

QK-A012 Wireless GPS Receiver Manual



Designed in UK



Features

- 50 Channels “All-In-View” Tracking
- Position accuracy of 2.5 meters 2D RMS
- Cold/Warm/Hot Start Time: 26/26/1 Seconds
- Reacquisition Time: 1.5 second
- Standard NMEA 0183 output through WiFi and USB
- Supports WiFi in Ad-hoc and Station mode
- Two LEDs indicate power and GPS activity
- USB 2.0 powered (<50mA@5.0V)
- BNC connector for 50 Ohm VHF antenna
- Powered SMA connector for 50 Ohm GPS antenna
- The internal WiFi access point connects up to 4 devices simultaneously
- Compatible with Windows 7,8,10,Mac OS X, Linux systems, Android and iOS

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1. Set up overview

Before you leave your home:

If you will be connecting to the A012 through USB or 'station mode' WiFi?

Drivers: are needed if accessing your data through the USB connection. The drivers usually install automatically to your computer if it is running an original Windows 10 version. If not, it is included on the FREE CD and to download from our website.

Configuration Software: is optional and requires a Windows PC. It is used to configure WiFi settings (unless connecting peer-to-peer, without an access point). The software is included on the FREE CD and as a download from our website.

Consider if you have CD reader/ internet access onsite: ensure you can load the driver and configuration software through the CD or through internet access (Download any software to your Windows laptop before travelling to your boat if needed)

1. You will need:

- **GPS Antenna and wire with SMA connector**
- **Correct length of wires to reach your location**
- **5.0V power source via USB.** If you do not have a stable 5.0V power source, consider the Quark-elec certified low noise power converter. Link below.

<https://www.quark-elec.com/product/qk-a013-12v-to-5v-low-interference-converter/>

3. Choose your Location: Position in a stable, dry location 0.5m from other WiFi equipment. The QK-A012 does not have mounting points to attach them to.

4. Connect to your GPS antenna

5. Connect to 5.0v power (through USB)

6. Check the LEDs:

Power: left LED flashes at 3 second intervals.

GPS: right LED Flashes every second while receiving a valid GPS message

7. Connect your QK-A012 to receive the GPS message:

Through WiFi, Set up on your phone, laptop etc. if desired: 15 seconds after the QK-A012 has powered up, you can scan for a WiFi network with an (SSID) which looks similar to '**QK-A012xxxx**'. Connect the device to '**QK-A012xxxx**' with the default password: '**88888888**'.

The QK-A012 is set to connect wirelessly in Ad-hoc mode (with no need for a router or access point) If you want to change to station mode (to view data through a WiFi access point), see the Station mode, chapter 8.2 of the manual.

Set up in you Chart software: set the protocol as '**TCP**', IP address as '**192.168.1.100**' and the port number as '**2000**' in the chart software.

(This is an overview only; familiarize you with the manual before installation.)

2. Introduction

QK-A012 is a compact GPS receiver which receives information from GPS satellites. The QK-A012 was originally designed for accessing location data for use in marine technology. The QK-A012 can be used for many different applications including automotive and recreational uses.

The QK-A012 receives and processes GPS signals from satellites, this means that with a power supply (even a power bank) and GPS antenna, the QK-A012 can calculate its location anywhere in the world. The antennas must have 4 out of a possible 33 satellites available in order to triangulate the data and calculate the antenna's location.

With added WiFi functionality, the GPS data can be accessed wirelessly through peer to peer (Ad-hoc) or station mode WiFi connection.

3. Location

Although QK-A012 comes with an extruded aluminium enclosure to shield it from external RF interference, it should not be fitted close to generators or compressors (e.g. refrigerators) as they can generate substantial RF noise. It is designed to be installed in a protected indoor environment. So generally a suitable placement of QK-A012 is together with other navigation equipment and the PC or chart plotter that will be used to display the location data.



Figure 1: Overview of QK-A012

4. Connections



Figure 2: Connections

The QK-A012 has the following electrical connections/indicators:

- **USB connector.** A USB micro B connector provides the 5.0V power source for the product and also outputs data.
- **LED lights.** The QK-A012 features two LEDs which indicate power and GPS status. The two LED's turn on and then off after initialization. When operating, these LED's flash as below:
 - Power LED:** left LED flashes at 3 second intervals.
 - GPS LED:** right LED Flashes every second while receiving a valid message
- **GPS connector.** Standard SMA male 50 Ohm connector. (required a GPS antenna)
- **WiFi connection:** WiFi connectivity in both Ad Hoc and Station modes.

5. Mounting

QK-A012 is designed to be securely positioned in an indoor environment and needs to be placed where it is well protected from humidity and water.

QK-A012 is **not** supplied with GPS antenna. An active GPS antenna with a female SMA connector should be mounted and ideally spaced 0.5 metres from other antenna.

6. Power up

The QK-A012 is typically powered by PC, laptop, tablet or other devices with 5.0V USB micro B connector. If USB data output isn't required (if accessing GPS data through WiFi), a power bank or other 5.0V supply (greater than 500mA current) power source can be used.

We recommend not using a cigarette lighter as they frequently provide an unstable current, which could damage the QK-A012. Check that the power source is 5.0V volts only. Excess power or power surges/fluctuations can damage the QK-A012.

If you have an unstable power source, we can recommend the QK-A012; this is a dedicated 12V to 5.0V power converter for marine and automotive purposes that will supply a stable power source. See link below.

<https://www.quark-elec.com/product/qk-a012-wireless-gps-receiver/>

7. Connecting to USB port

QK-A012 is supplied with a USB connector. This connector provides power supply and the GPS data output. This USB connector can be linked directly to a USB port on the PC or other mobile devices via the supplied cable.

Windows: To enable the USB data connection of QK-A012 to other devices, related hardware drivers may be needed dependent on system requirements.

Windows 7,8,10 the driver can be found on the CD in the packing box or can be downloaded from the Quark-elec website at:

<https://www.quark-elec.com/product/qk-a013-12v-to-5v-low-interference-converter/>

Connect QK-A012 to the computer; follow the instructions to install the driver if required.

The QK-A012 registers itself to the computer as a virtual serial com port.

The drivers usually install automatically to your device if it is running an original Windows 10 version. A new COM port will automatically show up in the device manager after plug in.

Mac: For Mac OS X, QK-A012 will be recognized and shown as a USB modem. The ID can be checked with the following steps:

1. Plug the QK-A012 into a USB port and launch Terminal.app.
2. Type: `less /dev/*sub*`
3. The Mac system will return a list of USB devices. QK-A012 will display as -
"/dev/tty.usbmodemXYZ" where XYZ is a number. Nothing further needs to be done if it is listed.

Linux: No driver is required for Linux. When plugged into the computer, QK-A012 will show up as a USB CDC device on /dev/ttyACM0.

7.1. USB connection status

Checking the USB connection: After the driver is installed, run the Device Manager and check the **COM number** (this is the number associated with the USB port you are using). Your chart software may require your COM number in order to access the data.

Checking the USB data flow: If desired, the USB data can always be checked with a terminal monitor application, like Putty or HyperTerminal. To do this, enter the following into the COM port settings: **Bits per second: 38400bps, Data bits: 8, Parity: None, and Stop bits: 1** as shown below using HyperTerminal on Windows as an example.

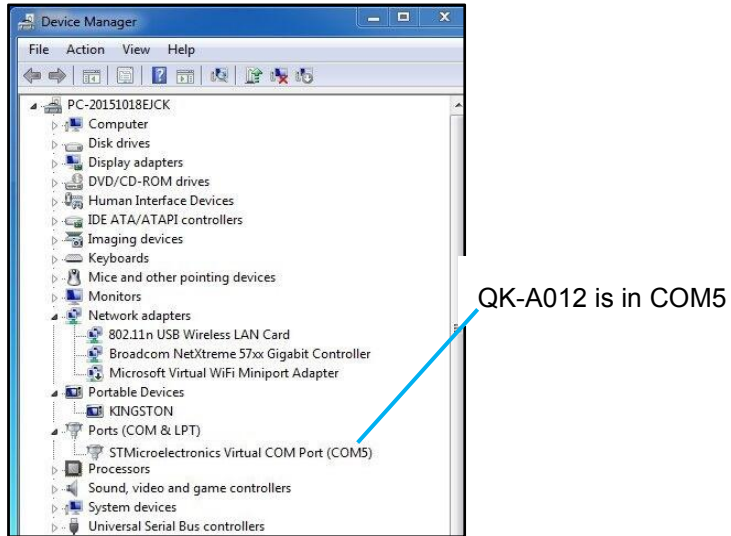


Figure 3: Checking the COM port in Device Manager

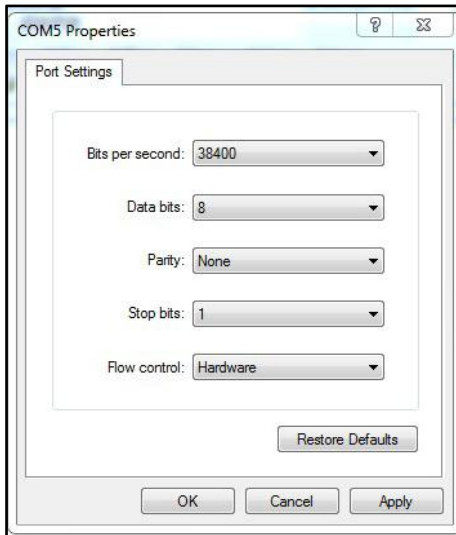


Figure 4: Setting on HyperTerminal /Putty

If all the above is set up correctly, similar messages to the examples below should be shown.

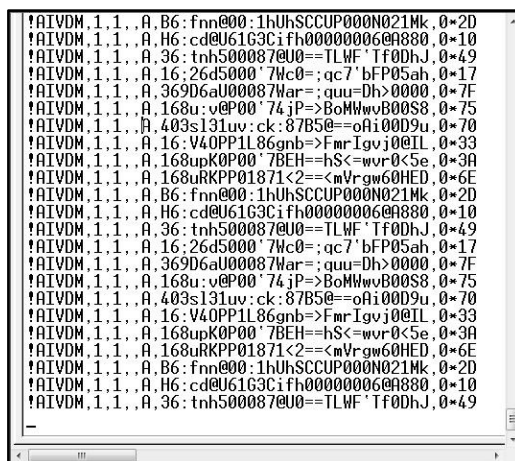


Figure 5: Display on HyperTerminal

8. Connection through WIFI

QK-A012 support both Ad-hoc mode and station mode.

1. **Ad hoc mode. The module will work in Ad hoc mode by default** but it can be easily setup to station mode through the configuration tool. Ad hoc is a direct connection wirelessly to the QK-A012 (peer to peer). Your laptop or mobile phone can search and connect to the WiFi signal being emitted by the QK-A012.
2. **Station mode** works by opening a connection in your wireless router and then QK-A012 connects directly to that connection on the router. This allows your router to handle all the traffic from the QK-A012. You can then access the data through the router from any device that you can connect to your router. This also allows your wireless device to have access to the internet whilst still receiving data from the QK-A012.

8.1. Ad-hoc mode

15 seconds after the QK-A012 has powered up, you will be able to scan for a WiFi network with an (SSID) similar to 'QK-A012xxxx'.

Connect the device to 'QK-A012xxxx' with the default password: '88888888'.

Device SSID	Similar to 'QK-A012xxxx'
WiFi password	88888888

In your chart software:

Set the protocol as 'TCP', IP address as '192.168.1.100' and the port number as '2000' in the chart software.

Protocol	TCP
IP address	192.168.1.100
Port	2000

With the above settings, wireless connection should be established and the user will be able to receive the data through the chart software. **Note: In Ad-hoc mode, the IP address should not be changed and the password should be between 8 to 12 characters.**

The user can always check the wireless connection with TCP/IP port monitoring software as shown below:

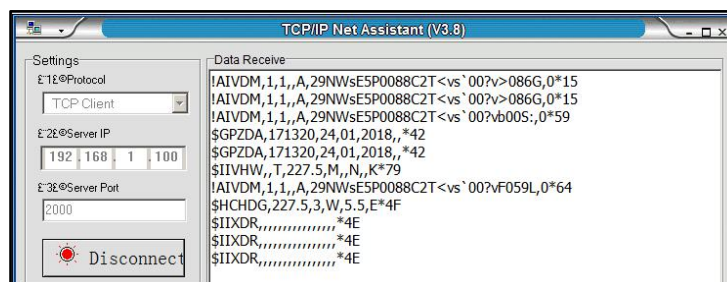


Fig 7: TCP/IP setting check

8.2. Station mode

Station mode allows for the QK-A012 to connect directly to your router. This allows the router to handle the data and traffic from the QK-A012. This data can then be picked up through the router anywhere on your local area network. Similar to plugging the QK-A012 directly into the router by wire but instead using wireless technology.

To allow the QK-A012 to connect to the router you may have to open an access point. This can be done in the router settings. Your router manufacturer will be able to give you instructions for adding this.

Once an access point is opened up, open the Quark-elec configuration software. Copy the router settings into the station mode section of the configuration tool.

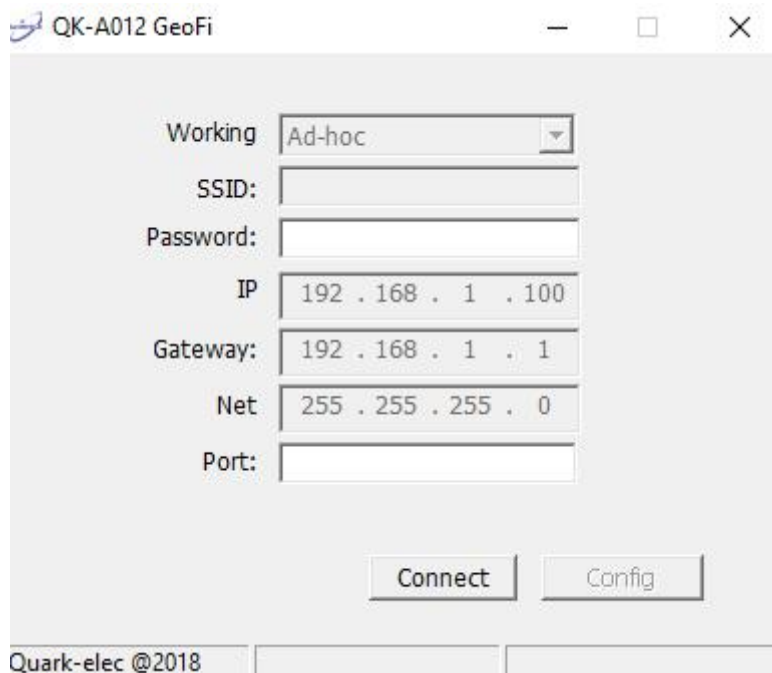


Figure 8: Station Mode Settings

By changing these parameters to those of your wireless access point as illustrated below you will connect the QK-A012 to the router. You will be able to see the GPS data coming through your regular WiFi connection:

The Configuration Software (GUI) can be used to adjust these settings at any time. You can download the software at <https://www.quark-elec.com/downloads/configuration-tools/>

Detailed instructions on how to use the Configuration software are available at https://www.quark-elec.com/doc/QK-A0xx_GUI_application_note.pdf

IN YOUR CHART SOFTWARE:

Set the protocol as 'TCP', enter your device's IP address and the port number as '2000' in the chart software.

Protocol	TCP
IP address	You can check the IP address through your router set-up page. Each router supplier

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	has a different layout. You can usually find the IP address under 'device list'.
Port	2000

With the above settings, wireless connection should be established and the user will be able to receive the data through the chart software.

9. Specification

Item	Specification
Operating temperature	-25°C to +80°C
Storage temperature	-25°C to +85°C
DC supply	5.0V(+/-0.2V)
Average supply current (typical quiescent)	50mA
Maximum supply current (cold start)	80mA
GPS receiver sensitivity	-162dBm
WiFi mode	Ad Hoc and Station modes on 802.11 b/g/n
Security	WPA/WPA2
Network Protocols	TCP

For more technical information and other enquiries, please go to the Quark-elec forum at:

<https://quark-elec.com/forum/>

For sales and purchasing information, please email us: info@quark-elec.com

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-, 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.

Accuracy of this manual

Quark- 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

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1.0	14/08/2018	Release of product

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