
AlphaComm-I

User's Manual

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1. INTRODUCTION

1.1 About This Manual

This manual describes the features and usage of the AlphaComm-I for research use, in free-moving animals.

1.2 Reference Documents

Intan Headstage manual

1.3 AlphaComm-I Overview

The AlphaComm-I is a motorized slip ring commutator for tethered free-moving animal setup. It supports both neural recording and stimulation. The commutator tracks the rotation of the Headstage cable and compensates for it, thus eliminating turn-induced torques at the end of the cable connected to the animal.

1.4 Highlights and Significant Features

- Supports 16-256 channels
- Additional 10 general purpose wires
- High-resolution sensing
- Controllable - Speed and sensitivity
- Compatible with optogenetics up to - 4 fibers
- Compatible with liquid tubes
- Allows electrical stimulation on all the channels
- Compatible with a variety of arena sizes and shapes
- Compatible with Intan Headstages
- Allows video tracking/recording

3. GETTING STARTED

3.1 Rod(cable holder) connection

Attach the rod to the commutator movement sensor. Make sure that the screw is well fixed. (See figure 2)

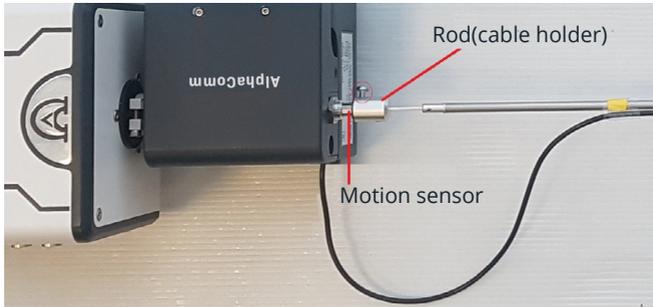


Figure 2 - Installing rod(Cable holder)

3.2 Connecting AlphaComm-I to Intan Headstage

Connect the Intan cable through the rod; the rod is marked with a yellow shrink. Tape the cable on the rod at the marked area, make sure that the cable length from the commutator to the yellow mark is 25cm. (see figure 3 below)

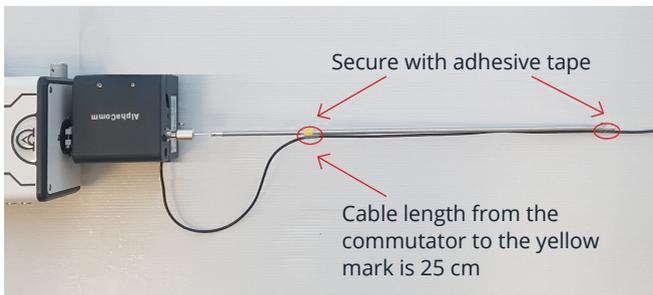


Figure 3 - Installing preamp Headstage

3.3 Connecting AlphaComm-I to data acquisition system

The AlphaComm-I connects directly to any Intan-based Data Acquisition (DAQ) system, up to two Headstages can be connected to AlphaComm-I. (See figure 4)

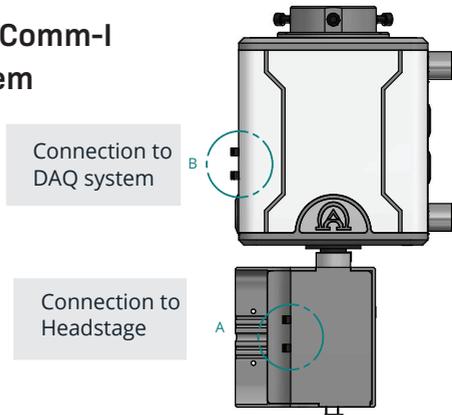


Figure 4 - AlphaComm-I connections

3.4 Installing optogenetics (Optional)

Insert the fiber in the AlphaComm-I from the top side and connect it with optogenetics rotary joint. Fix the rotary joint in the AlphaComm-I (see figure 5)

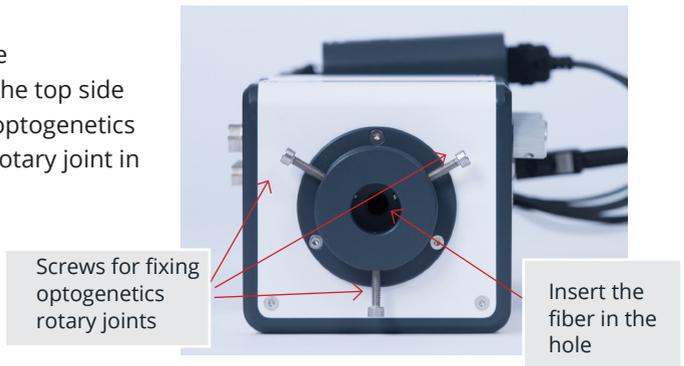


Figure 5 - Optogenetics integration

Pull the optic fiber cable out from the bottom side and connect it with a regular zip tie. (See figure 6)



Figure 6 – Optogenetics holder with zip tie

4. SETTING UP AND CONTROL

AlphaComm-I is controllable; the user can control the velocity of the motor rotation and sensitivity of the motion sensor.

4.1 Velocity control

When a motion is detected, the commutator starts to turn in a variable acceleration and reaches the maximum speed according to the maximum that was defined by the user. To define the maximum speed, the user needs to adjust the velocity knob (See figure 7)

4.2 Sensitivity control

Sets the number of displacement degrees from the original position at which the motor will start/stop rotating. To define the sensitivity, the user needs to adjust the sensitivity knob. (See figure 7)

4.3 Manual control

The commutator can be controlled manually by two buttons (Clockwise & counter-clockwise), each button rotates the commutator accordingly. In addition, these buttons reset the movement sensor.

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Note: After connecting the animal, it is recommended to use these buttons in order to get the ideal sensor position - no cable loops.
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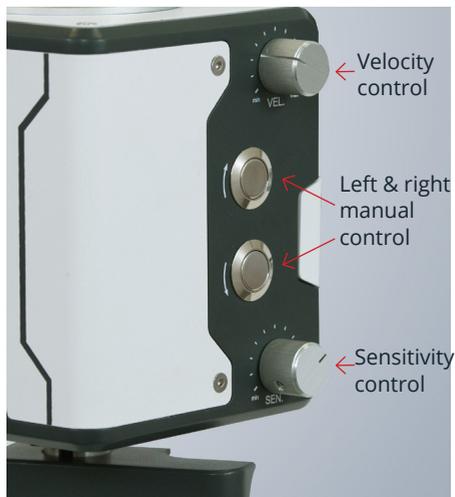


Figure 7 – AlphaComm-I controls

5. MOUNTING

The AlphaComm-I has a special mechanism for mounting called mounting panel, this part can be found in the rear panel of the AlphaComm-I.

5.1 Mounting panel

The mounting panel can be disassembled from the commutator and mounted on the suitable location.

The mounting panel has two M4 holes (4.3mm each). See figure 8

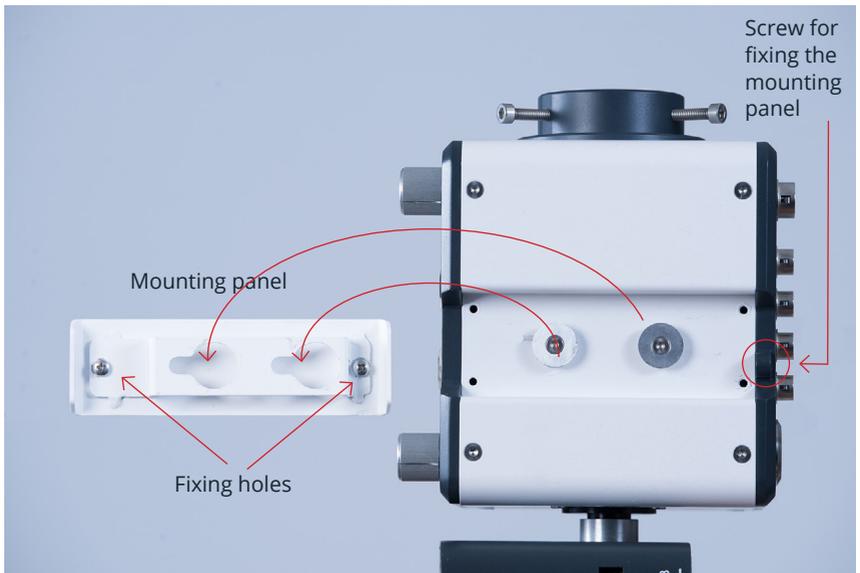
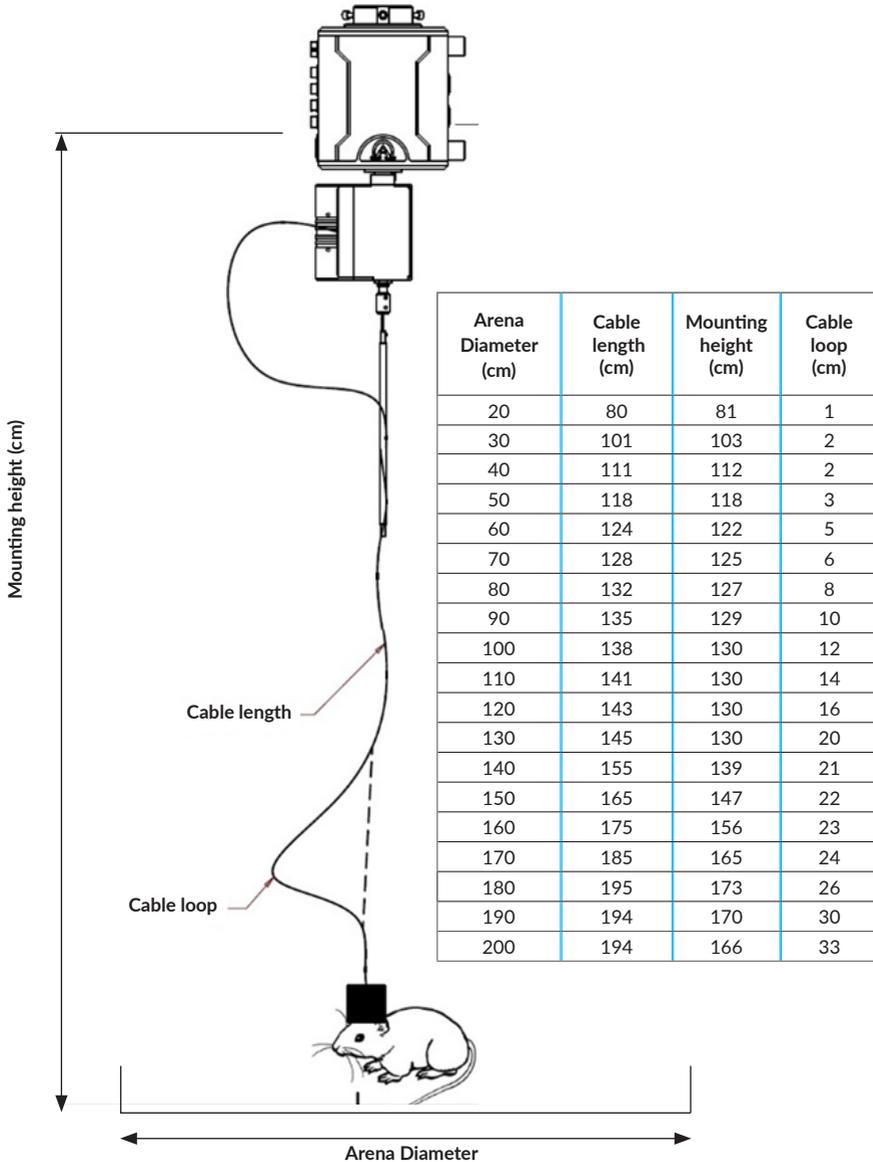


Figure 8 - Mounting Panel

5.2 Mounting Height, cable length and cable loop

The recommended mounting height of the commutator is defined by your arena diameter, see the schematic diagram and the table below:



6. AlphaComm-I DIMENSIONS

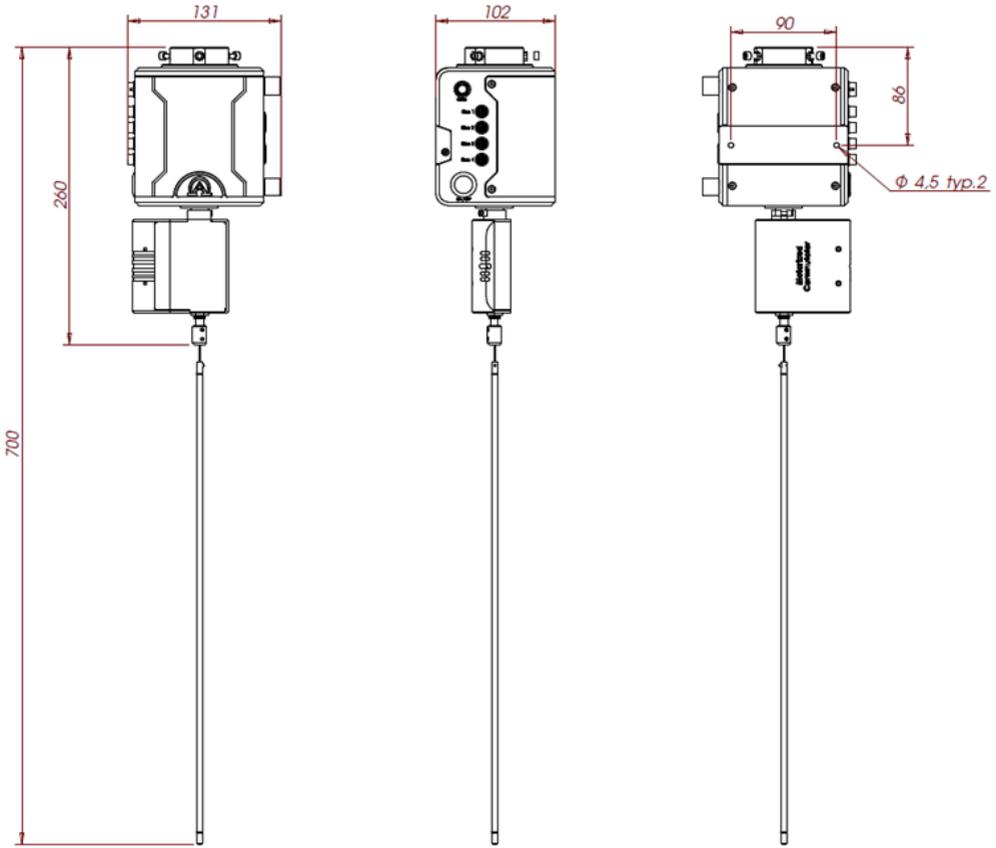


Figure 9 - Dimensions

Note: All the dimensions are in mm.



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