![Molecular Devices logo]

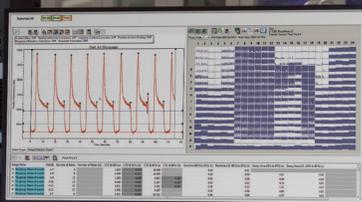# FLIPR® Penta

High-Throughput Cellular Screening System

High-throughput kinetic screening for lead compound identification and compound safety assessment

Real-time screening of iPSC-derived cardiomyocytes or neurons, GPCRs, and ion channels

Building on the success of the industry-leading FLIPR platform for monitoring of GPCRs and ion channels, the FLIPR High-Throughput Cellular Screening System offers a new high-speed camera option and the new Peak Pro 2 software module, allowing you to measure and analyze patterns of calcium oscillations of human iPSC-derived cardiomyocytes and neurons. Images can be taken at up to 100 times per second and patterns quickly analyzed using more than 30 various measurements.

Available with a range of pipettors, optics, and automation options, the system can be configured based on library size, detection mode, screening format, assay, and target, making the transition from assay development to lead optimization a seamless process.

Key benefits

- Assay adaptability with configurable optics

- Throughput flexibility with user-exchangeable 96-, 384-, and 1536-well pipettors

- Multi-user flexibility with intuitive software

- Future ready with FLIPR Cycler automation upgradeability

High-throughput early toxicity screening

New measures in the drug discovery world, such as the CiPA initiative, have placed added emphasis on early assessment of clinical potential. Calcium oscillation assays have been used for the evaluation of functional responses of different drugs and compounds, which has implications for compound efficacy and toxicity assessment. The instrument hardware flexibility and easy-to-use software interface of the FLIPR Penta system can help you navigate these paradigm shifts.

Key new highlights include:

- High speed, high sensitivity EMCCD camera for both fluorescent and luminescent detection
- Data acquisition of up to 100 Hz
- Peak Pro 2 analysis module with easy oscillation anomaly detection
- Over 30 peak measurement options
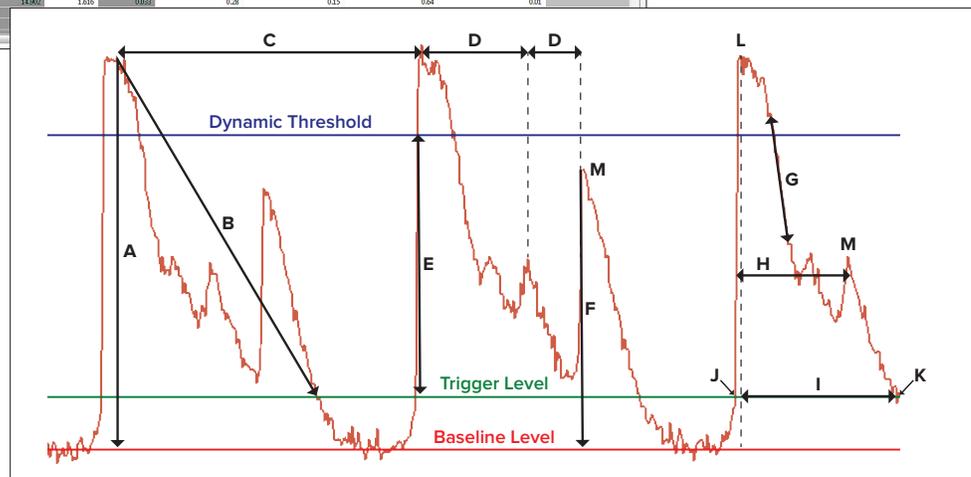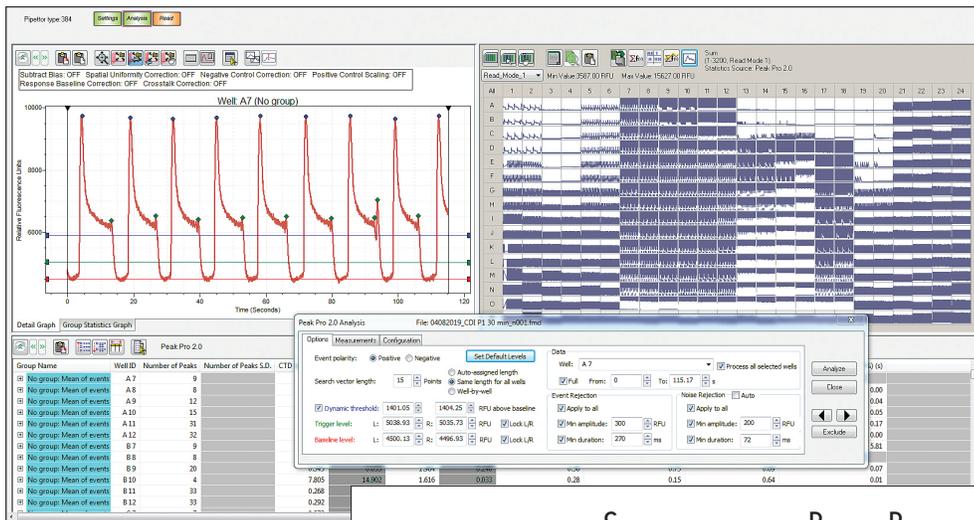
A	Main peak amplitude	G	Decay slope
B	Linear decay slope	H	Calcium-transient duration (CTD)
C	Main peak interval used to calculate the peak rate (in PpM)	I	Calcium transient duration from peak position (CTDP90)
D	Early afterdepolarization-like event (EAD-like) intervals used to calculate the EAD-like event (PpM)	J	Start of an event
		K	End of an event
E	Rise slope	L	Main peak
F	EAD-like event amplitude	M	Early afterdepolarization-like event (EAD-like)

Exclusive, configurable optics

Increase assay flexibility

The FLIPR Penta system is available with a new high-speed HS-EMCCD camera that captures up to 100 images per second and offers exceptional luminescence performance.

Choose your LEDs and filters at the time of purchase or upgrade later when your assay needs change. The FLIPR Penta system gives you options.

LED excitation banks

emission filter

CCD Camera

LED excitation banks
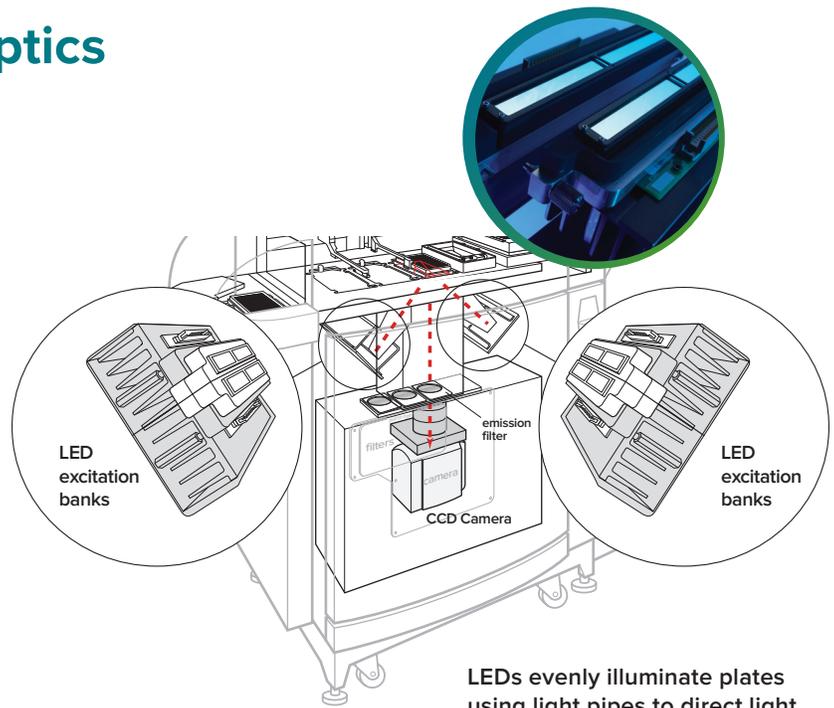
LEDs evenly illuminate plates using light pipes to direct light onto the bottom of the plate.

User-exchangeable 96-, 384-, and 1536-well pipettors
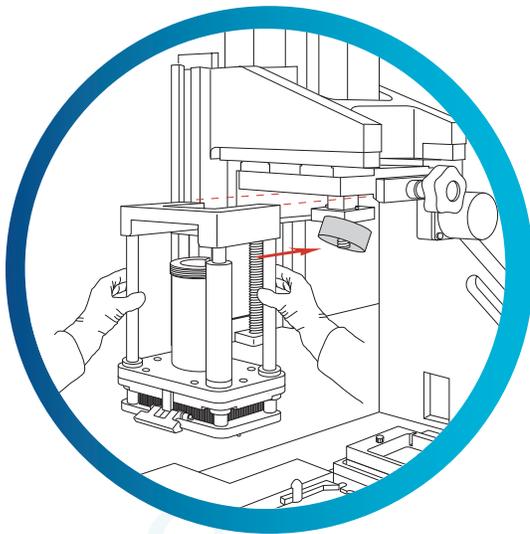
User-exchangeable pipettors are installed in minutes without tools. Pipetting accuracy and precision are assured with automatic pipettor identification and alignment.

Rapidly adjust throughput

User-exchangeable pipettor heads—available in 96-, 384-, 1536-well formats, as well as pin tools in 384 and 1536 formats—allow for the adjustment of screening rates based on throughput, material consumption, and assay requirements. The pipettor heads have a proven track record, with the 1536 pipettor utilizing the elastomeric positive displacement technology. Regardless of the format used, each pipettor can be exchanged by a system operator in minutes and can pipette reagents, compounds, or cells.

Intuitive, user-friendly software interface

Customize protocols and data processing

The FLIPR Penta system utilizes our ScreenWorks® software to define and run experimental protocols.

Using a drag-and-drop interface, protocols can be easily set up to include:

- Fluorescent or luminescent read modes
- Complex quadrant, multiple aspirations or multiple dispensing liquid handling
- Single or ratiometric kinetic cell-based reading
- Tip washing with up to two solvents
- Simple-to-create automation protocols
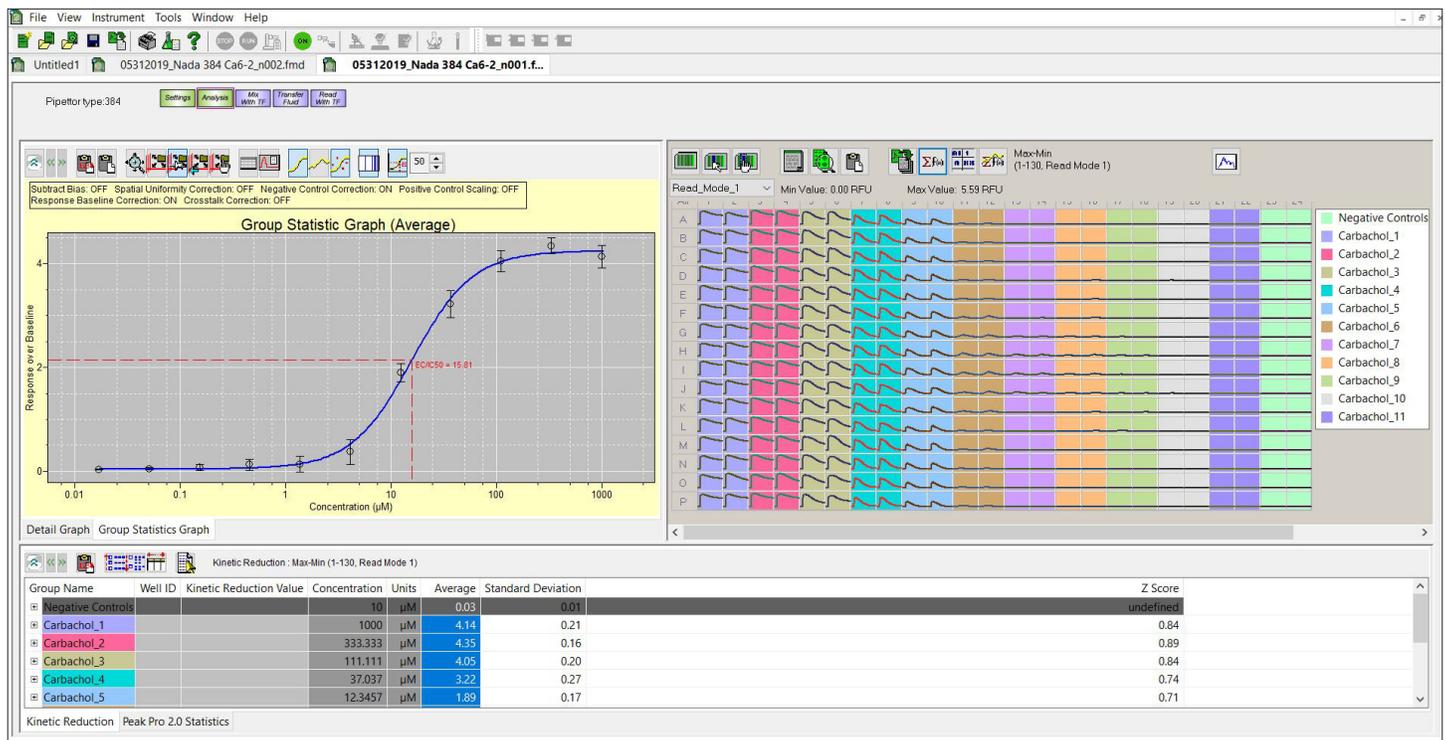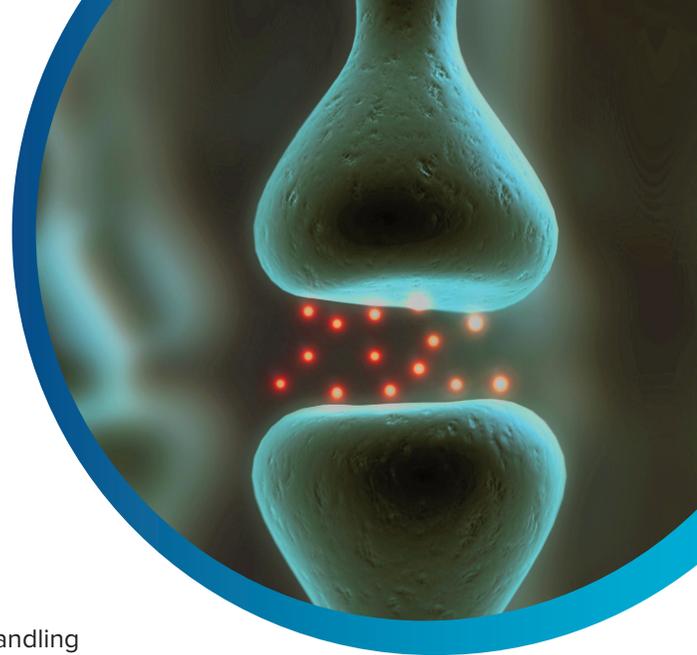
ScreenWorks software is both flexible and user friendly. During protocol setup, only relevant options are displayed, based on the installed fluidics and optics hardware, making it easy to choose parameters that are right for each assay. Live and information-rich data in 96-, 384- or 1536-well plate format is displayed while testing. Specific wells can be grouped for analysis or data export purposes. Graphs and tables can be easily copied and pasted into documents, presentations or worksheets, and different reductions can be selected for group statistics, making results readily accessible.

FLIPR Cycler internal plate handler

Accelerate throughput

FLIPR Cycler, the optional internal plate handler on the FLIPR Penta system, exchanges microplates between the system plate stage and an external third-party plate handler. FLIPR Cycler minimizes downtime between experiments, thus increasing throughput, by exchanging plates and tips while the experiment is in process.

The FLIPR Cycler features:

- Ability to exchange one read plate and up to 12 source plates and tips during one experiment
- Ability to run 20 read plates in one hour, including a two-minute read time and exchange of one source plate and tip rack
- Compatibility with low-profile plates using FLIPR Cycler gripper
- Elevated instrument intelligence creates an efficient interface between the FLIPR Penta system and the external plate handler

inner shuttle door

plate landing pad

outer shuttle door
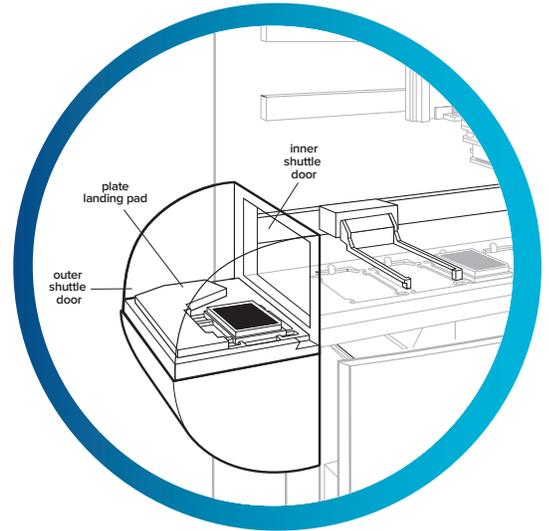
FLIPR Cycler moves plates through a light-tight door during experiments, reducing downtime.

The **FLIPR Penta system** is just one example of innovative, high-performance products that significantly enhances research productivity and effectiveness. Designed expressly to meet the needs of research professionals in **drug discovery** and other **advanced research**, it delivers the industry-leading capabilities required for accelerating time to market for new products.

FLIPR Penta system specifications

Target assay application	Ex LED (nm)	Em filter (nm)	Em (nm)
Calcium and potassium	470–495	515–575	
Membrane potential	510–545	565–625	
Fura-2 a	335–345	475–535	
Fura-2 b	380–390	475–535	
Voltage sensor probes	390–420	440–480	565–625
MQAE	360–380	400–460	
CFP	420–455	475–535	
Alexa 633 & Bodipy	610–626	646–706	
Ratiometrics	Up to 4 EX/EM pairs per experiment		
Data acquisition rate for ratiometric emission	1 Hz 2 EX/EM pairs		

• Instrument holds two pairs of LEDS, one for each side to cross illuminate the bottom of the plate

• Instrument has a 3-position filter slider that identifies the filter to the instrument

• Custom filter holders are available

Ordering Information

FLIPR Penta Base System	Part number
• Heated stage • Calcium optics kit • Computer with Windows 10 • 1-year warranty (after installation)	FLIPR PENTA

Cameras

HS-EMCCD	5073652

Pipettor Heads

96-well Pipettor Head Kit	0200-6071
384-well Pipettor Head Kit	0200-6072
1536-well Pipettor Head Kit	0200-6073
384- and 1536-well Pin Tool Heads	Custom configurations

Optics*	Part number
Calcium Optics Kit	0200-6206
Fura-2 Optics Kit	0200-6271
Membrane Potential Optics Kit	0200-6207
Voltage Sensor Probes Optics Kit	0200-6207

Other Options

FLIPR Cycler	5074364
96-well Pipette Tips, Clear (50 racks/case)	9000-0761
96-well Pipette Tips, Black (50 racks/case)	9000-0762
384-well Pipette Tips, Clear (50 racks/case)	9000-0763
384-well Pipette Tips, Black (50 racks/case)	9000-0764
FLIPR Penta 1536 Tip Block	0200-6112
FLIPR Penta 1536 Tip Gasket (40 gaskets/case)	9000-0746

* For additional excitation and emission optics, contact the Molecular Devices® Customer Service department.

Consumables
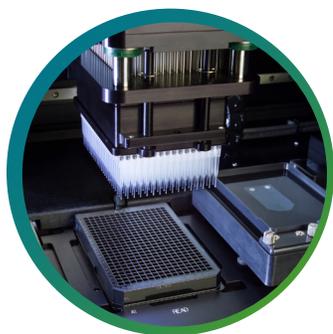
For more information about the FLIPR Penta system, reagent kits, and accessories, contact your Molecular Devices representative or visit our website at www.moleculardevices.com.

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