

AQUA-Nautica

Watermaker Control Panel

User Manual

Version 1.1.0

1. Overview

The AQUA-Nautica control panel is a touchscreen-based controller for watermaker systems. It features a 720x720 pixel high-resolution display with intuitive touch controls for managing power, flushing cycles, filter monitoring, automated operation modes, WiFi connectivity, and NTP-synchronized date / time.

1.1 Main Screen Layout

The main screen consists of the following elements:

- FILTER window (top left) - filter lifetime as percentage or hours
- RUNTIME window (top right) - total or user runtime hours
- FLUSH TIMER bar (center) - automated flush cycle countdown
- POWER button (left) - controls the water pump
- FLUSH button (right) - controls the water pump and flush valve
- AQUA-Nautica logo (bottom left) – AQUA-Nautica logo, also touch target for Service Menu access
- Date / Time (bottom right) - current weekday, date and time when internet is available

2. Basic Operation

2.1 POWER Button

Short press toggles the water pump ON / OFF. When ON, the button turns green and shows the operating time.

- AUTO OFF mode (default ON): countdown timer automatically shuts off power after the preset time (default 3 hours, adjustable 1-9 hours in 15-minute steps).
- Manual mode: when AUTO OFF is disabled, the water pump runs until manually turned off or until the Power Limit time is reached.
- Elapsed time (HH:MM) is displayed when AUTO OFF is disabled, starting from 00:00.
- Countdown timer (HH:MM) is displayed when AUTO OFF is enabled.
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2.2 FLUSH Button

Short press activates the flush cycle:

- POWER was OFF: FLUSH activates immediately, POWER turns ON after 2 seconds.
- POWER was ON, Flush Delay > 0: POWER turns OFF, FLUSH activates, POWER restarts after delay.
- POWER was ON, Flush Delay = 0 (default): both POWER and FLUSH remain active.
- Pressing POWER or FLUSH again deactivates both.
- During Flush Delay, pressing FLUSH cancels the delay and turns everything OFF.

When AUTO MODE is enabled on the FLUSH button (default ON), the system automatically starts a flush cycle when the AUTO OFF countdown expires. The flush runs for the preset duration (default 1 minute, adjustable 1-5 minutes in 15-second steps).

3. Display Windows

3.1 Filter Lifetime

Displays remaining filter lifetime. Short press toggles display between : Percentage and Hours mode.

- Percentage mode (default): shows 100-0 %.
- Hours mode: shows operating hours since the last filter reset.
- Colour: blue (100-30 %), orange (30-1 %), red (0 %).
- Long press in percentage mode: opens reset panel. Preview shows "100 %" in red. Press SAVE to reset filter.
- Long press in hours mode: opens settings panel to adjust filter lifetime (20-200 hours, step 10 h). Preview shows hours in white.

Display preference is saved permanently.

3.2 Runtime

Displays operating hours. Short press toggles between:

- USER (default): user-resettable runtime counter.
- TOTAL: total runtime since manufacturing (non-resettable by user).

Long press (USER mode) opens reset panel. Shows "0000 h" in red as preview. Press SAVE to reset.

Long press (TOTAL mode) automatically switches to USER mode first, then opens reset panel.

Display preference is saved permanently.

3.3 Flush Timer

Shows the automated flush timer in D:HH:MM format. When AUTO is active it counts down in real time. At 0:00:00 a flush cycle triggers and the timer restarts.

- Default interval: 5 days (adjustable 3-7 days).
- AUTO label: red when active, grey when inactive.
- Each flush activation resets the countdown.
- Repeat count limited by Reflushing Limit setting.
- When the Reflushing Limit is reached, AUTO deactivates automatically.

Note: Flush Timer AUTO state is **NOT** persisted - always starts OFF at power-up.

3.4 Date / Time

Displays the current date and time received via NTP over internet:

- Date : weekday + DD.MM.YYYY.
- Time : HH:MM in 24-hour format.

Updates whenever the displayed minute changes. The internal RTC keeps the clock running across temporary internet outages - once NTP has set the time at least once, the display stays accurate (small drift over days) until the next reboot. Timezone is auto-detected via Geo-IP and re-checked every 6 hours.

If no internet is available at first boot, placeholders `-- . -- . ----` and `--:--` are shown until NTP succeeds.

4. Settings Panel

Long press (3 seconds) on any configurable element opens the settings panel with 5 buttons:

- `<` decrease - adjusts value down, hold for auto-repeat
- `>` increase - adjusts value up, hold for auto-repeat
- `AUTO` - toggles auto mode ON / OFF
- `SAVE` - saves changes and closes the panel
- `ESC` - discards changes and closes the panel

The panel closes automatically after 10 seconds of inactivity. The source element frame turns red while the panel is open.

4.1 Long-Press Rules

Long-press is **always available** in the main screen, **except** when the targeted element is itself currently active:

Element	Long-press blocked when :
POWER	POWER is ON (running)
FLUSH	FLUSH is ON (running)
Flush Timer	Flush Timer is ON (active)
Filter	Never
Runtime	Never
Logo	POWER is ON (running)

4.2 Configurable Elements

Element	Range	Step	Default
POWER (Auto OFF)	1-9 hours	15 min	3 hours
FLUSH (countdown)	1-5 minutes	15 sec	1 minute
Flush Timer	3-7 days	1 day	5 days
Filter (max hours)	20-200 hours	10 h	100 hours
Filter (reset)	Long press in % mode	-	-
User Runtime (reset)	Long press in USER mode	-	-

5. Flush Delay

Flush Delay introduces a pause for POWER restart when a flush cycle triggers:

- AUTO OFF expires + AUTO MODE ON: POWER OFF, FLUSH starts, POWER restarts after delay.
- Manual FLUSH while POWER ON (delay > 0): POWER OFF, FLUSH starts, POWER restarts after delay.
- Manual FLUSH while POWER OFF: FLUSH starts, POWER starts after 2 seconds (fixed).
- Delay = 0 (default): no pause, POWER stays ON during flush.

Flush Delay is configured in the User Setup sub-screen of the Service Menu (0-180 seconds, step 15).

6. Screensaver

The screensaver activates after **5 minutes** without touch - **only on the main screen**. It is skipped while any modal is active (Service Menu, WiFi Setup, settings panel, etc.).

It displays only the AQUA-Nautica logo (with transparent background) on a black screen. Any touch wakes the display; the wake-up touch does not trigger buttons. All timers and counters continue running. No display updates occur while the screensaver is active.

7. Service Menu

Access: 3-second long press on the AQUA-Nautica logo area. Available regardless of POWER / FLUSH state. Timeout: 10 seconds of inactivity (except in the Factory Reset confirm dialog, which never times out).

7.1 Service Menu Main Screen

Five buttons:

Button	Action	Colour
FW UPDATE	Short press: check for firmware update and install if newer	Green
USER SETUP	Short press: opens sub-screen with user settings	Cyan
FACTORY DEFAULT	Short press: opens confirmation dialog (see 7.3)	Red

WIFI SETUP	Short press: opens WiFi configuration modal (see Section 9)	Yellow
DEALER SETUP	Short press: opens security code entry (star sequence)	White

7.2 User Setup Sub-Screen

Contains 3 adjustable settings. Short press cycles the value. Hold for auto-repeat.

Setting	Range	Default
FLUSH DELAY	0-180 seconds (step 15). 0 = no delay	no (0 s)
REFLUSHING LIMIT	0-9 times. 0 = single flush only	5 times
POWER LIMIT	0-9 hours. 0 = no limit (manual mode only)	6 h

Timeout returns to the Service Menu main screen.

7.3 Factory Default Confirmation Dialog

Pressing **FACTORY DEFAULT** opens a confirmation dialog:

All settings, saved WiFi networks,

user runtime and filter hours

will be reset.

Total runtime is preserved.

Device will restart afterwards.

Are you sure?

- No (blue): cancel, return to Service Menu.
- Yes (red): perform reset and restart.

The dialog has **no inactivity timeout** - the user must explicitly choose.

8. Date / Time and NTP

After the device joins a WiFi network with internet access:

1. Geo-IP query (ip-api.com) detects the device's public-IP timezone offset and sets the system TZ accordingly. Refreshed every 6 hours to catch DST transitions.
2. Date / Time appears in the bottom-right area below the FLUSH button.

The clock keeps ticking even when WiFi / internet is lost, until the next hardware reset. Drift is typically < 1 second per day.

9. WiFi Setup

Opens from Service Menu.

9.1 Network List

After entry the device scans (1-3 s, "Scanning" shown). The list shows up to 8 unique networks sorted by appearance, with for each:

- Info columns : dBm, Channel (Ch NN), encryption type (OPEN, WPA2, etc.).
- SSID in colour by signal strength:
 - Green: RSSI > - 65 dBm
 - Orange: RSSI < - 65 dBm
 - Red: RSSI < - 80 dBm
- Info columns colour:
 - White: default
 - Cyan: currently connected to this network
 - Cyan (only Encryption type): password is saved (network is known)

Bottom of screen: **Rescan** (blue, left) and **Close** (red, right).

Tap a row:

- Open network (no password): straight to CONNECTING.
- Encrypted: opens KEYBOARD screen. If a password is saved for this SSID, it is pre-loaded and shown masked (``).
- Currently connected network: skips directly to CONNECTED status screen.

9.2 On-Screen Keyboard

- PASSWORD : label top-left (cyan).
- SSID : <name> top-right (label cyan, name white).
- Password field spans full width below.
- Cursor: a small vertical bar after the last character.
- Display: on first entry the typed text is visible; once stored and re-loaded it is masked with `\*`. Deleting all characters (clearing the field) also clears the saved password and unmask future input.
- Cancel (red, left): return to list without connecting.
- Connect / OK: start connection attempt.

9.3 Connecting / Failed

- Connecting screen shows the target SSID and a Status line, 20-second timeout.
- On failure (wrong password, SSID not found, timeout): shows FAILED and the reason, with a single Back button. Pressing Back returns to the KEYBOARD screen with the password preserved for correction.

9.4 Connected

Shows current connection details:

- SSID, IP, Gateway, DNS, MAC, RSSI, Channel.
- Buttons : Disconnect (red), Networks (back to list), Close (return to home screen).

Disconnect also clears the auto-reconnect default - the device will not silently reconnect on the next boot.

9.5 Password Storage and Auto-Reconnect

- Up to 16 SSID / password pairs are stored persistently. Ring-buffer when full (oldest dropped).
- The last successfully connected SSID is recorded as the auto-reconnect default.
- On boot, the device silently attempts to reconnect to that network (non-blocking).
- Factory Default clears all stored networks.

10. Firmware Update (OTA)

The device supports over-the-air firmware updates via either **Ethernet** or **WiFi** (HTTPS). Initiated from the Service Menu.

10.1 Update Process

1. Enter Service Menu (long press on logo): press **FW UPDATE**.
2. Device checks link (Ethernet or WiFi must be up).
3. Device performs DNS-resolves the OTA host to verify actual internet access.
4. Device verifies its chip-ID registration at the server.
5. Device queries the server's firmware version.
6. If newer: downloads and installs automatically with progress bar, then restarts.
7. If same version: displays "Already up to date!".

10.2 Error Reporting

- "No network connection!" : connect Ethernet or join WiFi.
- "No internet access! / Check router / WAN" : link is up but DNS fails.
- "Connection timeout! / Try again" : handshake didn't complete in 5 s; retry usually succeeds.
- "Device not registered!" : server returned OK but chip-ID isn't in its database.
- "Server error: <code>" : HTTP error.

10.3 OTA Rollback Protection

After an update, the new firmware must complete its startup successfully. If it crashes before confirming validity, the device automatically rolls back to the previous working firmware version.

11. Touch Control Quick Reference

- Short press: < 1 second.
- Long press: 3 seconds.
- Between 1-3 seconds: no action (dead zone).

Element	Short Press	Long Press
POWER	Toggle ON / OFF	Settings panel (blocked while ON)
FLUSH	Start / Stop flush	Settings panel (blocked while ON)
Filter	Toggle % / hours	Reset (%) or Settings (hours)
Runtime	Toggle USER / TOTAL	Reset USER runtime
Flush Timer	-	Settings panel (blocked while active)
Logo	-	Service Menu
Screensaver	Wake up	-