

# LCD Display Controller V2.0

**Operation Manual** 

# Legal Information

### User Manual

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### **FCC Information**

Please take attention that changes or modification not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

FCC compliance: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

### **FCC Conditions**

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.
- 2. This device must accept any interference received, including interference that may cause undesired operation.

#### **EU Conformity Statement**

CE

This product and - if applicable - the supplied accessories too are marked with "CE" and comply therefore with the applicable harmonized European

standards listed under the EMC Directive 2014/30/EU, the RoHS Directive 2011/65/EU.





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### Industry Canada ICES-003 Compliance

This device meets the CAN ICES-3 (B)/NMB-3(B) standards requirements.

# Preface

## **Applicable Models**

This manual is applicable to the LCD displays.

### **Symbol Conventions**

The symbols that may be found in this document are defined as follows.

Symbol	Description
Danger	Indicates a hazardous situation which, if not avoided, will or could result in death or serious injury.
Caution	Indicates a potentially hazardous situation which, if not avoided, could result in equipment damage, data loss, performance degradation, or unexpected results.
<b>i</b> Note	Provides additional information to emphasize or supplement important points of the main text.

## **Safety Precautions**



- To reduce the risk of fire or electric shock, please do not expose the device to rain or humid environment.
- Electric discharge may last for a short period of time after the power is shut down. Please wait two minutes after the power is shut down before operating the device.
- To avoid the risk of electric shock, please do not operate when the power is on.
- This is a class A product and may cause radio interference in which case the user may be required to take adequate measures.
- To avoid the risk of fire or electric shock, please do not use overloaded AC power socket or extend the power cords.
- Do not cover or obstruct the vents and openings, because unobstructed ventilation can lead to overheating of the body, thus shorten the life of the product. Do not place products on sofas, carpets or other similar surfaces, as they can obstruct the vents. Do not place products in airtight

spaces such as bookcases or luggage racks unless appropriate ventilation is provided or manufacturer's instructions are followed.

• Inserting objects into vents or openings of the product is forbidden, as there exists high voltage and current in the product. Inserting objects will lead to electric shock or short circuit of internal parts. To avoid the risk of fire or electric shock, please keep water or other liquids away from LCD display, and please do not let objects such as paper clips or pins fall into the LCD display.



# Caution

- The LCD display is designed in accordance with international standards. However, improper use can also lead to electric shock and fire, causing personal injury and property loss. In order to prevent potential hazards, ensure your safety and extend the service life of the product, please read and comply with the instructions carefully when installing, using and cleaning the product.
- The product instructions must be properly preserved for future reference.
- Please put the device in a ventilated and dry place without strong vibration while working.
- Do not expose the product to humidity, rain, sand, sun or other places with high temperature for storage and usage.
- Do not use parts recommended by non-manufacturer and inappropriate use of parts can lead to accidents.
- Please do not plug and unplug the power cord frequently when the power is on.
- Do not use the power cords of other devices. Replace with the power cords with the same specifications from regular channels only.
- Please lay the power cord correctly to prevent from trampling or placing articles on it.
- Use standard 220 VAC power.
- Power consumption of the device depends on the type of product. When the device is not used for a long time, please turn off the power and unplug the power cords.
- If any of the following occurs, please unplug the power cords, and contact the service center.
  - The power cord or plug is damaged.
  - Liquid splashes on the product or an object falls into the product.

- The product is exposed to rain or water.
- The product is not properly operated according to the user manual. Do not adjust the control parts beyond the user manual. The inappropriate control of parts which are not described in the user manual will lead to the damage of the product, and will bring a lot of adjustment work to the technical personnel.
- The product falls down or damages.
- The product runs abnormally.
- When replacing the parts of the product, please ensure that maintenance personnel use the parts designated by the manufacturer or the parts with the same performance as the original parts, so as to avoid fire, electric shock or other damage caused by the use of unauthorized parts.
- After completing service or maintenance, maintenance technicians are required to perform safety checks to ensure stable operation of the product.
- When installing the product on walls or ceilings, ensure that the product is installed in compliance with the method recommended by the manufacturer.
- Please keep the product away from heat source, including radiators, heaters, stoves and other heating products.
- Using the product in situations with fatal dangers such as death, injury and serious personal injury is forbidden.

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# **Chapter 1 Overview**

## **1.1 Introduction**

LCD displays use industrial ultra-narrow edge panel and full LED array backlight. It features ultrahigh brightness, more uniform brightness, no boundary shadow, long service life and so on. The built-in splicing controller of the screen can realize the self-splicing of screens from the same source signals. LCD displays have abundant interfaces to receive DVI, VGA, HDMI and other signal sources, and supports a variety of control methods.

### **1.2 Key Features**

- Full LED array backlight, more uniform brightness and no boundary shadow.
- Ultra-high resolution, exquisite image and rich colors.
- High definition, high brightness and high gamut.
- The screen is almost visible horizontally because of extremely wide view.
- Large display area, small size and light weight.
- Variable splicing modes can adapt to different applications.
- Ultra narrow bezel.
- Stable operation, low maintenance cost, 24-hour continuous work.
- Wall-mounted installation, rack installation and cabinet installation are available.
- Metallic casing features anti-radiation, anti-magnetic field, anti-interference of strong electric field.
- Real-time temperature monitoring and self-protection from overheat to prevent panel burning.
- Screen control by the client.

# **Chapter 2 Remote Control**

## **2.1 Remote Control Functions**

The following table describes the functions of the remote control.

Appearance	Кеу	Functions						
POWER	POWER	Power switch.						
U TEST INFO	TEST	Enter the aging test.						
	INFO	View system information.						
	0-9	Enter numbers to select the desired screen or enter the special menu such as factory menu, etc.						
	SOURCE	Switch signal sources.						
	MENU	Enter/Exit the menu.						
	IDSEL	Select the desired display(s).						
+ ON + HOR FRAME VER	IDALL	Select all displays.						
-R.GAIN+ -R.OFFSET+ -G.GAIN+ -G.OFFSET+	Direction	Navigate between fields and menu items. Adjust parameters.						
-B.GAIN+ -B.OFFSET+ F1 F2 F3 F4	ОК	Confirm selection.						
	FRAME ON/OFF	Turn frame on/off.						
	HOR+/- VER+/-	Horizontal/vertical adjustment of the frame.						
	R、G、B GAIN +/-	Adjust color gains.						
	R、G、B OFFSET +/-	Adjust color offsets.						
	F1	Turn image quiescence on/off.						
	F2	Switch white balance (for some displays only).						
	F3	Switch image mode.						
	F4	Switch illumination mode (for some displays only).						

#### Table 2-1 Remote Control Functions

# 2.2 Screen Control

You can use remote control to control one screen, multiple screens or all screens.

To control one screen, press IDSEL to select screen ID.

To control multiple screens, press **IDSEL** to select screen IDs. For example, press **IDSEL**  $\rightarrow$  **0101**  $\rightarrow$  **2** to select screen 0101 and screen 0202.

## **i**Note

Only some LCD display models support multiple-screen control.

To control all screens, press IDSEL, and then press IDALL.

## 2.3 Virtual Remote Control

You can use **Remote Control** in the lower left corner of the client interface to control the display(s).



Figure 2-1 Virtual Remote Control

# **Chapter 3 Installation and Connection**

## 3.1 Installation Notice

- The LCD display must be installed or moved by two or more persons.
- When moving the LCD display, ensure to grasp the grips at the rear and bottom. Do not hold the LCD screen as it may cause damage, malfunction or personal injury.
- The LCD display should be mounted vertically relative to horizontal line.
- Mounting the LCD display on the wall requires special technologies, which must be done by professionals. You should not attempt to mount the LCD display yourself. Our company is not responsible for any accidents or personal injury caused by improper handling or mishandling.
- The LCD display should be used at room temperature from 0 °C to 40 °C. Leave enough space around it for internal heat dissipation.
- Do not block the vents. It may cause a device exception if the internal temperature of the LCD display rises.
- Do not place the LCD display on a hot device.
- Please use the mounting base and wall-mounting bracket which were specially designed for the LCD display.
- Before installing, wipe the casing and the screen panel cleanly, otherwise it will affect the use of the screen.
- Fix the screen but do not tighten it too tightly when installing the screen, otherwise the screen may not work normally because of deformation.
- Improper handling during adjusting and using may result in equipment damage. The LCD display can be used continuously.

# 3.2 Operation Notice

The LCD panel on the device is made by high-precision technology. However, tiny spots on the screen that are dim and dark may be observed, or when observed from side, the screen may be colorful or the brightness may appear to be uneven. Yet the above phenomena are common among LCD displays rather than faults and will not affect the performance of the LCD display.

- The LCD display and its accessories in this manual are subject to change without prior notice.
- The LCD display should be used at room temperature from 0 °C to 40 °C.
- This LCD screen contains fragile materials, which can be damaged by dropping or impact, so please take it lightly.
- Please do not let the screen display a static image for a long time, otherwise the "residual image" will be left on the screen to affect the normal use of the LCD display.
- It is strictly forbidden to scratch or tap the LCD display with hard objects. Do not switch on and off frequently. Do not hit the device. The above actions may damage the device and accelerate the aging of the device.

- If your LCD display is not working normally, especially if an unusual smell is emitted from the inside, unplug it immediately and contact your dealer.
- Please note that in addition to the compensation provided by law, the company is not responsible for errors caused by customers or third parties when using the machine, and is not responsible for any other related malfunctions or damages.
- Do not use the LCD display in environments with large amounts of dust, high humidity, or possible exposure to oil and water vapor, as this may result in fire or damage to the device.
- Do not place the LCD display on an unstable object or in an unsafe place. Do not subject the LCD display to strong shock or vibration. If the device is dropped, it may be damaged.
- Do not use the LCD display near heating facilities or any place where there may be high temperature, as this may cause the machine to overheat and cause a fire.
- Before installing the LCD display, please check if your accessories are missing. If there is any shortage, please contact the seller.

## **3.3 Power Cord Connection**

When connecting the power supply, plug one end of the power plug into the power input on the rear panel of the LCD display, and the other end into a properly grounded power socket (AC 220 V, 50/60 Hz).

In the use of the power cord, the following points should be noted:

- If the LCD display is not to be used for a long time, shut down the power of the device and disconnect the power supply.
- Do not damage the power cord. Do not place heavy objects on the power cord, stretch the power cord, or bend the power cord excessively. If the power cord is damaged, it may cause a fire or electric shock.
- Only use the original power cable delivered with the LCD display. Contact authorized dealer to purchase power cable with same specifications.
- Do not connect DC power.
- Plug the power plug directly into an AC socket. If you add an additional extended power cord, you may get a fire due to overheating.
- Do not remove or plug in the power plug with a wet hand. It may cause an electric shock.
- Do not attempt to repair if the power cord is broken or malfunctioning. Contact the service center for repair.

## **3.4 System Connection**

The LCD display achieves the video signal from the signal loop video input port (for example, the DVI-IN), and send the signal to the next unit through the signal loop video output port. The  $2 \times 2$  splicing is taken as an example for description. Follow the wiring method shown in the figure below to complete the connection.



### Figure 3-1 Serial Port Connection

### **i**Note

- The length of the cable as well as the environment condition may affect the image quality.
- The DVI-IN interface is suggested to be used as the signal input port.
- When operating on the cable connections, you must turn off the main power switch and pull out the power plug. Please read the *Installation Guide* first.
- Do not confuse the input and output interface, or it may cause the device exceptions or other problems.

### **3.5 Cleaning and Maintenance**

## **i**Note

Before cleaning the LCD display, be sure to unplug the power cord. Do not attempt to maintain it yourself. Opening the casing will expose you to high voltage or other hazardous materials. The LCD display must be maintained by professionals.

#### Clean the screen panel of the LCD display

- When wiping the screen, use a dry cloth that does not shrink, so as not to damage the surface coating of the screen. Do not use chemical fiber cloth or detergent, whose composition may cause the screen surface to fade or be damaged. Do not wipe the screen with a hard cloth or a rough and hard object, as this may damage the screen surface.
- If the surface of the screen is stained with grease, such as fingerprints, wipe it with a nonshrinking cloth diluted with neutral detergent, and then dry the screen with a soft, dry cloth. Do not use a spray cleaner as this may remove the coating or cause the cleaner to enter the device, which may cause malfunctions.

### Clean the casing of the LCD unit

- Do not use benzene, thinner or other chemical products to wipe the casing; do not spray volatile solvents such as insecticide on the casing; do not leave the casing exposed to plastic or rubber materials for a long time; do not use chemical fiber cloth, detergent or paraffin. All of the above behaviors may cause cracking, deformation and stripping of the casing.
- Use a non-shrinking cloth to wipe the device casing and its remote control. If it is dirty, wipe it with a soft damp cloth diluted with a mild detergent solution, and then dry with a soft, dry cloth.
- Do not use acidic/alkaline detergents, alcohol-based detergents, scouring agents, soap powders, OA cleaners, car waxes, glass cleaners, etc., as they may cause cracking, discoloration, and scratching of the casing.

# **Chapter 4 Client Configuration and Operation**

# 4.1 Register and login

#### Steps

1. Double click LCD Display Controller.exe in the disk to install the client according to the Install Shield Wizard.

# **i**Note

Recommended runtime environment of the computer:

- **Operating system:** Windows 7/Windows 8/Windows 8.1/Windows 10 (32/64-bit) English system, and Windows 7 64-bit system recommended.
- CPU: Intel Pentium 4.3.0@3.0 GHz or above, and Core i3-2100 3.1 GHz recommended.
- Memory: 2 GB or above, and 4 GB recommended.
- Graphics: RADEON X700 series or above, and NVDIA GeForce GT730 recommended.
- GPU: 256 MB or above, and 512 MB recommended.
- **2.** You need to register the admin user at your first login on the client. Enter the password and confirm.



Figure 4-1 Register Interface

# **i**Note

We highly recommend you create a strong password of your own choosing (using a minimum of 8 characters, including upper case letters, lower case letters, numbers, and special characters) in order to increase the security of your product.

- 3. Optional: Check Save Password and Auto Login as required.
- 4. Click Register to enter the client.

If you forgot your password, you have to uninstall the client and reinstall it. You need to reconfigure the client.

# 4.2 Basic Configuration

### 4.2.1 Configure the Serial Port

After registration, **Serial Port Configuration** interface will pop up. You need to firstly configure the serial port to control screens. Incorrect serial port configuration may result in screen control failure.

### **Before You Start**

Ensure that the serial ports are already connected correctly, otherwise some functions will be unavailable or abnormal.

Steps



Figure 4-2 Serial Port Configuration

- Select Serial Port. You can obtain your serial port in Computer Management → Device Manager → Ports.
- 2. Select Baud Rate. 9600 is recommended.
- 3. Enable Connection.

# iNote

When **Auto open when starting** is checked, the serial port set here will be connected automatically when you log in to the client next time.

### 4.2.2 Configure the Screen Layout

After configuring the serial port, you need to configure the screen layout according to the actual connections.

#### Steps

1. Enter Number of Rows and Number of Columns in the upper right corner of the client.



Figure 4-3 Screen Layout Configuration

- 2. Click OK to save the screen layout.
- 3. Optional: Click Refresh to get the newest screen status.

### **i**Note

**Refresh** is available only when the screen number is smaller than or equal to 9. When the screen number is greater than 9, there is no **Refresh** button on the client.

### 4.2.3 Match the Screen ID

You need to match the screen ID to distinguish the screens by manual match or auto match.

**i**Note

Some LCD display models will restart automatically when screen ID matched.

### **Manual Match**

Before You Start

Screen layout has been set.

#### Steps

- 1. Click o in the upper right corner of the client.
- 2. In the pop-up window, click **Confirm** to enter the technical page.





**i**Note

Click  $\bigcirc$  to go back to the home page.

3. Click Manual Match → Start Matching to match the screen ID manually.

Default Scene Virtual Screen			← Screen ID Manual Match
01-01	ox ) 0142	οκ	<ol> <li>Click Start Matching.</li> <li>ID will be displayed on the virtual screen.</li> <li>S Inter attibute ecide on the virtual screen and disk Ok.</li> <li>Click End Matching.</li> <li>End Matching</li> </ol>
62.01	OK 02	OK	

Figure 4-5 Manual Match the Screen ID

**4.** After clicking **Start Matching**, the attribute code defining the screen will be displayed on the upper left corner of every physical screen. According to the actual position of the physical screen, enter its attribute code into the textbox of the virtual screen.

# **i**Note

When the screen layout is greater than  $10 \times 6$ , you need to click **Match** on the virtual screen, and enter the attribute code into the pop-up textbox.

- 5. Click OK to finish the manual match of the first screen.
- 6. After all the screens are matched, click End Matching.

You can also match the screen ID using the remote control.

### Auto Match

#### **Before You Start**

Screen layout has been set.

#### Steps

- 1. Click o in the upper right corner of the client.
- 2. In the pop-up window, click **Confirm** to enter the technical page.
- 3. Click Auto Match.

Scene_1_Virtual Screen		
01-01	be matched rows and o 2 Click Star 3 Screens v auto match	t Matching. Mil follow connection rules to B → C i E + F H + I
02.01	Number of Number of	Columns 2

#### Figure 4-6 Auto Match Screen ID

4. Enter Number of Rows and Number of Columns according to the actual connections.

# iNote

The numbers of rows and columns must be the same as the actual screen layout, otherwise an error will occur during screen ID match.

5. Click Start Matching to finish screen ID auto match.

### 4.3 Screen Management

### 4.3.1 Switch the Signal Source

#### Steps

1. Select one or more virtual screens.

- **2.** You can switch the signal source using the following two ways.
  - Right-click and select **Switch Signal Source** to switch signal sources.

01-01			
	CVB IIII Turn off Screen		
	₩ Switch Signal Source >	Auto HDMI DVI VGA	
		CVBS USB	

Figure 4-7 Switch Signal Sources by Right-click

- Select one signal source in the drop-down list of **Signal Source** on the right of the client, and click **OK** to switch signal sources.

Number of Columns 2 OK		Screen Control	Ŭ.
01-02	Screen C	On Sc	reen Off
	All On		All Off
DVI / No Signal			
		-	- ОК
		Auto HDMI	
		DVI	ettings
02-02		VGA	
		CVBS	
		USB	

Figure 4-8 Switch Signal Sources by Drop-down List

- The types of signals sources supported vary with LCD display model. The client will obtain the types of signal sources supported from the LCD display when the serial port is connected.
- If a display does not send information about signal source types to the client, the client provides only three default types for you to switch. The three types include HDMI, VGA, and DVI.

### 4.3.2 Join Screens

#### Steps

1. Select the desired screens, and click Join on the right of the client to finish screen splicing.



Figure 4-9 Before Screen Splicing



Figure 4-10 After Screen Splicing

After the screen splicing, multiple virtual screens are joined into one screen to display one signal source image of the screen in the upper left corner.

**2. Optional:** Select the joined screen, and click **Split** on the right of the client to split the joined screen.

### 4.3.3 Manage Scenes

You can set and call a scene to configure screens quickly.

Scene	Default Scene Virtual Screen	
▼ ■ Default Scene		
Scene_1		
Scene_2		
Scene_3		
Scene_4		
Scene_5		
Scene_6		
Scene_7		
Scene_8		

Figure 4-11 Scene Management

#### Table 4-1 Operations of Scene Management

Operation	Step							
Save a Scene	After setting a scene, a prompt will pop up to remind you to save the scene before you switch to other scenes.							
Rename a Scene	Select a scene, and click 🖻 to rename it.							
Call a Scene	Select a scene, and click 💿 to call the scene. You can also double click the scene to call it as desired.							

# iNote

- The client supports 8 scenes at most.
- The default scene layout is 2 × 2.

### 4.3.4 Screen Time Sync

#### Before You Start

Ensure the LCD display supports sync function.

#### Steps

1. Click Settings of Time Sync on the right of the client.



Figure 4-12 Time Sync Settings

- 2. You can set the screen time in either of the following two ways.
  - Click 🔳 to set the time and date.
  - Check Use Local Time to save the computer time to the screen.
- **3.** Click **Save** to finish time sync.

### 4.3.5 View Screen Status

Select one virtual screen, and hover over 🔄 in the upper right corner of the screen to view the information.



Figure 4-13 View Screen Status

Color	Description
Green	The screen signal source is normal.
Black	The screen has no signal input.
	The screen is powered off.
	The serial port connection is abnormal.
Grey	The Screen status is unknown. Click <b>Refresh</b> to get the latest status when the screen layout is less than 3 × 3.
Orange	The screen temperature is too high.

#### Table 4-2 Description of Virtual Screen Color

### 4.3.6 Configure Screen Parameters

Only professionals are recommended to configure screen parameters.

#### Steps

- **1.** Click on to enter the technical page.
- 2. Select one or more screens as desired to configure.
- **3.** Configure parameters on the right.



Figure 4-14 Screen Parameter Configuration

#### **Color Temperature**

You can configure red/green/blue gains or offsets.

#### Backlight

You can increase or decrease the brightness of screen backlight.

### Screen Type

Different images can be selected to adjust chromatic aberration.

# 4.4 Screen On/Off

### 4.4.1 Turn On/Off the Screen Manually

### **Before You Start**

The serial port has already been configured correctly.

#### Steps

- 1. Select one or more screens.
- 2. You can turn on/off the screens in either of the following two ways.
  - Right-click and select **Turn on Screen/Turn off Screen**.
  - Click Screen On/Screen Off on the right of the client.

# **i**Note

Click All On/All Off to turn on/off all the screens.

- Press POWER on the remote control or click POWER on the virtual remote control.

# iNote

On/off commands are sent by the virtual remote control alternately. If you fail to turn on/off the screen with the virtual remote control, try it again.

### 4.4.2 Turn On/Off the Screen on Schedule

You can control the screen working time by setting its startup time.

### Steps

- 1. Select one or more screens as desired.
- 2. Click Settings of Startup Time on the right of the client.

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Figure 4-15 Startup Time Settings

- **3.** Drag and draw green bars in the days of a week. The area in green indicates the diaplay is turned on. In other duration, the display turns off.
- 4. Select the green bars to precisely set the starting and ending time.
- 5. Repeat the operations to set the schedule of the whole week.

- Only 2 startup periods can be set at most.
- The interval between startup periods must be at least 2 minutes.
- 6. Optional: The following operations can also be performed in Startup Time Settings.



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Delete the selected period.

Delete all the set periods.

Copy the schedule of the day to other days of the week.

- **7. Optional:** Set a startup interval for adjacent screens to prevent damage to the circuit due to current peaks.
- 8. Check Enable.
- 9. Click Save to finish startup time settings.

For some LCD display models, the startup time settings take effect only when the client is running.

## 4.5 Client Management

### 4.5.1 Lock/Unlock the Client

You can lock the client to prevent others from changing the configuration.

#### Steps

1. Click 🛆 in the upper right corner to lock the client.

### What to do next

To unlock the client, you need to enter the login password, and then click **Unlock**.



Figure 4-16 Unlock the Client

### 4.5.2 Change Login Password

#### Steps

1. Click o in the upper right corner of the client, and select Change Login Password.

Change Login Password		×
Old Password	Enter the old password. 🛛 👁	
New Password		
Confirm Password		
	Save Cancel	

Figure 4-17 Change Login Password

- 2. Enter the Old Password, then set a New Password and confirm.
- 3. Click Save to change the login password.

You need to enter the new password when logging in next time. You need to check **Save Password** and **Auto Login** again, too.

### 4.5.3 Enable/Disable Auto Login

Click on the upper right corner of the client, and select **Enable/Disable Auto Login**. Check/ Uncheck **Auto Login**.

### 4.5.4 View Client Information

Click o in the upper right corner of the client, and select **About** to view the name, version and etc.

### 4.5.5 View Open Source Software Licenses

Click on the upper right corner of the client, and select **Open Source Software Licenses** to view open source software licenses in the root directory.

