

*Time saving tool for
powertrain ECU calibration*

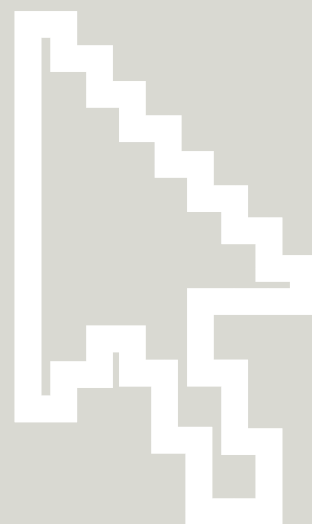
*Powerful and open ECU
calibration tool*

*Automatic optimisation
software*

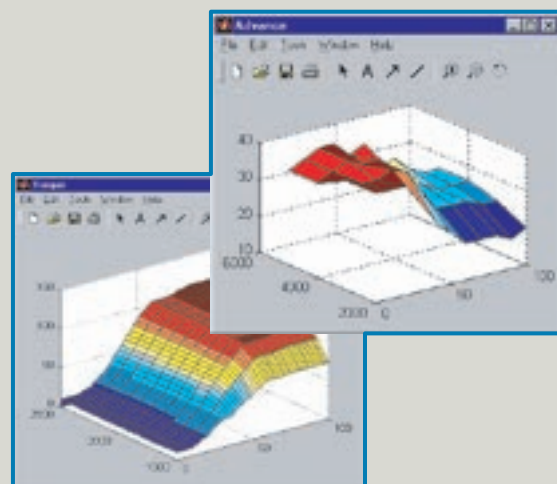
*ASAM compliant interfaces
for automation systems*

MORPHEE® is a Groupe D2T software development that allows the set up, the calibration and the automatic optimisation of powertrain ECU.

MORPHEE® enables a better operation of Engine test bed installations. MORPHEE® improves the quality and the speed of set up of engine control systems.



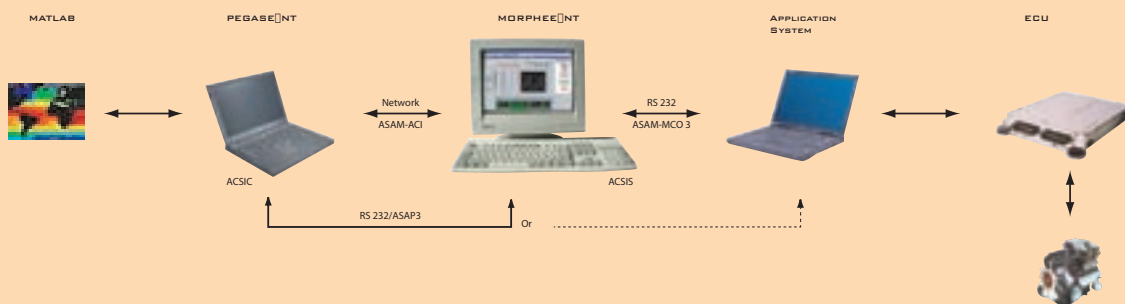
MORPHEE® has functionality's defined by the ASAM / STAUMECS working group. MORPHEE® is a fully open tool working under Windows™ NT. Its interface with MATLAB enables the user to develop and to manage every optimisation strategy.



THE MORPHEE® INTERFACE

MORPHEE® is installed on the engine test bed and is able to transfer and control, through an automation system like MORPHEE® for example, the parameters and the maps of the application system that are involved in the injection advance definition, the injection time, the load, the speed, spark advance, the EGR rate, etc....

MORPHEE® communicates with MORPHEE® in ASAM-ACI (previous ACS - I) protocol through an ETHERNET link and with the application system through the ASAP 3-MCD 3 (old name ASAP 3) protocol with an RS232 interface.

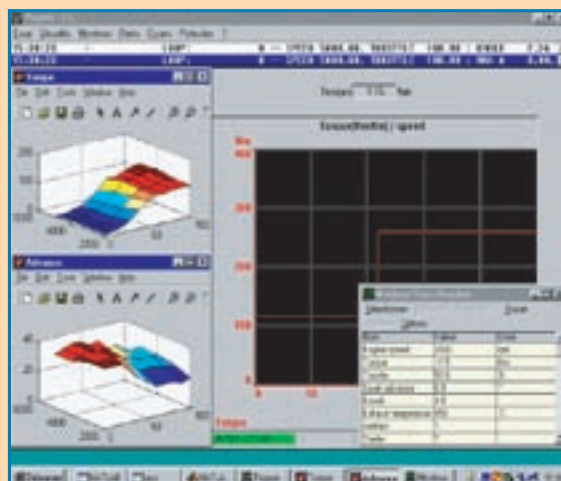


The ACSIS control driver enables MORPHEE® to be driven by ACS (Automatic Calibration System) like MORPHEE®. This driver works with ORBIX - version 3.0 (CORBA implementation) and is installed on the PC.

THE MORPHEE® USER INTERFACE

MORPHEE® can determine and improve the quality and the speed of real time set up of engine control systems

Based on the same principle as MORPHEE®, the MORPHEE® interface allows the user to take benefits from an homogenous test presentation between the control test bed tools (MORPHEE®) and the optimisation tool (MORPHEE®).



MORPHEE® CALIBRATION AND OPTIMISATION

BENEFITS OF THE MORPHEE® SYSTEM

Developed by the Groupe D2T / MACAO, MORPHEE® is now operational. MORPHEE® is a software package working under Windows™ NT. The software is used for the automatic determination of optimum values for parameters and maps available in the ECU of the engine control system.

The main benefit of automatic calibration software is to allow the engine R & D centre, whose main activity is engine calibration, to use their installations in case of staff absence and so to concentrate their work on calibration interpretation

Calibration covers 2 fields:

- Engine description and Mapping
- Engine development and Tuning

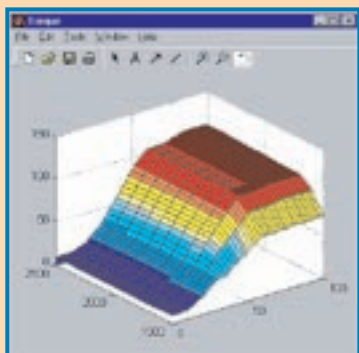
MORPHEE® is able to make the description of the automation sequences and the engine set up.

THE APPLICATIONS AND THE GOAL OF MORPHEE®

The components of this software package are as follows:

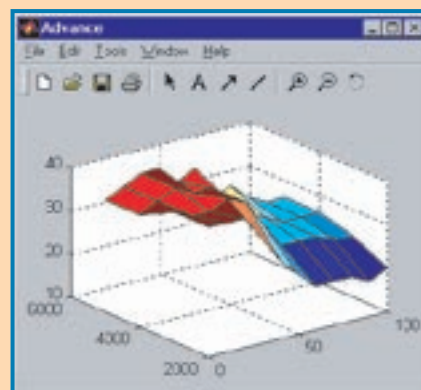
- MORPHEE® user interface working under Windows™NT for the display and the follow-up of the test.
- ASAM - 3 interface for communication with the application systems.
- ACS - I Interface for the communication with the test bed control system

ENGINE TORQUE 3D DISPLAY



MORPHEE® OFFERS THE FOLLOWING POSSIBILITIES:

- Fully open tool with the capability to drive all possible methods.
 - Input of project environment parameters
 - Communication with ASAP 3, a standard interface for reading and writing maps from engine ECU through an application system.
 - Display and manipulation from maps, description of test procedures with corresponding variable parameters.
 - Possibility of Parameterisation and complete engine optimisation on specific test points;
 - Possibility of using MATLAB for optimisation under certain constraints
 - ASCII File download through MATLAB
- MORPHEE® calculates the optimum values for several test points and displays new maps that can be downloaded to the ECU through the application system.



DISPLAY OF THE OPTIMUM CALIBRATED SPARK ADVANCE DURING TEST

RELATIONSHIP BETWEEN MORPHEE® AND MORPHEE® :

With the link between MORPHEE® and MORPHEE® , the user has an ideal and user-friendly software package for calibration. The programming of the optimisation models is made in MATLAB.



Morphee Test Cycle

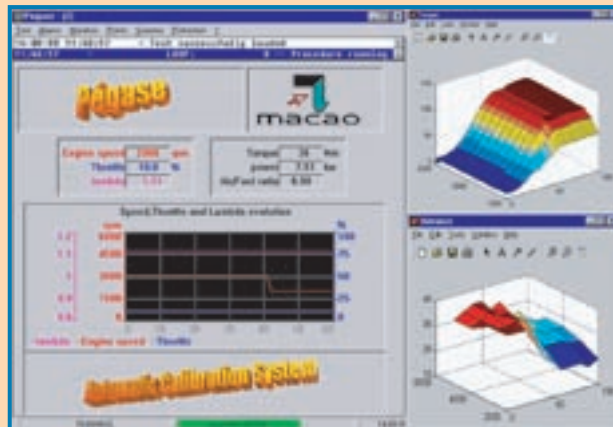
MORPHEE® provide the following functionality's:

- Modification of parameter values in maps
- Management of powertrain ECU through MORPHEE®
- Use of standard interface
- Possible to restart after a test stop

MORPHEE® manages real time optimisation:

- Mathematical modelling of the reference function
- Selection of different optimisation strategies
- Display of running optimisation
- Possible intervention of the operator

The results of the optimisation can be displayed through bargraphs and charts.



TOOLS NEEDED

MORPHEE® is provided with the following interfaces:

- MORPHEE® user interface
- ASAM - MCD 3 interface
- ASAM - ACI interface

Standard package:

- PC with Windows™ NT installed
- MORPHEE® license (Driver ACSIC + Run Time Orbix)
- Interface between MORPHEE® and the engine test bed application systems.
- MATLAB driver interface
- ACI license for MORPHEE® (Driver ACSIS + Run Time ORBIX)
- Documentation in English

Options:

- Commissioning and training
- Technical assistance

The MATLAB license with the optimisation and signal processing with tool boxes have to be provided by the customer.

Remark :

ASAM - ACI compliant, MORPHEE® can work with all test bed application systems that have an ASAM - ACI interface available.

SPECIFICATION

- Real time kernel under Windows™ NT
- MORPHEE® unlimited version
- Dictionary management (channels, calculation and units)

- Points file compatible with Excel™
- Management from standard interfaces: ASAM- CCC, ASAM
- MCD, ASAM - ODS.

APPLICATION EXAMPLES

- Engine test beds
- Transient optimisation

- ECU mapping
- Off line optimisation

All D2T products are warranted against defects in materials and workmanship for one year from date of delivery to the original purchaser. Specifications are subject to change without notice.