SISTEMES ELECTRÒNICS PROGRÉS

AGRÓNIC 4500

USER MANUAL

VERSION 1

INDEX

PRESENTATION

We are very grateful to you for the trust you have shown us when you are interested in or purchase the AGRÓNIC 4500.

Trust that, for our part, we strive every day to deserve and thus justify the tradition of quality of our products.

*This Manual will allow you to know the benefits of the equipment as well as its installation and use.*However, if you have any questions, let us know and we will gladly assist you.

1. USE GUIDE

This section is intended for people who are not familiar with the use of the Agrónic 4500.

1.1. GENERAL CONCEPTS

In Agrónic names such as Programs, Sectors, Records, etc. appear that may not be familiar to the user. Here is a brief explanation of each of these concepts. The features in the explanations are not all those offered by Agrónic, to see the complete features consult the installer's manual.

Header: it is the set of all the necessary elements to prepare the irrigation water and the nutrients towards a hydraulic irrigation network.

Motor: it can be a water impulsion pump or a general valve of the farm.

Sector: corresponds to an irrigation valve that opens the water to a part of the farm, for example, a branch of drippers. Each sector can be assigned a motor so that when the sector is activated the motor is also activated.

Fertilizer: by fertilizer we understand any liquid that you want to supply to the plant along with the irrigation water. Fertilizer can be supplied during the entire watering time or only part of it.

Program: they are automatic irrigation orders where we combine sectors and fertilizers with a start day and time, and a time for irrigation and fertilization.

Sensor: it is a mechanical or electronic device that measures magnitudes, states or quantities. They can be of three types: analog for magnitudes (for example, pressure, temperature, soil moisture, etc.), digital for states (for example, open or closed valve, full pond, etc.) and counters for quantities (for example, counter irrigation, rain gauge, etc.). The sensors are connected to Agrónic through the analog and digital inputs.

Determinant: they are controls that act on the irrigation programs based on the value of the sensors. For example, stopping irrigation when it is windy, starting irrigation if soil moisture is very low, modifying the amount of irrigation based on accumulated radiation, etc. This Agrónic can control up to 120 conditions.

Manual: it is any action that you want to do immediately. For example, activate or stop a program, deactivate an alarm, make an emergency stop, etc.

Record: Agrónic makes a record, with date and time, of everything it does. For example, starting and stopping programs, alarms and faults, communication failures, etc.

Anomaly: from the record made by Agrónic there are some things that are considered possible problems for irrigation, these are recorded as anomalies and the number is shown in the general query.

1.2. FIRST STEPS WITH AGRONIC

The first screen that appears in Agrónic, by default, when starting up is the *General Query* . From this screen you can go to the following menus:

- With the " **FUN** " key you access the " ***Function*** " *menu* where you can modify the irrigation programs, carry out manual actions, read the history and anomalies or change the operating parameters.

- With the " **CON** " key you access the " ***Query*** " *menu* where you can see what the programmer is doing (program status, communications,…) or the equipment characteristics (serial number, version,…). Values cannot be modified on these screens.

"FUN" or **"CON"** key is pressed, it returns to the main menu.

FUNCTIONS

1. PROGRAMS
2. MANUAL
3. READINGS
4. PARAMETERS
5. FOGGINS
6. PÍVOTS

CONSULT

01. GENERAL
02. PROGRAMS
03. SECTORS
04. FERTILIZATION
05. FILTERS
06. SENSORS
07. DETERMINING FACT.
08. DRAINS
09. PÍVOTS
10. SOLAR
11. WATER MIX
12. FOGGINS
13. HEADS
14. COMMUNICATION
15. MODULES
16. AGRÓNIC

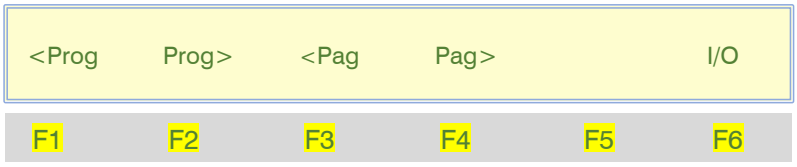
The up and down arrows scroll the menu selection. It can also be done by pressing the selection number. When the option we want to light up, press the "ENTER" key. When there is an arrow on the side of the screen it indicates that there are more options.

Modification of values: when a value is modified, it appears on the screen highlighted (blue background and black text). If it is a numerical value, it is entered with the number keys. If it is a text, see the next section. If it is a selectable field, it is shown between the *<field> symbols* and is modified with the left and right arrows. To validate and jump to the next value, press the enter key. If it is an input or output of the equipment, you can enter the 8-digit code or press F6 (I/O) where there is a help screen, to exit the validation key. With the up or down arrow keys it can also be validated, but instead of jumping to the next value, it jumps to the next screen.

Screen off: if no key is touched for five minutes, the screen turns off automatically. To turn it back on, all you have to do is touch a key and it returns to the General Query or screen configured by default. If any value is being modified, it is saved and the screen turns off.

1.3. USING THE KEYBOARD

Function keys: The F1 to F6 keys below the screen vary in functionality depending on the screen. They can be to go to the next item or go to the next page.



Validation and cancellation keys: the <check> key is used for "YES" and the <X> key is for "NO".

Text entry :

Place the cursor in the space before the text; pressing the "+" key accesses to modify it; at this point the operation of the keys is as follows:

"+" key	Moves the cursor one character to the right.
Key "-"	Moves the cursor one character to the left.
Up arrow	New character, the previous one, letter B passes to A .
Down arrow	New character, the later one, letter B passes to C.
GET IN	Accept the text, jump to the next value.

Key "1"	Capital letters.
Key "2"	Lowercase letters.
Key "3"	Numbers.
Key "4"	symbols.
"no" key	Delete and move left

1.4. MOST USED SCREENS

1.5. PRACTICAL EXAMPLES

2. TECHNICAL CHARACTERISTICS

If an update is made from Agrónic 4000 or Agrónic 7000 to Agrónic 4500, the technical characteristics of the original equipment are maintained.

overall power supply		Equipment for direct current
Strain		12Vdc ±10%
Energy consumption		Less than 12W
Fuse	Entrance	Thermal (PTC) 1.1A at 25ºC, self-resetting

power supply outputs		direct/alternating current
Strain		From 12 to 24 Vdc either Vac (maximum 30V)
Fuse	"R+" input	Thermal (PTC) 6A at 25ºC, self-resetting

Departures	digital	Number	24, expandable to 40, 56, 72, 88, 104.
		Guy	By relay contact, with 24 Vac potential (external transformer).
		Boundaries	30 Vac / 30 Vdc , 1 Ampere, 50-60 Hz, CAT II (per output)
	Analog/Pulsed *(option)*	Number	5 or 10
		Guy	4-20 mA (with galvanic isolation)
	All the outputs have double insulation with respect to the network input.		

Tickets	digital	Number	12
		Guy	Optocoupled , they operate at 12 or 24 Vdc either empty
	analog *(option)*	Number	5 or 10
		Guy	4-20 mA (with galvanic isolation)
		Number	1 or 2
		Guy	0-20 V (with galvanic isolation)

Atmosphere	Temperature	-5°C to45 °C
	Humidity	< 85%
	Altitude	2000 m
	Pollution	Grade 2

Weight (kg)	Model wall box	Model Embed
	2.0 to 3.0	3.0 to 4.5

Memory backup and clock	
Memory	Maintenance-free, 10 years for parameters and programs in MRAM memory and records in FLASH memory
Clock	48 hours without food

DECLARATION OF CONFORMITY

It complies with Directive 89/336/CEE for Electromagnetic Compatibility and Low Voltage Directive 73/23/CEE for Product Safety Compliance. Compliance with the following specifications was demonstrated as indicated in the Official Journal of the European Communities

CE

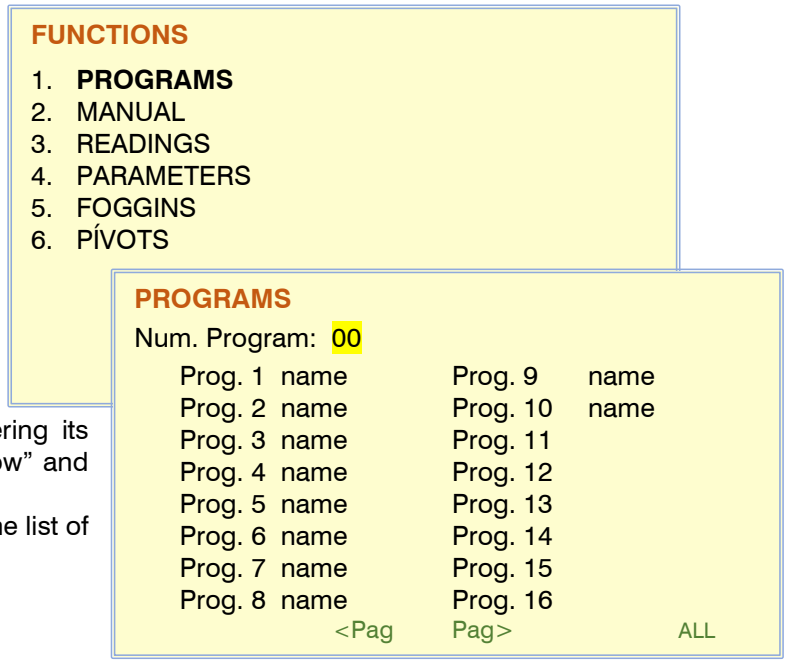
Symbols that may appear on the product	protective earth terminal 	Danger, risk of electric shock 	Ground Terminal 	double insulation 

This symbol indicates that electrical and electronic equipment must not be disposed of with household waste at the end of its useful life. The product must be taken to the corresponding collection point for recycling and proper treatment of electrical and electronic equipment in accordance with national legislation.

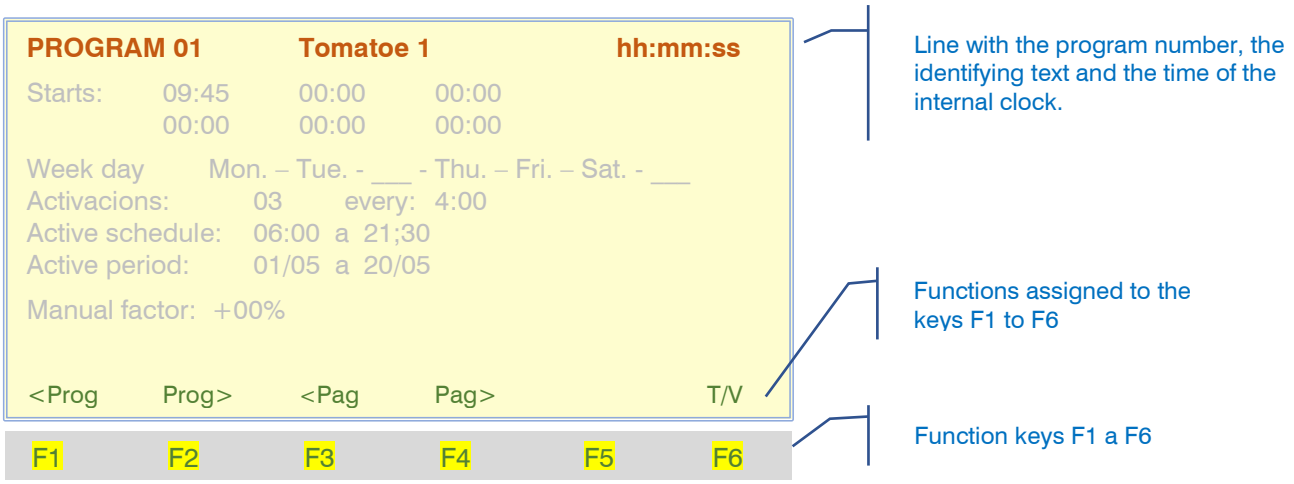
3. PROGRAMS

The program is an automatic irrigation order that includes the sectors to which it will be applied, at what time and the irrigation and fertilization units. The Agrónic has 99 independent or sequential programs. There are two types of programs, with subprograms (up to 20 with 10 sectors each) or with linear sectors (up to 20 sectors).

Using the function key “F6” you can filter the list of programs to see only those with defined values, key “DEF.”, or to see them all, key “ALL”.
A program can be accessed directly by entering its number or by moving the cursor with the “arrow” and “enter” keys.
The “F3” and “F4” keys increase or decrease the list of programs.



Once the program has been chosen, we find information on the top line on each of the screens, and functionalities on the bottom line to move within the different screens.



F1 < Program It decreases the program number showing its data, being at 01 it will go to 99.
F2 Prog > Increases the program number with its information, being at 99 it will go to 01.
F3 <Pg Decreases the program screen, if it shows the first one, then it will go to the last one.
F4 Pag> Increases to the next screen, from the last one it will go to the first one.
F5 No function
F6 T/V or (+/-) In the irrigation units it will appear to be able to change the type of units when possible. In values that may be negative, the sign of the value may be modified.

The values that are asked below are for all programs, regardless of their type (subprograms or linear). In sections [7.2] and [7.3] those that are only of one type are specified.

3.1. START CONDITIONS

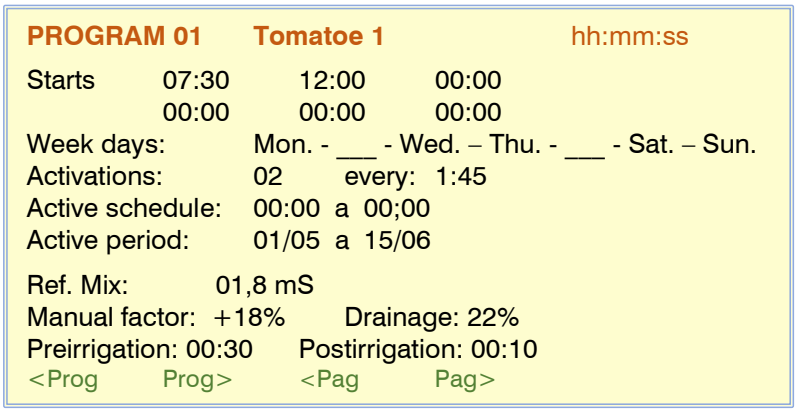
The first screen contains the information of the conditions for the start of the irrigation of the program , in the first line it indicates the program number, the identifying text and the current time.

Depending on what you have configured in *"Parameters – Programs"* there are one of these two questions:

Start Times: The program starts when you reach one of these times. There can be up to six program starts at different times. The time 00:00 does not start.

Schedule Sequential : The schedule starts when the schedule set here ends. From 0 to 99, 0 does not start.

If a program is sequential it is not going to ask for more values of the start conditions, it depends entirely on the first program that starts the sequence. If a program in the sequence has no values it will jump to the next one in the sequence.



If the start is not sequential from another program, and depending on what you have configured in " *Parameters - Programs - Watering days*" there are one of these three questions:

Days: days of the week that you will water.

Frequency: every how many days to water. He waters 1 every day, 2 he waters every other day, 3 he waters one day yes, two no.

Calendar: up to five dates of the year in which the program will enter

Activations: to make pulsed irrigations. First you enter how many times the program is to be repeated and then how much time there is between starts.

Active schedule: if the program starts by condition, it can only do so within this schedule. The active schedule does not affect hourly or manual activations. If it is left at 0, it indicates that the active schedule is all day. When a program that is watering leaves the active schedule, it can *continue* watering, *end* , or *be postponed* until it enters the active schedule, depending on what you have configured in *"Parameters – Programs – End outside of active schedule"* .
Format " hh:mm to hh:mm "
If in "*Parameters - Clock*" it has been configured to use the solar calendar, the active time will change according to the calendar. In this condition the value entered here will be added or subtracted from the sunrise or sunset time.
Format "± h:mm to ± h:mm

Active Period: Watering is allowed between two dates, day/month to day/month. It will not ask when the "start" is by "calendar"

Mixture reference: conductivity reference that must be maintained at the head inlet with the mixture of two waters of different salinity.

Manual Factor: The program watering amount can be manually changed by adding or subtracting a % from the amount. For example: if a program has to water 30 minutes and we set a manual factor of +10%, it will water 33 minutes. If the factor is -10% it will irrigate 27 minutes. From -99% to +99%.

Drainage: amount of drainage with respect to the amount of irrigation that you want to achieve in a hydroponic irrigation. For example: if a program has to irrigate 1000 liters and we set a drainage of 20%, the drainage sensor must have measured 200 liters at the end of the irrigation. This question is only asked if there is a drain associated with this program and the first sector of the program. From 0 to 90%. A drain sensor must be available. Outside of the active schedule, the drainage will not be controlled or the irrigation will be modified to compensate it, this gives us the possibility of starting a morning irrigation by schedule before "active schedule" to fill the hydroponic bag.

Pre-irrigation and post-irrigation : Pre -irrigation corresponds to the time or volume that must pass before starting fertilization. The post-irrigation corresponds to the time or volume that must pass between the end of the fertilization and the end of the subprogram or position of a linear, the post-irrigation acts as security to end the fertilization before the irrigation units defined as post-irrigation .

The "pre" and "post" units can be asked only once per program, in this case the same value will be applied in each subprogram or position, or be asked in each one to have differentiated values. In "*Parameters - Installer - Miscellaneous*" we choose this operation.

When the irrigation units are "m3/ha" or "mm" the value is entered in volume (m3).

3.2. SUBPROGRAMS

If in "*Parameters - Programs*" *the type of program* "*subprograms*" has been configured, it works like an Agrónic 4000, it has 20 subprograms with 10 sectors or groups of sectors each.
Irrigation and fertilization is indicated in each subprogram.
Only water one applet at a time, they act one after the other. The first to enter can alternate.
The irrigation and fertilization units can be different in each subprogram.
The sectors must all be from the same head.
At most a subprogram can have 40 sectors irrigating including the grouped ones.

PROGRAM 01 – Sub 01 **Tomatoe 1** **2/22**

Sectors: 005 – 008 – 014 – 143 – 504 – 000

Irrigation: 045,30 m3/ha 3:45 Pre: 012,50 Post: 005,00 m3

Fertilizers: proportional L/m3
F1: 008/005 F2: 003/005 F3: 000/000 F4: 002/001
F5: 020/001 F6: 009/001

Ref. pH: 05,9 TF1: 00:05 TF2: 00:23

As can be seen in the two sample screens, the variability of the values to be entered depends on how the program has been configured in the "Parameters" section.

PROGRAM 04 – Sub 01 **Peppers 1** **2/21**

Sectors: 501 – 000

Irrigation: 12'30"

Fertilizers: regulation CE (%)
F1: 033 F2: 000 F3: 045 F4: 060
F5: 012 F6: 005 F7: 060 F8: 000

Ref. EC: 03,5 mS

Ref. pH: 05,9 TF1: 00:05

For each subprogram:

Sectors: in each subprogram we have up to ten positions to assign sectors or groups of sectors, the sectors go from 1 to 400 and the groups go from 501 to 540, the latter are assigned in "Parameters - Groups of sectors " . The maximum number of sectors to be controlled by a subprogram is 40. If the sum of sectors and those that contain the groups exceeds this value, it will warn us that we have reached the limit.

Irrigation: the irrigation of each subprogram will be carried out with the units entered here. The format and type of units will have been configured in *"Parameters – Programs"* and in *"Parameters – Installer – Miscellaneous"* . In volume, the maximums are 65000/ 6500.0/650.00 m3 or 650.00 m3/ha or 99.00 mm. In time the maximums are 99:59 or 99'59". There is the possibility of being able to modify the units in each subprogram by means of the "T/V" key whenever the pre and post-watering are asked in the subprogram.

Security time: it is only asked if it is configured in "*Parameters - Installer - Miscellaneous*" and the irrigation units are in volume. When there is safety irrigation, the subprogram ends when the programmed volume units have passed or when this time ends (from 0 to 99:59).

Pre-irrigation and post-irrigation : if in "*Parameters - Installer - Miscellaneous*" it is configured to ask in each subprogram, the value is entered here. The units in which it is asked are the same as those for irrigation.

Fertilizers: the value to enter in the fertilizers varies depending on the configuration made in "*Parameters - Header - Fertilization*" and the type of fertilization that has been configured in "*Parameters - Programs*" .
If you fertilize in series. Fertilization is in units. The amount of each fertilizer is entered.
If you fertilize in parallel. Fertilization can be of the following types:

- *"CE regulation"* : Enter the target conductivity reference (CE) and the ratio of the 8 fertilizers (from 0 to 100%, to 0 is not used).
- "*EC input*" : Enter the objective reference of the conductivity (CE) in relation to the EC of the input water and the proportion relationship between the 8 fertilizers (from 0 to 100%, 0 is not used).
- *"uniform"* : enter the amount of fertilizer to distribute evenly between pre and post irrigation.
- *"units"* : enter the amount of fertilizer for a continuous application.
- *"proportional L/m3"* : enter two values, the first corresponds to the amount of fertilizer in liters and the second to the amount of irrigation in m3 (from 0 to 999). Irrigation has to be in m3 and meters in fertilizers.
- " *proportional cl /L"* : enter two values, the first corresponds to the amount of fertilizer in centiliters and the second to the amount of irrigation in liters (from 0 to 999). Irrigation has to be in m3 and meters in fertilizers.

In solar irrigation we have the possibility of using the proportional type in two operations, by "counter pulses" or by "expected flow", see the section "*Parameters - Hybrid solar irrigation*".

When the quantity of fertilizer is entered, in volume the maximums are 65000/6500.0/650.00 L or 650.00 L/ ha and in time they are 99:59 or 99'59".

CE reference: it only asks if the fertilization is in parallel and the type "*CE regulation*" and the CE regulation sensor is assigned. It is the conductivity reference that must be maintained with the injection of fertilizers (from 0 to 10.0 mS , at 0 it will not fertilize).

pH reference: it only asks if the pH regulation sensor is assigned. It is the pH reference that must be maintained with the injection of acid or base (0 to 10.0 pH, 0 will not inject acid).

TF1 and TF2: are the phytosanitary treatments or injection of microelements. The amount that is applied to irrigation is entered. The units and format are configured in "*Parameters - Header - Fertilization - Phytosanitary Treatments*" . TF begin to be applied, in each irrigation subprogram, after the time configured in *"Parameters – Programs – TF Delay"* . In volume the maximums are 65000/6500.0/650.00 L and in time they are 99:59 or 99'59".

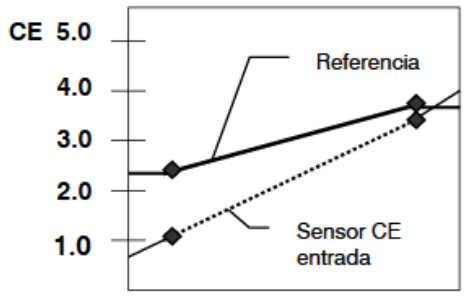
It asks if the TF Delay has been configured in Parameters – Programs and the general output in Parameters – General.

Ref.1, Ref.2: it only asks if the fertilization is in parallel and the type "*EC input*" and the EC regulation sensor and the EC input sensor are assigned. These two points mark the reference line (from 0 to 10.0 mS , 0 will not fertilize).

Int.1, Int.2: it only asks if the fertilization is in parallel and the type "*EC input*" and the EC regulation sensor and the input EC sensor are assigned. These two points mark the EC line of the input (from 0 to 10.0 mS , at 0 it will not fertilize).

From these two straight lines and the reading value of the input CE, the reference that the program follows is calculated. The calculated reference will always be between Ref. 1 and Ref. 2.

Gráfica de evolución de la referencia en relación a la CE de entrada con los puntos marcados en la pantalla anterior:



3.3. LINEAL

If in "*Parameters - Programs*" *the type of program* "*linear*" has been configured , it works like an Agrónic 7000, it has 20 positions that irrigate sequentially, in each one a sector or a group of sectors can be assigned. The 20 positions can be grouped so that you can irrigate more than one at the same time, each group will be identified with a color, if a sector is repeated within a group it will only serve to occupy a space within the group, in this case it will not ask for units irrigation.

If a sector has the units at 0 it will not carry out the irrigation, but it will be part of the group.

When a line is canceled leaving the sector at 0, the rest of the positions will be automatically moved to occupy the vacant space.

Watering is indicated at each position. Fertilization is unique for the entire program.

The sectors must all be from the same head.

At most one irrigation group can activate 40 sectors at the same time.

PROGRAM 03	Green bean	2/05
N01 008 20'30"	Pre: 02'00"	Pos: 00'30"
N02 023 18'00"		
N03 105 20'30"	Pre: 00'00"	Pos: 00'30"
N04 033 20'30"		
N05 034 20'30"	Pre: 00'00"	Pos: 00'30"
N06 034 00'00"		
N07 005 20'30"	Pre: 00'00"	Pos: 00'40"
N08 000		

N1 to N20: Position or index of the possible sequences where the sector and the irrigation units go, depending on how it has been configured, it will ask for the security time when watering by volume and even the independent pre- and post-irrigation for each position.
Sector - A single value for the sector, from 1 to 400, or a group of sectors, from 501 to 540.
Irrigation: the irrigation of each position will be carried out with the units entered here. The format and type of units will have been configured in *"Parameters – Programs"* and in *"Parameters – Installer – Miscellaneous"* . In volume, the maximums are 65000/ 6500.0/650.00 m3 or 650.00 m3/ha or 99.00 mm. In time the maximums are 99:59 or 99'59". There is the possibility of being able to modify the units in each subprogram by means of the "T/V" key as long as the pre- and post-watering are asked in the subprogram and the different positions are not grouped.

Security time: it is only asked if it is configured in "*Parameters - Installer - Miscellaneous*" and the irrigation units are in volume. When there is safety irrigation, the subprogram ends when the programmed volume units have passed or when this time ends (from 0 to 99:59).

Pre-irrigation and post-irrigation : if in "*Parameters - Installer - Miscellaneous*" it is configured to ask in each of the positions, the value is entered here. The units are the same as those for irrigation except when they are in "m3/ha" or "mm", then volume is entered. If the sequences have been grouped, only the first of each group will be asked. It is necessary to take into account the behavior of pre and post irrigation when the irrigation units are by volume and there are groups with different sectors. In this case, if they have different volumes, the pre-irrigation will end when the common pre-irrigation volume has been applied to the sectors of the group, the post-irrigation operation acts differently, in this case the sector of the irrigation group that reaches the units marked in the post-irrigation will wait for the rest of the sectors to also reach the post -irrigation units , at this point they will continue irrigating without applying fertilizer.

Fertilizers: the value to enter in the fertilizers varies depending on the configuration made in "*Parameters - Header - Fertilization*" and the type of fertilization that has been configured in "*Parameters - Programs*" . The fertilization is the same for all the positions or groups of the sequences, if it is by units the quantity configured here will be applied for each sector or group of sectors.
If you fertilize in series. Fertilization is in units. The amount of each fertilizer is entered.
If you fertilize in parallel. Fertilization can be of the following types:

- *"CE regulation"* : Enter the target conductivity reference (CE) and the ratio of the 8 fertilizers (from 0 to 100%, to 0 is not used).
- "*EC input*" : Enter the objective reference of the conductivity (CE) in relation to the EC of the input water and the proportion relationship between the 8 fertilizers (from 0 to 100%, 0 is not used).
- *"uniform"* : enter the amount of fertilizer to distribute evenly between pre and post irrigation.
- *"units"* : enter the amount of fertilizer for a continuous application.
- *"proportional L/m3"* : enter two values, the first corresponds to the amount of fertilizer in liters and the second to the amount of irrigation in m3 (from 0 to 999). Irrigation has to be in m3 and meters in fertilizers.

PROGRAM 03	Green bean	3/05
Fertilizers:	uniform L/ha	
F1: 005,33	F2: 025,50	F3: 000,00 F4: 008,50
F5: 011,50		
Ref. pH: 06,1	TF1: 00:25	

- *"proportional cl /L"* : enter two values, the first corresponds to the amount of fertilizer in centiliters and the second to the amount of irrigation in liters (from 0 to 999). Irrigation has to be in m3 and meters in fertilizers.

When the quantity of fertilizer is entered, in volume the maximums are 65000 L, 6500.0 L or 650.00 L and in time they are 99:59 or 99'59".

CE reference: it only asks if the fertilization is in parallel and the type "*CE regulation*" and the CE regulation sensor is assigned. It is the conductivity reference that must be maintained with the injection of fertilizers (from 0 to 10.0 mS , at 0 it will not fertilize).

pH reference: it only asks if the pH regulation sensor is assigned. It is the pH reference that must be maintained with the injection of acid or base (0 to 10.0 pH, 0 will not inject acid).

TF1 and TF2: are the phytosanitary treatments or injection of microelements. The amount that is applied to irrigation is entered. The units and format are configured in "*Parameters - Header - Fertilization - Phytosanitary Treatments*" . TF begin to be applied, in each irrigation subprogram, after the time configured in *"Parameters – Programs – TF Delay"* . In volume the maximums are 65000 L, 6500.0 L or 650.00 L and in time they are 99:59 or 99'59".

It asks if the TF Delay has been configured in Parameters - Programs and the general output in Parameters - General

Ref.1, Ref.2: it only asks if the fertilization is in parallel and the type "*EC input*" and the EC regulation sensor and the EC input sensor are assigned. These two points mark the reference line (from 0 to 10.0 mS , 0 will not fertilize).

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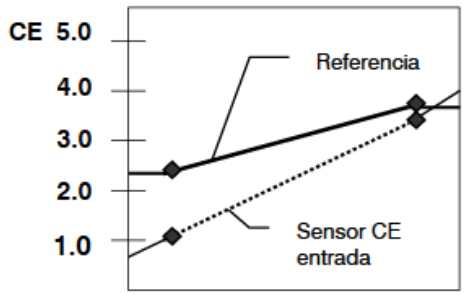
From these two straight lines and the reading value of the input CE, the reference that the program follows is calculated. The calculated reference will always be between Ref. 1 and Ref. 2.

Gráfica de evolución de la referencia en relación a la CE de entrada con los puntos marcados en la pantalla anterior:



3.4. CURVES

Curves: if in "*Parameters - Programs*" it is configured to work with curves, here the values of the three curves that the program can have are entered.

The curves have an “x” axis with 24 hours and a “y” axis that goes from -50% to +50%. 6 points of the curve are configured.

At the moment the subprogram or group of a linear is started, the modification of the units configured in the curves is applied in that hour/minute. If the program operates with activations (pulsed irrigation) it will calculate the time for the next one for each activation.

The functions of the curves are the following:

- To modify the irrigation units.
- To modify the fertilizer units or EC reference.
- To modify the time between activations.

PROGRAM 03 **Green bean** **4/05**

CURVE Point	Hour	Units irrigation	Units of fertilizer/CE	Time between activations
P1	[00:00]	- 05 %	+ 00 %	+ 00 %
P2	06:30	- 05 %	+ 00 %	+ 00 %
P3	10:00	+ 05 %	- 03 %	+ 00 %
P4	15:00	+ 08 %	- 05 %	+ 00 %
P5	18:00	+ 03 %	- 03 %	+ 00 %
P6	20:00	+ 00 %	+ 00 %	+ 00 %

Point 1 always corresponds to 00:00 and is not modifiable. The time of a point always has to be greater than that of the previous point.

With this we can, for example, carry out pulsed irrigation in which the time between activations will decrease at the hours of greatest activity of the plants or, for example, reduce the conductivity to apply less fertilizer in one period of the day.

The values of the last time will be linked to the time of the first point (P1).

3.5. CONDITIONS OF THE PROGRAM

Shows or even allows you to edit the references of the conditioning factors directly associated with the program, just as can be done in the *"Parameters – Conditioning Conditions" section* .

Here we will not see the conditions associated with all programs.

For each determining factor, it will indicate its status, the type of functionality, the origin (sensor, error, etc.) and the margin or reference.

PROGRAM 03 **Green bean** **5/05**

DETERMINING FACTORS

C006–C P. Conditional Digital sensor state:1

C022 P. Temporal Error flow -05% 023,35 m3/h
Margin high: 015 % Margin low: 019 %

C105-F Start Analogic sensor 031 cbar
Reference: 034 cbar

C118 Modify irrigation Analog sensor 4218 Wh/m2
Ref. P1: 3500 W/m2 Ref. P2: 9000W/m2

4. MANUAL

Manual orders allow actions to be carried out immediately in Agrónic.

FUNCTIONS

1. PROGRAMS
2. **MANUA**L
3. READINGS
4. PARAMETERS
5. FOGGINS
6. PÍVOTS

MANUAL

01. Out of service
02. STOP
03. Stop in progress
04. Heads
05. End stops & malfunct.
06. Programs
07. Filters
08. Sectors
09. Determining factors
10. Timer
11. Pivot
12. Fogging
13. Sensors
14. Calibration
15. Copy
16. Outputs

4.1. Out of service

When it enters out of service, it will end the irrigation in progress of all the heads, no new irrigation will enter while it remains in this state. At the end of the "Out of Service" the programming will be operational again and the irrigation will start when the conditions in each program are met.

4.2. Stop

Leaving the equipment in “Stop” will postpone the current irrigation of all the heads, it will allow new irrigation to start, also postponing them. At the end of the “Stop” state, it will resume programming at the same point at which it stopped.

4.3. Stop in progress

Momentary action to end all the irrigations in progress of all the heads. New risks will enter when the programs start them again.

4.4. Heads

No. of Head : 1 to 4, to which a manual order is going to be given, will only affect the programming and irrigation of the chosen head.

- Out of service: y/n
- Stop: s/n
- Stop in progress.

4.5. End Stops and Malfunctions

When one or more conditions of "definitive stop" have been activated, the programs, fertilization, pH regulation, nebulization, pivot or affected filters have to be reset manually. If you do not want to end the definitive stoppages for all of them at the same time, then you can access the particular "Manual" for each one of them, where you will be specifically asked for their completion.

End stoppages and breakdowns: *“yes”* ends the definitive shutdown of the affected control, resets its operation.
End deferred watering: only if the programs are reset.

- *“yes”* : the programs affected by the definitive stop are stopped canceling the pending watering.
- *“no”* : the programs affected by the definitive stoppage continue the irrigation at the point where they were when the stoppage entered.

When some condition has activated the alarm output, it must be stopped manually.
If it is a definitive stoppage of fertilizer or pH, it will start again
End alarm: *“yes”* if the alarm output is activated the stops.

Reactivate SMS: if the Agrónic has SMS sending and the maximum limit of SMS per day has been exceeded, it asks if you want to reactivate the sending. The shipment is automatically rearmed when the day changes.

Reactivate Events : When an event reaches the limit of records allowed in an hour, those that can be generated will be blocked until the next day, with the manual order they resume immediately. In *" Parameters – Installer"* this limit can be modified.

4.6. Programs

Program No .: program number (from 1 to 99).

If the program is stopped:

Start: *" yes "* manually starts the watering program. There are several points to keep in mind when manually starting a program:

- If you have several activations scheduled, you will only do one.
- If it is in a sequence of programs it will continue from this program to the end.
- It can be started manually, even if the program is outside of the active time or active period.

Subprogram No .: if it is an operation by subprogram, select the number (from 0 to 20, 0 does not start the program).

- It will activate the entered subprogram number up to the last one that comes after it.
- If it is an "alternate subprograms" operation then it will display the number of the subprogram that would start at the next startup. Note that you will end up in the applet before this one.

If the program is activated:

Stop: *"yes"* to manually stop the irrigation program. There are several points to keep in mind when manually stopping a program:

- If you have pending activations, you will not carry them out.
- If the program to be stopped sequentially starts another program, it won't do it.

Out of service: *"yes"* if the program is activated it stops and cancels the irrigation. It will not start again while it is out of order.

STOP program: *"yes"* will postpone the current irrigation of the program or stop starting new irrigations, also postponing them. At the end of the "Stop" state, it will resume the program at the same point where it was stopped.

Suspend: during the time indicated here, the program will not irrigate and the starts are lost. If the program is watering when it is suspended, it cancels the watering. After this time the program returns to normal operation (0 a250 hours).

Frequency: counter of days remaining for the next watering: at 0 it waters today, at 1 it will water tomorrow, etc. It is only shown if in "*Parameters - Programs*" it is configured to irrigate by "frequency of days".

Activations: pending activations counter, at 0 it is not watering or finishing the watering of the last one.

Time Between Acts : Time counter remaining until the next activation. It starts counting at the start of activation.

Drainage correction: Correction value applied in the last irrigation, if necessary it can be modified since it takes effect in the next irrigation.

Finalize definitive stoppage: *"yes"* ends the definitive stoppage of the program in addition to ending the determinant.

End postponed irrigation: if the definitive stoppage of irrigation is finished:

- *"yes"* : the program stops canceling the pending watering.
- *"no"* : the program continues the irrigation at the point where they were when the stoppage entered.

Finalize definitive fertilizer stoppage: *"yes"* ends the definitive fertilizer stoppage of the program.

Finalize definitive stop pH: *"yes"* ends the definitive stoppage of the pH regulation of the program.

End security irrigation: action to end security irrigation due to lack of start due to a condition, it will remain waiting for a timely start or due to a condition.

4.7. Filters

If there is more than one group of filters, it will ask for the head.

Head No .: head to which the group of filters belongs (from 1 to 4).

If filter cleaning is stopped :

Activate cleanup: " *yes* " manually starts the cleanup. It is taken into account if there is any program irrigating in the head, in this case it works by stopping or not the sectors in progress, if there are no programs irrigating then

the cleaning of the filters will enter and the assigned motors will start if "stop the sectors" has been configured. ” or it won't start them otherwise.

If filter cleaning is activated :

Stop cleaning: “ *yes* ” for filter cleaning. For both if it is with the outputs activated and if it is in the waiting time between cleanings.

If the filter cleaning is faulty :

Stop fault: “ *yes* ” resets filter cleaning after a fault. The fault occurs when more orders have been given from the pressure switch or pressure differential input than the maximum number of consecutive cleanings configured in "*Parameters - Filters*" .

Out of Service – “ *yes* ” disables automatic and manual filter cleanings while in this state.

4.8. Sectors

The sectors can be in “Automatic” in “Manual Stop” or in “Manual Start”.

Sector No.: sector number (from 1 to 400).

State: the sector can be in three states.

- *“Automatic”* : the programming controls the activation or not of the sector.
- *“Manual Stop”* : the sector is stopped.
- *“Manual Start”* : the sector is active.

To keep in mind:

- If a sector is in manual and a program associated with that sector enters, the program will be postponed until the sector is set to automatic.
- If a sector is started manually and it has an associated motor, the motor will be activated.
- The determining factors that are global will also affect a sector in “manual – running”.
- The units irrigated when the sector is in manual operation are counted in the history.

4.9. Determining factors

Determinant No .: number of the determinant to carry out the manual action (from 1 to 120).

Out of Service: The sector can be in three states.

- *“yes”* : no longer operational.
- *“no”* : in operation.

Finalize definitive stoppage: *“yes”* ends the definitive stoppage of the determining factor (irrigation, fertilizer or pH).

Finish deferred irrigation: if the definitive stoppage that affected irrigation is finished:

- *“yes”* : the programs that were affected by the definitive stoppage of the condition are stopped, canceling the pending watering.
- *“no”* : the programs that were affected by the definitive stoppage of the condition continue irrigation at the point where they were when the stoppage began.

If the determining factor is to "modify irrigation-fertilizers-frequency" the integration value can be modified or if it is for a "definitive stoppage" the temporary stoppage counter can be modified.

4.10. Timer

To change the date and time of the Agrónic.

4.11. Pivots

Consult the manual “Man A4500 – Centers” (R-2406).

4.12. Fogging

The fogging can be in "Automatic" in "Manual Stop" or in "Manual Start".

Fogging No .: nebulization number (from 1 to 8).

State: nebulization can be in three states.

- *"Automatic"* : it is controlled by the value of the sensors and/or conditions.
- *"Manual Stop"* : nebulization is stopped.
- *"Manual Start"* : nebulization is active.

End Definitive Stop: When the nebulization is in definitive stop, it will ask to end it.

4.13. Sensors

To change the value of virtual analog sensors.
The value of the virtual analog sensor can also be changed by SMS, from the Agrónic PC program or from the Cloud.

4.14. Calibration

To calibrate EC and pH sensors that are out of adjustment. For this, two standard liquids are needed, one low and one high, where the sensors are inserted and the calibration is carried out.

Sensor: Analog sensor number to configure (out of 1 a120).
Value: displays the last value read from the selected sensor.
Low value: low standard liquid value in which the sensor is inserted.
High value: high standard liquid value in which the sensor is inserted.
Calibrate:

- *"yes"* : save the sensor reading to do the calibration. You should only indicate yes when the sensor is inside the container with the standard liquid. The calibration of each point lasts 20 seconds.
- *"no"* : skips to the next screen without performing the calibration.

It is important to perform the low value calibration first and then the high value.
Calibration of each value takes 20 seconds to complete. When finished, it indicates if it was correct or not.
If the calibration is correct, it makes a record indicating the sensor that has been calibrated and the slope and displacement of the calibration line.
If the calibration is incorrect, it may be for one of the following reasons:

- The sensor is in error.
- The sensor reading has oscillated a lot during calibration.
- The sensor reading is very different from the calibration reference value.
- An attempt was made to calibrate the high value without first calibrating the low value.

If a new calibration is carried out and a previous one already existed, it will be necessary to delete the previous calibration (press the "Delete" button (F6)).

4.15. Copy

In this section you can copy the values of a Program or a Sector to a group of them

Source	**program : 00**	Destination, from: 00 to: 00
	sector : 00	Destination, from: 00 to: 00

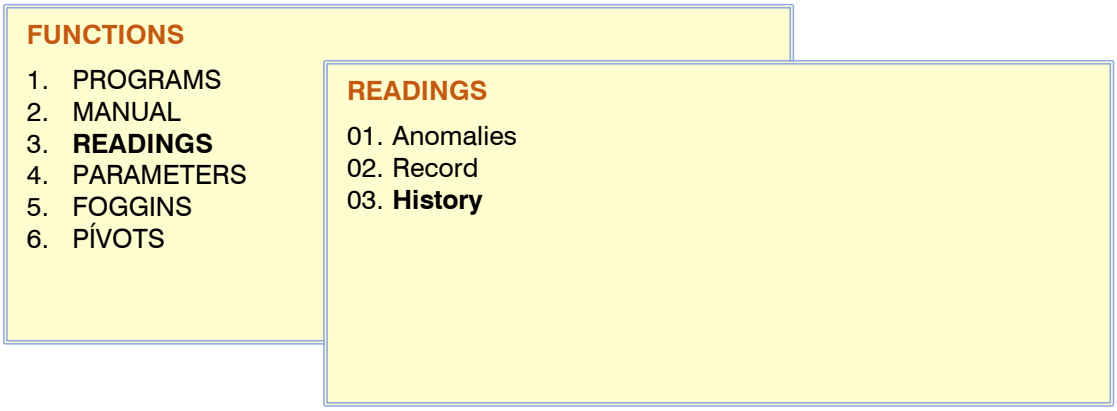
4.16. Outputs

To directly activate an Agrónic output without any control. It should only be used for equipment testing. Maximum 8 outputs at a time.

Allows you to activate digital outputs (M.SD) or analog outputs (M.SA)

5 . READINGS

Within the functionalities we find the "Readings" section where it informs us of the events that have occurred previously, it is divided into the "Anomalies" section where we find the records of the events that have been declared as anomalies, the rest of the "Records" or events and the "History" of different functionalities.



5.1. Anomalies

The log of events configured as anomalies is displayed. Configuring an event as an anomaly is done in [6.14.2.] *"Parameters – Installer – Events * "* and in [6.6.] *"Parameters – Determinants * "* .

As they are anomalies, when they occur, they appear on the general query screen and in this list so that it is more quickly accessible.

Anomalies are also included in the log.

In the following section there is a list of all the events that the Agrónic can record.

5.2. Record

Events that have been logged are displayed, including those declared as anomalies. They have been divided into an indexing of fifteen affectation groups.

Index	Affects	Description	(*)
1.1	Equipment	Power cut less than 1 minute.	
1.2	Equipment	Power cut between 1 and 10 minutes.	*still*
1.3	Equipment	Power cut between 10 and 60 minutes.	*still*
1.4	Equipment	Power outage for more than 60 minutes.	*still*
1.5	Equipment	Internal error.	
1.6	Equipment	Peripheral error.	
1.7	Equipment	Registration, exceeded the allowed limit.	
2.1	Manual	Enters or exits Stop - general, head.	
2.2	Manual	Enter or exit Out of Service - general, head, program, conditioning, filters.	
23	Manual	Shutdown in progress - general, spindle.	
2.4	Manual	End shutdowns and breakdowns	
2.5	Manual	Program – stop, start, suspend, end definitive stop, modify activations, modify frequency of days, end fertilizer or acid or safety irrigation.	
2.6	Manual	Sector – start, stop, automatic.	
2.7	Manual	Filters - start, stop.	
2.8	Manual	Virtual sensor, new value.	
2.9	Manual	Analog sensor automatic calibration, applied values.	
2.10	Manual	Digital output, order to activate or deactivate.	
2.11	Manual	Clock, adjustment done.	
2.12	Manual	Deletion, record of which element has been deleted.	
2.13	Manual	Nebulization – start, stop, automatic.	

3.1	Program	Start, reason information and start conditions.	
3.2	Program	Postponed , reason.	
3.3	Program	End , reason and related information.	
3.4	Program	Incident due to a programming or configuration error.	
3.5	Program	Stoppage of fertilization or injection of acid due to a determining factor.	*still*
4.1	Sector	Wrong flow detection.	*still*
5.1	Sensor	Digital sensor status.	
5.2	Sensor	Logic sensor status.	
6.1	conditioning	Definitive Unemployment, associated values.	*still*
6.2	conditioning	Temporary Unemployment, associated values.	
6.3	conditioning	Start of a Conditional Stop.	
6.4	conditioning	End of a Conditional Stop.	
6.5	conditioning	Start of a program by the determining factor.	
6.6	conditioning	End of a program due to the determining factor.	
6.7	conditioning	Start of a notice by the conditioner.	
6.8	conditioning	End of notice for the condition.	
6.9	conditioning	Modified the irrigation of a program, associated values.	
6.10	conditioning	Modified the fertilizer or CE reference, associated values.	
6.11	conditioning	Modified the frequency between activations, associated values.	
6.12	conditioning	Modified the reference of a condition, current value and the previous one.	
7.1	Communication	Exceeded the limit of SMS messages per day.	*still*
7.2	Communication	Command or order received in an SMS from the phone number.	
7.3	Communication	Executed sending an SMS to the phone number.	
7.4	Communication	Enter or exit communication error with a Monocable element	
7.5	Communication	Enter or exit communication error with an element of the AgroBee -L	
7.6	Communication	Enter or exit communication error with an element of Radio 433	
7.7	Communication	Start or end of communication with the Agrónic PC or the Cloud.	
7.8	Communication	Communication error with the GPRS modem.	
7.9	Communication	Communication error with the WIFI modem.	
7.10	Communication	Information on the daily consumption of data in the modem.	
7.11	Communication	Exceeded the monthly data limit allowed on the modem.	
7.12	Communication	Enter or exit communication error with an External ModBus device .	
8.1	Fertilizer	Surplus fertilizer, surplus treatment or imbalance (>10%) in the uniform application.	*still*
8.2	Fertilizer	Low level in fertilizer tank	
9.1	Filter	Start of filter cleaning, associated values (time and volume since the last cleaning)	
9.2	Filter	Uncontrolled filter cleaning.	*still*
10.1	mixture of waters	Position sensor error.	
10.2	mixture of waters	Conductivity sensor error.	
11.1	Diesel	There is oil pressure, when trying to start it is found that there is pressure.	*still*
11.2	Diesel	It does not start, different attempts have been made without starting the engine.	*still*
11.3	Diesel	Pressure drop with engine running.	*still*
12.1	misting	Start of nebulization, associated values.	
12.2	misting	End of nebulization, associated values.	
13.1	Sewer system	Values related to the drainage performed.	
14.1	center	Start of irrigation, associated values.	
14.2	center	End of irrigation, associated values.	
14.3	center	Deferred irrigation, associated values.	
14.4	center	Position value at the beginning, end, change of area or at the completion of the turn.	
14.5	center	Manual order, associated values.	
14.6	center	Alarm and its reason.	*still*
15.1	solar irrigation	Incident in radiation sensor or security sensor or by digital input	*still*

(*): Records marked with " An ." They are assigned from the factory as "Faults".

5.3. Record

In the History we find the summarized information of the current day plus the last seven days. In the Agrónic PC / WEB you can consult the complete information without limit of days in values saved every ten minutes.
history time offset configured in *"Parameters – Clock"* is taken into account and is applied to all history elements except "Program". For example, with an offset value of -4 hours then the information from 8:00 p.m. of the previous day to 8:00 p.m. of the current day will be displayed.

READINS HISTORY

1. Sector
2. Meter sensor
3. Analog sensor
4. Logical sensor
5. Starts
6. Program
7. Drains
8. Fertilizer tanks

5.3.1. Sector History

The history of each of the sectors contains the average of each day for the values of:

- watering time
- Irrigation volume plus flow offset
- energy consumed
- Average conductivity (mS)
- Average acidity (pH)
- Fertilizer time 1 to 8
- Volume of fertilizers 1 to 8

SECTOR DAY HISTORY

Sector: 001 Chard 15/05/21

Irrigation: 03:29 0028 m3 (+- 000 %)
Energy consumed : 0033,4 kW
Average of EC: 02,1 mS Average of pH: 06,4
F1: 01:12 00028 L F2: 01:12 00033 L
F3: 01:12 00030 L F4:
F5: 00:35 00017 L F6:
F7: F8:

<Sec Sec> <Day Day> Pag>

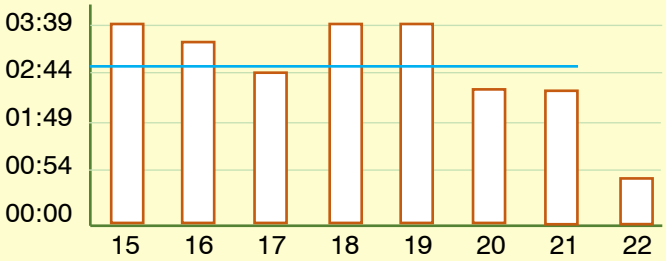
To obtain volume or energy values, it is necessary to have general meters.
It must be taken into account that when irrigating several sectors at the same time, the volumes are distributed proportionally to the expected flow of each one of them.
The time units in the fertilizers correspond to the effective opening time of the solenoid valve of each fertilizer, except in the CE regulation, which will be the entire regulation time.

The "function" keys located next to the bottom bar of the screen give us access to view a previous or subsequent sector or jump to a previous or subsequent day. With "< Pag" or "Pag >" we access to view the history graphs. To access a sector directly we will directly enter its number.

For the variables of irrigation time and volume , energy , EC and pH we have the graph of the last seven days plus today. On the (x) axis we see the days of the week and on the (y) axis the values of the unit of measure.
The first line indicates the sector, the units and the measured variable.
The blue horizontal line indicates the average of the 7 days.

SECTOR DAY HISTORY

Sector: 001 [HH:MM] Irrigation:



<Sec Sec> <Pag

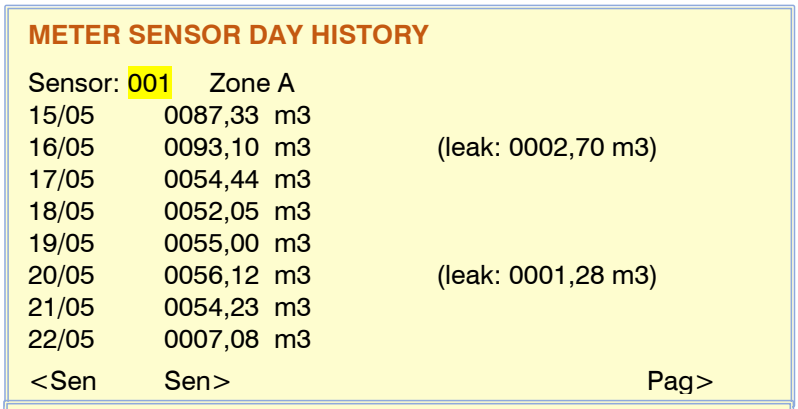
5.3.2. History Sensor Counter

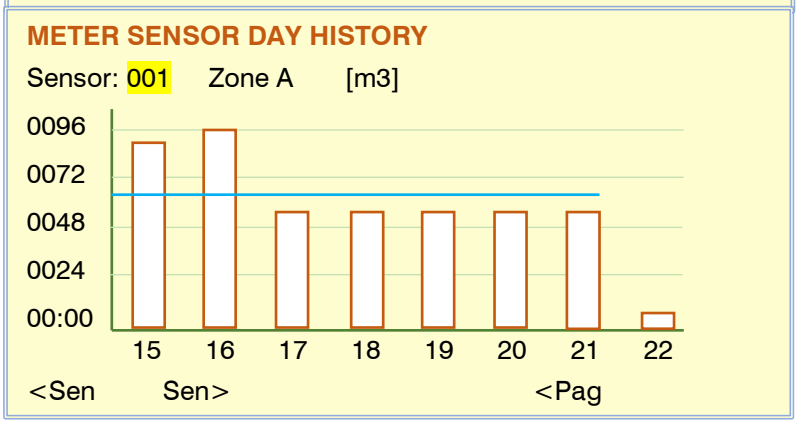
The history of the counter sensors is divided into two pages, on the first we see a line per day with the accumulated total plus the leak or accumulated value when there is no irrigation or fertilizer order.
The displayed unit depends on the configuration of the counter sensor:

m3,L, cl
kW
OR

The leak volume is included in the total volume.

To access a specific sensor, enter its number, pressing the function "<Sen" decreases or "Sen>" increases the sensor on the screen.
With the "Pag>" key we go to the history graph screen.
The blue horizontal line indicates the average of the 7 days.

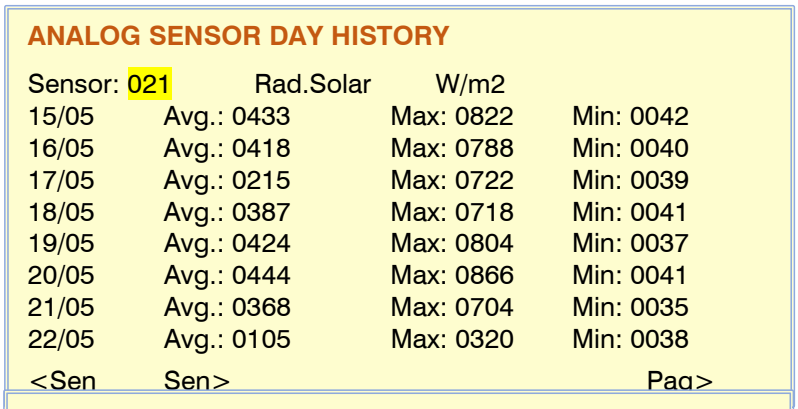


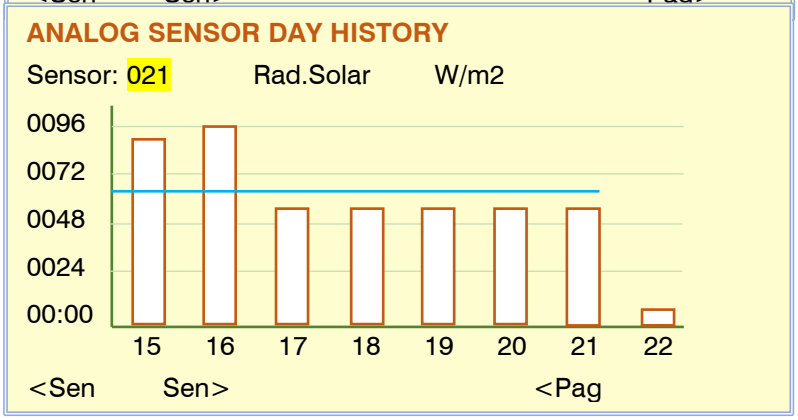


5.3.3. Analog Sensor History

In the history of the analog sensors we see for each one of them the descriptive text and the measurement units, all of it in the first line.
For each of the seven days plus today, it gives us the average value " Med ", it is the average of all the readings of the day, the value "Max" and "Min", correspond to the highest reading or the lowest of all readings for the day.

To access a specific sensor, enter its number, pressing the "<Sen" function decreases or "Sen>" increases the sensor on the screen.
With the "Pag>" key we go to the history graph screen.
The blue horizontal line indicates the average of the 7 days.





5.3.4. Logical Sensor History

The history of logical sensors is only carried out in those that have an addition, subtraction or average operation, in these cases we have the same representation that we have in an analog sensor.

5.3.5. History Beginnings

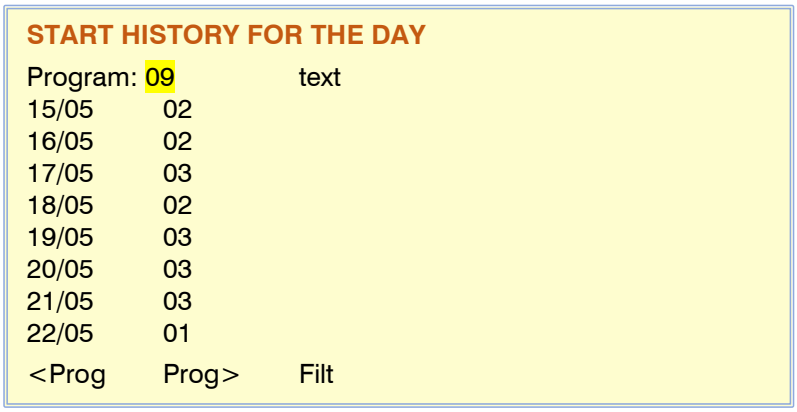
Within the start history are those made by each of the programs and also by the groups of filters .

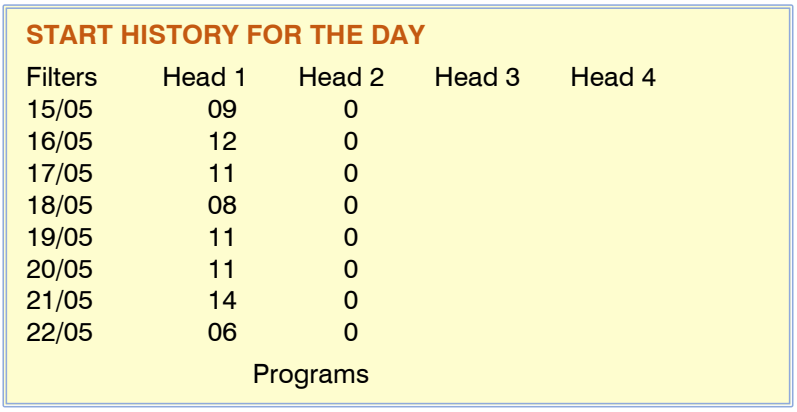
With the “F1” and “F2” keys we move the view to the previous or next program. To access a specific one, all you have to do is enter its number.

With the F3 key we access the view of the filters or from the filters we access the programs.

If a program contains several activations, all of them are counted as starts.

It must be taken into account that the history of the starts made of both the programs and the filters will be carried out within the time difference that has been configured.





5.3.6. Program History

For each program the history of the last irrigation or of the irrigation in progress is saved, if it works by activations it will show the last one, to see the history of the previous applications of the programs they can be consulted in the Agrónic PC / WEB.

To access a specific program, enter its number or use the "F1" and "F2" keys to move the view to the previous or next program.

In the first line we find the program number together with the date and time at which the program started watering.

PROGRAM HISTORY 03 **01/12**

Program: 03 Texto Tue. 06/05/2021 16:29:56
Start by schedule Normal end
Activation number: 2 de 3
Number of subprograms: 6 de 6
Manual factor: - 08 % Modify R.: -12 %
Modify Fert.: +00 % Modify Fre. Act.: +05 %
Drain: 26 % [D02]
Fertilization by: uniform in liters
Head: 1
<Prog Prog> <Pag Pag>

PROGRAM HISTORY 03 – SUB. 01 **02/12**

Program: 03 Texto Tue. 06/05/2021 16:29:56
Irrigation: 02:29 Spare: 00:32 ETc: 06.33 mm
Sector: 034, 018, 005

Preirrigation: 00:12 Postirrigation: 00:21
Ref. EC: 02,1 mS Average EC: 02,2 mS
Average Ref. EC: 02,0 mS Average EC ent.: 01,3 mS
Ref. pH: 05,9 pH Average pH: 05,8 pH

<Prog Prog> <Pag Pag>

PROGRAM HISTORY 03 – SUB. 01 **03/12**

Program: 03 Texto Tue. 06/05/2021 16:29:56
F1: 0023 L
F2: Treatments:
F3: 0066 L Spare: 0003 L TF1: 02’30”
F4: 0041 L
F5: 0012 L TF2: 03’30”
F6: 0008 L Spare: 00’18”
F7:
F8:
<Prog Prog> <Pag Pag>

PROGRAM HISTORY 05 **01/26**

Program: 05 Text Tue. 06/05/2021 15:49:00
Start by time End normal
Number of activation: 2 de 3
N. of sectors: 20, grouped each: 3
Manual Factor: - 08 % Modify R.: -12 %
Modify Fert.: +00 % Modify Fre. Act.: +05 %
Drain: 26 % [D02]
Fertilization of: EC regulation

<Prog Prog> <Pag Pag>

PROGRAM HISTORY 05 – GROUP 01 **02/26**

Program: 05 Texto Tue. 06/05/2021 15:49:00
N01 0123 m3 Spare: 0045 m3 ETc: 04.33 mm
Sector: 001
N02 0883 m3 ETc: 06.45 mm
Sector: 000 000 000 000 000 000 000 000 000 000 000
N03 0123 m3 Spare: 0045 m3 ETc: 04.33 mm
Sector: 021

<Prog Prog> <Pag Pag>

PROGRAM HISTORY 05 – GROUP 01 **03/26**

Programa: 05 Text Tue. 06/05/2021 15:49:00
F1: 033 %
F2: 000 % Preirrigation: 00:12
F3: 045 % Postirrigation: 00:21
F4: 060 % Treatment:
F5: 012 % TF1: 02’30”
F6: 005 %
F7: TF2: 03’30”
F8: Spare: 00’18”
<Prog Prog> <Pag Pag>

PROGRAM HISTORY 05 – GROUP 01 **04/26**

Programa: 05 Text Tue. 06/05/2021 15:49:00

Ref. pH: 05,9 pH Average pH: 05,8 pH

Ref. EC: 02,1 mS Average EC: 02,2 mS
Average Ref. EC: 02,0 mS Average EC int.: 01,3 mS

<Prog Prog> <Pag Pag>

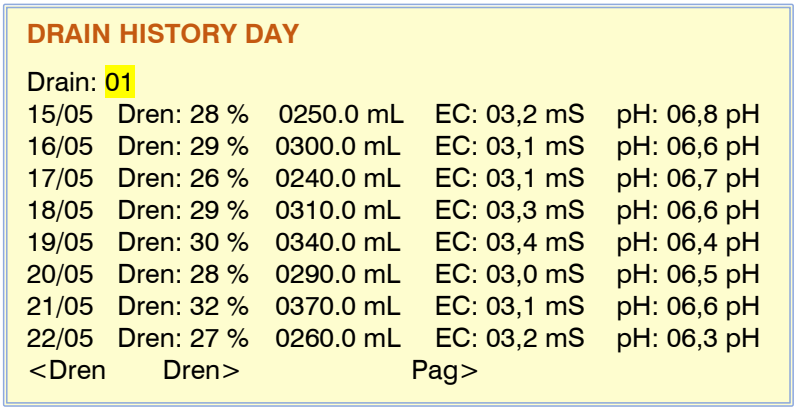
5 .3.7. History Drain

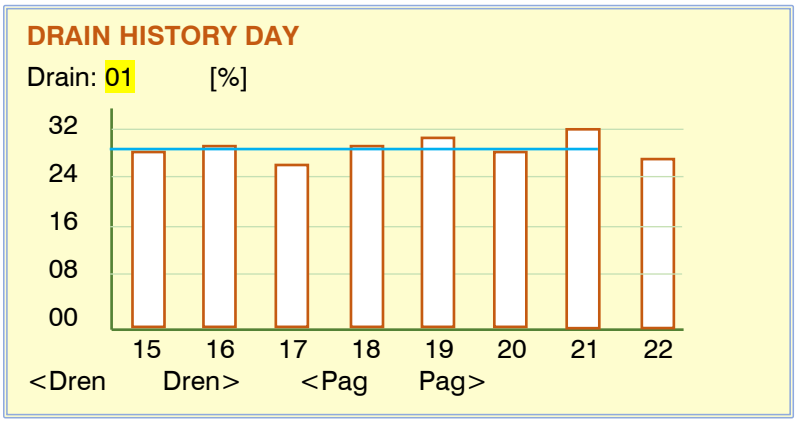
In the history of the 20 possible drainages we find the means of the percentage of drained irrigation water together with the values of conductivity and acidity.

To display a specific drain, enter its number or press the function keys “<Drain” or “Dren>”.

In the following screens we have the graphs of the last days of drainage, conductivity and acidity.

The blue horizontal line reflects the average of the seven days.

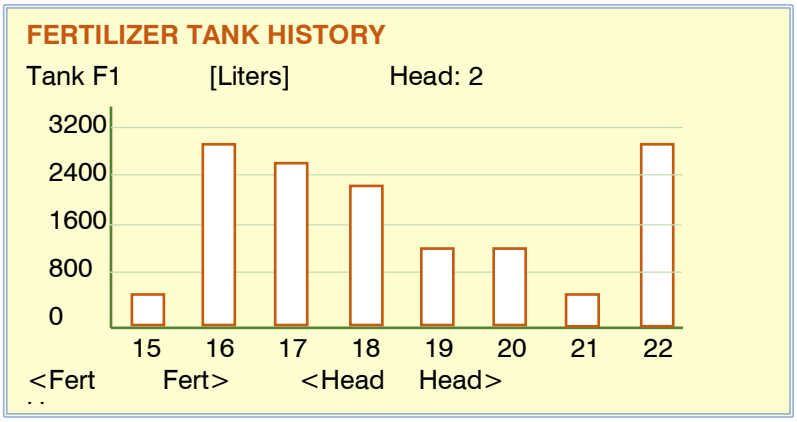




5.3.8. Fertilizer tank history

Screen with the graph of the last seven days showing the liters available at the last hour of the day for each fertilizer.

Using the function keys "F1" and "F2" we decrease or increase the displayed fertilizer. In the same way, with the “F3” or “F4” keys we access the different heads.



6. FOGGING

Misting is used to cool or maintain humidity in greenhouses by applying microdroplets into the environment.

Up to 8 different mists can be created. In each one, up to 8 outputs are configured that will be activated sequentially. When it ends there is a waiting time before starting the cycle again. Sensors play a role in reducing this waiting time.

FUNCTIONS

1. PROGRAMS
2. MANUAL
3. READINGS
4. PARAMETERS
5. **FOGGINS**
6. PÍVOTS

FOGGINS

N1. North 1
N2. North 2
N3. North 3
N4. South right
N5. South center
N6. South
N7.
N8.

Nebulization can start automatically for four reasons:

- If it has been assigned a "Start" or "Start / stop" condition, it starts when the condition is activated.
- If it has a temperature sensor assigned, it starts when it exceeds the reference and stops when it falls below the reference.
- If a humidity sensor has been assigned, it starts when it falls below the reference and stops when it rises from the reference.
- Due to the DPV (vapor pressure deficit), from a deficit value the nebulization will start, with a greater increase in the DPV it will carry out the nebulization more frequently as long as a safety value in relative humidity is not exceeded.

It can also be started manually.

Schedule: (active schedule) nebulization can only be activated within this schedule. Does not affect manual activations. If it is left at 0, it indicates that the active schedule is all day. If it has been configured to automatically follow the solar time then it will be asked in "+-h:mm " format, the hourly value will be added or subtracted from the sunrise value, for example, with "+2:30" the time active nebulization control would begin two and a half hours after sunrise.

FOGGING 1

Active schedule: 08:45 - 18:30
R1: 012" R2: 014" R3: 014" R4: 014"
R5: 014" R6: 012" R7: 000" R8: 000"
Pause time: 0230"
Temperature:
Reference: 28,6 ºC Band: 04,0 ºC
Modify pause: 20 %
Humidity:
Reference: 045 %HR Band: 10 %HR
Modify pause: 30 %
<Fog Fog>

Departures

R1 to R8: for each output we enter its activation time. time goes from 0 to 999". They are activated sequentially.

Pause time: waiting time, without nebulizing, before starting the cycle again (from 0 to 999"). This time can be modified automatically depending on humidity and temperature.

Temperature.

It only asks if the sensor has been configured in "*Parameters - Nebulization*" .

Reference: temperature above which nebulization is activated.

Band: when the temperature is at the "reference" value, the programmed pause will be applied; when it reaches the "reference plus the band" the time for the next cycle will decrease with the percentage entered in "modify pause". The higher the temperature, the less time between cycles.

Modify pause: when the temperature is above the reference+band , the pause time is decreased by the % configured here (from 0 to 50%). With this it is achieved that it nebulizes more frequently at a higher temperature.

Humidity

It only asks if the sensor has been configured in "Parameters - Nebulization".

Reference: ambient humidity below which nebulization is activated.

Band: when the humidity is between the reference and the reference-band, the pause time decreases proportionally. The pause time, at most, can be reduced by the % configured in "Modify pause".

Modify pause: when the humidity is below the reference-band, the pause time is decreased by the % set here (from 0 to 50%). This makes it nebulize more frequently. Modification always decreases this cycle.

DPV – Value Pressure Deficit.

It only asks if the DPV operation has been configured in "*Parameters - Nebulization*" .

Reference: Vapor pressure deficit value above which nebulization is activated.

Band: when the deficit is at the "reference" value, the programmed pause will apply; when it reaches the "reference plus the band" the time for the next cycle will decrease with the percentage entered in "modify pause". The more deficit, the less time between cycles.

FOGGING 1

Active schedule: +2:45 - -3:30
R1: 015" R2: 015" R3: 015" R4: 015"
R5: 015" R6: 000" R7: 000" R8: 000"
Pause time: 0290"
DPV:
Reference: 03,60 kPa Band: 0,80 kPa
Modify pause: 32 %
Maximum limit: 082 %HR

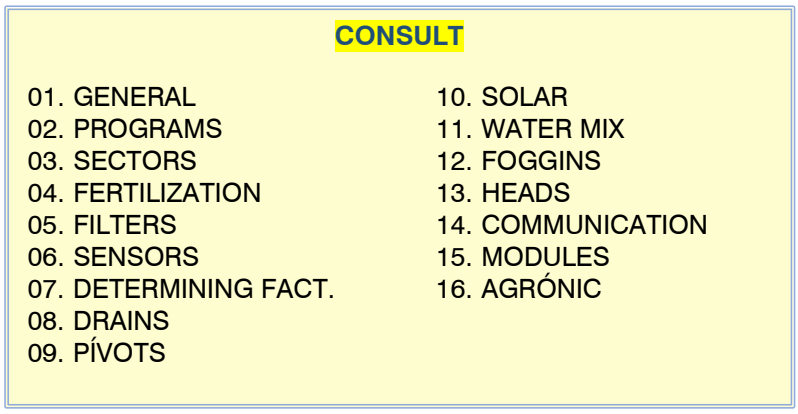
<Fog Fog>

Modify pause: when the deficit is above the reference+band, the pause time is decreased by the % configured here (from 0 to 50%).

Maximum humidity limit: value of relative humidity above which the humidification cycles will end, with this an attempt is made to avoid condensation on the plants, even if the DPV requests it. Leaving the limit at 0 does not work.

- If there are temperature and humidity controls configured, nebulization will be activated whenever one or both of them need it. And it will stop when both indicate it, that is, the temperature is below and the humidity is above the reference.
- If the pause time has to be modified by both temperature and humidity, the % modification that is applied is the greater of the two.
- When the nebulization is stopped by the sensors or by a conditional stop, when it is activated again it will do so at the point where it was.
- When it is activated manually, it does not take into account the conditions or the sensors.
- If it is activated by conditioning, it will take into account the sensors.

7. CONSULTATION

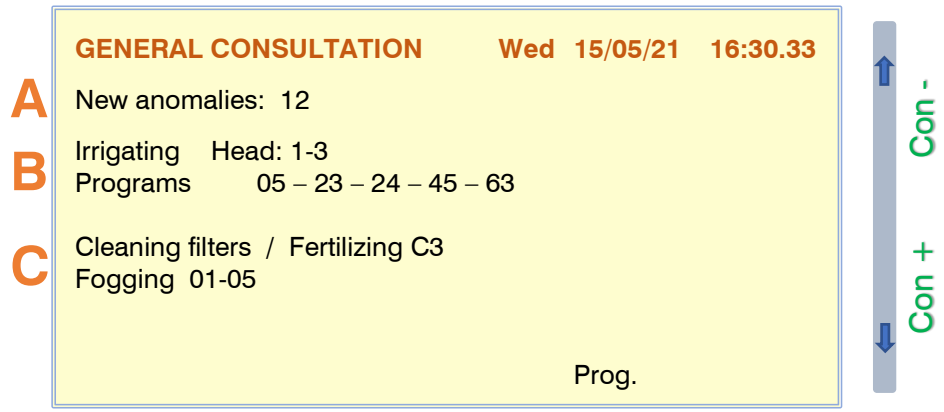


7.1. General

The general query shows a summary of the most important information to analyze the state of the equipment on a single screen.

In the first line it tells us which query we are in together with the date and time.

On the front, next to the right side of the screen, there is a scroll bar; clicking on the upper area will go to the previous query screen and clicking on the lower area to the next query of the 16 existing ones.



The last line assigns functionality to the F1 to F6 keys located below the screen .

If there is more than one screen within a query, the keys “F3” and “F4” will show the page backwards or forwards.

The “F5” key gives us access to see the summary of active “Sectors” or “Programs”.

A When there is an important incident or the state of the equipment requires it, the information will be displayed on the second line. If there is more than one message, they will be displayed one after the other in a cycle of a few seconds each.

Let's see the list of possible messages:

General Stop : The equipment is completely stopped, when it resumes it will continue where it was.
Out of Service General : All the work in progress has been finished and it is completely stopped, when resuming it will wait for the next starts.
Stop Head 1-2-3-4 : The heads indicated in are totally stopped, the rest are operative.
Out of Service Head 1-2-3-4: The heads indicated here have finished the work in progress and are completely stopped. At the end of the out of service they will wait for the next starts.
Out of Service Pivot 1-2-3-4 :
Definitive Stop: From a head , program , fertilization , pH , nebulization , filter or pivot . It informs us that the control is disabled due to an incident. To resume it will be necessary to access *“Manual – End Shutdowns and Malfunctions”* to end them all or for a specific one go to *“Manual – Program\Nebulization\Filters\Pivot”* .
Alarm output activated: The alarm output of the equipment is activated. To stop it, you must access *“Manual – End Shutdowns and Malfunctions”.*
New anomalies: indicator of the number of new anomalies that have occurred since the previous reading. When the *“Readings – Anomalies”* section is accessed, the counter will be updated to zero.

B When irrigation actions take place, it shows us information summarized in the next two lines of the screen.
Irrigation : shows us the text whenever there is an active program.
Head : indicates which heads are irrigating.

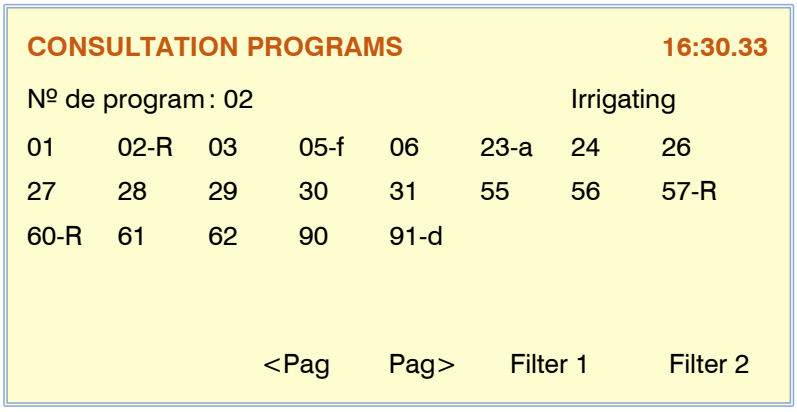
Programs or Sectors : List of the numbers of active programs or sectors. To jump from one view to another, press the “F5” key.

C The last lines summarize the activity of the rest of the controls:
Fertilizing : Fertilizer or treatment is applied.
Cleaning filters : filter cleaning in progress.
Nebulizing : misting is applied, it will indicate which ones are active.
Active pivot : informs us of those that are irrigated.

7.2. Programs

On the first screen it shows all the programs, next to the program number its status is indicated in summary:

- **R** = watering
- **a** = postponed, it can be postponed for multiple reasons, when entering the program consultation it will inform us.
- **p** = irrigation activations pending to be carried out.
- **d** = the program is in Definitive Stop of irrigation, fertilizer or pH.
- **f** = Out of Service by manual order.
- **s** = suspended for a while by manual order.
- **e** = error due to a bad configuration.



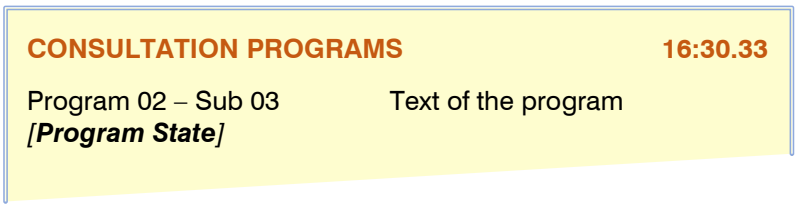
By means of the function keys “F5” – Filter1 and “F6” – Filter2 you can organize the view of the programs to see them all, only those defined (with values) or those that are in irrigation. The second filter shows those belonging to a specific head.

Filter1		Filter2	
All		**Cab.T**	(programs of all heads)
Def.	(only those configured)	**Cab.1**	(programs of spindle 1)
Irrigation	(those who are irrigating)	**Cab.2**	(head 2 programs)
		Cab.3	(programs of spindle 3)
		Cab.4	(programs of spindle 4)

The status of filters 1 and 2 is memorized, when re-entering the program query it will apply the same filters.

To have a more detailed consultation of a program, enter the number and the enter key.

When a program is not running it will display only the program number.
Program 02
If it is irrigating, it shows the current subprogram number to the right of the program.
Program 02 – Sub 03



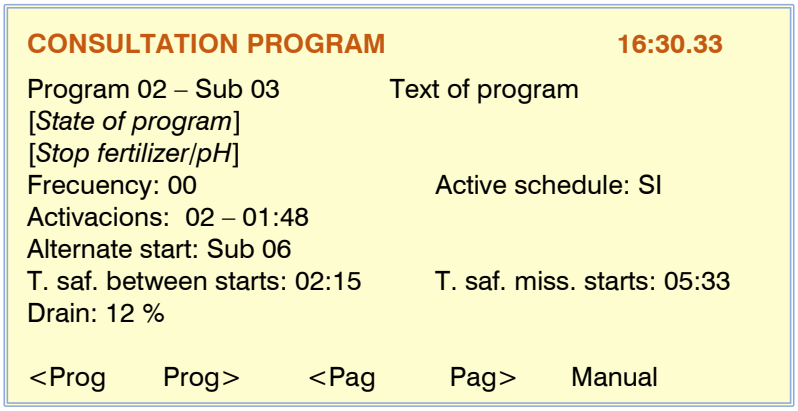
When consulting a program, it shows us a descriptive text of the " Program status ", the different variables are:

“ **Stopped** ” The program is stopped without any watering in progress or pending, it is waiting for the next start.
" **Irrigating by Schedule/Manual/Conditioning xx /Sequential xx /Security** " informs us of its status "in irrigation" and also what caused it to start.
“ **Out of Service** ” in this state generated by a manual order, the program is totally inactive.
" **Definitive Stop** " due to the effect of a condition, the program has been stopped definitively until it is reactivated by a manual order. When it is resumed, it will be possible to continue at the point where it stopped or canceling the pending irrigation and waiting for a new irrigation start.

“ **Pending activations** ” the program performs pulsed irrigation and continues to wait for pending activations.
“ **Suspended** ” by a manual order the program has been suspended for a period of time, at the end of the suspension hours it will resume at a next start.
“ **Priority Deferred** ”, there is a program running with higher priority.
“ **Postponed due to filter cleaning** ”, the filter cleaning is being carried out and there is an order to stop sectors while it is being executed.
“ **Postponed due to fertilizer overlap** ”, the program is put on hold because there is another program applying the same fertilizer, acid or treatment.
" **Postponed due to out of hours** ", waiting to re-enter active hours and resume irrigation.
“ **Postponed by Stop** ”, the equipment is in “Manual – Stop”, it will resume at the end of the manual order.
“Postponed by Program Stop, the program is in “Manual – Stop”, it will resume when the manual order is finished.
" **Postponed due to Conditional Strike** ", a condition has postponed the program, at the end of the strike it will resume.
“ **Postponed by Sector already active** ”, the same sector is active by another program.
“ **Delayed by Sector in manual** ”, is postponed as long as there is a manual order on the sector.
“ **Mix Postponed** ”, the sector is postponed while mixing valves are set.
“ **Postponed due to pre-agitation “, the** pre-agitation is being carried out before starting the irrigation.
“ **Postponed due to diesel** ”, the sector is postponed until the start of the diesel engine is complete.
“ **Deferred due to active sequential** ”, waiting to finish the group of sequential programs.
“ **Postponed due to solar irrigation** ”, pending the control of “solar irrigation” input to the program.
“ **Postponed due to fertilizer cleanup”,** waiting for serial fertilizer cleanup to finish
“ **Spindle error** ”, there are sectors with different heads and/or conditions with different heads.

Stoppage of fertilizer or pH , when there is a stoppage in the fertilization or in the regulation of the pH due to a condition, then it is stopped applying, the irrigation continues.
“ **Temporary Fertilizer Stop** ”, for the injection in the current subprogram or group, it will be applied again in the next one.
“ **Definitive Fertilizer Stop** ”, stops the injection until it is resumed in *“Manual – Programs”* or *“Manual – End Stops and Malfunctions”* .
“ **Temporary stop pH** ”, for the injection in the current subprogram or group, it will be applied again in the next one.
“ **Definitive stop pH** ”, stops the injection until it is resumed in *“Manual – Programs”* or *“Manual – End Stops and Malfunctions”* .

On this first screen of the program, it informs us of the status of the start conditions:



Active day / **Non-active day** , if the program works by days of the week or by calendar or there is an active period, then it does not report whether today is an active day for irrigation or not. If it is not, you can enter by manual order and if it is an irrigation day then it will need to be complemented with a start by time or by condition.
Frequency , when operating by frequency of days, it shows us the days that are missing for the next irrigation, at "0" it waters today, at "1" tomorrow, etc.

Active schedule , the program is within or outside the active schedule, the conditions can start within this schedule, also outside of the schedule you can postpone or end the irrigation in general.

Activations , there is the possibility of performing pulsed irrigation, here it shows us the activations that are pending and the time remaining for the next one.
Suspended , by manual order the irrigation can be suspended for a few hours, at the end of the time wait for a next start.

Alternate startup , when a program has been configured to alternate startup of the applets, it tells us which one will be first at the next startup.

The previous values, day/frequency/time/activations are not shown in the sequential programs. The values are held by the first program in the sequence.

Start by condition

When a program is going to start due to a condition, there are timings to detect a permanent request to start irrigation or it may never request it, for example, due to a sensor failure.

Safety time between starts , as long as there is time it will not make a new start, with this time is given to the inertia of the conditioning sensor. Each new start of irrigation this time is loaded, it is configured in *"Parameters – Programs"* .

Safety time due to lack of start , within the active schedule the lack of start is controlled by order of a condition, at the end of this time it will start the irrigation and from here it will carry out new irrigation in the time configured in " **Safety irrigation every** ".

Drainage , if a drainage control is associated with the program in question, then it will inform us of the drainage carried out at that moment.

The "functions" keys in the program query allow you to jump to the previous or subsequent program, always taking into account the filters provided in the first screen, we can also view the different screens of the same program with "<Pag" or "Pag> " and finally with the "F5" key gives us direct access to *"Manual – Program"* , when exiting it will return to the program consultation screen.

Informative screens of irrigation in progress in "subprograms" format

When watering a subprogram is carried out, one or more screens are generated with information on the watering in progress.

" **Sectors** " reports the sectors to which irrigation is applied.

" **Irrigation** " irrigation units pending to be applied, can be displayed in time " hh:mm " or " mm.ss " or in volume "m3". The units programmed in "mm" or "m3/ha" will be transformed into m3 related to the total area of the sectors involved. In volume irrigation you can have a security time that will display it to the right of the volume units.

```
CONSULTATION PROGRAM                    16:30.33
Program 02 – Sub 03          Text of program
[State of program]           Preirrigation: 008,50 m3

Sectors: 023/025/084/003
Irrigating: 045,30 m3        03:45
Fertilizers:      proportional l/m3
F1: 008/005  F2: 000/000  F3: 002/001  F4: 003/001
F5: 008/005  F6: 000/000
TF1: 00:22     TF2: 00:00
<Prog     Prog>     <Pag     Pag>     Manual
```

" **Pre-irrigation** / **Post-irrigation** " Quantity of pre-irrigation that is left to start fertilization, or amount of post-irrigation that is left to finish. It only appears if there is fertilizer and pre-post watering configured.

" **Fertilizers** ", if the program has fertilization programmed, then it will show the units pending to be applied or the proportion between fertilizers. Let's see examples of the different types of fertilization:

Type of fertilization by units or uniform , it will show the units (time or volume) pending to be applied, in "consult fertilizers" we will see how the uniform is distributed.

```
Fertilizers:      uniform in liters
F1: 233,5    F2: 000,0    F3: 167,0    F4: 201,2
F5: 056,0    F6: 012,0
```

Type of fertilization by EC regulation or EC input , it will show the relationship between the different fertilizers that are being applied to achieve the objective of the reference value, then it gives us the value of the conductivity and pH sensors together with the reference value (), In "consult fertilizers" we will see the rest of the information.

```
Fertilizers:      regulation EC (%)
F1:040  F2:012  F3:017  F4:088  F5:000  F6: 055
EC: 03,1 mS (03,2)      pH: 05,8 pH (05,8)
```

Type of proportional fertilization L/m3 or cl /L, it will show the units pending to be applied for each proportion.

```
Fertilizers:      propotional l/m3
F1: 008/005  F2: 000/000  F3: 002/001  F4: 003/001
F5: 008/005  F6: 000/000
```

In the last line we have the phytosanitary treatments TF1 and/or TF2 with the units pending to be applied.

If there are more subprograms pending to be applied or when it does not water, it will show us the sectors that contain each one of them in a new screen.
When the subprograms enter in "alternate" format, we will see them in the order in which they will be executed.

Program 02 Text of program
Next sectors in the subprograms:
Sub04- S: 033/098/503/504/001/002
Sub05- S: 085
Sub06- S: 506/526

In irrigation by " ETc " the list of sectors alternates with the irrigation value in "mm" that would apply at this time. The value is calculated with the evaporation of the crop minus the effective rainfall, all recorded from the previous irrigation.

Informative screens of irrigation in progress in "linear" format

The positions of a linear program can be grouped, in this screen it shows us the positions with their **sectors in irrigation (R)** , in addition to the units pending to be applied. If there are more positions to enter irrigation, all of them will be reported below and on the following screens.
It will be reported if one of the positions is on hold to carry out the post-dried process .

The number of positions in simultaneous irrigation can vary between 1 and 20, it will depend on the configuration of each program.

CONSULTATION PROGRAM **16:30.33**
Program 05 Text of program
[State of program] Postirrigation: 05’ 45”

N01**R** **S**105 08’ 30”
N02**R** **S**033 05’ 45” Waiting, postirrigation
N02**R** **S**034 06’ 10”
N03 **S**501
N04 **S**045
N05 **S**047
<Prog Prog> <Pag Pag> Manual

“ **Pre-irrigation** / **Post-irrigation** ” Quantity of pre-irrigation that is left to start fertilization, or amount of post-irrigation that is left to finish. It only appears if there is fertilizer and pre/post watering configured.

Fertilizers ” screen , if the program has fertilization programmed then it will show the units pending to be applied or the proportion between fertilizers. Let's see examples of the different types of fertilization:

Type of fertilization by units or uniform , it will show the units (time or volume) pending to be applied, in "consult fertilizers" we will see how the uniform is distributed.

CONSULTATION PROGRAM **16:30.33**
Program 05 Text of program
[State of program]

Fertilizers: Units [L]
F1: 012,5 F2: 000,0 F3: 017,0 F4: 001,2
F5: 006,0 F6: 012,0

TF1: 00’ 00” TF2: 01’ 05”

<Prog Prog> <Pag Pag> Manual

Type of fertilization by EC regulation or EC input , it will show the relationship between the different fertilizers that are being applied to achieve the objective of the reference value, then it gives us the value of the conductivity and pH sensors together with the reference value (), In "consult fertilizers" we will see the rest of the information.

F1:040 F2:012 F3:017 F4:088 F5:000 F6: 055
EC: 03,1 mS (03,2) pH: 05,8 pH (05,8)

Type of proportional fertilization L/m3 or cl /L, it will show the units pending to be applied for each proportion.

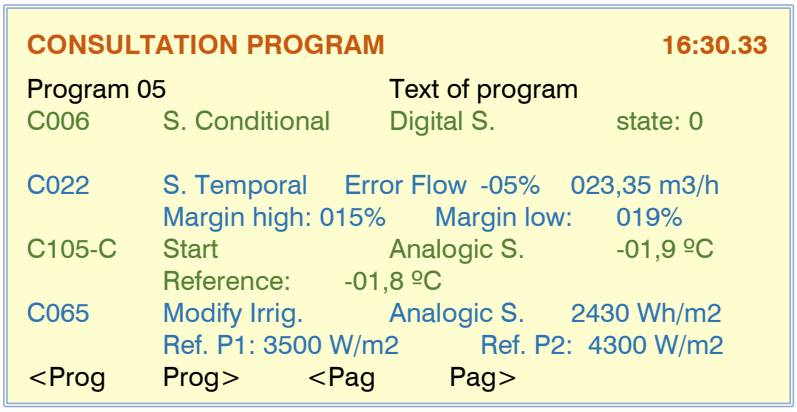
Fertilizers: proportional [l/m3]
F1: 008/005 F2: 000/000 F3: 002/001 F4: 003/001
F5: 008/005 F6: 000/000

In the last line we have the phytosanitary treatments TF1 and/or TF2 with the units pending to be applied.

Informative screens of the program conditions

The **determining factors** directly assigned to the program will be shown first, followed by the rest of those that affect it.

Each determinant occupies two lines of information, it is a summary, to see all the information you have to go to the "*Query - Determinants*".



The first value corresponds to the condition number " **C006** " followed by the status and the **type** , they can be the following:

Permanent/Temporary/Conditional
Unemployment
start/stop
Modify Irrigation/Fertilizer/Frequency

Next, it shows the **origin** associated with each determining factor:

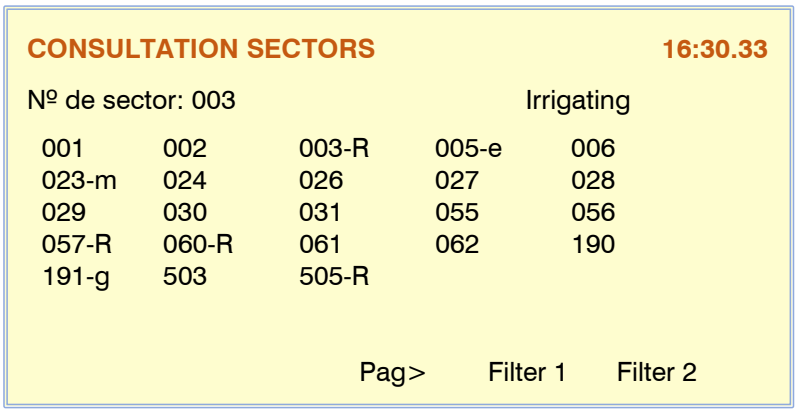
Digital/Analog/Logic Sensor/Counter
Flow/EC/pH/ratio/mix /drain error, Communication, Schedule.

Depending on the previous variables, it will show the informative variables of the conditioning control.

7.3. Sectors

On the first screen it shows all the sectors; Next to the sector number, its status is briefly indicated:

R = in irrigation
m = in manual macha
p = in manual stop
e = flow detector error
g = water hammer



By means of the function keys “F5” – Filter1 and “F6” – Filter2 you can organize the view of the sectors to see them all or only those defined (with values) or those that are in irrigation. The second filter shows those belonging to a specific head.

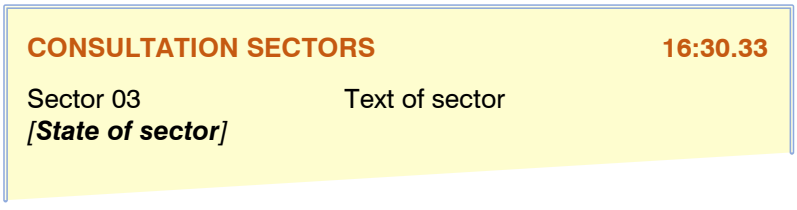
Filter1		Filter2	
All		**Cab.T**	(sectors of all heads)
Def.	(only those configured)	**Cab.1**	(head sectors 1)
Irrigation	(those who are irrigating)	**Cab.2**	(sectors of head 2)
		Cab.3	(sectors of head 3)
		Cab.4	(sectors of head 4)

The status of filters 1 and 2 is memorized, when re-entering the sector query it will apply the same filters.

Sector groups

At the end of the sector query, it will also show the "sector groups", numbered from 501 to 540, in this case it will apply the same filters as the F5 or F6 keys. If the group is running it will display “-R” next to the group number. Entering the group number plus the “ Enter ” key will go to a summary screen of the group sectors.

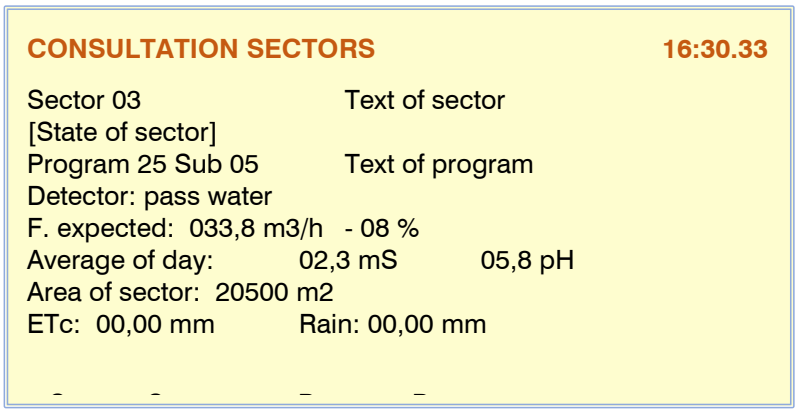
When accessing the consultation of a sector, it shows us a descriptive text of the " State of the sector ", the different variables are:



“ **Stopped** ” The sector is stopped without any irrigation in progress.
“ **Active** ” the sector is active due to a program in progress.
“ **Manual start** ” manual order to activate the sector.
“ **Manual stop** ” manual command to stop the sector.
“ **Manual digital gear** ” there is an order from the digital sensor associated to the sector.
" **Waiting, Postirrigation** " has paused irrigation while waiting for the other sectors of the group.
“ **Wait, Diesel** ” is starting the motor pump.
“ **Active, water hammer** ” has entered the sector, it is waiting to finish the water hammer.
“ **Stopped, water hammer** ” the sector is maintained while timing the water hammer.
“ **Active (Sec. Fert .)** ” as it is a fertilizer sector has opened the valve because the associated fertilizer is active.
“ **Stopped (Sec. Fert)** ” fertilizer valve associated to the sector, stopped because the fertilizer is not active.

Who uses the sector
Program , makes use of the sector the program number .
Pívot , indicates the number of pivot associated with the sector as well as indicating " **in area** " when it runs through its area.

Flow sensor
If the sector has activated the flow detector, digital or meter, it will inform us of its status.
Detector digital , status of the sensor located next to the solenoid valve of the sector.
“ **Pass water** ”, it is detected that there is a passage of water by means of the pressure switch or probe.
“ **No water passes** ”, the sensor does not detect the passage of water.
“ **Sensor error** ”, the field module does not report the status of the sensor.
“ **Error, water passes** ”, water is circulating when there is no order to open the valve.
“ **Error, no water passes** ”, there is an order to open the solenoid valve, but there is no water circulation.



Detector counter , each sector can have a particular counter located to count the consumption and see the flow, it also performs the control of the correct passage or not of irrigation water.
" **Flow Detector** " informs us of the circulating flow towards the sector.
control status
“ **Flow out of range error** ”, informs us when the circulating flow is outside the range established in the configuration.
“ **Error, water passes** ”, water is circulating when there is no order to open the valve and the detection conditions are met.
“ **Sensor error** ”, the field module does not report the status of the sensor

Expected flow , shows the expected flow of the sector plus the **gap** that the sector has compared to the real one, taking into account all the sectors in irrigation, if it has its own meter, the gap is measured with this meter. Positive value, waters at a higher flow rate than expected. Negative value, waters at less flow than expected.
For flow offset control, all sectors must have this value assigned.
Water hammer , if the sector is timing an opening or closing of the solenoid valve, it shows the value in seconds.
Average of the day CE and pH , when the conductivity or pH regulation is carried out, then it shows us the average of the irrigations carried out during today.

Fertilizer sector , if it is a sector with the function of activating the solenoid valve of a fertilizer located in the plot of the sector, then it will inform us of its status, **active** or **not active** and what fertilizer it is **Fx** .
Area , square meters of the area of the sector (10000m2 = 1Ha).
ETc / **Rain** , when irrigation is carried out by calculating the "Evapotranspiration of the crop" shows the accumulated values from the previous irrigation.

The last screen of the query of a sector reports the programs that contain this sector.

CONSULTATION SECTORS **16:30.33**

Sector 03 Text of sector
[State of sector]
Container programs:
Program 05 Text of program
Program 25 Text of program
Program 33 Text of program
Program 40 Text of program

<Sec Sec> <Pag Pag>

7.4. Fertilization

The information on the first query screen will depend on the type of fertilization used at any given time:

In all types it will inform to the right of the fertilizer number or in the acid with the following symbols to indicate the state in which it is found:

- ***** = applying fertilizer.
- **-** = not active or waiting to enter
- **t** = in Temporary Stop
- **d** = in Definitive Stop

SERIAL

The different fertilizers are entering one after the other.
Shows the units pending to be applied

There may be more than one program fertilizing at the same time if they do not repeat the same fertilizer.

CONSULTATION FERTILIZERS HEAD. 1 **16:30.33**

Fertilization		Serie		
F1	-	0	Text	Prog 05
F2	*	0078,5 L	Text	Prog 05
F3	*	0090,0 L	Text	Prog 02
F4	-	0100,0 L	Text	Prog 02
F5				
F6				
F7				
F8				

Head1 Head2 Head3 Head4 <Pag Pag>

PARALLEL - UNITS

It shows in each fertilizer the units in time or volume that remain to be applied.

There may be more than one program fertilizing at the same time if they do not repeat the same fertilizer.

CONSULTATION FERTILIZERS HEAD. 1 **16:30.33**

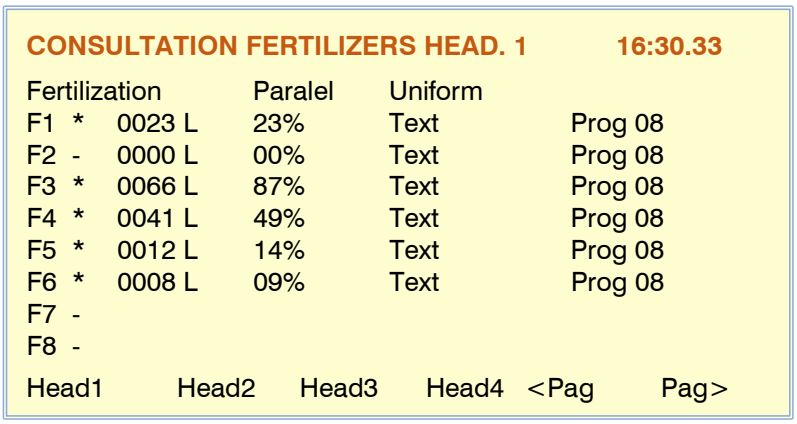
Fertilization		Paralel	Units	
F1	*	06’30”	Text	Prog 03
F2	*	08’05”	Text	Prog 03
F3	*	03’00”	Text	Prog 03
F4	-			
F5	*	12’45”	Text	Prog 14
F6	*	04’27”	Text	Prog 14
F7	-			
F8	-			

Head1 Head2 Head3 Head4 <Pag Pag>

PARALLEL - UNIFORM

The units of fertilizer in time or volume that remain to be applied.
injection percentage.
Descriptive text of the fertilizer.
Program that is using the fertilizer

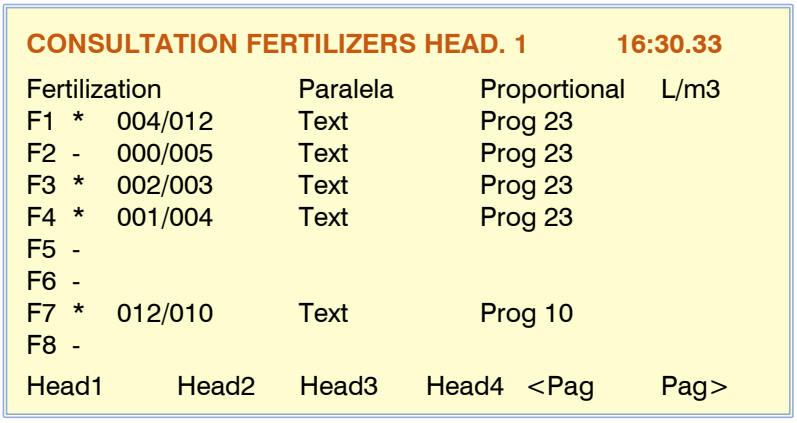
There may be more than one program fertilizing at the same time if they do not repeat the same fertilizer.



PARALLEL – PROPORTIONAL – COUNTER PULSES

In units of volume L/m3 or in cl /L.
In the query we see the pending values to be applied in the current proportion, the fertilizer on the left and the irrigation on the right.
When discounting the last irrigation unit, it will reload the proportion established in the program.

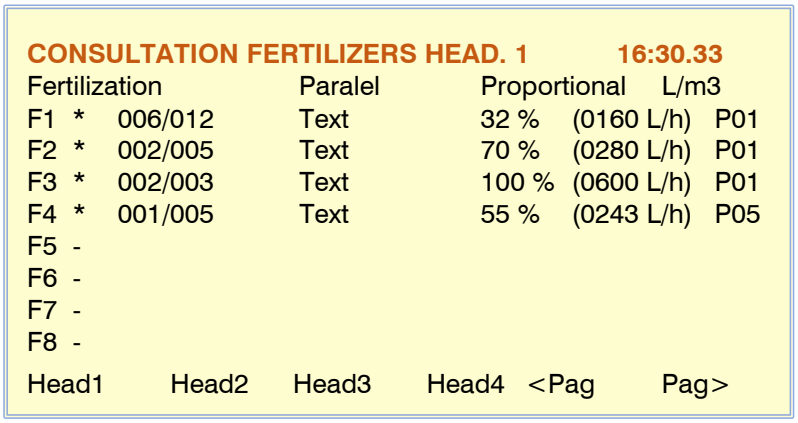
There may be more than one program fertilizing at the same time if they do not repeat the same fertilizer.



PARALLEL – PROPORTIONAL – EXPECTED FLOW

In units of volume L/m3 or in cl /L.
In the query we see the programmed values, the fertilizer on the left and the irrigation on the right, the name of the fertilizer, the percentage (%) of injection that is being applied to meet the proportion together with the value of theoretical flow that is being applied .

If it is not solar irrigation, there may be more than one program fertilizing at the same time if they do not repeat the same fertilizer.

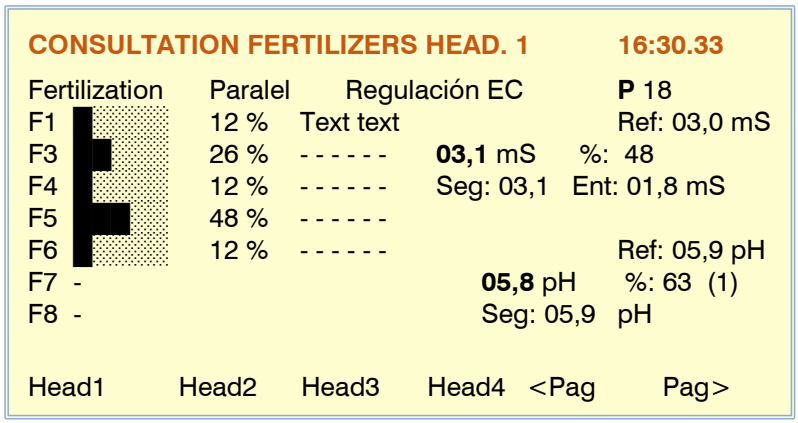


In the solar irrigation mode: as programs and sectors enter and leave due to the availability of energy, it is recalculated, depending on the theoretical irrigation flow and the injection flow of each fertilizer, the pulsations of injection. There can be several programs using the same fertilizer at the same time if they have the same ratio.

PARALLEL – CE REGULATION

It shows the percentage of injection of each fertilizer based on the configured proportion. On the right it shows the EC application percentage - and pH if there is acid regulation - the values of the main, input and safety sensors, and the reference for the work set point.

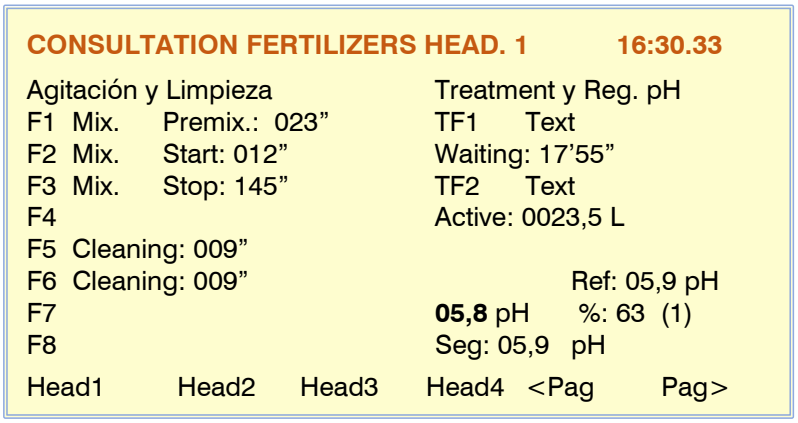
You can only fertilize one program at a time.



The second screen reports the variables related to fertilizers.
In the left column we find the times of each agitator or the time of use of the cleaning, in this case it applies water to the fertilizer injection.

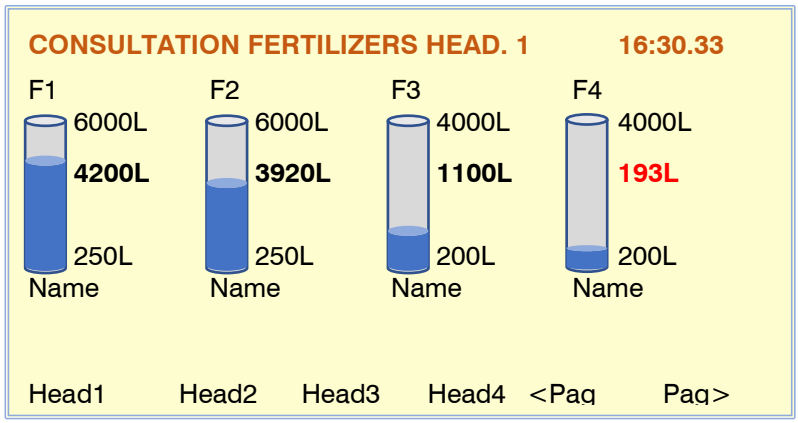
In the right column we have the phytosanitary treatments 1 and/or 2, with the waiting times to apply or the units of time or volume of application.

When there is a pH regulation outside of the EC regulation, then we find the values of the main and safety sensors, the reference for the work setpoint and the percentage of acid application.

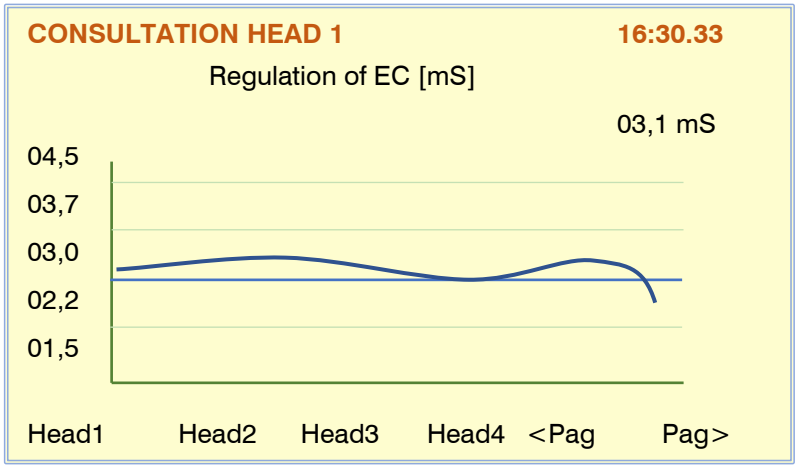


The third screen shows the volumes of fertilizer available in the tanks, their maximum volume and the alarm value.

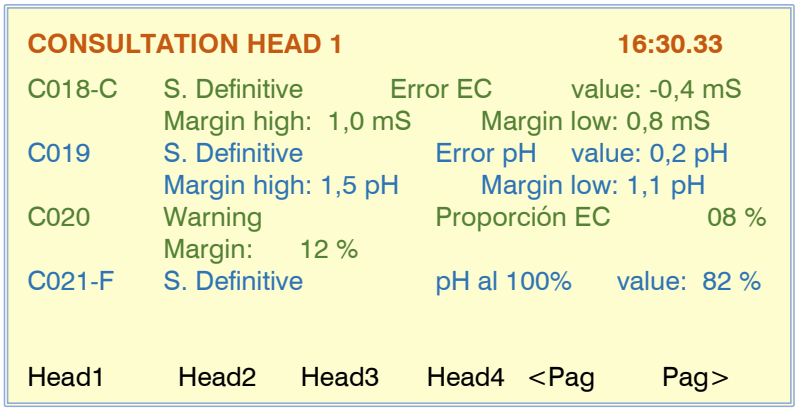
The fourth and subsequent screens summarize the "conditioning factors" related to fertilization



When operating in conductivity (EC) or acidity (pH) regulation we have the graphic screen where we see how the regulation evolves in the last 30 seconds, the EC or pH target reference is in the center of the scale, the value of the sensor is recorded with the oldest value located on the right and the most recent next to the scale.
The graph is updated every second.

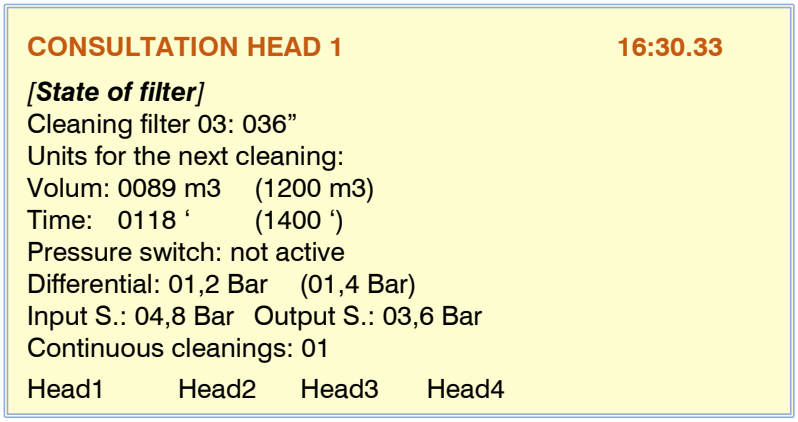


And already on the last screen we have the consultation of the conditions that may affect fertilization.



7.5. Filters

In this section it will show the information related to the cleaning of the filter groups.
If there is more than one group, we will access them using the function keys "F1" to "F4" marked with heads 1 to 4.



The first information corresponds to the " Filter status ", the different variables are:

Stopped , **the** filter is not cleaning or filtering.
Cleaning , the filters are being cleaned.
Filtering , irrigation water circulates through the filters.
Fault , a fault has occurred due to continued cleaning. To resume, you must carry out an order in *"Manual – Filters"* .
Out of service , stop cleaning by manual order.
Standby , cleaning will take place when you resume watering.
General Stop/Spindle , The equipment or spindle is completely stopped, when resuming it will continue where it was.
Out of Service General/Head end , All the work in progress has been finished and it is completely stopped, when resuming it will wait for the next starts.

cleaning values

Cleaning filter 03: 036" , a filter is washed, the time in seconds corresponds to the time remaining to finish.
Cleaning filter 04: pause 06" , the filter washing will be executed prior to the execution of the pause.

Sensors and counters

Units for the next cleaning: **Volume** : 0089 m3 (1200 m3) **Time** : 0118' (1400')
There is a counter for units of volume and time in which water has circulated through the filters, once it has reached the programmed value, value in brackets, then it will clean the filters.

Pressure switch , when the detection operation is by differential pressure switch then it will report if it is "active" or "not active"

Differential , value of the difference between the inlet pressure and the pressure at the outlet of the filters, in parentheses the reference value to activate cleaning.
of pressure **sensors , the first value corresponds to the pressure at the inlet and the second to the outlet.**
Differential: 01.2 Bar (01.4 Bar)
S. Input: 04.8 Bar S. Output : 03.6 Bar

Cleans in a row , here you will accumulate the number of cleans in a row, they start within five minutes after the end of a clean.

7.6. Sensors

Four different screens are available to show the status or value of the different sensors.
They are divided into four groups:

Digital Sensors	F1 SDig
Analog Sensors	F2 SAna
Sensors Counters	F3Scon
Logic Sensors	F4 SLog

Each one is accessed by pressing the function keys F1 to F4, also with the F5 and F6 keys to page down or page up, we see the previous or the following sensors of the same group.

Digital Sensors , shows each of the 80 sensors the status of the digital input, the status of the sensor and the descriptive text.
Sensor status :
Asset
Inactive
Mistake

Analog Sensors , each of the 120 sensors shows the value or status of the sensor and the descriptive text.
Sensor status :
sensor value
Mistake

In Counter Sensors, it shows each of the 80 sensors the status or value and the descriptive text.
Sensor status :
Sensor value, flow rate or energy flow.
Mistake
Information related to irrigation is added when the meter has assigned sectors, the offset of the instantaneous flow in relation to the expected flow of the active sectors and the leakage flow when there are no active sectors. A positive offset indicates more irrigation flow than expected.
If it is a rain gauge, it shows the precipitation of the day in addition to the value of the last hour.
If the counter sensor uses a digital input then it reports the status of the contact, 0: open, 1: closed.

Logical Sensors , there is a first summary screen of the 20 sensors, with the "operation", the text and the result.
Entering the sensor number accesses the summary screen.
Operation :
And (Y), OR (O), Addition, Subtraction and Average.
Result :
Active, Not Active, Value, or Error.

DIGITAL SENSOR CONSULTATION 16:30.33

Dig 001	[1] Active	Pressure
Dig 002	[1] Not active	Alarm
Dig 003		
Dig 004	[0] Not active	Level
Dig 005		
Dig 006		
Dig 007		
Dig 008		
Dig 009		

DigS AnaS MetS LogS <Page Page>

DIGITAL SENSOR CONSULTATION 16:30.33

Ana 001	18.3 ºC	Temp ext.
Ana 002	0677 W/m2	R. solar
Ana 003	062 %HR	Hum Rel
Ana 004		
Ana 005	34,2 %	Z1 lev20
Ana 006	29,7 %	Z1 lev30
Ana 007	22,8 %	Z1 lev40
Ana 008		
Ana 009		

DigS AnaS MetS LogS <Page Page>

DIGITAL SENSOR CONSULTATION 16:30.33

Con 01	002.4 m3/h	Gen 1	Leak	[0]
Con 02	078,6 m3/h	Gen 2	Irrigate -012 %	[1]
Con 03	0304 L/s	Well		
Con 04	0000 L/s	Raft		
Con 05	022,6 L/h	CFert1	Fert.	
Con 06	023,2 L/h	CFert2	Fert.	
Con 07	000,0 L/h	CFert3		
Con 08	008,50 L/m2	Rain.	H: 002,20	
Con 09	082,7 kW	Energy		

DigS AnaS MetS LogS <Page Page>

DIGITAL SENSOR CONSULTATION 16:30.33

Nº of Sensor: 00

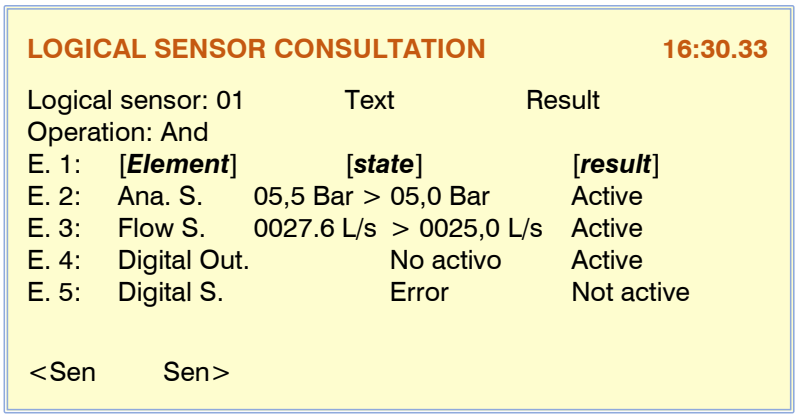
Log 01	And	Text	Active
Log 02	Or	Text	Not active
Log 03	Add	Text	318,3 m3/h
Log 04	Subtr.	Text	01,8 Bar
Log 05	Average	Text	12,9 ºC
Log 06			
Log 07	Or	Text	Not active
Log 08			

DigS AnaS MetS LogS <Page Page>

Entering the logical sensor number accesses the screen with expanded information on the sensor's operation.

Element, list of possible elements:

- digital sensor
- conditioning
- digital output
- logic sensor
- Sector
- analog sensor
- counter-flow sensor
- sensor logic-value
- analog output



The status of each item is displayed in the following column:

- Asset
- Inactive
- Sensor or output value, Greater (>) the reference value – active/not active
- Sensor or output value, Less (<) the reference value – active/not active
- Sensor value or output
- Mistake

The result of each element is shown in the following column:

- Asset
- Inactive
- Mistake

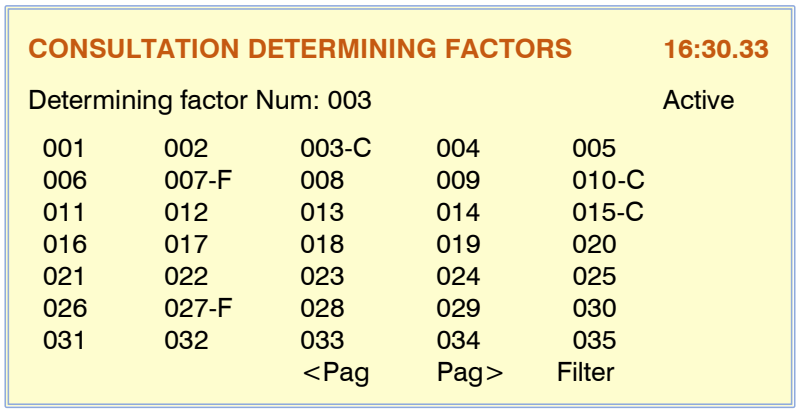
7 .7. Conditioning factors

On the first screen it shows all the conditions; Next to the condition number, its status is briefly indicated:

C = active, conditioning
d = active in permanent unemployment
F = in out of service

The function key “F5” – Filter, organizes the view of the conditions to see them all or only those defined (with values).

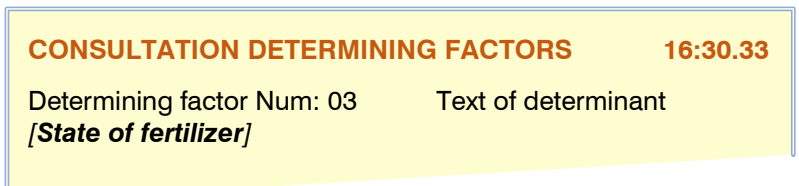
Filter **All**
Def. (only the configured ones)



The state of the filter is memorized, when re-entering the query it will apply the same filter.

When accessing the query of a determining factor, it shows its description and in the second line a descriptive text of the " State of the determining factor ", the different variables are:

“ **Not active** ” The conditions to be active are not met.
“ **Active** ” The conditions are met.



“ **Out of service** ” By manual order it has been left out of service, it will not condition.

The rest of the variables on the screen will depend on each “ Type ” and “ Origin ”.

Type “ **Definitive Stop** ” or “ **Temporary Stop** ”

Origin “Digital / Logical Sensor”
sensor status
Timing to detection
Origin “Analog / Logic Sensor” - “Flow Counter Sensor”
sensor value
Reference
Startup or detection timing
Origin “Accumulated Counter Sensor”
Value of the accumulated in the previous hours
Reference
Origin “Flow Error”
Sensor value and margin deviation value (%)
High / Low Margin Reference
Startup or detection timing
Counter Pulse Time (minutes)
Origin “ EC ratio error”
Fertilizer in “out of range” in injection rate.
Timing to detection
Origin “EC Error” - “pH Error” – “Mix Error” - “EC Drain Error” - “pH Drain Error” – “Drain Error”
sensor value
Reference (+) high margin and Reference (-) low margin
Timing to detection
Origin “100% EC” - “100% pH”
Injection value (%)
Detection timing
Origin “CE safety” - “pH safety”
Value of the difference between the regulation sensor and the safety sensor
difference reference
Detection timing
Origin "Communication"
Element status (module x, coordinator, EAR, EAM, user)
Equipment: AgroBee-L1-2, AM120 1-2, AR433 1-2, PC- Cloud .
Detection timing
Origin “Schedule”
Time condition status
Active schedule / Non-active schedule
Active day / Non-active day

Temporary attempts , number of attempts made before reaching the final shutdown. Once it has entered the definitive stoppage, it must be activated again by a “Manual” order.
What for : irrigation / fertilization / pH regulation

“ **Conditional Stop** ” **Type**

Origin “Digital / Logical Sensor”
sensor status
Timing to detection
Origin “Analog / Logic Sensor” - “Flow Counter Sensor”
sensor value
Reference
Startup or detection timing
Origin "Communication"
Element status (module x, coordinator, EAR, EAM, user)
Equipment: AgroBee-L1-2, AM120 1-2, AR433 1-2, PC- Cloud .
Detection timing
Origin “Schedule”

Time condition status
Active schedule / Non-active schedule
Active day / Non-active day

Type " **Start** " or " **Start** / **Stop** "

Origin "Digital / Logical Sensor"
sensor status
Timing to detection
Origin "Analog / Logic Sensor" - "Flow Counter Sensor"
Sensor value or "start" value plus sensor integration value
Reference
Startup or detection timing
Origin "Accumulated Counter Sensor"
Value of the accumulated in the previous hours
Reference

Type " **Notice** "

Origin "Digital / Logical Sensor"
sensor status
Timing to detection
Origin "Analog / Logic Sensor" - "Flow Counter Sensor"
Sensor value and the integrated value in the previous hours

Reference
Startup or detection timing
Origin “Accumulated Counter Sensor”
Value of the accumulated in the previous hours
Reference
Origin “Flow Error”
Sensor value and margin deviation value (%)
High / Low Margin Reference
Startup or detection timing
Counter Pulse Time (minutes)
Reference for leakage
leak delay
Origin “EC ratio error”
Fertilizer in “out of range” in injection rate.
Timing to detection
Origin “EC Error” - “pH Error” – “Mix Error” - “EC Drain Error” - “pH Drain Error” – “Drain Error”
sensor value
Reference (+) high margin and Reference (-) low margin
Timing to detection
Origin “100% EC” - “100% pH”
Injection value (%)
Detection timing
Origin “CE safety” - “pH safety”
Value of the difference between the regulation sensor and the safety sensor
difference reference
Detection timing

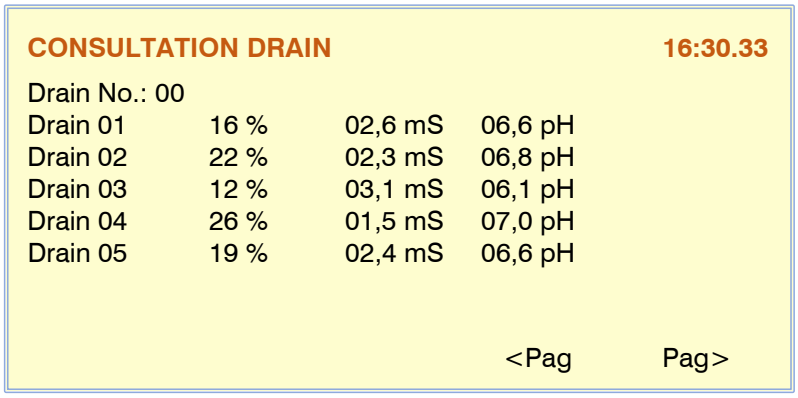
Type “ **Modify irrigation** ”, “ **Modify fertilizer** ” or “ **Modify frequency** ”

Origin “Digital / Logical Sensor”
sensor status
% to modify (of the last modification made)
Origin “Analog / Logic Sensor” - “Flow Counter Sensor”
Sensor value and the integrated value in the previous hours
% to modify (of the last modification made)
Origin “Accumulated Counter Sensor”
Value of the accumulated in the previous hours
% to modify (of the last modification made)

7.8. Drains

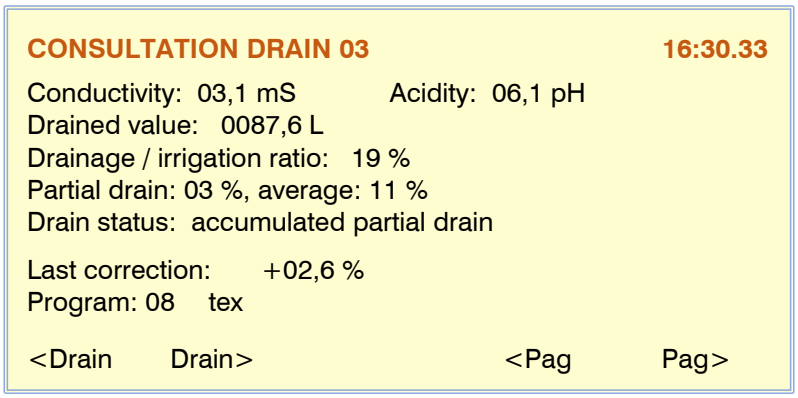
In this section it will show the information related to the drains.

In the first screens we have the list of the 20 possible drainages with the summarized information of the irrigation/drainage ratio and the current value of conductivity and acidity in the crop.



Entering the drainage number will access the complete information of each one of them. First of all, we have the EC and pH sensors with the units measured in the drained liquid.

The drained volume is shown in the second line, it will be in the format of liters or cubic meters, this value is initialized to "0" at the beginning of each irrigation.



The drainage value performed corresponds to the variable " Drain / irrigation ratio " it is the percentage of volume drained in relation to the volume or irrigation time programmed.

When the drainage compensation is carried out in the same irrigation, then we have the variables of " partial drainage " and the " average ".
The partial drainage counts the value drained since the end of the irrigation and the average corresponds to the partial drainages of the last five irrigations, all of which is used to adjust the increase or decrease of the current irrigation to achieve the objective drainage of the irrigation program.

Drain state , can be in three situations:

- Accumulating drainage, accounting for drainage while irrigating.
- Accumulating partial drainage, finished irrigation, continues counting.
- Finished, waiting for the next watering.

Last correction , "modification factor" of the irrigation units or the time between activations to achieve the target drainage in the types of compensation "next irrigation" or "activations". In the "same irrigation" type, it will not show the correction until the irrigation is finished, since it will modify the live units.

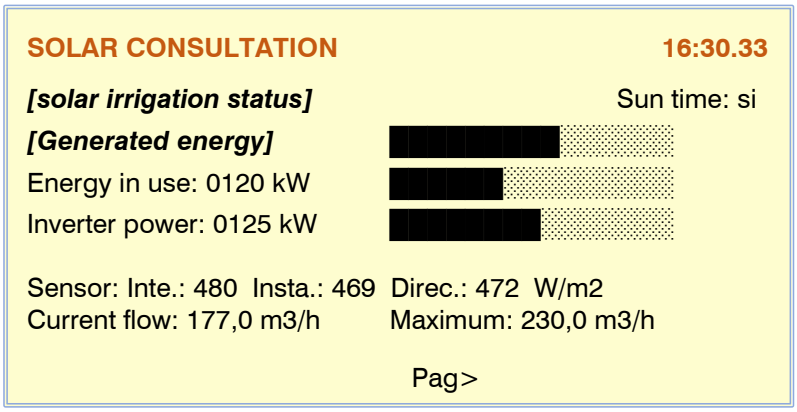
Program , number and descriptive text of the program associated with the sector that contains the witness of the drainage measurement.

On the next page we will find the summary of the conditions that affect the drainage in consultation.

To access the summary list of drains, press the “FUN” key, to access the previous or subsequent drain, press the function key F1 “Drain -” or F2 “Drena+”.

7.10. Solar

The hybrid solar irrigation query shows the variables involved in its control.



In the first line we have the " Solar Irrigation State " with the different states:

" **Not configured** ", solar irrigation is not managed.
" **Stopped** ", there are no watering orders.
" **Activo Solar** ", is being irrigated with solar energy.
" **Active Network** ", is irrigated with energy from the Network or Diesel.
" **Solar Active + Network** ", irrigating with the sum of the two energies.
" **Grid Active – Sensors Error** ", is irrigated with Grid or Diesel energy because the sensors are in error.
" **Sensors error** ", the solar irrigation cannot operate because the sensors are in error.
" **Inverter error** ", it cannot irrigate due to a fault in the inverter.

Solar time , on the right side of the screen, informs us if we are within or outside of solar time.

" Energy generated ", in the second line we see where the energy comes from:

Solar : 0000 kW, theoretical value generated by the solar plant.
Network : 0000 kW, if it is irrigated by network, it informs us of the contracted energy.
Solar + Network : 0000+0000 kW, when irrigating by network plus solar energy outside of solar hours.
Less than P1 , the solar energy value is less than the solar irrigation operating point.

Energy in use , theoretical value demanded by the irrigation sectors.
Drive power , value generated by the drive, actual value.

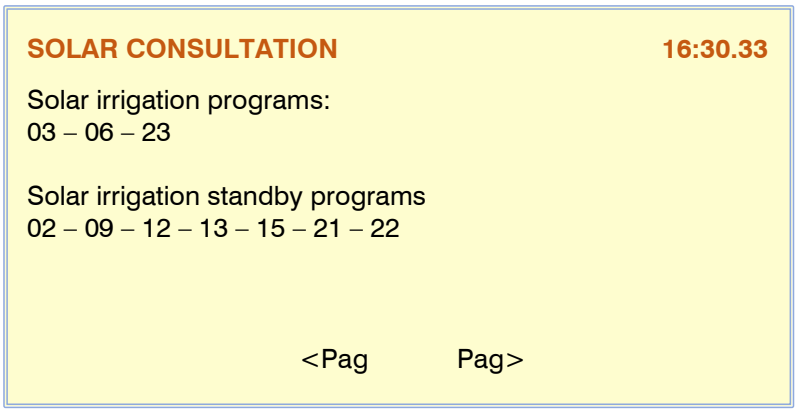
**The value of "solar energy generated" is recorded.*

Radiation sensor :

Int .: Integrated value of the last instantaneous values of the sensor.
Instagram: Instantaneous value compensated for the temperature effect.
Direc .: Value of the direct reading of the radiation sensor.

Current flow , value of the expected flow of the sectors in irrigation and the **maximum allowed** by the working pressure.

On a second screen we have additional information on solar irrigation.

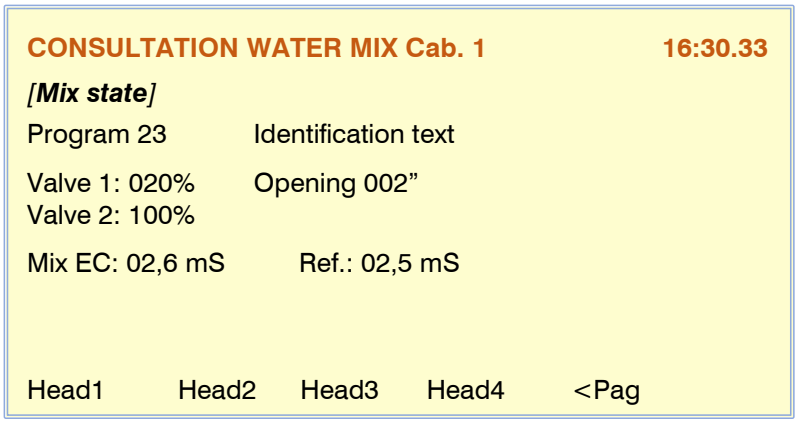


Solar irrigation programs , list of irrigation programs that use the solar irrigation control, at the end of the list add the pivots in solar irrigation.

Programs awaiting solar irrigation , list of programs or pivots waiting to be able to irrigate by solar, will do so due to an increase in energy or due to the completion of other ongoing programs.

7.11. Water mix

The merge query reports the status and related variables.
If there is more than one spindle, we will access them using the function keys "F1" to "F4" marked with spindles 1 to 4.



The first information corresponds to the " State of the mix ", the different states are:

stopped , The mixture is not active because there is no irrigation.
Initial position , it is placing the motorized valves before starting the irrigation.
Initial wait , once the valves are in the initial position, wait for the configured time to start the regulation.
Regulating , performing the regulation to achieve the mixing objective.
Final position , at the end of the irrigation it is placing the motorized valves in the final position.

who uses the mixture
Program , makes use of the program number mix.

Motorized valves , position and status of valve 1 (low conductivity) and valve 2 (high conductivity)

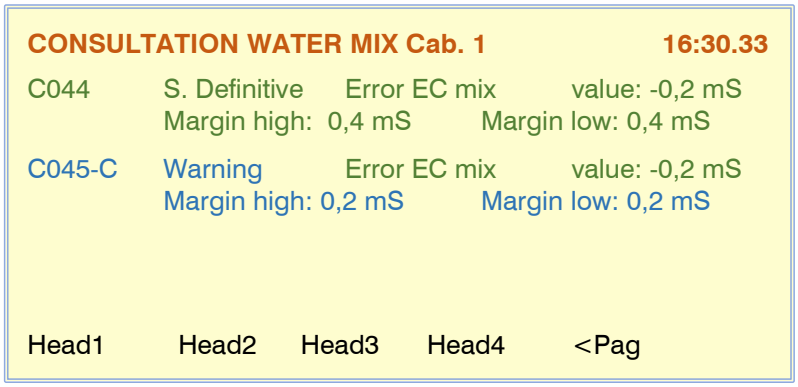
- Positioning by time :
  - 0 to 100%
  - 20%, opening 007”
  - 20%, closing 004”
- Sensor positioning :
  - 0 to 100%
  - 20%, opening at 23%
  - 20%, closing at 18%
  - 20% sensor error

mix conductivity

The sensor located at the outlet of the mixture of the two supplies gives us the resulting conductivity value, then the target reference.

Informative screen of the conditions of each mixture

The **determining factors** assigned to each mix will be displayed on a separate screen for each one.



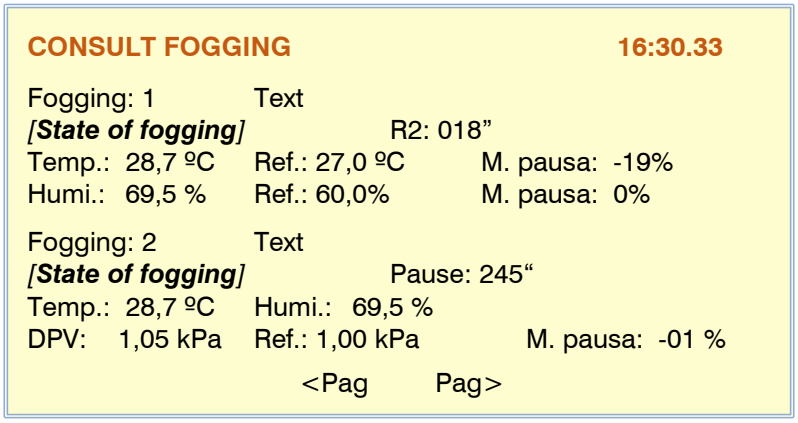
Each determinant occupies two lines of information, it is a summary, to see all the information you have to go to "*Query - Determinants*".

The first value corresponds to the condition number " **C006** " followed by the status and the **type** , they can be the following:
Temporary/Definitive Stop
Warning

7.12. Fogging

The nebulization screen reports the status of each one of them in groups of two per screen.

When accessing the nebulization query, it shows us a descriptive text of the " State of nebulization ", the different variables are:

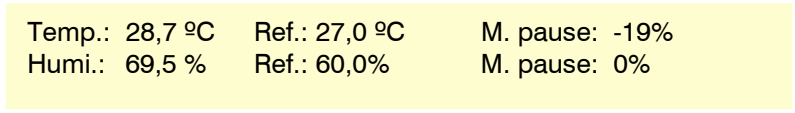


“ **Stop** ” the misting is stopped, there is no demand.
“ **Activa** ” is nebulizing.
“ **Active on pause** ” performing the pause between cycles.
" **Out of active hours** " when it is out of active hours, the nebulization stops.
“ **Conditional stop** ” there is a condition that keeps the nebulization stopped waiting to be able to resume.
“ **Definitive stop** ” a condition has definitively stopped the nebulization, the cause must be solved and access *“Manual – Nebulizations”* to end the stoppage.
“ **Manual start** ” manual order to maintain nebulization cycles.
“ **Manual stop** ” manual order to leave the nebulization stopped.

output active or pause

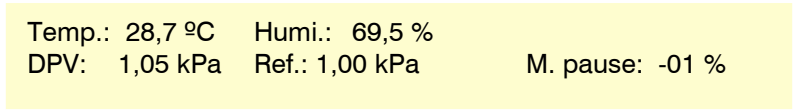
If the nebulization is "active" or "active in pause" it shows the times to the right of the "status"
R2: 018” , misting exit 2, 18 seconds to go to the next exit.
Pause: 420” , waiting to resume a new cycle.

Operative by temperature and/or humidity



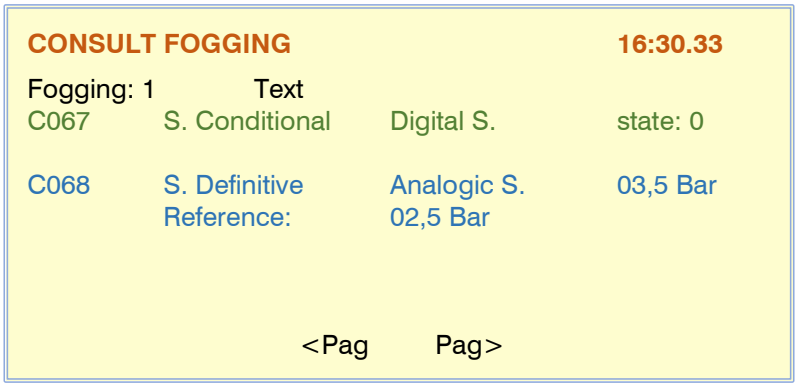
When the nebulization acts by the temperature and/or the relative humidity, it gives us the instantaneous value of the sensors together with their references, the value of "modify pause" corresponds to the percentage reduction of the pause time, the one with the highest will be applied. time.

Operative by DPV (Vapor Pressure Deficit)



When the nebulization works by calculating the DPV, it will begin to nebulize when the value reaches the reference and as the deficit increases, it will reduce the pause between cycles. The greater the deficit, the humidification will increase.
It shows the temperature value, the humidity value, the DPV result and the reference together with the reduction value.

Informative screens of the conditions of each nebulization



The **conditions** assigned to each nebulization will be shown on a separate screen for each one.

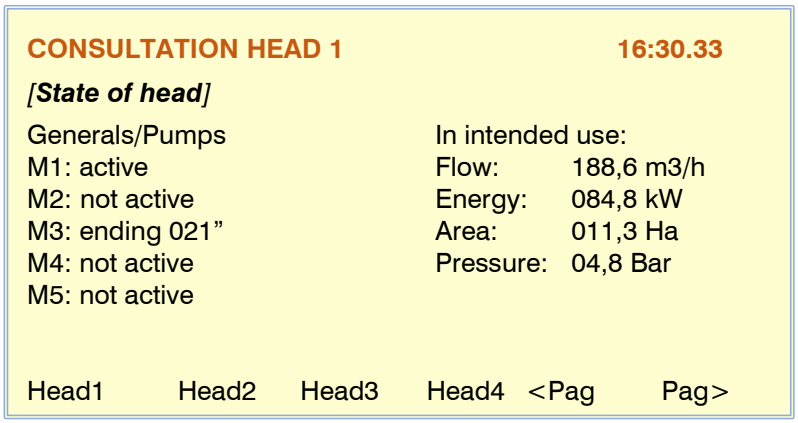
Each determinant occupies two lines of information, it is a summary, to see all the information you have to go to "*Query - Determinants*" .

The first value corresponds to the condition number " **C006** " followed by the status and the **type** , they can be the following:
Definitive/Conditional Unemployment
Start / Start/Stop

Next, it shows the **origin** associated with each determining factor:
Digital/Analog/Logic Sensor/Counter
Depending on the previous variables, it will show the informative variables of the conditioning control.

7.13. Heads

The head query reports the status and related variables.
If there is more than one spindle, we will access them using the function keys "F1" to "F4" marked with spindles 1 to 4.

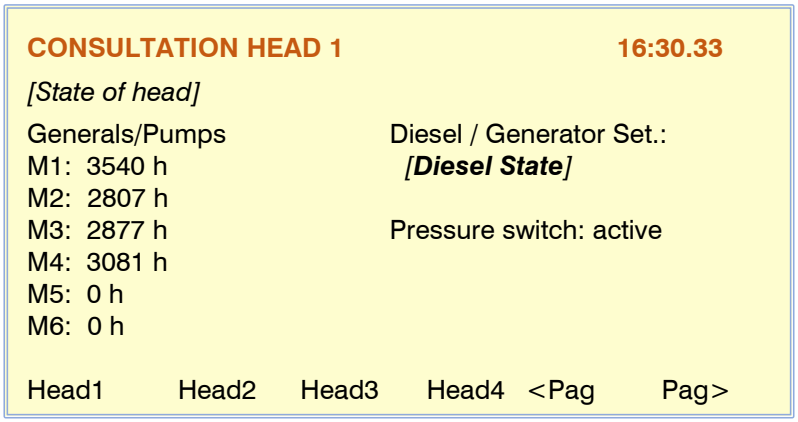


In the first line we have the header status , it can show the following:
" **Out of service** ", it is in this state due to a manual order on the spindle or in general.
" **Stop** ", waiting to resume pending irrigation, by manual order to the header or general.
" **Definitive Stop of Programs-Filters-Pivots** " one of these elements linked to the spindle is stopped.
" **In rest** ", no watering is carried out in the head.
" **In irrigation** ", water circulates through the head.
" **In irrigation + fertilization** ", watering and fertilizing.

Generals/Motors , the status of the motors or general valves can show:
"active", active output.
"not active", output stopped.
"finishing 018" ", waiting time to stop the motor or the closing of the general solenoid valve.
"waiting 009" ", waiting to activate, in seconds.
"diesel wait 067" ", only for M1, waiting to activate the alternator while the diesel group starts up.

Intended Use Values
"Predicted flow", the sum of the expected flows of the sectors in irrigation of the head.
"Foreseen energy", sum of the expected energy consumption of the irrigated sectors.
"Irrigated area", irrigated hectares, sum of the areas of irrigated sectors.
"Regulation pressure", pressure demanded by the current sectors (using motor 1).

On the next page, it reports the time in use of the engines and the variables related to the diesel engine/generating set.

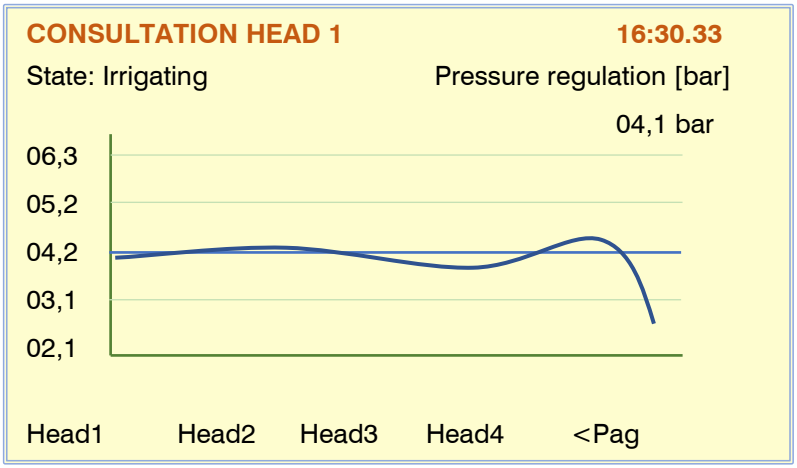


Time of use , for each motor or general valve, shows the accumulated hours of operation. To reset it to 0, go to "Delete motor totalizers"

Diesel / Generator , in the column on the right we find the information on its status:
" **Stopped** ", Engine stopped.
" **Preheating: 14"** ", preheating, pre-start time.
" **Start: 05"** / **attempt: 2** ", Carrying out the engine start next to the attempt number "
" **Wait for: 31"** / **attempt: 3** ", waiting for the next attempt.
" **Waiting M1: 45"** ", diesel started and waiting for the alternator of the generating set to enter.
" **Activated** ", Diesel engine or group activated.
" **Wait to stop: 112"** ", completed irrigation and M1, waiting to stop the diesel engine.
" **Stopping: 18"** ", stopping the diesel.
" **In fault** ", diesel in fault, has not started after several attempts. It will try again at the next watering.

Pressure switch , "active" or "not active" state of the oil pressure detector in the diesel engine, there is pressure in active.

Advancing to the next screen we have the graph where we see how the pressure regulation evolves in the last 30 seconds, the target pressure is in the center of the scale, the sensor value is recorded on the screen with the oldest value located at the right and most recent next to the scale.
The graph is updated every second.



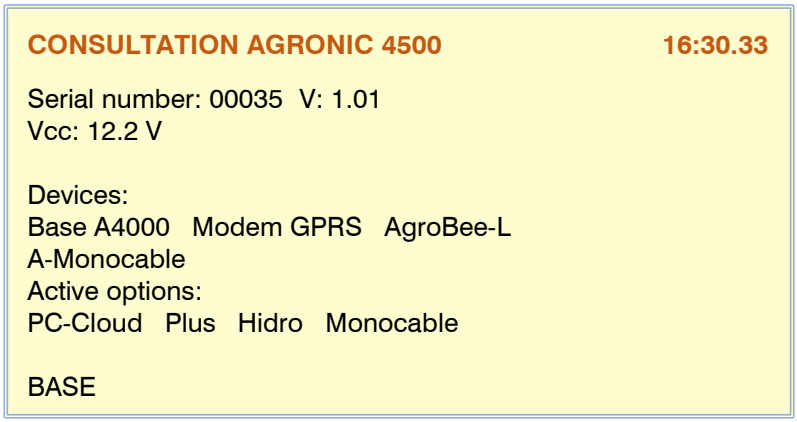
7.14. Communication

Consult the manual “A4500 – Communications”

7.15. Modules

Consult the manual “A4500 – External Modules”

7.16. Agrónic



Serial number : Agrónic serial number.
V: Agrónic software version.
Vcc : supply voltage.

Devices:
It shows which physical devices the Agrónic has connected.

A4000 Base: A4000 base is detected to be connected.
A7000 Base: A7000 Base has been detected to be connected.
A4500 Base - A4500 Base is detected to be connected.
Modem: The modem link has been detected to be connected.
Wifi: The Wifi link has been detected to be connected.
AgroBee -L: it has been detected that an AgroBee -L radio module coordinator is connected .
A- Single Cable : An EAM link has been detected to be connected.
A-Radio 433: Detected that an EAR link is connected.
ModBus Ext: An external ModBus device has been detected to be connected .
Davis: Detected that a Davis Ventage Pro 2 Station Gateway is connected.

Active options:
The activated software options PC-Cloud, Cloud, Plus, Hydro, Pivots, Solar, Climate, Monocable and Radio are shown.

Using the function key F1 (BASE), you can see which element (sector, general, fertilizer, filter...) is assigned to each of the inputs and outputs of the base, as well as its status.

First is the index and one of the following identifiers:

SD: digital output

DI: digital input
AI: analog input
AO: analog output

In the second column, the element followed by its index number, the identifying text and the raw value that is sent or received from the base.

Using the “1” key, you access an internal menu that allows you to check the communication status of the base and extensions, the status of the digital inputs and the analog inputs in mV (raw values).

8. PRACTICAL EXAMPLES

9. TROUBLESHOOTING

10. AGRONIC 4500 MANUALS

Apart from this manual, the Agrónic 4500 has other manuals and didactic videos that can be consulted on the Progrés website .

ASSEMBLY AND CONNECTION MANUAL.

Intended for the person who physically installs the Agrónic on the farm or in the electrical panel. The dimensions and how the wiring of the different connection options must be done are indicated.

INSTALLER'S MANUAL.

Aimed at the installer who configures the Agrónic irrigation system. There is an explanation of all the parameters related to irrigation: general, sectors, programs, fertilization, etc. The explanations of programming, manual and consultation are in the user manual.

USER'S MANUAL.

Aimed at the end user of Agrónic. There are simple explanations on the most common usage of programming, manual actions, and queries. Parameters are not explained in this manual.

COMMUNICATIONS MANUAL.

Intended for the installer that configures communications with the Progrés cloud for “Agrónic Web” and “Agrónic App” or with the Windows program “Agrónic PC”. There is an explanation of the different communication systems.

EXTERNAL MODULES MANUAL.

Intended for the installer who configures the communications and inputs/outputs of the external modules “ AgroBee -L”, “Agrónic Monocable 120”, “Agrónic Radio 433”, “External Modbus Devices” and “Expansion Modules”.

VIDEO TUTORIALS

Progrés website and on the YouTube channel you can find educational videos that explain, step by step, the most frequent queries we receive. We recommend that you consult them when you have any questions or problems, you may find the solution there.

OTHER MANUALS

Manual A4500 PIVOTS. Intended for the installer and the end user who uses the equipment to control pivots.

11. SUMMARY

Black color : basic model
Blue color : Plus option
Green color : Hydro option
Orange color : Pivots option
Red color : Solar option

In Italics : novelty in relation to A4000-A7000

PROGRAMS Settings for each

- Basic versión: 40 Versión Plus: **99**
- Type subprogram
  - 12 subprograms in basic version
  - 20 subprograms in plus version
  - *Alternate* or no
- Linear Type
  - 12 positions in basic version
  - 20 positions in plus version
  - Positions grouped each n
- Start:
  - Sequential
  - Days of irrigation:
    - weekly
    - Frequency
    - Calendar
- Units of irrigation:
  - Hours – minutes
  - Minutes – seconds
  - Cubic meters (m3)
  - *m3 per hectare*
  - *m3 per hectare of time (h:m)*
  - *Milimeters (mm)*
- Tipe of fertilization:
  - Units of time an volume
  - Uniform in time or volume
  - Proportional in L/m3
    - Meter pulses or predicted flow
  - Porportional in cl/L
    - Meter pulses or predicted flow
  - EC regulation
  - Input EC regulation
  - Acid 1 or 2
- Group or priority
- Irrigation curves
  - Irrigation units
  - Fertilizer units
  - Time between activations
- *Irrigation by ETc (evapotanspiration)*
  - m3 per hectare
  - Milimeters (mm)
  - m3 por hectare to time (h:m)

PROGRAMS – Starts conditions

- 6 Start times
- Start type
  - Secuential of program
  - Weekdays
  - Frequency of days
  - *Calendar*
- Nº of activations
- Active schedule
- Active period
- Manual factor
- Drain
- Mix reference

PROGRAMS – Type Subprogram

- For every subprogram:
  - De 1 a 10 sectors o *groups*
    - (maximum 40 sectors)
  - Units of irrigation
  - Security time
  - Pre y Postirrigation
  - Fertilizers 1 to 8
  - Reference of EC
  - Reference of pH
  - *Treatment 1*
  - *Treatment 2*

PROGRAMS – Lineal type

- For each position:
  - One sector or group
  - Units of irrigataion
  - Security of time
  - Pre y Postirrigation
  - Fertilizers 1 a 8
  - Reference of EC
  - Reference of pH
  - *Treatment 1*
  - *Treatment 2*

HYBRID SOLAR IRRIGATION

- Use of solar energy
- Use of grid or diesel power
- Use in “Add of energies” mode
- Generated Energy vs Solar Radiation
- Pressure Limit vs Flow
- Solar time

SECTORS

Basic version: 99 Plus version: **400**
Output
Auxiliary output
Nº de head
Assign to pumps/generals
Time for "water hammer"
Assign to general pump
Flow sensor:
- Digital
- *Private meter*

Expected flow
Assign to energy meter
Predicted power
Digital input for manual start
Pressure reference
Sector area
Crop
Correction coefficient
Descriptive text

GROUP OF SECTORS

Nº of groups: 40
Sectors by group: 20
Descriptive text
Numbered from 501 to 540

DETERMINING FACTORS

From 1 to 120
Type:
- Definitive stop
- Temporary stop
- Conditional stop
- Program start
- Start / Stop program
- Warning
- Irrigation modification
- Fertilzer modification
- Frequency modification

Origin:
- Digital sensor
- Analogic sensor
- Logic sensor
- Meter-flow sensor
- Meter- accumulated sensor
- Flow error
- EC error
- PH error
- 100% EC
- 100% PH
- Safety EC
- Safety PH
- EC proportion
- Mix EC error
- Drain error
- Drain EC error
- Drain PH error
- Comunication
- *Schedule*
- *Fertilizer tank*

SMS to phone A-B-C
Activate alarm
Anomaly yes/no
To all programs
Affects heads 1-2-3-4
Stop watering/fertilizer/pH
Descriptive text

SENSORS

Digitals, from 1 to 80
- Register, yes/no
- Descriptive text

Analogics, from 1 to 120
- Formats: 31
  - Units: multiple
- Tare
- Descriptive text

Meters, from 1 to 80
- Measure:
  - Volum
  - *Energy*
  - *Units*
- Descriptive text

Logics, from 1 to 20
- Operation:
  - Add
  - Substraction
  - Average
  - And (yes)
  - Or (or)
- Elements:
  - Digital sensor
  - Determinant factor
  - Digital output
  - Logic sensor
  - Sector
  - Analogic sensor
  - Meter sensor
  - Logic sensor
  - Analogic output
- Register, yes/no
- Descriptive text

CLOCK – SCHEDULES

Time zone
Summer schedule
Solar calendar, use in:
- Programs / Fogging / Solar irrigation

Weekend active hours
Time setting in history

FOGGINS

From 1 to 8 foggings
Regulation by ºC and/or %HR
Regulation by DPV
From 1 to 8 foggins valves

DRAINS

From 1 to 20 independent drains
Types of compensation:
- In the same watering
- At the next watering
- Changing the time between activations

PIVOTS

From 1 to 4 pivots
8 different irrigation áreas
16 outside áreas, gun/forward
GPS / GNSS position
Irrigation by passes or time
Limitations for two active schedules
One fertilizer
Speed control
Precipation and weather calculation
Alignment, slip and pressure control
Return dry or we with postponement
Operate with diesel engine or solar irrigation
Modify rainfall by sensors
Multiple manual actions

HEAD

Basic version: 1 Plus version: **4**
Fertilization
Generals
Filters
Pressure regulation
Diesel pump
Mix of two waters

GENERALS

of Filters
of pumps
- Water hammer

of fertilizers
of Acids
of Treatments
of Alarm
of mix of two waters
de Diesel engine

FERTILIZATION

Nº de fertilizers: 8
Application format:
- Serial
- Paralel:
  - EC inyection
  - Input EC
  - Uniform
  - Proportional
  - Units
- *Solar:*
  - EC inyection
  - EC input
  - Proportional
- Mixers
- Fertilzers cleanings

PH regulation: 2
Phytosanitary treatments: 2
Units:
- Hours - minutes
- Minutes – seconds
- Liters
- Liters per hectare

Volume control in tanks

FILTERS

Basic version: 1 Plus version: **4**
Filters per head or common to all
1 to 3 beat groups per ensemble
Cleaning by:
- Watering time
- Irrigation volume
- Differential pressure switch
- *Pressure diferencial*

Stoppage of sectors
Fertilzer strike
Control of continuous cleaning
Clean during watering or at startup

FIELDS MODULES

1 or 2 groups of 20 AgroBee-L modules
1 or 2 groups of 120 Monocable modules
1 or 2 groups of 60 Radio modules
1 to 32 elements with ModBus communication

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