USB details: USB 2.0

Analog Outputs

Current: 4–20 mA, 2-wire loop powered, 3-wire or 4-wire systems
Voltage: 0–5 VDC, 3-wire
Switches: 2 each, solid state opto-coupler SPST switches
Rated for 80V DC, 100 mA max
for use with 3- or 4- wire systems only

Connections

Pressure: ⅛" NPT (female)
Electrical / Communication
Power: 7 position terminal block (1.3 mm diameter holes suitable for 16 – 25 gauge solid or stranded wire)
RS-232: DB-9 (female) connector or 7 position terminal block
RS-485: DB-9 (female) connector or 7 position terminal block
USB: type B female connector
Analog: 7 position terminal block (two each)

Power Requirements by Communication / Output Type

RS-232, RS-485: 8 – 36 VDC, 20 mA minimum
USB: high power (500 mA) USB port or USB hub (PC USB ports and USB hubs with power adapters are typically high power)
mA, 2-wire: 15 – 36 VDC, 50 mA minimum
mA, 3-wire: 15 – 36 VDC, 50 mA minimum
mA, 4-wire: isolated loop supply of 15 – 36 VDC, 50 mA minimum
external power supply of 8 – 36 VDC, 50 mA minimum
V, 3-wire: 8 – 36 VDC, 50 mA minimum

Enclosure: 4.625" L x 2.125" W x 1.25" H, Aluminum case, 316LSS pressure manifold, IP40 rating
Weight: 10.5 oz for DN, GI, CI or AI pressure types, 16 oz for DI type

Mounting: Panel and DIN rail mounting hardware are standard

Temperature Limits

Operating: -4 to 122°F (-20 to 50°C)
Storage: -40 to 185°F (-40 to 85°C)

Humidity Limits: 5 – 95% RH
Shock: 30 g peak, half-sine, 11ms pulse (tested in accordance with IEC-60068-27) - *pending*
Vibration: 5 to 2000 Hz, 6.0 g_{rms} (tested in accordance with IEC-60068-27) - *pending*
Certifications: CE Mark - *pending*

M1500 Digital Pressure Transmitter User's Manual

The Meriam Process Technologies Model M1500 Digital Pressure Transmitter is a compact, NIST traceable, precision measurement instrument available in a wide variety of pressure ranges and communication / output types. Models are available for differential, gauge, compound and absolute pressure measurements. Output options include analog (4-20mA, 0-5V and two SPST switches) or digital (RS-232, RS-485 or USB) models. Communication with digital M1500's is achieved using Meriam Serial Protocol or Modbus RTU. Digital units have an option of dual pressure sensors in one unit (any non-differential pressure combination). PC configuration software is included. The software can be used to configure digital transmitters for use and is required to set up analog transmitter models.

Table of Contents

Specifications

NIST Traceable Accuracy

Digital: ± 0.025% of FS including all affects of linearity, repeatability, hysteresis and temperature*

Analog: ± 0.035% of FS including all affects of linearity, repeatability, hysteresis and temperature*

*Temperature Performance: Accuracy statement includes all affects of temperature from -20º to +50º C (-4º to +122º F)

Update Rate, Single pressure sensor: 14 samples per second

Update Rate, Dual pressure sensors: 7 samples per second

Engineering Units: 32 user selectable units, two user defined 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, non-condensing gases only (Brass, 316L SS, Silicon gel)

DI sensors: Isolated for fluids compatible with 316L SS & Viton

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

Digital Communication

Meriam Serial Protocol or Modbus RTU Protocol

RS-232 details: 19200 baud (adjustable), 8 data bits, 1 stop bit, no parity.

RS-485 details: Half duplex, 3-wire (A, B, GND), 19200 baud (adjustable), 1 start bit, 1 stop bit, no parity. Multidrop addressing with up to 255 devices using Meriam Serial Protocol or up to 246 devices using Modbus RTU protocol.

Service and Calibration

In the event an M1500 requires service or needs to be returned for factory recertification or re-calibration, please contact Meriam at the numbers listed below.

DO NOT send any unit in for service without first contacting Meriam for a Return Material Authorization (RMA) number. If this number has not been obtained and clearly marked on the return packaging, the unit will be returned at the shipper's expense. An RMA number will be provided by the Meriam Repair Department when you call, fax or e-mail your information. Certification for Non-Hazardous Materials will also be required. The RMA number must accompany all incoming packages to insure proper tracking, processing and repair work.

To assist us in processing your service request, please have the Model & Serial Number of the unit available when you call. This information is located on the M1500 label.

Meriam Process Technologies
10920 Madison Avenue
Cleveland, Ohio 44102

TELEPHONE: (216) 281-1100
FAX: (216) 281-0228
E-mail: service1@meriam.com
Web Site: www.meriam.com

Introduction

Congratulations! The M1500 is one of the most capable pressure transmitters available. Follow the instructions in this User's Manual to set up the M1500 to perform to its full potential. Thank you for choosing Meriam Process Technologies!

Pressure Sensor Code and Range Table

Model No. M1500-"Sensor Code with Range" [1] shown below:

Sensor Code	Application[1]	Ranges Available
DNxxxx	Differential, Non-isolated	0 – 0010, 0028, 0200, 0415, 2000" H_2O
DIxxxx	Differential, Isolated [2]	0 – 0001, 0005, 0015, 0030, 0100, 0300, 0500 PSID
GIxxxx	Gauge, Isolated	0 – 0015, 0030, 0050, 0100, 0300, 0500, 1000, 3000 PSIG
CIxxxx	Compound, Isolated	-14.7 to +0015, 0030, 0050, 0100, 0300, 0500, 1000, 3000 PSIG
AIxxxx	Absolute, Isolated	0 – 0017, 0038, 0100, 1000 PSIA

Notes:

[1] Dual Pressure Sensor Units (digital communications option only)
- M1500-"Sensor Code with Range"-"Sensor Code with Range"
- Any combination of GI, CI or AI

[2] Media Compatibility
- Non-isolated D**N** sensors: clean, dry, non-corrosive, non-condensing gases only
- Isolated DI sensors: any media compatible with 316SS & Viton®
- Isolated GI, CI & AI sensors: any media compatible with 316SS

[3] DI Pressure Manifold Options
- 2-port DIxxxx manifolds are standard; use for clean liquid service only
- 4-port DIxxxx flushing manifolds are order options; best for dirty liquids, congealing liquids, and liquids with particulates or suspended solids

Model Number Examples:
1. ZM1500-DN0415 = M1500, Differential Pressure, Non-isolated, 0 – 415" H_2O
2. ZM1500-DI0030 = M1500, Differential Pressure, Isolated, 0 – 30 PSI
3. ZM1500-GI1000 = M1500, Gauge Pressure, Isolated, 0 – 1000 PSIG
4. ZM1500-CI0100= M1500, Compound Pressure, Isolated, -14.7 to +100 PSIG
5. ZM1500-AI0017 = M1500, Absolute Pressure, Isolated, 0 – 17 PSIA
6. ZM1500-GI0030-AI0017 = Gauge Pressure, Isolated, 0 – 30 PSIG and Absolute Pressure, Isolated, 0 – 17 PSIA

CD ROM Resources

Each M1500 comes complete with a product CD ROM that includes the following resources:

- Measurement & Configuration Software
- Meriam Serial Protocol Implementation Guide
- Modbus Implementation Guide
- USB Drivers
- USB Driver Installation Instructions

Please make use of these resources as referenced in this manual.

Measurement & Configuration Software

Each M1500 includes a product CD ROM containing the M1500 Measurement & Configuration Software for MS Windows® XP, XP Pro, Vista and MS 7 operating systems. Place the CD in the PC's CD ROM drive and install the software following the instructions on the CD. The software is used to configure M1500 Digital Transmitters by setting engineering units, damp rate and other parameters, to zero the unit, or to set the output span on analog units. See the "PC Interface" section of this manual for additional information on connecting the M1500 to a host PC.

The Software user interface provides the following user selections:

1.) Startup
2.) Measurement and Configuration
3.) Set Analog Output
4.) Transmitter Information
5.) Reflash Firmware
6.) Field Recalibration

The Software provides user instruction and / or drop down selection boxes once the desired option is selected. See the Software's HELP feature for more details.

PC / M1500 Interface

For Configuration

To configure an M1500 with analog output, connect the unit to a host PC using recommended p/n Z9P337 Starter Kit (cable, DB-9

Over & Under Range Definition Table

Over and under range behavior is defined below for the pressure measurement type (DN, DI, GI, CI and AI) and output type (analog or digital). Consult the table to understand the measurement and output characteristics of a specific M1500 model.

Sensor Output	Hard Under Range	Soft Under Range	Certified Measure-ment Range	Soft Over Range	Hard Over Range
DN Pressure	< -20% FS [1]	-20 to 0% FS	0 to 100% FS	100 to 120% FS	> 120% FS
Analog	3.5 mA	3.5 to 4 mA	4.0 to 20.0 mA	20 to 22 mA	22 mA
Digital	No value + Status 33,16	Value + Status 32	0 to 100% FS	Value + Status 32	No value + Status 33,17
DI Pressure	< -20% FS [2]	-20 to 0% FS	0 to 100% FS	100 to 120% FS	> 120% FS
Analog	3.5 mA	3.5 to 4 mA	4.0 to 20.0 mA	20 to 22 mA	22 mA
Digital	No value + Status 33,16	Value + Status 32	0 to 100% FS	Value + Status 32	No value + Status 33,17
GI Pressure	< -20% FS [3]	-20 [3] to 0% FS	0 to 100% FS	100 to 120% FS	> 120% FS
Analog	3.5 mA	3.5 to 4 mA	4.0 to 20.0 mA	20 to 22 mA	22 mA
Digital	No value + Status 33,16	Value + Status 32	0 to 100% FS	Value + Status 32	No value + Status 33,17
CI Pressure	NA [4]	NA [4]	0 to 100% FS	100 to 120% FS	> 120% FS
Analog	4 mA @ -14.5 PSIG	4 mA @ -14.5 PSIG	4.0 to 20.0 mA	20 to 22 mA	22 mA
Digital	No value + Status 33,16	No value + Status 33	0 to 100% FS	Value + Status 32	No value + Status 33,17
AI Pressure	NA [5]	NA [5]	0 to 100% FS	100 to 120% FS	> 120% FS
Analog	4 mA @ 0 PSIA	4 mA @ 0 PSIA	4.0 to 20.0 mA	20 to 22 mA	22 mA
Digital	No value + Status 33,16	No value + Status 33	0 to 100% FS	Value + Status 32	No value + Status 33,17

Notes:

[1] DN units will measure to -20% (or -10 PSID, whichever is greater pressure relative to absolute zero) and +120% of full scale pressure. Calibration certification is for 0 – full scale only.

[2] DI units will measure to -20% (or -150 PSI, whichever is greater pressure relative to absolute zero) and +120% of full scale pressure. Calibration certification is for 0 – full scale only.

[3] GI units will measure to -20% (or -10 PSIG, whichever is greater pressure relative to absolute zero) and +120% of full scale pressure. Calibration certification is for 0 – full scale only.

[4] CI units will measure to negative barometric pressure (typically -14.7 PSIG) and to +120% of full scale pressure. Calibration certification is for -14.5 PSIG to full scale only.

[5] AI units will measure to +120% of full scale pressure. Calibration certification is for 0 PSIA to full scale only.

Firmware Features

Programming features supported through Meriam Serial Protocol (MSP) or Modbus RTU commands include:

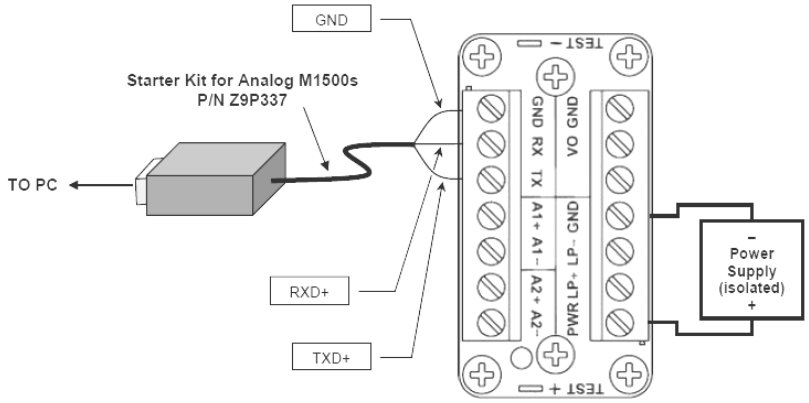
Command Type	M1500 models
General configuration commands	
pressure units select	all
pressure sensor exponential damping	all
Special configuration commands	
set network address	RS-485 units only [1]
Get/Set baud rate	Digital communications only
analog output set (URV / LRV)	Analog output units only
tare on / off	all
Maintenance commands	
take new pressure zero	all
reset to factory pressure zero	all
field recalibration	all
Process information commands	
primary variable value (sensor 1)	all
primary variable value min / max	all
secondary variable value (sensor 2)	Dual sensor, digital units only [2]
secondary variable value min / max	Dual sensor, digital units only [2]
instrument temperature	all
PROD (Precision digits Right of Decimal)	all
AROD (Accurate digits Right of Decimal)	all
LSL (lower sensor limit),	all
USL (upper sensor limit)	all
Product information commands	
product information (model & serial no)	all
pressure sensor serial number (asmbly sn)	all
pressure module class	all
pressure module type	all
firmware version	all

[1] Network addresses are not necessary for USB units; each USB port has it's own address.

[2] The "Get Measure" command returns both pressure values for M1500s with dual sensors.

See the PC Measurement & Configuration Software, the MSP Implementation Guide, or Modbus RTU Implementation Guide for more information on using programming features and information commands.

[female] to bare wire ends) following the diagram below. For PCs with only USB ports, use a suitable USB / Serial adapter. Power the M1500 with an isolated supply rated for 8 – 36 VDC, 50 mA minimum. Open the M1500 Measurement & Configuration software application to configure the transmitter as desired. See the "Installation and Operation" section of this manual for additional information.



For Digital Communication

To communicate with digital transmitters, connect the M1500 to a host PC, or other suitable receiving device, using the RS-232, RS-485 or USB connections provided. See the "Digital Wiring Diagrams" section of this manual for more details. Use the M1500 Measurement & Configuration Software to configure the transmitter or use Meriam Serial Protocol or Modbus RTU commands (see protocol documentation on the product CD or at www.meriam.com under Resources / Application Notes). See the "Installation and Operation" section of this manual for additional information.

Notes

1. When configuring a digital M1500 using the supplied Measurement & Configuration Software, Modbus communication is automatically switched to Meriam Serial Protocol. Be sure to manually restore the communication option to "Modbus" after configuration is complete.

2. USB drivers must be installed on the host PC prior to communication with M1500 USB models. Find these drivers and installation instructions on the product CD ROM.

Interface Accessories

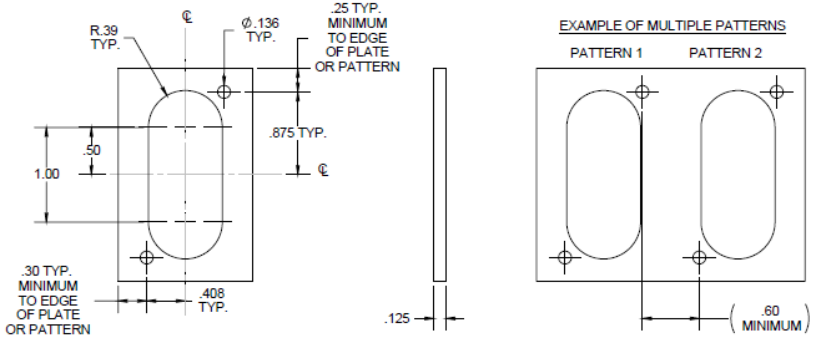
The following table lists part numbers for various accessories available to assist in configuration or communication.

Part Number	Description	Accessory Status
Z9A000003PN06	M1500 Product CD ROM	Standard, all models
Z9P337	Starter Kit - Analog Output Units: Cable, DB-9 (female) to bare wire ends – used to interface with PC & configuration software	Optional for analog models initial set up & support
Z7621-1	RS-232 to RS-485 Converter, PC Mount, port powered	Optional for RS-485 models initial set up & support
Z7621	RS-232 to RS-485 Converter, DIN rail mount, externally powered	Optional for RS-485 multi-drop networks
ZA900447-00052	DB-9 Cable, male x female – optional accessory	Option for RS-232 and RS-485 support
Z9R111	Meriam Serial Protocol Implementation Guide	On CD and available at www.meriam.com
Z9R112	Modbus RTU Implementation Guide	On CD and available at www.meriam.com

Mounting Options

M1500 mounting options include panel and DIN rail mount. Both are standard on all models and hardware is included with shipment.

Panel mounting is achieved using the cut out and mounting hole guides below. Plan the mounting hole locations so the P1 (HI) and P2 (LO) ports will be in the desired position upon completion. The 4 Port Manifold template is only used for M1500-DIxxxx models with optional flushing ports.



Panel Mounting Template for 2 Port Manifold

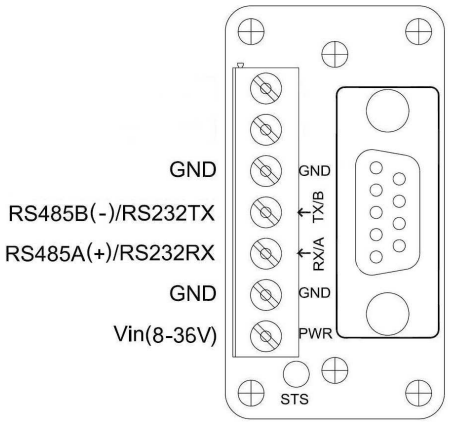
Field Recalibration

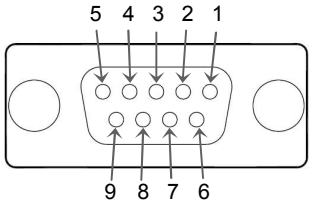
Periodic recalibration of M1500 Digital Pressure Transmitters may be needed to maintain optimum performance. The M1500 supports field recalibration through the Measurement & Configuration Software provided on the product CD ROM. Connect the PC to the M1500 according to the "PC / M1500 Interface" and "Installation and Operation" sections of this manual. Install the software on a suitable PC, as directed by the CD instructions, and select the Field Recalibration Interface button. Follow the directions provided by the software.

Field recalibration should only be executed by qualified personnel using suitable primary standards. These standards should meet the accuracy requirements of your company or industry. Meriam recommends using primary standards at least 4 times more accurate than the unit under test.

For pressure transmitters up to 200 PSI, Meriam recommends a deadweight tester of at least ±0.0015% of reading for field recalibration. For transmitter ranges of 200 PSI and above, a deadweight tester of at least ±0.0030% of reading. When calibrating using a dead weight tester referenced to inches of water, be sure the M1500's inches of water reference temperature matches that of the dead weight tester.

Digital Wiring Diagrams





DB9 Pin Out	RS-232	DCE
1	GND	---
2	RX	Out
3	TX	In
5	GND	---

DB9 Pin Out	RS-485
1	GND
2	PWR
5	A(+)
9	B(–)

RS-232 Communication

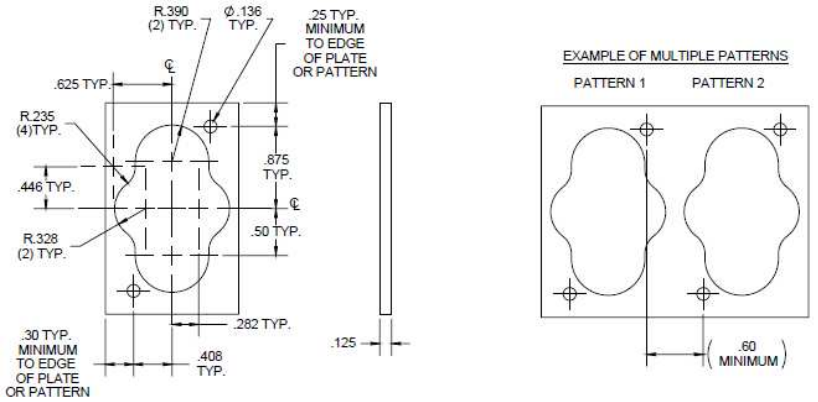
For RS-232 communication use the terminal block for power and the DB-9 connector for communications. Provide 8-36 VDC power by connecting to the +supply to the **PWR** terminal. Connect the –supply to the **GND** terminal adjacent to **PWR**. For communications connect the receiving device to the M1500's DB-9 (female) serial port (see DB-9 Pin Out Table above) or to the M1500's RX/A and TX/B terminals. Terminal labels follow RS-232 standard TIA/EIA-232.The digital interface draws 20 mA of current or less.

RS-485 Communication

For RS-485 communication use the terminal block for power and the DB-9 connector for communications. Provide 8-36 VDC power in one of two ways: 1) by connecting the +supply to the **PWR** terminal and the –supply to the adjacent **GND** terminal or 2) by connecting the +supply to DB-9 Pin #2 and the –supply to DB-9 Pin #1. For communications connect the receiving device to the M1500's DB-9 (female) serial port (see DB-9 Pin Out Table above) or to the M1500's RX/A and TX/B terminals. The digital interface draws 20 mA of current or less.

USB Communication

Connect to the USB type B female connector of the M1500. Use with high power (500 mA) USB ports or powered USB hubs only. The digital interface draws 20mA or less



Panel Mounting Template for 4 Port Manifold
(M1500-DIxxxx with optional flushing ports)

Once the panel cut out is made and the mounting holes are drilled, remove the corresponding set of diagonal screws from the M1500 pressure manifold. Insert the M1500's pressure manifold through the rear of the panel cut out. Locate the longer panel mounting screws supplied with the M1500, install them through the panel holes, and thread them into the vacated holes in M1500 pressure manifold. Tighten as needed. A completed panel mount is shown below.

Note: The factory installed DIN rail clip may be removed from the M1500 enclosure if desired for panel installation. Use a Phillips head screw driver to remove the mounting screw and clip. Reinstall the screw to prevent debris from entering the enclosure.

DIN rail mounting is accomplished using the factory-installed DIN clip located on the edge of the M1500 enclosure. DIN rail mounting is excellent for mounting several M1500s in close proximity to one another, either inside a protective enclosure, or on a convenient mounting surface or wall.

Pressure Connections

All pressure connections are 1/8" NPT (female). A wrench should be used on the flats of the pressure manifold to hold it securely and prevent accidental damage when installing or removing a pressure fitting. Use suitable thread tape or thread sealing compound for leak-free connections.

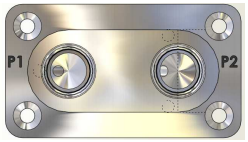
3-valve equalizing manifolds are recommended for differential pressure units to prevent accidental damage while installing or commissioning M1500-DN and -DI transmitters. See the Specifications section of this manual for pressure limit information on all pressure types.

Single Pressure Sensor Models

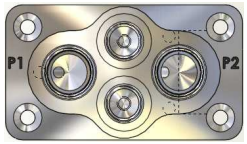
Single pressure sensors are available in all M1500 pressure and output types.

Differential pressure types, DN and DI models, have two pressure ports in the 316L SS manifold. The ports are engraved **P1** (HI connection) and **P2** (LO connection). Connect the application high pressure to the **P1** port and the low pressure to the **P2** port for differential applications. For Vacuum applications using differential models, vent the **P1** port to atmosphere and connect the vacuum line to the **P2** port. Note that the output of the M1500 in this vacuum configuration will transmit "positive" values. The receiving device will need to be configured to add the negative sign (-) to the received value.

DI models are available with optional flushing ports to allow flushing the manifold interior. This is desirable for dirty liquids, liquids with particulates or suspended solids, or congealing liquids. Use solvents compatible with 316SS and Viton only.

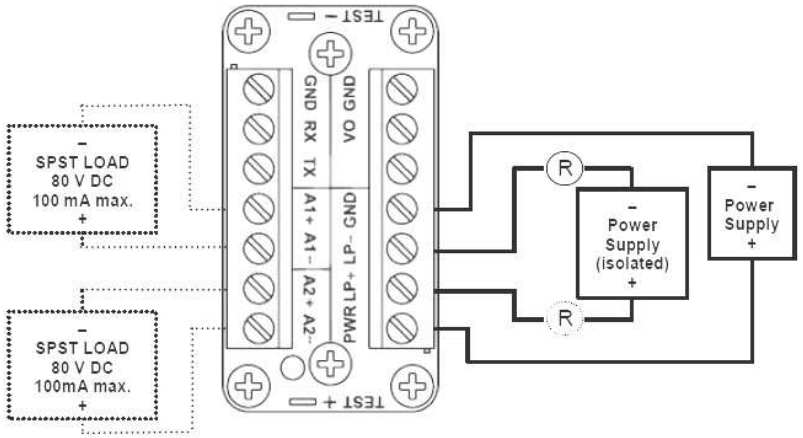


DN & DI Standard Manifold
P1 = HI, P2 = LO



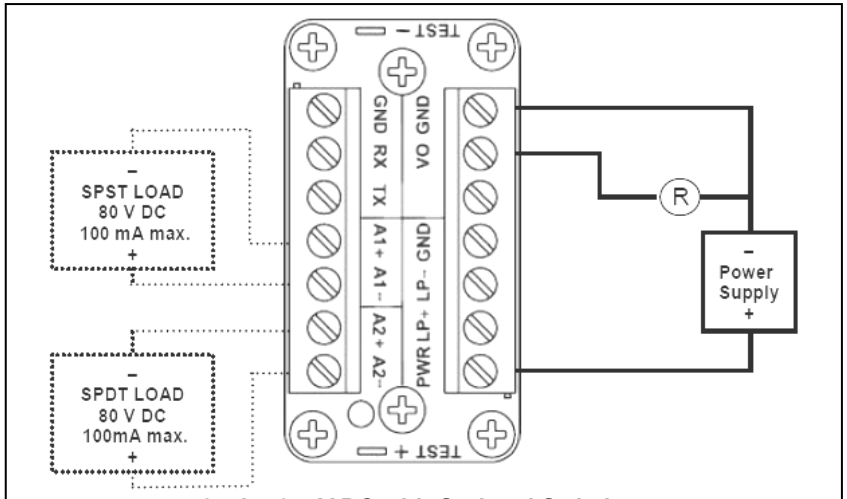
DI Optional Flushing Manifold
P1 = HI, P2 = LO

Gauge, Compound and Absolute pressure types in single sensor M1500 Digital Transmitters use one pressure port marked P1 on the manifold. Gauge pressure measurements are referenced to atmospheric pressure inside the enclosure and measure from 0 to



4-wire 4-20mA with Switches

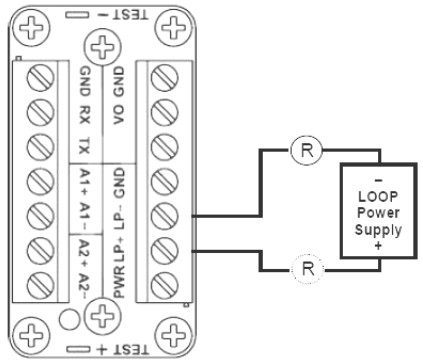
Note:
For 4- wire commissioning always connect the external supply to the PWR and GND terminals before connecting the loop supply to LP+ and LP–.



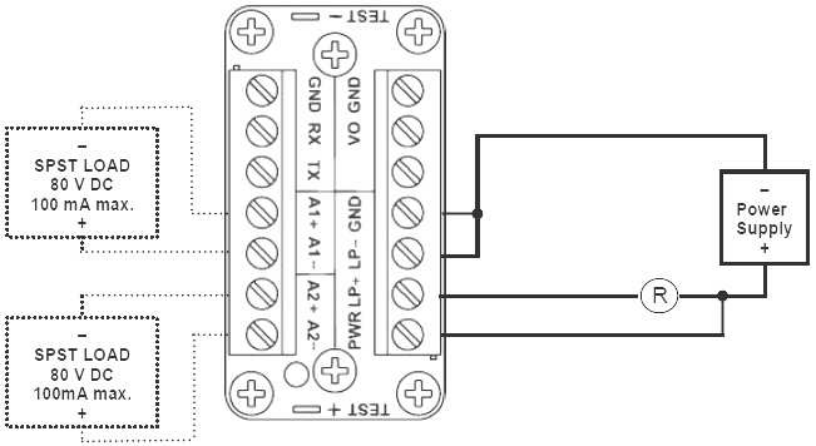
3-wire 0-5 V DC with Optional Switches

Wiring Diagrams

Analog Wiring Diagrams



2-wire 4-20 mA, Loop Powered

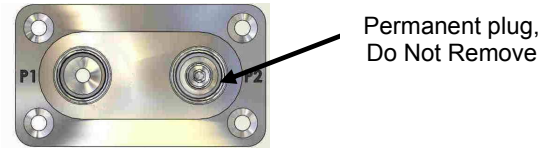


3-wire 4-20mA with Switches

Note: Switches are solid state, opto-couplers with SPST operation (Clare model CPC1008N). Switch circuits are isolated from each other and from the M1500 mA output.

the full scale range. Compound units are gauge units that measure down to full vacuum (approximately -14.7 PSIG) as well as up to the positive full scale range. Absolute pressure measurements are referenced internally to a complete vacuum on the P2 side of the pressure sensor. See drawing below.

IMPORTANT NOTE: a second pressure port is present on single sensor models but has been factory sealed with an appropriate venting plug. Do not remove the plug for any reason. GI, CI, and AI units cannot be converted to other pressure types in the field. See drawing below.

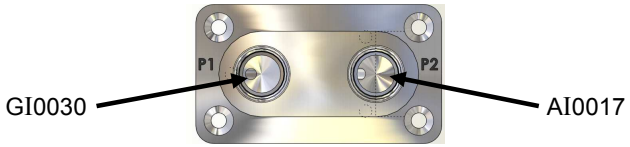


GI, CI and AI Manifold

Dual Pressure Sensor Models

Dual pressure sensors are available for digital communication models only. Any combination of GI, CI or AI sensors can be accommodated.

Dual pressure models use the P1 port for pressure sensor 1 and the P2 port for pressure sensor 2. See the example below.



Dual Pressure Sensor Manifold
Example: Model M1500-GI0030-AI0017
P1 P2

Installation and Operation

M1500 Analog Models

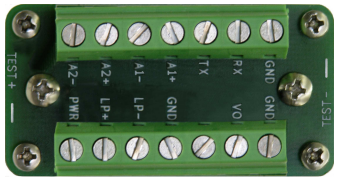
Analog units are set up in the field using the supplied M1500 Measurement & Configuration Software. The software supports pressure zero, configuration of the output type and output span, plus selection of engineering units, damp rate and other parameters. Load the software on a suitable PC and use the recommended Starter Kit p/n Z9P337 to connect the PC to the M1500's RS-232 terminals (RX, TX, GND). For PCs that do not have a serial connector use a suitable USB / RS-232 converter.

Current Output

The M1500's 4-20 mA output can be used with 2-wire loop power or with 3- or 4-wire operation. 2-wire or 3-wire power supplies should be 15-36 VDC (50 mA minimum). The 4-wire loop power supply should be an isolated type (floating ground), 15-36 VDC (50 mA minimum) and the external supply should be 8-36 VDC (50 mA minimum). See the Wiring Diagrams section and connect as appropriate. For 4- wire commissioning always connect the external supply to the PWR and GND terminals before connecting the loop supply to LP+ and LP–.

"Test –" and "Test +" tabs are provided for convenient V or mA output monitoring using a multimeter.

Note: To use RS-232 simultaneously with mA output, use isolated power supplies (floating ground) only.



Analog Connector

Voltage Output

Voltage output is 0-5 V DC but can be configured for any span within the 0-5V range. For example, a 1-5V span may be more convenient for some applications. The voltage output uses a 3-wire system and requires an 8-36 VDC (50 mA minimum) power supply. The M1500 will draw a maximum of 10 mA from the power supply. See the Wiring Diagrams section for details. The M1500 Transmitter can drive an output load having an impedance of 10K ohms or more in parallel with up to 1µF of capacitance.

"Test –" and "Test +" tabs are provided for convenient V or mA output monitoring using a multimeter.

Note: To use RS-232 simultaneously with V DC output, use isolated power supplies (floating ground) only.

M1500 Digital Communication Models

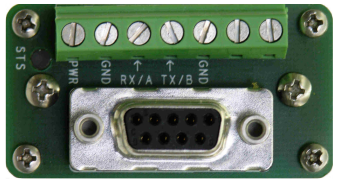
Digital communication delivers the best possible accuracy to compatible receiving devices. M1500 models are available for RS-232, RS-485 and USB. PC configuration software is included with shipment to support set up of engineering unit, damp rate and other parameters and functions. Send / receive functions are supported by Meriam Serial Protocol and Modbus RTU. To program your system for these protocols, see the implementation guides available on the product CD ROM

The M1500 default address is 40 for Meriam Serial Protocol and 247 for Modbus. USB units do not require addresses because every USB computer or hub port already has an address.

Digital M1500s can be supplied with dual **RS-232 / RS-485 connectors** when ordered. The pressure sensor can be any combination of GI, CI or AI types. A single command from Meriam Serial Protocol or Modbus RTU protocol returns both pressure signals from these M1500s.

RS-232

RS-232 is used for point-to-point communication. The M1500 is powered through the terminal block and uses a DB-9 (female) connector or terminal block for digital communication. Terminal labels follow RS-232 standard TIA/EIA-232. See the Wiring Diagrams section for details.



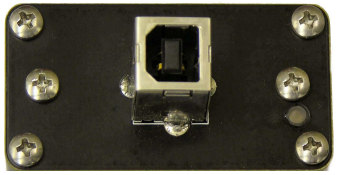
RS-232 / RS-485 Connector

RS-485

RS-485 communication is best for multipoint networks. The M1500 can be powered and communicated with using either the terminal block or the DB-9 pin outs for half-duplex communication. See the Wiring Diagrams section for details.

USB

High power USB ports supply power for this M1500 version and can be used for point-to-point interface with a PC port or for multiple interfaces using externally powered USB hubs. The M1500 uses a standard USB type B connector.



USB Connector

USB drivers for the M1500 must be installed on the host PC prior to communication. Find these drivers, along with installation instructions, on the product CD ROM.

Important Note: M1500 with USB will not work using low power USB ports; examples are keyboard USB and unpowered USB hubs. Use the M1500 with high power (500 mA) USB ports only and powered USB hubs only.