HOW-TO

How-to Configure 5x3MT Encoders in ADU

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ECU MASTER

1. Description

This guide explains how to set up the 5x3MT Ecumaster keyboard, which is equipped with 13 ordinary buttons and 2 rotary encoders. This guide focuses mainly on the configuration options for the encoders. For more general information on CAN bus keyboard support, see the ADU user manual.

To configure a keyboard, click Add in the Project Tree and then select CANbus Keyboard from the list or click the keyboard icon in the toolbar. Select the 5x3MT from the *Size* menu. The window will look as follows:
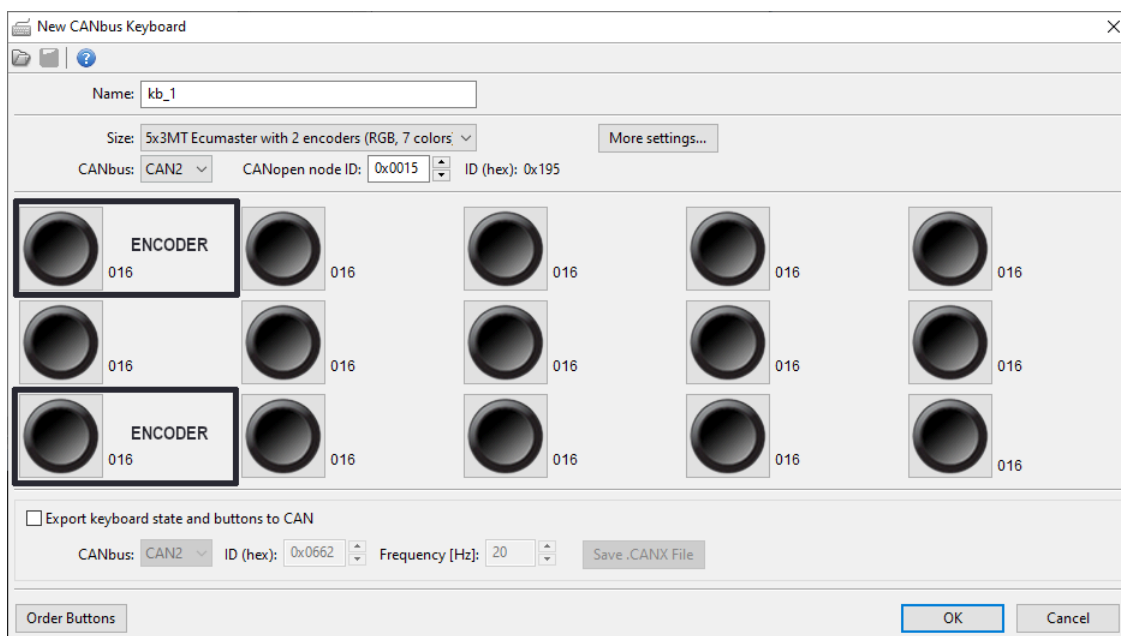
Surrounding the encoder are 16 LEDs that visually represent the current state of the encoder. Default starting LED is at 9 o'clock, numbered clockwise. To change, go to *More settings*, adjust 'Start offset for encoder LEDs' from 0 to 15, with 0 as the 9 o'clock position.

Knowing the three types of encoder operations is essential for getting the best configuration:

1. **encoder**

   Rotating the encoder adjusts the associated channel's value. Unlike a rotary switch, you have the flexibility to configure the encoder's range of values.
   - *First state* - the lowest encoder state
   - *Last state* - the highest encoder state
   - *Default state* - After startup, the encoder will adopt its default state unless the *Autosaved channels* feature is used. (Refer to the how-to guide document for detailed instructions on using *Autosaved channels* https://www.ecumaster.com/files/ADU/HowTo/How_to_Configure_Autosaved_Channels_in_ADU.pdf)

2. **page changer**

   Turning the encoder clockwise moves to the next page, and turning counter-clockwise goes back to the previous page. In this mode, the LEDs illuminate in a fan-like pattern, offering a visual indication of the operating mode.
   - *Wrap pages* decide if the encoder should jump from the last page to the first and vice versa.

3. **parameter controller** and **parameter selector**

   You can use the keyboard encoder to control multiple settings. This is possible by setting it to *parameter controller* mode. For each setting you want to manage, select a button and set its mode to *parameter selector* mode. These selector buttons function like radio buttons, allowing you to choose one active parameter at a time that is modified by the knob.

   Each *parameter selector* comes with its own range and state, updating the *parameter controller* when pressed.
   a. If there are no button presses defined as a *parameter selector*, *parameter controller* remains neutral and rotation has no effect.
   b. Pressing the button defined as a *parameter selector*, conveys the parameter information to the encoder. Encoder can change the state of the *parameter selector*.

c. After pressing the currently selected *parameter selector* button again or pressing the *parameter controller,* the encoder returns to the neutral behaviour. (Pressing any other button (not defined as a *parameter selector*) will not cause the encoder to lose control of the *parameter selector.*)
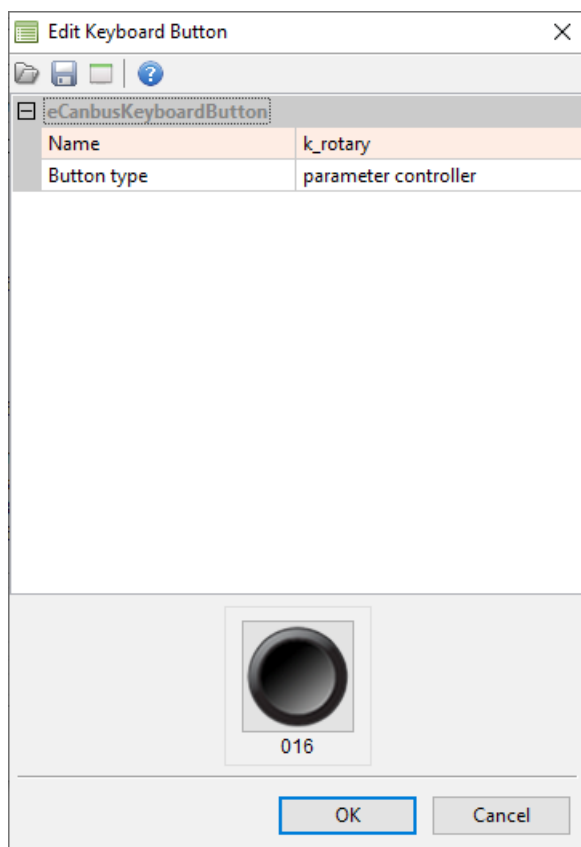
2. Example

We're configuring the 5x3MT to finely adjust four parameters and quickly navigate pages with the two rotary encoders. In this example we'll use the top encoder for pages and the bottom one to control parameters.

Let's start with the pages. In the keyboard settings, select the top-left box for the rotary encoder. Set it as a '*page changer*' and determine whether pages should wrap around.
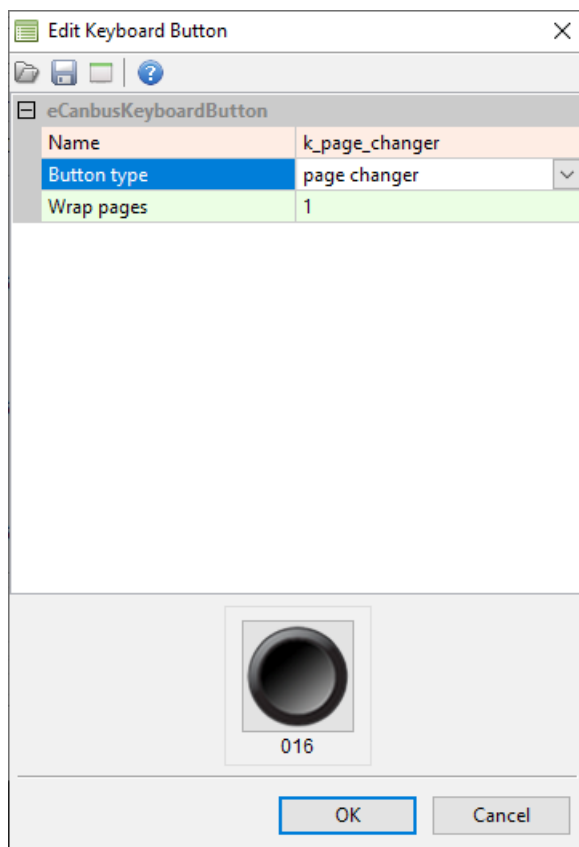

Moving on to our second goal, we aim to use the other encoder for controlling four parameters. Begin by selecting the bottom-left box and designate it as a '*parameter controller*'.

Now proceed to configure each parameter. For each of the four, choose one button, change its type to '*parameter selector*' and set the first, last, and default states to adjust their value range.
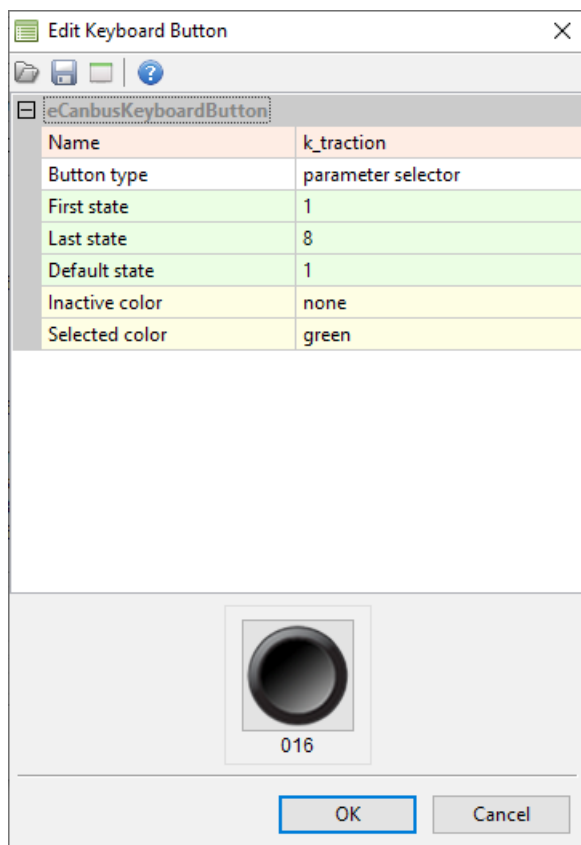
The final setup of our example keyboard looks as follows:
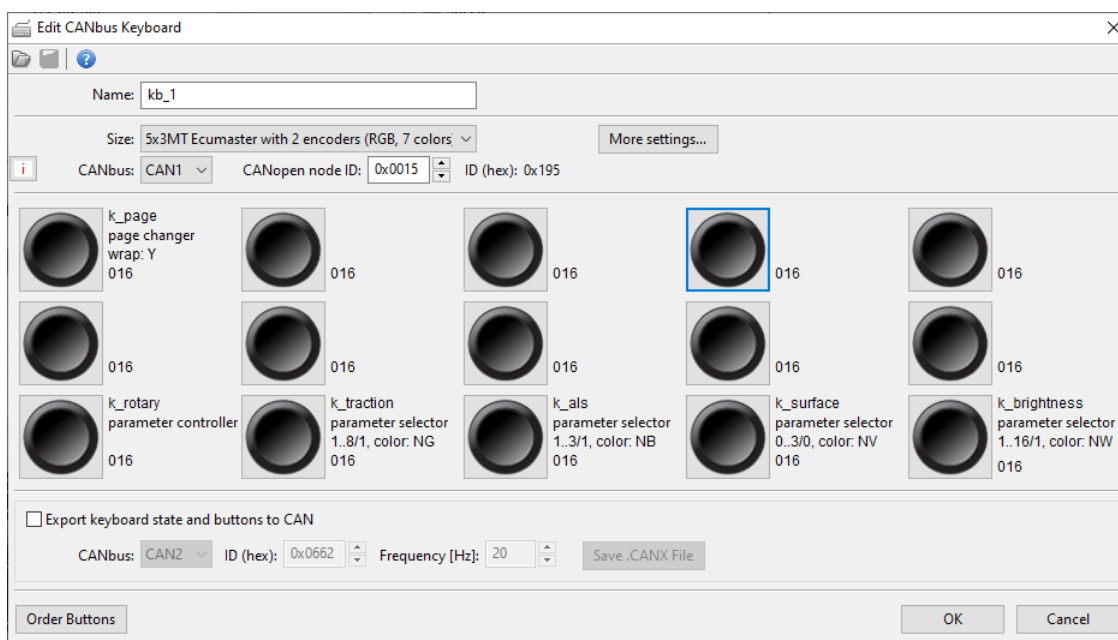
When the driver wishes to adjust a setting, they can press the corresponding button. The rotary encoder will activate, enabling them to change the parameter by turning it.

3. Document history

Version	Data	Changes
1.0	2024.02.27	Initial release