

# Joyu — Manual

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## Revision History

The following table shows the revision history of this document.

Rev.	Date	Description
1.0	July 2016	Initial release

# Contents

<b>1</b>	<b>Introduction</b>	<b>4</b>
1.1	General Description . . . . .	4
1.2	Technical Specification . . . . .	4
1.3	Special Versions . . . . .	4
1.3.1	Appearance . . . . .	4
<b>2</b>	<b>Installation &amp; Maintenance</b>	<b>5</b>
2.1	Mounting Dimensions . . . . .	5
2.2	Cable Installation . . . . .	5
2.3	Connections . . . . .	5
2.3.1	Nesis and Boxi . . . . .	5
2.3.2	Boxi . . . . .	6
2.3.3	Nesis . . . . .	6
2.4	Maintenance . . . . .	7
2.5	Repair . . . . .	7
<b>3</b>	<b>Operations</b>	<b>7</b>
3.1	Configuration Profiles . . . . .	7
3.1.1	Default Profile . . . . .	8
3.1.2	Custom Profiles . . . . .	8
3.2	Pairing . . . . .	9
<b>4</b>	<b>Limited Conditions</b>	<b>9</b>
4.1	Two Years Warranty . . . . .	9
4.2	TSO Information — Limited Operation . . . . .	10

# 1 Introduction

First of all, we would like to thank you for purchasing our device.

Joyu is an advanced flight control stick which acts as a remote control for Nesis device and adds functionality to the autopilot. When connected to Boxi it can be configured to control electrical actuators such as pitch and roll trim actuators, landing gear actuators, electronic throttle, radio transmission (PTT), etc.

This manual describes the technical description of the unit, installation and operation.

## 1.1 General Description

Joyu is a modern flight control stick. Under the leather skin is a strong nylon base which encloses the electronics. Metal top plate with metal buttons provides excellent comfort and ease of button use.

The electronics constantly monitors five pushbuttons, navigation joystick and wheel. Input states are packed into dedicated CAN message and transmitted over CAN bus.

Joyu is usually connected to system which consists of Nesis and Boxi devices which gives the best performance. However if desired, it can also be connected in a Nesis only or Boxi only system.

One of the key advantages is the ease of installation. Only four small-gauge wires need to be routed through the control bar which simplifys the installation.

## 1.2 Technical Specification

Table 1 shows some basic technical specification of Joyu.

Description	Value
Weight	155 g
Size	140 × 65 × 45 mm
Control rod mounting hole	2.54 mm (1 inch) diameter
Operational voltage	6 ~ 32 V
Power consumption	0.3 W
Current	25 mA at 12 V
Operating temperature	-30 ~ +85 °C
Humidity	30 ~ 90 %, non condensing
Communication	CAN bus, 29 bit header, 500 kbit, Kanardia protocol

Table 1: Basic technical specifications.

## 1.3 Special Versions

### 1.3.1 Appearance

Default version of Joyu comes with black leather and black stiches. One can order Joyu with custom colour of leather and stiches. Ask Kanardia for avaiable colour schemes.

## 2 Installation & Maintenance

Joyu is mounted on a control bar via aluminum adapter insert.

### 2.1 Mounting Dimensions

Mounting adapter..

### 2.2 Cable Installation

Supplied CAN cable must be routed from the top end of the control bar to the bottom end. The outgoing end of the cable must be routed away from control cables and must be assured that has enough loom in each of the flight control bar position not to break the wire. Figure 1 shows some good and bad installation practices.

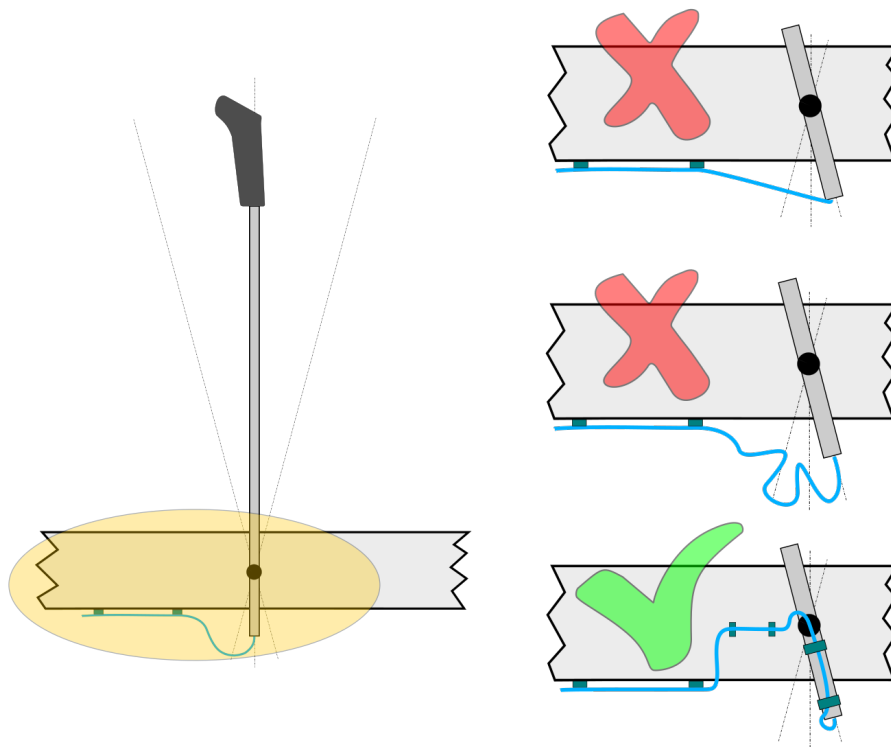


Figure 1: Cable installation.

### 2.3 Connections

There are three different possible connections which are defined by desired system configuration.

#### 2.3.1 Nesis and Boxi

Default setup consists of one or two Joyu devices, one Boxi unit and one or two Nesis units. Joyu units are used as a remote for Nesis and control for Boxi. Figure 2 illustrates connection among devices.

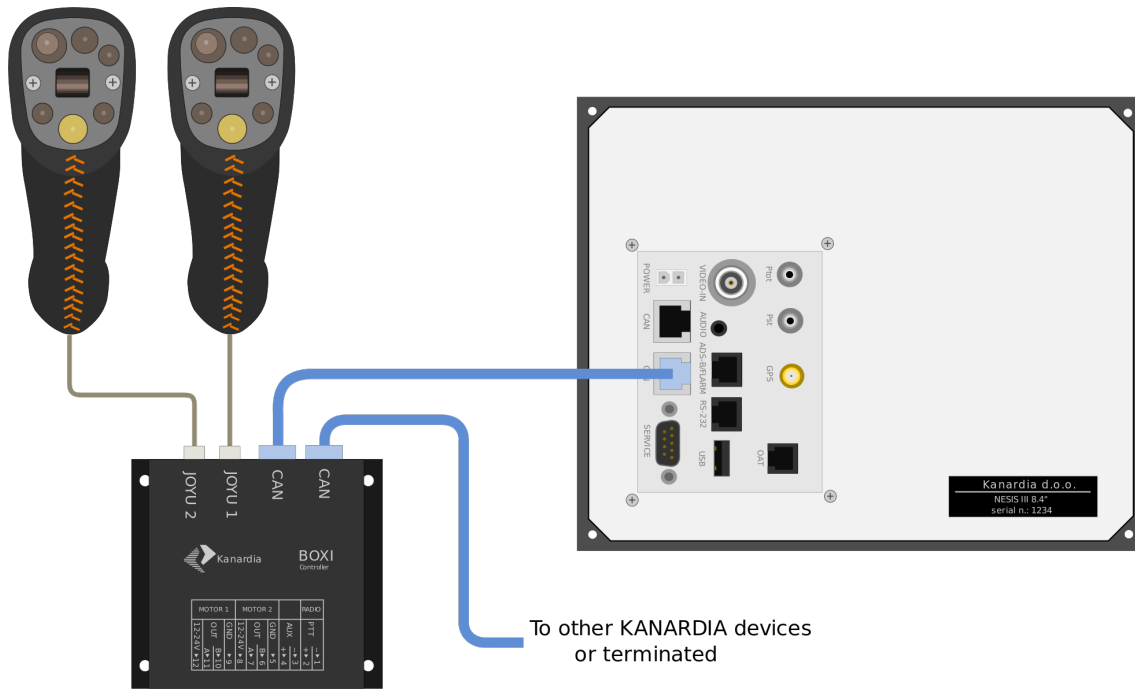


Figure 2: Connection example - Boxi and Nesis.

### 2.3.2 Boxi

If Joyu unit is used only for controlling Boxi it is recommended that the Boxi is not connected to primary CAN bus. One end (RJ45) of provided power cable shall be connected to one of Boxy's CAN ports, the other end shall be connected to power source. Blue lead shall be connected to aircraft ground (GND) and red lead to battery terminal (+12 to +30 V) via 0.5 A fuse. Figure 3 illustrates connection example for two Joyu units to Boxi where Boxi is isolated from primary CAN bus.

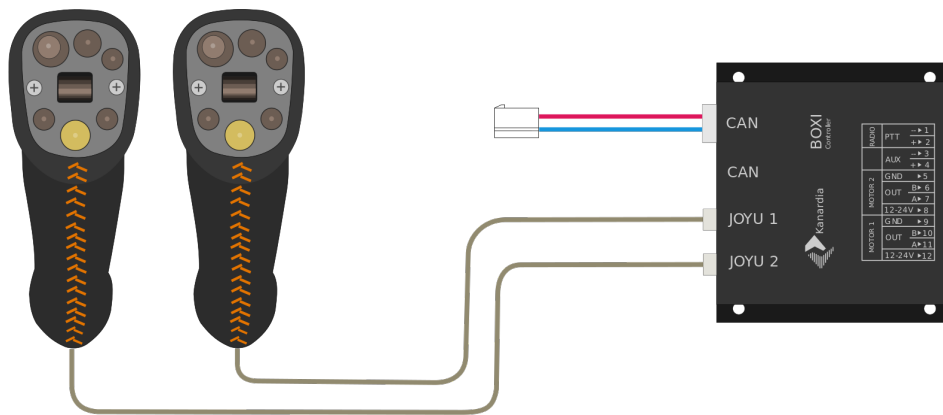


Figure 3: Connection example - Boxi.

### 2.3.3 Nesis

When Joyu is used only as a remote control for Nesis it can be connected directly to primary CAN bus via provided RJ11-to-RJ45 adapter, as illustrated on figure 4.

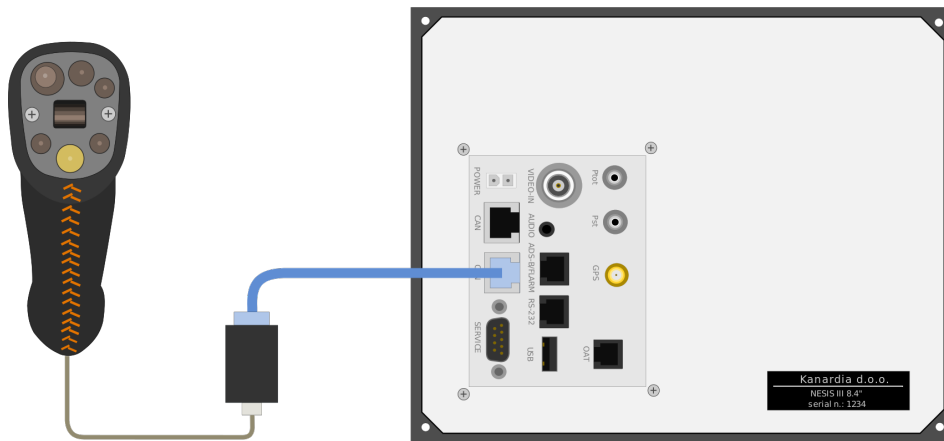


Figure 4: Connection example - Nesis.

## 2.4 Maintenance

No special maintenance is required.

## 2.5 Repair

The Joyu has no serviceable parts inside. In the case of malfunction, it must be sent to factory for a repair.

# 3 Operations

Figure 5 describes organization of Joyu control inputs:

1. **Navigation stick**
2. **User button**
3. **Page selector button**
4. **Cancel button**
5. **PTT button**
6. **OK button**
7. **Selector wheel**

## 3.1 Configuration Profiles

Configuration profile is a configuration which defines functions for all Joyu inputs. User can create up to three different profiles which can be created and selected under Nesis settings menu (Refer to section..).

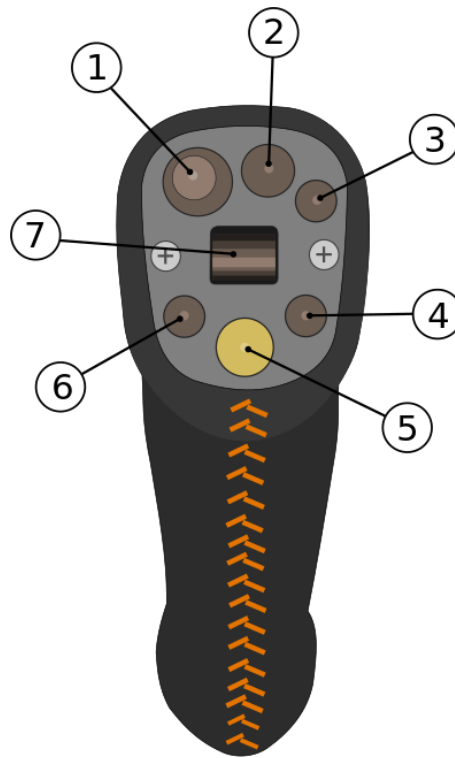


Figure 5: Button layout.

### 3.1.1 Default Profile

Default input configuration consists of four buttons and selector wheel for controlling Nesis and two buttons with navigation stick for controlling Boxi unit.

1. **Navigation stick.** Navigation stick is configured as a two 2-way sticks for controlling horizontal and vertical trim actuators via Boxi.
2. **User.** User button performs user selectable action, defined by Nesis user button configuration.
3. **Page selector.** Page-switching button is used to switch the Nesis screen to the next page.
4. **Cancel/Back/Close.** Cancel button is used to close opened windows, to go back or to cancel some action.
5. **PTT (Push to Talk).** Push to Talk button is used for manual radio transmission<sup>1</sup>.
6. **OK/Confirm.** OK button is used to select things and confirm selection under Nesis menus. It has same functionality as Nesis push knob.
7. **Selector wheel.** Selector wheel has a function of Nesis selector knob. It is used to change values, zoom levels, etc.

### 3.1.2 Custom Profiles

User can create and assign custom profiles via Nesis interface...

<sup>1</sup> Only when connected with Boxi.



## 3.2 Pairing

When two Joyu devices are connected to CAN bus or Boxi unit, the pairing procedure must be performed to define which Joyu controls which Nesis. Pairing is performed under Nesis settings menu.

## 4 Limited Conditions

Although a great care was taken during the design, production, storage and handling, it may happen that the Product will be defective in some way. Please read the following sections about the warranty and the limited operation to get more information about the subject.

### 4.1 Two Years Warranty

Kanardia d.o.o. warrants the Product manufactured by it against defects in material and workmanship for a period of twenty-four (24) months from retail purchase.

#### Warranty Coverage

Kanardia's warranty obligations are limited to the terms set forth below:

Kanardia d.o.o. warrants the Kanardia-branded hardware product will conform to the published specification when under normal use for a period of twenty-four months (24) from the date of retail purchase by the original end-user purchaser ("Warranty Period"). If a hardware defect arises and a valid claim is received within the Warranty Period, at its option and as the sole and exclusive remedy available to Purchaser, Kanardia will either (1) repair the hardware defect at no charge, using new or refurbished replacement parts, or (2) exchange the product with a product that is new or which has been manufactured from new or serviceable used parts and is at least functionally equivalent to the original product, or, at its option, if (1) or (2) is not possible (as determined by Kanardia in its sole discretion), (3) refund the purchase price of the product. When a refund is given, the product for which the refund is provided must be returned to Kanardia and becomes Kanardia's property.

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## **4.2 TSO Information — Limited Operation**

This product is not TSO approved as a flight instrument. Therefore, the manufacturer will not be held responsible for any damage caused by its use. The Kanardia is not responsible for any possible damage or destruction of any part on the airplane caused by default operation of instrument.