duet
by APOGEE

User's Guide
September 2011

APOGEE

Duet User's Guide

Table of Contents

Package Contents

The following items should be included in your Duet package:

- Duet
- 1 meter FireWire cable
- Duet's breakout cable

Duet

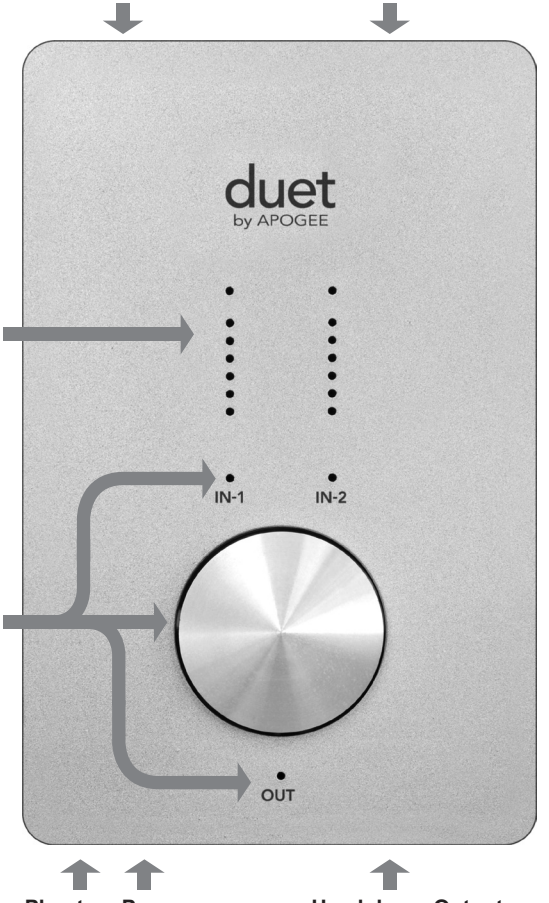
1 meter FireWire cable

Duet's breakout cable

Introducing Duet

FireWire Port
Using the included FireWire cable, connect your Mac here – Duet is powered from the FireWire connection.

I/O Breakout Cable
Using the included breakout cable, connect microphones, instruments, and line outputs here.



Input and Output Level
These LEDs display the level of the input or output selected with the encoder.

The Encoder Knob
Setting levels couldn't be easier. Press the encoder to select an input or output level to set, and turn the encoder to obtain the desired level.

Phantom Power
These LEDs indicate that 48 volt phantom power is engaged on the connections.

Headphone Output
Connect your headphones here.

Quick Start Guide

System Requirements

Mac G4 1GHz or faster, PPC or Intel CPU, 1 GB RAM minimum, 2 GB recommended,
OS X : 10.4.11 or greater must be installed, 10.5.3 or greater highly recommended.

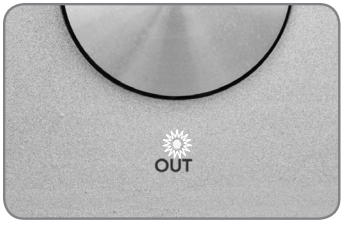
1 **Install Apogee Software Package**
Download the "Duet Software Installer" from:
http://www.apogeedigital.com/downloads.php
and follow the on-screen instructions.

When the installation is complete you will be required to restart your Mac.

Connect FireWire cable

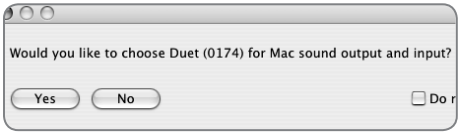
2 After restarting your Mac, connect Duet's FireWire port to a FireWire 400 port on your Mac using the provided cable.

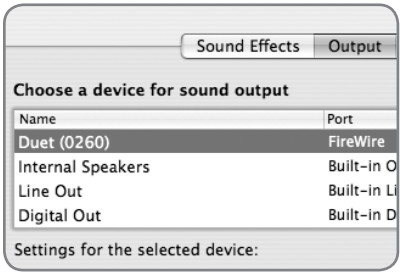
If you Mac has Firewire 800 ports only, connect Duet using a FW400 to FW800 cable. Note that, in this case, the FW800 port runs at the FW400 speed.



As Duet is powered through the FireWire connection, the **OUT** LED should light immediately.

Quick Start Guide





3 **Choose Duet for Mac Sound I/O**

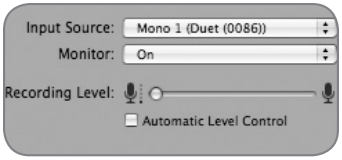
After connecting Duet to your Mac, the dialog box shown at the left will appear. Click **Yes** to choose Duet for Mac sound output and input.

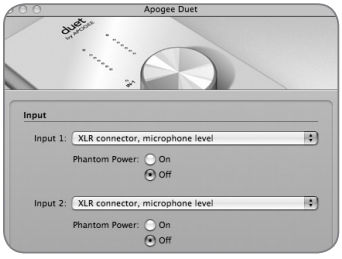
This selection may also be made in the System Preferences > Sound > Output pane.

4 **Connect Headphones**

Now, connect a pair of headphones to Duet's headphone output, open iTunes, and initiate playback of an audio selection. Playback should be audible in the connected headphones and displayed on Duet's top panel meters.

Quick Start Guide





5 Using Duet with GarageBand

4.0.0 or greater recommended

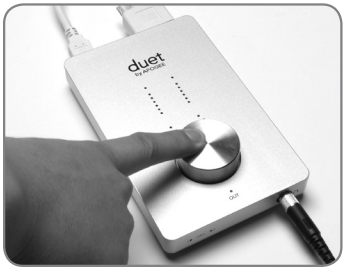
In GarageBand, choose GarageBand > Preferences, click on the Audio/Midi icon and set Audio Output and Audio Input to **Duet**.
Click on the Advanced icon and set Audio Resolution to **Better** or **Best**.

Choose Track > New Basic Track...

Double click the new track's header to view the Track Info pane; in this pane, set Input Source to **Mono 1 (Duet)**; set Monitor to **On**.

To open GarageBand's Apogee Duet control panel, click on the Edit button next to the Input Source menu.

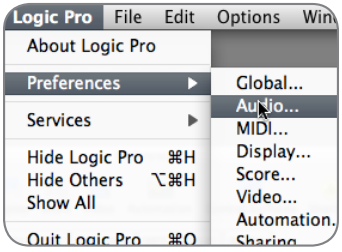
Connect the provided breakout cable to Duet's I/O connection, and connect a mic to the IN-1 XLR connector.



Click the center of the top panel encoder until the **IN-1** LED lights, then turn the encoder to obtain a proper recording level on the record-enabled track.

You're now ready to record!

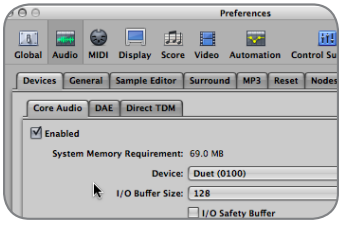
Quick Start Guide



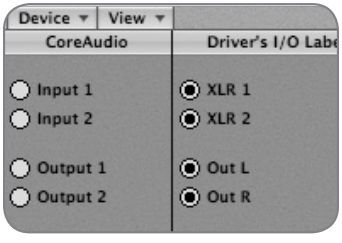
6 Using Duet with Logic Pro/Express

8.0.2 or higher recommended

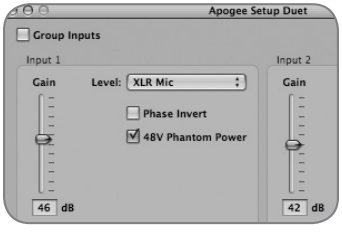
Under the Logic Pro menu, choose Preferences > Audio. Click on the Device tab, then on the Core Audio tab.



In the Core Audio pane, select **Duet** in the Device menu. Select **128** in the I/O Buffer Size menu.



Choose Audio > I/O Labels under the Options menu. Option-click on the first radio button under the Driver's I/O Labels column. Now, Duet's hardware labels appear in the input and output selections of your Logic session.



To control Duet directly from your Logic session, choose Audio > Open Apogee Control Panel under the Options menu.

If you're using another CoreAudio-compatible audio software app, use Apogee's Maestro software (installed in your Applications folder in Step 1) to control Duet.

Operation

Duet's settings may be easily changed using either its top panel encoder or the variety of software control panels described on page 10. Though several options are possible, you can choose the hardware and software controls that best suit your individual needs. For example, Logic Pro users may choose to adjust levels with Duet's top panel encoder and change static settings (such as input selection or phase) from the Apogee Control Panel found in Logic Pro 8. For convenience, many settings may be controlled from multiple control panels. The chart on page 9 indicates the settings and functions that may be changed from each control panel.

Duet Top Panel Encoder

Duet's top panel encoder provides simple and immediate control of input and output level settings.

Output level

To change Duet's output level (i.e the listening level of headphone and connected speakers), press and release the encoder repeatedly until the OUT LED lights. Now, turn the encoder to the desired listening level. The hardware encoder operates in parallel with any software level controls.

Input level

To change Duet's input level (i.e the recording level of mics and instruments), press and release the encoder repeatedly until the IN-1 or IN-2 LED lights. Now, turn the encoder until the desired recording level is obtained (as seen in your recording software).

Mute outputs

To mute the line and headphone outputs simultaneously, press and hold down the encoder until the **OUT** LED blinks; press and hold again to unmute outputs.

MIDI controller

The encoder can also send MIDI Controller and Song Position data to software applications. Please see pages 16-17 for details.

Operation

	Duet Hardware Encoder	Apogee Maestro	Apogee Control Panel (in Logic)	Apogee Duet pane in Garage-Band	Audio MIDI Setup	System Prefs
Input gain	✓	✓	✓	✓		
Input Control - Selection, 48v, Group, Phase		✓	✓	✓		
Output Control - Attenuation, Mute	✓	✓	✓	✓	✓	✓
Output Control - Nominal Level		✓	✓	✓		
Low Latency Mixer		✓				
Advanced Functions		✓	✓*	✓		
MIDI Controller	✓	✓				
Sample Rate (see p.10)					✓	
Assign Duet as Input/ Output for OSX					✓	✓

* All but Gain Mode

Operation

Apogee Maestro

Apogee Maestro software provides the most complete control of Duet, including control of all settings, store/recall of configurations and low-latency mixing. If your recording software doesn't include an Apogee control panel, then use Apogee Maestro to make settings.

Maestro low latency mixer

While recording, if you notice a delay between the moment you play or sing a note and when you hear it in your headphones, Maestro's low latency mixer may help. Please see pages 18-21 for more details about the low latency mixer.

For a more complete explanation of Maestro, please see pages 12-26.

Apogee Control Panel (Logic Pro 8, GarageBand)

The Apogee Control Panel, found in Apple's Logic Pro 8 and GarageBand software, provides control of Duet settings and store/recall of configurations. The control panels in these programs duplicate all of the settings found in the Maestro Control panel.

OS X System Preferences

The OS X System Preferences Sound window provides settings to choose Duet for Mac sound input and output . If you didn't choose Duet for Mac sound I/O in step 3 of the Quickstart guide, you may do so in this window.

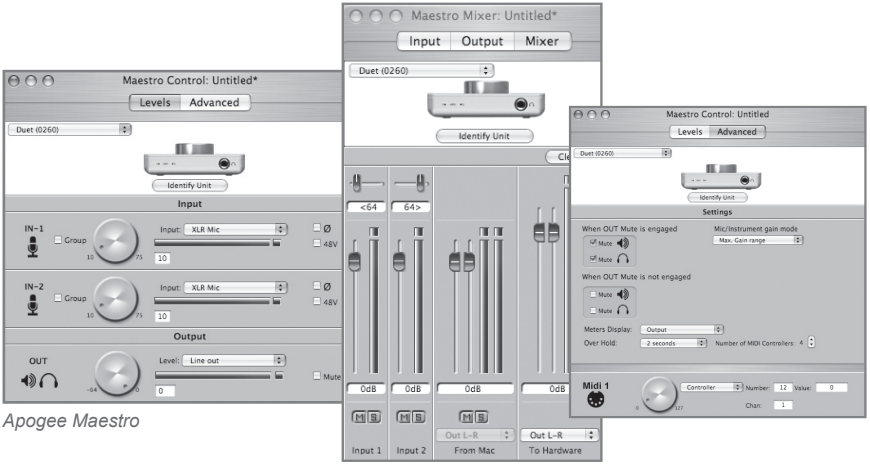
Choose Apple menu > System Preferences;
Open the Sound preference window by clicking on the speaker icon;
Click on the Output tab and select Duet in the Device window;
Click on the Input tab and select Duet in the Device window.

OS X Audio MIDI Setup

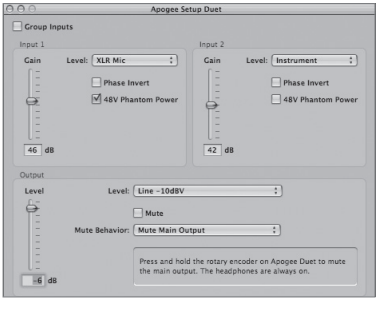
OS X Audio MIDI Setup (found in the Applications/Utilities folder) provides control of Duet's sample rate and output level, as well as settings to choose Duet for Mac sound input and output. To control Duet's output level and muting from AMS or from the Mac keyboard, set Default Output to **Duet**.

Setting Sample Rate

Duet operates at all standard sample rates between 44k1 and 96k. In most cases the sample rate is set by the audio application with which Duet is communicating. For example, when using Duet with GarageBand, Duet's sample rate is automatically set to 44k1, to match the GarageBand song's sample rate. For those audio applications that don't include a sample rate setting, such as iTunes, Duet's sample rate may be set in Audio Midi Setup.

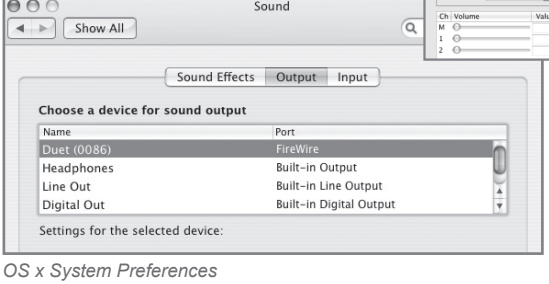


Apogee Maestro



Apogee Control Panel

OS X Audio MIDI Setup



OS x System Preferences

Maestro

Maestro Control – Levels

1 **Interface Menu**
When Duet is properly detected by Maestro, **Duet** plus the unit's serial number appears in this menu.

2 **Identify Unit**
Clicking on this button verifies that communication is established between Maestro software and Duet hardware by lighting all top panel LEDs. Click the button again to return Duet's LEDs to their normal function.

3 **Input**
This menu is used to select the input connector and level:

XLR Line +4dBu – Set Input to **XLR Line +4dBu** if you've connected a professional level line input, such as a pro mixing console, to the **IN** (XLR) connectors.
XLR Line –10 dBV – Set Input to **XLR Line -10dBV** if you've connected a consumer level line input, such as a CD player, to the **IN** (XLR) connectors.
XLR Mic – Set Input to **XLR Mic** if you've connected a microphone to the **IN** (XLR) connectors. The gain is adjustable between 10 and 75 dB.
Instrument – Set Input to **Instrument** if you've connected a guitar or keyboard to the **IN** (1/4") connectors; gain is adjustable between 0 and 65 dB. It's also possible to connect CD players and other consumer level (-10 dBV) devices to these inputs.

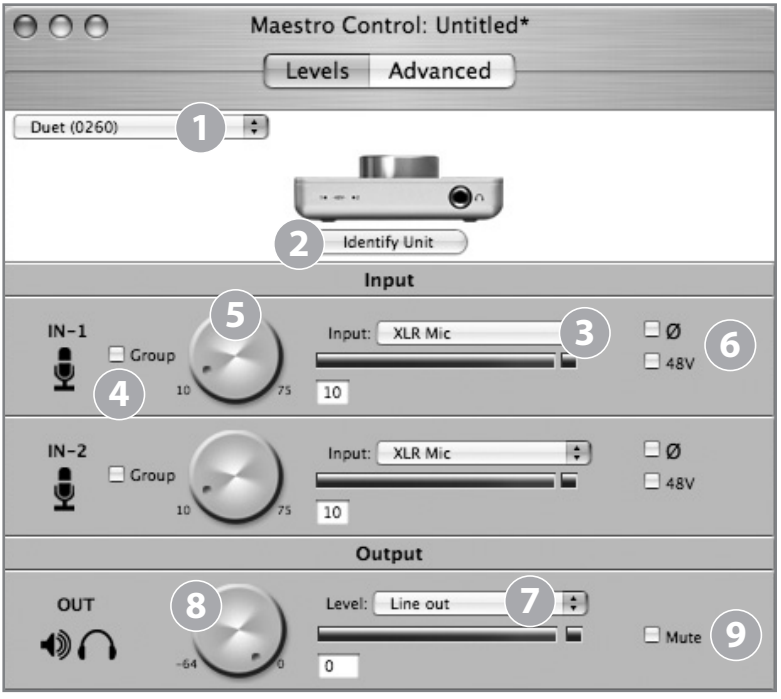
When **Input** is set to **XLR Mic** or **Instrument**, the following controls are accessible:

4 **Group** – Check either of these boxes to group the gain setting of both inputs, so that the hardware encoder or one software encoder controls both input gains simultaneously. If a gain offset is present between inputs when **Group** is checked, this offset is preserved.

5 **Input Level Software Encoder** – The gain of each input may be controlled from these software encoders. The gain level is indicated in the value box to the right of the encoder.

6 **Phase icon** – Check this box to reverse the polarity of the input signal. Under certain circumstances when two mics are used on one source, reversing the polarity of one mic may result in a fuller sound. For example, when placing mics over and under a snare drum, a fuller sound is obtained when the polarity of the bottom mic is reversed.
48V – Check this box to enable 48 volt phantom power on the XLR connections. Condenser mics require phantom power to operate.

Maestro



7 **Level**

The nominal or average level of the line outputs is set with this menu:

Line out – Set Level to **Line out** when connecting Duet's **OUT-L** or **OUT-R** connectors to powered speakers, a hi-fi system or a mixing console.

Instrument Amp – Set Level to **Instrument Amp** when connecting Duet's **OUT-L** or **OUT-R** connectors to an instrument amp input. The output level is fixed.

8 **Output Level Software Encoder**

The level of both line and headphone outputs is controlled simultaneously with this software encoder, when **Level** is set to **Line out**. The attenuation level is indicated in the value box to the right of the encoder.

9 **Mute**

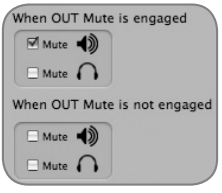
Checking this box mutes the line and headphone outputs simultaneously.

Maestro

Maestro Control – Advanced

1 **OUT Muting** – These check boxes determine which outputs actually mute when the **Mute** function is engaged. Here are a few example settings:

When boxes are checked as shown at left, it's possible to switch between a recording mode (headphones on, speakers connected to line outputs off) and a playback mode (headphones off, speakers on) with one action – engaging and disengaging **Mute**. As the volume control for the two outputs is shared, it's a good idea to check your level before unmuting line outs.



When boxes are checked as shown at left, the headphone outputs are never muted; when **Mute** is engaged, only the line outputs are muted.

2 **Mic/Instrument gain mode** – This menu sets the input gain mode:

Max. Gain range – The full range of gain is available, with a relay switch occurring after the first 10 dB of gain.

Clickless Operation – The gain range is reduced slightly but no relays are employed, resulting in clickless operation regardless of gain setting. An appropriate gain range is set based on the **Input** and **48V** settings.

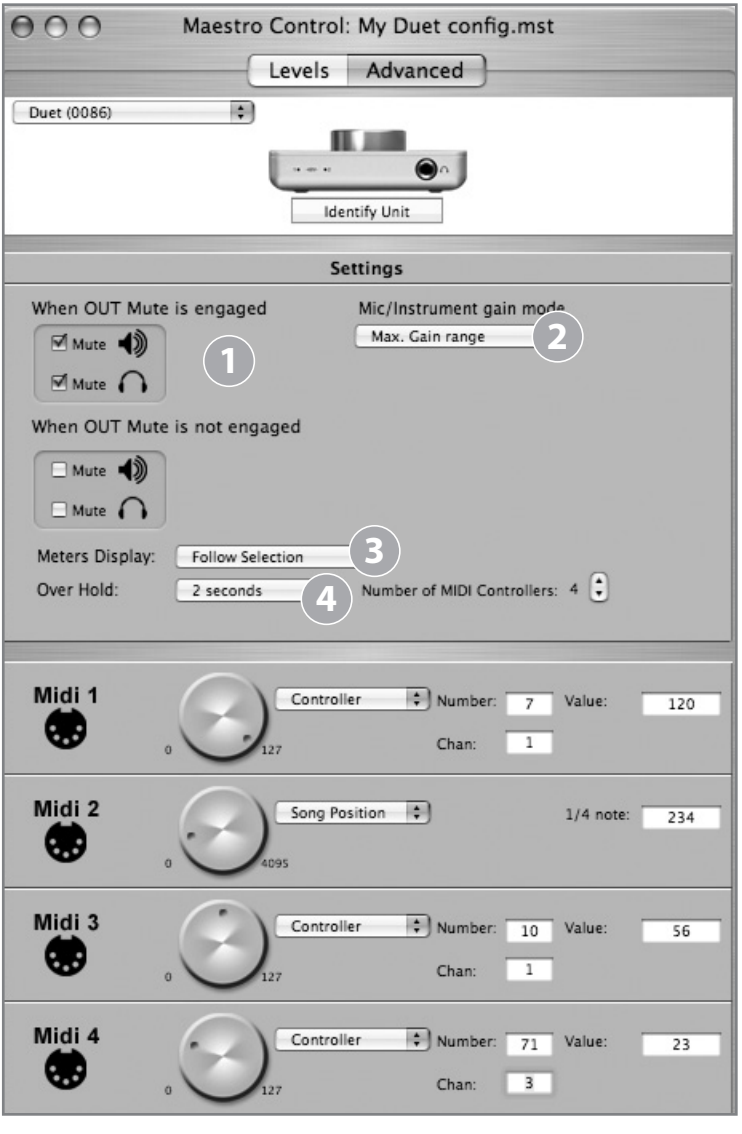
3 **Meters Display**

This menu selects the signal to be displayed on the top panel meters; selections are **Input**, **Output**, or **Follow Selection**. When **Follow Selection** is chosen, the meter display follows the top panel setting indicator; thus, when either **IN-1** or **IN-2** is selected, the meter displays both inputs, when **OUT** is selected, the meter displays the stereo output.

4 **Over Hold**

When **Over Hold** is set to **Infinite**, Over indications remain "on" until cleared by the user. Overs may be cleared by clicking on the Over indicator or clicking **Clear Overs** in the Maestro Mixer pane. When **Over Hold** is set to **2 seconds**, Over indications clear automatically after two seconds.

Maestro


Maestro Control: My Duet config.mst
Levels
Advanced
Duet (0086)
Identify Unit
Settings
When OUT Mute is engaged
Mute
Mute
1
Mic/Instrument gain mode
Max. Gain range
2
When OUT Mute is not engaged
Mute
Mute
Meters Display:
Follow Selection
3
Over Hold:
2 seconds
4
Number of MIDI Controllers: 4
Midi 1
Controller
Number: 7
Value: 120
Chan: 1
0
127
Midi 2
Song Position
1/4 note: 234
0
4095
Midi 3
Controller
Number: 10
Value: 56
Chan: 1
0
127
Midi 4
Controller
Number: 71
Value: 23
Chan: 3
0
127

Maestro

Maestro Control – Advanced: MIDI Controllers

1 **Number of MIDI Controllers** – To access Duet's MIDI functionality, instantiate 1 to 4 virtual MIDI controllers using this counter. Once 1 or more MIDI controllers are instantiated, they may be modified with either the top panel encoder or the corresponding software encoder. To select a MIDI controller using the top panel encoder, press the encoder until the Duet pop-up displays selection of the desired MIDI controller (see p. 16 for more about Duet pop-ups). Note that when MIDI controllers are selected, none of the top panel (**IN-1**, **IN-2** ,**OUT**) LEDs are lit.

When **Number of MIDI Controllers** is set to **1** to **4**, the following settings are accessible:

2 **MIDI encoder** – This software encoder is used to send MIDI Controller or Song Position data to software applications

When the function menu is set to **Controller**, the following settings are accessible:

3 **Number** – This box displays the MIDI Continuous Controller number. The full range of 7-bit controls (0 to 127) may be entered.

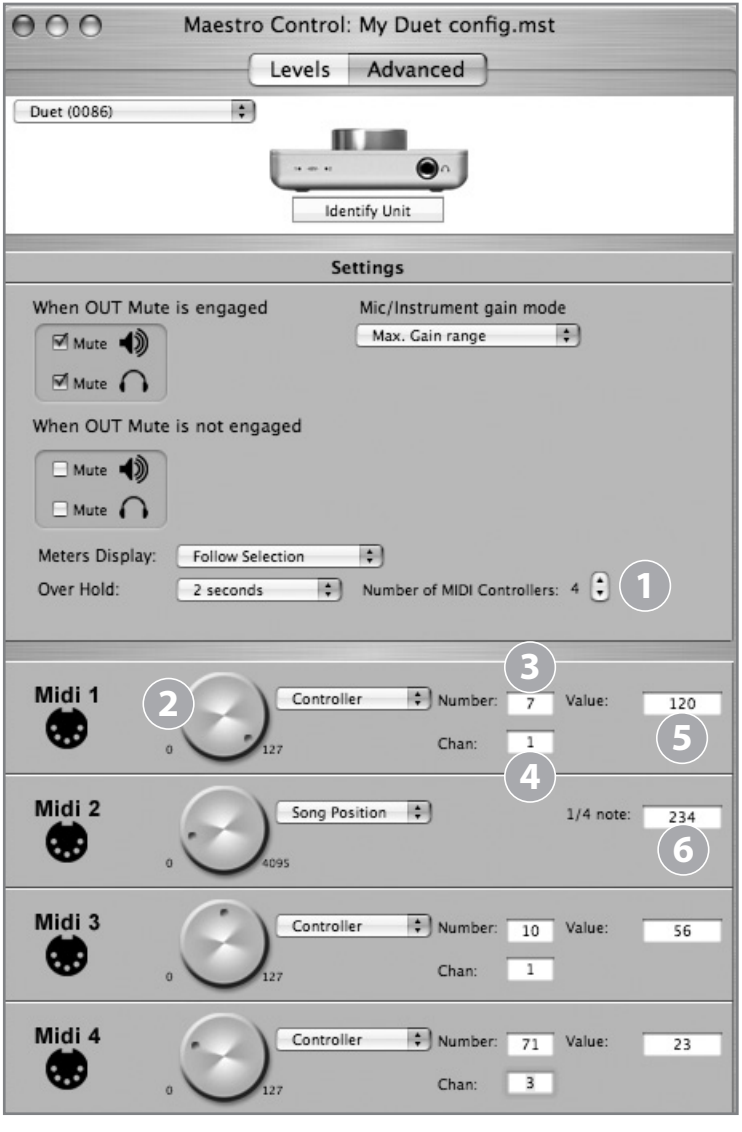
4 **Chan**: – This box displays the MIDI channel over which controller data is sent. Numbers between 1-16 may be entered.

5 **Value** – Numbers in the range 0-127 may be directly entered (followed by **Enter** or **Return** keys to accept the value), though rotation of the encoder will override numerical entry.

When the function menu is set to **Song Position**, the following setting is accessible:

6 **1/4 Note** – This box displays the current Song Position location, as defined as the number of 1/4 note beats from the beginning of the song, beat 0

Maestro


Maestro Control: My Duet config.mst
Levels
Advanced
Duet (0086)
Identify Unit
Settings
When OUT Mute is engaged
Mute
Mute
Mic/Instrument gain mode
Max. Gain range
When OUT Mute is not engaged
Mute
Mute
Meters Display:
Follow Selection
Over Hold:
2 seconds
Number of MIDI Controllers: 4
1
Midi 1
2
0
127
Controller
Number: 7
Value: 120
Chan: 1
3
4
5
Midi 2
0
4095
Song Position
1/4 note: 234
6
Midi 3
0
127
Controller
Number: 10
Value: 56
Chan: 1
Midi 4
0
127
Controller
Number: 71
Value: 23
Chan: 3

Maestro

Low Latency mixing

Before describing the functions of Maestro's Mixer pane, a bit of background information concerning latency and computer-based digital recording setups will help you better understand these functions.

When recording with most computer-based digital audio applications, the delay between the input and output of the recording system often disturbs the timing of the musicians performing. This delay, known as latency, means that the musician hears the notes he's produced a few milliseconds after having produced them. As anyone who has spoken on a phone call with echo knows, relatively short delays can confuse the timing of any conversation, spoken or musical.

To illustrate the effect of latency, figure A depicts the typical signal path of a vocal overdub session. A vocalist sings into a microphone, which is routed to an analog to digital converter, then to the audio software application for recording. In the software application, the vocalist's live signal is mixed with the playback of previously recorded tracks, routed to a digital to analog converter, and finally to the vocalist's headphones. A slight delay accumulates at each conversion stage, while a much greater amount of delay occurs through the software application, resulting in the vocalist hearing his performance in headphones delayed by several milliseconds.

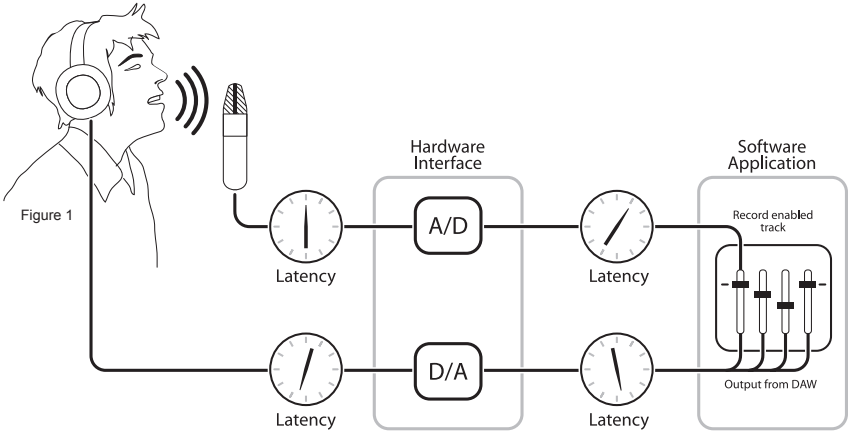


Figure A

Maestro

Low Latency mixing - continued

By routing the hardware input directly to the hardware output and mixing in playback as shown in Figure B, it's possible to provide the vocalist a headphone monitoring signal with a much shorter delay.

First, the signal being recorded (in this case, a vocal mic) is split just after the A/D stage and routed to both the software applicaton for recording and directly back to the hardware outputs without going through the latency-inducing software; this creates a low latency path from mic to headphones. Next, a stereo mix of playback tracks is routed to the low latency mixer and combined with the hardware input(s). This allows the performer to hear himself without a confusing delay while listening to playback tracks in order to record overdubs.

Note that the software application's mixer is used to set a stereo mix of playback tracks while the low latency mixer is used to set the balance between the stereo playback mix and the hardware inputs.

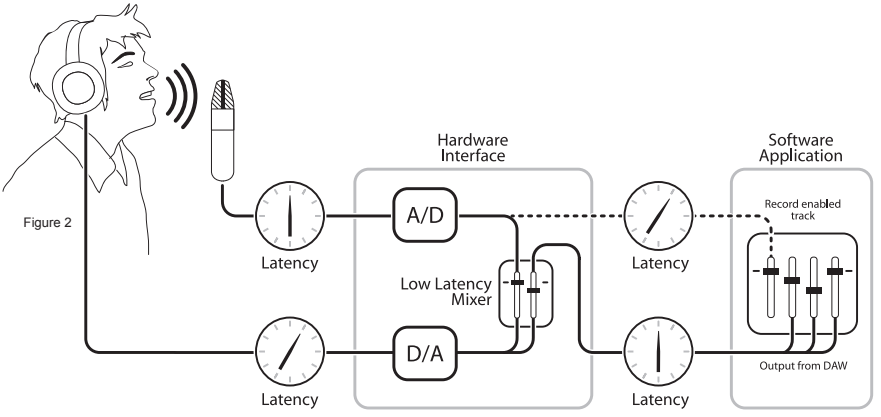
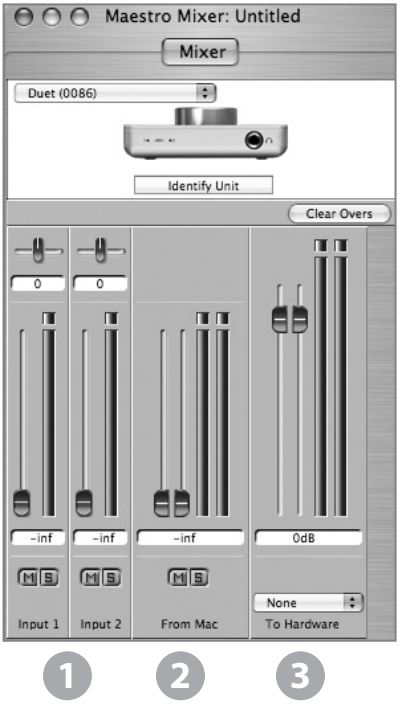


Figure B

Maestro

Maestro Mixer

The Maestro mixer provides the ability to blend Duet's hardware inputs with playback from an audio application, and route the resulting mix to Duet's hardware outputs. Using the Maestro mixer, it's possible to create a monitor mix where latency isn't a problem.



1. **Input 1**, **Input 2** – These channels provide mixing facilities to route and mix signal from each of Duet's hardware inputs directly to Duet's hardware outputs. The actual input source is determined by the Input setting (p. 12).

2. **From Mac** - This channel provides mixing facilities to mix the output of an audio application to Duet's hardware outputs.

3. **To Hardware** – This channel provides mixer output level and routing.

   When **To Hardware** is set to **Out L-R**, the mixer's output is sent to Duet's hardware outputs.

   When **To Hardware** is set to **None**, the mixer is disabled and the audio application's output is sent directly to Duet's hardware outputs, thus bypassing the Maestro Mixer.

Working with the Maestro Mixer

Do I need the Maestro Mixer?

The Maestro mixer serves to provide a low latency monitoring mix while recording. Therefore if you're using Duet to listen to iTunes or audio from another program, there's no need to use the mixer. Set **To Hardware** to **None** to disable the mixer.

It's possible that the latency of your particular recording system is low enough to be unnoticed. The system latency is determined by the recording software's buffer setting, and if your Mac is powerful enough, it's possible to set the buffer to a lower value (shorter latency) without encountering clicks and pops in the audio output. If the latency doesn't pose a problem while recording, the mixer may be disabled by setting **To Hardware** to **None.**

Recording software settings

Before using the Maestro mixer, it's necessary to change a few settings in your recording software.

Software monitoring - Because the signal to be recorded is monitored through the Maestro mixer, the outputs of software tracks actively recording should be muted - after all, that's the source of the latency. Most software applications provide an option to turn off software monitoring of recording tracks. In Logic Pro, for example, the software monitoring option is found in the same Audio preferences window used to select Duet as the hardware device (Logic Pro > Preferences > Audio). Uncheck the Software Monitoring box.

Playback mix - In your recording software, set up a mix of all playback tracks and route it to Out L-R. If a master fader controls the global output of the mix, it's suggested to set the fader to 0 dB.

Maestro settings

Maestro Mixer settings - Initially, set the Input, **From Mac** and **To Hardware** faders to 0 dB. Set the **To Hardware** menu to Out L-R.

After making the input selection and setting gain (as described on page 12), the signal should be displayed on both the Input and To Hardware meters. If the Input's Over LED lights, reduce the input gain in the Maestro Control window. If the To Hardware's Over LEDs light, reduce the Input fader.

Now start playback from the session. The playback signal should be displayed on the From Mac and To Hardware's meters. Use the From Mac and Input faders to establish a balance between the input and playback signals. If you've found a good balance but the To Hardware's Over LEDs light, reduce the To Hardware fader.

Maestro

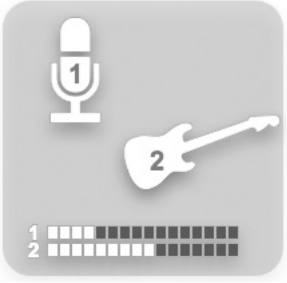
Maestro Preferences – Duet Preferences

The two Maestro preferences specific to Duet are described below. For a description of other preference settings, please see page 24.

Launch Maestro automatically when connecting a device
When this box is checked, Maestro is launched automatically when Duet is discovered on the Mac's FireWire bus. In order for Maestro mixer settings to be recalled after the computer restarts, this box must be checked. If this preference is unchecked, Maestro Mixer settings won't be preserved after the Mac has been shut down or restarted.

Enable Duet pop-ups
When this box is checked, Encoder pop-ups appear on the Mac which display various Duet settings, including input and output levels, **Input**, **Group** and muting. To illustrate, a few examples are shown below:

IN-1 selected,
Input set to **XLR Mic**,
encoder set to 40 dB



IN-1 and **IN-2** selected,
Group checked,
Input 1 set to **XLR Mic**,
Input 2 set to **Instrument**,
encoder 1 set to 30 dB,
encoder 2 set to 40 dB.

Maestro

OUT Level set to –12 dB
Mute engaged
OUT muting set as below

Mute engaged,
OUT muting set as below

Encoder set to modify MIDI Controller 1

Maestro

Menu by Menu

Maestro > About Maestro

Selecting this menu item opens the window shown at right, which indicates various software and firmware versions.

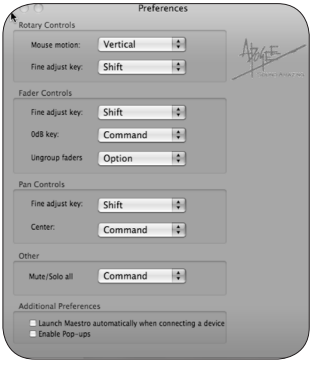
Maestro > Preferences

Selecting this menu item opens the Preferences window, in which mixer control actions may be defined.

Rotary Controls

Mouse motion – This selection defines the motion of the mouse required to adjust rotary controls.

Fine adjust key – This selection defines the key command to make fine adjustments to any rotary control.



Fader Controls

Fine adjust key - This selection defines the key command to make fine adjustments to any fader control.

0dB key – This selection defines the key command to set the fader to 0 dB when clicking in the level value window.

Ungroup faders - This selection defines the key command to adjust one side of the stereo From Mac and To Hardware faders.

Pan Controls

Fine adjust key - This selection defines the key command to make fine adjustments to any pan control.

Center - This selection defines the key command to set the pan control to <0>, or center, when clicking in the pan value window.

Other

Mute/Solo all - This selection defines the key command to engage all Mutes or Solos when clicking on the Mute or Solo buttons.

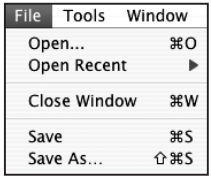
Additional Preferences

Launch Maestro automatically when connecting a device - When this box is checked, Maestro is launched automatically when Duet is detected.

Maestro

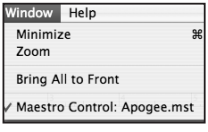
Menu by Menu

Maestro > Hide Maestro
Choosing this menu item hides the Maestro application.
Maestro > Hide Others
Choosing this menu item hides all other open applications.
Maestro > Show All
If Hide Others has been previously selected, choosing this menu item reveals all open applications in the Finder.
Maestro > Quit Maestro
Choosing this menu item closes the Maestro program.



File:
File > Open
Choose this menu item to navigate to a previously saved Maestro configuration file and open it.
File > Open Recent
Choose this menu item to re-open a recently opened Maestro configuration file.
File > Close Window
Choose this menu item to close the "active", or up-front, window.
File > Save
Choose this menu item to save the current settings of all windows.
File > Save As
Choose this menu item to save the current settings of all windows as a newly named file.

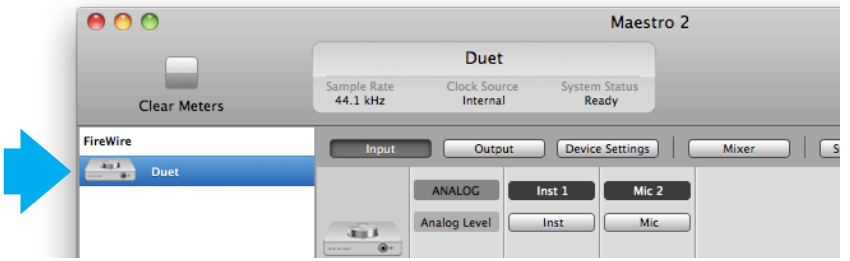
Tools:
Tools > Maestro Control
Choosing this menu item opens the Maestro Control window.
Tools > Maestro Mixer
Choosing this menu item opens the Routing/Mixer window.
Tools > Reset Symphony Clocking
In certain instances Apogee interfaces can't be detected until the clock setting of the first interface has been reset. Choosing Reset Symphony Clocking allows the reset of clock source on the first interface to Internal or External.
Tools > Refresh Connections
Choosing this menu item re-scans computer connections for connected Apogee hardware.
Tools > Reset Mixer
Maestro mixers may be reset with this menu item; choose Reset Displayed to reset the mixer displayed in the Maestro Mixer window; choose Reset All to reset all mixers.
Tools > Reset Routing
Choosing this menu item resets the Input and Output panes to a "pass through" configuration, where hardware and software I/O are connected on a one to one basis.



Window:
Window > Minimize
Choosing this menu item minimizes the up-front window to the OS Dock.
Window > Zoom
Choosing this menu item maximizes the size of the active Maestro window.
Window > Bring All to Front
Choosing this menu item places all Maestro windows in front of other applications' windows.

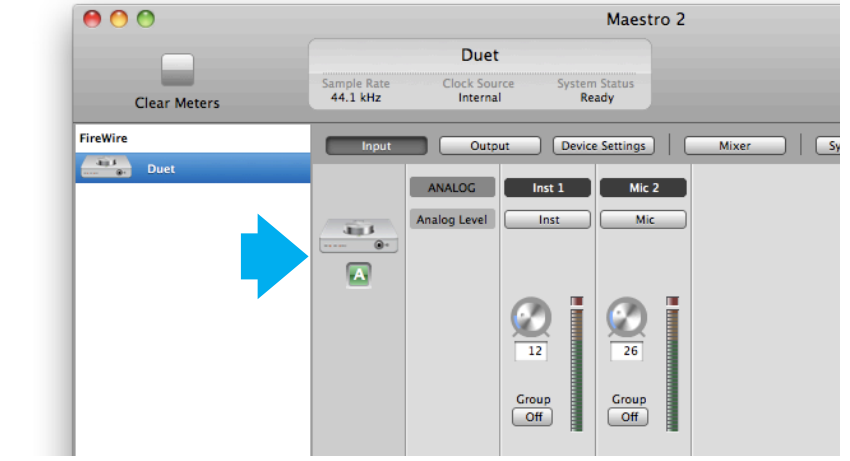
Maestro 2

Devices Sidebar



Any Maestro-compatible Apogee interfaces connected to the host computer are displayed in the Devices sidebar, regardless of whether the connection is made via Symphony PCI card, USB or FireWire. Hardware settings are displayed by first selecting one or more interfaces in the Devices sidebar and then clicking on a tab.

Device Icon & ID Button



A device icon and ID button is placed adjacent to each row of parameters to identify the hardware unit to which the row belongs. By clicking on the ID button, the corresponding hardware unit's front panel will illuminate. Each hardware unit is assigned a Peripheral Prefix (A-Z, found in Maestro's Device Settings tab window) which is displayed on the ID button.

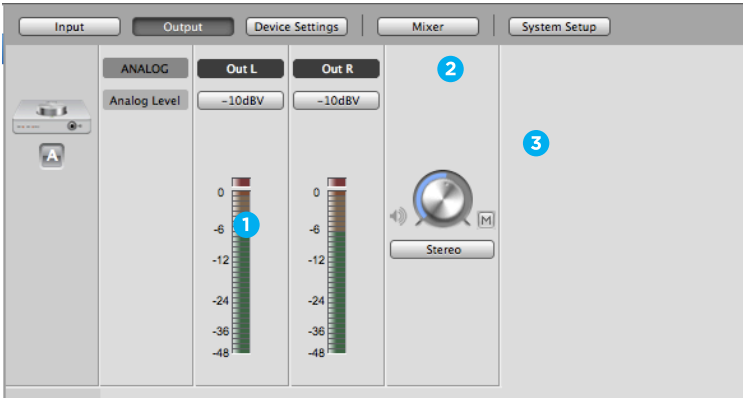
Maestro 2

Input Tab Window

1. Analog Level - Use this menu to select microphone, instrument, or line input.
2. Input Level - The gain of each input is controlled with these software knobs. The gain level is indicated in the value box below the knob.
3. Analog Input Meter - This meter displays the level of the analog input after A/D conversion.
4. Group On/Off - Use this to group the gain setting of both inputs so that the multi-function knob on Duet or one software gain knob controls both input gains simultaneously. If a gain offset is present between inputs when Group is set to On, this offset is preserved.
5. Phase - Check this box to reverse the polarity of the input signal. Under certain circumstances, when two mics are used on one source, reversing the polarity of one mic may result in a fuller sound. For example, when top and bottom mic'ing a snare drum, a fuller sound is obtained when the polarity of the bottom mic is reversed.
6. 48 V / Phantom Power - Engage this button for 48 volts phantom power on the XLR connections. Condenser mics require phantom power to operate.

Maestro 2

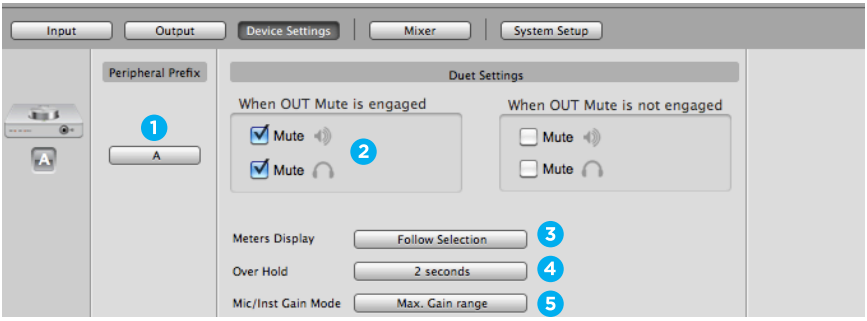
Output Tab Window



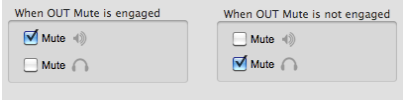
1. Analog Output Meter - This meter displays the level of the analog output before D/A conversion, in the range -48 to 0 dBFS.
2. Speaker Out Selection - This menu selects the software output that is sent to the speaker and headphone outputs.
3. Speaker Out Level - This knob controls the speaker and headphone output level.
Mute - Engage this to mute the speaker and headphone outputs.

Maestro 2

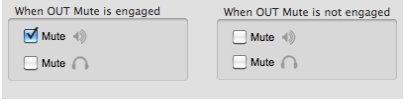
Device Settings Tab Window



1. Peripheral Prefix - Use this drop down menu to assign a letter prefix (A-Z) to each peripheral device displayed in the Devices Sidebar. The letter prefix is included in all graphic representations of the peripheral as well as I/O labels in Maestro and Core Audio compatible applications.
2. OUT Muting - These check boxes determine which outputs actually mute when the Mute function is engaged. Here are a few example settings:



When boxes are checked as shown above, it's possible to switch between a recording mode (headphones on, speakers off) and a playback mode (headphones off, speakers on) with one action – engaging and disengaging Mute. As the volume control for the two outputs is shared, it's a good idea to check your level before unmuting speakers.



When boxes are checked as shown above, the headphone outputs are never muted; when Mute is engaged, only the speaker outputs are muted.

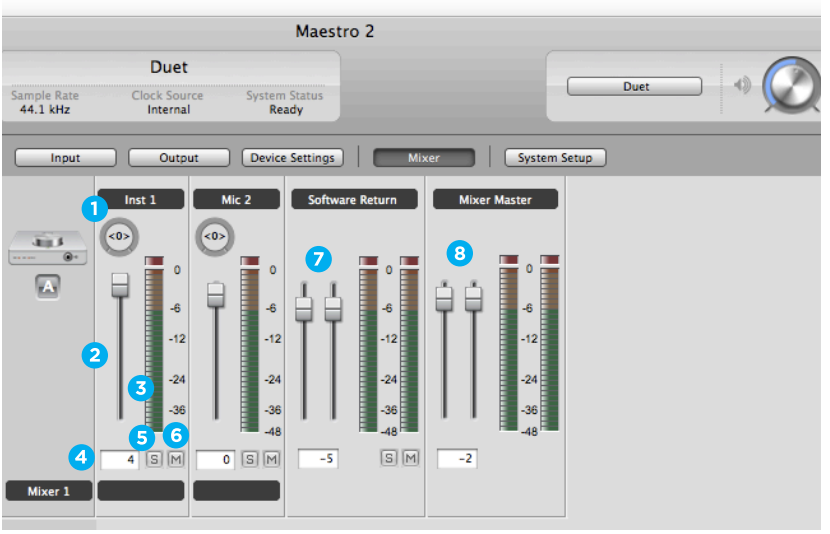
3. Meters Display - This menu selects the signal to be displayed on the top panel meters; selections are Input, Output, or Follow Selection. When Follow Selection is chosen, the meter display follows the top panel setting indicator; thus, when either IN-1 or IN-2 is selected, the meter displays both inputs, when OUT is selected, the meter displays the stereo output.
4. Over Hold - When Over Hold is set to Infinite, Over indications remain "on" until cleared by the user. Overs may be cleared by clicking on the Over indicator or clicking Clear Overs in the Maestro Mixer pane. When Over Hold is set to 2 seconds, Over indications clear automatically after two seconds.

5. Mic/Instrument gain mode - This menu sets the input gain mode:
Max. Gain range - The full range of gain is available, with a relay switch occurring after the first 10 dB of gain.
Clickless Operation - The gain range is reduced slightly but no relays are employed, resulting in clickless operation regardless of gain setting.
An appropriate gain range is set based on the Input and 48V settings.

Maestro 2

Mixer Tab Window

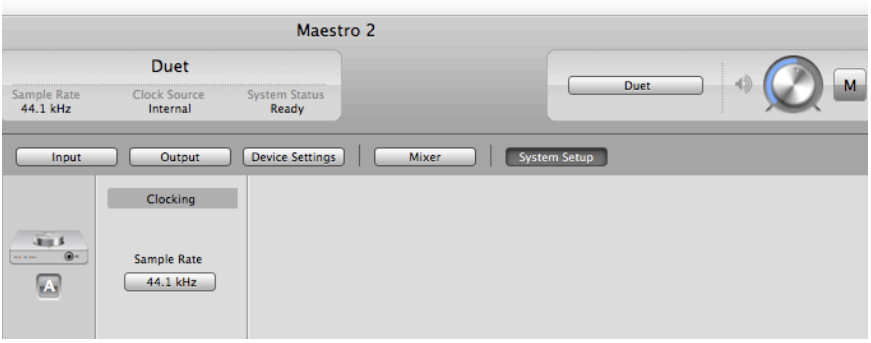
Use the Mixer Tab Window to adjust the Mix of input and output signals as well as configure Low Latency Mixing.



1. Pan - This rotary knob pans the input signal between he left and right sides of the Maestro mixer's stereo output.
2. Input Level fader - This slider sets the level of the input signal in the Maestro mixer's stereo output.
3. Meter - This bargraph style meter displays the pre-fader input level.
4. Level Value Window - The level value, between -48 and 0 dBFS.
5. Solo - This button mutes all other channels whose Solo buttons are not engaged.
6. Mute - This button mutes the input channel.
7. Software Return Fader - This stereo input channel provides level control, metering, and mute/solo functions for the signal from the software application containing playback.
8. Mixer Master - This is the level control and meter for the mixer's output.

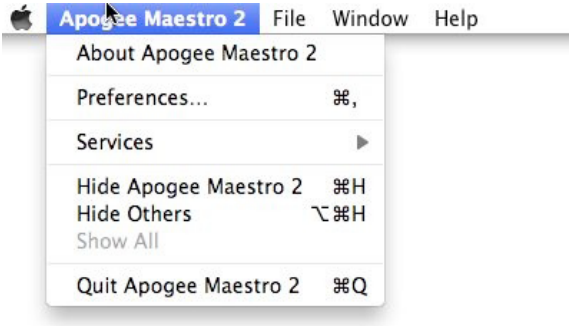
Maestro 2

System Setup Window



1. Sample Rate - This drop down selects the sample rate. Under certain circumstances, (for example, when a DAW session is open) this setting will be overridden by software sample rate settings.

Menu Bar Menus

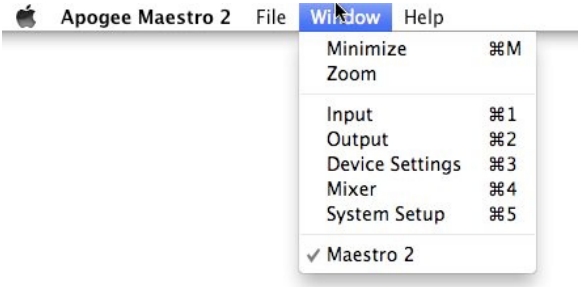


About Apogee Maestro - Choose this menu item to display version information.
Preferences - Choose this menu item to display Maestro's Preference panel.
Check Launch Maestro automatically when connecting a device to launch Maestro when the Mac is started.
Check Display Pop-ups to show top panel encoder adjustments.
Hide Apogee Maestro 2 - Choose this menu item to hide the Maestro application.
Hide Others - Choose this menu item to hide all other open applications.
Show All - If any open applications have been hidden, choose this menu item to reveal all open applications.
Quit Apogee Maestro 2 - Choose this menu item to quit Maestro.

Maestro 2

Menu Bar Menus

Close - Choose this menu item to close the Preferences panel when opened.
Rescan - Choose this menu item to re-initialize the link between Maestro software and Apogee hardware connected to the Mac, in the case where the hardware is correctly connected and powered on but not detected in Maestro.



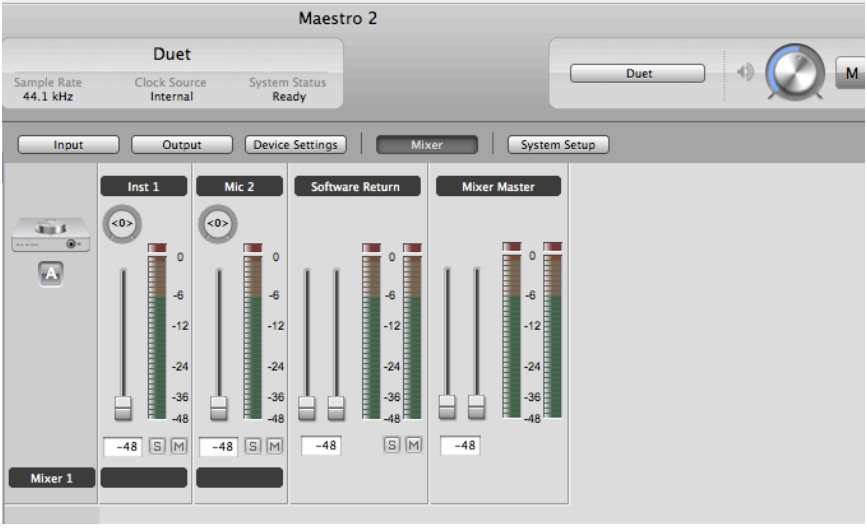
Minimize - Choose this menu item to minimize the Maestro window to the OS X Dock.
Zoom - Choose this menu item to maximize the size of the Maestro window.

Choose any of the currently active tabs to open the tab window.
Type Command + number to open the tab window.

Maestro 2

Low Latency Mixing

While recording, if you notice a delay between the moment you play or sing a note and when you hear it in your headphones you are experiencing latency. Maestro's low latency mixer may help and can be configured by clicking the Mixer tab in Maestro.



Maestro Low Latency mixing

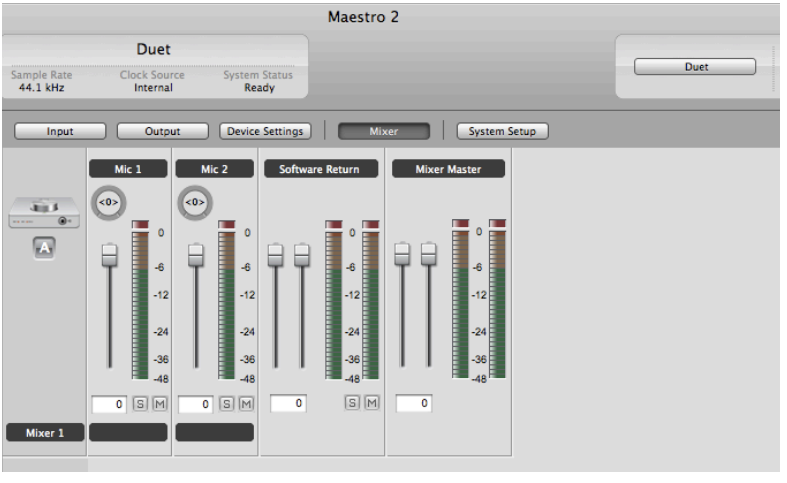
A bit of background information concerning latency and computer-based digital recording setups will help you better understand these functions.

When recording with most computer-based digital audio applications, the delay between the input and output of the recording system often disturbs the timing of the musicians performing. This delay, known as latency, means that the musician hears the notes played a few milliseconds after having actually played them. As anyone who has spoken on a phone call with echo knows, relatively short delays can confuse the timing of any conversation, spoken or musical.

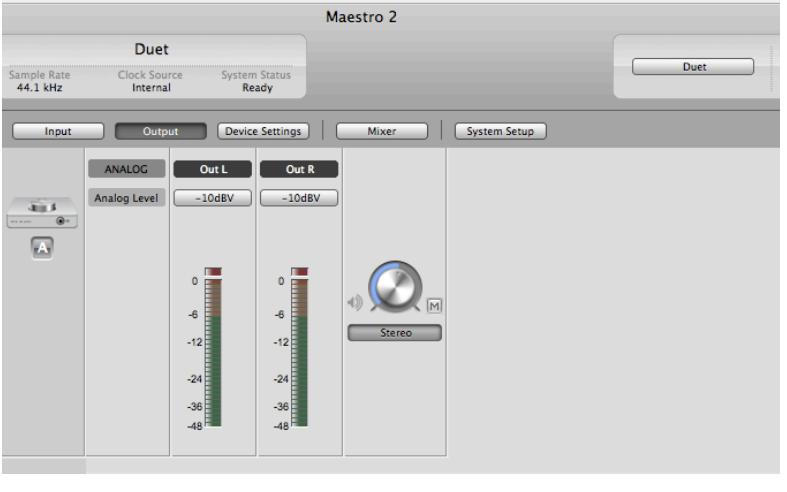
Maestro 2

Maestro Mixer Settings

Initially, set the Input, Software Return, and Mixer Master faders to 0 dB.



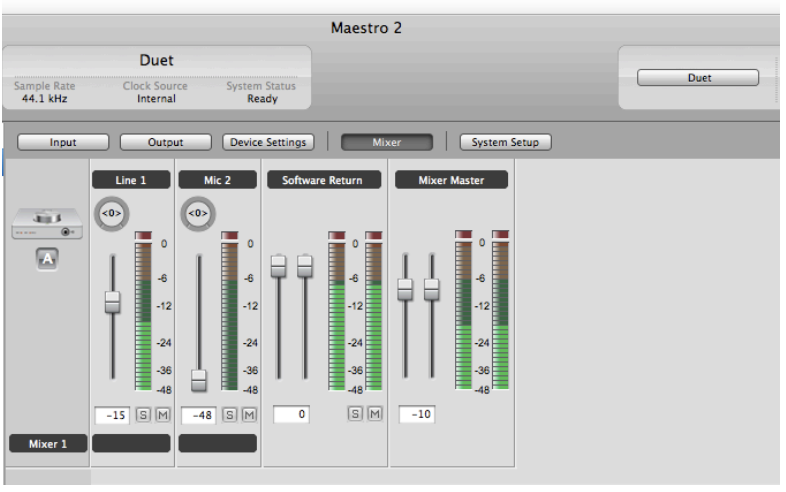
On the Output tab of Maestro, set the speaker, headphone, or both outputs to Mixer.



Maestro 2

Maestro Mixer Settings

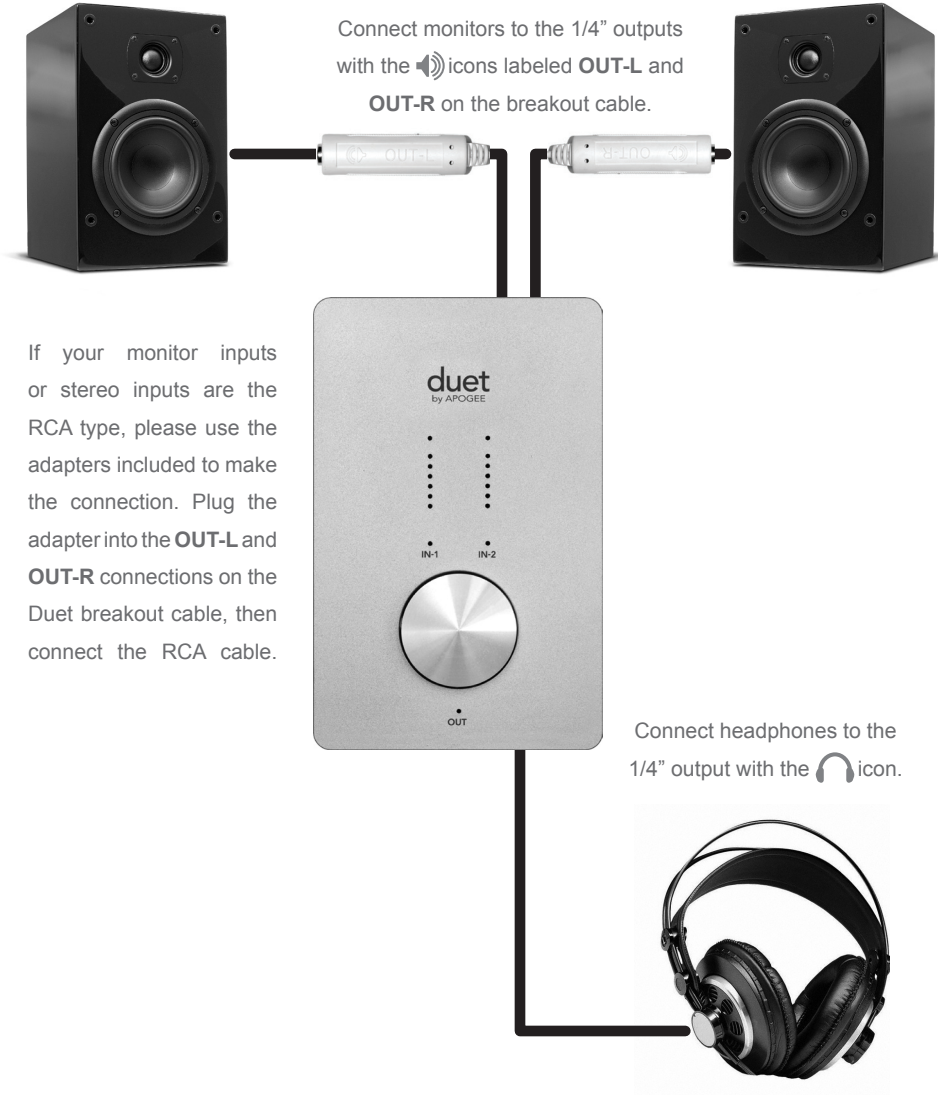
After making the input selection and setting gain, the signal should be displayed on both the Input and Mixer Master meters. If the Input's Over LED lights, reduce the input gain in the Maestro Control window. If the Mixer Master's Over LEDs light, reduce the Input fader.



Now start playback in your recording software. The playback signal should be displayed on the Software Return and Mixer Master's meters. Use the Software Return and Input faders to establish your desired balance between the input and playback signals. If you've found a good balance but the Mixer Master's Over LEDs light, reduce the Mixer Master fader.

Connecting Your Duet:

Monitors and Headphones

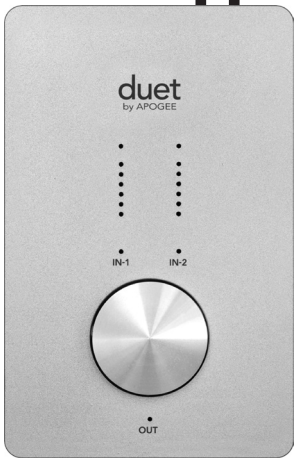


Connecting Your Duet:

Instrument and Mic

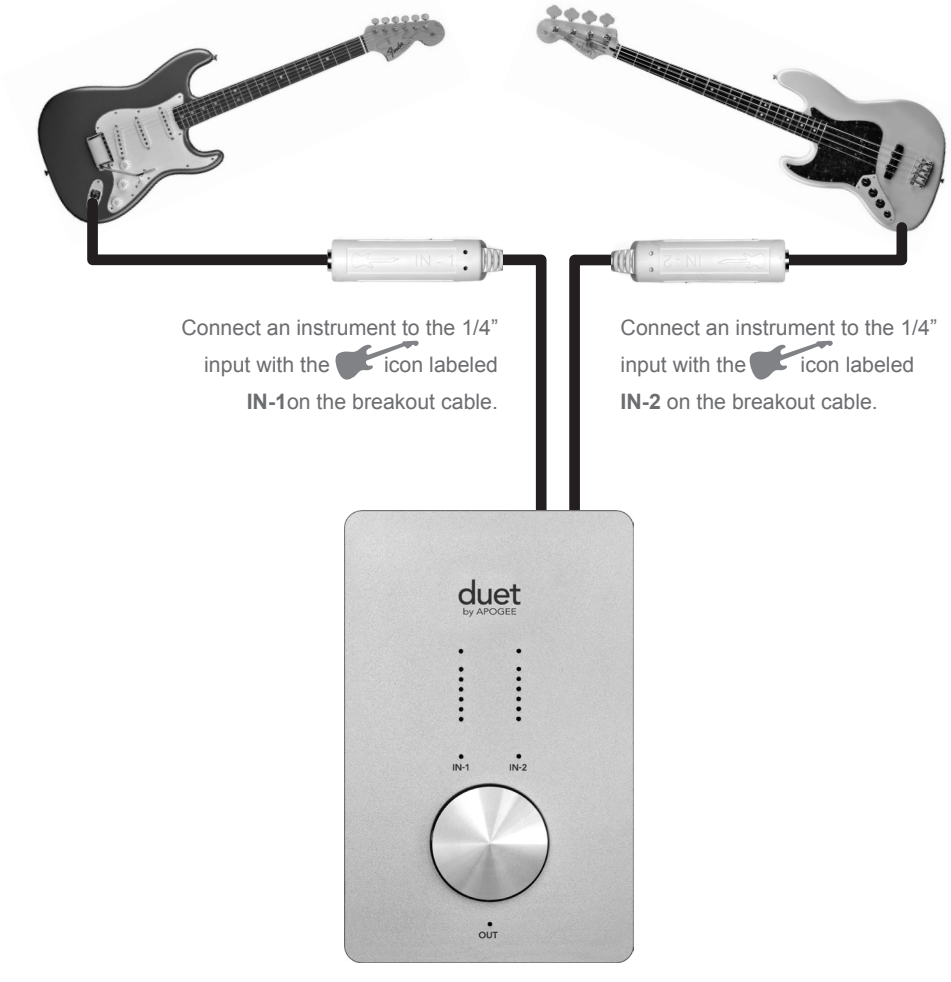
Connect an instrument to the 1/4" input with the icon labeled **IN-1** on the breakout cable.

Connect a microphone to the XLR input with the icon labeled **IN-2** on the breakout cable..



Connecting Your Duet:

Instrument and Instrument

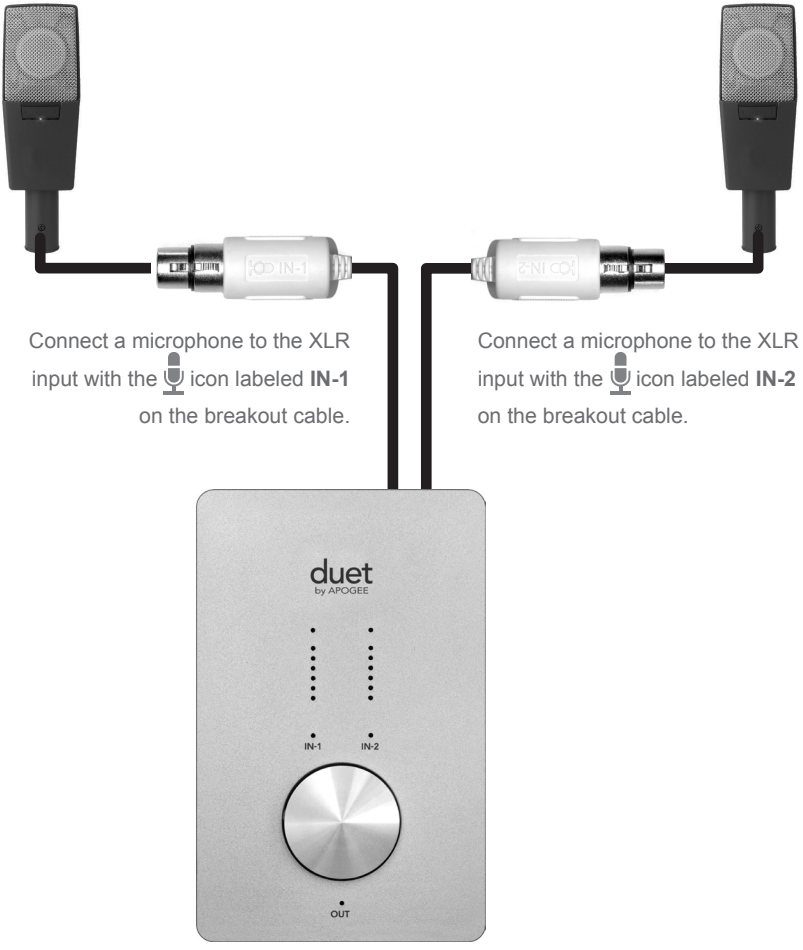


Connect an instrument to the 1/4" input with the icon labeled **IN-1** on the breakout cable.

Connect an instrument to the 1/4" input with the icon labeled **IN-2** on the breakout cable.

Connecting Your Duet:

Mic and Mic



Connecting Your Duet

Powered Monitors

Duet is also the best way to listen to audio from your Mac, be it from your iTunes library, an Internet radio station or CD/DVD playback.

To connect Duet's line outputs directly to powered speakers, you'll need 2 cables with 1/4" tip-sleeve plugs on one end to connect to Duet's **OUT-L** and **OUT-R** jacks and the appropriate connector on the other ends to connect your speakers. For your convenience, 2 1/4" to RCA adaptors are included with Duet, allowing the use of commonly available RCA to RCA cables when connecting consumer stereo equipment.

When connecting to powered monitors, use Duet's encoder knob to control playback volume.

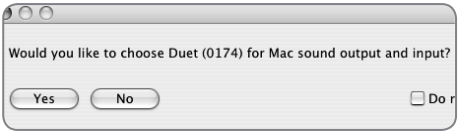
Connect monitors to the 1/4" outputs with the icons labeled **OUT-L** and **OUT-R** on the breakout cable.

Connecting To A Home Stereo:

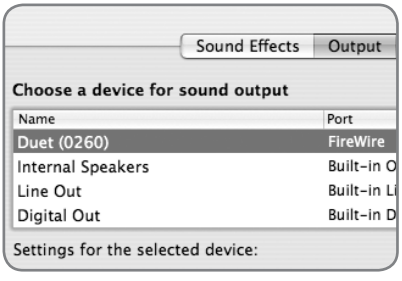
To connect Duet directly to your home audio system, insert the provided 1/4" to RCA adaptors in Duet's **OUT-L** and **OUT-R** jacks and use a commonly available RCA to RCA cable to connect to the AUX or CD input of your receiver.

When connecting to a home audio system, set Duet's output to 0 dB (i.e full volume) and use the receiver's volume control to set playback level.

Once audio connections have been made, connect Duet's Firewire port to your Mac. Once connected, the dialog box shown below will appear. Click **Yes** to choose Duet for Mac sound output and input.



This selection may also be made in the System Preferences > Sound > Output panel.



In iTunes, select Computer as the sound output. Any audio that is played back in iTunes will now be routed to Duet and the output will be available on your home audio system.

Troubleshooting

Q: When I press the encoder to select an input or output, the selection is unavailable. Why?

A: When the inputs are set to **XLR line** or the output is set to **Instrument Amp**, the encoder disabled, and thus not selectable

Q: When I press the encoder to select an input or output, **ALL** the LEDs go out. Why?

A: When 1 or more MIDI controllers are instantiated and selected for control by the top panel encoder, all the top panel I/O LEDs are turned off to indicate selection of a MIDI controller. If pop-ups are enabled in Maestro preferences, the MIDI controller selected will be displayed on screen.

Q: I've connected my guitar, but I'm not getting any input. What should I check?

A: In Maestro, be sure to set **Input** to **Instrument**.

Q: I'm not getting any output from audio software applications. What should I check?

A: If the **OUT** LED is flashing, the output is muted. Press and hold down the top panel encoder until the **OUT** LED stops flashing. Also, if the Maestro Mixer's output has been set to **Out L-R**, then the From Mac fader must be raised to send audio software application outputs to Duet's outputs.

Q: I want Maestro to open automatically each time I connect Duet. What should I set?

A: Open Maestro > Preferences and check the **Launch Maestro automatically when connecting a device** checkbox.

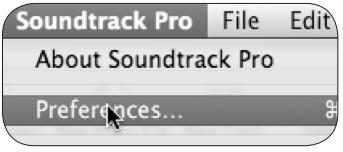
Q: Can I set the headphone and line outputs to different levels?

A: The headphone and line outputs are always controlled simultaneously. To set the balance between headphones and speakers connected to the line outputs, set the speaker's amplifier accordingly. It is possible to mute the headphones and line outputs independently.

Q: How do I reset Duet?

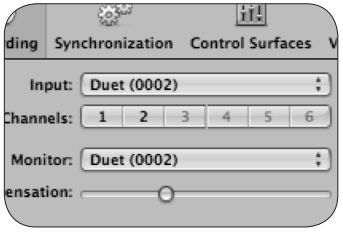
A: To reset Duet press and hold the encoder for 5 seconds. All settings will return to their default state.

Core Audio Applications Guide

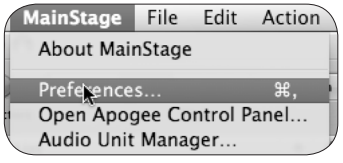


Using Duet with Apple Soundtrack Pro

Choose Soundtrack Pro > Preferences.

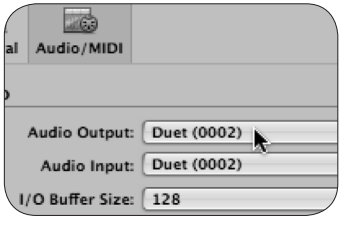


Click on the Recording tab.
Select **Duet** in both the Input and Monitor menus.
Close the Preferences window after making settings.

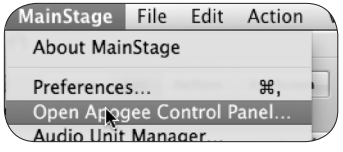


Using Duet with Apple MainStage

Choose MainStage > Preferences

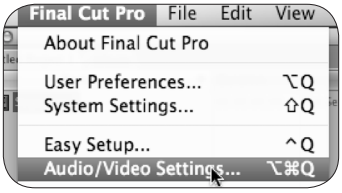


Click on the Audio/Midi tab
Select **Duet** in the Audio Output and Audio Input menus
Set I/O Buffer Size to **128**
Close the Preferences window after making settings.



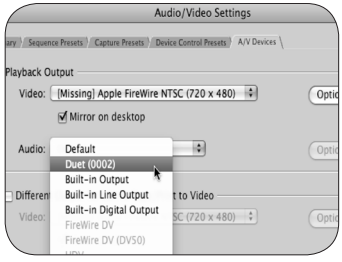
To control Duet directly from your Mainstage session, choose Mainstage > Open Apogee Control Panel.

Core Audio Applications Guide

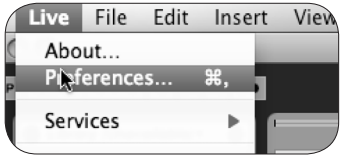


Using Duet with Apple Final Cut Pro

Choose Final Cut Pro > Audio/Video Settings.

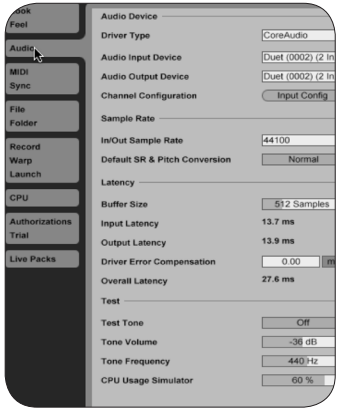


Click on the A/V Devices tab.
Select **Duet** in the Audio menu.
Click **OK**.



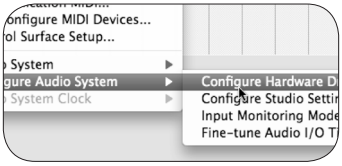
Using Duet with Ableton Live

Choose Live > Preferences



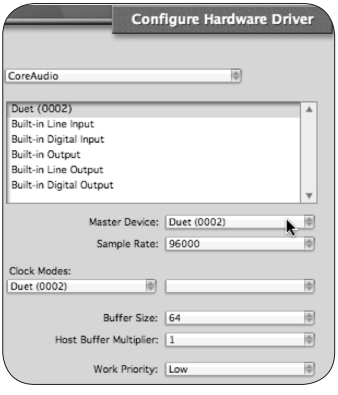
Click on the Audio tab.
Select **CoreAudio** in the Driver Type menu.
Select Duet in both the Audio Input Device and Audio Output Device menus.
Set Buffer Size to **128**.
Close the Preferences window after making settings.

Core Audio Applications Guide

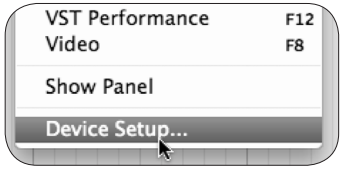


Using Duet with MOTU Digital Performer

Choose Setup > Configure Audio System >Configure Hardware Driver

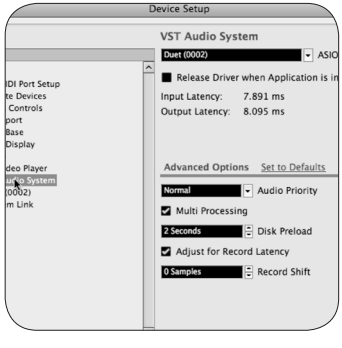


In the Configure Hardware Driver window, select **CoreAudio** in the topmost menu.
Select **Duet** in the device list.
Set Buffer Size to **128**.
Set Host Buffer Multiplier to **1**.
Set Work Priority to **Low**.
Click **OK**.



Using Duet with Steinberg Nuendo

Choose Devices > Device Setup



In the Devices window, click on VST Audio System.
Select Duet in the ASIO menu.

Once Duet is recognized by Nuendo, select Duet in the Devices window.
Click on Control Panel.
In the ASIO Settings pop-up, set Buffer Size to 128 and click OK.
In the Device Setup window, click OK.

Features & Specifications

- Two channels of professional-quality 24-bit/96kHz audio input and output
- Two balanced XLR inputs, with selectable 48V phantom power on each input
- Maximum input - +4 dBu setting: 20 dBu; -10 dBV setting: +8 dBV
- Mic Pre-amp gain: 10 to 75 dB
- Two unbalanced high impedance instrument inputs
- One high-level stereo headphone output
- Two unbalanced -10 dBV line outputs for powered speakers
- Multi-function controller knob for volume and input gain control and assignable MIDI control
- Multi-segment LED meters to display input or output levels
- FireWire 400, compatible with Mac OS X Core Audio
- Integration and control with Apple's GarageBand, Logic Pro, Logic Express and Final Cut Studio (Soundtrack Pro)
- Compatible with any Core Audio-compliant audio application
- Apogee's Maestro software for advanced control and low latency mixing

System Requirements

Computer: Mac G4 1GHz or faster, PPC or Intel CPU
Memory: 1 GB RAM minimum, 2 GB recommended
OS X : 10.4.11 or greater must be installed, 10.5.3 or greater highly recommended.
Connection: FireWire 400 port

Notifications

Owner's Record

The serial number is located on the rear panel of the unit. We suggest you record the serial number in the space provided below. Refer to it whenever you call an authorized Apogee Electronics repair facility or the manufacturer. Please be sure to return your completed warranty card immediately!

Duet Serial No._____

Purchase Date_____

Dealer_____

Phone_____

Address_____

CAUTION:
Any changes or modifications not expressly approved by APOGEE ELECTRONICS CORPORATION could void your authority to operate this equipment under the FCC rules.

Please register this unit by filling in the included registration card, or registering online at:

http://www.apogeedigital.com/register/

Warnings

FCC 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 when operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to take whatever measures necessary to correct the interference at his own expense.

Copyright Notice

Registration and Warranty Information

Be sure to register your Duet, either by filling in the enclosed Registration Card or by completing the on-line registration form at our Web site: http://www.apogeedigital.com/support/. If you do so, Apogee can contact you with any update information. As enhancements and upgrades are developed, you will be contacted at the registration address. Firmware updates are free for the first year of ownership unless otherwise stated. Please address any inquiries to your dealer or directly to Apogee at:

APOGEE ELECTRONICS CORPORATION,
1715 Berkeley St., Santa Monica, CA 90404, USA
Tel: (310) 584-9394
Fax: (310) 584-9385
Web: http://www.apogeedigital.com

APOGEE ELECTRONICS CORPORATION warrants this product to be free of defects in material and manufacture under normal use for a period of 12 months. The term of this warranty begins on the date of sale to the purchaser. Units returned for warranty repair to Apogee or an authorized Apogee warranty repair facility will be repaired or replaced at the manufacturer's option, free of charge.
ALL UNITS RETURNED TO APOGEE OR AN AUTHORIZED APOGEE REPAIR FACILITY MUST BE PREPAID, INSURED AND PROPERLY PACKAGED, PREFERABLY IN THEIR ORIGINAL BOX. Apogee reserves the right to change or improve design at any time without prior notification. Design changes are not implemented retroactively, and the incorporation of design changes into future units does not imply the availability of an upgrade to existing units.

This warranty is void if Apogee determines, in its sole business judgment, the defect to be the result of abuse, neglect, alteration or attempted repair by unauthorized personnel.

The warranties set forth above are in lieu of all other warranties, expressed or implied, and Apogee specifically disclaims any and all implied warranty of merchantability or of fitness for a particular purpose. The buyer acknowledges and agrees that in no event shall the company be held liable for any special, indirect, incidental or consequential damages, or for injury, loss or damage sustained by any person or property, that may result from this product failing to operate correctly at any time.

USA: Some states do not allow for the exclusion or limitation of implied warranties or liability for incidental or consequential damage, so the above exclusion may not apply to you. This warranty gives you specific legal rights, and you may have other rights which vary from state to state.

Service Information

The Duet contains no user-serviceable components: refer to qualified service personnel for repair or upgrade. Your warranty will be voided if you tamper with the internal components. If you have any questions with regard to the above, please contact Apogee.

In the event your Duet needs to be upgraded or repaired, it is necessary to contact Apogee prior to shipping, and a Return Materials Authorization (RMA) number will be assigned. This number will serve as a reference for you and helps facilitate and expedite the return process. Apogee requires that shipments be pre-paid and insured — unless otherwise authorized in advance.

IMPORTANT: ANY SHIPMENT THAT IS NOT PRE-PAID OR IS SENT WITHOUT AN RMA NUMBER WILL NOT BE ACCEPTED.

Declarations of Conformity

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
1. This device may not cause harmful interference
2. This device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits of a Class A 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. 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:

1. Re-orient or relocate the receiving antenna.
2. Increase the separation between the equipment and receiver.
3. Connect the equipment into an outlet on a different circuit from that to which the receiver is connected.
4. Consult the dealer or an experienced radio/TV technician for help.

NOTE: The use of non-shielded cable with this equipment is prohibited.
CAUTION: Changes or modifications not expressly approved by the manufacturer responsible for compliance could void the user's authority to operate the equipment.

Apogee Electronics Corporation, Betty Bennett, CEO.

Industry Canada Notice

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations. Cet appareil numérique de la classe B respecte toutes les exigences du Règlement sur le matérial brouilleur du Canada.

Declaration of Conformity – CE

Apogee Electronics Corporation hereby declares that the product, the Duet, to which this declaration relates, is in material conformity with the following standards or other normative documents:

EN55022:1998, EN55024:1998

EN61000-3-2, EN61000-3-3, EN61000-4-2, EN61000-4-3, EN61000-4-4, EN61000-4-5, EN61000-4-6, EN61000-4-8, EN61000-4-11

Declaration of Conformity – Japan

Apogee Electronics Corporation hereby declares that the Duet, to which this declaration relates, is in material conformity with the VCCI Class B standard.

Declaration of Conformity – Australia/New Zealand

Apogee Electronics Corporation hereby declares that the Duet is in material conformity with AN/NZS standard requirements.

Duet
User's Guide
May 2011

APOGEE

www.apogeedigital.com