

Sapir 2 – user manual



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1. Introduction

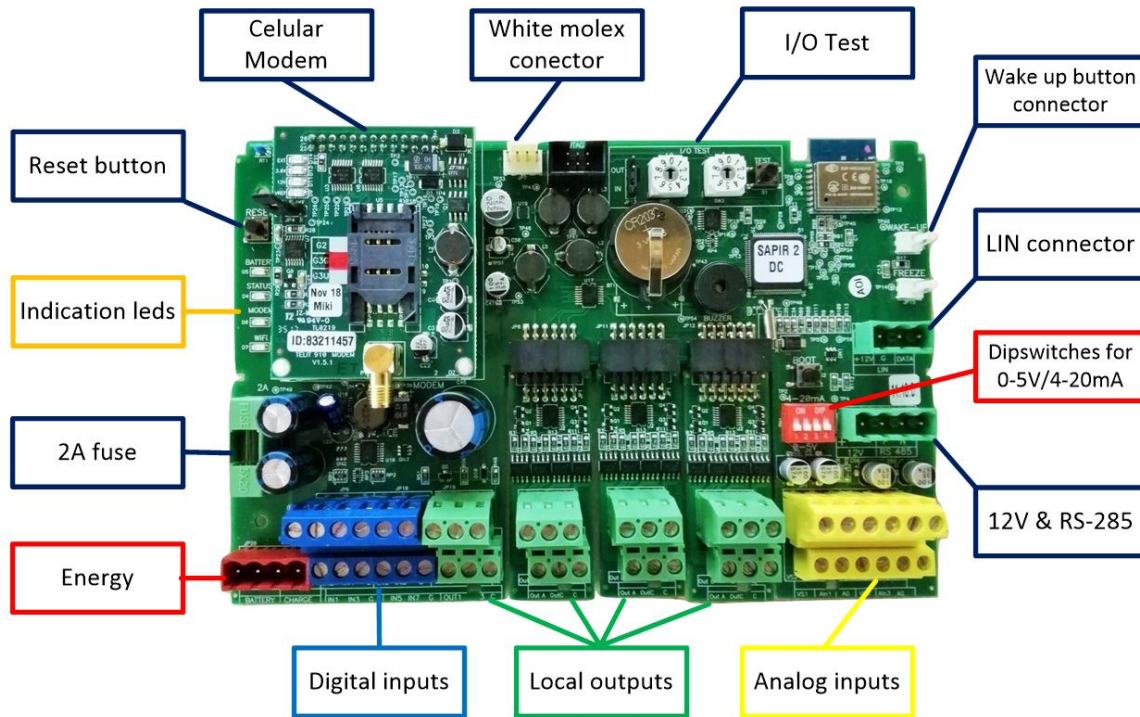
The SAPIR 2 is the next generation of central control irrigation systems. It allows combining various technologies to suit each project specific needs. It is an Internet enabled controller so the user can control and monitor everything from everywhere at any time using his PC or Smartphone.

The SAPIR 2 is the perfect solution for small to medium irrigation projects with a single irrigation head, suitable for both simple and most demanding applications.

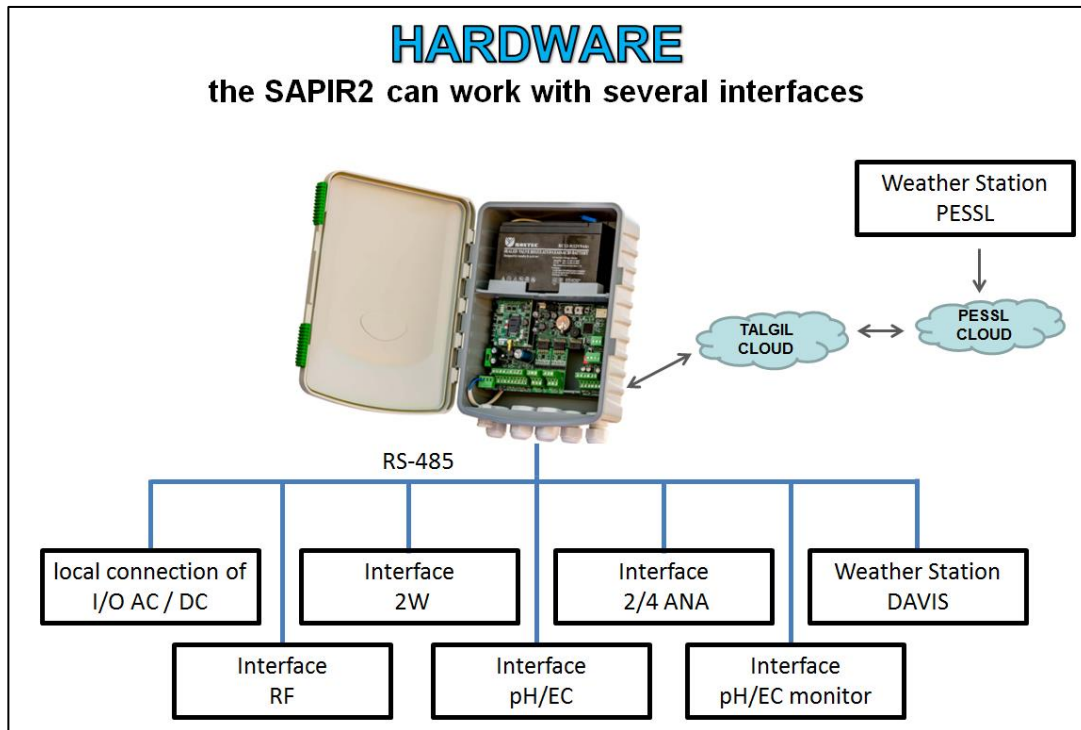
The SAPIR 2 HAS 16 local outputs + 16 in RTU's, 8 local digital inputs + 8 with RTU's and 4 analog inputs + 44 with RTU's / other interfaces.

2. The system structure

2.1 Hardware



2.2 Interfaces - The following schema describe the principal structure of the SAPIR 2 interfaces system.



The interfaces function is to communicate between the external I/O devices such as – RTU's, analog sensors, weather station.... and the CPU.

Note – the on board local I/O's doesn't have an external interface, it's included in the SAPIR 2 board hardware and software.

For example – the steps of an opening command to valve number 3, which is connected to RTU RF number 2 in output 1:

1. The CPU will send the opening command to the interface / master RF.
2. The interface / master RF will send the command to RTU number 2.
3. RTU number 2 will open output 1.

When use digital or analog senores, the same logic works but the other way around, meaning that the sensor is connected to an input in the RTU and when the sensor send a signal to the RTU, it sends it to the interface and the interface to the CPU.

Communication with the physically connected external interfaces is done by RS-485 communication protocol.

3. Communication

3.1 – Connection to the server

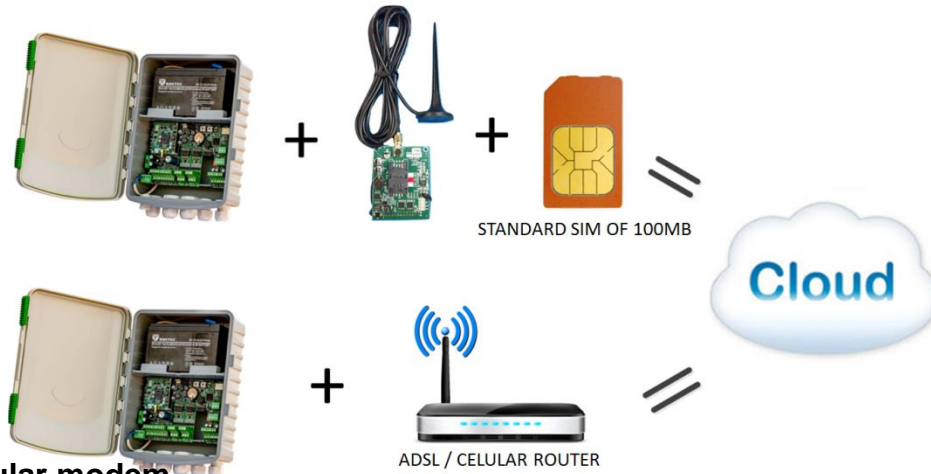
Connecting the controller to the server allows the user to program and monitor the controller from everywhere at any time, moreover, it allows to multiples users access to a certain controller and / or access with a certain user name to multiples controllers.

All the communication between the users pc / smartphone and the controller is happening in the server (except while using WIFI direct), for example, if a user changes a certain irrigation program from his computer using the CONSOLE, the changes are done in the server, and the information passes to the controller.

In addition, all the information from the controller (online controller) saved in TALGIL’s server (cloud).

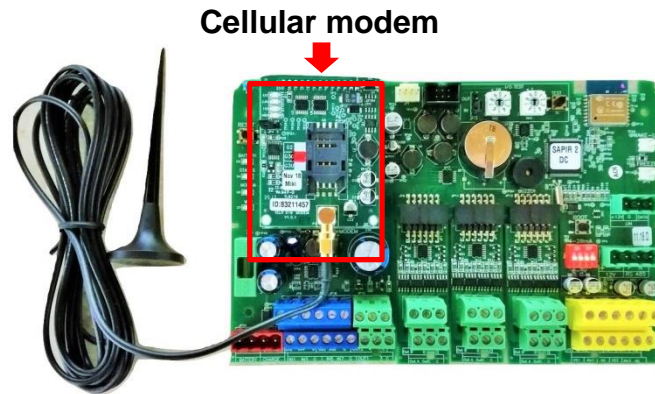


There are 2 ways to connect the SAPIR 2 to TALGIL server, first one is by cellular modem and a sim card with data package (at least 100Mb), and the second one is by connecting to the local Wi-Fi net.



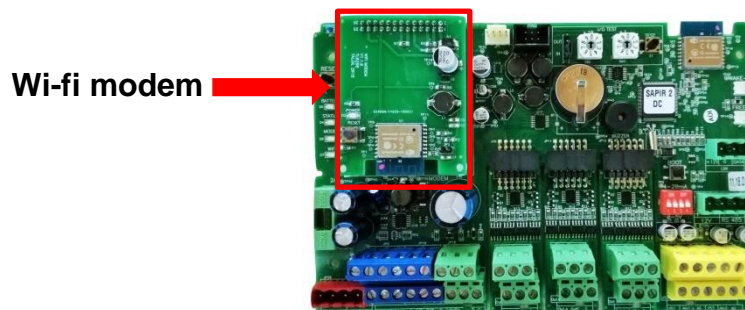
3.2 – Cellular modem

In order to connect the controller to TALGIL’s server, disconnect it from the power supply and rechargeable battery, open carefully the SIM card holder place it the right position and close the holder, to continue go to paragraph 6.



3.3 – WI-FI

The Wi-fi modem connection will be ready in Q1 of 2019.



4. Communication with the controller

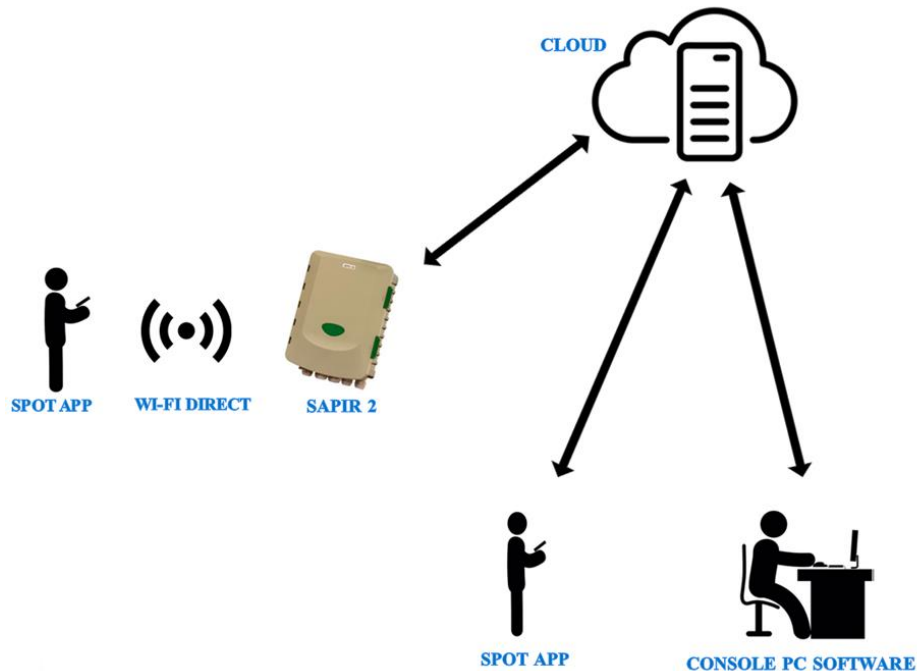
Communication with the controller is made by using 2 platforms, the first platform is the DREAM CONSOLE PC software (computers, laptops), and the second one is the SPOT app (smartphone, tablet).

4.1 Available internet connection

When there is a solid internet connection both options (Console and Spot) are available, the installer MUST connect the controller to the internet in order to create the system configuration.

4.2 No internet connection

In case of no internet connection, only the SPOT app is available and will work only while the user is standing near the controller and the internal WIFI component is turned on.



Note – there is no physical connection between the controller and the computer

5. First introduction with the console

5.1 What is CONSOLE?

The DREAM CONSOLE pc software is a platform that allows programming and monitoring the SAPIR 2 from any pc or laptop, the only requirements are internet connection of the controller and the computer, user name and password and downloading the software.

Using the software allows the user creating and editing irrigation programs, monitoring irrigation performance, graphical analyze of inputs (sensors water meters...), creating maps and so much more.....

5.2 Downloading

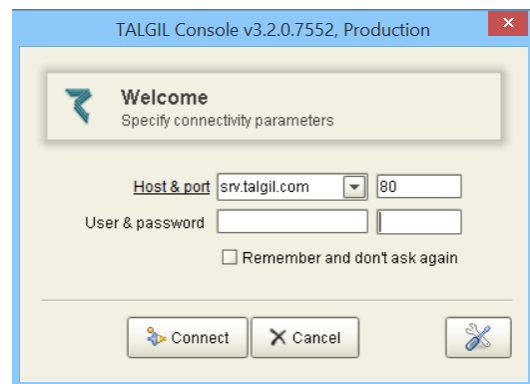
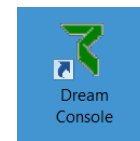
For downloading the CONSOLE software click [here](#),

or enter our website **www.talgil.com**, after reaching to the home page, select:

Software ➡ **Console** ➡ **Download Console 64 bit** ➡ **and follow the installation instructions.**

5.3 logging in

After the downloading process, a shortcut with the icon of TALGIL Should appear on the computer desktop, Double click on the short cut will Bring you to the user name and Password window, insert your user name and Password in the Designated spots and click “connect”.

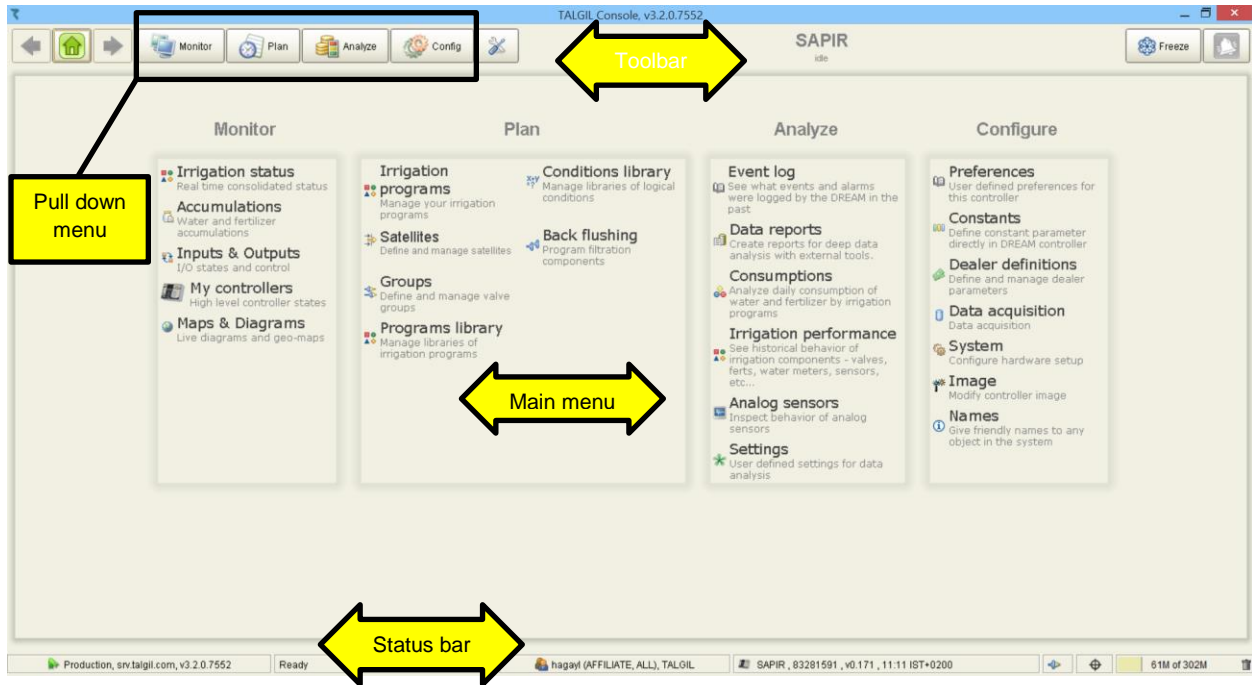


Note – before logging in make sure “Host” and “Port” are correct

- **Host** – srv.talgil.com
- **Port** – 80

5.4 Home page

the **Homepage** is the first screen you'll see, it contains the menu of all the subjects covered by the **CONSOLE**, it is the place from where the user can reach all of those subjects, let's have a closer look and see what else is there.




The Main Menu - The subjects of the **Main Menu** are grouped into meaningful groups, each group containing the relevant subjects. There are four groups:

- Monitor** – deals with monitoring the current activities
- Plan** – deals with the users irrigation planning.
- Analyze** – deals with analyzing accumulated historical information.
- Configure** – deals with all the information related with the system setup.

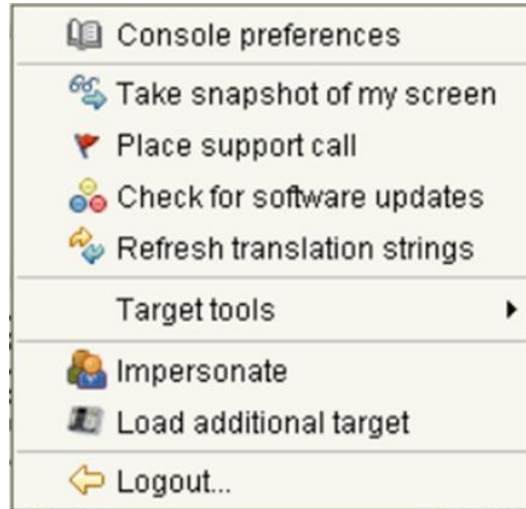
Depending on the configuration of the various targets there may be some differences in the list of subjects included in the menu.

The **pool down** menu contains the same parameters as the main menu, and it's available all the time in all the screens.

6. System Configuration - Advanced tool menu

In this chapter we will define the CONSOLE preference and create the system configuration, to enter the advanced tool menu click on  in the upper center of the home page screen.

After clicking the icon, a small tools table will appear:

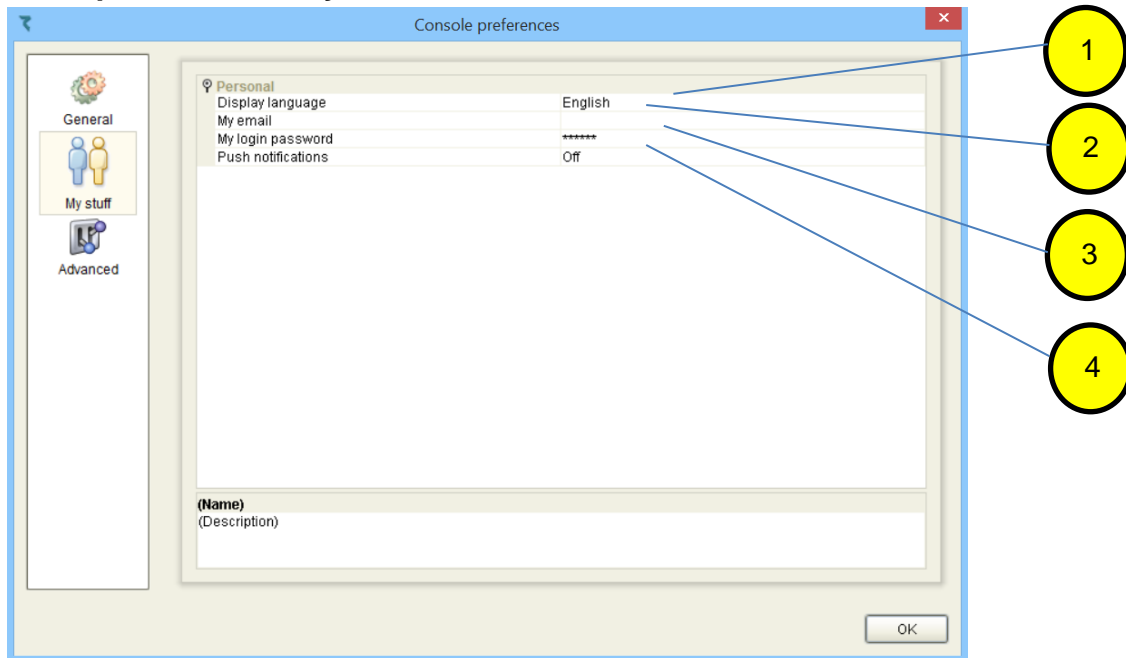


6.1 Console preferences

The **Console Preferences** perspective can be reached from the **Main menu** or the **Pull down menu** by selecting **Tools/ Console preferences**.

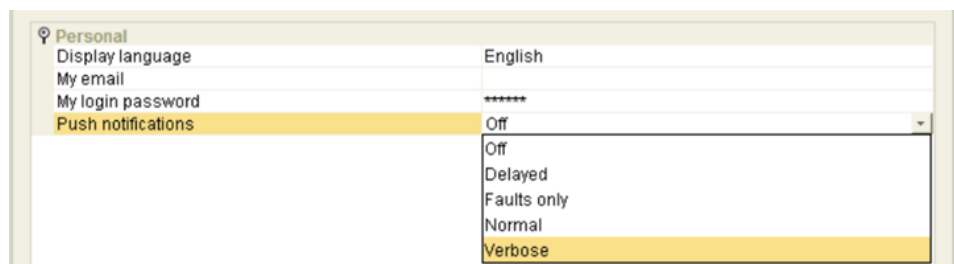
Obviously this section deals with setting some parameters that will affect the appearance and the behavior of the **Console**.

6.2 Console preference – my stuff



Pointers

1. Click to select the Console language.
2. Set your Email address, for receiving system reports and notifications.
3. Set your login password.
4. Enable / disable push notifications



Off – Push notifications will not be sent to this user, he will receive only emails according to the “**system events subscription**” list (paragraph 10.2).

Delayed – Push notifications will be sent to the user in bulks aggregate every 1 hour.

Faults only – Faults will be sent instantly as push notifications, other events are ignored.

Normal – Faults will be sent instantly; other events will be aggregated and sent every 5 minutes, all the notification will be sent as push notifications.

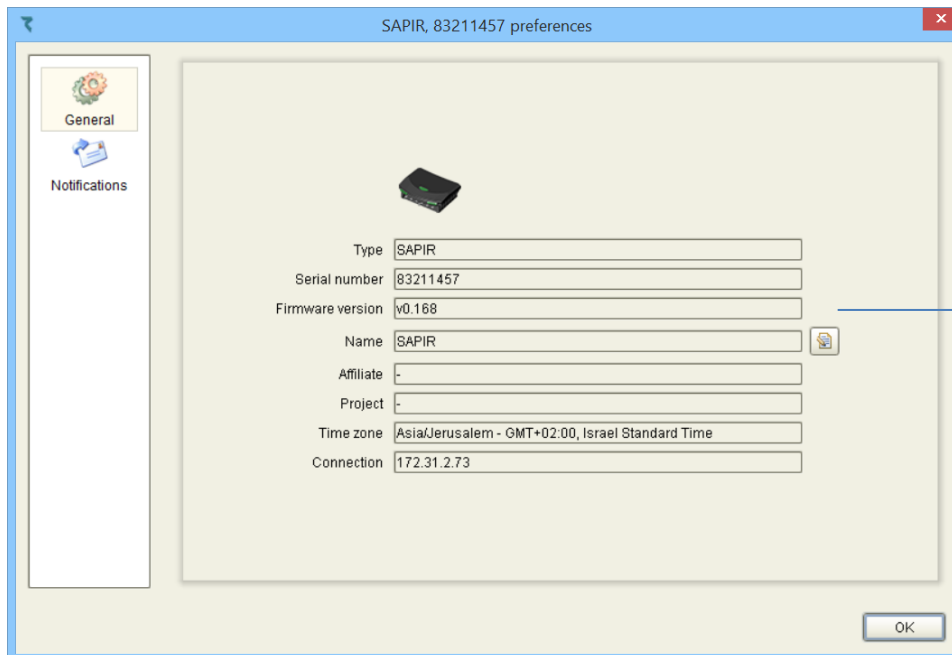
Verbose – Everything is sent instantly (developers and affiliates only)

7. Characteristics of the irrigation system – Configure

The following chapter focuses on the data involved with the Configuration of the controller and with the process of adapting it to the specific application. This is the place to look for information about the system structure, the hardware in use, the connections list of all the accessories, the constant parameters, the user preferences and more.

7.1 Configure – preferences – General

The General preference screen demonstrates general information of the controller.

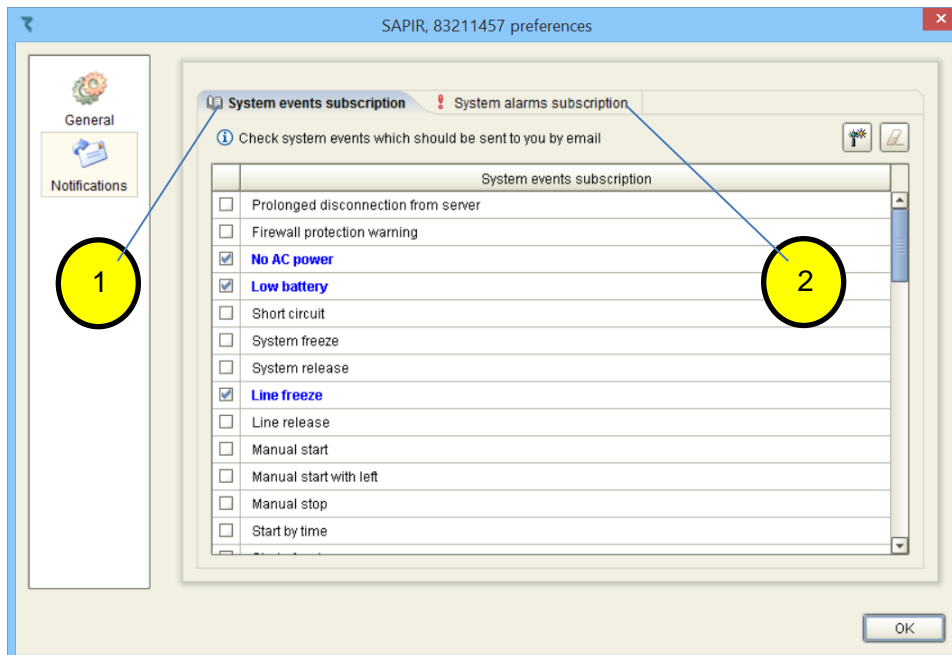


Pointers

1. Click on the icon to edit the controller name.

7.2 Configure – preferences – Notifications

The screen below is dedicated for selecting the Notifications the user would like to receive, there are two options of notifications the user may request.



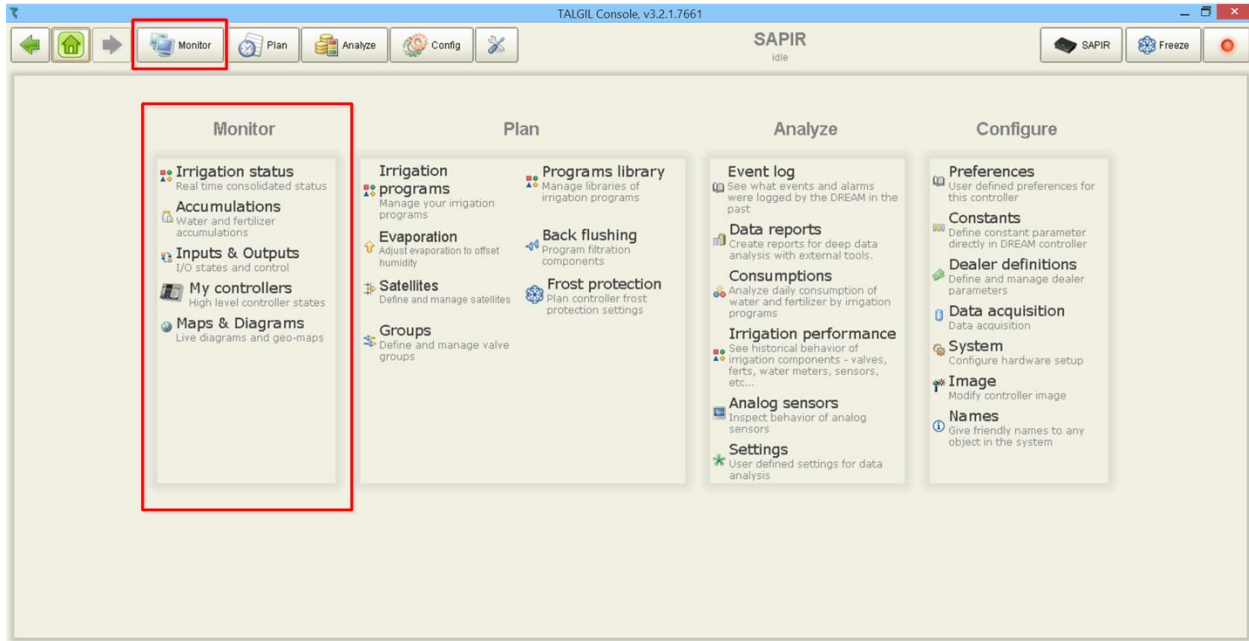
Pointers

1. **System events subscription** - Notifications by Emails or push notifications to the user smartphone, the user must have the “SPOT” app to receive push notifications.
2. **System alarms subscription** - Notifications by popup window will appear on the user computer screen while the CONSOLE software is open.

Note – the notifications are for each user of the controller, in case there is more than one user, each one of them can select the notifications that he would like to receive.

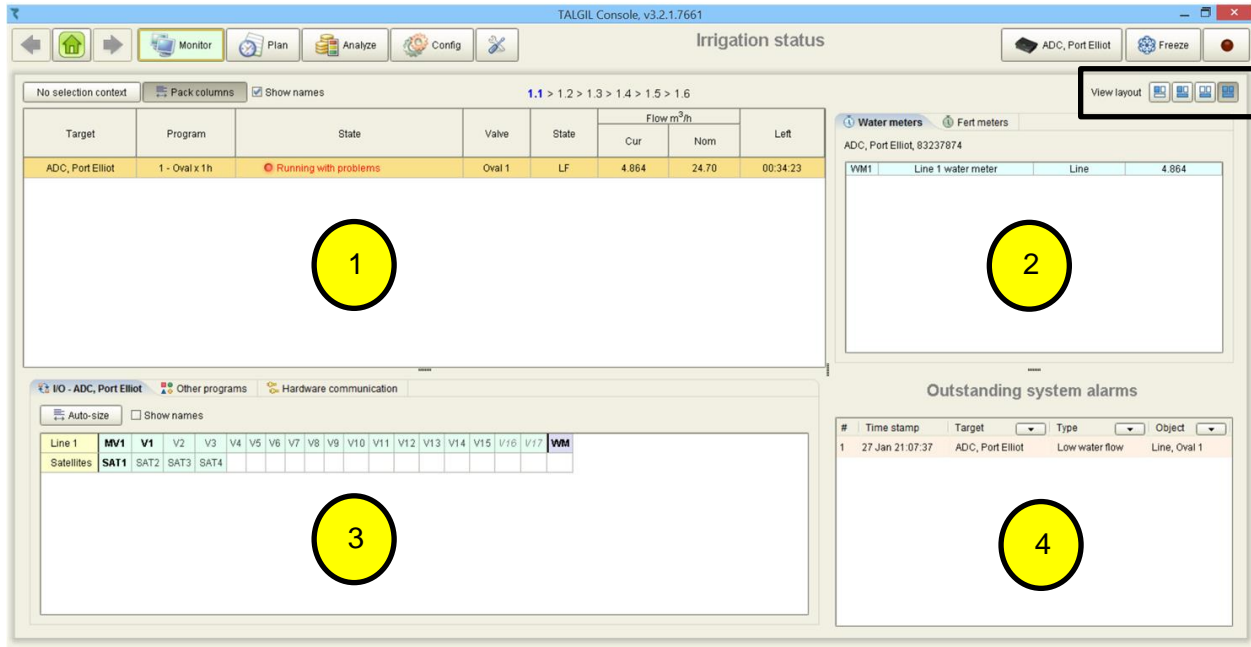
8. Irrigation monitoring - General

The following chapter deals with the Monitoring tools supplied by the System, you can find the monitor list of content in the main menu or in the pull down bar.



8.1 Irrigation status (monitor / irrigation status)

The irrigation status screen supplies real time information on all the current activities of the controller.

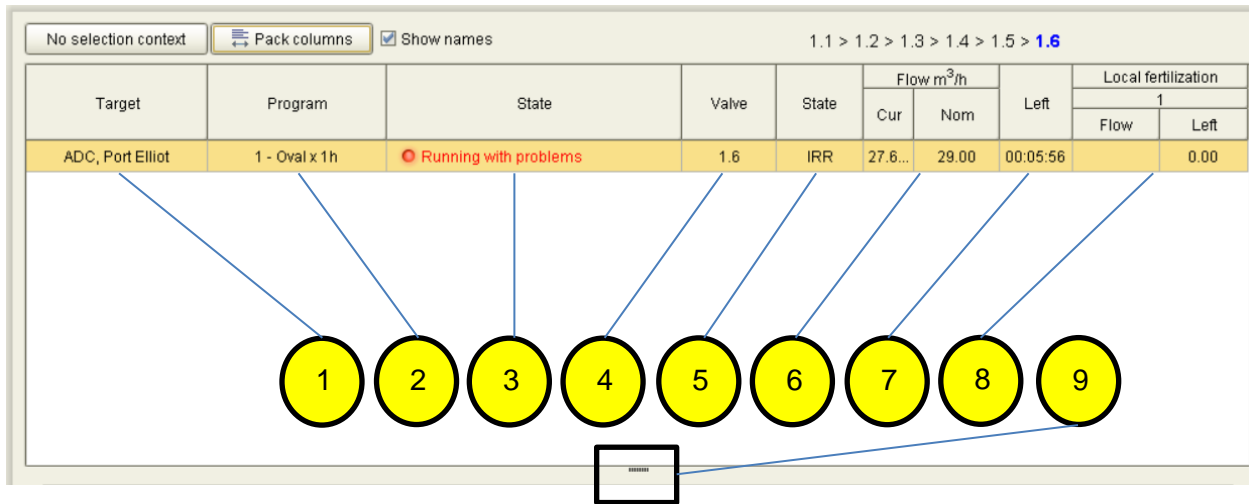


Pointers

1. Running irrigation programs window.
2. Water and Fertilizer flow meters window.
3. Window of **complimentary tabs**:
 - Inputs and Outputs status
 - Irrigation programs status.
 - Hardware communication.
 - Filters.
 - Analog sensors.
4. Outstanding system alarms.
5. Screen view layout.

Note – the type and quantity of **complimentary tabs** can change according to the system definitions, for example if you have analog sensor or filters you will see additional tabs.

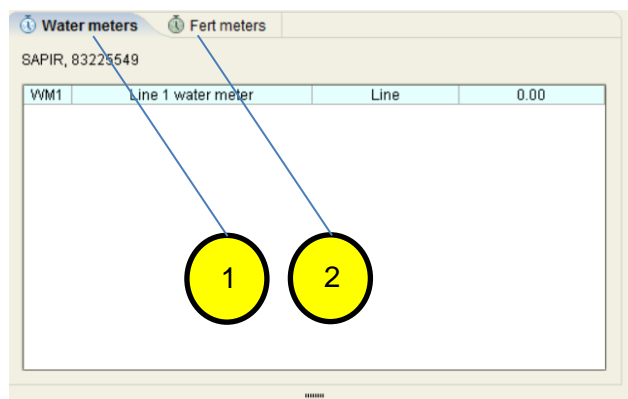
8.1.1 Running irrigation programs window (monitor / irrigation status)



Pointers

1. Name of the controller / target.
2. Name of the program.
3. Program state.
4. Valve / group number.
5. Valve / group state.
6. Valve / group current and nominal flow.
7. Volume or time left to finish the irrigation program.
8. Current fertilizer flow, and time / volume left to finish the fertilization program.
9. Changing the screen size by click and dragging.

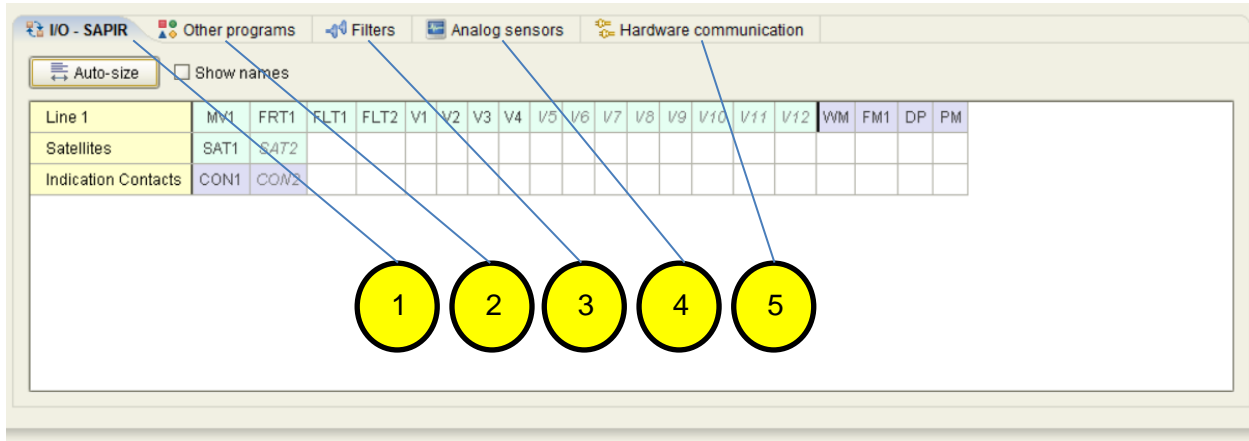
8.1.2 Water and Fertilizer meters window (monitor / irrigation status)



Pointers

1. Current water meter flow.
2. Current fertilizer meter flow.

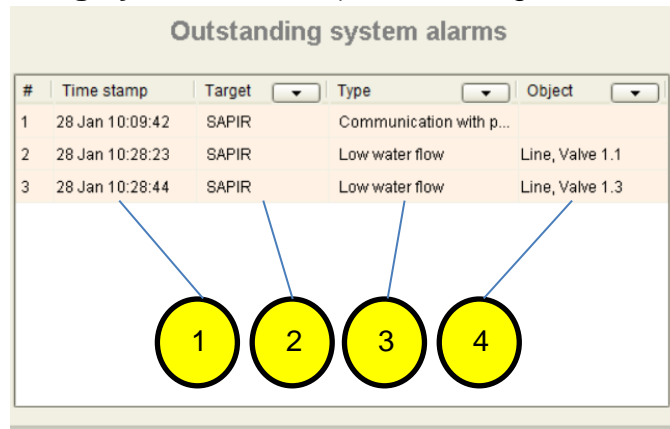
8.1.3 Window of complimentary tabs (monitor / irrigation status)



Pointers

1. **Inputs and outputs status tab** – demonstrate the current status of the outputs and digital inputs, clicking the right button of the mouse on one of the I/O will open a small list that contain options such as : open / close outputs manually, go to constants, etc. Open or close manually will only open/close the selected output.
2. **Other programs tab** – viewing programs status: Finished, scheduled, Frozen or incomplete.
3. **Filters** – viewing the filters program configuration and execute manual operation by clicking on the right button of the mouse on the filter site and select **Start flushing**.
4. **Analog sensors** – this tab is for viewing the current analog sensors values.
5. **Hardware communication** – shows the communication between the SAPIR 2 its interfaces and RTU's, when a communication problem occurs the interface or / and RTU will be colored in red and an alarm message will pop.

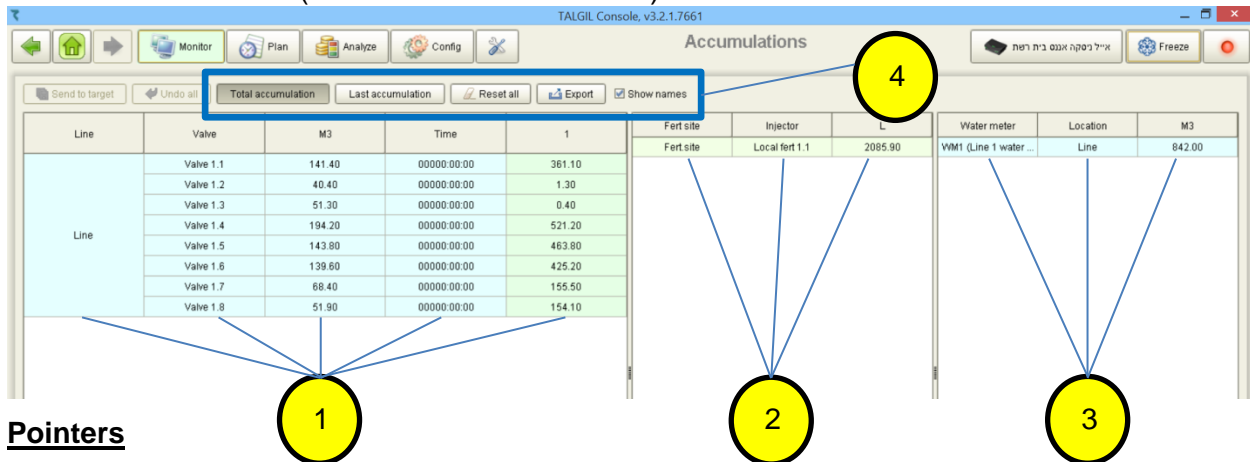
8.1.4 Outstanding system alarms (monitor / irrigation status)



Pointers

1. Time of the alarm.
2. Which target (in case the user have more than one controller).
3. Type of the alarm.
4. The object that indicates the problem.

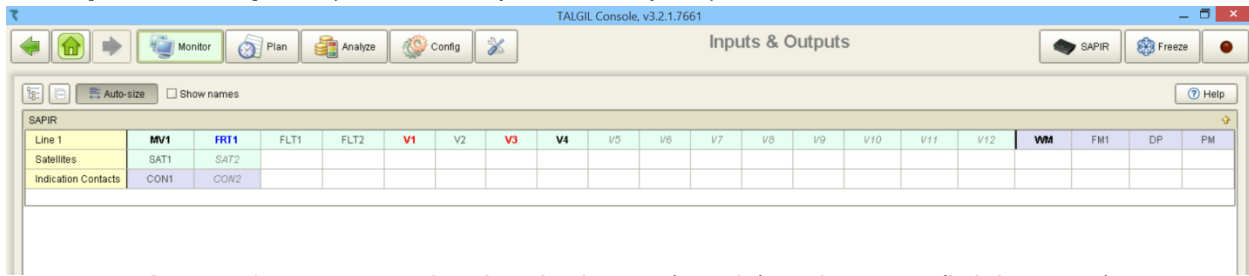
8.2 Accumulations (monitor / Accumulations)



Pointers

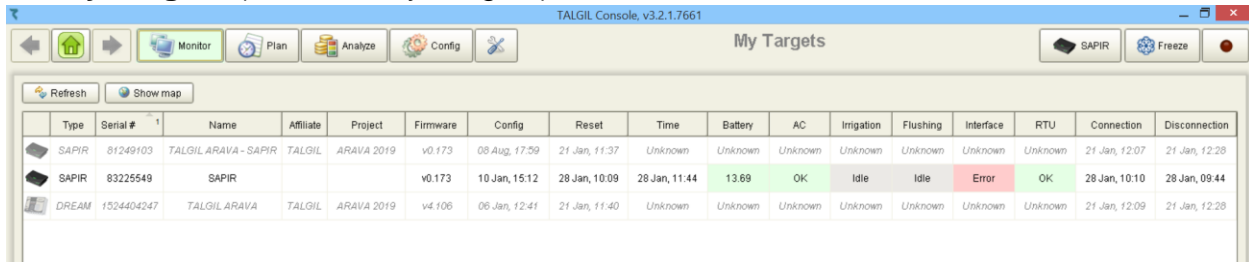
1. Water and fertilizers Accumulations by volume and time.
2. Fertilizer meters accumulations.
3. Water meter accumulation.
4. The tab bar contain several options such as: Total or Last accumulations, Reset all (delete all accumulations), Export all the accumulations to an Excel file.

8.3 Inputs & Outputs (monitor / Inputs & Outputs)



- **Inputs & outputs** – showing the inputs (purple) and outputs (bright green) status:
 Black – opened by program.
 Blue – opened manually.
 Red – problem.
- Clicking the right button of the mouse on one of the I/O will open a small list that contains options such as: open / close outputs manually, go to constants, etc.

8.4 My Targets (monitor / My Targets)



- This screen shows general information of the controllers related to the user name.

8.5 Maps & diagrams (monitor / Maps & diagrams)

- To create map please look in the maps and diagrams appendix.

8.6 Weather (monitor / Weather)

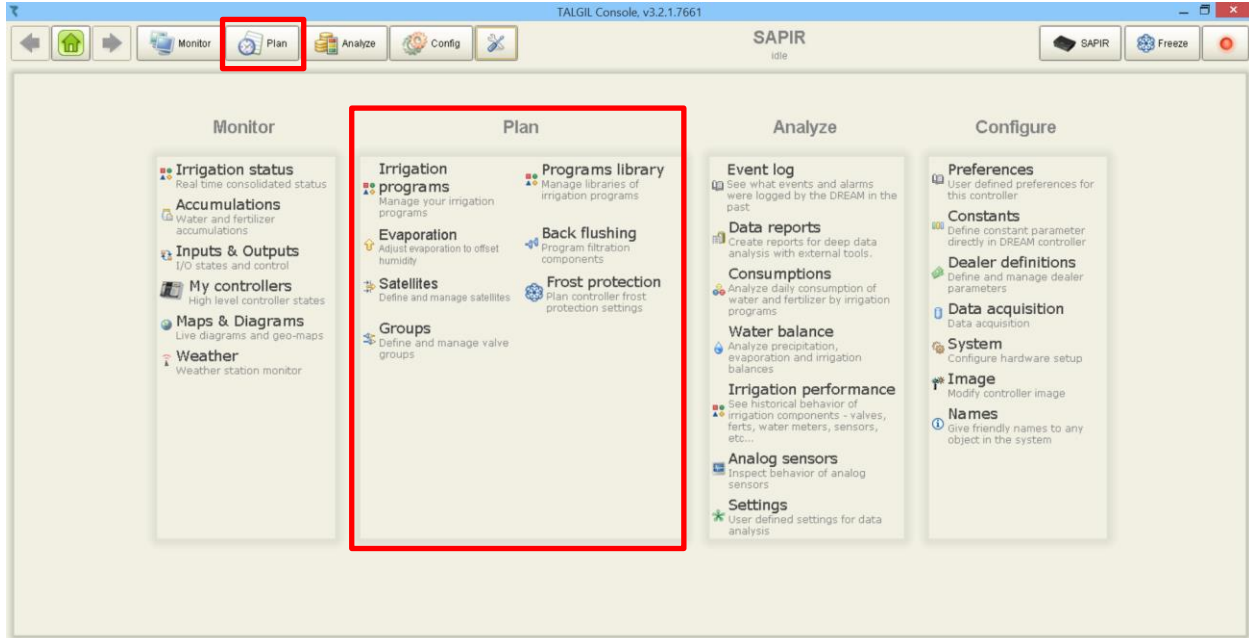


Pointers

1. In case it's a **PESSL** weather station this icon will appear, clicking on it will open **PESSL "Filed climate"** web page.
2. Clicking on the **Location** icon will open a map with the location of the weather station (only if it's **PESSL**).
3. Weather station current values (can be watched also in **"irrigation status"**).

9. Irrigation planning

The following chapter deals with planning irrigation programs and other activities, it can be reached from the main menu or from the pull down bar.



9.1 Irrigation programs (plan / irrigation programs)

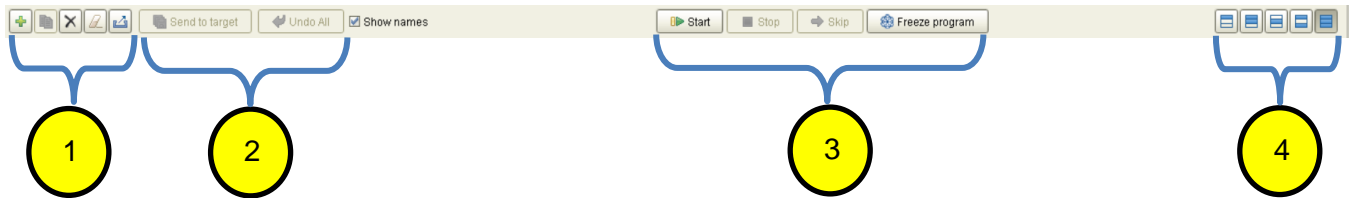
In the irrigation programs screen the user can create, edit or view his programs, it's the most used screen in the system.

The screenshot shows the 'Irrigation programs' window in the TALGIL Console. It features a top toolbar with icons for navigation and control. Below this is a table of programs with columns for ID, Name, State, Completion, Priority, Schedule, Conditions, and Sequence. A detailed view of a selected program is shown below the table, and at the bottom, there is a section for 'Irrigation schedule' with a grid for 'Auto-size' and 'Show names'.


Pointers



1. Irrigation programs toolbar.
2. Programs List and status.
3. Water and fertilization settings of a selected program.
4. Complimentary information view.


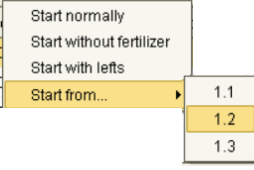




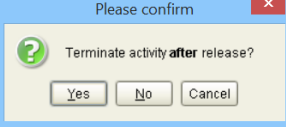
9.1.1 Irrigation programs toolbar




Pointers

1.  - Create new program, will open the programs wizard.
 - Not in use.
 - Delete selected program.
 - Delete all programs.
 - Export program to library.

2.  – after making changes in the **CONSOLE** click on **Send to target** in order to confirm the changes, it's possible to make several changes in the same screen before clicking on **Send to target**.
 - if you would like to cancel all the changes before clicking on **Send to target**, click on **Undo All**.

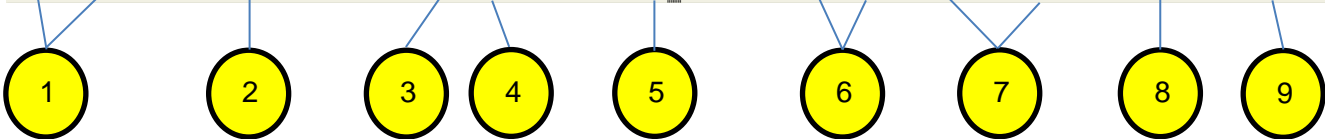
3.  - The **Start** icon contains several options to start a program.

 - Stop running program.
 - Skip the running valve or group and go to the next one in the sequence.
 - pause program.
 - release program.
 - after selecting Release program you can choose to terminate the program activity or continue from the pausing point.

4.  - These 5 icons are used to select the display of the screen.

9.1.2 Programs List and status

In the following window you can see all the programs and their status, double clicking on one of the programs under the selected column will allow you to change the program definitions by opening the programs wizard or inserting numbers directly.

ID	Name	State	Completion	Priority	Schedule	Cycles	Cycles left	Interval	Interval left	Conditions	Sequence
1		Running	Disabled	0	Start at 08:00:00, [F]-F-F--	0	0	00:00:00	00:00:00		1.1 > 1.2 > 1.3
2		Scheduled	Disabled	0	Start at 09:00:00, every 2-nd day, begin today	3	0	00:00:00	00:00:00		1.4 > 1.5 > 1.6
3	Program - 3	Between cycles	Disabled	0	Start at 10:00:00, [M]WWWWWWW	3	2	00:10:00	00:09:12		G1
4	Program - 4	Not ready	Disabled	0	Not scheduled	0	0	00:00:00	00:00:00	START STOP	1.4 > 1.8



Pointers

1. Program name and ID.
2. **Program status** – Running, Scheduled between cycles and etc.
3. **Completion** – Disabled or enabled automatic completion of an unfinished program.
4. **Priority** – giving priority to a certain program over other programs in case of a conflict between them, 9=high priority, 1=low priority.
5. **Programs schedule** – in which day, time and / or interval the program will start.
6. **Cycles** – how many cycles of irrigation for day
Cycles left – how many cycles are left.
7. **Interval** – time between cycles.
Interval left – time left for the next cycle.
8. **Conditions** – for start, stop, enable or disable a program.
9. **Sequence** – which valves or / and groups are participating in the program.

9.1.3 Water and fertilization settings of a selected program

	Valve 1.1	Valve 1.2	Valve 1.3	Valve 1.4	Valve 1.6	Valve 1.9	Valve 1.10	G1
<i>Valve state</i>	C	C	C	C	C	C	C	C
<i>Current flow (nominal), m3/h</i>	0.00 (25.00)	0.00 (34.00)	0.00 (19.00)	0.00 (100.00)	0.00 (100.00)	0.00 (100.00)	0.00 (100.00)	0.00 (400.00)
Water dosage method	hh:mm:ss	m3	m3/area	hh:mm:ss	m3	hh:mm:ss	m3	hh:mm:ss
Water dosage planned	00:35:00	30.00	2.50	00:30:00	150.00	00:48:00	52.00	00:15:00
Water dosage left	00:00:00	0.00	0.00	00:00:00	0.00	00:00:00	0.00	00:00:00
<i>Water dosage calc</i>	00:00:00	0.00	17.50	00:00:00	0.00	00:00:00	0.00	00:00:00
Water before local	00:00:00	0.00	0.00	00:00:00	0.00	00:00:00	0.00	00:00:00
Water after	00:00:00	0.00	0.00	00:00:00	0.00	00:00:00	0.00	00:00:00
[1] Local fert method	L/m3	L bulk	time	None	None	None	None	None
[1] Local fert planned	2.50	30.00	00:01:00	0.00	0.00	0.00	0.00	0.00
[1] Local fert left	0.00	0.00	00:00:00	0.00	0.00	0.00	0.00	0.00
[2] Local fert method	L prop	L prop	L prop	None	None	None	None	None
[2] Local fert planned	10.00	10.00	10.00	0.00	0.00	0.00	0.00	0.00
[2] Local fert left	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

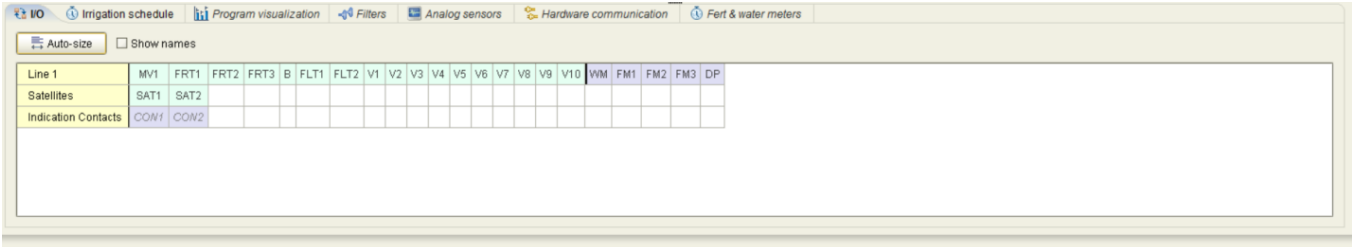
Pointers

- Valves or groups that participating in the program and their opening order from left to right, meaning that first to open will be valve 1.1 when it will finish valve 1.2 will open and etc.
- Valve state** – the letters in this line describes the valve status (for example C = Closed), pointing on the letter/s with the mouse will open a small window with the full description of the valve status.
Current flow (nominal), m3/h – describes the nominal flow of the valve or group (inside Parenthesis), and the current flow (outside Parenthesis).
- Water dosage method** – irrigating by hh:mm:ss (time), m3 (volume), m3/area (volume for area), evaporation. Double clicking on the box under the valve will open the list of dosage methods; in case the wanted dosage doesn't appear please check the parameters in **Configure / Dealer definitions**.
Water dosage planned – the planned water quantity, time and etc. for each valve or group.
Water dosage calc – the total quantity of water when irrigating by m3/area (for example – look at valve 1.3 in the image above, the dosage is 2.5 m3/area and the valve area is 7, 2.5*7=17.5m3 (the valves area are defined in **configure / constants / valves**).
- Water before local** – the amount of water / time taken from the **water dosage planned** to irrigate before starting fertilization.
Water after – the amount of water / time taken from the **water dosage planned** to irrigate after finishing fertilization.
- Local fert method** – by double clicking on the fert method box under the selected valve or group a list of fertilization methods will open, select the required method. to get an explanation or changing parameters of the fertilization methods go to **Configure / Dealer definitions** and select **Fertilization** tab.
Local fert planned – select the quantity of fertilizer that you would like to inject, the quantity can be time, L/M3, L bulk.....

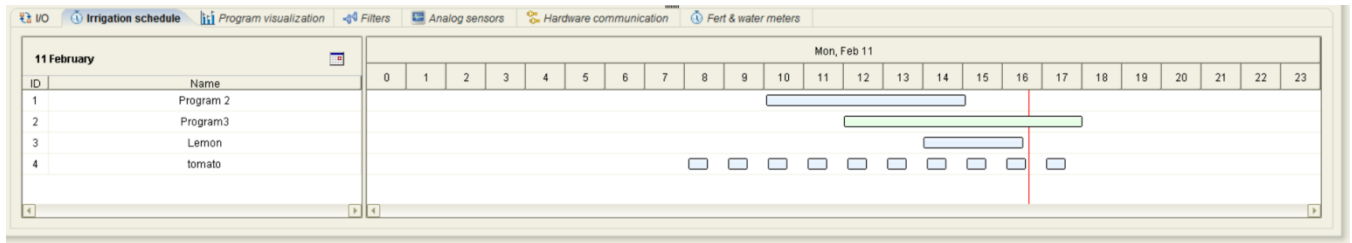
Note – the numbers in prentices (1), (2), (3) or (4) describing the fertilizer injectors numbers.

9.1.4 Complimentary information view

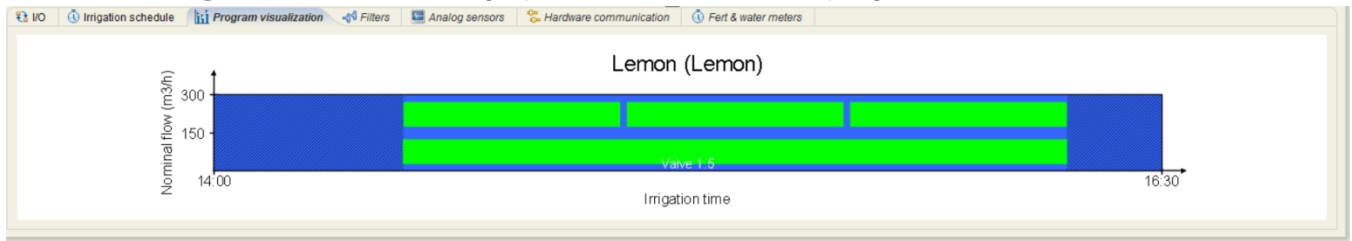
1. **I/O** – for more information go to Inputs & Outputs paragraph 8.3



2. **Irrigation schedule** – graphic view on the current day programs schedule.



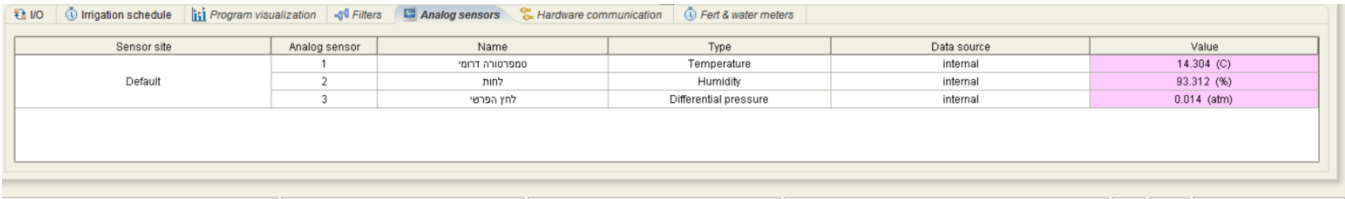
3. **Program visualization** - graphic view of a selected program.



4. **Filters** – a tab for viewing the filters backflush program, and manual operation by clicking on the right button of the mouse on the filter site and select Start flushing.

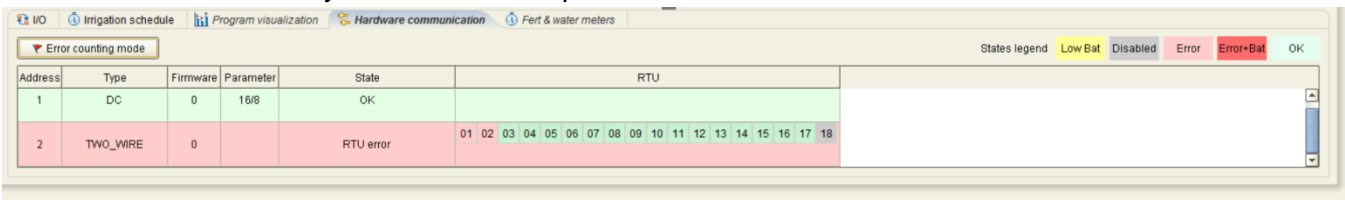
Site	Name	Filters	DP level	Pre dwell (mm:ss)		Interval (hh:mm)		Flush (mm:ss)		Dwell (mm:ss)		Flushing status			Count of flushing cycles		
				Planned	Left	Planned	Left	Planned	Left	Planned	Left	Name	Filter	DP	By time	By DP	Consecutive loops by DP
Line 1	Local filter site 1	2		-	-	03:00	03:00:00	00:45	00:00	00:20	00:00	CLOSED	Filter	OFF	0	0	0

5. Analog sensors – viewing tab of the analog sensors readings.



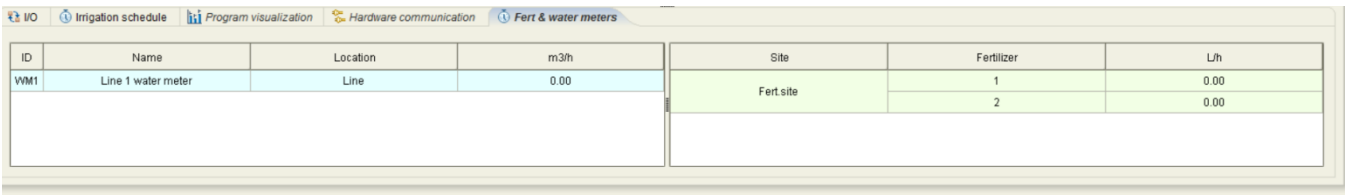
Sensor site	Analog sensor	Name	Type	Data source	Value
Default	1	טמפרטורה דרומי	Temperature	internal	14.304 (C)
	2	לחות	Humidity	internal	93.312 (%)
	3	לחץ הפרטי	Differential pressure	internal	0.014 (atm)

6. Hardware communication – a tab for checking interfaces and RTU status, pointing on one of the RTU's will open a window with the elements connected to it, in the right side of the screen you can see an explanation for each one of the RTU colors.



Address	Type	Firmware	Parameter	State	RTU
1	DC	0	16/8	OK	
2	TWO_WIRE	0		RTU error	01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18


7. Fert & water meters – the following tab demonstrate the current flow of the water meters and fertilizers meters.



ID	Name	Location	m3h
WM1	Line 1 water meter	Line	0.00

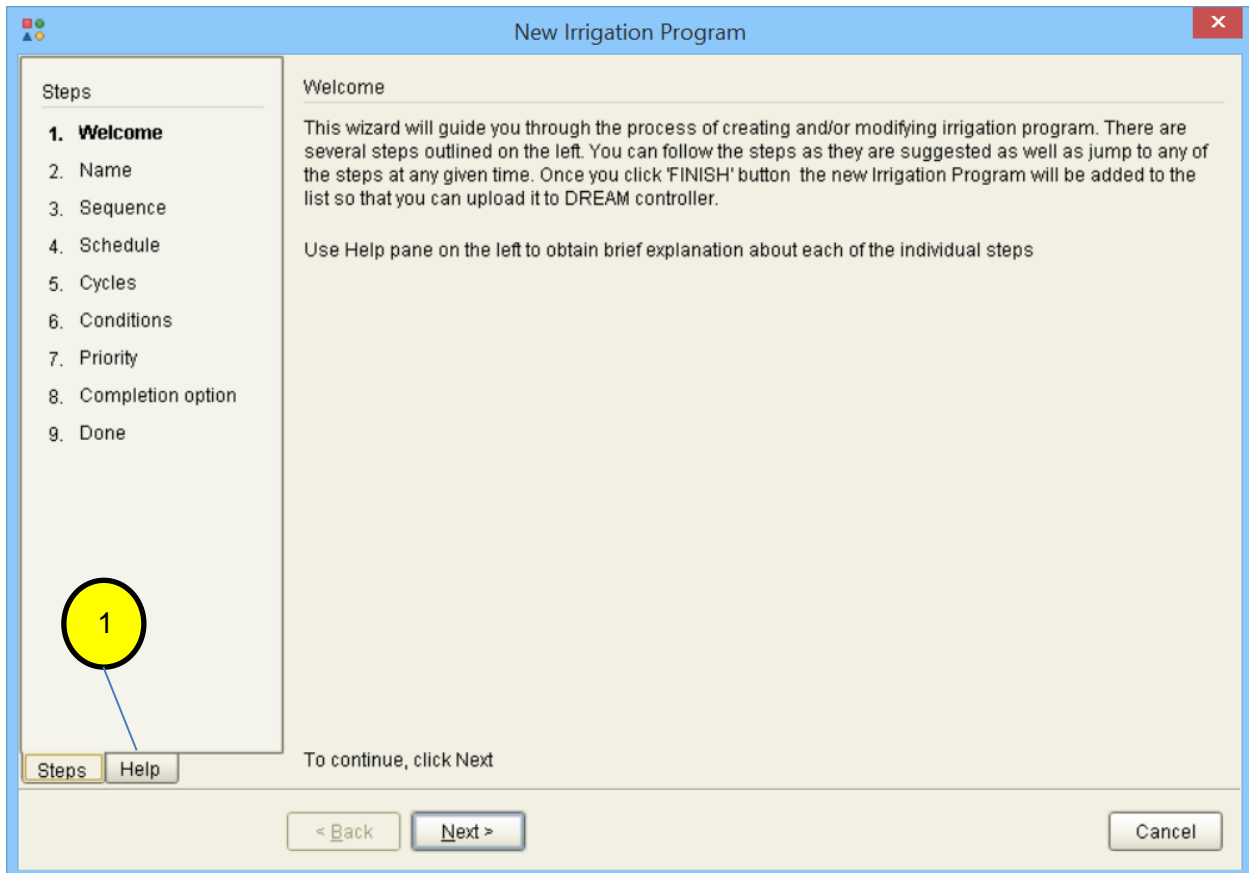
Site	Fertilizer	L/h
Fert.site	1	0.00
	2	0.00

9.2 Creating new irrigation program (plan / irrigation programs)

To create a new irrigation program click on the  icon in upper left side of the **irrigation programs** screen, it will open the irrigation program Wizard.

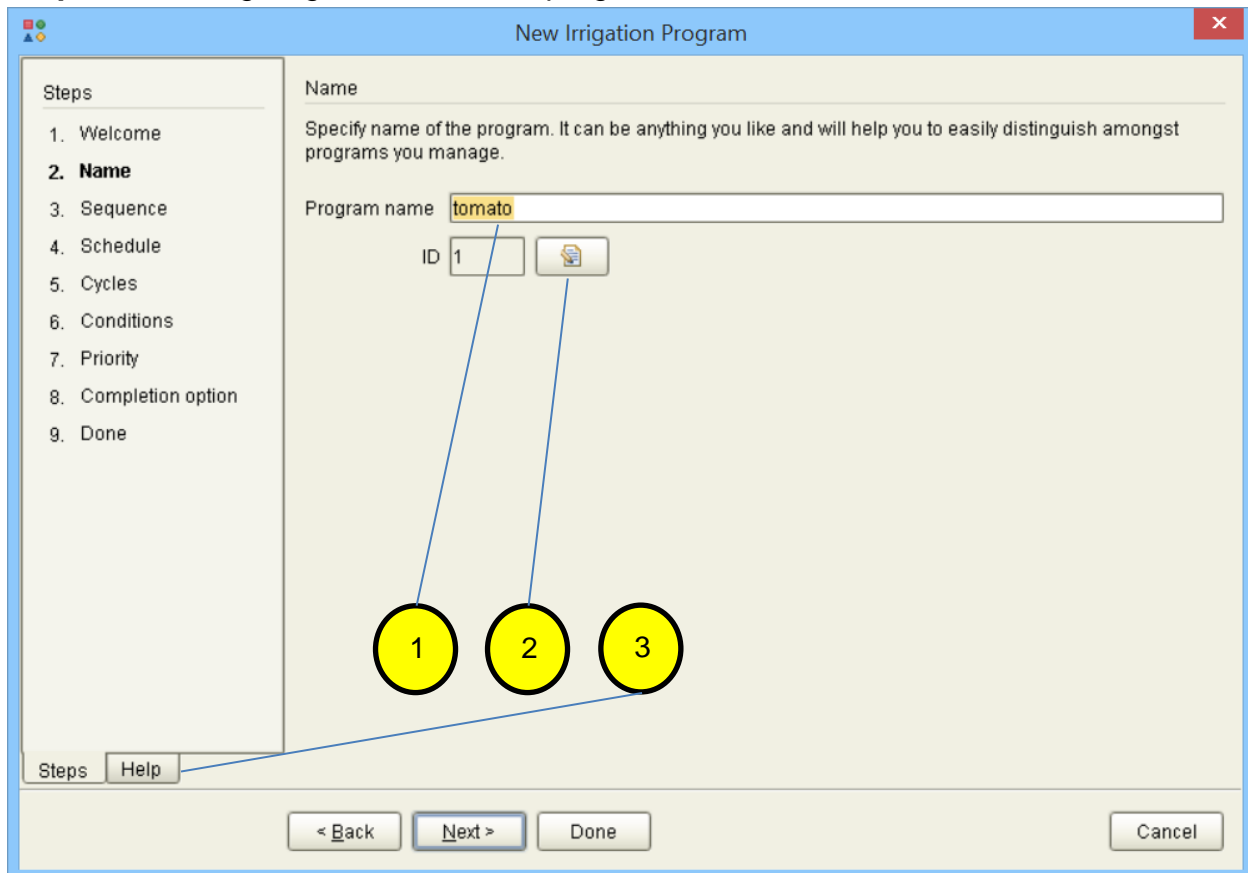
The Wizard contains 9 steps:

Step 1 - Welcome: in the first step you can find relevant information of how to use the Wizard. After reading it once you can skip it the future.



Pointers

1. In the **Help** tab you can find information of each step.

Step 2 - Name: giving a name for the program.**Pointers**

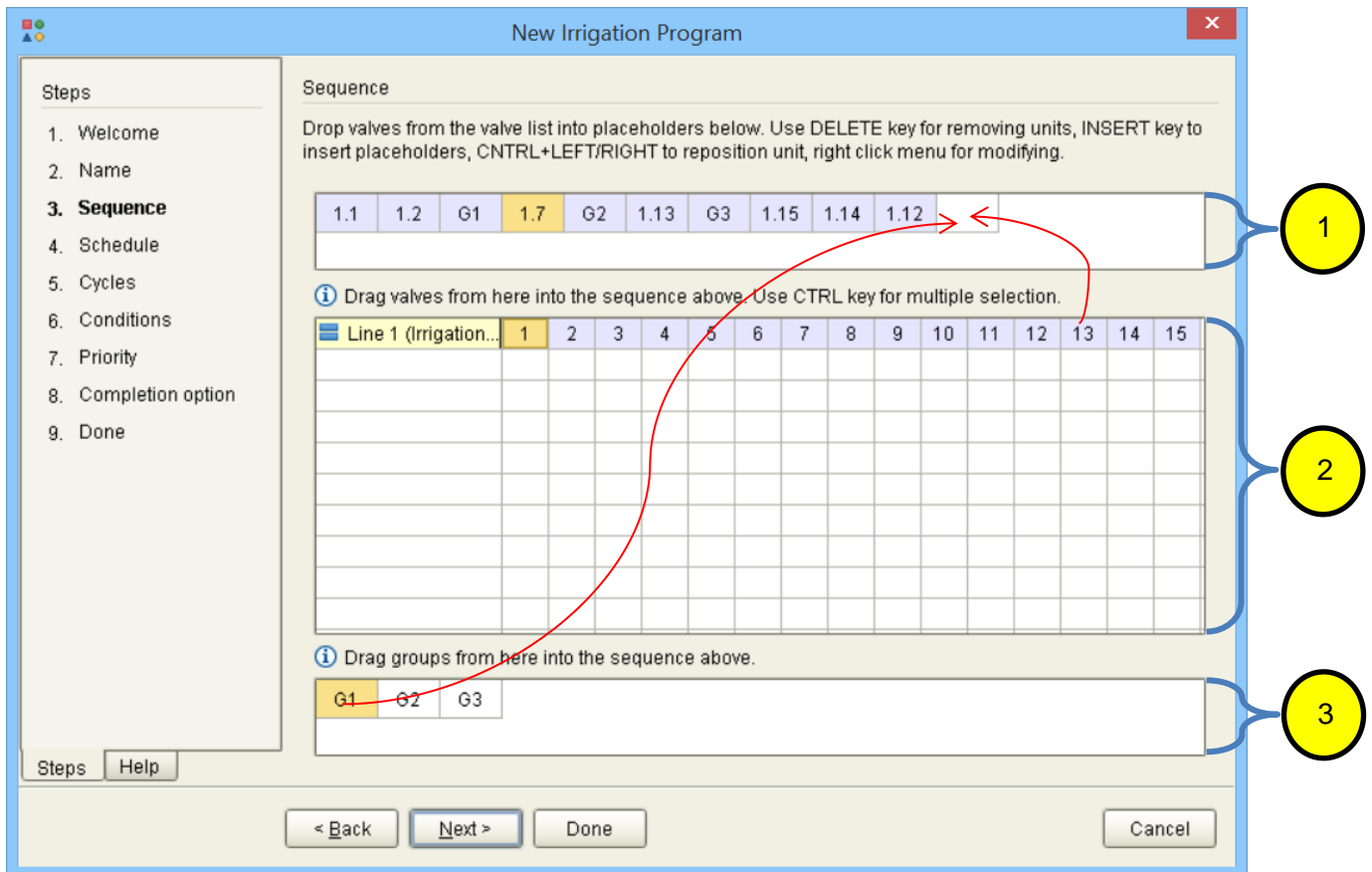
1. Write the desired name of the program.
2. Select ID (only in case you want to change it)
3. Help tab – for more information.

Note – for moving between the steps you can use the **Back** and **Next**, or click directly on the desired step from the list.

Done – is for finish and save the irrigation program (even when it's not completed).

Cancel – for exiting the Wizard.

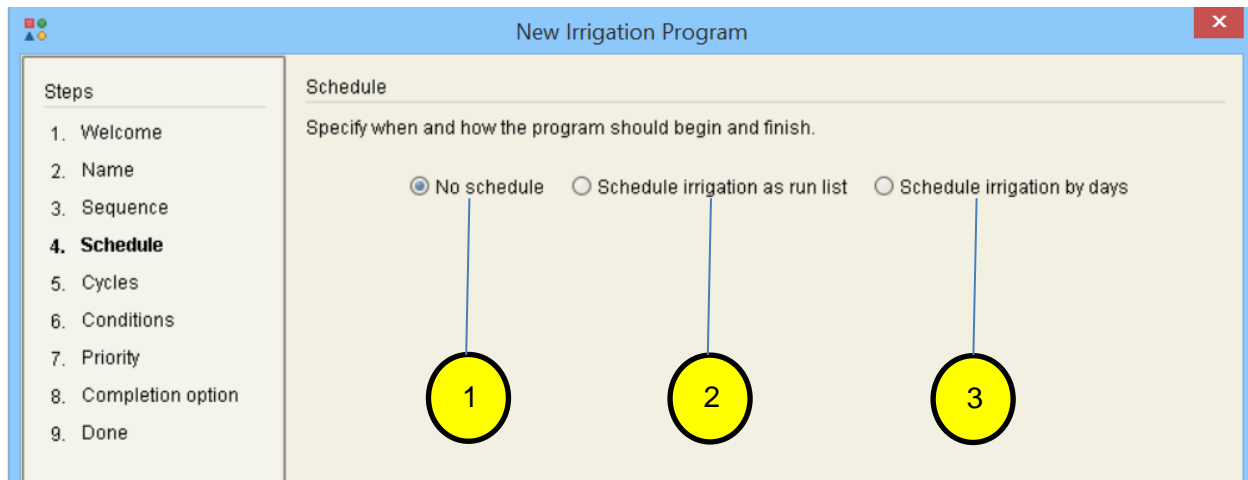
Step 3 - Sequence: selecting the valves and / or groups that will participate in the irrigation program.



Pointers

1. The valves or groups that appear in the irrigation sequence window are the ones that will participate in the irrigation program, by click and drag you can change the order of the valves. Removing valves is done by using the right click of the mouse on the selected valve or group.
When the program starts normally it will irrigate valve number 1.1 first, after it will finish, valve number 1.2 will open, after it will finish group number G1 and etc.
2. Adding valves to the irrigation sequence, click on one of the valves and drag it to the placeholder, as demonstrate with the red arrow.
3. Adding groups to the irrigation sequence, click on one of the groups and drag it to the placeholder, as demonstrate with the red arrow (the groups should be made before adding them to the program, please see **paragraph 9.4 Groups**).

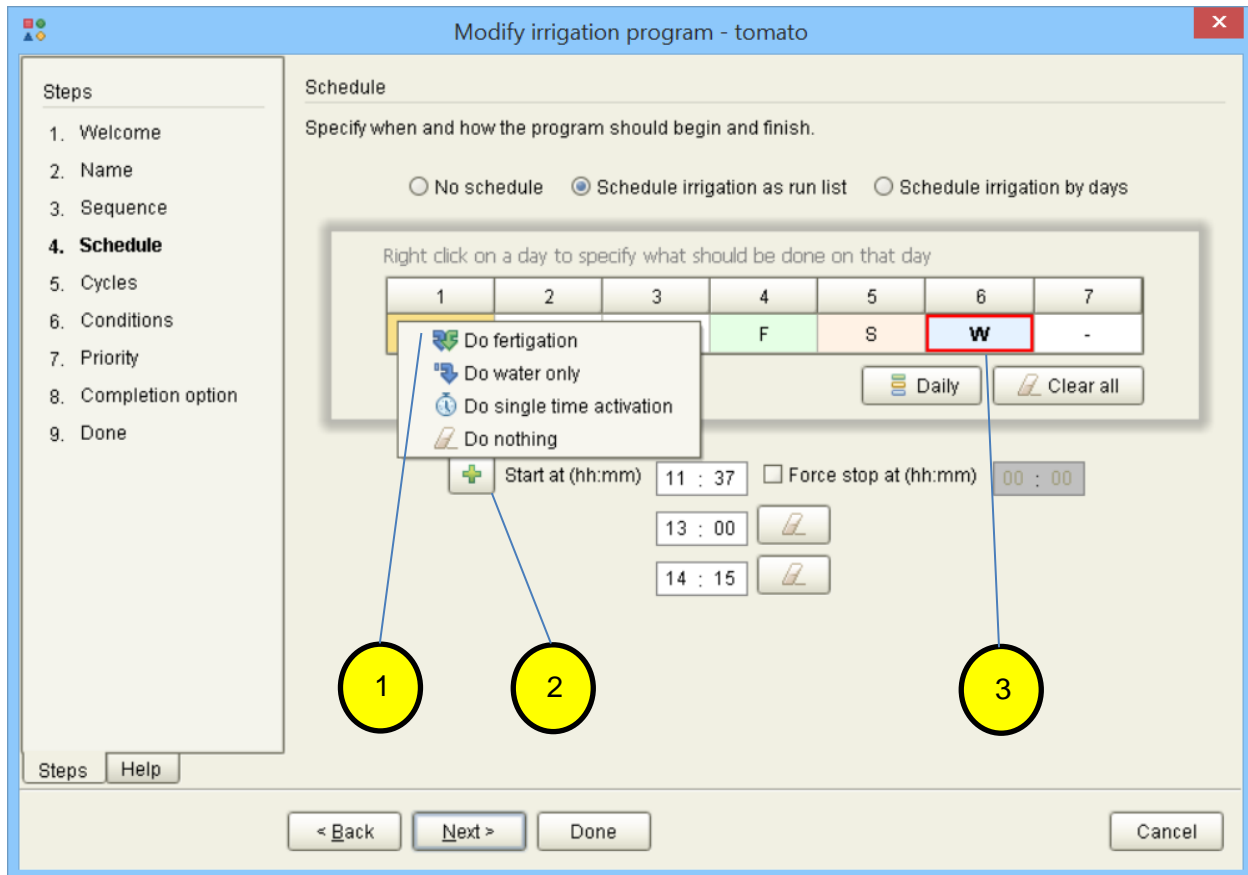
Step 4 - Schedule: select in which day and time the program will start.



Pointers

1. **No schedule** – starting the program will be by manual activation.
2. **Schedule irrigation as run list** – selecting the day from the run list. (See below paragraph A)
3. **Schedule irrigation by days** – selecting the day's interval. (See below paragraph B)

Paragraph A

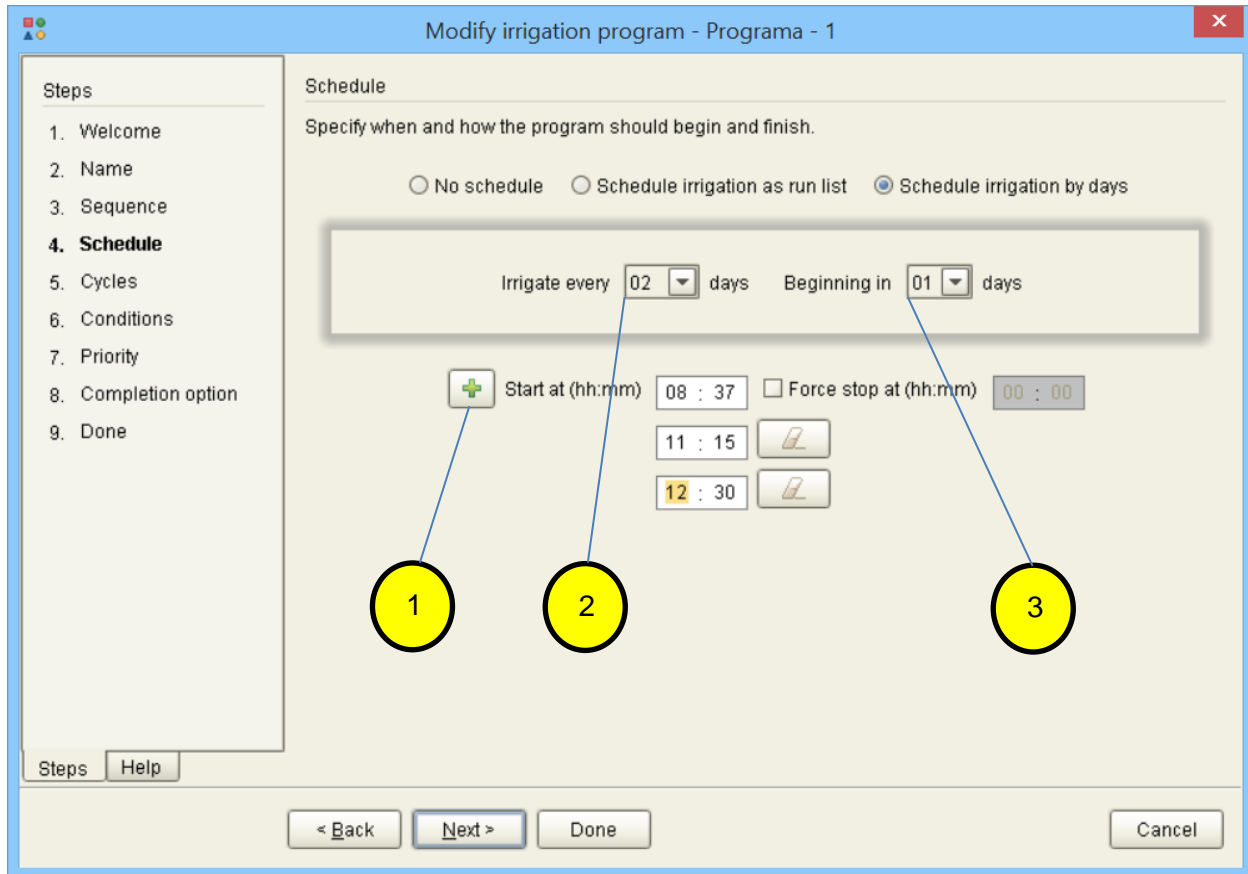


The run list is a list of days that allows to choose if and how to irrigate in each day, the run list works like a cycle (after day 7 comes day 1) and can be modified from 1 day up to 16 (the run list length can be modified in **Constants** screen under **General** tab).

Pointers

1. Right click on the box () under the day number will open a list of options:
 - **Do fertigation** – the program will irrigate and give fertilizer according to the program dosage.
 - **Do water only** – the program will only irrigate, even if there is dosage of fertilizers.
 - **Do single time activation** - the program will irrigate and give fertilizers according to the program dosage, but only in this 7 days cycle, after this cycle will finish and the next one will begin it will not irrigate.
 - **Do nothing** – no irrigation in this specific day.
2. Start time of the program, each program can have up to 6 different start time for each day.
3. The box marked in red represents the current day.

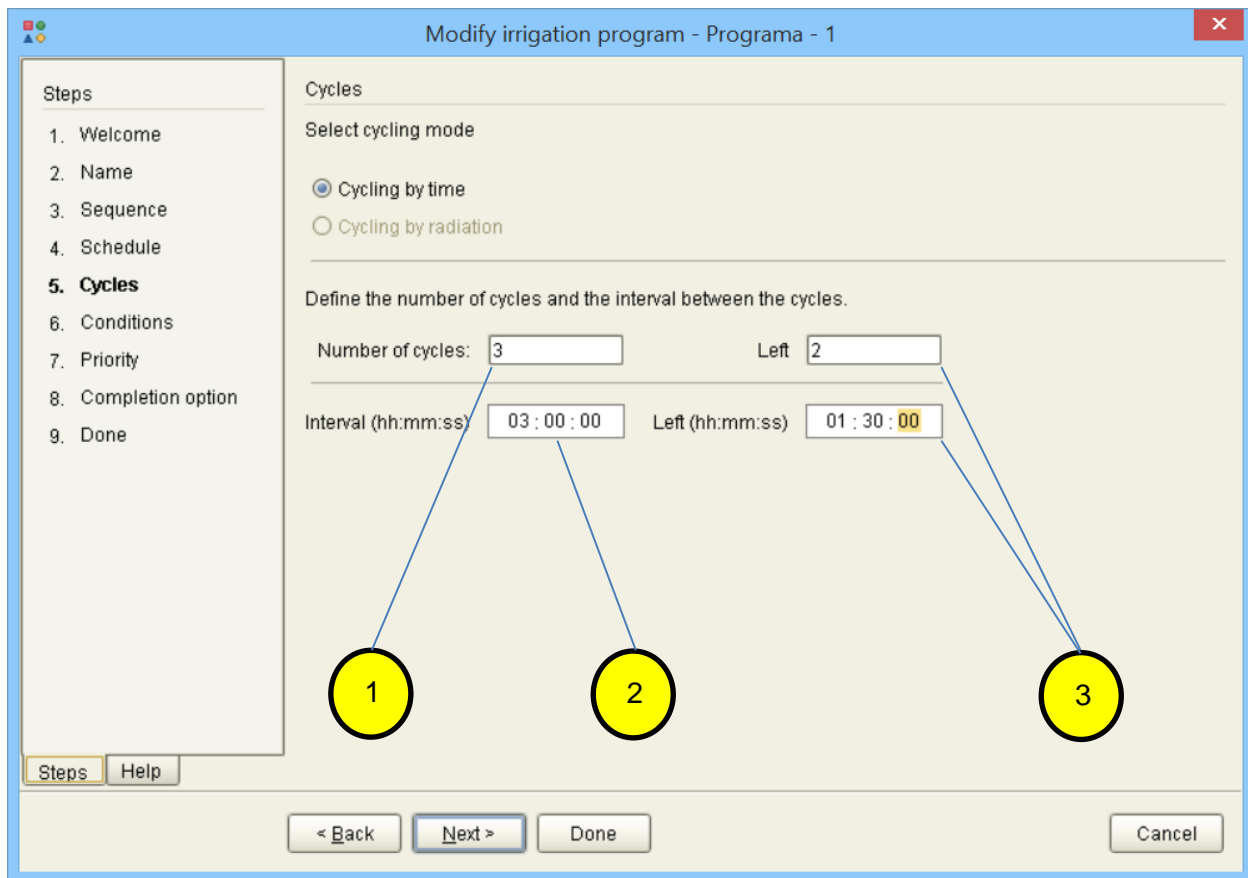
Paragraph B



Pointers

1. Start time of the program, each program can have up to 6 different start time for each day.
2. The number 02 (for example) represents the interval between irrigation days; in this case the program will work one day yes and one day no.
3. The number 01 (for example) represents the starting day of the program, in this case, the program will start tomorrow at 08:37 and will open again in the same day at 11:15, and again at 12:30,
 After the last irrigation time, it will wait one day (because of the 2 days interval) without working, and will start again in the next day.

Step 5 - Cycles: selection of the number of cycles and the interval between them, in case it's needed to irrigate several times in each day.



Modify irrigation program - Programa - 1

Steps

1. Welcome
2. Name
3. Sequence
4. Schedule
- 5. Cycles**
6. Conditions
7. Priority
8. Completion option
9. Done

Cycles

Select cycling mode

Cycling by time
 Cycling by radiation

Define the number of cycles and the interval between the cycles.

Number of cycles: Left

Interval (hh:mm:ss) Left (hh:mm:ss)

1 2 3

Steps Help

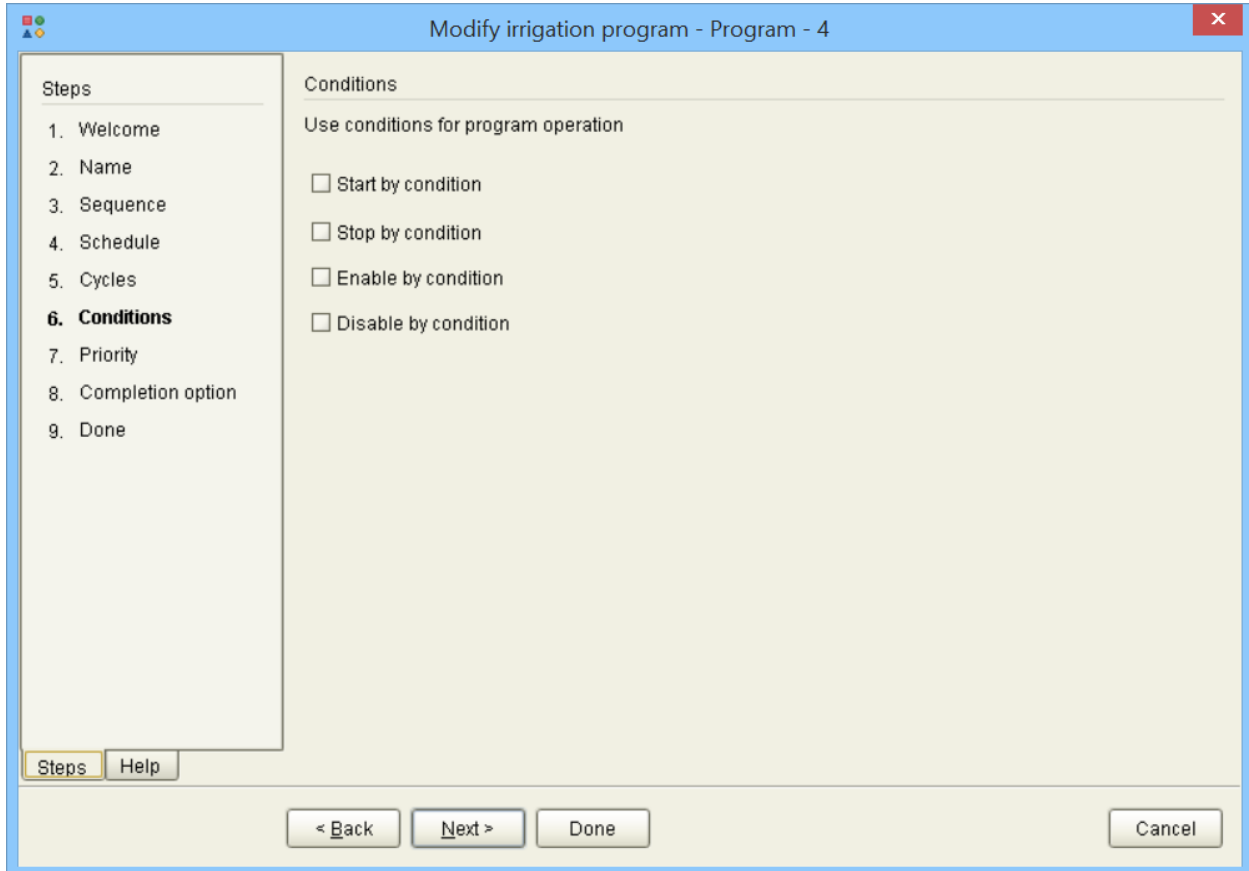
< Back Next > Done Cancel

Pointers

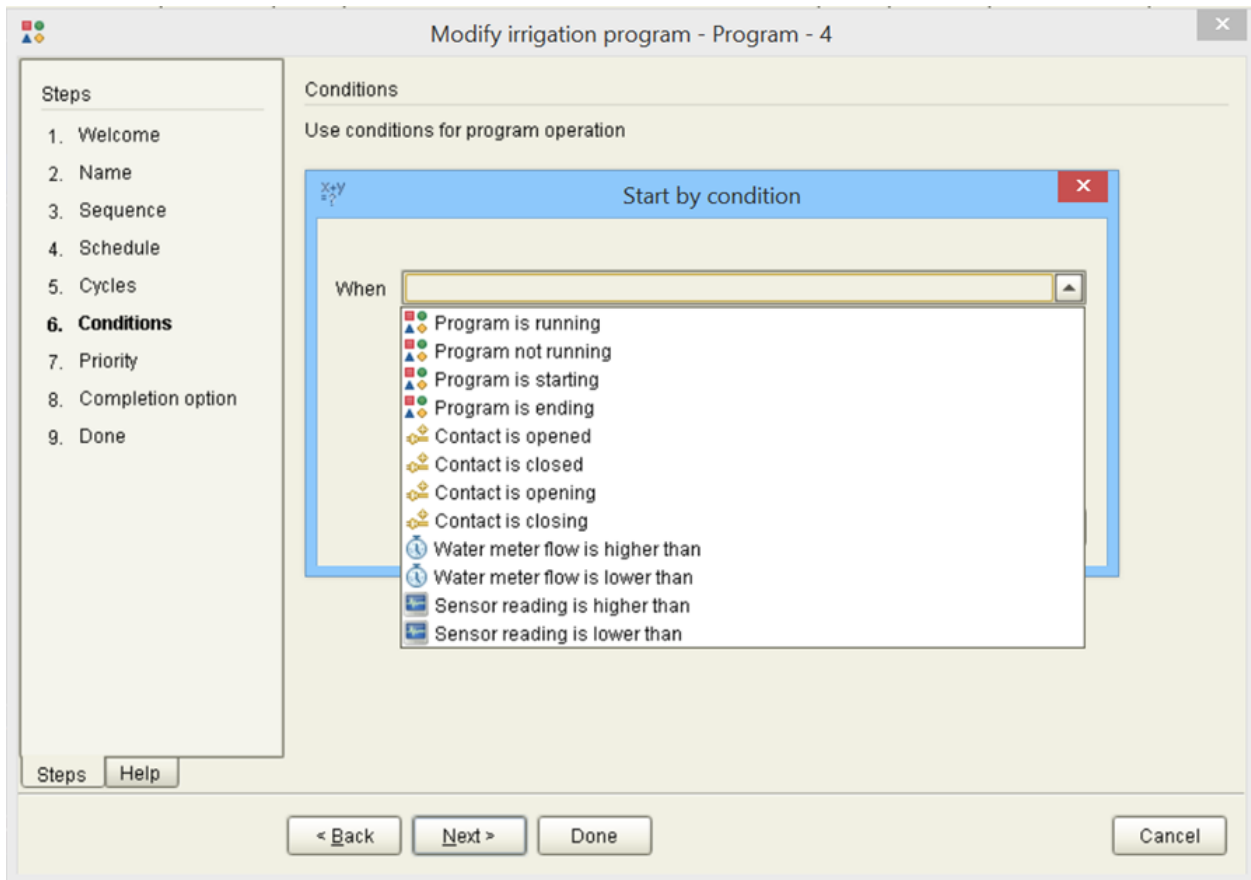
1. The number 3 (for example) represent the number of wanted irrigation cycles.
2. The interval is the time between each cycle, the interval time is from start to start, meaning that if the program starts at 8:00 the next cycle will start at 11:00 and the next one at 14:00.
3. **Left** – cycles lefts to finish the program.
Left (hh:mm:ss) – time left for the next cycle.

Step 6 - Conditions:

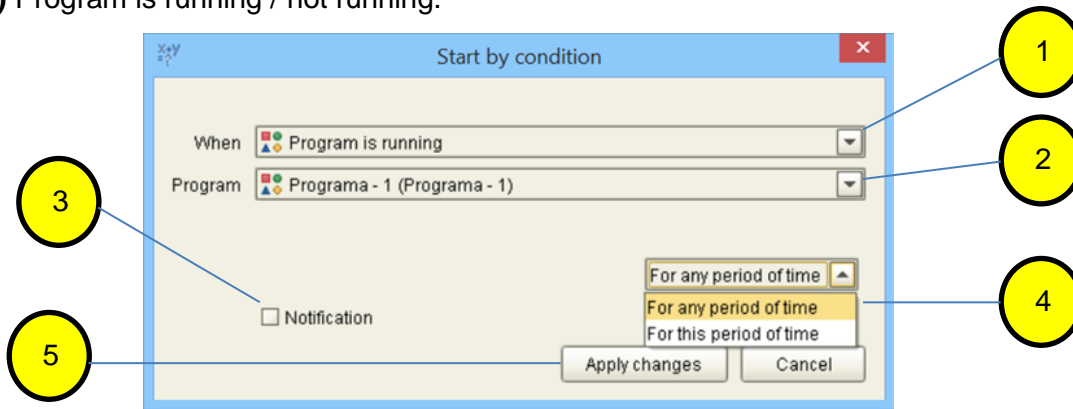
A) Selecting one of the following options allow starting / stopping / enabling / disabling the irrigation program, the conditions are being use in special cases when normal programing (start time and day, dosing by time volume....) is not enough.



B) After selecting to start, stop, enable or disable the program, a list of conditions will open, select the wanted condition from the list.



B.1) Program is running / not running.

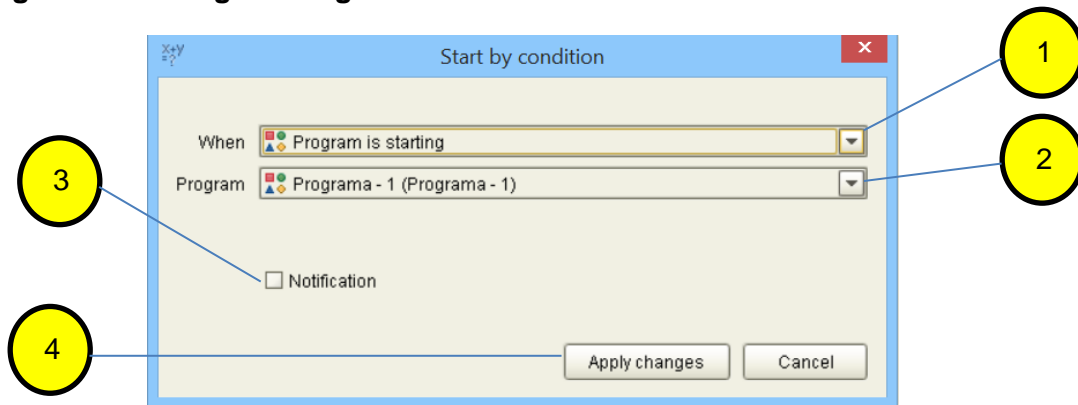


Pointers

1. **When** the condition will be active? In this case when program is running.
2. Which **program** should be running for the condition to be true? In this case programa-1.
3. Mark If you want to get **notification** when the condition takes place.
4. **For any period of time** means that if programa-1 is running the condition will take place.
For this period of time means that the condition will take place only if programa-1 will run more than the selected time, for example:
5. Click on **Apply changes** to finish the condition setup.

Short summary – This irrigation program will start when **programa-1** (name of the program) will run more than 30 minutes.

B.2) Program is starting / ending.

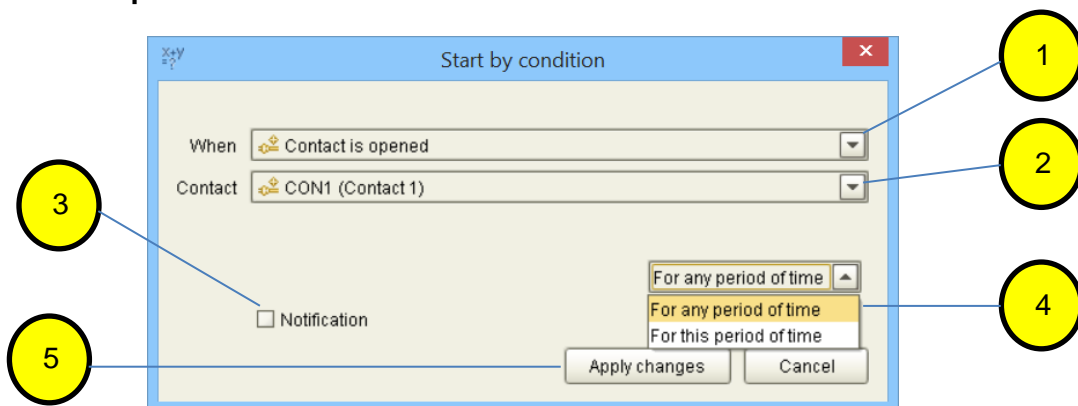


Pointers

1. **When** the condition will be active? In this case when program is starting.
2. Which **program** should be running for the condition to be true? In this case programa-1.
3. Mark If you want to get **notification** when the condition takes place.
4. Click on **Apply changes** to finish the condition setup.

Short summary – This irrigation program will start when **programa 1** (name of the program) is starting.

B.3) Contact is open / close

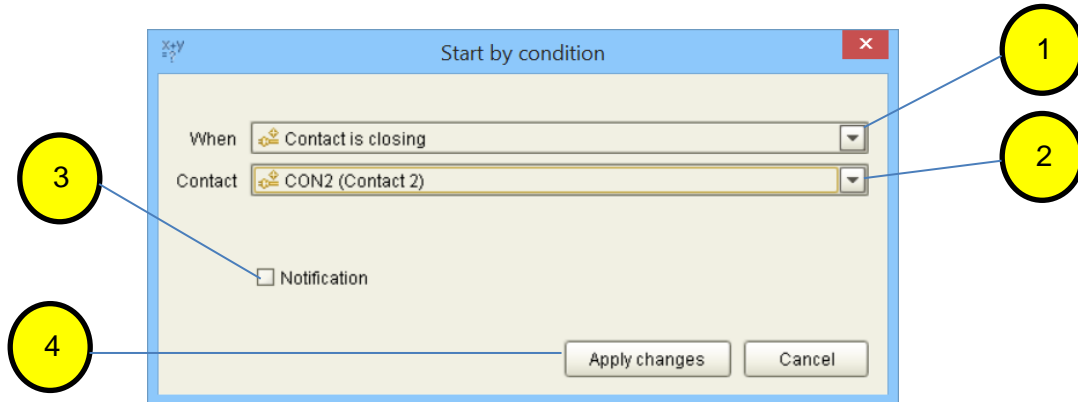


Pointers

1. **When** the condition will be active? In this case when the contact is opened.
2. Which **contact**? In this case Contact 1.
3. Mark If you want to get **notification** when the condition takes place.
4. **For any period of time** means that if Contact 1 is opened the condition will take place. **For this period of time** means that the condition will take place only if Contact 1 will be opened more than the selected time, for example: For this period of time 00 : 00 : 45
5. Click on **Apply changes** to finish the condition setup.

Short summary – This irrigation program will start when **Contact 1** (name of the Contact) will be opened more than 45 seconds.

B.4) Contact is opening / closing

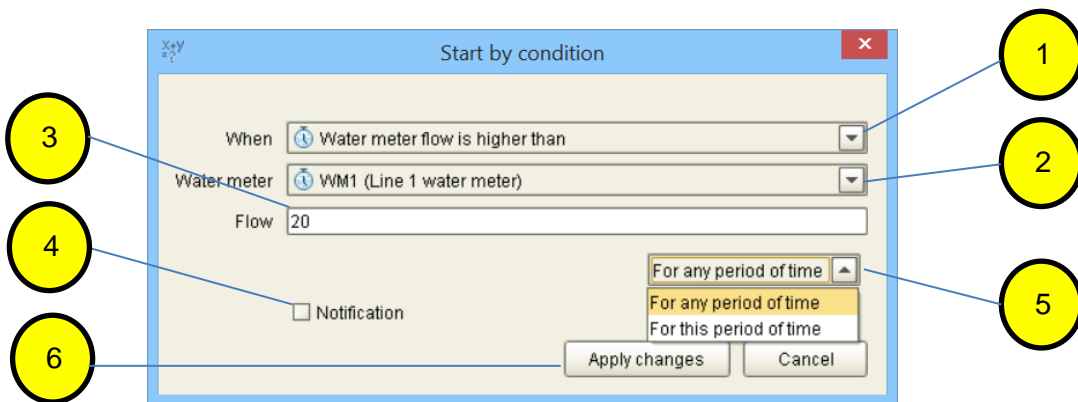


Pointers

1. **When** the condition will be active? In this case when Contact is closing.
2. Which **contact**? In this case Contact 2.
3. Mark If you want to get notification that the condition is take place.
4. Click on **Apply changes** to finish the condition setup.

Short summary – This irrigation program will start when **Contact 2** (name of the Contact) is closing.

B.4) Water meter flow is higher / lower than



Pointers

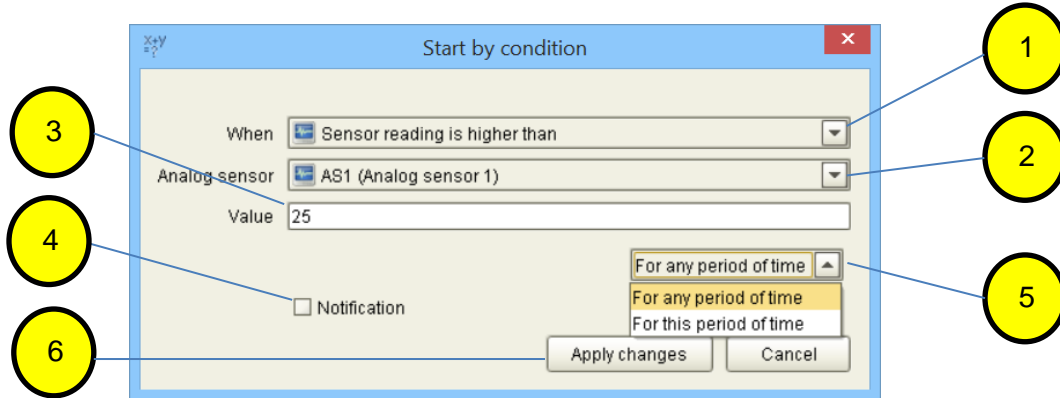
1. When the condition will be active? In this case when the flow is higher than 20.
2. Which **water meter**? The SAPIR 2 has only one water meter.
3. Flow in M3/H
4. Mark If you want to get **notification** when the condition takes place.
5. **For any period of time** - means that if WM 1 flow rate is higher than 20 the condition will take place.

For this period of time - means that the condition will take place only if WM 1 flow rate is higher than 20 M3/h, and lasting more than the selected time, for example:

For this period of time 00 : 00 : 45

- Click on **Apply changes** to finish the condition setup.

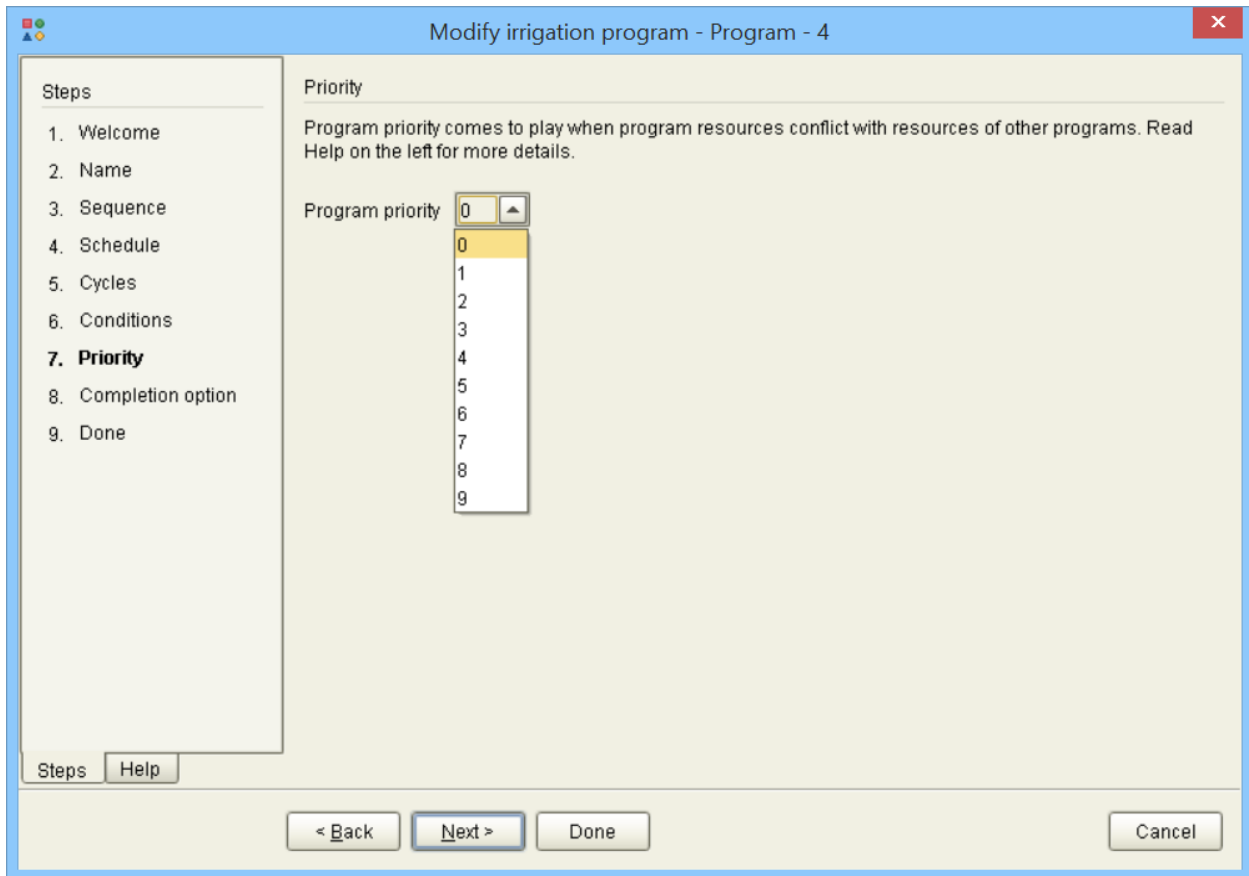
B.5) Sensor reading is higher / lower than



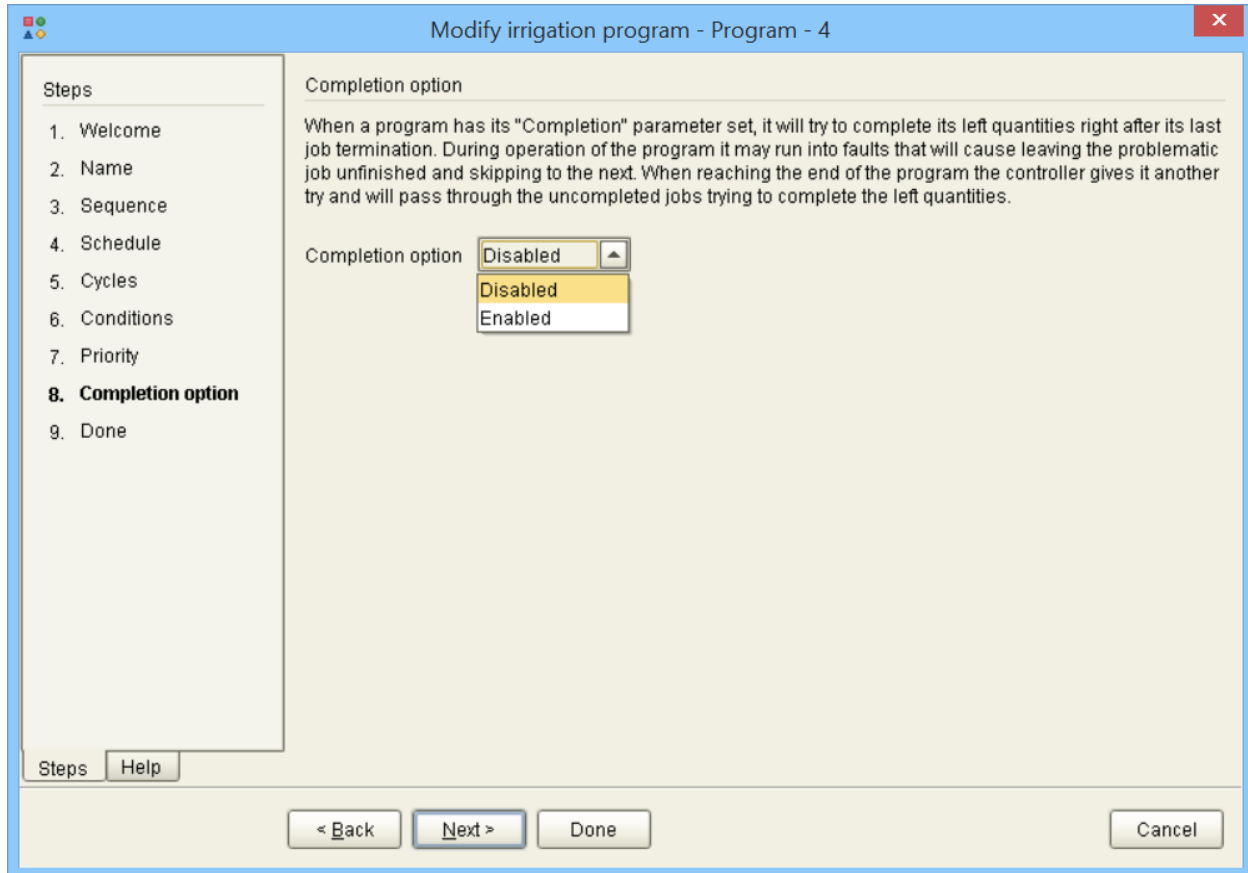
Pointers

- When** the condition will be active? In this case when the Sensor reading is higher than 25.
- Which **Analog sensor**? AS1.
- Value of the sensor, the units is according to the sensor definition.
- Mark If you want to get **notification** when the condition takes place.
- For any period of time** - means that if sensor reading is higher than 25 the condition will take place.
For this period of time - means that the condition will take place only if sensor reading is higher than 25, and more than the selected time, for example: For this period of time 00 : 00 : 45
- Click on **Apply changes** to finish the condition setup.

Step 7 - Priority: In case of a conflict between programs it will give a priority to the program with the higher priority number.



Step 8 – completion option: enable the completion option will give automatically another try to complete the left quantity of a program that from some reason couldn't finish its water/time dosage.

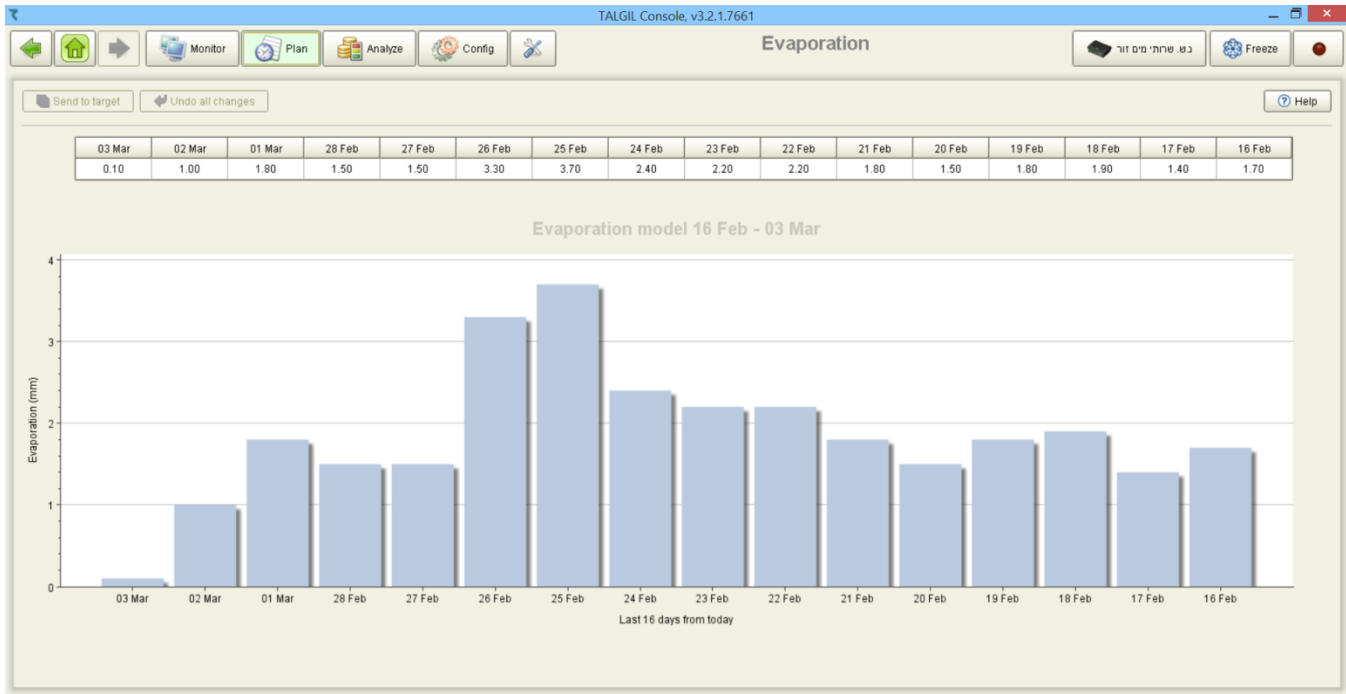


Step 9 – Done: select **Done** to save changes or **Cancel** to exit the wizard and discard changes.

Note – for water and fertilizers dosing go to paragraph 9.1.3 “**Selected program water and fertilization status**”

9.3 Evaporation

This screen demonstrates the evaporation of the last 16 days, the evaporation values can be inserted automatically if there is a weather station connected or manually by clicking on the dates and typing the evaporation of each day.



Irrigating according to the evaporation:

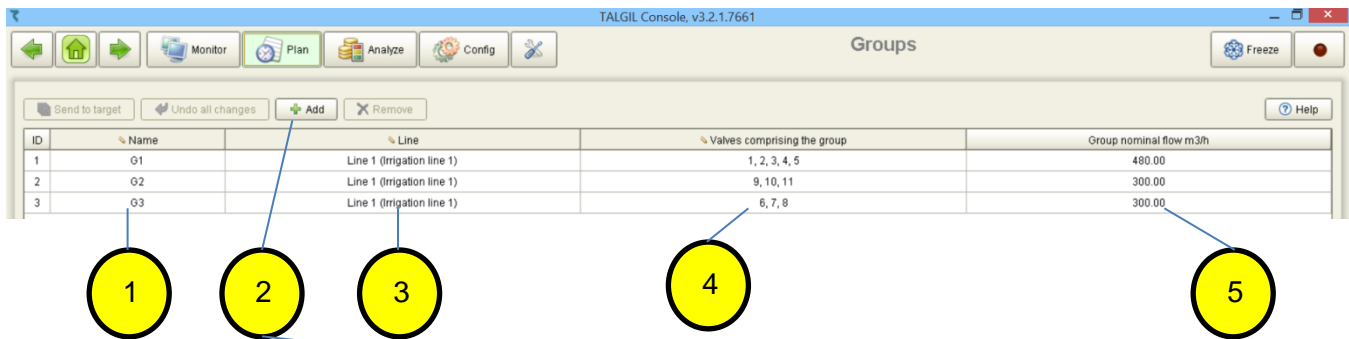
1. Select **evapo(m3)** or **evapo(time)** in the program **water dosage method**.

Valve state	C	Valve state	C
Current flow (nominal), m3/h	0.00 (80.00)	Current flow (nominal), m3/h	0.00 (80.00)
Water dosage method	evapo(m3)	Water dosage method	evapo(time)
Water dosage planned		Water dosage planned	
Water dosage left	0.00	Water dosage left	00:00:00
Water dosage calc	44.29	Water dosage calc	00:33:45

2. The controller will multiply yesterday evaporation value with the valves area and the crop factor (as defined in **Constans/valves**).
3. If the program contains several cycles, the water dosage per cycle will be calculated by dividing the daily calculated Water dosage by the number of cycles.

9.4 Groups

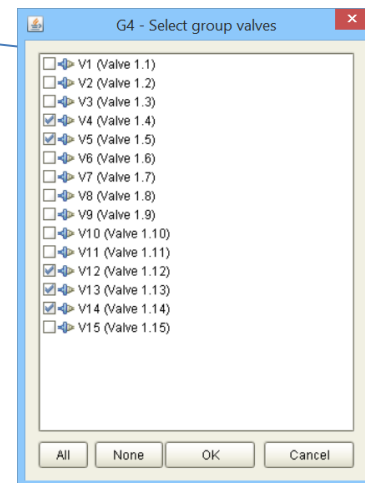
The groups screen allows creating groups of valves that will irrigate together.



ID	Name	Line	Valves comprising the group	Group nominal flow m3/h
1	G1	Line 1 (irrigation line 1)	1, 2, 3, 4, 5	480.00
2	G2	Line 1 (irrigation line 1)	9, 10, 11	300.00
3	G3	Line 1 (irrigation line 1)	6, 7, 8	300.00

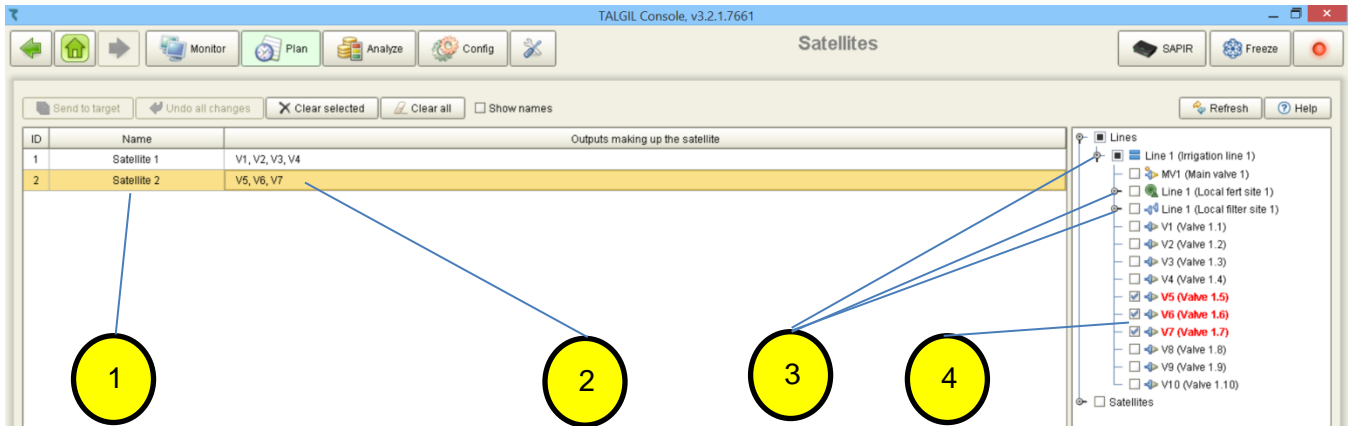
Pointers

1. Name of the program.
2. Add new group, after clicking on the Add icon, a Selection window with all the valves will open, mark the Valves you want to add to the group.
3. Line number (the SAPIR 2 have only one)
4. The valves that participating in the group, to edit an Existing group double click on the valves box and the Valves selection window will open.
5. The group calculated flow rate.



9.5 Satellites

Satellites are outputs that open simultaneously with other outputs.

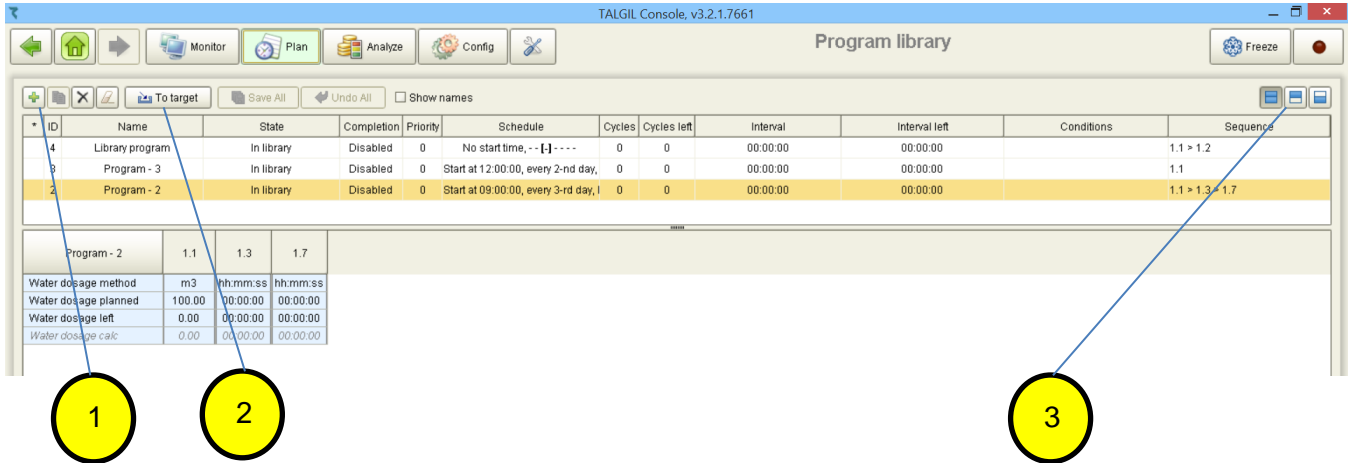


Pointers

1. Satellite name.
2. The selected outputs that will open the satellite, for example: every time that one of the following outputs V5, V6 or V7 opens, satellite 2 will open as well.
3. To be able to select specific items from each category click on the icon.
4. After opening the category, mark the desired outputs for the selected satellite.

9.6 Program library

The program library screen allows saving programs that are currently not in use, and when it's needed load them back to the controller. It is possible to create irrigation programs in the library or export them from the irrigation programs screen.

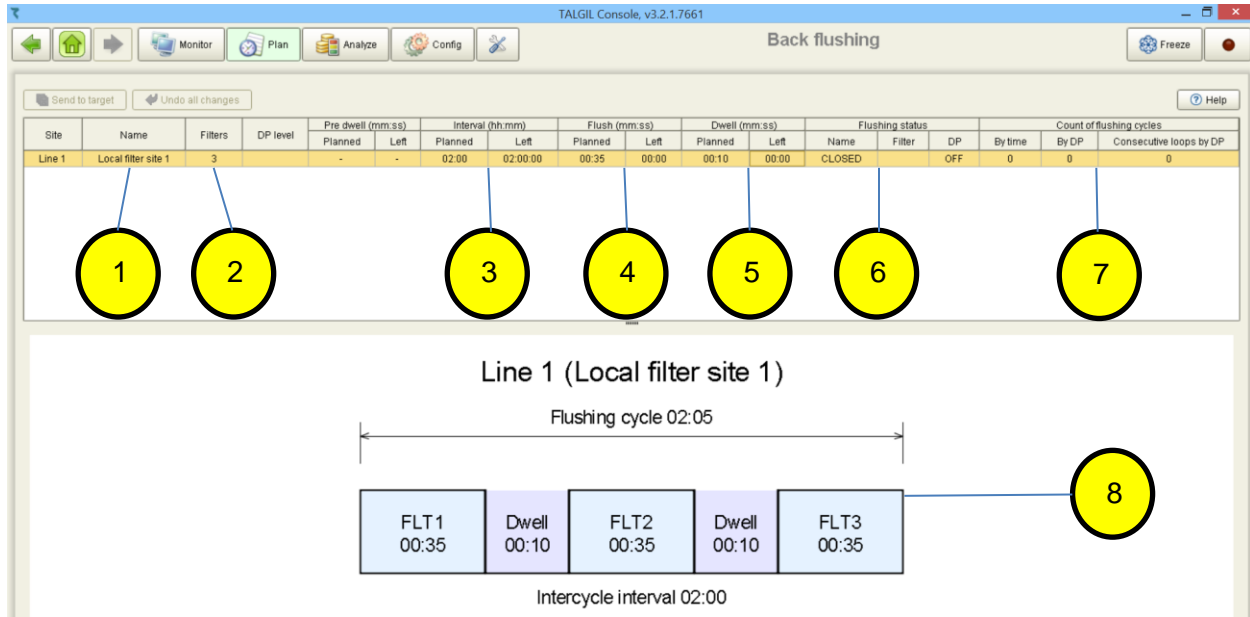


Pointers

1. Creating new program in the library, as long as it inside the library it won't be active.
2. **To target** – send the program to the irrigation programs screen, make it an active program.
3. Changing the screen display.

9.7 Back flushing

In case the filters are operated from the SAPIR 2, use this screen to program them. To set the Back flushing program insert the Planned Interval, Flush and Dwell.



Site	Name	Filters	DP level	Pre dwell (mm:ss)		Interval (hh:mm)		Flush (mm:ss)		Dwell (mm:ss)		Flushing status			Count of flushing cycles		
				Planned	Left	Planned	Left	Planned	Left	Planned	Left	Name	Filter	DP	By time	By DP	Consecutive loops by DP
Line 1	Local filter site 1	3		-	-	02:00	02:00:00	00:35	00:00	00:10	00:00	CLOSED		OFF	0	0	0

Line 1 (Local filter site 1)

Flushing cycle 02:05

Inter-cycle interval 02:00

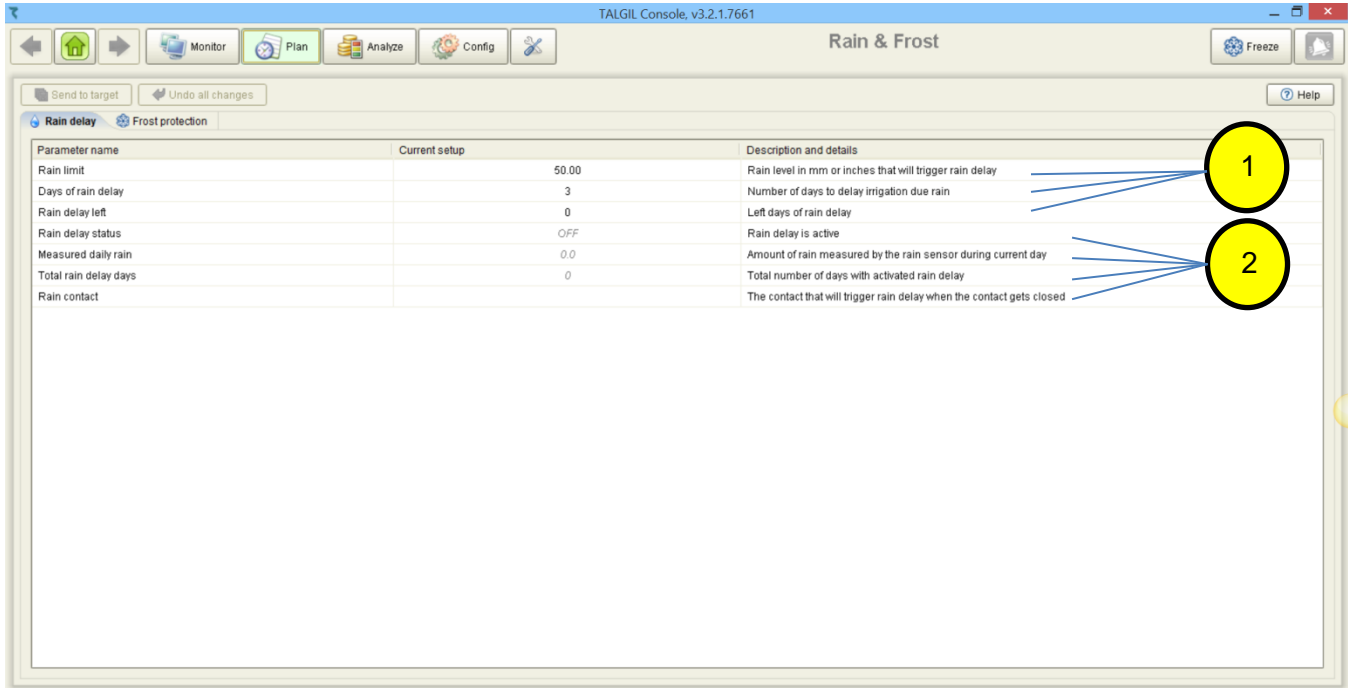
Sequence: FLT1 00:35 | Dwell 00:10 | FLT2 00:35 | Dwell 00:10 | FLT3 00:35

Pointers

1. Name of the local filter site.
2. The quantity of filters as defined in the configuration of the system (can't be changed in this screen).
3. Interval and left (time remaining to the next flush) time between flushes.
4. Flush and left (flush time remaining) time of each filter.
5. Dwell time, waiting time between the filters flushes.
6. The flushing status indicates:
 - Name** - status of the irrigation CLOSED, IRRIGATING or FLUSHING.
 - Filter** - indicates which filter is currently flushing when a flushing sequence take place.
 - DP** - indicates if the DP contact is ON or OFF.
7. Count of flushing cycles:
 - By time** - how many flushing cycles occurred by time
 - By DP** - how many flushing cycles occurred by DP.
 - Consecutive loops by DP** - how many continues flushing occurred by DP.
8. Graphical layout of the flushing sequence.

9.8 Rain delay

For using rain delay, the user must have weather station or analog rain sensor, in addition this option must be defined in **Dealer Definitions**. The Rain limit is count on a daily basis and resets back to zero once a day. This option allows to stop irrigation for a few days in case of rain event.

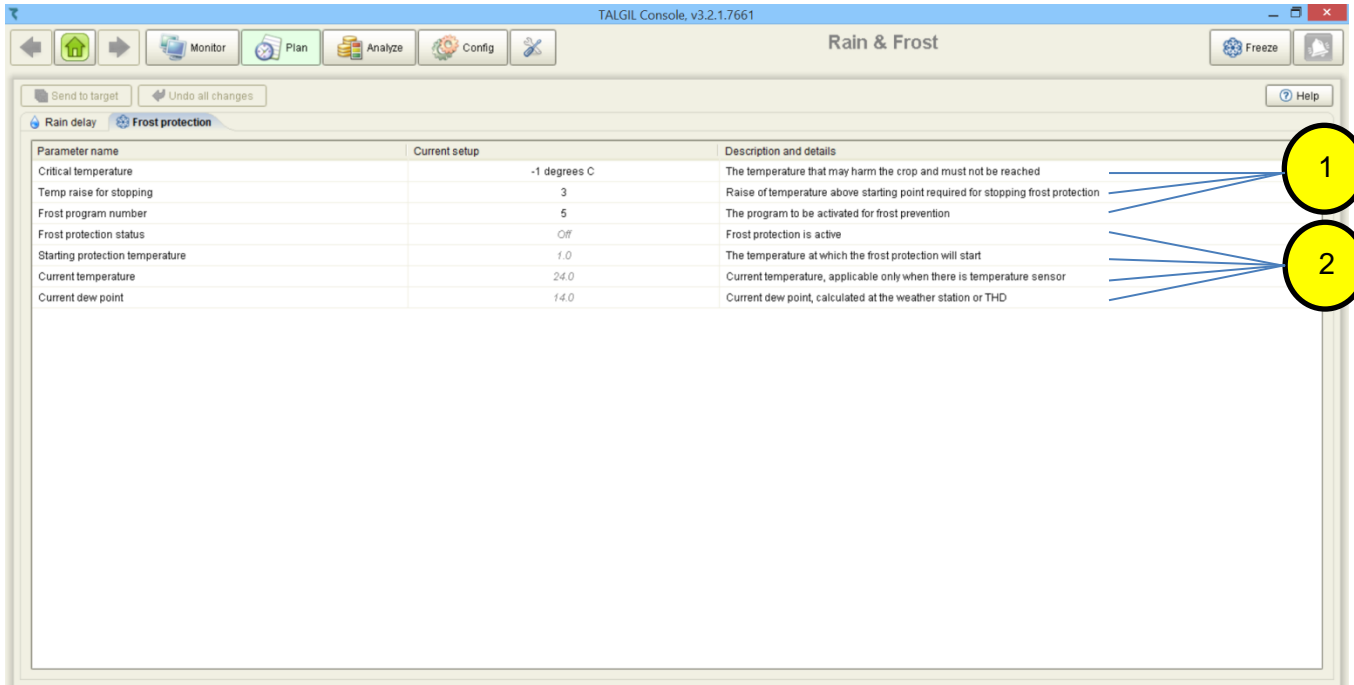


Pointers

- Rain limit** – the quantity of mm of daily rain to activate rain delay.
Day of rain delay – to how many days should the controller delay the irrigation in case of rain delay activation.
Rain delay left – how many days are left to finish the irrigation delay. In case you defined 3 day of delay and you had rain delay you can change this number to make the delay shorter or longer.
- Rain delay status** – Off not active, On active.
Measured daily rain – how much rain (Daily) was measured.
Total rain delay days – number of days with rain delay.
Rain contact – not active.

9.9 Frost protection

For using Frost protection, the user must have weather station or THD interface, in addition this option must be defined in **Dealer Definitions**. This feature is based on an algorithm that allows the user to insert the critical temperature for the crop and the controller will calculate the opening temperature of the selected program.

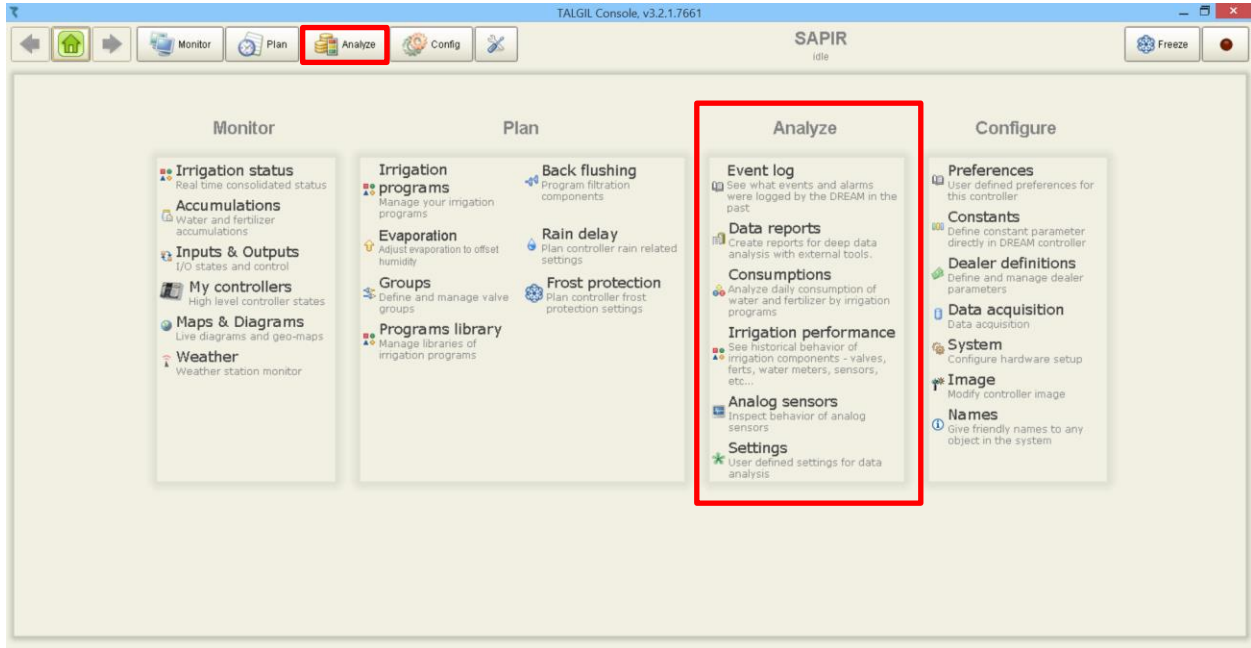


Pointers

- Critical temperature** – the temperature that may harm the crop.
Temp raise for stopping – insert the temperature that will close the program.
Frost program number – insert the frost protection program number.
- Frost protection status** – Off or On.
Starting protection temperature – the calculated temperature to start the program.
Current temperature – the reading of the Current temperature from the sensor.
Current dew point – the calculated current dew point.

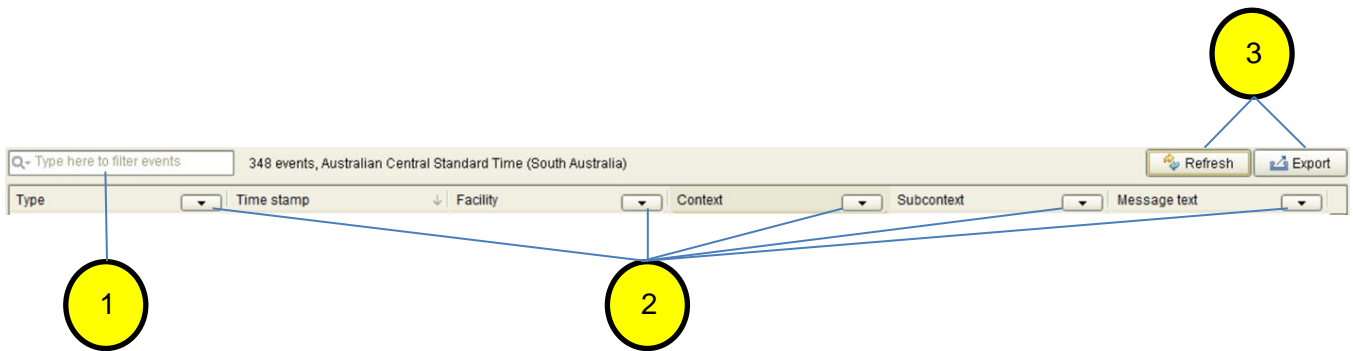
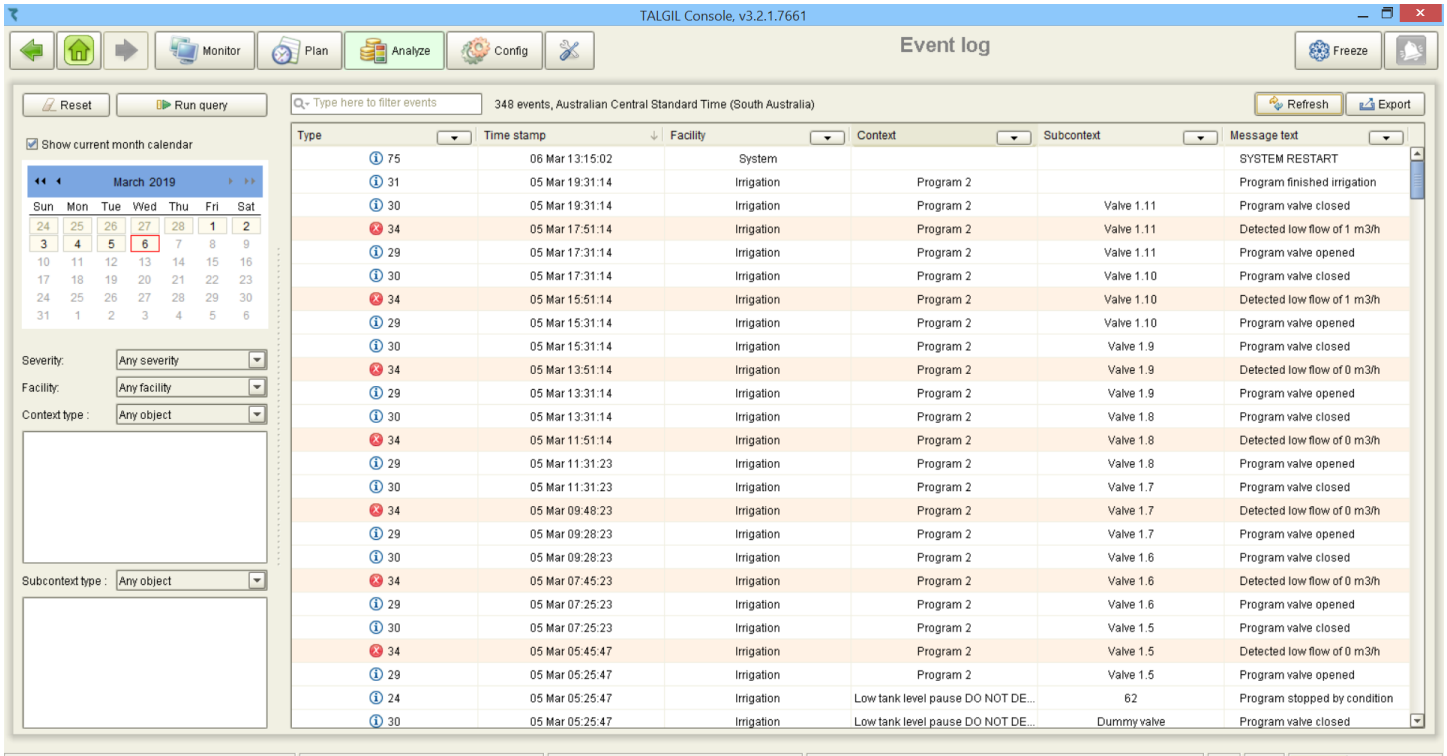
10. Analyze

The following chapter deals with the tools to analyze the controller activities, consumptions, behavior and creating reports. it can be reached from the main menu or from the pull down bar.



10.1 Event log

The event log screen allows reviewing the controller activities and behavior, the screen consists of the activities list, calendar and filters to make the search of something specific easier.

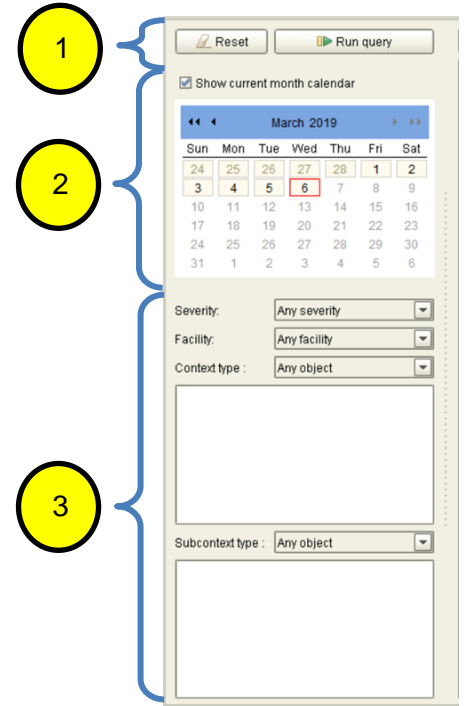


pointers

1. Free text to filter events.
2. Colmns filters, press on the filters icon and select from the list.
3. Export the list to Excel file or Refresh.

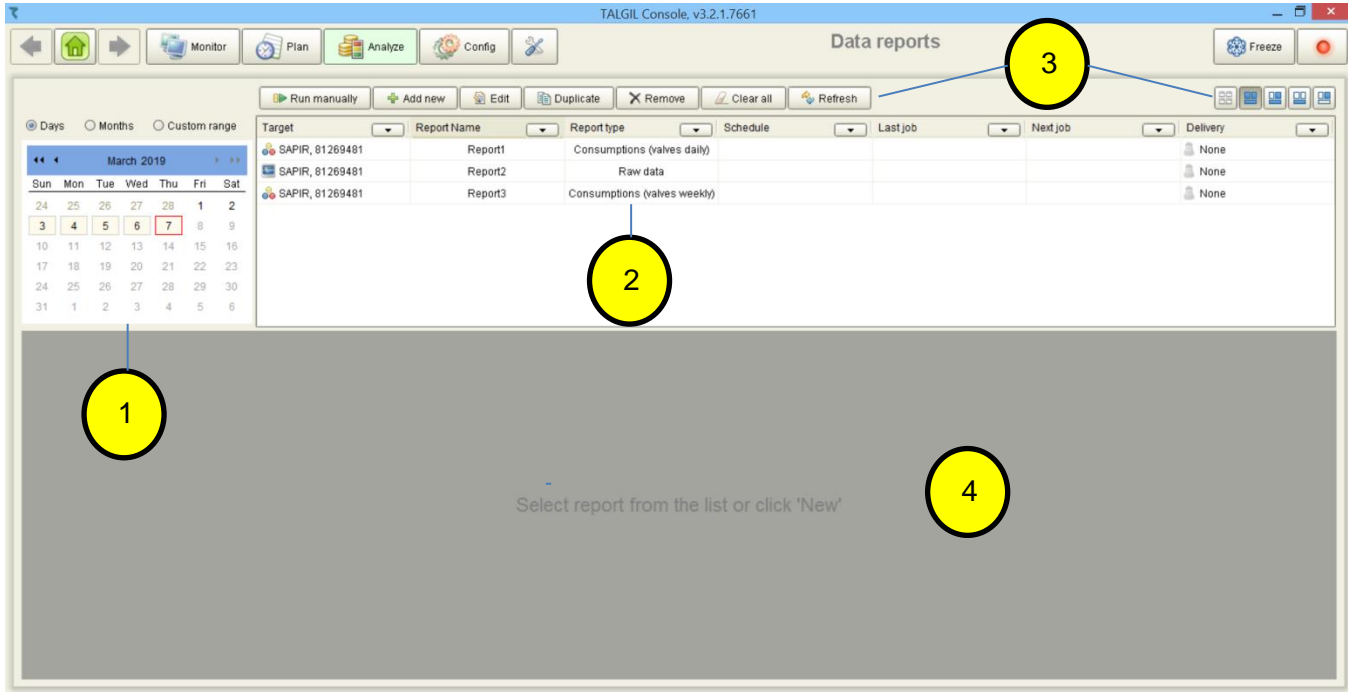
pointers

1. **Run query** – after selecting the dates and filters (if needed), click on it to run the search.
2. Mark the daisered date on the calender, if you need several days click and drag. The red scuere represents the current day.
3. Search filters to find error or information, in specific program, device ,site.....



10.2 Data reports

The Data reports perspective is the place where the user may define formatted documents by which various reports may be generated. There can be various types of reports: **Consumption** reports, **Raw data** reports or **Event log** reports.

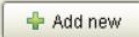


pointers

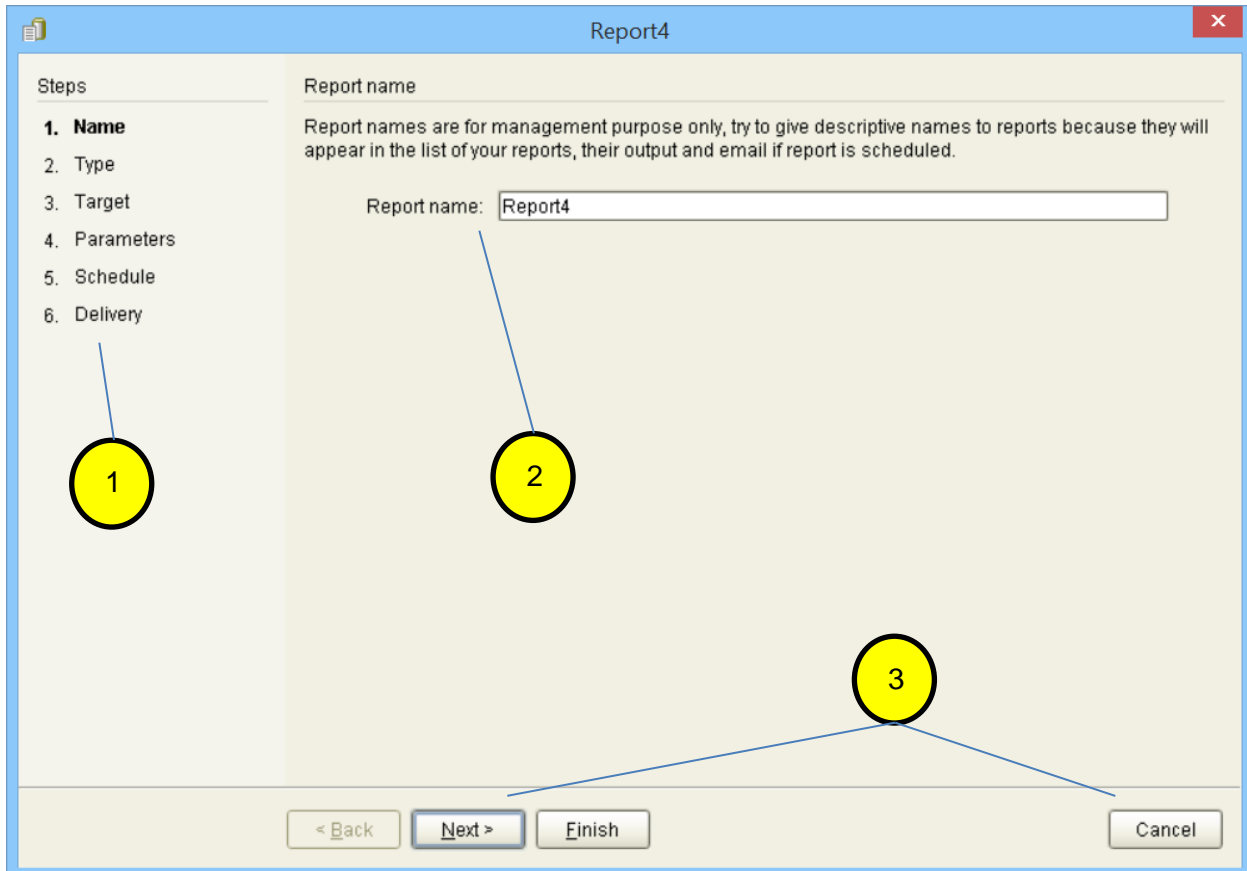
1. Range selection for manually generated reports.
2. List of defined reports.
3. Tool bar :

- After selecting a report from the list and the required day/s click on -
- To create a new report click on - (explanation of the report wizard is in the next page).
- To edit an existing report click on the report and then click on -
- To duplicate existing report click on -
- To delete report, mark it and click on -
- To delete all the reports click on -
- To refresh the page click on -
- To change the screen display click on -

10.2.1 Creating new report

To create new report click on Add new  to open the reports wizard. The wizard contain 6 steps:

Step 1 – name: giving a name to the report.



Report4

Steps

1. **Name**
2. Type
3. Target
4. Parameters
5. Schedule
6. Delivery

Report name

Report names are for management purpose only, try to give descriptive names to reports because they will appear in the list of your reports, their output and email if report is scheduled.

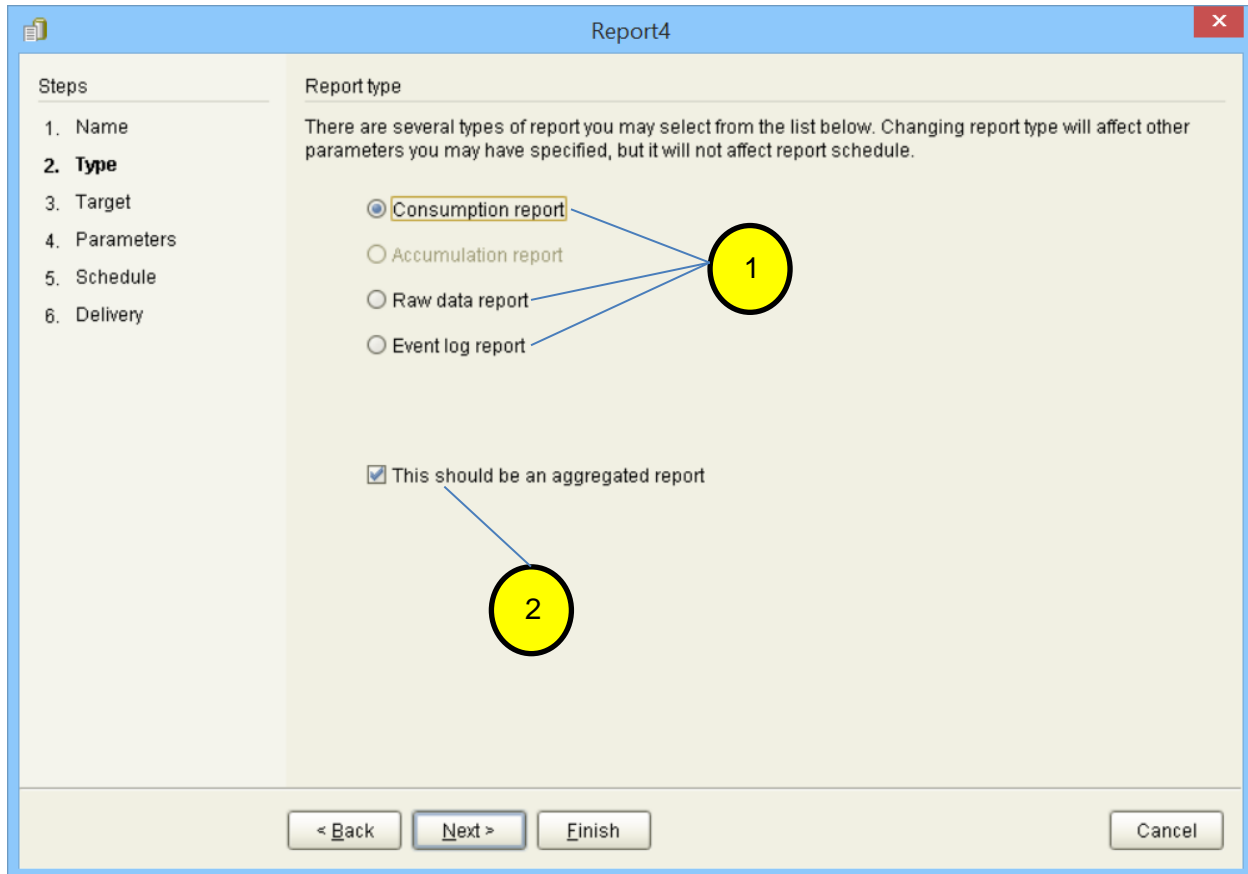
Report name:

< Back Next > Finish Cancel

Pointers:

1. The steps of the report wizard, click on the desired step to reach it directly.
2. Type the desired report name.
3. Move between the wizard steps, and finish or cancel the report configuration.

Step 2 – Type: selecting the report type, there are 3 types of reports: **consumption**, **raw data** and **event log**. Each type of report has different parameters screen. (look in the Step 4 – parameters)



Report4

Steps

1. Name
2. **Type**
3. Target
4. Parameters
5. Schedule
6. Delivery

Report type

There are several types of report you may select from the list below. Changing report type will affect other parameters you may have specified, but it will not affect report schedule.

Consumption report

Accumulation report

Raw data report

Event log report

This should be an aggregated report

< Back Next > Finish Cancel

Pointers

1. Select the required report type:

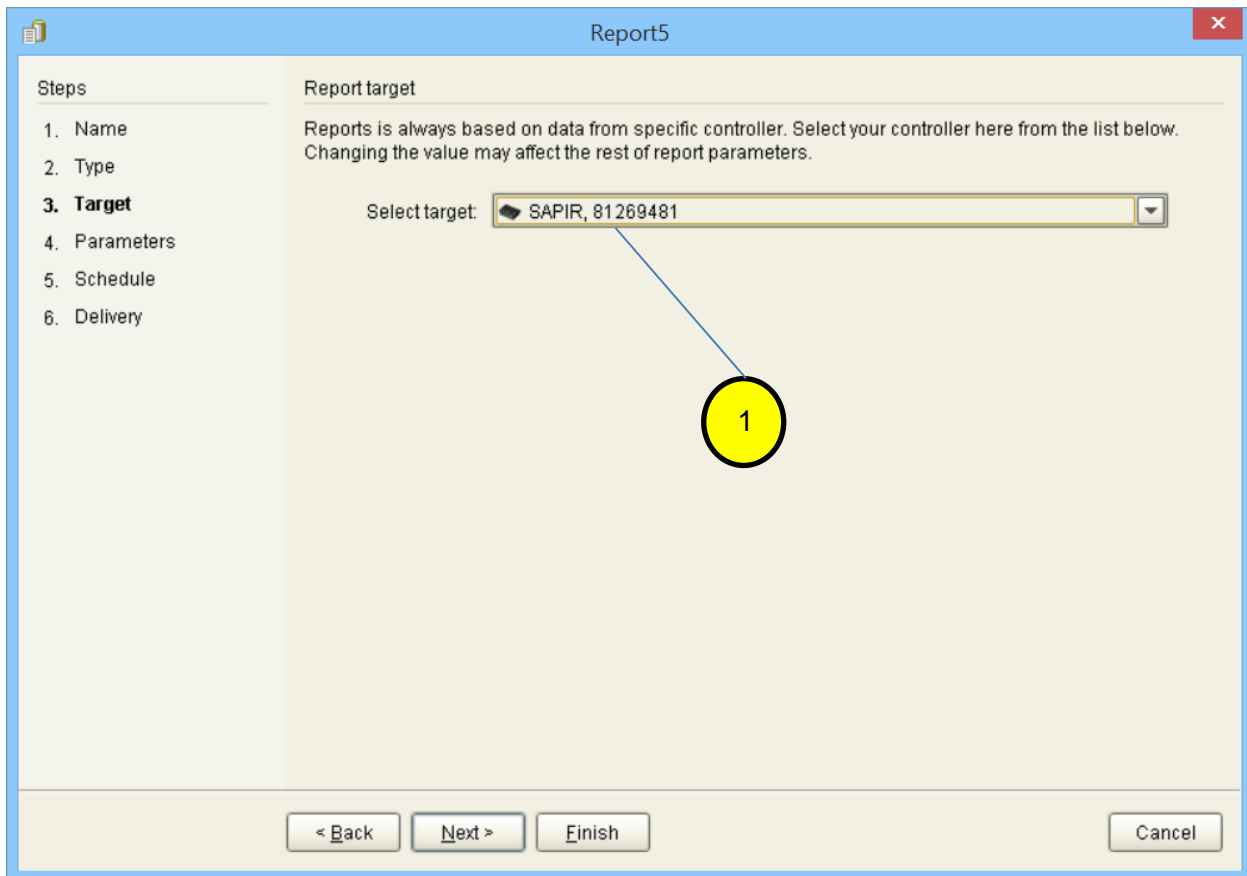
Consumption report – consumption of valves, groups and water meter.

Raw data report – creating reports from selected data.

Event log report – creating reports of system events.

2. Selecting this option will allow creating mixed consumption report.

Step 3 – Target: this screen is for selecting the controller in case there is more than one.



Report5

Steps

1. Name
2. Type
- 3. Target**
4. Parameters
5. Schedule
6. Delivery

Report target

Reports is always based on data from specific controller. Select your controller here from the list below. Changing the value may affect the rest of report parameters.

Select target: SAPIR, 81269481

1

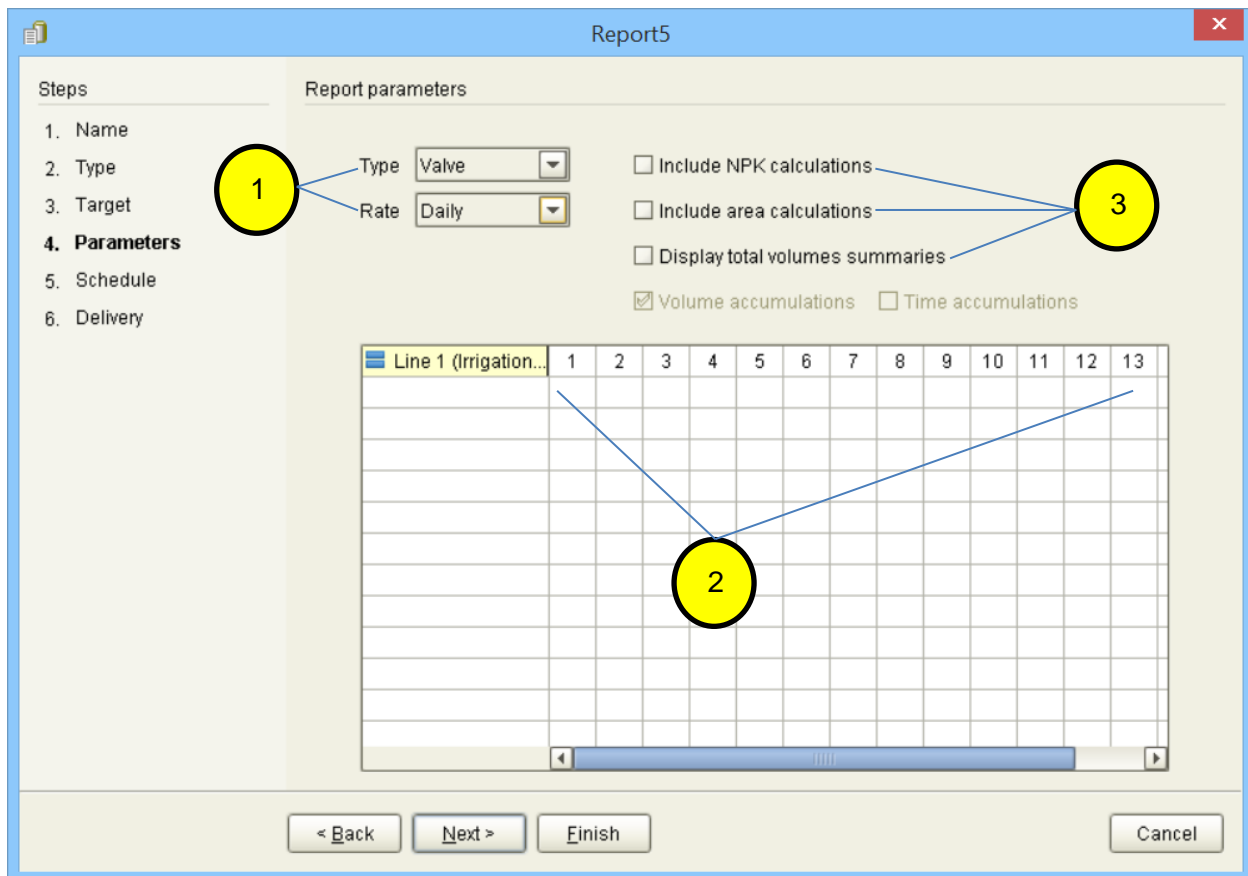
< Back Next > Finish Cancel

Pointers

1. Select the desired controller from the list

Step 4 – Parameters: the parameters screen is for selecting what will appear in the report. There 3 types of reports (see step 2) each type has its own parameters screen:

Consumption



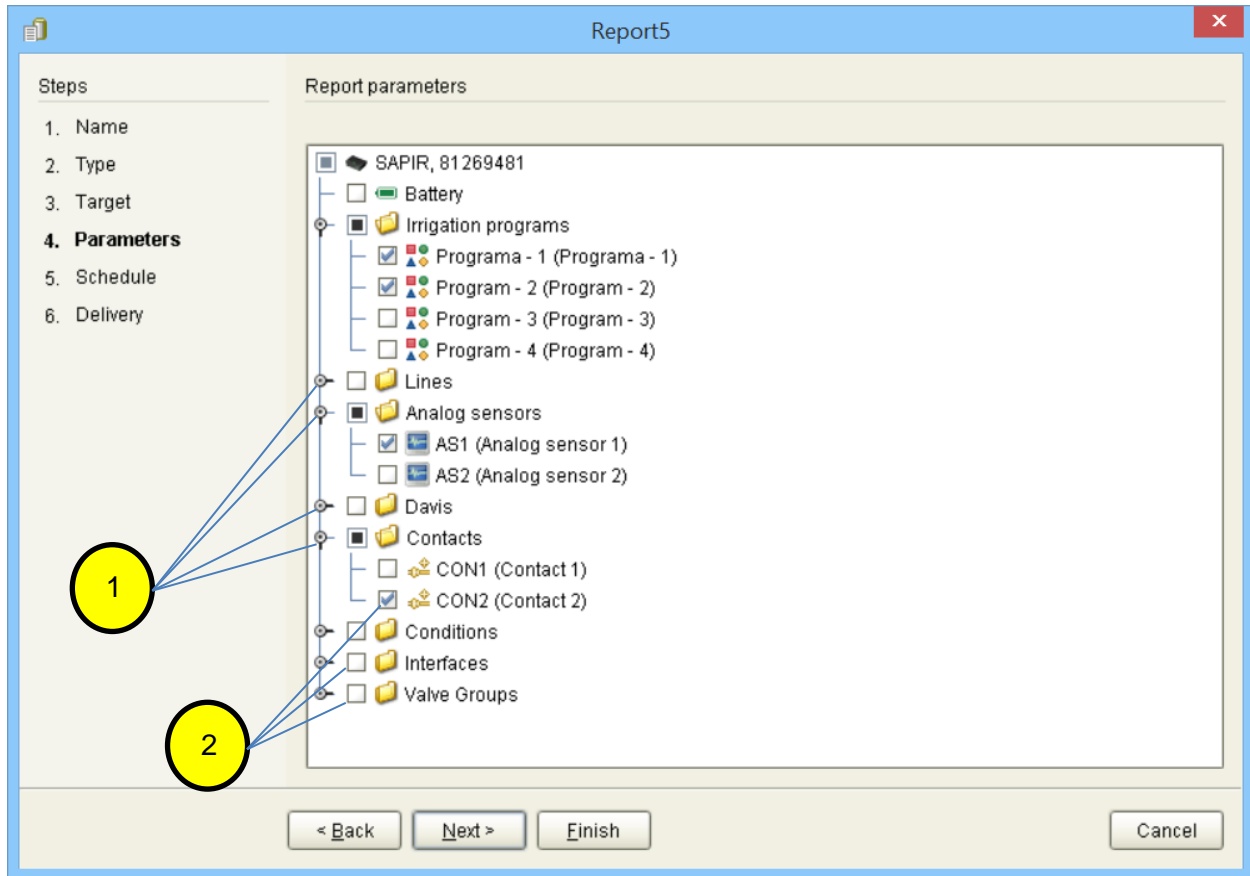
The screenshot shows the 'Report5' window with the following elements:

- Steps:** 1. Name, 2. Type, 3. Target, 4. **Parameters**, 5. Schedule, 6. Delivery.
- Report parameters:**
 - Type: Valve
 - Rate: Daily
 - Include NPK calculations:
 - Include area calculations:
 - Display total volumes summaries:
 - Volume accumulations:
 - Time accumulations:
- Grid:** Line 1 (Irrigation...) with columns 1-13.
- Navigation:** < Back, Next >, Finish, Cancel.


Pointers

1. **Type** – select the parameter type from the list.
Rate – select the time rate.
2. For example, if you chose Type – Valves, select the desired valves from the list. If you chose valves group, mark the desired group in the list. Do the same for Crops and Plots if nothing appears check again your configuration in Analyze / Settings.
3. Mark if it's necessary, make sure to define the valves area (in **constants**), and the NPK (in **Analyze / Settings**).

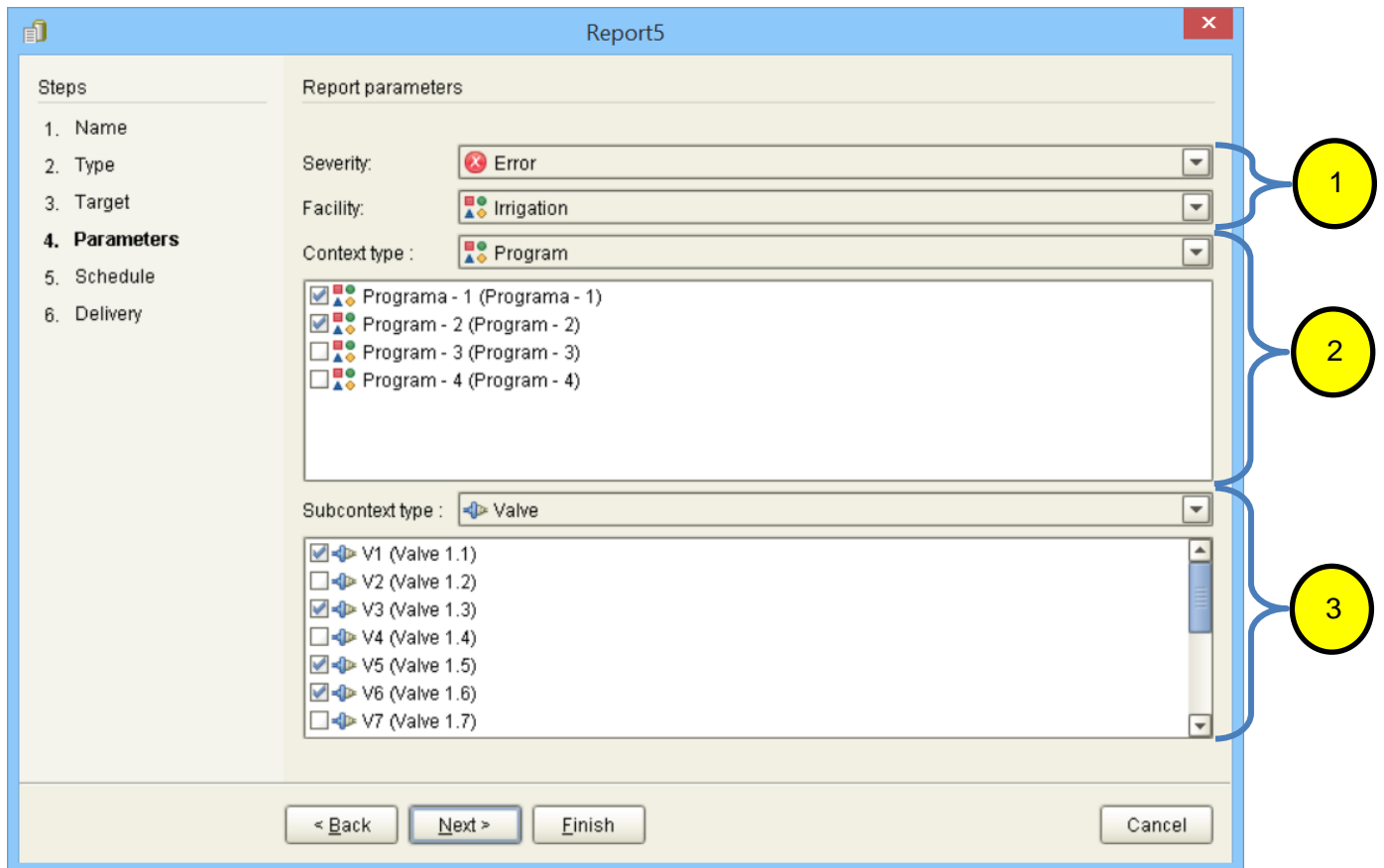
Raw data



Pointers

1. To be able to select specific items from each category click on the  icon.
2. Select the parameters that will appear in the report.

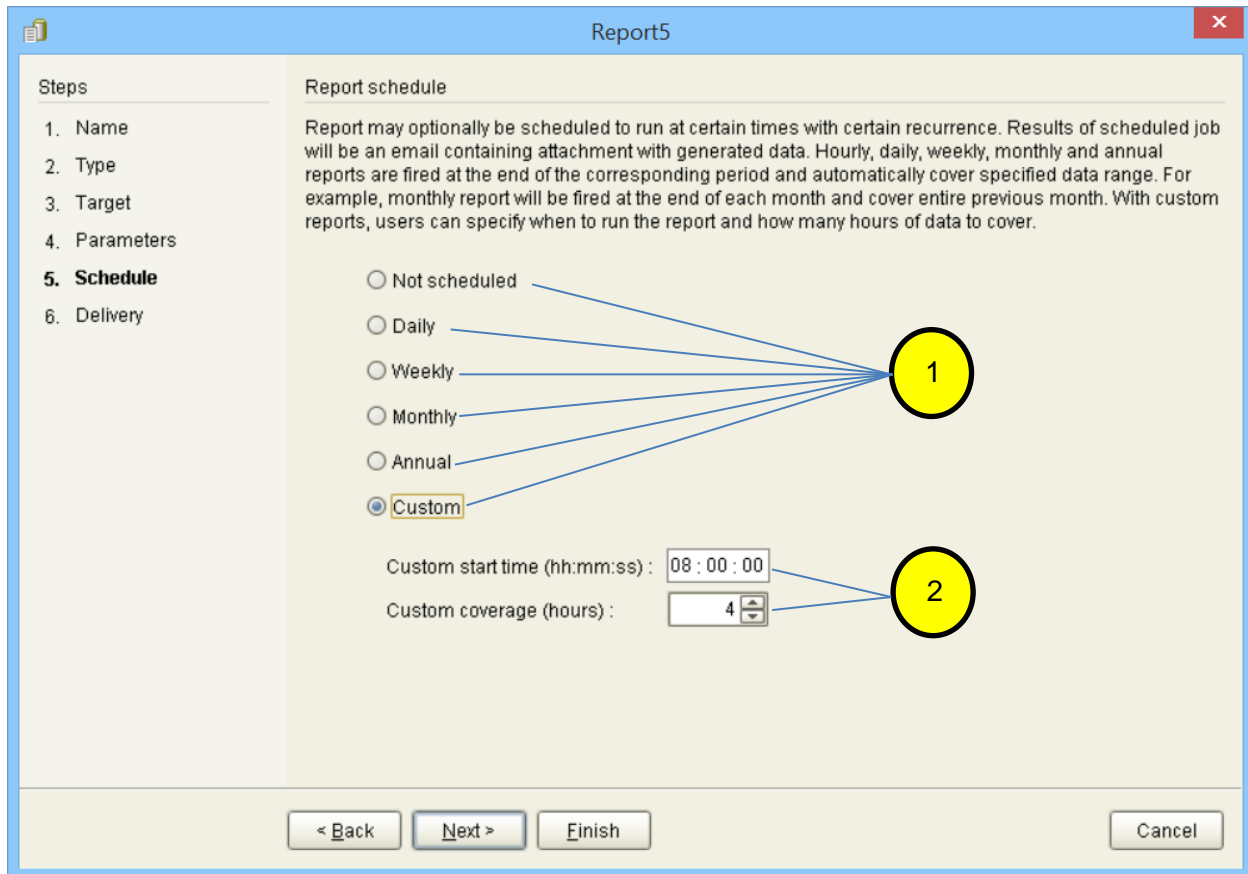
Event log



Pointers

1. **Severity** – select between Error, Info or any severity (Error and Info).
Facility - select from the list the facility according the report you want to produce.
2. Select the context type and mark in the list below the required items for the report.
3. Select the Sub context type and mark in the list below the required items for the report.

Step 5 – schedule: the schedule step allows defining when to send the automated reports.



Report5

Steps

1. Name
2. Type
3. Target
4. Parameters
- 5. Schedule**
6. Delivery

Report schedule

Report may optionally be scheduled to run at certain times with certain recurrence. Results of scheduled job will be an email containing attachment with generated data. Hourly, daily, weekly, monthly and annual reports are fired at the end of the corresponding period and automatically cover specified data range. For example, monthly report will be fired at the end of each month and cover entire previous month. With custom reports, users can specify when to run the report and how many hours of data to cover.

Not scheduled
 Daily
 Weekly
 Monthly
 Annual
 Custom

Custom start time (hh:mm:ss) : 08 : 00 : 00

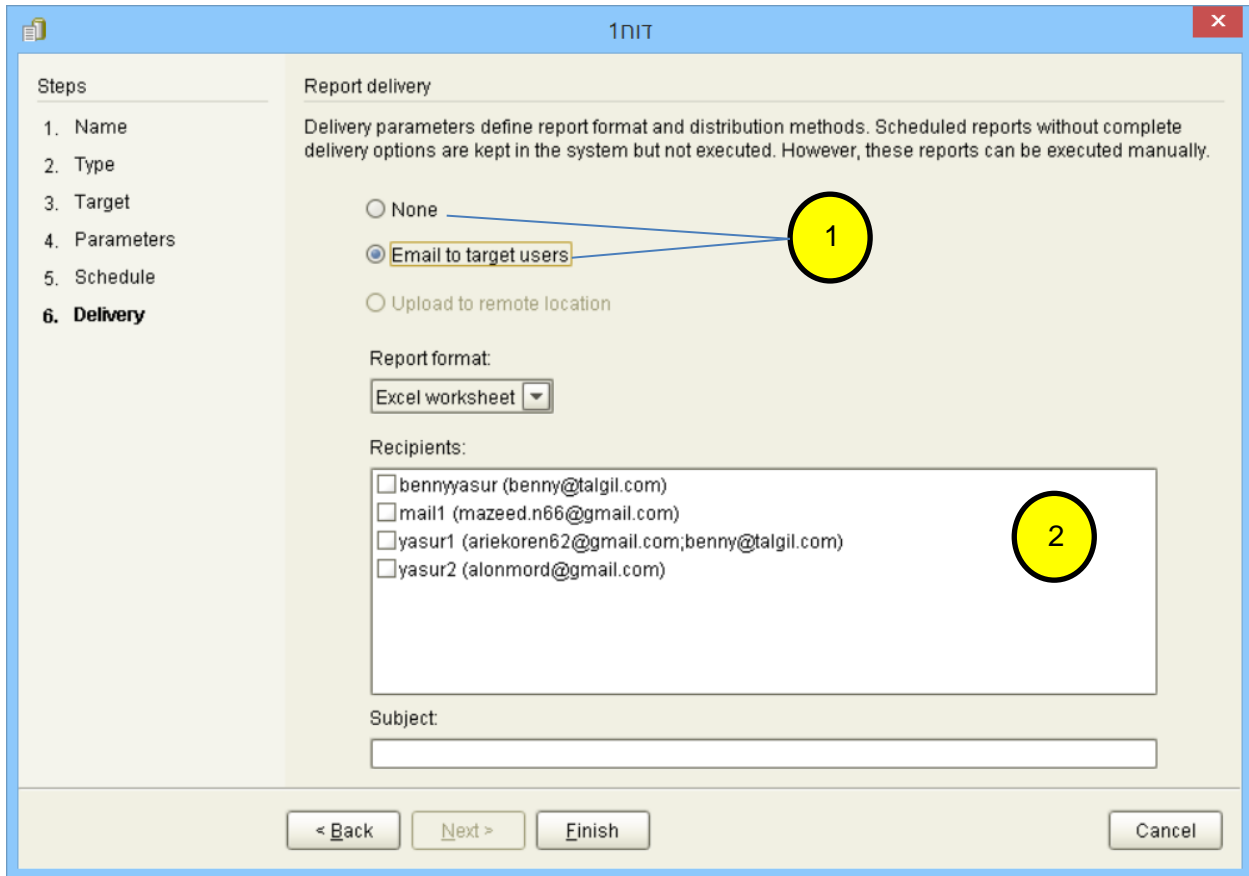
Custom coverage (hours) : 4

< Back Next > Finish Cancel

Pointers

1. **Select when to receive the reports:**
 - Not scheduled** – the report won't be sent automatically.
 - Daily** – the report will be sent every day, in the end of the day.
 - Weekly** – the report will be sent every week, select when the starting day of the week.
 - Monthly** - the report will be sent every end of month.
 - Annual** - the report will be sent every end of year.
 - Custom** – the report will be sent according to start time hour's coverage.
2. After selecting **Custom** define the start time, and the hours coverage of the report.

Step 6 – Delivery: define the users who will receive the automated report.

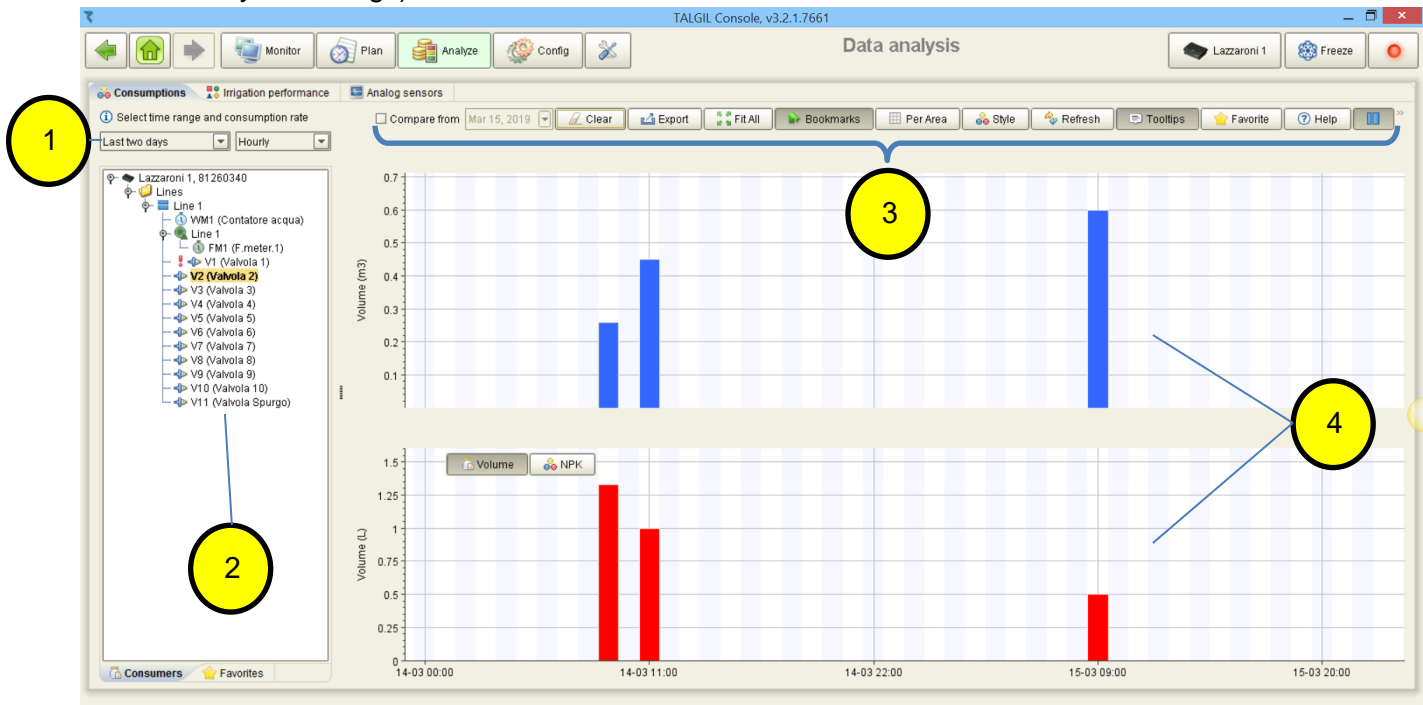


Pointers

1. **None** – the report won't be sent to anyone.
Email to target users – the report will be sent to the selected controller users.
2. **Recipients** - Select from the email list who will receive the report.
Subject – enter the subject of the email.

10.3 Consumption

The Consumptions perspective supplies tools that help analyzing the information accumulated in the data base about the water and fertilizers consumed by the Valves, Crops and Plots in the system (Crops and Plots will be available only if were configured in Analyze/Settings).

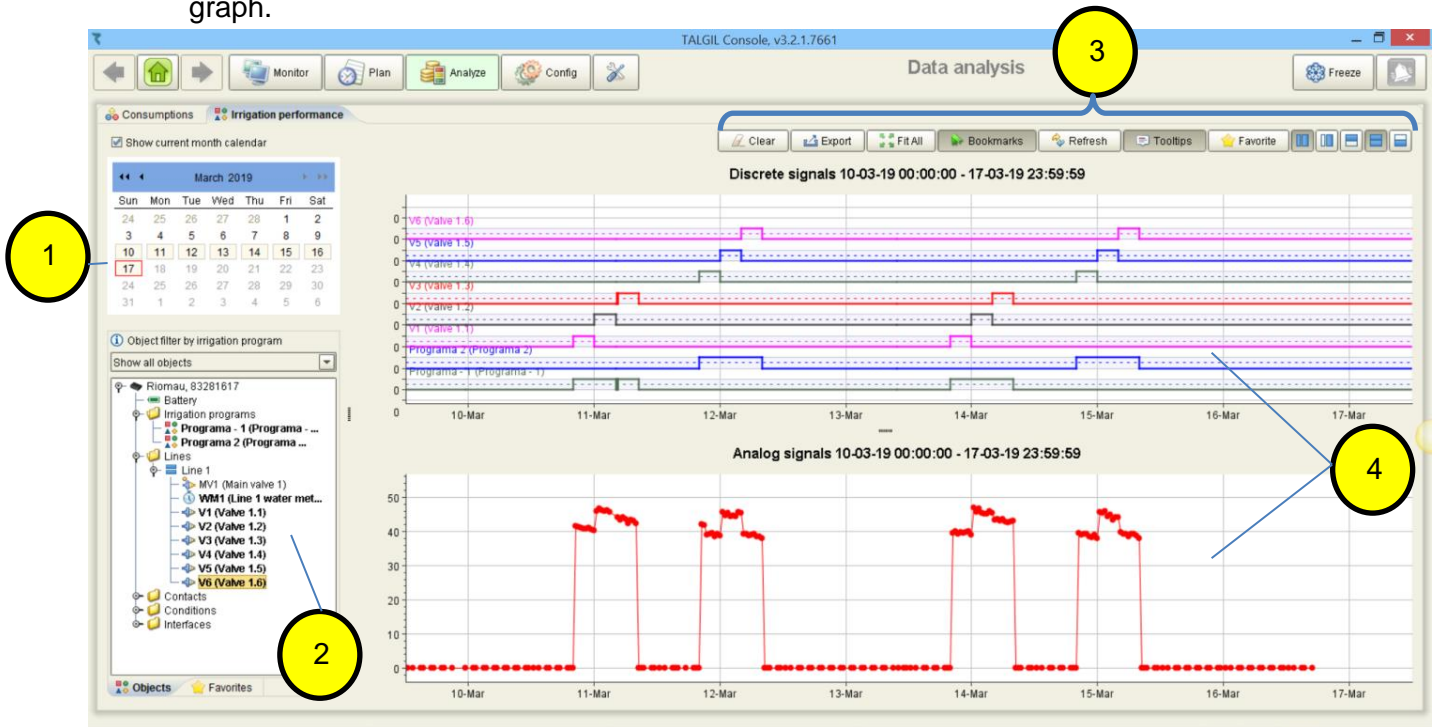


Pointers

1. Select the time range and consumption rate.
2. Select the items by drag and drop to the graphic view pane.
3. The Toolbar allows changing the screen display, exporting the data to an Excel sheet and seeing values **per Area**.
4. Graphic view pane.
When placing the mouse on the graphic pane values a list of the items, their values and the measuring time will appear.

10.4 Irrigation performance

The Irrigation performance perspective supplies various tools for analyzing historical data of activities in the system. The selected items activities along the given time span, are presented in a graphical view, enabling to put one against the other for example the starting and stopping of irrigation programs, opening and closing of valves, starting and stopping of pumps, etc. Additionally statuses of digital inputs, statuses of defined conditions, statuses of RTUs and the status of the battery can also be presented in the graph. To complete the picture values of analog sensors or flow of water meters can also be included in the same graph.

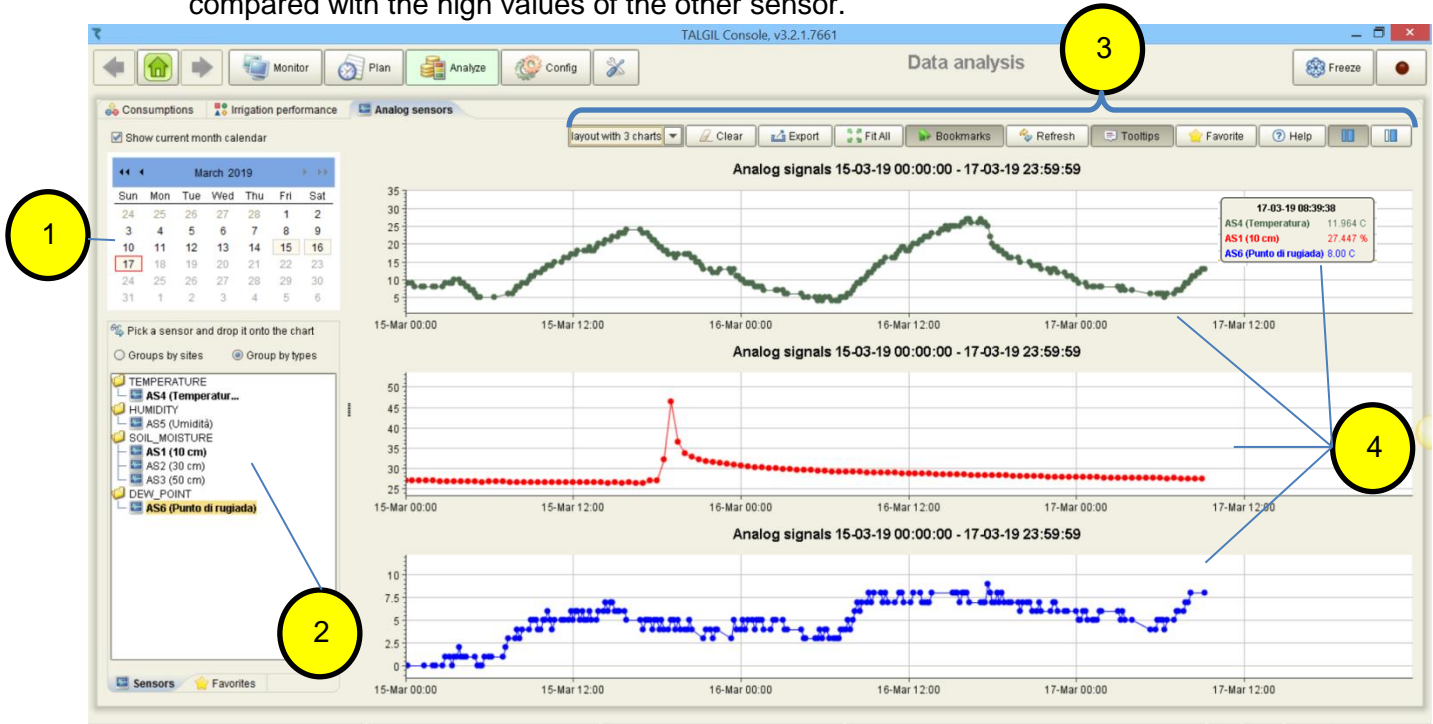


Pointers

1. Select the date or range (click and drag).
2. Select the items by drag and drop to the graphic view pane.
3. The Toolbar allows changing the screen display and exporting the data to an Excel sheet.
4. Graphic view pane.
When placing the mouse on the graphic pane a list of the items, their values and the measuring time will appear.

10.5 Analog sensors

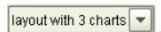
The speciality of the Analog sensors perspective is that it can be divided into 1-5 charts, each chart with its own axes, this enables placing one against the other, sensors with highly different range of values without causing the lower values to become nearly flat line compared with the high values of the other sensor.



Pointers

1. Select the date or range (click and drag).
2. Select the items by drag and drop to the graphic view pane, you can sort the list by types or sites.
3. The Toolbar allows changing the screen display and exporting the data to an Excel sheet.

In order to choose the quantity of charts use the list in the left side of the Toolbar

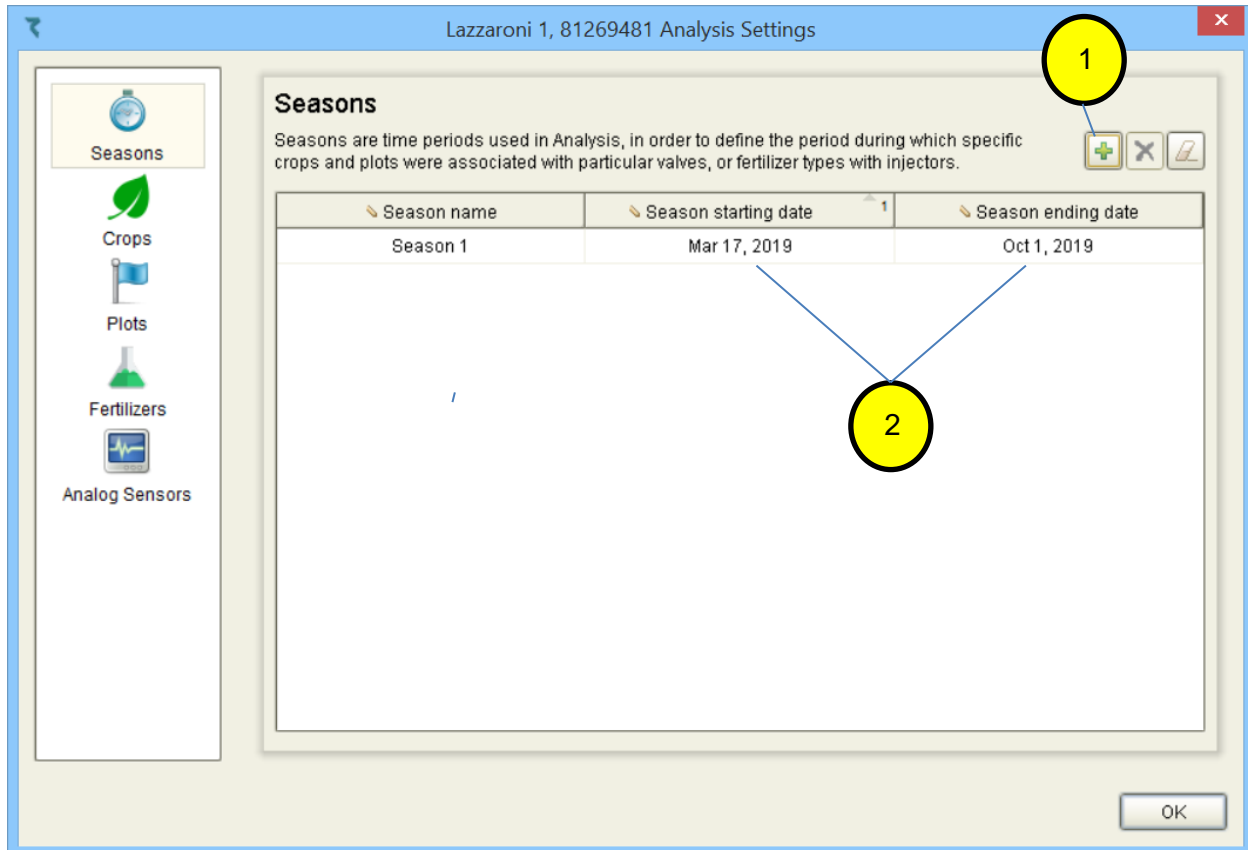


4. Graphic view pane.
When placing the mouse on the graphic pane a list of the items, their values and the measuring time will appear.

10.6 Analysis Settings


The Analysis settings are used to divide the valves by Crops and Plots, as well as determine the NPK values of the fertilizers to be able to know how much NPK was supplied to each Valve, Crop and Plot.

Seasons

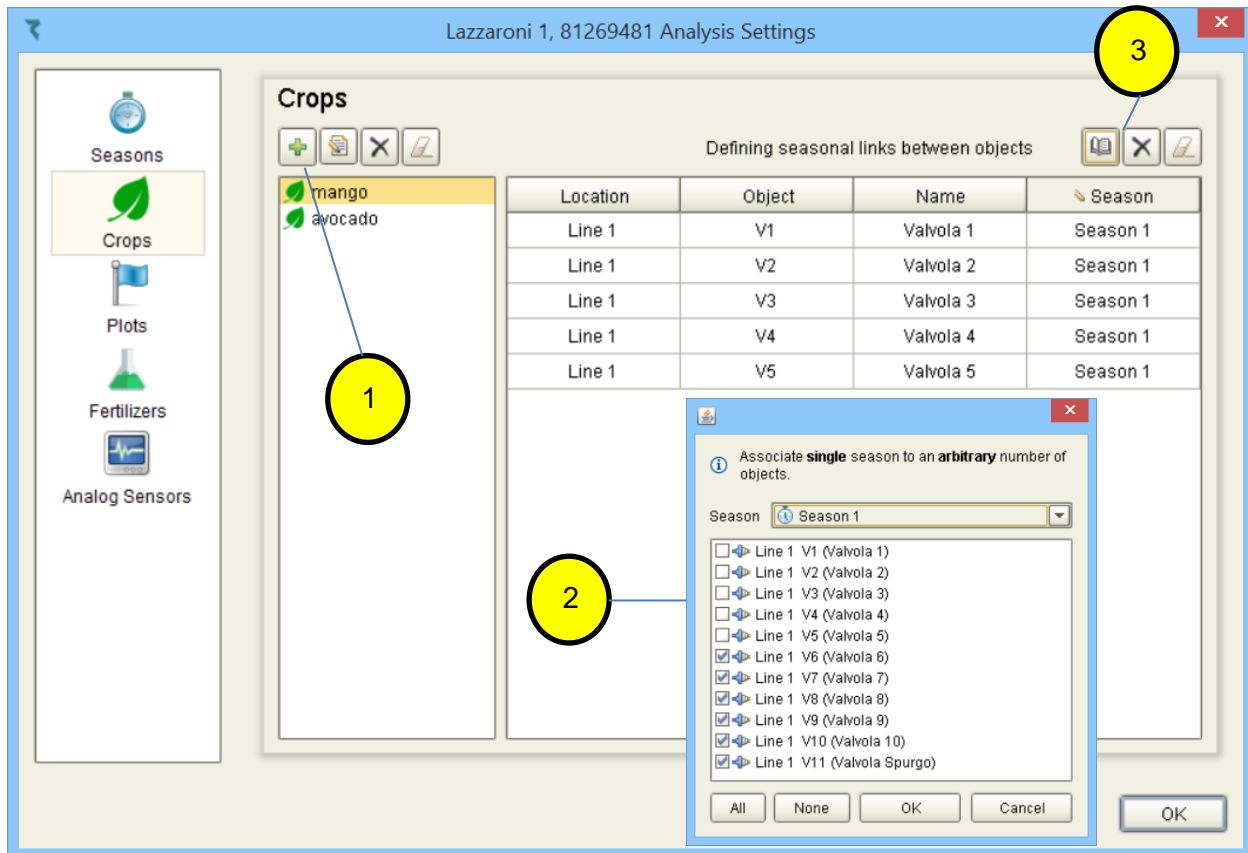


Season name	Season starting date	Season ending date
Season 1	Mar 17, 2019	Oct 1, 2019

Pointers

1. Click on the  icon to add new season and insert the season name, the correlation between valves, crops and plots may be dynamic and can change from one season to another, that why we should make this definition.
2. Set the time range of the season.

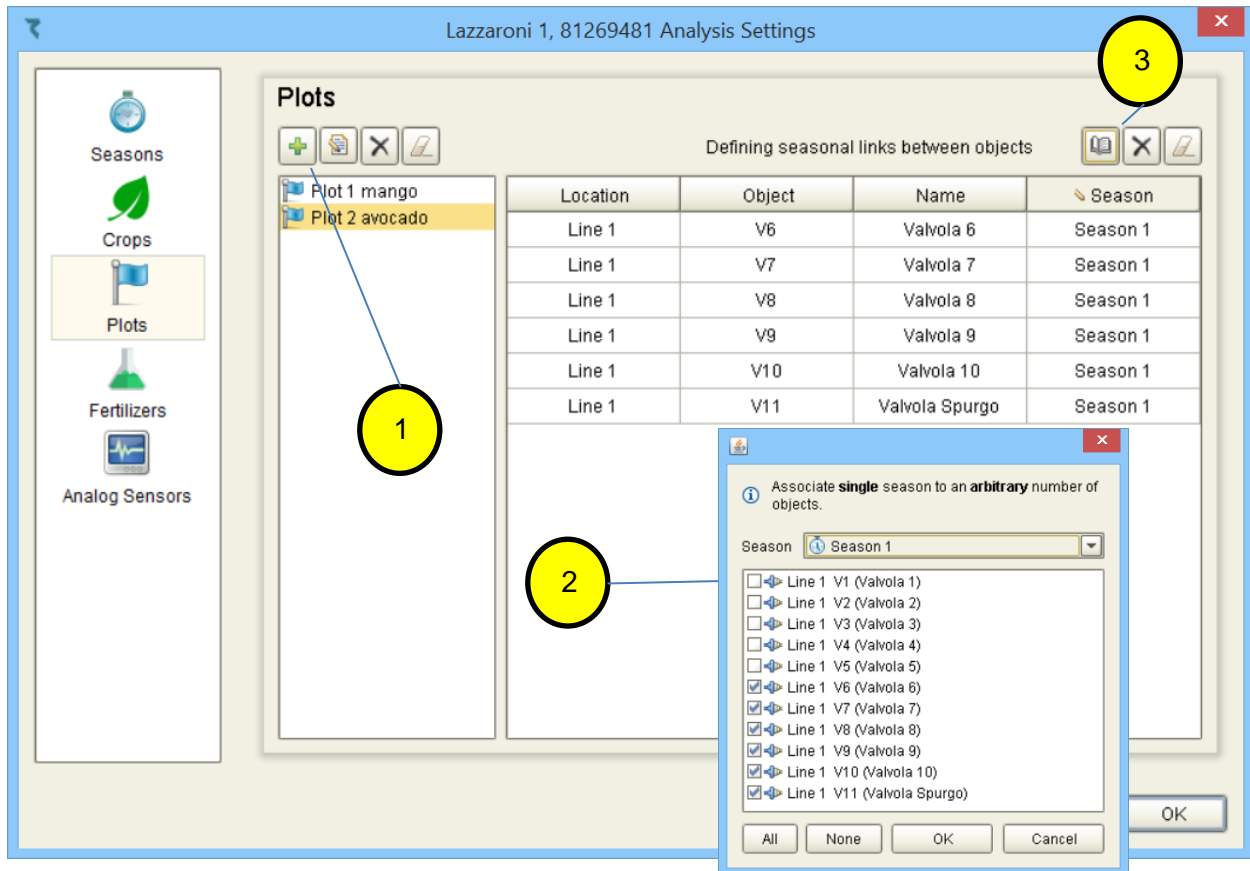
Crops



Pointers

1. Click on the icon to add new Crop and insert the Crop name.
To edit the Crop name use the icon.
To delete Crop click on .
To delete all click on .
2. Select the season (according to what you defined in Seasons), and mark the relevant valves.
3. Edit, delete or delete all.

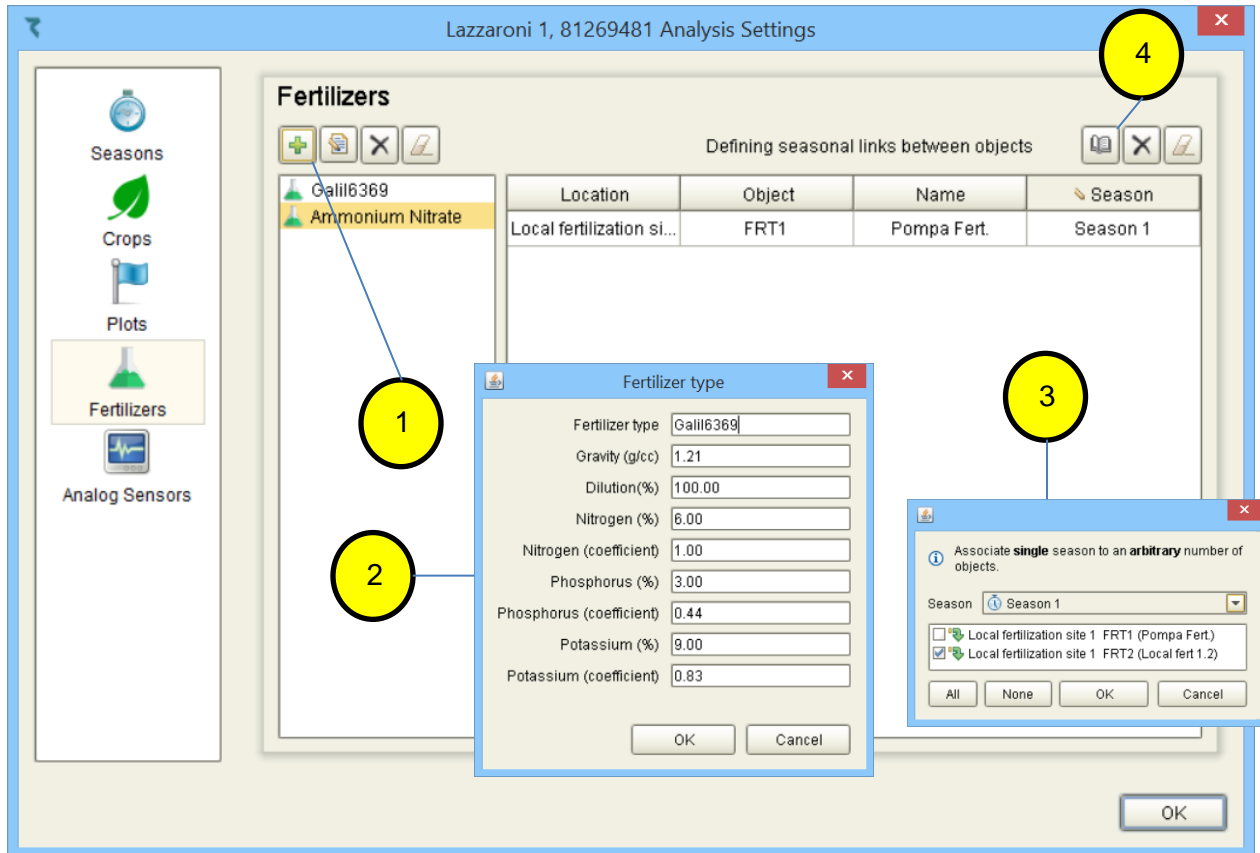
Plots



Pointers

1. Click on the icon to add new Plot and insert the Plot name.
To edit the Plot name use the icon.
To delete Plot click on .
To delete all click on .
2. Select the season (according to what you defined in Seasons), and mark the relevant valves.
3. Edit, delete or delete all.

Fertilizers



Pointers

1. Click on the icon to add new Fertilizer.
To edit the Fertilizer settings use the icon.
To delete Plot click on .
To delete all click on .
2. After adding new fertilizer fill the following chart according the fertilizer characters, click on OK for the next step.
3. Select the season (according to what you defined in Seasons), and mark the relevant fertilizer injector, the reason for it is to associate between the fertilizer type and fertilizer injector.
4. Edit, delete or delete all.

Analog inputs

Lazzaroni 1, 81269481 Analysis Settings

Seasons

Crops

Plots

Fertilizers

Analog Sensors

Analog Sensors

#	Name	Type	Units	Low-mark	Low-m na...	Top-mark	Top-m na...	Site
1	Analog sen...	Soil moistu...	%	0.00		0.00		Default
2	Analog sen...	Soil moistu...	%	15.00	low	20.00	high	Default
3	Analog sen...	Soil moistu...	%	0.00		0.00		Default
4	Temperature	Temperature	C	22.00	low	26.00	high	Davis
5	Humidity	Humidity	%	0.00		0.00		Davis
6	Dew point	Dew point	C	0.00		0.00		Davis

OK

Pointers

1. Serial number, Type and Units of the analog sensor.
2. Insert Low / Top mark values, and give them names in order to have thresholds.
3. Site of the analog sensor.

