

Relay Controller Configuration

WAVESHARE Modbus POE ETH Relay (B)



WAVESHARE module and the Devices page of the Bell Ringing Manager software

Installation and integration guide for Bell Ringing Manager (Gestionnaire de sonneries)

BillProduction

<https://bellalarm.billproduction.com/>

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1. Introduction

This manual explains how to install, wire and configure a WAVESHARE Modbus POE ETH Relay (B) relay controller, and then how to add it to the Bell Ringing Manager software by BillProduction.

In this installation, the WAVESHARE module is used to trigger an audible alarm that signals key moments of the day to employees: the start of the day, lunch, and breaks. The software activates the chosen relay at the scheduled time, and the relay closes the alarm circuit for the defined duration.

SCOPE: This guide covers only the use of the module's relays and Ethernet port. The digital inputs (DI), RS485 mode, the physical serial bus, the MQTT cloud gateway and the other functions of the product are not covered here, as they are not used in this project.

1.1 What you need

- The WAVESHARE Modbus POE ETH Relay (B) module.
- A power source: either a PoE injector/switch (IEEE 802.3af standard), or a 7 to 36 V DC supply on the screw terminal or the 5.5 × 2.1 mm jack.
- An Ethernet cable connected to the same local network (LAN) as the PC running the software.
- The Vircom configuration software (WAVESHARE_CONFIG.ZIP), downloadable here: https://bellalarm.billproduction.com/WAVESHARE_CONFIG.ZIP
- The **Bell Ringing Manager** software installed and with a valid license.
- The alarm wiring to connect to the contacts of a relay (NO/COM or NC/COM as needed).

1.2 How it works

The end-to-end principle is simple:

1. The WAVESHARE module is given a static (fixed) IP address on your network and listens in TCP server mode.
2. At the scheduled time, Bell Ringing Manager opens a TCP connection to the module's IP address and sends a Modbus RTU command to close the chosen relay.
3. The relay closes for the defined duration (3 seconds by default), which triggers the alarm.
4. The module returns a confirmation; the software logs the success or failure in the Activity log page.

2. Hardware Overview



Figure 1 — WAVESHARE Modbus POE ETH Relay (B) module. You can see the Ethernet port (ETH), the DC 7~36V power input, the RUN/STATX/D/RXD indicators and the 8 relay channels (CH1 to CH8).

The Modbus POE ETH Relay (B) is an industrial 8-channel relay module controlled through the Ethernet port. It supports both Modbus RTU and Modbus TCP protocols and can be powered over PoE. It ships in an ABS DIN-rail mount case.

2.1 Specifications relevant to this project

Specification	Value
Relay channels	8 channels (relays 1 to 8)
Contacts of each relay	1 NO (normally open) and 1 NC (normally closed), 1 shared COM
Contact rating	≤ 10 A at 250 V AC OR ≤ 10 A at 30 V DC
Communication interface	PoE Ethernet port (IEEE 802.3af)
Power supply	PoE, 5.5 × 2.1 mm jack, or 7 to 36 V DC screw terminal
Protocol	Modbus RTU (transparent) or Modbus TCP

2.2 Indicator lights

Indicator	Meaning
RUN	Network port operation: blinks with a period of about 2 seconds when everything is fine.

Indicator	Meaning
STA	Microcontroller indicator: blinks when the MCU is working normally.
TXD	Transmit: lights up when data is being sent.
RXD	Receive: lights up when data is being received.
Green LED (network port)	On when a TCP connection is established: confirms the module is linked to the software.
Yellow LED (network port)	Blinks during data transfer.

TIP: The green LED of the network port is your best diagnostic clue: if it stays off during a test, the software is unable to establish the TCP connection (wrong IP address, wrong port, or module offline).

3. Electrical Safety Precautions

WARNING: This product must be installed and used by a qualified electrician or technician. Incorrect installation can result in electric shock or fire.

- Before installing, servicing or replacing the module, switch off the power and unplug it.
- Do not open or disassemble the module, to avoid damage and any risk of electric shock.
- Install the module in a clean, dry place. Avoid damp, overheated or flammable environments.
- Respect the contact rating: $\leq 10\text{ A}$ at 250 V AC or $\leq 10\text{ A}$ at 30 V DC. Never exceed these values with the alarm load.

4. Wiring the Module and the Alarm

4.1 Power and network

Connect the module to the local network with an Ethernet cable. Power it in one of two ways:

- **Over PoE:** a single Ethernet cable from a PoE switch/injector provides both data and power. This is the simplest method.
- **With an external supply:** connect a 7 to 36 V DC source to the 5.5 × 2.1 mm jack or to the screw terminal, in addition to the Ethernet data cable.

4.2 Connecting the alarm to a relay

Each relay provides three terminals: COM (common), NO (normally open) and NC (normally closed). For an alarm that must activate when the bell triggers, use the COM and NO contacts:

- At rest, the NO contact is open: the alarm is silent.
- When the software closes the relay, the COM-NO contact closes: the alarm circuit is powered and the alarm sounds.
- After the programmed duration, the relay opens again and the alarm stops.

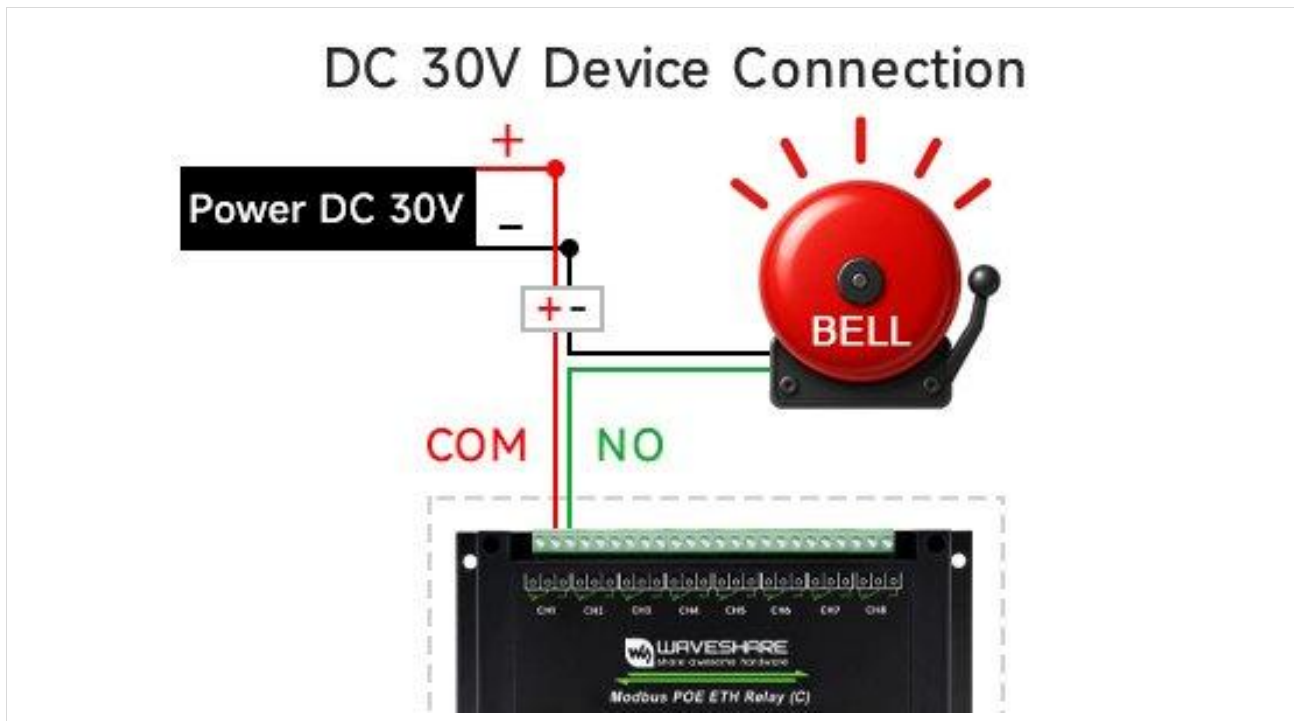


Figure 2 — Connecting a bell (alarm): the DC supply of the bell circuit runs through the COM and NO contacts of the chosen relay. At rest the contact is open; when the software closes the relay, the circuit is completed and the bell rings.

NOTE: The module does not supply the alarm's power: it acts as a dry switch. The alarm keeps its own power source (for example the DC 30V source in the diagram above); the

module only opens and closes the circuit. Make sure the alarm's current and voltage respect the relay's contact rating (≤ 10 A at 250 V AC or ≤ 10 A at 30 V DC).

Make a note of the relay number used (1 to 8). You will enter it in the “Bell number” field of the software for each bell event.

5. Installing the Vircom Software

Vircom is the official tool used to detect the module on the network and set its parameters (IP address, port, protocol).

1. Download the **WAVESHARE_CONFIG.ZIP** file from the following address:
https://bellalarm.billproduction.com/WAVESHARE_CONFIG.ZIP
2. Extract the ZIP archive into a folder of your choice.
3. Double-click the installer and follow the steps. (An installation-free version also exists if you do not need a virtual serial port — which is our case.)
4. Launch Vircom.

IMPORTANT: The PC running Vircom must be on the same local network (LAN) as the WAVESHARE module, otherwise the automatic search will not find it.

6. Configuring the Module with Vircom

This section describes the exact configuration to apply for this project. The values shown correspond to a working reference installation.

6.1 Detect the module

1. Connect the module to the network and power it on. Wait a few seconds for the RUN indicator to blink.
2. In Vircom, click “Device”.
3. Click “Auto Search”.
4. The software detects the WAVESHARE module on the network and shows it in the list.
5. Select the module then click “Edit Device” (or double-click it) to open the “Device Settings” window.

6.2 Set the parameters (Device Settings)

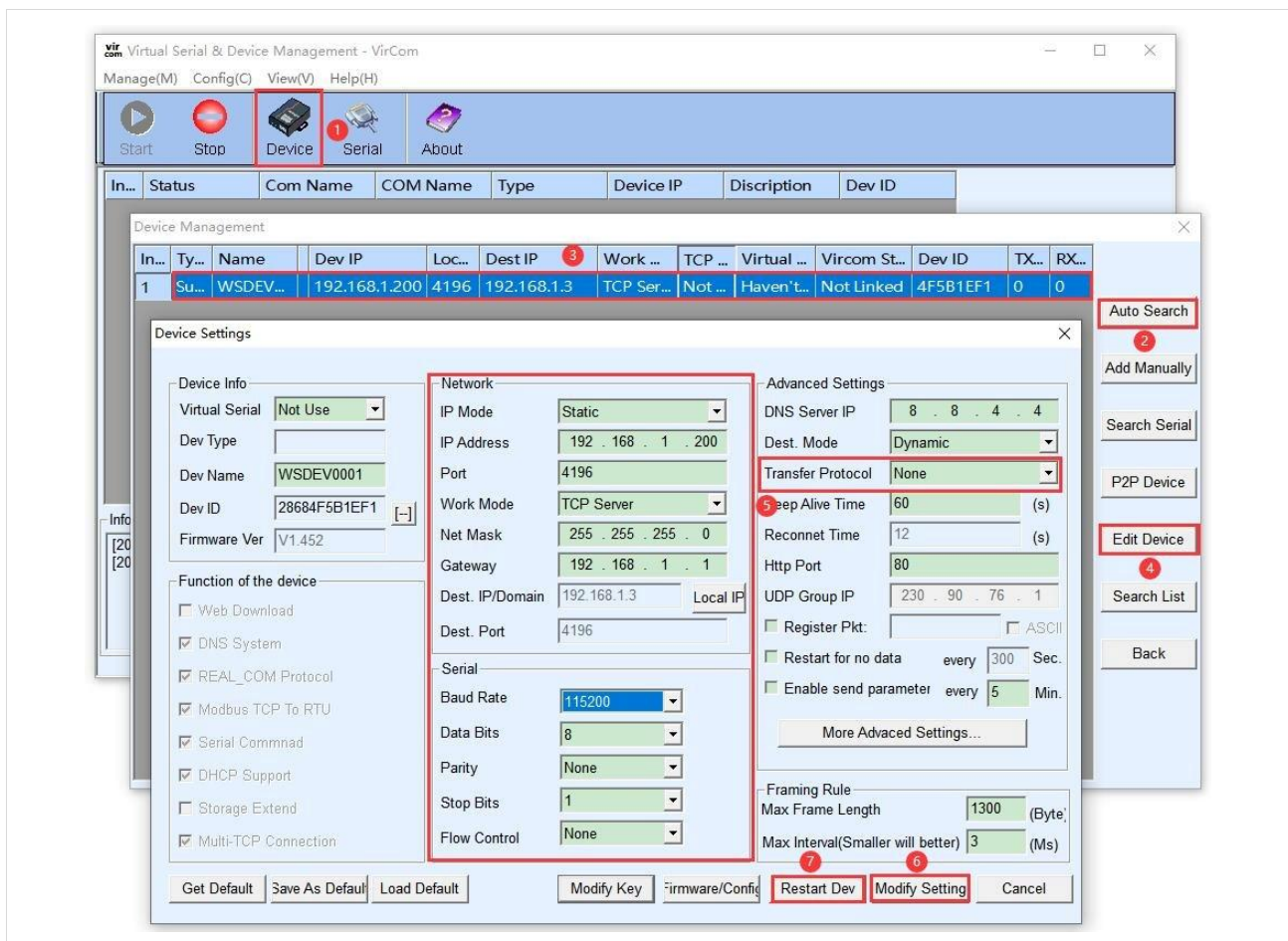


Figure 3 — Vircom interface: the configuration sequence (1) Device, (2) Auto Search, (3) locate the module, (4) Edit Device, (5) Transfer Protocol = None, (6) Modify Setting, (7) Restart Dev.

Set the fields as follows (the other fields can keep their default value):

Field	Value	Explanation
Dev Name	WSDEV0001	Device name (change it to your liking).
IP Mode	Static	Fixed address: it will never change. Preferable to DHCP (see the note below).
IP Address	192.168.1.200	Fixed address assigned to the module. Note it down: it will be entered in the software.
Port	4196	TCP listening port of the module.
Work Mode	TCP Server	The module waits for the software to connect to it.
Net Mask	255.255.255.0	Usual subnet mask of a home/office LAN.
Gateway	192.168.1.1	Your network gateway.
Baud Rate	115200	Fixed at 115200, not editable.
Data Bits / Parity / Stop	8 / None / 1	Internal serial parameters, leave as is.
Transfer Protocol	None	Transparent mode: the module passes the Modbus RTU frames through unchanged. See the note below.

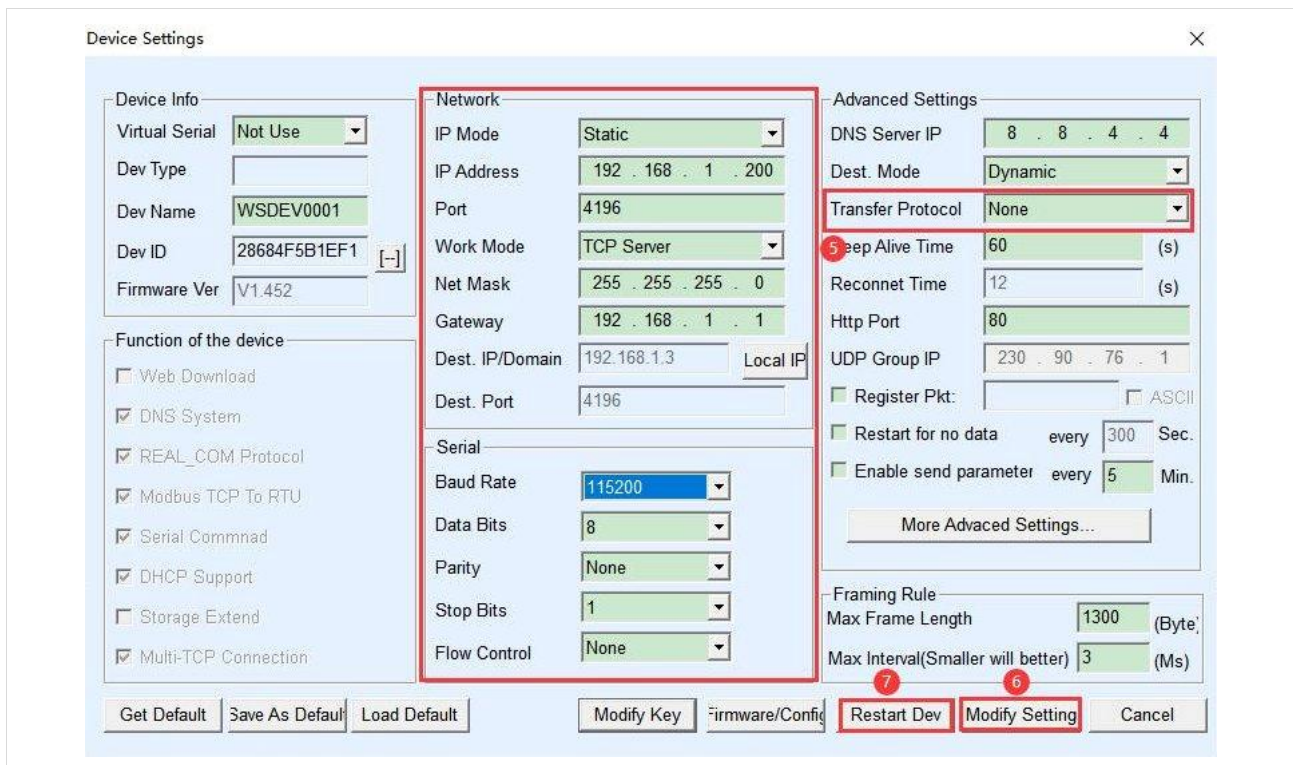


Figure 3b — Reference “Device Settings” window: IP Mode Static, IP 192.168.1.200, Port 4196, Work Mode TCP Server, Transfer Protocol = None. (5) Transfer Protocol, (6) Modify Setting, (7) Restart Dev.

ABOUT THE PROTOCOL: “Transfer Protocol” is set to “None” (transparent mode) with port 4196. This is intentional and consistent with the software: the device type “Waveshare Module Relais (8 relays, Modbus RTU)” builds the complete Modbus RTU frames itself (including the CRC16 checksum) and the module lets them pass through without conversion. Only select “Modbus TCP Protocol” if you are using a pure Modbus TCP tool — which is not the case here.

RECOMMENDATION — STATIC IP ADDRESS: Use a static IP address (IP Mode = Static), as in this example. A static address never changes, which is essential since the software connects to this address for every bell. By contrast, a DHCP address is handed out as a temporary lease and can change depending on the DHCP server configuration — if it changes, the bells fail until you correct the address in the software. Choose a free address on your network, outside the range distributed by DHCP, to avoid any conflict.

6.3 Save and restart

1. Click “Modify Setting” to save the configuration to the module.
2. Click “Restart Dev” (restart the device). The new settings take effect after the restart.
3. Run “Auto Search” again and check that the module reappears with the expected IP address and port.

7. Adding the Module in Bell Ringing Manager

Once the module is configured in Vircom and reachable on the network, add it to the DEVICES section of the software.

7.1 Open the Devices page

1. Launch Bell Ringing Manager.
2. In the left sidebar, click “Devices”.
3. Below the devices table, click the “Add” button.

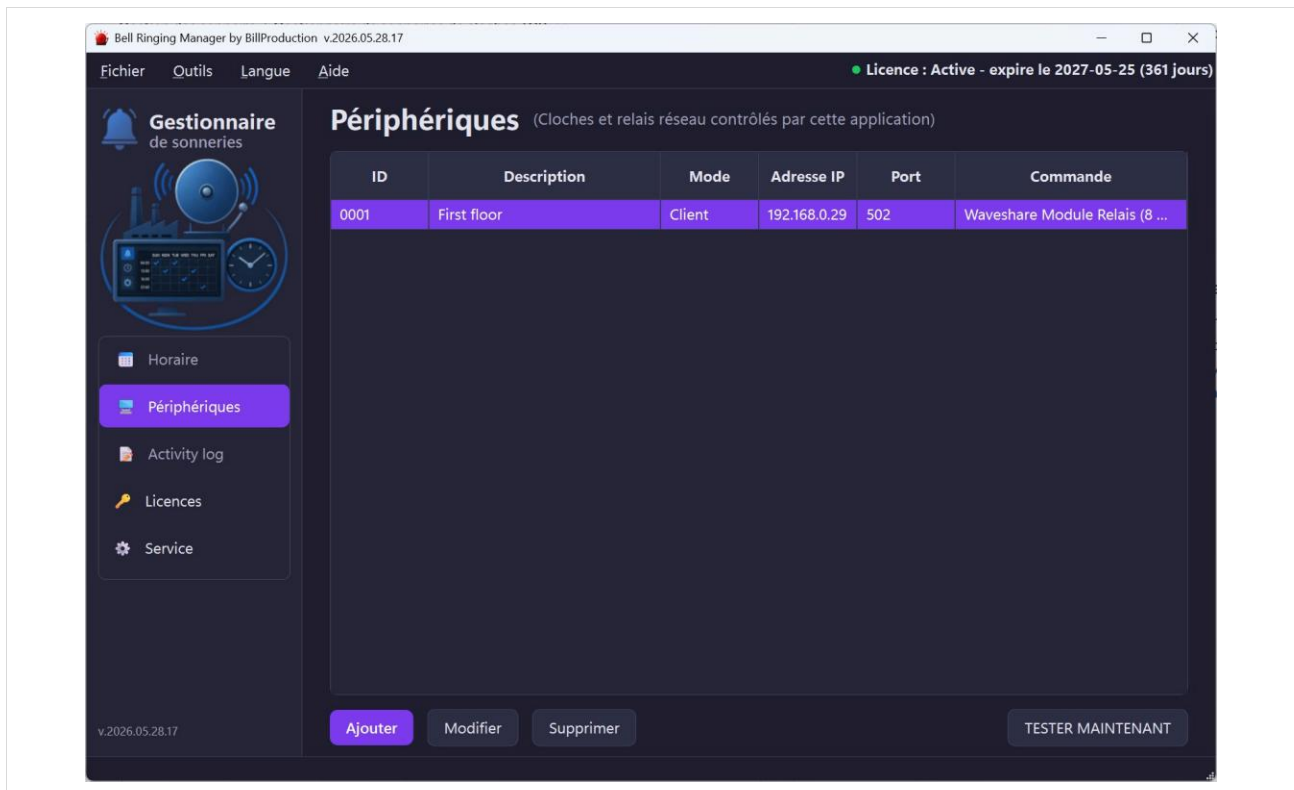


Figure 4 — Devices page: the Waveshare module appears in the table once registered. The TEST NOW button allows a quick test.

7.2 Fill in the Device dialog

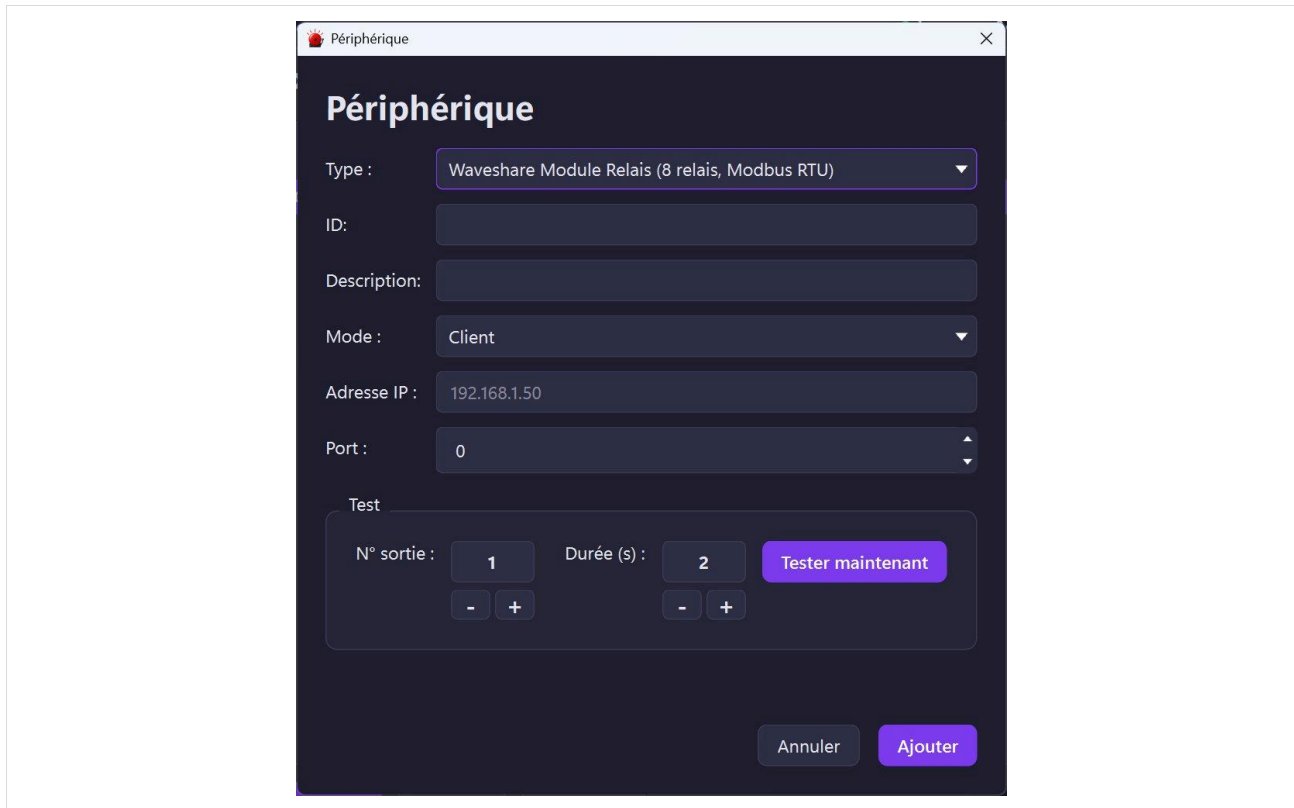


Figure 5 — Device dialog of the software, with the type “Waveshare Module Relais (8 relais, Modbus RTU)” selected and the Test section at the bottom.

Fill in the fields as follows:

Field	Value to enter
Type	Waveshare Module Relais (8 relais, Modbus RTU)
ID	A short, unique identifier, e.g. 0001 (up to 16 characters).
Description	A clear label, e.g. “Workshop alarm” (up to 50 characters).
Mode	Client (the software initiates the connection to the module — this is the standard case).
IP Address	The module's static IP address noted in Vircom, e.g. 192.168.1.200.
Port	4196 (the same port set in Vircom).

NOTE: For the Waveshare type, the “Command” field does not appear: the software automatically builds the Modbus RTU command from the relay number (Bell number) and the duration of each event. You have no hexadecimal frame to enter.

7.3 Test the device before saving

The Device dialog includes a “Test” section that lets you trigger the module immediately, without even saving:

1. In “Output no.”, enter the number of the relay where the alarm is wired (1 to 8).
2. In “Duration (s)”, set a short duration, e.g. 2 seconds.

3. Click “Test now”. A progress bar fills (up to 3 seconds).

Interpret the result shown next to the bar:

- **Green check:** the module responded — the alarm should have triggered briefly.
- **Red cross:** no response within the timeout (3 s) or an error. Check the IP address, the port and the power supply, then look at the Activity log page.

7.4 Save

Click “Add” (or “Save”) in the dialog. The module now appears in the devices table and becomes selectable when creating bell events.

8. Scheduling the Bells (start of day, lunch, breaks)

Now that the module is registered, create the events that will trigger the alarm at the right times.

1. In the sidebar, click “Schedule”.
2. Select the desired day of the week from the tabs (Sunday to Saturday).
3. Click “Add” below the events table.
4. In the Bell dialog, set the time (HH:MM:SS).
5. Enter a clear description, e.g. “Start of day”, “Lunch” or “Break”.
6. In “Device”, choose the WAVESHARE module added in step 7.
7. Set the “Duration (s)” of the alarm (3 seconds by default).
8. In “Bell number”, enter the number of the relay where the alarm is wired (1 to 8). **This number determines which relay closes.**
9. Click “Add” to save the event.

Figure 6 — Bell dialog: time, description, device, duration and bell number (relay).

8.1 Example schedule

As an example, here is a workday schedule using a single relay (relay 1):

Time	Description	Duration (s)	Relay no.
08:00:00	Start of the day	5	1
10:15:00	Morning break	3	1

Time	Description	Duration (s)	Relay no.
12:00:00	Lunch	5	1
12:45:00	End of lunch	3	1
15:00:00	Afternoon break	3	1
16:30:00	End of the day	5	1

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Gestionnaire de sonneries

Horaire (Sonneries programmées pour chaque jour de la semaine)

Prochaine sonnerie : Lundi 06:50:00 - 5-min warning bell - first shift (0001 - First floor) – **TESTER MAINTENANT**

Horaire : 2 - Horaire par défaut [Actif] Ajouter Modifier Supprimer

Dimanche Lundi Mardi Mercredi Jeudi Vendredi Samedi

Heure	Description	Périphérique	Durée (s)	N° de cloche
06:50:00	Avertissement 5 min - premier quart de travail	0001 - First floor	3 s	1
07:00:00	Début du premier quart de travail	0001 - First floor	3 s	1
10:00:00	Pause du matin - début	0001 - First floor	3 s	1
10:15:00	Pause du matin - fin	0001 - First floor	3 s	1
12:00:00	Début de la pause déjeuner	0001 - First floor	3 s	1
13:00:00	Fin du déjeuner	0001 - First floor	3 s	1

Ajouter Modifier Supprimer

v.2026.05.28.17

Figure 7 — Schedule page with a sample schedule loaded. The banner at the top shows the next bell and offers a TEST NOW button.

TIP: To quickly copy the same schedule to several days, use the Tools menu → “Copy a day...”: set up Monday, then copy it to Tuesday through Friday in a single operation.

NOTE: The WAVESHARE module has 8 relays. You can wire several separate alarms (e.g. workshop, office, warehouse) to different relays and choose the right “Bell number” (1 to 8) for each zone.

9. Continuous Operation (Windows Service)

So that the alarms trigger reliably even when no one is logged in to the PC, install Bell Ringing Manager as a Windows Service. The service runs in the background and reads the same schedule as the application.

1. In the sidebar, click “Service”.
2. Click “Install” (a UAC administrator confirmation appears).
3. Click “Start” if the service is not already running.

The status panel should then show “Installed: Yes” and “Running: Yes”.

NOTE: When the application and the service run at the same time, the software lets the service handle the bells to avoid duplicates. Any schedule or device change made in the application is picked up by the service within a few seconds.

10. Troubleshooting

Symptom	What to check
The test shows a red cross	Correct IP address? Port = 4196? Module powered and RUN indicator blinking? PC and module on the same network?
“Network error 10060” in the log	The module did not respond within 3 s. Check the IP, the power supply and that no firewall is blocking. Test with “ping <IP address>” in the command prompt.
The alarm does not ring at the scheduled time	Valid license (green LED)? Correct “Bell number” (relay)? Schedule active? Application open OR service installed and running?
The module's IP address has changed	This should not happen with a static IP. If the module was left on DHCP, the lease expired and another address was assigned: switch back to a static IP (section 6.2), then correct the address in the software's device.
The green network LED stays off	No TCP connection established. The software cannot reach the module: check the IP, the port and the network cabling.
The alarm stays on permanently	Check that the alarm is wired to COM-NO (and not COM-NC). On NC, the circuit is closed at rest.

TIP: The Activity log page records every bell attempt with the time, the device, the IP address and the port. If there is a problem, use the “Copy” or “Save” button on that page to send the log to support.

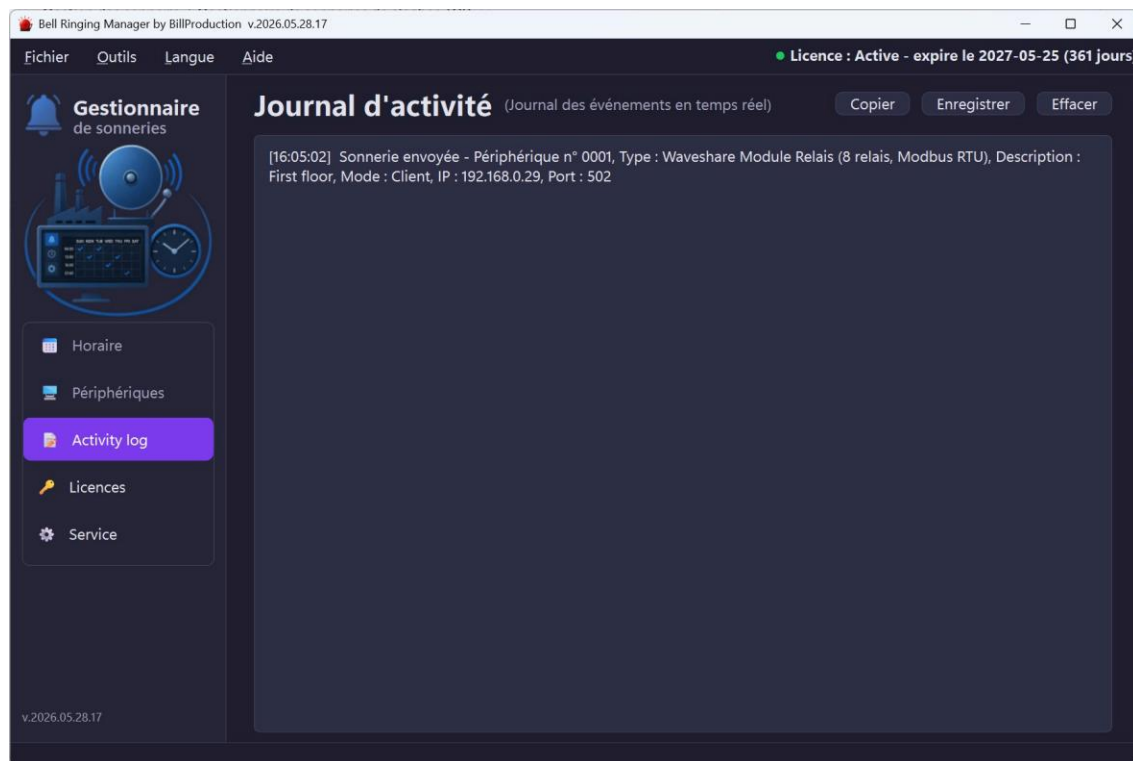


Figure 8 — Activity log page: each bell sent is traced with its device, its IP address and its port.

11. Appendix — Configuration Summary

11.1 Vircom parameters (module)

Parameter	Reference value
IP Mode	Static (fixed address, recommended)
IP Address	192.168.1.200 (example — to note down)
Net Mask / Gateway	255.255.255.0 / 192.168.1.1
Port	4196
Work Mode	TCP Server
Transfer Protocol	None (transparent Modbus RTU mode)
Baud Rate	115200

11.2 Device parameters in the software

Field	Value
Type	Waveshare Module Relais (8 relays, Modbus RTU)
Mode	Client
IP Address	Same as Vircom (e.g. 192.168.1.200)
Port	4196
Bell number (per event)	Number of the wired relay (1 to 8)

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Support: info@billproduction.com • <https://bellalarm.billproduction.com/>