

**25G HYBRID**  
signal management



# 25G HYBRID

signal management

visual engineering  
**LIGHTWARE**

## 25G HYBRID Signal Management

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# 25G HYBRID

signal management

25G Hybrid Signal Management introduces a completely new concept to the AV industry. Innovative engineering and design has resulted in a unique new technology that allows managing, switching and extending digital and analog video, audio, Ethernet and control in a new and inventive way. Designed to deliver exceptionally high resolution image quality and 24/7 reliability, 25G Hybrid technology sets a new standard in the professional AV industry.

25G Hybrid is more than just a switcher. 25G Hybrid is a complete source to display solution for all video, audio and control formats over a single CAT5/6/7 or fiber cable.

As a comprehensive line of digital matrix switchers, transmitters and receivers, 25G Hybrid combines switching with a powerful suite of diagnostic software tools for the digital age, delivering a superior user experience.



**Incredible speed** of 25 Gigabits per second - no video router ever built can carry 25 Gigabit per second per port.



**Multilayer Switching** provides the flexibility and freedom of independent signal switching per media layer.



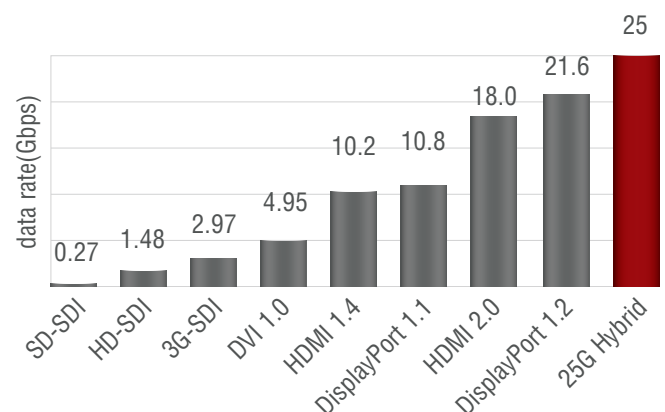
**Advanced audio** functions make this technology unique. The 25G Hybrid routers has 3 different audio layers: Embedded Audio, Forward Audio and Return audio.



**Various control** signals are also handled by the 25G Hybrid routers such as RS-232, Ethernet, KVM and IR.

This 25 Gigabits per second allows the transferring and switching of any existing standard video format, ensuring a reliable and future proofed platform for all signal management purposes.

Hybrid Signal Management supports multiple signal types including Video, Audio, Ethernet, USB KVM, IR, CEC and RS-232 control in a single chassis system.



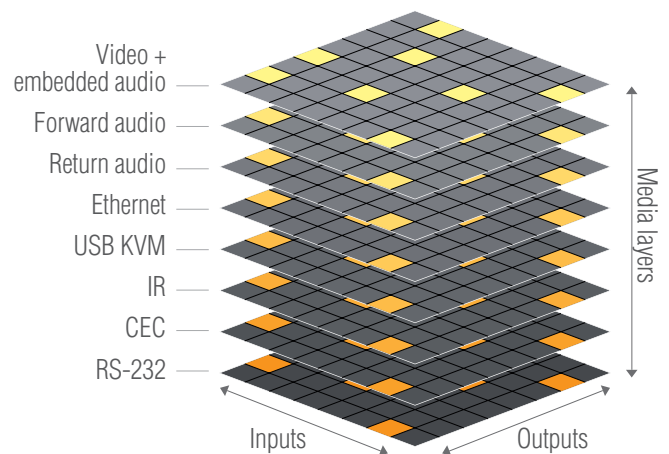
As we've said, this is not only a matrix switcher or router. It's a full signal path infrastructure from end to end. The Hybrid hardware and software design allows switching and transmission of all signals over one single fiber or CAT cable in one single router.

Lightware's 25G Hybrid matrix is the world's first fully compatible HDMI 1.4 matrix switcher that also provides HEC and ARC functions, supports 4K resolutions and full 3D formats. 25G Hybrid has 8 separate media layers, giving the rise to the expression: Multilayer switching.



## Multilayer Switching

Lightware has re-invented the term 'matrix switch'. We don't only handle inputs and outputs, we have added a third dimension, the Media layers which provides the flexibility and freedom of independent signal switching per Media layer. Inside a 25G Hybrid router there are as many Media layers as signal types. This means that there are as many individual routers as signal formats being incorporated. The advanced audio functions make this technology even more unique. The 25G Hybrid routers has 3 different audio layers: Embedded Audio, Forward Audio and Return audio.



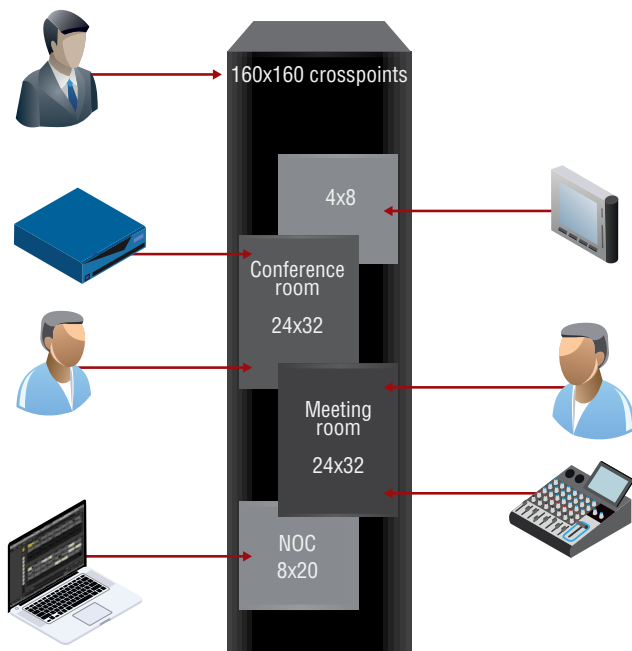


## Room Management

As the maximal crosspoint area in the 25G Hybrid routers is a large switching plane, we have introduced 'Room Management'. A room could be a conference room, meeting room or network operation center (NOC) – in essence, whatever you want it to be.

All these rooms can be programmed with their own sources and destinations, but also can share some resources if required. If, for example, you want to prohibit an operator in one room from accidentally making switches in another, the maximal crosspoint area can be divided in smaller virtual matrices called 'rooms'.

Third party controllers will see only the crosspoints assigned to them. In this example a remote control device located in the Conference room controls the 24x32 matrix area, while the touch panel system in the Meeting room has access to a 32x32 matrix area. These controllers do not know anything about the rest of the system. However, as you can see, the two mentioned matrices overlap meaning both controllers also share common resources.



## User Management

User Management allows the system administrator to control the rights of the users: Any number of users can be created and assigned with different rights. Combined with the Room Management the system administrator or users (based on the settings of the User Management) can create, edit and manage virtual rooms from the matrix topology. For an example if we have two 80x80 virtual rooms (room A and B) created of the 160x160 25G matrix the users assigned to room A can be set with reduced or no rights for room B.

## Reliability



The components used in this technology are industrial grade and typically designed for the telecom industry. All printed circuit boards are gold plated in order to achieve reliable and stable hardware performance. This technique results in better soldering and contact performance and eliminates corrosion problems caused by salt and humidity in naval military environments.



All boards that contain active electronic components are hot swappable. The front load design makes it easy to replace failed components. All fans and Power supplies can also be replaced in a simple movement.



The 25G matrix routers are designed for 24/7 operations and optional redundant CPU and Power supplies can be also added for further reliability.



The 25G CPU stores the settings of all boards and send backups for the second CPU. If the first CPU fails the second takes over automatically with the same settings. With the redundant power supplies N+1 and N+2 redundancies can be reached.

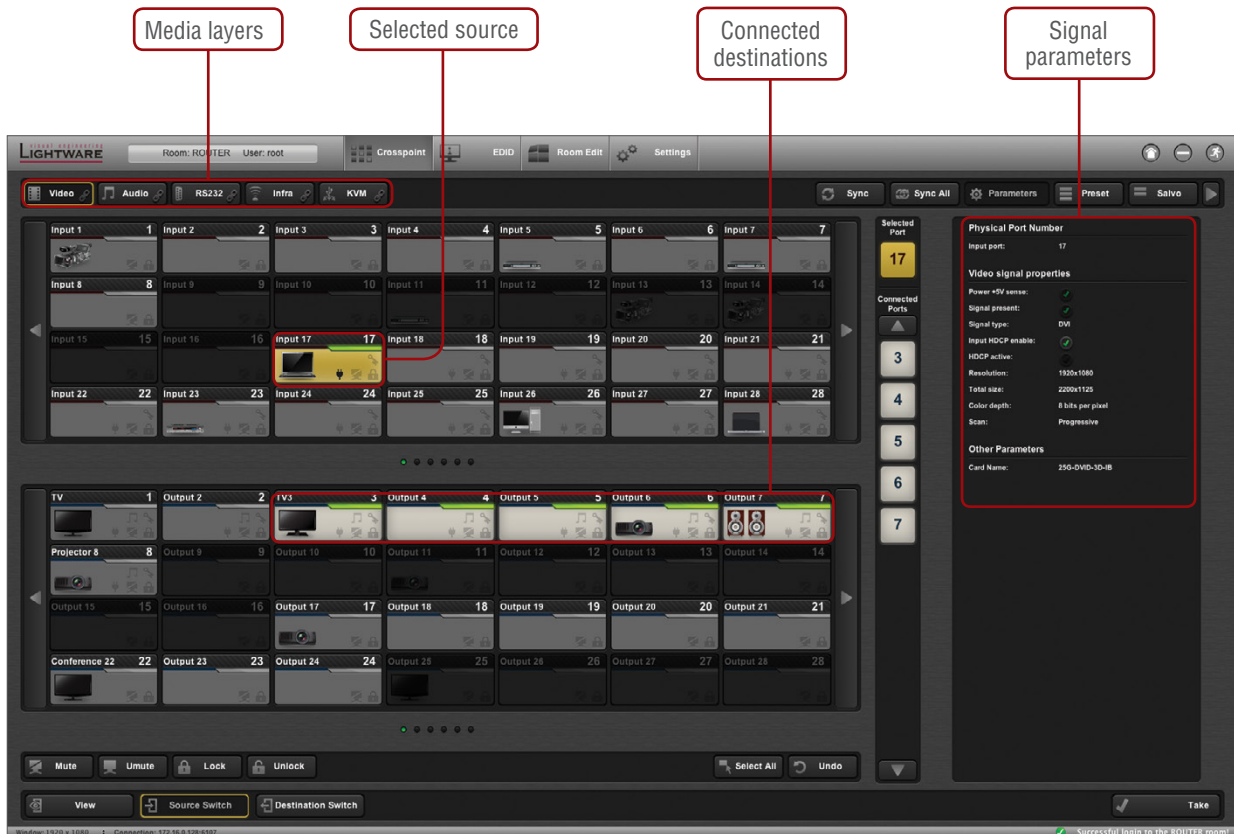
## Graphical User Interface

25G Hybrid matrices have a built-in JAVA-based graphical user interface which eases system control, setup, maintenance and troubleshooting. It is accessible via LAN, RS-232 and the front panel touch screen.

25G Hybrid matrices have a built-in front panel touch screen capable of showing the 25G control software with full control options. Unit information, crosspoint setup and switching, EDID Management, User & Room Management, maintenance, troubleshooting and every other tool is available on the front panel display.

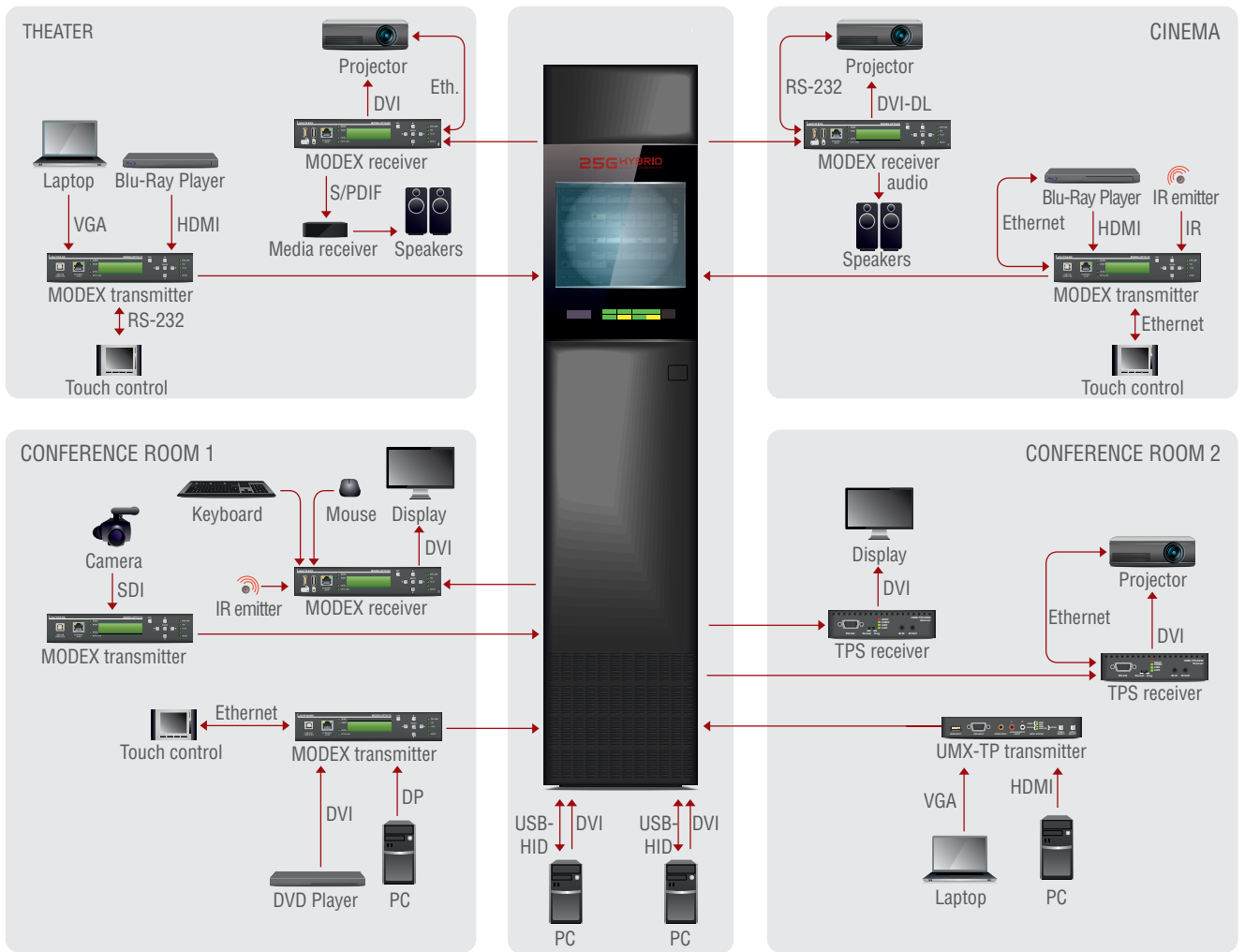
The control interface for these routers has been designed to accomplish 3 main principles:

- **Simplicity.** Crosspoint switching has never been easier. By pressing the buttons on the touchscreen interface you can perform multiple switches. The colors and icons are very informative with meaningful details.
- **Seamless control.** Straightforward control interface for all of the inputs and outputs on all 8 layers.
- **Exceptional diagnostics.** Maintain the strong diagnostic features already provided by previous Lightware architectures, such as Advanced EDID Management, Input signal analysis and the Frame Detector.



The screenshot above presents the GUI for the 25G routers. The control software is available for both Apple Macintosh and PC computers as a standalone desktop application.





The 25G Hybrid design includes the extender (transmitters and receivers) infrastructure called the MODEX family. MODEX (Modular Extender) offers a full range of modular transmitters and receivers including all functions of the 25G Hybrid technology. Extension can be achieved by a single CATx cable (TPS extension) or a single fiber (OPTS/OPTM version of the MODEX), both with full functionality.

MODEX transmitters and receivers extend digital and analog video, audio, USB KVM, Ethernet and control signals enabling the use of all the layers of the 25G matrix at remote locations.

The 25G Hybrid matrices also compatible with the Lightware OPT and TP series extenders as well.

## Configuration

The 25G Hybrid routers have three main components. To configure the best 25G solution for a particular application you need to choose a frame, need to find out what Media layers you will use for your application and then populate the ready frame with the input and output boards. The main point of this structure is that you only need to pay for what you need and won't have extra unused functions. To find the best configuration is very important so our sales and support teams are happy to help you.

## FRAMES

The first step is to choose the right frame. The biggest 25G frame handles 160 input and 160 output ports, this frame can be ordered with the same functionality but less ports as well like 120x120, 160x80, 80x160. Currently the smaller 25G frame has 80 inputs and 80 outputs.

CPU and power redundancy are available for the 25G matrices for a high level of security: it's possible to add a second redundant CPU and more redundant power supply as well. An additional monitoring board is also available for special applications that requires real time monitoring of any input or output signal.



**25G Hybrid up to 160x160 crosspoint matrix frame**

25G-FR160x160 / 25G-FR120x120 /

25G-FR160x80 / 25G-FR80x160

Part No: 9121 0001 (FR160x160), 9121 0002 (FR120x120), 9121 0003 (FR160x80),  
9121 0004 (FR80x160)

The 25G-FR160x160 frame handles up to 160 input and 160 output ports, making this frame one of the largest on the market. This frame is managing the signals on 8 different layers which means the signals are switched in 3 dimensions.

The 25G frames are able to: transmit video signals up to 4K resolution, support all the 3D formats, handle forward and return audio, transmit USB-KVM, Ethernet, bidirectional RS-232/RS-422, IR and CEC signals. The intuitive graphical user interface makes the controlling of the matrix very easy and allows the user access to all the functionality. Lightware's Advanced EDID Management is included in the frame which is also HDCP compliant as well.

Each board which contains electronic components are hot swappable which makes changes of the configuration very easy and quick and it also means that the system is able to work 24/7 without any and delays. If any error occurs it can easily be fixed without switching the matrix off. Redundant power supplies and CPU such as the monitoring board are also available for this frame for fail safe operation in mission critical applications.

This frame can come configured with 120x120, 80x160 and 160x80 crosspoints as well. Software upgrade for these frames is available if the user wants to raise the capacity up to 160x160.

**Features:**

- 25 Gbit/sec per port video signal speed
- Multilayer signal management – signal switching in 3 dimensions
- 160x160, 120x120, 80x160, 160x80 video crosspoint versions
- Independent switching of audio and video
- USB KVM extension
- Built-in 320 port 100 Mbit Ethernet switch with 1 gigabit uplink
- Dual redundant CPU processor boards for fail safe operation
- Hot swappable components
- RS-232 / RS-422 bidirectional transmission and control
- IR and CEC transmission
- Intuitive GUI interface for easy handling of all functions
- Room and User Management
- Front panel touch screen
- Genlock and Word clock
- Advanced error handling and logging with time code
- Combine non-HDCP and HDCP capable I/O boards in the same frame
- TCP/IP Ethernet control (multiple connections)
- Advanced EDID Management
- HDCP compliant
- Redundant power supplies – 24/7 secure operation
- Supports former LW protocols
- Barco Encore and Vista Spyder compatible
- Hybrid Modular technology



## 25G Hybrid 80x80 crosspoint matrix frame

### 25G-FR80x80

Part No: 9121 0010

The 25G-FR80x80 frame handles 80 input and 80 output ports and manages the signals on 8 different layers which means the signals are switched in 3 dimensions.

The 25G frames are able to: transmit video signals up to 4K resolution, support all the 3D formats, handles forward and return audio, transmit USB-KVM, Ethernet, bidirectional RS-232/RS-422, IR and CEC signals. The audio signals of the Forward and Return audio layers runs through the same crosspoint which allows the user to switch return audio signals to the Forward audio layer and forward audio signals to the Return audio layer.

The intuitive graphical user interface makes the controlling of the matrix very easy and allows the user access to all the functionality. Lightware's Advanced EDID Management is included in the frame which is also HDCP compliant as well.

Each board which contains electronic components is hot swappable which makes changes of the configuration very easy and quick and it also means that the system is able to work 24/7 without any delays. If any error occurs it can easily fixed without switching the matrix off. Redundant power supplies and CPU such as the monitoring board are also available for this frame for fail safe operation in mission critical applications.

#### Features:

- 25 Gbit/sec per port video signal speed
- Multilayer signal management – signal switching in 3 dimensions
- 80x80 video crosspoints
- Independent switching of audio and video
- Same crosspoint for the Forward and Return audio layers
- USB KVM extension
- Built-in 160 port 100 Mbit Ethernet switch with 1 gigabit uplink
- Dual redundant CPU processor boards for fail safe operation
- Hot swappable components
- RS-232 / RS-422 bidirectional transmission and control
- IR and CEC transmission
- Intuitive GUI interface for easy handling of all functions
- Room and User Management
- Front panel touch screen
- Genlock and Word clock
- Advanced error handling and logging with time code
- Combine non-HDCP and HDCP capable I/O boards in the same frame
- TCP/IP Ethernet control (multiple connections)
- Advanced EDID Management
- HDCP compliant
- Redundant power supplies – 24/7 secure operation
- Supports former LW protocols
- Barco Encore and Vista Spyder compatible
- Hybrid Modular technology



## Second CPU for redundancy

### 25G-CPUB1

Part No: 9121 0005

#### Features:

- Configuration of all other boards
- Controller connection (LAN, RS-232)
- LW3, LW2, P#2 protocols
- Advanced logging
- Redundant – hot swappable

The CPU board, which controls the whole system, can be doubled in the frames. In this case the first CPU is actively operating while the second is a “hot spare”. If the main CPU fails, the second takes over the control instantly and reports the failure of the previous one.



25G-CPUB1

## Monitoring board

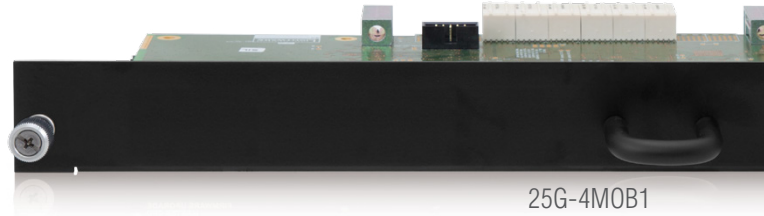
### 25G-4MOB1

Part No: 9121 0007

#### Features:

- Video output for monitoring function
- Maximal resolution 1920x1080@60Hz deep color

25G matrices have an advanced monitoring function. Every input and output can be monitored directly from the port: on both the input and output boards the monitoring video signal is sent to the matrix separately from the input/output port, so the same signal can be monitored that comes in/goes out. The monitored signal is sent to a separate dedicated connector and also can be switched to the front panel touch screen. The monitor output can send any signal converted to Single-Link DVI or HDMI signals with HDCP protection compliancy.



25G-4MOB1



## Additional power supply for redundancy

### 25G-PSU-1600 (1200)

Part No: 9121 0006

#### Features:

- Up to N+2 redundancy
- 24/7 operation

Power supplies are arranged for N+1 or N+2 redundancy. Depending on the configuration, one or even two power lines can fail while the system remains active. In addition, our approach to power supplies is to ensure that the load never exceeds 60% of their maximum rated output level. These two features will go a long way to providing a robust system capable of 24/7 operation in even the harshest environments.

## 25G-FR160x160 specifications

| <b>Media layers</b>  |   |
|----------------------|---|
| Video data rate:     | 25 Gbit/sec per port  |
| Video compatibility: | DisplayPort 1.2, HDMI 2.0 with 3D, Single & Dual-Link DVI, 3G-SDI   |
| Audio:               | 3 layers – embedded, forward and return audio channels  |
| Audio compatibility: | S/PDIF 7.1, 5.1 Dolby Digital, DTS Audio, HDMI 1.4 embedded audio (with ARC), stereo and multichannel PCM |
| Ethernet:            | 100 Mbit/port (total 320) with 1 Gigabit uplink   |
| USB KVM:             | USB HID crosspoint and extension  |
| RS-232 & IR:         | Control for all devices through the matrix  |
| CEC:                 | According to the HDMI standard  |

| <b>Control</b>            |   |
|---------------------------|---|
| Ethernet:                 | Redundant control (one for each CPU)                              |
| Ethernet control:         | Ethernet 10Base-T or 100Base-TX (Auto-negotiation)                |
| RS-232:                   | Redundant control (one for each CPU)                              |
| RS-232 Baud rate:         | Selectable baud rate (9600, 38400, 57600, 115200) (default:57600) |
| Room and User Management: | Unlimited rooms and users   |
| Virtual matrix option:    | Virtual I/O numbering, Virtual matrices                           |
| 3rd party control:        | Vista Spyder and Barco Encore compatible                          |

| <b>Connectors (frame)</b> |  |
|---------------------------|--|
| Ethernet control:         | 2 x RJ45 (1-1 per CPU)                   |
| RS-232 / 422 control:     | 2 x 9 pole D-sub (1-1 per CPU)           |
| Ethernet layer:           | 2 x RJ45 - 1 Gigabit uplink for Ethernet |
| Genlock input:            | 2 x BNC (loop through)                   |
| Word clock input:         | 2 x BNC (loop through)                   |
| SMPTE 269M Alarm output:  | 1 x BNC                                  |
| Power:                    | 4 x IEC-320 C-20                         |

| <b>Redundance &amp; Reliability</b> |                                      |
|-------------------------------------|--------------------------------------|
| CPU:                                | Dual redundant                       |
| Hot swappable:                      | Each IO board / CPU / fan tray / PSU |
| Power supplies:                     | Maximum 6 PSUs                       |
| PSU redundancy:                     | Up to N+2                            |
| MTBF:                               | 30.000 hours                         |

| <b>General</b>        |   |
|-----------------------|---|
| Crosspoint size:      | From 8 x 8 up to 160 x 160  |
| Power:                | 100 - 240 V AC  |
| Power consumption:    | 300 W (typ) - without I/O boards                                  |
| Power consumption:    | 2000 W (typ - depends on current configuration) - with I/O boards |
| Enclosure dimensions: | 446(482) W x 640 D x 1866 H mm                                    |
| High in rack units:   | 42U   |
| Temperature:          | 0°C to +50°C operational, -40°C to +70°C storage                  |
| Humidity:             | 10 to 90% non-condensing  |
| EMI/EMC compliance:   | Yes, EN 55022 Class B   |
| RoHS compliance:      | Yes   |

## Format compatibility of the separate audio layers:

| <b>Embedded audio</b>                           | <b>Forward audio (S/PDIF)</b> | <b>Return audio (S/PDIF)</b> |
|---|-------------------------------|------------------------------|
| Multichannel PCM (max 8 channel, up to 192 kHz) | Stereo PCM (up to 48 kHz)     | Stereo PCM (up to 48 kHz)    |
| Dolby Digital 2.1                               | Dolby Digital 2.1             | Dolby Digital 2.1            |
| Dolby Digital 5.1                               | Dolby Digital 5.1             | Dolby Digital 5.1            |
| Dolby Digital 7.1                               | Dolby Digital 7.1             | Dolby Digital 7.1            |
| DTS 2.1   | DTS 2.1                       | DTS 2.1                      |
| DTS 5.1   | DTS 5.1                       | DTS 5.1                      |
| DTS 7.1   | DTS 7.1                       | DTS 7.1                      |

## 25G-FR80x80 specifications

| Media layers         |   |
|----------------------|---|
| Video data rate:     | 25 Gbit/sec per port  |
| Video compatibility: | DisplayPort 1.2, HDMI 2.0 with 3D, Single & Dual-Link DVI, 3G-SDI   |
| Audio:               | 3 layers – embedded, forward and return audio channels  |
| Audio compatibility: | S/PDIF 7.1, 5.1 Dolby Digital, DTS Audio, HDMI 1.4 embedded audio (with ARC), stereo and multichannel PCM |
| Ethernet:            | 100 Mbit/port (total 160) with 1 Gigabit uplink   |
| USB KVM:             | USB HID crosspoint and extension  |
| RS-232 & IR:         | Control for all devices through the matrix  |
| CEC:                 | According to the HDMI standard  |

| Control                   |   |
|---------------------------|---|
| Ethernet:                 | Redundant control (one for each CPU)                              |
| Ethernet control:         | Ethernet 10Base-T or 100Base-TX (Auto-negotiation)                |
| RS-232:                   | Redundant control (one for each CPU)                              |
| RS-232 Baud rate:         | Selectable baud rate (9600, 38400, 57600, 115200) (default:57600) |
| Room and User Management: | Unlimited rooms and users   |
| Virtual matrix option:    | Virtual I/O numbering, Virtual matrices                           |
| 3rd party control:        | Vista Spyder and Barco Encore compatible                          |

| Connectors (frame)       |  |
|--------------------------|--|
| Ethernet control:        | 2 x RJ45 (1-1 per CPU)                   |
| RS-232 / 422 control:    | 2 x 9 pole D-sub (1-1 per CPU)           |
| Ethernet layer:          | 2 x RJ45 - 1 Gigabit uplink for Ethernet |
| Genlock input:           | 2 x BNC (loop through)                   |
| Word clock input:        | 2 x BNC (loop through)                   |
| SMPTE 269M Alarm output: | 1 x BNC                                  |
| Power:                   | 4 x IEC-320 C-20                         |

| Redundance & Reliability |                                      |
|--------------------------|--------------------------------------|
| CPU:                     | Dual redundant                       |
| Hot swappable:           | Each IO board / CPU / fan tray / PSU |
| Power supplies:          | Maximum 3 PSUs                       |
| PSU redundancy:          | Up to N+2                            |
| MTBF:                    | 30.000 hours                         |

| General               |   |
|-----------------------|---|
| Crosspoint size:      | From 8 x 8 up to 80 x 80  |
| Power:                | 100 - 240 V AC  |
| Power consumption:    | 200 W (typ) - without I/O boards                                  |
| Power consumption:    | 1500 W (typ - depends on current configuration) - with I/O boards |
| Enclosure dimensions: | 446(482) W x 640 D x 1288,5 H mm                                  |
| High in rack units:   | 29U   |
| Temperature:          | 0°C to +50°C operational, -40°C to +70°C storage                  |
| Humidity:             | 10 to 90% non-condensing  |
| EMI/EMC compliance:   | Yes, EN 55022 Class B   |
| RoHS compliance:      | Yes   |

## Format compatibility of the separate audio layers:

| Embedded audio                                  | Forward audio (S/PDIF)    | Return audio (S/PDIF)     |
|---|---------------------------|---------------------------|
| Multichannel PCM (max 8 channel, up to 192 kHz) | Stereo PCM (up to 48 kHz) | Stereo PCM (up to 48 kHz) |
| Dolby Digital 2.1                               | Dolby Digital 2.1         | Dolby Digital 2.1         |
| Dolby Digital 5.1                               | Dolby Digital 5.1         | Dolby Digital 5.1         |
| Dolby Digital 7.1                               | Dolby Digital 7.1         | Dolby Digital 7.1         |
| DTS 2.1   | DTS 2.1                   | DTS 2.1                   |
| DTS 5.1   | DTS 5.1                   | DTS 5.1                   |
| DTS 7.1   | DTS 7.1                   | DTS 7.1                   |



## MEDIA LAYERS

The second step of the configuration is to find out which layers the application requires. The video layer with the embedded audio is always included in the frame by default. If your application requires more layers you can choose from the seven options. Choosing the layers mean you need to decide what type of signals you want to get handled by the 25G router.

### Video layer with embedded audio included in the frame



#### Features:

- Up to 25 Gbit/s data throughput per channel
- Up to 160 inputs and 160 outputs
- 3D formats supported
- Featured video signals: VGA (input only), Single-Link DVI, Dual-Link DVI, HDMI 1.4, 3G-SDI (input only), DisplayPort 1.1 & 1.2

The Video layer, at 25 Gigabits per second per port, comprises of up to 160 video inputs and 160 video outputs.

The video could be analog VGA, Interlaced Composite Video, DVI, Dual-Link DVI, HDMI 1.4 with 3D, SDI, 3G-SDI and/or DisplayPort 1.1/1.2. No matter which video format you input, the pixels will be extended and switched by the 25G Hybrid router. Users can mix various video standards and any input signal can be switched to any output display.

The 25G Hybrid architecture has 3 different audio layers: Embedded Audio, Forward Audio and a Return Audio. The embedded audio lies within the 25G video layer itself, carrying up to 8 high definition audio channels. This audio is always routed with the video and runs from source to display.

### Forward audio layer

25G-LAYER-FWD-160, 25G-LAYER-FWD-80

Part No: 9121 0008 (160), 9121 0016 (80)



#### Features:

- A fully separate audio channel
- Supports Stereo PCM, 7.1 Dolby Digital, 7.1 DTS audio formats

The forward audio channel is a second independent S/PDIF audio stream not related to the embedded audio. A separate S/PDIF matrix switch manages Stereo PCM, 5.1 Dolby Digital, DTS and even 7.1 audio formats.

#### Examples

- You have a set-top box that outputs the HDMI video and audio. The same set-top box outputs the audio with a different language on its S/PDIF audio output. This box is connected to the 25G Hybrid network. Different customers can listen to the same content in different languages in different rooms.
- A media server is connected to the 25G Hybrid network inside the server room along with CD players and other equipment. The LCD displays are located in the demonstration rooms. On a certain display the picture may come from the media server, but the sound from the CD player.

### Return audio layer

25G-LAYER-RET-80

Part No: 9121 0022



#### Features:

- A fully separate audio channel routed the opposite way to the Forward audio layer
- Supports Stereo PCM, 7.1 Dolby Digital, 7.1 DTS audio formats

The Return audio layer enables the ability to send two different multichannel audio streams. One from source to display and another return channel in the opposite direction.

ARC (Audio Return Channel) was introduced by HDMI 1.4. This S/PDIF signal is sent in the opposite direction to the video signals. Usually displays send ARC to source devices - typically TV sound to audio receivers, or microphone sound from headsets to computers.

#### Examples

- When using microphones in a KVM environment, the operator may have an LCD display, 5.1 speakers, Keyboard, Mouse and a microphone. The microphone audio signal from his headset is sent in the opposite direction to the video, 5.1 and embedded audio.

### Ethernet layer

25G-LAYER-ETH-160, 25G-LAYER-ETH-80

Part No: 9121 0015 (160), 9121 0017 (80)



#### Features:

- 1 Gigabit uplink
- 100 Mbit connection for all matrix I/O ports
- VLANs can be defined
- Ethernet extension over TPS cable and OPTS/OPTM fiber
- HDMI 1.4 HEC
- Layer 2 Ethernet switch

All built-in ports 100 Mbit Ethernet switch can be used for controlling devices such as projectors and media players or can provide Ethernet access for all connected devices from a 1 Gigabit uplink.

Ethernet, as with every other layer, can be extended over a single fiber or single CAT cable. The VLAN function also allows the user to set up Virtual Networks inside the 320 port domain.

HEC is the Ethernet Channel over the HDMI cable and was introduced by HDMI 1.4. Lightware's 25G Hybrid matrix architecture is the world's first fully compatible HDMI1.4 matrix switcher that provides HEC and ARC functions, supports 4K resolutions and 3D formats.

### USB KVM layer

25G-LAYER-USB-KVM-160

25G-LAYER-USB-KVM-80

Part No: 9121 0014 (160), 9121 0021 (80)



#### Features:

- 2 USB HID devices per 25G I/O port
- Keyboard combinations for matrix control
- USB HUB can be connected to the outputs (Keyboard, Mouse, Smart Card)
- Point to point, point to multipoint, multipoint to point connections

With the USB KVM option, users can utilize the 25G Hybrid signal management for KVM matrix purposes. Up to 160 computers can be controlled by up to 160 operators. 25G allows point to point, point to multipoint and multipoint to point control. This technique allows multiple operators to control one single computer or one operator to control multiple computers.

Special key command can also be implemented in the 25G Hybrid routers. It is possible to control the matrix from any connected keyboard connected with these commands.

### IR layer

25G-LAYER-IR-160, 25G-LAYER-IR-80

Part No: 9121 0011 (160), 9121 0018 (80)



#### Features:

- Full transparent platform
- Bidirectional transmission
- Point to point, point to multipoint connection and switching

Infrared is commonly used for remote control based applications. This Media layer helps maintain the structure of the overall AV system. Third party control systems may send IR control commands to endpoints turning them on and off or switching their inputs.

### Consumer Electronics Control layer

25G-LAYER-CEC-160, 25G-LAYER-CEC-80

Part No: 9121 0013 (160), 9121 0020 (80)



#### Features:

- Point to point, point to multipoint connection and switching
- Full transparent platform
- Command injections
- CEC device discovery

CEC is also commonly used for remote control based applications like IR. Third party control systems can also send CEC control commands to endpoints turning them on and off or switching their inputs. CEC was introduced by HDMI standard, and is a bidirectional Consumer Electronics Control channel.

We can link sources and destinations via CEC communication while the router itself can initiate its own commands for example: „SYSTEM ON“ or „STANDBY“ commands.

### RS-232 & RS-422 control layer

25G-LAYER-RS232-160

25G-LAYER-RS232-80

Part No: 9121 0012 (160), 9121 0019 (80)



#### Features:

- Full transparent platform
- Bidirectional transmission
- Configurable baud rates per port (any user specified)
- Input baud rate could be different from output baud rate
- Standards: 9600, 14400, 19200, 38400, 57600, 115200

Full duplex bidirectional, more robust and more error proof than IR, RS-232 and RS-422 have become the standard control media for professional AV systems. The 25G Hybrid architecture is a fully transparent platform for RS-232 and RS-422 control signals. Ports can be linked together or treated separately allowing any 3rd party control systems to be connected.



## INPUT AND OUTPUT BOARDS

After we selected the frame and we picked the layers the third step is to populate the matrix with the Input and Output boards. The following 25G boards are already available for order and the number of them is also continuously growing with new developments. Some of the MX series boards are available for the 25G matrices too.

### DVI-D Single-Link input board

#### 25G-8DVID1-IB series

Part No: 9122 0001



25G-8DVID1-IB

#### Features:

- HDMI, DVI and HDCP compliant
- Resolutions up to 2560x1440@60Hz
- 3D compatible
- Advanced EDID Management
- Supports all standard audio formats: Multichannel audio, Dolby TrueHD and DTS-HD Master Audio
- Pixel Accurate Reclocking
- 30 m copper cable compensation on all inputs

25G-8DVID1-IB provides a fully transparent HDMI connectivity to the latest high-end digital sources including 3D functions between the endpoints. Resolution supported up to 2560x1440@60Hz. Each input has 30 m copper cable compensation and individual EDID management.

25G-8DVID1-IB accepts embedded audio in the HDMI signal, which can be sent as embedded audio to the 25G video layer or can be de-embedded and sent to the Forward audio layer.

#### Available add-ons

**K1** add-on supports USB keyboard, mouse and Smart Card connectivity. It handles two USB 2.0 (or 1.1) HID devices per port with the USB-B connector per port containing integrated USB HUBs.

### DVI-D Single-Link input board with KVM add-on

#### 25G-8DVID1-K1-IB

Part No: 9122 0016



- Handles 2 USB 2.0 HID devices per port
- 1 USB-B connector per port with integrated USB HUB

## 4K compatible DVI-D Single-Link input board

25G-8DVID2-IB series

Part No: 9122 0019



25G-8DVID2-IB

### Features:

- HDMI, DVI and HDCP compliant
- Resolutions up to 4096x2160@30Hz, 1080p@60Hz, 720p/1080i@120Hz
- 3D compatible
- Advanced EDID Management
- Available video test patterns
- Supports all standard audio formats: Multichannel audio, Dolby TrueHD and DTS-HD Master Audio
- Pixel Accurate Reclocking
- 30 m copper cable compensation on all inputs

25G-8DVID2-IB provides a fully transparent HDMI 1.4 connectivity to the latest high-end digital sources including 3D functions between the endpoints. Supports resolution up to 4096x2160@30Hz. The new 300 MHz board supports the latest 3D formats as well as HD multichannel audio. Each input has 30 m copper cable compensation and individual EDID Management.

25G-8DVID2-IB accepts embedded audio in the HDMI signal, which can be sent as embedded audio to the 25G video layer or can be de-embedded and sent to the Forward audio layer.

### Available add-ons

- K1** add-on supports USB keyboard, mouse and Smart Card connectivity. It handles two USB 2.0 (or 1.1) HID devices per port with the USB-B connector per port containing integrated USB HUBs.
- A2** add-on has bidirectional configurable S/PDIF connectors. The audio signal can be de-embedded from the HDMI signals or can be embedded (or replaced) to the HDMI signal.
- A3** add-on has bidirectional and configurable phoenix connectors. The audio signal can be de-embedded from the HDMI signals or can be embedded (or replaced) to the HDMI signal.

## 4K compatible DVI-D Single-Link input board with KVM add-on

25G-8DVID2-K1-IB

Part No: 9122 0020



- Handles 2 USB 2.0 HID devices per port
- 1 USB-B connector per port with integrated USB HUB

## 4K compatible DVI-D Single-Link input board with S/PDIF add-on

25G-8DVID2-A2-IB

Part No: 9122 0048



- Bi-directional S/PDIF breakout for every port

## 4K compatible DVI-D Single-Link input board with analog audio add-on

25G-8DVID2-A3-IB

Part No: 9122 0047



- Bidirectional configurable analog stereo ports with 5 pole phoenix connector

## HDMI input board

### 25G-8HDMI1-A1-IB series

Part No: 9122 0002



25G-8HDMI1-A1-IB

#### Features:

- HDMI, DVI and HDCP compliant
- Resolutions up to 2560x1440@60Hz
- 3D compatible
- Advanced EDID Management
- Supports all standard audio formats: Multichannel audio, Dolby TrueHD and DTS-HD Master Audio
- Pixel Accurate Reclocking
- 30 m copper cable compensation on all inputs

25G-8HDMI1-A1-IB provides fully transparent HDMI connectivity to the latest high-end digital sources including 3D functions between the endpoints. Resolution supported up to 2560x1440@60Hz.

25G-8HDMI1-A1-IB has 8 HDMI connectors with additional digital S/PDIF audio. Each input has 30 m copper cable compensation and individual EDID Management.

25G-8HDMI1-A1-IB handles embedded audio in the HDMI signal (with capabilities of routing to the 25G audio layers). The S/PDIF input signal can be embedded to the 25G Video layer or sent to the Forward audio layer as well. The HDMI input board's audio options are hardware configurable by jumpers on the board.

#### Available add-ons

**K1** add-on supports USB keyboard, mouse and Smart Card connectivity. It handles two USB 2.0 (or 1.1) HID devices per port with the USB-B connector per port containing integrated USB HUBs.

## HDMI input board with KVM add-on

### 25G-8HDMI1-A1K1-IB

Part No: 9122 0024



- Handles 2 USB 2.0 HID devices per port
- 1 USB-B connector per port with integrated USB HUB

## 4K compatible HDMI input board

25G-8HDMI2-A1-IB series

Part No: 9122 0023



25G-8HDMI2-A1-IB

### Features:

- HDMI, DVI and HDCP compliant
- Resolutions up to 4096x2160@30Hz, 1080p@60Hz, 720p/1080i@120Hz
- 3D compatible
- Available video test patterns
- Advanced EDID Management
- Supports all standard audio formats: Multichannel audio, Dolby TrueHD and DTS-HD Master Audio
- Pixel Accurate Reclocking
- 30 m copper cable compensation on all inputs

25G-8HDMI2-A1-IB provides fully transparent HDMI 1.4 connectivity to the latest high-end digital sources including the Audio Return Channel and 3D functions between the endpoints. Supports resolution up to 4096x2160@30Hz. The new 300 MHz board supports the latest 3D formats as well as HD multichannel audio.

25G-8HDMI2-A1-IB has 8 HDMI connectors with an additional digital S/PDIF audio connector for each HDMI port. Each input has 30 m copper cable compensation and an individual EDID Management.

25G-8HDMI2-A1-IB handles embedded audio in the HDMI signal (with capabilities of routing to the 25G audio layers). The S/PDIF input signal can be embedded to the 25G Video layer or sent to the Forward audio layer as well. The HDMI input board's audio options are software configurable.

### Available add-ons

- K1** add-on supports USB keyboard, mouse and Smart Card connectivity. It handles two USB 2.0 (or 1.1) HID devices per port with the USB-B connector per port containing integrated USB HUBs.
- A2** add-on has bidirectional configurable S/PDIF connectors. The audio signal can be de-embedded from the HDMI signals or can be embedded (or replaced) to the HDMI signal.
- A3** add-on has bidirectional and configurable phoenix connectors. The audio signal can be de-embedded from the HDMI signals or can be embedded (or replaced) to the HDMI signal.

## 4K compatible HDMI input board with KVM add-on

25G-8HDMI2-A1K1-IB

Part No: 9122 0027



- Handles 2 USB 2.0 HID devices per port
- 1 USB-B connector per port with integrated USB HUB

## 4K compatible HDMI input board with S/PDIF add-on

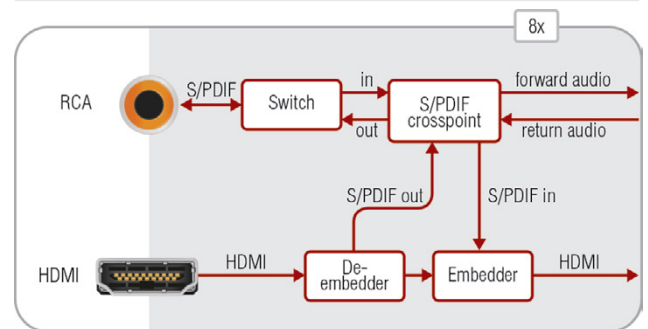
25G-8HDMI2-A2-IB

Part No: 9122 0028



- S/PDIF breakout for every port

### Port diagram



25G-8HDMI2-A2-IB

## 4K compatible HDMI input board with analog audio add-on

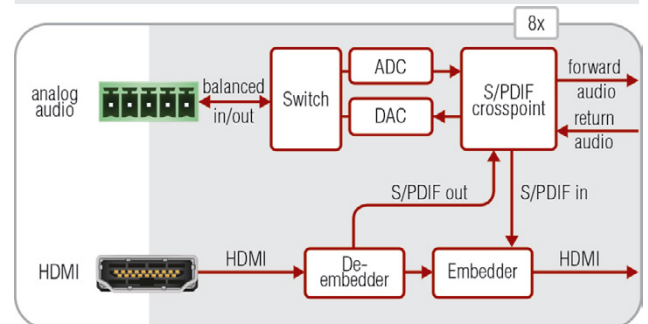
25G-8HDMI2-A3-IB

Part No: 9122 0029



- Bidirectional configurable analog stereo port with 5 pole phoenix connector

### Port diagram



25G-8HDMI2-A3-IB

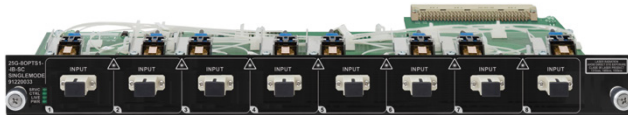
### Singlemode optical input board

25G-8OPTS1-IB- LC, -SC, -ST, -NT

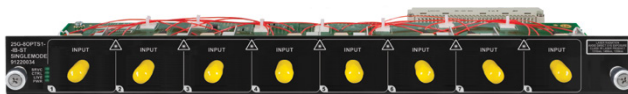
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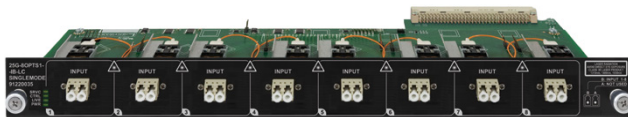
25G-8OPTS1-IB-NT



25G-8OPTS1-IB-SC



25G-8OPTS1-IB-ST



25G-8OPTS1-IB-LC

#### Features:

- Up to 10km extension distance
- Video and audio transmission
- 25G Monitoring compatibility
- Ethernet, USB KVM, RS-232, IR, CEC transmission
- Extension from MODEX transmitters
- 3D compatible
- Resolutions up to 2560 x 1440 (WQXGA) @ 60 Hz YCbCr 4:2:2
- Deep color support up to 1920 x 1080 @ 36 bit, 60 Hz

25G-8OPTS1-IB-LC, -SC, -ST, -NT is a new fiber optical input board for the 25G router family and available with a variety of fiber optical connectors like LC, SC, ST or Neutrik OpticalCON. These optical boards can extend up to 10.000m distance with singlemode fiber technology. The OPTS technology provides a transparent medium for all existing video, audio and control signal formats according to the 25G multilayer architecture (Video, Audio, Ethernet, USB KVM, RS-232, IR and CEC transmission), and allows the extension from MODEX transmitter units.

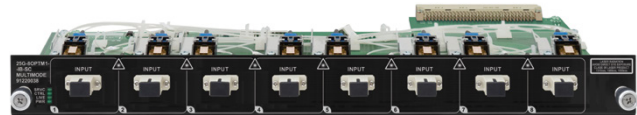
### Multimode optical input board

25G-8OPTM1-IB- LC, -SC, -ST, -NT

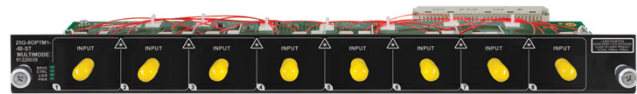
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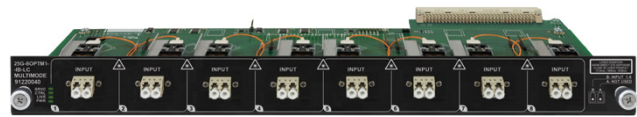
25G-8OPTM1-IB-NT



25G-8OPTM1-IB-SC



25G-8OPTM1-IB-ST



25G-8OPTM1-IB-LC

#### Features:

- Up to 300m extension distance
- Video and audio transmission
- 25G Monitoring compatibility
- Ethernet, USB KVM, RS-232, IR, CEC transmission
- Extension from MODEX transmitters
- 3D compatible
- Resolutions up to 2560 x 1440 (WQXGA) @ 60 Hz YCbCr 4:2:2
- Deep color support up to 1920 x 1080 @ 36 bit, 60 Hz

25G-8OPTM1-IB-LC, -SC, -ST, -NT is a new fiber optical input board for the 25G router family and available with a variety of fiber optical connectors like LC, SC, ST or Neutrik OpticalCON. These optical boards can extend up to 300m distance with Multimode fiber technology. The OPTM technology provides a transparent medium for all existing video, audio and control signal formats according to the 25G multilayer architecture (Video, Audio, Ethernet, USB KVM, RS-232, IR and CEC transmission), and allows the extension from MODEX transmitter units.



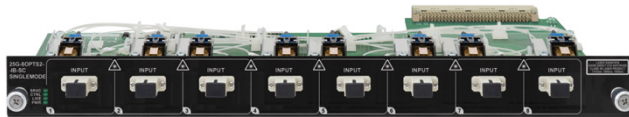
### 4K compatible singlemode optical input board

25G-8OPTS2-IB- LC, -SC, -ST, -NT

Part No: 9122 0049 (NT), 9122 0052 (SC), 9122 0051 (ST) 9122 0050 (LC)



25G-8OPTS2-IB-NT



25G-8OPTS2-IB-SC



25G-8OPTS2-IB-ST



25G-8OPTS2-IB-LC

#### Features:

- 4K support and 3D formats
- Up to 10km extension distance
- Video and audio transmission
- Ethernet, USB KVM, RS-232, IR, CEC transmission
- Extension from MODEX transmitters
- Resolutions up to 4K x 2K @ 30Hz,  
2560 x 1440 (WQXGA) @ 60 Hz YCbCr 4:2:2
- Deep color support up to 1920 x 1080 @ 36 bit, 60 Hz

25G-8OPTS2-IB-LC, -SC, -ST, -NT is a new 4K compatible fiber optical input board for the 25G router family and available with a variety of fiber optical connectors like LC, SC, ST or Neutrik OpticalCON. These optical boards can extend up to 10.000m distance with singlemode fiber technology. The OPTS technology provides a transparent medium for all existing video, audio and control signal formats according to the 25G multilayer architecture (Video, Audio, Ethernet, USB KVM, RS-232, IR and CEC transmission), and allows the extension from MODEX transmitter units.

### 4K compatible multimode optical input board

25G-8OPTM2-IB- LC, -SC, -ST, -NT

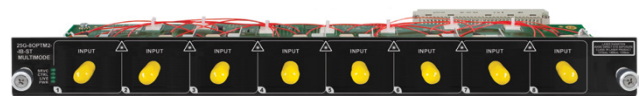
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25G-8OPTM2-IB-NT



25G-8OPTM2-IB-SC



25G-8OPTM2-IB-ST



25G-8OPTM2-IB-LC

#### Features:

- 4K support and 3D formats
- Up to 300m extension distance
- Video and audio transmission
- Ethernet, USB KVM, RS-232, IR, CEC transmission
- Extension from MODEX transmitters
- Resolutions up to 4K x 2K @ 30Hz,  
2560 x 1440 (WQXGA) @ 60 Hz YCbCr 4:2:2
- Deep color support up to 1920 x 1080 @ 36 bit, 60 Hz

25G-8OPTM2-IB-LC, -SC, -ST, -NT is a new 4K compatible fiber optical input board for the 25G router family and available with a variety of fiber optical connectors like LC, SC, ST or Neutrik OpticalCON. These optical boards can extend up to 300m distance over multimode fiber. The OPTM technology provides a transparent medium for all existing video, audio and control signal formats according to the 25G multilayer architecture (Video, Audio, Ethernet, USB KVM, RS-232, IR and CEC transmission), and allows the extension from MODEX transmitter units.

### TPS input board

25G-MX-TPS-IB

Part No: 9122 0032

#### Features:

- HDMI extension supporting 3D and 4K
- Accepts HDMI + Ethernet + RS-232 over one CAT5/6/7 cable up to 180m distance
- HDMI 1.4; DVI and HDCP compliant
- 4K, UHD, 2560 x 1440, HD video resolutions and all 3D formats are supported
- 10/100 Ethernet transmission
- Supports all HDMI audio formats
- Analog or digital audio support (optional)

### DVI-I input board

25G-MX-DVII-HDCP-IB

Part No: 9122 0011

#### Features:

- DVI-I (Analog+Digital) input board
- Digitizes VGA, YUV analog Input formats and converts to HDMI or DVI
- 10-bit HD and SD; interlaced and progressive A/D conversion
- Accepts DVI and HDMI 1.3 digital signals with embedded Audio
- HDCP compliant
- Autodetects input signal
- Deep color support
- Picture adjustments per input port, contrast, black level, color etc.
- Pixel Accurate Reclocking
- Advanced Digital and Analog EDID Management
- Adaptive DVI and HDMI cable equalization for up to 30 meters

### 3G-SDI input board

25G-MX-3GSDI-IB

Part No: 9122 0015

#### Features:

- Built-in 8 x SDI to HDMI converter
- SDI multichannel audio de-embedding
- Embeds multichannel SDI or external S/PDIF digital audio onto the HDMI signal
- Converts SDI, HD-SDI and 3G-SDI to DVI or HDMI
- Input cable equalization
- PLL Reclocking
- Auto detects input formats

### Twisted Pair HDMI Input board

25G-MX-HDMI-TP-IB

Part No: 9122 0012

#### Features:

- Accepts HDMI 1.3 and DVI signals over CAT5, CAT6, CAT7 cables
- HDCP compliant
- Supports all HDMI Audio formats such as Dolby TrueHD and DTS-HD Master Audio
- Advanced EDID Management
- Adaptive and Manual cable equalization
- Pixel Accurate Reclocking
- 3D signal compatibility with frame packing, side-by-side and top-bottom formats

### Twisted Pair DVI input board

25G-MX-DVI-TP-IB

Part No: 9122 0006

#### Features:

- Accepts DVI signals over CAT5, CAT6 or CAT7 cables
- Input cable equalization: Adaptive or Manual

### Twisted Pair DVI input board

25G-MX-DVI-TP-IB+

Part No: 9122 0007

#### Features:

- Optional extender remote powering over second CATx cable
- Advanced EDID Management over second CATx cable
- Accepts DVI signals over CAT5, CAT6 or CAT7 cables
- Input cable equalization: Adaptive or Manual

### HDMI and HDCP compliant fiber optical input board

25G-MX-HDMI-OPT-IB-LC, -NT, -SC, -ST

Part No: 9122 0013 (SC)

#### Features:

- Transmits HDMI and DVI signals over fiber optical cable
- Selectable connectors: LC, Neutrik OpticalCON, SC, ST
- Laser detect LED
- No video compression
- Zero frame delay
- Extension distance: 2500 m (1440x1200@60Hz)

### Fiber optical input board for Single-Link DVI-D signal extension

25G-MX-DVI-OPT-IB-LC, -ST, -SC, -NT

Part No: 9122 0008 (ST), 9122 0009 (SC), 9122 0010 (NT)

#### Features:

- Selectable connectors: LC, Neutrik OpticalCON, SC, ST
- Laser detect LED
- No video compression
- Zero frame delay
- Extension distance: 2500 m (1440x1200@60Hz)



## DVI-D Single-Link output board

25G-8DVID1-OB

Part No: 9123 0001



25G-8DVID1-OB

### Features:

- HDMI, DVI and HDCP compliant
- Resolutions up to 2560x1440@60Hz
- 3D compatible
- Advanced EDID Management
- Supports all standard audio formats: Multichannel audio, Dolby TrueHD and DTS-HD Master Audio
- Pixel Accurate Reclocking

25G-8DVID1-OB provides a fully transparent HDMI connectivity to the latest high-end digital destinations including 3D functions between the endpoints. Each output has 30m copper cable compensation and individual EDID Management.

25G-8DVID1-OB handles embedded audio in the HDMI signal, which can be the embedded audio with the video (25G Video layer) or can be embedded in the HDMI signal from the Forward audio layer.

## 4K compatible DVI-D Single-Link output board

25G-8DVID2-OB

Part No: 9123 0013



25G-8DVID2-OB

### Features:

- HDMI, DVI and HDCP compliant
- Resolutions up to 4096x2160@30Hz, 1080p@60Hz, 720p/1080i@120Hz
- 3D compatible
- Advanced EDID Management
- Available video test patterns
- Supports all standard audio formats: Multichannel audio, Dolby TrueHD and DTS-HD Master Audio
- Pixel Accurate Reclocking
- 30 m copper cable compensation on all outputs

25G-8DVID2-OB provides fully transparent HDMI 1.4 connectivity to the latest high-end digital sources including 3D functions between the endpoints. Supports resolution up to 4096x2160@30Hz. The new 300 MHz board supports the latest 3D formats as well as HD multichannel audio. Each output has 30m copper cable compensation and individual EDID Management.

25G-DVID2-OB handles embedded audio in the HDMI signal, which can be the embedded audio with the video (25G Video layer) or can be embedded in the HDMI signal from the Forward audio layer.

### Available add-ons

**A2** add-on has bidirectional configurable S/PDIF connectors. The audio signal can be de-embedded from the HDMI signals or can be embedded (or replaced) to the HDMI signal.

**A3** add-on has bidirectional and configurable phoenix connectors. The audio signal can be de-embedded from the HDMI signals or can be embedded (or replaced) to the HDMI signal.

## 4K compatible DVI-D Single-Link output board with S/PDIF add-on

25G-8DVID2-A2-OB

Part No: 9123 0034



- Bi-directional S/PDIF breakout for every port

## 4K compatible DVI-D Single-Link output with analog audio add-on

25G-8DVID2-A3-OB

Part No: 9123 0033



- Bidirectional configurable analog stereo ports with 5 pole phoenix connector

## HDMI output board

### 25G-8HDMI1-A1-OB

Part No: 9123 0002



25G-8HDMI1-A1-OB

#### Features:

- HDMI, DVI and HDCP compliant
- Resolutions up to 2560x1440@60Hz
- 3D compatible
- Advanced EDID Management
- Supports all standard audio formats: Multichannel audio, Dolby TrueHD and DTS-HD Master Audio
- Pixel Accurate Reclocking
- 15 m copper cable compensation on all outputs

25G-8HDMI1-A1-OB provides fully transparent HDMI connectivity to the latest high-end digital destinations including the Audio Return Channel and 3D functions between the endpoints. Resolutions supported up to 2560x1440@60Hz. Each output has 15m copper cable compensation and individual EDID Management.

25G-8HDMI1-A1-OB has 8 HDMI connectors with additional digital S/PDIF audio outputs that provides de-embedded audio from the HDMI signal or audio output for the Forward audio layer.

25G-8HDMI1-A1-OB handles embedded audio in the HDMI signal (with capabilities of routing the 25G audio layers). The S/PDIF output signal can be the de-embedded audio from the 25G Video layer or the Forward audio layer as well. The HDMI output board's audio options are hardware configurable by jumpers on the board.

## 4K compatible HDMI output board

25G-8HDMI2-A1-OB series

Part No: 9123 0015



25G-8HDMI2-A1-OB

### Features:

- HDMI, DVI and HDCP compliant
- Resolutions up to 4096x2160@30Hz, 1080p@60Hz, 720p/1080i@120Hz
- 3D signals support
- Available video test patterns
- Advanced EDID Management
- Supports all standard audio formats: Multichannel audio, Dolby TrueHD and DTS-HD Master Audio
- Pixel Accurate Reclocking
- 30 m copper cable compensation on all outputs

25G-8HDMI2-A1-OB provides fully transparent HDMI 1.4 connectivity to the latest high-end digital sources including the Audio Return Channel and 3D functions between the endpoints. Supports resolution up to 4096x2160@30Hz. The new 300 MHz board supports the latest 3D formants as well as HD multichannel audio.

25G-8HDMI2-A1-OB has 8 HDMI connectors with an additional digital S/PDIF audio connector for each HDMI port. Each output has 30 m copper cable compensation and individual EDID Management.

25G-8HDMI2-A1-OB handles embedded audio in the HDMI signal (with capabilities of routing to the 25G audio layers). The S/PDIF output signal can be de-embedded from the 25G Video layer or any audio signal can be taken from the Forward audio layer as well. The HDMI output board's audio options are software configurable.

### Available add-ons

**A2** add-on has bidirectional configurable S/PDIF connectors. The audio signal can be de-embedded from the HDMI signals or can be embedded (or replaced) to the HDMI signal.

**A3** add-on has bidirectional and configurable phoenix connectors. The audio signal can be de-embedded from the HDMI signals or can be embedded (or replaced) to the HDMI signal.

## 4K compatible HDMI output board with S/PDIF add-on

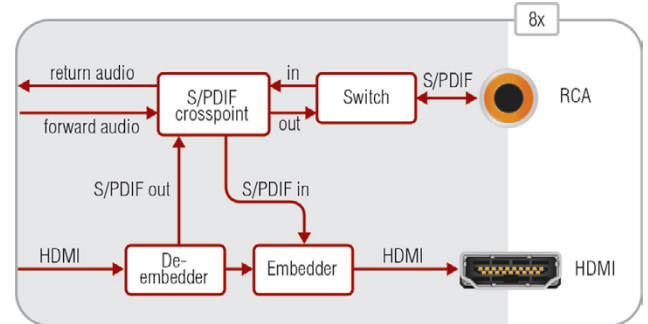
25G-8HDMI2-A2-OB

Part No: 9123 0016



- S/PDIF breakout for every port

### Port diagram



25G-8HDMI2-A2-OB

## 4K compatible HDMI output board with analog audio add-on

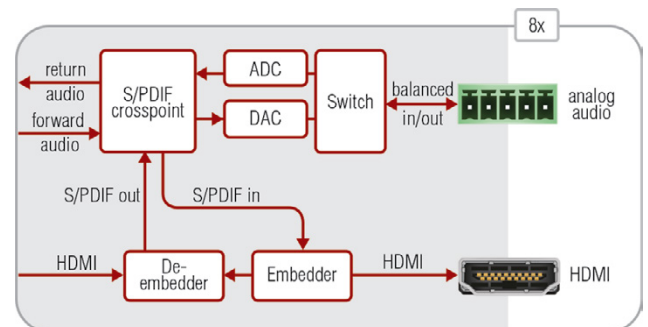
25G-8HDMI2-A3-OB

Part No: 9123 0017



- Bidirectional configurable analog stereo ports with 5 pole phoenix connector

### Port diagram



25G-8HDMI2-A3-OB

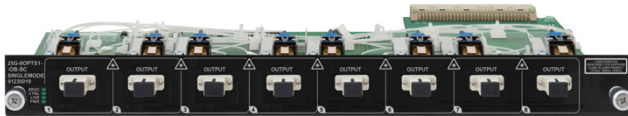
### Singlemode optical output board

25G-8OPTS1-OB- LC, -SC, -ST, -NT

Part No: 9123 0003 (NT), 9123 0019 (SC), 9123 0020 (ST) 9123 0021 (LC)



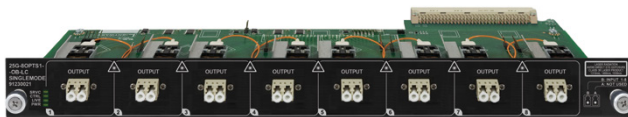
25G-8OPTS1-OB-NT



25G-8OPTS1-OB-SC



25G-8OPTS1-OB-ST



25G-8OPTS1-OB-LC

#### Features:

- Up to 10km extension distance
- Video and audio transmission
- 25G Monitoring compatibility
- Ethernet, USB KVM, RS-232, IR, CEC transmission
- Extension to MODEX receivers
- 3D compatible
- Resolutions up to 2560 x 1440 (WQXGA)W @ 60 Hz  
YCbCr 4:2:2
- Deep Color support up to 1920x1080@60Hz 36 bit

25G-OPTS1-OB-LC, -SC, -ST, -NT is a new fiber optical output board for the 25G router family and available with a variety of fiber optical connectors like LC, SC, ST or Neutrik OpticalCON. These optical boards can extend up to 10.000m distance with Singlemode fiber technology. The OPTS technology provides a transparent medium for all existing video, audio and control signal formats according to the 25G multilayer architecture (Video, Audio, Ethernet, USB KVM, RS-232, IR and CEC transmission), and allows the extension to MODEX receiver units.

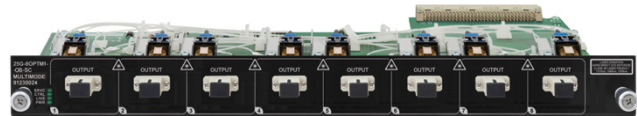
### Multimode optical output board

25G-8OPTM1-OB- LC, -SC, -ST, -NT

Part No: 9123 0004 (NT), 9123 0024 (SC), 9123 0025 (ST) 9123 0026 (LC)



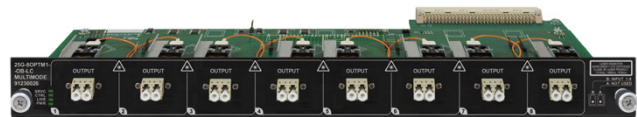
25G-8OPTM1-OB-NT



25G-8OPTM1-OB-SC



25G-8OPTM1-OB-ST



25G-8OPTM1-OB-LC

#### Features:

- Up to 300m extension distance
- Video and audio transmission
- Ethernet, USB KVM, RS-232, IR, CEC transmission
- Extension to MODEX receivers
- 3D compatible
- Resolutions up to 2560x1440 (WQXGA) @ 60Hz  
YCbCr 4:2:2
- Deep Color support up to 1920x1080@60Hz 36bit

25G-OPTM1-OB-LC, -SC, -ST, -NT is a new fiber optical output board for the 25G router family and available with a variety of fiber optical connectors like LC, SC, ST or Neutrik OpticalCON. These optical boards can extend up to 300m distance with Multimode fiber technology. The OPTM technology provides a transparent medium for all existing video, audio and control signal formats according to the 25G multilayer architecture (Video, Audio, Ethernet, USB KVM, RS-232, IR and CEC transmission), and allows the extension to MODEX receiver units.

### 4K compatible singlemode optical output board

25G-80PTS2-OB- LC, -SC, -ST, -NT

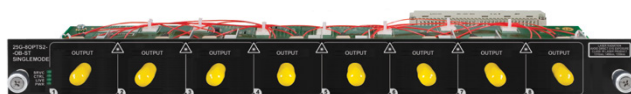
Part No: 9123 0035 (NT), 9123 0038 (SC), 9123 0037 (ST) 9123 0036 (LC)



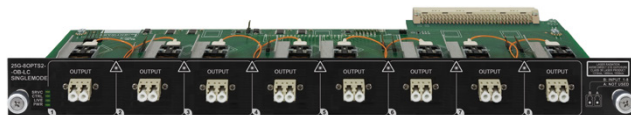
25G-80PTS2-OB-NT



25G-80PTS2-OB-SC



25G-80PTS2-OB-ST



25G-80PTS2-OB-LC

#### Features:

- 4K support and 3D formats
- Up to 10km extension distance
- Video and audio transmission
- Ethernet, USB KVM, RS-232, IR, CEC transmission
- Extension to MODEX receivers
- Resolutions up to 4K x 2K @ 30Hz,  
2560x1440 (WQXGA)W @ 60 Hz YCbCr 4:2:2
- Deep color support up to 1920x1080@60Hz 36 bit

25G-80PTS2-OB-LC, -SC, -ST, -NT is a new 4K compatible fiber optical output board for the 25G router family and available with a variety of fiber optical connectors like LC, SC, ST or Neutrik OpticalCON. These optical boards can extend up to 10.000m distance with Singlemode fiber technology. The OPTS technology provides a transparent medium for all existing video, audio and control signal formats according to the 25G multilayer architecture (Video, Audio, Ethernet, USB KVM, RS-232, IR and CEC transmission), and allows the extension to MODEX receiver units.

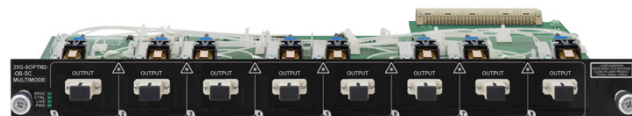
### 4K compatible multimode optical output board

25G-80PTM2-OB- LC, -SC, -ST, -NT

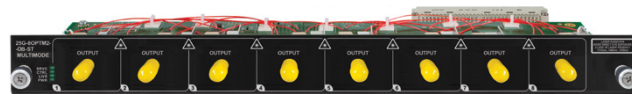
Part No: 9123 0031 (NT), 9123 0041 (SC), 9123 0039 (ST) 9123 0040 (LC)



25G-80PTM2-OB-NT



25G-80PTM2-OB-SC



25G-80PTM2-OB-ST



25G-80PTM2-OB-LC

#### Features:

- 4K support and 3D formats
- Up to 300m extension distance
- Video and audio transmission
- Ethernet, USB KVM, RS-232, IR, CEC transmission
- Extension to MODEX receivers
- Resolutions up to 4K x 2K @ 30Hz,  
2560x1440 (WQXGA) @ 60Hz YCbCr 4:2:2
- Deep color support up to 1920x1080@60Hz 36bit

25G-80PTM2-OB-LC, -SC, -ST, -NT is a new 4K compatible fiber optical output board for the 25G router family and available with a variety of fiber optical connectors like LC, SC, ST or Neutrik OpticalCON. These optical boards can extend up to 300m distance with Multimode fiber technology. The OPTM technology provides a transparent medium for all existing video, audio and control signal formats according to the 25G multilayer architecture (Video, Audio, Ethernet, USB KVM, RS-232, IR and CEC transmission), and allows the extension to MODEX receiver units.



### TPS output board

#### 25G-MX-TPS-OB

Part No: 9123 0018

##### Features:

- HDMI extension supporting 3D and 4K
- Accepts HDMI + Ethernet + RS-232 over one CAT5/6/7 cable up to 180m distance
- HDMI 1.4; DVI and HDCP compliant
- 4K, UHD, 2560x1440, HD video resolutions and all 3D formats are supported
- 10/100 Ethernet transmission
- Supports all HDMI audio formats
- Analog or digital audio support (optional)

### Twisted Pair HDMI output board

#### 25G-MX-HDMI-TP-OB

Part No: 9123 0010

##### Features:

- Transmits HDMI 1.3 and DVI signals over CAT5, CAT6 or CAT7 cables
- HDCP compliant
- Supports all Audio formats over HDMI: Dolby TrueHD and DTS-HD Master Audio
- Advanced EDID Management
- Pixel Accurate Reclocking
- 3D signal compatibility with frame packing, side-by-side and top-bottom formats

### Twisted Pair DVI output board

#### 25G-MX-DVI-TP-OB

Part No: 9123 0005

##### Features:

- Converts and transmits Single-Link digital DVI-D signals over one CATx cable
- Pixel Accurate Reclocking

### Twisted Pair DVI output board

#### 25G-MX-DVI-TP-OB+

Part No: 9123 0006

##### Features:

- Converts and transmits DVI signals over CAT5, CAT6 or CAT7 cables
- Advanced EDID Management
- Pixel Accurate Reclocking
- Optional extender remote powering over second CATx cable

### HDMI and HDCP compliant fiber optical output board

#### 25G-MX-HDMI-OPT-OB-LC, -NT, -SC, -ST

Part No: 9123 0011 (SC)

##### Features:

- Transmits HDMI and DVI signals over fiber optical cable
- Selectable connectors: LC, Neutrik OpticalCON, SC, ST
- Laser detect LED
- No video compression
- Zero frame delay
- Extension distance: 2500m (1440x1200@60Hz)

### Fiber optical output board for extending DVI-D signals

#### 25G-MX-DVI-OPT-OB- LC, -ST, -SC, -NT

Part No: 9123 0007 (ST), 9123 0008 (SC), 9123 0009 (NT)

##### Features:

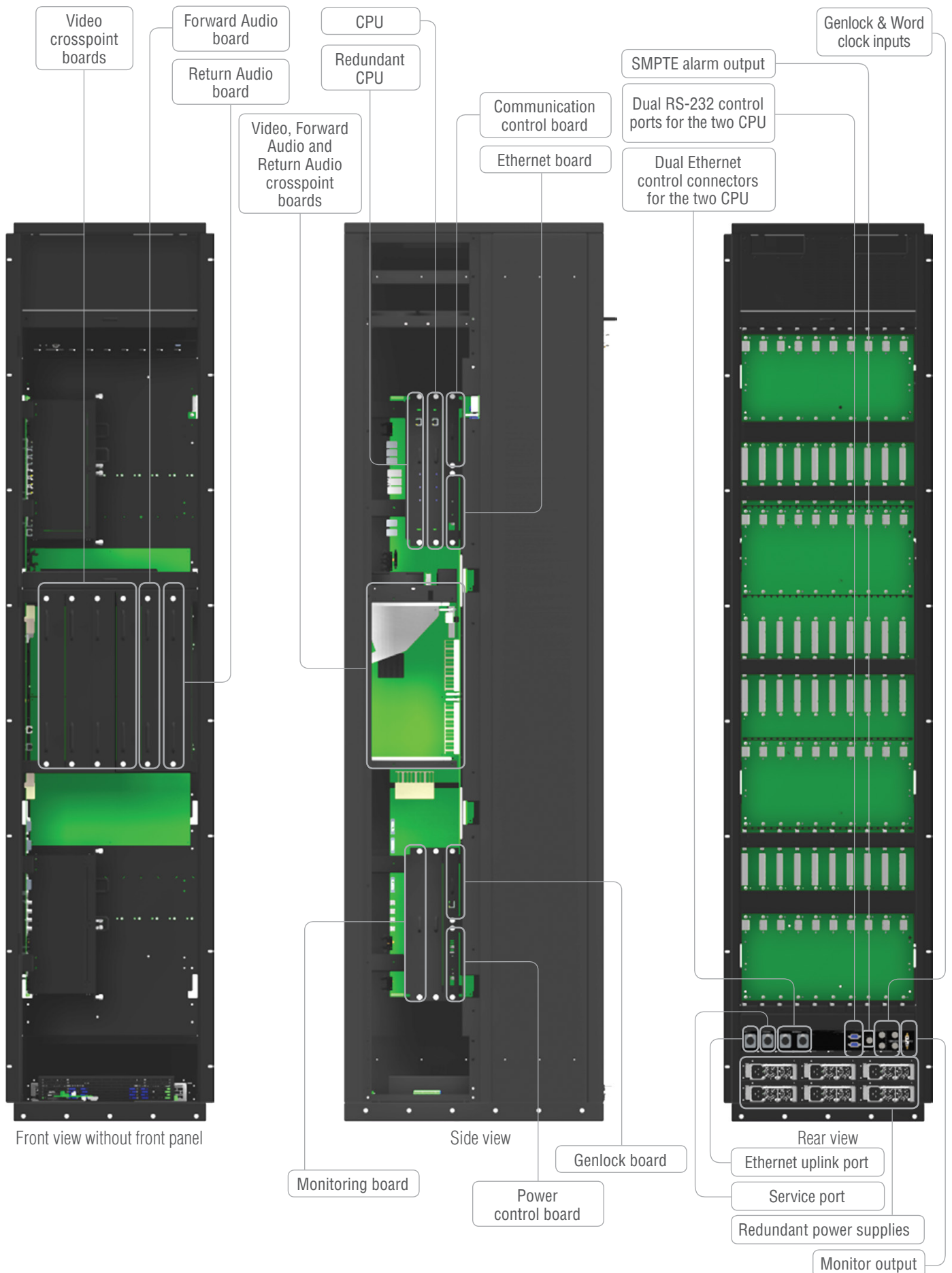
- 8 Single-Link DVI Multimode fiber Output
- Selectable connectors: LC, Neutrik OpticalCON, SC, ST
- Laser active LED for each output
- No video compression
- Zero frame delay
- Extension distance: 2500m (1440x1200@60Hz)

### Fiber optical output board with Pixel Accurate Reclocking

#### 25G-MX-DVI-OPT-OB-R-LC, -NT, -SC, -ST

##### Features:

- 8 Single-Link DVI Multimode fiber output
- DVI Pixel Accurate Reclocking
- Selectable connectors: LC, Neutrik OpticalCON, SC, ST
- No video compression
- Zero frame delay
- Extension distance: 2500m (1440x1200@60Hz)





**A1** - On input cards: this feature is a S/PDIF audio input on an RCA connector. The incoming signal can be embedded into the HDMI stream or sent to the forward audio layer.

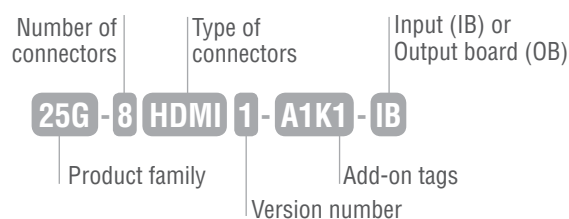
Output cards: this is a S/PDIF audio output on an RCA connector. The output signal can be the de-embedded audio from the 25G Video layer or the Forward audio layer as well.

The HDMI input / output board's audio options are hardware configurable by jumpers on the board.

**A2** - Bidirectional configurable S/PDIF signal on RCA connector. The audio signal can be de-embedded from the HDMI signals and sent out on the S/PDIF ports or the S/PDIF connectors can work as analog audio inputs, in this case the audio input signal can be embedded (or replaced) to the HDMI signal on the output board.

**A3** - Bidirectional configurable analog audio on Phoenix connectors. The audio signal can be de-embedded from the HDMI signals and sent out on the phoenix ports or the phoenix connectors can work as analog audio inputs, in this case the audio input signal can be embedded to (or replace) the HDMI signal on the output board.

**K1** - Supports USB keyboard, mouse and Smart Card connectivity. It handles two USB 2.0 (or 1.1) HID devices with a USB-B connector per port containing integrated USB HUBs.



| Input board                       | A1 | A2 | A3 | K1 |
|-----------------------------------|----|----|----|----|
| 25G-8DVID1-IB                     | x  | x  | x  | x  |
| 25G-8DVID1-K1-IB                  | x  | x  | x  | ✓  |
| 25G-8DVID2-IB                     | x  | x  | x  | x  |
| 25G-8DVID2-K1-IB                  | x  | x  | x  | ✓  |
| 25G-8DVID2-A2-IB                  | x  | ✓  | x  | x  |
| 25G-8DVID2-A3-IB                  | x  | x  | ✓  | x  |
| 25G-8HDMI1-A1-IB                  | ✓  | x  | x  | x  |
| 25G-8HDMI1-A1K1-IB                | ✓  | x  | x  | ✓  |
| 25G-8HDMI2-A1-IB                  | ✓  | x  | x  | x  |
| 25G-8HDMI2-A1K1-IB                | ✓  | x  | x  | ✓  |
| 25G-8HDMI2-A2-IB                  | x  | ✓  | x  | x  |
| 25G-8HDMI2-A3-IB                  | x  | x  | ✓  | x  |
| 25G-8OPTS1-IB, -LC, -SC, -ST, -NT | x  | x  | x  | x  |
| 25G-8OPTM1-IB, -LC, -SC, -ST, -NT | x  | x  | x  | x  |
| 25G-8OPTS2-IB, -LC, -SC, -ST, -NT | x  | x  | x  | x  |
| 25G-8OPTM2-IB, -LC, -SC, -ST, -NT | x  | x  | x  | x  |

| Output board                      | A1 | A2 | A3 | K1 |
|-----------------------------------|----|----|----|----|
| 25G-8DVID1-OB                     | x  | x  | x  | x  |
| 25G-8DVID2-OB                     | x  | x  | x  | x  |
| 25G-8DVID2-A2-OB                  | x  | ✓  | x  | x  |
| 25G-8DVID2-A3-OB                  | x  | x  | ✓  | x  |
| 25G-8HDMI1-A1-OB                  | ✓  | x  | x  | x  |
| 25G-8HDMI2-A1-OB                  | ✓  | x  | x  | x  |
| 25G-8HDMI2-A2-OB                  | x  | ✓  | x  | x  |
| 25G-8HDMI2-A3-OB                  | x  | x  | ✓  | x  |
| 25G-8OPTS1-OB, -LC, -SC, -ST, -NT | x  | x  | x  | x  |
| 25G-8OPTM1-OB, -LC, -SC, -ST, -NT | x  | x  | x  | x  |
| 25G-8OPTS2-OB, -LC, -SC, -ST, -NT | x  | x  | x  | x  |
| 25G-8OPTM2-OB, -LC, -SC, -ST, -NT | x  | x  | x  | x  |



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