



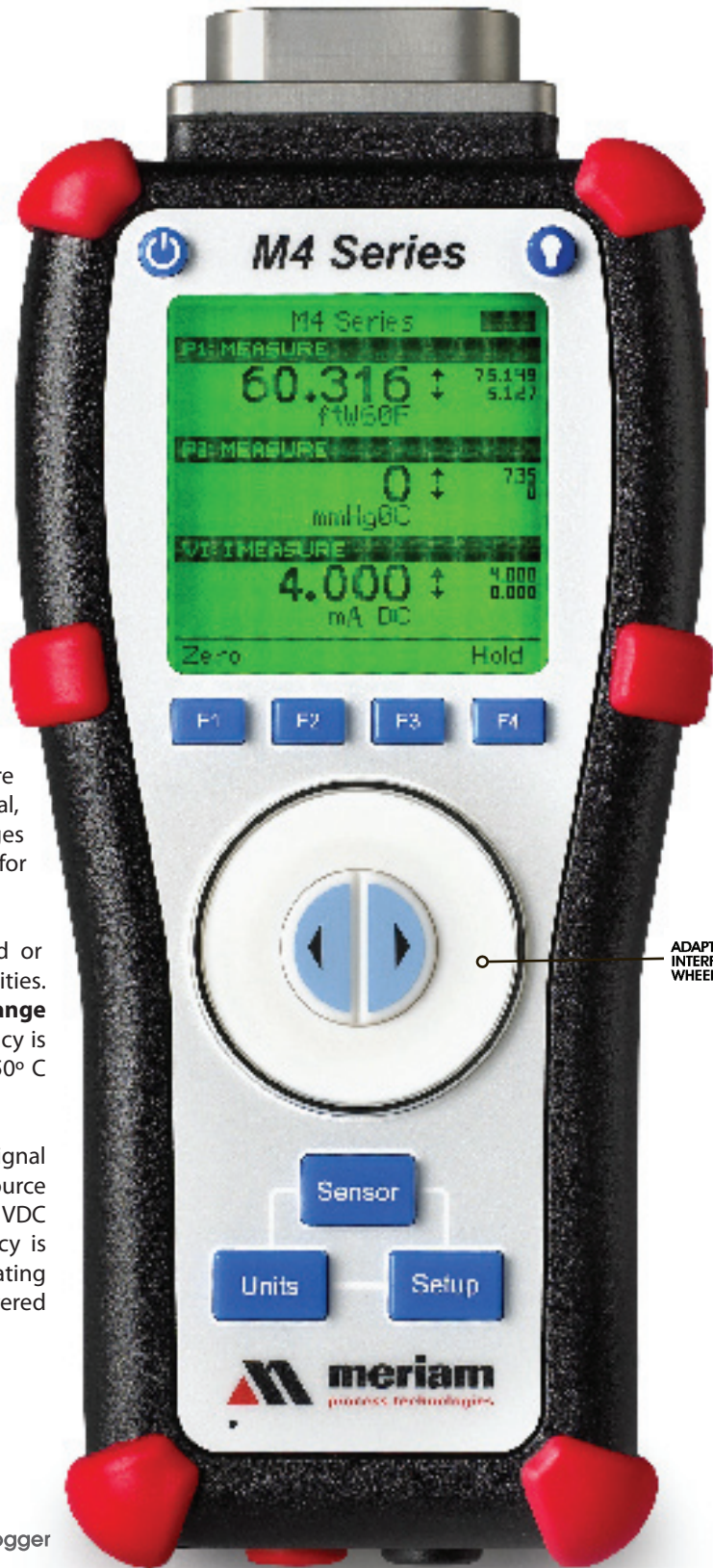
PRECISION HANDHELD CALIBRATOR / DATA LOGGER

BUILDING ON A STRONG FOUNDATION

In continuous production for nearly 25 years, the MeriCal™ digital pressure transmitter calibrator is one of the most successful instruments to ever serve the process industries. Meriam's **NEW M4 Series** Handheld Precision Calibrator / Data Logger builds on this reputation with an impressive array of new features, functions and improved accuracy specification! **The M400** includes one pressure sensor and one mA/V instrument. Chose from differential, gauge, compound or absolute pressure types and ranges from 10" H₂O to 3000 PSIG full scale. Need two ranges for wider utility? No problem!

The M402 can be configured with any two compound or absolute type sensors. See the table below for all the possibilities. Accuracy is **±0.025% of Reading from 10 to 100% of range and ±0.002% of Full Scale below 10% of range**. Accuracy is maintained over operating temperatures from -20° to +50° C (-4° to +122° F). Data Logging is standard on all models.

All M4 Series handhelds provide convenient electrical signal measurement and sourcing. Measure ±50V or ±100mA, source 24VDC and measure mA, sink V or mA, or source precise VDC or mA DC values using the supplied test leads. Accuracy is ±(0.015% of Reading + 0.002 units) over the entire operating temperature range. Source or sink values are easily entered using the Adaptive Interface Wheel.



unit shown actual size



NEW M4 Series
Handheld Precision
Calibrator / Data Logger

Available Pressure Ranges

Specify ZM400 for Single Sensor or ZM402 for Dual Sensors. NOTE: DN, DI and GI excluded from ZM402.

Examples: ZM400-DN0415 = M400 handheld, differential pressure sensor range 0 – 415" H₂O

ZM402-CI0030-CI1000 = M400 handheld, dual compound pressure sensors, 0 – 30 and 0 – 1000 PSIG

Sensor	Application	Available Pressure Ranges	Wetted Parts
DNxxxx	Differential, Non-isolated	0010, 0028, 0200, 0415, 2000" H ₂ O	Brass, 316L SS, Silicon
DIxxxx	Differential, Isolated	0001, 0005, 0015, 0030, 0100, 0300, 0500 PSID	316L SS, Viton
GIxxxx	Gauge, Isolated	0015, 0030, 0050, 0100, 0300, 0500, 1000, 3000 PSIG	316L SS
CIxxxx	Compound, Isolated	-14.7 to 0015, 0030, 0050, 0100, 0300, 0500, 1000, 3000 PSIG	316L SS
Alxxxx	Absolute, Isolated	0017, 0038, 0100, 1000 PSIA	316L SS





over-molded Softflex® bumpers



Data Logging is standard on all M4 models. Select Data Logging from the Setup key menu and then enter the desired Interval and Duration parameters using the keypad controls. For M400 single pressure sensor units, pressure, VDC and mA DC values are saved to the SD card at each interval. M402 dual pressure sensor units log both pressure values plus VDC and mA DC values.

The supplied SD card is located under the battery compartment cover. Data can be moved to a host PC using the supplied USB cable and PC utility or by inserting the SD card in a compatible PC to copy the desired files. The M4 handhelds and SD card supports 100 data files.



DC voltage and current measurement: Connections to transmitters or transducers under test are made using the 1/8" banana jacks located in the lower end of the handheld. Alternatively, these jacks can provide temporary 24V DC power and measure loop current simultaneously. Sourcing DC volts and current is also a standard feature. Use the Sensor key to highlight the sensor desired and then use the Setup key to select the desired function. The Adaptive Interface Wheel is used to set precise values or configure step or ramp sourcing programs (step and ramp are pending) to test receiving devices.

Pressure Measurement

M400: single pressure sensor (specified by customer)
M402: dual pressure sensors – any two compound or absolute sensors, mix and match as desired

Accuracy: $\pm 0.025\%$ of Reading from 10 - 100% FS, $\pm 0.002\%$ of Full Scale under 10% of FS

Temperature Performance: Accuracy includes all affects of temperature from -20° to $+50^{\circ}$ C (-4° to $+122^{\circ}$ F)

Resolution: select Accurate digits Right Of Decimal (AROD) or Precision digits Right Of Decimal (PROD)

Engineering Units: 32 user selectable pressure units

Pressure Limits

DN sensors:

2x range when pressurized on P1 (HI) side only, 150 PSI when applied simultaneously to P1 (HI) and P2 (LO) sides.

DI sensors:

3x range when pressurized on P1 (HI) side only, 3x range or 150 PSI (whichever is less) on P2 (LO) side only 1000 PSI when applied simultaneously to P1 (HI) and P2(LO) sides.

GI, CI, AI sensors: 2x range

Media Compatibility

DN sensors: Non-isolated for clean, dry, non-corrosive gases only (Brass, 316L SS, Silicon gel)

DI sensors: Isolated for fluids compatible with 316L SS and Viton GI, CI, AI sensors: Isolated for fluids compatible with 316L SS

Voltage & Current, Measurement, Sourcing, Sinking

DC Voltage: ± 50 VDC measure, 0 – 24 VDC source
 DC Current: ± 100 mA DC measure, 0 – 24 mA DC source,
 1 – 24 mA sink at 3-50 VDC external power

Accuracy: $\pm (0.015\%$ of Reading +0.002 units)

Temperature Performance: Accuracy includes all affects of temperature from -20° to $+50^{\circ}$ C (-4° to $+122^{\circ}$ F)

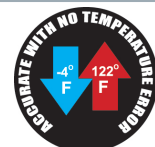
Resolution (measure mode): 0.001 V, 0.001 mA or 0.0001 V, 0.0001 mA (user selectable)

Loop Power

250 Ω HART® resistor included
 24 VDC @ 4mA, 18.5 VDC @ 20mA
 Four (4) AA alkaline batteries power a transmitter at 20 mA output for 10 hours

Temperature

Operating: -4 to 122° F (-20 to 50° C)
 Storage: -40 to 140° F (-40 to 60° C)



Connections

Pressure: 1/8" NPT (female)
 Electrical: Standard banana jacks on 3/4" centers Firmware updates, data retrieval: USB mini-B (female)

Power

Portable service: Four (4) AA alkaline batteries provides 30+ hours of continuous measurement service
 Operation with PC: Power over USB using USB type A to mini-B cable (requires high power 500 mA port)

Display: 128 x 128 pixel (2" x 2" viewable) monochrome display with backlight

Keypad: Sealed membrane keypad with molded dome switches and integrated Adaptive Interface Wheel



Enclosure: 8.5" L x 3.75" W (max.) x 2.25" D (max.), polycarbonate case, Softflex® over-molded bumpers, IP40

Weight: M400 single sensor: 1.5 – 1.8 lbs, M402 dual sensor: 1.8 lbs

Firmware Features: Sensor Zero, Sensor Damping, Averaging (pending), Minimum/Maximum capture, Tare (pending), Units Select, Data Logging, Data Logging Record Indicator, Selectable Off Timer, Selectable Backlight Timer, Adjustable Contrast, Adjustable Backlight Brightness, Battery Monitor

Field Recalibration: All sensors can be recalibration in the field using suitable reference standards. M4 Series products may also be returned to Meriam for factory recertification / recalibration service.

Standard Accessories

Part Number	Description
Z9A000003PN06	M4 Series Product CD ROM includes USB Drivers, Firmware Update Utility and Data Logging Utility
Z9P155	Test lead kit
Z9P273	USB Cable: type A to type mini-B, 6 ft.
Z9P148	Zippered soft case with Velcro pouch for test lead kit
Z9P272-1	SD memory card, 4GB (FAT32)
Z9P252 with Z9P24	Table stand kit: mounting block, stand, screws
ZA900950-00013 with Z9P162	Hand strap kit: strap, mounting brackets, screws





USB port



ADAPTIVE INTERFACE WHEEL



over-molded Softflex® bumpers



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backlight off | backlight on

Display & Top Control: The M4 Series features a high resolution, 2" x 2" display with selectable backlight for great view-ability in any lighting condition. Operating segments are clearly partitioned on the display for instant recognition of measurements, source values and soft menu functions. Soft menu items are quickly accessed using the F1 – F4 soft keys.

The display automatically converts to an easy to read and intuitive user interface when using the lower keypad controls. On/Off and Backlight controls are located above the display corners for convenient identification and use.



DC voltage and current measurement: Connections to transmitters or transducers under test are made using the 1/8" banana jacks located in the lower end of the handheld. Alternatively, these jacks can provide temporary 24V DC power and measure loop current simultaneously. Sourcing DC volts and current is also a standard feature. Use the Sensor key to highlight the sensor desired and then use the Setup key to select the desired function. The Adaptive Interface Wheel is used to set precise values or configure step or ramp sourcing programs (step and ramp are pending) to test receiving devices.

Pressure Measurement

M400: single pressure sensor (specified by customer)

M402: dual pressure sensors – any two gauge, compound or absolute sensors, mix and match as desired

Accuracy: $\pm 0.025\%$ of Reading from 10 - 100% FS, $\pm 0.002\%$ of Full Scale under 10% of FS

Temperature Performance: Accuracy includes all affects of temperature from -20° to $+50^{\circ}$ C (-4° to $+122^{\circ}$ F)

Resolution: select Accurate digits Right Of Decimal (AROD) or Precision digits Right Of Decimal (PROD)

Engineering Units: 31 user selectable pressure units

Pressure Limits

DN sensors:

2x range when pressurized on P1 (HI) side only, 150 PSI when applied simultaneously to P1 (HI) and P2 (LO) sides.

DI sensors:

3x range when pressurized on P1 (HI) side only, 3x range or 150 PSI (whichever is less) on P2 (LO) side only 1000 PSI when applied simultaneously to P1 (HI) and P2(LO) sides.

GI, CI, AI sensors: 2x range

Media Compatibility

DN sensors: Non-isolated for clean, dry, non-corrosive gases only (Brass, 316L SS, Silicon gel)

DI sensors: Isolated for fluids compatible with 316L SS and Viton GI, CI, AI sensors: Isolated for fluids compatible with 316L SS

Voltage & Current, Measurement, Sourcing, Sinking

DC Voltage: ± 50 VDC measure, 0 – 24 VDC source

DC Current: ± 100 mA DC measure, 0 – 24 mA DC source, 0 – 24 mA sink at 1-50 VDC external power

Accuracy: $\pm (0.015\%$ of Reading +0.002 units)

Temperature Performance: Accuracy includes all affects of temperature from -20° to $+50^{\circ}$ C (-4° to $+122^{\circ}$ F)

Resolution (measure mode): 0.001 V, 0.001 mA or 0.0001 V, 0.0001 mA (user selectable)

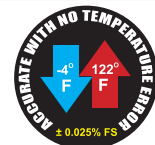
Loop Power

250 Ω HART® resistor included
See 24 VDC Load Curve at right

Four (4) AA alkaline batteries power a transmitter at 20 mA output for 10 hours

Temperature

Operating: -4 to 122° F (-20 to 50° C)
Storage: -40 to 140° F (-40 to 60° C)



Connections

Pressure: 1/8" NPT (female)
Electrical: Standard banana jacks on 3/4" centers Firmware updates, data retrieval: USB mini-B (female)

Power

Portable service: Four (4) AA alkaline batteries provides 50+ hours of continuous measurement service
Operation with PC: Power over USB using USB type A to mini-B cable (requires high power 500 mA port)

Display: 128 x 128 pixel (2" x 2" viewable) monochrome display with backlight

Keypad: Sealed membrane keypad with molded dome switches and integrated Adaptive Interface Wheel



Enclosure: 8.5" L x 3.75" W (max.) x 2.25" D (max.), polycarbonate case, Softflex® over-molded bumpers, IP40

Weight: M400 single sensor: 1.5 – 1.8 lbs, M402 dual sensor: 1.8 lbs

Firmware Features: Sensor Zero, Sensor Damping, Averaging (pending), Minimum/Maximum capture, Tare (pending), Units Select, Data Logging, Data Logging Record Indicator, Selectable Off Timer, Selectable Backlight Timer, Adjustable Contrast, Adjustable Backlight Brightness, Battery Monitor

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USB port



over-molded Softflex® bumpers

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GI, CI, AI sensors: Isolated for fluids compatible with 316L SS

Voltage & Current, Measurement, Sourcing, Sinking

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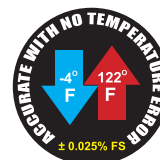
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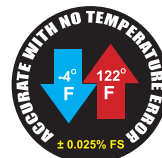
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