

Q181RC Ribbon Controller

Feb 2014

The Ribbon Controller produces a varying voltage as you move your finger along the ribbon strip. Great for pitch bending, playing notes, controlling filter frequency, or other parameters in the synthesizer system.

The Ribbon Controller uses our standardized Q181 single-channel Controller Interface module providing an Auto Gate, Switch Gate and a voltage output range switch.

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 at a specific position along the ribbon. This gate can be used to trigger sequencers and envelope generators.

A 3-color LED can be programmed to change colors as the ribbon changes position or as the Auto Gate is activated.



Q181RC Ribbon Specifications

Panel Size: 2.125"w x 8.75"h. (single-space)

Ribbon: 2" x .5"

Voltage Output: Selectable range - 5V, 2V, 4/12V

Auto Gate Output: 5V, adjustable position activation

Switch Gate Output: 5V, activated by panel button

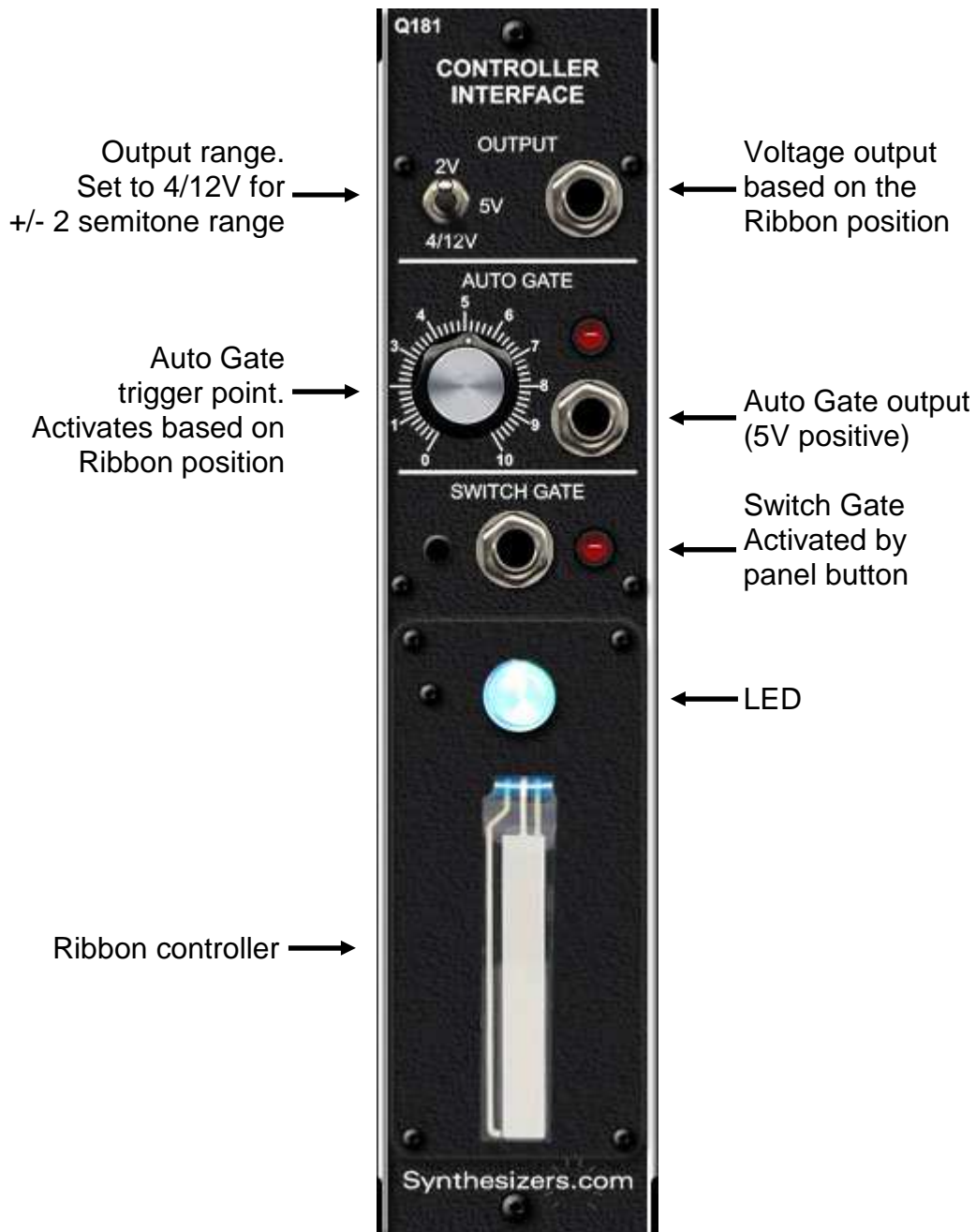
LED Colors: 3 primary colors (Red, Green, Blue)

LED Control: Down, Up, Power, or Auto Gate - user-configurable

Power: +15V@50ma, -15V@50ma, +5V@50ma

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Features and Operation

The Q181RC produces a voltage that varies as your finger is moved along the ribbon. The Ribbon controller operates through the Q181 Controller Interface module to produce voltages and gate signals. These signals may be used to control parameters in a synthesizer system.

Voltage Output

The main output of the Ribbon Controller is a voltage that varies depending upon where it is touched. When your finger is removed, the voltage remains. 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 of range 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 at a specific position along the ribbon. The location that triggers this gate signal is set by the variable panel 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. Auto Gate may also be used to transpose oscillators or alter filter parameters at certain positions. The Ribbon 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 Ribbon controller does not offer a mechanical switch so use the panel switch to activate the Switch Gate. This signal can be used to control envelope generators, sequencers, etc.

LED Colors

A programmable 3-color LED illuminates a round lens on the panel and responds to the ribbon's position. The LED can be programmed to change colors as the position moves. It can also stay a solid color, or change color as the Auto Gate triggers. These settings are made using a jumper array on the circuit board.

Ribbon mounted in a Box1



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 pressing the ribbon produces the correct voltage output. The trimmer nearest the edge of the PCB is Scale, and the other trimmer is the Offset.

Attach a voltmeter to the Output jack of the Q181 Controller Interface.

Set the Output range switch to 5V.

Set the Mode jumper on the Q181 PCB to bipolar (pins 1-2).

Press the lowest part of the ribbon surface and adjust the Offset trimmer to get 0 volts.

Press the highest part of the ribbon surface and adjust the Scale trimmer for 5.00 volts of change.

This may take many cycles.

Press the lowest part of the ribbon surface and adjust the Offset trimmer to 0 volts.

Now the Ribbon should produce -2.5 to +2.5 volts output.

LED Colors

A round lens is illuminated with a 3-color LED. The LED can stay on constantly with any of the 3 colors, change colors based on the ribbon's position, or change color based on the Auto Gate signal.

A 9-pin jumper array is provided to program the LED's operation. Move the jumpers according to the chart to get the effect you want. Letters in the chart represent LED colors and signals that control them.

COLORS

R = Red

G = Green

B = Blue

SIGNALS

U = Up

D = Down

P = Power

A = Auto Gate

LED Jumpers

G	D	B
A	R	U
B	P	G

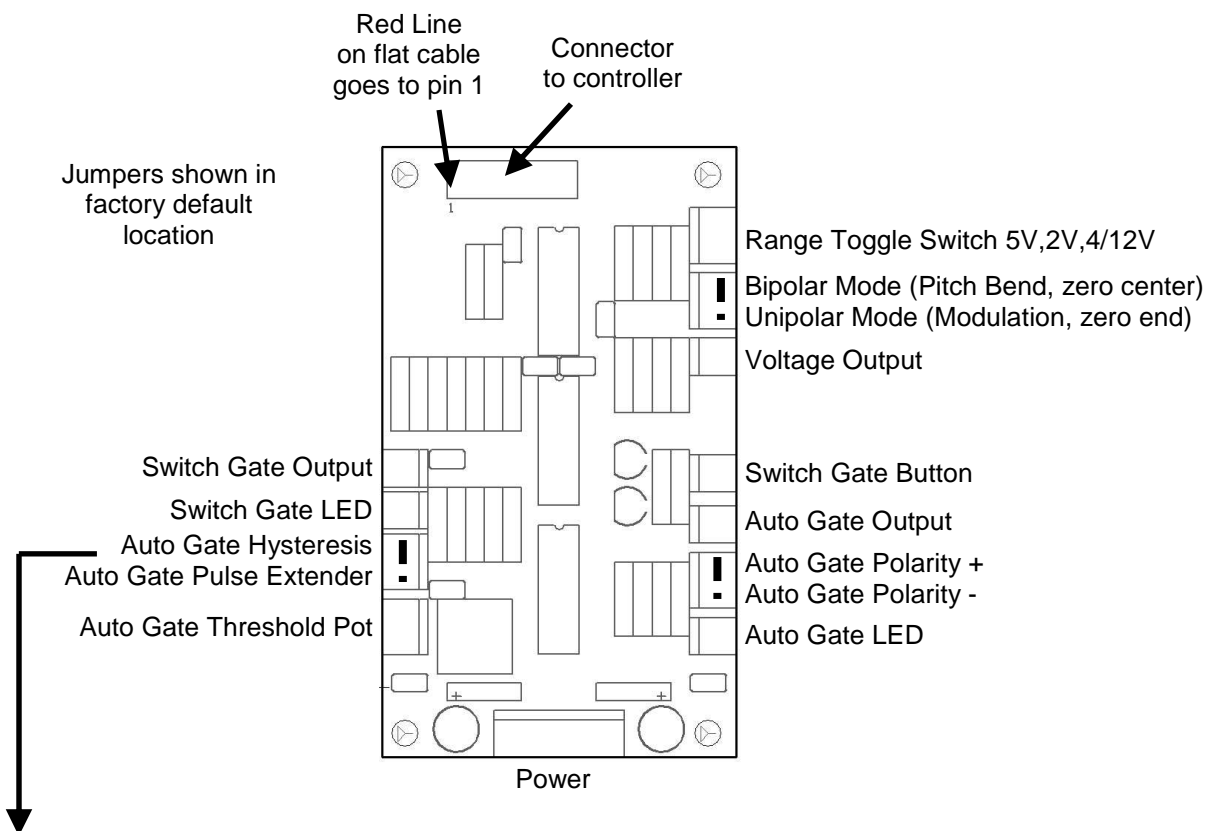
Examples:

To make the LED change from blue to red, jumper B to D (blue to down), and jumper R to U (red to up).

To have the LED blue all the time but switch to purple when the Auto Gate activates, jumper B to P (blue to power), and jumper R to A (red to Auto Gate). Blue and red together makes purple.

If you do not want LED illumination, simply hang the jumpers off to one side of the pins.

Q181 Controller Interface PCB



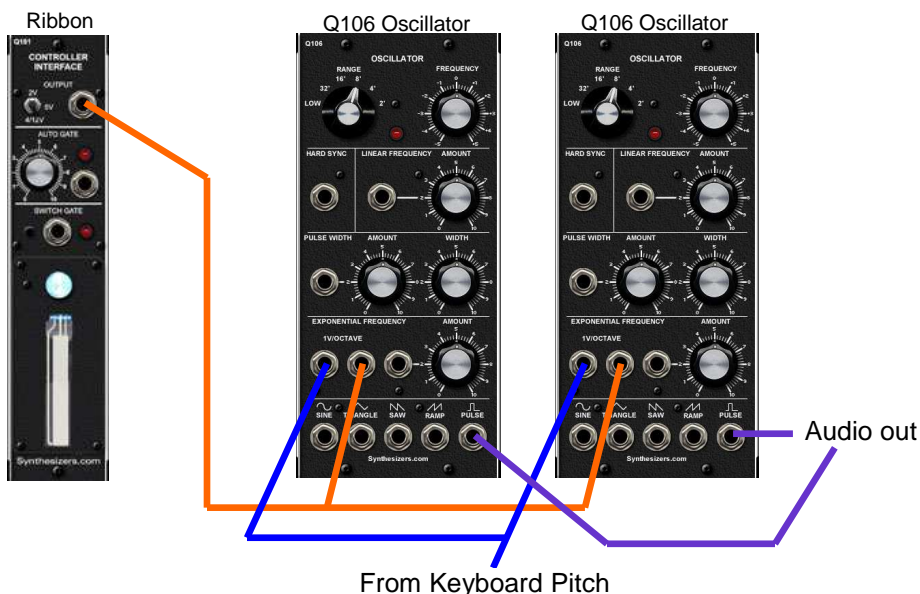
Hysteresis limits Auto Gate oscillation at the threshold. Pulse Extender is used for piezo sensors such as drums to lengthen the Auto Gate pulse.

14-Pin Controller Connector

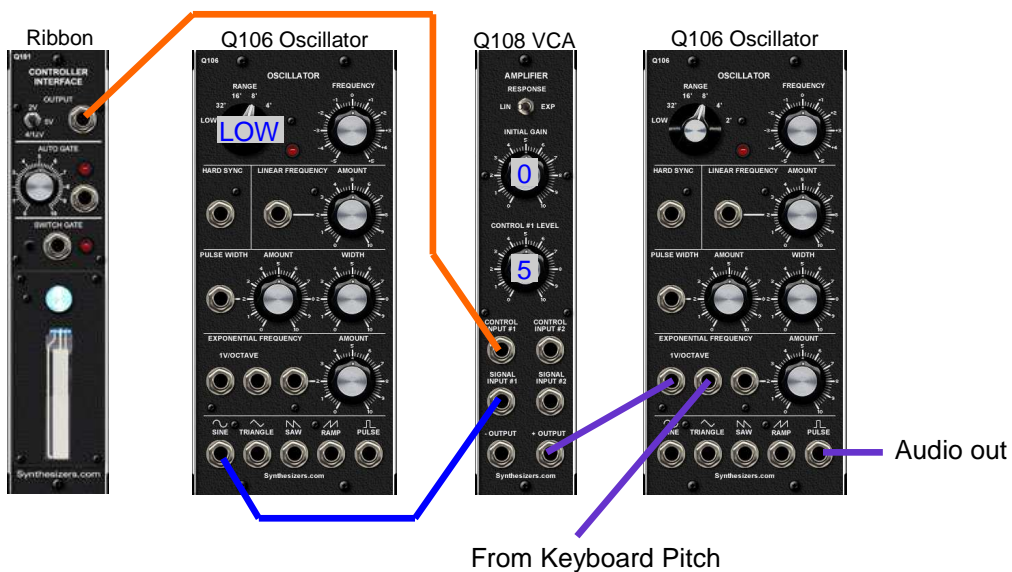
1 Ground	8 Range pot
2 +15V	9 Auto Gate
3 Key	10 +5V
4 -15V	11 Up LED
5 Offset pot wiper	12 Down LED
6 Sensor	13 Switch Gate
7 Range pot wiper	14 LED ground

Patch Ideas

This is a common patch where the Ribbon Controller is used to pitch-bend two oscillators. Voltage from the ribbon is added to the keyboard's pitch voltage at each oscillator. Use the 4/12V range position. The very center of the ribbon is 0. Pitch bend may also be accomplished by using the Q174 MIDI Interface's ADD-IN input.



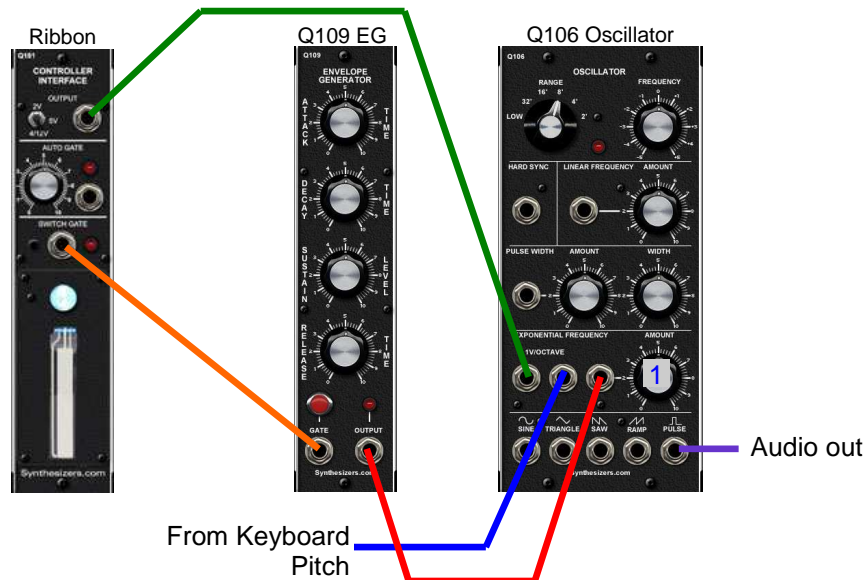
This patch shows the Ribbon Controller and a Q108 Amplifier (VCA) to control the modulation depth of an oscillator. The first oscillator is used as an LFO to create vibrato on the second oscillator. The second oscillator produces the waveform for the synthesizer voice.



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In this patch, the Ribbon Controller is used as a pitch bender and the Switch Gate triggers an envelope generator for a special effect. When the Switch Gate panel button is pressed, the envelope will trigger.



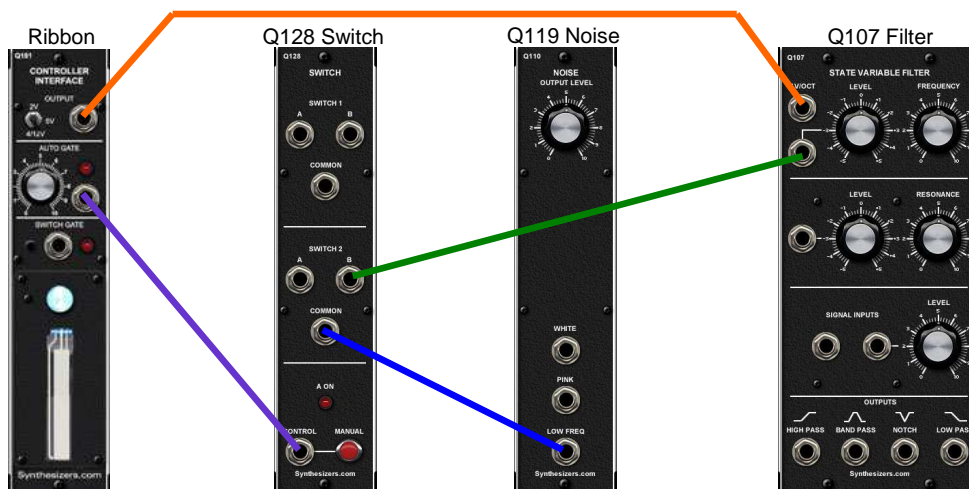
This patch shows the ribbon starting a Q960 or Q119 sequencer using the Auto Gate. The exact position on the ribbon that activates the Auto Gate depends upon the Auto Gate panel control setting.



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This patch shows the ribbon controlling a filter and the Auto Gate turning on noise modulation. At a certain position along the ribbon, the Auto Gate turns on according to the knob's position. That gate signal 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 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.

