



HOW-TO

How-to Configure 5x3MT Keyboard in PMU

Document version: 1.0

Firmware: 101.0

Published on: 05 April 2024

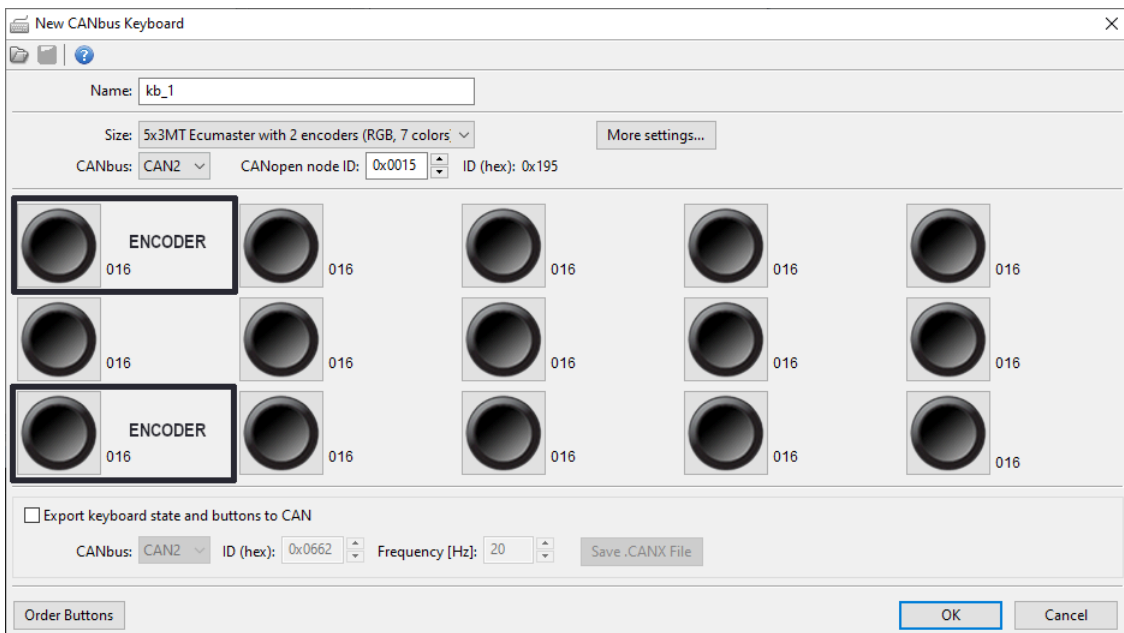


1. Description

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 PMU 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, with encoder positions marked with a frame:



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

2. **changer**

Operation in *changer* mode is similar to *encoder* mode but its main use is to change pages in the ADU. Turning the encoder clockwise moves to the next page, while turning counter-clockwise goes back to the previous page.

In changer mode, the LEDs illuminate in a fan-like pattern, offering a visual indication of the operating mode.

- *First state* - the number of the first page
- *Last state* - the number of pages in the ADU
- *Default state* - after startup, the page you want to start on
- *Wrap pages* - decide if the encoder should jump from the last page to the first and vice versa

For more information about the operation of the *changer* mode, see [Example \(on page 4\)](#).

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*.)

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.

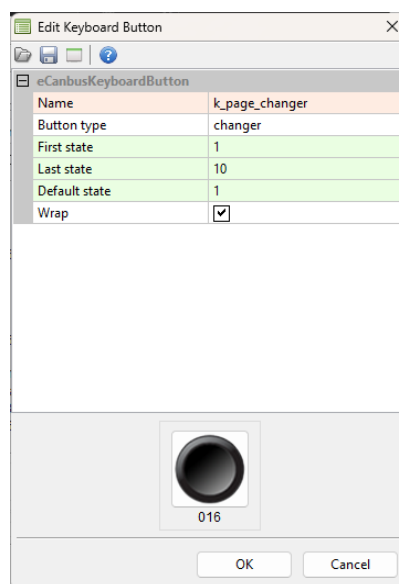
2. Example

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

Changing pages in the ADU via the PMU

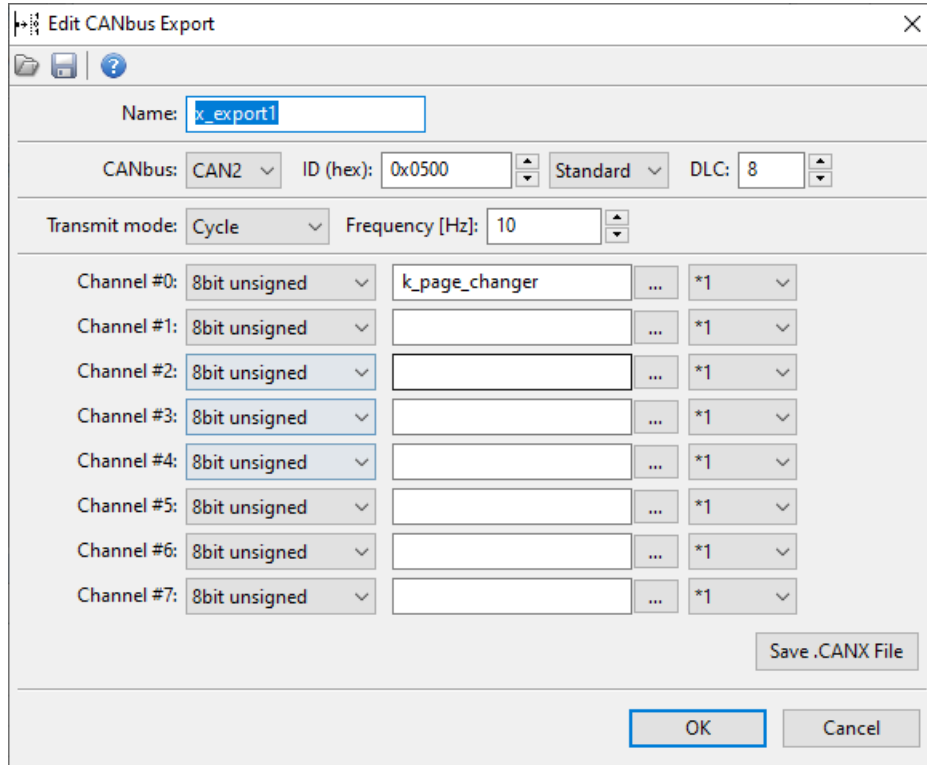
In the keyboard settings, select the top-left box for the rotary encoder. Set it as a *changer*. Determine the following parameters:

- *First state* - set to 1, to avoid confusion in page counting
- *Last state* - the number of pages in the ADU (remembering that it is not updated automatically - when you add or remove a page in ADU, it must be changed)
- *Default state* - after startup, the page you want to start on
- *Wrap pages* - decide if the encoder should jump from the last page to the first and vice versa

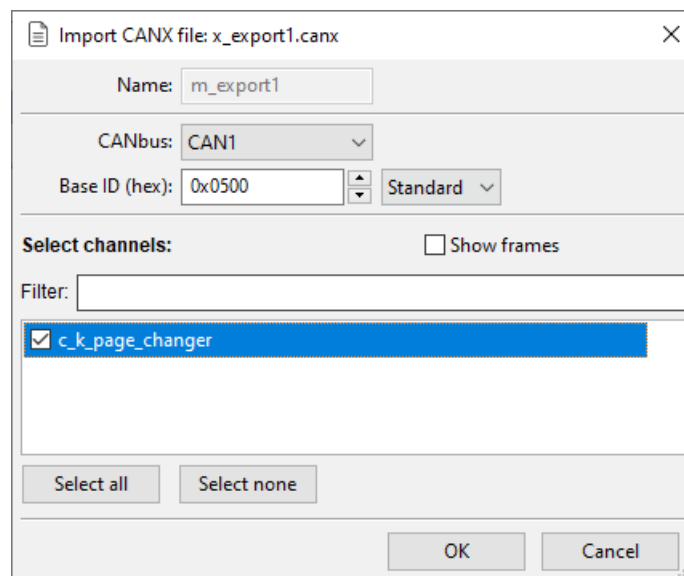


To enable page changes in the ADU, both the ADU and the PMU must be connected to the same CAN bus. Start in PMU, by adding CAN export in the Project tree. Remember to set correct CAN bus and an unoccupied ID. Select the channel that corresponds to the keyboard encoder set up in the previous step (*k_page_changer* in our example).

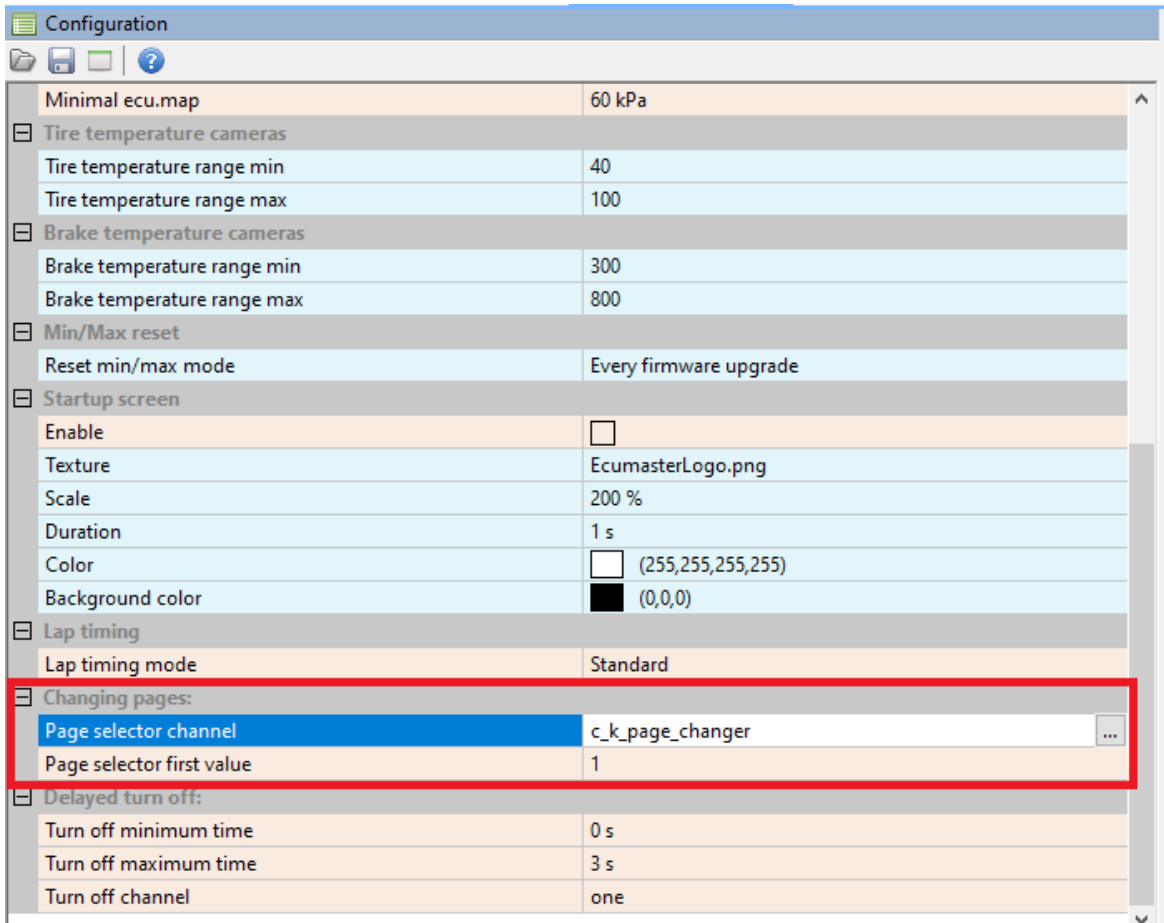
To streamline the import in the ADU, use *Save .CANX File* button.



In the next step, import the .CANX file created in the previous step into the ADU project.

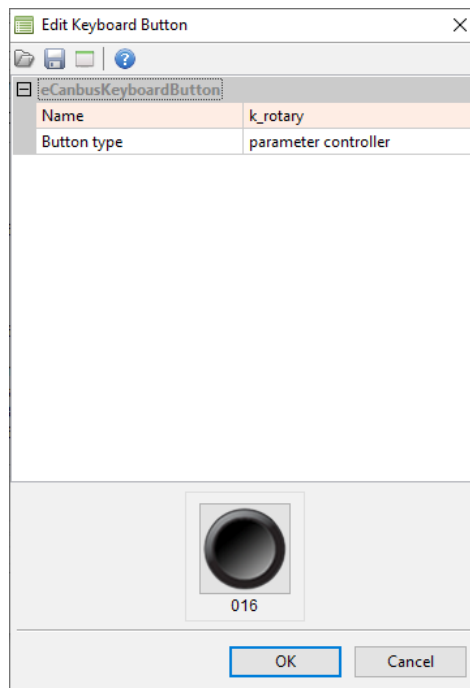


Then assign this imported channel in the *Configuration* panel to the *Page selector channel* and set *Page selector first value* as in the PMU configuration, equal to 1:

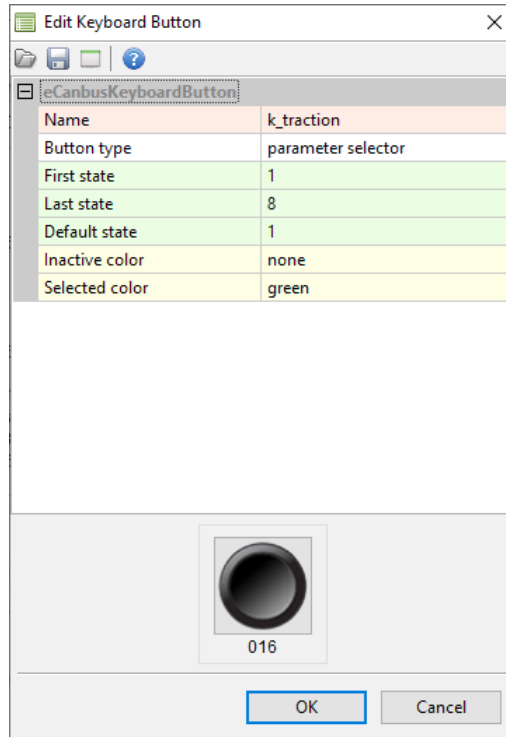


Controlling multiple parameters

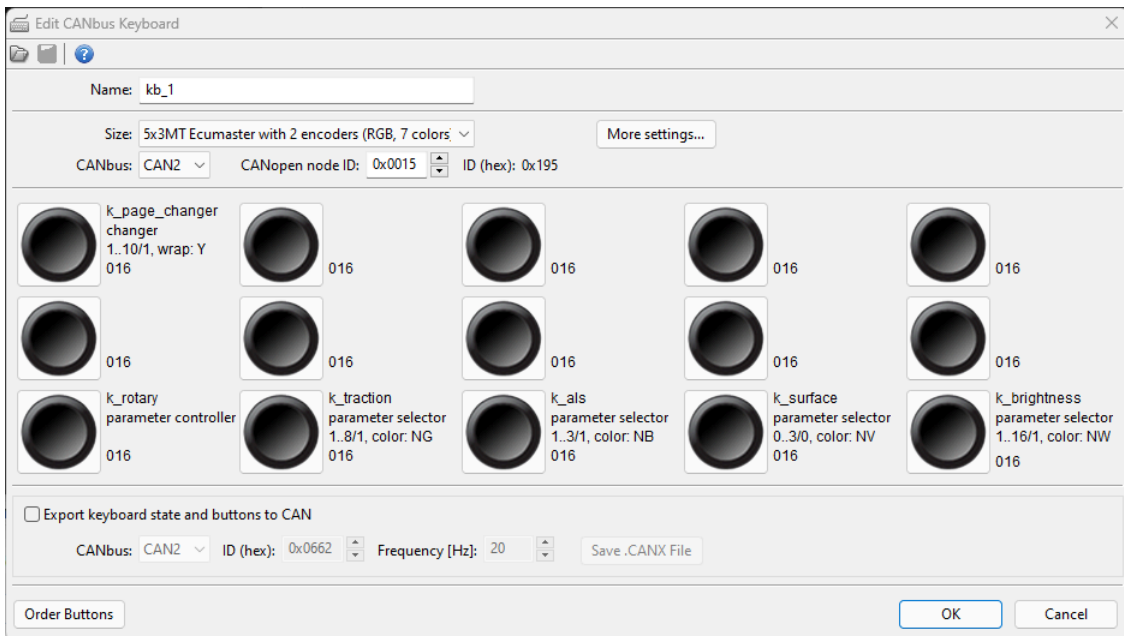
Back to the PMU software, we aim to use the other encoder for controlling four parameters. Begin by selecting the bottom-left box and designate it as a *parameter controller*.



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	Date	Changes
1.0	2024.04.05	Initial release