

# KM403

## AUDIO-VISUAL SHOW CONTROL MEDIA PLAYER

4K multi-output playback with DMX512-synchronized  
video, audio and lighting control

**3 x 4K / 6 x 2K**

HDMI OUTPUT PATHS

**11,520 x 2,160**

COMBINED CANVAS

**60**

PLAYBACK WINDOWS

**128 GB**

eMMC STORAGE

**SHOW CONTROL / IMMERSIVE ROOMS / KTV & ENTERTAINMENT**

## SECTION 01

# PRODUCT OVERVIEW

A purpose-built media playback and show-control platform for synchronized video, audio and lighting scenes.

The KM403 Audio-Visual Show Control Media Player combines multi-window 4K media playback, HDMI compositing, audio detection and DMX512 scene control in a 1U rack-mount chassis. It is designed for KTV rooms, 5D/6D immersive rooms, party rooms, bars and other entertainment venues that require coordinated screen content, music and lighting.

Its embedded architecture uses an eight-core processor with four Cortex-A76 cores, four Cortex-A55 cores and a Mali-G610 GPU. The unit includes 4 GB system memory and 128 GB eMMC storage, with hardware decoding for H.264 and H.265 media.

### 8-CORE

#### CPU ARCHITECTURE

4 x Cortex-A76 + 4 x Cortex-A55

### 3 x 4K

#### OUTPUT GROUPS

Six physical HDMI connectors

### 60

#### MEDIA WINDOWS

Arbitrary size, position and layering

### 128 GB

#### INTERNAL eMMC

Preloaded content and auto-start



KM403 front and rear views. Product appearance may vary by production revision.

| SYSTEM ROLE       | IMPLEMENTATION                                                                               |
|-------------------|----------------------------------------------------------------------------------------------|
| Media playback    | Internal media library with automatic startup, loop playback and command-triggered playback. |
| Video composition | HDMI input plus foreground and background layers; PIP/PBP, scaling, opacity and overlays.    |
| Show control      | DMX512, wall-panel, app, Web and audio-detection control paths.                              |
| Display output    | Three 4K output groups, independently routed or synchronized into a stitched canvas.         |

**POSITIONING** The KM403 is a show-control media player—not a general-purpose server—and is optimized for installed audio-visual entertainment systems.

## SECTION 02

# SYSTEM WORKFLOW

Multiple operator, automation and content sources converge into one synchronized audio-visual scene engine.



## Operational concept

- Recall scene modes from a wall panel, mobile app or DMX512 controller.
- Combine internal media with an external VOD or jukebox HDMI feed.
- Use real-time audio detection to trigger window and scene behavior.
- Synchronize visual content with music and DMX-controlled lighting effects.
- Manage layouts, media and device settings through the built-in Web interface.

## Typical deployment sequence

| STEP | ACTION                             | RESULT                                                      |
|------|------------------------------------|-------------------------------------------------------------|
| 1    | Load content by LAN or USB         | Media is stored in numbered scene folders.                  |
| 2    | Create scenes in the Web interface | Window geometry, layers and playback behavior are defined.  |
| 3    | Map DMX / panel commands           | Each command recalls the required content and effect state. |
| 4    | Run the show                       | Video, audio and lighting respond as one coordinated scene. |

**INTEGRATION** The standard HDMI outputs can feed LED sending systems from multiple manufacturers, subject to the input capability of the selected sending controller.

## SECTION 03

# FUNCTIONAL CAPABILITIES

Playback, compositing, effects and scene automation in a single embedded appliance.

| CAPABILITY              | DESCRIPTION                                                                                            |
|-------------------------|--------------------------------------------------------------------------------------------------------|
| <b>Embedded media</b>   | 128 GB eMMC storage; preloaded scene content; automatic playback after power-up.                       |
| <b>Video decoding</b>   | Hardware decoding for H.264 and H.265 high-definition media.                                           |
| <b>Multi-window</b>     | Arbitrary window combinations with configurable size, position and z-order; up to 60 playback windows. |
| <b>Layering</b>         | External HDMI input plus foreground and background layers; PIP/PBP composition.                        |
| <b>5D/6D scenes</b>     | Content slicing and multi-output composition for immersive-room canvases.                              |
| <b>Overlays</b>         | Text, image and video overlays with adjustable window opacity.                                         |
| <b>Playback modes</b>   | Loop playback, command-triggered playback and seamless media switching.                                |
| <b>Visual effects</b>   | Rotation, scaling, strobe, tiling, speed control and RGB adjustment.                                   |
| <b>Show automation</b>  | DMX512 commands, audio detection and scene recall coordinate video, music and lighting.                |
| <b>Operator control</b> | Web interface, front-panel keys, mobile app and wall-panel scene switching.                            |
| <b>Content update</b>   | Gigabit LAN or USB import with overwrite, clear-and-copy and append modes.                             |
| <b>System design</b>    | Low-power embedded hardware architecture for stable unattended operation.                              |

## Application scenarios

| VENUE                              | PRIMARY USE                                                                |
|------------------------------------|----------------------------------------------------------------------------|
| <b>KTV / karaoke rooms</b>         | Song-video PIP, scene recall and audio-responsive room visuals.            |
| <b>5D/6D party rooms</b>           | Sliced content across multiple displays for immersive visual environments. |
| <b>Bars and lounges</b>            | Music-synchronized effects, ambient loops and lighting-linked visuals.     |
| <b>Entertainment installations</b> | Centralized media playback and multi-protocol show control.                |

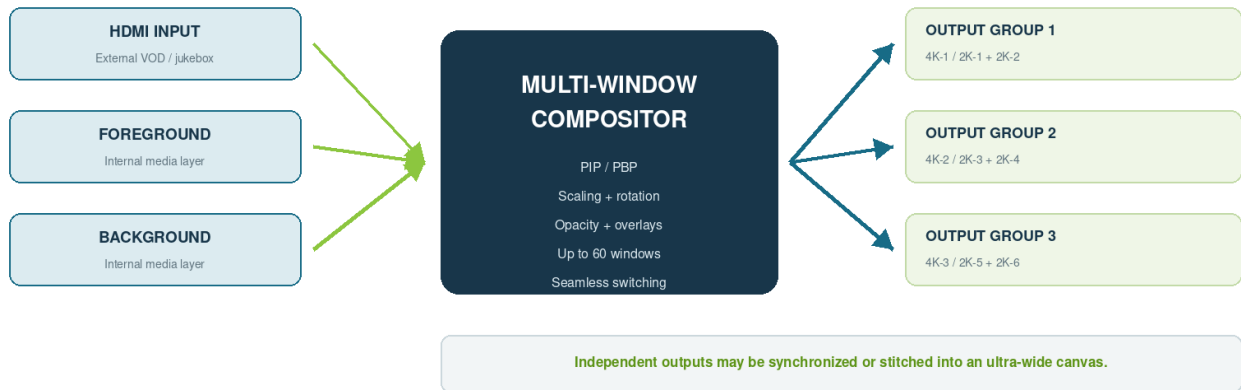
**SCENE RECALL** A scene may include media folders, window layouts, HDMI windows, audio-source selection, color parameters and DMX-controlled effects.

## SECTION 04

# VIDEO AND OUTPUT ARCHITECTURE

Three output groups support independent playback, synchronized presentation or one stitched ultra-wide canvas.

### VIDEO LAYER AND OUTPUT ARCHITECTURE



| FUNCTION               | CAPABILITY                  | ENGINEERING NOTE                                                                 |
|------------------------|-----------------------------|----------------------------------------------------------------------------------|
| <b>HDMI input</b>      | 1 external HDMI input       | May be composed with internal foreground and background layers.                  |
| <b>HDMI outputs</b>    | 3 x 4K output groups        | Rear panel provides six physical connectors arranged as three 4K / six 2K paths. |
| <b>Combined canvas</b> | Up to 11,520 x 2,160        | Three 4K-wide outputs may be stitched for an ultra-wide presentation.            |
| <b>Output behavior</b> | Independent or synchronized | Each group can carry independent content or frame-synchronized scene playback.   |
| <b>Windows</b>         | Up to 60                    | Window size, position, layer order and opacity are configurable in the Web UI.   |
| <b>Composition</b>     | PIP / PBP / overlays        | Supports external source windows, text, images and video layers.                 |

## Output connector convention

The rear-panel labels pair the 2K connectors into three 4K groups: 4K-1 uses the 2K-1 / 2K-2 pair, 4K-2 uses the 2K-3 / 2K-4 pair, and 4K-3 uses the 2K-5 / 2K-6 pair. The active mapping is determined by the configured output mode.

**CONFIGURATION NOTE** Available rasters, source-selection behavior and some DMX functions may depend on installed firmware and project configuration.

## SECTION 05

# CONTROL AND INTEGRATION

Flexible local, network and show-control interfaces for installed entertainment systems.

| CONTROL PATH    | PHYSICAL INTERFACE          | PRIMARY FUNCTION                                                                                |
|-----------------|-----------------------------|-------------------------------------------------------------------------------------------------|
| Web management  | Gigabit Ethernet            | Configure windows, scenes, device settings and the media library from a browser.                |
| DMX512          | 2 x RJ45, T568B             | Receive standardized show-control values for content, effects, color, audio and scene behavior. |
| Wall panel      | 2 x RS485 RJ45              | Manual scene switching from installed control panels.                                           |
| TTL wall panel  | 1 x RJ45                    | Additional hard-wired scene-switching interface.                                                |
| Mobile app      | Wireless network            | Recall configured scene modes from a mobile device.                                             |
| Front panel     | Five keys + numeric display | Set DMX, network, beat-detection and service parameters.                                        |
| USB             | 2 x USB 2.0 + 1 x USB 3.0   | Import content and connect supported peripherals such as a mouse.                               |
| Audio detection | VOD / DJ / shared audio I/O | Analyze program audio to drive audio-responsive visual and lighting behavior.                   |

## Third-party system integration

- Connect the HDMI output of a VOD or jukebox system to HDMI IN for PIP or source switching.
- Route VOD or DJ audio through the dedicated RCA interfaces for real-time level detection.
- Connect intelligent central-control equipment to the DMX512 ports for video/music/lighting synchronization.
- Use standard HDMI outputs with the LED sending-card system selected for the project.

## Audio-responsive scenes

Beat coefficient, minimum threshold, maximum threshold and dB sensitivity are adjustable from the front panel. These parameters should be commissioned using the actual room audio level and program material.

**COMMISSIONING** Verify DMX addressing, network mode, audio levels and scene mappings before the venue is handed over for unattended operation.

## SECTION 06

# MEDIA REQUIREMENTS AND DEVICE MANAGEMENT

Recommended content parameters and supported methods for maintaining the device.

## Media requirements

| ITEM                   | SUPPORTED / RECOMMENDED VALUE   |
|------------------------|---------------------------------|
| Container              | MP4                             |
| Video codec            | H.264 / H.265 hardware decoding |
| Recommended frame rate | 60 fps                          |
| Recommended resolution | 3840 x 2160                     |
| Maximum video bit rate | 30 Mbps                         |
| Still-image formats    | JPG, JPEG and PNG               |

## Device management

| ITEM                  | IMPLEMENTATION                                                                                       |
|-----------------------|------------------------------------------------------------------------------------------------------|
| Network communication | LAN connection through the Gigabit Ethernet port.                                                    |
| Program update        | Content can be updated over the network or from a USB drive.                                         |
| Management terminal   | PC or another supported smart terminal with a Web browser.                                           |
| Management software   | Built-in Web server; no dedicated client installation is required for basic configuration.           |
| Media library         | Numbered folders store scene content; layouts and playback behavior are assigned through the Web UI. |

## Playback and composition tools

| TOOL             | FUNCTION                                                             |
|------------------|----------------------------------------------------------------------|
| Loop playback    | Continuously repeats selected media.                                 |
| Command playback | Starts specified content in response to control commands.            |
| Sequential mode  | Plays a specified item first, then continues in folder order.        |
| Random mode      | Plays a specified item first, then randomizes the remaining content. |
| Single-play mode | Loops the specified media item.                                      |

**ENCODING** For reliable playback, encode all media to the project-approved raster, frame rate and bit rate before loading it into the media library.

## SECTION 07

# USB CONTENT IMPORT

Three controlled copy modes support routine updates without requiring a network connection.

### USB CONTENT IMPORT

Select exactly one mode per USB drive

#### OVERWRITE

MBBox/ktv/XXX

Replace same-name files in the corresponding device folder.

#### CLEAR + COPY

MBBox/ktv\_clear/XXX

Clear the corresponding device folder, then copy all USB content.

#### APPEND

MBBox/ktv\_add/XXX

Keep existing files; rename duplicates before copying.

XXX = folder number 001-255

## Folder structure

| MODE           | USB ROOT PATH       | DEVICE BEHAVIOR                                                                          |
|----------------|---------------------|------------------------------------------------------------------------------------------|
| Overwrite copy | MBBox/ktv/XXX       | Files with the same name in the corresponding device folder are replaced.                |
| Clear and copy | MBBox/ktv_clear/XXX | The corresponding device folder is cleared before all USB files are copied.              |
| Append copy    | MBBox/ktv_add/XXX   | Existing files remain. A duplicate is renamed with a numeric prefix before it is copied. |

## Procedure

- Create the MBBox folder at the root of the USB drive.
- Create exactly one mode folder: ktv, ktv\_clear or ktv\_add.
- Inside the selected mode folder, create one or more numbered folders from 001 through 255.
- Copy the required media into the corresponding numbered folder, then safely eject the USB drive.
- Insert the USB drive into the KM403 and wait for the front-panel copy indication to finish.

**IMPORTANT** The ktv, ktv\_clear and ktv\_add folders are mutually exclusive. Do not place more than one mode folder on the same USB drive.



## SECTION 08

# FRONT AND REAR INTERFACES

Physical connections for local operation, media import, networking, show control and multi-display output.

## Front panel



| INTERFACE        | DESCRIPTION                                                                                        |
|------------------|----------------------------------------------------------------------------------------------------|
| Power            | Front-panel power switch.                                                                          |
| Display and keys | Numeric display with +, -, MENU, OK and ESC keys; may also be used for configured scene switching. |
| AUDIO OUT / IN   | Front-panel analog audio output and input.                                                         |
| USB              | 2 x USB 2.0 and 1 x USB 3.0 for USB storage, mouse and supported peripherals.                      |

## Rear panel



| INTERFACE GROUP       | DESCRIPTION                                                                      |
|-----------------------|----------------------------------------------------------------------------------|
| Wi-Fi / DC 12 V / COM | Antenna; 12 V DC input; COM is reserved and has no current function.             |
| LAN / HDMI IN         | Gigabit Ethernet; 1 x external HDMI input.                                       |
| HDMI OUT              | Six physical HDMI connectors grouped as 3 x 4K or 6 x 2K output paths.           |
| DMX512 / RS485        | 2 x DMX512 RJ45 and 2 x RS485 RJ45, wired to T568B convention.                   |
| RCA audio             | VOD IN/OUT, DJ IN/OUT and shared ALL OUT for audio detection and linked control. |
| TTL / AC input        | 1 x RJ45 TTL wall-panel interface; AC 100-240 V, 50/60 Hz power input.           |

**PRODUCT IMAGE** Connector labeling and appearance may vary slightly by hardware revision. Use the labels on the delivered unit during installation.

## SECTION 09

# FRONT-PANEL OPERATION

Five keys provide direct access to DMX, network, HDMI and audio-detection parameters.

| KEY  | FUNCTION                                                              |
|------|-----------------------------------------------------------------------|
| +    | Increase the current value or move forward through available values.  |
| -    | Decrease the current value or move backward through available values. |
| MENU | Select the next menu function.                                        |
| OK   | Confirm the selected function or save the edited value.               |
| ESC  | Exit the current function without continuing navigation.              |

## FRONT-PANEL MENU DISPLAY EXAMPLES



## Basic navigation

- Press MENU until the required menu code appears.
- Use + or - to change the value or enter the available submenu.
- Press OK to save; press ESC to leave the current selection.
- Allow the device to complete any IP acquisition or USB copy process before power is removed.

**SERVICE SETTING** Menu J reports an MCU configuration/status code. Do not change service-level configuration unless instructed by authorized technical support.

## SECTION 10

# FRONT-PANEL MENU REFERENCE

Recommended defaults and commissioning guidance for menu codes A through K.

| MENU              | PARAMETER                     | FUNCTION / DEFAULT                                                                                            |
|-------------------|-------------------------------|---------------------------------------------------------------------------------------------------------------|
| <b>A</b>          | DMX512 start address          | + / - selects the starting DMX address.                                                                       |
| <b>b</b>          | DMX filter frames             | DMX data filtering. Recommended default: 3 frames.                                                            |
| <b>C</b>          | DHCP / IP                     | Cycles through the acquired IP address. Prefix 01 = static; 00 = dynamic. Example: 01 192 168 001 100.        |
| <b>C option 0</b> | Enable DHCP                   | Turns DHCP on.                                                                                                |
| <b>C option 1</b> | Disable DHCP                  | Uses static network configuration.                                                                            |
| <b>C option 2</b> | Acquire IP                    | Requests or refreshes the current IP address.                                                                 |
| <b>d</b>          | Log storage                   | 0 = save logs; 1 = do not save logs.                                                                          |
| <b>F</b>          | HDMI input status / selection | Displays the active HDMI input state. Automatic or manual source behavior may vary by firmware/configuration. |
| <b>G</b>          | Beat coefficient              | Scales beat-source data. Default: 6.                                                                          |
| <b>H</b>          | Beat-data minimum             | Lower beat threshold. Default: 40.                                                                            |
| <b>I</b>          | Beat-data maximum             | Upper beat threshold. Default: 140.                                                                           |
| <b>J</b>          | MCU status                    | Displays a configuration-specific status code; normally not adjusted.                                         |
| <b>K</b>          | dB sensitivity                | Audio sensitivity setting. For louder program levels, use a lower or negative value. Default: 3.              |

## Network example

A display sequence of 01 / 192 / 168 / 001 / 100 represents static IP address 192.168.1.100. If the address is changed upstream, use C option 2 or restart the network acquisition process to refresh the displayed value.

## Audio commissioning

Adjust G, H, I and K together while monitoring the actual audio feed. The objective is stable beat detection without false triggers during quiet passages or continuous triggering at high levels.

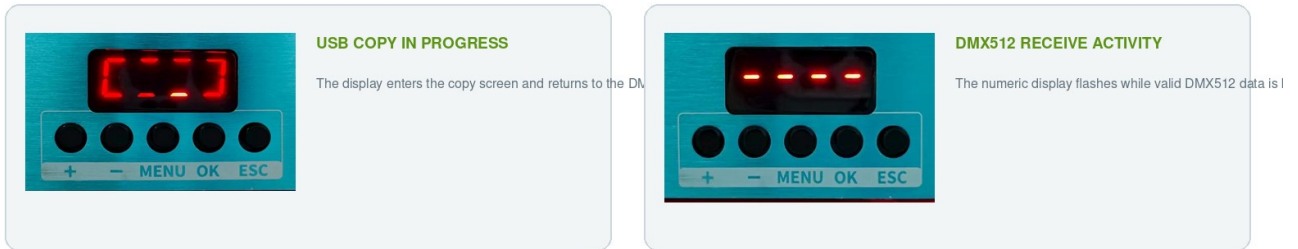
**FIRMWARE NOTE** Front-panel display codes and source-selection options may differ between firmware versions. Record final commissioned values in the project documentation.

## SECTION 11

# STATUS INDICATIONS AND FIELD CHECKS

Use the front-panel display to confirm DMX reception, USB import progress and basic commissioning state.

### SPECIAL FRONT-PANEL STATES



| STATE                     | INDICATION                                                   | REQUIRED ACTION                                              |
|---------------------------|--------------------------------------------------------------|--------------------------------------------------------------|
| <b>Normal standby</b>     | DMX start address or current menu value is displayed.        | No action required.                                          |
| <b>DMX data reception</b> | Numeric display flashes while valid DMX512 data is received. | Confirm expected channel response and scene mapping.         |
| <b>USB import</b>         | Display enters the USB copy screen.                          | Do not remove the USB drive or disconnect power.             |
| <b>Copy complete</b>      | Display returns to the DMX address screen.                   | Verify imported folders and media through the Web interface. |

### Field commissioning checklist

- Confirm the unit has a valid LAN address and is reachable from the commissioning PC.
- Verify HDMI input detection and the programmed PIP/PBP window behavior.
- Check all three 4K output groups, or all six 2K paths when used in that configuration.
- Send known DMX values and confirm the front-panel receive indication and mapped response.
- Test VOD/DJ audio detection at both low and high program levels.
- Perform a controlled USB import using non-critical test content before venue handover.

**POWER** Never interrupt AC power while the unit is writing imported content or saving configuration data.

## SECTION 12

# DMX512 REFERENCE | CHANNELS 1-10

Folder selection, media selection, layer opacity, strobe and RGB intensity control.

**ADDRESSING** Channel numbers below are relative to the DMX start address set in menu A. For example, if menu A is 101, logical CH1 responds to DMX universe address 101.

| CH | FUNCTION           | VALUE  | BEHAVIOR                                                                                                                                                      |
|----|--------------------|--------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1  | Foreground folder  | 0      | Off / no foreground folder selected. CH1 and CH3 must not both be 0.                                                                                          |
| 1  | Foreground folder  | 1-255  | Each value selects the correspondingly numbered media folder.                                                                                                 |
| 2  | Foreground media   | 0      | Randomly plays media in the selected folder, regardless of the Web playback mode.                                                                             |
| 2  | Foreground media   | 1-255  | Single mode: loop the specified item. Sequential mode: play it first, then continue in order. Random mode: play it first, then randomize the remaining items. |
| 3  | Background folder  | 0      | Off / no background folder selected. CH1 and CH3 must not both be 0.                                                                                          |
| 3  | Background folder  | 1-255  | Each value selects the correspondingly numbered media folder.                                                                                                 |
| 4  | Background media   | 0      | Randomly plays media in the selected folder, regardless of the Web playback mode.                                                                             |
| 4  | Background media   | 1-255  | Single mode: loop the specified item. Sequential mode: play it first, then continue in order. Random mode: play it first, then randomize the remaining items. |
| 5  | Foreground opacity | 0-255  | 0 = black output; 1-255 = graduated opacity adjustment; 255 = least transparent / most opaque.                                                                |
| 6  | Background opacity | 0-255  | 0 = black output; 1-255 = graduated opacity adjustment; 255 = least transparent / most opaque.                                                                |
| 7  | Strobe             | 0      | Off.                                                                                                                                                          |
| 7  | Strobe             | 1-80   | 1-10 content strobe; 11-20 red; 21-30 orange; 31-40 yellow; 41-50 green; 51-60 blue; 61-70 purple; 71-80 white.                                               |
| 7  | Strobe             | 81-255 | Off.                                                                                                                                                          |
| 8  | Red intensity      | 0-255  | 0 = off; 1-255 adjusts red intensity from minimum to maximum.                                                                                                 |
| 9  | Green intensity    | 0-255  | 0 = off; 1-255 adjusts green intensity from minimum to maximum.                                                                                               |
| 10 | Blue intensity     | 0-255  | 0 = off; 1-255 adjusts blue intensity from minimum to maximum.                                                                                                |

**LAYER RULE** Keep at least one of CH1 (foreground folder) or CH3 (background folder) above 0 when a visible internal media layer is required.

## SECTION 13

# DMX512 REFERENCE | CHANNELS 11-12

Playback-speed control and HDMI picture-in-picture window routing.

## CH11 — Playback speed

The same speed bands apply to the control scope exposed by the active firmware: all layers, foreground or background.

| VALUE | SPEED / STATE | VALUE | SPEED / STATE |
|-------|---------------|-------|---------------|
| 0-10  | Normal speed  | 31-40 | 0.8x speed    |
| 11-20 | 2.0x speed    | 41-50 | 0.5x speed    |
| 21-30 | 1.5x speed    | 51-60 | Pause         |

## CH12 — HDMI PIP window routing

| VALUE   | SOURCE 1 ROUTING               | VALUE   | SOURCE 2 ROUTING               |
|---------|--------------------------------|---------|--------------------------------|
| 0       | Close HDMI window(s)           | -       | -                              |
| 1-10    | Source 1 -> OUT1               | 71-80   | Source 2 -> OUT1               |
| 11-20   | Source 1 -> OUT2               | 81-90   | Source 2 -> OUT2               |
| 21-30   | Source 1 -> OUT3               | 91-100  | Source 2 -> OUT3               |
| 31-40   | Source 1 -> OUT1 + OUT2        | 101-110 | Source 2 -> OUT1 + OUT2        |
| 41-50   | Source 1 -> OUT1 + OUT3        | 111-120 | Source 2 -> OUT1 + OUT3        |
| 51-60   | Source 1 -> OUT2 + OUT3        | 121-130 | Source 2 -> OUT2 + OUT3        |
| 61-70   | Source 1 -> OUT1 + OUT2 + OUT3 | 131-140 | Source 2 -> OUT1 + OUT2 + OUT3 |
| 141-255 | Source 1 -> OUT1 + OUT2 + OUT3 | -       | -                              |

**LOGICAL SOURCE 2** The standard rear panel provides one physical HDMI input. Source 2 ranges are available only in firmware or project configurations that expose a second logical source; confirm behavior during commissioning.

## SECTION 14

# DMX512 REFERENCE | CHANNEL 13

Proportional scaling and animated scale sweeps for all, foreground or background layers.

## CH13 — Scale effects

| EFFECT               | ALL   | FOREGROUND | BACKGROUND | BEHAVIOR                                                     |
|----------------------|-------|------------|------------|--------------------------------------------------------------|
| Off                  | 0     | 0          | 0          | No scale effect.                                             |
| Proportional enlarge | 1-10  | 51-60      | 101-110    | Scale up proportionally to a maximum of 3x.                  |
| Proportional reduce  | 11-20 | 61-70      | 111-120    | Scale down proportionally to a minimum of 1 pixel.           |
| 1 pixel <-> original | 21-30 | 71-80      | 121-130    | Animated sweep between 1 pixel and the original window size. |
| Original <-> 3x      | 31-40 | 81-90      | 131-140    | Animated sweep between original size and 3x enlargement.     |
| 1 pixel <-> 3x       | 41-50 | 91-100     | 141-150    | Animated sweep from 1 pixel through 3x enlargement.          |

**SPEED** Within each animated ten-value band, a higher DMX value produces a faster sweep.

## Commissioning guidance

- Use the All range when foreground and background must scale as a composed scene.
- Use the Foreground range for subject or overlay effects without disturbing the background layer.
- Use the Background range for ambient motion while maintaining a stable foreground layer.
- Check edge cropping on every output group when enlargement is used on a stitched canvas.

## Range structure

| SCOPE      | VALUE SPAN | EFFECT BANDS                      |
|------------|------------|-----------------------------------|
| All layers | 1-50       | Five consecutive ten-value bands. |
| Foreground | 51-100     | Five consecutive ten-value bands. |
| Background | 101-150    | Five consecutive ten-value bands. |

**OFF STATE** Set CH13 to 0 to disable scaling and return to the configured window geometry.

## SECTION 15

# DMX512 REFERENCE | CHANNEL 14

Static-angle, continuous and axis-rotation effects with independent scope ranges.

| ROTATION EFFECT                        | ALL   | FOREGROUND | BACKGROUND |
|----------------------------------------|-------|------------|------------|
| Static 0-360 degree angle              | 1-10  | 81-90      | 161-170    |
| Clockwise 0-360 degree rotation        | 11-20 | 91-100     | 171-180    |
| Counterclockwise 0-360 degree rotation | 21-30 | 101-110    | 181-190    |
| 1 revolution CW, then 1 revolution CCW | 31-40 | 111-120    | 191-200    |
| X-axis rotation, outside to inside     | 41-50 | 121-130    | 201-210    |
| X-axis rotation, inside to outside     | 51-60 | 131-140    | 211-220    |
| Y-axis rotation, outside to inside     | 61-70 | 141-150    | 221-230    |
| Y-axis rotation, inside to outside     | 71-80 | 151-160    | 231-240    |

**OFF STATE** Set CH14 to 0 to disable rotation. Within continuous-motion bands, higher values increase the rotation speed.

## Scope selection

| SCOPE      | RANGE   | TYPICAL USE                                           |
|------------|---------|-------------------------------------------------------|
| All        | 1-80    | Rotate the fully composed scene.                      |
| Foreground | 81-160  | Animate a subject or overlay independently.           |
| Background | 161-240 | Animate the ambient layer behind a stable foreground. |

## Implementation notes

- The first ten-value band in each scope maps a static angle across 0-360 degrees.
- Axis rotations are perspective effects and should be validated on the final LED canvas.
- On a stitched 5D/6D layout, confirm that every output uses identical scene geometry before applying rotation.
- Avoid abrupt high-speed changes when the content includes fine lines or text, as they may reduce legibility.



## SECTION 16

# DMX512 REFERENCE | CHANNELS 15-16

Tiling-matrix selection and audio-source switching.

## CH15 — Tiling

| MATRIX  | ALL | FOREGROUND | BACKGROUND |
|---------|-----|------------|------------|
| 1 x 2   | 1   | 17         | 33         |
| 1 x 3   | 2   | 18         | 34         |
| 1 x 4   | 3   | 19         | 35         |
| 2 x 1   | 4   | 20         | 36         |
| 2 x 2   | 5   | 21         | 37         |
| 2 x 3   | 6   | 22         | 38         |
| 2 x 4   | 7   | 23         | 39         |
| 3 x 1   | 8   | 24         | 40         |
| 3 x 2   | 9   | 25         | 41         |
| 3 x 3   | 10  | 26         | 42         |
| 3 x 4   | 11  | 27         | 43         |
| 4 x 1   | 12  | 28         | 44         |
| 4 x 2   | 13  | 29         | 45         |
| 4 x 3   | 14  | 30         | 46         |
| 4 x 4   | 15  | 31         | 47         |
| All off | 16  | 32         | 48         |

CH15 value 0 disables the tiling effect.

## CH16 — Audio-source switching

| VALUE | AUDIO SOURCE / ACTION                                       |
|-------|-------------------------------------------------------------|
| 0     | Off                                                         |
| 1-10  | Select VOD audio channel                                    |
| 11-20 | Select DJ audio channel                                     |
| 21-30 | Select audio embedded in internal media                     |
| 31-45 | Internal MP3 single play; 15 values correspond to 15 tracks |
| 46-60 | Internal MP3 loop play; 15 values correspond to 15 tracks   |

**AUDIO ROUTING** Verify the VOD, DJ and ALL OUT RCA connections before commissioning CH16 scene changes.

## SECTION 17

# DMX512 REFERENCE | CHANNELS 17-20

Foreground transitions, running-screen groups, slice groups and the global stop function.

## CH17 — Foreground effects

| VALUE | EFFECT                                                 |
|-------|--------------------------------------------------------|
| 0     | Off                                                    |
| 1-10  | Foreground cube rotation, right to left                |
| 11-20 | Foreground cube rotation, left to right                |
| 21-30 | Foreground cube rotation, top to bottom                |
| 31-40 | Foreground cube rotation, bottom to top                |
| 41-50 | Foreground ghost-trail / out-of-body transition effect |

Within each CH17 ten-value band, higher values increase effect speed.

## CH18 — Running-screen groups

| VALUE  | GROUP / BEHAVIOR                                      |
|--------|-------------------------------------------------------|
| 0      | Off                                                   |
| 1-10   | Running-screen group 1; higher values increase speed  |
| 11-20  | Running-screen group 2; higher values increase speed  |
| 21-30  | Running-screen group 3; higher values increase speed  |
| 31-40  | Running-screen group 4; higher values increase speed  |
| 41-50  | Running-screen group 5; higher values increase speed  |
| 51-60  | Running-screen group 6; higher values increase speed  |
| 61-70  | Running-screen group 7; higher values increase speed  |
| 71-80  | Running-screen group 8; higher values increase speed  |
| 81-90  | Running-screen group 9; higher values increase speed  |
| 91-100 | Running-screen group 10; higher values increase speed |

## CH19 — Slice groups

| VALUE | SLICE GROUP |
|-------|-------------|
| 0     | Off         |
| 1-10  | Group 1     |
| 11-20 | Group 2     |
| 21-30 | Group 3     |
| 31-40 | Group 4     |
| 41-50 | Group 5     |

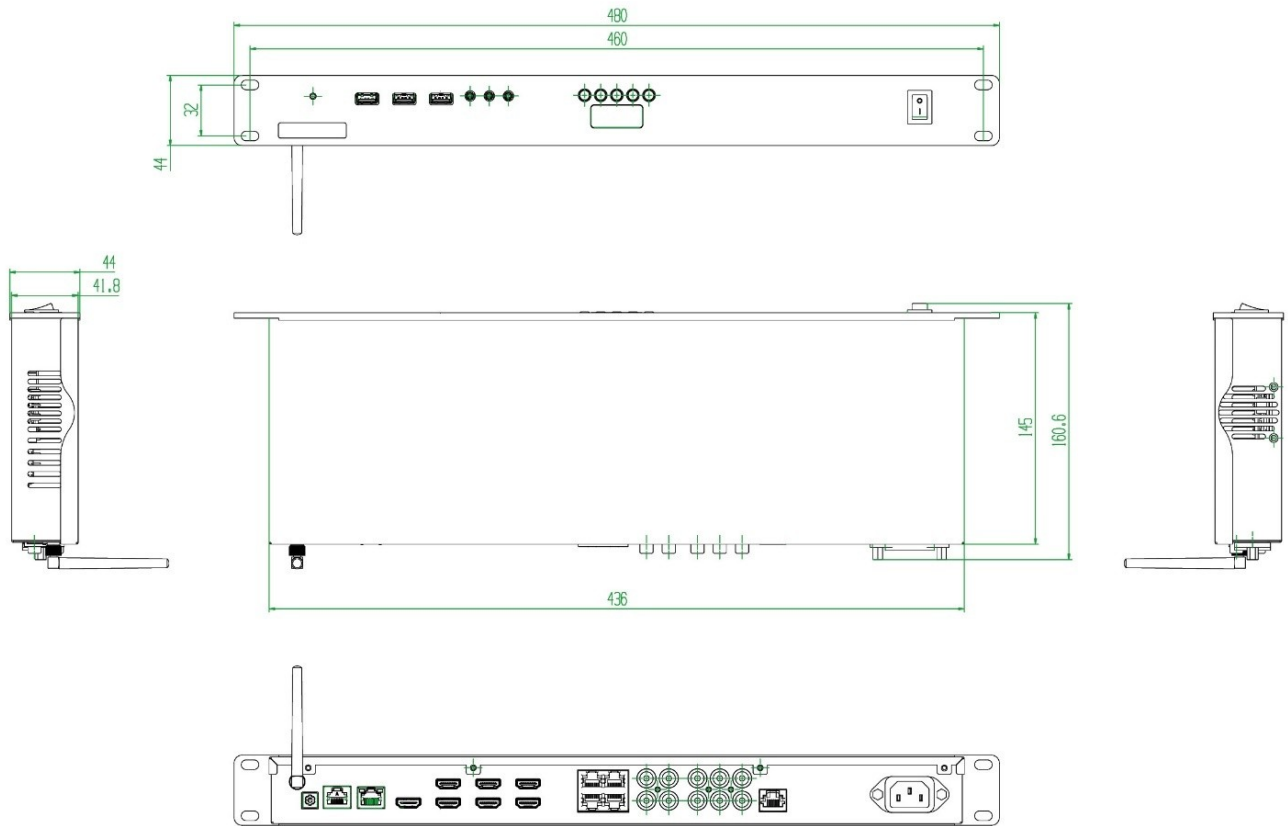
## CH20 — Stop / all-off

**FIRMWARE-DEFINED** CH20 is identified as the close/stop channel in the V4.1 mapping. Confirm the exact active value and affected layers in the installed firmware before programming a live show.

## SECTION 18

# MECHANICAL AND INSTALLATION DATA

1U rack-mount form factor with front-panel controls and rear-panel signal connectivity.



*Mechanical drawing. Dimensions in millimetres; tolerance  $\pm 0.3$  mm unless otherwise stated.*

| ITEM              | VALUE                                                     |
|-------------------|-----------------------------------------------------------|
| Overall width     | 480 mm, including rack ears                               |
| Chassis width     | 436 mm nominal                                            |
| Overall depth     | 160.6 mm; nominal specification 160 mm                    |
| Chassis depth     | 145 mm nominal, excluding projecting connectors / antenna |
| Height            | 44 mm / 1U                                                |
| Net weight        | 1.9 kg                                                    |
| Drawing tolerance | $\pm 0.3$ mm                                              |

## Installation requirements

- Install the unit in a stable 19-inch equipment rack or on a secure equipment shelf.
- Keep side ventilation openings clear and allow adequate airflow around the chassis.
- Provide cable strain relief so HDMI, RJ45 and RCA connectors are not mechanically loaded.
- Keep signal cables separated from AC power and high-current lighting cabling where practical.

**PROFESSIONAL INSTALLATION** Installation and commissioning must be performed by qualified personnel familiar with AC mains safety, ESD control and show-control systems.

## SECTION 19

# GENERAL SPECIFICATIONS

System, electrical, environmental, packaging and document-revision data.

## System and signal

| PARAMETER           | SPECIFICATION                                                                                              |
|---------------------|------------------------------------------------------------------------------------------------------------|
| Processor           | Eight-core CPU: 4 x Cortex-A76 + 4 x Cortex-A55 NEON, up to 2.4 GHz; Mali-G610 GPU                         |
| System memory       | 4 GB                                                                                                       |
| Internal storage    | 128 GB eMMC                                                                                                |
| Network             | Gigabit Ethernet                                                                                           |
| Video input         | 1 x HDMI input                                                                                             |
| Video output        | 3 x HDMI 2.0 4K output groups / six physical 2K-path connectors                                            |
| LED sending systems | Standard HDMI output; compatible with third-party LED sending controllers within their stated input limits |

## Electrical and environmental

| PARAMETER             | SPECIFICATION             |
|-----------------------|---------------------------|
| AC input              | 100-240 V AC, 50/60 Hz    |
| Rated power           | 15 W                      |
| Operating temperature | -20 to +65 °C             |
| Operating humidity    | 10-90% RH, non-condensing |

## Packing information

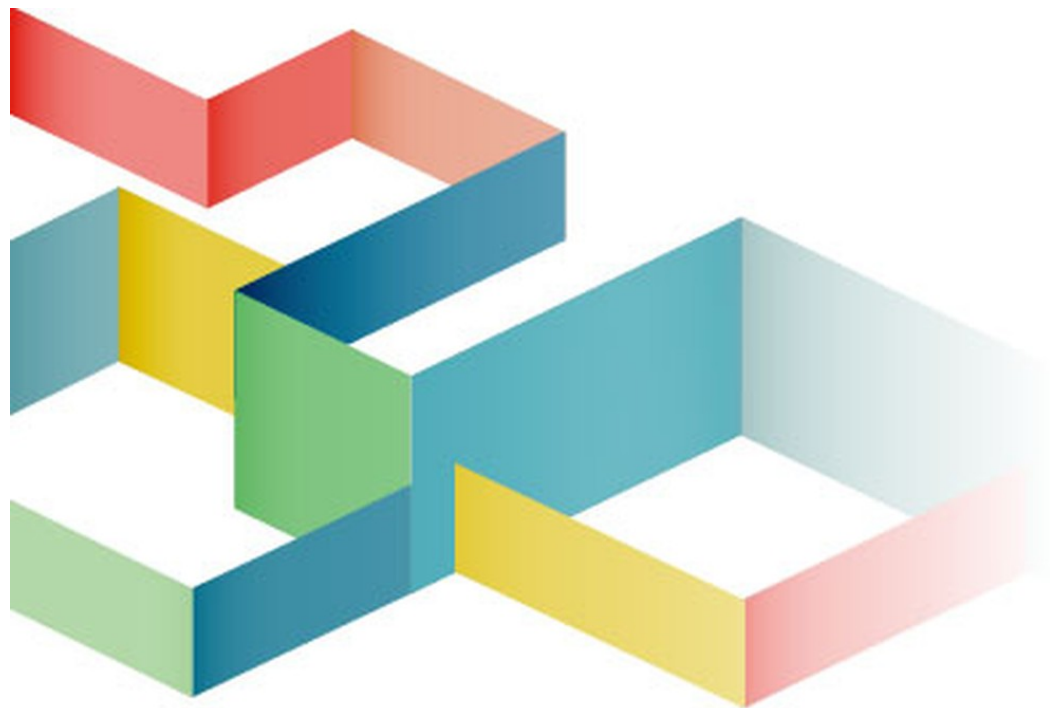
| ITEM                   | DETAIL                                                                           |
|------------------------|----------------------------------------------------------------------------------|
| Included accessories   | 1 x HDMI cable, 1 x power cord, 1 x network cable, 1 x certificate of conformity |
| Listed carton size     | 515 x 222 x 120 mm                                                               |
| Gross weight           | 2.7 kg per unit, including accessories and packing materials                     |
| Master-carton quantity | 3 units per carton                                                               |

## Document revision history

| VERSION | DATE        | CHANGE                         |
|---------|-------------|--------------------------------|
| V4.0    | 29 Jul 2025 | Initial document release       |
| V4.1    | 06 Nov 2025 | Updated DMX512 channel mapping |

**SAFETY** High voltage: AC 100-240 V. Use ESD precautions. Protect the unit from water, condensation and excessive dust. Installation must be completed by qualified personnel.

Specifications are based on the KM403 V4.1 source document. The product label, delivered hardware and project-specific firmware take precedence where configuration-dependent differences apply.



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Specifications are subject to change without prior notice.

