Sunfy328-12/24 - Irrigation Control Unit
User's Manual

Features

- Sunfy328-12 can control one 12 Volt solenoid valve for a maximum of 25 watts, and Sunfy328-24 can control one 24 Volt solenoid valve for a maximum of 50 watts.
- Waterproof boxing for outdoor installation. Transparent top for easy internal monitoring.
- Real-time clock with calendar and automatic daylight saving management. Leap years management. Fractional timezone management.
- Two independent alarms with a watering duration between 1 minute and 3 hours.
- Geolocalization of the unit with automatic adjustment of the alarms to dawn (Alarm 1) and to dusk (Alarm 2).
- Automatic adjustment of the watering duration accordingly with the season*.
- Manual/automatic skip of watering days.
- Immediate manual watering with timer.
- Integrated soil moisture/temperature sensor to skip watering due to excess humidity (optional).
- Extra watering after heatwaves.
- Clock calibration functionality.
- Time and settings battery back-up (CR2032). Battery charge level.
- Date/time recording of the last firing of each alarm.
- Low power consumption (recursive sleep mode).

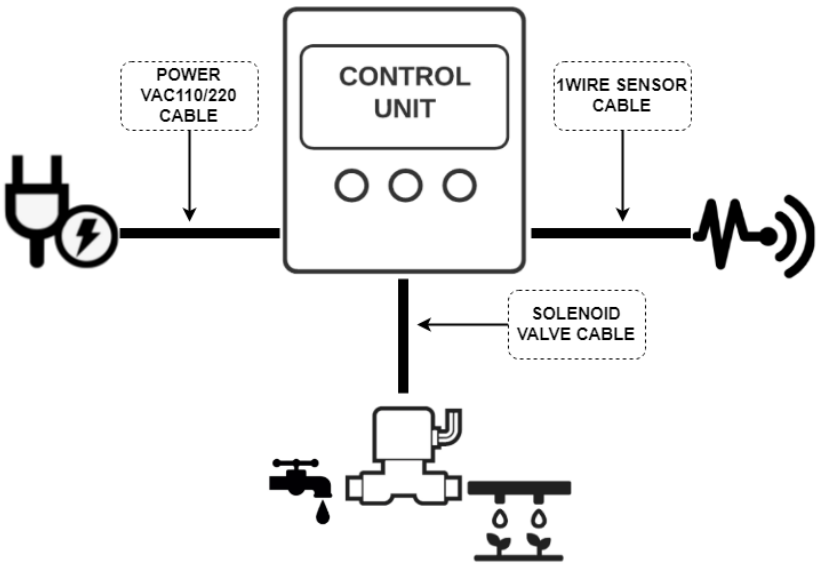
* The season is calculated as a function of the length of the day. This works well in most countries, but not those very close to the equator or the poles.

How To Install

Warning: wrong wiring can produce fire or explosion or expose you to electric shock. Only qualified electricians should install this product. Do not open the unit when it is connected to the power grid.

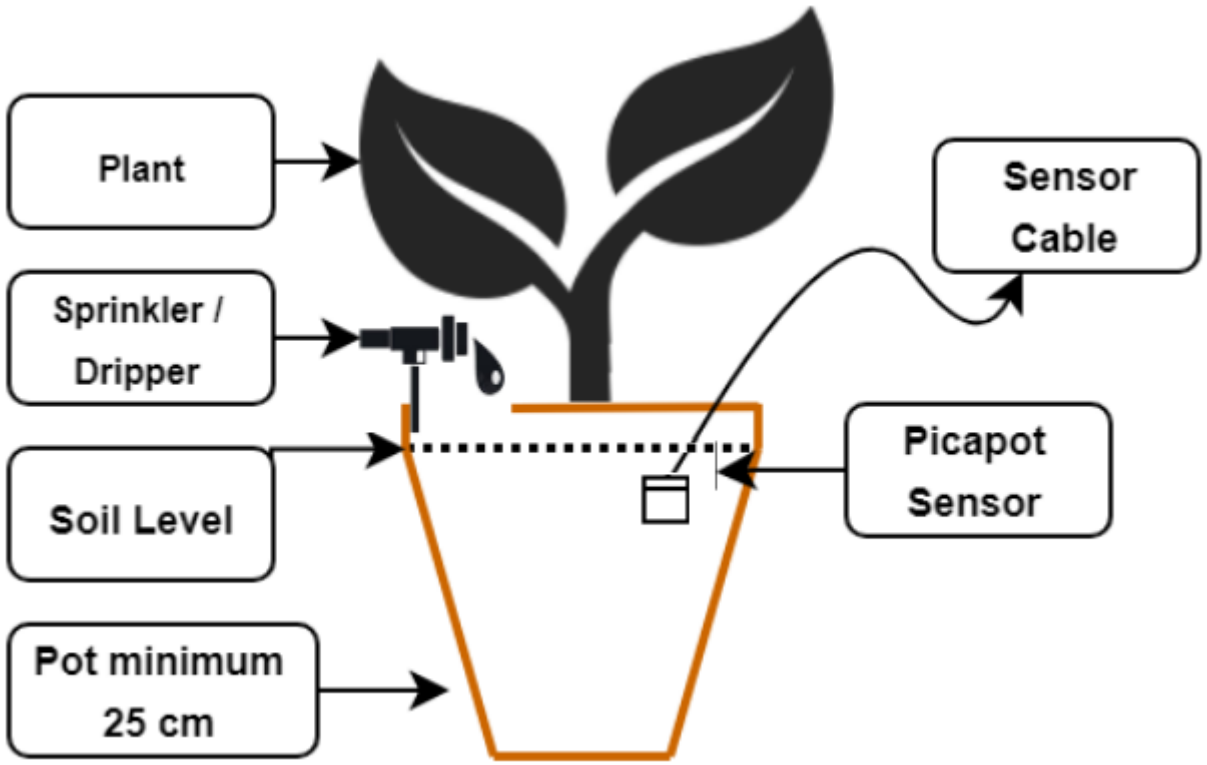
Sunfy328 has three cables, each one identified by a cable label.

Cable	Cores	Description
VAC110/220	3	This cable must be connected to the power grid. • L - Live (brown) • N - Neutral (blue) • GND - Ground (yellow/green)
VALVE	2	This cable must be connected to the solenoid valve. Standard solenoid (NC) valves have no polarity, so you can connect the wires in both ways. • V+ Positive (red) • V- Negative (black)
TEMP/SOIL SENSOR (Optional)	3 or 4	This cable has 3 cores if it is connected to a 1-Wire sensor or 4 cores if it is connected to an I2C sensor. • +5V (red) • GND (black) • 1-WIRE/SCL (yellow) • SDA (blue/green) *Sunfy328 is normally provided with the sensor already connected.*



Sensor Installation

The user can select from the Options (screen n.5) the model of the sensor connected to the Control Unit.
The Picapot sensor, if present, should be installed as shown in the picture below.
If another type of sensor is present, please refer to the installation instructions provided by the manufacturer.



How To Use Sunfy328

All information and settings are organized in 8 screens:

N.	Screen	Modes	Description
1	Date/Time	View/Edit/Watering	Main screen showing date, time, and sensors data.
2	Geolocation	View/Edit	Unit geolocation, timezone, and daylight saving.
3	Alarm-1	View/Edit	Alarm 1 configuration.
4	Alarm-2	View/Edit	Alarm 2 configuration.
5	Options	View/Edit	Skip ice, heatwave, clock calibration.
6	Watering Now	View/Edit	Immediate watering with timer.
7	Temperature	View	Minimum and maximum temperature of the day.
8	About	View	Program version, last alarm timestamp, voltages.

Screens can be managed using three buttons:

Button	Position	Functions
1	Left	Enter/exit edit mode when kept pressed for more than 2 seconds. In edit mode move to the next edit cell. Stops watering when kept pressed for more than 2 seconds.
2	Middle	In view mode move to the previous screen. In edit mode decrease the edit cell by one unit.
3	Right	In view mode move to the next screen. In edit mode increase the edit cell by one unit.

To move between the screens use buttons 2 and 3.
To change the values on a screen, enter edit mode keeping button 1 pressed for more than 2 seconds. Then use buttons 2 and 3 to insert the correct value in the current edit cell. When done, press button 1 to move to the next edit cell. When all the values have been inserted, keep button 1 pressed for more than 2 seconds to exit edit mode.

The monitor is turned off after 120 seconds of inactivity. To wake it up, press one of the buttons.

Screen 1 - Date/Time

This is the main screen shown after the system reboots or wakes up from sleep mode.
This screen shows (from left to right and from top to bottom) the following information:

Ord	Name	Description
1	Weekday	
2	Day	
3	Month	The transition from February to March on leap years is automatically managed.
4	Year	
5	Hour	Time is shown in 24H format. If the option Daylight Saving is ON (screen 2) the time will be automatically adjusted on the last Sunday of March and October.
6	Minute	
7	Second	
8	Battery level	A CR2032 battery is used to back up time and settings during blackouts. There are 5 levels of battery charge. On the lowest level, the icon starts blinking.
9	Temperature	Temperature is detected from the sensor (if one is connected).
10	Humidity	Humidity is detected from the sensor (if one is connected).

This screen, during waterings, shows a blinking text “WATERING” and a timer with the remaining time.
You can stop watering at every moment by keeping button 1 pressed for more than 2 seconds.

Screen 2 - Geolocation

With this screen you can input the geolocation of the unit.
Using this information, Sunfy328 can water at the daily dusk and dawn and adjust the watering duration accordingly to the length of the day. If you use the alarms only in MANUAL mode without seasonal adjustment, you don’t need to input the geolocation and you can configure only the setting Daylight Saving.

Ord	Name	Description
1	Timezone	Timezone where the unit is located. It can be a value: ● between -12 and +14 with 15 minutes increments
2	Daylight Saving	When the option Daylight Saving is ON, time will be automatically adjusted by 1 hour on the last Sunday of March and October. It can be one of the following options: ● ON (time is adjusted) ● OFF (time is not adjusted)
3	Latitude	Latitude of the unit. It can be a value: ● between -90 and +90
4	Longitude	Longitude of the unit. It can be a value: ● between -180 and +180

Screen 3 - Alarm 1

With this screen you can view/edit the Alarm 1 settings. The screen shows the following information:

Ord	Name	Description
1	Mode	Working mode of the alarm. It can be one of the following options: ● OFF (alarm is never fired) ● MANUAL (user can specify the exact time of the day when the alarm is fired) ● DAWN (alarm is fired at dawn) ● DAWN-90 (alarm is fired 90 minutes before dawn) ● DAWN-60 (alarm is fired 60 minutes before dawn) ● DAWN-30 (alarm is fired 30 minutes before dawn) ● DAWN+30 (alarm is fired 30 minutes after dawn) ● DAWN+60 (alarm is fired 60 minutes after dawn) ● DAWN+90 (alarm is fired 90 minutes after dawn)
2	Time	Hour and minute of the alarm. These two cells can be edited only if Mode is set to Manual. Otherwise, they are automatically calculated using geolocation (screen 2).
3	Duration	Watering duration. It can be ● a value from 1 minute to 3 hours
4	Season Adjustment	Maximum increase applied to the alarm Duration accordingly with the current season. The longer the daylight period, the bigger will be the increase. For example, if the duration is 5 minutes and Season Adjustment is 100%, on the shortest day of the year the effective duration will be 5 minutes, and on the longest day of the year, it will be 10 minutes. It can be one of the following options: ● OFF (no adjustment applied to the Duration) ● a value of maximum increase between +50% and +400%
5	Skip Humidity	Skip watering if the humidity percentage provided by the soil moisture sensor is greater than or equal to the inserted percentage. It can be one of the following options: ● OFF (never skip watering due to humidity) ● a value of humidity between 1% and 99%
6	Skip Days	Number of days, between two alarms, on which watering is OFF. It can be one of the following options: ● OFF (never skip days of watering) ● AUTO (the number of days to skip is calculated accordingly to the season: from watering every day during summer to watering every 4 days during winter) ● from 1 to 6 days

Screen 4 - Alarm 2

With this screen you can view/edit the Alarm 2 settings. The screen shows the following information:

Ord	Name	Description
1	Mode	Working mode of the alarm. It can be one of the following options: ● OFF (alarm is never fired) ● MANUAL (user can specify the exact time of the day when the alarm is fired) ● DUSK (alarm is fired at dusk) ● DUSK-90 (alarm is fired 90 minutes before dusk) ● DUSK-60 (alarm is fired 60 minutes before dusk) ● DUSK-30 (alarm is fired 30 minutes before dusk) ● DUSK+30 (alarm is fired 30 minutes after dusk) ● DUSK+60 (alarm is fired 60 minutes after dusk) ● DUSK+90 (alarm is fired 90 minutes after dusk)

The other Alarm-2 settings have the same number and functionality described in Alarm-1.

Screen 5 - Options

With this screen you can view/edit the remaining options. The screen shows the following information:

Ord	Name	Description
1	Temperature Unit	Measurement unit of the temperature It can be one of the following options: ● CELSIUS ● FAHRENHEIT
2	Skip Ice	When the temperature is lower than this value, alarms are not fired. This option is useful to protect the plants and the valve from frost. It can be one of the following options: ● OFF (never skip watering due to low temperature) ● a value of temperature between -3 and +11 Celsius (or a value between +25 and +51 Fahrenheit)
3	Heatwave Adjustment	When the maximum recorded temperature of the day is equal to or greater than this value, watering duration is increased of +30%. It can be one of the following options: ● OFF (never adjust the watering duration due to high temperature) ● a value of temperature between +30 and +55 Celsius (or a value between +86 and +131 Fahrenheit)
4	Clock Calibration	Number of seconds of calibration applied every day to the clock. For example, if the clock is losing one second every 24H, insert +1 to compensate for the loss. It can be: ● a value of seconds between -240 and +240

Ord	Name	Description
5	Sensor	Model of the sensor connected to Sunfy328. It can be one of the following options: ● NONE (no sensor connected) ● ATMEGA328 (internal ATMega328 temperature sensor) ● CATNIP (temperature/moisture sensor from Catnip Electronics) ● DS18B20 (waterproof version of the DS18B20 temperature sensor) ● PICAPOT (temperature/moisture sensor from Picapot)

Screen 6 - Watering Now

With this screen you can manually open the valve for the specified duration.
Keep button 1 pressed for more than 2 seconds to enter edit mode. Select the desired watering duration, and finally, keep button 1 pressed again for more than 2 seconds to start watering.
You can stop watering by keeping button 1 pressed for more than 2 seconds from the Date/Time screen.

Ord	Name	Description
1	Duration	Watering duration. It can be ● a value from 1 minute to 3 hours

Screen 7 - Temperature

This screen shows the minimum and maximum temperature recorded on the current day.

Screen 8 - About

This screen shows the following information:

- Software version
- Date/time of the last alarm 1
- Duration of the next alarm 1
- Date/time of the last alarm 2
- Duration of the next alarm 2
- Voltage of the logic and voltage of the backup battery
- Humidity value, humidity percentage, temperature