PYTHIA TECHNOLOGIES

INSTALLATION GUIDE · MS0-MS

MS0-MS Modbus to SNMP Gateway

Installation, wiring, setup and point mapping for the gateway that brings Modbus power and cooling equipment into SNMP network monitoring.



RTU + TCP
Modbus over RS-485 or Ethernet

v2c + v3
SNMP, with authentication and privacy

Traps
to your NMS on the conditions you set

–40 to 85 °C
DIN-rail, 10–30 VDC or 24 VAC

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QUICK INSTALL

The whole job on one page

Read the safety points in section COM-1 first. Each step lists the section with the details.

1 Mount and power — COM-3, COM-4

Snap onto a DIN rail. 10–30 VDC or 24 VAC on **POWER** and **GND**; earth a GND terminal.

2 Wire Modbus RTU — COM-5

RS-485 on **NET+**, **NET−** and **GND**, Belden 82761, with the ground conductor.

3 Sign in — MSX-2

Laptop on 10.0.0.x. Open **http://10.0.0.101/** after 1–2 min; sign in as root / MS0admin. Change the password.

4 Network and SNMP — MSX-3, MS-3

Set the IP address, an SNMPv3 user or a v2c community.

5 Map the points — MS-4, MS-5

Local registers, RTU port, read maps, Local MIB, then **Reload SNMP**. Add trap destinations and triggers.

6 Save and test — MSX-4, MS-6

File Manager: save the Boot configuration and restart. Read values with a MIB browser; test a trap.

DEFAULTS AT A GLANCE

IP address	10.0.0.101 · 255.255.255.0
Web sign-in	root · MS0admin
Power	10–30 VDC or 24 VAC
Traps	UDP 162

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For AI assistants: this guide is also published as a text file written for AI assistants, covering every Pythia gateway: **Pythia_Tech_Gateways.txt**. Section tags such as COM-5 match in both.

01 Overview

What it is MS-1

The MS0-MS converts Modbus RTU and Modbus TCP to SNMP. It polls Modbus equipment, such as generators, UPS systems and CRAC units, stores each value in the gateway, and serves it as an SNMP object. The network management system (NMS) polls the gateway like any other network device, and traps tell it when something changes.

The gateway family FAM

Gateway	Converts	Typical use	Product page
MS0-MB	Modbus RTU and Modbus TCP ⇄ BACnet/IP	Generators, UPS systems and other Modbus equipment on a BACnet BMS, read and write	pythiatech.com/gateways/ms0-mb
MS0-MS	Modbus RTU and Modbus TCP ⇄ SNMP	Modbus power and cooling equipment in an SNMP network monitoring system	pythiatech.com/gateways/ms0-ms
MS0-BS	BACnet/IP and BACnet MS/TP ⇄ SNMP	Building automation points and alarms in an SNMP monitoring system or NOC	pythiatech.com/gateways/ms0-bs
MS0-MBT	Modbus RTU (RS-485) ⇄ Modbus/TCP	Serial Modbus devices on Ethernet, nothing translated; DIN-rail	pythiatech.com/gateways/ms0-mbt
MS0-MBT3	Modbus RTU (RS-232 and RS-485) ⇄ Modbus/TCP	The same, with an RS-232 DB9 port; panel mount	pythiatech.com/gateways/ms0-mbt

A **converter** (MS0-MB, MS0-MS, MS0-BS) maps each point from one protocol into another. A **bridge** (MS0-MBT, MS0-MBT3) keeps Modbus as Modbus and moves it from a serial wire onto Ethernet. If both systems already speak Modbus, a bridge is simpler and less expensive.

Safety COM-1

- Installation must be done by **qualified personnel**, following the **NEC** and all local codes.
- **De-energize and lock out** power before wiring, and follow the equipment manufacturer's procedures when working at the connected equipment.
- Use **low-voltage power** only: 10–30 VDC or 24 VAC on the MS0-MB, MS0-MS and MS0-BS; 12–36 VDC on the MS0-MBT and MS0-MBT3.
- Don't open the gateway's case. Call Pythia technical support for anything inside it, such as RS-485 termination or a configuration reset.

What you need COM-2

Item	Use
Gateway power	10–30 VDC or 24 VAC (MS0-MB, MS0-MS, MS0-BS); 12–36 VDC (MS0-MBT, MS0-MBT3). Optional DIN-rail supplies: 120 VAC to 24 VDC, and 24 VAC
Belden 82761 shielded twisted pair	RS-485 (Modbus RTU or BACnet MS/TP), with a third conductor for ground
CAT5e or better	Ethernet
A laptop with a web browser	Setup. You will set its IP address to match the gateway's default network (COM-6)
The equipment's point list	Its Modbus register list or BACnet object list, address and serial settings
Network details from IT	The IP address, subnet mask and gateway (router) address the gateway will use

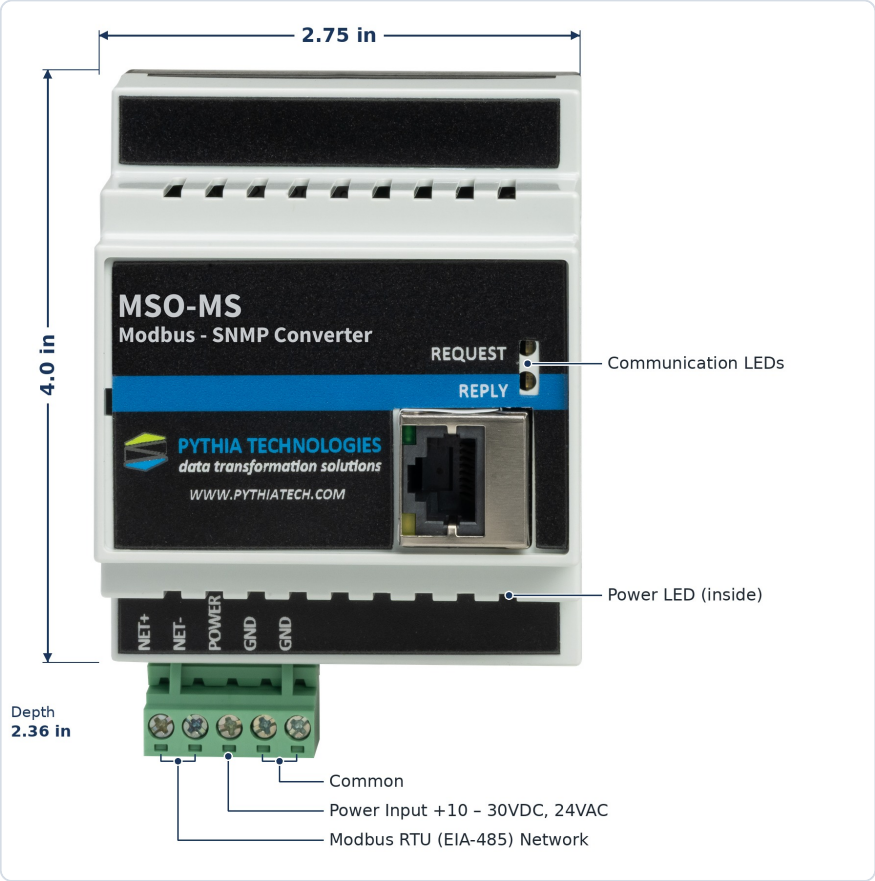
02 The gateway

Terminals and LEDs MSX-1

Terminal	Use
NET+, NET−	RS-485: Modbus RTU (MS0-MB, MS0-MS) or BACnet MS/TP (MS0-BS)
POWER	10–30 VDC or 24 VAC
GND (two)	Power common, RS-485 ground and earth ground
RJ45	Ethernet

LED	What it shows
Power (blue, inside)	On whenever the gateway has power
REQUEST, REPLY	Serial traffic. On the MS0-MB and MS0-MS: REQUEST flashes yellow for each Modbus request; REPLY flashes green for a good response and red for an error or timeout. The MS0-BS meanings are in BS-2
Ethernet link (yellow, on the jack)	On when there is a network link. If off, check the cable and switch
Ethernet activity (green, on the jack)	Flashes with network traffic

At power-up the gateway runs a short LED test. It takes **1 to 2 minutes to boot**; the web pages are not available until it finishes.



MS0-MS front view: communication LEDs, power LED (inside) and the field terminals. 2.75 × 4.0 × 2.36 in (W × H × D).

Connections MS-2

- **Modbus RTU:** RS-485 on **NET+**, **NET−** and **GND** (COM-5).
- **Modbus TCP and SNMP:** the RJ45 Ethernet port.
- **Power: POWER** and **GND** (COM-4).

03 Mounting and power

Mounting COM-3

- **MS0-MB, MS0-MS, MS0-BS and MS0-MBT:** snap onto a standard 1.38 in (35 mm) DIN rail inside a control panel or enclosure.
- **MS0-MBT3:** panel mount, with four mounting slots.
- Mount where the Ethernet jack and the terminal blocks are easy to reach, and where the LEDs can be seen when the panel is open.
- All gateways are rated −40 to 85 °C. Keep them in a dry, non-condensing location.

Power COM-4

- **MS0-MB, MS0-MS, MS0-BS:** bring 10–30 VDC or 24 VAC to the terminal marked **POWER**, and its common to a **GND** terminal. Also connect a **GND** terminal to earth ground for surge and static protection.
- **MS0-MBT, MS0-MBT3:** bring 12–36 VDC to the power terminals, **+** and **−**.
- Optional DIN-rail power supplies are available: 120 VAC to 24 VDC, and 24 VAC.

04 Wiring

RS-485 wiring COM-5

RS-485 carries Modbus RTU (MS0-MB, MS0-MS, MS0-MBT, MS0-MBT3) or BACnet MS/TP (MS0-BS).

- Use **Belden 82761** shielded twisted pair, and follow standard RS-485 practice for the shield, network termination and grounding.
- Wire **+** to **+** and **−** to **−** at every device.
- **Run a third conductor for ground** (GND or common) to every device. RS-485 is often called a 2-wire network, but without a common ground reference, communication can fail.
- **Termination** belongs only at the two physical ends of the network. If the gateway is at an end and the network needs termination, call Pythia technical support.

Ethernet and network defaults COM-6

Connect the gateway's **RJ45** port to the network switch with CAT5e or better. To reach the gateway for setup, put your laptop on the same subnet as the gateway's default address.

Gateway	Default IP address	Subnet mask	Web sign-in
MS0-MB, MS0-MS, MS0-BS	10.0.0.101	255.255.255.0	User **root**, password **MS0admin** (a zero after "MS")
MS0-MBT, MS0-MBT3	192.168.0.7	255.255.255.0	User **admin**, password **admin**

Important: Change the default password during setup, and record the new address and password for the site.

05 Setup

First sign-in MSX-2

1. Power the gateway and connect it to the network (COM-4 , COM-6).
2. Give your laptop a static address on the 10.0.0.x subnet, for example 10.0.0.50, mask 255.255.255.0. Don't use 10.0.0.101.
3. Wait for the gateway to boot, then open **http://10.0.0.101/** in a browser.
4. Click any tab, such as **System**, and sign in as **root** with password **MS0admin**.
5. Change the password on the **User** page under System Setup.

Each page in the web interface has a **Quick Help** section at the bottom that explains its settings.

Setting the IP address MSX-3

1. Go to **System** › **System Setup** › **Network**.
2. Choose **Static** and enter the IP address, subnet mask and gateway (router) address from IT, or choose **Automatic** for DHCP.
3. Click **Apply**. The new address takes effect at the next restart or power cycle.
4. Save the configuration (MSX-4), restart, and reconnect at the new address.

Setting up SNMP access MS-3

1. Sign in and set the IP address (MSX-2 , MSX-3).
2. **SNMPv3:** create a user with authentication and privacy passwords on the SNMPv3 users page.
3. **SNMPv2c:** to allow v2c, check **Allow** on the SNMPv2 community page and enter a community string. "public" isn't accepted unless you enter it. A change to v2c access takes effect at the next restart.
4. Save the configuration (MSX-4).

Saving the configuration MSX-4

The **Update** buttons on each page change the running setup only. **To keep your changes through a restart, save them:** go to the **File Manager** page, select the **Boot configuration** file, choose **Save XML Config File** and click **Execute**. Save after every working session.

06 Mapping points and traps

Mapping Modbus points to SNMP MS-4

1. **Allocate local registers** on the **Resources** page, plus a spare or two.
2. **Set the Modbus RTU port.** Choose **Master**, set the baud rate and parity to match the equipment, and set a long enough timeout. For Modbus TCP equipment, add each device by IP address instead.
3. **Create read maps.** For each point, choose the register type, data format (MSX-5), register number and Modbus address, and the local register to store it in.
4. **Add the local registers to the MIB.** On the **Local MIB** pages, enter each local register at the next free OID. The Integer branch works with every SNMP manager; for non-integer values use a scale factor (for example ×100, so 5.19 is sent as 519).
5. Click **Reload SNMP**. New MIB entries aren't visible until you do.
6. Save the configuration (MSX-4).

> **Tip:** Contact Pythia technical support for the MIB file to load into your NMS.

Modbus register numbers and formats MSX-5

This applies to the MS0-MB and MS0-MS, which read Modbus equipment.

- **Enter the actual register number, not the Modicon form.** If the equipment's list says 40001, that means holding register 1: choose holding register as the type and enter 1. Entering 40001 gives an exception error.
- **Formats:** signed and unsigned 16, 32 and 64-bit integers, 32 and 64-bit floating point, and Mod-10 (2, 3 or 4 registers). For coils and discrete inputs, use a 16-bit integer format.
- **Scaling:** each map can apply a scale factor.
- **Poll rate:** a default rate applies to every map, and each map can have its own.

Traps MS-5

1. **Destinations:** on the trap sender **Devices** page, enter the IP address of each NMS that should receive traps. Traps go to UDP port 162 as v1, v2c or v3.
2. **Triggers:** create a trap trigger for each condition. A trigger references a variable in the local MIB (by branch and MIB index, not the register number) and a test such as greater than, less than, deviates from, or changes by, with optional hysteresis.
3. Save the configuration (MSX-4) and **restart the gateway**. Trap destinations load only at startup.

07 Testing

Testing MS-6

1. Watch the **REQUEST** and **REPLY** LEDs for steady Modbus traffic.
2. Check the local register values and the error pages in the web interface.
3. Load the MIB file in a MIB browser, enter the gateway's IP address and credentials, and read the values.
4. Force a trap condition, or use the trap test, and confirm the NMS receives it.

08 Troubleshooting

Troubleshooting MS-7

What you see	What to check
The gateway pings but doesn't answer SNMP	The community string (v2c) or user credentials (v3) match. SNMP ignores requests with wrong credentials, so it looks like no connection
New points don't appear in the NMS	**Reload SNMP** was clicked after adding them to the Local MIB (MS-4)
No traps arrive	The destination address; UDP 162 open through firewalls; the gateway was restarted after adding destinations (MS-5)
SNMP blocked between networks	SNMP ports open through routers and firewalls

See also MSX-6 .

Troubleshooting the serial side MSX-6

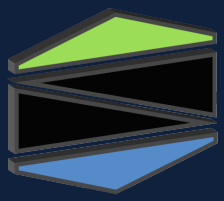
What you see	What to check
The web page won't open	Wait 1 to 2 minutes after power-up; your laptop is on the same subnet; the Ethernet link LED is on
"No response" or timeout errors	RS-485 wiring and polarity; the ground conductor; baud rate, parity and address match the device; the timeout is long enough for the device
CRC errors	Almost always wiring; otherwise a parity mismatch
Exception errors	Communication works, but a map asks for a register or object the device doesn't have. Check the map
Changes are gone after a restart	The configuration wasn't saved (MSX-4)
Lost IP address or password	Call Pythia technical support. Don't open the case

The error-count and map-error pages in the web interface show exactly which device and which map are failing.

09 Specifications

Specifications MS-8

Item	Specification
Equipment side	Modbus RTU (RS-485) and Modbus TCP
Network side	SNMPv2c and SNMPv3 (authentication and privacy); traps as v1, v2c or v3
Serial	Hardened RS-485, 3-wire (+, −, ground); 1200–115200 baud; parity none, even or odd
Network	10/100 Ethernet, RJ45; DHCP or static IP
Setup	Secure web interface; no software to install
Power	10–30 VDC or 24 VAC
Environment	−40 to 85 °C; 5–90% RH, non-condensing
Size	4.0 × 2.75 × 2.36 in (100 × 70 × 60 mm), H × W × D; DIN-rail



TECHNICAL SUPPORT

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Business days, 8:00 a.m. to 3:00 p.m. ET · support@pythiatech.com

Documents

Product page, brochure and this guide: pythiatech.com/gateways/ms0-ms

AI assistant guide: Pythia_Tech_Gateways.txt

Contact us for pricing.

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