LINEEYE

OPTIONAL KIT
FOR MULTI PROTOCOL ANALYZER
LE-8200A / LE-8200

CAN FD/CXPI Communications Expansion Kit

OP-SB87FD

Instruction Manual

Instruction

Thank you for your purchase of OP-SB87FD.

To use it correctly, you are advised to read and understand this instruction manual thoroughly. Keep this together with the warranty. If you encounter any problems, you will find helpful information in this manual.

NOTICE

It is prohibited to reprint or duplicate any part of the whole of this instruction manual without prior permission from LINEEYE.

The content of this instruction manual and specifications of the products are subject to change without any notice.

This instruction manual has been designed and edited with great care to give you all necessary information. If you have any questions, feel free to direct your inquiries to LINEEYE.

LINEEYE makes no warranty or guarantee, either expressed or implied with respect to its quality, performance, merchantability, or fitness for a particular purpose. LINEEYE shall not be liable for direct, in-direct, special, incidental, or consequential damages resulting from any defect in the product. The warranty and remedies set forth above are exclusive and in lieu of all others.

USER LIMITATION

This product is not intended to be incorporated into systems that equire extremely high reliability and safety, such as aerospace equipment, trunk communication equipment, nuclear power control equipment, and medical equipment related to life support. Therefore, do no use for those purposes.

Safety Information

Here, the important content has been described, for preventing the people who will use the object products and other people from being damaged and preventing damage of properties, and for using safely and correctly.

Before using, please read the main contents after you understand the following contents (symbols & marks).

⚠ **Warning**   Should the device be used without following these symbols, there is a possibility of accidents, such as a death or a serious injury, occurring.

⚠ **Caution**   Should the device be used without following these symbols, there is a possibility of accidents, such as a injury , and material damage occurring.

⚠ Warning	
🚫	● Stop using the analyzer immediately when smoke or smells emanate from itself. Continuous use may result in an electric shock, a burn and/or fire.
🚫	●Stop using the analyzer should a liquid or foreign substance get into the analyzer. This may result in an electric shock or fire. → Immediately switch off the analyzer and unplug it.
🚫	● Do not disassemble, modify or repair analyzer. This may result in a injury, an electric shock, fire, explosion and/or a breakdown due to overheating.
🚫	●Do not put the analyzer in fire or heat them. This may result in a injury and fire due to overheating or explosion.

⚠ Caution	
🚫	●Do not leave the analyzer in the following conditions. Strong magnetic field, static electricity or dusty place. Temperature and humidity above the specification. Condescending place. Not flat, or shaking place. Place with leaking water or electricity. Place affected by direct sun or near the fire .

Contents

Chapter 1 Before Using the Product

1.1 Unpacking

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

- The product has not been damaged during transportation.
- You have received all the standard accessories listed below.

☑	Interface board	1
☑	DB9 Monitor cable (LE-009M2)	2
☑	3-line Probe cable (LE-3LP)	2
☑	8-line Probe cable (LE-8EX)	1
☑	Line State sheet B	1
☑	Utility CD	1
☑	Instruction manual (This book)	1
☑	Customer Registration card / Warranty	1

Please contact your LINEEYE distributors if you find any damage to the product caused by transportation, or if there are accessories lacking.

3-line Probe cable   8-line Probe cable

DB9 Monitor cable

Line State sheet B   Interface board   Utility CD
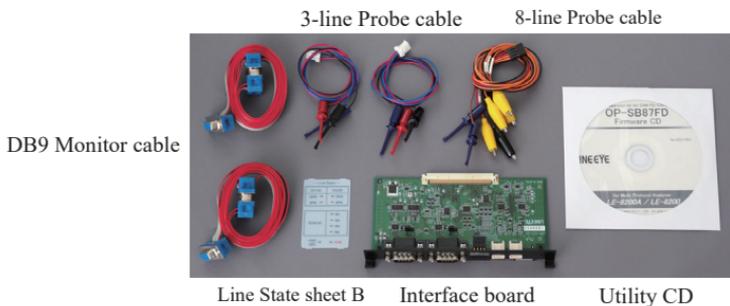
1.2 Overview

OP-SB87FD is the expansion kit to measure CAN, CAN FD and CXPI communications.

■ Monitor

OP-SB87FD monitors CAN/CAN-FD communications at 125K to 1Mbps (up to 5Mbps for high speed CAN-FD), and CXPI communications at 5K to 20Kbps. It supports CAN (ISO11898 conformity), CAN FD (ISO11898-1:2015 conformity, BOSH original protocol) and CXPI (JASOD015 conformity), and select CAN, CAN-FD or CXPI communications for each port.

■ Simulation

It transmits CAN-FD data frame and remote frame of CAN FD (standard format or expansion format) which is set by user by one touch press. In the case of CXPI, it is able to perform as a master or a slave.

1.3 Panel Description
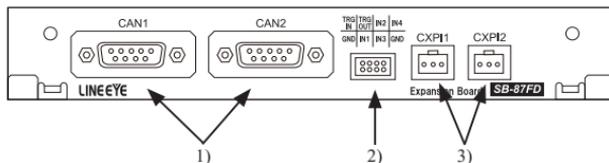
	Name	Function
1)	DSUB 9pin connector	Measurement port for CAN 1 / CAN 2
2)	Header 8pin connector	External input/output port
3)	Header 3pin connector	Measurement port for CXPI

Dsub9pin connector

Pin	Signal	Meaning
1	--	
2	CAN Low	Bus signal (Low)
3	SG	Signal ground
4	--	
5	FG	Frame ground
6	--	
7	CAN High	CAN bus signal (High)
8	--	
9	IN	General input(*1)

*1 : When this pin is used for external power source pin, you can confirm the power supply condition by the LEDs(ER for Ch1, DR for Ch2) of the analyzer

< Attention >

Do not input the voltage over 24V in this analyzer.

Header 3-pin connector

Probe Cable	Signal	Meaning
red	Vbat	9-18V
blue	CXPI_Bus	CXPI bus signal
black	SG	Signal ground

Header 8 pin connector

External I/O cable	Signal Name	Meaning
Black	GND	Signal ground
Brown	TRG IN	External trigger input
Red	TRG OUT	External trigger output
Orange	IN1	General input 1
Orange	IN2	General input 2
Orange	IN3	General input 3
Orange	IN4	General input 4
Black	GND	Signal ground

Chapter 2 Basic Operation

2.1 Preparation

<Insert the interface board>
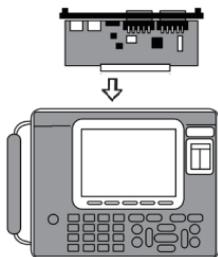
Exchange the standard interface board to OP-SB87FD.

1) Turn off the analyzer.
2) Screw off M3 screws on the interface board of analyzer.
3) Take the board off pulling the handles of the interface board.
4) Insert the interface expansion board into the slot completely.
5) Screw it on using M3 screws.

<Installation of Firmware>

First, install the firmware for this expansion kit on the analyzer.

Download Software for Transferring Firmware "LE8FIRM V1.10 or later" from our website (https://www.lineeye.co.jp/index.html) and unzip it to an appropriate folder. Download the latest firmware "opsb87fd_fw2_vxxx" of this expansion kit from the same website, and copy "OPSB87FD.FW2" in it to the same folder.

Below is how to use the AUX (RS-232C) port of the analyzer.

1. Connection between analyzer and PC
   Connect the AUX port of the analyzer and the COM port of the PC with the AUX cable attached to the analyzer.
2. Analyzer setting and operation
   1) Set the AUX condition of the analyzer as follows.
      Speed:115200bps, Data bit:8, Parity:None, X-control:Off
   2) Turn off the power of the analyzer once, and turn on the power again while pressing [Shift] and [File], and check the display of "Firmware loader".
3. Operation on the PC side
   1) Double-click the downloaded le8firm.exe to start it.
   2) Select "Serial port" for the connection, and select the COM port number and communication speed 115200 of the PC connected to the analyzer.
   3) Click the [Next] button.
   4) Click the [Select] button and select the previous firmware (OPSB87FD. FW2).
   5) Click the [Start] button to start the firmware transfer. When the transfer and writing are complete, "Finish" is displayed.
   6) Click [Close] to exit the transfer software.
4. Restart the analyzer
   When the display of the analyzer changes to "Firmware write succeeded.", turn off the power of the analyzer and turn it on again to start with the OP-SB87FD firmware.

> Operate the analyzer with the AC adapter, and never turn off the power of the analyzer while transferring the firmware. If the power is turned off during transfer, the analyzer may not start and the factory firmware write repair may be required.

📄 For the firmware update method using the USB port, see the Readme file of "LE8FIRM".

■ Return to previous firmware

After installing the OP-SB87FD firmware once, simply replace the interface board and turn on the power to select and start the firmware corresponding to the interface board.

<Line State Sheet>

Change the line state sheet to that of OP-SB87FD.
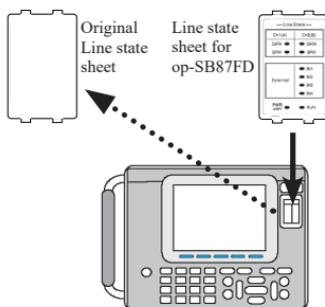
1) Remove the original line state sheet.
2) Fit the line state sheet of OP-SB87FD instead of the removed one.
   📄 Take care not to lose the detached sheet.

<Line State LED>

The following is the lighting when the attached line state LED is installed.

Name of signal		Signal	Level	Light
Ch1	DATA	Ch1 data	Dominant	ON
			Receptive	OFF
	BPW	Ch1 VBAT	9V or more	ON
Ch2	DATA	Ch2 data	Dominant	ON
			Receptive	OFF
	BPW	Ch2 VBAT	9 V or more	OFF
IN1			About 2.2 V or more	ON
IN2				
IN3				
IN4				

<Connection to the Target Devices>

It is possible to use 2 measuring channels of CAN or CXPI separately.

Connect Channel1(Ch1) to the port of CAN1 or CXPI1, and Channel2(Ch2) to the port of CAN2 or CXPI2, using the cables for CAN or CXPI attatched for the this product.

■ CAN

Able to use CH1 (CAN or CXPI) and CH2 (CAN or CXPI) simultaneously.

DSUB 9pin branch cable

Connect the cable to the port of CAN1 or CAN2 of the analyzer.

When the signal arrangement of the DSUB 9-pin is different, please use a conversion terminal block, etc.

Terminal block for DSUB 9-pin (screwless)
Sold separately (optional).
Model number: LE-9TB
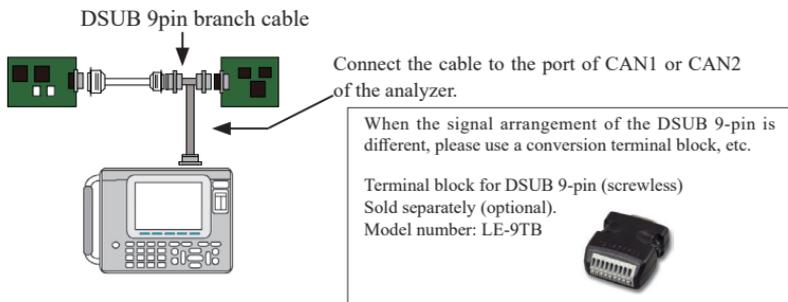
□Setting of Terminator

The jumper pin makes it possible to connect the terminator in the CAN communications.
（Factory setting: terminator OFF）

JP2 (1-2 short): Connect the terminator (120 Ohm) to CAN1 port.
JP1 (1-2 short): Connect the terminator (120 Ohm) to CAN2 port.

JP1 ——— ——— JP2

ON

3 ● ● ● 1

OFF

■ CXPI

3-line Probe cable

Connect the cable to the port of CXPI1 or CXPI2 of the analyzer.
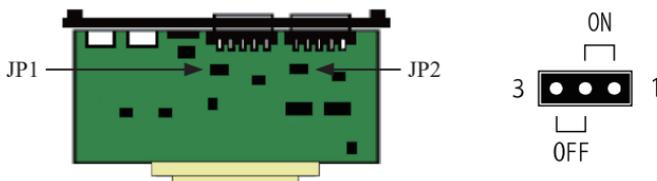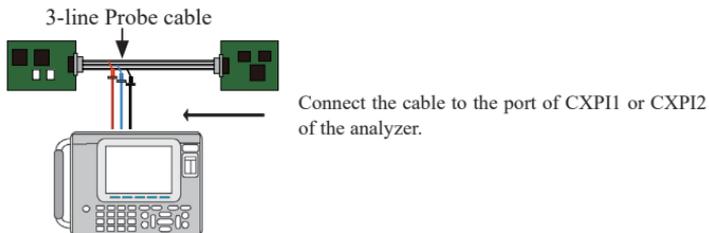
■ External Signal I/O terminal

The analyzer measure two channels, Ch1 (CAN or CXPI) and Ch2 (CAN or CXPI), simultaneously .

□Analog and Digital input (IN1 to 4)

Connect the terminals of the external signal I/O cable (IN1 to 4) to the target devices, using the attached 8-line probe cable. There are mark tubes (IN1 to 4) on the cable.

The analyzer measures/displays the voltage (unit: V) and the digital values of 4 target points along with the communication data. (Threshold, H=1: above 2.3V , L=0: under 1.0V)

Refer to "Chapter 4 Explanation of Display" for more details.

□Trigger input-output (TRG IN, TRG OUT)

Connect the brown cable (TRG IN) and red cable (TRG OT) of the 8-line probe cable to the target external signals used for trigger function.

Refer to "Chapter 5 Trigger" for more details.

<Pin arrangements>

TRG IN	TRG OUT	IN2	IN4
GND	IN1	IN3	GND

2.2 Setting of Interface

Measuring ports need to be set for measuring CAN/CAN FD or CXPI communications. Press "5: Interface" at the top menu.
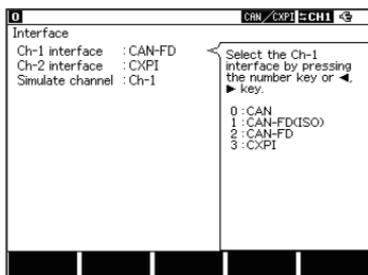
□ Ch1 interface/Ch2 interface

Select the interface for channel1 (Ch-1) and channel2 (Ch-2).

CAN	: CAN 2.0B communication,
CAN_FD	: non-ISO CAN FD communication (BOSH original protocol)
CAN_FD(ISO)	: CAN FD communication (ISO11898-1: 2015 conformity)
CXPI	: CXPI communication.

□ Simulate channel

Select the channel for simulation.

2.3 Setting of Communication Condition

The setting of analyzer is required following the communication condition (protocol, communication speed etc.) of the target devices. Press [0](Ch-1) or [1](Ch-2) key at the top menu to display the configuration screen for setting.

Setting of CAN/CAN FD Communications
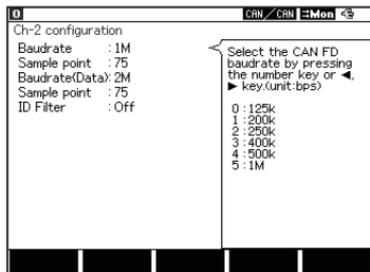
□ Baudrate

Select the communication speed from 125k, 200k, 250k, 400k, 500k, 1M (bps). For CAN FD, select the speed which excludes the data field (for CAN, includes it).

□ Sample point

Select the sample position from 60, 65, 70, 75, 80, 85 or 90 (%).

□ Baudrate (Data)

Select the communication speed (1, 2, 4, 5Mbps) of data field for CAN FD. If the Bit Rate Switch is "ON" in the simulation data table, the speed might be changed.

□ Sampling point

Select the sample position of data field from 60, 65, 70, 75, 80, 85 or 90 (%).
*It is not possible to select some positions with selected baud rate.

□ ID Filter

Sets valid/invalid (On/Off) of the ID filter and selects its filter type.

Off   : All the filters will be invalid.

Acceptance : The acceptance filter will be valid and it captures only the frames which corresponds with the ID set by bit unit.

Pass   : The pass filter will be valid and it captures only the frames which corresponds with the IDs (Max. 8) set in HEX.

Cut   : The cut filter will be valid and it does NOT capture the frames which corresponds with the IDs (Max. 8) set in HEX.

Pass&Cut   : The pass filter and the cut filter will be valid.

All filter on : All the filters will be valid.

When you select any option other than "Off", [F2](Acceptance), [F3](Pass), [F4](Cut) will appear. Then configure the filter condition at the setting display.

■ Acceptance filter

It captures corresponding ID frames by the hardware filter.
Input the number by bit unit ("0", "1", "*", and Don't care).
Set numbers from ID28 to ID18 (ID17 to ID0 should be Don't care) when it is standard format.
Set numbers from ID28 to ID0 when it is extended format.

Ch-1 Acceptance filter
ID 28-24 : ---0̲0000
ID 23-16 : 010000**
ID 15-8 : ********
ID 7-0 : ********

Set the CAN frame ID
by bit unit, which to be
the target of
capturing.

[0][1] : binary
[x] : * (Don't care)

Standard Format
ID28~18: 11bit,
(Always set "*" for
ID17~0)

Extended Format
ID28~0: 11+18bit

Esc
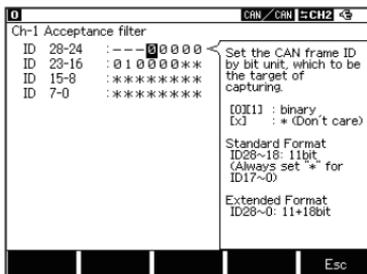
Example) If you want to display the frames which have 010 for ID when it is standard format.

ID 28 to 24 : ---00000

ID 23 to 16 : 010000**

ID 15 to 8 : ********

ID 7 to 0 : ********

Note: 00400000h to 0043FFFFh will also be captured when extended formats are mixed with standard formats.

□ Pass filter

It captures corresponding ID frames by the software filter.

Select format type from "Standard" or "Extended" at Frame type, then input ID in HEX ("0" to "F", "*", Don't care). (You can set up to 8 pass filters.)

Set numbers from the scope of ID:0 to 7FFh when it is standard format.

Set numbers from the scope of ID:0 to 1FFFFFFFh when it is extended format.

Ch-1 Pass filter
1) Frame type : Standard
   ID :01*
2) Frame type : Standard
   ID
3) Frame type : Standard
   ID
4) Frame type : Standard
   ID
5) Frame type : Standard
   ID
6) Frame type : Standard
   ID
7) Frame type : Standard
   ID

Set the frame ID to
filter.

[0]~[F] :in hex
[x] :*(don't care)
[Del] :delete

Standard ID is
000~7FFh.
Extended ID is
00000000~1FFFFFFFh.
Default :None

Esc
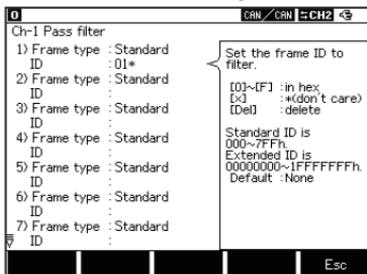
Example) If you want to capture frames which have 010h to 01Fh for its IDs when it is standard format.

1) Frame type : Standard

   ID : 01*

Note : When the pass filter is valid and no ID has been input, all the ID frames will not be captured.

□ Cut filter

It does not capture corresponding ID frames by the software filter.

Select format type from "Standard" or "Extended" at Frame type, then input ID in HEX ("0" to "F", "*", Don't care). (You can set up to 8 filters.)

Set numbers from the scope of ID:0 to 7FFh when it is standard format.

Set numbers from the scope of ID:0 to 1FFFFFFFh when it is extended format.

Ch-1 Cut filter
1) Frame type : Standard
   ID :02*
2) Frame type : Standard
   ID
3) Frame type : Standard
   ID
4) Frame type : Standard
   ID
5) Frame type : Standard
   ID
6) Frame type : Standard
   ID
7) Frame type : Standard
   ID

Set the frame ID to
filter.

[0]~[F] :in hex
[x] :*(don't care)
[Del] :delete

Standard ID is
000~7FFh.
Extended ID is
00000000~1FFFFFFFh.
Default :None

Esc
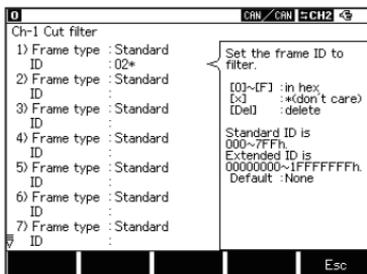
Example) If you do not want to capture frames which have 020h to 02Fh for its IDs when it is standard format.

1) Frame type : Standard

   ID : 02*

* If using the cut filter but not inputting any ID, all ID frames will be captured.

<Setting CXPI Communication>

```
┌─────────────────────────────────────┐
│ 0                    CXPI/CAN ≡CH2 ⊕ │
│ Ch-1 configuration                   │
│ Baudrate   : 19200  ┌──────────────┐ │
│ ID filter  : ─******│Set the CXPI  │ │
│                     │baudrate      │ │
│                     │by pressing   │ │
│                     │the number    │ │
│                     │key or ◄, ► key.│
│                     │(unit:bps)    │ │
│                     │              │ │
│                     │ 0 : 5000     │ │
│                     │ 1 : 9600     │ │
│                     │ 2 : 19200    │ │
│                     │              │ │
│                     │[F][F1]:      │ │
│                     │     To set any│ │
│                     └──────────────┘ │
│                                      │
│                                      │
└─────────────────────────────────────┘
```
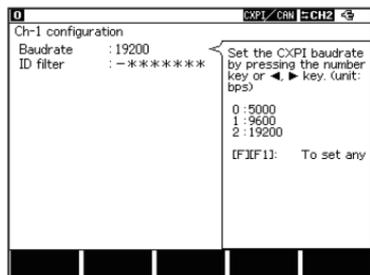
□ Baudrate :

   Selects communication speed from 5000bps, 9600bps and 19200bps, or sets arbitrary speed (from 5000 to 20000bps).

□ ID filter :

   Set PID filter in 0, 1 or *(don't care). Matched PID frame will be captured.

2.4 Record Control

Press [3](Record Control) and set the conditions of recording.

```
┌─────────────────────────────────────┐
│ 0                    CXPI/CAN ≡CH2 ⊕ │
│ Record control                       │
│ Buffer area   : BUF0 ┌─────────────┐ │
│  Protect      : Off  │Select which │ │
│  Full stop    : Off  │buffer memory│ │
│                      │to use. Press│ │
│ Auto save     : Off  │the number   │ │
│                      │key or ◄, ► key.│
│                      │             │ │
│ Time stamp    : MS1ms│0 : BUF0(whole)│
│ Auto backup   : Off  │1 : BUF1(partial)│
│                      │2 : BUF2(partial)│
│                      └─────────────┘ │
│                                      │
│                                      │
│                                      │
│                                      │
└─────────────────────────────────────┘
```
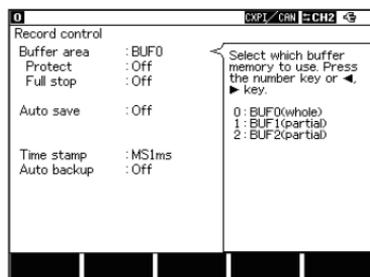
□ Buffer area : Select the buffer area.

□ Protect   : Protect data from overwriting.

□ Full stop   : Set "off" to use it as a ring buffer.

□ Auto save   : Save monitored data automatically in the storage device.

□ Time stamp   :   Select time stamp from [Hr:Min:Sec], [Min:Sec:1ms], [100µs], [10µs] or [1µs].

□ Auto backup :   Save data in the capture memory automatically.

□ Save device :   Select the storage device (CF/USB) to save data. (LE-8200A only)

2.5 Start and End of the Measurement

■ ONLINE   : Online monitor function
■ ANALOG   : Analog monitor function
■ MANUAL   : Simulation function

Start measuring:

   Press [Run].
   The analyzer starts measuring, displays the data on the screen and saves in the capture buffer.

Stop measuring:

   Press [Stop].

Chapter 3 Analog Monitor Function

Record four external signals (voltage) at specific cycle (1ms - 10min).

Record measured data since the last sampling, and analyze measured data corresponding to the external signals.

3.1 Setting of Analog Monitor

Select "ANALOG" at the top menu, then select "7: Analog options".
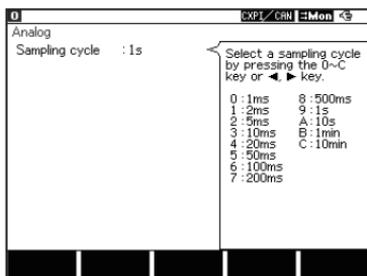
□ Sampling cycle

Select sampling cycle (1ms – 10min).

Attention :

For Analog Monitor function, select time stamp either from "HMS" or "MS1ms". If the time stamp is set as "100μs", "10μs" or "1μs", it will be changed to "MS1ms" automatically. When starting the measurement, Analog Data display will be appeared. If it has only analog data, other columns excepting "Time" and "I1234" will be blanks.

3.2 Start and End of the Measurement

Start measuring:

Press [Run]. It measures analog voltage following the sampling cycle.

Stop measuring:

Press [Stop]. It measures continuously until pressing [Stop] key.

Chapter 4 Explanation of Display

LCD Display

Frames are displayed in two lines. Frame type, DLC and CRC are displayed in the first line. Contents of data field is displayed in the second line. The first 24 bytes are displayed in the screen. To display the second 24 bytes, press [→] key.

Display	Meaning
Time	Displays the time (time stamp) when the frame is received. Press [F1] to display the difference of time stamps compared to the previous time stamp. ("Time" on the screen is changed to " △ Time") [*1]
Ch	Displays the channel received. (1:CH1, 2:CH2)
(Ptype-)ID	At the time of CAN/CAN FD, displays the ID of the frame received. For CXPI, it displays the PID value excepting a parity in HEX for event trigger type. Or, it displays PTYPE and PID value excepting a parity in HEX for polling type. (e.g. 00-01)
Type	Displays a type of the frame received.

DAT	Standard/extended data frame of CAN.
REM	Standard/extended remote frame of CAN.
FDAT	Standard/extended data frame of CAN FD.
ERR	Error frame of CAN/CAN-FD.
TFRM	Normal frame of CXPI for event trigger type.
BFRM	Burst frame of CXPI for event trigger type.
PFRM	Normal frame of CXPI for polling type.
BPFRM	Burst frame of CXPI for polling type.
WUP	WAKEUP pulse of CXPI.

|

Display	Meaning
DLC	Display the content of data length code in decimal.
St	Displays whether the condition of the frame is normal or abnormal.

G	Normal Frame
A	NAK of CAN / CAN FD
F	Form Error of CAN / CAN FD
C	CRC error of CAN / CAN FD / CXPI
E	Error frame of CAN / CAN FD
P	Parity error of CXPI
L	Length error of CXPI
F	Framing error of CXPI

|

	CAN	Display nothing.
Info	CAN FD(ISO)	Display the logical value of BRS/ESI bit, and staff counter value in HEX.
	CAN FD	Display the logical value of BRS/ESI bit.
	CXPI	Display the logical value of "Wakeup.ind" and "Sleep.ind", and CT value in HEX. (e.g. "10-F" stands for BRS bit "1", ESI bit "0" and staff counter "Fh(15)").
Data		Display the contents of data field in HEX. The first 24 bytes are displayed in the screen. To display the second 24 bytes, press [→] key. (e.g.) There is a display of (Data A-B) on the screen. (A-B) describes the position of data currently displayed.
CRC		Display the CRC in HEX.
I1234		The state of external input is displayed in binary number (0: low level / 1: high level).

□ Other display

[T]	Trigger occurrence.
PE	Parity error data of CXPI.
FE	Framing error (When the stop bit is Dominant.) *2

*1:If the data consists CAN FD and CXPI, the difference of time stamp may not be correct because of the speed difference.
(Maximum timestamp is described as following, and it returns to zero.)

Unit	Maximum	Meaning	Time	Available Function
1μsec	134.217.727	134S/217.727msec	Relative time	ONLIN / MANUAL
10μsec	1342.177.27	1342S/177.27msec	Relative time	ONLIN / MANUAL
100μsec	13421.772.7	13421S/772.7msec	Relative time	ONLIN / MANUAL
MS1m	59:59:999	59M/59S/999msec	Absolute time	ONLIN / ANALOG / MANUAL
HMS	23:59:59	23H/59M/59S	Absolute time	ONLIN / ANALOG / MANUAL

*2: By pressing [F2]"RAW", the framing error display and the data display are changed.

□ The type of screen display is changed by pressing [Data].

< Data display screen >

The frames of CAN/CAN FD or CXPI are displayed in the order of measured time.

◆Color code

Ch1 : Yellow   Ch2 : Green
* It is displayed in white color . If there is only analog data.

◆ Change of display

Press [F1], [F2] or [F3] to change the display.

CAN →
CXPI →

1)   2)

1) [F1] key : ime

Change the display of time stamp. "Time" displays the elapsed time from the start of measurement. "ΔTime" displays the elapsed time from the last frame.

2) [F2] key : Raw

Change the display of parity error (PE) and framing error (FE) to HEX display.

<Analog Display>

It displays the voltage of IN1 to IN4 when receiving a frame (unit: V).

Ch1 : Displays data in yellow.
Ch2 : Displays data in green.

*It displays data if have the analog data only.

<Logic Analyzer Display>
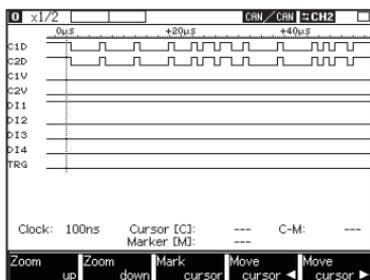
It displays the signals in digital waves.

D1D : Data bus signal of Ch1. *1
C2D : Data bus signal of Ch2. *1
C1V : General input signal of Ch1. *2
C2V : General input signal of Ch2. *2
Dl1 : General input signal. *3
Dl2 : General input signal. *3
Dl3 : General input signal. *3
Dl4 : General input signal. *3
TRG : External trigger input signal. *3

To have the logic analyzer display, press [4] "Wave monitor" from the top menu, and set "Sampling: On".

*1 : For CXPI, it displays data decoded into NRZ format.
*2 : Dsub 9pin(for CAN). 3pin connector of Vbat (for CXPI).
*3 : 8pin connector (IN1/ IN2/ IN3/ IN4/ TRG IN).

Chapter 5 Trigger

The analyzer can execute the specified action (Action) when it detects the specified factor (Factor). Select a trigger to be set by pushing [2]"Trigger" on the top menu display.
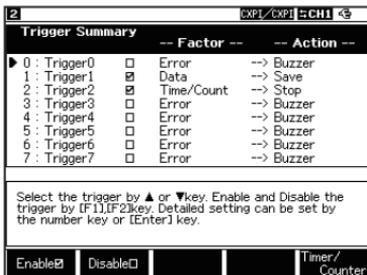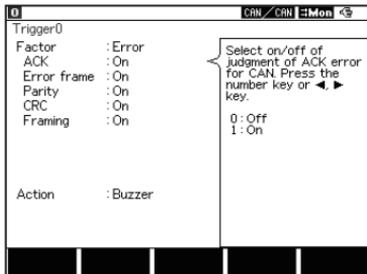
Go to the each setting display to configure Factor and Action. You can also make each trigger valid/invalid by pressing [F1] or [F2]. (Valid when the check box is checked.)

□ Factor

<Error>

Set an error detection as the Factor.

Error	Detection content
ACK	Non-Ack frame (CAN,CAN FD)
Error frame	Errro frame (CAN,CAN FD)
Parity	Parity error (CXPI)
CRC	CRC error(CXPI,CAN,CAN FD)
Framing	Framing error (CXPI)

<Data>
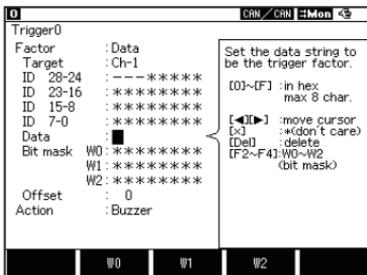
Set a reception of specific data frame as the Factor.

Target   : Set the receive channel.
ID   : Set an ID
Data   : Set a data
           Bit mask W0,W1,W2 can be set.
Bit mask : Set when you want to compare by bitwise.
Offset   : Set the first position of data field to be compared.

*1: ID should be set from superior.

When the format is standard and the target is for CAN and CAN FD device, set ID28 – ID18 (ID17 – ID0 must be Don't care (*)).

-17-

(e.g.)

When it is CAN, standard format, and the ID is ID023.

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

When it is CAN, extended format, and the ID is ID00000023.

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

When it is CXPI and the ID is ID023.

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

<Remote>

Set a reception of specific remote frame as the Factor.

ID : Set an ID. (How to is as same as that of "Data")

<Timer/Count>
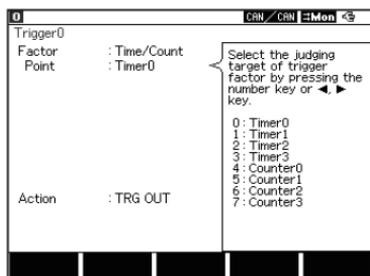
Set a coincidence of set values of Timer/Counter as the Factor.

Point : Select Timer or Counter.

<TRG_IN>
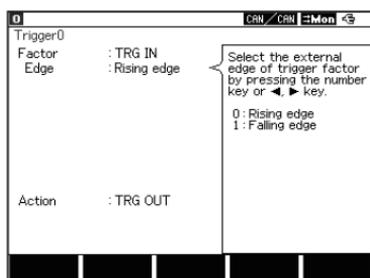
Trigger input is the cause.

Edge : Set rising and falling.

-18-

Trigger0

```
Factor        :External
  [* * * *]
   I  I  I  I
   N N N N
   1 2 3 4

Action        : TRG OUT
```

Set the combination of external digital signals to be the trigger factor.

[◄][►]:move cursor
[0]   :Logic 0
[1]   :Logic 1
[x]   :* (Don't care)

<Extemal>

Set a logical state of an external input as the Factor. Set from "0", "1", or "*".

□ Action

Trigger0

```
Factor        :Error
  ACK         : On
  Error frame : On
  Parity      : On
  CRC         : On
  Framing     : On



Action        : Stop
Stop          : Quick
```

Select the action when any of the trigger factor is satisfied.
Press the number key or ◄, ► key.

0 : Buzzer
1 : Stop
2 : Save
3 : Timer
4 : Counter
5 : Trigger switch
6 : Send
7 : TRG OUT

Action		Content
Buzzer		The buzzer sounds.
Stop		Stops measurement
	Quick	Stops immediately
	Before	Stops after capturing data for 1% off buffer size after the trigger point.
	Center	Stops after capturing the data for 50% off buffer size after the trigger point.
	After	Stops after capturing the data for 99% off buffer size after the trigger point.
Save		Saves the data after the trigger point into the memory card (the size for saving is specified by Offset.)
Timer		Controls the timer.
	Start	Starts the timer.
	Stop	Stops the timer.
	Restart	Clear the timer and restart it.
Counter		Controls the counter.
	Increment	Adds 1 to the counter.
	Clear	Clears the counter to 0
Trigger Switch		Controls the other trigger situation
	Disable	Disables a trigger watching
	Enable	Enables a trigger watching
	Change	Changes a condition of trigger watching Dissable <=> Enable
Send		Controls the transmission of data set to the CAN data table.Set the send data table to be controlled, control detail (transmit/stop), and the time until starting the control (Response).
TRG OUT		Outputs a Low pulse (about 1ms) to the external trigger terminal (TRG OUT).(Internally +5V, 10KΩ pull-up)

Chapter 6 Simulation Function

6.1 CAN/CAN FD Simulation

You can register send data frames to the data table (0 to F) and transmit it by [0] to [F] key operation.

6.1.1 Preparation of Transmission Data

```
0                          CAN／CXPI ≡Mon
Interface
Ch-1 interface  : CAN-FD      Select the Ch-1
Ch-2 interface  : CXPI        interface by pressing
Simulate channel : Ch-1       the number key or ◄,
                              ► key.

                              0 : CAN
                              1 : CAN-FD(ISO)
                              2 : CAN-FD
                              3 : CXPI
```
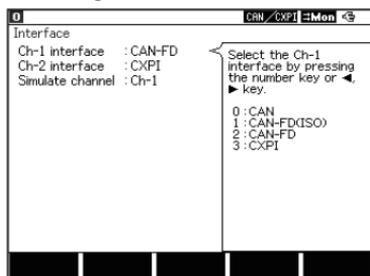
Press [5]"Interface" at the top menu and then select the channel where CAN/CAN FD(ISO)/CAN FD is selected for Simulate channel.

(Simulation channel is just one channel only.)

Select MANUAL at the top menu and press [9] "Data send table" to select the data table to be registered from [0] to [F] at CAN Data table Summary display. Up to 16 tables can be registered.

```
0                          CAN／CAN ≡CH1
  CAN Data table Summary
    Type       ID         Type        ID
▶ 0 : Data      555    8 : Data       555
  1 : Data      000    9 : Data       099
  2 : Data      000    A : ExData    0000000
  3 : ExData  0000000   B : ExRemote 0000000
  4 : Data      000    C : Data       555
  5 : Data      000    D : ExData    05555555
  6 : Data      077    E : Remote     0AA
  7 : Data      077    F : ExData    1FFFFFFF

  The contents of registration of a CAN data table are
  displayed. Edit by [0]~[F] key. (select by ▲▼◄► key.
  Then press [Enter])

Change
display
```

[Change the display]
You can exchange contents display "Type and ID" <=> "Data (8 bytes) by pressing [F1].

```
2                          CAN／CAN ≡CH1
  CAN Data table Summary
    Type       ID         Type        ID
  0 : Data      555    8 : Data       099
  1 : Data      099    9 : Data       099
  2 : ExData  11111111   A : Data       000
▶ 3 : Remote     022    B : Data       000
  4 : Data      099    C : Data       000
  5 : Data      099    D : Data       000
  6 : Data      099    E : Data       000
  7 : Data      099    F : Data       000

  The contents of registration of a CAN data table are
  displayed. Edit by [0]~[F] key. (select by ▲▼◄► key.
  Then press [Enter])

Change
display
```

```
2                          CAN／CAN ≡CH1
  CAN Data table Summary
    Type       ID         Type        ID
  0 : 8888888888888888   8 : 8888888888888888
  1 : 30313233343536 37  9 : 0000000000000000
  2 : 55                 A :
  3 :                    B :
  4 : 0000000000000000   C :
  5 : 0000000000000000   D :
  6 : 0000000000000000   E :
  7 : 0000000000000000   F :

  The contents of registration of a CAN data table are
  displayed. Edit by [0]~[F] key. (select by ▲▼◄► key.
  Then press [Enter])

Change
display
```

6.1.2 Registration of the send frames
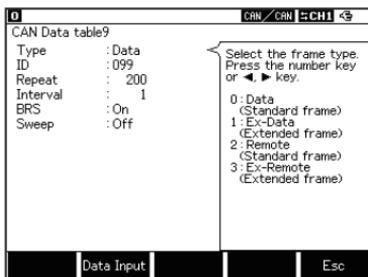
□ Type : Set the type of frame.

Data (CAN/CAN FD standard data frame)
Ex-Data (CAN/CAN FD extended data frame)
Remote (Standard remote frame)
Ex-Remote (Extended remote frame)

□ ID : Set the ID for 11bit (Standard format) or for 29bit (Extended format) in HEX.

□ Repeat : Set how much repeats the frame transmission. It continues transmitting when you set "0". (When there is no ACK response, it continues to transmit the same frame regardless of this setting.)

□ Interval : Set the time interval for continuous transmission from 1 to 99999ms. (When there is no ACK response, it continues to transmit the same frame regardless of this setting.)

□ BRS : Set on/off of communication speed change of data field when treating CAN-FD. When setting "On" the communication speed changes.

□ Sweep : Set On/Off of data sweep (continuous change). When setting "On" you need to set the parameters needed for sweep action. See 6.1.3 Sweep setting for the detail.

6.1.3 Sweep
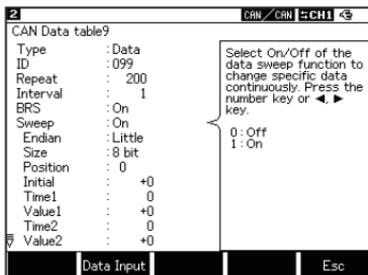
◆ Endian : Set the endian type of data to be swept from Little or Big.

(e.g.) When setting 0123h

Big   Little

| 01h | 23h | | 23h | 01h |

◆ Size : Select the data size to be swept from 8bit or 16bit. When selecting 8bit, lower 8bit/16bit of the data to be swept are set and the upper bit will be ignored.

(e.g) . When SIZE is set to 8 and the data to be swept is 256 (100h), 00h is set.

◆ Position : Set the position of the data field where the data to be swept is inserted.

(e.g.) Data field

| | | | | | | | |

When Size is 16bit and the Position is 1

The colored part of the data will be swept.

The data to be sent other than the swept part will be the one set in DATA field.

Set it within the data number range set in Data field.

- ◆Initial : Set the initial value of the data to be swept in decimal from –32768 to 65535.
- ◆Time1 : Set how much time takes from the initial value to the first target value (Value1) from 0 to 999999ms
- ◆Value1 : Set the first target value (Value1) in decimal.
- ◆Time2 : Set how much time takes from the Value1 to the second target value (Value2) from 0 to 999999ms.
- ◆Value2 : Set the second target value (Value2) in decimal.
- ◆Time3 : Set how much time takes from the Value2 to the third target value (Value3)
- ◆Value3 : Set the third target value (Value3) in decimal.

The relationship of the target values and the time are as shown in the following graph.
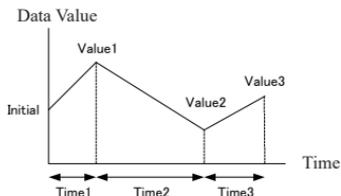
6.1.4 Data field setting
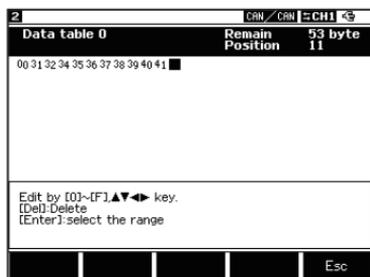
Press [F2]"Data" at send frame registration display to move to the editor of data field. Input the send data in HEX.

You can send up to 8 bytes for CAN and 64 bytes for CAN FD. The data can be set up to 64 bytes but the data to be sent are limited by the protocol selected at [5]"Interface".

Interface	Number of set data							
	0 ∼ 11	12 ∼ 15	16 ∼ 19	20 ∼ 23	24 ∼ 31	32 ∼ 47	48 ∼ 63	64
CAN	0 ∼ 8	8	8	8	8	8	8	8
CAN FD	0 ∼ 8	12	16	20	24	32	48	64

<Note for simulation of CAN/CAN FD>

The simulation port of the analyzer always responds ACK to the frames from other nodes when simulating CAN/CAN FD.

For CAN FD, the tables registered in Remote (CAN standard remote frame) or Ex-Remote (CAN extended remote frame) are not transmitted.

6.1.5 Start/Stop of simulation

■ Start measuring

1. Press [Run].
2. It transmits the data by pressing corresponding key of [0] to [F]
   While transmitting a frame continuously you can send another frame.
   (Press [Shift] + the same key ([0] to [F]) to stop the transmission.)

■Stop measuring

Press [Stop].

6.2 CXPI Simulation

Register a send data to the ID request table and the response data table and transmit the registered data following the master/slave simulation setting.

6.2.1 Preparation
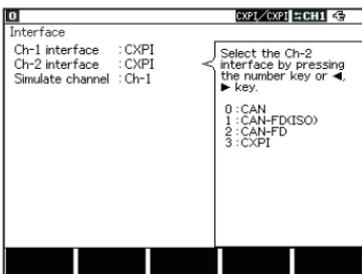
Press [5]"Interface] at the top menu and set the channel where CXPI is selected to the Simulate channel item.

6.2.2 CXPI simulation mode setting

Select MANUAL at the top menu and press [A]"CXPI Simulation" to configure the simulation condition at CXPI Simulation display.
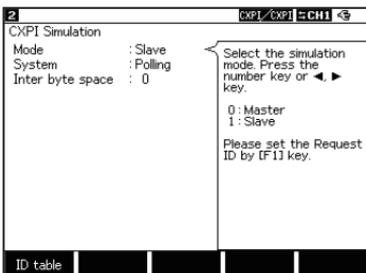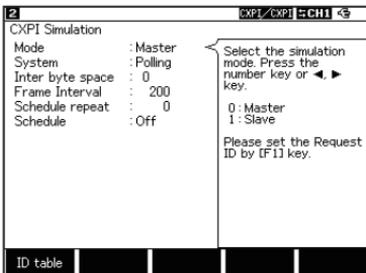
□ Mode   : Select the simulation mode from Master or Slave.
□ System   :   Select the access method from Event (event trigger method) or Polling (Polling method).
□InterByteSpace : Set the time to be inserted between the byte data by bit unit (0 to 99 bit)

<When using in Master mode and slave mode (event trigger)>

□ Frame interval : When the scheduled transmission is On, set the interval of IDs from 25 to 99999. Be sure to set the time longer than the frame length.

□ Schedule repeat : Set the repeat count of the schedule transmission function within the range of 0 to 99999.

□ Schedule : Set On (Enable) / Off (Disable) of Schedule Send function.

When On The valid IDs registered in the ID table are automatically transmitted in ascending order of the table number.

In case of Off Send the valid ID registered in the ID table by pressing the table number key.

Even in On, pressing the key corresponding to the ID table [0] - [F] sends the registered valid ID.

6.2.3 Registration of request ID

Press [F2] at CXPI Simulation display to set the ID tables. You can set up to 16 tables. Select the ID table to be set by [0] to [F] key and set it in HEX (without parity).

If you se 00 to the ID it will be sent as PTYPE.

<table>
<tr><td colspan="2">0</td><td>CXPI／CXPI ⊟CH2 🖰</td></tr>
<tr><td colspan="3">Schedule Request data summary</td></tr>
<tr><td>No</td><td>ID</td><td>No</td><td>ID</td></tr>
<tr><td>▶0 : ☑</td><td>00</td><td>8 : □</td><td>00</td></tr>
<tr><td>1 : □</td><td>00</td><td>9 : □</td><td>00</td></tr>
<tr><td>2 : □</td><td>00</td><td>A : □</td><td>00</td></tr>
<tr><td>3 : □</td><td>00</td><td>B : □</td><td>00</td></tr>
<tr><td>4 : □</td><td>00</td><td>C : □</td><td>00</td></tr>
<tr><td>5 : □</td><td>00</td><td>D : □</td><td>00</td></tr>
<tr><td>6 : □</td><td>00</td><td>E : □</td><td>00</td></tr>
<tr><td>7 : □</td><td>00</td><td>F : □</td><td>00</td></tr>
</table>

Select the displayed number by ▲, ▼ key.Enable and Disable to Response data by [F1], [F2] key.Detailed settings can be displayed by number key or [Enter] key.

Enable☑ Disable□   Esc

0   CXPI／CXPI ⊟CH1 🖰
CXPI ID table0
    ID   : 00   Set the ID. Press the
                                  number key or ◄, ►
                                  key.

                                  Range : 00～7Fh
                                  00=PTYPE

Depending on the setting, the analyzer actions as follows.

Mode	System	Schedule	Action
Master	Polling	Off	Transmits the valid ID by pressing a [0] to [F] key which corresponds with the ID table.
		On	Automatically transmits the IDs set as valid in the ID table in ascending order with the interval set at Frame interval.
	Event	Off	Transmits the valid ID by pressing a [0] to [F] key which corresponds with the ID table.
		On	Automatically transmits the IDs set as valid in the ID table in ascending order with the interval set at Frame interval.
Slave	Polling	Off	When PTYPE is sent, it automatically transmits the valid ID tables in ascending order of table number.
		On	
	Event	Off	Transmits the valid ID by pressing a [0] to [F] key which corresponds with the ID table.
		On	Automatically transmits the IDs set as valid in the ID table in ascending order with the interval set at Frame interval.

Attention : It does not have re-transmission function.

When using with the slave polling method, by auto ID transmission, the subsequent table of the table which responded to PTYPE responds the next PTYPE.

When the ID table has registration of [table0][table1]
<= [PTYPE]   [PTYPE]   [PTYPE]   [PTYPE]
<=   [Table 0]   [Table 1]   [Table 0]   [Table 1]

6.2.4 Response registration

Select MANUAL at the top menu and press [9]"Data send table" to select a response data table to be registered at CXPI Response data table Summary display.
You can exchange the display of ID <=> Data(8byte) as setting list display by pressing [F3](Display change).

At this table, register the response data to be sent automatically when PID is met.
Press [F1](Valid) for the response data to be sent at CXPI Response data table Summary display.
Press [F2](Invalid) for the one not to be sent. For the valid ID registered in this table, it checks the IDs of tables in ascending order and transmits the one which is met the registered ID.
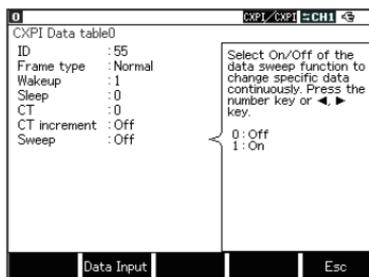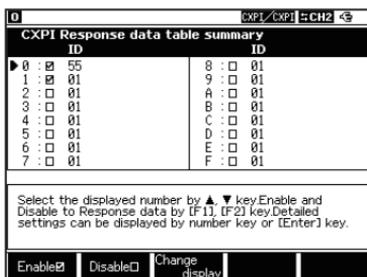
□ ID	:	Set the PID for response in HEX.
□ Frame type	:	Select the frame format from normal frame (Normal) or burst frame (Burst).
□ Wakeup	:	Set the Wakeup.ind bit in binary.
□ Sleep	:	Set the Sleep.ind bit in binary.
□ CT	:	Set the counter value which represents the continuity of frame from 0 - 3.
□ CT increment	:	When it is On, it adds 1 to the value set to CT for every transmission.
□ Sweep	:	Set ON/OFF of the data sweep (continuous change). When you set ON, you need to configure the parameters for sweep. See 6.1.3 Sweep setting for the detail.

6.2.5 Data field setting

Press [F2]"Data input" at the data table display to move to the editor of data field. Input the transmission data in HEX.
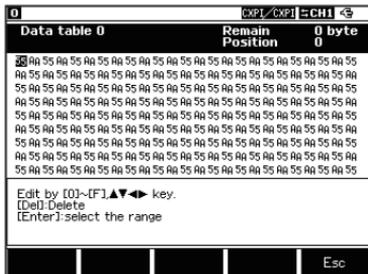
You can set up to 255 byte but the data to be transmitted are limited by the format selected at Frame type. When the Frame type is Normal the data after the 15th byte are ignored.

By auto transmission of response data, the subsequent table of the response table which received PID and responded to it responds the next PID.

When the ID table has registration of [table0][table1] for the same ID.

<=	[PID]	[PID]	[PID]	[PID]
<=	[Table 0]	[Table 1]	[Table 0]	[Table 1]

*Attention : It transmits when there is corresponding PID on the bus regardless of ID filter.

6.2.6 CXPI simulation setting example

<Master polling>

● Register 00 to the ID table

<=	[PTYPE]		[PTYPE]		:	ID Table
<=		[PID]		[PID]	:	Node
<=			[Data]		[Data]	: Node

PTYPE is sent from ID table (automatically in order when schedule ON) and each node responses.

● Register 00 01 to the ID table

<=	[PTYPE]		[PID01]		:	ID Table
<=		[PID]		[PID]	:	Node
<=			[Data]	[Data]	:	Node

PTYPE and PID=01 are sent from ID table (automatically in order when schedule ON) and each node responses.

<Master event>

● Register 01 02 03 to the ID table

```
<=  [PID01]          [PID02]          [PID03]          :  ID Table
<=           [Data]          [Data]          [Data]    :  Node
```

PID=01, PID=02, and PID=03 are sent from the IP table (automatically in order when schedule ON) and each node responses.

● Register 01 02 03 to the ID table

Register the data to the response table with ID=02.

```
<=  [PID01]          [PID02]          [PID03]          :  ID Table
<=           [Data]                          [Data]    :  Node
<=                          [Data]                     :  Response table
```

PID=01, PID=02, and PID=03 are sent from the ID table (automatically in order when schedule ON) and each node responses.

It automatically sends the data of response table when receiving PID=02 sent from itself.

<Slave polling>

● Register 01 02 to the ID table

Register the data to the response table with ID=02.

```
<=  [PTYPE]                   [PTYPE]                  :  Master
<=           [PID01]                   [PID02]         :  ID Table
<=                   [Data]                            :  Node
<=                                     [Data]          :  Response table
```

When receiving PTYPE from the master, it automatically transmits PID=01 and PID=02, from the ID tables. When receiving PID=02, it automatically transmits the data of response table.

<Slave event>

● Register 01 02 to the ID table

```
<=  [PID01]          [PID02]                           :  ID Table
<=           [Data]                                    :  Node
<=                           [Data]                    :  Response table
```

PID=01 and PID=02 are sent from the ID table (automatically in order when schedule ON) and when receiving PID=02 it automatically transmits the data of response table.

● Register the data to the response table with ID=02.

```
<=  [PID01]          [PID02]                           :  Master / Slave
<=           [Data]                                    :  Node
<=                           [Data]                    :  Response table
```

PID=01 and PID=02 are sent from the master/slave and when receiving PID=02 it automatically transmits the data of response table.

6.2.7 Start/Stop of simulation

Attention: The analyzer cannot provide 12V. Be sure to power the Vbat from exterior.

■ Start measurement

1. Press [Run].
2. When the schedule is "On", it automatically starts the transmission.
   When the schedule is "Off", it transmits the ID of [0] – [F] by pressing the ID table number. It automatically transmits the response data when the request ID (PID) meets.

<Wakeup pulse>

You can transmit a wakeup pulse as a Wakeup request while the simulation of slave in event method by pressing [End/x].
The analyzer is always in the normal mode and do not change to sleep mode.

* It is supported on firmware Ver1.07 or above. Dominant time stands for a total of 0.25usec or more per a bit as a communication speed.

■ Stop measuring

Press [Stop].

Chapter 7 Data Use

7.1 Data search

You can search a specific data by the search function.
Press [F5] to set the search condition. Press [F5] at the search condition setting display to search for forward direction or press [Shift] + [F5] to search for backward direction. (Press [E] at the data display to search for forward direction or press [F] to search for backward direction.

■ Factor

Item	Description
Trigger	Searches the data which corresponds with the trigger condition
Error	Searches an error (ACK(CAN/CAN FD), an Error Frame(CAN/CAN FD), Parity(CXPI), CRC(CAN/CAN FD/CXPI), or Framing(CXPI). By "Target" you can select the channel to be searched (CH-1, CH-2, or both).
Data	Searched a specific data frame. You can set the Receive channel, ID/PID, Contents of data field, Offset from the top of data field.(*1)(You can set Don't care or bit mask too.)
Remote	Searched a specific remote frame of CAN. You can set the Receive channel and contents of ID. (You can set Don't care or bit mask too.)
Time stamp	Searches a time stamp.(*2) You can specify the range of search time(Min time, Max time).
External	Searches the logical status of external signals (IN1 - 4).

*1 : Refer to "Chapter 5 Trigger" for the setting detail.
*2 : Available only when the time unit of "Time stamp" is set to HMS or MS1ms in "Record control" setting display.

■ Action

Item	Description
Display	Displays the data on the top of the display which corresponds with the search condition.
Count	Displays how much times it matched with the search condition.

7.2 Print Out

You can print out the measured data, setting condition and so on by the following format.

<Printing example of monitor result>

```
*=[LE-8200A]=====[2018-11-09 3:21:16]=*
* Model    : LE-8200A          *
* Version  : 1.00              *
* Extension : OP-SB87FD         *
* Serial No.: 99999999          *
* Start time: 2010-02-11 03:20:44   *
* Stop time : 2010-02-11 03:20:46   *
*------------------------------------*
* CH1 PROTOCOL  : CAN FD(ISO)    *
* BAUDRATE       :250k          *
* BAUDRATE(DATA):2M            *
* CH2 PROTOCOL  : CAN FD(ISO)    *
* BAUDRATE       :250k          *
* BAUDRATE(DATA):2M            *
*====================================*


----TM------CH------ID--TYPE--DLC-ST-INFO--CRC-----I1234-TRG
----------------------------DATA--------------------------
20:45:608   1    099 FDDAT 64  G  01-A  053492  0001 [T]
0000000000000000000000000000000000000000000000000000
0000000000000000000000000000000000000000000000000000
00000000000000000000000000000000
20:45:608   2    099 FDDAT 64  G  01-A  053492  0001
0000000000000000000000000000000000000000000000000000
0000000000000000000000000000000000000000000000000000
00000000000000000000000000000000
20:45:609   1    099 FDDAT 64  G  01-A  053492  0001 [T]
0000000000000000000000000000000000000000000000000000
0000000000000000000000000000000000000000000000000000
00000000000000000000000000000000
20:45:609   2    099 FDDAT 64  G  01-A  053492  0001
0000000000000000000000000000000000000000000000000000
0000000000000000000000000000000000000000000000000000
```

<Printing example of CAN send table>

```
*=[LE-8200A]=====[2018-11-08 3:19:21]=*
* CAN DATA TABLE                       *
*====================================*
--TYPE---------ID---DLC--REPEAT-INTERV-BSR-ENDIAN-SIZE-POS--INIT--TIME1-VALUE1--TIME2-VALUE2--TIME3-VALUE3
0:DATA          555      1    100    ON
55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA
55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA


1:DATA          000      1    100    OFF LITTLE 8  0    0  0  0    0      0     0     0


2:DATA          000      1    100    OFF


3:EXDATA   00000000   99999   99999  OFF LITTLE 16 63  65535 999999 -32768 999999 65535 999999 -32768
88888888888888881111111111111111188


4:DATA          000      1    100    OFF


5:DATA          000      1    100    ON


6:DATA          077      1    100    OFF
0000000000000000000000000000000000000000000000030000000000000000
0000000000000000000000000000000000000000000000000000000000000000


7:DATA          077      0    1      OFF LITTLE 8  0  0    5000   5   5000   0   5000    5
0000000000000000


8:DATA          555      1    100    ON
8888888888888888888888888888888888888888888888888888888888888888
8888888888888888888888888888888888888888888888888888888888888888


9:DATA          099      0    1      ON  LITTLE 8  23 0    5000   5   5000   0   5000    5
0000000000000000000000000000000000000000000010000000000000000000
0000000000000000000000000000000000000000000000000000000000000000
```

```
*=[LE-8200A]======[2018-11-08 3:21:37]=*
* CXPI DATA TABLE                       *
*=================================*


--ENABLE-TYPE----ID-WAKE-SLEEP-CT-CTINC-ENDIAN-SIZE-POS--INIT--TIME1-VALUE1--TIME2-VALUE2--TIME3-VALUE3
0: *  NORMAL  55   1    0  0  OFF  LITTLE  8  0  65535 999999   0      0       0       0       0
55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA
55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA
55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA
55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA
55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA
55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA
55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA
55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55


1:     NORMAL   7F   1    0  0  OFF
FF00F000
2:     BURST    55   1    0  0  OFF
55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA
55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA
55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA
55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA
55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA
55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA
55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA
55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55AA55


3:     BURST    7F   1    0  0  OFF
55


4:     BURST    01   1    0  0  OFF


5:     NORMAL   01   1    0  0  OFF


6:     NORMAL   01   1    0  0  OFF


7:     NORMAL   01   1    0  0  OFF
```

Chapter 8 Specification

Item	Description
Applicable Analyzer	LE-8200A/LE-8200
Interface	CAN/CAN FD: ISO11898/ISO11898-1:2015 (two Dsub9 pin connectors) CXPI: JASO D 015-3:2015 (two header3 pin connectors)
Traceiver	CAN/CAN FD: MCP2542FD (Microchip) or equivalent CXPI: BD41000AFJ (Rohm) or equivalent
Channel	2 channels in the combination of CAN, CAN FD, and CXPI
Extended Protocol	CAN-FD(ISO/Non-ISO), CAN2.0B, DeviceNet[*1], CXPI
Communication Speed	CAN: Up to 1Mbps CAN-FD: Up to 1Mbps, when BRS recessive 1M, 2M, 4M, 5Mbps CXPI: 5kbps to 20kbps
Monitor function	CAN/CAN FD: Standard and extended format are supported. Sample point can be set.[*2] CXPI: Normal frame and burst frame are supported. Arbitrary speed can be set.
Simulation function	Transmit pre-registered test frames by key operation. Increase/decrease data in the appointed position in a frame (sweep) CAN/CAN FD: Using trigger function it can respond to a reception of specified frame. CXPI: Scheduled transmission in both master and slave mode is available.
ID Filter	Only the specified acceptance ID (bitmask can be specified) can be recorded for each channel. You can specify 8 path IDs and 8 cut IDs and filter by AND condition with acceptance ID.[*3]
Time stamp	9-digit display. Real-time/difference-time display. Resolution: hour/minute/second, minute/second/1ms, 100μs, 10μs, 1μs can be specified.
Trigger function	OR operation and sequence operation are available by specifying up to 8 conditions and actions.
Trigger Condition	Error (non-ACK, ERROR frame, Parity, Framing, CRC)[*4], specified data frame (channel, ID, data, data offset, data bitmask), specified remote frame (channel, ID), timer match, counter match, external signal logic, external trigger input
Trigger Action	Stop measurement, save memory card, timer control, counter control, specified data transmission, buzzer, enable/disable trigger condition, external trigger output
Simulation function	Pre-registered test frame (CAN/CAN FD: 16 types, CXPI: 16 types) transmission test is available. It can automatically increase/decrease (sweep)[*5] the data of the specified position in the data field.
CAN/CAN FD test	Multiple frames selected by key operation can be transmitted at each specified cycle (number of transmissions can also be specified)
CXPI test	Master mode/slave mode, event trigger method/polling method can be specified. ID can be sent by schedule transmission. Sends ID match response.
External signal input	Real-time display of the external signal status of 4 channels by the LED Signal logic and voltage value can be recorded in conjunction with data Signal voltage value can be continuously measured at a specified cycle (measurement range: ±15V, measurement accuracy: ±1%FS)

*1: Only raw data can be displayed.

*2: The sampling points which can be set are limited depending on the communication speed.

*3: Available only for CAN/CAN FD.

*4: Non-ACK and ERROR frames are valid only for CAN/CAN FD.

*5: Endian, initial value, three-step target value, and the time to target can be specified.

There is a registration page on our web site.

(https://www.lineeye.com)

Please register your product for further support.

We will provide you the firmware update

 information and sales information etc.

LINEEYE CO., LTD.