



"Where Legacy Drives Innovation"

BLACKPEARL™
SERIES

TP Smart™

WIRELESS **pH**
MEASUREMENT

BATTERY OPERATED
& USB 2.0



MANUAL

Power: Battery Operated & USB 2.0

Device Name: TP Smart (Wireless pH Measurement)

CAUTION: Keep the Module dry

Please read and follow all the instructions in the manual strictly.

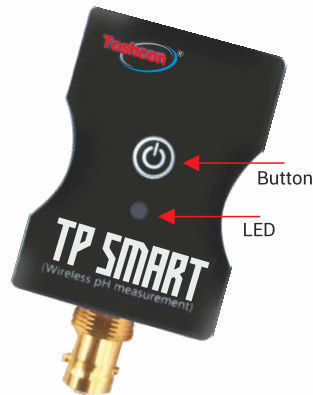
Safety Instructions

- Read this manual carefully and ensure you understand all the instructions and operation of the device.
- Place the device on a levelled and stable plate. If it falls or is severely shocked, it may lead to damage.
- While charging the device, ensure the cable is properly placed, and hanging or improper placement may lead to stepping on the device, knowingly or unknowingly.
- Make sure the TP Smart is charged correctly every time before using the transmitter and click the reset button to initialise the device.
- Do not disassemble the unit; it will lead to a lapse of warranty and may affect the measurement and readings.
- Handle the liquid samples carefully; the spillage of acid samples will damage the device.
- Always keep the button in looking up direction

System Function

The function of the TP Smart is to measure the pH of liquid samples and transmit the information through Bluetooth Low Energy (BLE). Android application and pH Electrode are required to extract the pH information of the solution.

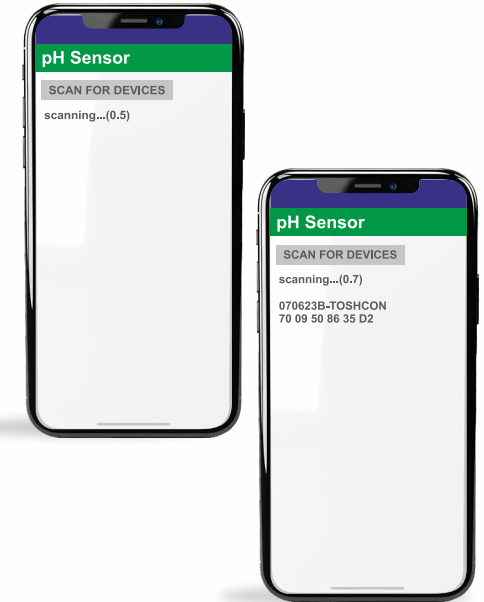
The default naming of the TP Smart is DDMMYYX TOSHCON, where DDMMYY is the date of manufacturing of the device, and X is the sequential alphabet and "TOSHCON" is the brand name of TOSHNIWAL INSTRUMENTS MFG PVT LTD, who manufactured the device.



1. Scanning of Device

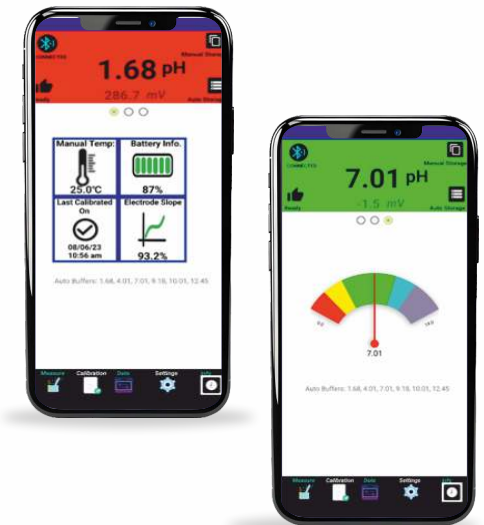
The transmitter works in tandem with the Android application "app". The app can be downloaded from the Play Store. Various permissions need to be provided to the app to detect the BLE devices. The permissions required are for location, storage and nearby devices.

The app is divided mainly into two screens: one is a scanning screen, and the other is a measurement screen. Once the app is running, as shown in the side diagram, click on scan for devices. The device scans for TP Smart for a duration of 10 seconds, and the counter decreases with time. If any "TOSHCON" TP Smart are visible, they will be shown automatically. If no devices are found, click on the TP Smart reset button; the device will start advertising, the LED will begin blinking & the device will appear in the list. Click on the device name; the app will automatically proceed to the measurement screen.



2. Measurement Screen

The measurement screen is divided into five tabs; they are "Measure", "Calibration", "Data", "Settings", and "Info". The measure screen is divided into three screens; the topmost part of the screen will provide information about "device connection status", "pH information", "millivolt information", "Manual Storage", "Auto Storage On/Off" and Measurement Status (measuring or ready). It will be fixed across all the tabs. The bottom is standard across all the tabs, providing seamless movement in all five tabs.



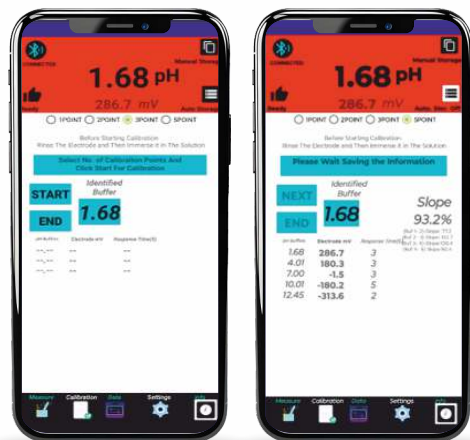
S. No	Parameter	Value	
1	Voltage Range	± 2000	Milli Volts
			100 μ V Resolution
2	Accuracy	± 1	mV
3	pH Range	0 - 14.00	
4	Accuracy pH	± 0.02 pH	With Calibration
5	pH Resolution	0.01 pH	
6	Temperature Compensation	0 – 100 (Manual)	$^{\circ}$ C (0.1 $^{\circ}$ C Resolution)
			Integrated with Voltage
7	Connectivity	Bluetooth Low Energy (BLE)	2.4 GHz
8	Range	50	Meters
9	Battery	500 mA	Li-Poly Rechargeable
			Battery Monitoring
10	Onboard Storage	2500 – Manual Storage	pH & Temp Values
		2500 – Auto Storage	Date and Time Stamped
11	GUI	Android App	Android 5.0 above Supp.
12	Sampling	10 milli Sec -10 Sec	Random / User Selectable
13	Indication	Multi LED	Blue - ON Power Indication
			Green - Calibrated & Bluetooth Connected
			Red - Out of Calibration/ Range/ Slope range of 90% - 105%
			Yellow- Charging in process
			Violet or any other colour/ indication/ blinking – Device below 25% battery
			Remaining battery % indication on Phone/ Tablet
14	Response	2-4	Seconds (buffer solution) for 90%
15	Power	USB/Battery	
16	Control	Button	

Measure

The middle section of the screen has three modes, which can be selected through a radio button; in one mode, it will provide information like "Temperature Setting", "Battery Information (Status of Charge)", "Last Calibrated On", & "Slope of the electrode". In mode two, the device will provide the pH information in graphical form. In mode three, the pH information is given in gauge form.

Calibration

In this mode, the device can be calibrated in 1-point, 2-point, 3-point and 5-point. The same can be selected through the radio button on the middle screen. Please read the instructions mentioned on the screen before starting calibration. The calibration can be started by clicking on the "Start Button". Before proceeding further, the app will request the temperature of the calibration sample and feed the temperature of the sample accordingly. Once the calibration starts, the app will automatically guide the calibration process. Also, the app will automatically detect the buffer; if there is any change in buffer value, the user can change the buffer value by clicking on the buffer value. After completion of the calibration, the app will automatically cal



Data

In this mode, the device data can be viewed and downloaded. The specific data, i.e., Real-Time Data (Auto Storage) & Manual Storage, can be downloaded, and the progress status will be shown on the progress bar. Once the data is downloaded, the app will automatically give options for sharing, such as e-mail or WhatsApp. Good Lab Practices are shown in the data mode, it will show the last calibration details, like pH buffers used, electrode mV, response time, slope and last calibrated information.



Settings

In this mode, the device settings can be viewed or changed. The basic settings that can be changed are the temperature of the solution, storage interval (for auto storage), and device name. The device shows the latitude and longitude of where the device is currently used. For better usage, the GPS and location services of the smartphone need to be turned on.



Info

In this mode, the device will show the manufacturer's logo, name, address, email address and contact details.



TP Smart™



Manufactured by:

Toshcon Instruments Manufacturing Pvt. Ltd.

(Formerly known as Toshniwal Instruments Mfg. Pvt. Ltd.)

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Website: www.toshcon.com

MANUAL

www.toshcon.com

TP Smart