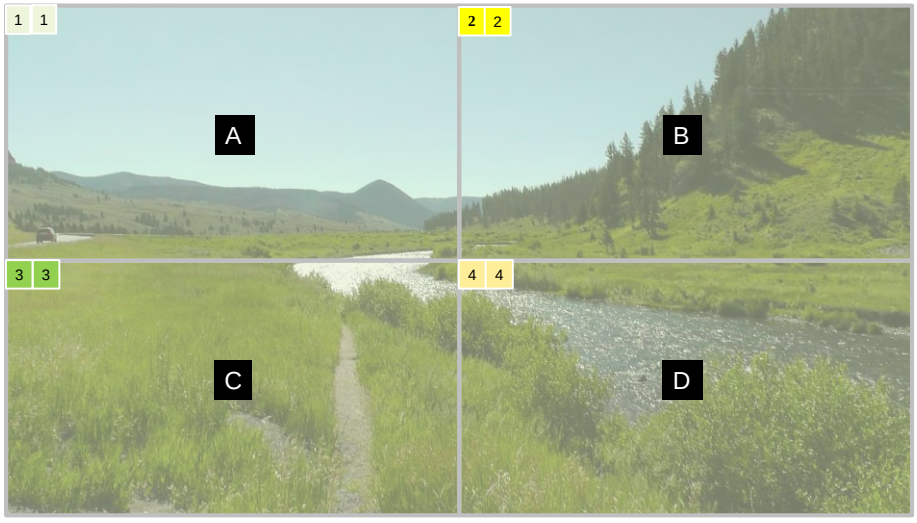
K-Frame 4K Mode



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4096 x 2160 is the standard 4K signal format

It can be used in 4 quadrants mode or 2SI mode

See appendix for more information on 4K signals

Operating a K-Frame in 4K mode

- The Standard and Compact K-Frame can operate in 4K mode if licensed for 1080p
- The S-series and V-series frames do not have a 4K mode
- Any Frame can also be used for 4K signals without switching to 4K mode with limitations
- The 4K mode makes 4K operations easier for the operator to set up and use
- It creates a 4ME – 3 Keyer, 4K switcher for the standard K-Frame if all boards are present

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K-Frame 4K Mode

The Standard K-Frame can be operated in 4K Mode

- It does require the 1080p license and specific setup to run as 4K
- This provides a 4 ME, 4K system, if all boards are installed
- Each ME is limited to 3 Keyers when running in 4K mode
- One ME will run in 1080p
- It does not require any additional hardware
- The full set up will be discussed as a separate item once the normal modes have been covered

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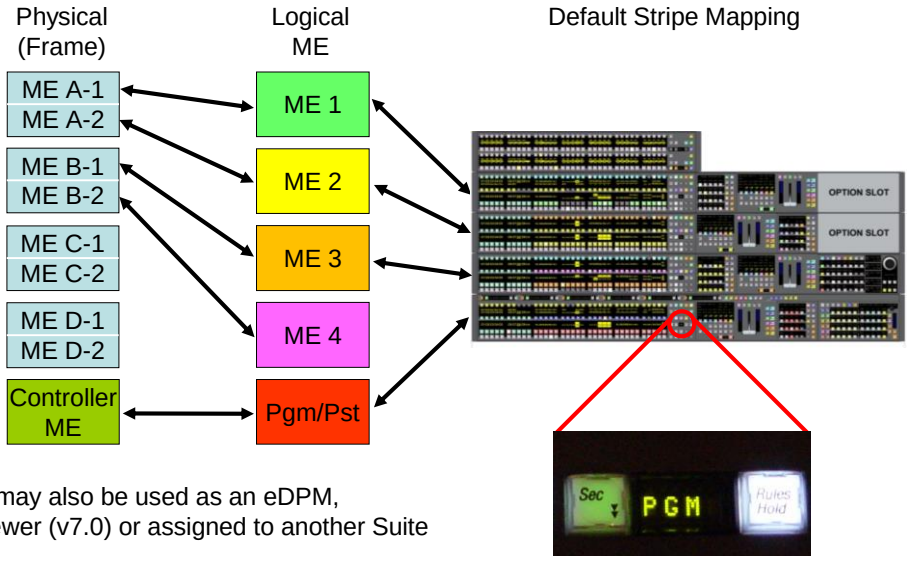
Output boards carry 16 output channels, each with 2 BNCs for a total of 32 connectors. Output delay and line drive abilities are on this output card. All outputs are being fed from the Frame processor Cross Point chip via the mid plane.

Optional Modular I/O assemblies may be used for Set Def and Match Def Scaling functions and / or additional normal inputs and outputs. Each module has 4 Scalar Circuits, 4 input and 4 output BNCs. These may be configured in any combination of Set Def and /or Match Def inputs and outputs with a MAXIMUM of 4 Scalar functions. There are 3 modes of operation that can be configured on a connector by connector basis: Match Def, Set Def and Bypass.

The “Set Def” option allows the format of the outgoing video to be changed to a different format as long as it is the same Vertical timing system as that of the switcher.

For example: If the switcher is operating in the 1080i / 59.94 format, then the Set Def hardware may convert and output 480i, 720p or 1080p formats as long as they are 59.94 Hz vertical.

K-Frame – Normal mode



An ME may also be used as an eDPM, MultiViewer (v7.0) or assigned to another Suite

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Note that The ME hardware is required to be used as a MultiViewer but it does not need an ME license. An ME can be used as an eDPM but does require an ME license.

ME A through ME D refer to physical hardware slots in the frame. Each ME Slot now carries a dual ME card or 2 separate sets of ME circuitry. Each slot is now labeled as the slot letter name with a 1 or 2 suffix.

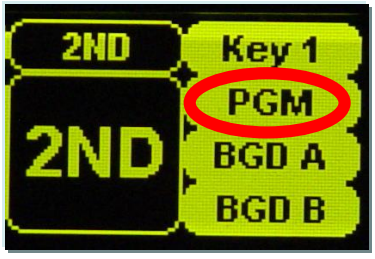
The Controller ME is identical to the full MEs except iDPM capability

As seen above left, the Physical Frame ME hardware may be Logically Mapped to any ME Name. Refer to the: “Eng Setup / Acquire Resources” menu.

As seen above center, the Logical ME Name may then be applied or mapped to any operating position (Stripe) on the Panel (or Panels in the case of multiple Suite delegations). Refer to the “Local E-Mem” panel, “Delegation Mode”. Once configured the operator only sees the Logical names in menus and panel displays.

The Karrera Panels use the same configurable mapping of hardware to Control Surfaces.

The Karrera Panel will display stripe to ME delegation at the right end of the CrossPoint display.



K-Frame – Using a switcher for 4K in Normal mode

Using a K-frame switcher in Normal mode for 4K (Quad mode)

You will need to set up the following items manually

1. Inputs

   Inputs are best labeled for each of the 4 signals to keep track of them (Such as A, B, C, D or TL, TR, BL, BR if using Quad mode)

2. ME Mode

   This will need to be set for Split mode and 3 keys allocated to the secondary ME

   Then, using 2 MEs together each in Split mode, 4 sources can be manipulated at the same time

3. Bus Linking

   Can be used to link four busses together so they switch four different inputs (A,B,C,D for the 4 quadrant signals) when a single button is pressed

4. Transition Chaining

   Can is then used to link the Key and Background transitions together on the MEs

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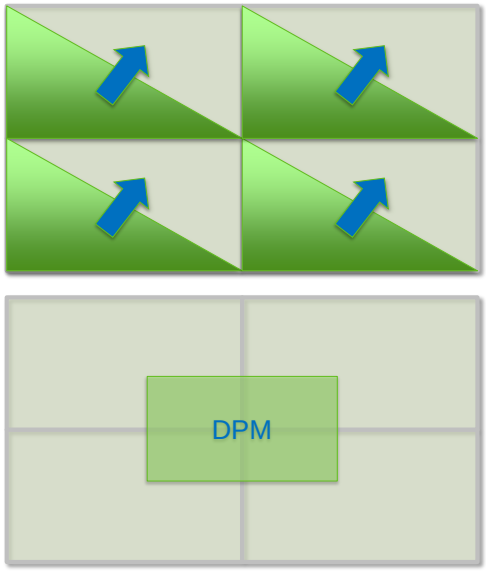
K-Frame – Using a switcher for 4K in Normal mode

5. Mixes
   - With transitions ganged, mixes will work across all 4 quadrants simultaneously with backgrounds or with keys or combinations
6. Wipes
   - Wipe transitions work the same way but you will get 4 wipes one in each of the 4 quadrants
7. DPMs
   - DPMs are not really usable, unless it's just for positioning or resizing a graphic element within one quadrant
   - Careful manipulation of 4 DPMs, one in each quadrant, can produce some zoom or slide effects, but these have to be manually set up individually for the DPM effect to work
   - i.e. timelines for 4 MEs running together



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K-Frame – Using a switcher for 4K in Normal mode

8. Keys
   - Keys within one quadrant can be set up as normal (Bugs, logos etc.)
   - Keys that cross multiple quadrants must be adjusted (Clip/Gain etc) together using Multi Select from the menu (or by copying settings to all of the associated Keyers)
9. Image Store
   - Output: This has to be treated as a regular input and bus linked to use 4 different images for the quadrants together
   - With only one input, Images need to be grabbed separately for each quadrant
10. ClipStore
    - Same applies as with the Image Store using 4 channels for Record and Play
    - Note: As a ClipStore the V/V mode is not accessible, as a non-ClipStore Summit it would be
11. Outputs
    - Switcher Outputs must be the combination of 4 separate outputs from the ME's (2 ME's Split into Primary and Secondary ie ME 1A, C and ME 2A and C)

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K-Frame – Using a switcher for 4K in Normal mode

12. E-MEM

These will work from Master E-MEM by ganging both Split MEs together along with any additional levels required for things like machine control

13. Macros

Most operators will use Macros to combine multiple actions together including E-MEMs

14. Multi Viewers

These can be set up to show 4 quadrants together but there is no specific way to see a 4K image

15. Preview

For a 4K preview the ME outputs (Priamary and Secondary) will need to be fed to a 4K monitor

To produce a preview for a non 4K monitor an ME could be used with 4 Keyers, each using a 2DPM to resize the 4 quadrants into each corner and the ME output is used as a normal 1080p signal

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K-Frame – Using a K-Frame in 4K mode

Things to know about 4K mode

1. It does not work with an S-series K-Frame!
2. It makes setting up and using 4K much easier
3. It allows you to create a 4 ME (3 Keyer) - 4K switcher
4. It is essentially a fixed mode – although the operator can override some of the preset conditions set up by selecting the 4K mode
5. Requires the 1080p license to operate
6. It does NOT provide all the functions of a normal K-frame

In particular these features:

- Image Store capture
- Many iDPM features
- Some Wipe operations

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K-Frame – 4K mode – Large Frame

What does 4K mode do?

1. Gangs 8 MEs together in pairs in the large K-Frame
   Requires all the K-frame ME boards to be present to produce a 4 ME, 3 Keyer 4K switcher
2. Allocates all 9 MEs to one Suite with 4 MEs operating in 'phantom' mode (i.e. not visible to the operator)
3. Assigns 3 Keys to each side of the Split ME
   This gives 4 MEs with 3 Keys each (8 MEs in Split mode ganged together)
   Plus there is one ME (the controller ME) in Normal (non-4K) mode
4. Gangs Inputs and Outputs together in adjacent groups of 4 when they are selected as 4K

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K-Frame – 4K mode – Large Frame

5. Synchronizes Background/Key Transitions per 'ganged ME'
6. Synchronizes Wipe transitions and positioning of the wipe in each quadrant
7. Gangs the operation of 4 - 2DPMs together for 2D effects
   Note there are limitations on using DPMs in 4K (See later)
8. Gangs Chroma Key setup for Auto set up across the 4K MEs
9. Gangs 4 outputs of the Image store together
   Channels 1,2,3 and 4 and 5,6,7 and 8 are ganged as 4K IS outputs

   Note: The Image Store only has one input so simultaneous grabs of 4 K images are not possible

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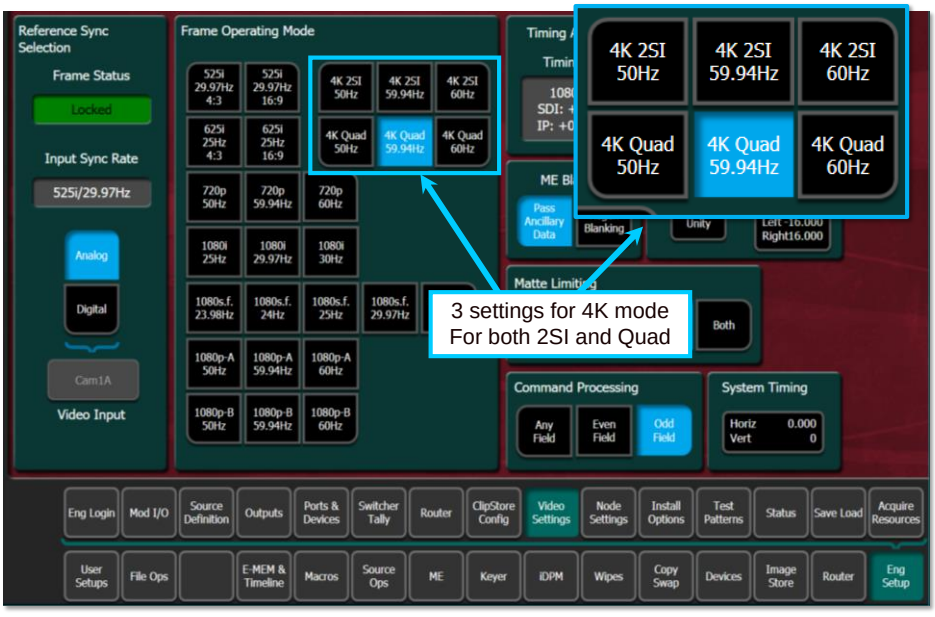
K-Frame – 4k Mode - Video settings

Choose a 4K mode

This will cause the switcher to reboot



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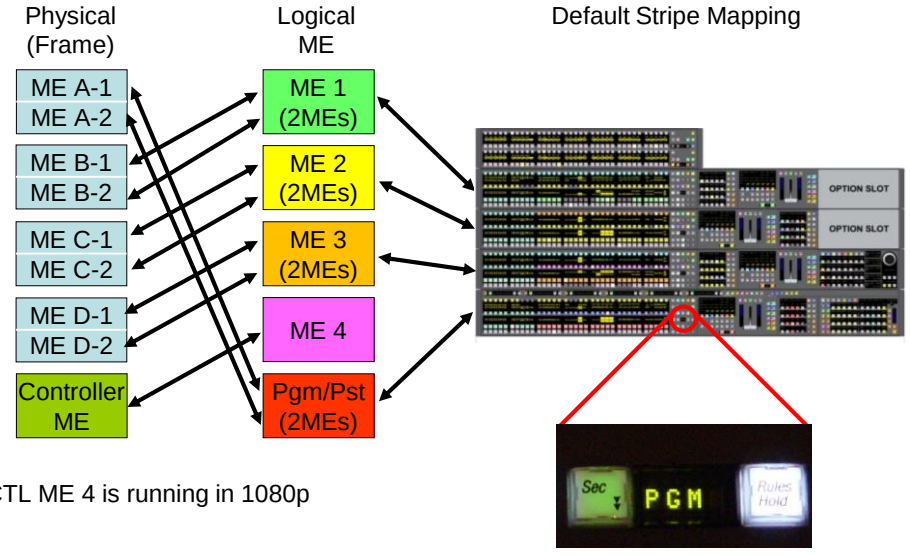
K-Frame Physical v Logical Mapping - 9 MEs - 4K mode



Note: CTL ME 4 is running in 1080p

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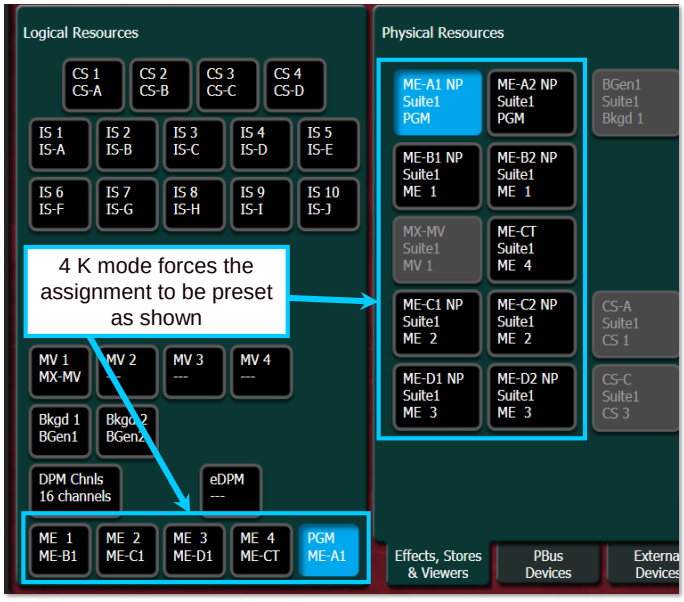
K-Frame – 4K mode – Resource allocation

Setting a large K-Frame into 4K mode will force the resources to be assigned as shown



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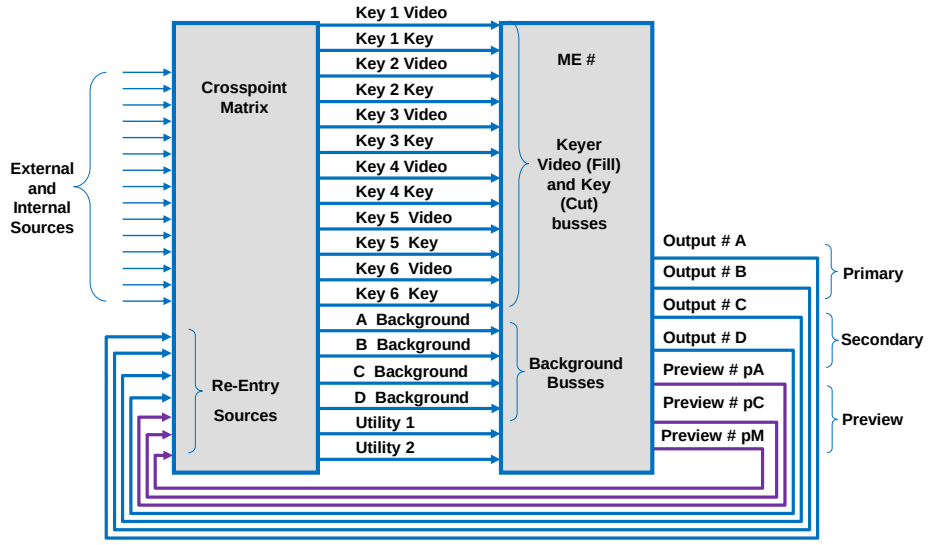
3G K-Frame ME Video Flow - Normal



Two Sets per Dual Video Processor

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ME Mode Notes:

* Key busses 5 and 6 only exist on the Dual ME boards.

** The Utility busses U1 and U2 only exist in the K-Frame Dual ME boards. These are used for backgrounds for the Secondary Partition in Split Mode described below.

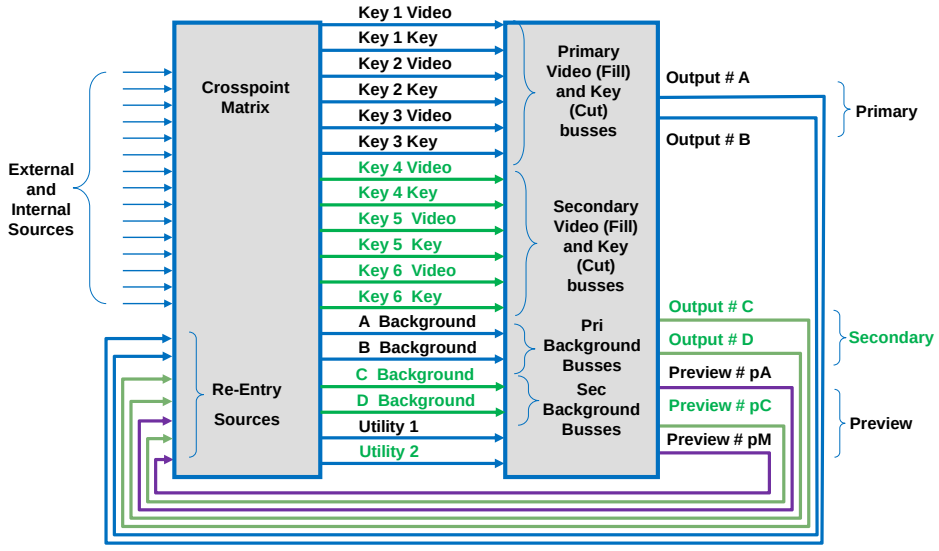
The C and D busses act as Utility busses for the S-series frame.

The other Difference is the ME View output (pM) active with v6.0 software.

Each Mix Effects can be configured for different operating modes.

1. Normal Mode. Main output is A – all keys active. B, C and D are clean outputs – No keys active.
2. Programmable Clean Feed Mode (PCF) (Flexi-Key) – Provides controllable keys on all 4 ME outputs
3. Split Mode. (Double Take) – Enables Primary and Secondary ME functions. Keys can be assigned to either Primary or Secondary. Utility busses are Secondary backgrounds.
4. Split / Layered mode configures an output as a Key channel. If in Split mode, the Primary side Key will be output B and the Secondary side Key will be output D.

3G K-Frame ME Video Flow – 4K Split Mode



Two Sets per Dual Video Processor

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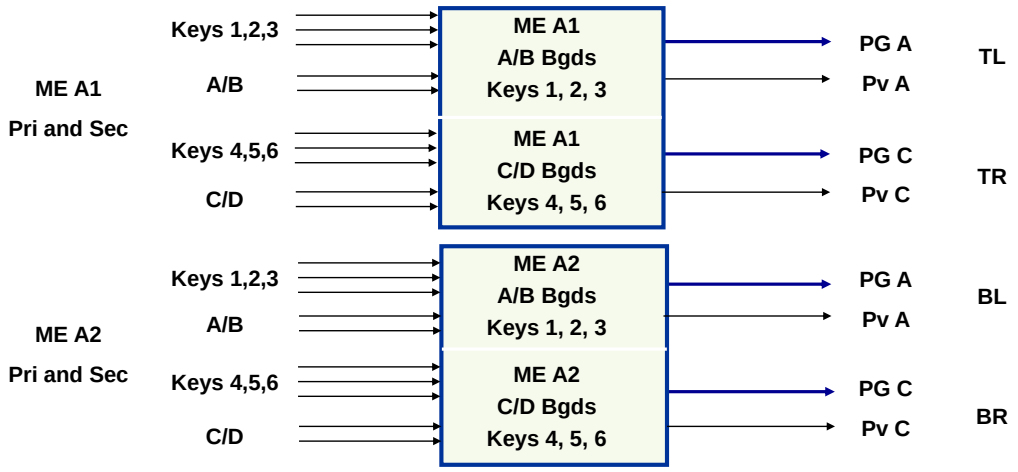
3G K-Frame Video for 1 '4K' ME



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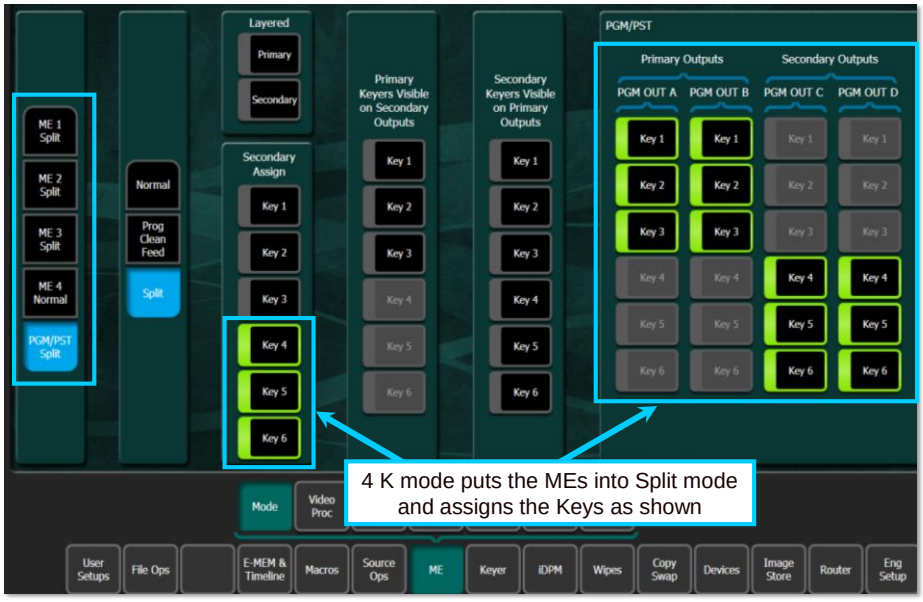
K-Frame – 4K mode – ME Mode



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K-Frame - 4K mode – Source configuration

Setting a Source into 4K mode will associate the adjacent 4 inputs together as 4K

They still need to be named for identification such as A,B,C,D or TL, TR, BL, BR if in Quad mode

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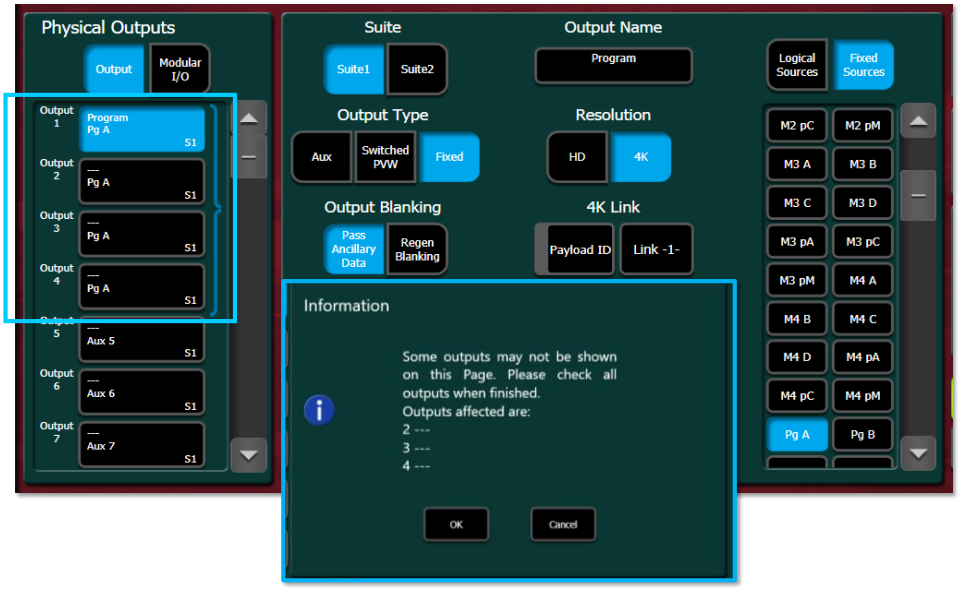
K-Frame - 4K mode – Outputs

When an Output is chosen as 4K the next 3 Outputs will be assigned to the associated signals

A warning box informs of the affected Outputs



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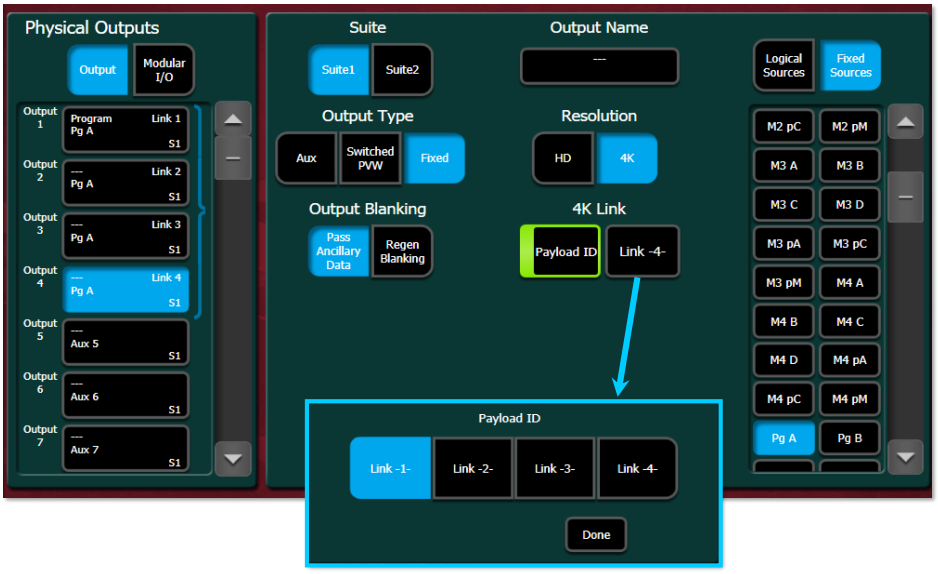
K-Frame - 4K mode – Outputs

Outputs can be configured for the specific Payload ID



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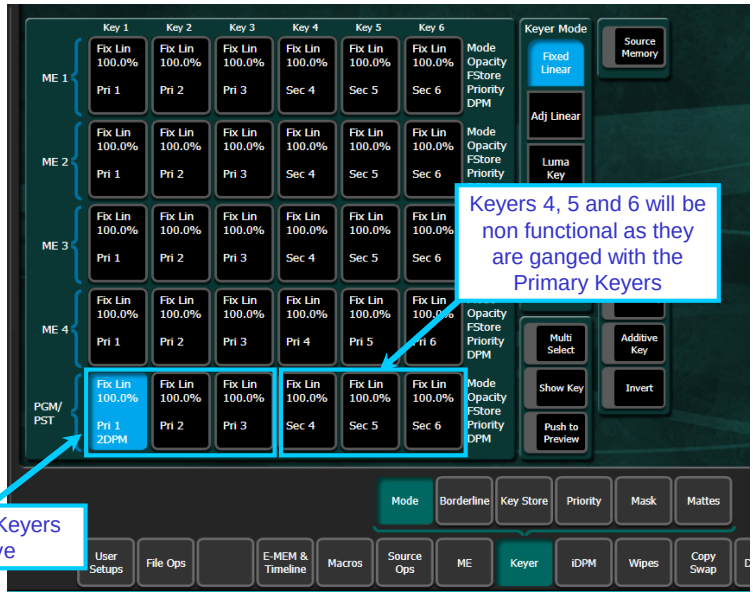
K-Frame - 4K mode – Keyers

The ME menus show the state of the 4 4K MEs

Only ME4 operates as a normal 1080p ME

The 'phantom' MEs do not show up in the menu



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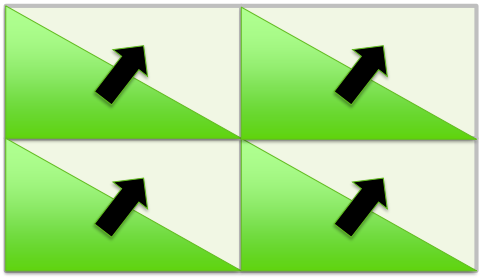
K-Frame - 4K mode – Wipes – Diagonal - Quad mode

Mixes and Keys operate as before but controls are ganged across Keyers

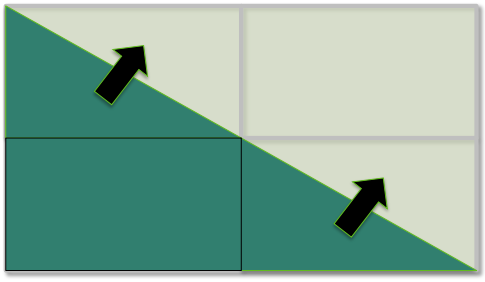
Wipes however are repositioned and ganged to produce the correct result for many patterns

Note: In 2SI the wipes will operate normally

Normal Mode Wipes



4K Quad Mode Wipes



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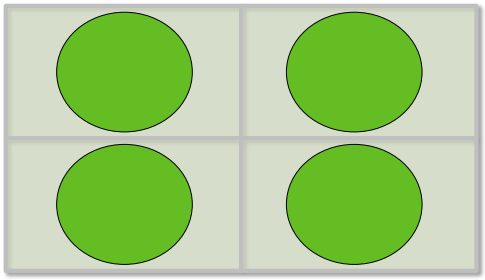
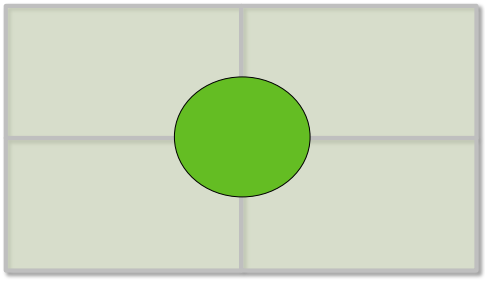
K-Frame - 4K mode – Wipes – Circle – Quad mode

- Enclosed Wipes are also repositioned and ganged to produce the correct result
- Not all patterns are supported in 4K Quad mode
- Refer to the User guide for what patterns are supported
- Unsupported patterns are not disabled

Normal Mode Wipes



4K Mode Wipes



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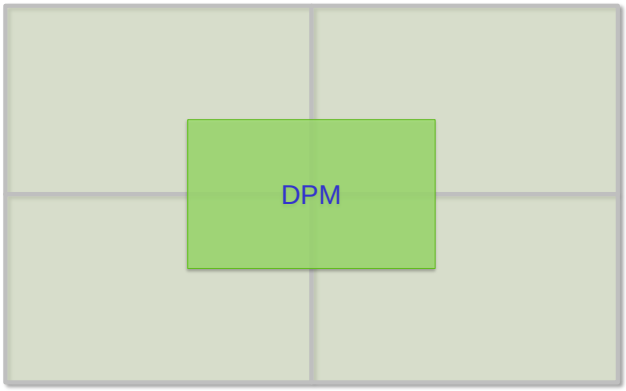
K-Frame - 4K mode – 2DPMs – Quad mode

2DPMs - using a 1080p source!

Selecting a 2DPM on a Keyer will turn on all 4 - 2DPMs for the associated Keyers and setup the default box to show the image at 1/2 the 4K size

This uses the 4 - 2DPMs, one in each quadrant to show part of the reduced 1080p image

The 2DPMs are all being supplied with the same 1080p image!



Note: Using 4 2DPMs to expand a 1080p image to fill 4 quadrants is how you can use any 1080p source in 4K mode

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K-Frame - 4K mode – 2DPMs – Quad mode

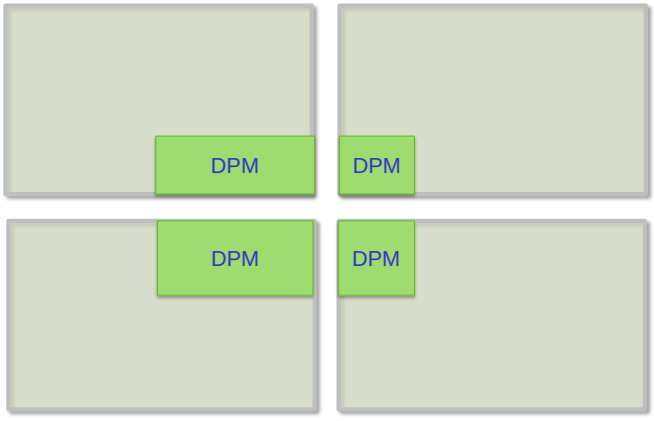
2DPM using a 1080p source!

This is easier to see if we split up the 4 quadrants

This shows that we need 4 DPMs one in each of the 4 Keyers to produce the single DPM box

As this is a 1080p image bringing the DPMs up to full screen it will have half the resolution of a 4K image

When the DPM is smaller than 1920x1080 there will be a reduction of information anyway



Note: There is no '4K preset' for the iDPM channels

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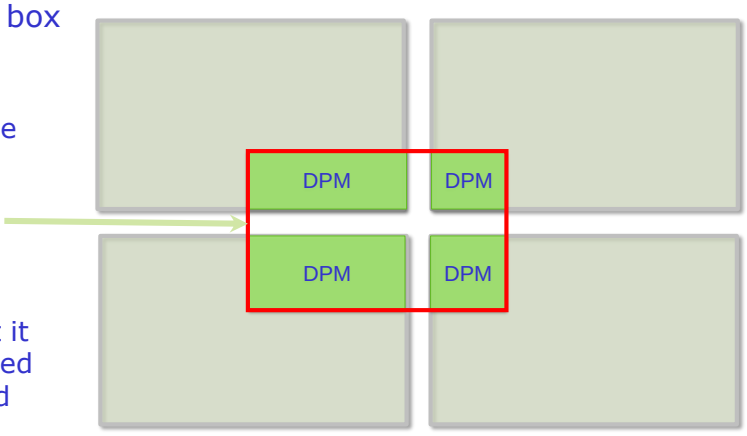
K-Frame - 4K mode – 2DPMs – Quad mode

What about using a 2DPM box effect using a 4K quad source?

Selecting a 4K source into the 2DPM would only show 1 quadrant of the incoming 4K quad signal (i.e. the top left 1080p image)

If this was a bug or logo occupying only one quadrant it could be used and repositioned on screen to any position and used successfully



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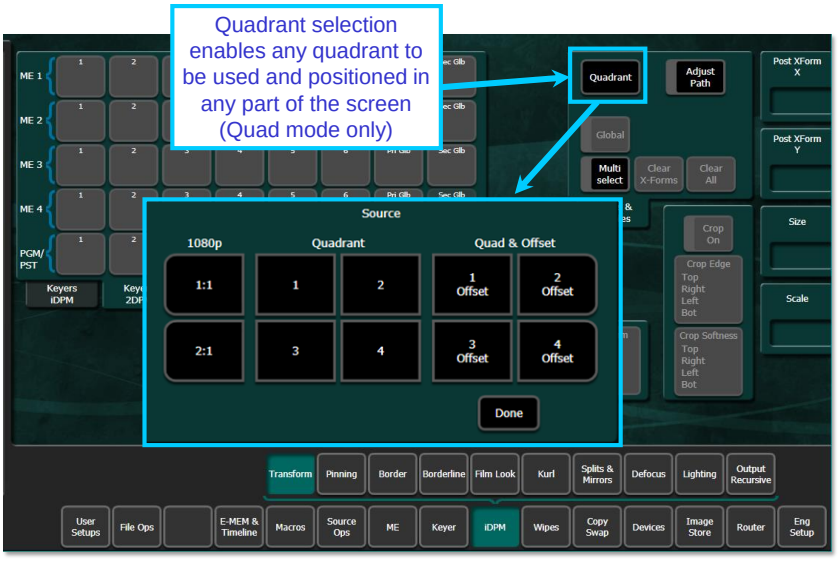
K-Frame - 4K mode – 2DPMs

Using a 4K quad source

As using a 2DPM uses one input only to create the box so only 1 of the 4 quadrants will be active

A quadrant selection menu allows the operator to choose which quadrant they wish to select and where it is to be positioned

Selecting 2:1 makes the image full size



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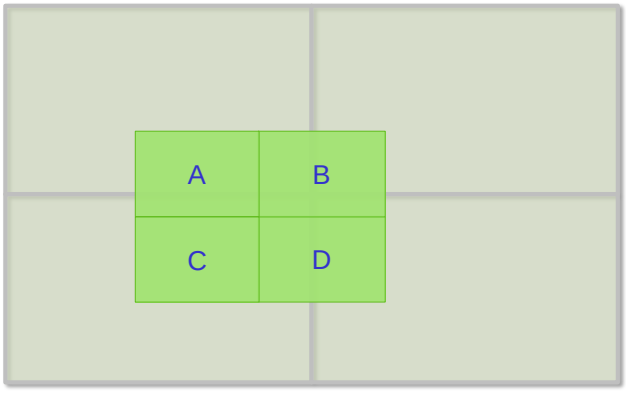
K-Frame - 4K mode – 2DPMs – Quad mode

What about using a 2DPM box effect using a 4K quad source?

We would need 4 - 2DPMs in each ME to resize the 4K image in each quadrant!



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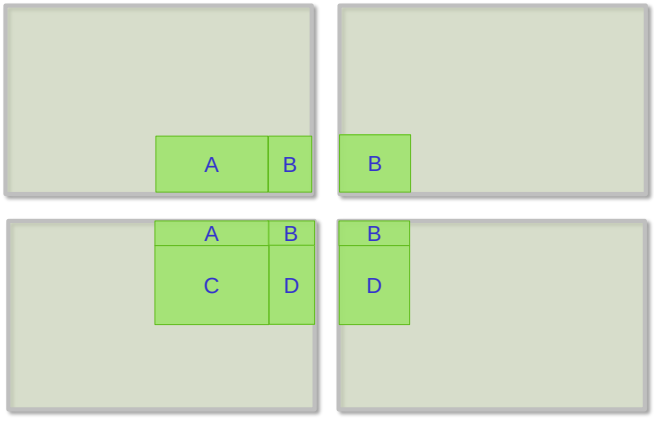
K-Frame - 4K mode – 2DPMs

2DPM using a 4K quad source

Again this is easier to see if we split up the 4 quadrants

You actually need 16 - 2DPMs 4 in each quadrant to produce the effect and provide movement across all quadrants

Each ME has only 3 Keyers so this type of manipulation is not possible unless the positioning of the resultant DPM box is constrained or 2 4K ME's are used



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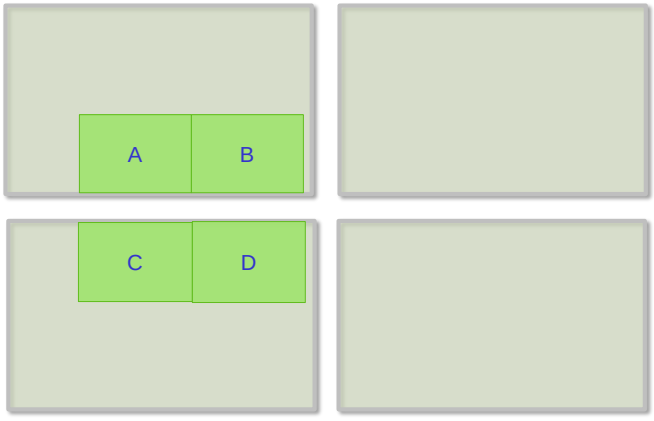
K-Frame - 4K mode – 2DPMs

2DPM using a 4K source

Here is an example of a constrained DPM use

In this case only 2 DPMs are required in 2 quadrants to produce the effect

Obviously this is somewhat limiting



Note: Constraining the movement is up to the operator

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K-Frame - 4K mode – 2DPMs

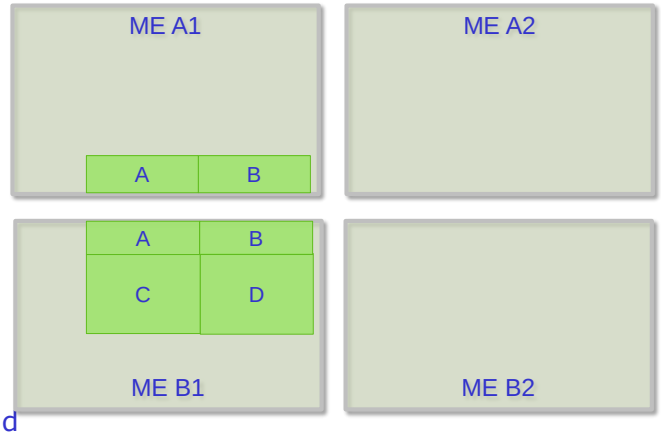
2DPM using a 4K source

This example shows a DPM positioned in the bottom left and needing 4 Keyers in ME B1

Although full movement is not possible across all quadrants a repositioned box can be created providing the operator is aware of the constraints for movement

To produce this effect 2MEs are required in cascade

3 of the boxes in the bottom left quadrant would be from one ME and the 4th would be from a second ME



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K-Frame – 4K mode - Features

1. For Chroma Key the color pick cursor moves across all 4 quadrants to allow picking a desired set up color
   The Chroma key controls are all ganged and set up the same for all quadrants

2. While the Image store cannot grab a full image from a moving video source in the K-Frame all Keyers have 2 frame stores
   This allows the operator to feed 4 Keyers with the live sources and using Macros, gang a grab in all 4 Keyers together!
   These grabbed images can then be transferred one at a time into the Image Store and recalled later together

3. The ClipStore will operate as normal with Video and Key and all 4 channels can be ganged for Record or Playback of 4 clips simultaneously

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K-Frame – 4K mode – 2SI

Using 2SI mode has some big advantage over Quad mode:

- Because each signal contains parts of the entire 4K image it can be displayed on a non 4K monitor and produce a usable result
- In this mode any one of the 4 signals could be used in a 2DPM as explained in a previous slides as a single 1080p image
- This allows more DPMs to be used with certain restrictions
  - Note: that there may be artifacts in the image
- This mode also allows more of the Wipes, 2DPM and iDPM features to be used

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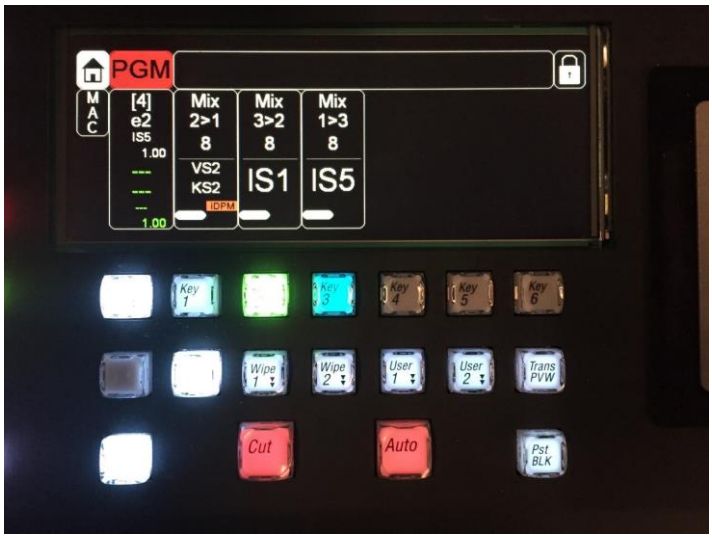
K-Frame – 4K mode – 2SI

- There are few changes to the panel when in 4K mode
- The main change is that only 3 Keyers are active on the transition module
- The MEs are always in Split Mode so there is no additional Split or PCF functionality for the MEs



grass valley
A BELDEN BRAND

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