AutoDrip Irrigation
Grow More With Less

User Manual

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Introduction

The Auto Drip Irrigation system is an automated irrigation system designed to reduce water usage and simplify farm irrigation. The system uses soil moisture sensors, weather forecasts, and a real-time clock to produce optimized watering schedules. Featuring three operating modes: Manual, Timer, and Automatic, our system provides a simple and flexible control scheme.

This user manual includes the control overview for our system including the physical and online interfaces, expansion options and automatic mode configurations.

Attached below is the full AutoDrip Irrigation simple system layout.
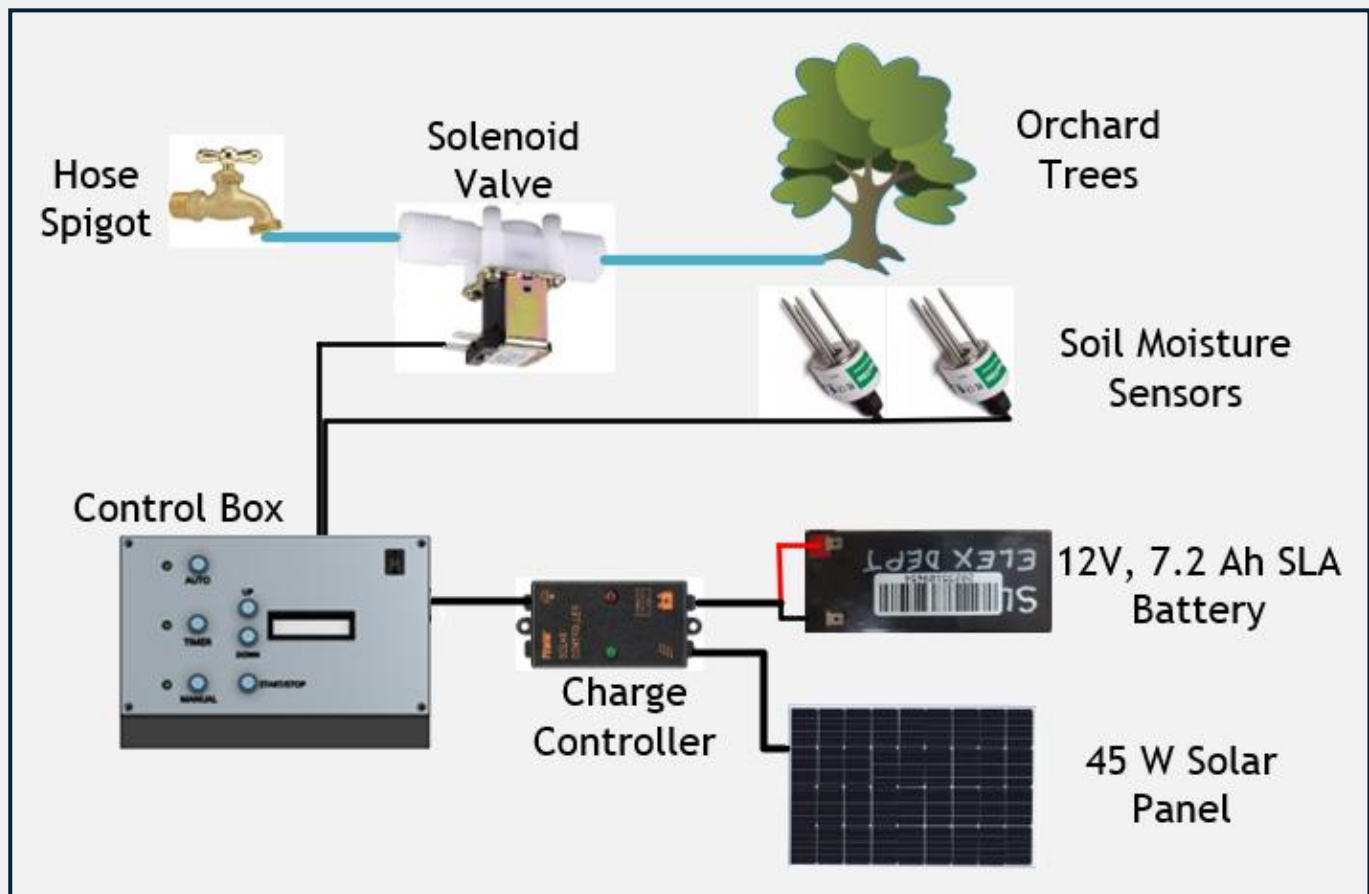
Control Overview

The AutoDrip Irrigation system gives the user full control over how and when irrigation occurs. Users can select between different watering modes, start or stop irrigation manually, and adjust timer settings as needed. The system also allows users to monitor real-time soil moisture readings and view system status indicators to confirm proper operation.

Control of the system can be done through two interfaces: the physical control box located on-site, and the online web application accessible from an internet-connected device. Each interface provides the same core control scheme, giving users flexibility in how they manage their irrigation process.

Listed below are the three main operating modes AutoDrip Irrigation features:

Auto - Hands free mode, designed to reduce water consumption. Uses weather, sensor and time date to process ideal watering schedule on its own.

Timer – Allows you to manually set desired watering time. Controlled from Up/Down time and Start/Stop buttons, this mode allows you simply control watering on a countdown timer.

Manual – Simple On/Off watering, Manual mode primarily acts as a valve controlled by the Start/Stop button.

In the next page you will learn how to operate these two interfaces with a detailed layout of each and explanation of how to use and analyze feature we offer.

Physical Control

The physical control of our system is implemented on the main enclosure lid with the interface shown in Figure 1. Listed below are the primary sections you will need to understand to control the AutoDrip Irrigation system that will point to listed features in Figure 1:
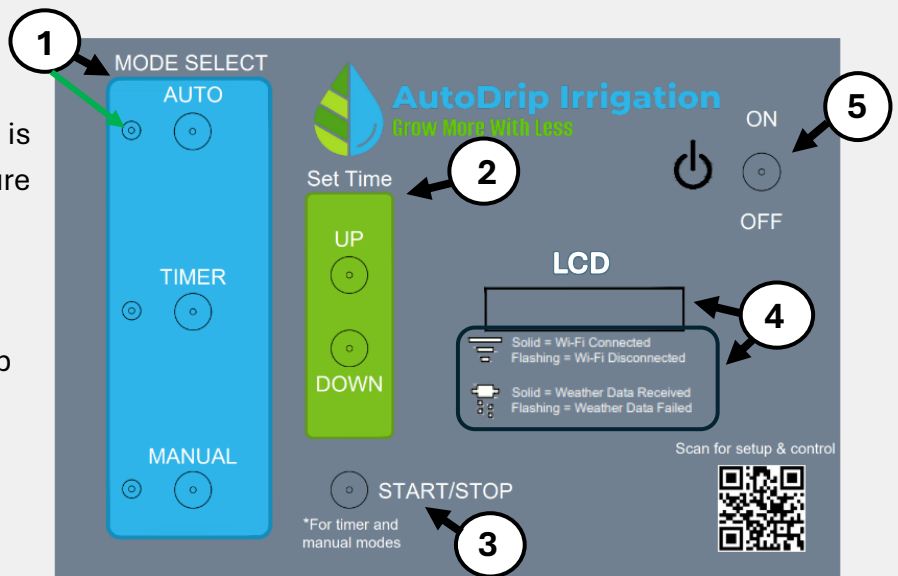

Figure 1- Physical Control Interface

1. **Mode Select** – Selects which operating mode the system will run in. Once a mode is selected a corresponding **LED** indicator on the left will turn on indicating the current mode the system is in.

2. **Set Time** – Set watering time manually. Set mode to timer, then use the UP and DOWN buttons to insert desired watering time that will be displayed on the LCD display. Once desired time is set, use the START/STOP button below to begin watering. The system will water until the countdown time reaches zero.

3. **Start/Stop** – Used for Timer and Manual mode.
   - Timer – Starts and Stops the countdown timer for watering
   - Manual – Toggles solenoid On/Off for watering

4. **LCD** – Displays information on Top and Bottom lines.
   - Top – Displays current operating mode and Wifi & Wetaher connectivity indicators
   - Bottom – Displays Irrigation status (On/Off) and Timer mode settings

5. **ON / OFF** – Turns On or Off the entire system and acts as the main disconnect or reboot option.

Figure 2 showcases the AutoDrip Irrigation Control box lid assembled with the user interface explained above.

Figure 2 - Control Box

Web App Control and System Monitoring
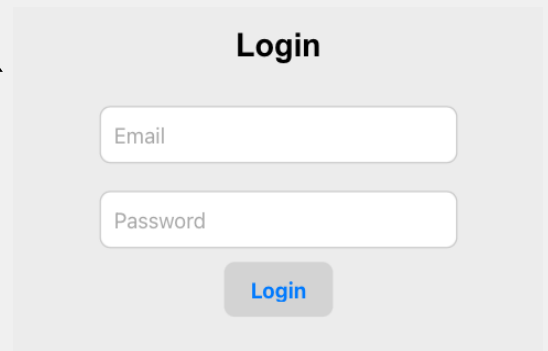
To access the Web Application, you must first scan the QR code (Figure 3) featured on the bottom right of the control box.

Listed below are the steps you will need to follow in order to gain access to the features the web app provides and fully learn how to operate the online interface.

Figure 3 – QR Code for Web App

1. The first step is to sign into your account shown in Figure 4. Once logged in, you will see the interface seen in Figure 5.

Figure 4 – User Login

2. You now have full access to the AutoDrip Irrigation system. The web app features 3 main sections:

- **Control Panel**

- **Live Data Readings**

- **Historic Data Readings**

The next page will cover these three sections in detail.
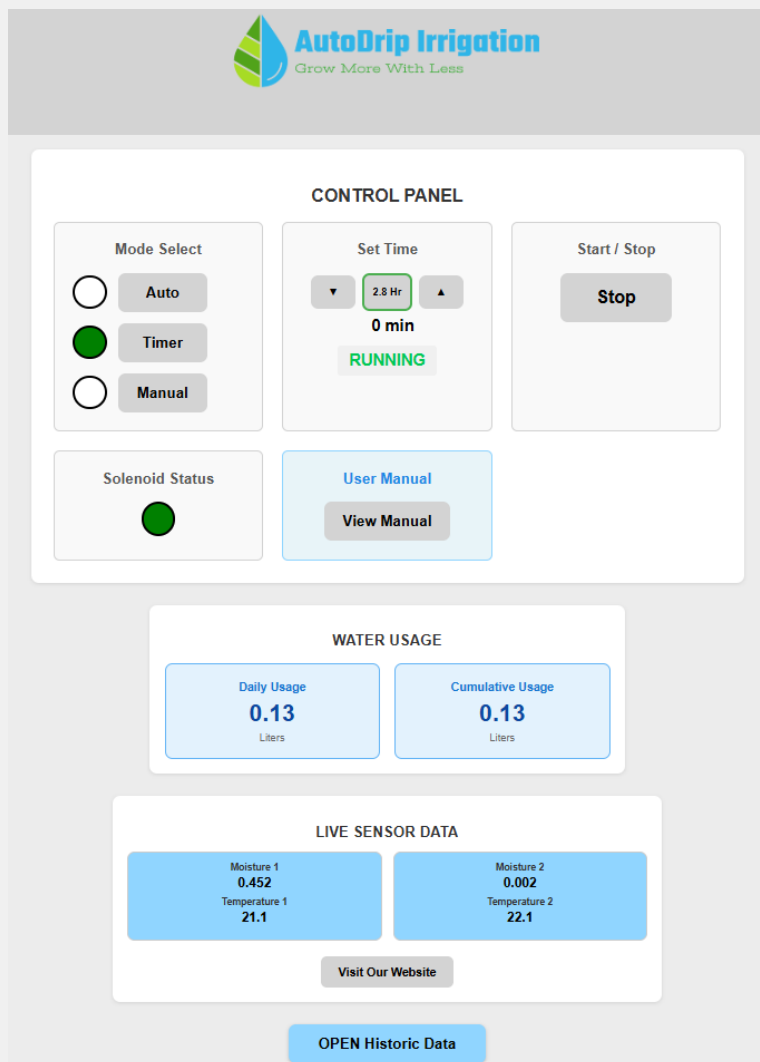
Figure 5 - Web App Interface

3. Follow along these three web app sections to learn how to use the interface and analyze data

Control Panel

The online control panel replicates the same control scheme as the physical control box interface. Refer to page 6 (Physical Control), for an explanation on the interface controls.
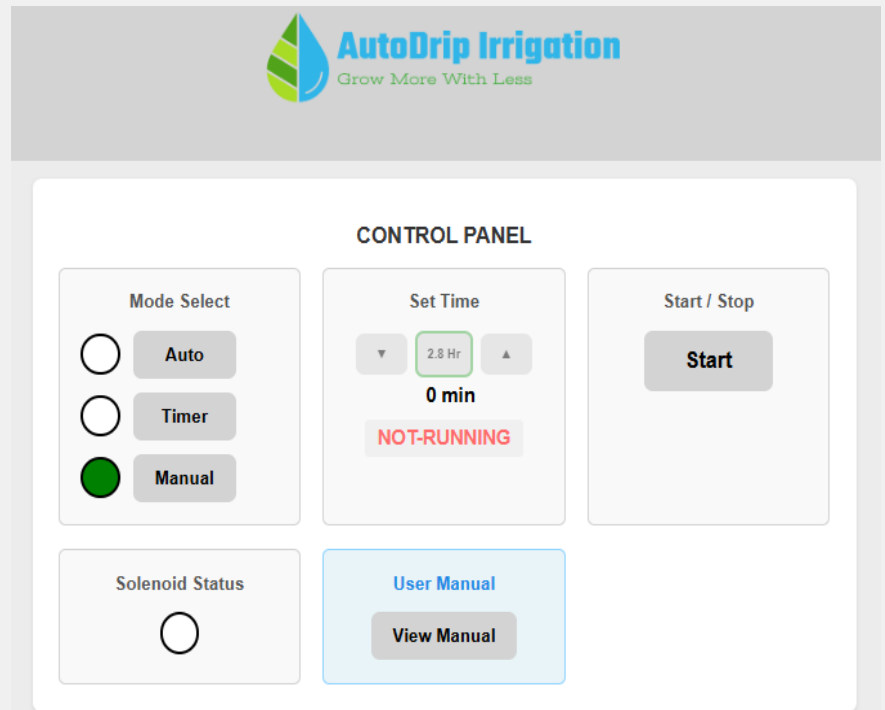
Figure 5 - Control Panel in Web App

Figure 4 - Live Data Reading in Web App

Live Data

The live data section features updated daily and cumulative water usage for the system as well as the live sensor readings including Moisture and temperature for each.

Both data displays will update throughout the day.

To see the Historic Data section select the "OPEN Historic Data button located at the bottom of the web app shown in Figure 4.

Historic Data

The historic data charts for our system include moisture and temperature readings from both the connected sensors, rain forecasts and daily water usage.
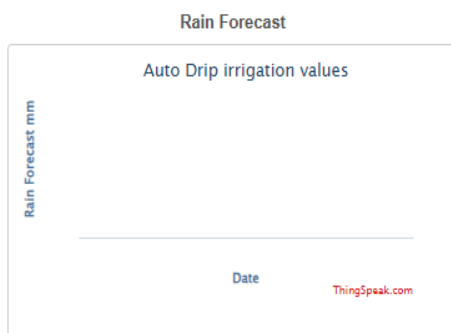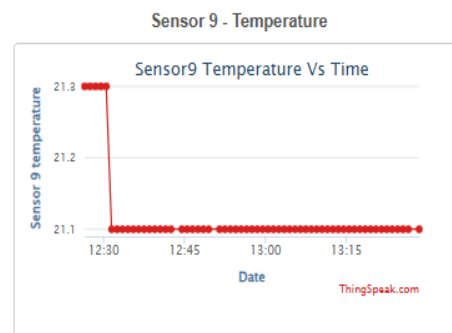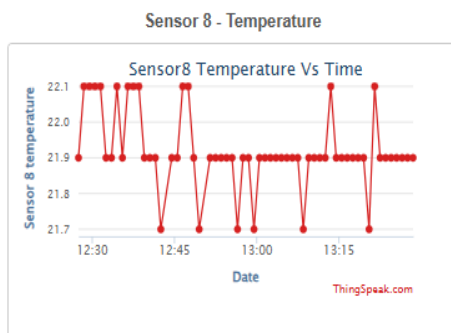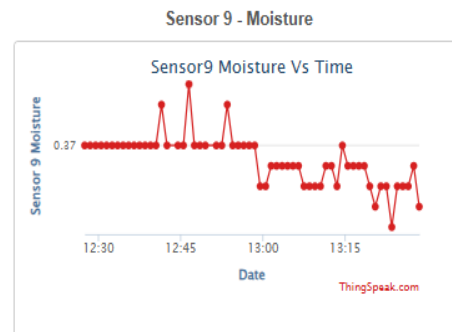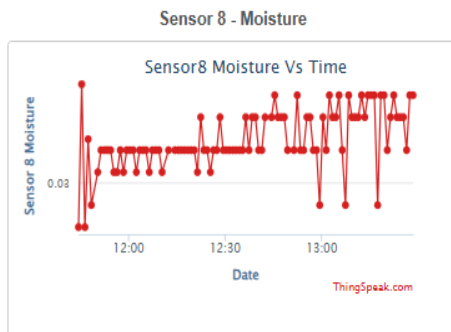
Figure 6 - Historic Data Charts on Web App

Expansion Options

There are two common add Ons that you may want to do for our system

1. Add extra moisture sensors to cover a larger range of crops
2. Add extra irrigation line and water emitters to irrigate more crops

If you feel the need of adding either of these add Ons to expand your system, please visit the contact page on the AutoDrip Irrigation Website and include any inquires. Our team will get back to you with the required steps to complete your request. This process may require a trained personal with the system or one of our team group members to provide help.

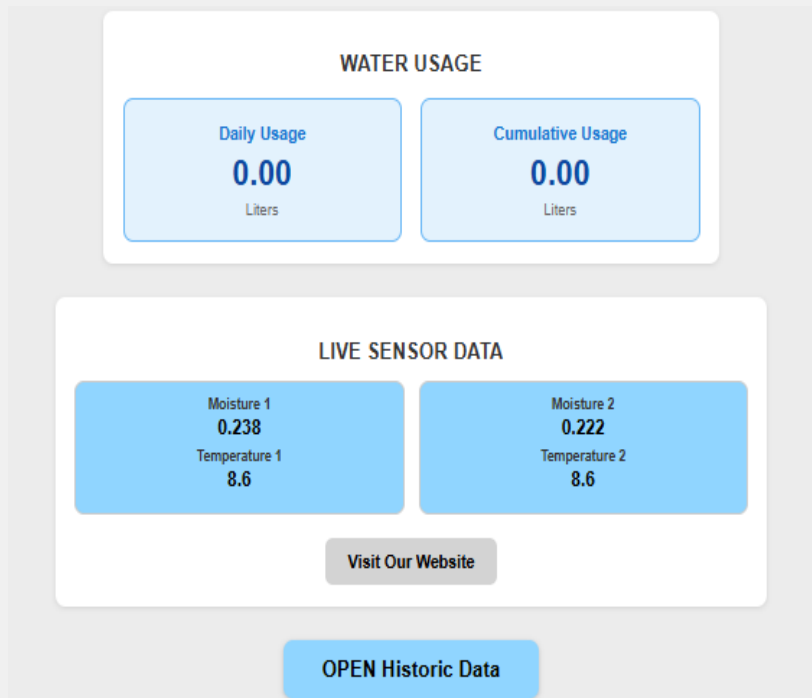# Changing Automatic Mode Configurations

The automatic mode for the system has embedded code and preset configurations in the software that are only changeable by opening the control box enclosure and connecting to the ESP32 on the PCB. Below are the three main preset configurations set in the embedded code. Read through them to find out if you might need to change anything.

WIFI connection settings

Within the code both the WIFI ID and WIFI password are set. If you require to connect your box to a new WIFI connection, please contact us.

Moisture Sensor Threshold

The moisture sensor threshold is essentially the moisture percentage level that will act as the triggering mark for the system to water or not. If you feel that the system is watering too much while the surrounding soil is wet, please contact us to resolve this issue.

Ideal Watering Time

This is the ideal daily watering time for the crops. For apple tree's our system has set this to 2.8 Hours a day. If you need to change this value for different crops, please contact us.

Weather Forecasting

Our system pulls weather forecasts from the exact longitudinal and latitudinal coordinates of your system. If you move, you box to a new location please contact us so we can update the location

If any of these configurations needs to be changed, please visit the contact page on our website for further steps or help.

Trouble Shooting

Power Diagnosis:

Reported Issue:

No Power to Control Box

- Red and Green LED's ON? (Charge Controller)
  - YES → Green LED OFF
    - YES → Check Solar Panel Connection
  - Green LED OFF → Red LED OFF
    - YES → Check Mode Setting → Red LED Flashing?
      - YES → Reconnect Load
  - NO → LCD Display ON? (control box)
    - YES → (to Check Battery Voltage)
    - NO → Check Battery Voltage
      - Voltage Range: 10.5V – 13.0V
        - YES → Contact a Licensed AutoDrip Technician
        - NO → Replace Battery

- Solar Panel Connected?
  - NO → Check continuity from solar panel to connector → Continuity?
    - YES → (back to No Power to Control Box)
    - NO → Replace Cable
  - YES → Battery Connected?
    - NO → Check continuity from battery to connector → Continuity?
      - YES → (to Check Battery Voltage)
      - NO → Replace Cable
    - YES → Control Box Connected?
      - YES → (to Check Battery Voltage)
      - NO → Check continuity from control box to connector → Continuity?
        - YES → (back to No Power to Control Box)
        - NO → Replace Cable

Moisture Sensor Diagnosis:

Reported Issue:

```
┌─────────────────────────────────────┐
│  Soil Moisture Sensors not Sending   │
│               Data                   │
└─────────────────────────────────────┘
                  │
                  ▼
            ◇─────────◇
            │Sensor(s) │
            │ not      │
            │ Working  │
            ◇─────────◇
                 │
                YES
                 │
                 ▼
        ┌──────────────────┐
        │ Check for a Break│
        │   in the Cable   │
        └──────────────────┘
                 │
                 ▼
┌──────────────┐      ◇───────────◇
│ Contact a    │◄─NO──│ Cable      │
│ Licensed     │      │ Broken?    │
│ AutoDrip     │      ◇───────────◇
│ Technician   │            │
└──────────────┘           YES
                            │
                            ▼
                    ┌──────────────┐
                    │ Replace Cable│
                    └──────────────┘
```

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Solenoid Diagnosis:

Reported Issue:

```
                              ┌─────────────────────┐
                              │ Solenoid Valve not   │
                              │ Working              │
                              └─────────────────────┘
```

- Reported Issue: Solenoid Valve not Working
  - Remains Open?
    - NO → Contact a Licensed AutoDrip Technican
    - YES → Set to Manual Mode and Turn Irrigation OFF
      - Still Open?
        - NO → (back to Remains Open?)
        - YES → Check Power Across Solenoid
          - 6V > Across Solenoid?
            - NO → Check Cable for a Break
            - YES → Replace Solenoid
  - Remains Closed?
    - NO → (to Contact a Licensed AutoDrip Technican)
    - YES → Set to Manual Mode and Turn Irrigation ON
      - Still Closed?
        - NO → (back to Remains Closed?)
        - YES → Check Power Across Solenoid
          - Voltage Across Solenoid?
            - NO → Check Cable for a Break
            - YES → Replace Solenoid

Check Cable for a Break
- Cable Broken?
  - NO → Contact a Licensed AutoDrip Technican
  - YES → Replace Cable

For any other problems or questions, feel free to contact us:
AutoDrip.Irrigation2025@gmail.com

Or Visit the Contact page on our website