



# BatteryLink

**WW-83XX**

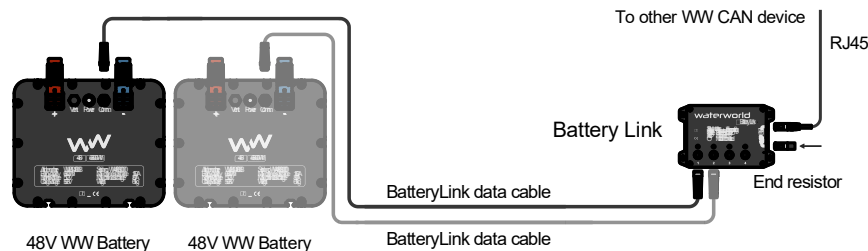
INSTALLATION MANUAL

# 1 BatteryLink integration

When combining Waterworld batteries with a WaterWorld electric drive, a system can be created in which the battery and motor communicate with each other. To enable this communication, a BatteryLink is added between the WaterWorld system and the WaterWorld battery.

## 1.1 Installation

The diagram below shows how the BatteryLink shall be connected within the WaterWorld system. Always connect the first battery to the leftmost communication port (1). When adding batteries use the next available port (port 2, port 3, port 4, etc.). On the side of the Battery Link 2 CAN (RJ45) ports are located. Connect the CAN communication cable to the BatteryLink and the other side to any CAN port on the WaterWorld system.



**Note:** batteries shall be properly installed, according to the WaterWorld battery installation manual.

## 1.2 LED indications

The Battery Link features a LED light for every (RS485) communication port. This LED signals the status of the communication.

- Green: the battery has successfully connected to the WaterWorld system.
- Green blinking: the system is trying to connect. Please wait a moment.
- Orange: The battery discharge is turned off. There is no voltage over the battery terminals.
- Red: there is no connection detected between the battery and the Battery Link. Please reset the system by turning off all batteries and turning them back on after 30 seconds. If there is still no connection please contact our customer support.
- LED off: there is no data cable connected. Please make sure you properly connected the cable to the RS485 data socket on the battery.

# 2 BatteryLink functions

The Battery Link integrates your batteries with the other components of your WaterWorld system. This results in an extremely reliable system. In addition, the functions of the BatteryLink ensure that your batteries are managed even better, so that they will last longer. The functions of the BatteryLink are described below.

## 2.1 Battery State of Charge (SOC)

Thanks to the built-in smart shunt of the battery management system in the battery, the current battery percentage of the battery is always communicated to the WaterWorld display. The self-learning algorithm in the battery management system corrects for degradation of your battery over time, so that the battery percentage and sailing time remain accurate over the entire life of your system.

## 2.2 High temperature power protection

When the battery gets too hot (60C+) it will switch off. To prevent this, the BatteryLink notifies the CANopen system to limit the maximum power consumption before this temperature is reached<sup>1</sup>. When this happens you will receive a notification in the WaterWorld display. Limiting the power gives the battery(s) the opportunity to cool down and ensures a reliable system that does not stop you unexpectedly.

## 2.3 Low temperature power protection

At low temperatures (below freezing) the BatteryLink protects the battery. The BatteryLink notifies the CANopen system to limit<sup>1</sup> the maximum power consumption until the battery is warmed up, after which the maximum power can be delivered. This will extend the battery lifetime.

## 2.4 Battery shut-off protection

In case of a multi-battery system, it can happen unexpectedly that a battery fails due to low battery voltage, too high temperature or some other problem. This can result in a chain reaction where other batteries have to deliver too much power beyond the limit as described in the specifications. This results in shutting down all battery(s) and thus shutting down the system. To prevent this, in this event the Battery Link will limit<sup>1</sup> the power so that the remaining battery(s) always continue to work within their specifications. This ensures that your system does not shut down and you can continue sailing. You will receive a message in the WaterWorld display with the error message.

## 2.5 Getting home safely

When the battery(s) are almost empty, it is important not to use too much power from the engine as this can result in the batteries dropping below cut off voltage. This is the case with all types of batteries. To minimize this effect, with a low “state of charge” of the batteries, the maximum power of the motor is reduced somewhat and you will receive an error message. This ensures that you can always come home safely and that you do not come to a standstill unexpectedly.

## 2.6 Error messages

When the Battery Link limits the system, you will be provided with a message in the display. This means you are always aware of what is happening in the system.

*<sup>1</sup>Note on limiting power consumption. When the BatteryLink detects that the power consumption needs to be limited for protecting the battery(s), it notifies other devices on the CANopen network. WaterWorld motorcontrollers use this information for limiting the maximum power consumption of the motor. When multiple motorcontrollers are on the network, they divide the maximum available power. For this to work properly, this needs to be configured by the manufacturer or an installation partner. Please note, that the WaterWorld system does not take into account other power consumers of the battery(s).*