



LAKE LIFTER

Hydraulic Standard Lift Controller

Hydraulic Lift • Solar Charging • LED Deck Light

USER MANUAL

Model: HC-AB-MP3 • Firmware v7.0

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HOLD-TO-RUN

Press and hold UP or DOWN to move the lift.
Release to stop.

SOLAR CHARGING

Built-in 4-stage MPPT-style charge controller
for 12V or 24V batteries.

LED DECK LIGHT

Toggle on / off with one button; configurable
auto-off timer.

LOW-VOLTAGE PROTECTION

Automatic shut-off at 9.7V protects your
battery from deep discharge.

The Hydraulic Standard Lift Controller is a self-contained boat-lift controller for solar-powered hydraulic lifts. It drives a hydraulic pump motor and two directional valves to raise and lower the lift on demand, while simultaneously managing battery charging from a solar panel through a four-stage charge controller. A 4-digit LED display shows battery voltage, state-of-charge percentage, and live charging status.

The unit operates as a **hold-to-run** controller: press and hold the UP or DOWN button to move the lift; release the button to stop immediately. There are no programmed up / down times to set, and no boarding-pause feature — the lift moves only as long as the operator is holding the button.

POWER

12 V or 24 V DC, sealed lead-acid or AGM battery

SOLAR INPUT

Compatible solar panel matched to battery voltage

MODEL

HC-AB-MP3 (Firmware v7.0)

COMPATIBILITY

Standard hydraulic lift pump + 2 valves

This controller is designed for off-grid boat lifts. The integrated solar charge controller maintains the battery automatically — no separate charger is required when sun is available.

Display

- **4-digit 7-segment LED display** for battery voltage, state-of-charge, and battery-type indication
- **Solar icon** — lights when solar power is charging the battery
- **Battery icon** — shows battery health (solid / flashing)
- **UP arrow icon** — lights while the lift is raising
- **DOWN arrow icon** — lights while the lift is lowering
- **V** and **%** labels — identify whether the display is showing voltage or percentage

Power-On Sequence

- 1 All segments illuminate briefly with a confirmation beep
- 2 The configured battery type is shown for 5 seconds: 12V or 24V
- 3 The display switches to the running state — battery voltage and percentage alternate every two seconds

Display Icon Reference

Icon	Solid	Flashing	Off
Solar	Charging in BULK or ABSORPTION stage	Battery is full — FLOAT maintenance	No solar input or low-battery shutdown
Battery	Battery voltage is healthy	Battery voltage is low — recharge soon	Low-voltage shutdown active (E01)
UP arrow	UP button is held; lift is raising	—	Idle
DOWN arrow	DOWN button is held; lift is lowering	—	Idle

The control panel has five buttons. Most operate by simple press-and-hold; only the LED button has a long-press function.

Button	Press & Hold	Short Press	Hold at Power-On
UP	Raise the lift while held	—	—
DOWN	Lower the lift while held	—	—
DISP	—	Show battery voltage / percentage on the display for one minute	Toggle between 12 V and 24 V battery type
LED	Long-press (about 5 sec): enter LED auto-off-timer setting. While in the timer screen, short-press LED to add 5 minutes (5 60, then back to 5).	Toggle the deck light on / off	—
REMOTE	—	Toggle key lock on / off (locks the UP and DOWN buttons against accidental presses)	—

A short beep confirms each button press. The buzzer is also used as the alarm when the low-battery cutoff trips — see Section 10.

Battery type must match the battery you connect. Connecting a 12 V battery while the controller is set to 24 V (or vice versa) will result in incorrect voltage readings, incorrect charging, and possible damage. Always confirm the type shown on the splash screen at power-on before operating the lift.

Raising the Lift

- 1 Make sure the key lock is OFF (see Section 7)
- 2 Press and **hold** the **UP** button
- 3 The hydraulic pump motor and the UP valve activate — the UP arrow icon lights on the display
- 4 Continue holding UP until the lift reaches the desired position
- 5 Release the UP button to stop the motor and close the valve immediately

Lowering the Lift

- 1 Make sure the key lock is OFF (see Section 7)
- 2 Press and **hold** the **DOWN** button
- 3 The hydraulic pump motor and the DOWN valve activate — the DOWN arrow icon lights on the display
- 4 Continue holding DOWN until the lift reaches the desired position
- 5 Release the DOWN button to stop the motor and close the valve immediately

Stopping

Releasing UP or DOWN stops all motion within a fraction of a second. There is no separate STOP button — the motor and both valves are de-energized as soon as the active button is released.

Do not press UP and DOWN at the same time. The controller has no protection against opposing commands — pressing both energizes both valves and the pump simultaneously, which can damage hydraulic seals and is not a valid operation.

If the battery voltage is below the cutoff threshold (see Section 10), the lift will not move regardless of how long the button is held — the display shows E01 instead and the buzzer alarms.

Battery Voltage Selection (12V / 24V)

The controller supports both 12 V and 24 V battery systems. The selected battery type is stored in non-volatile memory and is preserved across power cycles. The factory default setting is **12 V**.

How to Change the Battery Type

- 1 Disconnect the battery from the controller
- 2 Press and **hold** the **DISP** button
- 3 While still holding DISP, reconnect the battery
- 4 Continue holding DISP until the splash screen appears, then release
- 5 Confirm the new setting on the splash screen: 12V or 24V

Each time you hold DISP at power-on, the setting toggles — 12 V becomes 24 V, and 24 V becomes 12 V.

Why It Matters

- The displayed battery voltage and state-of-charge percentage are calibrated to the configured type
- The internal solar charge controller adjusts its target voltages for BULK, ABSORPTION, and FLOAT stages based on the configured type
- The low-voltage cutoff threshold (Section 10) is referenced to the configured type

Mismatch hazard: If a 24 V battery is connected while the controller is set to 12 V, the unit will read voltages incorrectly and may attempt to charge in a manner that damages the battery and / or the controller. Always verify the battery-type splash screen at every power-on.

The controller switches a 12 V or 24 V LED deck light through a dedicated output. The light has an auto-off timer to prevent battery drain if it is left on overnight.

- **Short-press LED:** toggle the deck light on or off
- **Long-press LED** (about 5 seconds): open the auto-off-timer setting screen
- While in the timer screen, each **short press of LED** adds 5 minutes to the timer (5, 10, 15, ... 60 minutes, then back to 5)
- The timer screen exits automatically after about 6 seconds without any button press, returning to the main display
- The light turns off automatically when the timer elapses

Default Timer

The factory default auto-off timer is **15 minutes**. Range: 5 to 60 minutes in 5-minute increments.

The key-lock feature blocks the UP and DOWN buttons against accidental presses (for example, when children are on the dock, or during dock cleaning).

- **Short-press REMOTE:** toggle the key lock on or off
- When the lock is ON, pressing UP or DOWN does nothing
- The DISP, LED, and REMOTE buttons remain active even when the key lock is on
- The key-lock state is not preserved across power cycles — it always starts in the OFF state when the controller powers on

The internal charge controller manages solar input automatically through four stages, optimised for sealed lead-acid and AGM batteries.

Stage	What It Does
Bulk	Drives the maximum available solar current into the battery to bring it back up quickly. The Solar icon is solid.
Absorption	Holds the battery at a constant high voltage for up to two hours to top off the last few percent of charge. The Solar icon is solid.
Float	Drops to a lower maintenance voltage to keep the battery topped up without overcharging. The Solar icon flashes to indicate Float mode.
Equalization	Periodic high-voltage cycle to balance battery cells. Treated the same as Bulk by the controller.

The controller automatically returns from Float to Bulk if the battery voltage drops far enough — for example after a heavy lift cycle or extended cloudy weather.

When the lift is idle, the main display alternates every two seconds between two readings:

- **Battery voltage** (V icon shown): for example 12.6V
- **State of charge** (% icon shown): a number from 0 to 100. The controller shows 100 when the battery is healthy and counts down through 9, 8, 7, ... 0 as it depletes.

To force the display to show battery status when it has gone blank, press the **DISP** button. The display stays active for one minute, then returns to its idle state.

The controller continuously monitors battery voltage. If the battery is allowed to drop too low, deep discharge can permanently damage it. To prevent this, an automatic shutdown engages when the battery falls below a critical threshold.

What Happens at Low Battery

- 1 Battery voltage drops below **9.7 V** for at least two seconds (12 V system)
- 2 The display switches to E01 with the percentage icon and 0 shown
- 3 The buzzer sounds an alternating alarm
- 4 The motor, both valves, and the LED deck light are disabled — the lift cannot move and the light cannot turn on
- 5 The buzzer and lockout remain active until the battery recovers

How the System Recovers

- 1 Apply a charging source — either solar input or an external charger
- 2 Once the battery rises above **9.8 V** and stays there for about 10 seconds, the cutoff clears automatically
- 3 The display returns to the normal main display and the lift becomes operable again

Protect the battery. Repeatedly running the battery down to E01 will shorten its useful life. If you see E01 after a normal day of use, the solar panel may not be matched to the load — verify the panel connections and consider whether the panel size is adequate for typical conditions.

The cutoff thresholds shown above (9.7 V trip, 9.8 V recover) are for a 12 V battery system. The controller scales these proportionally for 24 V mode.

Common Issues

Symptom	Possible Cause	Solution
Display blank after power-on	No battery power or blown fuse	Check battery connections, fuse, and battery voltage
E01 on display, alarm sounding	Battery below 9.7 V cutoff	Apply solar or external charging; cutoff clears automatically when battery rises above 9.8 V for 10 sec
Lift will not raise or lower	Key lock is on, or low-battery cutoff is active	Press REMOTE once to clear the key lock; check for E01
Battery type displayed is wrong	Battery type was set incorrectly at last setup	Disconnect battery, hold DISP, reconnect to toggle 12 V / 24 V (Section 5)
Solar icon never lights	Panel disconnected, panel voltage below battery voltage, or shaded	Check panel wiring and exposure to sunlight
Battery percentage stays low even in sunlight	Panel undersized, panel angle wrong, or battery near end of life	Verify panel rating and orientation; consider battery replacement
LED deck light will not turn off	Auto-off timer reached its maximum and re-armed	Short-press LED to turn off manually
Lift moves only briefly when button is held	Battery is near the cutoff and the load is collapsing the voltage	Recharge the battery; check connection lugs for corrosion

Factory Default Settings

Parameter	Default Value
Battery Type	12 V
LED Auto-Off Timer	15 minutes
Key Lock	OFF (resets at every power-on)
Low-Voltage Cutoff (12V)	9.7 V trip / 9.8 V recover