HIOKI

Data Logger Multicanale

						
Modello	**LR8410/20**	**LR8400/20**	**LR8401/20**	**LR8402/20**	**LR8431/20**	**8423**
Misure						
Tensione Vcc	Portate: ±10mV a ±100V	Portate: ±10mV a ±100V			Portate: ±10mV a ±100V	Portate: ±10mV a ±100V
Temperatura termocoppie	K, J, E, T, N, R, S, B, da -200°C a +2000°C	K, J, E, T, N, R, S, B, W, da -200°C a +2000°C			K, J, E, T, N, R, S, B, da -200°C a +2000°C	K, J, E, T, N, R, S, B, da -200°C a +2000°C
Temperatura termoresistenze	PT100 e JPT100, da -200°C a +800°C	PT100 e JPT100, da -200°C a +800°C			-	PT100 e JPT100, da -200°C a +800°C
Umidità	con sensore 2000Z da 0% a 100% U.R.	con sensore 2000Z da 0% a 100% U.R.			-	con sensore 9701 da 0% a 100% U.R.
Resistenza Rdc	Portate: da 10Ω a 200Ω	Portate: da 10Ω a 200Ω			-	-
Impulsi	-	8 canali	8 canali	8 canali	4 canali	120*
Ingressi logici	-	8 canali	8 canali	8 canali	-	120*
Prestazioni di misura e registrazione						
Velocità di campionamento	da 10msec a 60 min	da 10msec a 60 min			da 10msec a 60 min	da 10msec a 60 min
Memoria interna	16MB	16MB	16MB	16MB	7MB	32MB
Card	2GB	2GB	2GB	2GB	2GB	1GB
Ingressi di misura						
Ingressi isolati tra loro	SI*	SI*	SI*	SI*	SI	SI*
Tensione max tra canali	300Vcc	300Vcc*	300Vcc*	300Vcc*	60Vcc	200Vcc*
Tensione max verso terra	300Vcc/ca	300Vcc/ca	300Vcc/ca	300Vcc/ca	60Vcc	600Vcc/ca*
Max ingressi analogici	105	60	60	60	10	120
Max ingressi digitali	-	8	8	8	4 (solo impulsi)	120
Moduli di ingresso	Max 7, con Bluetooth	Max 4 per totale 60 canali analogici			-	Max 8 da 15 canali
Display						
Dimensioni display grafico	5.7 pollici	5.7 pollici	5.7 pollici	5.7 pollici	4.3 pollici	su PC tramite software
Interfacce						
USB	SI	SI	SI	SI	SI	SI
Slot per chiavi USB	SI	SI	SI	SI	SI	-
LAN	SI	SI	SI	SI	SI	SI
SD Card	SI	-	-	-	-	-
CF Card	-	SI	SI	SI	SI	SI
Alimentazione						
Diretta in CA	-	-	-	-	-	SI
Tramite adattatore in CA	SI	SI	SI	SI	SI	SI
Tramite batterie ricaricabili**	SI	SI	SI	SI	SI	-
Diretta in CC	SI	SI	SI	SI	SI	-

(*) le caratteristiche indicate con asterisco (*) sono da valutare in funzione dei moduli di ingresso intercambiabili (opzionali) installati sull'unità principale
(**) non fornite in dotazione

HIOKI

Mini Data Logger Bluetooth®

					
Modello	**LR8512**	**LR8513**	**LR8514**	**LR8515**	**LR8520**
Misure					
Tensione Vcc	-	-	-	±50Vcc	-
Corrente Acc	-	fino a 2000Acc	-	-	-
Corrente Aca	-	fino a 1000Aca	-	-	-
Temperatura	-	-	-40°C … +80°C	-	-40°C … +80°C
Termoresistenze (K e T)	-	-	-	-200°C … +1000°C	-
Umidità	-	-	0% … 100%	-	0% … 100%
Conta-Impulsi/ Contagiri	2 canali	-	-	-	-
Indice fungino	-	-	-	-	SI
Prestazioni di misura e registrazione					
Quantità di canali	2 canali	2 canali	2+2 canali	2 canali	1+1 canali
Memoria interna	500.000 dati/canale				500.000 dati
Cadenza di registrazione	da 0.1sec a 60min	da 0.5sec a 60min		da 0.1sec a 60min	da 0.5sec a 60min
Tipo di registrazione	Valore istantaneo	Istantaneo e medio	Valore istantaneo		
Comunicazione e interfaccia					
Tipo di connessione	Bluetooth®2.1 + EDR				
Dispositivi supportati	Windows PC e Android tablet + smartphone				
Sistemi Operativi	Windows 8.1/8/7/Vista (32-64bit) – Android OS 4.0.3 o superiore				
Software di analisi dati	Logger Utility (in dotazione)				
Display	40 x 25 mm				
Connettività a Data-Logger	tramite Bluetooth® a LR8410/20				
Alimentazione					
Tramite batterie	Nr. 02 batterie alkaline LR6 (in dotazione)				
Tramite adattatore in CA	Alimentatore in CA (opzionale)				
Esterna in CC	Da 5Vcc a 13.5Vcc (anche tramite USB con apposito cavetto, non fornito)				
Accessori in dotazione					
Batterie LR06	02	02	02	02	02
Cavetteria	L1010 (02)	-	-	-	L1010 (01)
Accessori opzionali					
Sensori	-	7 modelli, da 500mA a 2000A	Z2010 Z2011	-	Z2010 Z2011
Alimentatore in CA	Z2003 (da 100Vca a 240Vca, 50-60Hz – uscita 12Vcc)				
Supporto magnetico	Z5004 (cinghia di fissaggio con supporto magnetico)				

(*) le caratteristiche indicate con asterisco (*) sono da valutare in funzione dei moduli di ingresso intercambiabili (opzionali) installati sull'unità principale
(**) non fornite in dotazione

HIOKI

LR8400/20 & LR8401/20 & LR8402/20

Portatili, multicanale ed espandibili, registrano qualsiasi segnale

3 modelli con 30 canali analogici, per Tensione, Resistenza, Temperatura ed Umidità

Per ogni modello 30 canali analogici, espandibili fino a 60 canali

Ognuno dei 3 modelli base dispone di 2 moduli di ingresso pre-installati per un totale di 30 canali analogici di misura.
LR8400/20: 2 moduli tensione-temperatura LR8500 (30ch)
LR8401/20: 2 moduli universali LR8501 (30ch)
LR8402/20: 1 modulo tensione-temperatura LR8500 (15ch) + 1 modulo universale LR8501 (15ch)

Ogni modello base può essere equipaggiato di ulteriore 2 moduli di ingresso accessori LR8500 e/o LR8501.

VOLTAGE/TEMP UNIT LR8500
- 15ch
- M3 screw terminals (2 terminals per channel)

UNIVERSAL UNIT LR8501
- 15ch
- Push-button type terminals (4 terminals per channel)

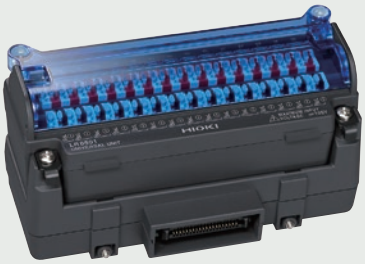
2 distinte unità di misura, ognuna con 15 canali analogici

LR8500: UNITÀ TENSIONE – TEMPERATURA (TERMOCOPPIE)

Tensione:	10 portate di misura:	da 10mV a 100V + 1-5V f.s. per trasduttori (ris. 500uV)
Temperatura:	9 tipi di termocoppie:	K, J, E, T, N, R, S, B, W su campo da -200°C a +2000°C, con risoluzione 0.01°C

LR8501: UNITÀ UNIVERSALE

Tensione:	10 portate di misura:	da 10mV a 100V + 1-5V f.s. per trasduttori (ris. 500uV)
Termocoppie:	9 tipologie:	K, J, E, T, N, R, S, B, W su campo da -200°C a +2000°C, con risoluzione 0.01°C
Termoresistenze:	2 tipologie:	PT100 e jPT100, da -200°C a +800°C, con risoluzione 0.01°C (canali non isolati tra loro)
Resistenza:	4 portate di misura:	10Ω, 20Ω, 100Ω, 200Ω, risoluzione 0.5mΩ (canali non isolati tra loro)
Umidità:	100%U.R. f.s.	con sonda 2000Z, risoluzione 0.1%U.R. (canali non isolati tra loro)

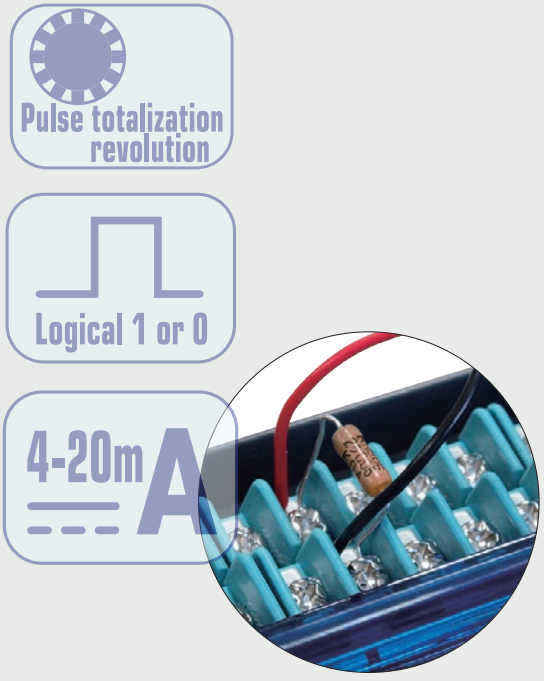


Canali logico-digitali e 4-20mA

L'unità centrale dei data-logger LR840x/20 incorpora 8 canali logico-digitali utilizzabili per le seguenti attività:

- **Conteggio** degli **impulsi** proporzionali provenienti da totalizzatori esterni quali contatori di energia, di flusso, di volume, ecc…
- Elaborazione della **velocità di rotazione** di motori, encoder, ecc…
- Rilevazione del cambio di stato logico ON-OFF, 0-1, Hi-Lo di segnali e/o contatti ausiliari.

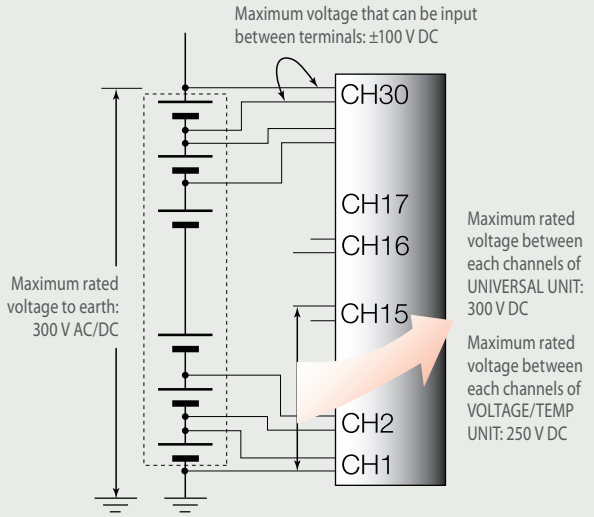
Per la misura/registrazione di segnali analogici 0-4/20mA provenienti da trasduttori e/o controllori di processo, inserire un resistore di precisione 250Ω, 0.1% sui terminali di ingresso di tensione e selezionare la portata di misura 1-5V o 10V f.s.



Elevata tensione nominale di lavoro

I data-logger LR840x/20 trovano particolare impiego nei campi di Ricerca e Produzione di celle a combustibile e/o batterie utilizzate su gruppi di continuità, veicoli elettrici ed ibridi, batterie di accumulo d'energia proveniente da fonti rinnovabili. È possibile controllare lo stato di funzionamento e di carica su unità collegate in serie con impianto utilizzatore connesso ed operativo. In questi casi è necessario che il misuratore disponga di canali di misura isolati che sopportano elevate tensioni nominali di lavoro, sia tra canale e canale, sia tra canale e terra.

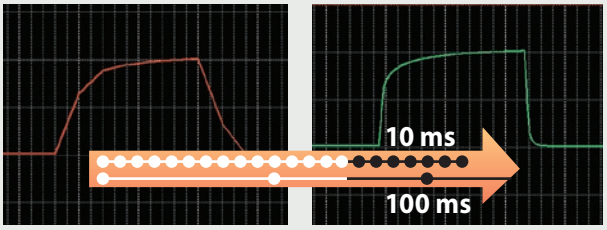
Massima tensione tra i canali: 300Vcc
Massima tensione verso terra: 300Vcc/ca



Campionamento ad alta velocità 10msec

Lo sviluppo di veicoli ibridi ed elettrici richiede strumenti in grado di misurare i cambiamenti improvvisi di carico.
Le velocità di campionamento sono così distribuite:

canali di misura da 01 a 15 = 10 msec di campionamento
canali di misura da 16 a 30 = 20 msec di campionamento
canali di misura da 31 a 60 = 50 msec di campionamento



Sampling at 100 ms intervals cannot capture abrupt load changes

Sampling the same waveform at ten times the speed, at 10 ms intervals, accurately captures the changes.

Elevata capacità di registrazione a lungo termine

Recording Capacity

Note: Use only HIOKI CF cards that are guaranteed to operate with the HiLOGGER for continuous long-term recording.

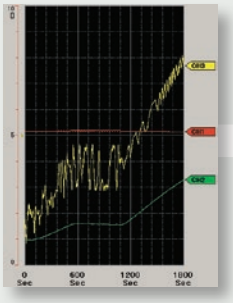
Recording intervals	Recording of 15 analog channels only (no pulse measurement, alarm output or waveform processing data)				
	Internal memory (16 MB)	Model 9727 (256 MB)	Model 9728 (512 MB)	Model 9729 (1 GB)	Model 9830 (2 GB)
10 ms * *For 15 or fewer analog channels*	1h 33m	1d 00h 51m	2d 01h 42m	4d 03h 25m	8d 06h 50m
Recording intervals	Recording of 30 analog channels only (no pulse measurement, alarm output or waveform processing data)				
	Internal memory (16 MB)	Model 9727 (256 MB)	Model 9728 (512 MB)	Model 9729 (1 GB)	Model 9830 (2 GB)
20 ms * *For 30 or fewer analog channels*	1h 33m	1d 00h 51m	2d 01h 42m	4d 03h 25m	8d 06h 50m
50ms	3h 53m	2d 14h 08m	5d 04h 16m	10d 08h 33m	20d 17h 06m
100ms	7h 46m	5d 04h 16m	10d 08h 33m	20d 17h 06m	41d 10h 12m
200ms	15h 32m	10d 08h 33m	20d 17h 06m	41d 10h 12m	82d 20h 24m
500ms	1d 14h 50m	25d 21h 22m	51d 18h 45m	103d 13h 30m	207d 03h 01m
1s	3d 05h 40m	51d 18h 45m	103d 13h 30m	207d 03h 01m	414d 06h 03m
2s	6d 11h 20m	103d 13h 30m	207d 03h 01m	414d 06h 03m	"★"
5s	16d 04h 21m	258d 21h 47m	517d 19h 34m	"★"	"★"
10s	32d 08h 43m	517d 19h 34m	"★"	"★"	"★"
20s	64d 17h 26m	"★"	"★"	"★"	"★"
30s	97d 02h 10m	"★"	"★"	"★"	"★"
1min	194d 04h 20m	"★"	"★"	"★"	"★"
2min	388d 08h 40m	"★"	"★"	"★"	"★"
5min to 1hour	"★"	"★"	"★"	"★"	"★"

- *Maximum recording time is inversely proportional to number of recording channels.*
- *Because the actual capacity of a CF card is less than that indicated, and because the header portion of waveform files is not included in capacity calculations, expect actual maximum times to be about 90% of those in the table.*
- *"★" exceeds 1 year.*

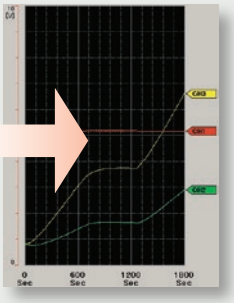
I data-logger LR840x/20 consentono di registrare a lungo termine i valori provenienti dai canali di misura, su memoria interna 16MB, su SD Card 2GB o su chiave USB. In caso di improvvisa mancanza di alimentazione, il file viene correttamente chiuso prima dello spegnimento definitivo e al ripristino la registrazione può ripartire automaticamente. LR840x/20 consente di sostituire il supporto di archiviazione (CF o USB) durante la fase di registrazione (entro 2 minuti) senza perdere alcun valore misurato.

Funzione di soppressione del rumore

La funzione di filtro soppressore riduce il rumore elettrico in uscita dai convertitori di potenza (inverter) a 50/60Hz.
L'effetto di riduzione del rumore migliora con intervallo di registrazione più lungo.
Le due immagini qui a fianco evidenziano la misura di temperatura su un forno elettrico, con e senza l'attivazione del filtro sul rumore elettrico.



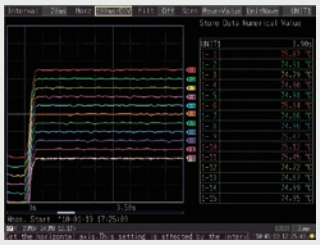
Without electric noise reduction, you will obtain a waveform like the one above in temperature measurements of an electromagnetic cooker



A digital filter in the HiLOGGER eliminates high-frequency noise to enable accurate temperature waveforms

Display ad alta visibilità

Il display grafico LCD a colori TFT di dimensione 5.7 pollici ha un angolo di visualizzazione maggiorato per migliorare la visione simultanea e sovrapposta di tante forme d'onda, da qualsiasi angolazione.

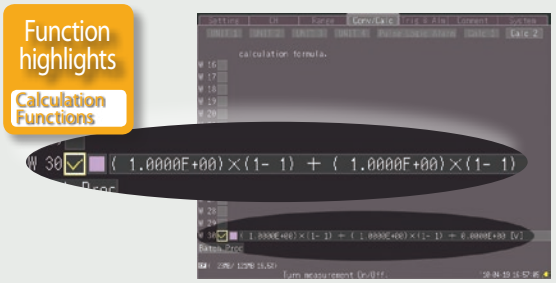


Funzione uscita allarmi

Il data-logger permette di configurare diverse segnalazioni di allarme che commutano un contatto di uscita e attivano il segnalatore acustico quando sono soddisfatti i requisiti di attivazione. Sono disponibili 4 uscite a collettore aperto (uscita 5Vcc e potere di commutazione 5-30V @ 200mA)
configurabili su singolo canale di misura o in combinazione multi-canale tramite formule logiche AND e OR tra i canali.

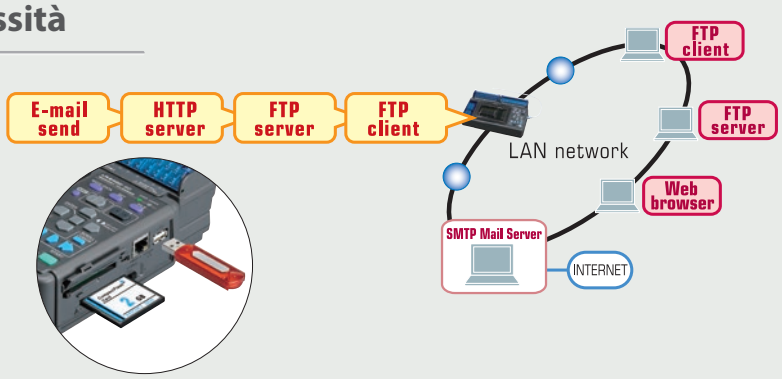
Funzione di calcolo aritmetico

LR840x/20 supporta le quattro operazioni matematiche principali (+, -, x, ÷) per elaborazione di calcolo tra i canali.
Il risultato matematico può essere visualizzato in tempo reale sotto forma di grafico nonché registrato nella memoria interna e gestito come fosse un reale canale di misura.



Una interfaccia per ogni necessità

- Interfaccia LAN 100Base-TX
- Funzione Web server
- Funzione FTP server
- Applicativo software Logger Utility
- Driver per chiavi USB
- Porta per mini-USB
- Slot per SD Card
- Applicativo E-mail sender



■ Product Specifications

General specifications (product and accuracy guaranteed for one year)	
Internal memory	16 Mega-bytes (8M data points)
Internal clock	Auto calendar, Precision ±3 s/ day (at 23 °C/ 73 °F)
Accuracy of timebase	±0.2s/ day on measurement (at 23 °C/ 73 °F)
Backup battery	For clock and setting conditions: battery life 5 years (at 23 °C/ 73 °F)
Operating temp. & humidity	0 °C (32 °F) to 40 °C (104 °F), 80 % rh or less (non-condensating, when charging: 10 °C/ 50 °F to 40 °C/ 104 °F)
Storage temp. & humidity	-10 °C (14 °F) to 60 °C (140 °F), 80 % rh or less, (non-condensating)
Conforming standards	Safety : EN61010-1, EMC : EN61326-1, EN61000-3-2, EN61000-3-3
Anti-vibration	JIS D1601: 1995 5.3 (1) Corresponds to Class 1: a passenger car, Condition: class A
External control terminal	External trigger input, Trigger output, 4 channel alarm outputs, +12 V/ 100 mA max. output, GND
Dimensions & Mass	Approx. 272 mm (10.71 in) W × 182.4 mm (7.18 in) H × 66.5 mm (2.62 in) D, 1.8 kg (63.5 oz), (LR8400 main unit, except the Battery Pack 370 g/ 13.1 oz) Approx. 272 mm (10.71 in) W × 234.8 mm (9.24 in) H × 66.5 mm (2.62 in) D, 2.6 kg (91.7 oz), (LR8500 × 2 and LR8400 × 1, except the Battery Pack 370 g/ 13.1 oz)
Accessories	Detailed operating manual ×1, Measurement guide ×1, AC ADAPTER **9418-15** ×1, USB cable ×1, CD-R (data collection software "Logger Utility") ×1
Data storage media	
CF card	CF card slot ×1, HIOKI **9727** (256 MB), **9728** (512 MB), **9729** (1 GB), **9830** (2 GB), Data format: FAT, FAT32
USB memory	Series A receptacle
Communication function	
LAN interface (ver. 1.20 or later)	IEEE 802.3 Ethernet 100BASE-TX, DHCP, DNS capable • Data acquisition, condition settings used with the Logger Utility software (supplied as standard) • Use the communication command to set and measure • Data download via FTP server function (stored in the CF card or the USB memory) • Automatically transmit data via FTP client function • Remote control via HTTP server function • Send mail function via E-mail system
USB communication interface	USB 2.0 High-speed capable, series mini-B receptacle • Data acquisition, condition settings used with the Logger Utility software (supplied as standard) • Configure the unit and measure using communication commands • Transfer data from the CF card to a PC via USB drive mode (data transfer not possible from USB memory sticks)
Display section	
Display device	5.7 inch TFT color liquid crystal display (640 × 480 pixel), horizontal 15 division, vertical 10 division, selectable between English and Japanese displays, Back light saver available
LCD Brightness	Selectable from 100, 70, 40, or 25 %
Power supplies	
AC Power	Using the AC ADAPTER **9418-15** (supplied as standard, 100 to 240 VAC, 50/60 Hz), Power consumption: 7 VA (with battery pack removed and maximum brightness)
DC Power	Using the BATTERY PACK **Z1000** (optional accessory, AC adapter has priority when used in combination with battery pack) Continuous operation time: 5 hours (at 23 °C, LCD brightness 25 %) Fast recharging time: 3 hours (using the AC adapter and main unit to recharge the battery, at 23 °C, reference value)
External	10 to 28 VDC (Rechargable voltage 12 to 16 VDC, Please contact your HIOKI distributor for connection cord) Maximum rated power: 24 VA (at 16 VDC external power supply, battery charge, LCD brightness 100 %)
Trigger functions	
Trigger mode, timing	Modes : Single / Repeat, Timing : Start / Stop / Start & Stop, Logical sum (OR) and product (AND) of each trigger source, Selectable for each channel
Analog signal source	Configure each individual channel for 30 channels or up to 60 channels depending on number of additional terminal modules installed. [Level trigger] Triggers when rising or falling through preset level [Window] Triggers when entering or exiting range defined by preset upper and lower limit values
Pulse signal source	8 channels of pulse totalizer inputs [Level trigger] Triggers when rising or falling through preset level [Window] Triggers when entering or exiting range defined by preset upper and lower limit values
Digital signal source	8 channels of digital signal inputs [Logic pattern trigger] agreement (or disagreement) in the specified [1/ 0/ ×] pattern
Timer trigger	Set up for year/ month/ day/ hour/ minute/ second
Trigger output	Open collector (active low, with 5 V output, at least 10 ms pulse width), M3 mm screw terminal
Alarm output	
Number of channels	4 channels, non-isolated (common ground with chassis)
Alarm source	60 channels of analog input, 8 channels of pulse totalizer inputs or digital inputs, Thermocouple burn-out detection
Alarm type	Level, Window, Logic pattern, Output latch/ no latch, Cancel alarm while measuring
Alarm sound	Buzzer, ON/OFF possible
Alarm output	Open collector (active low, with 5 V output), M3 mm screw terminal, Output refreshed at every recording interval
Output sink current	200 mA at 5 V to 30 VDC

Measurement Settings	
Recording Intervals (sampling period)	10 ms*1, 20 ms*2, 50 ms*3, 100 ms to 1 hr (19 selections) *Note: All input channels are scanned at high speed during every recording interval* *1 *Thermocouple burn-out detection OFF, and using up to 15 channels* *2 *Thermocouple burn-out detection OFF, and using up to 30 channels, or Thermocouple burn-out detection ON, and using up to 15 channels* *3 *Thermocouple burn-out detection OFF, and using up to 60 channels, or Thermocouple burn-out detection ON, and using up to 30 channels*
Graph time axis	100 ms/ div to 1 day/ div (21 selections) *Note: Setting is independent from the recording interval*
Recording Time	Enable continuous recording ON (records until the Stop key is pressed), or continuous recording OFF (enable a specified time span)
Repeating Recording	(ON/OFF) Enable to repeat recording after the specified recording time span has elapsed
Data Saving	
Storage media	Select a CF card or USB memory (Use only PC Cards sold by HIOKI)
Storage operation	Auto: Save waveform data or time divided calculation results in real time Manual: Push the save key (operation select: item choose/ directly save)
Real-time saving	Possible: Waveforms are saved approximately one minute as binary or CSV data to the CF card or the USB memory (if sampling rate is slower than 1 minute, waveforms are saved at each interval) To the PC: Waveforms are saved to the HDD in the PC via LAN or USB communication when used with the Logger Utility Software. Data can be saved in real time to the CF card or USB memory at the same time.
Divided saving	Simple divide: Save waveform data at pre-set times into separate files from the time measurement starts. On schedule: Designate a reference time within 24 hours and save data into separate files at every set time interval starting from the reference time.
Delete & save	Endless loop saving: New file overwrites the oldest file when the CF card or USB memory capacity runs short
Interruptions during saving	Storage media may be removed during real-time save after message confirmation. Upon inserting the storage media again, data saved in internal memory during that time will be saved as a separate file in the media.
Data protect	Possible: When a power failure occurs during real-time save, the file close sequence is completed before the unit is shut down. When powering with batteries and low battery power is detected, the file close sequence will automatically be executed.
Saved data types	Setting condition, Waveform data (binary or text style), Calculation of numerical value, Screen data (compressed BMP)
Loading data	Stored binary data can be recalled by the HiLOGGER in 16 MB quantities
Calculation function	
Numerical value calculations	No. 1 to 6, maximum 6 calculations can be conducted simultaneously Selections: average value, peak value, maximum value, time at maximum value, minimum value, time at minimum value
Data range of calculation	During measurement or after stopping: Store all data or data between A and B cursors into internal memory Times: Calculate values at pre-determined 1 sec to 1 day intervals and display the latest value
Calculation value save	Possible: After measuring the last calculated value is automatically saved to the CF card or USB memory as a text file Timed save: Save calculated data at pre-determined 1 sec to 1 day intervals as text data to the CF card or USB memory in real time.
Waveform calculations	*4 arithmetic calculations between each channel *Separate display of calculation graphs (only during measurement) and input waveforms *Real-time save of calculation graph data
Other functions	
Event marking	Search: Move to the event number entered and display the waveforms appearing before and after event Number of events: Maximum 100 per measurement
A-B cursor	Measurement: time difference between A and B, electric potential difference, electric potential of A or B and time Type: Trace the data, amplitude axis, time axis
Scaling	Convert and display the measurement value of each channel as a scaled value
Rate adjustment	Scaling can be set for a channel so that its value is the same as that for UNIT1-CH1
Comment input	Enter a title or a comment for each channel
Other	Start backup, save ten types setting conditions into main unit, auto set up, start/stop key lock, key-lock, beep sound
Pulse, Digital input	
Number of channels	8 channels, (digital / pulse selectable for each channel, M3 screw terminal × 8ch, 2 terminals per channel, not isolated, common ground)
Input condition	No-voltage 'a' contact (normally open contact), open collector or voltage input, Input resistance: 1.1 MΩ
Max. allowable input	0 V to 50 VDC (maximum voltage between input terminals that does not cause damage)
Max. rated voltage between channels	Not isolated (common ground)
Max. rated voltage to earth	Not isolated (common ground)
Detect level	2 selectable levels (H: over 1.0 V, L: 0 - 0.5 V), (H: over 4.0 V, L: 0 - 1.5 V)
Pulse input period	With filter OFF: 200 µs or more (both H and L periods must be at least 100 µs) With filter ON: 100 ms or more (both H and L periods must be at least 50 ms)
Slope	Rising or falling edge can be set for each channel
Pulse measurement mode	Totalized pulses: Integrated (pulse count integration from start), Instantaneous (pulse count value at each sampling, and integrated value is reset each time) Rotation count: Count input pulses during one second
Filter	For contact bound resistant (ON/OFF set for each channels)

Measurement parameters	Ranges	Finest Resolution	Range of Measurements
Pulse totalization	1,000 M (pulse) f.s.	1 (pulse)	0 to 1,000 M (pulse)
Pulse rotations	5,000/n (r/s) f.s.	1/n (r/s)	0 to 5,000/n (r/s)
	"n" above is the number of sensor output pulses per rotation, 1 to 1,000		
Digital input	Record logical "1" or "0" at each sampling		

■ Product Specifications

Analog input section (@23 ±5˚C/73 ±9˚F, 80% rh or less, from 30 minutes after power on)

Voltage Setting Ranges	Resolution	Measurement range	Accuracy
10 mV f.s.	500 nV	-10 mV to 10 mV	±10 µV
20 mV f.s.	1 µV	-20 mV to 20 mV	±20 µV
100 mV f.s.	5 µV	-100 mV to 100 mV	±100 µV
200 mV f.s.	10 µV	-200 mV to 200 mV	±200 µV
1 V f.s.	50 µV	-1 V to 1 V	±1 mV
2 V f.s.	100 µV	-2 V to 2 V	±2 mV
10 V f.s.	500 µV	-10 V to 10 V	±10 mV
20 V f.s.	1 mV	-20 V to 20 V	±20 mV
100 V f.s.	5 mV	-100 V to 100 V	±100 mV
1 – 5 V f.s.	500 µV	1 V to 5 V	±10 mV

Temperature Thermocouples (Excluding standard reference contact accuracy) (Compliance standard) K, J, E, T, N, R, S, B : JIS C1602-1995, IEC 584 W : ASTME-988-96

Thermocouple	Setting Ranges	Resolution	Measurement range	Accuracy
K	100 ˚C f.s.	0.01 ˚C	-100 to less than 0 ˚C	±0.8 ˚C
			0 to 100 ˚C	±0.6 ˚C
	500 ˚C f.s.	0.05 ˚C	-200 to less than -100 ˚C	±1.5 ˚C
			-100 to less than 0 ˚C	±0.8 ˚C
			0 to 500 ˚C	±0.6 ˚C
	2000 ˚C f.s.	0.1 ˚C	-200 to less than -100 ˚C	±1.5 ˚C
			-100 to 1350 ˚C	±0.8 ˚C
J	100 ˚C f.s.	0.01 ˚C	-100 to less than 0 ˚C	±0.8 ˚C
			0 to 100 ˚C	±0.6 ˚C
	500 ˚C f.s.	0.05 ˚C	-200 to less than -100 ˚C	±1.0 ˚C
			-100 to less than 0 ˚C	±0.8 ˚C
			0 to 500 ˚C	±0.6 ˚C
	2000 ˚C f.s.	0.1 ˚C	-200 to less than -100 ˚C	±1.0 ˚C
			-100 to less than 0 ˚C	±0.8 ˚C
			0 to 1200 ˚C	±0.6 ˚C
E	100 ˚C f.s.	0.01 ˚C	-100 to less than 0 ˚C	±0.8 ˚C
			0 to 100 ˚C	±0.6 ˚C
	500 ˚C f.s.	0.05 ˚C	-200 to less than -100 ˚C	±1.0 ˚C
			-100 to less than 0 ˚C	±0.8 ˚C
			0 to 500 ˚C	±0.6 ˚C
	2000 ˚C f.s.	0.1 ˚C	-200 to less than -100 ˚C	±1.0 ˚C
			-100 to less than 0 ˚C	±0.8 ˚C
			0 to 1000 ˚C	±0.6 ˚C
T	100 ˚C f.s.	0.01 ˚C	-100 to less than 0 ˚C	±0.8 ˚C
			0 to 100 ˚C	±0.6 ˚C
	500 ˚C f.s.	0.05 ˚C	-200 to less than -100 ˚C	±1.5 ˚C
			-100 to less than 0 ˚C	±0.8 ˚C
			0 to 400 ˚C	±0.6 ˚C
	2000 ˚C f.s.	0.1 ˚C	-200 to less than -100 ˚C	±1.5 ˚C
			-100 to less than 0 ˚C	±0.8 ˚C
			0 to 400 ˚C	±0.6 ˚C
N	100 ˚C f.s.	0.01 ˚C	-100 to less than 0 ˚C	±1.2 ˚C
			0 to 100 ˚C	±1.0 ˚C
	500 ˚C f.s.	0.05 ˚C	-200 to less than -100 ˚C	±2.2 ˚C
			-100 to less than 0 ˚C	±1.2 ˚C
			0 to 500 ˚C	±1.0 ˚C
	2000 ˚C f.s.	0.1 ˚C	-200 to less than -100 ˚C	±2.2 ˚C
			-100 to less than 0 ˚C	±1.2 ˚C
			0 to 1300 ˚C	±1.0 ˚C
R	100 ˚C f.s.	0.01 ˚C	0 to 100 ˚C	±4.5 ˚C
	500 ˚C f.s.	0.05 ˚C	0 to less than 100 ˚C	±4.5 ˚C
			100 to less than 300 ˚C	±3.0 ˚C
			300 to 500 ˚C	±2.2 ˚C
	2000 ˚C f.s.	0.1 ˚C	0 to less than 100 ˚C	±4.5 ˚C
			100 to less than 300 ˚C	±3.0 ˚C
			300 to 1700 ˚C	±2.2 ˚C
S	100 ˚C f.s.	0.01 ˚C	0 to 100 ˚C	±4.5 ˚C
	500 ˚C f.s.	0.05 ˚C	0 to less than 100 ˚C	±4.5 ˚C
			100 to less than 300 ˚C	±3.0 ˚C
			300 to 500 ˚C	±2.2 ˚C
	2000 ˚C f.s.	0.1 ˚C	0 to less than 100 ˚C	±4.5 ˚C
			100 to less than 300 ˚C	±3.0 ˚C
			300 to 1700 ˚C	±2.2 ˚C
B	2000 ˚C f.s.	0.1 ˚C	400 to less than 600 ˚C	±5.5 ˚C
			600 to less than 1000 ˚C	±3.8 ˚C
			1000 to 1800 ˚C	±2.5 ˚C
W	100 ˚C f.s.	0.01 ˚C	0 to 100 ˚C	±1.8 ˚C
	500 ˚C f.s.	0.05 ˚C	0 to 500 ˚C	±1.8 ˚C
	2000 ˚C f.s.	0.1 ˚C	0 to 2000 ˚C	±1.8 ˚C

Other specifications about thermocouple measurement

Reference junction compensation	Internal/ External, at INT RJC, total accuracy = add ± 0.5 ˚C
Thermocouple burn-out detection	ON/ OFF, detect at each sampling (when slower than 20 ms)

Temperature Platinum resistance temperature sensor (Compliance standard) Pt 100 : JIS C1604-1997, IEC 751, JPt 100 : JIS C1604-1989

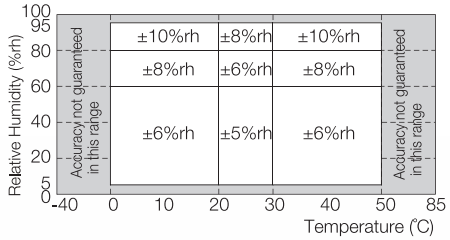
Types	Setting Ranges	Resolution	Measurement range	Accuracy
Pt 100	100 ˚C f.s.	0.01 ˚C	-100 to 100 ˚C	±0.6 ˚C
	500 ˚C f.s.	0.05 ˚C	-200 to 500 ˚C	±0.8 ˚C
	2000 ˚C f.s.	0.1 ˚C	-200 to 800 ˚C	±1.0 ˚C
JPt 100	100 ˚C f.s.	0.01 ˚C	-100 to 100 ˚C	±0.6 ˚C
	500 ˚C f.s.	0.05 ˚C	-200 to 500 ˚C	±0.8 ˚C
	2000 ˚C f.s.	0.1 ˚C	-200 to 500 ˚C	±1.0 ˚C

Resistance /testing current 1 mA	Resolution	Measurement range	Accuracy
10 Ω f.s.	0.5 mΩ	0 to 10 Ω	±10 mΩ
20 Ω f.s.	1 mΩ	0 to 20 Ω	±20 mΩ
100 Ω f.s.	5 mΩ	0 to 100 Ω	±100 mΩ
200 Ω f.s.	10 mΩ	0 to 200 Ω	±200 mΩ

Humidity (use sensor Z2000)	Resolution	Measurement range	Accuracy
100 %rh f.s.	0.1 %rh	5.0 to 95.0 %rh	Refer to table below

■ Humidity sensor Z2000 accuracy

■ 9701, 9681 HUMIDITY SENSOR Accuracy



Filter function (Thermocouple/ Resistance temperature sensor/ Voltage/ Resistance/ Humidity)

Digital filter	Select OFF/ 50 Hz/ 60 Hz (In order to remove harmonic components, during analog input the cut-off frequency is automatically set according to the sampling rate)

■ Optional Product Specifications

VOLTAGE/TEMP UNIT LR8500 (product and accuracy guaranteed for one year)

Number of input channels	15 channels (input type selectable from voltage, thermocouple, humidity, for each channel), M3 screw terminals (2 terminals per channel) *Note: Isolated from each channel to chassis*
Measurement parameters	Voltage, Temperature with thermocouples (K, J, E, T, N, R, S, B, W) *Note: Isolated between channels and from each channel to chassies* Humidity with the sensor Z2000 *Note: Not isolated between channels nor from each channel to chassies*
Input conditions	Input resistance: 1 MΩ (at voltage/ thermocouple measurement) Max. rating: ±100 V DC (max. voltage between input terminals without damage)
Max. rated voltage between isolated input channels	250 V DC (max. voltage between input channel terminals)
Max. rated voltage from isolated terminals to ground	300 V AC, DC (max. voltage from terminals to chassis ground without damage)
Measurement accuracy	Refer to MEMORY HiLOGGER main unit specifications
Dimensions & Mass	Approx. 128 mm (5.04 in) W × 52.8 mm (2.08 in) H × 64.5 mm (2.54 in) D, 380 g (13.4 oz)

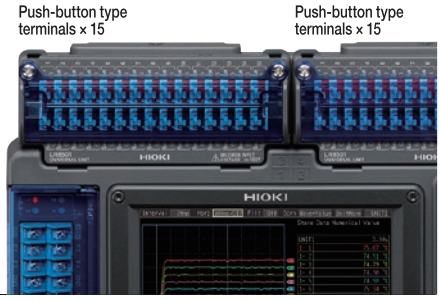
UNIVERSAL UNIT LR8501 (product and accuracy guaranteed for one year)

Number of input channels	15 channels (input type selectable from voltage, thermocouple, Pt 100/ JPt 100, humidity, resistance, for each channel), Push-button type terminals (4 terminals per channel) *Note: Isolated from each channel to chassis*
Measurement parameters	Voltage, Temperature with thermocouples (K, J, E, T, N, R, S, B, W) *Note: Isolated between channels and from each channel to chassis* Platinum resistance temperature sensor (Pt 100, JPt 100, 3-wired/ 4-wired, testing current 1 mA) *Note: Not isolated between channels* Resistance (4-wired, testing current 1 mA) *Note: Not isolated between channels* Humidity with the sensor Z2000 *Note: Not isolated between channels nor from each channel to chassis*
Input conditions	Input resistance: 1 MΩ (at voltage/ thermocouple measurement), 2 MΩ (at platinum resistance temperature sensor, or resistance measurement) Max. rating: ±100 V DC (max. voltage between input terminals without damage)
Max. rated voltage between isolated input channels	300 V DC (max. voltage between input channel terminals)
Max. rated voltage from isolated terminals to ground	300 V AC, DC (max. voltage from terminals to chassis ground without damage)
Measurement accuracy	Refer to MEMORY HiLOGGER main unit specifications
Dimensions & Mass	Approx. 128 mm (5.04 in) W × 52.8 mm (2.08 in) H × 64.5 mm (2.54 in) D, 300 g (10.6 oz)

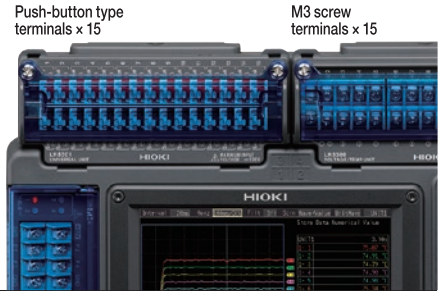
Model Line-up

Items	Specifications	Model LR8400-20 (with built-in VOLTAGE/TEMP UNIT × 2)
Analog input	Built-in 30 channels *Note: Isolated from each channel to chassis* [UNIT-1, UNIT-2] M3 screw terminals × 30 channels (2 terminals per channel)	***Caution:*** *Built-in M3 screw terminal units cannot be removed or replaced*
	Expandable by adding 30 more channels for a total of 60 input channels (optional input unit, Model LR8500 or LR8501, up to 2 units)	
Measurement parameters	Voltage, Temperature with thermocouples (K, J, E, T, N, R, S, B, W) *Note: Isolated between channels and from each channel to chassis* Humidity with the sensor Z2000 *Note: Not isolated between channels nor from each channel to chassis*	
Input resistance	1 MΩ (at voltage/ thermocouple measurement)	
Max. allowable input	±100 V DC (max. voltage between input terminals without damage)	
Max. rated voltage between isolated input channels	250 V DC (max. voltage between input channel terminals)	
Max. rated voltage from isolated terminals to ground	300 V AC, DC (max. voltage from terminals to chassis ground without damage)	

Items	Specifications	Model LR8401-20 (with built-in UNIVERSAL UNIT × 2)
Analog input	Built-in 30 channels *Note: Isolated from each channel to chassis* [UNIT-1, UNIT-2] Push-button type terminals × 30 channels (4 terminals per channel)	***Caution:*** *Built-in push-button terminal units cannot be removed or replaced*
	Expandable by adding 30 more channels for a total of 60 input channels (optional input unit, Model LR8500 or LR8501, up to 2 units)	
Measurement parameters	Voltage, Temperature with thermocouples (K, J, E, T, N, R, S, B, W) *Note: Isolated between channels and from each channel to chassis* Platinum resistance temperature sensor (Pt 100, JPt 100, 3-wired/ 4-wired, testing current 1 mA) *Note: Not isolated between channels* Resistance (4-wired, testing current 1 mA) *Note: Not isolated between channels* Humidity with the sensor Z2000 *Note: Not isolated between channels nor from each channel to chassis*	
Input resistance	1 MΩ (at voltage/ thermocouple measurement) 2 MΩ (at resistance temperature sensor, or resistance measurement)	
Max. allowable input	±100 V DC (max. voltage between input terminals without damage)	
Max. rated voltage between isolated input channels	300 V DC (max. voltage between input channel terminals)	
Max. rated voltage from isolated terminals to ground	300 V AC, DC (max. voltage from terminals to chassis ground without damage)	



Items	Specifications	Model LR8402-20 (with built-in UNIVERSAL UNIT × 1, VOLTAGE/TEMP UNIT × 1)
Analog input	Built-in 30 channels *Note: Isolated from each channel to chassis* [UNIT-1] Push-button type terminals × 15 channels (4 terminals per channel) [UNIT-2] M3 screw terminals × 15 channels (2 terminals per channel)	***Caution:*** *Built-in push-button terminal unit and M3 screw terminal unit cannot be removed or replaced*
	Expandable by adding 30 more channels for a total of 60 input channels (optional input unit, Model LR8500 or LR8501, up to 2 units)	
Measurement parameters	Voltage, Temperature with thermocouples (K, J, E, T, N, R, S, B, W) *Note: Isolated between channels and from each channel to chassis* Humidity with the sensor Z2000 *Note: Not isolated between channels nor from each channel to chassis* [UNIT-1 side only] Platinum resistance temperature sensor (Pt 100, JPt 100, 3-wired/ 4-wired) *Note: Not isolated between channels* Resistance (4-wired) *Note: Not isolated between channels*	
Input resistance	1 MΩ (at voltage/ thermocouple measurement) 2 MΩ (at platinum resistance temperature sensor, or resistance measurement)	
Max. allowable input	±100 V DC (max. voltage between input terminals without damage)	
Max. rated voltage between isolated input channels	250 V DC at M3 screw terminals, 300 V DC at push-button type terminals (max. voltage between input channel terminals)	
Max. rated voltage from isolated terminals to ground	300 V AC, DC (max. voltage from terminals to chassis ground without damage)	



■ Bundled software specifications

Logger Utility (bundled application software)

Operating environment	One CD-R, **CPU:** Pentium 3 (500 MHz or more), at least 512 MB of memory **Interface:** USB, LAN (LAN not available with the Model 8430-20/-21) **OS:** Windows 2000 (SP4 or later)/ XP (SP2 or later)/ Vista (32-bit/ 64-bit), (Ver 1.50 or later) Windows 7 (32-bit/ 64-bit) (This software is compatible only to the MEMORY HiLOGGER **LR8400-20s, LR8400-21s, 8423, 8430-20/-21**)
Real-time data acquisition	Measurements on multiple loggers connected by LAN* or USB can be controlled to sequentially acquire, display and save waveform data (for recording up to 10 million samples) **LAN available with HiLOGGER main unit Ver 1.20 or later* **Number of controllable instruments:** up to 5 units **Display:** Waveforms (multiple time axis can be displayed), Numerical values (logging), Alarm status at the same time, Numerical value monitoring in a separate window, Waveform scroll while measuring **Data saving destination:** Real-time data transfer to EXCEL (new function), or Real-time data acquisition file (LUW format, only for HIOKI) **Event marks:** can be applied while recording
Data acquisition settings	Data acquisition settings for the HiLOGGER **Saving:** The setting for multiple HiLOGGERs can be saved together in one file (LUS format); Instrument configuration settings can be sent and received
Waveform display	**Processed data file:** Real-time data acquisition file (LUW format), Record to internal memory data (MEM format) **Display format:** Simultaneously display waveform and numerical value, (time-axis divided display possible) **Maximum number of channels:** 300 channerls (measurement data, used with the LR8400-20s, LR8400-21s) + 60 channels (waveform processing data) **Others:** Waveform display on sheet for each channel, scroll, record event mark, cursor, hard copy, numerical value display
Data conversion	**Target data:** Real-time data acquisition file (LUW format), Record to internal memory data (MEM format), Waveform processing data **Converted sections:** All data, designation section **Format:** CSV format (separate by comma, space, tab), transfer to EXCEL spreadsheet, arbitrary data thinning
Parameter calculations	**Target data:** Real-time data acquisition file (LUW format), Record to internal memory data (MEM format), Data acquired in real time, Waveform processing data **Calculation items:** average, peak, maximum values, time to maximum values, minimum values, time to minimum values, ON time, OFF time, count the number of ON time and OFF time, standard deviation, integration, area values, totalization
Search function	**Target data:** Real-time data acquisition file (LUW format), Record to internal memory data (MEM format), Waveform processing data, **Search mode:** event mark, time and date, maximum position, minimum position, maximum pole, minimum pole, alarm position, level, window, amount of change
Print function	**Supported printer:** printer compatible with the OS **Target data:** Real-time data acquisition file (LUW format), Record to internal memory data (MEM format), Waveform processing data **Print format:** waveform image, report format, list print (channel settings, event, cursor value) **Print area:** the entire area, area between cursors A and B **Print preview:** supported
Waveform processing	**Processing items:** Four arithmetic operations **Number of processing channels:** 60 channerls

Main units and Options in Detail

LR8400-20 (with built-in VOLTAGE/TEMP UNIT × 2)

Built-in units are equivalent to the VOLTAGE/TEMP UNIT LR8500 (15 ch) × 2
Caution: *Built-in units cannot be removed or changed*

LR8401-20 (with built-in UNIVERSAL UNIT × 2)

Built-in units are equivalent to the UNIVERSAL UNIT LR8501 (15 ch) × 2
Caution: *Built-in units cannot be removed or changed*

LR8402-20
(with built-in UNIVERSAL UNIT × 1, VOLTAGE/TEMP UNIT × 1)

Built-in units are equivalent to the UNIVERSAL UNIT LR8501 (15 ch) × 1, and VOLTAGE/TEMP UNIT LR8500 (15 ch) × 1
Caution: *Built-in units cannot be removed or changed*

Measurement and input options

VOLTAGE/TEMP UNIT LR8500
2 terminals M-3 mm screw type, 15 channels
Voltage, Temperature with thermocouple, or Humidity measurement

UNIVERSAL UNIT LR8501
4 terminals push-button type, 15 channels
Voltage, Temperature with thermocouple, Platinum Resistance temperature sensor, Humidity, or Resistance measurement

HUMIDITY SENSOR Z2000
3 m (9.84 ft) length

Removable storage (CF card)

Supplied with PC Card adapter

PC Card Precaution
Use only PC Cards sold by HIOKI. Compatibility and performance are not guaranteed for PC cards made by other manufacturers. You may be unable to read from or save data to such cards.

- **PC CARD 2G 9830** (2 GB capacity)
- **PC CARD 1G 9729** (1 GB capacity)
- **PC CARD 512M 9728** (512 MB capacity)
- **PC CARD 256M 9727** (256 MB capacity)

Power supplies

Charges while installed in the HiLOGGER

BATTERY PACK Z1000
NiMH, Charges while installed

AC ADAPTER 9418-15
Supplied as standard, 100 to 240 V AC

PC communication

LAN CABLE 9642
Straight Ethernet cable, supplied with straight to cross conversion adapter, 5 m (16.41 ft) length

Cases

CARRYING CASE C1000
Includes compartment for options

FIXED STAND Z5000
For wall hanging and slanted bench mounting