



Capability, Overview, Set-Up, Optogenetics

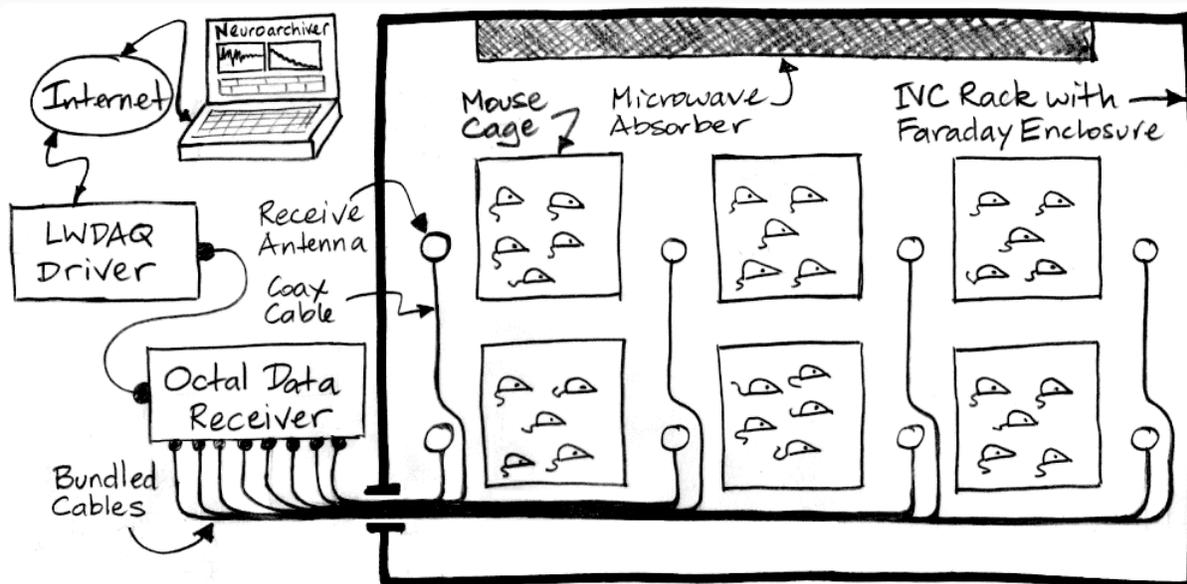
Wireless Telemetry by Open Source Instruments

24/7 Recording with Cohabiting Animals

Capability

Open Source Instruments' [wireless telemetry system](#) provides **continuous recording** of biopotentials from freely moving cohabiting animals. Biopotentials are low-pass filtered but otherwise **undistorted by digitization and transmission**. When electrodes are well-secured, EEG signals will be entirely free of movement artifact. The fidelity of the signal, combined with OSI's event-detection software, allows researchers to **find rare events automatically** in tens of thousands of hours of recordings, or to detect events automatically as they occur. All hardware and software is **well-documented and open source**.

Overview



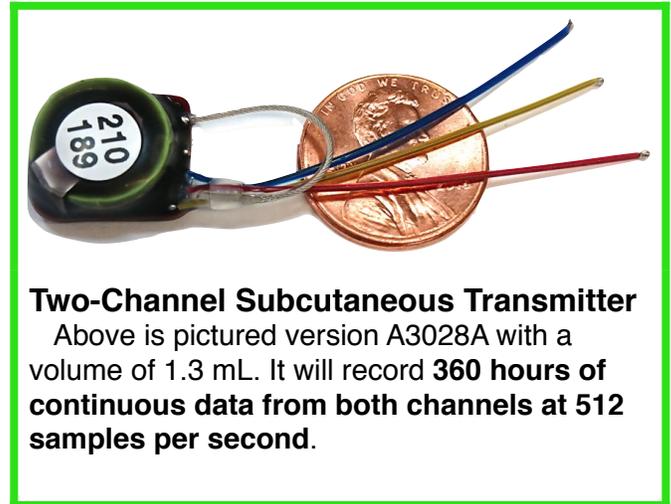
Subcutaneous transmitters are surgically implanted in rats, mice, or mouse pups. When turned on with a magnet, the transmitters broadcast biopotential measurements to be viewed in real-time or recorded for future analysis. The system can be used in an IVC rack or on a bench top. A single recording system, costing under \$20,000, will record **continuously** from up to 40 cohabiting animals.

Our Animal Cage Cameras (ACC) provide continuous day and night video recordings that are guaranteed synchronous with recorded telemetry to within +/- 100ms.

Set-Up

Transmitters are implanted in the abdominal cavity of the rodent. Subcutaneous leads connect the transmitter to [electrode screws](#) or [depth electrodes](#) mounted on the skull, which provide fully-subcutaneous telemetry in cohabiting animals.

- Smallest version 0.5 mL
- No operator supervision required
- Turned on / off magnetically
- One and two data channel models
- Sample rates up to 2048 SPS
- Bandwidth up to 640Hz
- Minimum frequency down to 0.0Hz
- Operating life up to 7000 hours
- More than 25 [versions](#) made to order



Two-Channel Subcutaneous Transmitter
Above is pictured version A3028A with a volume of 1.3 mL. It will record **360 hours of continuous data from both channels at 512 samples per second.**

There are two paths to setting up a telemetry system for recording.

1. Using our Octal Data Receiver (ODR) – with eight antennas, one such system can record from an entire IVC rack.
2. Using our Animal Location Tracker (ALT) – which is a platform fitted under the animal cages. The ALT is simpler to install because it has only a single ethernet cable, which also provides power. The ALT provides activity and proximity monitoring of individual animals in addition to biometric recording.

Faraday enclosure, or radio quiet chambers, are always required when using OSI telemetry systems. We offer a bench top Faraday enclosure that can hold up to six mice cages, or a Faraday Canopy that is large enough to enclose an entire IVC rack.

Optogenetics

The Implantable Stimulator-Transponder (IST) provides radio-controlled optical stimulus for mice in experiments lasting up to eight weeks. More details on our stimulators and head fixtures can be found [here](#).

In August 2021 Open Source Instruments completed its first trials of a new mouse sized implantable ontogenetic stimulator. Its fiber coupled light emitting diode [provoked circling](#) with 0.3ms flashes at 10Hz.