

# INCODIO® V1.2.1

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## Release Notes

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## 1 Introduction

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INCODIO® is a platform to support the integration and simulation of C-Code. INCODIO® enables the development and test of embedded C-Code in PC-based applications like software-in-the-loop, rapid prototyping and automatic calibration.

INCODIO® V1.2.1 allows easy integration of C-Code into the simulation tool INTECRIO from ETAS and it generates software components from C-Code for virtual prototyping on a PC as well as for the ETAS ES 1000 and for the compact ES910 rapid prototyping module.

This document describes the prerequisites and the conventions for INCODIO® V1.2.1.

### 1.1 Trademarks

The name INCODIO is a registered trademark of SYSTECS Informationssysteme GmbH.

## 2 Prerequisites

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### 2.1 Hardware

The following table lists the minimum and recommended hardware prerequisites to install INCODIO®.

Hardware	Minimum required	Recommended
Processor	Pentium IV, 1,5Ghz	Pentium IV, 3Ghz
Memory	1024	2048
Required free disk space ( for installation )	100MB	100MB
Display	1024 x 768	1280 x 1024

### 2.2 System Software

The following table lists the minimum system software prerequisites to install INCODIO®.

System Software	Supported
Operating System	Windows 2000 SP4 or higher Windows XP Professional SP2 or higher

### 2.3 Additional Software Prerequisites

Besides the system software, INCODIO® requires additional software to run. If this software is not available on the system, it will be installed by the INCODIO installation process.

Additional Software
Windows Installer 3.1
Microsoft .NET Runtime 2.0
Microsoft Visual C++ 2005 SP1 Redistributable Package (x86)
MSXML 3 (only on Windows 2000)

## 3 Supported Integration Platforms

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INCODIO® supports the following integration platforms and tools.

### 3.1 Integration Software

Supported Integration Software
ETAS INTECRIO V. 2.1
ETAS INTECRIO V. 2.2
ETAS INTECRIO V. 3.0
ETAS INTECRIO V. 3.1

### 3.2 Integration Hardware

Supported Integration Hardware
Virtual Prototyping on PC
ETAS ES1000 (ES1130 / ES1135)
ETAS ES910

### 3.3 C-Compiler

C-Compiler
GNU Compiler - MinGW 3.4.2
GNU Compiler - GCC 3.4.4

## 4 Third Party Software

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INTECRIO makes use of the following products that are released under the respective licenses:

### 4.1 Compiler

INCODIO® uses GNU Compilers for PowerPC and i386/Win32. The GNU Compilers are released under the GNU General Public License (GPL). The complete license information can be found at <InstallDirectory>\Tools\GNU-Compiler\V3.4.4-PowerPC\license.

The source code and further information can be obtained from <http://gcc.gnu.org>. Upon request, the source code of the used GNU compiler can be provided by SYSTECS in exchange for a fee for the process of physical transfer of the code.

### 4.2 ASAM-MCD-2MC Parser

The ASAM-MCD-2MC parser technology is based on the software components of Automotive Tools & Services of Visu-IT! ( <http://www.visu-it.de> ).

## 5 Distribution

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INCODIO® is available on a CD and as a download file on the SYSTECS internet site under <http://www.systemcs.com/english/automobilindustrie/produkte/downloads.html>. To obtain a CD, please contact [sales@systemcs.com](mailto:sales@systemcs.com).

### 5.1 User Documentation

INCODIO® is shipped with an online documentation. No printed copy of the manuals is available.

### 5.2 Software license activation

INCODIO® needs an activation key to get started. To obtain an evaluation or an unlimited activation key, please contact [sales@systemcs.com](mailto:sales@systemcs.com).

## 6 Installing and Uninstalling INCODIO®

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### 6.1 Install Procedure

You may install INCODIO® on any system met the minimal system prerequisites described in section 2. However, to run INCODIO® you need a software license activation key. Section 5.2 describes how to obtain an activation key.

To install INCODIO® V1.2.1 from CD

- Insert the INCODIO® CD into the CD drive of your computer.
- Open the folder for the CD drive.
- Double-click on Setup.exe to start the installation.
- Follow the instructions in the installation wizard.

To install INCODIO® V1.2.1 from a downloaded file

- Unzip the downloaded file to any folder.
- Open the appropriate folder.
- Double-click on Setup.exe to start the installation.
- Follow the instructions in the installation wizard.

### 6.2 Uninstall Procedure

INCODIO® will be installed by using the Microsoft windows installer. Thus, regular windows uninstall mechanisms can be used to remove INCODIO® from the system.

To uninstall INCODIO®

- Open the Windows Control Panel.
- Locate the Software entry and open it.
- Search for the INCODIO® entry in the list of installed software products and select it.
- Select the change/delete entry. An uninstall dialog appears. Please follow its instructions.

### 6.3 Parallel Installation

INCODIO® V1.2.1 and all prior versions can be installed in parallel. Note that parallel installation of refresh versions is not supported. Parallel installation only works on version and update level (1.1.x, 1.2.x, 2.0.x, ...).

## 7 Changes in INCODIO® V1.2.1

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### 7.1 Problems solved in INCODIO® V1.2.1

#### 7.1.1 (R3382) Wrong values in generated MDF-Software Component

Wrong values have been read from the MDF file when generating a MDF-Software Component if the value size in the MDF was one bit.

### 7.2 New Functionality Added in INCODIO® V1.2.0

#### 7.2.1 AUTOSAR support

An AUTOSAR software component parser has been added to INCODIO® 1.2.0. This parser enables INCODIO® to import AUTOSAR software components together with their runtime data. INCODIO takes this information to build a runtime environment that can be integrated with INTERIO. Like legacy C code, the AUTOSAR software component can also be enriched with MCD data. Therefore, it is possible to measure or calibrate variables used by the software component.

#### 7.2.2 Enhanced MDF support

INCODIO® 1.2.0 can now generate stimuli code from measurement data files (MDF) for either on-board or off-board simulation. For the off-board simulation, INCODIO® generates a separate data file that can be loaded from the executable either at once (atomic loading) or partially (consecutive loading). The off-board simulation is recommended for large MDF files and can be used on simulation platforms supporting a file system.

### 7.3 Problems solved in INCODIO® V1.1.3

#### 7.3.1 (R 2725) Ignore processes without trigger information

When generating the INTECRIO interface file (SCOOP-IX), an entry for a process has been generated even if no trigger information has been assigned to that process. INCODIO now ignores function without trigger information during generation.

#### 7.3.2 (R 2780) Warning has been removed

A warning for invalid ASAM identifiers has been disabled. Since they will be renamed correctly, there is no need to show hundreds of warnings.

#### 7.3.3 (R 2807) Support for decimal numbers for timer period/offset.

INCODIO supports now decimal numbers for period and offset.

#### 7.3.4 (R2834) Performance improvement

The performance of the ASAM-MCD-2MC parser has been improved.

#### 7.3.5 (R2842) Show warning for wrong references in ASAM-MCD-2MC files

A warning will be shown during parsing if an AXIS\_PTS\_REF element points to an element not defined as an AXIS\_PTS.

#### 7.3.6 (R 2902) Fixed include paths in INTECRIO interface file (SCOOP-IX)

In some cases INCODIO generated incorrect include paths into the INTECRIO interface file (SCOOP-IX). This issue has been fixed.

#### 7.3.7 (R 2937) Option page for log file handling

A new option page for log file handling has been added to the application option dialog. This dialog enables the user to view, copy, and delete the INCODIO log files.

### **7.3.8 (R 2966) Dependencies in trigger information have been corrected**

There were wrong dependencies between the process trigger data “Priority” and “Period”. After modifying the priority, the period has been set to its default value (100ms).

### **7.3.9 (R 2967) Show correct display format for INCODIO generated SCOOP-IX file**

When opening an INCODIO generated SCOOP-IX file through the “Open Content” command in INTECRIO, the file content has been shown in XML format in the Internet Explorer. With this fix, all newly generated SCOOP-IX files will be shown correctly in the content view. Already existing SCOOP-IX files are not affected by the fix and must be regenerated.

## **7.4 Problems solved in INCODIO® V1.1.3**

### **7.4.1 (R 2566) Changed log-level from “Error” to “Warning”**

While parsing ASAM-MCD-2MC files, INCODIO® has shown an error message in the application log window if a referenced variable (axis point referenced by a characteristic) could not be found. This will be handled as a warning. However, no ASAM-MCD-2MC information will be set for the referencing characteristic.

### **7.4.2 (R 2567A) Improved ASAM-MCD-2MC parser performance**

The performance of the ASAM-MCD-2MC parser has been improved.

### **7.4.3 (R 2567B) Ignore deleted variables**

INCODIO® will now ignore deleted C variables when parsing ASAM-MCD-2MC files.

### **7.4.4 (R 2836) Made C code compilable on UNIX / LINUX environment.**

Some of the #include statements in the generated header files contained a backslash. Therefore, these file were not compilable on UNIX / LINUX environments. To make the code compilable on all platforms, a Slash “/” will be used instead of a backslash “\”.

### **7.4.5 (R 2597) New warning message for trigger type “interrupt”**

The trigger type “interrupt” for processes is not supported by INTECRIO. INCODIO® will show a warning in the application log window when generating the INTECRIO interface file (SCOOP-IX) if the “interrupt” trigger has been assigned to a process.

## **7.5 Problems solved in INCODIO® V1.1.2**

### **7.5.1 (R 2495) Removed initialization for generated variable definitions**

Scalar variables definitions will not be initialized in the INCODIO® generated definition file. This is required to avoid multiple definition errors when integrating software components in INTECRIO if they contain the same definitions.

### **7.5.2 (R 2496) Ignore incomplete characteristic**

INCODIO® ignores now incomplete characteristics. This is, if a characteristic references axis points that are neither declared nor defined in the C code.

### **7.5.3 (R 2502) Multiple definitions in generated L1 C code**

INCODIO generates now unique L1 C code for INTECRIO. This is required to avoid multiple definition errors when integrating software components in INTECRIO if they contain the same L1 Code definitions.

### **7.5.4 (R 2503) Wrong relative files paths in INTECRIO interface file**

INCODIO generated wrong path information into the INTECRIO interface file (SCOOP-IX). Thus INTECRIO could not get access to some files.

## 7.6 New Functionality Added in INCODIO® V1.1.1

### 7.6.1 Fix Axis Support

INCODIO® can now read fix axis information from the characteristics axis description. This information will also be written into the standard ASAM-MCD-2MC file when generating the software component. Note that characteristics containing fix axis information will not be written into the INTECRIO specific ASAM-MCD-2MC file, because fix axes are not supported by INTECRIO.

## 7.7 Problems solved in INCODIO® V1.1.1

This section describes known issues of previous versions solved in INCODIO® V1.1.1.

### 7.7.1 (R 2371) Code generation failed for fix axis

The code generation for INTECRIO failed for characteristics containing a fix axis. Because fix axes are not supported by INTECRIO, the generation of such characteristics has been disabled.

### 7.7.2 (R 2422) Parsing of measurement data files failed

The parsing of measurement data files failed if a verbal conversion table has been assigned to a data channel.

### 7.7.3 (R 2423a) Performance of the measurement data file parser

The performance of the measurement data file parser has been improved.

### 7.7.4 (R2423b) Identical identifiers for data channel within the same data group

Because the max length for the channel-identifier is limited to at most 32 characters, the recording tool needs to truncate longer names. This can lead to identical identifiers if the first 32 characters of two or more channels are equal. Since INCODIO® uses the channel-identifiers to create C structs, it generated invalid C code in such a case.

### 7.7.5 (R 2424) Measurement data file parser failed when using relative paths

If a measurement data file is located in the software components "Source" folder, INCODIO® uses a file path relative to the software component. The MDF parser failed when trying to open such a file.

### 7.7.6 (R 2425) Invalid display identifier in ASAM-MCD-2MC files

When generating an ASAM-MCD-2MC file, INCODIO® did not replace all invalid characters for display identifiers. Thus, the ASAM-MCD-2MC file could not be opened by the INTECRIO-EE. This issue has been fixed. All invalid characters will be replaced by an underscore "\_".

### 7.7.7 (R 2427) Maximal sample rate for MDF

INCODIO® determines the sample rate based on the difference between the time stamps for a data group. In some cases, the calculated sample rate might be too low for the integration tool (e.g. INTECRIO). INCODIO® will now set the sample rate to at least of 1000 milliseconds.

### 7.7.8 (R 2430) Typedef of type "bit"

A typedef of the type "bit" (e.g. "#typedef unsigned int bit;") in the user C code conflicted with INTECRIO specific C code. This problem has been solved.

### 7.7.9 (R 2431) C code generator failed when generating type definitions

The generation of C code containing type definitions for function pointer failed. This issue has been fixed.

### 7.7.10 (R 2433) Disabled warnings for missing variables

INCODIO® will not show anymore a warning for axis points, characteristics, or measurements found in an ASAM-MCD-2MC file that are neither defined nor declared in the C code. These warnings were of no value for the user.

### 7.7.11 (R 2455) Case insensitive file extensions

Files with the same file extension but with different case (e.g. \*.h, \*.H) have been treated differently in INCODIO®. This has been fixed.

## 7.8 New Functionality Added in INCODIO® V1.1.0

### 7.8.1 MDF Parser / MDF Stimuli Generator

The new INCODIO® MDF (Measure Data Format) Parser imports data from MDF (\*.dat or \*.mdf) files into an INCODIO® software component, including formulas, physical units, and process trigger information. When generating the component, INCODIO® creates all necessary C files, ASAM-MCD-2MC descriptions, and interfaces needed to import the software component into an integration tool, e.g. ETAS INTECRIO.

### 7.8.2 Improved ASAM-MCD-2MC Parser Performance

The performance of the ASAM-MCD-2MC parser has been drastically improved.

### 7.8.3 User Defined Code Page Support for ASAM-MCD-2MC Parser

With INCODIO V1.1.0, it is possible to select the code page that shall be used to parse an ASAM-MCD-2MC file containing multi byte characters within long identifiers or comments.

### 7.8.4 Ignore Constant Qualifier for Variables

To calibrate constant variables, the “const” qualifier can now be ignored by either replacing it with volatile or by commenting it out (`/*const*/`).

### 7.8.5 Optional Code Generation of Definitions for Extern Declarations

In INCODIO® V1.0.x, a variable definition has been created for all extern declarations. This is now optional.

### 7.8.6 Parsing of Static Variables on File Scope

Optionally, INCODIO® V1.1.0 can now parse static variables on file scope. To get access to these variables from within the integration platform (e.g. ETAS INTECRIO), the static keyword will be ignored during the build process. Note that this changes the behavior of the compiled code at runtime if the static keyword is used on function scope.

### 7.8.7 Support for Japanese Windows

Support for Japanese Windows XP has been added.

### 7.8.8 Sample Libraries have been added

The new sample libraries can be opened in the main menu under *File – Sample Libraries*.

## 7.9 Problems solved in INCODIO® V1.1.0

This section describes known issues of previous versions solved in INCODIO® V1.1.0.

### 7.9.1 (R 1759) Include of empty header files

The wrong line number (`#line` directive) in the preprocessed C file has been set if a completely empty (even without whitespace characters) header file had been included. Thus, the wrong line number has been shown in further parsing errors.

### 7.9.2 (R 2032) INTECRIO SCOOP-IX import failed on Japanese systems

Because of a byte-order mark (BOM) at the beginning of the INCODIO® generated SCOOP-IX file, INTECRIO failed during the import. Now, the BOM will be suppressed to allow INTECRIO to import the SCOOP-IX files on Japanese systems.

### **7.9.3 (R 2034) File paths were not relative in all cases**

If a file was located in a software components source directory, in some cases its path was not relative to the software component directory. This has been fixed.

### **7.9.4 (R2057) INCODIO® could not be started**

On few systems, INCODIO® failed to start due to a wrong initialization sequence. The internal initialization sequence is now stable on all systems.

### **7.9.5 (R2121) New directory structure in output folder**

Due to newly added files, the generated output folder has been restructured. This change does not affect already existing software components. However, to apply the new structure to existing software components, they have to be regenerated.

### **7.9.6 (R2122) Naming rules for libraries and software components**

Because library and software component names are used during code generation, their names must obey C identifier rules. Thus, only the characters "\_", "A-Z", "a-z", and "0-9" can be used. The names must not start with a numeric character ("0-9").

### **7.9.7 (R2124) INCODIO® consumed processor time in idle mode**

INCODIO® consumed processor time in idle mode after parsing or generating. This has been fixed.

### **7.9.8 (R2147) Reset to default grid colors**

Default grid colors will be resetted correctly after equal colors have been selected for even and odd rows.

### **7.9.9 (R2150) Stabilization of code generation commands**

Failures during the code generation do not lead to application crashes anymore.

### **7.9.10 (R2231) Opening of software components failed**

The opening of a software component failed after the user had tried to open it by a double click on the file.

### **7.9.11 (R2237) Parsing of function like macros failed**

Fix for function-like macro (FLM) recursion guard problems by replacing FLMs called inside another FLM's argument list immediately.

### **7.9.12 (R2244) Wrong output directory when generating INTECRIO interface description**

If the output directory for software components had been redirected in the application options, the INTECRIO Interface description file has been generated into the wrong location.

### **7.9.13 (R2245) Redirection of output directories**

To avoid the generation of multiple software components into the same location, if the output path had been redirected in the library properties or in the application options, INCODIO appends additional macros to the new output directory. These macros will be replaced by the library and the software component name during code generation respectively.

## **7.10 Problems solved in INCODIO® V1.0.2**

This section describes known issues of previous versions solved in INCODIO® V1.0.2.

### **7.10.1 (R 1675) Parser error when parsing struct or union with unknown member type**

If the type name of a struct or union was unknown (e.g. missing typedef), the application crashed during the parsing. Now, a syntax error will be shown in the message log window.

### 7.10.2 (R 1677) Parser failed when parsing anonymous bit fields.

The parser failed when parsing structs containing anonymous bit fields. This issue has been fixed.

### 7.10.3 (R 1678) Support for anonymous member of composite type

The parser did not support composite types containing anonymous members of composite type.

```
struct{  
    union{  
        char c;  
        int i;  
    };  
} s;
```

In the above sample, the struct member of type union is unnamed. This does not follow the C standard. However, since most compiler support anonymous composite members, this feature has been added to the INCODIO® parser as well.

### 7.10.4 (R 1679) Wrong default min value in ASAM-MCD-2MC file

A wrong default min value had been generated for the min value parameter in characteristics for variables of type FLOAT32\_IEEE or FLOAT64\_IEEE.

### 7.10.5 (R 1686 ) Whitespace in function-like macro definition

The parser failed during parsing when a whitespace occurred after the last argument name in a function-like macro definition.

### 7.10.6 (R 1692) Recursion in macro replacement

In some cases, the preprocessor run into recursion when replacing macros.

### 7.10.7 (R 1694) Empty composite types

The parser now supports empty composite types with no members. This does not follow the C99 standard, but most compilers support this.

### 7.10.8 (R 1733) Problems with empty header files

The preprocessor stopped after including a completely empty header file.

## 7.11 Problems Solved in INCODIO® V1.0.1

This section describes known issues of previous versions solved in INCODIO V1.0.1.

### 7.11.1 (R VSS) Missing files in installed compilers

Files with no file extensions, had been ignored by the installer.

### 7.11.2 (R 1615) Parser error when parsing enum initializers

C-Code containing enumerations with initializers could not be parsed. The parser threw an error and the parsing has been aborted.

### 7.11.3 (R 1616) Error when parsing to many initializers

The parsing failed if the C-Code contains data structures initialized with too many values. E.g. an array of size 3 has five init values ( int val [3] = { 1, 2, 3, 4, 5 }; ).

### 7.11.4 (R 1617) Fix for two directive parsing bugs

Fix for two directive-parsing bugs, which resulted in some macro definitions containing trailing newline chars. Thus, the wrong line number had been shown in some parser error messages.

### 7.11.5 ( R 1624 ) Parsing ASAM-MCD-2MC file failed for some characteristics

The parsing of an ASAM-MCD-2MC file failed if the file contains insufficient information to describe a lookup table. The according characteristic will be ignored now and the message log window shows an error. The parsing process will be continued.

#### **7.11.6 ( R 1627 ) Software component could not be saved**

A software component could not be saved after an error occurred while parsing an ASAM-MCD-2MC file (see R 1624).

#### **7.11.7 (R 1636) Update problems in variable view**

The variable view did not update struct member data if the members were hidden during the parsing process. The view had to be reopened to show the fresh data.

#### **7.11.8 (R 1637) Error when parsing computation methods**

When parsing ASAM-MCD-2MC computation methods with invalid display format, the parsing failed for this computation method. Now the parser is more tolerant and allows formats not exactly matching the specification. Invalid formats will be replaced by "%0.0" and an error message appears in the message log window. The parsing process will be continued.

### **7.12 Known Issues**

Currently, there are no open issues.

### **7.13 Migration from previous INCODIO® versions to INCODIO® V1.2.1**

#### **7.13.1 Migration of libraries and software components**

Due to an enhancement of the data structure, libraries and software components created with previous versions of INCODIO® are not compatible to INCODIO® V1.1.x. Therefore INCODIO® V1.1.x uses a converter to open files created with a previous version. For each converted file, a backup (.bak) containing the original data will be created in the same directory. The converted libraries and software components cannot be opened with INCODIO® V1.0.x.

## **8 Important Notes**

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### **8.1 INCODIO® log files**

The INCODIO® log files can be found at "C:\Documents and Settings\\Application Data\SYSTECS\INCODIO\1.2.1\Logfiles".

## **9 Support and Problem Reporting**

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You can find the latest news on INCODIO at <http://www.systemecs.com>. If you have any questions about this release, please contact the following address:

INCODIO® Hotline      Phone: +49 (711) 722312-70      Email: [support.incodio@systemecs.com](mailto:support.incodio@systemecs.com)