



HYDRO BIOSCIENCE[®]
Eco Driven Solutions[®]

00QX-40V160-xx Series
24V Solar Charger/Controller Solar Controller
Outdoor, Sealed Construction
User's Manual



General Product Specifications

Model Number	Nominal Input Rating	Output Channel-1, Channel-2, Channel-3
00QA-40V160A65-01	Vmp=21Vdc min	40Vdc 1.75A, 40Vdc 1.75A, 10Vdc 0.75A
00QA-40V160B65-01	Vmp=21Vdc min	40Vdc 1.75A, 40Vdc 1.75A, 10Vdc 0.75A

- 'A': Bluetooth Communications not installed
'B': Bluetooth Communications installed

NOTE: ADDITIONAL UTILITY AND/OR PATENT PENDING APPLIED IN 2022/23



For direct access to the latest copy of this manual, please scan this QR Code or refer to the *Product Manuals* section at:
www.Hydro-Bioscience.com



Throughout this manual, look for this symbol. It means ‘BE ALERT – YOUR SAFETY IS INVOLVED’. If you do not follow these safety instructions, personal injury and/or property damage may occur.

USER SAFETY PRECATIONS


1. Do not operate the Solar Controller if it has received a sharp blow, been dropped, or otherwise damaged in any manner. Refer to a qualified service agent.
2. Solar Controller contains no serviceable parts. If the Solar Controller fails during its warranty period, contact Hydro Bioscience, LLC at 888-500-5011 or visit HBS’s website, www.hydro-bioscience.com for information concerning a warranty replacement or repair.
3. Before attempting any maintenance or cleaning, unplug Solar Controller from input power source. For external cleaning use a clean damp towel.
4. Have your distributor, dealer or other qualified service agent, repair or replace worn or damaged parts immediately. Repairs should not be attempted by people who are not qualified.
5. Whenever removing the input cable from its power source, pull from the body of the connector, not from the cord.
6. Do not operate the Solar Controller or any component attached to it if it is malfunctioning. Personal injury or property damage could result.

INPUT POWER SOURCE WARNINGS

1. Location of Solar Controller must be in a shaded location and must not be installed in direct sunlight. Derating of the output power may occur.
2. If installing underground electric utility power to a receptacle near a body of water such as a pond, lake, pool or reservoir, a customer supplied armored cable, run through conduit, must be used to minimize risk of damage and installed in accordance with Country, State and Local regulations.
3. Locate/route all cords where they will not be tripped over or damaged by vehicles or equipment with cutting blades such as lawn mowers and hedge clippers and away from vehicle traffic to prevent being driven over. If you have water animals (beavers, minks, nutria, otters, muskrats, turtles, etc.)

in your water system, additional cable protection is recommended such as a nylon or polyester braided sheath from the surface down to about 2 meters (6 feet) depth.

4. Personal Precautions While Working With Batteries:

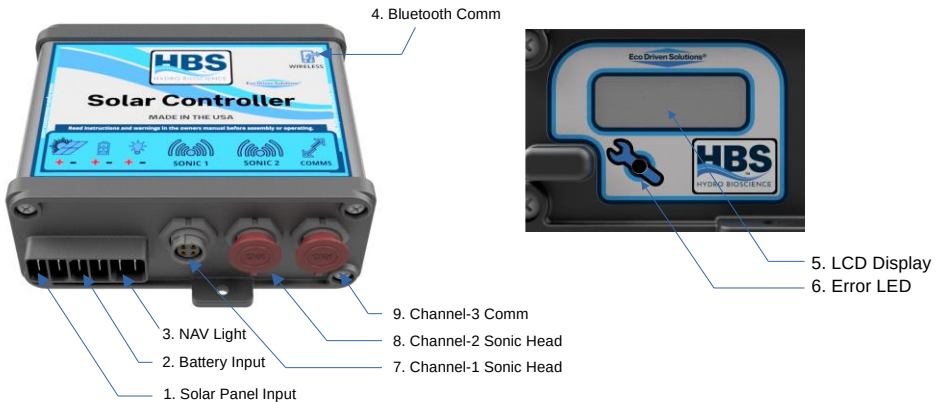
- a. Have someone within range of your voice to come to your aid if needed.
- b. Have plenty of fresh water and soap nearby in case battery acid contacts your skin, clothing or eyes. Wear eye and clothing protection and avoid touching eyes.
- c. If battery acid contacts skin or clothing, wash immediately with soap and water.
- d. If acid enters eye, immediately flush eye with running cold water for at least 10 minutes. Get medical attention immediately.
- e. NEVER smoke or allow a spark or flame in vicinity of battery.
- f. Be extra cautious not to drop a metal tool onto battery. It might spark or short circuit battery or other electrical part that may cause an explosion.
- g. Remove personal metal items such as rings, necklaces, watches, etc. Batteries can produce a short-circuit current high enough to weld such items causing a severe burn.
- h. NEVER charge a frozen battery. Thaw it out for safer and more efficient charging.
- i.  **WARNING: For your own protection, when using ANY type of charger, always ensure that the batteries in your Battery Pack ARE ALL at the same state of charge, same condition, same size, and same rating. DO NOT MIX DIFFERING BATTERY SIZES, BATTERY TYPES OR OLD BATTERIES WITH NEW. Never use charger for any purpose contrary to its intended purpose of charging rechargeable batteries in accordance with ALL instructions printed in the Charger's manual.**

5. Personal Precautions While Working With Solar Panels:

- a. Follow all safety precautions recommended by solar panel supplier including safe installation practices
- b. Solar Panels can generate high voltages greater than 43.2Vdc.
- c. Necessary precautions include:
 - i) Avoid short circuits which can produce energy arcing which can cause severe burns and/or property damage

- ii) Avoid touching bare wires which can cause personal harm, and even death – DC currents can be lethal
- iii) Use a minimum of 1guage larger conductor than the appropriate rated wire for solar panel’s Short Circuit Ampacity rating

PRODUCT FEATURES AND OPERATION



1. Solar Panel Input Power Connections

- a. The two terminals are male tabs 0.250 (6.35mm) tabs which accept female fast-on 0.250 (6.35mm) terminals.
- b. **The female fast-on terminal must be filled with Food Grade Dielectric Grease prior to mating the female fast-on onto the male tabs.**
- c. **Wire Gauge Minimum: 16Ga, Type UL-1015 or better**
- d. Female Fast-on Terminal part numbers (or equivalent):
 - i. Tyco Electronics: 3-350820-2
 - ii. Molex: 019005-0009
- e. The Input is polarized. Refer to the label designations to determine which terminal is Positive(+) and which is Negative(-).
- f. The two conductors from the solar panel are connected at these two terminals. Solar Panel specifications and requirements are listed in the **SPECIFICATIONS** section
- g. The Solar Controller is an MPPT (Maximum Peak Power Transfer) type controller. Its input must be set according to the solar Panels used.

2. Battery Input Power Connections
 - a. The two terminals are male tabs 0.250 (6.35mm) tabs which accept female fast-on 0.250 (6.35mm) terminals.
 - b. **The female fast-on terminal must be filled with Food Grade Dielectric Grease prior to mating the female fast-on onto the male tabs.**
 - c. **Wire Gauge Minimum: 16Ga, Type UL-1015 or better**
 - d. Female Fast-on Terminals are the same as '1'
 - e. The Output is polarized. Refer to the label designations to determine which terminal is Positive(+) and which is Negative(-).
 - f. The two conductors from the battery packs are connected at these two terminals. An explanation of the Battery Requirement is found, below

3. NAV (Navigation Warning) Light Control
 - a. The two terminals are male tabs 0.250 (6.35mm) tabs which accept female fast-on 0.250 (6.35mm) terminals.
 - b. **The female fast-on terminal must be filled with Food Grade Dielectric Grease prior to mating the female fast-on onto the male tabs.**
 - c. **Wire Gauge Minimum: 18Ga, Type UL-1015 or better**
 - d. Female Fast-on Terminals are the same as '1'
 - e. +10V 800mA limited current output drives an external Navigation light. A 1amp resettable output fuse is also included. If cabling is shorted accidentally, remove the short and remove the connections to reset this fuse. Then, remake the connections.
 - f. The output is polarized – refer to the label designations to determine which terminal is Positive(+) and which is Negative(-).

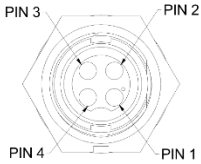
4. Bluetooth Communications
 - a. The product contains a Bluetooth registered internal device that connects to smart phones. Refer to the MyQuattro™ App instruction manual found on www.hydro-bioscience.com.
 - b. App functions include on/off power scheduling to the sonic heads, pausing or resuming functions, stats display, and more.
 - c. At the time of print of this manual, communications work with Android Smartphones and Apps only

5. LCD 16x2 character display
 - a. Backlight flashes periodically to show that the unit is powered on.
 - b. Displays status of operation of each Sonic Head attached to Channels 1 and 2
6. Error LED
 - a. Flashes RED to annunciate a condition that may need attention
7. Channel-1 Sonic Head
 - a. Provides 40Vdc to power the first Sonic Head
 - b. Refer to the Channel-1 Connector pinout for circuit details
 - c. Output is protected from short circuits by the use of an internal resettable fuse. To reset this fuse, disconnect the Sonic Head for 2seconds and then reconnect. Ensure short is removed.
8. Channel-2 Sonic Head
 - a. Provides 40Vdc to power the second Sonic Head
 - b. Keep Dust Cover installed on Connector when not used
 - c. Refer to the Channel-1 Connector pinout for circuit details since it is the same pinout functionality.
 - d. Output is protected from short circuits by the use of an internal resettable fuse. To reset this fuse, disconnect the Sonic Head for 2seconds and then reconnect. Ensure short is removed.
9. Channel-3 Comm
 - a. This channel supplies RS-232 communication and 10Vdc power to an optionally purchased and installed remote modem. When used with the optional modem, data and alerts can be sent to the cloud to the H2Oinfo™ Application.
 - b. Other functions include remote re-flashing from a PC, Modbus communications to implement SCADA, direct connection to a SONDS water quality monitoring probe and more. Consult with your dealer or request more information via 'Contact Now' on our website www.hydro-bioscience.com.
 - c. Keep Dust Cover installed on Connector when not used
 - d. Output is protected from short circuits by the use of an internal resettable fuse. To reset this fuse, disconnect the load for 2seconds and then reconnect. Ensure the source of the short is removed.

CHANNEL CONNECTOR CIRCUIT DESCRIPTION

Channel 1 and Channel 2 Connector Pinout and Signals:

View from Front of the Connector:



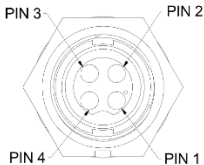
Pin-1:	+40Vdc Output
Pin-2:	Reserved/RS-485
Pin-3:	Sonic Head Heartbeat/RS-485
Pin-4:	Circuit Common

Connection Notes:

1. When using a voltmeter, connecting the probes to Positive(+) Pin-1 and Negative(-) Pin-4, the reading can be between 39Vdc to 50Vdc.
2. The connections are rated as IP-67. But the use of a very small amount of Food Grade Dielectric Grease on the face of the connector and very small 'spot' amounts in the sockets acts as an added layer of protection from humidity.

Channel 3 Connector Pinout and Signals:

View from Front of the Connector:



Pin-1:	+10Vdc Output
Pin-2:	RxD from external modem
Pin-3:	TxD to external modem
Pin-4:	Circuit Common

Connection Notes:

1. When using a voltmeter, connecting the probes to Positive(+) Pin-1 and Negative(-) Pin-2, the reading can be between 8Vdc to 12Vdc.
2. The connections are rated as IP-67. But the use of a very small amount of Food Grade Dielectric Grease on the face of the connector and very small 'spot' amounts in the sockets acts as an added layer of protection from humidity.

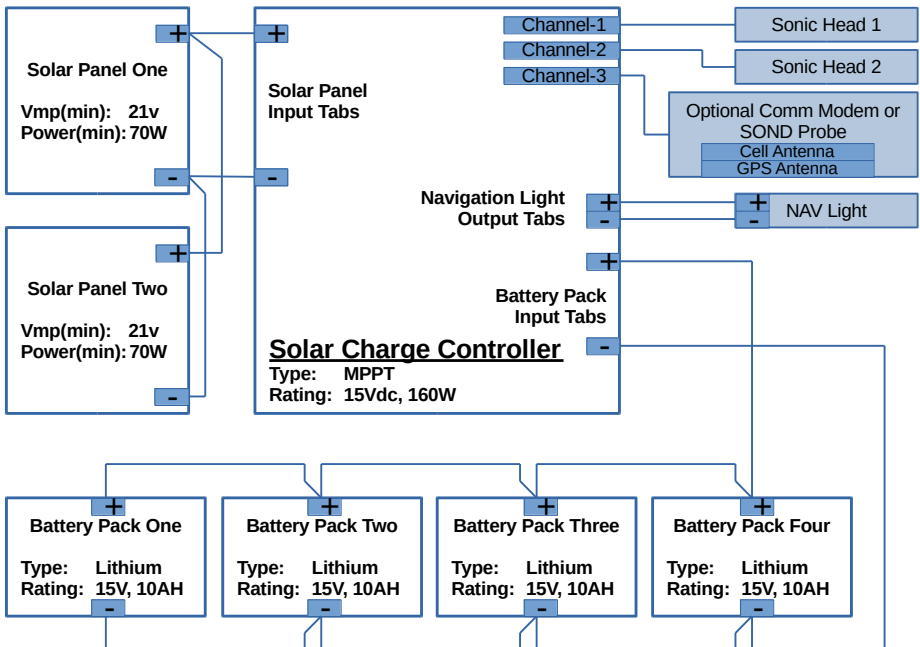
If the cable-side connector needs replacing request KITS0233 from our website www.hydro-bioscience.com used on Channels 1, 2, and 3.

TYPICAL CIRCUIT CONNECTIONS

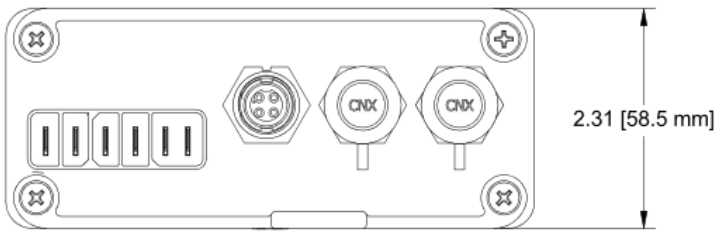
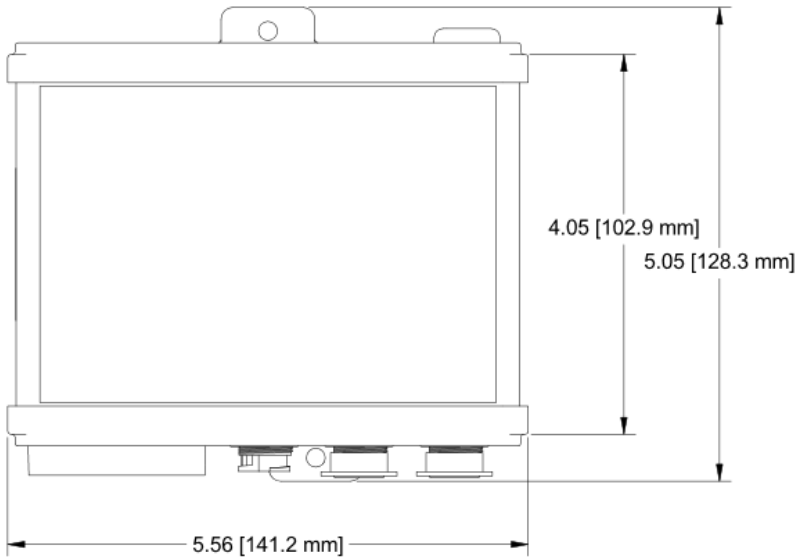
Circuit Notes And Disclaimer:

1. All wiring and assembly must be performed by a certified electrician in accordance with all local authority regulations
2. Charger and solar panel may or may not be provided by manufacturer of the 24Vac/dc Solar Controller – always read instruction manuals provided by the manufacturer of the components such as batteries, transformers, chargers, and solar panels.
3. Wiring Gauge is 16ga, UL-1015 minimum rated conductors
4. Hydro Bioscience is a manufacturer of lithium battery packs, solar panel assemblies, wiring and cabling, and transformers and can supply many of the components shown below in the connection schematics. Please visit www.Hydro-Bioscience.com for more component information.

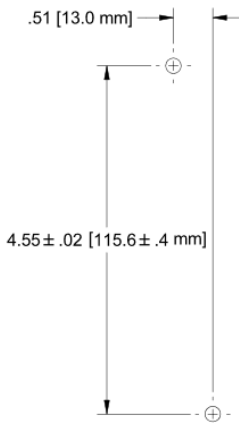
TYPICAL BATTERY/SOLAR CIRCUIT CONNECTION



Product Package Dimensions



Mount Pattern And Mounting Hole Description:



Drill Hole:

#6 Drill Size, 0.204in, 5.2mm

#8-32 or equivalent screw

Use Stainless Steel 18-8 minimum Hardware

Specifications

Parameter	Specification	Notes/Descriptions
Battery Specifications:		
Type:	Lithium, Lead Acid	Internally set at factory
Battery Voltage (Vbatt):	12V to 36V maximum	Internally set at factory
Solar Panel Specifications:		
Vmp:	(Vbatt + 3V) to 45V max	Maximum Power Voltage
Voc:	(Vbatt + 3V) to 48V max	Open Circuit Voltage
NAV Light Output Rating:	10Vdc, 0.70A Continuous	
Channel-1 Output Rating:	40Vdc, 1.75A Continuous	
Channel-2 Output Rating:	40Vdc, 1.75A Continuous	
Channel-3 Output Rating:	10Vdc, 0.75A Continuous	
Bluetooth Range:	Approximately 60m to 100m	
Ingress Rating, Enclosure:	IP-67 minimum, IP-68 Typical based on 2weeks testing	
Ingress Rating, Connectors:	IP-67 minimum	
Dimensions, LxWxH mm, in:	141 x 107 x 59mm, 5.6 x 4.3 x 2.3in	
Weight, kg, lb:	0.98kg, 2.15 lb	
Storage Temperature:	-35°C to 80°C, -31°F to 176°F	
Operating Temperature:	-35°C to 55°C, -31°F to 131°F	

GENERAL WARRANTY

Hydro BioScience, LLC (HBS) warrants that the product will be free from defects in materials and workmanship for a period of 3 years (1 year for accessories) from the date of purchase of the product by the original purchaser from HBS. This warranty only applies to the original purchaser and is not transferable to the third party.

If the product proves defective during the warranty period, HBS either will repair the defective product without charge for parts and labor or will provide a replacement in exchange for the defective product. Parts, modules, and replacement products used by HBS for warranty work may be new or reconditioned like new performance. All replaced parts, modules and products become the property of HBS.

To obtain service under this warranty, customer must notify HBS of the defect before the expiration of the warranty period. Customer shall be responsible for packaging and shipping the defective product to the service center designated by HBS, and with a copy of customer proof of purchase. Customer must ensure that an RMA (Return Material Authorization) number has been received from HBS. This RMA number must be printed on outside of the return packaging.

This warranty shall not apply to any defect, failure or damage caused by improper use or improper or inadequate maintenance and care. HBS shall not be obligated to furnish service under this warranty:

- a) to repair damage resulting from attempts by personnel other than HBS representatives to install, repair or service the product;
- b) to repair damage resulting from improper use or connection to incompatible equipment;
- c) to repair any damage or malfunction caused by the use of non-HBS supplies;
- d) to service a product that has been modified or integrated with other products when the effect of such modification or integration increases the time or difficulty of servicing the product.

Please contact the nearest HBS's Sales and Service Offices for services. For better after-sales service, please visit www.hydro-bioscience.com and register the purchased product online. Warranty may also be requested on-line, along with obtaining an RMA, automatically.

Excepting the after-sales services provided in this summary or the applicable warranty statements, HBS will not offer any guarantee for maintenance declared or hinted, including but not limited to the implied guarantee for marketability and special-purpose acceptability. HBS should not take any responsibility for any indirect, special, or consequent damages.

For Customer Service, and to request an RMA or obtain Return Information, please call Hydro Bioscience, LLC at 888-500-5011.

For all returns, clearly mark the RMA # on the outside of the packaging and send to:

Hydro Bioscience, LLC
414 Century Court
Piney Flats, TN 37686
RMA Number: _____