



POWER MANAGEMENT UNIT

## CHANGE LOG

2024-04-05

**Client: 101.0 experimental**  
**Firmware: 101.0 experimental**

### Firmware:

#### New features:

- Support for the new "5x3MT Ecumaster with 2 encoders" keyboard
- New Lookup5 operation (similar to Lookup2/3/4)
- Support for Autosaved Channels

#### Note about Autosaved Channels:

There are three conditions when the values of these channels are saved to permanent memory:

1. When an Ignition Switch is turned off (requires separate wiring for Constant +12V and Ignition Switch).
2. Periodically, but not more frequently than every 2 minutes.
3. When Engine RPM decreases to zero (requires the "Engine RPM channel" to be set in the "Standard Channels Assignment" panel).

### Client:

#### New features:

- New Configuration Panel (menu Tools / Configuration Panel) with all the configuration settings in one panel.

2024-03-14

**Client: 92.0.4 public release**  
**Firmware: (no changes)**

### Client:

#### Fixes:

- Merging project from PMU-16 AS to other models now properly handles different current rating for O6..O11 outputs (25A vs 15A).

#### Changes:

- We disabled the PWM functionality for the 7A outputs in PMU-24 DL due to the risk of overload when powering highly inductive loads. This precaution ensures the stability and longevity of the device, minimizing the risk of potential damage.

2024-02-15

**Client: 92.0.3-beta**  
**Firmware: (no changes)**

### Client:

#### New features:

- "File / Merge Project..." (Ctrl+M) command added

#### Improvements:

- The saving and loading of Analog Input and User Table dialogs is now functioning correctly

- Axis channel for a table can now be changed without regenerating axis bins (use context menu: Modify Axes / X/Y Axis Properties... and set Generation Type to Change Channel Only)
- Resolved issue causing application to become stuck in full-screen mode

Fixes:

- PMU-24 DL is now correctly displayed in the Device Selector window
- Fixed inconsistent number handling for keyboard layouts requiring shift to input numbers (e.g. Czech or French)
- Resolved issue causing application to become stuck in full-screen mode
- CANbus Export dialog: the "Save CANX File" button is now working properly for 32-bit bitfield channels (e.g., "pmu.outActiveMask.o21")

CAN Streams:

New:

- PMU-24\_#1\_ID668.canx
- PMU-24\_#2\_ID678.canx
- PMU-24\_#3\_ID688.canx
- PMU-16\_#1\_ID668.canx
- PMU-16\_#2\_ID670.canx
- PMU-16\_#3\_ID678.canx
- TPMS\_WHP.canx

**2023-09-27**

**Client: 92.0.2**  
**Firmware: 92.0**

Notes:

- The firmware "92.0 Release Candidate (RC)" has been renamed to "92.0". It is the exact same firmware.

Client:

New features:

- New menu command: "File / Change Target Device..." allows users to convert their projects without connecting to a physical device.

Improvements:

- Pinout Generator has been updated for PMU-24 DL and PMU-16 AS.

Fixes:

- Resolved crash issues when connecting to multiple PMUs with different firmware versions.

**2023-09-25**

**Client: 92.0.1 Release Candidate (RC)**  
**Firmware: 92.0 Release Candidate (RC)**

Firmware:

Improvements:

- PMU-24's 7A outputs can now handle H9 65W / Xenon 65W lamps (increased inrush current to 70A).

Fixes:

- Resolved a potential issue that could occur when downloading logs from the PMU's internal logger memory.

Client:

Fixes:

- Resolved compatibility issues when connecting with older firmware versions (pre 91.0).
- Fixed several issues related to accessing bitfields and constant channels in the Client.

Known issues:

- Pinout Generator has not been updated for PMU-24 yet.

2023-09-22

**Client: 91.0-beta**  
**Firmware: 91.0-beta**

Firmware:

New features:

- Support for PMU-24 DL.
- New custom PID Controllers (use Project Tree / Add / PID Controller...)

**Changes:**

- **The duty cycle control channel (DC Control) of a Power Output is now interpreted as a real value, as opposed to its previous raw format. When the firmware is updated or a project is loaded, an automatic conversion is executed. Users can now directly utilize the PID Controller's '.output' subchannel as the duty cycle control channel.**

Client:

Improvements:

- User interface now properly scales with higher DPI settings.
- Ability to swap pins between two Power Outputs.
- PMU-16 AS: Users can now combine the 40Amps and 25Amps outputs (e.g., O4 and O5). The maximum permitted current is 50 Amps (2x25Amps). This change enables the direct conversion of the PMU-16 / PMU-16 DL project to PMU-16 AS.

2023-08-29

**Client: 85.1**  
**Firmware: 85.1**

Notes:

- The firmware "85.1 Release Candidate (RC)" has been renamed to "85.1". It is the exact same firmware.

Client:

Fixes:

- Fixed a bug in real-time logging that sometimes prevented it from starting immediately after a firmware upgrade.

2023-08-09

**Client: 85.1 release candidate (RC)**  
**Firmware: 85.1 release candidate (RC)**

Firmware:

Hardware compatibility:

- Added support for PMUs-16 with updated accelerometer/gyroscope hardware component (same functionality as earlier) -- devices with serial numbers xxx-2329-xxxx or later

Fixes:

- ECUMASTER CANbus keyboards:
  - A correct color is now selected when 'First State' is set to '1' with the 'Latching Switch' button type

Client:

Fixes:

- Fixed a bug that prevented the firmware from being upgraded on the first attempt.
- Fixed a bug with real-time logging that sometimes didn't start after a firmware upgrade.

2023-05-22

**Client: 83.2 beta**  
**Firmware: 83.2 beta**

Firmware:

Fixes:

- ECUMASTER CAN Keyboards: LED lights are now working correctly, even with the keyboard firmware v2.23.

New features:

- ECUMASTER CAN Keyboards: New channel "kb\_X.active" added to CANbus Keyboards. It's '1' when a keyboard is active

Client:

Improvements:

- Performance improvements of the CSV export

Fixes:

- Application now properly checks the Table Memory limit when duplicating a Table
- Fixed the issue with the preview of the CSV not generating properly
- Fixed the issue with the CSV export crashing in case of large files

2022-10-24

**Client: 83.0 experimental**  
**Firmware: 83.0 experimental**

Firmware:

New features:

- Added support for '5x3 Ecumaster (7 colors)' keypad

Client:

Fixes:

- Keyboard dialog: "Order buttons" is now functioning correctly.

Changes:

- Project files created with this PMU client version cannot be loaded to an older version of the software. Please backup your projects before installing.

CAN Streams:

- BatteryIsolator.canx – updated for firmware 3.0 (or later) of BatteryIsolator

**2022-09-19**

**Client: 82.2 experimental**  
**Firmware: 82.2 experimental**

Firmware:

Fixes:

- CANbus Inputs are now functional after restarting a device. (Fixed bug from version 82.1).

**2022-09-01**

**Client: 82.1 experimental**  
**Firmware: 82.1 experimental**

Firmware:

New features:

- More CANbus Message Objects - 50 shared by CAN1 and CAN2 (up from 8+8)
- Increased number of CANbus Inputs to 150 (up from 100)
- Support for CAN Inputs located across 3 bytes (e.g. endian=little, bitCount=13, bitPosition=13)
- Custom multiplexer for compound CAN frames - any bitPosition and bitCount up to 16 bits
- Possible to read normal and compound inputs from one CAN frame
- Support for 'Motec M800 Set1' CAN stream
- CANbus Export: DLC can be specified

Improvements:

- CAN frame with wrong DLC (e.g. 15) is now treated as DLC=8 (solution for GET\_H4FSAE ecu)

Changes:

- CANbus Message Objects timeout works for all frames at once, not for individual frames like before

Client:

Improvements:

- DBC Importer: support for custom multiplexer for compound CAN frames
- USBtoCAN.DLL updated to 15.3 with stability improvements

Changes:

- Project files created with this PMU client version cannot be loaded to an older version of the software. Please backup your projects before installing.

CAN Streams:

New:

- Motec\_M800\_Set1.canx

2022-08-31

**Client: 57.3.2**

**Firmware: 57.3**

Client:

Improvements:

- Keyboard focus when editing a cell of a Table has been improved.

Fixes:

- Random program crash when editing a Table has been corrected.

2022-08-26

**Client: 57.3.1**

**Firmware: 57.3**

Notes:

- The firmware 57.3 and 57.3-beta are exactly the same firmware.

Client:

Fixes:

- Axes of tables are no longer corrupted when deleting/moving some other channels of the same type

CAN Streams:

New:

- Microtech.canx
- Haltech\_TMS.canx

Updated:

- Megasquirt2&3.canx – channels 'canout1' .. 'canout8' added

Fixed:

- KMS.canx – it's working again with the PMU

2022-04-29

**Client: 57.3 beta**

**Firmware: 57.3 beta**

Firmware:

New features:

- PMU16-AS standard stream: status of 6 low-side outputs added (frame 0x668 (default)):
  - byte 6: 0x01 – I1.active, 0x02 – I2.active, 0x04 – I3.active, etc
  - byte 7: 0x01 – I1.error, 0x02 – I2.error, 0x04 – I3.error, etc

Setup:

New files:

- DBC files for PMU16 and PMU16-AS are now installed in the Documents/PMU/ folder

2022-03-28

**Client: 57.0.1 beta**  
**Firmware: 57.0**

Client:

Fixes:

- CANX Loader: fix for compound streams (LinkECU\_GenericDash.canx is now imported properly)

Improvements:

- The software code is now digitally signed with "ECUMASTER Sp. z o.o." digital signature.

2022-01-15

**Client: 57.0**  
**Firmware: 57.0**

Notes:

- The firmware 57.0 and 57.0-exp are exactly the same firmware.

2021-12-29

**Client: 57.0 exp**  
**Firmware: 57.0 exp**

Notes:

**Starting from 1<sup>st</sup> January 2022 all devices produced by ECUMASTER will have 12-digit serial numbers (until now 8-digit serial numbers have been used).**

Firmware:

New features:

- **Added support for devices with 12-digit serial numbers**

Client:

New features:

- **Added support for devices with 12-digit serial numbers**
- Added firmware upgrade prompt when connecting the device for the first time to client software
- Added firmware upgrade prompt when opening the project file from newer firmware version
- Added "Offline firmware configuration selection" when loading project files from older firmware in offline mode (with CAN adapter not connected to PC)
- Added 'Fixed frequency' option for CSV exporter (GraphLog / Export icon / advanced exporter)

CAN Streams:

New:

- Lotus\_Elise.canx
- SCS\_Delta\_D800.canx
- BoschMotorsport\_MS4Sport.canx

Updated:

- EvoX.canx – fixed 'c\_gear' channel
- EMU\_BLACK.canx – added separate channels for virtual and parameter outputs
- Haltech.canx – added 'checkEngineLight' and 'batteryLight'

**2021-09-29**

**Client: 56.0.2 exp**  
**Firmware: 56.0 exp**

Client:

Improvements:

- DBC Importer (v4-pmu):
  - An additional space before the '@' character in the .DBC file is now handled correctly
  - The popup "Unit mapping file has been changed. Do you want to save it?" no longer appears if the unit mapping is not changed.
  - Signal multiplier and divider calculation has been improved

Fixes:

- A division by zero crash has been fixed (this bug could occur when the divider of CANbusInput has been set to zero by a previous version of DBC Importer).

**2021-08-05**

**Client: 56.0 exp**  
**Firmware: 56.0 exp**

Firmware:

New features:

- Delayed turning off (requires separate Battery 12V and Ignition Switch 12V wiring)
  - Use the F9 and type 'Delayed turn off' to put the pane of the current desktop:
    - Turn Off Minimal Time [seconds]
    - Turn Off Maximum Time [seconds]
    - Turn Off Channel (when this channel becomes high (non-zero) after Minimal Time the device will power off).
  - Channel 'pmu.isTurningOff' has been added to do custom actions
  - Switching the ignition switch back ON when Delayed Turning Off is used causes PMU to restart (it is possible after 0.5 seconds after starting the Delayed Turning Off procedure)

Improvements:

- A log file in the Internal Memory of PMU is properly closed when PMU is shutting down by the Ignition Switch (requires separate Battery 12V and Ignition Switch 12V wiring).

**2021-07-05**

**Client: 55.0.1**  
**Firmware: 55.0**

Notes:

- The firmware 55.0 and 55.0-exp are exactly the same firmware.

**2021-06-07**

**Client: 55.0.1 exp**



## **Firmware: 55.0 exp**

### Client:

#### Fixes:

- Project Tree: Confirmation of Delete operation works properly for all buttons of Grayhill keypads

### Ecumaster USBtoCAN:

- Internal software updated to v15.1 (automatic update offered when starting the PMU Client). This update improves the reliability of CAN communication with a PMU device.

**2021-05-07**

**Client: 55.0 exp**

**Firmware: 55.0 exp**

### Firmware:

#### New features:

- Added support for '5x2 Ecumaster (7 colors)' keypad
- Added support for 'Emtron' keypad
- Added support for Backlight Intensity for Grayhill / Emtron / Motec/RaceGrade keypads
- Switch element can now count downwards using channel "Input channel down" / "Trigger edge down"

#### Improvements:

- Changing Open Ceremony and Backlight Color now works on '2x2 Ecumaster RGB (7 colors)' keypad

### Client:

#### Fixes:

- Fixed keyboard width in the dialog for old "3 colors" keypads

**2021-02-18**

**Client: 53.5.1**

**Firmware: 53.5**

### Client:

#### Fixes:

- The Client software no longer freezes when trying to download very long logs from PMU-16DL / PMU-16AS internal memory.

**2020-10-05**

**Client: 53.5**

**Firmware: 53.5**

### Firmware:

#### Fixes:

- The first PWM-enabled output could be accidentally turned off or activated at DC=100% (regression from version 52.2)

**2020-08-07**

**Client: 53.1.1 exp**  
**Firmware: 53.1 exp**

Firmware:

Fixes:

- CAN Compound Streams: fixed frame corruption when frames with the same ID, but with index not defined by the project appears on the bus

Client:

Fixes:

- Editing the Hysteresis operation works again (fixed regression from version 53.0)

**2020-05-11**

**Client: 53.0 exp**  
**Firmware: 53.0 exp**

Firmware:

New features:

- Toggle operation now has two new optional channels:
  - "Set channel" to set value to 1
  - "Reset channel" to reset value to 0

**2020-04-10**

**Client: 52.3.4**  
**Firmware: 52.3**

Notes:

- The firmware 52.3 and 52.3-beta are exactly the same firmware.

**2020-01-27**

**Client: 52.3.4 beta**  
**Firmware: 52.3 beta**

Client:

Fixes:

- The Client software works again on Windows XP (fixed regression from version 52.2)

**2020-01-21**

**Client: 52.3.2 beta**  
**Firmware: 52.3 beta**

Client:

Fixes:

- DBC Importer: Proper importing of big-endian signals when bitPosition/bitCount is not multiple of 8 bits.
- Fixed device crashes after firmware upgrade when too many logged channels were used.
- Fixed overlapping of LED indicators on the status bar when more than 100% DPI scale was used

CAN Streams:

New:

- Electronics\_Limited\_ME1\_2.canx

- M11\_Korvet.canx
- VAG\_MED91.canx

Updated:

- Motec\_M1.canx: channels c\_Driver\_Switch1..6 and c\_Driver\_Rotary\_Switch1..8 added
- Motec M1: CAN Input c\_Fuel\_Used\_M1 changed to ecu.usedFuel
- Pectel SQ 6: CAN Input c\_Fuel\_Used\_ecu changed to ecu.usedFuel
- EMU Black: CAN Input ecu.usedFuel added

2020-01-03

**Client: 52.3.1 beta**  
**Firmware: 52.3 beta**

Client:

Fixes:

- Fixed improper "Only pins with same current rating (e.g. 25A and 25A) can be linked together." message.

2019-12-27

**Client: 52.3 beta**  
**Firmware: 52.3 beta**

Firmware:

Fixes:

- Fixed synchronization problems when sending/receiving frames to/from CAN network.

Client:

Improvements:

- DBC Importer: improved signal importing for factors 0.2, 0.5 and similar.

Fixes:

- The client now properly recognizes files saved in an earlier version as being non-autosport (bug in the Client 52.2).

Changes:

- The Client is now entering OFFLINE mode when opening the project file directly from the Explorer. This change has been made to protect the project in memory of the connected device.

2019-12-16

**Client: 52.2 beta**  
**Firmware: 52.2 beta**

Firmware:

New features:

- **PMU-16 AS autosport version** support:
  - 6 additional low-side outputs
  - Higher current rating for high-side outputs (2 x 40 Amps and 14 x 25 Amps)
  - Up to 10 outputs can be PWM modulated - even the low-side outputs

Improvements:

- The frequency of PWM output can now be changed while it's already active
- PWM DC Control now works properly for the 1%-99% range

- DC% log channel 'o\_output.dc' is now calculated more precisely.

Changes:

- PWM DC Control step is now 1%, no matter how the 'out of' denominator is specified.

Fixes:

- The states of the outputs are properly handled when deleting / moving up/down (when working with connected device)

**Note: This firmware 52.2 supports all the PMU-16 models: PMU-16, PMU-16 DL, PMU-16 AS**

Client:

Improvements:

- CANbus ID=0x000 is now allowed for CANbus Message Object and CANbus Export

Fixes:

- Expanding/collapsing the CANbus Message Object in ProjectTree no longer resets every CAN Input in the device

Changes:

- Hysteresis operation now accept two real constants (no need to multiply by 10/100/1000 anymore)

**2019-09-11**

**Client: 50.0.2 beta**  
**Firmware: 50.0 beta**

Client:

New features:

- Support for Peak PCAN-Ethernet Gateway.

Improvements:

- Added list of predefined sensors (Analog Input dialog - Wizard button)

Fixes:

- Missing channels from EMU\_BLACK.canx have been restored back (pump state, fan state, etc). (regression in version 50.0).

**2019-05-31**

**Client: 50.0 beta**  
**Firmware: 50.0 beta**

Firmware:

(NOTE: Firmware can be upgraded using File / UpgradeFirmware command from Client menu)

New features:

- Timers
- Calibrated Analog Sensors
- Decimal places and units support in Numbers, AnalogInputs and Tables
- Support for Compound CAN streams (4bit, 8bit, 16bit)
- New "Changed" operation for logical Functions

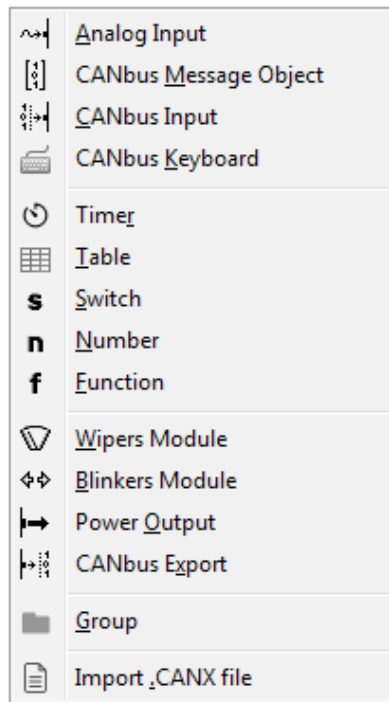
Improvements:

- Bitfield can be assigned as the channel of the Table

Changes:

- Evaluation order of elements has been changed to reflect order in the Project Tree. Now the evaluation order is the same as in the ADU.

CANbus-Keyboards
Tables
Analog Inputs
CANbus Mobs
CANbus Inputs
CANbus Keyboards
Timers
Tables
Switches
Numbers
Functions
Power-Outputs
Switches
Wipers
Blinkers
Power Outputs
CANbus Exports



Client:

New features:

- UI system has been adopted from the ADU - use F9 to add a pane to the desktop
- Duplicate button in the ProjectTree
- Save .CANX in the CANbusMob window
- Widths of columns are preserved: ProjectTree, TextLog, OutputMonitor, AnalogMonitor, VariablesInspector
- GraphLog: Shift+S toggles between lines and points+lines

Improvements:

- Channels added to Custom 1/2/3 Log windows are now preserved when upgrading the firmware
- Changed name of the F5 shortcut in the menu to "Reset project in the PMU-16"
- Delete command from ProjectTree is now working a lot faster
- Bitfield can be assigned as the channel of the Table (requires firmware 50.0 or later)

Changes:

- Changed MinimalClientVersion required to load a project. You will not be able to load a project saved by this Client software in its previous version. Please backup your project.
- The desktops layout file format has been changed and the extension of such files was renamed to .pmulayout2
- .CANX files moved to PMU\CANX\ folder and user .CANX files moved to PMU\CANX\USER\ folder

Fixes:

- Exporting the CSV files no longer causes a crash for some input data

Important note:

- Version number scheme of the Client has been changed: Now it's always FirmwareMajor.FirmwareMinor.ClientFixes (ClientFixes is omitted when zero) e.g. 50.0.1
  - FirmwareMajor changes when new firmware introduces new settings in the Client
  - FirmwareMinor changes on every fix in the new firmware that NOT introduces new settings
  - ClientFixes changes on every Client only update

CAN streams:

- Added AbitM11
- Added ECUMASTER Battery Isolator
- Added ECUMASTER CAN Switchboard V3
- Added Emerald
- Added Haltech
- Added Holley\_HEFI
- Added Hondata
- Added KMS MD56
- Added LinkECU GenericDash
- Added MBE
- Added Motec M84 to PDM
- Added Trijekt
- Several .CANX files has been updated

Ecumaster USBtoCAN:

- Internal software updated to v14.0 (automatic update offered when starting the PMU Client). This software improves compatibility with an older version of PMU/ADU Client.

**Client: 0.045**  
**Firmware: 0.045** **2019-04-25**

Firmware:

New features:

- Added support for RaceGrade / MoTeC keypad.
- Added new type of button 'Indicator3' to control individual LEDs (Grayhill / Racegrade / MoTeC keypads).

Client:

Changes:

- Changed MinimalClientVersion required to load project. You will not be able to load project saved by this Client software in its previous version. Please backup your project.
- The keypads are now configured using the CANopen node ID (default 0x15 for Ecumaster keypads) instead of the Buttons ID. This is exactly the same way as in the Light Client.

**2019-04-17**

**Client: 0.044.6.1**  
**Firmware: 0.044.6**

Client:

Fixes:

- Importing from CANX file more than 8 CANbus Mobs per CAN channel no longer leads to the project corruptions.

**2019-04-09**

**Client: 0.044.6**  
**Firmware: 0.044.6**

Firmware:

Fixes:

- Changing the speed of the CAN2 no longer causes Bit Stuffing Errors.
- PMU device no longer freezes when internal data flash memory is corrupted. An appropriate message will appear when connecting to the Client software.

Client:

Improvements:

- Improved support for Window XP

Fixes:

- Fixed another timeout bug in Ecumaster USBtoCAN update process (Windows XP).
- Peak CAN interface is working on Windows XP

Ecumaster USBtoCAN:

- Internal software updated to v0.12 (automatic update offered when starting the PMU Client).

**2019-03-26**

**Client: 0.044.5**  
**Firmware: 0.044.4**

Improvements:

- Names of documents on the menu bar are properly handled when working with multiple PMUs
- More space between names of devices on the toolbar.
- Performance of CAN input channels improved even in high CAN traffic.

Fixes:

- Grayhill 5x4 and 4x5 keypad: bottom row of buttons behaves as expected
- Fixed timeout bug in Ecumaster USBtoCAN update process.

**2019-01-02**

**Client: 0.044.2**  
**Firmware: 0.044.0**



Fixes:

- Encoding issue no longer causes a crash when working with the Finnish version of Windows.

2018-12-07

**Client: 0.044.0**

**Firmware: 0.044.0**

New features:

- Support for new '2x2 Ecumaster (7 colors)' keypad

Improvements:

- Master Retry now resets only overcurrent and undercurrent outputs. (Ecumaster ADU no longer restarts on Master Retry if connected to PMU output.)
- Master Retry does not reset the requested value of the output ("o\_output = k\_key or o\_output" will preserve its state).

Fixes:

- Switching access to the CAN between ADU / PMU / LightClient works in all cases.

2018-11-20

**Client: 0.043.1**

**Firmware: 0.043.0**

New CAN Streams: (Use: Import CANX from Project Tree)

- AEM
- DTA Fast S series
- Emtron
- Evo X
- Life Racing
- MaxxECU
- Megasquirt 2 & 3
- Syvecs

2018-10-15

**Client: 0.043.0**

**Firmware: 0.043.0**

New features:

- Support for Grayhill keypads added (CANopen version)

Fixes:

- Fixed PMU freeze when changing CAN2 speed when CAN bus line has different speed.
- Diagnostics channels pmu.diag.can1/2.rxErrors/txErrors work as expected
- Timeouts of CANbus message objects work properly in all situations

2018-09-20

**Client: 0.042.8**

**Firmware: 0.042.5**

New features:

- Switching CAN adapter between ADU and PMU. You can work with two clients at the same time and switch adapter between them. ADU Client 50.1 or newer is required

2018-09-19

**Client: 0.042.7**

**Firmware: 0.042.5**

Improvements:

- Ecumaster USBtoCAN: internal software updated to v0.10 (automatic update offered when starting the PMU Client).
- Status bar now shows CAN1 / CAN2 status (like in the ADU Client).

2018-04-09

**Client: 0.042.5**

**Firmware: 0.042.5**

Fixes:

- Function evaluation when "True delay" and "False delay" parameters were both non-zero fixed.
- Output voltage is now properly measured on PMU HW3 model.

2018-02-27

**Client: 0.042.1**

**Firmware: 0.042.1**

New features:

- Support for new '**6x2 Ecumaster (7 colors)**' keypad
- Changing **back light color** for 7-colors Ecumaster keyboards (Use More settings button in keyboard setup dialog)
- **Delays** in IsTrue/isFalse/comparison operations. Examples:
  - a) channel is 1, when c\_ecu\_rpm > 2000 for 5s
  - b) channel is 1, when c\_csb\_switch1 is holded down for 1s
- Pulse operation - **retrigger** (retriggering pulse in the middle of active pulse)

New CAN Streams: (Use: Import CANX from Project Tree)

- **Motec M1 ECU**
- **ViPec/Link ECU (Generic Dash 2)**
- **Ecumaster EGTtoCAN**

2018-01-08

**Client: 0.035.2**

**Firmware: 0.035.0**

Fixes:

- (client) Fixed crash when creating/editing Switch (bug since client version 0.034.1)

2018-01-02

**Client: 0.035.1**  
**Firmware: 0.035.0**

Fixes:

- (client) Fixed crash when editing CANbus Mob on firmware lower than 0.035

**2017-12-21**

**Client: 0.035.0**  
**Firmware: 0.035.0**

New features:

- Support for new '4x2 Ecumaster (7 colors)' keypad
- Support for **Pectel SQ6 CAN stream** (Use Import CANX from Project Tree)

Improvements:

- Now CANbus Inputs are automatically grouped by CANbus Mobs (firmware 0.035 required)
- Maximum length of names in a project increased to 30 characters (up from 20) - works with any firmware
- Heating model for outputs is now calculated using filtered current. It fixes some Overcurrent situation when Inrush current was equal to Max current.

Fixes:

- EMU\_BLACK.canx - fixed c\_ecu\_injPW and c\_ecu\_ignAng

**2017-12-07**

**Client: 0.034.1**  
**Firmware: 0.034.0**

This is Client only update. Contains firmware 0.034.0, the most recent firmware.

**The firmware 0.034.0 fixes CAN terminator issues on CAN1 / CAN2.**

**Now it works as documented:**

- **CAN1: no terminator (USBtoCAN termination or external terminator on CAN1 required)**
- **CAN2: user selectable terminator (Treeview/PMU/CANbus setup)**

Improvements:

- Added c\_ecu\_cltError to EMU\_BLACK.CANX
- Generate Pinout command: added *Min current*, *Max current*, *Inrush current / Inrush time* for outputs (menubar: Devices/Generate Pinout)

Fixes:

- Fixed bug with minimum and maximum value when creating the Table.
- Password is now correctly replaced with ●●●●● (fixed regression from version 0.033)

**2017-12-07**

**Client: 0.034.0**  
**Firmware: 0.034.0**

## The firmware 0.034.0 fixes CAN terminator issues on CAN1 / CAN2.

### Now it works as documented:

- **CAN1: no terminator (USBtoCAN termination or external terminator on CAN1 required)**
- **CAN2: user selectable terminator (Treeview/PMU/CANbus setup)**

### Improvements:

- Switch element – range has been extended to 0..255 (up from 0..4)
- Default frequency of some channels has been increased:
  - pmu.o?.voltage now logged at 25Hz (up from 5Hz)
  - pmu.a?.voltage now logged at 25Hz (up from 5Hz)
  - pmu.acc\*/pmu.gyro\* now logged at 25Hz (up from 5Hz)

### Fixes:

- Fixed program freezing after 5 hours of working
- Fixed terminator issues on CAN1 / CAN2
- Project Tree: Fixed channel corruption when Move up/Move down/Delete command was used and project used output.dc, output.timeAboveMax or mob.timeout channels.

2017-11-20

**Client: 0.033.0**

**Firmware: 0.033.0**

### New Features:

- User-defined tables (2D / 3D, variable size, each axis can be user-selectable), can be used as **PWM tables**

### Improvements:

- Wipers: “Brake delay time” added to allow fine-tuning of the wiper parking spot. The wiper motor is not powered in this state.
- PWM: When the Duty cycle is ZERO, the output is completely turned off.
- PWM can be activated even if the output is Active. No need to turn off / turn on the output.
- Project Tree: added keyboard shortcut for Move up / Move down – Alt+UpArrow / Alt+DownArrow
- Ecumaster USBtoCAN device: reliability and performance improvements (USBtoCAN software update to v0.5 is offered automatically when starting PMU Client).
- Parameter panel and Status bar are properly scaled on high-DPI devices.

### Fixes:

- Fixed rare crash related to “Use client data”/“Get data from PMU” when working with 2 PMUs.
- Fixed crash related to the escape key pressed in Canbus Mob creation invoked from Canbus Input dialog
- Fixed crash when exiting application in Offline mode

2017-10-13

**Client: 0.031.1**

**Firmware: 0.031.0**

Fixes:

- Fixed connection problems between Ecumaster USBtoCAN and the latest firmware 0.031.0

2017-10-04

**Client: 0.031.0**  
**Firmware: 0.031.0**

New Features:

- (firmware) Improved Power Control Model. Support for devices with delayed activation (such a ABS module in the car).
- (firmware) Password protection
- Added ability to choose "Use client data" or "Get data from PMU" if data are different when connecting
- Autoscale on GraphLog (requires firmware 0.030.0 or later)
- Export GraphLog data to Excel (CSV file format); also works with selection
- Display filter can be assigned to each GraphLog channel (GraphLog - right mouse button - Properties). Useful for smoothing accelerometer data. Turned on by default for two `pmu.boardTemperatures`.
- (firmware) Channels can be multiplied by constant \*1, \*10, \*100, \*1000, \*custom, raw in CANbusExport
- (firmware) Each subchannel can be multiplied by constant \*1, \*10, \*100, \*1000, raw in Number
- (firmware) Decimal places in Canbus Input – for example, `c_pmu.batteryVoltage` is now 12,5V instead of 12500
- Some channel can be viewed as bitfields (`pmu.can1.state`, `pmu.can2.state`, `pmu.outActiveMask`, `pmu.outFaultMask`, `pmu.outOvercurrentMask`, `pmu.outShutdownMask`) (requires firmware 0.031.0 or newer)
- (firmware) Number: added Modulo operation (reminder)
- (firmware) Number: added Lookup operations (for simple lookup tables; 2,3 or 4 entries)

Improvements:

- Reconnect command (Shift+Ctrl+B) – two PMU can be turned on one after another
- Hot unplug/plugin Ecumaster USBtoCAN possible
- When downloading log from DL memory of PMU, the file is saved to Logs\ directory with date/time included in file name (e.g. Logs\20170622\_1703\_12.pmulog)
- Added warning message when one of PC<=>PMU communications CAN IDs is used in CANbus Export (IDs 0x12-0x17 on CAN1).
- GraphLog – value axis has now variable number of helper lines
- GraphLog – current value displayed on each graph
- Wipers dialog – added check to ensure that Park Switch could be used only with output O8.
- Logs saved on PC: It's now possible to analyze logs, even if some modification was made to the project. Only names of elements must match.
- GraphLog min/max ranges automatically configured for CanbusInputs, AnalogInputs, keyboard buttons
- Pausing the GraphLog works as expected in all situations
- Channels outside of 8 bytes in Canbus Export are now disabled for easier understanding.
- EMU\_BLACK.CANX updated to support decimal places (for example: `c_ecu_lambda` from EMU/BLACK has now fractional part) – (requires firmware 0.031.0 or newer)

- PMU.CANX updated to support decimal places (requires firmware 0.031.0 or newer)
- GraphLog: Inrush current and Max current lines visible on o\_name.current channels

Fixes:

- Constant -16383 can be assigned to any channel (as stated in the documentation).
- Fixed bug when some u16/s16 empty channel in the middle of Canbus Export was not properly saved to the device.
- GraphLog now shares the same configuration for all desktops
- Sometimes during connecting Client showed that PMU data are corrupted and asked for restore. This rare bug has been fixed.
- When saving .pmulog file, the debug file .pmulograw is no longer saved
- Fixed focus problem on some popup windows, when clicked outside the popup

2017-07-19

**Client: 0.026.6 exp**  
**Firmware: 0.026.6**

Fixes:

- (firmware) Fixed proper activation of brake circuit for wipers. Wipers should park as expected now.
- (client) Fixed rare crash after firmware upgrade.
- (client) Fixed crash when using popupMenu on empty GraphLog

2017-07-04

**Client: 0.026.5 exp**  
**Firmware: 0.026.2**

This is Client only update. Contains firmware 0.026.2, the most recent compatible firmware.

Fixes:

- Fixed Group Selection command (Ctrl+G or button "Group"). The names of all elements in the project were corrupted after this command.

2017-06-08

**Client: 0.026.2 exp**  
**Firmware: 0.026.2**

Fixes:

- (firmware) Fixed not responding buttons on Ecumaster keyboard
- Fixed crash when using Undo (Ctrl+Z) too deeply after Firmware Upgrade

Improvements:

- Ecumaster USBtoCAN - performance improved on slower computers

2017-05-09

**Client: 0.026.0 exp**  
**Firmware: 0.026.0**

New Features:

- (firmware) CAN 2.0B support with extended ID (29 bits)

Improvements:

- Improved reliability of client on slow computers

Fixes:

- Fixed crash when saving some projects
- Fixed loading of projects containing channel with dot character (e.g. c\_pmu.a3.voltage)

2017-04-24

**Client: 0.025.0 exp**  
**Firmware: 0.025.0**

Improvements:

- (firmware) CANbus Input: Timeout value and Default value separated.

Fixes:

- Fixed Ecumaster USBtoCAN rare disconnection bug. USBtoCAN software update is offered automatically when starting PMU Client.
- Fixed CANbus Export – channels were accidentally changed when deleting other elements.

Changes:

- Changed MinimalClientVersion required to load project. You will not be able to load project saved by this Client software in its previous version.

2017-04-10

**Client: 0.024.0 exp**  
**Firmware: 0.024.0**

New Features:

- Support for Life Racing keyboard (ProjectTree: Add/Keyboard and change Size to '4x5 - Life Racing')
- Support for new Ecumaster 3x2 (7 colors) keyboard.
- Speed of CAN2 could be configured: 125 Kbps, 250 Kbps, 500 Kbps, 1000 Kbps (TreeView: PMU/CANbus Setup)

Improvements:

- Confirmation message added when deleting element that is referenced by other element.
- "EMULATED" text is shown on toolbar of Output/Analog Monitor when appropriate Emulator is used.
- Import .CANX file: CANbus ID could be configured (useful when using two EMUBLACKs in one car or EMUBLACK on non standard ID)
- Pinout Generator (menu Devices/Generate Pinout) - added CANbus Mobs and Keyboards.
- EMU\_BLACK.canx updated: added inputs c\_ecu\_nitrus and c\_ecu\_starterRequest

Changes:

- Changed MinimalClientVersion required to load project. You will not be able to load project saved by this Client software in its previous version.

Fixes:

- Device name is properly updated on Device Bar (#1. #2. #3. #4. #5.)
- Fixed rare crash when closing the application.
- When creating new CANbus Input default frame offset is now +0.
- Opened file name is preserved when doing Make Permanent and Upgrade Firmware.
- Keyboards: Radiobuttons now work as expected even if no 'Radiobutton Group' is present.
- F4 shortcut (Channel List) work properly when editing Power Outputs.
- Generated pinout is now properly displayed in Internet Explorer, Microsoft Edge and Mozilla Firefox.

2017-03-24

**Client: 0.023.2 exp**  
**Firmware: 0.023.2**

Fixes:

- (firmware) Fixed Output Emulator for outputs with double/triple pins.
- Several fixes for "Support for high DPI tablets/laptops and custom font size in Control Panel"

2017-03-22

**Client: 0.023.1 exp**  
**Firmware: 0.023.0**

Improvements:

- Support for high DPI tablets/laptops and custom font size in Control Panel.

2017-03-17

**Client: 0.023.0 exp**  
**Firmware: 0.023.0**

New Features:

- **Analog Emulator and Output Emulator** - just connect your PMU on your desk and you can emulate analog inputs and power outputs. See Help (F1) for details.
- Brightness support for CAN keyboard (key LED brightness / back light brightness)
- Up to 20 Switches can be created in project (up from 8).

Improvements:

- CAN keyboard can now be disconnected and reconnected again.
- CAN keyboard can now be powered by one of PMU power output without any problems.

Fixes:

- (client) Fixed USBtoCAN support on **Windows Vista** (USBtoCAN performance improvements on other systems as well)
- canSwBoard\_ID668.canx renamed to canSwBoard\_ID666.canx (This is only filename change, you don't need to reimport/change anything).



- EMU\_BLACK.canx, canSwBoard\_ID334.canx, canSwBoard\_ID666.canx - reintroduced changes from v0.020.6 (fixed regression from v0.021.0)
- CANbus Export now correctly supports CAN2

2017-03-09

**Client: 0.022.0 exp**  
**Firmware: 0.022.0**

- (firmware) Fixed reliability of logging to PC when working on slow computer / heavy loaded CAN1.
- (client) Added support for Kvaser CAN adapter.
- (client) Fixed several crashes related to handling corrupted logging data.
- (client) Fixed rare crash when PMU was disconnected
- (client) Proper detection of disconnection when CAN1 L and H is shorted.
- (client) Fixed firmware upgrade after previous upgrade was aborted.

2017-03-02

**Client: 0.021.1 exp**  
**Firmware: 0.021.1**

- Up to 50 Numbers can be created in project (increased from 20).
- Changed MinimalClientVersion required to load project. You will not be able to load project saved by this Client software in its previous version.
- (firmware) Fixed: Temperature values (temperature1/temperature2/flashTemperature) are correct immediately after starting the device
- Updated example projects in EXAMPLES/EXPO/
- Added link in Help menu: Online ChangeLog
- Default value for Inrush Current has been changed to 120A.
  - a) This settings allow easier tuning of Inrush Current (use the maximum value, test the output, see the Peak Current in Output Monitor and alternatively lower the Inrush Current value to proper value)
  - b) This settings protect output transistors from excessive flyback energy in the case of inductive load.
- Warning messages added to Help.

2017-02-24

**Client: 0.020.6 exp**  
**Firmware: 0.020.6**

- (firmware) Fixed: PMU16 (non DL) can freeze during startup when checking presence of DL memory.
- Client now checks if firmware is not outdated and suggest upgrade
- Added status bar information in Client about available: functions / numbers / operations.
- EMU\_BLACK.canx updated:
  - added input c\_ecu\_fuelPumpSt
  - added input c\_ecu\_coolantFanSt
  - added input c\_ecu\_acClutchSt
  - added input c\_ecu\_acFanSt
  - aln1..aln6 – changed Volts to miliVolts (0..5000 steps instead of just 0..5)

- mob renamed to "m\_emublack"
- canSwBoard\_ID668.canx / canSwBoard\_ID668.canx updated:
  - mob renamed to "m\_canSwBoard"

**2017-02-20**

**Client: 0.020.5 exp**

**Firmware: 0.020.4**

- Several fixes for slow computers
- [CHANGE] USBtoCAN adapter is detected ONLY once during Client startup. Single PMU can be connected later. But still if using multiple PMU – devices need to be connected before Client Startup.
- Fixed fatal popup window: assert failed: !"unreachable"
- Fixed fatal popup window: assert failed: "IsRunning(), Use ScheduleExit() on not running loop"
- Faster disconnection detection
- Fixed validation for PowerOutputs confirming dialog by ENTER key
- Updated HELP file
- Changed destination email address for BugTrap.
- [NEW] Ability to print Pinout - use menu item: Device/Generate Pinout to generate .HTML file
- [KNOWN ISSUE] Password protection is still not working. Please do not enter password.

**2-02-2017**

**Client: 0.020.4 exp**

**Firmware: 0.020.4**

- (Firmware) Fixed initialization of DataLogging system in PMU16-DL

**24-01-2017**

**Client: 0.020.3 exp**

**Firmware: 0.020.3**

- Initial Release