BAUER

FOR A GREEN WORLD

Operating Manual ECOSTAR 6000



Version V1-5 / IX-2016

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1 OPERATION AND INPUT

The ECOSTAR is operated with the **touchscreen**. In addition, the ECOSTAR 6000 **also has five physical buttons** that can be used for operation. These physical buttons perform the same function as the button on the screen that is shown directly above each physical button.
Each menu contains a "**back**" button in the lower left corner. Pressing this takes you back to the previous menu. Pressing the back button for three seconds will take you back to the main screen.
The buttons ↑ and ↓ move between the pages within a menu. These arrows are only shown if there is a next or previous page in the respective menu.

1.1 DIALOG WINDOW

The dialog window opens every time you would like to change a value or select an option. It appears after you press the value that you would like to change and serves for entering a value or selecting an option.



A numerical value can be entered in the left dialog window with the number block.

Entered numbers can be deleted with the ⌫ button.
In the right dialog, you can select from among multiple options. When an option is pressed, it appears in the provided field and can then be confirmed.

To confirm the entry, press the ✓ button; or to cancel the entry, press the ✗ button.

1.2 KEYBOARD

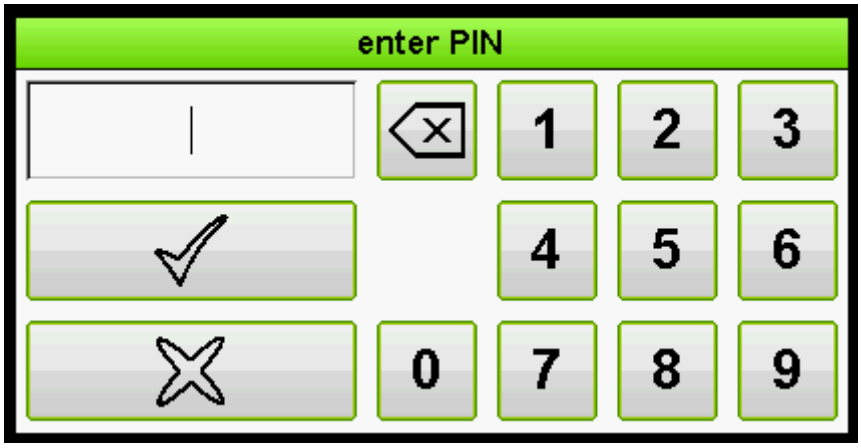
The keyboard opens every time you want to change a value that is entered as text. The keyboard appears after you press the value that you would like to change.



The ☒ button closes the keyboard without saving the input.
The "*BS*" (Backspace) button deletes individual letters.
The "*DEL*" button deletes the entire entry.
Use the "*OK*" button to close the keyboard and save the entry.

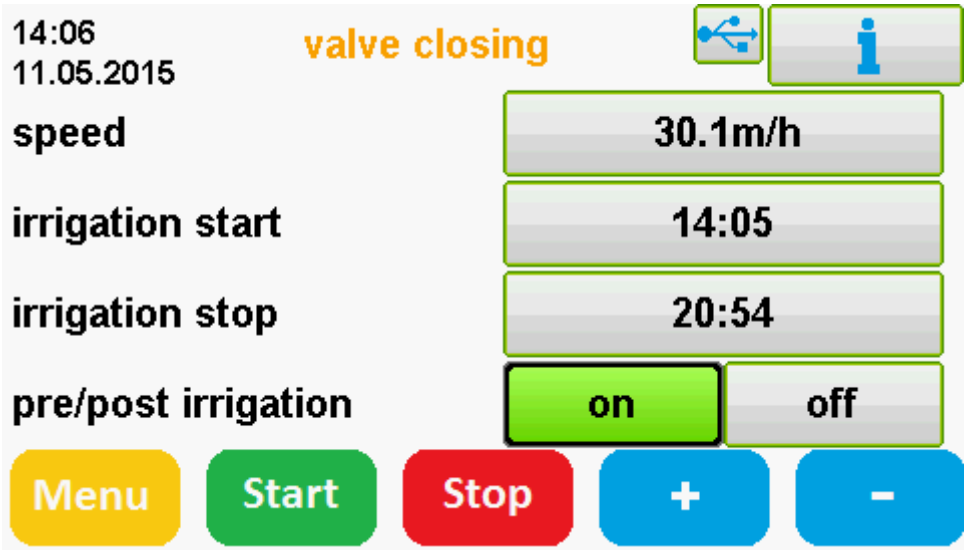
1.3 ENTERING THE PIN

The PIN code for the individual menus is set at the factory to 8570 and can be changed in the software at any time.
Before opening a menu, you will be asked to enter a PIN code. Every menu offers the option of changing the PIN code for the respective menu. There is also a master PIN code that allows you to access every menu.



2 MAIN SCREEN

In the **main screen**, you can **start and stop the irrigation**. The desired **speed** (irrigation amount) for the retraction can be **configured** here. You can also configure a **pre- or post-irrigation** or set a time when the irrigation should start automatically.
In the top line next to the time, the **current irrigation status** or an **error message** is displayed in color. If an error occurs, the info button i begins to flash red in addition to the error message.



Buttons:

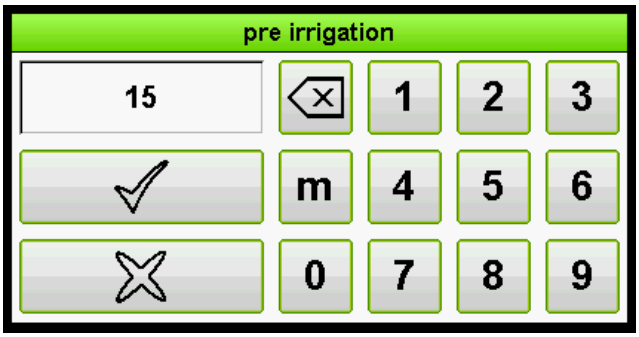
Menu: Takes you to the menu

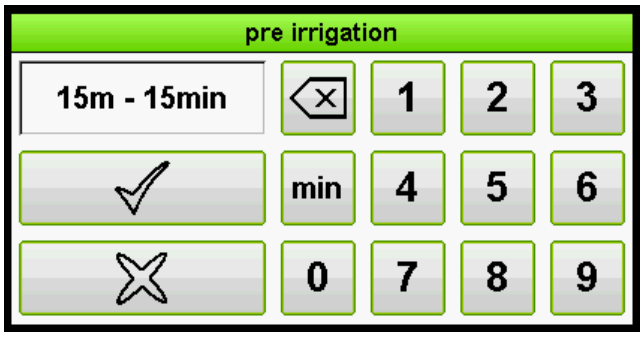
Start: The irrigation is started immediately as long as no start time or stop time is configured

Stop: The irrigation is stopped immediately. If the irrigation has already ended before the button is pressed, the ECOSTAR executes the shutdown sequence (turbine closes).

+ / - : Increases / decreases the retraction speed without opening a dialog window
Info button: In order to obtain more information about the current irrigation activity and any error messages, press the Info button i in the upper right corner. This takes you to the Info screen, which will be described in more detail later.

Pre/post irrigation:
A pre/post-irrigation is **activated** by pressing the button **once briefly**. The left button is for pre-irrigation and the right button for post-irrigation. To **deactivate** the pre/post-irrigation, the button must be **pressed again once briefly**.
If pre/post-irrigation is activated, the button turns green and displays the text “on”.
To **configure** the pre/post-irrigation, the button must be **pressed and held for three seconds**, which opens the following dialog window:





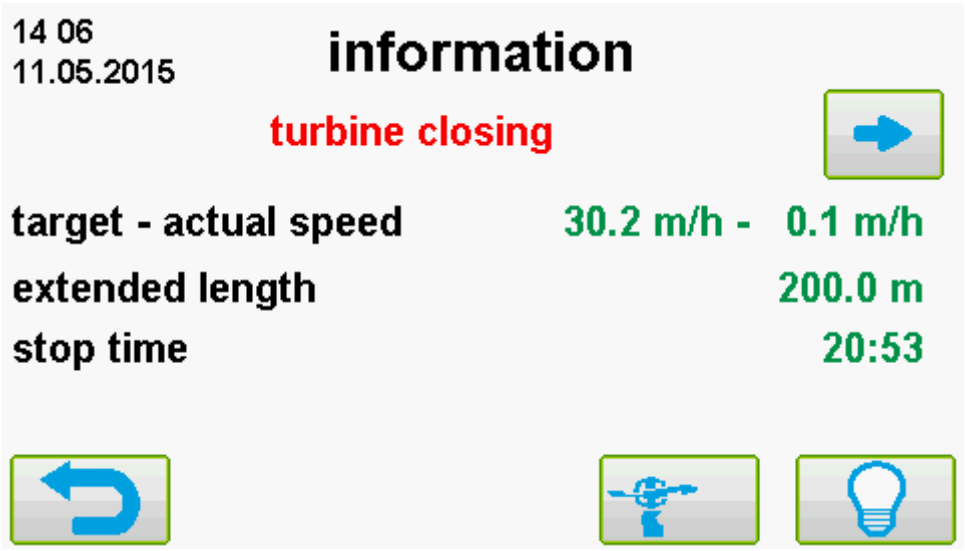
In this dialog window, you **first enter the distance** after which the pre-irrigation should be started, then press the m button (left). For post-irrigation, first enter the desired distance of the arm to the machine then confirm this with the m button.
Next, enter the time in minutes for which the machine should irrigate in place and then press the min button.

Start time:
To activate a start time, briefly press the button next to start time. To configure a time, the button must be held down. You can then enter a time at which the machine should start automatically. If the start button is pressed now, the machine switches to the status “waiting to irrigate” and the irrigation will start at the configured time.

Stop time:
The stop time calculated based on the configured speed is shown in the button next to the stop time. Here as well, it is possible to configure an automatic irrigation start. If a time is configured under stop time and activated, the ECOSTAR will calculate the duration of the irrigation based on the configured speed and use this to determine the start time required to finish the irrigation precisely at the configured stop time.

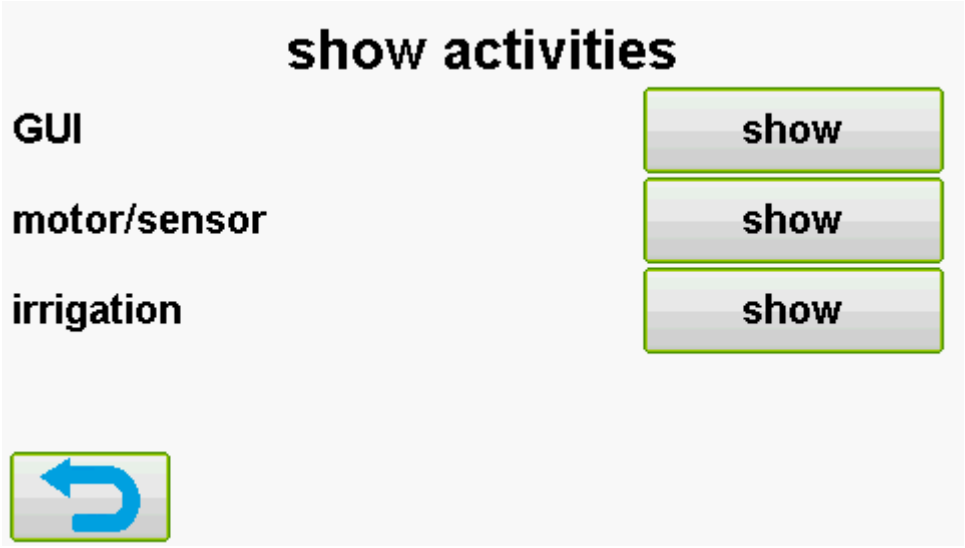
2.1 INFO SCREEN

Various information about the irrigation is displayed in the **Info screen**.
The **configured and current speed** (target / actual) as well as the currently **extended length** and the **calculated stop time** are displayed. It is also possible to configure a **sprinkler** and a **signal lamp** here. This is done by pressing the corresponding button once briefly to open the menu of the sprinkler or the signal lamp. If the button is lit green, the sprinkler and/or the signal lamp is active. When deactivated, the button is gray.
Pressing the → button with the **arrow** takes you to the **logs**.

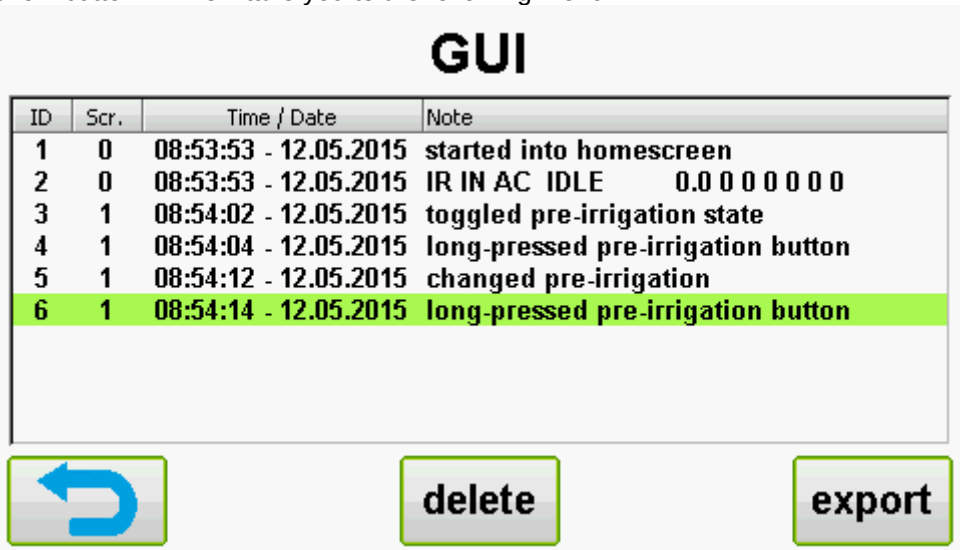


2.1.1 LOGS

The **GUI log** records information about **operations**. The **motor / sensor log** contains information about the **inputs and outputs** of the ECOSTAR. The **irrigation log** records information about the **irrigation** as well as **error messages**.
To view the log files more closely, press the “show’ button next to the desired log.



Pressing the show button will now take you to the following menu:



Here you will see a table containing the last 40 entries in the log file with date and time of the entry.
Pressing the “delete” button will delete the log file.
The “export” button can be used to export the file to a USB stick.
The export button only appears when a USB STICK is plugged into the ECOSTAR 6000

2.1.2 SPRINKLER 

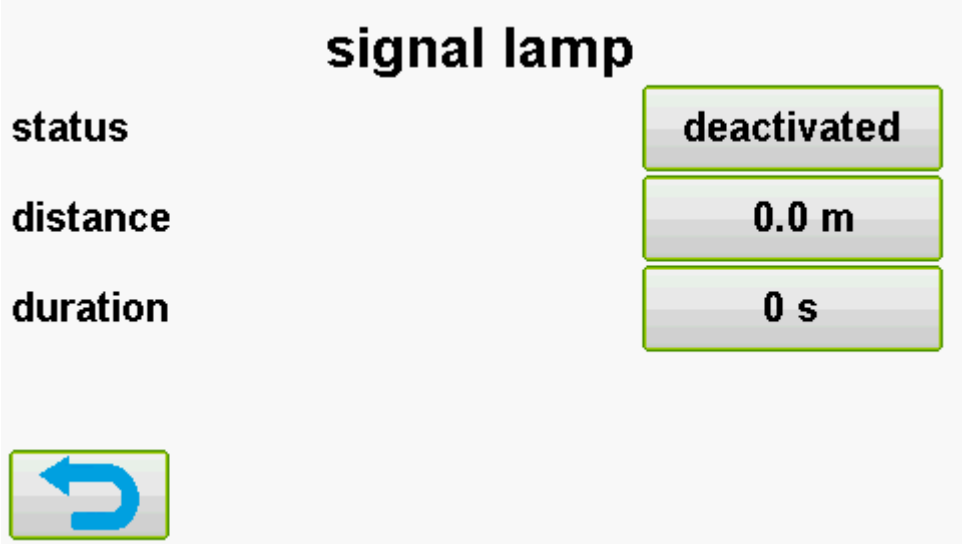
To activate the **sprinkler function**, the **activated** option must be selected in the first line (status). Under **start**, enter a **time** when the sprinkler should begin to irrigate, and under **stop time**, enter the **time** at which the sprinkler should stop.



2.1.3 SIGNAL LAMP

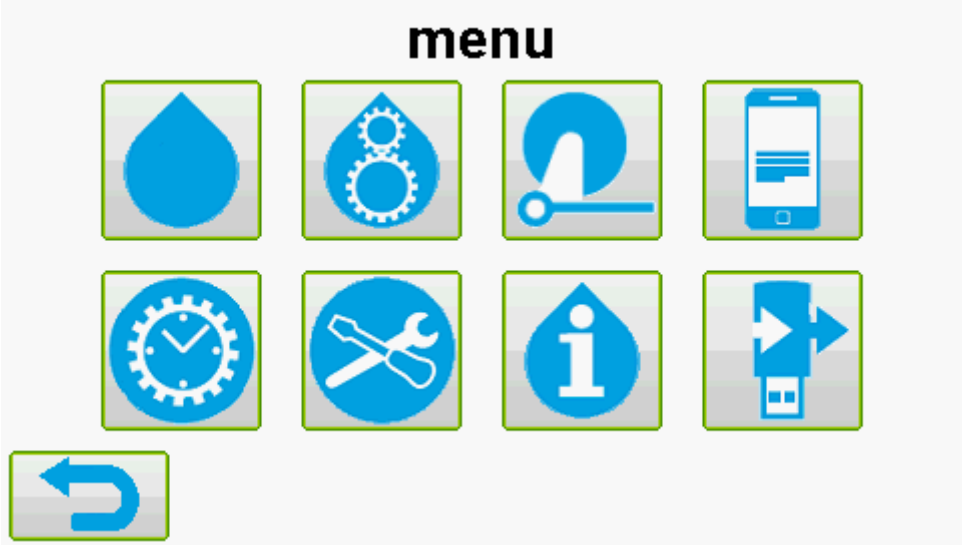


The **signal lamp** serves to give a visual signal during **extension** of the machine when a certain length has already been extended.
To activate the signal lamp function, select the option **activated** in the first line (status) after pressing the adjacent button. Under **distance**, specify how many meters of extension should cause the signal lamp to light / flash. The **duration** specifies how long the signal lamp should light / flash.



3 MAIN MENU

From the main menu, it is possible to navigate to any other menu.



	Irrigation menu	Irrigation programs are selected and created here
	Base settings	Various settings of the machine as well as the extended pipe length can be found here
	Machine data	Machine parameters are configured here Protected by PIN code
	SMS/Modem	Telephone numbers and SMS settings are configured here
	System settings	Settings at the system level, such as the date / time and the language, are found under system settings Protected by PIN code
	Service	Information that is required for troubleshooting the machine can be found here. Protected by PIN code
	Info	The operating hours, the water consumption and the battery voltage are displayed here
	Backup	In the backup menu, you can reset the ECOSTAR to the factory settings as well as save or load parameter sets Protected by PIN code

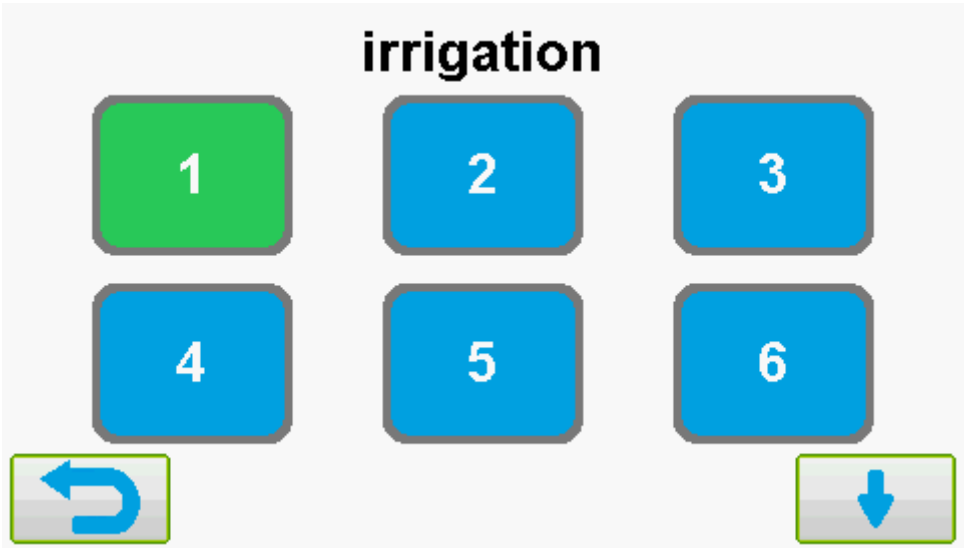
3.1 IRRIGATION MENU



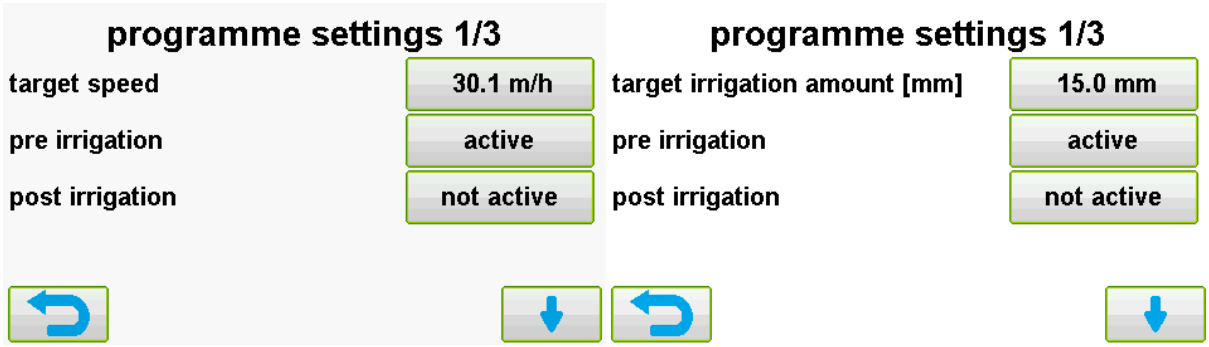
The irrigation menu offers the option of precisely adapting the irrigation to the respective field. With the **zone settings**, you can set a different retraction speed or irrigation amount for a specific section. The ECOSTAR 6000 offers the ability to divide the field up into 4 different sections.

Depending on the unit of the retraction speed, the irrigation amount is shown in mm or the retraction speed in m/h on the irrigation menu.

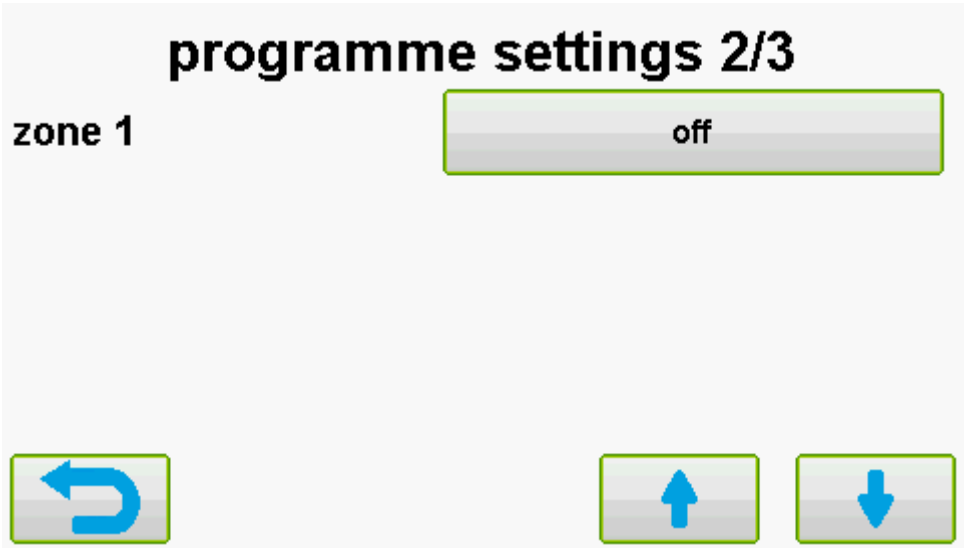
Up to **12 different programs** can be configured and then easily selected.



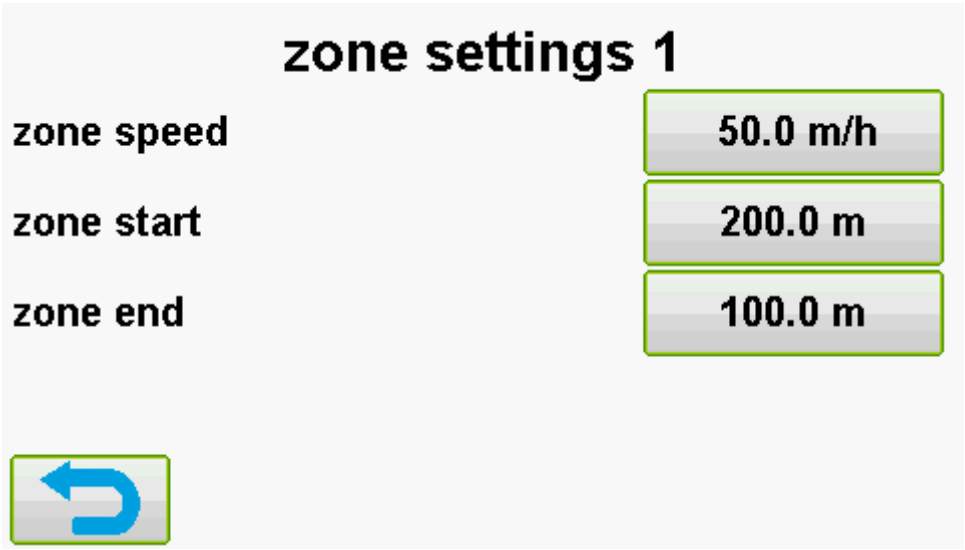
A long press of the button (3 seconds) opens the program configuration. A program can be activated or deactivated by pressing the button briefly.



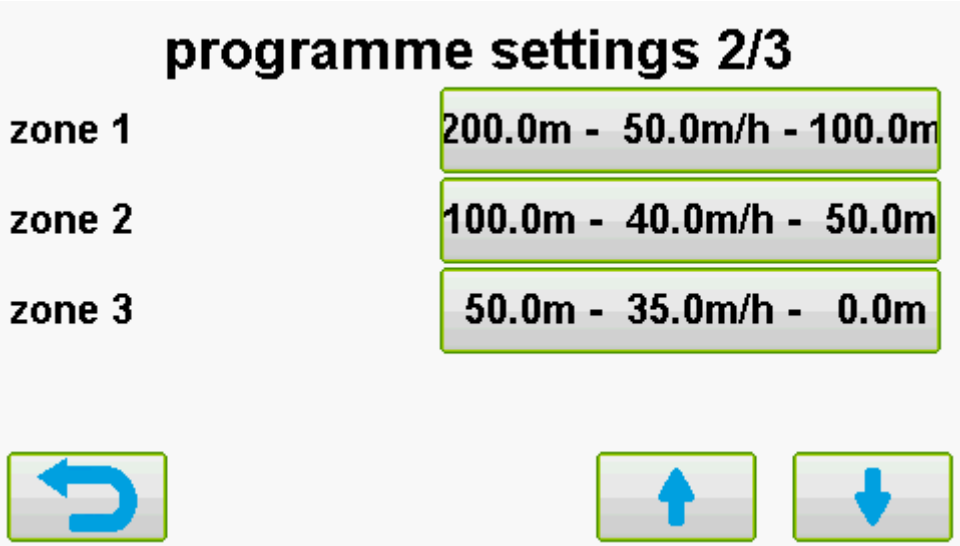
Target irrigation amount[mm]: The irrigation amount for the program is configured here. This setting is only used when no zones have been created.
Pre irrigation: Pre-irrigation for this program can be configured here.
Post irrigation: Post-irrigation for this program can be configured here.



Zone settings:
Up to 4 zones can be configured. For each zone, you can set the zone start (distance of the arm to the machine), speed / irrigation amount and zone end. To configure only 2 or 3 zones, the last desired zone must end at 0 m.
During irrigation, the current zone is shown in the main screen as a number next to the speed.



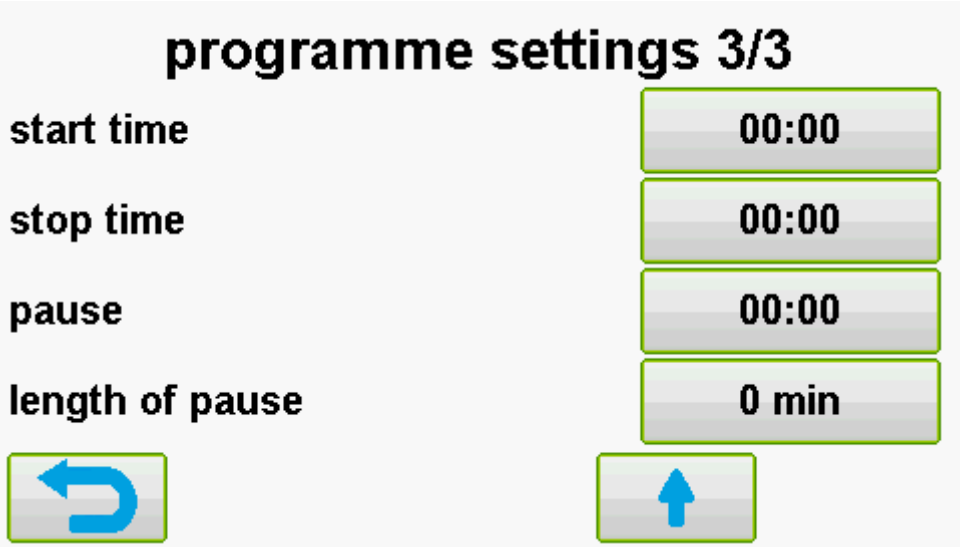
Zone speed: The retraction speed or irrigation amount (setting in m/h or mm) for the zone is configured here.
Zone start: Distance from the sprinkler to the machine at the start of the zone
Zone end: Distance from the sprinkler to the machine at the end of the zone



Example:

Zone 1: Between 200 m and 100 m distance between the sprinkler and the machine, retraction takes place at 50 m/h

Zone 2: When there is less than 100 m distance, the retraction speed is decreased to 40 m/h



Start time: Time at which the irrigation will be started automatically
00:00 means that the automatic start time is deactivated
In addition, the start button must also be pressed in the home screen to switch the ECOSTAR 6000 to the “waiting to irrigate” mode

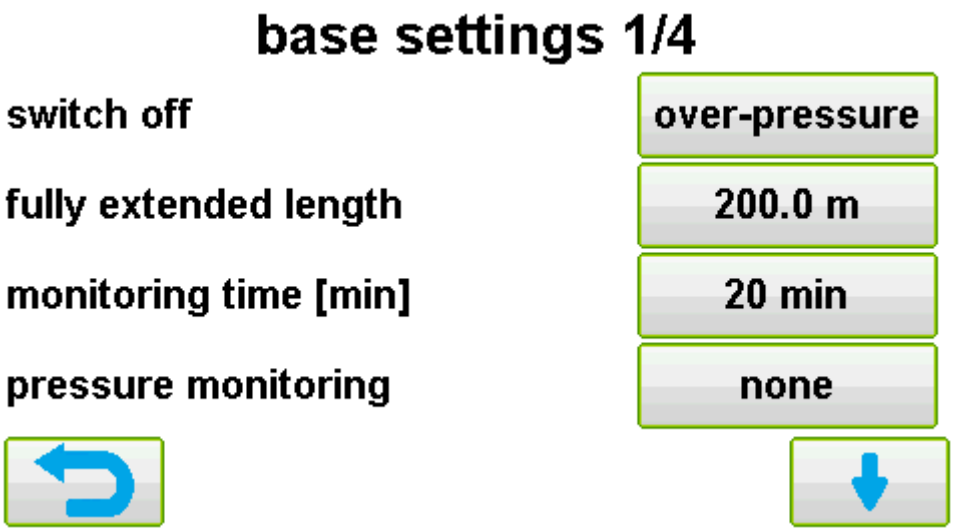
Stop time: Time at which the irrigation will be stopped
The ECOSTAR 6000 calculates the start speed such that the irrigation is ended precisely at the specified stop time
00:00 means that the automatic stop time is deactivated
In addition, the start button must also be pressed in the home screen to switch the ECOSTAR 6000 to the “waiting to irrigate” mode

Pause: Time at which the irrigation will be paused / stopped
00:00 means that the pause is deactivated

Length of pause: Specifies the length of the pause

3.2 BASE SETTING



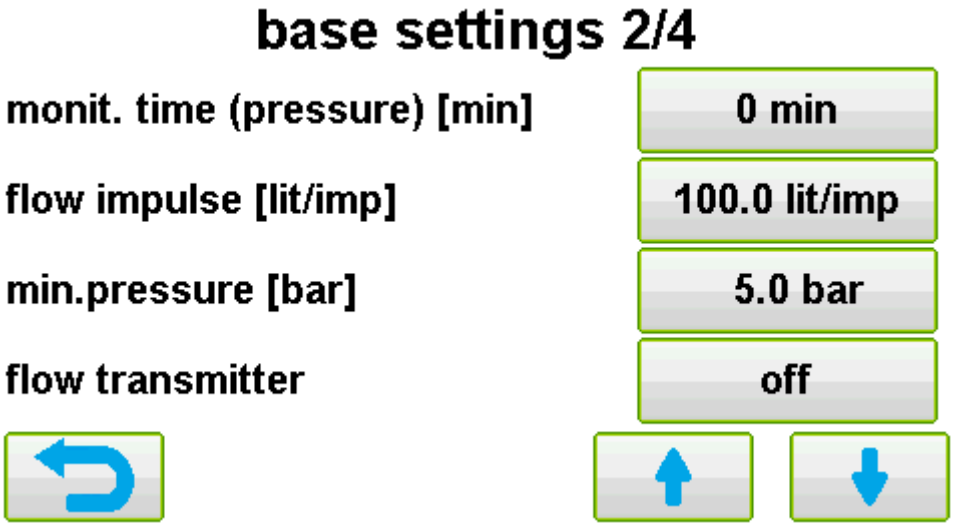


Switch off: Here you can select the switch-off method:
Low pressure shut-off: The shut-off valve opens for the configured time during shut-off and then closes again
Over-pressure shut-off: The shut-off valve closes during shut-off
None: The shut-off valve is not actuated

Fully extended length [m]: Here you can change or input the currently extended length.

Monitoring time [min]: Time after which the ECOSTAR should stop the irrigation if an error occurs or the configured speed is not achieved

Pressure monitoring: Here you can select whether pressure monitoring is present by means of a pressure switch or pressure sensor

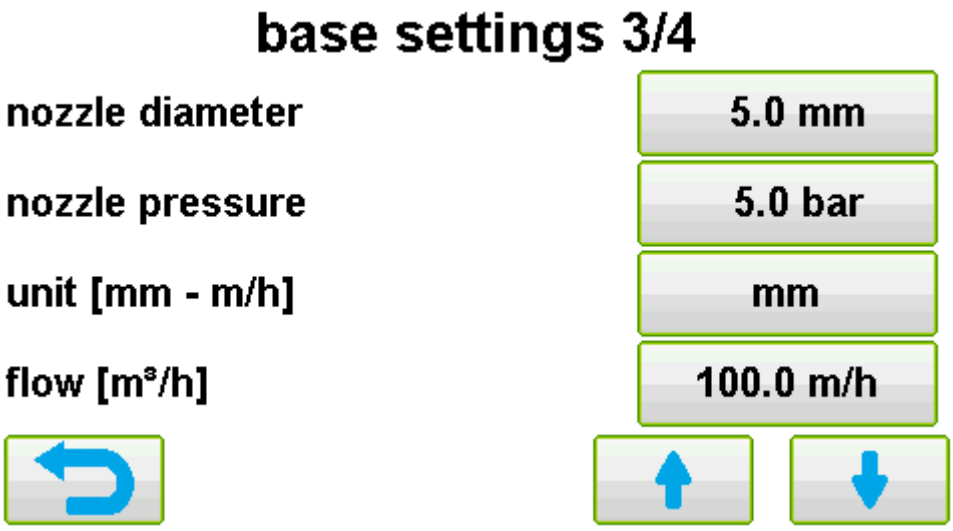


Monit. time (pressure) [min]: Time after which the ECOSTAR responds to the pressure switch (Pressure fluctuations)

Flow impulse [lit/imp]: This setting is used by the water consumption meter. The value to be entered here is shown on the water meter, if present.

Min. pressure [bar]: If the connection pressure falls below this value, the irrigation is stopped (pressure sensor)

Flow transmitter: Select whether or not the flow transmitter is active

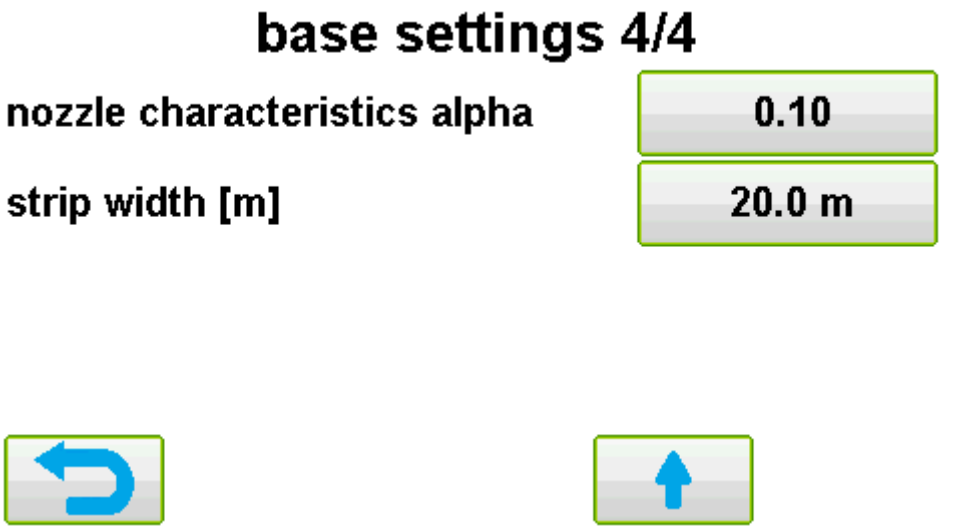


Nozzle diameter: Diameter of the endgun nozzle

Nozzle pressure: Nozzle pressure

Unit [mm-m/h]: Select whether the retraction speed is entered as an irrigation amount (mm) or a speed (m/h).

Flow: If the flow is known, it is entered here**.**
However, if the flow is not precisely known, enter 0 here. Otherwise the speed is calculated based on the flow.
In this case, the following parameters must be entered: Nozzle diameter, nozzle pressure, nozzle characteristics alpha and strip width.



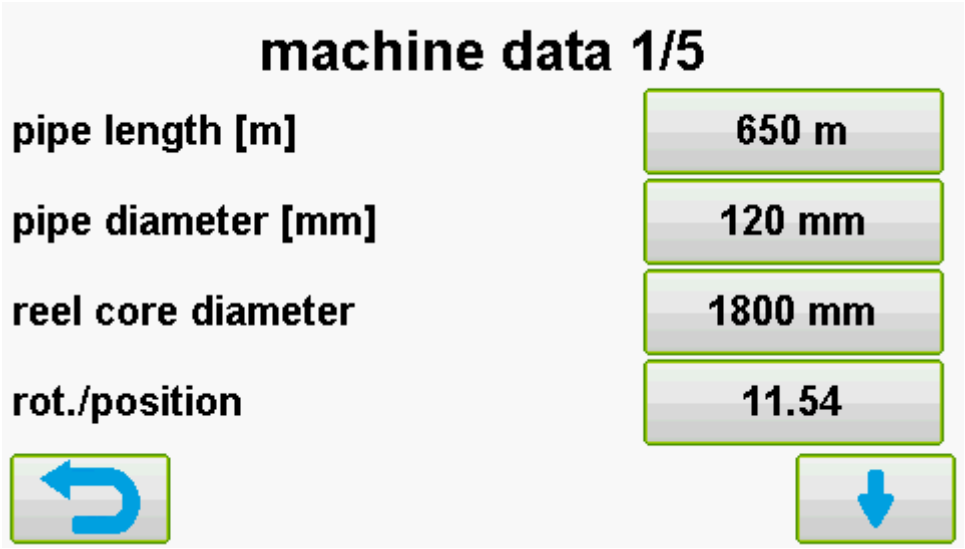
Nozzle characteristics alpha: The nozzle characteristics value can be found on the manufacturer table (Standard setting = 0.92)

Strip width: The strip width can be found in the conversion table on the RAINSTAR

3.3 MACHINE DATA

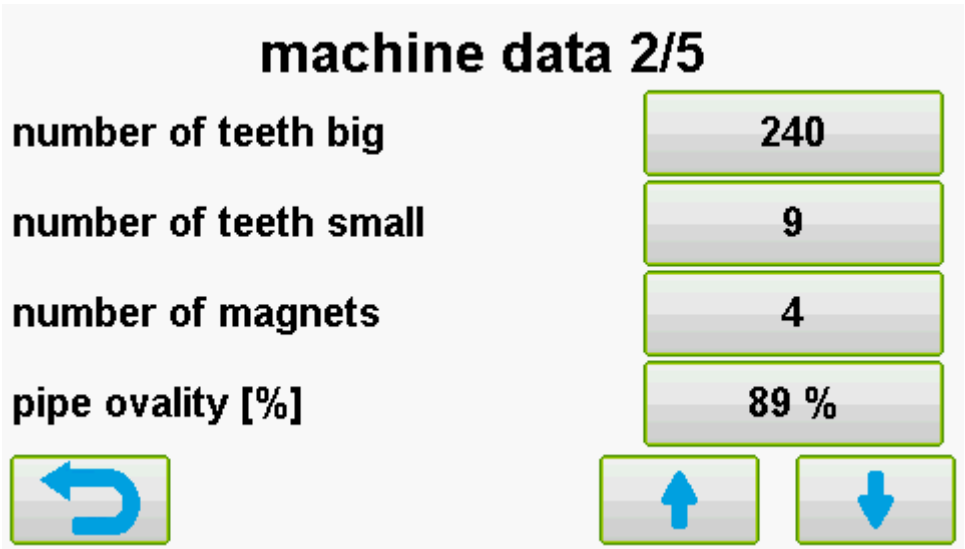


You can reach the machine data menu by pressing the machine data button in the main menu
!!!**This menu contains all data concerning the machine and may only be modified by trained persons!!!**



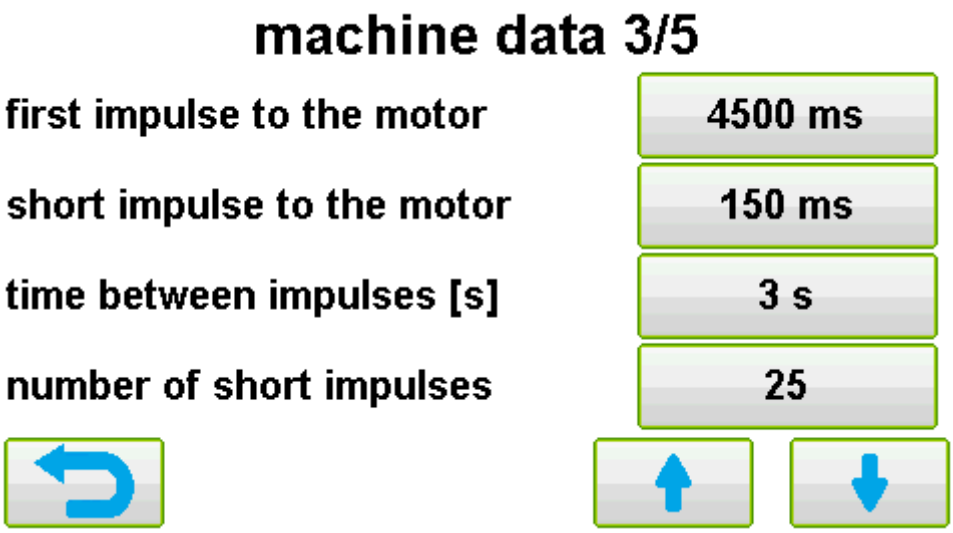
Page 1

Pipe length [m]:	PE pipe length of the machine in meters
Pipe diameter [mm]:	Internal diameter of the PE pipe in millimeters
Reel core diameter:	Diameter of the reel core in millimeters
Rot./position:	Rotations per position



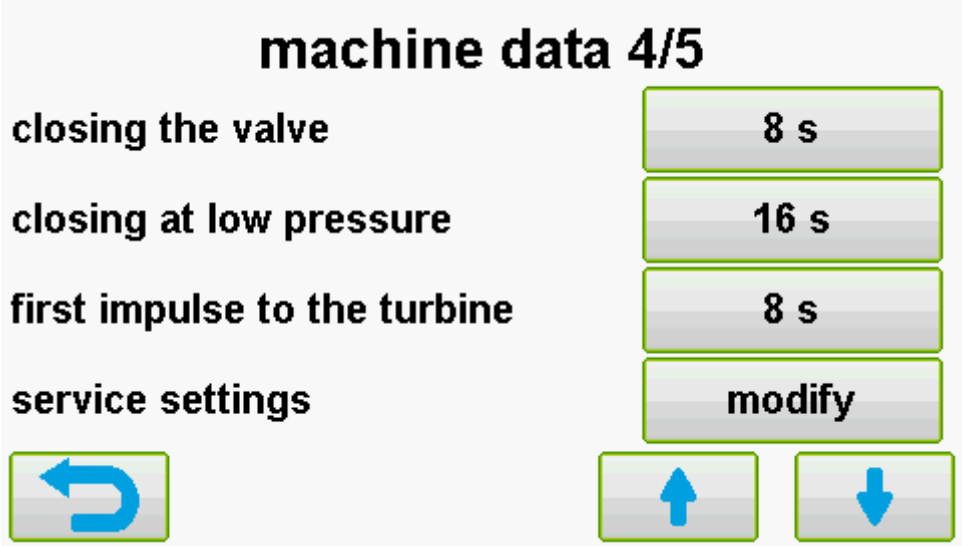
Page 2:

Number of teeth big:	Number of large teeth on the reel sprocket
Number of teeth small:	Number of small teeth on the reel sprocket
Number of magnets:	Number of magnets on the magnet disk (used for speed measurement)
Pipe ovality [%]:	Ovality of the pipe (always set at the factor to 89%)



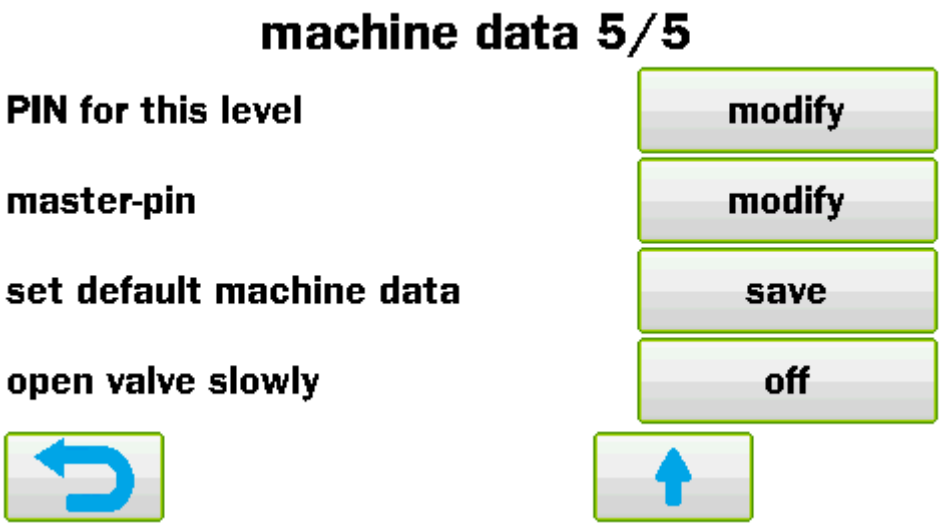
Page 3

First impulse to the motor [ms]: Duration of the first impulse to the shut-off valve during closing
Short impulse to the motor [ms]: Duration of the subsequent impulses to the shut-off valve (should be coordinated with the number of impulses)
Time between impulses [s]: Time between the short impulses to the valve
Number of short impulses: Number of short impulses to the shut-off valve



Page 4

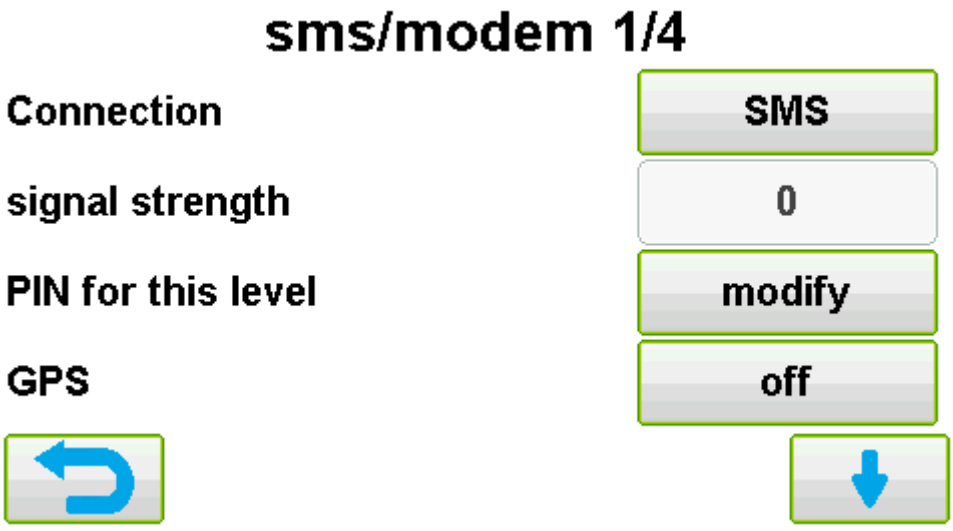
Closing the valve: Shut-off delay
Closing at low pressure: Low pressure shut-off only: Time for which the shut-off valve remains open during shut-off.
First impulse to the turbine: Length of the first impulse to the turbine
Service settings: Settings related to regulation are defined here



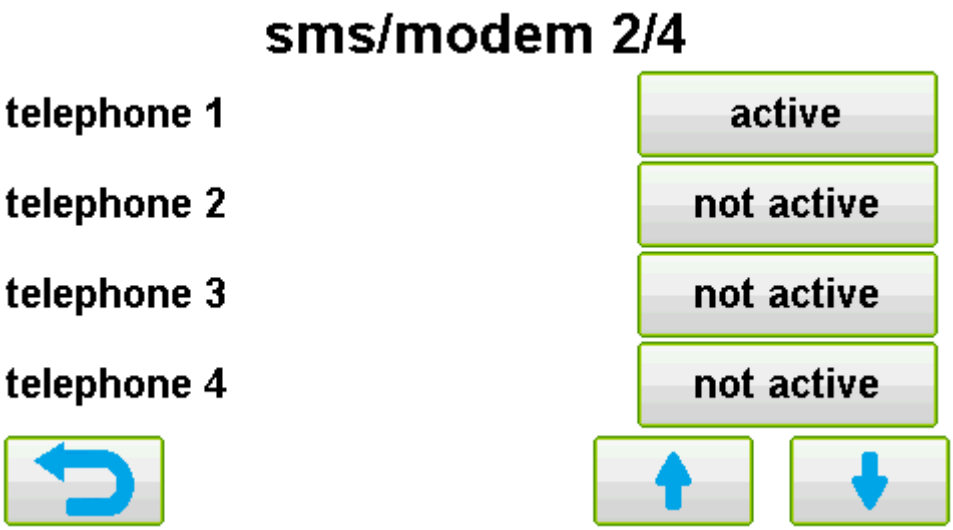
PIN for this level: The PIN code for the machine data menu is set here
Master PIN: The PIN code that opens every menu is set here
Set default machine data: The currently configured machine data is accepted as the default settings for this ECOSTAR.
Factory settings for the machine data are overwritten / replaced
Open valve slowly: Opens the valve slowly, using the settings for valve closing.

3.4 SMS/MODEM MENU

To use the sms function of the ECOSTAR 6000 a mini-sim-card is needed. The pin-code of this sim-card has to be disabled and the sim-card must be able send and receive sms-messages.
The settings for the SMS function and visualization are found in the SMS/modem menu.



Connection: The connection setting for the ECOSTAR (OFF/SMS/DATA) is set here
Signal strength: The current signal strength is displayed
PIN for this level: The PIN code for this menu can be changed here
GPS: Switches the GPS function on or off

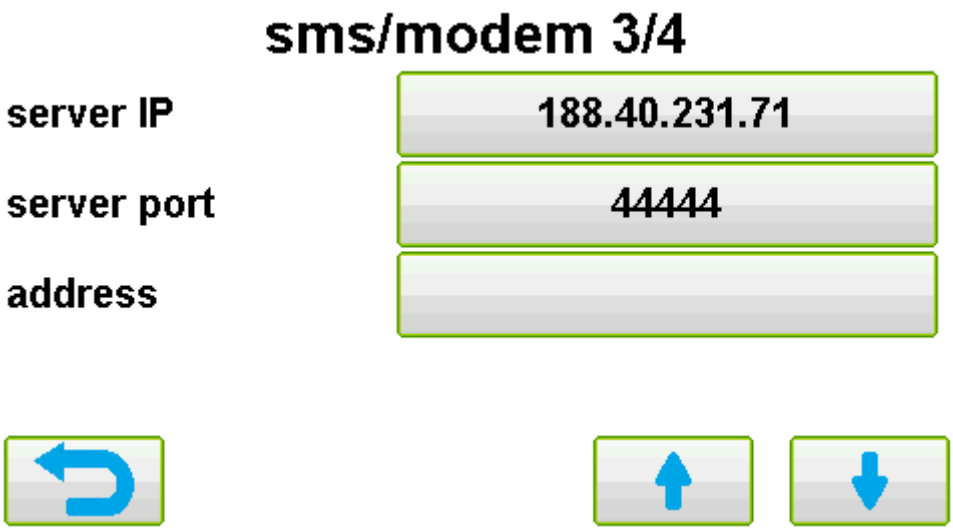


Telephone 1-4: One or more telephone numbers can be set and configured here

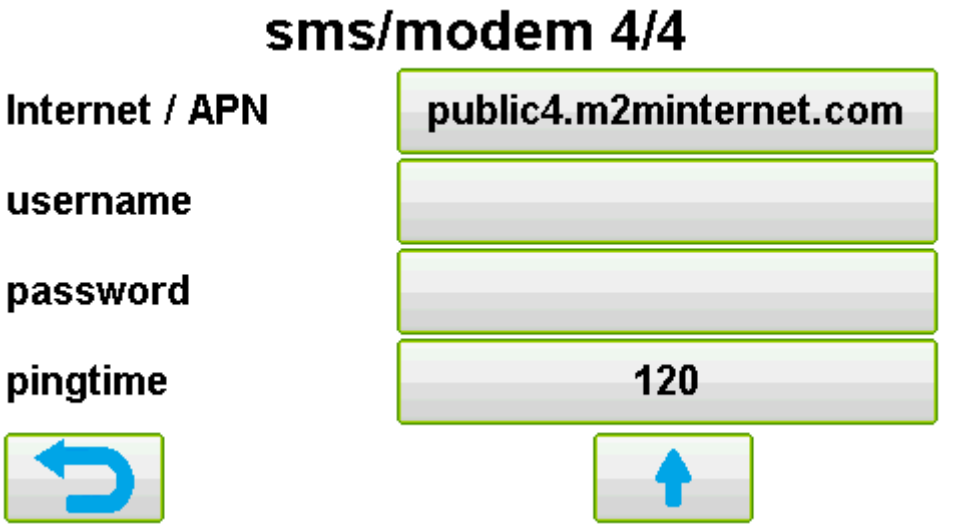


This menu is opened by selecting a telephone.

Telephone number: **!!!The number must always begin with the country code (+xx)**
Number active: If this setting is activated, this telephone is able to send commands to the ECOSTAR
Error message active: If this setting is activated, the ECOSTAR sends error messages to this telephone number



Server IP: IP address of the SmartRain server
Server port: Port of the SmartRain server
Address: Address assigned to the ECOSTAR for SmartRain



Internet / APN: APN of the SIM card provider
Username: username for internet connection (depends on sim-provider)
Password: password for internet connection (depends on sim-provider)
Pingtime: time to reconnect to the internet

3.4.1 SMS COMMANDS AND MESSAGES

Commands

START-CMD : Irrigation is started immediately
STOP-CMD : Irrigation is stopped immediately
STATUS-CMD : Status of the machine is loaded (current speed, stop time and extended length)
SPEED-CMD xx.xx : Current retraction speed is set to xx.xx m/h
RAIN-CMD xx.xx : Current irrigation amount is set to xx.xx mm
START-CMD hh:mm : Irrigation will be started at hh:mm
STOP-CMD hh:mm : Irrigation will be started when the stop time is precisely hh:mm

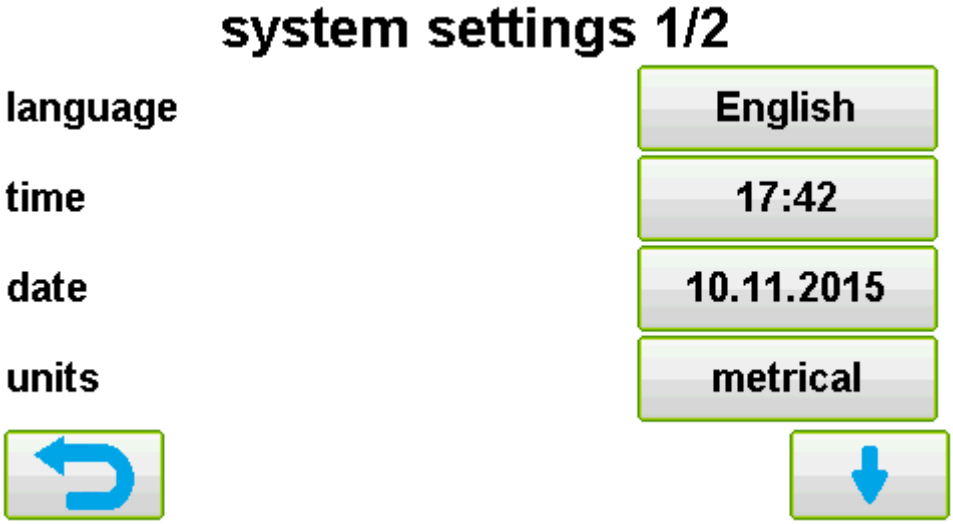
Messages

The ECOSTAR 6000 sends messages in the following cases:

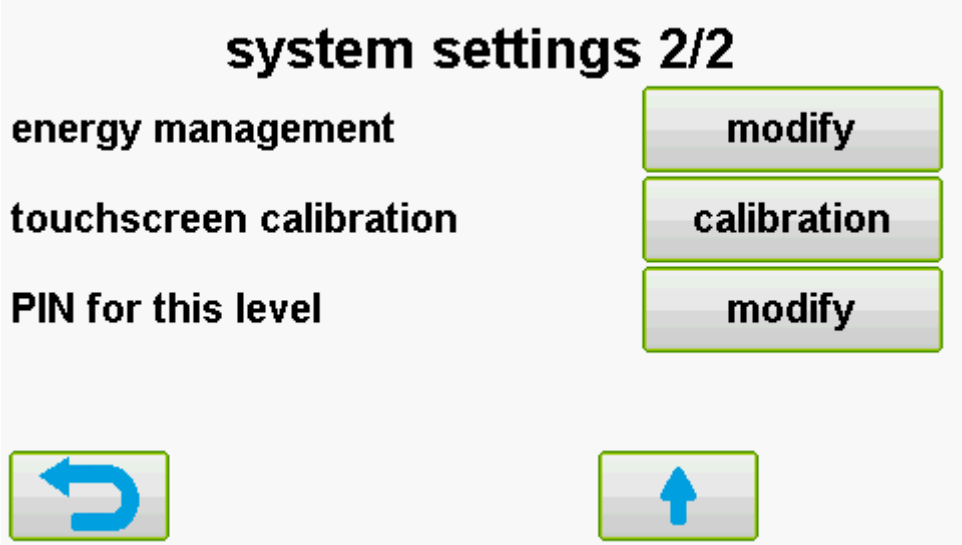
- Battery voltage is low
- Irrigation was stopped manually
- Irrigation finished
- Target speed not achieved (speed too high or too low)
- Stop sensor triggered too early
- No more PE pipe extended

3.5 SYSTEM SETTINGS:





Language: In the language menu, you can select the language or import additional languages. The current language files can also be updated (update)
Time: Sets the current time
Date: Sets the current date
Units: Select the unit system, metric or imperial

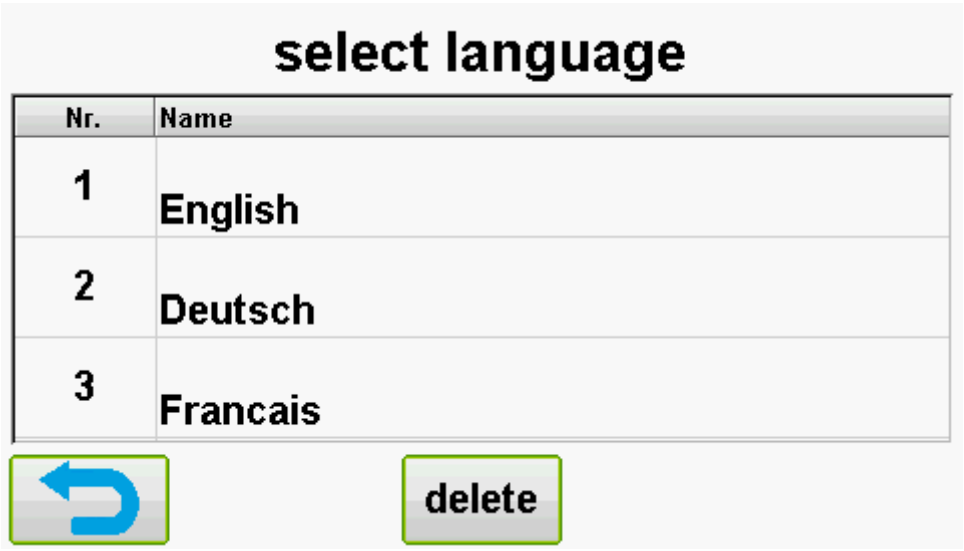


Energy management: The display brightness as well as the time before dimming and before switching off the display can be set here
Touchscreen calibration: The touchscreen can be recalibrated. During calibration, you must touch four points on the touch display in sequence.
PIN for this level: The PIN code for this menu is set here

3.5.1 LANGUAGE MENU:



Select language: All languages installed on the ECOSTAR are shown under this menu. When you select a language (press it), a “select” button appears in the lower right corner. Pressing this button activates this language for the ECOSTAR.



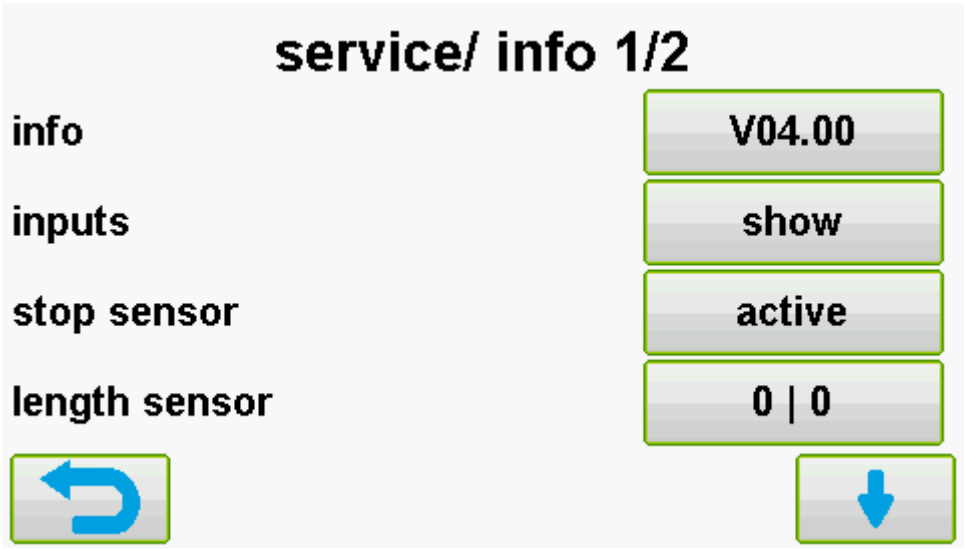
Import language:

Languages can be imported or updated here using a USB stick. To do this, load the ECOSTAR language file (Eco_xxx.csv) onto a USB stick and plug this into the ECOSTAR (*The USB stick must be inserted before opening the language settings menu*). All languages on the USB stick will then be displayed and can be imported. To import a language, first select it. An “import” button then appears in the lower right.

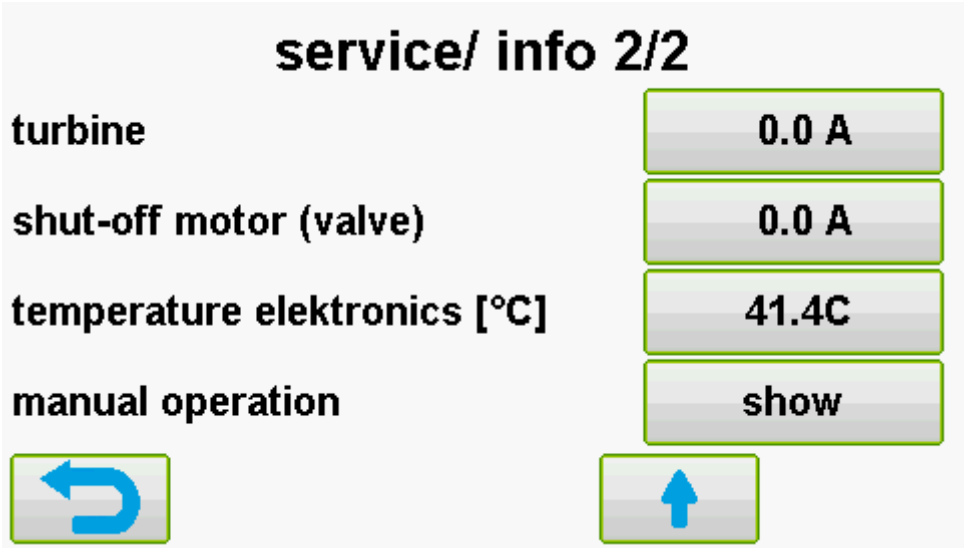


3.6 SERVICE MENU

Important information for troubleshooting the machine or the ECOSTAR 6000 is provided in the service menu.



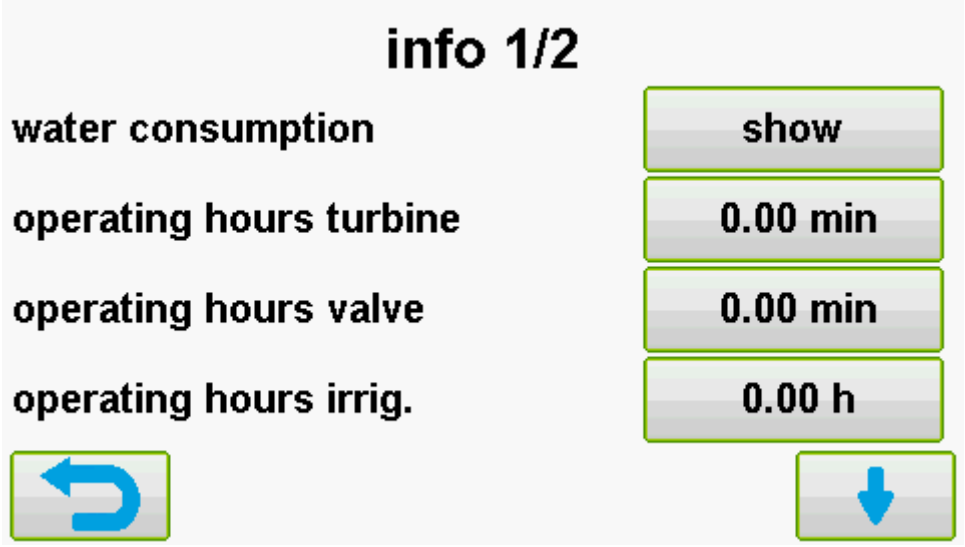
Info: Displays information about the software version and the ECOSTAR
Inputs: Inputs can be checked
Stop sensor: Displays whether the stop sensor is active
Length sensor: Sensor for entering the speed



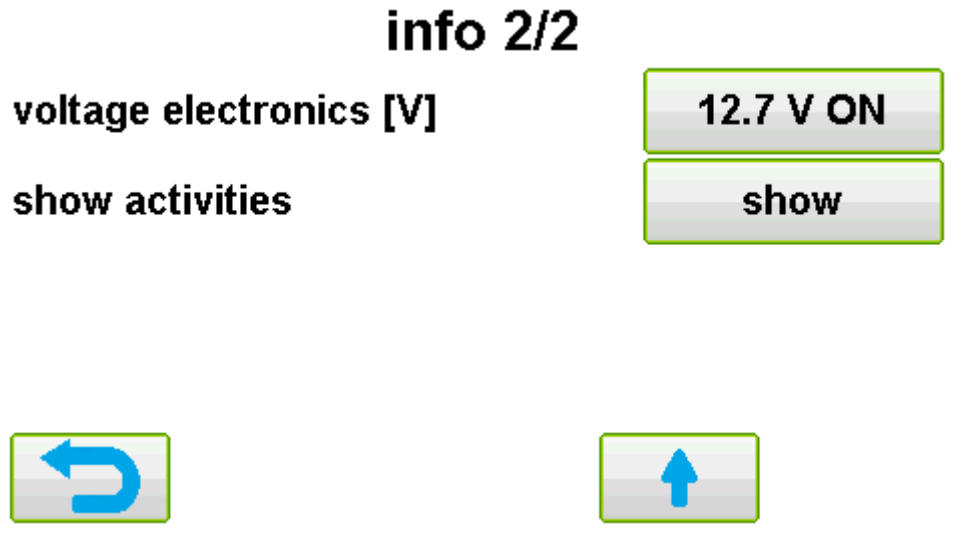
Turbine: Last received current of the turbine
Shut-off motor (valve): Last received current of the shut-off valve
Temperature electronics [°C]: Displays the current temperature of the control
Manual operation: All outputs of the ECOSTAR can be manually switched on and off

3.7 INFO 

No parameters can be changed or **settings configured** in this menu. It serves exclusively for information and troubleshooting purposes.

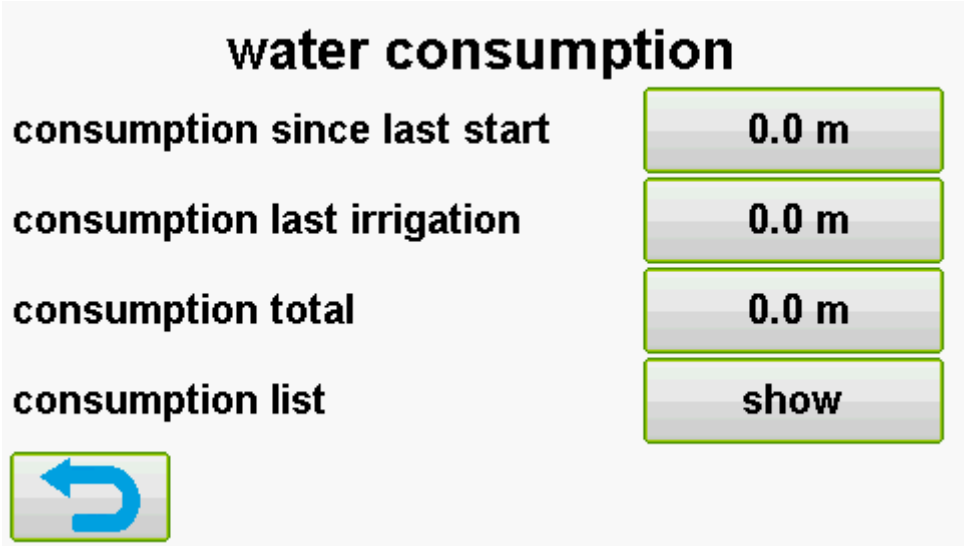


Info: Displays information about the software version and the ECOSTAR
Water consumption: Data about the water consumption is displayed here
Operating hours turbine: Time for which the turbine has been active in minutes
Operating hours valve: Time for which the shut-off valve has been active in minutes
Operating hours irrig.: Time for which the irrigation has been active



Voltage electronics [V]: Displays the voltage of the electronics (= voltage of the battery)
OFF or ON indicates whether or not the solar panel is currently charging the battery
Show activities: Loads logs

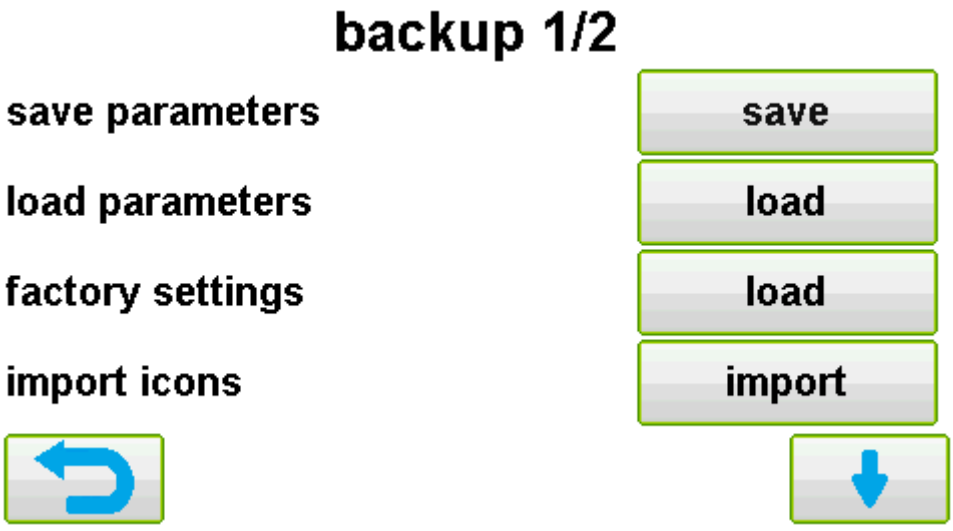
3.7.1 WATER CONSUMPTION



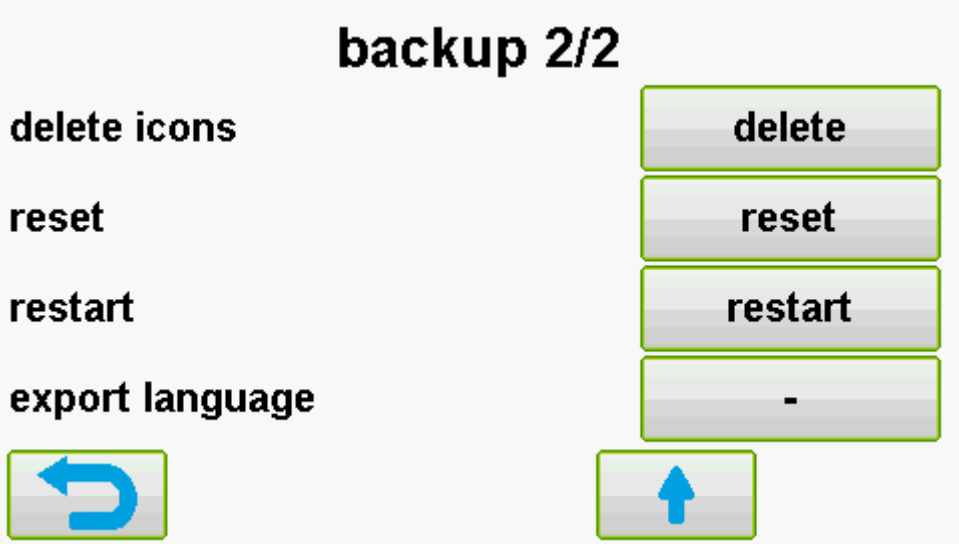
Consumption since last start: Displays the water consumption of the current irrigation
Consumption last irrigation: Displays the water consumption of the last irrigation
Consumption total: Displays the total water consumption (can be changed)
Consumption list: Displays a detailed list of the consumption of all irrigations, which can be exported to a USB stick

3.8 BACKUP MENU

The ECOSTAR can be reset to factory settings in the backup menu. You can also export the current machine data and settings to a USB stick. Data exported in this way can be loaded onto the ECOSTAR 6000 again at a later time from a USB stick.
Icons are imported in the backup menu and can also be deleted there.



Save parameters: Saves machine parameters and settings to a USB stick
Load parameters: Loads machine parameters and settings from a USB stick
Factory settings: Resets the ECOSTAR to the factory settings
Import icons: Icons are imported from a USB stick
This process takes 5-20 seconds, during which the ECOSTAR will not respond to the touchscreen.
After the import, the ECOSTAR 6000 must be power cycled (restarted) in order for the changes to take effect.



Delete icons: Deletes icons
This process takes 5-20 seconds, during which the ECOSTAR will not respond to the touchscreen.
After the import, the ECOSTAR 6000 must be power cycled (restarted) in order for the changes to take effect.
Reset: All settings are reset
Restart: The ECOSTAR 6000 is restarted (power on/off)
Import language: Languages can be imported here (see page 24 for details)

4 CONNECTION PLAN

Pin	Name	Wire color
1	+ Battery	Brown
2	- Battery	Blue
3	+ Solar module	Brown
4	- Solar module	Blue
5	Shut-off motor	----------
6	Shut-off motor	----------
7	Regulating motor	----------
8	Regulating motor	----------
9	Not assigned	
10	+ Signal lamp + Sprinkler	Red
11	- Signal lamp	Black
12	- Sprinkler	Black
13	Speed sensor 2	Yellow/green
14	Speed sensor 2	Brown
15	Speed sensor 1	Black
16	Speed sensor 1	Blue
17	Stop sensor	Blue or brown
18	Stop sensor	Blue or brown
19	Not assigned	
20	Pressure switch Water meter	Blue
21	Pressure switch	Brown
22	Water meter	Brown

5 BUTTON COMBINATIONS

Touchscreen calibration:
In order to recalibrate the touchscreen in an emergency, there is a button that must be pressed and held while the ECOSTAR is starting.
First the ECOSTAR must be de-energized for about 5 seconds. To do this, unplug the 12-pin plug from the circuit board for 5 seconds. After at least these 5 seconds, the plug must be reinserted and the **middle of the 5 buttons** on the front of the ECOSTAR 6000 must be pressed.
The ECOSTAR now starts in the calibration menu. Now press the points on the touchscreen in order (as instructed on the screen). *The points must be pressed precisely, for example with a pen*

Resetting the ECOSTAR:
To completely reset the ECOSTAR to the standard settings, the two outermost buttons on the front of the ECOSTAR must be pressed at the same time and held for 20 seconds. After 10 seconds, the ECOSTAR will beep for the first time. After another 5 seconds it will emit a longer beep, and after yet another 5 seconds an even longer one at another pitch. After the ECOSTAR has beeped for the third time, the ECOSTAR has been reset to the standard values.

Screenshot:
To take a screenshot of the current display, a USB stick must be inserted into the ECOSTAR 6000 and then the two buttons 2 and 4 (counting from left to right) must be pressed at the same time..
The ECOSTAR will beep and the screenshot process will be started. If the ECOSTAR beeps again after a few seconds in the same pitch, the screenshot was successful. If it does not beep the same as the first time, the screenshot failed.

6 SOFTWARE UPDATE

For a more detailed update guide visit our homepage www.bauer-at-com.

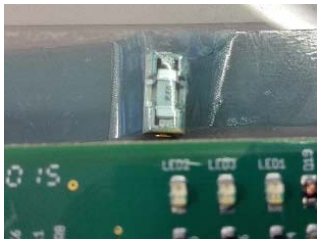
Step 1: Prepare the USB stick
The data required by ECOSTAR must be saved on a USB stick formatted as FAT32. The BIOS file “Bios.inf” is always required. In addition to the BIOS file, two more files are also needed: “EEPROM.bak” and “SPIFLASH.bak” (optionally also the file ECOSTAR.bin).
Step 2: Updating
Unplug the 12-pin plug from the circuit board and insert the USB stick.
Then reconnect the12-pin plug and watch the LEDS on the circuit board next to the USB port.
During the update process, these LEDS will flash and the screen of the ECOSTAR 6000 will be dark.
If the screen displays anything immediately after reconnecting the 12-pin plug, the update process has failed. In this case, perform step 2 again. If the second attempt also fails, check whether the USB stick is prepared as instructed in step 1.
Step 3: Checking the update
After roughly 10 seconds, the update process will be completed, and the ECOSTAR starts in the main screen. The USB stick must now be disconnected, and the software version must be checked to confirm that it matches the version in the release notes.
The currently installed software version can be found in the menu service/info 1.

7 HOW TO REPLACE THE FUSE

Remove the broken fuse from the holder.



Take the spare fuse out of its holder and insert it into the empty holder on the board.



8 MENU OVERVIEW



Irrigation program 1-12

Switch off
Fully extended length
Monitoring time
Pressure monitoring

Monitoring time pressure
Flow impulse
Min. pressure
Flow transmitter

Nozzle diameter
Nozzle pressure
Unit [mm – m/h]
Flow

Nozzle characteristics alpha
Strip width

Connection
Signal strength
PIN for level
GPS

Telephone 1-4

Internet/APN
Server IP
Server port
IMEI

Pipe length
Pipe diameter
Reel core diameter
Rot./position

Number of teeth big
Number of teeth small
Number of magnets
Pipe ovality

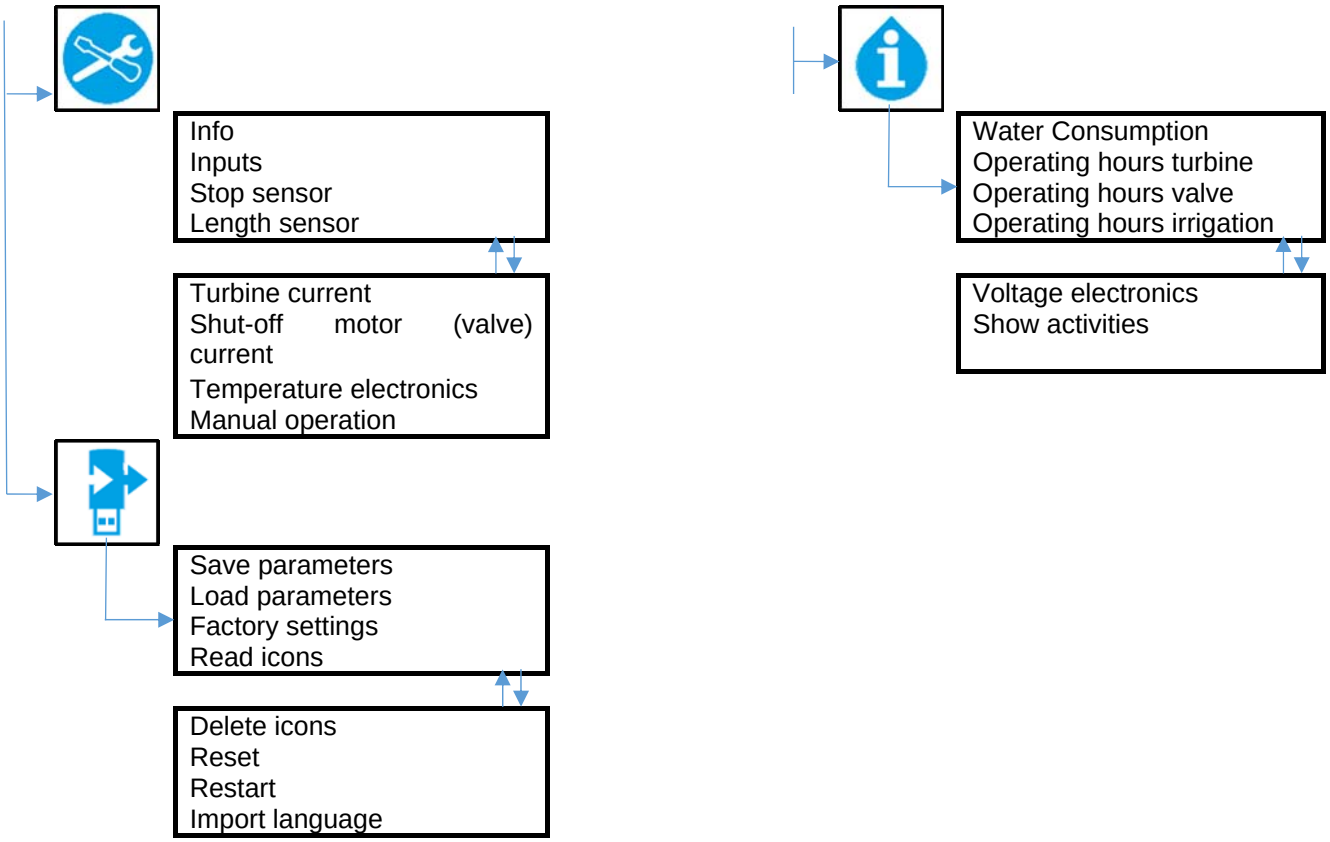
First impulse valve
Short impulse valve
Time between impulses
Number of short impulses

Closing the valve
Closing at low pressure
First impulse to the turbine
Service settings

PIN for level
Master PIN
Set default machine data

Language
Time
Date
Unit metric/imperial

Energy management
Touchscreen calibration
PIN for level


Info
Inputs
Stop sensor
Length sensor
Turbine current
Shut-off motor (valve) current
Temperature electronics
Manual operation
Save parameters
Load parameters
Factory settings
Read icons
Delete icons
Reset
Restart
Import language
Water Consumption
Operating hours turbine
Operating hours valve
Operating hours irrigation
Voltage electronics
Show activities

9 ERROR SOURCES AND SOLUTIONS

? Display is blank
Cause/remedy:

- Power supply from the battery interrupted. The fuse in the box may be blown. This happens when the battery is connected incorrectly.
- Display brightness is set to 0%. In this case, press the button combination for resetting the ECOSTAR.

? The turbine does not start when "Start" is pressed
Cause/remedy:

- The magnet at the stop sensor is not in the correct position or the sensor or its cable is damaged. Check the stop sensor input in the menu **service/info 1**. If the stop sensor shows "active", the stop sensor is currently being tripped or it is defective.

? The distance is measured incorrectly and the speed is not correct
Cause/remedy:

- Check whether the cable or sensor is damaged. Check the length sensor input in the menu **service/info 1**. In the length sensor display when the pipe is extended, the left number must always change to 1 first and then the right number must change to 1. Shortly after this, the numbers must change to 0 again, with the left number changing to 0 first.

? Any other Error
Cause/remedy:

- If there is any error, which is not mentioned above visit our homepage to check if there is latest software installed on your Ecostar 6000. If not, you can download the latest software from the customer area on our homepage www.bauer-at.com.

10 TECHNICAL DATA AND DETAILS

Size (HxWxD):	170x140x100
Voltage:	10-15 V DC
Power consumption:	160 mA
	7A max. power consumption of the motor
Fuse:	8 A (fast)