

TELEMETRY DIGITAL WATER LEVEL RECORDER (PIEZO-METER) USER MANUAL



For Service Support: +91 7046960991

Accumax Instruments Pvt. Ltd.

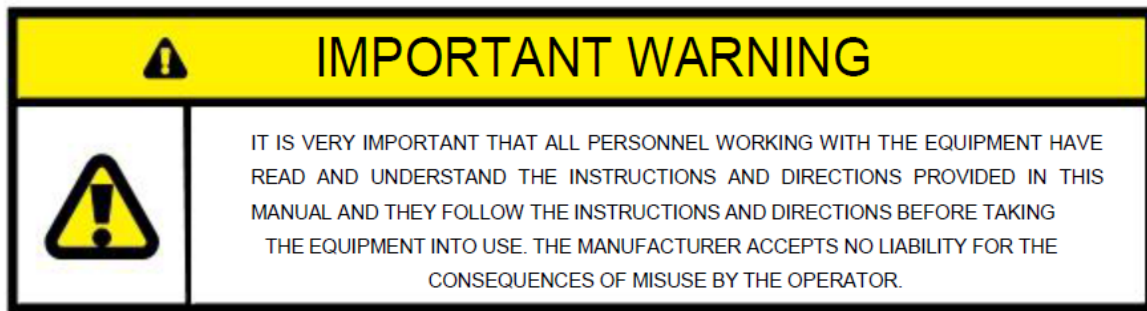
B-95, Electronic Estate, G.I.D.C., Sector-25,
Gandhinagar, Gujarat, India. 382024

Call us: +91 9033520529, +91 8849670588

Mail: accumaxinstruments@gmail.com /
service@accumaxinstruments.com

Web: <https://www.accumaxinstruments.com>





The operator shall bear responsibility for the suitability of the device for the specific purpose:

1. Improper installation and operation of the devices (systems) will cause the warranty to be void.
2. The manufacturer will not be liable for any damage of any kind by using its product, including, but not limited to direct, indirect, incidental, punitive, and consequential damages.

Installation, connection, commissioning, and service must be carried out by personnel who are qualified and authorized to do so.

Installation personnel must ensure that the measuring system is correctly connected according to the connection diagram.

This device contains electrical components with an electrical current therefore installation, services, and maintenance must be carried out by expert and qualified personnel, aware of all necessary precautions. Before opening any internal parts, please shut off the power supply.

The Device is composed of metal and plastic parts, all of which must comply with local norms and requirements concerning their trash disposal.

Manufacturer's design and safety statement

- Stresses and loading caused by earthquakes, traffic, high winds, and fire damage are not taken into account during device design.
- During operation do not exceed the pressure and/or temperature ratings indicated on the data label or in this Operating Manual.
- The manufacturer reserves the right to update safety information without prior notice.
- Read and follow all guidelines outlined in this manual to ensure a safe and reliable user experience.
- Ensure that the Device is connected to a power source within the specified voltage range.
- Insert and remove the SIM card with caution, Make sure the SIM card is not PIN-locked, and it has sufficient balance.
- Ensure the device is placed in an area with good cellular network reception.

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1. Introduction

1.1 Overview

Telemetry Digital Water Level Recorder (TDWLR) is a system used to appraise groundwater level, water temperature, atmospheric pressure, and atmospheric temperature. It is designed to calculate the water level on hydrostatic pressure analysis. It mainly consists of a piezo sensor along with a temperature sensor, sensor cable, data logger with telemetry unit, and UI application. The pressure-sensing device and temperature sensor are assembled in a submerged troll with a data collector module. The device will gather information at time intervals chosen by the user, save it on the SD card, and then send it to a server using the GSM network. The device can be configured with the help of a desktop application. The laptop/PC can be connected to a device via a USB to RS-485 converter. User have the option to monitor data through the device's built-in Wi-Fi feature. Through the Wi-Fi connection, user can view all the measured parameters conveniently on a webpage.

1.2 Key feature

- **Groundwater Monitoring:** Utilizes a pressure sensor to accurately monitor groundwater levels, providing essential data for environment, agriculture, and research applications.
- **GSM Data Monitoring:** GSM connectivity for remote data monitoring and transmission, enabling real-time access to groundwater data from anywhere on a server using cellular network coverage.
- **SD Card Data Storage:** SD card for data storage, ensuring data integrity and providing a backup option in case of network connectivity issues.
- **Wi-Fi Data Transmission:** Allows user to view and download data stored in an SD card using a smartphone or computer.
- **Solar Panel Charging:** Powered by a rechargeable battery that is charged using a solar panel, offering sustainable and environmentally friendly operation, particularly in remote or off-grid locations.
- **Desktop Application:** The desktop application enables user to view real-time data and download data from the SD card.

1.3 Package Contents

- TDWLR device with metal enclosure
- Solar panel with Chargeable battery
- SIM card
- Antenna
- Piezo sensor with cable
- SD card
- User manual

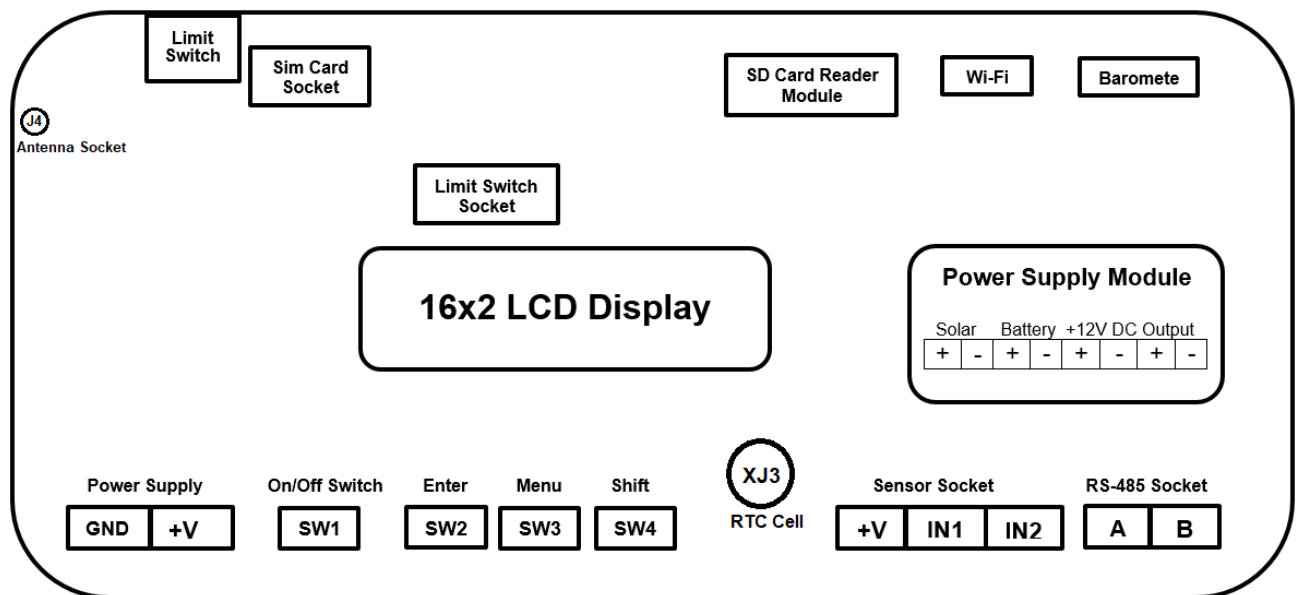
2. Setup and Configuration

2.1 Installation

- **Select Installation Location:** Choose a suitable location near the groundwater source for optimal sensor performance and ensure the area has adequate sunlight exposure for the solar panel and good cellular connectivity for the GSM.
- **Mounting the device:** Securely mount the device in a stable position using appropriate mounting hardware.

2.2 Hardware connections

- Connect the positive terminal of the 12V DC Output of the power supply module to the device +V terminal and the negative terminal to the device GND terminal.
- Insert the SIM card into the SIM card slot.
- Insert the SD card into the SD card module.
- While providing power to the circuit LCD will display text.



2.3 Sensor Connection

- Connect the voltage, temperature sensor, and pressure sensor cable of the sensor to the device's +V, IN1, and IN2 terminals respectively.

2.4 Power Supply Module Connection

- Connect the + and - solar terminals of the power supply module to the solar panel's positive and negative terminals respectively.
- Connect the + and - battery terminals of the power supply module to the 12-volt battery's positive and negative terminals respectively.
- Connect the + and - 12V DC output terminals of the power supply module to the device's +V and GND terminals respectively.

2.5 RS485 Connection

- Connect the A and B wires of the device to the RS485 module D+ and D- terminals respectively.

2.6 Antenna Connection

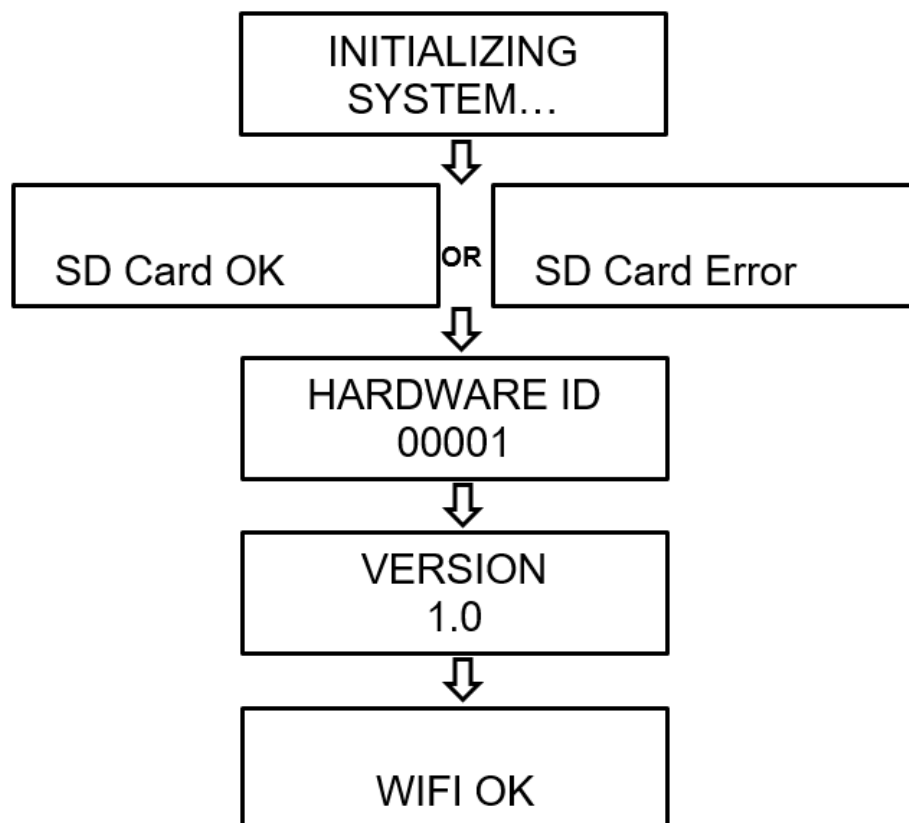
- Connect the antenna to the device's J4 terminal.

3. Device Operation

- SW 1 – ON/OFF
- SW 2 – Enter
- SW 3 – Menu
- SW 4 – Shift

3.1 Home screen

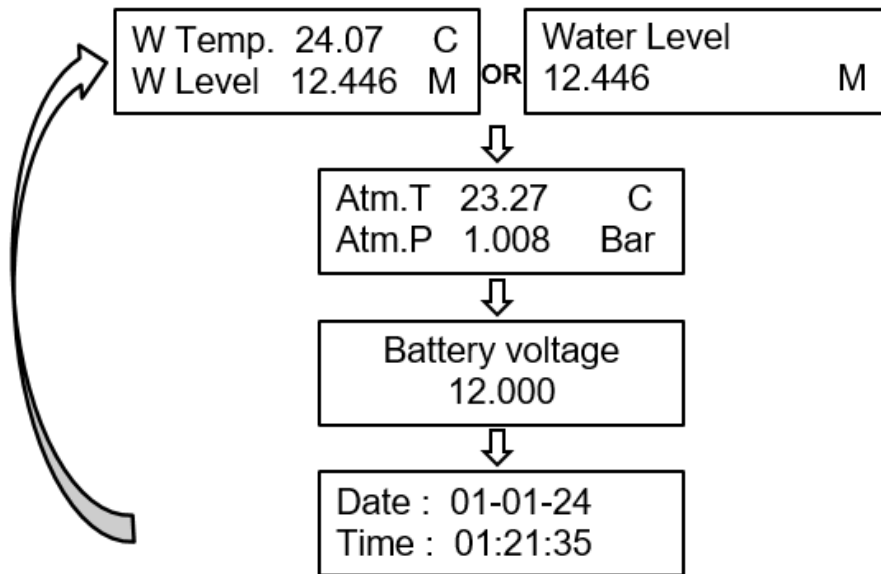
- Once the device is powered up below screen will appear in sequence.



Note: if an SD Card is inserted then the “SD Card OK” screen will appear and if an SD Card is not inserted or the SD Card is faulty then the “SD Card Error” screen will appear.

If Wi-Fi is ok then the “WIFI OK” screen will appear otherwise no screen will appear.

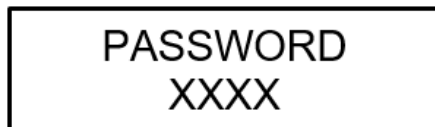
- Once system initialization is completed, the following screens appear in rotation.



Note: If water temperature is not enabled then, only Water level screen will appear on the Home screen as shown below.

3.2 Password menu

- Press **SW3** for Password mode.
- Press **SW3** to enter the number and **SW4** to shift the cursor.



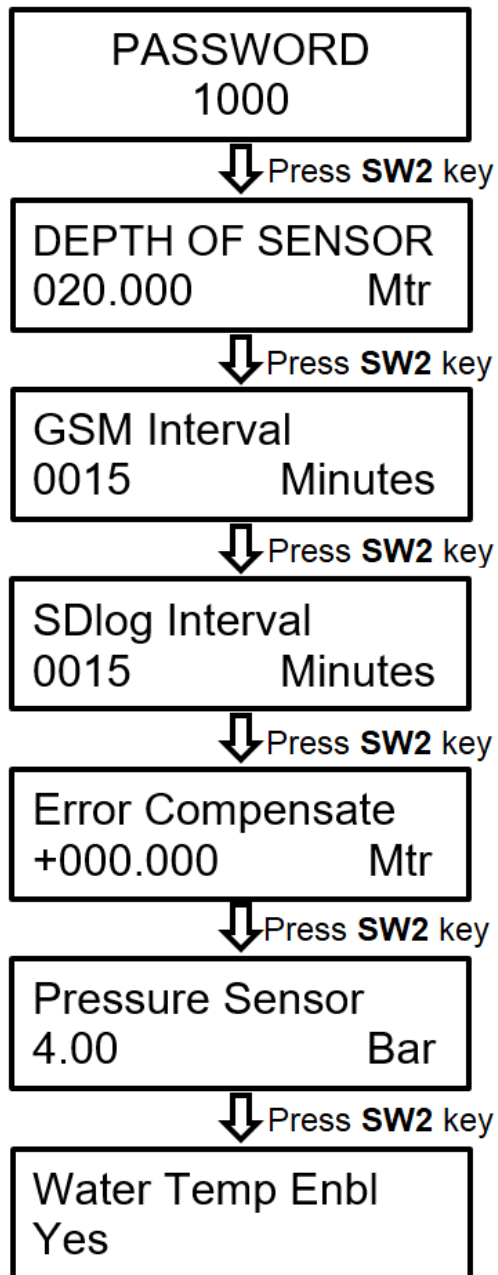
Password (XXXX)	Function
1000	Basic Configuration menu
2000	Live Screen menu
3000	SD Card Test menu
4000	Date & Time Settings menu
9876	Resetting menu

- Press the **SW2** key to access the menu screen, if the right password is entered then the below screen will appear.



3.3 Basic Configuration Menu

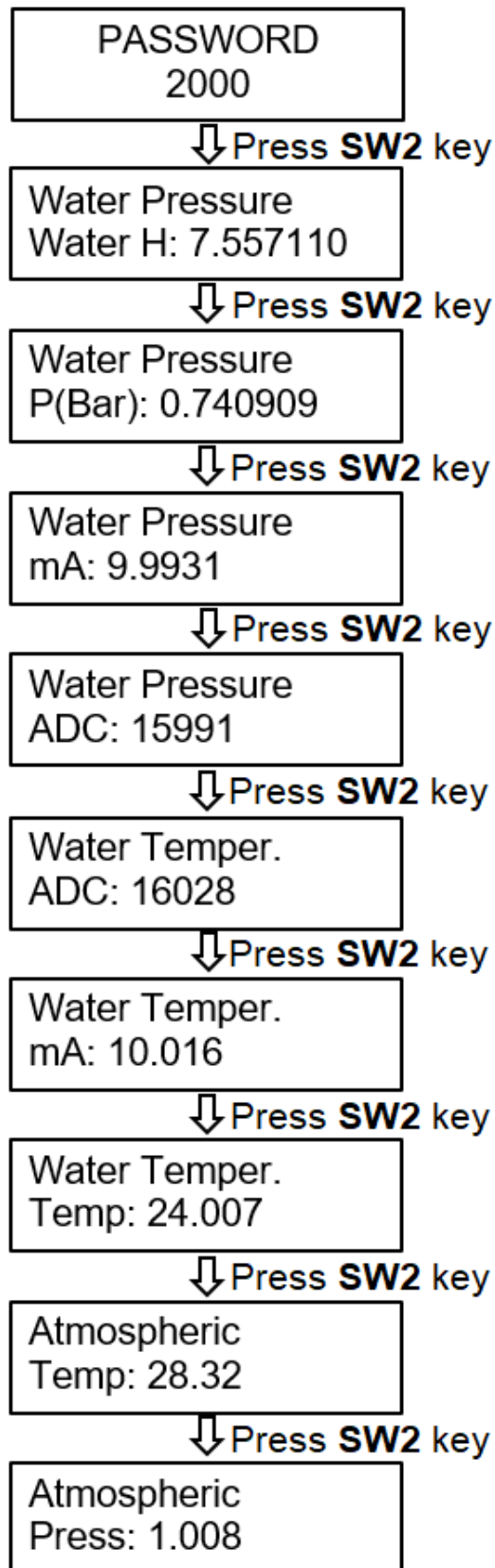
- Enter **1000** Password for Basic Configuration.



- Use **SW3** and **SW4** to enter the value and Press **SW2** to save the entered value
- If **SW2** is pressed then it will direct a user to the Home screen.

3.4 Live Screen Menu

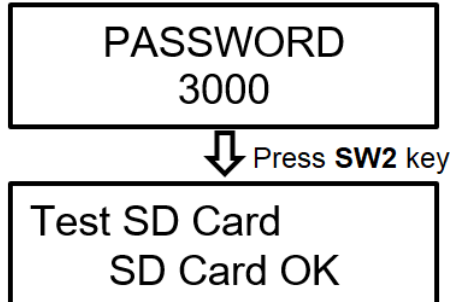
- Enter the **2000** Password for the observed run-time value in the live screen menu.



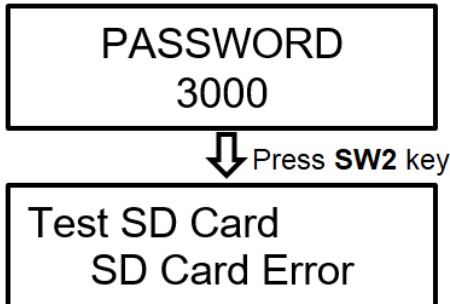
Note: If the water temperature is disabled then the “Water Temper.” screen will be skip.

3.5 SD Card Test Menu

- Enter the **3000** Password for the SD card test menu.
- If an SD Card is inserted then the following screen will appear.



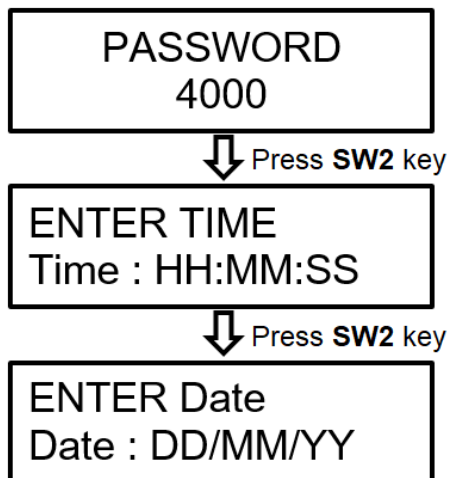
- If an SD Card is not inserted or SD Card is faulty then the following screen will appear.



- If **SW2** is pressed then it will direct the user to the Home screen.

3.6 Date & Time Settings Menu

- Enter the **4000** Password for the Date & Time setting menu.

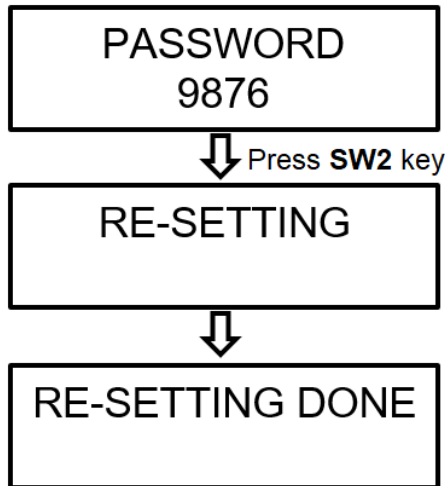


- Use the **SW3** and **SW4** keys to set the current date and Time, and Press the **Enter** key to save the date and Time.

- Once **Enter** is pressed with the correct Time and Date, then it will direct the user to the Home screen.

3.7 Resetting Menu

- Enter the **9876** Password for the Re-setting menu.

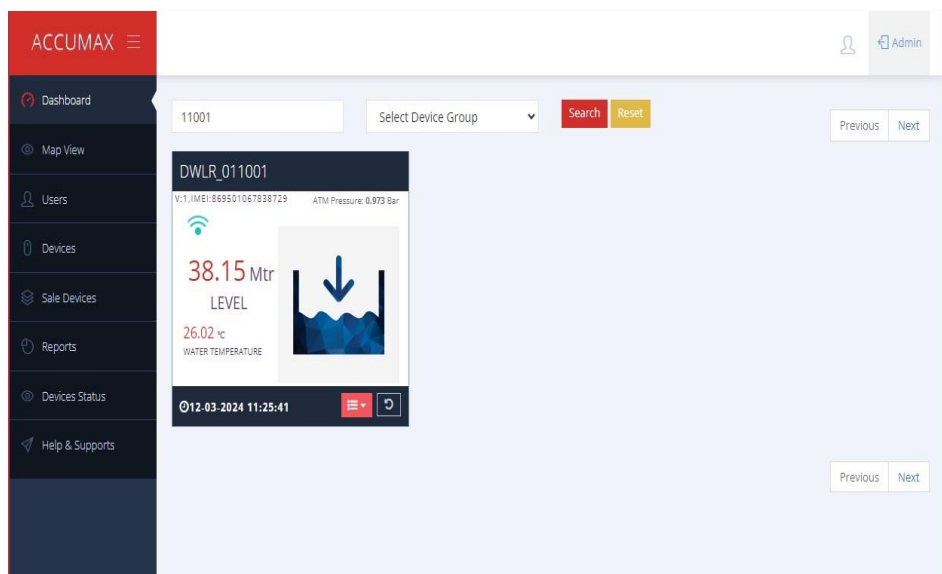


- Once Re-Setting is done, then all parameters will be set with the default value and it will direct the user to the Home screen.

4. Data Storage

4.1 GSM

- Using GSM the data is transmitted to the server at preset time intervals. User can log in using their credentials to monitor and download the data.
- Link: <http://live.accumaxinstruments.com>



4.2 Wi-Fi

- Wi-Fi fetches the data stored in an SD card and transmits it to the web page. User can connect the device's Wi-Fi using any PC or Smartphone for view and Download the Data.
- Data will be downloaded in .CSV file format.
- **Wi-Fi Connection**
 - Connect Wi-Fi using the Wi-Fi name.
 - Wi-Fi name will be "TDWLRHardwareID" (Example: If the Hardware ID is 00001, then the Wi-Fi name will be "TDWLR00001") and Password is "123456789".
 - After successfully connecting, open Chrome and enter the following link in the address bar "**tdwlr.local**" or use the IP Address "**192.168.4.1**" to search the web page.
 - After searching user can view data stored in the SD Card and Use the "Download Page" button which is located on the top left corner of the web page, where the user can download the data.

Date	Time	Corrected Water Level(Mtr)	Raw Water Level(Mtr)	Temp(C)	Atm Press(Bar)	Atm Temp(C)	Batt Volt
18-03-2024	15:42:20	037.511	037.499	15.89	1.001	32.27	05.00
18-03-2024	15:41:20	037.512	037.499	15.89	1.001	32.27	05.00
18-03-2024	15:40:20	037.512	037.500	15.89	1.001	32.31	05.00
18-03-2024	15:39:20	037.512	037.500	15.89	1.001	32.40	05.00
18-03-2024	15:38:20	037.512	037.500	15.89	1.001	32.36	05.00
18-03-2024	15:37:20	037.513	037.500	15.89	1.001	32.41	05.00
18-03-2024	15:36:20	037.513	037.500	15.89	1.001	32.47	05.00
18-03-2024	15:35:21	037.513	037.500	15.89	1.001	32.53	05.00
18-03-2024	15:34:20	037.513	037.500	15.89	1.001	32.51	05.00
18-03-2024	15:33:21	037.512	037.500	15.89	1.001	32.57	05.00
18-03-2024	15:32:20	037.512	037.500	15.90	1.001	32.59	05.00
18-03-2024	15:31:20	037.512	037.500	15.90	1.001	32.58	05.00
18-03-2024	15:30:20	037.512	037.500	15.90	1.001	32.58	05.00
18-03-2024	15:29:20	037.513	037.500	15.90	1.001	32.55	05.00
18-03-2024	15:28:21	037.513	037.500	15.90	1.001	32.52	05.00
18-03-2024	15:27:20	037.514	037.500	15.90	1.001	32.53	05.00
18-03-2024	15:26:21	037.514	037.500	15.90	1.001	32.49	05.00
18-03-2024	15:25:20	037.514	037.500	15.90	1.001	32.48	05.00
18-03-2024	15:24:20	037.514	037.500	15.90	1.001	32.44	05.00
18-03-2024	15:23:20	037.514	037.500	15.90	1.001	32.39	05.00
18-03-2024	15:22:21	037.513	037.499	15.90	1.001	32.37	05.00

DATA_COMPLETED

4.3 SD Card

- Data will be stored on an SD card in .CSV file format at preset time intervals.
File name of the device in SD card will be in (HardwareID) format.
Ex. 00001 (00001-HardwareID)
- Date, Time, Corrected Water Level(Mtr), Raw Water level, Water Temp(C), Atm Press(Bar), Atm Temp(C), and Batt Volt data will stored in an Excel sheet with given in the below format

	A	B	C	D	E	F	G	H
1	Date	Time	Corrected Water Level(Mtr)	Raw Water level	Water Temp(C)	Atm Press(Bar)	Atm Temp(C)	Batt Volt
2	18-03-2024	11:20:46	37.555	37.498	15.9	1.005	31.61	5
3	18-03-2024	11:22:46	37.554	37.497	15.9	1.005	31.69	5
4	18-03-2024	11:24:46	37.555	37.498	15.9	1.005	31.79	5
5	18-03-2024	11:26:46	37.555	37.498	15.9	1.005	31.84	5
6	18-03-2024	11:28:46	37.555	37.498	15.9	1.005	31.86	5
7	18-03-2024	11:30:46	37.554	37.498	15.9	1.005	31.84	5
8	18-03-2024	11:32:46	37.554	37.498	15.9	1.005	31.91	5
9	18-03-2024	11:34:46	37.554	37.499	15.9	1.005	31.93	5
10	18-03-2024	11:36:46	37.554	37.499	15.9	1.005	31.98	5
11	18-03-2024	11:38:46	37.553	37.498	15.9	1.005	31.92	5
12	18-03-2024	11:40:46	37.553	37.498	15.9	1.005	31.86	5
13	18-03-2024	11:42:46	37.553	37.499	15.9	1.005	31.96	5
14	18-03-2024	11:44:46	37.551	37.498	15.9	1.005	31.91	5
15	18-03-2024	11:46:46	37.551	37.498	15.9	1.005	31.86	5

4.4 RS485

- Connect the tdwlr device’s A and B wires to the PC via USB to RS-485 converter for view data and download the data using the Desktop Application.
- Read and set the following parameters: Pressure sensor, GSM log interval, SD card log interval, Depth of sensor, Error compensation, and Water Temperature enable.
- SD Card Data will be downloaded in .CSV file format using the “SD Card Data Download” button.

Telemetry Digital Water Level Recorder

Hardware ID: 00001

COM Port	COM3	Raw Water Level	037.498	Mtr
Water Level	037.552	Pressure Sensor	2.00	Bar SET
Water Temperature	15.90	GSM Log Interval	0002	M SET
atm Pressure	1.005	SD Card Log Interval	0002	M SET
atm Temperature	31.87	Depth of Sensor	050.000	Mtr SET
Battery Voltage	05.00	Error Compensation	000.000	Mtr SET
Date (DD/MM/YYYY)	18/03/2024	Water Temperature Enable	Yes	SET
Time (HH:MM:SS)	11:46:35			

Read Data SD Card Data Download

Tx Count: 1
Rx Count: 1

5. Technical specification

POWER	
DC	+12 volt DC / +24 volt DC
RANGE	
Range	Based on sensor Ex: 0 to 20 meters, 0 to 40 meters
INTERFACE	
Display	16 x 2 matrix display
Programming	3 tactile button
Memory	SD Card
Module	Wi-Fi Module, SD Card Reader Module, Barometer Module
ACCURACY	
Percentage	0.1% of full scale at a reference condition
OPERATING CONDITIONS	
Location	Indoor/outdoor
Temperature	0 degrees to 60 degrees if metal mounting

6. Troubleshooting

- If you encounter any issues with the telemetry digital water level recorder, try the following steps:
- **Power Issue**
 - Check the power supply and connections.
 - Check the Solar panel connection.
- **Sensor Output issue**
 - Check sensor connection.

- Check sensor condition.
- **Data not Received on the Server**
 - Check network connectivity.
 - Check the SIM card balance.
 - Check the antenna connection.
- **SD Card data storage Issue**
 - Check using SD Card Test Menu.
 - If SD card error occurred in SD Card test Menu, then Inserted SD card properly.
- **RS485 Issue**
 - Check the RS485 connection.
- If the problem persists, contact customer support for assistance.

7. Warranty and support

A warranty period for our company's products is within 12 months from the date of purchase.

- **The following are not covered by the free warranty period.**
 - Hardware failure due to inconsistent usage environment.
 - Failure or damage caused by a bad power environment.
 - Failure or damage caused by unauthorized disassembly, repair, or override of authority, modification, or abuse.
- ❖ Thank you for choosing our telemetry digital water level recorder (piezometer). We are confident that its advanced features and reliable performance will meet your monitoring needs effectively.