

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

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 alcaline 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

LR8431/20



**Palmare, versatile e leggero...
10 canali in un palmo di mano!!!**

**Ultracompatto...
tascabile, 10 canali a colori
per registrazioni semplici e precise**

Dimensioni e peso estremamente ridotti

Il volume ed il peso sono i più piccoli del mercato, il 40% in meno sul volume e il 55% in meno sul peso rispetto a qualsiasi altro oscilloscopio registratore. La trasportabilità è assoluta, anche in valigia 24ore, LR8431/20 è largo 176 mm, alto 101 mm e profondo 41 millimetri e pesa solamente 550 grammi.

10 ingressi analogici e 4 digitali, 1 uscita d'allarme, 1 trigger input & 1 output

10 CANALI ANALOGICI (isolati tra loro e verso massa) per:

Tensione: 6 portate di misura: da $\pm 10\text{mV}$ a $\pm 60\text{V}$ e 1-5V per trasduttori (risoluzione 500uV)

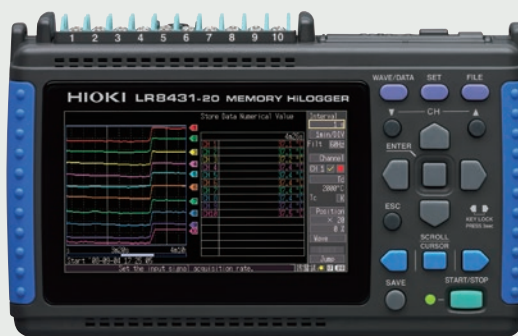
Temperatura: 8 tipi di termocoppie: K, J, E, T, N, R, S, B da -200°C a $+2000^\circ\text{C}$, con risoluzione 0.01°C

4 canali digitali per:

- Conteggio impulsi proporzionali da contatori esterni
- Velocità di rotazione di motori ed encoder

1 uscita per segnalazione allarme che si attiva quando è soddisfatto il requisito di attivazione. Configurazione tramite formule logiche AND e OR tra i canali (uscita 5Vcc e potere di commutazione 5-30V @ 200mA)

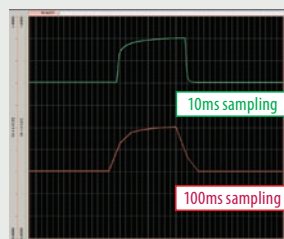
1 trigger input per avvio registrazione & 1 trigger output per segnalare in esterno la rilevazione di un evento



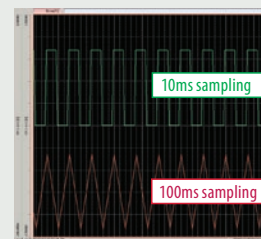
Campionamento ad alta velocità 10msec

Lo sviluppo di veicoli ibridi ed elettrici richiede strumenti in grado di misurare i cambiamenti improvvisi di carico.

LR8431/20 è in grado di monitorare e registrare forme d'onda con intervallo di campionamento di 10msec su tutti i 10 canali analogici in contemporanea.



Measurement comparison of abrupt load change in waveform with 10 ms (upper trace) and 100 ms sampling



Measurement comparison of 5 Hz square wave with 10 ms (upper trace) and 100 ms sampling

Misura e registrazione a lungo termine

Recording Time (Save to External storage in real-time of binary data) *Note: When saving in CSV data format, total recording time is 1/10 or shorter of the following.*

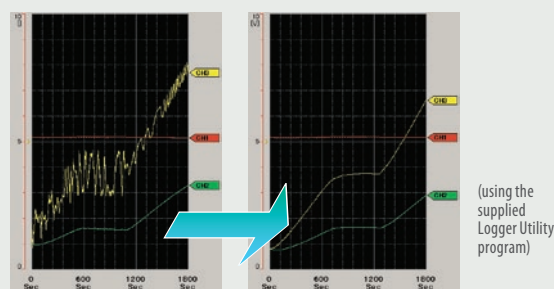
| Recording All Channels (ten analog, four pulse and one alarm) | | | | | |
|---|------------------------|--------------|--------------|--------------|--------------|
| Recording intervals | Internal memory (7 MB) | 256 MB | 512 MB | 1 GB | 2 GB |
| 10 ms | 32m | 19h 37m | 1d 15h 14m | 3d 06h 29m | 6d 12h 58m |
| 20 ms | 1h 04m | 1d 15h 14m | 3d 06h 29m | 6d 12h 58m | 13d 01h 57m |
| 50 ms | 2h 40m | 4d 02h 6m | 8d 04h 13m | 16d 08h 26m | 32d 16h 53m |
| 100 ms | 5h 21m | 8d 04h 13m | 16d 08h 26m | 32d 16h 53m | 65d 09h 47m |
| 200 ms | 10h 43m | 16d 08h 26m | 32d 16h 53m | 65d 09h 47m | 130d 19h 35m |
| 500 ms | 1d 02h 49m | 40d 21h 07m | 81d 18h 14m | 163d 12h 29m | 327d 00h 59m |
| 1 s | 2d 05h 39m | 81d 18h 14m | 163d 12h 29m | 327d 00h 59m | "★" |
| 2 s | 4d 11h 18m | 163d 12h 29m | 327d 00h 59m | "★" | "★" |
| 5 s | 11d 04h 16m | "★" | "★" | "★" | "★" |
| 10 s | 22d 08h 33m | "★" | "★" | "★" | "★" |
| 20 s | 44d 17h 06m | "★" | "★" | "★" | "★" |
| 30 s | 67d 01h 39m | "★" | "★" | "★" | "★" |
| 1 min | 134d 03h 18m | "★" | "★" | "★" | "★" |
| 2 min | 268d 06h 36m | "★" | "★" | "★" | "★" |
| 5 min to 1 hour | "★" | "★" | "★" | "★" | "★" |

- Maximum recording time is inversely proportional to number of recording channels.
- Because the actual capacity of the External storage 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 365 days.

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.



Registrazione e connessione a computer

LR8431/20 può registrare i dati di misura su chiave USB o su CF Card di dimensione massima 2GB. In caso di improvvisa mancanza di alimentazione, il file viene correttamente chiuso prima dello spegnimento definitivo e al ripristino la registrazione può ripartire automaticamente. LR8431/20 consente di sostituire il supporto di archiviazione (CF o USB) durante la fase di registrazione (entro 2 minuti) senza perdere alcun valore misurato.



USB receptacle for data communication



USB Memory (for real-time data saving)

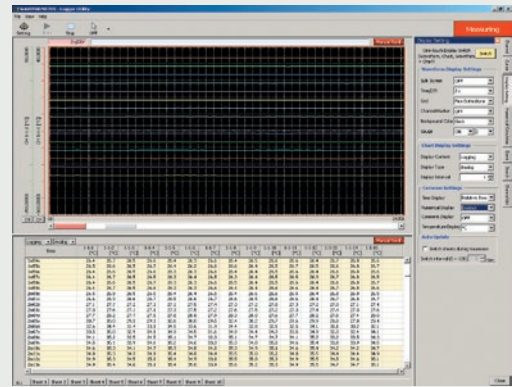


CF Card (for real-time data saving)

Supports HIOKI's 2GB Card
Note: Non-Hioki CF cards are not supported

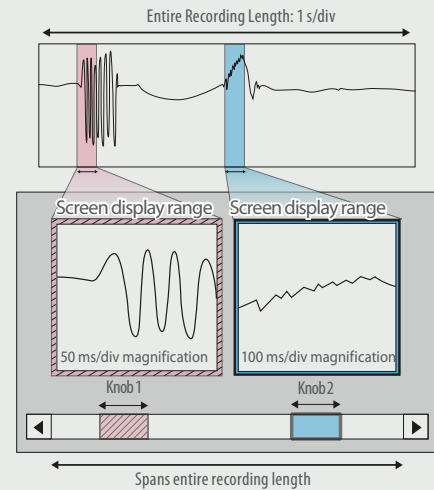
Software Logger Utility: gestione in tempo reale

Il programma in dotazione Logger Utility può essere utilizzato per analizzare in tempo reale su PC i dati in registrazione su LR8431/20. La barra di scorrimento orizzontale consente di muovere il cursore e la visualizzazione sull'asse dei tempi per analizzare i dati precedenti e le tendenze. Il software può gestire fino a 5 unità LR8431/20 in contemporanea, fornendo una visualizzazione grafica di 50 canali analogici e 20 canali digitali.



Software Logger Utility: visualizzazione con doppio zoom di dettaglio

In modalità grafica, la barra di scorrimento orizzontale fornisce l'indicazione dettagliata circa la posizione della porzione di forma d'onda ingrandita all'interno della forma d'onda complessiva. La possibilità di modificare la base tempi su ognuna delle 2 finestre di zoom fornisce un modo pratico e veloce per analizzare i dati raccolti nel lungo periodo.



Options in Detail



MEMORY HiLOGGER LR8431-20 (English model)

Supplied Accessories:

Measurement Guide × 1, AC ADAPTER Z1005 × 1, USB cable × 1,
CD-R (Instruction Manual, data collection software "Logger Utility") × 1

Supplied Accessories



AC ADAPTER Z1005
100 to 240 V AC

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)

Battery Pack



Charges while installed
in the HiLOGGER

BATTERY PACK 9780
NiMH. Charges while installed

Input cables



CONNECTION CABLE 9641
For pulse inputs, 1.5 m (4.92 ft) length

Other



To prevent damage to
the instrument's display

PROTECTION SHEET 9809
For LCD protection, pairs of additional sheets
can be purchased separately.

Case



SOFT CASE 9812
Includes space for small items,
Neoprene rubber



CARRYING CASE 9782
Includes compartment for options,
Resin coated

Product Specifications

| General specifications (product guaranteed for one year) | |
|--|--|
| Input System/Channels | Analog inputs: 10 (M3 mm dia. screw terminal block), electrically isolated between channels, and from chassis ground. Input impedance: 1 MΩ (when voltage input or temperature measuring with thermocouple burn-out detection OFF), 800 kΩ (with thermocouple burn-out detection ON) Pulse inputs: 4 channels (requires HIOKI Input Cable 9641) <i>Note: all pulse inputs share common ground with the HiLOGGER</i> |
| Analog Inputs | Maximum rating: 60 V DC (max. voltage between input terminals without damage) Maximum rated voltage from isolated terminals to ground: 60 V DC (max. voltage between input channel terminals, and from terminals to chassis ground without damage) |
| Pulse Inputs | Input limits: -5 to +10 V DC (max. voltage between input terminals without damage), non-isolated (common ground between pulse input channels, and with chassis) Pulse signal characteristic: No-voltage relay contact "a", open collector or voltage input (High: ≥ 2.5 V, Low: ≤ 0.9 V), Period: at least 200 μs (both high and low periods at least 100 μs) |
| Alarm Output | One channel, non-isolated: output from external control connector (common ground) Signal criteria: configurable high/low threshold levels, enter/exit threshold window, logical sum (OR) and logical product (AND) for every input channel. Output is refreshed each time recording starts. Signal characteristic: Open-collector output (active low, with voltage output) Voltage levels: 4.0 to 5.0 V (H) and 0 to 0.5 V (L), Max. sink current: 5 mA DC, Max. applied voltage: 30 V DC |
| Internal storage | 3.5 MWords (7 MB of two-byte data points, or four-byte pulse measurements) |
| External storage | 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: USB 2.0 High-speed capable, series mini-B receptacle, Data format: FAT, FAT32 |
| Backup Function (@25°C) | Backup battery life for clock and settings: approx. 5 years For measurement data: 100 hours with fully charged battery pack, or for as long as AC adapter is connected |
| External Control Terminals | External Trigger/Event Mark input (exclusion function), Trigger Output, Alarm Output |
| Display type | 4.3-inch WQVGA-TFT color LCD (480 × 272 dots) |
| Displayable languages | English, Japanese |
| External Interface | One USB 2.0 series mini B receptacle Functions: Control from a PC (Ver 1.00 or later), Transfers internal data on the CF card to a PC |
| Environmental conditions (no condensation) | Temperature and humidity range for use: 0°C to 40°C (32°F to 104°F), (or 5°C to 30°C, 41°F to 86°F when battery charging), 80% rh or less Temperature and humidity range for storage: -10°C to 50°C (14°F to 122°F), 80% rh or less |
| Compliance standard | Safety: EN61010, EMC: EN61326, EN61000 |
| Power Sources | (1) 100 to 240 V AC, 50/60 Hz using AC ADAPTER Z1005 (2) BATTERY PACK 9780 (when used with the AC Adapter, the AC Adapter has priority) (3) 12 V battery (10 to 16 V DC ±10%, Please contact HIOKI for connection cord) |
| Power Consumption | 10 VA |
| Continuous Operating Time | Approx. 2.5 hours (with Battery Pack Model 9780 while saving to the CF card) Charging time: Approx. 200 minutes (@5°C to 30°C ambient) |
| Dimensions and mass | Approx. 176 mm (6.93 in) W × 101 mm (3.98 in) H × 41 mm (1.61 in) D, 550 g (19.4 oz) (HiLOGGER only) |
| Supplied Accessories | Measurement Guide × 1, AC ADAPTER Z1005 × 1, USB cable × 1, CD-R (Instruction Manual, data collection software "Logger Utility") × 1 |

| Trigger functions | |
|--|---|
| Trigger Source (selectable for each channel) | All analog and pulse channels P1 to P4, external trigger, logical sum (OR) and product (AND) of each trigger source |
| External Trigger | Criteria: Short-circuit between external trigger input and ground, or voltage input (H-L transition from [3.0 - 5 V] to [0 - 0.8 V]) Pulse width: At least 1 ms (H), and 2 μs (L) Input limits: 0 to 7 V DC |
| Trigger Timing | Start, Stop and Start/Stop (different trigger criteria can be set to start and stop) |
| Trigger Types (Analog, Pulse) | Level: Triggers when rising or falling through preset threshold Window: Triggers when entering or exiting range defined by preset upper and lower thresholds |
| Level Resolution | Analog: 0.025% f.s. (f.s. = 10 display divisions) Pulse: Totalization 1 count, Rotations 1/n [r.s] (n: pulses per rotation) |
| Pre-trigger | Records for a specified period before triggering; can be set for real-time saving |
| Trigger Output | (1) Output signal at trigger occurred, (2) Output signal at start or trigger occurred, (1) or (2) mode selectable Open collector (active low, with voltage output, at least 10 ms pulse width, Voltage levels: 4.0 to 5.0 V (H) and 0 to 0.5 V (L), Max. sink current: 5 mA DC, Max. applied voltage: 30 V DC) |

| Measurement Settings | | | |
|--|---|---|-------------------|
| Recording Intervals (sampling period) | 10 ms to 1 hour, 19 selections <i>Note: All input channels are scanned at high speed during every recording interval</i> | | |
| Graph Timebase Scaling | 100 ms to 1 day per division, 21 selections <i>Note: Setting is independent from the recording interval</i> | | |
| Repeating Recording | (ON/OFF) Enable to repeat recording after the specified recording time span has elapsed | | |
| Recording Time | Enable continuous recording ON (records until the Stop key is pressed), or disable to record for a specified time span (days, hours, minutes and seconds) | | |
| Timer Recording | (ON/OFF) Enable to record for a specified time span, or between specified start and stop times | | |
| Auto Saving | Waveform (Binary or CSV data): stores data to the CF card or USB memory during real-time measurement Numerical value calculations: stores calculated values to the CF card or USB memory when finished measuring <i>Note: Don't shutdown while data saving</i> | | |
| Data Storage Methods | Each recording can be saved in a separate file Overwriting save (endless loop recording): New data overwrites the oldest data when the storage media is full Divided Saving: Enable to save data at a specified interval (days, hours and minutes) Divided Saving: Specified Time (specify a time of day at which to start saving data to files at a specified interval) <i>Note: Don't shutdown while data saving</i> | | |
| Load Stored Data | Stored data can be recalled by the HiLOGGER in 3.5 MWord (7 MB) quantities (for a single channel; less for multiple channels) | | |
| Settable Save/Reload | Configure saving and reloading to and from CF card or USB memory or internal memory Ten types for internal memory, no limit for CF card and USB memory | | |
| Numerical Calculations | Calculations 1 to 4, may be simultaneous Selections: average, peak, maximum and minimum values, time-to-maximum and time-to-minimum | | |
| Selectable Filters | 50Hz, 60 Hz, or OFF (digital filtering of high frequencies on analog channels) | | |
| Channel Settings | | | |
| Channel Settings | Enable/disable measurement (ON/OFF), selectable waveform color Analog channels (10): Voltage (DC only), Temperature (thermocouple only), Thermocouple types K, J, E, T, N, R, S, B Pulse input channels (4): Count Integration or revolutions Alarm output (1): Hold/not-hold, beeper enable/disable (ON/OFF), Show/hide alarm waveform display (ON/OFF) | | |
| Measurement parameters | Ranges | Range of Measurements | Finest Resolution |
| Voltage | 100 mV f.s. | -100 mV to +100 mV | 5 μV |
| | 1 V f.s. | -1 V to +1 V | 50 μV |
| | 10 V f.s. | -10 V to +10 V | 500 μV |
| | 20 V f.s. | -20 V to +20 V | 1 mV |
| | 100 V f.s. | -60 V to +60 V | 5 mV |
| | 1 - 5 V (Note) | 1 V to 5 V | 500 μV |
| | Accuracy: ±0.1 % f.s. (Note: 1 - 5V range's f.s. = 10 V) | | |
| Measurement parameters | Ranges | Range of Measurements | Finest Resolution |
| Temperature (Thermocouples) | 2000 °C f.s. | -200 °C to 2000 °C | 0.1 °C |
| Temperature input ranges (JIS C 1602-1995) | (K) -200 °C to 1350 °C | (J) -200 °C to 1200 °C | |
| | (E) -200 °C to 1000 °C | (T) -200 °C to 400 °C | |
| | (N) -200 °C to 1300 °C | (R) 0 °C to 1700 °C | |
| | (S) 0 °C to 1700 °C | (B) 400 °C to 1800 °C | |
| | | K, J, E, T, : ±1.0 °C (-100 °C or more), ±1.5 °C (-200 °C to -100 °C) N : ±1.2 °C (-100 °C or more), ±2.2 °C (-200 °C to -100 °C) R, S: ±2.2 °C (300 °C or more), ±4.5 °C (0 °C to 300 °C) B: ±2.5 °C (1000 °C or more), ±5.5 °C (400 °C to 1000 °C) | |
| Measurement Accuracy | Reference junction compensation [RJC] accuracy: ±0.5°C (horizontal positioning), ±1°C (vertical positioning) Internal [RJC] (internal reference junction compensation at 0 °C): Measurement accuracy = (temp. measurement accuracy) + (RJC accuracy) External [RJC] (using external junction compensation at 0 °C): Measurement accuracy = temp. measurement accuracy only | | |
| Temperature Other Functions | Thermocouple burn-out detection: ON or OFF | | |
| Measurement parameters | Ranges | Range of Measurements | Finest Resolution |
| Pulse (Totalization) | 1,000 M (count) f.s. | 0 to 1,000 M (count) | 1 (count) |
| | | Totalization mode: cumulative (counts from start) Instantaneous value: instantaneous value during each recording period | |
| Pulse (Rotations) | 5,000/n (r/s) f.s. | 0 to 5,000/n (r/s) | 1/n (r/s) |
| Slope Setting | ↑ (count of L-to-H pulse transitions), ↓ (count of H-to-L pulse transitions) | | |
| Displayed Range | Specified by position, or by upper/lower display limit values (Upper/lower limit values only at Totalization mode) | | |
| Common Channel Settings | | | |
| Scaling | Decimal (display decimal values), Exponential (display base-10 exponents), or Off Method: Ratio (set by slope and intercept), or 2-point (set by input/output values at two points) | | |
| Other Common Channel Settings | Enter comments for each channel, set start/stop triggers and alarm criteria | | |