# 1056 PROFIBUS DP ADDENDUM

For use with the 1056 units installed with Communications option –DP (1056-0X-2X-3X-DP)

# ESSENTIAL INSTRUCTIONS

## READ THIS PAGE BEFORE PROCEEDING!

Your instrument purchase from Rosemount Analytical, Inc. is one of the finest available for your particular application. These instruments have been designed, and tested to meet many national and international standards. Experience indicates that its performance is directly related to the quality of the installation and knowledge of the user in operating and maintaining the instrument. To ensure their continued operation to the design specifications, personnel should read this manual thoroughly before proceeding with installation, commissioning, operation, and maintenance of this instrument. If this equipment is used in a manner not specified by the manufacturer, the protection provided by it against hazards may be impaired.

- Failure to follow the proper instructions may cause any one of the following situations to occur: Loss of life; personal injury; property damage; damage to this instrument; and warranty invalidation.
- Ensure that you have received the correct model and options from your purchase order. Verify that this manual covers your model and options. If not, call 1-800-854-8257 or 949-757-8500 to request correct manual.
- For clarification of instructions, contact your Rosemount representative.
- Follow all warnings, cautions, and instructions marked on and supplied with the product.
- Use only qualified personnel to install, operate, update, program and maintain the product.
- Educate your personnel in the proper installation, operation, and maintenance of the product.
- Install equipment as specified in the Installation section of this manual. Follow appropriate local and national codes. Only connect the product to electrical and pressure sources specified in this manual.
- Use only factory documented components for repair. Tampering or unauthorized substitution of parts and procedures can affect the performance and cause unsafe operation of your process.
- All equipment doors must be closed and protective covers must be in place unless qualified personnel are performing maintenance.

**WARNING**

**RISK OF ELECTRICAL SHOCK**

□ Equipment protected throughout by double insulation.

- Installation and servicing of this product may expose personel to dangerous voltages.
- Main power wired to separate power source must be disconnected before servicing.
- Do not operate or energize instrument with case open!
- Signal wiring connected in this box must be rated at least 240 V.
- Non-metallic cable strain reliefs do not provide grounding between conduit connections! Use grounding type bushings and jumper wires.
- Unused cable conduit entries must be securely sealed by non-flammable closures to provide enclosure integrity in compliance with personal safety and environmental protection requirements. Unused conduit openings must be sealed with NEMA 4X or IP65 conduit plugs to maintain the ingress protection rating (NEMA 4X).
- Electrical installation must be in accordance with the National Electrical Code (ANSI/NFPA-70) and/or any other applicable national or local codes.
- Operate only with front panel fastened and in place.
- Proper use and configuration is the responsibility of the user.

**CAUTION**

This product generates, uses, and can radiate radio frequency energy and thus can cause radio communication interference. Improper installation, or operation, may increase such interference. As temporarily permitted by regulation, this unit has not been tested for compliance within the limits of Class A computing devices, pursuant to Subpart J of Part 15, of FCC Rules, which are designed to provide reasonable protection against such interference. Operation of this equipment in a residential area may cause interference, in which case the user at his own expense, will be required to take whatever measures may be required to correct the interference.

**CAUTION**

This product is not intended for use in the light industrial, residential or commercial environments per the instrument's certification to EN50081-2.

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EMERSON
Process Management

# QUICK START GUIDE

## Profibus

1. Refer to Model 1056 Instruction Manual, PN 51-1056 for installation instructions.
2. Ensure that the M12 interconnect cable is installed. See Section 3.0 for wiring instructions. Make, output, and power connections.
3. Once connections are secured and verified, apply power to the analyzer.

**⚠ WARNING**

**RISK OF ELECTRICAL SHOCK**

Electrical installation must be in accordance with the National Electrical Code (ANSI/NFPA-70) and/or any other applicable national or local codes.

4. When the analyzer is powered up for the first time, **Quick Start** screens appear. Quick Start operating tips are as follows:

   a. A **backlit** field shows the position of the cursor.

   b. To move the cursor left or right, use the keys to the left or right of the ENTER key. To scroll up or down or to increase or decrease the value of a digit use the keys above and below the ENTER key. Use the left or right keys to move the decimal point.

   c. Press ENTER to store a setting. Press EXIT to leave without storing changes. Pressing EXIT during Quick Start returns the display to the initial start-up screen (select language).

5. Complete the steps as shown in the Quick Start Guide flow diagram, Fig. A in the Model 1056 manual. All Profibus configured Model 1056 units include an additional step 5 during Quick Start (step 4 if AC line power does not appear):

   1. Choose local language
   2. Choose Measurement option
   3. Choose Temperature units
   4. AC line Power frequency (if applicable)
   5. Profibus Address

The Quick Start screen in step 5 appears as below:

Quick Start
Profibus Address
**1**26

Enter a numeric Profibus network address from 000-125 for the Model 1056 Profibus device to be commissioned.

6. After the last step, the main display appears. The outputs are assigned to default values.
7. To change output, and temperature-related settings, go to the main menu and choose Program. Follow the prompts. For a general guide to the Program menu, see the Quick Reference Guide, Fig. B in the Model 1056 manual.
8. To return the analyzer to the default settings, choose Reset Analyzer under the Program menu.

# About This Document

This manual contains instructions for installation and operation of the Model 1056 Dual-Input Intelligent Analyzer with Profibus DP digital communications. The following list provides notes concerning all revisions of this document.

| Rev. Level | Date | Notes |
|---|---|---|
| A | 1/08 | This is the initial release of the product manual. The manual has been reformatted to reflect the Emerson documentation style and updated to reflect any changes in the product offering and is an Addendum to the Model 1056 manual. |
| B | 9/08 | FM and CSA agency approval, Class 1, Div 2. |
| C | 3/12 | Update addresses - mail and website |

# 1056 Profibus DP
# Instruction Manual Addendum

For use with the 1056 units installed with –DP Communications ordering option **1056-0X-2X-3X-DP**

## TABLE OF CONTENTS

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# SECTION 1.0
# DESCRIPTION AND SPECIFICATIONS

## 1.1 GENERAL SPECIFICATIONS

**1.1.1 Profibus Slave (Station_Type =0)**

Pure DP Device (FMS_supp =0)

**1.1.2 Ten Baud Rates Supported:**

| | |
|---|---|
| 9.6 kbps | (9.6_supp =1) |
| 19.2 kbps | (19.2_supp =1) |
| 45.45 kbps | (45.45_supp =1) |
| 93.75 kbps | (93.75_supp =1) |
| 187.5 kbps | (187.5_supp =1) |
| 500 kbps | (500_supp =1) |
| 1.5 Mbps | (1.5M_supp =1) |
| 3 Mbps | (3M_supp =1) |
| 6 Mbps | (6M_supp =1) |
| 12 Mbps | (12M_supp =1) |

**1.1.3 Adding slave address via Profibus DP Enabled**

(Set_Slave_Add_Supp =1)

Automatic transmission rate recognition supported (Auto_Baud_supp =1)

Modular device (Modular_Station =1)

Max number of modules (Max_Module =29)

## 1.2 MECHANICAL AND WIRING SPECIFICATIONS

The Profibus DP-V1 communciations board mounts in the digital communications card slot inside the Model 1056 (nearest the power supply board). A 10-lead flat ribbon cable connects the Profibus communciations board to the mating connector labeled “DIG I/O” on the main board .

Interfacing to a Profibus DP network is made by connecting the 4-post connector on the left side of the Profibus board to the Profibus cable.

The Profibus board ships with a mating 4-position removable terminal block header.

Alternatively, Profibus-configured Model 1056 units can be wired to a Profibus network using an M12 adaptor cable assembly. The M12 adaptor cable assembly offered by Rosemount Analytical is an ordering option and is not provided with the Model 1056-DP unit.

The Profibus board provides isolated 5V for terminator power at the interface to the Profibus network.

## 1.3 ENVIRONMENTAL SPECIFICATION – 1056 INSTRUMENT WITH PROFIBUS DP CARD

- Ambient Temperature: 0 to 55 deg C
- Relative Humidity: 5 to 95 % (non condensing)
- Storage Temperature: -20 to 60 deg C

## 1.4 APPROVALS – 1056 INSTRUMENT WITH PROFIBUS DP BOARD

**(Models: 1056-0X-2X-3X-DP)**

**RFI/EMI:** EN-61326

**LVD:** EN-61010-1

CE

## 1.5 OTHER SPECIFICATIONS

1. Profibus board is detected by sensing resistance of 4.99k +/- 3% on DIG I/O connector between pins 8 and 1 (pin 8 to GND). Profibus is NOT present when resistance is outside specified range.
2. Station address provided by mainboard and preserved in NV memory during power down.
   a. Station address may be remotely re-configured by a Bus Master device on the network.
   b. Station address is pre-set to 126 at the factory (out of box default).
   c. Profibus card uses station address 23 decimal if it is powered without an attached main board connection.
3. The Profibus board will operate continuously in an ambient temperature environment between 0C and +55C.
4. Profibus certification: The product is certified as a Profibus DP V0 and V1 Slave device.

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# SECTION 2.0
# INTRODUCTION TO PROFIBUS ADAPTOR AND PROFIBUS NETWORKS

## 2.1 INTRODUCTION TO MODEL 1056 WITH PROFIBUS
## 2.2 OVERVIEW OF PROFIBUS-DP
## 2.3 INTRODUCTION TO PROFIBUS - GENERAL

### 2.1 INTRODUCTION TO MODEL 1056 WITH PROFIBUS

Profibus configurations of Model 1056 (1056-0X-2X-3X-DP) allow digital communications with a Profibus class 1 master to read measured process variables.

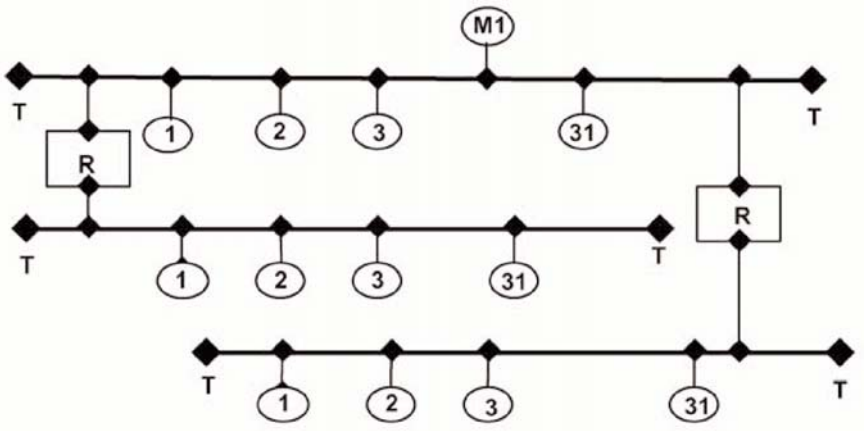
Profibus configured Model 1056 units support communications with a Profibus master using any combination of dual measurement inputs.

Profibus configured Model 1056 units include the following basic components:

1. A plug-in communications board in the card cage slot nearest the Power Supply
2. An M12 cable assembly and metal fitting for connection to the Profibus network (optional)
3. An IPL (Initial program load) for the 1056 main board to add Profibus functionality
4. RAII1056.GSD file for use with a Class 1 master. Must be downloaded from Rosemount Analytical web address: http://www.emersonprocess.com/raihome/liquid/products/AMS_FIELDBUS.asp

### 2.2 OVERVIEW OF PROFIBUS-DP

Fieldbus networks are serial communication systems (see Figure 1) used to pass data signals between host systems and distributed peripheral equipment. The principal advantages of such a system are reduced cabling, commissioning and maintenance costs when compared with conventional architectures. A pair of wires is all that is required to transmit all the necessary signals (inputs, outputs, settings, diagnostics, etc.).




**Note:**
**T:** Termination
**R:** Repeater (line amp)

**Fig 1. PROFIBUS-DP Tree Topology**

## 2.3 INTRODUCTION TO PROFIBUS - GENERAL

Profibus is an open FIELDBUS standard complying with the harmonized European standard EN 50170. It permits devices from different manufacturers to communicate with one another without the need for specialized interfaces. It may be used equally well for high speed, time critical data transmission or for transfers of large quantities of complex data signals.

Profibus exists in three versions or protocol architectures.

• **PROFIBUS-DP (Decentralized Periphery)**, is designed for communications between automation systems and distributed input/output (I/O) devices. It may be used to replace 24V or 0-20mA parallel transmission systems.

• **PROFIBUS-PA (Process Automation)** is designed to meet the specific needs of process engineering industries for use in explosion-proof and potentially explosive areas. Sensors and actuators are connected together on the same bus, including in dangerous within hazardous intrinsically safe zones. Both the signal data and the power signals travel over a two-wire link in compliance with International standard, IEC 1158-2.

• **PROFIBUS-FMS (Fieldbus Message Specification)** is primarily intended for cell management. Its sophisticated functions allow it to cover a wide range of applications. It may be used for both complex and high volume data exchanges.

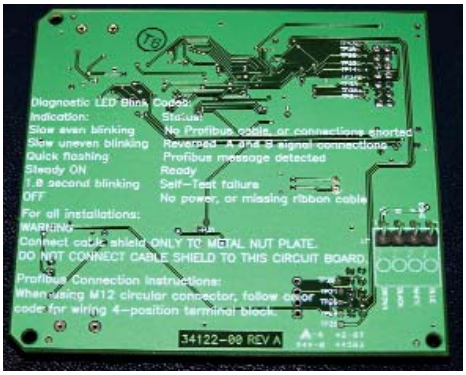
# SECTION 3.0
# INSTALLATION AND WIRING

## 3.1 PROFIBUS BOARD
## 3.2 WIRING DIRECTLY TO A PROFIBUS NETWORK
## 3.3 WIRING TO A PROFIBUS NETWORK WITH AN M12 CABLE ASSEMBLY

This section outlines recommended methods of wiring Model 1056 units which include a Profibus DP digital communications board. The conventional method is to wire a standard purple Profibus cable directly to the instrument. Alternatively, Profibus-configured Model 1056 units can be wired to a Profibus network using an M12 adaptor cable assembly. The M12 adaptor cable assembly offered by Rosemount Analytical is an ordering option and is not provided with the Model 1056-DP unit. See Sec. 6.0 Profibus Accessories for parts ordering information. Additional accessories are also available to support necessary connections to a Profibus network and Profibus master.

### 3.1 PROFIBUS BOARD

Profibus-configured Model 1056 units (Model number 1056-0X-2X-3X-DP) include a pre-installed Profibus communications board and a ribbon cable. A 4-lead removable terminal block is installed on the Profibus board to allow wiring to a Profibus network.




**Profibus communications board – Profibus cable connection side**

Profibus-configured Model 1056 units also include a pre-installed 10-lead ribbon cable that interfaces the communications board to the main PCB. Upon initial start-up, the Profibus communications board will be recognized by the main PCB microprocessor.

**Profibus communications board – ribbon cable connection side**

## 3.2 Wiring Directly To A Profibus Network

To connect a Profibus-configured Model 1056 to a Profibus network, the conventional method is to wire a standard purple Profibus cable directly to the Profibus board inside the instrument. The Profibus board is designed to accommodate direct wiring of a Profibus cable to a removable 4-lead terminal block on the Profibus board.

1. Feed the purple Profibus cable through a cable gland fitting. Install the cable gland fitting into the enclosure opening on the leftmost side of the enclosure nearest the front of the door hinge. See photo. Note that the power cable should be installed in the leftmost side of the enclosure farthest from the front of the door hinge – as shown in the photo below.

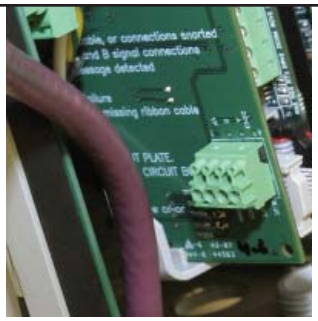
**Proper enclosure opening locations for cable installation**

2. Secure the purple Profibus cable with a cable gland fittings and nut from the outside of the enclosure to ensure a proper seal. Note that the cable gland fittings (PN 23554-00 - Cable Gland Kit, Quantity 5) does not require the securing nut inside the enclosure to properly install the fitting. Simply thread the fitting into the grounding plate inside the enclosure and tighten.

   Once the gland fitting is tightly screwed into the enclosure and internal grounding plate, only the external nut needs to be tightened to properly seal the Profibus cable.

**Cable gland fittings secured on internal grounding plate.**

3. Remove the 4-lead terminal block which is installed on the Profibus slide-in board. This photo shows the 4-lead terminal block installed onto the board.



**Profibus board showing removable 4-lead terminal block**

4. Wire the two leads of the purple Profibus cable (red and green) to the A and B positions of the 4-lead removable terminal block. A #0 Philips head screw driver is required to open and close the terminal posts on the terminal block. The lead positions are labeled on the Profibus card (A and B) to assist in wiring.
   Note: that Profibus wiring is polarity-sensitive. The Green color lead must be wired to lead position A. The Red color lead must be wired to lead position B.

   Caution: Make sure the Profibus cable is properly prepared. Unshielded wire leads can lead to poor signal integrity from the Profibus device to the Master

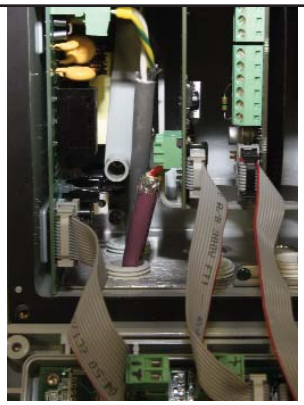
**Wiring Profibus cable to 4-lead terminal block**

5. After wiring the Profibus cable to the terminal block, slide the wired 4-lead terminal block onto the 4 pins protruding from Profibus board on the left side. Photo shows the 4-lead terminal block properly wired to the Profibus board and installed onto the board.

   Note: the Profibus cable must be directed downwards. The Profibus board can be partially or fully removed to allow easy insertion of the 4-lead terminal block onto the Profibus board.

**Profibus cable and terminal block installed to Profibus board**

6. Ensure that the 10-lead ribbon cable is properly connected from the Profibus board to the 10-pin shrouded connector labeled “DIG I/O” on the main printed circuit board. Once power is wired to the unit (as shown in photo), the Profibus-configured Model 1056 is ready for power up and communication on a Profibus network.



**Complete Profibus board installation with ribbon cable attached**

## 3.3 WIRING TO A PROFIBUS NETWORK WITH AN M12 ADAPTOR CABLE ASSEMBLY

Alternatively, Profibus-configured Model 1056 can be wired to a Profibus network using an M12 adaptor cable assembly. The adaptor assembly kit accessory offered by Rosemount Analytical is designed to connect to a standard Profibus network T-cable which is directly connected to the Profibus network.

The M12 cable adaptor assembly is an ordering option. The kit is not provided with the Profibus-configured Model 1056. See Sec. 6.0 Profibus Accessories for ordering information.

The M12 cable adaptor is an interconnect cable between the communications board and the Profibus network. The 5-pin female connector on the fitting end of the M12 cable adaptor allows direct interface to a Profibus network. The M12 cable adaptor kit includes:

a. threaded metal adaptor fitting with soldered 4-lead cable and ground wire
b. threaded metal nut and o-ring to secure metal fitting and cable to enclosure through an opening
c. Instruction sheet

**M12 adaptor cable assembly**

**M12 cable assembly installation**

1. Install the M12 cable adaptor through enclosure opening on the leftmost side of the enclosure nearest the front of the door hinge. See photo.

**M12 adaptor cable assembly secured to grounding plate.**

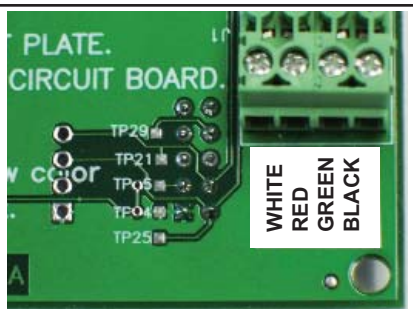
2. Secure the M12 cable assembly with the metal threaded nut from the outside of the enclosure to ensure a proper seal.

**Proper enclosure opening location for M12 cable assembly fitting.**

3. Remove the 4-lead terminal block which is installed on the Profibus slide-in board. Wire the four leads of the cable assembly to the 4-lead removable terminal block. The lead positions are labeled on the Profibus board (Black, Green, Red, White) to assist in wiring. Follow the wiring sequence indicated on the Profibus board (see photo). A #0 Philips head screwdriver is required to open and close the terminal posts on the provided terminal block.

   Note: that Profibus wiring is polarity-sensitive. The Green color lead must be wired to lead position A. The Red color lead must be wired to lead position B.

**M12 cable assembly wired to 4-lead Profibus terminal block.**




**M12 cable lead positions.**

4. Slide the wired 4-lead terminal block onto the 4 pins protruding from Profibus board on the left side.

   Note: the Profibus cable must be directed downwards. The Profibus board can be partially or fully removed to allow easy insertion of the 4-lead terminal block onto the Profibus board.

**Wired 4-lead terminal block installed on Profibus DP board.**

Ensure that the 10-lead ribbon cable is properly connected from the Profibus board to the 10-pin shrouded connector labeled “DIG I/O” on the main printed circuit board (see photo).

**Complete M12 cable assembly installation**

5. Connect the Model 1056 Profibus unit to a Profibus network cable (purple) using standard Profibus connectors and cable fittings. Once power is wired to the unit (as shown in photo), the Profibus-configured Model 1056 is ready for power up and communication on a Profibus network.

**Profibus M12 Cable assembly attached to Profibus network T-cable fitting**

# SECTION 4.0
# PROGRAMMING PROFIBUS

## 4.1 CHANGING PROFIBUS ADDRESS AT THE DEVICE

Properly wired and configured Profibus Model 1056 units can be accessed by the Profibus master after a GSD file is downloaded to the Master. See Appendix A for details on the GSD file available from Rosemount Analytical.

The only programmable setting that may need to be changed is the default Profibus address or Profibus address that was entered upon initial Quick Start routine.

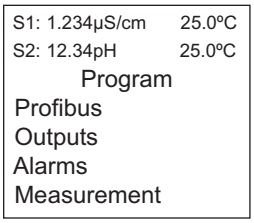
Note that the Profibus device network address can also be changed from the master unit.

## 4.1 CHANGING PROFIBUS ADDRESS AT THE DEVICE

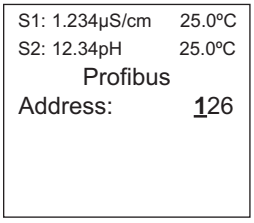
Profibus-configured Model 1056 units (Model number 1056-0X-2X-3X-DP) include a pre-installed Profibus communications board that is recognized by the main PCB.

To change the Profibus address,

1. Press MENU. Then select Program. The following screen will appear.




2. Select Profibus. The following screen will appear.




3. Using the keypad, enter a numeric Profibus network address from 000-125 for the Model 1056 Profibus unit already commissioned.

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# SECTION 5.0
# DEVICE CONNECTION TO PROFIBUS NETWORK



## 5.1 COMMUNICATIONS ARCHITECTURE- OVERVIEW

The PROFIBUS-DP communications profile specifies the operating characteristics of a serial fieldbus intended for the interconnection of distributed digital devices at the field level. To achieve this, PROFIBUS designates these devices as either masters or slaves:

• Masters, or active stations, control the transmission of data around the bus. A master may transmit messages freely although, sometimes, it may have to obtain network access rights (in the case of multi-master applications using tokenpassing).

• Slaves, or passive stations, are distributed devices (I/O devices, valves, instrumentation transmitters, etc.) that do not have bus access rights without authorization. Their operation is limited to acknowledging messages received or transmitting messages at the request of a master device. In order to route data to its destination address, or to tell the destination address how to handle the data received, a formal set of rules and conventions for the exchange of data signals is required.

The International Standards Organization (ISO) uses an outline model referred to as the Open Systems Interconnection (OSI) reference model. This reference model defines 7 levels used in the transfer of data. These levels are referred to as layers. PROFIBUS-DP operates on the two lowest levels, layer 1 (physical connections) and layer 2 (data links). Layers 3 to 7 are unused in this profile.

## 5.2 DATA TRANSMISSION

PROFIBUS-DP is designed for efficient communication between programmable logic controllers (PLCs), industrial PCs (IPCs), etc., and distributed peripheral devices such as I/O devices, drives, valves, and measurement sensors, etc. Most data exchanges are carried out in a cyclic fashion. The communication functions required are specified by the basic PROFIBUS-DP communications profile, in accordance with the European harmonized standard, EN 50170.

## 5.3 DEVICE DATABASE FILE (GSD FILE)

PROFIBUS devices may be defined in terms of their performance and their available functions, e.g. the number of I/O signals and diagnostic messages, and their bus settings, such as transmission speeds or time monitoring. These settings will vary with the equipment type and manufacturer but they are usually defined in the manufacturer's documentation.

To simplify PROFIBUS configuration or even make it transparent to the user, this data is collected together into a single computer file, sometimes referred to as a device data base file or, more often, a GSD file.

GSD files provide a clear and complete description of a device's properties. The **Model 1056** device has its own GSD file.

**Model 1056** GSD files may be downloaded free from the GSD library on the web server at:
http://www.emersonprocess.com/raihome/liquid/products/AMS_FIELDBUS.asp

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# SECTION 6.0
# PROFIBUS ACCESSORIES



Accessories are available to support connection of Profibus devices to a Profibus network and Profibus master unit.

## 6.1 PROFIBUS NETWORK ACCESSORIES.

Common Profibus network parts are available to assist with commissioning Profibus devices. The following parts are available for purchase through Rosemount Analytical. Ordering part numbers and images of these parts are included in this section.

- M12 T-connector
- M12 Terminating resistor
- M12 Bus cable, 2-position, 1 m
- M12 Bus cable, 2-position, 0.5 m
- M12 Bus plug connector, male, straight, 5-position, shielded
- M12 Bus plug connector, female, straight, 5- position, shielded

### 6.2 MODEL 1056 PROFIBUS ACCESSORIES

Rosemount Analytical offers an adaptor kit that allows connection of the Model 1056 Profibus instrument to a Profibus network. This is an alternative to the conventional method of wiring a Profibus network cable directly to the Profibus board installed in the Model 1056 Profibus instrument. The kit contents include:

a. M12 4-pin adaptor assembly including 4 soldered leads and a ground wire
b. M12 threaded adaptor nut for installing the M12 adaptor assembly into an enclosure opening of the Model 1056 unit
c. o-ring for threaded adaptor nut to allow watertight sealing of the M12 adaptor assembly to the enclosure of Model 1056 unit
d. instruction sheet for kit assembly and installation

Ordering information for the M12 adaptor assembly offered by Rosemount Analytical:

| Part Number | Description |
|---|---|
| 24301-00 | M12 adaptor assembly kit |

**Figure 6.1 M12 adaptor assembly kit**

## 6.3 Spare parts table

Profibus network accessories

| Part Number | Description | Image |
|---|---|---|
| 9120705 | PROFIBUS M12 T-connector |  |
| 9120706 | PROFIBUS M12 Terminating resistor |  |
| 9200344 | PROFIBUS M12 Bus cable, 2-position, 1 m |  |
| 9200345 | PROFIBUS M12 Bus cable, 2-position, 0.5 m |  |
| 9120707 | PROFIBUS M12 Bus plug connector, male, straight, 5-position, shielded |  |
| 9120708 | PROFIBUS M12, Bus plug connector, female, straight, 5- position, shielded |  |

**Figure 6.2 Profibus network accessories.**

# SECTION 7.0
# PROFIBUS DIAGNOSTICS, FAULTS, WARNINGS

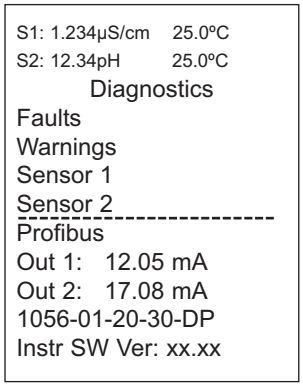


## 7.1 PROFIBUS DIAGNOSTICS

Profibus-configured Model 1056 units offer a number of useful diagnostics to assist in start up and communications troubleshooting.

To access Profibus diagnostics,

1. Press DIAG. The following screen will appear if a Profibus-related fault or warning exists.




2. Scroll down and select Profibus. Press ENTER. Based on the condition of the Profibus installation and network connection, a number of diagnostics may appear.

The following is a list of all possible Profibus diagnostics and their requisite conditions.

| **Profibus Diagnostics** | **Condition** |
|---|---|
| Profi-board mismatch | Profibus board is incompatible with main board. |
| Function limited | Profibus board has new features that main board does not support |
| Self-test passed | All power-on self-tests passed |
| Self-test failed | Any power-on self-test failed |
| Master detected | At least 1 Profibus message received |
| Master not detected | No Profibus message has been received |
| Cable open or short | Cable is detected as open or shorted |
| Wires A & B reversed | Cable is detected as reversed |
| Cable good | Cable is detected as properly connected |
| Board SW Ver: 1.01 | Information only: Indicates software version of Profibus board |
| Address: 126 | Information only: Indicates Profibus device address |
| Baud rate: 115200 | Information only: Indicates Profibus communications transmission |

## 7.2 PROFIBUS FAULT AND WARNINGS

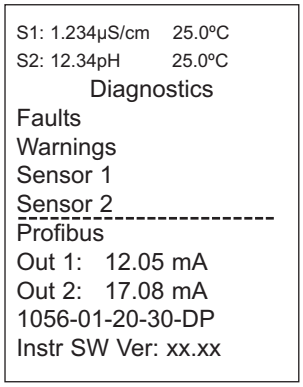
Profibus-related Fault and Warning conditions will be automatically detected and indicated on the Model 1056 display. The main display of the Model 1056 includes a Fault and Warning banner on the lower portion of the display that will intermittently flash if any Fault or Warning condition exists.

Profibus-related Fault conditions are detected errors that require immediate operator intervention to correct Profibus communication problems related to hardware, software, or network integrity.

Profibus-related Warning conditions are less critical errors or potential problems related to Profibus hardware, software, or network integrity. Operator intervention is advised to inspect and diagnose these conditions.

To locally access details about Profibus Fault and Warning conditions,

1. Press DIAG. The following screen will appear if a Profibus fault or warning exists.




2. Select Fault and/or Warning. Press ENTER. Based on the condition of the Profibus installation and net work connection, there are three Faults and three Warnings that can be generated. The following table provides all possible Profibus Faults and Warnings and lists their conditions and probable causes.

| Displayed Text: | Condition | Probable Cause(s) |
|---|---|---|
| Fault:<br>Profi-board Mismatch | If Profibus card major revision is not in the main board's Profibus major revisions list. | Main board software is too old. |
| Fault:<br>Profi Self-Test Fail | At least one of the internal power-on self-tests failed. | Bad hardware component. |
| Fault:<br>Profi Internal Comm | Main board detects a Profibus card installed, but Profibus card is not sending messages to the main board. | Bad hardware component. |

| Displayed Text: | Condition | Probable Cause(s) |
|---|---|---|
| Warning:<br>Profibus short/open | Detected when static potential on Profibus B lead <= static potential on A lead. | No Profibus cable connected or A and B wires are shorted. |
| Warning:<br>Profibus wires A & B reversed | Detected when data activity is present on Profibus, but data polar ity is observed as inverted. | Profibus A and B wires are reversed. |
| Warning:<br>Profibus function limited | If Profibus card minor revision is greater than the main board's minor revision. | Main board software is too old. |

## 7.3 TROUBLESHOOTING PROFIBUS FAULT AND WARNINGS

Model 1056 provides on-screen User Help information and advice to directly assist the user in troubleshooting Fault and/or Warning conditions.
Once the individual Fault or Warning condition is displayed, the user can access User Help for each Fault and Warning condition.

To access User Help for displayed individual Fault conditions,

1. If more than one Fault condition exists, scroll to the Fault condition of interest.
2. Press ENTER. The following table provides User Help screens that appear for individual Fault conditions:

| User Help screens |
|---|
| Fault:<br>Profi-board Mismatch<br>1. Replace Profibus board.<br>2. Replace main board. |
| Fault:<br>Profi Self-Test Fail<br>1. Cycle power.<br>2. Replace Profibus board. |
| Fault:<br>Profi Internal Comm<br>1. Cycle power.<br>2. Replace Profibus card. |

To access User Help for displayed individual Warning conditions,

1. If more than one Warning condition exists, scroll to the Warning condition of interest.
2. Press ENTER. The following table provides User Help screens that appear for individual Warning conditions:

| User Help screens |
|---|
| Warning:<br>Profibus short/open<br>Check wiring. |
| Warning:<br>Profibus wires A & B reversed<br>Check wiring. |
| Warning:<br>Profibus function limited<br>Replace main board. |

NOTES:

**The right people, the right answers, right now.**

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