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# Stick Hardware Manual

*Release 1.0*

**Embention**

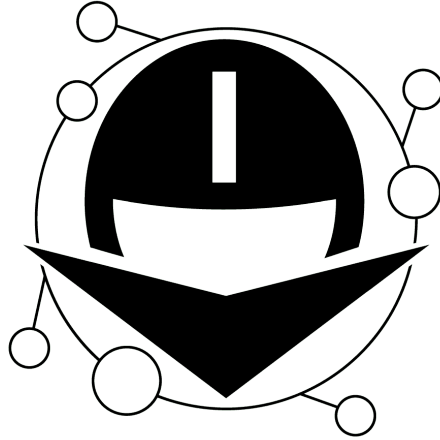
**2023-11-28**



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**STICK | VERONTE**  
A V I O N I C S



## INTRODUCTION

Veronte Stick Expander (VSE) system is a single solution to generate sixteen channels PPM. VSE works as a USB to PPM converter, enabling flying with **USB joysticks** or **Virtual Sticks**.



Fig. 1: Veronte Stick Expander





## QUICK START

This document describes how to install and use the VSE, including its technical specifications.

### 2.1 System Layout

The following image shows the standard VSE system layout for operation:

Fig. 1: VSE layout

### 2.2 Warnings

- **Power Supply:** Stresses above those listed in the power supply table (see *Power supply*) may cause permanent damage to the device. This is a stress rating only; functional operation of the device under these or any other conditions above those listed in the operational sections of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.



TECHNICAL

### 3.1 Features

- 802.11 b/g/n/ac Wireless LAN
- 1x SD Card
- 2x USB2 ports
- 2x USB3 ports
- 1x PPM Connector

### 3.2 Mechanical Specifications

Weight	280g
Enclosure material	Black anodized aluminium
Dimensions	90x64.5x33mm

### 3.2.1 Dimensions

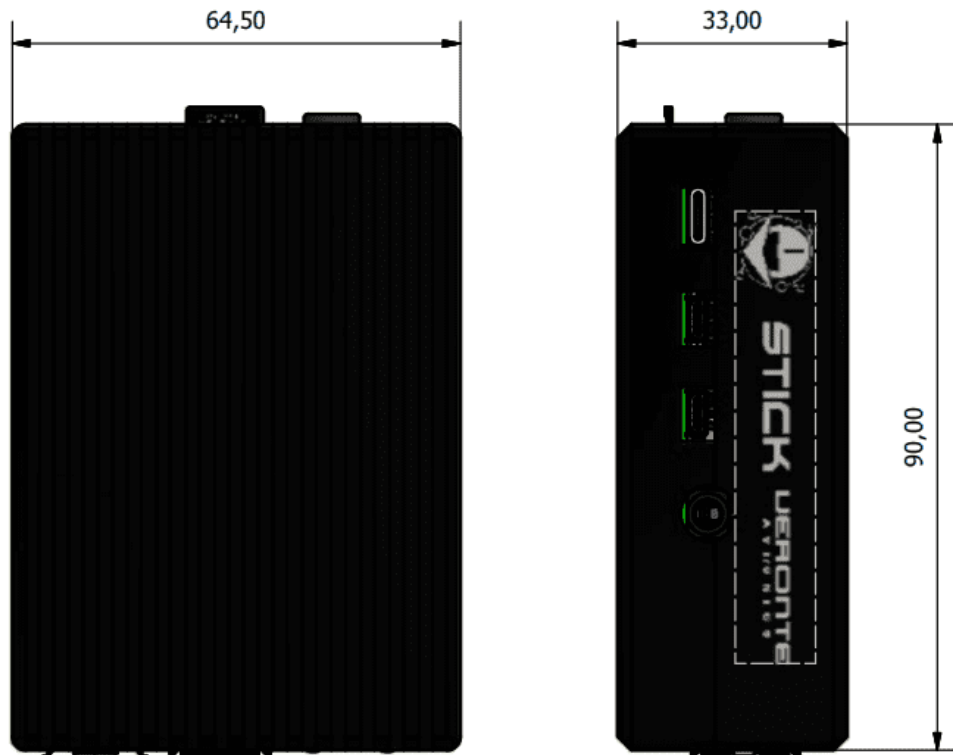


Fig. 1: Stick dimensions

## 3.3 Electrical Specifications

### 3.3.1 Power Supply

USB-C input	5.0V
Power Consumption	15W - 3A

### 3.3.2 I/O Specifications

#### Input voltage/current

- Power input: 5.0V up to 3A
- Minimum: -0.5V
- Maximum: 6.0V

#### 3.3V Output

#### Digital Input/Output (GPIO)

- Voltage: 3.3V

- Current I (oh): 1.6mA and I (ol) = -1.6mA

### 3.4 Interfaces

There is only one interface connection, with the following connectors:



Fig. 2: Interface connection

I/O Connections		
Number	Connector	
1	Female	1x Power input
2	Female	2x USB2 ports
3	Female	2x USB3 ports
4	Female	1x PPM
5	Male	1x SD Card



## HARDWARE INSTALLATION

### 4.1 Mechanical installation

The following diagram represents the basic mechanical installation of the VSE.

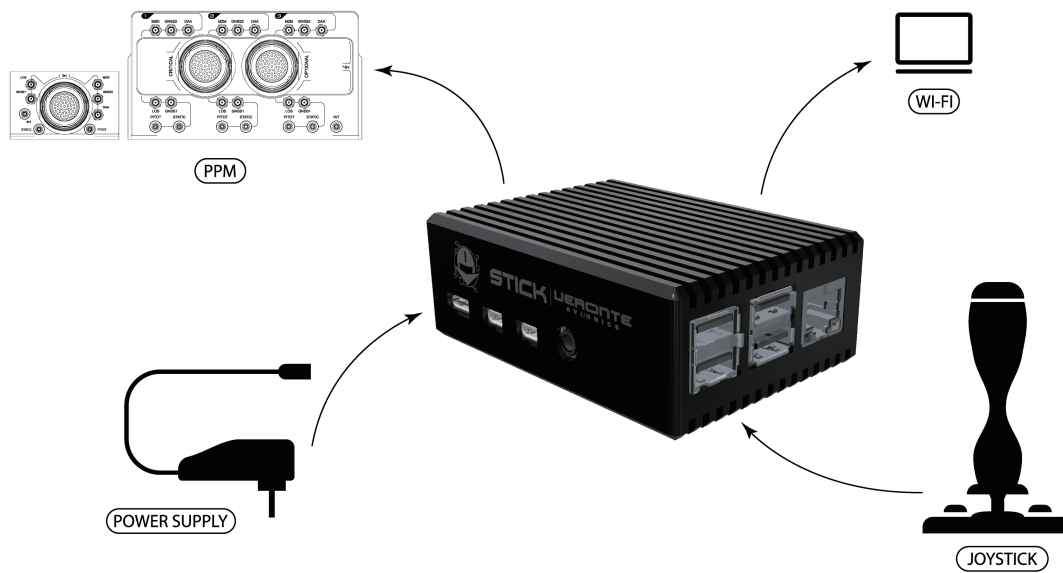


Fig. 1: Mechanical installation





## SOFTWARE INSTALLATION

A simple web application, **VSE Application**, allows the user to customize the number of channels and their output signals.

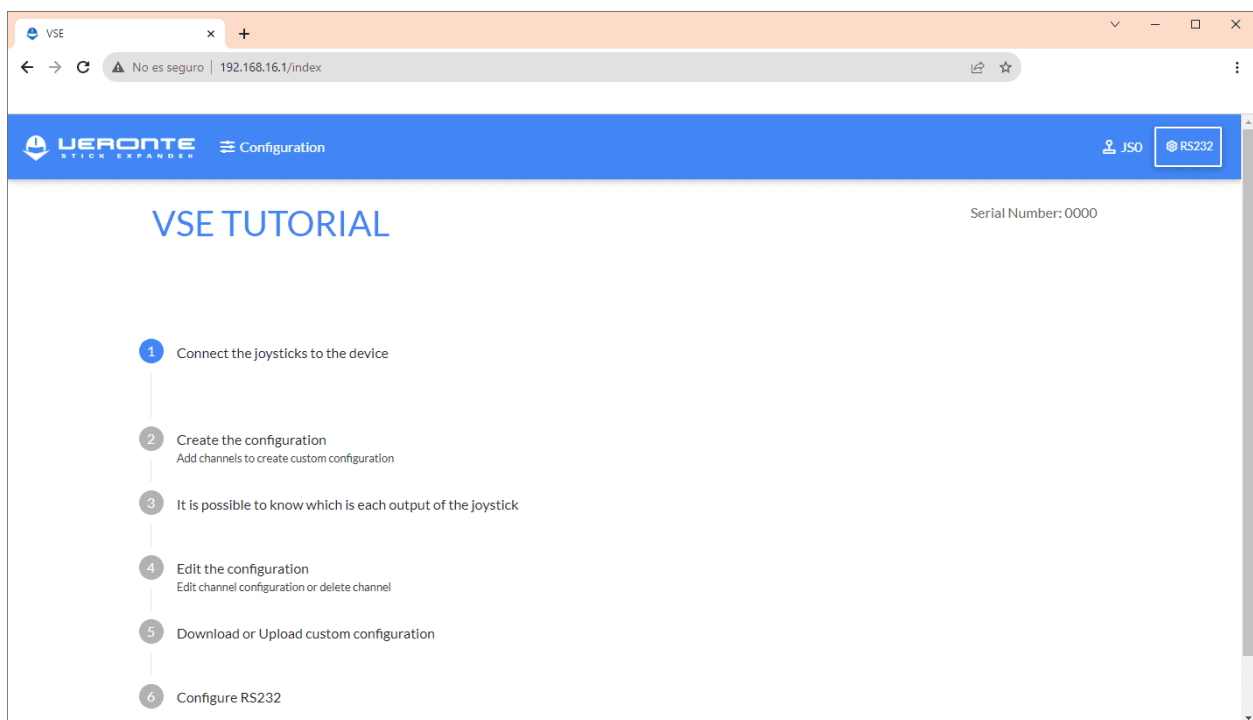


Fig. 1: Web VSE Application

To open this VSE Application it is necessary to follow these steps:

1. Connect the VSE:
  - To the **USB Joystick** through USB.
  - To **power supply**.
2. In the computer, click the Network icon and connect to the WiFi network named **VSE-0XXX**.

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**Note:** VSE network may need a few seconds to be displayed.

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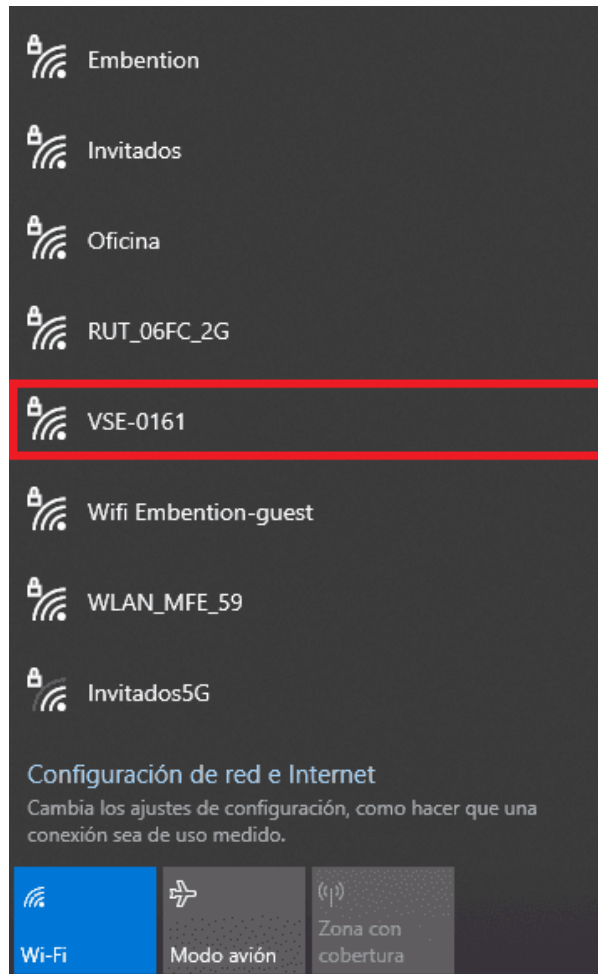


Fig. 2: Select WiFi network

4. Enter the WiFi password: **giy77uHQvORoMoLEwKK**.
5. Once connected to the network, open the browser and go to the page **http://192.168.16.1**.

## 5.1 Configuration

This section explains in detail all the features of **VSE Application**.

### 5.1.1 Channels

Once in the application, to configure the channels:

1. Click in Configuration.

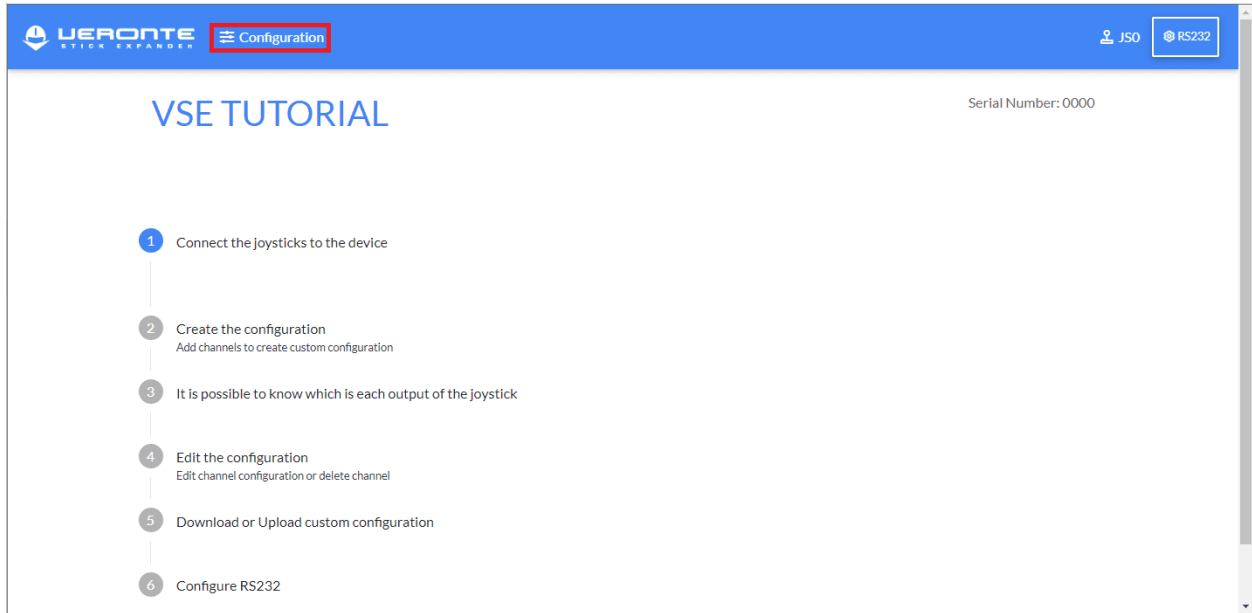


Fig. 3: Configuration

2. Click in Add Channel button.

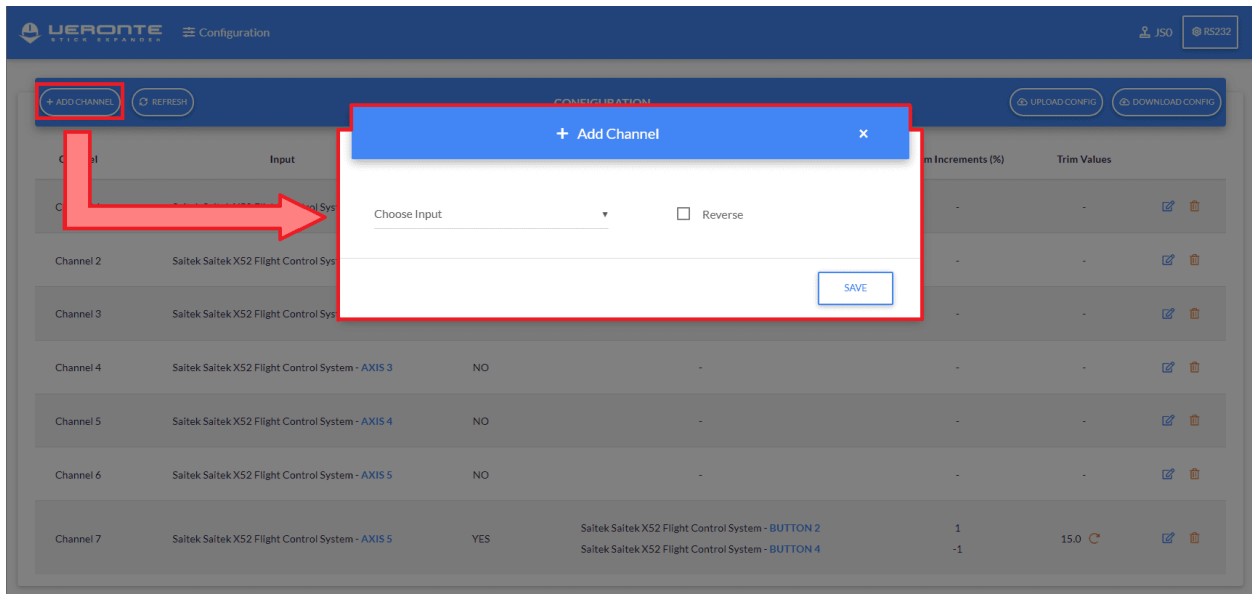


Fig. 4: Add Channel

3. Configure the channel as preferred:

- **Choose Input:** Select joystick input (axes or button).
- **Reverse:** Tick this checkbox to reverse the selected input.
- **Trim:** Users can select which button to press to trim the raw value of the selected axis. Each click of the

selected button will apply the following **Trim equation** to the axis output signal:

$$Final\ trimmed\ value = Initial\ Stick\ Input\ value + \left( \frac{Increment(\%)}{100} \times Initial\ Stick\ Input\ value \right)$$

The screenshot shows a configuration window titled '+ Add Channel'. At the top, it displays 'Axis: 0' and a checked 'Reverse' option. Below this is a 'Trim' section, highlighted with a red border, containing a table of trim parameters:

Button	Increment (%)	
CH Products WISENET SPC-2000 - buttor	5	x
CH Products WISENET SPC-2000 - buttor	-60	x
CH Products WISENET SPC-2000 - buttor	30	x

Below the table, there is a 'Button: 4' dropdown menu, a 'Trim Increment (%)' input field with the value '30', and an 'ADD' button. At the bottom right of the main panel is a 'SAVE' button.

Fig. 5: Trim parameters

1. **Choose button:** Select the button which will trim the input value.
2. **Trim Increment (%):** Percentage value used to calculate the trimmed value.

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**Note:** Trim Increment can be positive or negative.

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3. **Add:** Saves the configured trimming button.

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**Note:** It is possible to add  $N$  customized trimming buttons to each axis, which will be listed in the Trim section of this *Add Channel* panel.

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**Example:**

Initial Stick Input (r1)	Trim Increment	Trimmed Stick Input (rounded)
0.49	10%	0.54

4. Save the configured channel.

The configuration parameters of the created channel are displayed in the following list:

The screenshot shows the 'CONFIGURATION' page of the UERONTE STICK EXPANDER application. The page has a blue header with the logo and 'Configuration' text. On the right, there are user and device identifiers: 'JSO' and 'RS232'. Below the header, there are buttons for '+ ADD CHANNEL', 'REFRESH', 'UPLOAD CONFIG', and 'DOWNLOAD CONFIG'. The main content is a table with the following columns: Channel, Input, Reverse, Trim Inputs, Trim Increments (%), and Trim Values.

Channel	Input	Reverse	Trim Inputs	Trim Increments (%)	Trim Values
Channel 1	WiseGroup.Ltd Gameport to USB Controller - AXIS 0	NO	WiseGroup.Ltd Gameport to USB Controller - BUTTON 0	10	100.0
Channel 2	WiseGroup.Ltd Gameport to USB Controller - AXIS 1	NO	WiseGroup.Ltd Gameport to USB Controller - BUTTON 2 WiseGroup.Ltd Gameport to USB Controller - BUTTON 2	-50 50	0
Channel 3	WiseGroup.Ltd Gameport to USB Controller - AXIS 2	YES	-	-	-
Channel 4	WiseGroup.Ltd Gameport to USB Controller - BUTTON 5	NO	-	-	-

Users can edit these parameters with *Channels buttons*.

## 5.1.2 Joystick Output View

To make easier the configuration of channels, the application shows the output values of every connected joystick.

The screenshot shows the 'Joystick Output View' of the UERONTE STICK EXPANDER application. The page has a blue header with the logo and 'Configuration' text. On the right, there are user and device identifiers: 'JSO' and 'RS232'. The main content is titled 'CH Products WISENET SPC-2000' and is divided into two sections: 'Buttons' and 'Axes'.

The 'Buttons' section shows 11 buttons, each with a status indicator (ON or OFF):

- BUTTON 0: OFF
- BUTTON 1: OFF
- BUTTON 2: OFF
- BUTTON 3: OFF
- BUTTON 4: OFF
- BUTTON 5: OFF
- BUTTON 6: OFF
- BUTTON 7: OFF
- BUTTON 8: OFF
- BUTTON 9: OFF
- BUTTON 10: ON
- BUTTON 11: ON

The 'Axes' section shows three axes with their values between [-1, 1]:

- Axis 0: -1
- Axis 1: 0.5
- Axis 2: -1

Fig. 6: Joystick View

Joystick buttons are represented with ON or OFF status and the axes with their values between [-1, 1].

## 5.2 PPM Configuration in 1x PDI Builder

To properly use the **VSE** solution, it is important to configure the PPM inputs in Veronte Autopilot 1x using **1x PDI Builder** app. Users must perform the configuration corresponding to a **PPM Stick**, explained in further detail in **VSE (Veronte Stick Expander) - Integration Examples** section of the **1x PDI Builder** user manual.

The figure below shows the PPM signal that arrives to Veronte:

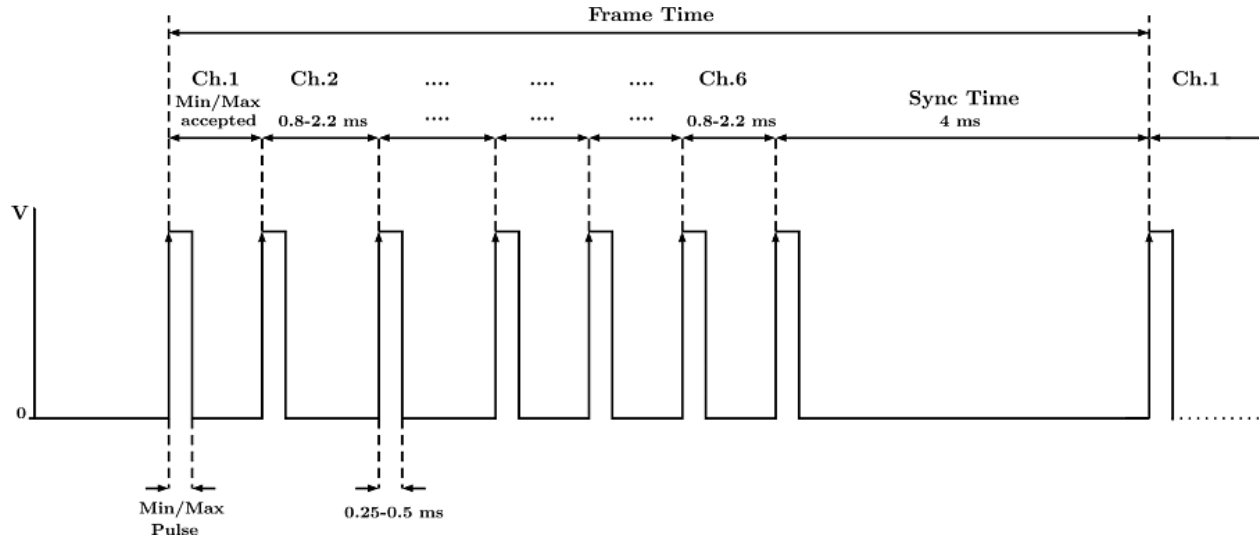


Fig. 7: PPM Pulses

## 6.1 Download Configuration Data

In the Configuration page, it is possible to download the configuration of the created channels by clicking on **Download Config** button.

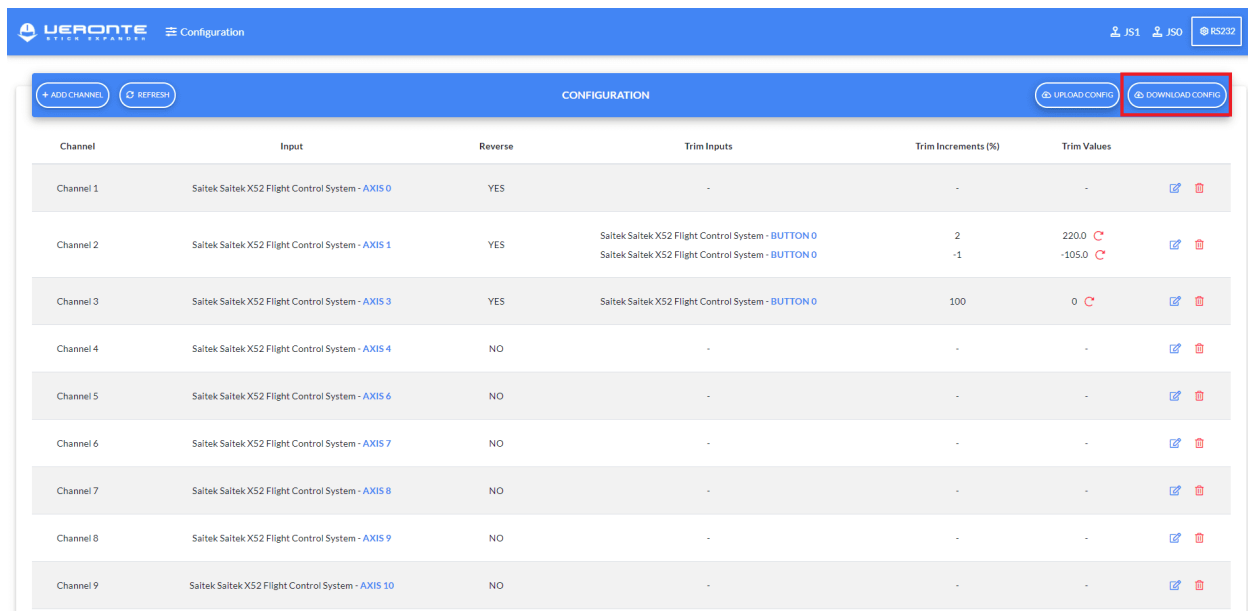


Fig. 1: Download Button

## 6.2 Upload Custom Configuration

In the Configuration page, channels can be customized importing a configuration file.

Click on **Upload Config** button and drag the file into the input area. Then click **Upload**.

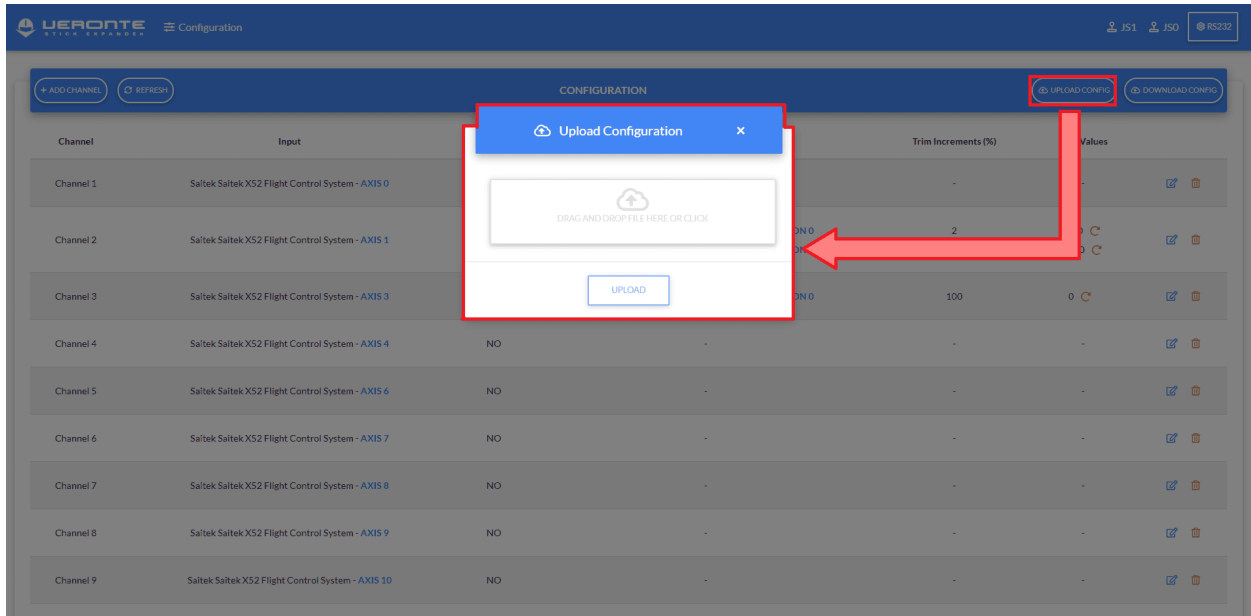


Fig. 2: Upload Modal

### 6.3 Refresh Joysticks

After connecting or disconnecting any Joystick, it is recommended to click **Refresh** button to reload and re-read all Joysticks again.

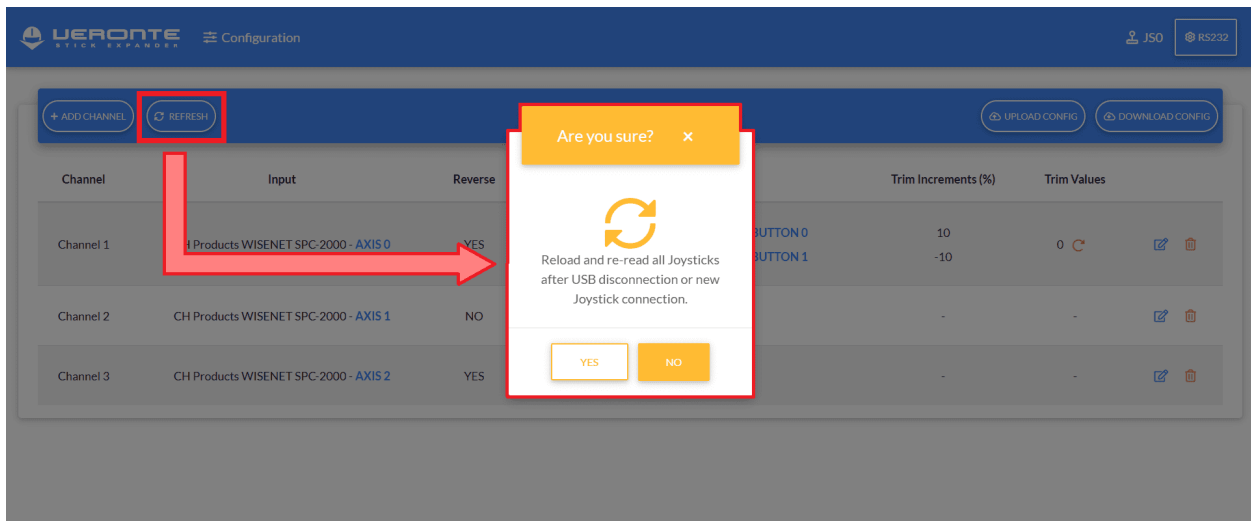


Fig. 3: Refresh Button



## 6.4 Channel buttons

Once the configuration of the channels is done, users can do the following:

1. **Reset Trim values:** If trimming buttons are clicked on too many times, users can reset the Trim value by clicking on the reset button.
2. **Edit Channel:** To modify a specific channel configuration.
3. **Delete Channel:** To remove a channel.

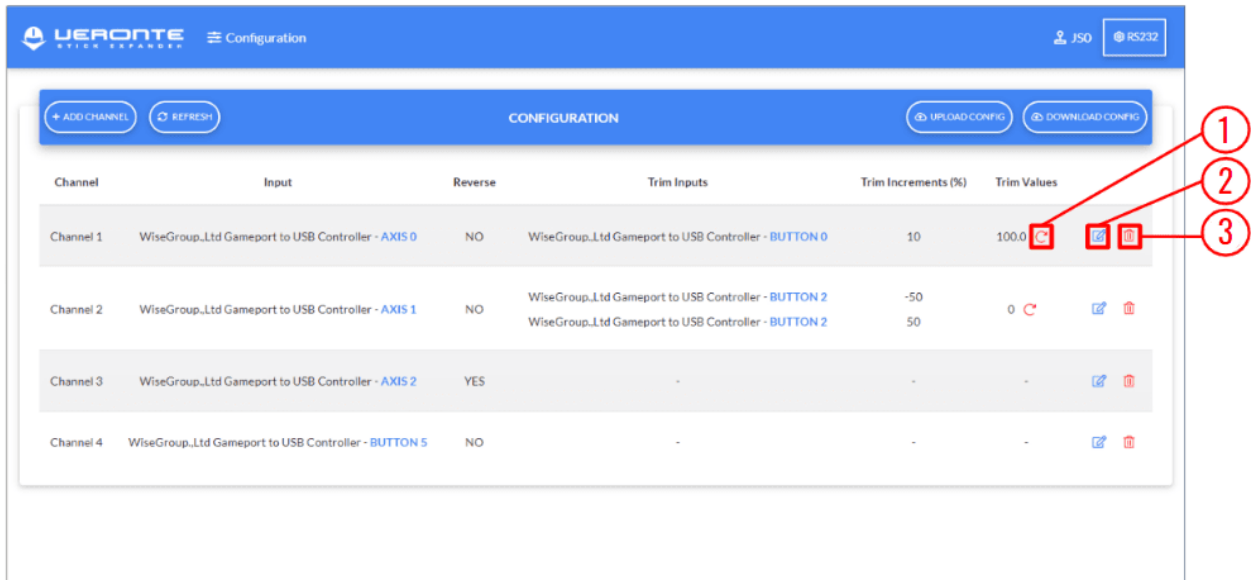


Fig. 4: Channel Buttons

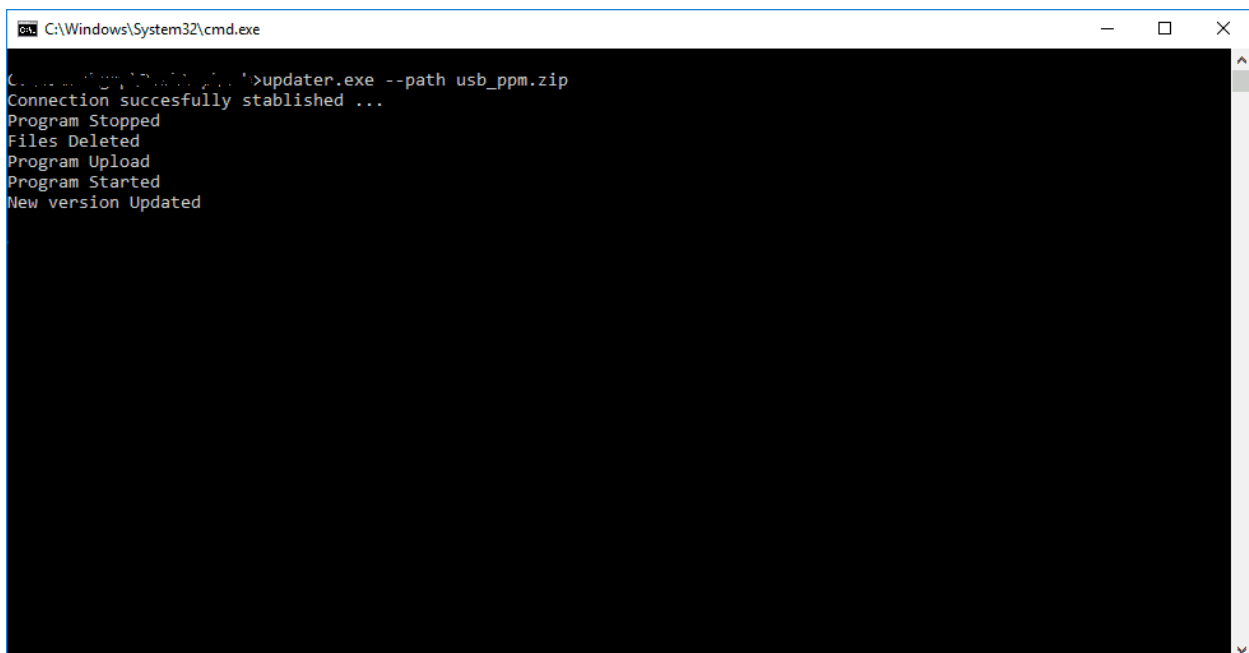


## MAINTENANCE

### 7.1 Software Update

The software version is updated using the executable program called **updater.exe** and the corresponding zip-folder with the new version. The customers will find these files in their FTP folder.

- Open the Command Line (CMD) in the folder where is the updater.exe.
- Write the command: **\*updater.exe --path usb\_ppm.zip\***.



```
C:\Windows\System32\cmd.exe
C:\Users\jguy\Documents>updater.exe --path usb_ppm.zip
Connection succesfully stablished ...
Program Stopped
Files Deleted
Program Upload
Program Started
New version Updated
```

Fig. 1: Update Script

If the zip-folder is not in the same root that the updater.exe, it is necessary to insert the complete zip-folder path. When the process is finished, the VSE software is updated.



## ACRONYMS AND DEFINITIONS

CMD	Command Line
GND	Ground
GPIO	General Purpose Input/Output
PPM	Pulse Position Modulation
RX	Reception
TTL	Transistor-Transistor Logic
TX	Transmission
USB	Universal Serial Bus
VCC	Voltage Common Collector
VSE	Veronte Stick Expander



## **CONTACT DATA**

You can contact Embention in any moment if you need further help and support from the acquired products. You can do that through email, telephone or by visiting our office.

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