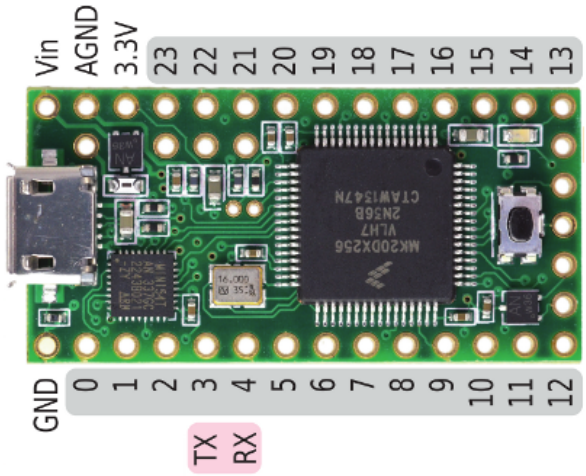
##CANbus Library for Teensy 3.1

###Introduction FlexCAN is a serial communication driver for the CAN0 peripheral built into the Teensy 3.1 CPU. The driver is organized in the Arduino library format.

When the FlexCAN object is constructed, Arduino pins Digital 3 and Digital 4 are assigned to CAN functions TX and RX. These should be wired to a 3.3V CAN transceiver TXD and RXD respectively to allow connection of the Teensy 3.1 to a CAN network.



Even though the Teensy is operating on 3.3V, use of 5V transceivers may be an option if the system has regulated +5V available. The CAN RXD input on the CPU is 5V tolerant and most 5V transceivers will accept the 3V TXD signal. This is a good choice for breadboarding due to availability of thru-hole 5V transceiver parts.

Note that CAN will normally not work without termination resistors.

Supported baud rates are 125000, 250000, 500000, and 1000000 bits per second. If the baud rate is not specified it will default to 125000.

###CAN Transceiver Options Please add parts you are using successfully with Teensy 3.1 to this list.

- TI SN65HVD230D on 3.3V (1MBPS)
- TI SN65HVD232D / SN65HVD232QDQ1 on 3.3V (1MBPS)
- NXP TJA1050T/VM,118 on the same 5V supply as the Teensy. (1MBPS)

- Microchip MCP2551 on 5V (reported at 500KBPS)

###Driver API **begin()** Enable the CAN to start actively participating on the CANbus.

end() Disable the CAN from participating on the CANbus. Pins remain assigned to the alternate function CAN0.

write(message) Send a frame of up to 8 bytes using the given identifier. **write()** will return 0 if no buffer was available for sending (see "Caller blocking" below).

message is a **CAN_message_t** type buffer structure.

read(message) Receive a frame into "message" if available. **read()** will return 1 if a frame was copied into the callers buffer, or 0 if no frame is available (see "Caller blocking" below).

available() Returns 1 if at least one receive frame is waiting, or 0 if no frame is available.

###Use of Optional RX Filtering **begin(mask)** Enable the CAN to start actively participating on the CANbus. Enable reception of all messages that fit the mask. This is a global mask that applies to all the receive filters.

setFilter(filter, number) Set the receive filter selected by number, 0-7. When using filters it is required to set them all. If the application uses less than 8 filters, duplicate one filter for the unused ones.

The mask and filter are **CAN_filter_t** type structures.

###Caller Blocking Support Support has been included for wait / blocking in both the **read()** and **write()** calls.

When the **CAN_message_t** field **timeout** is given, the **read()** and **write()** calls will wait if needed until the frame transfer can take place. The maximum wait for transfer is specified by **timeout** in milliseconds. If the call times out, it will return 0 as in the non-blocking case.

Setting the timeout field to 0 will make the calls non-blocking.

The timeout monitoring mechanism calls **yield()** until a buffer is found or the timeout time is exceeded.

###In-order Transmission Caller blocking can be used to **write()** frames guaranteed in-order to the bus. When caller blocking is selected for **write()** (non-zero timeout specified), a single hardware transmit buffer is used.