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User Manual

AND LibEdit

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1 General information

The AND Editor is an add-on for the AND Planning Program.

It is used both for editing and modifying the components and for creating new libraries. It enables you to modify technical data and the shape of component symbols as desired, to create and maintain cables, connectors, costing objects, amplifier objects. Components can be moved or copied by drag and drop.

Symbols can be displayed in multiple forms and sizes (frames).

This data is automatically converted on importing from libraries of the DOS version. The component editor is offered in two versions:

- as a pure component editor
- as an extended component editor with integrated calculation functionality for amplifiers (ARD Amplifier Raster Design)

Using the ARD program, you can calculate the entire CSO/CTB spectrum of coaxial CATV amplifiers for any frequency raster because of the fewer CSO/CTB measured values. It is immaterial which rasters the measured values are available for. As an alternative to CSO/CTB measured values, a series of KMA/IMA data items, e.g. from a DIN measurement station, can be used instead.

It is possible to simulate or calculate the change in the CSO/CTB spectrum of the amplifiers for preemphasis or gain ripple (input and output level alignment). The measurement station no longer has to be calibrated to a linear amplifier output level to be able to determine standard parameters.

With ARD, you can perform raster-independent comparisons of different CSO/CTB measurement series. The software also helps you define the frequencies to be measured for the CSO/CTB spectrum in the case of multi-channel measurement.

Of course, you can also document the calculated data and store it in the library.

1.1 Target Group of this Manual / Required Skills

The target group of this manual is user of the software LibEdit. It is assumed that this target group has knowledge of the use of personal computers and Windows operating system. Knowledge of using CAD-software is not required.

1.2 Starting the AND component editor

When you start the AND Component Editor an application window opens. You can vary the size of the window.

Using the pull-down menu, you can make several basic settings, create a new library and/or open an existing library.

1.2.1 The Toolbar



Toolbar file op- erations		Shortcut	Function
New	D	Ctrl+N	Creates a new library; any open libraries remain open.
Open	B	Ctrl+O	Loads and opens a library from a data medium.
Save		Ctrl+S	Saves the current library. If you have not yet assigned a name to the library you are now prompted to do so ("Save As" function).
Cut	*	Ctrl+X	Cuts the selected object to the clipboard.
Сору	6	Ctrl+C	Copies the selected object to the clipboard.
Paste block	8	Ctrl+V	Inserts an object from the clipboard.
Print	9	Ctrl+P	Prints out all created objects.
Print characteristic curve/spectrum	5		Prints out the characteristic curve/spectrum of any amplifier instances that have also been created.
About the Component Editor	?		Displays program information, version number and copyright.

1.2 Starting the AND component editor

1.2.2 The menu bar

<u>File Edit View Window ?</u>

1.2.2.1 File

Menu Item	Shortcut	Function
New	Ctrl+N	Creates a new library; any open libraries remain open.
Open	Ctrl+O	Loads and opens a library from a data medium.
Close		Closes the currently active library.
Save as		Saves the currently active library in the set directory path.
Saving options		Allows you to select save options. For example, this is where you can activate write and/or read protection.
Excel-Export		The objects selected in the dialog box are exported to an Excel list.
XML-Export		The library is exported to an XML file.
Print	Ctrl+P	A library can be printed out according to a selected layout.
Page view		The library is displayed the print preview in the selected lay- out.
Set printers		This is where you set a local printer or select a network printer.
Change directory		Sets the storage path.
Exit		Closes the component editor.

1.2 Starting the AND component editor

1.2.2.2 Edit

Menu Item	Shortcut	Function
Cut	Ctrl+X	Removes the marked object and copies it to the clipboard.
Сору	Ctrl+C	Copies the marked object and transfers it to the clipboard.
Insert	Ctrl+V	Inserts the content of the clipboard.
Search	Ctrl+F	Search for an object in the library.
Edit basic properties		Edit the basic properties of the basic data.
Edit objekt-attributes		Edit the object attributes.
Supplier		Edit the supplier data.
Mounting groups		Create and edit mounting groups.
Lokal references		Edit local references.
Color codes		Edit color codes.
Eldanorm-compari- son		Price information is adjusted by comparison with an El- danorm file.
Basic language		Change basic language of the basic data.
Raster		Edit raster list.
Set version		Set version number for all objects of the library.

1.2.2.3 View

Menu Item	Shortcut	Function
Symbols		Show and hide toolbars.
Status		
View		
Change language		Change menu language.
Global references		Displays all cables, connectors and optical references.

1.2.2.4 Window

Menu Item	Shortcut	Function
Cascades Tiles		Cascades or tiles open windows.
		All open libraries are listed in the lower screen section. The active library is indicated by a check mark.

In addition, the last 4 libraries to have been opened are listed under menu item "File".

1.3 Screen layout

1.3 Screen layout

When you load an existing library or create a new library, a window with three sections opens. You can set the width of each of the sections individually by moving the dividing bars with the mouse.

👑 LibEdit - [Unknown-1]	
Eile Edit View Window ?	_ 8 ×
Press F1, to obtain help.	

You can open multiple libraries at once, for example, to copy components from one library to another.

A separate window with its own toolbar opens for each library

品	E	E	*	칼	1	$\langle \langle \rangle$	0	7	Abc	ĸ		() ++	
---	---	---	---	---	---	---------------------------	---	---	-----	---	--	----------	--

With this toolbar, you can activate additional functions that apply to a particular library. This toolbar is not to be confused with that containing the standard functions (New, Open, Save).

Within each section you can activate context menus with the right mouse button, for example, to create new objects, frames or data.

For further information, please turn to the descriptions of the individual sections.

To save space, several windows are placed on top of the other in each section. Each window has an activation button, which has the appearance of a index card tab. A window can be brought to the foreground by clicking on the tab with the mouse.

Cable Conn. CalcObj. I Ripple Picture	Basic Data / Symbol Data / Attributes / PINS / Standard /	
Press E1 to obtain help		

1.4 Left-hand section

1.4 Left-hand section

The objects contained in the library are displayed in the left-hand section. Objects can be combined into groups much like files can be grouped into directories. However, unlike files and directories, it is not possible to combine several groups to form a higher-level group.

You can expand these groups with this button **E**. To collapse expanded groups, click this button **E**.

Objects can be displayed in two different ways:

- According to object type
- According to user group

According to object type

We distinguish between five different object types:

- Symbols
- Cables
- Connectors
- Costing objects
- Amplifier objects (not to be confused with the amplifier symbols)



1.4 Left-hand section

According to user group

Objects of different types that are, however, used in a related context

(for example, all amplifiers, cables and connectors used for network level 4) can be combined to form user groups. In this case, the "tab" is superfluous but is kept to maintain the familiar display.

Note: The assignment of an element to a group is not altered when you switch user group.

The object type is indicated by the icon used to display them.



You can switch between two types by clicking on the relevant button in the toolbar.

If you click the **button**,

the display is switched over and you can now see all library objects at once. You can reverse to the previous display by clicking on the button again. You can create or delete objects individually or within a particular group by means of the context menu that you activate with the right mouse button.

ARD:

In ARD, the amplifier symbols have a special function.

If measured data exist for an amplifier, a "+" box appears to the left of the amplifier. When you start the program, no measured data is loaded and the amplifier symbol appears white. When you double-click the amplifier or single-click the "+" box, the measured data is loaded (search for the relevant data, if necessary).

The amplifier symbol is now blue.

If you expand the amplifier, all instances of the amplifier are shown as its "children". The following figure shows all possible states of an amplifier:

1 General information

1.4 Left-hand section

	<u>F</u> ile <u>E</u> dit <u>V</u> iew <u>W</u> indow <u>?</u>
Amplifier without measured data	<u>*</u>
Measured data exist but are not loaded	
Amplifier with measurement data loaded but not expanded	▶ Demo-Amp 1 ► Demo-Amp 2
Amplifier with loaded measured and expanded measured data	- ⊕ ─ Demo-Amp 3 - ─ Demo-Amp 4 - Exemplar1
The measured data is stored in files with the extension *.amp. A file exists for each amplifier. The name of the file usually follows the convention	Exemplar2
amplifiername.amp.	

The working directory of the program indicates where the measured data is stored and where to search for the measured data to load it.

If you do not find the measured data while trying to load it, you can search for the measured data file in a dialog box.

You can set the working directory path with menu item "File / Change directory". You can import and export the measured data of an amplifier with the context menu (right mouse button).

You can also use the import function to add measured data to the existing measured data. You also create a new instance using the context menu.

1.4 Left-hand section

1.4.1 Copying, moving, and deleting components

Entire components can be duplicated either by drag and drop or by copy and paste. Drag and drop means grabbing the component (in the left section of the screen) with the mouse and moving it to another part of the display ("dragging" it) and then releasing it with the mouse button ("dropping" it). Either a copy is made at the new position and the original is kept or the original is deleted and generated at the new position, i.e. it is moved.

The standard drag and drop operation moves an object within a library and copies it outside a library.

You can influence the drag and drop operation by additionally pressing the



The (Alt) key forces the components to be moved, the (strg) key,

on the other hand, forces copying.

If it is not possible to "drop" an object onto the current position of the mouse, this is indicated by the mouse pointer.

Besides mouse-based copying, it is also possible to move components in and out of the clipboard using the copy and paste function. This is done by selecting cut, copy and paste from the menu, by clicking the relevant buttons in the toolbar or using shortcuts



Note: Neither of these procedures allows you to place components in windows not associated with their type, for example, creating symbols in a window for cables.

ARD:

Drag and drop cannot be used for instances of amplifiers.

However, examples can be copied to the clipboard and the copy then inserted at another position, using the Edit menu or using shortcuts with



Components and instances are deleted as follows:

Choose an object in the left section and either select the command

"Delete" from the context menu or press the bell key directly.

You can also delete an entire group.

1.4 Left-hand section

1.4.2 Recovering data

If you mistakenly delete an object, you can recover the data by exiting the library without saving. The library then returns to the state it was in when you last saved it.

You can restore deleted measured data and rasters by the same method.

Back-up copies with the extension *.bak are created when you save libraries, measured data and rasters.

You can also restore the status prior to the last time you saved by loading the relevant *.bak library.

To return measured data to the status prior to the last time you saved, import the *.bak file of the amplifier in question from the working directory (measured data are imported by means of the context menu item "Import Measured Data").

The old imported data are appended to the existing data.

All instances are now duplicated.

Delete the version you do not require from each duplicated instance.

Any changes to the rasters are ignored if you exit the library or the program without saving. A full list of the rasters is stored in the file *Raster.rst*.

The file *Raster.bak* contains the status of the raster list before your last changes.

In order to restore the old raster status you must overwrite the file *Raster.rst* with *Raster.bak*.

1.5 Center section

This section is activated whenever an existing symbol or cable is selected in the left section or when a new symbol or cable is created.

Symbol drawing



This is where the symbols are drawn.

1.5.1 Drawing symbols

* [21/	8	0	7	Abc	×
-----	-----	---	---	---	-----	---

You can draw lines, semicircles, circles and polygons using this toolbar.

As soon as you have completed a drawing action you can move, modify or delete the element you have just drawn.

The frame defines the size of the symbol and can be set individually for each drawing.

The frame cannot be made smaller than the symbol itself.

Using this \blacksquare button you can define connections (pins).

Connections can only be placed on the highlighted grid points.

You can select a connection type by clicking the pin.

The connection is marked red. It is currently not possible to select more than one pin.

Double-clicking on a connection opens the following dialog box with data about this connection:

Edit Pin
Properties: Pin Type: RF Output ID: 7 Group: 0 Max current: 99 A Remote Supply Possible Redundant Do not show level in Amplifierist Can be open Connector Reference: Type: Free Reference:
Cancel OK
It is possible to activate and deactivate these pins via the button This function does not affect calculation and display in AND.
Using the button, you can assign text to the symbol, independently of the grid.
If surfaces have been drawn, you can define the sequence of the levels with the \square
Clicking the button hides the grid

button.

1.5.2 Context menu

2	
· · · · · · · · · · · · · · · · · · ·	
Edit	
Style	
Move	
Delete	Del
Cut	Ctrl+X
Сору	Ctrl+C
Paste	Ctrl+V
Create New Frame	
Create Reverse-Path Frame	
Set as Reverse-Path Frame for	
Replace Frame	
Delete Frame	
Change Frame Number	
View Scale	
Flip Frame Horizontally	
Flip Frame Vertically	
Create Rotated-Flipped Frames	
Load block	
Save block	

A context menu opens when you press the right mouse button (mouse pointer must be positioned on the center section).

You can now:

- Edit pins
- Change line styles
- Move selected drawing objects
- Execute the functions cut, copy, paste
- Create new frames, delete frames, generate a reverse-path frame or set a reverse-path frame.
- As it is possible to create several drawings for each symbol, you can implement different forms of representation for one and the same symbol, for example, for different drawing hierarchies. However, only the first drawing can ever be written to the AND-DOS-compatible part.
- Scale the view
- Load a block
- Save a block.

You will find more detailed information in the description of drawing functions.

1.5.3 Frequency slope display window

This tab is used to graphically display the data for the frequency slope of the attenuation and gain from the right-hand section.

It appears for cables and symbols that could have frequency slope data.

For symbols, the interpolation between the measuring points is linear, for cables, the interpolation algorithm uses theoretical knowledge about the attenuation curve of a coaxial cable.



1.5.4 CSO, **CTB** calculation window



These windows only occur in the ARD version.

For symbols representing amplifiers with loaded measured data or an additional instance of the amplifier, two additional tabs labeled "CSO" and "CTB" appear for the calculation of the characteristic curve and the noise spectrum from the measured data in the right-hand section. Please turn to the relevant chapters for more detailed information.

1.5.5 Inserting an image



With this function you can assign an image, assign a link or delete an image already stored.

1.5.6 Overview of ARD

With the program "*Amplifier Raster Design*" (ARD) you can calculate the entire CSO/CTB spectrum of coaxial CATV amplifiers for any frequency raster in cases where you have fewer CSO/CTB measured values.

It is irrelevant to which raster the measured values apply.

Instead of CSO/CTB measured values, you can also use a series of KMA/IMA data items, for example, from a DIN measurement station.

It is possible to simulate or calculate the change in the CSO/CTB spectrum of the amplifiers during preemphasis or gain ripple (input or output level alignment), i.e., the measurement station no longer has to be calibrated to a linear amplifier output level to be able to determine standard parameters.

With "Amplifier Raster Design" you can compare different CSO/CTB measurement series of a coaxial CATV amplifier.

The software also helps you to define frequencies to be measured for the CSO/CTB spectrum in multiple channel measurement.

Of course, you can also document the calculated data and store it in the library.

Who is "Amplifier Raster Design" intended for?

CATV developers and operators of a multiple-channel measurement station whose efficiency will increase manifold through the use of ARD.

DIN 45004 measurement station users can calculate the CTB and CSO spectrum for CENELEC and any other rasters from a KMA/IMA data series.

1.5.7 Overview of NRD

Another program, the "*Network Raster Design"* (NRD), is available to CATV developers, network planners and operators.

This program permits the cascade calculation of CNR, the CSO/CTB spectrum of CATV networks with respect to the output level ripple of the CATV amplifier and its preemphasis.

The NRD can also calculate the CNR, CSO/CTB spectrum for laser-optical CATV systems and their cascading with coaxial CATV networks.

1 General information

1.6 Right-hand section

1.6 Right-hand section

Ubject No.: [16		DB-ID:	
Name: Blitzpfei	il (NzP)	Color:	•
Order No.:		Price: 0.00	/pc
Article No.:		Version: 1	1
Manufact.: 0		-	new
Availability			
Check	C from:		_
Description Test			
Short description: Blitznfeil NzP			
Short description: Blitzpfeil NzP			
Short description: Blitzpfeil NzP Language independe	ent Data:		
Short description: Blitzpfeil NzP Language independe Mounting Time	ent Data: : 0.0min		
Short description: Blitzpfeil NzP Language independe Mounting Time Screening > 80 MHz	ent Data: : 0.0 min : 0.0 dB	Screening 5-65	MHz: 0.0

The data of the components are edited in the right-hand window of the AND component editor.

In ARD, the right-hand section is also used to enter and select measured data.

The right-hand section consists of a selection of windows, only one of which is ever visible at any one time.

To switch from one window to another, select the tab on the lower edge of the display which places the associated window in the foreground.

Besides the basic data, the symbol data, the object attributes and the pins

(component connections), you will also find the "data packets" which exist for all symbol types.

1.6 Right-hand section

1.6.1 Basic data

The basic data are identical for all elements and can be created in several languages. The basic data consist of two areas:

a language-dependent area, which is located inside the frame of language-dependent data, and a language-independent section.

Components can contain language-dependent basic data in several languages. The language-dependent data are stored separately for each language.

For example, if you change the supplier in French, the supplier does not change in another language.

The language-independent data, however, apply globally to all languages.

- Language-dependent data: Name, order No., item No., supplier, price, available packet sizes, availability, tender text and brief description
- Language-independent data: Mounting time, display color, shielding values, version and special type designations.

Menu item "Edit/Edit basedata list" helps you to update the basic data information for all objects in the library in question.

ID	Tune	Name	Short	Mounti	Price	Order No	Article	Supplier	Long Description 1	Long Descriptio	Long Description 3	Long A
11	Tan	Ab 110.962	1v 10	0.0	0.00	28000020		0	Abzweiger 1,10, (862			
1	FOL	Fz 35	Entzerr	0.0	0.00	F235		0	Entzerrer 35			
2	FOIL	Ez 4 5	Entzerr	0.0	0.00	Ez 4 5		ň	Entzerrer 4.5			
3	FOU	E255	Entzerr	0.0	0.00	F255		0	Entzerrer 5.5			
5	FOU	Ez 7 5	Entzerr	0.0	0.00	Fz 7 5		ů.	Entzerrer 7.5			
6	FOU	E285	Entzerr	0.0	0.00	F785		0	Entzerrer 8.5			
7	FOU	E295	Entzerr	0.0	0.00	Ez 95		ů.	Entzerrer 9.5			
10	FOIL	Fz125	Entzerr	0.0	0.00	Ez 12.5		ñ	Entzerrer 12.5			
11	EQU	E2135	Entzerr	0.0	0.00	Ez 135		ñ	Entzerrer 13.5			
12	FOIL	Ez 145	Entzerr	0.0	0.00	Ez 145		ñ	Entzerrer 14.5			
13	EQU	Ez 15.5	Entzerr	0.0	0.00	Ez 15.5		0	Entzerrer 15.5			
14	FOL	Ez 16.5	Entzerr	0.0	0.00	Ez 165		Ô.	Entzerrer 16.5			
101	Passive Comp	KHK 4/20	Kontak	0.0	0.00	28000020		0	Kontakthülsenkunnlun			
102	Passive Comp	SK 1tKx	Schrau	0.0	0.00	SK 1tKx		0	Kabelverbinder nur 1tK			
1	Connector	KESJ	KESJ	0.0	0.00	28000020		0	Kahelendstecker 4/20			
2	Connector	KESN	KESN	0.0	0.00	28000020		0	Kabelendstecker 4/20			
3	Connector	KESO	KESQ	0.0	0.00	28000020		0	Kabelendstecker 4/20			
4	Connector	KESS	KESS	0.0	0.00	28000020		0	Kabelendstecker 4/20			
8	Connector	KESH	KESH	0.0	0.00	28000021		0	Kabelendstecker 4/20			
ŝ n	-	1100.0.11										

The list contains all objects of the library.

The basic data can be generated in multiple languages.

There is a separate tab card for each language that is created. This is where you change all basic data contained in the library.

Edit the data by clicking on the line you wish to shange

Edit the data by clicking on the line you wish to change.

If no basic data is entered for an object in one of the other languages, three dashes are displayed in that line:

ID	Туре	Name	Short	Mounti	Price	Order No	Article	Supplier	Long Description 1	Long Descriptio	Long Description 3	Long
		140	1440									
1	Fiber	1x1		0.0	0.00			0				1
										575c	1777	
•						m						,

1.6 Right-hand section

1.6.2 Symbol data

This is where the symbol properties are edited.

This tab only appears if "Symbols" is selected in the left-hand window.

The component type of the symbol must be defined before the associated data packets can be generated.

A data packet specifies the RF, electrical or optical data between the different connections. If only one data packet is defined, it applies to all outputs opposite the input.

You can only create new data packets in the window with the basic data by means of the context window.

Which packet types can be created depends on the component type that has been defined. The following data packets are possible:

- Standard
- Antenna
- DWDM
- Terminal
- Equalizer
- Filter
- Power supply unit
- Opt. standard
- Opt. attenuator
- Opt. receiver
- Opt. filter
- Opt. transmitter
- Opt. amplifier
- Parabolic antenna
- Reverse-path receiver
- Bridge Point (NTU)
- Optical Bridge Point
- LNC
- Splice
- Wall outlet
- Trace
- Converter
- Amplifier

For component type "tap-off", you can enter attenuation values of the tap outlet not only via the standard packet but also directly at the pin (attenuation identical across the entire frequency spectrum).

1 General information

1.6 Right-hand section

1.6.3 Symbol properties



This is where additional symbol properties are defined:

- Automatic capability
- Entry of this symbol in an amplifier list
- All pins are power passing

LO	mponent Type:
Co	onnector 🗾
	Active Appartment Termination
Γ	Has Transponder No
	Autonet Compatibility
Γ	Show in Amplifierlist
•	Irrelevant for NIS generation
	Remote Supply
Γ	Adjust Standalone
(Set max current to all pins
e	Use in netlist
С	Use in civilworks
0	Use in both

NIS graphically represents the hierarchical structure of the network. By selecting the "Irrelevant for NIS generation" checkbox, you define that the relevant component will be ignored during generation of the NIS structure.

1.6 Right-hand section

1.6.4 Attributes

Attributes can be assigned to all objects. An object attribute consists of a name and its associated value. The name of the attribute must be unique. Add If you wish to assign additional object attributes to an object, click the button. Enter the name of the object attribute and the value. 0K Then confirm this dialog box with If the name already exists, this name will not be created. Edit You can edit existing object attributes with Object attributes Value Name X Object attribute Name: EAN Number Value: 081508150815 ٠ 0K Cancel A

Help is provided under the "Edit/Edit object attributes" menu item for quickly editing multiple objects in a single step.

1 General information

1.6 Right-hand section

Objects:	Attributes names:	Attributes values:	
Kabelabdeckstein Kabelmarke Kabelmarke mit Schwingkreis Kabelschacht Kabelschacht Kabelschutzhaube KESH KESH KESN KESS KHK 4/20 KIometerstein Kleiner Rohrdurchmesser Korrosionschutzeinrichtung (K Korrosionschutzeinrichtung (K Norrosionschutzeinrichtung (K Norrosionschutzeinrichtung (K Norrosionschutzeinrichtung (K Norrosionschutzeinrichtung (K Norrosionschutzeinrichtung (K Norrosionsmeßpunkt (KSM) Mast	EAN NUMBER	081508150815	Add attribute Delete attribute Set value for <u>all</u> Change <u>value</u>
New Symbol Nordofeil (NzP)		d on the left hand ci	Done
	ary are displayed		lue.
ou can select one or	more objects ir	n the list to change t	their attributes.
'ou can select multi	ple objects at or	nce by pressing the	(Strg) key + clicking on the objects
I subsequent action	s are applied to	the selected objects	s.
you want to insert	a new object atl	tribute, click	ribute
our opton o pope a th	at alwardy avist	- to observe the suis	ting object attributes

Now enter a name that already exists to change the existing object attributes.

The center list contains the designations of the object attributes that exist in the

selected objects. If the same object attribute is found in multiple objects,

it only appears once in the list.

You can only select one entry from the list.

To delete object attributes, click

All the values for the objects pertaining to the selected object attributes are displayed

in the right-hand list. To change these values, click

Only those object properties showing the selected value are changed. If you want to change value that applies to all object attributes that you selected

in the left-hand list, click Set value for all and then enter the new value in the "Object attribute" window:

Name	FAN NUMBER
rumo.	
/alue:	08150812150815
	Add this attribute to objects that do not have this attribute

Here you can additionally define that the new attribute is to be applied to all objects that do not yet feature this attribute.

Check the check box accordingly.

1.6 Right-hand section

1.6.5 Component connections (pins)

The following tab of the right-hand section shows the connection list for symbols. A connection is displayed red in the center section when it is selected. Depending on the component type you have selected, the following connection types are possible:

- Electrical connections
 - RF input

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P 10

M11

Xз

K 1

- RF output
- RF user output
- RF tap
- Loop-through input/output
- RF isolation point
- Power supply
- Mechanical connections
- Mounting
- Optical connections
- Opt. input
- Opt. output
- Opt. separator
- Mech. cable connection (splice box)

1.6.6 Adaptation

Clicking the Adaption Data button allows you to enter existing value pairs in the table in any sequence.

This button is only active when at least one connection is defined.

You can start a new line by pressing the key.

To sort your entries in ascending order and have them displayed as a diagram in the center window, click the <u>Sort</u> button.

1 General information

1.6 Right-hand section



1.6.7 Frequency slope measured data window

This window only opens if a symbol, cable or amplifier object is selected, if the symbol is an amplifier, a filter or an equalizer, or if the symbol contains a standard packet or is a cable. It is used to edit measured data for the frequency slope of a data packet (i.e. of an input/output pair). The entered data is displayed in the center section.



2 Editing Libraries Graphically

2.1 Loading / opening libraries

2 Editing Libraries Graphically

2.1 Loading / opening libraries

You can load an unlimited number of component libraries, each containing an unlimited number of objects for each heading simultaneously.

You can call up existing libraries using the menu item "File/Open" , using the toolbar $\stackrel{[]}{\sqsubseteq}$ or

with the shortcut Strg +

A file selection dialog box opens, in which you can select a library and load it with or by double-clicking with the left mouse button. Open



You can abort the action without making a selection using the Cancel

button or



2.1 Loading / opening libraries

2.2 Changing the working directory

You can change the working directory with menu item "Choose directory". The following dialog box opens.

Look in	AND4	•	+ 🗈 💣 🗊 -	
C.	Name		Date modified	Туре
Recent Places	ANDPlugins Config Drivers Install log		10/13/2010 4:22 PM 10/13/2010 4:22 PM 10/13/2010 4:22 PM 10/13/2010 4:22 PM 10/13/2010 4:22 PM 10/13/2010 4:22 PM	File folde File folde File folde File folde File folde
	<) III.		•

If the library you wish to edit is not located on your computer, you can set the path in the network, if you have a network, with the **Network** button.

2.3 Creating and editing libraries

2.3 Creating and editing libraries

If you want to edit an existing library, load it as described above. If you want to create a new library, select menu item "File/New",

click or press the shortcut	Strg	+ N	
-----------------------------	------	-----	--

An empty worksheet opens.

In the left-hand section you can select a category (Symbol, Cable, etc.) using the tab at the bottom of the screen and with the right mouse button you can then open the pop-up menu

for symbols

for cables

for connectors

New Object
New Group
Delete
New Exemplar
Import Measured Data
Export Measured Data
Export as XML

Ne	w Coax Cable
Ne	w Fiber
Ne	w Duct Package
Ne	w Group
Del	ete

New RF-Connector
New Group
Delete

for amplifier objects and costing objects.

New Object
New Group
Delete

If display according to user groups is selected, the following menu opens:

New Symbol
New Cable
New Pin
New Amplifier Object
New Calculation Object
New Group
Delete

Select the menu item for the component you wish to create.

In this pop-up menu you can, of course, also delete components again or create a new group. Multiple components are combined into one group.

2 Editing Libraries Graphically

2.3 Creating and editing libraries

If you want to draw a new symbol by activating the "New symbol" field, the following screen will open:



If you want to increase or decrease the size of the symbol frame place the mouse pointer on the lower right-hand edge of the symbol frame.

The mouse pointer changes shape. Now, keeping the left mouse button pressed, drag the symbol frame to the required size.

You can also increase or decrease the length and width of individual symbol frames. You can also change the frame of the symbol even after you have begun to draw the component.

However, the frame can never be smaller than the symbol itself.

2.4 The system drawing function

2.4 The system drawing function

The symbol is drawn graphically in the center section. You can activate different drawing modes on this



toolbar.

2.4.1 Selection mode

You switch to selection mode with the 🖊 button.

This is where you change the size of the frame, define and draw blocks, move text, edit pins, select drawing elements, and move or modify them.

2.4.2 Block funktion

If you want to delete or move an existing line group, for example, drag a border around the objects in question using the left mouse button. They are then displayed in red.

You can also select objects with the Shift key 1.

Keeping the Shift key pressed, click one after the other on the objects that you want to select.

If you click an object that is already selected, it is removed from the selection again. If you want to add more objects to your selection, keep the Shift key pressed and insert other objects using the selection square.

It does not matter whether these objects were already selected or not.

Example: Creating a block



The pin selected in the block (blue circle) is included in all actions. See also "Showing and hiding connections"

2 Editing Libraries Graphically

2.4 The system drawing function

2.4.3 Moving objects

After selecting objects, press the right mouse button to open a drop-down menu.

Edit	
Style	
Move	
Delete	De
Cut	Ctrl+)
Сору	Ctrl+C
Paste	Ctrl+\
Create New Frame	
Create Reverse-Path Frame	
Set as Reverse-Path Frame for	
Replace Frame	
Delete Frame	
Change Frame Number	
View Scale	
Flip Frame Horizontally	
Flip Frame Vertically	
Create Rotated-Flipped Frame	es
Load block	
LODU DIOCK	

Now you can move the selected objects.

The easiest way of moving objects is to grab them with the mouse and then drag them to another position.

2.4.4 Cutting, copying and pasting objects

¥ 🖻 🛍

These actions can be performed with the help of the context menu. Other options are also available for performing these actions:

with the shortcuts familiar to you or by selecting one of the buttons shown here.



If you keep the Ctrl key pressed while you move an object you will create a copy of the object. Once you have copied an object or a group of objects to the clipboard, you can select another symbol or draw a new symbol and then insert the contents of the clipboard into it.

The clipboard is overwritten with the commands (strg) + (x) or (ent) or (ent)
2.4 The system drawing function

2.4.5 Saving and loading objects

These actions can only be performed using the context menu.

You can save an object or a group of objects to a file to use them again later. Select the objects and right-click one of the selected objects. Then select the function **Save Block** from the context menu.



Enter a valid file name here.

If you want to use an object you have saved again, proceed as follows. Select the ${\bf Load}~{\bf Block}$ function via the context menu .

IVIOVE	a : N ()		·
Delete	Organize INew foi	der	855 👻 🛄 🧐
Cut	🚖 Favorites 🥈	Documents library	Arrange by: Folder
Сору	🚾 Desktop	Includes: 2 locations	
Paste	Downloads	Name	Date modified
Create New Fra	Recent Places	📕 Visual Studio 2010	10/7/2010 9:07 AM
Create Reverse	😂 Libraries	🌗 Visual Studio 2008	9/1/2010 4:26 PM
Set as Reverse-	Documents	🍌 Visual Studio 2005	9/1/2010 4:09 PM
Replace Frame	A Music	🥼 Outlook-Dateien	10/14/2010 12:55
Delete Frame	Pictures	퉬 Bibiliothek	9/7/2010 4:27 PM
Change Frame	Videos	twest1.leb	10/14/2010 1:24 F
View Scale	<u>6</u>		
Flip Frame Hor	🖳 Computer 🛛 🔻		
Flip Frame Vert	File	name: twest1.leb	✓ LibEdit Blocks(*.leb) ✓
Create Rotated			

Make your selection here.

The object is now "attached" to the cursor.

Click the left mouse button to deposit the object inside the grid.

Complete the action by clicking the left mouse button again or pressing \square



2.4 The system drawing function

2.4.6 Scaling a view

This function allows you to change the size of the object in order to edit it. The scaling factor can be anywhere between 1 and 50.

Alternatively, you can also scale the object step by step with the \bigcirc or \bigcirc keys.



This function has no effect on the AND planning program.

2.4 The system drawing function

2.4.7 Drawing a line

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If you want to draw a line, press this button.

Click the starting point of your line and keeping the mouse button pressed drag a line to the end point.

•																																				
2				0				0				0				0				0				0				0				0				0
2		1			1	1		1			1								_		2				1			1	2		1			1		
																									1											
	2	2	1		1	1			1			-	1	1			1	1	_	1	2	1	1	0	÷	1	1	1	2	1	0	0	2	2		
0	0	0	- 7																		0	0	0	0	0	0	0		0	0	0	0	0	0	0	
					1	_																														
1	0	0		1	Г		Ś.					1		0		1		0	0	0	0			0	0		0	1	0	0	0	0	0		0	1
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•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	ΨĽ,	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	·	•	•	·	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	·	•	•	•	•	•	·	•	•	•	•	
۰.	٠	٠			٠		٠	•		٠	•		٠	٠		٠	٠	٠	٠	٠	٠	٠		٠	٠		٠	٠	٠	٠	٠	٠	٠	٠		
٠								+				٠				٠				٠				٠				٠				٠				+

Besides familiar functions such as Copy, Delete, etc., the context menu shown below (right mouse click) also includes functions for influencing the style of the lines.

<u> </u>			
·····			
Edit]	
Style			
Move			
Delete	Del		
Cut	Ctrl+X		
Сору	Ctrl+C		
Paste	Ctrl+V		
Create New Frame			
Create Reverse-Path Fr	ame		
Set as Reverse-Path Fra	me for		
Replace Frame			
Delete Frame			
Change Frame Numbe	r		
View Scale			
Flip Frame Horizontally			
Flip Frame Vertically			
Create Rotated-Flipped	Frames		
Load block			
C			

Here you can modify the line color and line thickness of individual lines or sections of lines.

2.4 The system drawing function



The altered line thickness is only visible when you call it up in AND.

Before you can delete, edit or move a drawn object,

you must mark it. You can mark a line by clicking it once with the left mouse button when the mouse pointer is positioned directly over the line.

If multiple objects are adjacent to each other, the object nearest the click point is selected.

However, if you want to select a different object, press the tab key.

Selection is only possible from among the objects that are near the click point.

If you cannot select the object you wish to edit, click again at a different position.

The element to be edited is then displayed in red and you can execute the relevant function.

You can undo this action by clicking the Cancel button or pressing the key.

2.4 The system drawing function

2.4.8 Drawing Polygons

If you want to draw polygons, select the 🖾 button. Make a click for each corner of the polygon.

To join up the polygon, click the right mouse button or press the $\underbrace{\texttt{Esc}}$ key.



You can subsequently change the shape of the polygon. Grab one of the corner points with the mouse pointer by moving the mouse pointer over the object while keeping the left mouse button pressed. Now you can release the corner points anywhere within the grid. You cannot generate additional corner points or delete them. You can edit individual polygons using the menu.

Please remember that older versions of AND may not support this function.

Here are some examples showing how they are represented in AND.

The line widths defined here are only visible in AND.

The defined filler color – yellow – is not visible until the polygon is deselected.

Here is the result in AND.



Line width: 3, Color: black Polygon filled, Color: gray Line width: 2, Color: blue Polygon filled, Color: yellow

2.4 The system drawing function

2.4.9 Drawing circles

\bigcirc

If you want to draw a circle, click this button.

First click a point that is to be the center point of the circle. Then pull the circle to the required size while keeping the left mouse button pressed. When you release the mouse button the circle is fixed on the grid. Circles are edited in the same way as polygons.



2nd step



Please remember that older versions of AND may not support this function.

2.4 The system drawing function

2.4.10 Drawing open circles, arcs

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```

If you want to draw **arcs**, click this button.

You define the opening of the arc with the first and second click you make in the drawing grid. A red line appears.

The subsequent dragging motion with the mouse defines the size of the arc. You complete this action with the third and final click.



Arcs, too, can be drawn in different ways.

Examples:



This variety of possibilities also allows you to draw graphical symbols used in other technologies, so that you can prepare sophisticated documentation for other systems, too.

Please remember that older versions of AND may not support this function.

2.4 The system drawing function

2.4.11 Order of the drawing levels

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같
```

Polygons and circles can be shown filled.

It is therefore necessary to define the order in which objects that overlap are to be displayed. Click this button to enter Z-order edit mode.

Numbers are now assigned to each object, indicating on which drawing level each object is located.

The individual objects are numbered starting from the lowest number.

The object assigned the lowest number is located at the bottom level (background). The subsequent numbers indicate in which higher level the remaining levels are located (foreground).

Lines are always located in the foreground.



Now click the objects in the sequence they are to overlap each other.

Start from the background.

The last object to be clicked can be recognized by the number in the blue box.

If you do not wish to start at the backmost object (number 1) but at a different position,

keep the strg pressed while clicking the object from which you want to start numbering.

Release the (strg) button and continue numbering as described above.

You can restart numbering by clicking the 🖾 button again.

Free texts are also subject to Z-order.

2.4 The system drawing function

2.4.12 Inserting free texts,

Abc
1

If you want to label objects, select this button. Now, left-click on the position where the text is to appear in the drawing. The "Edit Text" dialog box opens. Enter a text here and adapt the formatting.

ize: 12	Angle: 0
Style	Alignament
	C Right C Bottom

The text is positioned when you confirm your entries. If you want to edit your text, go to selection mode.

Double-click to return to the "Edit Text" dialog box. You can access the change color option from the context menu opened with a right mouse click.



Remember that older versions of AND may not support this function.

2.4 The system drawing function

2.4.13 Dynamic Labels

See also the description of dynamic labels in the AND Client documentation.

2.4.13.1 Create Dynamic Label

For creating a dynamic label for a pin, press this button:

Draw the rectangle for the text. The following dialog will appear:

Edit text		>	×
Text Size: 12	Ang	le: 0	Number Out Next (%NON) Number In Next (%NIN) Address Out Next (%AON)
Style Italic Bold	Alignament C Left C Center C Right	 Top Base line Bottom 	Address In Next (%AIN) Number Out Final (%NDF) Number In Final (%NIF) Address Out Final (%ADF) Address In Final (%ADF) Pin Name (%PI) Pin Info (%PI)
refers to pin: 0 Can	cel OK		Installation Number (%INO)

By clicking on the arrow, you can choose a placeholder variable for the dynamic label and enter additional text manually. Multiple placeholders can be entered, too.

The dynamic label has to be assigned to a pin to which it refers. This pin is used to calculate the value of the dynamic label in the connected network. To refer a label to a pin, enter the internal pin Id in the field "refers to pin".

Moreover some formatting options exist.

2.4.13.2 List of variables for dynamic labels

The list in the dialog contains only the most important variables. More combinations of 3 letters are available (for dynamic labels and splice/patch reports):

<What:1character><Where:2 characters>

Examples:

NON NameOutNext

AIF AdressInFinal

The following components of the variables are available:

What	Description
N	Numbers (Path of numbers, possibly relativized, see dynamic Labels)
A	Address (inherited from hierarchy if empty for object)
С	"Context", hiearchy context: hierarchy without lowest level (splice/pin)
Т	Type (of the lowest path, not inherited)
I	Info (type dependent)
0	O bject-Id (Installation No., Pin name,) of lowest hierarchy level,
	(without replacement by type or replacement string)
Р	P ath (whole hierarchy path, not relativized)
J	Ob J ect-No. of object containing the pin
	(incl. replacement)
М	Mounting (Object-No.+Rack-Pos.) of object containing the pin

2.4 The system drawing function

	(incl. replacement)
R	Rack-Position of object containing the pin
	(incl. replacement)
Y	Cit Y of object
Z	Zip code of object
L	Innermost Location rectangle with non empty installation number
19	Path part of the object $(1^* = O^*)$

Where	ere Stands for Description		
TH	This	Start/reference point (list in the report/label start)	
ON	Out Next	Next connection point, following connection away from symbol	
OF	Out Final	Last connection point, following connection away from symbol	
IN	In Next	Next connection point, following connection through symbol	
IF	In Final	Last connection point, following connection through symbol	
PP	Partner Pin	Partner pin of starting point (used for mounting pins)	
TP	Traverse	Partner pin of traversed symbol	
		(for future implementation of dynamic labels for links)	

There are (13+9)*7 = 154 combinations, e.g. "NON". "1TH".

Optionally, bundle and fibre information can be appended to each of these values to do so, append e.g. to %NON for an ONT having more than one fibre:

- .B<m> (m=1,..): route for bundle m (up tp first bundle split)
- .B < m > .F < n > (m=1,.., n=1,..): route using bundle m, fibre n
- .F<n> (n=1, ...): route using bundle 1, fibre n
- If m=0 and n=0, routing proceeds without wire information.

Examples:%NON.B1.F2,%AON.F1

2.4.13.3 Automatic pin assignment

Dynamic labels may also be created without assigning them to a pin manually and can later be assigned to a pin according to their position to the nearest pin. To activate this function, select multiple dynamic labels and from the context menu select the command "Reference Labels to Pins".

The following dialog will appear:

Reference Labels to Pins X
Pin position tolerance:
$\ensuremath{\overline{\bullet}}$ assign label to the next pin on top
\bigcirc assign label to the next pin on <u>b</u> ottom
o assign label to the next pin on left
C assign label to the next pin on right
OK Cancel

You may enter the maximum tolerance of the distance of the dynamic label to the pin as well as the direction of assignment. If the assignment cannot be done for all labels, a message appears.

2.4 The system drawing function

2.4.13.4 Pin Data for display in dynamic labels and reports

For displaying the pin in a dynamic label or in a splice/patch report, at least the **(Port)Name** should be provided:

lit Pin			
Properties:			
Pin Type:	Splicepoint	-	ID: 2
(Port)Name:			🔽 Patch pin
Info:			
Number of S	Splicepoints: 1		
Do not sho Can be op Connector Ref	ow level in Amplifier ben erence:	ist	
Туре:	Free		
Reference:			
		Cancel	ОК

Dynamic labels allow to display values from the next/last connection points in the connected network. Since not all pins should be considered as connection points (e.g. only the patch ports of the front of a patch field should be considered but not the pin of the back of the patch field with the whole bundle connected), pins have to be activated as being a **Patch pin**.

Patch pins define (together with splice points, terminating devices and path dividers) the **con-nection points** to be considered and displayed in dynamic labels and splice/patch reports. Moreover, patch pins may be displayed in splice/patch reports (like for the dynamic labels, only the front patch ports of the patch field should be listed, but not the back pin for the bundle).

2.4.13.5 Automatic naming of Pin/Port Names

Pin/port names may automatically be assigned. Chose "Autogenerate Pin Port Names" from the context menu of a selection of pins.

The following dialog is displayed:

Automatic Pin Port Naming	×
Prefix:	
Start value: 1	
Step: 2	
ОК	Cancel

You may enter

• a prefix

(e.g. for selected pins 1,...,9 you may choose prefix "P0" and for selected pins 10,11,12, you may choose "P", such that the alphabetic sorting oft he port names will work as expected)

2.4 The system drawing function

- the start value
 - (e.g. 10 (with prefix "P"))
- the step (e.g. in combination with start value 1 resp. 2 if there are two rows of pins with the even and odd numbers in the patch field).

Please take care for names which are alphabetically sortable, such that hierarchy sorting works in splice/patch reports, i.e.

not: P1, P10, P11, P12, P2, P3, P4, P5, P6, P7, P8, P9

but: P01, P02, P03, P04, P05, P06, P07, P08, P09, P10, P11, P12.

2.4.13.6 Patch fields

Patch fields have the same data as splice boxes, only some behavior is different:

- for patch fields, pins are by default activated as patch pins,
- automatic splice assignment by default is "Row assignment",
- Patch pins by default have a female connector reference, spliceboxes have none.

Row assignment of splices automatically assigns the pin with the maximum number of splice points the lowest with the lowest number splice points. The assignment order is determined from left to right and then downwards, i.e. first the uppermost row of pins is assigned left to right, then the next downward row, ...

2.4.13.7 Parent hierarchy for Symbols

Mounting symbols can be given a parent hierarchy, by marking the child symbol in the tab **Symbol Data** as being an **Assembly Unit** and by giving it an **Assembly Unit Level** lower than the assembly unit level of the parent.

Example: assembly unit level 0 for a patch field symbol and assembly unit level 1 for a rack symbol. If in AND the patch field is then mounted into the rack, the rack can be recognized as being a parent by considering the assembly unit level. E.g. for the rack with installation number R0117 and the patch field with installation number PF04 and an pin with name P01 the hierarchy path of the pin can be computed to be R0117-PF04-P01 if the assembly unit data has been entered as explained above.

See also the notes on the two documentation styles.

2.5 Connections (pins)

The connection selection is dependent on the component type.

The component type should be defined first.

The connection types (see below, Section 2.5.1) can be structured in three groups:

- RF connections:
 - RF input
 - RF output
 - RF user output (only useful for outlets)
 - RF tap (only useful for taps. Use with other component types is strongly discouraged.)
 - RF isolation point (internal intermediate point)
- Optical connections:
 - Optical input
 - Optical output
 - Opt. separator (optical intermediate point)
 - Optical connection (non-directional optical connection)
- Other connections:
 - Mounting (for placing multiple components on or next to each other)
 - Power supply (power passing connection)
 - Mechanical cable connection (mechanical contact point for splice boxes)

RF connections are possible for RF components; optical connections, for optical components. The types "Mounting" and "Power supply" are possible for all components.

2.5.1 Connection types

A list of possible connection types is given in this overview.

RF input	a signal entry point of an RF data packet
RF output	a signal exit point of an RF data packet
RF user output	 a signal exit point of an RF data packet can alternatively be assigned a tap loss in the "Attenuation" field, this side loss with respect to the input is identical across the entire frequency spectrum used as a subscriber connection for antenna wall outlets and for test sockets on amplifiers a measuring point but no cable can be connected here
RF tap	 a signal entry point of an RF data packet can alternatively be assigned a tap loss in the "Attenuation" field, which is, however, identical across the entire frequency spectrum used for tap outputs of multi-taps and taps
RF isolation point	 internal signal entry or exit point between two RF data packets, also RF separator used, for example, to define different gain levels of an RF amplifier not used as a component input or output because even though it is possible to select the connector reference here, this is not taken into account in AND
<i>Opt. separator</i>	 internal signal entry or exit point between two optical data packets not used as a component input or output because even though it is possible to select the connector reference here, this is not taken into account in AND
Mounting	 used to implement mechanical connections or semi-automatic/automatic combination of individual symbol parts to form one whole object
Optical input	a signal entry point of an optical data packet
Optical output	a signal exit point of an optical data packet
Optical connection	 an optical signal entry or exit point of a standard optical data packet. Only possible for component types: "Terminal" and "Opt. adapter"
Mech. cable con- nection	 only possible for splice boxes and used to implement mechanical connections between a fiber-optic cable and a splice box, the number of contact points describes the max. number of fiber strands in a fiber-optic cable for this pin in AND
Power supply	• entry or exit point of the power supply

2.5.1.1 Pins of type "loop" no longer supported

Loop pins are remnants from AND 2. In AND 2, loop pins were necessary to define converters which combine signals. They were also used to define neutral pins for 1:1 connectors, for instance, i.e. input or output pins, depending on the context. There has been no need to create loop pins in LibEdit since AND 3, but for compatibility reasons they have been kept in the program. Loop pins cannot be created any more in LibEdit 4.9 and later versions. AND 4.9 can still calculate objects with loop pins. It converts loop pins to inputs/outputs, depending on the context.

You cannot create loop pins in LibEdit 4.9 and later versions. If an old library is loaded and a symbol with loop pins is selected, the following message appears:



There is no urgent need to revise old components containing loop pins. Those components are still calculable in AND.

Example of how to redesign such an old component:

2.5 Connections (pins)

Old design:

Eile Edit View Window ? D Image: Comparison of the second se	<u>?</u>	- B ×
Auto Nr. 001 Auto Nr. 002 Auto Nr. 003 Auto Nr. 003 Auto Nr. 004 Auto Nr. 005 Auto Nr. 013 Auto Nr. 006 Auto Nr. 007 Auto Nr. 011 UFS 206 UFS 206 UFS 56 UVS 10 DSR-Ums. UWS 10 DSR-New		Deutsch New Language Language dependent Data: Dbject No.: Object No.: 82 Name: UWS 10 DSR-Ums. Order No.: 26676. Article No.: 260149 Manufact:: 100 Kathrein-Werke KG Availability C from: Check C to: Description Text: Description Text: Umsetzer für Digitalen-Sa Hohe Sel. OFW / Sammellei * * III * FINS

In the old design, there is only one converter pack from pin3 to pin4; pin1 and pin2 are of type "loop".

2.5 Connections (pins)

New design:

LibEdit - [KATH2GGA.LIB]		
Image: Constraint of the second state of the second st	• - Heb #**	Deutsch New Language Language dependent Data: Object No.: 14 Name: UWS 10 DSR-New Order No.: 2676. Article No.: 260149 Manufact.: 100 Kathrein-Werke KG Availability C from: Check C to Description Text: Umsetzer für Digitalen-Sa Hohe Sel. OFW / Sammellei + + Power Converter Standard
Press F1, to obtain help.		NUM

In the new design, the loop pins are converted to one input (pin1) and one output (pin2).

In the base data context menu, a standard pack from pin1 to pin2 is created, and the converter pack is changed to go from input pin4 to output pin3 and pin2.

Since a converter is a component with a fixed direction, in the new design pin2 is a fixed output, and pin1 is a fixed input. If the pins are to remain flexible, you can create a second frame and swap the positions of pin1 and pin2.

1:1 connectors are objects without direction, therefore there is no need to create a second frame.

2.5.2 Drawing connections



Create a connection for a symbol by clicking this button. Then click on the insert position for this connection.

You cannot create two connections on the same grid position.

Connections can only be positioned on the highlighted grid points.



- You can show or hide the drawing grid with the button.
- You can show or hide the connection grid with the 🛱 button.

2.5.3 Optical connections, RF connections, power supply

The connection that can be selected depends on the component type.

The component type should be defined first.

In the "Edit Pin" dialog box you can now define the attributes for this connection.

Properties: Pin Type: RFInpu		1
Group: 0	Max current: [99	A
Remote Supply I	Possible	
Conot show lev	el in Amplifierist	
Connector Reference	el in Amplifierist e:	
Do not show lev Can be open Connector Reference Type: Free	el in Amplifierist e:	

Each new connection defined is automatically assigned a consecutive connection number which cannot be edited.

Properties:	- ID: 4
Group: 0	Max current: 99 A
Do not show leve	el in Amplifierist
Connector Reference: Type: Free	

When you select a check box in the dialog box, the connection in question will be

power passing, with the exception of optical connections, now you can enter the max. current carrying capacity of the pin in the enabled "max. current" entry field.

- will be treated redundantly in AND
- will not be included in the amplifier list
- will be accepted by AND as an open connection.

2.5.4 Mounting points

Mounting points have no electrical function.

They permit the semi-automatic and automatic combination of multiple symbols (Macro). When you use a macro with semi-automatic mounting in AND, after selecting a basic object a dialog box opens prompting you to select one of the objects offered.

In automatic mounting, no dialog box opens when you select a basic object.

The macro is automatically assembled from the available objects in the background and then appears ready for use at the cursor.

A mounting point is inserted in each of the grouped symbols, "automatic mounting" selected where necessary and assigned to the same mounting group.

The mounting points are drawn to match up in the graphical display if the individual symbols are correctly combined.

A macro can contain an unlimited number of components.

Two objects of the same component type cannot be mounted together.

All mounting points of a macro should be located on one basic object.

The objects to be mounted do not have to belong to the same group.

Some examples of macros







2.5.4.1 Organizing mounting points

The newly defined mounting point is entered in the connection list with an automatically assigned "ID number".

Mounting points are organized in mounting groups in the "Edit Pin" dialog box. The connection list applies across all symbols for all frames.



and then labeling the group, you can specify whether the mounting point is to be mounted automatically with another object.



When you have confirmed the dialog boxes with ____OK ___ the mounting point is aligned on the grid.

٠	•	•	•	٠		•	•	٠		•	•	٠	•	•	•	٠		•	•	٠		•	•	٠
•	•	E	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	٦.		
•	•					•	•	•	•		÷		•	•	•				•	•	•	Т	÷	
•	•					•	•	•			÷		•	•	•				•	•	•	Т	÷	
٠	•			٠		•	•	٠	•			ŧ	•	•	•	٠		•	•	٠	•	Т		٠
•	•				•	•	•	•	•		•		•	•			•	•		•	•	Т		•
•	•		•	•		•	•	•	•	•	•		•	•	•			•	•	•	•	Т	•	•
•	•		N		л.	1	N	•	л	2	•		•	•	N		х	2	N	•	4		•	
٠	•	н	+	¥	+	1	+	¥	+	3	-	+	-	-	+	¥	4	2	+	¥	+	4	•	٠
•	•		1		I.	-	1		I.	7				•	1		1	-			1	Т		
•	•	Т				•	•	•	•		÷		•	•	•				•	•		Т	÷	
•	•					•	•	•			÷		•	•	•					•		Т	÷	1
٠	•			٠		•	•	٠				ŧ	•	•	•	٠			•	٠		Т		٠
•	•				•	•		•	•		•		•	•				•		•	•	Т		•
•	•					•	•	•	•		•		•	•				•	•	•	•	Т	•	•
•		L	_	-			_	_	_	_	_	_	_	_	_	-		_	_	-	-			
٠				+	۰.						۰.	+	•			+	۰.			+				

2.5 Connections (pins)

	Edit Pin		
Part 1	Properties: Pin Type: Assembly Pin Can be open Mounting Group:	ID: 1	
	Pat 1 Edit G		

▼ ID: 1

Edit Groups...

x

▼ ID: 1

mount automatically

Edit Groups...

×

▼ ID: 1

Edit Groups...

Pin Type: Assembly Pin

Edit Pin

Part 4

Properties:

Pin Type: Assembly Pin

Can be open Mounting Group: -Part 1 Part 2

Edit Pin

Properties:

Part 1 Part 2 Part 3

Pin Type: Assembly Pin

Can be open

Can be open Mounting Group: -

Now create the remaining mounting objects and reference the mounting points accordingly.

The completed mounting in AND:

°art 3

 <mark>Part 1</mark>	Part 2
Part 3	Part 4

2.5.5 Creating macros

The basic object contains ALL mounting points positioned precisely where the corresponding mounting objects are to be inserted. To generate a macro proceed as follows.

Create all 7 individual components.

2.5.5.1 The basic object



Draw the symbol for the basic object. Generate and organize the required mounting points. Create the required mounting groups. Label them and give them shape, if necessary.

2.5.5.2 The mounting objects

Finally, create all the necessary mounting objects one after the other together with their mounting points and organize them as described above.



2.5.6 Mechanical cable connection (splice box)

Mechanical cable connections can only be selected for splice boxes. Enter the number of splice points of this particular connection in the "Number of Splicepoints" entry field.

Properties:	
Pin Type: Splicepoint	▼ ID: 1
Number of Splicepoints	amplifierist
I✔ Can be open	

These splice points are called "pins".

In the cabling area, these connections are drawn in gray in the outer rectangle. The pins are drawn in black in the inside rectangle.

	Description: Port 1 with 6 subwires
Port Description	
<u></u>	Automatic splice Direction: C Left C Opposite Splice

You can enter a name for each connection.

To do this, click the connection, enter a name and click

When you move the mouse over the port, its name will appear in the display field. You can also have information about the pins displayed when you move the mouse over the pin. However, you cannot enter any data for pins here.

In AND you can plan standard cabling for splice boxes. Depending on the setting of "Editable in AND" option (see figure above), you can define whether or not the standard values can be edited in AND.

If this option is deactivated, the splice box cabling can only be edited in the component editor. This information is backed up in the splice packet.

0K

A splice box can only contain one splice packet, which is automatically generated by the component editor.

2.5 Connections (pins)



You can also add links to a splice box manually.

A connection can be linked to several pins, but a pin can only have one link. To add a new link, click on a pin and draw a link to another pin. This link is displayed in black.

If you do not finalize the link at a pin, that link will be removed again.

It is not possible to make a link to a pin that is already assigned.

You can remove existing links by clicking on an assigned pin while keeping the mouse button pressed.

The connecting line turns blue and the pin turns red.

When you drag the line into a vacant space and release the mouse button, the connecting line is removed. However, if you place the connecting line on a new pin, a new link is created.

If more connections and pins are defined than can be displayed, a scrollbar automatically appears



If you attempt to draw a link to a pin outside the visible area, the image automatically scrolls. The "Automatic splice" function will help you create a link automatically.

Automatic splice		
Direction:		1
C Left	Splice	
 Right Opposite 		

If you selected the setting "Left" or "Right", the pins on the right and left sides are connected to the upper and lower pins.

If you selected the setting "Opposite", the left pins are connected to the right pins and the upper pins are connected to the lower pins.

It is not yet possible to automatically remove links that were created automatically.

2.5.7 Cable and connector references

References support automatic connector search in AND.

References to associated reference numbers apply across libraries and cannot be changed by the user.

Cable and connector references are necessary for explicitly defining which connection options are available for cables, connectors/adapters in AND.

To uniquely identify cables and connectors, one unique reference from a list can be assigned to each type.

This reference can subsequently be replaced by another.

Whenever a new connection, connector or cable is generated, it initially has no reference.

After you have created a new connection, connector or cable, dialog boxes are provided for selecting a reference from a large selection of references.

Click this button to make your selection in the product-specific dialog boxes.

for RF-cables	for symbols	for fiber-optic-cables
		Fiber Data:
		Wavelength:
	Edit Pin	Attenuation / Inc. JD
Properties of Cable:	Properties: Pin Type: RF Input ID: 1	Atternation / xm de Dispersion: ps/(nm*km) IOR: 1 Cutoff Wavelength: 700.0 nm
Hesistance.	Group: 0 Max current: 99 A	Zero-Dispersion W/avelength 700.0 pm
Linestyle:	Remote Supply Possible Redundant	Helix Factor: 0 %
,	🔲 🔲 Do not show level in Amplifierist	Number of bundles: 1 Wires per bundle: 1
I No double line ☐ Readymade (fixed length)	Connector Beference	Linestyle: Opt. Standard 💌
		Colorcade: Show
Cable reference:	Type: Free Reference:	Readymade (fixed length)
lype: Free		Cable reference:
Reference:	Canaal OK	Type: Free
		Reference:

for connectors/adapters

Type:	Free	
Reference:		
Туре:	Free	
Reference:		

2.5 Connections (pins)

References References C Undefined C Male connector Female connector C Cable C Undefined Plugs Plugs
 Id
 Name

 001
 F

 002
 EC

 003
 BNC

 004
 PG11

 005
 Zoll

 006
 IEC14

 007
 IEC12

 008
 S/8

 009
 SP

 010
 SR

 011
 3.5/12

 012
 PG13.5

 013
 N 75

 014
 N 50

 015
 7/16

 016
 4/20

 017
 KES

 Id
 Name

 001
 F

 002
 EC

 003
 BNC

 004
 PG11

 005
 Zoll

 006
 EC 14

 007
 EC 12

 008
 5/8

 010
 SP

 010
 SP

 011
 3.5/12

 012
 PG 13.5

 013
 N 75

 014
 N 50

 015
 7/16

 016
 4/20

 017
 KF
 Description F-Norm F-Norm IEC-Norm BNC deutsch englisch Zoll Zoll Zoll Postnorm Kabal End -Var fuar Po Cancel ΟK

 Male connector C Female connector C Cable Description F-Norm IEC-Norm BNC deutsch englisch Zoll Postnorm Kahal,End,Stanker fran Post 0K Cancel

The following selections are available to you for the types RF male/female connector:

Make your selection from this reference table for optical connector components.

M B	Name	Description	
1 10 1 20	iber 50 iber 62 5	Multimode Glasfaser 50 µm	
02 I 03 f	iber SM	Singlemode Glasfaser 7-9 µm	
00 N	0 Microduct 1.8 Microduct Verbindungsstecker	Microduct Verbindungsstecker	

RF cables are identified by their different dimensions.

ables					
Id Name	Diameter	Dielectric	Shielding	Shelting	
001 102/50	Diamotor	- Diologano	6 40- 6 40	7 40- 7 40	0
002 BG178		0.84-0.84	0.40 0.40	1.80-1.80	
003 BG174	40	1 50-1 52	1. a 1.	2 55- 2 80	
004 BG316	-	1.52-1.52	(e);	2.50-2.50	
005 RG179	-	1.60-1.60		2.54-2.54	
006 RG122	2	2.45-2.50	120	4.05-4.10	
007 RG13	90.	7.10-7.10		10.30-10.30	
008 RG8		7.20-7.20		10.30-10.30	
009 RG12	26	7.20-7.30	3.00	10.30-12.50	
010 RG9	2	7.20-7.20	120	10.70-10.70	
011 RG215	90.	7.24-7.30	8 . =36	10.30-12.50	
012 RG216		7.24-7.30	(*)	10.80-10.80	
013 200/50		7.24-7.24	8.59-8.59	10.80-10.80	
014 RG34	2	11.60-11.70		16.00-16.00	
015 SEC. 04	0.30-1.00	1.50-4.60	2.20-4.50	2.55-6.30	
016 106	0.50- 0.90	2.45-3.70	3.10-4.00	4.95-5.38	
017 RG59	0.57, 0.64	3 70. 3 71	4 50, 4 50	5 40, 6 20	0.7

The assignments of the various cable dimensions are given in the reference table. The internal reference numbers are listed in the "ID" column.

2.5 Connections (pins)

AND makes the necessary connection between cable and matching connector/adapter based on these numbers. Select a reference from this table for fiber-optic cable. This reference describes the type and dimension of an individual fiber.

a I	Name	Description	
401	filens fiber 50	Multimode Glasfaser 50 um	
402	fiber 62 5	Multimode Glasfaser 62.5 um	
403	fiber SM	Singlemode Glasfaser 7-9 um	
300	Microduct 1.8	Microduct Verbindungsstecker	

Note: If you do not define any references (undefined), AND may define one of these information types if these products are used.

AND	×
No valid conr	nectors/connections found!
	OK
AND Information	×
Found Co Missing C	nnections: 184 onnections: 0
OK	Show List

2.5 Connections (pins)

2.5.8 Reference groups

Reference groups can be generated for each library. We distinguish between two groups:

The global group

Id	Name	Description	Child references:	
281	Gruppe D	Klemmanschluß Dosen	15: SEC. 04	
282	Gruppe IEC	Schraub/Klemm IEC	17: RG59	
283	Gruppe A	Klemm.Abzw.		
284	Gruppe C1		20: 01 24: RG62 25: RG71 26: 107	
285	Gruppe L2	Lrimp groß		
275	Gruppe 1	Typen: -UT, -TT		
275	Gruppe 2	Typen: SEC. 04,-01,-11		
277	Gruppe 3	Typen: -U2, -240	29: 103	
278	Gruppe 4	Furruba,		
273	Gruppe 5	Ful Fuba,		
200	Gruppe 6	Fui Fuba,		
200	Gruppe /	ruer Leipzig;		

This is where references are logically combined.

That is, references combined in this group represent cables of similar dimensions, which due to their mechanical properties can be connected to a connection with the same ID. This is displayed accordingly in the right-hand column "Child references". These groups apply across libraries and cannot be changed by the user.

The local group

This group can be freely edited by the user.

2.5.8.1 Creating reference groups

You can open this dialog box with menu item "Edit local references"

 1	Child references:

You can open another dialog box with the _____ which allows you to create a new local group.

ID: Name:	1			_		
Description:						
Child references:	Avaia	ble references:				
	Id	Name	Diameter	Dielectric	Shielding	She 🔺
	001	102/50			6.40-6.40	7.40-
	002	RG178		0.84-0.84		1.80-
	003	RG174		1.50-1.52		2.55-
	004	RG316		1.52-1.52		2.50-
	005	RG179		1.60-1.60		2.54-
	006	RG122		2.45-2.50		4.05-
	007	RG13		7.10-7.10		10.30-
	008	RG8		7.20-7.20		10.30-
	009	RG12		7.20-7.30		10.30-
	010	RG9		7.20-7.20		10.70-
	011	RG215		7.24-7.30		10.30-
	012	RG216		7 24- 7 30		10.80.
	1					•

A new ID is automatically assigned to this group.

When you have made your entries under "Name" and "Description",

the necessary references to this group are added with a double-click. You can move down the list with the scrollbar.

If you want to remove a cable, delete it by double-clicking it in the list.

When you have completed your entries, confirm with ____OK___. Now you can either create a new group, continue editing the group or close the dialog box.

Insert

button,

ld Name	Description	Child references:
DEMO		2: 66178 2: 86174 4: 86316 5: 86179

Local groups can also be created for optical cables.

2.6 Frames

Frames allow you to display a symbol in different shapes and sizes.

By displaying a different frame, for example, a tap, you can also prevent cable crossing in AND.

It is possible to generate several frames for each component.

The frames of one particular symbol do not all have to be the same size or have the same number of pins.

Try to avoid altering frames, especially the number and position of the connections. All changes are executed in AND and may generate error messages.

2.6.1 Creating a frame

You can generate a new frame in the left-hand section by selecting an object for which you want to generate a new frame.

In the drawing (center section), open the context menu with a right mouse click and select the "Create New Frame" menu item.



2.6 Frames

When you have confirmed the context menu item, the drawing of the current frame is applied and the next frame is generated.

You can create any number of frames in this way.



3 additional frames have been created

You can now start editing the newly created frames.

For example, you can change the shape and color or merely the direction of the inputs and outputs.

All connection information from the 1st frame is transferred 1:1 and

remains unchanged in all frames.

2.6 Frames



Examples in AND

Here, Frame 4 has been selected to avoid cable crossings.



Frame 2 shows the smaller form of representation of an amplifier.

2.6 Frames

Frame 1 Amplifier -Frame Demo



Be careful with Frame 2. The connections have different positions.

2.6.2 Creating reverse-path frames

Amplifier symbols can be extended with reverse-path frames.

These reverse-path frames are informal in character and have no effect on the electrical properties of the amplifier.

These are defined using the data packet.

Where amplifiers have a socket for the reverse-path amplifier, AND automatically uses this reverse-path frame instead of the normal frame as soon as a reverse-path amplifier module is used.

You can define one reverse-path frame for each amplifier frame.

To create a new reverse-path frame, select the amplifier from the toolbar (see left-hand section), then, if necessary, switch to the required frame and select menu item "Create Reverse-Path Frame" from the context menu of the drawing area (center section):
2.6 Frames

AND LibEdit	00164		
File Edit View Window	?	Contraction of the second second	
Splicebox1			
New Symbol	. .		• • • • • • • • • • • • • • • • • • • •
Splicebox 2			. сапа:
		Edit	
		Style	
		Move	Del
	•	Cet	CHLY
		Cut	Ctrl+X Ctrl+C
		Paste	Ctrl+V
		Create New Frame	
		Create Reverse-Pat	h Frame
		Set as Reverse-Path	Frame for
		Delete Frame	
		Change Frame Nur	nber
		View Scale	
		Flip Frame Horizon	tally
		Create Rotated-Flip	y pped Frames
		Load block	
Symbols / Cable / Conr	1/ <u>2</u> /3/4/Picture/	LOUG DIOCK	
Deers El de abdeia bala			
Press F1, to obtain help.			
Create Reverse-Path	Frame.		

A new frame with the same drawing and the same connections is generated exactly as it is when a normal frame is created.

You can now modify this frame by graphically drawing the reverse-path in it.

2.6 Frames

Example:



Defined as a reverse-path frame

You cannot generate, move or delete connections in a reverse-path frame, as they have to be identical to the connections of the first frame to which this reverse-path frame belongs. As soon as you change the connections in the first frame, these changes are automatically applied to the reverse-path frame.

2.6 Frames

Here, a second frame (smaller) and a matching reverse-path frame has been generated:

😤 LibEdit
Eile Edit View Window ?
DER XRE 56 ?
Bislicebax1 Bislicebax2 Splicebax2 NE4.22
·/·/Symbols/Cable / Conr 1/2/Ripple / Picture /
Press F1, to obtain help.

If you use this amplifier in AND, AND either shows the reverse-path frame or the normal frame, depending on whether a reverse-path amplifier module has been inserted or not. At least one reverse-path module must be defined for this amplifier.



You can now select 4 types of representation for an amplifier, where Frame 2 and Frame 4 are automatically generated if you select a reverse-path module.

2.6.3 Set as Reverse-Path-Frame for...

As earlier versions of the component editor did not include a reverse-path frame, many users solved the problem by drawing a second frame with a reverse path which they replaced manually in AND whenever they required a reverse path. These frames can now be converted to reverse-path frames in older libraries. To do this, choose menu item "Set as Reverse-Path Frame for..." from the context menu



Frame 2 (drawing 2) is converted to a reverse-path frame when you confirm the action. Now update the symbol graphically. If there is more than one frame without a reverse-path frame, you will be prompted to select the corresponding frame for this reverse-path frame



After confirmation, Frame 3 will become the corresponding frame for Frame 1.

2.6.4 Inserting a frame

This function is used, for example, to replace the current symbol drawing with another.

Use the copy-and-paste function to copy a product to the clipboard.

The "Insert frame" function only copies the symbol and all its frames from the clipboard. This resets reverse-path frames.

The symbol is copied with all its connections. All other data remain unaffected by this action.

• Copy a symbol to the clipboard.



- Call up the product whose symbol drawing you wish to replace.
- Press the right mouse button in the center section and choose the appropriate menu item.



2.6 Frames

The frame is replaced.

Die Lite View Winds	1.1
for the new Hoods	
A HE IS	
0.0101.0	
EH X Q/Q	
Spenetra i Spenetra i Angelini i Spenetra 2 Spenetra 2	
Sambols A Cable A Car	

The reverse-path frames of the source symbol have been reset.

Warning:

You must never graphically change components that you have already used in AND, delete them from their symbol location or assign another object ID number to the object in the editor!

Warning in the AND Component Editor:

LibEdit					
2	Be careful already us the AND- after chan Really cha	changin ed in an program ging the nge the	g an objects AND-drawir can't find th ID, objects ID?	ID. If the 19, 1e object	object is
			<u>Y</u> es		<u>N</u> o

Warning in AND after making changes in a library:



If you were now to click the <u>Yes</u> button in AND, serious errors would occur in the drawings that you have already created.

However, if you confirm the AND message with _____No____ the drawing will be correctly loaded together with its originally linked libraries.

3.1 Creating data packets

3 Entering / Modifying the Symbol Data

3.1 Creating data packets

After definition of the component type, the corresponding data packet is generated immediately.



Basic Data Asymbol Data Attributes APINS A Equalizer 1

A data packet specifies the RF data between different connections.

If only one data packet is defined, it applies to all outputs opposite the input.

To create additional data packets, press the right mouse button in the Basic data view to open the following context menu:



Basic Data / Symbol Data / Attributes /

The active fields depend on the defined component type.

Depending on which component type you have selected under "Symbol Properties",

3.1 Creating data packets

the various fields of the menu shown above are active.

The user, tap, and loop-through connections are exceptions. These are usually specified by entries in the "Edit pin" dialog box. The attenuation entered applies to the entire frequency spectrum.

 Attenuation: 	0	dB
C Attenuation g	jiven b	y standard pack

However, additional standard packets can also be created for these connection types. The corresponding function is selected in the "Edit pin" dialog box.

C Attenuation:	0	dB
 Attenuation g 	iven by	standard pack

3.1.1 Assignment of data packets

If you have specified additional data packets, they always refer to specific inputs and their associated outputs.

This assignment is indicated by a marking line between the input and the output in the symbol drawing.

There are several possibilities:

• A data packet refers explicitly to one output and one input.

	Insertable Components:
	Component Group: No Groups new
	Socket for Pad Pilot plugable
	Socket for Equ Socket for return path module
	Validity Range:
	This Package No.: 3 from Input: 1
·····β····β····β····1Π····1β····	to Outputs: 2
	Available Outputs: 13
1 Ripple Picture /	Attributes / PINS / Power / Amplifier / Amplifier / F

 Packets are created in such a way that all packets refer to the same connection pairs, as is required for split-band amplifiers, for example.

· · · · · · · · · · · · · · · · · · ·	Insertable Components: Component Group: No G	roups 💌 new
: : : : : : : : : : : : : : : : : : :	Socket for Pad or Equ	Pilot regulation built in
	Socket for Pad	Pilot plugable
	Socket for Equ	Socket for return path module
	Validiu Danan	, contenter totali partitioaa
······································	valiuly hange.	
······································	This Package No.: 3	from Input: 2 💌
······································		to Outputs: 1
	Available Outputs:	
· · · · · · · · · · · · · · · · · · ·		

In this example, 4 amplifier packets have been defined for 4 different frequency ranges.

• You define a packet for several outputs with respect to the same input. This usually only makes sense if different groups of the same outputs are required. In this case, for example, for the subscriber outputs for multi-switches.

3.1 Creating data packets



You can set "RF isolation points" for the internal component structure and use them both as a packet input and output.

3.1.2 Validity range

The "Validity range" appears at the bottom of the right-hand section of any data packet that can occur more than once or in combination with other packets. This is where you define the association of the packet to the connections. This is only possible if more than one packet has been created. If only one packet exists, it applies to all outputs opposite the input.



To define the validity range of the data packets you have to proceed as follows:

Packet No. 1 is to be associated with connections input "1" and tap outlet "2".

Please do not confuse with the tape labeling.

In the "Input" field, click the 🗾 button.



A list of available inputs opens

Once you have selected the input, you must define the output of the validity range. To do this, select the relevant output in the "*Available Outputs"* field. If the output you require is not available, scroll up or down until it appears in the selection window.

Clicking the button moves the selected output into "to Output".

3.1 Creating data packets

Validity Range:			
This Package No.:	2		from Input: 1
			to Outputs: 2
Available Outputs:	13	*	<
	3	-	>

At the same time, this validity range is made visible by a marking line, as already described. If you wish to expand the valid range to include more outputs, select the relevant outputs from the "*Available Outputs*" field and continue as described above.

The selected outputs are marked accordingly.



If you want to remove individual connections from the validity range,

select a connection and click the sutton.

The connection is now displayed again in the "Available Outputs" window. Now select all the data packets one after the other and define their validity ranges. If one of the data packets is not assigned to a validity range, the following message appears.



3.2 Creating a data packet RF standard

3.2 Creating a data packet RF standard

Data packets of type Standard are *RF data packets* and can be used with the following component types:

Termination/tap box	Equalizer	Multi-tap
Optical receiver	Optical transmitter	Optical amplifier
Passive component	Wall outlet	Tap-off
Converter	Connecting element	Amplifier
Splitter	Filter	

If you click this packet, the "Standard Package Data" dialog box opens

Input options:

2 T	Standard Pack	age Data:		
←	Min. Frq.:	0 MHz	Max. Frq.: 900	MHz
	Resistance:	0.00 Ohm	🔲 Return path	possible
		Frequency[MHz]	Attenuation[dB]	
←	1			-
	2			
	3			
	4			
	5			
	6			
-	7			_
	8	1	l	<u> </u>
		<u>S</u> ort		
	/alidity Range:			
	This Packag	le No.: 1	from Input:	None 💌
	Available O	utputs:	<	
()	ata /\ Sym	bol Data 🔨 Att	ributes /\PINS	∕\Standa

"min .Frq.:" and *"max. Frq.:*" of the forward path

"Resistance"

Attenuation values in the forward path (value pairs) Click into the first frequency field (marked red here), enter the frequency and switch to the next column with the key to enter the appropriate attenuation value. This automatically releases the next row.

The $2^{\circ n}$ button sorts the value pairs depending on the frequency.

"Validity Range"

3.3 Creating a data packet for an antenna

3.3 Creating a data packet for an antenna

Package Number:	1	
equency Range from:	0.0	MHz
to:	0.0	MHz
Gain at Fmin:	0.0	dB
Gain at Fmax:	0.0	dB

Indicate Attributes / PINS Antenna

Component type "Antenna" has been selected. You can now make the following entries in the input form shown in the figure above:

Antenna data:

"*Package Number:"* This field is not active and cannot be edited.

"*Frequency Range from: MHz"* Here you define the beginning of the receive range of the antenna.

"*Frequency Range to: MHz"* Here you define the end of the receive range of the antenna.

"*Gain at Fmin.: dB"* Gain of the antenna at the lower receive frequency.

"*Gain at Fmax.: dB*" Gain of the antenna at the upper receive frequency.

You can only create one data packet of type "Antenna". Please note that no supplementary data packets, such as standard packets, are possible.

3.4 Creating a data packet for DWDM

3.4 Creating a data packet for DWDM

One method for boosting the capacities of fiber-optic transmission systems is wavelength division multiplexing.

Here you can create a **D**ense **W**avelength **D**ivision **M**ultiplexer (DWDM) / Demultiplexer (DWDDM).

Channel 20, 1561.42 r 🔊 🛛		ITU Ch	Wavelen, [Attenuation (dB1	Output
Channel 21, 1560.61 n					
Channel 22, 1559.79 n					
Channel 23, 1558.98 n					
Channel 24, 1558.17 n	>>				
Channel 25, 1557.36 n 😑 🗌					
Channel 26, 1556.55 n					
Channel 27, 1555.75 n					
Channel 28, 1554.94 n					
Channel 29, 1554.13 n					
Channel 30, 1553.33 n					
Channel 31, 1552.52 n					
Channel 32, 1551.72 n					
Channel 33, 1550.92 n					
Channel 34, 1550.12 n					
Channel 35, 1549.32 n	<<				
Channel 36, 1548.52 n					
Channel 37, 1547.72 n					
Channel 38, 1546.92 n					
Channel 39, 1546.12 n 🚽					
				Innut	None

Component type "DWDM" has been selected.

Before you can define a DWDM data packet, the symbol drawing must have at least one optical input and one optical output.

You now have the following input options in the input form.

"ITU-Channels Grid:"

This list contains the defined ITU channel raster from which you can move individual channels to the channel table.

3.4 Creating a data packet for DWDM

Move buttons



With these buttons you can move ITU channels to the right-hand table or remove them again. You can speed up this action by double-clicking the ITU channel you want to move.

ITU Channels Grid:					
Channel 21, 1560.61 n 🔺		ITU Channel	Wavelen. [nm]	Attenuation [dB]	Output
Channel 22, 1559.79 n		20	1561.42		2
Channel 23, 1558.98 n					<u>ت</u> ک
Channel 24, 1558.17 n Channel 25, 1557.20 n					2
Channel 25, 1557.36 h	>>				3
Channel 27, 1555 75 n					4
Channel 28, 1554 94 n					с С
Channel 29, 1554.13 n					7
Channel 30, 1553.33 n					<u> </u>
Channel 31, 1552.52 n	-				
Channel 32, 1551.72 n					
Channel 33, 1550.92 n					
Channel 34, 1550.12 n					
Channel 35, 1549.32 n					
Channel 36, 1548.52 n	<<				
Channel 37, 1547.72 n					
Channel 39, 1546.32 n					
Channel 40 1545 32 n -					
		1			
				Innut:	None 🔻
				inpore.	Mana
Regis Data A Symbol Data	Λ.				None 1
Dasic Data / Symbol Data		undutes / (PINS /	UWDPI/	L.	·

This is where you define the attenuation of the selected ITU channel between an input and the previously defined *outputs*.

All outputs lead to an input!



A DWDM (multiplexer) is also used as a DWDDM (demultiplexer). Optional standard packets are possible as supplementary data packets here.

3.5 Creating a data packet for a terminal

3.5 Creating a data packet for a terminal

In Version 3.3 and higher, AND and LibEdit support symbols for terminals. These symbols represent optical devices of an unknown type or devices that do not process an analog signal.

Terminals are used to terminate the end of an optical cable.

Description:	1	•	Add	Update
Туре:	Undefined	•	Add	Update
Physical sign	al			
Description:		•	Add	Update
Туре:	Bidirectional	•	Add	Update
Validity Rang This Packa	je: ige <u>N</u> o.: 1	-		
from Inpu	t None 💌	to <u>U</u> ut	put: Nor	ne 💌

Basic Data / Symbol Data / Attributes / PINS / Terminat

Component type "Terminal" has been selected. You can enter a description and type for the logical and physical signal in the terminal data packet.

If you use some of values frequently, you can insert them in the selection list



by clicking Add

With the exception of the standard settings that LibEdit automatically makes available, your entries are stored locally in a file so that you can access them again later.

Optical transmitters (lasers) and optical receivers also have these settings.

As these objects represent physical elements, only the logical signal has to be described in the terminal data packet.

If you want AND to integrate this terminal in the optical path search you must additionally define an optical standard packet, specifying at least one wavelength.

"Validity Range"

3.6 Creating a data packet for a equalizer

3.6 Creating a data packet for a equalizer

40.0	MHz upto: 80.0 MHz
0.0	dB 🔲 Fixed Equalizer
0.0	dB
0.0	dB
0	MHz
_	from Input: None 💌
	to Outputs:
	<
	40.0 0.0 0.0 0.0

This data packet is used to define an equalizer or an attenuator.

Data:

"*Frequency Range from: MHz upto: MHz"* Here you define the beginning and end of the transmission range.

"*Attenuation: dB"* Here you enter the through loss (fixed).

"*Attenuation adj. Range: dB"* Here you enter the maximum attenuation value of the control range.

"Equalization adj. Range: dB" Here you enter the maximum equalizer value of the control range. This value refers to the lowest transmission frequency considering the base.

If the value entered is negative, "negative equalization" with reference to the base is assumed (for example, for cable simulation modules).

"Fixed Equalizer"

By clicking the Fixed Equalizer field, you define that it is a fixed equalizer.

"*Upper Turning Point"* Here you define which frequency will be used as the base of the equalizer.

"Validity Range"

Equalizer and standard packets are possible as supplementary data packets here.

3.7 Creating a data packet for a filter

3.7 Creating a data packet for a filter

Frequency Range from:	0.0	MHz
upto:	0.0	MHz
Inside Attenuation:	0.0	dB
Outside Attenuation:	0.0	dB
Resistance:	0.0	Ohm
- 🔲 valid for reverse path:		
Return path Atten.: 0	.0	dB
Frequency Range from:	.0	to: 40.0 MHz
alidity Range:		
This Package No.: 1	fr to	om Input: None Outputs:
	1 1	

Data:

"*Frequency Range from: MHz upto MHz"* Here you define the beginning and end of the transmission range.

"*Inside Attenuation: dB" (pass band)* Here you enter the attenuation within the specified frequency range (through loss).

"*Outside Attenuation: dB" (stop band)* Attenuation outside the specified frequency range.

"*Resistance: Ohm*" Remote feed impedance for this packet (if the component is power passing). After you have selected the valid for reverse path: field, the object is suitable for the reverse path.

This also activates the following entry fields: "*Return path Atten.: dB*" Here you can enter the attenuation of the reverse-path frequency range.

This is defined under: "Frequency Range from:to..... MHz" (reverse path)

Entry of the reverse-path frequency range

"Validity Range"

3.7 Creating a data packet for a filter

To specify filters better, you can create a frequency slope list with value pairs.

		i ([ab]	
1			-
2			
3			-
4			-
5			
6			-
7			-
8			-
	· · · ·		-

If data is entered in this frequency slope table,

it will only be used for calculations within the frequency window defined in "Filter Data".

All data outside the frequency window is ignored.

Filter and standard packets are possible as supplementary data packets here.

3.8 Creating a data packet for a power supply unit

3.8 Creating a data packet for a power supply unit

	Voltage:	0	v
Ma	aximum Current:	Ju	mΑ
Fix pow	er consumption:	0.0	W
Use	a list of values for	power con	sumption
Nr.	Voltage (V)	Current (i	mA) —
Nr. 1	Voltage (V)	Current (i	mA)
Nr. 1 2	Voltage (V)	Current (mA)
Nr. 1 2 3	Voltage (V)	Current (r	mA) —
Nr. 1 2 3 4	Voltage (V)	Current (i	mA) —
Nr. 1 2 3 4 5	Voltage (V)	Current (i	mA) —
Nr. 1 2 3 4 5 6	Voltage (V)	Current (i	mA) — ▲
Nr. 1 2 3 4 5 6 7	Voltage (V)	Current (i	mA) —
Nr. 1 2 3 4 5 6 7 8	Voltage (V)	Current (i	mA) —

Component type "Power supply unit" has been selected. This power supply unit is a *power source/transformer*.

Notes:

The list for the power consumption <u>cannot</u> be activated here. Please note that no supplementary data packets, such as standard packets, are possible here. 3.8 Creating a data packet for a power supply unit

Data:

"*Voltage: V"* This voltage is available to power power passing loads.

"*Maximum Vurrent: mA*" Here you enter the maximum current carrying capacity of the power supply unit.

For the following component types, a power supply unit data packet is automatically generated in addition:

amplifier, converter, optical amplifier, optical transmitter, optical receiver.

The power supply units of these types are only for powering **<u>loads</u>** and are integrated into these components.

You can activate the list for the power consumption here.

aximum Current		
aximum Current		
and an even of it.	0 mA	
er consumption:	0.0 W	
mote Supply		
cale Supply		
a list of values for	power consump	otion
Maltana 0/0	Coursent (mA)	
VOILage (V)		
		-
		-
<u>S</u> ort		
	er consumption: mote Supply cale Supply a list of values for Voltage (V)	er consumption: 0.0 W mote Supply sale Supply a list of values for power consump Voltage (V) Current (mA) Voltage Sort

"Minimum Voltage: ….. V" Here you enter the minimum voltage value that is required to operate the device.

"*Maximum Current: mA*" Here you enter the maximum current carrying capacity of the power supply unit.

"Fix power consumption: ….. W" Here you enter the power consumption of the device.

If you select this button <a>
 <ir>
 Remote Supply and select this check box

Use a list of values for power consumption,

you can then enter the value pairs in the table that has now been released. The previously entered values "Maximum Current" and "Fix power consumption" will now be ignored. 3.9 Creating a data packet for an optical adapter

3.9 Creating a data packet for an optical adapter

Wavelen	gths from: 0	upto: 0	nm
	Wavelen, [nm]	Attenuation[dB]
1			
2			
3			
4			1
5			
6			
7			1
8			-
	Sor	t	
Validity Range	<u></u>		
This Package I	No.: 1	from Input:	None 🔻
	,	to Outputs:	
Available Outp	uts:	<	
		>	

You can set up additional data packets of type opt. Standard.

Data:

"*Wavelengths from: ... upto... nm"* Here you define the beginning and end of the transmission range.

"*Wavelen. (nm)* Attenuation(*dB*)" Here you enter value pairs that exhibit the corresponding through loss depending on the wavelength.

The <u>Sort</u> button sorts the value pairs

"Validity Range"

3.10 Creating a data packet for an optical attenuator

3.10 Creating a data packet for an optical attenuator

Attenuatio	in: 🛄 dB
	🥅 Adjustable
Adjustment Rang	ge: dB
/alidity Range:	
This Package No.: 1	from Input: None 🚽
Available Outputs:	<

You can set up additional data packets of type opt. Standard.

Data:

"*Attenuation:... dB"* Here you define the through loss. This value is static.

Selecting this check box 🔽 Adjustable activates entry field

dB

Here you can define the control range.

This value is added to the through loss in AND.

"Validity Range"

3.11 Creating a data packet for an optical receiver

3.11 Creating a data packet for an optical receiver

Receiver Data:	2 33	
Frequency Range from:	0.0	MHz to: 0.0 MHz
Wavelength from:		nm to: nm
Input Power:	0.0	dBm to: 0.0 dBm
Photosensitivity:	0.0	AW
Darkcurrent:	0.0	nA 🗆 High/Low Jumper
Equiv. Input Noise:	0.0	pA/Hz ^{xx} 0.5
CSO:	0.0	dB Photodiode
CTB:	0.0	dB C Avalanche
Insertable Components: Component Group: No Socket for Pad or Equ Socket for Pad	Groups	Pilot built in Pilot pluggable
\Box Distortion Data (CSO/CTB) r	neasured	at :
 Flat Input Level Flat Output Level 	F Channel	Preemphasis: 0.0 dB Modulation: 0.0 %
		nput Power: U.U abm
Raster:		
Validity Range:		
This Package No.: 2	-	from Input: None 💌
Available Outputs:		to Outputs:
 Is ∧ Power ∧ Opt. Rec 	eiver/\	Level / Terminating device

You can create data packets of type opt. Standard, opt. Receiver and RF Standard.

3.11 Creating a data packet for an optical receiver

Data:

"Frequency Range from: MHz to MHz" Here you define the beginning and end of the transmission range.

"*Wavelength from: nm to: nm"* Here you define the receive range of the receiver.

"input Power: dBm to: dBm" Here you define the working range of the receiver.

"*Photosensitivity: A/W"* Here you enter the photosensitivity of the photodiode.

"*Darkcurrent: nA*" Here you enter the dark current of the diode.

"*Equiv. Input Noise: pA/Hz**0,5"* Here you enter the equivalent background noise of the receiver.

Here you define the type of diode:

PIN- Diode Avalanche- Diode

⊢ Pl	hotodiode ——
Œ	PIN
C	Avalanche

The interference data: "CSO: ...dB" "CTB: ...dB"

refer to the following settings:

Values for: level-aligned input level-aligned output

C	Flat Input Level	
œ	Flat Output Level	

"Preemphasis: ... dB"

Set preemphasis at the output.

"Channel Modulation: ... %" Channel modulation at the receiver.

"*Input Power: ... dBm"* Input power at the receiver.

Raster:

You select the raster here.

3.11 Creating a data packet for an optical receiver

Under the heading "Insertable Components", the socket options in the device are defined.

d.
•

Here you define the groups from which AND can select the components for the corresponding sockets.

Component Group: No Groups 💌 new..

The components selected in AND then appear both in the amplifier list and in the bill of materials.

"Validity Range"

Clicking the "Level" tab takes you to the level settings of the opt. receiver.

Level Adjustment Range: 0.0	dB			
High/Low - Jumper	sdwidth (PAL)			
	iamaan (i Ac)			
Output Level Begulated:		_		
	dBuV			
output Level 10.0	σομν			
C Output Level Non Regulated:		7		
Input Power:	dBm			

"Level Adjustment Range: ... dB"

Adjustable attenuation at the output of the receiver.

3.11 Creating a data packet for an optical receiver

If you want to set up a "High/low jumper", select this check box \Box High/Low Jumper. This allows AND to switch between two level states.

If you select this button 🙆 Output Level Regulated: the output level entered here

Output Level: 0.0 $dB\mu V$ remains constant irrespective of the input power.

Selecting the C Output Level Non Regulated: button activates further entry fields.

	OMI [%]	Level [dBµV]
1		
2		
3		
4		
5		
6	1	
7		
8	1	Í

"Input Power ... dBm"

Here you enter the input power of the receiver.

The value pairs for "OMI [%]" and "Level $[dB\mu V]$ " refer to the input power entered.

The <u><u>Sort</u> button sorts the value pairs.</u>

↓ S \ Power \ Opt. Receiver \ Level \ Terminating device \

By clicking the "Terminating device" tab, you can make entries for the logic signal.

3.12 Creating a data packet for an optical filter

3.12 Creating a data packet for an optical filter

Optical Filter Data:		
Lower Wavelength:	0.00	nm
Upper Wavelength:	0.00	nm
Attenuation:	0.0	dB
Validity Range: This Package No.: 1 Available Outputs:	valid	from Input: None 👤

When defining an optical filter, only the pass band is specified.

Data:

"Lower Wavelenght: ... nm" Here you define the beginning of the transmission range.

"*Upper Wavelenght: ... nm"* Here you define the end of the transmission range.

"*Attenuation: ... dB*" Here you define the through loss of the transmission range.

"Validity Range"

Please note that only opt. filter packets are possible here and not supplementary data packets, such as RF standard packets.

3.13 Creating a data packet for an optical splitter

3.13 Creating a data packet for an optical splitter

Attenuations: -			
Wavelen	gths from: 1290	upto: 1600	nm
	Wavelen, [nm]	Attenuation[dB]	
1			-
2			
3			
4			
5			
6			
7			
8		· ·	•
	<u>S</u> or	t	
Validity Range:			
This Package N	No.: 1	from Input: No to Outputs:	ine 💌
Available Outp	uts:	< >	

Optical splitters are defined by the creation of optical standard packets.

Data:

"*Wavelengths from: upto nm"* Here you define the beginning and end of the transmission range.

"Wavelen. (nm) Attenuation(dB)"

Here you enter value pairs that exhibit the relevant through loss, depending on the wavelengths.

The <u>Sort</u> button sorts the value pairs.

"Validity Range"

Please note that only opt. standard packets are possible here and not supplementary data packets, such as RF standard packets.

3.14 Creating a data packet for an optical transmitter

3.14 Creating a data packet for an optical transmitter

	🗌 Retu	urn Path Lase	er
Frequency Range from: Opt. power: Wavelength: SBS Threshold: Chirp: RIN: Max. modulation ratio:	0.0 0.0 0.0 0.0 0.0 0.0 35.0	MHz dBm nm dBm MHz/mA dB/Hz %	to: 0.0 MHz Modulation:
CSD: CTB: at channel modulation: Raster:	0.0	dB dB %	Overlay
Validity Range: This Package No.: 2 Available Outputs:		from Inp to Outpu <	ut: None 💌 ts:

You can create additional data packets of type opt. Standard, opt. Transmitter and RF Standard.

Return Path Laser

After you have set the check mark, you define whether it is a reverse-path laser. Additional input options for reverse-path lasers are now activated.

Notchfilterdaten /\ IMA /\ KMA /

This also deactivates the input options for "CTB", "CSO", "at channel modulation" and raster selection.

3.14 Creating a data packet for an optical transmitter

Data:

"Frequency Range from: MHz to MHz" Here you define the beginning and the end of the RF transmission range.

"*Opt. Power: dBm"* Here you define the output power of the laser.

"*Wavelenght: nm"* Here you define the output wave length of the laser.

"SBS Threshold: dBm" Here you enter the SBS threshold value at the laser..

"Chirp: MHz/mA"

direct	
extern	modulated lasers
	direct extern

"Chirp: MHz/Channel"

f the laser for

Chirp value of the laser for

"RIN: dB/Hz"

Here you enter the value for the noise behavior of a signal source.

"*Max. modulation ratio: %"* Here you enter the value for the maximum modulation depth.

The interference data

"CSO: dB" "CTB: dB"

refer to the following settings: "at channel modulation: %"

Channel modulation at the transmitter.

You can select the channel raster here. *"Validity Range*"

Raster:

Here you can select the laser type. This check box is currently for information only.

🗌 Overlay

If it is an overlay laser, set the check mark here. This check box is currently for information only. After clicking the "Modulation" tab, you can make entries.

-

3.14 Creating a data packet for an optical transmitter

AID	evel values refer to 1	MHz bandwid	th
	Level [dBµV]	OMI (%)	
1			
2			
3			-
4			
5	- <u> </u>		-
6	-ii		-
7	-ii		-
8	- []		
,		1	_

The values pairs establish a relationship between the RF input level "Level $[dB\mu V]'$ " and the modulation index "OMI[%]".

The <u>Sort</u> button sorts the value pairs.

Opt. Transmitter / Modulation / Terminating device /

By clicking on the "Terminating device" tab, you can make entries for the logic signal.

3.14.1.1 Reverse-path laser

For a reverse-path laser, set the check mark accordingly in Return Path Laser.

After you have selected "Notch filter data", the dialog box as follows appears:

	Neue Messreihe
	Messreihe Löschen
ła	
Spendämpfung:	dB
3 db - Bandbreite Notchfilter:	MHz
Frequenz des Notchfilters:	MHz
Min. Frequenz des Signals:	MHz
Max Frequenz des Signals:	MHz
Fiber Dämpfung:	dB
🗖 Diese Daten in	
Nr. Input(dBµV/Hz) Cli	NR(dB)
1	
2	
3	8
5	
6	
7	
8	·

The input forms for notch filter data, IMA and KMA measurement series are currently for information only.

The measurement series are NOT used for interference calculation in AND. There are plans to remove the forms from the component editor.

3.15 Creating a data packet for an optical amplifier

3.15 Creating a data packet for an optical amplifier

Min. Wavelength: 0	nm C SemiCon
Max. Wavelength: 0	nm 🔍 EDFA
Output Power: 0.0	dBm
Min. Input Power 0.0	dBm
Max. Input Power: 0.0	dBm
Amplification: 0.0	dB
Noise: 0.0	dB
at Input Power: 0.0	dBm
/alidity Range:	
This Package No.: 2	from Input: None 💌 to Outputs:
Available Outputs:	<

Attributes / PINS / Power / Opt. Amplifier /

Component type "Opt. amplifier" has been selected. You can create additional data packets of type opt. Standard and RF Standard.

You now have the following input options in the input form shown in the figure above.

"*Min. Wavelength: nm"* Here you define the beginning of the transmission range.

"*Max. Wavelength: nm"* Here you define the end of the transmission range.

"*Output Power: dBm"* Here you enter the max. output power of the amplifier.

"*Min. Input Power: dBm"* Here you enter the min. input power of the amplifier.

"*Max. Input Power: dBm*" Here you enter the max. input power of the amplifier.

"*Amplification: dB"* Here you enter the max. gain.

"*Noise: dB"* Here you enter the noise figure of the amplifier.

"*at Input Power: dBm"* Here you enter the input power, with reference to the noise figure.



Here you select the amplifier type. At the moment, this check box is for information only. *"Validity Range*"

3.16 Creating a data packet for a parabolic antenna

3.16 Creating a data packet for a parabolic antenna

Package Number:	1	
Diameter:	0	cm
Gain:	0.00	dB
Туре:		
 Central 	Supply S	iystem
C Offset D)ish	

Component type "Parabolic antenna" has been selected. You now have the following input options in the input form shown in the figure above:

"*Package Number:"* This field is not active and cannot be edited.

"Diameter: cm"

Here you define the beginning of the receive range of the antenna.

"*Gain: dB"* Gain of the parabolic antenna.



Here you select the type of parabolic antenna. At the moment, this check box is for information only. You can only create one data packet of type "Parabolic antenna".

Please note that no supplementary data packets, such as standard packets are possible.

3.17 Creating a data packet for a passive component

3.17 Creating a data packet for a passive component

Min. Frq.:	0	MHz	Max. Frq.: 900	MHz
Resistance:	0.00	Ohm	🔲 Return path	possible
	Freque	ency[MHz]	Attenuation[dB]	
1				-
2				
3	(<u> </u>			
4	Í			
5	Í			
6	í –			
7	í –			
8	Í			-
		<u>S</u> o	rt	
/alidity Range:				
This Packag	je No.:	1	from Input: 🛙	Vone 🔄
			to Outputs:	
Available ()	utputs:		< >	

Component type "Passive Component" has been selected. This component type is specified with "Standard" data packets.

You can create additional data packets of type Standard.

"Validity Range"

3.18 Creating a data packet for a reverse-path receiver

3.18 Creating a data packet for a reverse-path receiver

Min. Input Level:	: 00	dBμV
Max. Input Level	: 00	dBμV
Required CINR	: 00	dB
This Package No.: 1 Available Outputs:	valid fr	om Input: None

Component type "Reverse-path receiver" has been selected.

You now have the following input options in the input form shown in the figure above:

"*Min. Input Level: dBµV"* Here you enter the minimum receive level at the receiver.

"*Max. Input Level: dBµV"* Here you enter the maximum receive level at the receiver.

"*Required CINR: dB"* Here you enter the CINR ratio at the receiver. You can only create one data packet of type "Reverse-path receiver".

Please note that no supplementary data packets, such as standard packets are possible.

3.19 Creating a data packet for a bridge point (NTU)

3.19 Creating a data packet for a bridge point (NTU)

Taget Level 0.0 dBµV Taget Pererby 0.0 dBµV Taget Pererby 0.0 dBµV FragRam 0.0 dBµV Maximum Level 0.0 dBµV Required CTB: 0.0 dBµV Required CTB: 0.0 dB Required CTB: 0.0 dB Required CTB: 0.0 dB Fix Return PehD Data dB dB Maximum Alterusation: dB dB Maximum Angelication: dB dB
Target Level: 0.0 dBjW Target Pherenphasi: 0.0 dB Minimum Level: 0.0 dB JW Fig.Rat 60 dB JW Required CTB: 0.0 dB Required CTB: 0.0 dB Required CTB: 0.0 dB Required CM: 0.0 dB Fig.Raturn Path Data dB Maximum Alternuation dB Maximum Anglification: dB
Target Preemphaii: 00 d8 Minimum Level: 0.0 d8µV Frq-Rar Maximum Level: 0.0 d8µV Frq-Rar Required CE0: 0.0 d8 Frq-Rar Required CE0: 0.0 d8 Frq-Rar Fix Return Path Data d8 Maximum Anternation: d8 Maximum Anternation: d8 Maximum Anglification: d8
Minimum Level 0.0 dBµV Frq.Rat Maximum Level 0.0 dBµV Frq.Rat Required CTB: 0.0 dB Brq.and Required CTB: 0.0 dB Brq.and Required CTB: 0.0 dB Brd.and Fix Return Path Data Minimum Antenuation: dB Maximum Antenuation: Maximum Antenuation: dB dB Maximum Antenuation:
Maximum Level 0.0 dBµV Fig.Rat Required CFB 0.0 dB Required CFD 0.0 Required CFD 0.0 dB Required CFD 0.0 dB Fix Return Pell Nota dB dB Minimum Alternation dB dB Maximum Anternation dB dB dB dB dB dB
Required CTB: 0.0 dB Required CSD: 0.0 dB Required C/N: 0.0 dB Fire Return Path Data dB Minimum Afterwation: dB Maximum Afterwation: dB Minimum Afterwation: dB Minimum Afterwation: dB
Required CS0: 0.0 d8 Required CN: 0.0 d8 Fix Return Path Data Maximum Attenuation: d8 Maximum Attenuation: d8 Maximum Angelication: d8 Minimum Attenuation: d8 Maximum Angelication: d8
Required C/N: [0.0] d8 Fix Return Path Data Minimum Alternation d d Maximum Anternation Astronation d d Maximum Anglification d d Maximum Anglification d d
Fix Return Path Data Minimum Altenuation: dB Maximum Altenuation: dB Angelites Behind Bridge Point dB Minimum Angelitication: dB Maximum Angelitication: dB
Minimum Attenuation: dB Maximum Attenuation: dB T Amplifier Behind Bridge Point Minimum Amplification: dB Maximum Amplification: dB
Maximum Attenuation: dB Amplifier Behind Bridge Point Minimum Amplification: dB Maximum Amplification: dB
Amplifier Behind Bridge Point Minimum Amplification: dB Maximum Amplification: dB
Minimum Amplification: dB Maximum Amplification: dB
Maximum Amplification: dB
Maximum Amplincation: db
evel differences:
Frq min Frq max Level difference [dB]

Component type "bridge point (NTU)" has been selected.

Dynamic BP C Static BP

With this check box, you define whether this network termination unit is to be static or dynamic. If selection was "static", the entry fields are not active.

If selection was "dynamic" you have the following input options:

"Target Level: $dB\mu V''$ Here you enter the recommended level at the NTU.

"*Target Preemphasis: dB*" Here you enter the recommended preemphasis at the NTU.

"*Minimum Level:* $dB\mu V''$ Here you enter the minimum permitted level at the NTU.

"Maximum Level: $dB\mu V''$ Here you enter the maximum level difference at the NTU.

"*Required CTB: dB"* Here you enter the necessary CTB at the NTU.

"*Required CSO: dB"* Here you enter the necessary CSO at the NTU.

"*Required C/N: dB"* Here you enter the C/N at the NTU. You can only create one data packet of type "bridge point (NTU)". Please note that no supplementary data packets, such as standard packets, are possible here.
3.19 Creating a data packet for a bridge point (NTU)

3.19.1 Library Extensions For Bridge Points

The extension is implemented from Build 4.0.765.57 on and from Build 4.1.835.0 on The extensions in Libedit are marked in red below:

Bridge Point Data:				Maxir	num Le	vel For Differe	nt Frequency	Rannes X
Oynamic BP	0	Static BP	8					
Target Level:	0.0	dBμV		Г	Nr.	upto (MHz)	[dBµV]	
Target Preemphasis:	0.0	dB			1	300.00	75.00	
Minimum Level:	63.0	dBµV	Frq-Range		2	862.00	80.00	- [
Maximum Level:	80.0	dBµ\	Frq-Range		4			-
Required CTB:	0.0	dB			5	, 		
Required CSO:	0.0	dB			6			
Required C/N:	0.0	dB			7			
🔽 🗖 Fix Return Path Data]		8	J	J	
Minimum Attenuation:		dB				So	rt	
Maximum Attenuation:		dB		L				
Amplifier Behind Br	idge Point					Cancel	OK	1
Minimum Amplification:		dB						
Maximum Amplification:		dB						

Picture 1: Screenshot from Libedit.

3.19 Creating a data packet for a bridge point (NTU)

Extension 1: Maximum level of a bridge point can be frequency dependent.

The button "Frq-Range" was added at the right side of the editbox for the maximum-level. If the button is pressed, the dialog "Maximum Level For Different Frequency Ranges" opens, where you can enter the maximum allowed levels for different frequency ranges.

Note: The entered frequency is the upper border of the range. I.e. in the screenshot above we have:

For all frequencies $f \le 300$ MHz: Maximum Level = 75 dBµV For all frequencies f > 300 MHz: Maximum Level = 80 dBµV

The entered maximum values are used by the level-check-function of AND's netcheck. In our example a warning will be generated by the level-check-function, if for a channel with frequency \leq 300 MHz the level is higher than 75 dBµV or for a channel with frequency > 300 MHz the level is higher than 80 dBµV.



Picture2: In the outputwindow you see the warning of the level-check-function for the green bridgepoint with limits 75/80 like in Picture 1.

The warning refers always to the channel with the highest deviation, which is here 4.7 dB at 287 MHz.

3.19 Creating a data packet for a bridge point (NTU)

Hint: The limit from library is only used, if you have set exitpoint type to " Library/Warning Settings":

Inhouse Automatic Alt + U			
Tools View Manage hotspots Inhouse Automatic Alt + U Program Settings Drawingmode Adjust view Background editor Auto layer assignment Layer templates	Windows Image: Constraint of the second	 Number of MDUs: □ Upstream Levels: C Level is adjusted fix: 107.0 dBµV C Calculated dynamic depending on FM Level C Attenuation [dB]: Min.Atten.: 30.0 Max. Atten.: 42.0 ④ Amplifer behind BP [dB]: Min Ampli.: 3.0 Max. Ampli: 23.0 Upstream Distortions: Ingress Ratio: 0.0 dB Noise Ratio: 0.0 dB 	

3.19 Creating a data packet for a bridge point (NTU)

Extension 2: Upstream

The Bridgepoints in the library are extended by the following data:

Minimum Attenuation:	5.0	dB
Maximum Attenuation:	15.0	dB
Amplifier Behind Bri	dge Poinț	
Minimum Amplification:	5	dB
Maximum Amplification:	25	dB

- Checkbox "Fix Return Path Data". If this is unchecked the upstream data (attenuation range, amplifier behind, amplification range) are entered in AND. If this checkbox is checked, the upstream data are defined in Libedit and cannot be edited in AND.
- Editbox "Minimum Attenuation": The minimum passive return path attenuation behind this bridge point
- Editbox "Maximum Attenuation": The maximum passive return path attenuation behind this bridge point
- Checkbox "Amplifier behind Bridge Point".
 If this is checked, the adjustment of reverse amplifiers in AND will assume that directly behind the bridge point is an amplifier with amplification range entered below.
 The attenuation range is then interpreted as the passive attenuation behind the amplifier.
 If this is unchecked, the network behind the bridge point is pure passive with attenuation range entered above.

3.19.2 Signal source

Signal sources are defined directly in AND.

There is no way of specifying signal sources using data packets.

3.20 Creating a data packet for an Optical Bridge Point

3.20 Creating a data packet for an Optical Bridge Point

With the component editor, you can create an "Optical bridge point" (BP):



An "Opt.BP-Data packet" should be created for every optical connection of an optical BP:

LibEdit - [OptNeutral.lib]	
😤 Eile Edit View Window ?	_ <u>_</u>
IbbEdit - [OptNeutral.ib] Ele Edt Yew Window 2 Ele Edt Yew Window 2 Ele Fort Yet Parts 11 - C UP PTTX 1 - S DPROP - S DPROP - D DPWOX - S Sheet - D DS	Optical Bridge Point Data: Optical Bridge Point Data: Number of Wires: Data of the selected wire: Write 1 Direction: C Input C Dutput C Bidirectional Min. Input Power: 0.0 dBm Dutput Power: dBm Output Wavelength: nm
Symbols / Cable / 1/2 / Picture /	Validity Range: This Package No.: 1 valid from Input 1 valid from Inp

The first data packet is created automatically by the component editor. Any further packets have to be created manually using the context menu for basis data. In the data packet, the number of fibers (number of wires) of the connected glass-fiber cable is defined.

The standard value is number of wires = 1. For each fiber, a signal direction is entered in the "Direction" groupbox, defining whether the signal will flow in (input), out (output) or whether it is bidirectional, i.e. one signal flows in; another signal with a different wavelength or another time window flows out.

The first two enter boxes (Min./Max. Input Power) describe the permissible level window of the incoming signal.

3.20 Creating a data packet for an Optical Bridge Point

The AND network check function "Check bridge points" checks, for each opt. BP, whether the input signal is in the permissible range.

The bottom two enter boxes ("Output Power" and "Output Wavelength") describe the outgoing signal. Each optical BP with the signal direction "Output" or "Bidirectional" is an optical transmitter in AND.

The values entered in the library for the power and wavelength of the transmitter are the standard values for the state directly after creation of an object in AND. These values can be overwritten in AND.

The "Time Multiplex" checkbox is not evaluated by AND and is for information only. The example drawing "Demo OptUEP.net" shows the typical FTTx applications. The optical BPs all originate from the "OptNeutral.lib" library "OptNeutral.lib".



The figure shows an excerpt from "Demo optUEP.net".

The component "FTTx 11" has two connection pins for single-core cables:

the upper pin for the incoming signal, and the lower pin for the outgoing signal.

The component "FTTx 2" has a connection pin for a two-core cable.

The incoming downstream signal is expected on fiber 1;

the upstream signal is transmitted on fiber 2.

This signal assignment is supposed to be ensured by connection in the incoming splice box.

If the fibers at the BP have to be connected with swapped-round contacts,

a second library object "FTTx 2 exchanged" is used

The component "FTTx 1" has a connection pin for a single-core cable.

The data packet in the library is set to bidirectional. An incoming and outgoing signal flow on the same fiber, but with different wavelengths or time windows.

The components of type "Optical BP" behave in many respects like known optical signal entry or exit points, e.g. two projects can be connected with optical BPs and it is possible to jump between projects.

The differences between the two object types are:

- Entry/exit points take over the number of fibers from the connected cable. For optical BPs, the number of fibers is defined by the library object.
- Only cables with one bundle can be connected to an optical BP.
- A level window for outgoing signals can only be defined in the optical BP.

3.20 Creating a data packet for an Optical Bridge Point

3.20.1 Optical Bridge Point - Type ONT, ONU, OLT

Implemented from Build 1213 on.

Components of Type "Optical Bridgepoint" have an attribute "Type".

Possible values are:

- OLT
- ONT
- ONU
- other.





Consequences in AND

1. If the option "Check only ONTs and ONUs" is activated, the netcheck will check the input power only for this types.

Dialog for editing the warning setup:

Direck net structure Setup amplifiers Temperature drift Direck remote supply	The bridge points level check discovers all levels for each frequency at all bidge points and compares them with the limits given below. BF Level Deeck
Z Deck boket levels	Level (nin) 📅 🕀 dBy//
Check: open top pin levels	Level (next) 95
Disck connectors	Level difference (nac); 10.0 👘 dB
Dieck leskage linit	Links Optical Power Check:
	Check only ONT's and ONUs
For check of level and distortion:	Save Settings Load Settings Cancel DK

2. Each type will be displayed with different graphics in NIS:



The lowest node is of type "other".

The types correspond with the following database values of NIS_NODES::NODE_TYPE:

Туре	Value
ONT	772
OLT	1045
ONU	1046
other	1047

3.21 Creating a data packet for the feed (LNC)

3.21 Creating a data packet for the feed (LNC)

Package Number:	1	
requency Range from:	0.0	MHz
upto:	0.0	MHz
LNC Noise:	0.0	dB
Filter Noise:	0.0	dB
Total Noise:	0.0	dB
Amplification:	0.0	dB
Oscillator Frequency:	0.0	MHz
Polarisations:	1 Polaris	ation
С	2 Polaris	ations
С	4 Polaris	ations
Optional Data:		20
System's Quality:	0.00	dB/K
Voltage Supply:	0.0	۷
Current Supply:	0	mΑ
Data refer to output:	None	•

Component type "Feed (LNC)" has been selected. You now have the following input options in the input form shown above.

LNC data:

"*Package Number:"* This field is not active and cannot be edited.

"Frequency Range from: MHz" Here you enter the beginning of the transmission range.

"*upto: MHz*" Here you enter the end of the transmission range.

"*LNC Noise: dB"* Here you enter the background noise of the LNC without the polarization noise.

3.21 Creating a data packet for the feed (LNC)

"Filter Noise: dB" Noise of the polarization filter: This value results from the "LNC noise" and the "total noise". It is for information only and cannot be edited.

"Total Noise: dB" Here you enter the total noise of the LNC incl. the polarization filter.

"*Amplification: dB"* Here you enter the gain of the LNC.

"*Oscillator frequency: dB"* Here you enter the oscillator frequency of the converter.

Polarisations:	
🔲 Circular	I Polarisation
	C 2 Polarisations
-	4 Polarisations

This check box is not currently evaluated in AND and is therefore for information only.

Optional data:

This date is currently not evaluated in AND and is therefore for information only. "System Quality: dB/K"

Here you enter the figure of merit for a complete system. "Voltage Supply: V"

Here you enter the feed voltage of the LNC. "*Current Supply: mA*"

Here you enter the maximum feed current of the LNC.

Data refer to output: None 💌

Here you define the output to which the LNC packet is to apply.

The output is selected using the \blacksquare button.

Please note that no supplementary data packets, such as standard packets are possible.

3.22 Creating a data packet for a trap

3.22 Creating a data packet for a trap

Frequency Range from:	0.0	MHz
upto:	0.0	MHz
Inside Attenuation:	0.0	dB
Outside Attenuation:	0.0	dB
Resistance:	0.0	Ohm
Return path Atten.: 0 Frequency Range from: 0	1.0	dB to: 40.0 MHz
alidity Range:		
This Package No.: 1	ן ו	from Input: None 🔄 o Outputs:
Available Outputs:		<

Filter Data:

"*Frequency Range from: MHz upto MHz"* Here you define the beginning and the end of the stop band.

"Inside Attenuation: dB" This field can be ignored. You cannot influence the rejection. Various inputs are not taken into account.

"*Outside Attenuation: dB"* Attenuation outside the specified stop band.

"*Resistance: Ohm"* Remote feed impedance for this packet (for component power passing).

If you activate the valid for reverse path: field, the object is suitable for reverse path.

The following input fields then become active:

"Return path Atten: dB"

Here you can enter the attenuation of the reverse-path frequency range. This is defined under

"*Frequency Range from:to..... MHz*" Entry of the reverse-path frequency range.

"Validity Range"

3.23 Creating a data packet for a splice box

3.23 Creating a data packet for a splice box

You have selected the component type "Splice" .

•				•
Automatic splice		☑ <u>E</u> dita	ble from AND	
C Left Sp	lice			
C a b				

With this data packet, you can generate splice box objects.

The only relevant elements of these objects are the mechanical cable connections. In addition, supplementary connections can be generated that have no effect on the splice connections. 3.24 Creating a data packet for a wall outlet

3.24 Creating a data packet for a wall outlet

Min. Frq.:	0	MHz	Max. Frq.: 900	MHz
Resistance:	0.00	Ohm	🔲 Return path j	possible
	Frequen	icy[MHz]	Attenuation[dB]	
1				-
2				
3				
4				
5	<u> </u>			
6	<u> </u>			
7	<u> </u>			
8	<u> </u>			-
		<u>S</u> or	t	
/alidity Range:				
This Packa <u>c</u>	e No.: 1		from Input:	Vone 🔄
	_		to Outputs:	
Available ()	utputs:		< >	

Component type "Wall outlet" has been selected. This component type is selected with "Standard" data packets.

3.25 Creating a data packet for a trace

3.25 Creating a data packet for a trace

Components of this type are used to represent real objects that normally create connections and permit access to traces.

Cable trace objects are used for documentation, costing and routing traces.

(0	m	Weight	0		kg	
,	0	m					
2	0	m					
Vat	er protection:				-	New water protection	
Vat	er protection:	_			-	New water protection	
las	s of bridge:		▼ tons				

Component type "Trace" has been selected You now have the following input options in the input form shown in the figure above:

Trace Point Data:

"X, Y, Z m''Dimensions of the trace point.

"*Weight: Kg"* Total weight at the trace point.

"*Subtype:"* Subtypes are, for example, components or parts of a supply duct.

Clicking the New Subtype	button opens a new dialog box.
New Type	
Type Name	OK Cancel

Here you can define the name of the new subtype.

If you place a check mark in Has weight limit,

then the entry field Weight Limit kg is generated.

For example, the maximum load of a supply duct cover can be stated here.

3.25 Creating a data packet for a trace

Add

If you place a check mark in Has number of cable entries, then the entry field Number of cable entries is generated. The number of possible cable entries is documented here.

"Water protection:"

specifies the degree of protection of the cable trace object.

By clicking the New water protection button you can create new water protection types. The following dialog box then opens:

lew Type	
T	OK
	Cancel

After confirming the appropriate entries, a new button appears ______ that you can use to change or delete the entries at any time.

"Class of bridge:....tons" ((To be completed)) 3.26 Creating a data packet for a converter

3.26 Creating a data packet for a converter

Conversion from: Ch	annel 🔹 0.0 MHz
diaita la con	
olgital (noi	
Conversion to: Ch	annel 📃 🔽 0.0 MHz
digital no	ie 💌
Amplification: -0.1) dB 🗖 Conversion through FBAS
Adjustment Range: 0.0	dB
Max. Output Level: 0.0	dBμV IMA: 0.0 dB
Recom. Level: 0.0	dBμV
Self-Produced Noise: 0.0	dB
Validity Range	
This Package No.: 2	from Input: None 💌
,	to Ouputs:
Available Outputs:	<
	>

Component type "converter" has been selected. You now have the following input options in the input form shown in the figure above.

Converter Data:

"*Conversion from: MHz*" Here you select the input frequency of the converter. You can enter the band combinations or individual frequencies.

"*digital"* Here you define whether the input signal is received digitally.

"*Conversion to: ….. MHz*" Here you define the output frequency of the converter.

"digital"

Here you define whether the output signal is to be digital.

3.26 Creating a data packet for a converter

"*Amplification: dB"* Here you enter the maximum gain without control.

Conversion through FBAS

After you have selected the check box, frequency translation is not performed directly but via a video signal (rec. output level is applied in AND).

"*Adjustment Range: dB"* Here you define the control range of the adjustable attenuator.

"Max. Output Level.: dBµV"
" IMA: dB"
The maximum output level refers to the IMA value according to DIN entered here.

"*Recom. Level: ….. dB*" Here you enter the recommended output level (target level).

"Self produced Noise: dB" Background noise of the converter module.

"Validity Range"

3.27 Creating a data packet for a connecting element

3.27 Creating a data packet for a connecting element

Min. Frq.:	0	MHz	Max. Frq.: 0	MHz
Resistance:	0.00	Ohm	🔲 Return path	possible
	Freque	ncy[MHz] Attenuation[dB]	
1				-
2				
3				
4				
5				
6				
7				
8				-
		<u>S</u> o	rt	
alidity Range:				
This Packag	e No.:	1	from Input:	None 💌
Available O	utputs:		to Outputs:	

Component type "Connecting Element" has been selected. This component type is selected with "Standard" data packets.

You can create additional data packets of type Standard.

"Validity Range"

3.28 Creating a data packet for an amplifier

Amplifier RF Data:	
Freq. Range from:	40.00 MHz to: 80.00 MHz
Amplification:	-0.0 dB
Adjustment Range:	0.0 dB 🛛 🗖 Fixed Equalizer
Equalization Range:	0.0 dB Noise: 0.0 dB
Turning Point:	0 MHz Recom. Level: 0.0 dBµV
🔲 ReturnPath Att.:	dB Rec.Preemph.: 0.0 dB
Distortion Data:	
0.0 dB CTB	– All Values measured at: Output Level: 0.0 dBμV
0.0 dB CSO	C Preemphasis: 0.00 dB
0.0 dB KMA	© Equalization: 0.00 dB Raster:
0.0 dB IMA	
Values at differen	t levels
- Insertable Component:	8:
Component Group:	No Groups 🔹 new
Socket for Pad of	r Equ 🔲 Pilot regulation built in
Socket for Pad	Pilot plugable
Socket for Equ	Socket for return path module
Validity Range:	
This Package No.:	2 from Input: None to Outputs:
Available Outputs:	<
Attributes /	

Component type "Amplifier" has been selected. You can create supplementary data packets of type Standard. You now have the following input options in the input form shown in the figure above.

Amplifier RF Data:

"*Freq. Range from: MHz to MHz*" Here you enter the beginning and end of the transmission range.

"Amplification dB" Here you enter the maximum gain without control.

"Adjustment Range: dB" Here you enter the maximum attenuation value of the control range.

3.28 Creating a data packet for an amplifier

"Equalization Range: dB" Here you enter the maximum equalizer value of the control range with reference to the lowest transmission frequency.

If you place a check mark in.

Fixed Equalizer the value entered in "Equalization Range" is taken over

as the fixed equalizer value.

"*Turning Point: MHz"* Here you define the base for equalization.

If you do **not** place a check mark in.

🗖 ReturnPath Att.: dB

the amplifier is classified as not suitable for reverse path in AND.

If you select the check box, the entry field becomes active and you can enter the through loss for the reverse path.

The through loss entered refers to the highest transmission frequency of the reverse-path function entered in AND.

"*Noise: dB"* Here you enter the background noise of the amplifier.

"Recom. Level: dBµV"

"Rec. Preemph.: dB"

The values entered here are applied in AND and are the target values for the level and preemphasis of the amplifier.

3.28 Creating a data packet for an amplifier

Distortion Data

0.0	dB CTBA
0.0	dB CSOA
0.0	dB KMA
0.0	dB IMA

Here you can enter the catalog values for CTBA, CSOA, IMA and KMA of the amplifier. The CTBA and CSOA values are always used for calculation because these values are more meaningful. If no CTBA and CSOA values are available, the KMA and IMA values are used instead. If no data is entered here (value 0.0 dB), an error message is generated in AND.

Values at different levels

Clicking this button opens a new dialog box:

Enter Ca	italog [\]	Values:			Calcula	ted Val	ues:
Distortion	n Ratio	b: Lev	/el:		Distortio	on Rati	o Level:
KMA:	0.0	dB at:	0.0	dBμV	KMA:	0.0	dB at: 100 → dBµV
IMA:	0.0	dB at:	0.0	dBμV	IMA:	0.0	dB
CTB:	0.0	dB at:	0.0	dBμV	CTB:	0.0	dB
CSO:	0.0	dB at:	0.0	dBμV	CSO:	0.0	dB

You can use this dialog box to adapt the signal-to-noise ratios entered to a changed level. These values are automatically applied when you exit the dialog box.

All values entered refer to the

"Output Level: dBµV"

Here you enter the output level, with reference to the interference data.

"Preemphasis: dB" Slope in the selected channel bandwidth (raster) or

"*Equalization. dB*" Value of the equalization for the entire transmission range.

"Raster"

	Raster:	
From this combo box	▼	you select the frequency raster.

3.28 Creating a data packet for an amplifier

Insertable Components:

Under the heading "Insertable Components", the socket options in the device are defined.

Component Group: No Groups 🔹 new..

Here you define the groups from which AND can select the components for the corresponding sockets.

Socket for Pad or Equ This amplifier packet has a socket for an attenuator or equalizer.

Socket for Pad This amplifier packet has a socket for an attenuator.

Socket for Equ This amplifier packet has a socket for an equalizer.

Pilot regulation built in This amplifier packet has a pilot control permanently integrated.

Pilot plugable This amplifier packet has a socket for a pilot control.

The components selected in AND then appear both in the amplifier list and in the bill of materials.

"Validity Range"

3.28.1 Entering frequency slope measurement data

Attributes / PINS / Power / Amplifier / Ripple /

Selecting this tab gives you a new input form for value pairs.

Caution:

If value pairs are placed here, AND will use these values for calculation. That means that all other values are **<u>no longer</u>** used in the calculation!



The window in the right-hand section is used for editing value pairs to document any ripple. You can enter the value pairs in any order.

The value pairs will automatically be sorted by frequency.

You can most quickly enter the value pairs if you press the key after each entry.

At the same time, the data entered is shown in the center section. After each entry, the calculated average is the shown accordingly.

By operating this combo box	Pak 2 (Amplifier)	•	you can store value pairs
for each amplifier packet.			

3.28.2 Calculating using ARD

Using the program "*Amplifier Raster Design*" (ARD), you can calculate the entire CSO/CTB spectrum of coaxial CATV amplifiers for any frequency raster based on a few measured CSO/CTB measured values. It is immaterial for which raster measured values are available. As an alternative to CSO/CTB measured values, you can also use a series of KMA/IMA data, e.g. from a DIN measurement station.

The amplifier symbols have a special function here.

If there is measured data for an amplifier, a + box appears to the left of the amplifier. After you have started the program, the measurement data are not loaded and the amplifier symbol is white.

Double-clicking the amplifier or single-clicking the + box loads the measurement data – you may have to search for the relevant data – and the amplifier symbol is now blue. If the amplifier is expanded, all the instances of the amplifier will appear as its "children".

The following figure shows the possible states of an amplifier:



The measurement data is stored in files with the extension *.amp. There is one file for each amplifier. The name of the file is normally *amplifier_name.amp*.

The working directory of the program indicates where the measurement data is stored and where the measurement data is sought on loading.

If the measurement data is not found on loading, you can look for the measurement data file yourself in a dialog box.

The path of the working directory can be set with menu item "Choose Directory".

The measurement data of an amplifier can be imported and exported using the context menu (right-hand mouse button).

The import function can also be used to add further data to the existing measurement data.

The context menu is also used to create a new instance.

3.28.3 Entering CSO/CTB measurement data

If there is not yet any measurement data for a particular amplifier,

you must first create a new instance of the amplifier.

This is done by selecting the relevant amplifier, opening the context menu with the right mouse button, and choosing the menu item "New Exemplar" from it.

New Object New Group
Delete
New Exemplar
Import Measured Data
Export Measured Data
Export as XML

If you want to add further instances, proceed as described.

The center section contains the tabs CSO and CTB for the calculation.

1 Ripple Picture CS0 CTB

The right-hand section contains four tabs for the measurement data: CSO, CTB, IMA, KMA.

Amplifier / Ripple / CSO / CTB / IMA / KMA /

For example, if you want to enter CSO measurement data, choose the CSO tab in the right-hand section. You will then see the following display.



If the amplifier consists of more than one amplifier packet,

3.28 Creating a data packet for an amplifier

you first have to select the correct input/output pair in the Pak 3 from 1 to 3 combo box.

To do this, select the "1" tab in the center section to obtain a clearer view. This current input/output pair is highlighted in color there.



If you want to enter a new measurement series,

you first must create a new measurement series by clicking the

New Measrow button.

To change an existing measurement series, choose the relevant measurement series from the available measurement series.

First select the measurement raster in which the data were measured from the list. If the required raster is not yet in the list, you must define a new raster first.

In the dialog box that then appears, you can also view and modify the channel assignment of each raster.

After you have selected the raster, the interference frequency list of the raster is displayed. If measurement data is already entered, it will be cleared.

You are first warned of this by a message box.

Now you can enter the frequencies and CSO values.

To facilitate selection of the measurement channels and to avoid incorrect frequency selection, entry of frequencies is only possible by double-clicking the entry for the interference frequency list.

It is convenient to select the measurement channels evenly across the frequency range of the measurement raster and within the channels to select the measurement frequencies with the largest number of "beats" (bts).

The CSO/CTB values must be between 30 and 90 dB. To complete the data, you must enter the maximum test output level and the type of level alignment.

The "Comment", "Date" and "measured by" fields are to facilitate administration of the measurement data.

These data are not used in the calculation algorithm.

To delete a value pair, click the Del button to the left of the corresponding frequency field.

To delete a measurement series, select the measurement series to be deleted and

then click the Delete Measrow button.

The measurement data is now complete. The measurement series still has to be selected before calculation. The CTB data is entered in exactly the same way.

3.28.4 Entering IMA/KMA measurement data

If there is not yet any measurement data for a particular amplifier,

you must first create a new instance of the amplifier.

This is done by selected the relevant amplifier, opening the context menu with the right mouse button, and choosing the menu item "New Exemplar" from it.

Demo-Amp	lifier 1
	New Object
	New Group
	Delete
	New Exemplar
	Import Measured Data
	Export Measured Data
	Export as XML

If you want to add further instances, proceed as described.

The center section contains the tabs CSO and CTB for the calculation.

1 Ripple Picture CS0 CTB

The right-hand section contains four tabs for the measurement data: CSO, CTB, IMA, KMA.

Basic Data / PINS / Power / Amplifier / Amplifier / Ripple / CSO / CTB / IMA / KMA /

For example, if you want to enter IMA measurement data, choose the IMA tab in the right-hand section.

You will then see the following display:

Pak 3 from 1 to 3	-	measured by:	D	ate: 10/15/20
Existing Measrows:	_		Comment:	
Measrow 1		New Measrow		
		Delete Measrow		
		Data Import		
- Carriers Frequencies MHz A B 50 650.0 - Intermod. Products Type		KMA/IMA List Int_Frq = FrqA + 700.000 50.000 650.000 50.000 600.000 50.000 550.000 50.000	FrqB + Frq0 650.000 0.000 600.000 0.000 550.000 0.000 500.000 0.000	C IMA(db) 50.100 60.200 60.400 60.900
C A · B nterm. Frq: 700 MHz	~~	500.000 50.000 450.000 50.000 400.000 50.000 350.000 50.000 300.000 50.000 250.000 50.000 250.000 50.000	450.000 0.000 400.000 0.000 350.000 0.000 300.000 0.000 250.000 0.000 200.000 0.000	62.700 63.000 ≡ 64.800 65.400 65.000 66.400
IMA 50.10 dB Measuring Conditions		150 000 50 000	100.000 0.000	CO E00
C Input Leveling			Testoutlouel: 11	dB

INS / Power / Amplifier / Amplifier / Ripple / CSO / CTB / IMA / KMA /

If the amplifier consists of more than one amplifier packet,

you first have to select the correct input/output pair in the Pak 3 from 1 to 3 \square combo box.

To do this, select the "1" tab in the center section to obtain a clearer view. This current input/output pair is highlighted in color there.



If you want to enter a new measurement series, you first must create a new measurement series by clicking the New Measrow button.

To change an existing measurement series, simply select the measurement series in question. Entering the data:

Carriers Frequencies MHz	KMA/IMA List	
A B	Int_Frq = FrqA + FrqB + FrqC	IMA[db]
50 650.0	700.000 50.000 650.000 0.000	50.100 🔺
Interned Descharts Tures		60.200
Intermod. Products Type	550.000 50.000 500.000 0.000	60.900
• A + B	500.000 50.000 450.000 0.000	62.700
CAR	450.000 50.000 400.000 0.000	63.000 🗏
C A·B	400.000 50.000 350.000 0.000	64.800
	350.000 50.000 300.000 0.000	65.400
Interm Fra: 700 MHz	<< 300.000 50.000 250.000 0.000	65.000
	250.000 50.000 200.000 0.000	66.400
IMA 50.10 dB		67.500 -
Measuring Conditions		
Charles		dB
C Input Leveling		
Output Leveling	Testoutlevel: 115	i.0 dBμV

The window contains the fields for carrier frequencies A in the case of IMA or A and B in the case of KMA (B is calculated automatically for IMA with correct sign and C, for KMA).

Below this, you will find the buttons for the intermodulation types $(A \pm B \text{ for IMA and } A \pm B \pm C \text{ for KMA})$ and the entry fields for the intermodulation frequency **Interm. Frq.** and the KMA/IMA value.

To ensure that the measurement series are representative, interference products have to be entered for the main intermodulation types $A \pm B$ for IMA and A + B - C for KMA. To be compatible with common DIN measurement stations, only the usual combinations are listed for selection.

If unsupported frequency combinations are required, a negative offset can be entered for the B value.

On the right-hand side, the interference measurement list appears with the carrier frequencies. To transfer data from the entry fields into the interference list, you must click the add button ">>" with the mouse.

All frequencies are then written with the correct sign for this intermodulation type. T o remove data from the interference list again, mark the measurement data and click the remove button "<<".

You can import data with the context menu of the left-hand view.



In the case of IMA/KMA measurement data, it is also possible to import data from a data medium in the format of a Rohde&Schwarz measurement station.

This is done by clicking the _________. button.

Select the appropriate file from the menu that then appears.

Please do not confuse the KMA and IMA measurement series because the program cannot distinguish between KMA and IMA measurement data at this point.

After confirmation with <u>Open</u> the selected measurement series will appear on the right-hand side of the interference list.

In the case of KMA data, you still have to enter the reduction of the auxiliary test carrier (e.g. 6 dB for two out of three test carriers).

You also have to specify the test output level of the CATV amplifiers. If the standard table or your data on the data medium is different from usual (as, for example, on the measurement station of Rohde&Schwarz), you have to enter the data manually.

To reduce the influence of measurement errors and to improve the accuracy of determination of the nonlinearity of the amplifier, the amount of data must be sufficient. (It must be entered at 1 MHz intervals and there should be more than 5 KMA/IMA data items for each intermodulation frequency).

The "Comment", "Date" and "measured by" fields are to facilitate administration of the measurement data.

These data are not used in the calculation algorithm.

To delete a value pair, click the Del button to the left of the corresponding frequency field.

To delete a measurement series, select the measurement series to be deleted and

then click the Delete Measrow button.

The measurement data is now complete. The measurement series still has to be selected before calculation.

The KMA data is entered in exactly the same way.

Measurement data for the frequency slope 3.28.5



Entry of value pairs for each amplifier packet is explained in section 3.28.1 Entering frequency slope measurement data.

You have to enter the frequency and the gain of the amplifier over the entire transmission bandwidth in the case of a shallow, level-aligned input. However, it is enough to enter just the characteristic points of the gain,

at which there are considerable changes in the gain.

To enable the ripple to be considered in the calculation, the ripple of each instance must be entered for each instance of the amplifier.

The ripple is taken into account before the calculation if you select the check box



Verstärkungswelligkeit berücksichtigen

3.28.6 CSO/IMA – CTB/KMA calculation

The **CSO** and **CTB** tabs of the center section are responsible for the calculation. These windows only appear if an amplifier with loaded measurement data or an instance is selected.

See also the figure in section 3.28.2 Calculating using ARD.

Depending on the selected measurement data form selected, the CSO calculation window refers either to the CSO measurement data or to the IMA measurement data of the right-hand section.

The CTB calculation window refers either to CTB measurement data or to the KMA measurement data of the right-hand section. Only the selected measurement series are used for the calculation.



	,	Amplifier: AMP,	_TEST 2					AMP_TEST 2 Pak 2 Existing Measrows Weasrow 1 Exemplar 1 Weasrow 2 Exemplar 1	Comment:	asrow
								Pak 2 Existing Measrows Measrow 1 Exemplar 1 Measrow 2 Exemplar 1	New Me	asrow
								Existing Measrows Measrow 1 Exemplar 1 Measrow 2 Exemplar 1	New Me	asrow
							_	Measrow 2 Exemplar 1	New Me	asrow
				_				Measrow 3 Exemplar 2	Delete M	easrow
								Measrow 4 Exemplar 2		
									- Output:	
			_	_			_	measured by:	max. Level: 1	00.0 dE
								Date	Broomphonia [
							_		rieempriasis. ju	
								Used Lestraster:	Measurement	Conditions:
							_	IMESSPLATZ_C	I Input Lev	eling
									C Output Le	veling
								Distortion Frequency List:	⊢ MHz	CSO[db
								f=47.999 bts=10	Del 47.999	81.50
) 150.0	260.0 3	370.0 4	180.0	590.0	700.0	810.0	f[MHz]	f=48.999 bts=8 f=51.007 bts=1	Del 48.999	76.80
								f=52.007 bts=1	Del 51.007	82.80
								f=54.000 bts=1 out of ch.	Del 52.007	82.00
								f=54.996 bts=1 out of ch. f=56.000 bts=18 out of ch.	Del 53.004	77.30
								f=56.996 bts=1 out of ch.	Del	-
C	alculate for defau	ilt raster			Sa	ve Coefficient	5	1=58.005 bts=1 out of ch. f=59.006 bts=1 out of ch.	Del	-
	Calculate for any	raster	_	v	ith ampflicatio	n ripple		f=60.005 bts=1 out of ch.	Del	-
	150.0	150.0 260.0 3	150.0 260.0 370.0 4 Calculate for default raster Calculate for organizer	150.0 260.0 370.0 480.0 Calculate for default raster Calculate for any raster	150.0 260.0 370.0 480.0 590.0 Calculate for default raster Calculate for any raster	150.0 260.0 370.0 480.0 590.0 700.0 Calculate for default raster Sa Calculate for any raster V with ampficatic	150.0 260.0 370.0 480.0 580.0 700.0 810.0 Calculate for default raster Calculate for default raster Save Coefficient. Calculate for any raster If with amplification ripple	Calculate for default raster Save Coefficients Calculate for any raster If with amplication ripple	Image: Second	Image: Second

If you have selected the CSO tab, the following screen will appear:

You can access the CTB calculation window by pressing the **CTB** tab.

3.28.6.1 Steps to perform before calculation

- You have entered the measurement data as described.
- Now select the form for your measurement data.



• Select the measurement series to be used in the calculation from the available measurement series in the right-hand section by selecting the check box in front of each measurement series.

Deactivate the check box in front of the measurement series if you do not want these to be considered in the calculation. (see figure below).

AMP_TEST 2	Comment:
Pak 2 💌	
Existing Measrows	
Measrow 2 Exemplar 1	New Measrow
Measrow 3 Exemplar 2	
Measrow 4 Exemplar 2	Delete Measrow
Measrow 5 Exemplar 2	
Measrow 6 Exemplar 2	
	Output:
neasured by:	max. Level: 0.0 dBμV
Date: 10/15/2010	December in 19.9
Date. 10/13/2010	Preemphasis: 0.0 dB
Jsed Testraster:	- Measurement Conditions:
MESSPLATZ_C	C Input Leveling
	C Output Loughan
Distortion Frequency List:	MHz CSO[db]
f=47.999 bts=10	Del
f=48.999 bts=8	Del
f=51.007 bts=1	
IEDZ HUZ DISEL	Del
f=53.004.bts=1	Del
f=53.004 bts=1 f=54.000 bts=1 out of ch.	Dei
f=53.004 bts=1 f=54.000 bts=1 out of ch. f=54.996 bts=1 out of ch.	Del
=53.004 bts=1 f=54.000 bts=1 out of ch. f=54.996 bts=1 out of ch. f=56.000 bts=18 out of ch.	
=53,004 bts=1 f=54,000 bts=1 out of ch. f=54,996 bts=1 out of ch. f=56,000 bts=18 out of ch. f=56,996 bts=1 out of ch. f=58,005 bts=1 out of ch.	
=53,004 bts=1 f=54,000 bts=1 out of ch. f=54,996 bts=1 out of ch. f=56,000 bts=18 out of ch. f=56,996 bts=1 out of ch. f=56,0906 bts=1 out of ch. f=58,005 bts=1 out of ch. f=58,005 bts=1 out of ch. f=58,005 bts=1 out of ch.	Del Del Del
=53.004 bts=1 f=54.000 bts=1 out of ch. f=54.996 bts=1 out of ch. f=56.000 bts=18 out of ch. f=56.996 bts=1 out of ch. f=56.996 bts=1 out of ch. f=56.996 bts=1 out of ch. f=58.005 bts=1 out of ch. f=59.006 bts=1 out of ch. f=60.005 bts=1 out of ch.	Del Del Del T

- The picture shows the measurement series that have been selected for the calculation. If more measurement series have been created than can be displayed, you can make further measurement series visible using the scrollbar (marked red) to select them for the calculation.
- You should select a measurement series that covers the entire amplifier bandwidth for the calculation.
- You can perform also the calculation with all measurement data for different rasters.

• You can activate the option

with ampflication ripple

(see picture at the bottom of page 137) before the calculation. If this option is active, the ARD program can calculate the CTB/CSO spectrum, taking the amplifier ripple and preemphasis into account.

If this option is not activated or if there is no data on the frequency slope, calculation will be performed at a constant level.

• To start the calculation, click one of the two buttons:

Calculate for default raster

• Calculation is performed for the catalog raster and the output level that are entered for the amplifier packet.

Calculate for any raster

- Calculation is performed for any selected raster. The selected raster can be different from the measurement rasters. The selected raster on no account have a larger bandwidth than the amplifier bandwidth.
- After confirmation of one of the two calculation buttons, the following dialog box opens (with ampflication ripple must be selected):

Calculate with Carriers Ripple					
Name: AMP_TEST 2					
Calculate with					
Flat Output Leveling					
Calculate with Preemphasis: 0 dB					
assume, that equalizer is linear					
Cancel OK					

- Here you can set whether the calculation will be performed with a level-aligned input or level-aligned output.
- You can enter a preemphasis.
- If you activate the "assume, that equalizer is linear" check box, the frequency slope of the amplifier equalizer simulated linearly, otherwise it is simulated as equalization of the non-linear frequency slope of a typical coaxial cable, that is, a sort of cable equalizing characteristic.
- After entry of the required data, you can now click one of the two calculation buttons.

3.28 Creating a data packet for an amplifier

button,

- If you decided on the <u>Calculate for default raster</u> button, the calculation results will be displayed to you immediately, either as characteristic curves or in the spectrum.
- See page 142 Calculation result curve or
- section 3.28.7 Calculation result for CSO/CTB spectrum
- If you have selected the Calculate for any raster a further dialog box appears for selecting the raster. Here you can only select the raster.

Raster name and pic	ture standard: —		Frequency	List: -
Channel standard:	EUROPE STAN	DARD B+G	48.255	^
			133.251	- 11
MESSPLATZ_C-K	analanzahl=36	<u>^</u>	140.249	
CENELEC29-Kana	alanzahl=29	=	147.247	
BK450-Kanalanzal	hl=36		161.247	
BK606-Kanalanzal	nl=55		175.249	
NBaster860-Kanal	anzahl=97		189.251	
BK606_FUBA2-Ka	nalanzahl=55		217.255	
MESSPLATZ_C2-	Kanalanzahl=36	-	231.253	
			238.251	
Import D	elete Raster	Export	252.247	=
Madifu	Dastor / Caus Ar		259.246	
Moully	naster / pave As	>	273.249	
Reduce digital ampli	tude by	dB	280.251 287.250	
Define New Raster-			294.250 303.254	
C Europe Stand	ard B+G		311.253	
C France Standa	ard L		319.251	
C USA NTSC			335.247	
C Russia Standa	ard D		351.246	
C Define Free			367.249	
Define Raste	er		375.251 383.253 391.254	-

If you want to change a raster or define a new raster, choose menu item Raster (see next figure), change the raster data there and start the calculation again.

See also 4.1 Defining a new raster

	Mounting Groups	
	Mounting Groups	
	Local References	
	Color codes	
	Edit Graphical Style	
	Eldanorm price update	
	Default Language	
٢	Raster	
-	Set Version	

• The calculation window for the CTB calculation has an analogous layout.

3.28.6.2 Calculation result curve



The characteristic curve is a plot of the calculated frequency dependency of NLD2 or NLD3 (2nd and 3rd order coefficients of **N**onlinear **D**istortion) for each selected measurement series and for the representative CATV amplifier.

If the measurement error is relatively small, the curves for the measurement error analysis can be helpful even if they have been measured with different frequency channel assignments.

That especially applies to CTB measurement data because it usually contains smaller measurement errors and better measurement data repetition than the CSO measured values.

Randomness has a large influence on measurement of CSO because the number of "beats" is relatively small in this case, which makes measurement data repetition poorer. If the calculation is based on a statistical value, measurement points with a larger number of "beats" for representative amplifiers can be better defined. The following figure shows the CTB curve of the same amplifier.



3.28.7 Calculation result for CSO/CTB spectrum

The CSO/CTB value at a frequency is the difference between the video carrier level and the interference product level.

If the video carrier level changes within the bandwidth of the amplifier,

the CSO/CTB ratio also changes, even without any change to the interference product level.

If the measurement data of the CATV amplifier have been measured, or if the CATV amplifier exhibits a large ripple, a difference results between the calculated values and the measured values, e.g. on conversion to another frequency channel assignment.

A change in the ripple or the preemphasis can either improve or worsen the CSO/CTB values for a certain raster and a certain amplifier.

Without special numeric analysis, activated with the \Box with ampflication ripple check box, no prediction is possible.



The following figure shows the CSO/CTB spectrum of the selected raster.

If both the raster and the type of level alignment for a measurement series match the parameters selected for calculation, the data of this measurement series is plotted in short, horizontal dashes.

The figure above shows the result of a CTB calculation with the CENELEC29 raster and a level-aligned input.

Measurement series 2 was also measured with the CENELEC29 raster and a level-aligned input.

Consequently the measurement data for measurement series 2 appear as horizontal dashes in the spectrum. The color coding is the same for the curve display and the spectrum display, that is, lines of the same color belong to the same measurement series.

3.28 Creating a data packet for an amplifier

Using the boxes for changing the scale and offset

• •	<u>}</u>
-----	----------

You can move the measurement cursor simply by operating the mouse. You only have to move the mouse pointer to the required position in the image grid, c lick this position once and release the mouse button. The mouse pointer will then be at the required position.

Carrier Frq. This check box currently has no function
3.28 Creating a data packet for an amplifier

3.28.8 Writing calculated data into the library

After calculation you can store the calculated CSO/CTB values in the library with the corresponding amplifier.

For this purpose, the Save Coefficients button becomes active immediately after calculation.

The program will work with the data last calculated. If the input data of the calculation changes in some way or other, the button is deactivated again.

After you have clicked the button, an info box opens.

Test Raster Nam Measured Data:	e: CENE	LEC42			
Worst CSO/CTB	Values:	60.4	dB at	727.25	MHz
Input Levelling	Pre	eemphasis :	0	dB	
Calculated Value	s:				
Worst CSO/CTB	Values:	60.2	dB at	743.25	MHz
Eingepegelter Eir	ngang, Pre	eemphasis :	0	dB	
Worst CSO/CTB- calculation:	Values for f	urther	60.2	dB	

Here you can compare all measurement and calculation results again.

You exit the info box by clicking _____OK___. Now the calculated data is stored and the catalog data is written for CSO/CTB.



Confirming this info box finalizes the operation.

Storage of the CSO data is performed completely analogously.

On storage, only the product of the calculation results,

the characteristic curve with the library, is stored.

The stored measurement data are placed in a separate file (amplifier_name.amp) for each amplifier in the Lib folder.

These files are not required for planning in AND.

However, they should remain in the Lib folder because this file is accessed on every change to the amplifier.

3 Entering / Modifying the Symbol Data

3.28 Creating a data packet for an amplifier

3.28.9 Printing calculation results

D	Ê	*	6	6	8	?
						_

With the button (marked red) **With the button** (marked red) **with the graphics** currently visible in the calculation window.

If the button is not active, a mouse click on the image grid in the center section is enough.

If you have previously clicked the Save Coefficients button, the graphic will be printed out with the most important amplifier data.

3.29 Creating a data packet for a splitter

3.29 Creating a data packet for a splitter

Standard Package Data	a:		
Min. Frq.: 0	MHz	Max. Frq.: 0	MHz
Resistance: 0.00	Ohm	🔲 Return path	n possible
Frequer	ncy[MHz]	Attenuation[dB	1
1			-
2			
3			-
5			-
			-
7			-
8		·	•
	<u>S</u> or	t	
_			
Validity Range:			
This Package No.: 1		from Input:	None 👻
Available Outputs:		to Outputs:	
→ ata /\ Symbol Data	/\ Att	ributes / PINS	∕\ Standar

The component type "Splitter" was selected. This component type is specified with "standard" data packets. You can create additional data packets of type Standard.

"Validity Range"

4.1 Defining a new raster

4 Frequency Rasters

A raster consists of a name, a list of video carrier frequencies and a TV standard. The frequencies can also be digital.

List of Rasters	-	X
Raster name and picture standard:	Frequency L	.ist: —
Channel standard: EUROPE STANDARD B+G	48.255 62.253	Â
MESSPLATZ_C-Kanalanzahl=36 CENELEC42-Kanalanzahl=42 CENELEC29-Kanalanzahl=29 BK450-Kanalanzahl=55 NTSC_USA-Kanalanzahl=55 NTSC_USA-Kanalanzahl=97 NR aster860-Kanalanzahl=97 BK606_FUBA2-Kanalanzahl=55 MESSPLATZ_C2-Kanalanzahl=36	133.251 140.249 147.247 154.245 161.247 175.249 189.251 203.253 217.255 231.253	
Import Delete Raster Export Modify Raster / Save As Reduce digital amplitude by	245.249 252.247 259.246 266.247 273.249 280.251	Е
Define New Raster	287.250 294.250 303.254	
C Europe Standard B+G C France Standard L C USA NTSC	311.253 319.251 327.249 335.247 251 245	
C Russia Standard D C Define Free	359.245 359.247 367.249 375.251	
Cancel	391 254	*

The upper part of the raster list contains the channel standard of the selected raster.

The upper raster is marked ("MESSPLATZ_C-Kanalzahl=36").

The right-hand window shows the video carrier frequency list of the selected raster.

Reduce digital amplitude by dB

Level lowering for rasters with digital channels is specified here (usually 10.0 dB).

The standard measurement procedure prescribes unmodulated carriers for CSO/CTB measurement and determination.

Rasters with digital channels are used to check the CSO/CTB spectrum for assignment of the channel to a digital carrier frequency.

They can also be used to detect what interference PAL-unmodulated carriers are causing in these channels.

4 Frequency Rasters

4.1 Defining a new raster

4.1 Defining a new raster

Cut	Ctrl+X	
Сору	Ctrl+C	
Paste	List of Rasters	
Search	Raster name and picture standard:	Frequency List:
Edit Basedata L Edit Objects At	Channel standard: EUROPE STANDARD B+G	48.255 62.253 133.251
Suppliers	CENELEC42-Kanalanzahl=36 CENELEC42-Kanalanzahl=42 CENELEC29-Kanalanzahl=29	140.249 147.247 154.245
Mounting Gro Local Reference	BK450-Kanalanzahl=36 BK606-Kanalanzahl=55 NTSC_USA-Kanalanzahl=77	161.247 175.249 189.251
Color codes Edit Graphical	NRaster860-Kanalanzahl=97 BK606_FUBA2-Kanalanzahl=55 MFSSPLATZ_C2-Kanalanzahl=36	203.253 217.255 221.252
Eldanorm price	Import Delete Raster Export	238.251 245.249 252.247
Default Langua	Modifu Baster / Save As	259.246
Raster		273.249
Set Version	Reduce digital amplitude by dB	280.251
Flip all frames	Define New Raster	303.254
	C Europe Standard B+G	319.253
	C USA NTSC	327.249 335.247
	C Russia Standard D	351.246
	C Define Free	367.249
	Define Raster	383.253 391.254 T
	Cancel	<
	E	

These buttons allow you to import and export existing raster file.

Delete Raster With this button, y	ou can delete the currently selected raster.
LibEdit	
Yes <u>No</u>	

A message informs you that measurement series that refer to this raster will also be deleted.

Modify Raster / Save As

With this button, you can store or modify the selected raster with a new name. *"Reduce digital amplitude by: ….. dB*"

Channels marked as digital are lowered by the value entered here.

4.1 Defining a new raster

4.1.1 Freely defining a raster

To define a new raster, you must perform the steps shown in the figure at the top of page 149. You are now in the "List of rasters" dialog box ".

First select the standard of the frequency list

(marked green in the figure at the top of page 147.).

You have selected "Define free" within the section "Define New raster".

A click on the activated button Define Raster takes you to a new dialog box "Edit Raster".



"Frequency MHz"

Enter the required frequency in the intended field.

Clicking the "Add" button puts the frequency in question in the frequency list of used frequencies.

If you want to delete individual frequencies from the list of used frequencies,

select the required frequency and click the $\stackrel{\scriptstyle{\scriptstyle \mathrm{\scriptsize (1)}}}{=}$ button.

If you want to define individual frequencies of the list as digital,

first select the required frequency, and then click the

____ button.

Mark Digital Frequency

Clicking this button lowers the previously selected frequencies by the value defined in the list of rasters in the entry field

"Reduce digital amplitude by: dB"

The frequency in question is marked.

"Raster Name:"

Enter a unique name for the new raster here.

"Colorsystem" Choose one of the available colorsystems.

4.1 Defining a new raster

4.1.2 Defining a frequency raster according to a TV standard

To define a new raster, you must perform the steps shown in the figure on the top of page 149. You are now in the "List of Rasters" dialog box. First select the standard of the frequency list (marked green in the figure on the top of page 149).

In the "List of Rasters" You have selected the raster "Europe Standard B+G".

Clicking the Define Raster button takes you to a new "Edit Raster" dialog box.

Edit Raster	×
Available Frequencies	Used Frequencies
48:250 • 55:250 • 80:150 • 112:250 • 12:250 • 133:250 • 140:250 • 151:250 • 151:250 • Define Frequency: •	
ricqueriey je	
Add	
Mark Digital Frequer	псу
Raster Name:	
Colorsystem-	
PAL B and	łG
C PAL I	
G SECAMI	in and the second se
C SECAM D	
Cancel	<u>0</u> K

"Available Frequencies:" List of all frequencies that are available for transmission.

"Used Frequencies:"

In this list, the required frequencies are selected from the list of available frequencies.

That is done by double-clicking or

single selection followed by transmission with the \rightarrow button.

"Define Frequency:"

Here you can also add freely defined frequencies to the list of used frequencies. Clicking the "Add" button puts the frequency in question in the frequency list of used frequencies.

4 Frequency Rasters

4.1 Defining a new raster

The list of used frequencies is automatically sorted by frequency. If you want to remove individual frequencies from the list,

select the frequency in question and click the	button.
--	---------

Clicking this Mark Digital Frequency button lowers the previously selected frequencies by the value defined under

"Reduce digital amplitude by: dB"

The frequency in question is marked.

After you have entered a unique raster name, you can select the color system. However, you should not use the NTSC-USA standard for a European frequency list or vice versa.

Finalize your entries with After you have exited the dialo is calculated for the new raster	<u>jK</u> ig box, the i c.	nterference frequency list
If you exit the dialog box with	Cancel	the data you entered will be discarded.

For rasters with a large number of channels, calculation may take some time.

4.1 Defining a new raster

4.1.3 Modifying a raster / using an existing raster as a template

An existing working raster can be modified or renamed at any time.

This is done by clicking the		Modify Raster / Save As	button.
The following dialog box the	n oper	ns again	
Edit Raster	x		
Available Frequencies Used Frequ	encies		
48.250 48.255 55.250 52.250 80.150 133.251 112.250 140.249 142.250 147.247 119.250 >> 140.250 154.245 140.250 154.245 147.250 154.245 147.250 23.253 154.250 231.253 Define Frequency MHz Add MHz	A		
Mark Digital Frequency			
Raster Name: MESSPLATZ_C			
PAL B and G PAL I			
C SECAM L C SECAM D			
Cancel <u>D</u> K			

You can edit the list in this dialog box.

If you leave the original raster names unchanged, the existing raster will be modified, but if you change the raster name, you will create a new raster.

Finalize your entries with

After you have exited the dialog box, the interference frequency list is calculated for the new raster.

With <u>Cancel</u> you can exit this dialog box and the data you entered will be discarded. In rasters with a large number of channels, calculation can take some time.

4.1.4 Importing/exporting a frequency raster

The rasters used are also stored in a measurement data file. You can load a new raster indirectly by loading the measurement data that this raster uses. To import a complete raster list, overwrite the file "Raster.rst", which is located in the same directory as the program, with the new file.

This file must have the same name. Your old raster file is deleted by this. A message is displayed if you load later measurement data for a new amplifier that uses the old raster.

	Frequency SIEMEN	list of IS
One of the measured data refers to the unknown raster "SIEMENS"	48.250 62.250 119.250 133.250 140.250 147.250 154.250	* III
Add to rasterlist Delete all measuring rows using this raster	161.250 175.250 189.250 203.250 210.250 217.250 224.250 231.250	÷

button, the old raster is imported again with the measurement data.

Import Delete Raster Export

With a click on the "Export" button, you can export the existing raster list into an existing directory.

5 Cables

Each library can contain an unlimited number of cables.

We make a distinction between two basic types.

- Coaxial cables
- Fiber-optic cables

5.1 Multicolours

Cables, wires, bundles, duct packages and microducts can be multicoloured.

A "multicolour" consists of a background colour and an optional superimposed ring pattern.



Multicolour consisting of a blue background, a red and a black ring

A plain colour is simply a multicolour without a superimposed pattern. The number, positioning, width and colour of the rings is editable.

Multi color	_	(
lundundindundundu <mark>n:</mark> undu	ner minner imiter da	dontini kardoni ka

5.1.1 Multicoloured cables and duct packages

The multicolour for these object types is displayed in the base data view:



To edit a multicolour, click on the *Color* button.

5.1.2 Multicoloured colour code

Colour code entries can be multicoloured.

In the *Edit Colorcodes* dialog (*Edit* > *Color codes*), you can edit the multicolour of a single wire or bundle by double-clicking on the multicolour cell. Using the *Overlay Pattern* button, you can assign a pattern to all selected items. If no item is selected, the pattern is assigned to all items. This batch mode applies to ring pattern edits only. The background colour is ignored in this batch editing mode.

Edit Colorcodes		—
3x2 ▲ A-DF(ZN)-2 • central ring • DF2Y4Y 2x12E9/125 Draka 96 Draka 96 • OFS 12 fiber • OFS 192 fiber • OFS 192 fiber • Optonet • Standard1 • Standard2 • Standard4 • Standard5 • Standard5 • Standard5 • Swiss com • tdc 48-2 • <	Fibers	Bundles Count: 6 Color 1 2 3 4 5 6
Add		
Remove		
Rename	Overlay Pattern	Overlay Pattern
		Cancel OK

5.1.3 Colour codes for fibre cables

In AND 4.9 and earlier versions, there was a global colour code list. Each fibre cable would reference a colour code in that list. From AND 4.10 on, each fibre cable has its own instance of a colour code. The global colour code list still exists, but is used only for copying purposes.

inestyle:	Opt. Standard	-
	🔲 No double line	
Colorcode:	Standard	- Show

Fiberdata dialog in LibEdit

The *Show* button is for both viewing and editing. The colour code of the cable (e.g. "Standard") may differ from the "Standard" code in the global list. In this case you see two colour codes in the *Show* dialog called "Standard". The one assigned to the cable is selected, and the one from the global list is displayed with the suffix "(global)".

If there is no second entry with the suffix "(global)", the cable's colour code and the global code are identical. In this case, if you edit the global code in that dialog and select OK, the cable's code is a copy of that global code.

5.1.4 Multicolours for microducts and copper cables

Color	Label	Reserved
	Duskolarija	
	Dunkeigiun	
	Sobuera	
	Ocongo	
	Tijkia	
	Dunkobbu	
	Galb	
	Dunkolarou	
	Durikeigiau	

Microducts and wires of copper cables can also be assigned multicolours.

Edit dialog for Duct Package Data in LibEdit

You can edit individual multicolours by double-clicking on the respective cell. Select the *Edit* button to modify or replace the entire code.

The same multicolour functionality is available for the wires of a copper cable.

	Number of (wires: b	
Wire	es:		
	Wire	Description	Color
	1	white-blue	
	2	white-yellow	
	3	white-green	
	4	white-brown	
	5	white-grey	
	6	white-orange	

Note that in LibEdit and AND, multicolours are displayed as vertical patterns because a vertical layout is the best method to display several colours. For microducts, the pattern is often horizontal. For copper cables, multicolours might be used to represent the 2 colours of the twisted wire pair.

5.2 Coaxial cables

After you have selected the "Cables" tab in the left-hand section, the following screen will appear:

LibEdit - [Unknown-1]	
🔀 File Edit View Window ?	_ 8 ×
Symbols A Cable A Conn. A CalcObi. AmnObi. /	 81
(Contraction of the contraction	
Press F1, to obtain help.	NUM //

You will find information on each individual section in section **<u>1.3 Screen layout</u>** If you want to create a new coaxial cable, move the mouse pointer into the left-hand section. Press the right mouse button once here to obtain a context menu.



New Cable	Ripple of Attenuation	Deutsch New Language
	New Cable cable	Language dependent Data:
	K (dB)	Name: New Cable Color:
	8	Order No.: Price: 0.00 €/100m
	7	Article No.: Version: 1
	6	Manufact:
	5	C from:
	4	Description Text:
	3	
	2	
	0 100 200 300 400 500 600 700 800 900 MMH	s)
		Short description:
		Language independent Data:
		Installationtime / 0.0 min
		Screening > 80 MHz: 0.0 dB Screening 5-65 MHz: 0.0
		Specific Type:

After you have selected the required cable, the relevant screen is displayed:

The basic data is entered in an analogous way to the symbols.

See also 1.5.1 Basic data

You can create cable groups.

When a cable is replaced, AND only suggests cables that belong to this group. You now switch to the "Cable Data" tab in the right-hand section. The following window then opens:

50.00	MHz	dB	Linestyle:
100.00	MHz	dB	Standard
200.00	MHz	dB	-
300.00	MHz	dB	Readwords (Food levelt)
450.00	MHz	dB	i neadymade (iixed ierigin)
600.00	MHz	dB	
800.00	MHz	dB	Cable reference:
	MHz	dB	Type: Free
	MHz	dB	Reference:
	MHz	dB	
at tempe	rature: 20.0	3.	

Basic Data Cable Data Attributes

The figure shows the input form for the RF data. Values are already suggested to you by default. These can be overwritten at any time.

5.2.1 RF values

"Frequency MHz dB"

Value pairs are created here.

These refer to a frequency and the associated attenuation/100m for the temperature specified here.

The attenuation value for a cable with integral connectors is absolute.

at temperature: *C

Values can be entered quickly by clicking on the first entry field for frequency with the left

mouse button and then moving on field by field with the key.

Please note that these must be as evenly spread as possible over the entire frequency range of the cable.

The program interpolates between the individual data according to theoretical knowledge of the attenuation curve of a coaxial cable.

You can create up to 16 value pairs for one coaxial cable. At the same time, the frequency curve is graphically displayed in the center section.



5.2.2 Cable properties

Properties of Cable:
Resistance: Ohm/1000m
Linestyle:
Standard 💌
🗖 No double line
Readymade (fixed length)
Cable reference:
Type: Free
Reference:

"Resistance: Ohm/1000m"

Enter the loop impedance for 1000 meters of the cable without connectors fitted.

"Linestyle:"

You can choose between 7 other drawing styles in addition to the standard drawing style.

No double line

If you select this check box, AND will not permit a double line for this cable (the second continuous line is not permitted).

Readymade (fixed length)

With this check box, you can define whether the cable has integral connectors.

If you select this check box, the input form changes as shown in the figure below.

The attenuation and impedance values are absolute values for the fixed length of the cable with integral connectors.

Because a fixed length of cable is assumed, the attenuation values should correspond to the length of the cable created. AND considers the real attenuation values for each calculation frequency.

If the cable is created with integral connectors, a second check box appears. If you select this check box, it is assumed that both cable ends have the same connector (see the following figure).

5.00	MHz	1.00	dB	Linestule:
50.00	MHz	2.90	dB	Standard
100.00	MHz	4.20	dB	No double line
200.00	MHz	6.10	dB	Readwards (fixed length)
300.00	MHz	7.60	dB	V Preadyinade (inxed lenger) 0.
500.00	MHz	10.10	dB	l♥ Symetric
800.00	MHz	13.20	dB	Both sides:
950.00	MHz	14.50	dB	Type: Free
1750.00	MHz	20.90	dB	Reference:
2050.00	MHz	23.10	dB	
2400.00	MHz	25.40	dB	
3000.00	MHz	29.30	dB	
	MHz		dB	

If this check box is cleared, a distinction is made between the two cable ends (see picture below).

Readymade (fixed length)	0.00 m
🔲 Symetric	
Left Side:	
Type: Male plug	
Reference: 1: F	
Right Side:	
Type: Male plug	
Reference: 1: F	

For cables having different connectors at each end, it is possible to create different references. Because the position of the cable is relevant to the search for a connector in AND, the ends are shown with symbols, so that planners can distinguish between the two ends).

Male Connector

Female Connector

It is mandatory to select the connector references to match the integral connectors when defining a cable with integral connectors. If this is not done, the program automatically clears the check box for integral connectors.

You will find information on references in section 2.4.3 Cable and connector references.

You can define the object properties under the "Attribute" tab.

You will find information on attributes in section 1.6.4 Attributes.

5.3 Fiber-optic cables

After you have selected the "Cable" tab in the left-hand section, the following window will appear:

LibEdit - [Unknown-1]	and the second se	
Eile Edit View Window ?		_ 8 ×
Symbols / Cable / Conn. / CalcObj. / AmpObj. /		
Press F1, to obtain help.		NUM //

If you want to create a new fiber-optic cable, move the mouse pointer into the left-hand section.

Press the right mouse button once here to obtain a context menu.





After you have selected the required cable, the relevant window is displayed:

The basic data is entered in an analogous way to the symbols.

See also 1.5.1 Basic data

You now switch to the "Fiberdata" tab in the right-hand section. The following window then opens:

Waveleng	ath:	
nm	<<	
for the selec	cted wavelength:	
A	ttenuation / km	dB
	Dispersion:	 ps/(nm*km)
	IOR: 1	1
Cuto	off Wavelength: 700.0	nm
Zero-Dispers	ion Wavelength: 700.0	nm
	Helix Factor: 0	%
Colorcode:	(C	▼ Show
Readymade	e (fixed length)	
Cable referen	ice:	
	ree	
Type: F		
Type: F Reference: F		
Type: F		<u></u>
Type: F		
Type: F		

The figure shows the input form for the fiber-optic data. Values are already suggested to you by default. These can be overwritten at any time.

5.3.1 Fiber data

"Wavelenght: nm"

Here you define the wavelengths for the fiber-optic cable.

These refer to all fibers of the cable.

You can enter multiple wavelengths.

Move each entered wavelength individually into field for the transmission range

of the fiber-optic cable with the $\xrightarrow{}$ button.

Use the $\stackrel{\scriptstyle{\scriptstyle{\swarrow}}}{\overset{\scriptstyle{\scriptstyle{\leftarrow}}}}$ button to remove a selected wavelength from the window again.

This input form is generated afresh for each defined wavelength.

Wavelength:	Wavelength: nm
for the selected wavelength:	for the selected wavelength:
Attenuation / km 0.33 dB	Attenuation / km 0.20 dB
Dispersion: 3.50 ps/(nm*km)	Dispersion: 18.00 ps/(nm*km)
IOR: 1	IOR: 1

That means, if you select the wavelengths entered one after the other, the data for attenuation/km and dispersion will only be displayed for the selected wavelength.

"Attenuation / $km \dots dB''$ for the selected wavelength Here you enter the attenuation for 1 km of the fiber-optic cable with reference to the selected wavelength.

"*Dispersion: ps/(nm*km)" for the selected wavelength* Here you enter the dispersion of the fiber-optic cable with reference to the selected wavelength.

"*Cutoff- Wavelenght nm"* Here you enter the cutoff wavelength.

"Zero- Dispersion Wavelenght nm" Here you enter the zero-dispersion wavelength.

"Helix factor%" ((To be completed))

"*Number of bundles …..*" Here you enter the number of bundles of the fiber-optic cable.

"*Wires per bundle* " Here you enter the number of fibers of the bundle.

"Linestyle:"

You can choose between 8 other drawing styles in addition to the standard drawing style.

No double line

If you select this check box, AND will not permit a double line for this fiber-optic cable (the second continuous line is not permitted).

"Colorcode" :

See 5.2.2 Color code

"Show"

See 5.2.2 Color code

Readymade (fixed length)

With this check box, you can define whether the fiber-optic cable has integral connectors. If you select this check box, the input form changes.

The attenuation values are absolute values for the fixed length of the cable with integral connectors. Because a fixed length of cable is assumed, the attenuation values should correspond to the

length of the cable created. AND considers the real attenuation values for each wavelength.

If the fiber-optic cable is created with integral connectors, a second check box appears. f you select this check box, it is assumed that both cable ends have the same connector. If this check box is cleared, a distinction is made between the two cable ends. The fiber ends of a cable with integral connectors is shown thickened in AND. It is mandatory to select the connector references to match the integral connectors when defining a cable with integral connectors.

If this is not done, the program automatically clears the check box for integral connectors.

You will find information on references in section 2.4.7 Cable and connector references

You can define the object properties under the "Attribute" tab.

You will find information on attributes in section 1.6.4 Attributes.

5.3.2 **3-staged fibre cables**

AND supports fibre cables which are organised in three hierarchical levels. The first level is referred to as a "pack", the second level as "bundles" and the third level as single "wires". Example: A cable consists of 7 packs. Each pack comprises 12 bundles, and each bundle contains 12 wires. The cable thus has a total wire count of 7*12*12 = 1,008. In LibEdit, a 3-staged fibre cable is designed as a formal hybrid cable with subcables of type "fibre".

In AND, you can use 3-staged fibre cables in the same manner as any other hybrid cable. AND recognises pure-fibre hybrid cables and offers the same functions as for normal fibre cables, e.g. the "r" function.

🖶 🔚 patenspice	Language dependent Data: -	
Hybrids	Object No.: 57	DB-ID:
	Name: 1 blue	Color:
≡ 2 red	Order No.:	Price: 0.00 €/10
= 3 green	Article No.:	Version: 1
mi = 4 orange mi = 5 grey	Manufact.: 0	▼ new
<mark>≡ 6</mark> yellow	Availability	·
= 7 purple	Check C	to:

In order to design a 7x12x12 cable in LibEdit, create seven 12x12 subcables:

All subcables have identical technical data. They differ only in name and colour.

In LibEdit, a 3-staged fibre cable is designed as a hybrid cable. To create a new hybrid cable, select the *New Hybrid Cable* command in the context menu of the tree view. Enter the name "7x12x12", and add the seven subcables to it:



A 3-staged fibre cable with 7 packs. Each pack represents a 12x12 fibre cable.

Use the list control context menu to add and delete subcables.

The library name of a pack appears in the hybrid expanders in AND. It is recommended to assign a suitable colour to each pack. If the cables of a pack are to be ignored in the BOM, make sure there is no price, orderNo or ArticleNo entry for them in the library:

Eibers Hybrid	objectivo. Jos	טיטט. ן
	Name: 1 blue	Color:
≡ 2 red	Order No.:	Price: 0.00 €/

The subcables normally have identical physical properties. But it is also possible to use formal hybrid cables to design inhomogeneous fibre cables, e.g. a 2-staged cable with 12 wires in the first bundle and 24 in the second:

Sub-caples:		
Subcable id	Subcable name	Subcable type
2	1 blau 1x12	Fiber
3	2 rot 1x24	Fiber
	Subcable id 2 3	Subcable id Subcable name 2 1 blau 1x12 3 2 rot 1x24

5.3.3 Color code

"Colorcode:"

Fiber-optic cables have a certain code by which the sheath color of bundles and fibers is determined.

The standard color code is suggested here.

You can also select other color codes, display them with the <u>Show</u> button, edit them, or create new color codes.

5.3.4 Editing of color codes

You can obtain the window for editing color codes via the Edit/Colorcodes menu item.

Standard	Fibers	Bundles
test 10x10 test 9x12		
(est 0x12	2	2
	3	3
	4	4
	5	5
	6	6
	7	7
	8	
Add	Add	Add
Remove	Remove	Remove
Rename	1	

Standard colors are stored for 12 fiber colors and for 4 bundle colors.

The fiber and bundle colors recur in the same way.

That means that the sheath color of the 5th bundle of the cable to which this code has been assigned, is red again, the 6th bundle green, etc.

With the ______ Add _____ and _____ Bemove _____ buttons,

you can define or delete fiber or bundle colors.

If you want to add a fiber color, for example, click on "Add", and a new button will appear with the number 13. This button initially has the color gray. If you click the new button, you can select a color for the new fiber No. 13 from the

If you click the new button, you can select a color for the new fiber No. 13 fro color palette that is now open



Editing of the bundle colors is analogous.

5.3.5 Adding color codes

If you want to add a new color code, click on $``\mbox{Add}''$ in the list of color codes. A new dialog box opens.

Insert Colorcode	×
Name: Bundles: Fibers per Bundle:	4
Cance	

"Name:"

Enter the name of the new color code here.

"*Bundles:"* Enter the number of fiber bundles here.

"Fibers per Bundle:" Enter the number of fibers per bundle here.

After you have clicked OK the newly created color code appears in the list of color codes.

5.4 Twisted pair networks in AND

In LibEdit, it possible to create twisted pair cables, network components and twisted pair splice boxes. Twisted pair pins can be added to all kinds of optical and coax termination devices.

In AND, twisted pair cables are treated like other cables, but can be connected only to pins of type "twisted pair".

If you press "R'' for a twisted pair pin, AND shows data of both ends of the route. When routing through a network component AND uses the uplink flag to determine the next pin.

There are 2 distinct use cases. For computer and data networks, you use symbols of type "network component" and connect the pins of the network components with twisted pair cables. For the documentation of telephone networks, you split the twisted pair cables into subordinate wire pairs and distribute them using expanders and splice boxes.

5.4.1 Twisted pair cable

The context menu of the cables view includes a New Twisted Pair Cable item:

🞥 LibEdit	- [TwistedPair.lib]
😂 File	Edit View Window ?
	3 % BC 55 ?
3m 5m	Patchkabel Patchkabel
	New Coax Cable
	New Fiber
	New Duct Package
0	New Twisted Pair Cable
	New Hybrid Cable
	New Group
	Delete

nan vela	aow <u>r</u>		- 0
) 1 1	
E COax — 1m Patchkahel	Twisted Pair Data:		
= 3m Patchkabel	Number of wire pairs	: 4	
= 5m Patchkabel	Wire Pairs:		
	Wire Pair	Description	Color
	1 2	weiß-blau weiß-gelb	
	3	weiß-grün weiß-braun	
	1		
	🔽 Readymade (fixed	length) 3.00 m	
	Symmetric		
	- Both sides:		
	Type: Male plug	1	
	Reference: 518: RJ3	1X	
			27
	Linestula	: Standard	-
	Linestyle	e: Standard	T
	Linestyle	e: Standard 🔽 No double lir	Te

The *Twisted Pair* tab in the right panel shows the data of a twisted pair cable:

Number of wire pairs: The number of twisted subordinate wire pairs

List of *Wire Pairs*: Description and colour of each subordinate wire pair. As AND cannot render striped colours, you can enter only one colour in LibEdit.

Readymade: Enabled if the cable has a fixed length and, if so, the length and connectors.

Linestyle: The line style in which the cable is drawn in AND.

No double line: Do not draw as double line in AND.

The following connector reference types are supported:

Id	Name	Description	i	
501	BJ48S	8P8C for four-wire data line (DDS): dt : "BJ 45"		
502	B.148C	8P8C for four-wire data line (DSX-1): dt : "B.I 45"		
503	B.148×	8P8C with shorting bar, for four-wire data line (D		
504	BJ49C	8P8C. for ISDN BBI via NT1: dt : "BJ 45"		
505	RJ61C	8P8C, for four telephone lines; dt.; "RJ 45"		
506	RJ71C	12 line series connection using 50 pin connector		
507	RJ2MB	50-pin miniature ribbon connector, 2-12 telephon		
508	RJ11C/RJ11W	6P2C, for one telephone line (6P4C with power o		
509	RJ12C/RJ12W	6P6C, for one telephone line ahead of the key s		
510	RJ13C/RJ13W	6P4C, for one telephone line behind the key syst		
511	RJ14C/RJ14W	6P4C, for two telephone lines (6P6C with power		
512	RJ15C	3-pin weatherproof, for one telephone line		
513	RJ18C/RJ18W	6P6C, for one telephone line with make-busy arr		
514	RJ21X	50-pin miniature ribbon connector, for up to 25 li		
515	RJ25C/RJ25W	6P6C, for three telephone lines		
516	RJ26X	50-pin miniature ribbon connector, for multiple da		
517	RJ27X	50-pin miniature ribbon connector, for multiple da		
518	RJ31X	8P8C (although usually only 4C are used)		
519	RJ38X	8P8C, similar to RJ31X, with continuity circuit		
520	RJ41S	8P8C keyed, for one data line, universal		
521	RJ45S	8P2C + keyed, for one data line with programmin		

5.4.2 Network components

Switches, hubs etc. are designed as symbols of type *Network Component*:



The available pin types for network components are *Twisted Pair* and *Assembly Pin*; *Twisted Pair* is the default.

· · · · · · · · · · · · · · · · · · ·	
Pin Type: Twisted Pair (Port)Name Assembly Pin	▪ ID: 1
Info:	
V Uplink	
🔽 Can be open	
Connector Reference:	
Type: Female plug	
Reference: 501: RJ48S	

Uplink checkbox: If a network component has more than 2 twisted pair pins, one of the pins should be defined as an uplink. If routing in AND enters a network component at the non-uplink-pin, the uplink pin is regarded as the only possible pin to continue routing.

There can be only one uplink pin per symbol. If a pin has already been defined as the uplink, the *Uplink* checkbox is hidden.

The connector type is always *Female plug;* only twisted pair types are possible.

5.4.3 Twisted pair pins for other symbol types

Twisted pair pins are also supported for the following symbol types:

- o Optical receiver
- o Optical transmitter
- Optical bridge point
- o Optical transfer point
- \circ Terminating device
- RF signal source
- RF exit point

5.4.4 Splice boxes for a twisted pair

Symbols of type *Splice box* can be used for distributing the subwires of twisted pair cables, too.

Select the *Twisted pair splicebox* checkbox in the view for the splice box data pack.

Direction:	<u>E</u> ditable in AND <u>F</u> Twisted pair splicebox <u>F</u> Attenuation:
G Row Assignment	dB
[

6 Connectors/Adapters

Each library can contain an unlimited number of connectors/adapters. To edit RF connections or to define new RF connections,

click on the "Conn" tab in the left-hand section, move the mouse pointer into this section, and press the right mouse button.

The following screen opens.

New RF-Connector
New Group
Delete

If you confirm this context menu, a new connector is created.

LibEdit - [Unknown-1]	
Eile Edit View Window ?	- 8
원톤 🖡 🖉 / 것이 \ 🚧 🖉	
···· () New Connector	Deutsch New Language
	- Language dependent Data:
	Object No.: 1 DB-ID:
	Name: New Connector
	Order No.: Price: 0.00 €/pc
	Article No.: Version: 1
	Manufact.: new
	Availability C from
	Check C to:
	Description Text:
	Short description:
	<u>J</u>
	Language independent Data:
	Mounting Time: 0.0 min
	Screening > 80 MHz: 0.0 dB Screening 5-65 MHz: 0.0 dB
	Specific Type:
Symbols / Cable / Conn. / CalcObj. / AmpObj. /	Basic Data / ConnData / Attributes /
ss F1, to obtain help.	NUM

The basic data is entered in an analogous way to the symbols. *See also 1.6.1 Basic data*

You can create connector groups.

These are only for organization of the connectors within the library and do not have any function in AND.

The center section is not used in this mode.

You now switch to the "Conn.-Data" tab in the right-hand section and the following screen appears:

<u>品</u> [[] / ② / 公 ○ Abo → ☆	RF-Connector/Adapter:	•
	Type: Free Reference:	ш
	Type: Free	
	Adaption Data	

Every connector/adapter always has 2 references. Here you can reference both ends of the connector/adapter. *If no reference is assigned to a connector/adapter, this is not taken into account in the connector search in AND.*

Clicking the button causes a new menu to appear for the first end of the connector/adapter.

- 100 - 100	Course -	0.5	0.011	
Undefined	 Male connector 	 Female connector 	(Lable	
				1000

By default each newly created connector/adapter is created as undefined.

That means no referencing has been performed yet.

Each end of the connector/adapter is considered separately.

You therefore first define whether the first end of the connection element is a male or female connector and whether a cable is to be connected here (red marking in the figure above).

If you select this check box, for example, for a male or female connector, a new menu appears with all references for this type.

underined Jas	• Male connector	
Id Name	Description	
001 F	F-Norm	11
002 IEC	IEC-Norm	
003 BNC	BNC	
004 PG11	deutsch	
005 Zoll	englisch	
006 IEC14		
007 IEC 12		
008 5/8	Zoll	E
009 SP		
010 SR		
011 3,5/12		
012 PG 13,5		
013 N 75		
014 N 50		
015 7/16	Zoll	1.1
016 4/20	Postnorm	
N17 KES	Kahal End Stacker fuer Postnorm Kahal	0.70
nan anana)		

If you want to connect a cable, select the check box for cables

ohdu ohdu	inieu Fround Looph	Groupo Cables		remaie connec		
	Name	Diameter	Dielectric	Shielding	Shelting	
001	102/50			6 40- 6 40	7.40-7.40	1
002	RG178	2	0.84-0.84		1.80-1.80	
003	RG174	90.	1.50-1.52	(a))	2.55-2.80	
004	RG316	22	1.52-1.52	()#S)	2.50-2.50	
005	RG179		1.60-1.60		2.54-2.54	
006	RG122	2	2.45-2.50	-	4.05-4.10	
007	RG13	90.	7.10-7.10	((=))	10.30-10.30	
800	RG8	5 5	7.20-7.20	3 9 3	10.30-10.30	
009	RG12		7.20-7.30	3.50	10.30-12.50	
010	RG9	2	7.20-7.20	1.2	10.70-10.70	
011	RG215	90.	7.24-7.30	(a))	10.30-12.50	
012	RG216	#5	7.24-7.30	(e)	10.80-10.80	
013	200/50		7.24-7.24	8.59-8.59	10.80-10.80	
014	RG34	2	11.60-11.70	75277	16.00-16.00	
015	SEC. 04	0.30-1.00	1.50-4.60	2.20- 4.50	2.55-6.30	
016	106	0.50- 0.90	2.45-3.70	3.10-4.00	4.95-5.38	
017	8659	0 57, 0 64	3 70. 3 71	4 50, 4 50	5 40, 6 20	0.7

Select the relevant reference based on the cable dimensions.

See also 2.4.7 Cable and connector references.

Adaption Data button, you can create adaptation data for this connector.

You will find information on adaptation data in section 1.6.6 Adaption.

You will find information on attributes in section 1.6.4 Attributes.

Using the

7 Costing Objects

Costing objects are objects that can be assigned in AND either to discrete objects (e.g. antenna wall outlets) or length objects (e.g. cables).

These objects have no effect on electrical calculations but are included in the costing calculations.

Each library can contain an unlimited number of costing objects.

To edit costing objects or define new cost objects,

click on the "Calc.-Obj" tab in the left-hand section, move the mouse pointer into this section, and press the right mouse button.

The following screen opens.

	New Object		
_	New Group		
	Delete		

If you confirm this context menu, a new costing object is created.

x New CalcObj	Deutsch New Language
	Language dependent Data:
	Name: New CalcObj
	Order No.: Price: 0.00 €/pc
	Manufact:
	Availability C from:
	Description Text:
	Short description:
	Language independent Data:
	Mounting Time: 0.0 min

The basic data is entered in an analogous way to the symbols. *See also 1.5.1 Basic data.*
You can create object groups.

These are only for organization of objects within the library and do not have any function in AND.

The center section is not used in this mode.

You now switch to the "Calc.-Obj.-Data" tab in the right-hand section and the following screen appears:

Calculations Object:
Туре:
C Length Object (can have cable and channels assigned to it)
 Piece Object (can have symbols assigned to it)
Factor (multiplier): 1.0 Pieces
In cases using 'piece objects', each assignment in AND will take as many into consideration as have been defined in factor.

You define the type of costing object here.

Length Object

(can have cable and channels assigned to it)

If you select this check box, it is a length object. This means that this object can be assigned to cables and ducts in AND. At the same time, the multiplier of this object is generated.

Factor (multiplier): 1.0 m

If you assign this costing object (a length object in this case) to a cable in AND, the length in meters of the active cable section results in number of meters of the assigned costing object. If the factor is not equal to 1 for length objects, the length of the assigned cable is multiplied by this factor and the unit "Pieces" is used instead of "m".

 Piece Object (can have symbols assigned to it)

If you select this check box, it is a discrete object. This means that the object can be assigned to symbols in AND.

Factor (multiplier): 1.0 Pieces

If you assign this costing object (a discrete object in this case) to a symbol in AND, the number of units of the costing object that are included in the costing calculation is the number specified in "Factor".

You can define object properties under the "Attribute" tab.

You will find information on attributes in Section 1.5.3 Attributes.

8 Amplifier Objects

Amplifier objects are components that can be used with amplifiers and optical receivers. These are attenuators, equalizers, cable simulation modules, pilot controls, passive or active reverse-path modules.

Each library can contain an unlimited number of amplifier objects.

To edit amplifier objects or define one amplifier object, click the "Ampliefier-Objects" tab in the left-hand section, move the mouse pointer into this section, and press the right mouse button. The following window opens.



If you confirm this context menu, a new amplifier object is created.

2 New Calcoby	Deutsch New Language
	Language dependent Data:
	Object No.: 2 DB-ID:
	Name: New CalcObi
	Order No
	Atticle No : Version: 1
	Manuract:
	C from:
	L Check © to:
	Description Text:
	Short description:
	Short description: Language independent Data Mounting Time; [0.0 min
	Language independent Data Mounting Time: 0.0 min
	Short description:

The basic data is entered in an analogous way to the symbols.

See also 1.6.1 Basic data.

You can create object groups.



Switch to the "Amp.-Data" tab in the right-hand section and the following screen will appear:

Amplifier Component:

Selecting the appropriate check box defines the type of amplifier component.

Show in Amplifierlist

By selecting this check box, you define that the object will also be listed in the amplifier lists. On the "Attributes" tab, you can define the object properties.

Information on attributes is given in section 1.5.3 Attributes.

On the "Ripple" tab, you can store data pairs for the frequency slope, for example, for system equalizers

See also 1.6.7 Frequency slope measured data window.

See also 1.5.3 Frequency slope display window.

8.1 Amplifier object PAD (attenuator)

PAD

You want to create a PAD.

"Attenuation: dB"

You can define the maximum attenuation value here.

🗌 adjustable

The attenuator can be made adjustable with this check box. 0.... max. attenuation value in dB.

8.2 Amplifier object EQU (equalizer)

🖲 EQU

You want to create an equalizer.

adjustable

Selecting this check box makes the equalizer adjustable. 0.... max. equalization value in dB.

"*Attenuation: dB*" You define the residual attenuation value of the equalizer here.

"Equalization: dB" Here, you define the maximum equalization value. This means that this value is taken into account in calculation of the lowest frequency. If this value is negative, the value is taken into account in calculation of the highest frequency.

"*Min. Frequency: MHz"* You define the minimum frequency of the transmission range here.

"*Max. Frequency: MHz"* You define the maximum frequency of the transmission range here.

"*Upper Turning Point: MHz"* You define the base of the equalizer here.

8.3 Amplifier object pilot control

8.3 Amplifier object pilot control

Pilot

You want to create a pilot control module.

At the moment, only the residual attenuation is considered in AND. "Attenuation: dB"

You can define the residual attenuation here.

8.4 Amplifier object reverse-path amplifier

Active return path amplifier

You want to create an active reverse-path amplifier:

After you have selected this check box, the "Notch filter data", "IMA", and "KMA" tabs with the corresponding input forms will appear in the right-hand section. Here you can create measurement series in a similar way to forward amplifiers and have the fault data calculated.

These values are graphically displayed accordingly in the center section.

Reverse-path amplifier data:

"*Frequency Range from: MHz*" You define the minimum frequency of the transmission range here.

"*upto: MHz"* You define the maximum frequency of the transmission range here.

"*Amplification: dB"* You define the gain here.

"*Attenuation adj. Range: dB"* You define the control range of the integrated adjustable attenuator here.

"*Equalization adj. Range: dB*" You define the control range of the integrated adjustable equalizer here.

"Self produced Noise: dB''Enter the value for the noise figure here.

Insertable Components:

Under the heading "Insertable Components", the socket options in the device are defined

Socket for Pad or Equ

This amplifier packet has a socket for an attenuator <u>or</u> equalizer.

Socket for Pad

This amplifier packet has a socket for an attenuator.

Socket for Equ

This amplifier packet has a socket for an equalizer.

Component Group: No Groups - new..

Here, you define the groups from which AND can select the components for the corresponding sockets.

8 Amplifier Objects

8.4 Amplifier object reverse-path amplifier

The components selected in AND then appear both in the amplifier list and in the bill of materials.

Basisdaten / Attribute / Verst.-Daten / Notchfilterdaten / IMA / KMA /

After you have selected the "Notch filter data" tab, you can enter the data of the notch filter in the form.

Basisdaten / Attribute / Verst.-Daten / Notchfilterdaten / IMA / KMA

After you have selected the "IMA"/"KMA" tab, you can store the data for IMA/KMA.

See also 3.27.2.2 Entering IMA/KMA measurement data

In the center section, you can calculate and store the CINR from the KMA+IMA based on data entered.

Parallel with that, you can display the calculated curves.

8.5 Stages of Reverse Amplifiers can be split to different parent components

8.5 Stages of Reverse Amplifiers can be split to different parent components

Implemented from Build 4.5.1277 on, Mantis 9217.

It is possible to divide the stages of a reverse amplifier into different library components.

Details

The reverse amplifier adjustment in AND recognizes all stages automatically as one reverse amplifier, if all stages are plugged into the same component (but different amplifier packages)

If the stages are plugged into different library components, the automatic detection won't work. For this use case there is a checkbox "pre-stage" in the library:

Гуре:	
C PAD	
C EQU	
C AGC	
Active return path amplifier	
C Passive return path modul	
C System Equalizer	
Reverse Amplifier Data:	
min. Frequency: 5.0	MHz
max. Frequency: 200.0	 MHz
Amplification: 20.0	dB
Gain regulator: 20.0	dB
Slope regulator: 0.0	dB
Noise ratio: 0.0	- dB
(▼ pre-s	ane
Pluggable Components:	
Component Group: No Groups	▼ new
Socket for Pad or Equ	

If you set the check "pre-stage", you force that this reverse amplifier will be adjusted together with the following one (in sense of upstream signal direction)

I.e. if you have a 3-staged reverse amplifier split over several components you set the check for the first 2 stages in sense of upstream signal direction.

8.6 Amplifier object passive reversepath module

Passive return path modul

You want to create a passive reverse-path module.

"Frequency Range from: MHz" You define the minimum frequency of the transmission range here.

"*upto: MHz"* You define the maximum frequency of the transmission range here.

"*Attenuation: dB"* You define the through loss here.

"Attenuation adj. Range: dB" You define the control range of the integrated adjustable attenuator.

"*Equalization adj. Range: dB"* You define the control range of the integrated adjustable equalizer.

"Self produced Noise: dB" Please do not enter anything here. The entry field is not taken into account.

Insertable Components:

See 8.4 Amplifier object reverse-path amplifier

8.7 Amplifier object system equalizer

System Equalizer

You want to create a system equalizer. If you select this check box, the "Ripple" tab is generated. If you click on this tab, the following screen will be displayed:



Now enter your data pairs in the right-hand section. At the same time, the graphical display of the data is shown in the center section.

<u>S</u>ort

The data is sorted with this button.

9 **Printing Libraries**

To print the active library, confirm either with the button on the toolbar with the red border



by pressing the shortcut Ctrl+P, or by choosing the "Print" menu item from the menu bar.

Name:	Fax	Properties
Status:	Ready	
Туре:	Microsoft Shared Fax Dri	ver
Where:	SHRFAX:	
Comme	nt:	
Print Ra	nge	
• All		Number of copies: 1
0.0		
 Pag 	es trom: [1 to: [1	22
C Sele	ction	
	Kurz	-
_ayout:		
ayout:	Long	A
Layout:	Long NurKabel NurKak Objekte	
_ayout:	Long Nur Kabel Nur Kalk - Objekte Nur Stecker	
Layout:	Long Nur Kabel Nur Stecker Nur Stecker Nur Symbole Short	E OK Cancel

10 Supplier Data

You can access the supplier data using the menu.

Cut	Ctrl+X	
Сору	Ctrl+C	
Paste	Ctrl+P	
Search	Ctrl+F	
Edit <mark>B</mark> asedata List		
Edit Objects Attribu	es	
Suppliers		
Mounting Groups		
Local References		
Color codes		
Edit Graphical Style		
Edit Graphical Style Eldanorm price upd	ite	Edit View ?
Edit Graphical Style Eldanorm price upd Default Language	tte	Edit View ?
Edit Graphical Style Eldanorm price upd Default Language Raster	ite	Edit View ? Suppliers Default Language
Edit Graphical Style Eldanorm price upd Default Language Raster Set Version	ite	Edit View ? Suppliers Default Language Raster

Context menu when the library is loaded.

No library loaded.

You can now edit the supplier data in the following dialog box.

elect Supplier:	Manufacturer ID:	102	
102 : KATHREIN D :	Title	Firma	
101 : FUBA Hans Kolbe&Co 107 : Siemens 111 : Spaun 100 : Kathrein-Werke KG 112 : Wisi 125 : Sae 155 : 35 : Intern	Name: Street: Zip Code + City: Contact Person: Telephone: Fax: EN Number:		

The ______ button is used to create new supplier data.

Each supplier is automatically assigned a manufacturer ID.

The ______ button finalizes your entries.

At the same time, all changes are stored with the library and also in a separate file (supplier.and).

This file is located in your AND directory.

Resolving conflicts

Because the supplier data is stored both in the library and in a separate file, inconsistencies can arise on loading third-party or older libraries. When a library is loaded, the data stored in it is compared with a separate file. If this reveals conflicts, they are displayed here.

Supplier-ID:	101	
Name in loaded library:	Fuba Hans Kolbe & Co	
Name in supplier data:	FUBA Hans Kolbe&Co	
Use name from supplier data – Suppliers in internal	Correct supplier data	Assign a new ID
Use name from supplier data Suppliers in internal 0: 35: Intern	Correct supplier data	Assign a new ID
Use name from supplier data Suppliers in internal 0: 35: Intern 100: Kathrein-W/ 101: FUBA Hans 102: KATHREIN 103: Gimme	Correct supplier data database erke KG Kolbe&Co	Assign a new ID

Using this dialog box, you can decide whether to retain the previous data, take over the new data, or assign a new ID or replace the supplier with another supplier.

Use name from supplier data

The data from a separate file (supplier.and) is used and the supplier is replaced from the loaded library.

Correct supplier data

The data of the loaded file are retained and the entry is replaced in the separate file (supplier.and).

Assign a new ID...

The supplier in the loaded library is given a new ID number and therefore available as an additional supplier.

Replace by the selected supplier

The supplier is replaced by the selected supplier.

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Glossary (see Separate Manual)

A glossary and list of available keyboard shortcuts are combined in a separate manual that forms part of the AND documentation (see Section **Error! Reference source not found.**).