

LAB File for INCA
Description



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1 Introduction and Overview

1.1 Scope

LAB files contain flat lists of names of objects. These lists can be used to select objects, filter objects or transfer a given selection. The LAB file is a simple text file that can be either handled automatically or edited manually. The syntax uses new lines or semicolons as separators, which allows documents to be easily handled in MS Excel.

As the scope is measurement & calibration in the automotive area the LAB files specifies special object types that can be listed.

1.2 How this Manual is organized

This manual comprises the following chapters:

- Chapter 1, *Introduction and Overview*, on page 5 (this chapter)
This chapter gives a brief introduction into the ETAS ECU documentation interface for INCA.
- Chapter 2, *LAB File V1.0*, on page 6
LAB file V1.0.
- Chapter 3, *LAB File V1.1*, on page 7
LAB file V1.1.
- Chapter 4, *LAB File V1.2*, on page 10
LAB file V1.2.
- Chapter 5, *LAB File V1.3*, on page 14
LAB file V1.3.

1.3 Definitions and Abbreviations

ASAP2

ASAM MCD-2 MC Standard

BNF

Backus-Naur Format

LAB

Label File

BOM

Byte Order Mark, a marker for text files that indicates what kind of encoding is used inside the file

1.4 Conventions

The definition uses an extended Backus-Naur format.

Symbol	Meaning
"..."	Text in double hyphens has to appear as defined
<...>	Place Marker
[...]	Optional part (can occur only once)
{...}	Optional part (can occur multiple times)
	The vertical bar indicates an alternative

Table 1: BNF Terminology

2 LAB File V1.0

The LAB file is able to transfer two lists of objects: Measurements and Parameters. For each object a comment is possible.

2.1 BNF for LAB File V1.0

Non-terminals	Production rule	Explanation
<Section>	[<SectionName>] <EOL> { <ObjectName> [";" <Comment>] <EOL> } { <EOL> }	Sections for the different object types
<SectionName>	"RAMCELL" "LABEL"	RAMCELL describes measurements; LABEL describes parameters;
<ObjectName>	ASAP2 name of the listed object	
<Comment>	Comment string	does not contain ';' or ' ' ' '
<EOL>	Line break	

Table 2: Grammar for LAB File V1.0

2.2 Example for LAB File V1.0

```
[RAMCELL]
MyMeasurement01
MyMeasurement02; Comment

[LABEL]
MyParameter01
MyParameter02; Comment
```

Fig. 1: Example for LAB File V1.0

3 LAB File V1.1

The LAB file V1.1 is extended for two reasons:

- Add the measurement raster information
- Add function and group objects

The V1.1 definition is downward compatible. This ensures that tools that do not know the extensions are able to read the V1.1 files by skipping the additional information

Note

It is expected that tools that do not know the V1.1 extensions skip unknown entries.

The definition of V1.1 is done in a way that it could be easily opened and edited in MS Excel.

Note

When storing LAB files from MS Excel the semicolon must be used as separator. There may be additional semicolons (e.g. behind the section name). Tools must accept these additional semicolons to be compatible to MS Excel.

3.1 BNF for LAB File V1.1

Non-terminals	Production rule	Explanation
<Sections>	<SettingSection>{<ObjectSection> }	Setting Section is mandatory; Each type of Object Section has to occur only once; The Object Sections can occur in any order;
<ObjectSection>	["["<SectionName>"] "] <EOL> { <ObjectName> [";"<Raster>] [";"<Comment>] }] <EOL> } { <EOL> }	Sections for the different object types
<SectionName>	"RAMCELL" "LABEL" "FUNCTION" "GROUP"	RAMCELL describes measurements; LABEL describes parameters; FUNCTION describes software functions; GROUP describes groups;
<SettingSection>	"[SETTINGS]" <EOL> "Version;V1.1" <EOL> ["MultirasterSeparator;" <RasterSeparator> <EOL>]	For V1.1 the setting section is mandatory and uses a fixed structure
<ObjectName>	ASAP2 name of the listed object	Follows the ASAP2 'ident' rules

Non-terminals	Production rule	Explanation
<Comment>	Comment string	does not contain ';' or ' "'
<Raster>	<RasterName> {<RasterSeparator><RasterName>}	one or more raster
<RasterName>	Name string	Does not contain ';' or ' "' or RasterSeparator
<EOL>	Line break	
<RasterSeparator>	Character that separates two raster for multi-raster usage. Supported separators: " ", "&", "@"	

Table 3: Grammar for LAB File V1.1

Note

If the raster separator definition is missing in the setting section, "&" is used by default as the raster separator.

Note

ASAP2 allows all characters including blanks as raster names. Leading and trailing blanks are also supported. For a correct mapping all blanks have to be stated in the LAB file in the same way between ';' and <RasterSeparator> as in the ASAP2 file.

If the default <RasterSeparator> is used in the ASAP2 file the LAB file must use a different one.

3.2 Raster in LAB File V1.1

ECUs use rasters to run multiple software tasks, each with different priorities. Each software task writes values to measurements when running in the assigned raster. To get a consistent set of measure values the MC Tool reads the measure values at the end of each raster.

The different ECU interfaces (CAN, FlexRay, ETK ...) have different measurement capabilities. Normally not all rasters are available for all interfaces. This leads to the situation that the rasters are specific to the interface used. ASAP2 allows each interface to use different rasters with different names.

Note

The raster names given in the LAB file belong to one dedicated interface. It depends upon the ASAP2 interface description whether the raster names can be reused for different ECU interfaces.

3.3 File Encoding for LAB File V1.1

To be language independent the LAB files should use UTF-8 as encoding. If UTF-8 is used the LAB file has to support BOM information for UTF-8.

If the LAB File has no BOM the code page of the current operating system is used.

Note

Without UTF-8 (BOM) it is possible that strings are interpreted differently on different machines when the current encoding settings do not match.

3.4 Example for LAB File V1.1

```
[SETTINGS]
Version;V1.1
MultirasterSeparator;&

[RAMCELL]
MyMeasurement01
MyMeasurement02;;Comment
MyMeasurement03;10ms
MyMeasurement04;10ms;Comment
MyMeasurement05;10ms&100ms&sync;Comment Multi Raster

[LABEL]
MyParameter01
MyParameter02;;Comment

[FUNCTION]
MyFunction01
MyFunction02;10ms;Comment

[GROUP]
MyGroup01
MyGroup02;100ms;Comment
```

Fig. 2: Example for LAB File V1.1

4 LAB File V1.2

The LAB file V1.2 is extended for two reasons:

- Add the sort order for the usage as 'Key Variable List'
- Add the display info for the usage as 'Key Variable List'

Note

'Key Variable List' is a functionality in INCA that allows to predefine a prioritized list of measure signals and parameters that shall be recorded / displayed in the INCA experiment.

The V1.2 definition is downward compatible. This ensures that tools that do not know the extensions are able to read the V1.2 files by skipping the additional information

Note

It is expected that tools that do not know the V1.2 extensions skip unknown entries.

The definition of V1.2 is done in a way that it could be easily opened and edited in MS Excel.

Note

When storing LAB Files from MS Excel the semicolon must be used as separator. There may be additional semicolons (e.g. behind the section name). Tools must accept these additional semicolons to be compatible to MS Excel.

Non-terminals	Production rule	Explanation
<Sections>	<SettingSection>{<ObjectSection> }	Setting Section is mandatory; Each type of Object Section has to occur only once; The Object Sections can occur in any order;
<ObjectSection>	["["<SectionName>""] <EOL> { <ObjectName> [";" [<Raster>] [";" [<Display>] [";" [<Order>] [";" [<Comment>]]]]] <EOL> } { <EOL> }	Sections for the different object types
<SectionName>	"RAMCELL" "LABEL" "FUNCTION" "GROUP"	RAMCELL describes measurements; LABEL describes parameters; FUNCTION describes software functions; GROUP describes groups;
<SettingSection>	"[SETTINGS]" <EOL> "Version;V1.2" <EOL> ["MultirasterSeparator;" <RasterSeparator> <EOL>]	For V1.2 the setting section is mandatory and uses a fixed structure
<ObjectName>	ASAP2 name of the listed object	Follows the ASAP2 'ident' rules
<Comment>	Comment string	does not contain ';' or ' "'
<Raster>	<RasterName> {<RasterSeparator><RasterName>}	one or more raster
<RasterName>	Name string	Does not contain ';' or ' "' or RasterSeparator

Non-terminals	Production rule	Explanation
<Display>	"Display" "DisplayOnly" "RecorderOnly" "DoNotUse"	Display - Recording and display DisplayOnly - No recording, only display RecorderOnly - Only recording, no display DoNotUse – No recording, no display, only in the Key Variable List
<Order>	Positive number	Number that indicates a sort order. The lowest number has the highest priority
<EOL>	Line break	
<RasterSeparator>	Character that separates two raster for multi-raster usage. Supported separators: " ", "&", "@"	

Table 4: Grammar for LAB File V1.2

Note

If the raster separator definition is missing in the setting section, "&" is used by default as the raster separator.

Note

ASAP2 allows all characters including blanks as raster names. Leading and trailing blanks are also supported. For a correct mapping all blanks have to be stated in the LAB file in the same way between ';' and <RasterSeparator> as in the ASAP2 file.

If the default <RasterSeparator> is used in the ASAP2 File the LAB file must use a different one.

4.2 Raster in LAB File V1.2

See definition for V1.1. The V1.2 re-uses the same definition.

4.3 File Encoding for LAB File V1.2

See definition for V1.1. The V1.2 re-uses the same definition.

4.4 Display Information for LAB File V1.2

The display information describes whether the object shall be displayed, recorded or just be part of the LAB file.

4.5 Order Information for LAB File V1.2

The order information describes the priority of the object. Tools shall respect the order as a sequence to use the objects. Each order number must occur only once to ensure a unique

interpretation of the priority. The lowest order number has the highest priority. The order is used independent of the object type (RAMCELL, LABEL, FUNCTION, GROUP).

When a group or function owns multiple signals, labels, sub-groups or sub-functions these objects have by default the same order as their parent object.

Note

A signal can be stated as own object and as part of a function/group. The lower order number (object itself or function/group) defines its priority.

4.6 Example for LAB File V1.2

```
[SETTINGS]
Version;V1.2
MultirasterSeparator;&

[RAMCELL]
MyMeasurement01
MyMeasurement02;;;Comment
MyMeasurement03;10ms
MyMeasurement04;10ms;;;Comment
MyMeasurement05;10ms&100ms&sync;;;Comment Multi Raster
MyMeasurement06;10ms;RecordOnly;2
MyMeasurement07;10ms;RecordOnly;3;Comment

[LABEL]
MyParameter01
MyParameter02;;;Comment

[FUNCTION]
MyFunction01
MyFunction02;10ms;;;Comment
MyFunction03;10ms;Display;1;Comment

[GROUP]
MyGroup01
MyGroup02;100ms;;;Comment
MyGroup03;10ms;RecordOnly;4;Comment
```

Fig. 3: Example for LAB File V1.2

5 LAB File V1.3

The LAB file V1.3 is extended for following reason:

- Add the device information to support multiple devices with the same label names

Note

'device' is in this case a data source (ECU, Monitoring device, Measurement device ...) that allows to select objects by name. With the device information objects with the same name can be differentiated.

The V1.3 definition is downward compatible. This ensures that tools that do not know the extensions are able to read the V1.3 files by skipping the additional information

Note

It is expected that tools that do not know the V1.3 extensions skip unknown entries.

The definition of V1.3 is done in a way that it could be easily opened and edited in MS Excel.

Note

When storing LAB Files from MS Excel the semicolon must be used as separator. There may be additional semicolons (e.g. behind the section name). Tools must accept these additional semicolons to be compatible to MS Excel.

Non-terminals	Production rule	Explanation
<Sections>	<SettingSection>{<ObjectSection> }	Setting Section is mandatory; Each type of Object Section has to occur only once; The Object Sections can occur in any order;
<ObjectSection>	["["<SectionName>"] "] <EOL> { <ObjectName> [";" [<Raster>] [";" [<Display>] [";" [<Order>] [";" [<Device>] [";" [<Comment>]]]]]] <EOL> } { <EOL> }	Sections for the different object types
<SectionName>	"RAMCELL" "LABEL" "FUNCTION" "GROUP"	RAMCELL describes measurements; LABEL describes parameters; FUNCTION describes software functions; GROUP describes groups;
<SettingSection>	"[SETTINGS]" <EOL> "Version;V1.2" <EOL> ["MultirasterSeparator;" <RasterSeparator> <EOL>]	For V1.2 the setting section is mandatory and uses a fixed structure
<ObjectName>	ASAP2 / Monitoring name of the listed object	Follows the ASAP2 'ident' rules
<Comment>	Comment string	does not contain ';' or ' "'
<Raster>	<RasterName> {<RasterSeparator><RasterName>}	one or more raster
<RasterName>	Name string	Does not contain ';' or ' "' or RasterSeparator

Non-terminals	Production rule	Explanation
<Display>	"Display" "DisplayOnly" "RecorderOnly" "DoNotUse"	Display - Recording and display DisplayOnly - No recording, only display RecorderOnly - Only recording, no display DoNotUse - No recording, no display, only in the Key Variable List
<Order>	Positive number	Number that indicates a sort order. The lowest number has the highest priority
<Device>	Name string	Does not contain ';' or ' ' or RasterSeparator
<EOL>	Line break	
<RasterSeparator>	Character that separates two raster for multi-raster usage. Supported separators: " ", "&", "@"	

Table 5: Grammar for LAB File V1.3

Note

If the raster separator definition is missing in the setting section, "&" is used by default as the raster separator.

Note

ASAP2 allows all characters including blanks as raster names. Leading and trailing blanks are also supported. For a correct mapping all blanks have to be stated in the LAB file in the same way between ';' and <RasterSeparator> as in the ASAP2 file.

If the default <RasterSeparator> is used in the ASAP2 File the LAB file must use a different one.

5.2 Raster in LAB File V1.3

See definition for V1.1. The V1.3 re-uses the same definition.

5.3 File Encoding for LAB File V1.3

See definition for V1.1. The V1.3 re-uses the same definition.

5.4 Display Information for LAB File V1.3

See definition for V1.2. The V1.3 re-uses the same definition.

5.5 Order Information for LAB File V1.3

See definition for V1.2. The V1.3 re-uses the same definition.

5.6 Device Information for LAB File V1.3

The device information describes the data source the <ObjectName> is related to.

5.7 Example for LAB File V1.3

```
[SETTINGS]
Version;V1.3
MultirasterSeparator;&

[RAMCELL]
MyMeasurement01
MyMeasurement02;;;Device1;Comment
MyMeasurement02;;;Device2;Comment
MyMeasurement03;10ms
MyMeasurement04;10ms;;;Comment
MyMeasurement05;10ms&100ms&sync;;;Comment Multi Raster
MyMeasurement06;10ms;RecordOnly;2
MyMeasurement07;10ms;RecordOnly;3;Comment

[LABEL]
MyParameter01
MyParameter02;;;Comment

[FUNCTION]
MyFunction01
MyFunction02;10ms;;;Device1;Comment
MyFunction03;10ms;Display;1;Comment

[GROUP]
MyGroup01
MyGroup02;100ms;;;Comment
MyGroup03;10ms;RecordOnly;4;Comment
```

Fig. 4: Example for LAB File V1.3