DIGITAL YACHT

SAIL BOAT SPORT FISHING MOTOR BOAT

ST-NMEA (ISO) CONVERTER

Installation and instruction Manual

PRODUCT HANDBOOK

1. Introduction

Congratulations on the purchase of your ST-NMEA (ISO) Converter. This product is designed to allow SeaTalk data to be used on NMEA0183 Devices and for NMEA0183 Devices and Transducers/Sensors to send data to a SeaTalk network.

The ISO interface is a NMEA0183 compatible interface with electrical isolation and is designed to allow full bi-directional communication between a SeaTalk network and an NMEA0183 Device. Although this device is relatively simple in operation, wiring of the Converter to a SeaTalk network and NMEA0183 devices requires a level of practical ability and electrical knowledge. If you are not comfortable with electrics/electronics and making wiring connections, we recommend you have the converter installed by a professional installer/dealer.

ⓘ **Before operating the unit you should also familiarise yourself again with the user manual of the SeaTalk equipment and NMEA0183 Device that you will be using it with. Pay particular attention to the SeaTalk network wiring, the device's Interfacing Menu options and any other settings that need to be configured for correct operation.**

2. Before you start

If you need to extend the ISO cable of the ST-NMEA converter, please note that it has been successfully tested up to 25m, and although it should work over longer cable lengths, we recommend so avoid extending the ST-NMEA ISO cable beyond this length.

To install and test the ST-NMEA (ISO) converter you will need:

- Suitable tools and connectors to connect the ST-NMEA to the SeaTalk network and NMEA0183 Device
- M3 or M4 screws or other fixings appropriate to the mounting location

3. Installation

Before starting installation select a suitable location for the ST-NMEA. The unit is water resistant; however it should be installed below deck in a dry location. When locating the unit you should consider:

- Routing of SeaTalk and ISO cables to the unit
- Provision of sufficient space around the unit for comfortable cable routing.
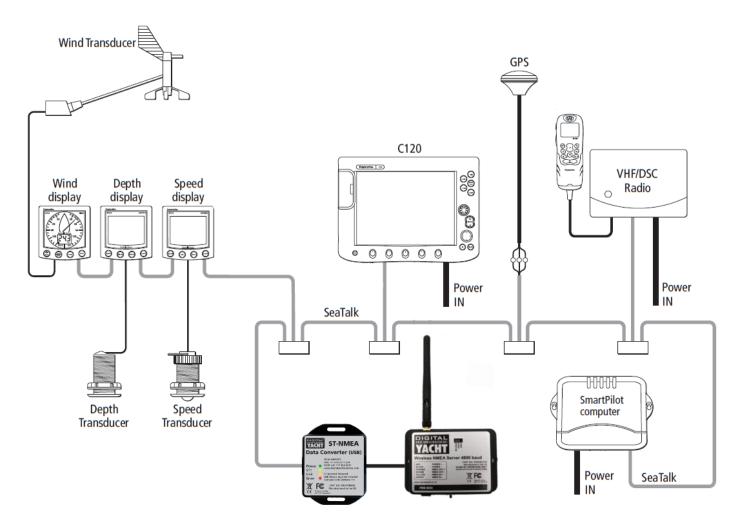- Maintaining the compass safe distance of 0.5m

3.1   Connecting to SeaTalk Network

- The ST-NMEA, has a three wire SeaTalk cable with bare ended wires, providing power and data to the unit. It needs to be connected to your existing SeaTalk network but where it connects is specific to your installation.

- The SeaTalk interface was originally developed by Autohelm in the early 1990's and was included on pretty much all Autohelm and Rarmarine (and some Raytheon) products up until about 2012. This has resulted in lots of different products, interfaces, cable assemblies, etc. being out in the market, making it impossible for this manual to provide a definitive guide on connecting our ST-NMEA converter in every possible scenario.

- In any SeaTalk network there may be a variety of devices including; instruments, an autopilot, Multi-Function Display (MFD), etc. Most devices that can be fitted outside will have a proprietary SeaTalk connector of one type or another, while most autopilot course computers and below deck devices will have screw or sprung terminals, which generally are easier to connect to.

- It is recommended that you spend some time studying your SeaTalk network, to decide the best location to connect the ST-NMEA converter in to the network.
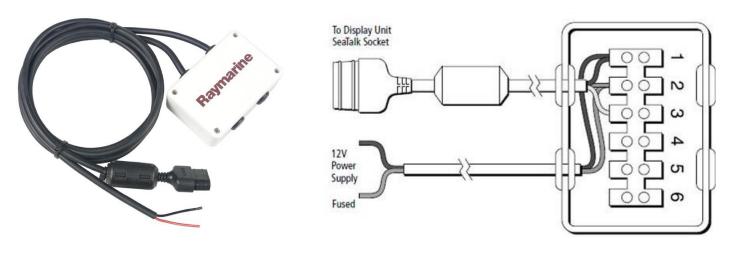
A typical large SeaTalk network diagram

- Raymarine made a SeaTalk junction box (P/No R55006) that is a good location to connect to if you have one in your SeaTalk network…

- If no obvious method of connection to the SeaTalk network exists at the location you want to mount the ST-NMEA converter, then it is possible to cut in to a SeaTalk cable and create/splice in your own connection point. **It is very important** that if you decide to do this, that you remove all 12v power from the SeaTalk network before cutting in to the SeaTalk cable.

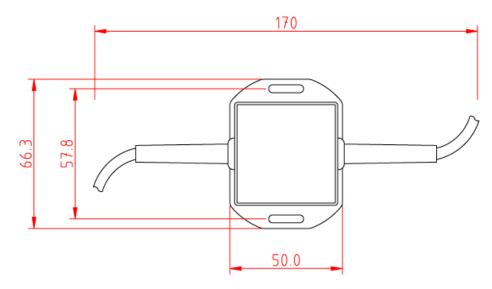- The three wires in a typical Raymarine/Autohelm SeaTalk network cable are;

  - RED   =   12v Supply (+)
  - YELLOW   =   Data
  - SHIELD   =   0v Supply (-)

- There are two cables on the Digital Yacht ST-NMEA ISO converter and the SeaTalk cable is the left hand, three core cable. This cable does not have a shield and the negative supply voltage wire is the Black one. After cutting in to an existing SeaTalk cable connect three wires of the ST-NMEA Converter's SeaTalk cable, so that the three RED wires are together, the three YELLOW wires are together and the Converters's BLACK wire plus the two SHIELDs are together.

3.2   Mounting

- The ST-NMEA Converter has two slotted 4mm Diameter fixing holes (see dimensions below). Use suitable fixings (not supplied) to fix the converter to a flat surface – Note the unit may be installed in any orientation.

Dimension drawing

3.3   ISO Connection

The ST-NMEA Converter has an integral 1m ISO cable allowing it to be easily plugged in to any NMEA0183 Device for full bi-directional data communication. The table below shows the different wire colours of this six core cable…
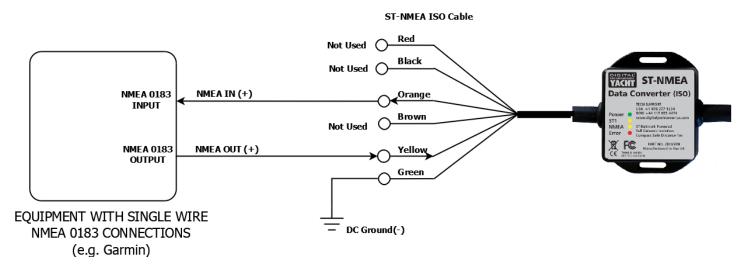
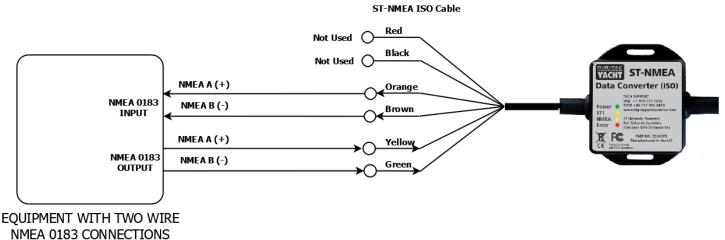| Wire colour	Description	Function
ORANGE	NMEA0183 port 1 TX+	NMEA0183 Output (4,800 baud)
BROWN	NMEA0183 port 1 TX-	
YELLOW	NMEA0183 port 2 RX+	NMEA0183 input (4,800 baud)
GREEN	NMEA0183 port 2 RX-	
RED	Analogue Input	Not Currently Used
BLACK	Transistor Output	

The ISO cable can be extended up to 25 meters without any problems.

Below is a typical connection diagram for connecting the ST-NMEA Converter to a single wire NMEA0183 Device such as you would find on some older systems including many Garmin chart plotters. If you want the ST-NMEA converter to receive data from the single wire NMEA0183 device, you must ensure the Green Input- wire is taken to DC Ground (-).
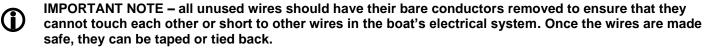

Below is a typical connection diagram for connecting the ST-NMEA Converter to a 2 wire NMEA0183 Devices, which are now what you will find in the majority of new systems and are fully NMEA0183 compliant.

The Red and Black wires in the ST-NMEA ISO cable are not power connections, but a single Input and Output wire which we have reserved for future use.

ⓘ **IMPORTANT NOTE – all unused wires should have their bare conductors removed to ensure that they cannot touch each other or short to other wires in the boat's electrical system. Once the wires are made safe, they can be taped or tied back.**

4. Operation

4.1   Power Up

The ST-NMEA Converter is designed to start converting data as soon as it powers up and no setup or configuration is required.

As it powers up all four of the LEDs will flash once and then either the Yellow "ST" or "NMEA" LED will come illuminate or flash to indicate what mode and baud rate the ST-NMEA Converter is set to (see section 4.3).

After about 1 second, the Yellow LEDs will go off and the Green "Power" LED should turn ON to indicate that the unit has powered up correctly.

As data starts to be received from the SeaTalk network or on the ISO interface (from the computer) the Yellow "ST1" and "NMEA" LEDs will flash. If they are not flashing, then no data is being received on that interface.

The Red "Error" LED indicates a data transmission issue and if it should illuminate or flash please contact Digital Yacht.

4.2   Data Conversions

All supported NMEA Sentences received will be converted into SeaTalk data, as long as that type of data is not already on the SeaTalk network i.e. if an NMEA depth sentence is received, but there is already a SeaTalk Depth Instrument putting depth data on to the SeaTalk network, then the NMEA depth sentence would not be converted.

If you are using the ST-NMEA Converter to connect a new NMEA0183 transducer/sensor to the SeaTalk network, then it is important that you remove the old SeaTalk transducer/sensor and set the relevent instrument that the transducer/sensor was connected to, so that it operates in "Repeater" mode (if applicable). This ensures that there is none of that data on the SeaTalk network and the ST-NMEA Converter will put its converted data on to the network.

Here is a list of the current NMEA0183 Sentence Conversions that the ST-NMEA Converter Supports and update rates:

OUTPUT (Convert from SeaTalk to ISO)		**INPUT** (Convert from ISO to SeaTalk)
APB	1 sec	APB
DPT	1 sec	DPT
HDG	1 sec	HDG
MTW	4 sec	MTW
MWV	1 sec	MWV
RMB	1 sec	RMB
RMC*	1 sec	RMC
RSA	1 sec	VHW
VHW	1 sec	
VLW	4 sec	

* NOTE – Time UTC from GPS is only updated every 10 secs on the SeaTalk network

If the ST-NMEA receives more NMEA Sentences than the SeaTalk Network can handle it will automatically filter/discard excessive sentences, so you can connect a 10Hz GPS or Compass sensor without flooding the SeaTalk network.

4.3 $STALK Mode and 38400 Baud Rate

Some software systems can read/write the raw SeaTalk data using a special $STALK sentence. By default our ST-NMEA Converter powers up in what we call "Normal" mode where it converts SeaTalk to/from standard NMEA0183 Sentences at 4800 baud. However, by sending it the following proprietary commands, it can be put in to $STALK mode and also work at the higher NMEA0183 baud rate of 38400.

To turn ON/OFF the special $STALK mode use these commands;

$PDGY,STalk,On
$PDGY,STalk,Off

To change the baud rate use these commands;

$PDGY,Baud,38400
$PDGY,Baud,4800

If you intend to use the $STALK mode, we do recommend selecting the 38400 baud rate.

Note that the above commands do not need a checksum, but your terminal program will need to transmit the command with <CR><LF> characters at the end. You will receive an acknowledgement from the ST-NMEA Converter.

The Mode and Baud Rate settings are saved in Non-Volatile memory and so the ST-NMEA converter will always power up in the selected Mode and Baud rate. During Power Up, the two Yellow LEDs; "ST" and "NMEA" will illuminate to show what mode and baud rate are set…

LED Status	Mode/Baud Rate
"NMEA" On for 1 sec	"Normal" Mode 4800 baud
"NMEA" Flash for 1 sec	"Normal" Mode 38400 baud
"ST" On for 1 sec	"$STALK" Mode 4800 baud
"ST" Flash for 1 sec	"$STALK" Mode 38400 baud

IMPORTANT NOTES & DISCLAIMERS
1. SeaTalk™ is a registered trademark of Raymarine UK Limited.
2. Digital Yacht is not in anyway connected or associated with Raymarine UK Limited or its associated companies.
3. No liability can be accepted for any injuries, damage or loss caused by using this ST-NMEA Converter.