Medical–Biological
Research & Technologies

HiPo MPP-96
Microplate photometer

User instructions

Contents

1. About this edition of user instructions

The current edition of the user instructions applies to the following models and versions of Microplate photometer:

- **HiPo MPP-96** .... versions V.1AW, V.1WW
- **QuantAssay** ....version 0.6.9.8 and newer

2. Safety precautions

Caution! Make sure you have fully read and understood the present Manual before using the equipment. Please pay special attention to sections marked by this symbol.

GENERAL SAFETY

- The protection provided can be ineffective if the operation of the appliance does not comply with the manufacturer's requirements.
- Save the unit from shocks and falling.
- Do not use the unit if it has visible mechanical damage.
- Store and transport the unit at ambient temperatures between -20°C and +60°C and maximum relative humidity of 80%.
- After transportation or storage and before connecting it to the electric circuit, keep the unit under room temperature for 2-3 hrs.
- Before using any cleaning or decontamination methods except those recommended by the manufacturer, check with the manufacturer that the proposed method will not damage the equipment.
- Do not make modifications in design of the unit.
- Do not place the optic parts under direct light.

ELECTRICAL SAFETY

- Connect only to the mains with voltage corresponding to that on the serial number label.
- Do not plug the unit into an ungrounded power socket, and do not use an ungrounded extension lead.
- Ensure that the power plug is easily accessible during use.
- Disconnect the unit from the mains before moving.
- This equipment is connected and controlled by PC. Please ensure that the attached PC itself conforms to safety and EMC standards.
- If liquid penetrates into the unit, disconnect it from the mains and have it checked by a repair and maintenance technician.
- Do not operate the unit in premises where condensation can form. Operating conditions of the unit are defined in the **Specifications** section.

DURING OPERATION

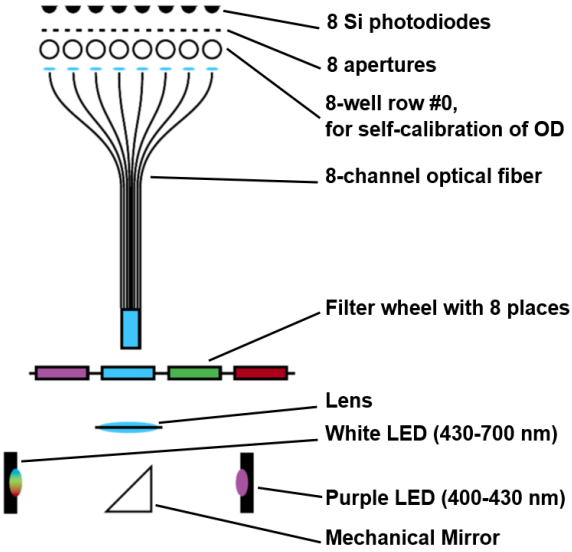
- Do not operate the unit in environments with aggressive or explosive chemical mixtures. Please contact manufacturer for possible operation of the unit in specific atmospheres.
- Do not operate the unit if it is faulty or has been installed incorrectly.
- Do not use outside laboratory rooms.

BIOLOGICAL SAFETY

- The user is responsible to carry out appropriate decontamination if hazardous material spills on or penetrates into the equipment.
- The user is responsible for decontamination of the unit before its decommissioning and utilization.

3. General information

Microplate Photometer **HiPo MPP-96** is a compact tabletop device for analysing the results of ELISA and microbiological studies by measuring optical density in 96-well microplates. Instrument is controlled by and outputs data to computer.



Scheme 1. Optical scheme of the unit

HiPo MPP-96 is supplied with analysis software QuantAssay. Software performs a single scanning with option of a second scanning on reference channel available. When using QuantAssay, it is possible to program the analysis of the following assays:

- Quantitative assays: the ability to install up 20 standards and choose fit model from 5/4 parameter logistic, linear and piecewise linear models.
- BestFit function for the selection of the best calibration curve.
- Multiplex analysis - up to 7 different tests on the same plate.
- Qualitative assays: the ability to install up to 8 types of controls (weak positive, strong positive, negative, etc.).
- Avidity / affinity assay.
- Save, load and export results.
- Create visual reports.

Together with standard light filters (with wavelengths of 405, 450, 492, 620 nm), it is possible to order light filters in the range from 400 to 700 nm, installed by manufacturer. See the list on page 11 in the **Specifications** section.

HiPo MPP-96 is factory calibrated using certified verification plate. Certificate of verification is included with the unit.

4. Getting started

4.1. **Unpacking.** Remove packing materials carefully and retain them for future shipment or storage of the unit. Examine the unit carefully for any damage incurred during transit. The warranty does not cover in-transit damage. Warranty covers only the units transported in the original package.

4.2. **Complete set.** Package contents:

4.2.1. Standard set:

- **HiPo MPP-96**, Microplate photometer..... 1 pce.
- USB flash drive with software and operating manual..... 1 pce.
- USB connector cable ..... 1 pce.
- External power supply ..... 1 pce.
- Certificate of verification..... 1 copy
- Operating instructions, declaration of conformity ..... 1 copy

4.2.2. Optional accessories:

- Light filters (custom, 400-700 nm) .....on request
- Verification microplate set .....on request

Verification microplate set

4.3. **Setup**.

- Connect the external power supply unit into the socket at the rear side of the unit and position the unit for an easy access to the external power supply and the power switch.
- Place the unit on horizontal even working surface.
- Insert the USB flash drive with software and install the QuantAssay software, following the instructions provided in the software installation and operation manual.

4.4. **Custom light filters**. If you are using custom filters, fill in the following table. The manuals and software reference channels with custom filters as Channels from 1 to 4.

Channel	Wavelength, nm
Channel 1	
Channel 2	

Channel	Wavelength, nm
Channel 3	
Channel 4	

5. Operation

5.1. Connect the external power supply to the mains. Switch the **Power** switch on the rear panel of the unit to position **I** (on, fig. 2/1). The **Power** LED light (fig. 1/3) turns on.

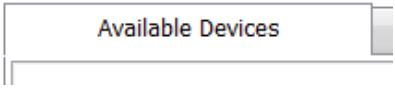
5.2. Connect the unit port (fig. 2/2) and the PC port with the USB cable. Turn on the PC. The **PC** LED light (fig. 1/1) turns on.

5.3. Lift the lid and place the microplate on the sliding platform.

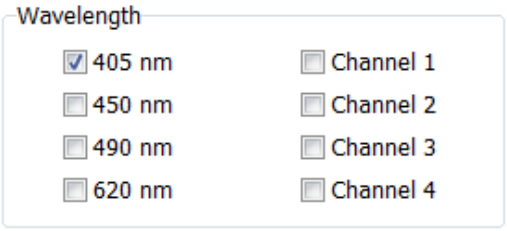
Note. Measurements can be affected by uneven or heterogeneous well contents. Visually inspect the plate for foaming, opaqueness, bubbles or particles in the well

5.4. **Starting the measurement**.

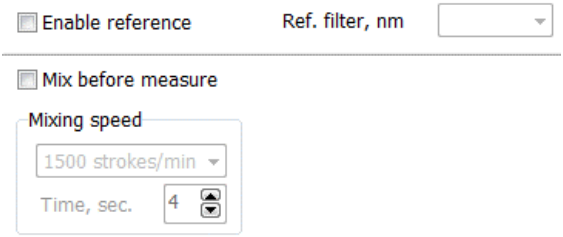
5.5. Launch the software on the PC. Navigate to the **Available units** tab.



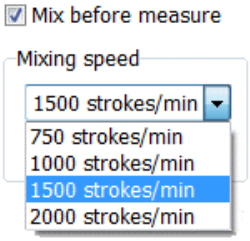
5.6. Select the wavelengths required for measurements.



5.7. Optionally: choose a reference channel and an option to shake before measurement.



Four mixing speeds are available; mixing time can be set between 3 and 15 seconds.



5.8. Press **Start** button. The **Measurement** LED light (fig. 1/2) turns on.

Attention! Do not open the lid during measurements!

5.9. **Measurement processing.** After an 8-second measurement, the software automatically opens the **Input data** tab that displays all measurement results.

	1	2	3	4	5	6	7	8	9	10	11	12
A	0.001	0.001	0.001	0.002	0.002	0.002	0.002	0.002	0.003	0.003	0.003	0.003
B	0.000	0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.003	0.003	0.003	0.003
C	0.001	0.001	0.002	0.001	0.001	0.002	0.002	0.001	0.002	0.002	0.002	0.002
D	0.001	0.001	0.002	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003
E	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.003	0.003	0.003	0.003	0.003
F	0.000	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.002	0.002	0.002	0.002
G	0.001	0.001	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002
H	0.001	0.001	0.002	0.002	0.003	0.003	0.003	0.003	0.003	0.004	0.004	0.004

5.10. **Data export.** To export data in PDF, XLS or CSV formats, press the corresponding button.

5.11. To save the data in Quant Assay file format, press **Save** button.

5.12. To export the data in the microplate format, press **XLS 96 well** button.

5.13. After completing the measurements, remove the microplate. Open the lid. Lift the nearest end of the microplate and slide it out of the unit. Close the lid.

Attention! Do not leave the microplate in the unit!

5.14. After finishing the operation switch the **Power** switch to position **O** (off, fig. 2/1). Remove the external power supply from the unit.

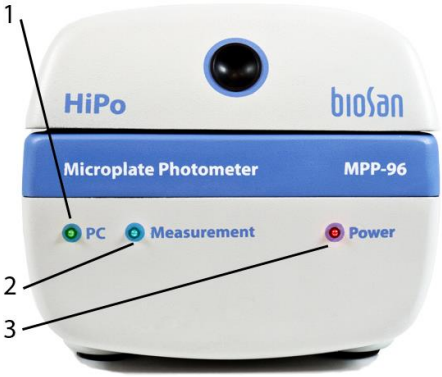


Figure 1. Front view

Figure 2. Rear panel

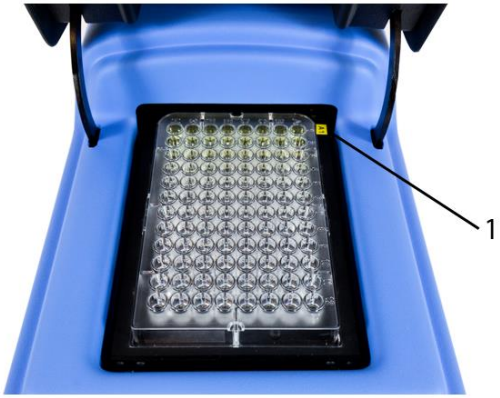


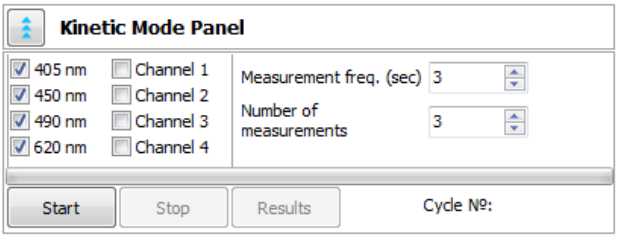
Figure 3. Correct microplate placement

6. Unit verification

6.1. **Checking the calibration.** If the user have any doubts in measuring precision, he may perform a basic control check as follows:

6.2. Remove microplate and close the lid.

6.3. In the software, open **Kinetic mode panel** and select all available channels (including additional, if they have filter installed) and also measurement frequency and number, as shown on the picture below.



6.4. Press **Start** button to launch the measuring. After finishing, press **Results** button to view results. These should be between -0.003 and 0.005.

Save to XLS

450 nm | 620 nm

Measurements | Statistics

	1	2	3	4	5	6	7	8	9	10	11	12
A	0.0004	0.0006	0.0009	0.0008	0.0011	0.0007	0.0010	0.0020	0.0022	0.0020	0.0034	0.0037
B	0.0001	0.0001	0.0001	0.0001	0.0006	0.0001	0.0007	0.0003	0.0002	0.0001	0.0001	0.0001
C	0.0003	0.0004	0.0002	0.0003	0.0001	0.0004	0.0008	0.0001	0.0001	0.0001	0.0005	0.0005
D	0.0003	0.0011	0.0013	0.0014	0.0011	0.0011	0.0014	0.0014	0.0018	0.0017	0.0022	0.0021
E	0.0010	0.0005	0.0011	0.0004	0.0004	0.0001	0.0004	0.0003	0.0005	0.0001	0.0004	0.0001
F	0.0002	0.0002	0.0001	0.0002	0.0004	0.0001	0.0004	0.0005	0.0005	0.0005	0.0006	0.0001
G	0.0003	0.0006	0.0008	0.0006	0.0009	0.0004	0.0009	0.0008	0.0008	0.0009	0.0011	0.0007
H	0.0009	0.0011	0.0011	0.0008	0.0009	0.0007	0.0014	0.0011	0.0009	0.0012	0.0014	0.0016
	1	2	3	4	5	6	7	8	9	10	11	12
A	0.0004	0.0003	0.0008	0.0002	0.0006	0.0003	0.0007	0.0008	0.0010	0.0010	0.0007	0.0010
B	0.0004	0.0006	0.0009	0.0002	0.0009	0.0003	0.0009	0.0006	0.0008	0.0014	0.0009	0.0008
C	0.0006	0.0012	0.0009	0.0013	0.0009	0.0005	0.0008	0.0009	0.0007	0.0010	0.0009	0.0008

6.5. **Using the verification microplate**. Please consult the OD plate manual on the USB flash drive that comes in the verification microplate set, section **Perform a Verification Test with OD Plate Verification Software**.

7. Specifications

The unit is designed for operation in cold rooms and closed laboratory rooms at ambient temperature from +4°C to +40°C in a non-condensing atmosphere and maximum relative humidity 80% for temperatures up to 31°C decreasing linearly to 50% relative humidity at 40°C.

Biosan is committed to a continuous programme of improvement and reserves the right to alter design and specifications of the equipment without additional notice.

7.1.	Detection mode	light absorbance
7.2.	Light source	LED, self-calibrating
7.3.	Photodetector	8 silicon photodiodes
7.4.	Microplate requirements	ANSI/SLAS compliant 96-well (see Table 1)
		MicroWell™ MaxiSorp™, flat-bottomed, transparent polystyrene
7.5.	Reading time, not more	5 s per wavelength
7.6.	Measuring modes	endpoint, kinetic, multi-label measurements
7.7.	Measurement channels	8
7.8.	Reference channel	1
7.9.	Optical density measurement range	0 - 4.3 OD
7.10.	Resolution	0.0001 OD
7.11.	Accuracy (at 405, 450, 492, 620 nm)	
	0.000 – 2.000 OD	≤ (0.5 % + 0.010 OD)
	2.000 – 3.000 OD	≤ (1 % + 0.010 OD)
7.12.	Precision / reproducibility (at 405, 450, 492, 620 nm)	
	0.000 – 2.000 OD	≤ (0.5 % + 0.005 OD)
	2.000 – 3.000 OD	≤ (1.0 % + 0.005 OD)
7.13.	Linearity	
	0.000 – 2.000 OD	≤ 1.0 %
	2.000 – 3.000 OD	≤ 1.5 %
7.14.	Filter optical range	400–700 nm
7.15.	Wavelength selection	4 standard filters, space for up to 4 more
7.16.	Standard filters	405, 450, 492 and 620 nm
7.17.	Linear shaking	4 amplitudes, 4 speeds
7.18.	Linear shaking time setting	3–15 s
7.19.	Software	**QuantAssay**
7.20.	PC requirements	Intel/AMD processor, 1 GB RAM, Windows Vista/7/8/10/11
7.21.	PC connectivity	USB
7.22.	Dimensions (WxDxH)	140x300x130 mm
7.23.	Operating voltage and current	12 V=, 5 A
7.24.	Power consumption	60 W
7.25.	External power supply	input 100–240 V~, 50/60 Hz, output 12 V=
7.26.	Weight[1]	4.6 kg

[1] Accurate within ±10%

Up to four bandpass filters of wavelengths other than the standard can be fitted in the unit per request. Following wavelengths are available (see LEDs' spectral power specification on figure 4):

- 400 nm, 455 nm, 458 nm, 460 nm, 470 nm, 480 nm, 486 nm, 488 nm;
- 500 nm, 508 nm, 510 nm, 515 nm, 520 nm, 532 nm, 535 nm, 540 nm, 546 nm, 550 nm, 560 nm, 568 nm, 580 nm, 589 nm, 594 nm;
- 600 nm, 610 nm, 632 nm, 636 nm, 640 nm, 647 nm, 650 nm, 656 nm, 660 nm, 671 nm, 676 nm, 680 nm, 685 nm, 690 nm, 694 nm.

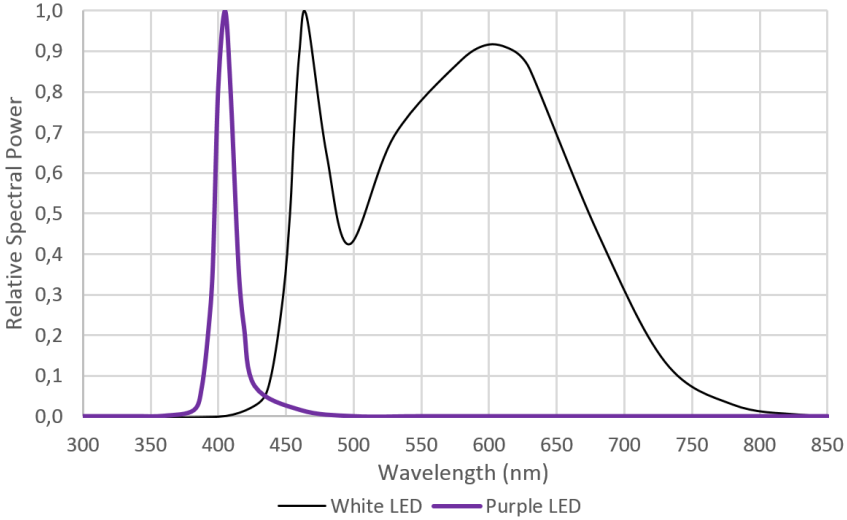


Figure 4. Relative spectral power in relation to wavelength for photodiodes (white and purple led maximum spectral power are not equal)

Table 1. 96-well plate dimensions

96-well plate	Dimension (mm)
Plate height	14,35
Plate length	85,48
Plate width	127,76
First well position X	14,38
First well location Y	11,24
Corner distance X	99
Corner distance Y	63

Optional accessories	Description	Catalogue number
Verification microplate	Microplate for annual verification of the unit	BS-050108-AK
Custom light filter	Up to four custom filters in the unit	–

8. Care and maintenance

8.1. If the unit requires maintenance, disconnect the unit from the mains and contact Biosan or your local Biosan representative.

8.2. All maintenance and repair operations must be performed only by qualified and specially trained personnel.

8.3. **Cleaning and decontamination**.

8.3.1. Standard ethanol (75%) or other cleaning agents recommended for cleaning of laboratory equipment can be used for external cleaning of the unit.

8.3.2. Do not use liquids to clean optical parts. Use air from rubber siphon to blow away any particles.

9. Warranty

9.1. The Manufacturer guarantees the compliance of the unit with the requirements of Specifications, provided the Customer follows the operation, storage and transportation instructions.

9.2. The warranted service life of the unit from the date of its delivery to the Customer is 24 months. For extended warranty, see **9.5**.

9.3. Warranty covers only the units transported in the original package.

9.4. If any manufacturing defects are discovered by the Customer, an unsatisfactory equipment report shall be compiled, certified and sent to the local distributor address. To obtain the claim form, visit **Technical support** page on our website at link below.

9.5. Extended warranty. For **HiPo MPP-96**, the *Smart* class model, extended warranty is a paid service. Contact your local Biosan representative or our service department through the **Technical support** section on our website at the link below.

9.6. Description of the classes of our products is available in the **Product class description** section on our website at the link below.

Technical support

biosan.lv/en/support

Product class description

biosan.lv/classes-en

9.7. The following information will be required in the event that warranty or post-warranty service comes necessary. Complete the table below and retain for your records.

Model	Serial number	Date of sale
HiPo MPP-96		

10. EU Declaration of conformity

EU Declaration of Conformity

Unit type	Microplate photometer
Models	**HiPo MPP-96**
Serial number	14 digits styled XXXXXXYYMMZZZZ, where XXXXXX is model code, YY and MM – year and month of production, ZZZZ – unit number.
Manufacturer	SIA BIOSAN Latvia, LV-1067, Riga, Ratsupites 7 k-2

The objects of the declaration described above is in conformity with the following relevant Union harmonization legislations:

LVD 2014/35/EU	**LVS EN 61010-1:2011** Safety requirements for electrical equipment for measurement, control, and laboratory use. General requirements.
EMC 2014/30/EU	**LVS EN 61326-1:2013** Electrical equipment for measurement, control and laboratory use. EMC requirements. General requirements.
RoHS3 2015/863/EU	Directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment.
WEEE 2012/19/EU	Directive on waste electrical and electronic equipment

I declare that the Declaration of Conformity is issued under sole responsibility of the manufacturer and belongs to the above-mentioned objects of the declaration.

Svetlana Bankovska
Managing director

Signature

07.02.2020.

Date

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