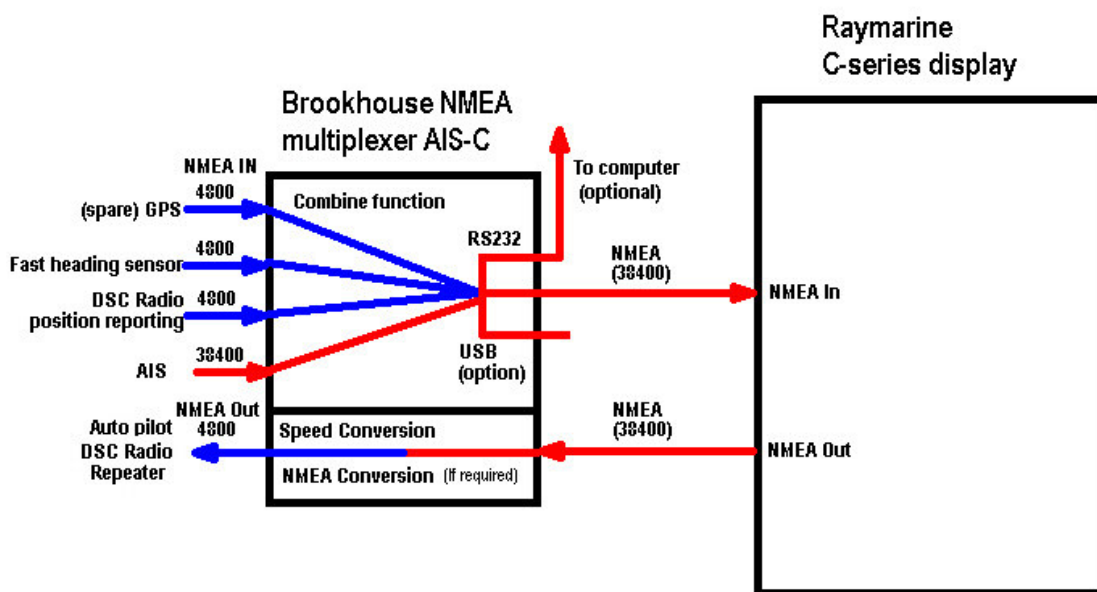


## Brookhouse NMEA Multiplexer model AIS-C



### General

This model Brookhouse multiplexer has been designed specifically for use with the popular Raymarine C-series displays. No other multiplexer or interface available today offers the same degree of integration of C-series displays with other instruments. It allows simultaneous connection of an **AIS receiver\***, **fast heading sensor**, **DSC radio** and **other NMEA-compatible marine instruments** to the single NMEA input port of the C-series display. In addition, the new multiplexer model accepts the NMEA output of the C-series and performs speed conversion as well as NMEA protocol conversion, if necessary, to enable

connection of NMEA listeners such as an **auto pilot**, a **DSC radio** etc. Installation of this multiplexer model is simple, no setup or configuration is necessary. The Brookhouse AIS-C multiplexer has 4 opto-isolated NMEA input ports, 2 NMEA (RS422) output ports, one RS232 output, one RS232 input, optional USB.

For some time Brookhouse NMEA multiplexers have been the popular choice for connecting multiple NMEA compatible instruments, including AIS, to C-series displays (C60, C80, C120). Based on the experience with typical installations and some issues surrounding C-series compatibility with other instruments, this new

model NMEA multiplexer was developed to take seamless integration a step further.

## **AIS**

Raymarine C-series products support AIS. For AIS receiver connection to the NMEA input port high-speed communication of 38400bps is required. The NMEA input port of the C-series can be configured for this baud rate. Before the new multiplexer model AIS-C was available, the standard Brookhouse multiplexer with high speed port option was already suitable for combined input of high speed AIS\* and other NMEA instrument data at standard baudrate and this product has found many satisfied users. However, activating AIS on the C-series has the side-effect that the NMEA output is rendered unusable. The new model AIS-C multiplexer offers a solution for this problem. Read about it below.

## **NMEA speed conversion**

Setting the baud rate of the NMEA input port of the C-series to 38400 for AIS, also affects the NMEA output port baudrate, which is set to 38400 at the same time. This high baudrate makes it impossible to directly connect instruments with standard 4800 baud NMEA input ports. The problem has been resolved by adding **speed-conversion** to the Brookhouse multiplexer. The C-series 38400 baud output can now be connected to a 38400baud NMEA input port on the multiplexer and the data stream is available at 4800 baud on another NMEA output port. Multiple standard NMEA listeners can be connected to this port. The speed-conversion is a separate, independent function in the multiplexer.

## **Auto pilot NMEA compatibility**

The features of the Raymarine C-series products have made it an attractive option for installation on boats with existing instruments and (non-Raymarine) auto pilots. The C-

series output NMEA version 3.01 auto pilot control data (APB sentence). However, the NMEA version accepted by many auto pilots is 2.1 or older. The result is that the newer data-format is not recognised and these auto pilots do not function with the C-series equipment. Therefore speed-conversion is not always enough to drive standard NMEA auto pilots from the C-series. The Brookhouse multiplexer model AIS-C has a unique feature that adapts the NMEA data from the C-series to a format recognised by the auto pilot, if required. The script to perform the conversion can be pre-loaded in the multiplexer or loaded by the user in the field.

## **Other NMEA compatibility**

Seatalk instrument and GPS data on the Seataalk-bus is converted to NMEA by the C-series and is also available via the NMEA output port. This data can be used to feed a DSC radio, repeater instruments, etc. Potentially NMEA compatibility problems may surface here as well. Again, these problems can be ironed out in an elegant way by the Brookhouse multiplexer. Many existing scripts are available from Brookhouse that can be loaded into the multiplexer in a simple way by the user, to perform conversions and adaptations of the data. Redundant NMEA data can be filtered out, if necessary. For the more technically oriented users, details are available in the Brookhouse document **"NMEA data manipulation and filtering"**

## **Fast heading sensor**

Raymarine recommend using a fast heading sensor to improve the performance of Marpa. Connection to the C-series display is via the NMEA port. The refresh-rate of heading-information is 10Hz. This means that 10 NMEA sentences with heading information per second are transmitted. Combining this high intensity data stream with AIS and other

NMEA equipment via the Brookhouse multiplexer presents no problems.

## NMEA GPS

The majority of C-series display installations use a Seatalk GPS receiver. Users are increasingly aware of the dependency on this single GPS. It is often mounted in a vulnerable position where it can easily receive physical damage. The prudent skipper will install a spare NMEA GPS as backup, preferably below-decks. The Brookhouse NMEA multiplexer provides enough input ports to connect this extra GPS together with AIS and other NMEA talkers to the C-series display.

## Installations without AIS

For C-series installations without AIS, but with a fast heading sensor, the high baudrate setting of 38400 is still preferable, as this ensures sufficient bandwidth for the data-intensive heading sensor plus other NMEA talkers. The Brookhouse multiplexer model AIS-C is still the recommended choice in this case, because of the speed-conversion and other features.

## Computers

As a chart plotter, the C-series offer all navigation options that one can desire. However, the display is often mounted outside at the steering position and on many boats we find a (laptop) computer at the navigation below-decks, which can be used as a back-up, for route planning, tracking etc. The Brookhouse NMEA multiplexer AIS-C has a RS232 port for output of the combined data stream to a computer. A USB port is available as an option.

## Other installations

Although the features offered by the Brookhouse multiplexer model AIS-C suit the Raymarine C-series displays very well, it is also suitable for many other purposes. The multiplexer can be reconfigured by the user, if required and the baud-rate conversion can be switched off. The same features are available as in the standard NMEA multiplexer, including filtering.

## Specifications

- 4 opto-isolated "NMEA Listener" (Input) ports.
- 1 Output RS232 port (typically for connection to computer)
- 1 Input RS232 port.
- 2 Output RS422 ports (differential NMEA talker port)
- Data speed: 3 Input ports @ 4800bps (standard NMEA speed), 1 input port @ 38400 bps, RS232 Output port: 4800/9600/19200/38400 bps selectable in setup mode, default 38400 bps.
- Speed conversion 38400bps-4800bps.
- Indicators: red LED for power, green LED for data-transmission.
- Supply Voltage: DC 9-35 Volts.
- Reversed polarity protection.
- Power Consumption: 45 mAmps. @ 12V (with all ports active)
- Physical size: 110x65x37mm (hwxwd)
- Weight: 120 grams
- Mounting: bulkhead mounting with screws.
- NMEA management and control:
  - NMEA Sentence Filtering
  - NMEA Sentence editing "on the fly" for NMEA protocol conversion.
  - Automatic port switching (mainly for GPS backup)
  - Data pacing
- Options:
  - Raymarine Seatalk support.
  - USB for computer connection.

\*All popular AIS receivers are supported, including NASA.