

## MiniPlex-USB

---

The MiniPlex-USB is an advanced NMEA multiplexer, combining data from up to four navigation instruments into two NMEA outputs and a USB port. It is the ideal solution for computers and laptops without a serial port. Also available as the MiniPlex-USB-AIS, featuring a high speed input for AIS receivers.



Using the MiniPlex-USB multiplexer has some major advantages:

- Data from multiple instruments is available as one single stream on one single cable. This reduces wiring cost.
- Seamless integration into existing Raymarine Seataalk<sup>®</sup> networks.
- All inputs are galvanically isolated, eliminating ground loops between instruments.
- The advanced filter can be used to manage the amount of NMEA data in the system: the amount of NMEA sentences can be reduced or sentences can be fully blocked per input.
- Automatic switching between computer navigation and GPS-based navigation.
- Automatic switching between primary and secondary instruments in case of failure.
- Connects directly to a USB port without the typical USB problems; Plug & Play as it was meant to be.

The two NMEA outputs (talker ports) allow distribution of the NMEA data to up to eight instruments.

The MiniPlex-USB can be connected directly to the USB port of the computer, without an additional Serial <-> USB converter. The supplied driver creates a virtual COM port on the computer, allowing all existing navigation software to be used with this multiplexer.

The combination of the MiniPlex-USB and it's virtual COM port driver is a dedicated NMEA solution, as opposed to using a generic Serial <-> USB converter. It therefore does not exhibit the well known problems of these generic converters like false detection of mice when the GPS is switched on or sudden drop-outs in the NMEA data stream.

Any attempt of Windows to detect Plug & Play devices on our virtual COM port is blocked. The result is that the MiniPlex-USB is a real trouble-free Plug & Play solution. Just plug in the USB cable, load the driver CD, a few clicks and you're up and running!

## Features

The MiniPlex-USB has a rich set of features and configuration options, enabling the user to tackle almost any NMEA bottleneck or interface problem. The supplied Windows utility MPX-Config allows full configuration of the multiplexer and monitoring of NMEA data passing through the multiplexer.

- Seatalk® conversion** When the Seataalk -> NMEA option is selected, NMEA In 4 becomes a SeaTalk® compatible input, offering conversion of the most common SeaTalk datagrams on a Raymarine® network into NMEA sentences.
- Operating modes**
- Server:** Data received on the NMEA inputs is sent to the computer. Data received from the computer is sent to a NMEA output.
- Hub:** All received data (on the NMEA inputs *and* from the computer) is sent to the NMEA output.
- Auto:** Automatic selection between **Server** and **Hub** mode. This is a useful feature for people who have a GPS and an autopilot connected to the multiplexer, and sometimes wish to sail without taking their laptop on board. When the laptop is not connected, the multiplexer is in **Hub** mode and cross track- and waypoint information from the GPS is directly sent to the autopilot. When the laptop is connected and sending data, the multiplexer automatically switches to **Server** mode and the autopilot will receive cross track- and waypoint data from the laptop instead.
- The **Auto** mode also serves as an emergency backup: when the laptop or computer crashes, the multiplexer will fall back to **Hub** mode after a time-out of 10 seconds.
- NMEA Filter** A flexible NMEA filter can be configured to pass or block specific sentences from each input channel. This greatly reduces the chance of an overflow and the resulting loss of data. Many GPS receivers for instance, transmit RMC, GSV, GSA, GLL and GGA sentences every second, accounting for 85% of the available bandwidth of the NMEA channel. By blocking unwanted or unnecessary sentences, bandwidth is preserved for other instruments.
- Real-Time** Gyro- and fluxgate compasses produce NMEA sentences at a high rate (10 sentences/second or more). This can lead to a buffer overflow in the multiplexer. Although this overflow is handled properly without data corruption, it will lead to a delay of NMEA sentences of up to 20 seconds in extreme situations. This produces a severe problem for autopilots, which cannot make proper course corrections when their heading feedback is delayed for 20 seconds. The Real-Time option prevents this delay by bypassing the buffer of that specific channel and forwarding the data immediately to the multiplexer's NMEA output. As a result, the heading is never delayed more than 0.2 to 0.5 seconds, depending on the amount of other NMEA sentences passing through the multiplexer.
- Heading conversion** This option converts a Magnetic Heading sentence (HDG) into a True Heading sentence (HDT). If the originating magnetic heading sentence contains a magnetic variation, it is used to calculate the true heading before conversion. This feature is useful for certain equipment like VDR's which need a true heading input, while the only available heading source is a fluxgate, delivering a magnetic heading.
- Channel Priority** With Channel Priority enabled, similar NMEA sentences on different inputs are only passed from the input with the highest priority. The RS-232 port has the highest priority, followed by inputs 1 to 4, in descending order. When for instance two GPS receivers are connected to inputs 1 and 2, and both transmit the same type of NMEA sentences, only those received on input 1 are passed. A time-out function ensures that similar sentences from the GPS at input 2 are passed when the GPS at input 1 stops sending these sentences.

Another example is where a GPS provides an SOG to a wind meter, while the latter repeats the sentences from the GPS. When the GPS is connected

to input 1 of the multiplexer (high priority) and the wind meter to input 2 (lower priority), the GPS sentences coming from wind meter will be blocked automatically while wind related sentences are passed.

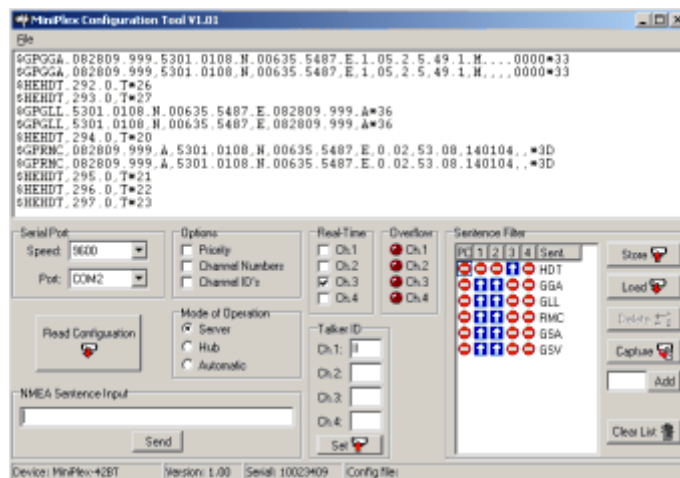
**Channel Number**

When this feature is switched on, the multiplexer will transmit a proprietary NMEA sentence indicating on which input channel the following NMEA sentence is received.

VirtualPlex-1 uses this to route NMEA sentences from specific inputs to specific virtual COM ports (**Channels** option).

**Talker ID substitution**

Talker ID substitution changes the talker ID of incoming sentences. The talker ID can be specified for each input channel. This option is useful for software or instruments that expect a specific talker ID or to distinguish between sentences from two similar instruments.



Screen shot of MPX-Config.  
Click to enlarge.

**Specifications:**

- Supply voltage: 5V<sub>DC</sub> from the USB bus or 8-35V<sub>DC</sub> external power.
- Current consumption: 50mA (100mA max. with fully loaded talker ports)
- Inputs: 4 x NMEA-183/RS-422, galvanically isolated
- Outputs: 1 x USB, 2 x NMEA-183/RS-422
- Buffers: 5 buffers of 1000 characters (4 x NMEA, 1 x USB)
- Filter list size: 30 sentence types
- Priority list size: 30 sentence types
- Speed NMEA in: 4800 Baud
- Speed NMEA out: 4800, 9600, 19200 or 38400 Baud
- Dimensions: 138 x 62 x 30mm