Product Brief

MDXE-16x16 Digital Modular Matrix Combined Matrix and Video Wall

www.smart-e.co.uk

Flexible and comprehensive enhanced next generation professional Digital Modular Matrix (DMM+) for Commercial, Education and Residential use

Seamlessly route 16 HD/UHD videoSources to 16 displays & create a Video Wall for HDMI, DVI, HDBaseT, Fibre with 3G-SDI & analogue video

New features

INPUT

- OSD characters
- Image cropping
- Preview card for source
- IP camera + split screen

OUTPUT

- Real time clock display
- Add rolling subtitles
- Background image
- Signal detection

Tech spec

- Resolutions to 4K UHD
- HDMI 1.3a compliant
- 10.2Gbps, 1080p@60Hz
- HDCP 1.3 compliant
- Supports Deep Colour
- Scaled outputs
- RS232 & IR control/passthrough
- Embedding & de-embedded Audio
- POC (remote powering receivers)

Features

- Modular 4 port cards
- IP Control
- Video Wall Processor
- Front panel control
- Integrated Web Browser
- Preview quad output
- Seamless Switching
- EDID management
- HDMI, DVI, HDBT, Fibre, VGA & SDI

Description

The MDXE-16x16 is a professional flexible Digital Modular Matrix (DMM+) capable of selecting between 8 different devices to 8 displays. Seamless switching together with output video scaling provides a professional image selection with the option of creating a multi-display Video Wall.

Connectivity to the matrix is via eighteen slots each capable of accepting 4-way modular input and output cards catering for a wide range of signal formats. Fully HDCP compliant and incorporating enhanced EDID management the MDXE-16x16 matrix is ideal for many multi-channel signal switching and distribution for Commercial, Educational and Residential solutions. Compact 3U 19" rack mounting chassis makes for ease of installation

Smart-e

DESIGN ◆ INNOVATE ◆ ORIGINATE

Product Brief

MDXE-16x16 Digital Modular Matrix Combined Matrix and Video Wall

www.smart-e.co.uk

DESCRIPTION - GENERAL

The DMM+ range of audio-visual (AV) matrices offer a complete solution for switching and distribution of the most common AV signal types and standard connectivity.

Differing signal types can be accommodated by the use of a modular construction. Removeable horizontal blades can be inserted or exchanged allowing inputs and outputs to be expanded in groups of 4 up to the maximum chassis size available. A variety of different blades are presented including: HDMI, DVI, HDBaseT, 3G-SDI and fibre options together with an analogue card capable of accepting RGBHV, YPrPb, Y/C and PAL/NTSC.

All input signals types are converted to an internal standard format allowing the flexibility of conversion to any output signal format. The conversion in an internal co-timed format provides a seamless switching feature allowing images to be changed without frame rolls or the need to go to black. Each output blade has a individual internal scaler allowing every output image to scale to the native resolution of the connected display for a more professional presentation.

Chassis' are available in sizes of 8x8, 16x16, 36x36, 72x72 through to 144x144. Each chassis is supplied with a quantity of empty slots capable of housing a number of 4 way input/output blades, depending on the maximum size of the matrix. The chassis can be partially populated helping match the installation and budget requirements.

All the matrices encompass comprehensive methods of control including IP, an internal web browser, RS232, remote panel and front panel buttons with LCD display.

The DMM+ range now incorporates the VMX Videowall processor technology which allows a number of output blades to be grouped together to form a multi display video mosaic or wall. This feature is available for the HDBT, DVI, 3G-SDI and fibre output cards.

Control signal routing is offered as standard allowing infrared and RS232 signals to be selected independently between the HDBaseT inputs and outputs. The signals can be connected via the blades directly or through the connected appropriate transmitters and receivers.

To aim ease of installation and improve power efficiency and heat dissipation, powering of the transmitters and receivers is achieved through the Cat 6/6A cable. DC power is sent via common mode connection across the 4 differential pairs of the network cabling.

For matrix sizes of 36x36 and larger there is the option of a dual redundant power supply. These are hot swapping, removeable units installed at the rear of the unit and connected by an additional IEC mains lead. Ideal for mission critical applications like command and control centres and disaster recovery vehicles.

Embedded multi-channel audio from the source device is routed along with the video signal but can be swapped with a locally generated signal and inserted via the HDMI or DVI blade. Similarly embedded audio is transmitted inside the output video signal but is also available as a stereo analogue signal on the HDMI and DVI output blades.

A preview card is also available as an output blade option. This features a streamed MPEG signal capable of displaying a composite of up to 4 input images. By using a streamed signal, remote monitoring of the matrix and the source devices is possible, ideal for inaccessible locations and in particular boats and yachts.

DESIGN ◆ INNOVATE ◆ ORIGINATE

Product Brief

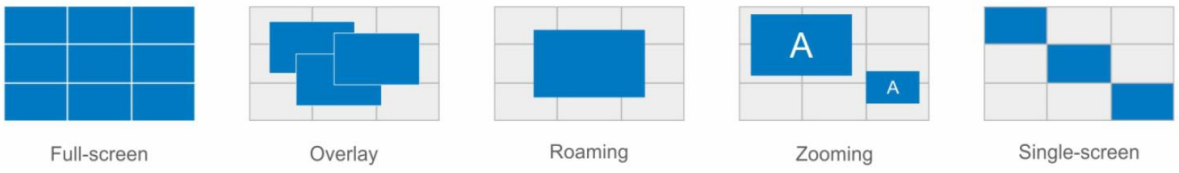
MDXE-16x16 Digital Modular Matrix Combined Matrix and Video Wall

www.smart-e.co.uk

DESCRIPTION - FEATURES

Video image processing

Video processing output blades are available for 1080p (4-way) and 4K30 (2-way) resolutions. The signal source can freely create windows, PIP (Picture in Picture), roaming, and zoom effects on the video wall. Additionally, vertical sync technology guarantees synchronized and smooth display of high-speed moving images across all spliced screens, along with customizable resolutions for individual LED screens.



Seamless switching technology

Utilizing full digital splicing switching technology, this system guarantees seamless switching with no black screens, no flashing, no fragmentation, and no static images. It supports arbitrary switching between 2K and 4K signals and employs a 4:4:4 full frame rate graphics processing algorithm, achieving a delay as low as 0 ms.

Signal source management

The input source image can be partially cropped to create a new video source, allowing for station logo display. Users can overlay images on the signal source or customize text in any language or font. Additionally, there is a setting for outputting a test image.

IPC decoding

Support for mass IPC signal access allows a single card to decode up to 100 IPC signals simultaneously on the screen. With unified IPC management, users can easily drag IPCs directly from the software interface onto the video wall.

Intelligent banner

Create a large-screen banner by customizing the welcome slogan or uploading images. You can modify the banner's color, font, size, position, and other details, as well as display the real-time clock.

Background image

Upload a local HD image as the background without impacting the number of window layers. There's no data loss when the power is turned off, and it automatically recovers upon power restoration.

DESIGN ◆ INNOVATE ◆ ORIGINATE

Product Brief

MDXE-16x16 Digital Modular Matrix Combined Matrix and Video Wall

www.smart-e.co.uk

DESCRIPTION - FEATURES

Monitoring alerts

The system monitors the status of each module and can proactively issue alerts and notifications in the event of equipment failure.

Visual operation of multi-terminal

Signal visualization preview: This system enables visualization, movement, and touch-based management across any PC, mobile phone, or tablet, with multiple operation terminals controlled and synchronized simultaneously.

Input signal full preview

Provides a web interface and software for visual preview of all input signal sources and real-time monitoring of spliced large-screen content. Additionally, it supports HDMI echo cards for hardware-based monitoring of the spliced large-screen content via a connected monitor.

Modular hardware architecture

The hardware modularization allows for flexible hybrid plug-in of input and output cards, enabling online maintenance and expansion. It features hot-pluggable fans for easy replacement and includes redundant power supplies for added reliability.

DESIGN ◆ INNOVATE ◆ ORIGINATE

Product Brief

MDXE-16x16 Digital Modular Matrix Combined Matrix and Video Wall

www.smart-e.co.uk

DESCRIPTION - FEATURES

Multi-device intelligent control

The system is able to send control commands to third-party devices, enabling operations such as switching large screens, raising or lowering curtains, and more.

IP Camera decoding - MDXE-IP2-IPC

- Provides 2 x independent RJ45 inputs
- Protocols: RTP, RTSP, RTCP, TCP, UDP, ONVIF
- Others: G711a, G711u, G726 & ADPCM
- Max resolution 4K@30Hz
- Multiple split screen view

IP input card

The MDXE-IP2-IPC blades allow a direct connection to the matrix from various IP sources. The blade is ideal for interfacing to IP cameras in security applications. Video feeds can be viewed as multiple split screens as 1, 4, 9, 16 or 25 separate images as a mosaic.

DESIGN ◆ INNOVATE ◆ ORIGINATE

Product Brief

MDXE-16x16 Digital Modular Matrix Combined Matrix and Video Wall

www.smart-e.co.uk

DESCRIPTION – FEATURES

Input signal preview - MDXE-PVW

- Provides 2 x independent RJ45 outputs
- Quad screen split image
- Resolutions: 1080p@30Hz or 720p@60Hz

Preview input source

The MDXE-PVW blade allows the monitoring of every input. Each source can be scrolled through prior to selection to the quad preview display. The preview video is available through an IP stream on an Ethernet port

KVM management

A single mouse and keyboard can control multiple computers, with the ability to switch between systems remotely using the keyboard

DESIGN ◆ INNOVATE ◆ ORIGINATE

smart-e.co.uk

specifications are subject to change without notice

Product Brief

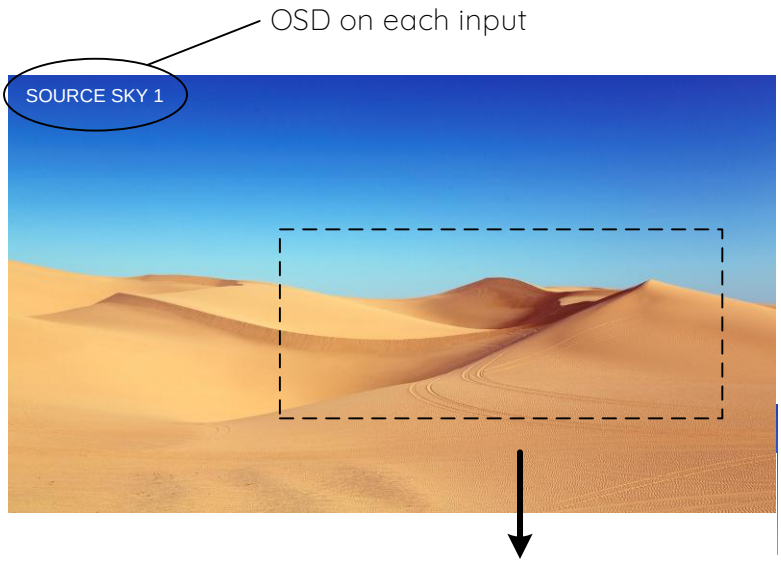
MDXE-16x16 Digital Modular Matrix Combined Matrix and Video Wall

www.smart-e.co.uk

NEW FOR MDXE RANGE

On Screen Display (OSD) for inputs

Input blade features include the ability to add an onscreen display to each individual input. Characters can be superimposed on the incoming video with the ability to change the text colour and background . The position can also be altered together with the facility to have the text move either forward or backward.



Input Image cropping

Each input video source can be cropped. Any portion of the image can be selected with X.Y co-ordinates and then scaled up to the appropriate resolution.

Output text and image

Each video wall output blade can provide a number of new features expanding the use of the system to other important applications. An additional image can be uploaded and stored locally for each output background. This image is in addition to the number of window layers available. Scrolling text with banner can be added to each output including the ability to adjust the colour, size, speed and direction of the text. Lastly system time and date stamp can be added to the image with position and size adjustable.

DESIGN ◆ INNOVATE ◆ ORIGINATE

Product Brief

MDXE-16x16 Digital Modular Matrix Combined Matrix and Video Wall

www.smart-e.co.uk

TECHNICAL SPECIFICATION

Video – Digital

Connectors	4 x HDMI (Type A) input and outputs 4 x DVI-D 4 x CAT 6 for HDBaseT 4 x HD15S for RGBHV/YPrPb/CV 4 x BNC for 3G-SDI
Signal type	HDMI - TMDS
Standards	HDMI 1.3a. HDCP 1.3
Maximum data rate	2.25Gbps per colour
Maximum pixel clock	340MHz
Resolution range - DTV	Max 1920x1080 @60Hz 36 bit colour depth
Resolution range - PC	Max 1920x1200 @60Hz 24 bit colour depth
Frame rate	24, 25, 30, 50 & 60 Hz
Gain	0 dB
Formats	RGB and YCrCb
Colour space	4:2:2 & 4:2:0
Clock jitter	<0.15T bit
Rise time	<0.3T bit (20-80%)
Fall time	<0.3T bit (20-80%)
Maximum transmission delay	5ns (+/- 1ns)
Signal strength	TMDS +/- 0.4V pk-pk
TMDS signal level	2.9V – 3.3V
Impedance	50R
Maximum DC offset	15mV
Maximum input cable length	15m 24 AWG
Maximum output cable length	15m 24 AWG

Audio – Digital

Standards	Embedded within the HDMI signal, SPDIF
Maximum audio channels	8
Maximum sample rate per channel	192 kHz
Sample size	16-24 bits

Audio – Analogue

Standards	Stereo - unbalanced
Bandwidth	20 - 20 kHz

Power

AC Voltage	100-230 VAC
AC frequency	50/60 Hz
Power consumption	13.5W (max)/1.2W (standby)
Operating temperature	0-40 degrees C
Storage temperature	-20-60 degrees C
Relative humidity	20-90%
Chassis size	3U 19" rack mounting
Chassis dimensions	440x394x133mm
Product weight	10Kg
MTBF	30,000 hours

---

smart-e

DESIGN ◆ INNOVATE ◆ ORIGINATE

Product Brief

MDXE-16x16 Digital Modular Matrix Combined Matrix and Video Wall

www.smart-e.co.uk

TECHNICAL SPECIFICATION

Control – RS232

Connector	D9
Signal type	Full duplex
Signal level	+/- 5V
Baud rate	115200
Data bits	8
Stop bits	1
Parity	None
Pinout	1-RX, 2-0V, 3-TX

Control – Ethernet

Connector	RJ45 female
Protocol	TCP/IP
Control rate	Adaptive 10M/100M full or half duplex

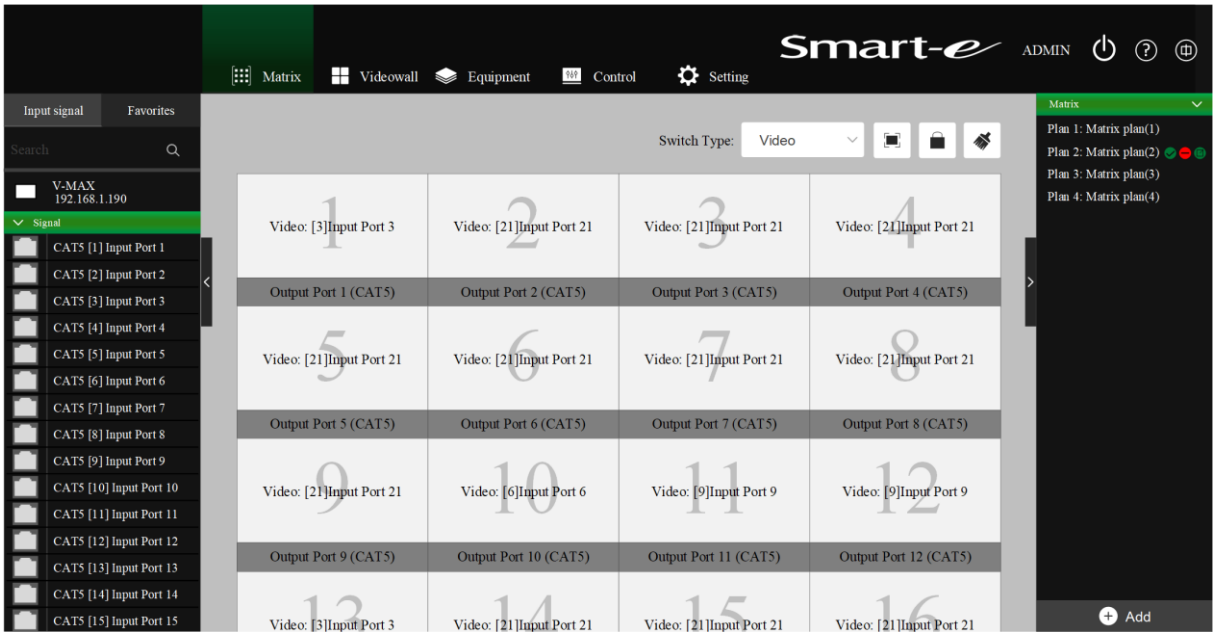
Control – IR

Connector	3.5mm mini-jack socket
Signal type	Full duplex (via 2 connections)
Signal bandwidth	20-60KHz

Cat cable connectivity

Number of cables	1 x Cat 6/6A screened twisted pair cables
Connectors	1 x female screened RJ45 connectors per unit
Termination standard	TIA/EIA T568B
Cable requirements	Solid conductor, 24 AWG or better
Cable recommendations	400 MHz bandwidth STP (shielded twisted pair)
Transmission distance	100m shielded twisted pair CAT 6 or CAT 6A

WEB BROWSER



DESIGN ◆ INNOVATE ◆ ORIGINATE

smart-e.co.uk

specifications are subject to change without notice

Product Brief

MDXE-16x16 Digital Modular Matrix Combined Matrix and Video Wall

www.smart-e.co.uk

SEAMLESS INPUT & OUTPUT BLADES

MDXE-IP4-HDMI

- Provides 4x independent HDMI [Type-A] inputs
- HDMI 1.4, DVI 1.0 & HDCP 1.3 protocol
- Supports EDID editing function
- Maximum input resolution:
- 1920x1200p @ 60Hz 24bit,1080p @ 60Hz 36bit

MDXE-OP4-HDMI

- Provides 4x independent HDMI [Type-A] outputs
- HDMI 1.4, DVI 1.0 & HDCP 1.3 protocol
- Maximum output resolution:
- HDPC: 1920x1200p @ 60Hz 24bit
- HDTV: 1920x1080p @ 60Hz 36bit (HD1080p60)

MDXE-RX4-HDBT

- Provides 4x independent HDBaseT inputs
- Compatible with HDBaseT protocol
- Supports EDID editing function
- Maximum input resolution:
- 1920x1200p @ 60Hz 24bit, 1080p @ 60Hz 36bit

MDXE-TX4-HDBT

- Provides 4x independent HDBaseT outputs
- Compatible with HDBaseT protocol
- Maximum output resolution:
- HDPC: 1920x1200p @ 60Hz 24bit
- HDTV: 1920x1080p @ 60Hz 36bit (HD1080p60)

MDXE-RX4-FB

- Provides 4x independent SC optical fibre inputs
- Multimode 850nm <300m
- Supports EDID editing function
- Maximum input resolution:
- 1920x1200p @ 60Hz 24bit, 1080p @ 60Hz 36bit

MDXE-TX4-FB

- Provides 4x independent SC optical fibre outputs
- Multimode 850nm <300m
- Maximum output resolution:
- HDPC: 1920x1200p @ 60Hz 24bit
- HDTV: 1920x1080p @ 60Hz 36bit (HD1080p60)

MDXE-IP4-DVI

- Provides 4x independent DVI inputs
- HDMI 1.4, DVI 1.0 & HDCP 1.3 protocol
- Supports EDID editing function
- Maximum input resolution:
- 1920x1200p @ 60Hz 24bit,1080p @ 60Hz 36bit

MDXE-OP4-DVI

- Provides 4x independent DVI outputs
- HDMI 1.4, DVI 1.0 & HDCP 1.3 protocol
- Maximum output resolution:
- HDPC: 1920x1200p @ 60Hz 24bit
- HDTV: 1920x1080p @ 60Hz 36bit (HD1080p60)

MDXE-IP4-3GSDI

- Provides 4x independent 3G-SDI inputs
- SDI, HD-SDI and 3G-SDI
- Supports EDID editing function
- Maximum input resolution:
- 1920x1200p @ 60Hz 24bit,1080p @ 60Hz 36bit

MDXE-OP4-3GSDI

- Provides 4x independent 3G-SDI outputs
- SDI, HD-SDI and 3G-SDI
- Maximum output resolution:
- HDPC: 1920x1200p @ 60Hz 24bit
- HDTV: 1920x1080p @ 60Hz 36bit (HD1080p60)

smart-e

DESIGN ◆ INNOVATE ◆ ORIGINATE

smart-e.co.uk

specifications are subject to change without notice

Product Brief

MDXE-16x16 Digital Modular Matrix Combined Matrix and Video Wall

www.smart-e.co.uk

SEAMLESS INPUT & OUTPUT BLADES

MDXE-IP2-HDMI4K

- Provides 2 x independent HDMI [Type-A] inputs
- HDMI 1.4a, DVI 1.0 & HDCP 1.3 protocol
- Supports EDID editing function
- Maximum input resolution:
- 1920x1200p @ 60Hz 24bit, 4K @ 30Hz 24bit

MDXE-OP2-HDMI4K

- Provides 2 x independent HDMI [Type-A] outputs
- HDMI 1.4a, DVI 1.0 & HDCP 1.3 protocol
- Maximum output resolution:
- HDPC: 1920x1200p @ 60Hz 24bit
- HDTV: 4K @ 30Hz 24bit

MDXE-RX2-HDBT4K

- Provides 2x independent HDBaseT inputs
- Compatible with HDBaseT protocol
- Supports EDID editing function
- Maximum input resolution:
- 1920x1200p @ 60Hz 24bit, 4K @ 30Hz 24bit

MDXE-TX2-HDBT4K

- Provides 2x independent HDBaseT outputs
- Compatible with HDBaseT protocol
- Maximum output resolution:
- HDPC: 1920x1200p @ 60Hz 24bit
- HDTV: 4K @ 30Hz 24bit

SPECIAL FUNCTION BLADES

IP Camera decoder

MDXE-IP2-IPC

- Provides 2 x independent RJ45 inputs
- Protocols: RTP, RTSP, RTCP, TCP, UDP, ONVIF
- Others: G711a, G711u, G726 & ADPCM
- Max resolution 4K@30Hz
- Multiple split screen view

Input signal preview

MDXE-PVW

- Provides 1 x independent RJ45 output
- Monitoring of all inputs
- Quad screen split image
- Resolutions: 1080p@30Hz or 720p@60Hz
- Outputs via streaming Ethernet protocol

smart-e

DESIGN ◆ INNOVATE ◆ ORIGINATE

smart-e.co.uk

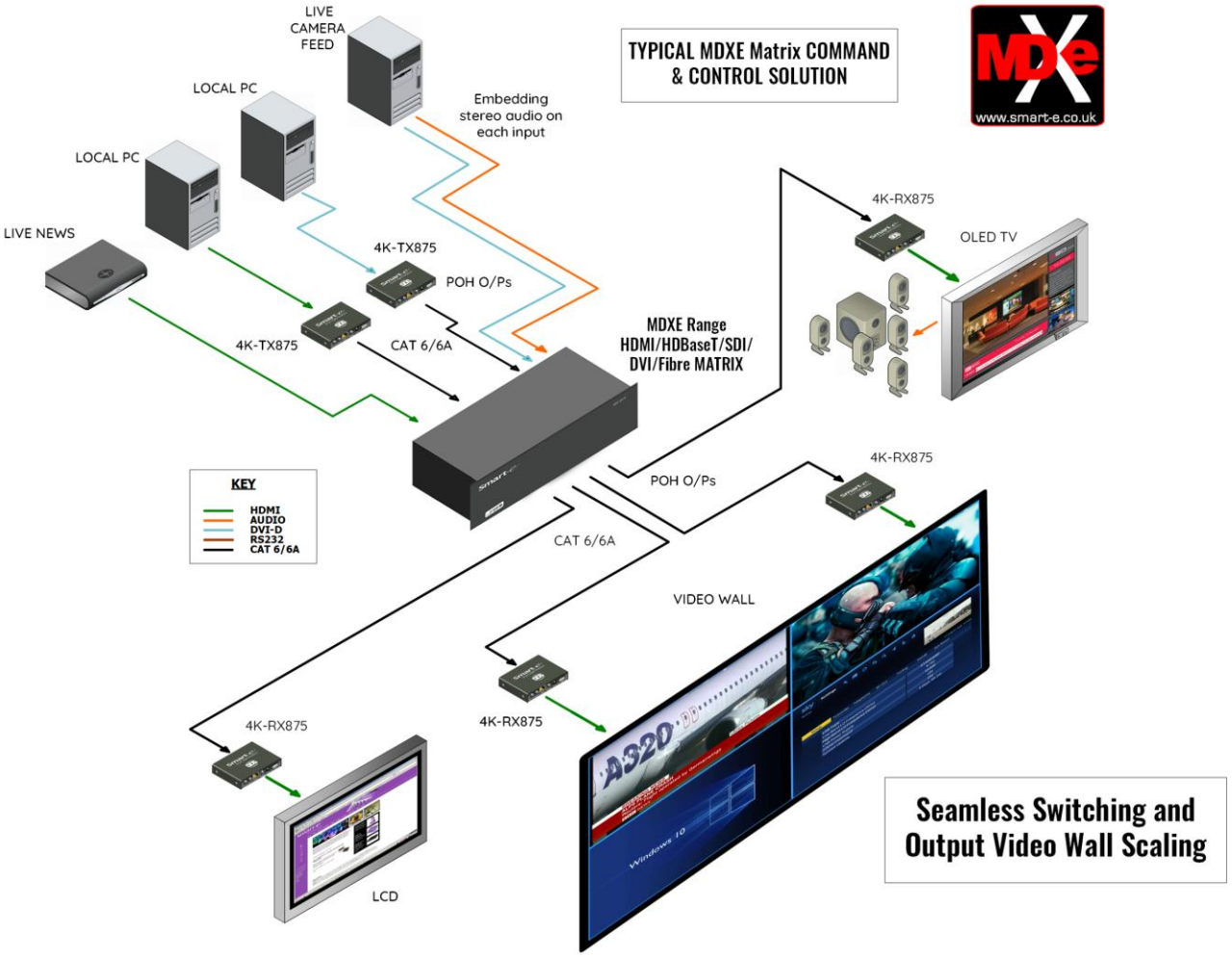
specifications are subject to change without notice

Product Brief

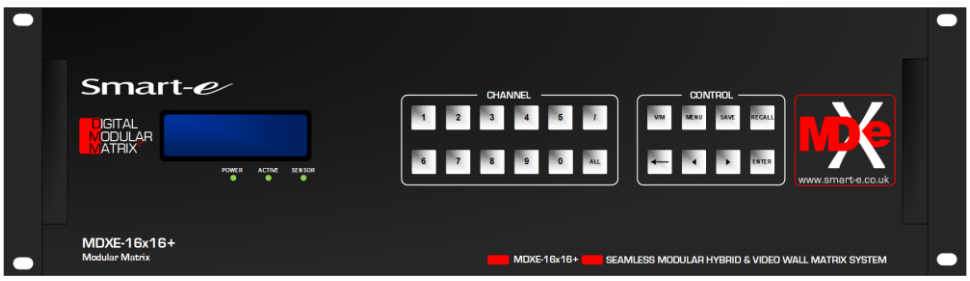
MDXE-16x16 Digital Modular Matrix Combined Matrix and Video Wall

www.smart-e.co.uk

SEAMLESS SWITCHING APPLICATION DRAWING



REAR VIEW



DESIGN ◆ INNOVATE ◆ ORIGINATE

Product Brief

MDXE-16x16 Digital Modular Matrix
Combined Matrix and Video Wall

www.smart-e.co.uk

VIDEO WALL OUTPUT BLADES

VMXE-OP4-HDMI-L2

- Provides 4 x independent HDMI [Type-A] outputs
- HDMI 1.4, DVI 1.0 & HDCP 1.3 protocol
- Maximum output resolution:
- HDPC: 1920x1200p HDTV: 1920x1080p
- Each video wall output provides 2 separate layers

VMXE-OP2-HDMI-L4

- Provides 2 x independent HDMI [Type-A] outputs
- HDMI 1.4, DVI 1.0 & HDCP 1.3 protocol
- Maximum output resolution:
- HDPC: 1920x1200p HDTV: 1920x1080p
- Each video wall output provides 4 separate layers

VMXE-TX4-HDBT-L2

- Provides 4 x independent HDBaseT outputs
- Compatible with HDBaseT protocol
- Maximum output resolution:
- HDPC: 1920x1200p HDTV: 1920x1080p
- Each video wall output provides 2 layers

VMXE-TX2-HDBT-L4

- Provides 2 x independent HDBaseT outputs
- Compatible with HDBaseT protocol
- Maximum output resolution:
- HDPC: 1920x1200p HDTV: 1920x1080p
- Each video wall output provides 4 layers

VMXE-TX4-MFB-L2

- Provides 4 x independent SC optical fibre o/ps
- Multimode 850nm <300m
- Maximum output resolution:
- HDPC: 1920x1200p HDTV: 1920x1080p
- Each video wall output provides 2 layers

VMXE-TX2-MFB-L4

- Provides 2 x independent SC optical fibre o/ps
- Multimode 850nm <300m
- Maximum output resolution:
- HDPC: 1920x1200p HDTV: 1920x1080p
- Each video wall output provides 4 layers

VMXE-OP4-DVI-L2

- Provides 4 x independent DVI outputs
- HDMI 1.4, DVI 1.0 & HDCP 1.3 protocol
- Maximum output resolution:
- HDPC: 1920x1200p HDTV: 1920x1080p
- Each video wall output provides 2 layers

VMXE-OP2-DVI-L4

- Provides 2 x independent DVI outputs
- HDMI 1.4, DVI 1.0 & HDCP 1.3 protocol
- Maximum output resolution:
- HDPC: 1920x1200p HDTV: 1920x1080p
- Each video wall output provides 4 layers

4K@30Hz VIDEO WALL OUTPUT BLADES

VMXE-TX2-HDBT4K-L2

- Provides 2 x independent HDBaseT outputs
- Compatible with HDBaseT protocol
- Maximum output resolution:
- HDPC: 1920x1200p HDTV: 1920x1080p
- Each video wall output provides 2 layers

VMXE-OP2-HDMI4K-L2

- Provides 2 x independent HDMI [Type-A] outputs
- HDMI 1.4a, DVI 1.0 & HDCP 1.3 protocol
- Maximum output resolution:
- HDPC: 1920x1200p HDTV: 4K @30Hz 24bit
- Each video wall output provides 2 separate layers

specifications are subject to change without notice

smart-e

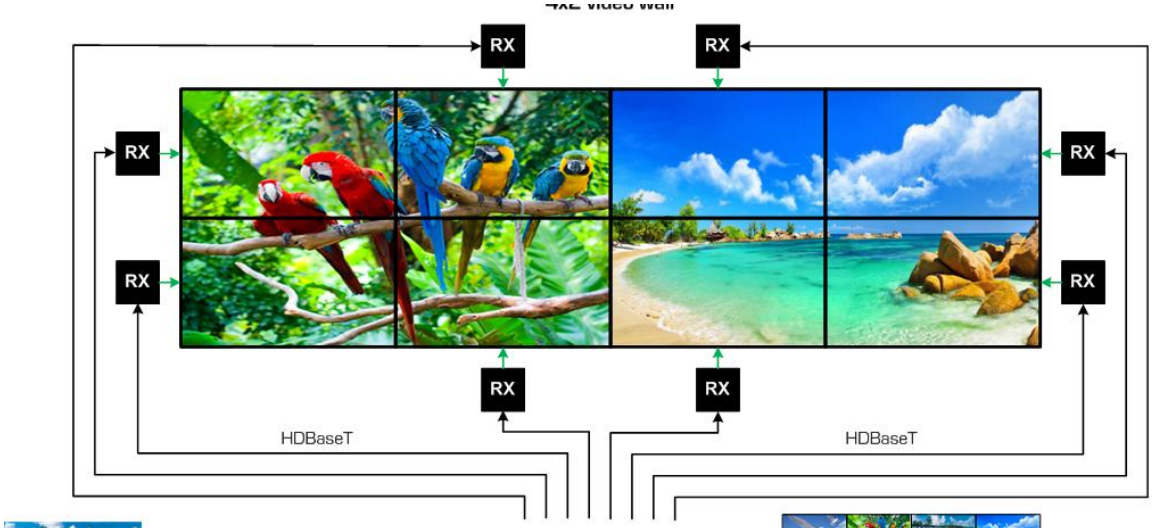
DESIGN ◆ INNOVATE ◆ ORIGINATE

Product Brief

MDXE-16x16 Digital Modular Matrix
Combined Matrix and Video Wall

www.smart-e.co.uk

VIDEO WALL APPLICATION DRAWING



8 x HDMI/VGA/
HDBaseT inputs

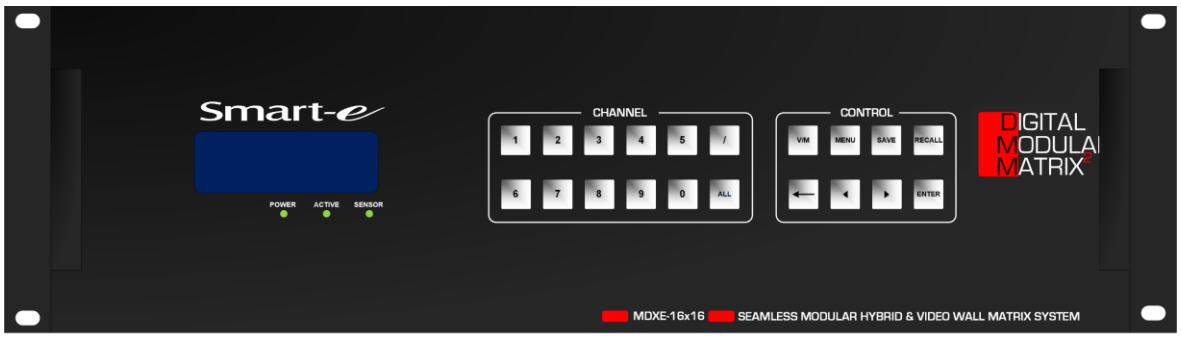
4x2 video wall

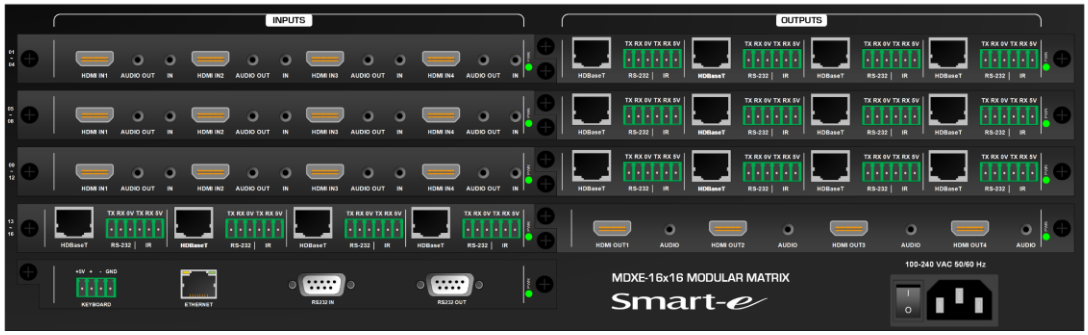
4x2 video wall

4x4 video wall

Model No.	Description
VMX-8x8	Modular 8 input by 8 output matrix
VMX-16x16	Modular 16 input by 16 output matrix
VMX-36x36	Modular 36 input by 36 output matrix

MDXE PANEL DRAWINGS





specifications are subject to change without notice

DESIGN ◆ INNOVATE ◆ ORIGINATE