

PRO X UPGRADE KIT

MIDAS PRO X Digital Console Control Centre
Upgrade Kit and NEUTRON High Performance
Audio System Engine



- ⊗ MIDAS PRO X digital console
Control Surface upgrade kit
- ⊗ Upgrades PRO3, PRO6 and PRO9
Control Surfaces to PRO X
- ⊗ Includes NEUTRON High Performance
Audio System Engine
- ⊗ 1 DL511 Centre Section PCB Assembly
- ⊗ 1 DL5101 Scan Processor
PCB Assembly
- ⊗ 2 DL5104 Advantech* motherboards
- ⊗ Complete set of fascia panels
- ⊗ Illuminated PRO X logo
- ⊗ Internal cables
- ⊗ Switch caps
- ⊗ 3-Year Warranty Program*
- ⊗ Designed and engineered
in England

The **MIDAS PRO Series** family moves up a gear with the **PRO X** control centre and the industry-changing NEUTRON Audio System Engine. Featuring 168 simultaneous input channels and 99 time-aligned and phase-coherent mix buses, the **PRO X** sets a new performance benchmark in high-profile live sound applications and is a truly impressive digital control surface for the engineer whose very livelihood depends on both unparalleled functionality and reliability. Like all **PRO Series** consoles, the **PRO X** features managed latency and 40 bit floating point processing precision.

The **MIDAS PRO X UPGRADE KIT** uniquely allows owners of **PRO3**, **PRO6** and **PRO9** digital console systems to fully upgrade to a **MIDAS PRO X** system and includes the NEUTRON high performance audio system engine. This upgrade path allows owners to protect the value of their investment in **MIDAS PRO Series** and bring their existing consoles up to the state-of-the-art in digital mixing console technology.

PRO X upgrades are only performed by authorised **MIDAS** service centres, please contact your local **MIDAS** distributor for more information.

*All third-party trademarks are the property of their respective owners. Their use neither constitutes a claim of the trademark nor affiliation of the trademark owners with MUSIC Group. Product names are mentioned solely as a reference for compatibility, effects and/or components. Warranty details can be found at music-group.com.

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NEUTRON High Performance Audio System Engine

The powerhouse at the centre of the **PRO X** system, the new **NEUTRON** High Performance Audio System Engine is the result of a three year research and development program that pushed the **MIDAS** engineering team well beyond their already considerable expertise and knowledge.

NEUTRON's cutting-edge, latest generation DSPs and high-performance FPGA (Field-Programmable Gate Array) technology, coupled with a highly efficient MIMD (Multiple Instruction, Multiple Data) architecture, delivers more than 100 Gigafllops of real-time audio processing. **NEUTRON** represents the state-of-the art in digital audio mixing technology.

HyperMAC and AES50 audio networking technologies allow up to 288 inputs and 294 outputs at 96 kHz sampling frequency combined with 40 bit floating point processing precision, which can be dynamically assigned to the **PRO X**'s input channels and bus outputs on a dynamic scene-by-scene basis. This high level of connectivity, coupled with the large channel and bus counts, make the **PRO X** and **NEUTRON** equally at home in theatres and symphony halls as it is in live concert touring, outside broadcast and music festivals.

PRO X Advanced Navigation

PRO X incorporates new and innovative methods of channel and mix bay navigation: FLIP Navigation, FX Navigation, GEQ Navigation, and MCA Navigation. These four options allow an engineer to easily and efficiently mix a large number of inputs on a compact control surface. **PRO X** also features the ability to display and control any output bus on the input control bay area. This navigation flexibility makes working with the console as simple as requirements dictate, or as deep and complex as a user desires. **PRO X**'s new centre section, which features 24 LCD switches that provide immediate access to up to 24 stereo pairs of output mix buses, also supports the new navigation modes.

- When in FLIP navigation mode, and the FLIP button is engaged, selecting an output flips the input faders to become the input channel send levels to the selected output. If the Collapsed Flip (Hide Unassigned Channels) preference is ticked, then the console will only populate with the input channels that are assigned to the selected output, otherwise all channels will be displayed.
- When the FX navigation button is engaged, selecting an output which is patched to an internal effects processor, this mode will deploy that effects processor on the display screen and map the ASSIGNABLE CONTROLS to the effects processor. If FADER FLIP is also engaged, the input channel faders will become the contributions to the effects processor. If COLLAPSED FLIP (Hide Unassigned Channels) preference is selected, the operator will only be presented with input channels that are sending to that effects processor.
- When the GEQ navigation button is engaged, selecting an output which has a graphic equaliser (GEQ) assigned, this mode will present the GEQ on the VCA faders. Scrolling the VCA faders left and right will provide access to all 31 GEQ faders. If FADER FLIP is also engaged, the input channel faders will become the contributions to the selected mix. If COLLAPSED FLIP (Hide Unassigned Channels) preference is selected, the operator will only be presented with input channels which are sending to that mix.
- If the MCA navigation button is engaged, when an output (mix) is selected, the MCA faders for that output will be deployed on the VCA fader bank. When MCA navigation is engaged, the MCA faders control the contributions of their members only to the currently selected bus. This is a unique and powerful mixing tool, which puts **MIDAS** in a class of its own for innovation and usability.



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All Items Included

The upgrade kit includes two replacement [DL5104](#) Advantech motherboard modules, one replacement [DL5101](#) scan processor PCB module and the new [DL511](#) centre section PCB module.

All other items necessary to upgrade the [PRO X](#) Control Centre, down to the required internal cables and switch caps, plus an illuminated [PRO X](#) logo, are included in the kit. A complete set of fascia panels is also provided that include the features unique to [PRO X](#) as well as enhancing the cosmetic appearance of the whole control surface.

You Are Covered

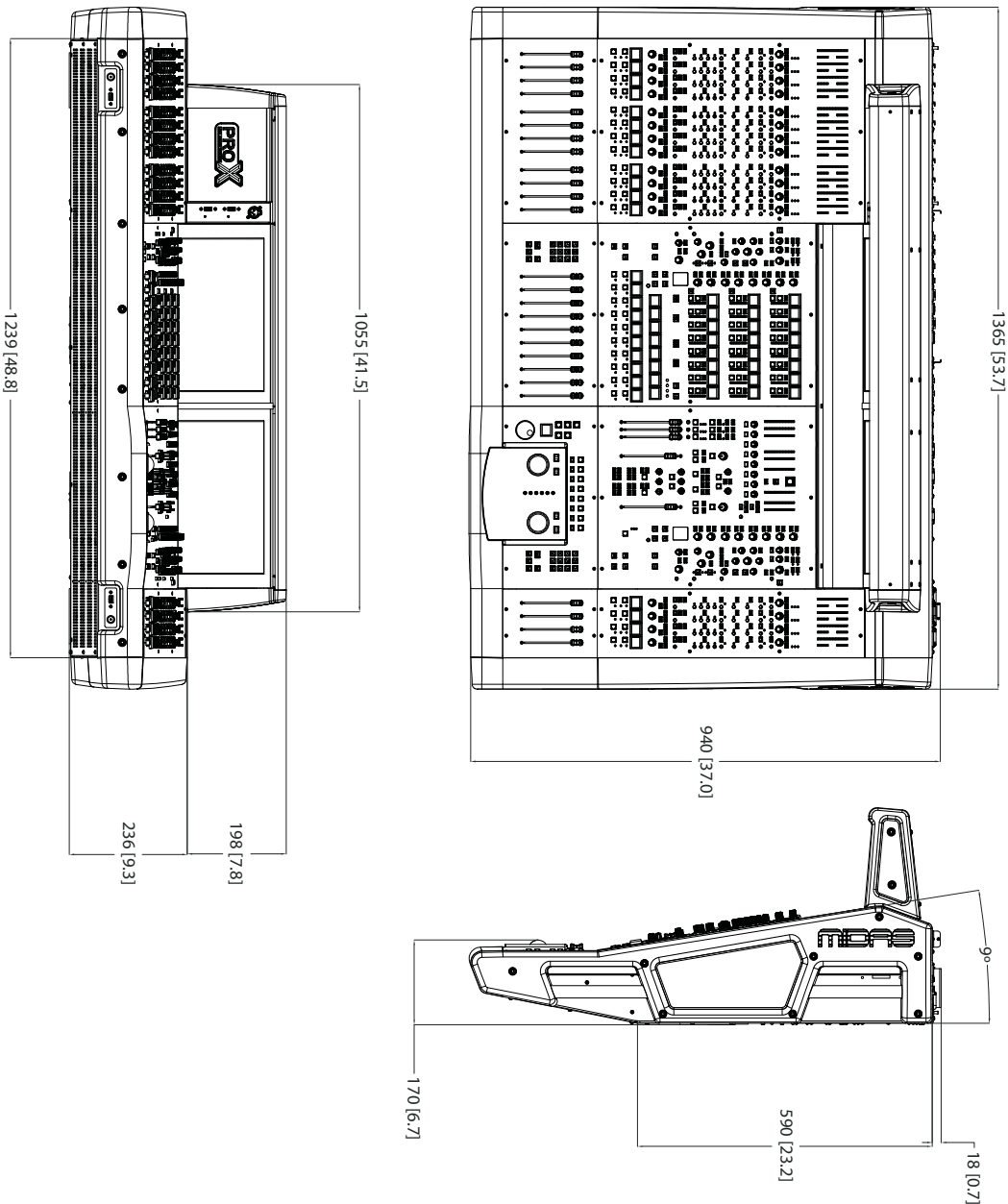
We always strive to provide the best possible Customer Experience. Our products are made in our own [MUSIC Group](#) factory using state-of-the-art automation, enhanced production workflows and quality assurance labs with the most sophisticated test equipment available in the world. As a result, we have one of the lowest product failure rates in the industry, and we confidently back it up with a generous [3-Year Warranty program](#).



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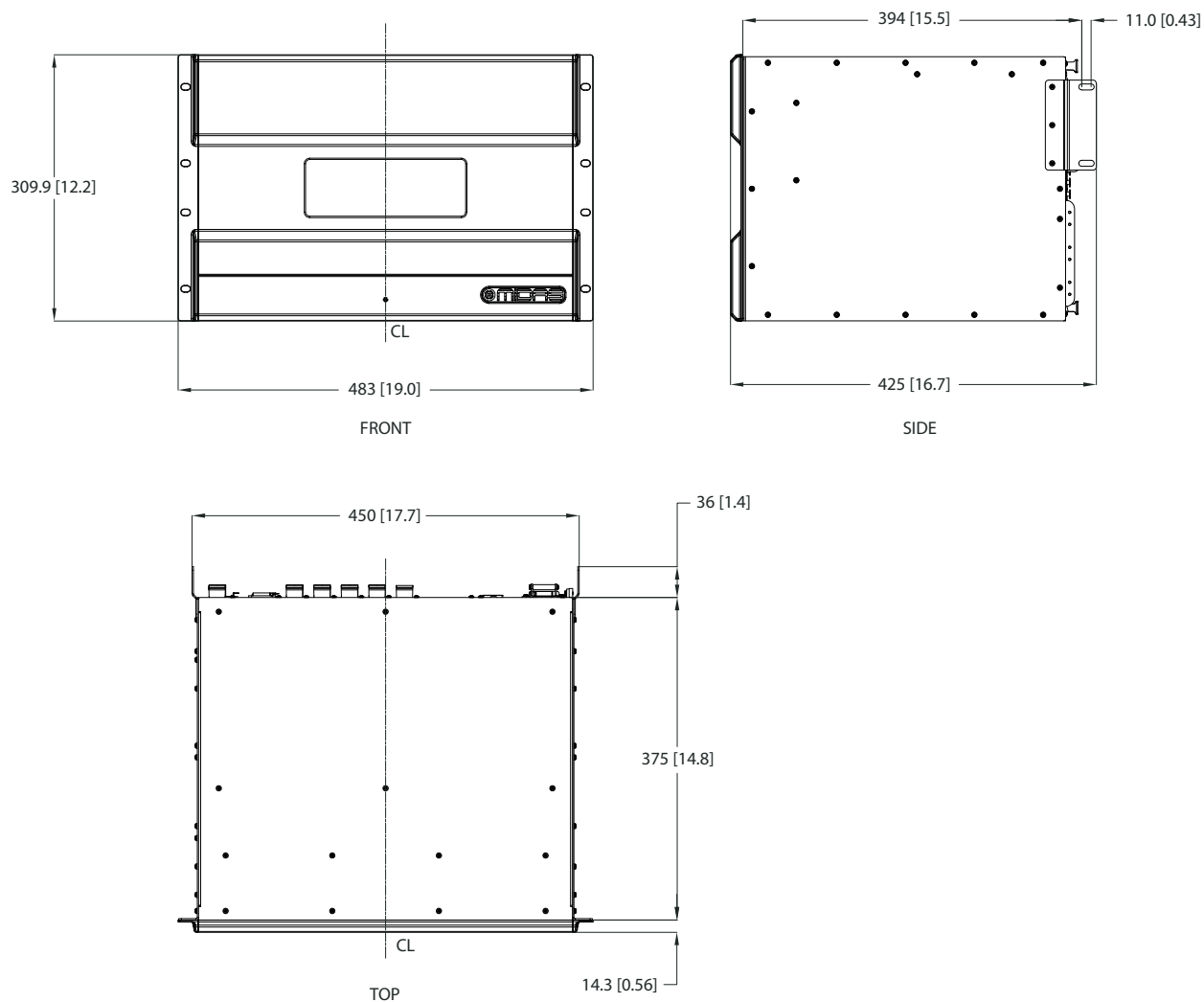
Dimensions PRO X



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Dimensions NEUTRON



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PRO X Technical Specifications

System Specifications

Sampling rate	96 kHz
Latency delay	<2 ms (Input to Master output with no latency compensation)
Dynamic range	110 dB, 22 Hz to 22 kHz
Maximum voltage gain	80 dB, Inputs to Subgroups and Masters 86 dB, Inputs to Aux and Matrix
Crosstalk	-100 dB physically adjacent input channels
Fader/pan cut off	-100 dB
Frequency Response	0 dB to -1.0 dB, 20 Hz to 20 kHz
Gain Error @ 1 kHz	±1.0 dB
Input CMRR	
0 dB gain	-80 dB
+40 dB gain	-90 dB
Distortion @ 0 dBu	
0 dB gain	0.01%
+40 dB gain	0.03%
Distortion @ +20 dBu	
0 dB gain	0.03%
+40 dB gain	0.03%
Noise Floor	
0 dB gain	-89 dBu, 22 Hz to 22 kHz (unweighted)
+40 dB gain	-87 dBu, 22 Hz to 22 kHz (unweighted)
Equivalent Input Noise (EIN)	
0 dB gain	-89 dBu, 22 Hz to 22 kHz (unweighted)
+40 dB gain	-127 dBu, 22 Hz to 22 kHz (unweighted)
Dynamic Range	
0 dB gain	110 dB, 22 Hz to 22 kHz (unweighted)
+40 dB gain	108 dB, 22 Hz to 22 kHz (unweighted)

Analogue Audio System Inputs

Mic/Line Inputs	
Quantity	8
Connector	3-pin XLR balanced mic/line input with +48 V phantom power
A/D converter	24 bit, 96 kHz with 128 x oversampling
Gain	-25 dB to +60 dB
Maximum input level	+26 dBu
Input impedance	10 kOhm
Talk Mic Input	
Quantity	1
Connector	3-pin XLR balanced mic input with +48 V phantom power
Mic gain	+15 dB to +60 dB
Maximum input level	+6 dBu
Input impedance	600 Ohm
Talk Back Input	
Quantity	1
Connector	3-pin XLR balanced line input
Maximum input level	+21 dBu
Input impedance	10 kOhm

Analogue Audio System Outputs

Line Outputs	
Quantity	8
Connector	3-pin XLR balanced line output
D/A converter	24 bit, 96 kHz with 128 x oversampling
Maximum signal level	+21 dBu
Monitor Outputs	
Quantity	4
Connector	3-pin XLR balanced line output
Maximum signal level	+21 dBu

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Assignable Outputs

Quantity	2
Connector	3-pin XLR balanced line output
Maximum signal level	+21 dBu

Talk Output

Quantity	1
Connector	3-pin XLR balanced line output
Maximum signal level	+21 dBu

Headphone Output

Quantity	2
Connector	¼" Jack (stereo)
Maximum signal level	+21 dBu

Digital Audio System Inputs and Outputs

AES3 Inputs

Quantity	4
Format	Conforms to AES3-2009 (2 channels of digital audio)
Connector	3-pin XLR
Sample rate	32 kHz to 96 kHz
Bypass	Sample rate converter bypass

AES3 Outputs

Quantity	4
Format	Conforms to AES3-2009 (2 channels of digital audio)
Connector	3-pin XLR
Sample rate	48 kHz, 96 kHz or auto-tracking to inputs
Bypass	Sample rate converter bypass
Word length	16, 20 or 24 bit

AES50 Audio

Quantity	3
Format	Conforms to AES50-2011 (24 channels of bidirectional digital audio @ 96 kHz)
Connector	Neutrik etherCON with status LEDs
Redundancy	N+1 cable redundancy (X & Y)

Snake (Copper)

Quantity	2
Format	KLARK TEKNIK HyperMAC (192 channels of bidirectional digital audio @ 96 kHz)
Connector	Neutrik etherCON with status LEDs
Redundancy	Dual cable redundancy (X & Y)

Snake (Fibre)

Quantity	2
Format	KLARK TEKNIK HyperMAC (192 channels of bidirectional digital audio @ 96 kHz)
Connector	Neutrik opticalCON DUO
Transmission	1.25 Gb/s 1000 base-SX physical layer on 50/125 multimode fibre
Redundancy	Dual optical fibre redundancy (X & Y)

Ethernet Control Data

Quantity	2
Connector	Neutrik etherCON with status LEDs
Redundancy	Dual cable redundancy (1 & 2)

Word Clock Input

Quantity	1
Format	TTL level, 96 kHz square wave
Connector	75 Ohm BNC

Word Clock Output

Quantity	1
Format	TTL level, 96 kHz square wave
Connector	75 Ohm BNC

AES3 Sync Input

Quantity	1
Format	Conforms to AES3-2009 (2 channels of digital audio @ 96kHz)
Connector	3-pin XLR

AES3 Sync Output

Quantity	1
Format	Conforms to AES3-2009 (2 channels of digital audio @ 96kHz)
Connector	3-pin XLR
Output	96 kHz Grade II reference clock

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Other Interfaces

External Ethernet Tunnel

Quantity	1
Connector	Neutrik etherCON with status LEDs

Screen Outputs

Quantity	2
Connector	Analogue VGA

KVM Inputs

Quantity	3
Connector	Analogue VGA, USB keyboard & mouse

USB Interface

Quantity	2
Format	USB 2.0 full speed (12.0 Mbit/s), 5 V 1 A maximum load
Connector	USB Type A

MIDI Interface

Quantity	3
Format	MIDI IN, MIDI OUT, MIDI THRU
Connector	5-pin DIN

Displays

Quantity	2
Type	15" daylight-viewable colour TFT LCD screen

Power

Power Supplies

Quantity	3
Format	PRO Series Power Supply Module (MKT-PSU-2)
Connector	IEC mains inlet
Mains Input Voltage	100 to 240 VAC, 50 to 60 Hz
Redundancy	N+1 power supply redundancy

Power Consumption

115 VAC	2 PSUs	1.8 A, 207 W
	3 PSUs	1.9 A, 219 W
230 VAC	2 PSUs	0.8 A, 184 W
	3 PSUs	0.9 A, 207 W

Physical

Dimensions	1365 mm wide x 940 mm deep x 434 mm high (53.7" x 37.0" x 17.1")
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Net weight	120 kg (264 lbs)
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Operating temperature range	+5°C to +40°C
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Storage temperature range	-20°C to +60°C
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NEUTRON Technical Specifications

System Specifications

Sample Rate	96 kHz
Processing Performance	108 Gigaflops
Processing Architecture	MIMD (Multiple Instruction, Multiple Data)
Processing Redundancy	N+1 DSP card redundancy
Simultaneous input channels	168
Output Mix Buses	99
Maximum Network I/O	288 Inputs x 294 Outputs

Digital Audio System Inputs and Outputs

AES50 Audio	
Quantity	8
Format	Conforms to AES50-2011 (24 channels of bidirectional digital audio @ 96 kHz)
Connector	Neutrik etherCON with status LEDs
Redundancy	N+1 cable redundancy
Snake (Copper)	
Quantity	2
Format	KLARK TEKNIK HyperMAC (192 channels of bidirectional digital audio @ 96 kHz)
Connector	Neutrik etherCON with status LEDs
Redundancy	Dual cable redundancy (X & Y)
Snake (Fibre)	
Quantity	2
Format	KLARK TEKNIK HyperMAC (192 channels of bidirectional digital audio @ 96 kHz)
Connector	Neutrik opticalCON DUO
Transmission	1.25 Gb/s 1000 base-SX physical layer on 50/125 multimode fibre
Redundancy	Dual optical fibre redundancy (X & Y)

Ethernet Control Expansion

Quantity	2
Connector	Neutrik etherCON with status LEDs
Redundancy	Dual cable redundancy (1 & 2)

External Ethernet Tunnel

Quantity	1
Connector	Neutrik etherCON with status LEDs

Word Clock Input

Quantity	1
Format	TTL level, 96 kHz square wave
Connector	75 Ohm BNC

Word Clock Output

Quantity	1
Format	TTL level, 96 kHz square wave
Connector	75 Ohm BNC

AES3 Sync Input

Quantity	1
Format	Conforms to AES3-2009 (2 channels of digital audio @ 96kHz)
Connector	3-pin XLR

AES3 Sync Output

Quantity	1
Format	Conforms to AES3-2009 (2 channels of digital audio @ 96kHz)
Connector	3-pin XLR
Output	96 kHz Grade II reference clock

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Power

Power Supplies		
Quantity	3	
Format	PRO Series Power Supply Module (MKT-PSU-2)	
Connector	IEC mains inlet	
Mains Input Voltage	100 to 240 VAC, 50 to 60 Hz	
Redundancy	N+1 power supply redundancy	
Power Consumption		
115 VAC	2 PSUs	1.10 A, 126.5 W
	3 PSUs	1.15 A, 132.5 W
230 VAC	2 PSUs	0.54 A, 124.2 W
	3 PSUs	0.69 A, 158.7 W

Physical

Dimensions	483 mm wide x 425 mm deep x 309 mm high (19.0" x 16.7" x 12.2")
Net Weight	24.0 kg (52.8 lbs)
Operating Temperature Range	+5°C to +45°C
Storage Temperature Range	-20°C to +60°C



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Architecture and Engineering Specifications

The upgrade kit shall be used in conjunction with an existing [MIDAS PRO3](#), [PRO6](#) or [PRO9](#) control centre and shall provide the following upgraded control centre functionality in conjunction with the supplied audio system engine:-

The upgraded control centre shall be designed for digital audio mixing applications and be optimised for use in live performance. It shall feature 168 simultaneous input channels and 99 time-aligned and phase-coherent output mix buses and operate at 96 kHz sampling rate.

The upgraded control centre shall include Gigabit and 100 Mbit/s Ethernet frame-based digital audio networking with a total network channel count capability of 288 inputs and 294 outputs at 96 kHz sampling rate. A Gigabit Ethernet frame-based digital audio network router shall be included with 192 bidirectional channels operating over optical fibre up to 500 m and CAT5/5E cable up to 100 m, and provide a dual redundant digital snake connection to the associated audio system digital signal processing engine.

The Gigabit digital audio network shall operate on a time-division multiplex basis, and shall provide accurate phase-aligned low-jitter clock distribution using embedded timing markers in the data streams to allow transmission over either Cat5/5E copper cable up to a distance of 100 m as specified by the IEEE 802.3 Ethernet standard, or up to distances of 500 m using 50/125 µm multimode optical fibre. It shall provide two levels of cyclic redundancy check (CRC) error detection - a checksum sent with the associated Ethernet frame and an additional checksum for audio data. A dedicated 200 Mbit/s auxiliary data channel shall be provided for control data.

The Gigabit digital audio network shall have an individual link latency of 62.5 µs at 96 kHz sampling rate and support dual redundant operation.

The 100 Megabit Ethernet frame-based digital audio network shall offer N+1 cable redundancy and be compliant with the Audio Engineering Society AES50-2011 standard.

In conjunction with the associated audio system engine digital signal processor, the upgraded control centre shall provide up to 36 assignable digital audio emulations of industry standard one-third octave proportional-Q response graphic equalisers and up to 24 simultaneous multi-channel digital audio effects. There shall be automatic latency management of all internal routing, external analogue insert and digital signal processing delays. This latency management system shall synchronise audio samples when summing to mix buses to ensure phase alignment of the summed signals.

The upgraded control centre shall provide a user navigation system including 10 variable control association (VCA) groups and 8 population (POP) groups. It shall also provide additional methods of user navigation including a mode to change the operation of the input faders to become send levels to the selected bus or output, a mode mapping of assignable controls to an internal effects processor, a mode to present the faders of an internal graphic equaliser on the VCA section faders and a mode to present the faders for a selected bus output on the VCA section faders.

The upgraded control centre shall have 29 motorised 100 mm faders with a rated life time of up to one million cycles and two daylight-viewable 15" full colour display screens. It shall include software interpolation of physical control elements and associated display feedback to eliminate digital quantisation artefacts.

The upgraded control centre shall have the provision for the optional wireless control using an Apple iPad*, with a bespoke software application available as a free download from the Apple App Store.

The upgraded control centre shall include dual-redundant control computers, and three auto-ranging universal switch-mode power supplies with N+1 redundancy for use on a worldwide basis. The power supply modules shall be externally removable and interchangeable with those in the associated audio system engine digital signal processor.

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The upgraded control centre shall be 1365 mm wide x 940 mm deep x 434 mm high (53.7" x 37.0" x 17.1"), with nominal weight 120 kg (264 lbs). The control centre shall be installed on a flat horizontal surface capable of safely supporting its weight. Input, output, and power connections shall be made at the rear panel of the upgraded control centre. Installers shall allow adequate space at the rear for connection and disconnection of input, output, and power connections. The power requirements shall be 100 to 240 VAC, 50 to 60 Hz.

The upgraded control centre shall in all respects be identical to the [MIDAS PRO X](#).

The audio system engine shall be designed for digital audio mixing applications and be optimised for use in live performance. It shall feature 168 simultaneous input channels and 99 time-aligned and phase-coherent output mix buses and operate at 96 kHz sampling rate.

The audio system engine shall include Gigabit and 100 Mbit/s Ethernet frame-based digital audio networking with a total network channel count capability of 288 inputs and 294 outputs at 96 kHz sampling rate. A Gigabit Ethernet frame-based digital audio network router shall be included with 192 bidirectional channels operating over optical fibre up to 500 m and CAT5/5E cable up to 100 m, and provide a dual redundant digital snake connection to the associated control centre.

The Gigabit digital audio network shall operate on a time-division multiplex basis, and shall provide accurate phase-aligned low-jitter clock distribution using embedded timing markers in the data streams to allow transmission over either Cat5/5E copper cable up to a distance of 100 m as specified by the IEEE 802.3 Ethernet standard, or up to distances of 500 m using 50/125 µm multimode optical fibre. It shall provide two levels of cyclic redundancy check (CRC) error detection - a checksum sent with the associated Ethernet frame and an additional checksum for audio data. A dedicated 200 Mbit/s auxiliary data channel shall be provided for control data.

The Gigabit digital audio network shall have an individual link latency of 62.5 µs at 96 kHz sampling rate and support dual redundant operation.

The 100 Megabit Ethernet frame-based digital audio network shall offer N+1 cable redundancy and be compliant with the Audio Engineering Society AES50-2011 standard.

In conjunction with the associated control centre, the audio system engine shall provide up to 36 assignable digital audio emulations of industry standard one-third octave proportional-Q response graphic equalisers and up to 24 simultaneous multi-channel digital audio effects. There shall be automatic latency management of all internal routing, external analogue insert and digital signal processing delays. This latency management system shall synchronise audio samples when summing to mix buses to ensure phase alignment of the summed signals.

The audio system engine shall be equipped with 4 digital signal processing cards as standard for N+1 redundant operation with only 3 cards required for full operation.

The audio system engine shall include an expansion card slot for support of additional connectivity options.

The audio system engine shall include three auto-ranging universal switch-mode power supplies with N+1 redundancy for use on a worldwide basis. The power supply modules shall be externally removable and interchangeable with those in the associated control centre.

The audio system engine shall be 483 mm wide x 425 mm deep x 309 mm high (19.0" x 16.7" x 12.2"), with nominal weight 24.0 kg (52.8 lbs). The audio system engine shall be installed on a flat horizontal surface capable of safely supporting its weight. Input, output, and power connections shall be made at the rear panel of the audio system engine. Installers shall allow adequate space at the rear for connection and disconnection of input, output, and power connections. The power requirements shall be 100 to 240 VAC, 50 to 60 Hz.

The audio system engine shall be the [MIDAS NEUTRON](#) and no other alternative shall be acceptable.

The upgrade kit shall be the [MIDAS PRO X UPGRADE KIT](#) and no other alternative shall be acceptable.

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