ISRAEL
TALGIL COMPUTING & CONTROL LTD.
NAAMAN CENTER, HAIFA - ACCO ROAD 7000
P.O.BOX 775 KIRYAT MOTZKIN 26119, ISRAEL
TEL: 972-4-8775947; 972-4-8775948
FAX: 972-4-8775949
E-mail: talgil33@netvision.net.il

Mini Agg 1-10 (DC/AC)

U S E R ' S M A N U A L

2015

TALGİL
Computing & Control Ltd.

Table of contents

General description 2
The Normal mode 3
Defining irrigation programs 3
Selecting the desired program 4
Entering into the desired program 4
Defining the irrigation days of programs 4
Setting irrigation days by use of a Run-list 5
Setting irrigation days by use of cycle of days 5
Defining the start times of programs 6
Defining the Water Runtime of valves 6
Defining the Fertilizers Runtime of valves 7
Adjusting the Water Runtime by % 7
Setting the current Time and current Day 8
Manual start/stop of programs 8
Monitoring the operations 8
Filters Backflushing 9
Rain Delay 11
The special function of program “C” 11
The initial setup procedure 11
How to enter into the Setup procedure? 11
Selecting between 24 hours clock and AM/PM clock 12
Defining the outputs in use 13
Connection of outputs and inputs to the terminal board 17
Alarm conditions detected by the controller 18
Low battery detection 18
No AC power 18
Short circuit situation 18
Endless looping of the Backflush program 18
Wiring Diagram 19
DC MODEL 19
AC MODEL 20
TECHNICAL DATA 20

Document Change Control

Date	Change description
18/6/2015	First edition

Mini Agg

General description

- The **Mini-Agg** is a modular irrigation controller of up to **10 outputs**, specially designed for agricultural applications which need **no volumetric** information.
- The 10 outputs can be flexibly allocated for the following uses:
  - a number of **irrigation valves**
  - 1 **main valve**
  - up to 2 **fertilizer injectors**
  - 1 **booster pump**
  - Up to 4 **backflush valves**
- For irrigation purposes there are 3 programs **A**,**B** and **C**. All programs can be scheduled to start by time, but program **C** can also be triggered by a dry contact sensor. All programs may include any of the irrigation valves and fertilizer injectors and the programs may run in parallel as long as they do not create conflicts.
- Irrigation days can be set in terms of **Days Cycle** or in terms of a **Run List** in which each day of the week can be set as an irrigation day or a day off.
- Each program can have 6 start times that become effective on the irrigation days.
- An additional program **F** is used for controlling the filters backflush process. Backflush cycles can be triggered either by a **DP** (Differential Pressure) sensor or by counting down the predefined interval.
- The unit can read 3 digital inputs which can be used for the following purposes: one for triggering the start of program **C**, one for **DP** sensor, and one for **Rain delay**.
- The user interface consists of a customized **LCD display** and a **keyboard** of 4 keys used as follows: (ENTER) key, key, key and (MANUAL) key.
- There exist DC and AC models.
- The DC model can be powered either by 6v DC or 12v DC and it activates 2 wired 12v DC latching solenoids. The voltage for the solenoids switching is stored in a capacitor, boosted by a charge pump.
- The AC model contains an internal transformer that can be powered by 110v or 220v from which it generates the 24v AC for powering the controller and the solenoids.

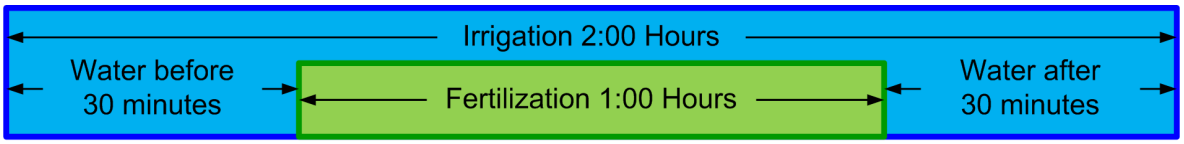
When the **Mini-Agg** is left untouched for a while, the LCD display will be turned off and remain blank. The only indication of the controller being alive, will be a double beep sounded every 15 seconds.
For turning the LCD back on, press and hold down any key of the keyboard.

The Normal mode

The **Normal mode** is the mode at which the everyday activities take place - planning, activating and monitoring the Irrigation, Fertigation and Backflush programs.
However before starting to use the controller in **Normal mode** it has to be set up according to the specific application, the **Setup procedure** is described on page 11 below.

A few facts about programs:

- The system recognizes 4 programs: **A**, **B**, **C** and **F**. Programs **A**,**B**, and **C** are used for irrigation and program **F** for controlling the filters backflushing.
- Apart from manual start, programs **A** and **B** can only start by time, while program **C** can also start by a sensor.
- Programs may run in parallel as long as they do not create conflict between water and fertilizers. If such a conflict occurs, the priority is given to the water and the fertilizer injection will be halted, but the time counting of the fertilizers continues, although no fertilization takes place. When the conflict is resolved the fertilization continues.
- The fertilizers are injected in a continuous mode. When the **Water Runtime** is longer than the **Fertilizer Runtime**, the difference will be divided in two, half of the difference will be used as **Water Before**, and the other half as **Water After** fertilization like demonstrated in the following drawing:



The water before and water after are calculated as half of the difference between the irrigation and the fertilization time

- Each program can have up to 6 start times that become in effect on the days defined as irrigation days.
- Optionally the water dosage of each irrigation program may be adjusted upward or downward by a multiplication factor of 0-250%, leaving the original dosage unchanged.

Defining irrigation programs

Defining an irrigation program consists of the following steps:

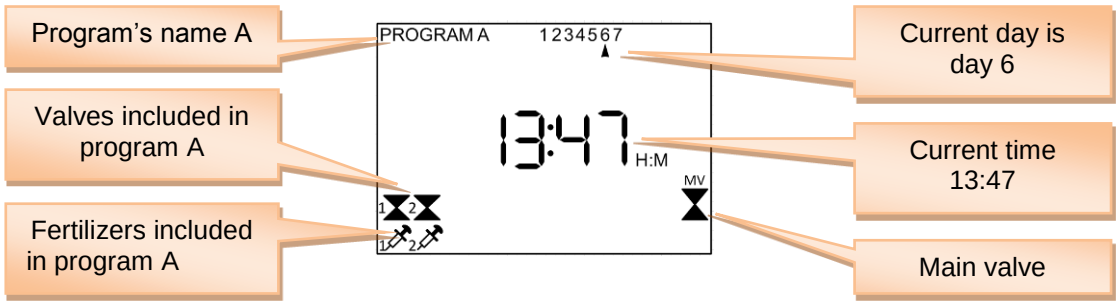
- Selecting the desired program.
- Defining the irrigation days.
- Defining the start times.
- Defining the water runtime per each valve to be included in the program
- Defining the fertilizers runtime per each valve.

For passing from one step to another the ⊕ or the ⊖ keys need to be used.

Selecting the desired program

How do we know we are in the right place for programs selection?

First you need to get to a screen like the one below, which is known as the **Opening screen,** then by pushing the ↵ key, the name of the program (**A,B,C,F**) will start blinking, now the ⊕ and ⊖ keys can be used to move from one program to another until arriving to the desired program.



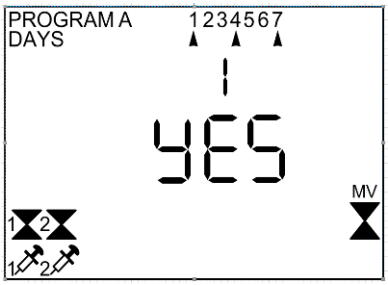
There are several tricks to get to the **Opening screen** from any other screen. If you pass through all the steps of a program definition by using the ⊕ key, eventually you get back to the **Opening screen**, or you can just wait until the display turns off and then hold down the ↵ key until it turns on again, or if you hold down the ⊕ and ⊖ keys simultaneously until entering **Setup mode**, then hold down the ↵ key until returning back to **Normal mode**, you will arrive to the **Opening screen.**

Entering into the desired program

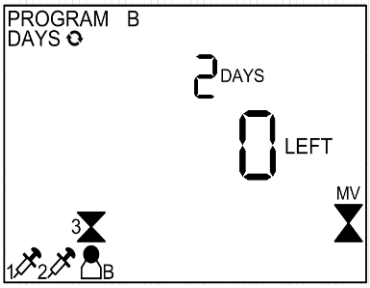
Once you are at the desired program you should hit the ↵ key again to turn off the blinking of the program's name and then you can start using the ⊕ or ⊖ keys to enter into the selected program, move between the fields and set the desired values.

Defining the irrigation days of programs

When the desired program is selected and the letter of the program's name is not blinking, use the ⊕ key to arrive to one of the following screens in which the field **Days** is blinking, indicating that this is now the actual field:



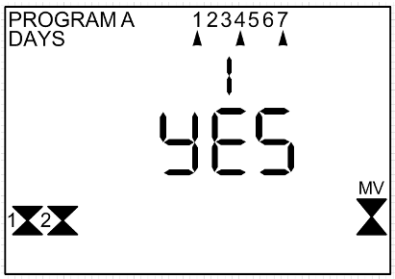
In program **A** the irrigation days are planned by a **Run-list** in which each day of the week that was selected as an irrigation day is marked by a small arrow.



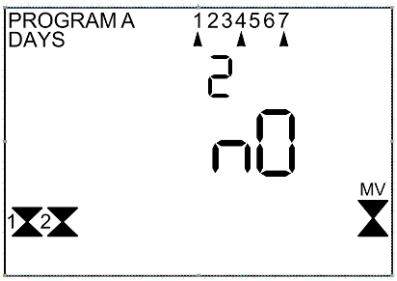
In program **B** the irrigation days are planned by **Cycle of days** in which the interval between cycles is specified. In the example above, program B will irrigate every 2 days.

Setting irrigation days by use of a Run-list

While the word "**Days"** is blinking and the 7 days of the **Run-list** are displayed, hit the key to indicate that you want to start setting the active irrigation days. The procedure will lead you through the seven days of the week, starting from day 1 and each day that should become an active irrigation day, should be marked **Yes**. If day 1 appears with a blinking "**No"** and you want to turn it into an active irrigation day, use the to change the "**No**" into "**Yes**" and confirm by . As a result, day 1 of the **Run-list** will get a marking of a small arrow indicating that it is now an active irrigation day. If day 1 already appears with a blinking "**Yes**" and we want to turn it into an inactive irrigation day, we shall use the key, turn the "**Yes**" into "**No"** and confirm by .



In both cases the actual day changes into 2 and we repeat the procedure as on day 1.

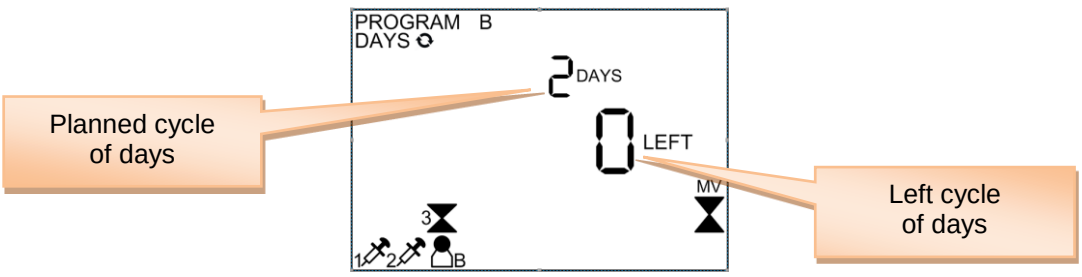


The rules are very simple:

- Each time you want to change into **Yes** you hit the key.
- Each time you want to change into **No** you hit the key.
- Each time you want to confirm the setting of the actual day and move to the next, hit the key.

Setting irrigation days by use of cycle of days

While the field- DAYS blinking, hit the key to indicate that you want to enter and set the **planned** or the **left cycle of days**.



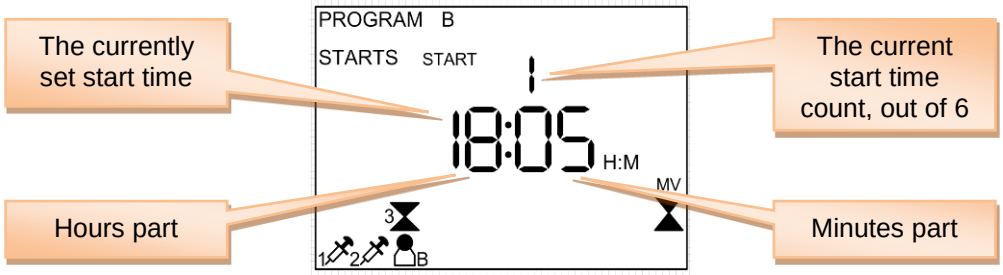
While the **planned cycle of days** is blinking use the key to increase or the key to decrease the value and confirm by .

How does the count of the cycle of days work? Only when the program is started by a start time (not manually), the **planned cycle of days** is automatically copied to the **left cycle of days.** Each midnight the left days will be decremented until becoming 0, indicating that the current day is an active irrigation day, in which the defined start times become effective.

REMARK The user can manually overwrite the left cycle of days at any time and thus delay or advance the next active irrigation day.

Defining the start times of programs

Each program may have up to **6 start times**. There is no priority between the start times, and the only order that counts is the chronological order.



Step 1 - While the word "**Starts"** is blinking, hit the key to indicate that you want to set the **start times**. The procedure will enable setting each of the six start times.

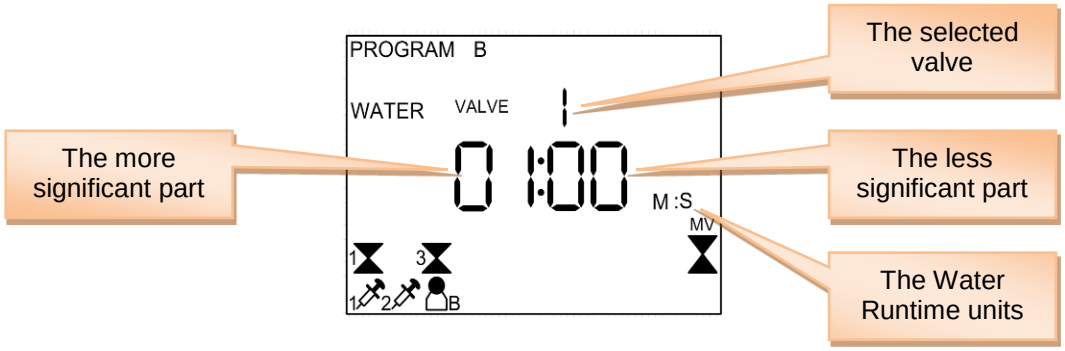
Step 2 - While the **current start time count** ("1" in the example above) is blinking, you may use the key to move forward to the next start time, or the key, to move back to the previous start time. When arriving to the desired start time hit the key to confirm.

Step 3 - The **Hours part** of the currently set **Start time** will start blinking, use the key to increase the value or use the key to decrease the value, then hit the key to get to the **Minutes part**. Use the same keys to edit the **Minutes part**.

Step 4 - Hitting the key again will get us back to step 1.

Defining the Water Runtime of valves

The **Water Runtime** of a valve indicates how long the irrigation valve will remain open after being activated. In order to include a valve in the selected irrigation program, it must have its **Water Runtime** set to a nonzero value. The units used for measuring the **Water Runtime** will be the units selected at the setup procedure for the particular program.



Step 1 - While the word **Water** is blinking hit the key and the valve number will start blinking.

Step 2 – If you wish to move to another valve use the or the keys until you get to the desired valve, whose **Water Runtime** you want to set and hit the key again. The two digits of the more significant part of the **Water Runtime** of the selected valve will start blinking.

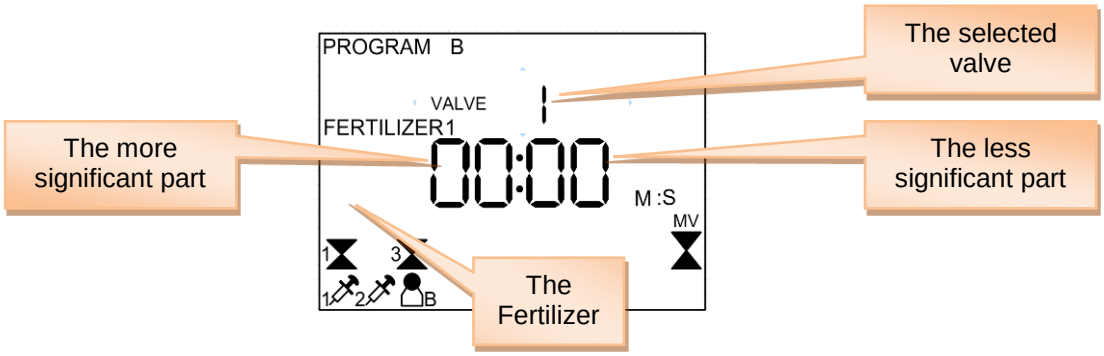
Step 3 - use the key to increase, or the key to decrease the value and confirm by . The two digits of the less significant part of the **Water Runtime** will start blinking.

Step 4 - Use the same keys of step 3 to edit the less significant part. When done, you will get the word **Water** blinking again, same as in step 1. If no more valves need setting of **Water Runtime,** use the or keys for moving to another subject, otherwise hit the key and you are back at step 2.

Defining the Fertilizers Runtime of valves

When the system contains two fertilizer injectors, each injector can have its own **Runtime** setting per each valve in each of the programs. The **Fertilizers Runtime** indicates how long the fertilizer injection will last, after being activated. The units used for measuring the **Fertilizers Runtime** will be the units selected for the particular program at the **Setup procedure**.

The **Fertilizer Runtime** of valves having no **Water Runtime** defined, will be ignored.



Step 1 - While the word **Fertilizer 1** is blinking hit the key and the valve number will start blinking.

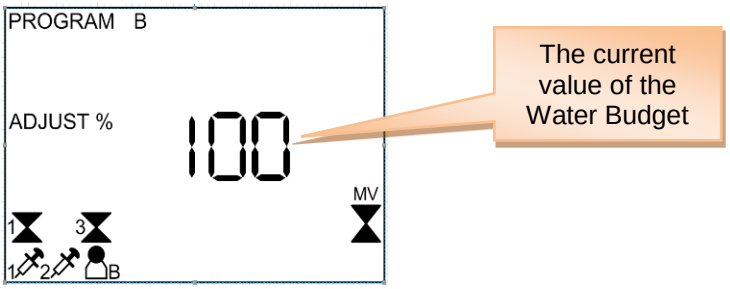
Step 2 – If you wish to move to another valve, use the or the keys until you get to the desired valve, whose **Fertilizer Runtime** you want to set and hit the key again. The digits of the more significant part of the **Fertilizer Runtime** of the selected valve will start blinking.

Step 3 - use the key to increase or the key to decrease the value and confirm by . The digits of the less significant part of the **Fertilizer Runtime** will start blinking.
Step 4 - Use the same keys of step 3 to edit the less significant part. When done, you will get the word **Fertilizer 1** blinking again, same as in step 1. If your system contains another fertilizer injector, using the key will cause the word **Fertilizer 2** to start blinking; otherwise it will get you to the next subject, in that case step 5 skipped.

Step 5 - If you wish to set the **Fertilizer Runtime** of the second injector as well, you may use the key and repeat steps 2, 3 and 4 above.

Adjusting the Water Runtime by %

The **Water Runtime** of all the valves included in a program may be adjusted by % upward (up to 250%) or downward (down to 0%) in steps of 5%. The adjustment will not affect the **Fertilizers Runtime**. The adjustment by % is also known as **Water Budget**. It is important to point out that the original Water Runtime remains unchanged.

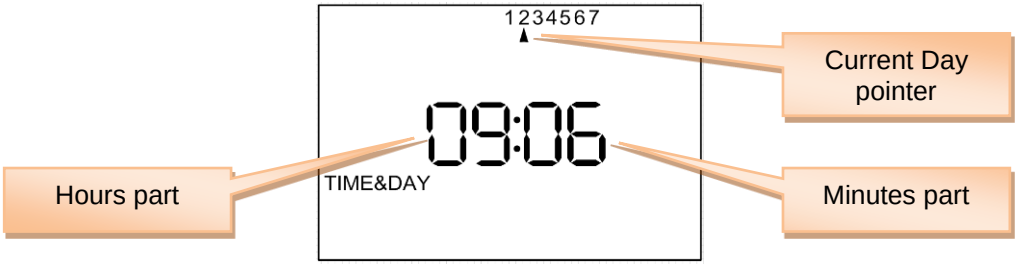


While the field- ADJUST % is blinking, hit the ↵ key to indicate that you wish to set the **Water Budget**.

The current value of the **Water Budget** will start blinking, use the ⊕ key to increase or the ⊖ key to decrease the value and confirm by ↵.

Setting the current Time and current Day

The last screen you are going to meet when you keep passing through all the subjects of any irrigation program deals with setting the current time and current day. In fact, it is important for the controller to know the current day and time in order to be able to start the irrigation programs on time.



Step 1 - When the **Time & Day** field is blinking, push the ↵ key and you will get the **Hours part** start blinking.

Step 2 - use the ⊕ key to increase or the ⊖ key to decrease the value and confirm by ↵. The **Minutes part** will now start blinking.

Step 3 - Use the same keys for setting the **Minutes part**. When done, the arrow pointing to the **Current Day** will start blinking.

Step 4 - use the ⊕ key to move the arrow to the next day or use the ⊖ key to move to the previous day and confirm by ↵.

Manual start/stop of programs

Any program can be started /stopped manually. When the desired program is selected, use the Ⓜ key to manually change its status, if the program is idle, it will start running and if it is already running, it will stop. A program that was manually started will have the symbol ✋ appearing on the screen.

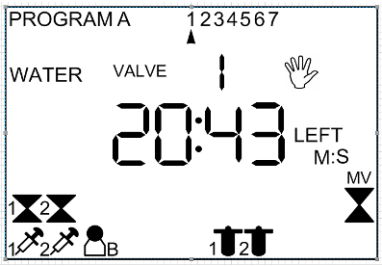
Monitoring the operations

How do we know what is the controller doing now, how do we know which programs are running and which valves are open, what is the stage an active program has reached?

In order to get the answers to these questions we need first to get to the **Opening screen** (as explained above) then we can pass program by program and look at the icons of the outputs belonging to each program. Blinking icons indicate activated outputs.

While filters backflushing is in progress, the icons of the filters will be blinking in any of the irrigation programs display and if the flushing was triggered by the DP sensor, then the Δp icon will appear as well. Under normal conditions the icon Δp should not be blinking, however when it does blink, it indicates an endless looping of the backflushing program.

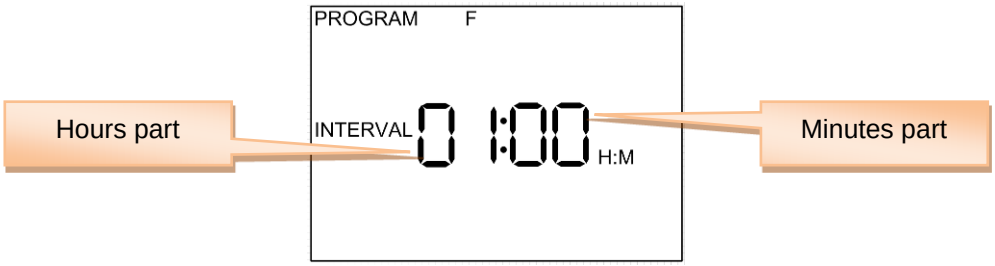
In order to see the **Left Runtime** of water and fertilizers of a running program, hold down the key for 3 seconds, the following screen will be displayed:



The word “LEFT” will be blinking along with the irrigating valve and all the other active accessories. In the example above, the irrigating valve is valve 1 and it has a **Left Water Runtime** of 20 minutes and 43 seconds. Now you may use the and keys to scroll between the **Left Runtimes** of the water and the fertilizers. In order to exit the mode of Left quantities display hit the key.

Filters Backflushing

Program **F** is the program for the filters backflushing. The program can be started manually any time, but it can be triggered to start by DP or by elapsed time only when there is an irrigation program in progress, the controller also has counters that count how many times the flushing program was started by DP and how many times by elapsed time.



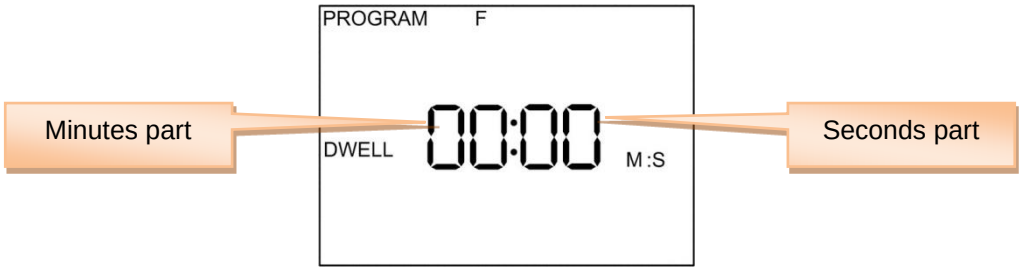
Step 1 - When program **F** is selected and the letter **F** is not blinking, use the key to move to the first screen of the backflush program, in which the **Interval** between flushing cycles is defined. The word **Interval** will start blinking.

Step 2 - push the key and you will get the **Hours part** of the interval start blinking.

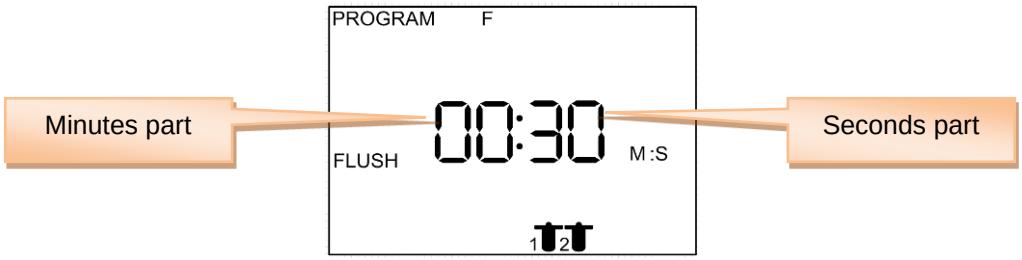
Step 3 - use the key to increase or the key to decrease the value and confirm by .
The **Minutes part** will now start blinking.

Step 4 - Use the same keys for setting the **Minutes part**. When done, the word **LEFT** will appear and now if you wish to delay or advance the next flushing cycle, you are able to repeat steps 3, and 4 in order to define the **LEFT Interval**.

When done, the word **Interval** will be blinking again, use the ⊕ key to get to the next screen that deals with the **Dwell time** definition, the word **Dwell** will start blinking. The **Dwell time** defines the delay between the flushing stations.



Step 5 - Set the **Minutes part** and the **Seconds part** of the **Dwell time** the same way as explained in steps 2,3 and 4 above. When done, the word **Dwell** will be blinking again, use the ⊕ key to get to the next screen that deals with the **Flush time** definition, the word **Flush** will start blinking. The **Flush time** defines how long will each of the stations be flushed.

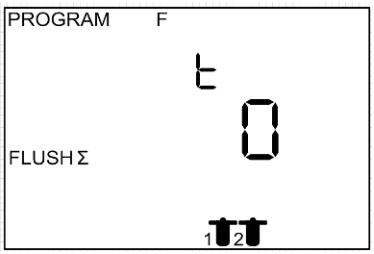


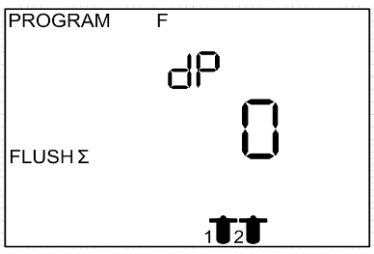
Step 6 - Set the **Minutes part** and the **Seconds part** of the **Flush time,** the same way as explained in steps 2,3 and 4 above. When done, the word **Flush** will be blinking again. At this stage you actually finished defining the backflush program **F**.

REMARK

Once the flush time is set , it can be edited, but cannot be cleared completely. Once the flush time is set , the icons of the filters 1 2 will start being displayed.

Step 7 - The remaining two screens of the program show the counters of flushing cycles triggered by time and by DP. The ⊕ key can be used for moving from one screen to the other.





When the field FLUSH Σ is blinking you may hit the ↵ key in order to edit the counter, usually it will be used for resetting the value to 0.

Rain Delay

When the input of the rain sensor senses a closed contact, it will cause the icon of the umbrella to appear on the display and the operation of the irrigation programs will be influenced in the following way:

All the programs that are already running will stop and as long as the rain indication exists, all **Start times** will be ignored and even **Manual start** of programs will not be respected.

The special function of program "C"

Program **C** has the same functions of programs **A** and **B**, but additionally it can be started by a sensor. When the input marked by , senses a closed contact, program **C** will start irrigating. If the contact is still closed when the program terminates, it will cause the program to start again. This feature enables using program **C** for frost protection, or for filling a reservoir by a level sensor.

It is important to point out that as long as the rain sensor indication exists , the sensor will not be effective.

The initial setup procedure

Before starting to use the controller for controlling the irrigation, fertigation and backflushing, it must undergo a setup procedure during which the following things are defined:

- The type of clock to be used – **24 hours** or **AM/PM** clock.
- The **outputs allocation**.
- Per each of the programs **A**,**B**,**C** –
  - Whether to use **Days Cycle** or **Run List** for specifying irrigation days.
  - Whether to use **H**ours:**M**inutes or **M**inuts:**S**econds for dosing the water and fertilizers.

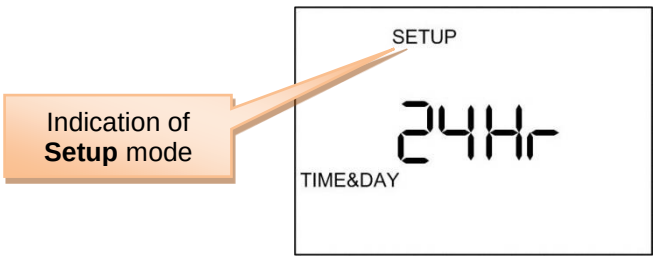
How to enter into the Setup procedure?

The **Setup** procedure can be entered by pressing and holding down simultaneously the and keys. To exit the setup procedure press and hold down the key.

Once inside the **Setup** procedure, moving from one programmable object to another, use the or keys.

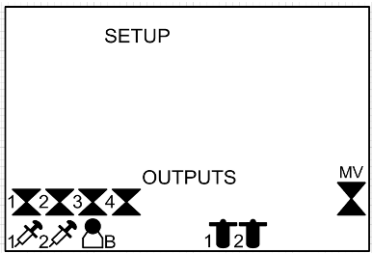
Example : As an example we shall demonstrate passing through the screens of the **Setup** procedure:

- Press and hold down the and keys. The first screen of the **setup** will pop up:



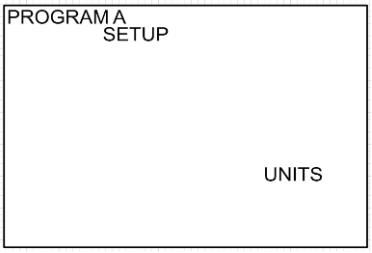
The "Time & Day" field will be blinking to indicate that this is now the actual subject we are dealing with. If we wish to enter and change from 24 hours clock to AM/PM clock we shall hit the key.

- Press the ⊕ key to move to the next subject in which the outputs allocation is done.



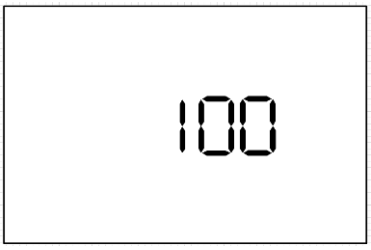
The word “Outputs” will now be blinking, indicating the new actual subject. If we wish to enter and change the existing outputs allocation, we shall hit the ↵ key and define all the outputs we intend to control by the controller.

- Press the ⊕ key to move to the next subject that deals with the mode of defining the irrigation days and the units used for defining the Runtimes. These setting are done per each program.



The “Units” will be blinking to indicate that this is the actual subject now. If we wish to enter and change the mode of defining the irrigation days or the Runtime units we shall hit the ↵ key.

- Press the ⊕ key to move to the next screen in which the software version of the controller is displayed.



This screen is the last screen in the **Setup** procedure, it is informative only, here nothing can be changed.

- Press and hold down the ↵ key and you are out of the setup procedure.

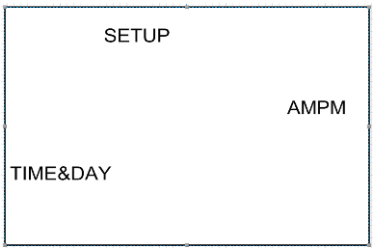
We shall now explain in details how each step of the **Setup** procedure is done.

Selecting between 24 hours clock and AM/PM clock

Enter **Setup** mode by holding down simultaneously the ⊕ and ⊖ keys and you arrive to the following screen:

The blinking “Time&Day” field indicates that this is now the actual subject that can be edited. Hit the key and the “24Hr” will start blinking to indicate that this is now the actual item we are dealing with.

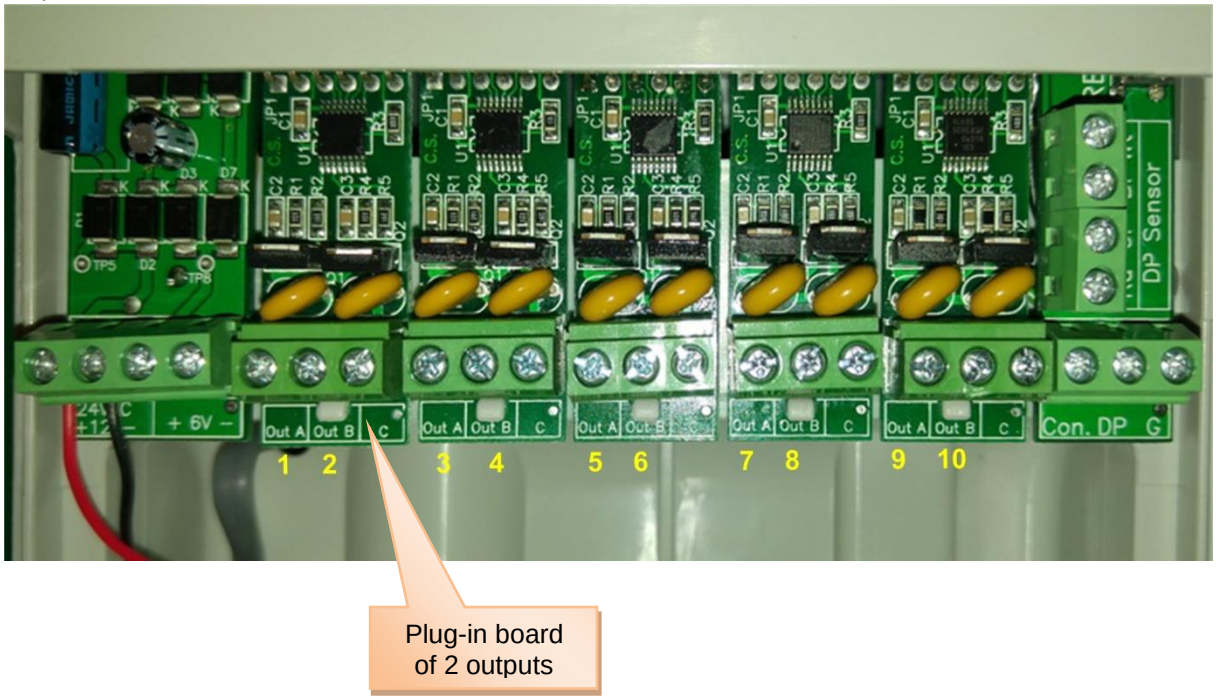
If you wish to change the 24 hour clock to AM/PM, hit the key and you will get the following screen:



“AM/PM” is now blinking. To confirm the selection hit the key.

Defining the outputs in use

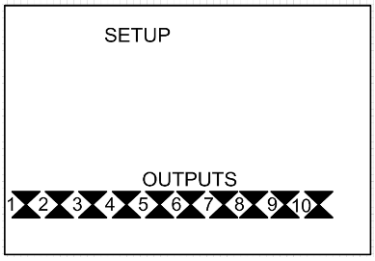
The modular structure of the controller enables it to have 2,4,6,8, or 10 outputs. The number of outputs available depends on the number of plug-in boards in use. Each plug-in board contributes 2 outputs.



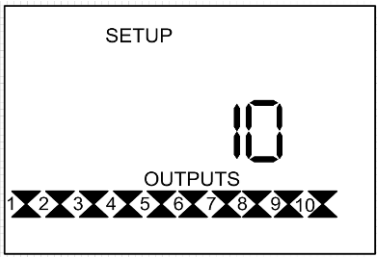
The available outputs can be allocated for **Irrigation valves**, **Main valve**, **Fertilizer injectors**, **Booster**, and **Backflush valves**. The order of connection of the allocated outputs is explained in a separate paragraph below.

The allocation procedure will go as follows:

Enter **setup** mode as explained above and press the ⊕ key until arriving to the outputs allocation screen that looks as follows:



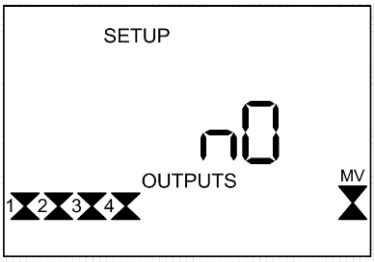
The blinking “Outputs” field, indicate that this is now the actual subject for editing and if we wish to make changes, we shall have to push the ↵ key and the screen will change as follows:



The blinking number “10” (in other cases it may be a different number) indicates that all the 10 outputs are currently allocated for irrigation valves. The symbols of the irrigation valves 1 2 3 4 5 6 7 8 9 10 will blink as well.

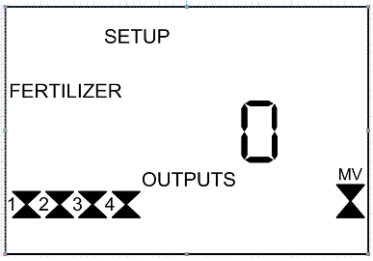
If the system to be controlled contains only 4 irrigation valves, we shall have to push the ⊖ key 6 times to reduce the number of valves to 4 and then confirm by pressing the ↵ key.

The following screen deals with allocation of a **Main valve** when existing.



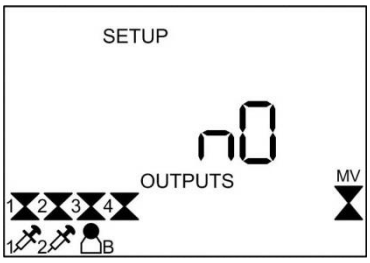
The symbol of the **Main valve** MV and the word “no” are blinking. If our system does contain a **Main valve** we shall use the ⊕ key to change the “no” into “yes” otherwise just leave it as it is and then confirm by ↵.

The following screen deals with allocation of **Fertilizer injectors.**



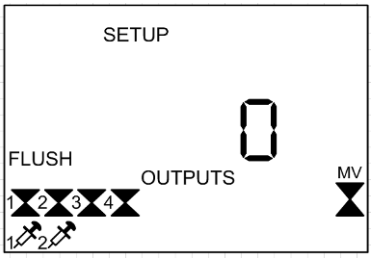
Yes, as you probably guessed, the blinking “0” indicates that currently there are no **Fertilizer injectors** defined, and if you wish to include in the configuration 1 or 2 **Fertilizer injectors**, just push the ⊕ key once or twice and confirm by pressing the ↵ key.

The following screen enables allocation of a **Booster pump** in case it is needed.



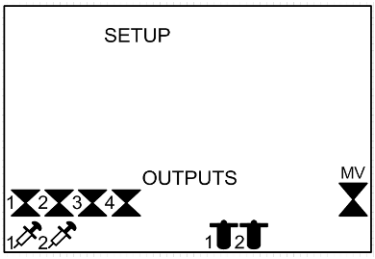
This time the blinking of the **Booster**’s symbol B and the word “no” indicate that currently there is no **Booster** defined. If you wish to allocate a **Booster pump** push the ⊕ key, else leave it as is and push the ↵ key for confirmation.

The following screen deals with the allocation of the filters **Backflush** valves.



Here again the blinking “0” indicates that currently there are no **Backflush** valves allocated. Each push of the ⊕ key will allocate an additional **Backflush** valve. When done, push the ↵ key for confirmation. The maximal number of Backflush valves is 4.

The resulting screen shows all the allocations made, which in our example includes 4 **Irrigation valves**, 1 **Main valve**, 2 **Fertilizer injectors**, and 2 **Backflush valves**.



The word “Outputs” is blinking again just as in the first screen, where we started the outputs allocation procedure. If we wish to enter again into the allocation procedure, we shall push the ↵ key, otherwise we shall push the ⊕ key which will take us to the next subject of the setup procedure that deals with defining the modes of the irrigation days and the dosing units to be used by the irrigation programs.

REMARK

It is important to understand that in all the cases above in which we used the ⊕ key to increase values or move forward, we could have used the ⊖ key to decrease values or move backward. Also when we used the ⊕ key to turn a “no” into “yes” the ⊖ key would have done the opposite.

REMARK

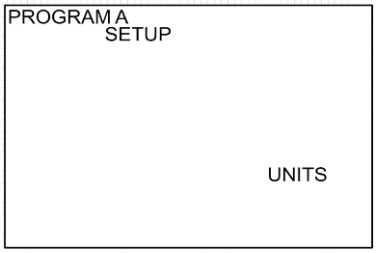
Once all available outputs are allocated, (Regardless of the stage we are in the outputs setup) the controller will skip to the first screen where the word “Outputs” is blinking.

An actual example of the connections can be seen on page 17 of this manual.

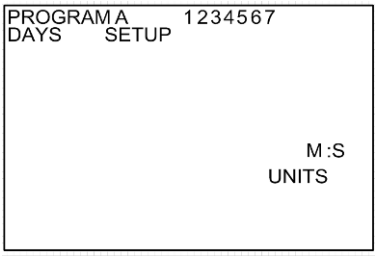
Defining the dosing units and the mode of setting the irrigation days

The decision about which units will be used for the water and fertilizers **Runtime** definition and how the irrigation days will be defined, is made during the setup procedure. Per each irrigation program

A,**B** and **C** we define independently whether the irrigation days will be defined by a **Run-list** or as a **Cycle of days**, and whether the **Runtime** will be expressed in **H**ours: **M**inutes or **M**inutes: **S**econds . Enter setup mode as explained above and press the ⊕ key until arriving to the following screen:



While the “Units” field is blinking push the ↵ key and the following screen will pop up:



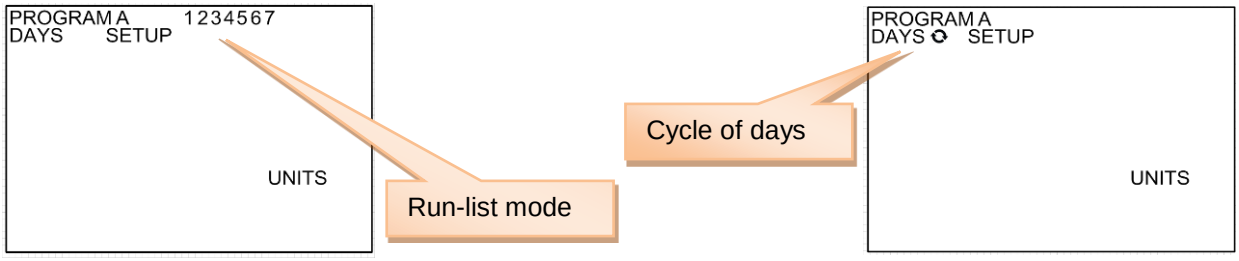
At this stage we are supposed to select the actual program we want to deal with, while the letter “A” is blinking we can use the ⊕ or ⊖ keys, to move forward or backward until arriving to the desired program and then make our selection by pushing the ↵ key.

There are two modes of setting the irrigation days. The first mode uses the **Cycle of days** and the second mode uses a **Run-list.**

When using the **Cycle of days** mode, the user specifies after how many days will the irrigation be repeated: 1 means every day, 2 means every second day, etc…

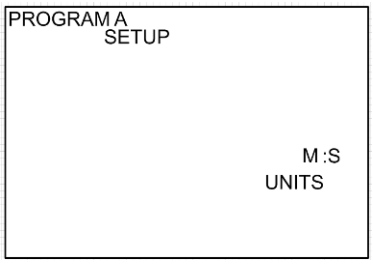
When using the **Run-list** the user marks per each day of the week on which days to irrigate.

Use the ⊕ or ⊖ keys to select the desired mode and confirm by ↵ .



The following screen enables selection between **H**ours: **M**inutes or **M**inutes: **S**econds to be used for setting the **Runtime** of water and fertilizers.

Use the ⊕ or ⊖ keys to change the units and confirm your selection by ↵ .



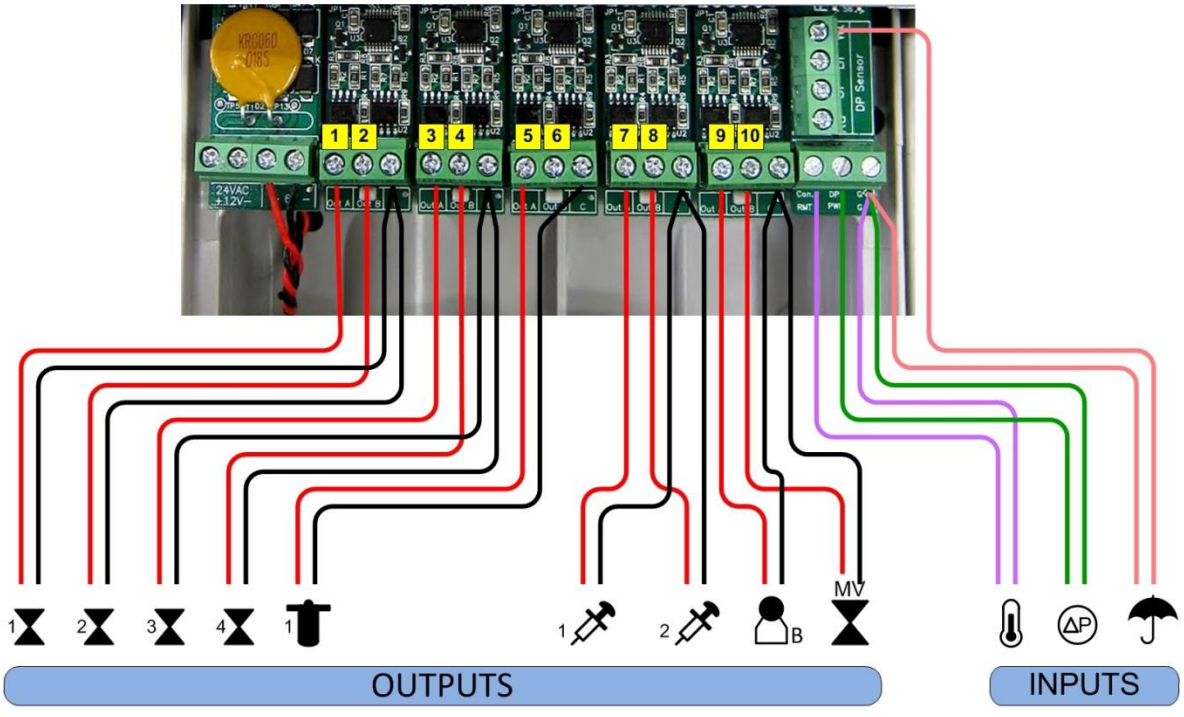
REMARK

At any stage inside the **Setup procedure** when the key board is left untouched for 1 minute the system will automatically exit **Setup mode** and return to **Normal mode**. Another way to force exit from **Setup mode** is by pushing and holding down the ↵ key.

Connection of outputs and inputs to the terminal board

The defined accessories will be connected to the terminal board according to the following rule: **Irrigation valves** will be connected starting from output 1 and up. **Backflush valves** will follow the last irrigation valve and continue upward. **Main valve** when existing will be connected to the highest available output. **Booster** when existing will be connected right in front of the Main valve, or in case there is no Main valve the Booster will be connected to the highest output. **Fertilizer injectors** will be connected right in front of the Booster, or if there is no Booster, then in front of the Main valve and if there is no Main valve, they will be connected to the highest available outputs. Injector 1 will be connected at the lower output.

For example, a controller with 10 outputs that needs to handle 4 Irrigation valves, 1 Backflush valve 2 Fertilizer injectors a Booster B and a Main valve MV, will have the following order of outputs connection:



As for the inputs, the 3 dry contact inputs recognized by the controller have their fixed connection points. The drawing shows where each of the sensors has to be connected:

- The sensor for triggering the start of program C.
- the DP sensor for triggering the backflushing by program F
- the rain sensor that triggers the rain delay

Sensor type / connection should be “Normally open”.

Alarm conditions detected by the controller

Low battery detection

When the controller is powered by batteries, the system will detect low battery condition by measuring the time it takes to fill back the capacitor that stores the energy for the outputs activation to the desired level. If it takes less than 6 seconds the battery is all right. If it takes more than 6 seconds, the battery is considered low and it will be indicated by the blinking icon and by a specific sound. All activities

continue as usual until the filling back of the capacitor takes more than 10 seconds, then the battery is considered being in critical condition, all activities stop after shutting down all outputs, including the specific sound, only the icon of the low battery remains.

No AC power

When the controller is powered from the mains and there is a power down situation, there will be an icon indicating the **No AC power** condition. The controller will keep on running with the power coming from its backup battery, although the programs will seem to continue running and counting down the Runtimes, physically all outputs will shut down.

Short circuit situation

The AC model of the controller will detect **Short circuited** outputs when existing. The notification about the **Short circuit** will be in the following way:

When the keyboard is left untouched and the display is usually becoming blank, under **Short circuit** situation the display will show a blinking icon of a lightning and the number of the output at which the **Short circuit** was detected. Then if we touch the keyboard and the display shows the **Opening screen**, the icon of the lightning will still be displayed but it will be blinking only when the output with the short circuit is shown as well.

Endless looping of the Backflush program

When the DP contact keeps triggering the flushing program **F** in a consecutive way, then after 5 repetitions, it will be considered as an **Endless looping** problem. As a result the controller will ignore the DP sensor signal, and will indicate the problem by blinking the icon at all the screens of all the programs.

REMARK Removing the signal of the DP sensor will be considered as end of the problem.

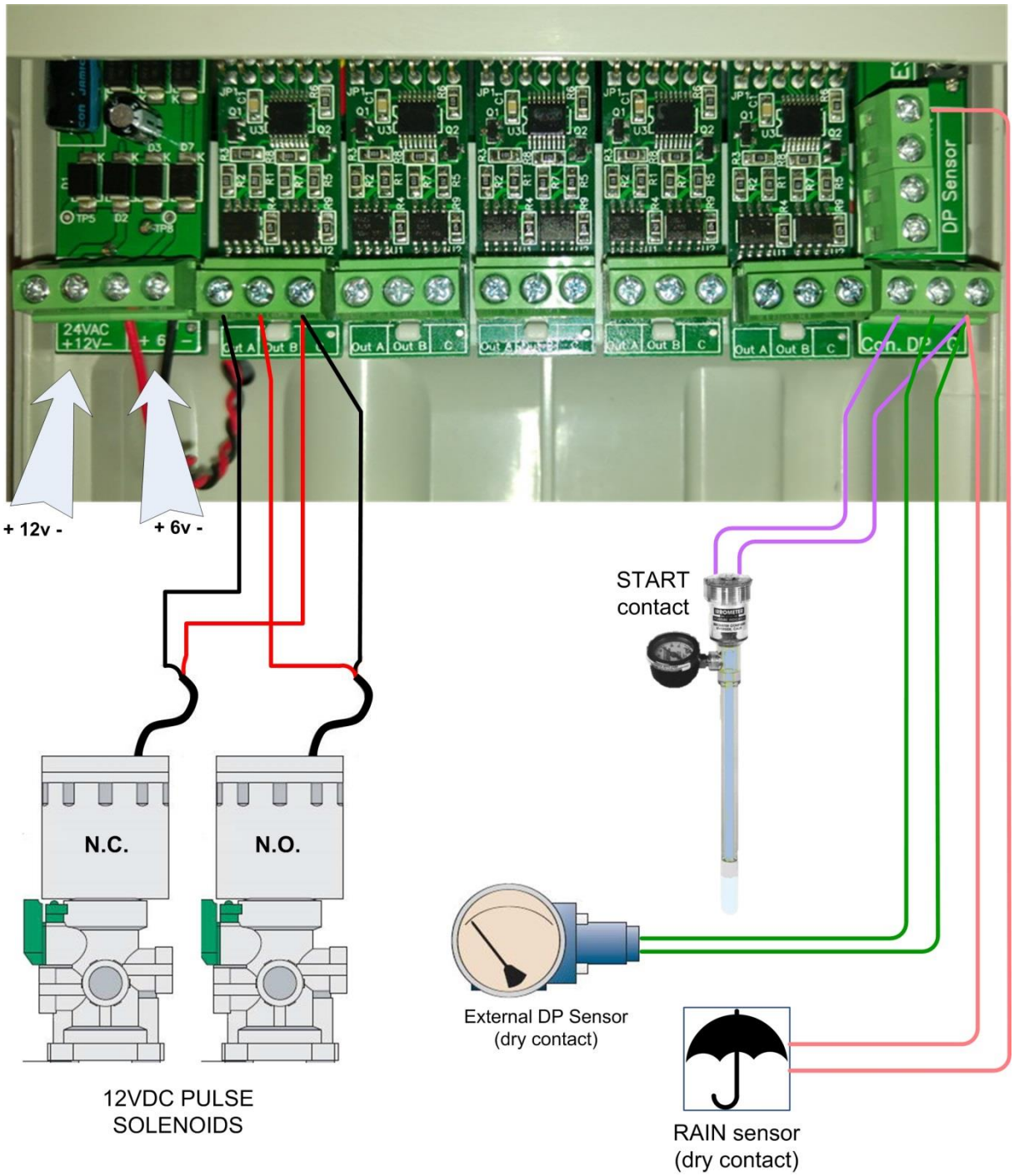
Wiring Diagram

DC MODEL

The drawing below shows the wiring of the DC model of the controller.

Notice that:

1. The powering of the unit can be either by 6v DC or 12v DC.
2. The solenoids will be of 12VDC latch.



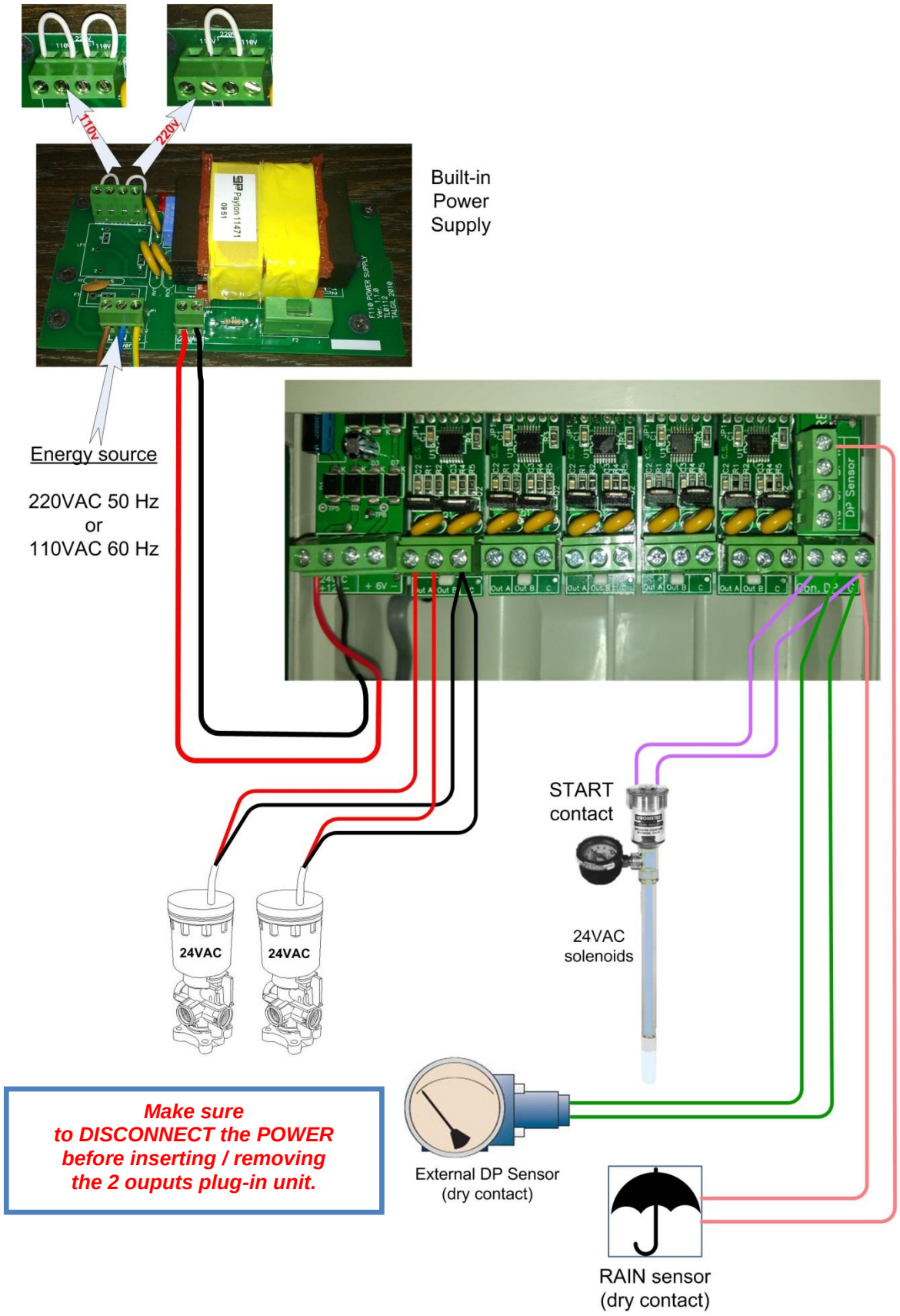
Make sure
to DISCONNECT the POWER
before inserting / removing
the 2 ouputs plug-in unit.

AC MODEL

The drawing below shows the wiring of the AC model of the controller.

Notice that:

1. The powering of the unit is by 24VAC transformed from 220/110 VAC.
2. The solenoids will be of 24VAC.



TECHNICAL DATA

DC MODEL

Power source:	6v supplied by 4 x 1.5 “D” size alkaline batteries. or 12v DC dry battery or 12v rechargeable battery with solar panel of 2 watts
Outputs :	12v DC latching solenoids.
Digital inputs:	Dry contact indication.
Operating temperature:	0-60° C.

AC MODEL

Power source:	220 or 110 v AC 50 or 60 Hz with built in transformer to 24v AC.
Outputs :	24v AC solenoids.
Digital inputs:	Dry contact indication.
Operating temperature:	0-60° C.