

## LE-3500R / LE-2500R Specifications

Model		LE-3500R	LE-2500R
Interface	RS-232C (V. 24)	○	○
	RS-422/485 <sup>(1)</sup>	○	○
	TTL/I <sup>2</sup> C/SPI	○	○
Expansion measurement interface.	X. 20/21	○ [ OP-SB10N + LE-25Y15 ]	○ [ OP-SB10N + LE-25Y15 ]
	RS-449	○ [ OP-SB10N + LE-25Y37 ]	○ [ OP-SB10N + LE-25Y37 ]
	V. 35	○ [ OP-SB10N + LE-25M34 ]	○ [ OP-SB10N + LE-25M34 ] <sup>(2)</sup>
	TTL(USART)	○ [ OP-SB5GL ]	○ [ OP-SB5GL ]
	Current loop	○ [ OP-SB1C ]	○ [ OP-SB1C ]
	CAN/LIN	○ [ OP-SB7GX ]	○ [ OP-SB7GX ]
Expansion firmware	High-speed HDLC/CC-Link	○ [ OP-FW10R ]	—
Standard Protocol	ASYN (Asynchronous), ASYN-PPP	○	○
	Character synchronous SYNC/BSC	○	○
	Bit synchronous HDLC/SDLC/X.25	○	○
	I <sup>2</sup> C	○	○
	BURST <sup>(3)</sup>	○	○
	Modbus	○	Not supported
Optional Protocol	CC-Link	○	Not supported
	CAN	○	○
	Devicenet	○	○
	LIN	○	○
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	Memory capacity <sup>(4)</sup>	64 MB	
	Added function with memory used	Two divided areas, data protection, and selection between fixed-size buffer and ring buffer, Auto save when finishing measurement.	
Baud rate	Max. speed (full-duplex)	2.048Mbps	1.000Mbps
	Max. speed (half-duplex)	2.048Mbps	1.000Mbps
	Speed setting range	50bps~2.048Mbps	50bps~1.000Mbps
	Speed setting step, accuracy	Freely set to four effective digits, separately for transmission and reception. (Margin of error: ±0.01% or less)	
Data format		NRZ, NRZI, FM0, FM1	
Data code		ASCII, EBCDIC, JIS7, JIS8, Baudot, Transcode, IPARS, EBCD, EBCDIK, HEX	
Character Framing	Asynchronous	Data bit (5, 6, 7, 8) + parity bit (0, 1) + stop bit (1, 2)	
	Character synchronous	Data bit + parity bit (6 or 8 bits in total)	
	Bit-oriented synchronous	Data bit (8 bits)	
Parity bit		NONE, ODD, EVEN, MARK, SPACE	
Multi-processor bit		MP (multi-processor) bit is shown with a special mark.	
Bit transmission order		LSB first or MSB first (switchable)	
Polarity inversion		Normal or Inverted (switchable)	
Error check	For all protocols	Parity (ODD, EVEN, MARK, SPACE), Framing, Break, BCC (LRC, CRC-6, CRC-12, CRC-16, FCS-16, CRC-ITU-T, FCS-32), BCC permeation mode.	
	For bit-oriented synchronous protocol	Abort, short frame	
Online monitor functions	Specification	Communication log is recorded continuously and displayed in the LCD without affecting the communication lines.	
	Idle time display	OFF (no recording); Resolution: 100ms, 10ms, 1ms; Max 999. 9 sec	
	Time stamp display	Date time stamp: Unit selectable among "Day/Hr/Min," "Hr/Min/Sec," "Min/Sec/10ms," or OFF (no recording)	
	Line status display	Records and displays the wave form of 4 signals (chosen from RS(RTS), CS(CTS), ER(DTR), DR(DSR), CD(DCD), Cl(RI), EXIN(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, scroll, paging, jump to the specified screen.	
	Bit shift display	Entire frame can be shifted to the right or left in 1 bit increments.	
Line status LED	Protocol translation display	SDLC (modulo 8/128), ITU-T X.25 (modulo 8/128), LAPD, PPP, BSC, I <sup>2</sup> C	
	Target signals	Two color LEDs of SD, RD, RS(RTS), CS(CTS), ER(DTR), DR(DSR), CD(DCD), Cl(RI), ST1(TXC1), ST2(TXC2), RT(RXC).	
	RS-232C	Logic ON (red) , logic OFF (green) , no connection NC (light off)	
Other interface		Logic ON (red) , logic OFF or no connection NC (light off)	
Interval timer		2kinds; Max. count: 999999 (Resolution: 1ms ,10ms ,100ms)	
General-purpose counter		2kinds; Max. count: 999999	
Data counter		For SD and RD (1 each): Max. count: 4294967295	
Trigger function	Simultaneous detection conditions	Up to 4 pairs of trigger condition and action can be specified. Sequential actions, which validate another condition after one condition is 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 external 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), and sends pulse output to external trigger terminal OT2.	
	External trigger output	Sends pulse to external trigger terminal OT1 when all conditions are satisfied. Sends pulse to external trigger terminal OT2 according to the trigger output specification.	
Data search function	Specification	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, and 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 <sup>(5)</sup> .	
Auto run/stop function		Enables measurement to start and end at the specified time at the selected repeating cycle (monthly, daily, hourly).	
Power ON auto run function		Enables measurement to start automatically after power is turned ON.	
Auto save function	Specification	Automatically saves the monitored data in the capture memory and saves as communications log file in a SD card or USB flash.	
	File size	BUF (capture memory size), 1MB, 2MB, 4MB, 8MB, 16MB, 32MB	
	Max. files	1024	

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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), and CD (DCD) over RS-232C (current/min/max, range $\pm 15V$ (RS-232C), $\pm 5.5V$ (TTL)).	
Statistical analysis function		Takes statistics and displays graphs of transmission/reception data count, number of frames, and satisfied trigger condition count.	Not available
Logic analyzer function	Specification	Measures the logical change of the interface signal in the sampling clock period, and displays its wave.	
	Sampling clock	1KHz to 20MHz (14 steps)	
	Sampling memory	Min 2,000	
	Trigger condition	Trigger conditions in the ONLINE monitor functions match. Logical status of interface signal or external signal match.	
	Trigger position	Before, center, after	
	Zoom in/out	$\times 8$ , $\times 4$ , $\times 2$ , $\times 1$ , $\times 1/2$ , $\times 1/4$ , $\times 1/8$ , $\times 1/16$ , $\times 1/32$ , $\times 1/64$	
	Other functions	Time measurement by cursor, signal line exchange, signal status search	
BERT (bit error rate test)	Specification	Conforming to ITU-T G.821 it measures line quality such bit error rate and block error rate <sup>(*)</sup> .	
	Communication mode	Synchronous (SYNC), Asynchronous (ASYNC) RTS/CTS flow control is available.	
	Measuring speed	50bps~2.048Mbps, freely set to four effective digits	50bps~1.000Mbps, freely set to four effective digits
	Measurement mode	Continuous measurement, specifies the number of receiving bit, specifies the time to measure, repeatedly measurement at the unit of 1 - 1440minutes	
	Test pattern	2 <sup>n</sup> -1, 2 <sup>n</sup> -1, 2 <sup>n</sup> -1, MARK, SPACE, ALT, DBL-ALT, 3in24, 1in16, 1in8, 1in4	
	Error bit insertion	Inserts 1-bit or 5-bit error in test pattern by key operation.	
Simulation function	Measurement range	It is able to measure the parameter of the ITU-T advice G.821. It is able to output the external trigger by detecting the error bit. Effective received bit (0~9999999), 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 9999999sec), loss count (synch loss: 0 to 9999), error duration (0 to 9999999sec), %EFS (normal operation rate: 0.000 to 100.000%)	
	Specification	Enables transmission/reception test of any given data in DTE or DCE mode (selectable).	
	Transmission data entry	Register 160 kinds of transmission data tables (10 groups x 16, total 16K data)	
	Error data entry	A part of transmission data can be registered 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.	
	Transmission driver control	Auto control turning ON driver only during data transmission or manual mode linking with ER (DTR) or CD (DCD) key operation can be selected during simulation of RS-485.	
MANUAL mode	(Manual test)	Sends the data assigned 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). <sup>(*)7)</sup>	
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. (Slave and master selectable)	
BUFFER mode	(Buffer transmission test)	Reproduces transmission of selected data (SD or RD) captured in memory by monitor function.	Not available
PROGRAM mode	(Program simulation)	Creates a simulation program (Max. type: 4, Max steps: 512) using the dedicated commands (37 types) to test the communication procedure.	Not available
File management function	Specification	Measurement data and condition can be saved in a SD card or USB flash. And the formatted data/condition can be used in the PC.	
	File types	Measurement data (.DT), all measurement conditions (.SU), trigger save data (TG SAVEnn.DT), and auto save data (#nnnnnnn.DT)	
	File operations	Normal file display, file display by specified type/created date basis, save, load, delete, delete all, and format	
	Max. capacity <sup>(*)8)</sup>	32 GB	16 GB
Printout function		Specified range of measurement data can be continuously printed in format corresponding to the display mode. Displayed images can be printed to make hard copies.	
LCD		Monochrome 240 x 64 dots with backlight	
Remote control		PC link software (light edition) <sup>(*)9)</sup> is attached. The library to control the analyzer is available. Application for Android smart phone " LE-REMOTE4 " is available.	
AUX(RS-232C) port		Mini DIN8 pin connector. Communication speed: 9600bps to 230.4Kbps (6 steps) Print out data, Can be used with PC [LE-PC300R], 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 [LE-PC300R], Can be used to upgrade the firmware.	
USB2.0 host port		A-connector on the host side for USB flash connection, it transfers data in High speed.	
Wi-Fi connection <sup>(*)10)</sup>		802.11 b/g/n for PC connection, used for LE-PC300R. STA mode (via an access point) and AP mode (directly with a PC) are selectable.	
External power supply		Provided AC adapter Input: 100 to 240 VAC at 50/60Hz	
Built-in battery		Nickel hydrogen battery (Model: P-19S), Battery operating time <sup>(*)11)</sup> : About 7 hours, Battery Charging time: About 2.5hours	
Temperature range		In operation : 0 to 40 degrees, In storage : -10 to 50 degrees	
Humidity range		85% (RH) max.	
Standard		CE(class A), EMC/EN61326-1 : 2013)	
Dimensions		210 ( W ) x 154 ( D ) x 38 ( H ) mm	
Mass		About 760g	
Accessories		Monitor cable for DSUB 25-pin (LE-25M1), Monitor cable for DSUB 9-pin (LE-009M1), DSUB25pin-9pin conversion adapter (LE-259AD), 5 wires TTL prove cable (LE-5LS), USB cable, AC adapter (6A-181WP09), carrying bag (LEB-01), Utility CD, instruction manual and warranty	

©: Standard support. ○: Supported with option product in [ ].

\*1: To monitor control line, expansion board "OP-SB10N" (which has RS-530 port) is needed. \*2: The control signal lines of V.35 are not supported. \*3: This mode is used to capture all data in synchronization with clock edges. \*4: Transmission/reception data, idle time, time stamp, and line status items consume 4 bytes of memory at each capture. \*5: This function supports only ASYNC, SYNC/BSC, HDLC/SDLC. Correct auto settings are impossible if the amount of communications data is small or communications data includes a large number of errors. \*6: Only ASYNC mode and SYNC mode are available. \*7: Only ASYNC is available. \*8: Only the SD cards purchased from LINEEYE are supported. \*9: This is the light edition of optional product "LE-PC300R" (with some limitation for its functions). \*10: Wi-Fi function is available only in Japan, USA, and Canada. \*11: The battery operating time was measured under LINEEYE's measurement conditions with the LCD backlight turned OFF.

## Order Information

### Standard Set



- LE-3500R/LE-2500R ..... (Comes with Japanese manual.)
- LE-3500R-E/LE-2500R-E ..... (Comes with English manual.)

- Portable communication analyzer ..... 1
- DSUB 25-pin monitor cable (LE-25M1) ..... 1
- DSUB 9-pin monitor cable (LE-009M1) ..... 1
- Conversion adapter for DSUB 25-pin to DSUB 9-pin (LE259-AD) ..... 1
- TTL prove cable (LE-5LS)..... 1
- USB cable ..... 1
- AC adapter (6A-181WP09) ..... 1
- Carrying bag (LEB-01) ..... 1
- Utility CD (the light edition of PC link software is included.) ... 1
- Instruction manual ..... 1
- Warranty ..... 1

