



HM-2325A.3F



HM-2330D.3F



### MiniLoggers—

You can fully automate your test data collection by using one of these MiniLoggers. The MiniLogger is a simple-to-use, four channel, stand-alone data-logging system specifically designed for use in: Soil Testing, such as: Triaxial, Consolidation, Direct Shear, CBR/LBR Unconfined Compression; Asphalt Testing, such as: TSR Hveem; Flow/Stability; and, Cement Testing such as: Soil/Cement and Cement Cubes.

Features include:

- Four channels with real-time data acquisition
- Backlit LCD display
- RS232 interface for computer or printer.

- Nonvolatile test data storage and instrument calibration
- Battery-backed real-time clock
- Auto conversion of instrument calibration between English or Imperial units and SI or metric units
- Test setup and selection via keypad
- Automatic triggering of test logging data
- View logged test data via the LCD display
- Logging rate as fast as 0.1 second/reading
- Windows-based software included for viewing and exporting test data into an Excel format files with plug and play features.
- Up to sixteen units can be connected to a computer.

### Specifications

Data Storage	1000 readings/channel
Voltage	110/220 VAC 50/60Hz
Weight	6 lbs. (2.7Kg)
Dimension (L x W x H)	8.3 x 9.5 x 4.7 inch (210 x 240 x 120mm)

Computer (Software/Hardware)

Windows 98, Windows 2000, Windows XP compatible, Pentium III or better, 512 Mbytes of RAM, 30Mbytes of space in hard drive.

### MiniLogger— HM-2325A.3F

- Ideal with instruments, such as Pressure Transducers, Load Cells, and Strain Transducers.
- Four individual, 16-bit analog to digital converters
- Instrumentation excitation supply of 10 VDC
- Analogue outputs for XYt chart recorder
- To be used with instruments with an output of 0 up to 100 mvdc



### MiniLogger— HM-2330D.3F

- For use with Digital Indicators
- Four individual, Digital Indicator inputs.
- Instrumentation excitation supply of 5 VDC.





### Load Rings—

Sometimes called “Proving Rings,” Load Rings are used with various asphalt, concrete, or soil instrumentation to measure loads, and are ideal for use with our MasterLoader compression machines, Direct Shear machines and other testing equipment.

Our high quality tensile steel rings have spherical seatings suitable for all shear boxes and load frames. Each load ring is shipped with a fitted dial gauge and calibration certificate, and supplied with tables listing all measurement units. 8-1/4" (210mm) high, 3/4-16 UNF thread female mounting. Available with digital indicators compatible with data acquisition systems. Eight models range in size from 110 to 22,000 lbf (0.5 to 100.0 kN). Meet ASTM E74.

### Load Ring with Dial Gauge

lbf	kN	kgf	Model
110	0.5	50	H-4454.001
220	1.0	100	H-4454.002
550	2.5	250	H-4454.005
1100	5.0	500	H-4454.010
2200	10.0	1000	H-4454.020
5500	25.0	2500	H-4454.050
11000	50.0	5000	H-4454.100
22000	100.0	10000	H-4454.200

### Load Ring with Digital Indicator

lbf	kN	kgf	Model
110	0.5	50	H-4454.001D
220	1.0	100	H-4454.002D
550	2.5	250	H-4454.005D
1100	5.0	500	H-4454.010D
2200	10.0	1000	H-4454.020D
5500	25.0	2500	H-4454.050D
11000	50.0	5000	H-4454.100D
22000	100.0	10000	H-4454.200D

### S-Type Load Cells—

Load cells are bi-directional for both tension and compression loads. Constructed from stainless steel. Load cells can be used with various instrumentation to measure loads. Includes: 6 ft. cable with 5-pin DIN plug and calibration certificate.

### Performance Specifications:

- Excitation Voltage:** 10 VDC, Maximum 15 VDC
- Rated output:** 3.0 mv/V Minimum
- Non-linearity:** 0.03% Full Scale Output
- Hysteresis:** 0.02% FSO
- Non-repeatability:** 0.01% FSO
- Creep (30 minutes):** 0.03% FSO
- Zero Balance:** ±1.0% FSO

### Bridge resistance

- Input: 350 ohms, nominal
- Output: 350 ohms, ±3.5 ohms

### Overload

- Safe Static: 150% of Rated Capacity
- Ultimate: 175% of Rated Capacity

### Temperature

- Compensated range: 0-150°F
- Effect on output: 0.0006% FSO/°F
- Effect on zero: 0.0008% FSO/°F

### Finish:

Nickel-plated or Stainless Steel

### Seal:

Waterproof

### S-type Load Cells

	Model
Load Cell 500 lbf (2.5 kN)	HM-2300.005
Load Cell 1000 lbf (5 kN)	HM-2300.010
Load Cell 2000 lbf (10 kN)	HM-2300.020
Load Cell 5000 lbf (25 kN)	HM-2300.050
Load Cell 10000 lbf (50 kN)	HM-2300.100
Single Channel Readout	HM-2350

Other capacities and styles of Load Cells are available, such as pancake and submersible, please contact Humboldt for information.



HM-2310.10

### Linear Strain Conversion Transducers (LSCT)

Extremely accurate and reliable strain gauge instruments. Compact size does not require a module. High resolution and performance superior to LVDT.

- Less than 250g spring force on spindle
- Non-linearity better than  $\pm 0.1\%$  of full scale deflection
- Hysteresis-compensated with linearity better than  $\pm 0.1\%$  of full scale in both directions
- Negligible temperature effect

Stainless steel casing for environmental protection. Operating temperature range 0 to 70°C. Requires input of 10V dc; output up to 6.5 mV per volt.

### LSCT

Range	Resolution	Model
Linear strain transducer, .4" (10mm)		HM-2310.04
Linear strain transducer, 1.0" (25mm)		HM-2310.10
Linear strain transducer, 2.0" (50mm)		HM-2310.20

### LSCT Mounting Bracket— HM-4178BRT

Bracket used for CBR and 3" bracket.

### LSCT Mounting Bracket— HM-2310BR

Bracket used in mounting LSCT to equipment in replacement of dial gauge.

### LSCT Mounting Bracket— HM-4193BR

Bracket used in mounting LSCT or dial gauge to the upper part of a triaxial cell with a 5/8" (15.5mm) dia. ram for strain measurement. (HM-2310BR also required for use with LSCT.)



HM-4172

### Digital Pressure Transducer— HM-4172

Solid state transducer/readout unit incorporates the latest semiconductor technology into a high-quality, yet inexpensive strain gauge. Three-digit readout display has  $\pm 0.25\%$  of full scale accuracy—comparable to others at twice the cost. Battery operated with very long battery life—typically up to 5 years. On/off button at top of readout has factory set "on" time built into the memory. Readout shuts off automatically after 20 minutes.



### Magnetic Indicator Mount— H-4470

Convenient, portable mount for mounting indicators and gauges. Mount has magnetic base, which mounts on flat or curved metallic surfaces. Non-magnetic stainless steel holding rod is 6 x 1/4" (154 x 6.4mm) and set in hardened ball socket so indicator or gauge may be mounted in almost any position.

H-4470



HM-4170

HM-4170B

### Pore Pressure Transducer— HM-4170

Highly accurate, 200 psi (1400 kPa) Pore Pressure Transducer. Designed for geotechnical lab applications with outstanding overload protection and protected from corrosive water. Requires input of 10 V DC, with an output of 100 mV. Supplied with 2 meter cable and 5-pin DIN plug.

### 6 Ft. Extension Cable— HM-4170EC

6-foot extension cable for Pore Pressure Transducer.

### De-Airing Block— HM-4170B

For use with Pore Pressure Transducer



HM-4469.10



H-4158.1



H-4665.25CC

### Digital Indicators—

Switchable inch/metric digital indicator is accurate to  $\pm .0001"$  (.002mm). Instant zero feature. Locks in maximum reading on LCD display with characters 0.240" high and 0.115" wide. Runs either clockwise or counter clockwise. Operates with replaceable batteries or AC power with automatic shutoff. Will replace any mechanical dial gauge.

### Digital Indicators

Range	Resolution	Model
.250" / 6.35mm	.0001" / .002mm	HM-4469.02
.600" / 15.0mm	.0001" / .002mm	HM-4469.05
1.0" / 25.4mm	.0001" / .002mm	HM-4469.10
2.0" / 50.0mm	.0001" / .002mm	HM-4469.20
4.0" / 101.6mm	.0001" / .002mm	HM-4469.40

### AC Adapter for Digital Indicator— HM-4469AC

Allows Indicator to run off AC power.

### Data Cable for Digital Indicator— HM-4469C

### Serial Data Cable for Digital Indicator— HM-4469RS

### USB Data Cable for Digital Indicator— HM-4469USB

Data cables to transfer data from indicator to MiniLogger, Load Frame or computer.

### 6' Data Cable Extension— HM-4170EC

### 25' Data Cable Extension— HM-2310C

### Gauge Contact Point Extensions—

Used in applications where gauges require longer contact points to ensure correct gauge placement. Contact Points feature hardened steel points with polished tip to prevent scratching. Points fit all standard indicators and gauges.

Contact Point Extensions	Model
.25" (6.4mm) Extension	H-4466.2
1" (25mm) Extension	H-4466.10
1.5" (38mm) Extension	H-4466.15
2" (50mm) Extension	H-4466.20
3" (76mm) Extension	H-4466.30
5" (127mm) Extension	H-4466.5

### Dial Gauges

Indicators are built to American Gauge Design Specifications for accuracy and are used in field and laboratory testing applications. Dials are high-quality, low-friction type, designed for long life and accurate repeatable readings. All dial indicators have continuous graduations and revolution counters that show revolutions of the indicator hand. They are furnished with a lug back (with a 90° mounting hole to be used vertically or horizontally), a regular contact point .25" long, and a dust cap. Dials listed are clockwise rotation; counter-clockwise rotation see note below.

### Dial Gauges, Inches

Range	Division	Diameter	Brake	Model
.200"	.0001"	2.25"	No	H-4460
.200"	.0001"	2.25"	Yes	H-4461A
.300"	.0001"	2.25"	No	H-4462
.500"	.0001"	2.25"	No	H-4471
1.000"	.001"	2.25"	No	H-4158.1
2.000"	.001"	2.75"	No	H-4463
3.000"	.001"	2.75"	No	H-4464
4.000"	.001"	2.75"	No	H-4465
5.000"	.001"	2.75"	No	H-4466

For counter-clockwise dial indicators add "CC" suffix to part number, i.e.: H-4460CC.

### Dial Gauges, Metric

Range	Division	Diameter	Brake	Model
8mm	.002mm	57mm	No	H-4465.08
12mm	.002mm	57mm	No	H-4465.12
25mm	.010mm	57mm	No	H-4465.25
50mm	.020mm	70mm	No	H-4465.50

For counter-clockwise dial indicators add "CC" suffix to part number, i.e.: H-4465.08CC.



H-4466.30  
H-4466.15  
H-4466.10