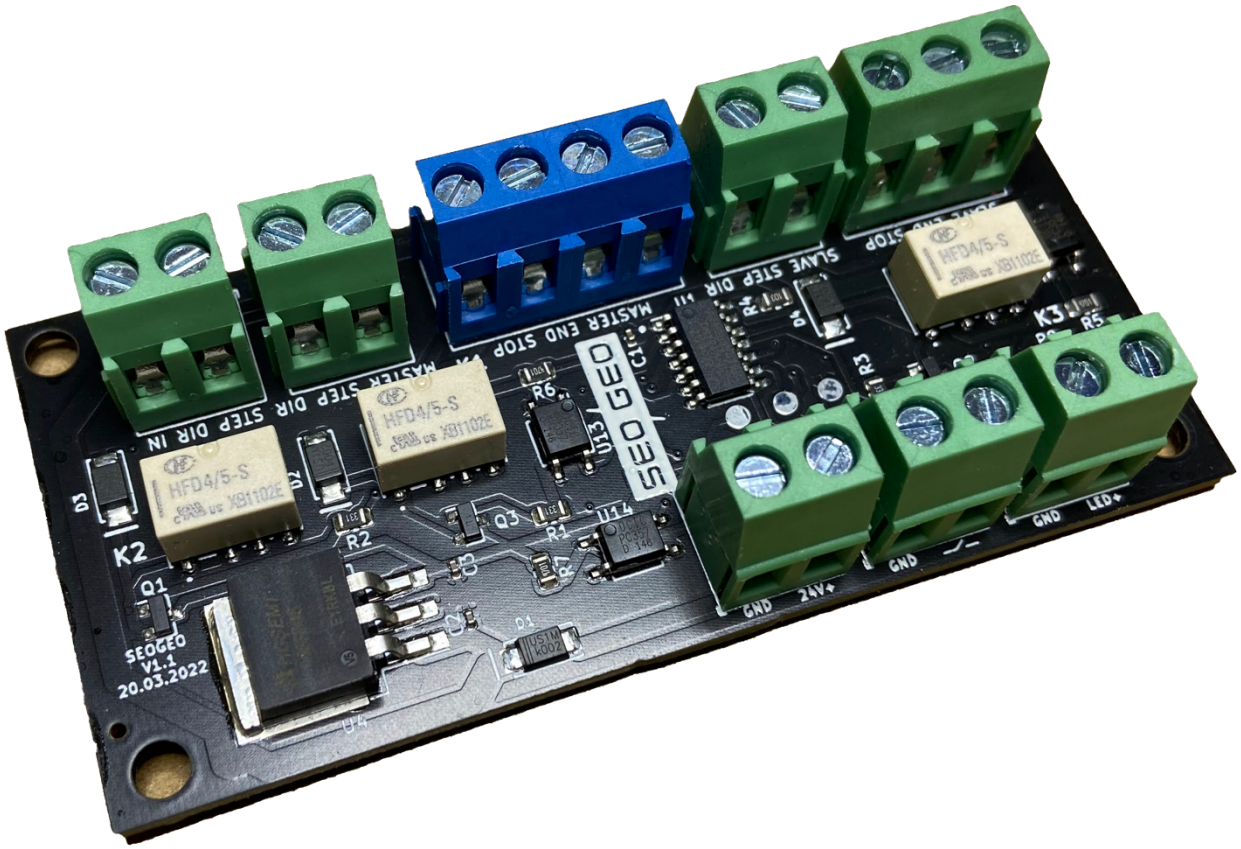


User manual

Gantry Squaring

Extension Board

SeoGeo | Daniel Seoane
Bleichstraße 30
74172 Neckarsulm

E-Mail: info@SeoGeo.de
Telefon: +49 (0) 151/10378053
Whatsapp: +49 (0) 151/10378053

Introduction

Thank you for your trust and the purchase of Extension Boards for Gantry Squaring. This document explains the connection and operation.

Caution

The board is not a complete control system, and it does not include safety devices for personal protection; this must be provided by the actual control system. SeoGeo is not liable for any property or personal damages that may result from the operation of the board.

If you have any questions, please feel free to contact us via email or WhatsApp:

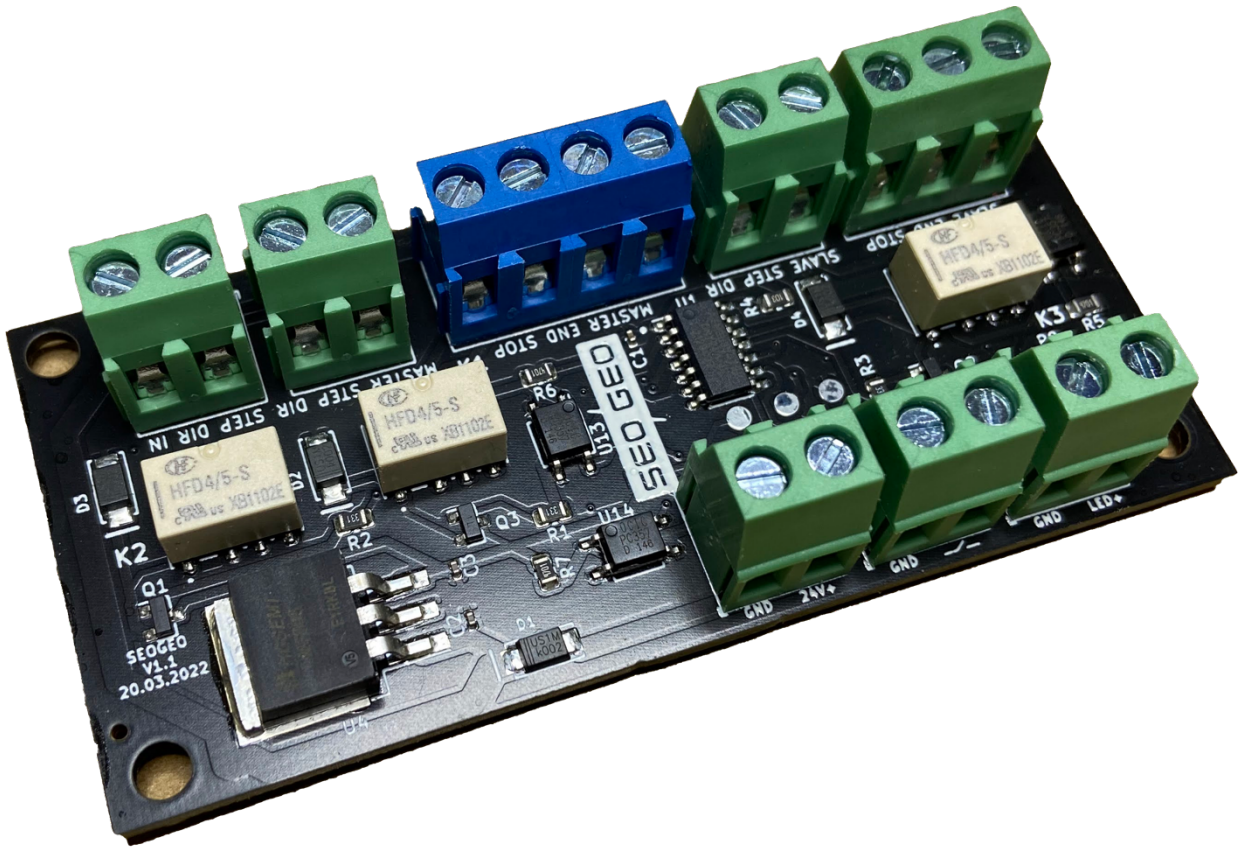
Email: info@SeoGeo.de

Phone: 0151/10378053

(Available via WhatsApp starting at 5:30 PM)

Benötigtes Werkzeug / Material

Screwdriver	Multimeter	Cable
Wire stripper	Wire end Sleeves	



Scope of Delivery

In the delivery scope, the board is included.

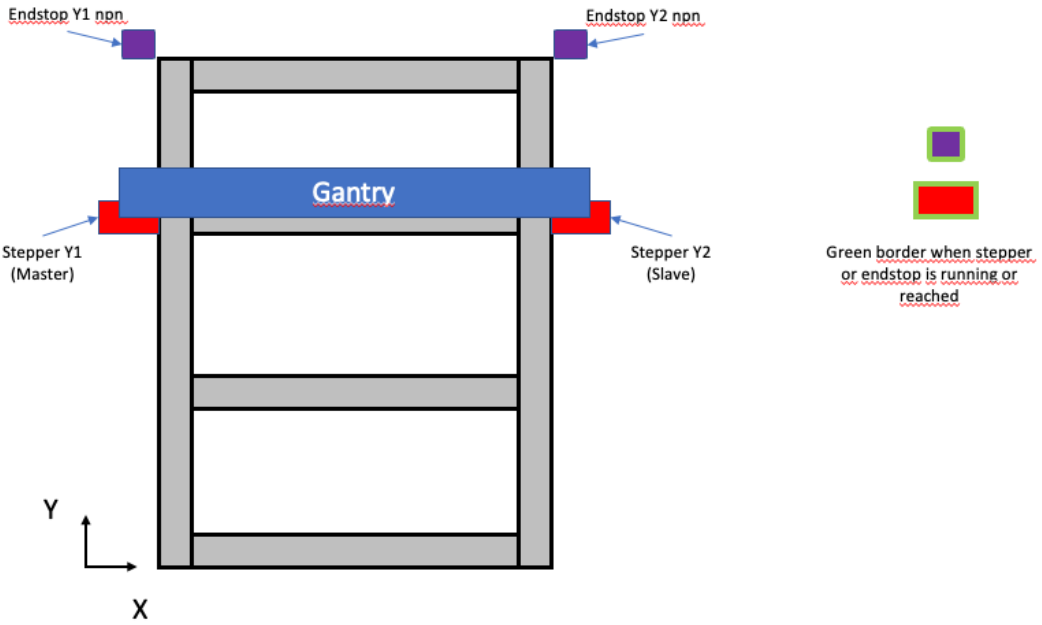
You can find a video tutorial here:

I need to make a new on in englisch

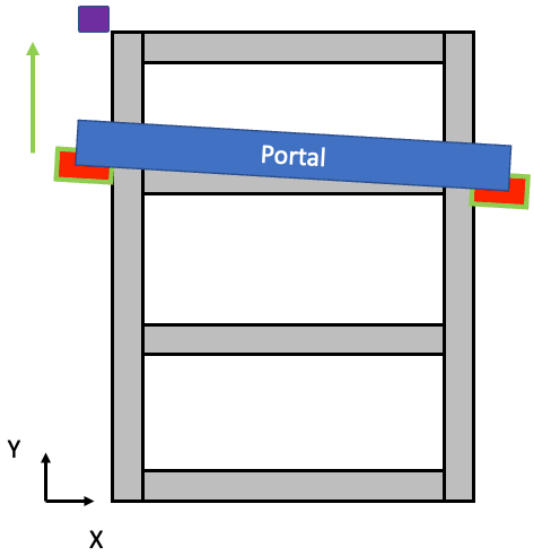
What is Gantry Squaring?

Explanation of the Sketch:

In general,



depending on the mechanical design, the gantry is aligned at a right angle. However, it might be possible that the gantry is not at a right angle due to the construction of the milling machine or its stability. In such cases, it is indeed possible for a gantry to be misaligned (exaggerated for illustration purposes).

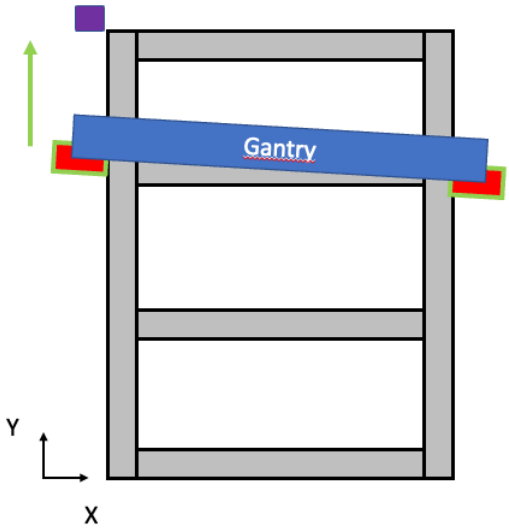


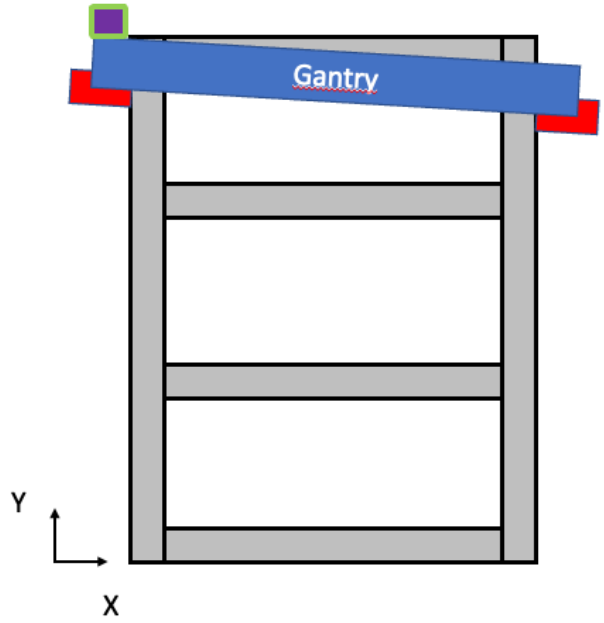
How can Gantry Squaring help with this?

Gantry Squaring aligns the gantry during the homing process of the system using two independently running stepper motors and two separate limit switches. However, initially, homing is done using two stepper motors running in parallel and one limit switch.

Homing without Gantry Squaring:

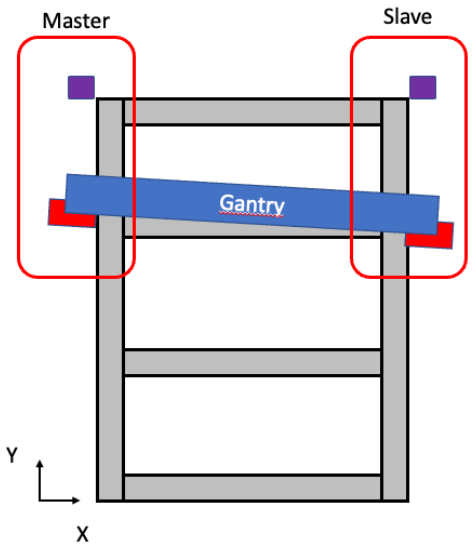
During homing, the gantry moves towards the limit switch.



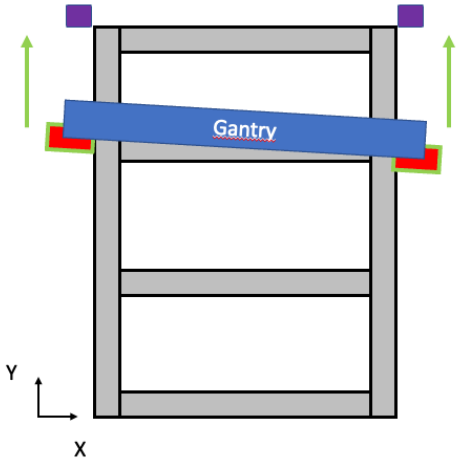


At the moment when the gantry reaches the limit switch, both stepper motors stop, but the gantry is still not squared. This is where Gantry Squaring comes into play, and it can be extended with this extension board if the control system does not support Gantry Squaring on its own.

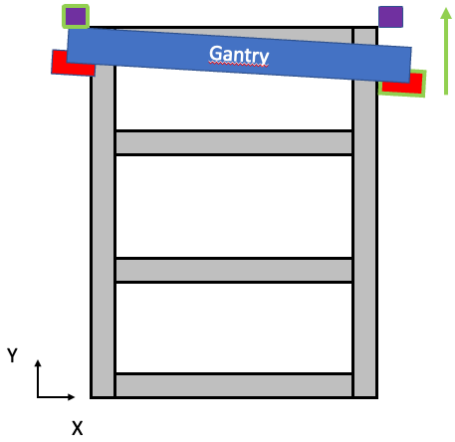
Homing with Gantry Squaring:



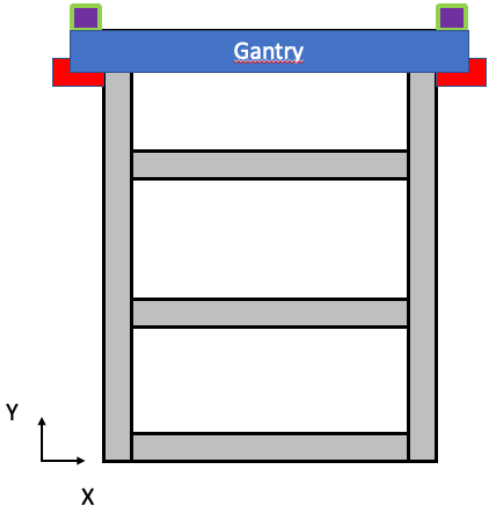
In a system with Gantry Squaring, each stepper motor is independently controlled and has its own limit switch, with one designated as the master and the other as the slave.



During homing, the gantry initially moves towards the limit switches as usual, with both drives moving towards their respective limit switches.



Once the first stepper motor (in this case, whether it's the master or the slave, it doesn't matter) reaches the limit switch, the master stepper is turned off and comes to a halt, while the slave stepper continues to move.

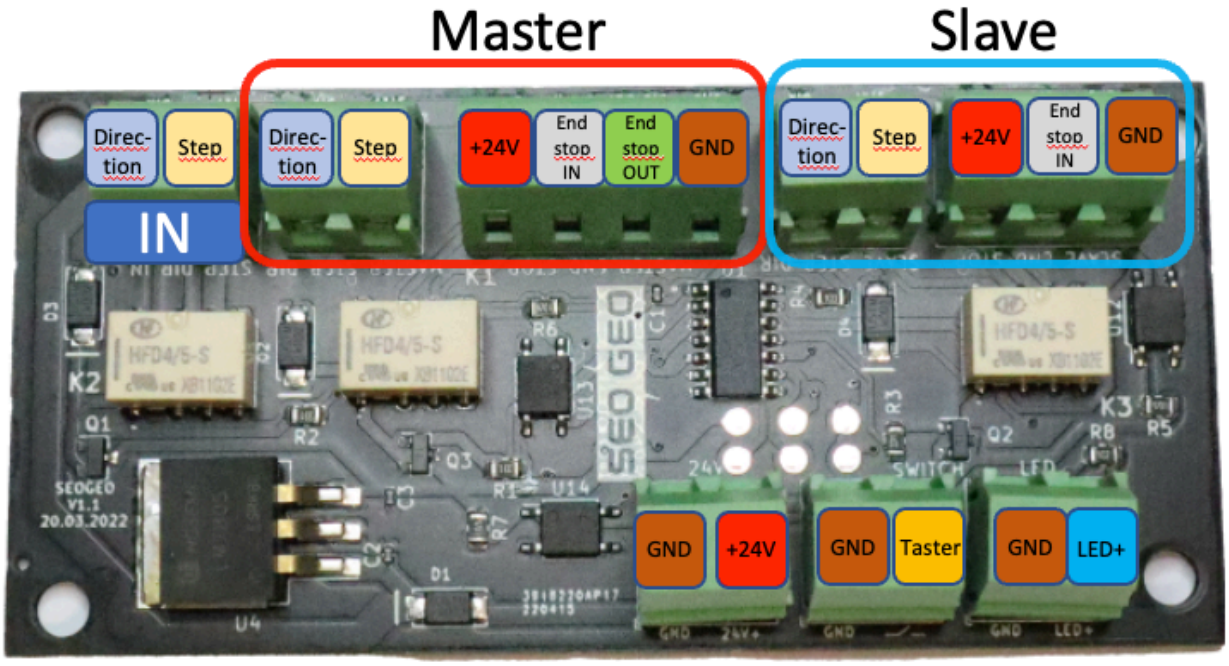


When the second stepper motor reaches the second limit switch, the gantry is squared, and the Gantry Squaring Board forwards the limit switch signal from the master to the control system.

The gantry is now aligned, and the squareness can be adjusted by moving one or the other limit switch forward or backward.

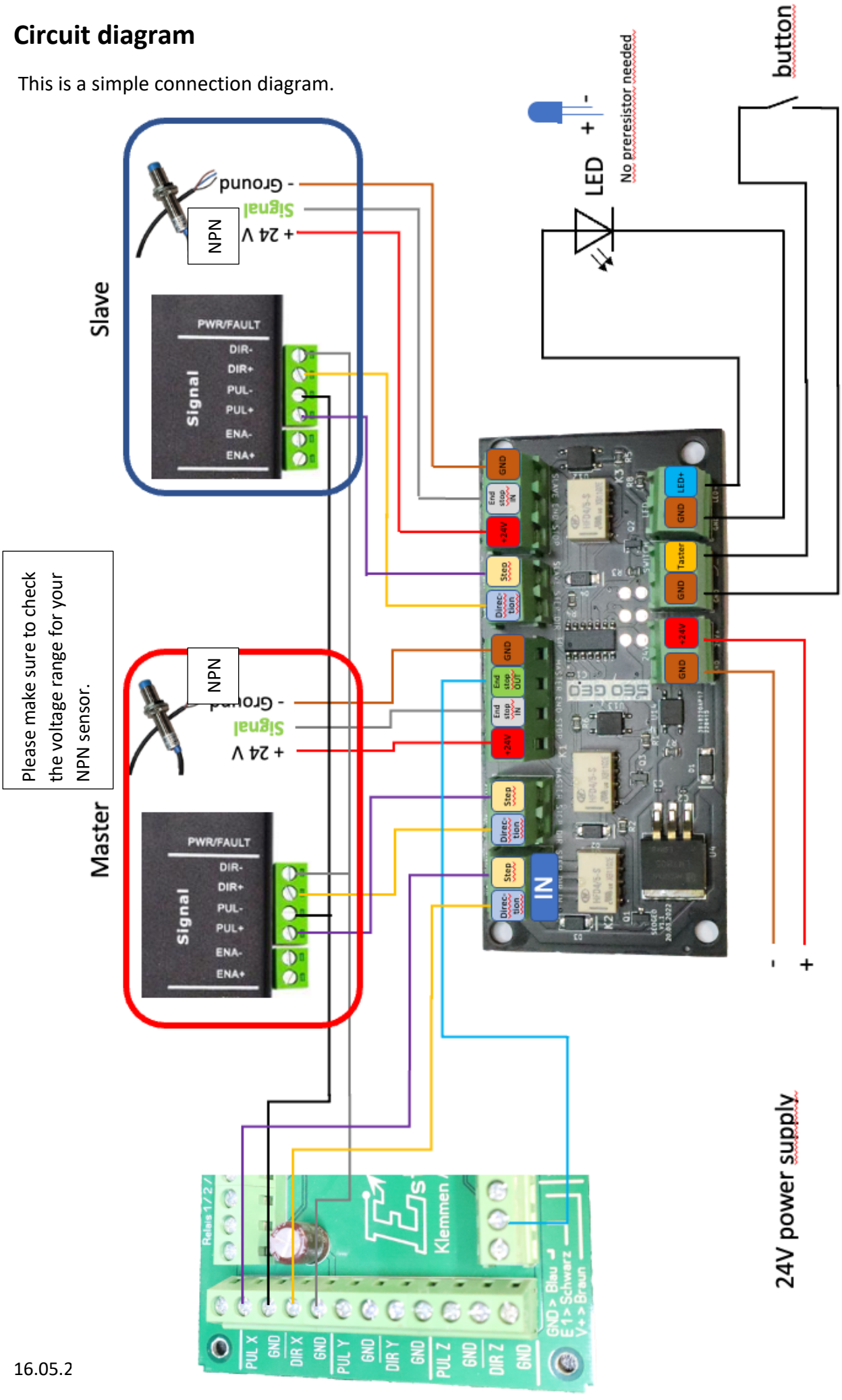
Connection diagram and operation of the Gantry Squaring Board

Pin Assignment of the Extension Board



Circuit diagram

This is a simple connection diagram.



Functionality

States of the Extension Board:

1. LED off: In this state, the Step Direction signals are connected in parallel, and both driver stepper driver the same Step Direction signal. Additionally, the master signal of the limit switch is passed through the board. This is done with galvanic isolation, and it does not affect the signal apart from the terminal connections. The milling machine now behaves like a system without the Extension Board.
2. LED on: In this state, the Gantry Squaring Board is in the mode for aligning the gantry. If one of the limit switches is triggered, the corresponding motor stops and waits for the second limit switch to be reached. When the second limit switch is reached, the second stepper motor also stops, and the limit switch signal from the master is returned to the control system. Both stepper motors are immediately switched back to normal operation. The LED turns off, and the control system is in state 1 (LED off)

   There is also a timeout after reaching the first limit switch. It waits for 6 seconds for the second limit switch to be reached. If the second limit switch is not reached within this time, the system returns to the first state.

Important!!!!

In state 2, Gantry Squaring Mode, you need to initiate homing in your control system for the steppers to start moving, at which point the Gantry Squaring Board can perform its intended function. The Gantry Squaring Board does not generate its own Step Direction signals. In state 1, your milling machine operates as usual, and when you initiate homing, only the master limit switch is considered, and the gantry is not squared.

Switching the states

By pressing the button, you can switch between state 1 and state 2 at any time.

State upon power-up:

By default, when the board is powered on, it is in state 2, ready to home the system or perform Gantry Squaring. This state also has a timeout, and homing must be completed within 10 minutes. After the timeout, the board switches to state 2.

The state upon power-up can be configured by holding the button while the board is being powered on.

Enjoy setting up your equipment! If you have any more questions or need further assistance, feel free to ask.