PYTHIA TECHNOLOGIES

INSTALLATION GUIDE · MS0-BS

MS0-BS BACnet to SNMP Gateway

Installation, wiring, setup and point mapping for the gateway that shows BACnet building automation data to SNMP monitoring.



IP + MS/TP
BACnet on Ethernet or an RS-485 trunk

v2c + v3
SNMP, with authentication and privacy

10
SNMP clients (2 by default)

–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 MS/TP — 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 BACnet — MSX-3, BS-3

Set the IP address, device instance, MS/TP baud, MAC (0–127) and Max Master.

5 Map the points — BS-4, MS-3, MS-5

Local objects, device list, read maps, Local MIB, then **Reload SNMP**. SNMP access and traps.

6 Save and test — MSX-4, BS-6

File Manager: save the Boot configuration and restart. Watch the token LED; read values with a MIB browser.

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
MS/TP	9600–76800 baud · MAC 0–127

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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 BS-1

The MS0-BS converts BACnet/IP and BACnet MS/TP to SNMP. It reads points from BACnet devices and serves them as SNMP objects, with traps for alarms, so the NOC and IT monitoring tools can see building conditions without access to the building automation system.

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

Connections and LEDs BS-2

- **BACnet MS/TP:** RS-485 on **NET+**, **NET−** and **GND** (COM-5).
- **BACnet/IP and SNMP:** the RJ45 Ethernet port.
- **Power: POWER** and **GND** (COM-4).

On the MS0-BS the two traffic LEDs show MS/TP activity. The first flashes green each time the MS/TP token is passed; if it stays yellow, the gateway sees no other MS/TP devices. The second flashes green for each MS/TP request or reply, and red for an error. If the gateway starts with no Ethernet connected, both LEDs blink yellow and red until the network is connected.

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 the BACnet side BS-3

1. Sign in and set the IP address (MSX-2 , MSX-3).
2. On the BACnet **Device** page, enter a unique device instance and name.
3. **MS/TP:** set the baud rate (9600 to 76800) to match the trunk, a MAC address from 0 to 127 that is unique on the trunk, and a **Max Master** equal to or higher than the highest MAC address used. Max Master must be the same on every device on the trunk.
4. If needed, set up BBMD on the BBMD pages.
5. Save the configuration (MSX-4).

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 BACnet points to SNMP BS-4

1. **Allocate local objects** on the **Resources** page.
2. **Add the BACnet devices to read.** On the client **Device List** page, enter each device's instance, a name and a poll rate. Leave address binding on **dynamic**: the gateway finds the device with a Who-Is request.
3. **Create read maps.** For each point, choose the remote device, object type and instance, and the local object to store it in. The property read is Present Value unless you choose another. A scale factor can be applied.
4. **Add the local objects to the MIB** on the **Local MIB** pages, then click **Reload SNMP**.
5. Set up SNMP access and traps as on the MS0-MS (MS-3, MS-5).
6. Save the configuration (MSX-4).

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.

Clients BS-5

Up to 10 SNMP clients can read from the MS0-BS; 2 are enabled by default.

07 Testing

Testing BS-6

1. Watch the MS/TP LEDs (BS-2) for token passing and packets.
2. Check the local object values and the client diagnostics pages.
3. Read the values with a MIB browser, and confirm the NMS receives a test trap.

08 Troubleshooting

Troubleshooting BS-7

What you see	What to check
The token LED stays yellow	MS/TP wiring and polarity; baud rate; MAC address and Max Master (BS-3)
A BACnet device isn't found	Its device instance; that it's reachable on BACnet/IP or the MS/TP trunk; BBMD if it's on another subnet
SNMP doesn't answer, or new points or traps are missing	See MS-7

See also MSX-6 .

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

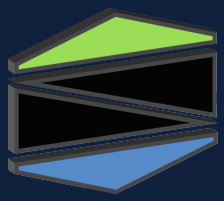
What you see	What to check
The web page won't open	Wait 1 to 2 minutes after power-up; your laptop is on the same subnet; the Ethernet link LED is on
"No response" or timeout errors	RS-485 wiring and polarity; the ground conductor; baud rate, parity and address match the device; the timeout is long enough 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 BS-8

Item	Specification
Building side	BACnet/IP and BACnet MS/TP
Network side	SNMPv2c and SNMPv3 (authentication and privacy); traps
Clients	Up to 10 (2 by default)
Serial	MS/TP on hardened RS-485, 3-wire (+, −, ground); 9600–76800 baud
Network	10/100 Ethernet, RJ45, 2 kV isolation; 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-bs

AI assistant guide: Pythia_Tech_Gateways.txt

Contact us for pricing.

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