



A Mesa Labs company

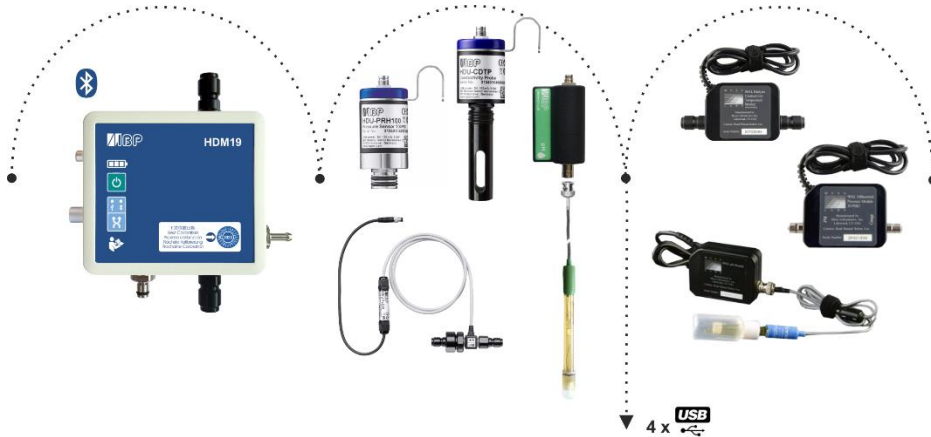
# SmartHDM

Introducing the new SmartHDM System from Mesa Labs and IBP. The SmartHDM System is the first tablet-based meter system designed for service of medical instrumentation.

## HDM Sensors Modules

## HDU Sensors

## 90XL Sensors



## APPLICATION INCLUDES

### Conductivity

- » Hemodialysis machines
- » RO Water Systems
- » Water Treatment

### Pressure

- » Hemodialysis machines
- » Ophthalmological lasers
- » Blood pressure meters
- » Automatic tourniquets
- » Drainage devices
- » IV pumps
- » Diagnostic, surgical suction
- » Ventilators
- » Pressure gauges

### Temperature

- » Hemodialysis machines
- » Temperature monitors
- » Electronic thermometers
- » Humidifiers/nebulizers
- » Blood warmers
- » Hypo/hyperthermia machines
- » Infant incubator
- » Radiant warmers

### Flow

- » Hemodialysis machines
- » RO Water Systems
- » Water Treatment

## SmartHDM SYSTEM

- » Android powered display units with four USB-A-Interfaces
- » Sensors and measuring modules
- » Sophisticated Software with class changing features

### New Concept

SmartHDM is a new approach combining a family of intelligent sensors, measuring modules and a smart handheld device for testing and quality control of medical devices. The product line combines more than 40 years of experience in innovative measuring device development.

### Customizable

The modular concept of the SmartHDM system allows the use of any combination of IBP and Mesa sensors and modules to fulfill a specific measuring application.

### Customizable

The SmartHDM System is modular and allows the use of any combination of IBP HDU and Mesa Laboratories sensors to measure Conductivity, Pressure, pH, Temperature and Flow.

The SmartHDM software is specially tailored to the requirements for the service and maintenance of medical devices.

The SmartHDM system was designed with the needs of a service technician in mind.

# HDU- and 90XL-Sensors

## Flexibility

The HDU- and 90XL sensor families fulfill the need for high accuracy and reliability, whether it be for taking conductivity, temperature, pressure, pH or flow readings. For annual calibration, only the sensors are needed.

## Different Versions

- » Conductivity
- » Temperature
- » Pressure
- » Flow
- » pH

## HDU-Sensors



Pressure



Flow

Different adapter such as Luer allows easy connection to any device.



Conductivity and Temperature

pH-Interface

A flow through adapter allows easy connection to dialysis machines.



## HDU-Sensor Specifications

### PRESSURE

#### HDU-PRS30

Range	-13,5 to 36,7 psi -700 to +1900 mmHg
Resolution	0.01 mmHg
Accuracy	0 to 300 mmHg $\pm$ 1 mmHg Otherwise $\pm$ 2 mmHg
Overpressure	2 x full scale
Media compatibility	Gasses and fluids

### CONDUCTIVITY

#### HDU-CDTP

#### Conductivity

Range	0 to 200.00 mS/cm
Accuracy	0 to 199 $\mu$ S/cm $\pm$ 0.6 $\mu$ S/cm 200 to 1999 $\mu$ S/cm $\pm$ 6 $\mu$ S/cm 2 to 11.99 mS/cm $\pm$ 0.06 mS/cm 12 to 19.99 mS/cm $\pm$ 0.03 mS/cm 20 to 200 mS/cm $\pm$ 0.6% of reading
Temperature Compensation	Referenced to 25°C Adjustable via multiple modes: linear one value, dynamic two values, nLF-Iso - nonlinear according to ISO7888

### Temperature

Range	0 to 100 °C
Resolution	0.01 °C
Accuracy	$\pm$ 0.1 °C

### FLOW

#### HDU-FL100.2000

Measuring principle	Turbine
Range	100 to 2000 ml/min
Resolution	1 ml/min
Accuracy	$\pm$ 2.0 % of reading
Repeatability	better $\pm$ 0,5%
Fluid temperature	-20°C to +80°C
Pressure	0 to 5 bar at 22°C

### pH

#### HDU-pH-I

Range	0 to 14 pH
Resolution	0.01 pH
Accuracy	$\pm$ 0.02 pH

For more HDU-Sensors visit [www.ibpmt.com](http://www.ibpmt.com)

## 90XL-Sensors

The 90XL-Sensors are part of the Mesa DiallyGuard product family. The 90XL sensors can be connected to HDC systems with a special interface cable.



pH-Interface

## DiallyGuard

by Mesa Labs



Conductivity and Temperature



Pressure

# HDM19 Measuring Module Family

Smart reference module family for the service and calibration of hemodialysis machines.

## Different Versions

- » Flow-through measuring cell for Conductivity, Temperature and Pressure
- » Pressure sensor for external sources
- » Dialysate pressure relieve valve for the service of Fresenius dialysis machines
- » USB and Bluetooth Interfaces
- » Internal Battery

## Multifunctional

The HDM19 sensor modules are specially designed for the service of hemodialysis machines. The modules can be used with any brand of dialysis machine.

The HDM19 modules feature a USB and Bluetooth interface for convenient connection to Android devices such as HDC84. The internal rechargeable battery makes the module independent from the Android device battery.

## Daily Use

The HDM-Modules have been developed having the busy Biomed technician in mind. Helpful accessories such as the IVPole adapter and a pressure tubing set are included in the delivery.

## SmartHDM-System

The HDM-Module is part of the SmartHDM-System and fulfills the need for high accuracy and reliability, whether it be for taking conductivity, temperature or pressure readings. The sensors intelligently communicate via USB or Bluetooth with the HDC display unit.

All HDM19 modules have a connection for HDU sensors, allowing to connect sensors from the HDU family.



# HDM19

Smart Reference Module Family for the Service and Calibration of Hemodialysis Machines

## Different Versions

	USB Interface	Bluetooth Interface	Conductivity Temperature	Pressure Extern	Pressure Intern	Pressure Relieve Valve
HDM19-BO	■	■	■	■		
HDM19-UM	■	■	■	■	■	■

## Conductivity/Temperature

The Conductivity, temperature sensors are integrated into the flow-through path of the device.

Years of experience with modern design and testing have proven that our 4-pole electrode in carbon plastic technology provides superior performance.

The SmartHDM software allows to select Conductivity/ Temperature compensation coefficients by brand name, ensuring high accuracy conductivity measurement.

## Pressure Flow-Through

The UM- and BS- module versions feature an internal pressure sensor integrated into the flow-through path for the dialysate. In combination with the external pressure sensor real transmembrane pressure can be measured. The software allows pressure change measurement.

## Pressure External

The pressure sensor has an external connector. The software allows pressure change measurement.

## Pressure Ventilation Valve

The UM module version feature a pressure ventilation valve. This functionality can be used for special test procedures on dialysis machines to open the flow through path to the environment. The valve can be activated by the SmartHDM-Software. The valve outlet on the right side of the module.

## USB-Interface

With different interface cable, the module can be connected to USB with Type A or C connectors.

## Bluetooth-Interface

The HDM19 has a Bluetooth interface that allows wireless communication with the display unit.

## HDU-Sensor Specifications

### CONDUCTIVITY

Range	0 to 30.00 mS/cm
Accuracy	0 to 199 uS/cm 0,3% ± 0.6 uS/cm 200 to 1999 uS/cm ± 6 uS/cm 2 to 11.99 mS/cm ± 0.06 mS/cm 12 to 15.99 mS/cm ± 0.03 mS/cm 16 to 30 mS/cm ± 0.06 mS/cm

Temperature Compensation	Referenced to 25°C Adjustable via multiple modes: linear 1 value, dynamic 2 values, nLF-Iso - nonlinear according ISO7888
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### TEMPERATURE

Range	0 to 100 °C
Resolution	0.01 °C
Accuracy	0.1°C

### PRESSURE INTERN – Flow through pass

Range	- 13,5 to 36,7 psi - 700 to + 1900 mmHg
Resolution	0.01 mmHg
Accuracy	± 2 mmHg
Selectable units	mmHg, kPa Bar or PSI
Overpressure	2 x full scale

### PRESSURE EXTERN – External connector

Range	- 13,5 to 36,7 psi - 700 to + 1900 mmHg
Resolution	0.01 mmHg
Accuracy	0 to 300 mmHg ± 1 mmHg Otherwise ± 2 mmHg
Selectable units	mmHg, kPa Bar or PSI
Overpressure	2 x full scale

### INTERFACES

Communication	USB 2.0, also charger connector M8-Connector for HDU-Sensor HDM19 only: Bluetooth Low Energy (BLE) Bluetooth 4.2 Certified to: FCC, IC, CE, KCC, NCC and SRRC
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### General

Protection Class	Ip64
Dimensions	155 x 115 x 55 mm
Weight	0,8 Kg
Power	Li-ion polymer battery 3,7 V / 5000 mAh, External charger

# SmartHDM Software

The SmartHDM software is specially tailored to the requirements for the service and maintenance of medical devices.

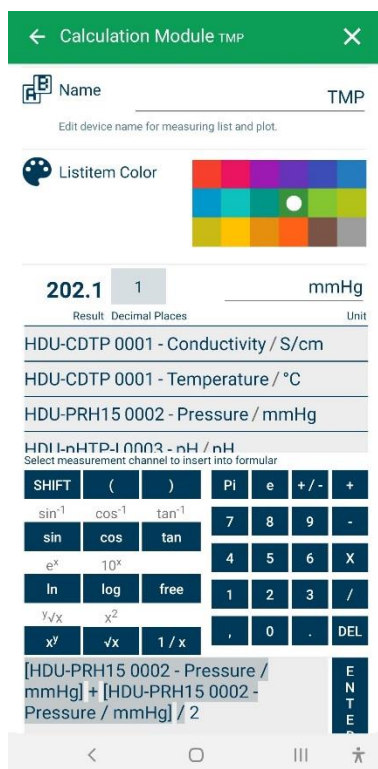
The SmartHDM software has amazing features that fundamentally will change your expectations about measuring instruments.

## Features Include

- » Numerical and graphical readings of measuring values
- » Extensive options for the display of measured values
- » Display of statistical measuring data
- » Helpful functions such as pressure change measurement
- » Data acquisition
- » Data export
- » Supports different languages

## Special Functions

The user can add additional calculation channels. The calculation channels behave in the system like normal measurement channels and can be integrated both in the list and graphical display.



The formulas for the calculations can be easily edited and allow the insertion of measurement channels and any mathematical expressions.

## Display Modes

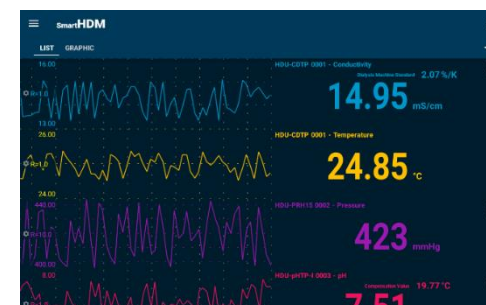
Various measured value displays always allow a perfect representation of the measured values.



One of the highlights of the APP is the representation of the Pareto distribution for measured values. It includes statistical values and allows the assessment of the stability of measured values.



The picture below shows a special landscape dark mode combining value and graphic readings.





# HDC Display and Control Units

The HDC-Devices are based on the popular Android operating system. This allows using all the features of a modern smart mobile device. Data handling was never so easy. Large batteries and robust mechanical design make the devices suitable for everyday use.

A clamp is included to attach the devices to an IV pole. This clamp also allows the user to set up the HDC device in a tilt position on a flat surface.



## HDC84 not for sale in the USA

- » 8" Capacitive touch screen
- » Large 29.6 Wh battery for long continues work
- » 4 USB-A-Interfaces for sensor connection
- » Android operating system

## Quality

Our products are developed and produced under a quality management system, according to ISO 13485. We offer an annual sensor calibration service with certification following the ISO 17025 standard.

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