Joyu — Manual

Kanardia d.o.o.

July 2016

Revision 1.0

Contact Information

Publisher and producer:
Kanardia d.o.o.
Ulica heroja Rojška 70
SI-3000
Slovenia

Tel: +386 40 360 512
Email: info@kanardia.eu

A lot of useful and recent information can be also found on the Internet. See `http://www.kanardia.eu` for more details.

Copyright

Credits

This document was written using TeTeX (LaTeX) based document creation system using Kile running on Linux operating system. Most of the figures were drawn using Open Office Draw and Inkscape applications. Photos and scanned material was processed using Gimp.All document sources are freely available on request under the licence mentioned above and can be obtained by email. Please send requests to info@kanardia.eu.

Revision History

The following table shows the revision history of this document.

Rev.	Date	Description
1.0	July 2016	Initial release

Contents

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 functionallity 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 all the electronics and stick shaker. 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.

There is a special version of Joyu with integrated stick-shaker[1]. When connected to Nesis device, Joyu can be configured to alert pilot on particular events (stall warning, overspeed, etc.) by several different vibrating patterns.

1.2 Technical Specification

Table 1 shows some basic technical specification of Joyu.

Description	Value
Weight	166 g (cca 250 g with stick-shaker)
Size	140 x 65 x 45 mm
Control rod mounting hole	2.54 mm (1 inch) diameter
Operational voltage	6 to 32 V
Power consumption	0.3 W
Current	25 mA at 12 V
Operating temperature	-30 °C to +85 °C
Humidity	30 % to 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 avaliable colour schemes.

[1] This option must be specefied when ordering Joyu.

1.3.2 Stick Shaker

Special version of Joyu has integrated stick-shaker which can be in combination with Nesis device used to alert pilot on particular events.

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 breake the wire. Figure 1 shows some good and bad installation practices.

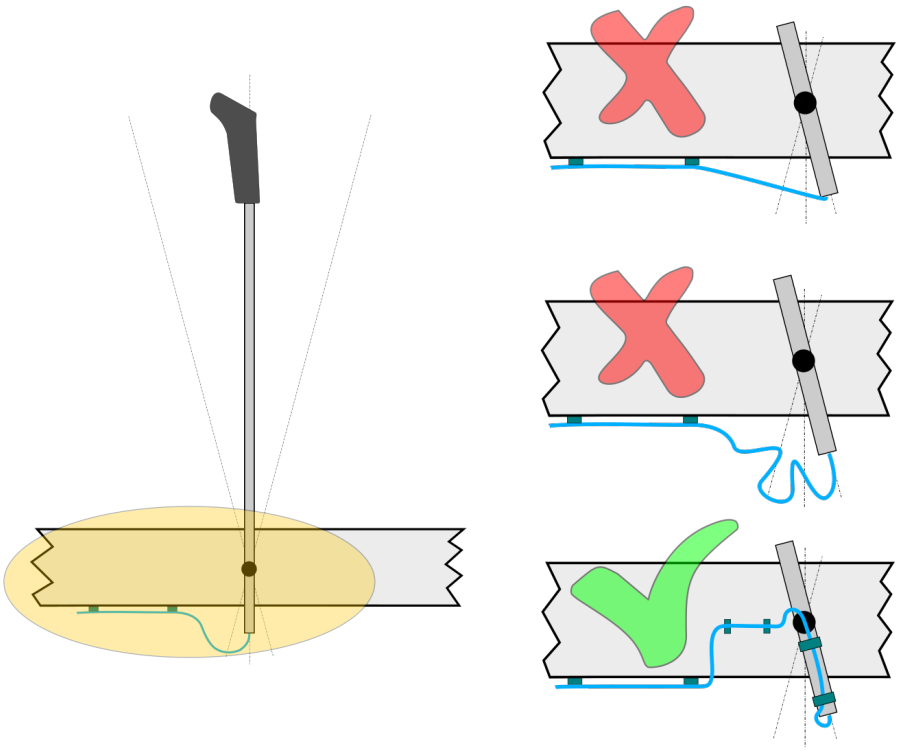

Figure 1: Cable installation.

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.

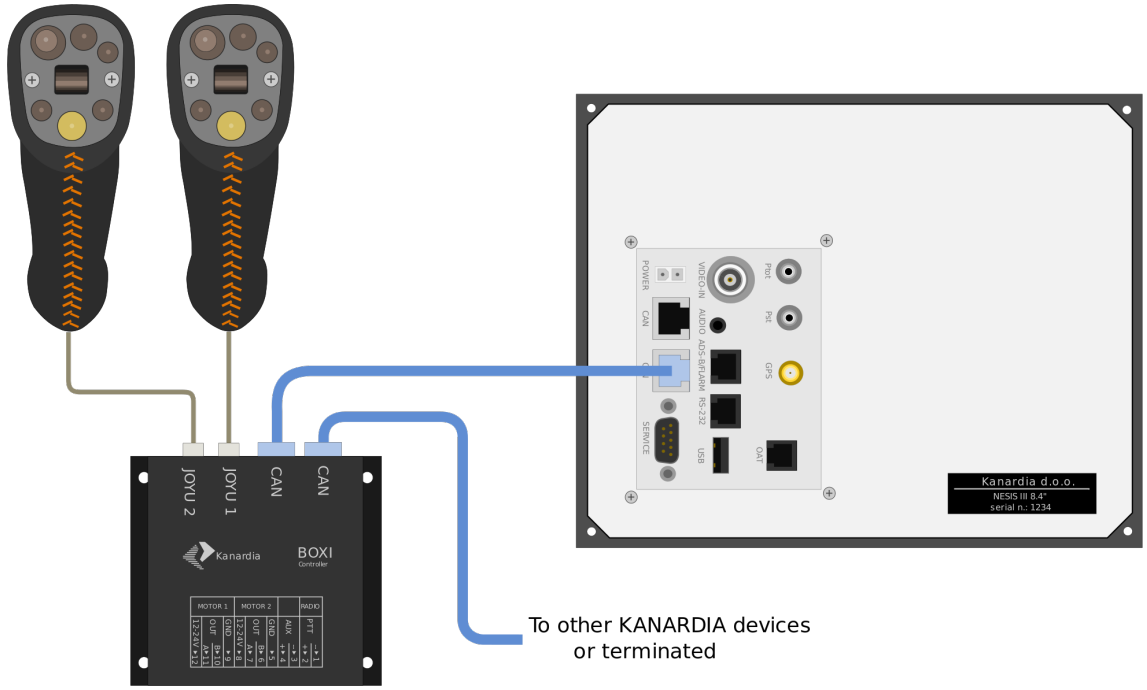

Figure 2: Connection example - Boxi and Nesis.

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.

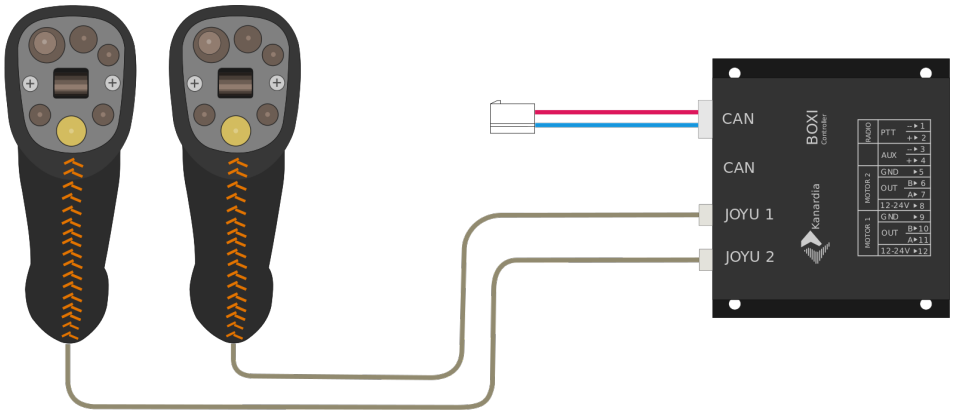

Figure 3: Connection example - Boxi.

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.

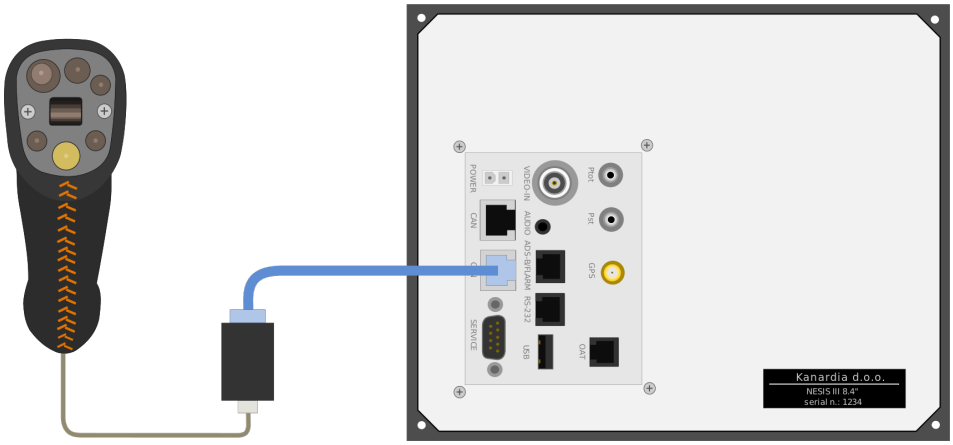

Figure 4: Connection example - Nesis.

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..).

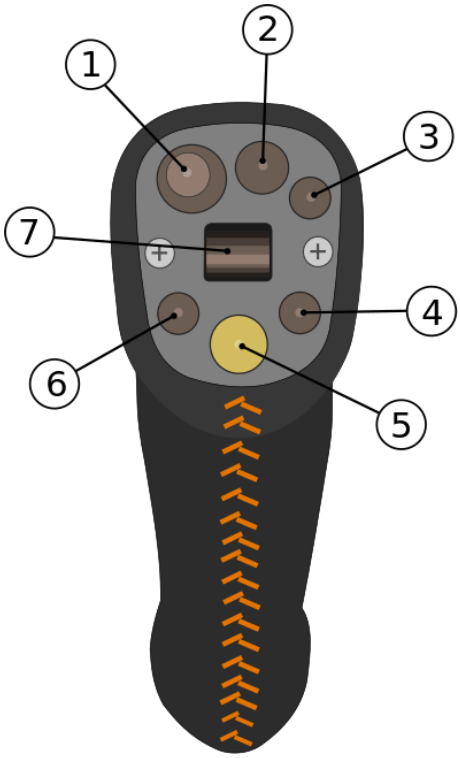

Figure 5: Button layout.

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[2].
6. **OK/Confirm.** OK button is used to select things and confirm selection under Nesis menus. It has same functionallity 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...

[2] 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 controlls 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 Kanarida 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.

Exclusions and Limitations

This Limited Warranty applies only to hardware products manufactured by or for Kanardia that have the "Kanardia" trademark, trade name, or logo affixed to them at the time of manufacture by Kanardia. The Limited Warranty does not apply to any non-Kanardia hardware products or any software, even if packaged or sold with Kanardia hardware. Manufacturers, suppliers, or publishers, other than Kanardia, may provide their own warranties to the Purchaser, but Kanarida and its distributors provide their products *AS IS*, without warranty of any kind.

Software distributed by Kanardia (with or without the Kanardia's brand name including, but not limited to system software) is not covered under this Limited Warranty. Refer to the licensing agreement accompanying such software for details of your rights with respect to its use.

This warranty does not apply: (a) to damage caused by use with non-Kanardia products; (b) to damage caused by accident, abuse, misuse, flood, fire, earthquake or other external causes; (c) to damage caused by operating the product outside the permitted or intended uses described by Kanardia; (d) to damage caused by service (including upgrades and expansions)

performed by anyone who is not a representative of Kanardia or an Kanarida Authorized Reseller; (e) to a product or part that has been modified to significantly alter functionality or capability without the written permission of Kanardia; (f) to consumable parts, such as batteries, unless damage has occurred due to a defect in materials or workmanship; or (g) if any Kanardia serial number has been removed, altered or defaced.

To the extent permitted by applicable law, this warranty and remedies set forth above are exclusive and in lieu of all other warranties, remedies and conditions, whether oral or written, statutory, express or implied, including, without limitation, warranties of merchantability, fitness for a particular purpose, non-infringement, and any warranties against hidden or latent defects. If Kanardia cannot lawfully disclaim statutory or implied warranties then to the extent permitted by law, all such warranties shall be limited in duration to the duration of this express warranty and to repair or replacement service as determined by Kanardia in its sole discretion. Kanardia does not warrant that the operation of the product will be uninterrupted or error-free. Kanardia is not responsible for damage arising from failure to follow instructions relating to the product's use. No Kanardia reseller, agent, or employee is authorized to make any modification, extension, or addition to this warranty, and if any of the foregoing are made, they are void with respect to Kanardia.

Limitation of Liability

To the extent permitted by applicable law, Kanardia is not responsible for indirect, special, incidental or consequential damages resulting from any breach of warranty or condition, or under any other legal theory, including but not limited to loss of use; loss of revenue; loss of actual or anticipated profits (including loss of profits on contracts); loss of the use of money; loss of anticipated savings; loss of business; loss of opportunity; loss of goodwill; loss of reputation; loss of, damage to or corruption of data; or any other loss or damage howsoever caused including the replacement of equipment and property, any costs of recovering, programming, or reproducing any program or data stored or used with Kanardia products and any failure to maintain the confidentiality of data stored on the product. Under no circumstances will Kanardia be liable for the provision of substitute goods or services. Kanardia disclaims any representation that it will be able to repair any product under this warranty or make a product exchange without risk to or loss of the programs or data. Some jurisdictions do not allow for the limitation of liability for personal injury, or of incidental or consequential damages, so this limitation may not apply to you.

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.