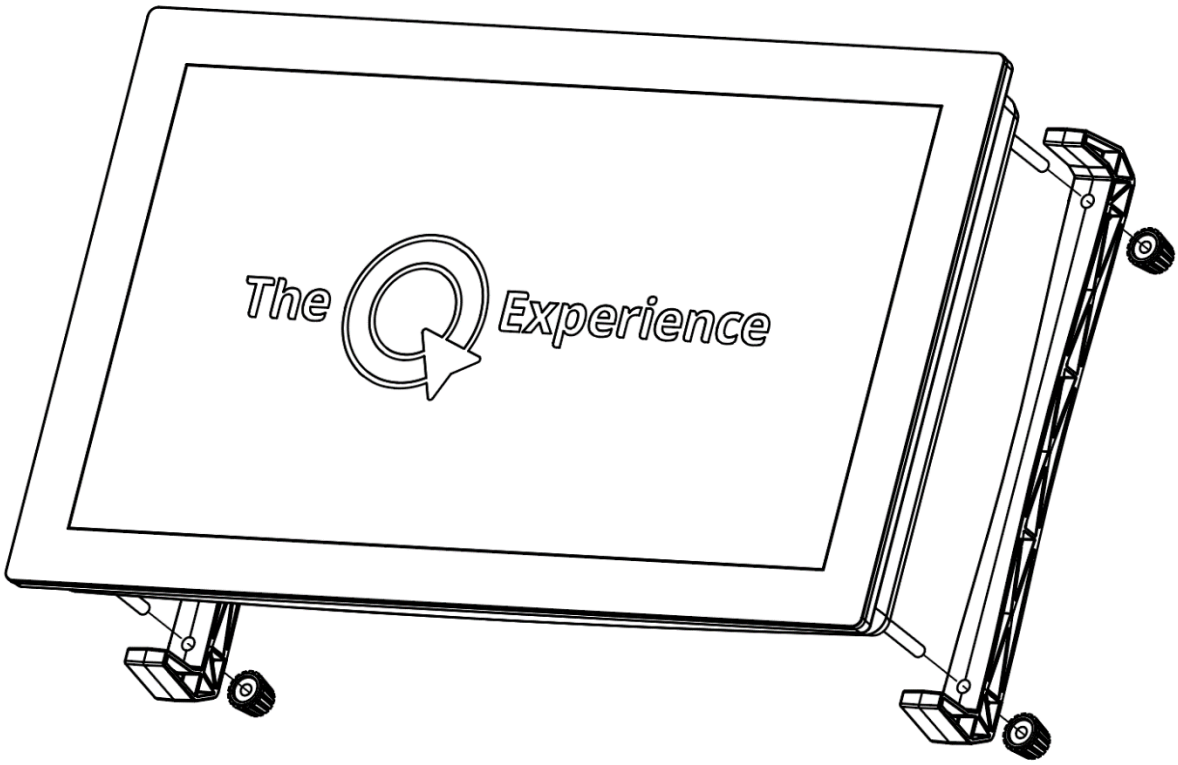


Q Display 2 Installation Instructions

Ver. 000021

Safety notices

The Q Display should be installed and used according to the provided instructions. Installation and use of the Q Display contrary to the recommendations specified in this document may result in loss of warranty and damage to the device, vessel, or operator.

WARNING: The customer must not disassemble or attempt to service the product. There are no user-serviceable parts. Any changes or modifications will result in voided warranty.

WARNING: Disconnect battery before starting the installation.

WARNING: The device has a voltage rating of 12V DC. Maximum operating voltage is 15V DC.

WARNING: The positive supply wire (BATTERY+) must always be connected via a fuse to the positive (+) terminal of the battery.

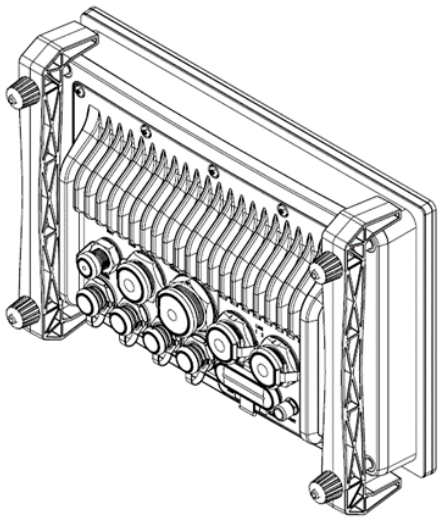
WARNING: Before connecting the Q Display to a power source, make sure that the device is grounded in accordance with the requirements of this manual. It is not possible to connect the Q Display to a circuit with positive grounding.

If you have questions about the installation or doubts about compatibility with other devices, contact q-support@nextfour.com

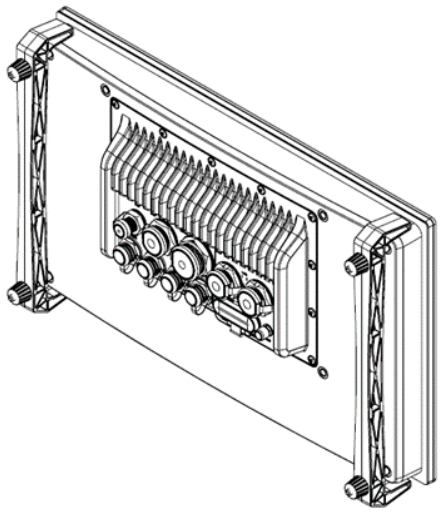
Applicable products

This document is applicable to the following products:

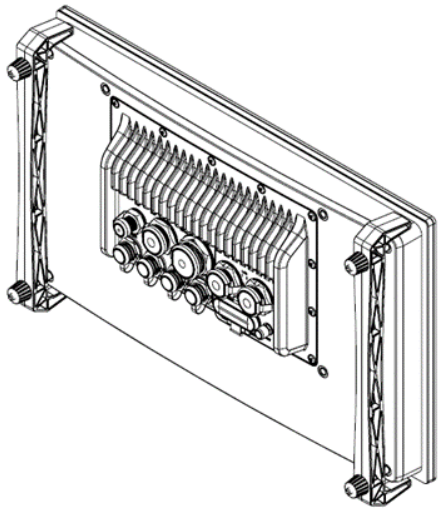
Product	Overall dimensions, mm	Panel cut-out, mm	Weight, kg
Q Display 210 & 210e	260 x 177 x 61	248 x 165	2,1
Q Display 212 & 212e	303 x 209 x 63	292 x 198	2,4
Q Display 216 & 216e	391 x 240 x 64	379 x 228	3,4
Q Display 210D	510 x 180 x 61	498 x 168	3,1
Q Display 222	518 x 318 x 64	506 x 306	6,5
Q Display 224	570 x 348 x 68	558 x 336	9,5



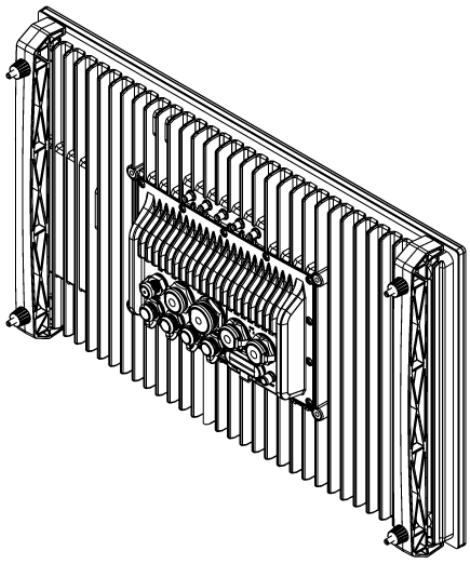
Q Display 210 (10”)



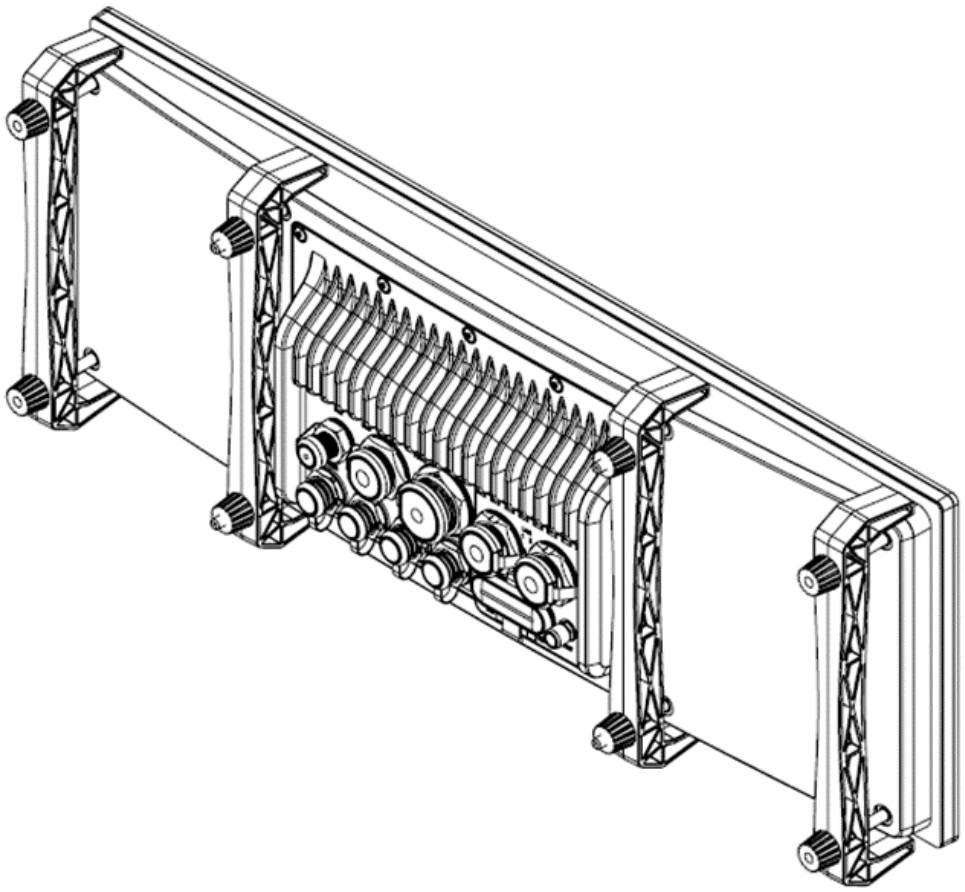
Q Display 212 (12”)



Q Display 216 (16”)



Q Display 222 (22”), 224 (24”)



Q Display 210D (Dual 10")

Surface mounting

When choosing a location to install the Q Display, consider that there should be enough room behind the panel for cable connections as well as for installation and maintenance operations.

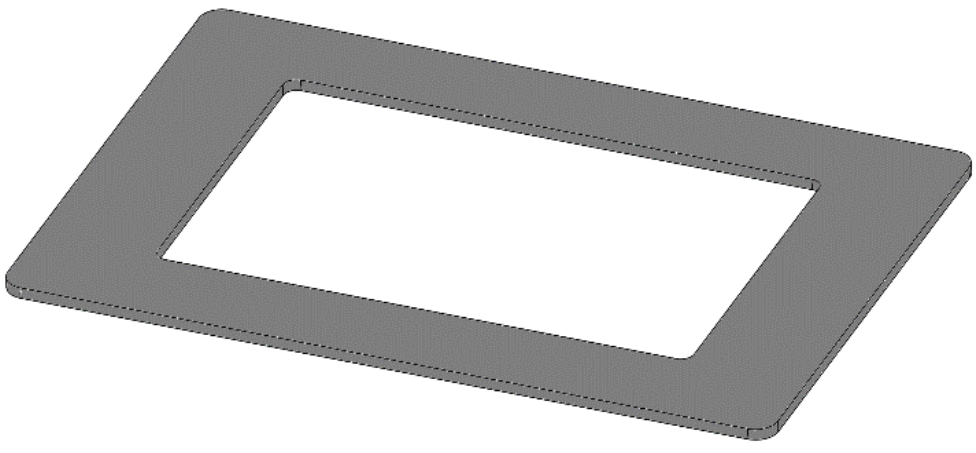
Proper air circulation must be provided around the device. The maximum operating temperature of the device is 55°C. Installation shall be designed and executed such that this temperature is not exceeded.

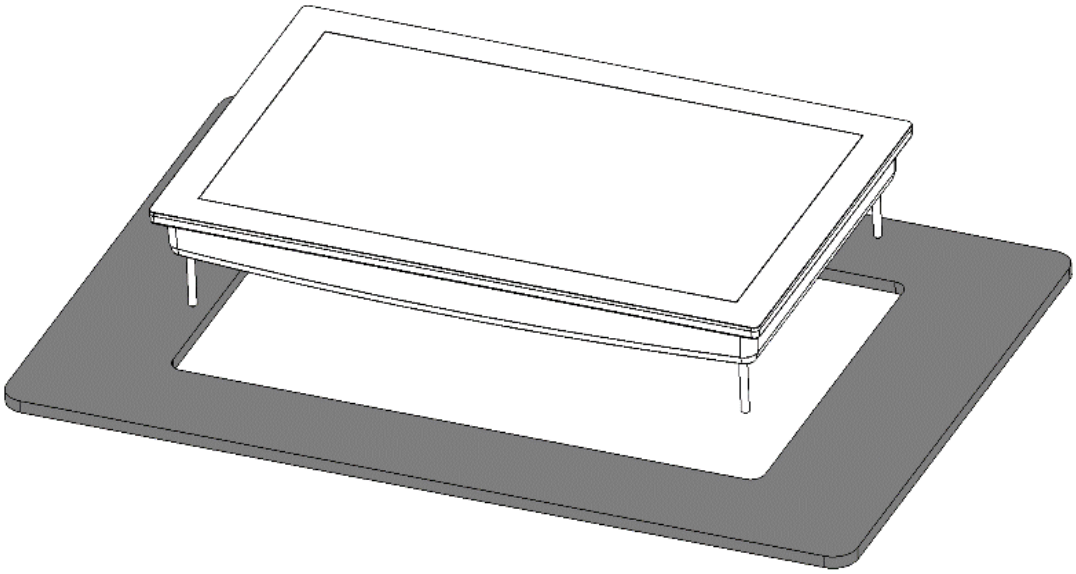
On outdoor installations, ensure that the panel is stiff and flat enough to form a seal with the device, and the intended panel is suitable to bear the weight of the Q Display.

In addition, consider that the Q Display has an internal GPS/GNSS receiver and 4G modem, which require radio-transparent material around the device to work correctly. Non-radio transparent materials are different types of metal but also carbon fibre laminates. Use an optional GPS/GNSS antenna accessory to enhance GPS reception onboard vessels with enclosed cabins and/or radio frequency-blocking construction, where the Q display does not have a clear view of the sky. As the 4G modem antennas are built-in and cannot be exchanged with external equipment, some way of letting the device communicate with the outside world must be arranged.

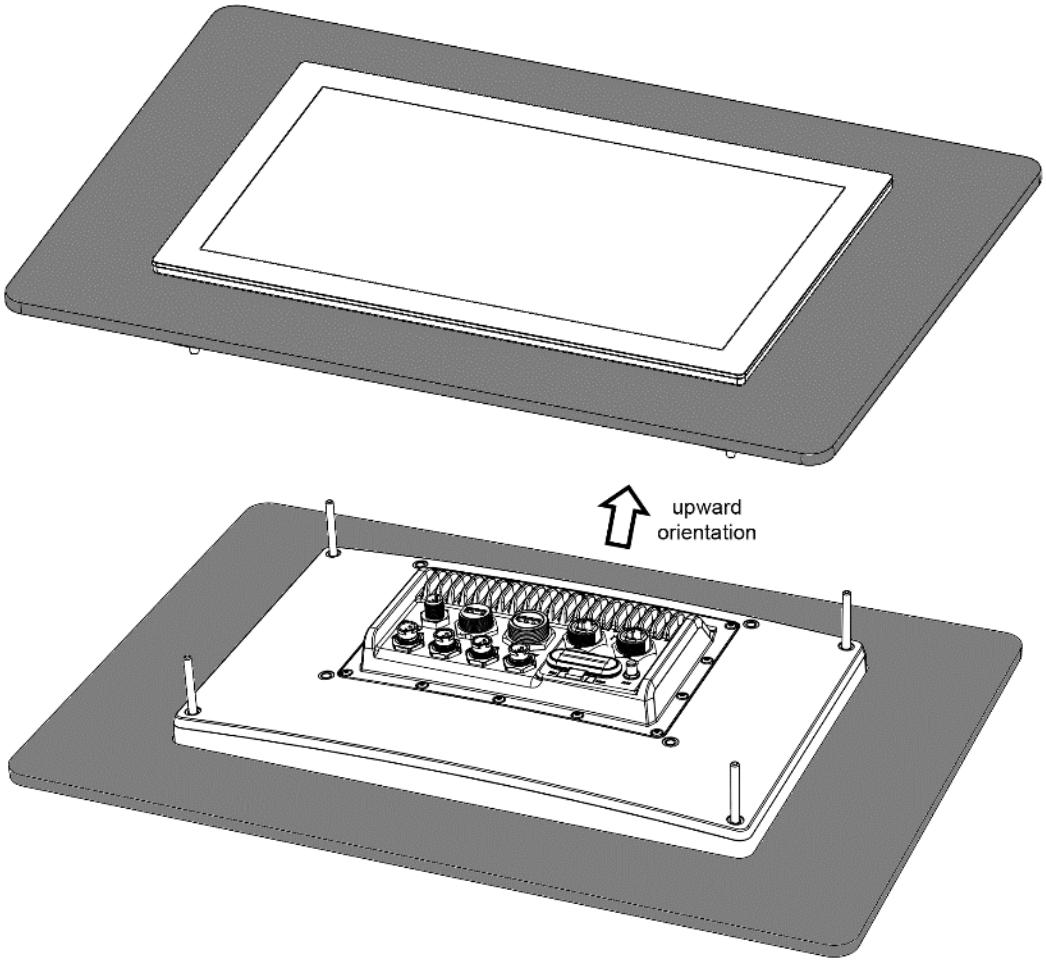
Note! Whenever the Q Display is not in operation, the supplied silicone cover should be used to protect the device from sun and other elements.

1. Cut a hole into the desired surface and insert the Q Display through the hole with the gasket in between.
   The cut-out templates for the Q Display 210 (10”), 212 (12”), 216 (16”), 222 (22”), 224 (24”), and 210D (Dual 10”) are provided within this manual.



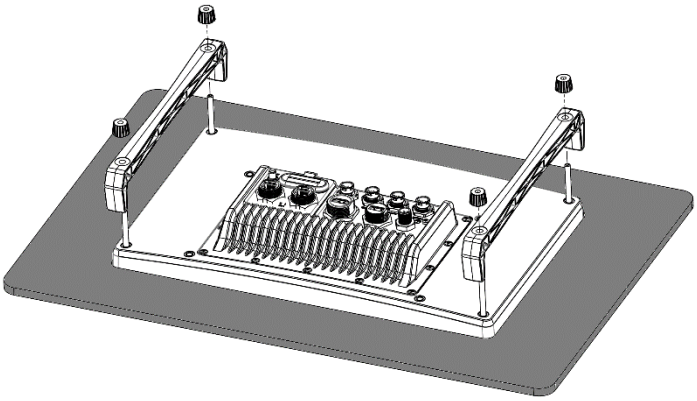


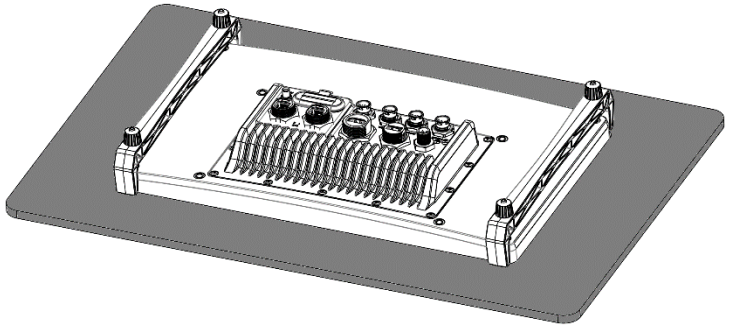
2. After inserting the Q display, check that it is properly in place considering the orientation and that the seam around the screen edge is properly sealed on all sides.

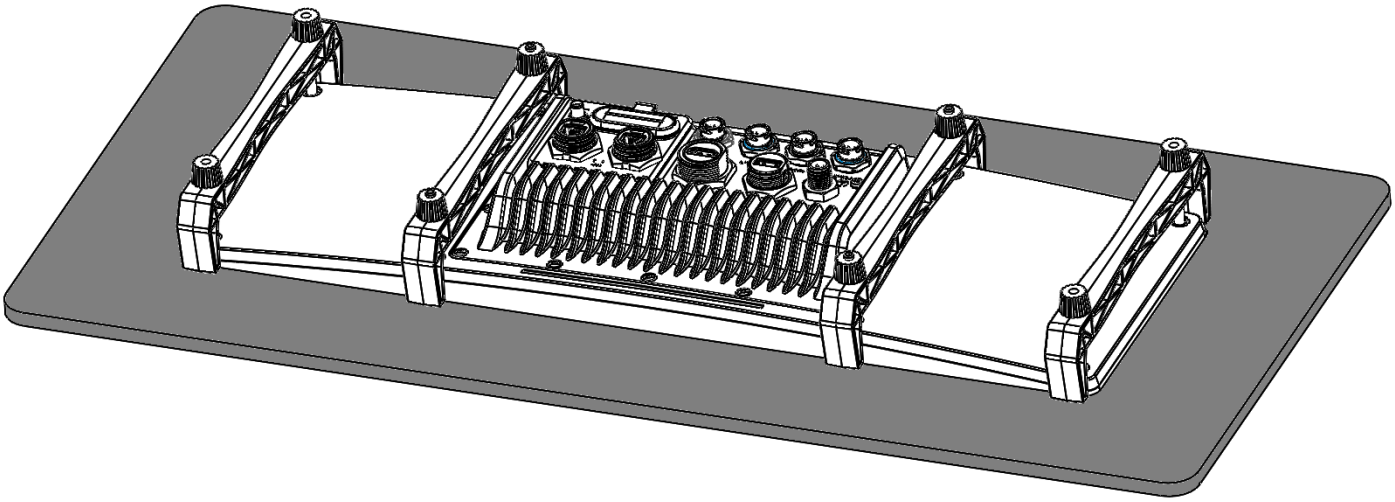


3. Fasten the brackets (supplied with device) with threaded studs and thumb nuts. The nuts shall be tightened carefully by hand to prevent them from loosening due to vibration, while making sure not to damage the Q Display from overtightening.

WARNING: Do not use tools or overtighten to avoid damage to the device. Max. torque 0.4 Nm.

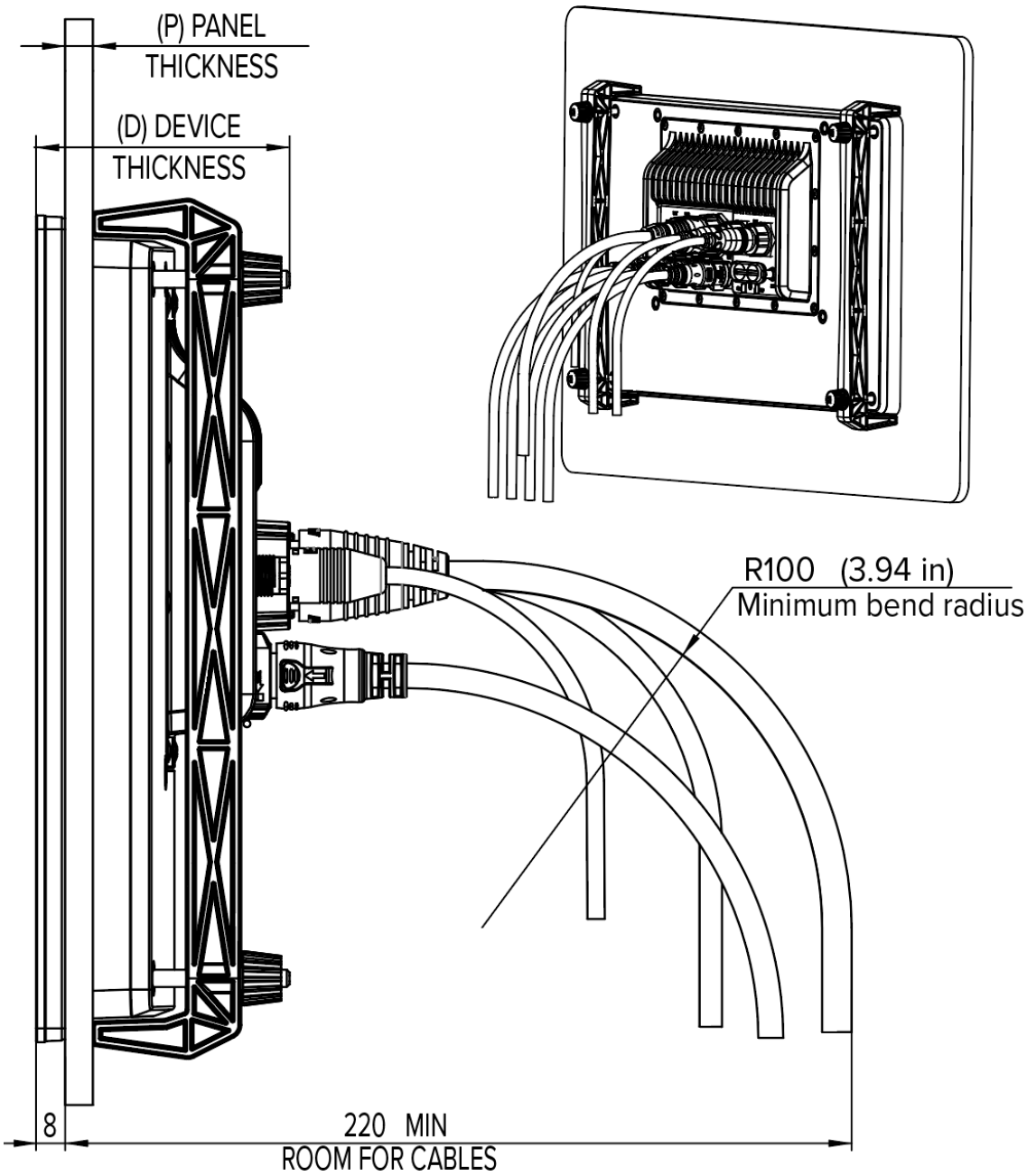






Note that the Q Display 210D (Dual 10") requires 4 brackets (supplied with device).

4. Note that extra room should be provided behind a Q Display due to the minimum bending radius of cables.



Product	P, mm		D, mm
Q Display 210 (10”)	4 min	15 max	76 min
Q Display 212 (12”)		16 max	81 min
Q Display 222 (22”)		11 max	81 min
Q Display 224 (24”)		11 max	88 min
Q Display 216 (16”)		13 max	76 min
Q Display 210D (Dual 10")		7 max	78 min

5. Protect cables from stress with strain relief clips (not supplied).

Bracket (Trunnion) mounting

Optional trunnion bracket can be used to mount the Q Display 210 (10”) and 210e (Auxiliary 10”) on a horizontal surface. The bracket is not suitable for mounting Q Display 212 (12”), 212e (Auxiliary 12”), 216 (16”), 216e (Auxiliary 16”), 222 (22”), 224 (24”) or 210D (Dual 10”).

When choosing a location to install the Q Display, consider that there should be enough room behind the panel for cable connections as well as for installation and maintenance operations.

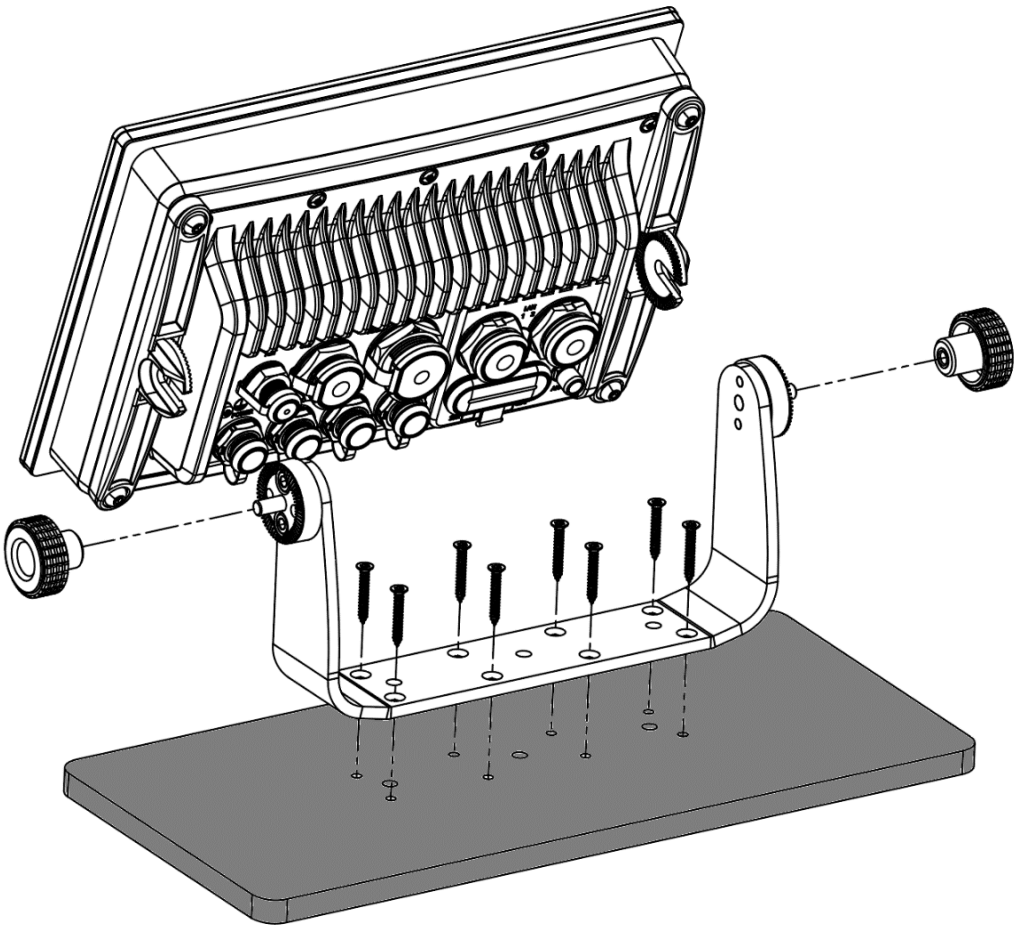
Proper air circulation must be provided around the device. The maximum operating temperature of the device is 55°C.

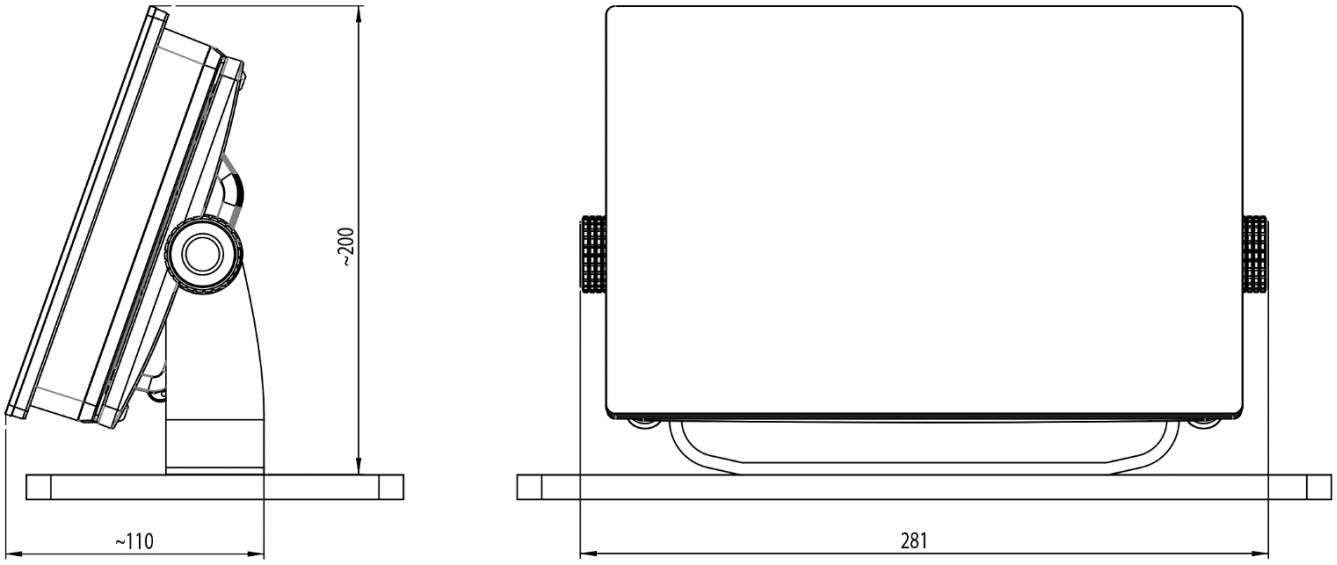
Install the two plastic mounts to the Q Display. Maximum torque 0.4 Nm. Use of low strength thread lock is recommended but not necessary.

Use the bracket as a template. Mark and drill at least 4x pilot holes on the mounting surface for the corresponding self-tapping screws (not provided with the bracket).

The side knobs shall be tightened sufficiently by hand to prevent them from loosening due to vibration when underway.

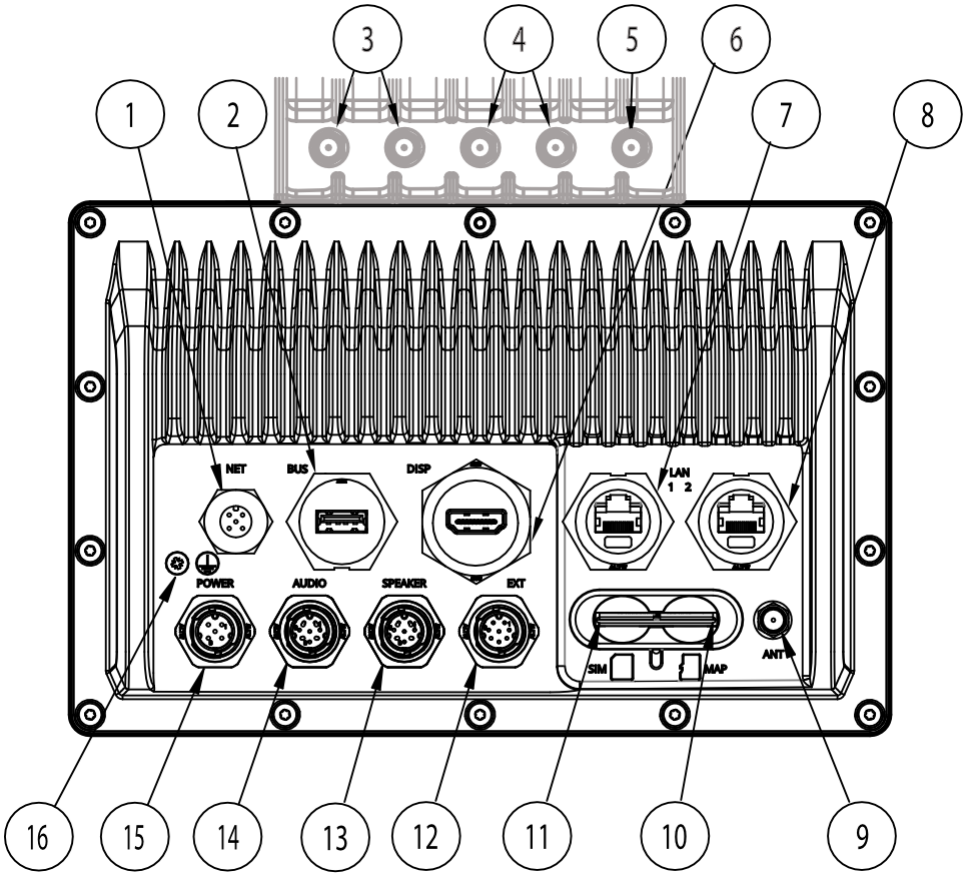
Note! Whenever the Q Display is not in operation, the supplied silicone cover should be used to protect the device from sun and other elements.




~200
~110
281

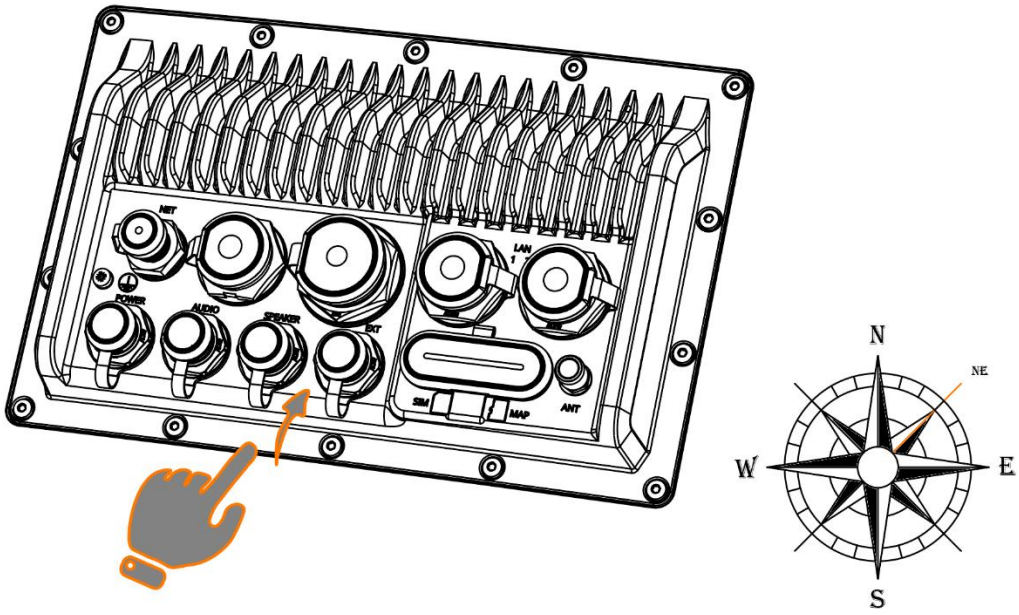
Connections overview

Overview of the Q Display connections.

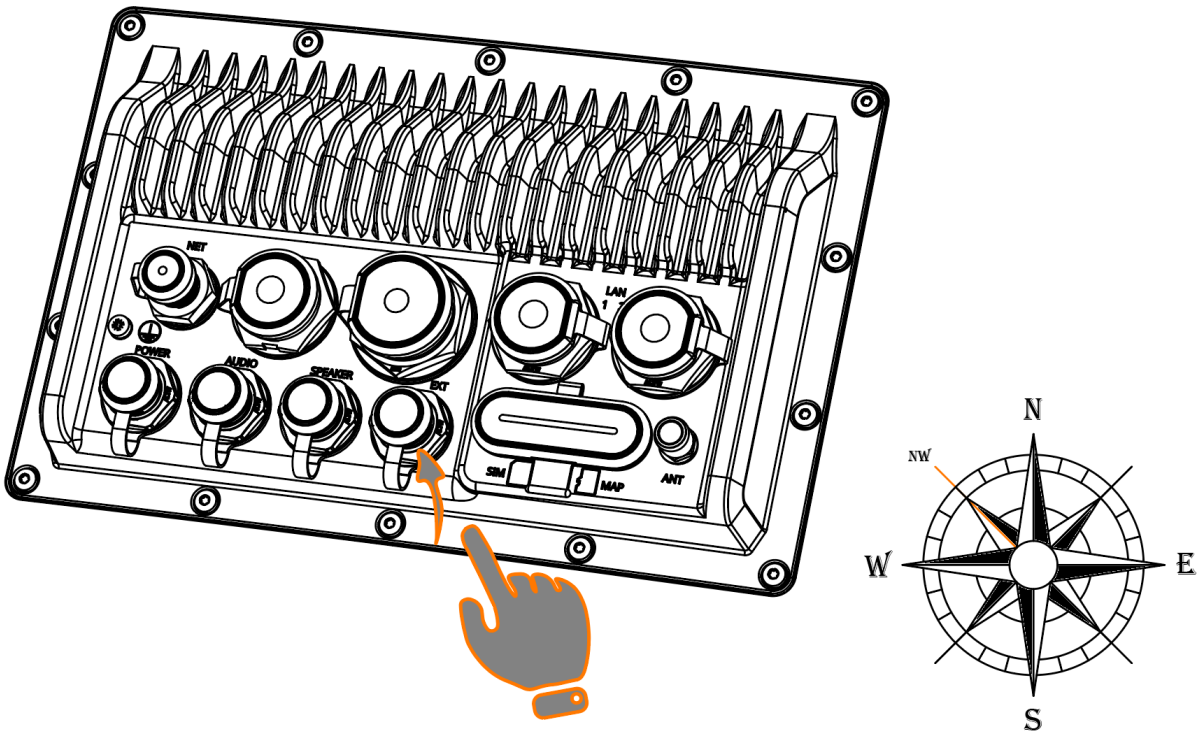


№	NAME	**DESCRIPTION**
1	NET	NMEA2000 network
2	BUS	Accessory port
3	-	GPS (only for Q Displays 222 and 224)
4	-	WiFi/Bluetooth (only for Q Displays 222 and 224)
5	-	4G (only for Q Displays 222 and 224)
6	DISP	Port for auxiliary Q Displays such as 210e, 212e and 216e
7	LAN1	1000Mbps Ethernet port
8	LAN2	100Mbps Ethernet port
9	ANT	FM/DAB radio antenna connector
10	CHART	Chart card holder
11	SIM	SIM card holder
12	EXT	Extension port
13	SPEAKER	Speaker port
14	AUDIO	External line level audio port
15	POWER	Power input
16	Ground	RF ground connector

NOTE: To open “Power”, “Audio”, “Speaker” and “Ext” caps: pull cap up and towards "NE" direction as shown on the picture below.



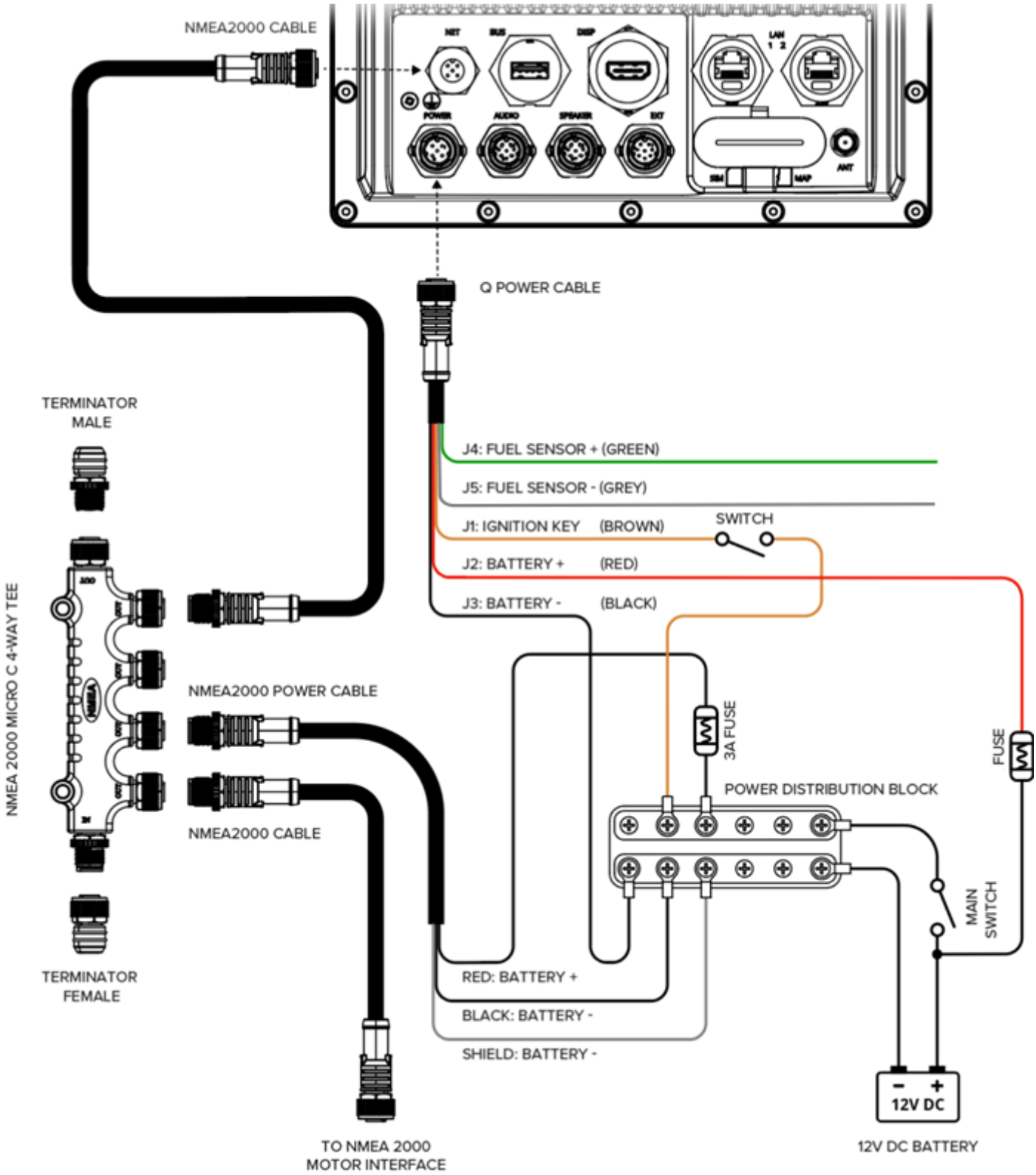
NOTE: To close “Power”, “Audio”, “Speaker” and “Ext” caps: slide cap towards "NW" direction and push down as shown on the picture below.



Basic installation

Basic installation connections

Basic installation includes Q Display, power supply and NMEA connections.



Power connection

Q Display is powered by 12V DC via corresponding Q Power cable. There are two options:

- Q2 Power Cable – MINIFIT, 0.4m, N4S_00663
- Q2 Power Cable – lead, 1m, N4S_00664

Fuse sizes:

Display	Fuse, size per unit
Q210/Q210e	5A
Q212/Q212e	5A
Q210D	5A
Q216/Q216e	5A
Q222/Q222e	10A
Q224	10A

Cable thickness:

Length [m]	5A [mm^2]	10A [mm^2]
4,5	1,5	2,5
6	1,5	2,5
7,5	2,5	2,5
9	2,5	4
12	2,5	4

The length used above is the sum of the positive and negative power leads.
Use thick enough power cables both on the positive and negative side. If you are using external amplifiers, connect the negative power supply of the display and amplifier at the same point to avoid ground loops.

Connect wire (BATTERY+) to 12V DC power supply positive (+) terminal through a waterproof fuse holder (not supplied).

Connect wire (BATTERY-) to 12V DC power supply negative (-) terminal.

Connect wire (IGNITION KEY) through ignition switch to 12V DC power supply positive terminal.

WARNING: Before applying power to the Q Display, ensure that it has been correctly grounded and circuit-protection fuse is installed in accordance with the instructions.

NOTE: The Q Display is powered ON and OFF by using switch on IGNITION KEY control signal.

Fuel level meter

1. If you connect fuel level meter, sensor must be resistive model, EU (0-190ohm) or American (240-30ohm). The connections for the fuel sensor can be found on the power cable.

WARNING: Do not connect ‘FUEL SENSOR‘ inputs to supply voltage! This will result in permanent damage to device.

- You can also use a NMEA2000 compliant transducer(s). Notice the NMEA instances of the different fuel transducers if you have two of them. The instances must be different on the separate transducers.

Remote control equipment

The outputs D_OUT2 and D_OUT3 on the EXT cable (see chapter “**Guard EXT Cable installation”**) can be remotely controlled from the accompanying mobile application. The outputs on the app are called “Climate” and “External”. The outputs can source 200mA each. If more power is needed, please connect a relay in between. The blue lead is +12V and the brown lead is ground. The outputs are protected for the spikes from a relay.

Powering external equipment

If there is a need to power up external equipment in sync with the Q, like an fishfinder, radar, amplifier via its remote input or NMEA network, it is possible to use the D_OUT3 output found on the EXT cable (see chapter "**Guard EXT Cable installation").** The output can source 200mA, if more power is needed, please connect a relay. The brown lead is ground, and the blue one is +12V.
The output can be enabled for local use in "Settings-Boat Settings-Control guard external line with Q Boot". The delay of activation can be adjusted. A normal delay for an amplifier would be approx. 40 seconds. Notice that if the output is used for steering external equipment in sync with the processor, it is no longer possible to steer the output remotely from the mobile app.

Grounding — optional dedicated drain wire

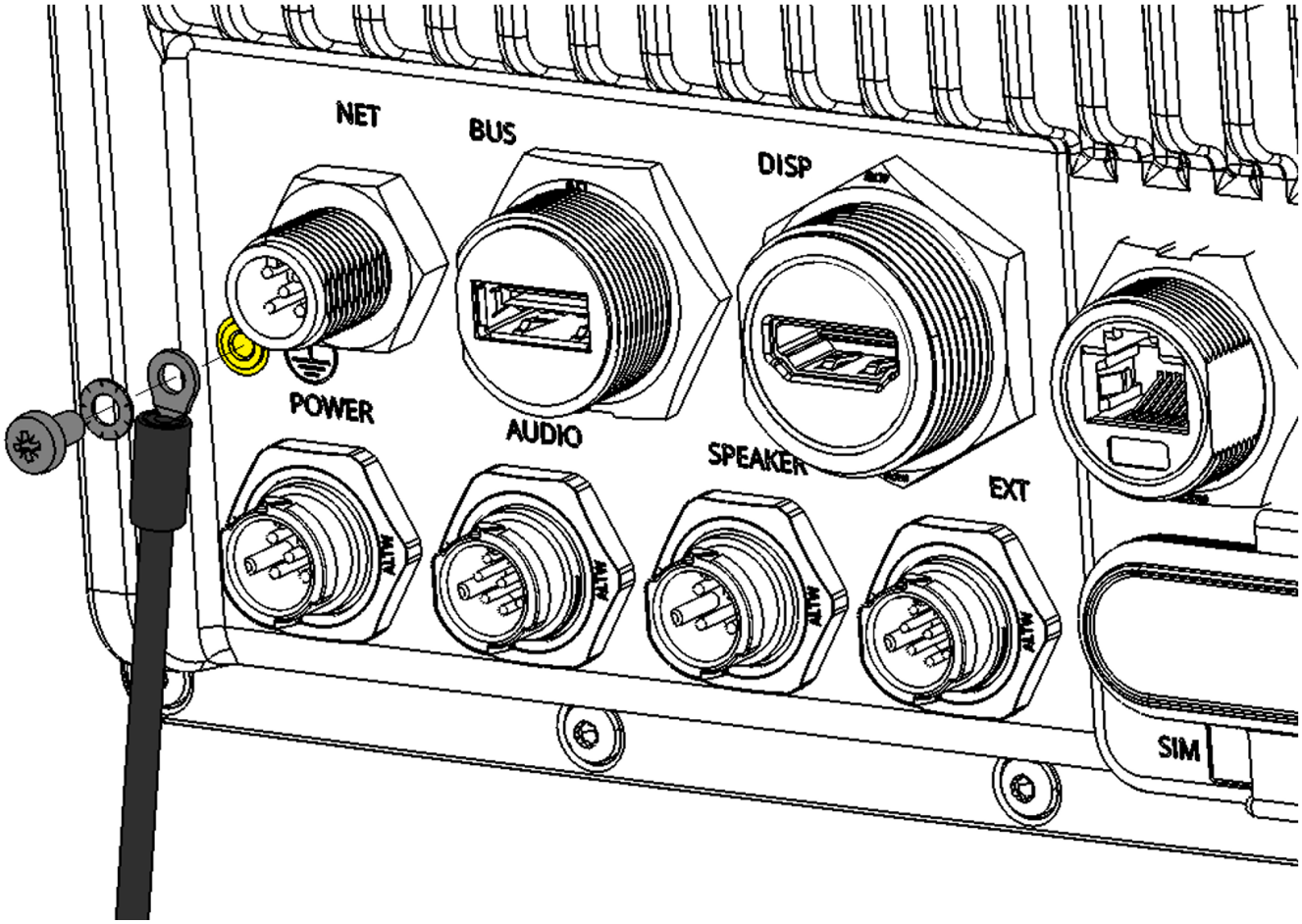
Frequencies emitted from devices such as switch mode power supplies or MF/HF transmitters etc. can cause interference with a touchscreen. If you experience issues with touchscreen performance, fitting an additional dedicated drain wire can resolve the issue.

Connect one end of the additional drain wire (not supplied) to your product.

Connect the other end of the additional drain wire to the same point as the power cable drain wire (shield). This might be either boat's RF ground point or the system's negative battery terminal.

The DC power system should be either:

- Negative grounded, where the negative battery terminal is connected to the vessel's ground; or
- Floating, where battery terminal is not connected to the vessel's ground.

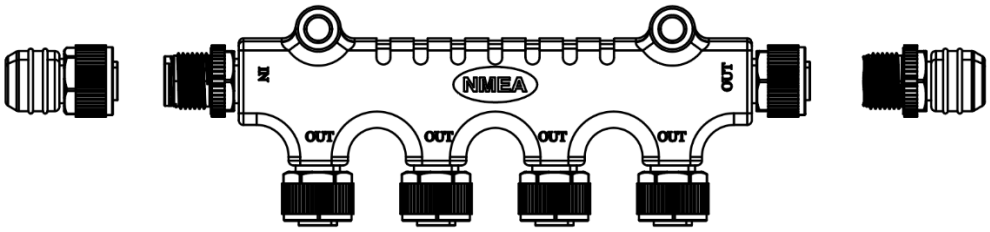


WARNING: Do not connect the Q Display to a system that has positive grounding.

NMEA Network

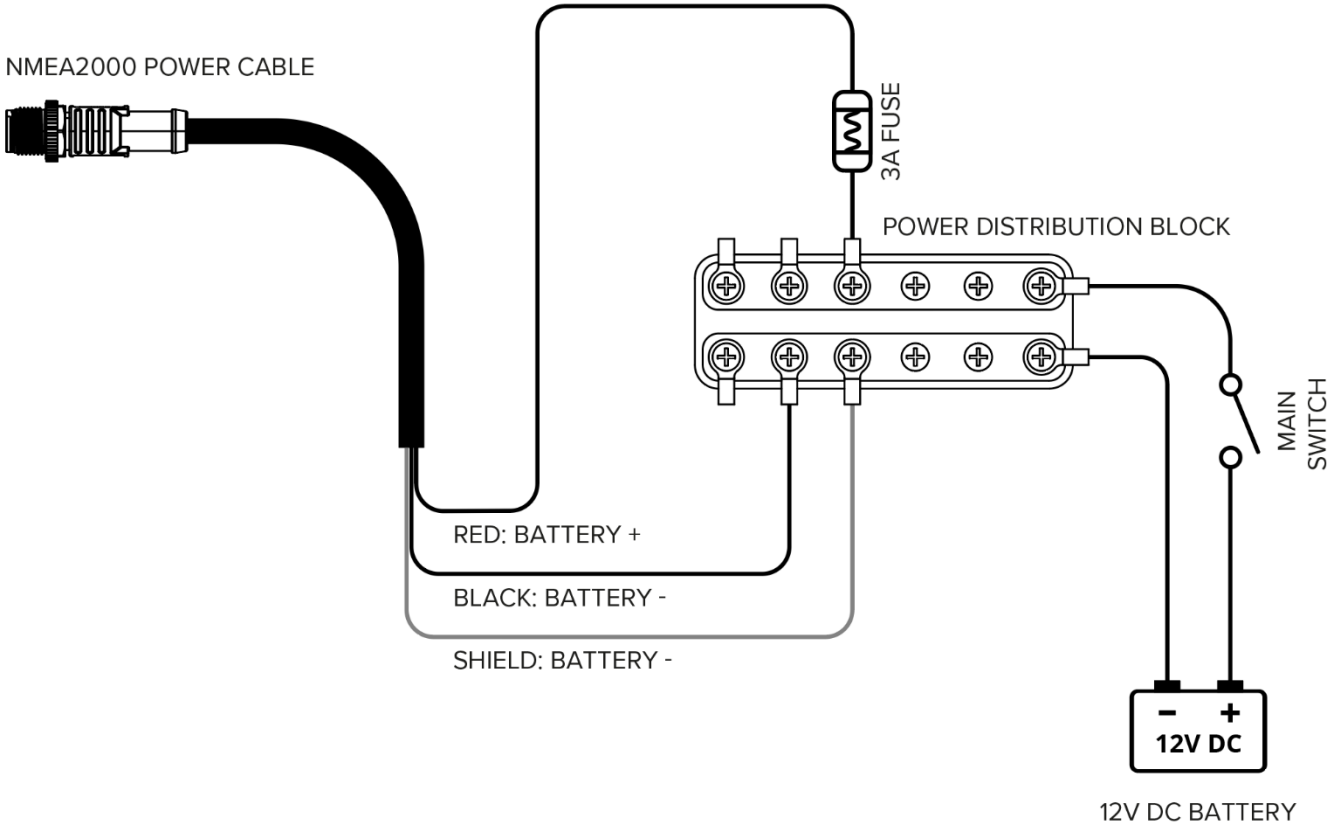
The NMEA 2000 network is used to receive engine status information to Q Display and to communicate with other compatible NMEA2000 devices. There are many more optional ways of building the network, this only as an example.

1. Mount NMEA2000 MICRO-C 4-WAY TEE (provided separately) to appropriate location. Add terminators to both ends of the Tee, a male terminator and a female terminator.
   A working system contains of 2 terminators. Care must be taken with larger systems, so that there are not more than 2. The terminators must be in the ends of a longer, more widespread network.



TERMINATOR FEMALE NMEA 2000 MICRO C 4-WAY TEE TERMINATOR MALE

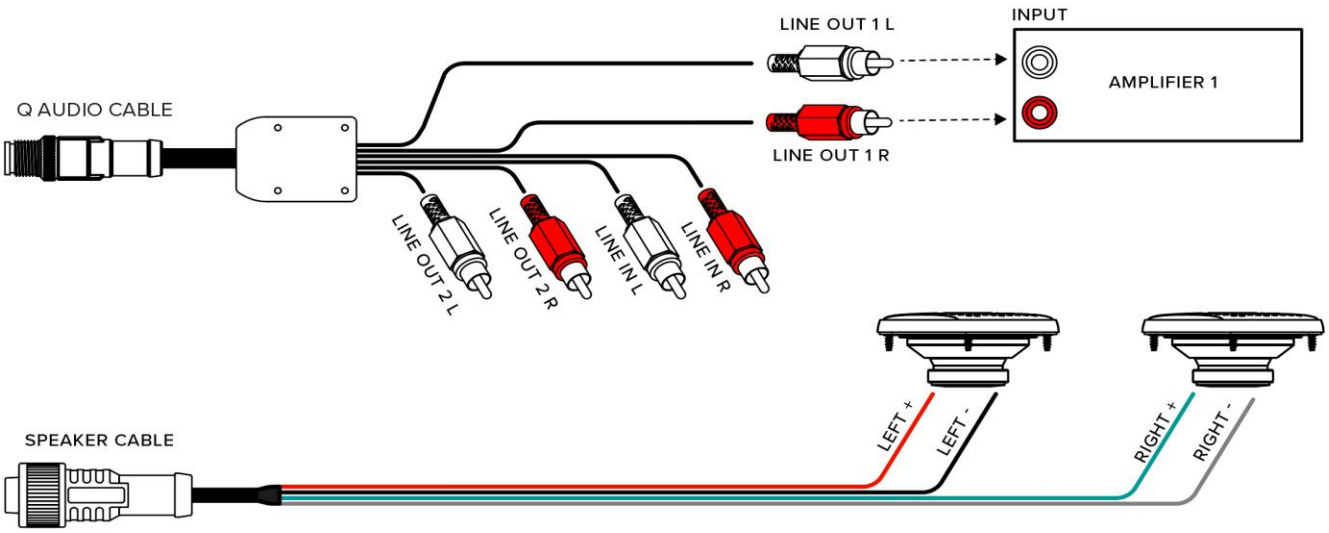
2. A working NMEA2000 network is always separately powered by 12Volt. Connect a NMEA 2000 Power cable (provided separately) with 3A fuse to 12V DC power source positive (+) pole, wire and to 12V DC negative (-) pole.



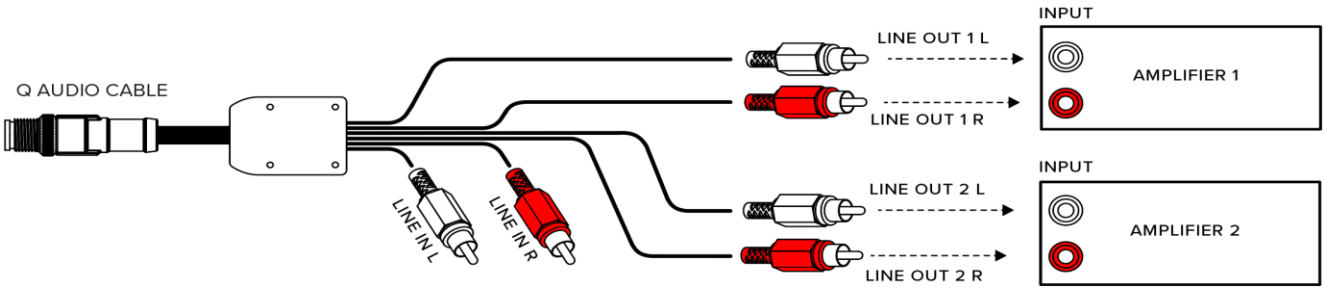
3. Connect one multiple-port output to the Q Display NET connector using NMEA 2000 double-ended M/F cable with suitable length (provided separately).
4. Connect one multiple-port output to NMEA Motor Interface using NMEA 2000 double-ended cable with suitable length (provided separately).

Entertainment installation

Note that Q Display has an internal audio amplifier as well as support for two external amplifiers. Two audio zones can be controlled separately:



a. Internal amplifier + LINE OUT 1 (external)



b. LINE OUT 1 (external) + LINE OUT 2 (external)

LINE OUT 2 is connected parallel to internal amplifier signal.

The recommend ways to connect Speakers/amplifiers are like follows:

- If the internal amp is used, connect one pair of speakers to the “Speaker” output of Q. “Enable internal amplifier” is to be put on in “Settings-Audio Settings”
- If the internal amp for one pair of speakers and one external amp for one pair of speakers are connected. Use the “Speaker” output for one pair of speakers and “Line out 1” for the external amplifier. “Enable internal amplifier” must be on in “Settings-Audio Settings. Enable Zone control in the “Audio settings menu”

- If two external amplifiers are going to be used. Connect one to “Line out 1” and the other on to “Line out 2”. Shut off the internal amplifier with the setting “Enable internal amplifier”. Enable Zone control in the “Audio settings menu”
A main rule is that the internal amplifier is shut off when an external amplifier is used on the AUDIO OUT cable “Line out 2”.

Use the “Volume boost” setting to adjust the output level, when needed. A high setting is outputting a higher level. A lower setting gives better sound quality on the output and is preferred.
The level or sensitivity setting on an amplifier is good to adjust as follows. Turn up the volume on Q (with the Volume boost “OFF”) to ¾ of the usable range. Now adjust your amplifier sensitivity so that your start to hear distortion from the speakers. If it feels like you do not get enough volume out of the speakers, you can use a higher setting on “Volume boost”.
If you experience disturbance or noise in the audio chain, caused by other equipment onboard or not optimal grounding of the equipment, a higher “Volume boost” setting and a lower sensitivity on the amplifier can be tried. This way the noise might be lowered to non hearable because it is “buried under” the higher-level audio signal.

Speaker connections (Internal amplifier 2X20W ClassD)

Connect Q Speaker Cable (provided separately) to the Q Display SPEAKER connector. The speakers are to be 4 Ohm and the recommend sensitivity is > 88 dB/W/m. The colours in the cable are as follows:

Green	Right +
Grey	Right -
Red	Left +
Black	Left -

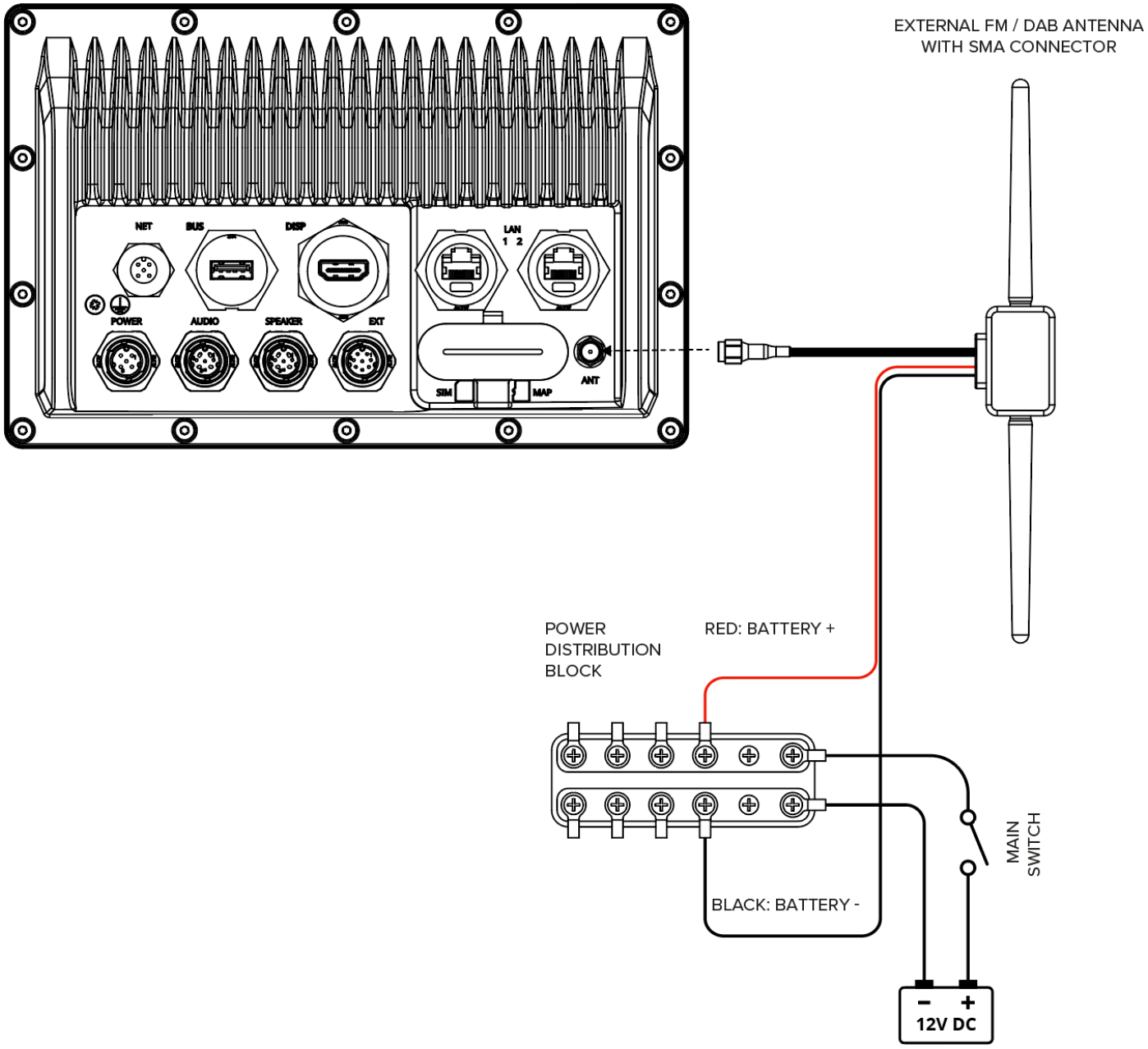
Audio connections (External amplifier)

Connect Q Audio Cable (provided separately) to the Q Display AUDIO connector.
LINE IN can be used as an auxiliary input, selectable as source in the Music app.
LINE OUT 1 and LINE OUT 2 volume can be controlled separately.

Note that LINE OUT 2 is connected parallel to the internal amplifiers signal.

WARNING: DO NOT connect audio ground (LINE OUTs) to a supply voltage!
This will result in permanent damage to the device.

FM-antenna connections



Connect FM/DAB antenna (provided separately) to the Q Display ANT connector. You can use FM/DAB antenna with SMA connector, or you can use SMA male to DIN female adapter cable and connect any FM/DAB antenna with DIN male connector to the adapter cable.

Nearby wireless connections

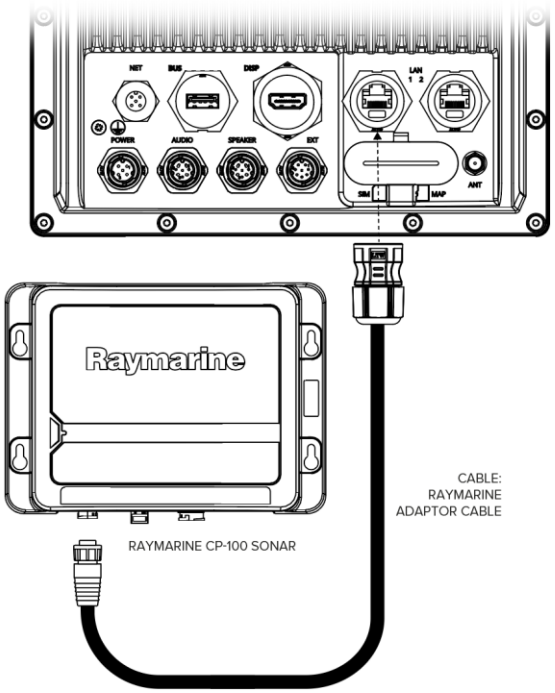
The Q Display can be connected to other devices via “Nearby wireless” pairing to play and control audio and to receive a notification of phone calls. Pair your phone with Q and then use your favorite app to play music. Choose “Mobile phone” as your source in the “Music” app on Q.

Fishfinder installation

The Q Display can be connected to a Airmar IC-TM90M and B190M series or a Raymarine CP100 Fish finder. The placement and physical installation of the transducers themselves play a large role for the performance of the fish finder. Please look for installation hints from the Airmar website.

The Raymarine sonar is connected to either LAN connector with a RayNet adaptor cable RayNet (F) to the RJ45 (M) Port.

The RJ45 connector of the cable shall be assembled with a cable gland (provided separately N4S_00752 “Cable gland for RJ45 Ethernet connector”) to protect the connection against water ingress and dust. See the CP100 manual for the fuse value and other installation hints.



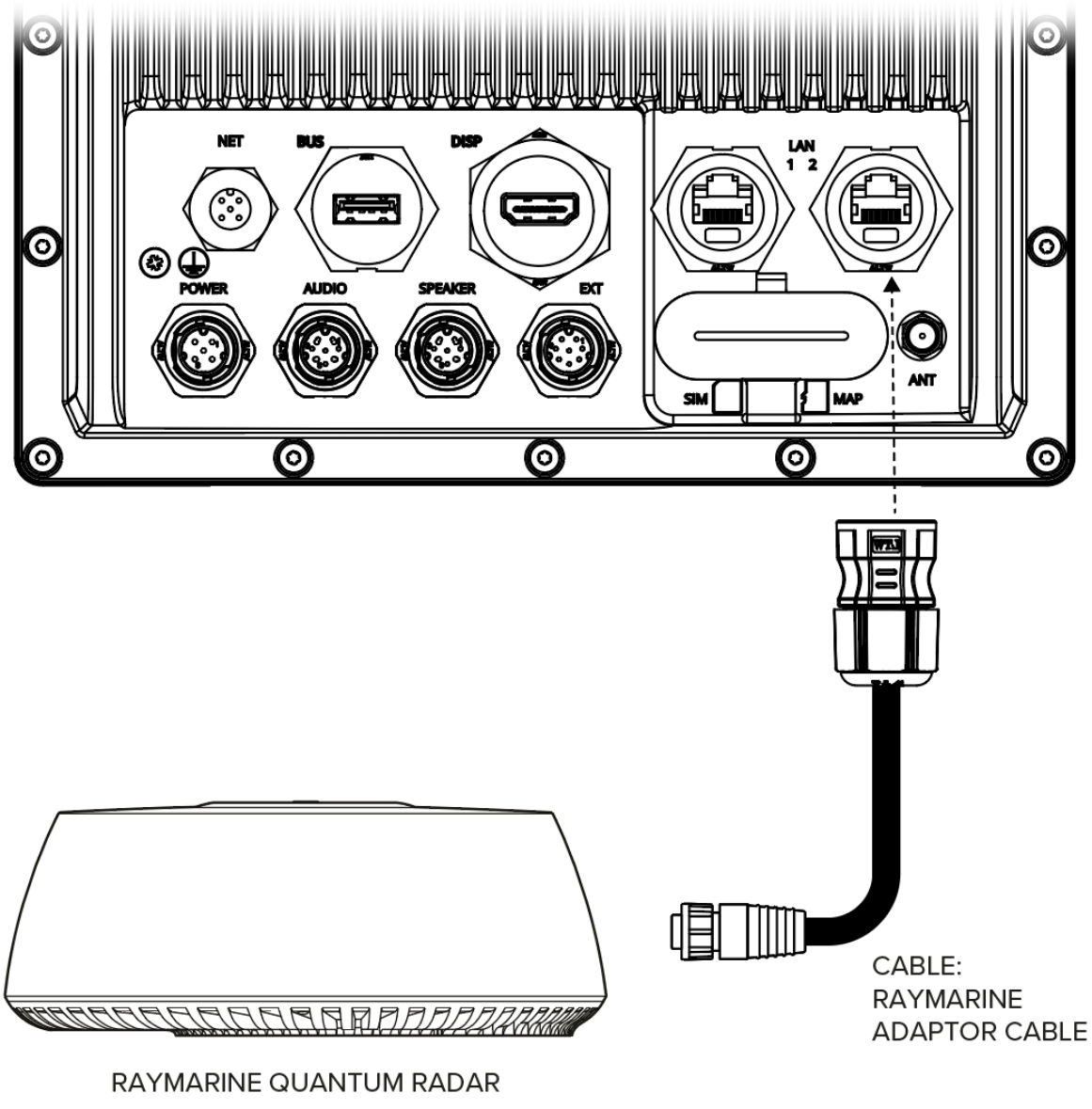
The Airmar IC-TM90M and B190M series have an own fixed RJ45 cable. Use a 3A slow blow fuse for the Airmar fish finder.
Connect the 12V supply so that it is cut and enabled simultaneously with the Q display power controlled thru the “Ignition” input. This is crucial for the correct operation of the data connection.

NOTE: The fish finders may be connected to either one of the two available LAN Q display connectors.

Radar installation

The Q Display can be connected to a Raymarine Quantum Radar. The radar is connected to either LAN connector with a RayNet adaptor cable RayNet (F) to the RJ45 (M) Port (provided with radar).

The RJ45 connector of the cable shall be assembled with a cable gland (provided separately) to protect the connection against dust and water ingress.



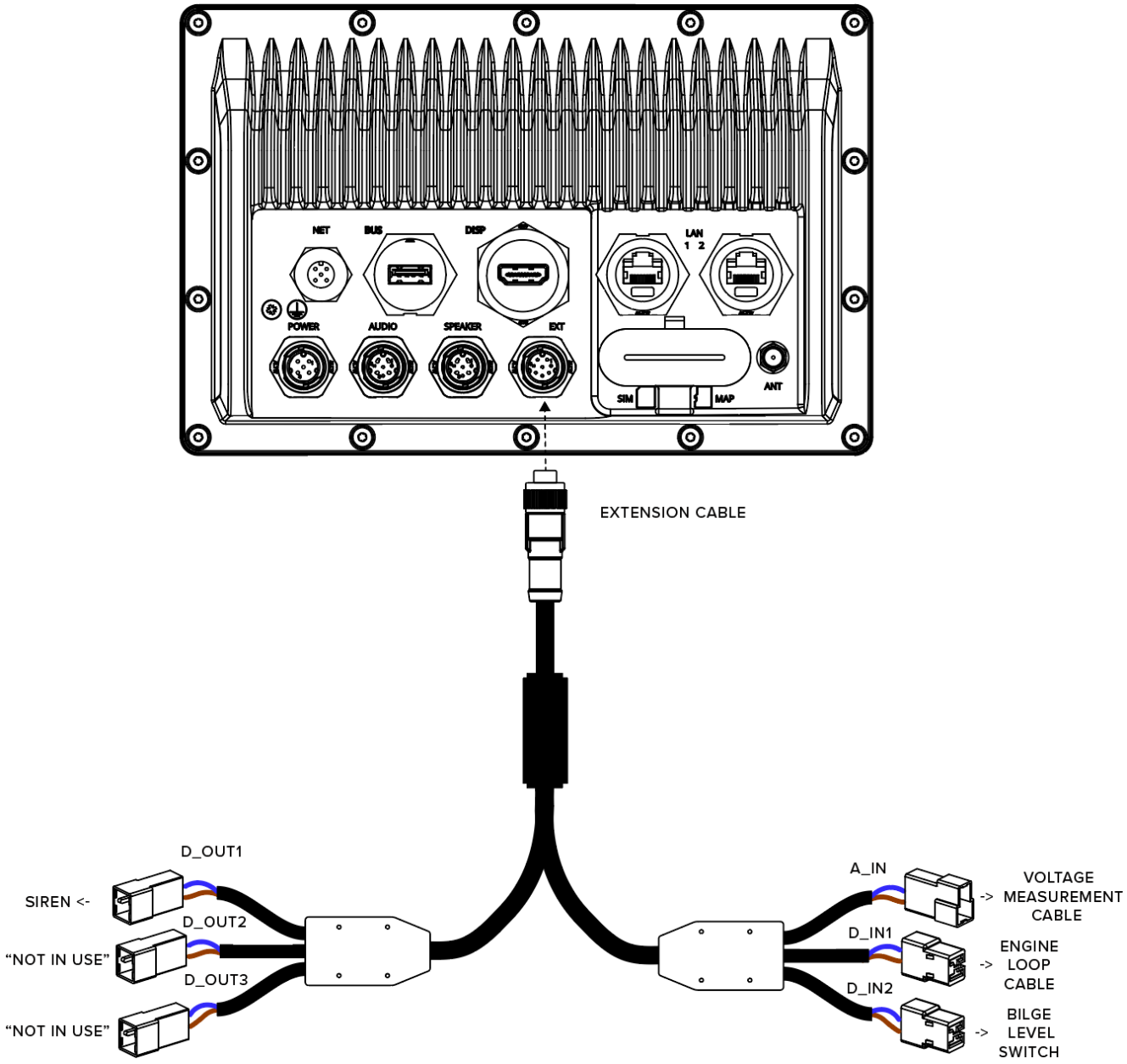
NOTE: The Radar may be connected to either one of the two available LAN Q display connectors.

Q Network Switch

If more than two peripherals with an Ethernet/RJ45 port are going to be connected to a Q display, a networks switch is needed. The network switch is powered by 12Volt. Use a slow blow 2A fuse on the power lead.
The power lead colours are:
+12Volt Yellow and brown together.
Ground is the orange and red cables together
The switch has a ground point which must be grounded by an own cable to the same point as the Q display ground point if interference is noticed.
Keep the protective caps on the unused ports.

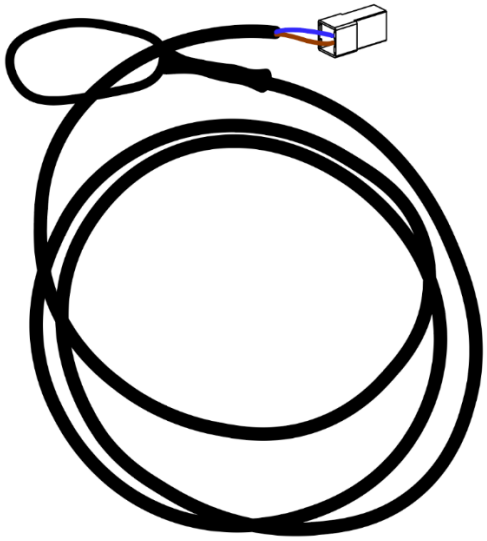
Guard EXT Cable installation

All Guard and EXT accessories are provided separately.

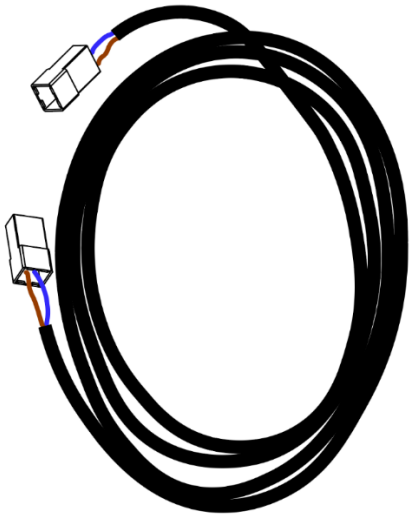


PART NUMBER	DESCRIPTION	Length
N4S_00667	Q2 EXT cable (Guard cable)	0,8 m

Q2 EXT Engine Loop cable



Engine Loop Cable

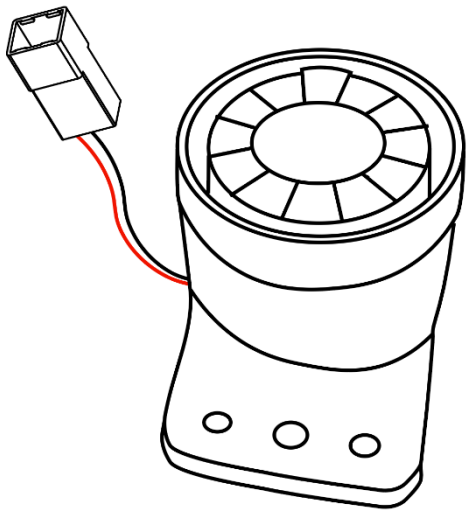


Extension cord (3m) or (5m)

Engine loop cable is installed around the engine such that engine removal requires cutting the cable, resulting in an alarm. Connected to DIGITAL IN 1.

PART NUMBER	DESCRIPTION	Length
N4S_00670	Q2 EXT Engine Loop cable	2m
N4S_00688	Q2 EXT extension cable	3m
N4S_00669	Q2 EXT extension cable	5m

Q2 EXT Siren

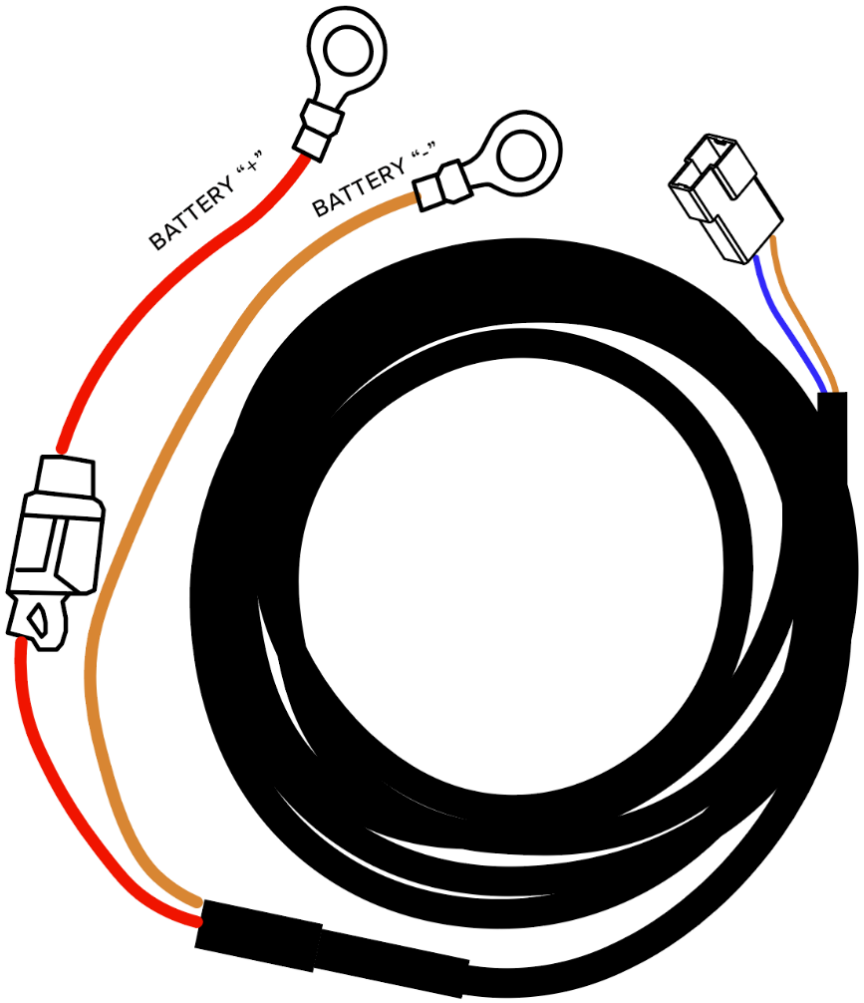


Connected to DIGITAL OUT 1

PART NUMBER	DESCRIPTION	Length
N4S_10556	Q2 EXT Siren	0,5 m

Q2 EXT Voltage Measurement Cable

Connecting the cable enables accurate voltage measurement of the boat's battery.



Connected to ANALOG IN.

PART NUMBER	DESCRIPTION	Length
N4S_00668	Q2 EXT voltage measurement cable	6,2m

WARNING: Do not connect 'BATTERY-' to battery positive terminal. This will result in permanent damage to device. Do not use this as a power cable for the Q display. This cable is made for voltage measurements. The fuse is only 1 Ampere.

Q2 Bilge Level Switch

Bilge Level Switch

Connected to DIGITAL IN 2

> **NOTE:** The Bilge Level Switch MUST be installed higher than a bilge pump detector to indicate only the water level over the expected limit.

PART NUMBER	DESCRIPTION	Length
N4S_10555	Q EXT Bilge Level Switch	3 m
N4S_00790	Q Bilge Switch Plate	-
N4S_00688	Q2 EXT extension cable	3m
N4S_00669	Q2 EXT extension cable	5m

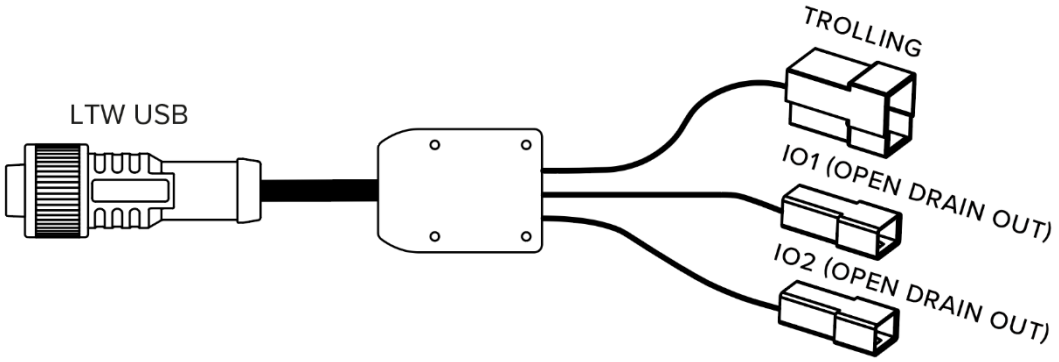
Trolling Cable installation

Via Q2 USB Cable it is possible to control and add:

- Trolling speed cable
- USB to CAN-bus adapter

All USB and trolling accessories provided separately.

Q2 USB Trolling Cable.



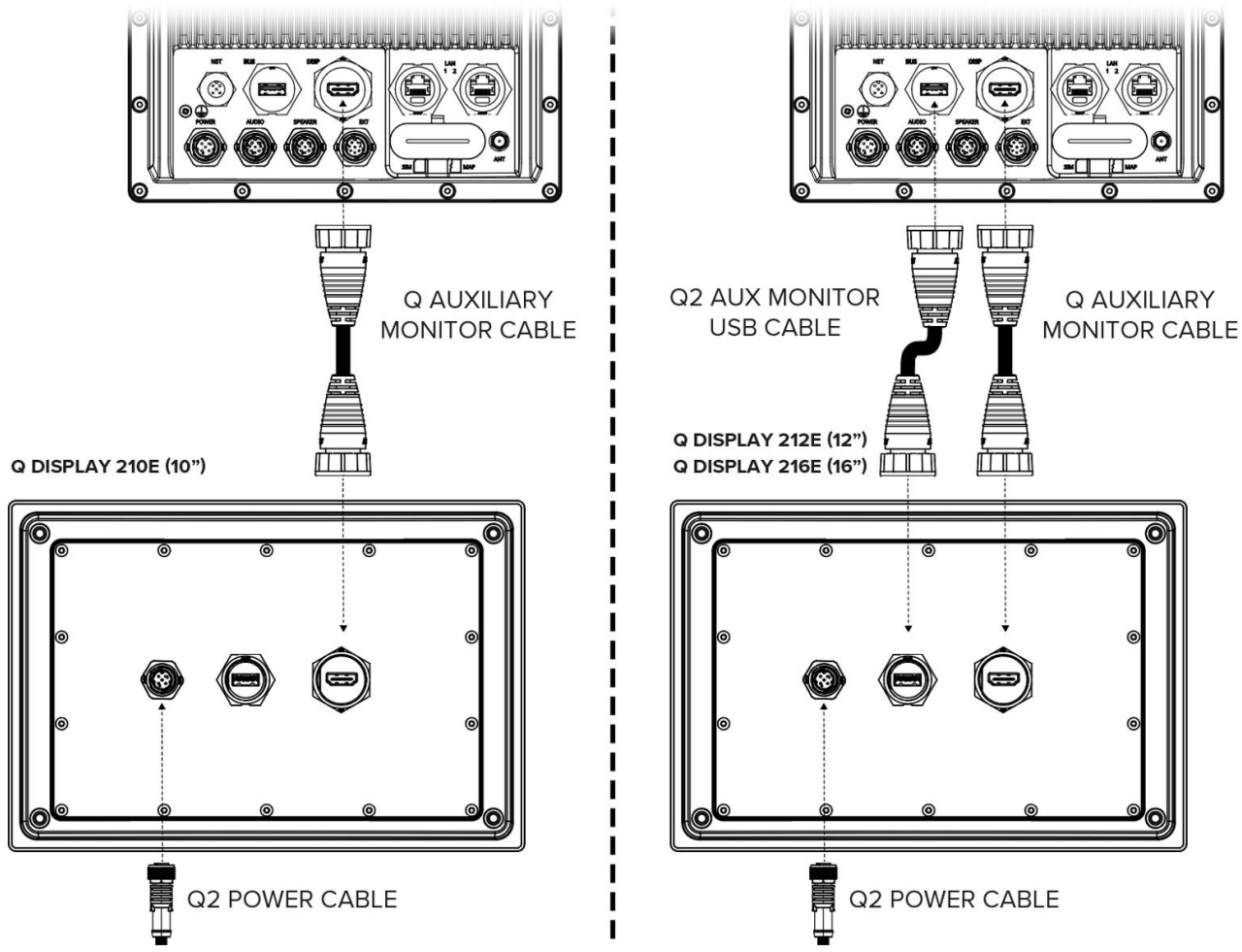
PART NUMBER	DESCRIPTION	Length
N4S_00738	Q2 USB Trolling Cable	1,5m

Q2 Trolling cable extension.

PART NUMBER	DESCRIPTION	Length
N4S_00761	Q2 Trolling cable extension	5,5m

Auxiliary Display installation

Auxiliary Q Display 210e (10”), Q Display 212e (12”) and 216e (16”) are connected as shown. All accessories provided separately.

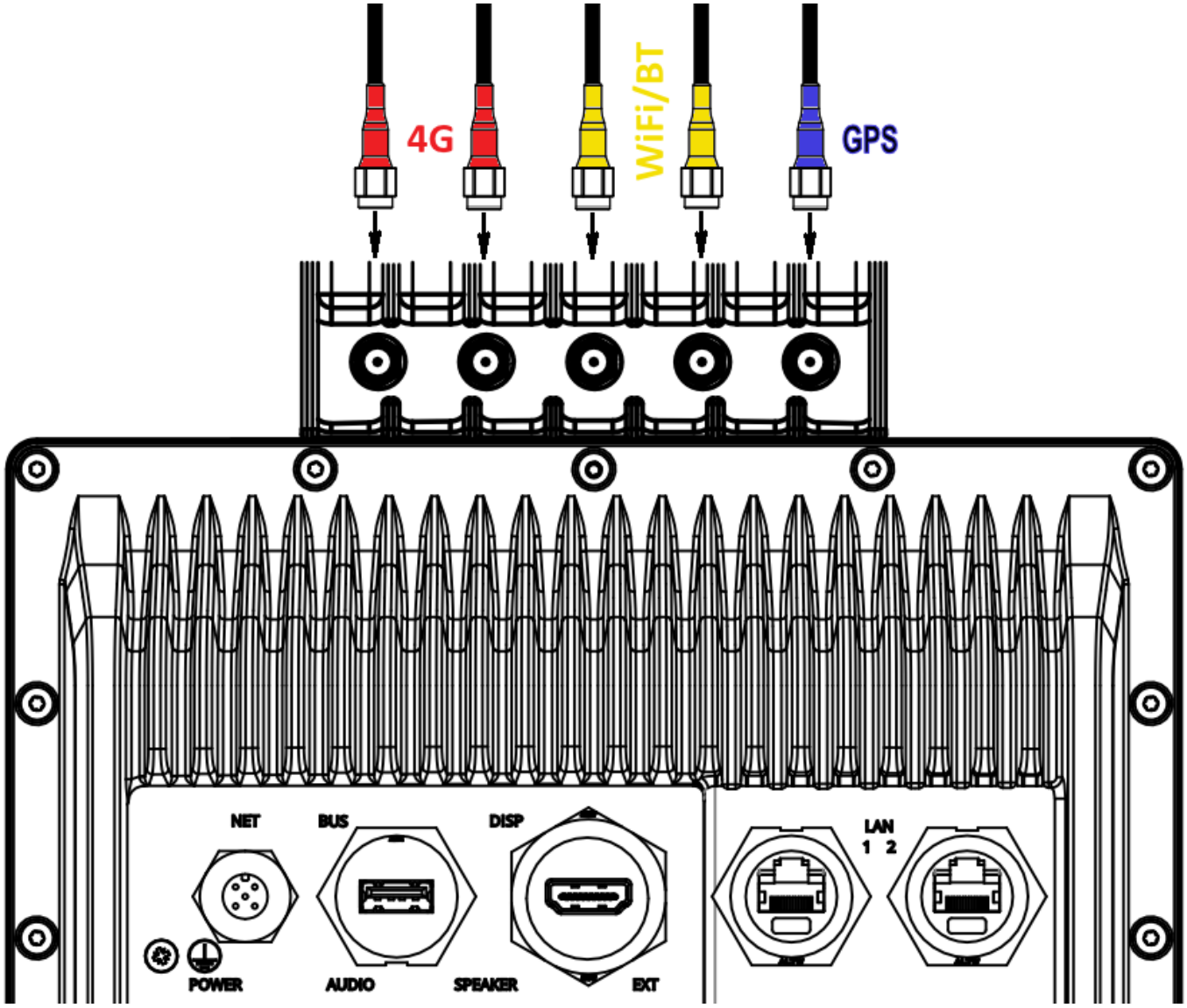


NOTE: Q Display 210e is connected with “Q Auxiliary Monitor Cable”. Q Displays 212e and 216e are connected with both “Q Auxiliary Monitor Cable” and “Q2 AUX monitor USB A-A cable”.

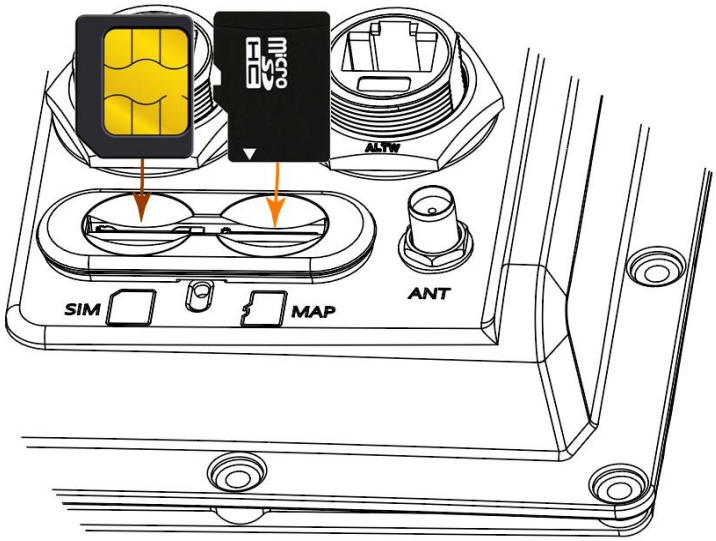
NOTE: Q Display 210e, 212e and 216e need their own power cables.

External multi-antenna for Q222/Q224

Q Display 222 (22”) and Q Display 224 (24”) are supplied with an external multi-antenna (N4S_00974) which must be connected as shown.



SIM and MAP cards



NOTE: Cards MUST be installed in the orientation shown in the picture above. If installed incorrectly, the slot will break, and the Q Display will not work properly.

Q Digital Switch

The Q Digital Switch (DSW) is a NMEA2000 bus controlled I/O device. The network must be separately powered like normal NMEA2000 networks normally are.
There are 20 I/O- signals configurable as either outputs or inputs. The outputs can be PWM 0-12V or supply 12V. The outputs cannot pull the output to the ground.

Each output has a settable fuse up to 10A. The fuse contains two different functions. One which trips the fuse directly when an overcurrent is detected. In this case DSW tries to reset the fuse 3 times, if not successful the supply is cut and a notification is shown on the Q UI. The second function is a function mimicking a thermal fuse. This then prevents cables and other electromechanical appliances from overheating. If there is danger of overheating, the supply is cut and a notification is shown on the UI, it is not automatically reset.

Each output is rated for maximum 10A, the total device average current may not exceed 50A.
The BAT+ bolt to be protected with external (max 100A) fuse. The DSW needs a connection to the 12Volt
The NMEA bus needs to be correctly terminated externally, the device does not have

termination resistors. The digital switch can only be used on 12-volt systems.

The Q Display can handle one switch on the network. Normal UI shows the UI elements for the functions below, by special order a different more graphical UI can be ordered. The configuration file lies in the switch itself. It can be updated by inserting a USB memory in a connected Q Display.

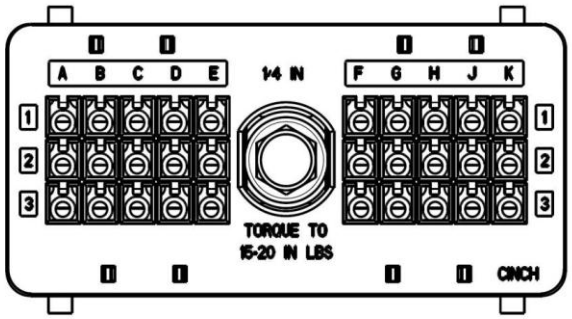
Different types of controls are:

ON/OFF
Momentary button
Slider on-off-on
Momentary slider on-off-on (anchor winches and similar)
Slider for PWM
Possibility to choose start-up state on or off.
On and off timers

Device mechanical dimensions are 130 x 43 x 135 mm (W x H x D). Mounting with two fasteners 4.0” apart(101.6 mm).

The DSW can be programmed on the field using a special file which is put on a FAT32 formatted USB memory stick. The Q display is asking for permission to update the switch.

Ask for the configuration file for your specific switch to see on which ports the outputs are. The file contains the port number in a number/letter coding. This coding is found on the DSW connector.



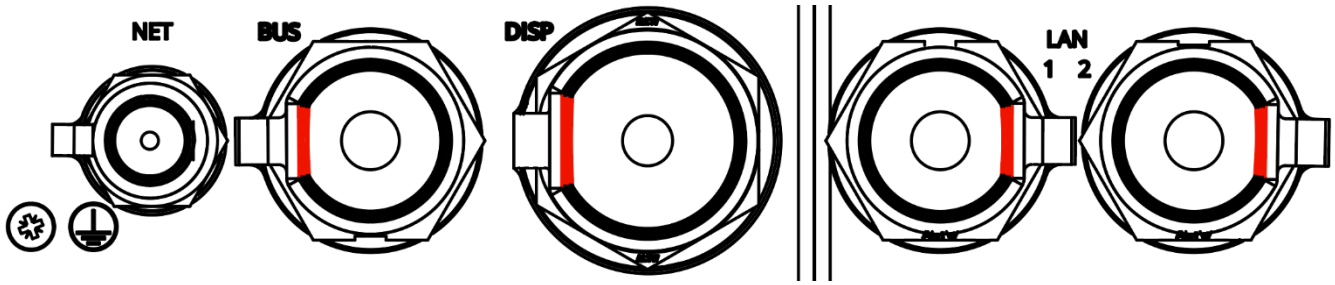
REAR VIEW

Finalization of the installation

Upon completion of installation work of the Q Display it is necessary to check that:

- All connections have been done according to these instructions.
- The device is mounted securely and there are no gaps between the device and the mounting surface.
- Connector sealing caps on the SIM / SD -slots and all unused connectors are fully tightened.

NOTE: Correct positioning of connector caps is crucial for protecting the device.
The geometry of the caps should match the connector geometry.



List of available products

DESCRIPTION	Length	PART NUMBER
Q2 Power Cable - MINIFIT	0,4 m	N4S_00663
Q2 Power Cable - lead	1 m	N4S_00664
Q2 Speaker Cable	1 m	N4S_00665
Q2 Audio RCA Cable	0,7 m	N4S_00666
Guard Cable Set	-	N4S_10710
Q2 EXT Cable (Guard cable) *	0,8 m	N4S_00667
Q EXT Voltage Meas. Cable *	6,2 m	N4S_00668
Q EXT Extension Cable, 5m *	5 m	N4S_00669
Q EXT Extension Cable, 3m *	3 m	N4S_00688
Q EXT Engine Loop Cable *	2 m	N4S_00670
Q EXT Bilge Level Switch *	3 m	N4S_10555
Q EXT Bilge Switch Plate *	-	N4S_00790
Q EXT Siren *	0,5 m	N4S_10556
Q Auxiliary Monitor Cable, 6m	6 m	N4S_00671
Q Auxiliary Monitor Cable, 1m	1 m	N4S_00672
Q2 USB Trolling Cable	1,5 m	N4S_00738
Q2 Trolling Extension Cable, 5,5m	5,5 m	N4S_00761
NMEA2000 Micro-C 4-way Tee	-	N4S_00037
NMEA2000 power cable	1 m	N4S_00334
NMEA2000 male terminator	-	N4S_00029
NMEA2000 female terminator	-	N4S_00030
NMEA2000 Micro-C T cable	1 m	N4S_00038
NMEA2000 T-adapter	-	N4S_00845
FM/DAB antenna with SMA connector	3 m	N4S_00248
Q2 Trunnion Bracket	-	N4S_10553
Q2 AUX monitor USB A-A cable, 6m	6m	N4S_00710
Q2 AUX monitor USB A-A cable, 1m	1m	N4S_00711
LAN Cable Gland, IP67, OD 6.5 – 8.0mm		N4S_00752
Digital Switch 2	-	N4S_10750
External Antenna for Q222/Q224 (5-in-1)	3m	N4S_00974

*included in Guard Cable Set [N4S_10710]

DESCRIPTION	Length	PART NUMBER
Q Display 210 (10”)	-	Customer/region specific
Q Display 212 (12”)	-	Customer/region specific
Q Display 216 (16”)	-	Customer/region specific
Q Display 222 (22”)	-	Customer/region specific
Q Display 210D (Dual 10")	-	Customer/region specific
Q Display 210e (Auxiliary 10”)	-	Customer/region specific
Q Display 212e (Auxiliary 12”)	-	Customer/region specific
Q Display 216e (Auxiliary 16”)	-	Customer/region specific
Q Display 222e (Auxiliary 22”)	-	Customer/region specific