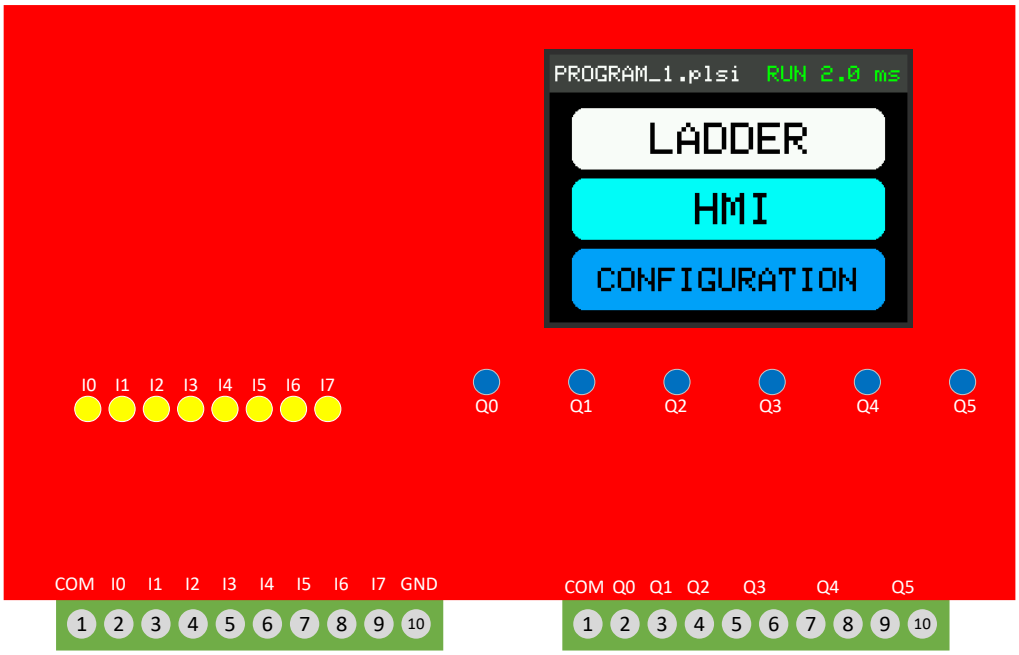
PLsi v0 User Manual



Project page:

https://github.com/ElPercha/PLsi

Free Software

Free as in Freedom

Purpose of this document

This PLsi manual provides you with information to build a PLsi v0 unit, it comprises the board assembly, firmware download and a series of tests to validate the main functionalities. For wiring, configuration and programming information use the "PLsi v0 User Manual" instead.

Please, create an issue in the PLsi repository if you see that this manual is not clear enough or has opportunities to improve.

Document information

Manual Name: **PLsi_v0_User_Manual**

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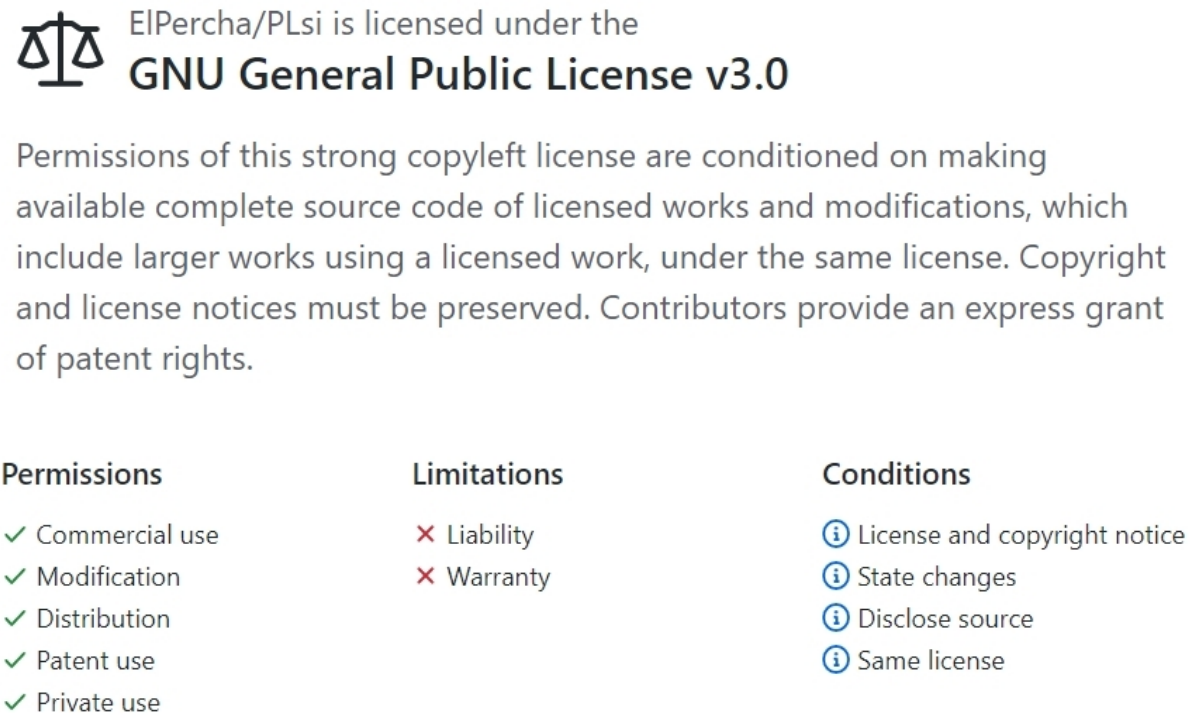
Revision history

Revision	Date	Description
A	April 23, 2021	First Revision

License

The complete PLsi Project is under GPL v3.0 license.

This includes Hardware, Software, Documentation and all related contributions:



A full copy of the License is included on the Master branch of the project for reference:

https://github.com/ElPercha/PLsi/blob/master/LICENSE

Original copy with useful FAQ:

https://www.gnu.org/licenses/gpl-3.0.html

Disclaimer

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Safety Guidelines

All applicable local and national codes that regulate the installation and operation of your equipment shall be followed in order to minimize the risk of potential safety issues.

PLsi is not fault-tolerant and must not be used to control equipment in hazardous environments where the failure of the system could lead to death, people injury, or severe environmental damage. Refers to the Disclaimer notice for more information.

This manual contains 3 levels of hints:

WARNING:
Death, serious harm to health or equipment damage can result if the stated measures are not followed !

CAUTION:
Harm to health or equipment damage can result if the stated measures are not followed

TIP:
Important information that requires your special attention

Table of Contents

1. Introduction

MANUAL ON CONSTRUCTION

I will work on it once I finish with the Hardware Manual

The objective of the PLsi project is to create an PLC + HMI with the following main characteristics:

- Does not require external systems such us Laptops or Cellphones to be programmed
- To be used on Classroom for educational purposes, IOT applications or industrial low risk applications
- Software and Hardware with Industrial performance and features

The hardware version 0 of PLsi system is designed to be cheap and easy to build. It does not have SMD components, what makes the building process easy, fast and feasible using basic tools. The components selection was oriented to use easy to get and cheap elements.
The PLsi v0 is mainly composed by:

- Main board
- ESP32 module
- TFT 2.8" SPI Display module with touchscreen
- Terminal blocks and common electronic components

The PLsi v0 board is designed to support different input output configurations. This manual will cover the 2 main suggested configurations. For that reason, before to start, you have to select which version are you going to build, these are the 2 main options:

1. Digital version:
   - 8 digital inputs (5 to 26VDC)
   - 6 relay outputs (10A max per PLsi, external fuse required)
2. Analog version:
   - 6 digital inputs (5 to 26VDC)
   - 4 relay outputs (10A max per PLsi, external fuse required)
   - 2 Analog Inputs (0-5V)
   - 2 Analog Outputs (0-5V)

This definition will modify your component list. The details of which component is required on each version is covered on the following chapters.

1.1 Project documentation

The PLsi project is hosted on GitHub:

https://github.com/ElPercha/PLsi

The tree structure is divided in 3 main folders:

1. **doc**: Contains project documentation and auxiliary tools
2. **firm**: Contains the Firmware, it is designed using PlatformIO + Visual Studio
3. **hard**: Contains the Hardware documentation, mainly:
   - Circuit schematic

- Component list
- Board fabrication details
- 3D Printed housing fabrication details

The most updated information is located on the master branch (link provided above), but it also might contain nightly builds of the firmware, hardware or any document. For this reason it is recommended to use the “releases”, they are a more trustworthy information source.

Each release contains a snapshot of the full project site by the moment of his creation, plus the required binaries to flash the ESP32 module.

By the time this document was created, the latest available is the “v0.00.03”.

It is recommended to use the latest available release to build your PLsi unit.

https://github.com/ElPercha/PLsi/releases

The details on how to use the binaries files to flash our PLsi are going to be covered in the next chapters.