Using MIDI with Non-MIDI Apps

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Introduction

CTR2-MIDI and **CTR2-Dial** are MIDI controllers designed for ham radio operators. I'll refer the **CTR2-MIDI** as *MIDI* and **CTR2-Dial** as *Dial* in this document.

The *MIDI* and the *Dial* utilize the MIDI protocol which was originally designed to control musical instruments in real time. This protocol is simple, light-weight, and fast.

Several radio control software vendors have recognized the advantages of using MIDI to control tuning and other features in their apps. Most notably, Marcus Roskosch, DL8MRE, creator of several radio control apps for iOS and Mac computers and Remote Ham Radio have done a fantastic job of integrating the *MIDI* and the *Dial* into their apps. Other apps such as Thetis, SDR-Console, and SparkSDR also support MIDI control.

Non-MIDI Applications

What if you want the versatility of having a physical tuning knob but your favorite app doesn't support MIDI? Or perhaps you want to operate your station remotely using AnyDesk but hate tuning your remote radio with your mouse.

You're in luck! Third-party MIDI translator apps such as CoyoteMIDI receive MIDI commands from the *MIDI* or *Dial* and convert them to other actions such as mouse scrolls or keystrokes and pass those actions to the in focus app. MIDI translator programs are available for Windows, Mac, and Linux.

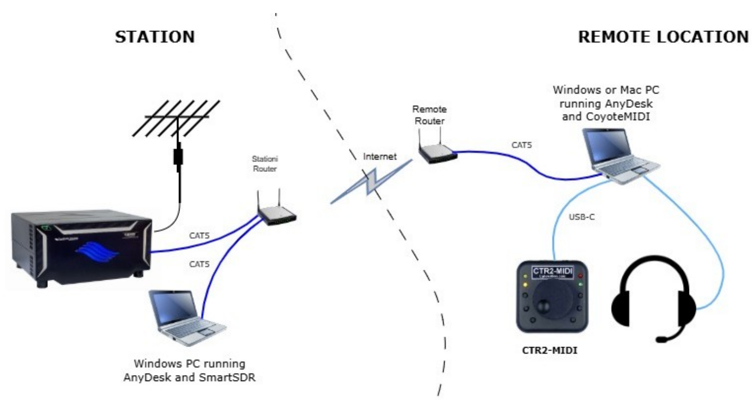
CoyoteMIDI allows the *MIDI* and *Dial* to be used as a physical tuning knob with radio control programs such a SmartSDR for Windows, wfView, Win4Icom, Win4Yaesu, WebSDR, and KiwiSDR that don't normally support external tuning knobs. And it doesn't stop there. Translator apps also allow the *MIDI* or *Dial* to be used with *any* program that accepts mouse scrolls or keystrokes for control. For instance, it makes a great jog wheel for [Audacity] or a control surface for the [N1MM] logging program. The possibilities are endless!

There are a couple of drawbacks to using a translation app instead of native MIDI control. First, like your mouse or keyboard, the app and possibly the parameter you want to control must be "in focus" to receive the mouse scrolls or keystrokes from the translation app. Second, most programs don't have a lot of control functions tied to mouse scroll or keystroke actions. For instance, **SmartSDR for Windows** only accepts mouse scroll actions for frequency control and **Win4Yaesu** only supports the cursor control keys for frequency control and frequency step selection.

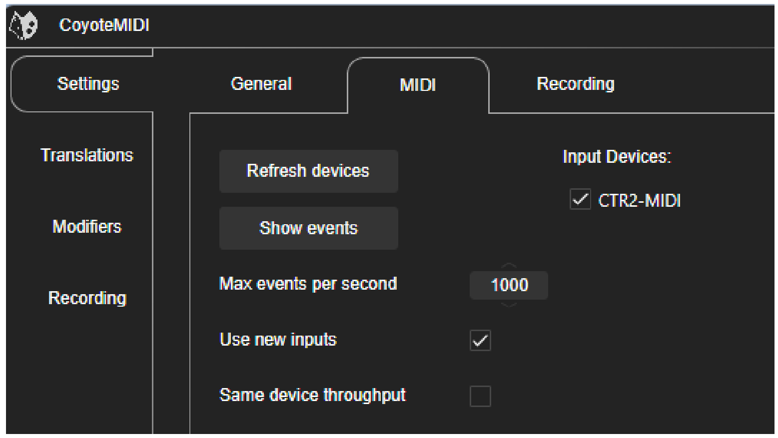
Using the *MIDI* or *Dial* with AnyDesk

One application for using a MIDI translator app is that it allows you to use the *MIDI* or *Dial* to tune a remote station using AnyDesk.

AnyDesk allows you to remotely view and control a Windows computer in your station that is running multiple radio control apps. AnyDesk is available for a wide variety of devices. It sends mouse commands and keystrokes from your local computer to the computer in your station. Simply install CoyoteMIDI on your traveling computer and plug in a *MIDI* or *Dial* for frequency control. The diagram below shows remote operation of SmartSDR without using SmartLink.
NOTE: Remote CW keying is not supported in this mode.



Configuring CoyoteMIDI



This section will cover configuring CoyoteMIDI and the *MIDI* to interface with SmartSDR for Windows and Win4Yaesu. If you use a different translator or a different radio control app the procedure may be different but the concepts are the same.

Before you start, plug the *MIDI* or *Dial* into a USB port on your computer. It will automatically register as a MIDI device. Make sure you are in the **Home** encoder mode (all yellow LEDs are OFF) on the *MIDI*. It any of them are on, press and release the encoder switch until they are all off. This puts the encoder in its **Home** encoder group. If you're using a *Dial* make sure you're on the first virtual dial (100) on the Dial control.

Once you've installed CoyoteMIDI open the app and navigate to the **Settings -> MIDI** tab. **CTR2-MIDI** or **CTR2-Dial** will show up on the **Input Devices:** list, depending on which unit you are using. Click the checkbox to enable it.

NOTE: If you don't see your unit in the **Input Devices** list, try another USB-C cable. Many USB-C cables are "charge only" cables. You must use a USB-C "data" cable.

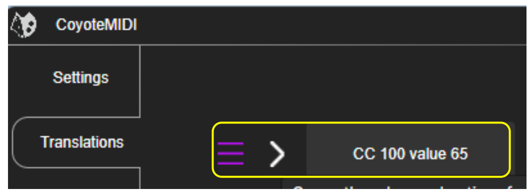
The following instructions assume you are using a *MIDI*. If you're using a *Dial* the MIDI control # is displayed on the top line of the Dial control label.

Configuration for SmartSDR Frequency Control

To start, click the **Translations** tab in CoyoteMIDI then click the **+ Add Translation** button in the top-right corner.

We'll use the **Home** encoder mode on the *MIDI* (MIDI control #100). This mode uses the **WheelA** MIDI control where any value above 64 represents a clockwise turn and any value below 64 represents a counter-clockwise turn of the knob.

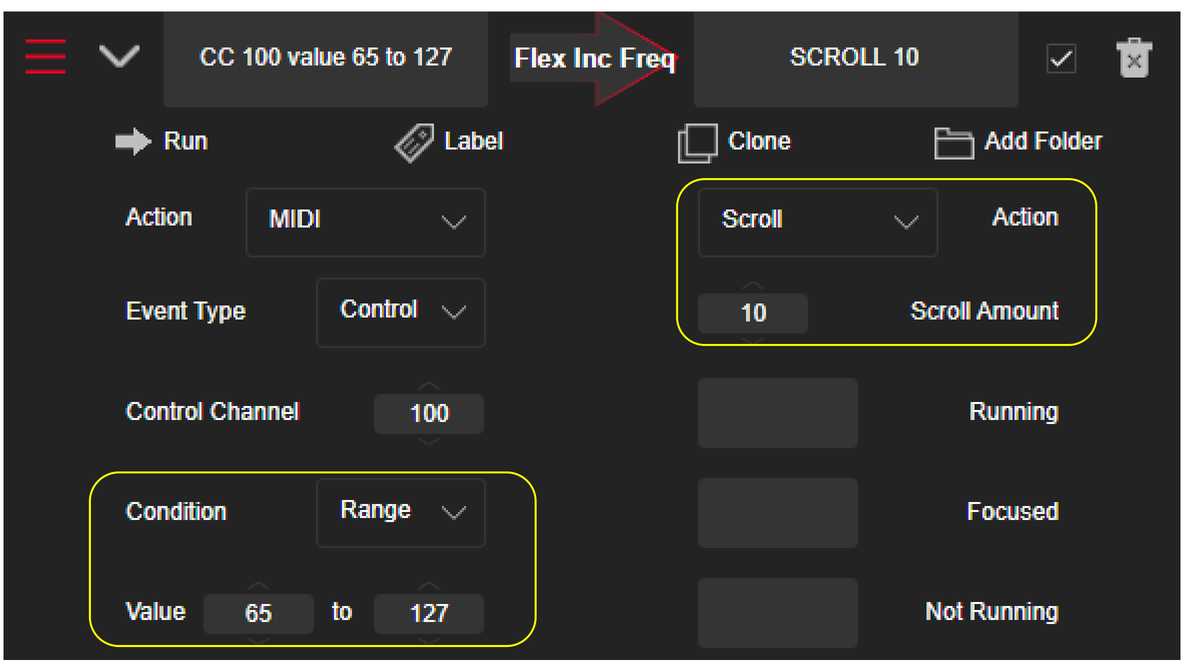
Add Flex Frequency Increment



Click the box on the left that says **Click to record** then turn the knob on the *MIDI slowly* clockwise. You should see **CC 100 value 65** appear in this box. If you see any other CC # press and release the encoder until all yellow LEDs are off.

Hover the mouse over this entry to show the violet menu and **>** icons shown above.

Click the **>** icon to see a detailed list of settings for this translations.



Click the **Condition** list box and select **Range** then change the **Value** field to **65 to 127.**

Next, click the **Action** list box on the right and select **Scroll** then set the **Scroll Amount** to 10.

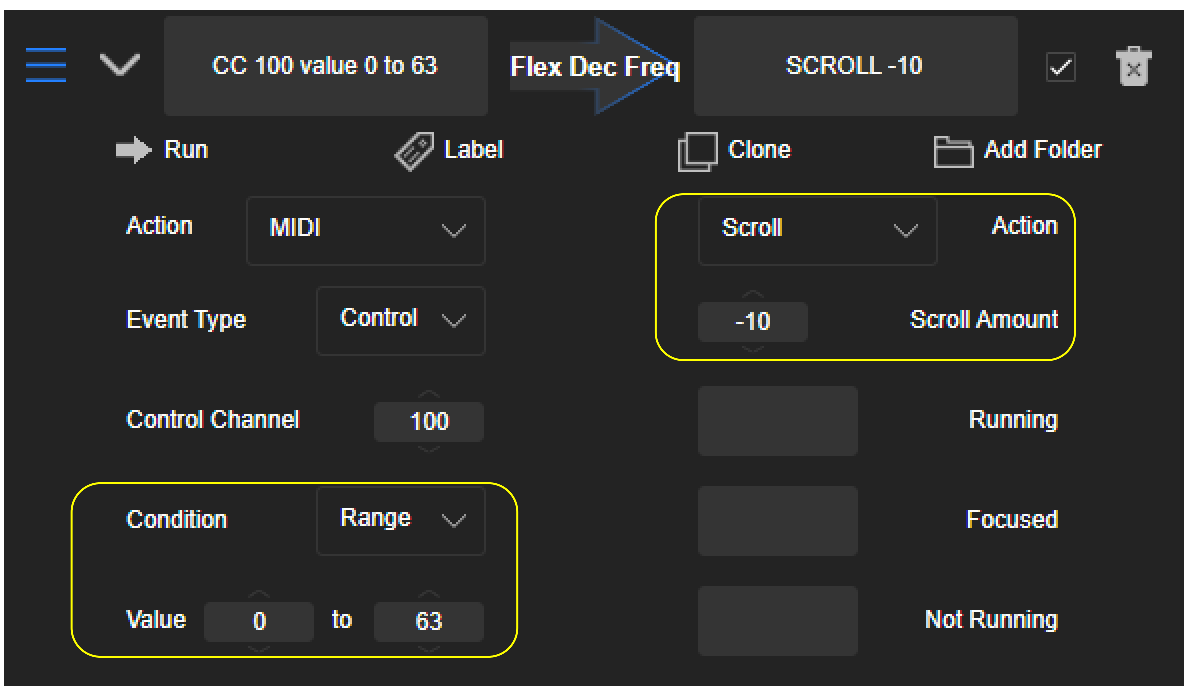
Finally, click the **Label** button to add a label and a color for this translation. I set it to **Flex Inc Freq** and selected a blue color.

The other options can be left as shown.

Add Flex Frequency Decrement

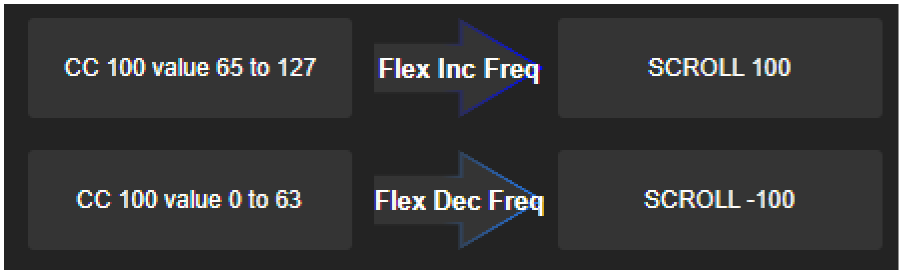
Do the same thing for the counter-clockwise rotation of the knob. Click the **+Add Translation** button to add a new translation, click the left box in the new translation and slowly turn the knob counter-clockwise. You should see **CC 100 value 63**. This is the value sent when you turn the knob CCW.

Click the **>** icon to open the detail list for the second translation.



On this screen, select the **Condition** to **Range** and the **Value** to **0 to 63**. On the right side set the **Action** to **Scroll** and the **Scroll Amount** to **-10.** Click the **Label** button and set the label to **Flex Dec Freq**. I also chose blue for this parameter.

When you're done, the first two translations should look like this:



That completes the configuration for SmartSDR. As you turn the encoder CW or CCW the label arrows in CoyoteMIDI will light up showing which translation is being sent.

Start SmartSDR for Windows and open a slice. To tune the frequency turn the knob on the *MIDI*. The **Frequency Step** is set in the small text box under the **Mode** list box. You can hover the mouse over this text box then use the scroll wheel on the mouser or turn the knob on the *MIDI* to change it.

Using Other MIDI Controls

The *MIDI* and *Dial* support multiple MIDI dial controls. Each is assigned to a MIDI control #.

The *MIDI* supports 8 dials in four groups. Groups are identified by the number of yellow LEDs lit. Press and release the encoder to step through each group.

- All off = Home group: <u>Turning</u> the encoder sends MIDI control 100 and <u>press and turn</u> sends MIDI control 101.

- Lower LED on = Encoder Group 1: Turning sends MIDI control 102 and press and turn sends MIDI control 103.
- Upper LED on = Encoder Group 2: Turning sends MIDI control 104 and press and turn sends MIDI control 105.
- Both LEDs on = Encoder Group 3: Turning sends MIDI control 106 and press and turn sends MIDI control 107.

The *Dial* supports 18 MIDI dial controls. The MIDI control number is show on the top of the Dial label. Turn the gray ring on the M5Dial to change the control #.

On both units the first MIDI control (100) is configured as a MIDI wheel which is continuously variable. The direction the knob is turning is sent in the MIDI command.

The other dial controls use the MIDI slider. The slider has a range of 0 to 127 counts. Using slider controls will be described next.

Add Frequency Increment for Win4Yaesu

Some radio control apps likeWin4Yaesu allow you to change the frequency using the **Up** and **Down Cursor** control keys. Let's configure MIDI control #102 to control the frequency on Win4Yaesu.

On the *MIDI*, press and release the encoder until the bottom LED is lit. On the *Dial* turn the gray ring on the M5Dial until **102** is shown at the top of the Dial label.

Press the **+ Add translation** button and follow the process outlined above. This time you'll see **CC 102 value xx**, where **xx** will be a number that increases as you turn the encoder.

Click the right box and press the **Up Arrow** cursor control key.

Click the **>** icon to open the detail list and set the **Label** to **Win4 Inc Freq**. I set the color to red.

Click the **Condition** list box and select **Decrease**.

Add Frequency Decrement for Win4Yaesu

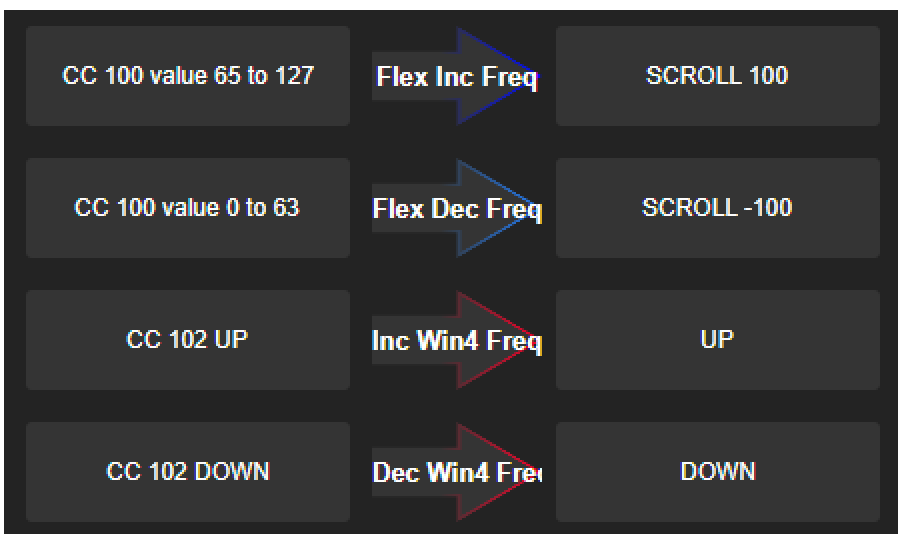
Next we'll add a translation to decrement the frequency in Win4Yaseu.

Click the **+ Add translation** button again and click on the left box that says **Click to record**. Turn the encoder slowly counter-clockwise until you see **CC 102 xx** in the box. Click the right box and press the **Down Arrow** cursor control key.

Press the **>** icon and edit the **Label** to say **Win4 Dec Freq**. I set the color to red.

Press the **Condition** list box and select **Increase**.

When you're finished your Flex and Win4Yaesu settings should look like this:



On Win4Yaesu the **Up/Down** arrow keys can also be used to adjust the levels in the control sliders. Just click a control and turn the encoder on the *MIDI* to adjust its level. Click back on the VFO-A or VFO-B control to control the frequency.

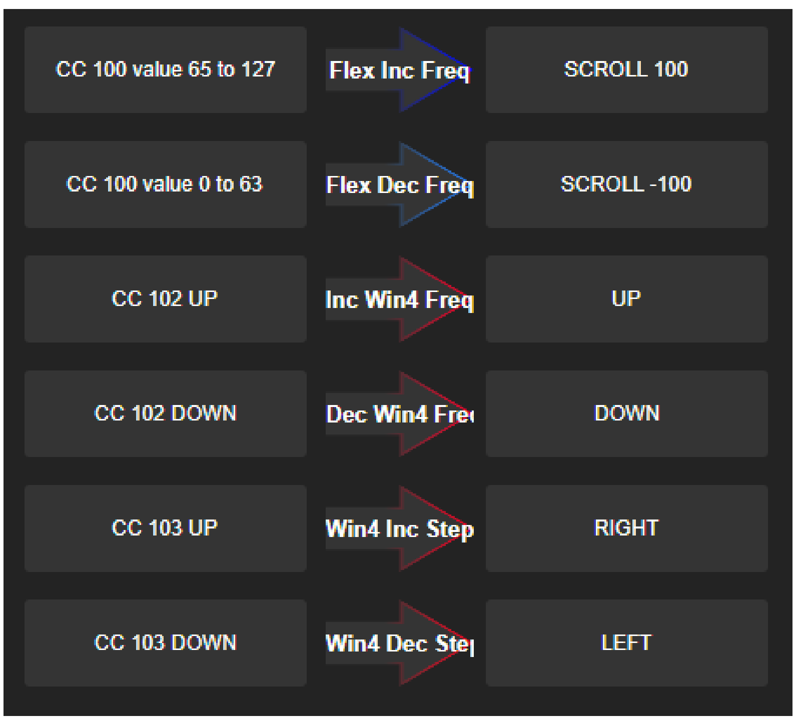
Add Frequency Step Control for Win4Yaesu

Win4Yaesu also allows you to change the frequency step using the **Left** and **Right** arrow cursor control keys.

You can set this up in CoyoteMIDI using the same process as outlined above for entering the frequency control translations only select the **Left** or **Right** arrow keys instead of the **Up** and **Down** keys.

On the *MIDI* you can use the push and turn encoder feature to change frequency step. For Group 1 this sends MIDI control #103. The advantage of using the push and turn feature is that you can quickly change the frequency step without changing the encoder group.

The final settings should look list this:



If you need a lot of translations consider using the *Dial*. Each dial control on the *Dial* can have a label attached to it describing its function. These labels also appear in the **Dial Menu** for quick selection.