time battery status on user interface through programming. When the panel starts to flash, the battery is running out. The device should be charged by external charger (USB charger, charging on cradle, wall charger).

Wall charger

Appearance and dimensions



Power indicator

As shown in above figure, the power indicator is below the equipment. The red indicator is always on when the equipment is powered up. The power indicator goes out after TL-1000 wireless touch panel plug in.

Charge port and guide rail

As shown in above figure, the charge port for TL-1000 wireless touch-panel is just below the equipment. There

are guide rails on both sides which guide and fix TL-1000 wireless touch panel for charging.

Charging on cradle



MINI USB port



MINI USB port is on the rear of the equipment. This port can be used as power input of the device. The factory provides an external charging power supply 5VDC 500mA with the equipment. When TL-1000 wireless touch panel connected to charging on cradle, this power input will charge the built-in lithium battery pack. In the case of complete discharge, the full recharge needs about eight hours.

Reset button

Reset button is on the rear of charging on cradle. Its main function is to switch work mode and setting mode of the device. Hold down the reset button for more than three seconds when switching and enter the setting mode as

serial port's red and green indicators flash. Click the reset button in setting mode process, the equipment will enter work mode and wireless serial port indicators stop flashing.

Query button

Query button is on the rear of the equipment. When unable to confirm position of TL-1000 wireless touch panel, hold down the query button, there will be a respond sound as long as the touch panel is within the communication distance of charging on cradle.

Power indicator

Power indicator is on the front of the equipment. The red indicator is always on when the equipment is powered up. The power indicator goes out after TL-1000 wireless touch panel plug in.

Charge port and guide rail

Charge port and lead rail is on the front of the equipment. They are applied to fix and charge TL-1000 wireless touch panel.

Temperature and humidity monitoring

TL-1000DRT has environmental temperature and humidity data acquisition function. It can periodically transfer environmental temperature and humidity data to TL-1000 touch panel by wireless RF mode. By programming, the detail data and real-time updates may be shown on TL-1000 wireless touch panel interface.

RF connection

TL-1000R or TL-1000RW has radio frequency control mode and must be used together with TL-1000DR or TL-1000DRT. The RF frequency range is near 416MHz. It's a kind of common frequency range micro-power wireless mode. The wireless control is bidirectional control.

Configure TL-1000R or TL-1000RW with the assorted integrated development software "Vision Master" (referred to as VM) and "Logic Master" (referred to as LM) software in WINDOWS environment. Set frequency range and address in "Device setup" menu dialog box. Drag RF channel to the corresponding wireless port in "Device view" in wireless touch panel's LM program. This port number represents the target address, namely the wireless transceiver address that communicates with it.

Configure charging on cradle TL-1000DR or TL-1000DRT that has wireless transceiver function with integrated development software RFX configuration tool in WINDOWS environment.

First of all, connect PC serial port and charging on cradle serial port with the accompanying serial port layout line.

Second, change work mode of charging on cradle. Press and hold the reset button that on the rear of charging on cradle for more than three seconds. Enter the setting mode as the red and green indicators on the rear of charging on cradle flash.

After connecting the RFX configuration tool, you can configure the frequency range (physical frequency), local host address, destination address (the address of touch panel) and the baud rate (external). To make two-way communication, the configuration of wireless transceiver and wireless touch panel must be the same to the frequency range and the addresses correspond with each other.

Chapter 3 Programming and Debugging

This chapter introduces the debugging usual steps, such as connection establishment, equipment set up, programming

steps, infrared function, network features and device dynamic settings, etc.

Connection establishment

- touch switch to start TL-1000 wireless touch panel.
- Windows prompts that a new hardware is found. Go to "cdcecm_demo.inf" and "cdcecm_demo.sys" file according to the prompt.
- Windows complete the installation of "CDC ECM network adapter DEMO!"
- after TL-1000 sleep/standby, TL-1000 and computer will be disconnected; you need to unplug the USB cable from the USB port and connect again. If you still can not upload program after connection, then restart TL-1000.

Device setup

Set various parameters of touch panel through "Project/Device setup" item in the menu of "Vision Master" software or the "Logic Master" software. The program upload IP address (USB virtual Ethernet mode) of TL-1000 wireless touch panel is fixed 192.168.100.100. No IP address set and reset operation should be done to it.

As for TL-1000 wireless touch panel, the device settings are as shown in the following diagram, including IP address, system clock, sleep time, buzzer length , buzzer volume, backlight brightness, the sound output volume (left and right channel), wireless RF frequency, local host wireless RF ID address

Programming steps

Now take control Pioneer DVD as example to demonstrate programming steps:

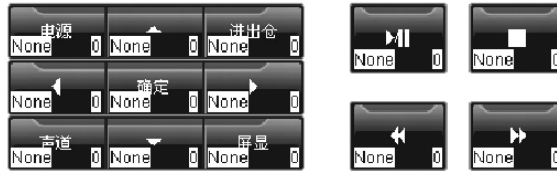
Vision Master

- install Vision Master 1.3.4 version, double-click **VM** icon to run the software.
- click "File" - "New" - "Project" in the main interface of the software to pop create project menu. Nominate the project as - "Demo_VM", select the project path -C: \ Documents and Settings\All Users\Project, select the touch panel type-TL-1000.
- click "File" - "New" - "page" in the main interface of the software to pop up the page name menu, enter the new page name-Main. Click "Edit" - "mark as Home". The

Vision Master program is in a page form, so the Home page must be set to determine the displayed page.

- click "Draw"- "text" in the main interface of the software, then the mouse is in cross shape, draw the desired text box on the page; click on the "single click to assign text" button in "click to assign property toolbar" to pop up assign text menu, input "DVD control demonstration program", click OK button, the mouse is in hand shape, click on the text box to assign the text, press "ESC" button to return to the select status .
- click "Draw" - "button" in the main interface of the software, then the mouse is in cross shape, draw the desired button on the page, click the "assign button style" button to pop up style selector, double-click to select the appropriate style; the mouse is "hand-shape" now, click the button to assign style.
- Draw buttons and composite and arrange them according to the control functions as shown below:

DVD control demonstration program



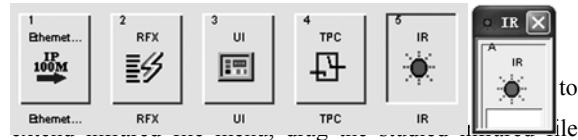
- Click the "Click assign numeric code" button to assign codes for all of the buttons (please refer to Vision Master Help file for code introduction); after code assignment, the number on lower right corner of the button will become the corresponding code.
- So far, Vision Master programming is accomplished and can be uploaded to the device.

Logic Master

- Install Logic Master 1.3.4 version software, double-click the **LM** icon to run the software.
- Click "File"-"New Project" in the software main interface to pop new project menu. Nominate the project

as - "Demo_LM", select the project path -C: \ Documents and Settings \ All Users \ Project.

- Click the "+" in basic equipment window Intelligent Control System (ICS) to start device menu, drag Wireless Virtual Control Machine -2 (WVCM2) or right click "add a device to project" to the device main window.
- select the infrared port IR in device main window, as shown below:

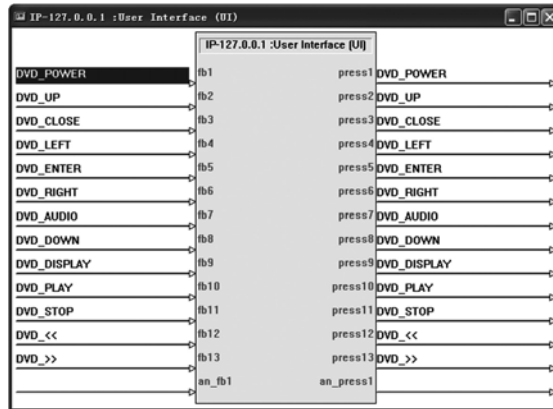


(see "infrared functions for "IR learning and import) to the IR A port.

- Click "Show logical view" button in the main interface of the software, click the "+" in Project window Wireless Virtual Control Machine -2 (WVCM2) to extend device port menu; double-click to select Local bus3: IP-127.0.0.1 in UI: User Interface (UI), the logical main window displays module structure. The digital output signal <press> of the touch panel may generate high status signal

when there is touch action in the controls corresponding to the touch panel. As <fb> signal in high status, the high signal will be transferred to the corresponding control in the touch interface to display "activate" status. The position value of <press> signal corresponds to the code of control in Vision Master.

- Signals' nomenclature is shown as below:



- click "Show Logical View" button in the main interface of the software, click the "+" in project window Wireless Virtual Control Machine -2 (WVCM2), extend device port menu; double-click to select Local bus5: the Port-A in IR: IR Device: DVD-V7200 (take Pioneer DVD-V7200 as an example), the module structure is displayed in logical main window. Add signals of IP-127.0.0.1 : User Interface (UI) to Port-A : IR Device : DVD-V7200 according to their functions.
- So far, Logic Master programming is accomplished and can be uploaded to the device

Compile and upload

The program needs to be recompiled after writing or modification. Select "Project" - "Compile" in menu of Logic Master or Vision Master Software. After successful compiling, the system will prompt "Compile successful, upload or not", click "OK" to upload the project to the target device.

Program may be saved to the device. After successful compiling, select "Project" - "upload and save project" in

Logic Master or Vision Master software menu to pop up password input dialog box, enter 4 to10-bit password; select "Project" - "Download and retrieve project" in software menu, enter the password that set in uploading. Select the required location to save the project after clicking "Select Path" button after input the right password.

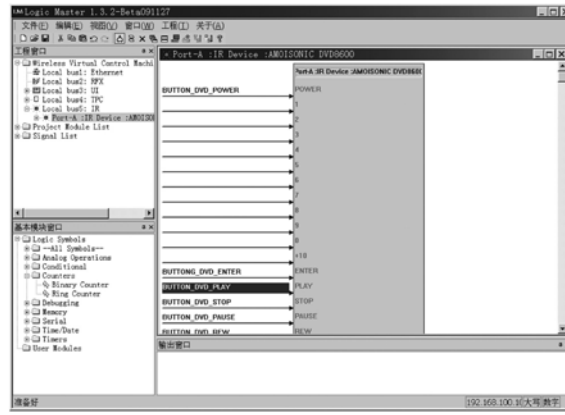
IR functions

IR function learning

IR function learning needs TSINGLI TL-LIR learner. Run LIR Infrared learning software with the learner to learn infrared code of every button of infrared remote in sequence and generate *.sir IR code file, and import the IR code file or save it to IR code file library catalog of Logic Master program.



function when the corresponding signal changes from low to high.



Equipment dynamic setting (TPC)

Touch panel calibration: as this input activated, the touch panel enters the calibration interface. The calibration should be manually carried out following the prompts. The touch panel interface will automatically re-run and display "homepage" of the interface.

Buzzer length: there are three options. Trigger the corresponding option as activating. The last activated option is valid. "Buzzerlength1" has the shortest duration; "buzzerlength2" has longer duration, "buzzerlength3" is the longest.

Buzzer volume: There are four options. Trigger the corresponding option as activating. The last activated option is valid. "Buzzervol0" means the buzzer is mute, the buzzer sounds of "buzzervol1", "buzzervol2" increase in sequence and "buzzervol3" has the greatest voice.

Backlight brightness: there are five options. Trigger the corresponding option as activating. The last activated option is valid. "backlight1" means the LCD panel

backlight is turned off, the LCD backlight brightness of "backlight2", "backlight3", "backlight4" increase in sequence and "backlight5" has the brightest backlight.

Left and right channel sound output volume (leftvol, rightvol): it's analog input. Effective range of the analog input range is 0, 1, 2 ... 49, 50, where 0 is silent, 0-50 volume increase gradually from 0 to 50, and 50 means the maximum volume.

Left and right channel volume of external input (leftlinevol, rightlinevol): similar to Left and right channel sound output volume, indicating the volume of external input (import third-party audio equipment by wireless means), only for TL-3000V-type device.

Sleep time (powersavetime): indicates sleep time of touch panel in minutes, range from 0 to 120 minutes. 0 means no sleep, 1-120-minute means the touch panel will be in sleep status as no touching within the set period. Press touch panel after sleep to cancel sleep.

Battery capacity (batterycapacity): shows wireless touch panel device's current battery service condition. Its output is analog.

Chapter 4 Tips and Troubleshooting

TL-1000 device uses intelligent power management. Uses only a "soft switch" to do touch panel start, shutdown, standby, wake up and other activities.

Start: press on-off button to start the devices when the TL-1000 device is turned off. It will enter the start procedure after start. The procedure will take about 10 seconds.

Shutdown: press and hold down on-off button for about 3 seconds when the TL-1000 device is in running status, then the display (backlight) is turned off and the equipment goes into shutdown status.

Standby: When the TL-1000 device is in running status, press on-off button, the display (backlight) will be turned off and the equipment goes into power save status. The device preserves various statuses before sleep and restores them after wake up.

Wake up: When TL-1000 device is in sleep status, press the on-off button to wake up. The device restores the

status before sleep.

Reset: When the device can not start, shutdown, standby or wake up, you may use the reset button on the touch panel to reset. Reset start is a cold start of touch panel device.

Troubleshooting:

phenomenon	probable cause	solution
boot issue	Build-in battery exhausted	Start with power or after charging
	Application program error	Press reset button
No display on touch panel	On-off button is not pressed	Press on-off button
	touch panel standby	Press on-off button to wake up the device
	Build-in battery exhausted	Connect to external power supply to charge
No sound from touch panel	program error	Check and modify the program
	Volume is too low	Adjust output volume

No response after touching	Improper touch panel calibration or no calibration	Recalibrate touch panel
Compile failed	Program is not saved	Check and save the program
	program error	Check and save the program

Note: For other questions, please contact your supplier.

Chapter 5 Battery replacement and the equipment cleaning

TL-1000 device is equipped with built-in lithium polymer battery. Its normal working life is longer than 500 times charge and discharge. The lithium-polymer battery is selected specially. The parts (order additionally) that factory provides should be selected and the replacement should be replaced in accordance with battery instructions or send to agency. Do not put the equipment into or near fire or high temperature object at any time.

Please turn off TL-1000 and unplug the USB charging plug before cleaning. No power operation.

When cleaning, use a semi moist and fluff-free soft cloth to wipe off dust from the equipment softly and dry it immediately with a dry cloth. Do not let water into the device to prevent water penetrate into the equipment and cause short circuit and so on. You can use a special camera

lens cleaning paper or a chamois leather to clean display (touch membrane). Do not let water penetrate into the gap between display (touch membrane) and the casing around. As the compositions of cleaning agents are complicated, the selection of cleaning agent should ensure that no harm to the device at first hand.

Chapter 6 Warranty and contact

Beijing union control technology Co., Ltd promises a three-year warranty to the materials or processes of our products except the following specified parts. The disk drive or mechanical component that needs adjustment, power supply, touch panel display parts have one year warranty. 90-day warranty for touch parts of the touch panel and battery.

Warranty period starts from the date that factory deliver to user or through agent. There should be a written record of the delivery date.

The damage caused by improper installation, improper use, accidental damage, human modification and vandalism are not covered under warranty. The company does not undertake any joint responsibility for any direct or indirect losses that caused by possible defects of the product.

As for the equipment or parts that need repair due to failure, we reserve the option to repair or replace. Any repaired equipment or parts have warranty period of 90 days and the former warranty is invalid.

Our enterprise has the final power of interpretation of this article.

For further help, please send an Email to public@unioncontrol.com or directly contact us by phone.

Telephone: (86)-(10)-62,243,207.

Website: www.unioncontrol.com.

FCC NOTE : THE MANUFACTURER IS NOT RESPONSIBLE FOR ANY RADIO OR TV INTERFERENCE CAUSED BY UNAUTHORIZED MODIFICATIONS TO THIS EQUIPMENT. SUCH MODIFICATIONS COULD VOID THE USER'S AUTHORITY TO OPERATE THE EQUIPMENT.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: 1. This device may not cause harmful interference, and 2. This device must accept any interference received, including interference that may cause undesired operation.