

PC Link Software LE-PC7XCL

Instruction Manual

The CD-ROM attached to the product contains the latest instruction manuals in PDF format. Please also refer to them.

You need the serial number when installing. You will find the serial number on the side of the box that contains LE-PC7XCL (or on the card packed with LE-PC7XCL).

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Chapter 1 Before Using the Product

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LINEEYE CO., LTD.

Chapter 2 Introduction

Thank you for your purchase of LINEEYE's "LE-PC7XCL" software.

- To use it correctly, you are advised to read and understand this together with the instruction manual for analyzer thoroughly.
- Keep this instruction manual.

General Description

This software allows LE-2500XR/LE-3500XR to capture the monitored data measured by OP-SB7XC/OP-SB7XL (optional expansion kit) into a PC through a USB port, a Wi-Fi, or a memory card.

The light version of LE-PC7XCL is available from LINEEYE web page. The differences between the light version and full version is below.

- The remote monitor function of light version works only 10 minutes.
- The light version can convert only 3 files into text format simultaneously.

Unpacking

When you unpack the product, make sure of the following.

- | | |
|---|----|
| <input type="checkbox"/> CD-ROM (software) | :1 |
| <input type="checkbox"/> Instruction Manual (This book) | :1 |
| <input type="checkbox"/> User Registration Card | :1 |

Please contact your LINEEYE distributors if you find any damage to the product caused by transportation, or if there are accessories lacking. Please be sure to do user registration (from our website) as it is necessary to receive support such as version upgrade.

Chapter 3 Before Start-up

USB Driver Installation

To connect the analyzer and the PC with a USB cable, install the USB driver of LE-2500XR/LE-3500XR into the PC. Follow the instruction below.

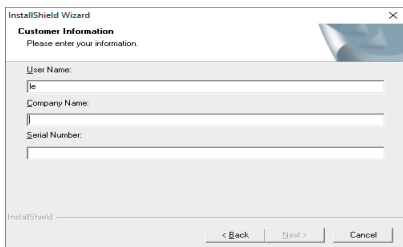
- 1) Do not connect the analyzer to the USB port of PC before the driver installation.
- 2) Download the USB driver compatible with the analyzer from the LINEEYE website, unzip to a proper folder. (The driver is also included in the CD attached to the product.)
- 3) Execute setup.exe in the folder.

- 4) Follow the instructions on the screen to proceed the installation. If the “User account control” or “Windows Security” window is displayed, click “Yes” or “Install” to proceed.
- 5) After the installation is complete, connect the analyzer with a USB cable. After the PC recognize the USB connection a connection message will appear in the task tray at the bottom right.

Installation Guide

- 1) Execute “setup.exe” in the attached CD.
- 2) First, click “Yes” in the “User Account Control” display.
- 3) When the Windows firewall displays a message such as “Windows protected your PC”, click “Detail”-“Run” to run the program.
- 4) Even if the virus security software displays a message that blocks this software, click the option to run the software such as “Run this program” to cancel the blocking.
- 5) When the installer starts up, proceed according to the instructions on the screen.

You will be prompted for the serial number during installation. Please enter the serial number of this software written on the attached user registration card.



- 6) For the light version “LE-PC7XCL(LITE)” which you can download free of charge from the LINEEYE website, the serial number will be automatically entered as “LITE”.
- 6) When the installation completion message is displayed, click “Finish”.

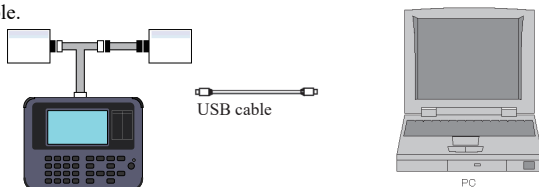
Uninstallation Guide

- 1) Open “Uninstall or change a program” (or “Program and Features”) from the control panel. (Or right-click on “LE-PC7XCL” in the start menu and select “uninstall”).
- 2) Select “LE-PC7XCL” from the list and execute “Uninstall and change”.
- 3) First, click “Yes” in the “User Accounts” display.
- 4) Click “OK” at the deletion confirmation display.
 - When the light version “LE-PC7XCL(LITE)” is already installed in the PC, uninstall the light version before installing the full version.“LE-PC7XCL”
 - When updating the product version (full edition), you can install the new version without uninstalling the old version. By doing so, the product serial number etc. will be carried over.

Analyzer Setting

<USB connection>

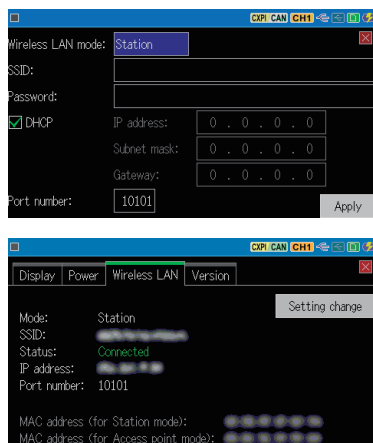
- 1) Connect your analyzer to the target devices you wish to measure.
- 2) Connect the USB device port of analyzer and the USB port of PC using the attached USB cable.



<Wi-Fi connection>

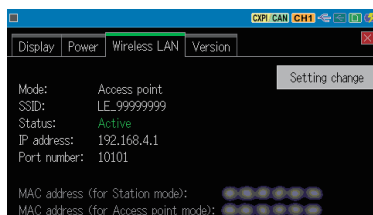
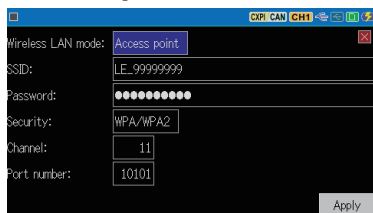
- 1) Connect the analyzer with the communication line to be measured.
- 2) Select the wireless LAN mode of the analyzer from the station mode “Station” or access point mode “Access point”.
Station : It connects via Wi-Fi access point
Access Point : The analyzer itself becomes wireless access point
- 3) Configure the items for the connection.

<Station>



Item	Contents
SSID	Set the identifier of the access point.
Password	Set the security key (encryption key).
DHCP	Mark on the box to use the DHCP function. Do no mark on the box to use the fixed IP.
IP address	IP address of the analyzer
Subnet mask	Subnet mask of the analyzer
Gateway	Default gateway
Port number	Port number of the analyzer

<Access point>



Item	Contents
SSID	Identifier of the analyzer
Password	Security key (encryption key).
Security	Select the authentication protocol from followings; OPEN, WPA, WPA2, WPA/WPA2
Channel	The channel used for Wi-Fi
Port number	Connect port number of the analyzer

- Set the Channel taking care not to interfere other wireless devices

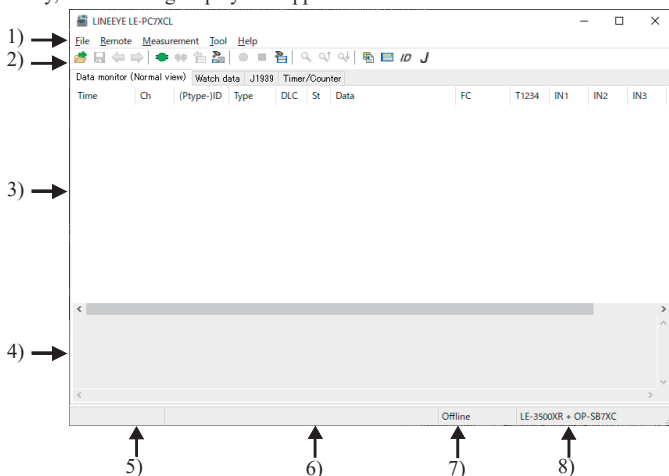
Attention

- * Before using the LE-PC7XCL, set the configuration of analyzer first.
- * Do not turn off the power of analyzer while the analyzer is connecting to LE-PC7XCL.
- * Set off the power saving mode in the PC to keep the connection with the PC link software.
- * Turn off the Wi-Fi function before using the LE-PC7XCL with USB connection.
- * Do not use the auto measurement function.

Data Window

Select “LINEEYE” “LE-PC7XCL” from the Windows start menu.

Normally, the following display will appear.



1) Menu

Can perform various operations.

2) Tool Bar

Can perform various operations.

3) Data display part

Displays the measured data.

4) Details of data display

Displays the details of selected data.

5) Measurement status

Displays the status of measurement. (Measuring/Stopping)

6) Position of data

Displays the position of selected data on the data monitor display.

(8 / 91 position of selected data/ position of last data)

While it is measuring, it displays the number of received data and lost data.

















7) Connection state display part

Displays the remote connection state between LE-PC7XCL and your analyzer.

8) Model name display part

Displays the model name of your analyzer being set at the time of offline, and one of your analyzer being connected at the time of online.

Functions of Data Window

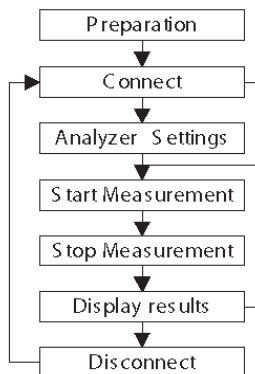
Menu	Tool Bar	Meaning
File		
Open data file...		Opens data files (extension .DT) ^{(*)1}
Save data file...		Names and saves the data displayed on the Data Window.
		Opens the previous file. ^{(*)2}
		Opens the next file. ^{(*)2}
Show data property		Displays the configuration and measurement time.
Exit application		Closes LE-PC7XCL.
Remote		
Connect		Connects to the analyzer
Disconnect		Disconnect to the analyzer.
Receive data		Receives the measured data from the connected analyzer.
Remote setting...		Sets remote settings.
Measurement		
Run Measurement		Starts measuring by the remote control.
Stop Measurement		Stops measuring by the remote control.
Analyzer setting...		Set the analyzer.
		Sets the data retrieval conditions and finds it.
		Finds the previous data.
		Finds the next data.
Tool		
Text conversion		Performs text conversion.
Key emulation		Performs key emulation.
Difference timestamp		Displays the difference of timestamp (compares to the last timestamp)
Watch data Setting	<i>ID</i>	Sets the "ID" to display the watch data.
J1939 display Setting	<i>J</i>	Sets the translation display of parameter defined in J1939.
Help		
Contents...		Displays the help file.
About...		Displays the version of the software.

*1: The file except OP-SB7XC/OP-SB7XL data cannot be opened.


*2: Cannot open the data which is named, or data files are not in order.

Steps

Operation procedure of LE-PC7XCL to save measured data in the PC is below.




Step 1. Preparation

When using LE-PC7XCL at the first time, press “” (or press [Remote] in the menu bar.) Set the place for saving data and so on.

* “Remote” setting is described at Chapter5.

Step 2. Connect

After setting “Remote”, check the connection with the analyzer. Press “” (or [Remote] -> [Connect])

It will ask to make a saving folder if it cannot find the place for saving data. Press “OK”. (If “Cancel”, it cannot connect with the analyzer)


*If it cannot find the place for saving data, it will make a saving folder such as below.

...\\My Documents\\LEPC7XCL\\Remote\\Buffer

...\\My Documents\\LEPC7XCL\\Remote\\Screen

Step 3. Analyzer Settings


Before starting measurement, it is necessary to set the communication conditions.

Press “” to set by the remote control. (or [Measurement] -> [Analyzer settings])


- * It is not necessary if settings are set by the analyzer.
- * Analyzer settings are automatically reflected in the software. (“Setting synchronization” is set as the default.

Step 4. Start Measurement

Start measurements if analyzer settings are all done.



Press “” to start measurement. (or [Measurement] -> [Run measurement])

Step 5. Stop Measurement

Click “” to stop measurement. (or [Measurement] -> [Stop measurement])


- * Mark on the box of “Full stop” from “Remote monitor” in the “Remote setting” to stop measuring automatically when block count reaches to the maximum number.

Step 6. Display Results


After the measurement, the last data file will be loaded in the screen. To display the previous file, press “”. To display the next data, press “”. Name the data file if necessary.

- * Details of the data display is described at Chapter7

Step 7. Disconnection

When finishing the application, press “”. (or [Remote] -> [Disconnect] in the menu bar.)

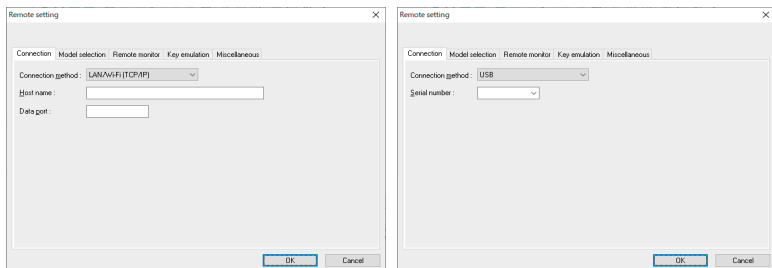
Remote Setting

Click “” on the tool bar of the data window (or [Remote Setting] of [Remote] menu) to set the remote setting.

The remote setting consists of “Connection”, “Model selection”, “Remote monitor”, “Key emulation” and “Miscellaneous” page. Press “OK” when finishing the settings.

■ Connection

Sets the remote connection



● “Connection Method”

Select a connection method to connect with the analyzer.

- USB: Connect via USB port.
- LAN/Wi-Fi(TCP/IP): Connect via Wi-Fi

<USB>

● “Serial number” (USB)

Set the serial number of the analyzer to be controlled.

You can select it from the drop down list when the analyzer is connected.

< LAN/Wi-Fi(TCP/IP)>

● “Host name”

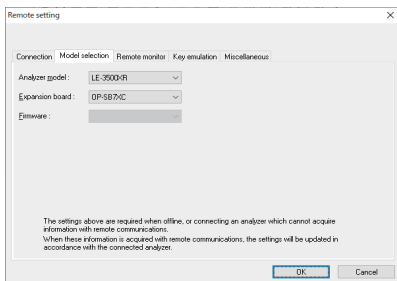
Set the IP address of the analyzer.

● “Data Port”

Set the port number for the send/receive of the measured data. Set the same port number set to the analyzer.

■ Model selection

Sets your analyzer settings. Mainly, it is used at the time of offline. However in the case of that there is information which is not received by remote communication at the time of online, it is used as it is set. In addition, if the information is received by remote communication, these settings are automatically changed.



- "Analyzer model"

Selects the model name of the target analyzer.

- "Expansion board"

Selects the expansion board which is equipped with a target analyzer.

Select OP-SB7XC or OP-SB7XL.

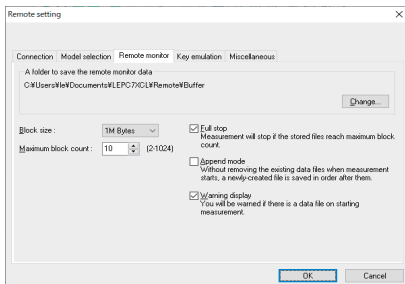
- "Firmware"

Sets when you use optional firmware on the target analyzer.

This is for future use. Not available now.

■Remote monitor

Sets the remote monitor



- “A folder to save the remote monitor data”

This folder is to save data received by your analyzer for the remote monitor function.

To change the setting, click “Change” button. Then the window to select a folder appears. Select the proper folder and click “OK” button. The file name of saving data is started from “00000000.DT” in numerical order.

* Recommends to specify an exclusive folder.

* Specify a drive which has enough capacity.

(When it does not have enough capacity, the PC may not operate correctly.)

- “Block size”

Sets the data capacity per file. You can select from “1M Byte”, “2M Byte”, “4M Byte”, “8M Byte”, “16M Byte”, “32M Byte”

- “Maximum block count”

Sets the maximum block count of a file to save. You can set from 2 to 1024. When the number of the data file is over this setting, the data file with a small number file is deleted.

- “Full stop”

If the stored files reach to the maximum block count, measurement will automatically stop.

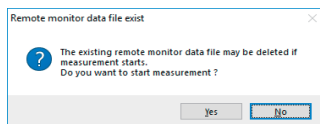
- “Append mode”

When measurement starts, a newly-created file is saved in the order after the existing files. The file name of saving data is started from [0000000.DT] in numerical order.

If the numbers of the whole data files are over the maximum block count setting, a data file with a small number file (includes data files which were saved on the former measurement) is deleted even in the append mode.

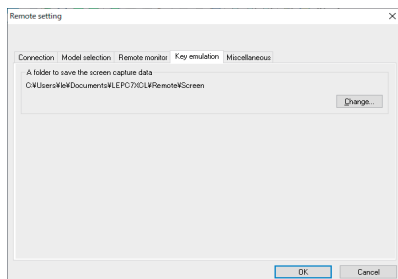
- “Warning display”

You will be warned if there is a data file in the files to save when starting measurement.



- Key emulation

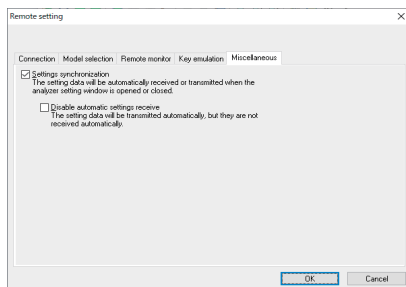
Sets the key emulation.



- “A folder to save the screen capture data”

A folder to save a screen image when you save it on the key emulation screen. Click [Change] and the folder selecting window appears. Select the folder and click [OK].

■Miscellaneous



- “Settings synchronization”

Transmits and receives the setting automatically at the time of the opening and closing the analyzer setting window.

However, at the time of OFF-Line, and settings changed while measuring, settings are not sent to the analyzer automatically.


- “Disable automatic settings receive”

It automatically sends the settings to the analyzer. But it will not receive the settings from the analyzer automatically.


Chapter 6 Remote Monitor

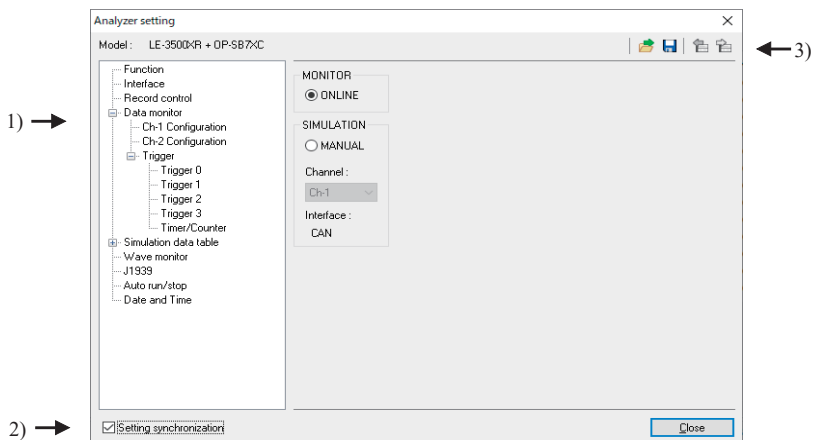
This function allows to start measurement of your analyzer and to record measurement data in the SSD/HDD of the PC.

Connection

After setting the “Remote setting”, click “” to connect with the analyzer. (or [Remote] -> [Connection] in the menu bar.) When it completes the connection, it displays “Online” and “model name” in the data window. While using the remote monitor, you cannot operate by the analyzer.

Analyzer Setting

Click “” on the tool bar of the data window to set you analyzer (or click [Analyzer setting]-> [Measurement] in the menu bar.)



1) Analyzer setting window





On the analyzer setting window, every time you change the setting on a tree (on the left side of the window), the contents of the setting (on the right) are changed. Set the necessary settings.

* To have the remote monitoring for long hours do not set the configuration of stopping the measurement automatically, such as “Write Control: Full Stop”, “Trigger Action: Stop measurement” and “Auto Run” .

2) Setting Synchronization

Setting information in the analyzer can be synchronized with the settings in the software.
Go to [Remote setting] -> [Miscellaneous] .

3) Tool Bar

Tool Bar	Meaning
	Capture settings from a file (.SU format)
	Name and save the setting (.SU format)
	Transmit settings to the analyzer.
	Receive setting from the analyzer.

Start Measurement

Click “ ● ” in the data window and starts measurement. (or [Measurement] -> [Run measurement].) When starting the measurement, “Watch data” window will appear and data on the “data monitor” window will be cleared.

While it is measuring, received frames and numbers of data loss are displayed in the data position part on the status bar.

Stop Measurement

Click “ ■ ” in the data window and stops measurement. (or [Measurement] -> [Stop measurement].)

Data will be saved in the specified folder automatically. After stopping the measurement, the last data file will be loaded in the data monitor screen automatically.

Max Frames of Remote Monitoring

Max frames of recording without any data loss is different by the connection method to the PC.
Refer to the followings.speed.

USB connection : Max. 5Mbps

Wi-Fi connection : Max. 400Kbps

* This is the result under the test environment of LINEEYE when the analyzer monitors CAN FD standard data frame (64 byte) with 1ms interval.

For Wi-Fi connection, depending on the radio condition the speed may be lower than above value.

- It will cause the data loss if the actual communication speed is more than the max. speed. And PC will stop the action until the analyzer process all measured data to the PC.
- Key emulation mode will decrease the max. speed.

Data Monitor Display

After measuring, it displays CAN/LIN/CXPI frame data monitored by the analyzer. (cannot display data at real time.)

To display data in the PC, memory card or USB flash drive, to display data from a memory card or a PC, click “📁” (or [File] -> [Open data file] from menu bar) and then select the data file (extension .DT) and click “OK”. To display sequential named data file, press “⏪”(previous) or “⏩”(next).

If controlling via USB or Wi-Fi, click “🌐” on the Tool Bar (or [Remote] -> [Connect] from menu bar) to make it ON-Line and then click “📡” (or [Remote] -> [Receive data] from menu bar).

Time	Ch	(Ptype-)ID	Type	DLC	St	Data	FC	T1234	IN1	IN2	IN3
27:12.045	1	1AB89DE3	FData	4	G	FE DC BA 98	01 D5 78	01000	+6.92	0.00	0.00
27:12.067	1	555	FData	64	G	01 23 45 67 89 AB CD 01 23...	04 4C 3A	01000	+6.92	-0.03	0.00
27:12.068	1	04F	FData	7	G	AB 96 42 BA ED C6 05	01 81 29	01000	+6.92	-0.03	0.00
27:12.111	2	5A [DA]	Frame	5	G	45 67 89 AB CD	78	01000	+6.84	-0.03	-0.03
27:12.167	1	555	FData	64	G	01 23 45 67 89 AB CD 01 23...	04 4C 3A	01000	+6.72	0.00	-0.03
27:12.175	1	1AB89DE3	FData	4	G	FE DC BA 98	01 D5 78	01000	+6.68	-0.03	0.00
27:12.216	1	04F	FData	7	G	AB 96 42 BA ED C6 05	01 81 29	01000	+6.65	-0.03	-0.03
27:12.267	1	555	FData	64	G	01 23 45 67 89 AB CD 01 23...	04 4C 3A	01000	+6.53	0.00	-0.03
27:12.305	1	1AB89DE3	FData	4	G	FE DC BA 98	01 D5 78	01000	+6.48	+0.03	+0.03
27:12.316	2	01 [01]	Frame	10	G	00 01 02 03 04 05 06 07 08 ...	C1	01000	+6.41	-0.03	-0.03
27:12.367	1	555	FData	64	G	01 23 45 67 89 AB CD 01 23...	04 4C 3A	01000	+6.41	-0.03	0.00
27:12.368	1	04F	FData	7	G	AB 96 42 BA ED C6 05	01 81 29	01000	+6.41	-0.03	0.00
27:12.435	1	1AB89DE3	FData	4	G	FE DC BA 98	01 D5 78	01000	+6.22	0.00	0.00

00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F	0123456789ABCDEF	
00	01	23	45	67	89	AB	CD	01	23	45	67	89	AB	CD	01	23	# 00: ... # 00: ... #
10	45	67	89	AB	CD	01	23	45	67	89	AB	CD	01	23	45	67	# 01: ... # 01: ... #
20	89	AB	CD	01	23	45	67	89	AB	CD	01	23	45	67	89	AB	# 02: ... # 02: ... #
30	CD	01	23	45	67	89	AB	CD	01	23	45	67	89	AB	CD	01	# 03: ... # 03: ... #

Stopping 34 / 341 [00000017.DT] Online LE-3500XR + OP-SB7XC

* If there is a data loss, it displays “Lost Data” at “Time” in the data monitor display.

Meaning of the Displays on the Data Window

	Meaning
Time	Displays the time (timestamp) when the frame is received.
deltaT	Displays the difference of timestamp. (compares to last timestamp)
Ch	Displays the received channel. (1: Ch1, 2: Ch2) For external input data, "Ext" is displayed.
Break	Displays the number of bit of LIN BreakField width.(In CAN/CXPI, it is not displayed)
Synch	Displays LIN Synch Field.(In CAN/CXPI, it is not displayed)
ID	In CAN, displays the ID of received frame in HEX. In LIN, displays an Identifier without parity and an Identifier with parity in HEX in []. e.g. 11110101->35 [F5] For event trigger type of CXPI, ID without parity is displayed in HEX. (PID with parity is enclosed with []) e.g.10000011->03[83] For polling type of CXPI, PTYPE and ID without parity is displayed in HEX. (PID with parity is enclosed with []) e.g.00-03[83]
Type	Displays the types of received frame Data : Data frame of CAN (Data transmission) Remote : Remote frame of CAN (Request for data) Error : Error frame of CAN FData : BRS=0, ESI=0 CAN FD Frame FData! : BRS=0, ESI=1 CAN FD Frame FData* : BRS=1, ESI=0 CAN FD Frame FData*! : BRS=1, ESI=1 CAN FD Frame Frame : Normal frame of LIN/CXPI BFrame : Burst frame of CXPI Wakeup : Wake up pulse of CXPI Illegal : Illegal frame of LIN/CXPI
DLC	In CAN/CXPI, displays the contents of data length cord(number of data byte) in decimal. In LIN, displays the data length which is set on the configuration screen of the analyzer in decimal. (If the "Frame end" is set in "time", this is not displayed.)
St	Displays whether or not the frame is normal. (Refer to "St Display")
Data	Displays the contents of data field in HEX Max 51 bytes.
FC	Displays CRC for CAN/CXPI and contents of checksum for LIN in HEX.
T1234	Displays the digital value in TRG IN and TRG IN1 to IN4. (0=Low, 1=High)
IN1 to 4	Displays the analog value in IN1 to IN4.
TRG	Displays the frame of which trigger is generated.

◆ St Display

St	Meaning
G	Normal frame
A	ACK error of CAN/CAN FD.
F	Form error of CAN/CAN FD or framing error of LIN/CXPI .
C	CRC error of CAN/CAN FD/CXPI or Checksum error of LIN.
E	Error frame of CAN/CAN FD.
B	BreakField error of LIN.
S	SynchField error of LIN.(Dominant is 10 bit)
P	Parity error of LIN/CXPI.
L	Data length error of LIN/CXPI.
R	No response field of LIN.

◆ Miscellaneous

Display	Meaning
()	Framing error (when the stop bit is dominant) Example: (01)

◆ Data display

Selected data is displayed in the bottom of window.

Framing error (stop bit is dominant) is displayed with ##.

Watch Data Display

Displays the latest ID frame data by using “Watch data setting”. It updates the data every second and displays only the latest data .When stopping the measurement, it cannot update data.

No	Time	Ch	ID	Type	DLC	Data	FC	T1234	IN1	IN2	IN3
0	24:11.170	1	010	FData	64	01 23 45 67 89 AB CD 01 23...	00 09 54	00000	+0.00	+0.00	-0.01
1	24:19.249	1	00000010	FData*1	5	15 92 6A 37 B8	00 97 44	00000	+0.00	+0.00	+0.00
2	24:16.055	2	10[10]	Frame	2	55 AA	2F	00000	+0.00	+0.00	+0.00
3											
4											
5											
6											
7											
8											

* Only Time, Ch, ID, Type, DLC, Data , FC, T1234, IN1 to IN4 are displayed.

* Watch data display cannot be saved, edited or printed.

* It is deleted after starting the measurement.

Watch Data Settings

Click “**ID**” (or [Tool] -> [Watch data settings]) and set the frame ID to watch. It is possible to change this setting while measuring.

	Channel	Frame Type	ID		Channel	Frame Type	ID
No.0	Ch-1	Standard	010	No.8	Ch-1	Standard	
No.1	Ch-1	Extended	00000010	No.9	Ch-1	Standard	
No.2	Ch-2	Standard	010	No.A	Ch-1	Standard	
No.3	Ch-1	Standard		No.B	Ch-1	Standard	
No.4	Ch-1	Standard		No.C	Ch-1	Standard	
No.5	Ch-1	Standard		No.D	Ch-1	Standard	
No.6	Ch-1	Standard		No.E	Ch-1	Standard	
No.7	Ch-1	Standard		No.F	Ch-1	Standard	

Include all frames.

OK Cancel

■ [Channel]

Ch-1 : CAN1/ LIN1/CXPI1 frame Ch-2 : CAN2/ LIN2/CXPI2 frame

■ [Frame Type]

Standard : CAN standard format /LIN/CXPI standard format

Extended : CAN extended format

■ [ID]

Set the ID to watch in HEX. If nothing is input, it cannot watch data.

CAN standard format :specify in the range of 0 to 7FFh

CAN extended format :specify in the range of 0 to 1FFFFFFFh

LIN :specify in the range of 0 to 3Fh

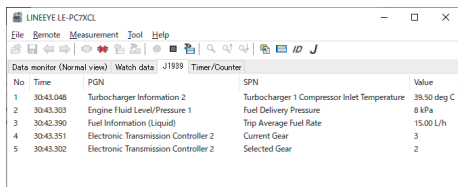
CXPI :specify in the range of 0 to 7Fh

■ [Include all frames]

If selecting it, it displays all frames including remotes and errors, that matches with ID.

J1939 Display

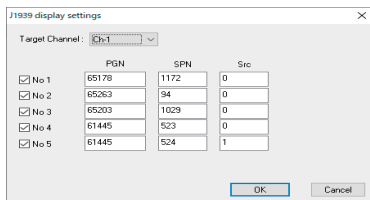
It is able to translate a part of parameter which is defined in SAE J1939-71 (Rev.2013-12).
Refer to the help file for more information of parameter.
Only the latest data is displayed and data is updated every second.
When the measurement ends, it does not update data.



- * J1939 display cannot be saved, edited or printed.
- * Measured value is all cleared after restarting the measurement.
- * J1939 settings on the LE-PC7XCL are not linked with the settings on the analyzer.

J1939 Display Settings

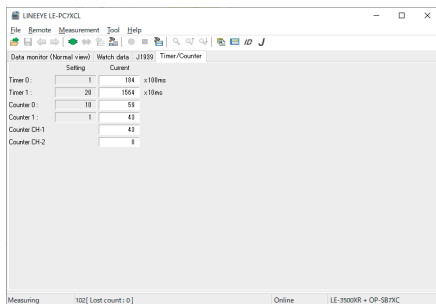
On the tool bar, click “J” (or menu->[Tool]->[J1939 display settings]).
It is able to change J1939 display settings during the measurement.



- [Target Channel]
Select the interface channel for target frame to translate.
Ch-1: CAN1 is the target
Ch-2: CAN2 is the target
- [No1 ~ 5]
Mark on the box to translate.
- [PGN]
Input “Parameter Group Number” in decimal.
- [SPN]
Input “Suspect Parameter Number” in decimal.
- [Src]
Input “Source Address” in decimal.

Timer/Counter Display

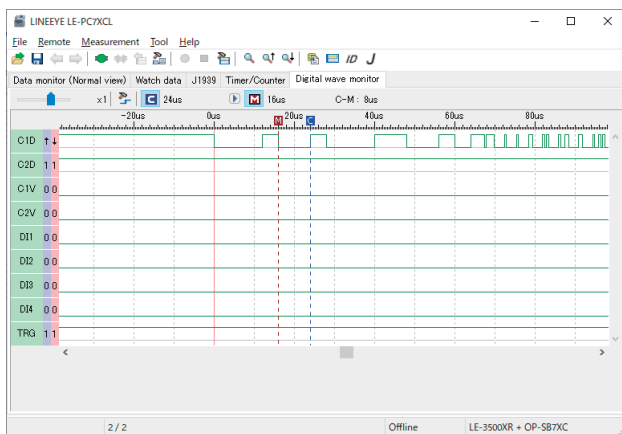
To display timer/counter which is used in trigger function, click the tab of [Timer/Counter].












- Timer 0 to Timer 1 : General timer
- Counter 0 to Counter 1 : General counter
- Counter CH1/CH2 : Number of received frames on channel 1 or channel 2.


Chapter 8 Digital Waveform Monitored Data

It is able to display digital waveform monitored data if the analyzer measures logic analyzer data.



- Scaling factor Move the slider “  x1 ” and select the scaling factor.
- Cursor display Press “  ” and double-click the waveform display to display the cursor at that position. When you press “  ” again, the cursor disappears.
- Marker display Click “  ” or “  ” to display the marker at the cursor position. When you press “  ” again, the marker display disappears.
- Time measurement Drag “  ” and “  ” on the screen of the wave monitor to the position you wish to measure. “C-M:***” shows the time between the cursor and the marker (eg. The image above indicates C-M: 8us.).
- Signal display order setting Click “  ” to set the order of signals on the display .

Chapter 9 Data Search

To search data, click “” on the Tool Bar in the Data Window. Set some factors on the data search window.

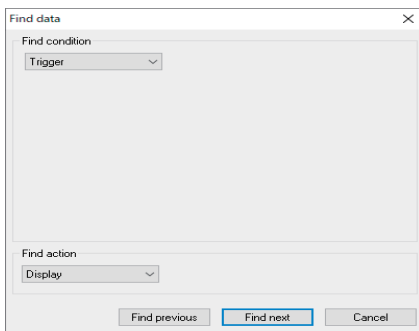
(It cannot search data unless displaying data on the screen.)

FACTOR

There are six factors(Trigger, Error, CAN Data, CAN Remote,LIN Data,CXPI Data, Timestamp, External) to search.

◆ Trigger

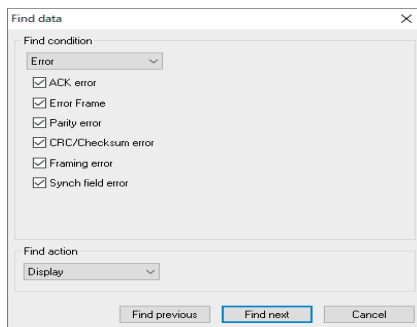
Search the frames of which trigger is generated.



◆ Error

Search for CAN/CAN FD ACK error, error frame, LIN/CXPI parity error, framing errors, CAN/CAN FD/LIN/CXPI CRC/checksum errors, and LIN sync field errors.

Select error condition.



◆ CAN/LIN/CXPI data

It is able to retrieve CAN data frame or LIN/CXPI frame by selecting the target channel, ID and data.

Find data

Find condition

CAN Data

Target channel: Ch-1

Standard ID 10-0: * * * * *

Extended ID 17-0: * * * * *

Data: * * * * * Offset: 0

Bit mask W0: * * * * *

Bit mask W1: * * * * *

Bit mask W2: * * * * *

Find action

Display

Find previous Find next Cancel

- Target channel

Select the receiving channel to search, either from Ch1 or Ch2.

- ID

Set the ID from upper rank in bit unit. (0, 1, or don't care (*)).

For CAN

For extended format, input ID with 17 to 0 in the extended ID, and input ID with 10 to 0 in the standard ID.

For standard format, set ID with 10 to 0 in the standard ID.

For LIN

Set ID with 5 to 0.

For CXPI

Set ID with 6 to 0.

Example of ID setting.

- CAN extended format, ID=12345CDEh

Standard ID 10-0	1	0	0	1	0	0	0	1	1	0	1							
Extended ID 17-0	0	0	0	1	0	1	1	1	0	0	1	1	0	1	1	1	1	0

- CAN standard format, ID=24Dh

Standard ID 10-0	0	1	0	0	1	0	0	1	1	0	1						
Extended ID 17-0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*

- LIN, ID=2Dh

ID 5-0 :	-	-	1	0	1	1	0	1
----------	---	---	---	---	---	---	---	---

- CXPI, ID=2Dh

ID 6-0 :	-	0	1	0	1	1	0	1
----------	---	---	---	---	---	---	---	---

- Data

Input the data to search in the data line (D0 to D7 from the left box) in HEX.

Also, it is able to set don't care (*) and bit mask (W0, W1, W2) for each byte of data.

Data :	W0	42						
Bit mask W0 :	*	*	*	*	0	0	0	1
Bit mask W1 :	*	*	*	*	*	*	*	*
Bit mask W2 :	*	*	*	*	*	*	*	*

This example shows that Data D0 searches “01h to F1h”, and D1 searches “42h”.

- Bit mask W0 to W2.

To set bit mask, input 0, 1 or don't care (*) in the W0, W1 and W2. (7bit to 0bit from the left box)

- Offset

Set the position of target data as off set.

◆ CAN Remote

Search the specific CAN remote frame conditions set in Channel and ID.

The 'Find data' dialog box is shown with the following settings:

- Find condition:** CAN Remote
- Target channel:** Ch-1
- Standard ID 10-0:** A row of 11 'x' characters.
- Extended ID 17-0:** A row of 17 'x' characters.
- Find action:** Display
- Buttons:** Find previous, Find next (highlighted), Cancel

- Target channel

Select the receiving channel (to search either from Ch1 or Ch2).

- ID28 to 0

Set the ID with bit unit (0, 1, don't care (*))

For CAN extended format, set the ID in extended ID and standard ID.

For CAN standard format, set the ID in the standard ID.

◆ Timestamp

It is able to find the specific timestamp. Only timestamp units of [Hour:Min:Sec] or [Min:Sec.1ms] are available.

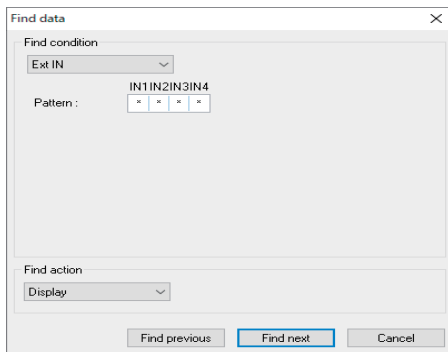
The 'Find data' dialog box is shown with the following settings:

- Find condition:** Time stamp
- Minimum time stamp:** 00 : 00 : 00 . 00
- Maximum time stamp:** 00 : 59 : 59 . 99
- Find action:** Display
- Buttons:** Find previous, Find next (highlighted), Cancel

◆ Ext IN

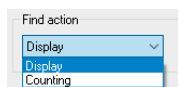
Search the level(0=Low, 1=High) in the external input (IN1 -4).

It is possible to set the don't care(*).



ACTION

There are two action types, “Display” and “Counting” to display the result of search.



◆ Display

Display the data that matches the search conditions.

When it finds the matched frames, the first frame will be highlighted.

LINEEVE LE-PC7XCL

File Remote Measurement Tool Help

Data monitor (Normal view) Watch data J1939 Timer/Counter

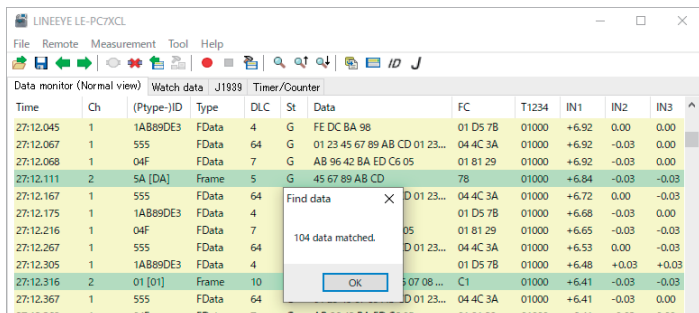
Time	Ch	(Ptype-)ID	Type	DLC	St	Data	FC	T1234	IN1	IN2	IN3
27:12.045	1	1A89DE3	FData	4	G	FE DC BA 98	01 D5 7B	01000	+6.92	0.00	0.00
27:12.067	1	555	FData	64	G	01 23 45 67 89 AB CD 01 23...	04 4C 3A	01000	+6.92	-0.03	0.00
27:12.068	1	04F	FData	7	G	AB 96 42 BA ED C6 05	01 81 29	01000	+6.92	-0.03	0.00
27:12.111	2	5A [DA]	Frame	5	G	45 67 89 AB CD	78	01000	+6.84	-0.03	-0.03
27:12.167	1	555	FData	64	G	01 23 45 67 89 AB CD 01 23...	04 4C 3A	01000	+6.72	0.00	-0.03
27:12.175	1	1A89DE3	FData	4	G	FE DC BA 98	01 D5 7B	01000	+6.68	-0.03	0.00
27:12.216	1	04F	FData	7	G	AB 96 42 BA ED C6 05	01 81 29	01000	+6.65	-0.03	-0.03
27:12.267	1	555	FData	64	G	01 23 45 67 89 AB CD 01 23...	04 4C 3A	01000	+6.53	0.00	-0.03
27:12.305	1	1A89DE3	FData	4	G	FE DC BA 98	01 D5 7B	01000	+6.48	+0.03	+0.03
27:12.316	2	01 [01]	Frame	10	G	00 01 02 03 04 05 06 07 08 ...	C1	01000	+6.41	-0.03	-0.03
27:12.367	1	555	FData	64	G	01 23 45 67 89 AB CD 01 23...	04 4C 3A	01000	+6.41	-0.03	0.00
27:12.368	1	04F	FData	7	G	AB 96 42 BA ED C6 05	01 81 29	01000	+6.41	-0.03	0.00
27:12.435	1	1A89DE3	FData	4	G	FE DC BA 98	01 D5 7B	01000	+6.22	0.00	0.00

◆ Counting

Display the number of data that matches the search conditions.

When it finds the matched frames, the number of frames will be displayed.

(The data which is highlighted will not be included.)



Start Data Search

1. Select one factor from Trigger, Error, Data, Remote, Timestamp or External to search.
2. Set the search conditions.
3. Select the action either from "Display" or "Counting".
4. Click [Find Previous] or [Find Next].
5. To search continuously, click "Find next" or "Find previous" on the Tool Bar.

Only one factor selected from Trigger, Error, Data, Remote, Timestamp or External will be searched. (Not "AND" condition)

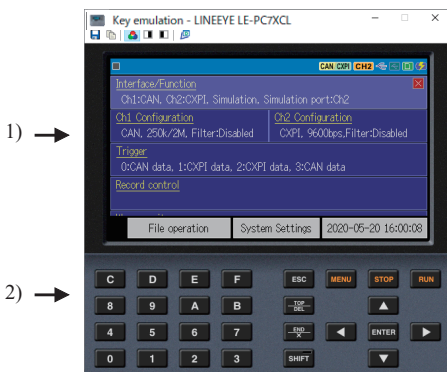
When finishing the application, the search conditions will be cleared.

Chapter 10 Key Emulation

This function allows to control the analyzer from a far place. (remote control)

Key Emulation

Click “” on the Tool Bar in the Data Window (or [Remote] -> [Connect] from menu bar) to make the analyzer On-Line. And then click “” (or [Tool] -> [Key emulation] from menu bar).



1) →

2) →







1) Displays the screen of your analyzer being connected.

2) Emulate the key of your analyzer.

* It cannot operate “Key emulation” without connecting to the analyzer.

Save the Screen Image


It is possible to save the screen image of analyzer in bitmap(BMP) file format.

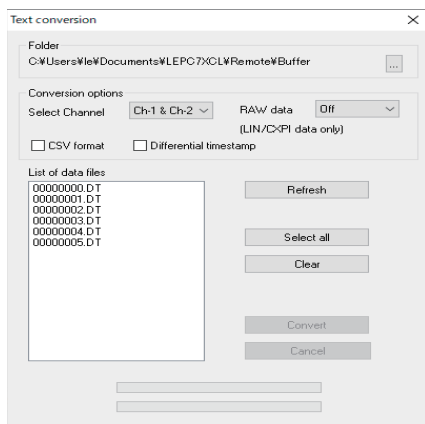
Button	Meaning
	Saves the current screen display as a bitmap file.
	Copy the present screen to the clipboard.
	Create a bitmap file in a gray scale mode.
	Create a bitmap file in a gray scale mode.(inverted)
	Create a bitmap file in a color mode.
	Activates the main window.

Chapter 11 Text Conversion

This function allows to convert the data which is measured on the remote monitor, and which is saved on a memory card or SSD/HDD into a text file.

Text Conversion Function Setting

Click “” on the toolbar of the data window (or [Tool] -> [Text conversion] from menu bar).



- Folder
Specify a folder which has the data to convert into text.
- Conversion options
Select options for text conversion.
 - Select Channel
Select a channel from Ch-1, Ch-2 or Ch-1&Ch-2.
 - RAW data
This is only for LIN/CXPI data.
OFF :Does not include parity bit of ID.
Display the framing error data as “###”
ON :Display ID including parity bit in HEX.
Display the framing error data in HEX.
 - CSV format
Mark this box to output the file in CSV format.
 - Differential timestamp.
Mark this box when to output the difference of timestamp. When outputting the file in CSV format, it will output the difference of timestamp every time.

- “List of data files”
Select a file to perform the text conversion. When clicking the file, it will be selected. When clicking the file one more time, the selection will be cleared.
(It is possible to select the multiple files.)
- “Refresh”
Update the list of data files.
- “Select all”
Select all files displayed in the list of data files.
- “Clear”
Clear all files selected in the list of data files.
- “Convert”
Selected data files will be converted into text format.
- “Cancel”
Cancel text conversion.

Start Text Conversion

1. Select a folder which has data to convert into text format.
2. Set the conversion options.
3. Select a file to convert from the list of data files.
4. Click “Convert”.

After the text conversion, data will be saved in the same file as before, and the file name will be the same name plus “.txt” at the end.

If marking the “CSV format” box, the file name will be the same name plus “.csv” at the end.

Chapter 12 Specification

Applicable analyzer	LE-2500XR or LE-3500XR with OP-SB7XC or OP-SB7XL.	
Connection	USB, Wi-Fi	
Number of analyzers	Connect only one analyzer and have remote control function.	
Measurement conditions	Measurement conditions (communication parameters, triggers and simulation data)	
Key emulation	Displays the analyzer's display and keys on the PC screen and can perform the analyzer remote control.	
Remote monitor ^{(*)2}	Starts/stops the measurement, displays the measurement data on the PC screen, and records the data continuously.	
	Recording mode	Fixed buffer mode: Measures data up to the specified size and stop automatically. Ring buffer mode : Records the latest data of the specified size endlessly.
	Recording capacity	Max.32GB : Can be specified up to 1,024 files in the unit of 32MB.
Display	Standard display	Timestamp (differences between timestamps) Frame display of CAN/LIN/CXPI (BreakField ^{(*)1} , SynchField ^{(*)1} , ID, TYPE, DLC, DATA, Checksum ^{(*)1} /CRC, error), matched trigger, external input.
	Watch data	Timestamp, CAN/LIN/CXPI frame display (BreakField ^{(*)1} , SynchField ^{(*)1} , ID, TYPE, DLC, DATA, Checksum/CRC)
	J1939 display	Translate a part of parameter which is defined in SAE J1939-71 (Rev.2013-12).
	Timer/Counter display	Display the value of timer/ counter used in trigger function. Timer 0 to 1 : General Timer Counter 0 to 1 : General Counter Counter CH1/CH2 : Counter for received f rames in Channel 1/2.
	Digital waveform monitor display	Scale-up or scale-down the waveform of logic analyzer. (Counting time and changing the order of lines are possible.)
Search	Displays the data or number of data that matches the search.	
	Searching Conditions	Trigger : Trigger matching frame Error : ACK error, Error frame, Parity error, CRC/Checksum error, Framing error, Sync field error ^{(*)1} Data : Specified ID (don't care(*) can be set) Character string (up to 8 character, don't care(*), bit mask can be set) Remote : Specified ID (don't care(*) can be set) Timestamp : Specified timestamp. External : Logical status of external signal (IN1-4)
Text Conversion ^{(*)3}	Converts the recorded files into text format or CSV format.	
Save the Screen Images	Saves the screen image of analyzer displaying by Key emulation function in bitmap file.	
System Requirements	PC	RAM : 1GB or more (recommended) SSD/HDD: 3MB+free space for saving the measurement data.
	OS	Windows 8.1/10
Accessories	CD (software), Instruction manual, Warranty.	

*1: LIN frame only.

*2: Light version can work only 10 minutes.

*3: Light version can convert only 3 files simultaneously.

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