

# HALCYON™\_AMBIOS



# Table of Contents

|                                         |           |
|-----------------------------------------|-----------|
| <b>1 Fischer and AK4 Connectors</b>     | <b>2</b>  |
| 1.1 Symbios CCR Pod at a Glance         | 2         |
| 1.2 Specifications                      | 2         |
| 1.3 Power Management                    | 3         |
| 1.4 Connecting Sensors                  | 3         |
| 1.5 Battery Replacement                 | 3         |
| 1.6 Preparing to Dive                   | 4         |
| 1.7 Diving                              | 5         |
| Alarms and Warnings                     | 5         |
| Bailout Mode                            | 5         |
| 1.8 Troubleshooting                     | 5         |
| Pairing not possible                    | 5         |
| Calibration failed                      | 5         |
| <b>2 CCR Pod CAN Bus Manual</b>         | <b>6</b>  |
| 2.1 Symbios CCR Pod CAN Bus at a Glance | 6         |
| 2.2 Specifications                      | 6         |
| 2.3 Operation and Power Management      | 6         |
| 2.4 Preparing to Dive                   | 6         |
| 2.5 Diving                              | 7         |
| Alarms and Warnings                     | 7         |
| Bailout Mode                            | 7         |
| 2.6 Troubleshooting                     | 7         |
| Pairing not possible                    | 7         |
| Calibration failed                      | 7         |
| <b>3 Warranty</b>                       | <b>8</b>  |
| 3.1 Limitations of Liability            | 8         |
| <b>4 Notices</b>                        | <b>9</b>  |
| 4.1 Trademark                           | 9         |
| 4.2 Copyright                           | 10        |
| 4.3 Disclaimer                          | 10        |
| 4.3.1 Translation Note                  | 10        |
| <b>5 Identification</b>                 | <b>10</b> |
| <b>6 Information</b>                    | <b>10</b> |

# 1 Fischer and AK4 Connectors

We're pleased you've chosen the Halcyon CCR Pod with a Fischer or AK4 connector. The Halcyon CCR Pod establishes a wireless connection between closed-circuit rebreathers (CCRs) with compatible connectors and Symbios dive computers, allowing rebreather data to be transmitted in real time. The CCR Pod is available in three connector variants, including 7-pin Fischer or AK 4 for analog systems, and AK 5 for CAN bus systems. This manual covers 7-pin Fischer and AK 4 systems and provides information on installation, operation, battery replacement, maintenance, and troubleshooting of your CCR Pod. Please read this manual and take the time to familiarize yourself with the device before use.



CCR Pod: 7- pin Fischer Connector



CCR Pod AK 4 Connector

These devices enable a wireless connection between a compatible rebreather and a Symbios dive computer. The CCR Pod can connect to up to three O<sub>2</sub> sensors. Those O<sub>2</sub> sensors may be either galvanic O<sub>2</sub> sensors with a nominal output voltage of 8 to 15 mV at 0.21 bar partial pressure of oxygen (pO<sub>2</sub>), or a Halcyon GREENFLASH optical pO<sub>2</sub> sensor set to analog mode.

## 1.1 Symbios CCR Pod at a Glance

- Wireless pO<sub>2</sub> sensor readout
- Connects to analog rebreathers equipped with a Fischer or AK 4 connector
- Acts as a bridge enabling wireless communication between compatible rebreathers and Symbios dive computers

## 1.2 Specifications

- Battery: CR123 lithium
- Size: 90 mm/3.5 in length, 40 mm/1.6 in diameter
- Weight: approx. 110 g/3.9 oz
- Frequency: 125kHz

- Transmission range: up to 90 cm/35 in
- Transmission method: wireless magnetic transmission
- Transmission interval: once per second

### 1.3 Power Management

The CCR Pod is powered by a CR123 lithium battery, which enables operation for up to 200 diving hours and as much as 1 year in standby. The CCR Pod begins transmitting as soon as it detects a change in the  $pO_2$  signal from any connected sensor, including a GREENFLASH sensor connected to input 3. It enters sleep mode when the  $pO_2$  at the sensor remains stable for more than 15 minutes; the sensor signal must be within  $\pm 1$  mV for the device to enter sleep mode. If you are using a Halcyon GREENFLASH sensor, connect it to the input for sensor 3. Connecting it in sensor position 1 or 2 might prevent the device from entering sleep mode.

### 1.4 Connecting Sensors

Up to three  $pO_2$  sensors with analog output can be connected to the device. If you use a Halcyon GREENFLASH  $pO_2$  sensor, connect it to the input for sensor 3.



### 1.5 Battery Replacement

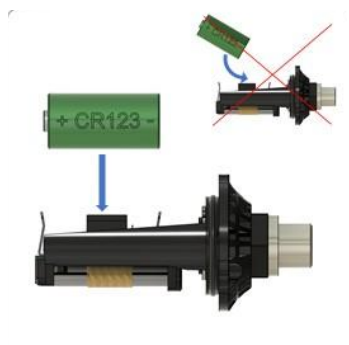
The device uses a CR123 battery. To replace it:



Remove the three screws.



Open the housing.



Insert a new CR123 battery with the positive (+) terminal facing the battery cap, as shown.

Orings



Orings



Check the O-ring for damage and lubricate it with silicone grease.



Reassemble the housing, ensuring the O-ring is correctly positioned, and tighten the screws evenly.

## 1.6 Preparing to Dive

- Read your Symbios dive computer manual and become familiar with its operation.
- Switch the dive computer to CCR mode: menu→SETTINGS→DIVE MODE→CCR MODE

- Activate the device by changing the  $pO_2$  at any connected sensor.
  - Pair the device:  
menu→SETTINGS→PAIRING→CCR INTERFACE
  - Set the correct fraction of the calibration gas:  
menu→SETTINGS→CCR SETTINGS→ $FO_2$  CAL GAS
  - Enter the calibration menu:  
menu→SETTINGS→CCR SETTINGS→CALIBRATE CCR
  - Flush the sensors with calibration gas.
  - Allow the mV output of the sensors to stabilize at their highest output.
  - Confirm the mV readings by long-pressing button B on your Symbios device.
- A calibration is accepted when the sensor output is between 38 and 80 mV at 1 bar  $pO_2$ . If you use fewer than three sensors, disable the sensors that are not used:  
menu→SETTINGS→CCR SETTINGS→ $PO_2$  SENSORS

## NOTICE

Only enabled sensors are used for  $pO_2$  warnings, decompression, and central nervous system (CNS) calculation.

## 1.7 Diving

The average of the enabled  $pO_2$  sensors is used to calculate tissue inert gas loading, decompression schedule, time-to-surface (TTS) forecast, and CNS exposure. The TTS and decompression-stop forecasts are based on the current loop  $pO_2$ . The calculated loop  $pO_2$  is the average of all enabled sensors, provided the sensors are within 20% of the average. Otherwise, the lowest  $pO_2$  value is used for decompression calculation, and the highest value for CNS exposure calculation.

## Alarms and Warnings

Warning pop-ups and vibration alarms inform the diver of dangerous situations, such as excessively high or low  $pO_2$ . Warnings can be confirmed by long-pressing both device buttons.

For a list of all available alarms and warnings, please refer to your Symbios computer manual.

## Bailout Mode

By long-pressing button B on your device, you can toggle between CCR mode and open-circuit bailout mode. In open-circuit bailout mode, the first activated gas is the currently selected diluent gas.

## 1.8 Troubleshooting

### Pairing not possible

Try the following:

- Activate the wireless screen (select ALL), turn your Symbios device to the wireless page, and check for data transmission from the transmitter.
- Enable the transmitter by changing the  $pO_2$  at the sensor (allow at least 10 seconds)
- Check the battery voltage and replace the battery if needed.

### Calibration failed

Try the following:

- Check the sensor's condition and connection to the CCR electronics
- Disable sensor channels that are not used
- Check the setting for the fraction of the calibration gas

## 2 CCR Pod CAN Bus Manual

Thank you for purchasing the Halcyon CCR Pod CAN Bus with AK 5 Connector.

The Halcyon CCR Pod establishes a wireless connection between a rebreather with an AK 5 connector and Symbios dive computers, allowing rebreather data to be transmitted in real time. The CCR Pod is available with an AK 5 connector. This manual provides information on installation, operation, maintenance, and troubleshooting of your CCR Pod. Please read this manual and familiarize yourself with the device before use.



CCR Pod with AK 5 Connector

The CCR Pod enables a wireless connection between a compatible CAN bus rebreather and a Symbios dive computer. The CCR Pod is typically plugged into the HUD port, where it broadcasts relevant pO<sub>2</sub> information to a Halcyon Handset or HUD.

### 2.1 Symbios CCR Pod CAN Bus at a Glance

- \_ Wireless bridge to Symbios dive computers
- \_ Wireless pO<sub>2</sub> sensor transmission from CAN bus rebreathers
- \_ Displays pO<sub>2</sub> of each cell on a Symbios Handset or HUD

### 2.2 Specifications

- \_ Powered by the battery of the CCR head
- \_ Supply voltage on the CAN bus should be between 3.3 and 4.3 V
- \_ Size: 90 mm/3.5 in length, 40 mm/1.6 in diameter
- \_ Weight: approx. 110 g/3.9 oz
- \_ Frequency: 125 kHz
- \_ Transmission range: up to 90 cm/35 in
- \_ Transmission method: magnetic
- \_ Transmission interval: once per second

### 2.3 Operation and Power Management

The device is powered by the CCR head's battery. It is actuated by water contacts and goes into standby mode once the contacts are dry.

### 2.4 Preparing to Dive

- \_ Read the Symbios dive computer manual and become familiar with its operation.
- \_ Switch the dive computer to CCR mode: menu→SETTINGS→DIVE MODE→CCR MODE
- \_ Activate the device by touching both pins at the same time with wet fingers.
- \_ Pair the device: menu→SETTINGS→PAIRING→CCR INTERFACE

- \_ Set the correct fraction of the calibration gas:  
menu→SETTINGS→CCR SETTINGS→FO<sub>2</sub> CAL GAS
- \_ Enter the calibration menu:  
menu→SETTINGS→CCR SETTINGS→CALIBRATE CCR
- \_ Flush the sensors with calibration gas.
- \_ Allow the mV output of the sensors to stabilize at their highest output.
- \_ Confirm the mV readings by long-pressing button B on your Symbios device.

### NOTICE

We recommend calibrating the device at the same time you calibrate the main controller of your device. Failure to do so might lead to differences in the displayed values between your main controller and your Symbios device.

A calibration is accepted when the sensor output is between 38 and 80 mV at 1 bar pO<sub>2</sub>. If you use fewer than three sensors, disable the sensors that are not used:  
menu→SETTINGS→CCR SETTINGS→PO<sub>2</sub> SENSORS

Only enabled sensors are used for pO<sub>2</sub> warnings, decompression, and central nervous system (CNS) calculation.

## 2.5 Diving

The average of the enabled pO<sub>2</sub> sensors is used to calculate tissue on/off gassing, the decompression schedule, the time-to-surface (TTS) forecast, and CNS exposure. The TTS and decompression-stop forecasts are based on the current loop pO<sub>2</sub>. The calculated loop pO<sub>2</sub> is the average of all enabled sensors, provided the sensors are within 20% of the average. Otherwise, the lowest pO<sub>2</sub> value is used for the

decompression calculation and the highest value for the CNS exposure calculation.

## Alarms and Warnings

Warning pop-ups and vibration alarms inform the diver of dangerous situations, such as excessively high or low pO<sub>2</sub>. Warnings can be confirmed by long-pressing both buttons.

## Bailout Mode

By long-pressing button B on your device, you can toggle between CCR mode and open-circuit bailout mode. In open-circuit bailout mode, the first activated gas is the currently selected diluent gas.

## 2.6 Troubleshooting

### Pairing not possible

Try the following:

- \_ Activate the wireless screen (setting ALL) to see if the transmitter is sending data.
- \_ Activate the device by touching both pins at the same time with wet fingers.
- \_ Check the battery voltage on your CCR head and replace the battery if needed.

### Calibration failed

Try the following:

- \_ Check the sensors.
- \_ Disable sensor channels that are not used.
- \_ Check the setting for the fraction of the calibration gas.

## 3 Warranty

### Halcyon Manufacturing, Inc. Limited Warranty

During the warranty period, Halcyon Manufacturing, Inc. or an authorized service center will remedy defects in materials or workmanship free of charge either, at its sole discretion, by repairing, replacing, or refunding, subject to the terms and conditions of this limited warranty.

#### Warranty period:

- The limited warranty period begins on the date of original purchase.
- The warranty period is 2 years for products, unless otherwise specified.
- The warranty period for accessories is 1 year.

#### The limited warranty does not cover:

- normal wear and tear, such as scratches, abrasions, and alteration of the color.
- defects caused by inappropriate handling
- defects or damage resulting from use contrary to intended and/or recommended use, improper care, negligence, and accidents such as dropping, crushing, and flooding
- printed materials and packaging

#### The limited warranty is not enforceable if the product or accessory:

- has been opened or tampered with by unauthorized individuals or entities, except when opened by the user solely for battery replacement in accordance with the instructions in this manual
- has been altered using unauthorized spare parts
- has been repaired by an unauthorized service center

- has been exposed to polymer-damaging chemicals, including but not limited to sunscreen, insect repellent, solvents, fuels, oils and other chemicals capable of degrading polymer components

### 3.1 Limitations of Liability

With the purchase of the Symbios CCR pods, you hereby agree to the following exclusions and limitations of Halcyon Manufacturing, Inc.'s liability to you.

You agree and understand that scuba diving is a high-risk, possibly life-threatening activity, and the use of the Symbios CCR Pod is in no way a substitute for proper scuba training and certification.

You understand and agree that Scuba diving contains inherent risks and due to the varying nature of such and the diverse potential effect on individuals engaged in scuba diving, Halcyon Manufacturing, Inc. does not warrant or guarantee that your use of this product will prevent decompression sickness, embolism, narcosis, or any other condition or injury you may incur.

You understand and agree that variables may include, but are not limited to, dehydration, obesity, age, prior injuries, or other physical conditions of the diver, or temperature extremes, poor training, poor diving practices, or other acts or omissions that may cause injury or death.

Independent O<sub>2</sub> monitoring must always be available, as the Symbios CCR Pod should not be used as the sole source of oxygen information. Divers should also carry a backup method for tracking dive time and calculating decompression obligations.

You agree that you understand and accept all risks associated with diving, and that Halcyon Manufacturing, Inc., its elected and appointed officials, employees, volunteers or others working on behalf of Halcyon Manufacturing, Inc. are not liable to you or any other person, including your heirs, executors, agents, officers, attorneys, successors, assigns or personal representatives, for any loss, damage, cost, expense, or claim arising out of, caused by, or relating to your personal injury or death while diving, even if your personal injury or death is caused, in whole or in part, and directly or indirectly, by the purchase of the Symbios CCR pod or your use thereof, or arising from breach of the warranty, breach of contract, negligence, strict tort, or any other legal or equitable theory, even if Halcyon Manufacturing, Inc. knew, or should have known of the likelihood of such damages, and regardless of whether or not the diving computer functioned properly or was defective in any way. Halcyon Manufacturing, Inc. shall not be liable for delay in rendering service under the limited warranty, or loss of use during the time the product is being repaired.

You hereby irrevocably waive and release Halcyon Manufacturing, Inc., its elected and appointed officials, employees, volunteers or others working on behalf of Halcyon Manufacturing, Inc. from any liability or obligation to you or your heirs, executors or personal representatives for any loss, damage, cost, expense, or claim arising out of, caused by, or relating to your personal injury or death while diving, even if your personal injury or death is caused, in whole or in part and directly or indirectly, by the Symbios CCR Pod or your use of the Symbios CCR Pod, or arising from breach of the warranty, breach of contract, negligence, strict tort, or any other legal or equitable theory, even if Halcyon Manufacturing, Inc.

knew, or should have known of the likelihood of such damages, and regardless of whether or not the Symbios CCR pod functioned properly or was defective in any way.

You have read and you accept the agreement with all limitations and exclusions of Halcyon Manufacturing, Inc.'s liability to you.

## 4 Notices

### 4.1 Trademark

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The Symbios HUD is protected by Registered Community Design No. 008834816-0001. GREENFLASH and OXYGEN SCIENTIFIC are registered trademarks.

In addition, the mechanical designs, electronic designs, and firmware of the Symbios products are proprietary intellectual property owned by Oxygen Scientific GmbH.

## 4.2 Copyright

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## 4.3 Disclaimer

Halcyon Manufacturing, Inc. reserves the right to make changes or improvements to its products, manuals, and specifications at any time without prior notice.

While every effort has been made to ensure accuracy, Halcyon Manufacturing, Inc. assumes no liability for errors or omissions in this document.

Users are responsible for familiarizing themselves with the latest version of this manual and for following all applicable safety and maintenance instructions.

### 4.3.1 Translation Note

This manual may be available in multiple languages to comply with regional requirements. In the event of discrepancies

between translations, the English version shall prevail.

## 5 Identification

The Symbios CCR Pod is laser-marked with a label that includes the manufacturer, model, and serial number.



## 6 Information

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