

made to measure

Flexible Extra and Intracellular Recording Systems

Differential Intracellular Recording and up to 16 Additional Extracellular Recording Channels for Field Potentials or Single Units



TMR-02M

DPA-2FS

BF-48DGX

ELC-01MX

IMX AUDIS-03/8M

Timer Module Amplifier/Filter Modules for Extracellular Signals

ELC Amplifier Module

Audio Monitor Module

Ref.: Lapray et al., Nature Neuroscencei. 2012. 15(9):1265-1271





Example of Headstage and Breakout Box for 6 extracellular and 1 juxtacellular Channel

- ⇒ TMR-02M for gating juxtacellular current trains
- ⇒ DPA and BESSEL modules for amplification and filtering of extracellular signals
- ⇒ Extracellular signals can be measured single-ended or differential
- ⇒ ELC-01MX for intracellular recording in bridge mode or juxtacellular recording and stimulation
- AUDIS-03/8M for acoustic monitoring of intracellular or extracellular signals
- One miniature headstage for recording all signals and for stimulation



Miniature Headstage e.g. 6 + 1 channels

Standard Headstage

Electronic Instruments for the Life Sciences

npi 10/18

Amplifiers for Tetrode Recording

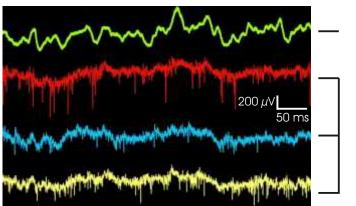
Sample Configuration



ISO-STIM 01M Isolated Stimulator Module μ V Amplifier/Filter

Modules

EXT-T1M Tetrode Module



dentate gyrus of the hippocampus (0.1 - 800 Hz) electrode tip diameter: $\sim \! 15$ micrometers

different locations in the dorsal thalamus (0.1 - 6000 Hz) electrode tip diameter: 3-6 micrometers

Tetrode recordings (sampling rate: 10 kHz) of rat hippocampus and dorsal thalamus (adult rat under light anesthesia)

Data kindly provided by Didier Pinault, Univ. Strasbourg

Recording with Two Tetrodes



EXT-T2

- One headstage for each tetrode
- Lowpass filter: 500, 2k, 7k Hz, set internally by DIL switches
- ⇒ Highpass filter: 0.24, 0.3, 1 Hz, set internally by DIL switches
- Gain: x200, x500, x1000, set internally by DIL switches
- ⇒ Headstage with x10 amplification for low-noise operation
- Two BNC OUTPUTs for each channel



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ModularTetrode Recording



- Customized configurations
- → Module for stimulation (up to ±280 nA, bipolar) and electrode resistance meter
- Current injection frequency and amplitude set by 10-turn potentiometers
- Electrode resistance test separately for each tetrode unit (selected by switch)
- Low pass filters, high pass filters and gain to be set internally by DIL switches
- Can be combined with audio module or high voltage modules for setting lesions

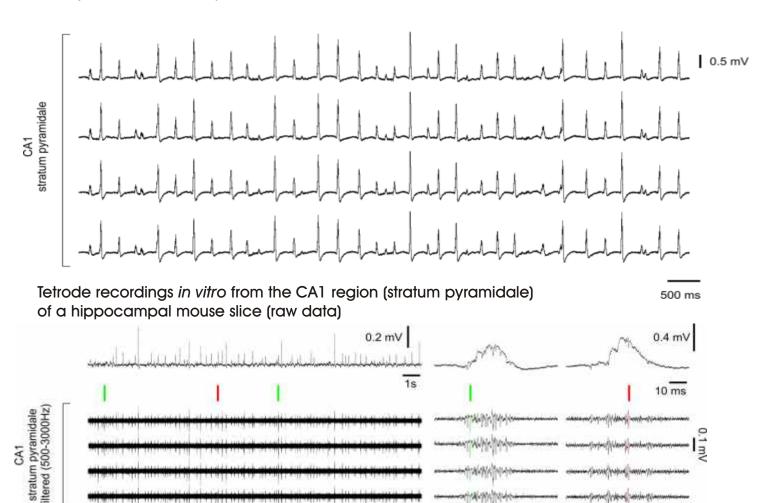


Tetrode Headstage



Tetrode Amplifier R/I-T1M Resistance Test,

Current Injection



Further analysis (PCA, KlustaKwik, (Harris, JNeuroSci 84, 2000)) reveals well separated single-unit signals Data kindly provided by Susanne Reichinnek, INMED, Marseille Ref.: Reichinnek, et al., J Neurosci. 2010. 17;30(46):15441-15449



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Amplifier for Multiple Site Recording





R/I-T1DX - EXT-16DX

Extracellular Amplifier - Electrode Resistance Meter / Current Injection Unit

- Extracellular recordings with up to 16 channels
- ⇒ Up to 16 gain stages, 16 high pass and 16 low pass filter corner frequencies; set by rotary switch
- Customized configuration for each channel (set by factory)
- Digital display of selected channel, gain, high pass and low pass filter corner frequency
- Remote operation with digital I/O card or manual operation with rotary switches and push buttons
- ⇒ Brightness of displays adjustable
- Referenced or single ended recording mode (set by switch)
- External npi power supply or rechargeable batteries
- Extracellular signals available at BNC connectors or at SCSI/SubD connector for direct linking to data acquisition card
- ⇒ Electrode resistance test separately for each electrode

Ref.: Stroh et al., Neuron. 2013. 20;77(6):1136-1150 Justus et al., Nature Neuroscience. 2016. 20(1): 16-19

Suitable for:

NeuroNexus Electrodes



PlasticsOne Electrodes



Tucker Davis Electrodes



Ejector / Extracellular Amplifier



PEXT-01

Pneumatic Drug Ejector and Extracellular Amplifier

- > Pneumatic drug ejection and extracellular recording with the same or different electrodes
- > INPUT with BNC connectors or small headstage with high impedance
- ⇒ OUTPUT: DC with OFFSET control or AC FILTERED (x10 to x10k); with AUDIO monitor



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Extracellular Recording Systems

For Recording Field Potentials or Single Units



Dual Channel Amplifier
with Headstages.
Adjustable Gain and Filters,
Notch Filter.
Additional Input for Stimulator.
With External Power Supply.
Electrode Resistance Meter
and Audio Monitor Optional.
For up to 8 Channels

EXT-02B



EXT standard headstage



Miniature EXT headstage with housing and gold pin for electrode holder



Miniature EXT headstage without housing

Miniature Headstages for Recording in Freely Moving Animals Available with or without Housing



Single Channel Amplifier with Optional Headstage. Adjustable Gain and Filters. Notch Filter optional. Audio Monitor with Threshold for Removing Background Noise

EXT-02F/1



Dual Channel Amplifier
with Optional Headstage.
Adjustable Gain and Filters.
Notch Filter optional.
Audio Monitor with Threshold
for Removing Background Noise

EXT-02F/2



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Modular Extracellular Recording and Signal Processing



EXT 10-2F





LPBF-01GX

Amplifier with Low Pass BESSEL Filter and Gain

General: npi electronic GmbH

Phone: +49-7141-9730230 Fax: +49-7141-9730240 sales@npielectronic.com www.npielectronic.com



EXT-10C

Single Channel Amplifier with Headstage, Gain and **Capacity Compensation**



BF-48DGX

Amplifier with High Low Pass BESSEL Filters and Gain

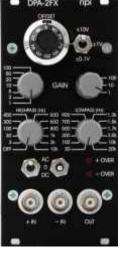
North America: **ALA Scientific Instruments**

Phone: +1-631-393-6401 Fax: +1-631-393-6407sales@alascience.com www.alascience.com



DPA-2FX/2FS

Amplifier with **High/Low Pass Filters** and Gain



DPA-2FL

Extra Low-Noise Amplifier with High/Low Pass Filters and Gain



DI-01NX

Differentiator Integrator



WD-01

Window Discriminator

Switzerland:

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