

## PC Linke software *LE-PC87*

### 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-PC87 (or on the card packed with LE-PC87).

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# Chapter 1 Before Using the Product

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## Chapter 2 Introduction

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Thank you for your purchase of LINEEYE's PC Link Software, LE-PC87.

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

### Outline

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This software allows LE-8200A/LE-8200 to capture the monitored data measured by OP-SB87 (optional expansion kit) into a PC through a USB port, an AUX port (serial), or a memory card.

### Unpacking and Accessories

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

CD-ROM(Software)	: 1
Instruction Manual	: 1
Warranty	: 1

Please let us know if you find any damage to the product caused by transportation, or if there are accessories lacking.

## Chapter 3 Before Start-Up

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### Installation Guide

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1. Insert the CD-ROM into the CD-ROM drive.
2. From “Start” menu, select “Run”.
3. Input “D(specify the CD-ROM drive) : \setup” in the command line and click “OK”.
4. The installer program will start. To install, follow the set-up instruction.
5. Click “Finish” after “Finish the installation” is indicated.

### Uninstallation Guide

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1. From control panel, click “Add/Remove Programs”.
2. Select “LE-PC87” from the list, then click “Remove” button.

## USB Driver Installation

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This PC link software can control the analyzer via USB.

You need to install the USB driver to control the analyzer via PC.

USB driver is stored in the CD-ROM.

Supported OS are Windows 2000/XP/Vista/7/8.

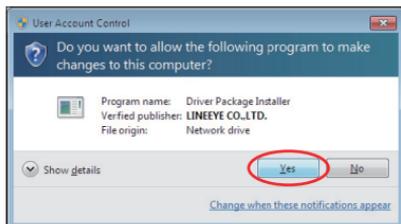
< Windows 2000/XP >

1. Connect USB port of this analyzer and USB port of the PC using a USB cable.
2. Turn on the power of analyzer. The detection wizard of the hardware will appear on the PC.
3. If the message appears that "Can Windows connect to Windows Update" to search for this time," and click "Next".
4. Select "Install from a list or specific location"," and click "Next".
5. Select "Search for the best driver in these locations." with checking the box "Include this location in the search." and designating the folder including the driver file. Then click "Next" to start installation.
6. In installing the driver ,if the message that it has not passed Windows logo testing, you can ignore that and click "Continue Anyway".
7. After finishing installation, the dialog "Completing the Found New Hardware Wizard" appears. Click "Finish" to close the dialog.

Above is the installation for Windows XP. It will be almost same for Windows 2000.

<Windows Vista/7>

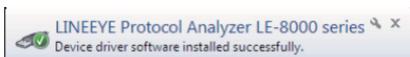
1. Set the attached CD-ROM into the CD-ROM driver of the PC that will be connected to LE-8200.
2. Execute "setup.exe" file in Driver folder of the attached CD-ROM.
3. "User Account Control" appers in the display of the PC.Then click "Yes".



4. "LINEEYE driver package installer" appears. Then click "Yes".
5. "Device Driver Installation Wizard" appears. Then click "Next".
6. Windows security window appears. Then click "Install".



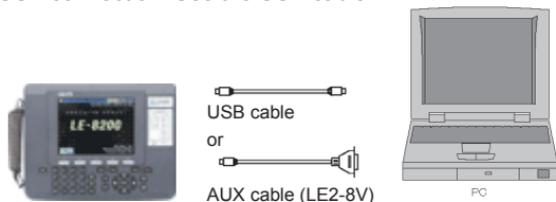
- 7.If the window says "Completing the Device Driver Installation Wizard", click "Finish".
- 8.Connect the analyzer to the PC.The installation is completed if the message like below is appears on the task tray.



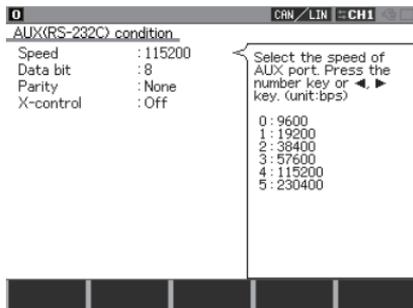
Above is the installation for Windows 7. It will be almost same for Windows Vista/8.

## Analyzer Setting

- 1) Serial connection: Connect the analyzer and a PC by the AUX cable (LE2-8V). USB connection: Use the USB cable.



- 2) Set the AUX port of the analyzer as follows if using the serial connection.  
(Not necessary to set the AUX port if using the USB connection.)



<Example of setting>

Speed: 115200bps  
Data length: 8-bit  
Parity: NONE (recommend)  
X-CONT (flow control ): OFF

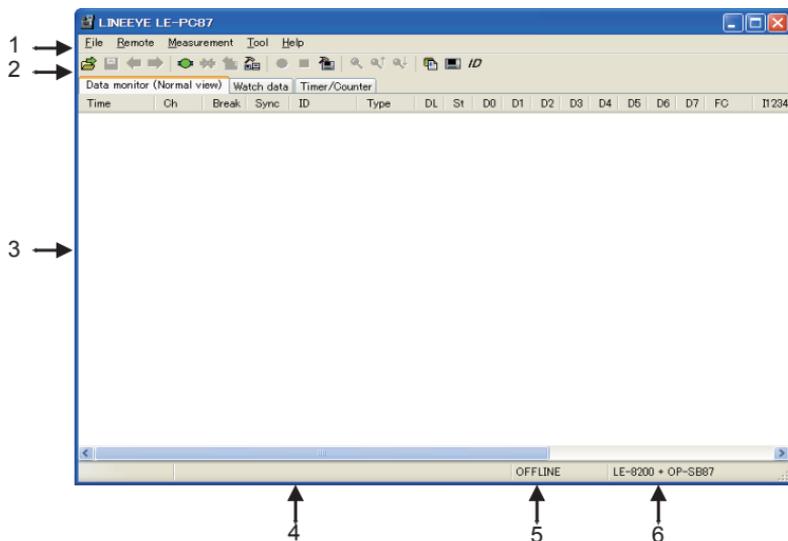
<Notice>

- \* Firmware of OP-SB87 should be Ver1.07 or above. If using the firmware below that, please update it.
- \* Do not turn off the analyzer when connecting to a PC.
- \* If using the AUX port for connection, do not put anything in the USB port.
- \* It may cause some data loss if using the AUX port for remote control compared to the USB port.
- \* When the PC goes into a power saving mode, LE-PC87 will be disconnected. Set off the power saving mode.
- \* Refer to the On-Line Help for other functions.

## Chapter 4 Data Window

### Explanation of the Data Window

From “Start” menu, click “Programs” or “All Programs” -> “LINEEYE” -> “LE-PC87” -> “LE-PC87”. The following display will be appeared.



#### 1.Menu

Performs various operations.

#### 2.Tool Bar

Performs various operations.

#### 3.Data Display

Displays measured data.

#### 4.Data Position Display

Tells you where you are pointing, out of whole data in the Data Display.

2 / 7

#### 5.ON-LINE/OFF-LINE Display

Tells you whether or not the analyzer is connected.

#### 6. Model Name of Analyzer

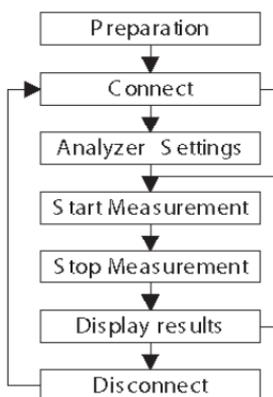
Shows the model name of analyzer and expansion kit when ON-Line. Shows the model name of analyzer which is set by the software when OFF-Line.

## Functions of Data Window

Menu	Tool Bar	Meaning
<b>File</b>		
Open data file...		Opens data files (extension .DT) <sup>(*)1</sup>
Save data file...		Names and saves the data displayed on the Data Window.
		Opens the previous file. <sup>(*)2</sup>
		Opens the next file. <sup>(*)2</sup>
Exit application		Closes LE-PC87.
<b>Remote</b>		
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.
<b>Measurement</b>		
Start		Starts measuring by the remote control.
Stop		Stops measuring by the remote control.
Analyzer setting		Set the analyzer.
		Sets the data conditions and finds it.
		Finds the previous data.
		Finds the next data.
<b>Tool</b>		
Key emulation		Performs key emulation.
Text conversion		Performs text conversion.
Display the difference of time stamp		Displays the difference of time stamp (compares to the last timestamp)
Watch data		Sets the "ID" to watch data.
<b>Help</b>		
About...		Displays the version of the software.

\*1: The file except CAN/LIN data cannot be opened.

\*2: Cannot open the data which is named, or the name is not in succession.



### Step 1. Preparation

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When using LE-PC87 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\LEPC87\Remote\Buffer

... \My Documents\LEPC87\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 [measure] -> [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

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Start measurements if analyzer settings are all done.

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

### Step 5. Stop Measurement

---

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

\*it will stop measurement when block size set in the “remote monitor” of “remote settings” becomes the maximum size.

### Step 6. Display Results

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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

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

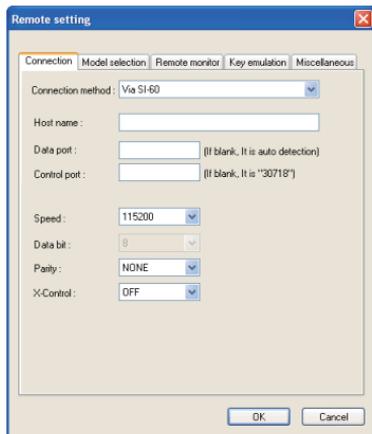
## Chapter 5 Environment Setting

### Remote Setting

Click “” on the Tool Bar (or [Remoto] -> [Remote Setting] in the menu bar) to set remote settings. In the “Remote Setting”, there are “Connection”, “Model selection”, “Remote monitor”, “Key emulation” and “Miscellaneous” page. Press “OK” when finishing the settings.

#### ■ “Connection” Page

Set conditions for remote connection.



#### ● [Connection method]

Select a connection method to connect with the analyzer.

##### “Serial port direct”

Select when connecting by the serial port on the PC or using the Serial-USB converter (LE-US232B etc.)

##### “USB”

Select when connecting by the USB port.

##### “Via SI-60”

Select when connecting via LAN-Serial converter (SI-60/60F).

(To learn more about settings of the converter, read the instruction manual of converter. To control via SI-60, you need to have LE2-8C, or LE2-8V and a Dsub25 (male) -9 (female) converter.)

<Serial port direct>

- [Serial port]

Select the Serial port of PC from COM1 - COM9. Or, input the COM port number if the COM port is above COM10.

<USB>

- [Serial number]

Sets the serial number of the analyzer. If the analyzer is connected, select from the drop down list.



<Via SI-60>

- [Data port]

Set the port number for transmitting and receiving serial data. Normally, do not put any number. If blank, it is auto detection. If the port number is changed by router or firewall etc., it needs to be set.

- [Control port]

Set the control port number of SI-60. Normally, do not put any number. If blank, it is auto detection. If the port number is changed by router or firewall etc., it needs to be set.

<Serial port direct / Via SI-60>

- [Speed]

Set the same speed as the AUX port setting on the analyzer.

- [Data bit]

Data bit is fixed to be 8 bit. Also the AUX port setting on the analyzer must be 8 bit.

- [Parity]

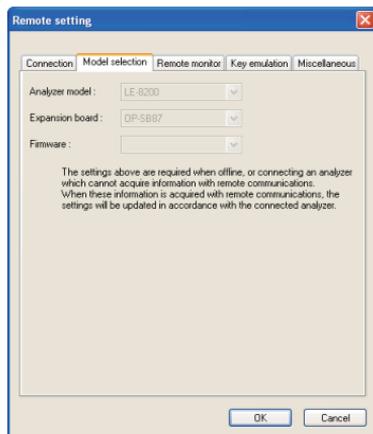
Set the same data parity as the AUX port setting on the analyzer. Normally, put "None".

- [X-Contro]

Set whether or not to use the flow control of X-Control for the communications between software and analyzer. Normally put "None".

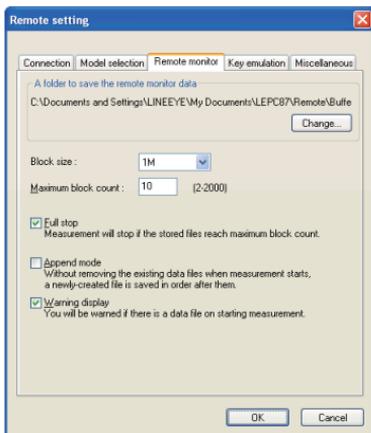
## ■ “Model selection” Page

Sets the analyzers setting. Mainly, it is for the time of Off-line.  
This is for expansion purpose only and cannot be used now.



## ■ “Remote monitor” Page

Sets the remote monitoring function.



- [A folder to save the remote monitor data]

This folder saves data received by the analyzer using the remote monitor function. To change the settings, 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 original folder.

Specify a drive which has enough capacity.

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

- [Block size]

Set the data capacity per a file. Select from “1MB”, “2MB”, “4M”, or “8MB”.

- [Maximum block count]

Set the number of maximum saving file. Set from 2 to 20000. When the number of the data file exceeds this setting, the measurement stops automatically.

- [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.

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.

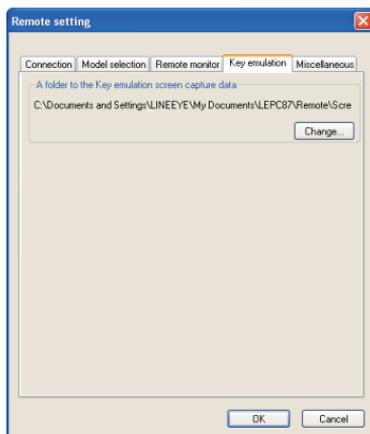
- [Warning display]

If there is an existing data file where data is going to be saved, warning message will appear when starting the measurement.



## ■ “Key emulation” Page

Set conditions for Key emulation.

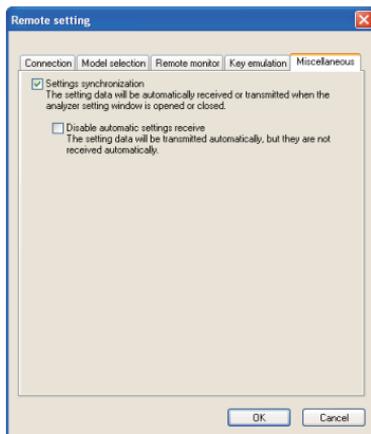


### ● [A folder to the Key emulation screen capture data]

This is the folder to save a screen image on the key emulation screen. Click [Change] and the folder selecting window appears. Select the folder and click [OK].



## ■ “Miscellaneous” Page



### ● [Settings synchronization]

At the time of ON-Line, when opening the analyzer setting window, it automatically reflects the settings of analyzer. When closing the window, it automatically sends the settings to the analyzer.

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

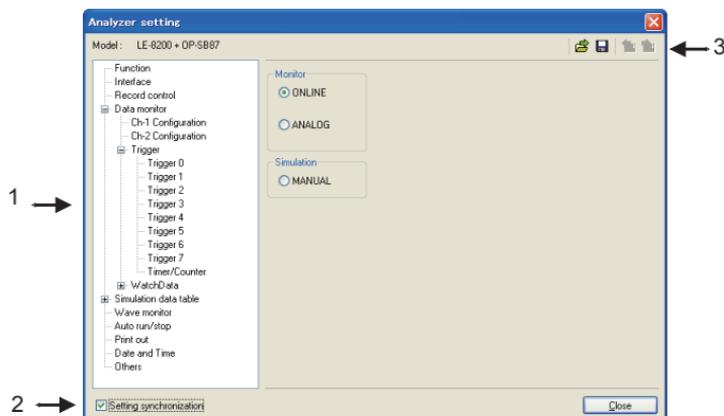
Measures by the analyzer and records data in the HDD of a PC.

### 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 “On-Line” and “analyzer model” in the data window. While using the remote monitor, you cannot operate by the analyzer.

### Analyzer Setting

Clicks “” in the data window and sets the analyzer settings. (or [measurement] -> [analyzer setting] in the menu bar)



#### 1. Analyzer setting window

When clicking a different setting in the bar, the settings in the right gray zone become different.

\*Do not set the configuration of stopping the measurement automatically, such as "Record Control: Full Stop", "Trigger Action: Stop" and "Auto Run" to have the remote monitoring for long hours.

## 2. Setting Synchronization

Setting information in the analyzer can be synchronized with the settings in the software. If changing this setting, it reflects the setting in the [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] -> [start measurement].) When starting the measurement, “watch data” window will appear and “data monitor” window will be cleared. “watch data” window displays the received frames, numbers of data loss, and number of files in the data position display (bottom).

## Stop Measurement

---

Click “” in the data window and stops measurement. (or [measurement] -> [stop measurement].) When the block size set in the [remote setting] -> [remote monitor] reaches the maximum block number, it stops the 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. Refere to the followings.

USB connection	: Approx.15000 frames/sec
Serial port direct (115.2Kbps connection)	: Approx. 140 frames/sec
Via SI-60 (230.4Kbps connection)	: Approx. 280 frames/sec

\*1: This is the max frames per second without any data loss. Even the speed of the target device is 1Mbps, it can measure data without any loss, if it does not exceed the above max frames.

■ It will cause the data loss if the actual communication speed exceeds the above speed. And PC will stop the action until the analyzer process all measured data to the PC.

■ Key emulation mode will decrease the maximum speed.

## Chapter 7 Data Display on the Data Window

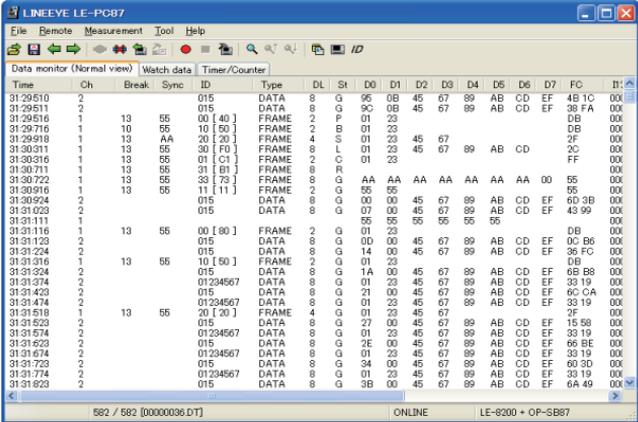
### Data Monitor Display

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

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 AUX port, 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	Break	Sync	ID	Type	DL	St	D0	D1	D2	D3	D4	D5	D6	D7	FC	It	
31:29:510	2			015	DATA	8	G	96	08	45	67	89	AB	CD	EF	4B 1C	00	
31:29:511	2			015	DATA	8	G	9C	08	45	67	89	AB	CD	EF	38 FA	00	
31:29:516	1	13	55	00 [ 40 ]	FRAME	2	F	01	23							DB	00	
31:29:716	1	10	55	10 [ 50 ]	FRAME	2	B	01	23							DB	00	
31:29:918	1	13	AA	20 [ 20 ]	FRAME	4	S	01	23	45	67					2C	00	
31:30:211	1	13	55	30 [ F0 ]	FRAME	8	L	01	23	45	67	89	AB	CD		2F	00	
31:30:316	1	13	55	01 [ C1 ]	FRAME	2	C	01	23							FF	00	
31:30:711	1	13	55	31 [ B1 ]	FRAME	8	R										00	00
31:30:722	1	13	55	33 [ 73 ]	FRAME	8	G	AA	00	55	00							
31:30:916	1	13	55	11 [ 11 ]	FRAME	2	G	55	55							55	00	
31:30:954	2			015	DATA	8	G	00	00	45	67	89	AB	CD	EF	6D 3B	00	
31:31:023	2			015	DATA	8	G	07	00	45	67	89	AB	CD	EF	43 99	00	
31:31:111	1							55	55	55	55	55	55				00	00
31:31:116	1	13	55	00 [ 80 ]	FRAME	2	G	01	23							DB	00	
31:31:123	2			015	DATA	8	G	0D	00	45	67	89	AB	CD	EF	0C B6	00	
31:31:224	2			015	DATA	8	G	14	00	45	67	89	AB	CD	EF	36 FC	00	
31:31:316	1	13	55	10 [ 50 ]	FRAME	2	G	01	23							DB	00	
31:31:324	2			015	DATA	8	G	1A	00	45	67	89	AB	CD	EF	6B B8	00	
31:31:374	2			01234567	DATA	8	G	01	23	45	67	89	AB	CD	EF	33 19	00	
31:31:423	2			015	DATA	8	G	21	00	45	67	89	AB	CD	EF	6C CA	00	
31:31:474	2			01234567	DATA	8	G	01	23	45	67	89	AB	CD	EF	33 19	00	
31:31:518	1	13	55	20 [ 20 ]	FRAME	4	G	01	23	45	67					2F	00	
31:31:523	2			015	DATA	8	G	27	00	45	67	89	AB	CD	EF	15 58	00	
31:31:574	2			01234567	DATA	8	G	01	23	45	67	89	AB	CD	EF	33 19	00	
31:31:623	2			015	DATA	8	G	2E	00	45	67	89	AB	CD	EF	66 BE	00	
31:31:674	2			01234567	DATA	8	G	01	23	45	67	89	AB	CD	EF	33 19	00	
31:31:723	2			015	DATA	8	G	34	00	45	67	89	AB	CD	EF	60 3D	00	
31:31:774	2			01234567	DATA	8	G	01	23	45	67	89	AB	CD	EF	33 19	00	
31:31:823	2			015	DATA	8	G	3B	00	45	67	89	AB	CD	EF	6A 49	00	

\* When controlling via AUX port on the analyzer, it may take some time to receive data from the analyzer if there is a large amount of data. Also, it cannot receive data while the analyzer is measuring.

\* If there is a data loss, it displays "LOSTDATA" at "Ch" in the data monitor display.

## Meaning of the Displays on the Data Window

	Meaning
Time	Displays the time (time stamp) when the frame is received.
deltaT	Displays the difference of time stamp. (compares to last time stamp)
Ch	Displays the received channel. (1: Ch1, 2: Ch2)
Break	Displays the number of bit of LIN Synch Break width. (In CAN, it is not displayed)
Sync	Displays LIN Synch Field. (In CAN, 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 [ ]. Example: 11110101= 35 [F5]
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 FRAME: Frame of LIN (Standard frame) ILLEGAL: Illegal frame of LIN.
DL	In CAN, displays the contents of data length code (number of data byte) in decimal. In LIN, displays the data length which is set on the CONFIG screen of the analyzer in decimal. (It can not be displayed when "FRAME END" is "TIME".)
St	Displays whether or not the frame is normal. (Refer to "ST Display")
D0 ~ D7	Displays the contents of data field in HEX.
FC	Display 2byte of CRC for CAN, and contents of Checksum in HEX for LIN.
IN1234	Displays the digital value in IN1 to IN4. (0=Low, 1=High)
Analog ch 1 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
B	SynchBreak error of LIN. (Dominant is 10 bit)
S	SynchField error of LIN. (other than 55h)
P	Parity error of LIN.
L	Data length error of LIN. (When "FRAME END" setting is "ID")
R	When there is no data in the response field of LIN.
C	Checksum error of LIN or CRC error of CAN.
A	ACK error of CAN.
E	Error frame of CAN.
F	Form error of CAN. (When CRC or ACK delimiter is "0") <sup>(*)</sup>

\*1:Support if OP-SB87 firmware is Ver1.05 or above.

### \* Miscellaneous

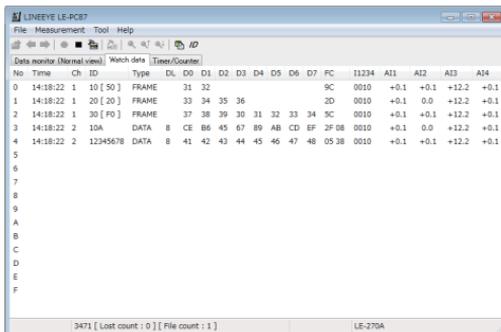
Display	Meaning
( )	Framing error (when the stop bit is dominant) Example: (01)

## 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.

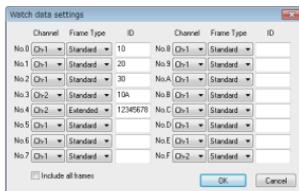
- \* If selecting [Include all frames] in the Watch Data Display setting, the target (displayed) frames will be changed.

Displayed items are Time, Ch, ID, Type, DL, D0-D7, FC, IN1234 and AI1-4.



## Watch Data Settings

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



- Channel

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

- Frame Type

Standard : CAN/LIN standard format

Extended : CAN extension format

- ID

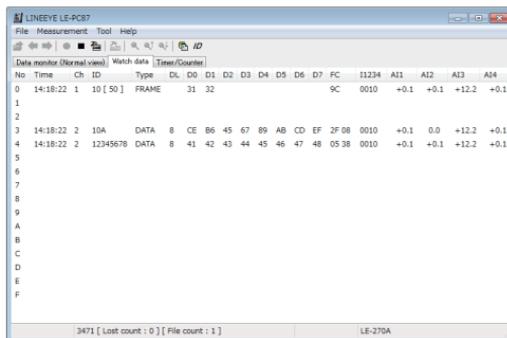
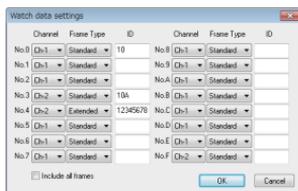
Set the ID to watch in HEX. If nothing is input, it cannot watch data.

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

LIN standard format : specify in the range of 0-3Fh

CAN extended format : specify in the range of 0-1FFFFFFh

- Include all frames (LE-PC87 software Ver1.04 or above)
  - If not selecting it (default), it displays normal CAN data frames, that matches with ID, or frames with LIN response data.(specification of last version)
  - If selecting it, it displays all frames including remotes and errors, that matches with ID.(It cannot find the error status in the Watch Data Display.)
- Example Watch Data Display
  - Set LIN1 ID as "10h" in the No.0.
  - Set Can2 standard format ID as "10Ah" in the No.3.
  - Set Can2 extension format ID as "12345678h" in the No.4.



- \*Cannot edit or print the watch data display.
- \*When starting the measurement, only the latest data will be displayed.
- \*It is not related to the "watch data display" function of analyzer.
- \*Watch Data display will be erased when starting the measurement.

## Display the Difference of Time Stamp

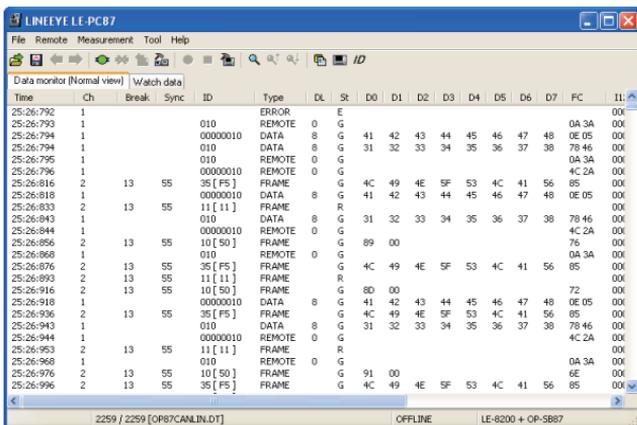
Click [Tool] -> [Difference timestamp] from menu bar. It displays the difference of time stamp compared to the previous time stamp. (CH1/CH2 does not matter) It will go back to the normal mode when clicking [Difference timestamp] one more time.

\*It changes the title of "Time" to be "deltaT".

\*When having nothing in the previous time stamp, there will be "-- :-- :--".

\*Cannot retrieve the difference of time stamp.

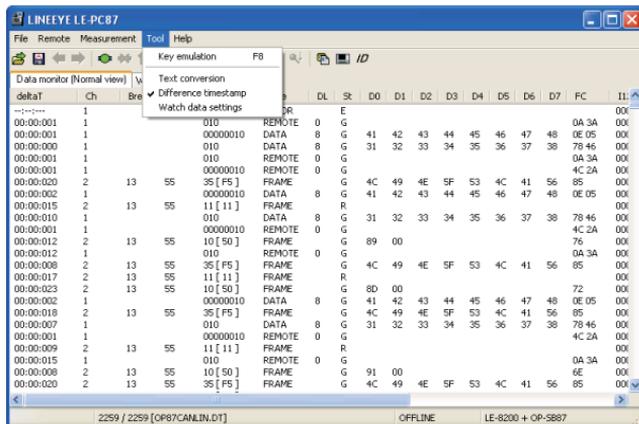
<Display the normal time stamp>



The screenshot shows the 'Data monitor (Normal view)' window. The 'Time' column displays absolute timestamps from 25:26:792 to 25:26:996. The data includes various protocols like ERROR, REMOTE, DATA, and FRAME with their respective details.

Time	Ch	Break	Sync	ID	Type	DL	St	D0	D1	D2	D3	D4	D5	D6	D7	FC	IL
25:26:792	1				ERROR	E											00
25:26:793	1			010	REMOTE	0	G									0A 3A	00
25:26:794	1			00000010	DATA	8	G	41	42	43	44	45	46	47	48	0E 05	00
25:26:794	1			010	DATA	8	G	31	32	33	34	35	36	37	38	78 46	00
25:26:795	1			010	REMOTE	0	G									0A 3A	00
25:26:796	1			00000010	REMOTE	0	G									4C 2A	00
25:26:816	2	13	55	35 [ F5 ]	FRAME	G	4C	49	4E	5F	53	4C	41	56	85	00	00
25:26:818	1			00000010	DATA	8	G	41	42	43	44	45	46	47	48	0E 05	00
25:26:833	2	13	55	11 [ 11 ]	FRAME	R										00	00
25:26:843	1			010	DATA	8	G	31	32	33	34	35	36	37	38	78 46	00
25:26:844	1			00000010	REMOTE	0	G									4C 2A	00
25:26:856	2	13	55	10 [ 50 ]	FRAME	G	89	00								76	00
25:26:866	1			010	REMOTE	0	G									0A 3A	00
25:26:876	2	13	55	35 [ F5 ]	FRAME	G	4C	49	4E	5F	53	4C	41	56	85	00	00
25:26:893	2	13	55	11 [ 11 ]	FRAME	R										00	00
25:26:916	2	13	55	10 [ 50 ]	FRAME	G	8D	00								72	00
25:26:918	1			00000010	DATA	8	G	41	42	43	44	45	46	47	48	0E 05	00
25:26:936	2	13	55	35 [ F5 ]	FRAME	G	4C	49	4E	5F	53	4C	41	56	85	00	00
25:26:943	1			010	DATA	8	G	31	32	33	34	35	36	37	38	78 46	00
25:26:944	1			00000010	REMOTE	0	G									4C 2A	00
25:26:953	2	13	55	11 [ 11 ]	FRAME	R										00	00
25:26:968	1			010	REMOTE	0	G									0A 3A	00
25:26:976	2	13	55	10 [ 50 ]	FRAME	G	91	00								6E	00
25:26:996	2	13	55	35 [ F5 ]	FRAME	G	4C	49	4E	5F	53	4C	41	56	85	00	00

<Display the difference of time stamp>



The screenshot shows the 'Data monitor (Normal view)' window with the 'deltaT' column selected. A context menu is open over the 'Difference timestamp' option. The 'Time' column now displays relative time differences from 00:00:001 to 00:00:020.

deltaT	Ch	Break	Sync	ID	Type	DL	St	D0	D1	D2	D3	D4	D5	D6	D7	FC	IL
00:00:001	1			010	REMOTE	0	G									0A 3A	00
00:00:001	1			00000010	DATA	8	G	41	42	43	44	45	46	47	48	0E 05	00
00:00:000	1			010	DATA	8	G	31	32	33	34	35	36	37	38	78 46	00
00:00:001	1			010	REMOTE	0	G									0A 3A	00
00:00:001	1			00000010	REMOTE	0	G									4C 2A	00
00:00:020	2	13	55	35 [ F5 ]	FRAME	G	4C	49	4E	5F	53	4C	41	56	85	00	00
00:00:002	1			00000010	DATA	8	G	41	42	43	44	45	46	47	48	0E 05	00
00:00:010	1			010	DATA	8	G	31	32	33	34	35	36	37	38	78 46	00
00:00:001	1			00000010	REMOTE	0	G									4C 2A	00
00:00:012	2	13	55	10 [ 50 ]	FRAME	G	89	00								76	00
00:00:008	2	13	55	35 [ F5 ]	FRAME	G	4C	49	4E	5F	53	4C	41	56	85	00	00
00:00:017	2	13	55	11 [ 11 ]	FRAME	R										00	00
00:00:023	2	13	55	10 [ 50 ]	FRAME	G	8D	00								72	00
00:00:002	1			00000010	DATA	8	G	41	42	43	44	45	46	47	48	0E 05	00
00:00:018	2	13	55	35 [ F5 ]	FRAME	G	4C	49	4E	5F	53	4C	41	56	85	00	00
00:00:007	1			010	DATA	8	G	31	32	33	34	35	36	37	38	78 46	00
00:00:001	1			00000010	REMOTE	0	G									4C 2A	00
00:00:009	2	13	55	11 [ 11 ]	FRAME	R										0A 3A	00
00:00:015	1			010	REMOTE	0	G									0A 3A	00
00:00:008	2	13	55	10 [ 50 ]	FRAME	G	91	00								6E	00
00:00:020	2	13	55	35 [ F5 ]	FRAME	G	4C	49	4E	5F	53	4C	41	56	85	00	00

## Chapter 8 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, Data, Remote, Time stamp, External) to search.

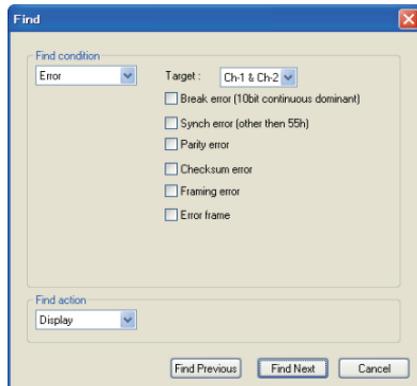
#### ◆ Trigger

Search the frames of which trigger is generated.



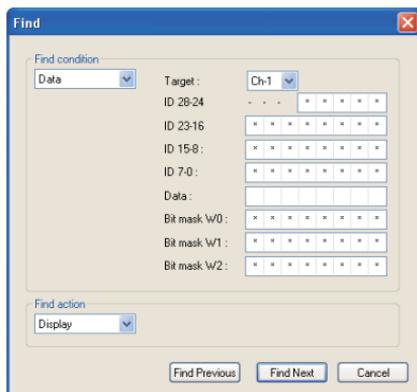
#### ◆ Error

Search Break error (LIN), SYNC error (LIN), Parity error (LIN), Checksum error (CAN/LIN), Framing error (LIN) or Error frame(CAN).  
Select the reception channel (Ch1, Ch2, Ch1&Ch2) and error conditions.



◆ Data

Search the specific data frame set in Channel, ID and Data.



◆ “Target”

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

◆ “ID28 to ID0”

Set the ID from ID28 to ID0 in bit ( 0, 1, or don't care(\*)).

[CAN]:

Extension format - set the ID from ID28 to ID0.

Standard format - set the ID from ID28 to ID18.

(set “don't care(\*)” from ID17 to ID0)

[LIN]:

Set the ID from ID26 to ID21. (set “don't care(\*)” from ID20 to ID0)

(It is possible to set the PARITY Bit in ID28(P1) and ID27(P0))

<Examples of the ID setting>

ID00000023 (CAN extension format)

ID 28-24	---	0 0 0 0 0 0
ID 23-16	0 0 0 0	0 0 0 0 0 0
ID 15-8 :	0 0 0 0	0 0 0 0 0 0
ID 7-0 :	0 0 1 0	0 0 0 1 1 1

ID023 (CAN standard format)

ID 28-24	---	0 0 0 0 0 0
ID 23-16	1 0 0 0	0 1 1 * * *
ID 15-8 :	* * * *	* * * * * *
ID 7-0 :	* * * *	* * * * * *

ID23 (LIN)

ID 28-24	---	* * 1 0 0
ID 23-16	0 1 1	* * * * * *
ID 15-8 :	* * * *	* * * * * *
ID 7-0 :	* * * *	* * * * * *

◆ “DATA”

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

It is possible to set “don't care (\*)” etc.

◆ Bit Mask “W0 to W2”

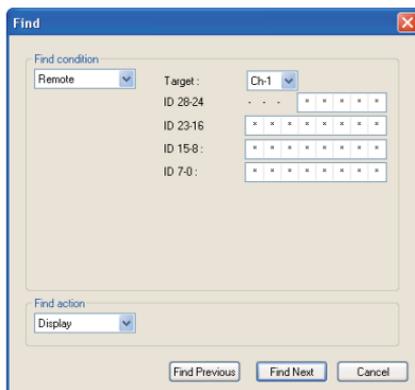
It is possible to set Bit Mask of 1 byte data (W0, W1, W2). To set the Bit Mask, input 0, 1, or “don't care (\*)” in the W0, W1, or W2 lines (7 bit to 0 bit from the left). Input W0 to W2 in the data line.

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

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

◆ Remote

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



◆ Target

Select the receiving channel (Ch1, Ch2 or Ch1 &2).

◆ ID28- 0

Set the ID from ID28 to ID0 in bit ( 0, 1, or don't care(\*)).

Extension format - set the ID from ID28 to ID0.

Standard format - set the ID from ID28 to ID18.

(set “don't care(\*)” from ID17 to ID0)

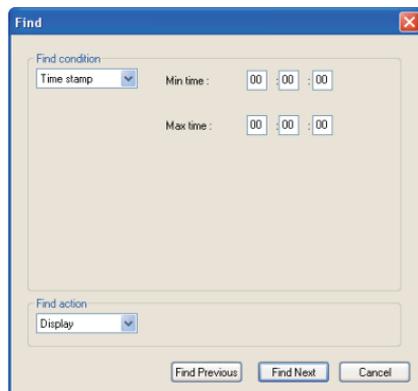
◆ Time stamp

Search the time stamps between “Min time” and “Max time”.

The unit of time stamp should be “HMS” or “MS1ms” in the “Time stamp” setting.

Example: Min time“52:27:50”, Max time“52:27:51”

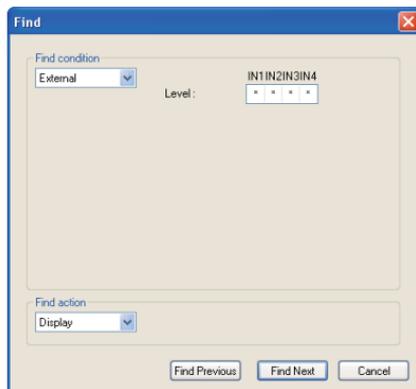
Target range is from 52:27:500 until 52:27:519.



◆ External

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.

Time	Ch	Break	Sync	ID	Type	DL	SL	D0	D1	D2	D3	D4	D5	D6	D7	FC	IT
000:000:354	1			400	DATA	0	C									00 00	00
000:000:355	1			195	DATA	8	G	81	00	00	00	00	00	00	00	38 AA	00
000:000:357	1			595	DATA	8	G	88	00	00	00	00	00	00	00	48 4C	00
000:000:822	2	13	AA	20 [20]	FRAME	4	S	01	23	45	67					25	00
000:042:452	2	13	55	50 [F0]	FRAME	8	L	01	23	45	67	89	AB	CD		20	00
000:000:939	2	13	55	00 [FF]	FRAME	8	L	01	23	45	67	89	AB	CD		20	00
000:057:450	1			595	DATA	8	G	88	00	00	00	00	00	00	00	28 D2	00
000:000:024	2	13	55	21 [81]	FRAME	8	R										00
000:100:383	2	86	55	22 [22]	FRAME	8	L	01	23	45	67	89	AB	CD		EF	00
000:100:637	2	13	55	00 [40]	FRAME	2	F	01	23							00	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.)

Time	Ch	Break	Sync	ID	Type	DL	SL	D0	D1	D2	D3	D4	D5	D6	D7	FC	IT
000:000:354	1			4	DATA	0	C									00 00	00
000:000:355	1			195	DATA	8	G	81	00	00	00	00	00	00	00	38 AA	00
000:000:357	1			595	DATA	8	G	88	00	00	00	00	00	00	00	48 4C	00
000:000:822	2	13	AA	20 [20]	FRAME	4	S	01	23	45	67					25	00
000:042:452	2	13	55	50 [F0]	FRAME	8	L	01	23	45	67	89	AB	CD		20	00
000:047:719	2	13	55	01 [C1]	FRAME	2	C	01	23	45	67	89	AB	CD		FF	00
000:057:450	1			595	DATA	8	G	88	00	00	00	00	00	00	00	28 D2	00
000:000:024	2	13	55	21 [81]	FRAME	8	R										00
000:100:383	2	86	55	22 [22]	FRAME	8	L	01	23	45	67	89	AB	CD		EF	00
000:100:637	2	13	55	00 [40]	FRAME	2	F	01	23							00	00

## Start Data Search

1. Select one factor from Trigger, Error, Data, Remote, Time stamp 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 “” (Previous) on the Tool Bar.

Only one factor selected from Trigger, Error, Data, Remote, Time stamp or External will be searched. (Not “AND” condition)

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

## Chapter 9 Key Emulation

It is possible to operate the analyzer by remote control from a far place from the analyzer.

### Explanation of 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. Display the screen of analyzer which is connecting.
2. Emulate keys of the 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.

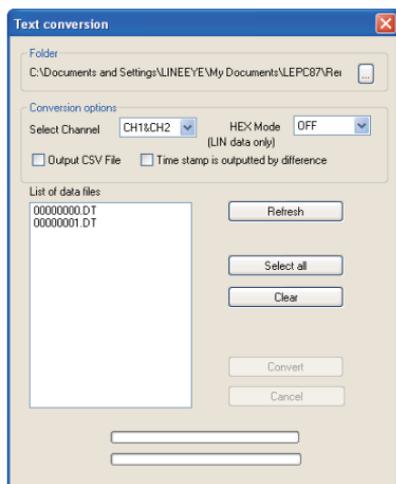
Button	Meaning
	Saves the present screen display in bitmap file.
	Copies the present screen display on the Clipboard.
	Makes a bitmap file in monochrome.
	Change the monochrome, black ->w hite, w hite ->black.
	Makes a bitmap file in color.
	Activates the main window .

## Chapter 10 Text Conversion

The data saved on a memory card or HDD can be converted into text format.

### Explanation of Text Conversion

Click “” on the Tool Bar in the Data Window (or [Tool] -> [Text conversion] from menu bar).



- “Folder”  
Select a folder which has the data to convert into text format.
- “Conversion options”
  - ◆ Select Channel  
Select a channel from CH1, CH2 or CH1&CH2.
  - ◆ HEX Mode  
This is only for LIN 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.
  - + Output CSV file  
Mark this box when outputting the file in CSV format.
  - + Output the difference of time stamp  
Mark this box when outputting the difference of time stamp. When outputting the file in CSV format, it will output the difference of time stamp everytime.

- “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 “Output CSV file” box, the file name will be the same name plus “.csv” at the end.

## Chapter 11 Specifications

Applicable Analyzer	LE-8200A/LE-8200 with OP-SB87.	
Connection	Serial, LAN (LAN-serial converter(SI-60F/SI-60)), USB	
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 screen and keys of the analyzer on the PC.	
Remote monitor	Starts/stops the measurement. Displays the measurement data on the PC.	
	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. 16GB: Can be specified up to 2,000 files in the unit of 1/2/4/8 MB.
Display	Standard display	Time stamp, (Difference of time stamp), CAN/LIN frame display (SynchBreak <sup>(*)</sup> , SynchField <sup>(*)</sup> , ID, TYPE, DLC, STATUS, DATA0-7, Checksum/CRC), External in(Analog, Digital), TRIGGER point
	Watch data display	Time stamp, CAN/LIN frame display (SynchBreak <sup>(*)</sup> , SynchField <sup>(*)</sup> , ID, TYPE, DLC, DATA0-7, Checksum/CRC, External in(Analog, Digital)
	Timer/ Counter display <sup>(*)</sup>	Display the value of timer/ counter used in trigger function. Timer 0 to 3 : General Timer Counter 0 to 3 : General Counter Counter CH1/CH2 : Counter for received frames in Channel 1/2.
	Analog wave display <sup>(*)</sup>	Display Analog monitored data (IN1 to 4) in waveform. Max voltage unit: 1V, 2V, 5V, 10V, 16V selectable.
Search Function	Displays the data or number of data that matches the search	
	Searching Conditions	Trigger :Trigger matching frame Error :Break,Sync,Parity,Checksum,Framing,Error frame Data :Specified ID (don't care <sup>(*)</sup> ) can be set Character string (up to 8 character,don't care <sup>(*)</sup> , bit mask can be set) Remote : Specified ID (don't care <sup>(*)</sup> ) can be set Time stamp :specific time stamp between min and max time. External :Logical status of external signal (IN1 -4)
Text Conversion	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: 512MB(1GB for Vista) or more (recommended) HDD: 3MB+free space for saving the measurement data.
	OS	Windows 2000/XP/Vista/7/8
Accessories	CD (software), Instruction manual, Warranty	

\*1: LIN frame only.

\*2: Support on firmware version 1.07 or above.

The card packed with the product is the user registration card for Japanese customers. For overseas customers, there is a registration page on our web site.([www.lineeye.com](http://www.lineeye.com))

## **LINEEYE CO., LTD.**

4F., Marufuku Bldg., 39-1Karahashi Nishihiragaki-cho, Minami-ku,  
Kyoto, 601-8468 Japan  
Phone: 81-75-693-0161 Fax: 81-75-693-0163

URL: <http://www.lineeye.com>

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