
Keypad Controller

Keypad Controller User Manual

The Keypad Controller allows keypads to communicate to CUBLOC via PAD communication. When connecting a keypad directly to CUBLOC or CuTOUCH, you will need to use 8 I/O ports for 4x4 keypads and 16 I/O ports for 8x8 keypads.

By using CUBLOC's PAD communication, you will be able to easily connect up to 8x8 keypads while only using 4 I/O ports. Another advantage is that the PAD communication protocol supports interrupts, meaning you can use valuable processor time for other processes.

The keypad controller can be used with up to an 8x8 keypad. There are also plug-and-play holes for using with Comfile's 3x4, 4x4, and 4x5 keypads.

Features:

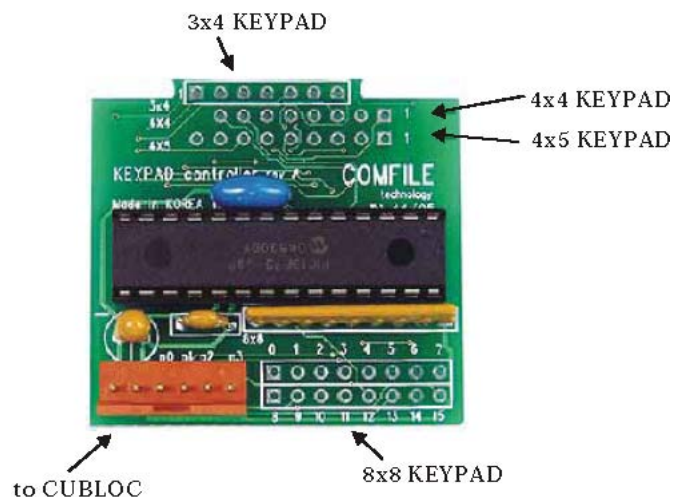
Up to an 8x8 keypad can be connected to product automatic SPI data to CUBLOC/CuTOUCH.

Removes bouncing and repeat input timing can be controlled.

Comfile's 3x4, 4x4, and 4x5 keypads can be connected easily.

Direct connection to CuBASE and CuSB series boards' KEYBOARD connection.

How to connect:



Keypad Controller Example:

Here's a sample source code for CuBLOC Studio for using with the keypad controller.

When there's input from the keypad controller, the user will be able to see the current scan code on the debug screen.

```

Const Device = CB280
Set Pad 0,1,2          ' Mode 0, 1 byte packet, 2 bytes of buffer
On Pad Gosub KEYIN_RTN ' PAD communication receive interrupt, jump to KEYIN_RTN.
Dim KC As Integer
Low 8                  ' Connect buzzer/piezo to pin 8 for keypad sound effects

Do                    ' Infinite loop until there's a PAD receive interrupt
Loop
    
```

KEYIN_RTN:

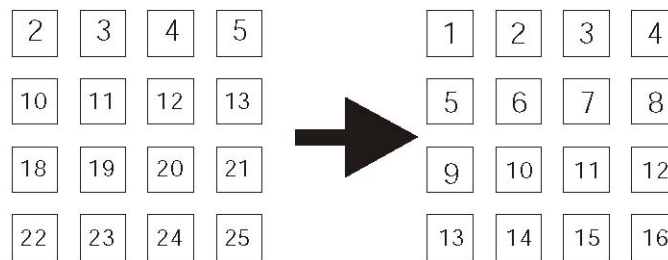
```

Pulsout 8,300        ' Create buzzer/piezo sound
KC = Getpad(1)       ' Read 1 byte from PAD receive buffer (Scan code value)
Debug Dec KC,CR      ' Print the scan code to debug screen
Return
    
```

The key scancode will differ depending on which keypad is used. When using 4x4 or 4x5 keypads, the scancode will start at 2. When using 3x4 keypads, the scancode will start at 1. The scancode is based on an 8x8 keypad. This will prevent repetition of same scan code value.

If you want to be able to access the right scan codes for your keypad, you can use a conversion key table.

The below source program will convert the scan codes to a 4x4 keypad.



```

Const Device = cb290
Set Ladder Off
Set Pad 0,1,4
Dim I As Byte
Dim X As Byte
Const Byte KEY_TABLE = (0,0,1,2,3,4,0,0,0,5,_,
    6,7,8,0,0,0,0,9,10,11,_,
    12,0,0,0,0,13,14,15,16)
    
```

```
On Pad Gosub PAD_RTN
```

```
Do
```

```
Loop
```

```
PAD_RTN:
```

```
X = Getpad(1)
```

```
If X > 29 Then Return
```

```
X = KEY_TABLE(X)
```

```
Debug Dec X,CR
```

```
Return
```

Connecting a 4x4 Keypad to the Keypad Controller

Please connect like the picture below and simply solder the pins.

You can also reverse the keypad controller and put it on to of the keypad.



Connecting to CUBLOC/CuTOUCH

Connect a 6 pin cable between the Keypad Controller and CUBLOC or CuTOUCH

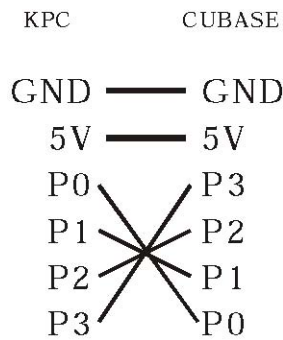
KPC		CUBLOC
GND	—	GND
5V	—	5V
P0	—	P0
P1	—	P1
P2	—	P2
P3	—	P3

CUBLOC's P0, P1, P2, and P3 ports are used for PAD communications. PAD communication protocol is basically an SPI protocol used for keypad and touch panel interfaces. For detailed information about the PAD communication protocol, please refer to CUBLOC User Manual. The Keypad Controller uses Mode 0 of the PAD communication protocol. (MSB first, Rising Edge sampling)

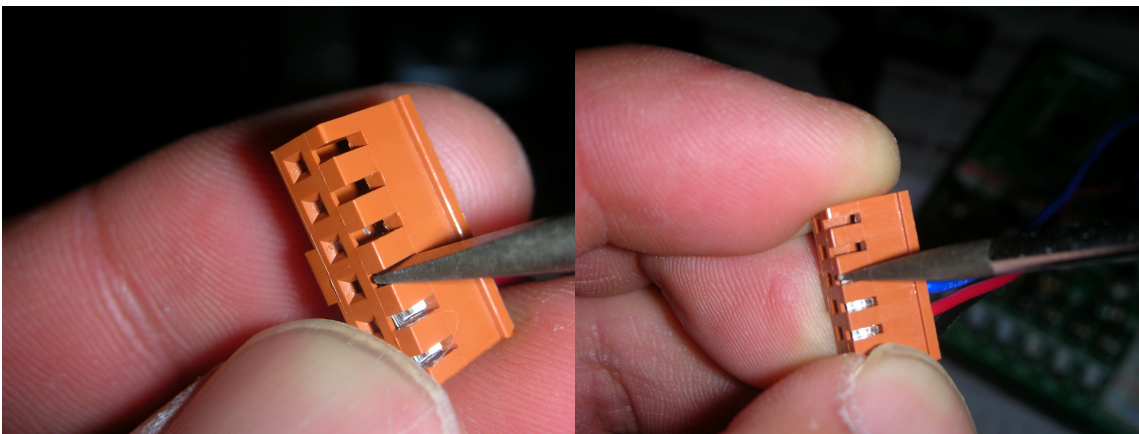
- P0 will go LOW when there key input.
- P1 is for Clock and P2 is for data.
- P3 has no actual use. This pin is for future features.

Connecting to CuBASE

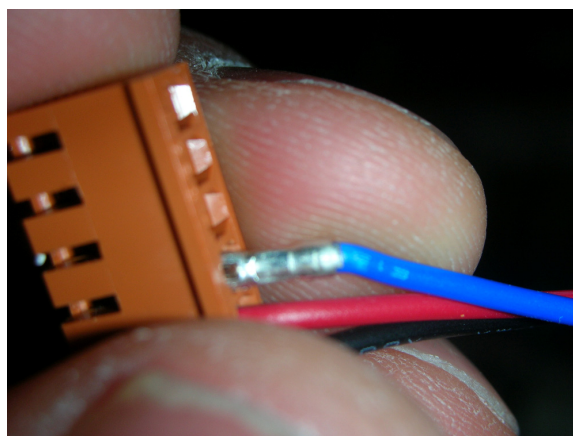
CuBASE has a Keypad Controller connector. Depending on the model used, the pin numbers can be different. In the case that pin numbers are different, please modify the cables as shown below:



Here are some pictures on how to change the pins on the orange connectors:

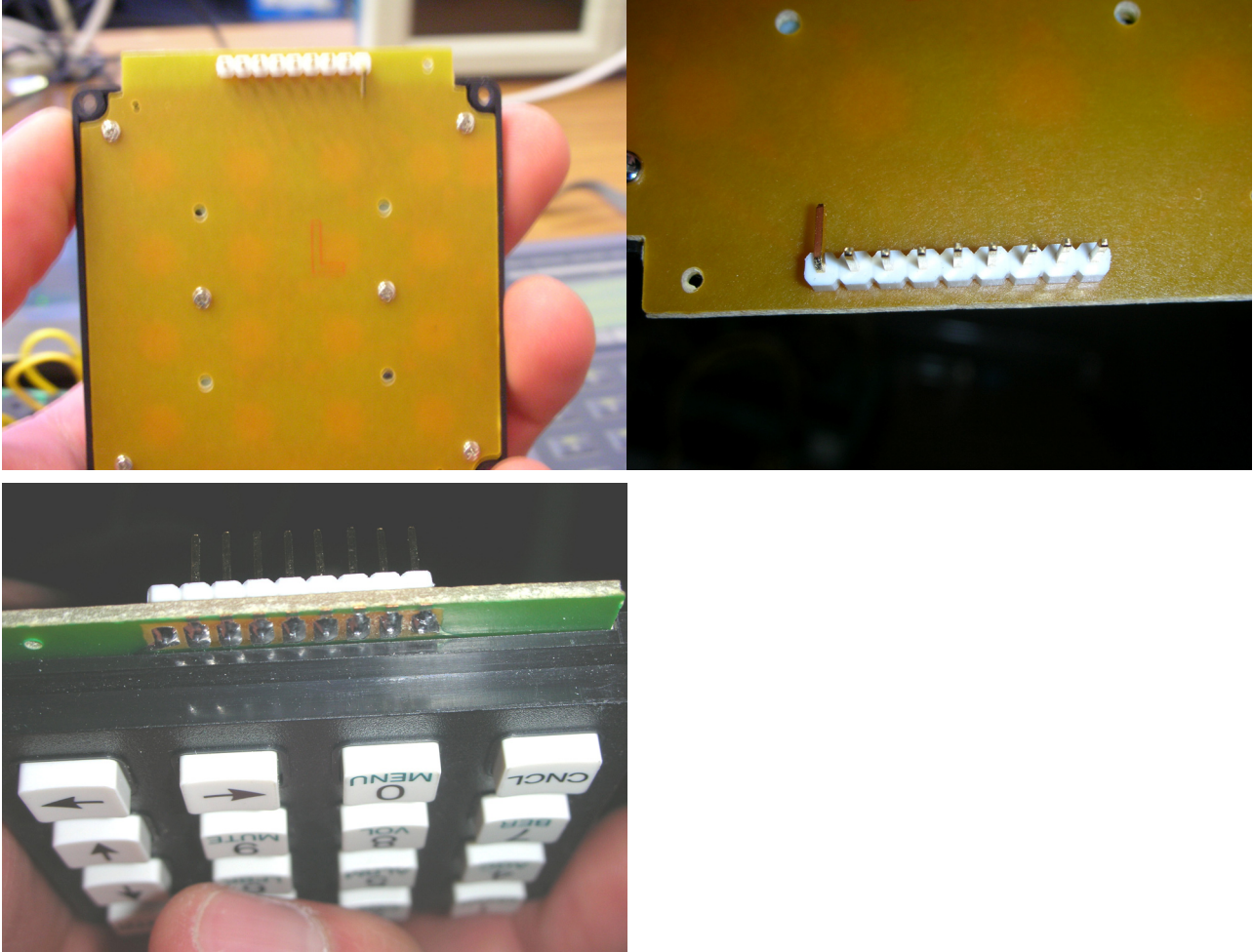


1) Use a (-) screw driver to apply slight pressure to the inside of the pin. You can angle the screw driver slightly angled as shown.



2) You should be able to get it out easily and place it where you need to.

Connecting 4x4 Numerical Keypad w/ 9 pins



One of the pins are not used in the numerical keypad, please bend them or cut the pin off before attaching to the Keypad Controller.

Connecting to 8x8 Keypad

Please connect the 8x8 keypad as shown below:

