



INCODIO[®]

- Integration & Simulation of automotive C-Code -

Overview

- SYSTECS is a specialist for **innovative Software Technology**
 - founded in 1994; independent
 - 35 highly qualified Employees
 - Location Leinfelden-Echterdingen, Germany
 - Portfolio includes **Services and Products**



SYSTECS

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Overview

SYSTECS

Innovative Software Technology

Tools

Embedded Software

- **Software Engineering Tools**
 - with SYSTECS .NET Technology
 - with SYSTECS AUTOCAD-3D Technology

Service

- **INCODIO®**
Embedded Software -> Tools
 - Integration & Simulation of C-Code

Product

- **Consulting & Workshops**
 - Development Methods & Tools
 - Software Architecture, Product Lines
 - **AUTOSAR**

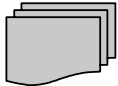
Service

Customers



Overview INCODIO®

Automotive
C-Code



**ASAM-MCD
AUTOSAR**



INCODIO®

SYSTEMCS

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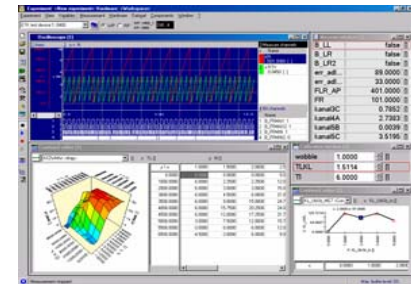
INTECRIO

The INTECRIO interface displays several data windows: a top window with a blue waveform plot, a middle window with a 3D surface plot, and a right window with a table of parameters. The table includes parameters like 'L1', 'L2', 'L3', 'L4', 'L5', 'L6', 'L7', 'L8', 'L9', 'L10', 'L11', 'L12', 'L13', 'L14', 'L15', 'L16', 'L17', 'L18', 'L19', 'L20', 'L21', 'L22', 'L23', 'L24', 'L25', 'L26', 'L27', 'L28', 'L29', 'L30', 'L31', 'L32', 'L33', 'L34', 'L35', 'L36', 'L37', 'L38', 'L39', 'L40', 'L41', 'L42', 'L43', 'L44', 'L45', 'L46', 'L47', 'L48', 'L49', 'L50', 'L51', 'L52', 'L53', 'L54', 'L55', 'L56', 'L57', 'L58', 'L59', 'L60', 'L61', 'L62', 'L63', 'L64', 'L65', 'L66', 'L67', 'L68', 'L69', 'L70', 'L71', 'L72', 'L73', 'L74', 'L75', 'L76', 'L77', 'L78', 'L79', 'L80', 'L81', 'L82', 'L83', 'L84', 'L85', 'L86', 'L87', 'L88', 'L89', 'L90', 'L91', 'L92', 'L93', 'L94', 'L95', 'L96', 'L97', 'L98', 'L99', 'L100'. Below the table is a graph showing a line plot. The interface also features a 3D car chassis model and a laptop icon.

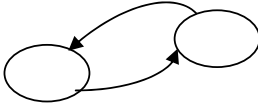
Prototyping, Test, Calibration

Key Features

- **INCODIO® Version V1**
 - supports **INTECRIO** from **ETAS**
 - enables **Simulation** of production C-Code in the Loop with Vehicle Models (**SIL**)
 - ... together with Simulink or ASCET Models



Key Features



ASCET

MATLAB / Simulink

C-Code
c=a+b;

C-Code IDE

INTECRIO
ASCET Connector

INTECRIO
Simulink Connector



**Tools for
ECU
Software
Development**

INTECRIO

**INCODIO® enables the integration
of C-Code
into the ETAS tool INTECRIO**



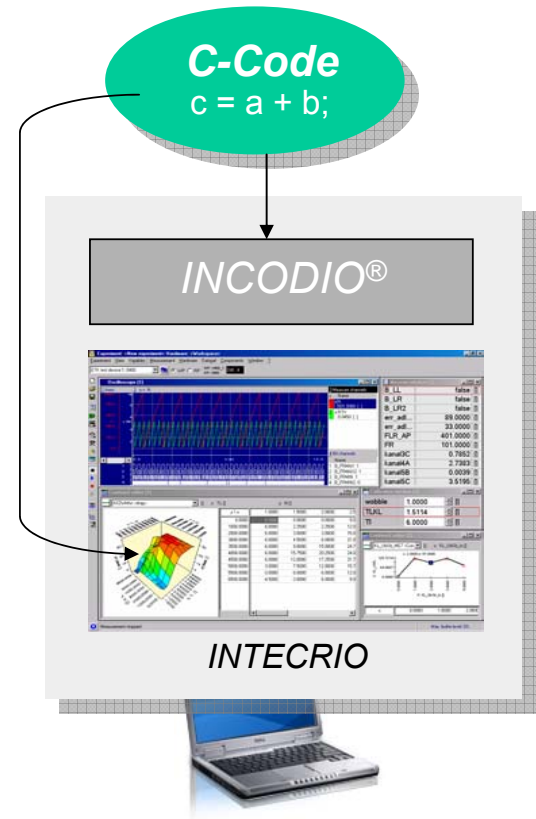
INCODIO® V1 – Use Cases

- Which Customers will use *INCODIO*®?



Development of
C-Code

- Your benefit
 - Rapid Design and Verification of C-Code in a **real-time** simulation environment



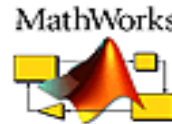
INCODIO® V1 – Use Cases

- Which Customers will use **INCODIO®**?



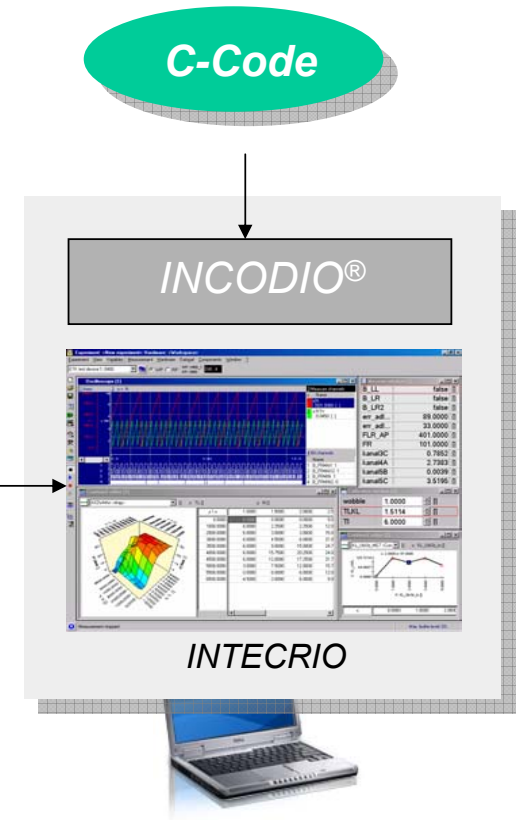
Simulation & Validation of Production C-Code

ASCET or

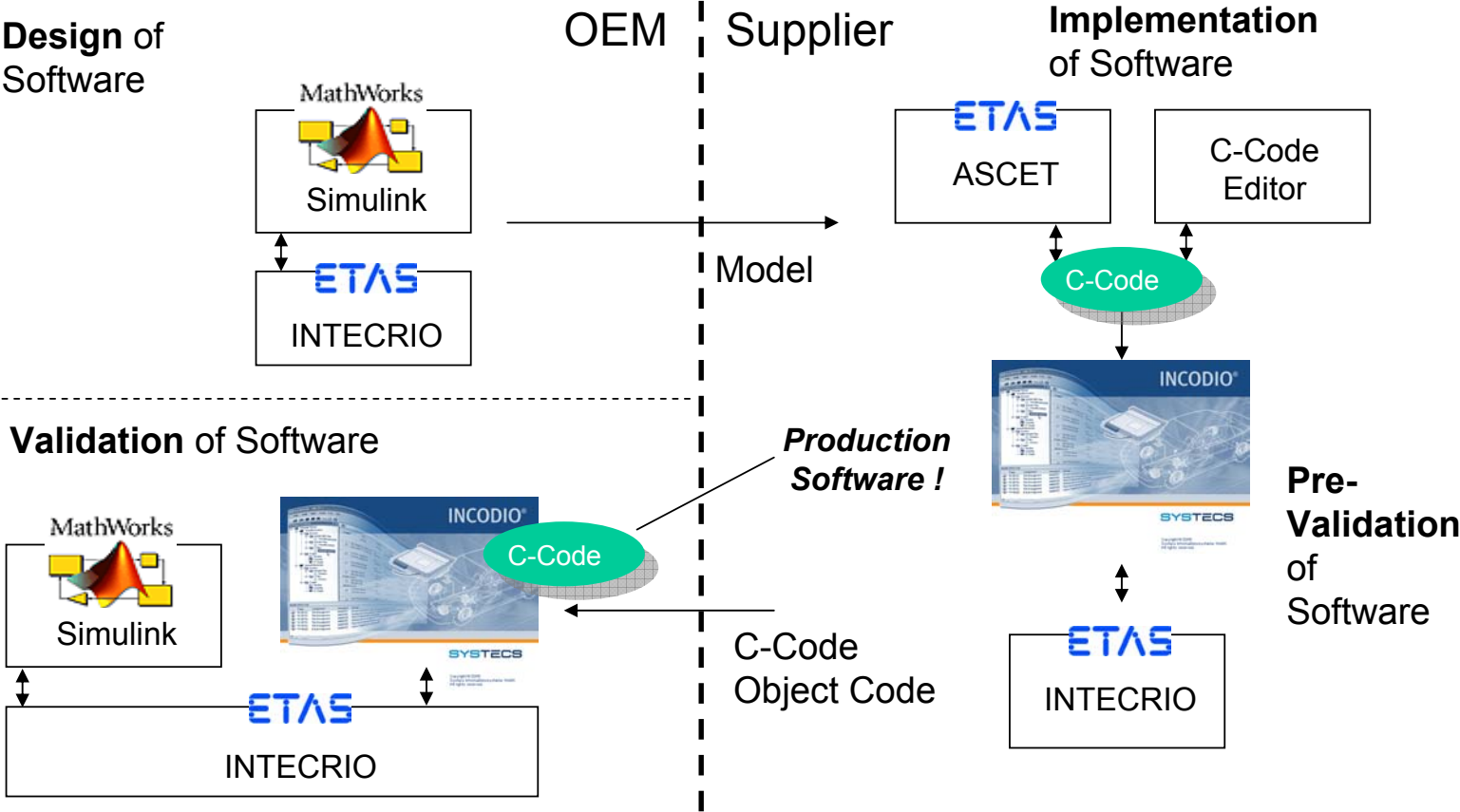


- Your benefit**

- fast integration of Production C-Code
- ... and simulation in the Loop with ECU Software Models and / or Vehicle Models



INCODIO® V1 – Use Cases

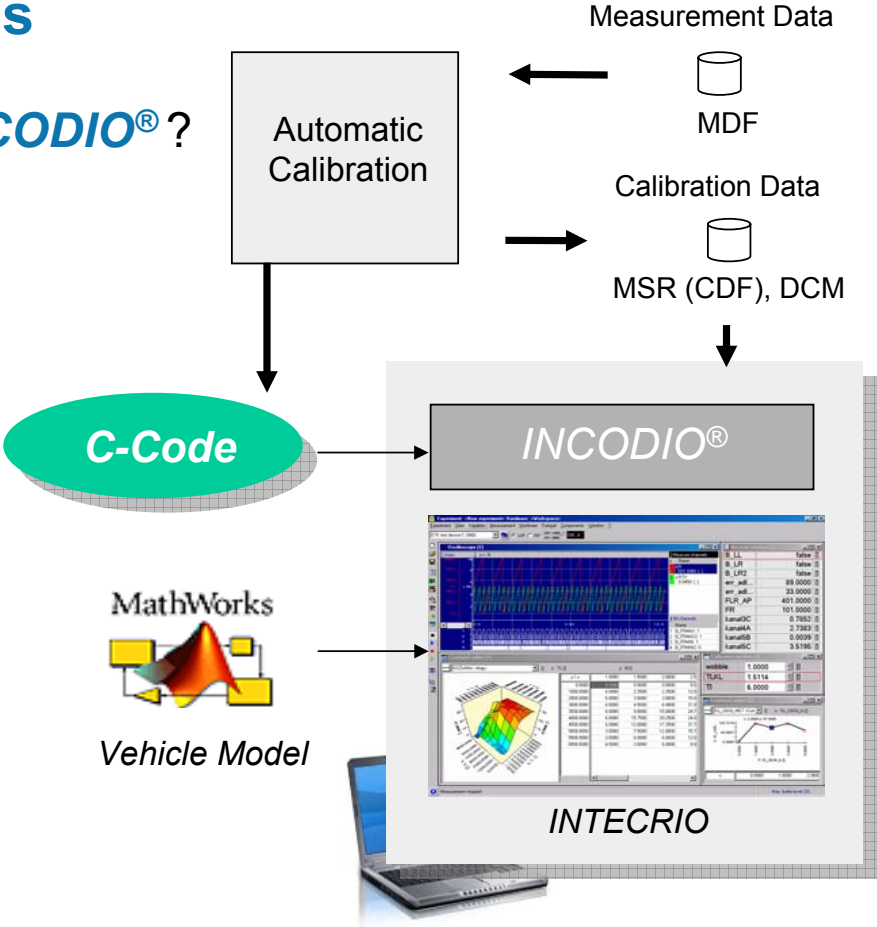


INCODIO® V1 – Use Cases

- Which Customers will use *INCODIO*® ?



- Your benefit
 - (automatic) Calibration of Production Software in the Lab



INCODIO® V1 – Use Cases

- Which Customers will use **INCODIO®**?



... who
**already use
 INTECRIO** for
 Model-based Rapid
 Prototyping



- Your benefit**

- Excellent migration from verified legacy C-Code to model based development
- Simulation of C-Code together with Models for ECU Software and Vehicles

Key Features

- **INCODIO® Version V1**
 - Supports full **parsing** of C-Code
 - enables direct integration of C-Code into INTECRIO **without additional effort**
 - no additional Function & Variable definition in INTECRIO
 - no consistency problems with redundant definitions in INTECRIO



Key Features

- **INCODIO® Version V1**
 - Supports full **parsing** of C-Code
 - Supports unions, struct, ...
 - Supports redefinition of ECU specific declarations
 - E.g. CONST -> VOLATILE redefinition
- **makes C-Code ready for simulation !**



Key Features

- **INCODIO® Version V1**
 - Supports **ASAM-MCD-2MC**
 - enables display of **physical Values** of ECU Software variables
 - allows identification of **Input/Output** signals of Software Components
 - allows **Calibration** of production Parameters, Curves and Maps during Simulation
 - **Arbitrary Record Layouts supported**



Key Features

- **INCODIO® Version V1**
 - Supports specification of **Real-time behavior**
 - Automatic identification of Processes & Additional Functions
 - Specification of Priority, Trigger Mode, Period, ... for Processes



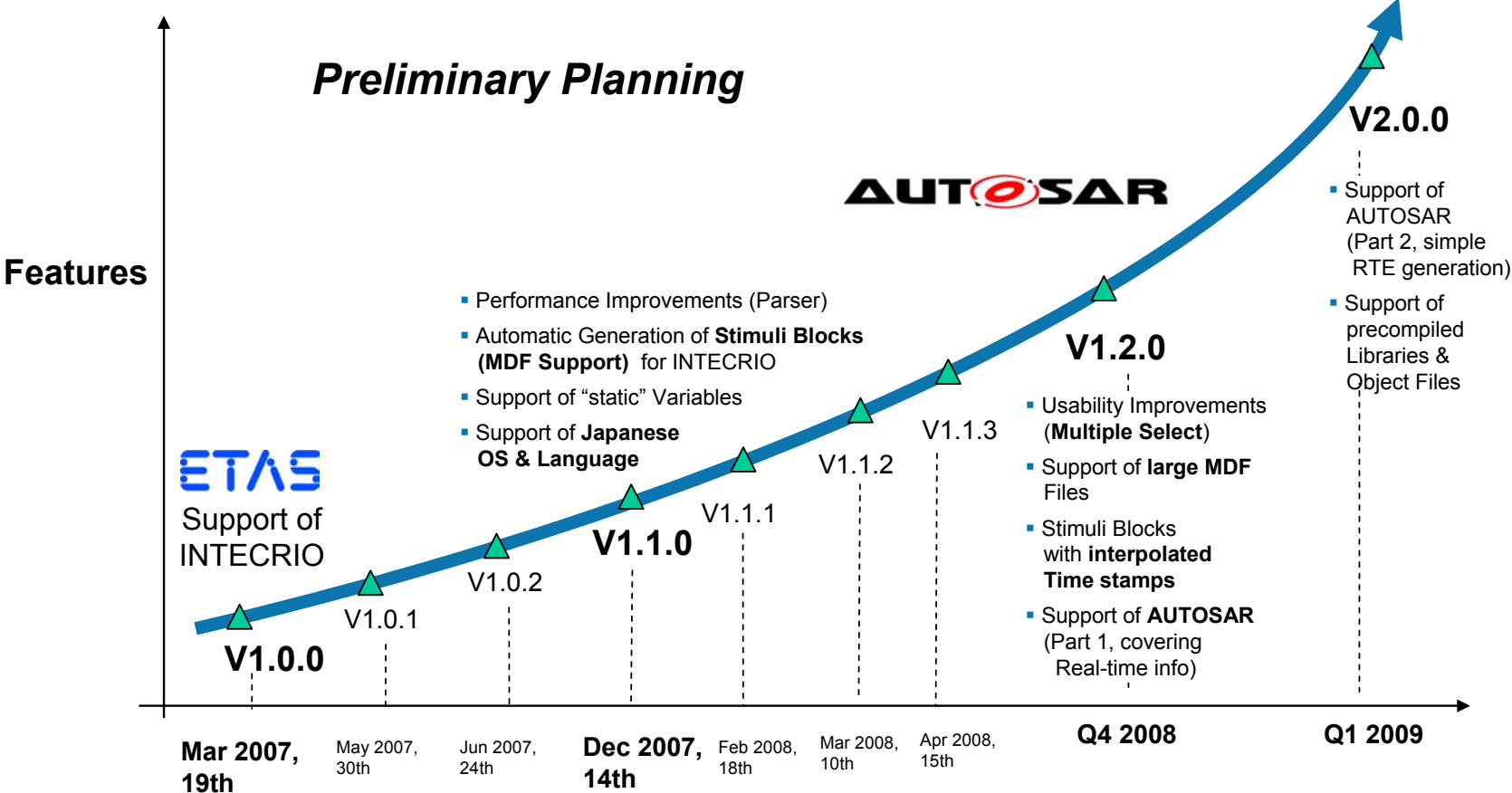
Key Features

- **INCODIO® Version V1 (.1)**
 - supports Japanese Language for C-Files and ASAM-Files
 - especially Comments and Long names

```
/begin CHARACTERISTIC bp4bData N 0 SW          /* name */  
"j ETASグループは、自動車業界に特化した価値あるパートナー
```

- supports Japanese Windows OS

INCODIO® – Roadmap



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