SZABO SCANDIC
Part of Europa Biosite

IMPLEN

NanoPhotometer®

Microvolume 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 supporting the work flows in modern research. Today thousands of biological, chemical, pharmaceutical and forensic research organizations around the globe rely on Implen products.

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 and Westlake Village, California, 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 continuously apply our creativity to the technologies of 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 product life time.

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. 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.

Table of Contents

Unmatched NanoPhotometer® Features

Sample Compression Technology™
Unique contained sample environment

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

Certainty in Real Time
Blank Control™, air bubble and impurity recognition

WiFi HotSpot LAN

Endless Connectivity
Built-in File Server for data access from Windows and Mac computers Print to Airprint and HP Universal Driver compatible printers as well as Dymo Label printers

Battery Powered
Up to 10 hours battery operation

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

Sample Compression Technology™- Accuracy & Precision

### 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.

No Evaporation
Samples are completely enclosed in a stable micro-environment during the entire measurement process. Evaporation and contamination of samples are reduced to a minimum. Even stable kinetic measurements in small volume samples are possible as well as the determination of samples in volatile organic solvents.

Smallest Volume
Microvolume samples are measured in an advanced reflection mode on the NanoPhotometer®. With only 0.3 μl minimum sample volume the NanoPhotometer® is the instrument with the lowest volume requirement available!
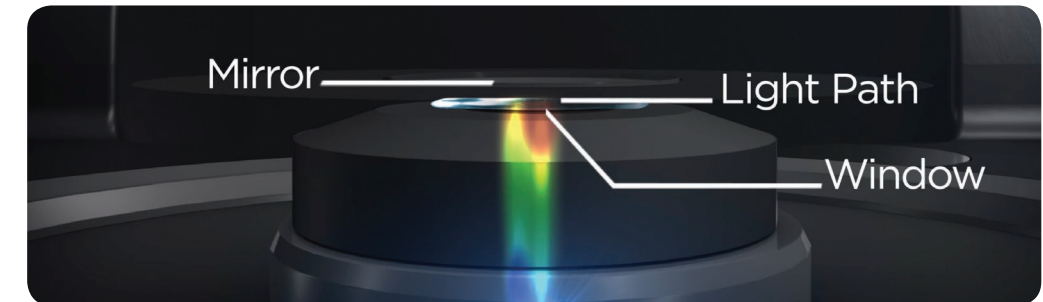
True Path Technology™ – Lifetime Accuracy Guaranteed

Simplicity is key for reliability. Implen's True Path Technology™ covers the extensive dynamic range with only two precisely defined path lengths. The sealed mechanical setup is providing two fixed anchor points that are not changing over the lifetime of the instrument. No recalibration is necessary, Implen guarantees lifetime accuracy.

The unique Quartz based and metal free measurement environment is scratch resistant, inert, and does not require surface reconditioning. It allows the use of a wide range of solvents (aqueous and organic) as well as buffers with higher or lower pH values (an updated list of compatible solvents can be downloaded from www.implen.de).

Certainty in Real Time

Sample Control™

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

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.
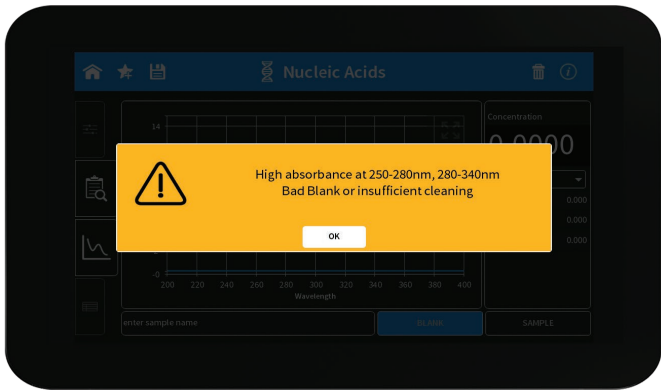
Confidence with Blank Control™

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.

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.

NanoPhotometer® NP80

Microvolume & 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 also page 5)

Easy

NPOS Operating System: intuitive graphical user interfaces (GUI) 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 / PC (see page 17). Equipped with Wi-Fi, USB A/B, HDMI, and LAN interface connections. Define and store your own methods.

Mobile

Spectroscopy can now be taken anywhere. The optional integrated battery pack provides up to 10 hours of stand-alone battery powered operation.
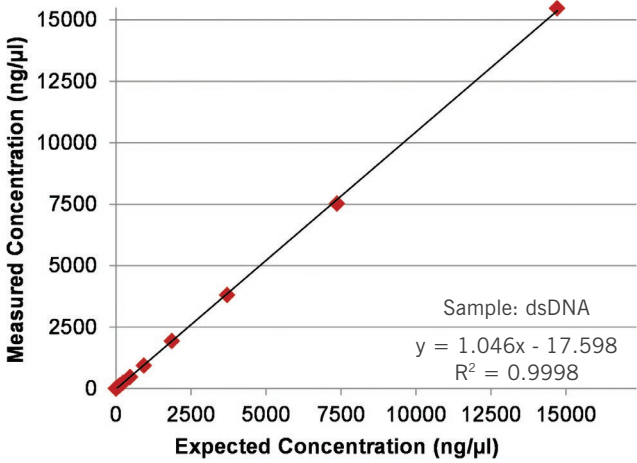
Powerful

Built-in computer with a high performance Q7 quad core 1 GHz processor and 32 GB of onboard memory provides rapid analysis and easy data storage.

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 3.5 - 6 sec.

Sensitive

Precision readings over the entire range from 1 ng/μl to 16,500 ng/μl for dsDNA (NP80 and N60) with the patented true path technology. The sealed optical setup provides unmatched perfromance without the need for error-prone stepper motor mechanics.

Sample: dsDNA
$y = 1.046x - 17.598$
$R^2 = 0.9998$

Measured Concentration (ng/μl) vs Expected Concentration (ng/μl)

Exceeding Expectations

0.3 μl Sample Volume

7" Color Touchscreen

Illuminated Sample Window

Temperature Controlled Cuvette Holder

Power Indicator

Low Vibration Vortexer

Easy to Clean Surfaces

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

NanoPhotometer® N60 / N50

Microvolume

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 5)

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Powerful
Built-in computer with a high performance Q7 quad core 1 GHz processor and 32 GB of onboard memory provides rapid analysis and easy data storage.

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 3.5 - 6 sec.

Sensitive
Precision readings over the entire range from 1 ng/μl to 16,500 ng/μl for dsDNA (NP80 and N60) with the patented true path technology. The sealed optical setup provides unmatched perfomance without the need for error-prone stepper motor mechanics.

Sample: dsDNA
$y = 1.046x - 17.598$
$R^2 = 0.9998$

Measured Concentration (ng/μl) vs *Expected Concentration (ng/μl)*

Best in its Class

Power Indicator

Illuminated Sample Window

7" Color Touchscreen

0.3 μl Sample Volume

Easy to Clean Surface

Low Vibration Vortexer

NanoPhotometer®	N60		N50	
Detection Limit	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

Powerful

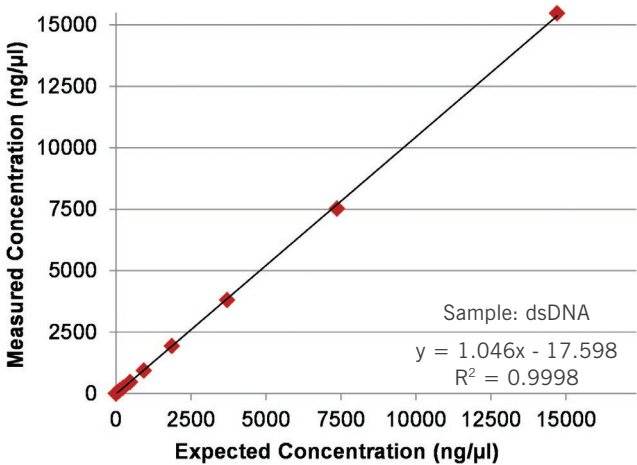Built-in computer with a high performance Q7 quad core 1 GHz processor and 32 GB of onboard memory provides rapid analysis and easy data storage.

Mobile

Spectroscopy can now be taken anywhere. The optional integrated battery pack provides up to 10 hours of stand-alone battery powered operation.

Easy

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

Upgradable

The C40 NanoPhotometer® can be upgraded to a full microvolume Spectrophotometer using Implen's proven Submicroliter Cell (SMC) which utilizes its patented Sample Compression Technology™. Being able to measure 0.3 μl samples you will have access to comprehensive life science methods and application detecting concentrations from 2 ng/μl up to 18,750 ng/μl.

Flexible

Control your NanoPhotometer® via Touchscreen / Smartphone / Tablet / PC (see page 17). Equipped with Wi-Fi, USB A/B, HDMI, and LAN interface connections. Define and store your own methods.

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 3.5 sec.

More than just a Cuvette Spectrophotometer

7" Color Touchscreen

Temperature Controlled Cuvette Holder

Detection Limit	Min	Max
dsDNA	0.100 ng/μl	130 ng/μl
BSA	0.003 mg/ml	3.7 mg/ml

NanoPhotometer® Model Comparison

Model	NP80	N60	N50	C40
	Nanovolume + Cuvette	**Nanovolume**	**Nanovolume**	**Cuvette**
Full Spectrum Scan	200 - 900 nm	200 - 900 nm	200 - 650 nm	200 - 900 nm
Detection Range Nanovolume	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	Upgradable with SMC
Detection Range Cuvette	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	0.67 and 0.07 mm	0.67 and 0.07 mm	0.67 and 0.07 mm	10 mm
Touchscreen	Optional	Optional	Optional	Optional
Customizable Methods	●	●	●	●
Built-in Cuvette	●	○	○	●
Built-in Vortex	●	●	○	○
Built-in Battery Pack	Optional	Optional	○	Optional

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 10 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 OD600 DiluPhotometer™ 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 two different available versions DiluCell™ 10 and DiluCell™ 20 allow an automatic 1/10 and 1/20 dilution of the sample. Bypassing manual sample dilutions reduces dilution errors and cross contamination making DiluCell™ ideal for GLP. Combined with small sample volume requirements and bubble free filling, the DiluCell™ allows for convenient spectrophotometric analysis from 340 - 900 nm.

NPOS

The most powerful operating system in UV/Vis spectrophotometry provides flexibility and mobility with its web based interface running on multiple devices (Computer, Tablet and Smartphone) and systems (Windows and Mac). Pre-programmed and customizable applications with intuitive interfaces and 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.

The innovative graphical user interface (NPOS GUI) allows easy touch and / or conventional access to all parameters. Results can be edited, exported and graphically overlaid. The most advanced GUI in history of lab equipment – combined with ease of use at its best. The software puts the focus on what is the most important: The measurement itself.

Flexible Unit Control

Smartphone   LCD Touchscreen

Tablet   PC/Mac

Mobile and easy control of the NanoPhotometer® via Wi-Fi from any Tablet or Smartphone (Android OS & iOS). Easy control from any PC (Windows & Mac) with fast and flexible connection options including Wi-Fi, USB, HDMI and LAN. Optional 7" built-in color LCD Touchscreen with glove compatible touch technology.

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 and will be continuously extended.

Universal Printing

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

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 server drive is accessible from Windows and Mac computers just like any standard server drive in the lab network.

Endless Connectivity

WiFi

LAN

HotSpot

USB

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

Technical Specifications

NanoVolume Performance

Detection Range dsDNA	1 ng/μl to 16,500 ng/μl (N50: 5 ng/μl to 7,500 ng/μl)
Detection Range BSA	0.03 mg/ml to 478 mg/ml (N50: 0.15 mg/ml to 217 mg/ml)
Minimum Sample Size	0.3 μl
Photometric Range (10 mm equivalent)	0.02 - 330 A (N50: 0.1 - 150 A)
Path Length	0.67 and 0.07 mm
Dilution Factor	15 and 140
Vortexer	2,800 rpm; tube size up to 2.0 ml

Cuvette Performance

Detection Range dsDNA	0.1 ng/μl to 130 ng/μl
Detection Range BSA	0.003 mg/ml to 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

Optical Specifications

Wavelength Scan Range	200 - 900 nm (N50: 200 - 650 nm)
Measure Time For Full Scan Range	3.5 - 6.0 seconds
Wavelength Reproducibility	± 0.2 nm (N50: ± 1 nm)
Wavelength Accuracy	± 0.75 nm (N50: 1.5 nm)
Bandwidth	better than 1.8 nm (N50: 5 nm)
Stray Light	< 0.5 % at 240 nm using NaI (N50: < 2 %) and < 1 % at 280 nm using Acetone (N50: < 2 %)
Absorbance Reproducibility	< 0.002 A (0.67 mm path) @ 280 nm (N50: < 0.004 A (0.67 mm path) @ 280 nm)
Absorbance Accuracy	< 1.75 % @ 0.7 A (0.67 mm path) @ 280 nm of the reading

Zero Stability	±0.003 A/hour after 20 min warm up @ 280 nm
Noise	0.002 A rms at 0 A @ 280 nm 0.002 A (pk to pk) at 0 A @ 280 nm
Optical Arrangement	1 x 3648 CCD Array (N50: 1 x 1024 CCD Array)
Lamp	Xenon flash lamp
Lifetime	10^9 flashes, up to 10 years

Processing Power & Compatibility

Operating System	Linux based NPOS
Onboard Processor	Quad Core 1 GHz
Internal Storage	32 GB
Control Options	Onboard with built-in Touchscreen, Computer, Smartphone and Tablet
Software Compatibility	Windows 7, 8, 10 (32 & 64 bit), OS X, iOS & Android OS
Min. Requirement Smartphone/Tablet	4" screen; Apple: iPad 2, iPhone5 & iOS 6; Android Phone: OS version 4.4; Android Tablet: OS version 5.0, Quadcore 1.2 GHz with 1 GB RAM

General Specifications

Main Body Size	200 mm x 200 mm x 120 mm
Weight	3.8 - 5.2 kg depending on configuration
Operating Voltage	90 - 250 V, 50/60 Hz, 60 W (90 W with battery pack), 18/19 VDC
Display	1024 x 600 pixels; Touchscreen glove compatible
Built-in Battery Pack	Optional rechargeable lithium ion battery; 95 Wh, 6.6 Ah; Operation time: up to 10 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
In & Output Ports	2x USB A, USB B, HDMI, Ethernet, WLAN
Additional Data Input	Mouse & keyboard options
Security	Slot for Kensington lock

Features and specifications are subject to change without notice.