intellijel

MIDI 1U System

1U USB/DIN MIDI-to-CV Interface System

MIDI 1U Module

+

+ OPTIONAL

Up to four CVx 1U Expander Modules

MIDI IN Jacks 1U

OR

7U Case

OR

Palette Case

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COMPLIANCE

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, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by Intellijel Designs, Inc. could void the user's authority to operate the equipment.

Any digital equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is 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.

This device meets the requirements of the following standards and directives:

EMC: 2014/30/EU
EN55032:2015 ; EN55103-2:2009 (EN55024) ; EN61000-3-2 ; EN61000-3-3

Low Voltage: 2014/35/EU
EN 60065:2002+A1:2006+A11:2008+A2:2010+A12:2011

RoHS2: 2011/65/EU

WEEE: 2012/19/EU

OVERVIEW

Intellijel's MIDI 1U system comprises several elements, which work together to provide flexible, programmable MIDI-to-CV conversion to your Eurorack modules: The system comprises two mandatory components, and one optional component:

- **MIDI 1U module** - This class-compliant, 14HP module receives MIDI from an attached, external MIDI input connector (7U or Palette case, or MIDI IN Jacks 1U module), and works in one of two modes:

  SINGLE Mode   The module controls a single synth, listening to a single user-selectable MIDI Channel. It extracts (by default) PITCH, VELOCITY, MOD, CC, GATE, TRIG, CLOCK and RESET (or RUN) messages — sending the proportional voltages to individually labeled 3.5mm jacks for patching.

     CC and MOD jacks can be assigned to any MIDI CC input (either low- or high-res) and, if desired, configured to respond instead to Channel Aftertouch. Numerous other settings (such as pitch bend range, trigger length, coarse tuning, note priority, etc) can also be set.

  DUAL Mode   This mode maintains the Clock & Reset/Run functionality of SINGLE mode, but uses the other six jacks to transmit Pitch, Velocity and Gate messages to two different synthesizers — each responding to its own incoming MIDI channel.

     In this configuration, the PITCH, VEL and GATE jacks output the indicated data on the MIDI Channel assigned to synth 1; while the MOD, CC and TRIG jacks are repurposed as Pitch, Velocity and Gate outputs for the MIDI Channel assigned to synth 2.

- **MIDI input connector** - The MIDI 1U module does not have its own MIDI input jack. This enables you to use the MIDI/USB inputs built-in to your Intellijel *7U Performance Case* or *Palette Case*. If you don't own one of these cases, you can purchase the *MIDI IN Jacks 1U* module to allow connection of an external MIDI device.

- **CVx 1U module** (OPTIONAL) - This optional 14HP 1U module connects to the MIDI 1U module and adds an additional eight 3.5mm CV outputs. These outputs are fully programmable using the *Intellijel Config* app, providing your Eurorack system with 8 additional synths (and MIDI channels) while greatly expanding your control options — including polyphonic MIDI control, drum module connection and extensive multi-channel CC/CV conversion and routing. You can chain up to four CVx modules to a single MIDI 1U, giving you an additional 32 fully assignable output jacks — each assignable to any of 10 synths (on up to 10 MIDI channels).

The MIDI 1U system provides all the essentials to control and sync your Eurorack modular from your computer, mobile, or hardware MIDI device with a minimum of fuss. Several of the MIDI 1U module's most important features can be changed using its two front panel buttons, with full configuration capabilities offered via the *Intellijel Config* app, which is available for both Mac and Windows. The connectivity, feature set, expandability, and compact size make the MIDI 1U system ideal for integrating your modular gear with the rest of your rig.

INSTALLATION

The MIDI 1U system is designed specifically for use within an Intellijel-standard 1U row, such as contained within the Intellijel 4U, 7U, and Palette cases. Intellijel's 1U specification is derived from the Eurorack mechanical specification set by Doepfer that is designed to support the use of lipped rails within industry standard rack heights.
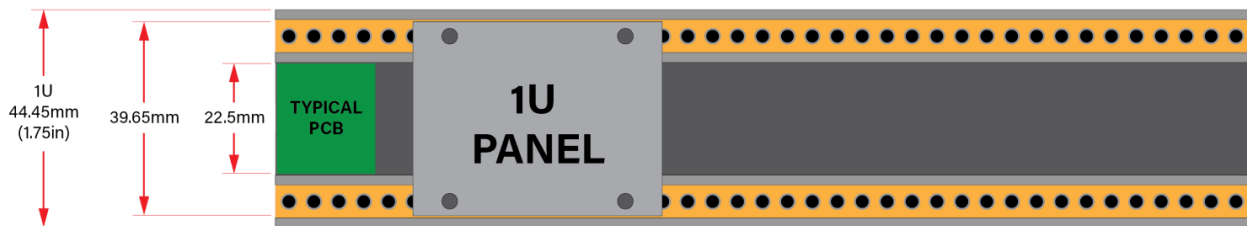
Power requirements for 1U conform to the Eurorack standard.

Before You Start

Before installing a new module in your case, you must ensure your power supply has a free power header and sufficient available capacity to power the module:

● Sum up the specified +12V current draw for all modules, including the new one. Do the same for the -12 V and +5V current draw. The current draw will be specified in the manufacturer's technical specifications for each module.

● Compare each of the sums to specifications for your case's power supply.

● Only proceed with installation if none of the values exceeds the power supply's specifications. Otherwise you must remove modules to free up capacity or upgrade your power supply.

You will also need to ensure your case has enough free space (hp) to fit the new module. To prevent screws or other debris from falling into the case and shorting any electrical contacts, do not leave gaps between adjacent modules, and cover all unused areas with blank panels. Similarly, do not use open frames or any other enclosure that exposes the backside of any module or the power distribution board.

You can use a tool like ModularGrid to assist in your planning. Failure to adequately power your modules may result in damage to your modules or power supply. If you are unsure, please contact us before proceeding.

Installing Your Modules

When installing or removing a module from your case always turn off the power to the case and disconnect the power cable. Failure to do so may result in serious injury or equipment damage.

IMPORTANT: The MIDI 1U Module has two different 10-pin connectors on its circuit board. One is for connecting to power, and the other is for connecting to the MIDI/USB jacks on your case or *MIDI IN Jacks 1U* module. Be sure, when connecting power, that you connect it to the one labelled POWER, as illustrated here.

MIDI JACK/CASE CONNECTOR

POWER CONNECTOR

MIDI EXPANDER CONNECTOR
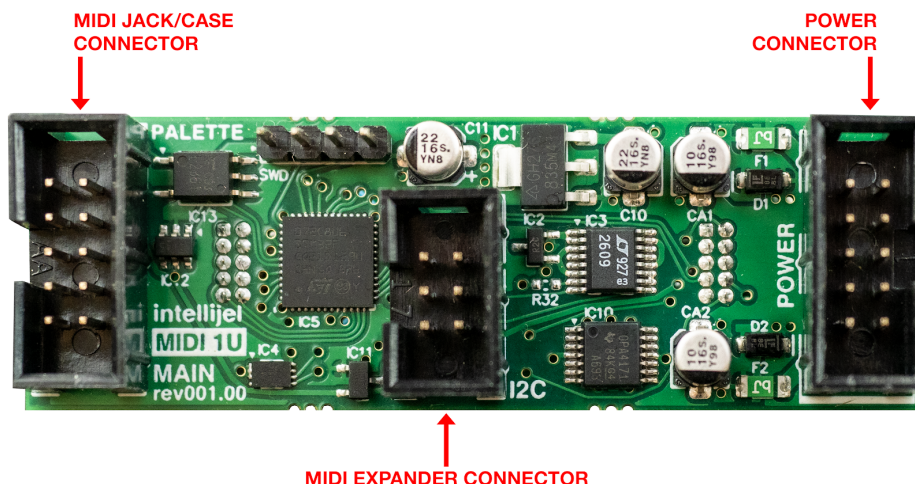
Connecting Power to the MIDI 1U

To power the MIDI 1U module, use the included 10-pin to 16-pin cable. Plug the 10-pin end into the 10-pin connector labelled "POWER" on the MIDI 1U (as shown above). **DO NOT plug it into the other 10-pin connector.** The connector is shrouded, and can only be inserted in one direction (ensuring proper orientation if you use the supplied Intellijel power cable). If you're using a different power cable, make sure the red stripe (negative) is closest to the thick white line printed on the circuit board along one edge of the POWER connector.

Plug the other end of the cable (the end with the 16-pin connector) into the power bus board of your Eurorack case. Ensure the red stripe on the cable lines up with the -12V pins on the bus board. On Intellijel power supplies the pins are labelled with "-12V" and a thick white stripe. Sometimes the connectors are shrouded, ensuring the cable can be oriented in only one direction. If you are using another manufacturer's power supply, check their documentation for instructions.

Before reconnecting power and turning on your modular system, double check that the ribbon cable is fully seated on both ends and that all the pins are correctly aligned. If the
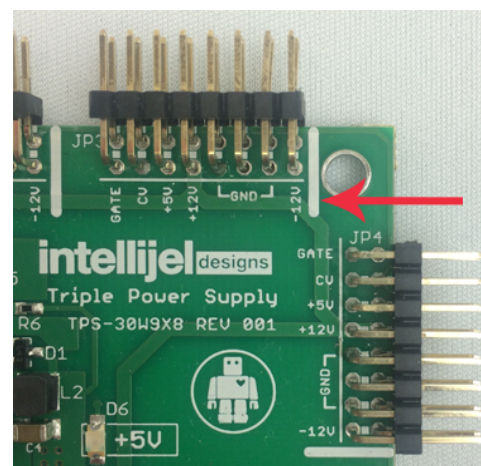
pins are misaligned in any direction or the ribbon is backwards you can cause damage to your module, power supply, or other modules.

After you have confirmed all the connections, you can reconnect the power cable and turn on your modular system. You should immediately check that all your modules have powered on and are functioning correctly. If you notice any anomalies, turn your system off immediately and check your cabling for mistakes.

Connecting the MIDI 1U to a MIDI IN Jacks 1U

You will need to connect the MIDI 1U to either a MIDI IN Jacks 1U module or to a case with built-in MIDI/USB jacks. This section discusses how to connect the MIDI 1U to the MIDI IN Jacks 1U module.

1. Turn off power to the case.

2. Connect the supplied 10-pin-to-16-pin power cable between the MIDI 1U and one of the Case's 16-pin power connectors (as discussed previously).

3. Connect one end of the supplied 10-pin to 10-pin ribbon cable to the shrouded 10-pin port on the MIDI 1U module. The connector is keyed, and will fit in only one direction.

4. Connect the other end of the cable to the MIDI IN Jacks module.

   Pay particular attention to the orientation (aligning the red wire with the white stripe on the circuit board).
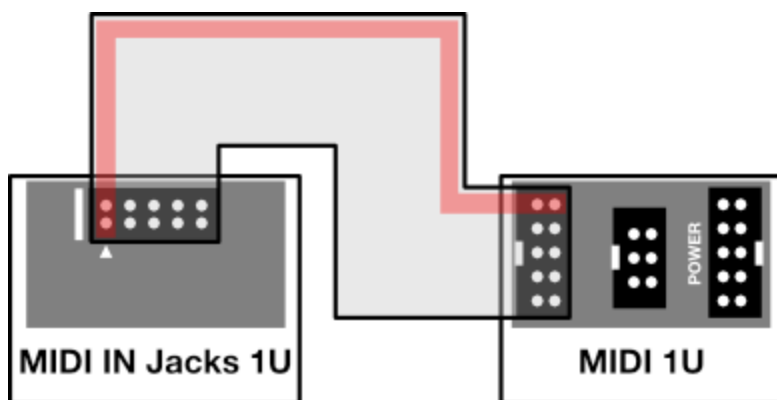
Connecting the MIDI 1U to a 7U Case
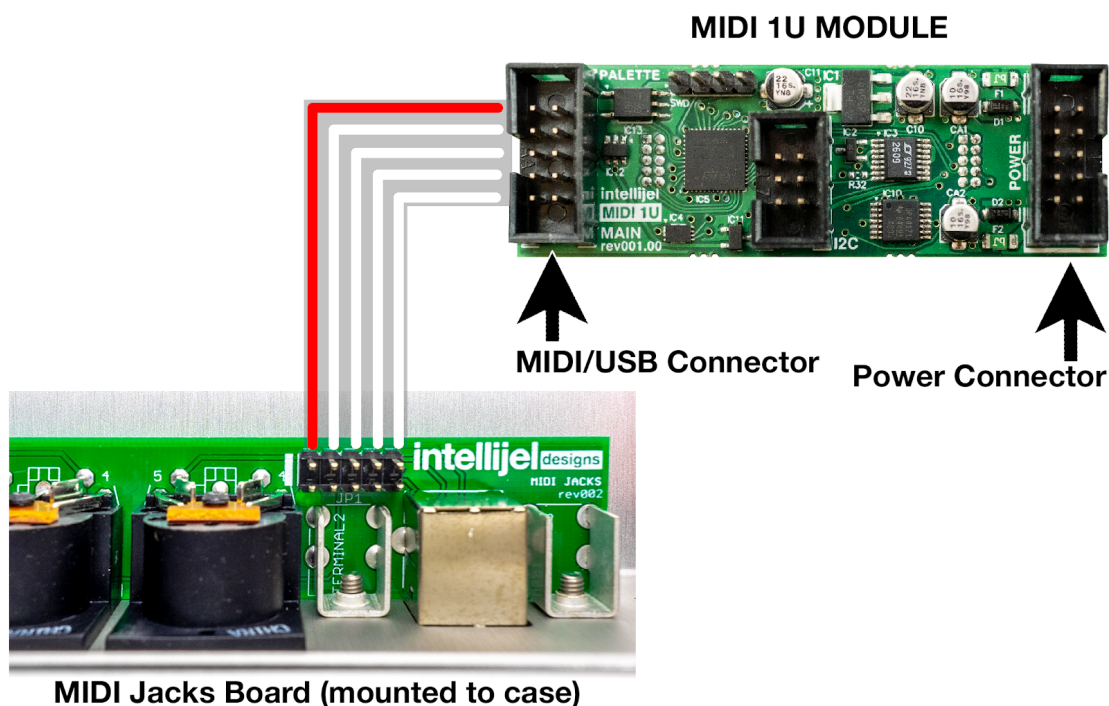
You will need to connect the MIDI 1U to either a MIDI IN Jacks 1U module or to a case with built-in MIDI/USB jacks. This section shows how to connect the MIDI 1U to the MIDI/USB jacks on an Intellijel 7U case.

1. Turn off power to the case.

2. Connect the supplied 10-pin-to-16-pin power cable between the MIDI 1U and one of the Case's 16-pin power connectors (as discussed previously).

3. Connect one end of the supplied 10-pin to 10-pin ribbon cable to the shrouded 10-pin port on the MIDI 1U module. The connector is keyed, and will fit in only one direction.

4. Connect the other end of the cable to the MIDI Jacks circuit board on your 7U case. On newer 7U cases, this connector is shrouded (ensuring the cable fits in only one orientation). On older cases, the connector is not shrouded, so pay particular attention to the orientation (aligning the red wire with the white stripe on the circuit board).

MIDI 1U MODULE

MIDI/USB Connector   **Power Connector**

MIDI Jacks Board (mounted to case)

5. Power on the 7U Case.

The MIDI 1U module will now receive MIDI from the 7U case's MIDI IN jacks (both USB and 5-pin MIDI) and convert it to CV. In addition, the 7U case's MIDI OUT jack will function as a MIDI Thru — passing along any MIDI data received at its MIDI IN jack.

Connecting the MIDI 1U to a Palette Case

You will need to connect the MIDI 1U to either a MIDI IN Jacks 1U module or to a case with built-in MIDI/USB jacks. This section discusses how to connect the MIDI 1U to the MIDI/USB jacks on an Intellijel Palette case.
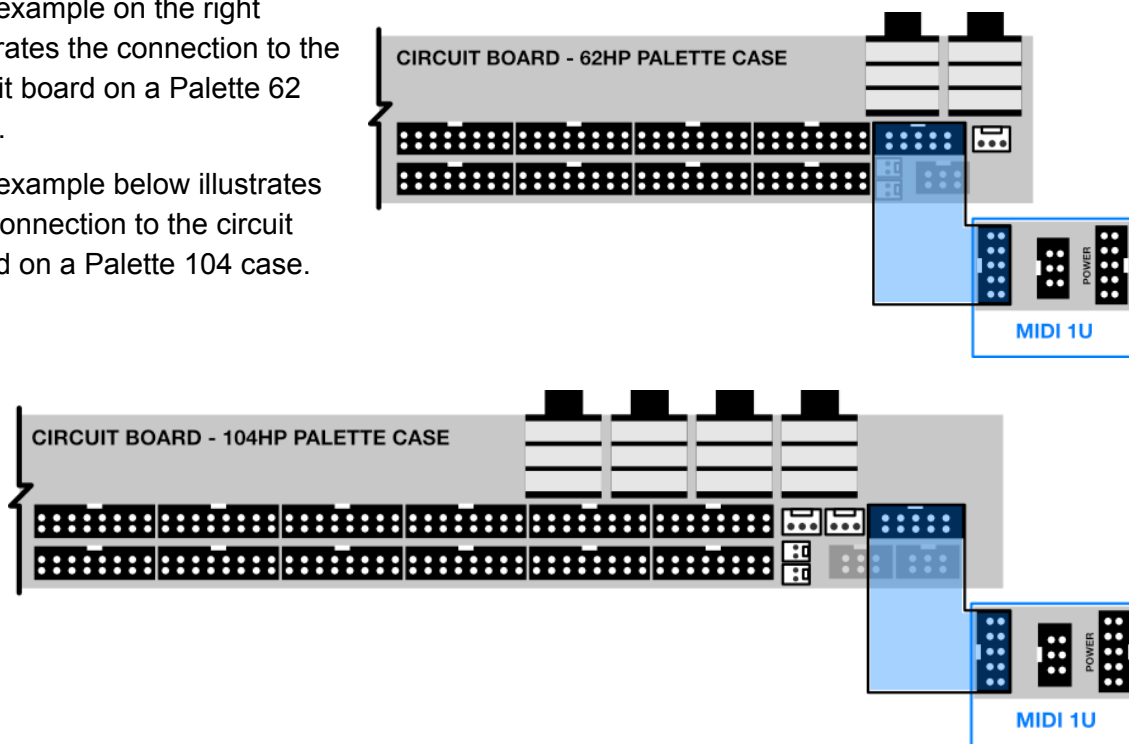
1. Turn off power to the Palette Case.

2. Connect the supplied 10-pin-to-16-pin power cable between the MIDI 1U and one your case's 16-pin power connectors (as discussed previously).

    IMPORTANT: Be sure to plug power into the MIDI 1U's POWER connector, and not the other 10-pin connector, as illustrated earlier in Installing Your Modules.

3. Connect one end of the supplied 10-pin to 10-pin ribbon cable to the shrouded 10-pin port on the MIDI 1U module. The connector is keyed, and will fit in only one direction.

4. Connect the other end of the supplied 10-pin-to-10-pin ribbon cable to the shrouded 10-pin port on the Palette Circuit Board. The connector is keyed, and will fit in only one direction.

The example on the right illustrates the connection to the circuit board on a Palette 62 case.

The example below illustrates the connection to the circuit board on a Palette 104 case.

5. Power on the Palette Case.

    The MIDI 1U module will now receive MIDI from the Palette's MIDI IN jacks (both USB and Type-A TRS-MIDI) and convert it to CV. In addition, the Palette's MIDI OUT jack will function as a MIDI Thru — passing along any MIDI data received at its MIDI IN jack.

Connecting a CVx to a MIDI 1U

If you use the optional *CVx* expander module, you will need to connect it to both power and to the *MIDI 1U* module.

1. Turn off power to your case.

2. Connect the supplied 10-pin-to-16-pin power cable between the *CVx* and one of your case' 16-pin power connectors (using the same technique discussed earlier in Connecting Power to the MIDI 1U).

3. Connect one end of the supplied 6-pin to 6-pin ribbon cable to the 6-pin I2C connector on the *MIDI 1U* module. The connector is keyed, and will fit in only one direction.

4. Connect the other end of the supplied 6-pin-to-6-pin ribbon cable to either one of the 6-pin I2C connectors on the *CVx*. The connector is keyed, and will fit in only one direction.

5. Set both DIP switches on the back of the CVx to the down position.

EXPANDER 1
SW 1 DOWN, SW 2 DOWN

In the following example, we've set both DIP switches to their down positions, which identifies the CVx as "Expander 1" (important if you chain together multiple CVx modules, as described in the next section).

6. Power up your case.

Connecting Multiple CVx Modules to a MIDI 1U

You can connect up to four CVx modules to a single MIDI 1U module — creating an expansive and powerful MIDI-to-CV controller for your eurorack system. Each CVx has two I2C jacks, allowing them to be chained together, with their dip switches each set to a different address. Specifically:

1. Turn off power to your case.

2. Connect the 10-pin power connector on each CVx to your power supply using the included 10-pin-to-16-pin power cable.

3. Connect one end of the supplied 6-pin to 6-pin ribbon cable to the 6-pin I2C connector on the *MIDI 1U* module. The connector is keyed, and will fit in only one direction.

4. Connect the other end of the supplied 6-pin-to-6-pin ribbon cable to either one of the 6-pin I2C connectors on *CVx #1*. The connector is keyed, and will fit in only one direction.

5. Set the dip switches on the back of the CVx to give it a unique ID.

EXPANDER 1
SW 1 DOWN, SW 2 DOWN

EXPANDER 2
SW 1 UP, SW 2 DOWN

EXPANDER 3
SW 1 DOWN, SW 2 UP

EXPANDER 4
SW 1 UP, SW 2 UP

You can connect up to four CVx units to your MIDI 1U — each of which requires its own ID (1-4) as set with the dip switches on the CVx' back panel.

6. Connect the remaining I2C-2 connector on CVx #1 to either I2C connector on CVx #2, and set CVx #2's dip switches to a different ID than you used for CVx #1.

7. In the following example, CVx #1 has both dip switches to their down positions, identifying it as "Expander 1," while CVx #2 has the "1 switch" in the up position, identifying it as Expander 2."

CVx 1U #2   CVx 1U #1   MIDI 1U
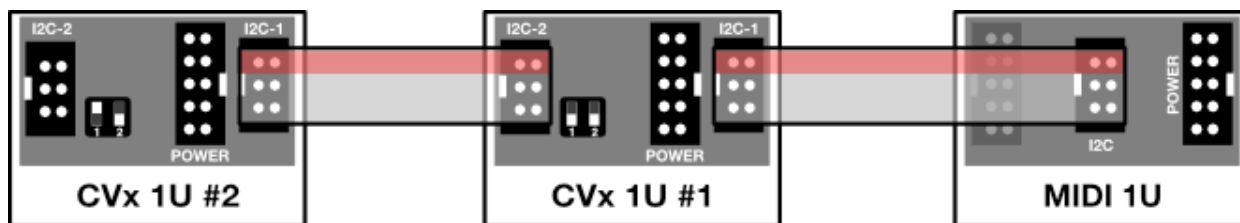
8. Continue chaining additional CVx modules as needed; setting each CVx' dip switches to a different ID.

9. Power up your case.

SYNTHS

The MIDI 1U System supports multiple MIDI Channels through the concept of *synths*. In MIDI 1U lingo, a "synth" defines the device you wish to control, and the MIDI channel on which you want to control it.

Intellijel's MIDI 1U system can control up to 10 different synths on up to 10 different MIDI channels.

By itself, without any CVx expanders, the MIDI 1U can control up to two monophonic synths (called **synth 1** and **synth 2**) on up to two different, user-selectable MIDI channels. Adding one or more CVx expander modules increases the available synth count (and MIDI channel count) to 10, with **synth 3 - synth 10** capable of monophonic, polyphonic, or drum operation.

Specifically:

● **Monophonic**

   Monophonic synths are configured to control a single oscillator or monosynth voice. This is the usual operation of most monophonic Eurorack devices, and the only mode supported by an unexpanded MIDI 1U.

   Various related parameters, such as MIDI channel, pitch range, note priority mode, pitch bend range, coarse tuning, and trigger length can be set for each monophonic synth.

● **Polyphonic**

   Polyphonic synths are configured to control a polyphonic oscillator or synth voice. This option requires a CVx expander, and is available only for Synths 3-10.

   Polyphonic synths support a maximum of 8 voices, with the actual number of voices determined by how many outputs you assign to a particular synth. For example, if you use the *Intellijel Config* app to configure a CVx to have 4 pitch outputs and 4 gate outputs assigned to the same synth, then you will have 4-voice polyphony. If you assign 8 pitch outputs and 8 gate outputs to the same synth across multiple CVx modules, you will have 8 voice polyphony, etc.

   Various related parameters, such as MIDI channel, pitch range, voice allocation, pitch bend range, coats tuning, and trigger length can be set for each polyphonic synth.

● **Drum**

   Select this option to control a drum/percussion voice or sampler module, where different MIDI note numbers trigger different drum sounds. This option requires a CVx expander, and is available only for Synths 3-10.

   Drum mode supports up to 8 voices per MIDI Channel. Use the *Intellijel Config* app to assign voices to MIDI Note numbers and determine whether the output is a gate, trigger or velocity value. If multiple outputs are assigned to the same MIDI Note, those outputs use only a single voice.

MODULE MODES

The MIDI 1U module works in one of two modes: *Single* or *Dual*. You can toggle between these two modes using either the **Module Mode** parameter in the [Intellijel Config](#) app, or by long-pressing (>2 sec) the **LEARN** button, as described in [Dual Mode Configuration](#).

Single Mode

This is the default (and most basic) mode of operation, and is the mode indicated by the panel graphics. Single mode uses only a single, monophonic **Synth** (**synth 1**), which responds to MIDI commands on the selected (or learned) MIDI channel. Incoming MIDI data on that channel is analyzed and converted to control voltages, which are sent out the correspondingly labeled jacks.

Many functions can be learned and configured from the front panel, while the Intellijel Config app offers even greater opportunity for customization.

When MIDI 1U is in Single Mode, the **LEARN** button is unlit (unless you're using it to learn parameter values).
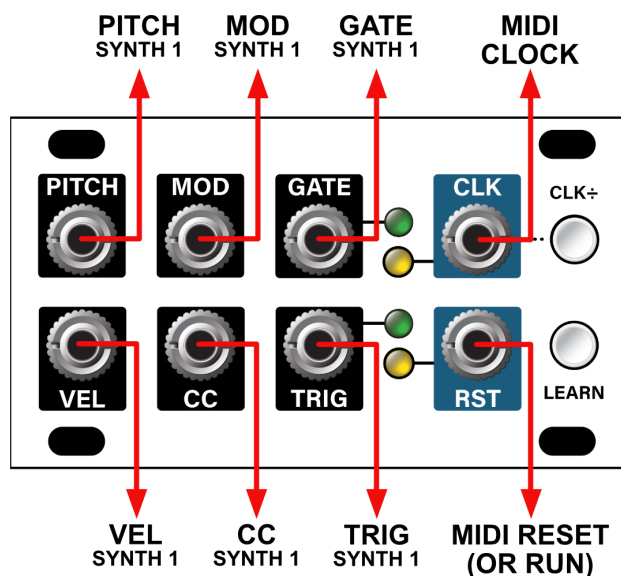
Dual Mode

This is an alternate, dual-synthesizer mode that allows a single MIDI 1U module to control two separate monophonic **Synths** (**synth 1** and **synth 2**). In this mode, you have independent MIDI control of the pitch, gate and velocity for two entirely different synths — each of which can respond to its own MIDI channel. When Dual Mono is selected, the **MOD**, **CC** and **TRIG** jacks are repurposed as **PITCH**, **VEL** and **GATE** jacks for **synth 2**).

You will need to configure any desired **CLK** division before entering Dual Mode. When MDI 1U is in Dual Mode, the **LEARN** button glows **yellow**.
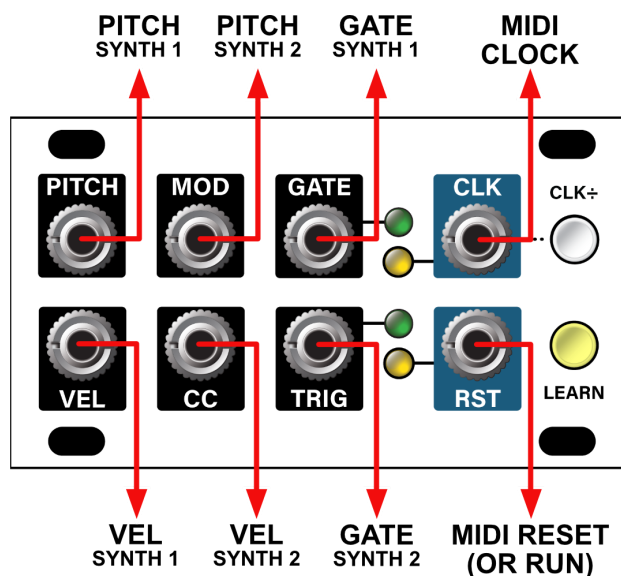
MIDI 1U FRONT PANEL

Controls

[1] **LEARN** button - Use this button to learn which MIDI channel the MIDI 1U will respond to, as well as the MIDI CC numbers assigned to both the **CC [F]** and **MOD [E]** output jacks.

MIDI 1U automatically saves all learned settings (**CLK ÷** *button flashes* **green**) after 2 seconds of MIDI inactivity, ensuring it returns to exactly the same state after a power cycle.
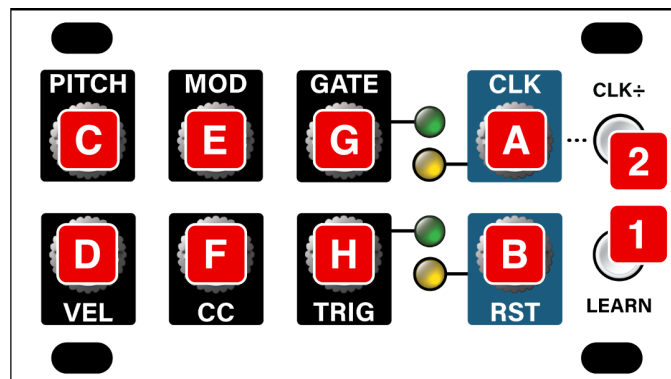
Pressing the LEARN button cycles through three states:

OFF : When the button is off, MIDI 1U is in normal operation and works to convert incoming MIDI data into CV for your eurorack system.

SOLID BLUE : Indicates the MIDI 1U is in LEARN CC+CH mode, meaning the module is awaiting a MIDI message, and that it will use the first message it receives to set both the **synth 1** MIDI Channel, and its **CC [F]** jack assignment.

FLASHING BLUE : Indicates the MIDI 1U is in LEARN MOD+CH mode, meaning the module is awaiting a MIDI message, and that it will use the first message it receives to set both the **synth 1** MIDI Channel, and its **MOD [E]** jack assignment.

For more information about using the **LEARN** button, see Configuring MIDI 1U Using the Front Panel, later in this manual.

Alternatively, you can set the MIDI channel, **MOD,** and **CC** jack assignments using the *Intellijel Config* app, discussed later.

DUAL MODE: MIDI 1U offers an alternate, dual channel mode that reconfigures the jacks for dual synth (2-channel) operation. In this mode, you have independent MIDI control of the pitch, gate and velocity for two different MIDI channels. See Dual Mode *for detailed information about enabling the mode, and using the LEARN button within it.*

[2] **CLK ÷** button - This button serves two functions.

NORMAL OPERATION:

In normal operation (i.e., the **LEARN [1]** button is off/unlit), pressing **CLK ÷** sets the clock division of the incoming MIDI clock. Press the **CLK ÷** button repeatedly to cycle through the following divisions of 96:

- /1 (clock out = 24 ppq)
- /3 (clock out = 32nd notes)
- /6 (clock out = 16th notes)
- /12 (clock out = eighth notes)
- /24 (clock out = quarter notes)
- /48 (clock out = half notes)
- /96 (clock out = whole notes)

The CLK LED blinks in time with the clock division.

Alternatively, you can use the *Intellijel Config* app to set the desired Clock Division.

LEARN OPERATION:

When the MIDI 1U is either **solid blue** (LEARN CC+CH mode) or **flashing blue** (LEARN MOD+CH mode), the **CLK ÷** button toggles the **CC** or **MOD** jack's CV output between **unipolar** (**green**) or bipolar (**red**/**green**) operation. This is described in detail, later in the manual.

Alternatively, you can use the *Intellijel Config* app to set the **CC** or **MOD** polarity.

*NOTE: MIDI 1U automatically saves any changes after 2 seconds of MIDI inactivity — ensuring it returns to exactly the same state after a power cycle, and that it does not interfere with time-sensitive operations (such as clock). The **CLK ÷** button flashes green when MIDI 1U auto-saves its settings.*
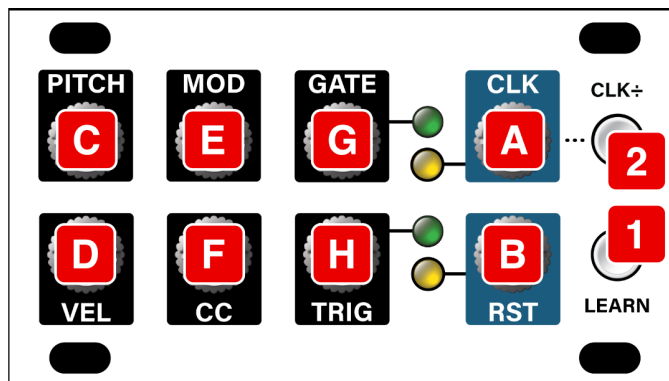
Outputs

[A] CLK out - Clock output, which transmits a divided MIDI clock pulse with a division set by the **CLK ±** **[2]** button. The corresponding LED blinks in time with the **CLK** out.

Alternatively, you can use the *Intellijel Config* app to set the desired Clock Division.

[B] RST out - Operates as either a RESET output or a RUN output, depending on how it's configured in the *Intellijel Config* app.

If configured as a RESET output (the factory default), this jack transmits a trigger signal whenever a MIDI reset message is received. The corresponding LED lights whenever a RESET message is sent.

If configured as a RUN output, this jack transmits a run gate that stays high (5V) for as long as the external MIDI Clock In is running. Stopping the external MIDI clock sets the gate low (0V). This is useful for starting/stopping any eurorack sequences in sync with an external MIDI sequencer. The corresponding LED lights whenever the RUN gate is high.

[C] PITCH out - This is 1V/oct CV output with a range of ±5V. The voltage output is determined by the note value present on the MIDI Channel Number assigned to MIDI 1U **synth 1**, plus any additional pitch bend. MIDI note 0 (C-2) maps to -5V and note 120 (C8) maps to +5V. Use the *Intellijel Config* app to configure various pitch-related parameters, such as Pitch Bend Range, and Coarse Tuning.

The signal present at the PITCH output jack is always the **synth 1** pitch output, whether or not the MIDI 1U is in SINGLE or DUAL mode.

NOTE: Pitches can be slewed (portamento) using a standard MIDI CC message (CC 65) to enable/disable portamento and MIDI CC 5 to set the portamento time. See 'Using Portamento on a Mono Synth' for more information.

[D] VEL out - This is the velocity output for **synth 1**. It has a range of 0-5V, and is proportional to the MIDI velocity received on the MIDI Channel Number assigned to MIDI 1U **synth 1**.

The signal present at the VEL output jack is always the **synth 1** pitch output, whether or not the MIDI 1U is in SINGLE or DUAL mode.

[E] MOD out - The signal present at the MOD output jack depends on the MIDI 1U's active mode. Specifically:
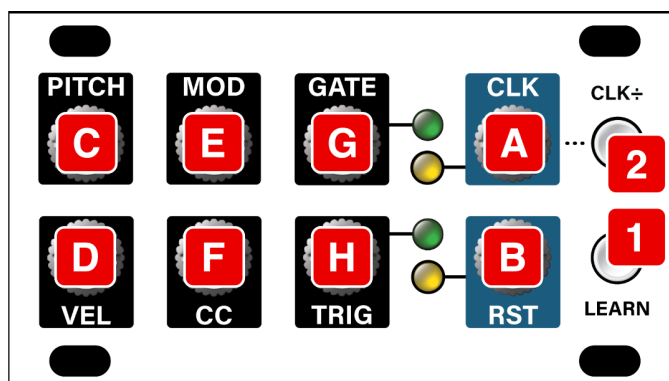
- SINGLE Mode : CV output for **synth 1**. Output is either 0-5V or ±5V (depending on the polarity assignment, as learned with the **CLK ±** [2] button or configured with the *Intellijel Config* app).

  By default, this jack outputs a control voltage proportional to the Mod Wheel data (CC #1) transmitted by your MIDI controller on the MIDI Channel Number assigned to MIDI 1U's **synth 1**. You can override this default CC assignment using the **LEARN** [1] button, or you can redefine its purpose entirely using the *Intellijel Config* app.

- DUAL Mode : Pitch output for **synth 2**. This is 1V/oct CV output with a range of ±5V. The voltage output is determined by the note value present on the MIDI Channel Number assigned to MIDI 1U's **synth 2**, plus any additional pitch bend. MIDI note 0 (C-2) maps to -5V and note 120 (C8) maps to +5V. Use the *Intellijel Config* app to configure various pitch-related parameters, such as Pitch Bend Range, and Coarse Tuning.

[F] CC out - The signal present at the CC output jack depends on the MIDI 1U's active mode. Specifically:

- SINGLE Mode : CV output for **synth 1**. Output is either 0-5V or ±5V (depending on the polarity assignment, as learned with the **CLK ±** [2] button or configured with the *Intellijel Config* app).

  By default, this jack outputs a control voltage proportional to the Breath Control data (CC #2) transmitted by your MIDI controller on the MIDI Channel Number assigned to MIDI 1U's **synth 1**. You can override this default CC assignment using the **LEARN** [1] button, or you can redefine its purpose entirely using the *Intellijel Config* app.

- DUAL Mode : Velocity output for **synth 2**. Output has a range of 0-5V. The voltage is proportional to the MIDI velocity received on the MIDI Channel Number assigned to MIDI 1U's **synth 2**.

[G] GATE out - This is the Gate output for **synth 1**, which is high (5V) for as long as a note is being held on the MIDI Channel Number assigned to MIDI 1U's **synth 1**. The corresponding LED lights whenever the GATE out is high.

The signal present at the GATE output jack is always the **synth 1** gate output, whether or not the MIDI 1U is in SINGLE or DUAL mode.

[H] TRIG out - The signal present at the TRIG output jack depends on the MIDI 1U's active mode. Specifically:

- SINGLE Mode : Trigger output for **synth 1**. Transmits a +5V trigger signal whenever a MIDI Note On message is received on the MIDI Channel Number assigned to MIDI 1U's **synth 1**. By default, the Trigger length is 5ms, but you can override this using the *Intellijel Config* app. The corresponding LED lights whenever the TRIG out is high.

- DUAL Mode : Gate output for **synth 2**, which is high (5V) for as long as a note is being held on the MIDI Channel Number assigned to MIDI 1U's **synth 2**. The corresponding LED lights whenever **synth 2's** GATE out is high.

CONFIGURING MIDI 1U USING THE FRONT PANEL

You can configure the MIDI 1U module using either its front panel or the *Intellijel Config* app (available for download from www.intellijel.com). This section discusses configuration via the front panel. Using the *Intellijel Config* app is discussed later in this manual.

Learn a MIDI Channel (Synth 1)

You can set the MIDI receive channel for **synth 1** using the **LEARN** button. Specifically:

1. If the **LEARN [1]** button is not lit, press it once.

   The **LEARN** button lights solid **blue**, indicating the MIDI 1U is awaiting a MIDI message.

2. Send any channel-based MIDI message into the MIDI 1U.

   MIDI 1U **synth 1** will automatically sets itself to the sent message's MIDI channel, and the **LEARN** button will extinguish.

   Additionally, MIDI 1U will automatically save all learned settings (**CLK ÷** *button flashes* **green**) after 2 seconds of MIDI inactivity, ensuring it returns to exactly the same state after a power cycle.

NOTE: You can also learn CC and MOD jack assignments while learning a MIDI channel, as described below.
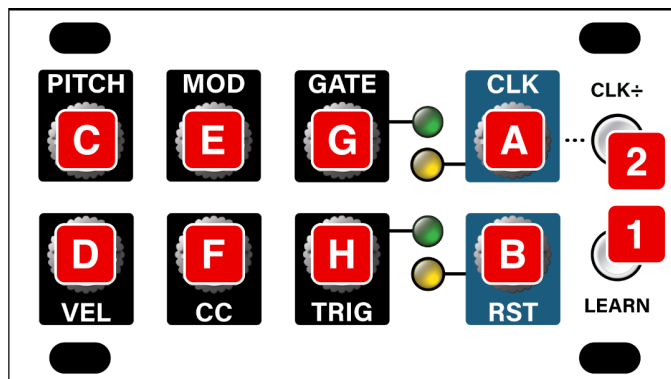
Learn the CC Jack Assignment (Synth 1)

If using Single Mode, you can also assign a function to the MIDI 1U's **CC [F]** jack using the **LEARN** button. Specifically:

1. If the **LEARN [1]** button is not lit, press it once.

   The **LEARN** button lights solid **blue**, indicating the MIDI 1U is in LEARN CC+CH mode, and is awaiting a MIDI message.

   In the following steps you will be learning the syn 1 MIDI Channel and MIDI CC# you want assigned to the **CC [F]** jack, plus that jack's CV Polarity.

2. Press the **CLK ÷ [2]** button to toggle between **unipolar** (0-5V) or **bipolar** (±5V) operation for the **CC [F]** jack. Specifically.

Unipolar :	**GREEN** button: If the **CLK ÷** button is **solid green** when learning the **CC** jack assignment, then the **CC** jack's output voltage will be set to unipolar mode. (i.e. CC Values of 0-127 = 0V - 5V).
Bipolar :	**RED**/**GREEN** button: If the **CLK ÷** button is flashing **red**/**green** when learning the **CC** jack assignment, then the **CC** jack's output voltage will be bipolar (i.e. CC Value of 64 = 0V; CC Value of 0 = -5V; CC Value of 127 = +5V).

3. Send the MIDI 1U a MIDI message using the MIDI CC number that you want assigned to the MIDI 1U's **CC [F]** jack.

   MIDI 1U will automatically assign its **CC [F]** jack to the CC# sent, while simultaneously setting the **synth 1** MIDI channel to match. It will assign the desired polarity to that jack, and extinguish the **LEARN** button.

For example, if you turn an Expression (CC 11) knob on a MIDI controller assigned to Channel 2, then MIDI 1U **synth 1** will automatically assign itself to respond to CH 2, and it will configure its **CC** out jack to transmit a control voltage based on Expression (CC 11) data from your MIDI source.

Additionally, MIDI 1U will automatically save all learned settings after 2 seconds of MIDI activity (**CLK ÷** *button flashes* *green*), ensuring it returns to exactly the same state after a power cycle.

Learn the MOD Jack Assignment (Synth 1)

If using Single Mode, you can also assign a function to the MIDI 1U's **MOD [E]** jack using the **LEARN** button. Specifically:

1. If the **LEARN [1]** button is not lit, press it _**twice**_.

    The **LEARN** button _**flashes blue**_, indicating the MIDI 1U is in LEARN MOD+CH mode, and is awaiting a MIDI message.

    In the following steps you will be learning the **synth 1** MIDI Channel and MIDI CC# you want assigned to the **MOD [E]** jack, plus that jack's CV Polarity.

2. Press the **CLK ÷ [2]** button to toggle between **unipolar** (0-5V) or **bipolar** (±5V) operation for the **MOD [E]** jack. Specifically.

Unipolar :	**GREEN** button: If the **CLK ÷** button is **solid green** when learning the **MOD** jack assignment, then the **MOD** jack's output voltage will be set to unipolar mode. (i.e. CC Values of 0-127 = 0V - 5V).
Bipolar :	**RED**/**GREEN** button: If the **CLK ÷** button is flashing **red**/**green** when learning the **MOD** jack assignment, then the **MOD** jack's output voltage will be bipolar (i.e. CC Value of 64 = 0V; CC Value of 0 = -5V; CC Value of 127 = +5V).

3. Send the MIDI 1U a MIDI message using the MIDI CC number that you want assigned to the MIDI 1U's **MOD [E]** jack.

    MIDI 1U will automatically assign its **MOD [E]** jack to the CC# sent, while simultaneously setting the **synth 1** MIDI channel to match. It will assign the desired polarity to that jack, and extinguish the **LEARN** button.

For example, if you turn a Portamento Time (CC 5) knob on a MIDI controller assigned to Channel 3, then MIDI 1U **synth 1** will automatically assign itself to respond to CH 3, and it will configure its **MOD** out jack to transmit a control voltage based on Portamento Time (CC 5) data from your MIDI source.

Additionally, MIDI 1U will automatically save all learned settings (**CLK ÷** _button flashes_ _**green**_) after 2 seconds of MIDI activity, ensuring it returns to exactly the same state after a power cycle.

Dual Mode Configuration (Synth 1 + Synth 2)

MIDI 1U offers an alternate, dual channel mode that reconfigures its output jacks for dual synth operation. In this mode, you control both **synth 1** and **synth 2** from the MIDI 1U module, giving you independent MIDI control of the pitch, gate and velocity for two different MIDI channels (repurposing the **MOD**, **CC** and **TRIG** jacks for **PITCH**, **VEL** and **GATE** jacks, respectively, for **synth 2**).
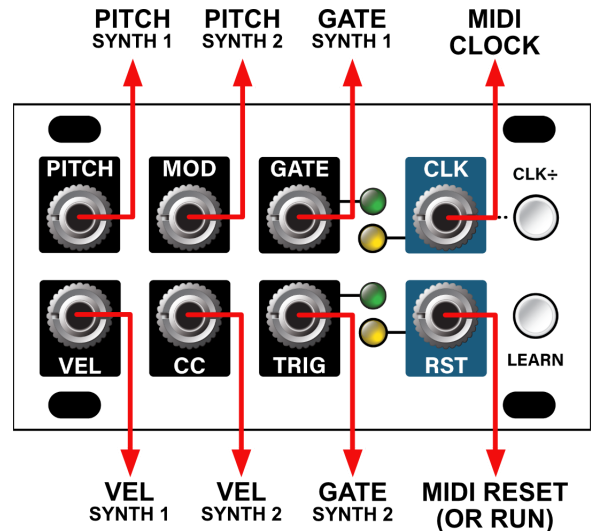
*NOTE: You will need to configure any desired **CLK** division before entering Dual Mode.*

To enter Dual Mode:

1. Long press (>2 sec) the **LEARN** button.

    MIDI 1U reconfigures as a dual channel device, and the jacks take on the functions indicated in the graphic to the right.

    The **LEARN** buttons glow yellow, indicating the device is in Dual Mode.

To learn the Synth 1 MIDI Channel:

1. Press the **LEARN** button.

    It will turn red, indicating that you're learning Synth 1's MIDI channel.

2. Send any channel-based MIDI message into the MIDI 1U.

    Synth 1 automatically sets itself to the sent message's MIDI channel, and the unit will return to Dual Mode (i.e. the **LEARN** button is lit yellow).

To learn the Synth 2 MIDI Channel:

1. Double-press the **LEARN** button.

    It will flash red, indicating that you're learning Synth 2's MIDI channel.

2. Send any channel-based MIDI message into the MIDI 1U.

    Synth 2 automatically sets itself to the sent message's MIDI channel, and the unit will return to Dual Mode (i.e. the **LEARN** button is lit yellow).

To exit Dual Mode:

1. If MIDI 1U is currently in Dual Mode (**LEARN** button is lit yellow), long press (>2 sec) the **LEARN** button to revert to Normal Mode.

    MIDI 1U reconfigures back to controlling a single (**synth 1**) device, and restores the **MOD**, **CC** and **TRIG** settings to their previously programmed conditions.

Using Portamento on a Mono Synth

MIDI 1U responds to standard MIDI CC Portamento commands, allowing it to operate in portamento mode. This slews the voltage change (with constant time) between pitches in a mono synth. Send standard, channelized, MIDI CC messages from your DAW, sequencer or controller to turn that channel's Mono Synth Portamento on/off, and to set the portamento time. Specifically:

- **CC 65** (Portamento Control) on MIDI Channel "x".

  Value 127 = Turns MIDI 1U Portamento ON for the mono synth assigned to channel "x"

  Value 0 = Turns MIDI 1U Portamento OFF for the mono synth assigned to channel "x"

- **CC 5** (Portamento Time MSB) on MIDI Channel "x".

  Values 0-127 = Sets the MIDI 1U's portamento time from 0 seconds (CC 5 = 0) to about 1.1 seconds (CC 5 = 127), slewing the pitch output voltage from the mono synth assigned to channel "x".

CVx 1U FRONT PANEL

Each of the optional *CVx 1U* expander modules has eight user-assignable outputs. Using the *Intellijel Config* app, you can assign each of the eight jacks to generate just about any type of voltage that can be derived from a MIDI signal.

You connect a CVx expander module to the MIDI 1U using their 6-pin I2C connectors, as discussed in Connecting a CVx to a MIDI 1U. You can chain up to four CVx modules to a single MIDI 1U using their I2c connectors, as discussed in Connecting Multiple CVx Modules to a MIDI 1U.

Connecting one or more CVx modules to a MIDI 1U increases its synth count from 2 synths (on two MIDI channels) to 10 synths (on 10 MIDI channels).

There are 8 user-configurable output jacks on each CVx — each with its own status LED. To configure these jacks requires use of the *Intellijel Config* app, discussed later in the manual.
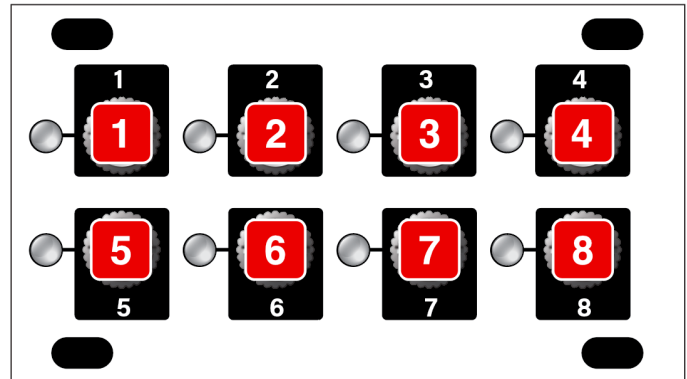
INTELLIJEL CONFIG APP

You can customize various aspects of the MIDI 1U system using the *Intellijel Config* app (available for both Mac and Windows), which is available to download from the www.intellijel.com website.
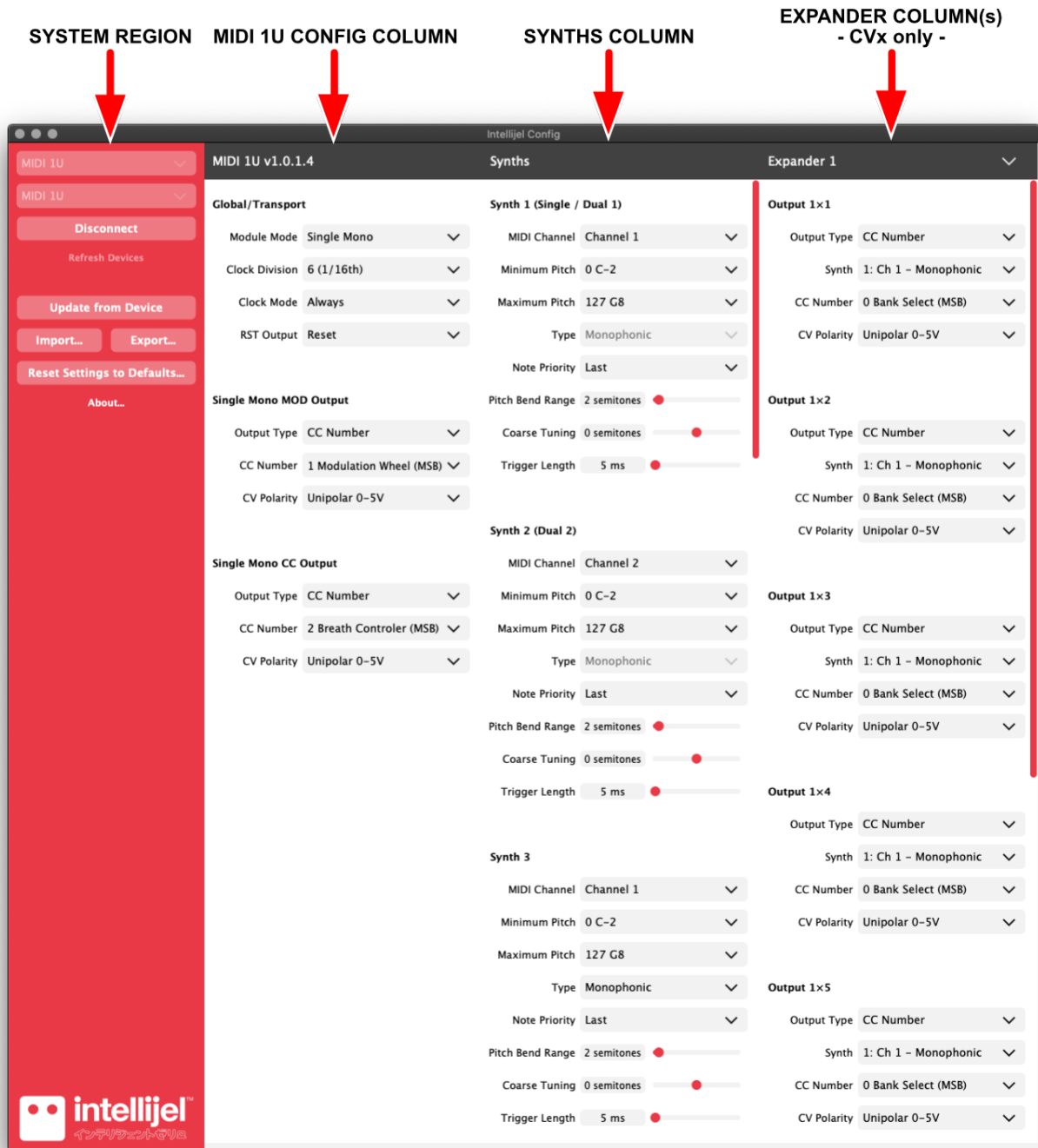
System Region

On the far left is the red System Region, which is used to select and connect to the desired MIDI 1U system, and to export and import various saved settings. The following options are available:

MIDI Input	Select the MIDI Device you want to configure from the drop down MIDI Input list.
MIDI Output	Select the MIDI Device you want to configure from the drop down MIDI Output list.
	*NOTE: To enable bidirectional communication between the computer and your MIDI 1U system, you must select the MIDI 1U in both the **MIDI Input** and **MIDI Output** menus.*
Connect / Disconnect	Click this button to connect to the device selected in the **MIDI Input** & **MIDI Output** menus. Once connected, the button becomes a **Disconnect** button.
Refresh Devices	With the Intellijel Config app disconnected from any devices, click this to refresh the list of available MIDI devices supplied to the **MIDI Input** and **MIDI Output** columns.
Update from Device	Click to query the device. This is handy if, for example, you use the MIDI 1U's **LEARN** button to configure it while connected to the Intellijel Config app. The **Update from Device** button repopulates the *Intellijel Config* app with the latest settings from the device.
Import	Click this button to import (load) a different MIDI 1U .xml format system configuration from disc. System configurations can be saved to disc via the **Export** button.
	NOTE: You cannot import an XML file that was saved with a different number of expander modules than you currently have.
Export	Click this button to export (save) the current MIDI 1U system configuration as a .xml file on your computer. The ability to export MIDI system configurations is particularly useful when working with large, MIDI-integrated eurorack systems, since it enables you to save and recall different complex routings.
Reset Settings To Defaults	Click this button to reset the entire MIDI 1U system (including any connected CVx modules) to the factory default settings.

MIDI 1U Config Column

The MIDI 1U Config column is used to configure the various outputs of the MIDI 1U module selected in the [System Region's](#) **MIDI Input** and **MIDI Output** menus. At the top of the column is the name of the selected device and its current firmware version. Beneath are all the available parameters, divided into three sections:

- **Global/Transport**
- **Single Mono MOD Output**
- **Single Mono CC Output**

Each section is described on the following pages.

Global/Transport Settings

Use these settings to configure the MIDI 1U **Clock** and **RST** jack functions. Specifically:

Module Mode		The MIDI 1U module works in <u>one of two modes</u>: Single or Dual. Use this menu to select between the two operations.
	Single Mono	This is the default (and most basic) mode of operation, and is the mode indicated by the panel graphics. Single mode uses only a single, monophonic synth (**synth 1**) as configured in the <u>Synths Column</u>, which responds to MIDI commands on the assigned MIDI channel. Incoming MIDI data on that channel is analyzed and converted to control voltages, which are sent out the correspondingly labeled jacks.
	Dual Mono	This is an alternate, dual-synthesizer mode that allows a single MIDI 1U module to control two separate monophonic synths (**synth 1** and **synth 2**) as configured in the <u>Synths Column</u>). In this mode, you have independent MIDI control of the pitch, gate and velocity for two entirely different synths — each of which can respond to its own MIDI channels. When Dual Mode is selected, the **MOD**, **CC** and **TRIG** jacks are repurposed as **PITCH**, **VEL** and **GATE** jacks for **synth 2**.
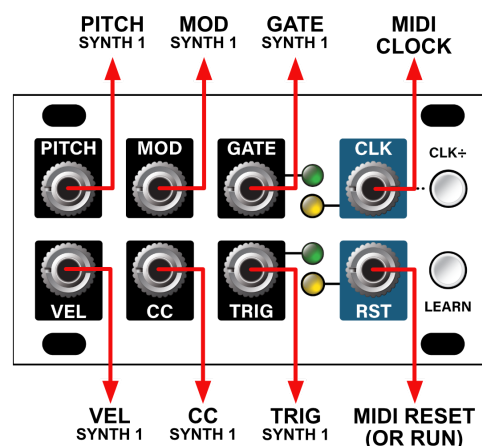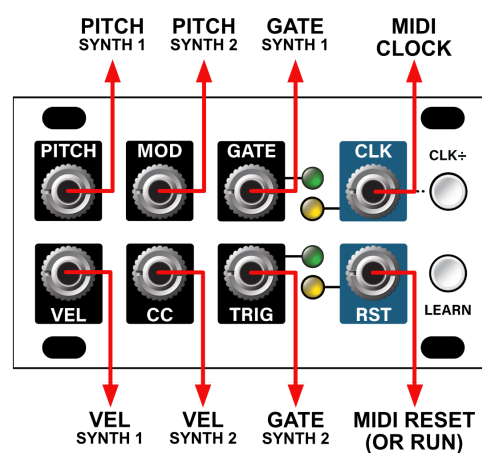
Clock Division		Selects a clock division to apply to the incoming MIDI clock. The divided clock is sent out the **CLK** output.
	/1	clock out = 24 ppq
	/3	clock out = 1/32 notes
	/6	clock out = 1/16 notes
	/12	clock out = 1/8 notes
	/24	clock out = 1/4 notes
	/48	clock out = 1/2 notes
	/96	clock out = whole notes
Clock Mode	Always	The received MIDI clock will be output regardless of the Transport state (Start/Stop).
	Running	The MIDI clock will only be output when the Transport is "running."
RST Output	Reset	The **RST** jack transmits a trigger signal whenever a MIDI RESET message is received, and when a START message is received. This is the factory default.
	Run	The **RST j**ack transmits a run gate that goes high (5V) on a MIDI START/CONTINUE message, and goes low (0V) when a STOP message is received. This is useful for starting/stopping any eurorack sequences in sync with an external MIDI sequencer.

Single Mono MOD Output Settings

Use these settings to configure the source and type of signal sent from the **MOD** jack when MIDI 1U is set to Single Mode.

*IMPORTANT: These setting apply **only** when MIDI 1U is set to Single Mode, since the **MOD** jack is used for **synth 2's** Pitch output in Dual Mode).*

Output Type		Selects the type of voltage sent out the **MOD** jack. By default, this is a CC Number (the value of which is selected from the **CC Number** menu), however other assignments are possible. Specifically:
	Clock (Always)	The jack outputs a clock signal (timed at the rate set by the **Clock Division** parameter, which appears when "Clock (Always)" is selected). The received MIDI clock will be output regardless of the Transport state (Start/Stop).
		*NOTE: If you assign the output to "Clock" (either "Always" or "Running"), then you have the option of setting an arbitrary number of clock divisions (from 1 to 192), rather than the preset options offered by the module's dedicated **CLK** output.*

Clock (Running)	As with "Clock (Always)," the jack outputs a divided clock signal, but only when the transport is "running."
	NOTE: If you assign the output to "Clock" (either "Always" or "Running"), then you have the option of setting an arbitrary number of clock divisions (from 1 to 192), rather than the preset options offered by the module's dedicated **CLK** *output.*
Reset	The jack transmits a trigger signal whenever a MIDI RESET or START message is received.
Run	The jack transmits a run gate that goes high (5V) on a MIDI START/CONTINUE message, and goes low (0V) when a STOP message is received.
CC Number	The jack outputs a control voltage derived from the MIDI CC # selected in the **CC Number** menu on the **MIDI Channel** assigned to **synth 1**. Voltage polarity is selected by the **CV Polarity** parameter.
CC Number (High Res)	The jack outputs a control voltage derived from the High Res MIDI CC # selected in the **CC Number** menu on the **MIDI Channel** assigned to **synth 1**. Voltage polarity is selected in the **CV Polarity** menu. This allows fine-control of voltages from any external DAW or MIDI Device capable of transmitting them.
	NOTE: Ableton Live users who wish to take advantage of MIDI 1U's 14-bit control capabilities can download Intellijel's free "High-Res CC" Max for Live plugin from the Intellijel website, which is included in the Intellijel Config *application download.*
Pressure (Aftertouch)	The jack outputs a voltage derived from Channel Aftertouch on the **MIDI Channel** assigned to **synth 1**.
Pitch	The jack outputs a 1V/oct pitch output with a range of ±5V. The actual pitch is determined by the note value received on the **MIDI Channel** assigned to **synth 1**, plus any additional pitch bend.
Gate	The jack outputs a gate signal, which is high (5V) for as long as a note is being held on the **MIDI Channel** assigned to **synth 1**.
Trigger	The jack outputs a +5V trigger signal whenever a MIDI Note On message is received on the **MIDI Channel** assigned to **synth 1**. By default, the Trigger length is 5ms, but you can override this, per-channel, using the **Trigger Length** option for **synth 1**.

	Velocity	The jack outputs a velocity value with a range of 0-5V. The voltage is proportional to the MIDI velocity received on the **MIDI Channel** assigned to **synth 1**.
Clock Division		*NOTE: Available only if **Output Type** = "Clock (Always)" or "Clock (Running)"*
		Selects a clock division to apply to the incoming MIDI clock.
	1-192	If you assign the output to "Clock" (either "Always" or "Running"), then you have the option of setting an arbitrary number of clock divisions (from 1 to 192), rather than the preset options offered by the module's dedicated **CLK** output.
CC Number		*NOTE: Available only if **Output Type** = "CC Number" or "CC Number (High Res)"*
	(0 - 127)	Selects which MIDI CC# is the source of the control voltage sent out the jack. For example, if you select `5 Portamento Time`, then the jack will transmit a control voltage based on CC #5 data on the **MIDI Channel** assigned to **synth 1**.
		*NOTE: Note that, if the **Output Type** = "CC Number (High Res)", then fewer CC sources are available than if **Output Type** = "CC Number", and the disabled CC options are greyed out.*
CV Polarity		*NOTE: Available only if **Output Type** = "CC Number" or "CC Number (High Res)"*
	Unipolar	The jack outputs a unipolar signal ranging from 0V to +5V. Incoming MIDI CC data is interpreted as a unipolar signal, meaning a CC value of 0 maps to 0V and a CC value of 127 maps to +5V.
	Bipolar	The jack outputs a bipolar signal ranging from -5V to +5V. Incoming MIDI CC data is interpreted as a bipolar signal, meaning a CC value of 64 maps to 0V. Values less than 64 map to negative voltages (with a CC value of 0 generating -5V). Values greater than 64 map to positive voltages (with a CC value of 127 generating +5V).

Single Mono CC Output Settings

Use these settings to configure the source and type of signal sent from the **CC** jack when MIDI 1U is set to Single Mode.

*IMPORTANT: These setting apply **only** when MIDI 1U is set to Single Mode, since the **MOD** jack is used for **synth 2's** Pitch output in Dual Mode).*

The options available here are identical to the options available for the Single Mono MOD Output.

Synths Column

Intellijel's MIDI 1U system can control up to ten different **synths** on up to ten different MIDI channels.

By itself (without a CVx), the MIDI 1U can control up to two monophonic **synths**.

Connecting one or more CVx expanders adds eight additional **synths** — each of which can be configured as a monophonic synth; a polyphonic synth; or a collection of note-mapped drum assignments.

All synths are configured in this column, which displays two synths (**synth 1** and **synth 2**) when using a single, standalone MIDI 1U module. It displays an additional 8 synths (**synths 3 - 10**) if one or more CVx units are connected.

Every synth has an identical set of configuration parameters, which are detailed on the following pages.

MIDI Channel	**(**1-16)	Selects the MIDI channel to which the synth responds. Each synth can respond to a different MIDI Channel, or you can assign the same channel to multiple synths for layers and splits.
Minimum Pitch	(0-127)	Sets the minimum pitch value to which the synth responds. This value (along with the **Maximum Pitch** value) are useful for setting up splits and layers when multiple synths are set to the same **MIDI Channel**.
Maximum PItch	(0-127)	Sets the maximum pitch value to which the synth responds. This value (along with the **Minimum Pitch** value) are useful for setting up splits and layers when multiple synths are set to the same **MIDI Channel**.
Type		Sets the type of device (*monophonic*, *polyphonic*, or *drum*) that you wish to control with the synth.
		*NOTE: **Synth 1** and **Synth 2** (as provided by a standalone MIDI 1U module) are monophonic only, and cannot be set otherwise.*
	Monophonic	Select this option to control a single oscillator or monosynth voice. This is the usual operation of most monophonic Eurorack devices.
	Polyphonic	Select this option to control a polyphonic oscillator or synth voice. This option requires a CVx expander, and is available only for Synths 3-10.
		Poly mode supports a maximum of 8 voices, with the actual number of voices determined by the **Output Type** assignments in the Expander column(s). Specifically, the number of voices = max number of outputs assigned to a given type. So if you have 4 pitch outputs and 4 gate outputs assigned to the Poly Synth's **MIDI Channel**, then you will have 4-voice polyphony.
	Drum	Select this option to control a drum or percussion voice or sampler module, where different MIDI note numbers trigger different drum sounds. This option requires a CVx expander, and is available only for Synths 3-10.
		Drum mode supports up to 8 voices per **MIDI Channel**. Use the Expander column(s) to assign voices to **MIDI Note** numbers and determine whether the output is a gate, trigger or velocity value. If multiple outputs are assigned to the same **MIDI Note**, those outputs use only a single voice.

Note Priority

*NOTE: Appears only if **Type** = "Monophonic".*

If the incoming MIDI stream has more sustained notes than your system can play simultaneously, this option determines which note is actually heard.

Last

The most recently played (last) note will always override the currently playing note, and is always the note you will hear.

Highest

The highest note currently being held is the note you will hear. Any note you play that is lower will be ignored. Any note you play that is higher will override the previous note.

Lowest

The lowest note currently being held is the note you will hear. Any note you play that is higher will be ignored. Any note you play that is lower will override the previous note.

Voice Allocation

*NOTE: Appears only if **Type** = "Polyphonic".*

Standard

Each time a note is triggered, it's assigned to the least recently used voice, unless you repeat a note that has not yet been re-assigned. Held notes will only be re-assigned when more voices are needed, in which case the oldest note will be silenced in favour of the additional note.

For example, if you configure CVx for 4-voice polyphony and play a 4 note chord, it assigns notes to voices 1, 2, 3 and 4. If you release voice 2 and play a different note, it will also use voice 2. If you then play a 5th note, it will drop voice 1 since that's the oldest voice. Then, if you play a sixth note while holding these down, it will replace voice 3 (since voices 1 and 2 were replaced more recently than voice 3).

Round Robin

Each time a note is triggered, it uses a different voice. Any currently held notes will be silenced when their current voice is needed by the round robin cycle.

Pitch Bend Range   *NOTE: Does not appear if **Type** = "Drum".*

(1 - 24)   Sets the max number of semitones that an incoming MIDI Pitch Bend message will affect the **PITCH** output.

Coarse Tuning   *NOTE: Does not appear if **Type** = "Drum".*

(± 24)   Changes overall coarse tuning (in semitones) of the MIDI channel. This is particularly useful for shifting octaves, and placing 0V at the desired octave (i.e. C0, C1, etc).

Trigger Length   (5 - 100ms)   Sets the amount of time that the channel's trigger signal stays 'high.' The factory default is 5ms.

Expander Column(s)

When you connect one or more CVx modules to your MIDI 1U and launch the *Intellijel Config* app, you'll see an additional Expander column for each CVx in the chain. Each additional column will be titled "Expander <n>", where <n> is the Expander ID as set with the rear panel dip switches.

You can chain up to four CVx expanders to a single MIDI 1U.

Each jack on each expander has an identical set of configuration options, and is identified as *Output <n>x<#>* where *<n>* = the Expander ID (1-4) and # = the jack number (1-8).

The following pages discuss the various parameters available for each output in the Expander column(s).

Expander 1 ⌄

Output 1×1

Output Type	CC Number ⌄
Synth	1: Ch 1 – Monophonic ⌄
CC Number	0 Bank Select (MSB) ⌄
CV Polarity	Unipolar 0–5V ⌄

Output 1×2

Output Type	CC Number ⌄
Synth	1: Ch 1 – Monophonic ⌄
CC Number	0 Bank Select (MSB) ⌄
CV Polarity	Unipolar 0–5V ⌄

Output 1×3

Output Type	CC Number ⌄
Synth	1: Ch 1 – Monophonic ⌄
CC Number	0 Bank Select (MSB)
CV Polarity	

Output Type		The selection made here determines the type of data transmitted out the corresponding CVx jack. The selection impacts the availability of other jack parameters.
	Clock (Always)	The jack outputs a clock signal. When "Clock (Always)" is selected, a dedicated **Clock Division** parameter materializes, with which you set the rate. The received MIDI clock will be output regardless of the Transport state (Start/Stop).
	Clock (Running)	As with "Clock (Always)," the jack outputs a divided clock signal, but only when the transport is "running."
	Reset	The jack transmits a trigger signal whenever a MIDI RESET or START message is received.
	Run	The jack transmits a run gate that goes high (5V) on a MIDI START/CONTINUE message, and goes low (0V) when a STOP message is received.
	CC Number	The jack outputs a control voltage derived from the selected MIDI **CC Number** arriving on the **MIDI Channel** used by the selected **Synth**. Voltage polarity is selected with the **CV Polarity** option.
	CC Number (High Res)	The jack outputs a control voltage derived from the selected MIDI **CC Number** arriving on the **MIDI Channel** used by the selected **Synth**. Voltage polarity is selected with the **CV Polarity** option. This allows fine-control of voltages from any external DAW or MIDI Device capable of transmitting them.
		NOTE: Ableton Live users who wish to take advantage of MIDI 1U's 14-bit control capabilities can download Intellijel's free "High-Res CC" Max for Live plugin from the Intellijel website, which is included in the Intellijel Config *application download.*
	Pressure (Aftertouch)	The jack outputs a voltage derived from Channel Aftertouch messages arriving on the **MIDI Channel** used by the selected **Synth**.
	Pitch	The jack outputs a 1V/oct pitch signal with a range of ±5V. The actual pitch is determined by the note value received on the **MIDI Channel** used by the selected **Synth**, plus any additional pitch bend. Pitch Bend Range, Coarse Tuning, and Note Priority are all set per-synth in the Synths Column.

Gate	The jack outputs a gate signal, which is high (5V) for as long as a note is being held on the **MIDI Channel** used by the selected **Synth**.
Gate (Any)	*NOTE: Available only for "polyphonic" and "drum" Synth types — not available for "mono" Synth types.*

Similar to the **Gate** output option (above) except it will output a gate when *any* voice is played by either a "polyphonic" or "drum" synth, and not just the gate associated with the voice that's currently being used. This is ideal for paraphonic patches in which multiple voices are routed through a single envelope generator.

For example:

> In the **Synths** column of the *Intellijel Config App*, set the Synth 3 **Type** = *"Polyphonic"*
>
> Then (assuming you want four voice paraphony), in the **Expander** column, set Outs 1-4 to **Output Type** = *"Pitch"*.
>
> Next, set Out 5 to **Output Type** = "*Gate (Any)"*.
>
> When you play your MIDI keyboard, any of the four voices will generate a gate signal on Out 5. This is different than setting **Output Type** = *"Gate"*, which would result in each voice needing its own gate output assignment (for true polyphony, as opposed to paraphony).

Trigger	The jack outputs a +5V trigger signal whenever a MIDI Note On message is received on the **MIDI Channel** used by the selected **Synth.** By default, the Trigger length is 5ms, but you can override this, per-synth, using the **Trigger Length** option in the Synths Column.
Velocity	The jack outputs a velocity value with a range of 0-5V. The voltage is proportional to the MIDI velocity received on the **MIDI Channel** used by the selected **Synth.**

Clock Division

*NOTE: Available only if **Output Type** = "Clock (Always)" or "Clock (Running)"*

    1-192

Selects a clock divisi*on to apply to the incoming MIDI clock.*

If you assign the output to "Clock" (either "Always" or "Running"), then you have the option of setting an arbitrary number of clock divisions (from 1 to 192), rather than the preset options offered by the module's dedicated **CLK** output.

Synth

*NOTE: Not available if **Output Type** = "Clock (Always)," "Clock (Running)," "Reset" or "Run"*

    (1 - 10)

Selects which Synth (1 - 10) is the source of that jack's output voltage. The **Type** of synth (as selected in the [Synths Column](#)) is also indicated. The output voltage present at this jack is derived from whichever incoming MIDI channel is assigned to that Synth (also selected in the Synths Column).

CC Number

*NOTE: Available only if **Output Type** = "CC Number" or "CC Number (High Res)"*

    (0 - 127)

Selects which MIDI CC# is the source of the control voltage sent out the jack. For example, if you select `5 Portamento Time`, then the jack will transmit a control voltage based on CC #5 data on the **MIDI Channel** used by the selected **Synth.**

*NOTE: Note that, if the **Output Type = CC Number (High Res)**, then fewer CC sources are available than if **Output Type = CC Number**. Disabled CC assignments are greyed out.*

CV Polarity		*NOTE: Available only if **Output Type** = "CC Number" or "CC Number (High Res)"*
	Unipolar	The jack outputs a unipolar signal ranging from 0V to +5V. Incoming MIDI CC data is interpreted as a unipolar signal, meaning a CC value of 0 maps to 0V and a CC value of 127 maps to +5V.
	Bipolar	The jack outputs a bipolar signal ranging from -5V to +5V. Incoming MIDI CC data is interpreted as a bipolar signal, meaning a CC value of 64 maps to 0V. Values less than 64 map to negative voltages (with a CC value of 0 generating -5V). Values greater than 64 map to positive voltages (with a CC value of 127 generating +5V).
MIDI Note		*NOTE: Available only if **Output Type** = "Gate," "Trigger" or "Velocity" AND the assigned **Synth** is a "Drum" type.*
	(Note Num)	Determines which MIDI Note Number to transmit from the jack. In Drum Mode, CVx spreads different MIDI notes to different outputs. For example, C0 might trigger a kick drum, so you would assign C0 to the jack and patch it into your kick module; D1 might trigger a snare drum, so you would assign D1 to another jack and patch it into your snare module, etc.

Expander Shortcuts Menu

At the top of each Expander column is a drop-down shortcuts menu, which enables you to quickly configure all 8 CVx outputs for a particular use.

Set All Synths To   Sets all output jacks to the selected Synth number (1-10).

Quick Poly   Various shortcuts that configure the 8 output jacks for 2-voice, 3-voice, or 4-voice polyphonic operation.

Quick Drums   Various shortcuts that configure the 8 output jacks for either 8 drum sounds, or 4 drum sounds with velocity control.

Each preset has a sub-menu for selecting the bottom pitch in a range of sequential note assignments. For example, if you have 8 drum voices and select C0 as the starting note, the voices 1-8 are assigned to MIDI Notes C0 - G0, sequentially.

NOTE: You can constrain note assignments to only the white keys or only the black keys by holding down the SHIFT key while selecting the bottom note. For example, if you hold SHIFT while selecting C0, then only the white keys will be assigned to drums (C0, D0, E0, etc.). If you hold SHIFT while selecting C#0, then only the black keys will be assigned to drums (C#0, D#0, F#0, etc.).

SYSTEM RESET

You can restore MIDI 1U to its factory default configuration using either the *Intellijel Config* app or the hardware itself.

To Reset using the Device:

1. Power up with Clock Div held down test mode to reset defaults

   The **CLK ±** and **LEARN** buttons will both flash **red**, **green** and **blue**.

2. Long-press (>1 sec) the **CLK ±** button.

   The **CLK ±** and **LEARN** buttons will briefly cycle through a series of rapid **red** flashes, then return to alternately flashing **red**, **green** and **blue**.

3. Long-press (>1 sec) the **LEARN** button to return MIDI 1U to normal operation.

To Reset using the *Intellijel Config* app:

1. Launch the *Intellijel Config* app on your Mac or Windows computer

2. In the left column, select the desired MIDI 1U device from both the **MIDI Input** and **MIDI Output** drop-down menus.

3. Click **Connect**.

4. At the bottom of the right column, click the **Reset Settings to Defaults** button.

   Your MIDI 1U is now restored to its factory defaults.

FIRMWARE UPDATES

Firmware updates are contained within the latest *Intellijel Firmware Updater* application, which you can download from the product's page on the Intellijel.com website. The application is available in both Macintosh and Windows formats, and will install firmware into your module over USB. Use the drop-down lists at the top of the application to select the product you wish to update, and the firmware version you want to install. Click the **Instructions** button to read specific instructions for updating your module.

If you wish to see what firmware versions are currently installed in your MIDI 1U and CVx 1U modules, you will need to download and install the *Intellijel Config* app, which will display the modules' current firmware versions.

1.2.6.0 (Oct 5, 2023)

- **NEW**: Extended the assignable CCs available to the full range, 0-127.

    IMPORTANT: Intellijel Config App v1.4.3.0 or higher is required to use this feature. The Intellijel Config App is available at intellijel.com/support.

1.2.4.0 (Nov 3, 2022)

- **FIX**: The increased rates from v1.2.2 were causing instability with the onboard DAC (module appeared to hang on boot, intermittently). This version reduces the rate, but it's still double that of pre-1.2.2 versions.

1.2.2.0 (Sep 15, 2022)

- **FIX**: Increase communication rates with CVx. Only noticeable when using 2 or more CVx modules.

1.2.1.0 (Mar 18, 2022)

- **REVISED**: Improves connection reliability over USB MIDI with Intellijel Config App.

    IMPORTANT: Intellijel Config App v1.2.1 or higher is required to use this feature. The Intellijel Config App is available at intellijel.com/support.

1.2 (Dec, 2021)

- **NEW**: MIDI 1U can now operate in portamento mode, slewing (with constant time) between pitches in a mono synth. Send standard, channelized, MIDI CC messages from your DAW, sequencer or controller to turn that channel's Mono Synth Portamento on/off, and to set the portamento time. Specifically:

  CC 65 (Portamento Control) on MIDI Channel "x".

    Value 127 = Turns MIDI 1U Portamento ON for the mono synth assigned to channel "x"
    Value 0 = Turns MIDI 1U Portamento OFF for the mono synth assigned to channel "x"

  CC 5 (Portamento Time MSB) on MIDI Channel "x".

    Values 0-127 = Sets the MIDI 1U's portamento time from 0 seconds (CC 5 = 0) to about 1.1 seconds (CC 5 = 127), slewing the pitch output voltage from the mono synth assigned to channel "x".

- **NEW**: Output type "Gate (Any)" is available as an **Output Type** for each jack on the expander module (accessed via the *Intellijel Config App*). This will generate a gate signal when any "polyphonic" or "drum" synth voice is played, allowing for paraphonic operation, in which all voices trigger the same envelope (for example).

- **NEW**: Arbitrary Clock Dividers for the assignable outputs (such as the MOD/CC assignments on a single MIDI 1U, or the assignable outputs on an expander module). The **CLK** divisions remain the same (cycling through 7 fixed options), but if you reassign CC/MOD or an Expander Output to "Clock", you can set the division to anything from 1 division to 192 divisions.

1.1.3 (May 26, 2021)

- **CHANGE**: Increase maximum number of held notes in Mono Synths to 16. Though mono synths obviously play only one voice at a time, this fixes a problem with the way some arpeggiators deal with large numbers of held notes.
- **FIX**: Fix assignment of MOD and CC outputs to sources other than Controllers.

1.1.2 (Feb 02, 2021)

- **FIX**: "All Notes Off" messages resetting output CV. Only gates are reset.
- **NEW**: Handling of "Reset All Controllers" CC 121 messages.

1.1.1 (Jan 28, 2021)

- **FIX**: Monophonic notes not retriggering in some instances

1.1.0 (Jan 09, 2021)

- **NEW**: Added support for CVx expander modules
- **REVISED**: Restructured UI (particularly in the Intellijel Config app) to support the new synth-focussed (rather than channel-focussed) configuration technique.

1.0.0.1 (Oct 06, 2020)

- Initial Release

TECHNICAL SPECIFICATIONS

MIDI 1U

Width	14 hp
Maximum Depth	32 mm
Current Draw	34 mA @ +12V 2 mA @ -12V

CVx 1U

Width	14 hp
Maximum Depth	32 mm
Current Draw	55 mA @ +12V 6 mA @ -12V

MIDI IN Jacks 1U

Width	8 hp
Maximum Depth	30 mm
Current Draw	None - Passive module