

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 down 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 sensor broken implemented
- Citroen C2 CAN stream sends coolant temperature 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 delay when cranking
- RPM limit increased to 20000 RPM
- 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 controlled 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 introduced 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 3rd 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 2nd 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 3rd 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 3rd 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 3rd 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 2nd 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,
- 2nd 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 3rd 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 2nd 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