

# QUICK START GUIDE: OPTO-4

Rev A



## Installation Guide

This guide provides the most important information for the OPTO-4 and its installation.

Actisense recommends users visit the OPTO-4 product page, [www.actisense.com/OPTO-4](http://www.actisense.com/OPTO-4) for the latest user manual, software and resources.

## Overview

The NMEA 0183 specification from version 2.0 onwards requires an RS422 style “differential” connection. The input of a Listener should be electrically isolated to protect equipment and wiring against the risk of ground loop damage which is common in a marine environment. On a standard PC the RS232 input is not isolated and is not differential. The OPTO-4 allows a differential NMEA 0183 device to correctly connect to a PC and provide electrical isolation between them.

## Powering the OPTO-4

The OPTO-4 takes power from the RS232 TX line and the handshaking lines RTS and DTR. In most installations especially when connecting to a PC, no external power supply is required.

In systems that cannot provide power on the handshaking lines, a DC power supply can be used instead. In this instance use a male 9-pin D-type connector to connect to the OPTO-4 pins.

For the majority of installations that require external power, only positive power is needed.

- Connect positive power (9V to 15V) to pin 7
- Connect the power ground to pin 5
- Connect the power ground to pin 4

For some installations both positive and negative supplies may be required.

- Connect positive power (9V to 15V) to pin 7
- Connect the power ground to pin 5
- Connect negative power (9V to 15V) to pin 4

Note that connecting an external power supply may create a ground loop between the RS232 device and the power supply. Ensure that the supply ground is at the same potential as the RS232 device ground before connecting.

## Connecting to a PC

The OPTO-4 has a female 9-pin D-type connector for connecting to a standard RS232 PC serial port, by simply plugging the OPTO-4 into the serial port of the PC.

## Connecting a Talker to the PC

For NMEA 0183 version 2.0 or later:

- Connect the OPTO-4 Red wire to the NMEA 0183 Talker A/+.
- Connect the OPTO-4 Black wire to the NMEA 0183 Talker B/-.

For RS422 or RS485 type devices that are not specifically NMEA 0183, connect as above.

For RS232 devices, whether NMEA 0183 or not:

- Connect the OPTO-4 Red wire to the Talker RS232 Tx or +ve data.
- Connect the OPTO-4 Black wire to the Talker ground.

## Connecting a Listener to the PC

For NMEA 0183 version 2.0 or later (Listener must have an isolated input):

- Connect the OPTO-4 White wire to the Listener A/+.
- Connect the OPTO-4 Blue wire to the Listener B/-.

Listeners that use ground for the –ve data line, such as RS232 or older NMEA 0183 V1 devices, the OPTO-4 may not be suitable. There is no isolation between the RS232 port and the Blue wire.

Connecting the Blue wire to the ground of the Listener will be connecting it to the ground of the PC. Connecting the OPTO-4 Blue and Black wires together will negate the OPTO-4 isolation.

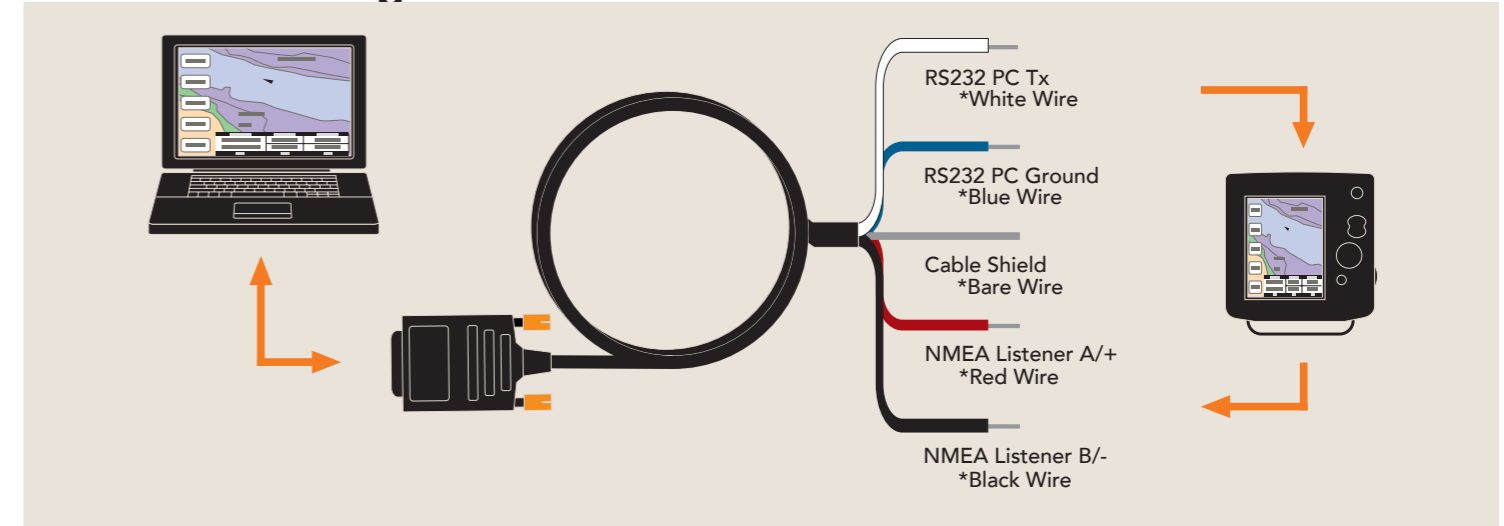
## Connecting to an RS232 Port (non PC)

The connections and power options are the same when connecting to a standard RS232, 9-pin D-type connector. Refer to the sections regarding connecting to a PC.

## Connecting a Serial to USB Converter Cable

Connecting to a USB to Serial converter cable is the same as connecting to a standard RS232 PC serial port. See section ‘Connecting to a PC’ replacing all instances of PC with the converter cable. Note that not all converter cables will provide power on the handshaking lines, see ‘Powering the OPTO-4’.

## Connection Diagram



## DB9 Pin Out Table

DB9 Pin Number	Function
Pin 1	No Connection
Pin 2	PC Rx / OPTO-4 Tx
Pin 3	PC Tx / OPTO-4 Rx
Pin 4	PC DTR / OPTO-4 Power
Pin 5	GND
Pin 6	No Connection
Pin 7	PC RTS / OPTO-4 Power
Pin 8	No Connection
Pin 9	No Connection

## Guarantee and Returns Procedure

Actisense prides itself on having a very low returns rate, giving every product a 3 year guarantee.

In the unlikely event that you need to return your OPTO-4 for repair, contact Actisense Tech Support via phone or email for an RMA number. To qualify for an RMA number you will need to provide the serial number, date of purchase and where you purchased the unit from.

Any units returned without an RMA number will incur a delay in processing and may result in a charge dependant on the guarantee status of the unit.

## NMEA 0183 Wiring Table

OPTO-4 Wire Colour	Function (connects to)
Red	OPTO-4 Listener Rx A/+ (Talker Tx A/+ or Data)
Black	OPTO-4 Listener Rx B/- (Talker Tx B/- or Ground)
Bare	Shield
White	OPTO-4 Talker Tx A/+ (Listener Rx A/+ or Data)
Blue	OPTO-4 Talker Tx B/- (Listener Rx B/-)

## Product Registration

Please register your product at [www.actisense.com](http://www.actisense.com).

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