LINEEYE

USB 2.0 Protocol Analyzer

LE-650H2/LE-650H2-A

INSTALLATION MANUAL

NOTICE

- No part of this document may be reproduced in any form without the prior written consent of LINE EYE Corporation.

- The contents of this manual may be revised without prior notice.

- All efforts have been made to ensure the accuracy of all information in this manual. If you notice any part unclear, incorrect, or omitted in this manual, contact our company.

- We assume no responsibility whatsoever for any damages resulting from the use of this machine.

USE LIMITATION

This product has been developed for the purpose of using as an analyzer only.

When you use this product with the following devices that are required to function with a high degree of reliability, safety and accuracy, use it under considering the safe design of the system in order to maintain reliability and safety for that system;

- Devices that are directly related to transportation such as airplanes, trains, cars and etc.
- Devices for crime prevention and disaster prevention
- Each kind of safety devices and so on

This product has not been developed for the use that needs exclusively high reliability and safety; aerospace apparatus, trunk communication apparatus, nuclear control apparatus, medical apparatus related with life maintenance and etc. Therefore, do not use for those purposes.

Please read the operating instruction carefully before use to ensure safe operation of LE-650H2/LE-650H2-A. The general safety rules are provided for your benefit to protect you and those around you. Please read and follow them to avoid unnecessary injury and damage to the product and property and to use LE-650H2/LE-650H2-A right and safely.

Before you use this LE-650H2/LE-650H2-A, please familiarize yourself with the contents (symbols, marks) provided below.

[Explanation of the symbols (The degree of the hazard factor)]

⚠WARNING	The symbol denotes that improper handling poses a risk of causing death or serious injury.
⚠CAUTION	"The symbol denotes that improper handling poses a risk of causing injury or damage to the product and property."

Notice

*"Injury" indicates injury, burn, an electric shock, or the like which does not require hospitalization or the extend over a long period of hospital visit.

*"Damage to the product and property" indicates damage expansion related to a house, a building, furniture, apparatus, livestock or a pet.

[Explanation of the figure marks(concrete detail)]

🚫	Indicates prohibition (things that you must not do)
❗	Indicates compulsion (things that you must do)

⚠WARNING

🚫	*Stop using LE-650H2/LE-650H2-A immediately when smoke or smells emanate from LE-650H2/LE-650H2-A.The continuous use may result in an electric shock, a burn and/or fire.
🚫	*Do not disassemble, modification or repair LE-650H2/LE-650H2-A Failure to observe this may result in injury, an electric shock, fire and/or a breakdown due to overheating.
🚫	*Do not throw LE-650H2/LE-650H2-A into a fire, or expose to heat. Failure to observe this may result in fire, fire due to explosion and/or injury.
❗	*Do not use LE-650H2/LE-650H2-A if any form of liquid or foreign matter entered LE-650H2/LE-650H2-A . Failure to observe this may result in an electric shock and/or fire.

⚠CAUTION

🚫	Do not place LE-650H2/LE-650H2-A in the following places. Failure to observe this may result in overheating, a burn, an electric shock and/or breakdown. ■a place where strong magnetic field and static electricity are generated, a dusty place ■a place where unstable place and vibration are generated ■a place exposed to direct sunlight, a circumference of fire or the place where it is filled with heat ■a place with danger of the electric leak and water leak

Software License Agreement

This is a legal agreement between you, the end user, and LINEEYE CO., LTD.(LINEEYE). Carefully read all the terms and conditions of this agreement prior to use the software program or attached document. You are consenting to be bound by and are becoming a party to this agreement.

1 Copyright
  The rights and copyrights of the SOFTWARE are owned by LINEEYE.

2 Grant of License
  LINEEYE grants to you this software can be used on only one computer when you get this software and agree
  to our License agreement. Therefore, you may not transfer, rent lease and loan to third parties.

3 Copy / Analysis / Modification
  This license does not allow you to copy, analyze or modify the whole or any part of the material except
  for the case that it is prescribed in the installation manual.

4 Upgrade
  This software may be upgraded without a advance notice because of technical progress of hardware or
  software. LINEEYE provides software upgrades by payment for upgrade. For upgrade, it is granted only to
  the agreed License Agreement owner of this software.

5 Limitation of Liability
  In no event shall LINEEYE be liable for any direct or indirect damages, special or consequential damages
  resulting from the use or in way related to the use of the software. Besides in no event shall LINEEYE
  be liable for damages resulting from equipments or mediums.

6 General
  If any provision of this agreement is invalid, such provision shall be removed from this License
  Agreement.

7 Support
  LINEEYE will support only to the problems are caused by this software or functions and operation of this
  software.

8 Others
  The articles are not mentioned in this agreement, conform to the copyright laws and the other related
  laws.

<p align="center">LINEEYE CO., LTD.</p>

1. Outline

LE-650H2/LE-650H2-A is apparatus which connects with a PC, and analyzes "USB Protocol". "USB Protocol" is recorded on the hard disk of PC on real time, and it is displayed intelligibly for a LE-650H2/LE-650H2-A Software window.

HIGH/FULL/LOW speed modes automatic identification

● The device speed to observe is judged automatically.

Continuous record a max.10Gbyte (Max. 40Gbyte for LE-650H2-A)

● Monitored USB data is recorded up to 10Gbyte into the PC hard disk drive. And the screen can be also scrolled during analysis. It is effective in the analysis of the unspecified trouble which rarely happens.

Intelligible Display

● "Packets" in monitored data is intelligibly displayed per "Transaction".

"Standard device request" and "Descriptor" are translated in detail.

Trigger function linking with other measuring instruments

● It is possible to specify up to 16 sets of trigger which can excute the actions in sequence. When receiving error or specific packets, you can select start and stop of measurement or trigger output which is effective to link with other measuring instruments.

Upgraded Off-Line Analysis Capability

● It is easy to find data which you are interested in from enormous recorded measurement data by filtering functions and Find functions.

To learn more about details, please refer to the online help.

2. Composition

Please check whether the following have gathered at the time of delivery of goods.

< LE-650H2/LE-650H2-A>

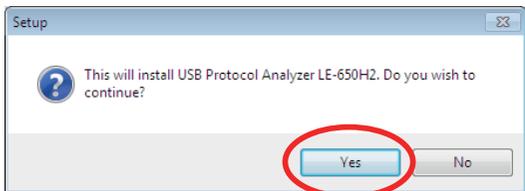|		
●	USB Analyzer	1
●	USB cable (with A-B plug 1.8m/0.9m):	2
●	CD-ROM (LE-650H2 software):	1
●	Installation manual	1
●	Warranty/Customer registration card:	1

3. Installation of software and drivers

3-1. Installation of software for Windows Vista / 7 / 8
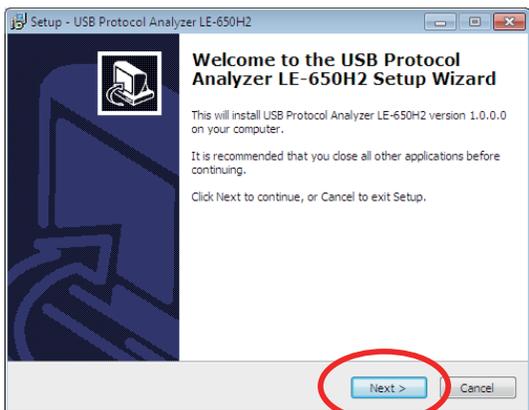
Insert the attachment CD-ROM into the CD-ROM Drive of PC.

Then, the installer automatically starts. If it does not start automatically, click "setup.exe" on the CD-ROM.

Attention: Please install the software before connecting the analyzer.
The driver will be available when connecting the analyzer to the PC at the first time
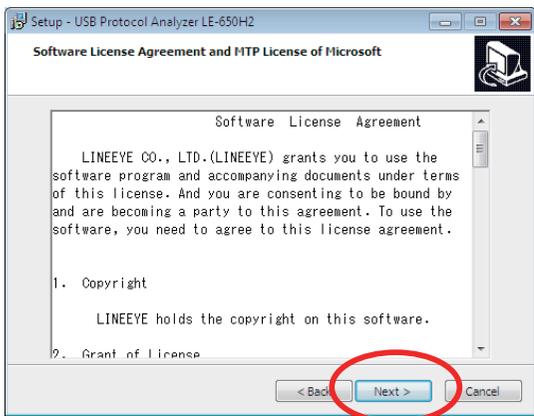after installing the software.

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(1)The setup dialog box appears. To start the setup wizard, click "Yes."

(2)Click "Next", when following setup dialog is displayed.

(3)Confirmation of Software licence agreement and MTP(Media Transfer Protocol) licence of Microsoft are displayed .To use these functions of MTP, you need to accept the license agreements and click "Next".

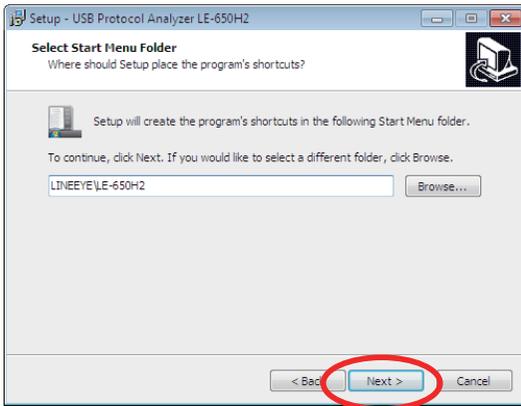(4)Click "Next" to continue. If you would like to select a different folder, click Browse.

(5) The license key will automatically appear when "Verifying license key" dialog is displayed. Then click "Next" to continue.
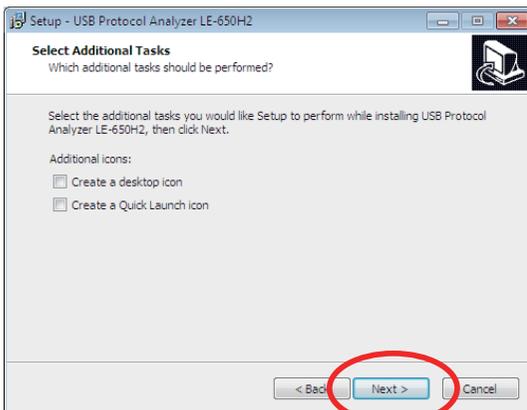
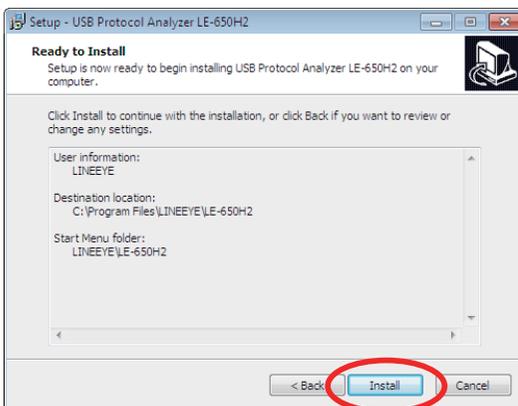*In case of installing the trial version, click "Next" without filling the blank.

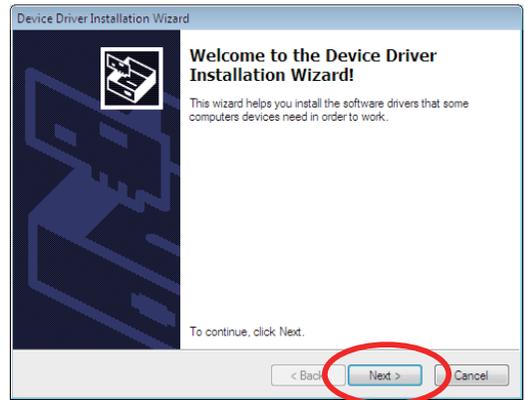(6)Click "Next" to continue. If you would like to select a different folder, click Browse.

(7)Select the additional tasks which you would like Setup to perform, then click "Next".

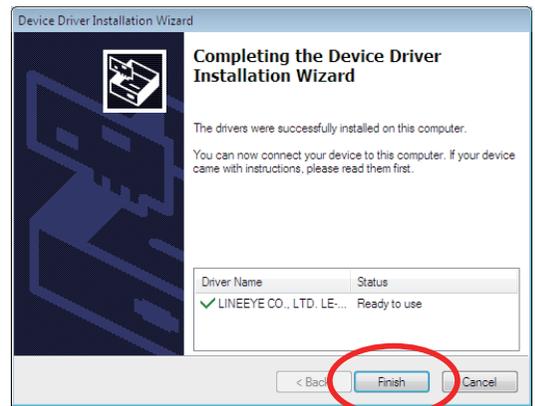(8)Click "Install" to continue with the installation.

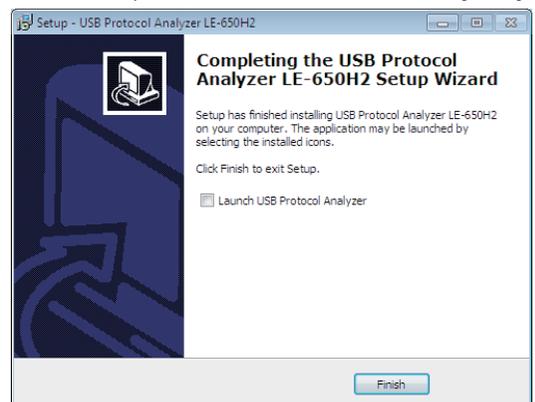(9) Click [Next] when starting the installation of the device driver.

(10) Click "Install" , when the following dialog is displayed.

(11) When the following dialog is displayed, the installation of driver has been done. Click [Finish].

(12)Installation of software will be started. When the set-up wizard is completed, the installation is finished. Click [Finish].
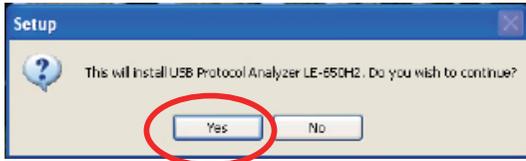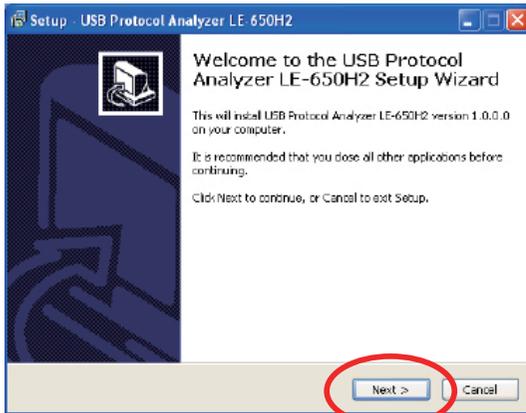
Insert the attachment CD-ROM into the CD-ROM Drive of PC.

Then, the installer automatically starts. If it does not start automatically, click "setup.exe" on the CD-ROM.

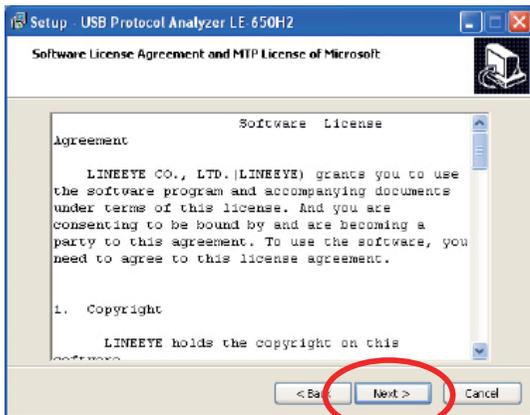Attention: Do not connect the analyzer to the PC until finishing the step (13)

(1)The setup dialog box appears. To start the setup wizard, click "Yes."
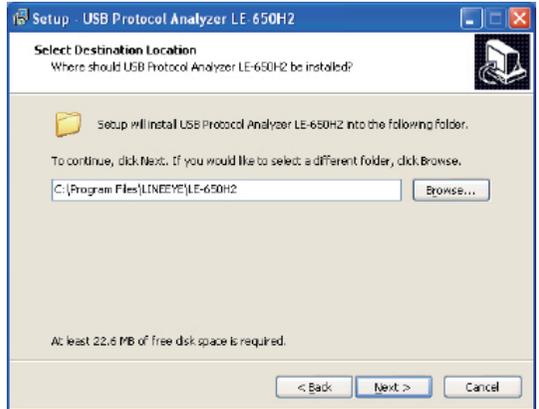

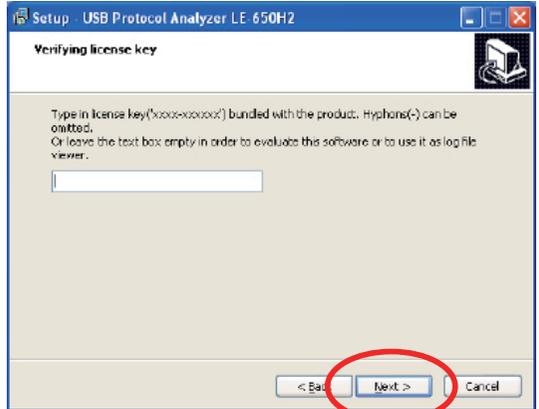(2)Click "Next", when following setup dialog is displayed.

(3)Confirmation of Software licence agreement and MTP(Media Transfer Protocol) licence of Microsoft are displayed .To use these functions of MTP, you need to accept the license agreements and click "Next".

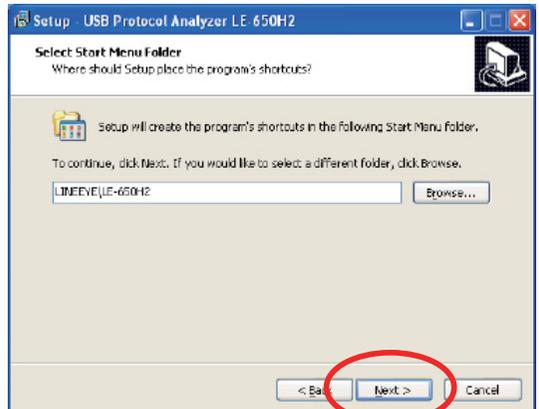(4)Click "Next" to continue. If you would like to select a different folder, click Browse.

(5) The license key will automatically appear when "Verifying license key" dialog is displayed. Then click "Next" to continue.
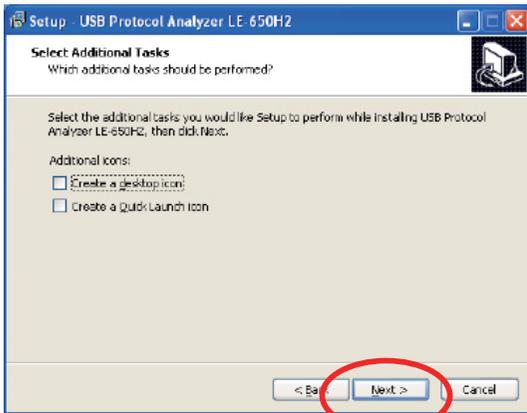

*In case of installing the trial version, click "Next" without filling the blank.

(6)Click "Next" to continue. If you would like to select a different folder, click Browse.

(7)Select the additional tasks which you would like Setup to perform, then click "Next".

(8)Click "Install" to continue with the installation.

(9)Click [Next] when starting the installation of the device driver.

(10) Click "Continue Anyway" , when the following dialog is displayed.
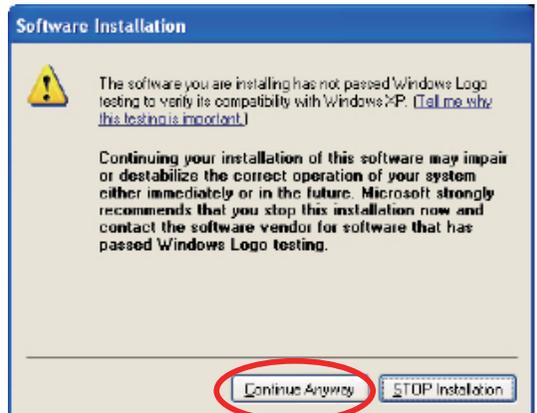
(11) When the following dialog is displayed, the installation of driver has been done. Click [Finish].
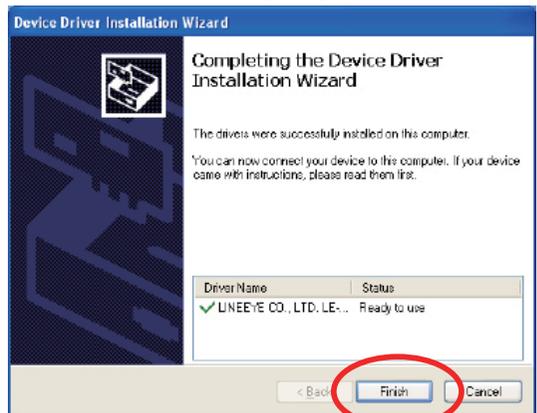
(12)Installation of software will be started. When the set-up wizard is completed, the installation is finished. Click [Finish].
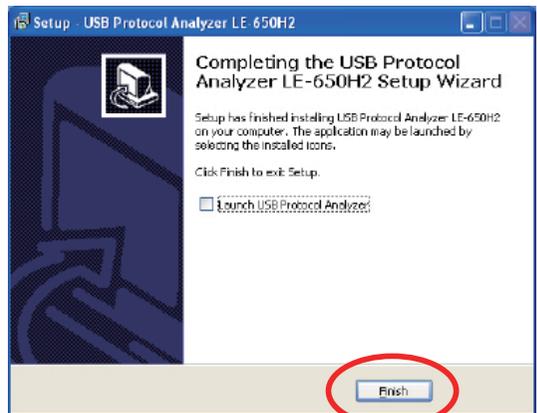
(13). Connect the analyzer to the PC. When the hardware wizard is displayed, select [start installation of software] and click [Next]

(14). The driver for LE-650H2 will be detected and complete the installation. Click [Complete]

You can install the software to the PC which does not have a CD drive via LAN, using another PC with a CD drive.

(1) Insert the CD to the PC with a CD drive.

The PC for installation without a CD drive   The PC with a CD drive

LAN

Insert the CD
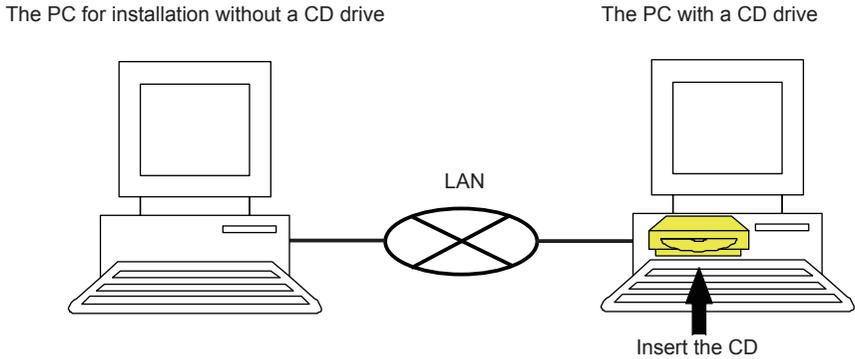
(2) Set the property of the CD drive to access from the PC without the CD drive (for more information, please consult your network administrator).

(3) Copy "setup.exe(v1.0.0.2 or above)" to the appropriate folder in the PC without the CD drive.
    *If you have the CD which version is v1.0.0.1 or below, install the latest software from LINEEYE web-page.

The PC for installation without a CD drive   The PC with a CD drive

Copy setup.exe.

LAN
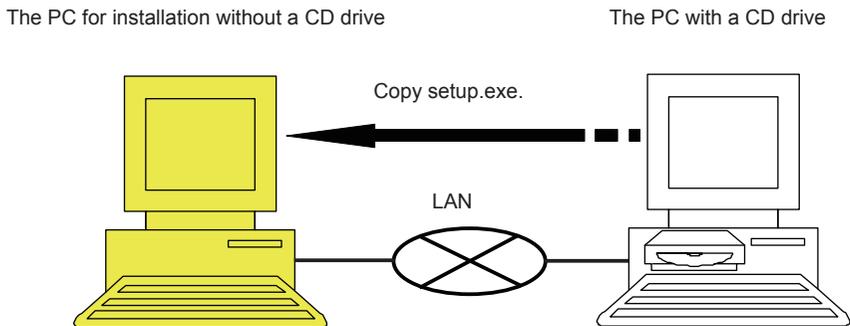
(4) Execute "setup.exe" in the PC with the CD drive. Then proceeed the process until "The USB Protocol Analyzer LE-650H2 setup wizard" appears.

The PC for installation without a CD drive

The PC with a CD drive

Execute setup.exe.

LAN

Welcome to the USB Protocol Analyzer LE-650H2 Setup Wizard

This will install USB Protocol Analyzer LE-650H2 version 1.0.0.2 on your computer.

It is recommended that you close all other applications before continuing.

Click Next to continue, or Cancel to exit Setup.

Next >   Cancel
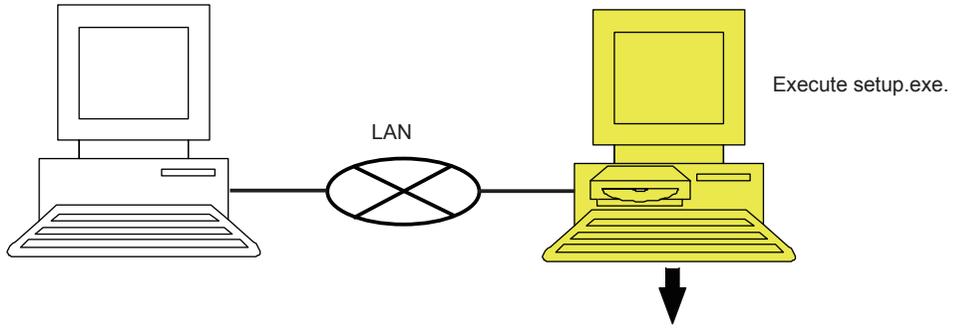
(5) Execute the "setup.exe" from the PC without the CD drive. The license key number is automatically filled and then complete the setup wizard.

The PC for installation without a CD drive

The PC with a CD drive

Execute setup.exe.

LAN

Completing the USB Protocol Analyzer LE-650H2 Setup Wizard

Setup has finished installing USB Protocol Analyzer LE-650H2 on your computer. The application may be launched by selecting the installed icons.

Click Finish to exit Setup.

☐ Launch USB Protocol Analyzer
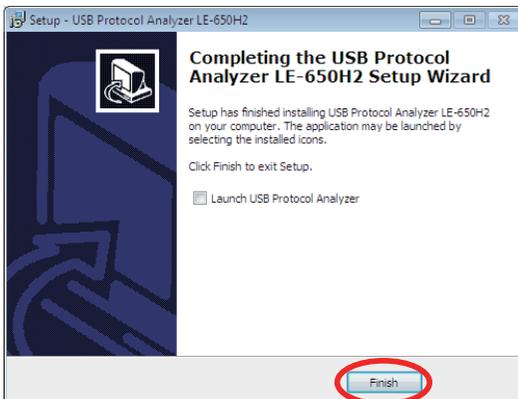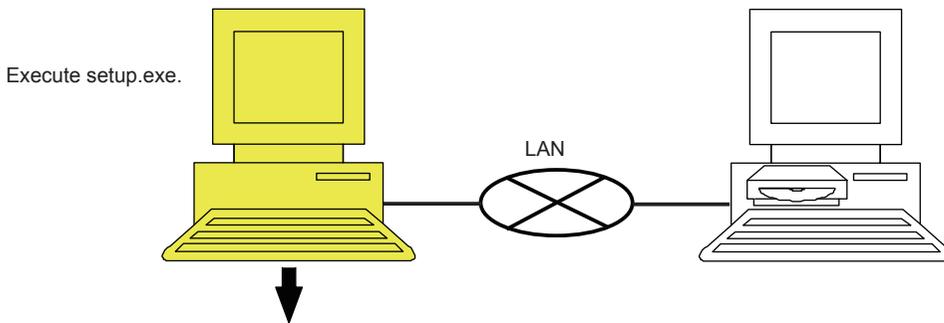
Finish

(6) After finishing the installation at (5), cancel the setup wizard started at (4).

The PC for installation without a CD drive

The PC with a CD drive

LAN

Setup - USB Protocol Analyzer LE-650H2

Welcome to the USB Protocol Analyzer LE-650H2 Setup Wizard

This will install USB Protocol Analyzer LE-650H2 version 1.0.0.2 on your computer.

It is recommended that you close all other applications before continuing.

Click Next to continue, or Cancel to exit Setup.

Next >   Cancel
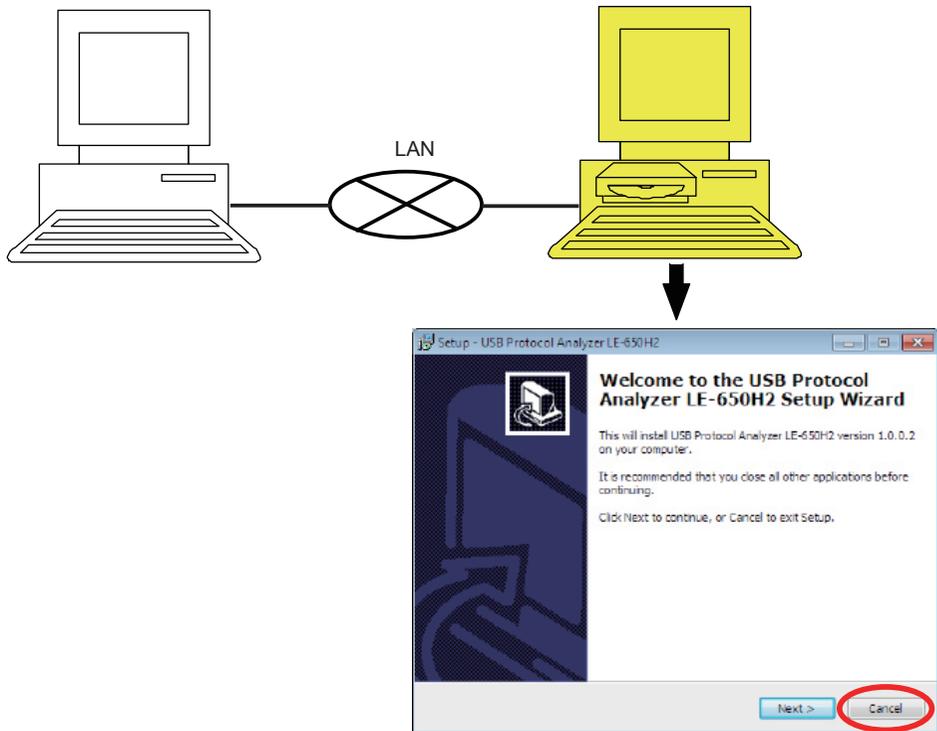
3-4. About Version Up

The latest version of monitoring software can be used by downloading it from our website. However, it requires a "license" to use new functions which are added later than about 1 year after your purchase of the product.

Note: Bug fixing can be updated without this limitation.

4. UNINSTALL

Analysis Software Uninstallation

(1) Open "Add/Remove Programs" in the "Control Panel."

(2) Choose "USB Protocol Analyzer LE-650H2" from a program list.

(3) To uninstall, click the "Add/Remove" button.

5. Warranty and Repair

■Warranty

For a period of 12 months from date of shipment, LINEEYE warrants that the products (excepting consumable parts like the batteries and software) are free from defects in material and workmanship when properly operated in accordance with procedures described in documentation supplied by LINEEYE. If a defect exists during the warranty period, please send it back to LINEEYE distributors or LINEEYE office. LINEEYE will repair or exchange it at no charge. In this case, the shipping charge is at your own expense.

The foregoing warranties are the sole warranties given by LINEEYE. The warranties set forth above shall not apply to my products which has been modified, repaired or altered, except by a LINEEYE employee and which has been subjected to unusual physical or electrical stress, misuses, abuse, negligence or accidents.LINEEYE disclaims all other warranties including the warranties of merchantability, fitness for a particular purpose and non-infringement of third party right. LINEEYE does not promise that the software is error-free or will operate without interruption.

If an error exists on software, the content and modified program will be shown on our website (http://www.lineeye.com). So, please download it from there.

■Repair

LINEEYE will repair the product at your own expense.
For malfunction, please contact the LINEEYE distributor you purchased at. Or, FAX or E-mail the technical support.
If your product needs to be repaired, please read details about a repair on our website and ask for a repair.

■Technical Support

Please contactl LINEEYE head office including the following requirements.

(1) Your Country	(2) Your Name	(3) FAX Number or E-mail Address
(4) Your Distributor Name	(5) Model Name	(6) Serial Number
(7) Description on Your Trouble		

●Head Office   FAX : 81- 75 - 693 - 0163
                    Mail Form: Please click "contact us" on our web page.

We do not have support on the phone.

6. Specifications

Model		LE-650H2	LE-650H2-A
Standard		USB2.0/1.1	
		HIGH(480Mbps)/FULL(12Mbps)/LOW(1.5Mbps) Automatically judged and selected	
"Storage Capacity"	Analyzer	Capture memory: 128 MB	
	PC	Max. 10 GB *1 (Can be specified every 1 MB)	Max. 40 GB *1 (Can be specified every 1 MB)
Recoding Method		Record USB packets and bus status (Bus Reset, Suspend, Disconnect, Device Chirp, Hub Chirp) in the HDD/SDD of the PC as a log file continuously.	
Time stamp		Resolution of 16.7ns for 5 hours max.	
VBUS Measurement		Display voltage, current and power consumption of VBUS in real time. VBUS logger mode; Recode, display and convert into CSV format at specified ctcle.	
VBUS Measurement cycle		100ms - 1s (4steps)	0.1ms-1s(13 steps)
Packet Display		"SOF, IN, OUT, SETUP, DATA0, DATA1, ACK, NAK, STALL, PRE, DATA2, PING, MDATA, SPLIT, ERR, NYET, and Unknown (undefined)" Display data in every USB transaction.	
Filter	Log	Record or do not record SOF, IN-NAK, OUT-NAK, SETUP-NAK, PING, with or without multiple particular address/end points.	
	Display	Display or do not display SOF, IN-NAK, OUT-NAK, SETUP-NAK, PING, with or without multiple particular address/end points.	
Trigger	Condition	If particular address/end point, packet type, error, data packet payload, bus status, external trigger input or VBus is matched with the trigger conditions, the device outputs external trigger or stops measuring in the sequent (up to 16 sequence).	
	Action	log stop, external trigger output (levels or pulses specification possible)	
	External	Input: 4 (TTL level), Output: 4 (LVTTL level)	
Search function		SOF, IN, OUT, SETUP, PING, ACK, NAK, STALL, NYET, ERR, Data, SOF number, idle time more than specified, Error condition (CRC/PID/DATA toggle sequence/Packet combination in transaction/Undefined log item), MassStorage(SCSI,ATAPI,SFF-8070i), Audio, HID, HUB, Printer, Video, Communication, USBTMC Class command, PTP/MTP, Standard requests, and specific addresses/end points in combination can be searched.	
Detailed display		Standard requests, HUB/HID/Audio/Communication/MassStorage(Bulk Only Transport)/Printer/USBTMC/Wireless controller(only for HCI protocol for Bluetooth dongle) Class-Specific device requests, Standard descriptors, HUB/HID/Audio/Printer/USBTMC/Communication descriptors in each class,MassStorage/Bulk Only Transport command (SCSI transparent command set, SFF-8070i), MTP/PTP (Operations, Responses, events, and Video),Commands and events of HCI protocol for Bluetooth dongle specified class can be displayed in detail.	
Statistic analysis		The number of transactions, the number of transfer bytes and the average transfer rate are totaled and displayed.	
Mark/Jump		Up to 99 marks can be set in specific recorded data, and can jump to any specific marked position.	
OP-SB84 data conversion		A log file of OP-SB84 (.DT) can be read and be displayed or saved as a log file of LE-650H2(.usr).*3	
Save		Saving raw data or data in text or CSV format . Binary format (only data payload) . (Data can be copied and pasted through the clipboard, and saved data can be added with comments.)	
Print		Specified ranges of recorded data can be printed (in monochrome or color as specified). *2	
Connectors	For measurement	USB standard A/B receptacles : 1 each	
	For PC connection	USB B receptacles : 1	
	For external trigger	male10pin(2.54mm pitch) : 1	
LED Display		2-colored LED, POWER/RUN, VBUS, DATA, SPEED	
Power supply		USB Bus Power (Current consumption : 400mA max)	
Ambient temperature		Operating: Centigrade 0 to +40 degree Storage: Centigrade -20 to +60 degree	
Ambient humidity		Operating: 20 to 80% RH Storage: 10 to 85% RH (no condensation)	
Dimensions and weight		86(W)×130(D)×30(H) mm, approx. 210g	

*1 MAX 2GB on VBus logger mode.

*2 Not supported by VBus logger mode.

*3 If the data file of OP-SB84 contains both USB data and VBus measurement data, the file cannot be opened by LE-650H2 software.

LINEEYE CO., LTD.