

PiKoder /SPE LAN Development board

Building instructions

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General information

With the PiKoder /SPE LAN development board you control a PPM signal via LAN. Typical applications use a PC to operate a remote control transmitter remotely and with a joystick.

Before you start building the development board for the PiKoder/SPE LAN read these instructions through to the end. You then know what is important and can therefore avoid errors from the outset, which sometimes require a lot of effort to correct.

The kit contains a circuit board that is already populated with all SMD parts. This makes the construction much easier, but basic knowledge of electronic components and their handling and experience in soldering are still required.

Carry out soldering and wiring absolutely cleanly and conscientiously; do not use acidic soldering tin, soldering grease or similar. Make sure that there are no cold soldering points. Because unclean soldering or poor soldering joints, loose contacts or poor construction mean complex and time-consuming troubleshooting and, under certain circumstances, destruction of components.

The possibility of something not working after assembly can be drastically reduced by careful and clean assembly. Check each step before moving further. Follow the construction instructions! Do not do the step described there differently and do not skip anything! Check each step twice: once for building, once for testing.

In any case, take your time: crafting is not piecework and should, first and foremost, be fun!

2

Kit scope and aids

This kit contains all the components required to build a development board for the PiKoder/SPE LAN, including the already programmed PIC16F1455 microcontroller.

Please first check the completeness using the following parts list:

semiconductor

PIC16F1455

IC1

√



Miscellaneous

4-pin pin header, angled

Socket strip 2x5-pin

Socket strip 1-pole (2x)

Circuit board partially assembled



In addition, the following tools are required to assemble this kit:

1. Electronic soldering iron with a fine tip
2. Electronic soldering tin
3. Side cutters

To put the PiKoder/SPE LAN into operation you also need:

1. Micro USB cable
2. Ethernet patch cable
3. 5 Volt power supply
4. PC with application software (download from the Internet)

Construction

The following sections describe the assembly of the missing components on the circuit board. All components are located on the assembly side and the assembly process itself is supported by the assembly imprint on the circuit board. The order of assembly depends on the height of the components - the general rule is that the flattest components are assembled first.

Equipping the angled pin strip

First the angled pin header is populated. Please make sure that the contact pins are parallel to the circuit board after soldering so that the connecting cables can be plugged in later without any problems.



Equipping the controller

Plug the controller into the appropriate position on the assembly side of the circuit board. Please note the notch (marked with a red arrow in the picture).

To prevent the controller from falling out when turning the board around for soldering, two diagonally opposite pins are bent very slightly and then all connections are soldered.

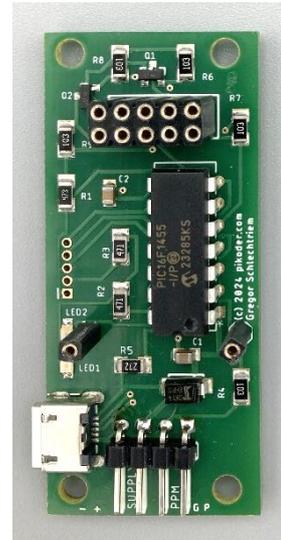


Assembling the socket strips

Finally, the remaining socket strips have to be fitted, which will then accommodate the Ethernet converter .

For alignment, the socket strips are plugged into the converter and then placed onto the circuit board. If you carefully turn the circuit board over, you can solder the sockets in the correct position and the adapter can be easily pulled out later if necessary .

This completes the construction of the hardware.



Commissioning

Commissioning the finished development board consists of three steps:

1. Setting the PPM and connection parameters of the PiKoder on the lower base board
2. Assigning the network address and defining the connection data of the Ethernet adapter
3. Joystick setup

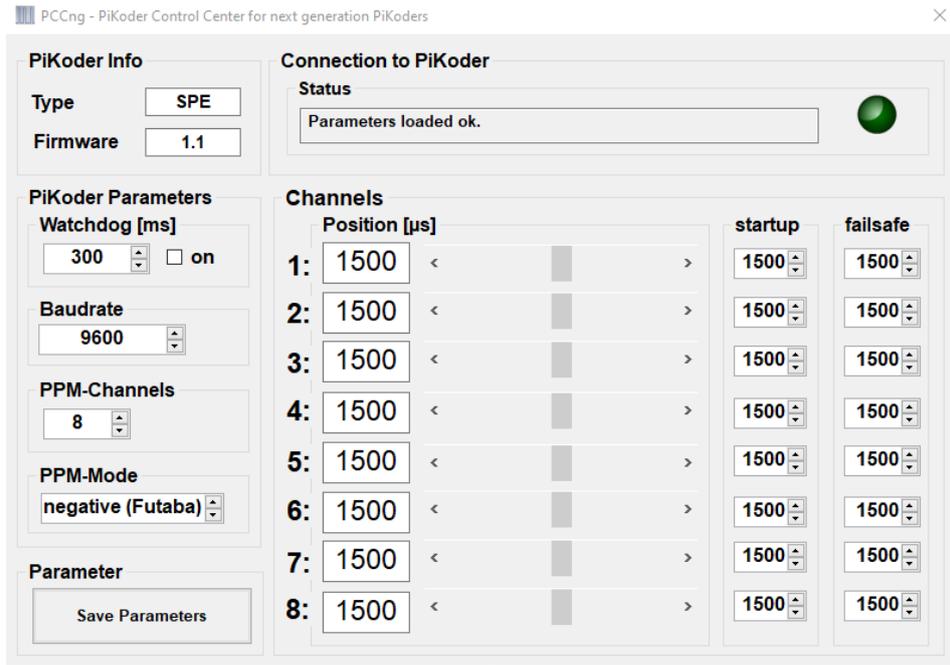
The required software modules are available to download free of charge on the Internet.

PPM and connection settings

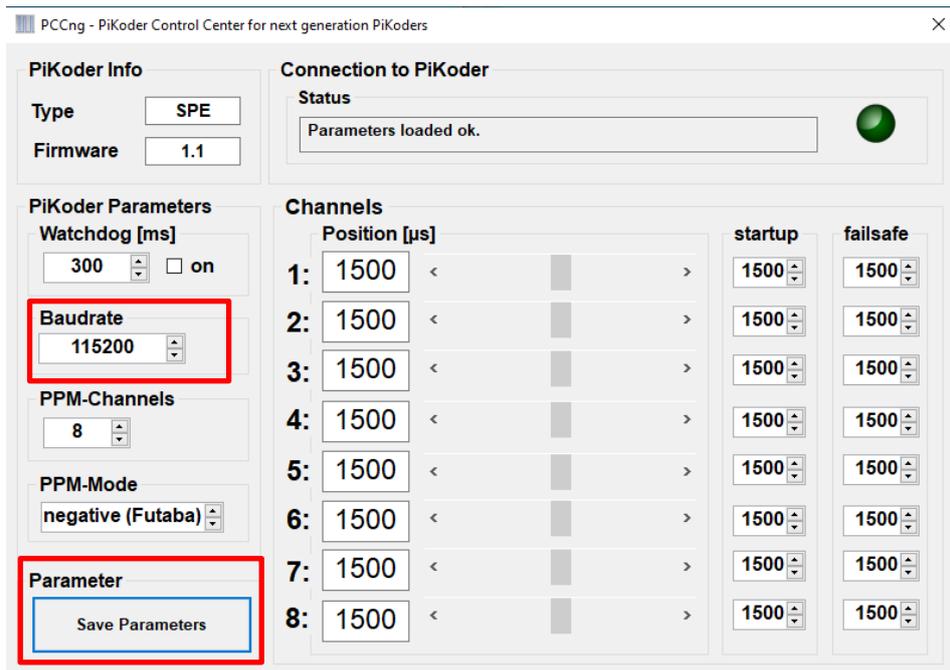
In the first step, you make the PPM and connection settings of the PiKoder via the USB port on the base circuit board. In addition to a suitable USB cable, you also need the [“PCCng” app](#), which you can get free of charge in the Microsoft store.

First connect the PiKoder/SPE LAN to your computer with the USB cable. Windows will automatically install the required driver and the green LED of the PiKoder should light up.

Install the PCCng app on your computer and start the program. Your PiKoder will be found automatically and the settings will be displayed.



Please change the baud rate to 115200 and then press the “Save Parameters” button.

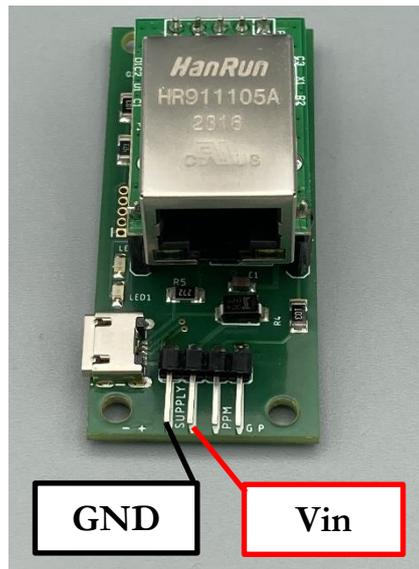


This completes the setting of the PiKoder/SPE and you can remove the USB cable.

Setting the Ethernet adapter

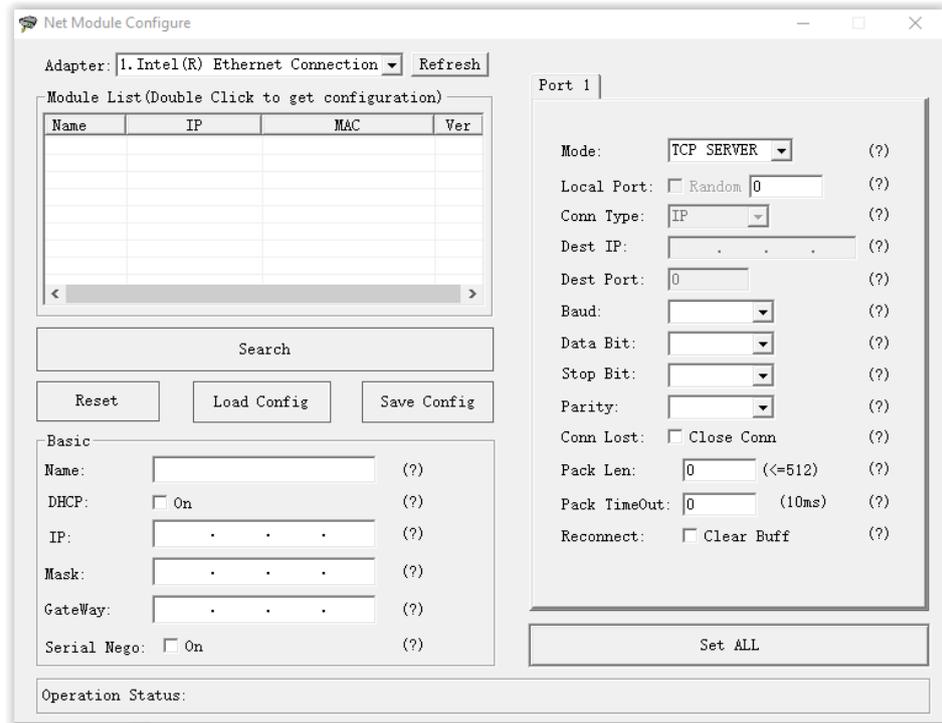
The following section describes the necessary settings of the Ethernet adapter .

First connect your PiKoder/SPE LAN to a 5 Volt power source as shown in the following image.

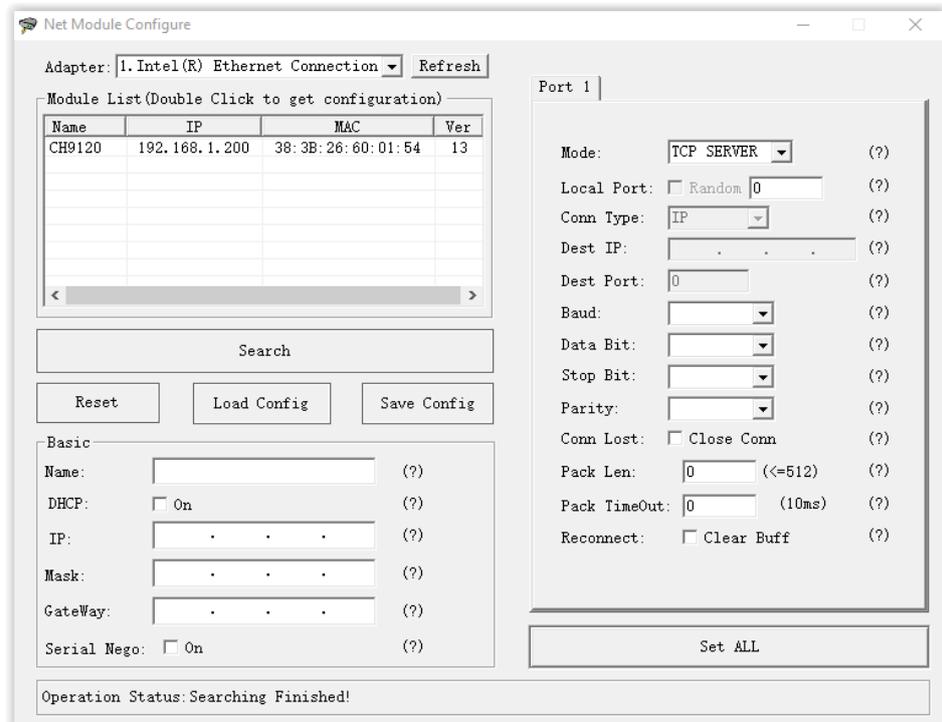


To parameterize the Ethernet adapter, use the manufacturer's configuration program [ETH-002 configuration.exe](#) , which you can download from the PiKoder website. The program does not require installation and can be started directly after downloading.

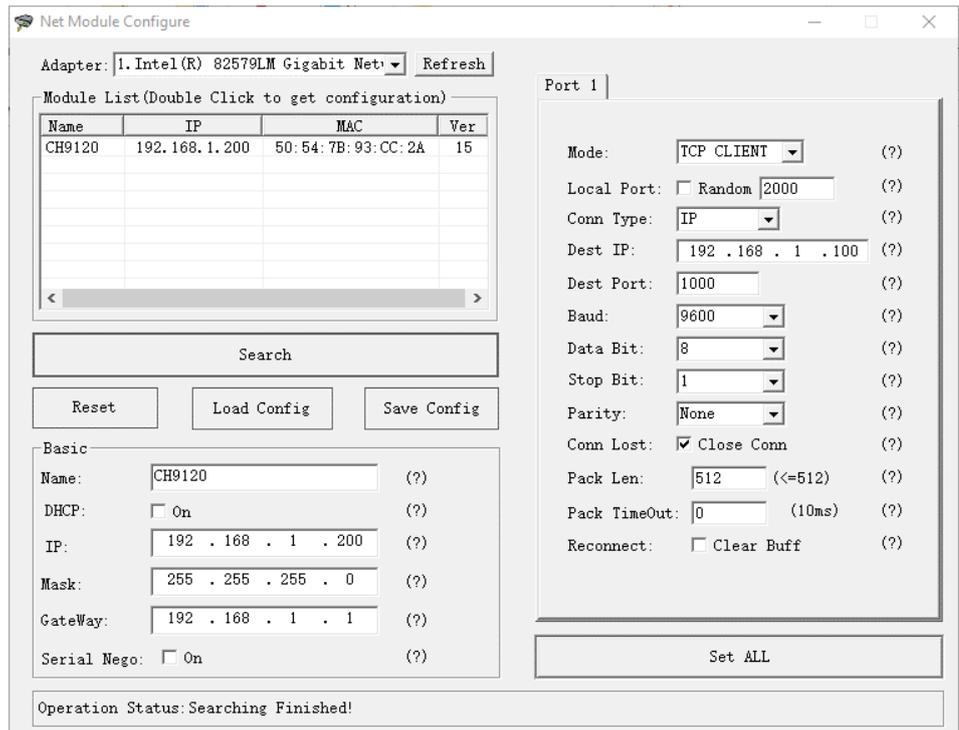
If you have activated a firewall, please allow the configuration program to access private networks when the corresponding query appears.



If you press the “Search” button, your adapter will be found and displayed.

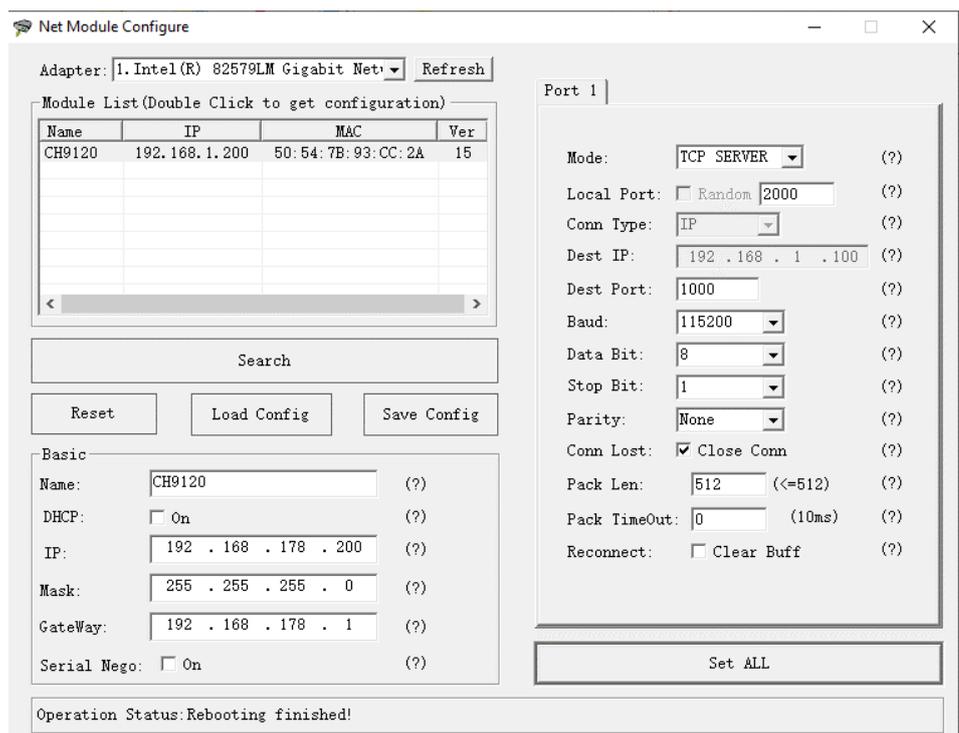


If you now double-click the line with your adapter, the settings will be loaded.



Please make the following adjustments (see below):

- IP address: please assign the adapter an IPv4 address within your network
- Gateway: please adjust according to the assigned IP address
- Mode: switch to TCP_SERVER
- Baud: increase to 115200

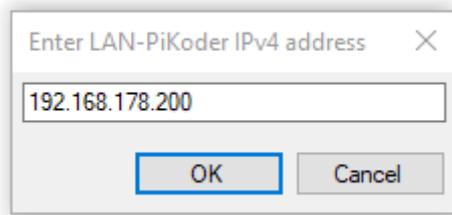


Finally , save the new configuration by pressing the “Set ALL” button. This completes the configuration of the PiKoder/SPE LAN. Now the joystick is configured.

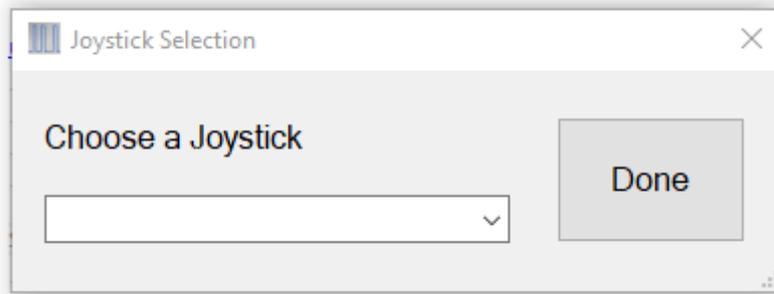
Joystick UI for Windows

You operate the PiKoder / SPE LAN with the JoystickUI4LAN - [PiKoder app](#), which you can get for free from the Microsoft Store. Install the app, connect your PiKoder to the 5 volt power supply and your network and then start the app.

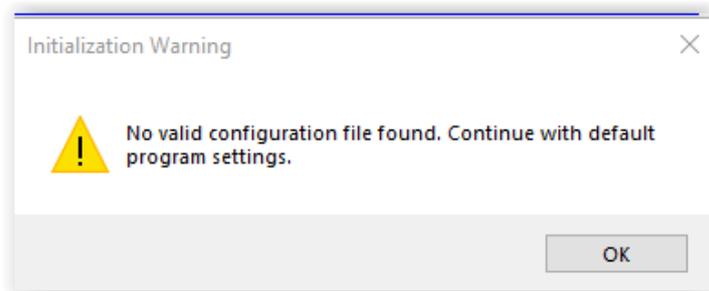
First, you will be asked to enter the IPv4 address of the PiKoder that you assigned in the previous step into the app.



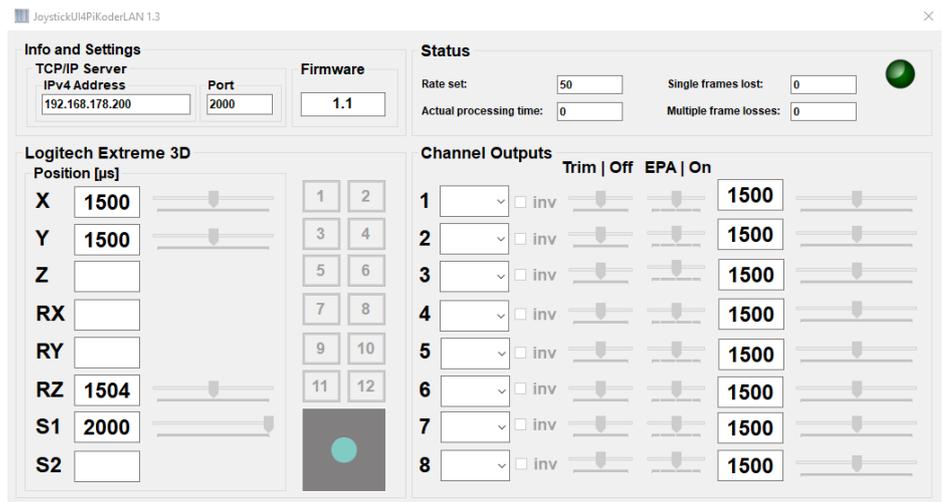
If only one joystick or gamepad is connected to your computer, the app will automatically connect to this device. Otherwise, you make a selection as to which device to use.



In the next step, the program checks whether a suitable configuration file has already been created for the configuration found. If this is not the case then you will receive a warning.



After acknowledging the warning, the main screen of the app appears. Here you assign the functions of the joystick to the individual channels.



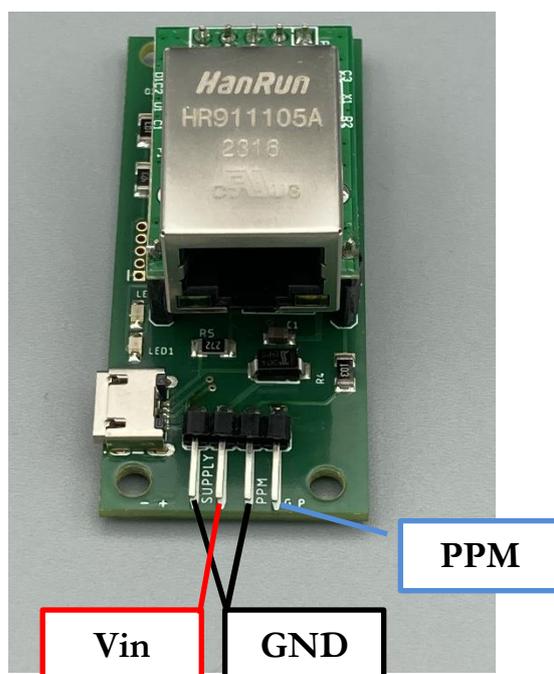
JoystickUI4PiKoder-LAN keeps statistics on the transferred PPM data in the upper right “Status” area.

The app works with the standard frequency for PPM of 50 Hz (“Rate set ”). This means that an update is sent to the PiKoder every 20 ms . The time that the program needs to calculate the current channel values is shown in the “ Actual processing time” is displayed in ms .

If the calculation takes longer than 20 ms , then an update to the PiKoder is missing (“Single frame loss ”). If the processing takes longer than 40 ms , then a “Multiple frame loss ” would be displayed. However, both cases should not occur in practice.

A

Connections



B

Schematics

