

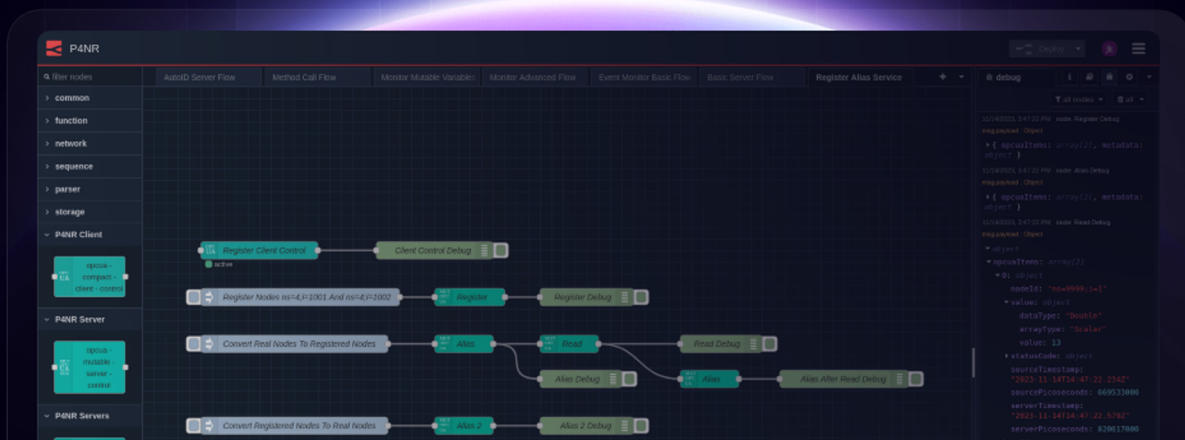


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Contribution Modbus

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Your PLUS in connectivity and support for Node-RED and FlowFuse



PLUS for Node-RED - Contribution Modbus

The Open Source Modbus Tools

Klaus Landsdorf (Iniationware, P4NR), Kay Grewe, Mohammed Yachou, and JohnOtten

This book is available at <https://leanpub.com/p4nr-contribution-modbus>

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This is a [Leanpub](#) book. Leanpub empowers authors and publishers with the Lean Publishing process. [Lean Publishing](#) is the act of publishing an in-progress ebook using lightweight tools and many iterations to get reader feedback, pivot until you have the right book and build traction once you do.

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Disclaimer

This book documents **node-red-contrib-modbus** for the **v5.x open-source** line (edition upgrade aligned with package 5.60.1+).

It teaches Node-RED 5.x and Node.js 24 as the recommended learning stack. The package engines allow Node.js ≥ 22 and Node-RED ≥ 4 .

TLS and next-major architecture belong to the **v6** product line and are only mentioned as “see v6” where needed.

Always verify behaviour against the package [CHANGELOG](#)¹ and the in-package examples under **Import → Examples → node-red-contrib-modbus**.

Your P4NR Team

¹<https://github.com/BiancoRoyal/node-red-contrib-modbus/blob/master/CHANGELOG.md>

Edition note — 5.60.1+

This edition upgrades the existing Contribution Modbus book for the public v5 LTS line of `node-red-contrib-modbus`.

Stack	Target
Package	5.60.1+ (examples and reconnect behaviour as of 5.60.1)
Node-RED	5.x recommended (package requires ≥ 4)
Node.js	24 recommended (package requires ≥ 22)

What this upgrade adds without discarding prior chapters:

- Corrected install pins, DEBUG namespaces, and the current palette node list
- Client ops honesty for timeouts / DNS reconnect (5.60.1)
- A numbered **Learning Path** matching package examples 01–18
- Settings reference and troubleshooting aligned to current flags

Cover art is set in the Leanpub UI (no embedded title page in this manuscript). TLS and next-major architecture remain a v6 topic (“see v6”).

Introduction

This book is a guide to using the P4NR Modbus package to integrate Modbus communication into Node-RED workflows. It provides an overview of the Modbus communication protocol, explains how to use the P4NR Open Source Modbus package, and demonstrates how to create automation projects using Modbus and Node-RED.

This book introduces you to Modbus as a Industrial IoT protocol, that is a widely used communication protocol in industrial automation, energy systems and buildings. We'll explore the Modbus communication protocol and learn how to use it in the Node-RED environment. Whether you're an expert or a beginner, this guide will help you understand and use Modbus for IoT and automation applications and workflows.

We'll cover topics like Modbus services, data structures, error handling, and communication. We'll also look at examples and use cases to show you how Modbus can be used in real-world projects. This book is your complete guide to mastering Modbus integration with Node-RED. So, let's get started and discover how Modbus can enhance your projects!

The book is focused on helping technicians add new business cases and contribute to the digital transformation of existing Modbus communication devices and machines. By enabling technicians to use JavaScript/NodeJS inside Node-RED, they can customize and enhance their Modbus communication systems to meet their specific modern needs.

We have identified the energy, buildings, and manufacturing markets as relevant to this book. These industries can benefit significantly from Modbus integrations with Node-RED, as it can help them improve safety, security, and efficiency in their automation projects.

FlowFuse and P4NR

FlowFuse is a Node-RED management tool that simplifies the integration of connectivity like Modbus via Node-RED flows, enabling users to create sophisticated automation solutions with ease. With FlowFuse's platform, users gain access to a set of nodes specifically designed for communicating with devices, streamlining the process of reading and writing data registers, as well as executing custom function codes. FlowFuse is a platform that simplifies the integration of Node-RED in industrial environments to share flows and manage them in a secure way including deployment, auditing, snapshots, users and team management and many more.

FlowFuse is a partner of the P4NR stakeholder Initiationware, a B2B community that provides a set of packages to simplify the integration of connectivity like Modbus via Node-RED flows. P4NR's packages enable technicians for the digital transformation of existing Modbus communication devices and machines.

By using P4NR's packages, users can customize and enhance their Modbus communication systems to meet their specific modern needs. P4NR's packages are designed to be user-friendly and efficient, providing a seamless integration of Modbus with Node-RED and FlowFuse.

Understanding P4NR and Modbus Integration

P4NR is a B2B community to simplify the integration of connectivity like Modbus via Node-RED flows, enabling users to create sophisticated automation solutions with ease. With P4NR's packages, users gain access to a set of nodes specifically designed for communicating with devices, streamlining the process of reading and writing data registers, as well as executing custom function codes.

Key Features of our P4NR Modbus Package

1. **Flexibility:** P4NR's Modbus package offers flexibility in customizing function codes and data registers, empowering users to use communication protocols according to their specific application requirements.
2. **Efficiency:** By providing intuitive interfaces for configuring Modbus communication parameters, P4NR simplifies the setup process, reducing development time and effort.
3. **Reliability:** P4NR's Modbus nodes are designed to robustness and reliability, ensuring seamless communication between Node-RED flows and Modbus devices.

Who should read this book?

The book can serve as a learning resource for technicians and contributors who want to understand and implement Modbus communication without needing to write code from scratch. Node-RED provides a no-code starting point, making it more accessible for technicians to get started. By integrating Modbus with Node-RED, the book can help technicians improve the safety and security of their Modbus communication systems. The queue system can enhance safety by controlling the flow of data, while Node-RED's available protocols and technologies, such as HTTPS and MQTT secured, can provide additional layers of security.

Structure

- Chapters
 - Introduction
 - Client

- Services
- Server
- Examples
- Development
- Summary

Future Updates

This book will be updated for the current major version. Meaning, if a new version 5.X.Y gets released, this book will be updated shortly after. You still own a copy of the book, and you can download the updated version like you downloaded this one with no extra costs. If the new version is 6.X.Y, then this book will not be updated for that version. There will be a new book from the start of that major version. That guarantees each user has an at least somewhat correct documentation for the version they are using. But as long as the major version is supported, the affiliated book will be also held up to date.

This book is a living document, and we will continue to update it with new content, examples, and use cases. We welcome feedback and suggestions from readers to help us improve the book and make it more useful for the community.

Conclusion

In summary, the P4NR Modbus package makes it easy to use the Modbus protocol with Node-RED in very new ways. This helps you create better and more complex automation projects in the Digital Transformation. With P4NR, you can do more with Modbus in Node-RED environments.

Happy wiring! Klaus Landsdorf, P4NR B2B Community Expert

Modbus Package Installation

Recommended stack (this edition)

Component	Recommendation
Node.js	24 (package requires ≥ 22)
Node-RED	5.x (package requires ≥ 4)
Package	node-red-contrib-modbus@5.60.1 or newer

Install from the Palette

1. Open Node-RED → **Menu** → **Manage palette** → **Install**.
2. Search for node-red-contrib-modbus.
3. Install, then **restart Node-RED** if the runtime asks you to.
4. Confirm nodes appear under the Modbus category.

Install with npm

In the Node-RED user directory (often `~/ .node-red`):

```
1 cd ~/ .node-red
2 npm install node-red-contrib-modbus@5.60.1
```

Global install (less common for palette nodes):

```
1 npm install -g node-red-contrib-modbus@5.60.1
```

If native builds fail (serialport), try:

```
1 npm install node-red-contrib-modbus@5.60.1 --unsafe-perm --build-from-source
```

Update / pin a version

```
1 npm show node-red-contrib-modbus@* version
2 npm install node-red-contrib-modbus@5.60.1
```

What v5 does not include

- TLS / encrypted Modbus TCP — see the v6 product line.
- **Modbus-Flex-Server** — not part of current v5; use in-package **Modbus-Server** (buffer slave) for demos and simple gateways. Flow-based dynamic gateway work is tracked separately (GitHub #567).

Serial note (honesty)

Serial RTU needs a native serialport binding. On some **ARM64 + Node 24** images, nested older serialport under @openp4nr/modbus-serial has been reported to segfault (GitHub #577). Prefer TCP labs until your serial stack is verified.

Modbus Client

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What does modbus client node do in general?

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How does the output look like?

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Provide examples of how to use the node with different function codes and data types.

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Modbus Queue Info

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Communication Switch Example

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What is the role of the Catch node in the Modbus Switch TCP flow example?

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How does the Modbus Read node read data from Modbus slave devices?

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Which input message does this modbus read node supports?

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Key Features Of Modbus Read Node

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Handling Errors in the Modbus Flex Connector Node

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How can the Modbus Queue Info node be used to troubleshoot communication issues?

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FIFO Queue

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Modbus Client Communication Example

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How can I modify the function node for other types of registers or coils?

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What do two identical outputs signify in this node, and how do they function?

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FC3: Reading Holding Registers

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Modbus Services

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Modbus Basic Services

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Modbus Advanced Services

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IO's for Read/Write Services

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Configuration and Performance

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Modbus Response Node

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Modbus Read Node

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Modbus Getter Node

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Modbus Flex Getter Node

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Modbus Write Node

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Modbus Flex Write Node

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Flex-Connector

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Modbus Read Service

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What does Modbus Read node do in general?

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How does the input message look like?

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Reading Inputs, Coils and Registers

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Add more information about the different configuration options of the node, such as the data type (holding registers, input registers, coils, discrete inputs), the poll rate, and the timeout settings.

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Provide examples of how to use the node with different function codes and data types.

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Explain how to handle errors and exceptions in the Node-RED flow.

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I want to read or write to more than 10 registers or coils , how should i do?

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How can I read exactly with the package?

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Read Modbus by Events

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Configuration:

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Modbus Write Service

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What is the correct function code for writing to holding registers?

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How does the format of a write message differ from a read message?

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Coils and discrete inputs (FC1, FC2, FC5, FC15)

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Modbus Flex Write Example

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Monitoring Results of Writing Multiple Holding Registers Using FC16

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Modbus Sequence Service

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Modbus Sequence Settings

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Modbus Custom Function Codes (Flex FC)

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Modbus Event Read FC3

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Configuration:

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FC1: Read Coil Status

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FC2: Read Discrete Inputs

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FC3: Read Holding Registers

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FC4: Read Input Registers

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Modbus Server

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Demo Server (Modbus-Server)

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What this server is not

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Examples

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Import Examples

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Modbus Flex Server HTTP Request Example

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Modbus Client Read by Event Example Flow

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Modbus Server Read Example Flow

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Modbus Server Write Example Flow

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Development

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How to Enable Debug Mode for this package

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Modbus Response

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Troubleshooting Common Error Messages with Modbus-Read Node

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Error: Connection Refused

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Error: Illegal Data Address

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Error: Illegal Data Value

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Error: Timeout

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Error: Slave Device Failure

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Flex-FC Configuration (Custom-FC)

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Client ops — timeouts, queue, and reconnect (5.60.1)

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Connection and timing

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Queue and concurrency

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Logging toggles

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What 5.60.1 changed (honesty)

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Lab

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Shared client isolation

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Learning Path — package examples

01-18

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Path overview

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Labs 10–18

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Appendix — Settings reference (v5.60.1+)

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Modbus-Client (summary)

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Service nodes (common)

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emptyMsgOnFail / keepMsgProperties

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Appendix — Troubleshooting (v5.60.1+)

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