d10 Tactical Racing Display

INSTRUCTIONS FOR USE

Welcome to Racegeek

Congratulations on the purchase of your **d10.**

Welcome to the racegeek family.

The d10 was built by racers for racers

Working from our own experience as active racing sailors and taking feedback and guidance from world class professionals we have combined the best technological elements available with an interface and functionality that is designed to deliver all you need on the race course in an easy to use format.

Your d10 will continue to improve

The d10 is a living instrument that will improve and evolve as we continuously develop and refine the device based on feedback from our professional sailors and from you the racegeek community.

Engage with the racegeek community

We strongly encourage you to register the device so we can inform you of any updates that will provide improved and extended features and so that you can take advantage of the racegeek cloud where your data can be viewed, shared and analyzed and you can interact with the racegeek community.

it's all about the numbers
racegeek

Contents

INTRODUCTION

d10 Layout

The d10 is designed to provide you the information you need, when you need it.

The display layout consists of four elements: Top Digits, Middle Digits, Graphic Display and Touch Controls as shown in the illustration below.

The d10 operates in two basic modes: Smart Repeater and Tactical Compass.

Modes are changed using the a10 app and changing "Display Mode" in Settings.

See App Layout for more info on using the a10 app with the d10.

Top Digits

Middle Digits

Graphic Display

Touch Controls

Left Arrow "Fred" Right Arrow

Circle Square
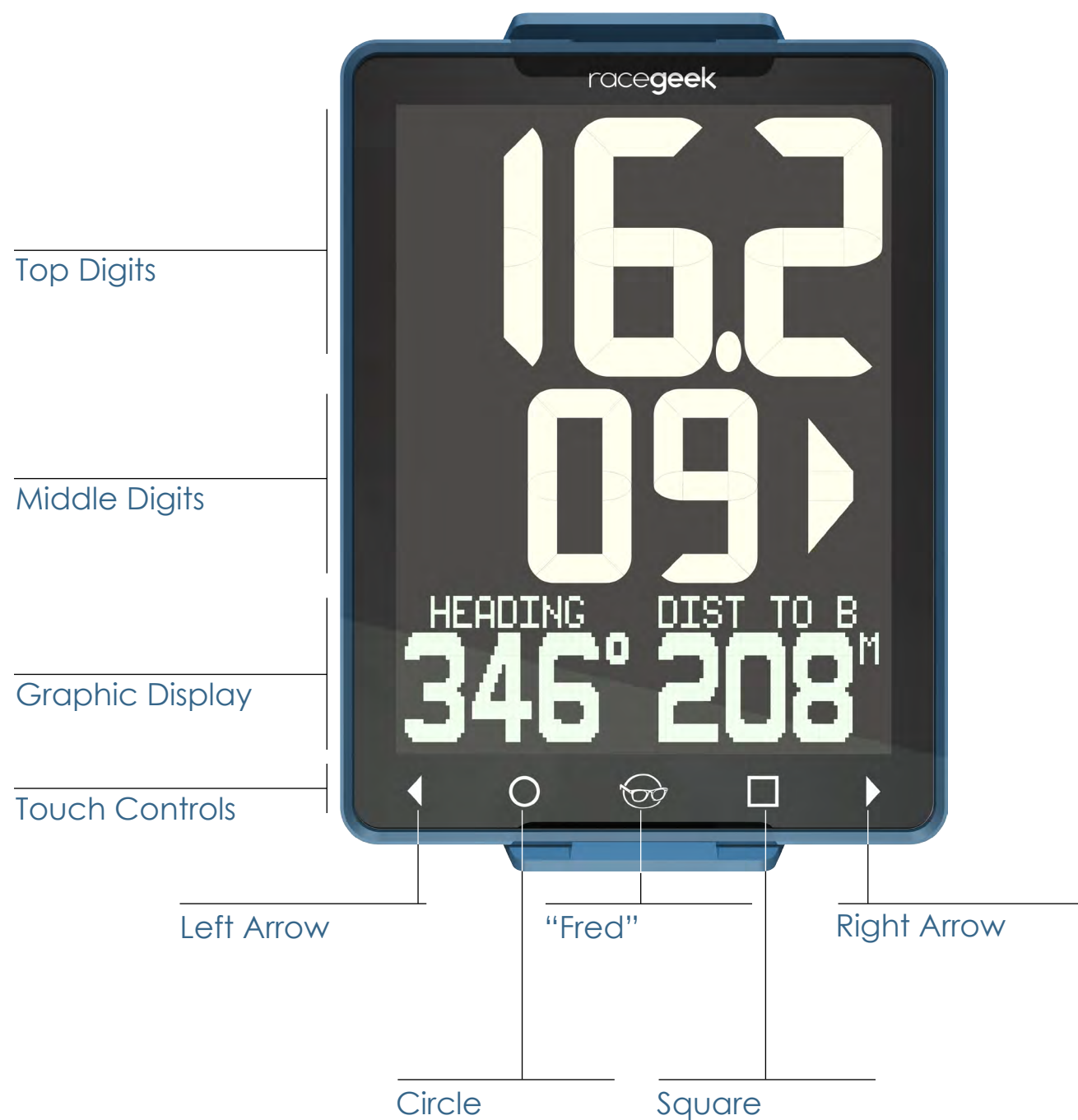
d10 Overview

Smart Repeater

Smart Repeater mode is started by changing "Display Mode" in Settings on the a10 app to "Repeater".

In smart repeater mode the d10 acts as a repeater displaying either internal sensor data from the d10 and connected sensors or NMEA data streamed over a connected or WiFi network.

There are 4 pages that can each have 2 sets of data saved for display. You can also use the Timer and Distance to Line functionality in Smart Repeater mode.

Starting/Stopping Timer and Grabbing Pin and Boat are controlled only by the a10 app when in Smart Repeater Mode.

Left Arrow
- Change display page

"Fred"
- Open context menu

Right Arrow
- Change display page

Circle
- Change top data source

Square
- Change bottom data source

Tactical Compass

Tactical Compass mode is started by changing "Display Mode" in Settings on the a10 app to "Full" or "Sport".

In Tactical Compass Mode "Full" the d10 displays information broken down into five pages: Prestart, Performance, Tide-Depth, Navigation and Wind.

In Tactical Compass Mode "Sport" the d10 displays information broken down into three pages: Prestart, Performance, Tide-Depth.

Each of these pages displays data relevant to that category.

Left Arrow
- Change display page
- Change selection

"Fred"
- Open context menu

Right Arrow
- Change display page
- Change selection

Circle
- Start timer
- - Minute on timer
- Capture pin
- To waypoint
- Capture tack

Square
- Stop/Sync timer
- + Minute on timer
- Capture committee
- From waypoint
- Change display items in a page

Smart Repeater Overview

To change pages touch the left arrow (◀) or right arrow (▶) in the touch controls. You can cycle though the screens back to your original screen by continuing to touch the arrow in either direction.

1
- ○ Change Top Source
- □ Change Bottom Source

2
- Enter Menu
- ◀▶ Select Save Display
- □ Save Changes

3
- Enter Menu
- ◀▶ Select Reset Display
- □ Reset to Saved

12 Tactical Compass Overview

To change pages touch the left arrow (◂) or right arrow (▸) in the touch controls. You can cycle though the screens back to your original screen by continuing to touch the arrow in either direction.

Page Menus

Each page has a contextual menu that can be accessed by touching the central racegeek icon we affectionately call - Fred. When in the contextual menu the left arrow (◂) or right arrow (▸) scroll through the menu options. Touching Fred again exits from the menu and returns you to normal operation.
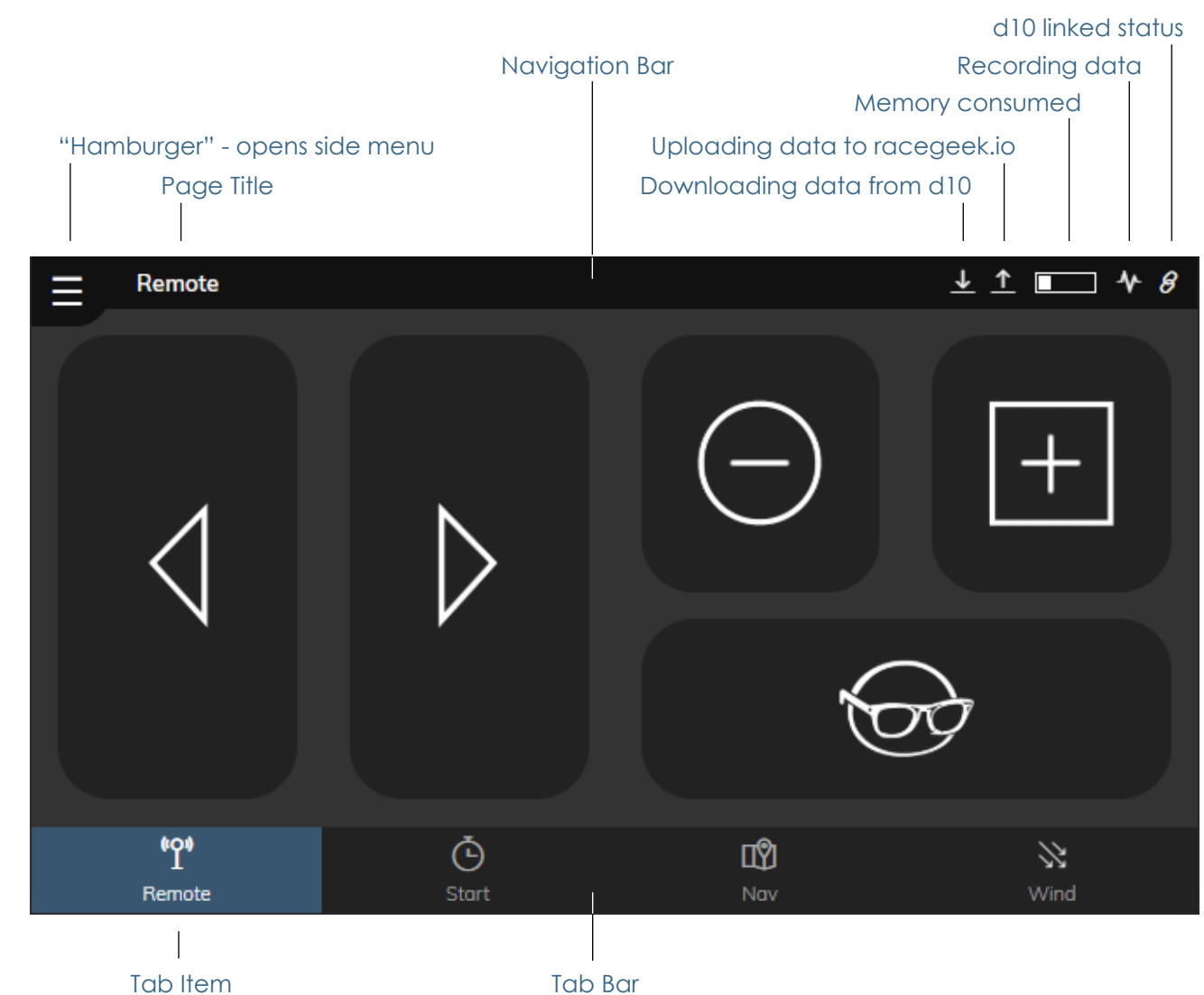
Prestart **Performance** **Tide-Depth**

Navigation **Wind**

13 a10 App Layout

The a10 companion app is designed to configure the d10 settings and mark and course libraries. The d10 does not require the app to work on the water while racing, however the a10 adds additional functionality by displaying the data streamed from the d10 in additonal formats and provides context specific remote and display functionality.

The a10 provides the following functionality to the d10:

* Supplies a user interface to adjust all the d10 settings

* Manages all marks and courses

* Acts as a remote control to the d10

* Offloads data from the d10 to the racegeek analytics server

* Acts as a standalone repeater displaying upto 4 separate pieces of information including graphs

* Provides context specific visualizations and remotes for different aspects of the race: Prestart, Navigation, Wind

d10 linked status
Navigation Bar
Recording data
Memory consumed
"Hamburger" - opens side menu
Uploading data to racegeek.io
Page Title
Downloading data from d10

Tab Item
Tab Bar

a10 App Overview

Introduction

Change Settings	Manage Marks	Control d10

Context Specific Remotes

Start, Navigation, Wind

Get highly detailed context specific information on the race course

Multiple View Modes

Daylight, Night, Color Modes to optimize viewability in all conditions

Smart Repeater

Display upto four additional items

Digits, Graphs, Min/Max/Mean

INITIAL SETUP

Registration is done electronically at racegeek.io or within the a10 App. To register your device you will need the d10's UUID and DEVICE PIN - found in the documentation that came with your d10.
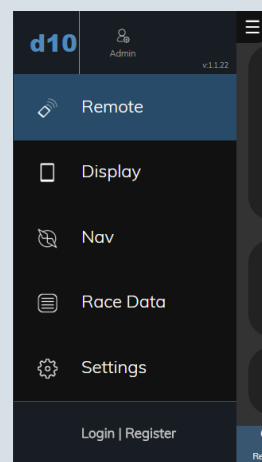
It is important to register your d10 at your first opportunity to prevent losing your security information.
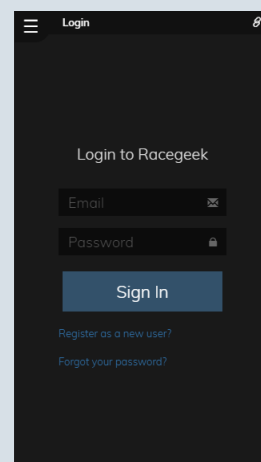
Register in app
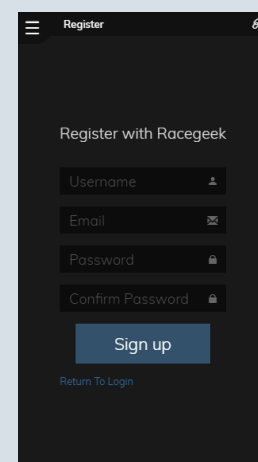
Create Account
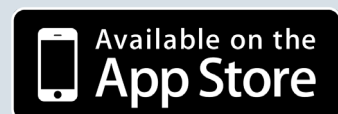
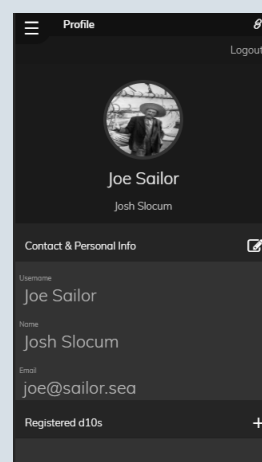Download App

Open side menu and select "Login | Register"

Select "Register as a new user"

Enter your registration details. A confirmation email and link will be sent

Register d10

After receiving an email and clicking the confirmation link you can login to your account

Touch the + button next to "Registered d10s" to add a d10 to your account.
Enter the d10 UUID and Device Pin that came with your d10.

Once registered you will always have access to your security details

Register at racegeek.IO

Create Account

Visit racegeek.**IO**

Select "Register as a new user"

*** note ***
Racegeek.**IO** is the analytics portal.
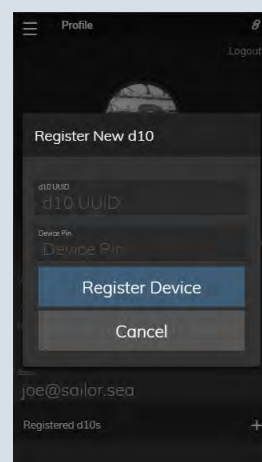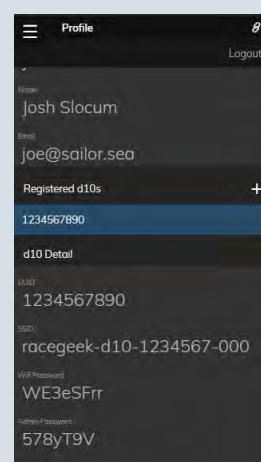
Racegeek.**IE** is the sales portal.

Enter your registration details. A confirmation email and link will be sent
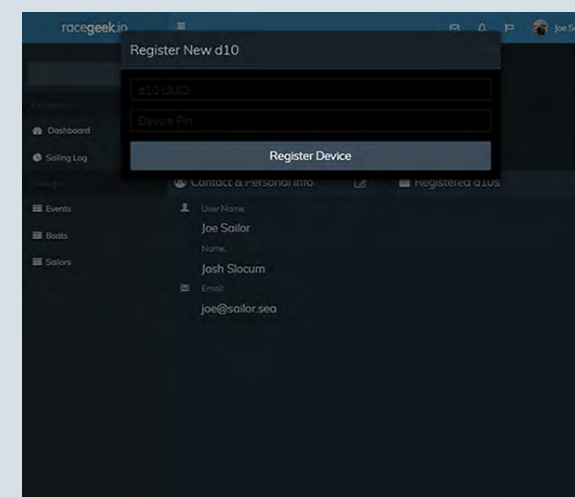
Register d10

After receiving an email and clicking the confirmation link you can login to your account. Touch the + button next to "Registered d10s" to add a d10 to your account. Enter the d10 UUID and Device Pin that came with your d10.
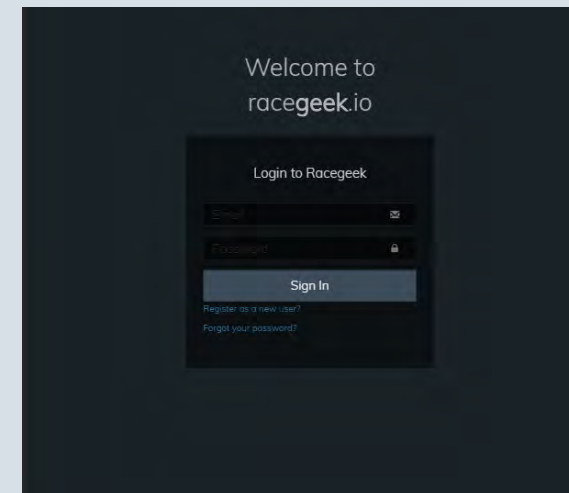
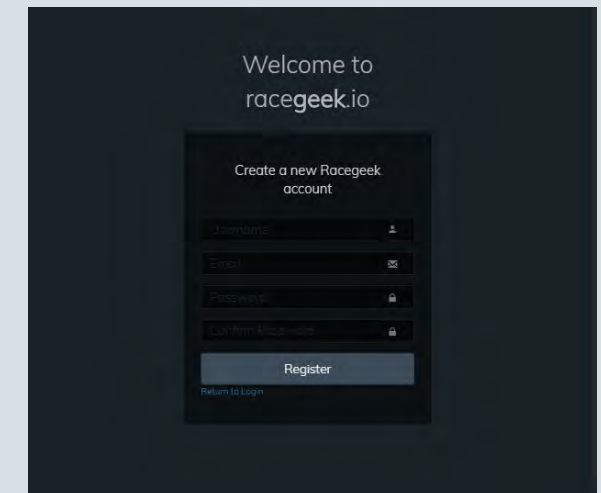Once registered you will always have access to your security details

A majority of the functionality of the d10 operates out of the box, but certain features such as Settings, Waypoints, and WiFi and must be configured with the free a10 app available from one of the links below.

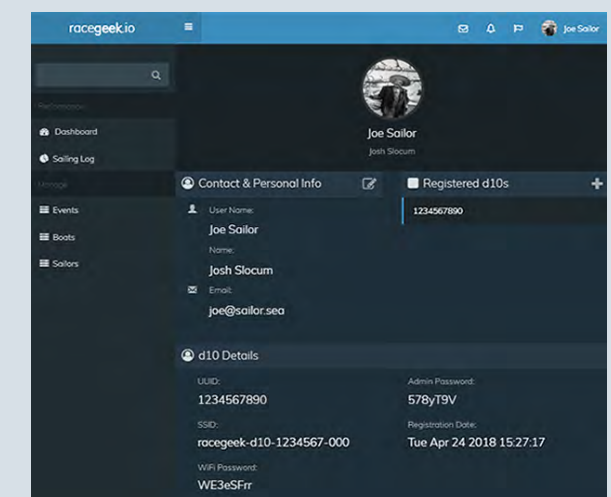Available on the **App Store**

ANDROID APP ON **Google play**

OPERATION

To make changes to the d10 via the a10 app you must be connected to the d10's WiFi access point with the mobile or tablet the a10 app is installed on.

You connect to the d10 by WiFi the same way you would connect to any other WiFi Access point:

1. Using the device that has the a10 app installed - open the wireless settings for that device to list the available Wireless Access points

2. Locate the WiFi network with the SSID listed in the documentation that came with your d10 and select. An example SSID: racegeek-d10-123456789

3. When prompted for password enter the WiFi password provided in the documentation

The "link" icon in the top left of the app indicates the a10 is successfully connected to the d10. If this icon is shown as a "broken link" then the app is not connected to the d10. Check your WiFi connection.
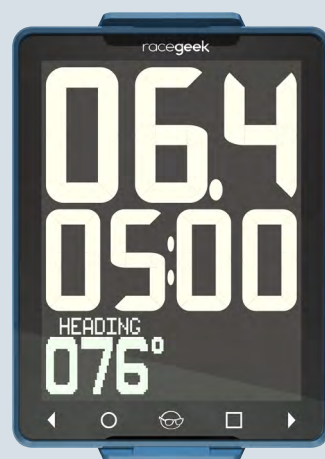
PreStart Overview
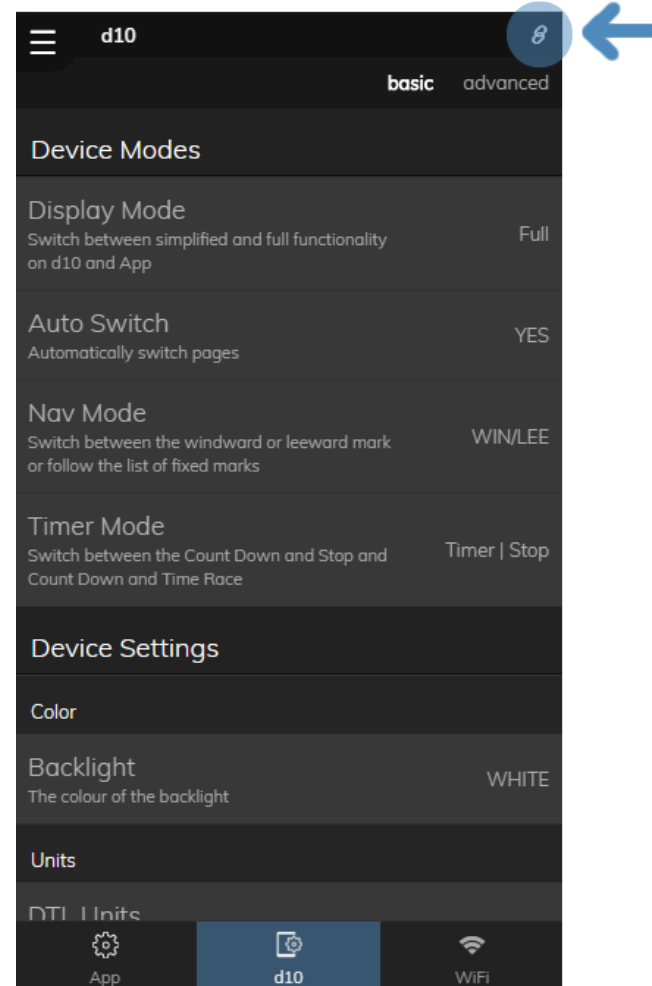
The Prestart page can be accessed by touching the left or right arrows in the touch controls until the graphic display shows "PRESTART" in large text.

The Prestart page is used to display: Timer, Line Information and Boat Speed.

Before Line Captured

— Boat Speed

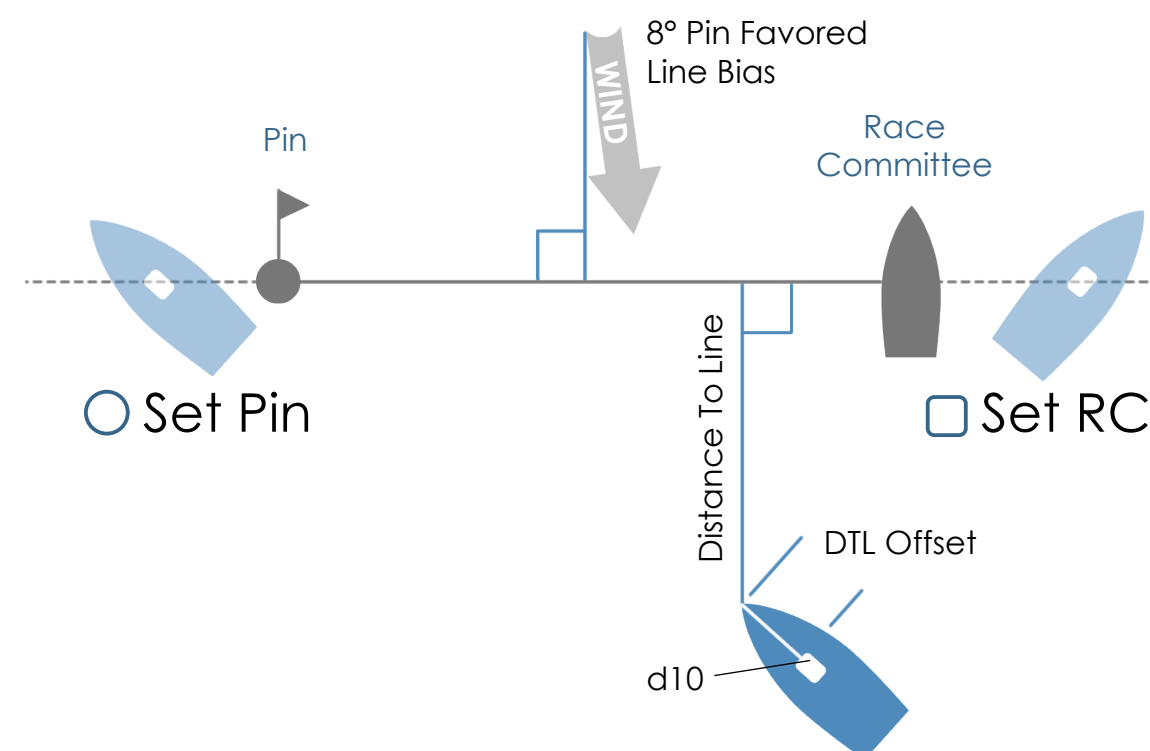— Timer

— Heading

Line Captured

Distance

Timer

Heading

Above/Below Line

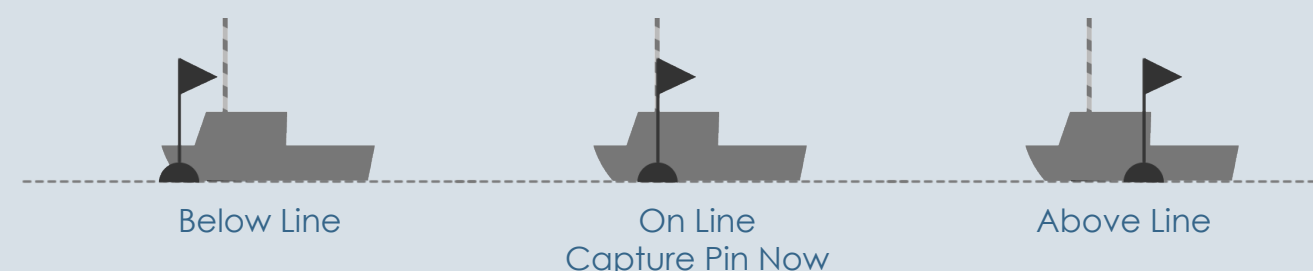Up Arrow   Behind Line
Down Arrow Over Line

Timer < 1 minute

Heading changes to Speed

Distance To Line

8° Pin Favored Line Bias

Pin

Race Committee

WIND

○ Set Pin   □ Set RC

Distance To Line

DTL Offset

d10

Using a transit view to capture a line end from outside line

Below Line   On Line Capture Pin Now   Above Line

The d10 acquires the current GPS position when the ○ or □ are touched. Pin and Race Committee (RC) ends of the line can be captured anywhere along the line or its extension by touching the appropriate button.

To capture a more precise position for each end of the line we recommend sailing outside the line and sighting down the line and use the transit view.

Distance To Line
The distance the d10 is from the start line measured perpendicular to the line.

DTL Offset
Correction for the additional distance the d10 is from the bow of the boat. Configurable in d10 settings.

Line Bias
The amount in degrees one side of the line is favored based on wind direction relative to the line.

Capture Line

To activate Distance To Line functionality, the Pin and Race Committee

Setting A Fixed Line

You can create a fixed start line using mark waypoints in the d10. Once fixed line is set you return to Prestart screen you will have Distance To Line functionality.

1

Open Menu
Select PING LINE

1

Select Navigation

2

Capture Pin
Icon fills in when successful

Capture Committee
Icon fills in when successful

Exit Capture Mode

2

Open Waypoints

Scroll Waypoints

3

Once Pin and Committee are captured speed will be replaced with Distance To Line

When timer < 1 minute Heading changes to Speed

3

Set Port End
Waypoint lists TO

Set Star. End
Waypoint lists FROM

Timer

When the timer countdown hits zero the d10 automatically changes to display the Performance Page and the timer begins counting the race duration.

Start/Stop

○ Start Timer

▢ Stop Timer

Sync Time

○ Sync to nearest minute when timer is running timer keeps running

▢ When timer is stopped touching again resets race and time to 5 minutes

Change Time

👓 Open menu
Select CHANGE MINS

○ - minute

▢ + minute

Performance Overview

The Performance page can be accessed by touching the left or right arrows in the touch controls until the graphic display shows "PERFORMANCE" in large text. The Performance page is also accessed automatically when the timer in the Prestart page reaches zero.

When the boat turns upwind (above 80° of the mean wind direction) the d10 automatically changes to the Performance page.

The Performance page has three different modes. To change the mode touch ▢

Tactical Mode

—— Boat Speed

—— True Heading
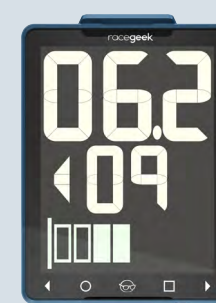
—— Mean Wind Adjusted To Tack

Off Wind Mode

—— Boat Speed

—— True Heading

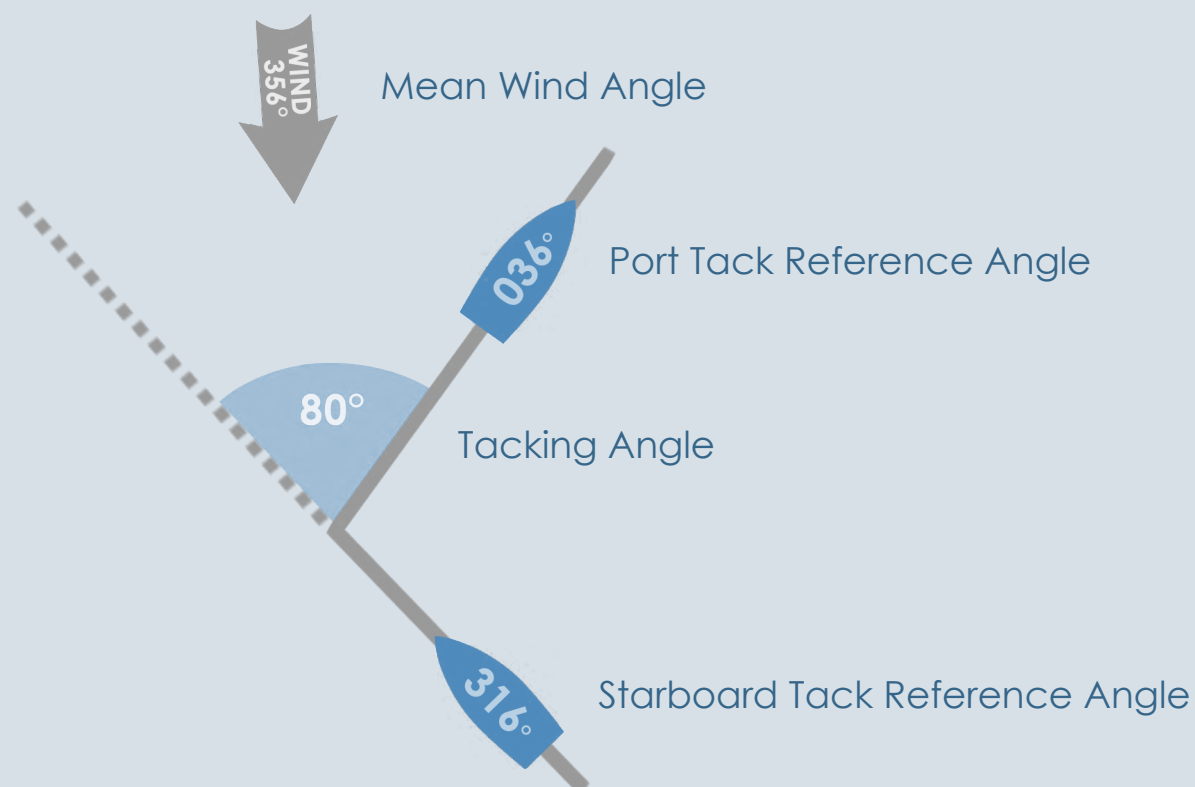—— Heel Angle

Performance Mode

—— Boat Speed

—— Shift Indicator

—— Heel Angle

Mean Wind

The d10 stores the mean wind direction and tacking angle in order to provide shift tracking when going up wind.

Mean Wind

WIND 356°

Mean Wind Angle

036°

Port Tack Reference Angle

80°

Tacking Angle

316°

Starboard Tack Reference Angle

Capture Initial Mean Wind

If mean wind has not been captured yet the Performance page will show instructions in the Graphic Display.

Update Mean Wind

Once the mean wind has been captured you can update at any time when sailing upwind by touching the ○ when in the Performance page.

Mean Wind Before and After Start

Before the start (when the countdown is not zero) the d10 builds up an average based on the readings taken each time you press the circle button. By capturing the mean wind repeatedly you'll build up a better idea of what the average wind direction is.

Mean Wind After Start

After the start the mean wind is reset based on the current heading and the tacking angle - no averaging is performed.

Set Initial Mean Wind

If reference angles and mean wind have not been captured yet the Performance page will show instructions in the Graphic Display.

○ Head upwind on either tack and touch when ready

1

○ Change tack and touch when ready

2

□ Display switches to Tactical Mode, touch □ to change mode

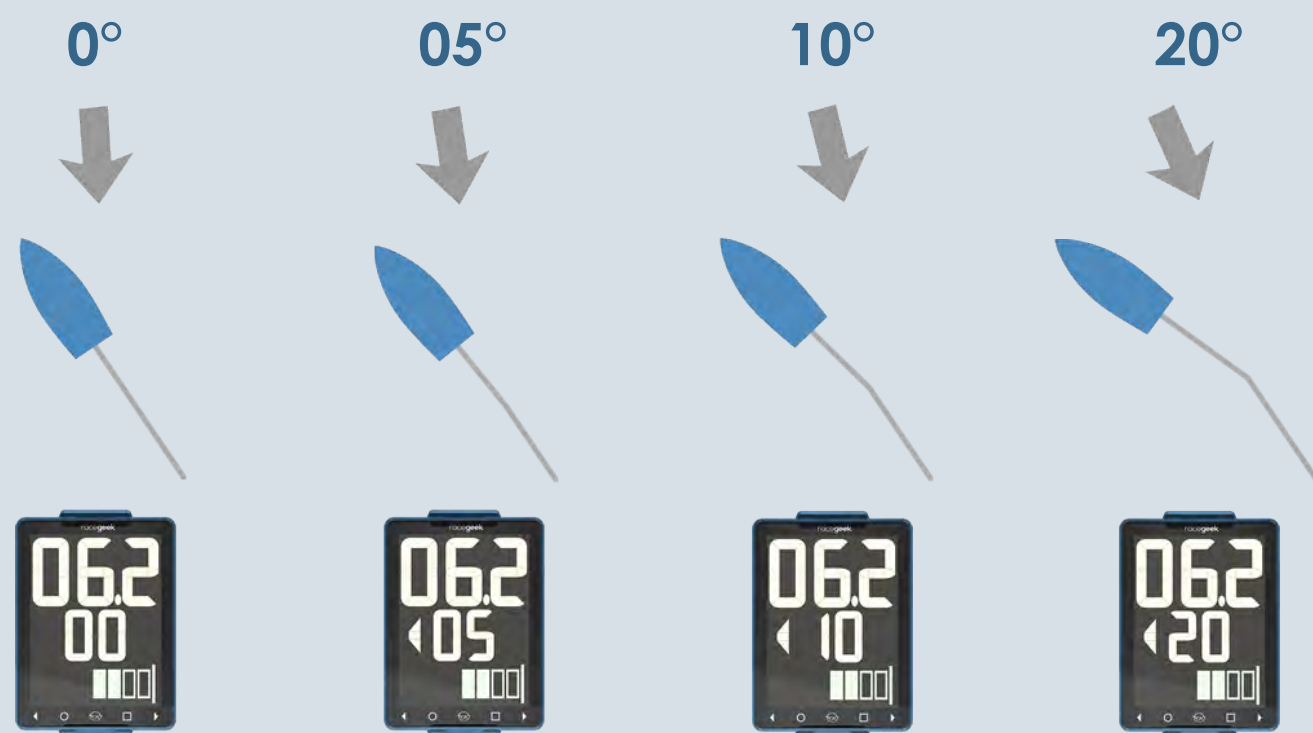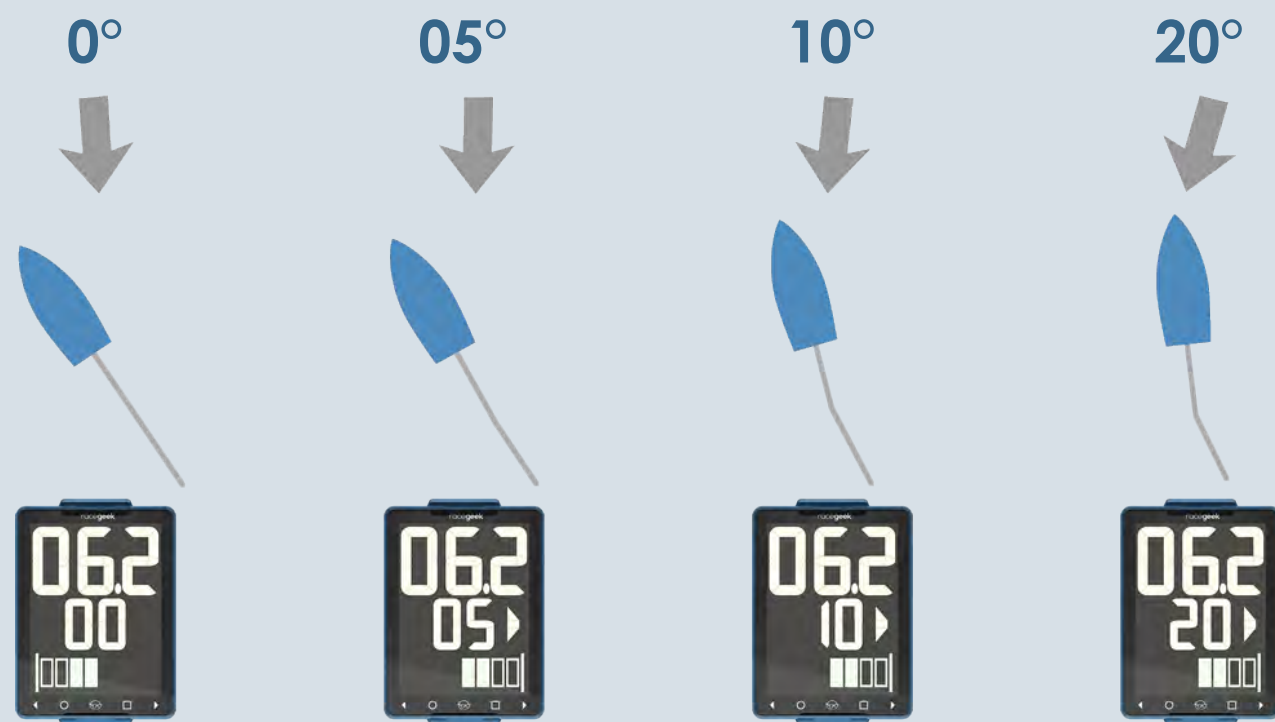**3**

👓 Open menu

◀▶ Select

○ Decrease

□ Increase

28 Shift Tracking

The d10 uses the saved Mean Wind Direction compared to the boat's current heading to show changes in wind direction. After the start you can reset the Mean Wind Direction at any time when sailing upwind by touching the ○

Header

0°	05°	10°	20°

06.2 00

06.2 ‹05

06.2 ‹10

06.2 ‹20

Lift

| 0°	05°	10°	20°

06.2 00

06.2 05›

06.2 10›

06.2 20›

29 Tide/Depth Overview

The Tide-depth page can be accessed by touching the left or right arrows in the touch controls until the graphic display shows "TIDE-DEPTH" in large text.

The Tide-Depth page displays: Boat Speed, Heading, Tide/Current Differential and Depth. The Tide-Depth page has four different modes. To change the mode touch □

Heading, Tide, Depth History Mode

06.2 038° TIDE 0.4
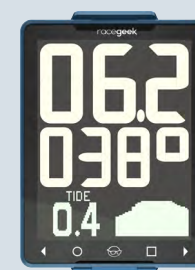
— Boat Speed
— True Heading
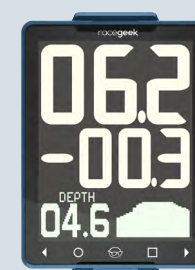— Tide/Current Difference & Depth Graph

Heading, Depth, Depth History Mode

06.2 038° DEPTH 04.6

— Boat Speed
— True Heading
— Depth & Depth Graph

Tide, Depth, Depth History Mode

06.2 -00.3 DEPTH 04.6

— Boat Speed
— Tide/Current Difference
— Depth & Depth Graph

Depth, Depth History Mode

06.2 04.60

— Boat Speed
— Depth
— Depth Graph

Tide/Current
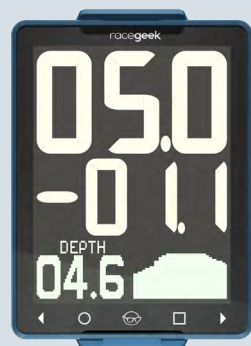
When a paddlewheel is connected to the d10 it can provide you with tide/current speeds using the difference in speed between the GPS and the Paddlewheel.

Press ○ set SOG and STW difference to zero for current conditions. This gives a zero baseline for any changes in tide/current from this point forward. To reset

Tide/Current

← SOG (GPS): 5.0kts

SOG (GPS): 7.2kts →

← STW (Paddle): 6.1kts

STW (Paddle) : 6.1kts →

→ Tide/Current = -1.1kts

Tide/Current = +1.1kts →

Depth Sensor Offset

Sensor offset above keel in centimeters and can be set from the d10 or via the app. From the app in the Tide-Depth page:

Open Menu

Select Depth Offset

Decrease Offset

Increase Offset

Navigation Overview

The Navigation page can be accessed by touching the left or right arrows in the touch controls until the graphic display shows "NAVIGATION" in large text.

The page name displays for 2 seconds before the Graphic Display reverts to active mode.

The Navigation page provides: Boat Speed, Turning Angle, Heading, Distance To Mark, Time To Mark, Course Over Ground.

The Navigation page has two different display modes. To change the mode touch □

If Auto Switch is set to yes in the d10 Settings on the a10 App - when the boat turns downwind (below 80° of the mean wind direction) the d10 automatically changes to the Navigation page.

Distance Mode

—— **Boat Speed**

—— **Turning Angle**

—— **Heading and Distance To Mark**

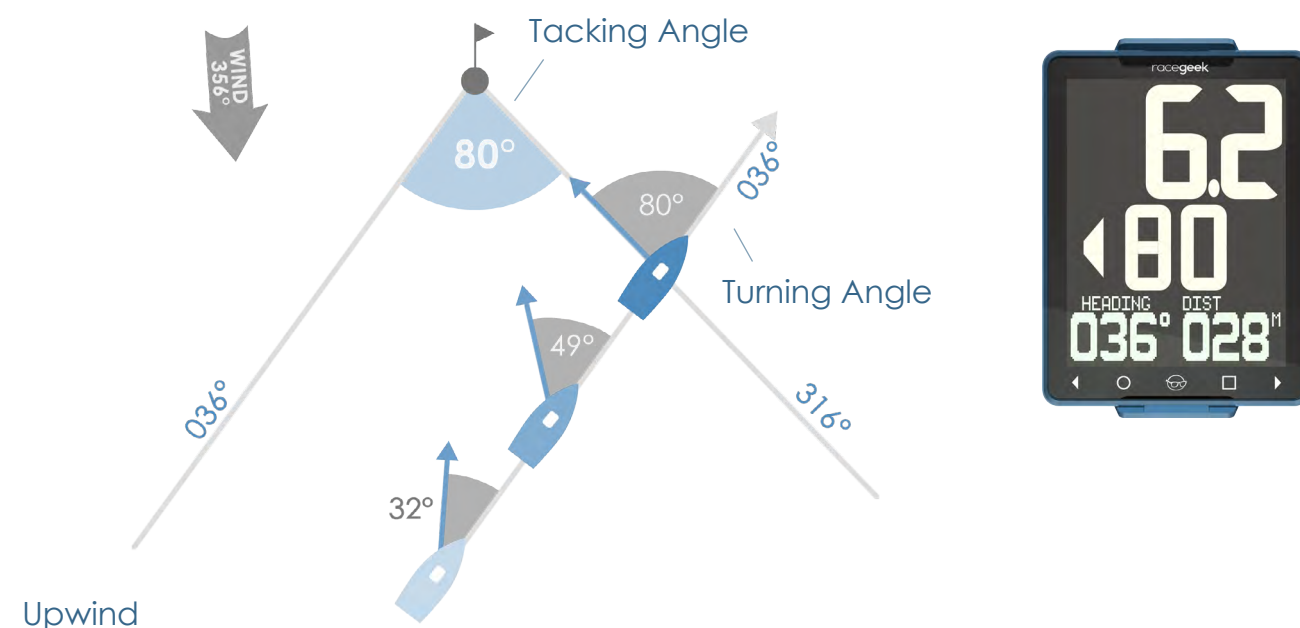## Time Mode

—— **Boat Speed**

—— **Turning Angle**

—— **Heading and Time To Mark**

Turning Angle

The middle digits in all Navigation modes shows the Turning Angle. The left and right arrows show the direction of turn required to travel directly towards

Upwind

Tacking Angle

Turning Angle

Upwind

Sailing upwind the turning angle shows the difference between the heading and bearing to a waypoint or mark. When the Turning Angle equals your tacking angle then you are on the layline.

Downwind

Tacking Angle

Turning Angle
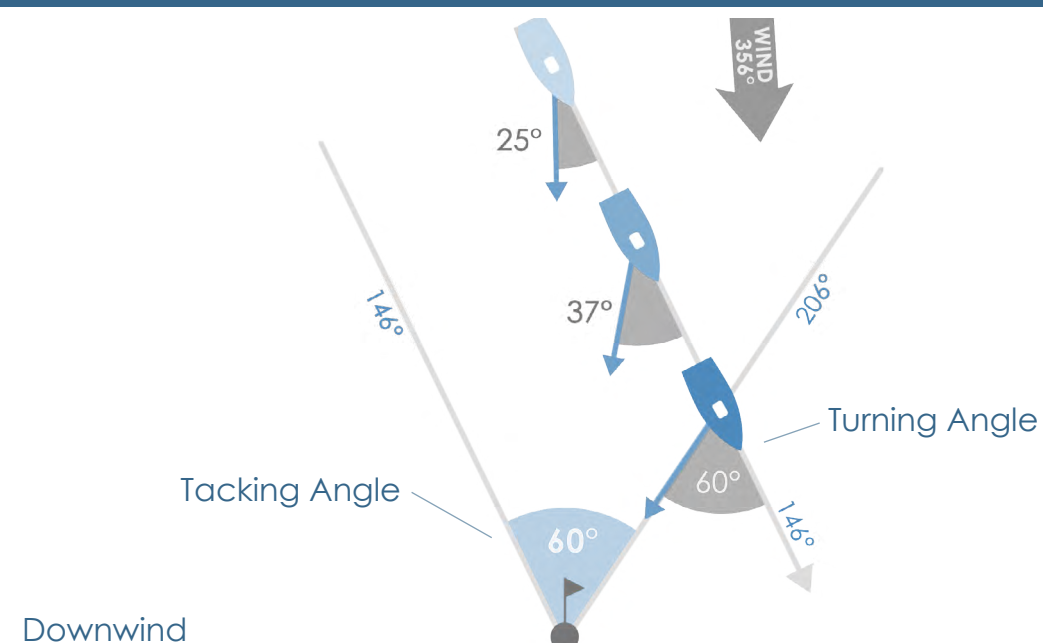
Downwind

Sailing downwind the turning angle shows difference between the Course Over Ground (COG) and bearing to the waypoint.
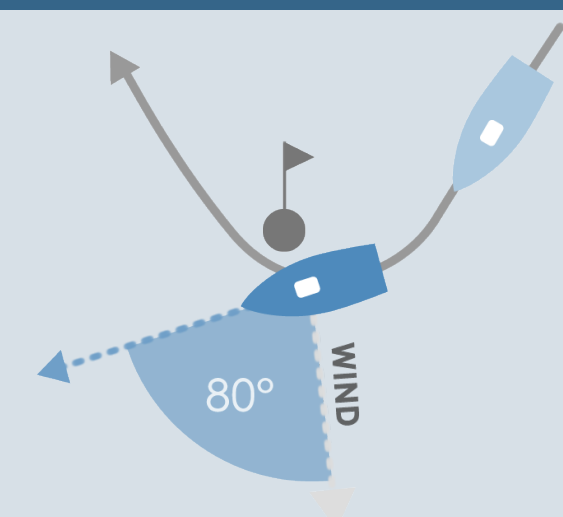
Auto Acquire Marks

When Navigation Mode in settings is set to: Windward/Leeward, the d10 uses the current heading, mean wind direction and GPS position to acquire the windward and leeward mark positions.

Once the heading passes 80° above or below the mean wind direction the GPS grabs the boat's current position and saves it.
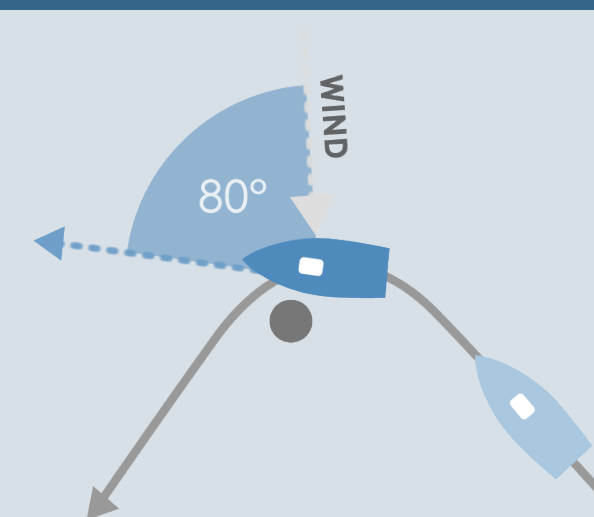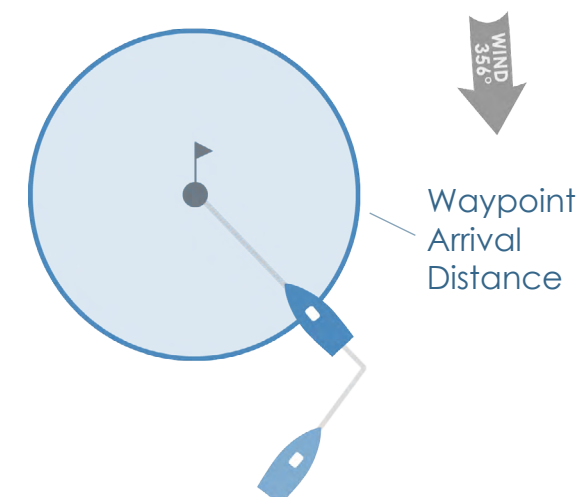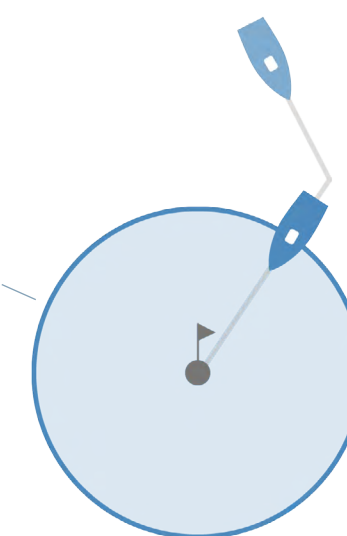
Windward Mark   Leeward Mark

Auto Progress Course

When Navigation Mode in settings is set to: Course Mode, the d10 uses the current GPS position, saved mark GPS position and the Waypoint Arrival Distance to auto progress the course to the next saved mark. The Waypoint Arrival Distance can be changed in the d10 settings.

Windward Mark   Leeward Mark

Waypoint Arrival Distance

There are three types of Navigation modes: Windward/Leeward, Win/Lee Fixed and Fixed.

Windward/Leeward

Windward and Leeward marks are Auto Acquired when the d10 turns above or below the mean wind angle by the number of degrees set in the a10 app.. The default value is 80 degrees. See **Auto Acquire Marks** for more detail on how d10 acquires marks

Windward/Leeward Fixed

Windward and Leeward Marks are fixed and manually entered based on distance and bearing from start line using a10 app.

Fixed

Navigates route of marks sent to the d10. Auto advances route based on proximity set in Settings.

Additional Settings

Arrival Distance - Sets the distance in meters from a mark that route advances.

Leg Angle (advanced settings) - The number of degrees above/below mean wind that the d10 acquires Windward/Leeward marks.

Dip Check Time (advanced settings) - The time in seconds a course change has to be maintained for d10 to acquire mark. Prevents dips from triggering mark acquisition.

Configure Navigation Mode

Available on the App Store

ANDROID APP ON Google play

Download App

Open side menu and select "Settings"

Select "d10"

Select "Nav Mode" and touch +/- to change value

Marks and Courses are managed and added to d10 from the a10 App.
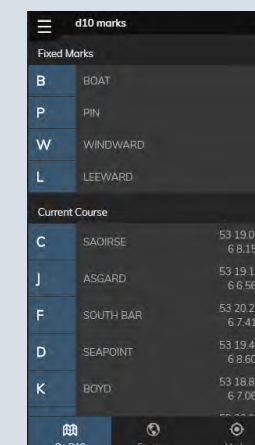
You can download marks, create your own marks, create courses and upload them to the d10 and see what marks are already on the d10.
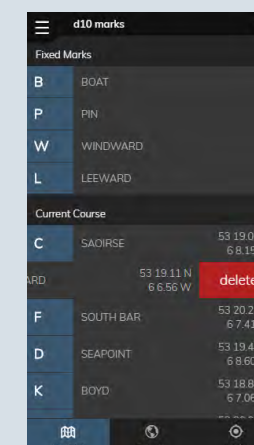
Manage Marks

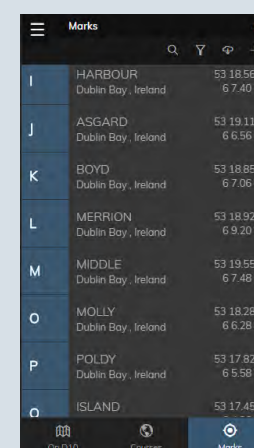### View marks on d10
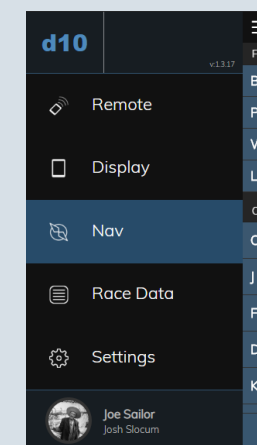
Open side menu and select "Nav"

"On D10" shows the current marks on the d10 including the current gps positions of fixed marks

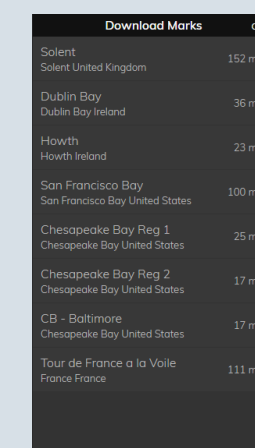Left swiping a mark in the course will allow you to delete the mark.
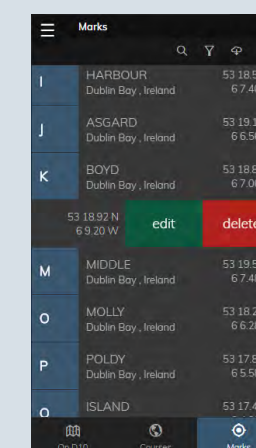
Add marks to Mark Library

Select Marks

To add new mark select + at top of Marks screen and Add Mark screen will appear.
To get current position of d10 or device select icon in Position section
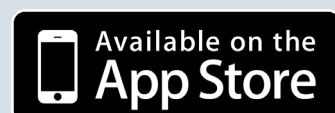
To add complete mark library cloud icon at top of Marks screen and list of available mark libraries will appear. Select one and the marks will be downloaded
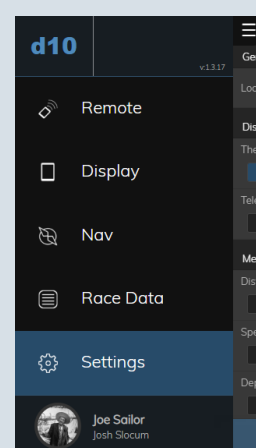
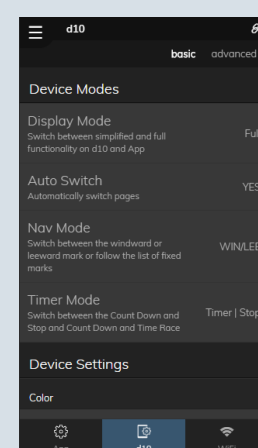Swipe left on any mark to show options to edit or delete mark.

Manage Marks

View/Sort Marks
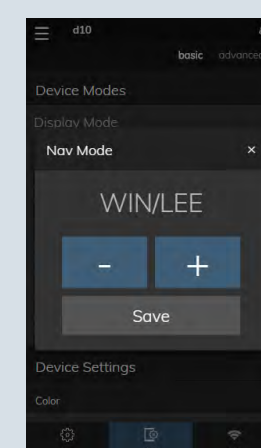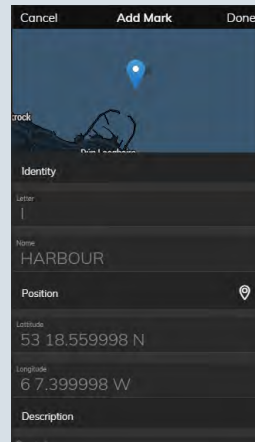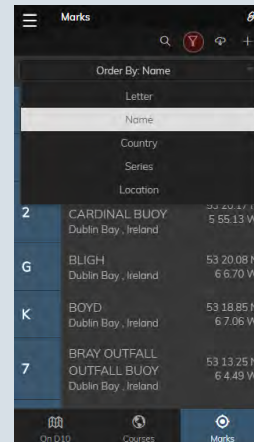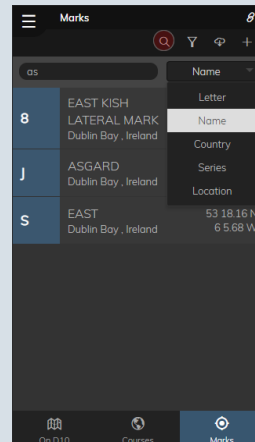
Select mark from list or swipe mark and select "Edit" to view mark details
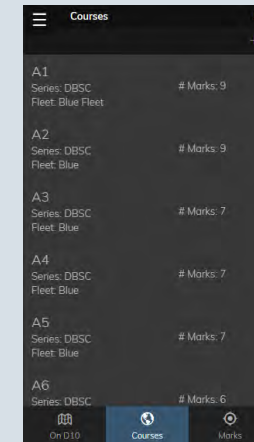
Select Order Icon to Sort Marks

Select Search Icon, choose which filed to search by and mark list will filter by the value entered in the search box

Manage Courses

View/Edit Courses

Select "Courses" to see all saved courses
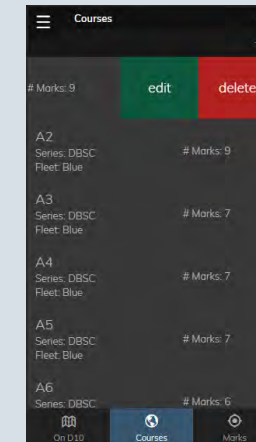
Swipe left to show option to edit or delete
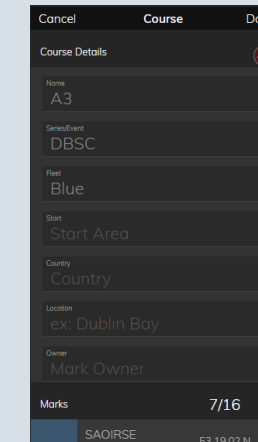
Course Detail Screen Pops up. To Hide details and display Course either swipe up or touch collapse icon
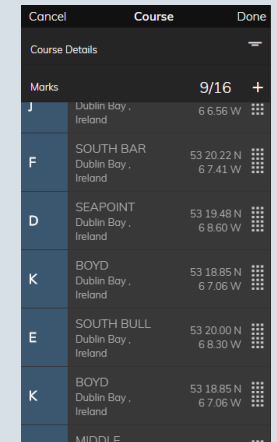
View, Re-Order, Add or Delete Marks in Course

Create and Courses
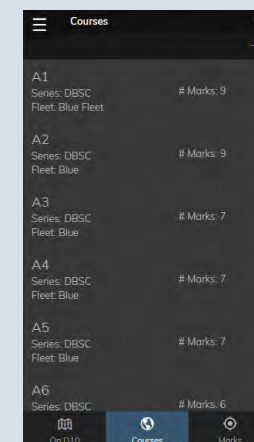
Select "Courses" and press + near top right of screen to open new Course
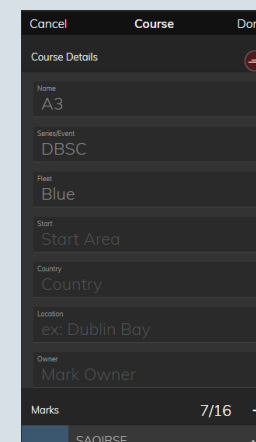
Course Detail Screen Pops up. To Hide details and display Course either swipe up or touch collapse icon
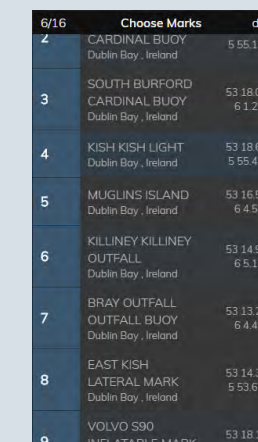
To add marks press the + sign and the list of available marks appears. Touch a mark to add it. If a mark is selected more than once it will darken in shade
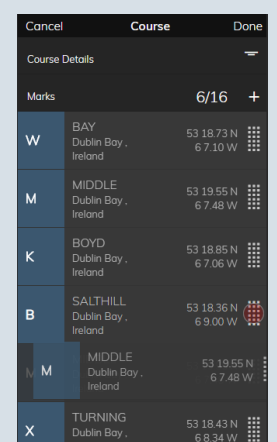
To re-order touch grid and drag and drop. Once complete touch done to exit and save or to exit touch cancel

Manage Courses

Submit Course to d10
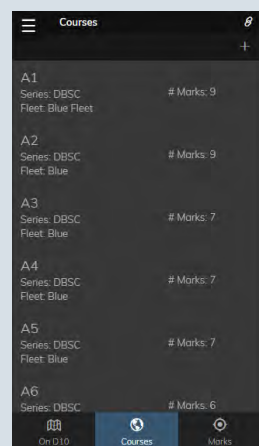
Select "Courses" to see all saved courses
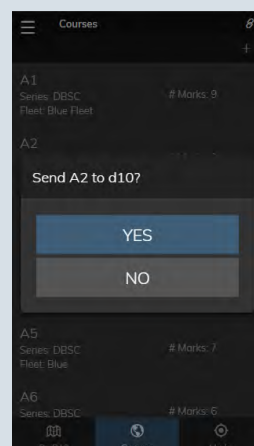
Touch course you wish to send to d10 and choose yes to send
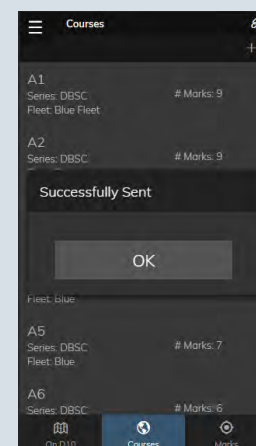
Dialog will appear telling you status of course update to d10
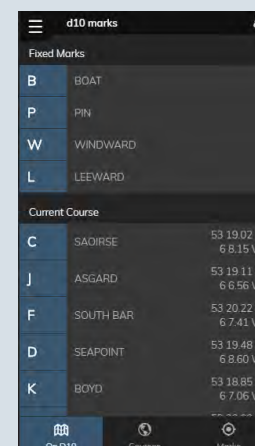
Choose "On D10" to see course successfully loaded on d10

Manually Choose Marks

Waypoints that have been loaded onto the d10 can be selected manually from the Navigation menu at any time during a race.

Open Menu

Select Waypoint

Select Waypoint TO

Select Waypoint FROM

Wind Overview

The Wind page can be accessed by touching the left or right arrows in the touch controls until the graphic display shows "WIND" in large text.

The Wind page has three different modes. To change the mode touch ☐

Apparent Wind

—— Wind Speed

—— Wind bearing relative to boat

Apparent Brng

—— Wind Speed

—— Wind magnetic bearing

Speed and WInd

—— Boat Speed

—— Wind bearing relative to boat

SETTINGS

Settings

The d10 settings can only be changed from the free a10 companion app. The app can be downloaded below:

Available on the App Store

ANDROID APP ON Google play
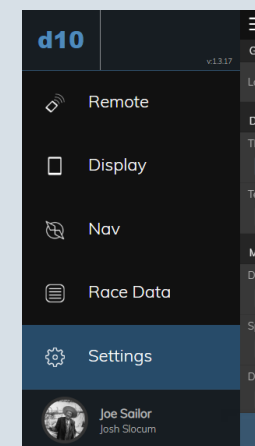
Manage Settings

Open Side Menu and select "Settings"
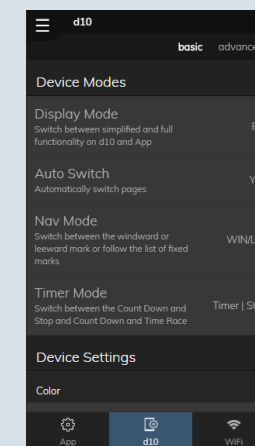
Choose "d10" to change settings for your d10The "Basic" settings appear. Choose "Advanced" to see all settings

Touch a setting you wish to change and a dialog box pops up. Choose +/- to change and Save to close and save.

Settings List

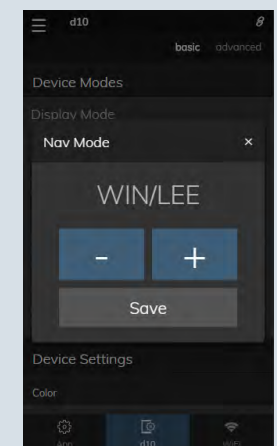| Name	Function/Description	Options
Device Modes		
DISPLAY MODE	Switch between smart repeater, simplified and full functionality on d10	Sport, **Full**, Repeater
AUTO SWITCH	Turn on/off d10 automatic page switching In auto mode the d10 changes pages at the end of the countdown and when you change between windward and leeward	**No, Yes**
NAV MODE	Switch between Windward Leeward and Course Mode In windward/leeward mode the destination way point is changed between the windward and leeward mark depending on whether you are going upwind or downwind. In course mode the d10 will move to the next mark in the waypoint list on arrival.	**Win/Lee**, Fixed, Fixed Win/Lee
TIMER MODE	Switch between Count Down and Stop and Count Down and Time Race	**Timer | Stop**, Timer | Count Up
Device Settings		
Color		
BACKLIGHT	Change the backlight colour The options are none, white, red and pink (red and white together)	None, **White**, Red, Pink (red/white together)
Units		
DTL UNITS	Units displayed for distance to line	'Feet', '**Meters**', 'Boat lengths 20ft', 'Boat lengths 25ft', 'Boat lengths 30ft', 'Boat lengths 35ft', 'Boat lengths 40ft'
BOW OFFSET	Distance from the bow to where the d10 is mounted	Value (**0mm**)
ARRIVAL DIST	Distance to the mark at which the d10 switches to the next mark in fixed mark navigation mode	Value (**50m**)
Data		
DATA RATE	The number of times a second telemetry is logged	10x, 5x, 2x, 1x
DATA FORMAT	Format of the data streamed by the d10	None, **NMEA**, Signal K, Telemetry
Touch Controls		
BUTTON TOUCH TIME	Length of time, in 10ths of a second, that a button must be touched before it is recognized	Value (**0.3s**)
BUTTON TIME OUT	Length of time, in 10ths of a second, after which a touch and hold is NOT recognized	Value (**5s**)
Tracking		
LEG ANGLE	The angle the boats turns off the wind that triggers the next leg and the acquisition of the mark when rounding a mark	Value (**80**)
DIP CHECK TIME	The amount of time, in seconds, between a course change greater than the set LEG ANGLE and setting the new leg and mark. Used to prevent dips being registered as new legs	Value (**30s**)

Sensor Settings		
Wind		
WIND OFFSET	Compensate for misalignment of the mast head unit to the boats center line in degrees	Value (**0**)
WIND CALIBRATION	Measured wind speed as a percentage of real wind speed	Value (**100%**)
Inclinometer		
PITCH OFFSET	Compensates for any error in tilt of the d10 fore and aft	Value (**0**)
ROLL OFFSET	Compensates for any error in tilt of the d10 to starboard or port	Value (**0**)
Compass		
COMPASS RATE	Number of times a second the heading is updated	10x, **5x**, 3x, 2x, 1x
d10 OFFSET	Compensates for any error between the angle of the d10 to the boats center line	Value (**0**)
DECLINATION	The difference between true and magnetic North, automatically updated from GPS	Value
COMPASS PRE-FILTER	The amount of pre-filtering done to the accelerometer and magnetometer	Value (**60**)
COMPASS GYRO - BIAS	How much influence the Gyro has on stability of heading	Value (**95**)
COMPASS DAMPING - LOW	The amount of damping applied to the compass heading during a slow/small turn	Value (**7**)
COMPASS DAMPING - HIGH	The amount of damping applied to the compass heading during a fast turn	Value (**10**)
COMPASS THRESHOLD - LOW	Rate of turn that the Compass Damping-Low is applied	Value (**40**)
COMPASS THRESHOLD - HIGH	Rate of turn that the Compass Damping-High is applied	Value (**70**)
Speed		
SPEED SOURCE	Choose source of boat speed, either automatic (Paddle wheel given preference) or manual	**Auto**, STW, SOG
BOATSPEED RATE	Number of times a second the boat speed is updated	10x, 5x, **3x**, 2x, 1x
PADDLE TYPE	Paddle wheel type connected to d10.	SIGNET, **Airmar ST Series**, Airmar DST/CST
PADDLE CAL	Paddle boat speed as a percentage of real boat speed	Value (**100%**)
Depth		
DEPTH OFFSET	Depth of sensor in cm	Value (0cm)
Device Details		
Device Information		
Device ID (info only)	The unique ID of this d10	
Firmware Version (info only)	The version of hardware and software you are using	
Device Information		
FACTORY RESET (command)	Reset all settings to default values	

Specs

General

- 190mm x 136mm x 24mm
  7.5" x 5.3" x .9"
- 640g / 1.4lbs
- Touch sensitive buttons
- White and red backlights

Display

- Large 60mm and 40mm LCD digits
- 35 mm graphic display
- Anti-Glare Corning® Gorilla® Glass protective cover

Compass

- State of the art 9 axis AHRS (gyroscope, accelerometer, magnetometer)
- 1 degree accuracy
- 10 hz rate
- GPS/GLONAS

WiFi

- WiFi Access Point & WiFi Device
- NMEA0183 & SignalK

Connectivity

- NMEA0183
- NMEA2000 (with external cable)
- SignalK
- Analog

Memory

- 128MB on board memory
- Logs data at 10hz*
- Race Processor
- 85Mhz programmable processor

Case

- IP67 Rating
- Tested to 24hrs submersion @ 1.5m

Power

- @12v - 80mAh
  w/Backlight 120mAh
- External Battery - 9-32v
  (not supplied)

*avail 2018

Maintenance

The d10 is totally sealed against water and is not serviceable.

Any attempt to take the d10 apart will invalidate the warranty.

To clean, use only a damp soft cloth. No detergents, solvents or abrasives should be used.