



CONTACT ANGLE METER

Contact Angle Meter

with Integrated High-Speed Camera

Holmarc's Contact Angle Meter Model No: HO-IAD-CAM-01BH is a cutting-edge instrument designed for precise dynamic contact angle measurements. It features a high-speed camera which significantly enhances its capabilities for high-speed and high-precision scientific research.

This advanced contact angle meter incorporates motorized precise tilting

for the substrate holder, allowing for accurate positioning and dynamic measurements. The dispenser to camera positioning unit ensures the camera can be positioned at different angles for optimal drop imaging. The system also includes an automated dispenser and temperature control, making it versatile for various applications.

Measuring Method:

The sessile drop method is employed for accurate contact angle measurements. The system utilizes automatic curve fit analysis using the drop snake method, providing reliable and precise data.

Optics and Illumination

Equipped with a high-performance aberration-corrected imaging lens, the system ensures clear and detailed images with precise manual focus adjustment. The LED-based diffused lighting mechanism includes fixed backlit LED illuminators and angled illuminators for top view imaging, ensuring optimal illumination for various sample types.

Camera Focus Adjustment:

The linear stage offers a travel range of ≥ 75 mm, allowing for precise positioning and focusing of the CMOS/Optics assembly.



Integrated High-Speed Camera:

The integration of the high-speed camera enhances the system's capability for capturing rapid events with high precision. The camera supports resolutions up to 1920×1080 pixels and frame rate up to 1,25,000 fps at lower resolutions. It features an 8-bit depth and a dynamic range of 60dB, ensuring high-quality image capture.

Liquid Dispenser:

The system includes a motorized syringe pump with programmable flow rate of 1 - 100 $\mu\text{l}/\text{min}$ & 1 - 100 $\mu\text{l}/\text{hr}$ ensures precise and controlled dispensing of liquids for accurate measurements. Three syringes with capacities of 50, 100, and 250 microliters are included.



MODEL NO: HO-IAD-CAM-01BH

Advanced Functionalities:

- Support for ROI acquisition window settings, resolution, and frame rate linkage adjustment.
- Auto exposure, EDR support.
- Internal and external synchronization capabilities.
- Various external signal triggering options (rising edge, falling edge, low level, high level).
- Automatic triggering of image changes in very small areas.
- Standard shutter release cable for shooting control.
- Real-time screen monitoring with a 1080P@50 frames format.
- Intelligent positioning trigger key-frames and image key-frames

Measurement Range and Accuracy:

The contact angle meter offers a measurement angle range of 0 - 180 degrees with an accuracy of ≤ 1 degree, making it suitable for a wide range of materials and surfaces.
Integrated High-Speed Camera:

Substrate and Sample Holder:

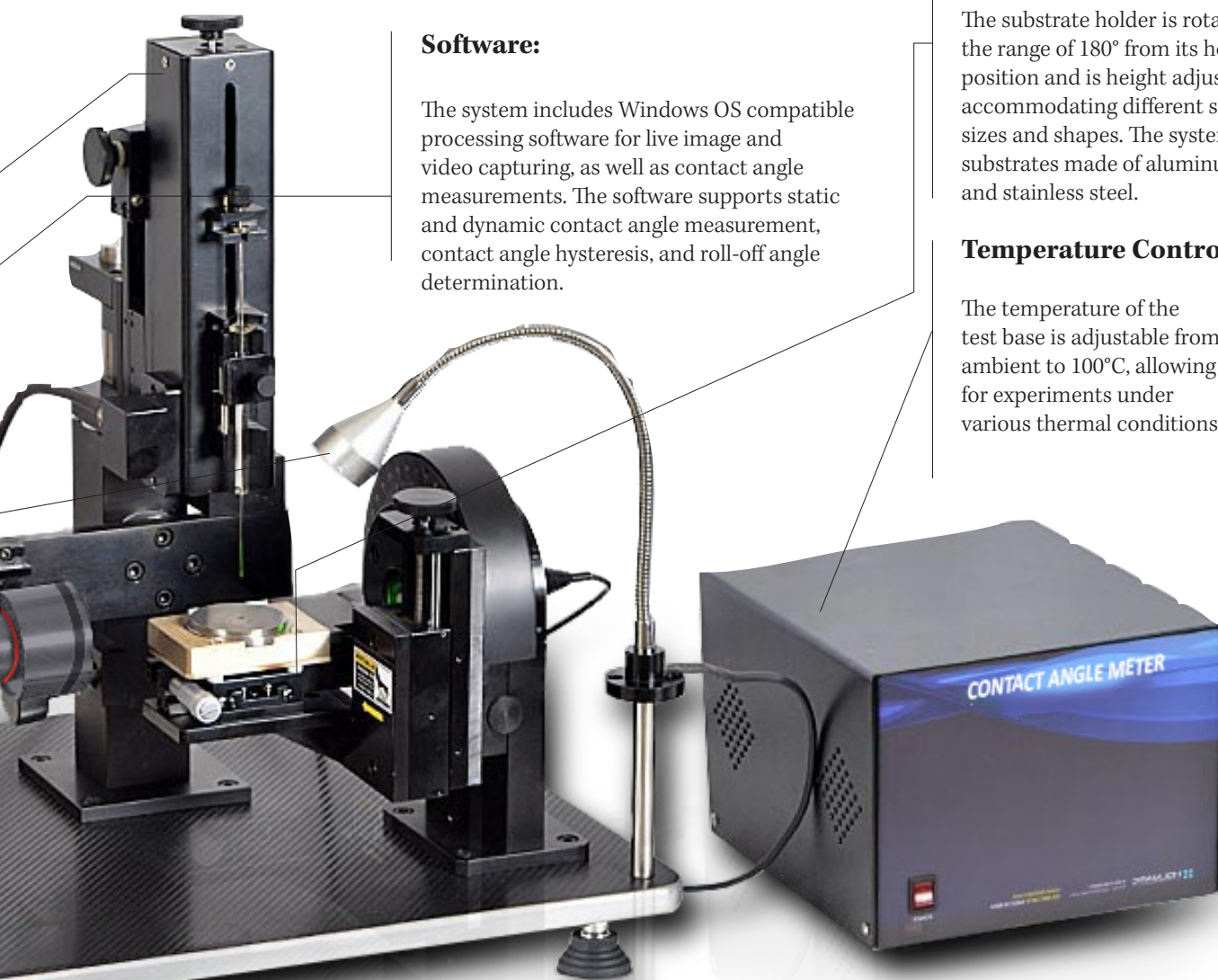
The substrate holder is rotatable in the range of 180° from its horizontal position and is height adjustable, accommodating different sample sizes and shapes. The system includes substrates made of aluminum, brass, and stainless steel.

Temperature Control:

The temperature of the test base is adjustable from ambient to 100°C, allowing for experiments under various thermal conditions.

Software:

The system includes Windows OS compatible processing software for live image and video capturing, as well as contact angle measurements. The software supports static and dynamic contact angle measurement, contact angle hysteresis, and roll-off angle determination.

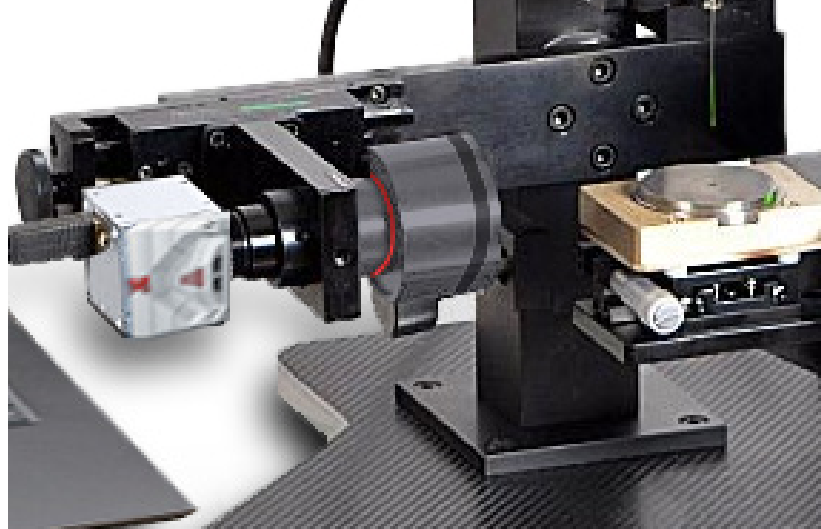


Construction and Warranty:

The system is built with rigid and vibration-resistant construction, suitable for tabletop operation. It comes with a minimum one-year warranty from the date of installation, ensuring reliability and peace of mind.

Typical Applications:

- Non-contact 3D high-speed measurement of vibration displacement
- Automotive collision and high-speed train chassis inspection
- Microfluidics and biotechnology research (with microscope)



KEY FEATURES

Measuring method	Sessile drop method
Analysis method	Automatic curve fit analysis using the drop snake method
Optics	High-performance aberration corrected imaging lens with precise manual focus adjustment
Measurement angle range	0 - 180 degree
Measurement accuracy	≤ 1 degree
Camera type	CMOS Sensor (Upgraded to High-Speed Camera)
Image Resolution in Pixels	2592 x 1944 pixels (typical, max.)
Video system	High performance CMOS sensor and suitable shielded cable of minimum 3 m length
Dispenser to camera positioning unit	Designed for top view
Illumination mechanism	LED based diffused lighting
Illumination Units	Fixed backlit LED illuminator and angled illuminator for top view imaging
Liquid dispenser	Through motorized syringe pump; includes three syringes with 50, 100, and 250 micro litre capacity
Temperature Control	Adjustable from ambient to 100°C
Substrate / sample holder	Rotatable in the range 180° from its horizontal position; Height adjustable
Substrates	Aluminum, brass and stainless steel (1 each)
Focusing	≥ 75 mm travel of CMOS / Optics assembly for fine focus
Software	Windows OS compatible processing software included for live image/video capturing and contact angle measurements
Input Power	230 VAC, 50Hz
Warranty	Minimum one year warranty from the date of installation
Construction	Rigid & vibration-resistant suitable for table-top operation

The system has rigid & vibration resistant construction suitable to operate on a table top

Laptop is not in scope of supply

Advanced Functionalities:

- Support for ROI acquisition window setting, resolution, and frame rate linkage adjustment
- Auto exposure, EDR support
- Internal and external synchronization capabilities
- Various external signal triggering options (rising edge, falling edge, low level, high level)
- Automatic triggering of image changes in very small areas
- Standard shutter release cable for shooting control
- Real-time screen monitoring with a 1080P@50 frames format
- Intelligent positioning trigger key-frames, image key-frames
- Mechanical movements, process improvement, fault detection, and more

Integrated High-Speed Camera:



M230

High Speed Camera

The Mini series is a high-end, high-quality, small-size, high-speed camera for high-precision scientific research, defence and high-speed industrial fields.



Camera Specifications		
Resolution	1920x1080	
Bit Depth	8 Bit	
Frame Rate	Resolution	FPS
	1920x1080	3000fps
	1280x720	4500fps
	640x480	6700fps
	256x16	125000fps
Memory	64/256/512GB/1TB/2TB	
Dynamic Range	60db	
Analog Gain	1-4	
Pixel	10um	
ISO	25,000(M) / 8000(C)	
Color	Mono/Color	
ROI	Support	
Auto Exposure	Support	
Ethernet	1 Gigabit Interface	
Lens Mount	F / C	
Size without Lens	98x98x98mm	
Weight	≤1210g	

Model Name	Memory	Specifications	Camera Photo
M120M/C	16GB	Max. Resolution 1280*1024 @ 2,000fps, 16GB storage, Pixel size 10um, Lens mount F/C W*H*L: 87x87x149mm	
M220M/C	16GB / 64 GB	Max. Resolution 1920*1080 @ 2000 fps, 16/64GB storage, Pixel Size 10um, Lens mount F/C W*H*L: 98*98*98mm	
M230M/C	16GB / 64GB	Max. Resolution 1920*1080 @ 3000 fps, 16/64GB storage, Pixel size 10um, Lens mount F/C W*H*L: 98*98*98mm	
S1307M/C	192GB	Max. Resolution 1280*1024 @ 7000fps, 192GB storage, Pixel size 14.6um, Lens mount F/C W*H*L: 110*110*205mm	
S1310M/C	192GB	Max. Resolution 1280*1024 @ 10,000fps, 192GB storage, Pixel size 14.6um, Lens mount F/C W*H*L: 110*110*205mm	
S1315M/C	192GB	Max. Resolution 1280*1024 @ 15,000fps, 192GB storage, Pixel size 14.6um, Lens mount F/C W*H*L: 110*110*205mm	

Contact Angle Meter

with Dispenser to camera positioning unit,
Motorized Substrate Holder, Automated Dispenser
& Temperature Control

Holmarc's Contact angle meter Model No: HO-IAD-CAM-01BC is an advanced model that features dynamic contact angle measurements with motorized precise tilting for the substrate holder, dispenser to camera positioning unit (camera can be positioned at different angle for drop imaging), automated dispenser and temperature control. Advancing and receding contact angle can be measured at different angle (Image acquisitions are also automated) and roll-off angle can also be measured.

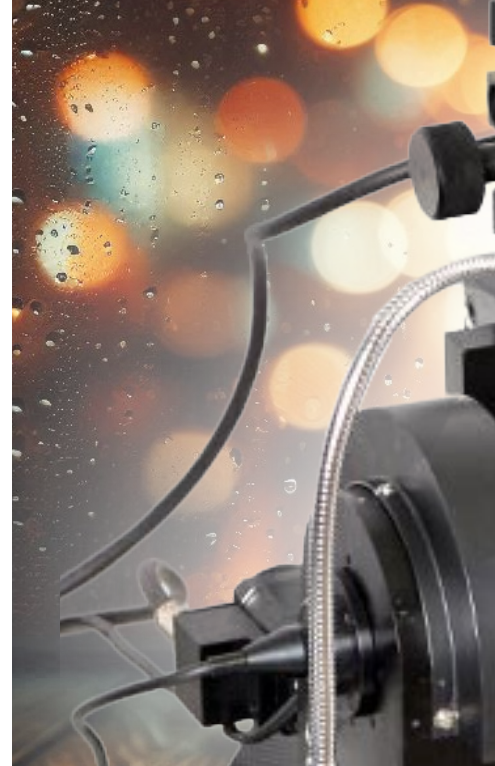
We are using a sessile drop optical method to find out the contact angle meter but we can incorporate a pendant drop method to find out surface free energy. Additional feature from the Model: HO-IAD-CAM-01A is that this model is equipped with temperature control for the substrate holder (up to 100 degree Celsius from ambient). This proves to be ideal for the study of contact angle variations with

respect to temperature. Motorized syringe pump is provided in the equipment for precise dispensing and camera interface for measuring contact angle of liquids on solid surfaces. Video capturing and video image processing features are included in Holmarc Contact angle analysis software.

The surface over which contact angle is to be measured can be rotated through 180 degree from its horizontal position for advancing and receding contact angle by tilt plate method and roll-off angle can also be measured. Three chromatographic syringes with 50 micro litre, 100 micro litre and 250 micro litre capacity are supplied along with the equipment. The wettability of a droplet is also dependent on the substrate in contact with the liquid. We provide three different substrates along with the equipment - made of aluminium, brass and stainless steel. However, the substrate according to customers' choice can also be loaded into the equipment.

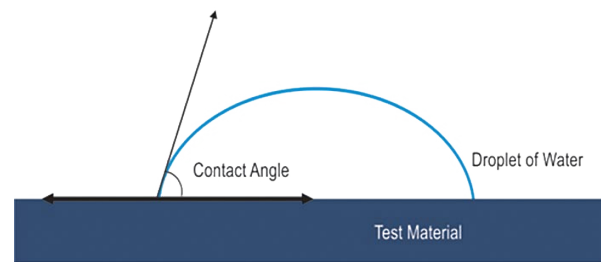
TECHNICAL HIGHLIGHTS

- White light LED with variable intensity control ensures extreme low heat radiation.
- Precise travel adjustment provided for CMOS with Optics assembly to fine focus the image.
- Motorized syringe pump for precise micro liter dispensing.
- 50, 100 & 250 micro liter sample syringes provided with the system.
- Precision height adjustment and angular displacement provided at the test base.
- Vibration inhibiting solid construction for sharp drop images.
- Powerful and user friendly windows software provided for image analysis.
- Live images can be viewed on the PC monitor showing the droplet on the solid surface reassures the operator - regarding validity of the contact angle measurement.
- Substrate can be rotated 180 degree from horizontal position.
- Captured image and its Angle measurement table can be saved for future reference.



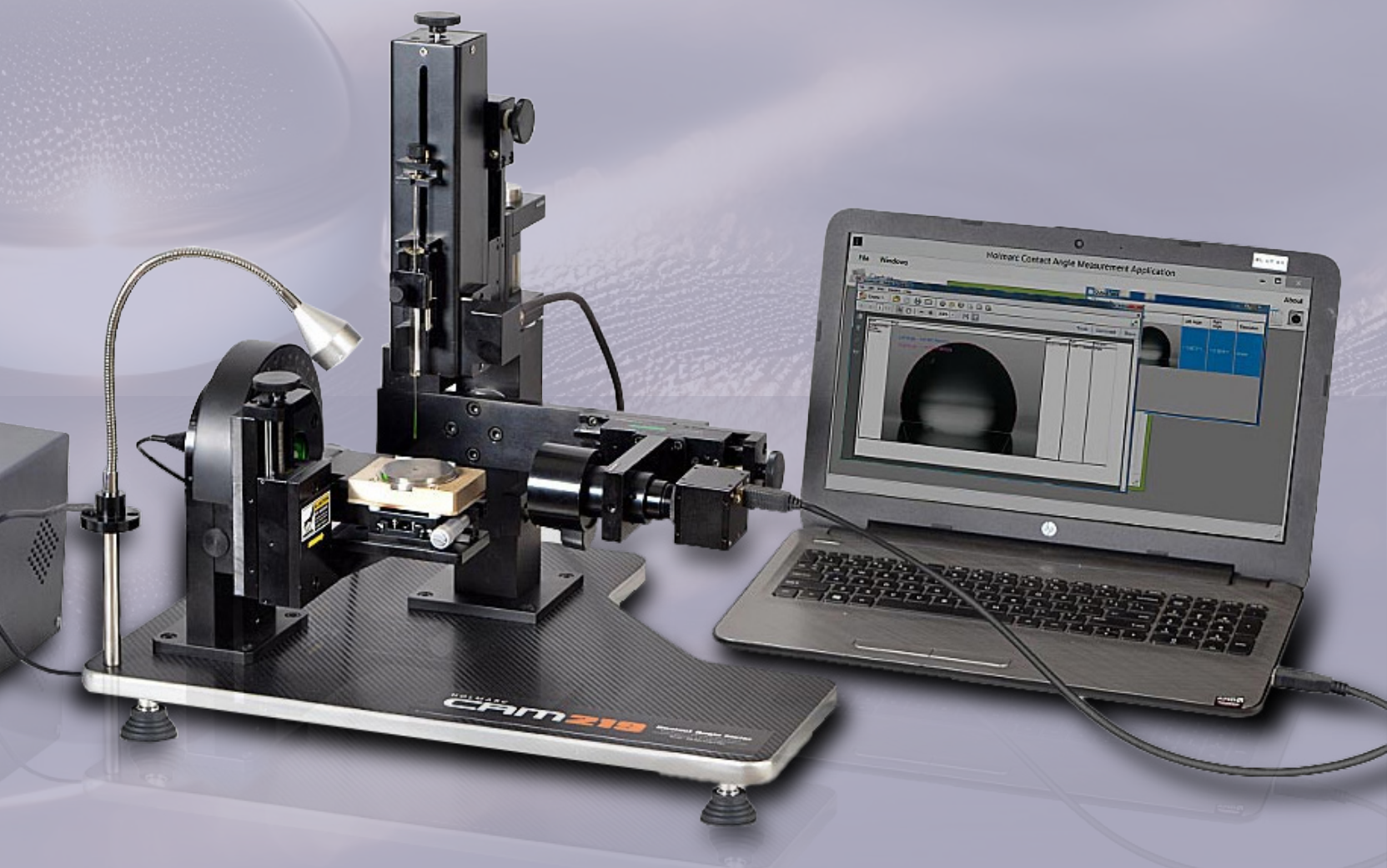


What is Contact Angle ?



Contact angle is the angle formed by a liquid at the phase boundary where a liquid, gas and solid intersect. The shape of the drop is controlled by the three forces of interfacial tension. Static Angle and Advancing Angle are quantitative measures of the wetting of a solid by the liquid, but they can also be used as a quality control measure in surface treatments and surface cleanliness. Receding Angle is a quantitative measure of the adhesion of a solid to a liquid.

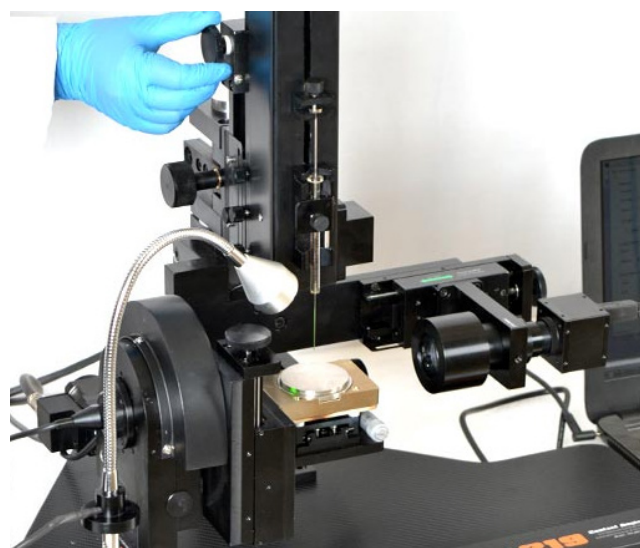
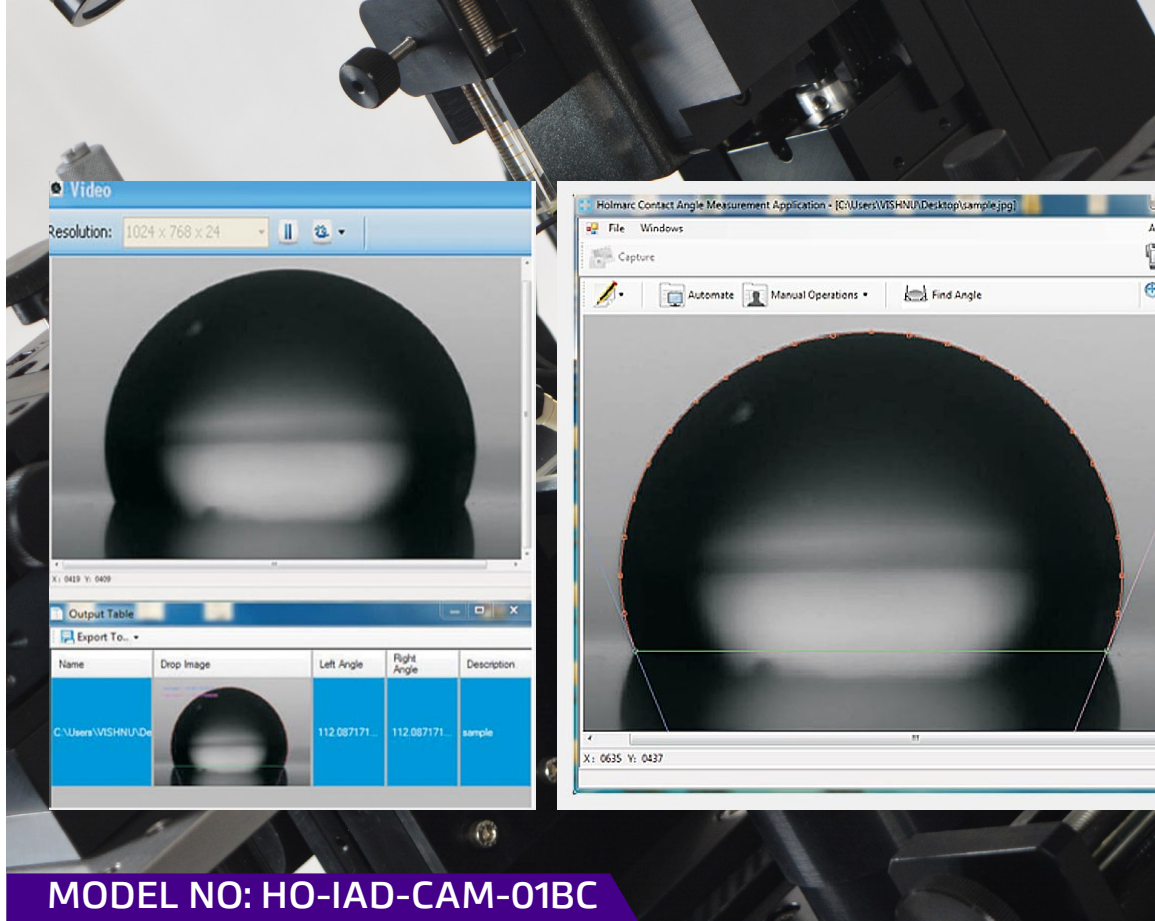
MODEL NO: HO-IAD-CAM-01BC

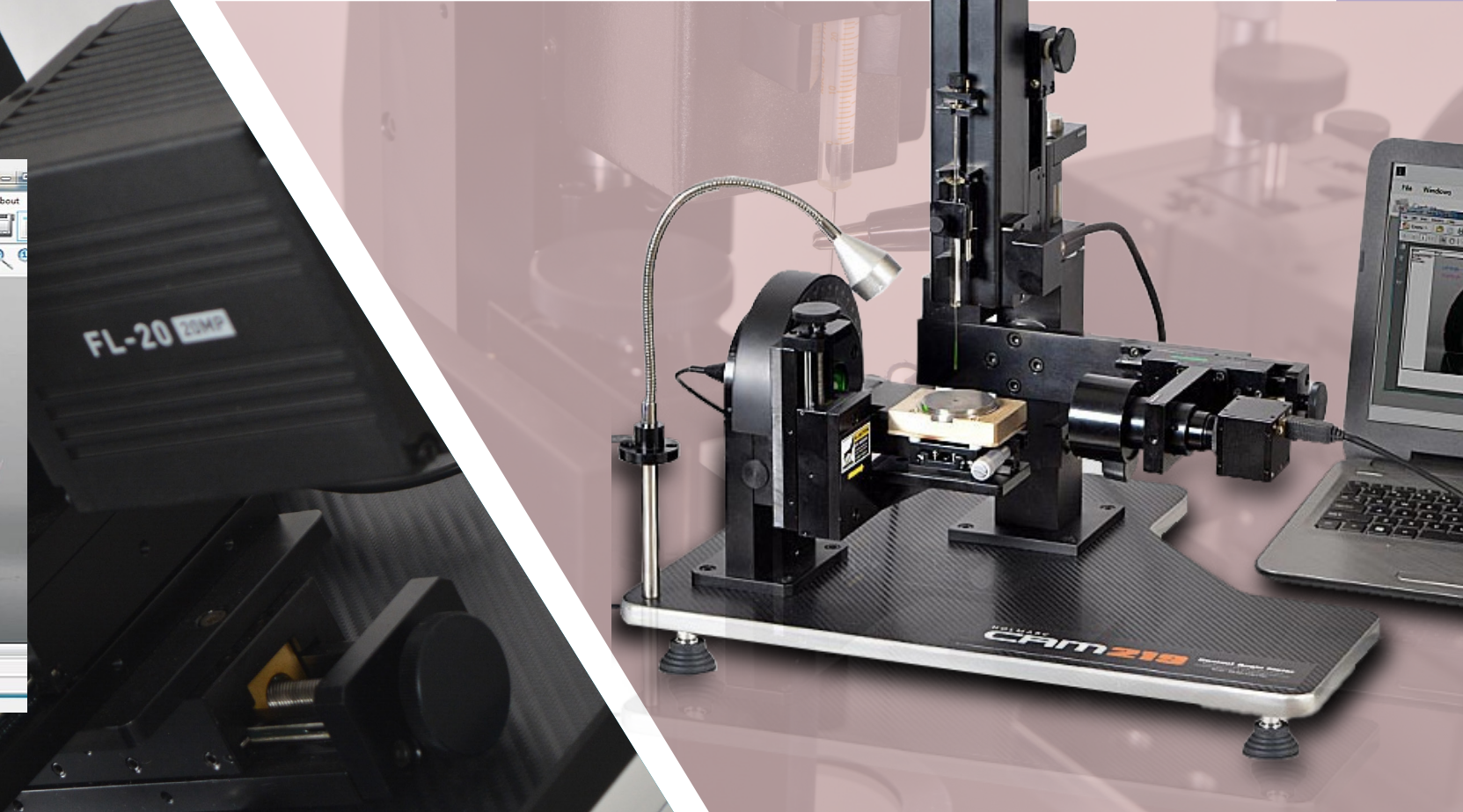


State-of-the-art optics, precise opto-mechanics, high-resolution CMOS detector and associated electronics used in our instrument guarantee error free measurements. Manual and automatic dosing of liquids can be done using our system.

Standard off the shelf syringes can be integrated from 0.4 to 20 ml, from any manufacturer.

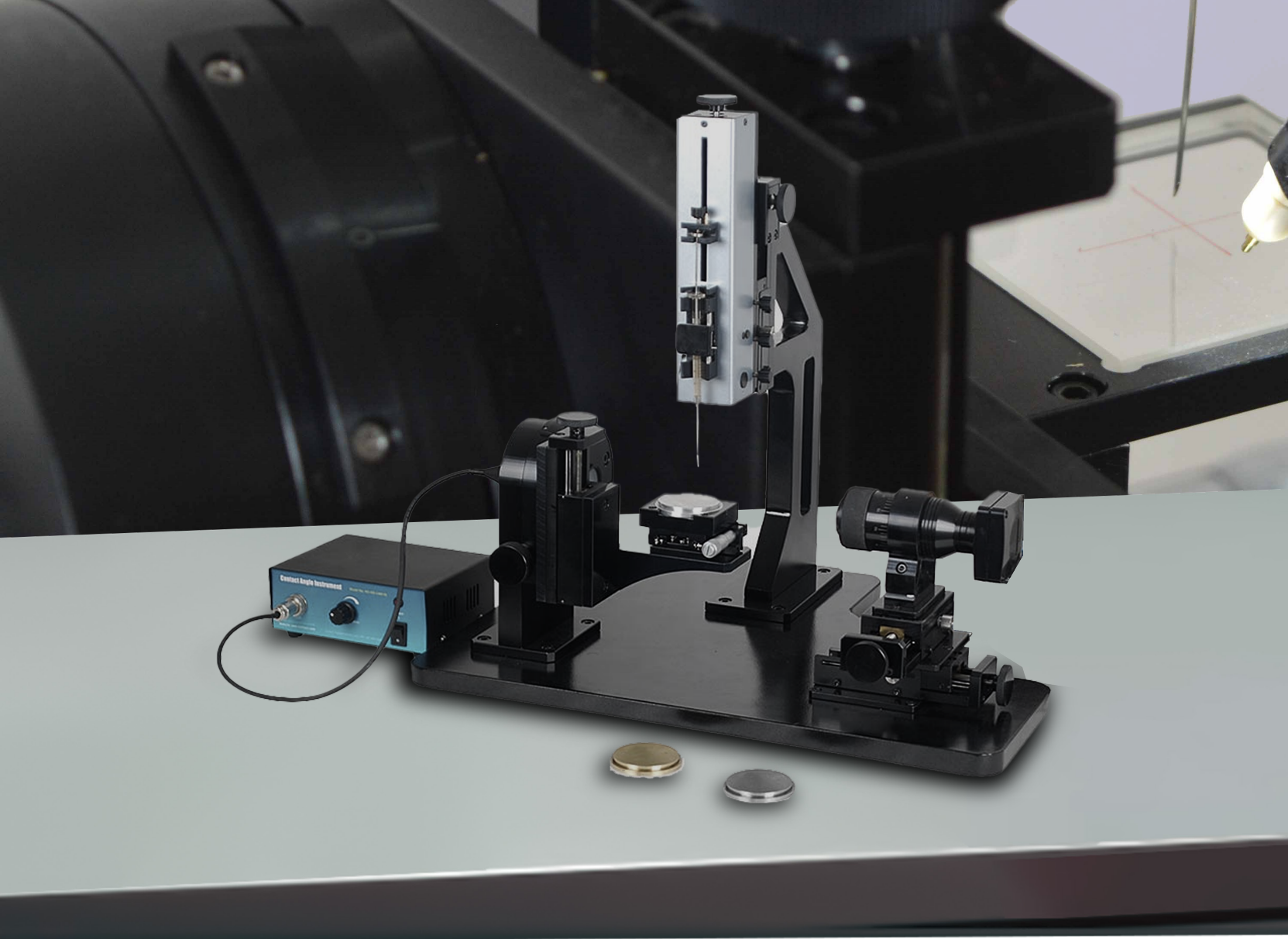
Compatible with glass, plastic and SS syringes.





SPECIFICATIONS

Measuring method	Sessile drop method
Analysis method	Automatic curve fit analysis using drop snake method.
Optics	High performance aberration corrected imaging lens with precise manual focus adjustment.
Measurement angle range	0 - 180 degree
Measurement accuracy	≤ 1 degree
Camera type	CMOS Sensor
Image Resolution in Pixels	2592 x 1944 (typical, max.)
Video system	High performance CMOS sensor and suitable shielded cable of minimum 3 m length
Dispenser to camera positioning unit	Designed for top view
Illumination mechanism	LED based diffused lighting
Illumination Units	Fixed backlit LED illuminator and angled illuminator for top view imaging
Liquid dispenser	Through motorized syringe pump; suitable for both motorized and mechanical type
	Three syringes with 50, 100 and 250 micro litre capacity will be included
Temperature of test base	Adjustable from ambient to 100°C
Substrate / sample holder	It will be rotatable in the range 180° from its horizontal position; Height adjustable
Substrates	Aluminum, brass and stainless steel (1 each)
Focusing	≥ 75 mm travel of CMOS / Optics assembly to fine focus the ima
Other accessories	For live image / video capturing and contact angle measurements, windows operating system (OS) compatible processing software is included. The system has provision for : i. Static and dynamic contact angle measurement ii. Contact angle hysteresis, iii. Roll-of Angle
Input power	230 VAC, 50Hz
Warranty	The complete unit will have minimum one year warranty from the date of installation
The system has rigid & vibration resistant construction suitable to operate on a table top	
# Laptop is not in scope of supply	



Model : HO-IAD-CAM-01

Contact Angle Meter - Base Model

Holmarc's Contact Angle Meter (Model No: HO-ED-M-01) is a compact and cost effective CMOS based instrument for measuring contact angles of liquids over solid substrates. It has manual dispensing unit with camera interface for measuring contact angle of liquids on solid surfaces. The surface over which contact angle is to be measured is held in horizontal position to find out contact angle using

sessile drop method.

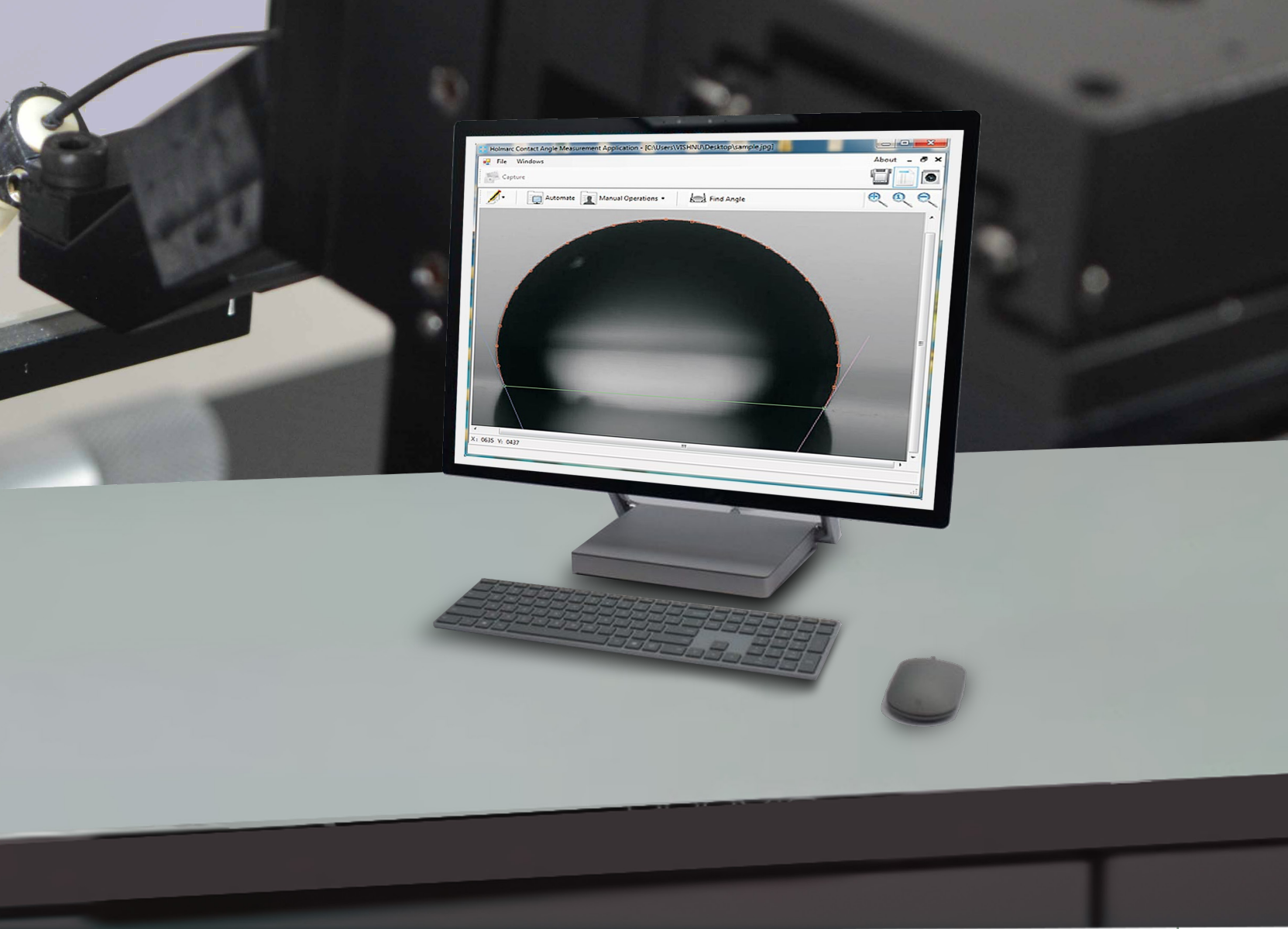
State-of-the-art optics, precise opto-mechanics, high-resolution CMOS detector and associated electronics used in our instrument guarantee stable and accurate measurements. The illumination intensity of the back light LED can be controlled.. The surface over which contact angle is to be measured can be rotated through 180 degree

from its horizontal position for advanced contact angle study and to find out contact angle hysteresis.

The wettability of a droplet is also dependent on the substrate in contact with the liquid. We provide 3 different substrates along with the equipment - made of aluminium, brass and stainless steel. However, the substrate according to customers' choice can also be loaded into the

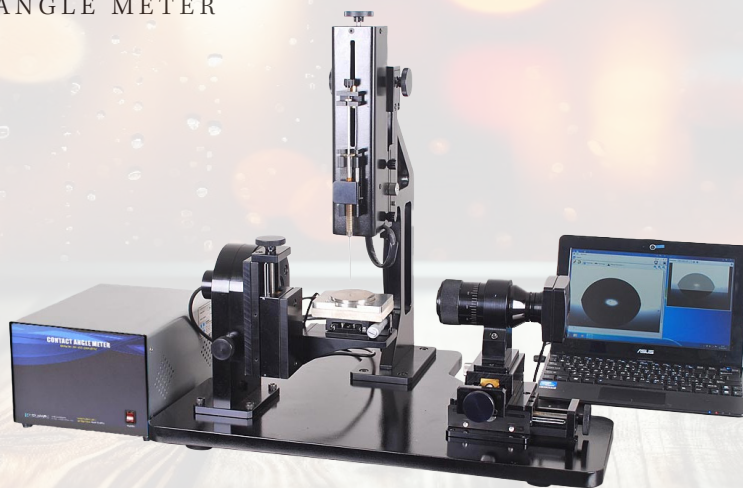
equipment.

Standard off the shelf syringes can be integrated from 0.4 to 20 ml, from any manufacturer. The equipment is compatible with glass, plastic and SS syringes. Three chromatographic syringes with 50 micro litre, 100 micro litre and 250 micro litre capacity are supplied along with the equipment.



SPECIFICATIONS

Measuring method	Sessile drop method
Analysis method	Automatic curve fit analysis using drop snake method.
Optics	High performance aberration corrected imaging lens with precise manual focus adjustment.
Camera type and FPS	CMOS Sensor
Image Resolution in Pixels	2592 x 1944
Video system	High performance CMOS Sensor. 3m shielded USB cable included.
Video Resolution in Pixels	640 x 480 at 17 fps , 1280 x 960 at 10 fps 1920 x 1080 at 9 fps , 2048 x 1536 at 6 fps 2592 x 1944 at 4 fps
Lighting	LED Based diffused lighting mechanism.
Dispenser	Mechanical dispenser with precise control.
Dimension	350 x 125 x 350 mm
Weight	30 kg (approx)
Power supply	230VAC, 50 Hz. / 110V AC, 60Hz (Optional)
Other specifications	15mm height adjustment for Sample holder. 180 degree rotation for the sample holder. 75mm XY travel provided for the CMOS - optics assembly. Rotatable screws provided beneath the base for levelling purpose.
# Laptop is not in scope of supply	



Model : HO-IAD-CAM-01A

Contact Angle Meter with Rotatable Substrate Holder & Automated Dispenser

Holmarc's Contact angle meter Model no: HO-IAD-CAM-01A is an instrument for research as well as industrial application with motorized syringe pump for precise dispensing and with camera interface for measuring contact angle of liquids on solid. Video capturing and video image processing features are included in Holmarc Contact angle analysis software.

State-of-the-art optics, precise opto-mechanics, high-resolution CMOS detector and associated electronics

used in our instrument guarantee stable and accurate measurements. The illumination intensity of the back light LED can be controlled using the software. The flow rate and volume to be dispensed can be controlled from the software. Three chromatographic syringes with 50 micro litre, 100 micro litre and 250 micro litre capacity are supplied along with the equipment. Standard off the shelf syringes can be integrated from 0.4 to 20 ml, from any manufacturer. The equipment is compatible with glass, plastic and SS syringes.

SPECIFICATIONS

Measuring method	Sessile drop method
Analysis method	Automatic curve fit analysis using drop snake method.
Optics	High performance aberration corrected imaging lens with precise manual focus adjustment.
Camera type	CMOS Sensor
Image Resolution in Pixels	2592 x 1944 (Max.)
Video system	High performance CMOS Sensor. 3m shielded USB cable included.
Video Resolution in Pixels	640 x 480 at 17 fps , 1280 x 960 at 10 fps 1920 x 1080 at 9 fps , 2048 x 1536 at 6 fps 2592 x 1944 at 4 fps
Lighting	LED Based diffused lighting mechanism.
Dispenser	Mechanical & Motorized dispenser.
Dimension	500 x 400 x 498 mm
Weight	35 kg (approx)
Power supply	230VAC, 50 Hz. / 110V AC, 60Hz (Optional)
Other specifications	30mm height adjustment for Sample holder. 180 degree rotation for the Sample Holder. 75mm XY Travel provided for the CMOS - Optics assembly. Rotatable screws provided beneath the base for levelling.
# Laptop is not in scope of supply	



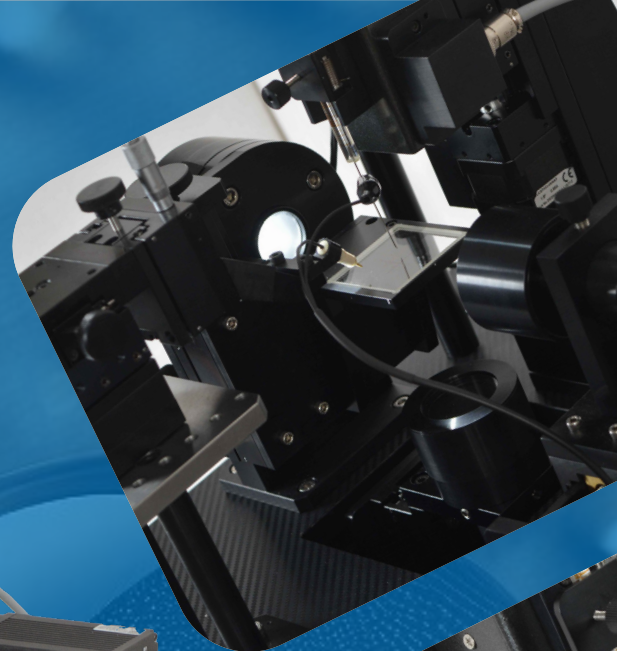
Model : HO-IAD-CAM-01B

Contact Angle Meter with Rotatable Substrate Holder, Automated Dispenser & Temperature Control

Holmarc's Contact angle meter Model no: HO-IAD-CAM-01B is an advanced model with automated dispenser, rotatable substrate holder and temperature control. Additional feature from the Model: HO-IAD-CAM-01A is that this model is equipped with temperature control for the substrate holder (up to 100 degree Celsius from ambient). This proves to be ideal for the study of contact angle variations with respect to temperature. Video capturing and video image processing features are included in Holmarc Contact angle analysis software. The surface over which contact angle is to be measured can be rotated through 180 degree from its horizontal position for advanced contact angle studies

and to find out contact angle hysteresis. State-of-the-art optics, precise opto-mechanics, high-resolution CMOS detector and associated electronics used in our instrument guarantee stable and accurate measurements. The illumination intensity of the back light LED can be controlled using the software. The flow rate and volume to be dispensed can be controlled from the software. Three chromatographic syringes with 50 micro litre, 100 micro litre and 250 micro litre capacity are supplied along with the equipment. Standard off the shelf syringes can be integrated from 0.4 to 20 ml, from any manufacturer. The equipment is compatible with glass, plastic and SS syringes.

Measuring method	Sessile drop method
Analysis method	Automatic curve fit analysis using drop snake method.
Optics	High performance aberration corrected imaging lens with precise manual focus adjustment.
Camera type	CMOS Sensor
Image Resolution in Pixels	2592 x 1944 (Max)
Video system	High performance CMOS Sensor. 3m shielded USB cable included.
Video Resolution in Pixels	640 x 480 at 17 fps , 1280 x 960 at 10 fps 1920 x 1080 at 9 fps , 2048 x 1536 at 6 fps 2592 x 1944 at 4 fps
Lighting	LED Based diffused lighting mechanism.
Dispenser	Mechanical & Motorized dispenser.
Dimension	500 x 400 x 498 mm
Weight	35 kg (approx)
Power supply	230VAC, 50 Hz. / 110V AC, 60Hz (Optional)
Test base temperature	Ambient to 100°C
Other specifications	30 mm height adjustment for Sample holder. 180 degree rotation for the Sample Holder. 75mm XY Travel provided for the CMOS - Optics assembly. Rotatable screws provided beneath the base for levelling purpose.
# Laptop is not in scope of supply	





HOLMARC

INGA 23

**CONTACT
ANGLE
METER**



Holmarc Opto-Mechatronics Ltd has been organized as a provider of engineering tools for scientific research. Our company is equipped to meet most challenging and demanding requirements of scientific community with our manufacturing and development capabilities in optics, mechanics, electronics and software. At Holmarc, experienced engineers, designers and technicians work hand in hand to deliver state of the art engineering solutions to our clients.

All of us at Holmarc stay tuned to absorb the changes in technology as fast as possible. We deliberately keep our technical skills as well as manufacturing infrastructure flexible and maintain a dynamic work culture throughout our operations.

We have distributors and collaborators in all parts of the world and are well equipped to serve world scientific community. We welcome queries irrespective of geographical and political boundaries.

Office & Factory Address

Mailing Address
B.7., HMT Industrial Estate, H.M.T.P.O,
Kalamassery 683503, Kerala, India

Phone Contacts

+91 920-719-7771
+91 920-719-7772
+91 920-719-7776

CIN : U33125KL1993PLC006984
GST No: 32AAACH9492C1ZQ
MSME : UDYAM-KL-02-0043524
ISO 9001:2015 Certified

Visit Us @
Email : sales@holmarc.com
Website : www.holmarc.com

Get in touch with our technical experts and discuss your application needs and unique requirements. You can be sure that you will receive rapid response and service.

HMV-08AUG24-08