



Quick Start Guide

NGW-1

Conversion Gateway

NMEA

Tel: +44 (0)1202 746682
 Email: support@actisense.com
 Web: www.actisense.com

Active Research Ltd
 21 Harwell Road
 Poole
 Dorset
 UK, BH17 0GE



Important Notices

The device to which this manual relates complies with the Electromagnetic Compatibility requirements according to EN60945. The unit should always be used in conjunction with appropriately approved, shielded cable and connectors as per NMEA 0400 to ensure compliance. A declaration of conformity is available for download at www.actisense.com.

If the device to which this manual relates is to be installed within five metres of a compass, please refer to the 'Compass Safe Distance' section in the 'Technical Specifications' table.

Trademarks and Registered Trademarks

Actisense® and the Actisense logo are registered trademarks of Active Research Limited (Ltd). All other trademarks are the property of their respective owners.

The NMEA® name and NMEA logo are copyright held by the NMEA. All uses in this manual are by permission and no claim on the right to the NMEA name or logo are made in this manual.

Fair Use Statement

The contents of this manual may not be transferred or copied without the express written permission of Active Research Ltd.

Copyright © 2020 Active Research Ltd. All rights reserved.

Product Registration

Please register your product via the online form at <https://www.actisense.com/product-registration/>.

Your product package includes a unit serial number. The serial number is six digits long and can be found below the barcode on the label. Your registration will assist Actisense Support to link your product to your details, simplifying any future assistance you may require.

Product Disposal

Please dispose of this product in accordance with the WEEE Directive. The product should be taken to a registered establishment for the disposal of electronic equipment.

Technical Accuracy

To the best of our knowledge the information contained in this document was correct at the time it was produced. Active Research Ltd cannot accept liability for any inaccuracies or omissions.

The products described in this manual and the specifications thereof may be changed without prior notice. Active Research Ltd cannot accept any liability for differences between the product and this document. To check for updated information and specifications please check actisense.com.

Active Research Ltd will not be liable for infringement of copyright, industrial property rights, or other rights of a third party caused by the use of information or drawings described in this manual.

Product Guarantee

This product comes with a three year 'return to base' guarantee. If you suspect that the unit is faulty please refer to the Troubleshooting Section of the User Manual before contacting support.

It is a requirement of the guarantee that all installations of electronic equipment follow the NMEA 0400 specification. Any connection to a battery or power supply must meet the mandatory essential safety requirements that may be imposed by local regulatory agencies.

Actisense products are intended for use in a marine environment, primarily for below deck use. If a product is to be used in a more severe environment, such use may be considered misuse under the Active Research Ltd guarantee.

Introduction & Features

The Actisense NGW-1 is an intelligent Gateway that converts NMEA 0183 data to NMEA 2000 (and vice versa), allowing you to share information between devices from the two standards. This creates the possibility of upgrading some of the vessel's electronics to NMEA 2000 and keeping the remaining NMEA 0183 devices. This can help reduce the initial upgrade cost to NMEA 2000, by allowing existing NMEA 0183 devices to be part of the NMEA 2000 network.

ISO variants connect easily to NMEA 0183 devices using one pair of data wires for transmit and another pair for receive, allowing the NGW-1 to share data bi-directionally if required. As with all the latest Actisense products, OPTO-Isolation is included on the input and ground breaking ISO-Drive™ technology on the output to keep your devices safe from hazardous ground loops.

USB variants offer an easy PC connection when using a software application that requires NMEA 0183 data.

Powering the NGW-1

ISO Variants:

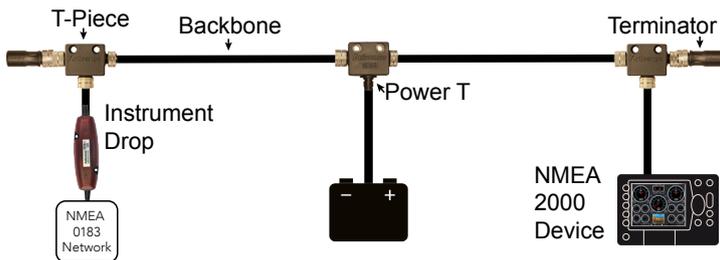
All ISO variants of the NGW-1 receive their power supply when connected to a correctly powered NMEA 2000 backbone. The backbone must also be correctly terminated to allow connected devices to communicate. Refer to the "Connecting to an NMEA 2000 Network" section for more information.

USB Variants:

All USB variants are powered by the PC/laptop USB connection once the USB drivers have been successfully installed. Depending on the settings of the PC/laptop connected to the NGW-1, the latest Actisense USB drivers will install automatically from Windows update if an internet connection is available. If this does not happen, the same USB drivers are available on the CD included in the box with the NGW-1 or from the [NGW-1 Downloads](#) page.

Connecting to an NMEA 2000 Network

The illustration below provides an example of the minimum requirements for an NMEA 2000 network. The horizontal cable illustrating the backbone is not always needed in reality as a backbone can be formed by simply connecting T-pieces directly to each other. The drop cable connecting a device to a T-piece must not exceed 6 metres as defined in the NMEA 2000 specification.

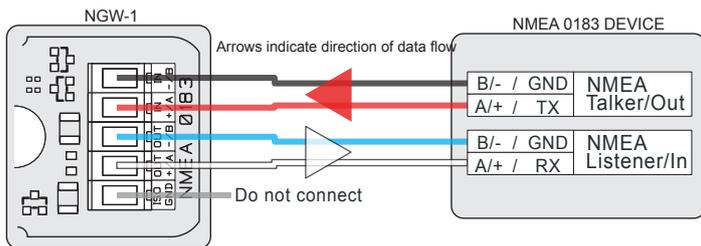


Connecting to a SeaTalkNG Network

Raymarine's SeaTalkNG network uses exactly the same data messages as a standard NMEA 2000 network, but utilises proprietary cables and connectors. To connect a standard NMEA 2000 device (like the NGW-1) to an STNG network, an "NMEA 2000 to SeaTalkNG" adapter cable ([Actisense STNG-A06045](#)) is required between the device and the SeaTalkNG backbone/network.

Connecting to NMEA 0183 Devices

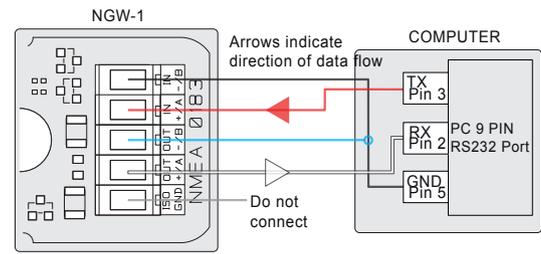
The diagram below illustrates how to connect the ISO cable bare wires from any ISO variant NGW-1 to the Tx/Rx terminals of an NMEA 0183 Talker/Listener.



Wire Colour	Label	Connects To
Black	IN B / -	Talker OUT B / - / GND
Red	IN A / +	Talker OUT A / + / Data
Blue	OUT B / -	Listener OUT B / - / GND
White	OUT A / +	Listener OUT A / + / Data

Connecting to a PC/laptop

The diagram below illustrates how to connect the ISO cable bare wires from any ISO variant NGW-1 to a serial cable (like the [Actisense DB9-F](#)). If the PC/laptop does not have a serial port, a USB-serial converter will also be needed. Alternatively, an [Actisense USBKIT](#) or [Actisense USG-2](#) can create a quick and easy PC connection.



Changing Firmware v2.500 (and newer) (2020)

From NGW-1 firmware v2.500, switching between 'AIS conversions' and 'Standard conversions' no longer requires changing the NGW-1 firmware, instead [Actisense Toolkit](#) offers a comprehensive suite of options to quickly modify the NGW-1 configuration.

The "Start with..." configuration option creates the base set of conversions ('Standard', 'AIS/Full', 'Fast Heading' etc.) that can then be tweaked to build up the required NGW-1 configuration.

Changing Firmware v2.420 (and older) (pre 2020)

For NGW-1 firmware v2.420, both the 'Standard conversions' firmware and 'AIS conversions' firmware can be installed into any hardware variant (ISO, USB, STNG) using the corresponding ActiPatch. The firmware has all possible conversions enabled by default, ready to go. [Actisense NMEA Reader](#) can be used to disable any Rx or Tx PGNs that are not required.

If required to change between the 'Standard conversions' and 'AIS conversions' firmware, download the ActiPatch that matches the NGW-1 hardware variant (ISO, USB, STNG) and the new conversion type from the [NGW-1 Downloads](#) page and use it to update the firmware. The NGW-1 must also be powered.

LED Behaviour

There are two LEDs inside the NGW-1, one on the NMEA 0183 side, one on the NMEA 2000 side. The unique start-up behaviour will flash both LEDs alternately very quickly for 2 seconds.

The NGW-1 NMEA 0183 LED indicates reception of any NMEA 0183 sentence with a valid format. The NMEA 2000 LED indicates reception of a PGN on the Rx PGN Enable list. The LED flashing speed corresponds to the percentage of used bandwidth, which is why it is normal for the NMEA 0183 LED to flash faster than the NMEA 2000 LED due to NMEA 0183's lower bandwidth.

If no data is received on either input, both LEDs will flash together once every 10 secs (for firmware v2.420) or 5 secs (for firmware v2.500+). For NMEA 0183, this could indicate incorrect Talker wiring or a mismatched baud rate. For NMEA 2000 this could indicate no PGNs available that have been enabled.

If any irregular behaviour is observed, please consult the NGW-1 User Manual (available on the Actisense CD or [NGW-1 Downloads](#) page) or visit the [Actisense Support Centre](#) for a full list of NGW-1 help articles.

Conversion List

A list of all the conversions a particular firmware version is capable of is always available on the [NGW-1 Downloads](#) page. This list details exactly what NMEA 0183 sentences will be output by the NGW-1 when it receives a particular NMEA 2000 PGN, and what NMEA 2000 PGNs it will output when it receives a particular NMEA 0183 sentence. [Actisense Toolkit](#) can configure which of these conversions are enabled/disabled and their transmit rates.