

## NMEA Old2New

- \* Converts NMEA 0183 V1.5 to V3
- \* **No set up required** for simple operation
- \* Additional NMEA 0183 multiplexed input
- \* USB for direct connection to PC
- \* Opto Isolated
- \* Optional user selected filtering



## User Manual

For software version 1.00

Tinley Electronics Limited  
235 Bentley Way, LYMINGTON, SO41 8JW  
Tel: 01590 610071 Fax: 01590 610072  
email: [electronics@tinley.net](mailto:electronics@tinley.net)  
[www.tinleyelectronics.com](http://www.tinleyelectronics.com)



## Introduction

Congratulations on your purchase of the NMEA Old2New from Tinley Electronics. This interface combines clever thinking with incredibly simple operation, and represents Tinley Electronics' commitment to providing customers with the finest products.

The NMEA Old2New converts NMEA 0183 V1.5 data connected to Input 1 into V3. In addition this unit can 'multiplex' NMEA data connected to Input 2. The output is a single stream to either an NMEA receiver such as a chart plotter, or via USB to a computer. When connected to a PC the unit will automatically divert it's output to the PC and the PC can then use the NMEA output to drive an NMEA receiver, such as an Autopilot. The output can be customised by the use of built in user selectable filters that can be set to filter in or out any combination of NMEA sentences independently from either input.

Before you begin using your new Tinley product, please take the time to read this manual to help you achieve the full potential from your new interface.

## Certification



This device meets requirements for CFR47 Part 15 of the FCC limits for Class B equipment, and meets the standards set out in European Standard EN 60945: 1997 IEC 945: 1996 for maritime navigation and radiocommunication equipment and systems.

## Disclaimer

Tinley Electronics Limited accept no responsibility for the use of this equipment. This equipment is not designed to replace conventional navigation procedures. Information in this document is subject to change without notice. Tinley Electronics Limited reserve the right to change its products and documentation without obligation to notify any person or organisation of such changes.

# Operation

For basic operation the interface converts NMEA V1.5 on input 1 to V3 and multiplexes NMEA on input 2 to one output. When USB is connected, the interface merges the two inputs to the connected PC and transmits data from the PC via the NMEA output.

As far as the host PC is concerned, the NMEA Old2New appears to be a COM port, (RS232). Note that other than selecting the correct COM port, no other settings are necessary... you do not have to select baud rate etc., this is automatic.

To find the correct com port, either:

1. Check in Windows Vista or XP 'Device Manager' under 'Ports (COM & LPT)'; the interface will be listed as 'TINLEY USB to UART (COM X)' where X = COM port number. The interface must be plugged in and driver loaded.
2. Open software, (such as Hyperterminal or your navigation package), without the interface plugged in and check the available COM ports under 'Properties' or similar. Close 'Properties' and Plug in interface. Now check the available COM ports again, noting the new one! Some software may require closing and re-opening to see the new port.

Note that the COM port number is specific to the USB port in use... if you change the USB port, the COM port will also change. Plug the interface back into the original USB port and the original COM port will be remembered, even when the PC reboots. This is useful if you want to use more than one Tinley USB device!

Open the COM port in Hyperterminal and the interface will output the following start-up message:

```
Tinley Electronics Limited (c) 2011  
NMEA 01d2New X. XX-X. XXX
```

Any valid data on either input will now follow in a continuous stream.

**\* ALWAYS CONNECT USB BEFORE OPENING APPLICATION \***

## Filtering

The NMEA 0183 protocol has its limitations... one of these is the speed and hence the maximum throughput of data. If the NMEA Old2New is overloaded with data, i.e. more data is available on the inputs than is physically possible to fit the output, some data **MUST** be discarded. The intelligent software maintains up to date data flow on a first come first served basis with minimum delay, while intelligently discarding repeated sentences. This ensures no important data is lost.

All incoming data is scrutinised to check for NMEA compatibility. Checksum, if present, and other parameters will be checked and the sentence will be discarded if corrupt. Note that corruption can occur due to electrical noise, poor connections or long cable runs, etc.

## User Filtering

Filtering can be used to choose which device the data comes from, eliminate data loops, stop data overload, etc. There are two types of filtering that can be applied to each input independently.

1. Filter in (allow): Only allow sentences in the list to propagate.
2. Filter out (remove): Remove all sentences in the list.

To set filtering, some knowledge of the NMEA three letter formatters is assumed. First connect the interface to a USB equipped PC with driver loaded and ensure that no NMEA data is being received at the inputs. Using Hyperterminal or similar terminal software, select and open the correct COM port. Confirm the start-up message is displayed. To enter 'SET MODE' Type:

**#SET** return

The terminal window should now show a list of functions available as follows:

NMEA 01d2New 1.00-4.114

#SET

\*\*\* SET MODE \*\*\*

Type required code followed by 'enter'

HLP - Displays this HELP screen

ESC - Exits set mode

SH0 - Shows current user settings

RES - Resets memory to default, no filtering

UPD - Update software \*\*\* CAUTION! READ MANUAL \*\*\*

To set filtering, first select the filter type required below:

FA1 - Allow selected on input 1

FA2 - Allow selected on input 2

FR1 - Remove selected on input 1

FR2 - Remove selected on input 2

Then enter up to 40 NMEA 3 letter formatters separated with commas

Most functions are self explanatory. To return to normal 'RUN MODE' use the 'ESC' function.

As an example, to set the interface to only allow 'RMB' and 'RMC' on input 2 type:

**FA2 return RMB, RMC return**

Interface confirms with the reply:

**Channel 2 filter - allow:**

**RMB, RMC**

To reset an individual input to no filtering type the function followed by an empty list as follows:

**FA2 return, return**

Interface confirms with the reply:

**Channel 2 filter - none**

# Updating Software

In the event that new releases of software become available, the Old2New NMEA can be flash updated through the USB port using a terminal program, such as Hyperterminal.

\*\*\* Caution \*\*\* This procedure should only be carried out by people very familiar and competent with computers and software. Any mistakes and it is likely that the unit will have to be returned to the factory for repair. Do not disconnect unit from USB during download.

The unit should be disconnected from all inputs and powered only by the USB host during the update.

From the 'SET' mode type:

**UPD** return

Followed by:

**YES** return

Now disconnect the terminal program followed by the USB connection as prompted. Now reconnect USB and re-open terminal program and you get the following message:

**Stowe Marine Limited (c) 2008  
USB Bootloader Version X.XX-X.XXX**

Now send the new software 'Old2New.hex' as a text file. See documentation that comes with your terminal program for help.

Now disconnect the terminal program followed by the USB connection as prompted. Now reconnect USB and re-open terminal program and you get the following message:

**Tinley Electronics Limited (c) 2008  
NMEA Old2New X.XX-X.XXX**

Note the new software version should be displayed. Note that the Bootloader version will NOT change.

# Installing Driver

The driver only has to be installed the first time the interface is plugged into each USB port. The Windows Vista, XP, NT or 2000 driver file is available for download from:

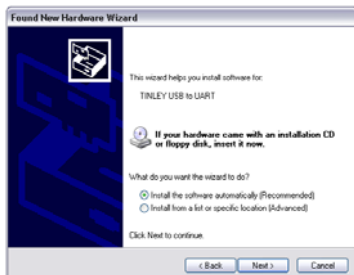
[www.tinleyelectronics.com/Tinley\\_NTXP.inf](http://www.tinleyelectronics.com/Tinley_NTXP.inf)

The following example is for windows XP:

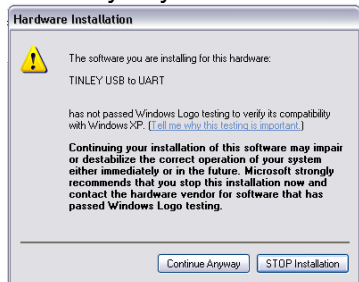
1: Plug interface into required USB port. 'Found New Hardware Wizard' will be displayed. Select 'No, not this time' and click 'Next'



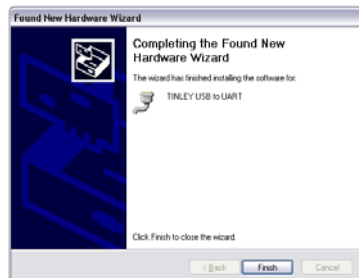
2: Insert CD. If windows does not automatically detect CD then click 'Next'



3: Ignore warning and click 'Continue anyway'



4: Wait for software to load and click 'Finish'





# NMEA 0183 V1.5 to V3 Conversion

V1.5 does not need a checksum, but if it is present it will be checked  
Conversion on Input 1 only

V1.5

\$-HDM,xxx,M

\$-VWR,xxx.x,a,xx.x,N,xx.x,M,xx.x,K

V3

\$IHDG,xxx,,, \*hh

\$IIMWV,xxx,R,xx.x,N,A\*hh

# Tinley NMEA Old2New Installation Diagram

Software Version 1.00

Power supply:  
Not required when using USB

12/24 Volts nominal  
9-32 Volts < 150mA  
Under full load

Protect with 250mA fuse

Inputs NMEA 0183 (EIA-422-A)  
RS232 compatible

Input 1 NMEA V1.5 converted to V3 (See Manual)  
Input 2 'multiplexed' with Input 1 without conversion

Over voltage and reverse polarity protected

Full Opto Isolation better than 5kV

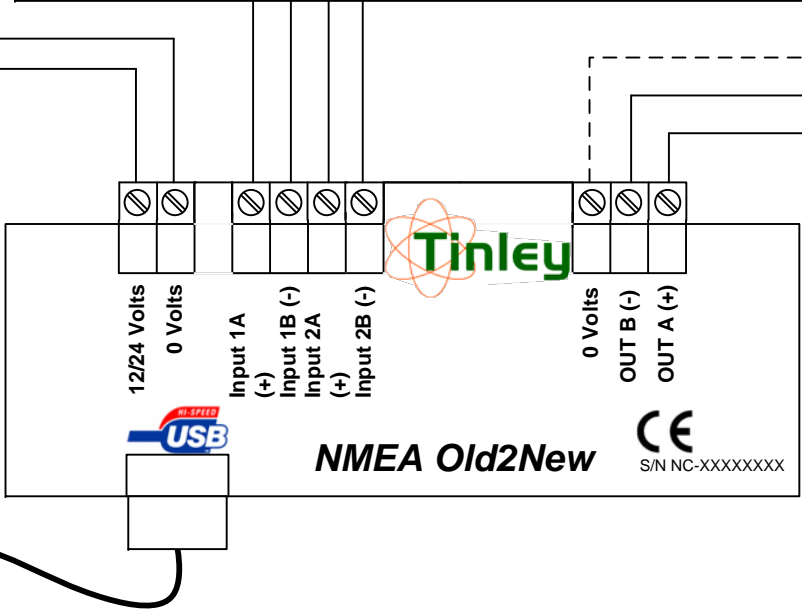
Output NMEA 0183  
(EIA-422-A). Max 60mA.

Short circuit protected

Note: Some interfaces that are not compliant with NMEA 0183 or EIA-422, (PC's or RS232 for example), can cause a conflict with this output. This results in excessive current drawn and corruption of data. If this is the case, (and on all PC's), connect 'Output A' as the output signal and use '0 Volts' as signal ground. Do not connect NMEA Output B to 0V or ships ground. If in doubt, use a multimeter to check for continuity between the connecting equipment's NMEA ground input and ships ground.

USB Hi-Speed  
V2.0  
(Also compatible with V1.1)

Drivers provided for:  
Windows XP  
Windows Vista  
Download from  
[www.tinleyelectronics.com/Tinley\\_NTXP.inf](http://www.tinleyelectronics.com/Tinley_NTXP.inf)



Compass safe distance: 200mm

A=Signal  
B=Return