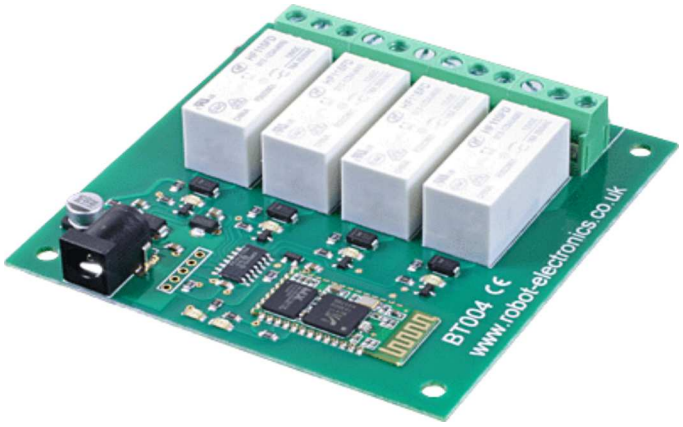
BT004 - 4 relay outputs at 16A

Technical Documentation



Overview

The BT004 provides four volt free contact relay outputs with a current rating of up to 16Amp each controlled over a HC06 Bluetooth serial port. The module is powered from a 12vdc supply which can be regulated or unregulated. The DC input jack is 2.1mm with positive core polarity, DC supplies are required to supply at least 500mA at 12vdc. The relays are SPCO (Single Pole Change Over) types. The normally open, normally closed and common pins are all available on the screw terminals.

LED Indication

The BT004 provides a red LED mounted immediately next to each relay to indicate whether it is in a powered state (LED on), there are also two LED's near the power connector, one indicates power and the other will flash when the board is waiting for a connection and remain lit when a connection is present.

Relay Power Rating

If the contact load voltage and current of the relay are in the region enclosed by the solid and dotted lines in the figure below, the relay can perform stable switching operation. If the relay is used at a voltage or current exceeding this region, the life of the contacts may be significantly shortened.

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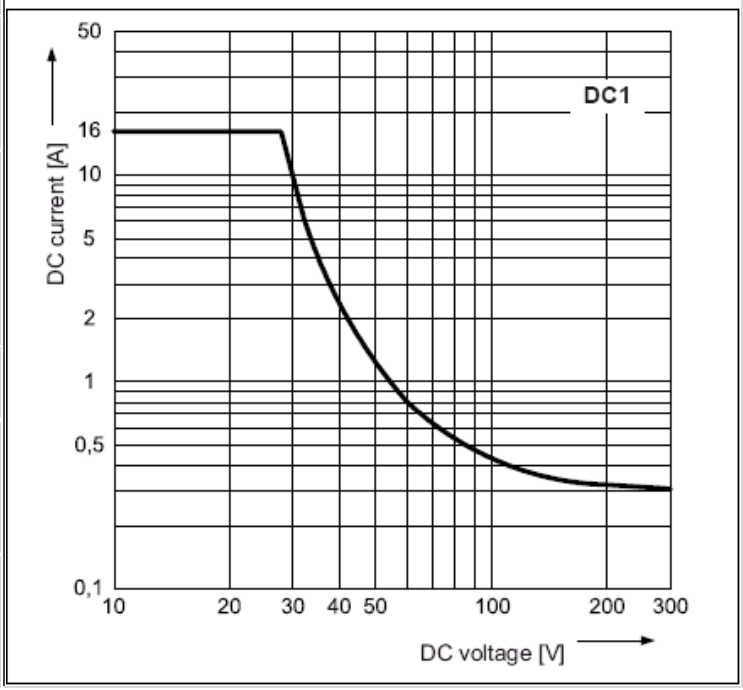
load type	Typical applications	Rating
AC1	Non inductive or slightly inductive loads	16A @ 250V AC
AC15	Control of electromagnetic load (>72VA)	3A @ 120V AC 1.5A @ 240V AC
AC3	Control of motor	750W
DC1	Non inductive or slightly inductive loads	16A @ 24V DC
DC13	Control of electromagnetic loads	0.22A @ 120V DC 0.1A @ 250V DC

Max DC load capacity



A full datasheet for the relays used on the BT004 is here: HF115FD datasheet

Module Pin Code and Name

By default the module name will be "BT004" and the pin code will be "1234" These can be changed by using our android application

"IO Bluetooth" which can be downloaded from the Google play store. If you forget the pin code there is a factory reset that will change both the name and pin back to the default setting.

Factory Reset

If you forget your pin and are unable to connect to the device anymore then you can perform a factory reset to change the modules name and pin back to the default of "BT004" and "1234". To do this first power the module down completely. Next connect together the top 2 contacts (nearest the relays) of the 5 holes next to the dc power connector and apply power. Keep these pins shorted until the red power LED goes off, the green connection LED will blink on and off periodically. Once the power LED comes on again the module is ready to use at its default settings.

BT004 Binary Command Set

Commands are sent to the BT004 using its HC06 Bluetooth serial port.

Command		Action
dec	hex	
16	10	Get Module Info, returns 3 bytes. Module ID (27 for BT004), Hardware version, Firmware version.
32	20	Digital active - follow with 1-4 to set relay on, then a time for pulsed output from 1-255 (100ms resolution) or 0 for permanent Board will return 0 for success, 1 for failure
33	21	Digital inactive - follow with 1-4 to turn relay off, then a time for pulsed output from 1-255 (100ms resolution) or 0 for permanent Board will return 0 for success, 1 for failure
35	23	Digital set outputs - the next single byte will set all relays states, All on = 255 (xxxxxx11) All off = 0 Board will return 0 for success, 1 for failure
36	24	Digital get outputs - sends a single byte back to the controller, bit high meaning the corresponding relay is powered
120	78	Get Volts - returns module supply voltage as byte, 125 being 12.5V DC

Digital Active/Inactive

This is a 3 byte command:
The first byte is the command, 32 (active means on) or 33 (inactive).
Second byte is the relay number (1-2).
Third byte is the on time. Set this to zero for un-timed operation, or 1-255 for a pulse in 100mS intervals (100mS to 25.5 seconds).
For example:
0x20 - turn the relay on command
0x02 - relay 2
0x32 (50) - 5 seconds (50 * 100ms)
Board will return 0 for success, 1 for failure.

BT004 ASCII Command Set

All ASCII Commands begin with a colon (":") with any data needed separated by commas (",") and end with a carriage return ("\r").

Command	Examples
Get Module Info (GMI)	":GMI\r" returns a string with the module ID, software version and hardware version separated by commas and ending with a carriage return e.g. "30,1,1\r"
Digital Output Active (DOA)	":DOA,3,0\r" Make digital output 3 active, returns "OK\r" for success and "NAK\r" for failure ":DOA,1,5\r" Make digital output 1 active for 500mS, returns "OK\r" for success and "NAK" for failure
Digital Output Inactive (DOI)	":DOI,2,0\r" Make digital output 2 inactive, returns "OK\r" for success and "NAK\r" for failure ":DOI,4,10\r" Make output 4 inactive for 1 second, returns "OK\r" for success and "NAK\r" for failure
Get Digital Output (GDO)	":GDO,1\r" Gets the state of output 1, returns "ACTIVE\r" or "INACTIVE\r"
Get Supply Voltage (GSV)	":GSV\r" returns module supply voltage as string ending with a carriage return, 125 being 12.5V DC e.g. "125\r"

Android App

We provide an Android app "IO Bluetooth" for controlling the BT004 which can be downloaded from the Google play store. It allows you to name the digital outputs and set the pulse times for each of them. Using this app you can also update the modules pin and name.

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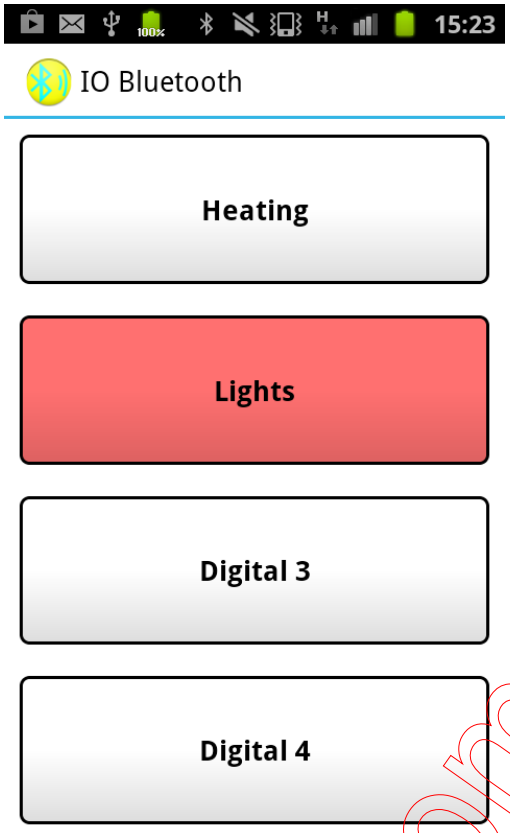
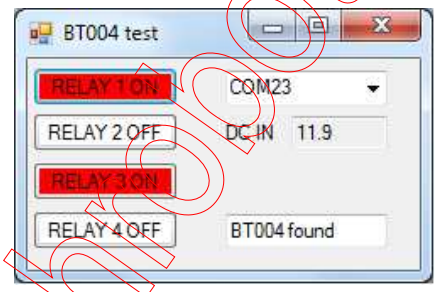


Windows Test Program

If you have a windows PC with Bluetooth support you can also use our BT004 windows test app to control the board. If your PC doesn't have Bluetooth capabilities you can use a
Bluetooth dongle for communicating with the BT004. It can be downloaded as an installer package here, or the source code here



Setup Bluetooth Device Windows

To setup a Bluetooth device on Windows 7 first first make sure that your computers Bluetooth adapter is enabled and that your BT004 is turned on. Now open the start menu and select "Devices and Printers" and in the window that appears click "Add a device". In the window that appears select the device you wish to add to your computer and click next.

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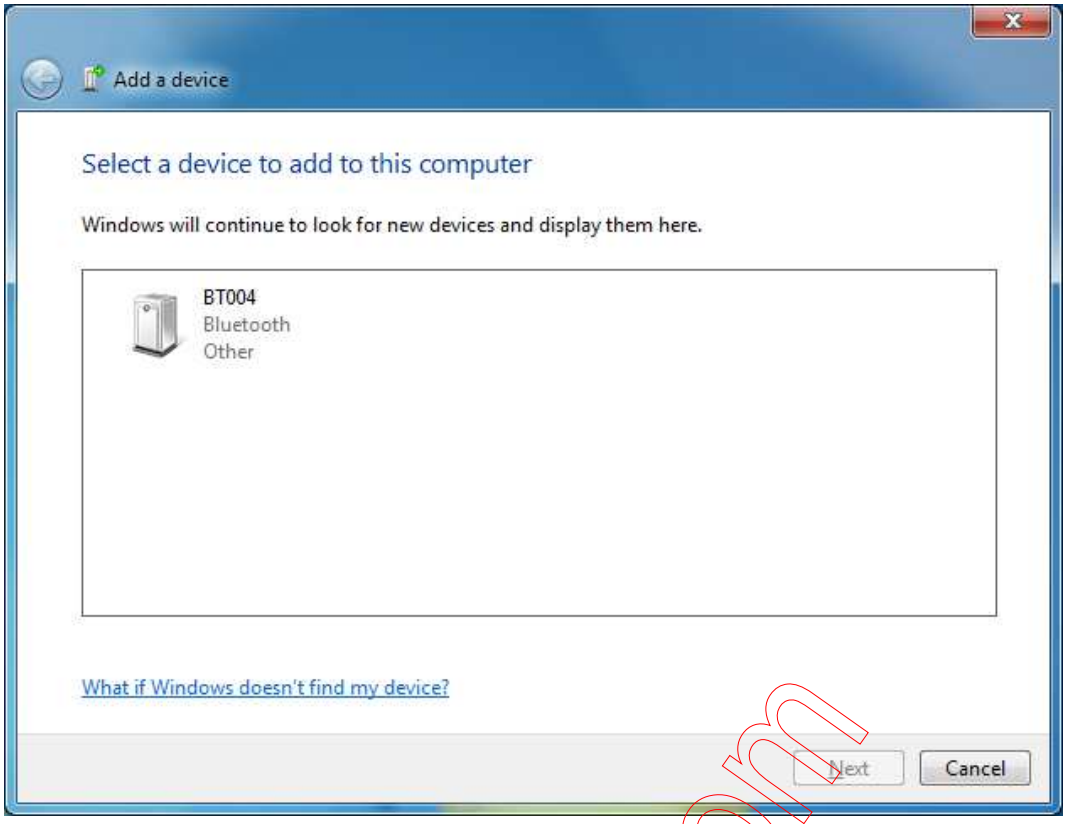
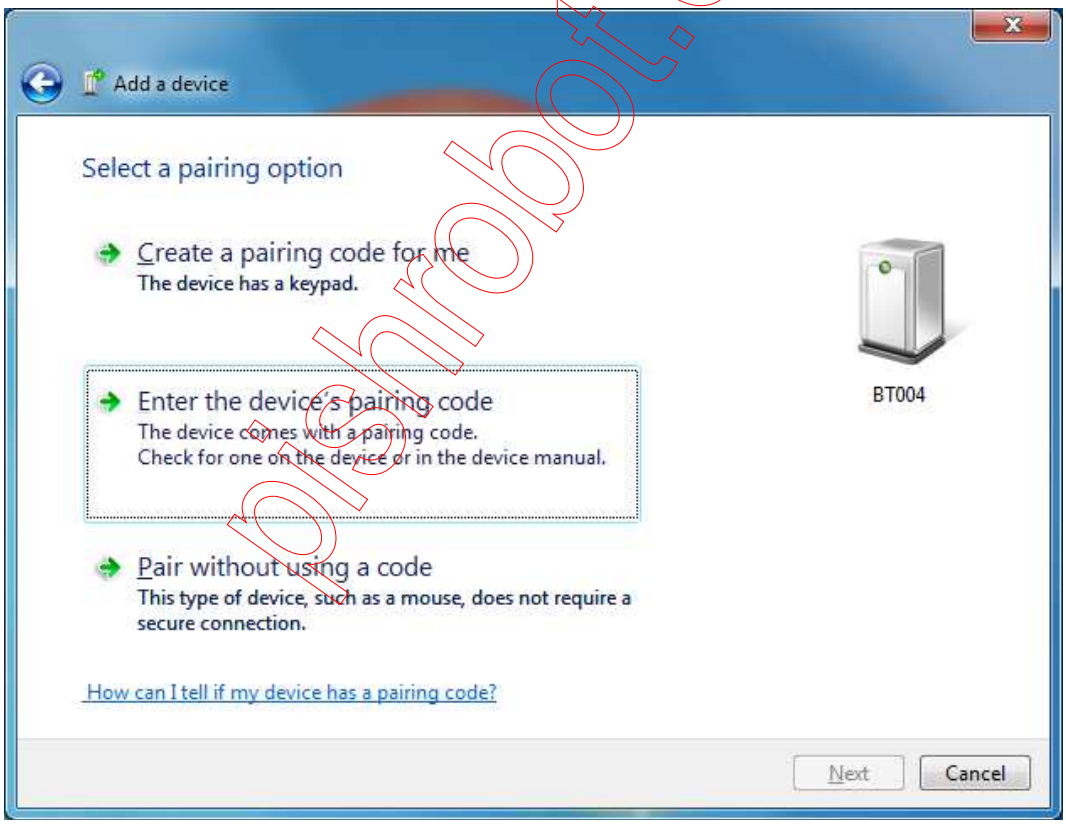


At the next window select the option to enter the devices pairing code and when prompted enter it, the default pin code for the BT004 is "1234".



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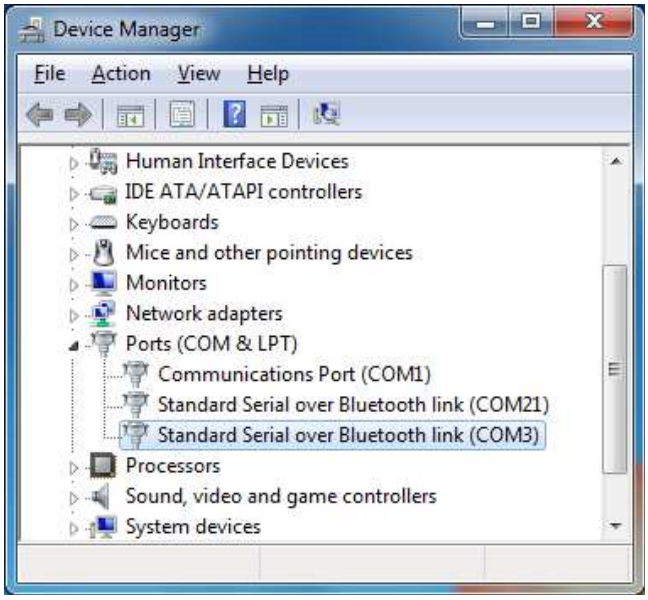
Once the device has been added to your computer it will appear as a COM port, To find out where it is, right click on your "My Computer" desktop icon and select "Properties->Hardware->Device Manager". Now scroll down and open the "Ports (COM & LPT)" tab. You should see the serial port listed. If you want to change the COM port number - just right click on it, select properties, select advanced and select the COM port number from the available list.



Mac Test Program

A Mac test program for controlling the board is available for download. It can be downloaded as a runnable app here, or as an Xcode project here

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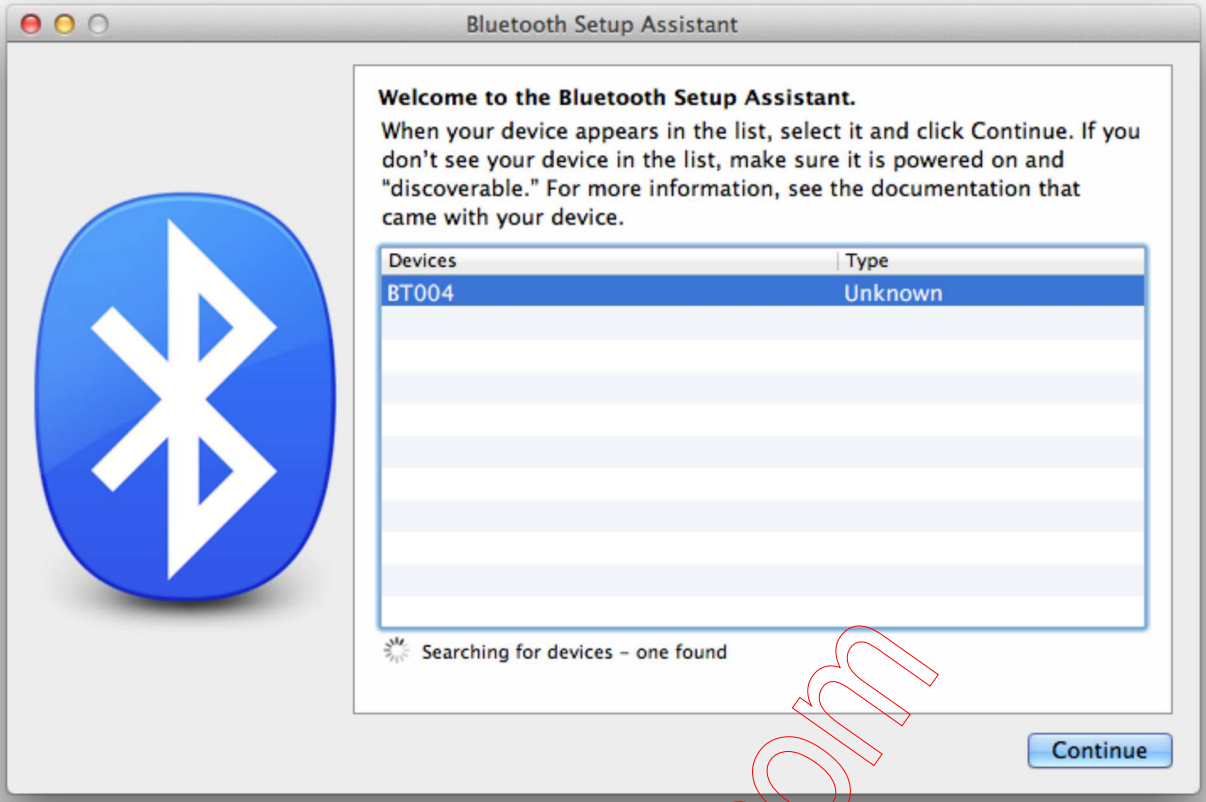
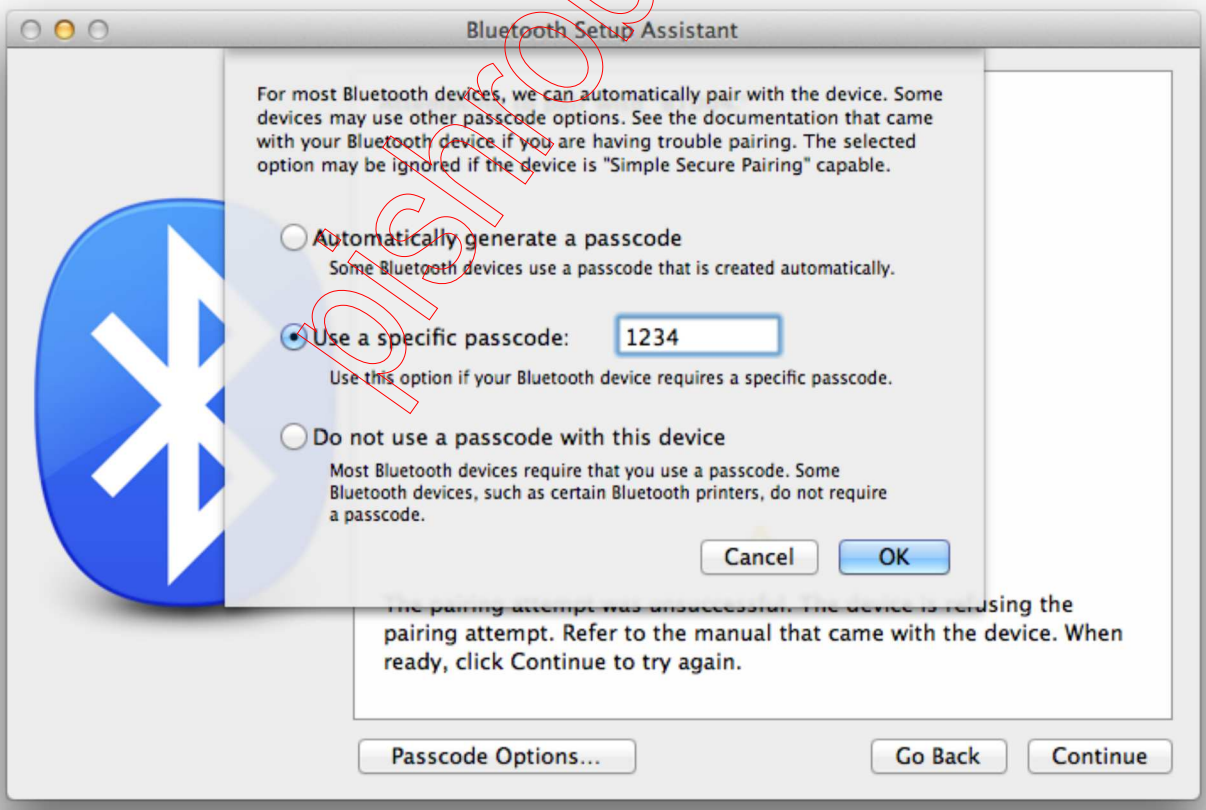
Setup Bluetooth Device Mac OS X

To setup a bluetooth device on your mac first make sure that your mac's Bluetooth port is enabled and that your BT004 is turned on. Now in open your systems Bluetooth preferences and under the list of paired devices click the + button to add a new device. The following window will appear, select the device you wish to add from the list and click continue.

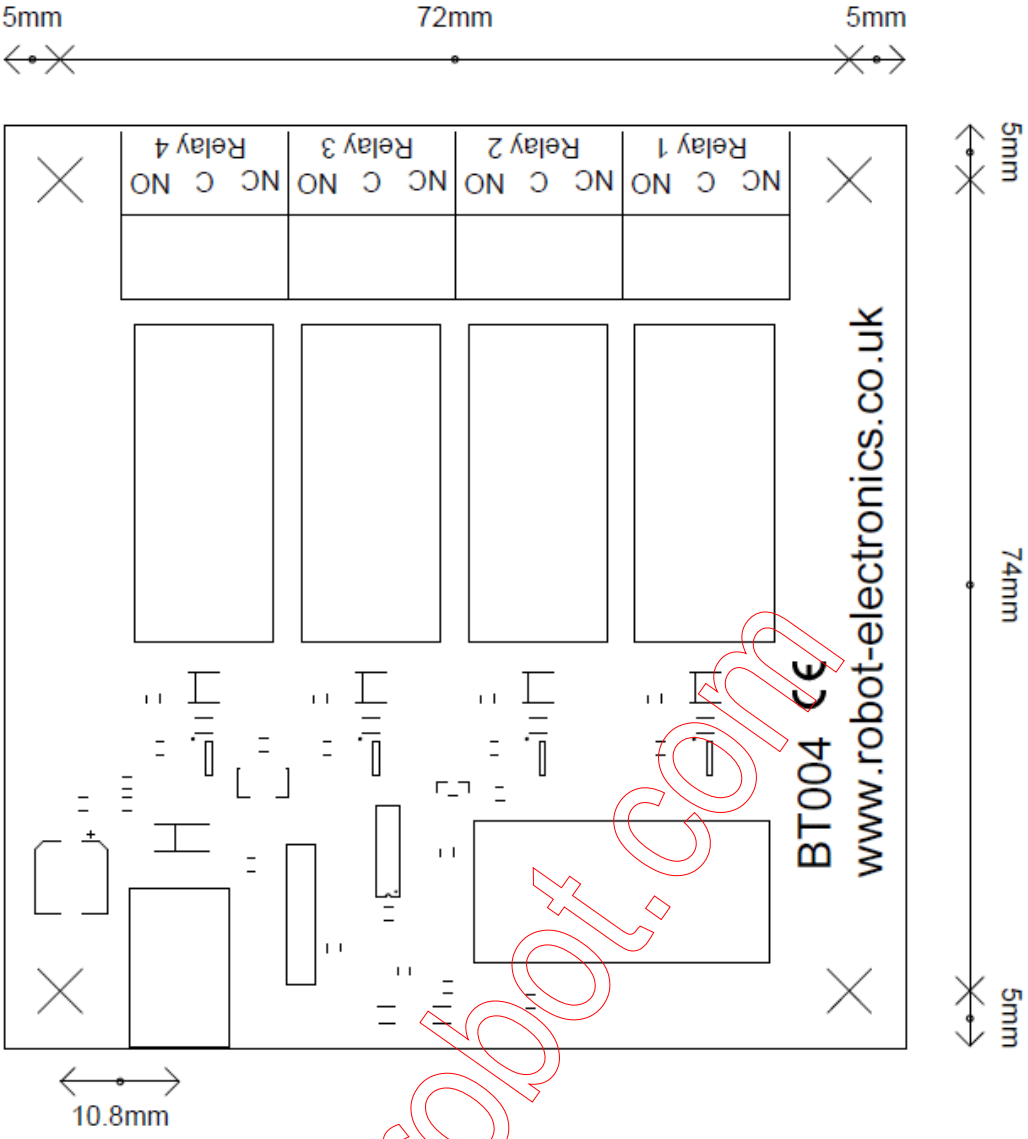


Your mac will now attempt to pair with the selected device, as OS X attempts to pair with Bluetooth devices first time without a pin code this pairing will fail. When OS X prompts you that pairing has failed click the "Passcode Options" button and select to use a specific passcode. In the text box enter your BT004's passcode, the default passcode is "1234".



Once pairing is complete your BT004 serial port will be ready to use.

Drilling Plan



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