

multicomp PRO



MP720646 Two-Channel Series PC Based Oscilloscope User Manual

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1. General Safety Requirements

*! Before using the device, we strongly recommend to browse “**Safety Warnings**” carefully and completely, so as to avoid any possible human body injury, or any damages to the device, or its accessories, or communicated facility. !*

Safety Warnings

- i. The device only been allowed to work within specified application scenario.
- ii. Before communicating the device with PC, please refer to the user manual to familiarize the allowed rating value completely.
- iii. Making sure the allowed rating value of all terminals been well-followed, so as to avoid any potential short circuit or electric shock.
- iv. NO direct human body touch with any naked conductor of device when working the device. The naked conductor covers joints, connecting probe tip, communication interface, and others.
- v. No further operation is allowed provided any undetermined failure appears when working the device, better to seek the assistance of qualified technicians.
- vi. DO NOT work the device in humid environment.
- vii. DO NOT work the device in the explosive atmospheres.
- viii. Keep the device in good ventilation environment, and always keep the device surface clean and dry.
- ix. Better to send the device to qualified technicians for necessary maintenance.

2. Safety Terms and Signs

Safety Terms

Terms in this quick guide. It covers,



Warning which indicates the condition or the operation that may cause human body injury or permanent life loss.



Caution which indicates the condition or the operation that may cause device damage, or its accessory damage, or communicated facility damage.

Terms on the device. It covers,

Danger which indicates the operation may result in the immediate human body injury.

Warning which indicates the operation may result in potential human body injury.

Caution which indicates the operation may result in potential damage to the device, or its accessory, or communicating facility.

Safety Signs

Signs on the device. It covers,



Hazardous Voltage



(please refer to user manual for further details)



Protective Earth Terminal



Chassis Ground



Communication Interface Ground

To avoid possible human injury, and / or device damage, and / or its accessory or communicating facility damage, before working the device, we strongly recommend to read the following safety information.

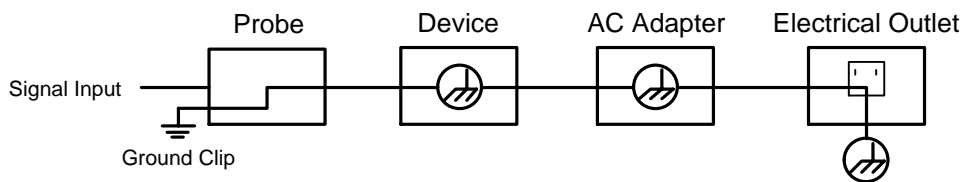
 **Warning**

To avoid any potential short circuit or electric shock, DO use the power adapter of original local standard.

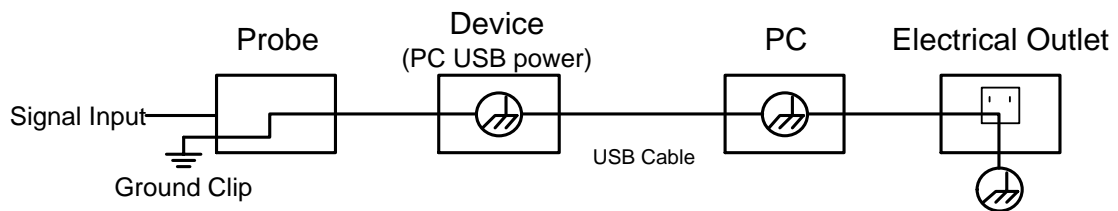
 **Warning**

The channels of the device are non-isolated electrically. When working the device, to avoid possible short circuit, the ground of two probes are NOT allowed to connect to 2 different non-isolated DC level.

The illustration of the device's built-in ground wire connection -



When the device communicating with PC via USB communication interface (with PC powered by AC power source), the illustration of the ground wire connection -



It is NOT allowed to measure AC power when the device been powered by AC power source through the adapter, or when the device powered by PC USB connection cable (via USB communication interface of PC, with PC powered by AC power source).



Warning

When the device input is getting through the voltage larger than 42 Vp-p (30Vrms), or on circuit of 4800+VA, to avoid any potential short circuit or electric shock -

- i. DO use probes and adapter come along with the original device.
- ii. Before working the device, DO check probes and accessories carefully to see whether any mechanical damages exist, making sure probes and accessories in normal-working status.
- iii. When device in non-working condition, to remove probes and accessories firstly, then put them in suitable places.
- iv. When working the device in CAT II environment,
 - DO NOT get the 40+ V input voltage from earth surface through any non-isolated input;
 - DO NOT get the 40+ V input voltage of dropout voltage through any non-isolated input
- v. DO NOT introduce input the voltage larger than the rated one, especially when probe attenuation set in 1:1, since the voltage from probe tip will go through to the device itself.
- vi. NO NOT contact the exposed part of metal BNC terminal directly by hand or any other human body part.
- vii. DO NOT insert any metal object into device connectors.

- Note -

- i). The rated voltage mentioned in point v. is the fixed value of working voltage, matching VACrms / 50 - 60Hz under AC sine wave application, and VDC under DC sine wave application;
- ii). CAT II indicates local level for electrical appliance and portable device.

3. Communication Interface Introduction



Figure 3-1. Communication Interface of the Device

- i.** power input: for AC-DC adapter
- ii.** USB host: for extension
- iii.** USB device (type-C): for PC communication
Note: when the device powered by PC USB connection cable (via USB communication interface of PC, with PC powered by AC power source), without adapter connection, the input current should reach 1.5A or above.
- iv.** LAN: for PC communication within network
- v.** Built-in Signal (3.3 V/1 kHz) Output: for probe compensation
- vi.** MULTI: for signal output of function generator
- vii.** CH2: for signal input
- viii.** CH1: for signal input

4. Device General Checking

Before working the device, we strongly recommend to check the device as per following steps:

i. to check whether any package deformation, breakage exists

Provided any package deformation, breakage appears, firstly, take photos about the package for good records; secondly, open the package, to check whether device inside in good shape, if not, take photos for good records, then back to your direct buying source, or back to factory for the solution.

ii. to check any physical defect / damage towards the device

Provided any obvious physical defect / damage towards device surface / communication interface / protection cover found, firstly, take photos about the defect / damage for good records, then back to your direct buying source, or back to factory for the solution.

iii. to check whether device accessories is complete

The complete accessory been listed onto page 15 "*Appendix I. Device Accessory List*", please check whether any accessory is missing, or with obvious physical defect, provided yes, take photos for records firstly, then back to your direct buying source, or back to factory for the solution.

Provided the result of device general checking is positive, then congratulations to start working the device from now on.

5. How to Communicate Device with PC

to communicate the device with PC, it's a must to install software firstly.

i. software installation solution

i). full installation

Target user(s): general PC oscilloscope user(s), and programmer(s) get secondary development need

Installation process -

- On the basis that NI-VISA driver or similar VISA driver already worked normally onto PC, to install "PC_OSC_Software.exe" from accompanying CD which comes along with device.
- Provided no proper VISA driver found onto target PC, as first step, to install "ni-visa_19.5_online_repack.exe*" from accompanying CD which comes along with device.

*. This .exe file will instruct the user(s) to download NI-VISA driver, and the user(s) could choose necessary NI package kit in the process as well.

The second step is to run "PC_OSC_Software.exe".

Note: According to the user(s) preferences, different version NI-VISA available via - visit www.ni.com through web browser, type "NI-VISA" onto search column, click NI-VISA Download web linkage from searching results, in accordance with the PC operation system and its version, to choose preferred suitable NI-VISA version.

ii). simple installation

Target user(s): general PC oscilloscope user(s)

Installation process -

To install Runtime version NI-VISA driver from accompanying CD which comes along with device firstly, after that, to run "PC_OSC_Software.exe".

iii). minimum installation

Target user(s): PC oscilloscope user(s) who only need to communicate the device with PC via direct network cable (no requirements for USB communication)

Installation process -

To run "PC_OSC_Software.exe" from accompanying CD which comes along with device directly.

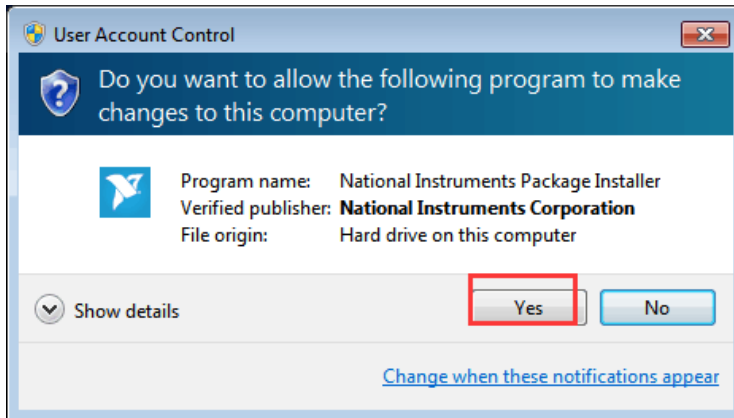
Note: The users could refer to [xiii.how to use socket connection](#) for "when the device communicates with PC by direct network cable" under VII. Device Operation from page 41 - 43 of e-format user manual.

ii. to install NI-VISA driver

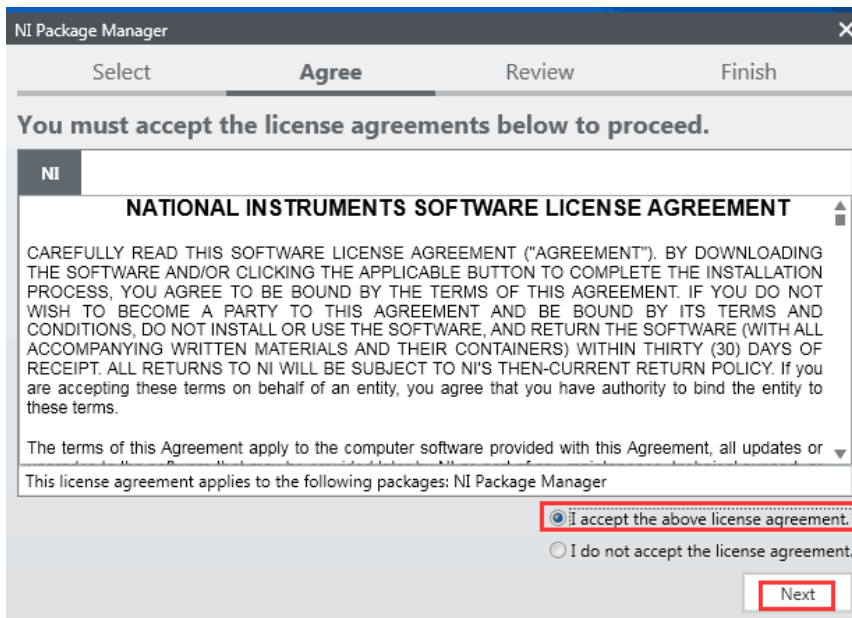
To assure PC software running normally, and smoothly, it is a must to install NI-VISA driver firstly.

Note: On condition that NI-VISA driver, or similar VISA driver already worked normally onto the target PC, step ii could be skipped.

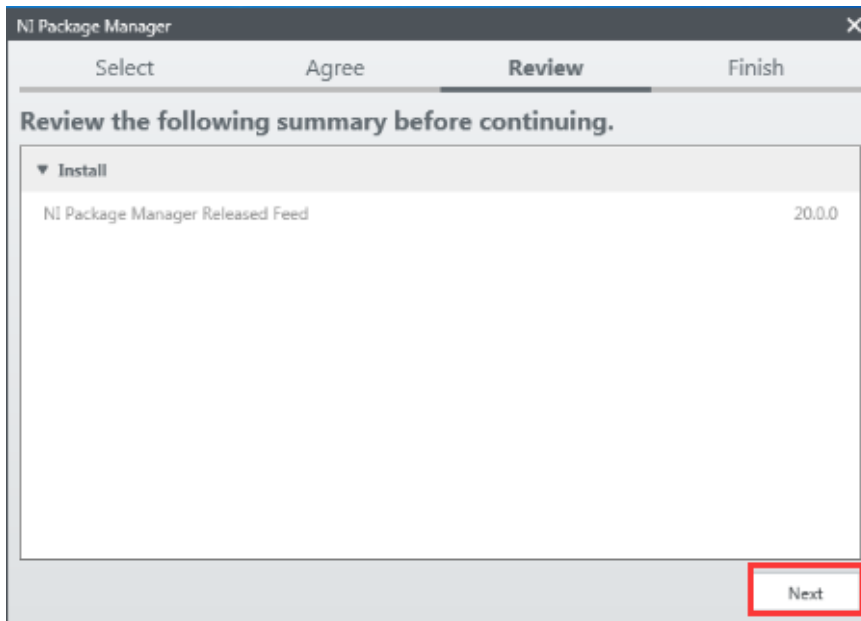
To run `ni-visa_19.5_online_repack.exe` from accompanying CD which comes along with device, to start NI-VISA driver installation,



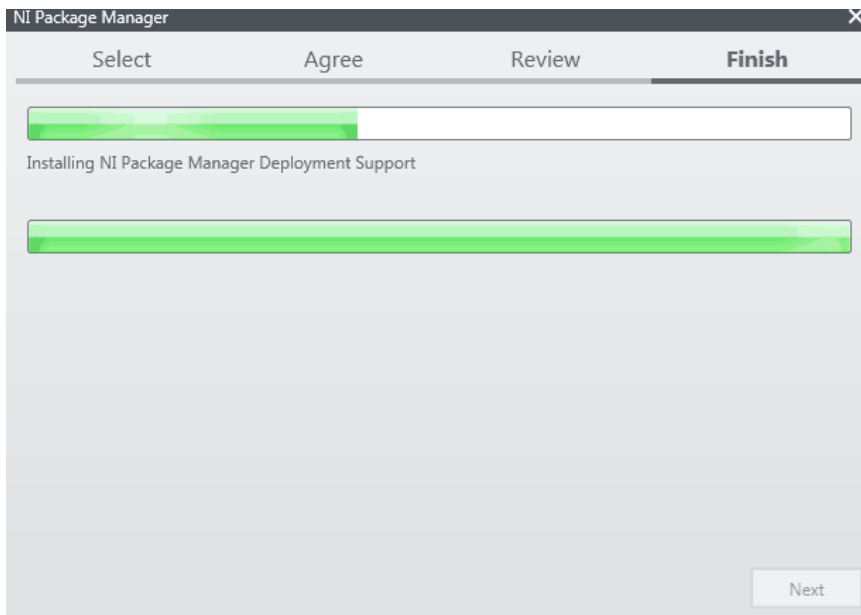
click "Yes" to continue, and following window comes,



dot-tick "I accept the above license agreement", then "Next",



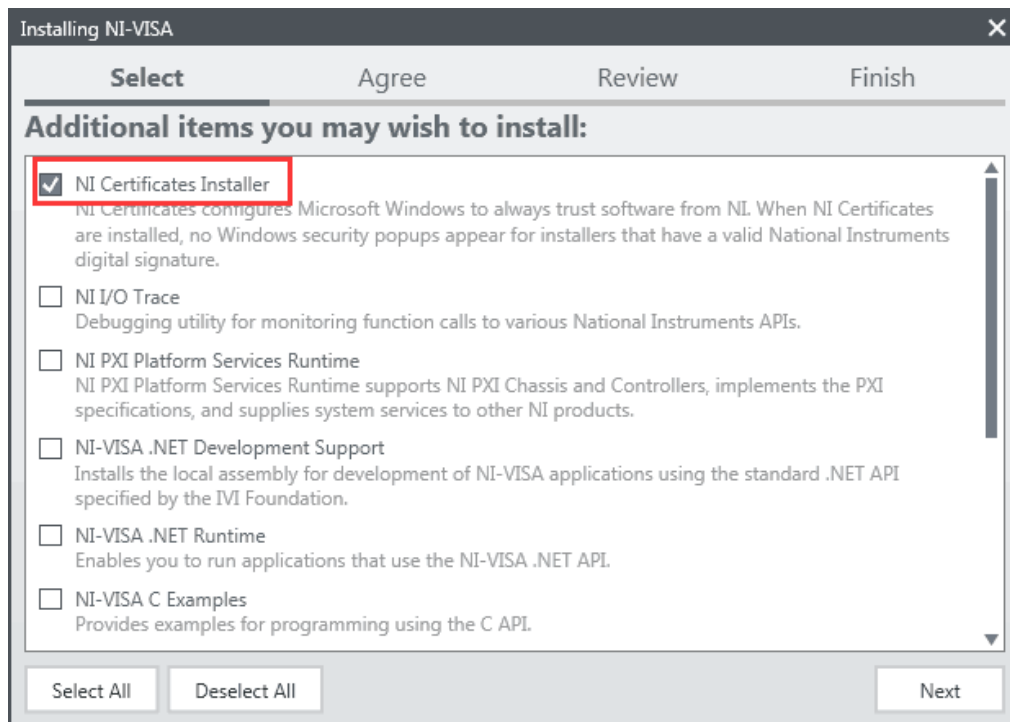
another “Next”, to enter into NI Package Manager processing window,



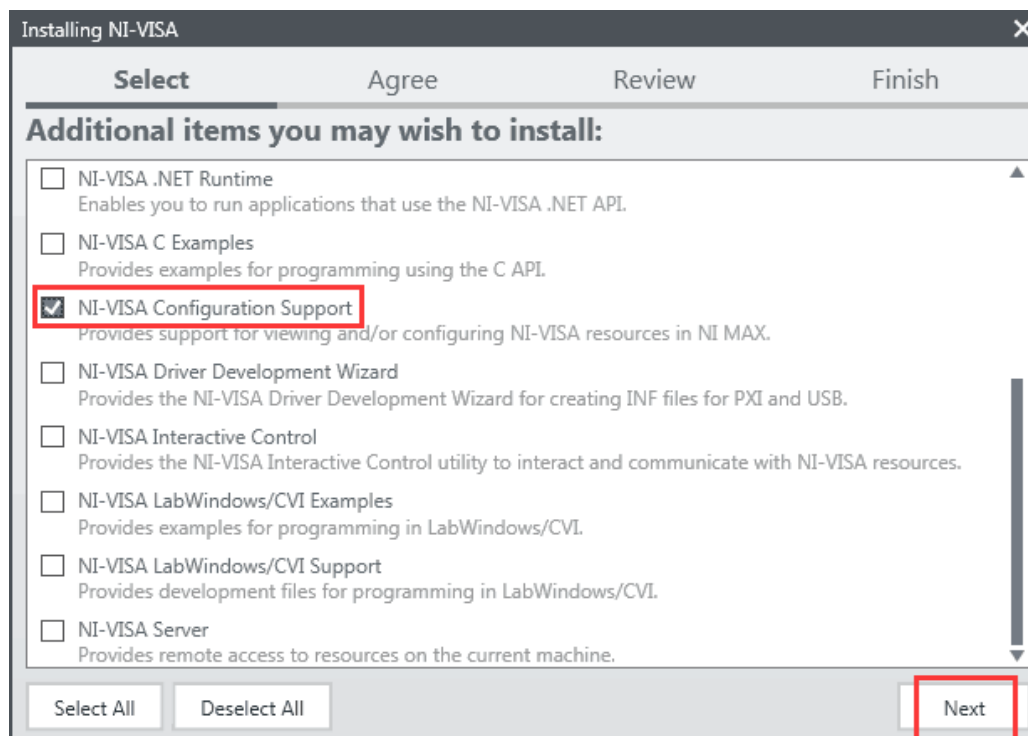
then this window,



later, when following window appears,

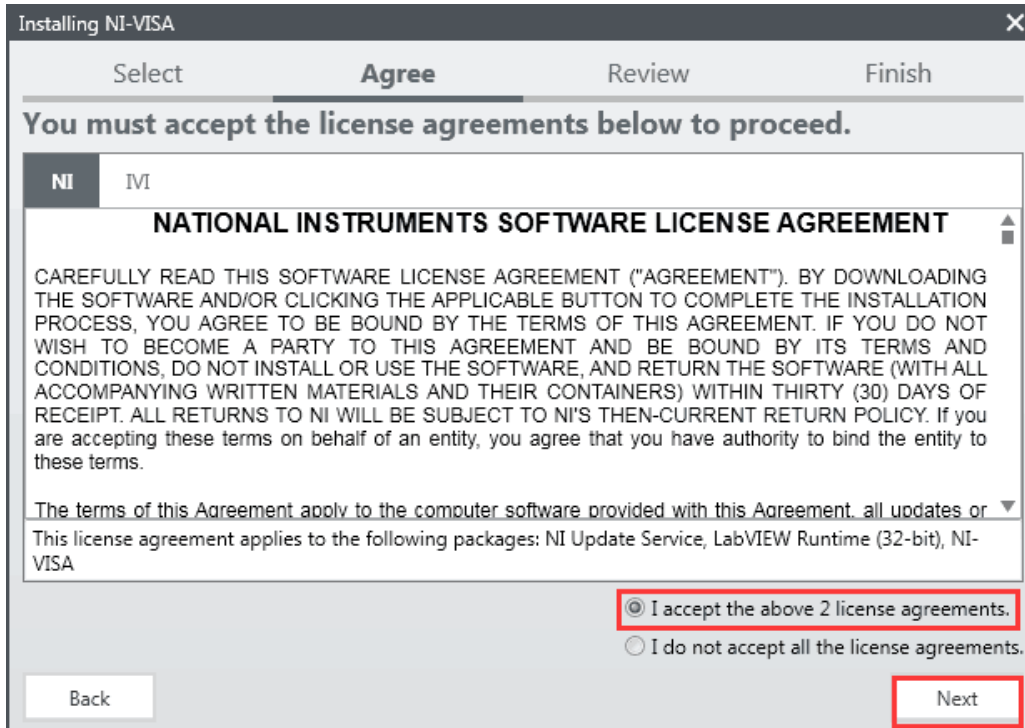


to select additional items you may wish to install,



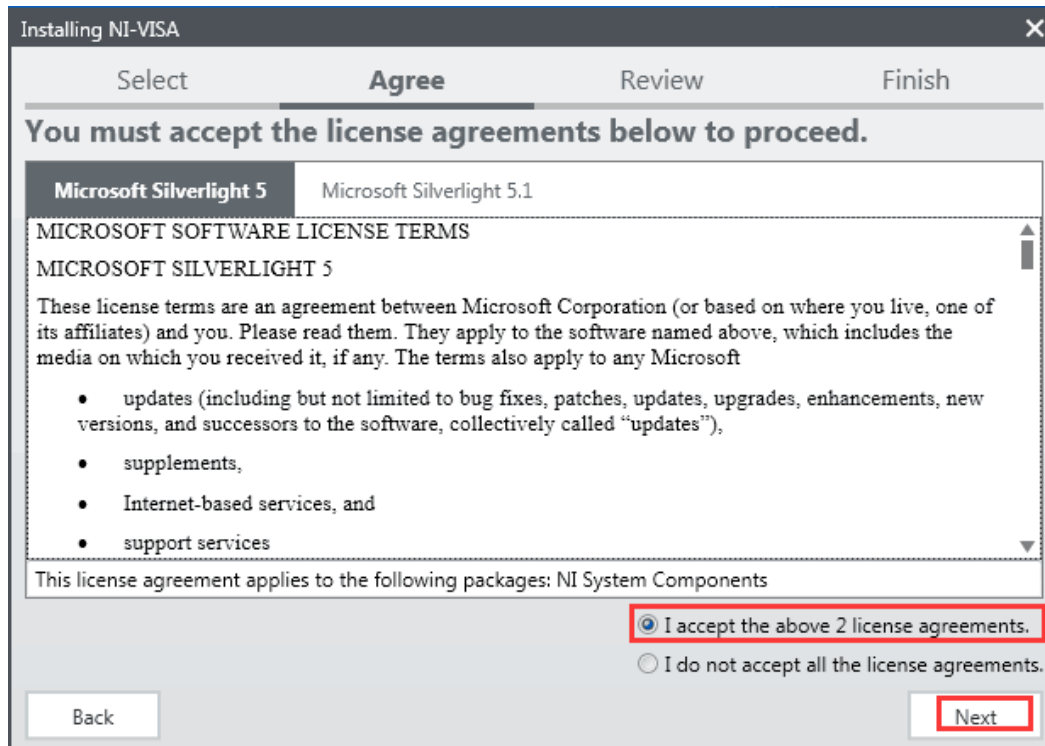
via scroll bar, to select more necessary options,

from here,



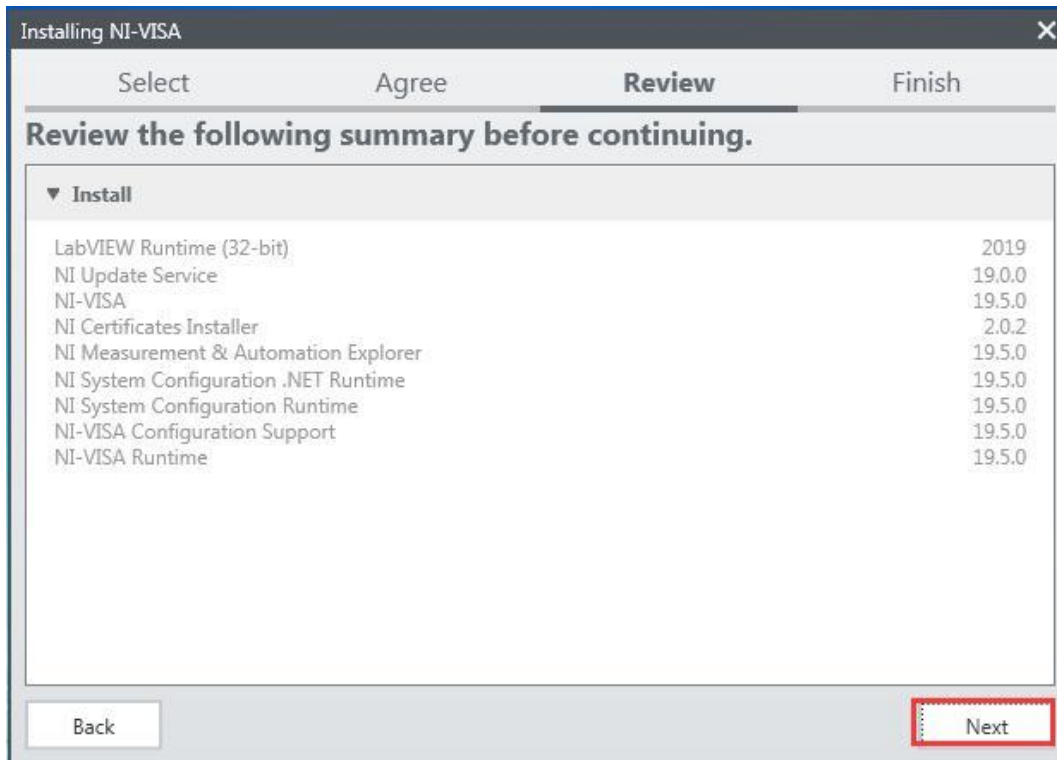
dot-tick "I accept the above 2 license agreements", again "Next",

until this window,



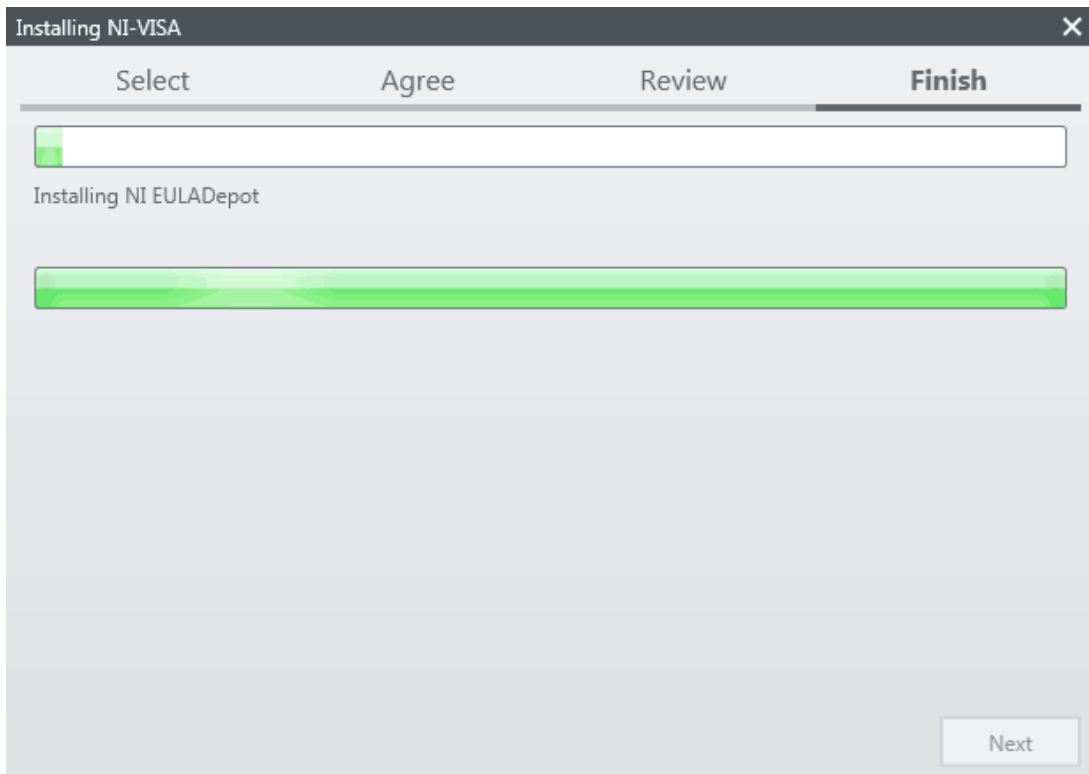
dot-tick "I accept the above 2 license agreements" for another time, and another "Next",

welcomes “Review” window,



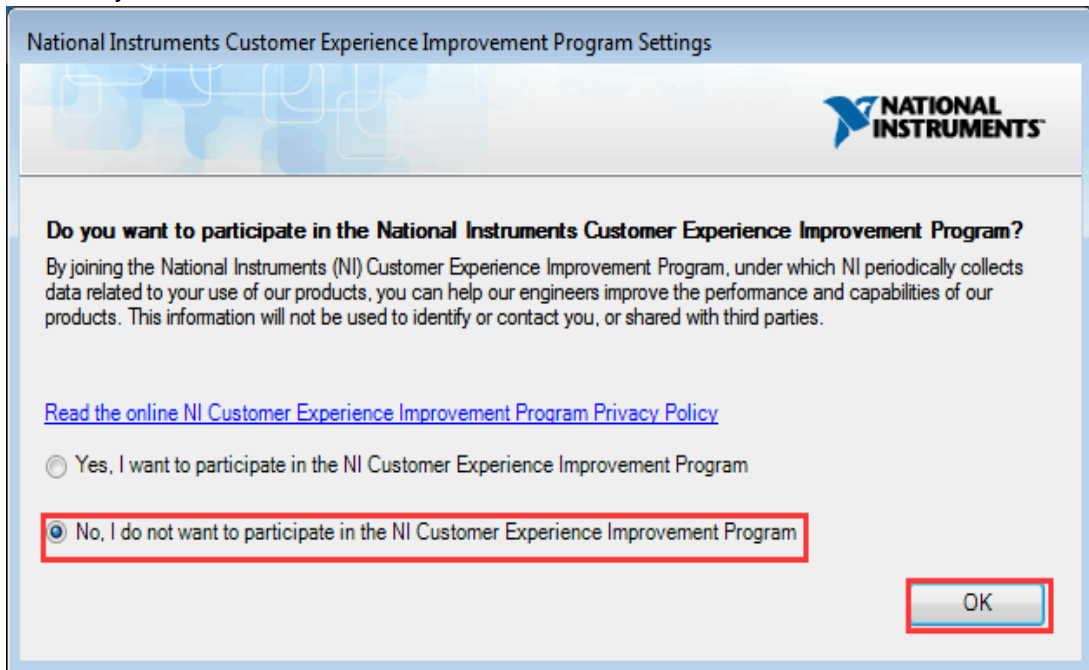
via “Next”,

get access to NI-VISA installation,



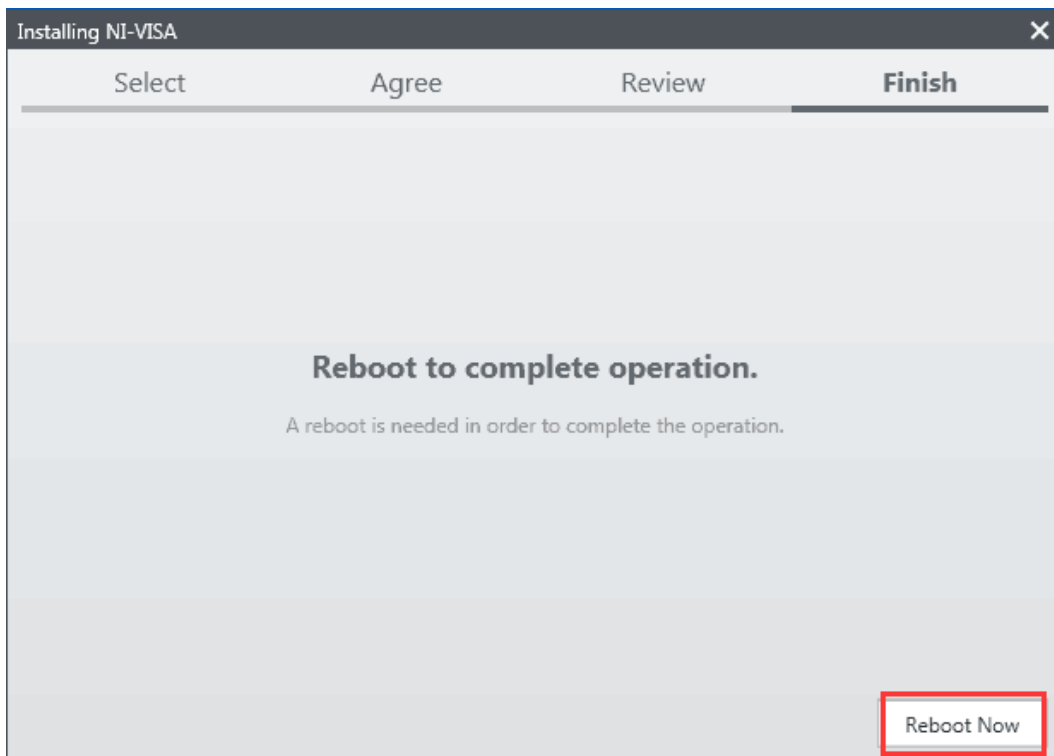
one more “Next”,

to make your decision at this window,



press "Ok" to finish the whole process,

this window indicates the successful installation,



to reboot the PC through mouse-clicking "Reboot Now"

After PC restarts, the NI-VISA driver been installed onto target PC successfully.

iii. to install PC Software

To run "PC_OSC_Software.exe" from accompanying CD which comes along with device directly, to install PC software accordingly.

iv. to work PC Software

Via short-cut to PC software from the desktop of target PC, double-click “ PC DSO” to start the software.

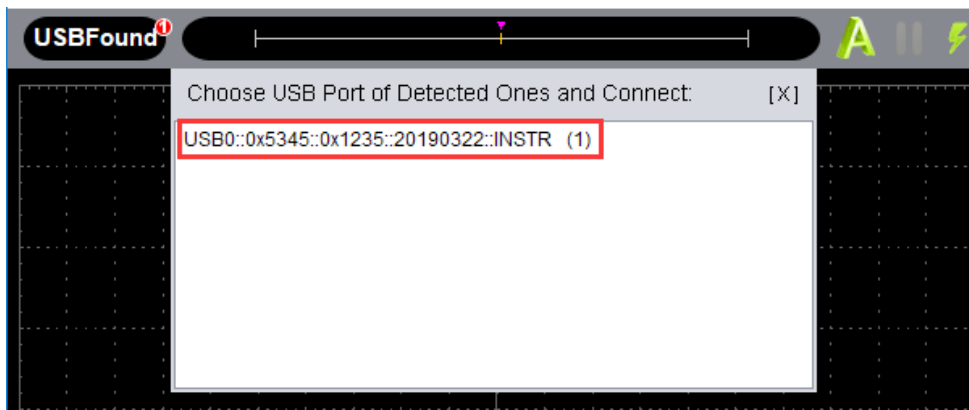
v. to communicate the device with PC

The user(s) gets 2 options to communicate the device with PC: through USB communication port, or through LAN port.

to communicate the device with PC through USB communication port

After powering the device via AC-DC adapter, its status indicator lights red for seconds.

Via USB connection cable (type-C), through matching communication interface, to connect the device with PC. When the status indicator lights green, PC software detects effective USB port, mouse-click the detected option to communicate the device with PC.



to communicate the device with PC through LAN port



2 solutions available to communicate the device with PC through LAN port -

Solution 1. By socket connection, upon with the combination of IP address and port, please refer to [xiii. how to use socket connection](#) under VII. Device Operation from page 41 - 43 of e-format user manual.

Solution 2. By adding LAN/LXI network device, please refer to [xiv. how to use LAN communication interface](#) and [xv. how to work WiFi with PC software](#) under VII. Device Operation from page 44 - 51 and page 52 - 58 of e-format user manual.

6. Device Function Checking

To verify whether the device in normal-working status, better to do a fast function check. After communicating device with PC successfully, please follow up following steps to do a fast function check -



- i. From PC software operation interface, mouse-click  to restore the device to factory settings. The default probe attenuation value in PC software reads x10.
- ii. To switch the probe attenuation in x10, work probe with Channel 1 via communication interface. The operation step goes in -
 - i) to align the probe slot with the BNC connector of CH1 communication interface, insert it through, then rotate the probe rightwards, to make the connection tightly.
 - ii) to connect the probe tip and its ground clamp with the coupler of the probe compensator.
- iii. Mouse-click  from right top of the PC software operation interface, the square wave of 1 kHz / 3.3 V will come.

These 3 steps are to check the status of device's Channel 1, the user(s) may repeat these 3 steps to check the status of device's Channel 2, and remember to choose the Channel 2 communication interface in the checking process.

7. Probe Compensation

Before working the probe with either of input channels (Channel 1 / Channel 2), better to adjust its compensation, to assure ideal measurement effect. Since the probe in non-compensated, or improperly-compensated (overcompensated / under-compensated) status always cause possible error or mistake to the measurement result.

Following operation steps to adjust probe compensation -

i. From PC software operation interface, mouse-click  to get access to device function menu, choose "Channel", then "CH1", set the "Probe Rate" as "x10". Switch probe attenuation to X10 option, then get the probe through Channel 1 input via device communication interface. Provided the probe hook tip been introduced, make sure it is in close touch with the probe. Connect the probe tip with the signal output coupler of probe compensator, and connect the reference wire clamp with the ground wire coupler of the probe compensator, and then click  to do auto set.

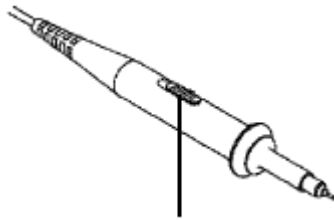


Figure 7-1. Probe Attenuation Switch Position (could set in 1X or 10X option)

ii. The probe compensation goes in 3 different status (as *Figure 7-2* shows),

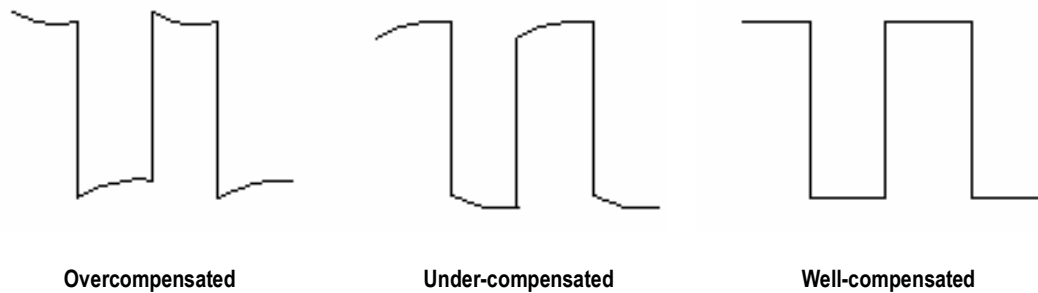


Figure 7-2. Different Status of Probe Compensation

provided probe in overcompensated or under-compensated status, use probe adjust (from device accessories) to adjust the screw (leftwards or rightwards) of probe body (*Figure 7-3*).

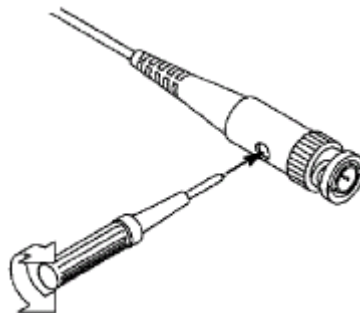


Figure 7-3. Probe Screw Adjusting

For different brand-new probe, please repeat these steps to get ideal compensation.

8. How to Use the Probe Safely

The safety guard ring around the probe body protects human finger from any electric shock, its location as *Figure 8-1*.

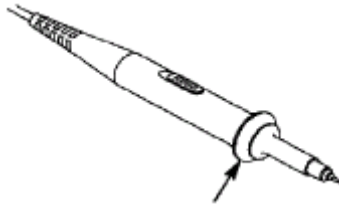


Figure 8-1 Finger Guard Location



Warning:

To avoid possible electric shock, when working the probe, always keep human finger behind the safety guard ring.

To avoid possible human body injury from electric shock, DO NOT touch any metal part of the probe tip when probe working with voltage source.

Before any measurement operation, always connect the probe to the device, and connect the ground terminal to the earth.

9. Appendix

Appendix I. Device Accessory List

Accessories -

- 2 x passive probe
- 1 x type-C cable
- 1 x hard copy quick guide
- 1 x AC-DC adapter
- 1 x BNC/Q9 cable
- 1 x PC software / user manual CD

Appendix II. Device Maintenance

Storage

To avoid any possible damage to the device, and probe, keep these items FAR AWAY from sprays, liquids, or solvents.

Surface Cleaning

As per the operation condition requirements, DO check the device and probe surface from time to time.

When cleaning the device / probe surface, please follow up with operation steps as follows -

- i. Before the surface cleaning, making sure the device is powered off, without any accessory / outer communicating facility connected; making sure probe not working with the device / outer communicating facility.
- ii. DO use non-electrostatic soft cloth to remove the surface dust.
- iii. For further surface cleaning, recommend to use a wet-but-no-water-dripping soft cloth, or soft detergent.

Note: To avoid permanent damage to the surface of device and probe, DO NOT introduce any corrosive chemical cleaner / detergent.



Warning:

After device surface cleaning, before working the device for next time, please confirm that the device surface in a relative dry condition, so as to avoid any possible short circuit risk, or possible human body injury caused by electric conduction from the wet surface.

INFORMATION ON WASTE DISPOSAL FOR CONSUMERS OF ELECTRICAL & ELECTRONIC EQUIPMENT.

When this product has reached the end of its life it must be treated as Waste Electrical & Electronics Equipment (WEEE). Any WEEE marked products must not be mixed with general household waste, but kept separate for the treatment, recovery and recycling of the materials used. Contact your local authority for details of recycling schemes in your area.



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