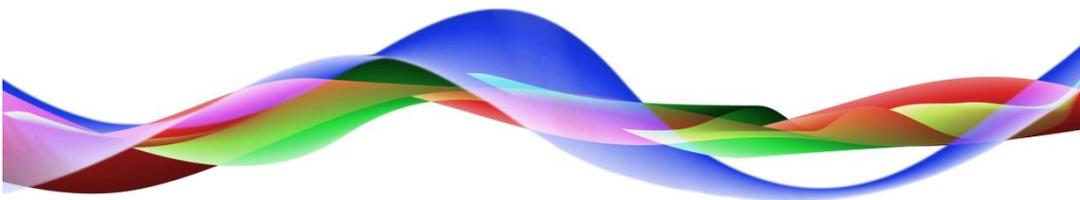


05 Signal Paths

vsmStudio

Manual



Legend



Please note: This information is of prime importance.

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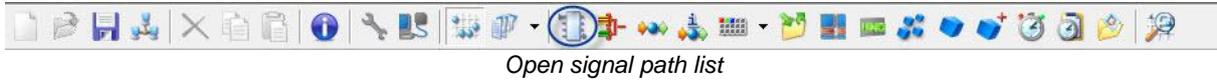
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D-55411 Bingen
www.l-s-b.de

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1 Signal Path List



Open the signal path list by clicking the appropriate button in the main menu. It shows all existing signals and allows the set-up of new ones.

Signal path list

Signal Path Name	VM	Layer	Moor	Info	Fam.	Primary	Secondary	Mixer	Protocol	Extern
Audio In 1	S: 000001	Audio	S: 00010							
Audio In 2	S: 000002	Audio	S: 00011							
Audio In 3	S: 000003	Audio	S: 00012							
Audio In 4	S: 000004	Audio	S: 00013							
Audio In 5	S: 000005	Audio	S: 00014							
Audio In 6	S: 000006	Audio	S: 00015							
Audio In 7	S: 000007	Audio	S: 00016							
Audio In 8	S: 000008	Audio	S: 00017							
Audio In 9	S: 000009	Audio	S: 00018							
Audio In 10	S: 000010	Audio	S: 00019							
Audio Out 1	T: 000001	Audio	T: 00010							
Audio Out 2	T: 000002	Audio	T: 00011							
Audio Out 3	T: 000003	Audio	T: 00012							
Audio Out 4	T: 000004	Audio	T: 00013							
Audio Out 5	T: 000005	Audio	T: 00014							
Audio Out 6	T: 000006	Audio	T: 00015							
Audio Out 7	T: 000007	Audio	T: 00016							
Audio Out 8	T: 000008	Audio	T: 00017							
Audio Out 9	T: 000009	Audio	T: 00018							
Audio Out 10	T: 000010	Audio	T: 00019							
Black	S: 000023	Video	S: 00001							
Camera 1	T: 000022	Video	T: - V -							
Camera 1	S: 000025	Video	S: - V -							
Camera 2	T: 000023	Video	T: - V -							
Camera 2	S: 000026	Video	S: - V -							
Camera 3	T: 000024	Video	T: - V -							
Camera 3	S: 000027	Video	S: - V -							
Camera 4	T: 000025	Video	T: - V -							
Camera 4	S: 000028	Video	S: - V -							
Camera 5	T: 000026	Video	T: - V -							
Camera 5	S: 000029	Video	S: - V -							
Camera 6	T: 000027	Video	T: - V -							
Camera 6	S: 000030	Video	S: - V -							
Camera 7	T: 000028	Video	T: - V -							
Camera 7	S: 000031	Video	S: - V -							

The signal path name can be found in the column titled *Signal Path Name*. It is also displayed as identifier (see chapter 5.2.1 Signal Path Name) in the master matrix (see chapter 6). This name is created during the set-up of the signal path (see chapter 5.2 New Signal Path) and must be unique (across all routers) in the entire controlled system.

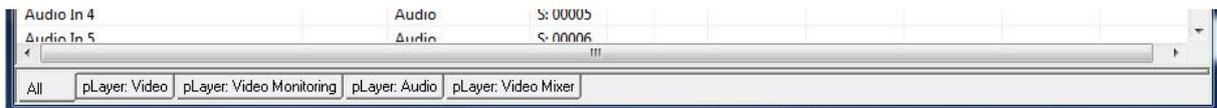
The column *VM* shows the location of each signal on a virtual layer (see chapter 4.2 New Virtual Layer). The column *Layer* shows on which physical layer each signal lies (router, mixer, etc., see chapter 4.1 New Physical Layer). The column *Moor* indicates the position of each signal path on the physical layer. The abbreviations *S* and *T* stand for source and target, respectively.

The column *Info* shows for each signal path whether it contains secondary functions or is linked to another signal. In the column *Fam.*, each signal path's family is shown (see chapter 5.2.2 Signal Path Families).

The column *Primary* shows the primary label of each signal used on operating devices and UMDs (see chapter 17). The column *Secondary* shows the secondary label.

The column *Mixer* may contain a label that is specifically displayed on a mixer. The same applies to *Protocol*. In this case, it depends on the label ID that is transferred in the network. If a label is shown under *Extern*, it overlays the primary label.

1.1 Layer-Oriented Display of Signal Paths

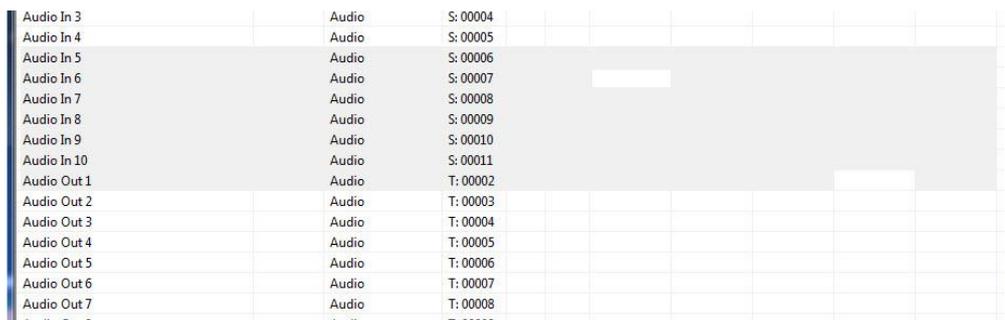


Layer-oriented display of signal paths

The first tab in the bottom left of the signal path list shows all signal paths. To obtain a better overview, the signal paths can be displayed by individual layers.

1.2 Changing Signal Path Names

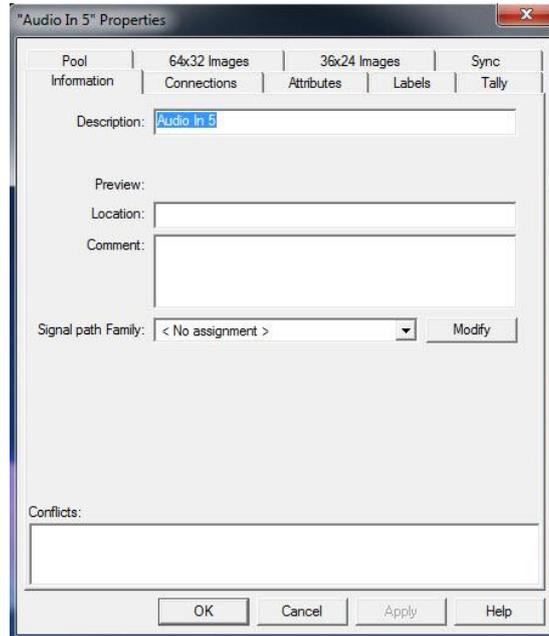
It is possible to change or add to all labels in the signal path list except for the *Identifier* entered as signal path name. To do so, select the relevant signal path, click into the field that is to be changed, and overwrite the old signal name with the new one.



Changing labels in the signal path list

To change the names of multiple selected signal paths, it is possible to navigate from top to bottom by pressing the *Enter* button.

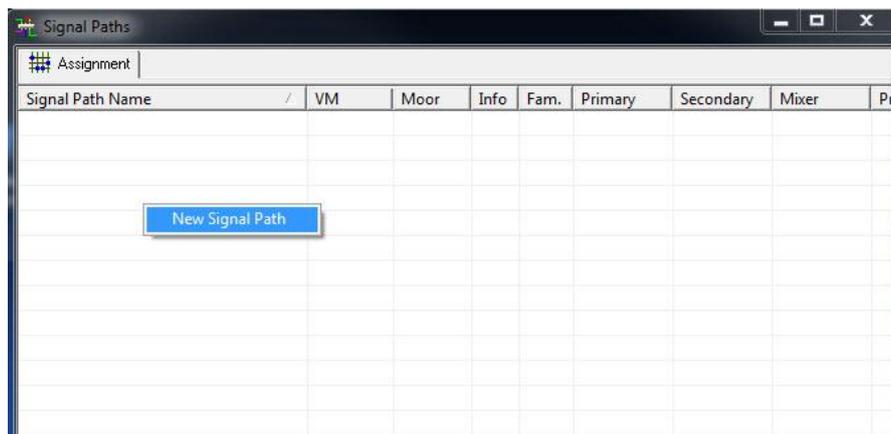
1.3 Signal Path Properties



Signal path properties

Double-clicking on a signal will open the signal path's properties.

2 New Signal Path



Setting-up a signal path

Right-click onto the signal path list to set-up a new signal path.

2.1 Signal Path Name

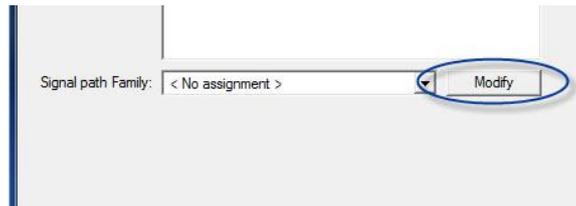
Signal path settings

Enter a unique name, the so-called identifier, for the signal path in the field titled *Description*. Since the field features an iterator, multiple, consecutively counted signal paths can be set-up using curly brackets, for example {In1-10} (see vsmStudio Application Note 020 Using Iterators). It is also possible to enter the number of consecutively counted signal paths as a digit in the field *Amount*.

The *Preview* shows the newly set-up signal paths. Both the field *Location* and *Comment* are not mandatory. They rather serve to distinguish signal paths more precisely, for example by their locations. If the chosen identifier is already in use, the resulting conflict is indicated as shown below:

Naming conflict

2.2 Signal Path Families



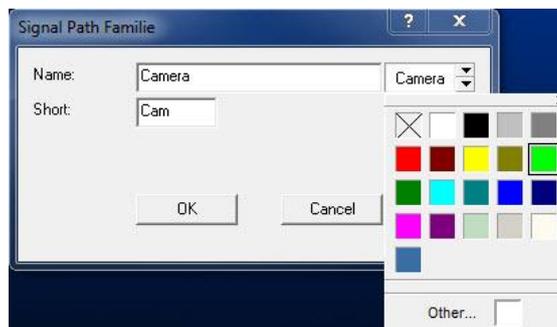
Creating signal path families

Groups of signal paths can be marked as families through the option *Signal path Family*. This first requires the creation of signal path families. Select *Modify* followed by *New Family* to do so.



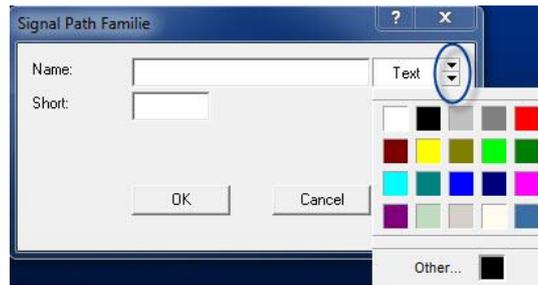
New signal path family

A short form and a colour can be assigned to each new signal path family, for example the family *Camera*.



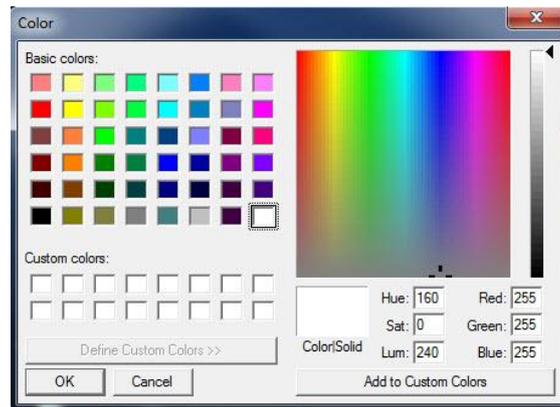
Assigning name, short form, and colour

The purpose of the upper drop down menu in the colour field is to assign a colour to the text; background colour is assigned with the lower drop down menu.



Changing the text colour

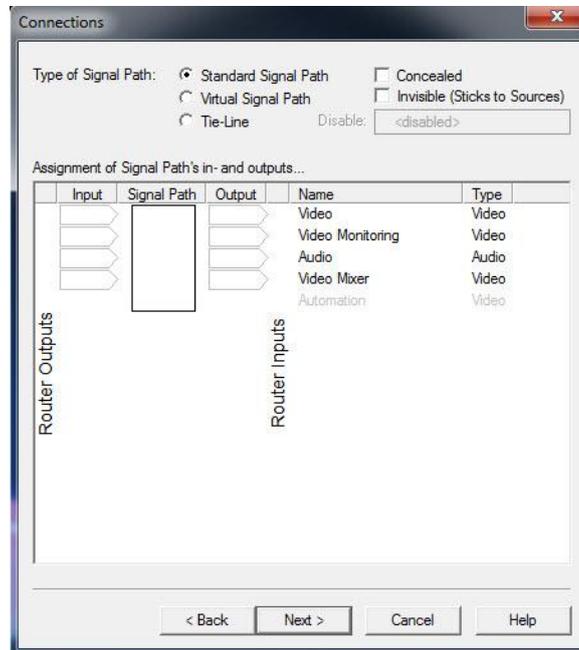
If the required colour is not included in the list, it can be added through *Other...*



Adding a colour

2.3 Signal Path Connections

When all required information has been entered, select *Next* to continue to the signal path connections.



Signal path connections

2.3.1 Signal Path Type

The type of the signal path can be selected as a *Standard Signal Path* (a physical signal), a *Virtual Signal Path* (see chapter 5.4 Virtual Signals) as well as a cross connection or *Tie-Line* (see chapter 5.5).

If the option *Concealed* is checked, the label of this signal path will not be displayed but concealed. Instead, the label of the signal that is switched onto it is shown.

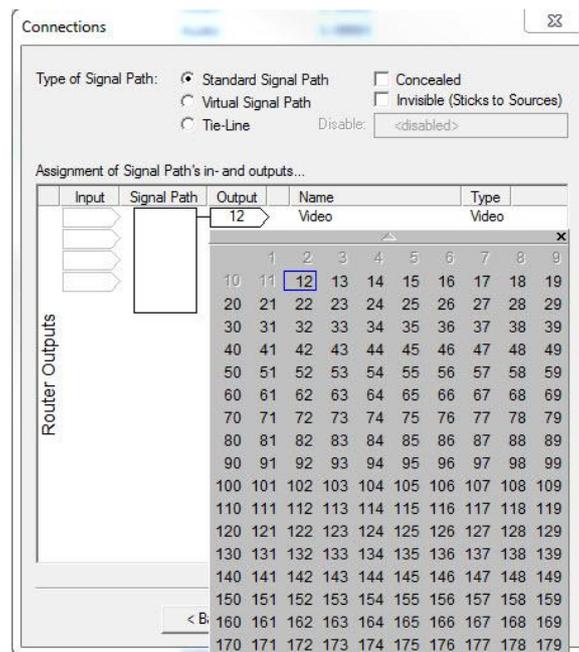
The option *Invisible (Sticks to Sources)* is mainly used for loop-through devices, in which case the loop-through device is generally “attached” to the source signal. Effectively, the physical crosspoint is set at the loop-through device, but the target is being switched. This allows, for example, assigning sources to processing devices, without them having to be visible or manually assigned to each target.

2.3.2 Assignment of Router Inputs and Outputs

Under *Assignment of Signal Path's in- and outputs...* it is possible to define whether the created signal is a router input or output, meaning the physical position of the signal path. To this end, this field offers the device input for the router output (shown vertically at the margin)

as well as the output for the router input. Signal paths that are looped-though multiple signals, such as a frame synchronizer, must be assigned on both the inputs and the outputs side. The assignment window also shows the *Name* and *Type* of the layers.

To start the physical assignment, click on the rhombus that represents the relevant side of the layer to be connected, for example the audio router. Subsequently, choose a free spot (the numbers shaded in grey represent used spots that do not allow another assignment) and select it. A number framed in blue indicates the successful assignment of the signal path. An assignment can be reverted by right-clicking into the blank field in front of 1.



Assigning a signal path to a layer

2.4 Signal Path Attributes

When the signal has been assigned, the next window offers *Attributes* for the signal path.

2.4.1 Settings Relevant to the Connection

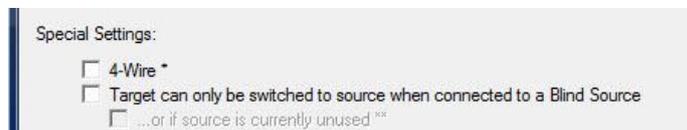


Signal path attributes relevant to the connection

The attribute *No loopback* is checked by default. It prevents that the signal is switched onto itself. The second option makes the created signal a blind source.

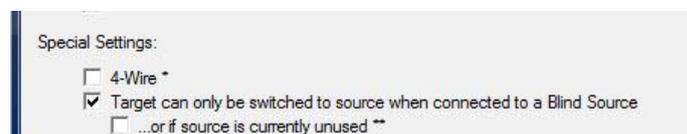
If the attribute *Is "Cardinal" Source* is activated, this source will be set and displayed independently of all other signals. With the option *"Talk Back" Source*, the previously selected source can automatically be selected again: If this source is selected after a crosspoint had been set with it, the crosspoint will jump back to the previous source.

2.4.2 Special Settings



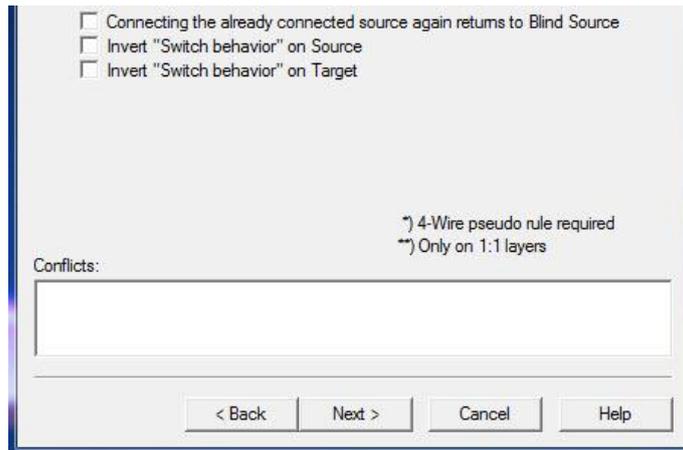
Special settings

The option *4-Wire* allows (with the required 4 wire pseudo device rule, see chapter 12) the creation of a 4 wire line. If *Target can only be switched to source when connected to a Blind Source* is checked, a target must first be connected to a blind signal before being switched to a source.



Option switch only when connected to blind source

If *Target can only be switched to source when connected to a Blind Source* is checked, the option *...or if source is currently unused* becomes automatically available. Through it, the target can be switched directly to an unused source. This only applies to layers with 1:1 switch behaviour (see chapter 4.1.1 Switch Behaviour of the Router).

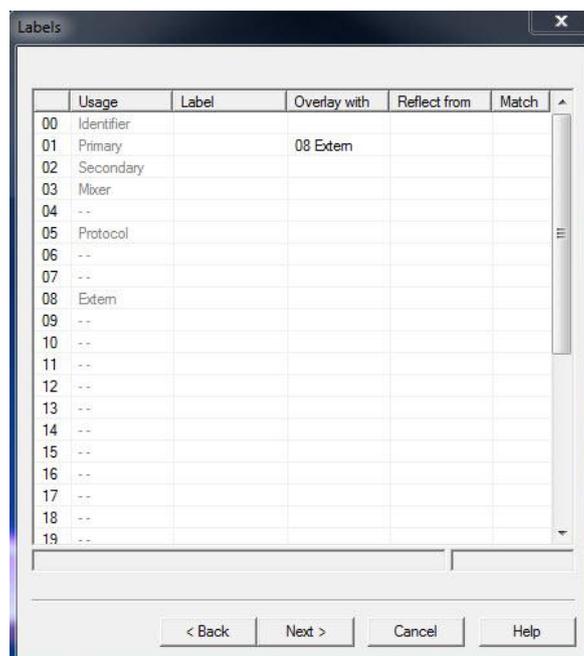


Other settings

If the attribute *Connecting the already connected source again returns to Blind Source* is activated for a target, and if the target is switched to a source, it is connected to a blind signal when the source is selected again. If the options *Invert "Switch behavior" on Source* and *Invert "Switch behavior" on Target* are checked, it is possible to define a 1:1 switch behaviour for this signal.

2.5 Labels

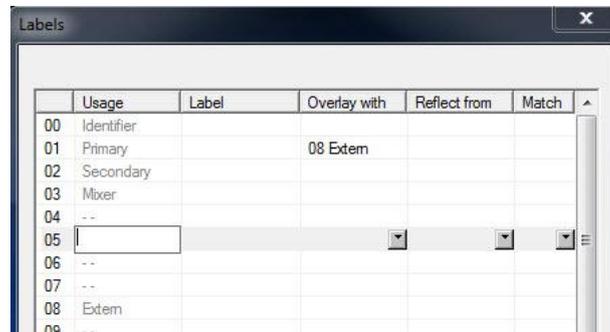
The next window allows the creation of up to 32 IDs for different labels. The primary label, for example, is used on panels and UMDs (see chapter 17).



Labels

2.5.1 Label Names

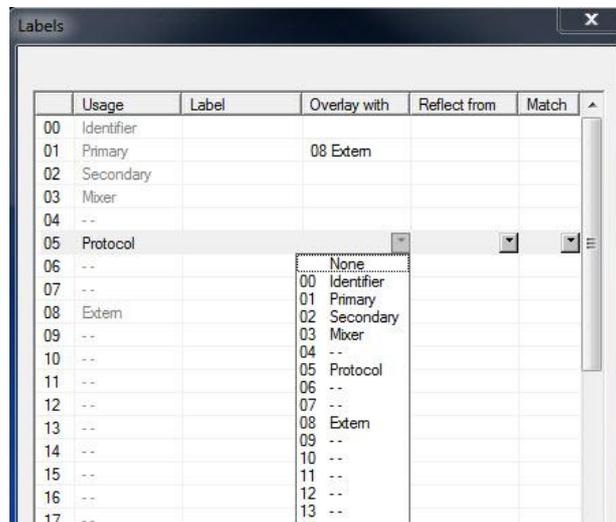
The column *Usage* shows the name of the labels. To overwrite or add a name, simply right click on the relevant field. The name will then be displayed in the signal path list as an additional tab (see chapter 5.1 Signal Path List).



Changing a label name

2.5.2 Overlaying Labels

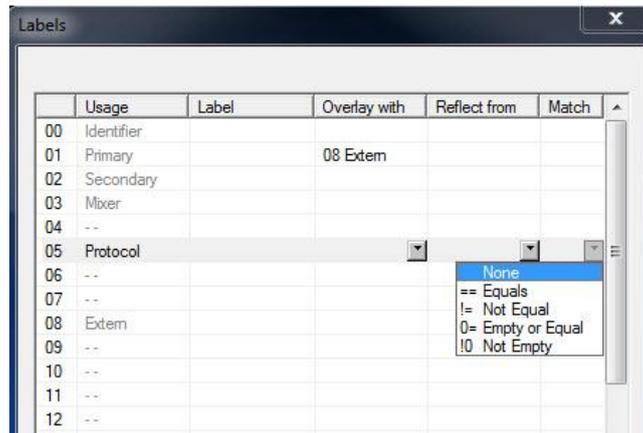
The *Overlay with* function allows a label to be overlaid by another one. To do so, choose the field with the ID that should be overlaid by the label. Subsequently, the newly defined label will be displayed.



Selection of the overlaying label

2.5.3 Reflecting Labels and Match

The *Reflect from* function reflects the label of the target to the switched source.



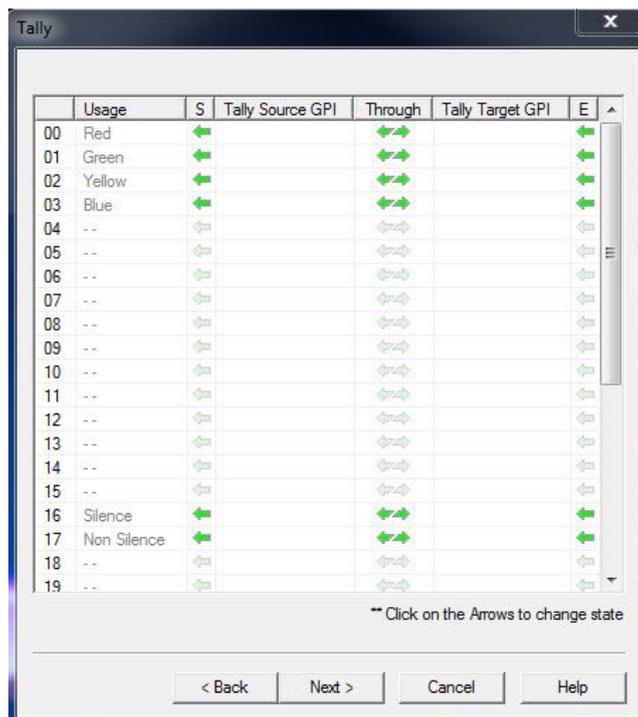
Match

Through the *Match* function, the switching of a source can be changed as follows:

- *== Equals*: The selected target will only be connected with sources of the same name.
- *!= Not Equal*: The signal will only be connected to sources that have a different label.
- *0= Empty or Equal*: The target will only be connected to the source that has the same or a blank label.
- *!0 Not Empty*: The target will only be connected if the field *Label* is not blank.

2.6 Tally

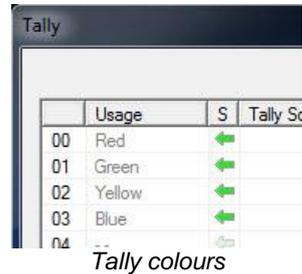
The next view shows whether tally is configured for this signal.



Tally configuration

2.6.1 Tally Colours

All tally colours are shown in the column *Usage*.

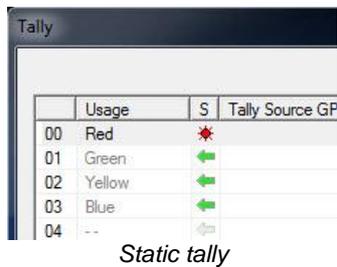


	Usage	S	Tally Sc
00	Red	→	
01	Green	→	
02	Yellow	→	
03	Blue	→	
04	--	→	

Tally colours

The names of the colours can be changed here, and new ones can be added.

2.6.2 Static Tally



	Usage	S	Tally Source GP
00	Red	★	
01	Green	→	
02	Yellow	→	
03	Blue	→	
04	--	→	

Static tally

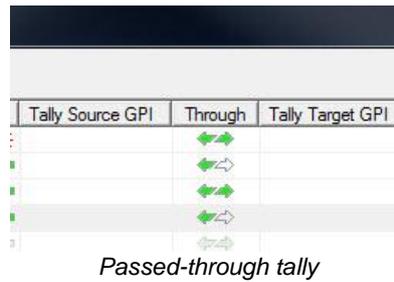
In the column *S* (static), a static tally can be assigned to this signal by right-clicking on the green arrow.

2.6.3 Tally Source/Target GPI

Tally Source GPI and *Tally Target GPI* define which GPO tally triggers. If the relevant signal is a target, the GPO can be found under *Tally Target GPI*. If it is a source, the GPO is located under *Tally Source GPI*.

2.6.4 Passed-Through Tally

In the column *Through*, tally can be passed through two layers if the signal is linked with two layers. Tally is then displayed on both layers.

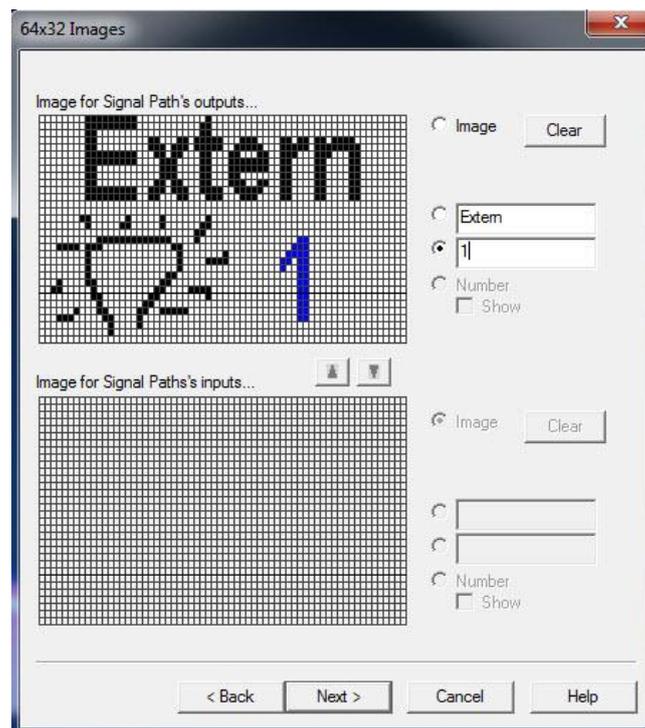


To display tally on one layer only, click on one of the two green arrows to deactivate it.

2.7 Bitmaps

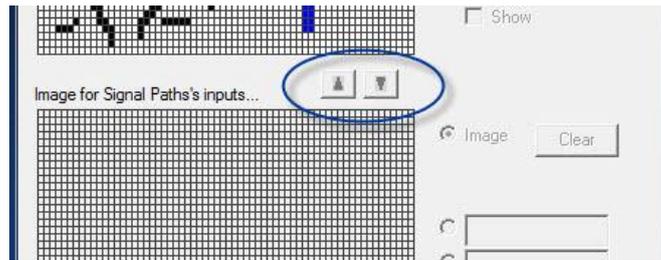
2.7.1 64x32 Images

In the next window *64x32 Images*, a bitmap can be created for the signal. It is displayed on panels.



Bitmap 64x32

Here, two lines of text can be entered and moved to the desired position. Alternatively, select *Image* and draw an image. The blue element hereby represents the active one. If loop-through devices are used, an image can be created for both input and output. All other signals are usually represented with one image only.

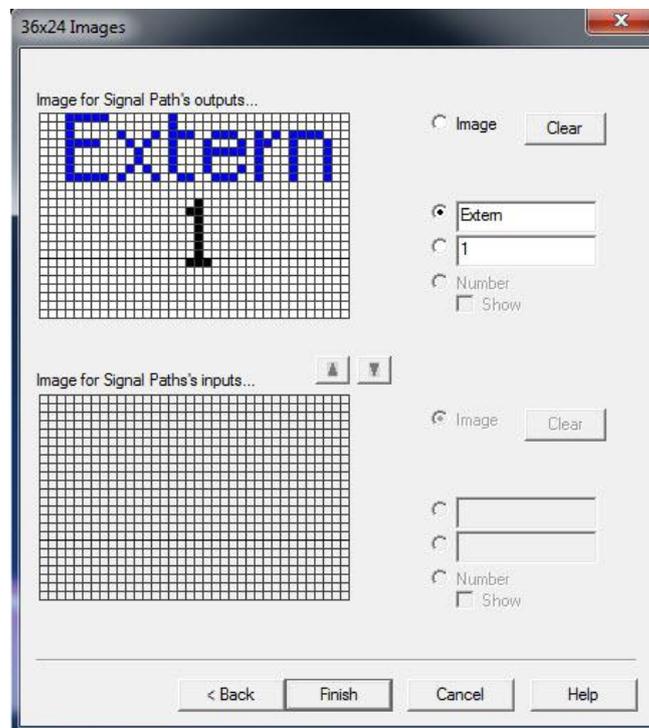


Transfer of images

Using the two arrows located between the two areas, an image can be transferred from one area into the other.

2.7.2 36x24 Images

The same options are available in a lower resolution in the following window, *36x24 Images*.

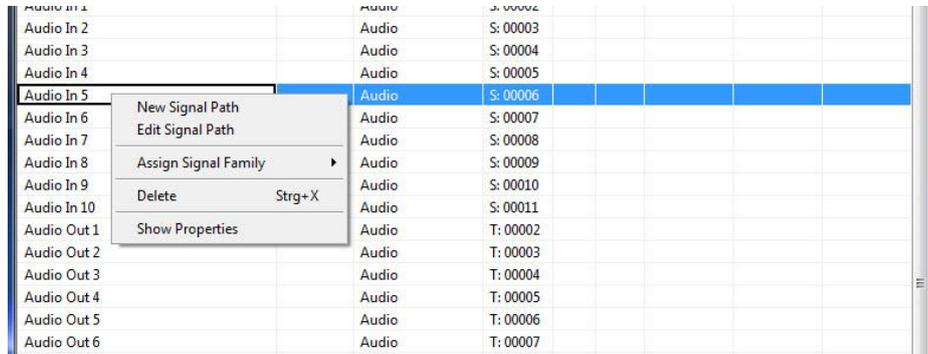


36x24 image

Select *Finish* to end the set-up of the new signal path.

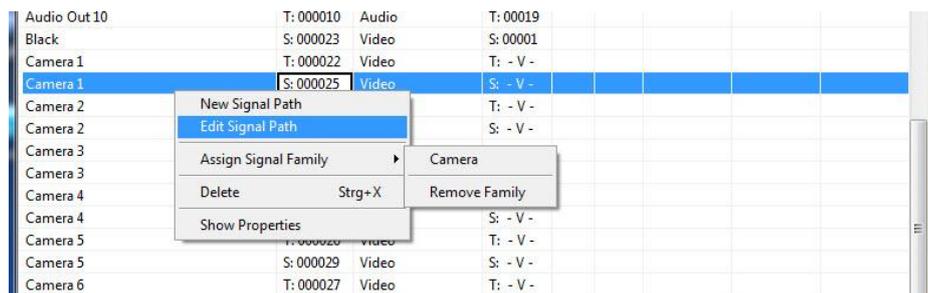
3 Edit Signal Path

Existing signal paths can be edited, deleted, or added by right-clicking on them and selecting the appropriate option.



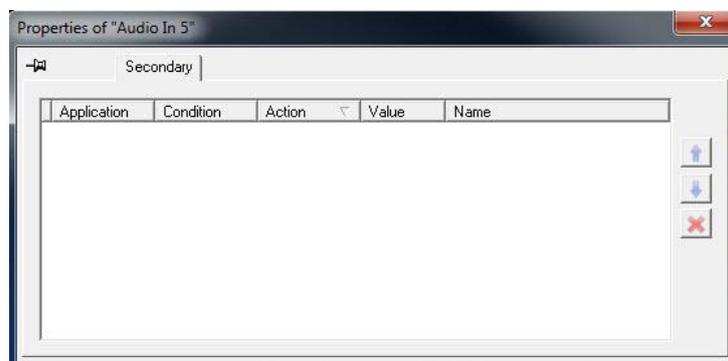
Edit, delete, or add signal paths

In the same way, it is possible to assign families to signal paths or remove previously assigned families. Select multiple signals to assign them to the same family (see chapter 5.2.2 Signal Path Families).



Assign families to or remove families from signal paths

The function *Show Properties* opens a window in which the signal's existing secondary commands are listed.



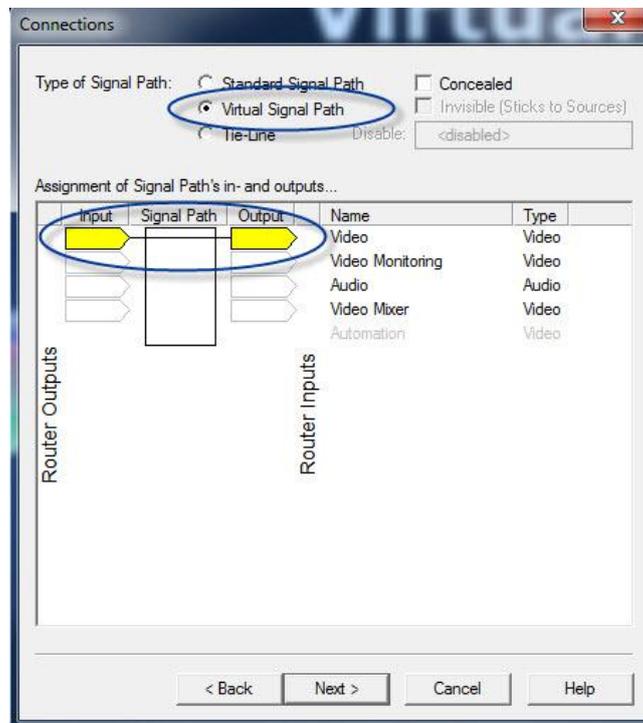
Secondary commands of a signal path

4 Virtual Signals

Virtual signals are used to assign physical signals dynamically. They serve as support signals that offer addition function, but do not use any additional physical resources. Virtual signals function independently of the size of physical layers (see chapter 4.1 New Physical Layer) and can be used across tie-lines (see chapter 5.5) to transfer assignments across physical layers.

4.1 New Virtual Signal

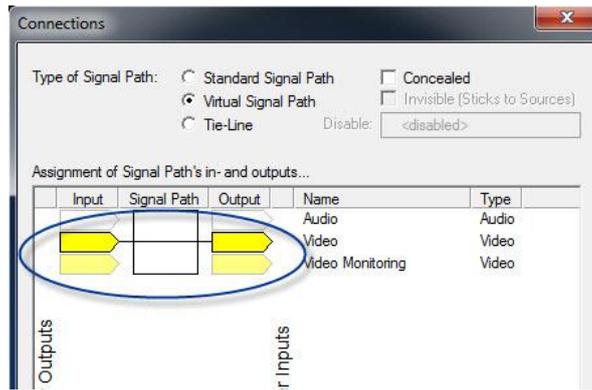
Virtual signals, like physical signals, are set-up in the signal path list (see chapter 5.2 New Signal Path). To define them, go to the window *Connections* and select *Virtual Signal Path*.



Setting-up a virtual signal path

Virtual signals must be set-up as router inputs and outputs. This allows them to be assigned to physical signals dynamically at a later point in time. To do so, left-click both in the input and the output side. The virtual signal path is represented by yellow markings.

As with all other signals, virtual signals must be assigned to ports from the virtual matrix (see chapter 6) since, at this point, no physical ports have been defined.

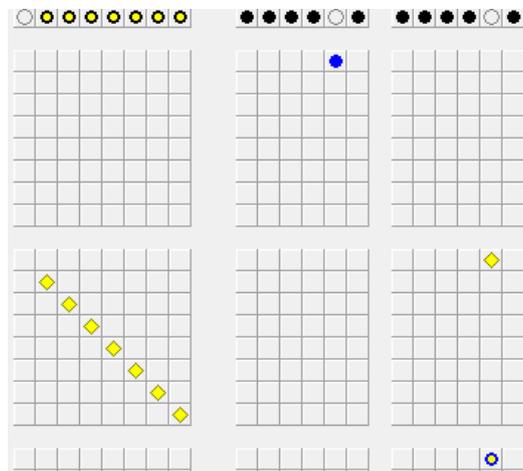


Virtual signals on layers linked by tie-lines

If virtual signals are assigned to layers that are linked by tie-lines (see chapter 5.5), the second layer is shown in a pale yellow to indicate its availability.

4.2 Crosspoints with Virtual Signals

A virtual crosspoint is represented by a yellow rhombus in the virtual matrix (see chapter 6). If a physical crosspoint is connected due to a virtual assignment, it is shown as a yellow dot with blue outline. A black dot with yellow fill indicates the assignment of a blind source to a target over virtual signals (see chapter 6.2.4.2 Crosspoints with Virtual Signals).



Crosspoints with virtual signals in the master matrix



Please note: A virtual-physical crosspoint has a lower priority than a physical crosspoint that is connected through a virtual-physical assignment. Therefore, a physical crosspoint overwrites a virtual-physical crosspoint.

5 Tie-Lines

5.1 Dynamic Tie-Line Management

The VSM control system offers integrated, dynamic tie-line management. If the vsmStudio software administers the tie-lines, multiple routers connected with tie-lines can be controlled like one large router. For switches across routers, the dynamic tie-line management searches for a tie-line and connects the signal through that tie-line. If the source signal already lies on the tie-line, the already assigned tie-line is switched to the new receiver. No new tie-line is assigned.

Label and tally information are concealed and transferred through the tie-line. If all tie-lines are used, the switches are not executed. This is indicated by a red button on the control device. In this event, the tie-lines must be cleared by a user. For automations with label transfer support, the tie-lines can be switched with priority. For these, switches over the VSM control system always have the highest priority.

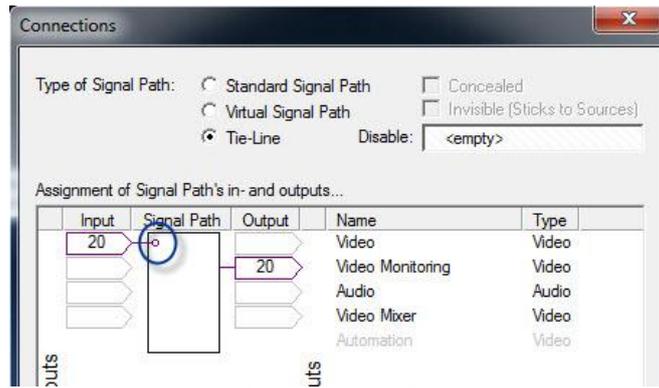
5.2 New Tie-Line

To set-up a tie-line, follow initially the same steps that were required to set-up a new signal path (see chapter 5.2 New Signal Path) until the window *Connections* is reached. There, choose the setting *Tie-Line*.



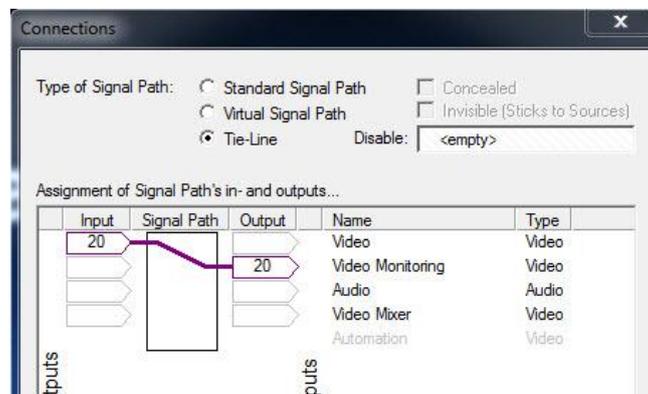
Attribute tie-line

The attributes *Concealed* and *Invisible (Sticks to Sources)* are greyed out automatically. A new field becomes available, in which one or multiple tie-lines can be deactivated using a GPO (see chapter 15). This can be used, for example, to reserve some tie-lines should all of them be assigned and to clear them at the push of a button using a GPO.



Assigning a tie-line

The assignment of tie-lines can be defined in the rhombi located below input and output. Generally, this is done in the same fashion as the assignment of signal paths (see chapter 5.2.3 Signal Path Connections). However, layer inputs and outputs are assigned to tie-lines. To finish the set-up of a tie-line between two layers, right-click on the dot to the right of input.



Setting-up a tie-line

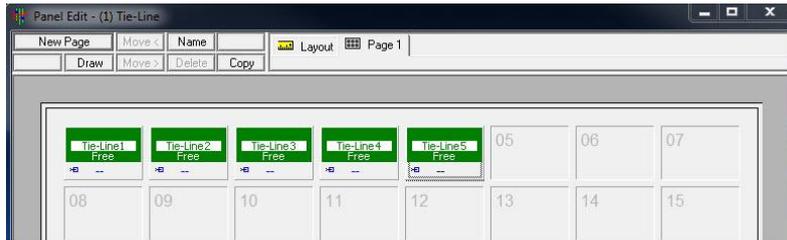


Please note: A blind signal must be created on each router layer used so that tie-line management will work properly (see chapter 5.2.4.1 Settings Relevant to the Connection). This blind signal is generally a Black or Mute on the relevant layer. Without this signal, the tie-lines cannot be cleared and the status of the tie-line with respect to its recipient cannot be reported properly.

5.3 Managing Tie-Lines

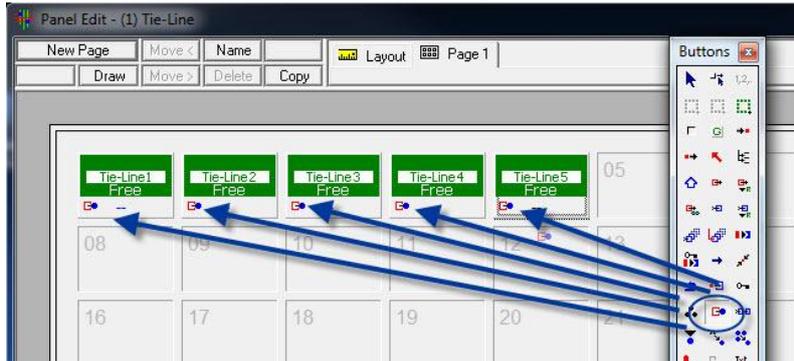
5.3.1 Tie-Line Management at the Control Panel

It is recommended to configure a panel to monitor the assignment of tie-lines. To do so, open the Panel Edit and create a new control panel or use an existing one. First, the tie-line's targets are assigned to the first five buttons of the panel.



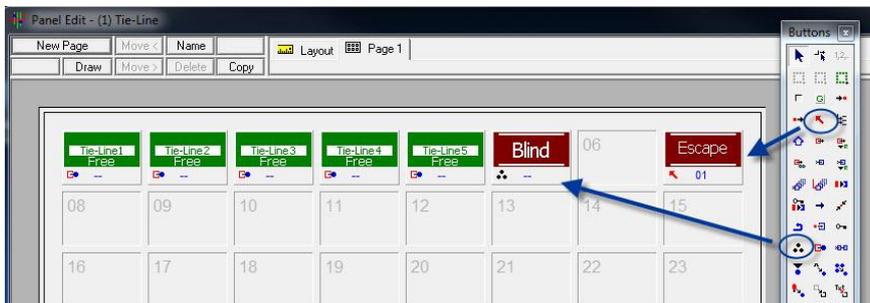
Panel with tie-line targets

Next, assign the function *Target of Source* from the button toolbox to every signal.



Overwriting the tie-lines with the *Target of Source* function

Finally, add a *Blind-Source* button and a navigation button to the panel.

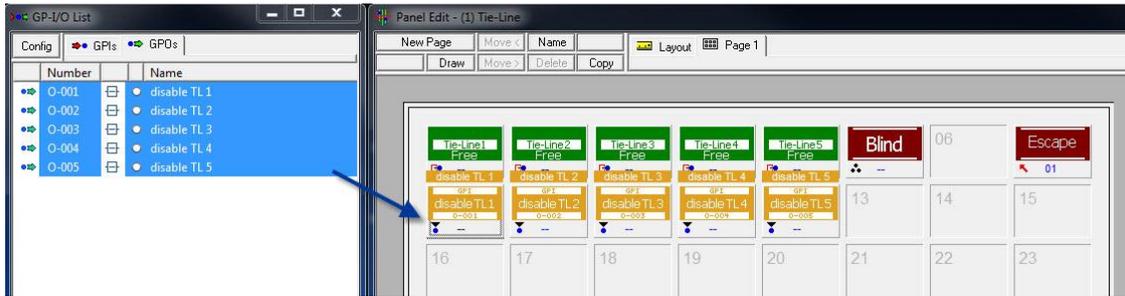


Adding *Blind-Source* and *Escape* keys



Please note: This page should only be used for tie-line management. No other sources or targets should be configured to this page of the panel.

The GPOs for activation or deactivation can be included on this page.



Tie-line panel with Blank button, Escape button, and deactivation function

If the signals are connected and placed on the tie-lines, the panel shows clearly which tie-lines are available and which ones are used.



Panel with available tie-lines

The source located on the tie-line is shown in the first line on each button. The middle line shows the name of the tie-line, while the bottom line shows the last connected target.

Used tie-lines can only be cleared through a panel configured for the management of tie-lines. Select the relevant tie-lines and click the blind signal button.



Tie-Line 1 cleared

Since there may be more than one receiver, this process must be repeated until the tie-line button displays *Free*. The tie-line's current receiver is shown in the bottom line.



Video 1 In 1 is switched onto Video 2 Out 3. Blind is connected. Video 2 Out 3 is connected with Blind.



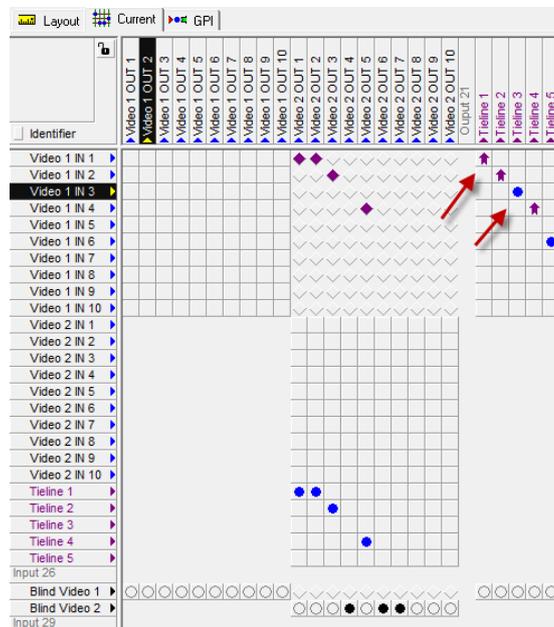
Video 1 In 1 is also switched onto Video 2 Out 1. Blind is connected. Video 2 Out 1 is connected with Blind.



The tie-line is available.

5.3.2 Tie-Line Management in the Master Matrix

In the master matrix (see chapter 6), the view of this arrangement also indicates the available and unavailable tie-lines clearly: a purple arrow represents unavailable tie-lines, a blue dot available tie-lines (see chapter 6.2.4.3 Crosspoints with Tie-Lines).



Master matrix view



Please note: Beware that the tie-lines cannot be connected directly. The system prevents this action as arrangement of tie-lines is exclusively done with the VSM. The use of tie-lines from the same memory group should be avoided.



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