Teensy 3.2 based Actisense format listener/sender for NMEA 2000 bus 30.07.2016

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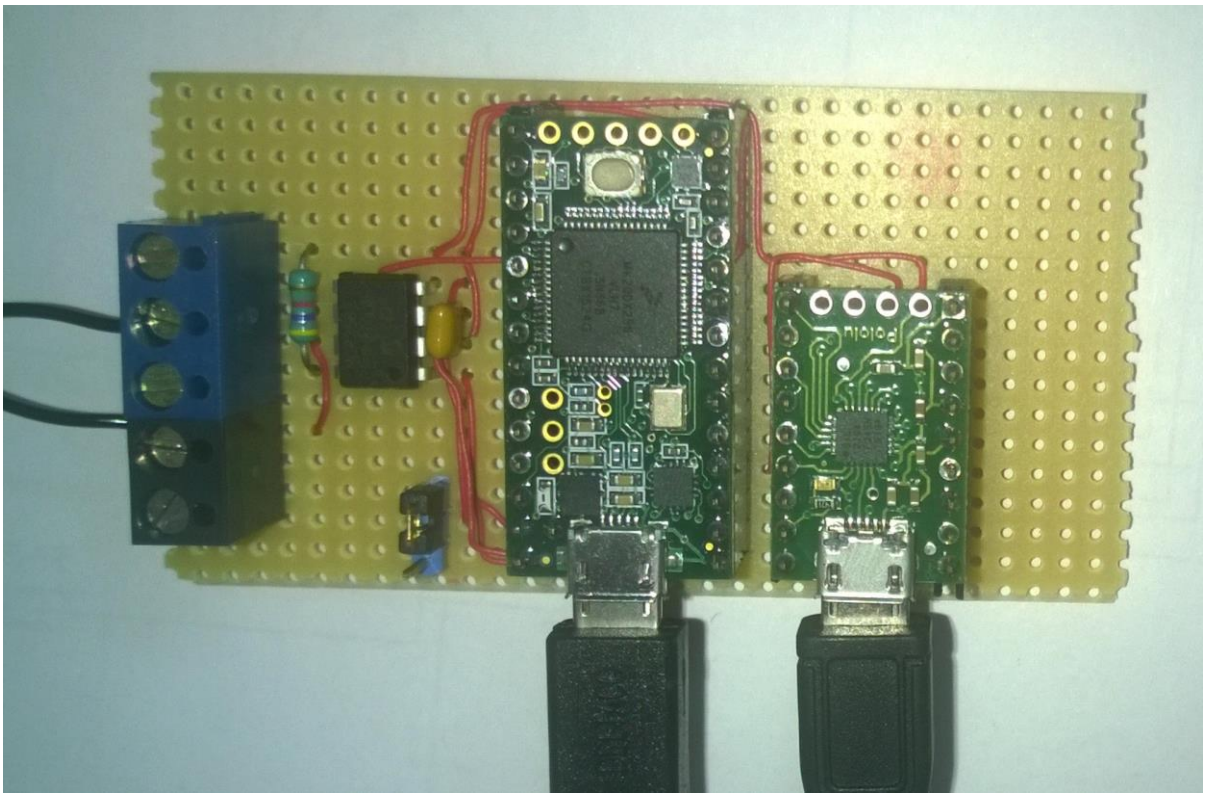
1 Introduction

First of all - as normal - you can use these instructions, but there is not any guarantee and you use it with your own risk!

Teensy 3.2 based Actisense format listener/sender module is basically designed for NMEA 2000 bus testing. Module has two USB ports – Teensy USB for sending data to NMEA 2000 bus and extra USB module (Pololu CP2104 USB to serial adapter) for receiving data from NMEA 2000 bus. Data can be send e.g. with NMEA Simulator (see. http://www.kave.fi/Apps/index.html). Data can be read with any application, which can read data from PC serial port provided in Actisense format. E.g. Actisense own NMEA Reader (http://www.actisense.com/products/actisense-software/nmeareader-eblreader/nmea-reader-downloads) or some navigation software like Nobeltec Admiral.

Compared to Actisense own NGT-1 NMEA 2000 to PC interface this module has some advantages:

- Two USB, one for sending and other for reading data, which can be used simultaneously with separated application.
- No filtering at all, so all messages will be sent or received, when used by default code TeensyActisenseListenerSender.ino
- Open Source, you can develop code as you like for your purposes.

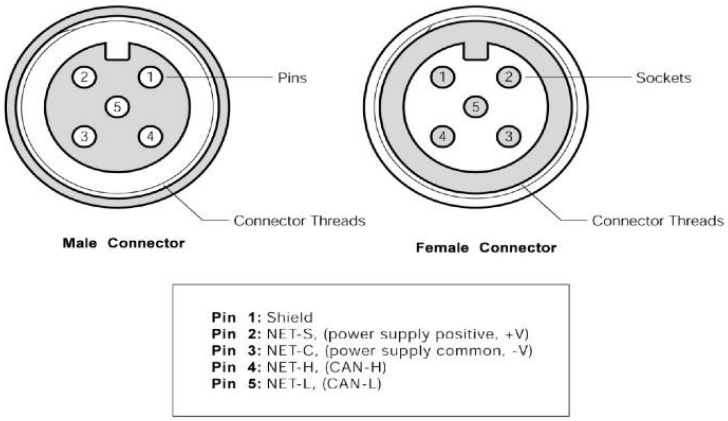


2 Using the module

Ready module has two USB ports and program ready for running. To use module:

- Connect NMEA 2000 bus NET-H wire to screw connector marked with H and NET-L wire to screw connector L. As default do not need to connect NMEA 2000 bus +, - or shield. These can be used, if you want to use module for other purposes and get power from NMEA 2000 bus.

  NMEA 2000 bus NET-H wire has normally white color and can be marked also as CAN-H
  NMEA 2000 bus NET-L wire has normally blue color and can be marked also as CAN-L



- Connect both USB to the PC USB port. Module will be powered by port on Teensy board.
- Open e.g. NMEA Simulator NMEA 2000 port to port, which you can see on your device manager as “Teensy USB serial (COMx)”
- Open e.g. NMEA Reader to port, which you can see on your device manager as “Silicon Labs CP210x USB to UART Bridge (COMx)”

3 Build your own module

3.1 Parts needed

- Teensy 3.2
- Pololu_CP2104_USB_to_Serial_adapter
- MCP2562_CAN-bus_transceiver
- 4.7 kohm resistor
- 100nF condensator
- screw or some connector for NMEA 2000 bus connection

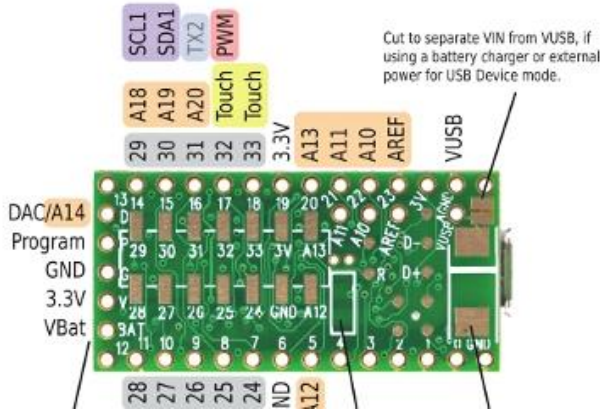
- board for making connections

3.2 Making connections

- Make connections by following the schematics on Teensy_Actisense_listener_sender_schematics.pdf. As default you do not need parts marked optional. See notes below!

- Note! If you make device only USB powered, you do not need jumper to select power. Just make shortcut to jumper 2-3 pins.

- Note! If you add jumper to select power, cut small folio on Teensy board to separate Vin from USB. See "Cut to separate VIN from USB…" noted on picture below.



3.3 Program the module

- Follow the instructions on document "NMEA 2000 library reference" (https://github.com/ttlappalainen/NMEA2000/blob/master/Documents/NMEA2000_library_reference.pdf) for preparing library for Teensy 3.2 board.

- Open TeensyActisenseListenerSender.ino sketch by double click and send it to the board.

- Start to use the module.

4 Finally

You can use this module in different ways:

- Testing NMEA 2000 with different devices on bus.

- As replacement Actisense NGT-1. Then you do not need Pololu module, but you need to program it by using https://github.com/ttlappalainen/NMEA2000/tree/master/Examples/ActisenseListener

- Add optional parts and use it e.g. as 1-wire Temperature monitor. I have code ready so it can be found from NMEA 2000 library examples some day. For this you either do not need Pololu module.

- Or invent your own solution by extending.