



Portable Turbidity Meter

LB-19PTM

Portable Turbidity Meter LB-19PTM

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2. Introduction

Portable Turbidity Meter LB-19PTM measures turbidity from 0 to 1100 NTU, 0 to 275 EBC, and 0 to 9999 ASBC using a 30 ml sample. It uses the nephelometric method with an infrared diode and silicon photodiode for fast, accurate results. It offers both single and continuous measurement modes for versatile operation. Our turbidity meter is equipped with an easy-to-read LCD, ensuring user-friendly handling.

3. Features

- Supports NTU, FNU, EBC, and ASBC units
- Auto-power off for extended battery life
- Customizable setup menu and factory reset function
- Auto power-off function

4. Specifications

Model No.	LB-19PTM
Measurement Range	0 to 1100 NTU
	0 to 275 EBC
	0 to 9999 ASBC
Resolution	0.01 (0 to 99 NTU)
	0.1 (100 to 999 NTU)
	1 (1000 to 1100 NTU)
Accuracy	± 2% of reading (0 to 500 NTU)
	± 3% of reading (501 to 1100 NTU)
Measurement Principal	ISO 7027 nephelometric method (90°)
Sample Volume	30 mL
Operating Temperature Range	0 to 50°C
Calibration Points	2 to 5 points
Calibration Standards	0.02, 10, 200, 500, 1000 NTU
Light Source	Infrared-emitting diode (850 nm wavelength)
Detector	Silicon photodiode
Stray Light	< 0.02 NTU
Sample Vial	60 × 25 mm
Memory Capacity	100 data sets
Communication Interface	USB
Display	Custom LCD (60 × 40 mm)
Power	3 × 1.5V AA batteries/DC5V power adapter
Dimensions (L × W × H)	180 × 85 × 70 mm
Packaging Dimensions (L × W × H)	280 × 80 × 230 mm
Net Weight	300 g
Gross Weight	1.5kg

5. Applications

Portable Turbidity Meter LB-19PTM is used for measuring water clarity and assessing contamination levels. It is used for environmental monitoring, water treatment, and laboratory analysis.

6. Instrument Introduction

6.1 Components of the Meter

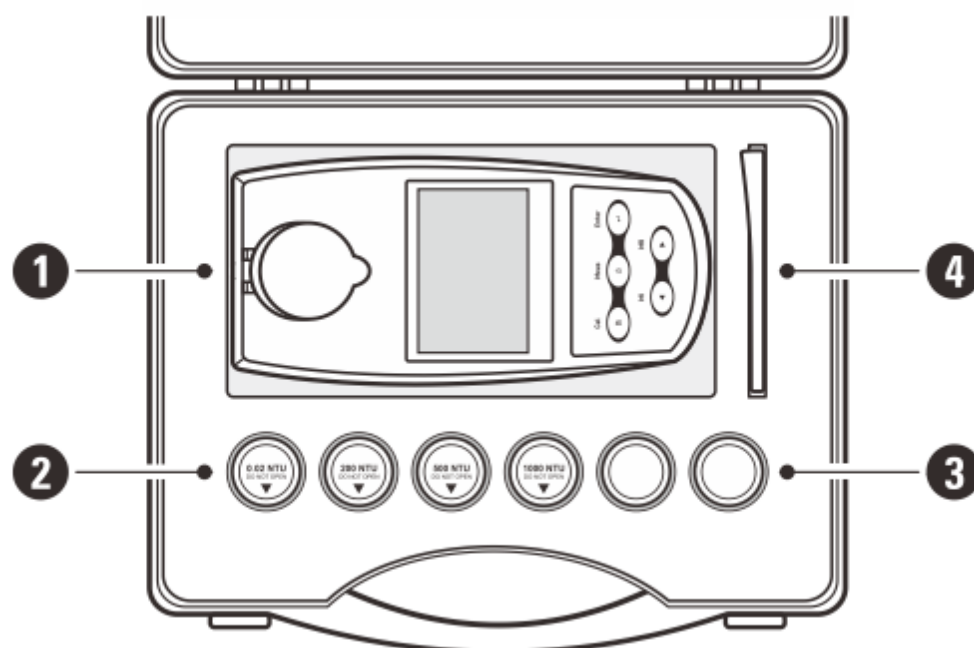


Figure 1

1. LB-19PTM Meter
2. Turbidity Standards
3. Sample vials
4. Lint-free cloth

During manufacturing, the sample vial in the measurement chamber was indexed with the 0.02 NTU and 10 NTU standards.

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6.2 Meter Description

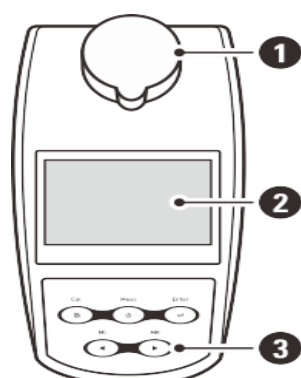


Figure 2

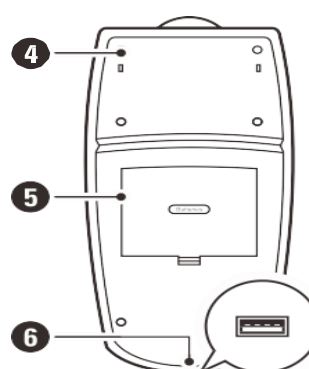


Figure 3

1.	Measurement chamber
2.	Display
3.	Membrane keypad
4.	Measurement module
5.	Battery compartment
6.	USB-A interface for connection to a computer or power adapter

Keypad

Key	Function
Meas 	- Switch the meter on or off. - Start the measurement. - Exit the calibration, settings, and data logs, and return to the measurement mode.
Cal 	- Start calibration. - Press and hold the key to enter the setup menu.
MI 	- Store the current reading in memory. - Increase the value or scroll up through a list of options.
MR 	- View the data logs. - Decrease the value or scroll down through a list of options.
Enter 	Confirm the calibration or the displayed option.

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Display

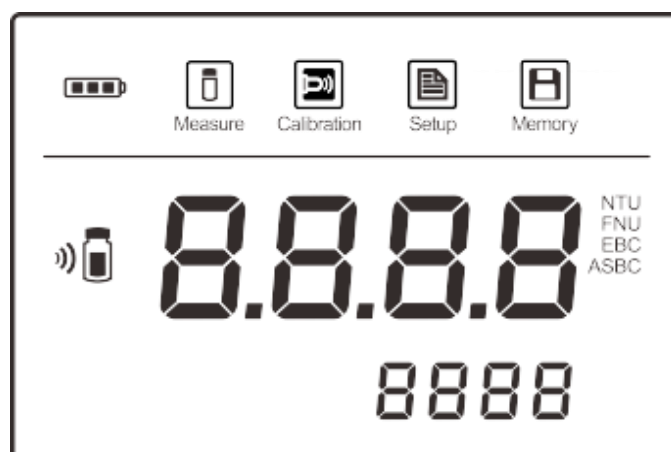


Figure 4

Icon	Description
	Indicates that the meter is in measurement mode.
	Indicates that the meter is in calibration mode.
	Indicates that the meter is in setup mode.
	Indicates that you are viewing stored readings or readings have been stored in memory.
	Indicates that the meter is calibrating.
	Shows the battery status. Replace the batteries if the icon disappears.

7. Installation

7.1 Installing the Batteries

1. Remove the battery compartment cover from the back of the meter.

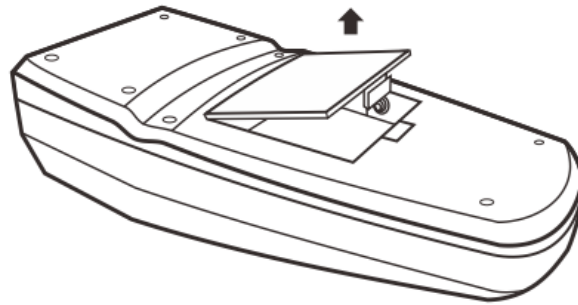


Figure 5

2. Insert three AA batteries into the battery compartment, ensuring the correct polarity.

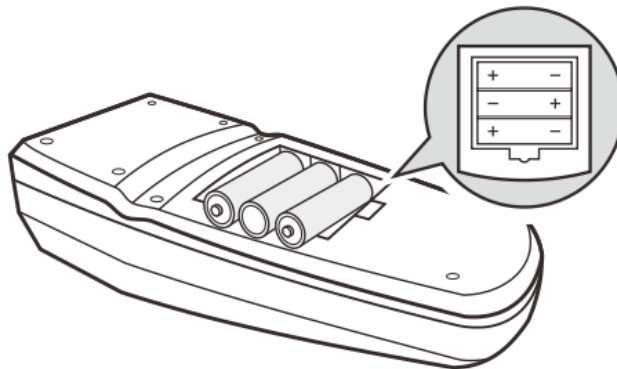


Figure 6

3. Replace the battery compartment cover to its original position and push the limiter until it locks securely.

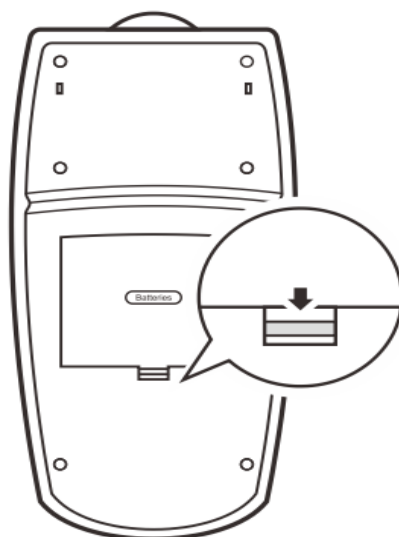


Figure 7

The meter can be powered using a 5V DC power adapter or a computer's USB port.

Note: Remove the batteries before connecting an external power supply.

8. Operations

8.1 Operating Principle

The LB-19PTM Portal Turbidity Meter operates based on the nephelometric principle of turbidity measurement and is designed to meet the criteria specified in ISO 7027.

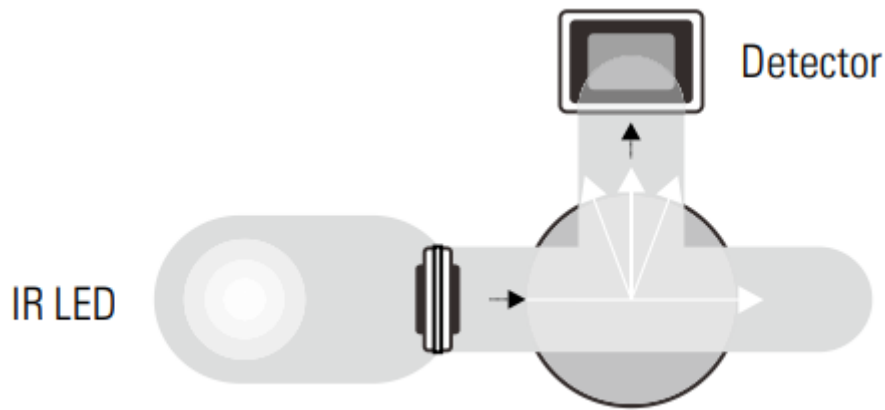


Figure 8

8.2 Switching the Meter ON and OFF

- Press  the key to switch on the meter.
- Press and hold  the key to switch off the meter.



Figure 9

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8.3 Meter Setup

The LB-19PTM Portal Turbidity Meter's setup menu contains 8 items.

The following table describes the functions of each option.

Menu Item	Option and Description									
CAL	Calibration Points Set the number of calibration points. <table><tr><td>2</td><td>2 to 5 points (default 2 points)</td></tr></table>		2	2 to 5 points (default 2 points)						
2	2 to 5 points (default 2 points)									
DATE	Date and Time Set the date and time for data logs.									
UNIT	Measurement Unit Set the default turbidity unit. <table><tr><td>NTU</td><td>Nephelometric turbidity unit (default)</td></tr><tr><td>FNU</td><td>Formazin nephelometric unit</td></tr><tr><td>EBC</td><td>European Brewing Convention</td></tr><tr><td>ASBC</td><td>American Society of Brewing Chemists</td></tr></table>		NTU	Nephelometric turbidity unit (default)	FNU	Formazin nephelometric unit	EBC	European Brewing Convention	ASBC	American Society of Brewing Chemists
NTU	Nephelometric turbidity unit (default)									
FNU	Formazin nephelometric unit									
EBC	European Brewing Convention									
ASBC	American Society of Brewing Chemists									
RESO	Resolution Set the Resolution of the turbidity measurement. <table><tr><td>0.01</td><td>0.01 (Default)</td></tr><tr><td>0.1</td><td>0.1</td></tr></table>		0.01	0.01 (Default)	0.1	0.1				
0.01	0.01 (Default)									
0.1	0.1									
HOLD	Auto-Hold Set the measurement mode. <table><tr><td>YES</td><td>Single measurement (default)</td></tr><tr><td>NO</td><td>Continuous measurement</td></tr></table>		YES	Single measurement (default)	NO	Continuous measurement				
YES	Single measurement (default)									
NO	Continuous measurement									
OFF	Auto-Power Off If enabled, the meter will automatically switch off if no key is pressed within 15 minutes. <table><tr><td>YES</td><td>Enable</td></tr><tr><td>NO</td><td>Disable (default)</td></tr></table>		YES	Enable	NO	Disable (default)				
YES	Enable									
NO	Disable (default)									
CLR	Clear Stored Data Delete all data logs in the memory. <table><tr><td>YES</td><td>Enable</td></tr><tr><td>NO</td><td>Disable (default)</td></tr></table>		YES	Enable	NO	Disable (default)				
YES	Enable									
NO	Disable (default)									
RSF	Factory Reset Reset the meter to factory default settings. Note that the meter must be recalibrated. <table><tr><td>YES</td><td>Enable</td></tr><tr><td>NO</td><td>Disable (default)</td></tr></table>		YES	Enable	NO	Disable (default)				
YES	Enable									
NO	Disable (default)									

1. Setting Default Option

- 1) In the measurement mode, press and hold the  key to enter the setup menu, and press the ◀/▶ key to select a menu item.



- 2) Press the Enter key, and the meter will display the current option.
- 3) Press the ◀/▶ key to select a default option and press the Enter key to save.



2. Setting the Date and Time

- 1) Press and hold the  key to enter the setup menu while in measurement mode.
- 2) Press the ▶ key until the meter shows *DATE/P-2*.
- 3) Press the **Enter** key, and the meter shows the current year.



- 4) Press the ◀/▶ key to set the year and the Enter key to switch to the date and time options.
- 5) Press the ◀/▶ key to set the month, day, hour, and minute, and press the Enter key to save until the meter returns to the measurement mode.

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To exit the setup menu without saving changes, press the Meas key.

8.4 Measurement and Calibration Hints

- Do not hold the meter in your hand during calibration or measurement.
- Never pour liquid directly into the measurement chamber.
- Keep the outside of the vial clean and dry. If necessary, wipe it with a lint-free cloth.
- If the vial has scratches or scuffs, replace it with a new one.
- Ensure that the sample is homogeneous. Avoid shaking or agitating the solution violently to prevent air bubbles.
- During the calibration and measurement processes, align the triangle mark on the vial with the arrow on the meter.
- Always close the light shield lid to prevent measurement errors caused by ambient light.
- Wash the vial thoroughly with distilled water after each measurement, as any residue can cause inaccurate readings.

8.5 Turbidity Calibration

- The LB-19PTM Portal Turbidity Meter allows calibration up to 5 points, with a minimum of 2 points.
- The default calibration points include 0.02, 10, 200, 500, and 1000 NTU. For better accuracy, we recommend selecting a calibration point close to the sample value being measured.

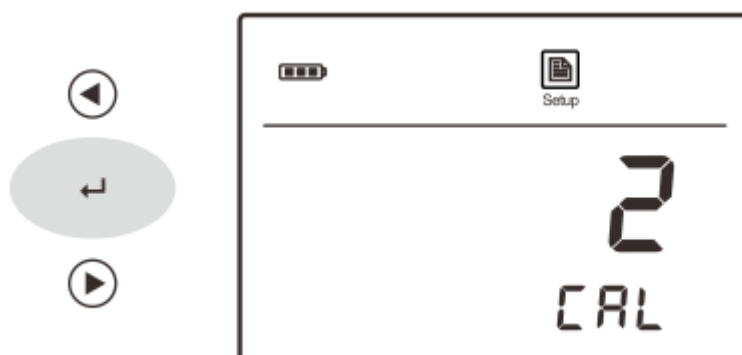
Note: The meter is calibrated with Formazin Standards at the factory and does not require user calibration before use.

8.5.1 Selecting the Number of Calibration Points

- 1) Press and hold the  key to enter the setup menu.



- 2) Press the **Enter** key, and the meter shows 2/CAL (2 points calibration).
- 3) Press the ◀/▶ key to select the number of calibration points.
- 4) Press the **Enter** key to confirm.



8.5.2 Calibrating the Meter

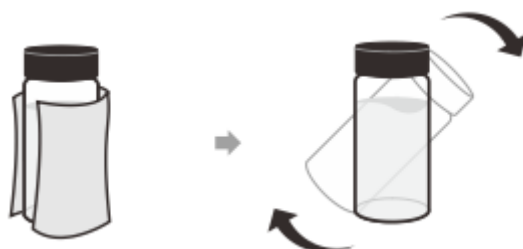
- 1) Press the **Cal** key, the meter enters the calibration mode, and the display shows 0.02 NTU/CAL 1.



If necessary, press the ▶ key to select the first calibration point, and the meter will perform the calibration from low to high turbidity.

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- 2) Take out the corresponding turbidity standard from the carrying case (e.g., 0.02 NTU). Wipe the vial with a lint-free cloth to remove any fingerprints. Hold the vial cap and gently invert the vial several times. Ensure that the turbidity standard is homogeneous and free of air bubbles.



- 3) Insert the vial into the measurement chamber. Align the triangle mark on the vial cap with the arrow on the meter. Close the light shield lid.



- 4) Press the **Enter** key to begin calibration. The  icon will flash continuously.



- 5) When the reading stabilizes, the meter will automatically show the next calibration point. If necessary, press the  key to select a desired calibration point.
- 6) Repeat steps 2 through 4 above until the meter shows **End**. Calibration is completed.
- To exit the calibration without saving the calibrated value, press the **Meas** key.

8.6 Measurement

8.6.1 Selecting the Measurement Mode

The LB-19PTM Portal Turbidity Meter has two measurement modes. In single measurement mode, the meter will automatically detect a stable reading and lock the measurement. In continuous measurement mode, the meter will continuously measure and update the readings.

- 1) In the measurement mode, press and hold the  key to enter the setup menu.
- 2) Press the  key until the meter shows HOLD/P-5.



- 3) Press the **Enter** key. The display will show "YES/HOLD," indicating that the single measurement mode is enabled.



- 4) Press the  key, and the display shows NO/HOLD indicating that the continuous measurement mode is enabled.



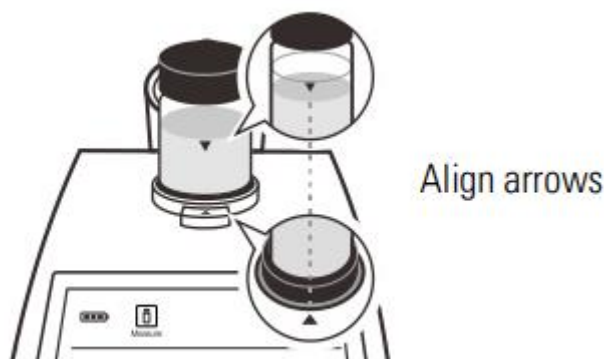
8.6.2 Single Measurement - Low Turbidity Samples

For the low turbidity samples (< 200 NTU), we recommend that use the same vial to perform the calibration and measurement.

- 1) Rinse the vial with approximately 10 mL of the sample. Cap the vial and gently invert it several times. Discard the used sample and repeat the rinsing procedure two more times.
- 2) Fill the vial with the sample. Cap the vial and wipe it with a lint-free cloth to remove water droplets and fingerprints. Ensure that the outside of the vial is dry and clean, the sample is homogeneous, and there are no air bubbles.

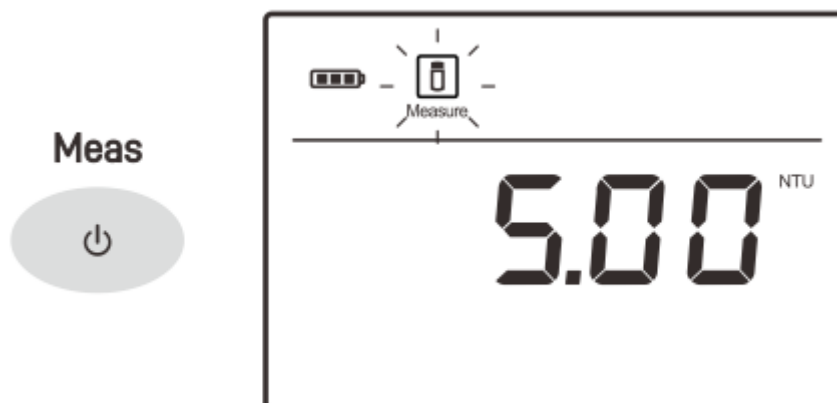


- 3) Insert the vial into the measurement chamber. Align the triangle mark on the vial with the arrow on the meter. Close the light shield lid securely.



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- 4) Press the Meas key to begin measurement. When the reading stabilizes, the Measure icon will stop flashing.



- 5) If necessary, press the **Meas** key to take a new measurement.

8.6.3 Single Measurement - High Turbidity Samples

For high turbidity samples (> 1100 NTU), the solution must be diluted before measurement. The dilution water should be obtained by filtering distilled water through a < 0.45 µm filter membrane.

- 1) Repeat steps 1 through 4 above and record the reading.
- 2) Calculate the true turbidity of the original sample using the following formula:

$$T = [Td (Vs + Vd)] / Vs$$

Where:

T = True turbidity of the original sample

Vs = Volume of the original sample (ml)

Td = Measured value

Vd = Volume of the dilution water (ml)

8.6.4 Continuous Measurement

- 1) Ensure that the meter is in the continuous measurement mode.
- 2) Repeat steps 1 through 3 above.
- 3) Press the **Meas** key, the Measure icon begins flashing, and the meter continuously measures the sample.

To stop the measurement, press the **Meas** key again.

8.7 Data Management

8.7.1 Storing of Measurement Result

The TB100 turbidity meter can store and recall up to 100 data sets. During the measurement process, press the **MI** key to store the reading in memory, and the Memory icon will appear on the display.

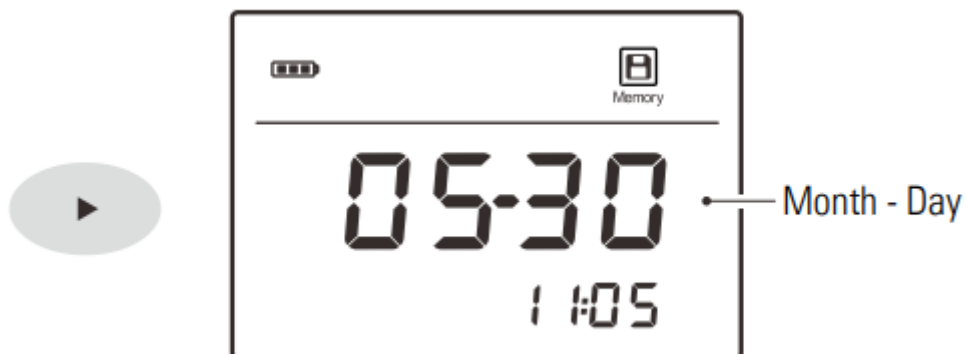


8.7.2 Viewing the Data Logs

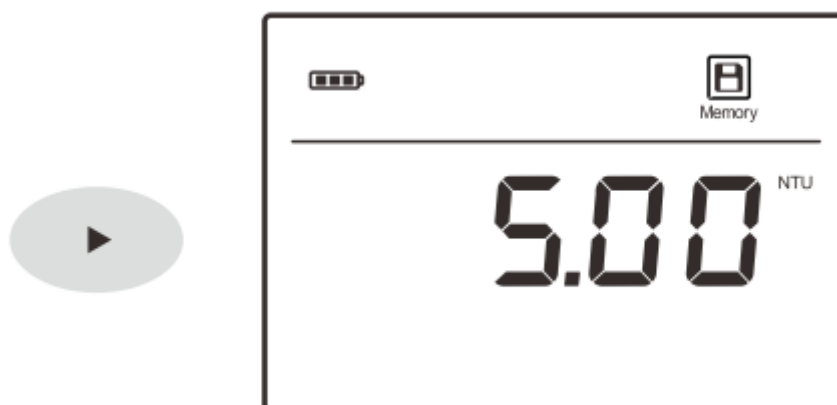
- 1) Press the MR key, and the meter will display the serial number of the stored data.



- 2) Press the ► key to view the date and time of the measurement.



- 3) Press the ► key to view the stored data.



- 4) Press the  key to view the next data set.
- 5) Press the **Meas** key to return to the measurement mode.

8.7.3 Clearing the Data Logs

If the memory is full, the meter will automatically display a message when the MI key is pressed. To delete data logs, follow the steps below.

- 1) Press and hold the  key to enter the setup menu in the measurement mode.
- 2) Press the  key until the meter `CLR/P-7` shows
- 3) Press the **Enter** key and the meter `NO/CLR` shows
- 4) Press the  key to select the `YES/CLR`, press the **Enter** key to confirm.

8.8 Communication

The meter can transfer data to a computer or import it into Excel using DAS software. You can download this software from our official website. Before installing the software, ensure that your computer is running the Windows 10 operating system.

8.8.1 Receiving the Data

- 1) Connect the USB cable to the meter and the computer.
- 2) Click the **DAS_TB_Series** icon. The system will automatically scan for an available communication port and display a message box saying, "Found a port on your computer."
- 3) Click the **OK** button to start the application.
- 4) Click the **Connect** button. The screen will display "Port is connected."
- 5) Click the **OK** button, then click the **Receive** button to transfer the stored data automatically to the computer.

If your computer can not find a communication port, click the "CP210x VCPInstaller_x64.exe or CP210xVCPInstaller_x86.exe" to update the drive program.

8.8.2 Creating an Excel File

When the transfer is completed, click the Save as Excel button, the readings in the datasheet will automatically convert to an Excel file.



Note, that once the software is closed, all received data will be lost and cannot be recovered.

9. Accessories

Standard Accessories

- Turbidity Standards
- Sample Vials
- Lint-Free Cloth

Optional Accessories

- 480ml Calibration Solution × 1 Bottle

10. Appendix

10.1 Indexing a Sample Vial

The United States Environmental Protection Agency recommends indexing the vial used for turbidity calibration or sample measurement. This ensures the vial is positioned to provide the lowest turbidity reading.

The indexing methods are as follows.

- 1) Fill the vial with distilled water (< 0.5 NTU) and cap it.
- 2) Wipe the vial with a lint-free cloth to ensure the outside is clean and dry.
- 3) Place the vial in the measurement chamber and align the triangle mark on the vial with the arrow on the meter.
- 4) Press the **Meas** key to begin the measurement.
- 5) Slowly rotate the vial at approximately 45° . Close the light shield lid and record the reading.
- 6) Repeat step 5 until the lowest turbidity reading is obtained. Mark this position on the vial.

10.2 Matching the Sample Vials

For better accuracy and repeatability, using an indexed sample vial is the best choice for turbidity measurement. If multiple vials are needed, it is necessary to match them.

- 1) Repeat steps 1 through 6 above for each vial and record the readings.
- 2) Identify the position with the closest measurement value for each vial and mark it.

10.3 Preparation of Formazin Standards

Turbidity-Free Water:

Turbidity-free water is used for preparing turbidity standards and is made by filtering distilled water through a membrane with a pore size of $0.45\ \mu\text{m}$ or smaller.

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Turbidity Standards

4000 NTU	Dissolve 1 gram of hydrazine sulfate $(\text{NH}_2)_2 \cdot \text{H}_2\text{SO}_4$ in turbidity-free water and dilute to 100 mL in a volumetric flask. Dissolve 10 grams of hexamethylenetetramine $(\text{CH}_2)_6\text{N}_4$ in turbidity-free water and dilute to 100 mL in a volumetric flask. Mix 5 mL of the hydrazine sulfate solution and 5 mL of the hexamethylenetetramine solution in a 100 mL volumetric flask. Let it stand for 24 hours at $25 \pm 3^\circ\text{C}$.
2000 NTU	Mix 50 mL of the 4000 NTU standard in a 100 mL volumetric flask and dilute to the mark with turbidity-free water.
1500 NTU	Mix 37.5 mL of the 4000 NTU standard in a 100 mL volumetric flask and dilute to the mark with turbidity-free water.
1000 NTU	Mix 25 mL of the 4000 NTU standard in a 100 mL volumetric flask and dilute to the mark with turbidity-free water.
500 NTU	Mix 12.5 mL of the 4000 NTU standard in a 100 mL volumetric flask and dilute to the mark with turbidity-free water.
200 NTU	Mix 10 mL of the 4000 NTU standard in a 100 mL volumetric flask and dilute to the mark. Then, mix 50 mL of the above standard in a 100 mL volumetric flask and dilute to the mark with turbidity-free water.
10 NTU	Mix 2.5 mL of the 200 NTU standard in a 100 mL volumetric flask and dilute to the mark. Or - Mix 2 mL of the 500 NTU standard in a 100 mL volumetric flask and dilute to the mark.



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