Q182JS Joystick Controller

Feb 2014

The Joystick controller is a dual-axis controller that produces voltages as the stick is moved up/down and left/right. Perfect for pitch bending or controlling filter frequency and resonance as you play notes on the keyboard. The outputs can be used to control any parameter in the synthesizer system.

The Joystick controller uses our standardized Q182 dual-channel Controller Interface module providing an Auto Gate, Switch Gate and a voltage output range switch for each axis. The left side of the panel handles the X axis (left/right) and the right side handles the Y axis (up/down).

The module can be mounted in a Box-style cabinet next to your keyboard controller, or in a synthesizer cabinet just like any other module.

An Auto Gate signal is automatically created for each axis as the Joystick is moved. This gate can be used to trigger sequencers and envelope generators.

Switch Gate signals are produced by the panel buttons.

Q182JS

Joystick Sub-Module

Q182JS Joystick Controller Specifications

Panel Size: 4.25"w x 8.75"h. (double-space)
Stick: 1.25" tall, Spring return to center on one or two axis.
Voltage Output: Selectable range - 5V, 2V, 4/12V
Auto Gate Output: 5V, adjustable position activation
Switch Gate Output: 5V, activated by manual buttons
Power: +15V@100ma, -15V@100ma, +5V@100ma

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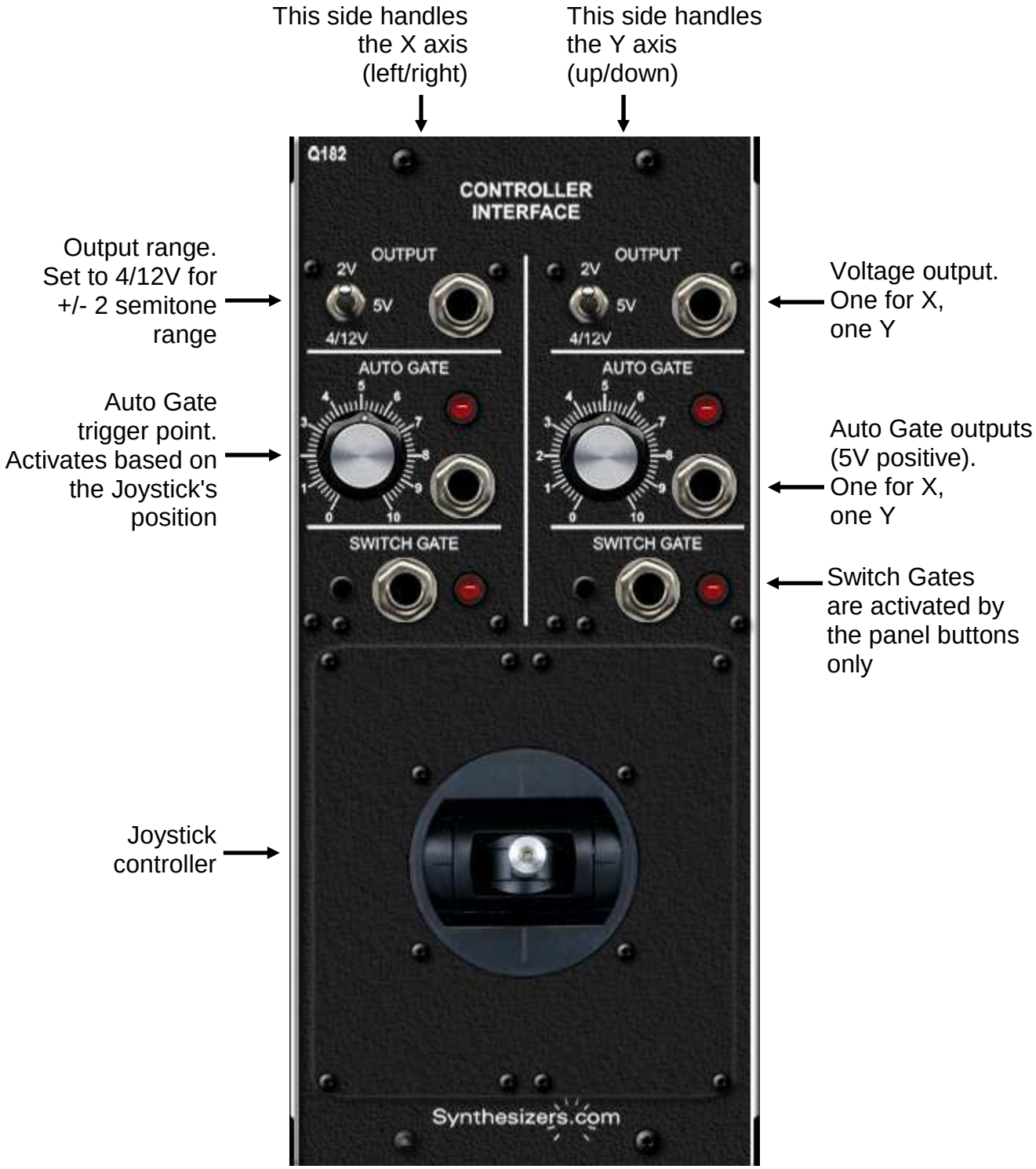

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Features and Operation

Joystick controller mounted in a Box2

The Q182JS produces signals as the stick is moved up/down and left/right. The controller operates through the Q182 Controller Interface module to produce voltages and gate signals - one set for X axis movement, another set for Y axis movement. These signals can be used to control parameters in a synthesizer system.

Voltage Output

The main outputs of the Joystick Controller are voltages that vary as the stick is moved. The range of this voltage is controlled by the output range switch to select 5 volts, 2 volts or 4/12ths volt. Use the 4/12ths volt position for 4 semitones which works well for pitch bending. For modulation, use the 5 volt position then attenuate or invert the signal at the destination module.

Auto Gate

A gate signal is produced automatically when the controller changes. One for the X axis, one for the Y axis. The position that triggers this gate signal is set by the variable control. An LED shows status of the Auto Gate. This Auto Gate signal can be used to trigger envelopes, start sequencers or change other module parameters depending on the controller's position. Auto Gate may also be used to transpose oscillators or alter filter parameters at certain stick positions. The Joystick controller can be used for this Auto Gate feature alone, ignoring the voltage output if desired. Use a Q125 Signal Processor module to Invert, offset or attenuate this gate signal as needed.

Switch Gate

The Joystick mechanism has no internal switches. Switch Gate signals are activated by the panel buttons only and can be used to control envelope generators, sequencers, etc. The controller can be used solely for this Switch Gate feature if desired.

Calibration

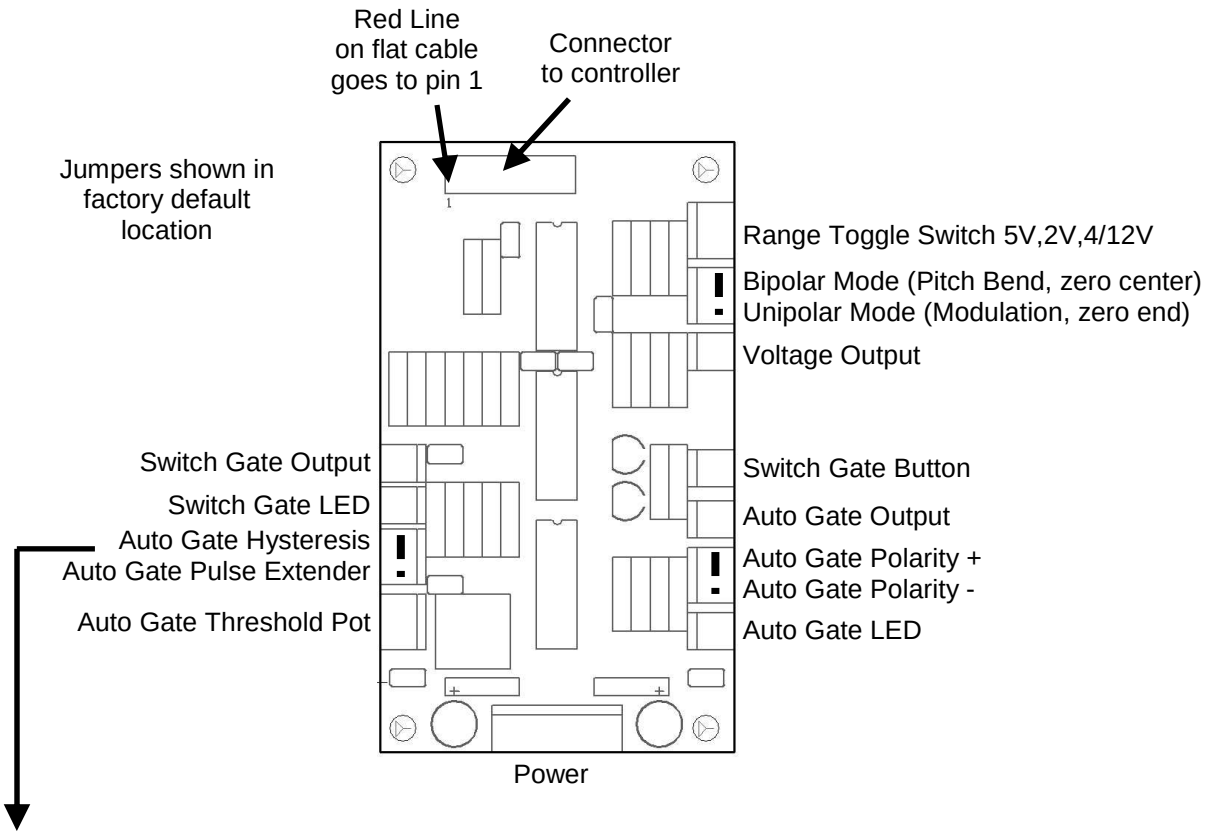
Calibration is done at the factory and not required under normal circumstances. Only attempt these procedures if you have the skills and a good digital voltmeter. We can perform this procedure for you.

Two trimmers provide Scale and Offset adjustments so the stick's motion produces the correct voltage output. Two pair of trimmers are used for each axis.

X Axis motion calibration (left side of module):
Attach a voltmeter to the Output jack of the Q182 Controller Interface.
Set the Output range switch to 5V.
Set the Mode jumper on the Q181 PCB to bipolar (pins 1-2).
With the stick fully left, adjust the Offset trimmer to get 0 volts.
Move the stick between full left and full right
and adjust the Scale trimmer for 5.00 volts of change.
This may take many cycles.
Then with the stick centered, adjust the Offset trimmer to 0 volts.
Now the X axis should produce -2.5 to +2.5 volts output.

Y Axis motion calibration (right side of module):
Attach a voltmeter to the Output jack of the Q182 Controller Interface.
Set the Output range switch to 5V.
Set the Mode jumper on the Q181 PCB to bipolar (pins 1-2).
With the stick fully down, adjust the Offset trimmer to get 0 volts.
Move the stick between full down and full up,
and adjust the Scale trimmer for 5.00 volts of change.
This may take many cycles.
Then with the stick centered, adjust the Offset trimmer to 0 volts.
Now the Y axis should produce -2.5 to +2.5 volts output.

Q181 Controller Interface PCB

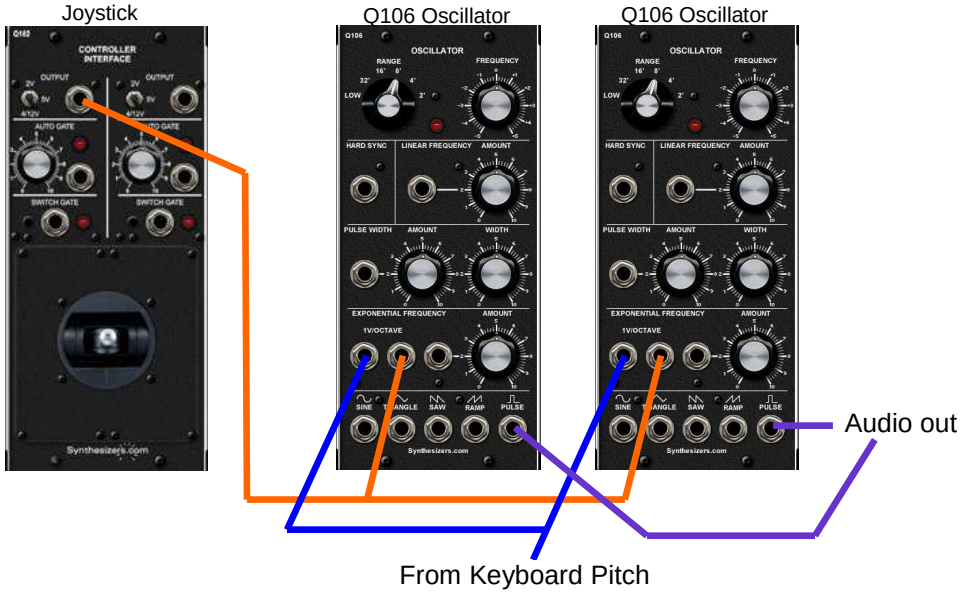


14-Pin Controller Connector

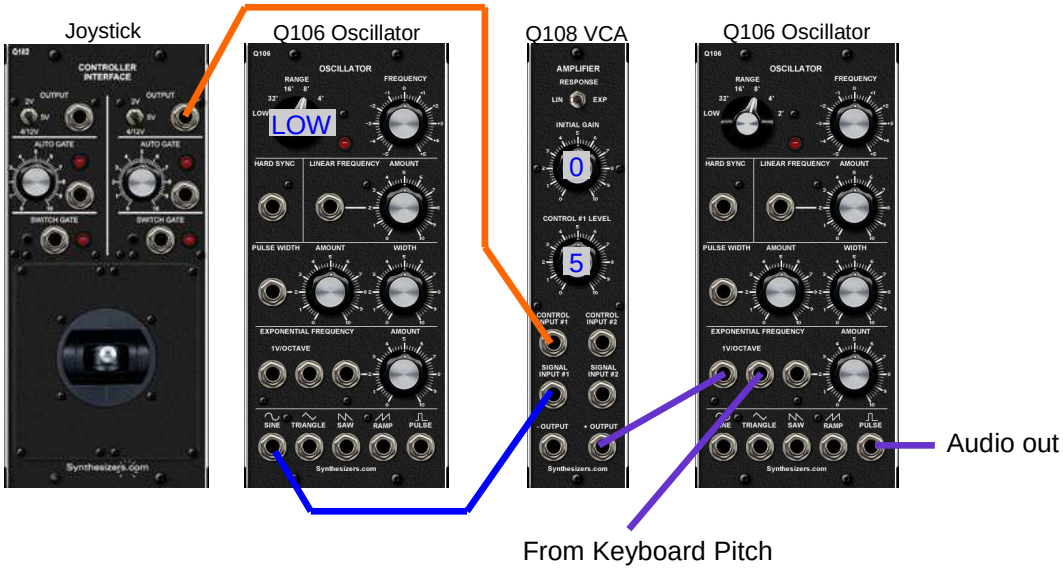
1 Ground	8 Range pot
2 +15V	9 Auto Gate
3 Key	10 +5V
4 -15V	11 Up LED
5 Offset pot wiper	12 Down LED
6 Sensor	13 Switch Gate
7 Range pot wiper	14 LED ground

Patch Ideas

This is a common patch where the Joystick controller is used to pitch bend two oscillators. Voltage from the stick's X axis is added to the keyboard's pitch voltage at each oscillator. Pitch bend can also be accomplished by using the Q174 MIDI Interface's ADD-IN input.



This patch shows the Y axis output and a Q108 Amplifier (VCA) controlling the modulation depth of an oscillator. The first oscillator is used as an LFO to create vibrato on the second oscillator. The second oscillator produces the waveform for the synthesizer voice.



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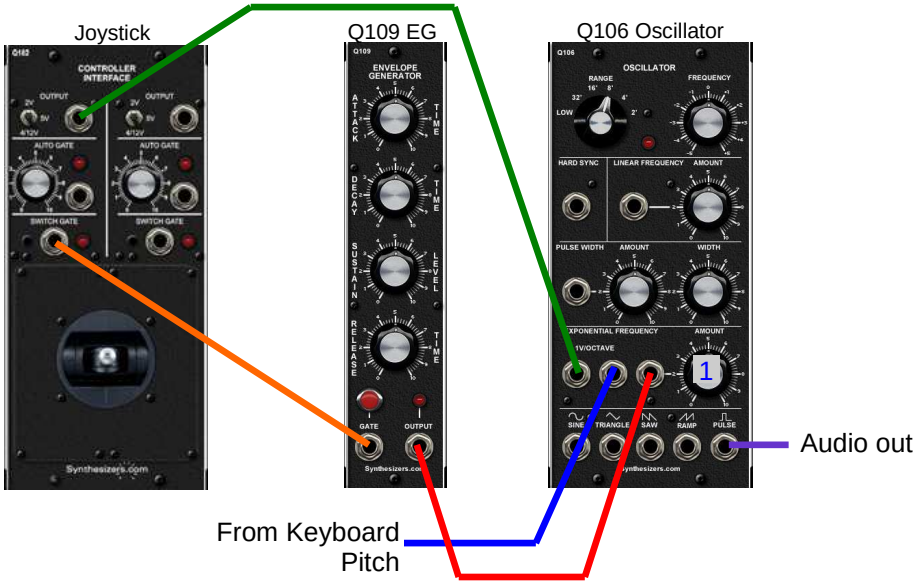
In this patch, the Joystick controller is used as a pitch bender and the Switch Gate triggers an envelope generator for a special effect. Press the panel button to activate the Switch Gate.



This patch shows the Joystick controller starting a Q960 or Q119 sequencer using the Auto Gate signal. The stick location which activates the Auto Gate is set by the panel control.

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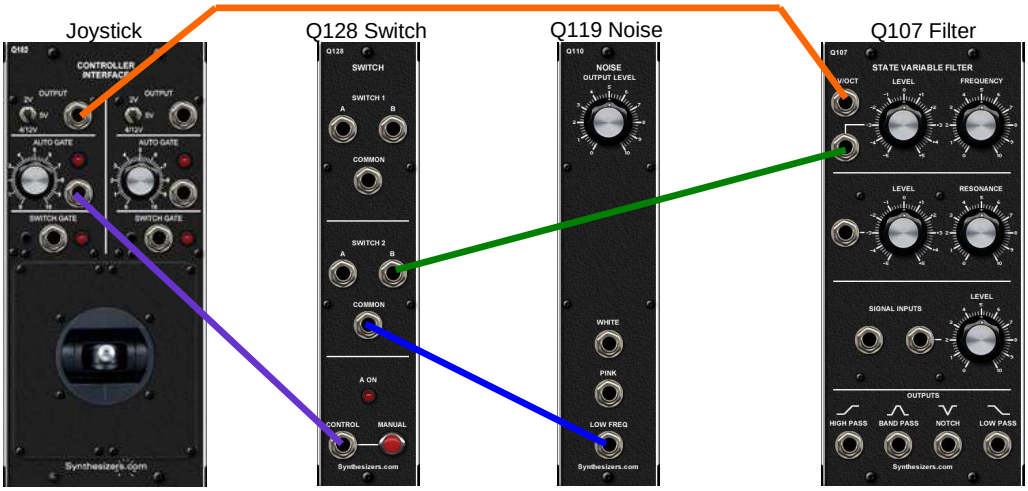
This patch shows the Joystick controlling a filter and the Auto Gate turning on noise modulation. As the stick is moved, the Auto Gate turns on according to the knob's position. That gate is then used to switch on a noise signal using a Q128 Switch. A Q108 Amplifier could be used as the switch.



Auto Gate and Switch Gate can be used for more than on/off functions. In this patch, Auto Gate from the Y Axis is used to transpose an oscillator by one octave. Auto Gate provides 5 volts to the variable input on the oscillator and adjusted to produce a 1-volt (1-octave) change.