Waveshare INPUT/OUTPUT Relay - Quick Setup Guide

Introduction

This guide is specific to the Waveshare Modbus INPUT/OUTPUT Relay Plugin for Q-SYS. It is not a general guide for the Waveshare Device.

Please note: if you decide to change device settings via the web GUI or the Vircom software, you should read this guide to understand the implications.

Quick Reference

Factory Default Device Settings: *(depending on firmware version)*

- **Default IP Address:** `http://192.168.1.200` or `http://192.168.1.254`
- **Default Web Password:** `Empty - Leave blank` or `123456`
- **Default Device Port:** 4196 (RTU mode - **must be changed to 502**)
- **Default Protocol:** None (RTU mode - **must be changed to Modbus TCP to RTU**)
- **Device Power:** POE or 7-36V DC power supply

> **Important:** The device ships in RTU mode on port 4196. This plugin uses Modbus TCP on port 502. You **must** configure the device before it will work with the plugin - see Initial Device Configuration below.

Prerequisites

- Q-SYS Designer v9.10.2 or higher
- Waveshare Modbus POE ETH Relay (B) module
- Network connectivity between Q-SYS Core and Waveshare device
- Device IP address and network configuration
- Valid plugin license key

Installation

1. Hardware Setup

1. **Connect the Waveshare to your network** via Ethernet cable.
2. **Power the device** using PoE (Power over Ethernet) or external 7-36V DC power supply.
3. **Verify network connectivity** - ensure the device and Q-SYS Core are on the same network or have proper routing.

2. Plugin Installation

1. **Drag the Waveshare INPUT/OUTPUT Relay Plugin** from the Plugins section of the Schematic Library into your Q-SYS design.
2. **Configure the plugin properties** before starting the design. See Configuration section below.

Initial Device Configuration

Accessing the Web Interface

1. **Open a web browser** and navigate to your device's IP address:
   - No DHCP: `http://192.168.1.200` or `http://192.168.1.254`
   - DHCP: Scan the subnet for the device IP

1. **Login to the web interface:**
   - Password field: Leave blank (empty) OR enter `123456`
   - Click Login

Required Device Settings

The device ships in RTU mode on port 4196. This will not work with the plugin out of the box. You must change the device port and protocol before connecting.

The screenshot below highlights the two settings you must change. **Device Port** must be changed from `4196` to `502`, and the **Multi-Host Protocol** must be changed from `None` to `Modbus TCP to RTU`.

[See device_settings.png included in this download]

Network Configuration

- **IP Mode:** Static (recommended)
- **IP Address:** Set to a static IP within your network range
- **Device Port:** Change from `4196` to `502`
- **Gateway:** Configure according to your network
- **Work Mode:** TCP Server

Multi-Host Settings (Required)

- **Protocol:** Change from `None` to `Modbus TCP to RTU`
- **Instruction Timeout:** 192
- **Enable Multi-host:** Yes
- **Conflict Time Gap:** 20

> **Note:** Multi-host is always enabled when Protocol is set to Modbus TCP to RTU. This is required for Q-SYS integration.

Q-SYS Plugin Configuration

Plugin Properties

- **IP Address:** Enter your Waveshare device IP address
- **Port:** 502
- **Feedback Rate:** Controls how often the plugin polls the device for relay state and digital input feedback. Default is `1` second.

Controlling Relays

The plugin provides the following control methods:

Individual Relay Control

- **Relay Toggle:** Toggle individual relays on or off
- **Relay Flash:** Pulse relay on briefly then auto-off

Group Control

- **All Toggle:** Turn all relays on or off simultaneously

Using Control Pins

You can connect momentary buttons or any Q-SYS control to the Relay Toggle control pins for custom on/off behaviour. For example, connect a UCI momentary button to a relay's control pin for push-to-activate control. This is useful for things like phone paging, door releases, or timed triggers.

Digital Inputs

The Waveshare (B) variant includes **8 optically isolated digital inputs**. The plugin displays the real-time state of each input as an LED indicator on both the Control and Feedback pages.

Wiring Digital Inputs

The digital inputs can be triggered in two ways:

- **Dry contact closure:** Short the **DI** terminal to **DGND** via a switch or dry contact.
- **Voltage driven:** Apply a voltage source (5-36V DC) to the **COM** terminal, with the **DI** terminal switching to **DGND**.

Status Monitoring

- **Connection Status:** Green = Connected, Yellow = Connecting/Reconnecting, Red = Disconnected/Error

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Troubleshooting

Cannot Connect to Device

Check network connectivity:

- Verify device IP address using ping from Q-SYS Core
- Ensure no firewall is blocking port 502
- Confirm device and Core are on the same network/VLAN

Verify device settings:

- Access web interface to confirm IP and port settings
- Ensure Multi-Host Protocol is set to "Modbus TCP to RTU"
- Confirm Enable Multi-host is set to "Yes"
- Confirm Device Port is set to 502

Connection Drops Frequently

Check network stability:

- Verify network infrastructure between Core and device
- Consider using a dedicated network/VLAN for control devices
- Check for network congestion or packet loss

Relays Not Responding

Check protocol settings:

- Ensure device Multi-Host Protocol is set to "Modbus TCP to RTU" (not "None")
- Verify port number is 502 in both the device web interface and plugin settings
- Confirm Enable Multi-host is set to "Yes"

Digital Inputs Not Triggering

Check wiring:

- Ensure the **DI** terminal is being shorted to **DGND** via the switch or contact
- Confirm you are using **DGND**, not chassis ground

Web Interface Access Issues

If you cannot access the device web interface:

1. **Find current IP address** using network scanning tools
2. **Reset to factory defaults** if necessary:
   - Power off the device
   - Short the "DEF" pins on the circuit board for 5+ seconds
   - Power on - device will reset to IP 192.168.1.254
   - **Reconfigure network settings** via Vircom software if web access fails

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Advanced Configuration

Integration with Q-SYS Logic

Connect plugin outputs to:

- **Snapshot triggers** for scene recall
- **Logic components** for complex automation
- **Custom Lua scripts** for advanced control

Multiple Device Support

For installations with multiple Waveshare modules:

- Use unique IP addresses for each device
- Configure separate plugin instances

Configuration Best Practices

1. **Always use static IP addresses** for control devices
2. **Set device Protocol to "Modbus TCP to RTU"** - this is required for Q-SYS integration
3. **Set Device Port to 502** in both the device web interface and plugin settings
4. **Enable Multi-host** in device configuration
5. **Use a dedicated network** for control devices when possible
6. **Wire digital inputs correctly** - short DI to DGND via a switch or dry contact