■ LE-8200A/LE-8200 Specification

Interface	RS-232C (V. 24), RS-422/485 (RS-530)
Expansion measurement interface [*1]	RS-422/485 terminal block [LE-25TB,LE-530TB], X. 20/21 [LE-25Y15], RS-449 [LE-25Y37], V. 35 [LE-25M34], 1.8V/2.5V/3.3V/5.0V TTL/I²C/SPI [OP-SB85L], Current loop [OP-SB85C], CAN/LIN [OP-SB87], CAN FD/CAN/CXPI [OP-SB87FD] LAN[OP-SB89/OP-SB89E/OP-SB89G], USB2.0 [OP-SB84]
Standard Protocol	ASYNC (Asynchronous), ASYNC-PPP, Character synchronous SYNC/BSC, Bit synchronous HDLC/SDLC/X. 25, Modbus, PROFIBUS
Optional Protocol	I²C, SPI, BURST [*2], IrDA(IrLAP), CC-LINK, CAN, Devicenet, LIN, CAN FD, CXPI, Ethernet, EtherCAT, USB
Synchronous clock	ST1 (DTE transmission clock), ST2 (DCE transmission clock), RT (DCE reception clock), AR (The synchronous clock extracted from the edge of the transmission and reception data)
Capture memory [*3]	Capacity : 100MB It is composed of DDR-SDRAM of which allows high-speed access . Two separated screens. Auto backup[*4]. Error erasure prevention. Choose ring buffer or fixed size buffer.
Backup memory	Capacity:4MB It can be saved the measurement data and conditions by the built-in lithium battery for 10 years.
Max. speed	Full duplex: 2.150Mbps / Half duplex: 4.000Mbps
Speed setting range	50bps to 4.000Mbps Freely set to four effective digits, separately for transmission and reception. (Margin of error:± 0. 01% or less)
Expansion speed (HDLC mode)	115.2Kbps to 12Mbps [OP-FW12G, OP-FW12GA]
Data format	NRZ, NRZI, FM0, FM1, 4PPM, ASK, Manchester 0, Manchester 1
Data code	ASCII, EBCDIC, JIS7, JIS8, Baudot, Transcode, IPARS, EBCD, EBCDIK, HEX
Character Framing	ASYNC : data bit (5, 6, 7, 8) + parity bit (0, 1) + stop bit (1, 2) Character synchronous : data bit + parity bit (6 or 8bits in total) Bit synchronous : data bit (8bits)
Parity bit	NONE, ODD, EVEN, MARK, SPACE
Multiprocessor bit	MP (multiprocessor) bit is shown with a special mark.
Bit transmission order	LSB first or MSB first (switchable)
Polarity inversion	Normal, Invert (switchable)
Error check	Parity (ODD, EVEN, MARK, SPACE), Framing, Break, Abort, Short frame, BCC (LRC, CRC-6, CRC-12, CRC-16, CRC-ITU-T, FCS-16, FCS-32). BCC permeation mode.
Online monitor function	Communication log is recorded continuously and displayed in the LCD without affecting the communication lines.
Idle time display	OFF (no record); Resolusion: 100ms, 10ms, 1ms; Max 999. 9 sec
Time stamp display	OFF (no record); Date time stamp: unit selectable among "Day/Hr/Min", "Hr/Min/Sec", "Min/Sec/10ms". Expansion time stamp:"Yr/Mon/Day/Hr/Min","Mon/Day/Hr/Min/Sec" and "Day/Hr/Min/Sec/10ms"; Elapsed time from the measurement start: Resolution 100μsec/10μsec/1μsec (9digits)
Line status display	Records and displays the wave form of 7 signals (chosen from RS(RTS), CS(CTS), ER(DTR), DR(DSR), CD(DCD), CI(RI), TRGIN(external trigger input) along with the transmission/ reception data.
Address filter	Records only frames of the specified address. (only when HDLC/SDLC/X.25)
Data display and operations	Pause in capture, two seperated screens, scroll, paging, jump to the specified screen.
Bit shift display / Line Break	Entire frame can be shifted to the right or left in 1 bit increments. ASYNC frames can be displayed in the new line by each time stamp.
Protocol translation display	SDLC (modulo 8/128), ITU-T X.25 (modulo 8/128), LAPD, PPP, BSC, I²C, User defined
Line status LED	Two color LEDs of SD, RD, RS(RTS), CS(CTS), ER(DTR), DR(DSR), CD(DCD), CI(RI), ST1(TXC1), ST2(TXC2), RT(RXC).
RS-232C	Logic ON (red) , logic OFF (green) , no connection NC (light off)
Other I/F	Logic ON (red) , logic OFF or no connection NC (light off)
Interval timer	4kinds; Max. count: 999999 (Resolution: 1ms ,10ms ,100ms)
General-purpose counter	4kinds; Max. count: 999999
Data counter	For SD and RD (1 each): Max. count: 4294967295
Trigger function	Up to 8 pairs of trigger condition and action can be specified. (sequential action, which validates another condition after one condition satisfied, is also possible.)
Trigger condition	Communication error (Parity, MP, framing, BCC, break, abort, short frame can be specified individually.), communication data string up to 8 characters (don't care and bit mask available), idle time more than the specified duration, match time/counter value, logic status of interface signal line and extarnal trigger input
Trigger action	Stops measurement/test (offset can be set), validates trigger condition: controls timer (start/stop/restart), controls counter (count/clear), activates buzzer, saves monitor data on a memory card, sends the specified character string (during manual simulation), sends pulse to external signal
Data search function	Retrieves the data with specific condition from capture memory.
Search condition	Communication error (Parity, MP, framing, BCC, break, abort, short frame),communication data string up to 8 characters (don't care and bit mask available), idle time more than the specified duration, specified timestamp (don't care available), trigger matching data.
Search action	Shows the match data at the top or enumeration display (selectable)
Monitor conditions auto setting	Measurement conditions such as protocol, transmission speed, (max. 115.2Kbps), data code, synchronous character and BCC check can be set.
Auto run/stop function	Enables measurement to start and end at the specified time at the selected repeating cycle (monthly, daily, hourly).
Auto save function	Automatically saves the monitored data in the capture memory and saves as communications log file in the CF card, or USB flash(LE-8200A only).
File size	BUF (capture memory size) , 1MB , 2MB , 4MB , 8MB, 16MB , 32MB , 64MB
Max files	2048
Delay time function	Measures and displays the interval of change in the interface signal line. (current/min/max/average, resolution: 0. 1ms)
Signal voltage measuring function	Measures and displays the value of voltage amplitude: SD, RD, ER(DTR), external signal EXIN. (current/min/max, range± 15V resolution : 0.1V)
Statistical analysis function	Takes statistics and displays graphs of transmission/reception data count, number of frames, and satisfied trigger condition count. Range:1 sec - 240min
Logic analyzer function	Measures the logical change of the interface signal in the sampling clock period, and displays its wave.
Sampling clock	1KHz to 100MHz (16 steps)
Sampling memory	Min 4,096
Trigger condition	Trigger conditions in the ONLINE monitor functions match. Logical status match between interface signal line and external signal.
Trigger position	Before, center, after
Zoom in/out	x10, x5, x2, x1, x1/2, x1/4, x1/8, x1/16, x1/32, x1/64
Other functions	Time measurement by cursor, signal line exchange, signal status search

Bit error rate test	At DTE or DCE mode (It is possible to change the pin arrangement), line quality measurement test such as error rates can be done by loop back test or interactive test.
Communication mode	Synchronous (SYNC), Asynchronous (ASYNC)
Measuring speed	50bps~4. 000Mbps, freely set to four effective digits
Measurement mode	Continuous measurememt, specifies the number of receiving bit, specifies the time to measure, repeatedly measurement at the unit of 1 - 1440 min.
Test pattern	2^6-1, 2^9-1, 2^{11}-1, 2^{15}-1, 2^{20}-1, 2^{23}-1, MARK, SPACE, ALT, DBL-ALT, 3in24, 1in16, 1in8, 1in4
Error bit insertion / notification	Inserts 1-bit or 5-bit error in test pattern by key operation. Outputs a pulse to the external trigger terminal when finding an error bit.
Measurement range	It is able to measure the parameter of the ITU-T advice G.821. Effective received bit (0 to 9999999 to 9. 99E9), bit errors (0 to 9999999 to 9. 99E9), bit error rate(0 to 9. 99E-9 to 1), block errors (0 to 9999999 to 9. 99E9), block error rate (0 to 9. 99E-9 to 1), Savail(available measurement time: 0 to 9.99E8sec), loss count (synch loss: 0 to 9.99E8), error duration (0 to 9.99E8), %EFS (normal operation rate: 0. 000 to 100. 000%)
Simulation function	Enables transmission/reception test of any given data in DTE or DCE mode (selectable with pin assingnment).
Transmit data entry	Can be registered in 160 types of transmission data tables (16×10 groups. Total of 16 K data).
Error data entry	A part of transmission data can be registerd as error data such as parity error.
Line control mode	Auto (Controls transmission timing with RS(RTS), CS(CTS), ER(DTR), CD(DCD) signal lines automatically in 1 ms increments) or manual (key operation) can be selected.
Transmit driver control	Auto control (Turns ON driver only before and after data transmission) or manual mode (link with ER(DTR), CD(DCD) key operation) can be selected during simulation of RS-485.
MANUAL mode (Manual test)	Sends the data assinged to operation keys each time a key is pressed, while checking communications status on the display. Can be used together with the trigger function.
FLOW mode (Flow control test)	Simulates the X-on /X-off control data and flow control procedures of RTS/CTS control line. (Sender and receiver selectable)
ECHO mode (Echo test)	Sends the received data frame by frame (buffer echo), by data (character echo) or by loop back.
POLLING mode (Multi-polling test)	Simulates multi-polling communications procedures. (Sender and receiver selectable)
BUFFER mode (Buffer transmission test)	Reproduces transmission of selected data (SD or RD) captured in memory by monitor function.
PROGRAM mode (Program simulation)	Creates a simulation program (Max. type: 4, Max steps: 512) using the dedicated commands (47 types) to test the communication procedure.
PULSGEN mode	Outputs the waveform measured by the logic analyzer function.
File management function	Measurement data and condition can be saved in the external memory. And the format of the data/condition can be used in the PC.
File types	Measurement data (.DT), measurement condition (.SU), trigger save data (TG SAVEnn.DT), auto save data (#nnnnnnn.DT), auto back-up data(@AUTOBU0/1/2.DT)
File controls	Normal file display, sort display, file display by specified type, save, load, delete, delete all, format
External memory	2G byte to 128G byte CF card (only the LINEEYE guarantees to use), or USB flash drive up to 128G byte (LE-8200A only)
Printout function	Measurement data can be printed in various formats. Text files can be saved in the external memory. Screen image can be printed and saved in the external memory.
Remote Control	PC link soft (light edition [*5]), library for controling analyzer (available on web page).
LCD	5.7 inch TFT color liquid crystal display. 320 x 240 dot. LED back light can be adjusted.
AUX(RS-232C) port	Mini DIN8 pin connector. Communication speed: 9600bps to 230.4Kbps (6 steps) Print out data, Can be used with PC [PC link software], Can be used to upgrade the firmware.
USB2.0 device port	B-connector in device side. Transfer data in high-speed. Can be used with PC [PC link software], Can be used to upgrade the firmware.
USB2.0 host port	A-connector in host side. Transfers data in high speed. Used for connecting USB flash drive.
Power supply	Built-in nickel hydrogen battery or AC adapter DC9V, 2A(AC100 to 240V, 50/60Hz).
Battery operating time [*6]	About 4 hours Power saving mode: Auto back light off, Auto power off (It will not work while measuring.)
Battery charging time	About 2.5 hours
Ambient temparatures	In operation : 0 to 40 degrees, In storage : -10 to 50 degrees
Ambient humidity	In operation : 20~80%RH (No condensation), In storage : 10~85%RH (No condensation)
Standard	CE(class A), EMC(EN61326-1:2013)
Dimension [*7], mass	240 (W) x 190 (D) x 48 (H) mm , about 1.1Kg

*1 : To have the function, optional accessory described in "[ ]" is need.   *2 : Mode in which all data is imported in synch with clock edge.
*3 : Only 1M of capture memory will be backed up by the battery. Transmission/reception data, idle time, time stamp, line status consume 4 bytes of memory at each capture.
*4 : This function automatically saves the measurement data in the external memory or back up memory, when the measurement end.   *5 : The light edition has some restrictions. *6 : Under the normal operation.
*7 : Hand strap is not contained.

Standard Set

- Portable communication analyzer.....................................   1
- DSUB 25-pin monitor cable (LE-25M1)...........................   1
- DSUB 9-pin AUX cable (LE2-8V)....................................   1
- External signal input/output cable (LE-4TG)...................   1
- Hand strap...   1
- Line state sheet...   1
- AC adapter (6A-181WP09)..   1
- Carrying bag (LEB-01)...   1
- Utility CD (LE-PC800G light version included)...............   1
- Instruction manual...   1
- Warranty..   1

*Hand strap is already set in the analyzer.