



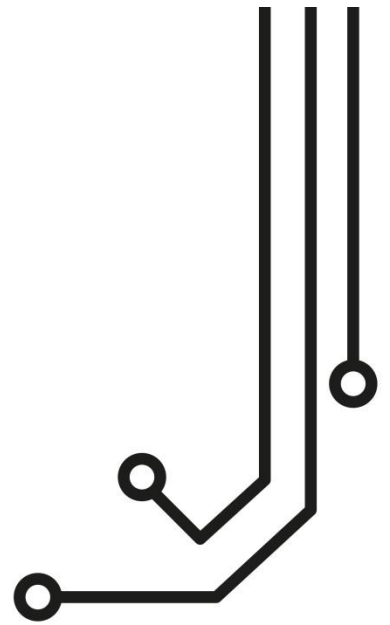
SAIL BOAT



SPORT FISHING



MOTOR BOAT



# **iKREATE NMEA 2000 SIMULATOR**

Installation and instruction Manual



## 1. Introduction

Congratulations on the purchase of your iKreate NMEA 2000 Simulator. This product is designed to allow NMEA2000 data to be simulated or replayed by a simple HTML5 based app that can be opened in any modern browser that supports the Serial Web APIs – Chrome, Opera, MS Edge or Chromium. This means that it can be run on Windows, LINUX, Mac or Raspberry Pi computers.

The USB interface is simple “plug and play” and in most cases does not require any special drivers. iKreate comes with an integral NMEA 2000 cable that can be plugged in to any spare connection on an NMEA 2000 network.

**i** **Simulating NMEA 2000 on a real NMEA 2000 network onboard a vessel can seriously affect the normal and safe operation of the boat’s NMEA 2000 devices. We strongly recommend that the iKreate Simulator is only ever operated as part of a controlled/test NMEA 2000 network in an office or workshop.**

## 2. Before you start

If you need to extend the USB cable of the iKreate simulator, please note that the maximum length of a standard USB cable is 5m, so avoid extending the iKreate USB cable beyond this length.

To install and test the iKreate NMEA 2000 Simulator you will need:

- Suitable tools and connectors to connect the iKreate to the NMEA2000 network
- M3 or M4 screws or other fixings appropriate to the mounting location
- Suitable Windows/Mac/LINUX PC with a spare USB port
- The USB drivers are included in the MAC and LINUX operating systems, but if you are using a Windows computer please install the USB drivers from our “Online CD-ROM” at <https://support.digitalyacht.net>, located in the “NMEA to USB Adaptor Drivers” folder
- Suitable Navigation software running on the Windows/Mac/LINUX PC that can read the converted data

## 3. Installation

Before starting installation select a suitable location for the iKreate. The unit is water resistant; however it should be installed below deck in a dry location. When locating the unit you should consider:

- Routing of NMEA2000 and USB cables to the unit
- Provision of sufficient space around the unit for comfortable cable routing.
- Maintaining the compass safe distance of 0.5m

### 3.1 Connecting to NMEA2000 Network

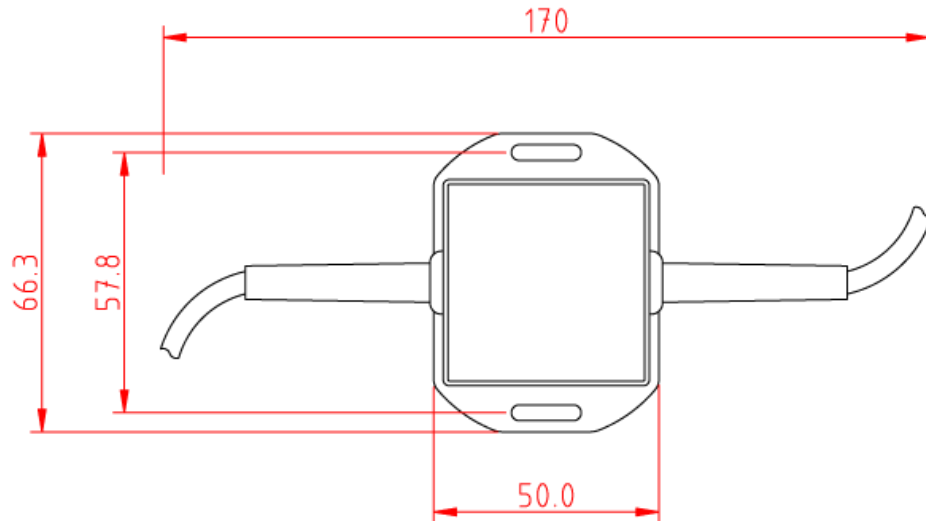
- The iKreate, has an integral NMEA2000 cable terminated with a male connector that is designed to connect straight in to a standard NMEA2000 network via a spare “T-Piece”. If you are creating a new NMEA2000 network, then you may wish to consider [Digital Yacht’s NMEA2000 Starter Kit](#), that provides all of the cables, connectors and terminators required for a basic NMEA2000 network.
- iKreate takes its power and data from the NMEA2000 network.
- If you are connecting iKreate to a non-standard NMEA2000 network, then a suitable adaptor cable will need to be sourced from the relevant manufacturer;
  - SeaTalkNG (Raymarine P/No A06045)
  - Simnet (Simrad P/No 24006199)



### 3.2 Mounting

- The iKreate Simulator has two slotted 4mm Diameter fixing holes. Use suitable fixings (not supplied) to fix the simulator to a flat surface – using the dimensions and details shown in the drawing below. Note that the unit may be installed in any orientation.

Dimension drawing



### 3.3 USB Connection

The iKreate Simulator (USB) has an integral 1m USB cable allowing it to be easily plugged in to any computer with a spare USB type A socket. Before connecting the iKreate Simulator to the PC, it is necessary to install the USB drivers. The exact procedure varies between the different types of Operating Systems that exist for PCs, but the following section details the procedure for the popular operating systems;

#### Windows

Download the drivers from our “Online CD-ROM” at <https://support.digitalyacht.net>, located in the “NMEA to USB Adaptor Drivers” folder.

Once downloaded, right click on the “USB Driver Setup” program and select the option “Run as administrator”. Follow any onscreen instructions until the program has finished and then insert the cable of the iKreate in to a spare USB port on the PC and the Windows “Found New Hardware” wizard should briefly appear while the PC completes the installation.

You may need to enter the Windows Device Manager to find out what COM Port the iKreate has been allocated by Windows. In the Device Manager, the NMEA Simulator should appear in the **Ports COM & LPT** section as a “USB Serial Port (COMx)” where x = the COM Port number allocated by Windows to the iKreate USB. This is the COM port number that you will need to enter in your Navigation Software to tell it where to get the NMEA data from.

For more information on the Device Manager, visit our blog at [www.digitalyacht.net](http://www.digitalyacht.net) and search for “Device Manager”. You should then be able to see an article called “Managing the Device Manager” that explains this process.

#### Mac Os X

If you are using the iKreate USB with a Mac, you will need to install the drivers before connecting the Simulator to a spare USB port on the Mac.



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**LINUX**

The USB drivers for the iKreate USB are already included in the LINUX Kernel and it is simply a case of plugging the Simulator in to a spare USB port on the PC.

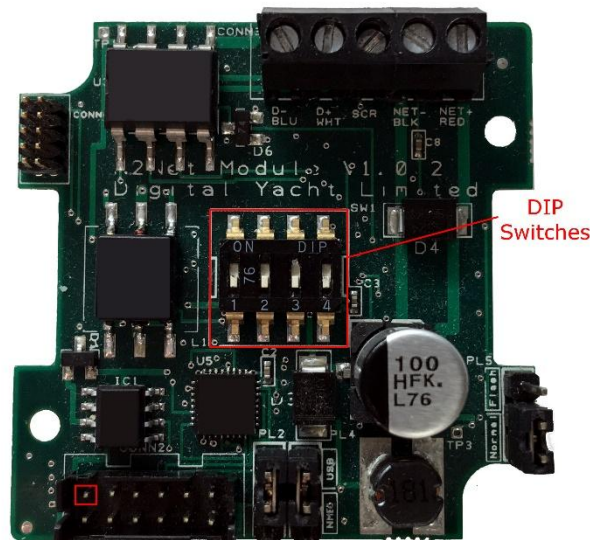
However, recently we have received reports of changes to the way Ubuntu and other LINUX distributions handle COM ports which has caused some problems for our customers. Please visit our blog at [www.digitalyacht.net](http://www.digitalyacht.net) and search for "Ubuntu". You should see an article that explains this issue and how to fix it.

## 4. Operation

### 4.1 Operating Modes

The iKreate Simulator will support a number of different operating modes, which can be configured by changing the positions of four DIP switches inside the unit.

To open the iKreate Simulator, just unscrew the two cross head screws in the base of the unit.



By default iKreate is set to Mode 0, where all of the four DIP switches are OFF. In this mode it will convert all of the common GPS/Nav/Instrument data at 4800 baud.














On the following page is a table showing all of the currently supported modes. In many cases, the default mode will be fine, but if you want iKreate to do a specific conversion i.e. Wind or Heading, or you want to convert more data at a higher baud rate, then select the required mode via the DIP switches.

Once you have set the DIP switches, power cycle iKreate (OFF...wait 2 seconds...ON) and when it powers up, it will be in the selected mode.

The operating modes have been defined to satisfy the installation scenarios most commonly found on pleasure boats. If you have an installation requirement, that is not covered by one of these modes, please let us know.



Table of iKreate Conversion Modes (V2.39 Firmware of higher)...

Switches (1234)	MODE	Interface	BAUD	NMEA DATA	Sentences
	Gateway Mode	NMEA0183	4800	GPS/Navigation/Instruments	RMC, HDG, VHW, MWV, DPT, MTW,MDA, APB, RMB, VLW, XTE, ROT, RSA
	Gateway HS Mode	NMEA0183	38400	GPS/Navigation/Instruments/AIS	RMC, HDG, VHW, MWV,DPT, MTW, MDA, APB, RMB, VLW, XTE,ROT, RSA,VDO and VDM
	GPS Mode (1Hz)	NMEA0183	4800	GPS Only (1Hz)	RMC, GSA, GSV, ZDA
	GPS HS Mode (10Hz)	NMEA0183	38400	GPS Only (10Hz)	RMC, GSA, GSV, ZDA
	Wind Mode (5Hz)	NMEA0183	4800	Wind Only (5Hz)	MWV
	AIS Mode	NMEA0183	38400	AIS + GPS Only	VDO, VDM, RMC, DPT
	Mag Heading Mode	NMEA0183	4800	Heading and Rate of Turn (10Hz)	HDM + ROT
	Instrument Mode	NMEA0183	38400	GPS/Navigation/Instruments (1Hz)	RMC, HDG, VHW, MWV, DPT, MTW,MDA, APB, RMB, VLW, XTE, ROT, RSA
	Depth Mode	NMEA0183	4800	Depth+Water Temp+GPS (1Hz)	DPT, MTW,MDA, VHW, VLW, RMC
	Legacy Autopilot Mode	NMEA0183	4800	Navigation+Wind	APB, RMB, VHW, VWR (from NMEA2000 to NMEA0183)
	N2K Autopilot Mode	NMEA0183	4800	Navigation+Wind	APB, RMB, VHW, VWR + RMC
	True Heading Mode	NMEA0183	4800	Heading and Rate of Turn (10Hz)	HDT + ROT
	For Future Use				
	For Future Use				
	Full Mode	NMEA0183	115200	All Supported Sentences	APB,RSA,VHW,HDG,ROT,DPT,VLW,RMC,XTE,VDR,GSV,GSA,MWV,MWD, MDA,MTW,GGA,VTG,ZDA,VWR,RMB,VDO,VDM
	RAW Mode	N2Net Protocol	230400	RAW NMEA2000 data over serial	RAW NMEA2000 data over serial

Some examples of how these Operating Modes can be used are;

- 1) You have an older DSC VHF that needs GPS data in NMEA0183 format, you can set iKreate to **GPS (1Hz) Mode** and the VHF radio will receive this data from the NMEA2000 network.
- 2) You have an AIS unit with an NMEA0183 Output and you want to use it with a new Chart Plotter that only has an NMEA2000 interface, you can set iKreate to **AIS Mode** and the AIS data will be converted to NMEA2000.
- 3) You have a navigation software package running on a PC/Mac and want to convert all of your NMEA2000 data in to NMEA0183, which is the only format the software supports, set iKreate to **Simulator HS** (High Speed) mode and all of the data NMEA2000 supported by NMEA0183 sentences will be converted.

Note that conversions are in both directions, so for example in Depth Mode, if NMEA0183 Depth data is received it will be converted to NMEA2000 or if NMEA2000 Depth is on the network, then this will be converted to NMEA0183.

For software applications or devices that know how to read NMEA2000 PGNs, we have developed a special “RAW Data” Mode that takes the NMEA2000 binary PGN data and encapsulates it in a Digital Yacht proprietary NME0183 sentence. The same application can also transmit data on to the NMEA2000 network, by sending another proprietary sentence with the binary PGN data back to iKreate.

To set iKreate in to this special “RAW Data” mode, simply set all of the DIP switches to “ON” and all of the NMEA2000 data will be available in the proprietary sentences at 230400 baud.

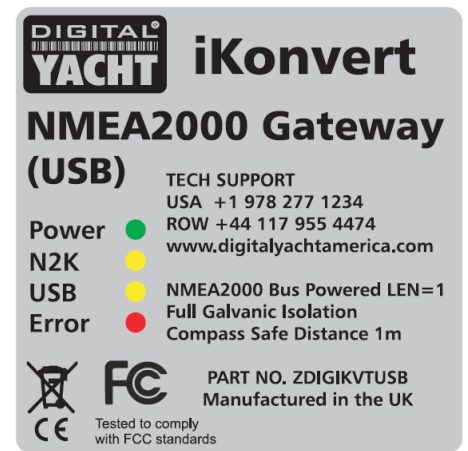
As more modes are added, Digital Yacht will release firmware updates and revisions to this manual.



## 4.2 LED Behaviour

iKreate has four LEDs, which behave as follows;

LED	State	Meaning
Power	ON	iKreate is powered up
N2K	FLASH	NMEA 2000 data being received
USB	FLASH	USB data being received
Error	ON	Serious Error condition contact Digital Yacht



## 4.3 Further Information

iKreate is available in two versions;

- 1) USB version for use with PCs, Macs, Raspbery Pi and LINUX computers
- 2) ISO version with an opto-isolated NMEA0183 interface for use with dedicated hardware

Both versions will run the same firmware and they will support a number of different NMEA0183 conversion modes, plus the “RAW Data” mode that requires software developers to integrate/support it on their applications.

We know of a number of developers who are working on this “RAW Data” Mode integration and it is already compatible with CANBoat and the Node Signal K server.

We have created a dedicated GitHub site for iKreate that will always have the latest Developer’s Guide, Firmware and technical information on iKreate.

<https://github.com/digitalyacht/iKreate>

For iKreate technical support please email [support@digitalyacht.co.uk](mailto:support@digitalyacht.co.uk)