# IS10 Manual

## NMEA 2000 DIGITAL TOUCH SCREEN GAUGE


Designed in UK

## Features

- 2.8” LCD touch screen
- Intuitive graphical user interface that allows for comprehensive customization
- Day & Night mode for improved visibility
- Data views include essential information for sailors, such as engine performance, navigation metrics, environmental data, battery status and more
- Plug and play NMEA 2000 connection, no configuration needed
- IP67 waterproof rating for reliable performance in marine environments
- Efficient power consumption
- Straightforward dash mounting for a flush fit
- Ability to alter units and which screens are shown

# Contents

# 1. Introduction

The IS10 is a cutting-edge digital touch screen gauge engineered to provide essential marine data via the NMEA 2000 bus. This innovative instrument seamlessly integrates multiple functions into a single, streamlined display, significantly enhancing your on-board experience.

Designed for durability, the IS10 features a robust construction and a waterproof design, making it well-suited for the harshest marine environments. Its 2.8-inch colour touch screen display ensures clear visibility and easy readability.

The IS10 offers a user-friendly interface that can be easily customized to meet your specific requirements. It delivers real-time data from the NMEA 2000 network, presenting a comprehensive range of critical information, including: engine RPM, engine temperature, working hours, fuel level, oil pressure, heading, bearing, depth, wind speed and direction, battery voltage, SOG, COG, rudder angle, speed through water(STW), time, position, water temperature, and more.

To maintain its position at the forefront of technology and functionality, the IS10 supports UI and firmware updates. This capability facilitates the ongoing addition of new features and supported information, ensuring your gauge evolves alongside your needs.

Figure 1 Side View

# 2. Mounting

The IS10 was designed with marine industrial level requirements in mind and is aimed at the commercial, leisure, fishing boat and vessel monitoring markets. It is suited to both indoor and outdoor use and can be flush mounted.

When selecting a mounting location, the following considerations must be observed:

• **Sturdy mounting surface -** The mounting surface must be strong enough to support the weight of the device and protect it from excessive vibration or shock. Although the display unit is waterproof from the front when installed correctly, it is good practice to mount it in a protected area, away from prolonged and direct exposure to rain and salty seawater.

• **Convenience** - the mounting location should allow easy access to touch screen.

• **Viewing angle** - To be mounted at a suitable angle to ensure best visibility of the display. The mounting location should be at or below eye level to provide optimal viewing as you operate your vessel.

• **Access** - There must be suitable room behind the device to allow for the rear mounted connections, to avoid sharp bends in any cables, be within range of a NMEA 2000 backbone and also be removeable in case of firmware updates.

• **Airflow** - to prevent overheating, do not restrict airflow at the rear of the display unit; ensure that there is adequate ventilation, particularly if the display unit is pod-mounted.

### 2.1. Flush mounting

When preparing to flush mount the device, exercise caution while cutting the hole. The clearance between the case and the mounting holes is minimal, and cutting the hole too large could compromise the stability of the device once mounted. We advise that the diameter of the drill holes should be set to between 88mm to 92mm. Do not use the device itself as a template for drilling the mounting holes, as this may damage the enclosure and void the warranty.

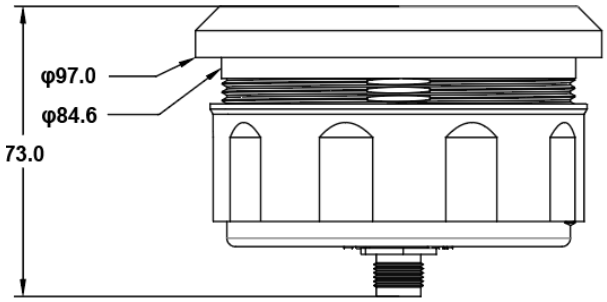


Figure 2: Dimensions(mm) for Flush Mounting

## 3. Front Panel and buttons

The IS10 features a highly responsive touch screen that is the primary interface for navigating menus and display screens. The touch screen allows users to navigate, adjust data parameters, and switch between day and night modes.

At the bottom of the screen, there are three distinct touch regions that act as buttons. These buttons enable navigation of the various displays and gauge options, this also allows for the preferred layout and data fields to be displayed. All changes are stored in embedded memory, so settings are retained each time the device is powered on.


Figure 3 Front Panel

| Item | Description |
|---|---|
| 1 | LEFT ARROW: Used to navigate through the display screens. |
| 2 | QUARK-ELEC: Press and hold for 5 seconds to reach the menu for screen settings. |
| 3 | RIGHT ARROW: Used to navigate through the display screens. |

# 4. Connecting the display

The IS10 has the following connection ports used for data input and firmware updates.

- Micro SD slot
- Type-C USB connector
- NMEA 2000 connector


Figure 4 Connectors (back view)

## 4.1. SD Card Connector

The IS10 features a Micro SD card slot specifically designed for User Interface (UI) updates. We are committed to continuous innovation, regularly reviewing our products to integrate the latest technologies. This dedication ensures the IS10 provides an intuitive user interface for our customers.

It is important to note that the SD card (not included) must not be inserted while the device is in use to avoid system crashing.

## 4.2. USB connector

The IS10 is equipped with a Type-C USB connector and comes with a USB cable for firmware upgrades. The USB cable can be directly connected to a USB port on a Windows PC. Please ensure that the USB cable is only used for firmware upgrading, and please do not connect while the device is in use.

It is important to note that upgraded firmware must be compatible with the related UI files, which need to be updated via the SD card. Always refer to the 'readme' file in the firmware folder on our website before proceeding with any firmware upgrades.

## 4.3. NMEA 2000 connector

The IS10 features a standard male NMEA 2000 connector, enabling data sources to provide real-time data to the IS10. This connector also supplies power to the IS10. The device comes with a standard 1-meter NMEA 2000 drop cable.

⚠ Unlike the IS20, the IS10 cannot select a preferred data source if multiple devices of the same type are on the N2K backbone (outputting the same type PGN data). Customers can either remove the additional devices, keeping only one on the backbone, or opt for our IS20, Networked Multifunction Instrument, which supports multiple data sources.

# 5. Getting Started

## 5.1. Turning the unit on and off

Powering the IS10 is as simple as connecting the included drop cable onto a NMEA 2000 backbone. It is best practice to connect the drop cable to the IS10 when the backbone is not powered.

## 5.2. Adjust the brightness

When the IS10's screen is active, the touch buttons either side of ‘QUARK-ELEC’ at the bottom of the screen can be used to navigate to the menu screen (shown below). Slide the yellow bar from left (0%) to right (100%).


Figure 5 IS10 Screen Brightness

## 5.3. Customize settings

The IS10 features two different menus where settings can be adjusted. Similar to the process of adjusting the brightness, navigating to the menu screen will display various options to choose from. This includes screen brightness as well as the units for temperature, speed, pressure and the time zone buffer.


Figure 6 Units and Time Zone

To access the second menu, press and hold the centre ‘QUARK-ELEC’ symbol for 5 seconds. This menu allows the choice between day and night modes and the method of selecting which display screens are shown. Deselecting a screen will hide it, but it can easily be re-selected to make it reappear. Simply pressing the left or right button will save the settings and navigate the device as normal.


Figure 7 IS10 Pages Setting

# 6. Display options

The IS10 has the below screens enabled as default, this can be changed from the menu:

- Table
- Bars
- Heading
- SOG
- Rudder angle
- 2x2 Grid
- 2x2 Grid with Position or Time
- Menu
- Favourites Menu

## 6.1. Table

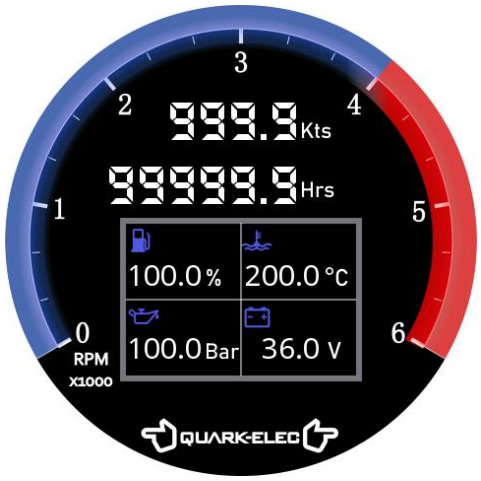


Figure 8 IS10 Table

The first screen on the IS10 is the table screen. This displays a wide range of parameters which have been chosen carefully to work together.

This will provide a clear visual RPM gauge, vessel speed, engine hours, fuel level, water temperature, oil pressure and battery voltage.

On this page and the next page (Bars), the IS10 displays engine working hours as part of the engine information, allowing users to monitor engine status. The working hours data can be sourced in two ways, selectable by pressing and holding the ‘Hrs’ area on the screen. Data can either be sourced from the N2K bus if PGN 127489 is present, or the IS10 can monitor RPM data and count the time when RPM exceeds 1500 as working hours. These hours are saved and will not reset, even when the IS10 is powered off and back on.

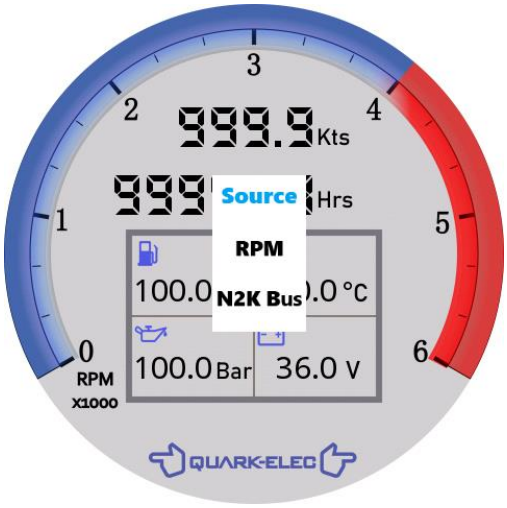


Figure 9 IS10 Engine Hours Source

## 6.2. Bars


Figure 10 IS10 Bars

The second screen on the IS10 is the Bar screen. Like the Table screen, this displays a wide range of parameters which have been chosen carefully to work together.

This will provide a clear visual RPM gauge, vessel speed, engine hours, fuel level, water temperature, oil pressure and battery voltage.

## 6.3. Heading


Figure 11 IS10 Heading Display

This screen will provide a clear heading indicator around the perimeter of the display, it also features the heading value and wind speed and direction fields.

In this page, there is the choice between Heading and SOG being displayed at the bottom of the screen. Simply pressing and holding ‘HDG’ on the screen area will bring up the selection between the two options.


Figure 12 HDG and SOG selection

## 6.4. SOG


Figure 13 IS10 SOG Display

This screen puts a focus on SOG, highlighting the value in the middle, along with RPM gauges on each side and the additional parameters above and below.

## 6.5. Rudder Angle


Figure 14 IS10 Rudder Angle Display

The main feature of this screen is its rudder angle display, this will clearly show the rudder angle between ±45°, the colour of the value will also reflect the standard red and green for port and starboard respectively. It also features RPM, engine parameters, water speed and SOG as typical information need for sailors.

## 6.6. 2x2 Grid

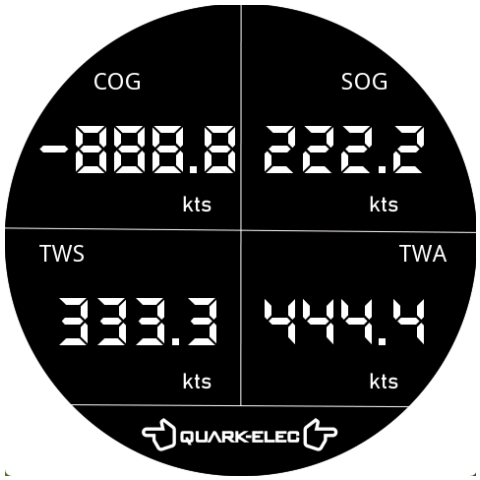


Figure 15 2x2 Grid page

This screen is designed for pure and simple data display. By pressing the parameter name, a drop-down list will appear. This list contains all of the possible parameters which can be displayed in this section.

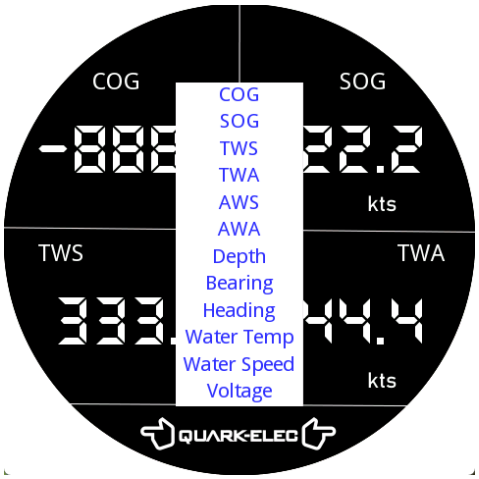


Figure 16 Parameter List

## 6.7. 2x2 Grid with fixed position or time

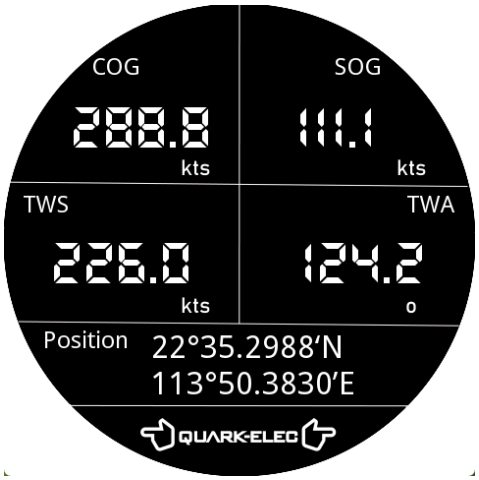


Figure 17 2x2 Grid with Position or Time

This screen is designed for pure and simple data display. By pressing the parameter name, a drop-down list will appear. This list contains all of the possible parameters which can be displayed in this section.. It also features a fixed portion to display GPS position or time.

Below are the different parameters that can be selected. On the left side, options for Position and Time are available exclusively on bottom area of this screen. On the right, all parameters currently available for display in the four data fields are listed. This configuration can be utilized in both the 2x2 screen layout and the 2x2 layout with fixed position or time.

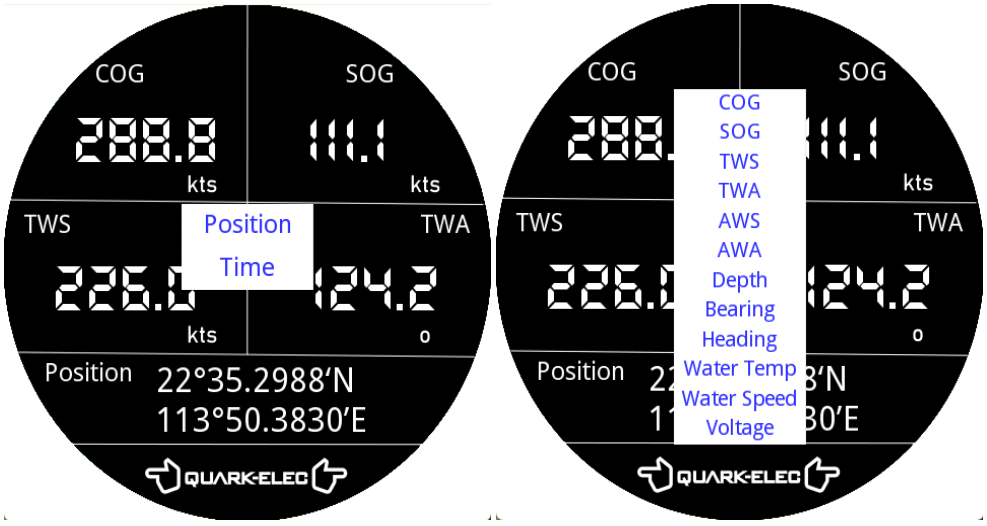


Figure 18 2x2 Field List

## 6.8. Menu


Figure 19 IS10 Menu

This screen allows for the adjustment of units for Temperature, Speed, and Pressure, as well as setting a time zone buffer. The brightness of the screen can also be adjusted using the slider.

## 6.9. Favourites Menu


Figure 20 Favourites Menu

This screen allows for the hiding or showing of certain displays, creating a more personalized experience. From this screen, the IS10 display can also be switched between day and night mode for the applicable screens.

# 7. NMEA 2000 PGNs

The following NMEA 2000 PGNs are supported by the IS10's current firmware. Quark-elec remains dedicated to ongoing development and improvement of the IS10, consistently delivering firmware updates to enhance functionality, supporting more PGNs.

| NMEA 2000 PGN | Function |
|---|---|
| 127245 | Rudder |
| 127250 | Vessel Heading |
| 127488 | Eng. Rapid Param. - Engine RPM |
| 127489 | Eng. Param. Dynamic - Engine oil pressure |
| 127489 | Eng. Param. Dynamic - Engine Oil Temperature |
| 127489 | Eng. Param. Dynamic – Engine Hours |
| 127505 | Fluid Level - Fuel Level |
| 127508 | Battery Status - Battery Voltage |
| 128259 | Speed Through Water |
| 128267 | Water Depth |
| 129026 | COG & SOG, Rapid Update |
| 129033 | Time & Date |
| 129284 | Bearing Data |
| 129540 | GPS Position |
| 130306 | Wind Data; AWA, TWA, AWS, TWS |
| 130310 | Environmental Parameters |

# 8. Upgrading UI file and Firmware

Before upgrading the firmware, the currently installed version number can be seen when the device is booting up. It is displayed under ‘Accept’ on the disclaimer screen. This can be cross referenced against the firmware found on our website.

When upgrading the UI file, changes will be applied to the display and interface of the device. This update affects the appearance and layout of menus and screens, reflecting any visual adjustments or reorganizations made to the user interface.

Functional updates to the IS10, however, are managed through firmware updates. These updates can introduce new features, add support for additional PGNs, resolve bugs, and more. In essence, while UI updates modify the look and structure of the interface, firmware updates enhance or expand the device's operational capabilities. In many cases, UI upgrades do not require a simultaneous firmware upgrade. However, when upgrading the firmware, it is usually necessary to upgrade the UI at the same time to ensure compatibility.

## 8.1. Upgrade UI via SD Slot

Please follow the steps below to upgrade the UI file. You will need a formatted Micro SD card and a PC with an SD card reader for this process.

1. Insert the formatted Micro SD card into the card reader and connect this to the PC.
2. Download the latest firmware version from our website ‘Downloads>firmware>IS10.
3. Copy the folder called ‘UI’ or similar directly onto the SD card, this must be the only file on the SD card.
4. MAKE SURE THE IS10 IS REMOVED FROM ITS POWER SOURCE BEFORE THIS NEXT STEP.
5. With the IS10 disconnected from the N2K backbone, insert the Micro SD card into the slot on the back of the device until it clicks into place.

6. Connect the power back to the IS10.The update process will then begin automatically, once it has completed it will automatically reboot with the latest firmware.

7. Remove the power once again and then remove the SD card and repower.

### 8.2. Upgrade firmware via USB

The IS10 is sold with the latest customized firmware, and in most cases, firmware upgrades are not necessary. If you have been advised to update the firmware by us or our distributor, or if you have purchased a customized firmware version, please contact us at info@quark-elec.com. We will provide the necessary program and instructions.

For security reasons, the firmware upgrade process is not included in this manual.

## 9. Specification

| Item | Specification |
|---|---|
| DC Supply | NMEA 2000 Network Power, 12v |
| Average supply current | 120mA |
| Operating temperature | -20°C to +70°C |
| Storage temperature | -25°C to +80°C |
| Display size | 2.8'' inch LED, Touch screen |
| Brightness | 300 cd/m$^2$ |
| Screen Resolution | 480x480 pixels |
| Data input type | NMEA 2000 |
| NMEA 2000 load equivalency number (LEN) | 3 |
| Waterproof level | IP67 |

## 10. Limited Warranty and Notices

Quark-elec warrants this product to be free from defects in materials and manufacture for one year from the date of purchase. Quark-elec will, at its sole option, repair or replace any components that fail in normal use. Such repairs or replacement will be made at no charge to the customer for parts and labour. The customer is, however, responsible for any transportation costs incurred in returning the unit to Quark-elec. This warranty does not cover failures due to abuse, misuse, accident or unauthorized alteration or repairs. A returns number must be given before any unit is sent back for repair.
The above does not affect the statutory rights of the consumer.

## Disclaimer

This product is designed to aid navigation and should be used to augment normal navigational procedures and practices. It is the user's responsibility to use this product prudently. Neither Quark-elec, nor their distributors or dealers accept responsibility or liability either to the products user or their

estate for any accident, loss, injury or damage whatsoever arising out of the use or of liability to use this product.

Quark-elec products may be upgraded from time to time and future versions may therefore not correspond exactly with this manual. The manufacturer of this product disclaims any liability for consequences arising from omissions or inaccuracies in this manual and any other documentation provided with this product.

## Document history

| Issue | Date | Changes / Comments |
|---|---|---|
| 1.0 | 17-10-2024 | Initial release |

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