



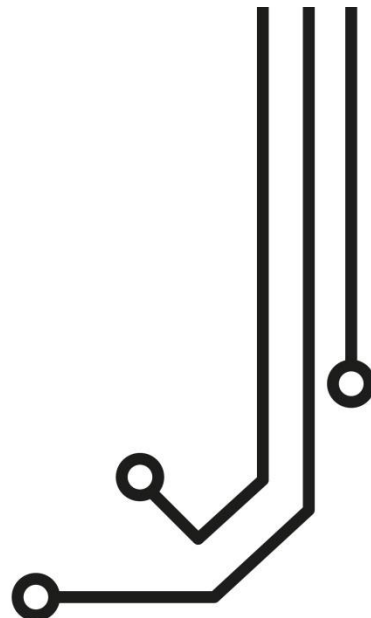
SAIL BOAT



SPORT FISHING



MOTOR BOAT



iKommunicate NMEA - Signalk Gateway

Installation and instruction Manual



1. Introduction

Congratulations on the purchase of your iKommunicate Gateway. It is recommended that your gateway is installed by a professional installer. If iKommunicate is to be connected to the internet via a long range Wi-Fi, 3G/4G or satellite connection, it is recommended that this installation/configuration is carried out by someone with suitable IT experience and knowledge of Ethernet networks.

The iKommunicate can be used in the following configurations;

- 1) Directly connected to a PC or Mac via its supplied network cable in an Ad-Hoc network
- 2) In conjunction with a Digital Yacht iKConnect or iNavConnect wireless router if you do not already have an Ethernet network on your boat
- 3) Connected to the boat's existing Ethernet network via the supplied network cable

 **Before operating the unit you should familiarise yourself with this Quick Start manual and any manuals for the equipment you intend to interface with iKConnect.**

2. Before you start

You will need the following items and tools to complete the installation:

- The iKommunicate Gateway
- RJ45 Cat 5 cable to connect between the iKommunicate and your Ethernet network (supplied)
- A connection to the boat's 12v DC supply where the unit is to be installed.
- Four screws for fixing the iKommunicate in a suitable mounting location.

To test and configure the iKommunicate you will need:

- A PC, Mac, iPhone/iPad or other wireless device that has a web browser such as IE, Chrome, Firefox, etc.

To connect the iKommunicate to the internet to check and download firmware updates, you will need:

- Your boat's Ethernet network to have a long range Wi-Fi, 3G/4G or satellite connection to the internet
- A standard RJ45 Network cable (supplied)

To update the iKommunicate firmware when you do not have an internet connection on the boat you will need:

- A cross head screw driver to remove the iKommunicate plain end cap
- A computer with an SD card slot or USB Card Reader and if required the micro SD adaptor (supplied)

To interface the iKommunicate to your boat's navigation systems, then you will need;

- A spare "T Piece" connection to the NMEA2000 network
- An adaptor cable if connecting to SeaTalkNG (Raymarine P/No A06045) or Simnet (Simrad P/No 24006199)
- Additional multi-core cable (Alarm/Signal Cable is suitable) for NMEA0183 connections

3. Installation

Before starting installation select a suitable location for the iKommunicate Gateway. The unit is designed for below deck mounting on board a boat and is not water resistant. It should be installed in a cool, dry location and can be mounted on a vertical or horizontal surface. When locating the unit you should consider:

- Routing of power, data and network cables to the unit.
- Provision of sufficient space around the unit for cable connections.
- Maintaining the compass safe distance of 0.5m.
- Visibility of status LEDs



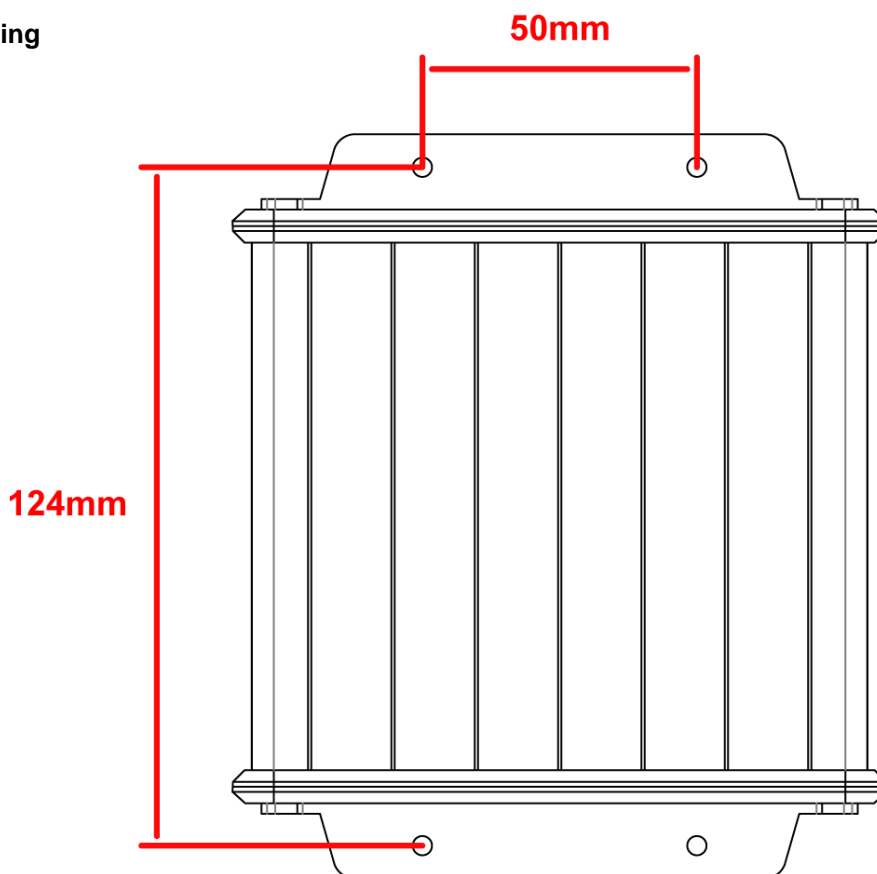
3.1 Preparation

- The only critical consideration in siting iKommunicate is if you are connecting it to an NMEA2000 network (SeaTalkNG/Simnet). We supply an integral 1m NMEA2000 cable and ideally you should connect this directly to a spare "T Piece" on the NMEA2000 network's "backbone". You can purchase and fit a 3rd party NMEA2000 extension cable, but the total drop cable length between iKommunicate and the "T piece" should be 5 meters or less.
- The supplied 1m network cable will need to be connected to the boat's wireless router or network switch. If you need to fit a longer network cable, then we recommend that the cable is a shielded Cat6 SFTP network cable, which are slightly more expensive than normal unshielded network cables, but are less prone to crosstalk and electrical interference in the "noisy" confines of a modern boat's nav station.

3.2 Mounting

- iKommunicate has 4 x 4mm Diameter fixing holes. Use suitable fixings (not supplied) to fix the iKommunicate 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 DC Power (12V or 24V)

- Provide power connections to the unit from the boat's supply. Power is connected to the iKommunicate via the integral Power/Data cable. The Red wire is the positive (+) connection and the Black wire is the negative (-) connection. Connect the wires to the nearest source of primary 12V or 24V DC power. **Ensure that the supply is connected via a suitable 1A fuse or circuit breaker.** Add the fuse in the positive power connection to the unit if necessary.



3.4 NMEA0183

- The following steps only need to be followed if you are connecting the iKommunicate to other equipment using NMEA0183 interfacing
- iKommunicate has three NMEA0183 Inputs and two NMEA0183 Outputs. All of the connections are brought out on the Power/Data cable and a table showing the wire colours is shown below;

Wire colour	Description	Function
RED	Power in +	Power supply connections
BLACK	Power in -	
ORANGE	NMEA0183 port 1 TX+	Low speed NMEA0183 Output (4,800 baud)
BROWN	NMEA0183 port 1 TX-	
LIGHT BLUE	NMEA0183 port 1 RX+	Low speed NMEA0183 input (4,800 baud)
GREY	NMEA0183 port 1 RX-	
PINK	NMEA0183 port 2 TX+	Low speed NMEA0183 Output (4,800 baud)
VIOLET	NMEA0183 port 2 TX-	
YELLOW	NMEA0183 port 2 RX+	Low speed NMEA0183 input (4,800 baud)
GREEN	NMEA0183 port 2 RX-	
BLUE	NMEA0183 port 3 RX+	High speed NMEA0183 input (38,400 baud) <i>Ideal for connecting AIS</i>
WHITE	NMEA0183 port 3 RX-	

- iKommunicate can receive the following NMEA0183 Sentences and convert them to Signal K;

Sentence	Description
APB	Heading Track Controller (Autopilot) Sentence B
DBT	Depth Below Transducer
DPT	Depth
GLL	Geographic Position Lat Long
GSV	GNSS Sats in view
HDG	Heading Deviation and Variation
HDM	Heading Magnetic
HDT	Heading True
MTW	Water Temperature
MWV	Wind Speed and angle (relative and theoretical)
RMB	Recommended Minimum Navigation Info
RMC	Recommended Minimum Specific GNSS Data
RSA	Rudder Sensor angle
VHW	Water Speed and Heading
VLW	Dual Ground/Water Distance
VTG	Course over Ground and Ground Speed
VWR	Relative (apparent) Wind Speed and Angle
XTE	Cross track Error Measured



- iKommunicate will also retransmit all NMEA0183 data that it receives on to the Ethernet network via TCP or UDP. The TCP or UDP connections must be enabled in the Web Interface (default is OFF) but once enabled, all sentences (not just the ones in the previous list) will be retransmitted.
- It is also possible for NMEA0183 TCP data received from a network device to be retransmitted to one of the NMEA0183 Outputs for driving an autopilot. This must be configured in the Web Interface and only one device/app can drive an autopilot at a time.

3.5 NMEA2000

- The following steps only need to be followed if you are connecting the iKommunicate to other equipment using NMEA2000 (SeaTalkNG/Simnet) interfacing
- iKommunicate has an N2Net connection which is Digital Yacht's NMEA2000 compliant interface. To connect to other NMEA2000 products, simply find or add a spare NMEA2000 "T" piece on the existing NMEA2000 network and connect the AIT2000 N2Net connector to the "T" piece.
- The N2Net cable is just over 1m long and is terminated in an NMEA2000 Micro Male Connector.
- The AIT2000 does not take any power from the NMEA2000 network
- For connection to a Raymarine SeaTalkNG network a SeaTalkNG to Device net female adaptor cable will be required (Raymarine Part No. A06045)
- For connection to a Simrad Simnet network a Micro C female to Simnet adaptor cable will be required (Simrad P/No 24006199)
- iKommunicate can receive the following NMEA2000 PGNs and convert them in to Signal K;

PGN	Description
127245	Rudder
127250	Vessel Heading
127251	Rate of Turn
127258	Magnetic Variation
128259	Speed Water Referenced
128267	Water Depth
128275	Distance Log
129025	Position, Rapid Update
129026	COG SOG, Rapid Update
129029	GNSS Position
129033	Time and Date
129044	Datum
129283	Cross Track Error
129284	Navigation Data
130306	Wind Data
130310	Environmental Parameters
130316	Temperature
127488	Engine Parameters, Rapid Update
127489	Engine Parameters, Dynamic



PGN	Description
127493	Transmission Parameters
127505	Fluid Level
127506	DC detailed Status
127508	Battery Status
127513	Battery Configuration Status
129038	AIS Class A Position Report
129039	AIS Class B Position Report
129794	AIS Class Static and Voyage Related Data
129809	AIS Class B Static Related Data
129810	AIS Class B Static Data Report

- iKommunicate will also convert some of the data coming in on NMEA2000 in to NMEA0183 sentences that it outputs the network as TCP and/or UDP data. Currently only the following limited number of popular sentences are output;

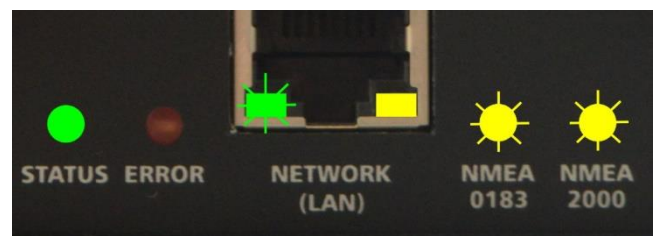
Sentence	Description
DPT	Depth
GLL	Geographic Position Lat Long
GSV	GNSS Sats in view
HDG	Heading Deviation and Variation
VTG	Course over Ground and Ground Speed
VDM	AIS Data

3.6 Networking

- iKommunicate is designed to be connected to a normal wired Ethernet network (10 or 100Mbps) via its RJ45 connector and the supplied network cable. By default it will try to automatically obtain a network address via DHCP and self assign itself an IP address if its DHCP request fails. It can also be configured via its web interface to use manual (static IP) network settings.
- If you need to use a longer network cable, we recommend using a shielded Cat5e SFTP cable.

3.7 Powering Up

- Make one last check that all of the connections are correct and then apply power to iKommunicate
- After 1-2 seconds, there should be some LED activity and if iKommunicate connects to the Ethernet and NMEA2000 networks correctly after about 10 seconds the LEDs should be as shown





4. Configuring iKommunicate

- Once iKommunicate has got an IP address on the network, you will need to “discover” what IP address it has. iKommunicate supports two network Discovery services; Windows SDDP and mDNS (also known as Bonjour).
- If you have a Windows Laptop on the same network, simply open Windows Explorer, go to your Network and, as long as you have network discovery turned on, you will see “iKommunicate” listed as a network device.
- Double clicking “iKommunicate” will open your browser and display the iKommunicate Web interface (see Fig1).

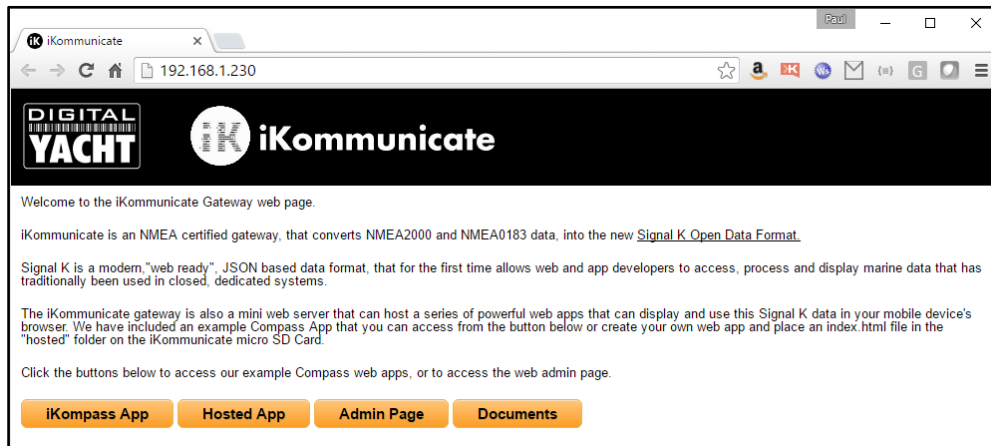


Figure 1

- If you are using LINUX, open a terminal and use Avahi to browse for network devices. The command is **avahi-browse -a** or if you want to see all of the information **avahi-browse -a -r** to resolve all of the discovered data.
- For iOS, we recommend a free Bonjour App called “Discover” or one called “Fing” which scans the network rather than uses Bonjour.
- For Android the best free app to use is “Bonjour Browser” which is also available for Windows and Mac.
- Once you have discovered the IP address of iKommunicate, type this in to the address bar of your browser and this will bring up the iKommunicate web interface as shown in Fig.1.
- To configure iKommunicate, click on the “Admin Page” button and you will see the web page shown in Figure 2.

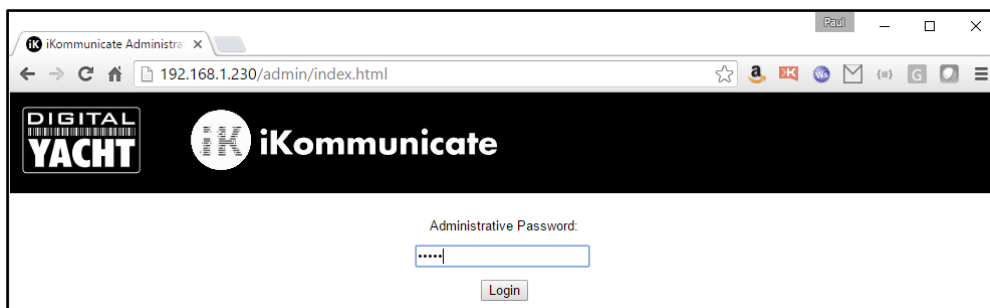


Figure 2

- The password to login to the “Admin Page” is **admin** and once logged in you will see the page shown in Fig 3.
- The web interface has a number of different “tabs” (pages) that can configure iKommunicate, monitor the NMEA data and also update the iKommunicate firmware (if connected to the internet).

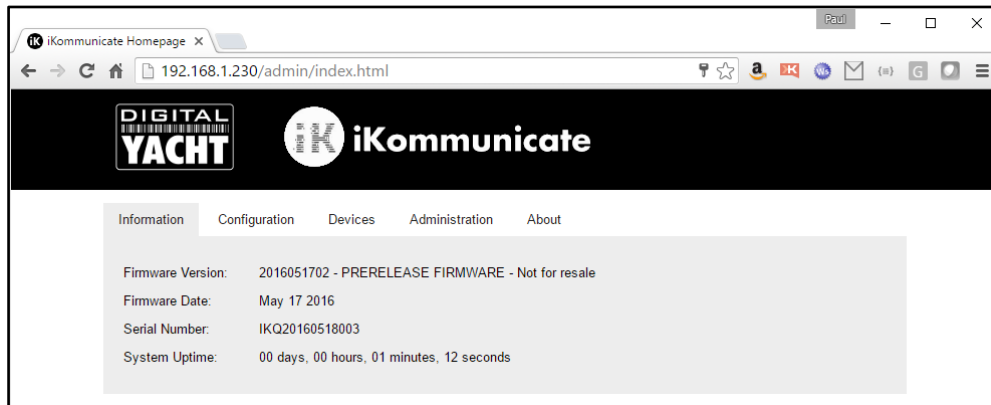


Figure 3

- The "Configuration" tab allows you to configure a number of different settings including;
 - Your boat's MMSI and Boatname plus iKommunicate's network Hostname
 - Whether iKommunicate uses an automatic (DHCP) IP address or a fixed (static) one
 - The baud rates of the three NMEA 0183 ports (also displays the sentences received)
 - Enabling NMEA0183 Output on Port 1, 2 or over the network via TCP/UDP

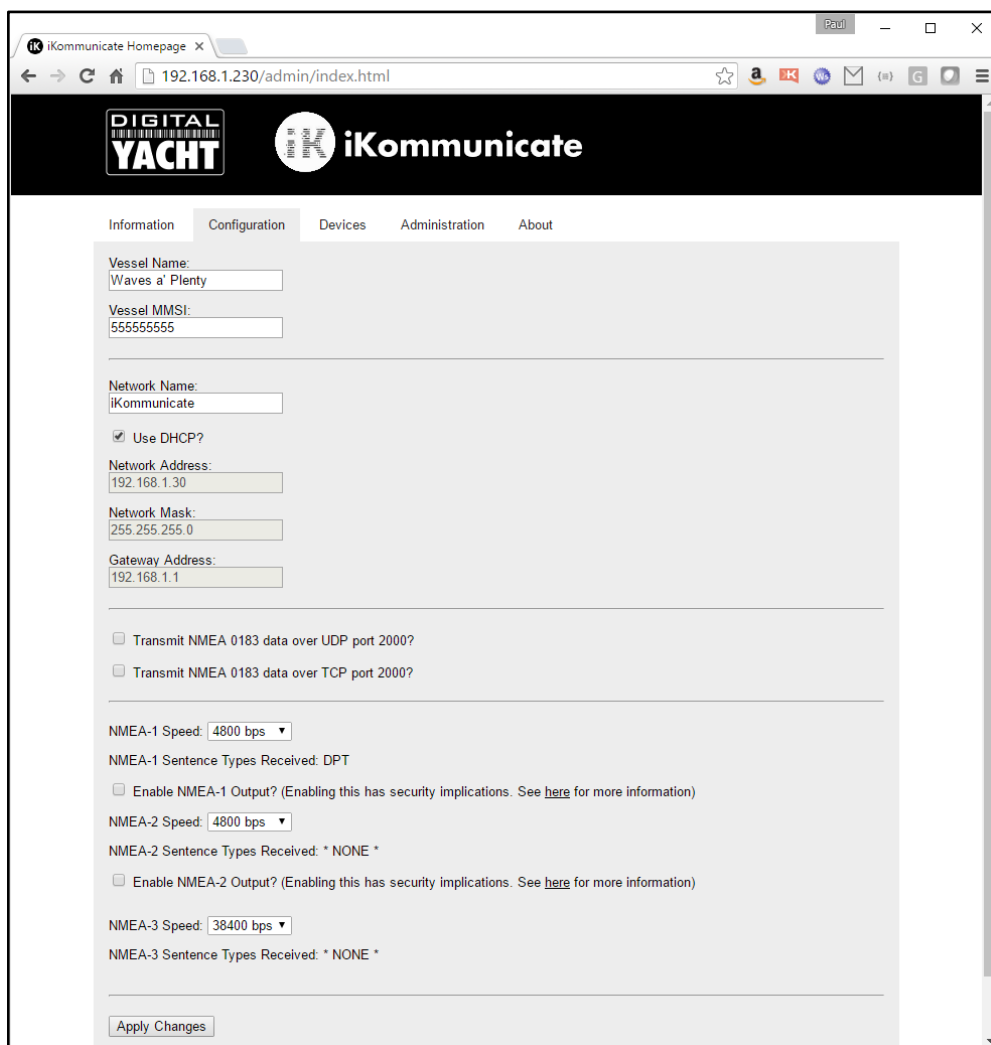
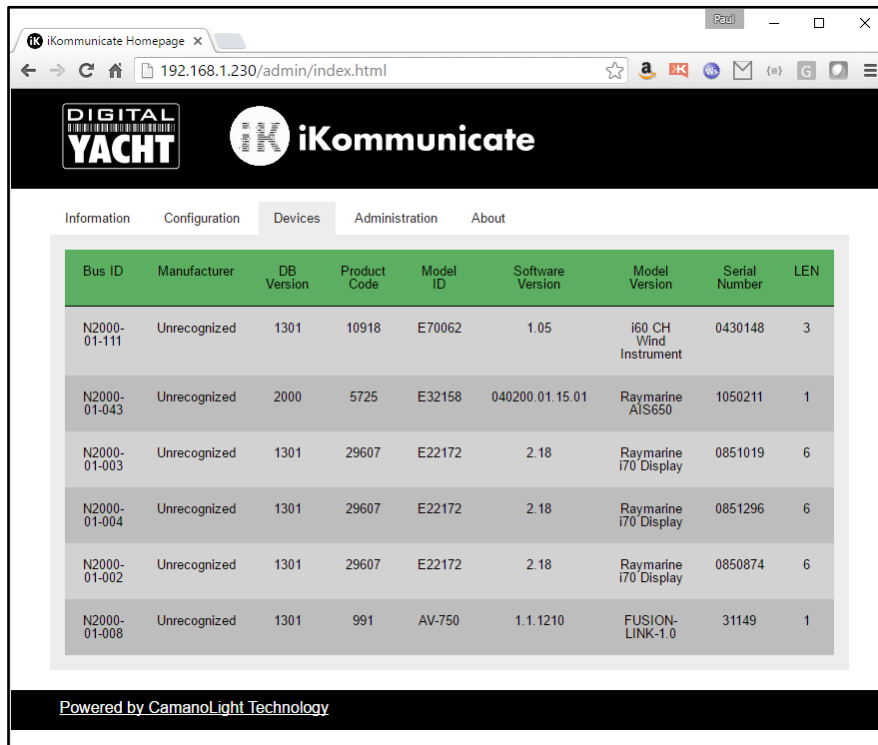


Figure 4



- The “Devices” tab lists all of the devices on the NMEA2000 network as shown below in Fig 5.

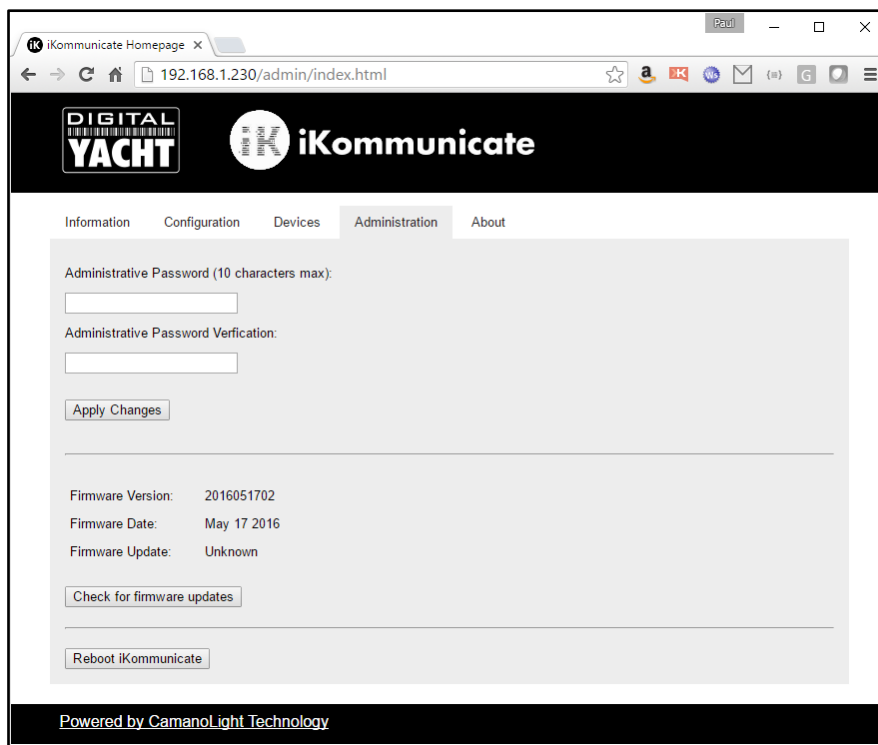


Bus ID	Manufacturer	DB Version	Product Code	Model ID	Software Version	Model Version	Serial Number	LEN
N2000-01-111	Unrecognized	1301	10918	E70062	1.05	i60 CH Wind Instrument	0430148	3
N2000-01-043	Unrecognized	2000	5725	E32158	040200.01.15.01	Raymarine AIS650	1050211	1
N2000-01-003	Unrecognized	1301	29607	E22172	2.18	Raymarine i70 Display	0851019	6
N2000-01-004	Unrecognized	1301	29607	E22172	2.18	Raymarine i70 Display	0851296	6
N2000-01-002	Unrecognized	1301	29607	E22172	2.18	Raymarine i70 Display	0850874	6
N2000-01-008	Unrecognized	1301	991	AV-750	1.1.1210	FUSION-LINK-1.0	31149	1

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Figure 5

- The “Administration” tab is where you can change the password for accessing the Admin Web Interface and also check for firmware updates and download them (requires the network to have internet an connection).



Administrative Password (10 characters max):

Administrative Password Verification:

Firmware Version: 2016051702
 Firmware Date: May 17 2016
 Firmware Update: Unknown

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Figure 6



5. iKommunicate Features

iKommunicate is primarily designed to convert NMEA data in to Signal K data, so that Signal K apps and servers can access the boat's NMEA data. However, to get you started, we have pre-loaded a couple of Signal K Apps that you can play with "straight out of the box". To access these apps, type the IP address of iKommunicate in to your browser and you should see iKommunicate's Home page again (Fig 7).

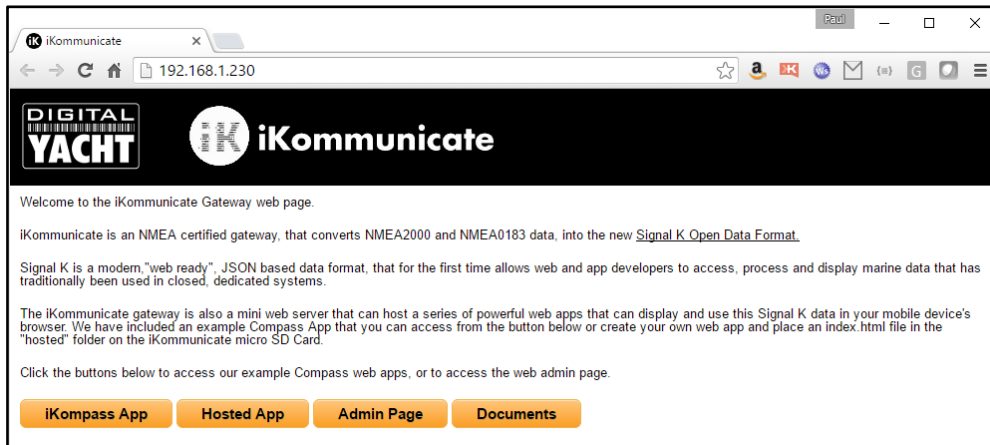


Figure 7

5.1 iKompass App (Embedded)

Clicking the "iKompass App" button on the home page will display Digital Yacht's embedded App. iKompass is stored in iKommunicate's flash memory along with the firmware and will always be available even if the micro SD card is removed.

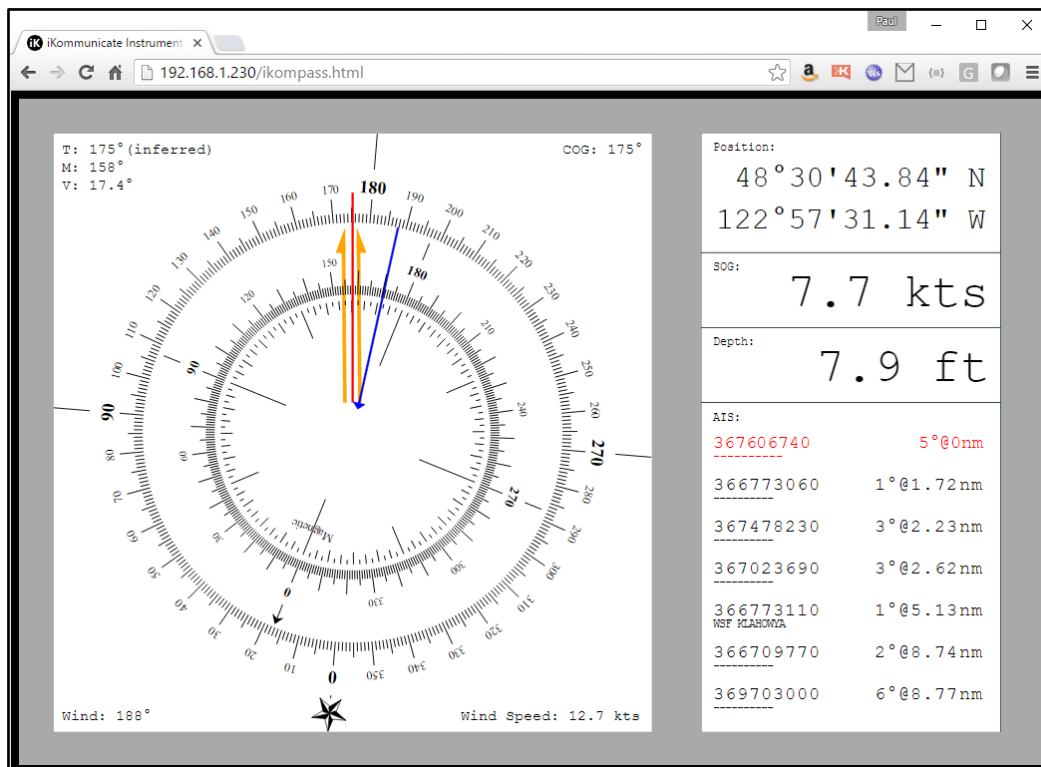


Figure 8



iKompass reads the Signal K data and assuming that all of the information it needs is available, displays a compass rose with the boat's COG, heading and wind direction (and speed). On the right side of the screen is the boat's current position, SOG and Depth and a list of the seven nearest AIS targets, with range and bearing.

5.1 Instrument Panel App (Hosted)

Clicking the "Hosted App" button on the Home page displays the Index.html page in the "hosted" folder on the iKommunicate's micro SD Card – see section x.x for details of how to access the micro SD Card.

It is intended that users will be able to store their favourite Signal K Web Apps on the SD Card and then use iKommunicate as a simple web server to serve up the web apps and the data they require.

We have included a copy of the popular Instrument Panel web app that is written and maintained by the Signal K development team. It is an open source web app with all of the sources and documentation available at...

<https://github.com/SignalK/instrumentpanel>

To access a hosted app, click on the "Hosted App" button on the Home page and the Index.html page in the "hosted" folder on the micro SD Card will be displayed (see Fig.9).

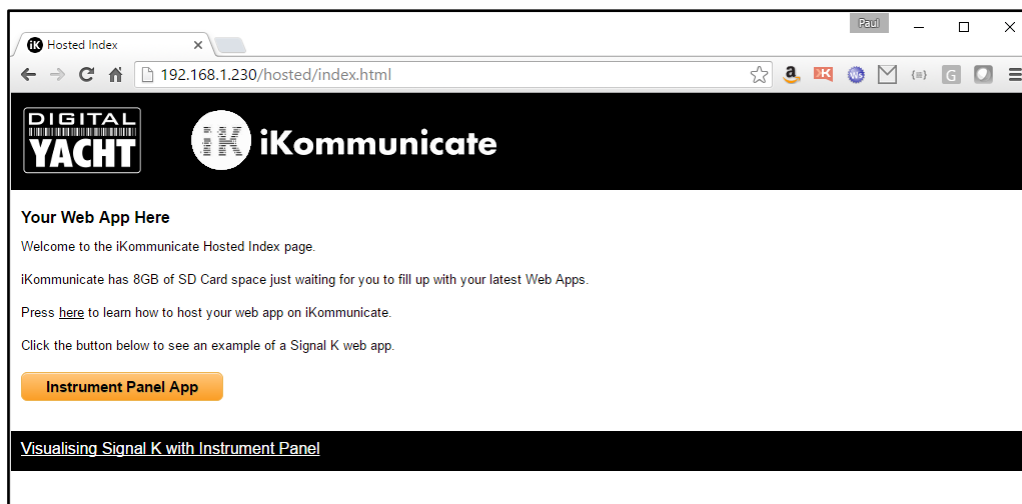


Figure 9

If you have played with HTML, then you will find it very easy to edit this Index.html landing page and add your own buttons to link to additional Web Apps that you copy in to the "hosted" folder on the micro SD Card.

Instrument Panel is a very flexible app that can display most of the data that Signal K currently supports and as such provides a good method of checking what data is available on your boat's NMEA networks. When you run Instrument Panel for the first time, it will display a screen like the one in Fig.10.

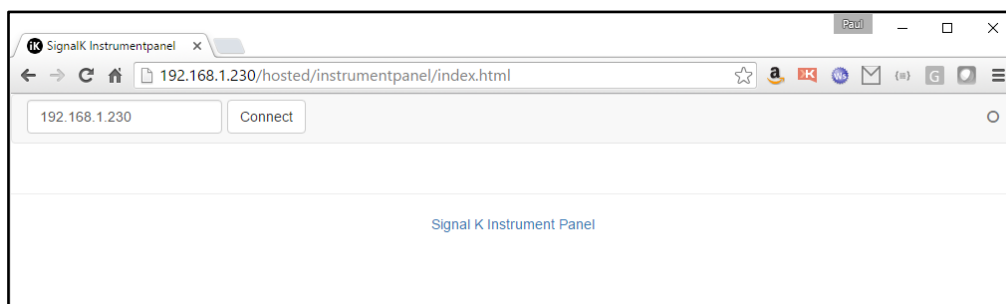


Figure 10



Instrument Panel will automatically set the correct IP address for iKommunicate, so you can just click the “Connect” button and see what data is available from iKommunicate (Fig.11).

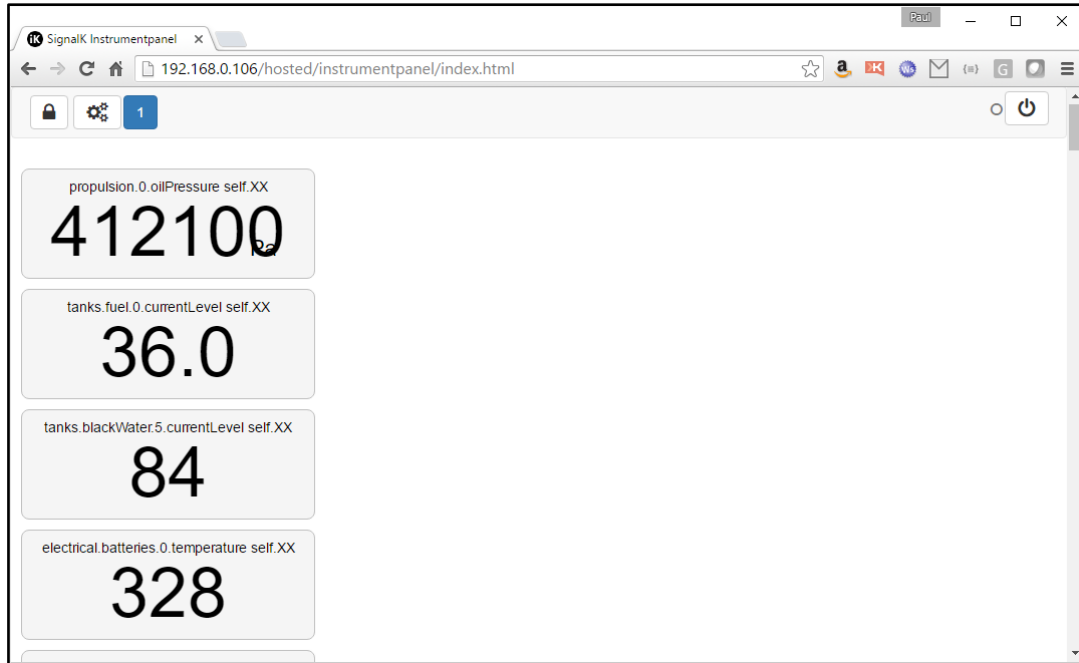


Figure 11

Each data reading is shown in a different panel and these will scroll all the way down the page. The panels are fully editable and you can decide which ones are visible, stretch and drag them around the page, set what units they are displayed in and whether they are Digital or Analogue gauges.

Step 1 - Choose what panels to display by clicking the  button and you will see the page shown in Fig.12.

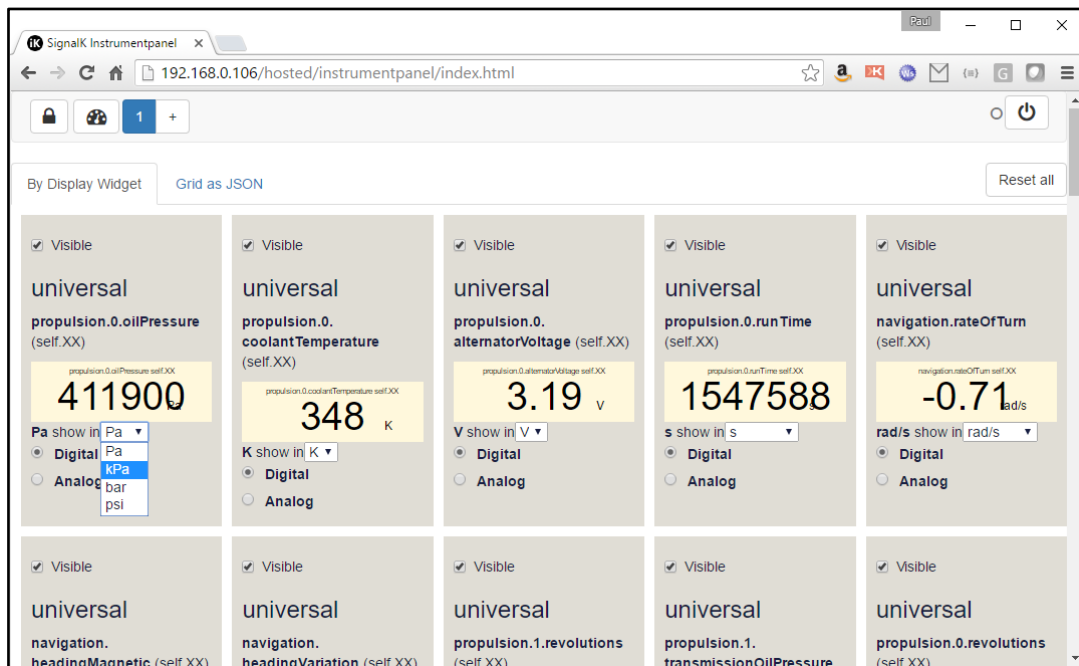


Figure 12



From this page you can set three things for each panel;

1. Whether the panel is visible by un-ticking the "Visible" check box
2. The type of panel either Digital or Analogue
3. The units the panel displays from the drop down box

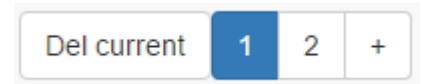
Once you have finished configuring the panels, click the



icon to return to the normal screen and see your changes, which will be automatically stored.

Also in the Settings page you can add additional pages and have a different set of panels on each page i.e. a Navigation set, a Propulsion (Engine) set and an Electrical set.

To Add a new page, click on the + button next to the Blue button with a 1 in it and a new Page 2 will be added. Also a new "Del Current" button will appear so that you can delete the current page if you need to



Finally in the Settings page, there is a

Reset all

button, which as the name suggests deletes all of the stored settings for Instrument Panel.

Step 2 - Resize and Position your panels by clicking the



icon and the panels will turn yellow as in Fig.13

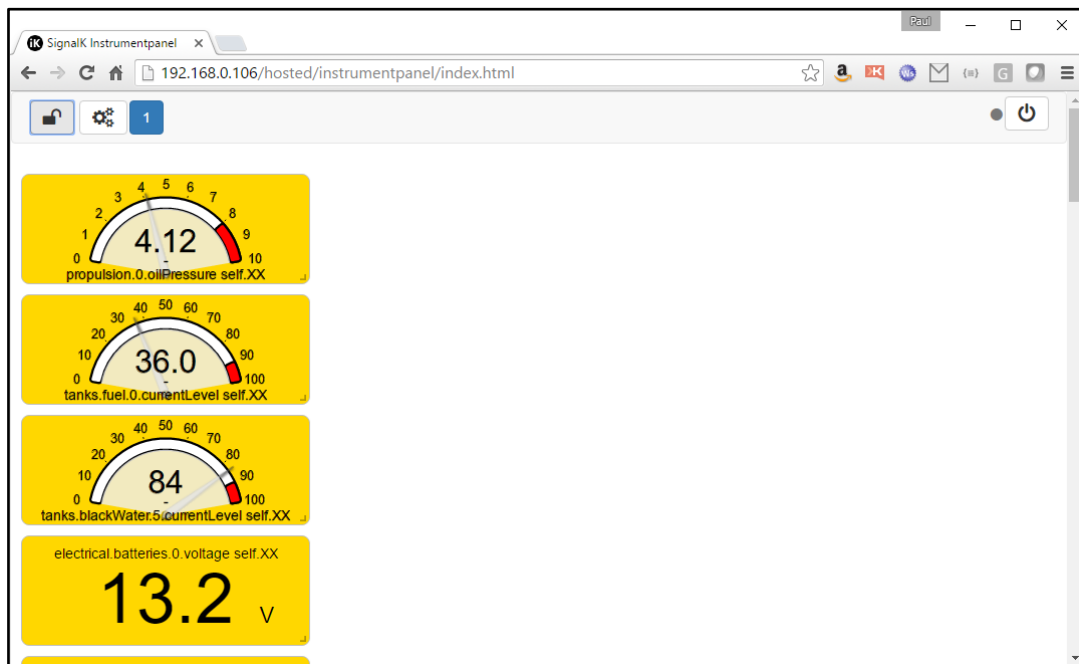


Figure 13

Now you can click on a panel, drag it in to the position (row/column) you want or click and drag the bottom right corner of a panel to resize it. All of the changes you make are specific to that page and will be stored as soon as you click the Padlock icon again.

In Figures 14 and 15 you can see two typical pages.

In the top right hand corner of Instrument Panel are a Power Icon and a data indicator



The Power Icon closes the websocket connection between Instrument Panel and iKommunicate, while the data indicator flashes each time a new Delta message is received.

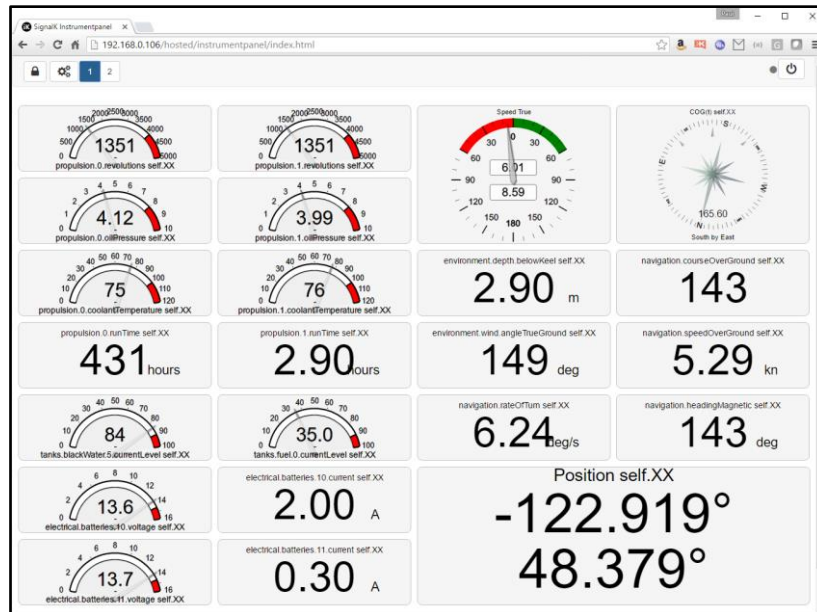


Figure 14

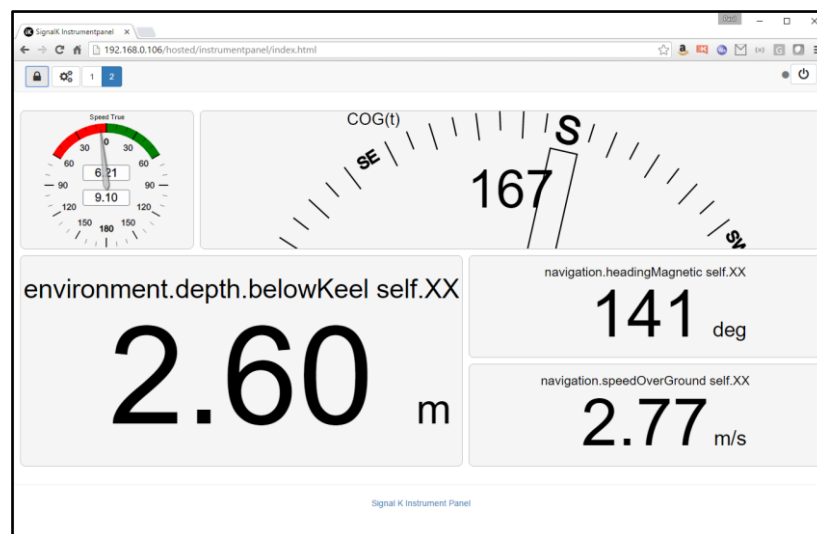


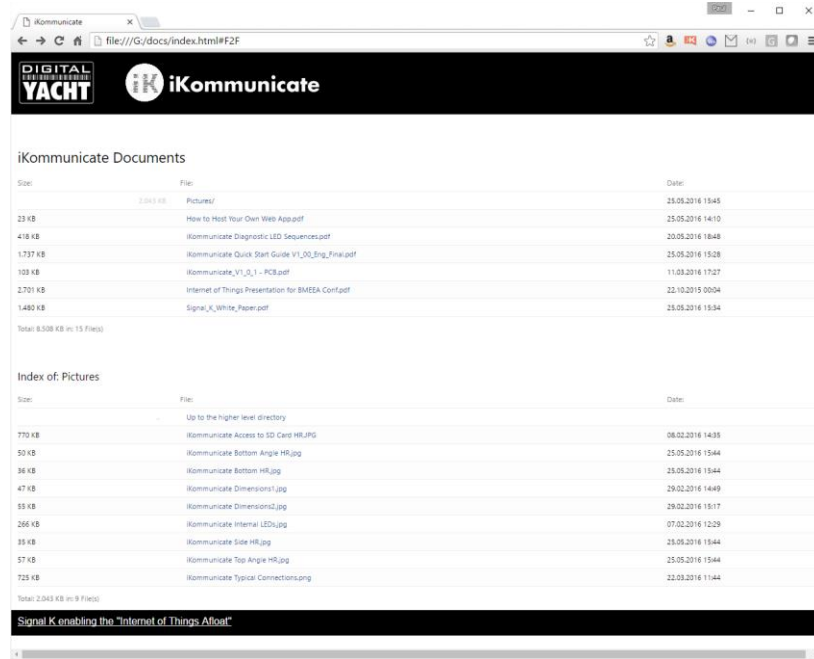
Figure 15

5.3 Document Storage

Clicking the “Documents” button on the Home page, will display the contents of the “docs” folder on the iKommunicate micro SD Card. We have included some useful documents and pictures on iKommunicate and Signal K (including this manual) and you can click on any of the document links to display the PDF, JPG or PNG file in your browser.

If you are experienced in HTML, it is fairly easy to edit the Index.html file in the docs folder and add your own documents and links. There are also some useful tools available online to generate the Index.html file with all of the links to whatever files you include in the docs folder. We used [Arclab Dir2HTML](http://www.dir2html.com/) which is a very simple, yet powerful indexing tool but there are other tools available, including some free ones.

Fig.16 below shows the list of documents included on the SD Card. The top table is the main Documents folder and the bottom table is the Pictures sub-folder.



The screenshot shows the iKommunicate web interface. At the top, there's a header with the Digital Yacht logo and the iKommunicate logo. Below the header, there's a section titled "iKommunicate Documents" which contains a table of files. Below this, there's another section titled "Index of: Pictures" which contains a table of image files. Both tables have columns for "Size", "File", and "Date".

Size	File	Date
23 KB	How to Host Your Own Web App.pdf	25.05.2016 13:45
418 KB	iKommunicate Diagnostic LED Sequences.pdf	25.05.2016 14:10
1.737 KB	iKommunicate Quick Start Guide V1_00_0mg_Final.pdf	25.05.2016 15:28
103 KB	iKommunicate_V1_0_1 - PCB.pdf	11.03.2016 17:27
2.701 KB	Internet of Things Presentation for BMEEA Conf.pdf	22.10.2015 00:04
1.480 KB	Signal_K_White_Paper.pdf	25.05.2016 15:34
Total: 6.508 KB in 15 Files		

Size	File	Date
770 KB	Up to the higher level directory	
770 KB	iKommunicate Access to SD Card HR.jpg	08.02.2016 14:35
50 KB	iKommunicate Bottom Angle HR.jpg	25.05.2016 15:44
36 KB	iKommunicate Bottom HR.jpg	25.05.2016 15:44
47 KB	iKommunicate Dimensions1.jpg	29.02.2016 14:49
55 KB	iKommunicate Dimensions2.jpg	29.02.2016 15:17
266 KB	iKommunicate Internal LED.jpg	07.02.2016 12:29
35 KB	iKommunicate Side HR.jpg	25.05.2016 15:44
57 KB	iKommunicate Top Angle HR.jpg	25.05.2016 15:44
725 KB	iKommunicate Typical Connections.jpg	22.03.2016 11:44
Total: 2.043 KB in 9 Files		

Figure 16

Then once you click on the file you wish to look at, it will open in your browser (see Fig.17).



Figure 17