

## Interface Expansion Boards and Options for Multi Protocol Analyzer LE-3500XR / LE-2500XR



V.35 Monitor Cable



RS-449 Monitor Cable

### Expands target measurement

with expansion kits >>> **CAN FD** **CAN** **CXPI** **LIN**

**Current Loop** **RS-530**

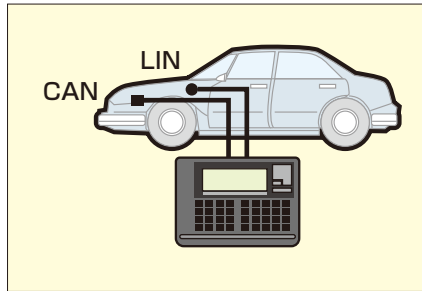
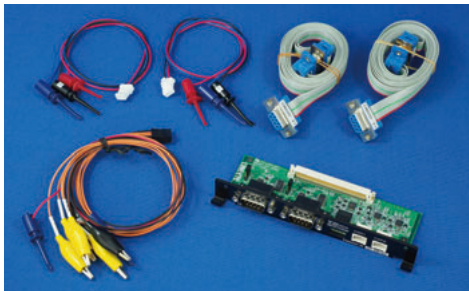
with dedicated cables >>> **RS-449** **X.20/X.21** **V.35**

LE-3500XR/LE-2500XR is the multi protocol analyzer which can monitor data for long time and send test data.

- Standard interfaces are RS-232C, RS-422/485, TTL (UART/I2C/SPI).
- Color LCD with a capacitive touch panel.
- Data on display can be scrolled vertically and horizontally by swiping the touch panel.
- USB bus powered. 7 hours operation by built-in lithium-ion battery.

# Expansion Kits for In-vehicle Communications and TTL/I<sup>2</sup>C/SPI Communications

## CAN FD/CAN/CXPI Expansion Kit **OP-SB7XC** / CAN FD/CAN/LIN Expansion Kit **OP-SB7XL**



**[CAN/CXPI Monitored Data]**

| Time_stamp | Ch | Type     | ID     | Type | DLC | St | Data                          | FC    |
|------------|----|----------|--------|------|-----|----|-------------------------------|-------|
| 06:49.847  | 1  | 050      | FData  | 8    | 6   | 01 | 02 03 04 05 06 07 08 01 4f 8c |       |
| 06:49.862  | 1  | 051      | Remote | 0    | 6   |    |                               | 44 E7 |
| 06:49.881  | 1  | 18FE9A00 | Data   | 8    | 6   | 29 | 22 11 22 33 44 55 66 42 07    |       |
| 06:49.894  | 1  | 00FEFF04 | Data   | 8    | 6   | 22 | 33 44 55 66 77 88 99 48 21    |       |
| 06:49.898  | 1  | 00FEFF04 | Data   | 8    | 6   | 33 | 44 55 66 77 88 99 06 53 0c    |       |
| 06:49.895  | 1  | 1CFEB302 | Data   | 8    | 6   | 04 | 55 AA 00 06 01 00 67 17 50    |       |
| 06:49.910  | 2  | 31 31    | BFrame | 64   | 6   | F0 | F0 F0 FA F9 F8 F7 F6 24 E3    |       |
| 06:49.921  | 1  | 001EE100 | FData* | 64   | 6   | 00 | 40 44 4c 60 61 62 63 10 00 F0 |       |
| 06:49.924  | 1  | 00FEFF04 | Data   | 8    | 6   | 11 | 22 33 44 55 66 77 88 47 71    |       |
| 06:49.927  | 2  | 32 32    | Frame  |      |     |    |                               |       |
| 06:49.945  | 1  | 18FEFFFF | Data   | 8    | 6   | 06 | 33 33 33 33 33 33 33 1E E1    |       |

**[CAN/LIN Monitored Data]**

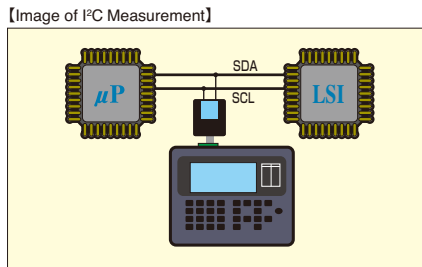
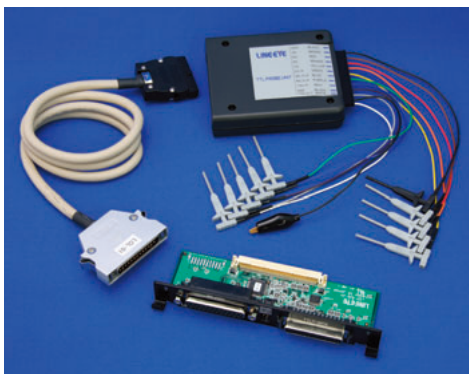
| Time_stamp  | Ch | BSPID       | ID     | Type | DLC | St | Data                          | FC    |
|-------------|----|-------------|--------|------|-----|----|-------------------------------|-------|
| 037.862.338 | 1  | 050         | Data   | 8    | 6   | 01 | 02 03 04 05 06 07 08 58 45    |       |
| 037.865.274 | 1  | 1CFEB302    | Data   | 8    | 6   | 04 | 55 AA 00 01 00 00 67 58 13    |       |
| 037.864.138 | 1  | 00F00501    | Data   | 8    | 6   | 7E | 00 00 70 00 00 00 00 1E FA    |       |
| 037.872.194 | 1  | 020         | Remote | 0    | 6   |    |                               | 45 A2 |
| 037.876.906 | 1  | 1F1         | FData  | 64   | 6   | 30 | 31 32 33 34 35 36 37 06 AA 75 |       |
| 037.886.450 | 1  | 18FEFFFF    | Data   | 8    | 6   | 40 | 33 33 33 33 33 33 33 1A 07    |       |
| 037.892.321 | 1  | 001EE100    | FData* | 64   | 6   | 41 | 40 44 4c 60 61 62 63 10 00 73 |       |
| 037.893.492 | 2  | 13 55 2f 2E | Frame  |      |     | 67 | 32 61 54                      |       |
| 037.894.347 | 1  | 00800001    | Remote | 2    | 6   |    |                               | 3E 05 |
| 037.905.291 | 1  | 1CFEB302    | Data   | 8    | 6   | 04 | 55 AA 00 02 00 00 67 78 10    |       |
| 037.907.931 | 1  | 051         | Data   | 8    | 6   | 00 | 07 06 05 04 03 02 01 00 4E    |       |

**[Signal Voltage / Digital Logic Value]**

| Time_stamp | IN1   | IN2   | IN3   | IN4   | T1234 |
|------------|-------|-------|-------|-------|-------|
| 54:11.115  | +3.32 | +1.71 | +0.03 | +0.03 | 11100 |
| 54:11.124  | +3.32 | +1.68 | 0.00  | 0.00  | 11100 |
| 54:11.148  | +3.16 | +1.60 | +0.03 | +0.03 | 11100 |
| 54:11.165  | +3.09 | +1.57 | 0.00  | 0.00  | 11100 |
| 54:11.173  | +3.01 | +1.65 | -0.03 | 0.00  | 11100 |
| 54:11.198  | +2.97 | +1.45 | 0.00  | 0.00  | 11100 |
| 54:11.215  | +2.90 | +1.53 | -0.03 | -0.03 | 11100 |
| 54:11.223  | +2.86 | +1.41 | -0.03 | -0.03 | 11100 |
| 54:11.248  | +2.74 | +1.37 | -0.03 | +0.08 | 11100 |
| 54:11.265  | +2.66 | +1.33 | 0.00  | 0.00  | 11100 |
| 54:11.274  | +2.62 | +1.37 | -0.03 | 0.00  | 11100 |

| Model                 | OP-SB7XC                                                                              | OP-SB7XL                                                       |
|-----------------------|---------------------------------------------------------------------------------------|----------------------------------------------------------------|
| Interface             | CAN FD/CAN: ISO 11898-1:2015/ISO 11898<br>CXPI: JASO D 015-3:2015                     | CAN FD/CAN: ISO 11898-1:2015/ISO 11898<br>LIN: ISO 9141        |
| Max Speed             | CAN FD : 1Mbps (5Mbps for high-speed), CAN: 1Mbps, CXPI: 20Kbps                       | CAN FD : 1Mbps (5Mbps for high-speed), CAN: 1Mbps, LIN: 26Kbps |
| Protocol              | CAN FD, CAN2.0B, DeviceNet, CXPI                                                      | CAN FD, CAN2.0B, DeviceNet, LIN                                |
| Measurement CH        | 2 channels (selectable from CAN FD/CAN/CXPI)                                          | 2 channels (selectable from CAN FD/CAN/LIN)                    |
| Function              | Monitor, Simulation, Trigger                                                          |                                                                |
| External Signal Input | 4 channels, voltage range: ±18V                                                       |                                                                |
| Accessories           | Expansion board, Dsub9pin monitor cable x2, 3-line probe cable x2, 8-line probe cable |                                                                |

## TTL/I<sup>2</sup>C/SPI Expansion Kit **OP-SB5GL**

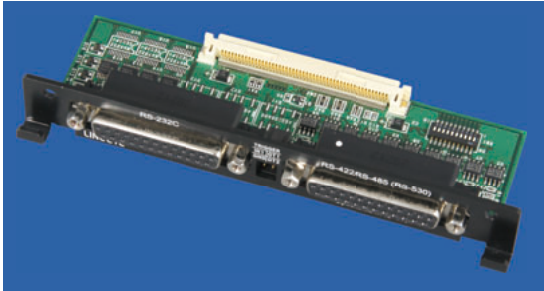


|              |                                                                                                   |
|--------------|---------------------------------------------------------------------------------------------------|
| Interface    | RS-232C, TTL/CMOS (I <sup>2</sup> C, SPI)                                                         |
| Protocol     | ASYNC, ASYNC-PPP, SYNC(BSC), HDLC(SDLC), BURST, I <sup>2</sup> C, SPI                             |
| Max Speed    | 2.048Mbps (LE-3500XR) <sup>*1</sup> , 1Mbps (LE-2500XR)<br>1Mbps for I <sup>2</sup> C simulation. |
| Function     | Monitor, Simulation, BERT                                                                         |
| Signal Level | 5.0V/3.3V/2.5V/1.8V (selectable)                                                                  |
| Accessories  | Expansion board, Relay cable, High-speed probe pod, Probe unit                                    |

\*1: It will be faster with an option "OP-FW10XR".

# Cables and Boards for Legacy Interface and Current Loop

## RS-530 Expansion Board **OP-SB10N**



OP-SB10N is an expansion board for using RS-530 port. The standard board of LE-3500XR/LE-2500XR has RS-422/485 interface with 5 terminal (RXD+/-, TXD+/-, GND) but do not have any control line of RS-422. OP-SB10N has RS-422/485 interface with RTS/CTS and DSR/DTS control lines.

|             |                                   |
|-------------|-----------------------------------|
| Interface   | RS-232C(V.24), RS-422/485(RS-530) |
| Function    | Monitor, Simulation, BERT         |
| Accessories | Expansion board                   |

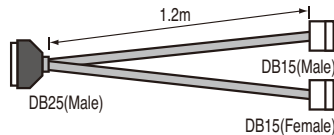
### • Cables for Monitoring X.20/ X.21/ V.35/ RS-499/ RS-530

Connect following cables to the RS-422 (RS-530) port of OP-SB10N.



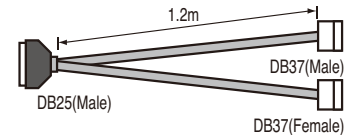
#### X.21 Monitor Cable (Shield Type) **LE-25Y15**

Branch cable for measuring X.20/21 over DSUB 15pin with Shield Type.



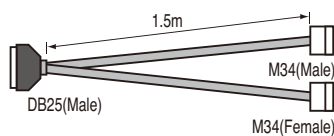
#### RS-449 Monitor Cable (Shield Type) **LE-25Y37**

Branch cable for measuring RS-449 over DSUB 37pin with Shield Type.



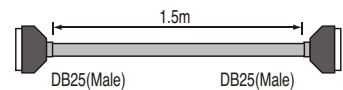
#### V.35 Monitor Cable **LE-25M34**

Branch cable for measuring V.35 over M34pin



#### RS-530 Cable **LE-25S530**

Shield cable for RS-530 interface.



## Current Loop Expansion Kit **OP-SB1C**



|                       |                                                                    |
|-----------------------|--------------------------------------------------------------------|
| Interface             | Current loop(4-pole terminal block), RS-232C                       |
| Max Speed             | 38.4Kbps                                                           |
| Measurement signal    | SD, RD                                                             |
| Monitor current level | 10 to 60mA (10 to 40mA is recommended)                             |
| Function              | Monitor, Simulation, BERT                                          |
| Circuit type          | Passive or active (selective)                                      |
| Accessories           | Expansion board, Current loop adapter, Relay cable (length: 800mm) |

## Firmware for High-speed HDLC/SPI **OP-FW10XR**



|                     |                                                   |
|---------------------|---------------------------------------------------|
| Applicable Analyzer | LE-3500XR                                         |
| Interface           | RS-422/RS-485, TTL, SPI                           |
| Protocol            | HDLC, SDLC, X.25, CC-Link, SPI                    |
| Max Speed           | 10Mbps for half duplex.<br>5Mbps for full duplex. |
| Function            | Monitor, Simulation                               |
| Time stamp          | 1ms, 100 μs, 10 μs, 1 μs                          |
| Pass filter (HDLC)  | 2 characters (don't care/bit mask available)      |
| Accessories         | Firmware CD                                       |

# PC Link Software Enhances the Link between Analyzer and PC

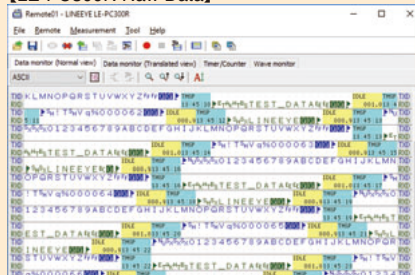
## PC Link Software **LE-PC300R**

## PC Link Software (for CAN(FD)/CXPI/LIN) **LE-PC7XCL**

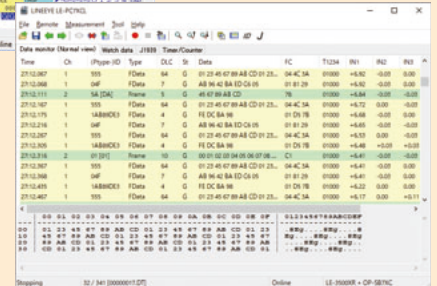
- \* Light version (limited version) is attached to LE-3500XR/LE-2500XR.
- \* For LE-PC7XCL, OP-SB7XC or OP-SB7XL is needed.

- Enables remote control from PC by USB or Wi-Fi connection.
- Displays data on the large PC screen with various protocols.
- Records data in the PC up to 256GB (32GB for LE-PC7XCL).
- Converts data into text or CSV format all at once.
- Key emulation for easy operation.
- Controls multiple analyzers simultaneously from a PC. (LE-PC300R only)
- Watch data display to find data in a specific frame. (LE-PC7XCL only)

[LE-PC300R Raw Data]



[LE-PC7XCL Monitored Data]



### ● Cables / Terminal Blocks / Converter

|                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                     |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Monitor cable for DSUB 25pin<sup>(*)</sup><br/><b>LE-25M1</b></p>  <p>Branch cable for measuring RS-232C over DSUB 25pin.</p>      | <p>Monitor cable for DSUB 9pin<br/><b>LE-259M1</b></p>  <p>Branch cable for measuring RS-232C over DSUB 9pin of PC, etc.</p>                                                    | <p>Branch Cable for DSUB 9pin<sup>(*)</sup><br/><b>LE-009M2</b></p>  <p>Branch cable for measuring RS-232C and CAN over DSUB 9pin.</p> | <p>5-wire TTL probe<sup>(*)</sup><br/><b>LE-5LS</b></p>  <p>Spin probe cable for TTL port or external trigger terminal.<br/>Length: 350mm</p>                   |
| <p>10pin external I/O cable<br/><b>LE-10ES1</b></p>  <p>10pin cable for TTL port and external signal I/O port.<br/>Length: 300mm</p> | <p>Terminal Block for DSUB 25pin<br/><b>LE-25TB</b></p>  <p>Converts DSUB 25pin connectors to terminal block.</p>                                                              | <p>3.81mm pitch terminal block<sup>(*)</sup><br/><b>LA-5TEB45</b></p>  <p>Removable terminal block. (5 terminal)</p>                  | <p>Micro-USB cable<sup>(*)</sup><br/><b>LE-US18MC</b></p>  <p>Micro-USB cable to connect analyzer and PC or USB charger.<br/>1.8m with A-MicroB connector.</p> |
| <p>32GB SDHC Card<br/><b>SD-32GX</b></p>  <p>Optional SDHC card confirmed by LINEEYE.</p>                                            | <p>USB charger<sup>(*)</sup><br/><b>LE-P2USB</b></p>  <p>Charges built-in battery or uses for bus-powered running.<br/>Input: AC100-240V, 50/60Hz<br/>Output: DC5.2V, 2.5A</p> | <p>Lithium-ion Battery Pack<sup>(*)</sup><br/><b>P-26LS1</b></p>  <p>Lithium-ion battery pack<br/>Rating: 3.7V, 2600mAh</p>           | <p>Carrying bag<sup>(*)</sup><br/><b>LEB-01</b></p>  <p>Bag with pockets for storing and carrying accessories.</p>                                             |

\*1 : Same as the one packed with LE-3500XR/LE-2500XR.  
\*2 : Attached to the LE-3500XR/LE-2500XR. For replacement.

**SAFETY WARNING** Read the instruction manual provided with the product before use and use the product as explained in that manual. Using the product in ways not guaranteed in the manual, connecting it to systems outside of the specified ranges and remodeling can all cause trouble and damage. LINEEYE CO. LTD. will assume no responsibility whatsoever for trouble or damage arising because of unauthorized ways of use.

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