

## Version 2.113 19-03-2019

- Autocalibration of DBW added

## Version 2.112 11-03-2020

- Offset for Tx frames in User Defined bug fixed

## Version 2.111 01-03-2020

- DSG support improvements (better blip, LC control mode activated in the gearbox)
- Oil pressure sensor plausibility check added
- Oil pressure cut strategy can be disabled when oil pressure sensor fails
- RGB Keypads control changed
- Backlight color for RGB keypads can be defined
- Lotus 2ZZ odometer fixed
- Race Technology serial stream modified
- Blending for DWB characteristic tables added
- Disable handbrake when the brake pedal pressed parameter added for the diff control
- PNP ECUs support added
- PNP ECUs - internal MAP sensor can be calibrated using MAP Cal. table
- PNP ECUs - SW1,SW2,SW3 switches have proper polarity
- VDO BMW S65B40 idle throttle support removed
- Scatter plots point size bug fixed
- DC ref MAP based table for boost control bug fixed

## Version 2.110 28-12-2019

- Engine protection flags log channel added
- To read wheels speed using vehicle specific CAN stream, Speed source in VSS and Gearbox settings must be set to *CAN wheel speed*
- Ecumaster Lambda 2 CAN readings bug fixed
- EWG base DC Y axis changed from kPa to Bar
- Ford Fiesta MK7 CAN stream fixed (wheels speed)
- CLT protection units conversion between metric and imperial fixed

## Version 2.109b 25-11-2019

- 3D graphs OPEN GL compatibility improved

## Version 2.109 21-11-2019

- Calibrations comparator
- New 3D tables
- Editing with keys enabled on 3D tables

- Export log to CVS bug fixed
- Fiesta MK7 CAN stream wheel speed added
- Used fuel channel added (in l)
- ALS switching DBW target tables bug fixed
- BMW E46 CAN battery indicator support modified
- Renault Laguna CAN stream fixed

#### **Version 2.108 14-10-2019**

- Slow tables editing bug fixed
- Channel value offset is properly supported by used defined stream (bug introduced in 2.107)
- Ecumaster GPS speed support added to VSS (GPS BASE ID 0x646)
- Global debounce for CAN SWITCH BOARD v3 added
- Graph log drawing improved
- Cell selection in tables bug fixed

#### **Version 2.107 29-09-2019**

- Switches improved
- Lotus Exige ESP support fixed
- CAN Switch board V2 enable debouncing bug fixed (inverted parameter)
- Restore to defaults for 2D tables
- New injectors calibrations in Injectors Wizard (thanks to Miroslav Karanović)
- EGT#1 can be used as CLT input value. (Sensors setup ->Temperature->Parameters)
- Engine start is disabled when DSG gearbox is not in P / N mode or brake pedal is not pressed. The engine stays in Inactive State during cranking
- Overboost strategy bug with Boost Target when using scaling fixed. Now after scaling boost target cant be lower than MAP 100kPa (means boost = 0kPa/0bar/0psi)
- Restore to default for 2D tables added
- Boost control PID resets when the boost control is inactive

#### **Version 2.106 08-09-2019**

- Ecumaster Wheel speed to CAN support added
- Built-in switches debounce time increased
- Fiat 500 CAN stream bug introduced in version 2.103 fixed
- Loading log bug introduced in 2.104 fixed
- Overlapping of channel name and channel values on Graph log fixed

#### **Version 2.105 30-08-2019**

- Bug with gear information for DSG gearbox introduced in 2.104 fixed
- New log channel with the voltage from internal mux switch adc (*Switches voltage raw*)

#### **Version 2.104 23-08-2019**

- DSG engine torque calculation based on VE fixed
- DSG engine torque table added
- Engine torque correction based on fuel cut % and spark cut %
- Engine torque correction base of fuel cut
- Torque correction table when the nitrous is active

- Engine power log channel added
- Engine torqu and power can be displayed in imperial units
- Boost DC ref can be Boost target based (x axis)
- Fuel cut probablity is displayed on the log as % (0-100) instead of (0-255)
- Momentary switch states added to parametric / virtual outputs variables

### Version 2.103 15-07-2019

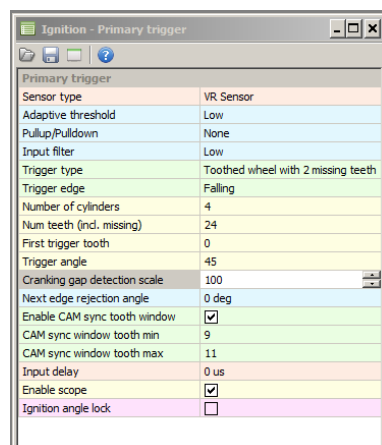
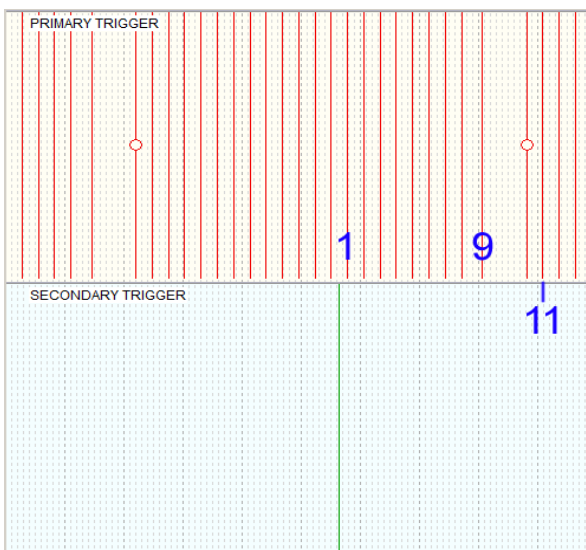
- Support for Ecumaster WBO CAN controller as Lambda #2
- Ford Fiesta MK6 CAN stream added
- Lotus Elise S3 CUP - Traction control preset displays on the dash
- Rev matchin strategy bugs fixed (still under testing)
- Gear cut bug with load cell support introduced in version 2.080 fixed
- Bug with can switches introduced in version 2.102 fixed
- If the clutch input defined, the gear calculation is inactive when the clutch is pressed
- Log interpolation of negative numbers bug fixed

### Version 2.102 06-07-2019

- Staged injection when Rotary support is enable is offsetef by 180 degrees between *Staged injector #1* and *Staged Injector #2*
- DSG torque calculation improved
- DSG gearbox selector
- CAN Analog inputs inverted can be used as a switch

### Version 2.101 16-06-2019

- New heater strategies introduced for WBO (Conservative heat up, Fast heat up and Always active (replaces *enable when no RPM parameter*))
- Support of CAN Switch Board V3 bug fixed
- New log channel *Lambda error mult.* added. It represents *Lambda/Lambda target* value and can be used for VE table cell correction
- New parameters added to the primary trigger setup: Enable CAM sync tooth window, CAM sync tooth window tooth min, CAM sync tooth window tooth max. This feature is usefeul in the case of high compression engines, when during cranking it is not possible to detect missing tooth. For example on the following scope the crank tooth 0 is the first tooth after the gap (marked with the dot). We can define that during cranking the missing tooth can be onlu decoded between tooth 9 and 11 after the CAM sync trigger tooth (green line). The missing tooth will be detected when the tooth relative to CAM sync is  $> 9$  and  $< 11$  (tooth 10)



### Version 2.100, 04-06-2019

- Bug with PWM control of boost control solenoid introduced in version 2.099 fixed
- Debounce option added to the support of CAN Switch board V1

### Version 2.099, 25-05-2019

- Bug with the switches introduced in version 2.098 fixed
- Bug with the VTEC support introduced in version 2.098 fixed
- New algorithm for calculating WBO Ri value
- New PID settings for WBO controller
- Removed parameter *Enable WBO when no RPM*
- Bosch ABS M5 CAN support added (wheel speed reading)
- Lotus Evora CAN stream added
- Lotus Exige and Lotus Elise S3 ESP CAN stream improved (ESP light is off now)
- Renault Clio RS3 CAN stream improved
- Parametric outputs can work as virtual outputs (select *Act as virtual output* as Output)
- New variables added to parametric / virtual output: *CAM2 switch, Fuel Pump state, AC clutch state, Parametric output 1 to Parametric output 5*
- *Parametric output 1 to Parametric output 5* can be used to activate PWM#2 (in addition to *Virtual outputs*)

### Version 2.098, 25-04-2019

- Bosch LSU 4.2 / LSU 4.9 strategy for water condensation phase modified
- User defined CAN stream bug introduced in 2.097 fixed
- Autotune bug introduced in version 2.097 fixed
- Launch control bug introduced in version 2.097 fixed
- LOTUS S3 CUP CAN stream improved: texts on the dash (PIT LIM, LAUNCH, TC) support for tables switch
- Parametric / Virtual outputs update rate changed from 20ms to 10ms (100Hz)
- Unipolar stepper motor support fixed. For unipolar motors the common connection must be connected to +12V!!!
- Switches (SW1, SW2, SW3) support fixed
- Pulse option on signal edge added to Parametric / Virtual outputs (Cycle once must be selected)
- Shift light argument added to Parametric / Virtual outputs
- Traction control bug with scaling driven and undriven axles fixed
- Bug when Analog input #6 was selected in DBW parameters (warning) fixed
- Desktops save correctly when firmware is upgraded
- EWG control when min sensor voltage is greater than max sensor voltage the position of throttle is inverted

### Version 2.097, 07-04-2019

- Memory optimisations
- Afterstart ignition lock feature negative angle bug fixed
- CAN BUS performance optimised
- DSG: Emulation of ESP to allow launch control (for non VW cars)
- DSG: Shifter (gear selector) emulation fixed (no more gearbox errors)

- DSG: Gearbox CAN timeout errors fixed

#### **Version 2.096, 29-03-2019**

- Log file name displayed on the application title bar
- Rev matching for H-Pattern gear box introduced (alpha version)
- EVO X - AC pressure read from CAN
- EVO X - in the case of using EMU differential control strategy, the index of selected tables is sent to the Dash
- Boost IAT correction bug fixed
- Lotus Elise S3 CUP CAN stream added
- Lambda target is send over standard CAN stream
- Gearcut blip minimal RPM added
- Afterstart ignition lock feature added
- Per injector fuel cut, ethanol content fuel cut, overboost fuel cut and overrun fuel cut also set log channel *Fuel Cut*

#### **Version 2.095, 18-03-2019**

- User defined CAN stream can send messages independently on CAN-Bus dash setting,
- EGT1, EGT2 and CAN EGT 1-8 are added to parametric output
- Lotus Elise S3 CAN stream added

#### **Version 2.094, 10-03-2019**

- Desktops are stored before firmware upgrade
- Coolant pressure and crankcase pressure sensors added
- Hysteresis for coolant fan can be set to 0
- Boos DC can be used as an axis for PWM2 output
- Paddle shift: to switch from 1 to N, switch must be kept pressed

#### **Version 2.092, 16-02-2019**

- VW CAN stream bug introduced in version 2.087 fixed
- RaceChrono support bug fixed (only via CAN to BT module)
- CAN SW5 is set to 1 when the gear is changing up
- 0x677 BLIP message, extended to set current gear (byte 2)
- WBO controller memory usage optimised

#### **Version 2.091, 09-02-2019**

- VW CAN stream bug introduced in version 2.087 fixed
- VW CAN stream fuel consumption bug fixed
- Suzuki Swift MK3 odometer support bug fixed
- Secondary throttle can be controlled using idle / stepper motor
- LC. The restore time of ignition angle and spark cut can be slowed downy by factor of 10
- CSB V2 preliminary support added
- RaceChrono support added (only via CAN to BT module)

### **Version 2.089, 03-02-2019**

- Virtual TPS option added, when there is switch instead of variable throttle position sensor
- Options for controlling CAN switchboard using parametric / virtual outputs added to ECM switch board window
- IAT and CLT voltage added to log
- Colt CZ AC control over CAN bug fixed
- EGO correction behaviour improved when WBO sensor is not valid for the short time

### **Version 2.088, 28-01-2019**

- EWG control strategy added
- PWM controlled radiator fan hysteresis bug fixed
- PWM controlled radiator fan turn off during cranking implemented
- PWM controlled radiator fan turn on at maximum speed when senso broken implemented
- Citroen C2 CAN stream sends coolant temepature to the dashboard
- ESP/ASR support for VW cars

### **Version 2.086, 05-01-2019**

- VSS added to axes in PWM #2 table
- Spark can be disabled during start engine dealy when cranking
- RPM limit increased to 20000 RP
- Clamp DBW pos when exit idle strategy uses DBW Target instead of DBW Pos

### **Version 2.085, 20-11-2018**

- PWM #2 table added with customizable axes
- PWM #1 and PWM#2 tables can be controled via virtual output
- PWM controlled radiator fan support added to Coolant fan strategy
- Delay parameter added to all parametric and virtual outputs
- Colt CZ support of Start button (CAN SW 3 and 4)
- Bug with temperatures range for VVti when imperial unit selected fixed

### **Version 2.084, 14-11-2018**

- **User CAN stream bug intorduced in version 2.082 fixed**
- The number of log channels exported to cvs file increased from 8 to 16

### **Version 2.083, 13-11-2018**

- Bug with loading old log files fixed
- DSG torque reduction ignition angle restores 3 degs / rev
- DSG fuel enrichment for up shifts
- Traction control indicator output invert option
- Traction control indication when disable bug fixed
- Ecumaster EDL-1 protocol V2 introduced (required EDL firmware ver 1.08)

### **Version 2.082, 12-11-2018**

- Beta version of DSG Gearbox support (Other / DSG control)
- VW/AUDI CAN streams updated
- 12 POS RGB keypad bug fixed

- Mazda RX8 CAN added "mode 5 ABS" and additional option for emulation power steering
- Clamp DBW position when exit idle strategy bug fixed

### Version 2.081, 31-10-2018

- Scatter plots
- Gear cut MAP correction for cut duration table added
- Gear cut: When signal source is *load cell* and activation level is *level low*, the cut/blip condition changed. Gearcut is when the voltage from load cell is lower than *Gear force down* value. Blip is when the voltage from load cell is higher than *Gear force up* voltage.
- Idle control: when stepper motor is used, it is possible now to keep it powered when the MAP is above defined target. It prevents stepper motor to move during boost.
- Nitrous active parameter added to parametric / virtual outputs
- X Axis of PWM table can be now: MAP, TPS, IAT,CLT, Analog1 to Analog6
- Traction control output light, can be configured to light up when TC is disabled
- VTEC: Additional parameter to activate vtec over given RPM, independent to other parameters

### Version 2.080, 10-10-2018

- Engine states transitions behaviour changed. Now when the engine enters running state never comes back to afterstart and cranking again (even when the rpms drops below cranking threshold)
- New option for idle control and DBW. ***Clamp DBW pos. when exit idle*** enables clamping throttle position in the situation when after exiting idle the throttle position target from characteristic table is lower than idle control throttle position. It prevents
- Renault Laguna 2006 CAN stream added: clt, rpm, wheel speed, ac clutch control, ac status (CAN\_SW1), engine state, check engine
- Honda S2000 colant temp gauge support improved
- CAN EGT channels range in log fixed
- Cursor displaying on tables when table is scaled down fixed

### Version 2.079, 03-10-2018

- Toyota GT86 CAN stream improved
- Ford Focus RS oil temp and oil pressure gauges support improved
- VW ABS wheel speed support fixed
- VW steering angle sensor support added (via CAN)
- Ford F150 CAN support improved
- RX8 ABS initialisation fixed
- User CAN stream (receiving) fixed
- Vehicle speed value when using GPS fixed
- Interrupts management modified

### Version 2.078, 19-07-2018

- New Ecumaster RGB keypads support added

### Version 2.077, 17-07-2018

- Ford Focus RS2 oil temperature gauge and AC switch bug fixed
- AC control strategy can override PWM output DC (to enable PWM controlled coolant fans)

- Narrow band oxygen sensor support improved
- Copy / paste clipboard crash fixed

#### **Version 2.076, 30-06-2018**

- HALDEX Gen. 1 direct support added to differential control
- filtering for DPRF value added

#### **Version 2.075, 26-06-2018**

- Yamaha FX trigger added (24-1 + 1 cam sync)
- 13b rotary engine ignition support added (12 + 1 cam sync)
- start delay added to engine start/stop strategy
- boost min RPM parameter added for boost control (in previous version this value was fixed to 400 RPM)

#### **Version 2.074, 25-06-2018**

- bug with staged injection when Aux outputs were assigned fixed. (The injector can open for no reason),
- *idle rpm ref* table is used also when map sensor value condition is not met
- new plausibility check added to the PPS (sum of both pots should be 5V)
- CAN EGT channels can be used for EGT alarm,
- Toyota GT86 start button (when pressed with the clutch) assigned to CAN\_SW 6
- un-driven axle can be used instead of VSS for boost scale
- maximum RPM limit for all strategies increased to 16000
- DC range for differential control to scale tables to differential usable range

#### **Version 2.073, 05-06-2018**

- Motec M800 CAN stream fixed
- ALS, LC and BOOST current parameters set, added to EMU CAN STREAM
- Ford FX-150 CAN stream added

#### **Version 2.072, 26-05-2018**

- User CAN stream input channels bug fixed (bug introduced in 2.068)
- Fuel Level filtering improved
- Peugeot 207 CAN stream added
- PMU keypad assignment to CAN switches bug fixed
- Check engine channel added to parametric output
- User defined CAN stream parameter offset bug fixed
- Back pressure sensor range extended to 8 Bar
- PIT limiter active flag added to EMU CAN stream (Flags1)

#### **Version 2.071, 24-04-2018**

- Gear calculation strategy rewritten. Now tolerance means percentage of ratio to the next gear ratio.



- Gear detection delay added
- Alternator control signal can be inverted
- Boost can be reduced when knock occurs
- DBW throttle position plausible check improved. Now it works with systems where 2 pots produce the same voltage
- Undriven axle speed can be used for parametric outputs

#### Version 2.070, 16-04-2018

- COLT CZ CAN stream added

#### Version 2.069, 09-04-2018

- Bosch ABS support added
- Subaru BRZ / Toyota GT86 CAN stream added
- Traction control active log channel bug fixed
- Traction control undriven axle speed source bug fixed
- Traction control user torque reduction scale bug fixed
- 12-2 cranking bug timeout fixed
- New user defined shortcuts added: Previous desktop / Next desktop
- New shortcuts added for Log graph:
  - **Ctrl+Left / Ctrl+Right** - Previous tab / Next Tab
  - **F5** start new log (clear log + resume if paused)
  - **S** - save log
  - **O** - open log
  - **Ctrl + X**- clear log

#### Version 2.068, 10-03-2018

- Lambda tables size lowered to 8x10 with separate independent axes bins. **PLEASE CHECK YOUR LAMBDA TABLES AFTER UPGRADE!**
- Log format file modified, \*.emublog files cannot be loaded in previous client versions!
- Traction control based on wheel speeds added
- VTEC override FlexFuel VE tables blend option added
- Warmup tables are now 3D
- Lambda control strategy PID modified, less signal filtration
- Caterham CAN added
- Ecumaster CAN stream expanded. See CAN stream details in help
- Idle control afterstart RPM increase, increases the idle control range RPM
- Activation delay added to Idle PID and ignition control
- Idle afterstart DC scale table added
- Coolant fan can be disabled over defined vehicle speed
- EGO transient delay range increased from 255ms to 2000ms
- Bug with VSS when the sensor was connected to the FlexFuel input fixed
- Now log channels selector added

#### **Version 2.066, 02-03-2018**

- FIAT 500 reverse gear information send over CAN (hill holder bug fixed). The reverse gear switch should be connected to the switch 1 input

#### **Version 2.065, 02-03-2018**

- Astra VRX CAN stream improved
- Corsa VRX CAN stream introduced
- Gearbox oil temperature and differential oil temperature added to parametric outputs

#### **Version 2.064, 14-12-2017**

- OBD 2 support
- EMU serial protocol modified (increased update rate)
- Android Dashboard log import fixed (new Android Dash application is required)
- BMW E46 ABS CAN wheel speed support
- Ethanol content variable added to parametric / virtual outputs
- Marking modified cells can be disabled (General options)
- Log channel *CAM#2 switch state* added
- Astra VRX CAN vehicle speed output fixed
- Idle vss increase parameter could be higher than 255 RPM
- Launch control time to activate parameter added
- 2D tables description font size fixed for high DPI displays
- New password entering dialog

#### **Version 2.063b, 29-11-2017**

- 2D tables bug introduced in version 2.063 fixed

#### **Version 2.063, 28-11-2017**

- Fiat 500 CAN stream modified (Hill holder error)
- Paddle shift strategy bug fixed, added 3<sup>rd</sup> input for R and 1 gear engagement
- EMU serial protocol modified (channels frequency)
- Modified cell marks are removed from autotune window

#### **Version 2.062, 30-10-2017**

- Nissan QR25DE trigger pattern added
- Astra Vrx CAN stream updated

#### **Version 2.061, 30-10-2017**

- Astra Vrx CAN stream updated
- Paddle shift strategy improved (added gear count and down shift per gear RPM limit)

#### **Version 2.060, 28-10-2017**

- Dwell calculations strategy during cranking improved
- Nissan alternative trigger strategy added
- User CAN stream bug with log channels > 255 fixed

#### **Version 2.059, 23-10-2017**

- Switch inputs improved (denouncing added)
- Paddle shift strategy

#### **Version 2.058, 19-10-2017**

- Mazda BP 4/3 trigger support
- Saab CAN stream
- Opel Astra VRX CAN stream

#### **Version 2.057, 12-10-2017**

- Mini Cooper R53 CAM stream improved, (DSC system works)
- Fiat 500 CAN stream improved (No random battery warning)
- Knock noise table is 3D now
- Gear cut strategy bug fixed (external controller)
- Debouncing added to momentary switches

#### **Version 2.056, 05-10-2017**

- Overrun fuel resume enrichment
- Honda S2000 coolant gauge recalibrated
- Boost target was wrong when Dcref is MAP based

#### **Version 2.055, 04-10-2017**

- Vehicle speed from GPS can be assigned to VSS channel
- Ignition angle could be trimmed using analog input (2D table)
- External fuel temperature sensor support added in addition to Flex Fuel
- Audi A3 2006 CAN stream added
- BMW E46 AC switch support added to CAN stream

#### **Version 2.054, 29-09-2017**

- Improved behavior on notebooks with FHD and SHD screens
- Fiat 500 EURO 6 CAN stream added

#### **Version 2.053, 13-09-2017**

- EGO feedback update interval bug fixed
- EVOX wheels speed sorted
- Steering wheel angle offset extended to -125 to 125 degs
- EGT alarm settings for ALS and LC added
- Knock sensing could be disabled during gear cut

#### **Version 2.052, 30-08-2017**

- Overboost protection added
- Ethanol content based RPM limit added
- Seadoo 36-2 specific trigger added
- EGO corection bug introduced in 2.051 fixed

- Modified cells in tables are marked

#### **Version 2.051, 03-08-2017**

- GPS speed could be used as parametric output argument
- MAP sensor trigger added to idle control
- Flex fuel TPS limit bug fixed
- VVTi PWM generation improved
- Swift 2<sup>nd</sup> gen odometer increase fixed

#### **Version 2.050, 31-07-2017**

- Fuel level calibration table visibility fixed (bug introduced in 2.047)

#### **Version 2.049, 28-07-2017**

- Fuel cut option added to ALS
- ALS ignition retard rated parameter added
- Brake switch support for Suzuki Swift 3<sup>rd</sup> gen CAN stream

#### **Version 2.048, 11-07-2017**

- Imperial units support bugs fixed
- FlexFuel input could be used as VSS source (HALL sensor only)
- GPS speed channel added to log

#### **Version 2.047b, 10-07-2017**

- Imperial units support bug fixed
- User CAN stream could be exported to canx format for PMU use
- EDL-1 logs could be load by open log function

#### **Version 2.047, 09-07-2017**

- Imperial units introduced (general settings)
- New help format introduced (general settings)
- Clio Williams trigger synchronization improved
- Brake switch added
- EVO X lateral G and Yaw rate reading fixed
- EVO X steering wheel position offset added (Sensors/Other/Parameters)
- Corvette CAN stream added (AC switch, wheel speed)
- DBW characteristic could be as a TPS/MAP function (experimental)
- Fuel cut reason flags bug fixed (fuel pressure cut, oil pressure cut, idle fuel cut)
- Gear cut switch support modified (inverted state, works once per switch)
- Gear cut works correctly with analog#5 and analog#6 inputs
- Gear detection when gear sensor used fixed
- EMU connection status on status bar fixed
- Copy / Paste bug fixed with floating point values (eg. Lambda tables)

#### **Version 2.046, 13-06-2017**

- Seadoo spark CAN stream added

- Lotus Exige CAN stream fixed
- When idle valve type is set to None, idle control is disabled
- Soft RPM limiter hysteresis minimum value is 1 now
- Differential control tables size changed from 6x6 to 8x5

#### **Version 2.045, 23-05-2017**

- CAN BUS wheel speed validation for VSS calculations
- Swift 3<sup>rd</sup> gen CAN stream improved
- Lotus Exige CAN stream added

#### **Version 2.044, 13-05-2017**

- Bug with analog inputs used as enable switch for strategies fixed. (The bug was introduced in version 2.040)

#### **Version 2.043, 11-05-2017**

- Swift 3<sup>rd</sup> generation speed from CAN reading fixed
- Nissan 350Z AC clutch activation message added
- CAN Analogs and CAN Switches added to Virtual and Parametric outputs

#### **Version 2.042, 10-05-2017**

- User defined CAN stream bug fixed (when the user CAN stream was enabled, always during, connection PC local calibration differs from EMU BLACK calibration),
- injection angle control code performance optimized

#### **Version 2.041, 07-05-2017**

- RPM of 2<sup>nd</sup> engine can be set via user CAN stream,
- idle after start rpm increase bug fixed (when rpm increase was > 255),
- rpm spike (for low resolution trigger wheels and TFI) during cranking bug fixed,
- CAN analog inputs defined in user CAN stream (in rx messages) have priority over PMU standard stream

#### **Version 2.040, 28-04-2017**

- Second fuel rail support (for additional fuel delivery)
- Staged injection could be assigned to 2 outputs
- Switches based on CAN Analog inputs bug fixed
- Quick tune display flickering issue fixed
- Graphical log tabs names are correctly refreshed after opening user layout at startup

#### **Version 2.039, 22-04-2017**

- Staged injection load could be forced to MAP when Alpha-N selected
- Swift MK3 oil pressure sensor CAN support fixed
- Blending for LC tables added (use rotary switch or pot)
- Virtual output 3 could be used to activate idle PID control
- Displaying floating point numbers in quick tune window improved

#### **Version 2.038, 13-04-2017**

- CAN Analog inputs could be used for Diff control rotary switch,
- Gear cut indicator added on status bar

#### **Version 2.037, 06-04-2017**

- CLT boost scale added,
- 2<sup>nd</sup> lambda sensor could be connected using external controller,
- LSU 4.2 / 4.9 PID settings are embedded into firmware and cannot be altered anymore,
- Copy / Paste in client software correctly handle non integer numbers

#### **Version 2.036, 04-04-2017**

- BMW ITB throttle control added
- Start / stop strategy sends starter motor request over CAN BUS

#### **Version 2.035, 29-03-2017**

- Bug from versions 2.030 – 2.034 with pullups when BT CAN stream enabled fixed,
- Gear detection bug fixed
- 1JZ/2JZ CAM#2 support added for faster synchronization
- For ALS pedal position is used instead of TPS
- Bug with CLT/IAT error code at device startup fixed
- DBW can control is assigned to fixed ID 0x667

#### **Version 2.034, 13-03-2017**

- Copy / Paste functions for tables use windows clipboard (it is possible to copy tables cells to Excel)
- Race Technology dash serial stream fixed (low update rate)
- Honda S2000 CAM#2 support added for faster synchronization
- Swift 3<sup>rd</sup> gen CAN oil pressure switch support

#### **Version 2.033, 10-03-2017**

- Fix for user defined CAN

#### **Version 2.032, 07-03-2017**

- Fix for high DPI laptops displays,
- Golf R32 can stream added,
- User defined CAN stream UI improved,
- ALS max egt is now calculated using internal EGT as well as CAN EGT

#### **Version 2.031, 06-03-2017**

- Firmware 2.030 doesn't contain all listed features and fixes. 2.031 is the proper one

#### **Version 2.030, 06-03-2017**

- User defined CAN stream,
- CAN output added for Nitrous output,

- Differential controller oil pump maximum work time added,
- Differential controller behavior during Launch control could be defined,
- Check engine code added for differential control (when oil pump cannot build required pressure),
- Switch input could be used as Oil pressure sensor input,
- Nitrous active state added to the EMU CAN stream,
- Gear and gear ratio is calculated when speed source is CAN wheel speed

#### Version 2.029, 16-02-2017

- Lancer EVO CAN stream update: steering wheel angle, yaw rate
- Nissan 350ZX CAN stream coolant fan support added

#### Version 2.028, 16-02-2017

- USB packet timeout restored to the value from version 2.026 (fix connection issue on slow PC)
- EVO X CAN stream fixed
- Nissan 350ZX CAN stream added
- Lotus 2ZZ cable throttle CAN stream added
- Idle control PWM generator bug fixed (when the PC connected to device)
- Log based autotune bug fixed
- Bug with loading autos save logs fixed

#### Version 2.027b, 25-01-2017

- Connection time improvement

#### Version 2.027, 24-01-2017

- All inputs / outputs could be labeled by user (Show assigned outputs / inputs and press right mouse button to rename)
- Boost blend now works correctly with CAN Analogs
- USB communication improved
- Firmware upgrade time improved (25sec instead of 30 sec)
- Switch#1-#3 debouncing added
- Dwell error value is correct when spark cut occurs
- Visible min and max values for given channel are marked on the log
- Drawing log speed is improved by a factor of 5
- Open log window allows also opening EDL-1 files
- Numeric keypad could be used for entering table values

#### Version 2.026, 05-01-2017

- All pressure sensors are defined as 2 point 2D table. Each sensor has own x axis (voltage). **Due to this modification when upgrading from older firmware pressure sensors calibration should be corrected!.**
- Differential control added (for EVO 9,10) and Haldex,
- Differential oil pressure sensor added,
- Quick tune display log channels could be customized (right mouse button)

- New log groups (pressure and temperature)
- Crash when right mouse button was pressed on log group icon fixed

#### **Version 2.025, 29-12-2016**

- Lotus CAN stream fixed (fuel level and check engine status)
- Suzuki Swift 2<sup>nd</sup> gen CAN stream added
- TAB+Arrows allow to swap between windows
- Default deskto layout added

#### **Version 2.024, 17-12-2016**

- Output for VVTi control could be inverted (for HBRIDGE low side control)

#### **Version 2.023, 13-12-2016**

- Haldex 4gen control strategy added ( requires modification of haldex module)
- Ignition outputs 4+5 could be paired
- PWM output signal generation bug fixed
- VSS max value increased to 500 km/h
- DBW calibration package included

#### **Version 2.022, 08-12-2016**

- DC Ref table in DBW configuration can be in function of target pos or throttle pos
- Tables processing speed optimized
- VSS value is calculated correctly when speed source is CAN
- Real time autotune improved (lock cells)

#### **Version 2.021, 06-12-2016**

- Idle DC correction in function of IAT
- Real time autotune improved

#### **Version 2.020, 04-12-2016**

- Wizard for temperature and pressure sensors
- Real time autotune replaces "K" key based autotune (experimental)
- Bug when restoring password protected device to factory state fixed

#### **Version 2.019, 26-11-2016**

- Internal MAP could be used as BARO when external MAP is used



- VIPER V10 trigger added
- Device delayed off using virtual output as off condition
- Renault Clio CAN stream fixed
- Help updated

### **Version 2.018, 18-11-2016**

- DBW PWM control signal generation modified to decrease heat and lower the throttle noise
- Bug with initialization of DBW and FlexFuel input when there was CAN BUS error during startup
- Boost control solenoid can be disabled by switch / analog

### **Version 2.017, 04-11-2016**

- PC USB communication improved
- ECM CAN switch board support improved
- PMU CAN communication improved

### **Version 2.016, 30-10-2016**

- Support for CAN keyboard connected to PMU
- New temperature sensors added (gear box oil, differential oil, power steering fluid, pre IC)
- Default state for CAN keyboard can be defined
- Overrun fuel cut bug fixed (the cut was always performed above resume RPM)
- Tabs added for graph window to speed up switching between different log sets (shortcut keys from 1 to 6)

### **Version 2.015, 17-10-2016**

- 8 CAN analog inputs added (from PMU device)
- 8 CAN Switches added (16 total)
- CAN support for CAN switch board (8 switches + 2 analogs) (CAN ID 0x666)
- 3 momentary switches added (could be controlled via CAN switch board or CAN keyboard)
- CAN ID for EGT moved to 0x660 and 0x661
- CLT engine protection bug fixed
- Now all BLACK files (log, calibration, scope, DL1 logger files) are associated with application and could be opened just by mouse click,
- Fuel cut reason log group added
- Graph log window improved:
  - Zoom extent
  - Channel autoscale
  - Scaling center is at the cursor
  - Extended popup menu (mouse button right) allow fast channel change or setup
  - Different line style (thin, thick, dots)
  - Up to 16 channels on the log

## **Version 2.014, 08-10-2016**

- Bosch LSU 4.2/4.9 response speed improved
- Alternator control added
- When importing DL1 data logger data, log window refreshes correctly
- All files associated with BLACK (project, log, scope DL1 log) can be opened just by clicking the file