



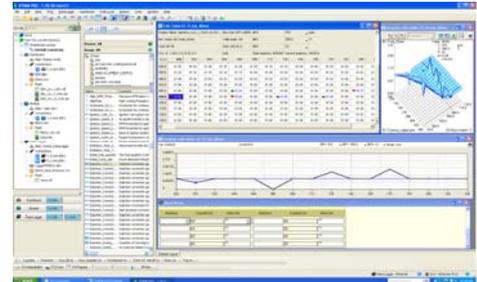
# **SYSMA**

## **Vehicle Tuning and Configuration Tool**

**SYSMA** is the new Magneti Marelli integrated tool designed for configuring and tuning vehicle control systems for the most advanced levels of motorsport.

SYSMA is the integration and evolution of the previous Magneti Marelli tools: Vision (ECU monitoring and calibration), Axon (Data Logger and Dashboard setup), Sysfiles (Channel List editor) and ExeFiles (Codeload).

SYSMA includes several environments for data analysis and data management. A complete suite of graphical instruments allows you to monitor and tuning the whole system. A large set of keyboard accelerators, user customisable, make SYSMA easy and fast to be used.

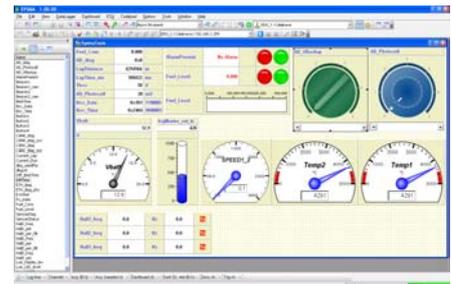


It allows all functionalities for the setup, measurement & calibration of the ECU, the Data Logger and the Dashboard.

SYSMA manages all the configurations files, analyses the measured data and reprograms the HW devices also flashing the embedded firmware.

SYSMA allows full configurability of the screen layout accordingly to the end-user preferences (layouts, windows, parameters, hot-keys).

SYSMA allows to compare and merge data versions, importing data between different firmware releases.



SYSMA is compatible with all the latest Microsoft Operating Systems

SYSMA is flexible software designed to be opened of the universal standard automotive platforms (ASAM), in order to ease of exchange data between electronic and software suppliers.

At the same time SYSMA implements data formats and protocols dedicated for the Motorsport world and its needs of performances and reliabilities.

SYSMA supports an open architecture in order to permit integration with custom additional software tools. Public services are provided so that other applications can use SYSMA functions to fully control the system.

*This is the result of more than 25 years of continuous evolution and close partnership with the top ranking teams in F1, FIA, FOM, WRC, Le Mans, GT, MotoGP, SuperBike, AMA, and Powerboats.*

## SYSMA FEATURES

- ✓ Advanced interactive Graphic User Interfaces
- ✓ Projects management
- ✓ Data Logger Setup
- ✓ ECU Calibration and Setup
- ✓ Dashboard Editor
- ✓ Integrated programming tool for flashing firmware
- ✓ Simultaneous monitoring and recording of measurement from ECU and Data Logger
- ✓ Save measurement in Wintax4 data format
- ✓ Integrated Math Channels Editor
- ✓ System database managements for calibrations and measurement
- ✓ User Level Access management
- ✓ Compare and Merge of data versions, importing data between different firmware releases.
- ✓ Support of Ethernet, CAN and Bluetooth lines
- ✓ Compatibility with standard common used CAN Card (*Vector, Peak, CanDo*)
- ✓ External potentiometer management (Desk AMC6 / AMC4)
- ✓ Compatibility with ASAM standards: MCD-3 (test bench interface), MCD-2 MC (ECU description for measurement and calibration system)
- ✓ Support of standard *DBC* database format (*Communication Database for CAN*)
- ✓ Support of Standard CAN signals (advanced graphic editor for CAN messages)
- ✓ Complete Customisation: layouts, graphs, math libraries, colours schemes to suit user preferences
- ✓ Open to standard tools: e.g. Excel<sup>®</sup>, Matlab<sup>®</sup> and Simulink<sup>®</sup>
- ✓ OLE/Automation inter-process communication protocol supported
- ✓ Interfaced to third party data systems via dedicated APIs
- ✓ SYSMA is compatible with latest Microsoft Operating systems Microsoft<sup>®</sup> XP 32/64bit, Vista<sup>®</sup> 32/64bit Windows<sup>®</sup> 7 32/64bit and Windows<sup>®</sup> 8 32/64bit, compatible with dual core and quad core processors
- ✓ Extensive contextual HELP
- ✓ Compatibility with all Magneti Marelli Motorsport products

## Projects Management

All the system files (ECUs calibration database, Data Logger Tables, firmware, settings...) are included in "projects" files. This means simplicity and reliability of management for data versions

SYSMA easily allows to update the database of calibrations and measurements to newer embedded software versions.

Furthermore, SYSMA provides all the functionalities to configure, modify, set up, export and import parameters and calibrations to/from projects.

SYSMA allows you to convert the old setup files (Axon (TPX), Vision (PTA), Sysfiles (CLL), Exefiles (CDL, Bin)) to new projects.

## Data Logger Setup and Monitoring

Sysma integrates all functionalities of logging setup. In a very easy way it allows you to be connected to the Data Logger and to generate the measurements logging table.

Sysma Data Logger main features are:

- ✓ Real time display of logged measurements
- ✓ Setup of signals to be acquired
- ✓ Setup of all Data Logger options (e.g. Trigger options)
- ✓ Management of multiple sets for logging tables
- ✓ Management of protected subsets of measurements for different Users
- ✓ Compare and merge of logging tables

## ECU Measurement and Calibration Management

Sysma integrates all functionalities for ECU Measurements and Calibrations management.

Sysma *Measurement and Calibration* main features are:

- ✓ Real time display of measurement
- ✓ Parameters editing, including 2D and 3D maps
- ✓ Subsets of parameters for single application (e.g Chassis, Engine,...)
- ✓ Management of multiple Sets for calibrations values (e.g. set for "Dyno", set for "Race", set for "Raining Race" etc. on the same project.
- ✓ Integrated calibration manager tool for comparison and merging of calibration parameters
- ✓ Support of Ethernet and Can protocols
- ✓ Support of Bluetooth protocol
- ✓ SYSMA allows to control multiple ECUs
- ✓ One ECU can also support several SYSMA clients.
- ✓ ASAP3 protocol support for automated tuning
- ✓ Recording of ECU's parameters in Wintax4 format
- ✓ External potentiometer management (desk AMC6 / AMC4)

## Dashboard Editor

Sysma integrates all functionalities for Dashboard Setup, main features are:

- ✓ Graphical Dashboards setup
- ✓ Bitmap libraries
- ✓ Font libraries
- ✓ Dashboard Layouts



## Firmware Codeload

Sysma integrates all functionalities for programming all system devices: ECU, Data Logger, Dashboard and Modules. The main features are:

- ✓ Integrated Codeload programming environment
- ✓ Automatic project update with new firmware
- ✓ Simple monitoring interface for standard Users (progress bar and basic status messages)
- ✓ Advanced monitoring interface for expert Users (deeply debug messages, setups for advanced codeload options)

## Monitoring and Recording

Sysma provides a large amount of functionalities which allow visualization and recording of the measurements of the system devices:

- ✓ Instruments and Gauge controls
- ✓ Alphanumeric & Statistics
- ✓ Diagnostic and Alarm
- ✓ Oscilloscope window (time based view, multiple signals, analysis cursors, signal list & signal values, "data save" for post processing analysis (WinTAX4 compatibility))

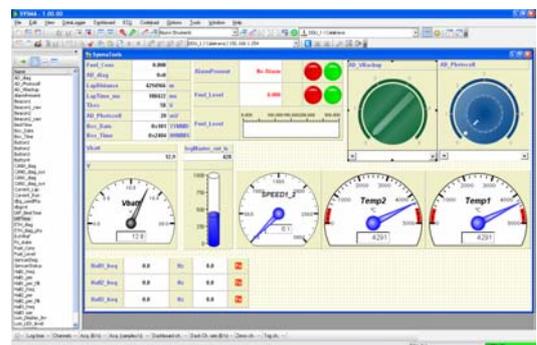
### Instruments

The overall appearance of instruments is fully configurable to suit your preferences or to adjust the display to the different brightness scenarios (garage, outdoor etc.)

A large variety of styles allows you to customize the instruments appearance and to adapt them in to SYSMA's layouts.

All parts of instruments are configurable: scale, font, colours, hand, alarm, layout, ticks, and unit.

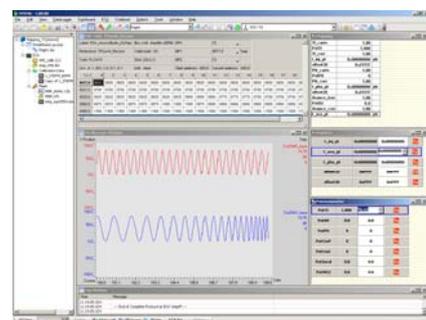
The instruments live display the parameters variations. .



### Oscilloscope

Shows measurements as waveforms against time

- ✓ Real time analysis
- ✓ Multi channels graphs
- ✓ Save data in Wintax4 format
- ✓ Math Channels support



## Displaying Measurements

The *Measurements* display mode presents each channel as a label followed by its instantaneous value, measurement unit and an optional graphical representation. Values are re-read at each refresh cycle.

P_Baro_used	593.3 mBar	T_Air1	40 °C
P_Air	4100 mBar	T_ECU	42.9 °C
TCK1	10.13 °C	5 271 548 824 1100	
TCK2	0 °C	5 271 548 824 1100	

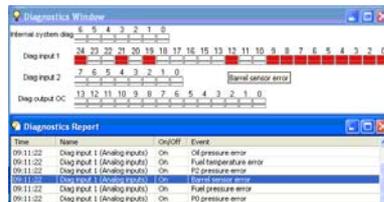
## Potentiometer Measurements

Potentiometer mode allows the user to enter a replacement value for a specific channel which is then transmitted to the electronic device.

Rpm	8763
TPS	39.1 %
5.0 22.5 50.0 77.5 105.0	

## Diagnostic and Alarm window

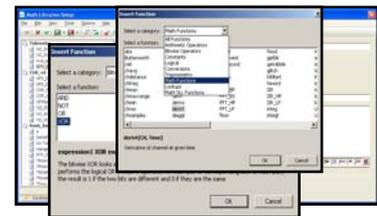
The Diagnostic window displays messages decoding the bit mapped diagnostics generated by the electronic device.



The Alarm window displays messages when a channel exceeds the configured alarm level thresholds. Report windows show the timestamp of events (both active and memorized).

## Maths channels

Virtual channels are generated from user-defined functions of measurements. A graphical editor, with advanced features, allows complex math expressions to be built up quickly.



Virtual channels can be also organised in libraries

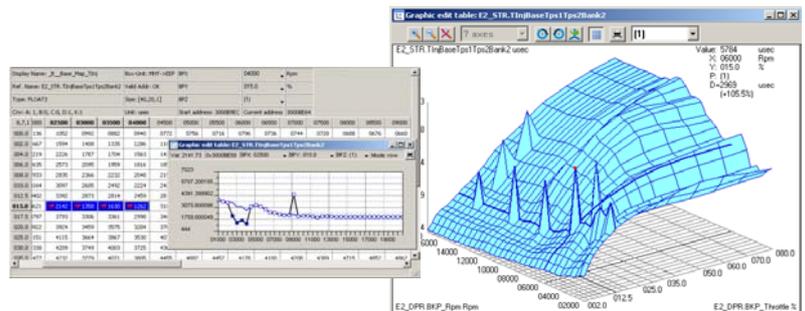
## Calibrations Tuning

Sysma provides a large amount of functionalities which allow editing and managing of the calibration for all system devices. The main features are:

### Calibration Editor

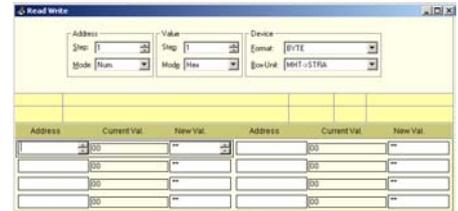
The Calibration Editor is the core display for tuning vehicle's calibrations maps.

- Change values by typing cells
- 2D and 3D maps can be viewed as graphs. Change values by dragging points on the graph.
- Export/Import calibration values to/from Excel, CSV
- String enum values are also supported
- Mapping / Work Point function to write potentiometer corrections to ECU
- Extract calibration data from the ECU and also perform comparisons with other sets of data.



### Read/Write

This special display allows the administrator users to read/write any software variable allocated in the unprotected regions of ECU memory.



### Desk Potentiometer support

Sysma support external potentiometers (Desk AMC6 / AMC4) where you can modify operating parameters values in faster way through the rotary dials, instead of using the keyboard.

### Mapping Function

The SYSMA Mapping function lets you directly write correction's values to the maps contained in the ECU.

### Asap3 protocol support

Sysma support Asap3 protocol allowing communication with commonly used dynamometric

## Compare & Merge

### Compare

Sysma implements an enhanced integrated compare tool. It allows to compare calibrations & measurements sets as well as the logging tables.

All results are clearly displayed in a report where you can also copy values from compared sets.

- Textual display of differences
- 2D and 3D graphic display of differences



### Merge

The merge utility is dedicated to update calibrations values to the newer software embedded projects.

It allows in a very easy way to copy all vehicles setups between different software versions. Sysma in fact automatically copies all the values of parameters in the new firmware addresses without need of user interaction. At the end of merging a detailed report is produced for easy reference.

## Standard Formats and Interfaces

- ✓ Support of the ASAM standards MCD-2 MC (ASAP2 - ECU description for measurement and calibration systems): import A2L and MOT allows to create parameters database starting from standard automotive files
- ✓ Support of the ASAM standards MCD-3 (test bench interface): ASAP3 protocol support for automated tuning
- ✓ Support of an extensive amount of hex file formats like Motorola S or INTEL-Hex
- ✓ Support of CAN db for CAN monitoring and sending
- ✓ Support of standard DBC database format (Communication Database for CAN)
- ✓ API for interaction with Windows® applications

## OLE Automaton

SYSMA provides powerful possibilities for interfacing with external applications using the Automation Server technology (formerly OLE Automation Server). Automation is a protocol which allows an application to make its own objects available for use in other applications, programming tools or via scripting languages.

In this way SYSMA can be run and controlled by any program which has the characteristics of Automation controller. Some examples of applications which make great use of Automation are Microsoft Excel®, Access®, Project®, Matlab®, Simulink® and many others written in Visual Basic or Visual C++.

It is possible, for example, to open a SYSMA window from an Excel spreadsheet, analyze information via Matlab or run commands directly from an external application written in Visual Basic.

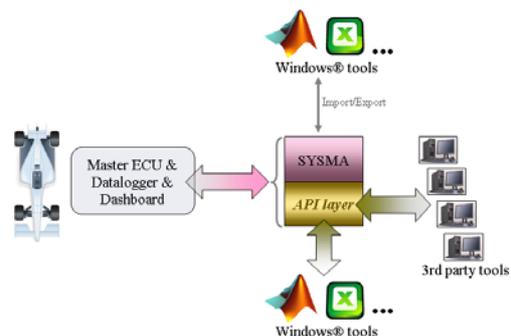
## SYSMA APIs

A complete suite of add-on modules increase the potential of SYSMA, as well as the APIs interfaces allow SYSMA to be used in conjunction with external applications.

The APIs layer allows third party applications to read and write measurement and calibrations.

APIs main functionalities concern:

- Data Logger parameters
- ECU parameters
- ECU Calibration



## Complete Customisation

The main screen area of SYSMA contains graphic or alphanumeric analysis windows in which logged data may be represented in a variety of different ways. Each *User* may save commonly-used combinations of analysis windows as *Layouts*, which allow the waveforms to be organised into logical screen containers.

User-configurable accelerator keys make SYSMA easy to use

Colour schemes the overall appearance of SYSMA to be changed to suit user preferences or ambient light conditions (e.g. Pitwall, Garage etc.)

Global settings can be modified locally to each windows making SYSMA completely configurable to adapt to every wish. For each window: colours, styles, fonts, scales, filters, channels position...

**For further information, please contact:**



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