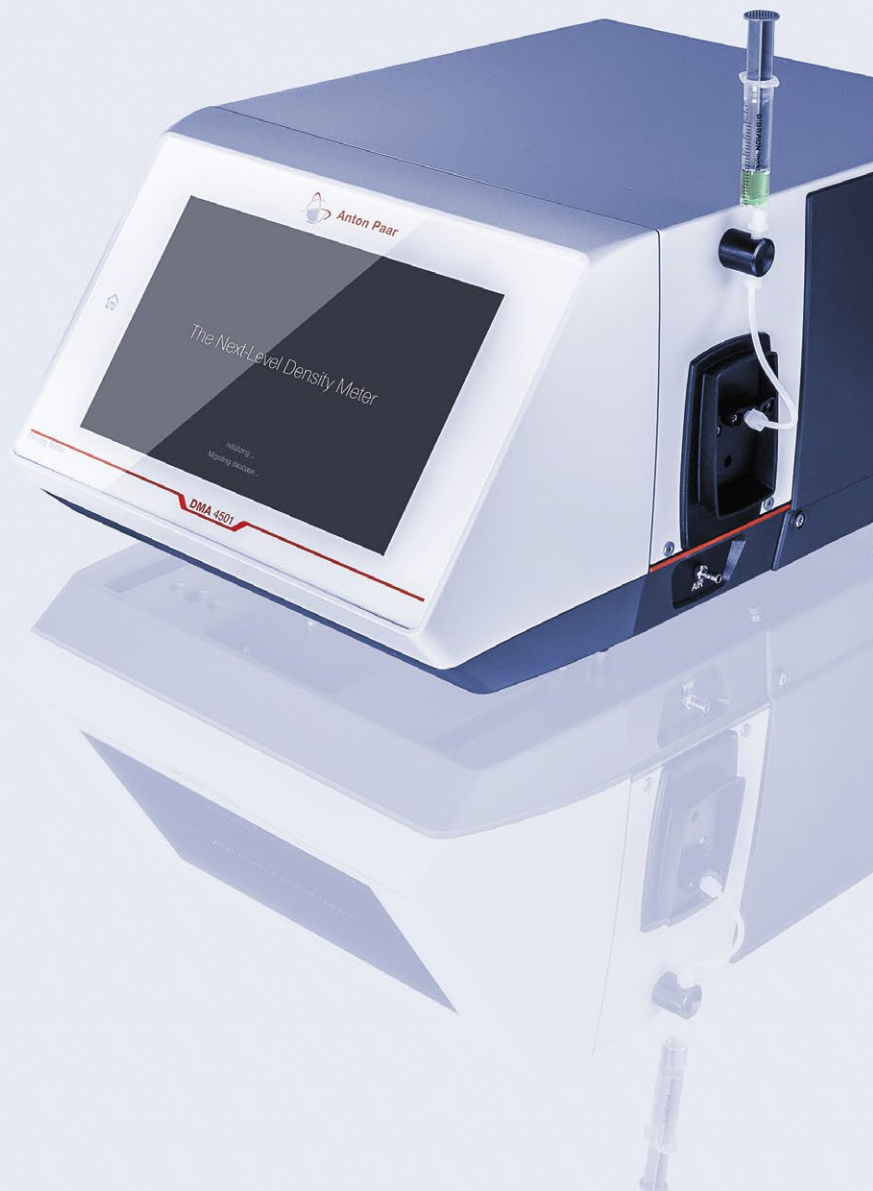Anton Paar

DMA 4101
DMA 4501
DMA 5001

0.998203

The Next-Level Density Meter

Taking Density Measurement **to** the Next Level

Five decades innovating. Five decades refining. Five decades making industry-pioneering density meters. Ever faster. Ever more focused. Now taking density measurement to the next level: The Next-Level Density Meter.

Driven by our unique Pulsed Excitation Method (PEM), combined with a new, even-smarter algorithm, the new density meters are a time-saver, and a joy to use. The freshly designed measurement modes deliver accurate results in 20 seconds. No time to wait for temperature adaptation? Your intelligent DMA predicts the result with zero compromise on accuracy. The camera has 3x higher, 1280 x 800 resolution, backlight adaptation, frame repositioning, and a zoomable U-View™ feature allowing detailed visual checks during filling and cleaning for 100 % correct results. The new software features quicker updates and a more practical user experience based on feedback from over 10,000 density meter customers.

At the heart of it all: Powerful hardware, state-of-the-art software, your great work, our half-a-century commitment to quality and innovation, and a time-tested revolutionary measuring principle. Together, we've made the world's fastest, most intelligent density meter. No matter how challenging your samples, Anton Paar's DMA 4101/4501/5001 density meters deliver.

FIND OUT MORE

www.anton-paar.com/dma

CRITICAL PARTS MANUFACTURED IN-HOUSE **98 %**

4-digit accuracy in 20 seconds
↓
Next-generation speed

3x faster measurement

3x shorter boot time (1.5 minutes)

6x faster data export (15 seconds)

Ready to use, out of the box
↓
Next-generation software

30+ guided user workflows

5 industry-specific profiles

200+ available conversion tables

Crystal clear
↓
Next-generation display

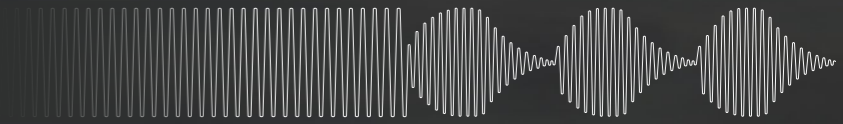**10.1"** touch display

64x more display colors (1.67 million)

3x greater screen resolution (1280 x 800 px)

Tech with a Kick: Best-in-Class User Experience

Pulsed Excitation Method

← The Next-Level Density Meter's patented Pulsed Excitation Method (PEM), the beating heart of the instrument, takes digital density measurement to another level. When stable oscillation of the U-tube is achieved, the excitation is switched off, allowing the oscillation to freely fade out. The excitation fade-out sequence repeats continuously, creating a pulsing oscillation pattern. This natural U-tube oscillation – along with evaluation of the oscillation pattern – provides the instrument with much more information than the conventional Forced Oscillation Method. That's why the Next-Level Density Meter is so precise, and offers such repeatability and reproducibility. The PEM method also allows for filling error detection with FillingCheck™, and for reliable bubble and particle detection, increasing efficiency – and permitting improved viscosity correction.

Display

To simplify your daily routine, you need structured data presentation and fast user interaction. The new, high-resolution touch display is of unmatched sensitivity and robustness. Operation is quick and simple, data is visible in customizable views and reports. You can immediately see if the quality of your sample is outside defined limits – even from a distance.

Inspection camera

You find viscous samples tricky to fill with a syringe because bubbles occur easily. Is there a better way? The camera allows you to apply detailed visual checks during filling and cleaning to obtain 100 % correct results with the first measurement.

Measuring principle

You want highly efficient sample measurement, with automatic temperature control, and measurement and cleaning cycles. You want to avoid filling issues and long-term measurement drifts. The new, high-performance density meters offer best-in-class U-tube technology with the Pulsed Excitation Method, viscosity correction, fastest measurement mode, and the bubble-detection feature FillingCheck™. Measure fast and accurately, with zero compromise. All relevant incidents are documented as a matter of course.

Data management

Transferring data across your IT network and into your data management system is inconvenient and time-consuming. The new density meters operate across numerous data interfaces and, in combination with our lab execution software, AP Connect, set the basis for your future paperless lab. Storage of 10,000 measurements on instrument level, with user-defined output reports, is available. Data export is 6x faster than for its predecessor. Simplify your data management with and without a network connection.

Modularity

You wish to measure multiple parameters in one go to save time, and to measure the same sample under the same conditions. The new density meters offer an array of options for multiparameter analysis (7+ additional parameters, 7+ different sample changers). Benefit from high throughput featuring parallel module measurement options so that you can get more done.

The Need for Speed:
## 20 Seconds to 4-Digit Accuracy

Time-to-result
You want to measure multiple samples across various conditions, keep throughput high without losing measurement performance, and be efficient with standard instrument checks. All new models have modes for ultra-fast measurement, multiple sample measurements, and temperature scan. Save time with fast sample throughput, effective sample characterization, and documentation. Obtain accurate results with groundbreaking speed, and push down your lab's time-to-result.

Software performance
You want software that performs. Updates for the new density meters are quick, sample throughput is quick, industry-profile customization is quick, sample diagnostics with the new, automatic algorithm-driven FillingCheck™ are quick, allowing for quick single measurements. It's all quick. Enjoy the intuitive process only this advanced software can deliver.
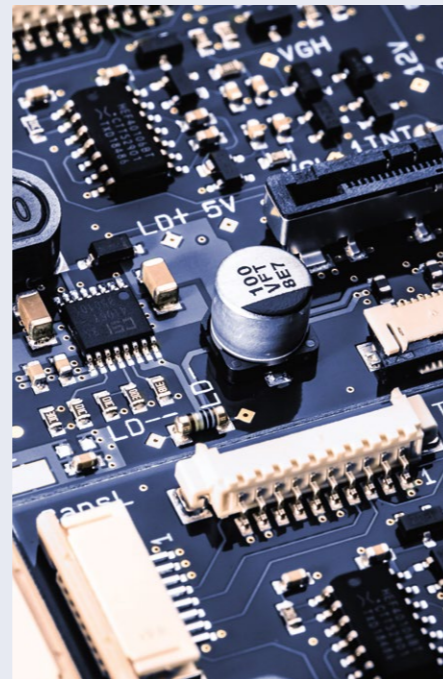
Hardware performance
You want fast hardware that can keep up with your instrument's high performance. The new density meter's hardware delivers a 4-digit result in 20 seconds – pushing your science and quality checks forward.

Sample throughput
You're looking for highly efficient sample measurement, with automatic temperature control, measurement, and cleaning cycles. You want to avoid filling issues related to manual operation. Our new density meters fully support a wide range of automation options (Xsample series).

Sample diagnostics
You want to detect invisible contamination or micro-bubbles in the sample. Benefit from an automatic, fast, and accurate FillingCheck™ – in real time, with both vertical and horizontal syringe filling. Sit back and enjoy operator-free, PEM-based sample-filling diagnostics within just a few seconds including identification of invisible micro-bubbles.

Customization
You need methods and scales for known standard materials available to choose from the instrument. Select from 200+ predefined quantities and scales. Avoid time-consuming manual calculations and human errors. Enjoy the easier data management with customized report configuration.

Compliance:
Standard Conformity, Data Integrity Assured

Petroleum →
You need to fulfill petroleum industry standards and legislation requirements. The new, high-performance density meters deliver accuracy and sample diagnostics according to industry-wide standards. Rest assured that you're in full compliance with ASTM D4052, D5002, and ISO 12185.

Pharmaceuticals ↑
You need to adhere to rigorous pharma industry standards and data integrity regulations. The new DMA density meters are fully traceable to USP <841> standards and other Pharmacopeia. They're also compliant with 21 CFR Part 11 on data integrity, and align with PQP qualification requirements. Know that you're in full compliance with all relevant Pharmacopeia (US, EU, JP, CN) and other pharma industry-related standards and regulations.

Data integrity
You require total consistency during measurement procedures and documentation. You have to be ready for – and pass – internal and external audits. The DMA density meters lay a meticulous audit trail, with signing of measurement results (user management) – in full GMP/GLP and 21 CFR Part 11 compliance. Satisfy data integrity and traceability standards (e.g., 21 CFR Part 11, GMP 4 Annex 11&15, ALCOA+).

In-house ISO calibration
You require a measurement certificate from an accredited measurement lab. We provide in-house ISO/IEC 17025 calibration in a one-stop-shop approach. Obtain an ISO/IEC 17025-calibrated density meter directly from the supplier.

Reference materials
You're searching for certified reference materials that you need to adjust the instrument. Who can supply them? Use standards directly from Anton Paar - certified according to ISO 17025 and even ISO 17034. It's a comprehensive solution.

🛒 Buy online
shop.anton-paar.com

360° Care:
We're with You
All the Way

We're confident in the high quality of our instruments. That's why we provide **a full warranty for three years.**

All new instruments* include repair for three years. You avoid unforeseen costs and can always rely on your instrument. Alongside the warranty, we offer a wide range of additional services and maintenance options.

*Due to the technology they use, some instruments require maintenance according to a maintenance schedule. Complying with the maintenance schedule is a prerequisite for the three-year warranty.

Service and support directly from the manufacturer
Our comprehensive service provides you with the best individual coverage for your investment so that maximum uptime is ensured.

Safeguarding your investment
Regardless of how intensively you use your instrument, we help you keep your device in good shape and safeguard your investment – including a three-year warranty.

The shortest response time
We know that sometimes it's urgent. That's why we provide a response to your inquiry within 24 hours. We give you straightforward help from real people, not from bots.

Certified service engineers
The seamless and thorough training of our technical experts is the foundation of our excellent service provision. Training and certification are carried out at our own facilities.

Our service is global
Our large service network for customers spans 86 locations with a total of 350 certified service engineers. Wherever you're located, there's always an Anton Paar service engineer nearby.

Application know-how
You don't want just any density meter. You want a density meter manufactured with application know-how accumulated over decades. And you want the promise of quality associated with such an experience. Our new density meters are an expression of quality and reliability – refined over decades of industry-leading experience.

In-house manufacturing
You want the seal of excellence that in-house manufacturing brings and the peace of mind that comes from knowing critical components are top-notch. 98 % of critical parts for our density meters are manufactured in-house. Rest assured that the critical components you require come quickly with minimal downtime – and with the Anton Paar, in-house quality guarantee. And in the unlikely event you need parts replaced, Anton Paar can help get them to you quickly.

Paperless lab
You're looking for ways to future-proof your lab, centralize your data, and go paperless. Our lab execution software, AP Connect, links 50+ Anton Paar instruments, triggers measurements with 10+ parameters, and stores tens of thousands of measurements in a single digital space. No transcription errors. Your data is available at a snap, accessible from any network computer. Streamlining your data flow like this frees up time for analysis.

Buy online
shop.anton-paar.com

Webshop
All consumables for the density meters can be ordered 24/7 through our easy-to-use webshop. Replenishment is just a click away.

Flexibility for You:
A Revolutionary User Experience

Top usability, refined over decades
A revolutionary new operating system. Feedback from 10,000 customers channeled into usability design.

The result: an intuitive, smartphone-like experience, with 30+ guided user workflows, 200+ available conversion tables, and 5 industry-specific profiles.

The effect: efficient sample throughput, industry-profile customization, fast sample diagnostics with the new, automatic algorithm-driven FillingCheck™, and reliable single measurements. The automated setup for the industry-specific user interface delivers an out-of-the-box measuring experience.

Instrument updates ensure that customers enjoy a constant stream of new features and software functionalities.

From quality control to accurate measurement
Choose your industry profile with a click during the setup process. The instrument automatically tailors dashboards and product selection to your specific needs, for the industry selected.

Chemicals: Secure quality control of raw materials and the final product, determine concentration of acids and bases, use 200+ conversion tables.

Non-alcoholic beverages: Determine sugar content for quality control of syrup concentrate and finished soft drinks, measure total extract content of tea and coffee mixtures.

Alcoholic beverages: Measure sugar/extract content during wine and beer production, and the alcohol content of spirits and liqueurs.

Petroleum products: Assure quality control for crude oil, fuels, and lubricants. Perform blending and quality control checks for raw materials and biofuels. Determine concentration of by-products and density of gases.

Pharmaceuticals & cosmetics: Measure density and specific gravity of infusions and of raw materials used in drug production. Control filling volume of sprays. Implement quality controls for finished creams, sprays, and raw materials.

The Next-Level
Density Meter

DMA 4101

The fastest and most efficient measurements

→ High throughput for quality control with ultra-fast measurement mode

→ 4-digit accuracy in 20 seconds

DMA 4101 is the right choice for density and concentration measurements in industry whenever you need quick and precise density values. Predefined concentration tables extend the measurement options for the chemical industry. DMA 4101 is the most reliable and economical Next-Level density meter, fully compliant with industry standards.

DMA 4501

The industry specialist

→ The industry-proven device for high-accuracy measurements on a wide range of samples

→ 5-digit accuracy

DMA 4501 is the reliable device that delivers outstanding measurement performance, covering all types of samples, from beer and soft drinks to lubricants and solvents. It's the ideal tool for quality assurance and is used as a reference instrument for production control. Combining DMA 4501 with available measuring modules for various applications creates a powerful multiparameter setup for your industry.

DMA 5001

The highest accuracy for challenging samples

→ Unmatched 6-digit accuracy, even with highly viscous and highly dense samples

→ Capitalize for best performance in demanding high-end applications

DMA 5001 provides 6-digit accuracy and offers a precise measurement mode on top for measurements requiring the utmost precision. DMA 5001 is ideal for high-end R&D applications and sets the tone for authorities as well as standards organizations. There is no other digital density meter on the market able to deliver comparably accurate results over the entire range.

	DMA 4101 ↓	DMA 4501 ↓	DMA 5001 ↓
MEASURING RANGE			
Density	0 g/cm³ to 3 g/cm³		
Temperature	0 °C to 100 °C (32 °F to 212 °F)		
Pressure	Up to 10 bar (145 psi) absolute pressure		
ACCURACY*			
Density	0.0001 g/cm³	0.00005 g/cm³ (full range) 0.00001 g/cm³ (0 g/cm³ to 1 g/cm³, 15 °C to 20 °C)	0.000005 g/cm³
Temperature	0.03 °C (0.05 °F)	0.02 °C (0.04 °F) (full range) 0.01 °C (0.02 °F) (15 °C to 20 °C)	0.01 °C (0.02 °F)
REPEATABILITY*			
Density	0.00001 g/cm³	0.000005 g/cm³	0.000001 g/cm³
Temperature	0.02 °C (0.04 °F)	0.01 °C (0.02 °F)	0.001 °C (0.002 °F)
REPRODUCIBILITY*			
Density	0.00005 g/cm³	0.00002 g/cm³	0.000005 g/cm³
DIGITAL RESOLUTION			
Density	0.0001 g/cm³	0.00001 g/cm³	0.000001 g/cm³
FEATURES			
Power features	U-View™, FillingCheck™, ThermoBalance™, full-range viscosity correction, ultra-fast measurement		
Special functions	QM compliance, temperature scan, built-in ambient pressure sensor, condition monitoring, adjustment at high viscosity (only DMA 5001)		
Automation	Automatic sample changers		
Modularity	pH, alcohol, CO₂, O₂, color, turbidity, refractive index		
Optional accessories	Aerosol adapter, heating attachment		
TECHNICAL DATA			
Minimum measuring time	20 s	30 s	40 s
Minimum sample volume	Approx. 1 mL		
Dynamic viscosity**	0 mPa.s to 3000 mPa.s		
General density standard	ISO/EN 15212-1		
Dimensions (L x W x H)	526 mm x 347 mm x 230 mm (20.7 in x 13.7 in x 9 in)		
Weight	22.04 kg (48.6 lbs)		
Power supply	AC 100 to 240 V, 50/60 Hz, fluctuation ±10 %, 190 VA		
Display	10.1" TFT WXGA (1280 x 800 px); PCAP touchscreen		
Controls	Touchscreen, optional keyboard, mouse, and bar code reader		
Communication interfaces	5 x USB, Ethernet, CAN, RS232		
Internal storage	More than 10,000 measuring values with camera images		
Inspection camera	1920 x 1080 pixels		

* Under ideal conditions and for low densities/viscosities | ** For Newtonian fluids only | *** According to ISO 5725

Modularity: pH, alcohol, CO_2, O_2, color, turbidity, refractive index

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