PoNET kbd48CNC



User's manual



Version: 18/10/2019

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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Description

PoNET kbd48CNC is 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.

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 plugin) 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 400mA (depending on number and brightness of output diodes)
Number of keys/LEDs:	48 arranged in 3 groups of 4x4
Interface:	PoNET (supported by PoKeys56 and PoKeys57 devices)

Front panel cutout dimensions



Connecting to PoKeys device and configuration

Connect the PoNET keyboard device to the PoKeys device with the supplied cable. There are two identical connectors on each device that enable parallel connection of multiple devices via PoNET bus.



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.

PoNET settings	
PoNET devices: Configured devices PoNET kb48CNC (v0) at 1 [update available]	Selected device Device type: PoNET kb48CNC v1.0 Number of inputs: 48 Number of outputs: 48 Assigned I2C address: 1 Device options: Image: Complex and the symbol Image: Complex and the symbol 1 Device options: Image: Complex and the symbol Image: Complex and the symbol 1 Device options: Image: Complex and the symbol Image: Complex and the symbol 1 Device options: Image: Complex and the symbol Image: Complex and the symbol 10 Image: Complex and the symbol 10 Image: Complex and the symbol 10 Image: Complex and the symbol 10
Status: Ready	

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.

Matrix	keybo	ard set	tings						
Pleas	e sele	ct matrix	(keyba	oard siz	e		Mat	rix keyb	oard present at Pol2C device
Num	ber of ro	ows: 6	*	Numbe	r of colu	imns: 8		\$	Enable keys with alternate function
	Α	В	С	D	Е	F	G	Н	Fn+ key input pin: 💽 🗸 🗸
1	A1	B1	C1	D1	E1	F1	G1	H1	Selected key settings
2	A2	B2	C2	D2	E2	F2	G2	H2	 Direct key mapping
3	A3	B3	C3	D3	E3	F3	G3	НЗ	Triggered mapping
4	A4	B4	C4	D4	E4	F4	G4	H4	Down key: 💽 😪
5	A5	B5	C5	D5	E5	F5	G5	H5	Modifiers: 🗌 Ctrl 🗌 Alt 📄 Alt Gr
6	A6	B6	C6	D6	E6	F6	G6	H6	Shift 🗌 Win
									Up key: 💉
									Modifiers: 🗌 Ctrl 📃 Alt 📃 Alt Gr
									Shift Win
									 Mapped to macro
									Macro: 💽
									E di macros
									Close

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 with the provided cable

- 2. Connect the PoKeys device to PC
- 3. Open PoKeys configuration software and connect to your device

File	Peripherals	Settings	Device	Pulse engine	e					
Mode		Assigment		Not cor	nected		Assigment		Mode	
	1	_						- 55		
	2	_		Send to	device			- 54		
	- 3	- 1	Pin settin	igs				- 53		
	- 4	-	Inactive	e 🕜 Analog	input 🕥 Digi	ital input		- 52		
	5	-	Invert	pin 🔘 Analog	output 🕥 Digi	ital output		- 51		
	6	-		Triggered input	t 🗌 Connect	ion signal		- 50		
	- 7	-	Enable	e Counter 📃 🖁	Rising Direction	pin:		- 49		
	8	_			aling	-		- 48		
Select device										
Pokeys						Cor	ol numbou		25000	
Refresh list				Configure	Connect	Loc	al number k status: work addre urity statu	ess:	25000 unlocked 192.168. Full acces	8.10
Refresh list	- 19	_			Connect	Loc	k status: work addre	ess:	unlocked 192.168. Full acce	8.10
Refresh list Network settings	19 20	_	Key repe	at options		Loc	k status: work addre	ess: s: - 37 - 36	unlocked 192.168. Full acce	8.10
Refresh list Network settings	19	-	Key repe	at options beat key if held i	down	Loc	k status: work addre	ess: s: - 37 - 36 - 35	unlocked 192.168. Full acce	8.10
Refresh list Network settings	- 19		Key repe	at options beat key if held o lore than		Loc	k status: work addre	ess: s: - 37 - 36 - 35 - 34	unlocked 192.168. Full acce	8.10
Refresh list Network settings	19 20 21 22 22 23		Key repe	at options beat key if held i	down	Loc	k status: work addre	ess: s: - 37 - 36 - 35 - 34 - 33	unlocked 192.168. Full acce	8.10
Refresh list	19 20 21 22 22 23 23 24		Key repe	at options beat key if held (lore than	down ms ms	Loc Net	k status: work addre	ess: s: - 37 - 36 - 35 - 34 - 33 - 32	unlocked 192.168. Full acce	8.10
Refresh list Network settings	19 20 21 22 23 24 25		Key repe	at options beat key if held (lore than	down		k status: work addru urity statu	ess: s: - 37 - 36 - 35 - 34 - 33 - 32 - 31	unlocked 192.168. Full acce	8.10
Refresh list	19 20 21 22 23 24 25 26		Key repe	at options beat key if held (lore than	down ms ms		k status: work addru urity statu	ess: s: - 37 - 36 - 35 - 34 - 33 - 32 - 31 - 30	unlocked 192.168. Full acce	8.10
Refresh list Network settings	19 20 21 22 23 24 25		Key repe	at options beat key if held (lore than	down w ms repeat m Cdi macr		k status: work addru urity statu	ess: s: - 37 - 36 - 35 - 34 - 33 - 32 - 31	unlocked 192.168. Full acce	8.10

4. Go to Peripherals > PoNET settings...

PoNET devices: Refresh Re-initialize	Selected device
Unconfigured device	Device type: (device type)
Unconfigured device - double	Number of inputs: (inputs) Number of outputs: (outputs) Assigned I2C address: (i2c address)
	Device options: Enable mapping to matrix keyboard
	PoNET Keyboard device test: LED test mode LED test mode 2 (random) Backlight test LED intensity: Light sensor test (light)

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

PoNET devices:	Refresh Re-initialize	Selected device
Configured devices PoNET kbd48CNC (v4) at 1		Device type: PoNET kbd48CNC v1.0 Number of inputs: 48 Number of outputs: 48 Assigned I2C address: 1 Device options: I Image:
		PoNET Keyboard device test: LED test mode LED test mode Backlight test LED intensity: Light sensor test

- 6. Check the 'Assigned I2C address' display. If it does not display 1, click the 'Re-initialize' button and repeat step 5.
- When using kbd48CNC with Mach3/Mach4, <u>'Enable mapping to matrix keyboard' should not</u> <u>be checked</u>. 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



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

Config Function Cfg's View Wizards Operato	or PlugIn Control He	elp			
g <mark>ram Run (Alt-1) MDI (Alt-2) Tool Path (</mark>	Alt-4) Offsets (Alt-	-5) Settings (Alt-6) [Diagnostics (Alt-7) Mill->G15 G	80 G17 G40 G21 G90 G94	4 G54 G49 G99 G64 G97
	PlugIn Control and Act	R Zero F Zero L Zero	+58.0100 +41.4891	Scale +1.0000	ool:0
Le : No File Loaded. ycle Start <ale-r> Edit G-Code Recent File Close G-Code Load G-Code Cod</ale-r>	Enabled Pli Fia Doy Po Po Pri Tu	ugin Name ash-FlashScreen-SWF-Plugin- Sytick-loyStick-PluginArt-F okeys-PoLabs-v0.01 interScope-Port-Scope-1.00.0 arnDiags-Turn-Diags-1.00.1 deoB.Barker-Ver-1.0	enerty-Ver-1.0a CONFIG	× 00000	egen. bipath Bpindle Speec Spindle CW F5 1 Spindle CW F5 1 Reset RPM S-ov 0
Clear Status: ReConfiguration E	odes	Jog ON/OFF (Linite/Min	0.00 0.00	Spindle Speed

3. Select your PoKeys device and click Configure

PlugIn Contr	ol and Activation	+34.00	Scale	
Enabled	PoKeys plugin settings PoKeys devices:	x	NFIG NFIG	
	Pokeys [20023] mot detected Pokeys56E [25000] Pokeys [25002] mot detected	Add new Configure	NFIG NFIG NFIG NFIG	
		OK Cancel		FRO %
ī	On/Off Elapsed	00:00		

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 a download '<u>kbd48CNC Mach3 plugin setup</u>' from poscope.com (please download the file and use WinZip or similar program to extract the contents of the file).

Device settings	Scale Scale	То
PoKeys mapping Encoders settings Matrix keyboard settings Puls	e engine settings Import/Export settings	
PoKeys pin mapping		
Encoders settings and mapping		
Matrix keyboard settings and mapping		
PoExtBus mapping		
kbd48CNC mapping		
Pulse engine settings		
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		Too
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e		D
B		Ľ
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re Import	Export	
bc	OK Cancel Apply	
	Cancea Apply	
Configuration Estop.		

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.

	Function	LED		Button	DRO	
🕀 🚞 PoKeys pins					_	
Hatrix keyboard					_	-11
						-11
						-11
	1					Ξ
Cycle Start	Key		_	Button 1000: Cycle start	1	-11
Feed Hold	-	none	-			-
	Key	none	-	Button 1001: Pause (Feed Hol 🔻	-	-
⊢ ▷ Stop	Key	none	•	Button 1003: Stop		-
► P Reset	Key	none	-	Button 1021: Reset 💌		-
→ Single Step	Key	none	-	Button 1004: Single 👻		-
→ P Reverse	Key	none	-	Button 279: Run reverse 💌		-
→ ▷ Optional	Key	none	-	Button 177: Optional Stop "s 🔻		-
⊢ ▷ Edit	Key	none	-	Button 115: Edit G-code 🔹		-
└── ▷ Load	Key	none	•	Button 216: Load G-code 🔻	1	-
Close	Key	none	-	Button 169: Close current file 🔻	1	-
Recent	Kev	none	-	Button 214: Show recent G-c 🔻	1	
∢ [III				F

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

Image: Construction of the second state of the second s			Function	LED	Button	
Image: Matrix keyboard Image: Matrix keyboard Image: PoExtBus Image: PoExtBus Image: PoExtBus Image: PoExtBus Image: PoExtBus Key LED Image: PoextBus	🗄 🚞 PoKey	s pins				
Image: State Sta						
Image: Start LED service servic	🕀 🗀 PoExte	Bus				
Image: Construction of the second state of the second s	🖽 🚞 kbd48	CNC				
Image: Construction of the second state of the second s	🖵 🖻 kbd48	CNC LEDs				=
Image: Construction of the c	- 🖓 🗟 Lef	t	-			
Image: Description of the state of the		Cycle Start	Key LED	LED 804: Start LED	•	
Image: State production Image: State production Image: State production Image: State production </td <td></td> <td>Feed Hold</td> <td>Key LED</td> <td>LED 805: Pause LED</td> <td>•</td> <td></td>		Feed Hold	Key LED	LED 805: Pause LED	•	
Image: Construction of the c		Stop	Key LED	none	•	
Image: Second Secon		Reset	Key LED	LED 800: Reset LED	-	
Image: Second Secon		Single Step	Key LED	LED 82: Single Step mode Active L	-	
Image: Description Image:		Reverse	Key LED	LED 97: Running in reverse (dupli	-	
Image: Description of the second		Optional	Key LED	LED 65: Optional Stop On LED	-	
→ Close Key IED none ·····		Edit	Key LED	none	-	
				none	_	
4 11		Close	Kev I FD	none	▼	*

7. To save the settings, click OK.

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