# CAN Bus logger with SD-card

0. What is it?

This is just simple logger which writes everything from CAN bus to text file on a micro SD card. It has following features:

- Easy to use: only one start/stop button and all the settings are stored in configuration text file on SD card.
- Optional message filtering based on ID mask matching
- Selectable listen-only mode (without CAN bus acknowledge)
- Three LEDs for indication of logger status packet acceptance filter for every port based on CAN ID mask matching,

Device specification:

Parameter	Value
Power supply voltage	5V-20V
Current consumption	60mA at 5V input
CAN baudrate	up to 1Mbps (any non-standard baudrate supported)
CAN ID mask filters	1
Microcontroller	STM32F405RGT6
CAN transceiver	SN65HVD232DR
PCB size	48.26 mm x 20.85 mm (1.9 in x 0.82 in)

Board connections:
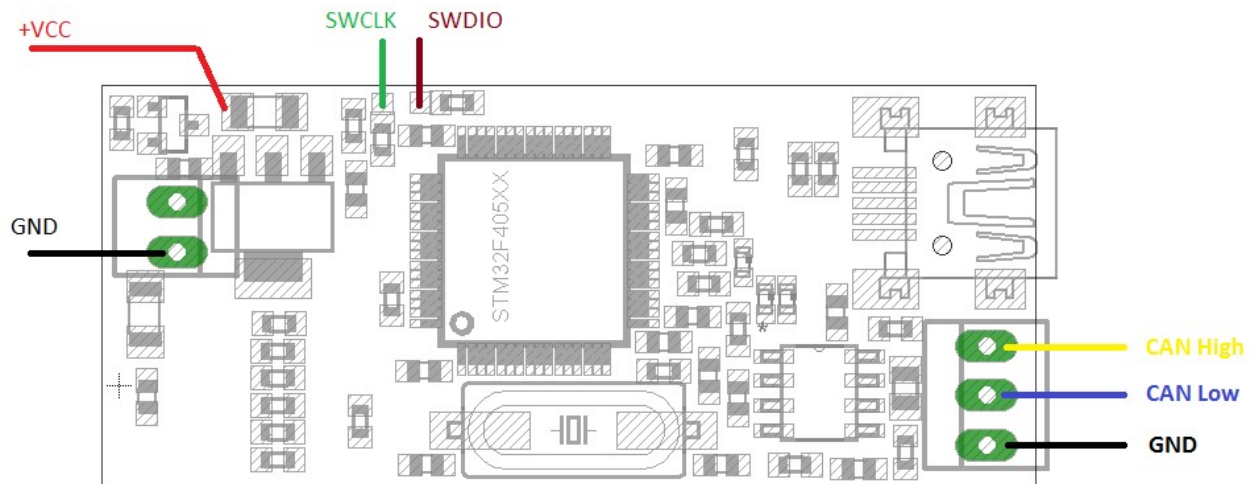
LEDs:
- Green: power on, also toggling every time when the CAN receiving and accepting message,
- Blue: blinking each time when block of data has been written to the SD card,
- Red: fault indication (see below).

1. How to start

- Connect CAN bus
- Connect power supply (make sure the correct polarity and voltage range is connected!)
- Place Config.txt file to the root folder of SD card (here is [example](#) of the file)
- Insert SD card
- Press "START" button to start log
- The blue LED should blinking periodically (with speed dependant from writing rate)
- Press "START" button again to stop the log
- The log file placed to root folder and has name in format: HH-MM-SS.csv , where HH-MM-SS is time from power cycling of the device

2. Configuration file format

All numbers in Config.txt should be decimal (even filter data mask, sorry of inconvenience)

Parameter	Meaning
`baud`	CAN bus baudrate in kbps
`ack_en`	If 1 then CAN logger is responding with ACK slot on reception of a valid CAN frame. Set to 0 for silent (listen-only) mode.
`id_filter_mask`	Bit mask for ID filtering
`id_filter_value`	Expected value for ID
`log_std`	Messages with standard (11 bit) ID are accepted if set to 1
`log_ext`	Messages with extended (24 bit) ID are accepted if set to 1
`timestamp`	If 1 then every record in log file has timestamp (in milliseconds)

The ID filter acceptance criteria is:

Message ID *bitwise and* `id_filter_mask` = `id_filter_value` *bitwise and* `id_filter_mask`

For example if `id_filter_mask` = 10 = 1010 binary and the `id_filter_value` = 2 = 0010 binary. It means that the bit #1 and bit #3 of CAN identifier will be checked, and the bit #1 is expected to be 1 and bit #3 to be 0. Thus only identifiers with binary ending of …0X1X will be accepted by CAN1, i.e. in hex 0x?2, 0x?3, 0x?6, 0x?7.

Set `id_filter_mask` = 0 for disabling ID filter.

3. Log file format

```
Timestamp,ID,Data0,Data1,...,
78824,38,80,00,08,00,00,00,C7
78825,244,10,00,00,00,00,00,00,5E
78826,3A,00,00,00,00,04,00,45
78827,348,00,01,00,00,00,52
78828,3E,1D,E6,44
78829,3B,00,00,00,E3,23
78829,20,00,00,07
78830,30,04,00,00,00,00,20,00,5C
78830,39,23,00,10,70
78830,B1,00,00,00,00,11,C8
78830,B4,00,00,00,00,00,00,00,BC
78831,120,00,00,00,00,10,10,00,49
78833,38,80,00,08,00,00,00,C7
78835,3A,00,00,00,00,04,00,45
```

Data
(byte#0 - byte#6)

Header line

Message ID

Timestamp (in ms)

4. Faults and indication

- If red LED and blue LED are both on just after pressing "START" button, then this is Config.txt file problem, check configuration file.
- If red LED is on during logging then this is either data buffer overflow or SD card problem: check if there is enough free space on SD card or SD card has acceptable writing speed rate.