PoLabs

PoNET kbd48CNC v2 - User's manual

Version: 12/8/2020

SAFETY INFORMATION

This product is intended for integration by the user into a computer numerical control (CNC) machine. It is the user's responsibility to assess the overall system design and address all safety considerations that affect the users and equipment. The user assumes all responsibility for system design, including compliance with regulatory standards and codes issued by the applicable entities. PoLabs do not make any claims as to the suitability of this equipment for the user's application. Serious personal injury or equipment damage can occur from the improper integration, installation or operation of this product.

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CNC machine tools are inherently dangerous, and can cause injury to operators and maintenance personnel. Operators and maintenance personnel shall be properly trained in the safe use, operation and maintenance of such machines. Automated machines that this equipment may be used with can move at any time. All persons exposed to such machines must understand the dangers that are present.

Description

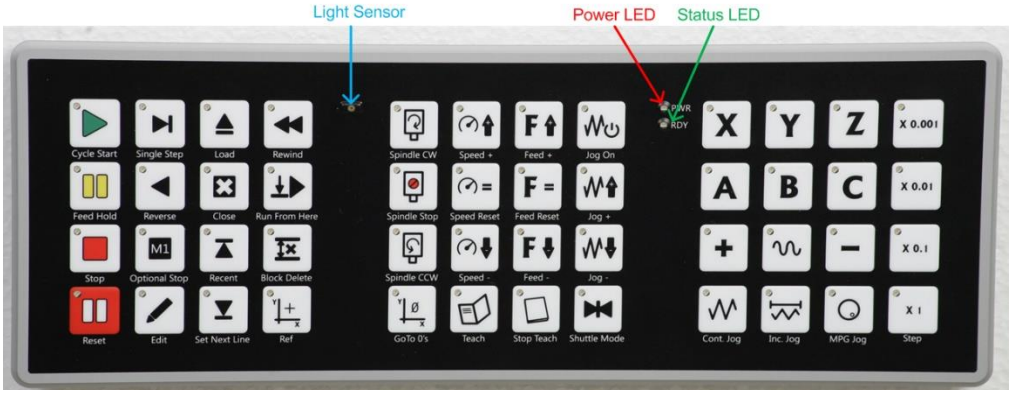
PoNET kbd48CNC v2 is a new upgraded version of PoNET kbd48CNC keyboard, an excellently machined extension keyboard for PoKeys devices in CNC machines. The keyboard has 48 buttons with graphics that equal to most commonly used symbols and functions of a CNC machine. For providing additional feedback functionality, each key is equipped with a red LED backlight, which can indicate various states of the CNC machine. The upgraded version improves on the reliability of the operation in machining environments and allows longer connecting cables to be used.

Keyboard can be customized and used as a general-purpose matrix keyboard without any additional software. However, applications that are aware of the keyboard (e.g. PoKeys Mach3 or Mach4 plugins) can make a full use of its functionality.

Two LEDs on the keyboard are used to indicate power supply and device status. »Power LED« (red color) switches on immediately after power supply is connected, while »Status LED« (green color) signals the current status of the device:

- Solid On: device is connected and working normally
- Slow blinking: no connection to Pokeys device
- Fast blinking: bootloader operation
- Solid Off: device disabled

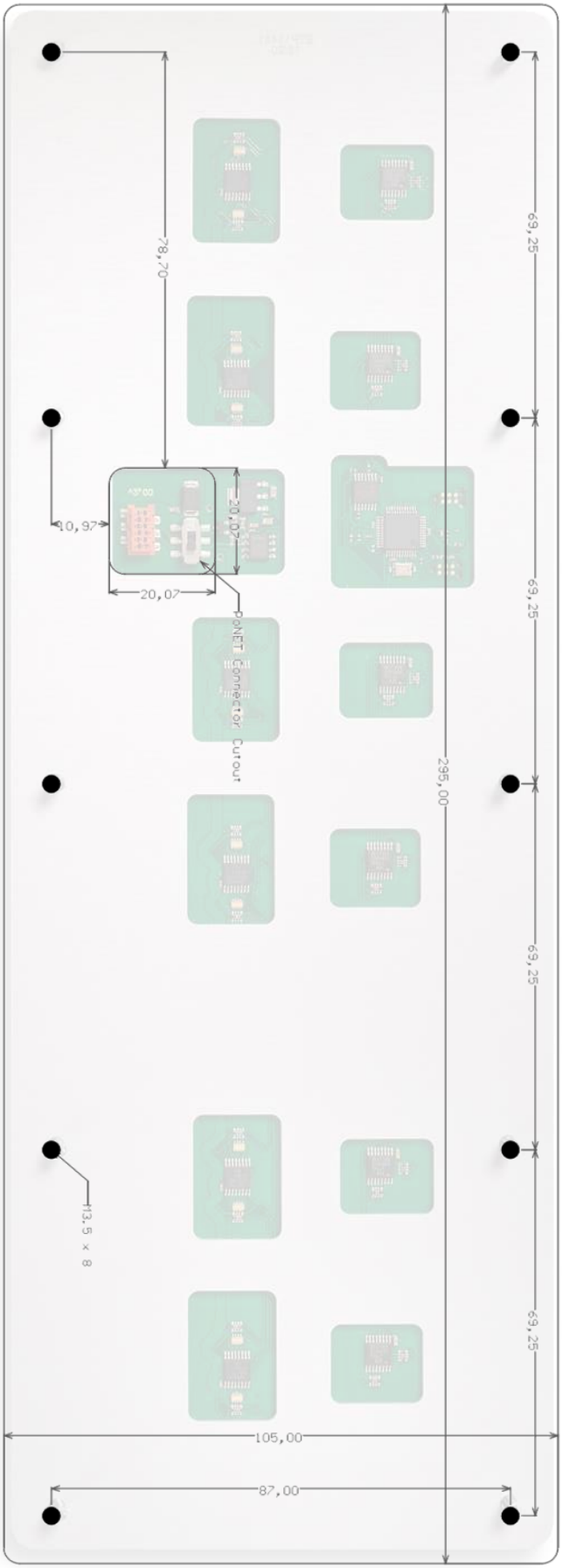
The keyboard is also equipped with a light sensor, which can be used to monitor the level of the ambient light and adjust the brightness of the LEDs.



Specifications

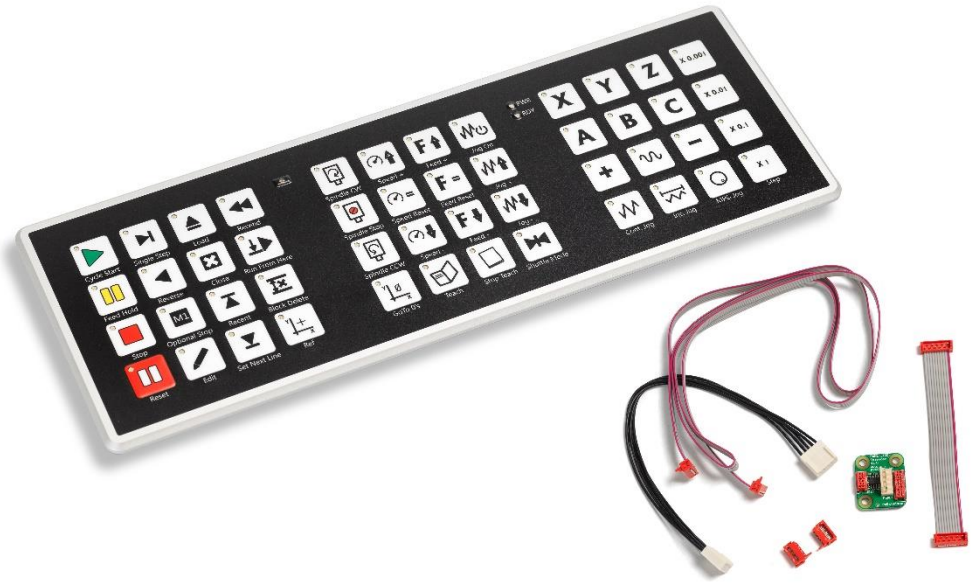
Dimensions:	**295mm X 105mm X 4mm**
Power supply:	5V ±10%
Power consumption:	max 500mA (depending on number and brightness of output diodes)
Number of keys/LEDs:	48 arranged in 3 groups of 4x4
Interface:	PoNET via adapter (supported by PoKeys57 devices), maximum cable length: 3000 mm

Front panel cutout dimensions



What is included in the package

The kbd48CNC v2 comes packaged with a cable pack and adapter board. The adapter board enables the connection between the keyboard and adapter board to be extended beyond the 300 mm limitation of the original kbd48CNC device. The connection between the keyboard and the adapter board is made either with a supplied 6-wire flat cable or can be custom made using the provided set of connectors.

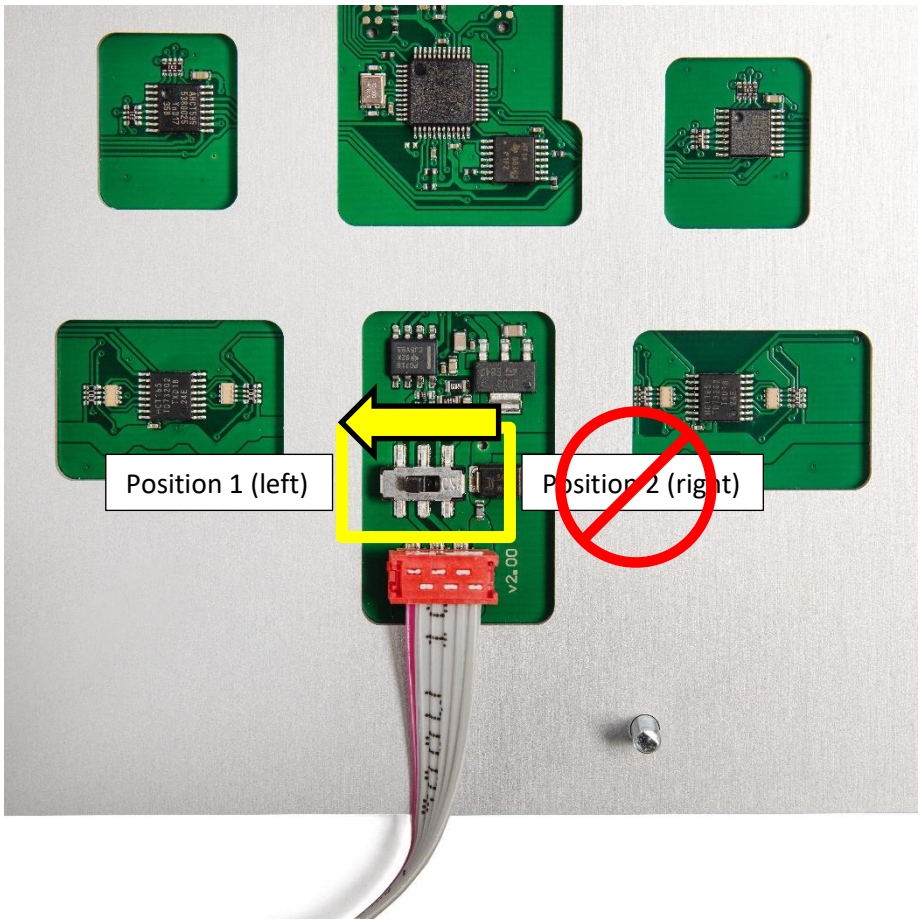


Contents of the package:

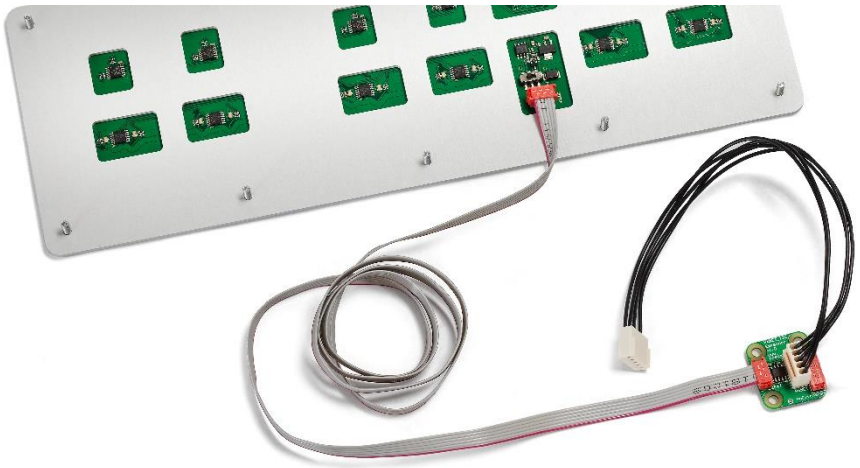
- kbd48CNC v2 keyboard
- adapter board (PoNET_I2C Extender)
- 1000 mm 6-wire flat cable with attached connectors
- 100 mm 10-wire flat cable with attached connectors (for use with PoExtension bus)
- 200 mm 5-wire PoNET connection cable
- 2x 6-pin Micro-MaTch red connector (part number 215083-6) for custom cable crimping (for cable length exceeding the included length of 1000 mm)

Connecting to PoKeys device and configuration

First, make sure that the configuration switch on the back of the device is in position 1, as indicated below.



Then, connect the keyboard with the provided 6-wire flat cable with the adapter board and install the 5-wire PoNET cable, as indicated in the picture below. The cables provide both power and communication.



Then, connect the PoNET cable to the 5-pin PoNET connector on the PoKeys device.

PoKeys configuration software must be used to initialize the connection between kbd48CNC and PoKeys device. Run PoKeys configuration software, connect to PoKeys device and go to Peripherals > PoNET menu. The following dialog will appear:

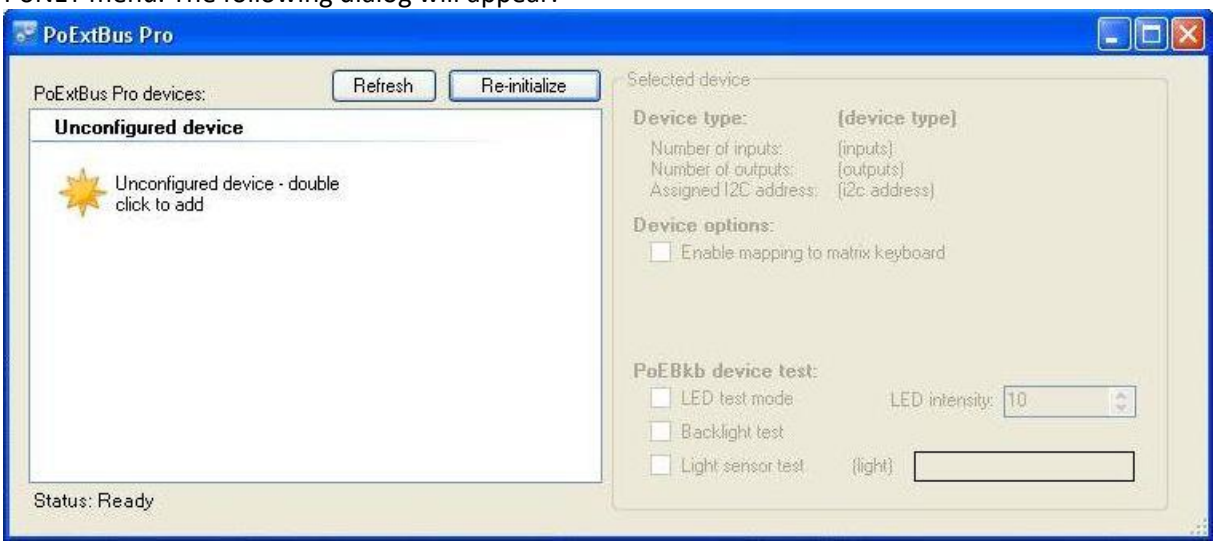


Figure 1: PoNet configuration dialog showing a unconfigured device

On the left, all PoNET devices are listed. Unconfigured PoNET devices will be listed as illustrated above. To configure the new device, double click on *Unconfigured device* icon and press any key on the device that you want to add (you have a 10 seconds time window to do that). If configuration process for a device was successful, the green »status LED« will stop to blink and will be constantly lit. The device will also be listed as »configured device« in the dialog.

To change the settings of the device, click on the configured device in the list on the left. If you will be using the kbd48CNC with a PoKeys Mach3 or Mach4 plugins, see detailed step by step instructions in the later part of this user manual. Close the dialog and click the button 'Send settings to device', which will save the configuration.

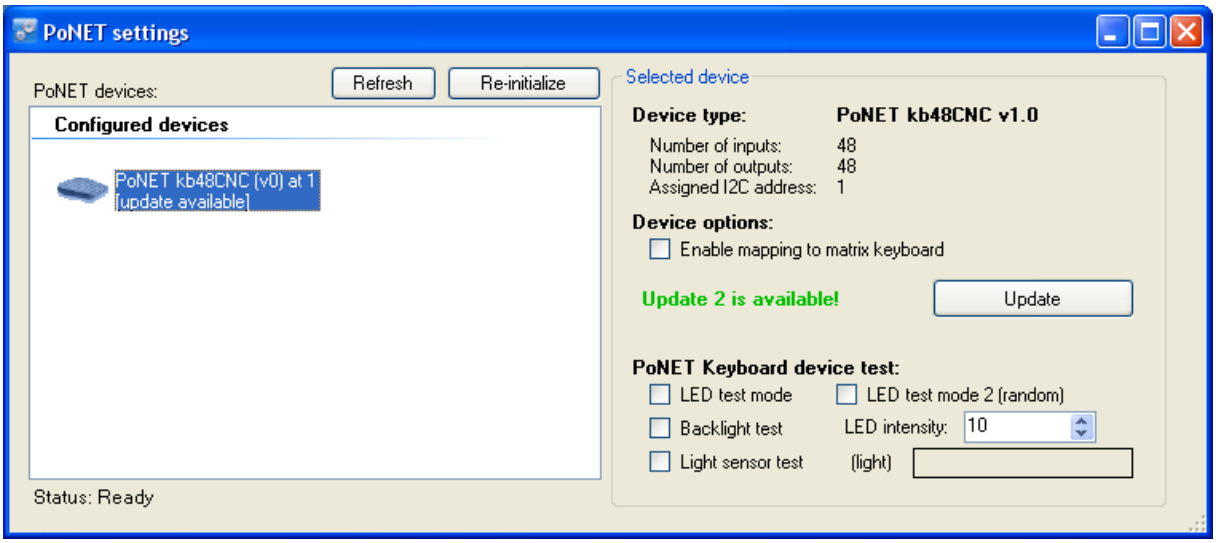
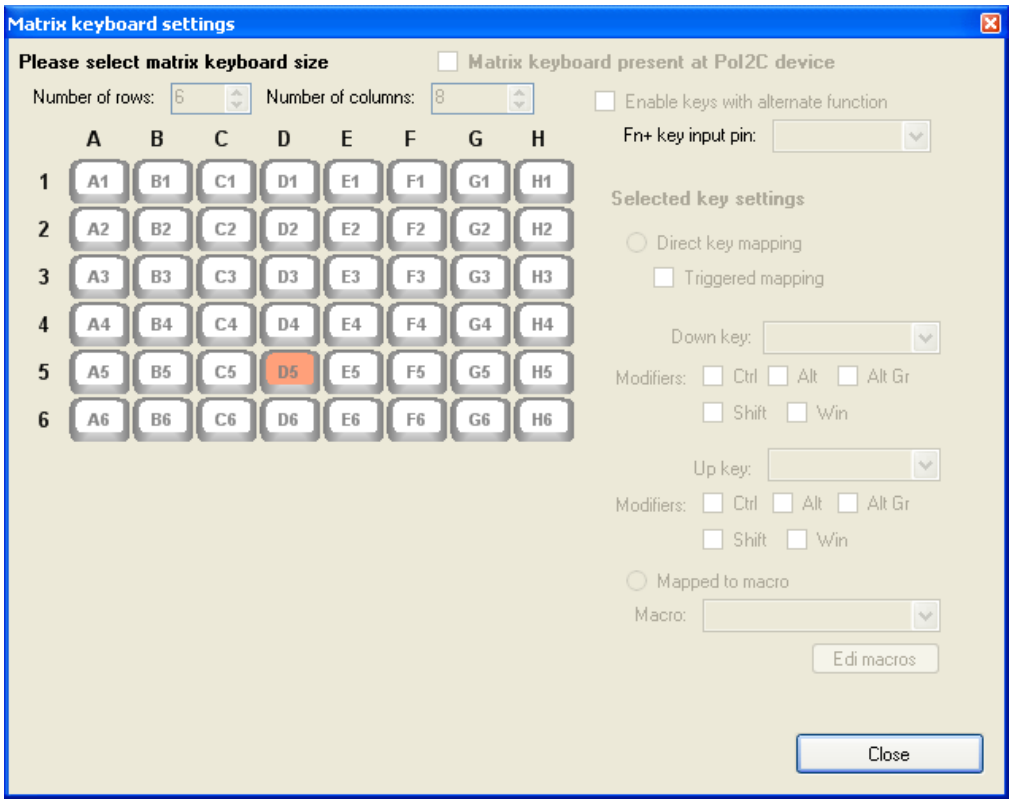


Figure 2: Settings for a configured device

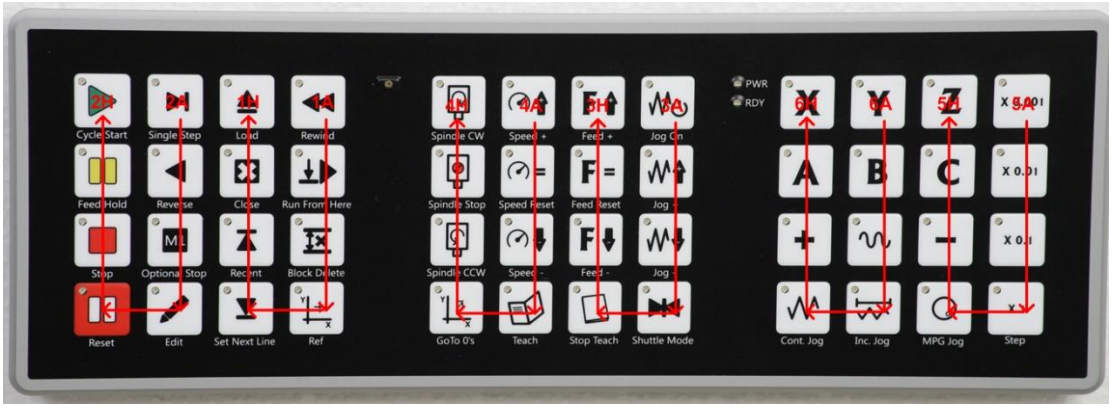
Standalone operation as a matrix keyboard

If you wish to configure the keyboard manually without the use of the 'kbd48CNC aware' application, check the option *Enable mapping to matrix keyboard* option in the PoNET device settings. Then, close this dialog and click 'Send to device' button and restart the application.
Open the Peripherals > Matrix Keyboard menu, where you can track your keyboard actions and define key mapping options.



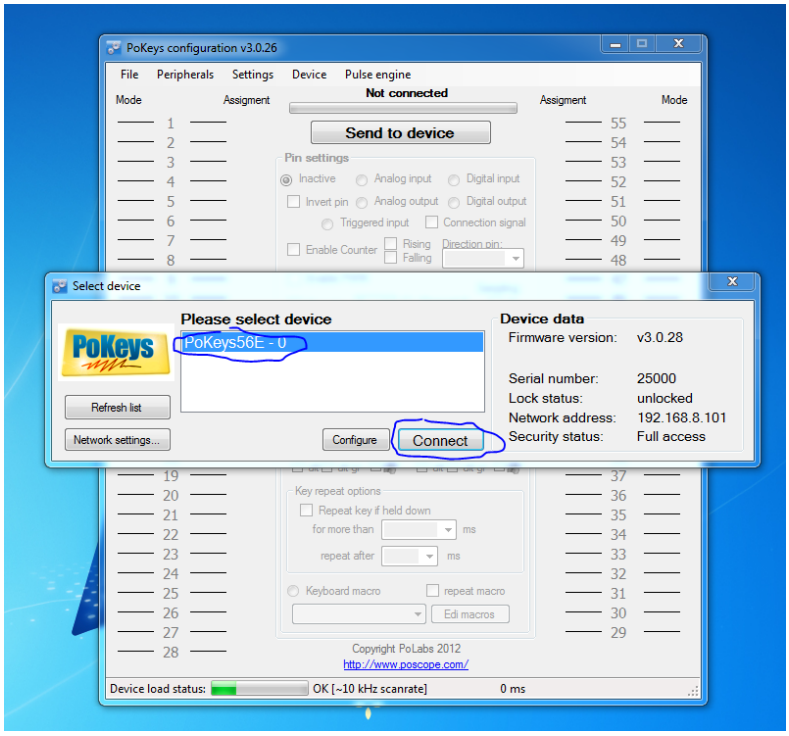
The following naming scheme is used for buttons on the kbd48CNC

Matrix keyboard key indexing:

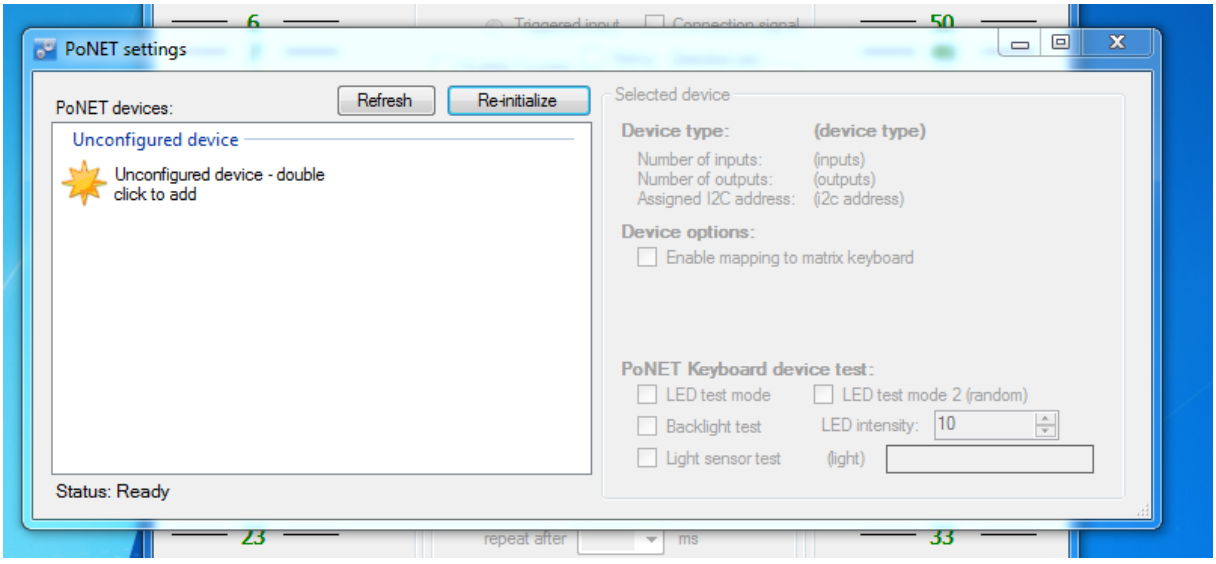


Connecting kbd48CNC to the PoKeys device and configuring it in Mach3/Mach4

1. Connect the kbd48CNC to the PoKeys device as described in the previous chapter
2. Connect the PoKeys device to PC
3. Open PoKeys configuration software and connect to your device

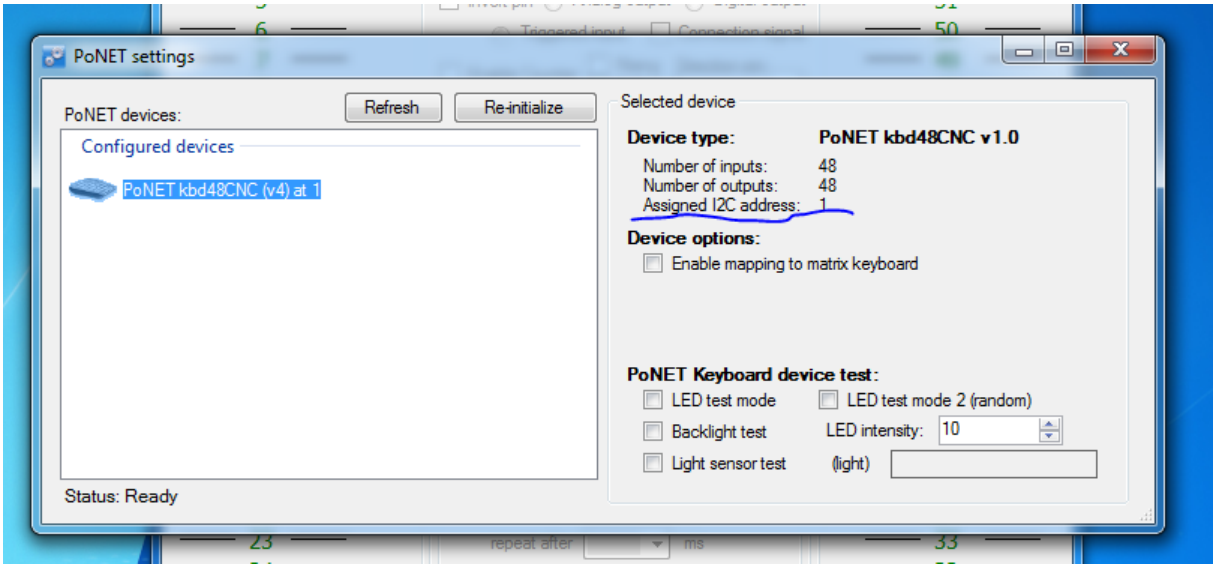


4. Go to Peripherals > PoNET settings…



If ‘Unconfigured device’ display is not present, please check the cable connections and click ‘Refresh’ button.

5. Double click on the 'Unconfigured device – double click to add' entry and press any key on the kbd48CNC within 10 seconds. If device was recognized, the following will appear and the green LED on the kbd48CNC will stop blinking



6. Check the 'Assigned I2C address' display. If it does not display 1, click the 'Re-initialize' button and repeat step 5.
7. When using kbd48CNC with Mach3/Mach4, 'Enable mapping to matrix keyboard' should not be checked. In the bottom part of the dialog, various test modes are available to test the keyboard (these will function only when the 'PoNET settings' dialog is open).
    a. LED test mode: any key press will start a wave like pattern radiating from the key that was pressed
    b. LED test mode 2 (random): LEDs will be randomly blinked
    c. Backlight test: ambient light sensor is used to set the LED brightness
    d. Light sensor test: (light) displays the amount of ambient light detected
8. Close PoNET settings dialog and click 'Send to device' button to save the settings. Then close the PoKeys application.

Configuring the keyboard with Mach4

The easiest was to configure kbd48CNC with Mach4 plugin is to enable 'kbd48CNC' as one of the peripherals in the 'New device wizard' when adding the PoKeys device to the plugin configuration. If this configuration is being done afterwards, follow these steps:

1. Open PoKeys plugin settings and double-click on the PoKeys device with the kbd48CNC device attached.
2. Switch to 'Pendant' tab and enable 'Enable pendant mode', 'Map pandant signals to Mach4' and 'kbd48CNC' options.

This will configure the plugin with the default functionality of the kbd48CNC device. Note that some functions may not be available in Mach4.

Default functionality in Mach4

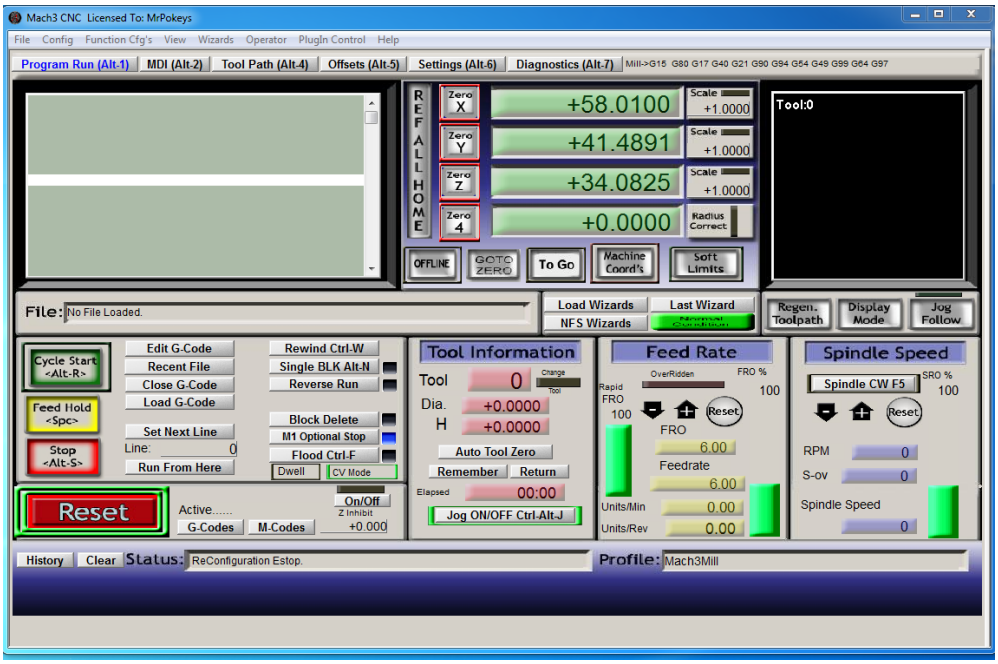
This is the default functionality supported:

- Cycle start: start the cycle
- Feed hold: pause
- Stop: stop immediately
- Reset: enable/disable function
- Optional stop: enable/disable optional stop feature
- Close: close current file
- Rewind: rewind the current job to beginning
- Block delete: block delete function in Mach4
- Goto 0's: move to position 0 started if pressed for 1 second
- Spindle CW, Stop, CCW: start/stop spindle
- Spindle speed adjustment: increase/decrease or reset (100%) the spindle speed
- Feedrate adjustment: increase/decrease or reset (100%) the federate
- Jog On: enable/disable jogging
- Jog speed adjustment (Jog+/Jog-): increase/decrease jog speed
- Jog mode selection: switch between Continuous, Incremental or MPG jogging modes
- Jog axis selection: select between axes X, Y, Z, A, B or C
- Jog step selection: switch between preset step sizes in incremental or MPG jogging modes (configurable in Mach4 config)
- Jog action (+ / - keys)
- Rapid jog (between + / - keys): enable/disable rapid jog function

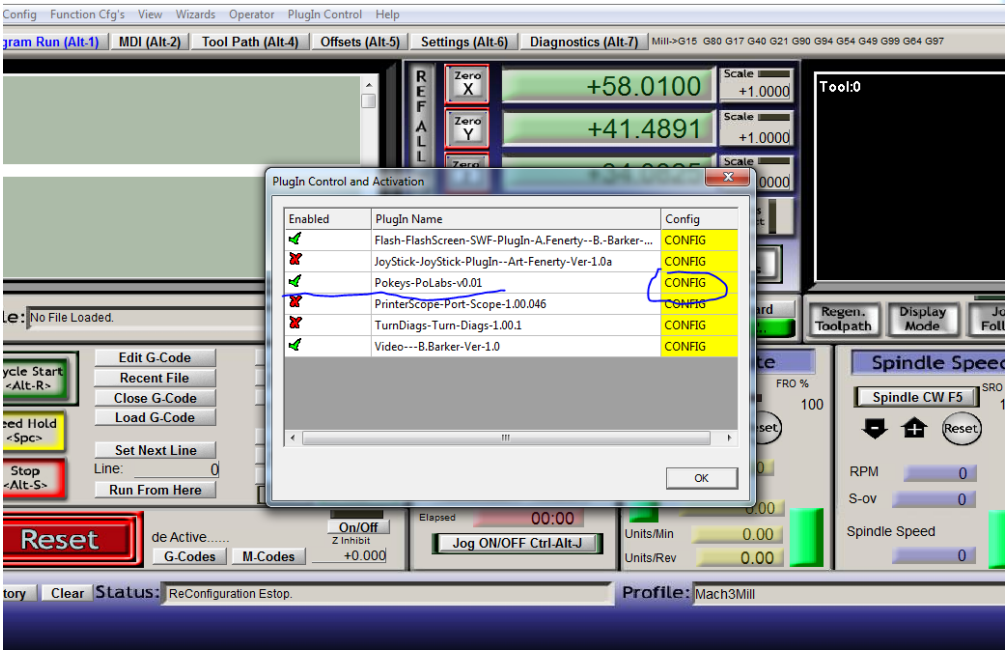
Other functions can be customized - to customize the behavior of the kbd48CNC device, IO signal mapping or LUA scripting can be used – keyboard key statuses and LED indicators are available via 'PoKeys_[serial number]_kbd48CNC' device.

Configuring the keyboard with Mach3

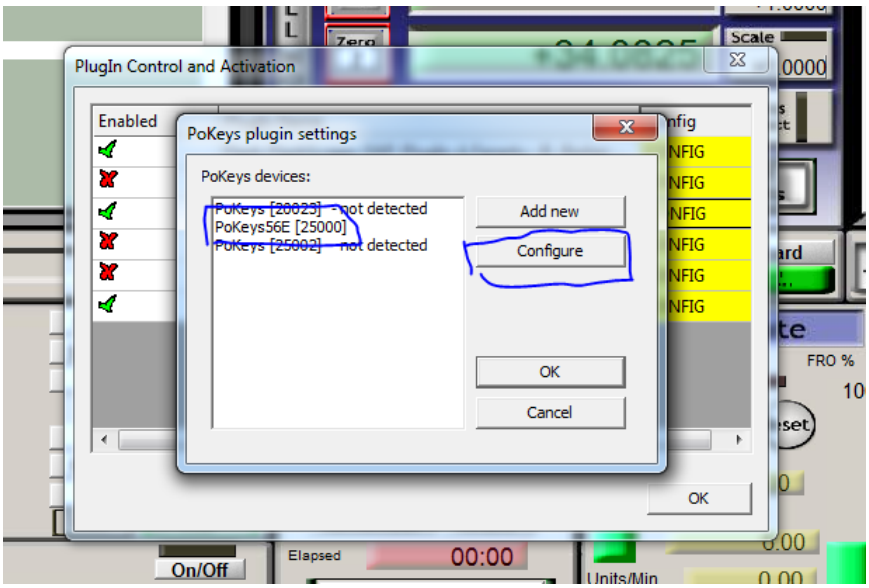
1. Open Mach3 (it Mach3 PoKeys plugin is not yet installed, follow the steps in ‘PoKeys Mach3 plugin manual’ to install it.



2. Go to Config -> Config plugins… and click yellow ‘CONFIG’ button for the PoKeys plugin

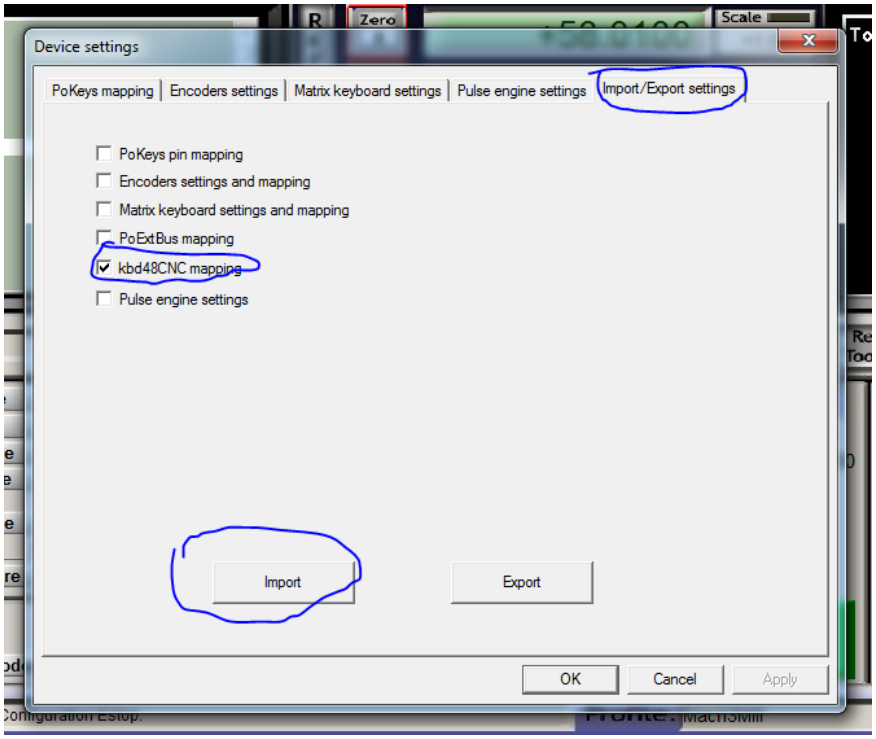


3. Select your PoKeys device and click Configure

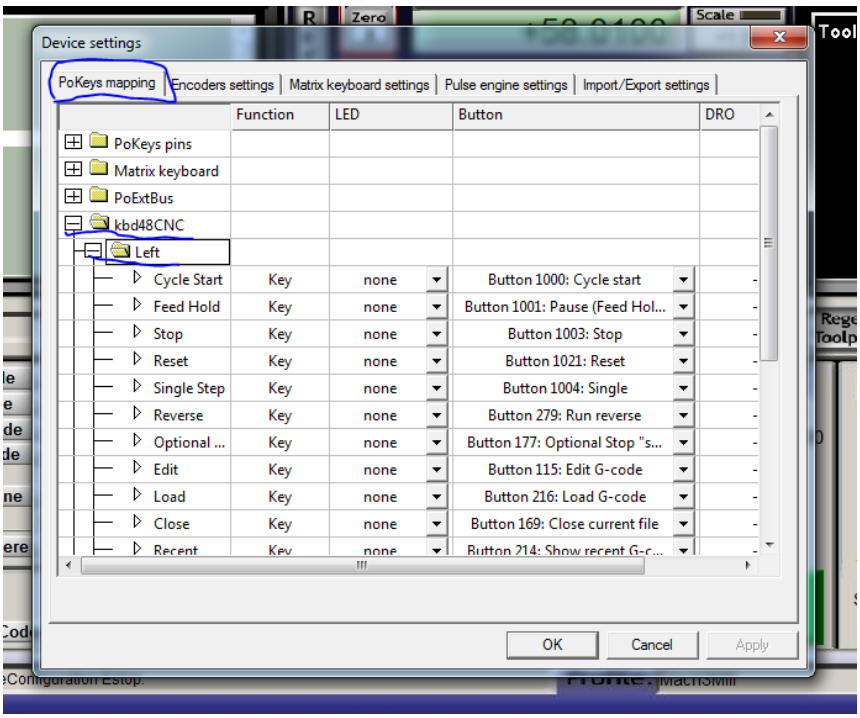


If no device is displayed, follow the steps in the 'PoKeys Mach3 plugin manual' to add it.

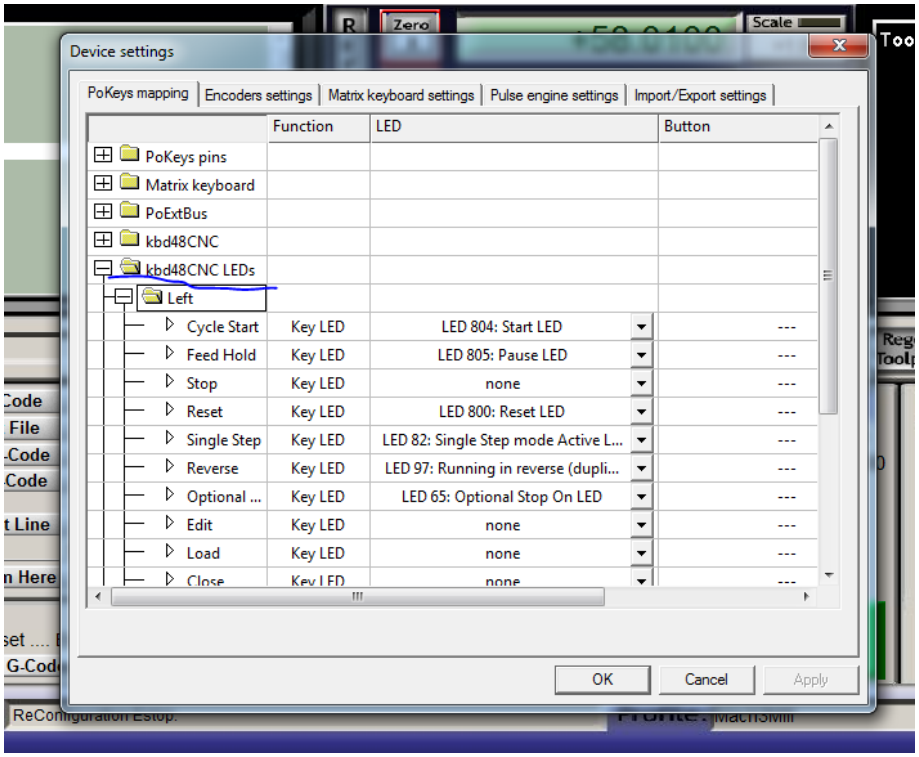
4. Go to 'Import/Export tab' and select kbd48CNC mapping. Then click Import and select the kbd48CNC.xml file that is available as file kbd48CNC_SettingsNew.xml in the package '**kbd48CNC Mach3 plugin**' from polabs.com (please download the file and use WinZip or similar program to extract the contents of the file).



5. The previous step will load the default configuration for the keyboard. To change the default setup, go to 'PoKeys mapping' tab and find kbd48CNC. This section is used to setup the buttons in all three sections of the keyboard. Function of a button is simply changed by selecting a different LED or button mapping from the list of available OEM LEDs or buttons.



6. To setup the keyboard LEDs under the keys, go to ‘kbd48CNC LED’ section.



7. To save the settings, click OK.

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