

## Vessel tracking with Brookhouse eMux

If the Brookhouse eMux and a 3/4G router is used for wifi transmission of the vessel's GPS and instruments data stream, vessel tracking via 3/4G is an additional possibility. The router can be set up to allow external access to the eMux through internet, so that authorized individuals can tap into the vessel's NMEA data stream from any remote internet connection. Not only can the vessel's position be determined, but other data such as course, speed, wind direction and wind-speed are all available as if received directly via the on-board wifi network. The data stream can be used to feed navigation software running on a computer, iPad or iPhone so that the vessel's progress and navigation can be observed from any remote location.

There are many possible applications for the above. A few examples are:

- Tracking of charter vessels.
- Tracking and observation of navigational data of commercial vessels by harbour authorities.
- Tracking of harbour ferries.
- Tracking of coast guard vessels.

As no special equipment, 3rd party services or specialised website are required, this is a very efficient and economical method of keeping track of the movement of vessels with insight in their navigation, in any coastal area with cellular coverage.

To make this all possible, some special features in the on-board 3G/4G router are required:

1. Support of "Port forwarding"
2. Support of DDNS (Dynamic Domain Name System)

Most modern routers support these features, even some of the smallest low-cost models.

Port forwarding is a router function whereby incoming (from internet) TCP/IP traffic with a certain port specified is directed to a particular computer or other device, locally connected to the router. The eMux has the local IP address 192.168.1.99 and is a server for port 10110 (standard port for NMEA 0183 data). In simple wording, port forwarding for the eMux tells the router to direct any TCP traffic for port 10110 to local IP address 192.168.1.99, being the eMux.

## Example of Port Forwarding setup page for eMux

TP-LINK® 3G Wireless N Router  
Model No. TL-MR3020

Virtual Servers

ID	Service Port	Internal Port	IP Address	Protocol	Status
1	10110	10110	192.168.1.99	TCP	Enabled

Add New... Enable All Disable All Delete All

Previous Next

http://192.168.1.254/userRpm/DateTimeCfgRpm.htm

The Dynamic Domain Name System is necessary to make the IP address of the vessel's router publicly available, so that a direct 'point-to-point' connection can be established from a remote internet connection.

Each time the 3G/4G router activates communication with internet, the provider assigns a unique IP address. This IP address is stored in the router and is included in each TCP packet for internet communication. The IP address is not fixed. It can be changed due to various circumstances.

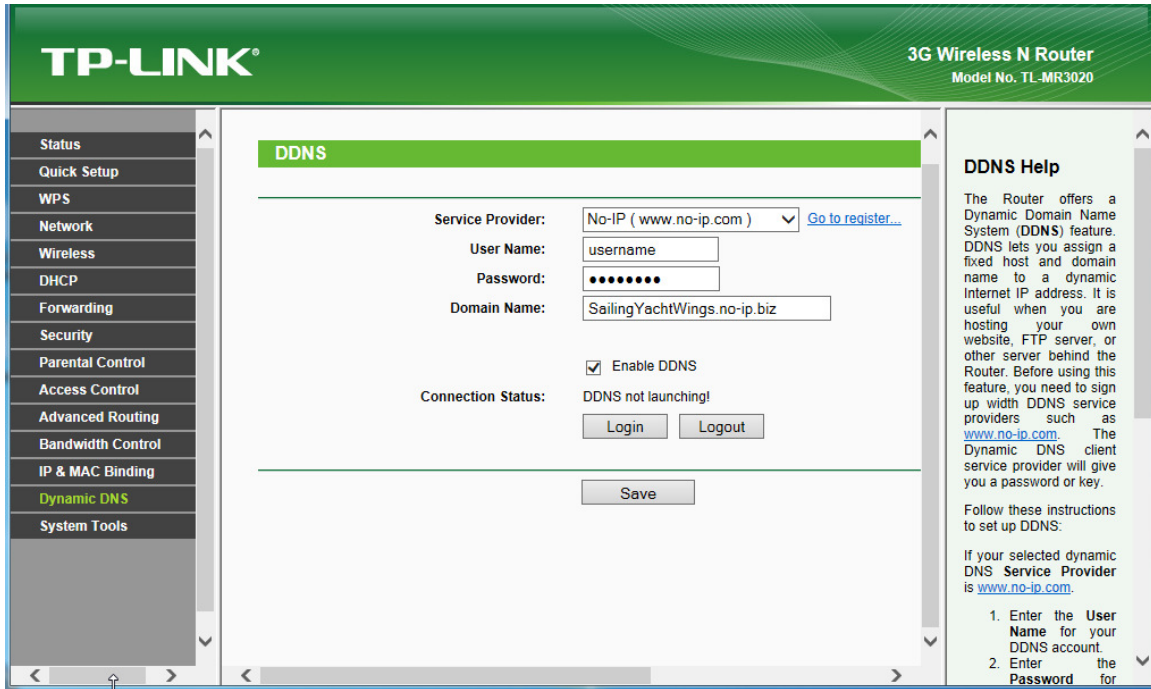
It is impossible to know for anyone who wants to make direct contact through internet what the IP address of the remote router or computer is. For this reason there are so called DDNS servers, specialised servers that are part of the internet structure, that convert domain names to IP addresses. The function is very much like DNS servers, which translate website names to website IP addresses, but websites usually have static addresses, so DNS updates are only sporadic.

For DDNS servers to stay up to date and translate a domain name to the correct IP address, they need to receive the new IP address whenever it changes.

Therefore the router has to support this function and has to be programmed to contact the DDNS server automatically whenever a new IP address is assigned by the provider. There are a number of DDNS servers available. The cost for their services varies, but can be as little as \$15.00 per year. Some well known DDNS servers are:

DynDNS.com  
TZO.com  
ChangIP.com  
No-IP.com

### Example of DDNS set-up page



The screenshot shows the DDNS configuration page of a TP-LINK 3G Wireless N Router (Model No. TL-MR3020). The page is divided into three main sections: a left sidebar with navigation options, a central configuration area, and a right sidebar with help text.

**TP-LINK® 3G Wireless N Router**  
Model No. TL-MR3020

**DDNS**

**Service Provider:** No-IP ( www.no-ip.com ) [Go to register...](#)

**User Name:**

**Password:**

**Domain Name:**

Enable DDNS

**Connection Status:** DDNS not launching!

**DDNS Help**

The Router offers a Dynamic Domain Name System (DDNS) feature. DDNS lets you assign a fixed host and domain name to a dynamic Internet IP address. It is useful when you are hosting your own website, FTP server, or other server behind the Router. Before using this feature, you need to sign up with DDNS service providers such as [www.no-ip.com](http://www.no-ip.com). The Dynamic DNS client service provider will give you a password or key.

Follow these instructions to set up DDNS:

If your selected dynamic DNS Service Provider is [www.no-ip.com](http://www.no-ip.com).

1. Enter the **User Name** for your DDNS account.
2. Enter the **Password** for