

# "Alexa, sail my boat"



















# What we will focus on today

- The Mobile App Revolution
- Interfacing
- Internet on Board
  - Long Range Wi-Fi
  - 3G/4G Broadband
- The "Internet of Things" Afloat



# **Apps + Interfacing**

Using Apps to make your Mobile Device do more on your boat....

"Data, data everywhere!"

April 2018



#### **Latest Mobile Device Statistics**

- 99% of devices use Android or iOS
- Q4/2016 sales
  - 350 Million Android Devices
  - 80 Million iOS Devices
- 77% of US adults own a Smart Phone and 51% own a Tablet
- Over 25 Billion iOS apps and 90 Billion Android apps were downloaded in 2016
- With stats like this, it is hardly surprising that so many boat owners have smart phones and tablets and want to use them onboard







#### digital YACHT

# Why bother?

- The existing dedicated MFDs and other marine electronics are still as good as ever at what they do
- Mobile devices and Apps are becoming popular for many reasons;
  - Cost
  - Portability
  - Multi-Purpose
  - Back-up







# **This or That ?**

#### £1000 – Axiom 9





£300 - 9.7" iPad Pro





# **An Extremely Powerful Package**

- Large Colour Screen
- GPS + Compass
- 9 Axis Accelerometer
- Camera
- Wi-Fi
- 32GB Storage





#### **Best Marine Apps**

- Things are constantly changing in the app world and keeping up to date takes time and commitment
- Digital Yacht maintain a list of the apps customers are using with our products which can be downloaded from here...
  - Best Marine Apps for iOS V1.06
  - Best Marine Apps for Android V1.06







# What a Tablet/Smart Phone Cannot Do

- Measure Depth
- Make VHF Calls
- Live AIS data
- Work below deck
- Measure Wind

"But combine it in a system like this and everything is possible with a suitable App"





#### Interfacing...

- To get data in to a mobile device it really needs to be wireless
- Apple makes Bluetooth possible but expensive and bureaucratic
- Wi-Fi has become the most common method





#### What is Wireless NMEA?

- Wireless NMEA is traditional NMEA0183 data sentences converted to network packets
- This "open" standard is already supported by many apps and new apps are constantly being released that support this data format
- A complete NMEA0183 sentence is stored in one network packet for reliability...





IP Payload

<\$GPRMC,092750.000,A,5321.6802,N,00630.3372,W,0.02,31.66,280511,,,A\*43>



### **TCP versus UDP**



### **Upgrading Legacy Systems...**



- In the current economic climate, many customers are choosing to upgrade what they have instead of buying new boats/systems
- Any legacy navigation system from Raymarine, Garmin, Furuno, Navico, etc. that has an NMEA output can be upgraded to wireless





















# **Example Wireless Instrument System...**

- Most installations have an NMEA0183 output
- The red dots show two possible places where our WLN10 could connect in this Raymarine system
- Simple two wire connection
- Data is at standard 4800 baud
- Instrument, Navigation and GPS data will be available



#### SeaTalk – No Problem...



- Our latest interface, released to fill the space left by the E85001
- Indicator LEDs to show NMEA/USB and SeaTalk data being received, fully opto-isolated and multi-stage transistor SeaTalk interface
- ISO (NMEA0183) and USB Versions available
- Powered from SeaTalk bus



ST-NMEA ISO Cable



# **Internet Onboard**

Staying Connected in the Modern World or.... "How to keep the family happy!"



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#### Don't take away my internet...

The Internet is part of our every day life and can cause real problems and anxiety when we are disconnected

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What we take for granted at home, in the office or even when travelling is a challenge to achieve on a boat but not impossible



# Getting online, onboard...

- 1. Long range Wi-Fi
- 2. 3G/4G Mobile Network
- 3. Satellite Broadband







## **Everything has a cost...**

	Wi-Fi	3G/4G	Sat
Range (typical)	1 Mile (from Hotspot)	15 Miles (from Array)	Unlimited
Coverage	All major Marinas and Towns	Good/Improving in many areas	Worldwide
Speed (typical)	> 1Mb/sec	<20Mb/sec	2Mb/sec
Cost (typical)	£5 per day (unlimited)	£25 per month for 30GB roaming	\$1-\$6/MB (VSat)

### Links in a Chain...





# 3G/4G Solution...

- Allows you to connect to your mobile phone network up to 15-20 miles off-shore using 3G/4G (LTE) broadband
- Standard antennas are good for most installations but for non-GRP hulls or if you want the best possible reception fit external "pro" antennas
- In areas where 3G/4G coverage is good this is the best solution
- Avoids "rush hour" marina slowness





# **Practical Tips...**

- Change the SSID and Password of the your wireless router
- Don't wind up the transmit gain on Long Range Wi-Fi
- Be careful on "Open" networks
- Turn off all heavy data features



# The "Internet of Things" Afloat

The connected boat...

"Alexa have I said something to upset you?"



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#### What is the "Internet of Things"?...





The Internet of Things (IoT)....

"A proposed development of the Internet in which everyday objects have network connectivity, allowing them to send and receive data."



### The Classic "Internet of Things" Example...

- The Internet of Things covers an extremely wide variety of devices and applications but the classic example is "the smart fridge"
- Any sensor or device connected to the internet and sending information to other devices or a cloud server is part of the "Internet of Things"
- An actual marine example.... Digital Yacht's Sonar Server
  + Navionics App collecting crowd sourced Depth data







#### "IoT" is Going to be BIG...



Source: Mario Morales, IDC



# Let's be part of the "IoT" Revolution...

- So, we have...
  - A Boat
  - An Internet connection (albeit temporary)
  - A set of Devices and Sensors (Instruments, Engine Gauges, MFDs, Autopilots, DSC Radio, GPS, etc.)
- So let's start transmitting and receiving data...





### **NMEA Data Standards**



- The NMEA0183 standard is over 30 years old and even the "latest" NMEA2000, as the name suggests, is over 15 years old
- Both standards have proven very "fit for purpose" and will continue to be used for many years to come
- Neither 0183 or 2000 are data formats suited to this new mobile and internet enabled world that we find ourselves in
- Developers that wish to use NMEA data, must join the NMEA, purchase the specifications, test tools, manufacturer code, product codes, etc. and this can add up to thousands of dollars





- A few years ago, a group of software developers, with a love for boating decided to create a new, modern, open data format for boats
- The name Signal K comes from the blue and yellow Maritime Signal Flag (K – Kilo), which means

"I Wish to Communicate with you"



- The Signal K data format is based on JSON, the most popular method of communication between web apps and web servers
- Any developer can find the free specification on the Signal K website and start developing their own Signal K apps and services at no cost



#### How does it connect together?





#### In-Built Web Apps...









Depth (K)	Speed
11.4	20.0
Meters	Knots
Heading (M)	Wind (App)
181	012-22
Degrees	Knots

# **On Board Web Server**



- Any developer can create Web Apps for iKommunicate and its easy to modify the open source code we have published on GitHub
- iKommunicate can store manuals, drawings and photos of the boat, and view on any device with a browser – great for boat builders
- Web pages can easily be branded and customised by any web designer



No more handbooks to clutter up the boat!





#### **Remote Access...**

- Getting the new iKommunicate Alexa Skill working was a challenge
- Unless you have an expensive Fixed IP address SIM, then most 3G/4G mobile devices cannot be remotely accessed
- We created a Cloud Service <u>http://ikommunicate.cloud</u> which allows the 4GConnect to "dial out" and become remotely accessible





### **Once Connected Anything's Possible...**

- Alexa is a fun toy but the remote connection was the key goal
- Now it is possible to access iKommunicate and the boat's data anywhere in the world
- Learn more about iK and the Signal K technology that powers it at... http://ikommunicate.com

