

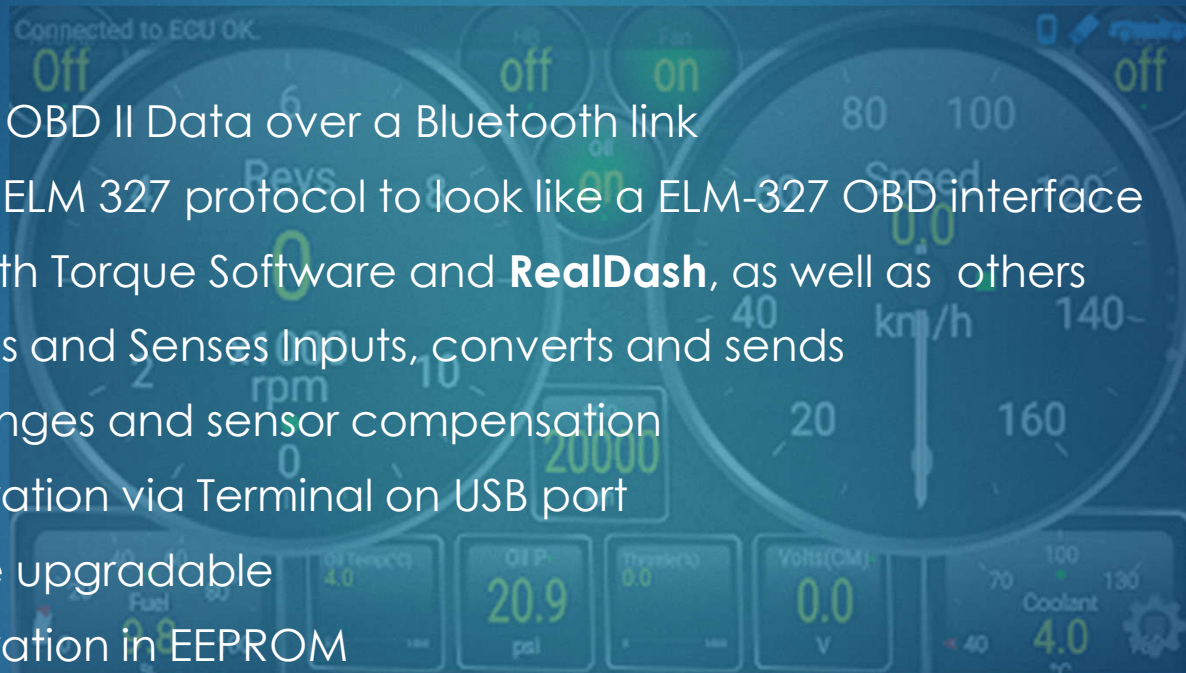
Rae-San OBD Bridge

MODERN DIAGNOSTICS AND DASHES ON YOUR VINTAGE
MOTORCYCLE



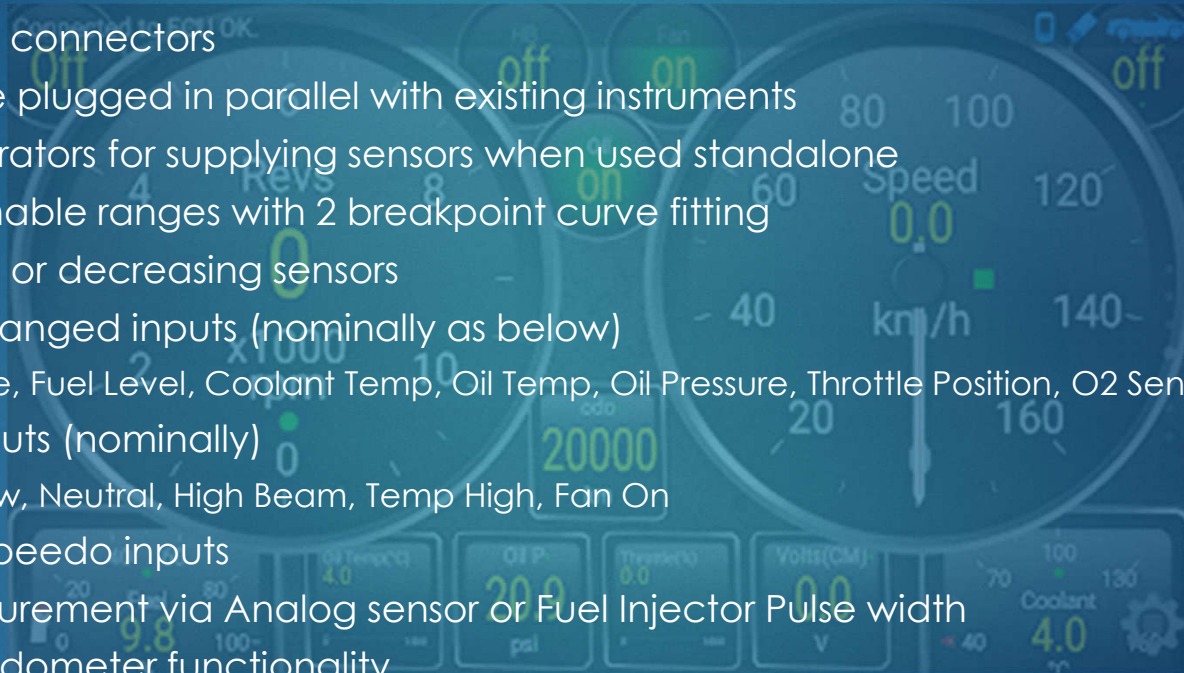
OBD-BRIDGE - Overview

- ▶ Provides OBD II Data over a Bluetooth link
- ▶ Uses the ELM 327 protocol to look like a ELM-327 OBD interface
- ▶ Works with Torque Software and **RealDash**, as well as others
- ▶ Measures and Senses Inputs, converts and sends
- ▶ Input Ranges and sensor compensation
- ▶ Configuration via Terminal on USB port
- ▶ Software upgradable
- ▶ Configuration in EEPROM



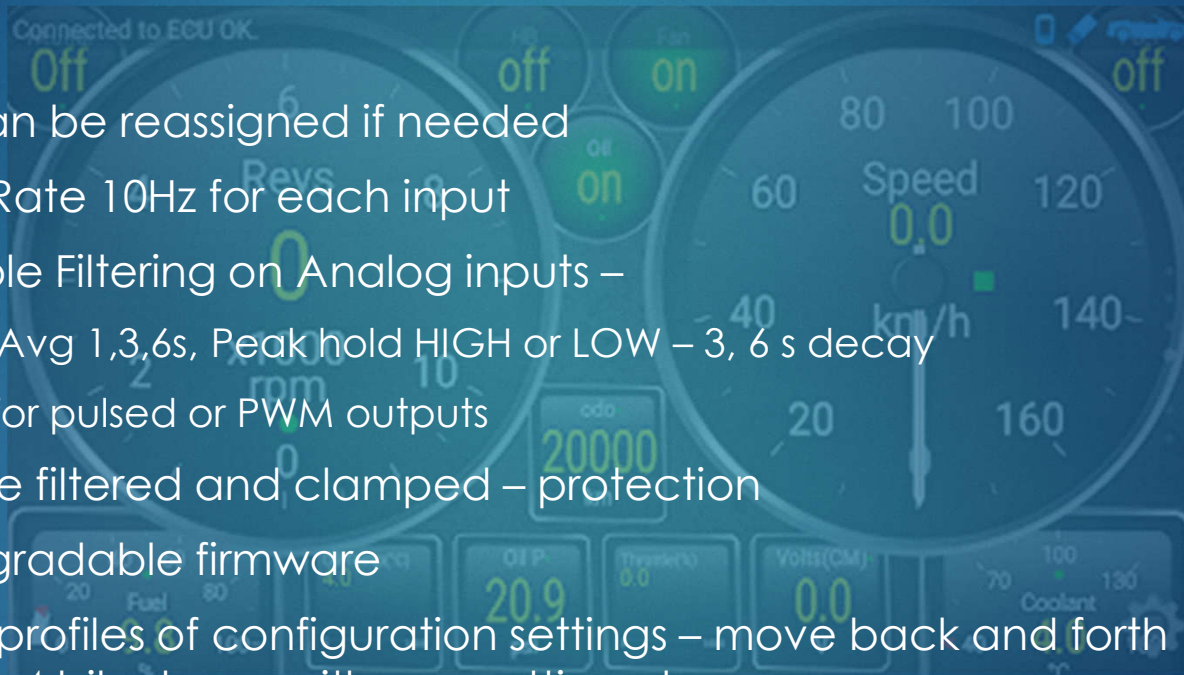
OBD-Bridge - Features

- ▶ Small Size
- ▶ Pluggable connectors
- ▶ Able to be plugged in parallel with existing instruments
- ▶ Bias Generators for supplying sensors when used standalone
- ▶ Programmable ranges with 2 breakpoint curve fitting
- ▶ Increasing or decreasing sensors
- ▶ 6 analog ranged inputs (nominally as below)
 - ▶ Voltage, Fuel Level, Coolant Temp, Oil Temp, Oil Pressure, Throttle Position, O2 Sense
- ▶ 5 state inputs (nominally)
 - ▶ Fuel Low, Neutral, High Beam, Temp High, Fan On
- ▶ Tacho + Speedo inputs
- ▶ Fuel Measurement via Analog sensor or Fuel Injector Pulse width
- ▶ Includes odometer functionality
- ▶ Voltmeter calibration to allow for voltage drops.



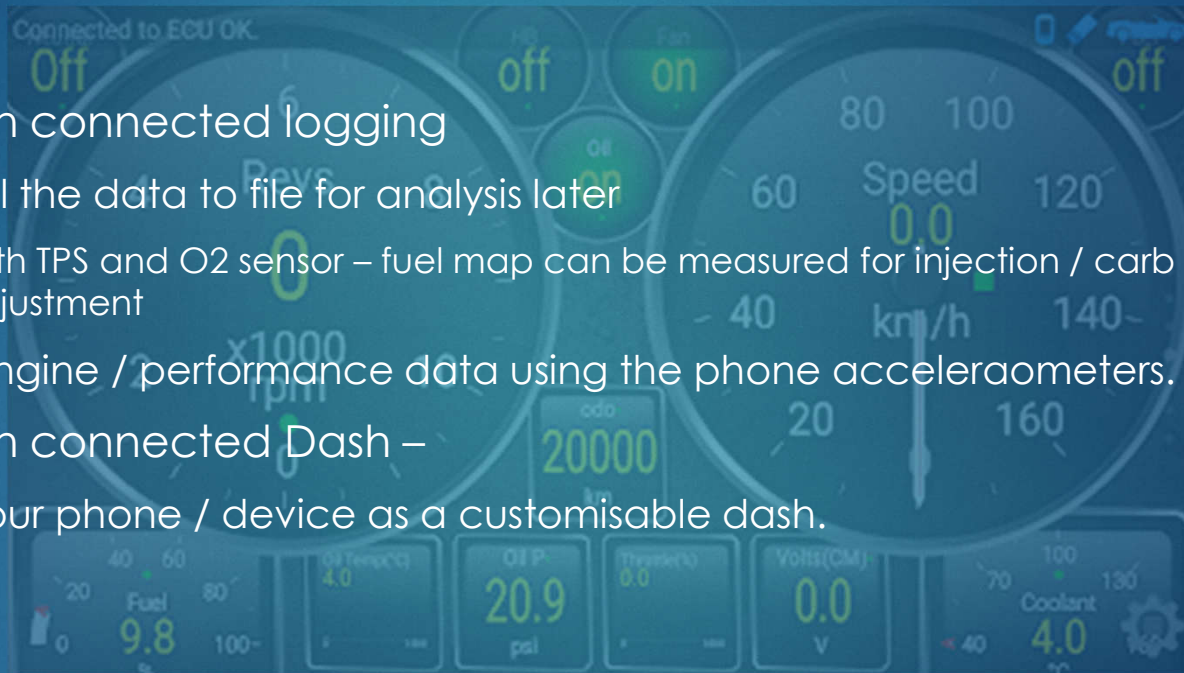
OBD-Bridge – Features 2

- ▶ Inputs can be reassigned if needed
- ▶ Sample Rate 10Hz for each input
- ▶ Selectable Filtering on Analog inputs –
 - ▶ RAW, Avg 1,3,6s, Peak hold HIGH or LOW – 3, 6 s decay
 - ▶ Used for pulsed or PWM outputs
- ▶ Inputs are filtered and clamped – protection
- ▶ Field Upgradable firmware
- ▶ 4 stored profiles of configuration settings – move back and forth between 4 bike types with one setting change.
- ▶ Profiles come preconfigured for popular bikes.



OBD-Bridge - Uses

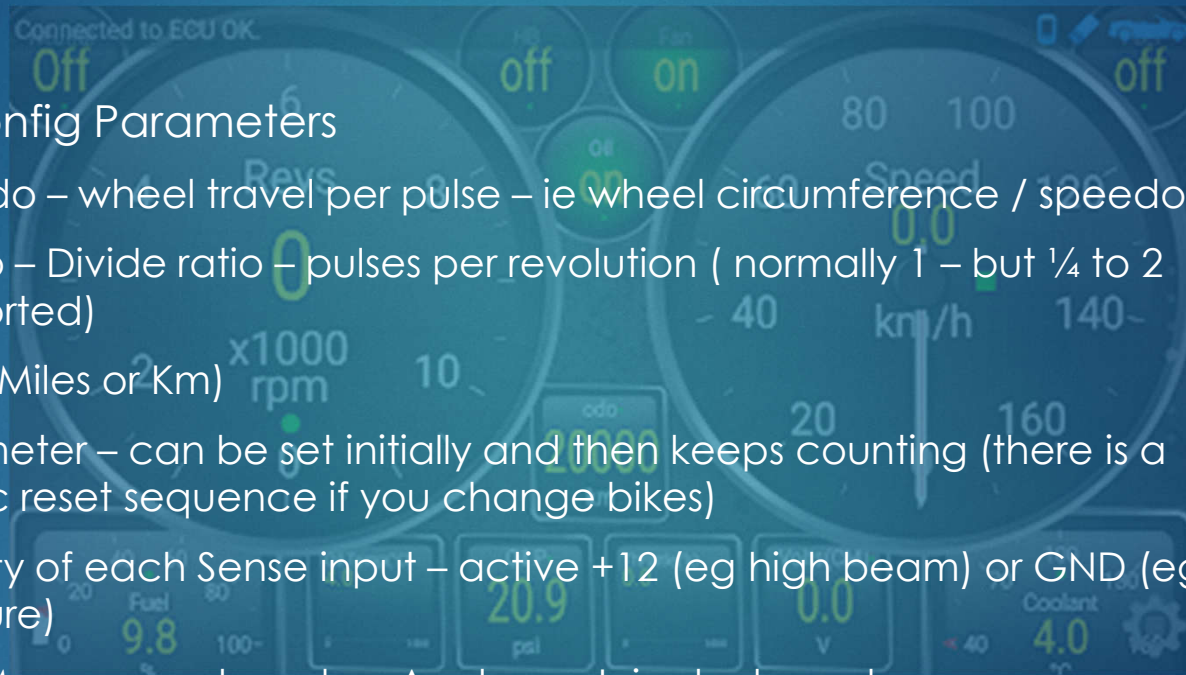
- ▶ Bluetooth connected logging
 - ▶ Log all the data to file for analysis later
 - ▶ With TPS and O2 sensor – fuel map can be measured for injection / carb adjustment
 - ▶ Log engine / performance data using the phone accelerometers.
- ▶ Bluetooth connected Dash –
 - ▶ Use your phone / device as a customisable dash.



OBD-BRIDGE – Configuration

▶ Basic Config Parameters

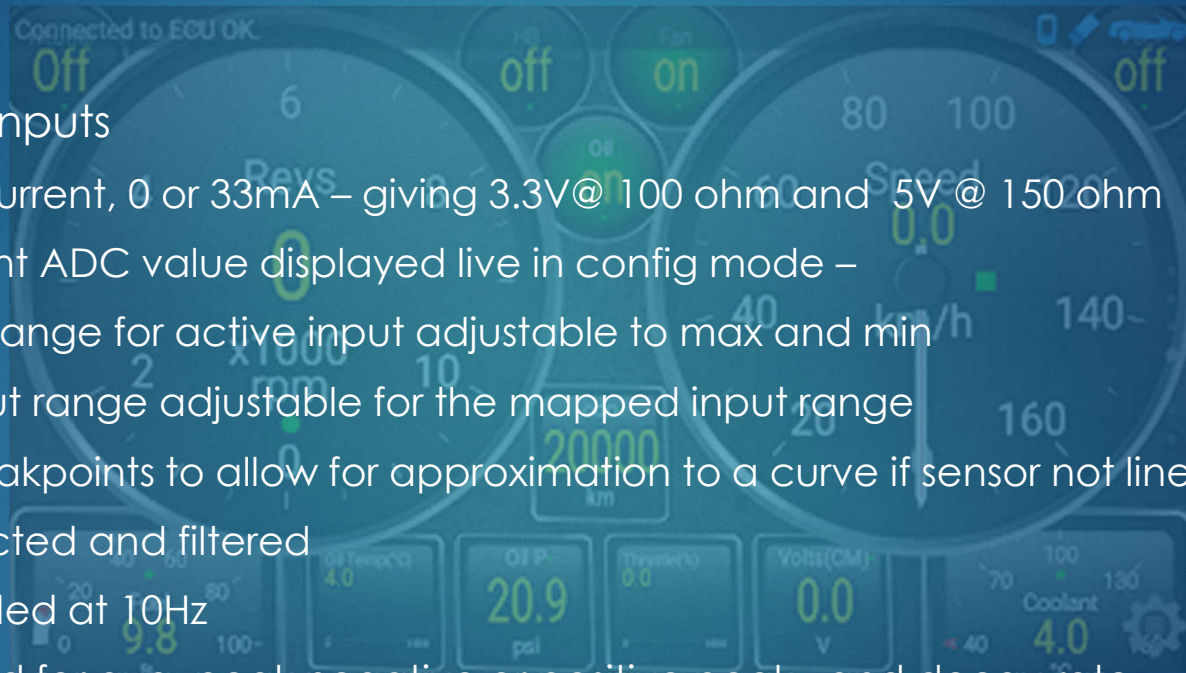
- ▶ Speedo – wheel travel per pulse – ie wheel circumference / speedo cal
- ▶ Tacho – Divide ratio – pulses per revolution (normally 1 – but ¼ to 2 supported)
- ▶ Units (Miles or Km)
- ▶ Odometer – can be set initially and then keeps counting (there is a magic reset sequence if you change bikes)
- ▶ Polarity of each Sense input – active +12 (eg high beam) or GND (eg oil pressure)
- ▶ Fuel Measurement mode – Analog or Injector based



OBD-BRIDGE – Configuration 2

▶ Analog Inputs

- ▶ Bias current, 0 or 33mA – giving 3.3V@ 100 ohm and 5V@ 150 ohm
- ▶ Current ADC value displayed live in config mode –
- ▶ ADC range for active input adjustable to max and min
- ▶ Output range adjustable for the mapped input range
- ▶ 2 breakpoints to allow for approximation to a curve if sensor not linear
- ▶ Protected and filtered
- ▶ Sampled at 10Hz
- ▶ Filtered for avg, peak negative or positive peak , and decay rate
 - ▶ Supports resistive, pulsed , pwm and voltage quantities

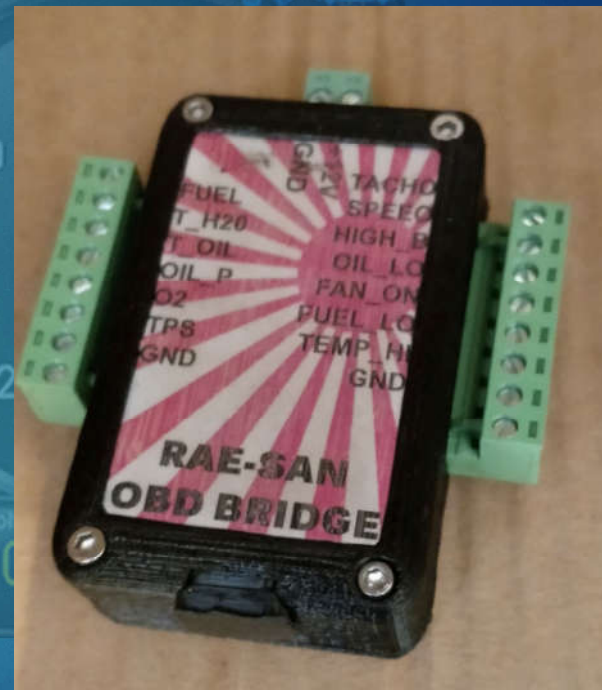
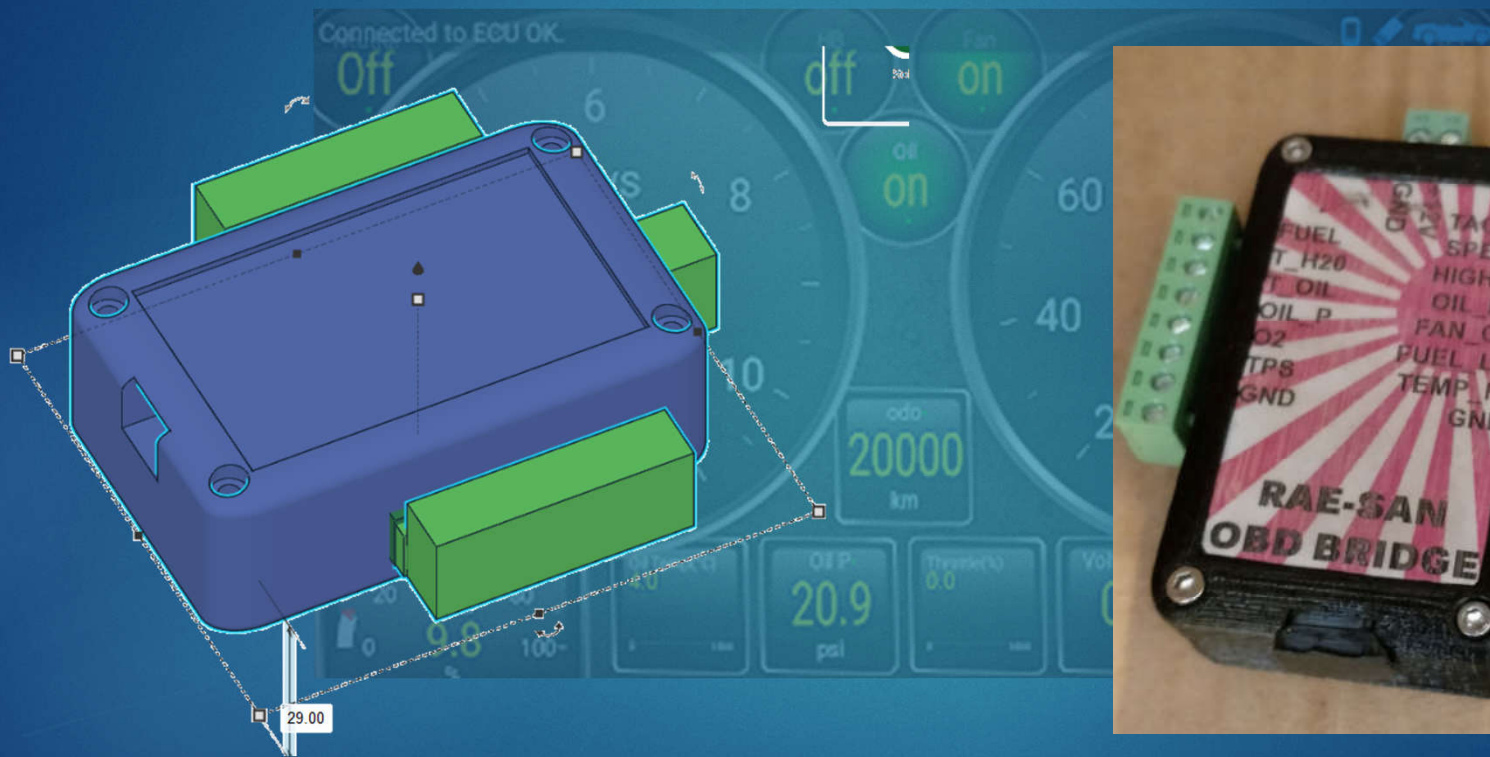


OBD-BRIDGE – Analog Inputs

- ▶ Analog Inputs – default allocation – can be mapped to another quantity.
 - ▶ Voltage
 - ▶ Fuel – resistive or other
 - ▶ Coolant Temperature
 - ▶ Oil Temperature – Additional sensor
 - ▶ Oil Pressure – can use standard resistive sensor or Piezo sensor
 - ▶ Rae-San unit available as option
 - ▶ Throttle Position – from Throttle Position sensor if fitted
 - ▶ O2 sensor – WB02 Sensor if fitted can be reported

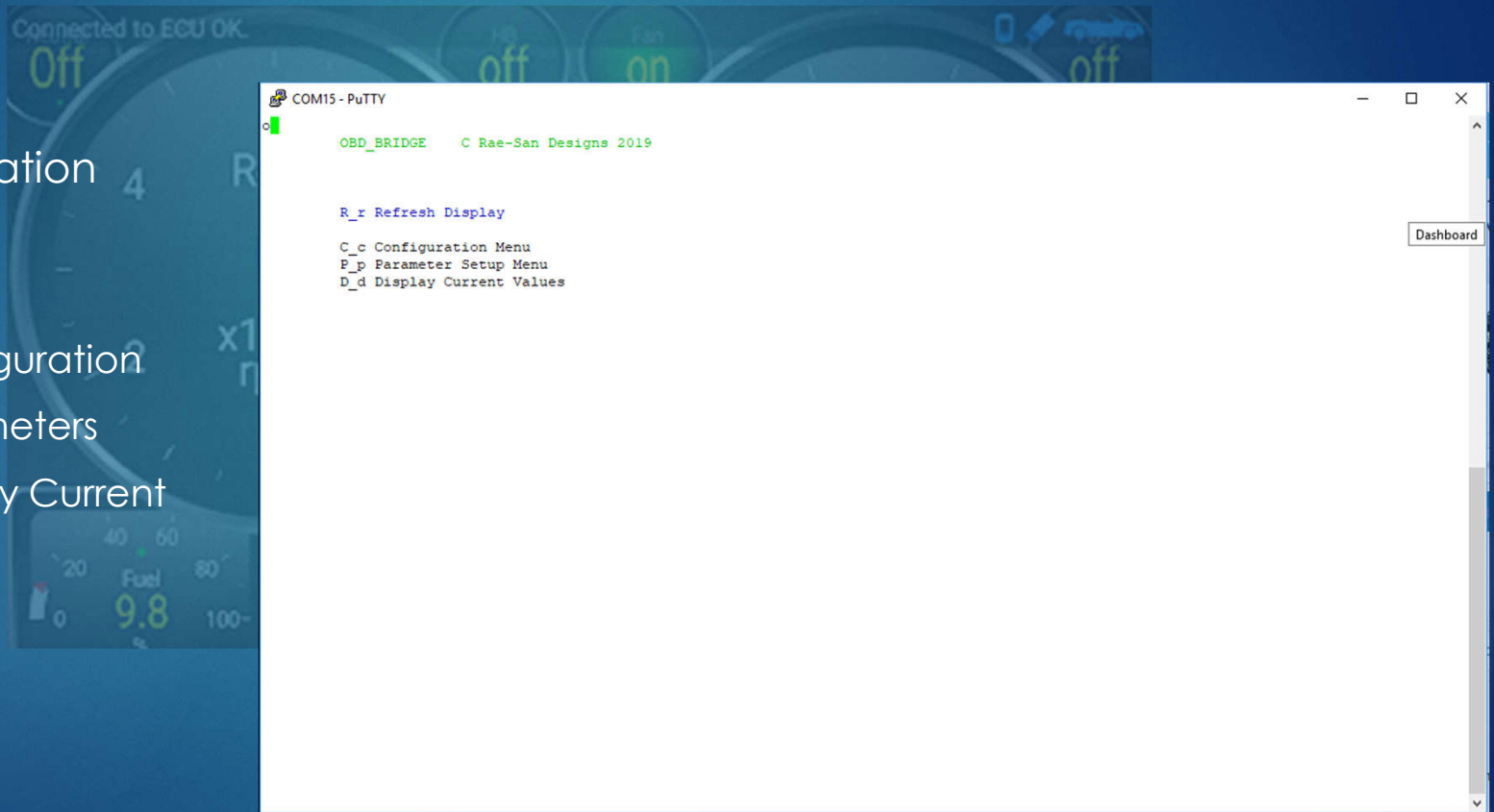


OBD-BRIDGE – Physical



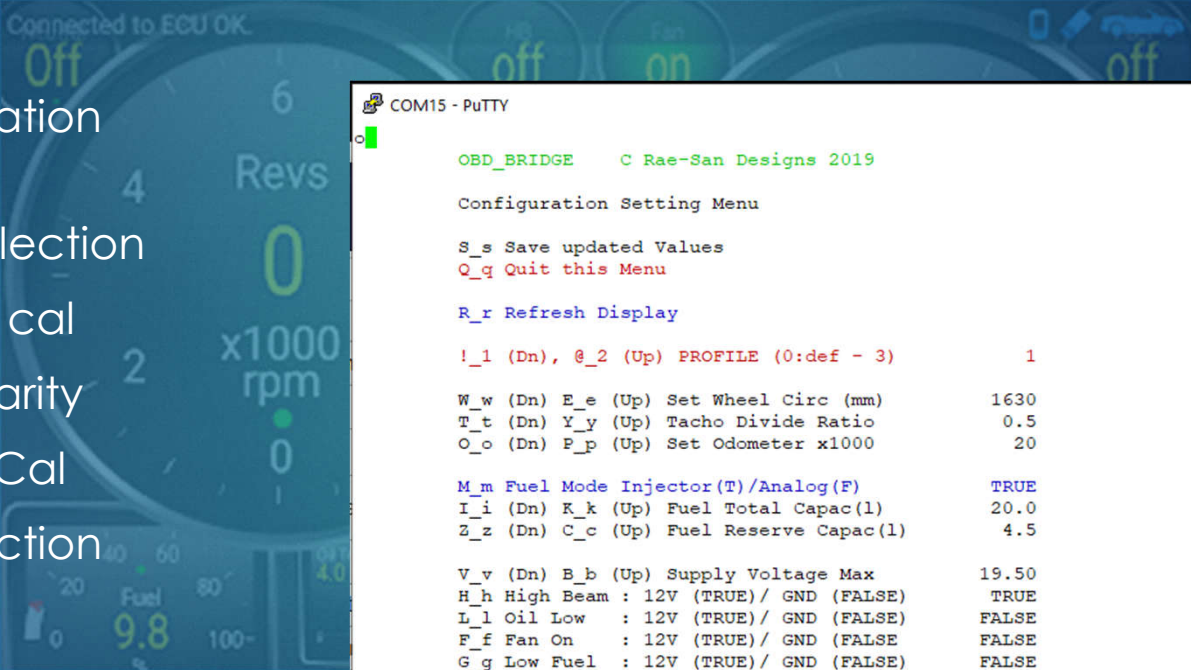
OBD-BRIDGE – Top Level Config

- ▶ Root configuration screen
- ▶ Select
 - ▶ Configuration
 - ▶ Parameters
 - ▶ Display Current



OBD-BRIDGE – Config Values

- ▶ Configuration screen
- ▶ Profile Selection
- ▶ Distance cal
- ▶ Input Polarity
- ▶ Voltage Cal
- ▶ Fuel Selection



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Configuration Setting Menu

S_s Save updated Values
Q_q Quit this Menu

R_r Refresh Display

!_1 (Dn), @_2 (Up) PROFILE (0:def - 3)          1

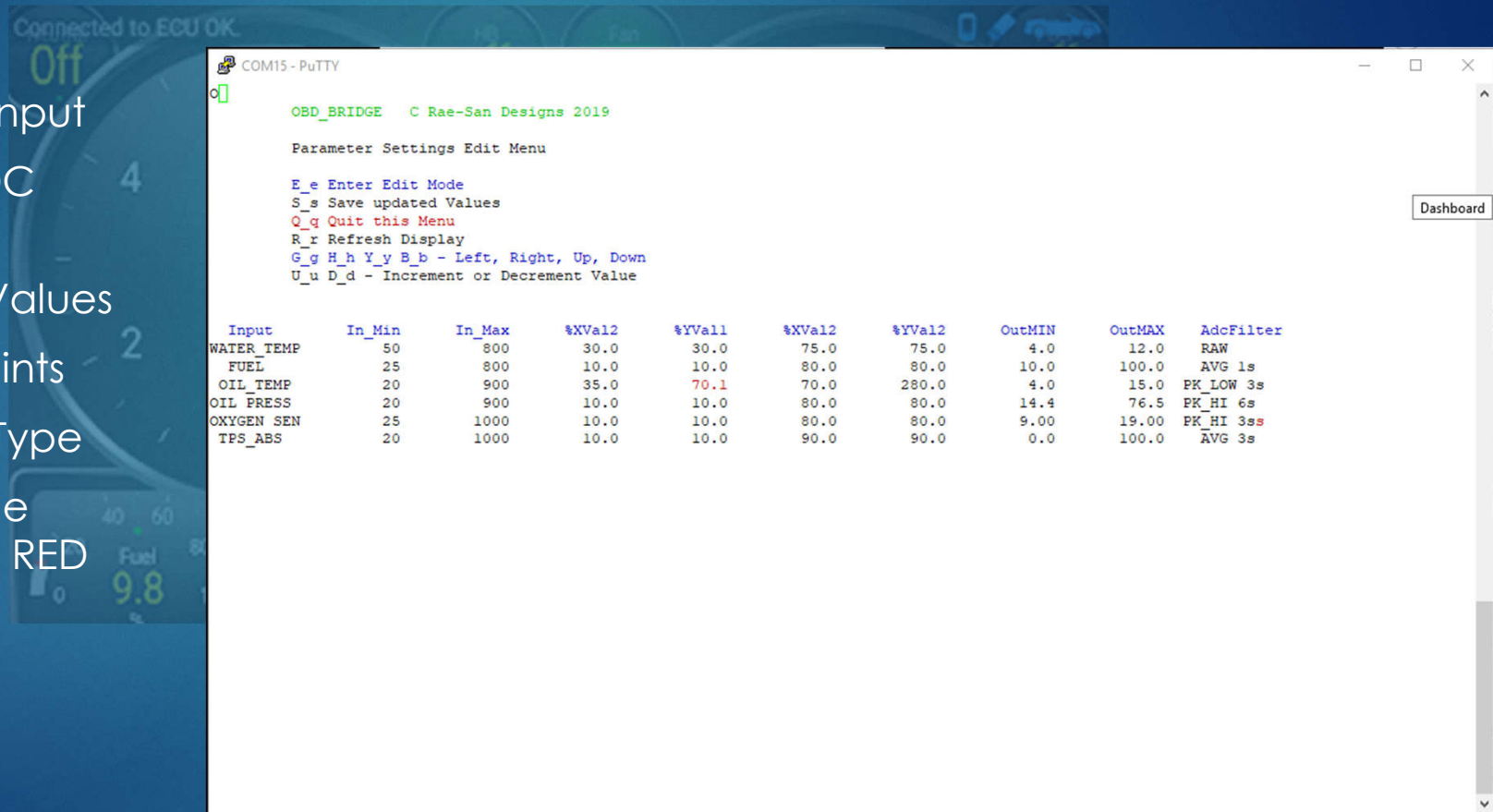
W_w (Dn) E_e (Up) Set Wheel Circ (mm)         1630
T_t (Dn) Y_y (Up) Tacho Divide Ratio          0.5
O_o (Dn) P_p (Up) Set Odometer x1000          20

M_m Fuel Mode Injector(T)/Analog(F)          TRUE
I_i (Dn) K_k (Up) Fuel Total Capac(1)         20.0
Z_z (Dn) C_c (Up) Fuel Reserve Capac(1)       4.5

V_v (Dn) B_b (Up) Supply Voltage Max          19.50
H_h High Beam : 12V (TRUE)/ GND (FALSE)       TRUE
L_l Oil Low   : 12V (TRUE)/ GND (FALSE)       FALSE
F_f Fan On   : 12V (TRUE)/ GND (FALSE)       FALSE
G_g Low Fuel  : 12V (TRUE)/ GND (FALSE)       FALSE
X_x Temp High : 12V (TRUE)/ GND (FALSE)       TRUE
```

OBD-BRIDGE – Analog Parameter Values

- ▶ Analog input
- ▶ Input ADC values
- ▶ Output Values
- ▶ Break Points
- ▶ Filtering Type
- ▶ Edit Value shown in RED



Connected to ECU OK

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Parameter Settings Edit Menu

E_e Enter Edit Mode
S_s Save updated Values
Q_q Quit this Menu
R_r Refresh Display
G_g H_h Y_y B_b - Left, Right, Up, Down
U_u D_d - Increment or Decrement Value
```

Input	In_Min	In_Max	%XVal2	%YVal1	%XVal2	%YVal2	OutMIN	OutMAX	AdcFilter
WATER_TEMP	50	800	30.0	30.0	75.0	75.0	4.0	12.0	RAW
FUEL	25	800	10.0	10.0	80.0	80.0	10.0	100.0	AVG 1s
OIL_TEMP	20	900	35.0	70.1	70.0	280.0	4.0	15.0	PK_LOW 3s
OIL PRESS	20	900	10.0	10.0	80.0	80.0	14.4	76.5	PK_HI 6s
OXYGEN SEN	25	1000	10.0	10.0	80.0	80.0	9.00	19.00	PK_HI 3ss
TFS_ABS	20	1000	10.0	10.0	90.0	90.0	0.0	100.0	AVG 3s

Dashboard

OBD-BRIDGE – Measured Values

- ▶ Current Inputs
 - ▶ Discretes according to polarity set
 - ▶ Raw Analogaog ADC values

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Display Values Menu
Q_q Quit Display Values
R_r Refresh Display

High Beam : OFF
Oil Low   : ON
Fan On    : ON
Low Fuel  : OFF
Temp High : OFF

FUEL LEVEL : 0
TEMP H2O   : 0
TEMP OIL   : 0
OIL PRESS  : 0
O2 SENSE   : 803
TPS SENSE  : 0
VOLTAGE    : 732 █
```

OBD-BRIDGE –Contents

- ▶ Rae-San OBD Bluetooth Module
- ▶ Rae-San 2 x 8 pin and 1 x 2 pin pluggable screw terminal connectors
- ▶ USB to micro USB cable
- ▶ USB port rubber plug



OBD-BRIDGE –Options

- ▶ Rae-San Pressure Sensor Kit
- ▶ Rae-San Throttle Position Adaptor Kit
- ▶ Rae-San Capacitive Fuel Sensor Kit



OBD-BRIDGE – Customisations

- ▶ Pre-configuration available for known bikes
- ▶ Custom PIDS for special sensor mappings

