



# NEUROPIXELS ONEBOX

## Description



The Neuropixels OneBox is a user-friendly plug & play acquisition system developed for the Neuropixels neural probes. This small compact box connects to up to two cables to enable recording from two Neuropixels 1.0 probes, two Neuropixels 1.0 NHP probes, four Neuropixels 2.0 probes, or two Neuropixels 2.0 QB multishank probes simultaneously.

It can be synchronized with various hardware and software trigger modes, is compatible with SpikeGLX and Open Ephys software, and the API is available for custom software development.

The OneBox comes with a break out board and SDR cable for easy connection to the auxiliary ADC/DAC channels via BNC connectors, and wall mount brackets to allow mounting on eg. a shelf or instrument rack.

### Important Information

The Neuropixels probes are intended for RESEARCH USE ONLY ("RUO") in non-human subjects such as small animals\*. These Neuropixels probes should not be used in humans and are not manufactured or approved for human use. They have no proven human efficacy and are not indicated for human use or any form of clinical use. The Neuropixels probes are provided and delivered for use only under the imec general terms and conditions of sale of Neuropixels 1.0 probes ("GTC"). [The GTC is available for download on [www.neuropixels.org](http://www.neuropixels.org)]

# Key Applications

## Probe compatibility:

- Compatible with Neuropixels 1.0/1.0 NHP, Neuropixels 2.0 and Neuropixels 2.0 QB multishank headstages

## Synchronization:

- TimeStamp counter: 100 kHz, 30 bit
- External SYNC input or internal SYNC source (configurable between 0.03 and 500 Hz)
- Trigger signal sources:
  - Threshold crossing on auxiliary analog signals
  - Edge detection on auxiliary digital input signals
  - User configurable on live recorded neural data (spike detection, threshold crossing)
  - External input from SMA
  - Software

## Auxiliary I/O:

- DAC: 16 bit, 12 channels:
  - Waveform player: samples uploaded from software (Max. sample rate and buffer size scales with number of active channels: 1 channel: 500 kHz sample rate, 30 s buffer)
  - Play selectable probe channel
  - Digital output with configurable voltage levels
- ADC: 16 bits, 30 kHz max. sample frequency, 12 channels

## Front panel connectors:

- 2x USB-C to Neuropixels headstages
- 1x Shrunk Delta Ribbon connector for auxiliary I/O (26 pins, compatible with Open Ephys I/O Board)
- 1x SMA for ADC channel
- 1x SMA for DAC channel
- 1x general status LED, 2x probe status LED

## Rear panel connectors:

- USB 3.0 for PC interface
- 1x SMA for synchronization
- On/Off switch
- DC power connector

## Dimensions:

- 16 x 16 x 2.6 cm (without wall mount brackets)

## Weight:

- 600 g (without wall mount brackets)

## Power Supply:

- External 12 V adapter

## FPGA code:

- FPGA code completely open source



Figure 1: Neuropixels OneBox with breakout board and SDR cable, and a plugged-in neuropixels 1.0 probe

## Ordering information



ORDER CODE	DESCRIPTION
ONEBOX_1000	OneBox acquisition system

## About Neuropixels

The Neuropixels 1.0 neural probe is an advanced silicon CMOS digital integrated microsystem and a tool for neuroscience research. It was developed through a collaboration funded by Howard Hughes Medical Institute (HHMI), Wellcome Trust, Gatsby Charitable Foundation and Allen Institute for Brain Science. Probes were designed, developed and fabricated at imec, Leuven, Belgium in collaboration with HHMI Janelia Research Campus, Allen Institute for Brain Science and University College London.

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\* Small animals like rodents and non-human primates