How to use the VMware Workstation / Player to create an ISaGRAF (Ver. 3.55) development environment?

- **Application Note**

The 32-bit operating system has been gradually replaced by the 64-bit system on the market. Due to the ISaGRAF Workbench install only on 32-bit Windows operating system, this document will describe how to use VMware Workstation or VMware Player to create a 32-bit Windows virtual machine and then install and run the ISaGRAF Workbench in this development environment.

- **Advance Preparation**

VMware Workstation or VMware Player is the virtual machine software that allows user to install or run multiple operating systems on a Host PC, so we can take this advantage to create a proper installation environment for the ISaGRAF Workbench 3.55.

Note: If using the ISaGRAF-256 (support 256 I/O tags), an ISaGRAF dongle that supports only USB2.0 is required (refer to Section 1.6). So, make sure your PC has USB 2.0 port.

The following content will show you how to use VMware Workstation or VMware Player to create a Windows XP (32-bit SP3) virtual machine on your Host PC.

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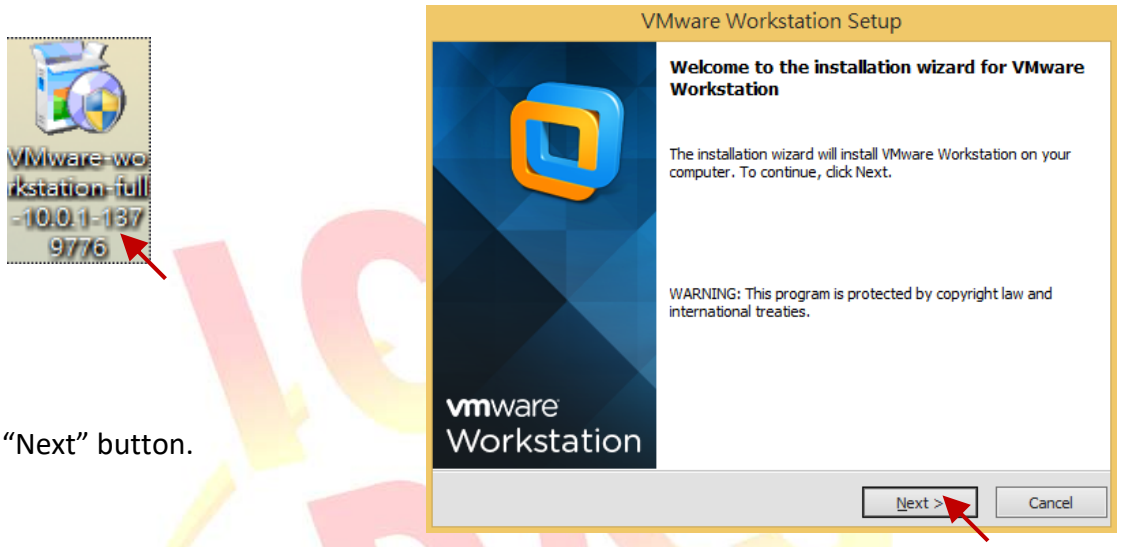
1. Installing Windows XP (32-bit, SP3) on a virtual machine by using VMware Workstation

1.1. Installing VMware Workstation

Users can download the VMware Workstation 10.0 (trail version) on this website:
https://my.vmware.com/web/vmware/info/slug/desktop_end_user_computing/vmware_workstation/10_0

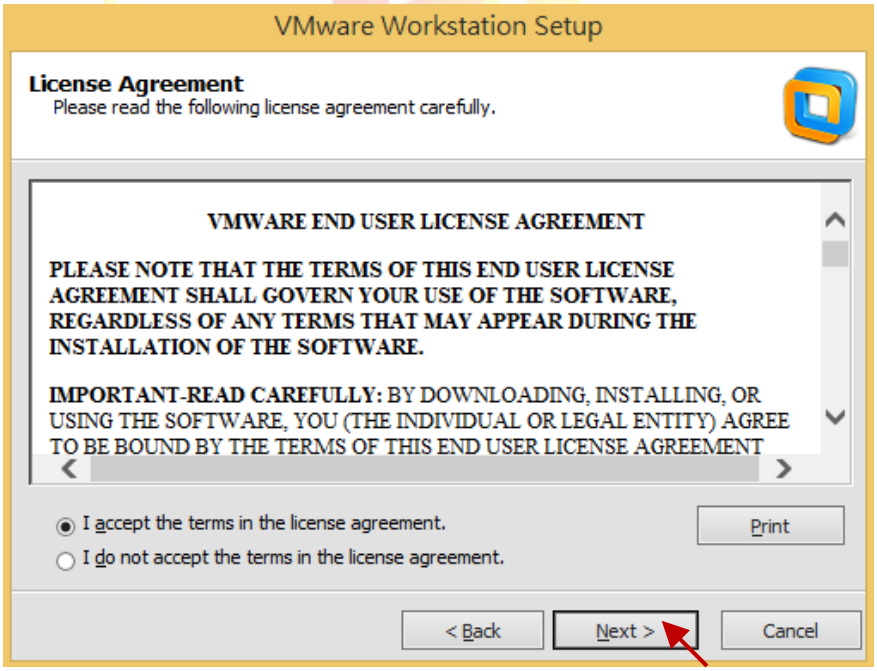
The following steps describe how to install VMware Workstation on a Windows-bases system.

1. Double-click on the setup file to start the installation procedure.

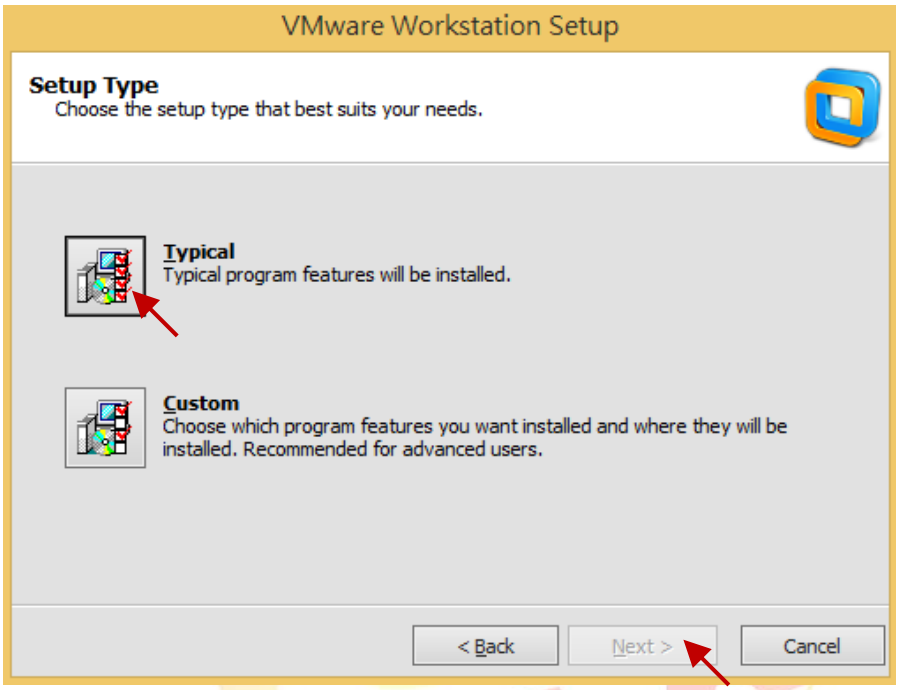


2. Click the “Next” button.

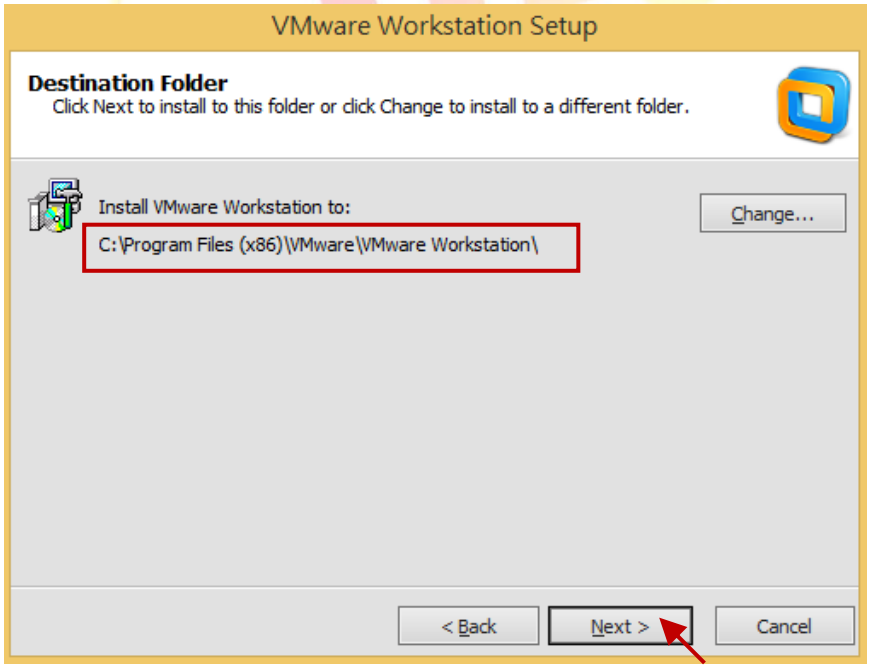
3. Select the “I accept the terms in the license agreement” option, and click the “Next” button.



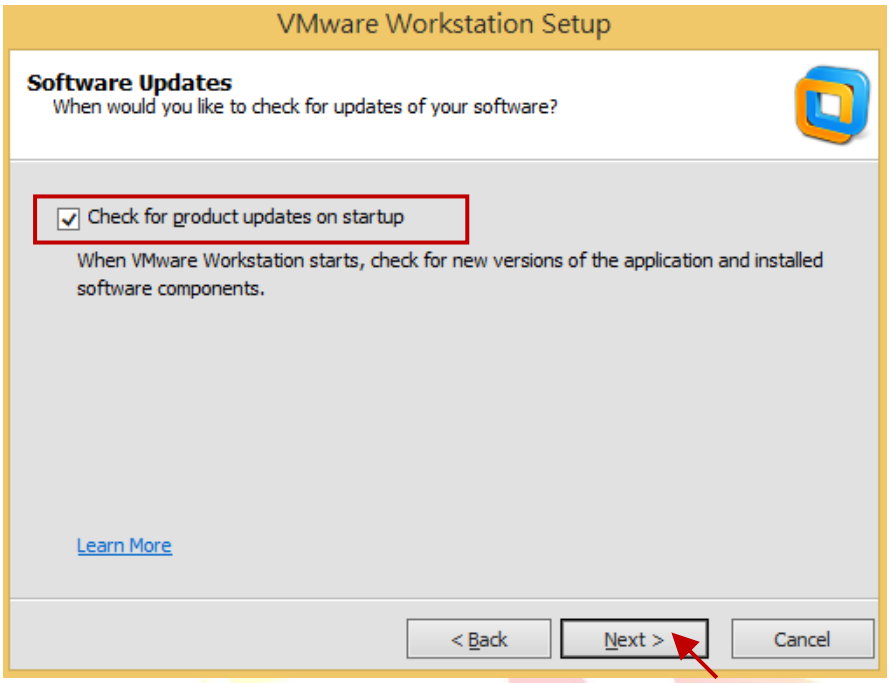
4. Click the “Typical” button here, and click “Next” to continue.
   (Click the “Typical” button to install typical Workstation features.
   Click the “Custom” button to select which Workstation features to install.)



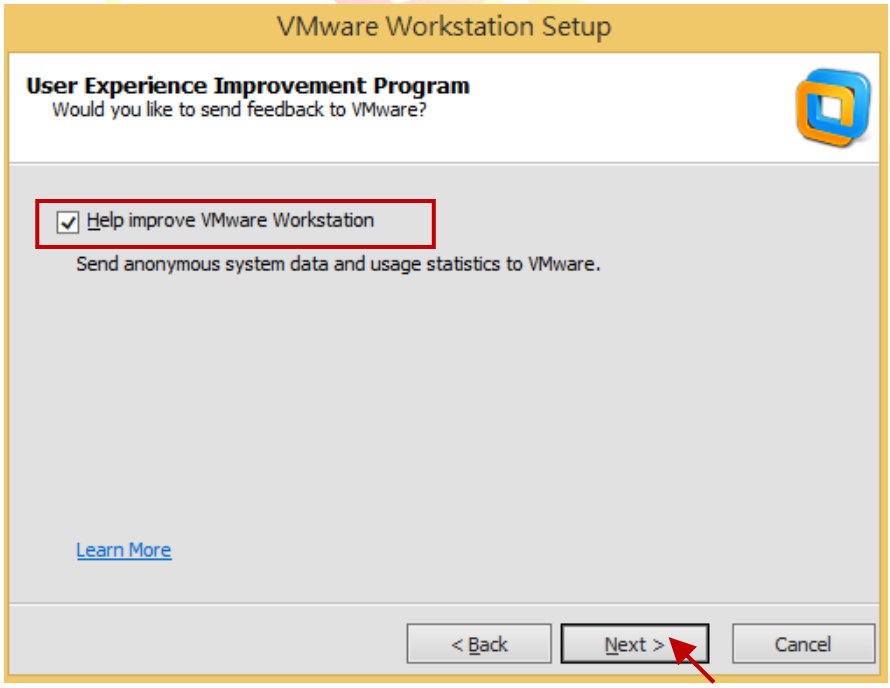
5. Click the “Change” button to assign the location to install; here we use the default installation path.
   Click the “Next” button to continue.



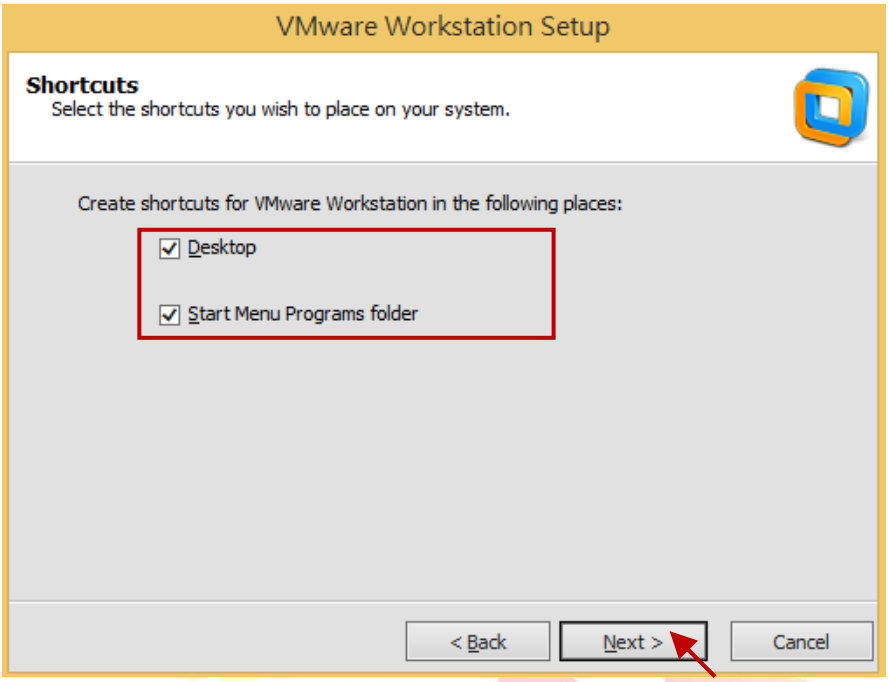
6. By default the “Check for product updates on startup” option is checked that means to check for new versions of the software when VMware Workstation starts.
   Here we take the default setting and click the “Next” button to continue.



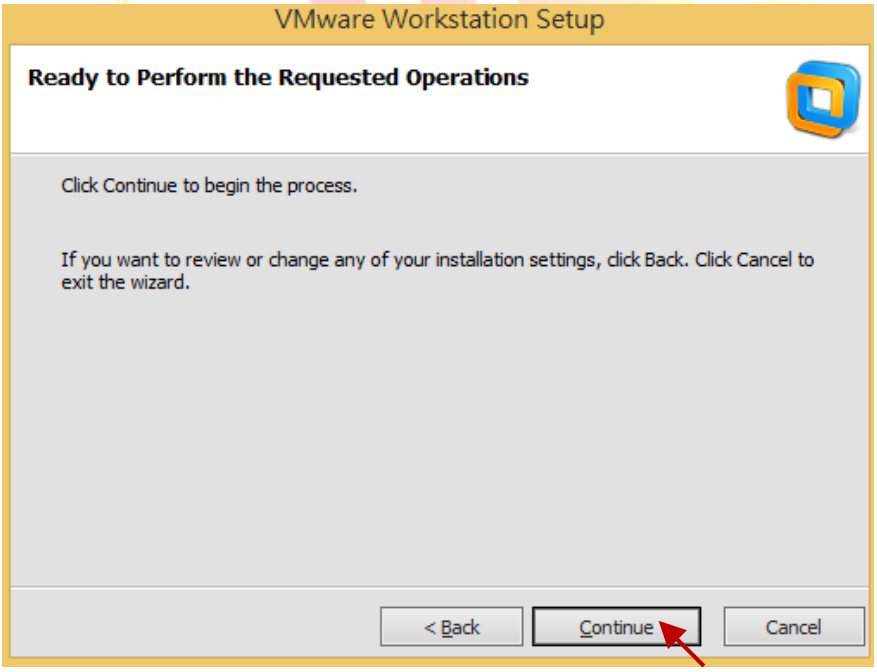
7. By default the “Help improve VMware Workstation” option is checked that means you agree to send feedback to VMware. Here we take the default setting and click the “Next” button to continue.



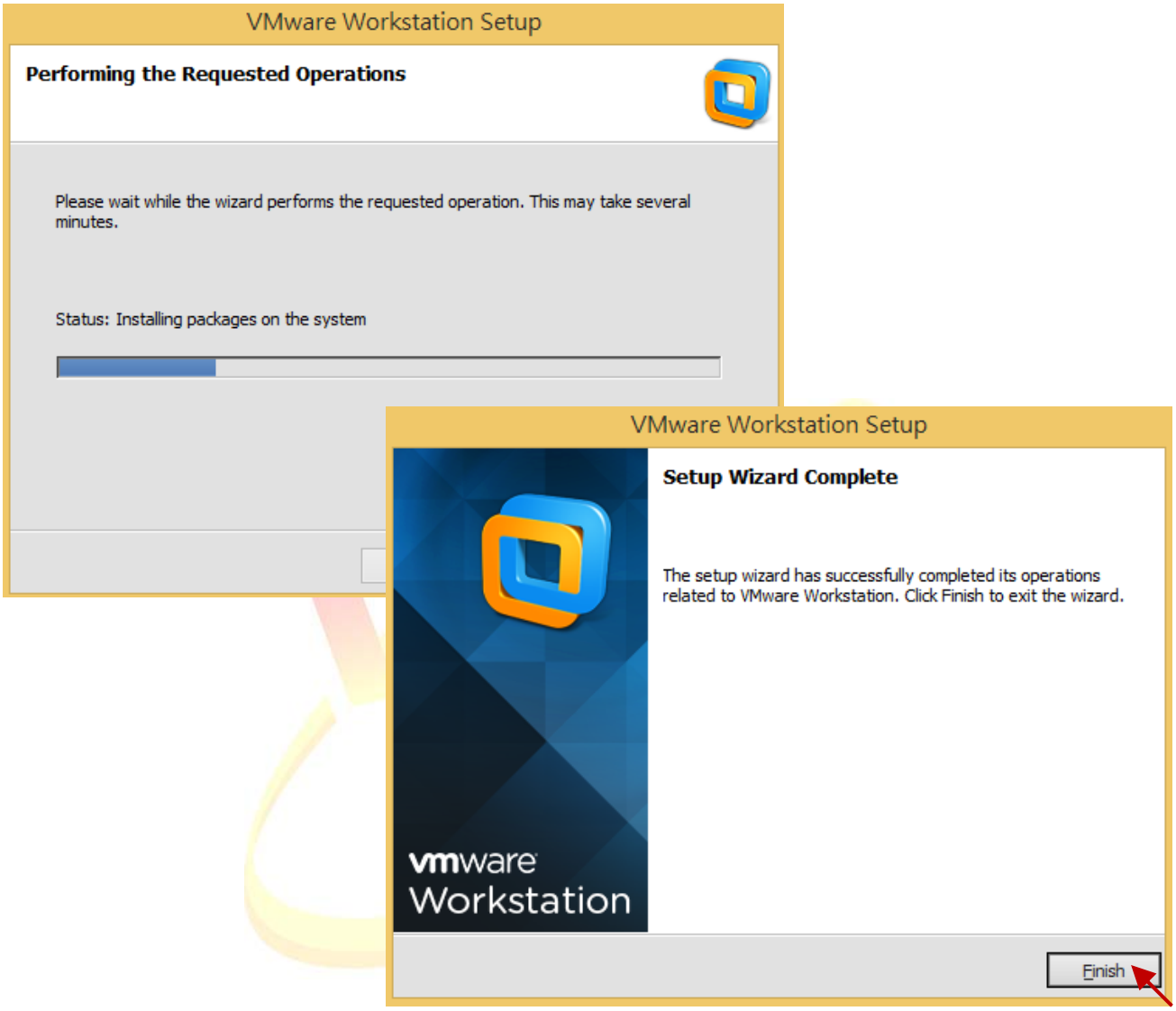
8. By default the “Desktop” and the “Start Menu Program folder” options are checked that means to create shortcuts on Windows desktop and in the Start menu.
   Here we take the default setting and click the “Next” button to continue.



9. Click “Continue” button to begin the process.

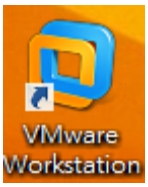


10. Wait a few minutes to complete the setup and then click “Finish” button to exit the setup wizard.

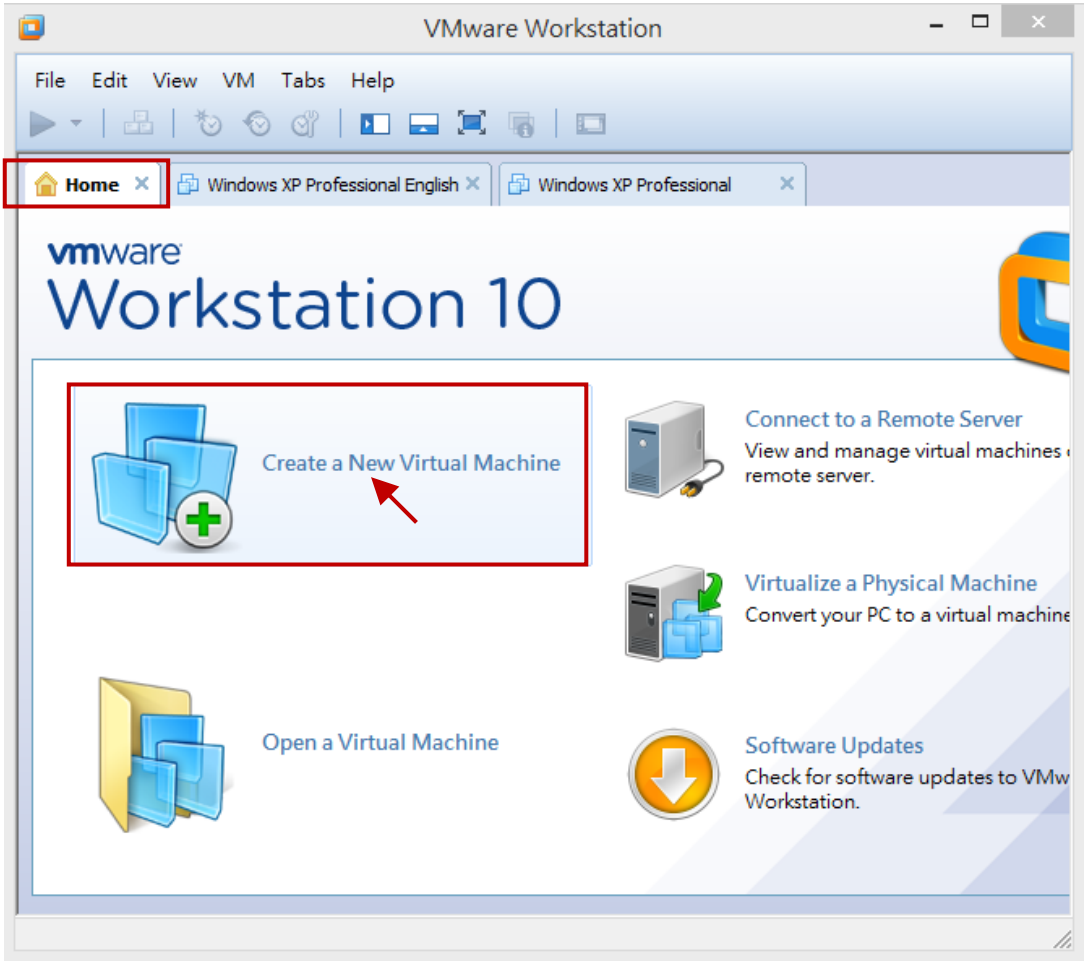


1.2. Creating a virtual machine running Windows XP (32-bit, SP3)

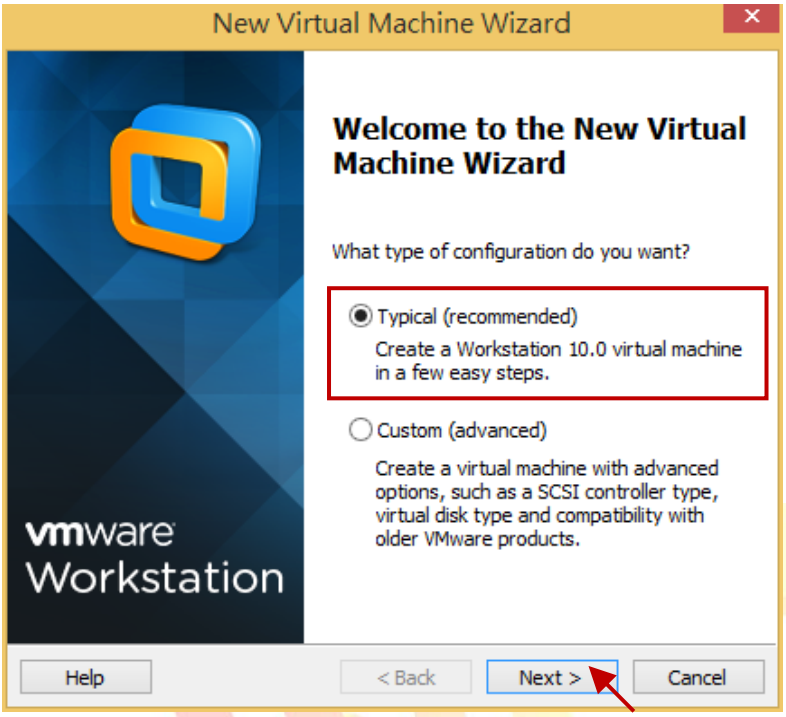
1. Double-click the VMware Workstation shortcut on your desktop to run it.



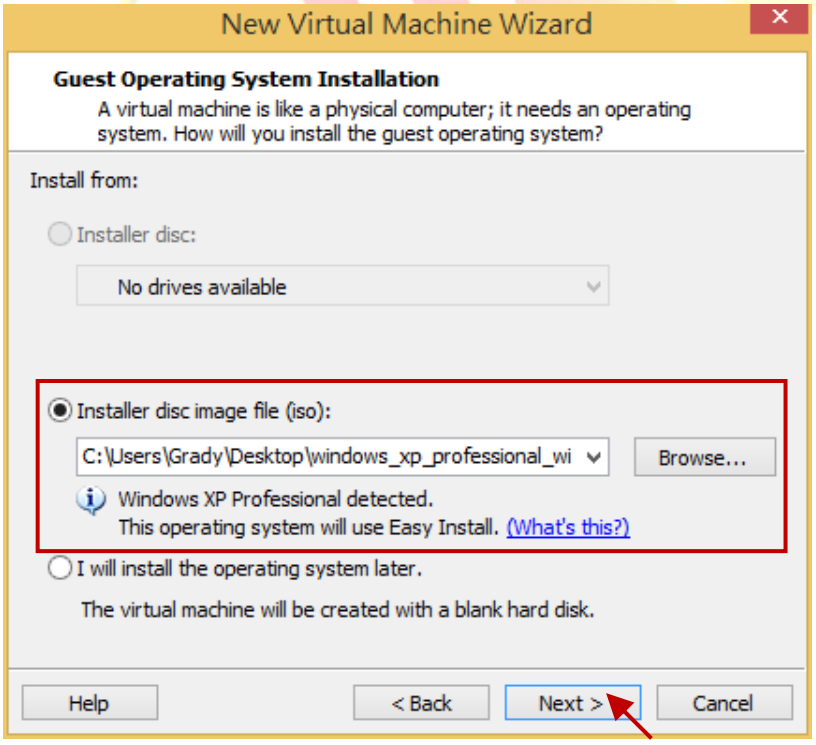
2. Click the “Create a New Virtual Machine” button in the “Home” tab.



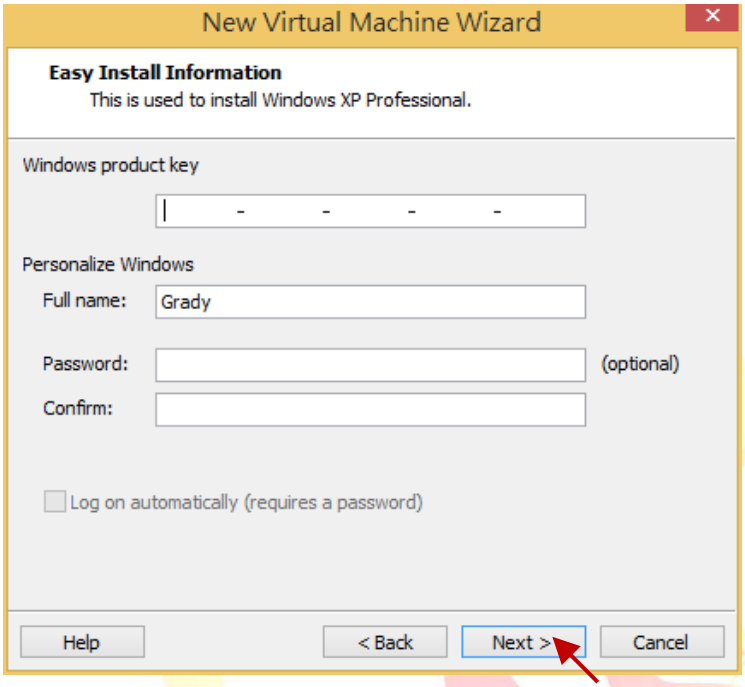
3. Click the “Next” button to continue with the default setting (i.e., “Typical”).



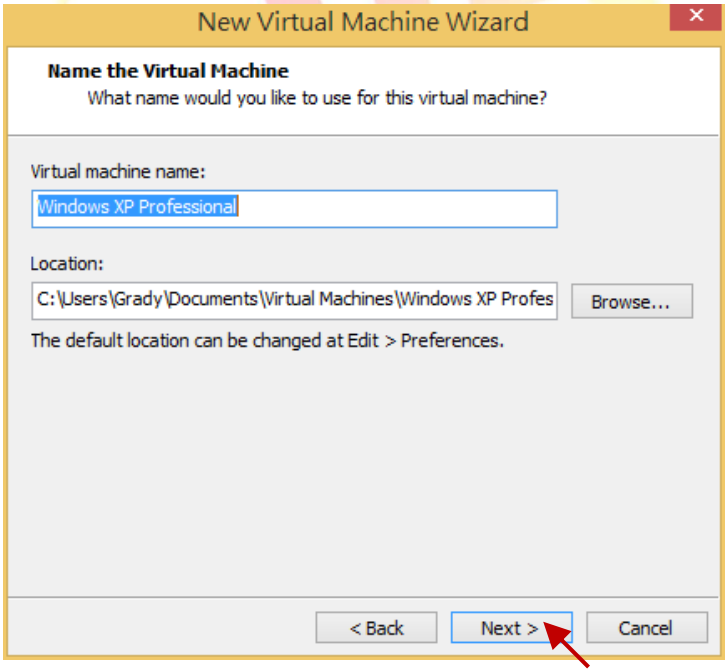
4. In this step, you need to specify the sources of the installation file. Select the “Installer disc image file” option that means to install a guest operating system from an ISO image file. Then click the “Next” button to continue.
(If using an installation disc, click the “Installer disc” option and give a drive letter.)



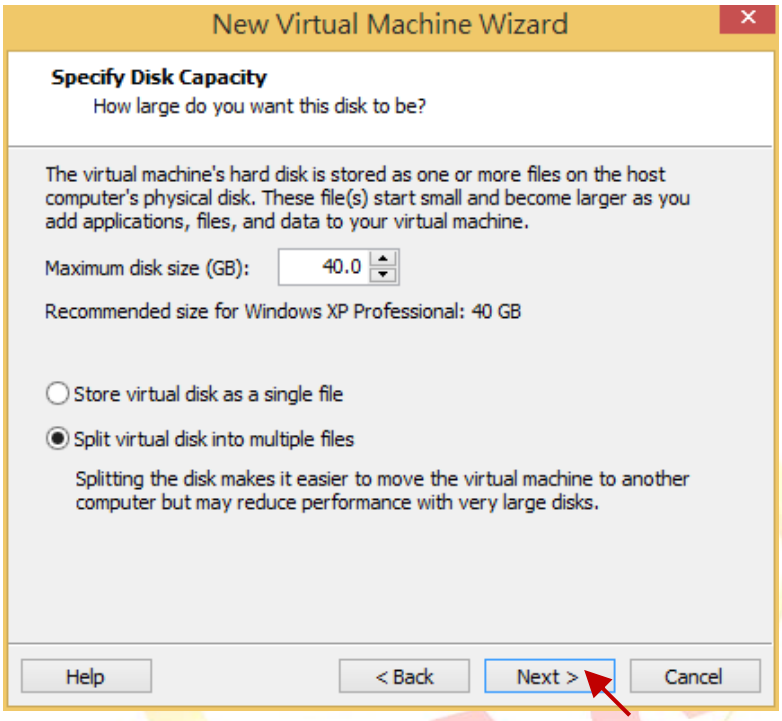
5. In the previous step, the OS version (i.e., “Windows XP Professional”) that you want to install has been detected by the VMware Workstation wizard. Enter the requested information, product key, login ID and password (blank, which means that to login without a password), and then click the “Next” button to continue.



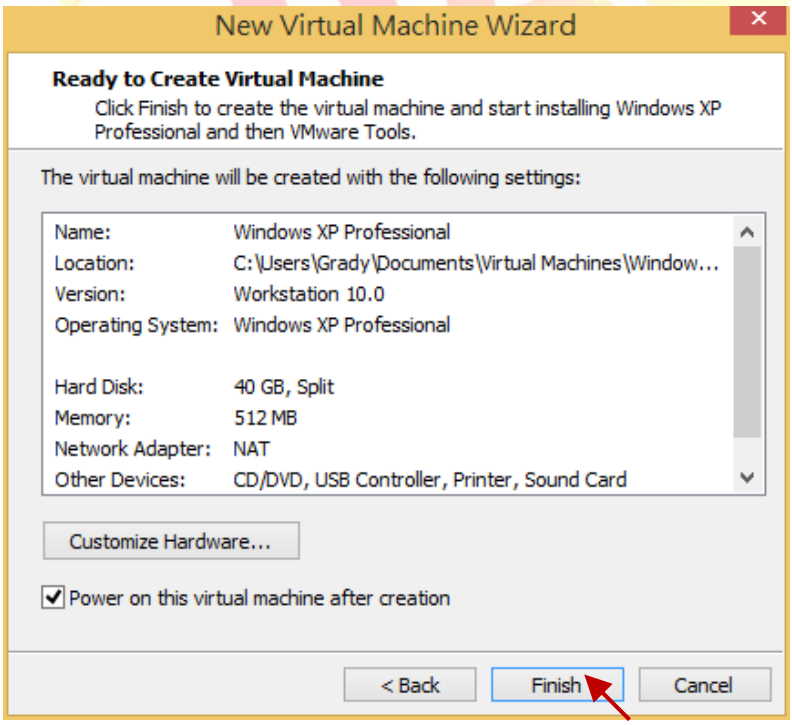
6. Give your virtual machine a name and specify a location to store the virtual machine file. Here we use the default name and location, click the “Next” button to continue.



7. Decide how much RAM to dedicate to your virtual machine and the way to store files.
   Using the default settings, Disk size: 40 GB; Storage way: Split virtual disk into multiple files, and then click the “Next” button to continue.



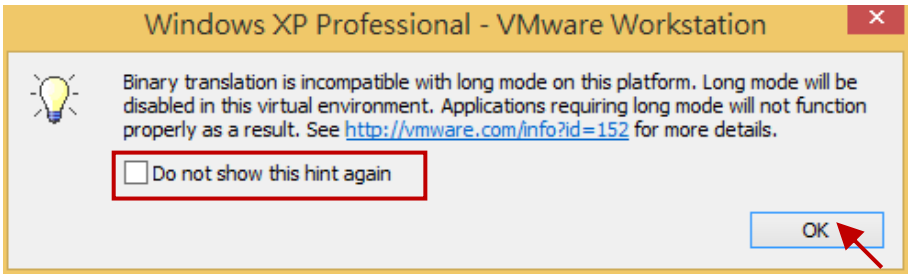
8. Review all the settings shown in the window and then click “Finish” to create the virtual machine.

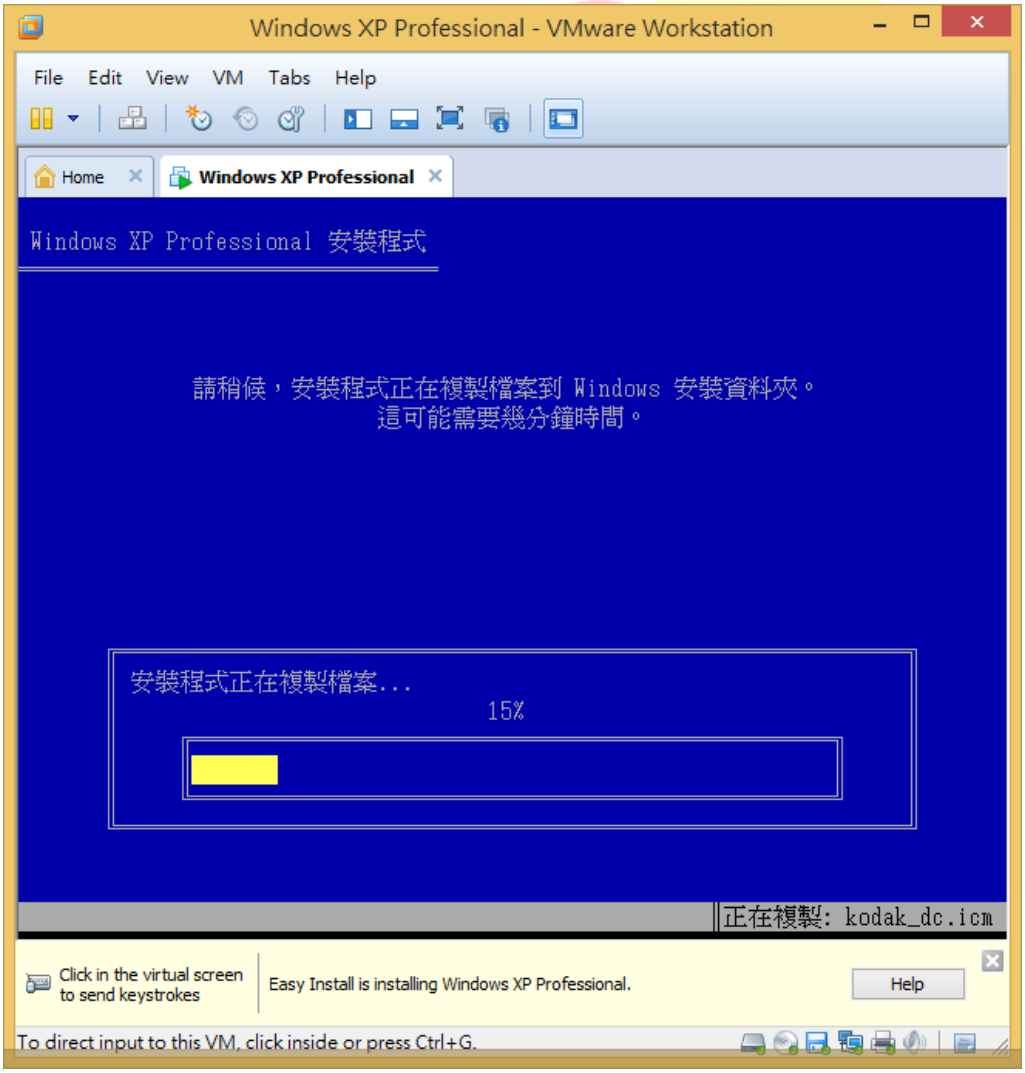


9. Now, the virtual machine starts installing the OS (i.e., “Windows XP Professional”).

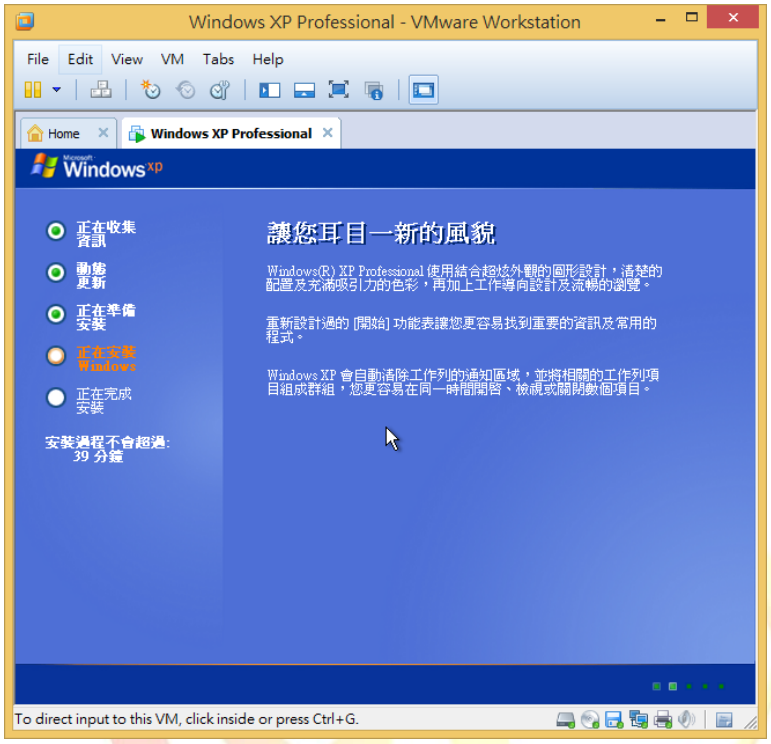
Note: If this alert window pops up, just click "OK" to proceed.

If you don’t want to see this hint again, check the “Do not show this hint again” box and then click “OK” to close this window.

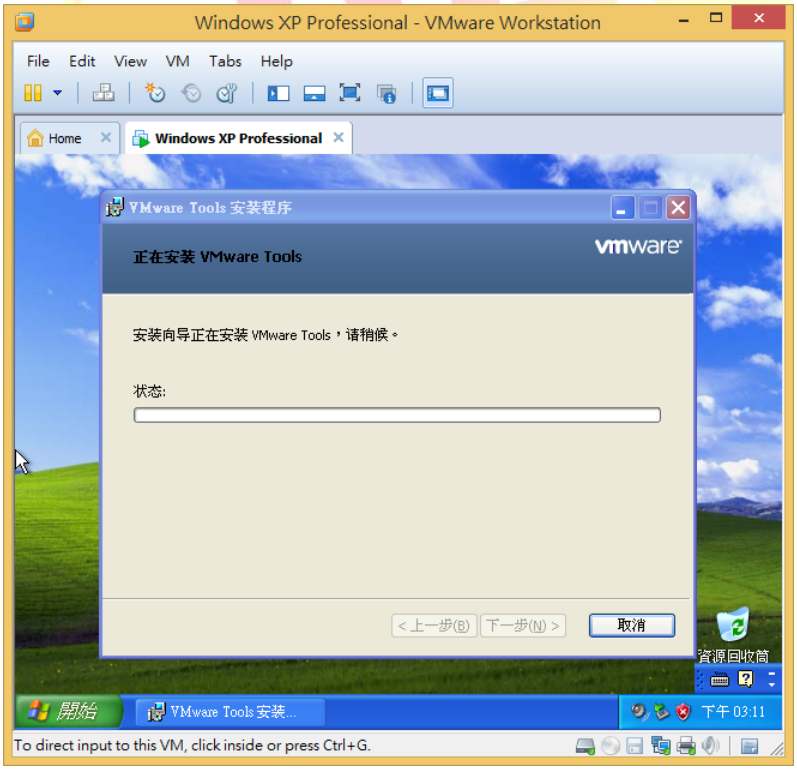




10. The screen during Windows XP Professional installation.



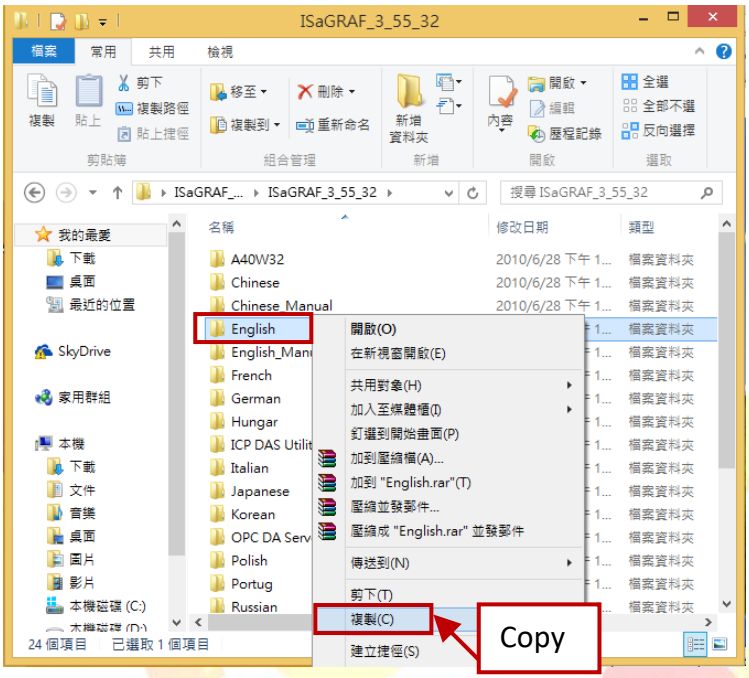
11. After log on to the operating system, it will automatically install “VMware Tools” on this Windows virtual machine. The “VMware Tools” allow you to operate a Windows guest operating system just like a Host application.



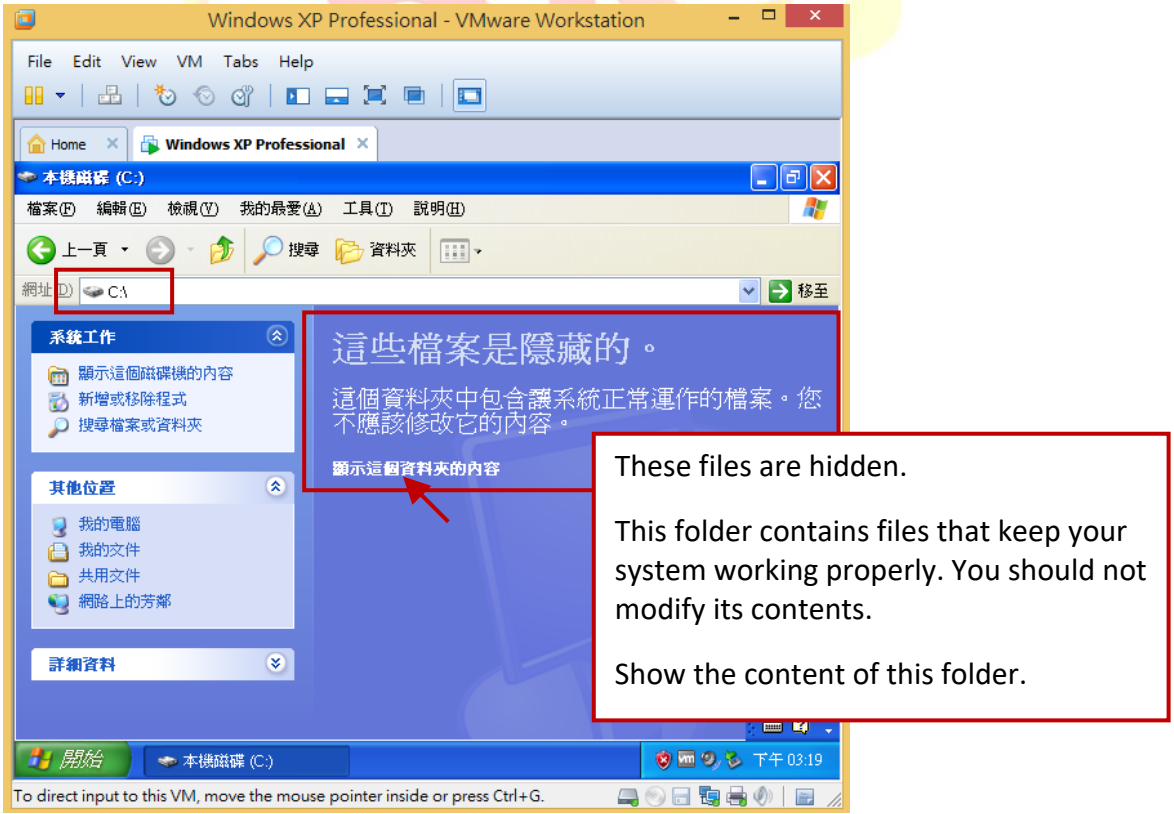
1.3. Installing ISaGRAF Workbench 3.55 on a virtual machine

1. In the Host PC, mouse right-click on the “English” folder in the ISaGRAF Workbench installer disc and then select “Copy” from the menu.

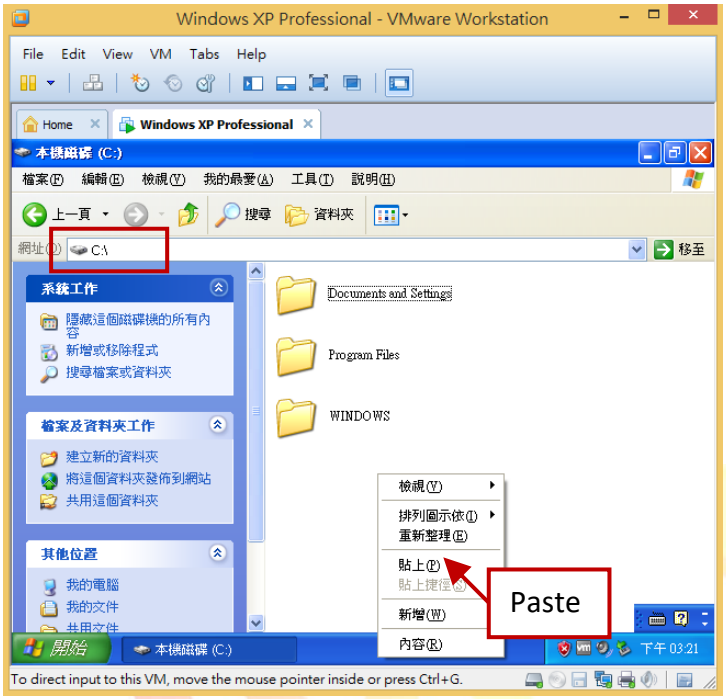
   Note: If using the ISaGRAF-256, the Host PC must have USB2.0 port (refer to Section1.6).



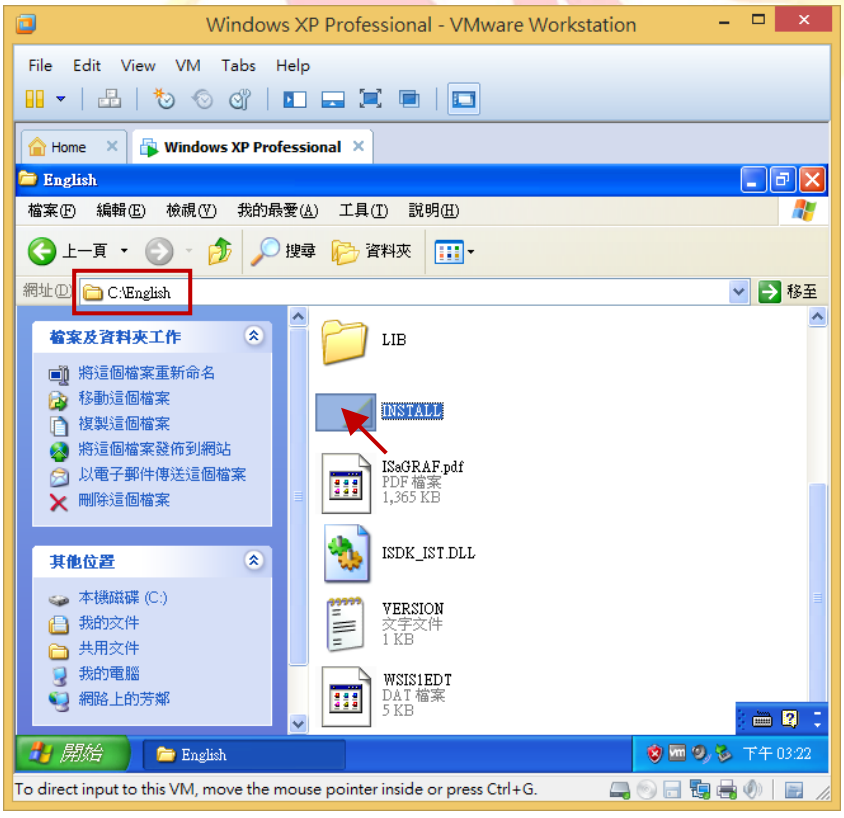
2. In the virtual machine, open your hard drive root folder (i.e., “C:\”). If a message informs you that these files are hidden, select “Show the content of this folder”.



3. In the root folder of the C drive (i.e., “C:\”), mouse right-click on the blank area and select “Paste” to move the “English” folder from the Host PC to the virtual machine.

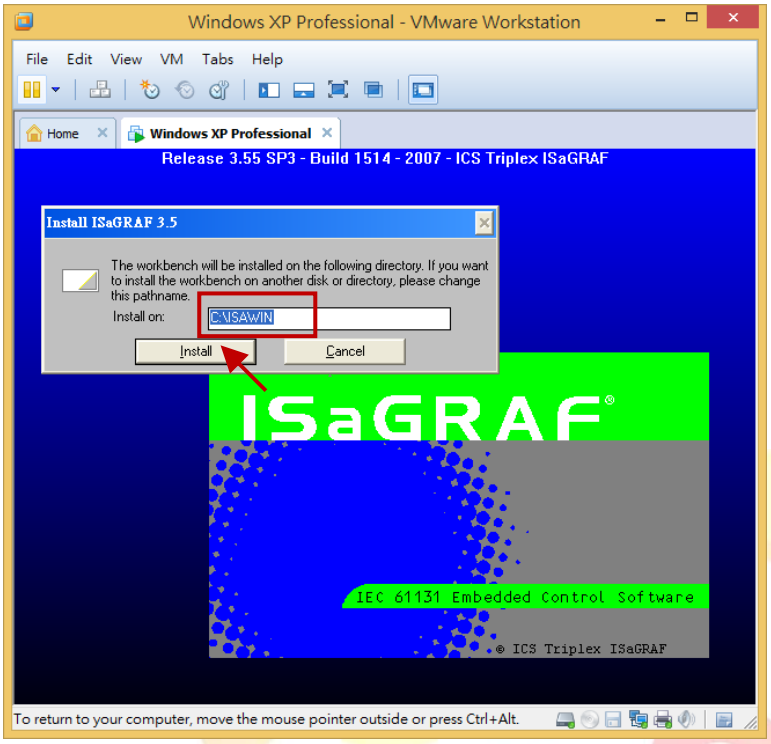


4. After you complete this process, double-click on the “English” folder and then double-click on the “Install.exe” file to start installing the ISaGRAF Workbench.

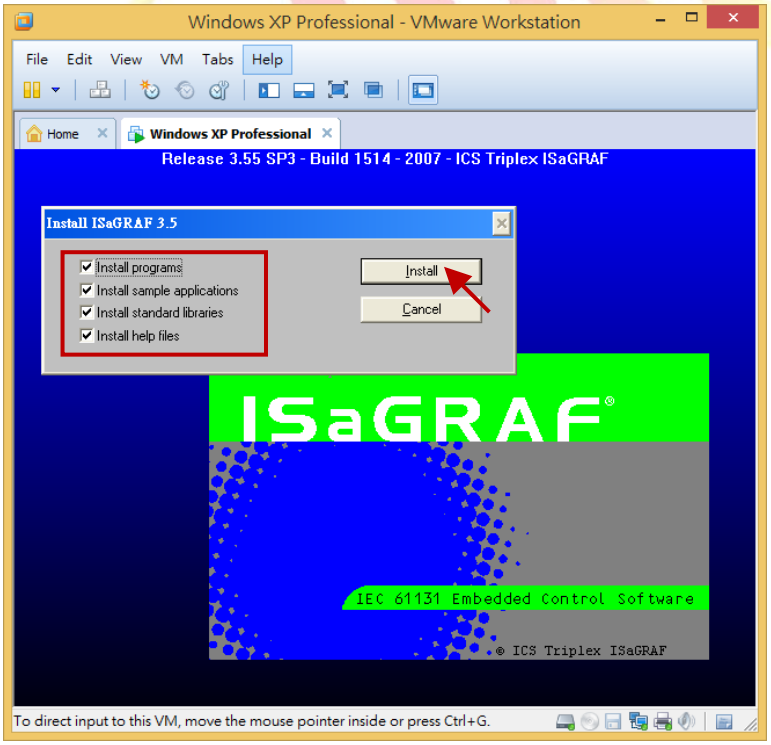


5. Using the default installation path of the ISaGRAF Workbench and click “Install” to continue.

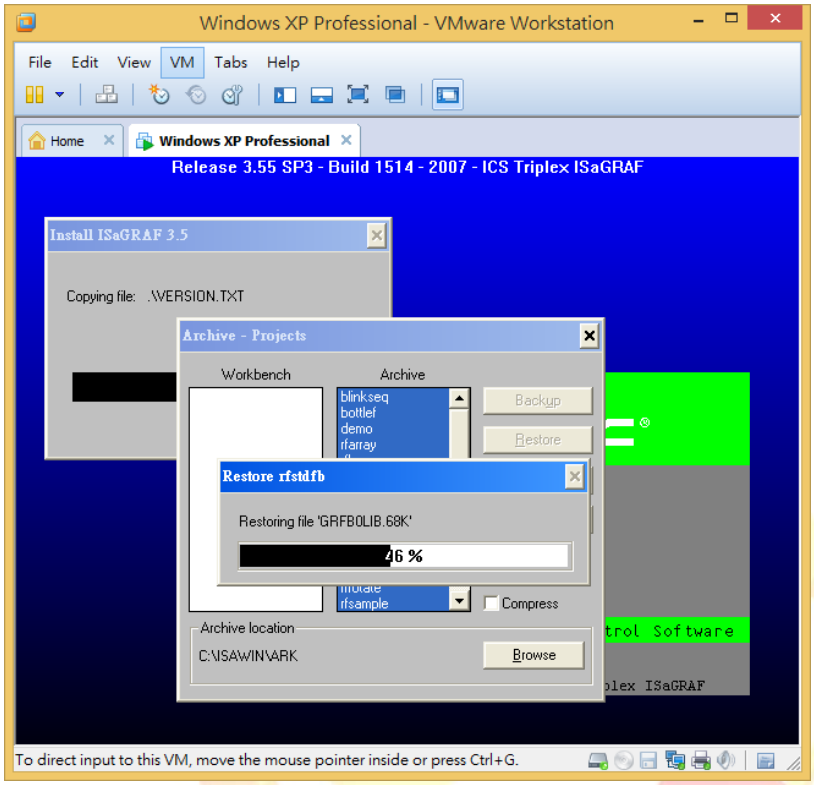
   Note: We strongly recommended using the default path (“C:\ISAWIN”), do not modify it.



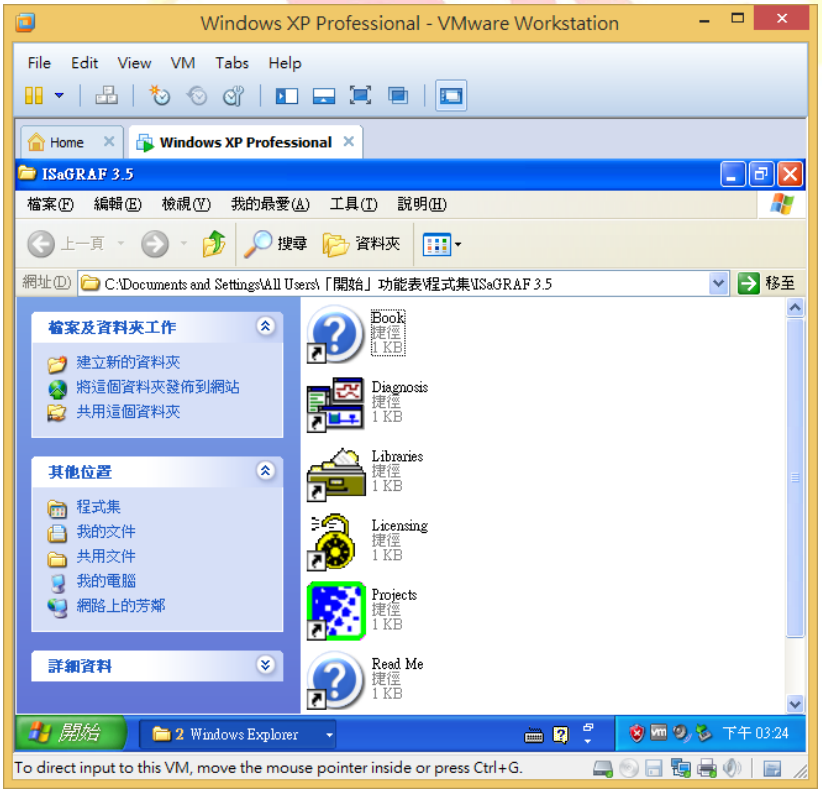
6. Using the default settings and click the “Install” button to continue.



7. The screen during the ISaGRAF installation.



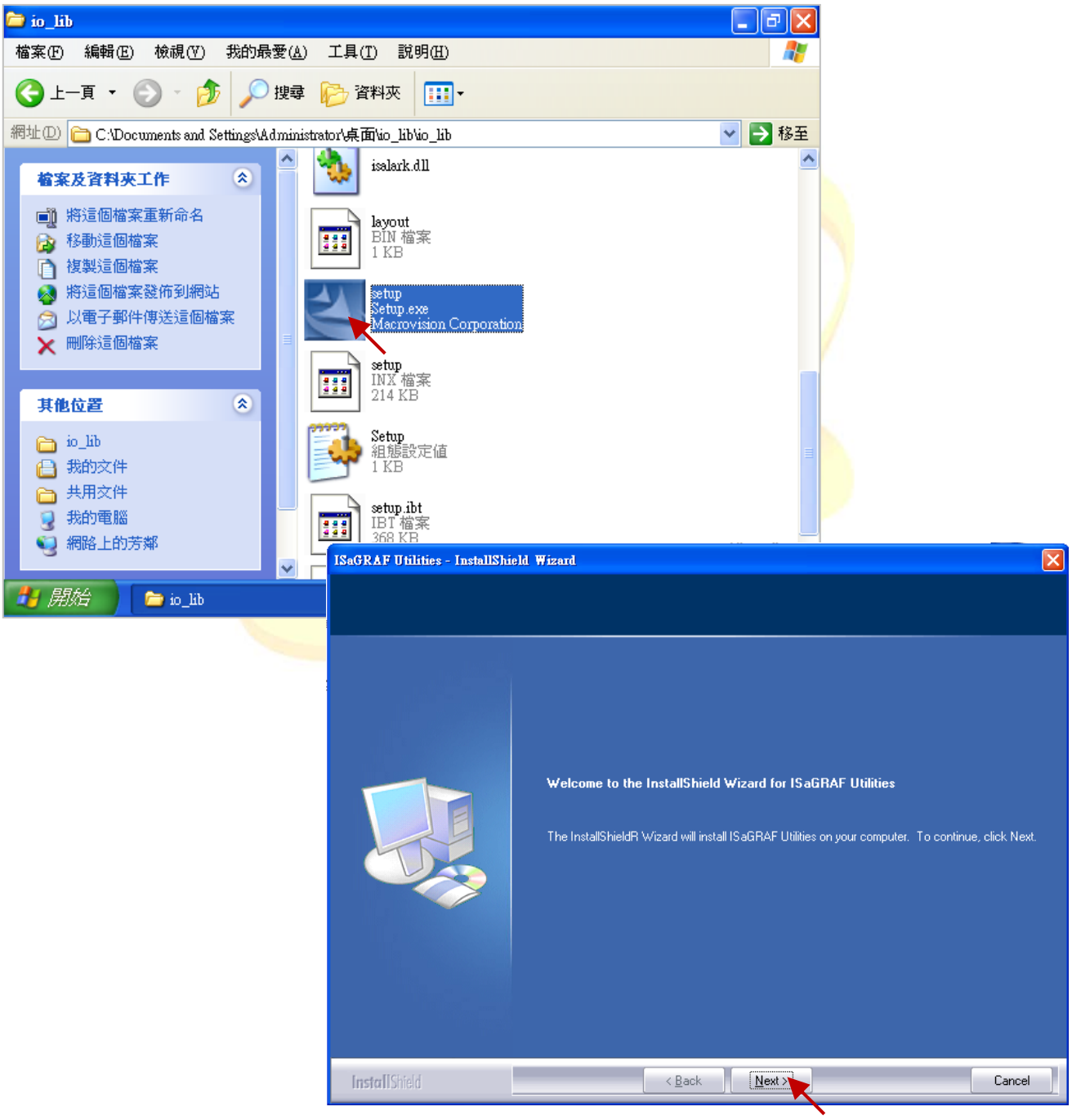
8. Wait for several minutes to finish the ISaGRAF installation.



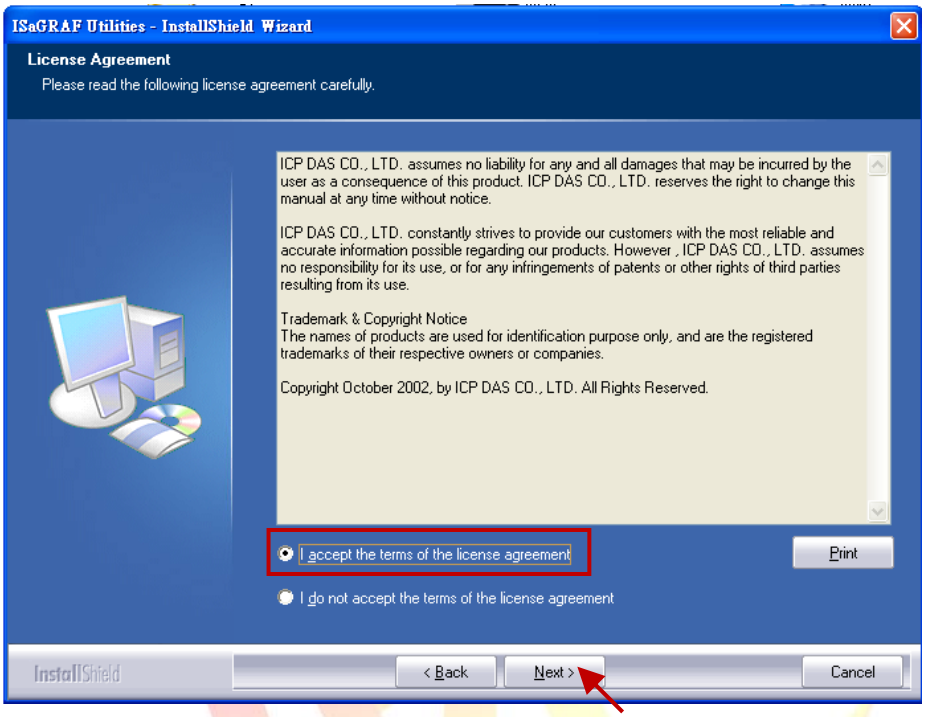
1.4. Installing ISaGRAF I/O Library on a virtual machine

1. In the Host PC, users can download the latest ISaGRAF I/O Library on this web page: http://www.icpdas.com/en/download/show.php?num=368&nation=US&kind1=&model=&kw=isagraf unzip the “io_lib.zip” file and copy this folder from Host PC to the Windows desktop on the virtual machine (refer to Section 1.3 – step1, 2).

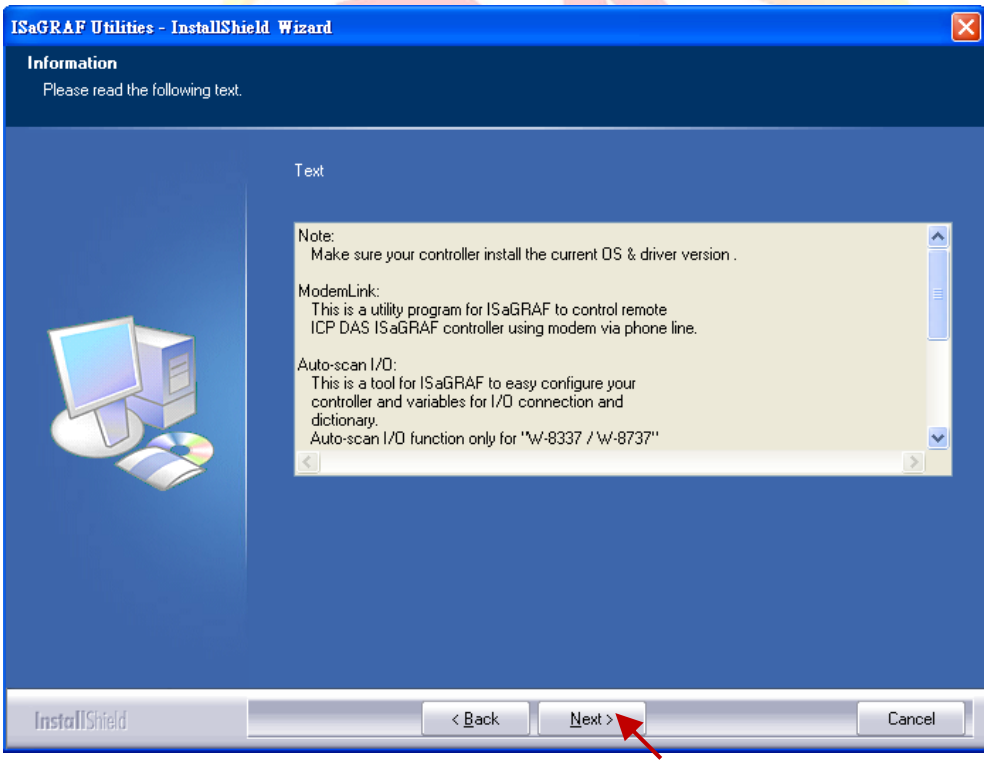
2. Double-click the “Setup.exe” file in the “io_lib” folder to install the I/O library.
3. Click the “Next” button to continue.



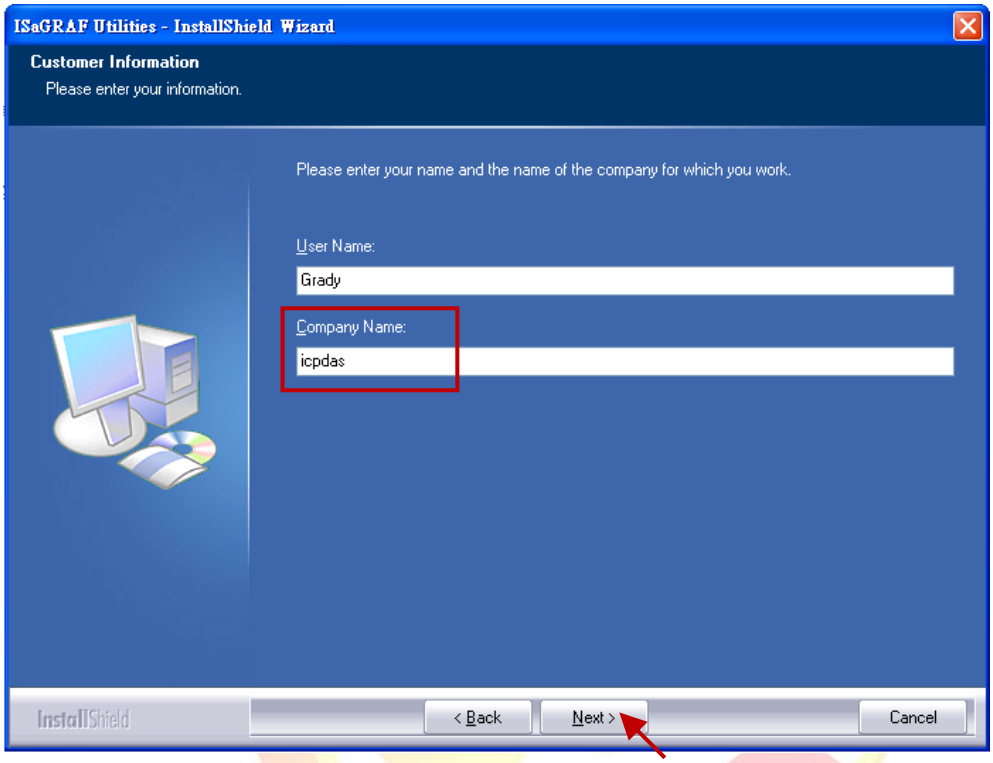
4. Select the “I accept the terms of license agreement” option and click the “Next” button to continue.



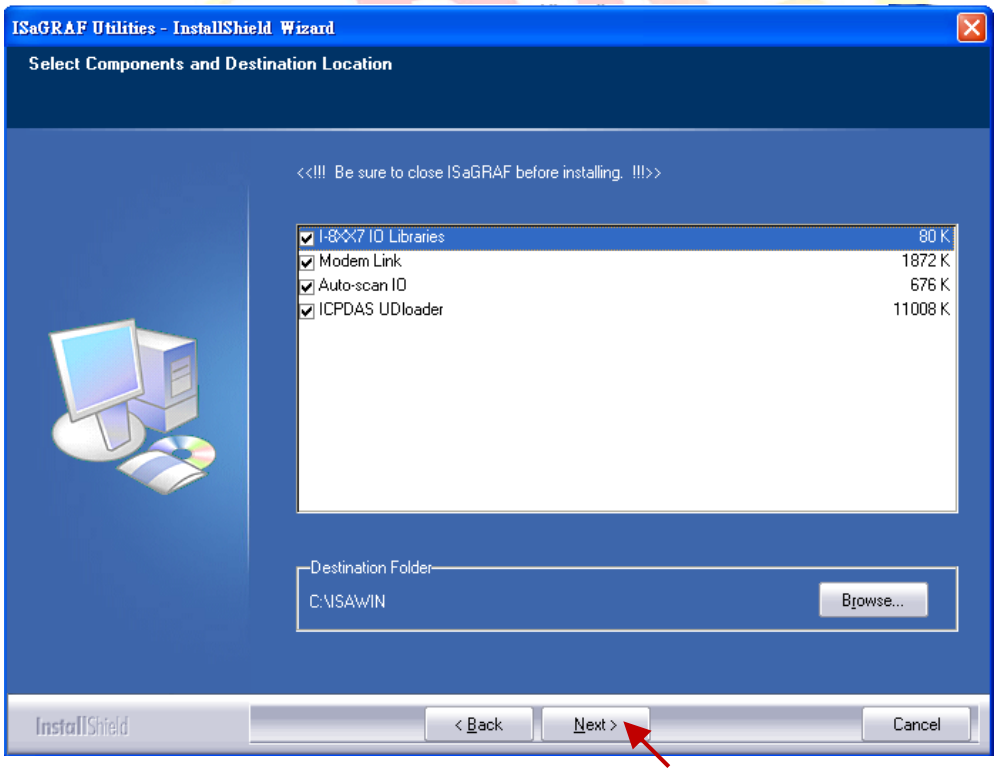
5. Click the “Next” button to continue.



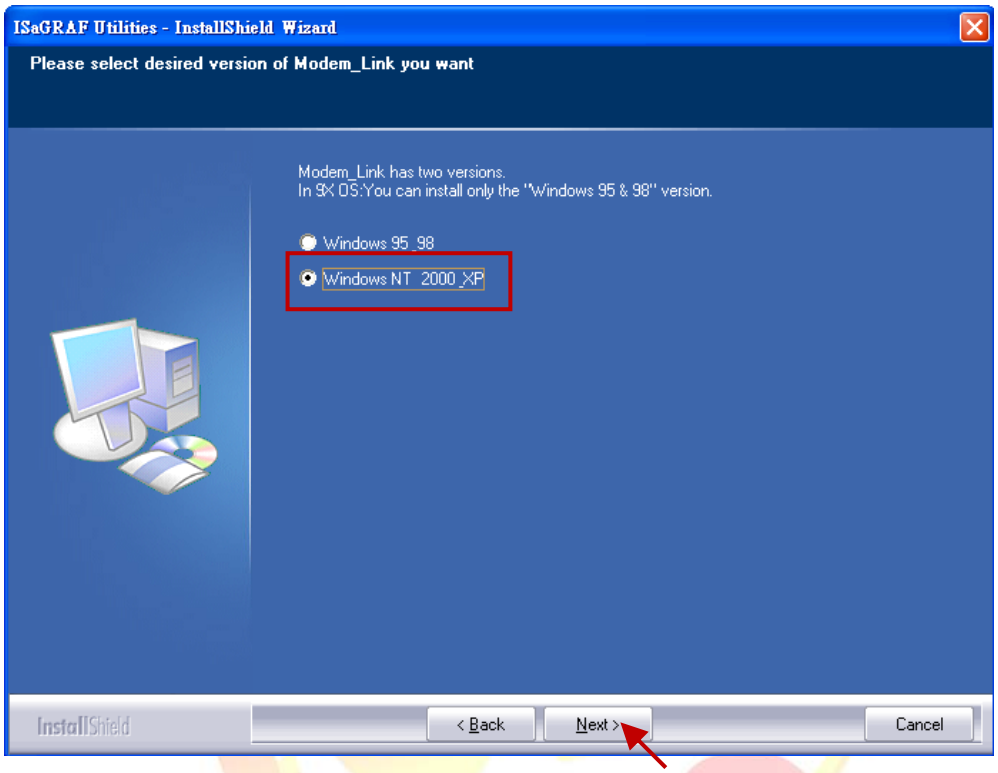
6. Fill in the company name and click the “Next” button to continue.



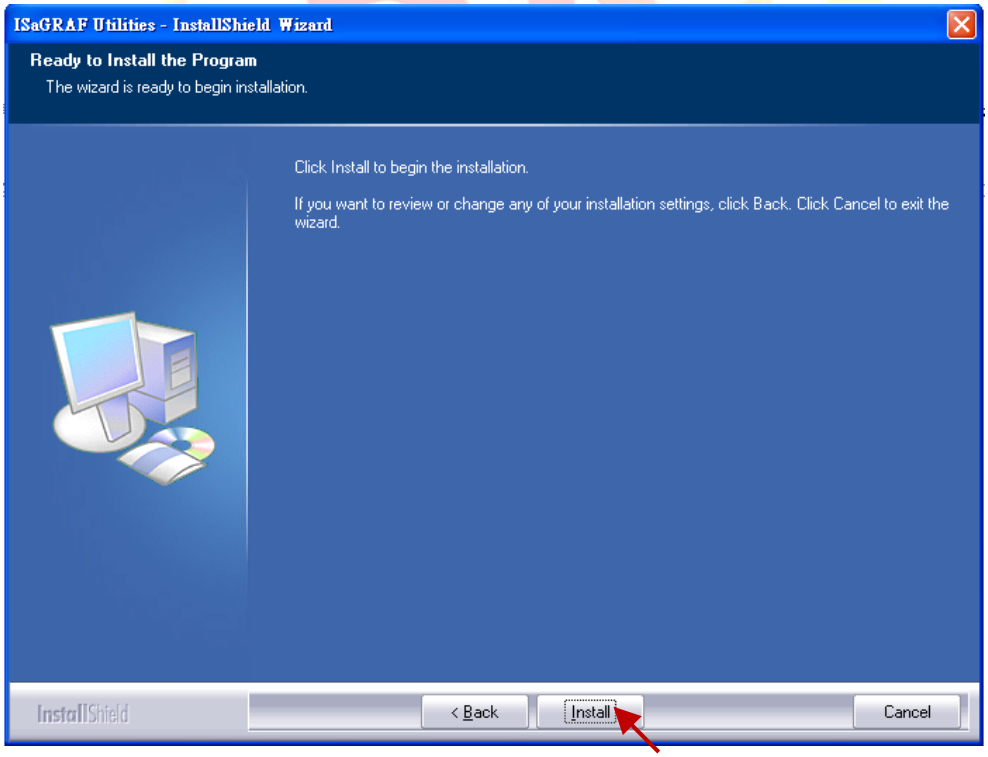
7. Using the default settings and click the “Next” button to continue.



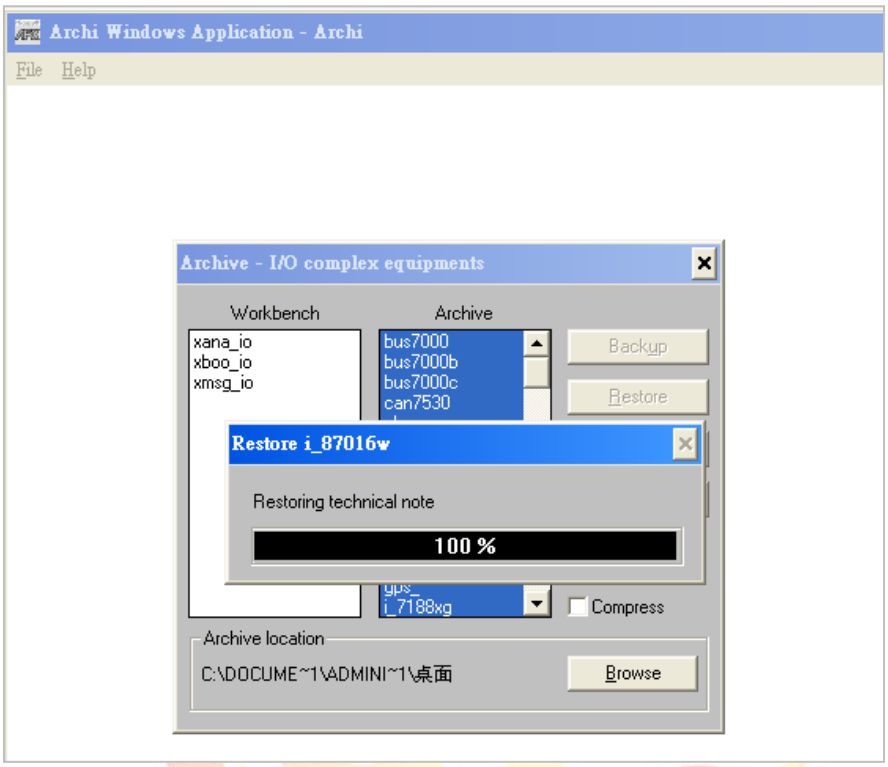
8. Using the default setting “Windows NT 2000, XP” and click the “Next” button to continue.



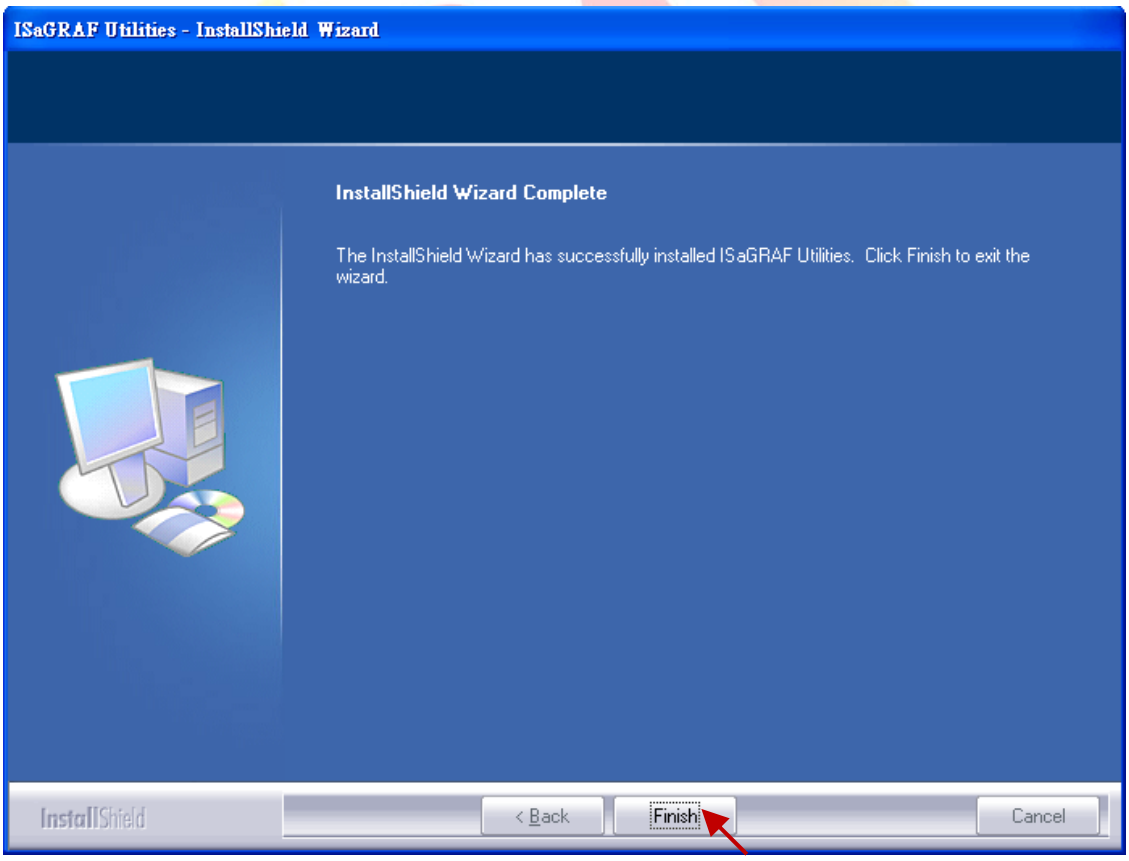
9. Click the “Install” button to begin the installation.



10. The screen during the ISaGRAF I/O Library installation.

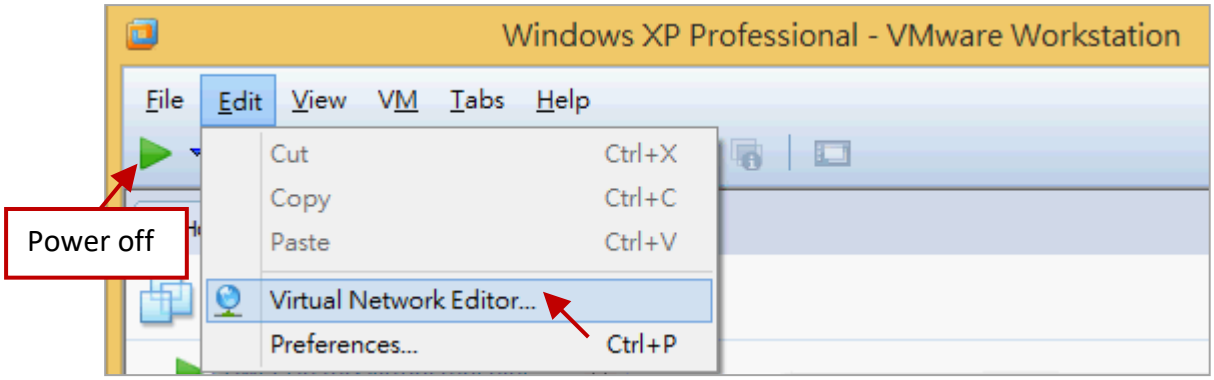


11. After the installation is complete, click “Finish” to exit the wizard.

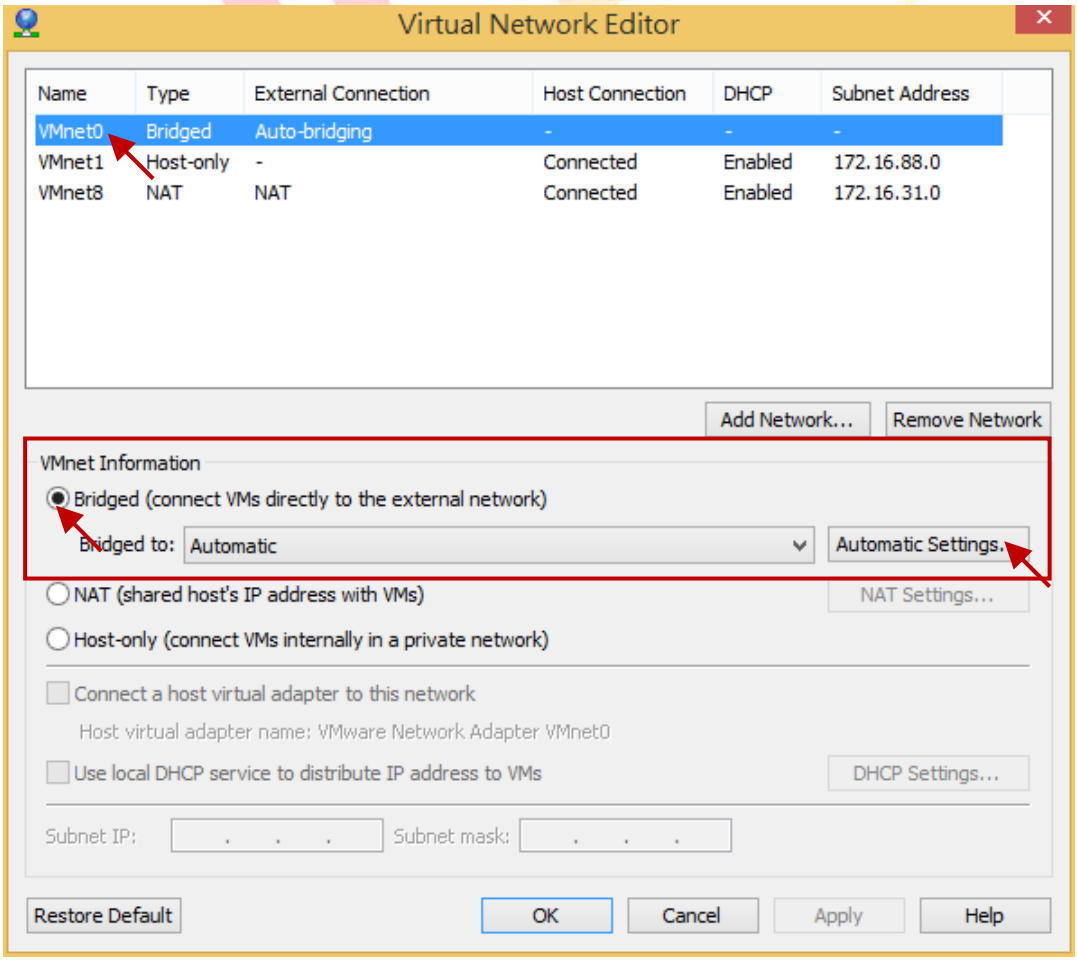


1.5. The related settings for a virtual machine

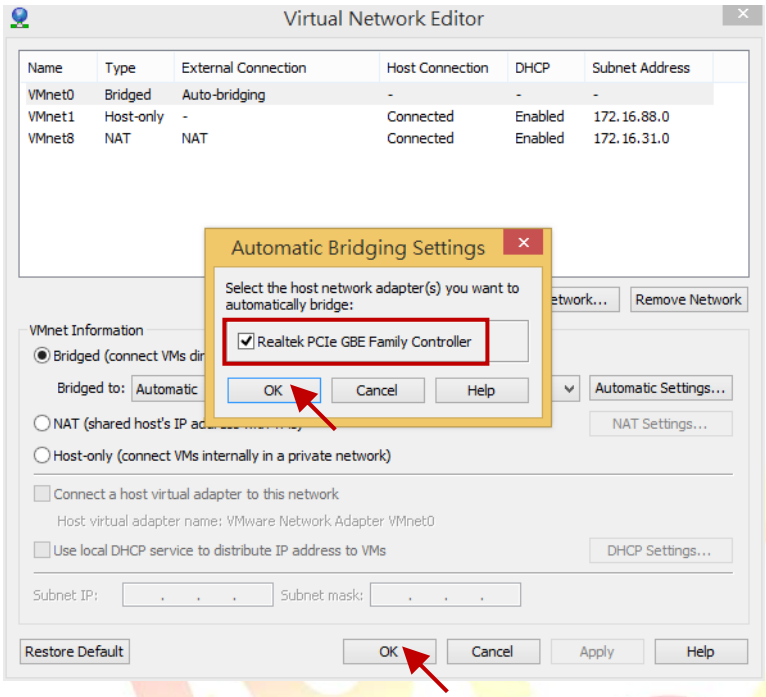
1. First power off the virtual machine to be able to change the related settings.
2. Click “Edit” > “Virtual Network Editor” to configure the network environment.



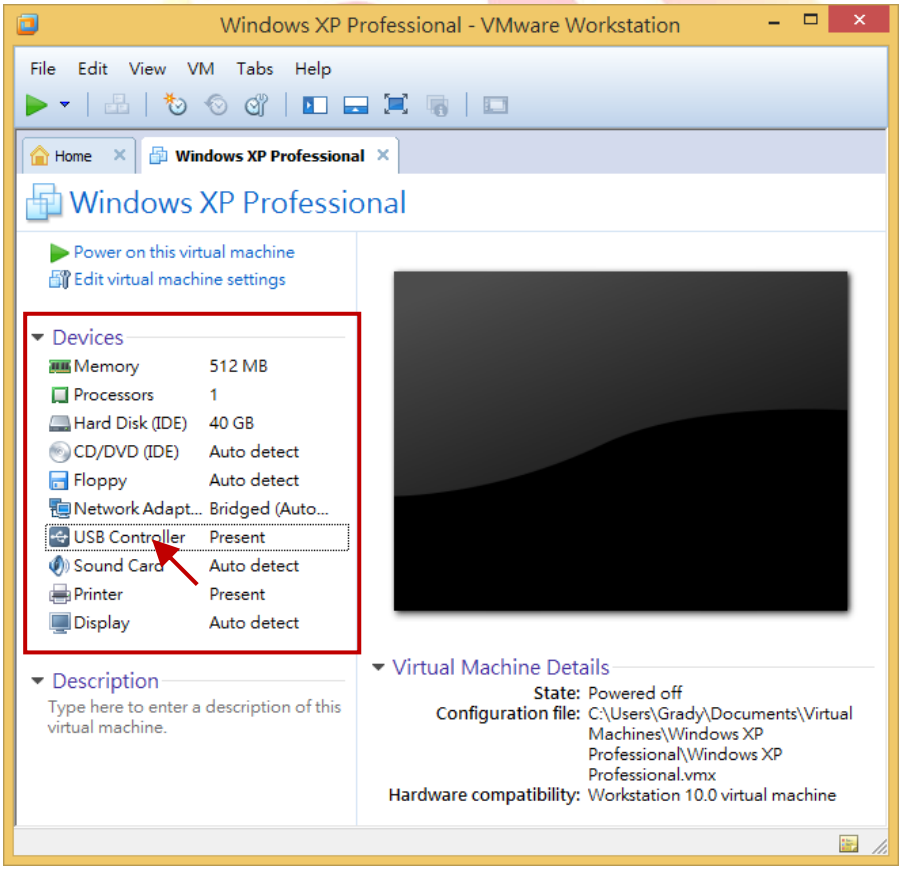
3. Click the name “VMnet0” in the lists and select the “Bridged” option in the “VMnet Information” field, then click the “Automatic Settings...” button.



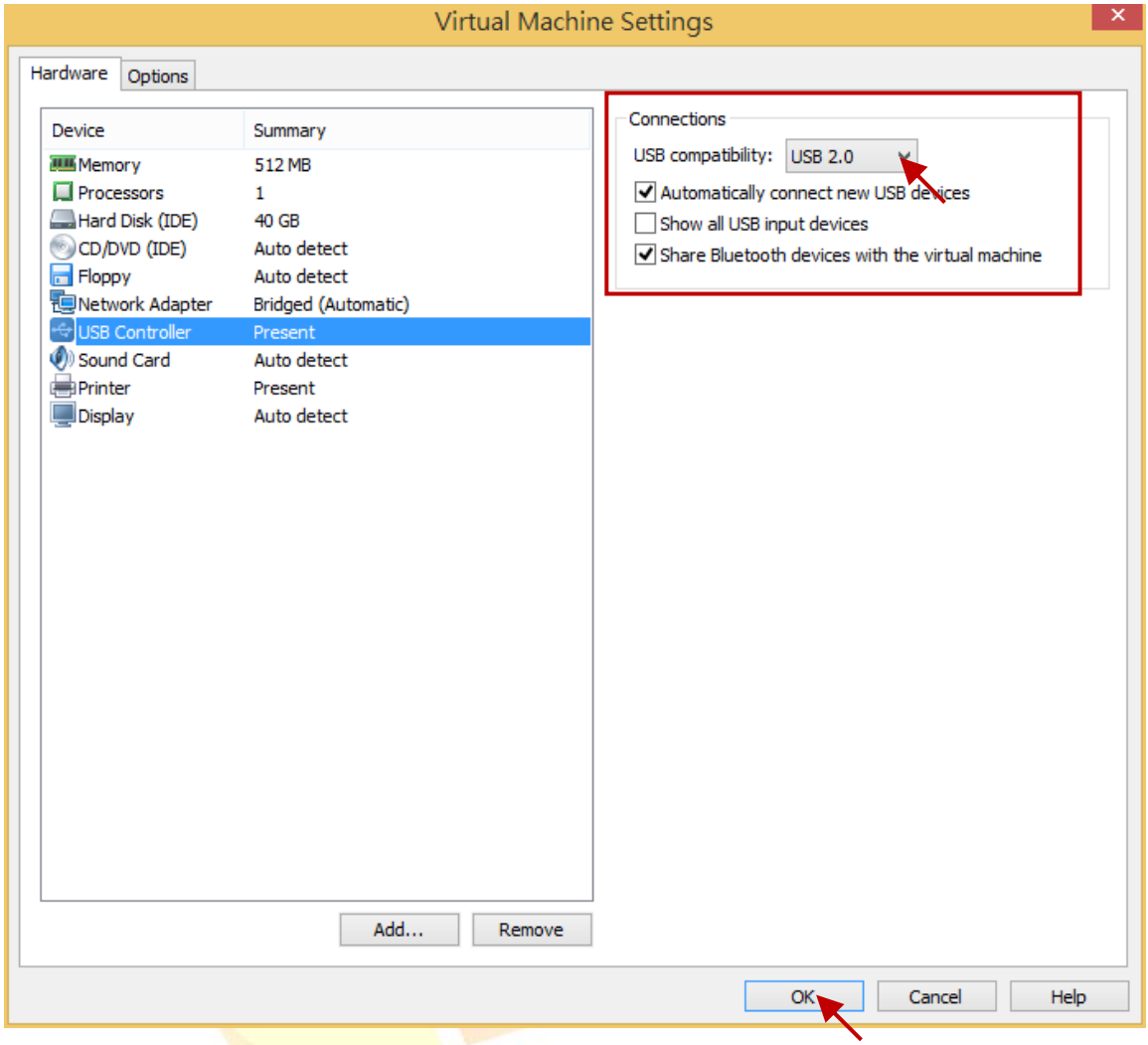
4. Select **Only** the host network adapter that to prevent an ISaGRAF project that develop on the virtual machine cannot connect to the ISaGRAF PAC via the wired network. Then, click “OK” to exit the setting window.



5. Click the “USB Controller” option in the “Devices” list of the virtual machine.



6. Set “USB compatibility” to “USB 2.0” in the “Connections” field, and then click “OK” to exit the window.

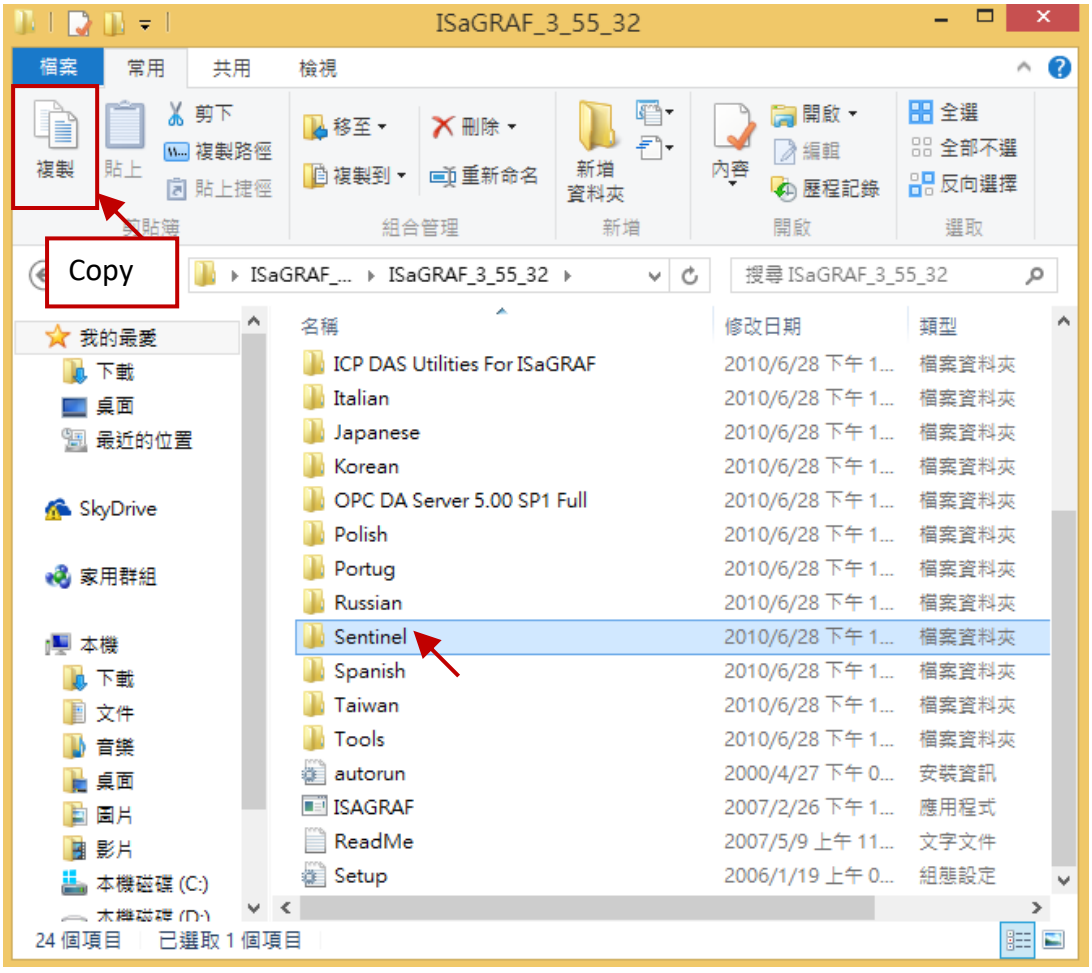


1.6. Installing USB dongle driver on a virtual machine

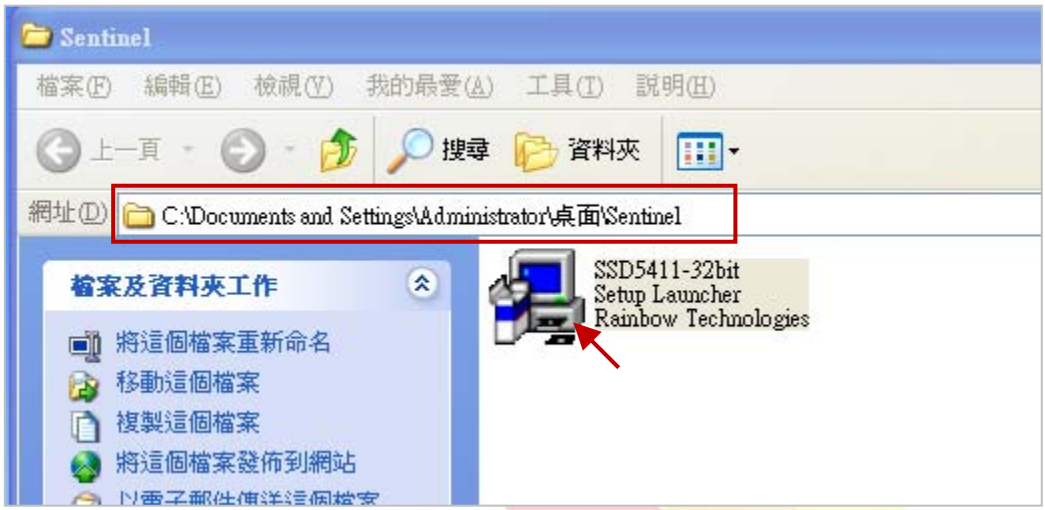
If your ISaGRAF Workbench 3.55 comes with a USB dongle, follow these steps to install the driver on the virtual machine.

Note: The ISaGRAF USB dongle only support the USB 2.0 port. Therefore, the VMware Workstation and ISaGRAF Workbench must be installed on a Host PC that has the USB 2.0 port.

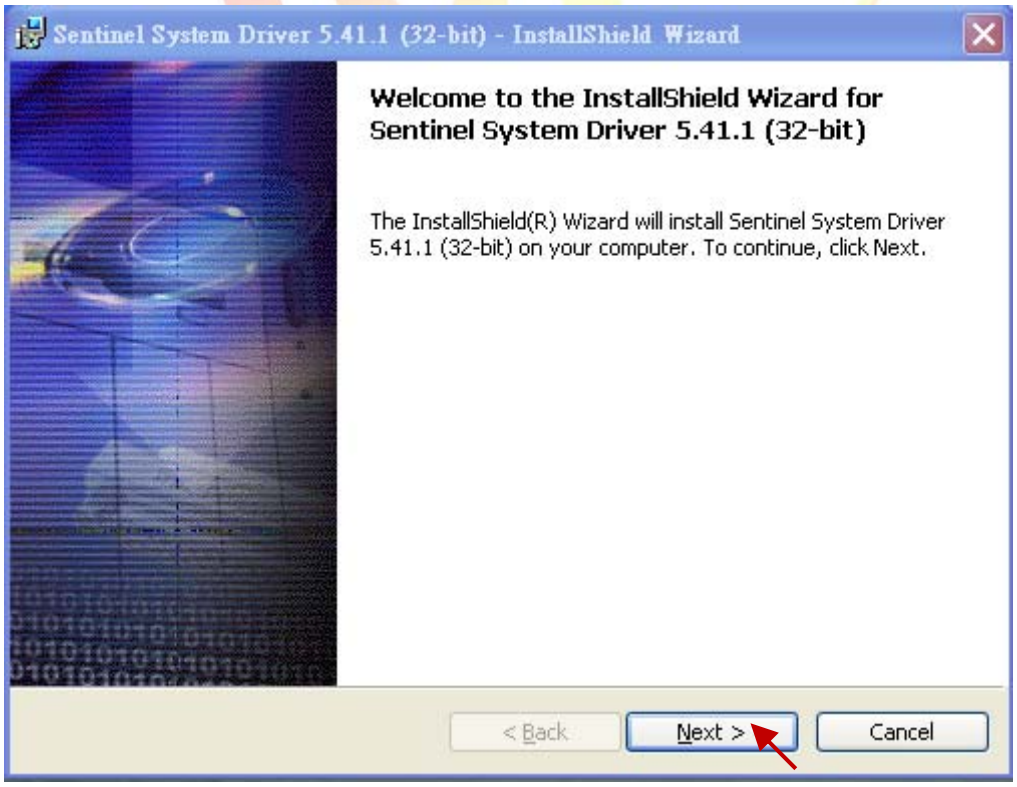
1. Copy the “Setinel” folder by using the right-click menu or pressing “Ctrl + C” (keyboard) from the ISaGRAF Workbench installer disc.



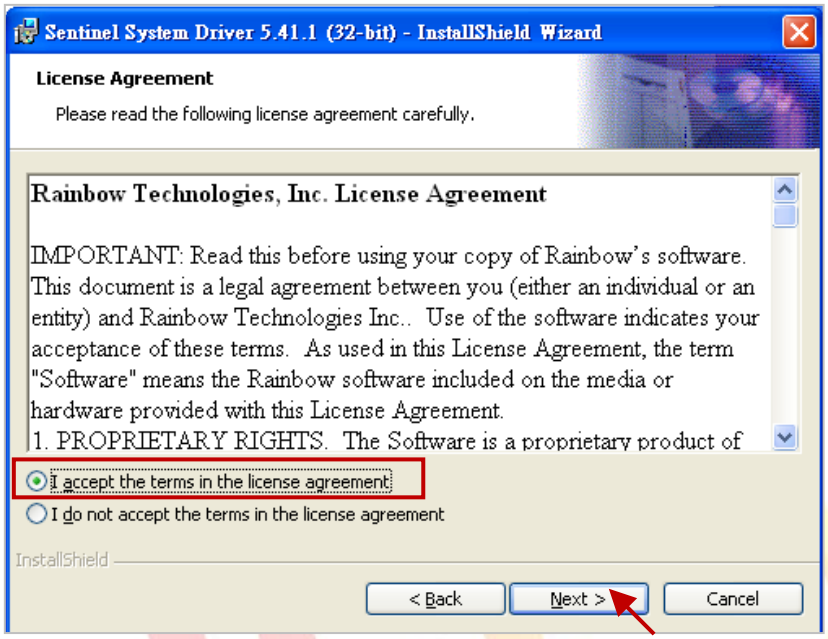
2. Put the “Setinel” folder on the desktop of the Windows virtual machine and then double-click the “SSD5411-32bit.exe” file in the “Setinel” folder to begin the driver installation of the ISaGRAF dongle.



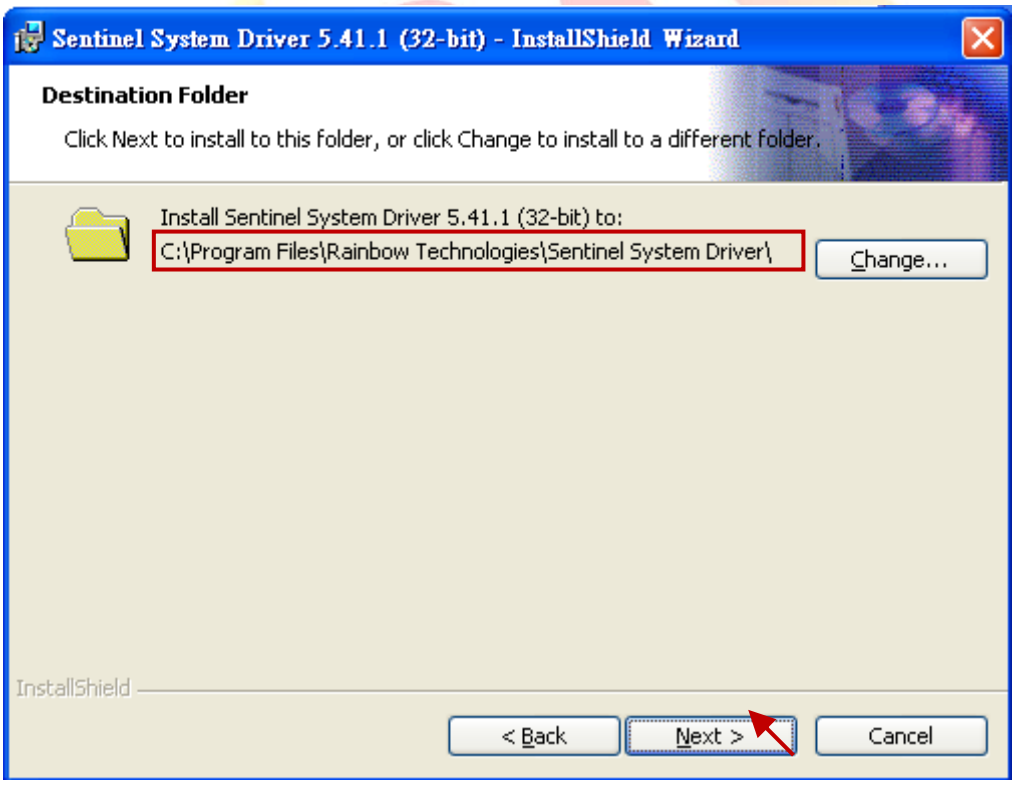
3. Click the “Next” button to continue.



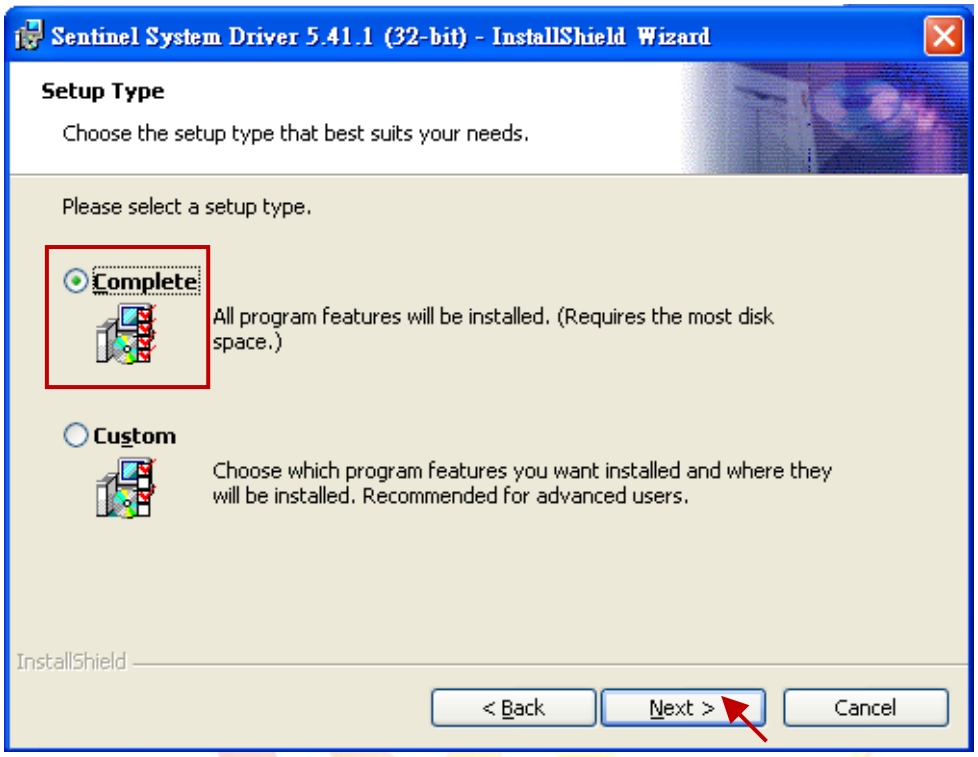
4. Select the “I accept the terms in the license agreement” option, and click the “Next” button to continue.



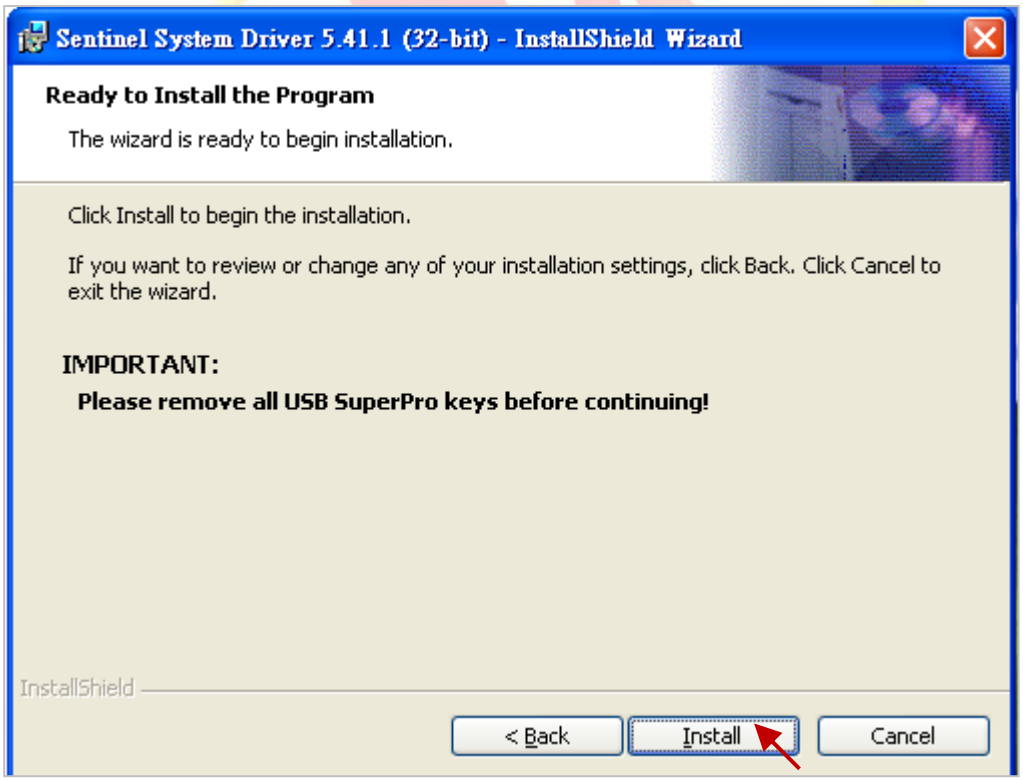
5. Using the default installation path, and click the “Next” button to continue.



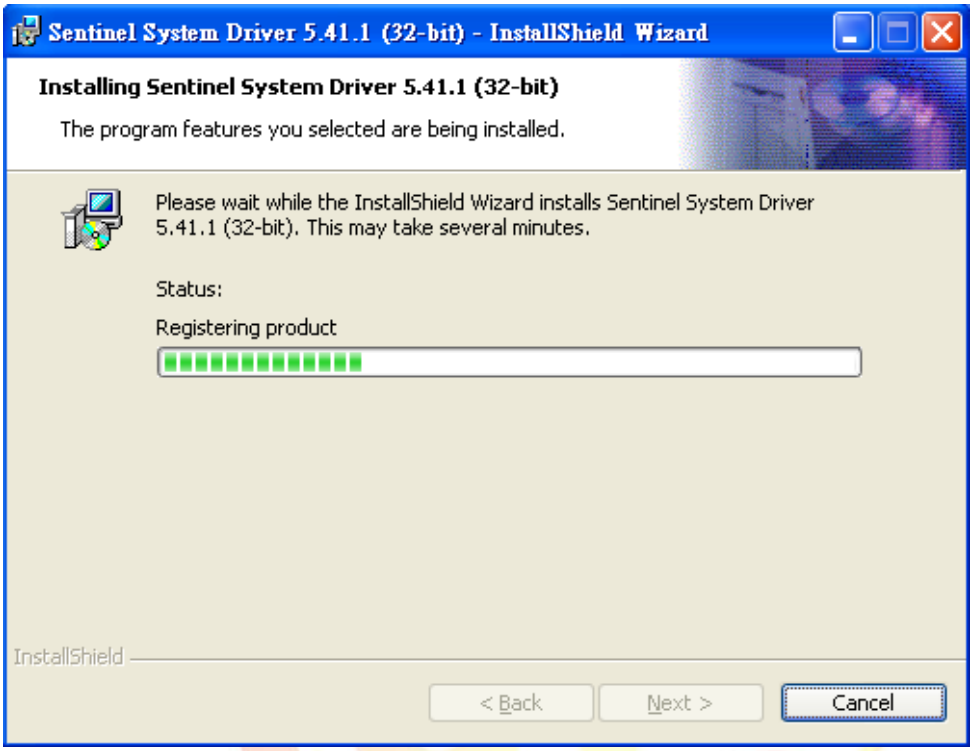
6. Select the “Complete” option and click the “Next” button to continue.



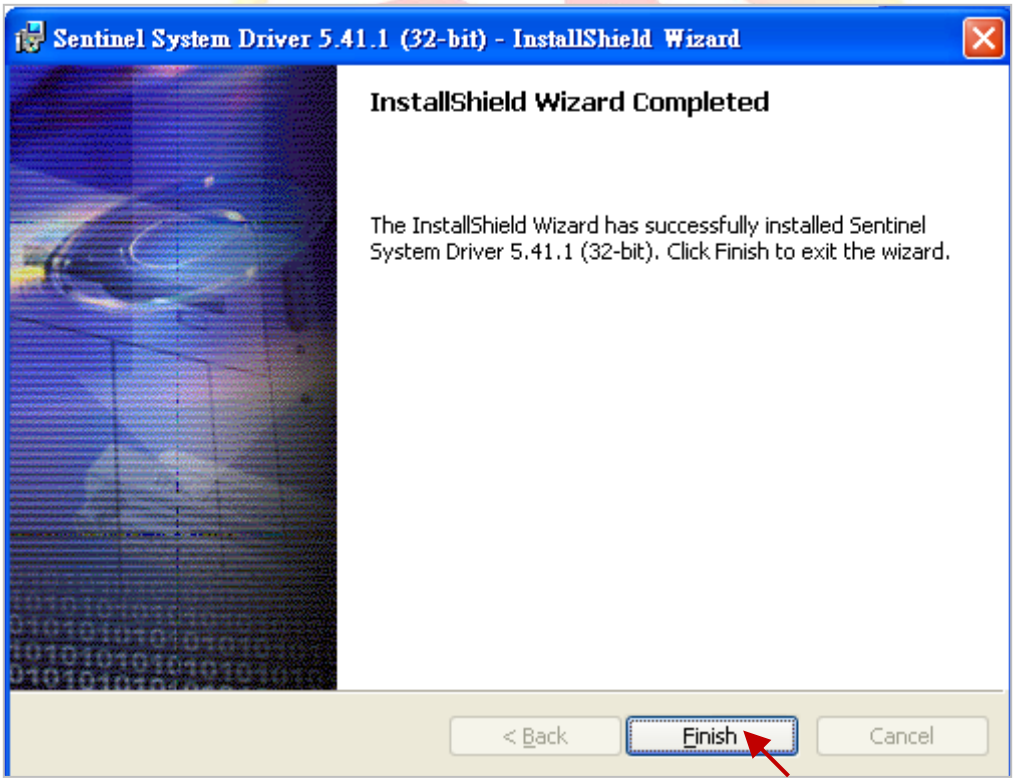
7. Click the “Install” button to continue.
   Note: Before click the “Install” button, make sure there is **NO** USB Dongle in the PC that to avoid the installation failure.



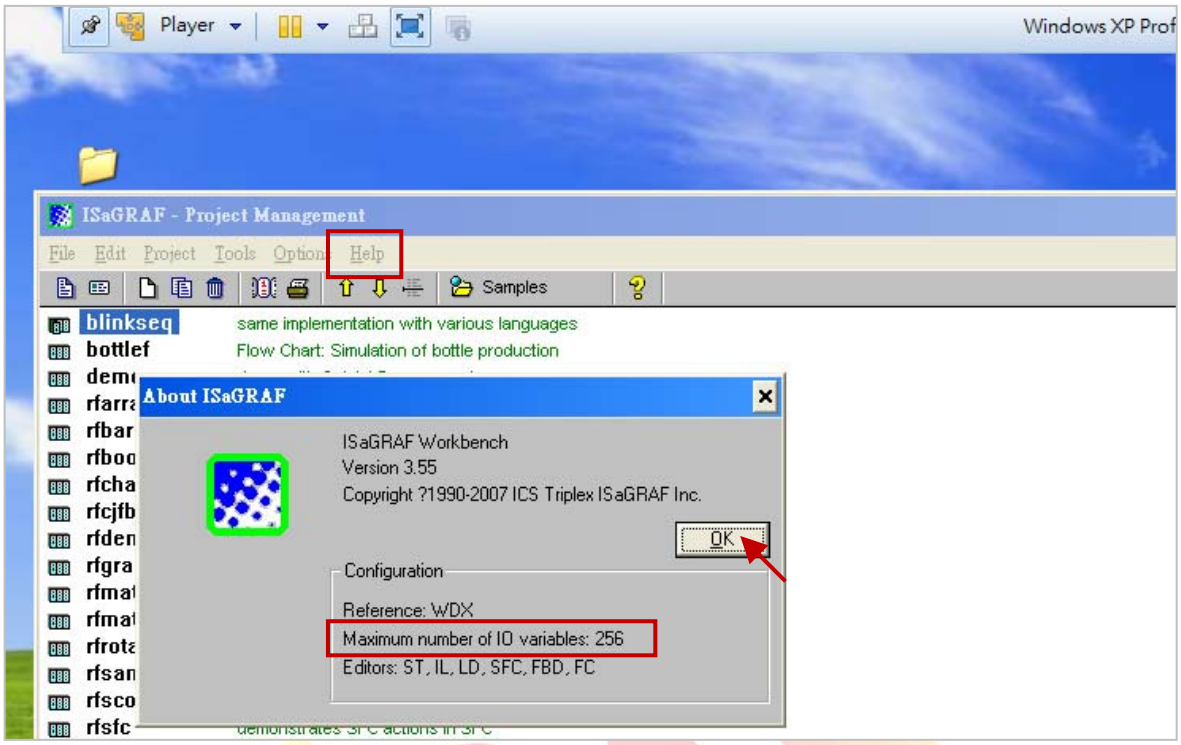
8. The screen when installing the driver for USB Dongle.



9. After the driver installation is complete, click “Finish” to exit the wizard.



10. Insert the USB Dongle into the Host PC's USB 2.0 port, and then run the ISaGRAF Workbench on the virtual machine. Click the "Help" menu and select "About" and then check to see if the "Maximum number of IO variables" is "**256**" that means the USB Dongle driver has been successfully installed.



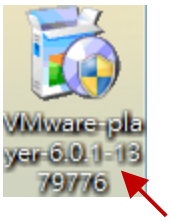
2. Installing Windows XP (32-bit, SP3) on a virtual machine by using VMware Player

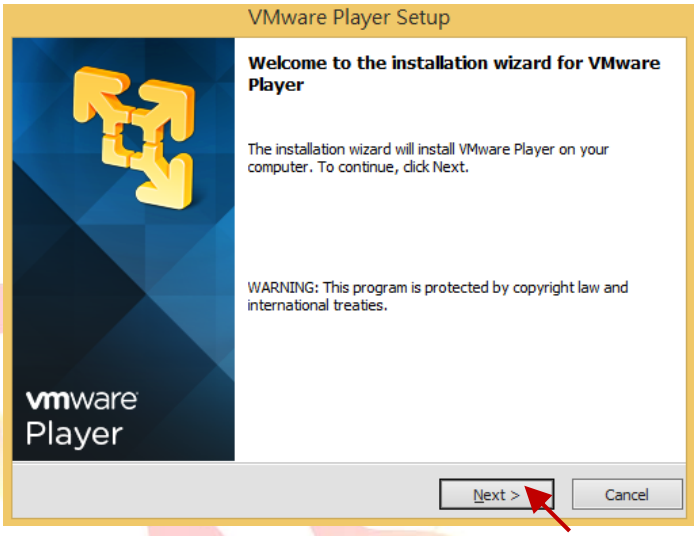
2.1. Installing VMware Player

Users can download the VMware Player 6.0 (trail version) on this website:
https://my.vmware.com/web/vmware/free#desktop_end_user_computing/vmware_Player/6_0

The following steps describe how to install VMware Player on a Windows-bases system.

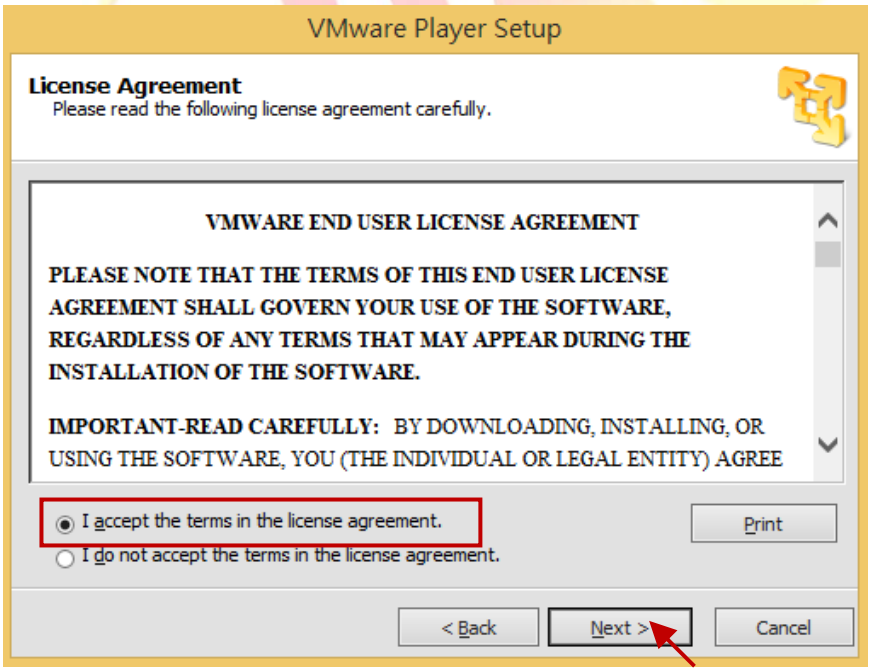
1. Double-click on the setup file to start the installation procedure.



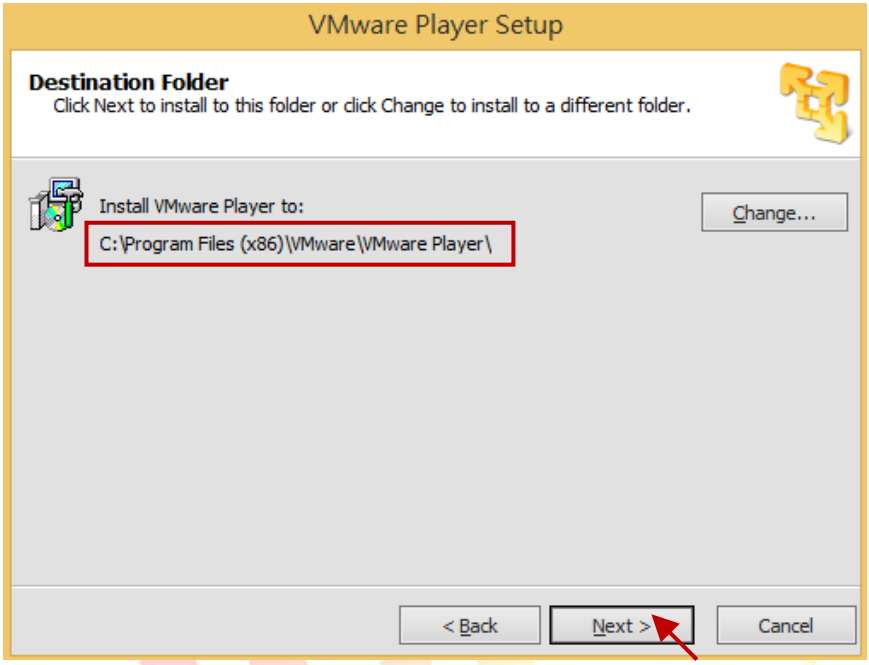


2. Click the “Next” button.

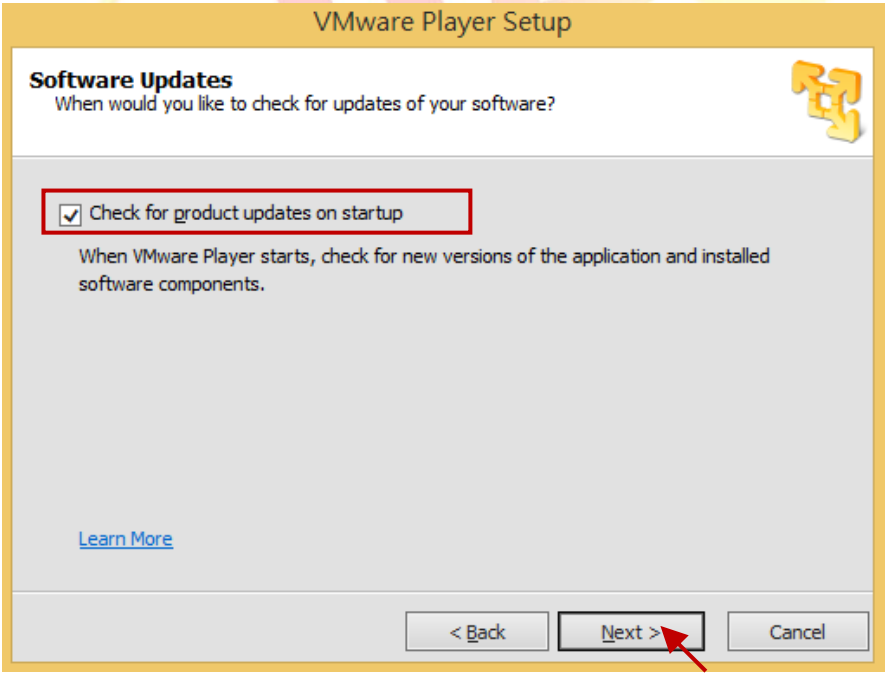
3. Select the “I accept the terms in the license agreement” option, and click the “Next” button.



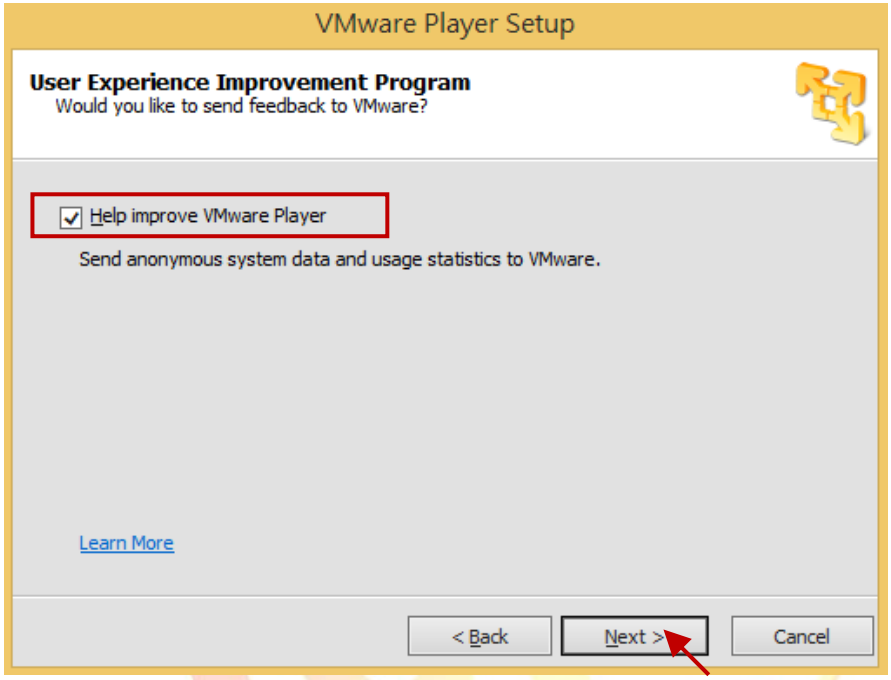
4. Click “Change” button to assign the location to install, here we use the default folder.
   Click the “Next” button to continue.



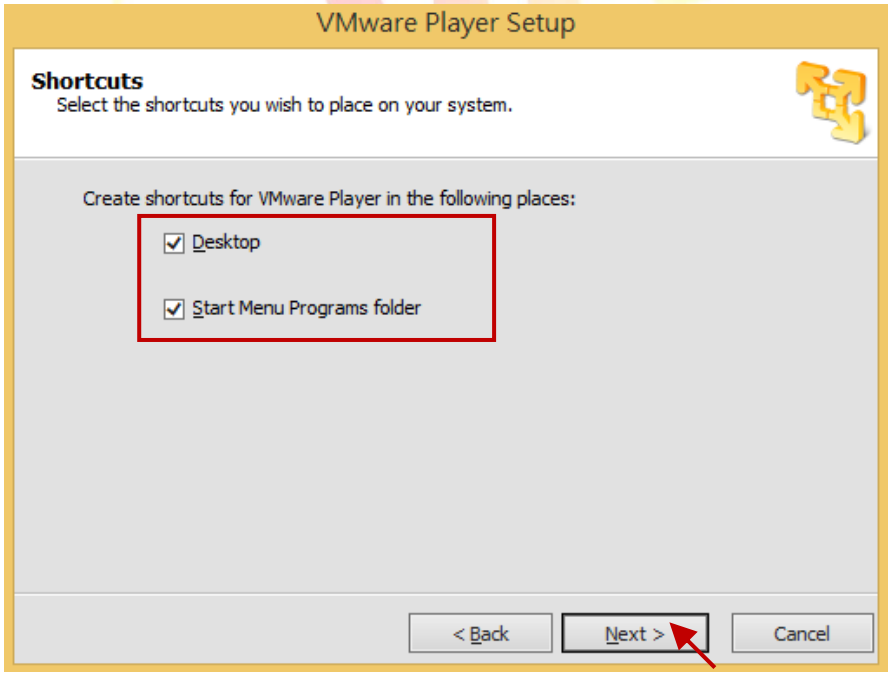
5. By default the “Check for product updates on startup” option is checked that means to check for new versions of the software when VMware Player starts.
   Here we take the default setting and click the “Next” button to continue.



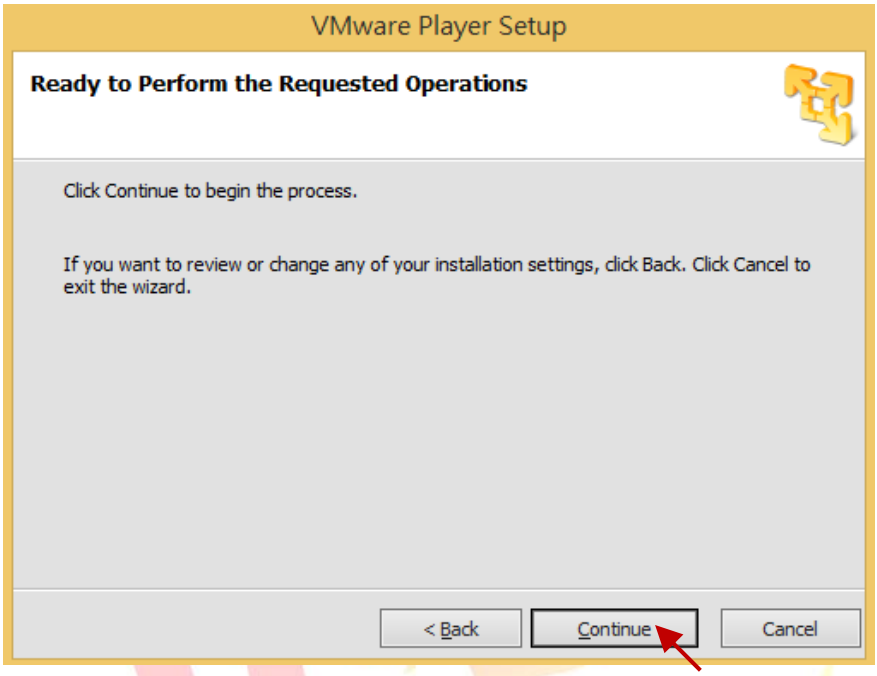
6. By default the “Help improve VMware Player” option is checked that means you agree to send feedback to VMware. Here we take the default setting and click the “Next” button to continue.



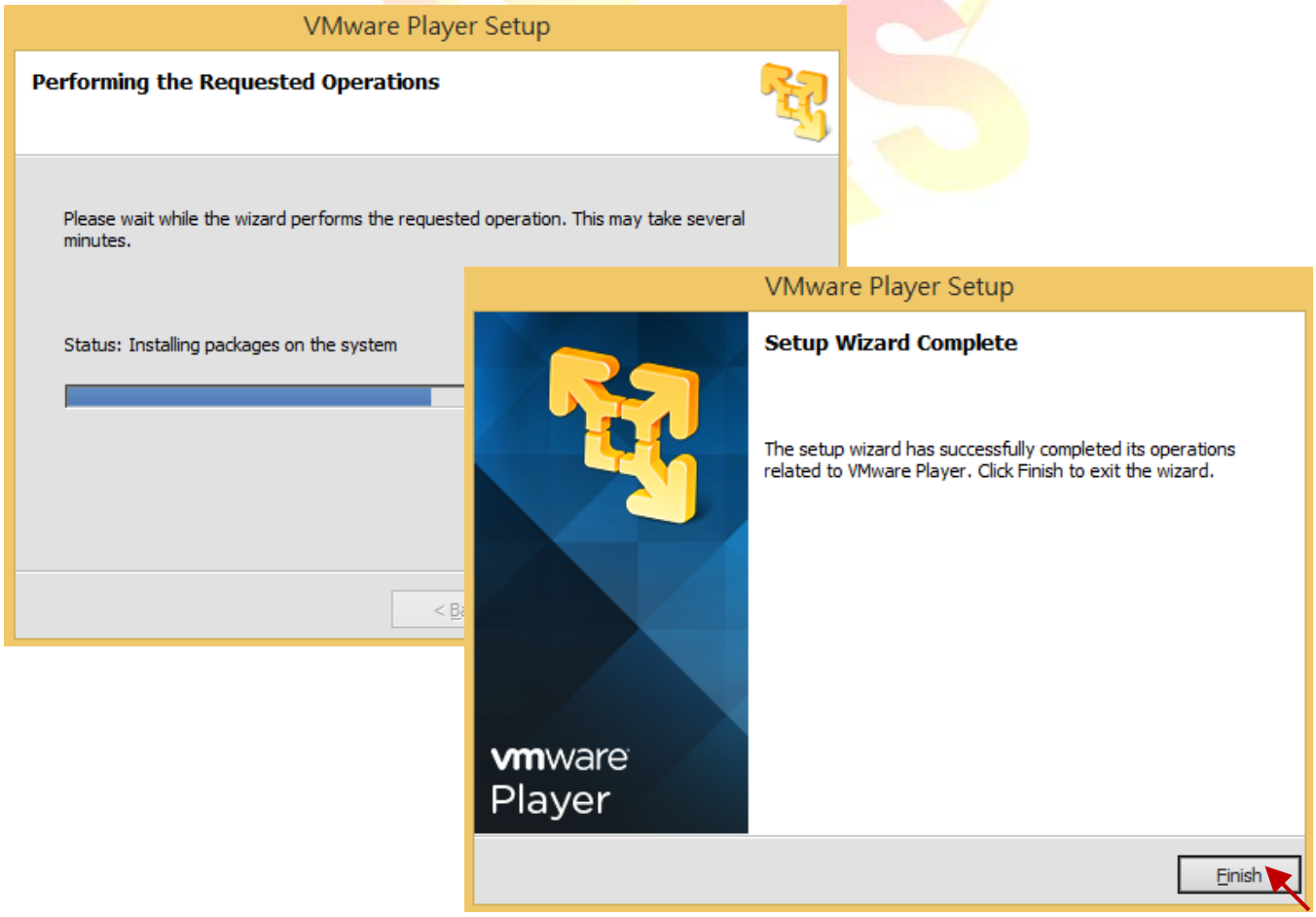
7. By default the “Desktop” and “Start Menu Program folder” options are checked that means to create shortcuts on Windows desktop and in the Start menu.
   Here we take the default setting and click the “Next” button to continue.



8. Click the “Continue” button to start installing.



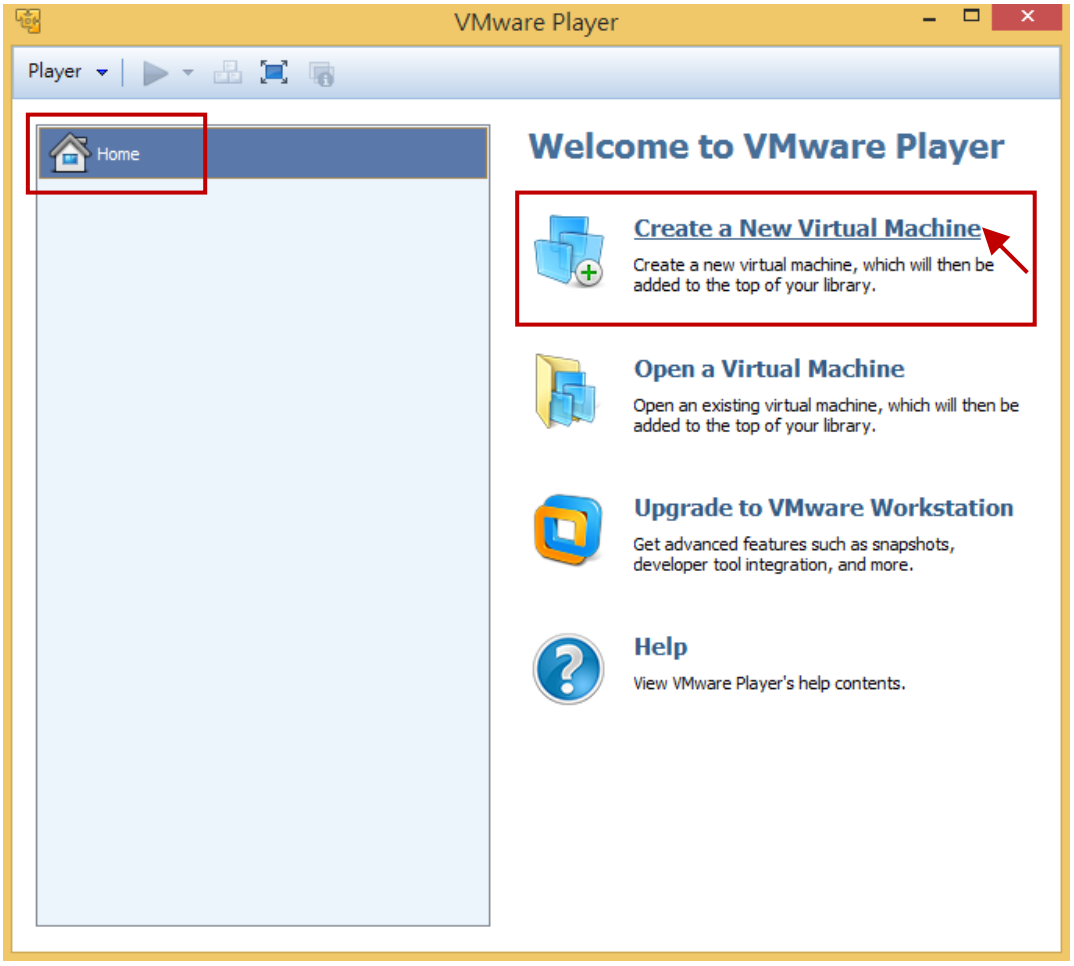
9. Wait a few minutes to complete the setup and then click the “Finish” button to exit the setup wizard.



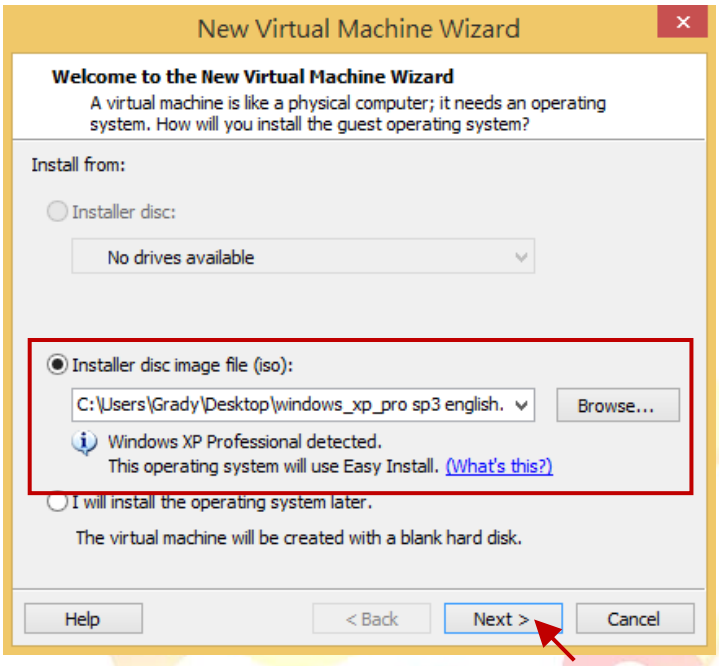
2.2. Creating a virtual machine running Windows XP (32-bit, SP3)

1. Double-click the "VMware Player" shortcut on your desktop to run it.

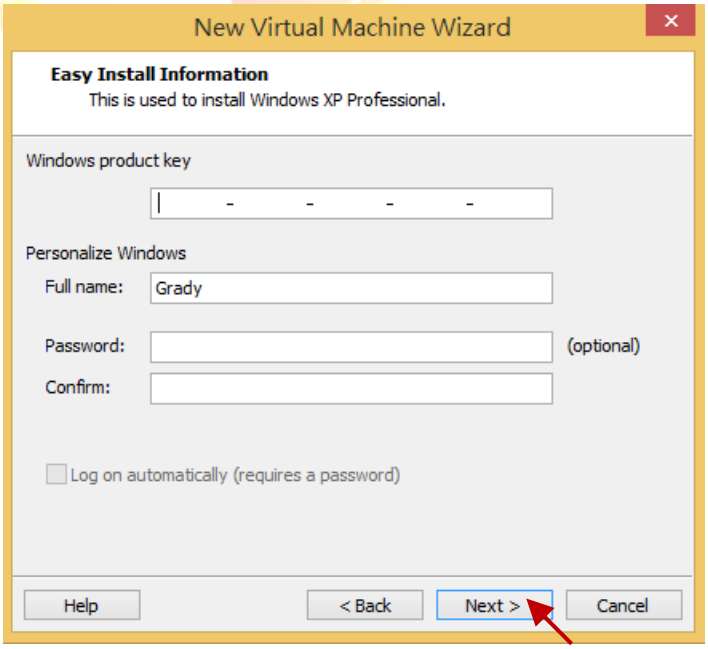
2. Click the “Create a New Virtual Machine” button in the “Home” tab.



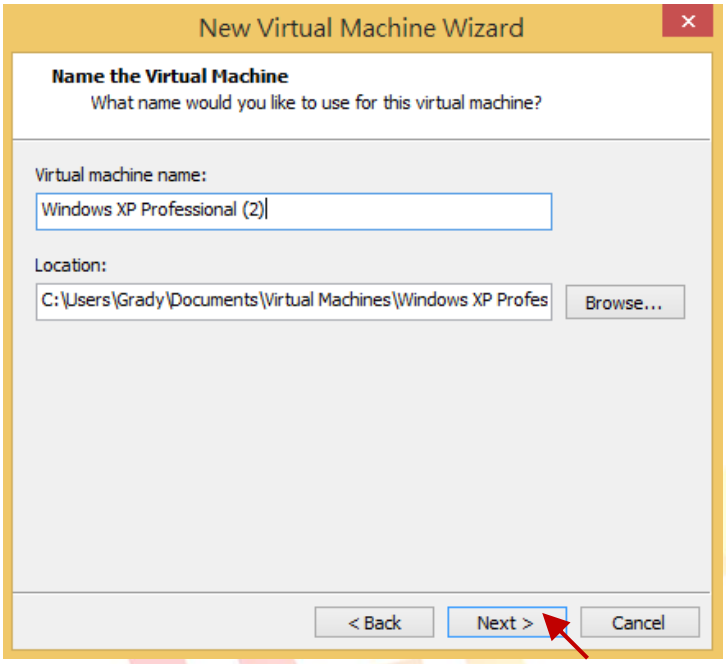
3. In this step, you need to specify the sources of the installation file. Select the “Installer disc image file” option that means to install a guest operating system from an ISO image file. Then click the “Next” button to continue.
   (If using an installation disc, click the “Installer disc” option and give a drive letter.)



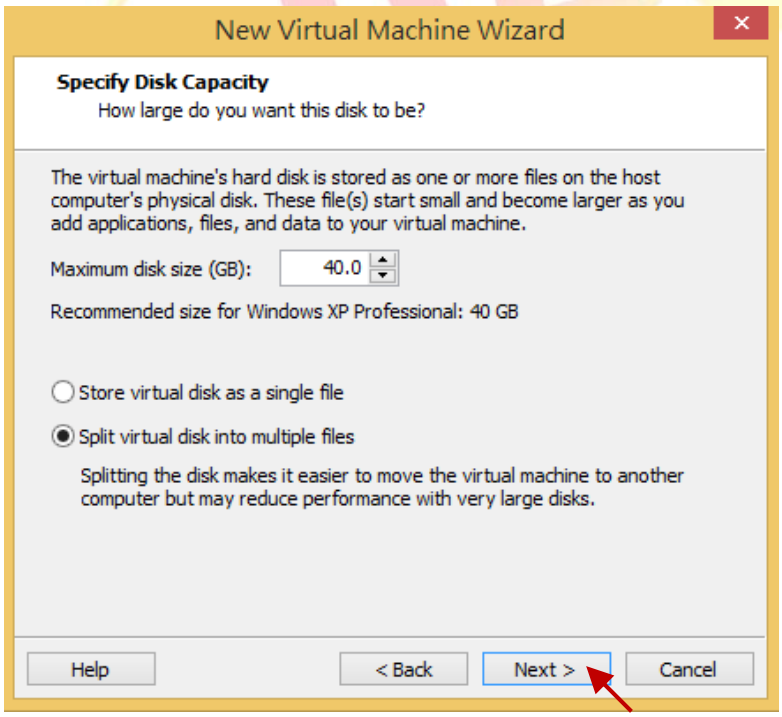
4. In the previous step, the OS version (i.e., “Windows XP Professional”) that you want to install has been detected by the VMware Player wizard. Enter the requested information, product key, login ID and password (blank, which means that to login without a password), and then click the “Next” button to continue.



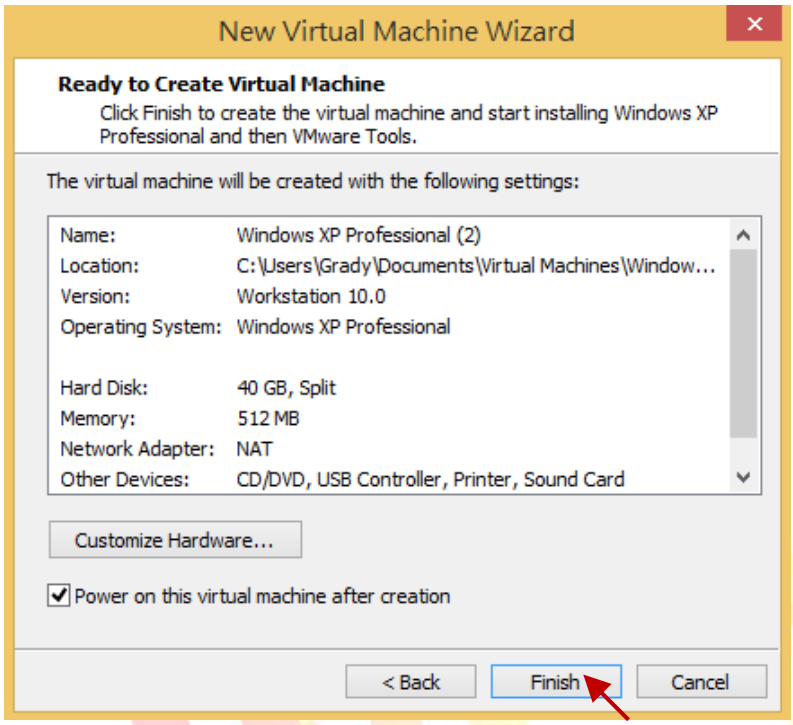
5. Give your virtual machine a name and specify a location to store the virtual machine file.
   Here we use the default name and location, click the “Next” button to continue.



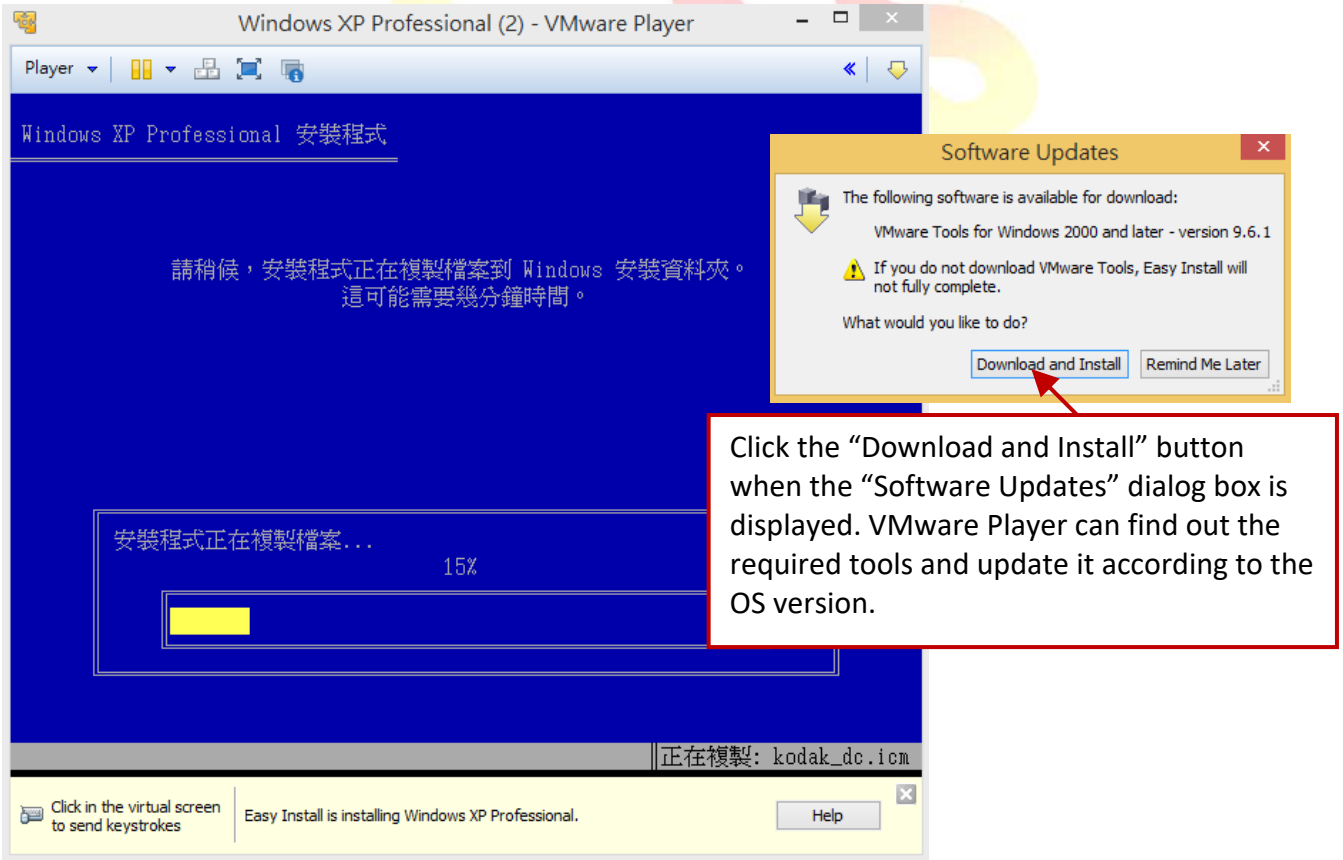
6. Decide how much RAM to dedicate to your virtual machine and the way to store files.
   Using the default settings, Disk size: 40 GB; Storage way: Split virtual disk into multiple files, and then click the “Next” button to continue.



7. Review all the settings shown in the window and then click “Finish” to create the virtual machine.

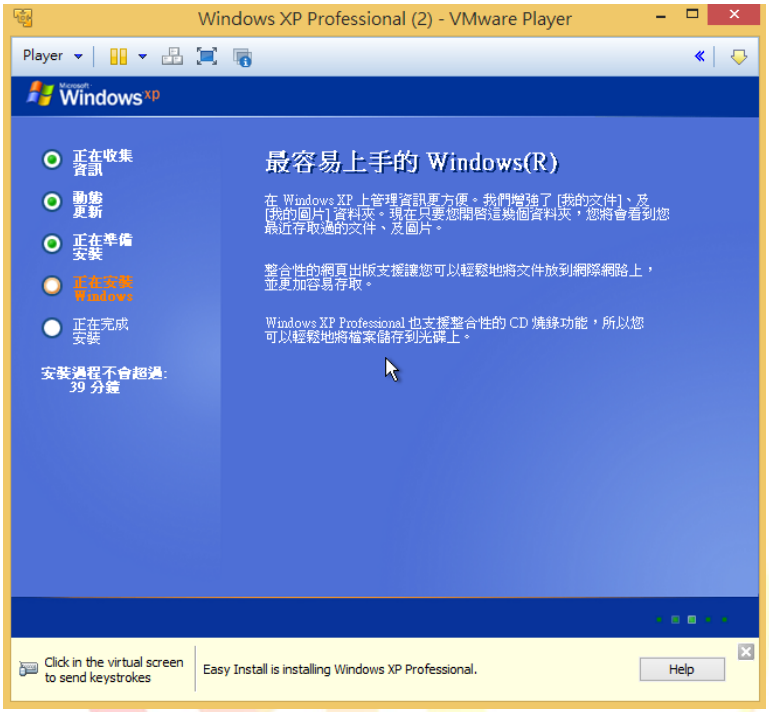


8. Now, the virtual machine starts installing the OS (i.e., “Windows XP Professional”).

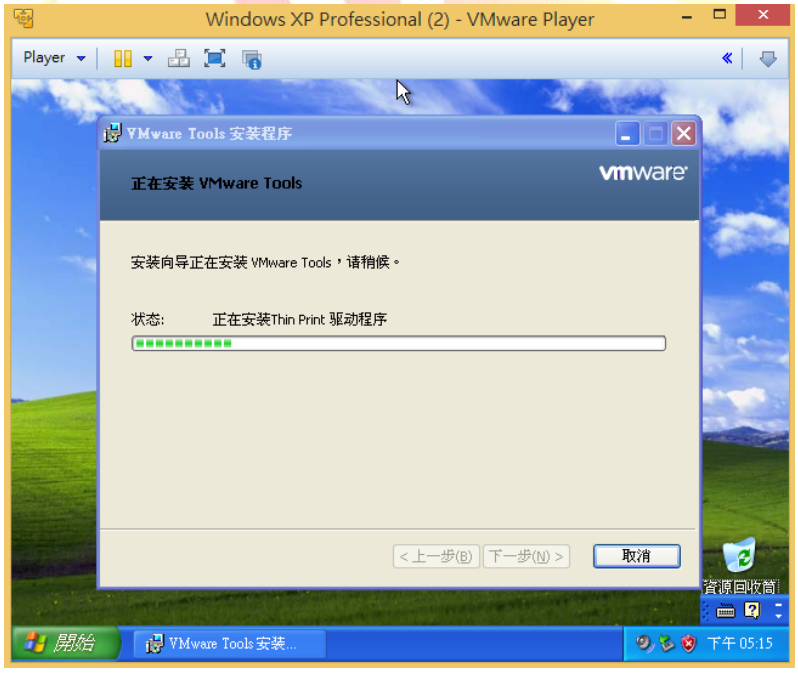


Click the “Download and Install” button when the “Software Updates” dialog box is displayed. VMware Player can find out the required tools and update it according to the OS version.

9. The screen during Windows XP Professional installation.



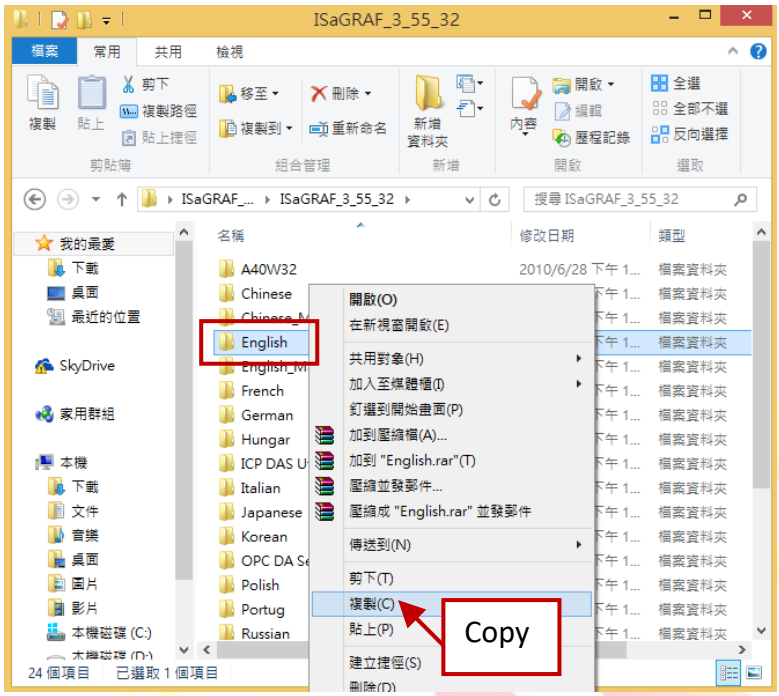
10. After log on to the operating system, it will automatically install “VMware Tools” on this window virtual machine. The “VMware Tools” allow you to operate a Windows guest operating system just like a Host application.



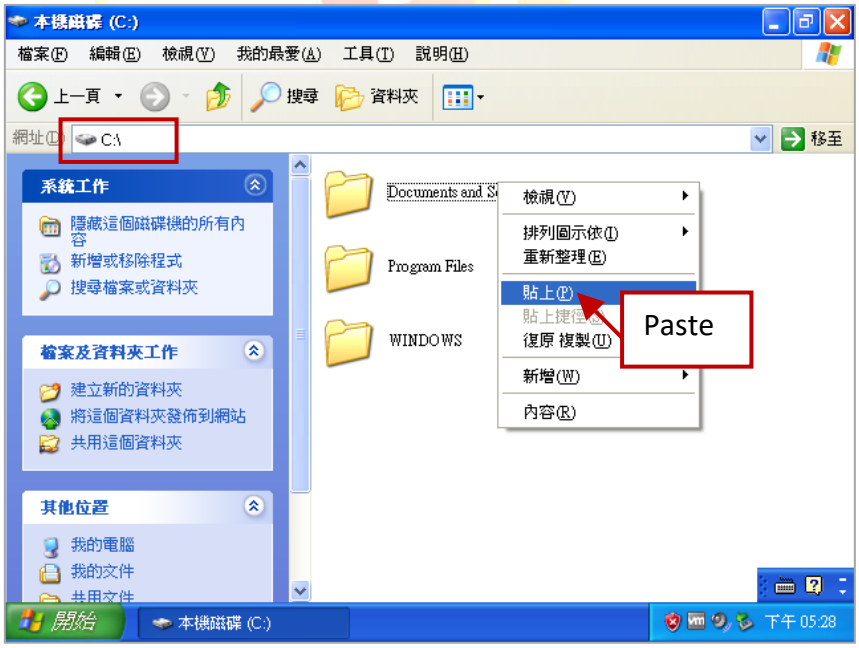
2.3. Installing ISaGRAF Workbench 3.55 on a virtual machine

1. In the Host PC, mouse right-click on the “English” folder in the ISaGRAF Workbench installer disc and then select “Copy” from the menu.

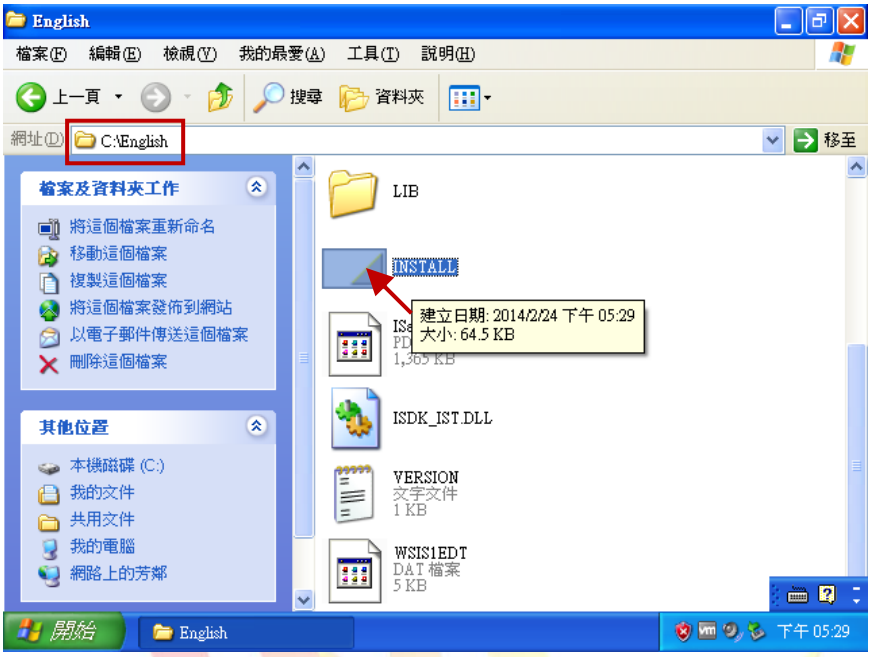
   Note: If using the ISaGRAF-256, the Host PC must have USB2.0 port (refer to Section 2.6).



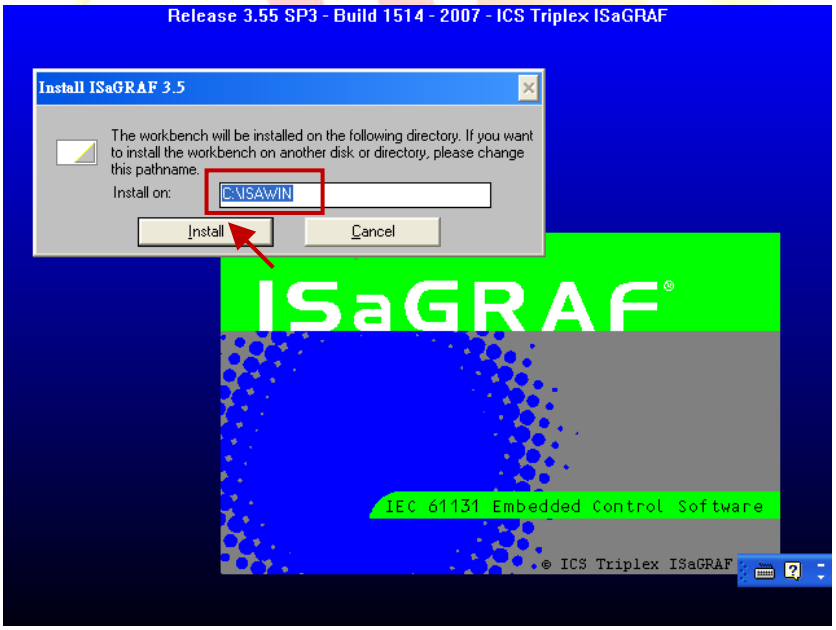
2. In the root folder of the C drive (i.e., “C:\”), mouse right-click on the blank area and select “Paste” to move the “English” folder from the Host PC to the virtual machine.



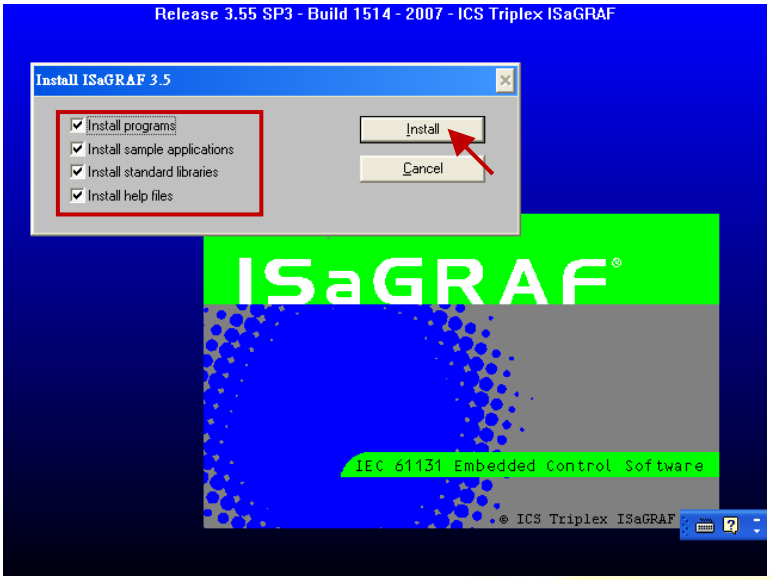
3. After you complete this process, double-click on the “English” folder and then double-click on the “Install.exe” file to start installing the ISaGRAF Workbench.



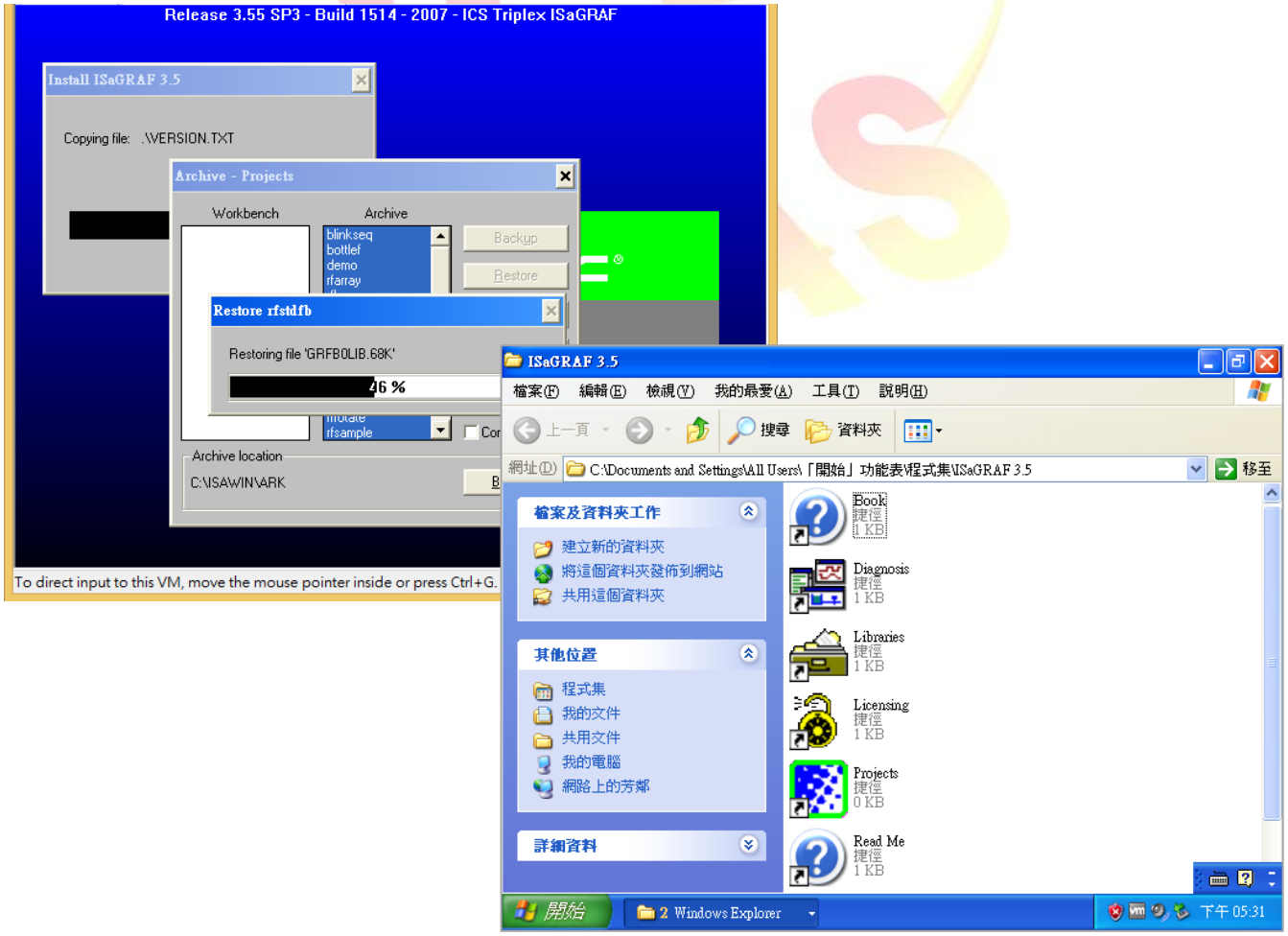
4. Using the default installation path of the ISaGRAF Workbench and click “Install” to continue.
   Note: We strongly recommended using the default path (“C:\ISAWIN”), do not modify it.



5. Using the default settings and click the “Install” button to continue.



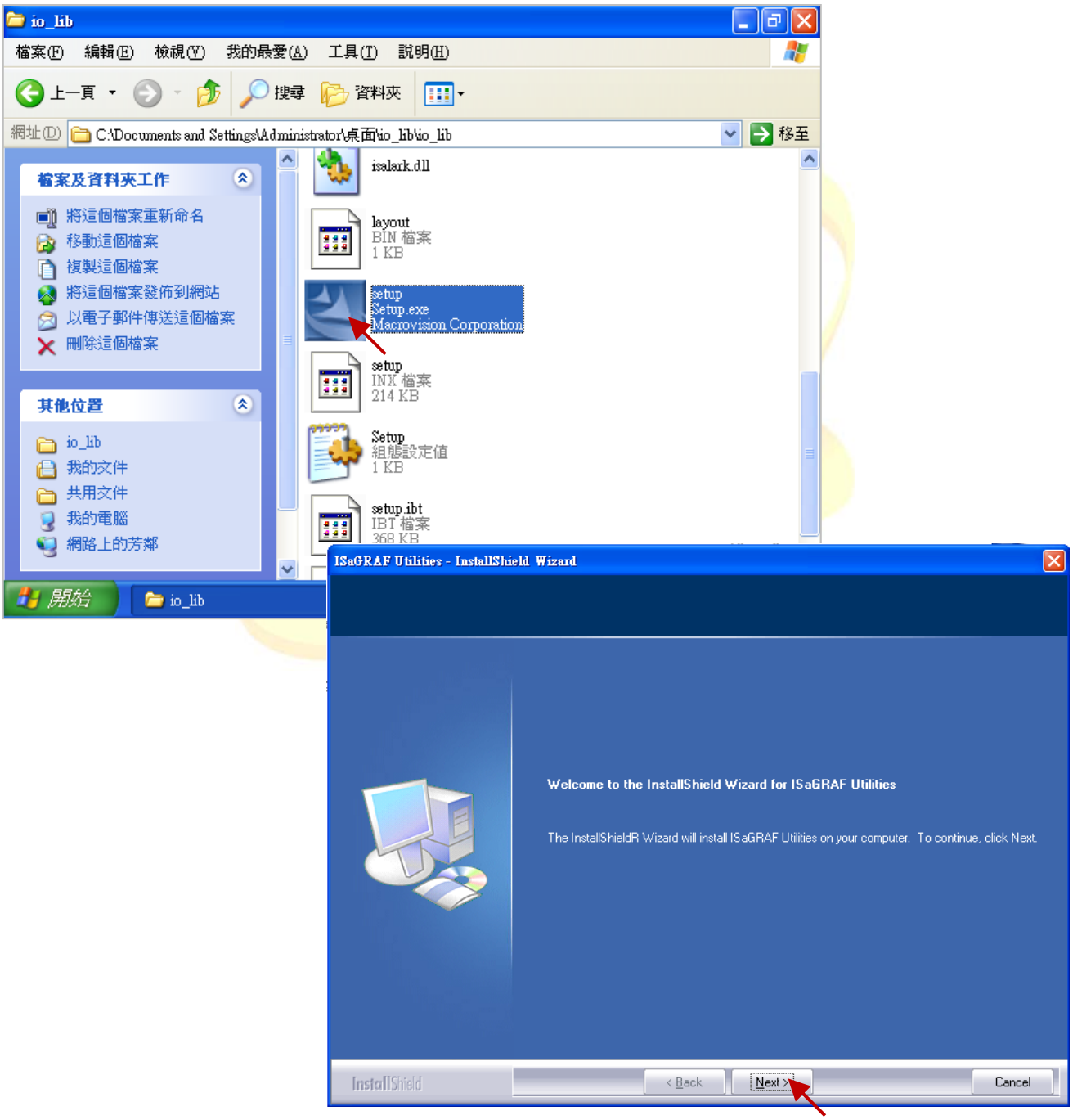
6. As the screen below, just wait a few minutes to finish the ISaGRAF installation.



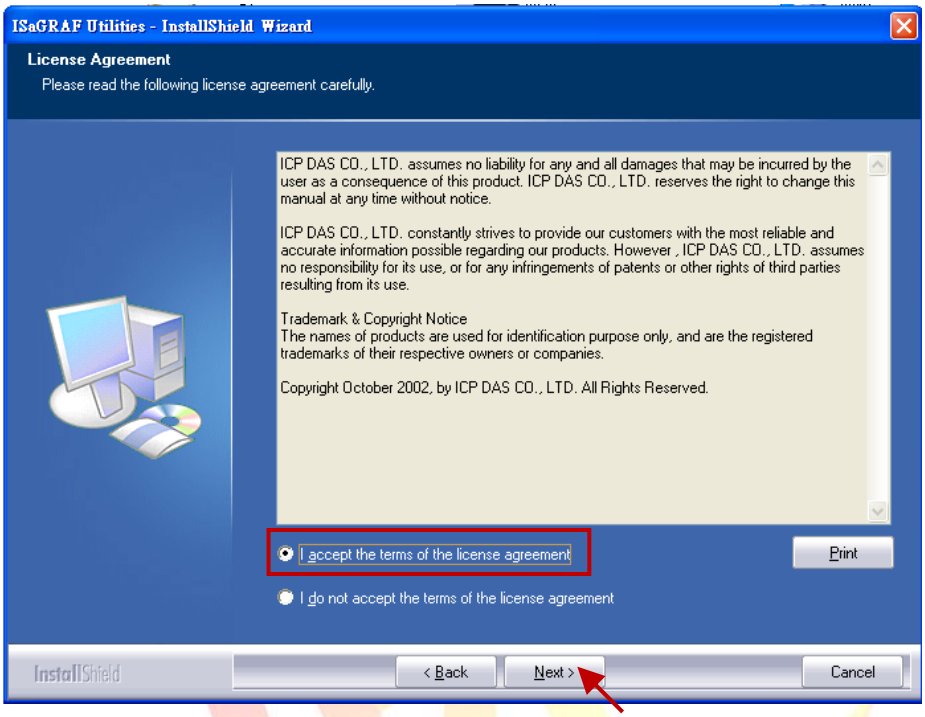
2.4. Installing ISaGRAF I/O Library on a virtual machine

1. In the Host PC, users can download the latest ISaGRAF I/O Library on this web page: http://www.icpdas.com/en/download/show.php?num=368&nation=US&kind1=&model=&kw=isagraf unzip the “io_lib.zip” file and copy this folder from Host PC to the Windows desktop on the virtual machine (refer to Section 2.3 – step1, 2).

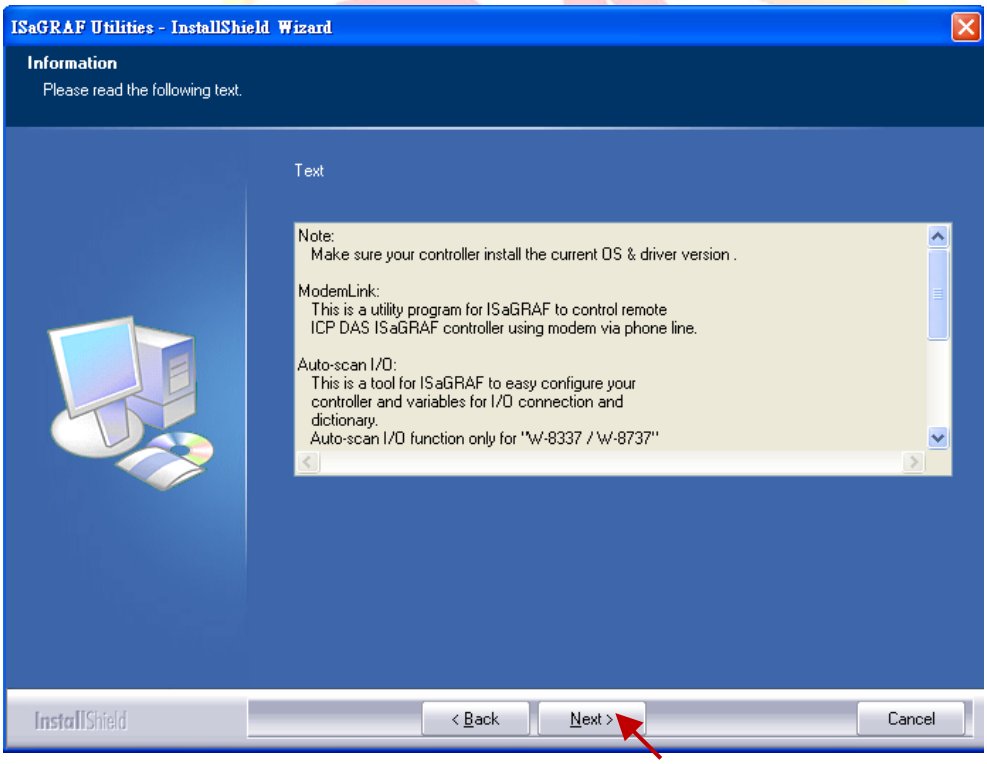
2. Double-click the “Setup.exe” file in the “io_lib” folder to install the I/O library.
3. Click the “Next” button to continue.



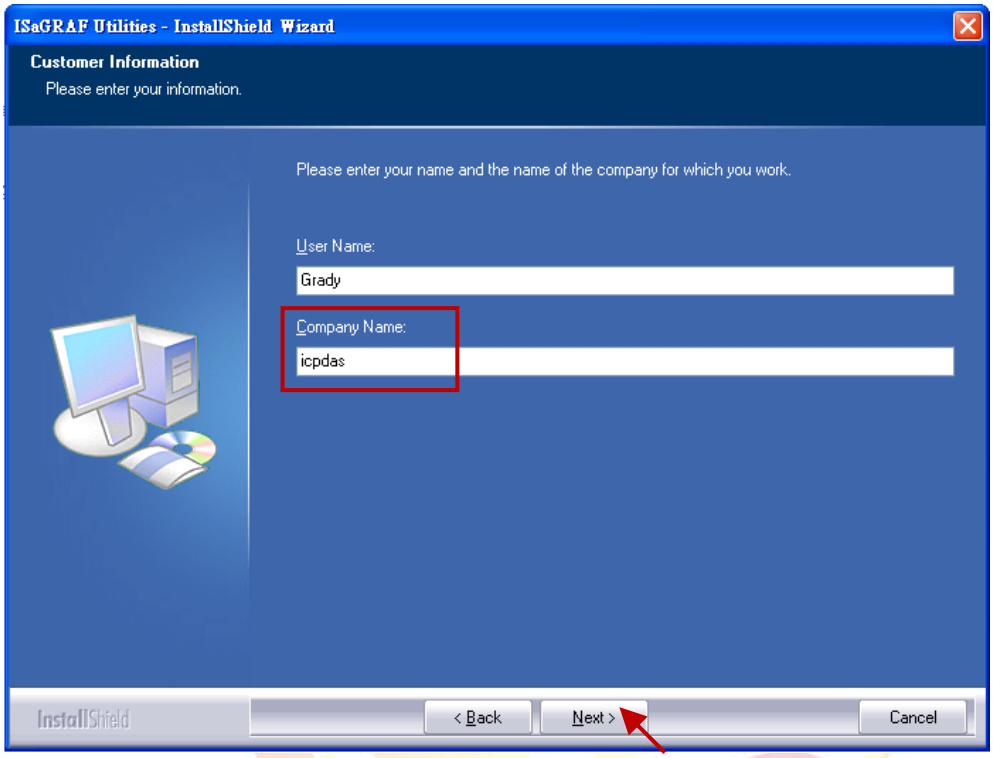
4. Select “I accept the terms of the license agreement” and click the “Next” button to continue.



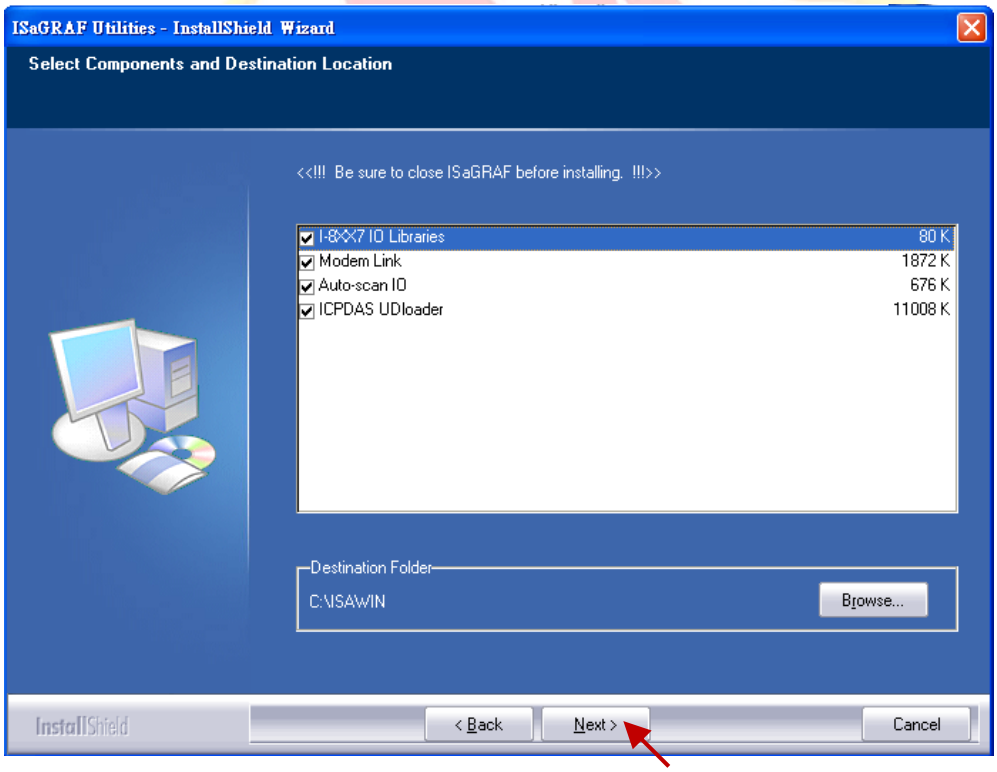
5. Click the “Next” button to continue.



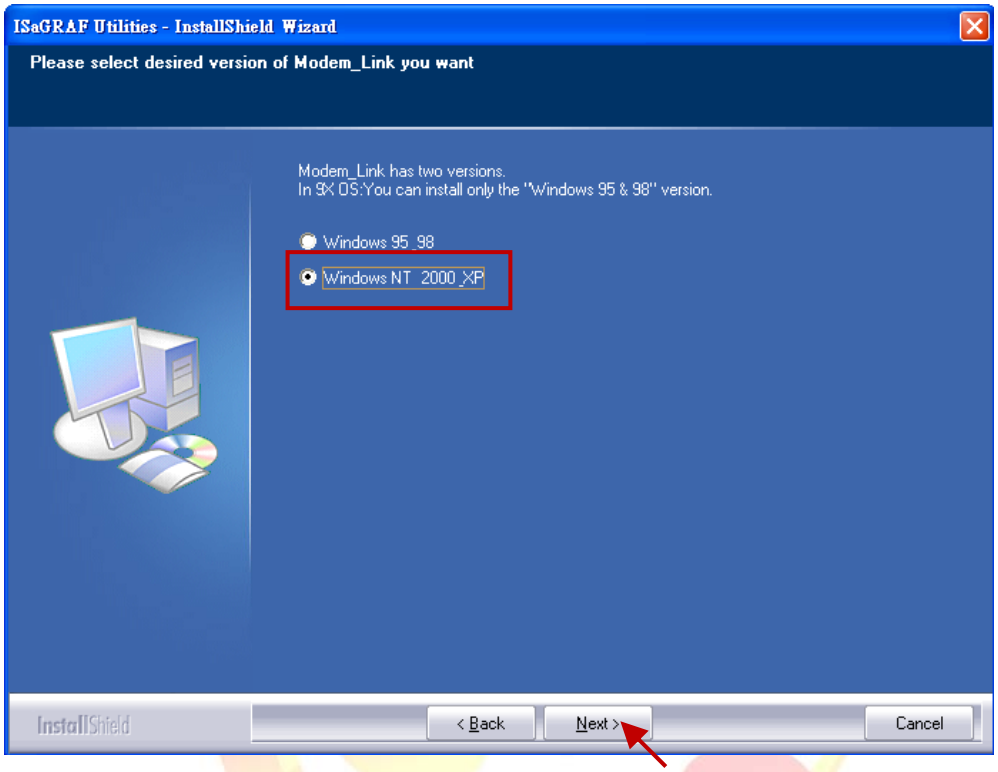
6. Fill in the company name and click the “Next” button to continue.



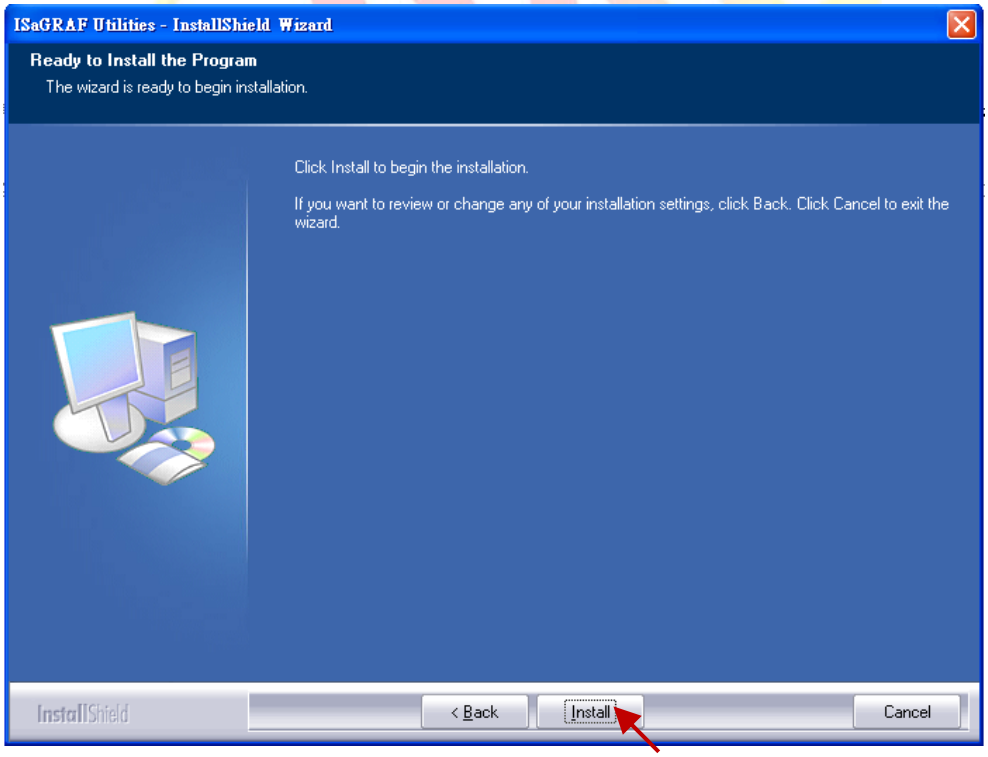
7. Using the default settings and click the “Next” button to continue.



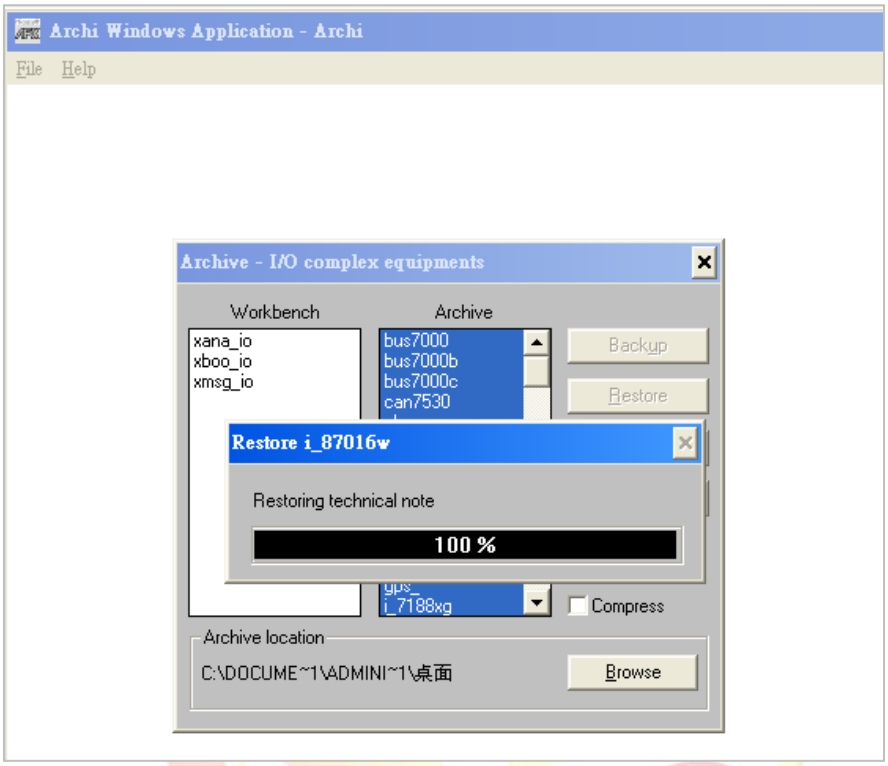
8. Using the default setting “Windows NT 2000, XP” and click the “Next” button to continue.



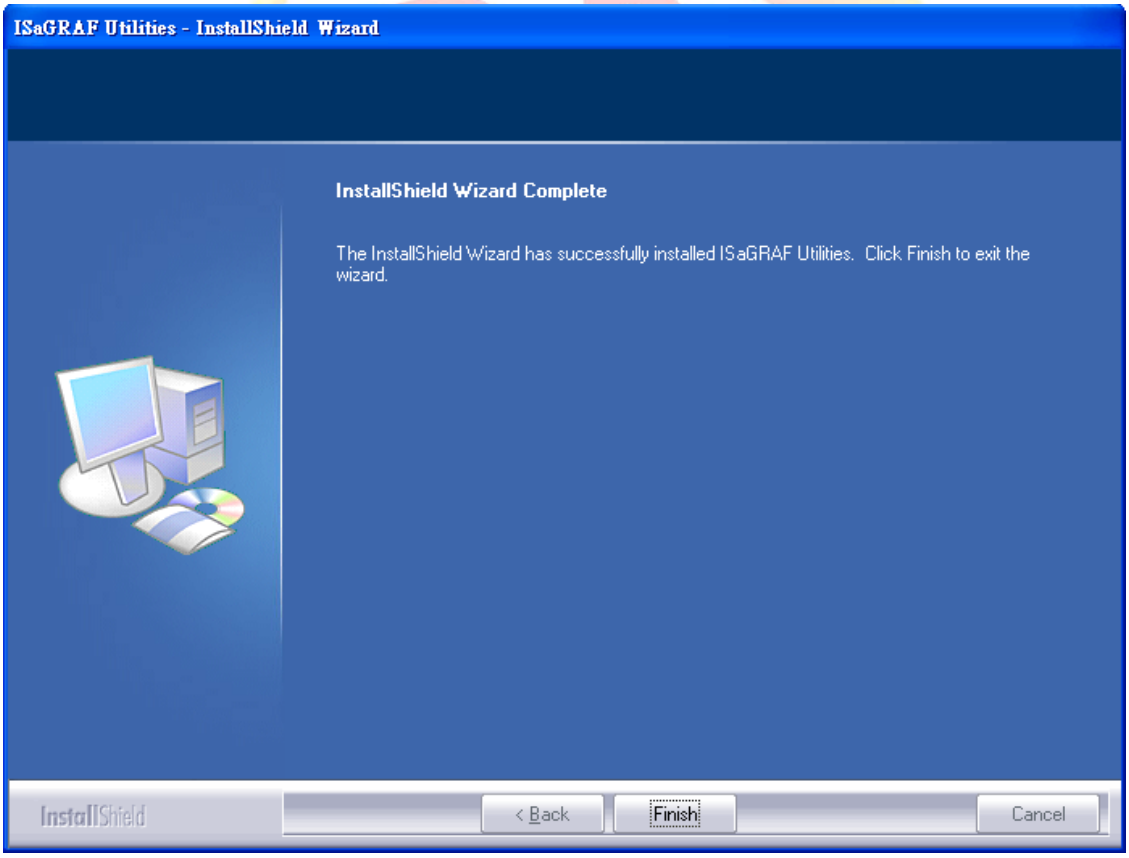
9. Click the “Install” button to begin the installation.



10. The screen during the ISaGRAF I/O Library installation.



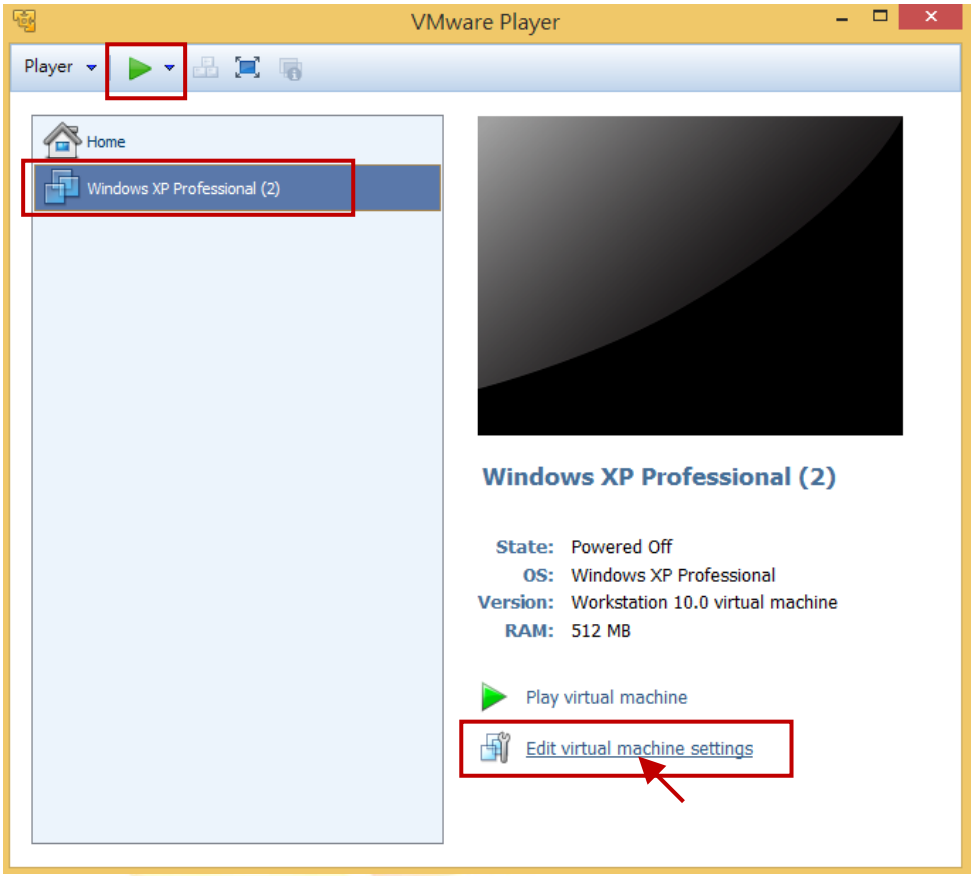
11. After the installation is complete, click the “Finish” button to exit the wizard.



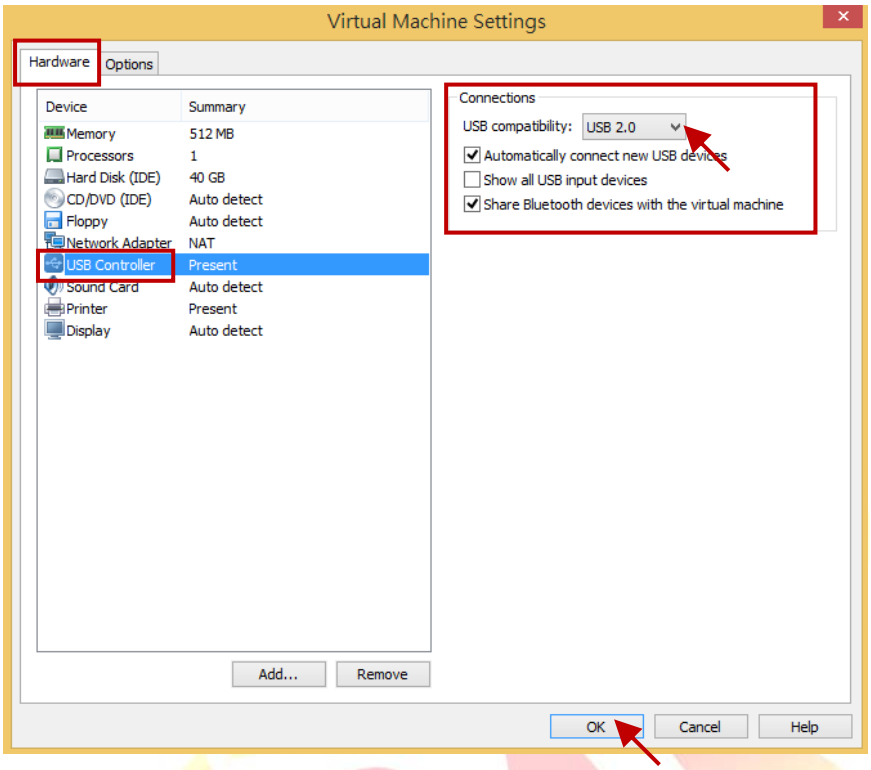
2.5. The related settings for a virtual machine

1. First power off the virtual machine to be able to change the related settings.

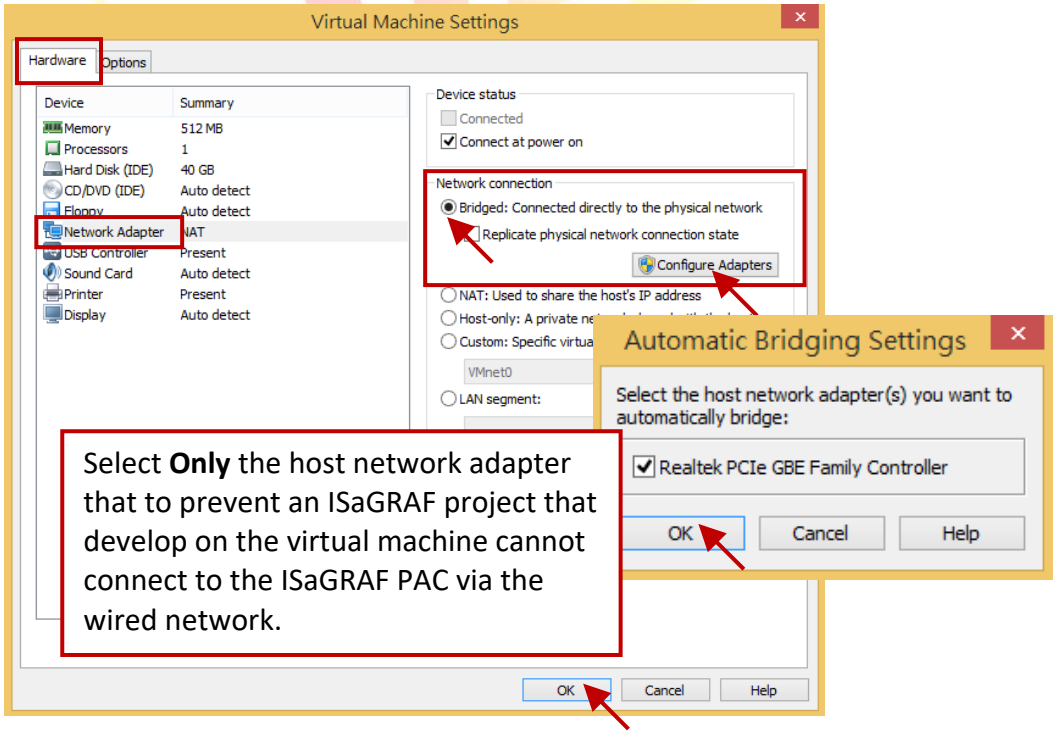
2. As the figure below, click the “Edit virtual machine settings” to go to the settings window.



3. Click “USB Controller” in the “Hardware” tab and set “USB compatibility” to “USB 2.0” in the “Connections” field, then click the “OK” button to exit the window.



4. Click “Network Adapter” in the “Hardware” tab and select “Bridged” option in the “Network connection” field, and then click the “Configure Adapters” button.

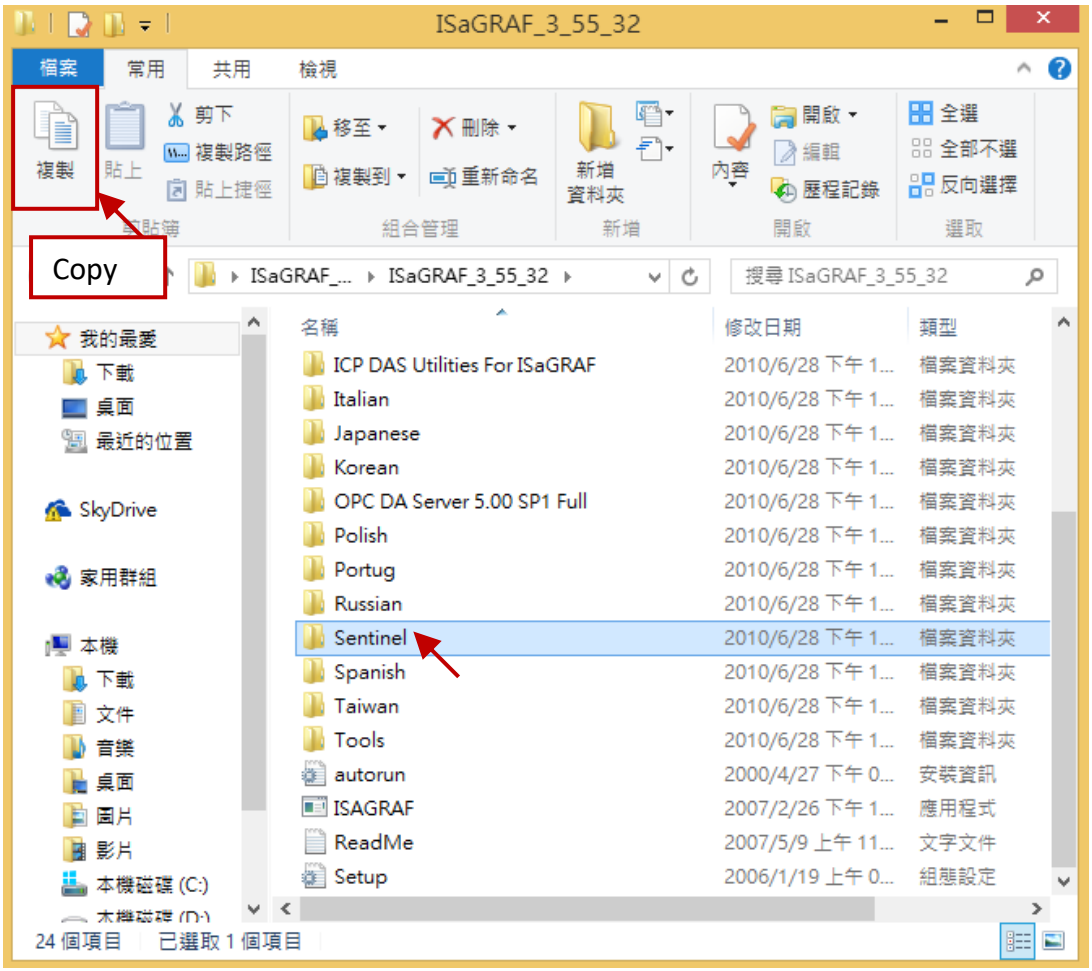


2.6. Installing USB dongle driver on a virtual machine

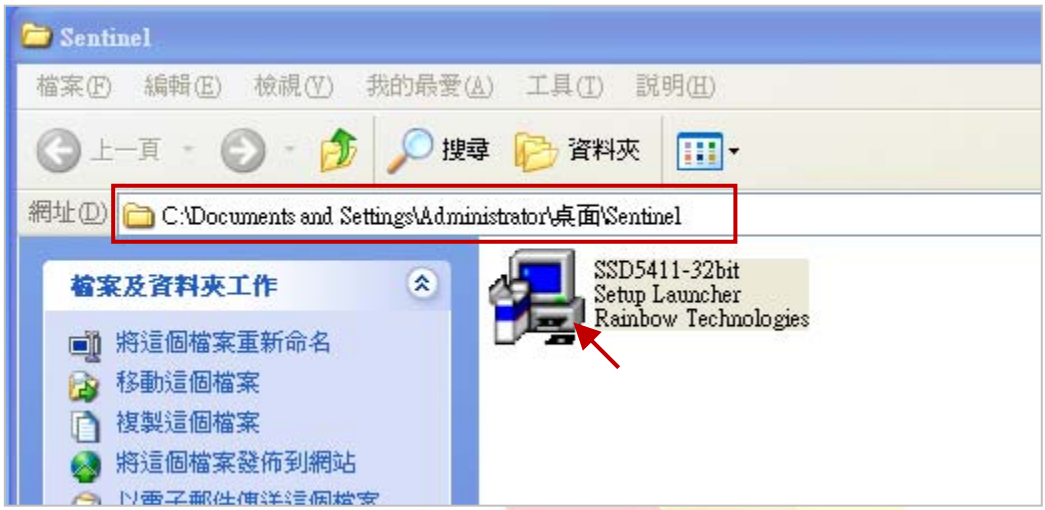
If your ISaGRAF Workbench 3.55 comes with a USB dongle, follow these steps to install the driver on the virtual machine.

Note: The ISaGRAF USB dongle only support the USB 2.0 port. Therefore, the VMware Player and ISaGRAF Workbench must be installed on a Host PC that has the USB 2.0 port.

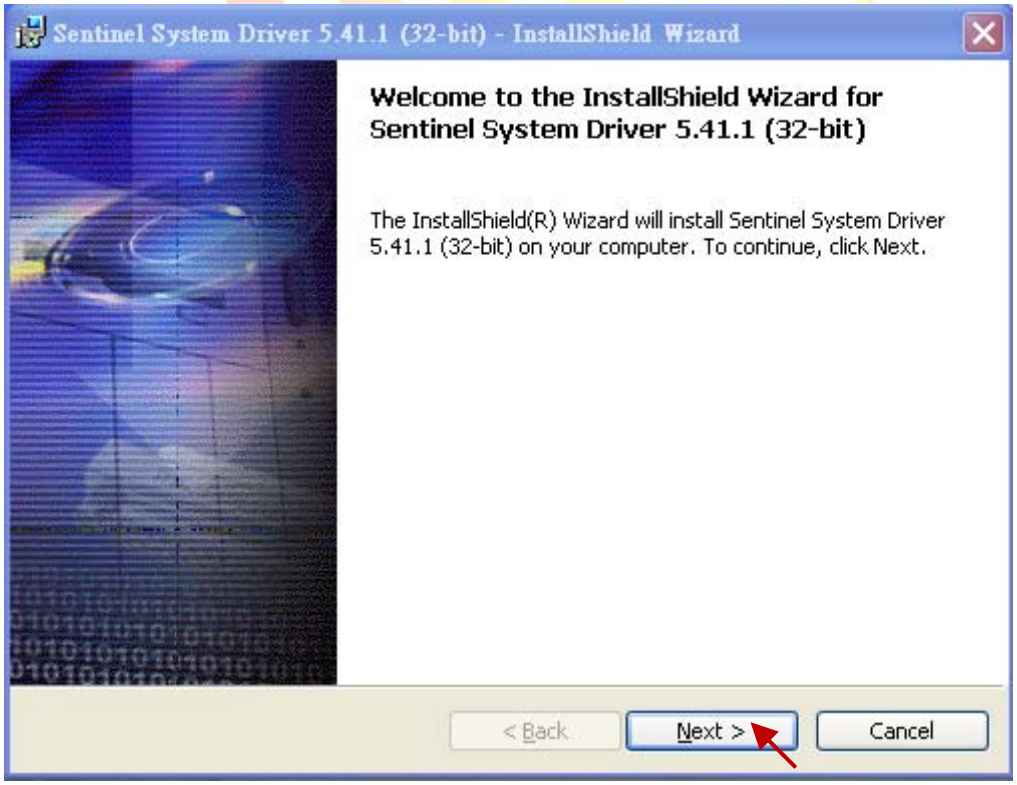
1. Copy the “Setinel” folder by using the right-click menu or pressing “Ctrl + C” (keyboard) from the ISaGRAF Workbench installer disc.



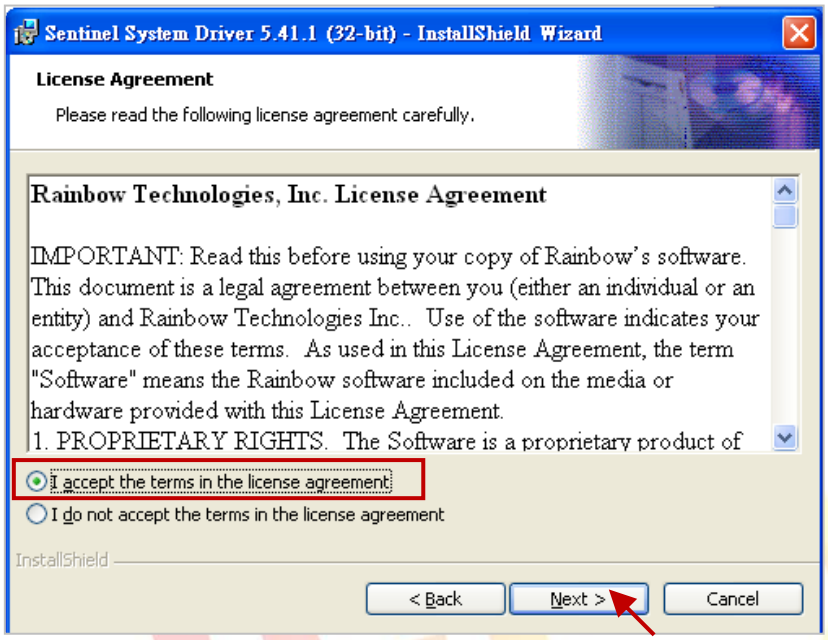
2. Put the “Setinel” folder on the desktop of the Windows virtual machine and then double-click the “SSD5411-32bit.exe” file in the “Setinel” folder to begin the driver installation of the ISaGRAF dongle.



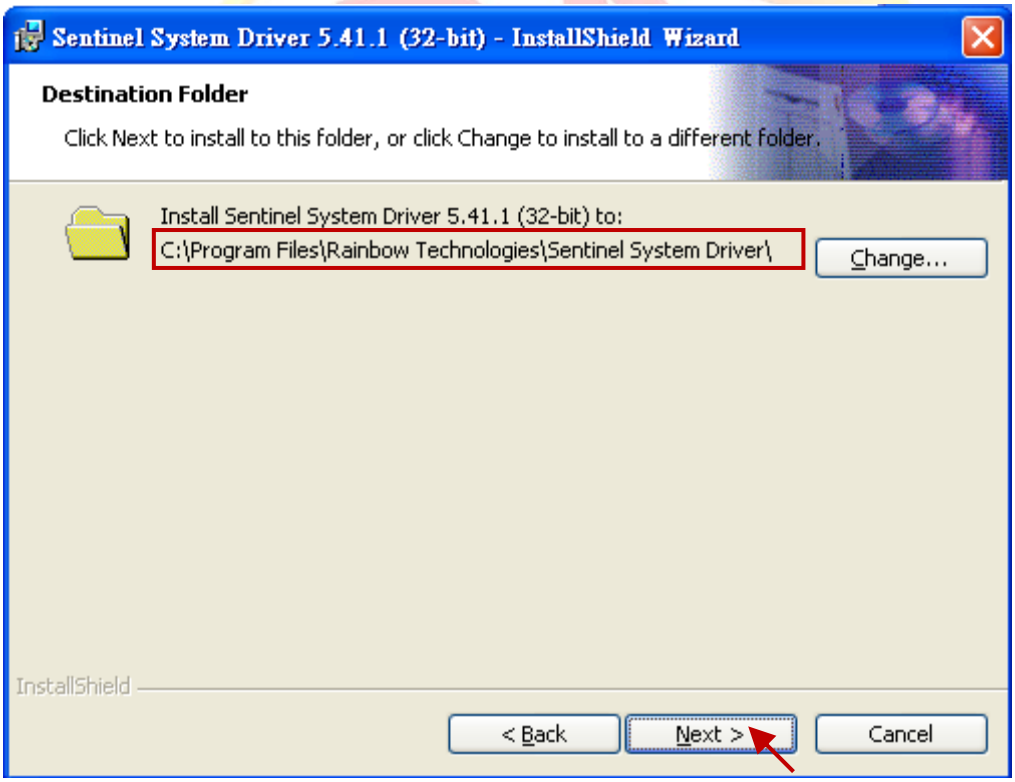
3. Click the “Next” button to continue.



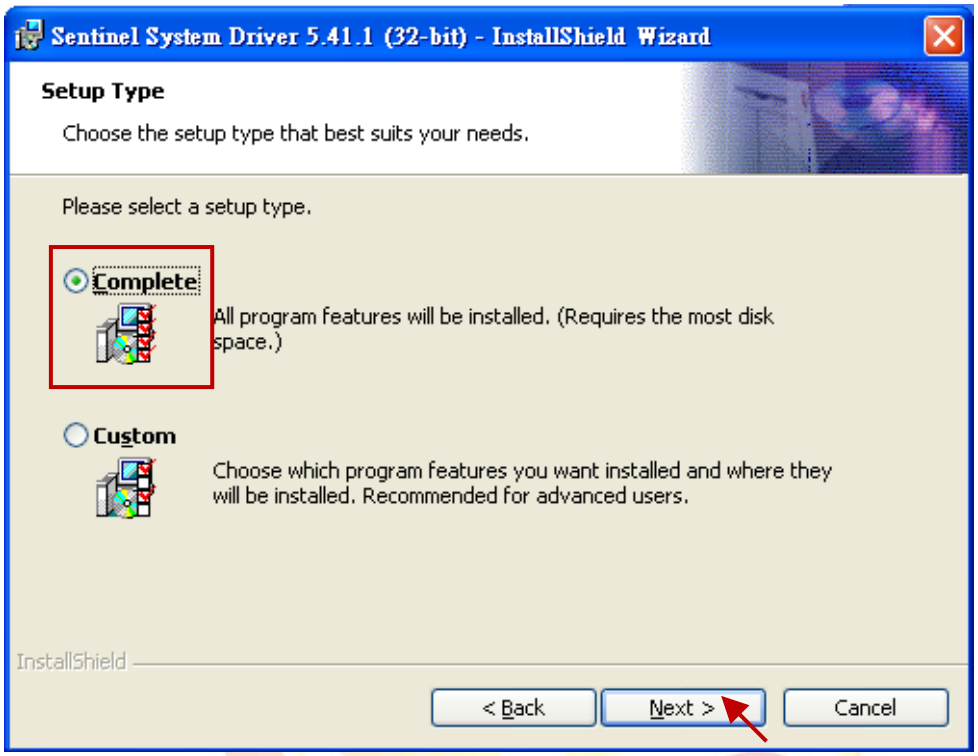
4. Click the “I accept the terms in the license agreement” option, and click the “Next” button to continue.



5. Using the default installation path, and click the “Next” button to continue.

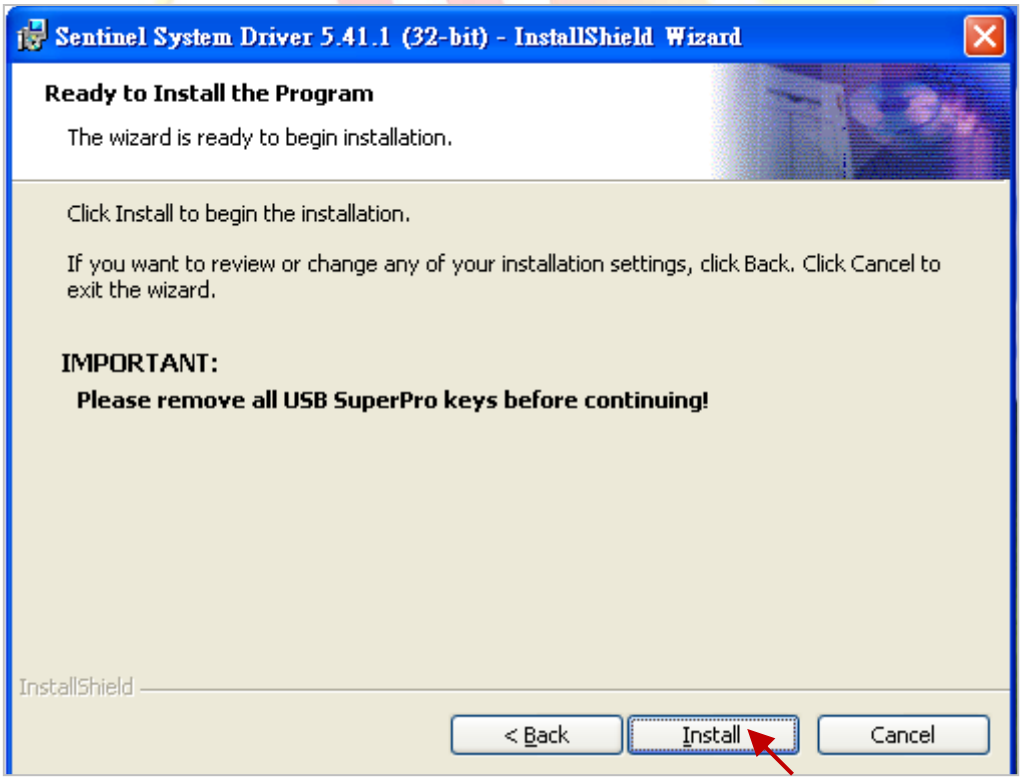


6. Click the “Complete” option and click the “Next” button to continue.

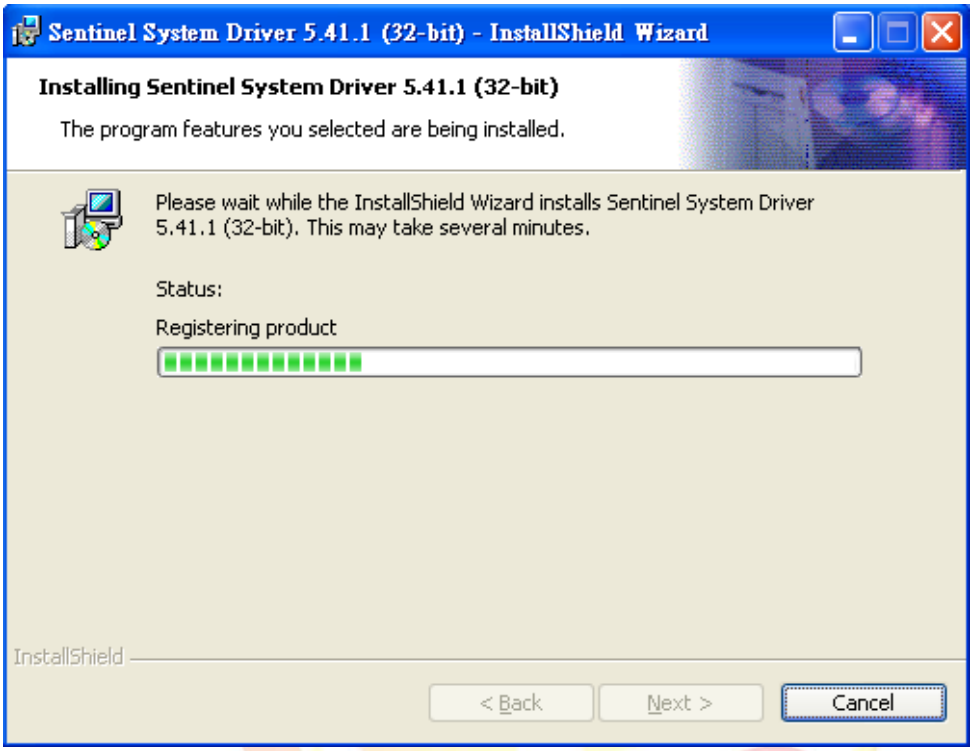


7. Click the “Install” button to continue.

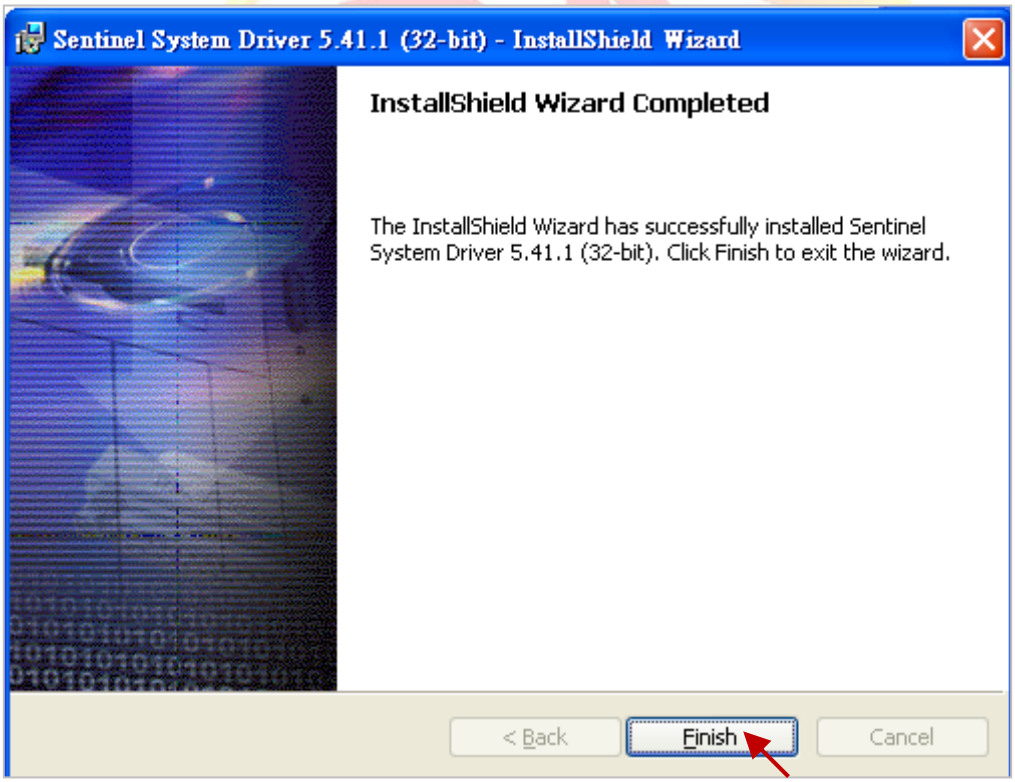
   Note: Before click the “Install” button, make sure there is **NO** USB Dongle in the PC that to avoid the installation failure.



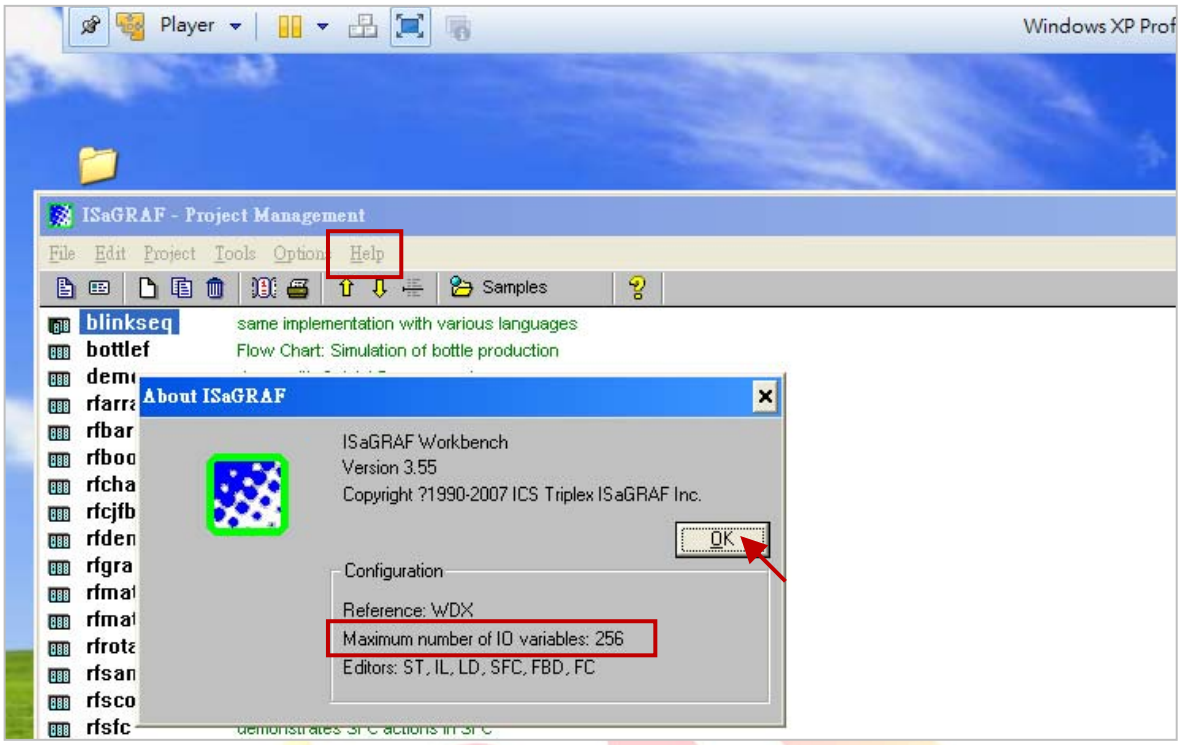
8. The screen when installing the driver for USB Dongle.



9. After the driver installation is complete, click “Finish” to exit the wizard.

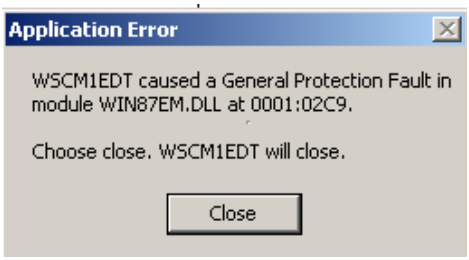


10. Insert the USB Dongle into the Host PC's USB 2.0 port, and then run the ISaGRAF Workbench on the virtual machine. Click the "Help" menu and select "About" and then check to see if the "Maximum number of IO variables" is "**256**" that means the USB Dongle driver has been successfully installed.



3. General troubleshooting

1. If a “General Protection Fault” error message is displayed during the debugging process:



   Problem solving steps:
   a. Check to see if the virtual machine is powered off.
   b. Find out the VM configuration file (the default path as below):
      C:\Users\<your_user_name>\My Documents\Virtual Machines\<virtual_machine_name>.vmx
   c. Using a text editor (e.g., Notepad) to open the VM configuration file.
   d. Add one command at the end of the file.
      monitor_control_enable_rigorous_fpu_save_restore = “TRUE”
   e. Save the file and close the text editor.
   f. Reboot the virtual machine.

2. Unable to make connection with the ISaGRAF PAC.
   Problem solving steps:
   a. Make sure the network setting for the virtual machine is set to “Bridged” and specify a correct network adapter. (Refer to Section 1.5 or Section 2.5 for more details on the network setting.)
   b. Check the Network Connection settings to confirm both the virtual machine and the ISaGRAF PAC are in the same network segment.

3. The USB Dongle is not working.
   Problem solving steps:
   a. Make sure your PC’s USB Port support USB 2.0.
   b. Refer to Section 1.5 or Section 2.5 for the USB setting, and confirm the USB devices on the virtual machine is set to “USB 2.0”.
   c. Refer to Section 1.6 or Section 2.6 for the description of the driver installation.
   d. Plug the USB dongle in to your PC and then run the ISaGRAF Workbench, click the menu “Help” and select “About”, to see if the screen shows "Maximum number of IO variables: **256**".