

INTECRIO V5.0.2

What's new

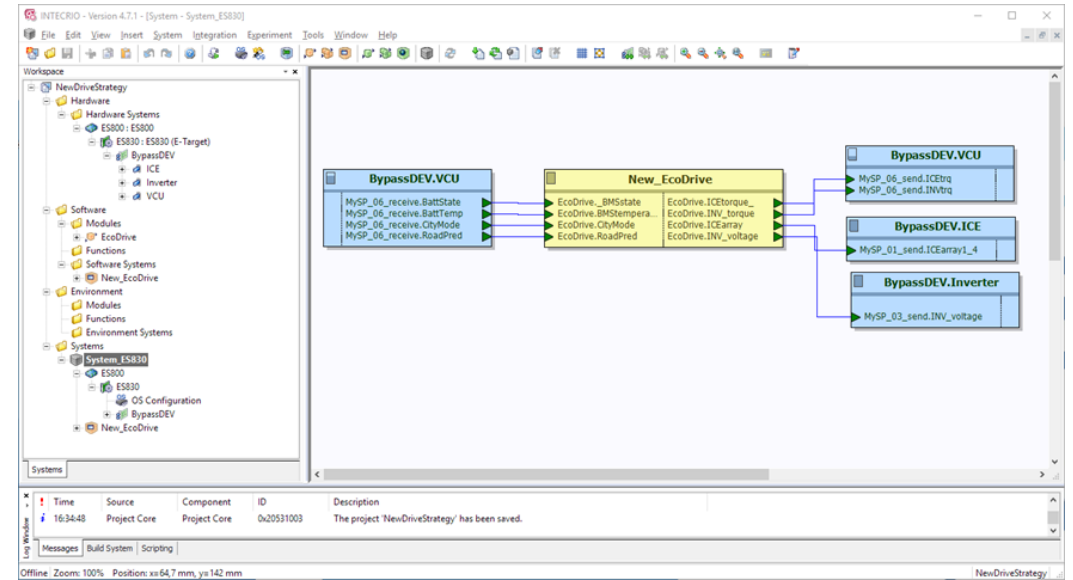


DRIVING EMBEDDED EXCELLENCE

What's new INTECRIO V5.0.2

Content

1. Overview
2. CDFX file generation
3. ARXML Importer for CAN & FlexRay
4. Support of Simulink R2021a/b
5. A2L ECU_INTERNALS checking
6. Support of TAB_INTP CompuMethod



What's new INTECRIO V5.0.2

Overview

New features in this version:

- CDFX file generation to enable Offline Calibration with INCA-EIP
- ARXML Importer for CAN & FlexRay
- Support of Simulink R2021a/b
- Check on A2L import if A2L file was prepared with EHOOKS
- Support of TAB_INTP CompuMethod for A2L files



What's new INTECRIO V5.0.2

CDFX file generation 1/3

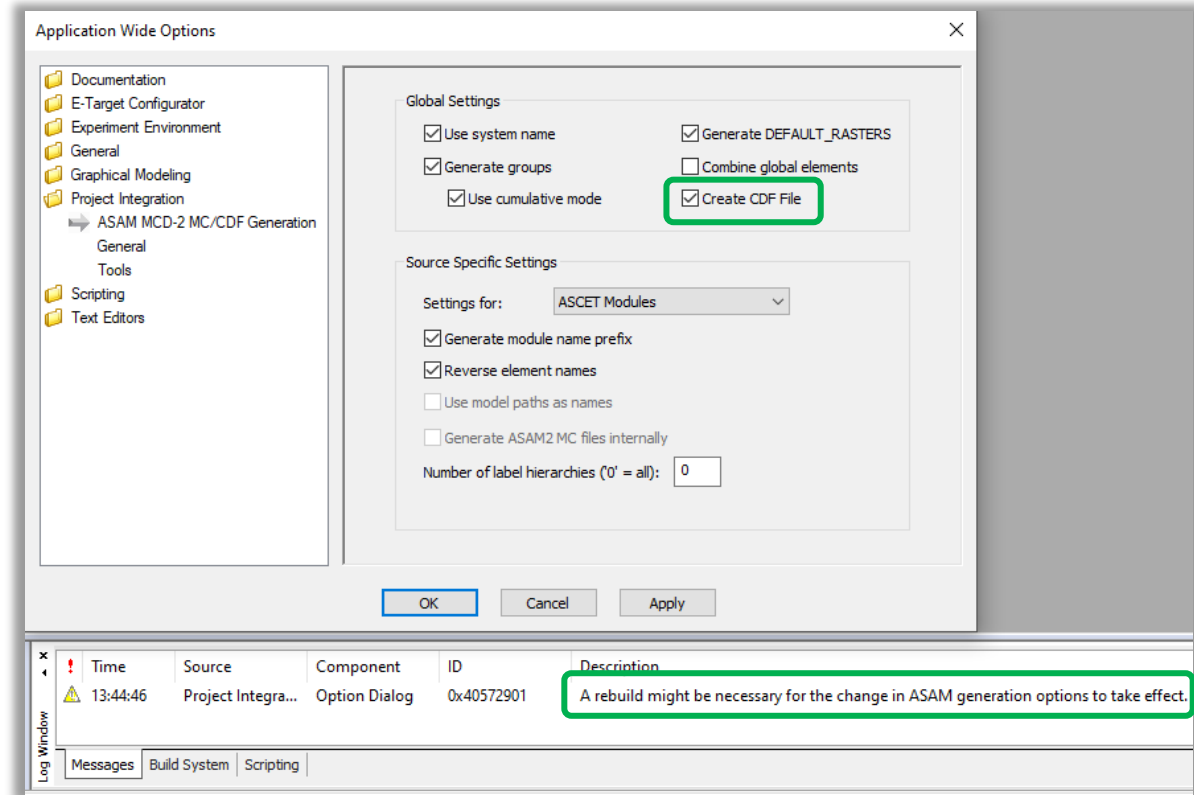
In the “Application Wide Options” you can enable “Create CDF File” in the “ASAM MCD-2 MC/CDF Generation” settings.

If this option is enabled a CDFX File is created by system build in addition to the A2L and COD file in the results folder.

Default setting is disabled.

The CDFX file contains the initial values of variables and characteristics of your INTECRIO system.

It can be used to create an initial data set in INCA-EIP when project is imported in INCA-EIP.



What's new INTECRIO V5.0.2

CDFX file generation 2/3

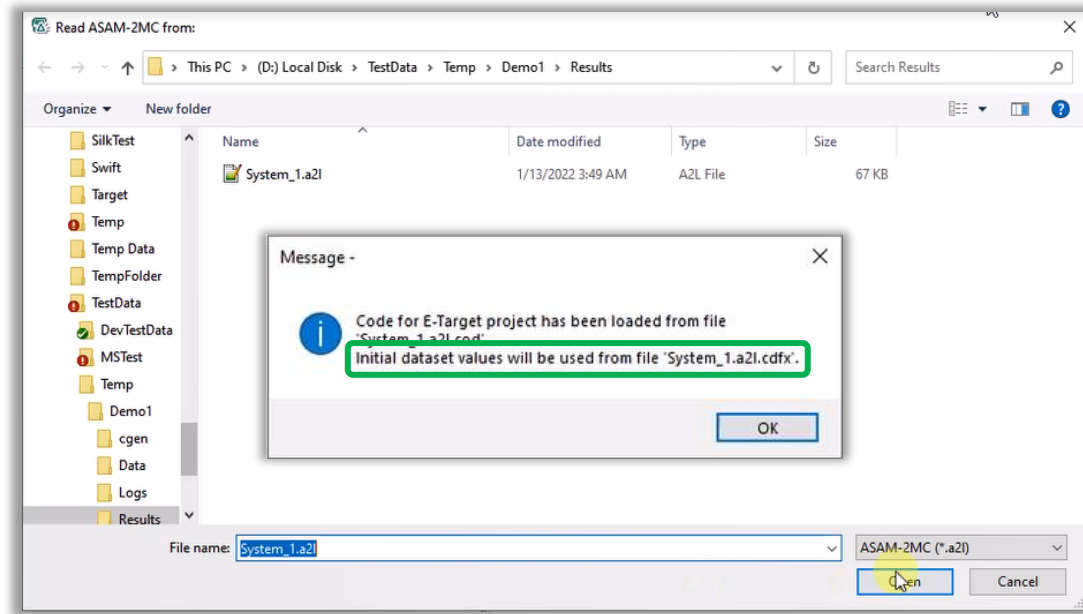
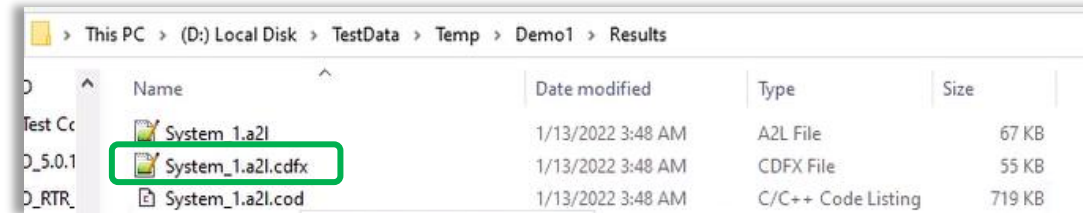
The created CDFX File has the same base name as the COD and the A2L file.

If a CDFX file with the same name is available, it is automatically imported in INCA-EIP together with the generated A2L and COD file. An initial data set is created and can be used for calibration directly after import.

When using a CDFX file it is not needed to connect a Simulation-Controller (ES830 or ES910) to create an initial data set in INCA.

See INCA-EIP manual for further information.

The CDFX Format is standardized by ASAM CDF.



What's new INTECRIO V5.0.2

CDFX file generation 3/3

Restrictions for CDFX file generation:

- Initial values from ASCET can only be processed correctly, if they are defined in the physical domain.
- Adaptive Characteristics do not support initial values and thus they are not created in the CDFX file.
This is particularly relevant for INTECRIO hardware send signals, which are configured as adaptive characteristics in order to allow calibration in case they are not connected to the model. Also for these, no value will be created in the CDFX file.
- When using ASCET models, at least SCOOP-IX generation version 1.5 needs to be used as a prerequisite for CDFX file generation. ASCET code generation needs to be configured accordingly.
- In Simulink models only column-major mode is supported for 2D lookup tables and parameters.

Hint: If an E-Target hardware (ES910 or ES830) is connected, the initial values are uploaded from the connected E-Target hardware. The E-Target hardware values are always the master and the imported CDFX values will be overwritten. However, before overwriting the datasets, the Memory Page Manager displays a message that the datasets differ. You can change the Action from Upload to Download to avoid overwriting.

For further information please check INCA-EIP manual.

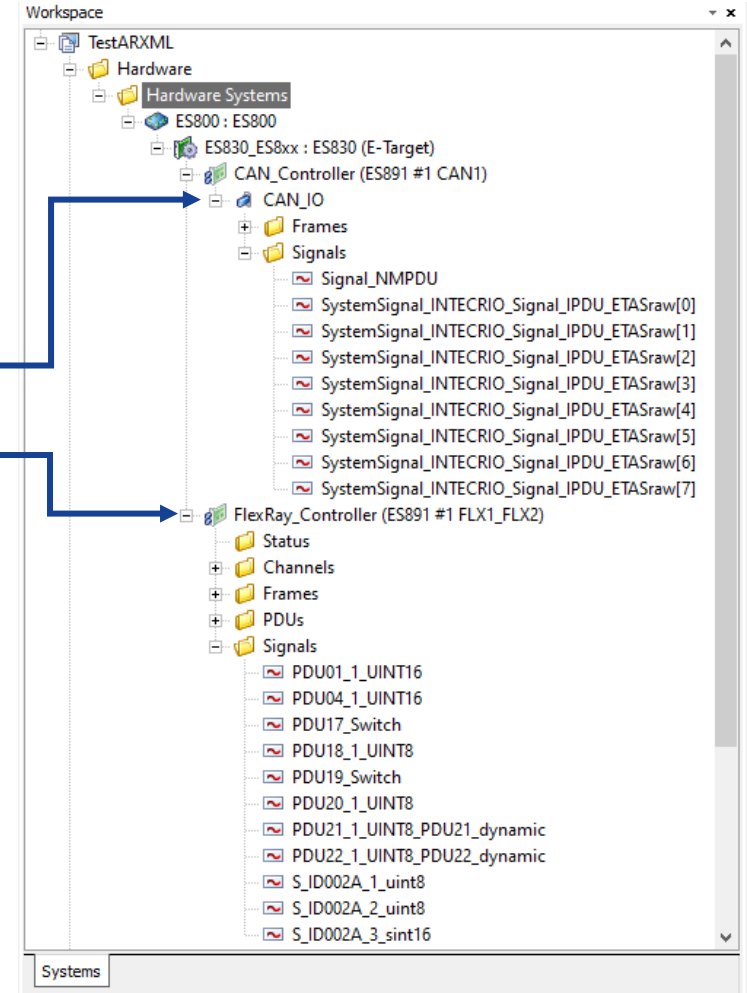
What's new INTECRIO V5.0.2

ARXML Importer for CAN and FlexRay 1/10

INTECRIO now supports the import of CAN and FlexRay configurations from AUTOSAR ARXML files.

ARXML files can be selected in the file selection dialog in addition to CANdb and FIBEX XML files.

The Import process of ARXML files is identical to the import of CAN/FlexRay configurations with CANdb/FIBEX files.



What's new INTECRIO V5.0.2

ARXML Importer for CAN and FlexRay 2/10

The import of ARXML files is identically to the import of CAN/FlexRay configurations with CANdb/FIBEX files.

1

Workspace

- TestARXML
 - Hardware
 - Hardware Systems
 - ES800 : ES800
 - ES830_ES8xx : ES830 (E-Target)
 - CAN_Controller (ES892 #1 CAN1)
 - CAN_IO
- Software
 - Modules
 - Functions
 - Software Systems
 - Modules
 - Functions
 - Environment Systems
 - Systems

Open ...
Insert ...
Import CAN Configuration ...
Export CANdb ...
Import...
Export...
Copy
Paste

2

Import CAN Configuration File

File Selection
Please select the CAN Configuration file to import.

Internal Test Files\MyTestFile.xml

Help Next > Cancel

3

Import CAN Configuration File

Node Selection
Please select the bus node from the CAN Configuration file to import.

ECU1:Controller_ECU1_e1b311354168f2d9
ECU2:Controller_ECU2_74cf92f2b2e3a4db

Help

4

Import CAN Configuration File

Import Options
Please specify the options for the import.

Frame Identification:
 Frame Name
 Frame ID

Invert Directions (Import Counterpart)
 Discard Existing CAN-IO-Configuration
 Delete Unused Signals after Import

Help

5

Import CAN Configuration File

Frame Importer Details
Please select the Frames to import.

< Filter > (5 / 5)

Select / Deselect All Select / Deselect All

Frame Name	CAN Configuration Frame ID				Frame ID in Model
CanFrame_INTECRIO_Signal_sint64_ident	0x2B - std.	↔	<input checked="" type="checkbox"/>		
CanFrame_INTECRIO_Signal_sint64_Linear...	0x2D - std.	↔	<input checked="" type="checkbox"/>		
CanFrame_INTECRIO_Signal_uint64_ident	0x2A - std.	↔	<input checked="" type="checkbox"/>		
CanFrame_INTECRIO_Signal_uint64_ident_2...	0x2E - std.	↔	<input checked="" type="checkbox"/>		
CanFrame_INTECRIO_Signal_uint64_Linear	0x2C - std.	↔	<input checked="" type="checkbox"/>		

Help < Back Finish Cancel

What's new INTECRIO V5.0.2

ARXML Importer for CAN and FlexRay 3/10

INTECRIO is a Configuration and Integration Tool for Rapid Prototyping. Focus is on flexibility and on fast modifying and testing algorithms. The focus of AUTOSAR and ARXML files is very different.

INTECRIO is not based on the AUTOSAR Architecture and therefore cannot support all mechanisms and features of AUTOSAR ARXML files.

AUTOSAR ARXML files are much more than a simple replacement for CANdb and FIBEX files!
They often contain specific AUTOSAR functionalities that are not possible with CANdb and FIBEX files.

The following pages list the most important topics to be considered when using ARXML files for FlexRay and CAN configuration in INTECRIO.

What's new INTECRIO V5.0.2

ARXML Importer for CAN and FlexRay 4/10

General topics:

- **All frames defined in the ARXML file will be imported in INTECRIO.** No Frames are skipped, but some Frame types, PDU types and Signal types will be handled in a special way.
- PDU and Signal Update Bit for CAN are not supported
- Signal Update Bit for FlexRay is not supported
- AUTOSAR PDU-Triggering/Signal-Triggering is not supported.
Timing specification for sending and receiving from ARXML file are ignored (for example: every 10 ms, only if value is changed, only if signal has dedicated value, ...).
INTECRIO OS Auto mapping feature maps all CAN signal groups to the fastest timer task which is usually 10ms task.
- Imported ARXML bus configurations are sometimes quite large and can exceed the maximum number of frames and signals supported by the RP system (INTECRIO/ES910/ES830). A build of the system is not possible then.
The number of frames of affected bus nodes need to be reduced by disabling (CAN) or deleting (FlexRay) frames or slots.

What's new INTECRIO V5.0.2

ARXML Importer for CAN and FlexRay 5/10

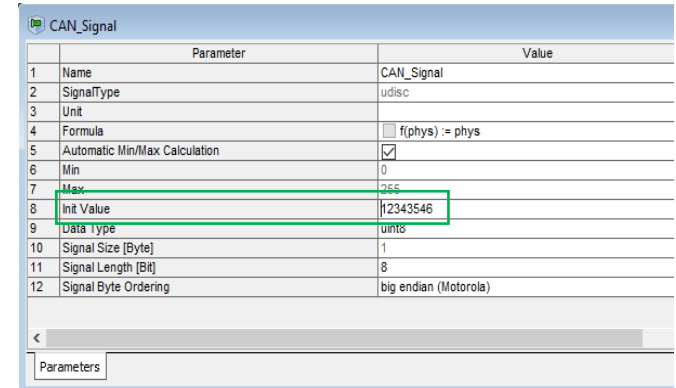
Further restrictions:

Initial Values:

For the definition of initial values two options are possible in ARXML:

1. **Default value of CompuMethods** can be imported by INTECRIO.
2. **INIT-VALUE assigned to ISignals** cannot be imported in INTECRIO, initial value is set to 0 (zero) or the smallest allowed number.

Workaround: Init values can manually be entered in INTECRIO.



	Parameter	Value
1	Name	CAN_Signal
2	SignalType	udisc
3	Unit	
4	Formula	<input type="checkbox"/> f(phys) := phys
5	Automatic Min/Max Calculation	<input checked="" type="checkbox"/>
6	Min	0
7	Max	255
8	Init Value	12343546
9	Data Type	uint8
10	Signal Size [Byte]	1
11	Signal Length [Bit]	8
12	Signal Byte Ordering	big endian (Motorola)

Extended CAN(FD) Controller Settings:

– Currently only the baud rate for arbitration and data phase is imported

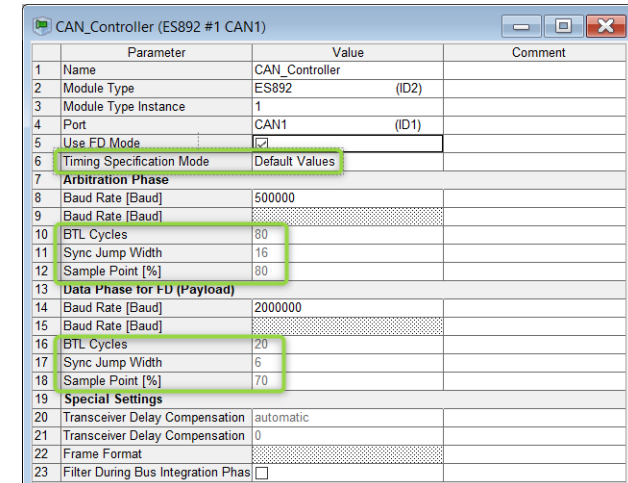
– CAN Bus parameter definitions of type

CAN-CONTROLLER-CONFIGURATION

CAN-CONTROLLER-FD-ATTRIBUTES

CAN-CONTROLLER-CONFIGURATION-REQUIREMENTS and

CAN-CONTROLLER-FD-REQUIREMENTS are not supported.



	Parameter	Value	Comment
1	Name	CAN_Controller	
2	Module Type	ES892 (ID2)	
3	Module Type Instance	1	
4	Port	CAN1 (ID1)	
5	Use FD Mode	<input checked="" type="checkbox"/>	
6	Timing Specification Mode	Default Values	
7	Arbitration Phase		
8	Baud Rate [Baud]	500000	
9	Baud Rate [Baud]		
10	BTL Cycles	80	
11	Sync Jump Width	16	
12	Sample Point [%]	80	
13	Data Phase for FD (Payload)		
14	Baud Rate [Baud]	2000000	
15	Baud Rate [Baud]		
16	BTL Cycles	20	
17	Sync Jump Width	6	
18	Sample Point [%]	70	
19	Special Settings		
20	Transceiver Delay Compensation	automatic	
21	Transceiver Delay Compensation	0	
22	Frame Format		
23	Filter During Bus Integration Phas	<input type="checkbox"/>	

What's new INTECRIO V5.0.2

ARXML Importer for CAN and FlexRay 6/10

The following ARXML **PDU types** are not fully supported and treated in a special way:

ContainerPDUs cannot be handled automatically by INTECRIO. They are imported as disabled, the PDU data is imported as a sequence of one byte raw signals (unsigned bytes with IDENTICAL CompuMethod), „_ETASraw[i]“ is added to the signal names.

SecuredPDUs are imported in INTECRIO. In general the payload is not encrypted and the imported signals can be directly used in the model. The checking and calculation of Checksums and Alive Counters is not supported. The appropriate signals needs to be handled manually in model.

Special purpose PDUs:

These are for example: **Dcm PDUs**(Diagnostic Communication Manager), **J1939 Dcm**, **Multiplexed PDUs**, **N PDUs** (used internal for transport layer), **Nm PDUs** (Network Management), **UserDefined PDUs** and **XCP PDUs**
They have no signals defined in the ARXML file and are imported as disabled with one byte raw signals.

What's new INTECRIO V5.0.2

ARXML Importer for CAN and FlexRay 7/10

Several PDU types are automatically imported as disabled Frames/PDUs in INTECRIO. See table below. These are mainly PDUs without defined signals or special purpose PDUs that are not fully supported by INTECRIO.

PDU type	CAN import	FLEXRAY import
ISignalPDU	enabled	enabled
DCMPDU	disabled	disabled
ContainerPDU	disabled	disabled
Secured PDU	enabled if payload is defined, otherwise disabled	enabled if payload is defined, otherwise disabled
UserIPDU	disabled	disabled
UserPDU	disabled	disabled
MultiplexPDU	disabled	disabled
NMPDU	disabled	disabled
NPDU	disabled	disabled
GeneralIPDU	disabled	disabled
GeneralPDU	disabled	disabled
XcpPDU	disabled	disabled
J1939PDU	disabled	skipped

If these disabled PDUs/Frames are to be used for Rapid Prototyping, they can be enabled, but the user must take special care in the model to handle these PDUs/Frames/Signals correctly.

What's new INTECRIO V5.0.2

ARXML Importer for CAN and FlexRay 8/10

The following ARXML **Signal types** are treated in a special way by INTECRIO.

Arrays are split into sequence of single element signals, „[i]“ is added to the signal names

Strings (in all variations) are treated like Arrays, element signal type is set to uint8 or uint16.

Model can access Strings character wise.

Alive Counter and Checksum signals are imported in INTECRIO, but the calculation/checking of Alive Counter und Checksum signals are not supported for CAN. These have to be handled by the model.

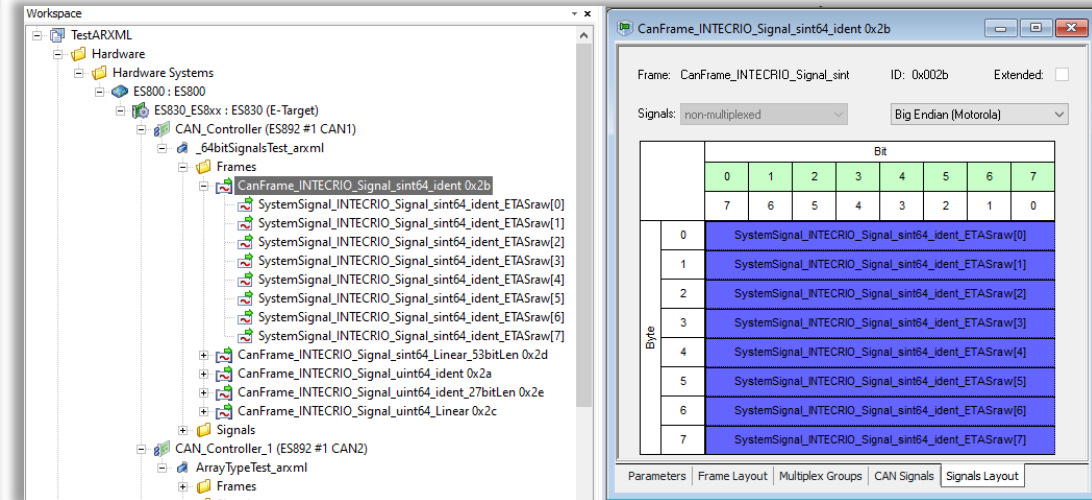
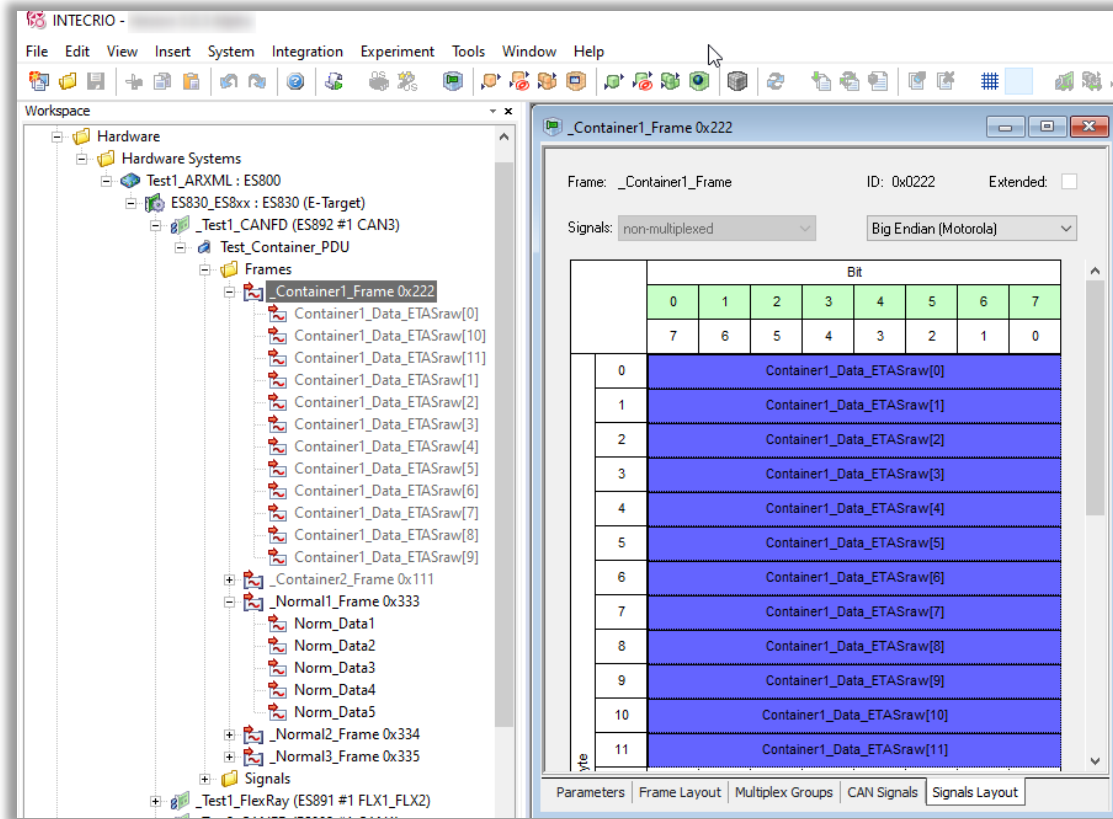
64 bit integer signals are split into a sequence of one byte signals (unsigned bytes with IDENTICAL CompuMethod), „[i]“ is added to signal name.

Record Signal type is a complex data type. All elements of a Record are imported as scalar signals.

To all **signals that can not be represented correctly** in INTECRIO (e.g. several ranges with formulas, unknown CompuMethod, unknown data type,) „_ETASraw“ is added to the signal name and IDENTICAL CompuMethod is used. In this case a log message indicates that the user must take special care in the model to handle these signals correctly.

What's new INTECRIO V5.0.2

ARXML Importer for CAN and FlexRay 9/10



Example: Signal of Type 64bit Integer, split in 8 bytes

Example: ContainerPDU, disabled (grey)

What's new INTECRIO V5.0.2

ARXML Importer for CAN and FlexRay 10/10

Not all ARXML **CompuMethods** can be supported by INTECRIO.

Supported: IDENTITY, LINEAR, TEXTTABLE, BITFIELD_TEXTTABLE

Partly supported: SCALE_LINEAR, SCALE_LINEAR_AND_TEXTTABLE, RAT_FUNC, SCALE_RAT_FUNC and SCALE_RATIONAL_AND_TEXTTABLE

INTECRIO can support this **only if it can be reduced to one simple linear formula.**

If additional to linear formula further TEXTTABLE entries are defined, then INTECRIO transforms these additional entries also along with the formula; the model code must be adapted if these values shall be used.

Not supported:

TAB_NOINTP, PHYS_TO_INTERNAL

For not supported CompuMethods the IDENTITY CompuMethod is used and the model is provided the raw signal value as long as the data type and data length can be evaluated. Log messages are displayed.

For **signals without CompuMethod** definition the IDENTITY CompuMethod is used and suffix “_ETASraw” is added to the signal name. Log messages are displayed.

What's new INTECRIO V5.0.2

Matlab®/Simulink® version support for R2021a/b

In total, INTECRIO V5.0.2 Beta supports the following Simulink versions:

- Simulink R2016a and R2016b
- Simulink R2017a and R2017b
- Simulink R2018a and R2018b
- Simulink R2019a and R2019b
- Simulink R2020a and R2020b
- Simulink R2021a and R2021b

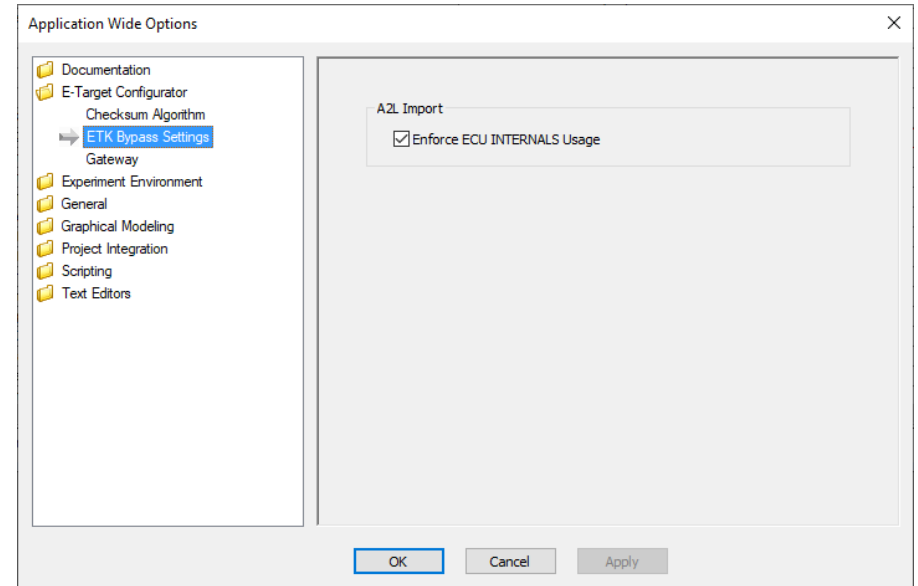
What's new INTECRIO V5.0.2

A2L “ECU_INTERNALS” checking

Some customers want to ensure that only EHOOKS prepared A2L files are used.

Therefore, the option “Enforce ECU INTERNALS Usage” was added to “ETK Bypass Settings” in the “Application Wide Options” dialog.

Default setting is “off”.



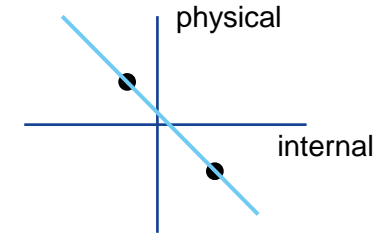
Message logs if option is enabled and no ECUINTERNALs section is contained in the A2L file

Time	Source	Component	ID	Description
11:51:26	ETC	Bypass Importer	0x20582104	Semantic check of 'C:\Us... The import at node 'Ethernet_Controller.X_FETK_Bypass' failed. The Application Option 'Enforce ECU INTERNALS Usage' is activated and the ASAM-MCD2 file contains no ECUINTERNALs IF_DATA section. Use a file with an ECUINTERNALs IF_DATA section or deactivate the option.
11:51:26	ETC	ETC ESETK	0xC0580DA9	The import at node 'Eth...
11:51:26	ETC	ETC GUI Action...	0xC0583B05	The A2L import failed.

What's new INTECRIO V5.0.2

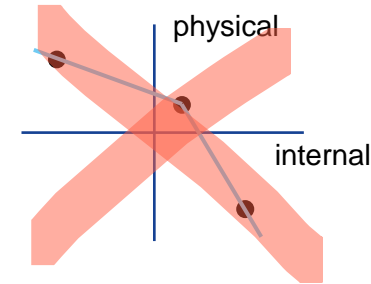
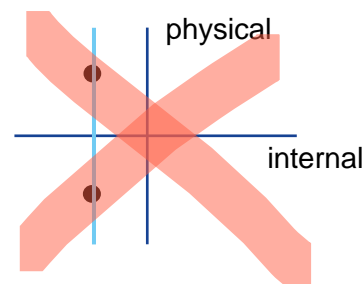
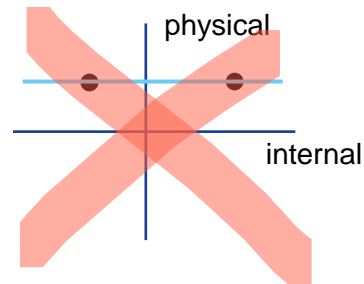
Support of TAB_INTP CompuMethod for A2L files

TAB_INTP CompuMethod: Table with interpolation between data points



TAB_INTP CompuMethod is now supported for A2L files with following **restrictions**:

- Only two points are supported
- The two points must not have the same physical or internal values



When the TAB_INTP definition is not supported by INTECRIO then the IDENTITY CompuMethod is used and a message is displayed in the log window.

What's new INTECRIO V5.0.2

Support of TAB_INTP CompuMethod for A2L files

For unsupported TAB_INTP definitions log messages with explanations are displayed.

The screenshot displays the INTECRIO V5.0.2 software interface. The top part shows a table of device definitions with columns for Device, Group, Direction, Name, Signal Type, Unit, and Formula. The bottom part shows a log window with error messages.

	Device	Group	Direction	Name	Signal Type	Unit	Formula
1	X_FETK_Byp	_6_25ms_2_r	receive	Msrmnt_Correct_0_5_x	cont		f(phys) := 0.5 * phys +0
2	X_FETK_Byp	_6_25ms_2_r	receive	Msrmnt_Correct_Backwards_InVal	udisc		f(phys) := phys
3	X_FETK_Byp	_6_25ms_2_r	receive	Msrmnt_Correct_Ident	udisc		f(phys) := phys
4	X_FETK_Byp	_6_25ms_2_r	receive	Msrmnt_Correct_Minus_X	cont		f(phys) := -1 * phys +0
5	X_FETK_Byp	_6_25ms_2_r	receive	Msrmnt_Correct_Offset_Not_Zero	cont		f(phys) := 0.00151064316777295 * phys +50.5007553215839
6	X_FETK_Byp	_6_25ms_2_r	receive	Msrmnt_Correct_Small_OutVal	cont		f(phys) := 9.31322574615479e-10 * phys +0
7	X_FETK_Byp	_6_25ms_2_r	receive	Msrmnt_Correct_wild	cont		f(phys) := 0.000244140625 * phys +0
8	X_FETK_Byp	_6_25ms_2_r	receive	Msrmnt_Wrong_Less_InVal	udisc		f(phys) := phys
9	X_FETK_Byp	_6_25ms_2_r	receive	Msrmnt_Wrong_Missing_Compu_Tab	udisc		f(phys) := phys
10	X_FETK_Byp	_6_25ms_2_r	receive	Msrmnt_Wrong_Same_InVal	udisc		f(phys) := phys
11	X_FETK_Byp	_6_25ms_2_r	receive	Msrmnt_Wrong_Same_OutVal	udisc		f(phys) := phys
12	X_FETK_Byp	_6_25ms_2_r	receive	Msrmnt_Wrong_Too_Many_InVal	udisc		f(phys) := phys

The log window shows the following messages:

- 08:28:20 ETC A2L Importer 0x07E030D COMPU_TAB 'CT_WRONG_SAME_INVAL' for COMPU_METHOD 'CM_WRONG_SAME_INVAL' defines the same number twice. This is invalid. Objects depending on it
- 08:28:20 ETC A2L Importer 0x07E030B COMPU_METHOD 'CM_WRONG_SAME_OUTVAL' cannot be reduced to coefficients of a linear function. Objects depending on it will use the identity formula.
- 08:28:20 ETC A2L Importer 0x07E030E Unsupported COMPU_TAB 'CT_WRONG_LESS_INVAL' for COMPU_METHOD 'CM_WRONG_LESS_INVAL'. Only COMPU_TABs that define 2 points are supported. Objec
- 08:28:20 ETC A2L Importer 0x07E030E Unsupported COMPU_TAB 'CT_WRONG_TOO_MANY_INVAL' for COMPU_METHOD 'CM_WRONG_TOO_MANY_INVAL'. Only COMPU_TABs that define 2 points are su
- 08:28:20 ETC A2L Importer 0x07E030C COMPU_TAB 'CT_WRONG_MISSING_COMPU_TAB' for COMPU_METHOD 'CM_WRONG_MISSING_COMPU_TAB' could not be found in input file. Objects dependin
- 08:28:20 ETC A2L Importer 0x407E0314 MEASUREMENT 'Msrmnt_Wrong_Same_InVal' uses the identity formula instead of COMPU_METHOD 'CM_WRONG_SAME_INVAL' because it is a non linear formula.
- 08:28:20 ETC A2L Importer 0x407E0314 MEASUREMENT 'Msrmnt_Wrong_Same_OutVal' uses the identity formula instead of COMPU_METHOD 'CM_WRONG_SAME_OUTVAL' because it is a non linear form
- 08:28:20 ETC A2L Importer 0x407E0314 MEASUREMENT 'Msrmnt_Wrong_Less_InVal' uses the identity formula instead of COMPU_METHOD 'CM_WRONG_LESS_INVAL' because it is a non linear formula.
- 08:28:20 ETC A2L Importer 0x407E0314 MEASUREMENT 'Msrmnt_Wrong_Too_Many_InVal' uses the identity formula instead of COMPU_METHOD 'CM_WRONG_TOO_MANY_INVAL' because it is a non linear formula.
- 08:28:20 ETC A2L Importer 0x407E0314 MEASUREMENT 'Msrmnt_Wrong_Too_Many_OutVal' uses the identity formula instead of COMPU_METHOD 'CM_WRONG_TOO_MANY_OUTVAL' because it is a non line
- 08:28:20 ETC A2L Importer 0x407E0314 MEASUREMENT 'Msrmnt_Wrong_Missing_Compu_Tab' uses the identity formula instead of COMPU_METHOD 'CM_WRONG_MISSING_COMPU_TAB' because it is a
- 08:28:20 ETC Bypass Importer 0x20582104 Semantic check of 'C:\Users\jsr5fe\Desktop\AZ\TAB_INTP_Testdata.a2l' successfully passed.
- 08:28:20 ETC Bypass Importer 0x20582105 ASAM-MCD2 file 'C:\Users\jsr5fe\Desktop\AZ\TAB_INTP_Testdata.a2l' imported successfully.

Thank you



DRIVING EMBEDDED EXCELLENCE