IOM OCTOPUS

Automatic Filter Backwash Controller

Tackling climate
change together

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OCTOPUS Automatic Filter Backwash Controller

INTRODUCTION

Baccara Automation & Control congratulates you for purchasing the OCTOPUS Automatic Filter Backwash Controller; please follow this document for a step-by-step narrated description of the installation, operation, and maintenance processes of the controller.

The OCTOPUS Automatic Filter Backwash Controller is designed to control the backwash process of an up to ten-unit filtration batteries via a dedicated mobile application. The OCTOPUS operates in agricultural, waterworks, Industrial and other non-hazardous environments, within the pressure and temperature framework described in the specification table of this document.

SAFETY INSTRUCTIONS

General

- Prior to installation, operation, maintenance or any other type of action carried out on the Octopus Automatic Filter Backwash Controller, read the safety, installation and operation instructions carefully.
- The Octopus Automatic Filter Backwash Controller operates as part of larger irrigation systems; therefore, it is essential to comply with all the safety instructions and standards relevant to the whole irrigation system.
- During installation, operation, or maintenance of the controller all conventional, general and local safety instructions should be observed in order to avoid danger to the workers, the public or to property in the vicinity.
- Always use personal safety gear such as gloves, full coverage clothes, helmet, and safety goggles.
- When installing or servicing the Octopus Automatic Filter Backwash Controller, use only standard and adequate tools.
- The Octopus Automatic Filter Backwash Controller must be used with non-hazardous liquids.
- The filtration battery controlled by the Octopus Automatic Filter Backwash Controller enters to backwashing mode automatically without warning.
- No change or modification to the equipment is permitted without a written notification given by Baccara Automation & Control.
- Always observe standard safety instructions and good engineering practices whilst working in the filtration system vicinity.
- Use the Octopus Automatic Filter Backwash Controller only for its intended use, as designed by the manufacturer, any misuse of the controller may lead to undesired damage and may affect your warranty coverage.

Preparation to Installation

- Shipping and transporting the Octopus Automatic Filter Backwash Controller must be done in a safe manner and in accordance with the relevant standards and regulations.
- Electrical wiring should be performed by an authorized electrician only, using standardized and approved components and tools. Locate the Octopus Automatic Filter Backwash Controller where direct water splashing on the electrical components of the controller is avoided. Prevent electrification; when using an external power, appropriate external fuse and wires gauge are required.
- Install the Octopus Automatic Filter Backwash Controller where the filtration battery can be clearly seen from its installation point.

Installation

- Install the Octopus Automatic Filter Backwash Controller according to the detailed Installation Instructions provided with it and according to the description given in this manual.
- Leave enough clearance around the Octopus Automatic Filter Backwash Controller for easy access for safe maintenance.
- Ensure easy and safe access to the Octopus Automatic Filter Backwash Controller without climbing on pipes or equipment. Make sure that any access equipment is built, installed and used in accordance with the relevant local regulations and standards.

First Startup

- Carefully observe the First Start-up operation instructions prior to the first operation of the Octopus Automatic Filter Backwash Controller.
- For smooth operation and performance of the Octopus Automatic Filter Backwash Controller, make sure to perform the startup and first operation procedures exactly as described in this manual.

Operation and Maintenance

- Do not operate the Octopus Automatic Filter Backwash Controller before reading carefully and being familiar with its operation instructions.
- Never operate or use the Octopus Automatic Filter Backwash Controller for purposes other than its original design and operational envelope.
- When servicing the Octopus Automatic Filter Backwash Controller, disconnect it and the filters from the power supply.
- Before returning to regular operation follow the First-time Start-up Operation instructions as detailed in this user manual.

THE TECHNOLOGY

General

Note: This chapter is brought here for broadening the end-user knowledge on backwash processes; if you are familiar with filtration systems operation, you may skip this chapter.

The OCTOPUS Automatic Filter Backwash Controller is designed to control the backwash process of an up to ten-unit filtration systems, it consists of two major components: the controller and the cellphone application.

The controller's hardware consists of the following: system electronics, operation software, hydraulic components, solenoids, sensors and housing. Once installed, configured, and started, the controller independently controls the backwash process of the filtration battery. The cellphone application is used by the user for configurating, controlling, and monitoring the controller's operation.

The OCTOPUS Automatic Filter Backwash Controller:
For controlling the backwash process, the controller has 11 DC Letch outputs that can be connected to up to 10 filter solenoids, and a single main valve, downstream valve or a pump output. The controller monitors the upstream, downstream and differential pressures using two integral 8mm (5/16") control tube inlets; one for the upstream pressure and the other for the downstream pressure. Please refer to the Installation Chapter and the Specifications Table of this document for details.

The OCTOPUS10 Automatic Backwash Controller has two main operation modes: Filtering and Backwashing. The backwash process can be triggered by Differential Pressure (DP), Time Intervals (based on the controller real-time clock), or by a Manual Start command (issued by the operator through the cellphone application). The set-points for the required DP level and the Time intervals can be set by the user through the cellphone application.

The Filtering mode

All the outputs are Off, the controller monitors the Differential Pressure, it counts down the Time to Next Flush, and waits for a Manual Start Backwash Command.

In order to prevent unnecessary backwash cycles due to momentarily high Differential Pressure, the software includes a DP Delay Parameter that sets the time the DP signal should be ON before the start backwash command is issued.

The Backwash proses

Once a start backwash trigger is received, the controller performs the following steps:

Note: This is a general description only, for the complete details please refer to the configuration chapter of this document.

No.	Stage / Process	Default Value
1	Internal delay for starting backwashing	2.5 sec
2	Start main valve / downstream valve / pump	If exists - delay before starting the first filter - 5 sec.
3	Start backwashing the first filter	The backwash time of the filter - 15 sec
4	Stop backwashing the first filter	Delay between filters - 5 sec
5	Repeat stages 3 and 4 till the backwashing of the last filter	The backwash time of the last filter - 15 sec
6	Stop main valve / downstream valve / pump	
7	Increase the backwash cycles counter	Increase the backwash cycles counter by 1
8	Reset all triggers	Restart counting the Time Interval
9	Return to Filtering mode	

The Cellphone Application

The cellphone application connects to the OCTOPUS Automatic Filter Backwash Controller via short-range communication; it enables the user and a qualified technician to configure, control, and monitor the controller operation. Please refer to the designated chapters of this document for details.

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PRE-INSTALLATION

Dimensional Drawing
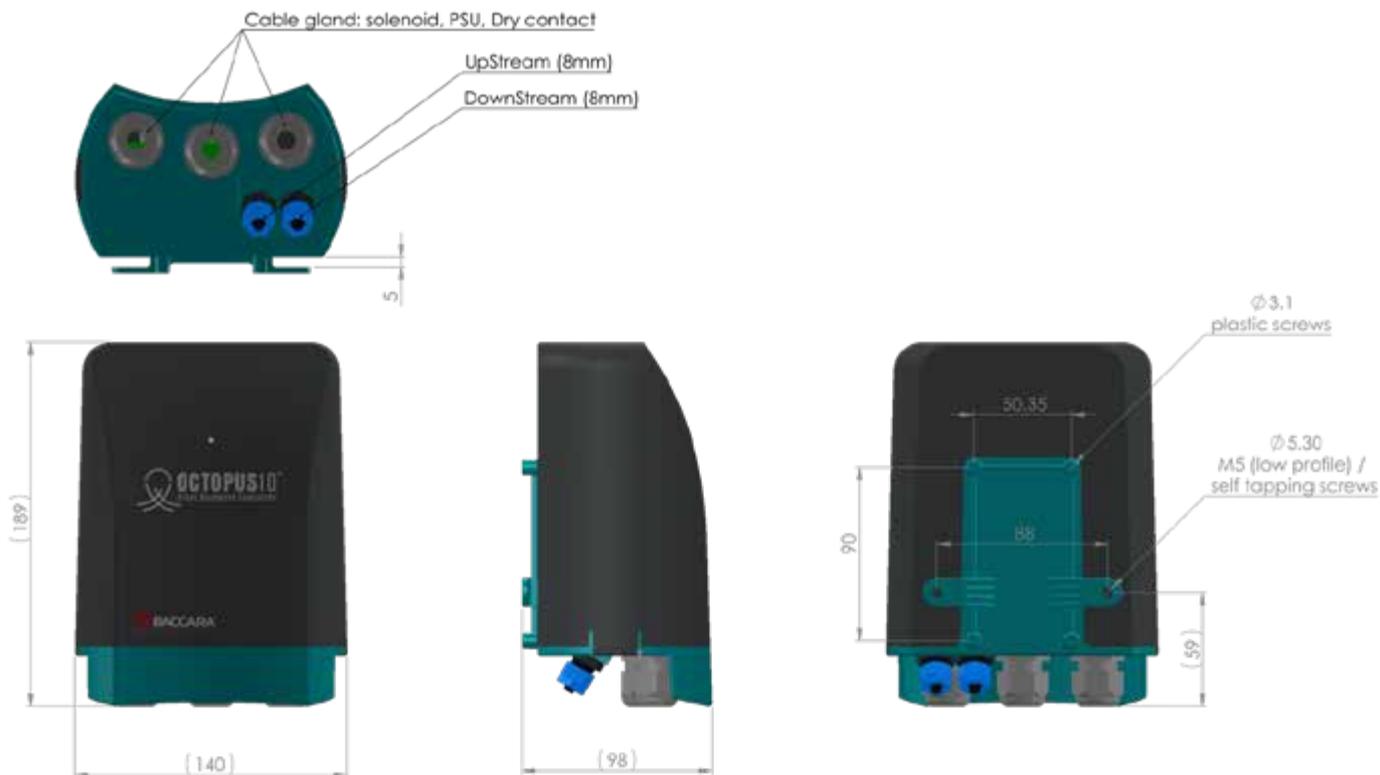
Pre-Installation requirements and considerations

- Important: Before performing any work on the controller make sure that all workers on site are familiar with the safety instructions and the relevant local and general safety instructions and work regulations.
- Carefully remove the products from the shipping package. Place the content carefully on a dry, sturdy, and leveled surface, taking care not to drop any component
- It is recommended to assign an easily accessible installation point for the controller that is clearly marked for preventing damage.
- The controller installation point should be near the filtration system and within the communication range of the controller, this ensures that the operator can clearly and safely see the filters while operating the system.

Mounting the controller
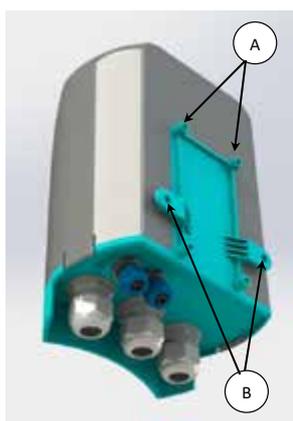
Mount the controller to a stable bracket using the four ø3.5 plastic-screws [A]
or the two M5 (low profile) self-tapping screws [B].

INSTALLATION

Removing the cover

Once the controller is firmly mounted to its bracket, remove the controller's cover by slightly pushing out the two tabs in its side [A],
and pulling up the cover [B].

Connecting Solenoids

Connect up to ten solenoids to the terminal strip, the Octopus can control up to 10 filters and a single downstream/main/pump output. Refer to the following drawings:
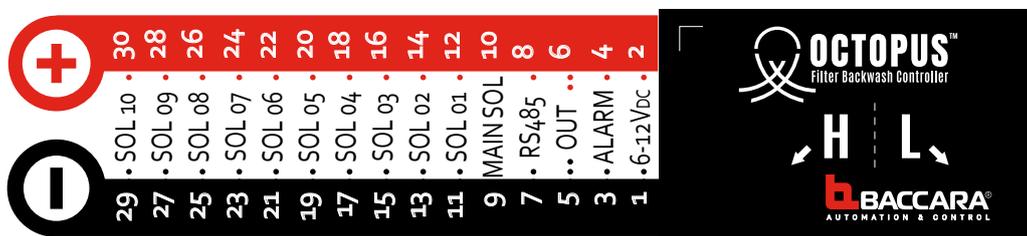

Note the connectors sticker found under the controller's terminals strip.

Terminals' strip

Connectors' sticker
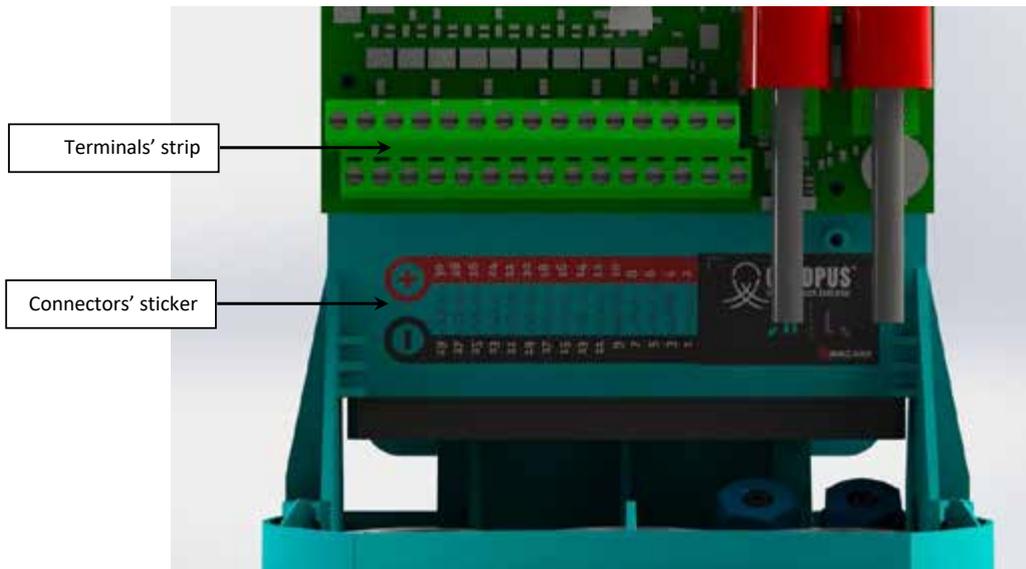
- Connect the red wire (+) of the solenoid to its designated connector at the upper side of the terminal strip.
- Connect the black wire (-) of the solenoid to its designated connector at the lower side of the terminal strip.
- The connectors numbered 9 & 10 are designated for the main / downstream valve / pump output.
- The connectors numbered 3 & 4 are designated for the alarm output.
- The DC power connectors are 1 (-) and 2 (+). Please refer to the butteries' installation chapter below.

Important Note: except for the DC battery wires, all the other wires should pass through the cable glands at the lower side of the controller (see drawing below).

Cable Glands

Upstream pressure connector

Downstream pressure
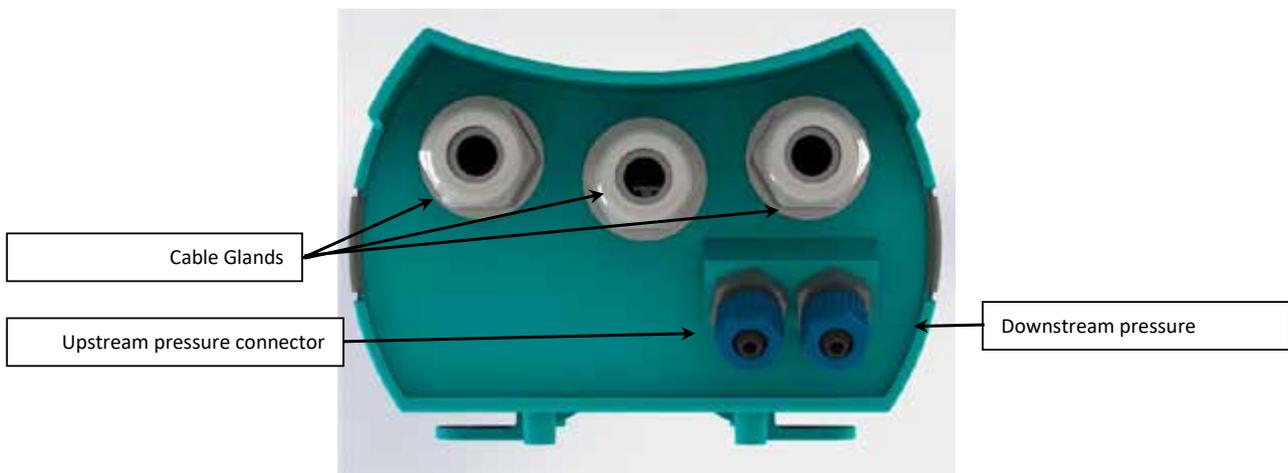
## Connecting the DP signal Control-tubes

Connect the filtration system upstream pressure tub (High) to the 8mm connector marked with H and the downstream tube (Low) to the 8mm connector marked L, found at the controller's bottom side (see picture above).

Batteries Installation

Before installing the battery:

1. Read the safety instructions chapter of this document

2. Make sure that all the wires (solenoids, alarm, and RS485) connected to the terminals' strip are isolated from each other - prevent short circuits.

3. Install eight C type alkaline batteries in the batteries tray of the controller.
   Note that the controller starts running its factory default program immediately. (see drawing below)
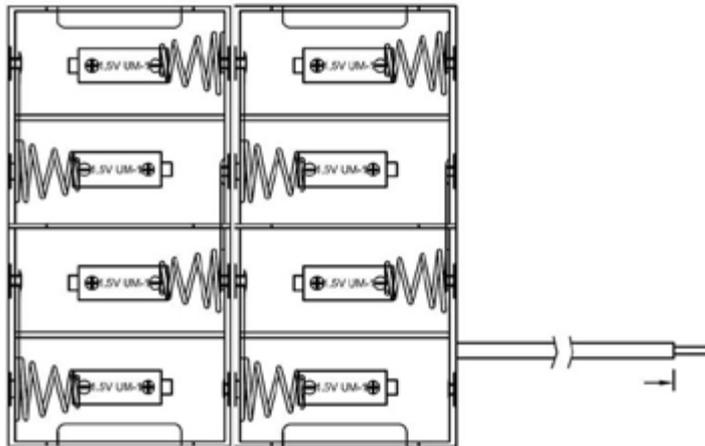
4. Insert the batteries tray back to its designated place in the controller's housing behind the PCB. (see drawing below).

5. Reinstall the controller's cover.
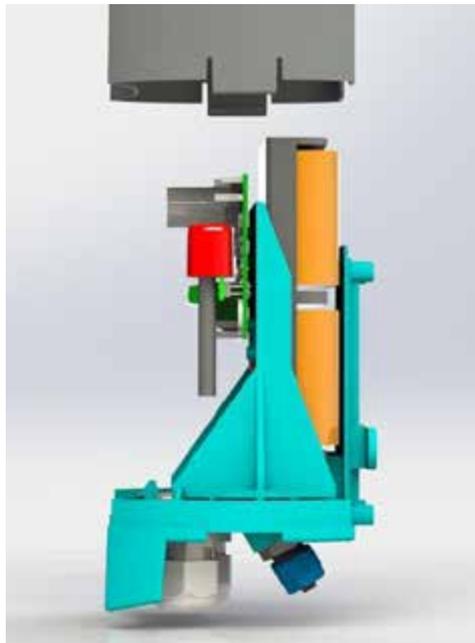
Replacing the battery

1. Replace the battery at the beginning of each irrigation season and whenever the Low Battery Symbol appears on the OCTOPUS Application screen.

2. Always use the best quality batteries to ensure long operation of the controller.

AC to DC adaptor

Adaptor output: 500 mA @ 9-12 VDC min 22AWG (Not included)

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DOWNLOADING AND INSTALLING THE APPLICATION

Batteries Installation

1. Download and install the smartphone's Octopus Application, either by scanning the appropriate QR Code or by searching for Baccara Octopus Application in the App store.
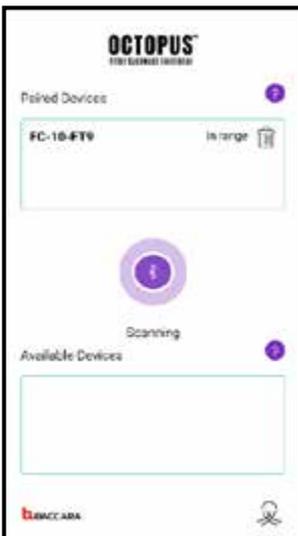

Android QR -

Note: required smartphone versions: Android - Version 8 or newer

Apple QR

Note: required smartphone versions: iPhone - Version 10 or newer

2. Accept all the application's access requirements.

3. Make sure that all the communication options of your smartphone are active and then start the Octopus Application. The following screen appears:


The application scans for Octopus units in its communication range and lists the units related to the current phone:

In the Upper Side of the screen the application lists the Octopus units that are already associated with this phone. An "In Range" message appears next to each one of the units that are currently within the communication range of the phone. Deleting a unit from the list is done by selecting it and pressing the Trash Bin icon next to its name. Scroll along the list and select the unit you would like to connect to from the "In Range" units, The Application connects the unit and displays the Home screen.

The Lower Side of the screen lists the Octopus units that are currently within the communication range of this phone, but are not associated yet with the application. Select the Octopus unit you would like to associate with the application and connect to; it will be moved to the paired devices list in the upper part of this screen.

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USING THE APPLICATION

Moving along the application screens: In its uppermost line the application displays the name of the currently connected Octopus unit together with its status icons. The second line is the entry point to the three main screens that are ordered in 3 designated tabs along the second screen's line: "Home", "Logs", and "Settings".
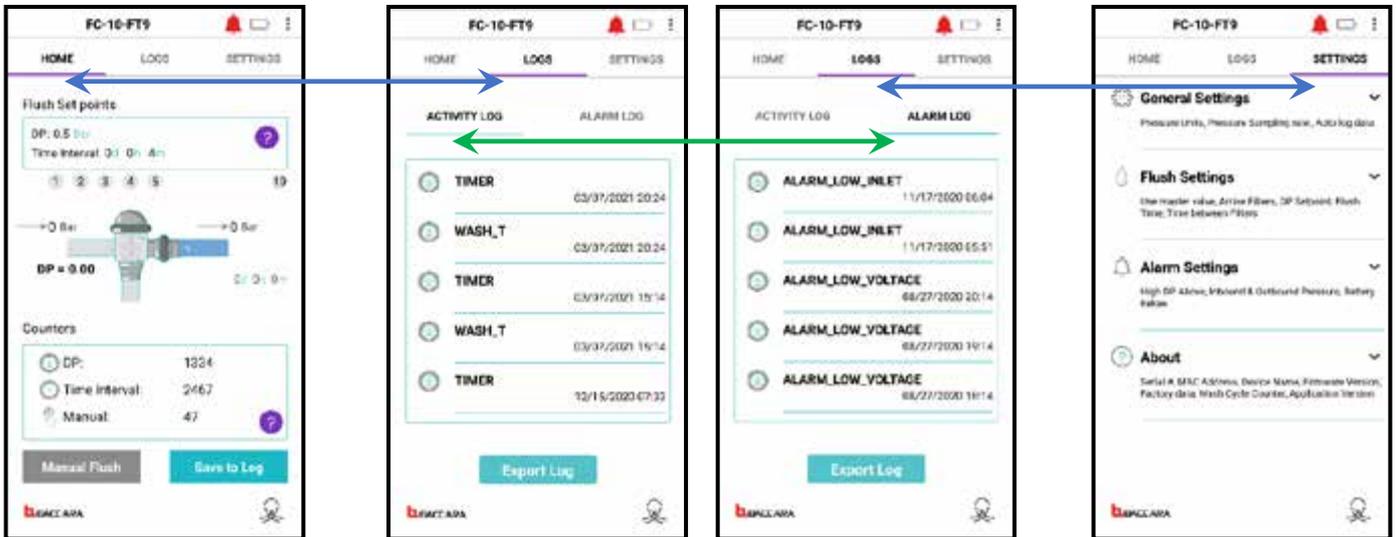

"Home" - In the middle of the screen, an interactive general-drawing of the filtration system displays the current system status.

The **Upper Side** of the screen displays the two setpoints that can trigger an automatic back-flush cycle of the filtration system; DP (Differential Pressure) and Time Intervals.

The **Lower side** of the screen displays the backwash counters divided according to the trigger that started each cycle. The buttons at the lower part of the screen enables the user to start a manual backwash cycle and to save the current status to a log file. Press the "?" icon next to each parameter for details.

"Logs" - The two log screens list the system activity and the alarm events together with a time tag and an option to export the log to an external log file.

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"Settings" - The screen has four segments; entering each segment is done by clicking the Down-Arrow next to the segment name.
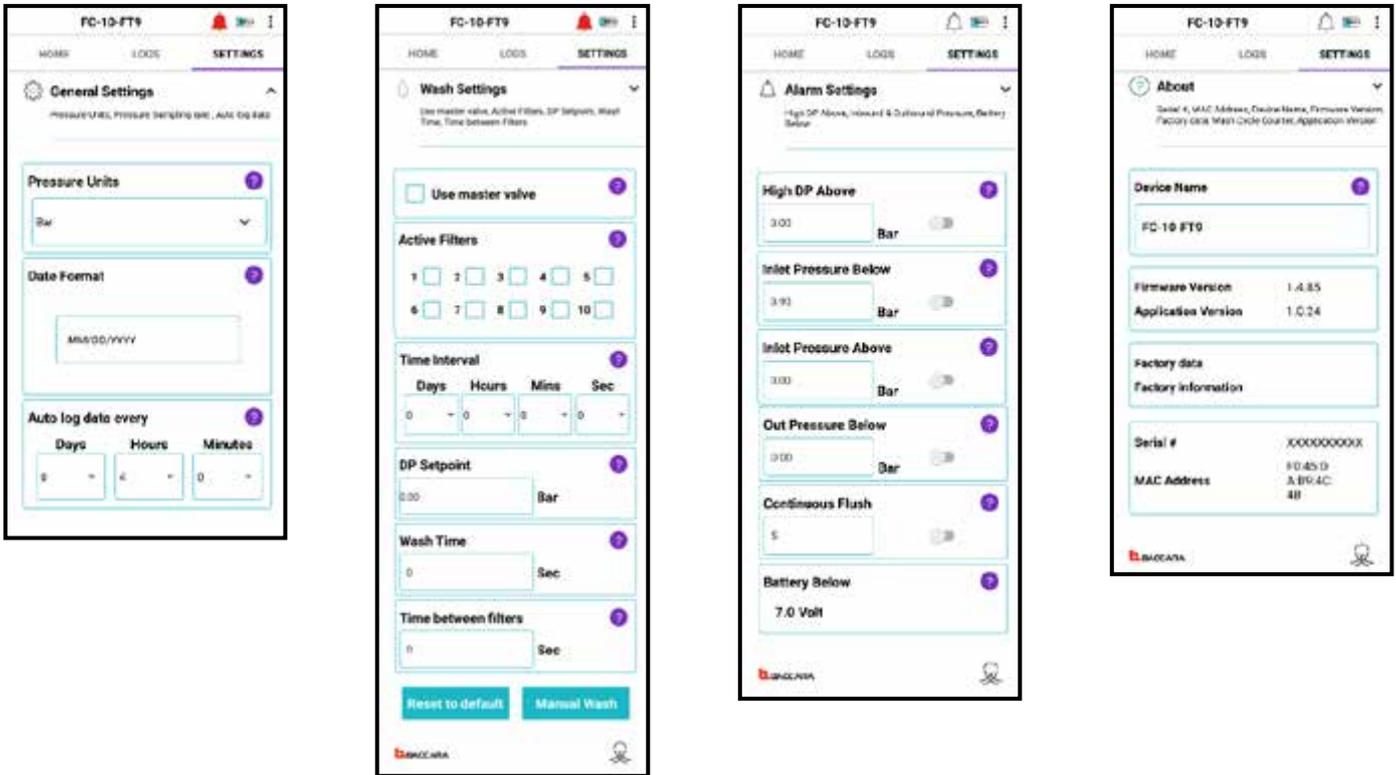
The four segments of the "Settings" screen are: "General Settings", "Flush Settings", Alarm Settings", and "About".

Getting help: A "?" icon appears next to each parameter of the controller's screens; Pressing the "?" icon opens a floating window, which explain the task of the selected parameter, and when applicable gives explanation on how to

OCTOPUS Automatic Filter Backwash Controller
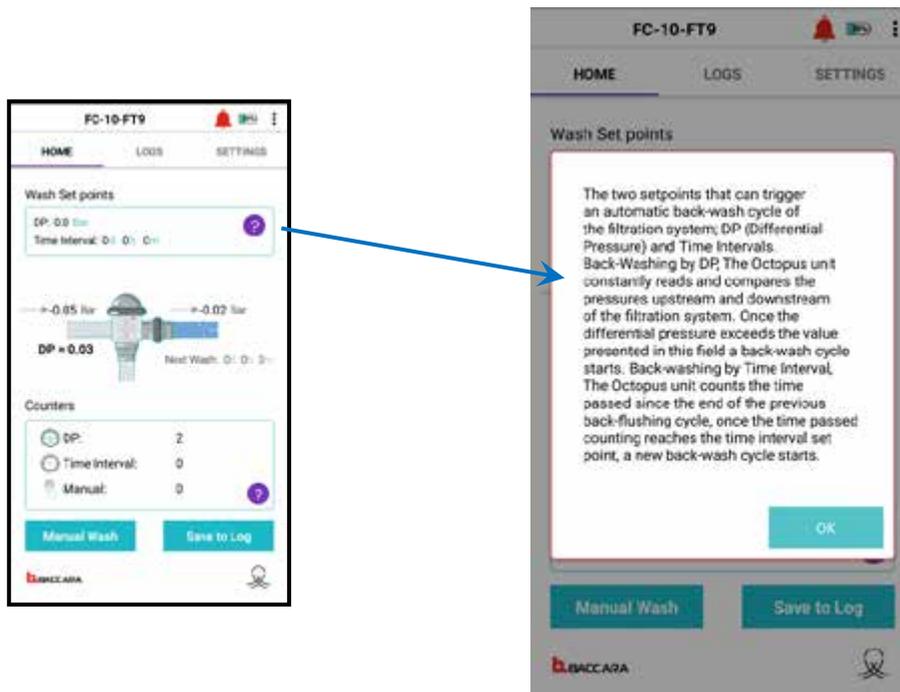
THE USER INTERFACE

This chapter describes in detail the various user screens of the OCTOPUS Application:

The Home Screen
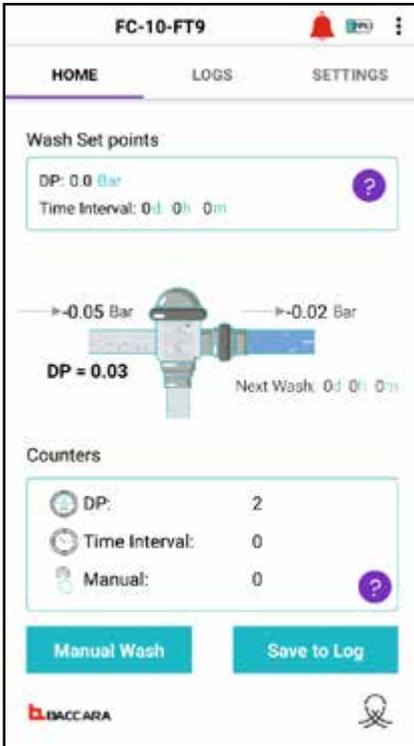
This screen presents the following data:

Wash Set points - The two setpoints that can trigger an automatic backwash cycle of the filtration system; DP (Differential Pressure) and Time Intervals.

Backwash by DP - The Octopus unit constantly reads and compares the pressures upstream and downstream of the filtration system. Once the differential pressure exceeds the value presented in this field a backwash cycle starts.

Backwash by Time Interval - The Octopus unit counts the time passed since the end of the previous backwash cycle, once the time passed counting reaches the time interval set point, a new backwash cycle starts.

The central graphics - animation of the current controller's status together with the current readings of the upstream and the downstream pressures, the current DP reading, and the time remains till the next programed backwash cycle.

Counters - The Octopus unit counts the backwash cycles and presents the counts divided according to the trigger that started each cycle.

- DP - Backwash cycles that started due to a Pressure Differential signal
- Time Intervals - Backwash cycles that started due to the time intervals setpoint parameter.
- Manual - Backwash cycles that started due to a Manual Start command issued by the system user.

Manual Wash - Press this button for starting a backwash cycle.

Save to Log - Press this button for saving the current status of the controller to a log file that is found in the Internal Storage (Root Folder) of your mobile phone.

The Logs Screen
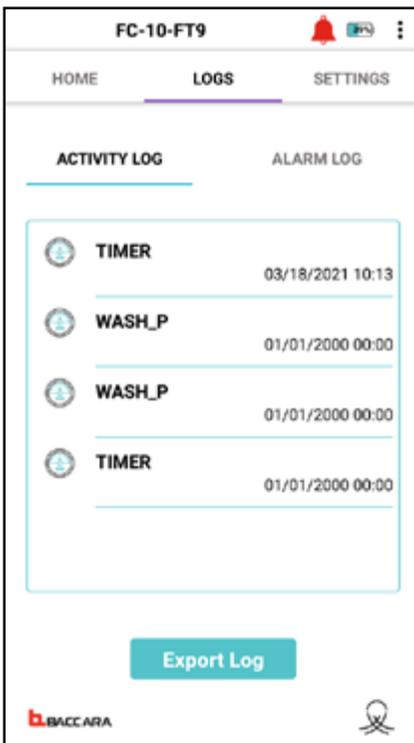
This screen presents the following data:

The Logs Screen displays two types of logs: Activity Log and Alarm Log

Activity Log - A cyclic log that holds the last 200+ activities of the controller. Each record in this log displays the activity type (name), and a Date/Time tag of the activity.

Please refer to the Activity Log types list, later in this document, for explanation on the various controller's activities.
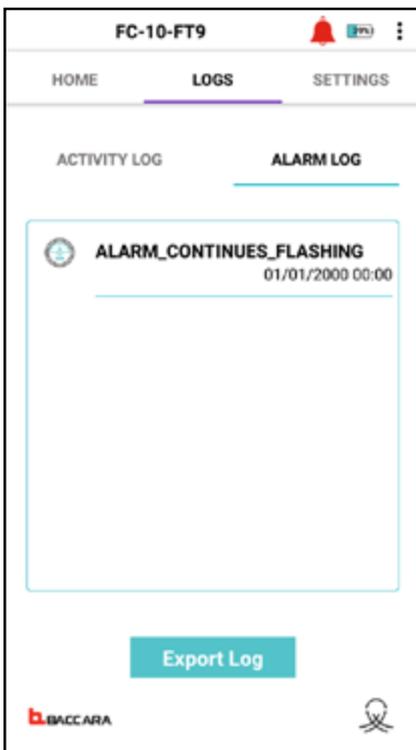
Timer - Time based log save

Wash_P - DP based backwash

Wash_T - Time based backwash

Wash_M - Manual backwash

Note: once connected to the application, the Octopus clock synchronizes with the mobile phone clock.

The Logs Screen (Cont.)

(Cont.) This screen presents the following data:

The Logs Screen displays two types of logs: Activity Log and Alarm Log

Alarm Log - A cyclic log that holds the last 200+ fault alarms occurred in the controller. Each record in this log displays the Alarm type (name), and a Date/Time tag of the fault.

Please refer to the Alarm Log types list, later in this document, for explanation on the various controller's faults that may happen.

Note: the total number of records in the Activity + the Alarm loges together is 250.

Alarm Continuous Flushing - The Octopus is in Continuous backwashing cycles.

Alarm Low Inlet - The Inlet pressure reading is below the set point pressure.

Alarm Low Outlet - The Outlet pressure is below the set point pressure.

Alarm High Inlet - The Inlet pressure is above the set point pressure.

Alarm High DP - The Differential Pressure is above the set point parameter.

The Settings Screen
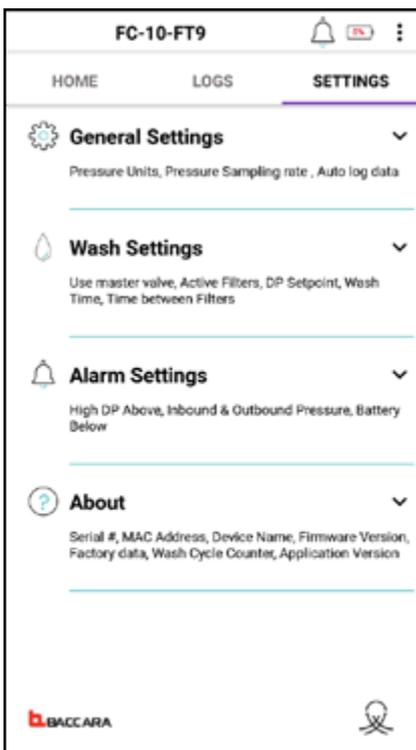
This screen is the entry point to the various settings screens of the controller:

The Settings Screen displays the following setting groups:

General Settings - an entry point for setting the general and common settings of the controller.

Wash Settings - an entry point for setting the parameters required for activating the backwash operation of the controller.

Alarm Settings - an entry point for setting the various parameters required for activating Alarms that may occur during the controller's operation.

About - an entry point to a screen that presents general information on the controller and the application.

The Wash Settings Screen
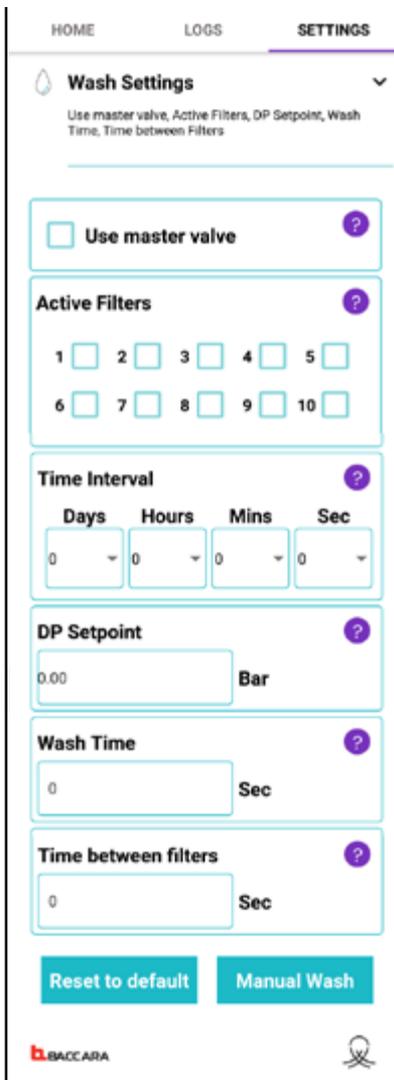
Use master valve - The Main output can be a Main Valve, Downstream Valve, or a Booster Pump. When exists, the Main Output switches ON at the beginning of every backwash cycle, before backwashing of the first filter, and switches OFF after the completion of the last filter backwashing.

Active Filters - Set the active filters in this filtration battery.

Time Interval - Set the required Time Interval for backwashing the filtration battery. The controller starts to recount the interval at the end of every backwash cycle. Once the time, that passed from the previous backwash cycle, exceeds the value of this parameter, a new backwash cycle begins.

DP Setpoint - Set the required DP set point for starting a backwash cycle. Once the differential pressure across the filtration battery exceeds the value entered in this parameter, a new backwash cycle begins.

Wash Time - Set the backwash duration, in seconds, of the filters in the filtration battery. Each filter, in its turn, is backwashed for the time duration set in this parameter.

Time between filters - Set the delay time between filters during the backwash process. The controller starts to count this delay at the end of each filter backwash; the next filter starts to backwash once this delay passed. This parameter ensures complete closure of the filter's flush valve, before the next filter starts backwashing.

Reset to default - Press this button to return the controller to its factory default setting.

Manual Wash - Press this button to start a backwash cycle.

The Alarm Settings Screen
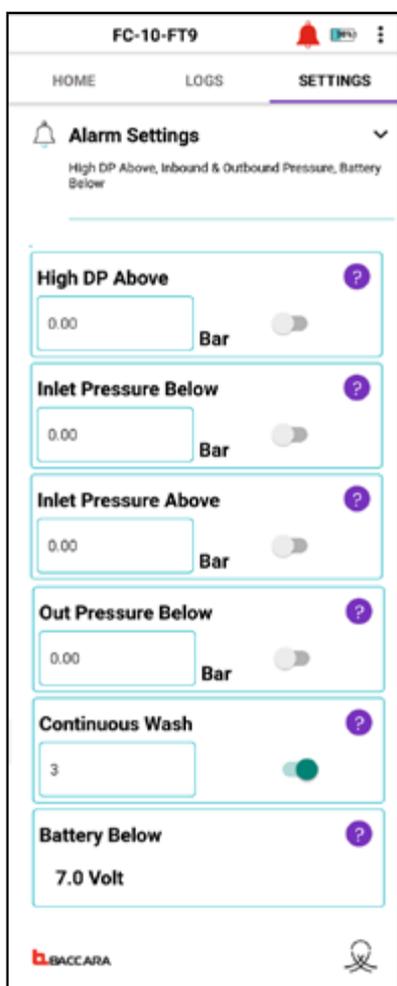
High DP Above - Set the DP value that once exceeded, the controller issues a High DP alarm. This alarm indicates that the cleaning process of the filters is not sufficient, and the filters may be clogged. Set the switch ON at the right side to activate this parameter.

Inlet Pressure below - Set the minimal Inlet Pressure value for sufficient operation of the system; once the controller reads that the inlet pressure is below this value, it issues an alarm. Set the switch ON at the right side to activate this parameter.

Inlet Pressure Above - Set the maximal Inlet Pressure value for this system operation; once the controller reads that the inlet pressure is above this value it issues an alarm. Set the switch ON at the right side to activate this parameter.

Out Pressure below - Set the minimal Outlet Pressure value for sufficient operation of the system; once the controller reads that the outlet pressure is below this value it issues an alarm. Set the switch ON at the right side to activate this parameter.

Continuous Wash - Set the number of maximal allowed consecutive backwash cycles; once the number of consecutive backwash cycle exceeds this number the controller issues an alarm. Set the switch ON at the right side to activate this parameter.

Important note: Once the continuous backwash cycles exceed the number entered to this parameter, the Octopus stops backwashing!

Battery below - this parameter defines the minima battery voltage for issuing a Low Battery Alarm.

Do not change this parameter without consulting first with Baccara Field Service experts!

The About Screen

This screen displays the ID data of this specific controller, and allows the user to set a meaningful name for it.

Device name - set a meaningful name for this controller (name of field, name of crop, name of geographical location, etc.)

Firmware Version - the number of the installed controller's Firmware.

Application Version - the number of the installed controller's Application.

Factory data - left blank

Factory information - left blank

Serial # - the serial number of the controller

MAC Address - the ID of the controller's communication board.

The Advanced Screen
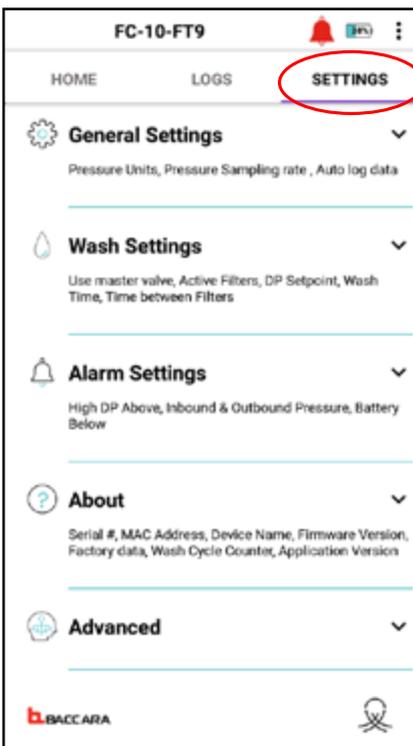
Important! The advanced screens should be used by Baccara trained technician. Do not change any parameter if you are not qualified for this type of work!

Entering the advanced screen is done by tapping five times on the Settings headline of the home screen settings tab. The Advanced dropdown menu appears.

The Advanced Screen

Firmware Upgrade - This button is the entry point to the OCTOPUS Firmware upgrade procedure. Be sure that you are qualified to do so, or you are supported by a technical support engineer.

Clear Data Logger - press this button to erase all the recorded data from the OCTOPUS datalogger. Note: This action is not reversable!

Reset to Factory Settings - pressing this button erases all the device's parameters and restarting the device with its initial factory settings.

Restart Stabilization Time - Stabilization delay that counts once the power supply is first connected; it prevents backwashing during this period of time.

Pressure Stabilization Time - Stabilization delay of the DP reading; prevents un-necessary backwash cycle due to momentarily high DP reading.

Wait for next DP measurement - after the completion of a backwash cycle the Octopus ignores the DP reading for the duration entered in this parameter (for pipeline filling and pressures stabilization).

Pressure Sampling rate - the rate of the pressure readings interval.

Charge Time - Maximal time for the capacitor charging.

Battery below - the lowest possible battery level for regular operation. Below this level the Octopus stopes backwashing. Set the switch ON at the right side to activate this parameter.

Zero Offset - this button resets and calibrate to zero the pressure meters. Press this button only when the two pressure inlets are disconnected.

Sync Date - press this button to synchronize the controller's Realtime Clock with your smartphone clock.

TROUBLESHOOTING

Problem	Cause	Check	Solution
The controller does not perform flushing (Automatic or Manual)	1. No water	1. Check the inlet pressure and the system flowrate	1. Make sure that the water supply (or the pump) is on.
	2. Empty Battery	2. Check the battery	2. Replace the battery
	3. Incorrect DP settings - High	3. Check the DP across the filtration system. If it is lower than the setting, make sure it is increasing over time. If not check the filters integrity.	3. Lower the DP setting to appropriate valve for the specific water quality and dirt load.
	4. No control pressure	4. Check the control tubes filter for clogging	4. Clean the control tubes filter
The controller backwashes constantly	1. Incorrect DP settings - Low	1. Check if the DP is set too low	1. Set the DP to 0.5 bar
	2. Sensor not zeroed	2. Disconnect the upstream and downstream tubes and check that the pressure indicated in the octopus app is 0	2. Disconnect the upstream and downstream tubes and perform 'Zero offset' from the advanced settings screen
Valve does not open / close	1. The valve number selected is incorrect	1. Check the valve number	1. Select the correct valve number
	2. Faulty solenoid	2. Check the solenoid	2. Replace the solenoid
	3. No control pressure	3. Check the control tubes' filter for clogging	3. Clean the control tubes filter
	4. Faulty flushing valve	4. Check the valve	4. Service or replace the valve
Valves open instead of closing and close instead of opening	1. Solenoid valves in reverse polarity	1. Check if the solenoids are connected in reverse polarity	1. Reverse the solenoids connections polarity
App. malfunction	1. App. Is not updated	1. Updates available in your application store	1. Update the Octopus application.

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LOGS SCREENS MESSAGES

Activities Log Screen Messages

Message	Meaning
Timer	Time based log save
Wash_P	DP based backwash
Wash_T	Time based backwash
Wask_M	Manual backwash

Alarms Log Screen Messages

Message	Meaning
Alarm Continuous Flushing	The Octopus is in Continuous backwashing cycles.
Alarm Low Inlet	The Inlet pressure reading is below the set point pressure.
Alarm Low Outlet	The Outlet pressure is below the set point pressure.
Alarm High Inlet	The Inlet pressure is above the set point pressure.
Alarm High DP	The Differential Pressure is above the set point parameter.

SPECIFICATIONS

Item	value	
Pressure range	0-10 bar (0-150 psi)	
Power	Octopus10: 8xC type batteries Octopus3: 6xC type batteries	External: 9-12 VDC (22 AWG wires)
Temperature range	(-)10°C to (+)60°C	
Dimensions	Dimensions Octopus10: Depth: 97 mm / 3.82 inch Height: 190mm / 7.48 inch Width: 140mm / 5.51 inch Dimensions Octopus3: Depth: 97 mm / 3.82 inch Height: 160mm / 6.3 inch Width: 140mm / 5.51 inch	
Pressure sensors	Integrated	
IP Rating	IP65	
User Interface	Via smartphone application	
Filter technologies	Automatic filtration systems	
Standards	This device complies with Part 15 of the FCC Rules and Industry Canada license-exempt RSS standard(s)	FCC ID: 2AZBT-OCTO10

WARRANTY

Baccara Geva ACS Ltd. ("Baccara") products are made to exacting standards of design, material, workmanship, and quality control and are warranted to be free of defects in material and workmanship and reasonably fit for the uses set forth in Baccara's catalog or the purchase order specifications for twelve (12) months from delivery or eighteen (18) months from shipment of the product to buyer, whichever occurs first, if properly installed and maintained and under the normal use and service for which the product is intended.

This warranty does not apply in cases of damage resulting from breakage, negligence, neglect (such as neglect in the maintenance of the product, including the use of unfiltered water, if applicable), abuse, mishandling, normal depreciation or wear and tear, short circuit, breakdown resulting from an irregular power supply (voltage drop), fall or any accident including natural disaster and force majeure damage. For clarity, any repair of such damage, if possible, shall involve a fee.

This warranty will not apply in the event of a breakdown due to operation not in accordance with the instructions for use mentioned in our catalog and the customer information leaflets.

Buyer shall inspect the product within ten days of delivery and must immediately notify Baccara of any defects. Failure to so notify Baccara within such ten-day period shall constitute a waiver of all claims by Buyer against Baccara arising out of such defects.

This warranty is in lieu of all other warranties whether they are statutory, express or implied, including, among other things, any implied warranty of merchantability fitness for a particular purpose not set forth in Baccara's catalog.

The warranty will expire in the event of any modification and / or repair made to the product not by a person authorized by Baccara and / or the use of chemicals not in accordance with our instructions.

Baccara shall not be liable for any consequential, incidental, or special damages resulting directly or indirectly from the design, material, workmanship, operation or installation of any of its products and neither assumes nor authorizes any other person to assume on its behalf any other liability in connection therewith. Buyer's exclusive remedy shall be the repair or replacement, according to Baccara's exclusive discretion, of any such defective product, after inspection and verification by Baccara, provided that such defective product was purchased from Baccara or from any of its authorized distributors. Service and repair pursuant to this warranty shall be provided in Baccara's facilities and is subject to presenting the warranty certificate, invoice and delivery of the product for inspection. Buyer shall deliver the product to one of Baccara's facilities and collect it from the same facility once repair is completed.

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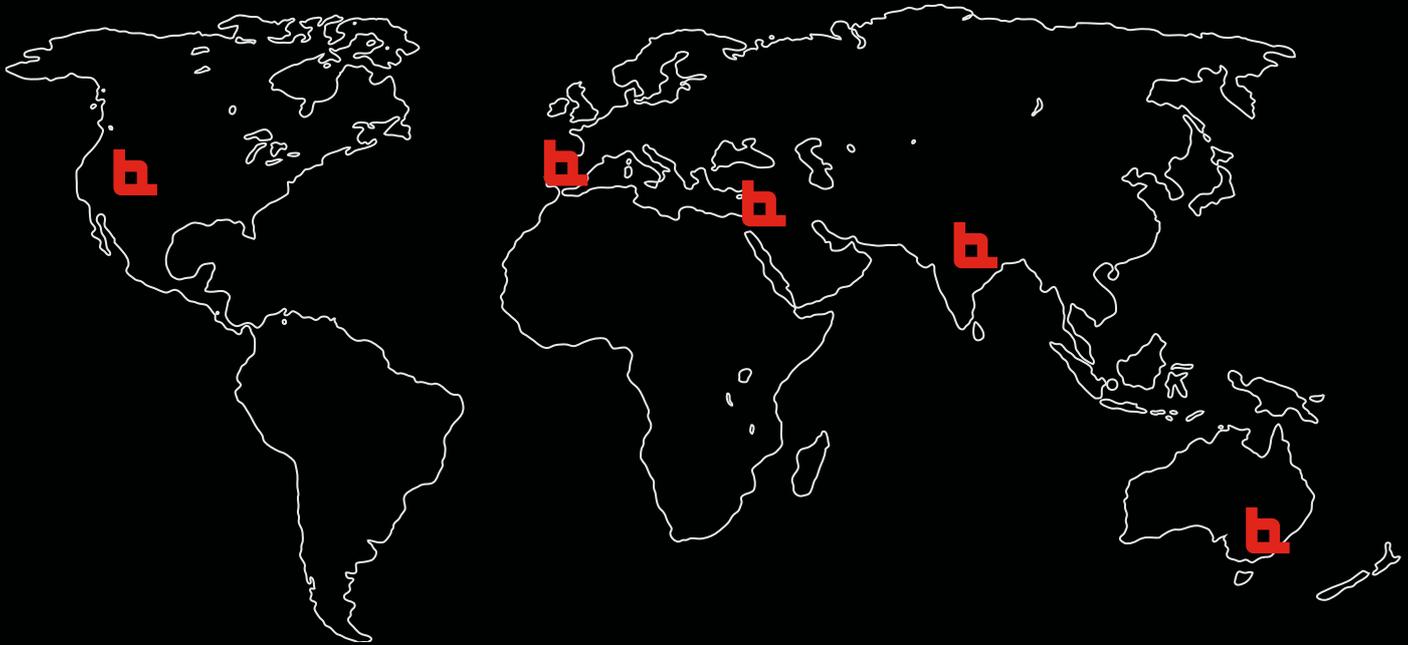
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05/2021