NAVLink Blue – Info for app developers

Our NAVLink Blue device uses Bluetooth Low Energy (BLE) to connect the NMEA 2000 (CAN BUS) to Bluetooth clients in a full duplex mode.

Contents

BLE Service and characteristics:

Our gateway uses a single service.

- Service UUID: ABF0

- Characteristics:

- ABF2:

- Streams NMEA 2000 data via notifications using a RAW protocol format.

- Receive data from the client via Write operation and forwards it to the bus

- ABF3:

- Used to send commands to the server to configure filters or set the sample rate.

-ABF4 : low sample rate characteristic for battery power application and boat monitoring

BLE advertisement:

- Device Name: NAVLinkBlue-XXXX (where XXXX is the unique device ID)

- Connectable: Yes

- Manufacturer Data: Encoded in ASCII as DYACHTXXXX, with XXXX being the device's unique ID.

- Service UUID: ABF0

Switching between Bluetooth and Wi-Fi:

Our gateway can be switched to a Wi-Fi mode like a lot of our product. This Wifi mode can be used to perform software updates, debug the NMEA network and configure filters.

- To switch modes, hold the reset button for 5 seconds. The LEDs will light up in sequence to indicate the switch.

- For WiFi, the device creates a network with the password PASS-XXXX, where XXXX corresponds to the last four characters of the SSID (e.g., 2F9C in the example below).

Over-the-Air (OTA) update:

1. Switch to WiFi mode.

2. Connect to the WiFi network with the password format PASS-XXXX.

3. Access the device via 192.168.1.1.

4. Upload the firmware file (NAVLinkBlue_VXXX.bin) from the settings page.

How to receive the NMEA data from our gateway:

- Clients can subscribe to notifications from ABF2, and the server will periodically send NMEA 2000 data to the client in RAW protocol format (Base64-encoded). Further information on the format can be found here:

https://github.com/digitalyacht/iKonvert/wiki/4.-Serial-Protocol#41-rx-pgn-sentence

-Some filters can be applied to the data so the client will only receive certain PGN. The sample rate is the same for all of the data sent and will use the last NMEA Message received if a PGN has a higher sample rate than what you have chosen.

How to send data to the bus through our gateway :

- To send data from a client to the server, write data to the characteristic ABF2 using a BLE write operation. This will transfer the data from the client to the NAVLink Blue device. The device will then process this data and, if applicable, send it to the NMEA 2000 CAN Bus.

This data must be in our RAW format : https://github.com/digitalyacht/iKonvert/wiki/4.-Serial-Protocol#42-tx-pgn-sentence

Command structure via ABF3:

Commands are sent in the format:

NB : The Light Blue app can be used to test commands (Figure 1)

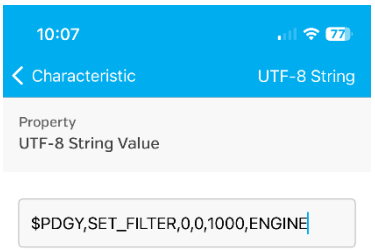

Figure 1 Example of a command to set the sample rate to 1hz and activate the ENGINE category

$PDGY,ACTION,0,0,SAMPLE_RATE,ACTION_TYPE

- ACTION: SET_FILTER

- SAMPLE_RATE: The rate in milliseconds (e.g., 1000 for 1 Hz).

- ACTION_TYPE: Defines the filter to toggle. The following are supported:

- AIS: includes data related to AIS (Automatic Identification System), covering position reports, navigation aids, and various types of vessel and static data.

- ELECTRICAL: includes data related to electrical systems on board, such as battery status, power usage, and electrical measurements.

- ENGINE: includes data related to engine performance and status, including RPM, engine temperature, fuel consumption, and other engine diagnostics.

- ENVIRONMENT: includes environmental data such as wind conditions, water depth, and atmospheric pressure.

- GENERAL: includes general system information such as product information, configuration, and diagnostics.

- NAVIGATION: Includes navigation-related data like heading, course, position, speed, and waypoint information.

- ALLOFF: Turns off all filters.

Please note that the 0,0 are mandatory

If you want to activate multiple categories, please resend a command with the same sample rate. By default, the NAVLink Blue will send all the data with no filtering and with the same sample rate as the NMEA Bus