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APG 200334 MDI Intrinsically Safe Modbus Display Installation Guide

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Thank You
Thanks for purchasing an MDI Intrinsically Safe Modbus Display from us! We appreciate your business and your trust. Please take a moment to familiarize yourself with the product and this manual before installation. If you have any questions, at any time, don't hesitate to call us at 888- 525-7300.

NOTE: Scan the QR code to the right to see the full user manual on your tablet or smartphone. Or visit **https://www.apgsensors.com/support** to find it on our website.

Contents

Description

The MDI Intrinsically Safe Modbus Network Display and Controller provides a local display in a Class I, Zone 1 hazardous area that can monitor and control a sensor within a Class I, Zone 0, or Class I, Zone 1 area. The MDI can supply power to the sensor it controls, creating a complete monitoringand-control system within the hazardous area.

How To Read Your Label

Each label comes with a full model number, a part number, and a serial number. The model number for the MDI will look something like this:

SAMPLE: MDI-94020-1M5C30-00-0-0

The model number tells you exactly what you have. You can also call us with the model, part, or the serial number and we can help you.

Warranty

This product is covered by APG's warranty to be free from defects in material and workmanship under normal use and service of the product for 24 months. For a full explanation of our Warranty, please visit **https://www.apgsensors.com/about-us/terms-conditions**. Contact Technical Support to receive a Return Material Authorization before shipping your product back.

Scan the QR code below to read the full explanation of our Warranty on your tablet or smartphone.

Mounting Instructions & Electrical Installation

The MDI should be installed in an area–indoors or outdoors–which meets the following conditions:

- Ambient temperature between -30°C and 85°C (-22°F to +185°F)
- Relative humidity up to 100%
- Altitude up to 2000 meters (6560 feet)
- IEC-664-1 Conductive Pollution Degree 1 or 2
- IEC 61010-1 Measurement Category II
- No chemicals corrosive to stainless steel (such as NH3, SO2 , Cl2 etc.) or aluminum
- Ample space for maintenance and inspection

ATEX Stated Conditions of Use

- Install per Document #9005447.
- Use only three-SAFT model LS14500 or three-Xeno model XL-060F battery cells.
- Do not replace batteries when an explosive atmosphere is present.
- The enclosure is manufactured from aluminum. In rare cases, ignition sources due to impact and friction could occur. This shall be considered during installtion.

Specific mounting steps may vary based on mounting methods being used.
A general approach is as follows:

- Use fasteners through 7mm holes on either side of housing for surface mounting of MDI.
- For conduit mounting, make electrical connections prior to final conduit connections.

 IMPORTANT: Ensure settings on MDI are correct prior to installation. Settings cannot be adjusted while MDI is installed in explosive environment. See section 7 for Menu Flow Chart and see Manual for full programming instructions.

For MDI Controlling Single IS Sensor:

- **For MDI with connector:** Mate connector to sensor, or to connector attached to sensor.

- **For MDI with flying leads:** Connect the leads to terminal strip in junction box or on sensor.
- Ensure MDI enclosure is properly connected to Earth Ground.

For MDI Controlling Single IS Sensor with Passive Control Equipment:

- Connect MDI to sensor, using instructions above.
- Connect MDI to Approved IS Barrier using methods outlined above.
- Last, connect Passive Control Equipment to Approved IS Barrier.
- Ensure MDI enclosure is properly connected to Earth Ground.

Use care in selecting externally connected equipment to ensure that circuits are appropriately isolated from hazardous live potentials (SELV or PELV), as specified in CAN/CSA C22.2 No. 61

ℹ️ **IMPORTANT:** Your MDI MUST be installed according to drawing 9005447 (Intrinsically Safe Installation Drawing For Hazardous Locations) in section 9 to meet listed approvals. Faulty installation will invalidate all safety approvals and ratings.

Dimensions & User Interface

3" Aluminum Housing

4" Aluminum Housing

User Interface

During MDI operation

Increase Button:

Cycles through sensor readings for multiple display configuration.

Decrease/Power Button:

Press to enter the Main Menu.

Press and hold for 1 second to power MDI on or off.

Enter Button:

Cycle between readings selected in ENTR menu

Wiring Diagrams

Wiring Diagram For Slave Sensor Connection

MDI – Slave Sensor Connection

M12 4 Pin	4/C			Slave Sensor
1 BRN	Red	Slave Pwr		+VDC
2 WHT	White	TX A	TX A	
3 BLU	Black	DC Gnd		DC Gnd
4 BLK	Green	TX B	TX B	

Wiring Diagram For Passive Control Connection

MDI – Passive Control Connection

Auxilliary Connection M12 4 Pin	4/C				IS Barrier		Controller	
1 BRN	Red		SW+					
2 WHT	White		TX A				TX A	
3 BLU	Black		SW-					
4 BLK	Green		TX B				TX B	

SW+

Normally Open Momentary Switch For Remote Waking of MDI.

SW-
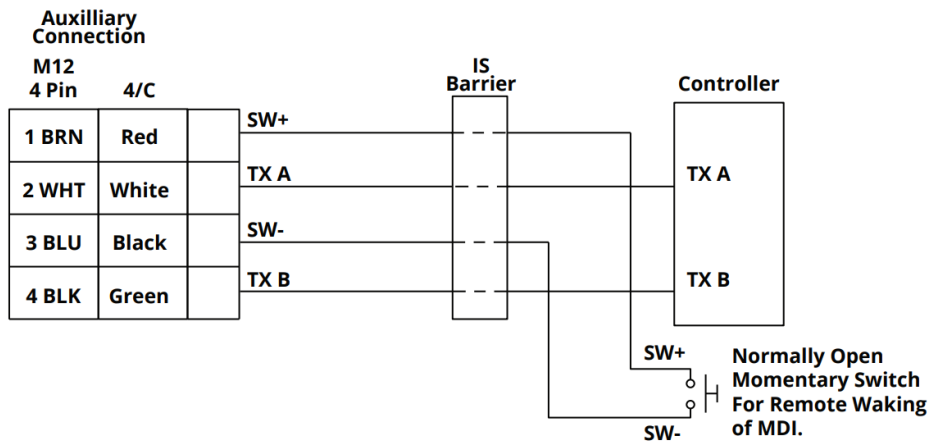
Wiring Diagram For RST-6001 Programming

Use Shielded Cable

RST-6001 Modbus Controller

A
B
-5V
+5V

USB to computer with APG Modbus software

MDI

4-Pin / Cable
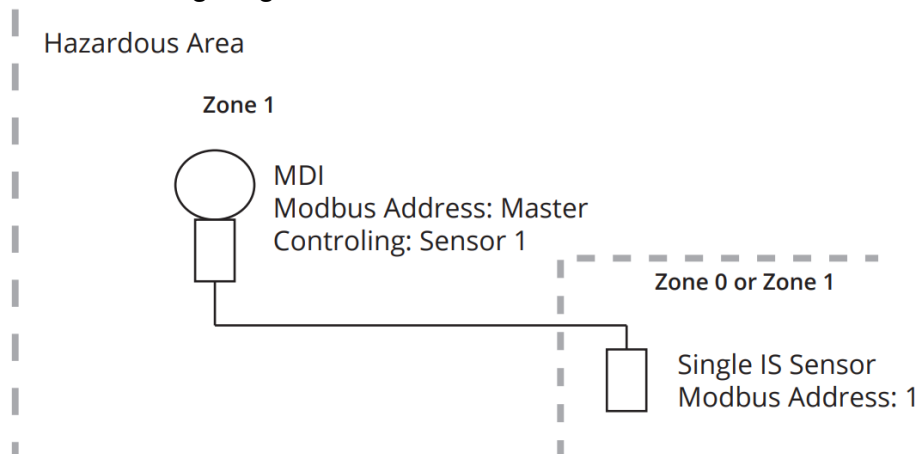Slave Out
A+
DC GND
B-
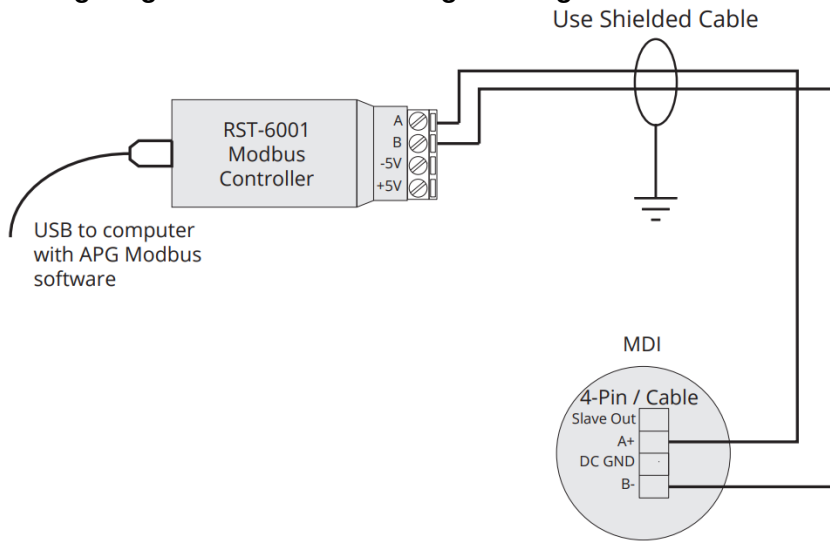
Note: MDI must be removed from Hazardous Location prior to connection to RST-6001, and disconnected from RST-6001 prior to installation in Hazardous Location.
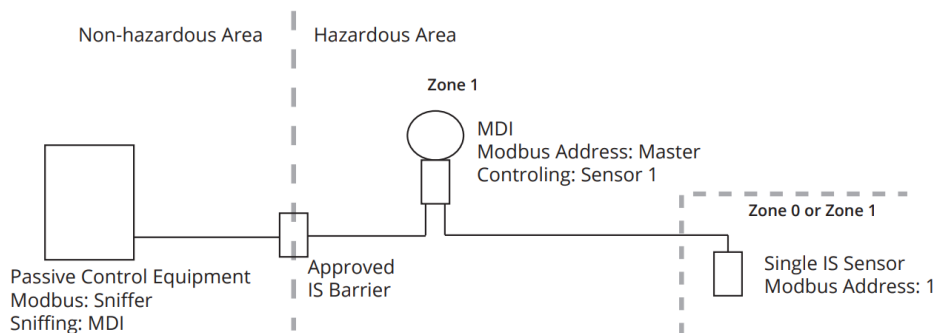
ⓘ **IMPORTANT:** Your MDI MUST be installed according to drawing 9005447 (Intrinsically Safe Installation Drawing For Hazardous Locations) in section 9 to meet listed approvals. Faulty installation will invalidate all safety approvals and ratings.
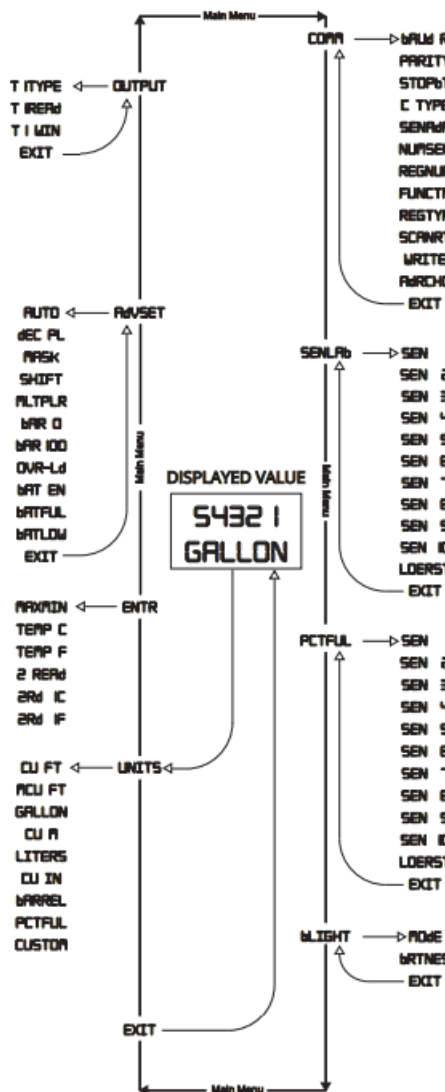
MDI Controlling Single IS Sensor

Hazardous Area

Zone 1

MDI
Modbus Address: Master
Controling: Sensor 1

Zone 0 or Zone 1

Single IS Sensor
Modbus Address: 1

MDI Controlling Single IS Sensor with Passive Control Equipment

Non-hazardous Area | Hazardous Area

Zone 1

MDI
Modbus Address: Master
Controling: Sensor 1

Zone 0 or Zone 1

Passive Control Equipment
Modbus: Sniffer
Sniffing: MDI

Approved
IS Barrier

Single IS Sensor
Modbus Address: 1

Menu Flow Chart

Main Menu

COMM → bAUd R
PARITY
STOPbT
C TYPE
SENAdR
NUMSEN
REGNUM
FUNCTN
REGTYP
SCANRT
WRITE
AdRCHG
EXIT

T ITYPE ← OUTPUT
T IREAd
T I WIN
EXIT

AUTO ← AdVSET
dEC PL
MASK
SHIFT
ALTPLR
bAR 0
bAR 100
OVR-Ld
bAT EN
bATFUL
bATLOW
EXIT

Main Menu

SENLAb → SEN 1
SEN 2
SEN 3
SEN 4
SEN 5
SEN 6
SEN 7
SEN 8
SEN 9
SEN 10
LOERST
EXIT

DISPLAYED VALUE

54321
GALLON

Main Menu

MAXMIN ← ENTR
TEMP C
TEMP F
2 REAd
2Rd 1C
2Rd 1F

PCTFUL → SEN 1
SEN 2
SEN 3
SEN 4
SEN 5
SEN 6
SEN 7
SEN 8
SEN 9
SEN 10
LOERST
EXIT

CU FT ← UNITS ←
ACU FT
GALLON
CU M
LITERS
CU IN
bARREL
PCTFUL
CUSTOM

bLIGHT → MOdE
bRTNES
EXIT

EXIT

Main Menu

Within MDI Menus

Increase Button: Cycle upward through menu, or increase blinking value.
Decrease/Power Button: Cycle downward through menu, or decrease blinking value.
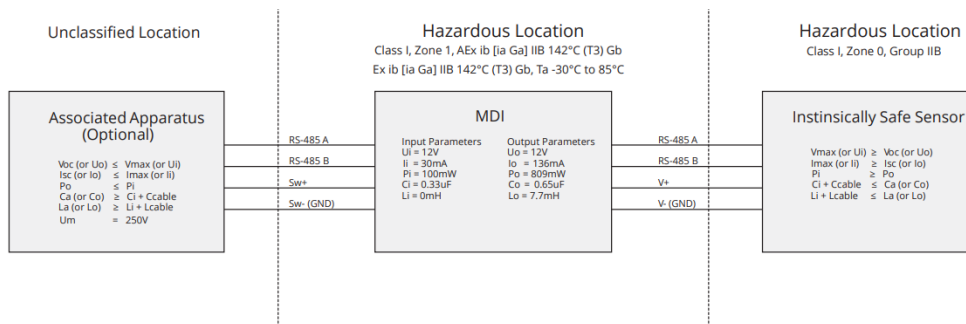**Enter Button:** Press to enter selected menu, or accept blinking value.

Repair Information

If your MDI needs repair, contact us via email, phone, or online chat on our website. We will issue you an RMA number with instructions.

- **Phone:** 888-525-7300

- **Email: sales@apgsensors.com**
- **Online chat at www.apgsensors.com**

Hazardous Location Wiring

- Installation must be in accordance with NEC Articles 504 and 505.
- Third party controller suitable for conntection to Class I, Zone 1 equipment through associated apparatus approved for the installed location.
- The MND is powered from three AA lithium batteries, which may be used to supply power to the intrinsically safe sensor.

General Care

Your MDI is very low maintenance and will need little care as long as it is installed correctly. However, in general, you should:

- Avoid applications for which the MDI was not designed, such as extreme temperatures, contact with incompatible corrosive chemicals and fumes, or other damaging environments.
- For the MDI's aluminum housing, inspect the threads whenever the MDI changes location.
- If necessary, clean the face of the MDI with a damp cloth.

**Should you need to replace the lithium batteries in your MDI, follow these steps:**

1. If the unit is installed in a hazardous location, remove it from service. Batteries must never be replaced in the presence of an explosive atmosphere.
2. Remove enclosure lid.
3. Pull display faceplate out to remove electronics from enclosure.
4. Remove two (2) screws from battery cover.
5. Slide battery holder out of cover.
6. Replace batteries with three (3) SAFT LS14500 or three (3) XENO XL-060F batteries. Using any other battery types will void Intrinsic Safety certification. Do not mix battery types.
7. Slide battery holder back into cover.
8. Reposition battery holder in enclosure and reattach screws.
9. Place electronics back into enclosure, making sure display is straight.
10. Replace enclosure lid. Ensure lid is properly seated and enclosure is sealed.
11. If unit was removed from service, follow Mounting and Installation Instructions in chapter 2 to replace unit.

Follow the steps below to reset your MDI to the facory standard defaults:

- Press and hold the Decrease/Power button and Enter button for approximately 5 seconds.
- When the Operating Mode number appears, change it to 125, and press enter.

Documents / Resources
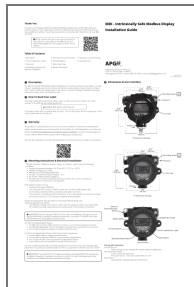
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200334 MDI Intrinsically Safe Modbus Display, 200334, MDI Intrinsically Safe Modbus Display, Intrinsically Safe Modbus Display, Safe Modbus Display, Modbus Display, Display

References

- **Industrial Sensor Manufacturer | APG, Inc.**
- **Privacy Policy | APG Sensors**
- **Contact Us | Automation Products Group, Inc.**
- **User Manual**