



# OWNER'S MANUAL





## Warranty

iConnectivity warrants to the original purchaser that this unit is free of defects in materials and workmanship under normal use and maintenance for a period of one (1) year from the date of original purchase. The warranty applies only to registered iConnectivity users that purchased this product from an authorized iConnectivity reseller and registered their product(s) within sixty (60) days of time of original purchase. To register iConnectivity products, visit [iConnectivity.com](http://iConnectivity.com). If the unit qualifies for warranty service during the one (1) year period, it will be repaired, or replaced, at iConnectivity's option, at no charge, when returned prepaid to the iConnectivity Technical Service Center with proof of purchase – the sales receipt may be used for this purpose. Installation labor is not covered under this warranty.

All replacement parts, whether new or re-manufactured, assume as their warranty period for only the remaining time of this warranty. This warranty does not apply to damage caused by improper use, accident, abuse, improper voltage service, fire, flood, lightning, or other acts of God, or if the product was altered or repaired by anyone other than iConnectivity Technical Service Center. Consequential and incidental damages are not recoverable under this warranty. Some regions do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply. This warranty gives you specific legal rights, and you may also have other rights, which vary from state to state. No portion of this warranty may be copied or duplicated without the expressed written permission of iConnectivity. THIS WARRANTY IS NOT TRANSFERRABLE.

## Compatibility

mio2 is compatible with any Mac or Windows PC with an available USB port. The included iConfig software works with Windows 7 or later and Mac OS X 10.8 or later.



## PRECAUTION/IMPORTANT NOTES

### Interference with other electrical devices

Radios and televisions placed nearby may experience reception interference. Operate this unit at a suitable distance from radios and televisions.

### Indoor use only

To avoid the risk of electrocution and/or damage to other connected equipment, this equipment must not be used under wet or high moisture conditions. All interconnecting cabling must also be indoors. Should moisture suddenly increase, immediately disconnect power to the equipment.

### Power sources

Ensure that correctly rated power outlets are used with the supplied power supply.

### Heat

Keep this equipment away from all heat sources. Ensure that sufficient ventilation and/or heat dissipation is provided for the equipment and all connected devices.

### Packaging

Keep all packaging materials away from children. Properly dispose of unwanted packaging.

### Handling

To avoid breakage, do not apply excessive force to the switches, connectors or directly to the equipment. Do not apply excessive bending force to the cables. Use the connector casings of cables to attach and detach cables from their receptacles to avoid damage to the cable and/or its receptacles.

### Ingestion

Do not ingest the packaging, equipment, attachments, or accessories. Do not ingest paint or removed parts from the equipment or accessories. If this occurs, immediately seek medical attention.

### Care

If the exterior becomes dirty, wipe with a clean, dry cloth. Do not use liquid cleaners such as benzene or thinner, or cleaning compounds or flammable polishes.

### Keeping foreign matter out of your equipment

Never set any container with liquid in it near this equipment. If liquid gets into the equipment, it could cause electrical damage, breakdown, fire, or electrical shock. Be careful not to let metal objects get into the equipment.

### Notice regarding disposal (EU only)

Disposal of this product, package, or cables must be done in an approved manner. Do not discard this product, package, or cables along with ordinary household waste. Disposing in the correct manner will prevent harm to human health and potential damage to the environment. Since the correct method of disposal will depend on the applicable laws and regulations in your locality, please contact your local administrative body for details.

### FCC (USA) / IC (Canada) Regulation Warning

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Adjust the receiving antenna
- Increase the separation between the equipment and receiver
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected
- Consult the dealer or an experienced radio/TV technician for assistance

Unauthorized changes or modifications to this system can void the user's authority to operate this equipment.

### IMPORTANT NOTICE TO CONSUMERS

This product has been manufactured according to strict specifications and voltage requirements that are applicable in the country in which it is intended that this product should be used. If you have purchased this product via the Internet, through mail order, and/or via a telephone sale, you must verify that this product is intended for use in the country in which you reside.

WARNING: Use of this product in any country other than that for which it is intended could be dangerous and could invalidate the manufacturer's or distributor's warranty. Please also retain your receipt as proof of purchase; otherwise, your product may be disqualified from the manufacturer's or distributor's warranty.

### Caution

Always keep children and pets under constant adult supervision. The packaging, equipment, and included accessories are not toys and must be kept out of reach of children and pets. Use only under constant adult supervision.

## Introduction

Thank you for purchasing the mio2™ Advanced MIDI Interface, a member of iConnectivity's line of innovative interfaces.

Your interface has full support for two Macs or PCs - at the same time! The mio2™ offers extremely flexible MIDI routing between everything connected: both computers plus the MIDI hardware plugged into its two in/out pairs of 5-pin MIDI.

Between all those external and internal connections, your mio2™ has a total of ten configurable 16-channel MIDI ports! All those data streams let you use a substantial number of modern and vintage MIDI devices, get them all talking to each other, and also bring in "guest" equipment and computers very quickly when you collaborate with other musicians on stage or in the studio.

Because of your mio2's built-in MIDI filtering/routing/merging, stand-alone hardware units aren't needed for those functions. MIDI can also be routed to multiple destinations, for example if you want to layer sounds on different instruments, and each destination can have its own MIDI processing.

All the MIDI routing and processing is simple to set up in the included iConfig software for Mac and PC ([www.iConnectivity.com/support/downloads](http://www.iConnectivity.com/support/downloads)), and your complete configuration can be saved in non-volatile flash memory on the device. It remembers it all when you power up the next time.

There are no Mac or PC software drivers to install, because the interface is USB Class-Compliant, and it is powered by the USB bus so no other power adaptor is necessary.

# TABLE OF CONTENTS

Initial Setup .....	3
mio2 Hardware Layout.....	4
mio2 Features .....	5
iConfig Software.....	6
Device Info Page.....	6
Abbreviations and Port Naming.....	7
MIDI Info Page.....	8
MIDI Routing and Processing Pages.....	9
<i>MIDI Port Routing Page</i> .....	10
<i>MIDI Port Filters Page</i> .....	11
<i>MIDI Channel Remap Page</i> .....	11
<i>MIDI Controller Filters Page</i> .....	12
<i>MIDI Controller Remap Page</i> .....	12
Using mio MIDI Management to Optimize Your Rig.....	13
mio2 Block Diagram .....	15

## Initial Setup

The following steps will help you set up and integrate your mio2 as easily as possible.

**1. Connect a Mac or PC to USB Device jack 2, using the supplied USB-A to USB-B cable.**

*mio2 is powered by the the far-right USB Device jack connection, marked "POWER IN." If you are using only one computer with the mio, always connect it to USB Device Jack 2.*

**2. Download and install the included iConfig software to a Mac or PC from [www.iconnectivity.com/support/downloads](http://www.iconnectivity.com/support/downloads). Launch the program.**

*iConfig will automatically check to ensure your interface has the latest firmware installed.*

*mio2 is shipped from the factory with a default configuration that includes MIDI routing and merging between all the connected devices. You can operate the mio2 in this default configuration, or use iConfig to customize the routing and MIDI management for your specific needs. Custom settings can be saved on the interface for next use.*

*mio2 requires no driver software to operate on either Mac OS X or Windows.*

**3. Connect your MIDI devices and/or an additional Mac or PC to the interface. Your interface can also operate stand-alone without a computer as long as you provide power on USB Device Jack 2 using a USB charger source or powered hub.**

For detailed information about hardware connections, please see the [mio2 Hardware Layout](#)

**4. The mio2's MIDI routings are in the factory default state, which is a "one size fits all" setup that you can reconfigure. Your Mac/PC DAW software automatically sees all the available 16-channel MIDI port sources and destinations the mio2 provides, and connected MIDI devices are routed to both computers and to each other.**

For information about MIDI routing, both the factory default setup and how to customize it, please see the [MIDI Routing and Processing](#) section.

## mio2 Hardware Layout



### 1. Power button

- Sleep Mode: Hold for two seconds until green LED goes out, then release.
- Wake: Touch button briefly.
- Hard-reset: Hold button for seven seconds until all LEDs light up; release button.
- Bootloader mode to receive firmware updates: Hold button for four seconds until power LED turns red; release button. MIDI 1 and MIDI2 lights alternate on and off. Press and hold to abort bootloader mode.

### 2. Power LED

Green indicates mio is powered up normally.

### 3. MIDI 1 & 2 LEDs

Indicate that MIDI data is being sent/received at corresponding MIDI DIN jacks.

### 4. USB Device Jacks 1 & 2 LEDs

Indicate MIDI is being sent to/from a computer on the USB-B computer device jacks.

### 5. USB Device Jack 1

USB computer device jack for a Mac or PC, using a standard USB-B cable. Does not power the device or support firmware loading.

### 6. USB Device Jack 2 (Power)

USB computer device jack for a Mac or PC. Powers the device over the USB bus. Supports firmware loading. Accepts a USB-B cable.

### 7. MIDI 1 in/out jack pair

Connect standard 5-pin MIDI DIN equipment.

### 8. MIDI 2 in/out jack pair

Connect standard 5-pin MIDI DIN equipment.

### 9. Security lock port (right side)



## mio2 Features

The mio2 comes equipped with a powerful suite of features for managing your MIDI interconnections. These are described briefly below, while detailed operating instructions appear in the following pages.

### Port Routing

Each MIDI port on each connection can be routed to any other port. Multiple ports can be merged and routed to a single port. A default routing configuration is loaded in the factory. To view and edit the MIDI port routing, refer to the [MIDI Port Routing](#) section.

### Port Filters

Filters can be applied to any MIDI input or output port. Filters block specific MIDI event messages from being received on an input port or from being sent through an output port, allowing you to manage the content and volume of MIDI traffic. For details on port filter settings, refer to the [MIDI Port Filters](#) section.

### Channel Remap

Each MIDI port has 16 channels of MIDI data. Specific events on any one channel can be remapped to another channel on the same port, allowing more customization and control. Channel mapping can be applied to inputs as well as outputs. For details on channel remap settings, refer to the [MIDI Channel Remap](#) section.

### Continuous Controller Filters

Filters can be defined to remove specific continuous controller messages on selected channels of either input or output ports, allowing another way to tailor your MIDI setup. For details on continuous controller filters, refer to the [MIDI Controller Filters](#) section.

### Continuous Controller Remap

Specific continuous controller messages can be remapped to another continuous controller type, to redefine the effect of the controller. Remapping can be applied to selected channels on selected inputs or output ports. For details on continuous controller remapping, refer to the [MIDI Controller Remap](#) section.

## iConfig Software

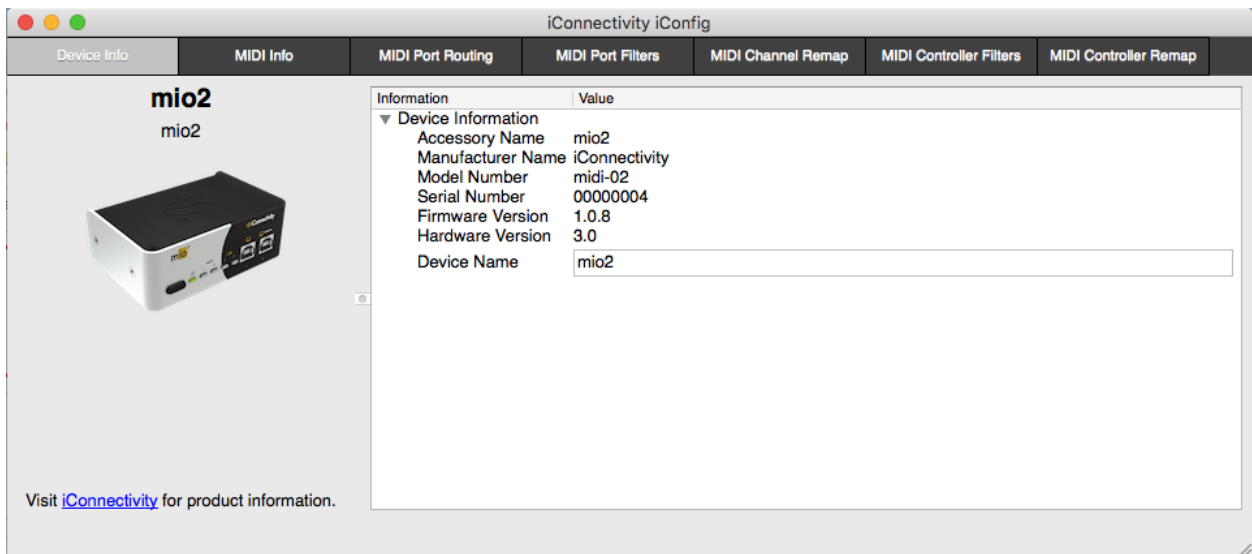
The included iConfig program looks and works the same on Mac and Windows. Use it to configure all the setup, MIDI routing, and MIDI processing features in your mio2. iConfig also works with additional iConnectivity interfaces connected to the same computer; you only need one installation.

**IMPORTANT NOTE:** To save the mio2's configuration to memory, select "Device" on the top menu bar, and then select "Save Current Settings". The settings will be stored in non-volatile memory while the mio is powered off.

The following sections explain each page that appears under the tabs at the top of the iConfig application.

### Device Info Page

This page displays overall information about the mio2.



#### Device Information:

The **Device Name** field is editable, so you can give the mio2 a unique name.

## Abbreviations and Port Naming

The iConfig software uses standard abbreviations for MIDI port names, and the factory-default names reflect the factory-default MIDI routing. These are explained below.

### Abbreviations:



DIN 1 and DIN 2: the MIDI 5-pin DIN in/out pairs  
USB 1 and USB 2: USB computer device jacks (connections to MAC or PC computers)

### Port Naming:

Each MIDI port can be assigned a custom name in the MIDI Info Page of iConfig, and the mio is pre-configured at the factory with a default set of port names.

The names given to the DIN ports simply reflect the port type and number (i.e. DIN port 2 is named *DIN 2*).

**In the case of USB computer device jacks, the ports have been named according to the routing in the mio2. (i.e. USB device jack 1 port 1 is routed to DIN 1, so it has been named *DIN 1*).**

The reason for this naming choice is for convenience when viewing the ports on your computer's DAW software.

As shown in the Pro Tools example on the right, the computer software lists the ports connected to the MIDI interface and includes the custom names in the port naming. By assigning names based on the port routing, you can see the end destination or source for the MIDI data when viewing the ports in your DAW software.

**USB device jack ports are named based on their default routing connections in the mio2. This way you can view the MIDI end destinations or sources from your DAW software:**



Note: After changing a port name in iConfig it may be necessary to remove the mio2 from the computer's device listing and re-connect the mio2 so that the computer refreshes the port names.

## MIDI Info Page

The screenshot shows the iConnectivity iConfig application window with the MIDI Info tab selected. The interface is divided into several sections:

- Information:** A table showing MIDI-related statistics.
 

Information	Value
Number of MIDI Ports	10
Number of DIN Pairs	2
Number of Device Jacks	2
Number of USB MIDI Ports/Device Jack	4
Enable Running Status on DIN ports	<input type="checkbox"/>
- Port Information:** A section containing three tables:
  - DIN Jacks:**

Jack	Name	Input	Output
1	DIN 1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
2	DIN 2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
  - USB Device Jack 1 (Type:None, Name:None):**

Port	Name	Input	Output
1	DIN 1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
2	DIN 2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
3	USB 2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
4	none	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
  - USB Device Jack 2 (Type:Mac/PC Host, Name:None):**

Port	Name	Input	Output
1	DIN 1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
2	DIN 2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
3	USB 1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
4	none	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

### MIDI Information:

**Number of MIDI Ports:** Shows the total number of MIDI ports available on the 5-pin DIN Jacks and USB Device Jacks.

Note: Each MIDI port is a 16-channel data stream.

**Number of DIN pairs:** Shows the number of standard 5-pin MIDI DIN connector pairs (In/Out).

**Number of Device jacks:** Shows the number of USB-B connections available for Mac or PC computer devices.

**Number of USB MIDI Ports/Device Jack:** Each Device Jack can support multiple MIDI ports. This entry shows the total number of ports supported on each jack.

**Enable Running Status on DIN ports:** Running Status is a MIDI command that must be implemented - correctly - by receiving devices, so it is disabled by default. Its function is to reduce the amount of MIDI data by eliminating redundant status bytes.

### Port Information:

**General:** Every MIDI port available to each mio2 connection can have both its input and output enabled or disabled. Everything is on by default. Port Names can be edited.

Note: The default port names are based on the factory default routing so they may no longer be appropriate once you modify the routing.

## MIDI Routing and Processing Pages

MIDI data is routed from the mio2 inputs to the outputs according to the settings on the MIDI Port Routing Page. The MIDI data can also be manipulated in the mio2 by filtering or remapping functions. These settings are configured in the MIDI Port Filters, MIDI Channel Remap, MIDI Controller Filters, and MIDI Controller Remap pages.

Note: MIDI filtering and remapping functions are performed in a specific order on the MIDI inputs and outputs. Please refer to the [mio2 block diagram](#).

### General Page Layout:

The iConfig pages for MIDI routing and processing share a common layout, with a PORT panel on the left and a SETTINGS panel on the right, as shown below.

Channel	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Pitch Bend Events																
Channel Pressure Events																
Program Change Events																
Control Change (CC) Events																
Poly Key Pressure Events																
Note On/Off Events																
Reset Events																
Active Sensing Events																
Realtime Events																
Tune Request Events																
Song Select Events																
Song Position Pointer Events																
Time Code (MTC) Events																
System Exclusive Events																

**PORT panel:**  
This panel lists the available MIDI ports, grouped by physical connector. Select a port from this panel to view or edit the settings in the SETTINGS panel. Filters and Remapping can be applied either to either the input or output path of the port, by selecting Input or Output type at the top of the panel.

**SETTINGS panel:**  
This panel shows the settings for the selection in the PORT panel. Selections are filled with grey color and can be changed with a mouse click. This example shows the MIDI Port Filters page, and the Input filtering applied to the USB Device Jack 1, "DIN1" port.

**NOTE:** As shown in this settings panel, each MIDI port supports 16 channels of MIDI data. Filters and Mapping can be applied selectively to specific channels.

Please refer to the [Abbreviations and Port Naming](#) explanations on the previous page.

## MIDI Port Routing Page

Every 16-channel MIDI port input from each physical connection can be routed to one or more destinations. For example, a DAW track routed to 5-pin DIN 1 could be routed to an additional DIN jack to layer a synth sound.

In the Port Routing example below, MIDI sent to port “DIN 1” from the first computer (on USB Jack 1) is being routed both to the DIN 1 jack and to the other computer's Port 4 (on USB Jack 2).

The screenshot shows the iConnectivity iConfig application window with the MIDI Port Routing tab selected. The interface is divided into two main sections: 'Port' and 'Port Routes (Destinations)'. The 'Port' section on the left lists various MIDI ports, including USB Device Jack 1, USB Device Jack 2, and DIN Jack 1 and 2. The 'Port Routes (Destinations)' section on the right is a table that maps MIDI channels from source ports to destination ports. The table has four columns representing destination ports (1, 2, 3, 4) and four rows representing source ports (USB Device Jack 1, USB Device Jack 2, DIN Jack 1, and DIN Jack 2). The routing is as follows:

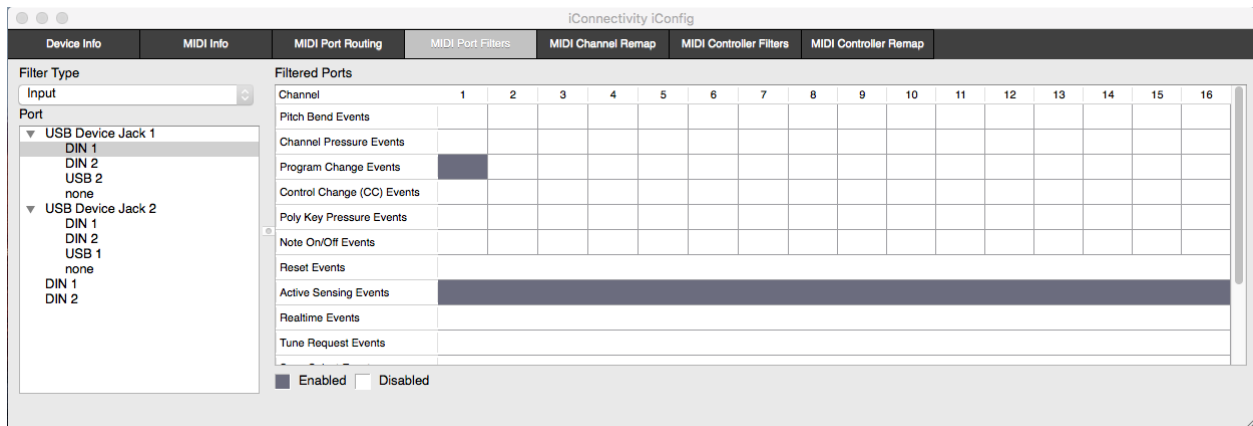
Source Port	Destination 1	Destination 2	Destination 3	Destination 4
USB Device Jack 1	1	2	3	4
USB Device Jack 2	1	2	3	4
DIN Jack 1	DIN 1			
DIN Jack 2	DIN 2			

At the bottom of the interface, there are checkboxes for 'Enabled' and 'Disabled'.

## MIDI Port Filters Page

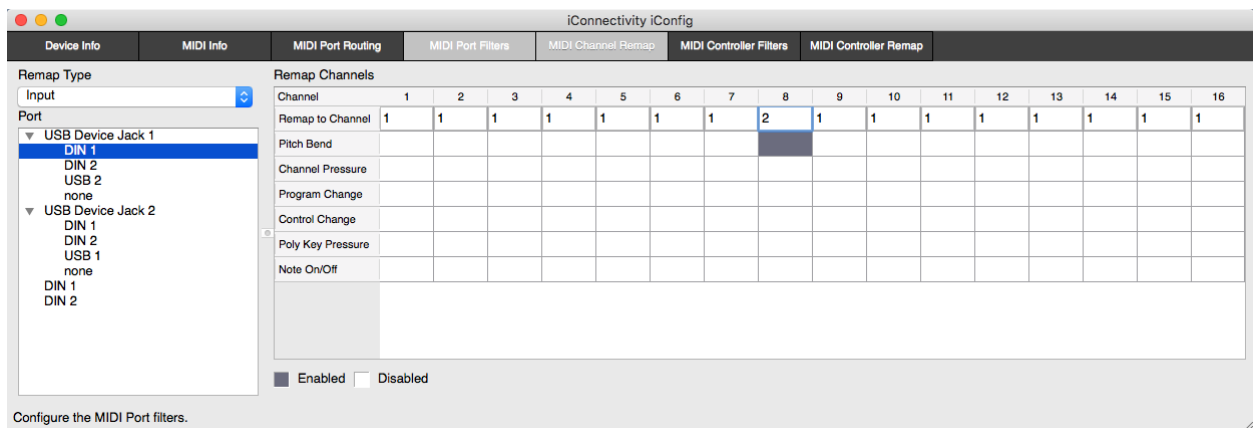
This setting allows specific kinds of MIDI data to be removed (filtered) from each port on either the input or output path. In the Filter Type selection box, choose between Input and Output to select where the filtering is to be applied.

Active Sensing and Program Changes are being filtered from the USB 1 / Port “DIN 1” input in the following example.



## MIDI Channel Remap Page

This setting allows MIDI data to be re-assigned from one channel to another on either the input or output path. Choose specific message types on specific channels by clicking on the corresponding box in the matrix. Edit the “Remap to Channel” entry below the channel number to indicate which channel the messages should be re-assigned to. In the example below, Pitch Bend messages on channel 8 of port 1 (“DIN 1”) from the computer are remapped to channel 2 before routing the data to its destination port (DIN 1). The Pitch Bend messages will be removed from channel 8 and inserted into channel 2 instead.

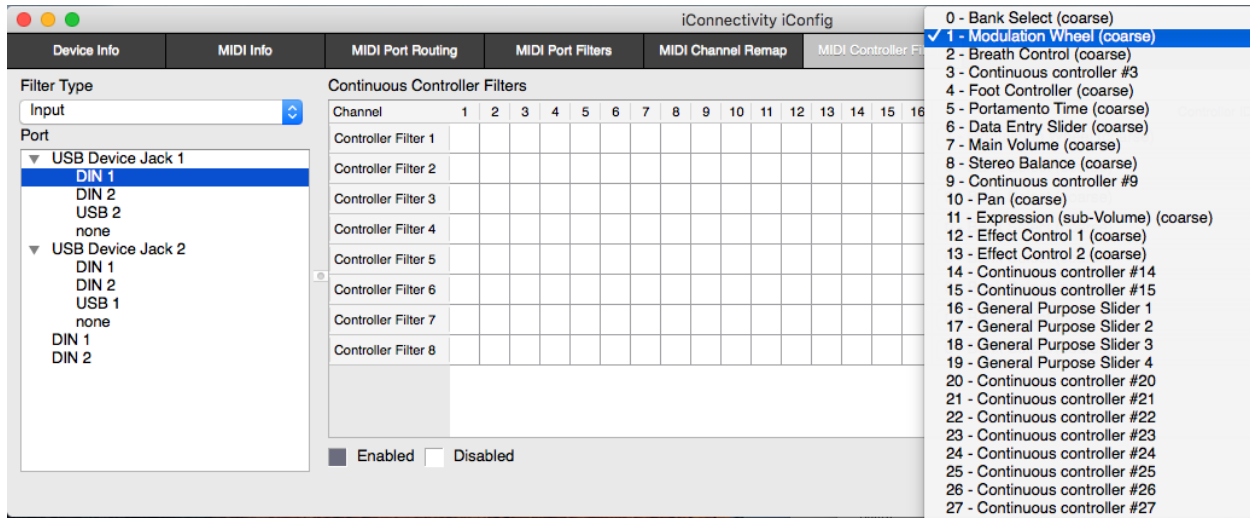


Configure the MIDI Port filters.

## MIDI Controller Filters Page

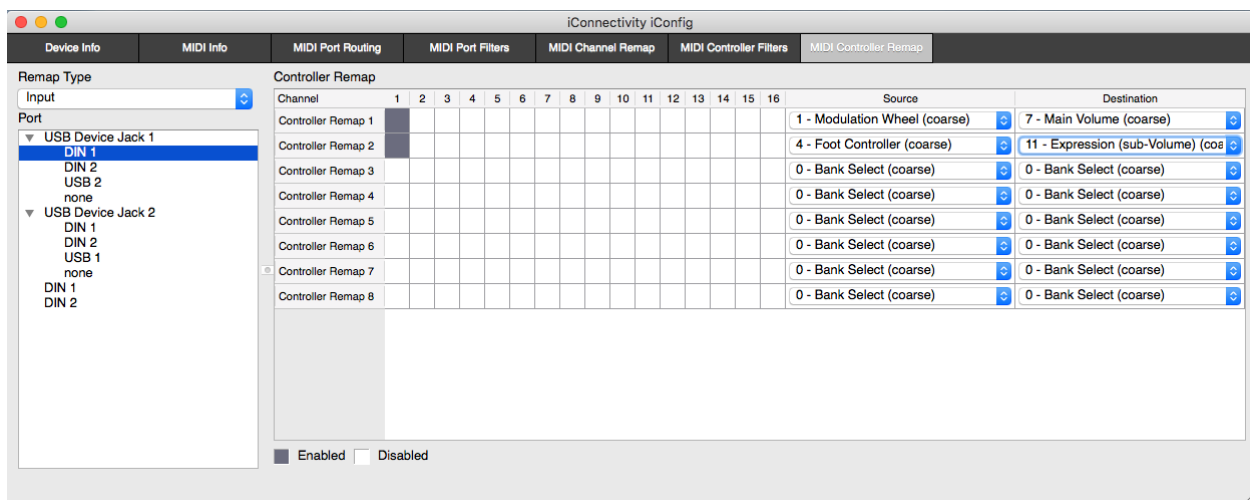
This setting allows specific MIDI Controller messages to be removed (filtered) on either the input or output path. The list of all 128 controller IDs in the MIDI spec is available, and up to eight different controller filters can be specified.

The example below shows Modulation Wheel messages (ID 01) being removed at the input from USB 1 / port “DIN 1,” on MIDI channel 1.



## MIDI Controller Remap Page

This setting allows MIDI Controller messages to be changed to a different controller message. In this example two controller messages have been remapped at the input on USB 1 / port “DIN 1,” MIDI Channel 1. Modulation wheel messages are being used to control volume and foot pedal messages are being used to control expression.





## Using mio MIDI Management to Optimize Your Rig

The factory setup for your mio2 connects “everything to everything,” so you can quickly get gear connected, use your controllers, and listen to your sounds.

Once you have your gear connected and working, and you’ve become familiar with the mio2’s MIDI management features, we recommend you spend some time tweaking your settings to improve efficiency, minimize latency, and avoid potential data loss.

Here are some recommended guidelines for optimizing your setup, to be done in the order shown. Don’t forget to save your new configuration to the mio2 for next power-up:

### **1. Disable MIDI outputs for controllers that only send MIDI data.**

If you have a MIDI controller connected to one of the DIN ports and that controller doesn’t need to receive MIDI data (it may not even have a MIDI input jack), you should disable that DIN output. Or if any of the DIN output jacks are not connected to anything, you should disable those DIN outputs. The easiest way to do this is to go to the [MIDI Info Page](#) in iConfig and uncheck the “output enable” box. This will prevent any MIDI events from being sent to those ports.

### **2. Disable MIDI inputs for controllers that only receive MIDI data.**

Perhaps you have a sound module that never sends MIDI data, or a sound module that sends MIDI data that you don’t need. It’s best to remove that module as a source of MIDI data. You could do this by removing the MIDI cable that connects the DIN input jack on mio2 to the sound module’s DIN output jack. Another way to do this is to go to the [MIDI Info Page](#) in iConfig and uncheck the “input enable” box.

### **3. Remove MIDI routes that are not necessary.**

As we said earlier, the default factory routing connects “everything to everything” to help you get started. You can improve efficiency by trimming this down so that connections are only made from sources to destinations that require it. You may have a sound module that you only want to connect to your Mac for DAW playback and to one of your MIDI controllers for entering note data. The default routing may have that sound module receiving MIDI data from all other ports. Disconnect all the routes that you don’t absolutely need (see [MIDI Port Routing Page](#)).

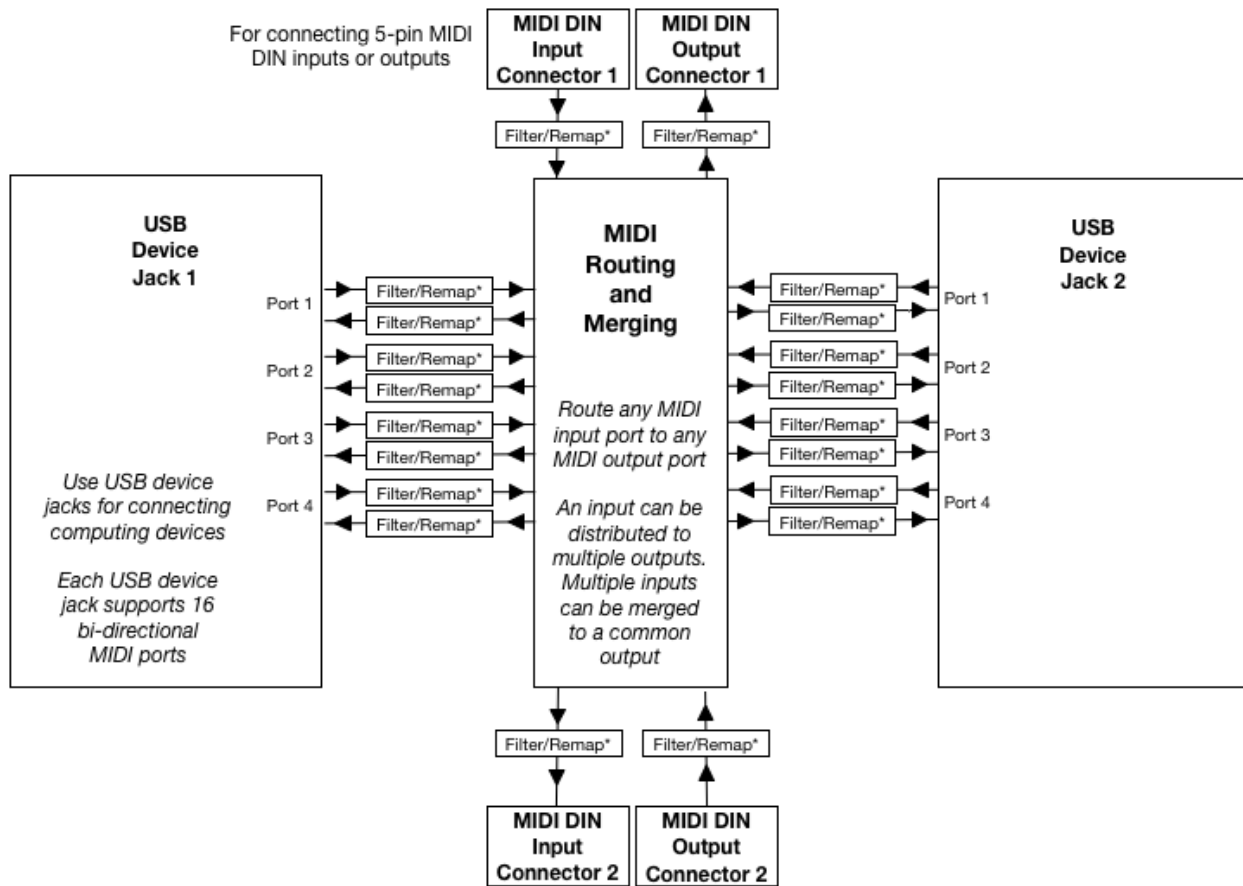
### **4. Enable filters.**

There are many kinds of MIDI data. Some of them you may need in your setup but some you may not. The factory default filters out active sense messages, but all other MIDI data types are enabled. You may have a controller that is sending out after touch messages whenever you press on the keyboard, or is sending out sysex messages whenever you touch something on the front panel, or is sending out MIDI clock messages all the time. If those messages aren’t required by something else in your setup, then filter them out at the source by adding a filter to the MIDI input (see [MIDI Port Filters Page](#)). Similarly, if you have a MIDI sound module that is receiving after touch messages or MIDI clock messages or sysex messages but isn’t using them, then add a filter to the MIDI output. Enabling filters can greatly reduce the amount of unnecessary MIDI data clogging the system.

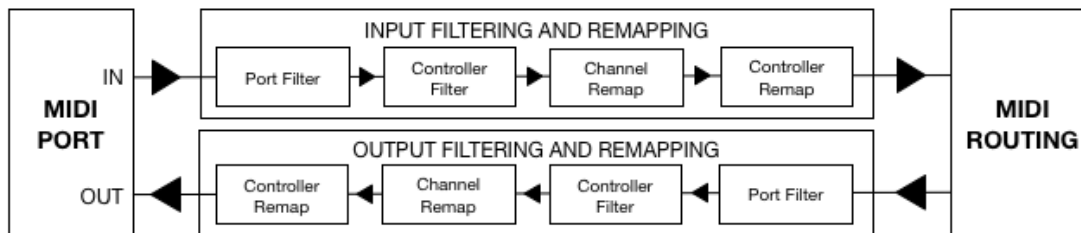
Depending on the loading of your system, the above optimizations can yield a tremendous improvement in data handling and latency.

At iConnectivity we like to design smart interfaces that let you build the system you need and ensure the best performance and lowest latency possible. We hope you enjoy your mio-based setup and wish you the best in your creative endeavors.

# mio2 Block Diagram



\* Filtering and remapping functions available on all MIDI input and output ports



## Support

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