

SMART CALIBRATION

CAMEO MODEL & MAP

ALL - IN - ONE POWERTRAIN CALIBRATION

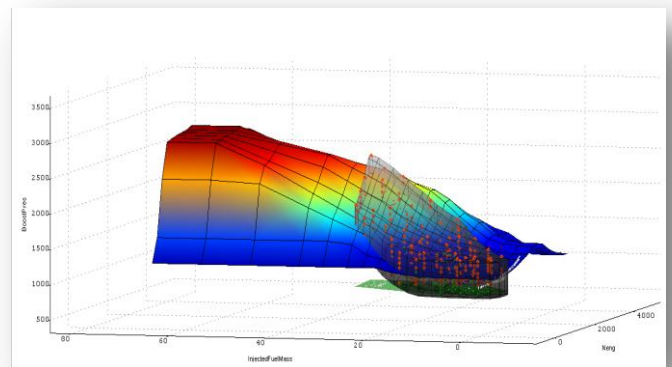
The CAMEO MODEL & MAP is part of the Powertrain Calibration Software CAMEO with the aim to perform the creation of a test design, the plausibility check, modeling and optimization of engine calibration data coming from an engine test bed. The optimized data are the source for the map calculator to create optimized maps as result.

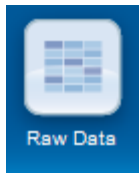
The main features of the CAMEO MODEL & Map can be summarized as follows

Access to all calibration data coming from the test bed environment and being stored via the CAMEO TEST & MEASURE product. Alternatively to the online measurement calibration access, data can be imported using several file formats or can be read from an ASAM-ODS compatible data base.

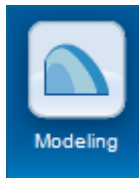
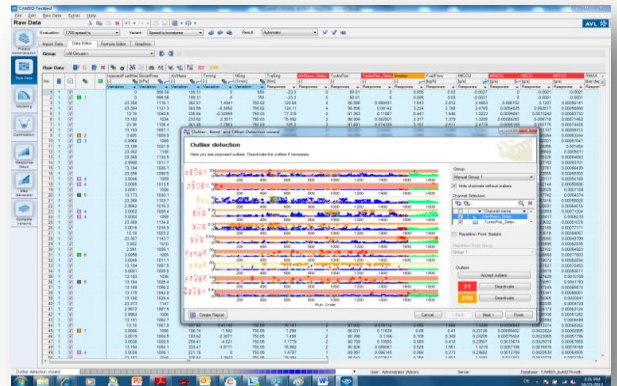


Creating of local and global DoE designs and support of all state of the art DoE designs. All DoE designs can be prepared in CAMEO MODEL & MAP and executed by CAMEO TEST & MEASURE on the engine test bed.

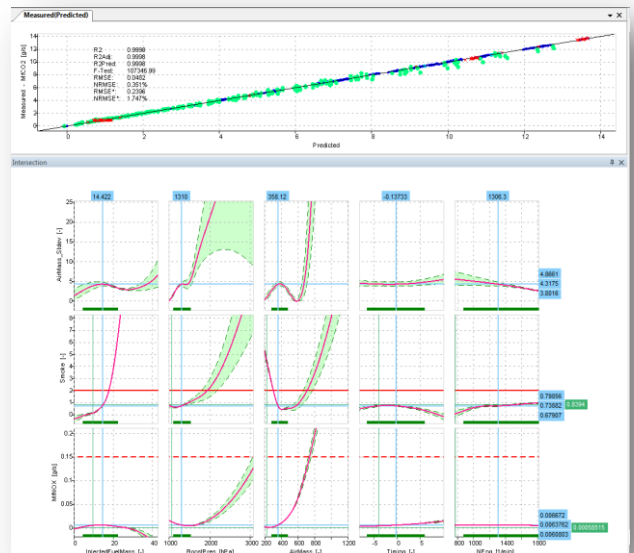




Editor to manipulate measured raw calibration data or to generate new calculated data from these raw values. All calibration data modified in this way are of course automatically marked as manually manipulated. A powerful outlier detection helps the user to find measurement data, which are not plausible. A deactivation of outlier points can be done by one click.



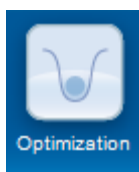
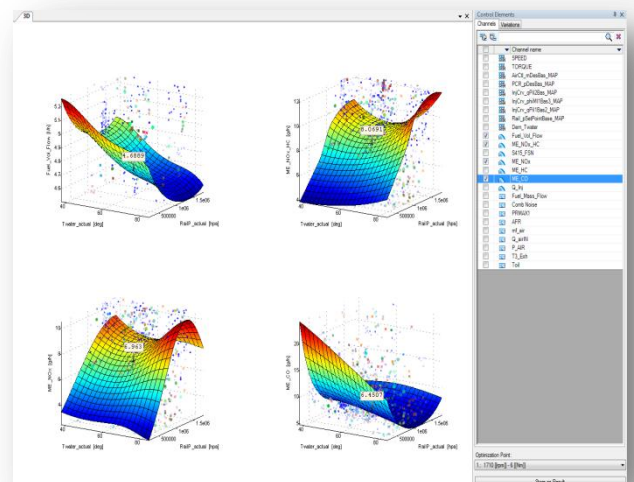
CAMEO MODEL & MAP offers several modelling algorithms as typically Polinomial Models for free definable orders, Polinomials with free definable interacting terms or the possibility to extend the standard algorithm by several types of Neural Network algorithms. These model algorithms are prepared to generate not only local models, but also global models. These global engine models describe the engine behaviour for each engine response versus the entire operation range.



Furthermore the CAMEO MODEL & MAP informs the engineer about the model quality and goodnes of model prediction by statistical means. In case of low model quality, which is usually is caused by the quality of the used measurement instrumentation used on the testbed, the CAMEO MODEL & MAP suggests strategies to increase the quality (e.g.: outlier

elimination).

The CAMEO MODEL & MAP model graphics, as typically the intersection plot, allow a presentation of the multi-objective variation space. Thus engineers can identify the dependencies of engine responses in an easy way. Furthermore an automatically reporting can be triggered.

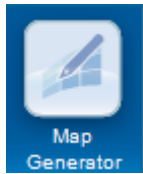


The CAMEO MODEL & MAP offers several possibilities to optimize any engine response model regarding defined calibration target functions, as automatic search algorithms or



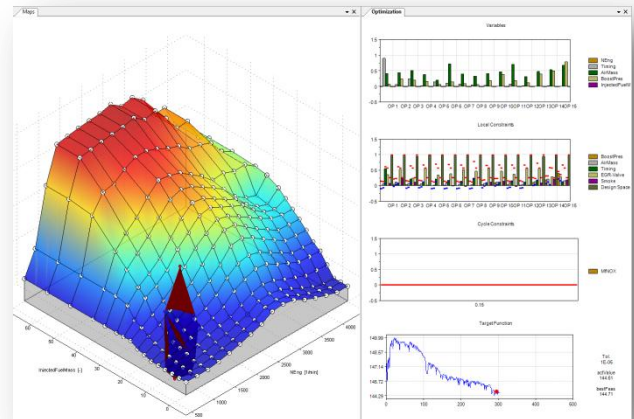
manual optimizations performed by the user.

The optimized engine response models always depend on conditions or constraints (e.g. EPA regulations). Therefore the CAMEO MODEL & MAP offers, besides to the standard hard constraint optimization limits, also named softflexible constraints, that allow the engineers to search even outside the defined border lines if necessary.



The finally calculated optimized points of the engine response models are prepared to be handed over to a map generator for calculating optimized maps.

A major ability of the CAMEO MODEL & MAP user interface is the break down of the ECU calibration process into manageable work steps, each containing a guided workflow with as much visual representation of information as possible.



Your advantages at a glance

- The quality of engine response models and optimization results depends very strongly on the quality of the received measured raw data. The CAMEO MODEL & MAP offers therefore intelligent methods to improve the model and optimization result quality, which influences the entire calibration process by saving process time and increasing the result quality
- The CAMEO MODEL & MAP software is tuned to the requests of the engine development and engine calibration process and supports the application engineer in the modelling, optimization and map creating tasks.
- The CAMEO MODEL & MAP supports the application engineer without the necessity of detailed mathematical knowledge to build models. Thus the training effort in terms of modelling techniques is reduced to a minimum.

Scope of Supply

- CAMEO Data DVD
- License file (after notification of the MAC address)

Recommended options / extensions

To guarantee the functioning of the powertrain calibration workflow by the CAMEO software, AVL recommends supplementing the product CAMEO MODEL & MAP with the following further CAMEO products:

- CAMEO EMISSION CYCLE OPTIMIZATION
- CAMEO MODEL EXPORT
- CAMEO FLOATING LICENCE SERVER
- CAMEO CENTRAL DATABASE



Please also visit us at www.avl.com/cameo or contact one of our technical offices for further details.