
NMEATrax

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User Guide

Alex Klouda, Greyson Stelmaschuk

Electronics & Computer Engineering Technology

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Kimberly Lemieux

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1.0 INTRODUCTION

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NMEATrax is a device that connects to the user's vessel using NMEA 0183 or NMEA 2000, allowing you to view and record available vessel information. This document contains an initial setup procedure and detailed information on device and application features.

1.1 Acronyms and Abbreviations

Glossary of acronyms and abbreviations commonly used in this manual.

Table 1. Acronyms and Abbreviations

Acronym	Description
NMEA	National Marine Electronics Association
CAN Bus	Controller Area Network Bus
WebView	Data Monitoring Website
NMEA 0183	NMEA 0183 Data Communication Protocol
NMEA 2000	NMEA 2000 Data Communication Protocol
AP	WiFi Access Point

1.2 Device Connections

The devices external connectors and indicators are shown and listed below.

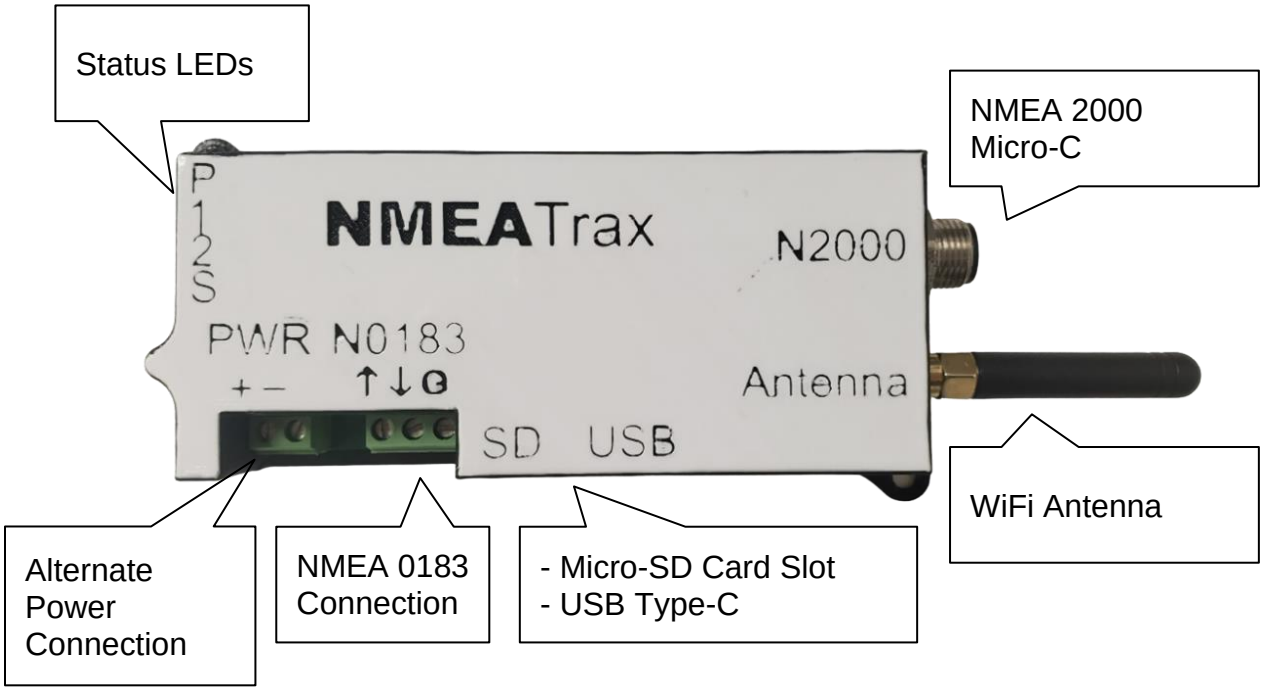

Figure 1. NMEATrax device External Connections

Table 2. External Features of the NMEATrax Device

Name	Function
Status LEDs	The 4 LEDs indicate the activity of various aspects of the device. The functions of each LED are listed in the table below.
NMEA 2000 Micro-C Connector	This connector is used to connect to the NMEA 2000 backbone.
WiFi Antenna	This is the External Antenna used for WiFi.
USB Type-C	This is for updating the device's firmware.
Micro-SD Card Slot	This is used to store recordings.
NMEA 0183 Connections	NMEA 0183 Connection. Up arrow indicates incoming data. Down arrow indicates outgoing data. G indicates ground.
Alternate Power Connection	This screw terminal allows the device to be powered when NMEA 2000 power is not available. The accepted voltage range is 7-35V.

Status LEDs

The meaning of each status LED is listed in the table below.

Table 3. Status LED Description

Identifier	Description
P	This LED is lit while the device has power and is working.
1	This LED blinks when there is NMEA 0183 data being processed.
2	This LED blinks when there is NMEA 2000 data being processed.
S	This LED is lit if the SD card is installed and working.

1.3 Downloads

You can download the NMEATrax device firmware and NMEATrax Replay App from the links below.

NMEATrax device firmware: https://github.com/agk1190/NMEATrax-n2k-firmware.

NMEATrax Replay App: https://github.com/agk1190/NMEATrax-Replay-app/releases.

2.0 GETTING STARTED

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This section provides a step-by-step guide for the installation of your new device, while offering a brief overview of the device and accompanying application.

2.1 Installation

The following steps will guide you through the initial setup of the NMEATrax device.

1. Insert an SD Card formatted as FAT32 (optional).

   > ! This may be more challenging after mounting.

2. Mount the device in the desired location using M4x12 screws, Uglue/Command strips, or Zip Ties.
3. Connections (only use 1 method)
   a. Connect a NMEA 2000 Micro-C cable to the device if you are using NMEA 2000.
   b. Connect vessel power to the Alternate Power Connections.

   > ⚠ WARNING: DO NOT CONNECT BOTH POWER OPTIONS.
   > Doing so may cause damage to the device or the vessel.

4. Power on the device and confirm the Power LED is lit.
5. Connect to the WiFi access point “NMEATrax”.
6. Open a web browser and type in “192.168.1.1”.
7. WiFi Configuration
   a. If you want to connect to an existing WiFi access point, go to the section “WiFi - Device Mode” below.
   b. If you want the device to broadcast its own WiFi access point, go to the “WiFi - Access Point Mode” section below.

WiFi - Device Mode

Configuring WiFi in device mode.

1. Click “Configure WiFi”.
2. Input the WiFi access point SSID and Password.
3. Click “Save”.
4. Go to the IP address of the device in a web browser.

   The IP address of the device is saved to a ‘wifi.txt’ file on the SD card (if inserted).

   Example.

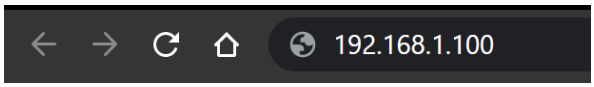
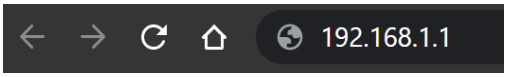


Figure 2. NMEATrax WiFi Manager

WiFi - Access Point Mode

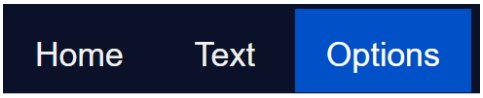
Configuring WiFi in Access Point mode.

1. Click “Exit”.
2. Connect to the “NMEATrax” WiFi access point using the default password of “nmeatrax”.
3. Go to “192.168.1.1” in a web browser.



It is not required but is highly recommended for security reasons to change the WiFi SSID and/or Password. Follow the steps below to do so.

4. Go to the “Options” tab in the NMEATrax WebView.



5. Change the WiFi SSID and or Password.

> ! The device will reboot after each change. ie. you will have to do these steps twice to change both parameters.

6. Connect to the new WiFi access point (if changed) with the new password (if changed).

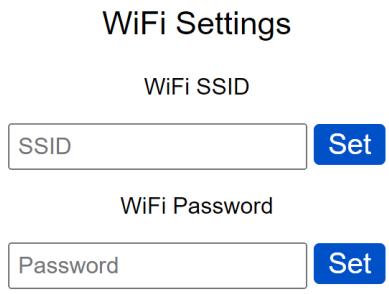


Figure 3. NMEATrax Local WiFi Settings

2.2 NMEATrax WebView Overview

You will be able to access NMEATrax device data and settings through our website. There are three (3) pages on the website: Home, Text, and Options. Home displays the data as gauges; **T**ext displays the data in a table; **O**ptions allows the user to configure settings. More information is available on page 1**3**.

2.3 Replay Application Overview

The Replay App is a separate Windows desktop application that allows the user to review the data recorded by NMEATrax while onboard the vessel. More information is available on page 18.

3.0 USING THE DEVICE

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This section provides detailed descriptions of the NMEATrax device functions**.**

3.1 WebView

The NMEATrax device hosts a website, referred to as WebView. It can be accessed through a web browser by typing in “192.168.1.1” or the IP address of the device.

3.1.1 Home / Gauges Page

The Home screen displays live NMEA data in the form of gauges. The data is updated every 1 second. The temperature and depth units can be changed in the Preferences section on the Options page. This page is optimized for desktop users; only one gauge is displayed at a time on mobile devices.

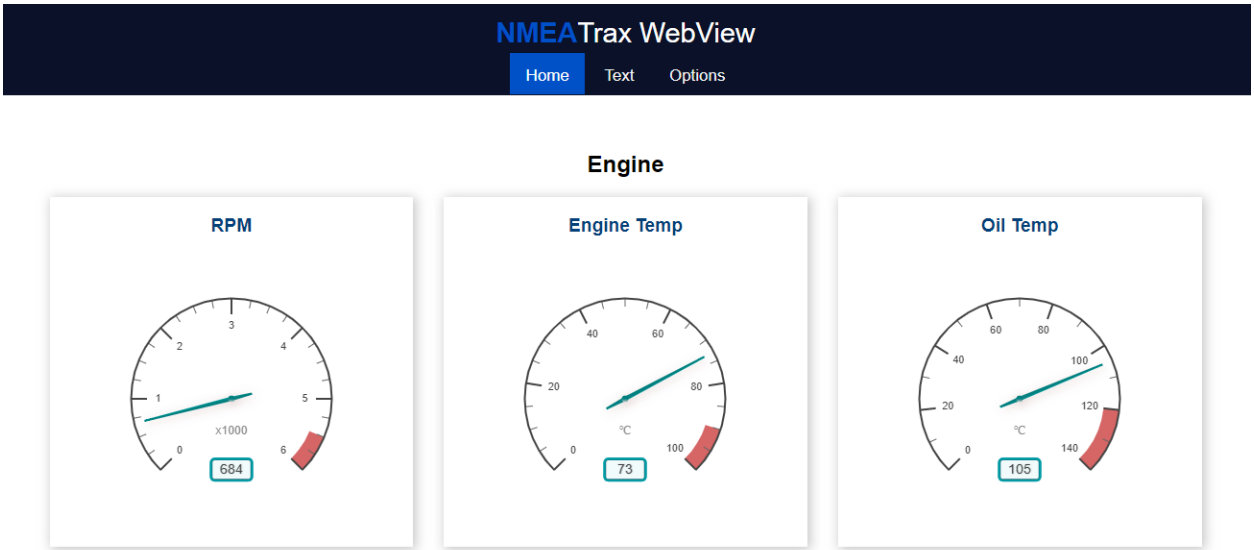

Figure 4. NMEATrax WebView Home Page

3.1.2 Text Page

The Text page is optimized for mobile users, as it allows you to view more values simultaneously. The data is updated every 1 second and the units can also be changed.

Engine

Name	Value
RPM	698
Engine Temp	73°C
Oil Temp	104°C
Oil Pressure	491 kPa
Fuel Rate	5.00 L/h
Fuel Pressure	684 kPa
Fuel Level	58.00%
Leg Tilt	12
Engine Hours	122
Gear	N

Figure 5. NMEATrax WebView Text Page

3.1.3 Options Page

The Options page gives users the ability to configure various settings while also allowing for management of the logs.

Table 4. Settings available on the NMEATrax WebView options page

Feature	Functionality
Recording Toggle	Enable or disable recording NMEA data to the SD card.
Recorded Data - Download Logs	Download any recording saved on the SD card.
Recorded Data - Erase Logs	Erase all recordings on the SD card.
WiFi Settings - SSID & Password	Set the SSID and Password of the NMEATrax device's Access Point.
WiFi Settings - Reset WiFI & Reboot	Change the WiFi configuration settings. The user can choose to connect to a new AP, reconnect to a previous AP, or change WiFi modes.
Recording Interval	How often the data is saved to the SD card.
Timezone	Allows the user to adjust their timezone setting.

Preferences

The first 2 toggles allow the user to enable or disable processing of either NMEA protocol. For example, the user can leave NMEA 0183 disabled if they are not using it.

The next 7 toggles allow the user to choose where they want certain data to come from. For example, if speed was available on both NMEA 0183 and NMEA 2000 networks.

The last 2 toggles allow the user to switch temperature and depth units.

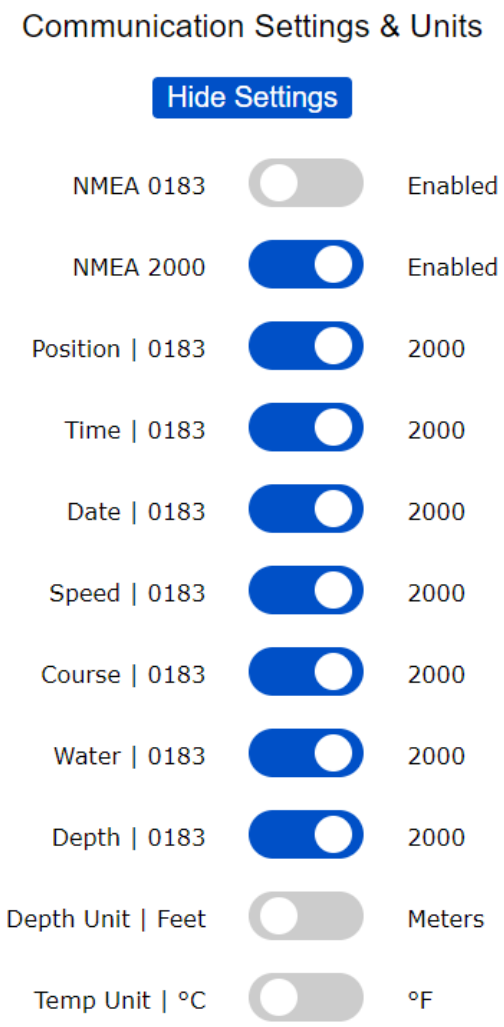

Figure 6. NMEATrax Settings Toggles

3.1.4 SD Card

The SD Card (if installed) allows the device to store the recorded NMEA data in a csv file as often as is selected by the user through the recording interval setting on the options page.

The maximum space the device can use is 4GB.

Each line of recorded data is ~100 bytes. You can use this information to determine how often you want to record. The more frequent the recording, the larger file size.

Retrieving The Data

There are 2 methods for retrieving the recorded data.

1. Via the Options page
    a. Click “Download Logs”.
    b. Enter the name of the file you want to download and click “Download”.

> ! Only files less than 100kB or 1000 lines in size can be downloaded from the website. Otherwise, you must use method 2 below.

2. Manually off of the SD Card
    a. Power off the device.
    b. Remove the SD card.
    c. Copy or move the files off the SD card using any available method.
    d. Re-insert the SD card.
    e. Power on the device.

3.2 Replay App

The Replay App can playback the recorded logs from the NMEATrax device. This allows the user to analyze the data to aid in performance monitoring.

3.2.1 Live Data

The boxes in this section will display the recorded values from the log file at the interval specified on the scroll bar.

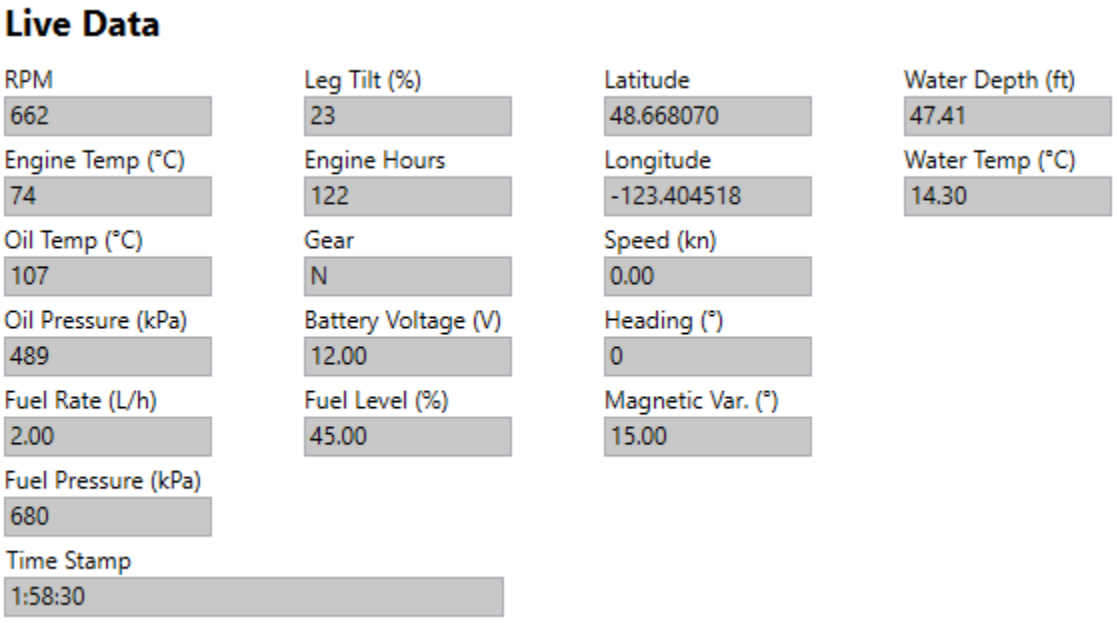

Figure 7. NMEATrax Replay App Live Data

3.2.2 Live Data Limits

This section allows the user to set minimum and maximum limits for the live data. If a value in the live data boxes exceeds the limit specified, the corresponding box will be highlighted in red. The user is also able to save these settings to a file that can be loaded back in at another date.

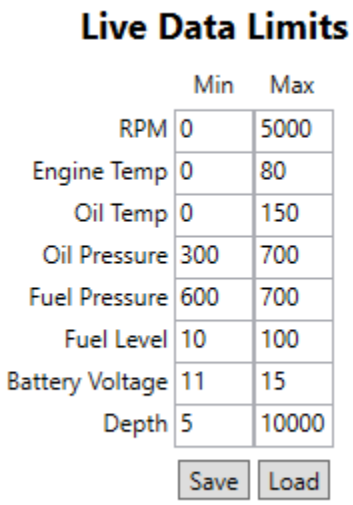

Figure 8. NMEATrax Replay App Live Data Limits

3.2.3 Analyze

The analysis section allows the user to see when a parameter exceeds the limits set at every point in the recorded file.

To the analyze function:

1. Select the variable to analyze.
2. Set the upper and lower limits.
3. Click “Analyze”.

The user can then go to each line where the limit was exceeded and view the values.

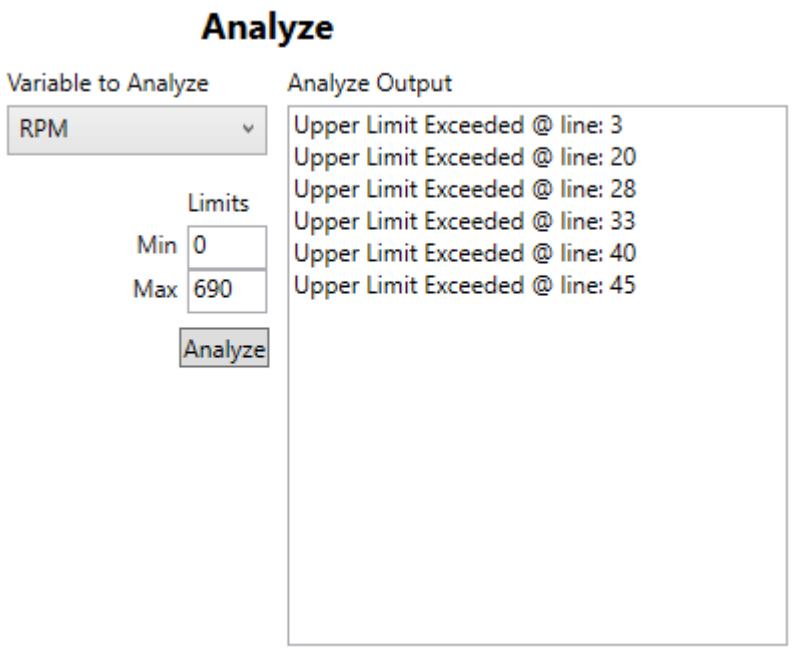

Figure 9. NMEATrax Replay App Analyze Section

3.2.4 Controls

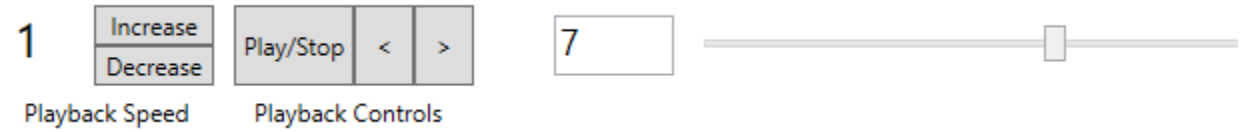

Figure 10. NMEATrax Replay App Controls

To navigate through the data, the user can play through the data between a rate of once per second and up to 64 times a second. There are also buttons to dictate the line of data displayed. The horizontal scroll bar is the fastest way to navigate the data.

4.0 CONCLUSION

We hope that you enjoy using NMEATrax and find it very useful. Any updates can be found on our website and on the GitHub page. Thank you.