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Example 4:

Display the change of a value in an extra row:

1. *Create a Formula on the Parameter to observe:*
2. *You may enter the following Formula:*

```
// This creates the Local Variable OldVal, which is initialized to Zero on the First Call
OldVal:=GETVAR(OldVal,0);
// Get the New Value
NewVal:=ValueDbl;
IF(OldVal == NewVal,
// Do not modify the output on no change
RETURN();
);
// Display the Change in Extension Row 1
IF(NewVal<OldVal,
EXT1:="It Goes Down"
,
EXT1:="It Goes Up"
);
// Store the value for the Next Cycle
OldVal:= NewVal;
```

The Value Assignment to the EXT1 Property causes the display of the extra Column:
You may add up to 4 Column with EXT1 to EXT4

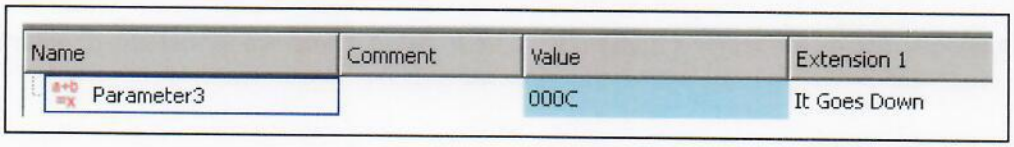


Figure 172: Using an Extension Column of the Assign

Note: for Change Functions it is helpful to use the Rate property on the "Input Properties" page, so there is a defined duration which may be used to calculate a change. You may use "Rate" within the formula to derive the value.

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Example 5:

Changing Display Colours:

To set the Foreground and Background Colours which should display the value, you may use the pre-defined variables BGC for the Background Colour, and FGC for the Foreground (Text) Colour.

All the colour names defined at http://www.w3.org/TR/SVG/types.html#ColorKeywords can be used.

Alternatively you may enter "browse colors" in the script console, to get a list of all predefined colour names. Furthermore you change also the colour of the extension rows with BGCx/FGCx for the EXTx properties.

e.g. the Formula ….

```
DISP:="This is Red on Blue";
BGC:="blue";
FGC:="red";
EXT1:="This is Green on Black";
BGC1:="black";
FGC1:="lightgreen";
```

displays the following:

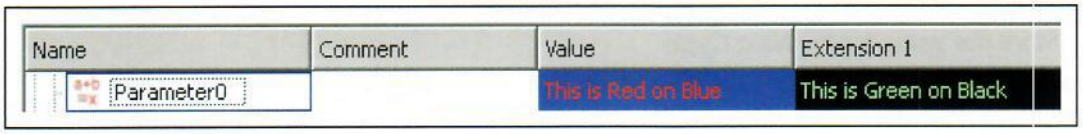


Figure 173: Changing Display Colours

Example 6:

Create a special display format for a parameter value to setup a time like format string, enter the Function:

```
// Get the Raw Value
RAW:=ValueRaw;
// Create a string which shows the High and Low Byte as Hex String
DISP:=STR((RAW>>8)&0xFF,H) + ":" + STR(RAW&0xFF,H)
```

A Raw Value of hex 1234 will be displayed as String "12:34"

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The following predefined Variables or Properties of the Assign Entry may be used within the Assign Calculation Formula. All assignment to other Variables is function internally.

Name	Read/Write	Purpose
ValueDbl	Read/Write (Write only for writable Parameters)	The Double (Floating Point Number) representation of the Assign Value. Modifying this value also affects Value and ValueStr
ValueStr	See: ValueDbl	The String representation of the Assign Value, as it is displayed
ValueRaw	See: ValueDbl	This is the Parameter Raw value from the Parameter Source. ValueRaw and ValueDbl is typically the same value, except for Parameters with the Scaled or Float Format. In this case ValueRaw displays the Value of the Parameter without Scale and Offset. ValueDbl displays ValueRaw*Scale + Offset
Value	See: ValueDbl	The Value of the Assign as Variant. Typically represents the Parameter Raw Value, except for Scaled Parameters, where it is the same like ValueDbl.

DISP	Read/Write	Any value assigned to the DISP Variable is used to Display instead of the real Assign Value. But this value is not used by an eventually setup Assign Signal option.
		DISP:="Hello World";// String
		DISP:=1; // Integer
		DISP:=1.234 // Double
		But:
		DISP:=0x123 will be displayed in decimal 291
		For e.g. Hex Display you have to use e.g.
		DISP:=STR(0x123,H)

P1 to P8	Readonly	Representing the Values connected in the Input Properties page. If no input is connected to the Value, it may deliver an undefined value.

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		These Variables can only represent Double Values.
V1 to V8	Readonly	Representing the Values connected in the Input Properties. If no input is connected to a Parameter, it may deliver an undefined value. These Variables can represent either String, Integer or Double Values, depending on the connected input.
Result	Read/Write	Is used to modify the value connected in the output properties. This Variable can only represent Double Values.

VR1 to VR8	Read/Write	Is used to modify the value connected in the output properties.
		These Values can represent String, Integer or Double Values depending on the Assignment within the function.
		VR1:="Hello World";// String
		VR1:=1; // Integer
		VR1:=1.234 // Double

Rate	Readonly	Returns the Value of the Calculation Rate, defined in the Input Properties Page (in ms)
EXT1 to EXT4	Read/Write	Can be used to add Extra Info Rows to the Assign Display. These Variables can represent any value. These Values can represent String, Integer or Double Values depending on the Assignment within the function. For the Display of EXT1 to EXT4 variables, the same conditions apply than for the DISP variable.
BGC[1..4]	Read/Write	Background Colour. Can only hold Strings representing a Colour Name Strings like specified above.
FGC[1..4]	Read/Write	See BGC
REF	Read	Variable Representing the Assign Entry itself. Can be used for the Object Related Functions

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		(GETPROP/SETPROP)
PARAM	Read	The Parameter Value on resource side (Parameter Ref)

DBSPARAM	Read	The related DBS Parameter from the Database
		e.g.
		// Get the Value String
		DISP:=ValueStr;
		// Read the Unit Property of the Database Parameter
		UNIT:=GETPROP(DBSPARAM,Unit);
		IF(STRLEN(UNIT) != 0,
		DISP:=DISP+" "+UNIT
		)

Table 6: Predefined Variables and Properties for the Assign Calculation Formula

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9.4 Offline Parameter Replay

The PBA.pro supports offline parameter replay of a recording file. Currently only assign entries related on database parameter definitions are supported.

The parameter replay is accessible via the offline replay button  of the DBS main window toolbar.

The Parameter Replay supports the following features:

- Replay of data to the Assign
- Step forward/ backward through the replay
- Synchronised recording file views to the current replay position
- Search for dedicated values
- Create bookmarks in the related recording files either manually or on a condition (Assign Signal)

Depending on the Parameter Types added to the assign, a different recording file selection is shown.

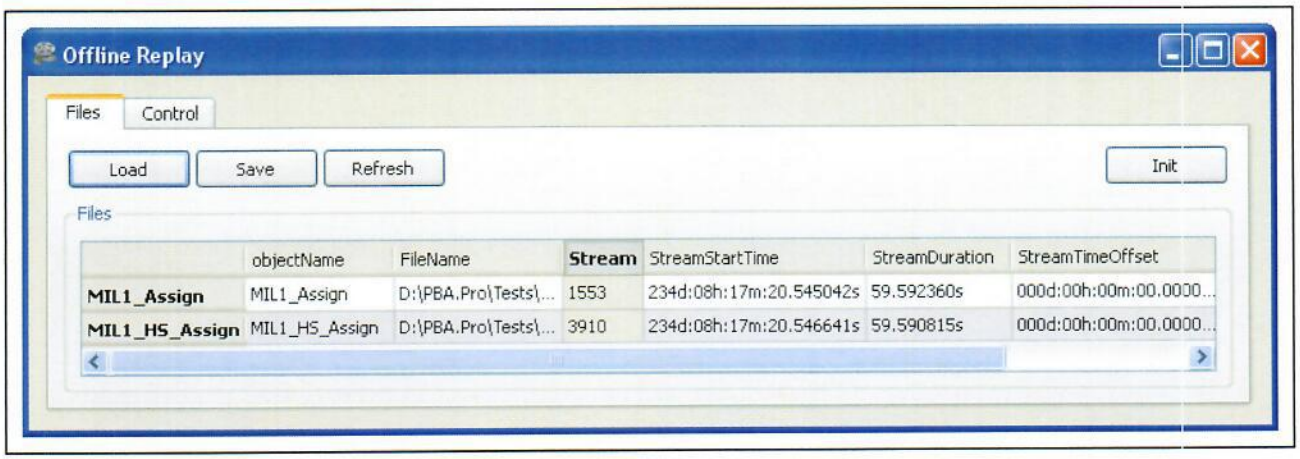


Figure 174: Offline Replay file selection

The Control Tab allows controlling the Parameter Replay

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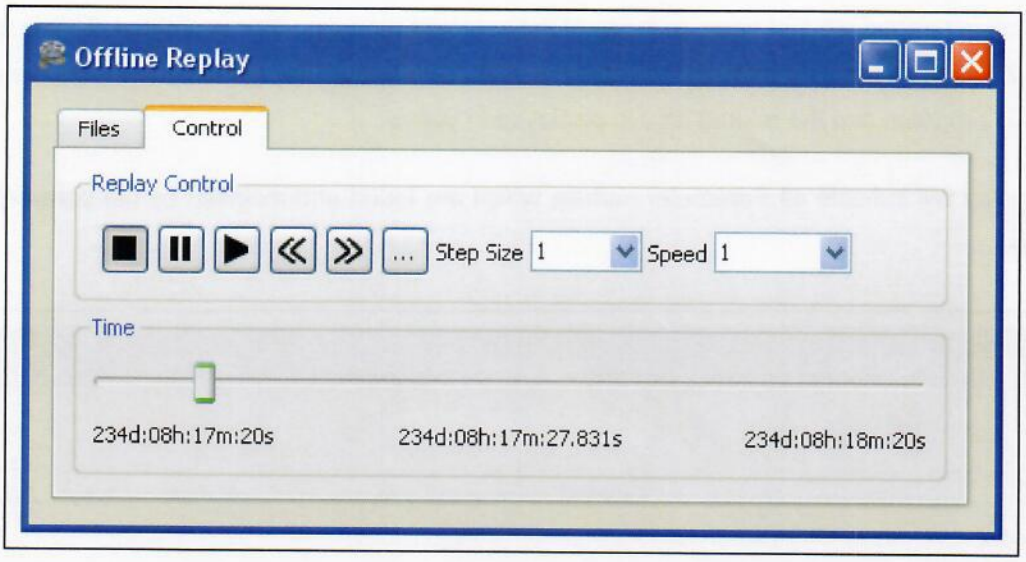


Figure 175: The Offline Replay Control Tab


Pauses the Replay


Replay Play


Backward/ Forward the selected step size in seconds

A click to the  button provides several further options:

- "Load File": Displays the current replayed Recording File
- "Sync Replay on Index View Sync To Time": If this is checked, a "Sync To Time" Menu Pick from an Index (Recording File View) will replay to the selected time
- "Sync open Index Views to the current Replay Time": This will cause, that open index Views show the current area of the recording file, which is currently replayed (updated once a second)
- "Sync open Index Views": Same as above, but can also be used in Replay Pause Mode, or if a new view has been opened
- "Add Bookmark": This will add a bookmark to the current recording file. The list of added bookmarks is accessible via the Event Marker stream of the Bus Monitor

Note: the Selection of the Replay Speed is seen as a speed hint. If it is not possible to replay with the selected speed, the current replay time is displayed in yellow and the replay is done as fast as possible.

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If the Control Tab is opened the first time, an index of the selected recording files is created. This is to enable forward and backward jumping through the replayed area. Due to this, the end time will increase during the Indexing is in progress and the related time is displayed in yellow.

The Assign Display will indicate all Parameter names, which are found and modified by the parameter replay, in light blue.

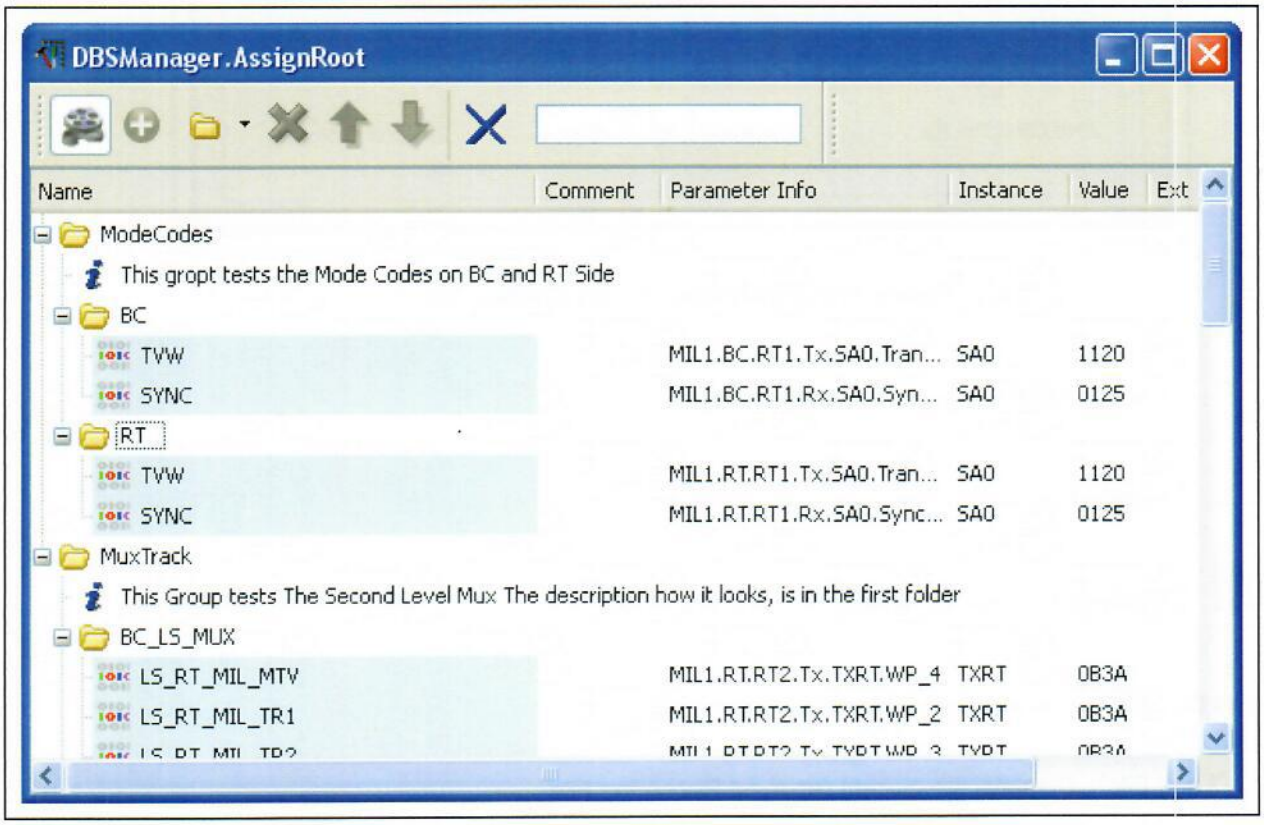


Figure 176: Assign Window using the Offline Parameter replay

A search may be initiated by the selection of “Search In Replay” entry of context menu of a selected parameter or by pressing the Shortcut CTRL-F.

The assign signal option provides 2 options, which are applicable only for the parameter replay. The related options have no effect on the normal online assign operation mode:

- **PauseOLReplay**: If this Option is enabled, the offline replay is paused as soon as the condition becomes true. The reason for the stop will be shown in the Replay Dialog
- **BookmarkOLReplay**: If this Option is enabled, the offline replay will create a bookmark in the Related recording file

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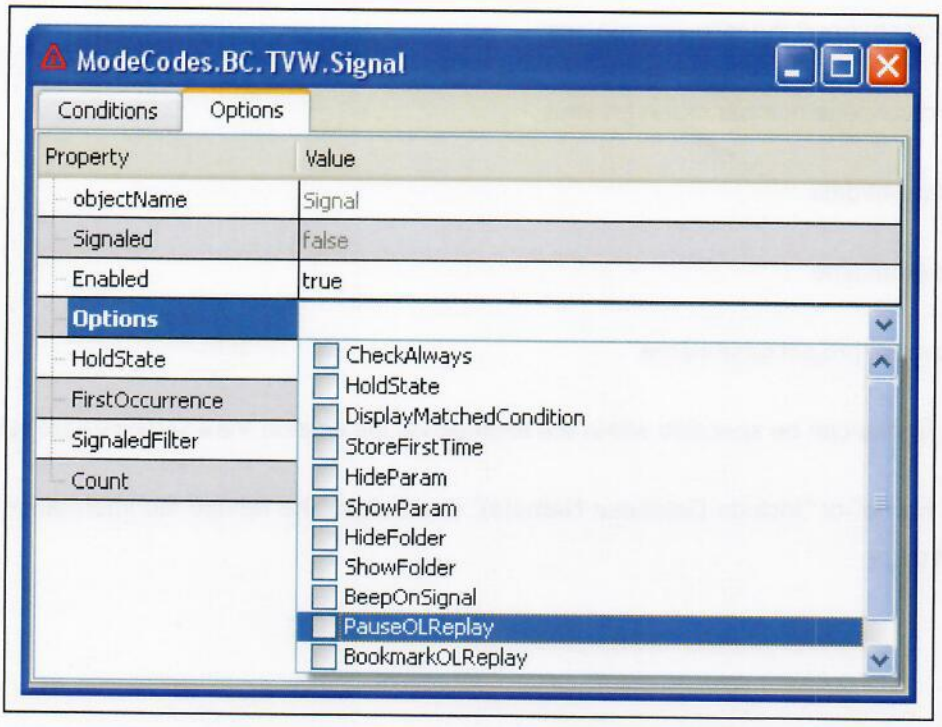


Figure 177: Assign Signals for the Offline Replay

9.5 Assign Print

By selecting “Print” in the context menu or by pressing CTRL-P it is possible to print the contents of the assign display. The printout will contain the visible columns, where the width of the single columns on the printout corresponds to the width of the columns of the assign display. The columns may be shown or hidden by a right click on the header of the table and the selection of the related column.

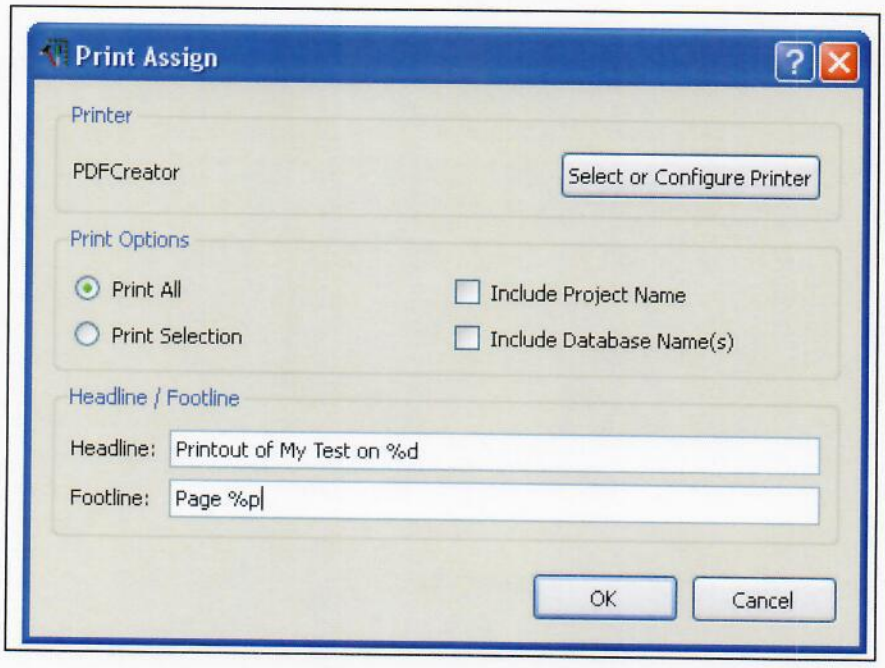


Figure 178: Assign Print dialog

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The header and footer support the following macros:

- %p The actual page number of the printout
- %d The current data
- %t The current time
- %f The current project base name

The date and time format can be specified within the settings via the section ViewSettings/AssignEdit/Print.

If "Include Project Name" or "Include Database Name(s)" is checked, the related file information is added on the first printout page.

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10 Parameter Classification

The Parameter Classification allows to mark Parameters according their classification (e.g. Secret, Restricted etc). For this each Parameter has an extra property, which may contain the short name for each classification.
The Classification Types can be free defined by the user, via the file **classification.ini**, which should be placed within the PBA.pro Application Config Directory. If the related file is not present, the Classification functionality is not available.

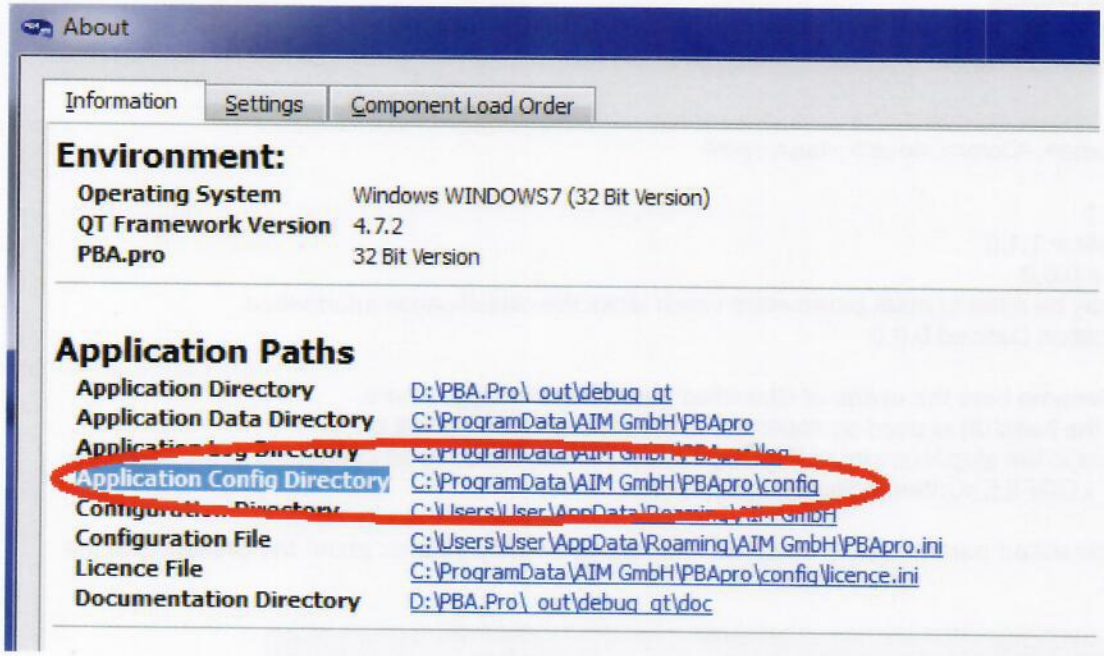


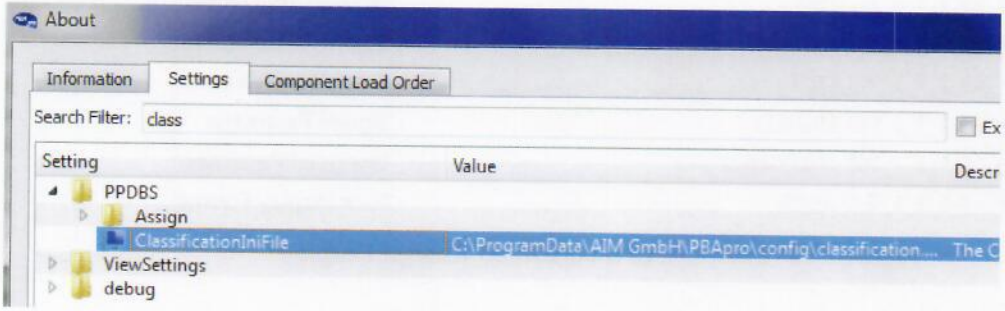
Figure 179: Location of the classification.ini file

The default installation contains the file _classification.ini (with underscore), which may be used as default.

If you use the Parameter Classification, you may show the presence of dedicated parameters within the assign. The load and printout of assigns, containing classified parameters may be logged to a file.

Notes:

- The File format is the same as used in ParaView
- The location may be specified via the Settings Key PPDBS/ClassificationIniFile
  e.g. to use the same file as ParaView



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Example for the classification.ini file:

```
[classification]
; <Name>     of the classification like it should appear in the PDI
; <FullName>  Like it should appear on the display
; <color>     The color, which should be used to mark the assign display. Allowed Values:
; none, red, blue, yellow, cyan
; <Level>     A number identifying the level. A higher level means a higher weight.
;           e.g.
;           NS has a level of 2
;           NC has a level of 1 -> NS defines the over all classification in case there are NS and NC
;           Parameters present
;<log>:      1/0: Log Assign Load and Printout to the CLASSIFICATION_LOGFILE
;<prn>:      1/0: Mark on Printout

; e.g.
; <NAME>=<FullName>,<Color>,<level>,<log>,<prn>

NS=Secret,red,2,1,1
NC=Confidential,yellow,1,1,0
NR=Restricted,none,0,0,0
; The None entry may be used to mark parameters which lacks the classification information
NONE=No Classification Defined,0,0,0

; If you specify a Filename here the usage of Classified parameters is logged here.
; The value behind the hash (#) is used as separator in the file (optional, default is ',')
; Use the same value in the step1conv.ini of the Step1 Converter, to have the all operations in the same file
CLASSIFICATION_LOGFILE=C:\temp\classification.csv#;
```

If the presence of classified parameters is detected, the Assign Display informs about the presence of the related parameters.

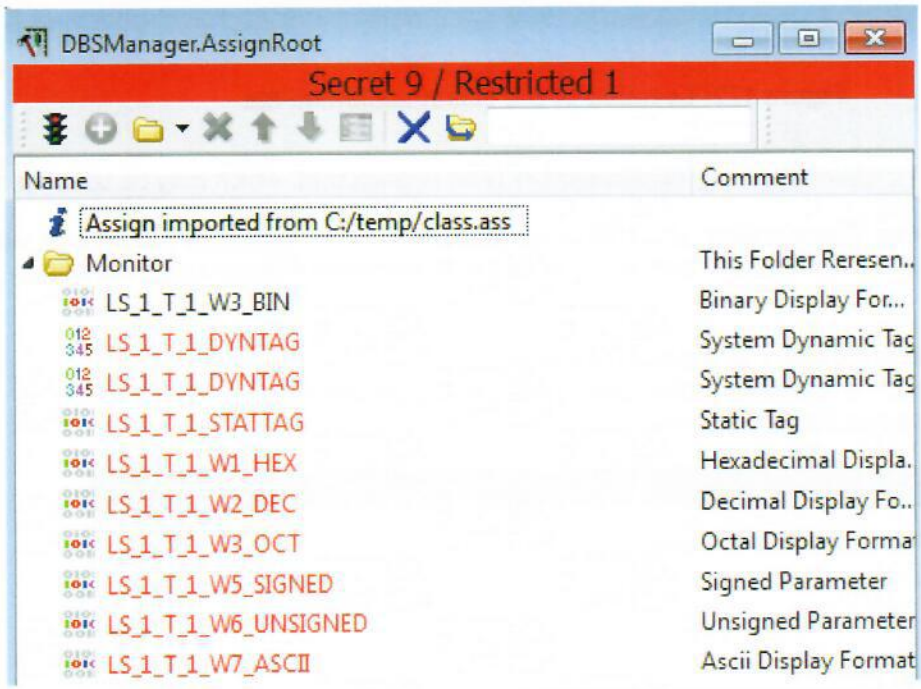


Figure 180: Example of a classified Assign Display

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The Printout of an Assign is marked with a watermarking.



Figure 181: Example of a classified Assign Printout

The different classifications may be restricted with the PBA.pro user Component (e.g. User not allowed to view Secret parameters). In this case the related Parameters are hidden and cannot be seen on the user interface. However, the Parameters (not the values) may be read by a script.

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11 Automatic Template creation

If the Designer component is enabled, automatic templates for visualisation of parameter values are provided. These templates can be created either for a parameter of the resource tree or for any object dropped to the Assign View.

To create an automatic template, the context menu of the corresponding Parameter or assign node provides a context menu entry “Open Custom Display”. Selection of the entry will start the template creation procedure as described in this chapter.

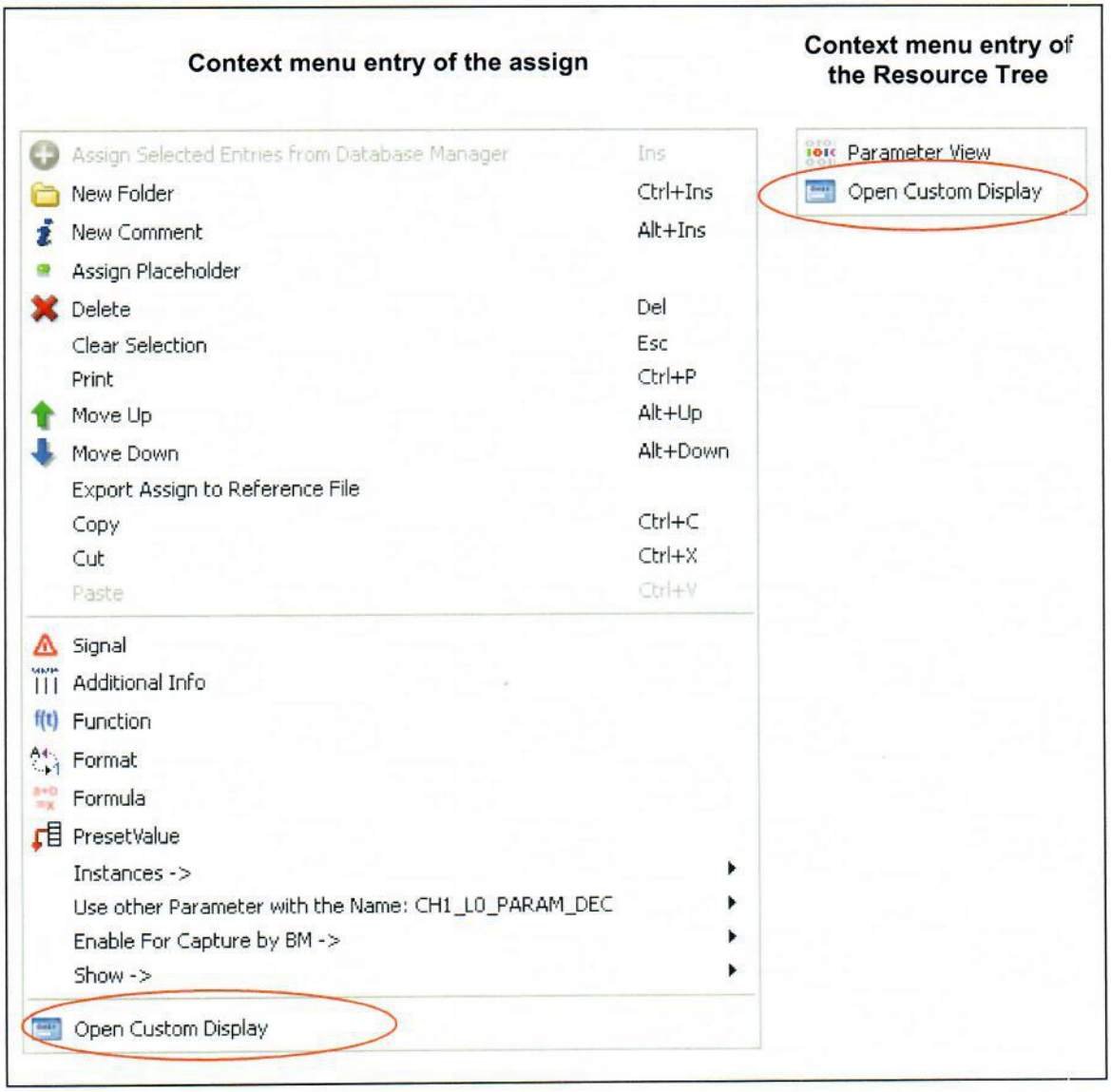


Figure 182: Assign and Resource Context menu entries for Custom Displays

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Note that the assign provides to select multiple nodes. Depending on the amount of selected objects, the Widget Selection Dialog, where the user has to specify the widget(s) to be created on the template, will pop up. In addition to this, selection dependent options will be provided.

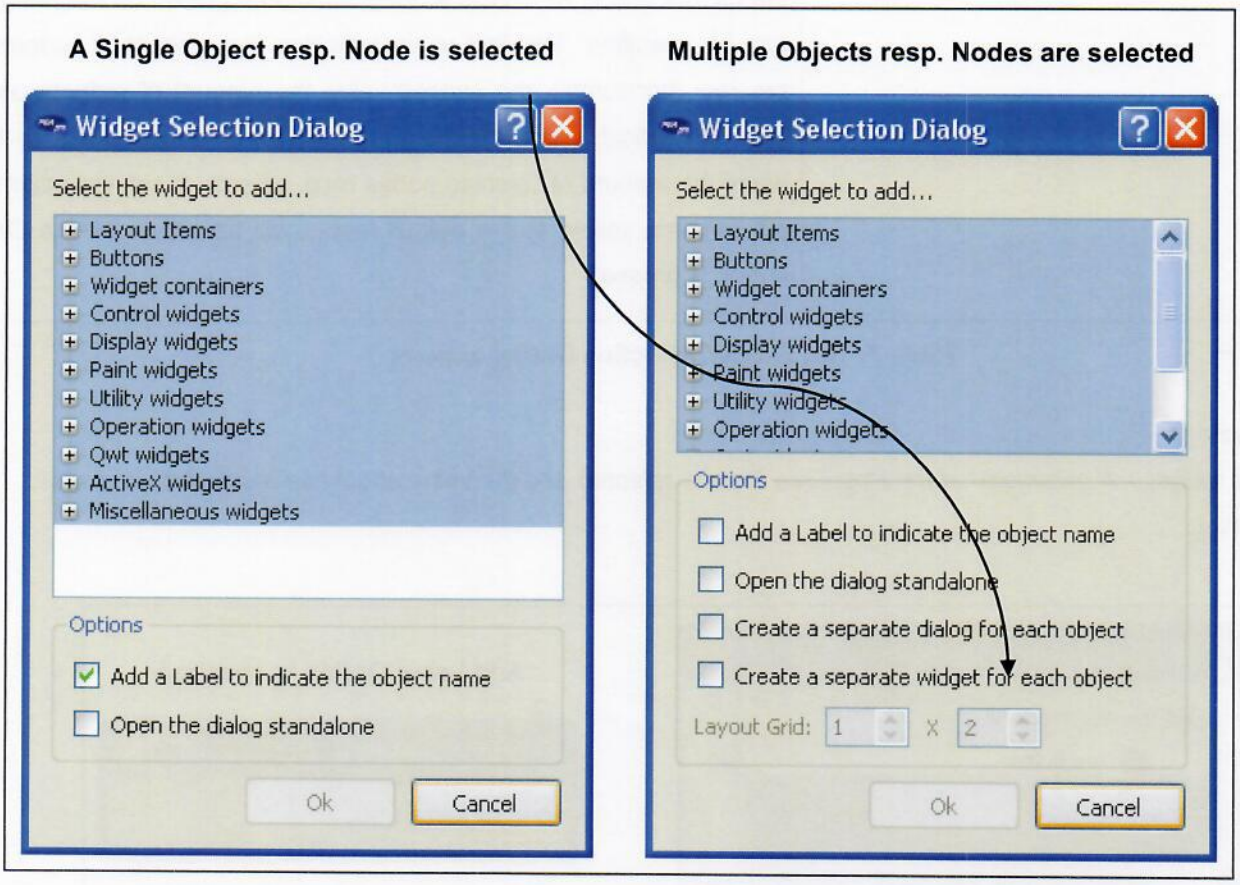


Figure 183: Widget Selection Dialog

Depending on the options and the selected widget, a template dialog will be created:

Option	Description
Add a Label to indicate the object name	A Label will be added in front of the selected widget
Open the dialog standalone	The template dialog will be opened as standalone widget
Create a separate dialog for each object	This option will indicate that one separate dialog should be created for each selected node resp. object. Note that this option is only available if multiple objects have been selected and the "Create a separate widget for each object" option is not selected
Create a separate widget for each object	This option will indicate that one separate widget should be created for each selected node resp. object. Note that this option is only available if multiple objects have been selected and the "Create a

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	separate dialog for each object" option is not selected
Layout Grid	If the "Create a separate widget for each object" option is selected, the Layout grid in which the widgets should be placed on the dialog can be specified. The first value indicates the amount of widgets per row (horizontal), the second value the amount of widgets per column (vertical). Note that the grid multiplication must be higher or equal the amount of selected nodes resp. objects. If not, the editors will become yellow and a default layout will be created if the OK button is pressed

Table 7: The Widget Selection Dialog options

Example 1

Single widget – A parameter of the Resource Tree is selected and the value should be displayed via a simple Label.

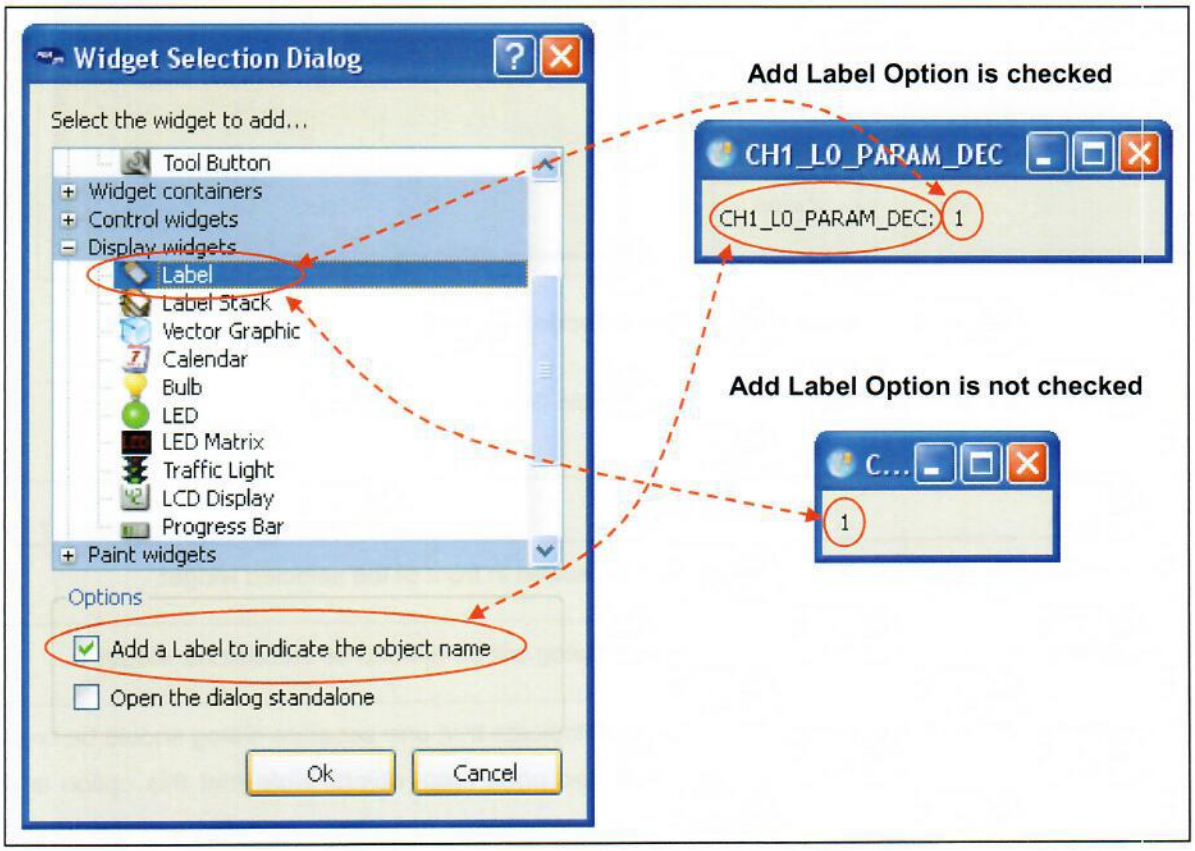


Figure 184: Display a Parameter Value via a Label

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Example 2

Multiple widgets – Two parameter nodes of the Assign View are selected and the value should be displayed via a QWT Thermo.

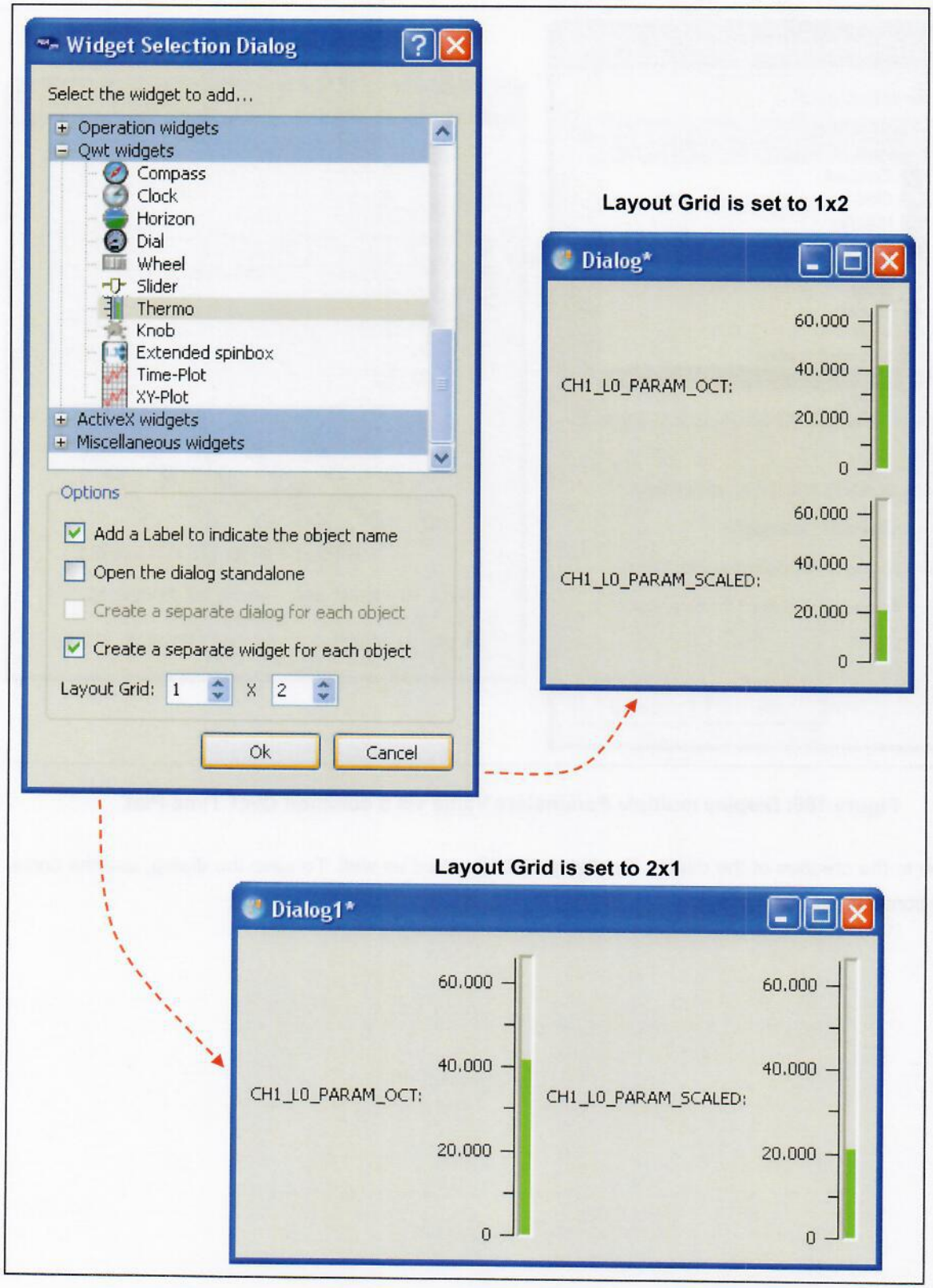


Figure 185: Display multiple Parameters Value via QWT Thermo widgets

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Example 3

Multiple widgets – Four parameter nodes of the Assign View are selected and the values should be displayed via a common QWT Time-Plot.

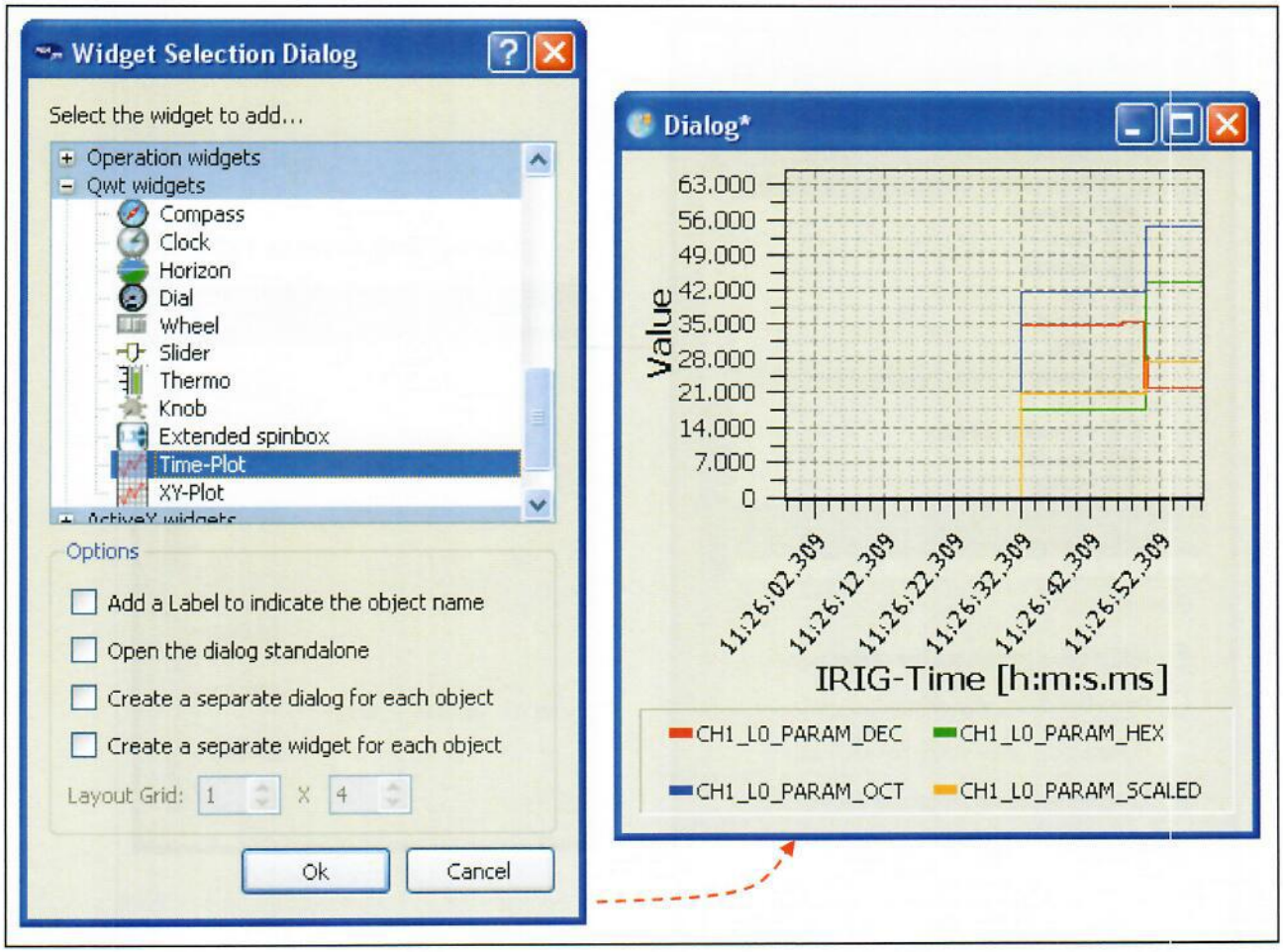


Figure 186: Display multiple Parameters Value via a common QWT Time-Plot

In addition to the creation of the dialog, the dialog can be saved as well. To save the dialog, use the corresponding context menu of the dialog.

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12 Recording File Export

The Database component allows several export modes of recording files. In the Index View one can select via the Export Dialog to export the recording as CSV file. ("Parameter Export to *.CSV"). This option will export the parameter values to a Text File separated by a "," or ";". The Default Separator can be changed within the Settings via PPDBS/ ParameterExport.

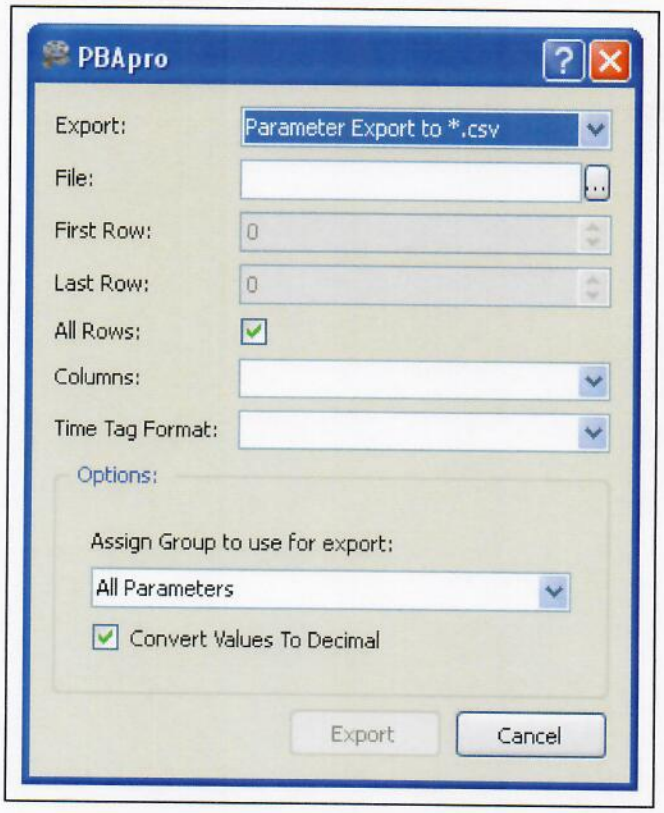


Figure 187: Recording export dialog

As it is possible to have different parameters with equal names, it may not be possible to distinguish between the different parameters only by name. Hence, the format of the name, written to the export file can be configured as follows:

The Key PPDBS/ParamExport/Header contains several settings:

- All respectively <ClassName>: This key allows to define the settings either for all parameters, or for parameters of the given class type
- If the value is equal "info", the parameter Info, as displayed in the assign, will be prepended before the parameter name. if "-info" is used, it will be appended
- If you specify a value from 1 to x, the name of the Parent DBS Nodes will be prepended for the given path. If you provide a negative value

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- Alternatively a list of class names (separated by ";"), which will be used as stop class, can be defined. For example "MilDBSDirection" will stop at the RX/TX node of for MIL Parameters

- If an external program does not allow dedicated characters like for example a dot or a hash character, the settings *InvalidChars* and *InvalidCharsReplace* can be used to replace the InvalidChars characters with the characters specified by InvalidCharsReplace

  Example: To replace all dots from the returned string with __ setup the settings as follows

  InvalidChars=.

  InvalidCharsReplace=__

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13 ParaView Import

The PBA.pro provides an additional component to Import ParaView Assign Files (*.ass) as well as parts of the ParaView Project files *.pvp. To do so, select the following import component during PBA.pro Installation:

- **"Import of PBA and ParaView Setups"**

This component has to be explicitly selected during the Installation of the PBA.pro, as it is not installed by default. The component can be added after an installation by starting the installation again and by selecting "Modify" in the related installer dialogue.

The following items can be imported by the component:

- ParaView Assign (*.ass)
- Database Stream Assign from the Project (*.pvp)
- Auto RT Setup
- Selected PBA BC,RT or Setup Files from the System Assign

The following functions are not supported yet:

- ParaView Export Files, but you may specify dedicated folders from the Assign during the Parameter Export
- Parameter Recording

Parameter Logging to a text file can be done with a script in the examples folder of the PBA.pro installation Directory.

If you load an assign file, you have to ensure, that you have already a matching database loaded. The files can be loaded via the global "File Open" function.

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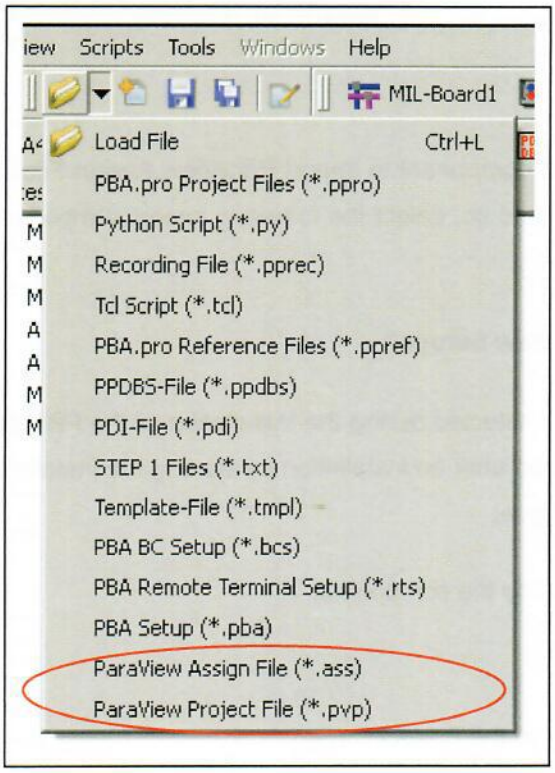


Figure 188: ParaView file import

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14 User Databases

Despite the standard database formats, PBA.pro provides an interface to import user defined databases (e.g. SQL or CSV) via script. To do so, the settings have to be set up as shown and described below:

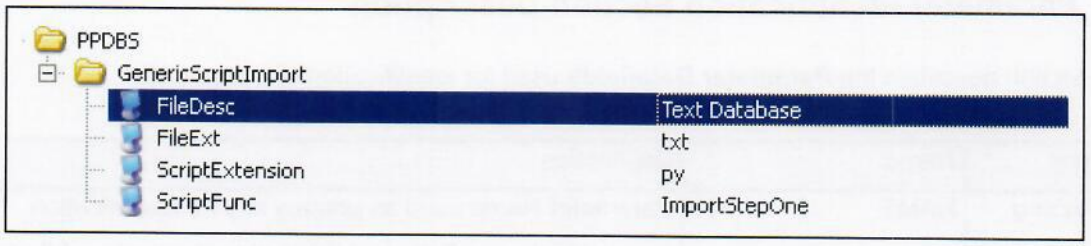


Figure 189: User Database settings

- The **FileDesc** setting is used to specify the description of the database
- The **FileExt** setting defines the extension of the file which should be opened
- The **ScriptExtension** specifies the Script type to be used (currently tcl or py)
- The **ScriptFunc** setting defines which function should be called to import the related file. The script file, containing the related function, should be included to the Script manager and the related script has to be sourced (started).

There are several sample scripts showing the creation of database parameters from script where e.g. a simple example script (import_user_dbs_sample.py), which implements this required stub, is provided in the examples of the PBA.pro.

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15 PDI Format Description

15.1 Datarecord Description

15.1.1 Parameter Identification Section Description

This logical section describes the **Parameter Datafields** used for identification of a parameter.

Field No	Type	Name	Description
1	`String`	NAME	Parameter Name used as primary key for identification - no blanks, no Tab, no ASCII values lower than 30 (dec) - It is recommended to use unique parameter names
2	`String`	COMMENT	Additional Parameter Information
3	`String`	UNIT	Parameter Unit string (e.g. Knots, °C ...)
4	`String`	RESERVED	

Table 8: PDI - Parameter Identification Section Description

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15.1.2 Parameter Source Section Description

This logical section describes the Parameter Data fields used for the source definition of a Parameter.

15.1.2.1 MIL-STD1553 / STANAG3838 Source

Field No	Type	Name	Description
5	**String**	SRC_BUS	Source Bus MIL1, MIL2, MIL3, MIL4, .. MIL20
6	**String**	SRC_TYPE	RT: RT related parameter BC: BC related parameter (Not for RT-RT Transfers)
7	**Num**	RT_ADDR	RT Address in decimal 0 .. 31
8	**String**	TX_RX	TX or RX Transmit/ Receive Message association
9	**Num**	SUB_ADDR	RT Sub address in decimal 0 .. 31
10	**Num**	WPOS_LO	Parameter LSW Word Position in decimal 0 .. 31 Note: In case of a SUB_ADDR value of 0 or 31, this field contains a Mode code number 0 .. 31 Note: The LSW of a parameter which uses 2 data words must be always located in the higher data word
11	**Num**	WPOS_HI	Parameter MSW Word Position in decimal 0 .. 31 (for Parameters using 2 data words) Note: If this field is not set to a value between 0 .. 31 and the Parameter exceeds one 16-Bit data word the WPOS_HI = WPOS_LO – 1 (it is assumed that the parameter resides in two subsequent data words)
12	**Num**	BIT_POS	Parameter Bit-Field Start Position in decimal 0 .. 15 (0 = LSB)
13	**Num**	LENGTH	Parameter Bit-Field Length in decimal 1 .. 64
14	**Num**	WORD_CNT	Only relevant for SRC_TYPE BC: Word Count value of associated BC Message in decimal 0 .. 31
15	**String**	MODE	Parameter Mode: NORMAL or field empty: Standard Parameter TAG: Dynamic Data Function is applied to Parameter

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			The Bit-Field value starts at 0 and is incremented each time the parameter is updated (once per minor cycle). It counts up to the maximum value, given by the BIT_POS and LENGTH fields and wraps around to zero. Note: Parameter Bit-Field must reside in one 16-Bit data Word! Initial Tag Mode given on MODE_EXT Note: Only applicable for SRC_TYPE = RT TX_RX = TX only TRACK: Defines a Track parameter for further multiplex parameter MUXTRACK: Defines a Track parameter which is located on a track parameter (Second Level Multiplexing) MUX: Defines a Multiplex parameter which is related to a specific track parameter Note: MUX, TRACK and MUXTRACK is only applicable for SRC_TYPE = RT TRACK_REL: Similar to "TRACK" except the Track Parameter may be located anywhere within the Multiplexed Area instead of the start only
16	**String**	MODE_EXT1	Parameter Mode Extensions: MODE = NORMAL: N/A MODE = TAG: Tag Initial Mode ENA = enabled SUSP = suspended MODE = TRACK MODE = MUXTRACK Size of the Track in Words (1..64) MODE = MUX Name of the Track Parameter this parameter is located The Track parameter must be defined before the MUX parameter

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17	**Variant**	MODE_EXT2	MODE = TRACK MODE = MUXTRACK Number of MUX States (2..1024) MODE = MUX Value of the Track parameter this parameter belongs to
18	**Num**	MODE_EXT3	MODE = TRACK Buffer (1..128) MODE = MUXTRACK Value of the Track parameter this parameter belongs to
19	**STRING**	MODE_EXT4	MODE = MUXTRACK Name of the Track Parameter this parameter is located The Track parameter must be defined before the MUXTRACK parameter

Table 9: PDI - MIL-STD1553/ STANAG3838 Source Description

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15.1.2.2 STANAG3910 Source

Field No	Type	Name	Description
5	**String**	SRC_BUS	Source Bus MIL1_HS, MIL2_HS, MIL3_HS, MIL4_HS
6	**String**	SRC_TYPE	RT: RT related parameter BC: BC related parameter (Not for RT-RT Transfers)
7	**Num**	RT_ADDR	RT Address in decimal 0 .. 31
8	**String**	TX_RX	TX or RX Transmit/ Receive Message association
9	**Num**	MID	HS Message Identifier 1 .. 127
10	**Num**	WPOS_LO	Parameter Word Position in decimal 0 .. 4095 Note: The LSB of a parameter which uses 2 data words, must be always located in the higher data word This will change the valid range in some special cases from 1...4095 decimal!
11	**Num**	WPOS_HI	Parameter MSW Word Position in decimal 0 .. 4095 (for Parameters using 2 data words) Note: If this field is not set to a value between 0 .. 4095 and the Parameter exceeds one 16-Bit data word the WPOS_HI = WPOS_LO – 1 (it is assumed that the Parameter resides in two subsequent data words)
12	**Num**	BIT_POS	Parameter Bit-Field Start Position in decimal 0 .. 15 (0 = LSB)
13	**Num**	LENGTH	Parameter Bit-Field Length in decimal 1 .. 64
14	**Num**	BLK_COUNT	Only relevant for SRC_TYPE BC: Block Count value of associated BC HS Transfer (Action Word) 0 .. 127
15		MODE	see: STANAG3838/ MIL-STD1553 Source
16		MODE_EXT1	see: STANAG3838/ MIL-STD1553 Source
17		MODE_EXT2	see: STANAG3838/ MIL-STD1553 Source
18		MODE_EXT3	see: STANAG3838/ MIL-STD1553 Source
19		MODE_EXT4	see: STANAG3838/ MIL-STD1553 Source

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15.1.2.3 AFDX Source

Field No	Type	Name	Description
5	**String**	SRC_BUS	Source Bus AFDX1 – AFDX20
6	**String**	PROTOCOL	UDP: Parameter source is located on a Capture Port of the fdXplorer (Sampling and Queuing Port) BYTE_POS is relative to the beginning of UDP Payload UDP_CTRL: Parameter source is located on a Send Setup of the fdXplorer BYTE_POS is relative to the beginning of UDP Payload RAW: Parameter source is located anywhere in the MAC Frame BYTE_POS is relative to the first Byte of the MAC Frame **Note: RAW type parameters are not available for ParaView Monitor and Control Display purposes!**
7	**IP-Addr**	SRC_IP	Source IP Address (e.g. 224.224.0.0) *255.255.255.255 identifies IP address is don't care* *(only applicable for PROTOCOL Type RAW)*
8	**Num**	SRC_PORT	Source Port *'*' identifies UDP Port is don't care* *(only applicable for PROTOCOL Type RAW)*
9	**Num**	VL	Virtual Link
10	**IP-Addr**	DEST_IP	Destination IP Address (e.g. 224.224.0.0) *255.255.255.255 identifies IP address is don't care* *(only applicable for PROTOCOL Type RAW)*
11	**Num**	DEST_PORT	Destination Port *'*' identifies UDP Port is don't care* *(only applicable for PROTOCOL Type RAW)*
12	**N/A**	RESERVED	Future expansion
13	**N/A**	RESERVED	Future expansion
14	**Num**	BYTE_POS	Byte Position in the Message Payload Note:

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			The Byte Position is related to the LSB of the Parameter e.g. 32 Bit Parameter from byte pos 0 to 3, the 3 has to be specified for the parameter location in the word position
15	**Num**	BIT_POS	Parameter Bit-Field Start Position in decimal 0 .. 7 (0 = LSB)
16	**Num**	LENGTH	Parameter Bit-Field Length in decimal 1 .. 64
17	**N/A**	RESERVED	Future expansion
18	**N/A**	RESERVED	Future expansion
19	**N/A**	RESERVED	Future expansion

Table 11: PDI - AFDX Source Description

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15.1.2.4 ARINC 429 Source

Field No	Type	Name	Description
5	String	SRC_BUS	Source Bus: ARINC_1, ARINC_2, ARINC_3, ARINC_4
6	Num	SRC_CHN	ARINC429 Channel Number in Decimal Values: 1..16
7	N/A	RESERVED	for future expansion
8	String	TX_RX	Transmit/ Receive Parameter Values: RX or TX
9	Num	LABEL	ARINC Label Number in octal Values: 0..377 (octal)
10	Num	SDI	Source Destination Identifier (optional) Values: 0..3 / Empty -> N/A
11	N/A	RESERVED	for future expansion
12	Num	BIT_POS	Parameter Bit-Field Start Position in decimal 9.. 31 (1 = LSB) Start Position cannot be Bit 1..8 (Label) respectively 1..10 (if SDI is given) and cannot be Bit 32 (Parity)
13	Num	LENGTH	Parameter Bit-Field Length in decimal 1 .. 23
14-19	N/A	RESERVED	for future expansion

Table 12: PDI - ARINC 429 Source Description

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15.1.2.5 PANAVIA Source

Field No	Type	Name	Description
5	**String**	SRC_BUS	Source Bus: PSI_1, PSI_2, PSI_3, PSI_4
6	**Num**	SRC_CHN	PANAVIA Channel Number in Decimal Values: 1..32
7	**N/A**	RESERVED	for future expansion
8	**String**	TX_RX	Transmit / Receive Parameter Values: RX or TX
9	**Num**	TAG	PANAVIA Tag Number Values: 0..31 (decimal)
10	**N/A**	RESERVED	for future expansion
11	**N/A**	RESERVED	for future expansion
12	**Num**	BIT_POS	Parameter Bit-Field Start Position in decimal 0.. 23 (0 = LSB) Bit 0…15 (Tag Data) , Bit 16..23 (Error Flags)
13	**Num**	LENGTH	Parameter Bit-Field Length in decimal 1 .. 24
14-19	**N/A**	RESERVED	for future expansion

Table 13: PDI - PANAVIA Source Description

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15.1.3 Parameter Translation Section Description

This logical section describes the **Parameter Data fields** used for the translation of a Parameter's raw value into an Engineering Unit.

Field No	Type	Name	Description
20	**String**	FORMAT	Parameter default format type (described in alphabetical order) A = ASCII : Parameter Bit-Field is divided into 7- or 8 Bit subfields and translated into its corresponding ASCII code Non-displayable ASCII codes are shown in a hexadecimal format Additional FORMAT information: 7- or 8-Bit ASCII interpretation is selected via the FORMAT_EXT1 field B = Binary : Parameter Bit-Field is shown as a 0/1 Sequence Additional FORMAT information: none C = BCD: Parameter Bit-Field is a BCD coded value Note: The resulting float value x can be additionally scaled using following formula: f(x) = C + a*x Additional FORMAT information: a: represented by the FORMAT_EXT2 field C: represented by the FORMAT_EXT3 field Note: Alternatively it is possible to specify the MSB value for a scaling by specifying the scale value with a Leading M: e.g. M10.0 . In that case the formula changes as follows:

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f(x) = C + a/p*x where p is the Physical MSB Value which depends on the Bit length of the parameter

Note: Alternatively it is possible to specify a Divisor value for a scaling by specifying the scale value with a Leading D: e.g. D10.0 . In that case the formula changes as follows: f(x) = C + x/a

D = Decimal : Parameter Bit-Field is shown in it's corresponding Decimal value (no sign, no scaling)

Additional FORMAT information: none

E = Enumerated : Parameter Bit-Field value is translated into states represented by textual synonyms

Additional FORMAT information:

Enumerated data record identification in FORMAT_EXT1
Numerical value of a state in FORMAT_EXT2
Associated synonym in FORMAT_EXT3

Note: An Enumerated Parameter definition requires at least 2 Data records!
The first record declares the Start of an Enumerated parameter

Definition and the subsequent data records define the states and the associated synonyms.

F = Float : Parameter Bit Field is translated into a float value, based upon the IEEE754 single (BITLEN = 32) and double (BITLEN = 64) precision float value definition

Note: The resulting float value x can be additionally scaled using following formula:
f(x) = C + a*x

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Additional FORMAT information:

a: represented by the FORMAT_EXT2 field

C: represented by the FORMAT_EXT3 field

H = Hexadecimal: Parameter Bit-Field is shown in its corresponding Hexadecimal value (no sign, no scaling)

Additional FORMAT information: none

L = Boolean/Logical: Parameter Bit-Field must have a LENGTH of 1!

Additional FORMAT information:

True-State (Bit = 1) Synonym in FORMAT_EXT1

False-State (Bit = 0) Synonym in FORMAT_EXT2

O = Octal: Parameter Bit-Field is shown in its corresponding Octal value (no sign, no scaling)

Additional FORMAT information: none

S = Scaled: Parameter Bit-Field is treated as a signed or unsigned coded Integer value. In case of a signed coded value, negative values

are expected to be coded as a 2's complement format.

Note: The resulting float value x can be additionally scaled using following formula:

$f(x) = C + a*x$

Additional FORMAT information:

a: represented by the FORMAT_EXT2 field

C: represented by the FORMAT_EXT3 field

Note: Alternatively it is possible to specify the MSB value for a scaling by specifying the scale value "a" with a Leading M: e.g. M10.0 . In that case the formula changes as follows: $f(x) = C + a/p*x$ where p is the Physical MSB Value which depends on the Bit length of the parameter

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			Note: Alternatively it is possible to specify a Divisor value for a scaling by specifying the scale value with a Leading D: e.g. D10.0 . In that case the formula changes as follows: f(x) = C + x/a Additional FORMAT information: TRANSLATION represented by the FORMAT_EXT1 field CONVERSION represented by the FORMAT_EXT2 field
21	**Variant**	**FORMAT_ EXT1**	Dependent on FORMAT type (Field 20) A = ASCII: 7 or 8 for ASCII character width in bits B = Binary: N/A C = BCD: Empty: BCD Coded SSM: Sign Status Matrix Coded Value SSM Information in Bit Position 30..31 D = Decimal: N/A E = Enumerated: must be set to 'E' for Enumerated data record Identification F = Float: N/A H = Hexadecimal: N/A L = Boolean/ Logical: Synonym of True-State (Bit = 1) O = Octal: N/A S = Scaled: S for signed, U for unsigned coding Or SSM for Sign Status Matrix Coded Data Note: The SSM Information is always expected at Bit Position 30 and 31 U = Parameter Translation Name (optional)
22	**Variant**	**FORMAT_ EXT2**	Dependent on FORMAT type (Field 20) A = ASCII: N/A B = Binary: N/A C = BCD: Scale value a for f(x) = C+ a*x (see Field 20) D = Decimal: N/A E = Enumerated: contains the numerical value of the enumerated bits, optional radix qualifier are possible:

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			B: value is given in Binary H: value is given in Hexadecimal O: value is given in Octal D or no qualifier: value is given in decimal The corresponding synonym is given in FORMAT_EXT3 This field can bet set to ELSE in order to define a synonym used for all non-defined values of the Parameter Bit-Field. F = Float: Scale value a for f(x) = C+ a*x (see Field 20) H = Hexadecimal: N/A L = Boolean/Logical: Synonym of False-State (Bit = 0) O = Octal: N/A S = Scaled: Scale value a for f(x) = C+ a*x (see Field 20) U = Parameter Conversion Name (optional)
23	**Variant**	**FORMAT_ EXT3**	Dependent on FORMAT type (Field 20) A = ASCII: N/A B = Binary: N/A C = BCD: Offset value C for f(x) = C+ a*x (see Field 20) D = Decimal: N/A E = Enumerated: contains the synonym string for the value, given in FORMAT_EXT2 F = Float: Offset value C for f(x) = C+ a*x H = Hexadecimal: N/A L = Boolean/Logical: N/A O = Octal: N/A S = Scaled: Offset value a for f(x) = C+ a*x (see Field 20)
24	**Vari-ant**	INIT_VAL	Init Value for Transmit Parameters in Engineering Units (Dependent on FORMAT type) Note: Only applicable for following conditions: STANAG3838/ MIL-STD1553 / STANG 3910 SRC_TYPE = RT and TX_RX = TX SRC_TYPE = BC and TX_RX = RX

Table 14: PDI - Parameter Translation Section Description

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