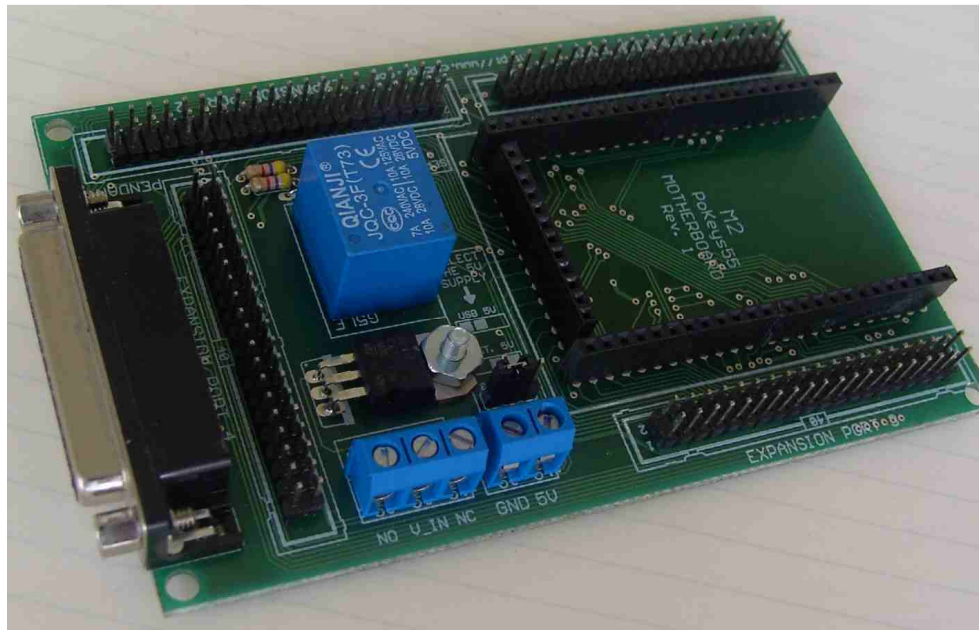


M2- PoKeys55 MOTHERBOARD

Rev. 4.3

User manual Rev. 1



1. Overview

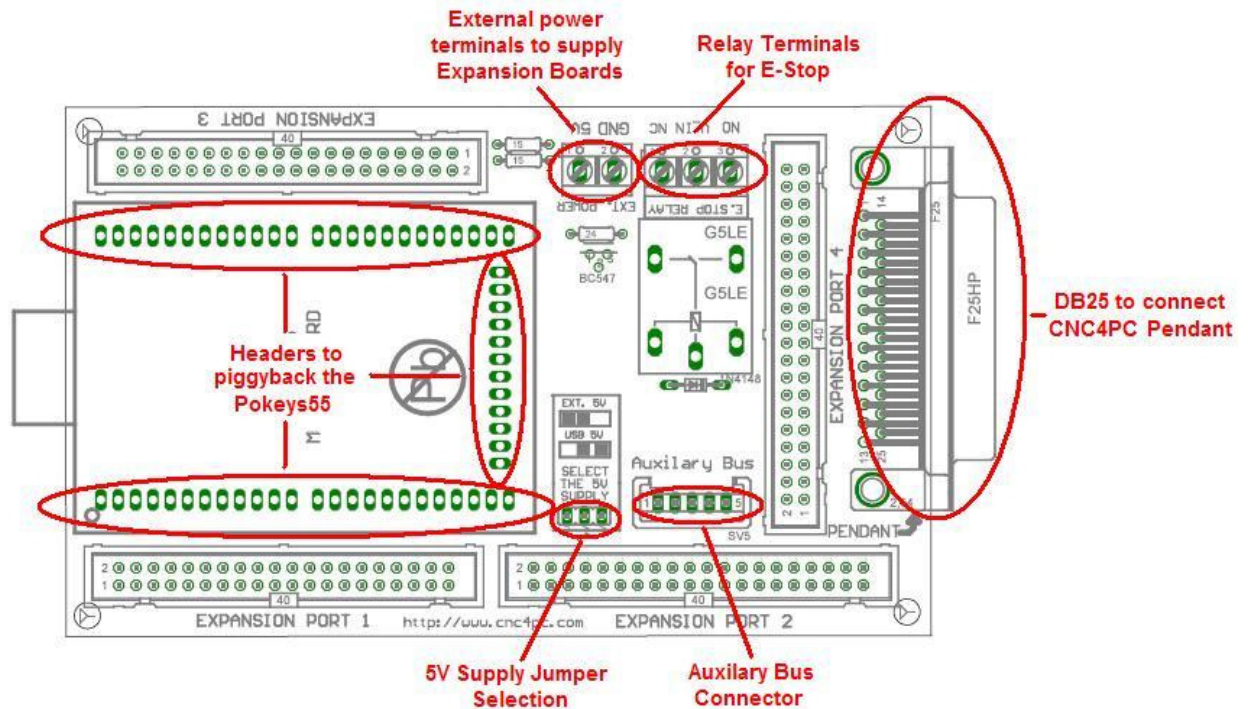
This card is a motherboard for the PoKeys55 Core Board. The PoKeys is an amazing piece of hardware and software. The problem is that it can only provide 4mA discrete signals, and it can only source a total of 100mA in total. Wiring of special features can also be complex. The Motherboard puts the power of the PoKeys55 on the everyday CNC user. It provides easy integration to expansion boards that works on standards used on industrial environment. Different types of expansion boards can be connected to this board providing different types of I/Os and features. New features are continually been added to the Pokeys boards and new expansion boards are to be coming out to make use of these features.

2. Features

- *Designed to be used with a PoKeys55.*
- *Allows the use of up to 54 Pokeys55 pins*
- *Allows the use of the Pokeys55 Auxiliary Bus (New).* With this

- bus additional 80 digital outputs are provided.
- **Pin headers to connect up to 4 expansion boards, each one with 12 or 24 I/Os.**
 - **Every pin header handles 5V, 3.3V and PoKeys55 I/O pins.**
 - **Jumper to select power source.** The board can be powered with the USB cable, or an external power source.
 - **DB25 connector to connect CNC4PC pendants.**
 - **Includes an electromechanical relay for e-stop.** This allows using the e-stop button of the pendant at a hardware level.
 - **Different combination of expansion boards can be used.**
 - **The Pokeys55 piggybacks on the motherboard.**

3. Board description



3.1 Power Requirements

The board can supply 5V to the expansion boards using the voltage from USB Port. An external 5VDC @ 500 milliamps power supply can be used.



WARNING

Check the polarity and voltage of the external power source and connect the 5V and GND. Overvoltage or reverse-polarity power applied to these terminals can cause damage to the board, and/or the power source.

4. Special functions supported

CNC4PC expansion boards support special functions like:

- *Analog output.* (Supported only for expansion ports 1 and 3). This function is included in the M24 expansion board.
- *Analog Inputs.* (Supported only for expansion ports 2 and 4). This function is included in the M23 expansion board.
- *4X20 LCD.* (Supported only for expansion port 3). This function is included in the M29 expansion board.
- *Keypad matrix (up to 16 x 8).* (Supported only for expansion ports 1 and 2). This function is included in the M31 and M32 expansion board.
- *2 "8 X 8 LEDs Matrixes".* (Supported only for expansion ports 2 and 4).
- *Auxiliary Bus.* (Available only for Auxiliary Bus Connector). This function is supported in the M38, M39 and M41 expansion boards.

Sample combination of expansion boards that can be used.

	Expansion Port 1	Expansion Port 2	Expansion Port 3	Expansion Port 4	DB25	Auxiliary Bus connector
M21	X	X	X	X		
M22	X	X	X	X		
M23		X		X		
M24	X		X			
M25	X	X	X	X		
M26	X	X	X	X		
M27	X	X	X	X		
M28	X	X	X	X		
M31	X	X				
M33			X			
M38						X
M39						X
M41						X
Pendant					X	

M21 12ODI: 12 optoisolated discrete input.

M22 12ODO: 12 optoisolated discrete output.

M23 10ODI2AI: 11 optoisolated discrete input and 2 analog inputs.

M24 11ODI1O1AO: 12 optoisolated discrete input and 1 optoisolated analog input.

M25 12T: 12 Terminals

M26 12R: 12 Electromechanical Relay

M27 12ODI(24V): 12 optoisolated discrete input 24V

M28 12ODO(24V): 12 optoisolated discrete output 24V

M31 PRIMARY 4X4 MEMBRANE KEYPAD BOARD

M33 4 x 20 LCD Display

M38 PoExtBusOC: 8 Open Collector discrete outputs

M39 PoExtBusRE: 8 Electromechanical Relay

M41 AUXILARY BUS EXPANSION BOARD: Support 2 expansion boards (M22, M25, M26 or M28).

5. Pinout

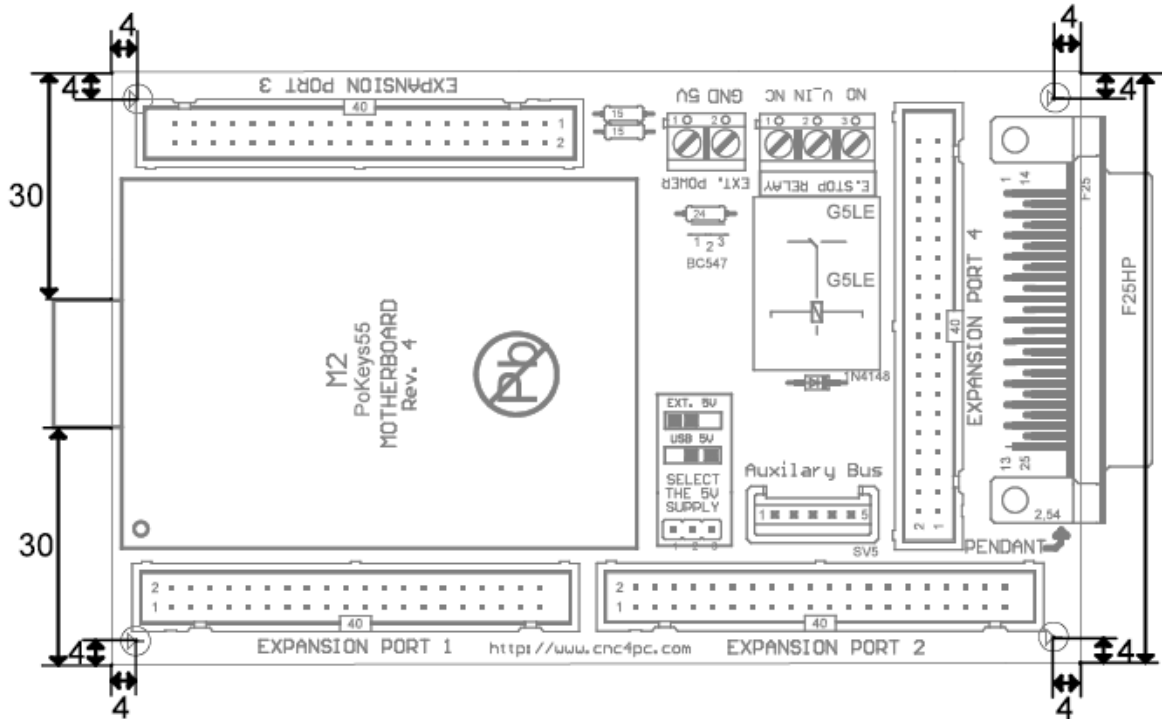
EXPANSION HEADER PIN	PORT 1		PORT 2		PORT 3		PORT 4	
	Pokeys Pin	Function	Pokeys Pin	Function	Pokeys Pin	Function	Pokeys Pin	Function
1	GND	GND	GND	GND	GND	GND	GND	GND
2	GND	GND	GND	GND	GND	GND	GND	GND
3	GND	GND	GND	GND	GND	GND	GND	GND
4	GND	GND	GND	GND	GND	GND	GND	GND
5	5	KEYPAD MATRIX COLUMN A	3	KEYPAD MATRIX COLUMN G	33	LCD D5	40	KEYPAD MATRIX ROW 9
6	6	KEYPAD MATRIX COLUMN B	4	KEYPAD MATRIX COLUMN H	28	LCD RW	41	KEYPAD MATRIX ROW 10
7	7	KEYPAD MATRIX COLUMN C	9	LED MATRIX1 DATA	29	LCD RS	42	KEYPAD MATRIX ROW 11
8	8	KEYPAD MATRIX COLUMN D	38	KEYPAD MATRIX ROW 5	30	LCD E	50	KEYPAD MATRIX ROW 12
9	12	KEYPAD MATRIX ROW 1	39	KEYPAD MATRIX ROW 6	34	LCD D4	51	KEYPAD MATRIX ROW 13
10	14	KEYPAD MATRIX ROW 2	43	KEYPAD MATRIX ROW 7	22	LCD LED TERMINAL	52	KEYPAD MATRIX ROW 14
11	17	KEYPAD MATRIX ROW 3	10	KEYPAD MATRIX LATCH	48	TERMINAL	53	KEYPAD MATRIX ROW 15
12	18	KEYPAD MATRIX ROW 4	11	LED MATRIX1 CLK	49	TERMINAL	13	KEYPAD MATRIX ROW 16
13	19	KEYPAD MATRIX COLUMN E	15	FAST ENCODER A 3	31	LCD D7	23	LED MATRIX2 DATA
14	26	KEYPAD MATRIX COLUMN F	16	FAST ENCODER B 3	32	LCD D6	24	LED MATRIX2 LATCH
15	27	KEYPAD MATRIX ROW 8	44	ANALOG INPUT 1	47	TERMINAL	25	LED MATRIX2 CLK
16	20	PWM 3 (SPINDLE)	45	ANALOG INPUT 2	21	PWM LCD CONTRAST	46	ANALOG INPUT 3
17	3.3V	3.3V	3.3V	3.3V	3.3V	3.3V	3.3V	3.3V
18	5V	5V	5V	5V	5V	5V	5V	5V
19	5V	5V	5V	5V	5V	5V	5V	5V
20	5V	5V	5V	5V	5V	5V	5V	5V
21	GND	GND	GND	GND	GND	GND	GND	GND
22	GND	GND	GND	GND	GND	GND	GND	GND
23	GND	GND	GND	GND	GND	GND	GND	GND
24	GND	GND	GND	GND	GND	GND	GND	GND
25	3	KEYPAD MATRIX COLUMN G	NC	NC	40	KEYPAD MATRIX ROW 9	NC	NC
26	4	KEYPAD MATRIX COLUMN H	NC	NC	41	KEYPAD MATRIX ROW 10	NC	NC
27	9	LED MATRIX1 DATA	NC	NC	42	KEYPAD MATRIX ROW 11	NC	NC
28	38	KEYPAD MATRIX ROW 5	NC	NC	50	KEYPAD MATRIX ROW 12	NC	NC
29	39	KEYPAD MATRIX ROW 6	NC	NC	51	KEYPAD MATRIX ROW 13	NC	NC
30	43	KEYPAD MATRIX ROW 7	NC	NC	52	KEYPAD MATRIX ROW 14	NC	NC
31	10	LED MATRIX1 LATCH	NC	NC	53	KEYPAD MATRIX ROW 15	NC	NC
32	11	LED MATRIX1 CLK	NC	NC	13	KEYPAD MATRIX ROW 16	NC	NC
33	15	FAST ENCODER A 3	NC	NC	23	LED MATRIX2 DATA	NC	NC
34	16	FAST ENCODER B 3	NC	NC	24	LED MATRIX2 LATCH	NC	NC
35	44	ANALOG INPUT 1	NC	NC	25	LED MATRIX2 CLK	NC	NC
36	45	ANALOG INPUT 2	NC	NC	46	ANALOG INPUT 3	NC	NC
37	3.3V	3.3V	3.3V	3.3V	3.3V	3.3V	3.3V	3.3V
38	5V	5V	5V	5V	5V	5V	5V	5V
39	5V	5V	5V	5V	5V	5V	5V	5V
40	5V	5V	5V	5V	5V	5V	5V	5V

A CNC4PC PENDANT connected on the DB25 connector instead of Port 4.. The below table shows its pinout.

DB25 pin	Pokeys Pin	Pendant Function
1	5V	5V
16	5V	5V
2	GND	GND
6	GND	GND
14	GND	GND
7	46	AXIS X
8	51	AXIS Y
9	23	AXIS Z
10	24	AXIS 4
18	53	AXIS 5
19	13	AXIS 6
11	40	X 1
12	41	X 10
13	42	X 100
5	50	LED
15	55	ESTOP
17	52	*
20	47	NC
3	1	ENCODER A
4	2	ENCODER B
23	25	*
24	44	NC
21	48	NC
22	49	NC
25	45	NC

* Pins are available for future implementations.

6. Dimensions



All dimensions are in Millimeters.

Disclaimer:

Use caution. CNC machines could be dangerous machines. DUNCAN USA, LLC or Arturo Duncan are not liable for any accidents resulting from the improper use of these devices. The M2 is not fail-safe device, and it should not be used in life support systems or in other devices where its failure or possible erratic operation could cause property damage, bodily injury or loss of life.