

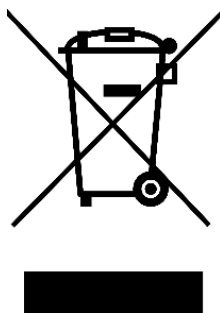
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FCC Statement for PRO CV to MIDI

NOTE: 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:

- Reorient or relocate 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 help.

Information on Disposal for Users of WEEE



This symbol on the product and / or accompanying documents means that used electrical and electronic equipment (WEEE) should not be mixed with general household waste. For proper treatment, recovery and recycling, please take this product(s) to designated collection points where it will be accepted free of charge.

Alternatively, in some countries, you may be able to return your products to your local retailer upon purchase of an equivalent new product.

Disposing of this product correctly will help save valuable resources and prevent any potential negative effects on human health and the environment, which could otherwise arise from inappropriate waste handling.

Please contact your local authority for further details of your nearest designated collection point.

Penalties may be applicable for incorrect disposal of this waste, in accordance with your national legislation.

For disposal in countries outside of the European Union

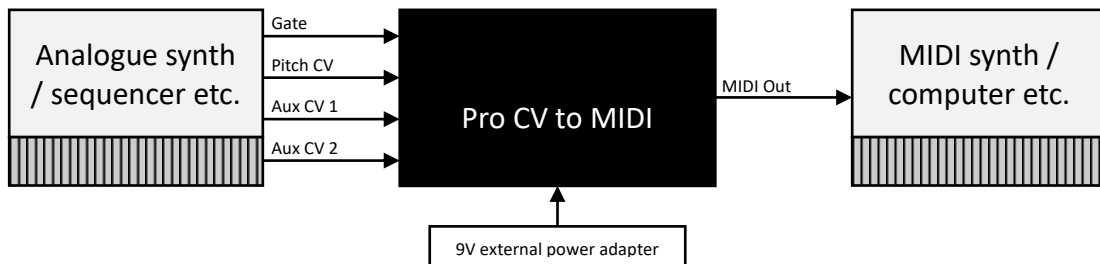
This symbol is only valid in the European Union (EU). If you wish to discard this product, please contact your local authorities or dealer and ask for the correct method of disposal.

INTRODUCTION

Congratulations on your purchase. The *PRO CV to MIDI* is a high specification, fully configurable control voltage to MIDI converter, capable of tracking pitch Control Voltages very accurately, be it Volt/Octave, 1.2V/Octave or Hz/Volt. It also supports pitch bend, modulation and non-quantised continuous tracking in addition to two user-assignable auxiliary CV inputs.

The *PRO CV to MIDI* also includes an intelligent auto tune feature, to make it as easy as possible to set up with your analogue equipment.

CONNECTIONS



MIDI OUT

Plug your receiving MIDI device in here.

(This socket also serves as a MIDI input for updating the firmware)

CV (-3V to +10.65V usable range)

Plug your pitch CV connection in here. The scale type (V/Oct, Hz/V, 1.2V/Oct) is set using the menu.

GATE / S-TRIG

Plug your gate connection in here. The gate type (Gate / S-Trig) is set using the menu.

AUX 1 & AUX 2 (0V to +10V usable range)

Plug auxiliary inputs in here. These two sockets are assignable to a number of different functions, such as MIDI CCs, Note Velocity, MIDI Clock and more – see *parameters 30 & 40*.

DC IN 9V

Plug your power adapter into here. The converter will take an adapter with an output of 9 volts DC regulated or unregulated, centre +ve. The Pro CV to MIDI is supplied with a power supply suitable for the destination country. Other power supplies can be used as long as their output is 9 volts DC regulated, can supply at least 100mA and have 2.1mm centre +ve plug.

WARNING: Do not use an adaptor with an output voltage higher than 9V. The *PRO CV to MIDI* must not share an adaptor with any other device. Failure to observe this will invalidate your warranty, and will probably damage the other device, the *PRO CV to MIDI* and/or the power supply.

EDITING THE *PRO CV to MIDI*

Switching On

When the *PRO CV to MIDI* is switched on, the words '**KENTON PRO CV TO MIDI**' scroll across the display.

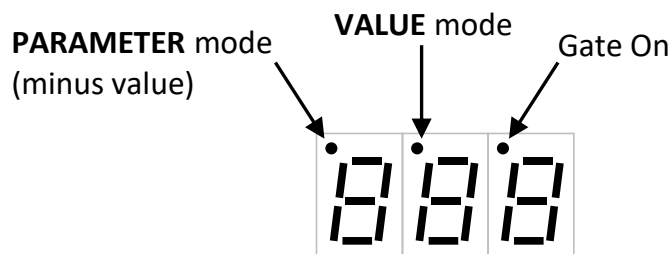
The Display

The display has 3 digits, each with a dot above.

The first dot, when lit solidly, indicates that **PARAMETER** mode is currently selected. This dot is also used to signify a minus number in **VALUE** mode, in which case it will be blinking.

The middle dot when lit indicates that **VALUE** mode is currently selected.

The last dot will light whenever the **GATE** is on (key pressed down).



Stepping Through Parameters

Ensure that the **PARAMETER** dot is lit solidly. If you need to, you can change between **PARAMETER** and **VALUE** modes by briefly pressing the **SELECT** button, you can then use the **INC** and **DEC** buttons to scroll through the available parameters. The available parameters are printed on the case of the *PRO CV to MIDI* for convenience. For additional confirmation, a "P" will appear in the left digit when parameter mode is selected.

Changing Values

Ensure that the **VALUE** dot is lit. You can change between **PARAMETER** and **VALUE** modes by briefly pressing the **SELECT** button. You can then use the **INC** and **DEC** buttons to scroll through the available values. If the value is a minus number, the **PARAMETER** dot will be blinking.

Speeding up editing

If you press and hold the **INC** key, then also hold the **DEC** key, the value will increase faster. If you press and hold the **DEC** key then also hold the **INC** key, the value will decrease faster.

Storing Changes

Any value you change is automatically stored when changing from **VALUE** mode to **PARAMETER** mode, either manually or after the 10 second timeout. You can also store the current setup to one of 32 memory locations for later recall. See page 9.

Auto-tune & notes

It is best to use Auto-tune where possible to tune the *Pro-CV to MIDI* to your keyboard or sequencer. Although the notes on page 10 relate to the Parameters listed on pages 6 to 9, we recommend that you read through all of the notes before using the *Pro-CV to MIDI* as they give you a useful overview of how to get the best results from your unit.

16 Gate / S-Trig select (default: gat)

The following can be selected;

Gate	[gat]
S-Trig	[Str]

Switches the Gate type between Gate (also known as V-Trig) or S-Trig. For more information about the various Gate types, see page 11.

17 Interval select (default: Stn)

The following can be selected;

Semitone (quantised)	[Stn]
Continuous (unquantised)	[Cnt]
A440 (note 69 plus pitchbend)	[A44]

Sets whether or not Pitch CV will be quantised to 1-semitone intervals. If this is set to Continuous, the MIDI note will also be transmitted with an accompanying pitch bend message in order to fully represent the pitch. A440 is similar to continuous, but only MIDI note 69 is played with accompanying pitchbend. [See note 3]

18 CV settle time (default: 0)

Range 0 to250 = 0 to 25mS approx

Sets the time delay in tenths of mS from receiving the gate signal to sending the MIDI note message. This is intended for some keyboards or devices which take a while for the CV to settle to a stable value, or in some cases where they send the gate signal before the CV signal.

19 Hz/V linearity (default: 0)

Range -127 to 0 to +127

If you are using a Hz/V CV source and are having trouble getting it to track in tune, this parameter can compensate for imperfections in the incoming logarithmic curve. The changes will be more noticeable the lower the note, so the bottom end of the keyboard will be the most affected. Use with fine tune.

30 Aux 1 controller number (default: 16)

The following can be selected;

CCs 0 to 119	[0 to 119]	
CCs 0 to 31 (High res)	[H0 to H31]	(CCs sent as two messages giving higher resolution)
Off	[oFF]	(best way to get to these is often backwards from zero)
Start/stop	[Stt]]	[See note 7]
Clock	[clk]	[See note 5]
Pitch bend	[Pbd]	
Velocity	[vEL]	
Chan. Aftertouch	[Aft]	

Sets which MIDI controller / message Aux 1 is assigned to.

Note: if either Aux 1 or Aux 2 is set to velocity, they will override the fixed velocity value (parameter 14). If both are set to velocity, then the most recent message takes priority.

31 Aux 1 minimum voltage (default: 0)

Range 0 to 100 = approx. 0 to 10Volts – so each step of one is approx. 100mV

32 Aux 1 maximum voltage (default: 100)

Range 0 to 100 = approx. 0 to 10Volts – so each step of one is approx. 100mV

These two parameters set the minimum and maximum expected voltages for Aux 1. The MIDI output data will be zero for the minimum and below, and 127 for the maximum and above.

Note: if the minimum value is set greater than the maximum, the response will be inverted – i.e. a lower voltage will result in a greater CC value etc. If both values are set the same, the input is treated as a switch – i.e. if the input signal is greater than the max/min value, the MIDI message will be fully on.

33 Clock in 1 PPQN (default: 24)

The following can be selected;
48, 24, 12, 8, 6, 4, 3, 2, 1

[See note 6]

Sets the number of pulses-per-quarter-note expected to be received to output MIDI standard 24 cpqn when using Aux 1 for clock input.

40 Aux 2 controller number (default: 7)

The following can be selected;

CCs 0 to 119	[0 to 119]	
CCs 0 to 31 (High res)	[H0 to H31]	(CCs sent as two messages giving higher resolution)
Off	[oFF]	(best way to get to these is often backwards from zero)
Start/stop	[Stt]]	[See note 7]
Clock	[clk]	[See note 5]
Pitch bend	[Pbd]	
Velocity	[vEL]	
Chan. Aftertouch	[Aft]	

Sets which MIDI controller / message Aux 2 is assigned to.

Note: if either Aux 1 or Aux 2 is set to velocity, they will override the fixed velocity value (parameter 14). If both are set to velocity, then the most recent message takes priority.

41 Aux 2 minimum voltage (default: 0)

Range 0 to 100 = approx. 0 to 10Volts – so each step of one is approx. 100mV

42 Aux 2 maximum voltage (default: 100)

Range 0 to 100 = approx. 0 to 10Volts – so each step of one is approx. 100mV

These two parameters set the minimum and maximum expected voltages for Aux 2. The MIDI output data will be zero for the minimum and below, and 127 for the maximum and above.

Note: if the minimum value is set greater than the maximum, the response will be inverted – i.e. a lower voltage will result in a greater CC value etc. If both values are set the same, the input is treated as a switch – i.e. if the input signal is greater than the max/min value, the MIDI message will be fully on.

43 Clock in 2 PPQN (default: 24)

The following can be selected;
48, 24, 12, 8, 6, 4, 3, 2, 1

[See note 6]

Sets the number of pulses-per-quarter-note expected to be received to output MIDI standard 24 cpqn when using Aux 2 for clock input.

90 Socket select (default: MO)

The following can be selected;

MIDI OUT [MO]
MIDI IN [MI]

Selects whether the MIDI socket is used for input or output.

Note: MIDI input is only used for updating the firmware. This setting is not stored in EEPROM and will revert to its default of MIDI OUT at power-on.

91 Clock auto start (default: on)

The following can be selected;

Off [oFF]
On [on]

If enabled, a MIDI Start message will be transmitted as soon as a clock signal is received (if an Aux input is set to generate MIDI clock). A MIDI Stop message will be transmitted a couple of seconds after the clock signal stops.

Note: this setting will be overridden if either Aux input is being used for Start/Stop.

97 Load program (default: 1)

Range 1 to 32

Sets the memory location to load from. To load program, while parameter 97 is selected (para or val) press and hold the **SELECT** button until the display reads [Lod] (load).

98 Store program (default: 1)

Range 1 to 32

Sets the memory location to write to. To store program, while parameter 98 is selected (para or val) press and hold the **SELECT** button until the display reads [Sto] (store).

99 Auto tune

The *PRO CV to MIDI* includes an auto tune function, which can set up all of the scale, signal type and tuning parameters for you. It works by having you play a series of notes, from which it works out the required settings. You need to select the correct gate type before using Auto tune. [See note 4]

Note: only ever play Cs, starting at the lowest and continuing to the highest, regardless of what notes the keyboard starts and finishes on. If the auto tune procedure is not performed properly, it will produce incorrect results and will have to be repeated.

Press the **SELECT** button to enter **AUTO TUNE** mode.

When in **AUTO TUNE** mode, the buttons have the following functions:

DEC = go back to start (play bottom C)
INC = start or finish (depending on where you are)
SEL = abort (returns to normal parameter view)

Press **INC** to start. You will be prompted to play bottom C. When this has been captured, the display will say [C1] and then prompt you to play the next C.

When this has been captured, the display will say [C2] and again will prompt you to play the next C.

When this has been captured, the display will say [C3] and will prompt you to either play the next C or press **INC** to finish, or if six Cs have been captured it will finish anyway. You are then prompted to press **INC** again to store the captured settings. Stored to memory will scroll across the screen.

Notes:

1. If any parameter would take the MIDI output outside the available range then the output will be the highest (127) or lowest note (0) available and maximum/minimum pitchbend range as applicable.
2. Numbers over 1000 are not accessible from the front panel but can be set by the autotune function, these are displayed with three horizontal lines in the left digit followed by the two least significant digits.
3. A440 mode is intended to be used with pitchbend range set to 48 (4 octaves up and down). However not many receiving devices can be set to pitchbend range of 48. It is however usable with pitchbend range of 12, giving a range of 24 notes, 12 up and 12 down from A (MIDI note 69) You can still use the transpose feature to shift the centre note.
4. As of firmware version 1050, the Autotune feature works fully for 1V/Oct and 1.2V/Oct and sets up all relevant parameters. You might however want to adjust the transpose to suit personal taste. Hz/V will be recognised and selected, however for Hz/V you might still need to tweak the results using the fine tune, scale, linearity and transpose parameters.
5. For best results, when either of the Aux inputs are set to clock or stop/start please set both the min and max value of that Aux input to the same value. The value should be halfway between the input-on voltage and the input-off voltage. So if the clock pulse you are using is 5 volts for On and zero volts for Off, then the halfway point would be 2.5 volts. For both Aux inputs min and max values of 100 represent approximately 10 volts, so 25 would represent 2.5 volts, so in this example both min & max values of the Aux used for clock should be set to 25.
6. If you are using a clock ppqn number setting of less than 24 there will be fewer clock pulses coming in than MIDI timing clock messages that need to go out so the Pro CV to MIDI will do its best to try and space the outgoing clocks evenly. However, when the very first clock is received, the firmware has no idea when the next one is likely to be and so has no reference and will use a default value. The answer to this is to run the clock for a few seconds so the output tempo has plenty of time to stabilise, then stop the clock. Now, when you restart, the tempo you were using is ready to be used from the start.
7. If neither Aux1 nor Aux2 are set to STT (start-stop) then Auto-Start-Stop will be used. If you are using auto-start/stop and you have pressed Stop on your master clock device then you must always wait until the controlled (slave) device has completely stopped before pressing Start again, otherwise your next start will initially be at the wrong tempo. If you are using a very low ppqn setting such as 1 this could be as much as 4 seconds after you pressed stop. This is because at very slow tempos and low ppqn settings, clock pulses may be up to 3 seconds apart and the firmware has to be sure that the incoming clock has actually stopped rather than having changed to a slower temp, or is just late.

RESETTING THE *PRO CV to MIDI* TO FACTORY DEFAULTS

If you wish to reset your *PRO CV to MIDI* to its default settings, you can do so by turning the unit on whilst holding down all three push buttons. When this has been completed [Fd] (factory defaults) will be displayed. You can then release the buttons.

CHECK LIST FOR SETTING UP THE *PRO CV to MIDI*

1. Make sure all cable connections have been made. ✓
2. Set MIDI receive channel you wish to use. ✓
3. Make sure you have set the GATE input correctly to either `Gate` or `S-Trig` type triggers. ✓
4. Make sure you have set the CV input correctly to either `V/oct` or `Hz/V.` ✓
5. You may wish to adjust the AUX, or any other settings to those that work best for your set-up. ✓

DISPLAYING THE SOFTWARE VERSION NUMBER

Power on the *PRO CV to MIDI* whilst holding the **INC** button pressed and the software version [1xxx] will be displayed in 3 groups e.g. 10 50 --- repeated.
Releasing the buttons will revert to the normal operational mode.

UPDATING THE FIRMWARE OVER MIDI

Disconnect the MIDI plug from the DIN socket on the PRO CV to MIDI.
Set parameter 90 to 'MIDI IN' – see page 9.
Connect the *Pro CV to MIDI*'s MIDI port to the MIDI output of your MIDI interface.
Follow the firmware update instructions included with the update.
The MIDI port will revert back to MIDI OUT on power-up.

A BRIEF OVERVIEW OF CV AND GATE TYPES

Pitch CV

The CV (control voltage) is a voltage that tells the synth what note to play. Most synths use the 1 Volt per Octave (V/Oct) pitch scaling system to control the pitch. This means, that each octave is 1V apart (or 0.0833V per semitone).

For example, bottom C (MIDI note #36) often corresponds to 0 Volts. The next C will be 1V, 2V, 3V etc. This system was used by Moog, Roland, ARP and indeed most other manufacturers **except** Yamaha and Korg.

Some other synths, most notably those by Korg and Yamaha, use a different pitch scaling system. This is an exponential method called Hertz per volt (Hz/V). This means that for the next octave up, the voltage is doubled. Bottom C (note#36) will be 0.25V, the next C will be 0.5V, 1V, 2V, 4V etc. **Note:** the Korg Monopoly is an exception, using V/oct scaling.

If you use a Hz/V synth with a V/oct pitch output (or vice-versa), the synth will play out of tune but will not cause any damage to the synth.

Gate / S-Trig

The GATE signal, sometimes called V-trig (voltage trigger), is a voltage that tells the synth when to play the note. The GATE voltage will usually be a positive voltage when the note is on, and 0V when off.

Some other synths, like Moog, Korg, and Yamaha, use S-TRIG (short-circuit trigger) instead of GATE. This signal performs the same function, but it is a different type of signal (electrically). To tell the note to play, the converter will provide a short-circuit at it's S-TRIG output (0V), and to turn off the note the output will be open circuit (literally like opening and closing a switch).

A point to watch for; unless you know the synth, it will not always be clear what type of CV and GATE signals are required to play the synth. For instance, the Korg MS-20 requires an S-TRIG signal, but the input is labelled TRIG.

For more information about the various CV and Gate systems, please visit:
<http://www.kenton.co.uk/info/midi-cv-info.shtml>

SPECIFICATIONS

Power Input	9V DC regulated
Power	80mA, 2.1mm plug (centre positive)
MIDI	Out on 5 pin DIN socket (switchable to In for firmware update)
Analogue inputs	CV (V/oct, Hz/V, 1.2V/Oct) Gate (Gate or S-trig) 2 x Aux
Weight	170g
Dimensions	122 x 75 x 42 mm
A to D conversion	16 bit high quality / low drift ADC and reference for CV input 12 bit ADCs for Auxes 1 & 2
Non-volatile memory EEPROM (no back-up battery required)	

WARRANTY

The *PRO CV to MIDI* comes with a 12 month (from purchase date) back to base warranty, (i.e. customer must arrange and pay for carriage to and from Kenton Electronics).

KENTON

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firmware rev# 1052

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