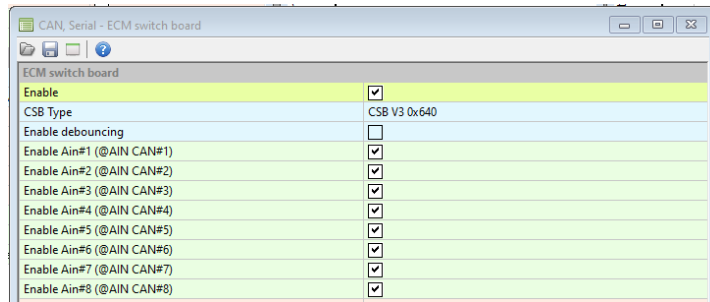


# CANTCU – EMU Black integration

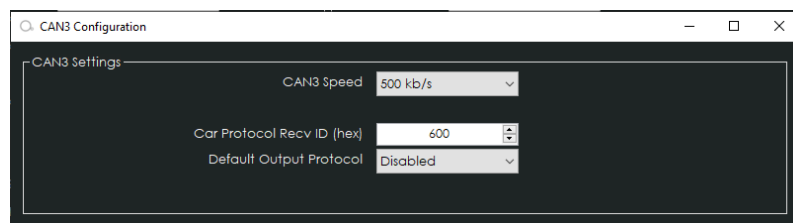
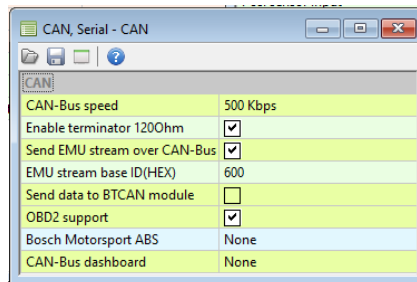
- **CAN Speed** is configurable
- CAN2.0B, Standard 11bit identifiers

## ECUMaster Configuration

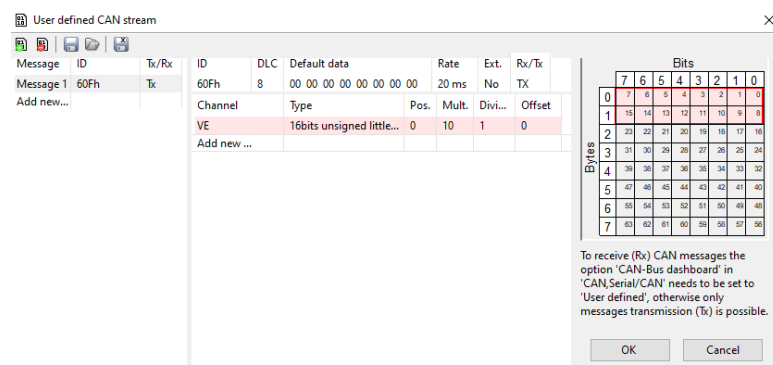
- **ECM Switch board** needs to be enabled, type **CSB V3 0x640**.



- EMU Stream needs to be enabled. Base ID can be changed, but it needs to match in both ECUMaster and CANTCU. (default value 0x600h)



- Add a user defined CAN stream (Tx). Frame ID is calculated by adding 0x0Fh to the **EMU Stream base ID** (e.g. 0x600h + 0x0Fh = 0x60Fh). The CAN stream preset is available for download in the wiki.



## Available Realtime-values in CANTCU (sent from ECUMaster)

- Engine RPM
- TPS Value (Pedal %)
- Engine MAP
- VSS Speed
- Brake Switch
- Coolant Temperature
- Engine Oil Temperature

## Available Realtime-values in ECUMaster (sent from CANTCU)

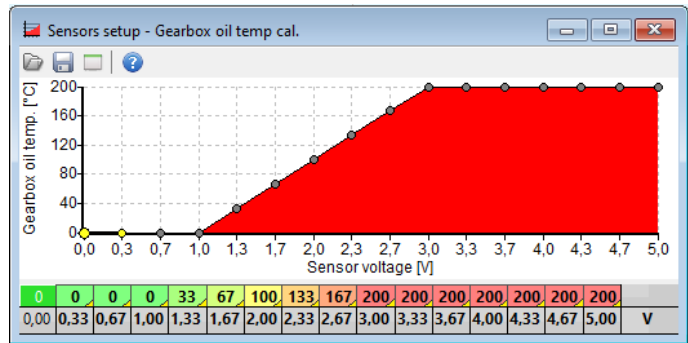
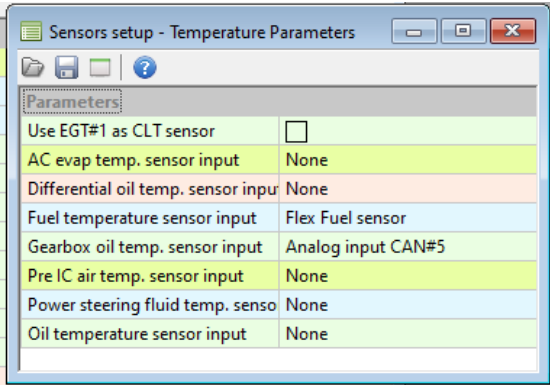
- Gearbox Gear
- Gearbox Modes
- Gearbox Oil Temperature
- Shiftcut (percentage and 0/1)
- Blip % (percentage and 0/1)
- Clutch Slip %
- Gearbox RPM Target

## Value Mapping CANTCU to ECUMaster

ECM Channel	Type	Value Range	CANTCU variable	Scaling	Offset
AIN1	UINT16	0-5000mV	Cut %	50mV / %	
AIN2	UINT16	0-5000mV	Blip %	50mV / %	
AIN3	UINT16	0-5000mV	Clutch Slip %	25mV / %	2500mV = 0%
AIN4	UINT16	0-5000mV	RPM Target	0.5mV / RPM	
AIN5	UINT16	0-5000mV	TCU Oil Temperature	10mV / °C	1000mV = 0°C
AIN6	UINT16	0-5000mV	Gear Number	100mV / Gear	1000mV = "0" Gear
AIN7	UINT16	0-5000mV	Drive Mode	1000mV/ Mode	
AIN8	UINT16	0-5000mV	DriveLogic Mode	1000mV/ Mode	
Switch 1	single bit	0/1	Cut Active	0/1	
Switch 2	single bit	0/1	Blip Active	0/1	
Switch 3	single bit	0/1			
Switch 4	single bit	0/1			
Switch 5	single bit	0/1			
Switch 6	single bit	0/1			
Switch 7	single bit	0/1			
Switch 8	single bit	0/1			

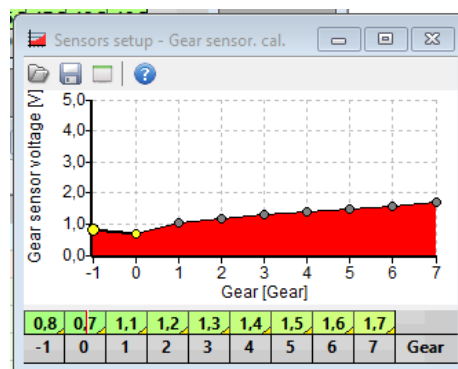
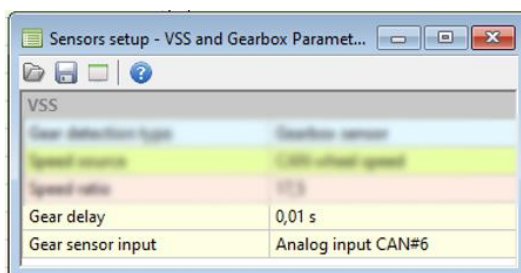
## Configuring Inputs – Oil Temperature

Oil Temperature is configured by selecting **Analog input CAN#5** as Gearbox oil temp. sensor input in the **Sensors** -> **Temperature** menu structure. ECUMaster does not accept negative values, so minimum shown temperature is limited to 0°C.



## Configuring Inputs – Gearbox Gear

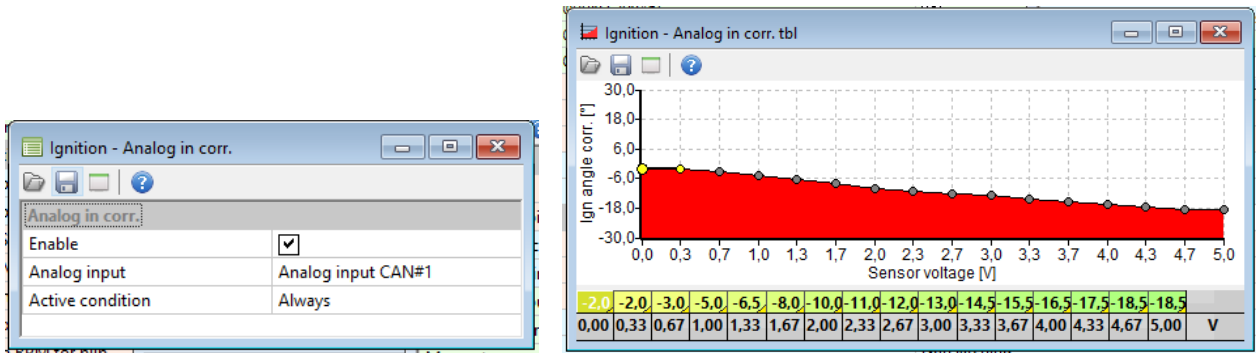
Gear number is configured by selecting **Analog input CAN#6** as Gear sensor input in the **Sensors** -> **VSS and Gearbox** menu structure. Calibration steps are 100mV per gear. Gear 0 = Neutral, Gear -1 = Reverse. A maximum of seven forward gears can be defined.



Tuning – Shiftcut

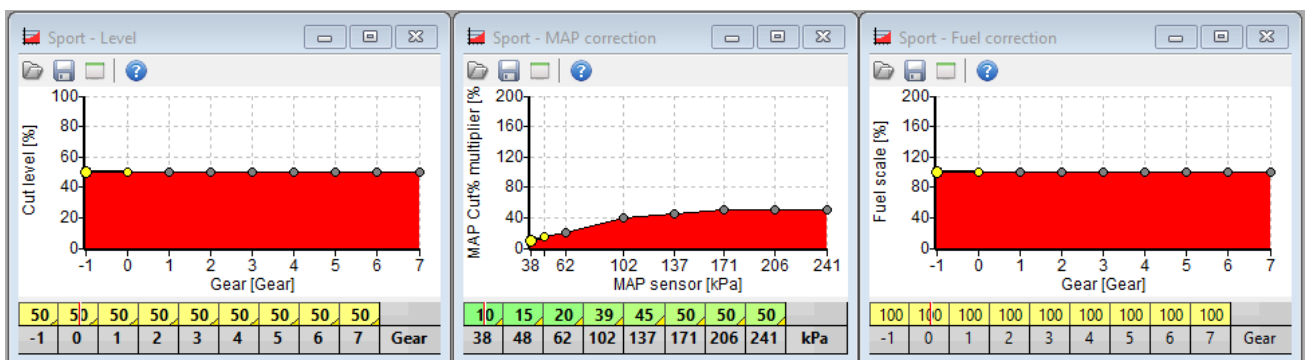
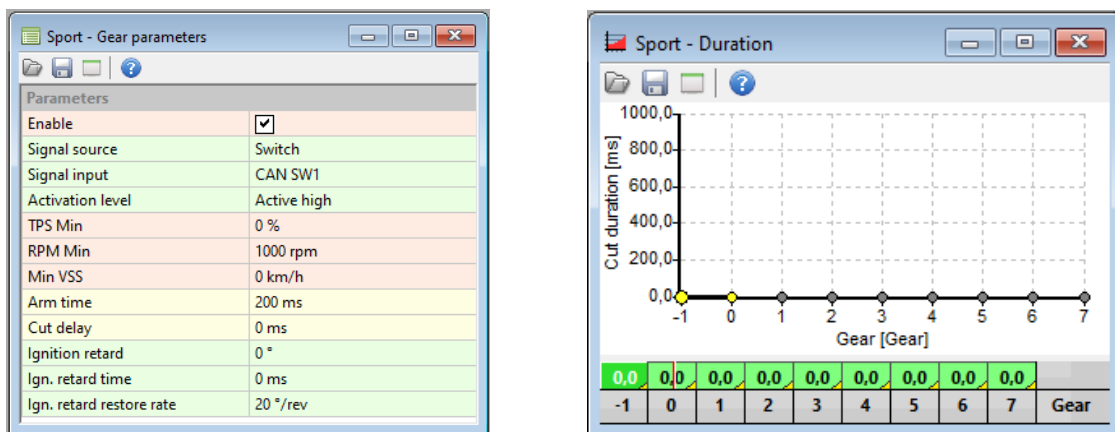
There are several different ways of configuring cuts. The way described here has been tested to work nicely in various applications. The strategy combines both cutting and retarding the ignition, and makes use of the analog and digital triggers sent from CANTCU.

In **Ignition** -> **Corrections** an input and table can be configured for retarding ignition based on **Analog input CAN#1**.



In **Sport** -> **Gear Cut** a CAN switch (Cut Active Indication 0/1) is defined to trigger functions and maps related to the Gear Cut function. The various parameters affecting the cut can then be adjusted until the desired functionality/shift characteristic is achieved.

Note: Sport – Duration map shall be set at 0 ms



Tuning – Throttle Blip

Throttle blips can be done either using various methods, like the **Sport** -function, a **DBW Characteristic map** blended in using the Blip % as a blend value, or directly through **DBW Parameters** as a CAN-request. It's recommended to use one of the **DBW** options, as they offer the best flexibility for tuning. The CAN-request option is explained here.

By using direct control of the DBW throttle, the desired DBW opening % is directly requested and modulated by CANTCU during the blip. The function is enabled in **DBW -> Parameters**. CAN control should be activated, and the CAN ID used set to 0x667h. In **CANTCU Configurator** it is possible to adjust the sensitivity and max blip percentage. Adjustment is described on the [ECUMaster integration page](#) in CANformance Wiki.

Enable traction accrue	<input checked="" type="checkbox"/>
Second PPS pot. input	None
PPS Plausible check type	2nd pot voltage follows pot 1st
Enable CAN control	<input checked="" type="checkbox"/>
CAN ID(hex)	667
Characteristic switch	None
Blend characteristics	<input type="checkbox"/>
Disable when no RPM	<input type="checkbox"/>
BMW ITB mode	<input type="checkbox"/>

**Blip Control**

Max Blip Throttle  %

Decel Blip  %

Driving Blip  %

Maximum Blip Throttle defines maximum DBW throttle angle during blips.

Decel/Driving Blips change aggressiveness/gain of blip activation.

**NOTE!**

**All tuning should always be done by a professional in safe environment (track/dyno)**

Before activating the blip function, it's recommended to test downshifting and verify (realtime or logging) that the user table is behaving correctly during the blip. Starting values for tuning the blip should be low and gradually increased to avoid overrevving and undesired behavior/acceleration during the shift.