cpac System CPAC-ECW Easy Connect Gateway Instruction Manual

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Contents

Document Information

Purpose

The purpose of this document is solely to give general guidelines for the installation of Easy Connect gateway (CPAC-BTGW) in boats, supplied by Volvo Penta.
It does not replace the specific instructions included in the gateway kit box, but gateway is easy to connect. There are four possible connections and the box is fastened by using three screws.

Revision History

Rev	Date	Name	Description
PA1	2022-06-27	David Andersson	Created

Confidentiality

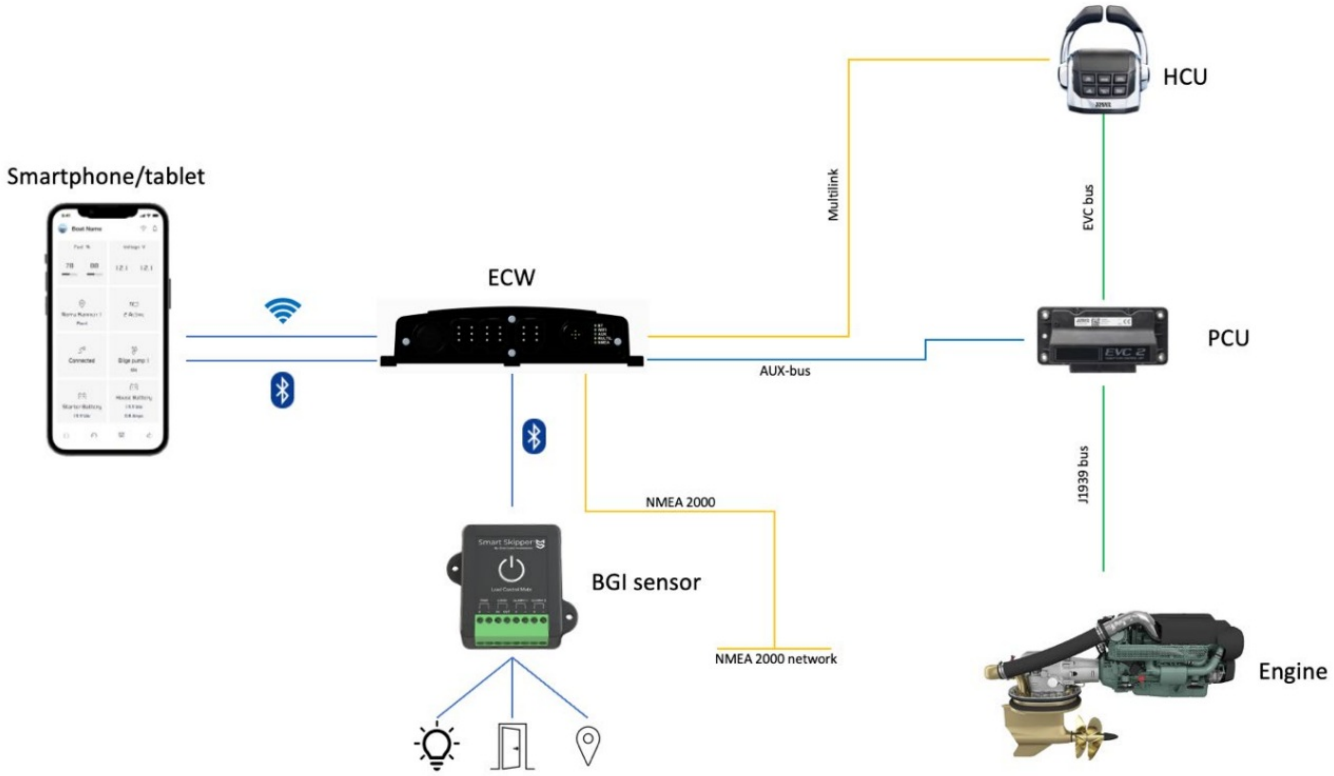
This document is solely to be used by CPAC and Volvo Penta, or companies specifically appointed by Volvo Penta for integrating the CPAC-ECW unit into VP supplied systems.
The document is neither intended for the end users of the boats, nor for the public.

Terminology

Term	Explanation
BTGW	Bluetooth gateway. Product name designation used by CPAC Systems AB
EVC	Electronic Vessel Control
TBD	To Be Defined
VP	Volvo Penta
ECW	Easy Connect Wi-Fi
BOS	Back Office System

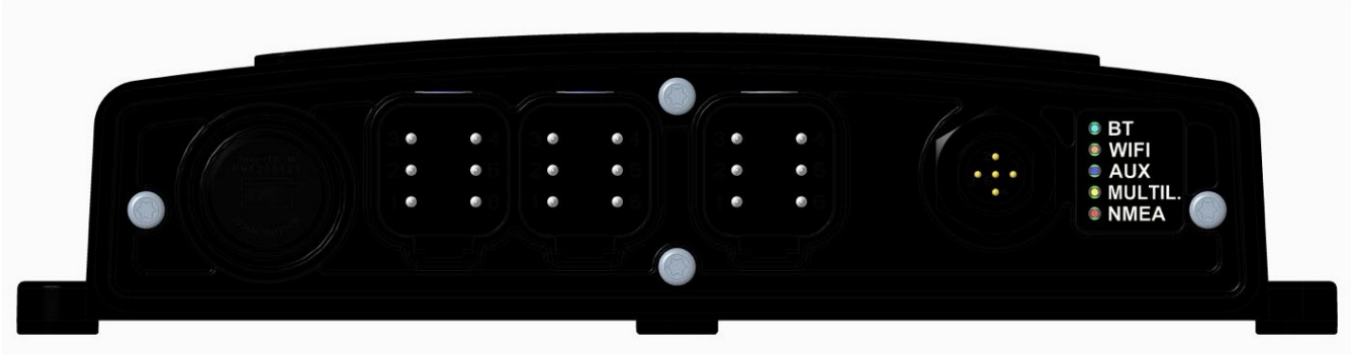
Feature Overview

Function purpose
The Easy Connect Wi-Fi is a part of the strive towards a higher level of connectivity in the marine leisure segment. It is a new project that encapsulates the functionality of the former Easy Connect application (NMBTGW), where a Bluetooth dongle was developed to enable data from the vessel to be transferred to a phone or tablet app.
The part of the Easy Connect Wi-Fi developed by CPAC enables the driver to access boat and trip data from the phone or tablet, both connected and not connected to the vessel. Online will from now on describe that the device is connected to the vessel by Bluetooth, Wi-Fi and Offline represents the device not connected to the vessel but it can access the boat through internet.



Overview

The Easy Connect Wi-Fi front as seen in the image below has four different connectors. Three 6-pole deutsch connectors and one NMEA2000 connector. The connectors marked with the blue label is the AUX-bus in and out. The yellow connection is the port for connecting the multilink cable to access the EVC system. The threaded M12 connection is the port for connecting to the boats NMEA2000 network.
The NMEA2000 connection is the only connection that cannot provide power to the ECW interface to run the system.



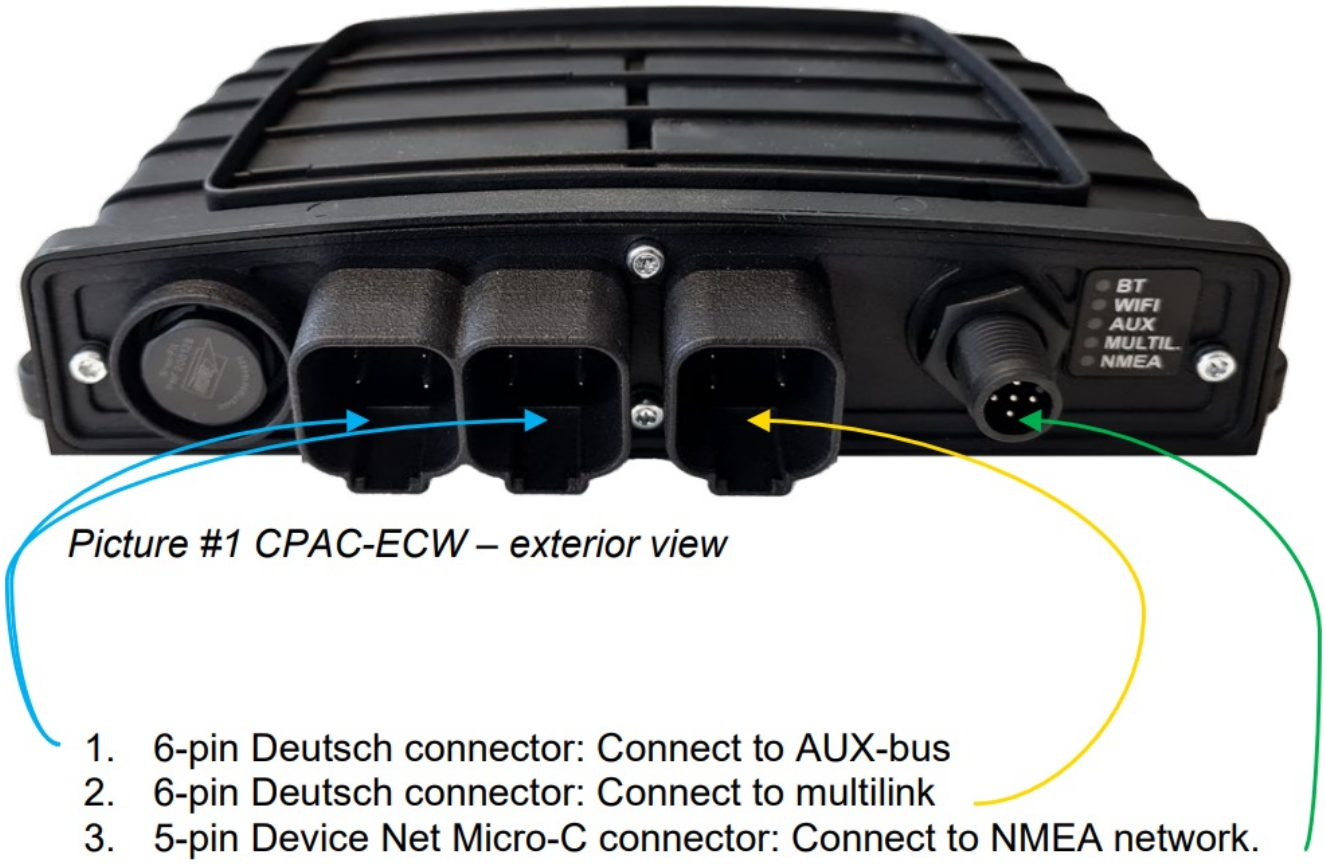
Despite from the connectors there is also a Gore-Tex vent on the front to ensure that there is no humidity in the box and to ensure that the box is IP67 classified. To the right of the NMEA2000 connection there is 5 LED lights that indicates if there is a connection for any of the cables or communication status for Bluetooth and/or Wi-Fi. If there is a solid light from the connector it means that it is active but not connected, hence not transmitting, or receiving any data.
General purpose for the ECW is to transfer engine and boat data via Bluetooth protocol to a mobile device application.

- Access data from Engine CAN (J1939), multilink bus and transfer to mobile device, (app).
- Access data from NMEA2000 sources and transfer to mobile device, (app).
- Access data from AUX-bus and transfer data to mobile device, (app).
- Support software upgrade:

    - Over-The-Air (OTA) software upgrade of BLE and Wi-Fi interface from App.
        - Possible to update BLE chip with new software release by using the app.
        - Possible to update Wi-Fi chip with new software release by using the app.
- Set-up / Pairing:
    - Unique code on BLE gateway to be entered in app to secure privacy.
    - Bluetooth concept is low Energy BLE.
    - Wi-Fi is connected by providing the dongle with network credentials
    - MQTT is used to ensure a secure connection between dongle, BOS and app.

Installation

ECW – Connections



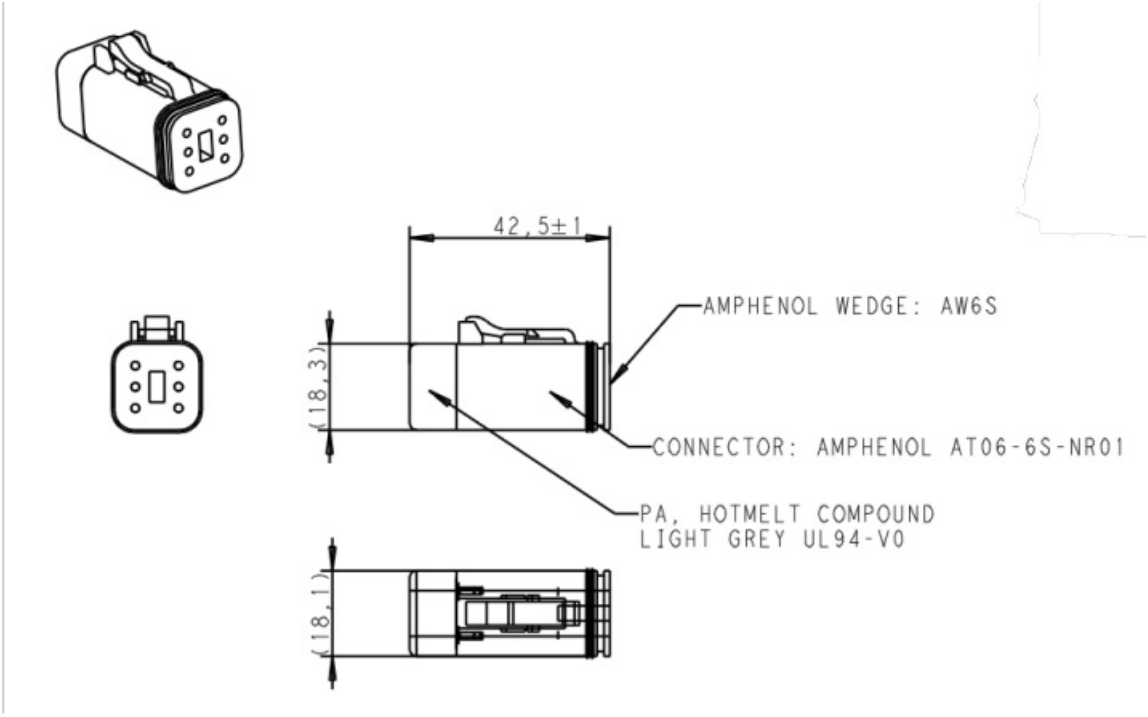
Picture #1 CPAC-ECW – exterior view

ECW – Deutsch 6P plug

The ECW dongle is not IP67 resistant without having the cables connected or the Deutsch 6P plug connected ton either of the three connections. If there are no cables connected to all the three Deutsch connections, it is necessary to connect the plug to ensure correct IP classification.

Alternatives:

- AN: 6ES-82585-00

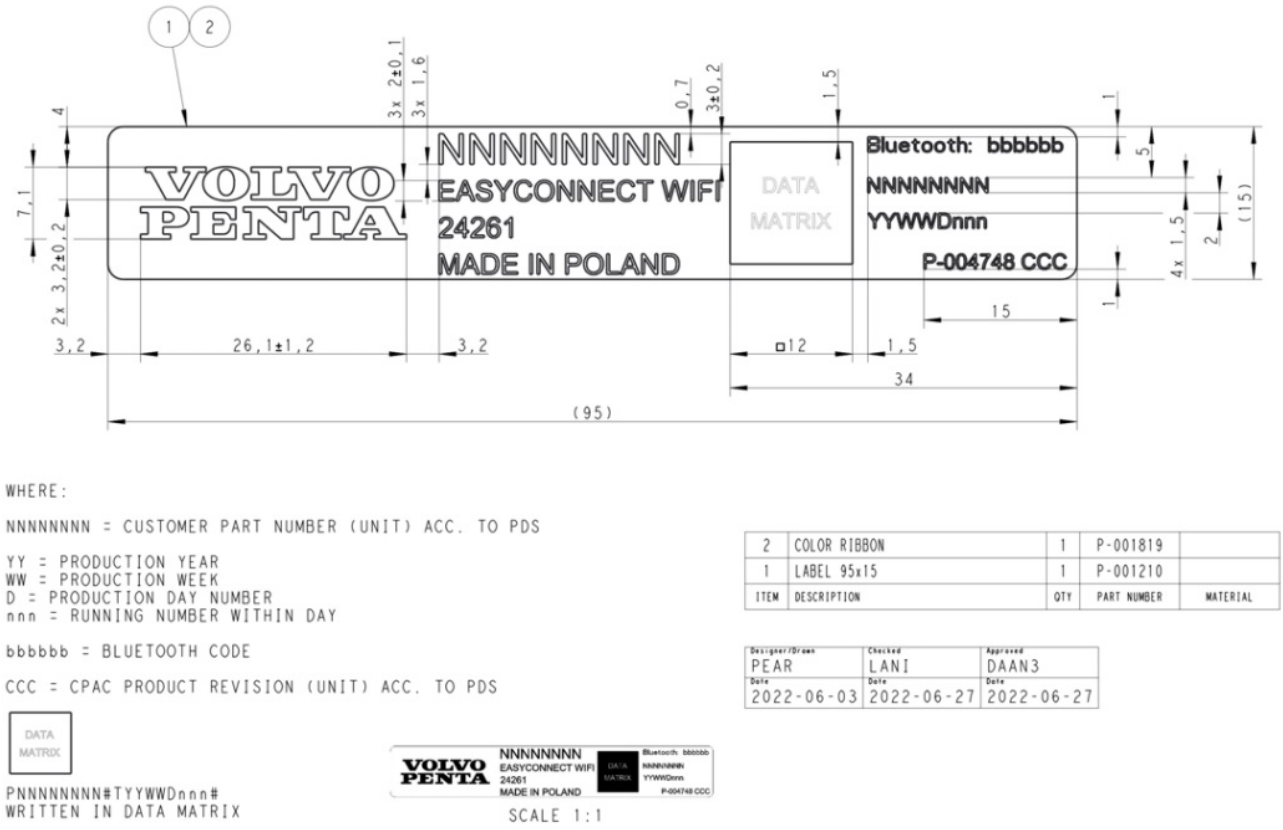


- AUX plug AN: 21825714 – Same as the plug above, but with termination
- Use the two plugs that are delivered with the engine AUX cable and the VMM. Reduces scrap, but the ECW risks not being properly protected.

ECW – LED

BT (Blue) – Solid light if Bluetooth is active and not connected and flashing if it is paired and connected to at least one mobile device. (Only off if it is damaged or no power)
WIFI (White) – Solid light if Wi-Fi is active but not connected to a network and flashing when connected to a network. (Only off if it is damaged or no power)
AUX (Blue) – Solid light if AUX-bus is connected and powered, flashing light if communication on the AUX-bus (Off when not connected)
MULTIL. (Yellow) – Solid light if multilink is connected and powered, flashing light if communication on the multilink (Off when not connected)
NMEA (Green) – Solid light if NMEA2000 network is connected, flashing light if communication on the NMEA2000 network (Off when not connected)

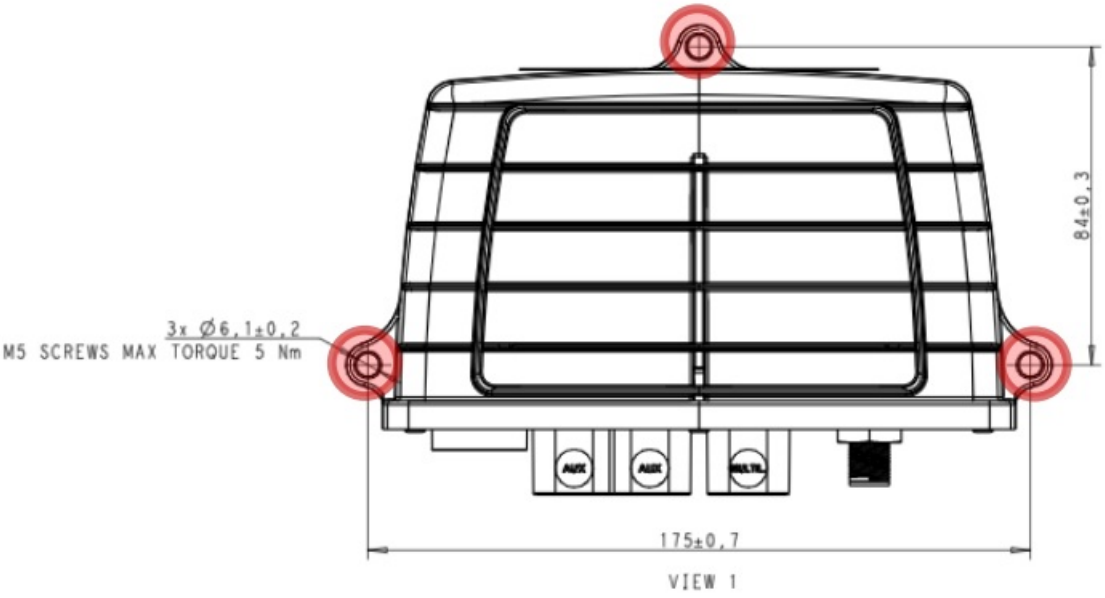
ECW – Label



Mounting requirements – unit

ECW unit shall normally be mounted under the dashboard at the boat helm station, by fastening it using screws in the dedicated positions on the dongle (marked red in the images below). Boat builder or VP dealer to decide where to mount ECW.

- The unit can be mounted horizontally or vertically.
- No hot surfaces shall be close to or come in contact with the unit and cables.
- No moving parts shall be allowed touch the cables or the unit

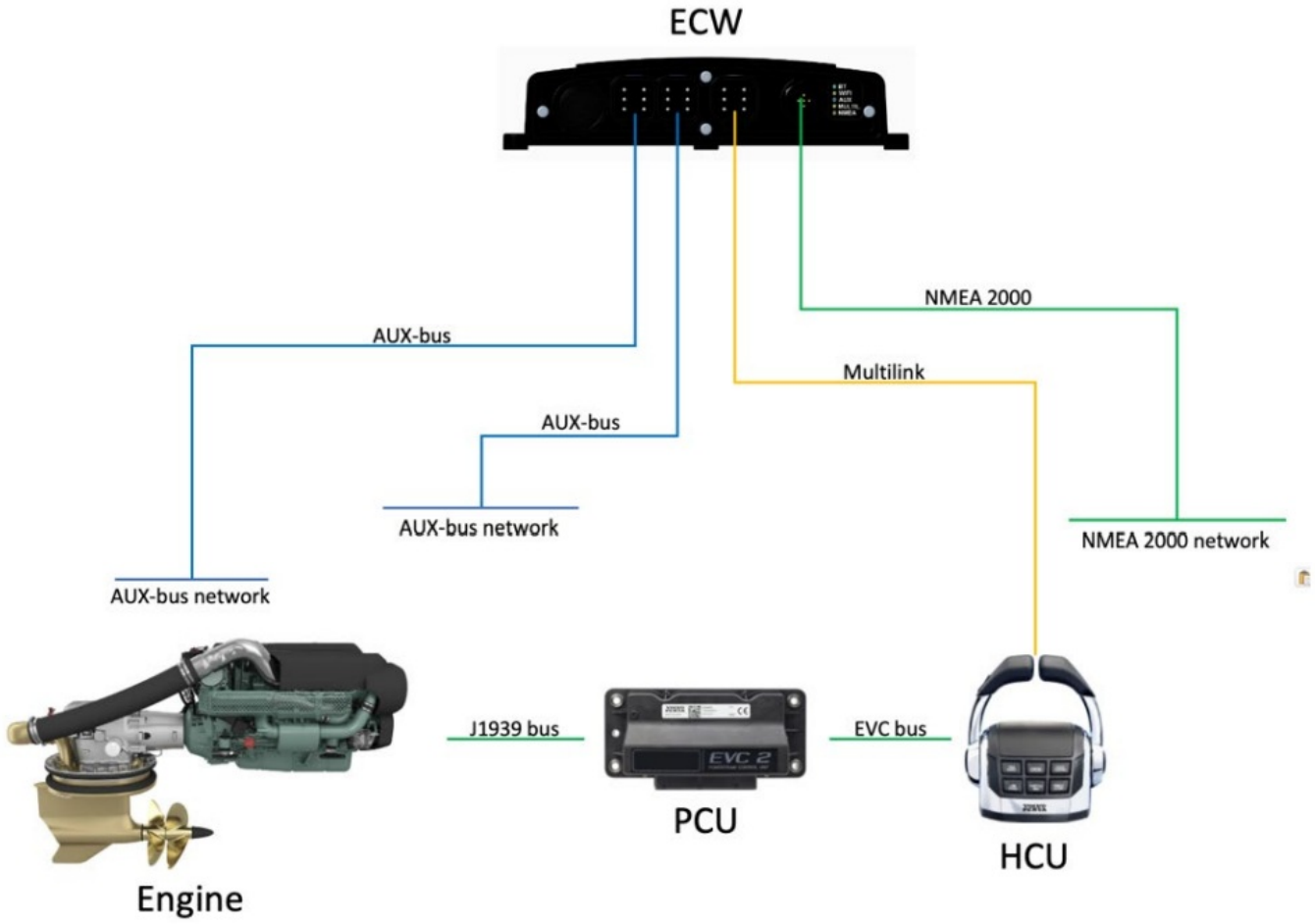


Mounting requirements – cables

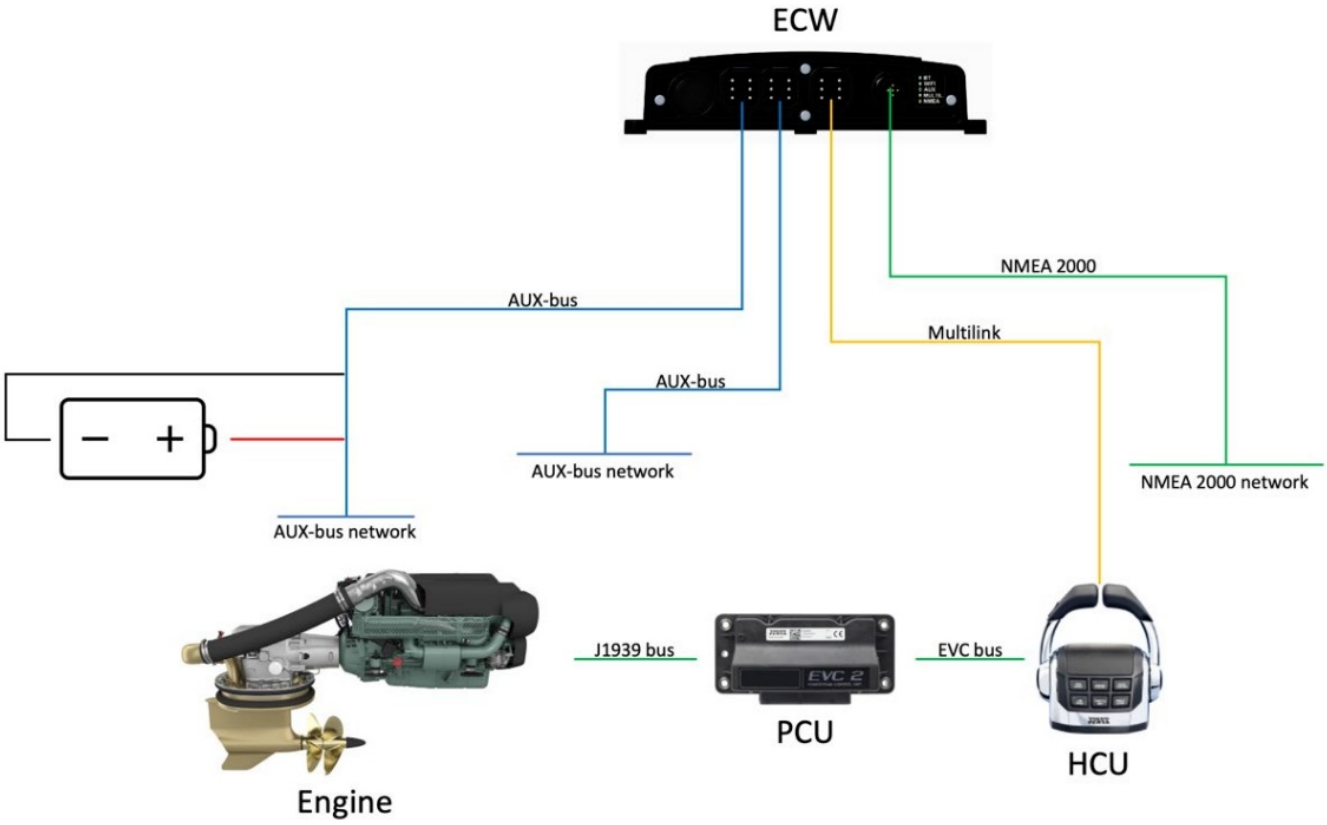
- The cables shall be strapped to avoid tension (push/pull/torque) on the connectors.
- Cable and connector mounting, and clamping shall follow “VP guidelines”
- The cables shall normally be routed away from electrical disturbance sources like radio transmitters, electrical motors, power inverters etc.
- All electrical equipment within 2 m from the cables shall comply with the Volvo EMC directives

Connecting requirements – cables

ECW connection for EVC 2 installations (POWER ON MULTILINK/AUX)
The ECW interface receives power through the multilink and/or Aux, hence it requires ignition on to function. This installation dose not enable off-boat functionality.

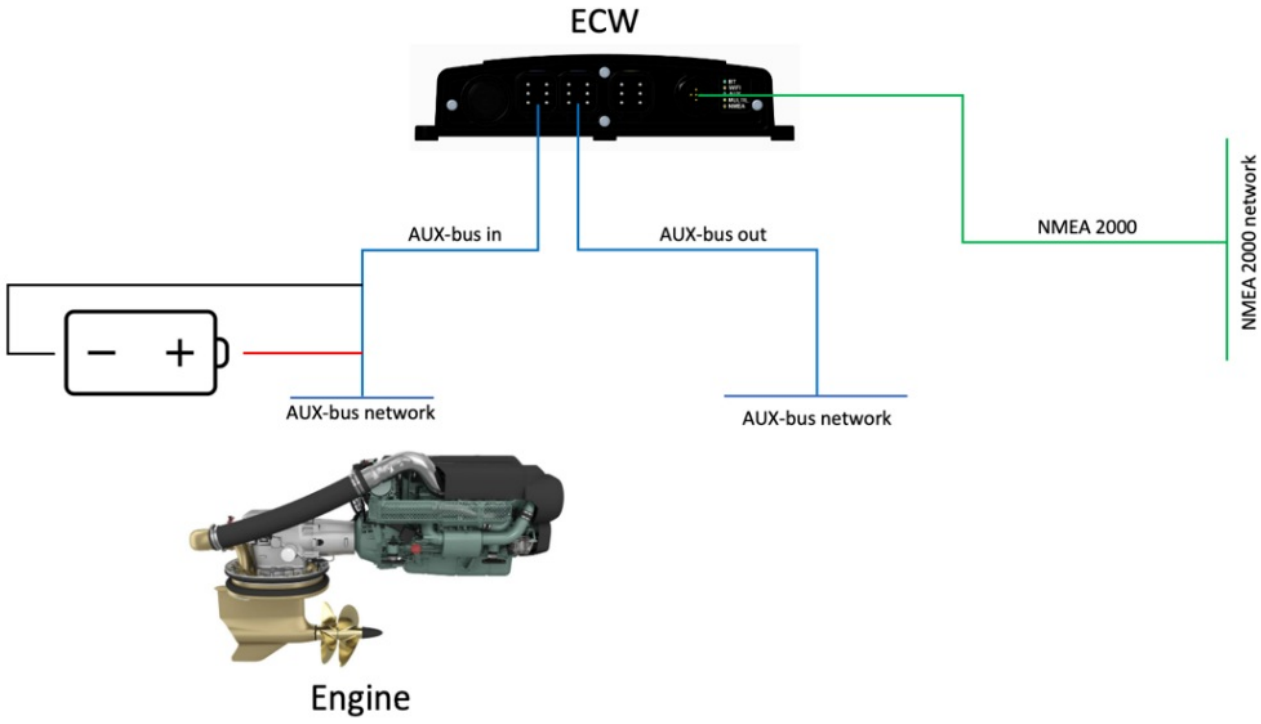


ECW connection for EVC 2 installations (POWER DIRECTLY FROM BATTERY)
The ECW interface receives power directly from the battery, hence it is active even if the boats ignition is turned off. This set-up enables off-boat usage of ECW.

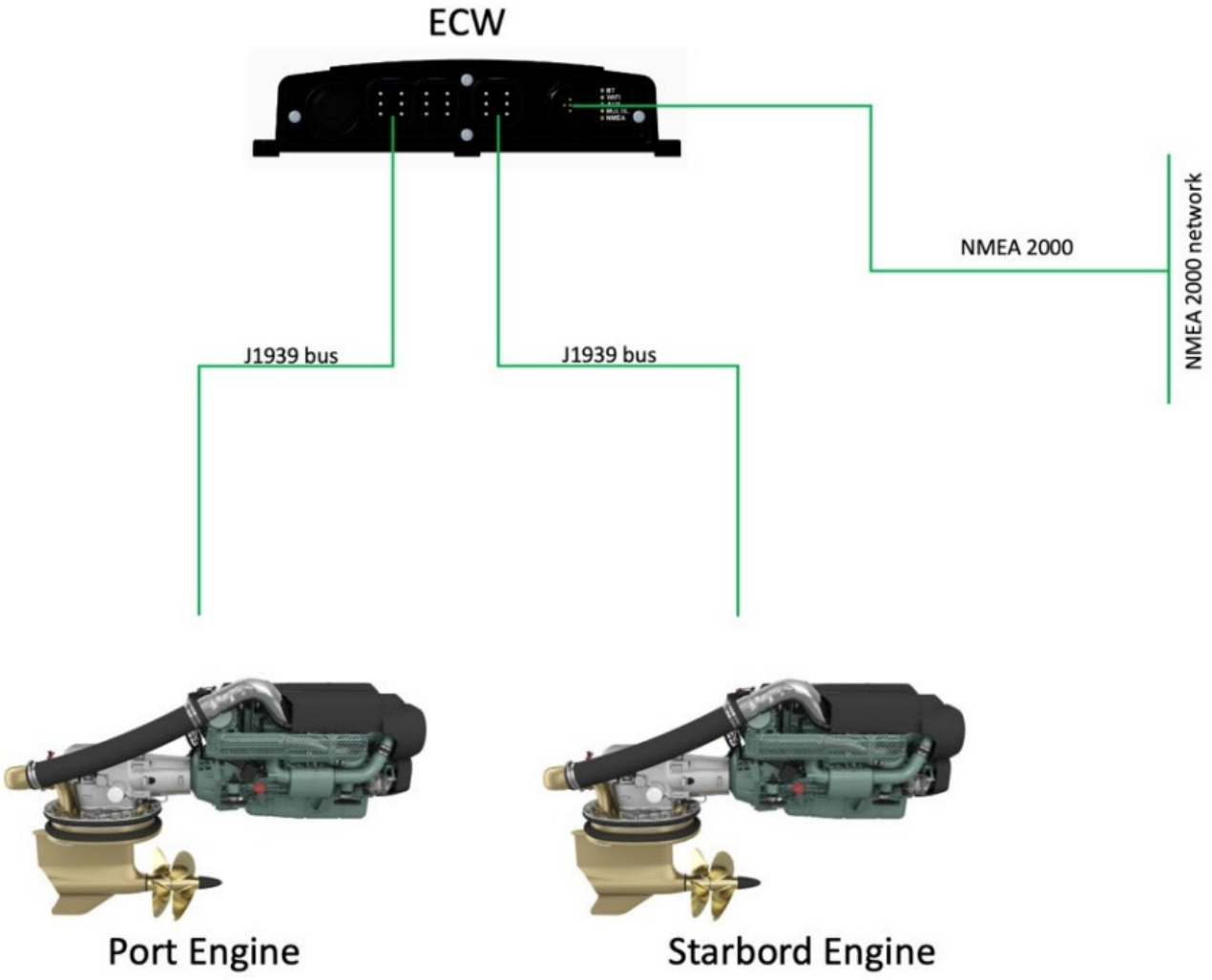


Connecting requirements – cables for non EVC system

- ECW shall be connected to a non EVC system according to this if



- ECW shall be connected to a TWIN non EVC system according to this:

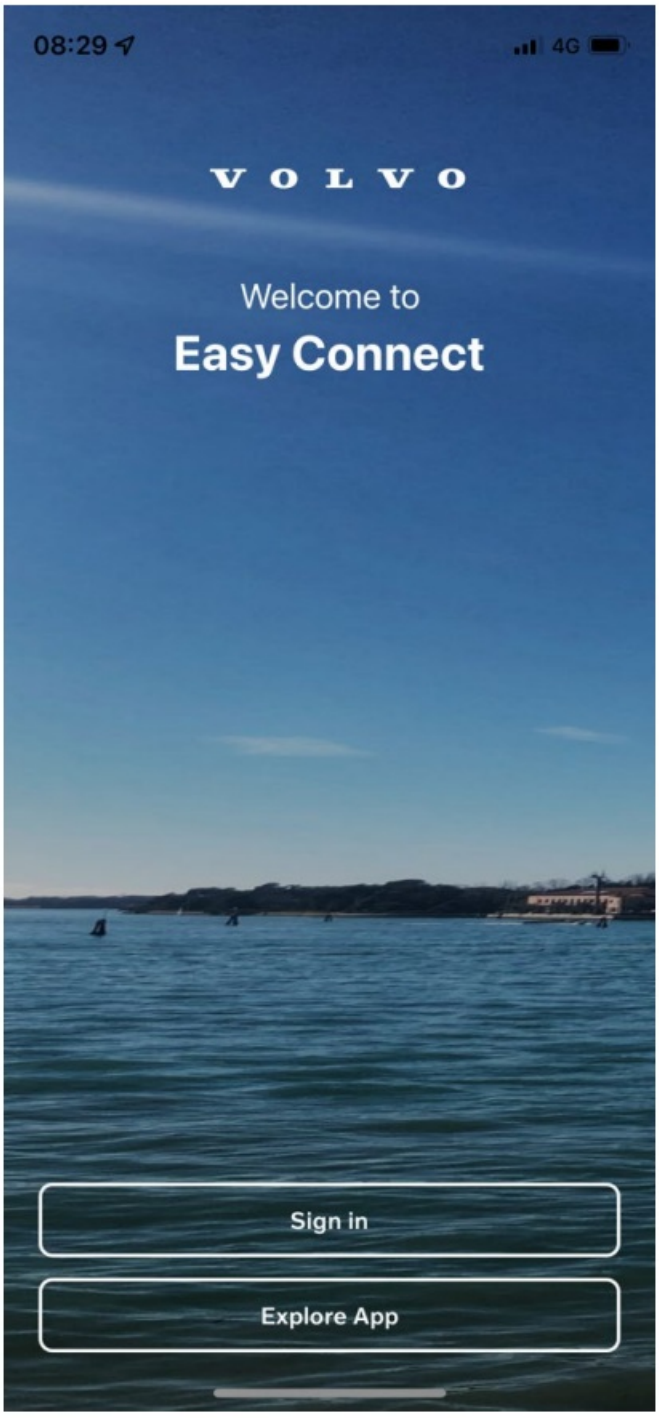


CONNECTING AND CONFIGURING ECW AND APP

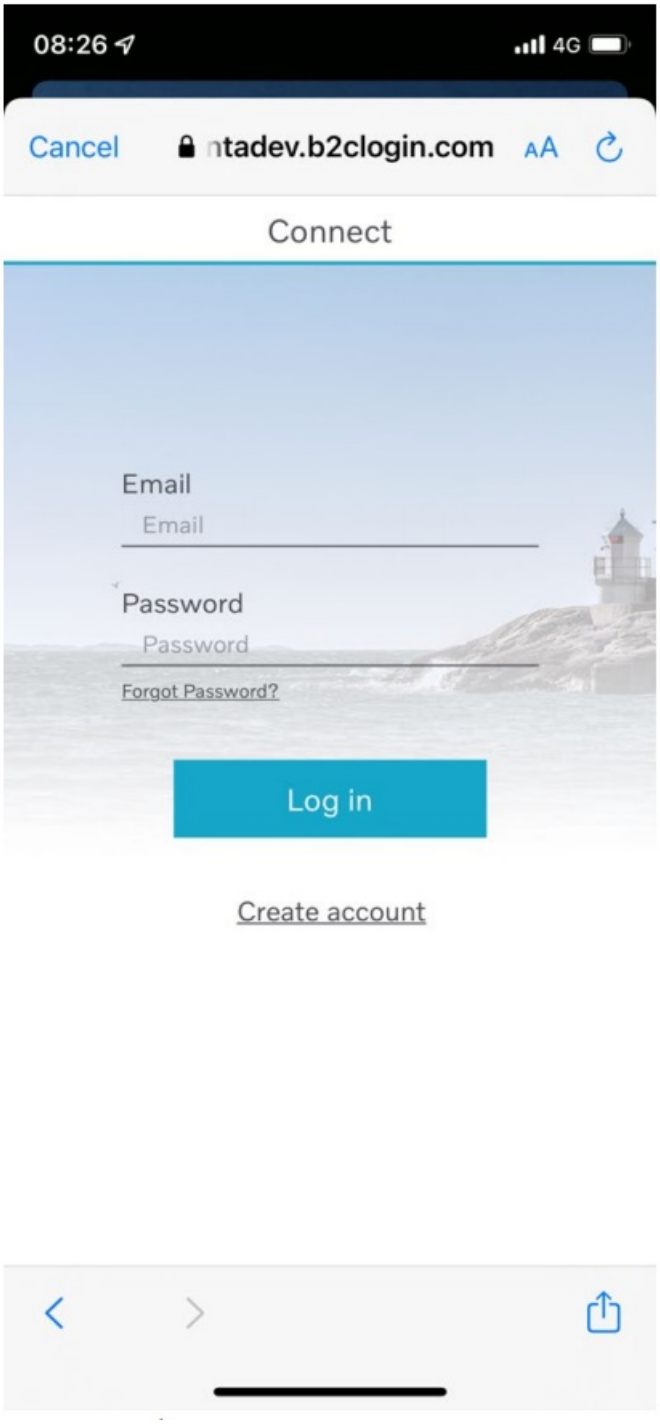
Connecting Penta account – Mobile device app and dongle

The ECW interface is designed to only allow one Penta account per dongle. The account can be used on multiple mobile devices at the same time to allow multiuser support. When first time activation is being performed as seen bellow, the Penta account is being synced to the dongle. Thereby setting up the dongle to send data from the boat to the BOS service connect to the configured Penta account. After the first-time activation the user is required to be singed into the app to receive full functionality on the device. If the user is not signed in it will receive limited functionality and have the possibility to perform a factory reset.
To change which account the dongle is sending the data to the user needs to perform a factory reset of the dongle. Thereafter the user has the possibility to perform the first-time activation again.

Press into the Sign in button to start the login process



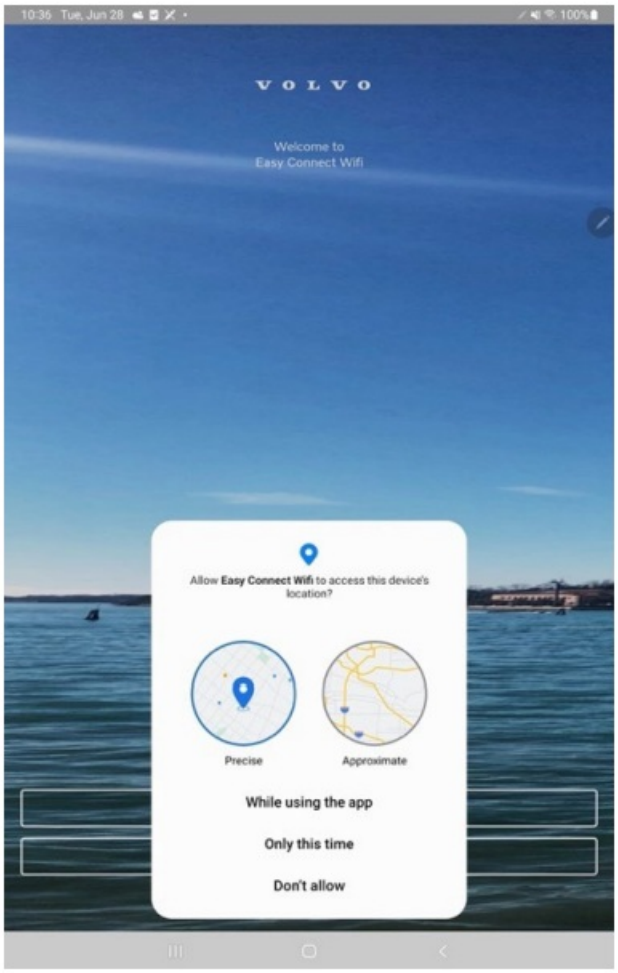
Use your Volvo Penta account or create a new one.



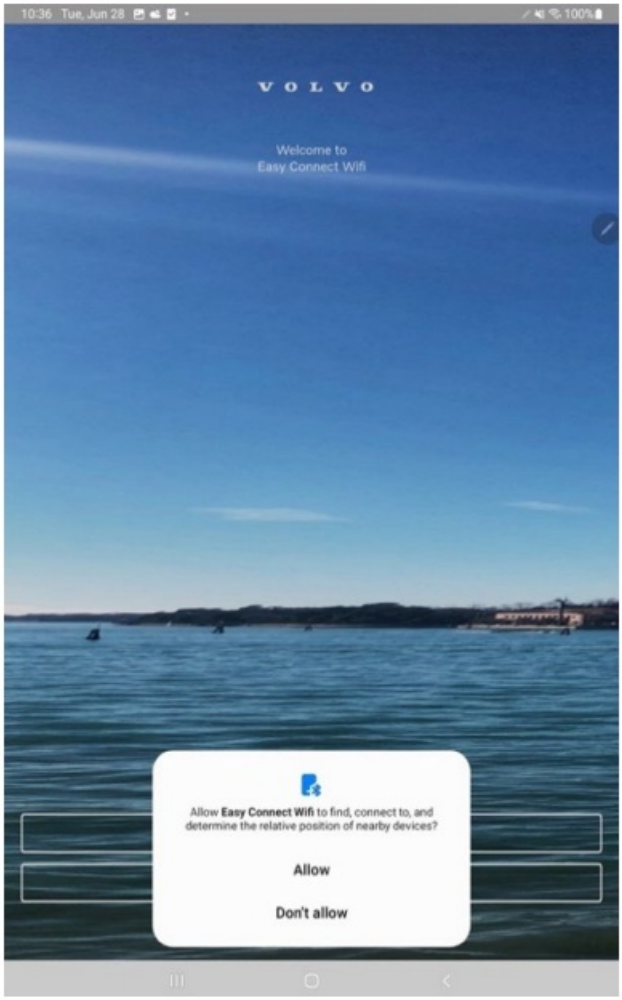
Connecting Bluetooth – Mobile device app

- Search for Volvo Penta Easy Connect app at App Store (iOS) or Play Store (Android).
- Download Easy connect app to mobile device.
- Gateway shall be connected in boat and be powered on according to the above alternatives in 4.7.

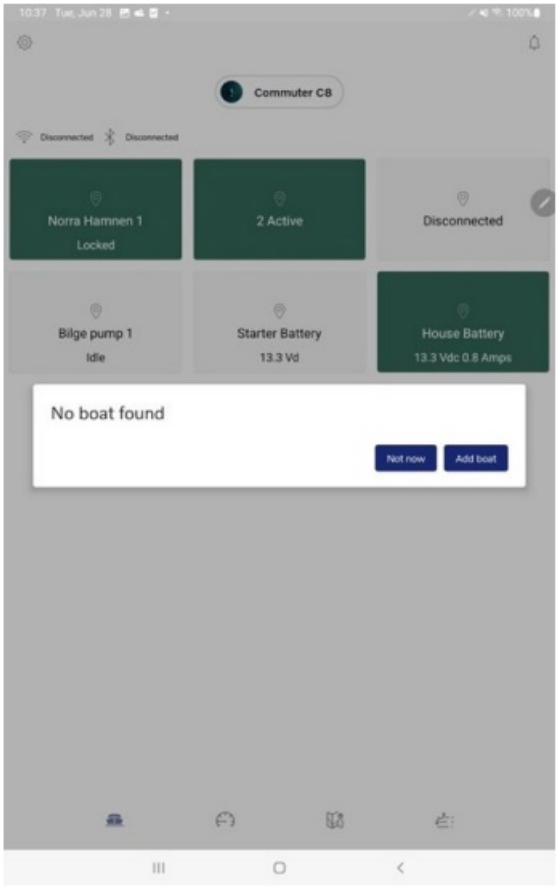
Location permission at this point is necessary to find Bluetooth devices. The app needs this permission to work correctly.



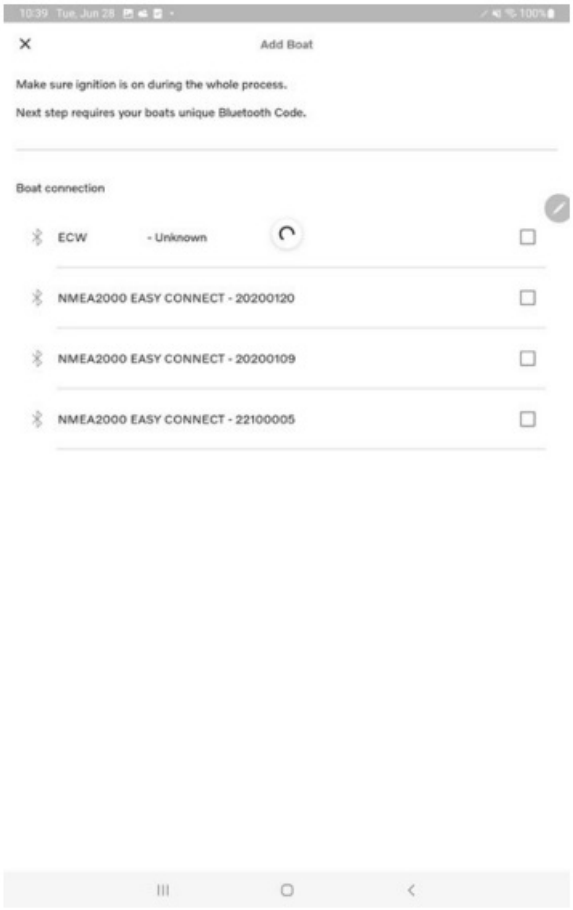
Bluetooth permission is necessary to handle Bluetooth devices. The app needs this permission to work correctly.



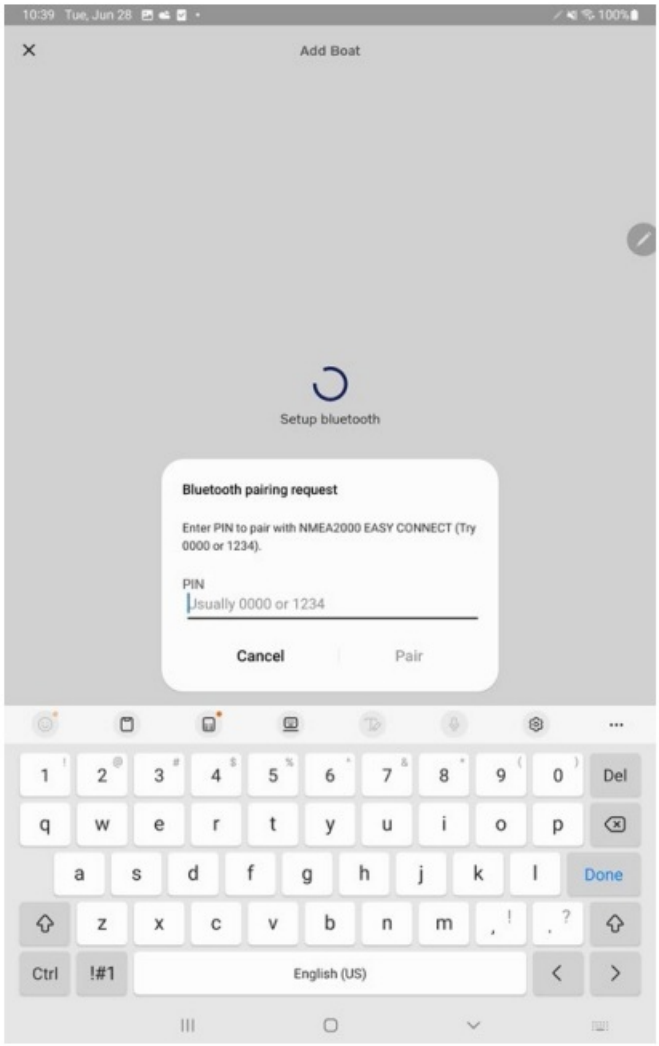
Press “Add Boat” to pair a new dongle and create a boat on the app.



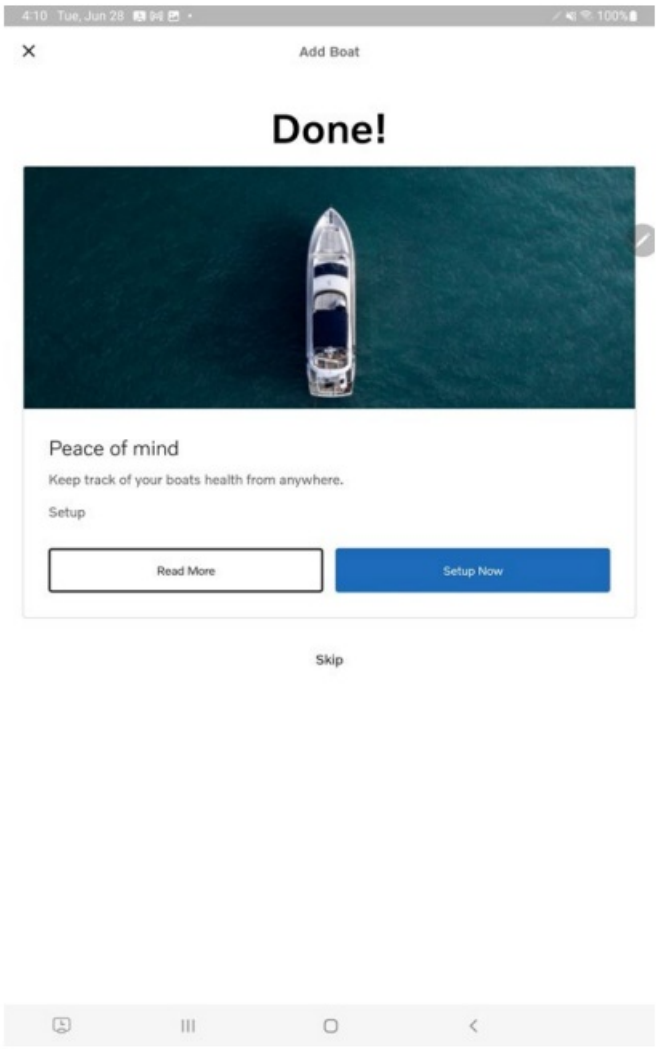
Select the correct easy connect dongle device.
It always will be the name followed by the serial number on the dongle label.



Add the correct Bluetooth code, that is available on the dongle label. See image in 4.4



If this page is visible means that the Bluetooth setup is done with success.



Connecting WI-FI – Mobile device app

- After Bluetooth setup, press “Setup Now” to start the WI-FI setup.
- The mobile device needs to be connected to the correct WI-FI network, that the ECW interface shall be connected to.
- To setup the WI-FI connection into the dongle, double check if the WI-FI SSID s is correct, then input the password and press continue. If everything is correct after the loading screen, you will be redirected to the main screen.

Modes of Operation

Modes of ECW unit

The CPAC-ECW unit has three modes: On, Off or EVC off ECW On:

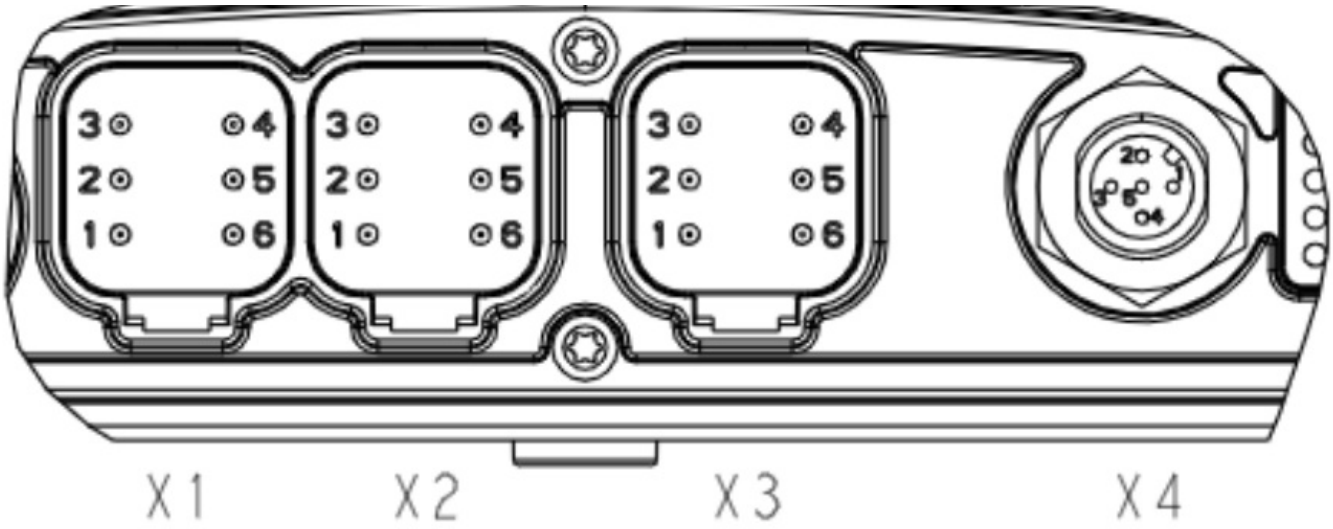
- The power state of the boat is ignition off. ECW is not powered up and not functional.
- The power state of the boat is ignition on. ECW is powered up and functional.
- The power state of the boat is ignition off. ECW is powered up by external source and functional.

Sleep mode

When the ignition is turned off and the EVC system is powered off there is no active communication on the can buses. In systems with external power to the ECW where it might be necessary to reduce power consumption from the ECW by entering a low power sleep mode. The necessity of sleep mode will depend on how often the BOS must communicate with the boat to retrieve status of Bluetooth sensors etc.

Additional Technical Data

Overview of Connectors



X1 AND X2		DEUTSCH DT04-6P
PIN Nr	SIGNAL NAME	DESCRIPTION
1	B+	
2	ACANL	CAN LOW SIGNAL
3	B-	CAN HIGH SIGNAL
4	B-	NEGATIVE SUPPLY INPUT
5	ACANH	CAN HIGH SIGNAL
6	15+	POSITIVE SUPPLY INPUT

X3		DEUTSCH DT04-6P
PIN Nr	SIGNAL NAME	DESCRIPTION
1	CANL	CAN LOW SIGNAL
2	CANL	CAN LOW SIGNAL
3	CANH	CAN HIGH SIGNAL
4	S-	NEGATIVE SUPPLY INPUT
5	CANH	CAN HIGH SIGNAL
6	S+	POSITIVE SUPPLY INPUT

X4		DeviceNet MicroC
PIN Nr	SIGNAL NAME	DESCRIPTION
1	SHIELD	NOT CONNECTED
2	NET-S	SUPPLY+
3	NET-C	SUPPLY-
4	NET-H	CAN HIGH SIGNAL
5	NET-L	CAN LOW SIGNAL

Bluetooth Low Energy (GFSK)

Power

- Power consumption: 100 – 500mA with 12V supply
- Voltages: 8-32V is the full supply range

Environment

- IP class: IP67, ISO 20653
- Temperature (operational): -20 – +85 ºC
- Temperature (storage): -20 – +85 ºC

Bluetooth antenna

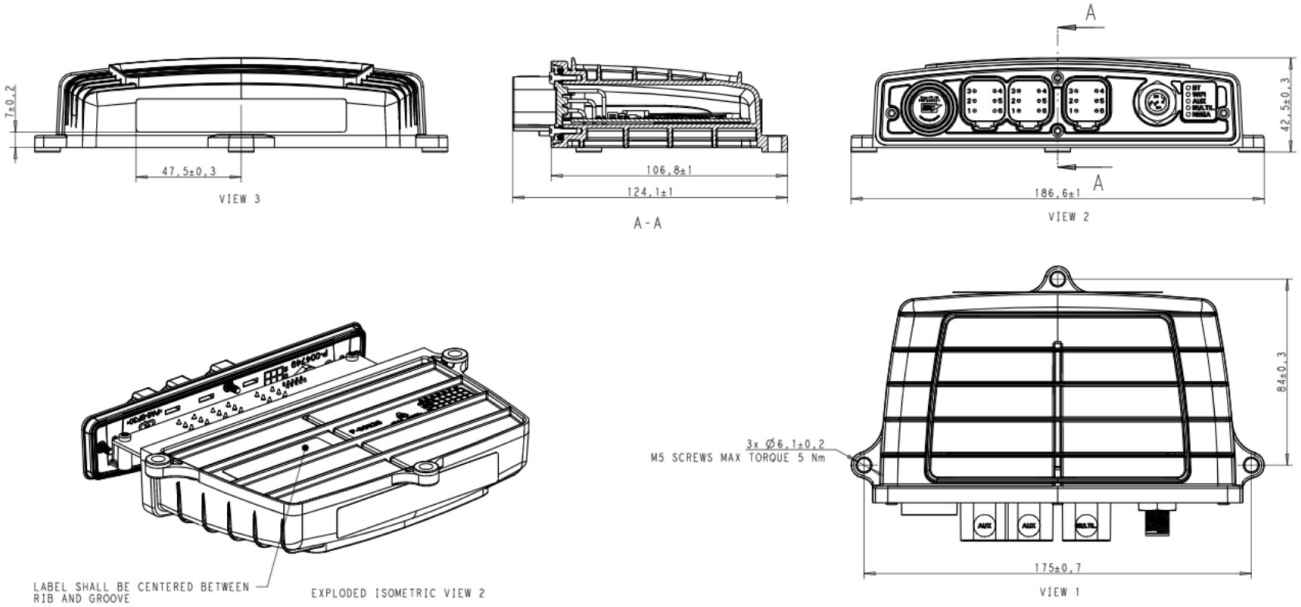
- Internal antenna built in unit.
- Operating Frequency: 2,4GHz
- Output power: <7dBm from IC before harmonic filter on BLE
- Number of channels: 40 channels

Wi-Fi antenna

- Internal antenna built in unit.
- Operating Frequency: 2,4GHz
- Output power: <20dBm from IC before harmonic filter on Wi-Fi
- Number of channels: 11 channels in US, 13 channels in EU + Japan

Physical Specification

- Size: 186,6 mm x 124,1 mm x 42,5 mm
- Weight: 255 g



Regulatory Information

US and Canada

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s) and complies with part 15 of the FCC Rules.
Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation of the device.

Changes or modifications made to this equipment not expressly approved by CPAC Systems AB may void the FCC authorization to operate this equipment.
This equipment complies with FCC/ISED radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance of 20 cm between the radiator and your body. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Customer Support

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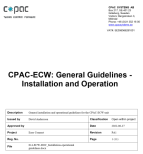
Box 217, SE-401 23
Göteborg, Sweden
Visitors: Bergskroken 3,
Mölndal
Phone: +46 (0)31 352 16 00
www.cpacsystems.se

Documents / Resources

	cpac System CPAC-ECW Easy Connect Gateway [pdf] Instruction Manual AHV-ECW, AHVECW, CPAC-ECW, CPAC-ECW Easy Connect Gateway, Easy Connect Gatewa y, Gateway