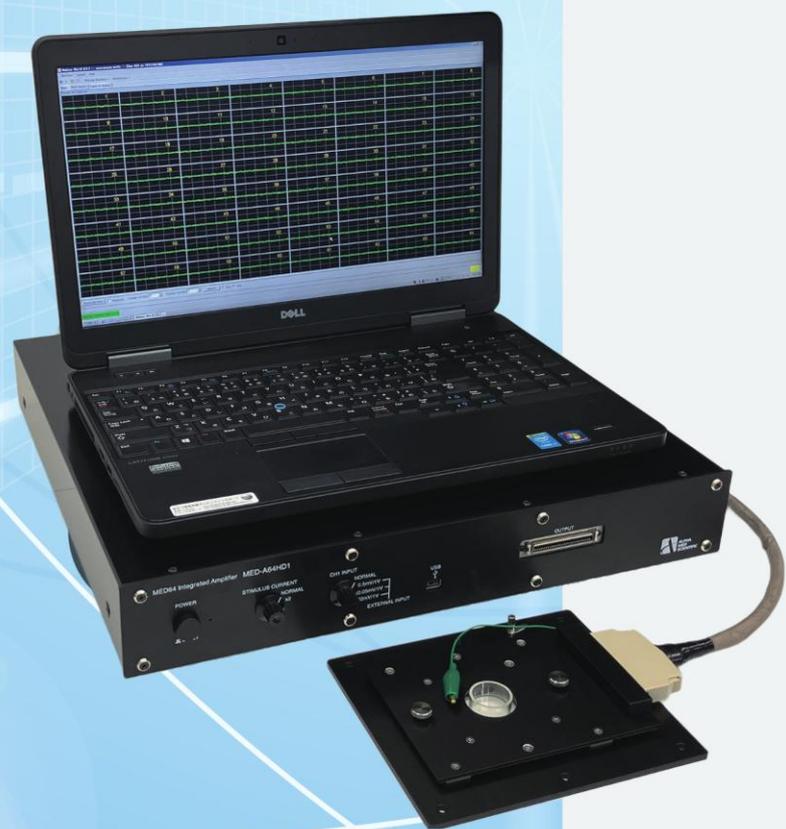


The most sensitive
microelectrode array system
for *in vitro* extracellular electrophysiology

MED64



MED64

Unrivaled Data Quality for the Highest Reliability and Reproducibility

The MED64 System is the world's first commercialized microelectrode array system. Since its launch in 1996, the MED64 has attracted attention as an advanced solution for *in-vitro* extracellular electrophysiology.

The MED64 system features highly sensitive electrodes and an amplifier designed exclusively to optimize their performance. Engineered for low-noise, the MED64 provides the highest level of reliability and the highest-quality electrophysiological experiments. Due to its excellent S/N ratio, it has been highly regarded by researchers who prioritize data quality.

Evolution of MED64 Applications



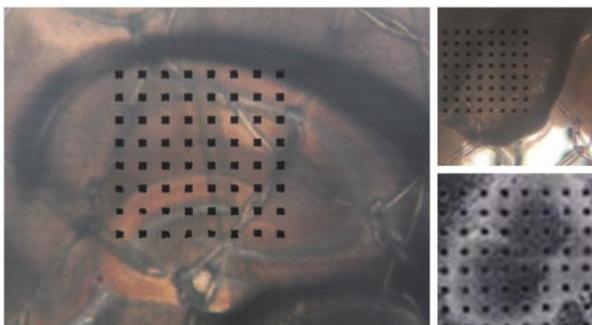
MED8 System
Introduced the world's first commercial MEA system, the MED8 System



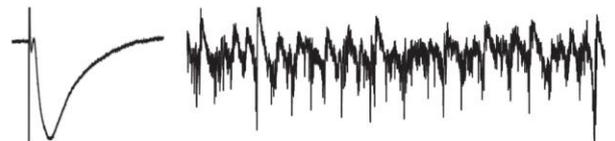
MED64 Integrated System
Established brain slice applications, helping make the MED platform widely recognized in electrophysiology research

1997

1999



Brain slices



Evoked potential

Oscillation (rhythmic and periodic activities)



Light-induced multifocal electroretinograms

Wide range of features

- High-precision SNR with a noise level of $0.8 \mu\text{V}_{\text{rms}}$ (signal acquisition bandwidth $< 3 \text{ kHz}$).
- High-quality evoked signals with minimal stimulus artifacts (no blanking circuit necessary).
- Combination of low-noise and broad acquisition bandwidth for highly reliable signal recording.
- Current-driven stimulation via any electrode
- Environmental control via head stage installation in an incubator.
- Low-cost system reconfiguration via purchase of an additional head stage.
- Extensive lineup of dedicated peripheral devices for various experimental needs.
- Thorough technical support system backed by over 20 years of experience.



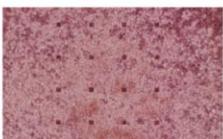
MED64-Basic
Expanded MEA applications to cultured cells with MED64-Basic, supporting advances in stem cell and drug discovery research

2010

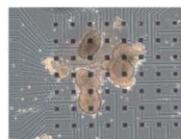
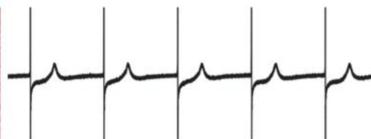


MED64 Integrated Amplifier
Introduced a next-generation 64-channel amplifier

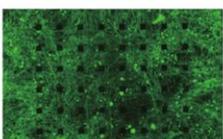
2026



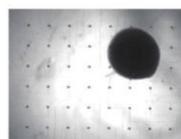
Cardiac field potential



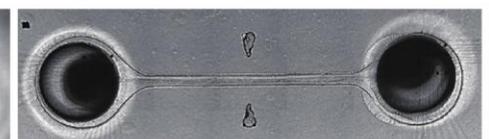
Glucose-stimulated activities in pancreatic islet



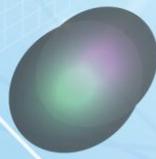
Neuronal spontaneous spikes and bursts



Brain and nerve organoid



Hardware



Extensive lineup of systems tailored to different target specimens, throughput, and budget requirements.



64 channels	MED64-Basic	MED64-Quad II	MED64-Allegro	MED64-Plex 4 (or 8)
Overview	A basic system for a 64-electrode single-well MEA	All-round system for four 16-electrode single-well MEAs	Medium-throughput system for multi-well MEAs with 16 or 8 electrodes	A time-sharing system for 64-electrode single-well MEAs that enables data acquisition from up to 4 (or 8) samples via time-division controls
Hardware Configuration	MED64 Integrated Amplifier *1			
	MED Connector or MED Thermo Connector	MED Duet Connector ×2	MED Multi-well Connector	MED64 Multiplexer ×1 (or 2) MED Connector ×4 (or 8) or MED Thermo Connector ×4 (or 8)
	-	MED Thermo Base ×2	MED Thermo Base	-
Compatible MED Probe	MED Probe	MED Mini Probe ×4	MED Multi-well Probe	MED Probe ×4 (or 8)
Applicable Specimens *2	Acute slice, organotypic & dissociated cultures	Acute slice, organotypic & dissociated cultures	Dissociated cultures	Acute slice, organotypic & dissociated cultures

1. Built-in current-driven stimulator. MED64 Main & Head Amplifier with built-in voltage-driven stimulator is also available.
2. Depend on the well size of the compatible MED Probe.

MED64 Integrated Amplifier [MED-A64HD1]

- Wide bandwidth of 0.1 Hz -10 kHz allows users record several types of extracellular potentials.
- Equipped with analog high-pass and low-pass filters, enabling selective removal of unwanted frequency bands during data acquisition.
- Built-in 2-channels stimulator allows users to program and deliver complex stimulation sequences independently through any 2 electrodes.
- Includes a switch lever that allows the trigger output to an external device to be displayed on Channel 1.



General	Power supply	DC 12 V, 0.9 A, 10.8 W	Digitizer	Resolution	16 bit
	Weight (w/o PSU)	6.6 kg		Sampling rate	20 kHz
	Dimensions (w/o PSU)	W430 × D437 × H74mm		Max. input	±5 V
Amplifier	# Channels	64	Stimulator	Output	USB 2.0
	Gain	× 200 - 2170		# Channels	2
	Bandwidth	0.1 Hz - 10 kHz (+0 dB to -3 dB)	Output format	Current-driven	
	Input impedance	100 MΩ	Max. output	±200 μA	
	Input terminal	68 pin × 1, 20 pin × 4	F1 stimulus input	Max. input	±4 V
	Output terminal	68 pin × 1	F1 output	I/V conversion ratio	25 μA/V
	High-pass filter (LCF)	0.1 / 1 / 10 / 100 Hz (-12 dB/oct)	External signal input	Max. output	±4 V
	Low-pass filter (HCF)	1 / 2.5 / 5 / 7.5 / 10 kHz (-12 dB/oct)		Receiving channel	Channel 1
Power supply unit (PSU)	RMS noise (short-circuited)	14 nV/√Hz	Sensitivity	0.5 / 0.05 / 0.02 mV/1V	
	Input	AC 100 - 240 V (50 / 60 Hz)			
	Output	DC 12 V, 5 A, 60 W			

MED Connector [MED-C03]

MED Duet Connector [MED-C05]

MED Multi-well Connector [MED-C11]

- A headstage that "connects" the MED probe to the amplifier and detects signals from the probe terminals.
- NO active onboard electrical circuitry; Connectors can safely be placed in high-humidity environment (e.g. cell culture incubator)

Product number	Weight	Dimensions	Material	MED Probe securing mechanism	Contact resistance
MED-C03	480 g	W174 × D150 × H21 mm	Aluminum (body),	Screw down	< 30 mΩ
MED-C05	381 g	W130 × D85 × H30 mm	Gold plating	Slide in	
MED-C11	700 g	W210 × D83 × H34 mm	(contact pins)		



MED Connector [MED-C03]



MED Duet Connector [MED-C05]



MED Multi-well Connector [MED-C11]

MED Thermo Connector [MED-CP04]

- Heater and thermocouple sensors are incorporated into the MED Connector.
- Bath temperature in the MED Probe is maintained.
- Can be used with or without perfusion. Included tubing through connector provides in-line solution heating.
- Aperture in the unit bottom allows observing biological samples with microscope.

Weight	Connector: 510 g Controller: 357 g
Dimensions	Connector: W200 × D112 × H21 mm Controller: W153 × D115 × H50 mm
Material	Aluminum, Gold plate for contact pins
MED Probe securing mechanism	Screw down
Contact resistance	< 30 mΩ
Heater	Transistor
Temperature accuracy	±0.1°C
Range of verified < 1°C	w/ perfusion: 32°C (Ta = 25°C) w/o perfusion: 37°C (Ta = 25°C)



MED Thermo Base [MED-CPB02]

- Heater pad for MED Duet Connector. Loading a MED-C05 or a MED-C11 to maintain temperature around recording electrodes on the MED Probe with internal controller.

Weight	620 g
Dimensions	W160 × D125 × H54 mm
Material	Aluminum
Heater	Transistor
Temperature accuracy	±0.1°C
Range of verified < 1°C	w/ perfusion: 32°C (Ta = 25°C) w/o perfusion: 37°C (Ta = 25°C)



MED64 Multiplexer [MED-A64SF1 / MED-A64SF2]

- A unit that connects up to four MED Connectors or MED Thermo Connectors and automatically switches them under program control to output signals to a 64-channel amplifier.
- By adding the MED-A64SF2 to the MED-A64SF1, time-shared data acquisition from up to eight connectors is possible.

General	Weight (w/o PSU)	6.1 kg
	Dimensions (w/o PSU)	W430 × D437 × H74 mm
	Number of through input	1 (Input 1-4)
	Gain	×1
	Maximum input / output voltage	×4 V
	Control signal	3 bit BCO
	Control signal level	TTL
Power supply unit (PSU)	Input	AC 100 - 240 V (50 / 60 Hz)
	Output	DC ±12 V



384 channels

MED64-Presto**High-throughput system with a 384-channel amplifier for multiwell MEA plates.**

- Dedicated MEA plates are available in the following configurations: 64-electrode × 6-well, 16-electrode × 24-well, and 8-electrode × 48-well. The plates are manufactured using the same process as MED Probes, ensuring high data quality while enabling easy optical observation and high throughput.
- Built-in temperature controls the experimental environment controlled by supplying research-grade mixed gas (5% CO₂-Air, optional) through the MEA plate cover.
- Built-in stimulation amplifier enabling simultaneous stimulation from fixed electrodes in each well.
- Control software MEA Symphony includes key analysis functions for cultured neurons and cardiomyocytes. Data files can be converted to Mobius format.
- Dual-monitor support allows for the simultaneous display of raw signals from all 384 electrodes and online analysis results.

**MED64-Presto Amplifier [MED-A384iN]**

General	Power supply	DC ±12 V, 2 A, -0.2 A, 25 W	External stimulus input	# Input channels	1	
	Weight (w/o PSU)	8.4 kg		Max. input	±4 V	
	Dimensions (w/o PSU)	W300 × D388 × H155 mm		I/O conversion ratio	2:1	
Amplifier	# Channels	384	Trigger output	# Terminals	1	
	Gain	× 1000		Max. output	±4 V	
	Bandwidth	0.1 Hz - 5 kHz	Connector	# Contact pins	432 (48 for ref electrodes)	
	Input impedance	100 MΩ		Contact pin type	1.4 mm stroke spring probe	
	RMS noise (short-circuited)	13 nV/√Hz		Contact pin material	Gold plating	
	Digitizer	Input range	±5 mV	Power supply unit (PSU)	Input	AC 100 - 240 V (50 / 60 Hz)
		Resolution	16 bits		Output	DC ±12 V, +4 A, -1 A, 60 W
Sampling rate		20 kHz	Temperature controller	Power supply	DC ±12 V, +2.5 A, -0.1 A, 30 W	
Max. input		±5 V		Heater	Transistor × 4	
Output	USB 2.0	Sensor		Sensor IC		
Output electrodes	Switchable fixed 1 (unipolar) and 2 electrodes (bipolar) stimuli	Temperature controller		Omron EG5C		
Stimulator	Output format	Voltage-driven	Range of verified < 1°C	32 - 37°C (Ta = 25°C)		
	Max. output	±2 V	Resolution	±0.1°C		

16 channels

MED64-Entry II**Entry model with a 16-channel amplifier offering excellent affordability.**

- Simultaneous extracellular recordings from the 16 pre-assigned electrodes out of 64 electrodes using a dedicated MED probe
- 22-mm-diameter well that can accommodate acute slices, organotypic cultures, and dissociated cultures.
- Current-driven stimulation via any electrode (up to two electrodes simultaneously).
- Dedicated control software for data acquisition (provided free of charge). With this software, users can monitor neural activity by selecting a time-series plot of either evoked potential amplitude, spike count, or inter-spike interval (equivalent to RR interval). This enables appropriate timing of electrical stimulation or drug application.

**MED64-Entry II Amplifier [MED-A16HD1]**

- Used in combination with a MED Connector or MED Thermo Connector to configure the system.
- Features a built-in A/D board, enabling control from a notebook PC via USB connection.
- Compact A4-size enclosure allows space-saving installation.

General	Power supply	DC 12 V	Stimulator	# Channels	2
	Weight (w/o PSU)	1.7 kg		Output format	Current-driven
	Dimensions (w/o PSU)	W298 × D237 × H54 mm		Max. output	±200 μA
Amplifier	# Channels	16	F1 stimulus input	Max. input	±4 V
	Bandwidth	0.1 Hz - 10 kHz (+0 dB to -3 dB)		I/V conversion ratio	25 μA/V
	Input impedance	100 MΩ	F1 output	Max. output	±4 V
	Input terminal	68 pin × 1		Power supply unit (PSU)	Input
	RMS noise (short-circuited)	14 nV/√Hz	Output		DC 12 V, 5 A, 60 W
	Digitizer	Resolution	16 bit		
Sampling rate		20 kHz / 80 kHz			

Consumables

High-performance MEAs featuring highly sensitive planar microelectrodes patterned in various configurations

“MED Probe”: microelectrode array with the industry’s smallest* impedance electrodes

The microelectrodes that make up the MED Probe have the industry’s smallest* impedance (8 kΩ at 1 kHz). This enables low-noise recordings and an excellent signal-to-noise ratio, while also allowing the application of large currents. The new carbon nanotube–plated electrodes have a flat surface structure that provides excellent cell adhesion.

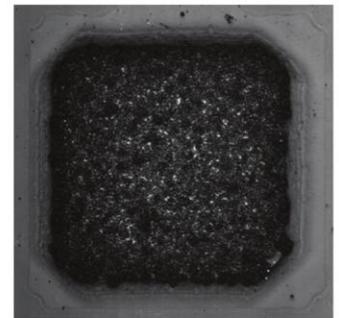
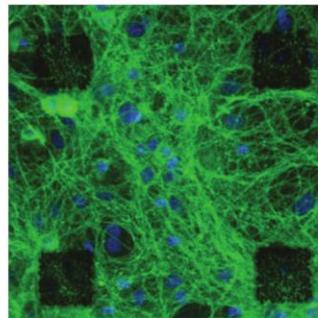
*As of April 2026

The general specifications are listed on the back cover.

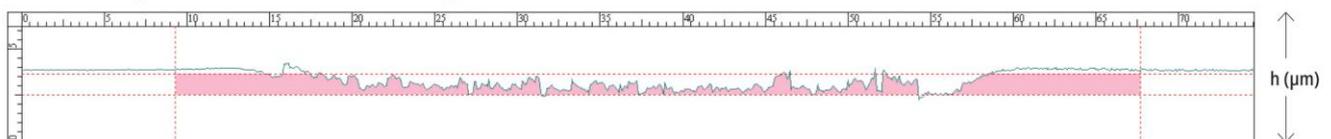


Carbon Nanotube Plating Technology

- Superior cell adhesion due to flat surface structure.
- High sensitivity due to low impedance.
- Excellent durability



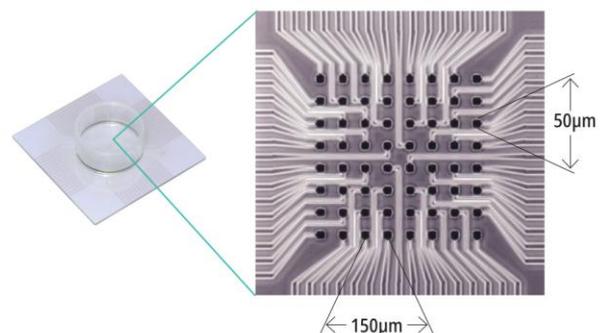
Cross-section diagram for the carbon nanotube electrode (pink)



MED Probe

Standard 8×8 Arrays

Product number		Array size (mm)	Recording electrodes		Chamber depth (mm)
CNT	Platinum black		Size (μm)	Spacing (μm)	
MED-R210S	MED-P210S	0.7 × 0.7	□20	100	5
MED-R210A	MED-P210A	0.7 × 0.7	□20	100	10
MED-R515S	MED-P515S	1 × 1	□50	150	5
MED-R515A	MED-P515A	1 × 1	□50	150	10
MED-R530S	MED-P530S	2 × 2	□50	300	5
MED-R530A	MED-P530A	2 × 2	□50	300	10
MED-R545S	MED-P545S	3 × 3	□50	450	5
MED-R545A	MED-P545A	3 × 3	□50	450	10

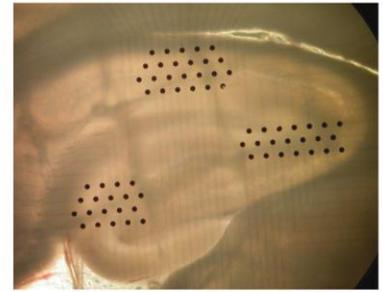


MED-R515A Enlarged view of central electrode area

Special Arrays (hippocampal, hexagonal, 32 × 2, 16 × 4)

Product number		Array	Recording electrodes		Chamber depth (mm)
CNT	Platinum black		Size (μm)	Spacing (μm)	
MED-R50015	MED-P50015	Rat hippocampus	φ20	150	5
MED-R5001A	MED-P5001A	Rat hippocampus	φ20	150	10
MED-R50025	MED-P50025	Mouse hippocampus	φ20	150	5
MED-R5002A	MED-P5002A	Mouse hippocampus	φ20	150	10
MED-R2H075	MED-P2H075	Hexagonal	φ20	70	5
MED-R2H07A	MED-P2H07A	Hexagonal	φ20	70	10
MED-R50035	MED-P50035	32 (4 × 8) × 2	φ50	150	5
MED-R5003A	MED-P5003A	32 (4 × 8) × 2	φ50	150	10
MED-R50045	MED-P50045	16 (4 × 4) × 4	□50	150	5
MED-R5004A	MED-P5004A	16 (4 × 4) × 4	□50	150	10

Special Array



Hippocampal slice preparations on MED-P5001A

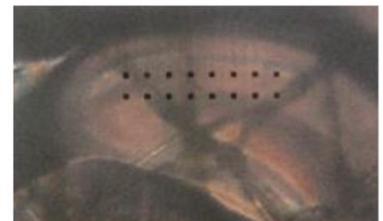
Multi-sample Arrays

Product number		# Wells	# Electrodes / well	Chamber depth (mm)
CNT	Platinum black			
MED-R5D15A	MED-P5D15A	2	32 (4 × 8)	10
MED-R5D15B	MED-P5D15B	2	32 (4 × 8)	5
MED-R5DF15	MED-P5DF15	2	32 ((4 × 4) × 2)	10
MED-R5FF15	MED-P5FF15	4	16 (4 × 4)	10



MED Mini Probe

Product number		Array	Recording electrodes		Chamber depth (mm)
CNT	Platinum black		Size (μm)	Spacing (μm)	
MED-RG207	MED-PG207	4 × 4	□20	70	10
MED-RG515A	MED-PG515A	4 × 4	□50	150	10
MED-RG501A	MED-PG501A	2 × 8	□50	150	10
MED-RG530A	MED-PG530A	4 × 4	□50	300	10



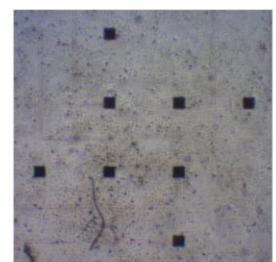
Hippocampal slice preparations on MED-RG501A

MED Multiwell Probe

Product number		# Wells	# Electrodes / well	Well size (mm)	Electrode size (mm)	Chamber depth (mm)
CNT	Platinum black					
MED-R5NF30	MED-P5NF30	4	8	φ16	□50	10
MED-R5N811	MED-P5N811	8	4	7.5 × 16	□50	10



MED-R5N811



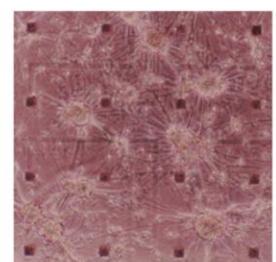
7DIV iPS cells-derived cardiomyocytes on MED-P5N811

MEA Plate

Product number	# Wells	# Electrodes / well	Well size (mm)	Recording electrodes		Chamber depth (mm)
				Size (μm)	Spacing (μm)	
MED-Q2430L	24	16	φ16	□50	300	10
MED-Q2430M	24	16	φ11	□50	300	10
MED-Q4830	48	8	7.5 × 16	□50	300	10
MED-Q630	6	64	φ22	□50	150	10



MED-Q2430M



18DIV neuronal culture on MED-Q2430M

Software

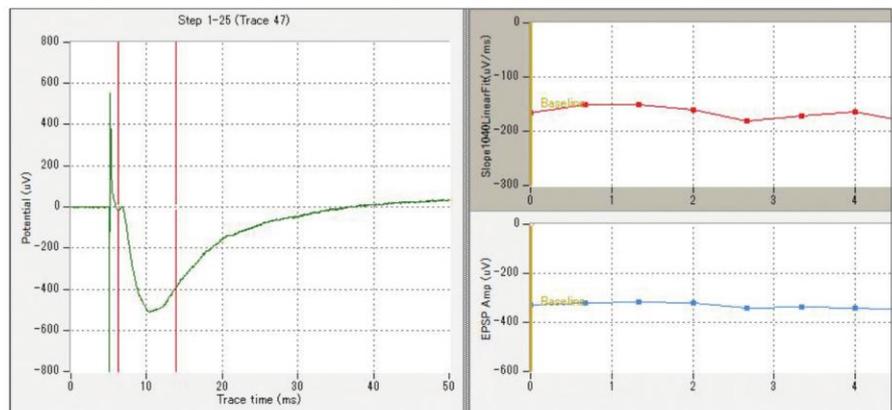
MED64 Mobius – Advanced, customizable control software

MED64 Mobius is data acquisition and analysis software compatible with all system configurations featuring 64-channel amplifiers. Select and purchase packages specialized for representative MEA applications such as EP (evoked potential), Spike Sorter, QT, or combinations of these. The template workflows provided to make the software accessible to beginners. All analysis functions can be performed not only after data acquisition during recording as well as recording, and data files, including raw signals and analysis results, can be exported in formats compatible with third-party software.

MOBIUS

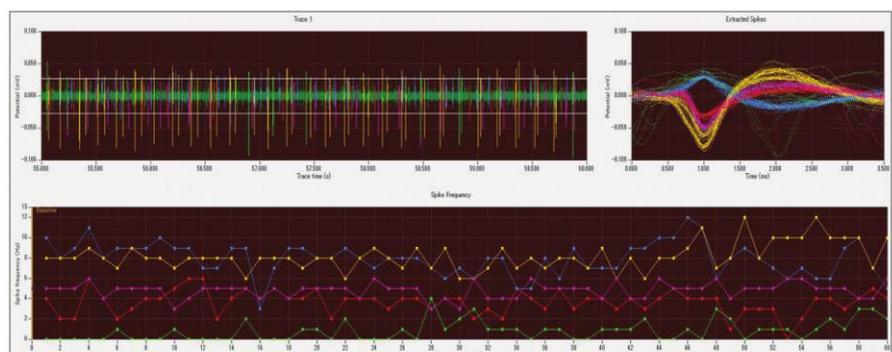
Mobius EP

- Evoked field potentials (e.g., fEPSPs) through electrical stimulation
- Waveform analysis (e.g., amplitude, slope, area, timing)
- Time-series plotting of analysis results online and offline
- Complex stimulation patterns (e.g., theta-burst stimulation)



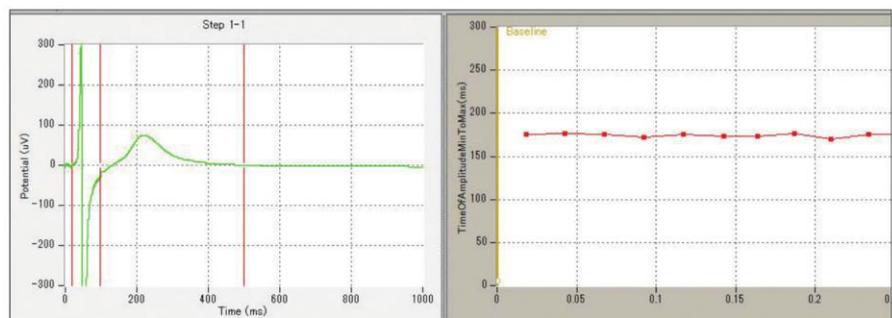
Mobius Spike Sorter

- Detects spikes as signals exceeding user-specified amplitude thresholds
- Methods to specify amplitude thresholds:
 - 1) Mouse operation on 64-electrode or single-electrode charts
 - 2) Direct numerical input
 - 3) Automatic calculation based on RMS noise
- Spike sorting using an algorithm that classifies based on waveform similarity
- Spike frequency calculation and display as time-series plots



Mobius QT

- Detects cardiomyocyte field potentials for each beat exceeding user-specified amplitude thresholds
- Calculates FPD (field potential duration), beat rate, and inter-beat intervals, with a time-series plot display



MEA SYMPHONY

MEA Symphony is the most sophisticated acquisition and analysis software dedicated to MED64-Presto, featuring MEA experiment in both neuron and cardiomyocyte cell culture.

Visualizing raw data as its collected will allow for quick identification of interesting or anomalous data.

With a number of automated data collection and analysis features, it is intuitive and easy-to-use.

The MEA Symphony has a number of high-level analyses to choose from so data analysis is in the experimenter's hands, where it belongs!



Neuro workflow has sophisticated spike, burst, and network burst analyses. Automated drug dose-response analysis makes compound testing assays effortless.

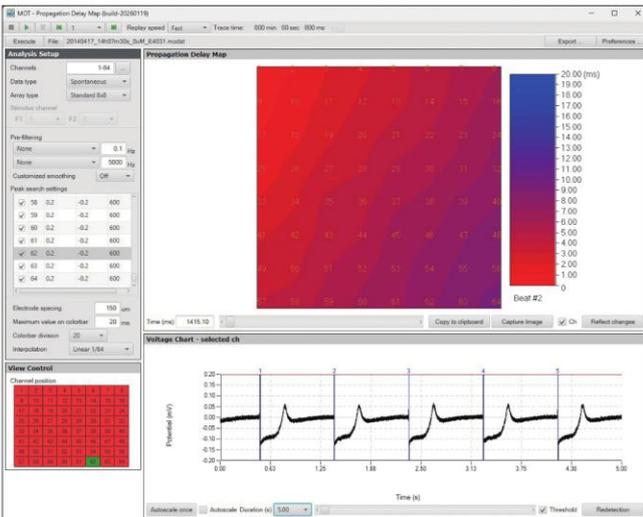


Cardio workflow has sophisticated beat rate and FPD analyses as well as automated compound and drug dose-response analyses.

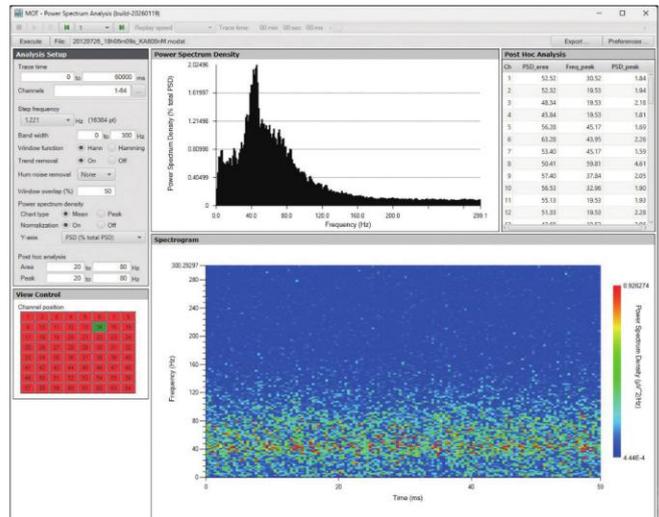
MED64 OFFLINE TOOLKIT

MED64 Offline Toolkit is an offline analysis platform consisting of more than 15 independent programs.

Compatible with the data formats of Mobius and MED16 II (MED64-Entry II control software), it allows previously acquired data files to be loaded offline and provides a more detailed and advanced analysis environment.



Propagation Delay Map
Propagation Delay Map creates excitation propagation maps for planar cultured cardiomyocyte preparations.



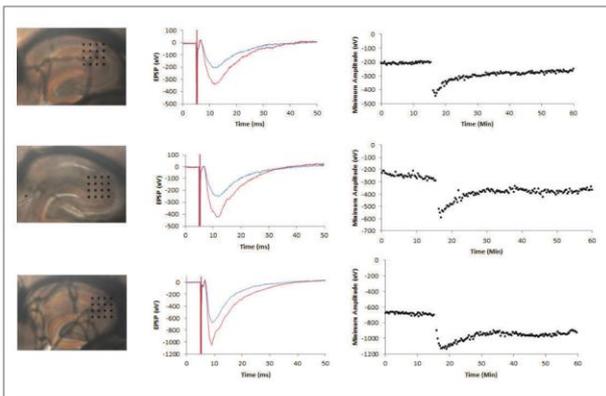
Power Spectrum
Power Spectrum Analysis performs frequency-domain analysis of oscillatory discharges in hippocampal slice preparations.

Examples of Applications & Sample Types

The MED64 system supports advanced applications with high sensitivity and reliability

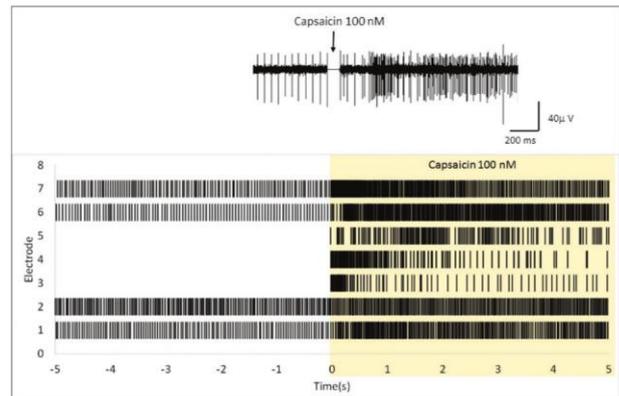
The MED64 system offers exceptionally high sensitivity, providing excellent data quality without the need for digital filtering. It can accurately capture subtle electrical activity that would be lost in typical commercial systems. It delivers highly reliable measurements with superior reproducibility using a purpose-designed system.

LTP studies



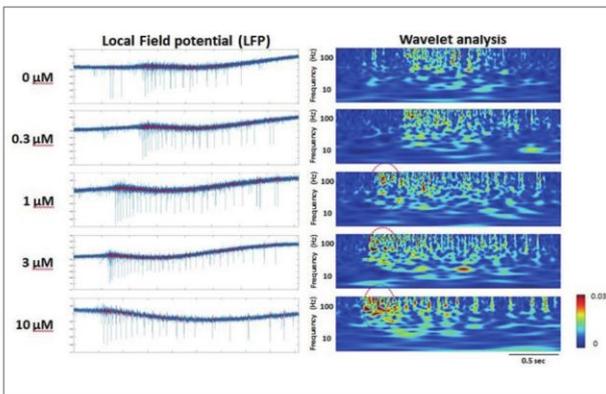
Simultaneous LTP recording from four hippocampal slice preparations using MED64-Quad II

Pain research



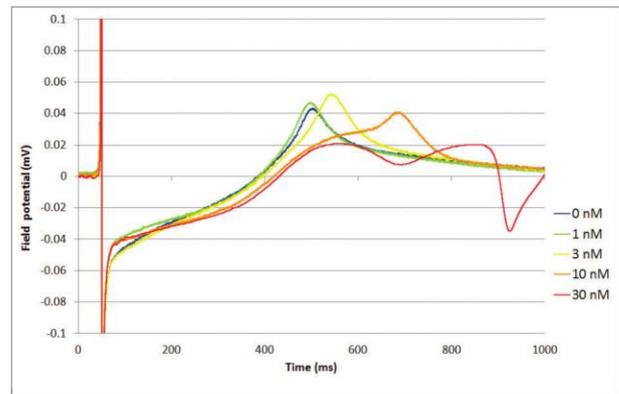
Capsaicin-induced responses in dissociated DRG (dorsal root ganglion) cultures

Neurotoxicity research

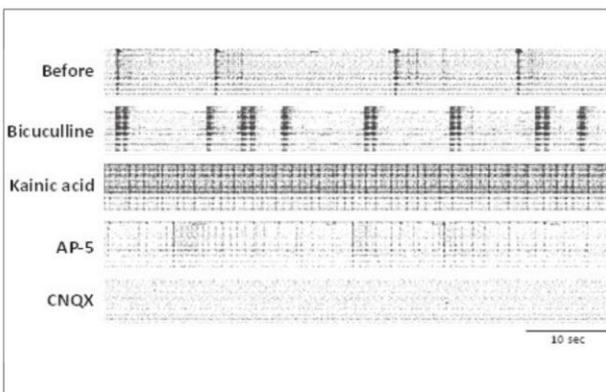


LFP (local field potential) and wavelet analysis

Prediction of drug-induced proarrhythmic effects



Evaluation of FPD (field potential duration) prolongation



Raster plot display of burst firing in cultured neuronal networks

Representative applications

- EP measurement and LTP/LTD assays in brain slice preparations
- Oscillation (rhythmic activity) measurement in brain slice preparations
- Spontaneous activity measurement in cultured neuronal networks or brain organoids
- FPD assays in cardiomyocyte preparations for proarrhythmic evaluation
- Measurement of light-evoked responses in the retina
- Measurement of pacemaker-like potentials in intestinal smooth muscle
- Measurement of glucose-stimulated responses in pancreatic islets/ β -cells

MED Probe / MEA Plate

Substrate/Chamber	Substrate	Glass, T = 0.7 mm		
	Conductioning layer	Indium tin oxide (ITO), T = 0.15 μm		
	Insulation layer	Polyimide (or Acrylic)		
	Substrate size	MED Probe	50 \times 50 mm	
		MED Mini Probe	30 \times 40 mm	
		MED Multi-well Probe	100 \times 35 mm	
MEA Plate		105 \times 140 mm		
Chamber	Glass (OD: 25 / ID: 22 mm) Acrylic resin (for MED Multi-well Probe and MEA Plate)			
Electrodes	Material	CNT	Platinum black	
	Product number	MED-R****	MED-P****	
		MED-RG****	MED-PG****	
		MED-Q****	—	
	Impedance at 1 kHz, 50 mV	\square 50 μm	8 k Ω (Typ.)	10 k Ω (Typ.)
		\square 20 / ϕ 20 μm	10 k Ω (Typ.)	15 k Ω (Typ.)
	Max. output	Current	\pm 200 μA	\pm 200 μA
Voltage		\pm 0.5 V	\pm 0.1 V	



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