ULTIMARC
Ultimate Arcade Controls

Interface Buyers Guide

Introduction

Firstly, congratulations on coming to the right place for your USB arcade gaming interface needs.

We have been producing interfaces since 2001 and have become the benchmark standard in this area with many thousands of boards out there in MAME-land.

Our current boards are much more than simply keyboard encoders and have features such as multi-operability of keyboard, game controller and mouse controls on one board, control of volume, sleep, wake, LED control, interactive configurability, full-speed USB interfaces (as opposed to low speed on standard keyboards) and many other advanced features, so you are in the right place!

This guide presents some example control panel configurations to help you select which products are best to order.

The first point we would like to make is that we wont be trying to cover which joysticks and buttons you should use, as this is a very subjective choice. Its rather like advising someone which car to buy. The description on our controls pages attempt to give as much detail as possible but at the end of the day its down to personal preference on control types and quantities.

This guide is meant to be completely objective and therefore does not present any example panel layouts or designs. We have deliberately kept it brief and text-only. For design ideas we recommend taking a look at the project pages on www.arcadecontrols.com. There are hundreds of designs on there so its bound to spark off some ideas.

Example Panels

Basic 2-player, 6-button per player panel. Non-illuminated

This is the kind of panel which is fine for all classic games, 2 players.

Controls would consist of 2 joysticks (for example J-Stik), 6 buttons per player, Start1 and 2 logo buttons. Optionally you could add some function buttons such as ESC (for quitting games), volume up/down, pause, but these are not essential as these functions can be done using the I-PAC shift (ie hold down Start1). Each joystick uses 4 connections.

There are two interface options for this type of panel:

I-PAC 2 :

This would be wired up manually. You could order our wiring kit which contains wire, crimps and crimp tool to do this. This is quite time consuming but gives a very neat and satisfying result when done properly. If you are building a one-off cabinet you are not going to be worried too much about spending the time. The I-PAC 2 is always our biggest seller.

Mini-PAC:

This board saves a great deal of time as it comes with an optional wiring harness. This means all controls simply plug into the harness and no crimping or screw connections are used. The entire panel can be wired up in a matter of minutes. Its fair to say the result is not as neat as the manually-wired I-PAC though as all the harness wires are the same length (320mm).

You might wish to consider joystick mounting kits and PCB feet kit with either of the above options.

2-player 6-button per player panel. Illuminated

There is an obvious choice for this panel, which is our **I-PAC Ultimate I/O board**

This board will handle all of the controls and uses the same wiring harness as the Mini-PAC (above). It also has 96 LED channels.

If you are using RGB buttons (our ClassicRGB or Ultralux RGB), these use 3 channels each, and simply plug into the board. Our illuminated joystick handles also use 3 channels. So there are ample channels for all the controls on a 2-player panel.

RGB buttons can be lit to any color, and when using the LEDBlinky software there are all kinds of special functions available such as lighting the controls use in each game, animations etc. The Ultimate I/O board also has its own configurable attract-mode LED scripting feature.

You could instead choose single-color buttons. These do require some extra wiring, see the Ultimate I/O page for more information on what to order.

While we are on the subject of LED controllers, here is a little technical tidbit: Our I-PAC Ultimate I/O and PacLED64 controllers have *CURRENT CONTROLLED OUTPUTS.* This means they can always drive the LED at its correct brightness regardless of whether it has an inbuilt resistor or not. Most alternative LED controllers do not have this type of driver and rely on a crude resistor to limit the LED current.

Adding a trackball and spinner to the above

Our U-Trak trackball uniquely mounts through a wood panel without the need for a mounting plate, and the Spintrak spinner mounts through a pushbutton-sized hole. Both these controls require NO ADDITIONAL INTERFACE when used with any of the above configurations. The only point to remember is, if using a Mini-PAC you need to order the Opti version for trackball/spinner support.

We have an illumination kit for the U-Trak which plugs into the Ultimate I/O board and uses 3 channels.

4-Player Non-Illuminated panel

Typically a simple 4-player panel would have 6 buttons for players 1 and 2, and 4 buttons for players 3 and 4, plus Start1,2,3,4 logo buttons This gives a total of around 44 inputs with a few function buttons.

The manually-wired option for this panel would be the **I-PAC 4** which has 56 inputs.

4-player Illuminated panel

The **I-PAC Ultimate I/O** board is a candidate for this. If you don't connect a trackball or spinner to this board, all 48 inputs are available for controls.

You would need to add up the number of switches on your panel (each joystick is 4) and check the total is 48 or less. NOTE: You can connect 2 buttons to one input if you wish, for example side pinball buttons don't usually need a dedicated input pin.

For illumination, the UIO board has 96 channels. This would be 32 if all controls are RGB. So you would need to add up the number of channels required for all controls, 3 for each RGB button (or joystick handle) or one for each single-color button.

If the number of LED channels (96) or control channels (48) is not enough, see the "Mega Panel" option later.

Make sure to consult the "what to order" table on the product page.

Adding a trackball/spinner to the above 4-player panels

Simply order the U-Trak or Spintrak with their own USB interfaces. This option is selectable when adding to the shopping cart. These would each require a USB port, rather than routing via the control interface. We have an illumination kit for the U-Trak which plugs into the Ultimate I/O board and uses 3 channels.

4-player Giant Mega Panel.

An increasing number of our customers are asking about the ultimate panel with no holds barred on number of buttons and controls. We have solutions!

This option applies where the number of switches exceeds 48 or the number of LED channels exceeds 96. The best way of doing this is to configure the following boards:

Left-hand side (2 players): install a **Mini-PAC Opti** for controls and trackball support.
Install a **PacLED64** board which has 64 LED channels.

Right-hand side (2 players): Install a second **Mini-PAC Opti** for controls and spinner support. (Note you could use a non-Opti Mini-PAC for this board and connect the trackball and spinner both to the first board).
Install a second **PacLED64** board which has 64 LED channels.

The above gives 128 LED channels and 64 switch inputs. Its pretty unlikely any panel would need more than this! The advantage of this approach is that the boards can be physically located at eigher sides of the panel. As this type of panel can be large, this avoids harness length issues.

Note you will need to reconfigure the Mini-PACs using **WinIPAC**, so the keycodes are all unique and match the locations they are connected to. Some panels use the center two locations for players 1 and 2 and the outer for 3 and 4, so bear this in mind if you decide to do this. It does not really matter how you wire the controls, as long as you keep track of which keycodes are assigned to which controls, and to avoid confusion, stick to the MAME standard keys.

Other Goodies

All our joysticks are switchable 4-way to 8-way from under the panel but you might like to look at the following two special joysticks

ServoStik. This is a joystick which has a motor-driven restrictor which can switch 4 to 8-way automatically

Ultrastik 360. This is a contactless stick with full analog capability, and can have maps downloaded to configure it as 4-way, 8-way or special configurations. This stick has an 8-input switch interface built in.

Also:

Aimtrak. Most people will already be familiar with our best-selling Aimtrak gun system.

U-HID. This is a product which was designed for use in simulators and other applications which require a universal interface capable of digital, analog and optical controls, LEDs, and has special switch modes for gear shifters and flying controls which might use "always-closed" switches.

Interfacing to Consoles.
The I-PAC 2 board has an on-board Pac-Link high speed expansion interface which plugs into our adaptor for Xbox360, Playstation 3 and Xinput (PC).

Conclusion

We hope this brief guide has helped your buying decision.

We have tried to keep this as concise as possible so you might have further questions. Let us know at andy@ultimarc.com if so.