NanoPhotometer®

NanoVolume and Cuvette Spectroscopy

IMPLEN – A Global Acting Company

History

Founded in 2003, Implen has become a leading supplier for innovative spectroscopy instruments and consumables for the non-destructive analysis of ultra-low volume liquid samples. The success story began with the introduction of the first NanoPhotometer® generation in 2006. Since then Implen has been providing best in class products, offering unmatched performance to its users and supporting workflows in modern research. Today the most prestigious biological, chemical and pharmaceutical companies as well as research organizations around the globe rely on Implen products. The NanoPhotometer® has become the most innovative line of microvolume UV/Vis spectrophotometers – cited in thousands of scientific publications worldwide.

Products & Services

Using patented technologies our products serve the demand for accurate and cost effective analysis for a wide range of liquid samples and mobile applications. The compact designed products captivate by ease of use and proven reliability. Implen's NanoPhotometer® products are a forerunner in modern data communication and instrument control and provide flexibility to its user which has never been available before. From our locations in Munich, Germany, Westlake Village, California and our Sales and Support Office in Beijing, China we provide outstanding service to customers to answer technical questions and provide application support.

Core Values

We listen to our customers and design innovative products that provide the highest benefit to our users. Implen's highly qualified associates are our most valued asset. As a team, we push ourselves creatively to foster innovative products, services, and processes. Continuous improvement is our way of life. We constantly measure how well we execute and define appropriate measures to do even better to achieve outstanding customer satisfaction.

Martin Sahiri & Dr. Thomas Sahiri

Technology Made in Germany

Reliability

Designed by German engineers, our NanoPhotometer® products will exceed your expectations with regards to ease of use, functionality, robustness and reliability over the product lifetime.

Implen GmbH

ISO 9001:2015

Quality First. Always.

We are highly demanding towards the quality of our products and services. Quality targets are implemented during the early product design phase; achieving them is verified throughout the entire development process. Manufactured, at our location in Munich, Germany, every NanoPhotometer® is fully tested before being sent out to customers.

Implen's Quality Management System is ISO 9001:2015 certified. The NanoPhotometer® complies with IEC 61010-1, safety requirements for electrical equipment for measurement, control, and laboratory use.

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NanoPhotometer® Family Features

Sample Compression Technology™
Uniquely contained sample environment avoids evaporation and the need for surface tension.

Vortex
Ensure homogeneous samples with built-in low vibration vortex.

Auto Sample
Starts sample measurement automatically once sample arm is closed.

Data Export/Saving
Data can be saved on the internal storage (File Server), network folder or USB flash drive.
REST API for LIMS integration.
64/128 GB onboard data storage.

Data Export/Printing
Print to AirPrint and HP Universal Driver compatible printers as well as DYMO label printers.

Endless Connectivity
Wi-Fi® HotSpot LAN
Built-in File Server for data access from Windows and Mac computers.

Certainty in Real Time
Impurity and air bubble recognition with Sample Control™ and Blank Control™

True Path Technology™
Optics providing exact path lengths with two fixed anchor points. No drift over lifetime.

Flexible Unit Control
Computer (Windows & Mac)
Built-in Touchscreen
Smartphone/Tablet (Android OS & iOS)

NP80
NanoVolume and Cuvette

N120
12 Channel NanoVolume

N60/N50
NanoVolume

C40
Cuvette

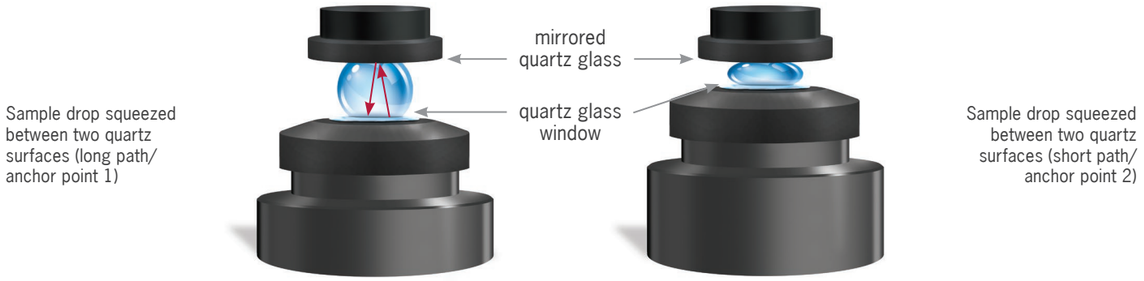
Battery Powered
Up to 8 hours battery operation.

IQ/OQ Documentation
Consists of a liquid and/or solid NIST traceable secondary standard depending on the configuration and specifications of the NanoPhotometer® model.

CFR21 Software
Optional 21 CFR Part 11 compliant software provides password protected user accounts, data integrity, electronic signatures and audit trail functionality.

Sample Compression Technology™ – Accuracy & Precision

The NanoPhotometer® uses Sample Compression Technology™ acting like a microscope slide and a coverslip to form a capillary film between two quartz surfaces with each sample, eliminating the need for surface tension. This allows for accurate readings of proteins and the ability to use organic solvents as well as detergent buffers. The NanoPhotometer® works with two precisely defined fixed path lengths to guarantee linearity over the full detection range of the instrument.



With each measurement, light from the xenon flash lamp travels through the sample from below; the light is reflected by a quartz mirror in the upper region of the measurement window. The light then travels back through the sample and lower quartz window (light path indicated by red arrows) to a detector. The actual distance between the two quartz surfaces is half of the path length as a result. The reduced distance between the surfaces allows for a reduced sample volume to be utilized; this also has an immensely positive influence on sample drop stability, especially for challenging samples like proteins or samples consisting of volatile solvents.

Enclosed Sample Environment

Samples are enclosed in a stable micro-environment during the entire measurement process. Evaporation and contamination of samples are reduced to a minimum. This feature allows for accurate measurement of samples eluted in volatile organic solvents.

Reliable Protein Measurements

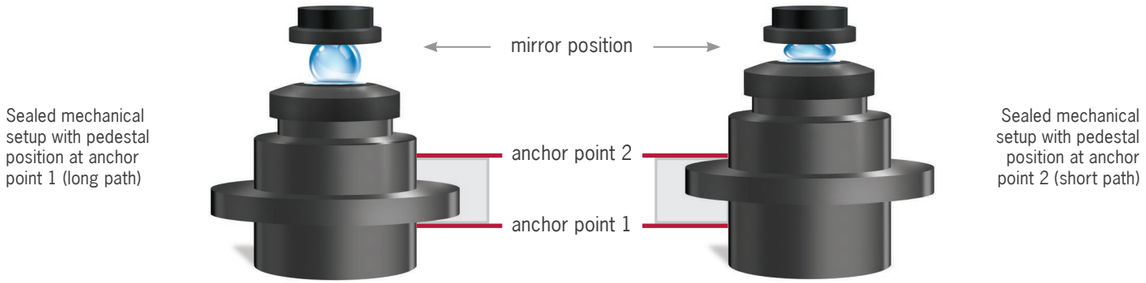
Reliable microvolume protein measurements are a challenge for most researchers due to a lack of surface tension and a complex matrix of components in the samples. Implen's Sample Compression Technology™ provides a reliable measurement geometry for such challenging samples. A capillary film is formed between two scratch-resistant and metal-free quartz surfaces with each sample eliminating the need for surface tension.

True Path Technology™ – Lifetime Accuracy Guaranteed

Simplicity is key for reliability. Implen's True Path Technology™ covers an extensive dynamic range with two precisely defined path lengths. The sealed mechanical setup provides two fixed anchor points that are immobile over the lifetime of the instrument. No recalibration is necessary. The unique quartz based, metal-free measurement environment is scratch-resistant and inert. It allows for the use of a wide range of solvents (aqueous and organic) as well as buffers with higher or lower pH values (a list of compatible solvents can be downloaded from www.implen.de/downloads).

Precise Path Length Setting

Implen's True Path Technology™ works with two accurate path lengths defined by fixed anchor points. To guarantee path length precision, the enclosed pedestal is engineered with high precision metal parts. Positioning of the pedestal at anchor point 1 correlates with the longer path length and anchor point 2 with the shorter path length setting (anchor points are indicated in red).



Movement between the two path lengths is controlled by a magnet. As this magnet can only position the pedestal at one of the two path lengths and cannot stop anywhere in between, path length drift is eliminated. The NanoPhotometer® is therefore recalibration-free over the lifetime of the instrument – Implen guarantees lifetime accuracy.

Automatic Path Length Setting

In the Nucleic Acid and Protein UV methods, the instrument automatically selects the appropriate path length for achieving optimal measurement results. Each sample is initially measured at the longer path length. Based upon the sample absorbance measured, the device determines if the sample is within the linear range of the path length. If the sample concentration is not within specification, the instrument measures the sample at the shorter path length. Path length must be chosen manually in all other applications.

NanoPhotometer® Model Comparison

Model	**N120** 12 Channel NanoVolume	**NP80** NanoVolume & Cuvette	**N60** NanoVolume	**N50** NanoVolume	**C40** Cuvette
Sample Number	1 – 12	1	1	1	1
Minimum Sample Volume	2 µl	0.3 µl	0.3 µl	0.3 µl	Depends on Cuvette
Full Spectrum Scan	200 – 900 nm	200 – 900 nm	200 – 900 nm	200 – 650 nm	200 – 900 nm
NanoVolume Detection Range	dsDNA: 2 – 8,000 ng/µl BSA: 0.06 – 230 mg/ml	dsDNA: 1 – 16,500 ng/µl BSA: 0.03 – 478 mg/ml	dsDNA: 1 – 16,500 ng/µl BSA: 0.03 – 478 mg/ml	dsDNA: 5 – 7,500 ng/µl BSA: 0.15 – 217 mg/ml	○
Cuvette Detection Range	N/A	dsDNA: 0.1 – 130 ng/µl BSA: 0.003 – 3.7 mg /ml	N/A	N/A	dsDNA: 0.1 – 130 ng/µl BSA: 0.003 – 3.7 mg/ml
Path Lengths	1 and 0.125 mm	0.67 and 0.07 mm	0.67 and 0.07 mm	0.67 and 0.07 mm	10, 5, 2, 1, 0.5 mm
Built-in Cuvette	○	●	○	○	●
Built-in Vortex	○	●	●	○	○
Built-in Battery Pack	Optional	Optional	Optional	○	Optional
IQ/OQ Package	Optional	Optional	Optional	○	Optional
CFR21 Software	Optional	Optional	Optional	○	Optional
Recalibration-Free	●	●	●	●	●

NanoPhotometer® N120

12 Channel NanoVolume

Fast High Throughput

With full scan capability range from 200 – 900 nm for rapid and complete sample analysis in as little as 1.7 seconds per sample, the NanoPhotometer® N120 record breaking design will exceed expectations. Measure 96 samples up to 100 times faster with 33% less operational steps required when compared to other scanning measurement methods such as most microplate readers. In addition to saving hands-on time with the one-step Auto Sample feature, you attain detailed information for each sample – including full high resolution scan results along with sample purity ratios.

Stand-Alone Operation

Save valuable bench space. An integrated computer with an Intel Celeron Processor and 128 GB of data storage eliminates the need for a dedicated external computer. The compact, all-in-one design including a 7" glove compatible touch display and a built-in battery pack significantly reduces the bench top footprint of the device. Multi sample spectroscopy can now be taken under a laminar flow hood/ clean bench, shared between labs or out into the field.

Easy Sample Application

The NanoPhotometer® N120 features our unique and proprietary 12 Point Technology™ which consists of several positioning guides for single and multi-channel pipettes. Patented illuminated sample windows and animated sample processing grid ensures convenient and error-free sample application. The design is compatible with various multi-channel pipettes and supports the user while positioning the tips on the sample windows.

Accurate

Patented Sample Compression Technology™ with guaranteed fixed path lengths allows for unmatched accuracy and precision. Independent from surface tension and free from evaporation. Lifetime accuracy guaranteed.

Consistent Results

Reliably analyze up to 12 samples per run over a wide concentration range (2 to 8,000 ng/µl for dsDNA). In comparison to other technologies, the NanoPhotometer® N120 provides trustworthy data for the accurate determination of 260/280 and 260/230 ratios. Blank Control™ and Sample Control™ monitor the entire measurement process and will highlight readings that are not within the expected purity range.

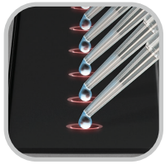
Easy

NPOS Operating System: intuitive graphical user interfaces providing one-step method access, pre-programmed and customizable applications based on the ultimate level of data security. Import and export of sample IDs from Excel files is available for fast and automated sample mapping.

Flexible

Control your NanoPhotometer® via touchscreen/tablet/ computer (see page 18). Equipped with Wi-Fi®, USB A/B, HDMI, and LAN interface connections. Define and store your own data and methods and retrieve them through the NanoPhotometer® Network Drive. Connection and control via LIMS is available as an option.

Performance Accelerated



Detection Range	Min	Max
dsDNA	2 ng/µl	8,000 ng/µl
BSA	0.06 mg/ml	230 mg/ml

NanoPhotometer® NP80

NanoVolume & Cuvette

Accurate

Patented Sample Compression Technology™ with guaranteed fixed path lengths allows for unmatched accuracy and precision. Independent from surface tension and free from evaporation. Lifetime accuracy guaranteed.

Recalibration-free

Sealed optics without path length drift eliminates the need for costly and time consuming recalibrations. Durable, inert surfaces provide easy to clean, scratch-resistant surfaces that do not require reconditioning.
(See page 7)

Easy

NPOS Operating System: intuitive graphical user interfaces providing one-step method access, pre-programmed and customizable applications based on the ultimate level of data security.

Flexible

Control your NanoPhotometer® via touchscreen/ smartphone/tablet/computer (see page 18). Equipped with Wi-Fi®, USB A/B, HDMI, and LAN interface connections. Define and store your own data and methods and retrieve them through the NanoPhotometer® Network Drive. Connection and control via LIMS is available as an option.

Powerful

Built-in computer with a high performance dual core 2.4 GHz processor and 64 GB of onboard data storage provides rapid analysis and easy data management.

Mobile

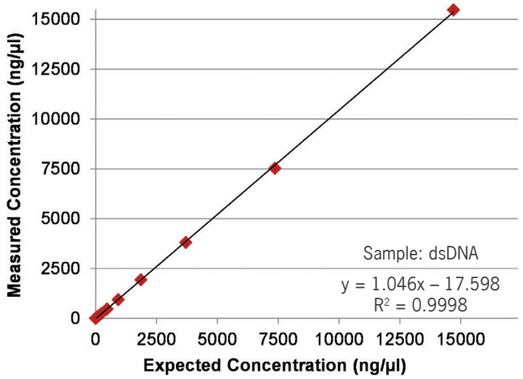
Spectroscopy can now be taken anywhere. The optional integrated battery pack provides up to 8 hours of stand-alone battery powered operation. You can now work effortlessly under laminar flow hood/clean benches or share the device between different lab members or groups.

Fast

Power on and instantly measure without lamp warm-up time. Full scan capability from 200 – 900 nm provides rapid and complete sample analysis in only 2.5 – 4.0 sec.

Sensitive

Precision readings over the entire range from 1 to 16,500 ng/µl for dsDNA with the patented True Path Technology™. The temperature controlled cuvette port provides an unmatched dynamic range of up to 2.6 Abs without the need for a cover during the reading.



Exceeding Expectations

Detection Range	Min	Max
dsDNA	1 ng/µl	16,500 ng/µl
BSA	0.03 mg/ml	478 mg/ml

NanoPhotometer® N60/N50

NanoVolume

Accurate

Patented Sample Compression Technology™ with guaranteed fixed path lengths allows for unmatched accuracy and precision. Independent from surface tension and free from evaporation. Lifetime accuracy guaranteed.

Recalibration-free

Sealed optics without path length drift eliminates the need for costly and time consuming recalibrations. Durable, inert surfaces provide easy to clean, scratch-resistant surfaces that do not require reconditioning.
(See page 7)

Easy

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Powerful

Built-in computer with a high performance dual core 2.4 GHz processor and 64 GB of onboard data storage provides rapid analysis and easy data management.

Mobile

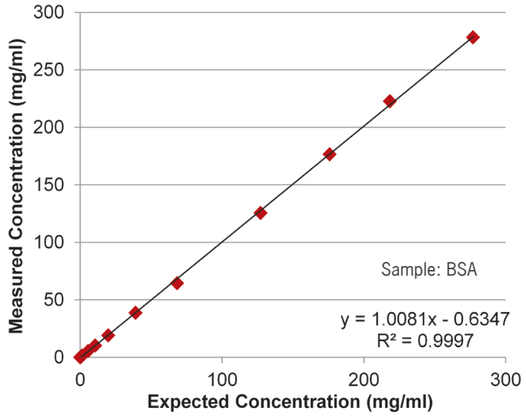
Spectroscopy can now be taken anywhere. The optional integrated battery pack provides up to 8 hours of stand-alone battery powered operation. You can now work effortlessly under laminar flow hood/clean benches or share the device between different lab members or groups.

Fast

Power on and instantly measure without lamp warm-up time. Full scan capability from 200 – 900 nm (N50: 200 – 650 nm) provides rapid and complete sample analysis in only 2.5 – 4.0 sec.

Sensitive

Precision readings over the entire range from 1 to 16,500 ng/µl for dsDNA (N60) with the patented True Path Technology™. The sealed optical setup provides unmatched performance without the need for error-prone stepper motor mechanics.



Best in Its Class

Model	N60		N50	
Detection Range	Min	Max	Min	Max
dsDNA	1 ng/µl	16,500 ng/µl	5 ng/µl	7,500 ng/µl
BSA	0.03 mg/ml	478 mg/ml	0.15 mg/ml	217 mg/ml

NanoPhotometer® C40

Cuvette

Sensitive and Accurate

The temperature controlled cuvette port of the NanoPhotometer® C40 provides an unmatched dynamic range of up to 2.6 Abs without the need for a cover during the reading. Sealed optics without mechanical drift eliminate the need for costly and time consuming recalibrations. Lifetime accuracy guaranteed.

Powerful

Built-in computer with a high performance dual core 2.4 GHz processor and 64 GB of onboard data storage provides rapid analysis and easy data management.

Mobile

Spectroscopy can now be taken anywhere. The optional integrated battery pack provides up to 8 hours of stand-alone battery powered operation. You can now work effortlessly under laminar flow hood/clean benches or share the device between different lab members or groups.

Easy

NPOS Operating System: intuitive graphical user interfaces providing one-step method access, pre-programmed and customizable applications based on the ultimate level of data security.

Fast

Power on and instantly measure without lamp warm-up time. Full scan capability from 200 – 900 nm provides rapid and complete sample analysis in only 2.5 sec.

Flexible

Control your NanoPhotometer® via touchscreen/ smartphone/tablet/computer (see page 18). Equipped with Wi-Fi®, USB A/B, HDMI, and LAN interface connections. Define and store your own data and methods and retrieve them through the NanoPhotometer® Network Drive. Connection and control via LIMS is available as an option.

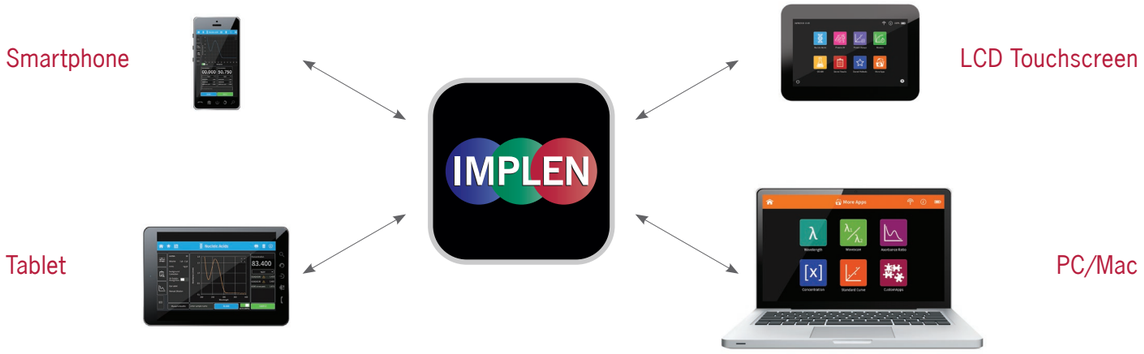
Cuvette

The built-in high performance cuvette option (with a spectral resolution < 1.8 nm) in the NanoPhotometer® C40 provides a dynamic range of up to 2.6 OD, which can even be expanded using our proprietary DiluCell™. DiluCell™ 10 provides an automatic dilution of 1/10 expanding the range to 26 OD (1 cm). The cuvette port is optimized for any kind of standard sized cuvettes (quartz, glass or plastic) with a center height of 8.5 mm.

More Than Just a Cuvette Spectrophotometer

Detection Range	Min	Max
dsDNA	0.1 ng/µl	130 ng/µl
BSA	0.003 mg/ml	3.7 mg/ml

NPOS Operating System



The most powerful operating system in UV/Vis spectrophotometry provides flexibility and mobility with its web based interface running stand-alone utilizing the built-in 7 inch screen or through access from multiple devices (computer, tablet and smartphone*) and systems (Windows, Mac, Android OS, and iOS). Pre-programmed and customizable applications are available with intuitive interfaces and a one-step method access for easy data analysis and data/method saving. The Linux based NPOS (NanoPhotometer® Operating System) also provides the ultimate level of data security.

*Smartphone is not available with the N120

The innovative NPOS graphical user interface allows easy touch and/or conventional access to all parameters. Results can be edited, exported and graphically overlaid. The software puts the focus on what is the most important: The measurement itself.

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Android™ is a trademark of Google LLC., Mountainview, CA
Windows is a trademark of Microsoft, Redmond, WA

Applications

Nucleic Acids

Easy one-step analysis of dsDNA, ssDNA, RNA, miRNA and oligonucleotides including dye concentration and frequency of dye incorporation determination for conjugated nucleic acids. A full scan graph and table with raw data points including 260/280 and 260/230 purity ratios are provided.

Proteins, Peptides and Antibodies

Protein, peptide and antibody quantification using direct Protein UV/280 measurements. Adjust to the appropriate wavelength for the sample and select from preprogrammed dye labels or create custom dye methods to determine degree of labeling of dye conjugated proteins. Results are provided as OD1 value or as concentration reading based on the extinction coefficient and selected wavelength. A full scan graph and table with raw data points including 260/280 purity ratios are provided.

Protein Assays

Quantify proteins using preprogrammed colorimetric assays including BCA, Bradford, Biuret and Lowry.

Kinetics

Measurement of change in absorbance as a function of time at a fixed wavelength. Displayed are Absorbance (An) for each measurement point, delta A (difference between start and last absorbance), slope and correlation coefficient (calculated from linear regression of the data points).

OD600 Cell Density

Absorbance readings at 600 nm. Bacterial cell cultures are routinely grown until the absorbance at 600 nm (known as OD600) reaches approximately 0.4 OD prior to induction or harvesting. Preprogrammed calculation method to determine cells/ml is available.

Wavescan

Record the absorption (Abs) or transmission (%T, cuvette mode only) spectrum in a drop or in a cuvette for a custom range between two user defined wavelengths. Automatic identification of peak height and position to determine the characteristics of any sample absorbing between 200 and 900 nm.

Standard Curve

Generate a standard curve at a single user specified wavelength between 200 and 900 nm. Prepare a multi-point calibration curve from standards of known concentration to quantify unknown samples in a drop or in a cuvette. Ability to store the curve as a method to be recalled for future experiments.

Other Available Apps

Wavelength, Concentration, Absorbance Ratio, Custom Apps.

Comprehensive Data Processing

Universal Linguist

NPOS offers the user interface in a selection of languages. The advanced language functionality allows the operator to effectively understand and interact with the unit, boosting productivity in the lab. In addition to a multilingual user interface, the NanoPhotometer® provides the flexibility to print results in multiple languages, which prevents misinterpretation of data and time consuming translations. The selection covers most widely spoken languages including English, Chinese, French, German, Japanese, Portuguese, Russian, and Spanish.

Universal Printing

Every NanoPhotometer® is able to print full page, labels and cryo labels via USB and through a network connection. Supported printers are AirPrint compatible devices, printers with HP universal printer driver capability and Dymo Label Printers.

モデル名	NP80
ソフトウェアバージョン	NPOS 2.0m UAT11 build 12597
シリアルナンバー	M80798
日付	2017-02-14
時刻	09:52:56
セルフテスト 合格	2017-02-13; 16:38
パラメーター	値
メソッド	Nucleic Acids
種類	dsDNA

Barcode Ready

Data entry as easy and flexible as it can be: automatically read sample names with one of the approved 1 and 2 D bar code readers for the NanoPhotometer® and edit sample names manually with the integrated digital keypad if necessary.

File Server Built-in

The unique File Server functionality allows access of data stored on the NanoPhotometer® drive from any computer in the lab. Data are stored in the proprietary encrypted Implen Data Standard format (IDS) to comply with audit regulations, as fully compatible Excel file or as printable PDF for archiving purposes. The File Server is accessible from Windows and Mac computers just like any standard server drive in the lab network.

Endless Connectivity

Every NanoPhotometer® is equipped with Wi-Fi®, built-in HotSpot, LAN, HDMI and USB A/B interface connections for remote instrument control, data accessibility and printing. NPOS supports AirPrint compatible printers, printers compatible with the HP Universal driver, and DYMO label printers (cryo and standard labels).

AirPrint is a trademark of Apple, Inc., Cupertino, CA
DYMO Corporation, Berkeley, CA

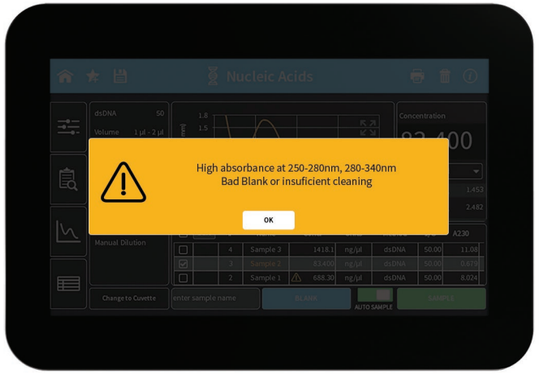
Certainty in Real Time

Sample Control™

Sample Control™ – the leading edge quality control technology to identify sample impurities, potential contaminations, turbidity, lint residue, and air bubbles.

Air bubbles are the highest cause of false readings in samples containing proteins and detergent buffers. The NanoPhotometer® implements proprietary quality control features that detect air bubbles and alert the user, preventing inaccurate absorbance readings of a sample.

Sample Control™ monitors handling characteristics and sample quality in real time to ensure that the measured concentrations are reproducible and most precise.

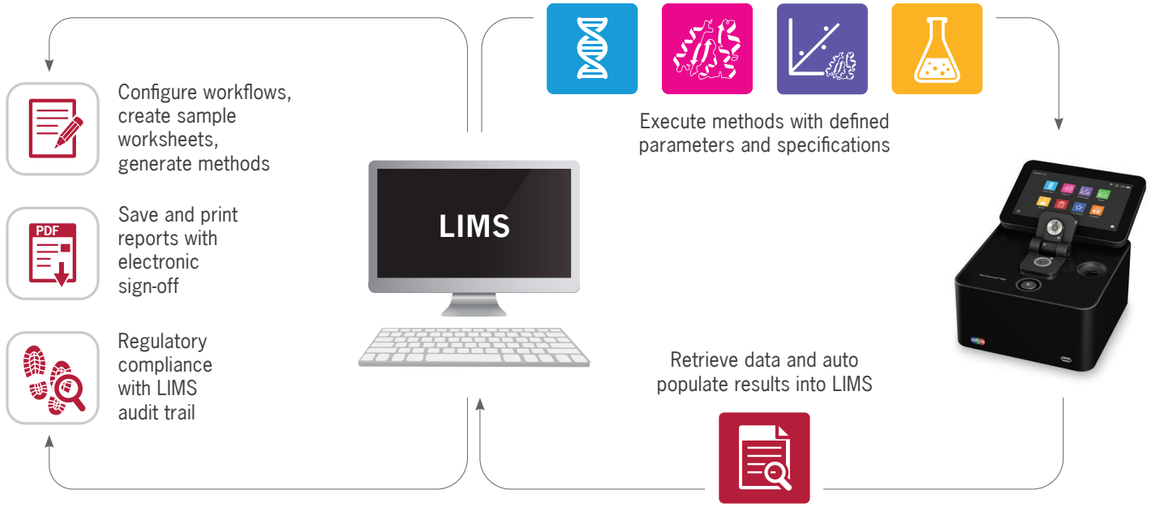


Confidence with Blank Control™

Be sure that your data are precise with Implen's unique Blank Control™ feature. Blanks with high background or residues from previous users are the main cause for inaccurate readings.

Blank Control™ will protect you from wasting time and precious sample on inaccurate readings caused by high background blanks or inappropriate cleaning.

LIMS Integration



Control Processes

Create methods with defined parameters in your LIMS for UV/Vis spectroscopic analysis. Control and command your NanoPhotometer® through the LIMS graphical user interface utilizing the NanoPhotometer® REST API.

Uncompromised Regulatory Compliance

For data integrity, the NanoPhotometer® provides audit trail functionality (within LIMS or the NPOS optional CFR21 software). Resultant data are fully compliant with GxP requirements as data files cannot be altered or manipulated. These records provide historical proof of compliance and operational integrity.

Eliminate Errors and Save Time

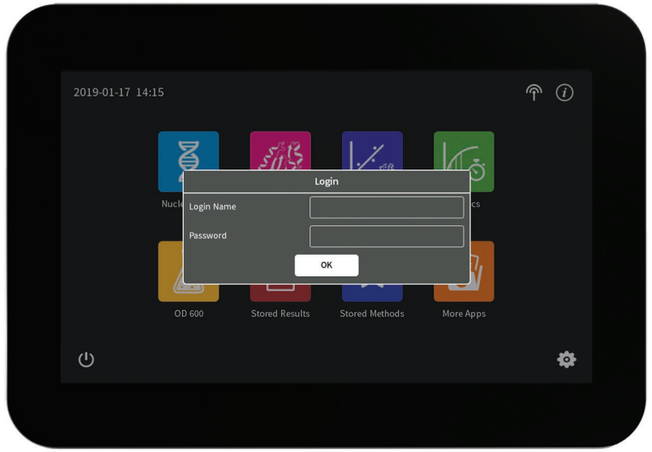
The NanoPhotometer® offers electronic data transfer utilizing the proprietary NPOS Representational State Transfer Application Program Interface. Existing sample worksheets within LIMS are automatically populated without introducing an error-prone manual data entry step.

Flexibility

NanoPhotometer® users can choose to operate the instrument through the NanoPhotometer® user interface or take measurements directly from their LIMS. The built-in battery pack and Wi-Fi® HotSpot provide users with the option to move around the lab with ease whilst a unit is being connected and controlled from the LIMS.

CFR21 Software

The CFR21 software complies with FDA 21 CFR Part 11 requirements and is an optional software tool ideal for GxP laboratories, which require proper electronic record keeping. It includes user management, access control, electronic signatures, data integrity, security, and audit trail functionality.



User Management

Individual Role Based Access Control (RBAC) provides password protected access and control of the NanoPhotometer®. Create multiple user accounts with different access rights which are handled in a hierarchic structure. User role options are Administrator, Power User, User, and Viewer. Organize users into working groups to facilitate access of shared data and stored methods within a lab. Option for increased transparency with Four Eye Administrator Rights. Various password settings are available within the CFR21 software – for example secure password and password expiration options. Effectively improve data security and fulfill audit regulations easily with flexible and appropriate RBAC user management solutions. All features can be enabled or disabled on demand to meet your laboratory needs.

Electronic Signature

Measurement data can only be saved when confirmed with User ID and password. All saved files include the user name/author, User ID, date and time of saving for proper electronic records. IDS and PDF files cannot be altered and ensure data integrity.

Implen NanoPhotometer®

Instrument Type	N120	
Version	NPOS 4.0 13220	
Serial Number	M120100	
Selftest passed	2019-02-25; 15:56	
Autosave	No	
Reason	Author	Read/Save/Print
User ID	bjones	msmith
User Name	Becky Jones	Mark Smith
eSign Date	2019-02-26	2019-02-26
eSign Time	09:23:31	16:49:32

Parameter

Method	Protein UV	Wavelength (nm)	280
Type	BSA	Background Correction	320 nm
Mode	MultiChannel	Air Bubble Recognition	Off
Protein Factor	1.500	Sample Loading	Horizontally

Position	Sample ID	Content	Conc.	Units	A230	A260	A280	A320	A260/A280	Dilution
A01	BLK01	B	0.0000	mg/ml	0.000	0.000	0.000	0.000	0.000	
A02	BLK02	B	0.0000	mg/ml	0.000	0.000	0.000	0.000	0.000	
A03	BLK03	B	0.0000	mg/ml	0.000	0.000	0.000	0.000	0.000	
B01	SPL01	S	0.0090	mg/ml	0.024	0.016	0.009	0.003	2.167	10
B02	SPL02	S	- - -	mg/ml	-0.004	-0.003	-0.014	-0.003	-0.000	10
B03	SPL03	S	- - -	mg/ml	-0.003	-0.007	-0.006	-0.004	1.500	10

Audit Trail

The audit trail automatically records all actions and preference changes in an audit log. The audit log contains an ID, time stamp, User ID, and category for each action. Audit trails can be exported by an Administrator for documentation purposes.

Audit Trail

Year 2022

ID	Date/Time	Login Name	Category	Action	Details
65492	2022-03-15 17:38:27	Admin	Administrator	Sample measurement	109747 3
65491	2022-03-15 17:38:18	Admin	Administrator	Sample measurement	109747 2
65490	2022-03-15 17:38:12	Admin	Administrator	Sample measurement	109747 1
65489	2022-03-15 17:38:06	Admin	Administrator	Sample measurement	109747
65488	2022-03-15 17:37:44	Admin	Administrator	Sample measurement	109760_turn 2
65487	2022-03-15 17:37:39	Admin	Administrator	Sample measurement	109760_turn 1
65486	2022-03-15 17:37:26	Admin	Administrator	Sample measurement	109760_turn
65485	2022-03-15 17:37:07	Admin	Administrator	Sample measurement	109760 2
65484	2022-03-15 17:36:56	Admin	Administrator	Sample measurement	109760 1
65483	2022-03-15 17:36:52	Admin	Administrator	Sample measurement	109760
65482	2022-03-15 17:36:25	Admin	Administrator	Sample measurement	Air
65481	2022-03-15 17:36:15	Admin	Administrator	Blank measurement	Blank 2
65480	2022-03-15 17:36:02	Admin	Administrator	Blank measurement	Blank 1
65479	2022-03-15 17:31:43	Admin	Administrator	Login	NanoPhotometer
65478	2022-03-15 17:04:36	System	System	Warning message	Battery is low. Please connect to power!
65477	2022-03-15 12:13:50	Admin	Administrator	Logoff	Control Device
65476	2022-03-15 12:10:33	Admin	Administrator	File opened successfully	NanoPhotometer/Admin/Graukeil-3N.ids
65475	2022-03-15 12:10:17	Admin	Administrator	Login	Control Device

IQ/OQ Package

International Standard

To comply with international standards in regulated environments, documented verification that your instrument is installed and functioning according to its intended use is required. Our Installation Qualification and Operation Qualification (IQ/OQ) package provides conforming data to document and verify that your instrument is working according to specifications in case of an audit. Even though the NanoPhotometer® is considered recalibration-free, also non-regulated laboratories may utilize the IQ/OQ package, since it provides added peace of mind that the system is working appropriately and producing high-quality data.

IQ/OQ Straightforward

The NanoPhotometer® IQ/OQ package consists of a liquid and/or a solid NIST traceable secondary standard and a corresponding Excel based software tool depending on the type of instrument. The liquid standard is based on a non-toxic compound absorbing at 280 nm to cover the area of most interest for Life Science applications. All secondary standards come with a certificate of compliance. The Excel based software produces an automated report displaying all relevant data for an audit.

Accessories

Field Kit

Leave the lab bench behind ... start exploring! The NanoPhotometer® field kit is your mobile screening lab. With space for pipette, sample and buffer containers, accessories and documentation the limitations of a lab are eliminated. With up to 8 hours of battery power there is no need to worry about a power outlet.

The convenient NanoPhotometer® roller case is specially designed to fit into the overhead bins on most major airlines. To comply with TSA requirements the case can be equipped with a TSA lock for safe airline transportation.

DiluCell™

DiluCell™ is especially designed for use with the NanoPhotometer® and Implen OD600® for the analysis of bacterial and yeast cultures and Bradford protein assays. Due to the reduced path length DiluCell™ provides an automatic dilution without the need of a physical dilution of higher concentrated samples. The DiluCell™ 10 allows an automatic 1/10 dilution of the sample.

Bypassing manual sample dilutions reduces dilution errors and cross contamination making DiluCell™ ideal for GxP. Combined with small sample volume requirements and bubble free filling, the DiluCell™ allows for convenient spectrophotometric analysis from 340 – 900 nm.

Technical Specifications

NanoVolume Performance

Detection Range dsDNA	N60, NP80: 1 – 16,500 ng/µl N50: 5 – 7,500 ng/µl N120: 2 – 8,000 ng/µl
Detection Range BSA	N60, NP80: 0.03 – 478 mg/ml N50: 0.15 – 217 mg/ml N120: 0.06 – 230 mg/ml
Sample Volume	N50, N60, NP80: 0.3 – 2 µl N120: 2 – 3.5 µl
Photometric Range (10 mm equivalent)	N60, NP80: 0.02 – 330 A N50: 0.1 – 150 A N120: 0.04 – 160 A
Path Length	N50, N60, NP80: 0.67 & 0.07 mm N120: 1 and 0.125 mm
Dilution Factor	N50, N60, NP80: 15 and 140 N120: 10 and 80
Vortex	N60, NP80: 2,800 rpm Tube size up to 2.0 ml

Cuvette Performance – NP80 & C40

Detection Range dsDNA	0.1 – 130 ng/µl
Detection Range BSA	0.003 – 3.7 mg/ml
Photometric Range	0 – 2.6 A
Center Height (Z-Height)	8.5 mm
Cell Types	Outside dimension 12.5 x 12.5 mm
Heating	37 °C ± 0.5 °C

Processing Power & Compatibility

Operating System	Linux based NPOS
Onboard Processor	Intel Celeron dual core 2.4 GHz
Internal Data Storage	C40, N50, N60, NP80: 64 GB N120: 128 GB
In & Output Ports	2x USB A, USB B, HDMI, Ethernet, Wi-Fi®
Software Compatibility	Windows 8, 10, 11 (32 & 64 bit) OS X (Intel x86 and Apple M1) iOS and Android OS

Optical Specifications

Wavelength Scan Range	C40, N60, NP80, N120: 200 – 900 nm N50: 200 – 650 nm
Measure Time For Full Scan Range	C40, N50, N60, NP80: 2.5 – 4.0 sec N120: 1.7 – 2.5 sec per sample
Wavelength Reproducibility	C40, N60, NP80, N120: ± 0.2 nm N50: ± 1 nm
Wavelength Accuracy	C40, N60, NP80, N120: ± 0.75 nm N50: ± 1.5 nm
Bandwidth	C40, N60, NP80: < 1.5 nm N50: < 3 nm N120: < 2.5 nm
Absorbance Reproducibility	C40, NP80 (Cuvette): < 0.002 A @ 0 – 0.3 A @ 280 nm CV < 1% @ 0.3 – 2.0 A @ 280 nm N50 (Lid 15): < 0.004 A @ 0 – 0.3 A @ 280 nm CV < 1% @ 0.3 – 1.5 A @ 280 nm N60, NP80 (Lid 15): < 0.002 A @ 0 – 0.3 A @ 280 nm CV < 1% @ 0.3 – 1.7 A @ 280 nm N120 (Lid 10): < 0.004 A @ 0 – 0.3 A @ 280 nm CV < 0.4% @ 0.8 A @ 280 nm
Absorbance Accuracy	< 1.75% @ 0.7 A @ 280 nm of the reading
Stray Light	N60, NP80, C40: < 0.5% @ 240 nm using NaI N50: < 2% @ 240 nm using NaI N120: < 1% @ 240 nm using NaI
Optical Arrangement	C40, N50, N60, NP80, N120: 1x 4096 CMOS Array
Lamp | Lifetime	Xenon flash lamp | 10^9 flashes, up to 10 years

General Specifications

Main Body Size	200 x 200 x 120 mm
Weight	3.8 – 5.2 kg depending on configuration
Power Requirements	90 – 250 V ± 10%, 50/60 Hz, supplied external power supply: 90 W, 18/19 V DC; typ. power consumption: 20 W
Display	1024 x 600 pixels; glove compatible touchscreen
Built-in Battery Pack: Optional rechargeable lithium ion battery	C40, N60, NP80: 95 Wh, 6.6 Ah, 8 h N120: 47.5 Wh, 3.3 Ah, 3 h Min. charging cycles: 800
Certification	CE, IEC 61010-1:2012 and EN 61326-1:2013
Battery Certification	IEC 62133 and UN38.3 transport test
Security	Slot for Kensington lock

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Features and specifications are subject to change without notice.