

## Digital Mixers

# PRO SERIES

## PRO X-CC-TP

Live Digital Console Control Centre with 168 Input Channels, 99 Mix Buses, 96 kHz Sample Rate and Touring Grade Road Case



- ⊗ Live performance digital console control centre with up to 168 simultaneous inputs
- ⊗ 99 time-aligned and phase-coherent mix buses
- ⊗ HyperMAC and AES50 networking allows up to 288 inputs and 294 outputs @ 96 kHz Sample Rate
- ⊗ Touring grade road case featuring marine grade plywood, aluminium extrusions and composite density protective foam
- ⊗ HyperMAC router with 192 bidirectional channels over copper and optical fibre
- ⊗ Provides dual redundant snake connection to the NEUTRON Audio System Engine
- ⊗ Snake connections up to 500 m with optical fibre or 100 m with CAT5/5e cable
- ⊗ 10 VCA (variable control association) and 8 POPulation groups
- ⊗ 36 assignable 1/3 octave KLARK TEKNIK DN370 graphic equalisers
- ⊗ Up to 40 simultaneous multi-channel digital signal processing effects algorithms
- ⊗ 29 MIDAS PRO motorised 100 mm faders
- ⊗ 2 daylight viewable 15" full colour TFT display screens
- ⊗ Fully interpolated touch sensitive controls
- ⊗ Optional wireless remote control with MIDAS MIXTENDER App for iPad\*

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.



HyperMAC and AES50 audio networking technologies allow the PRO X to dynamically assign up to 288 inputs and 294 outputs at 96 kHz sampling rate to any of its input channels and bus outputs on a scene-by-scene basis. This high level of connectivity, coupled with the large channel and bus counts, makes the PRO X equally at home in theatres and symphony halls as it is in live concert touring, outside broadcast and music festivals.

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- ⊗ Three bay auto-ranging universal switch-mode power supply with N+1 redundancy
- ⊗ 3-Year Warranty Program\*
- ⊗ Designed and engineered in England



## Digital Audio Networking

SuperMAC (AES50-Compliant) and HyperMAC digital audio networking technologies from KLARK TEKNIK simultaneously provide high channel counts, ultra low and deterministic latencies, sample-synchronous and phase-aligned networked clock distribution, error detection, network redundancy, and ease of deployment and use – to meet the demanding requirements of live concert touring.

The PRO X HyperMAC router provides a dual redundant snake connection to the NEUTRON Audio System Engine over optical fibre and copper with a bandwidth of 192 bidirectional channels of 96 kHz 24 bit digital audio, up to a distance of 500 m with optical fibre or 100 m with CAT5/5e cable.

PRO X is compatible with all MIDAS PRO Series digital I/O units, as well as with any other 96 kHz-enabled AES50-equipped devices. Multiple PRO Series consoles can be connected together to create either larger mixing systems, or multiple discrete mixing consoles can share a common resource of networked and distributed I/O interfaces..

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## Touring Grade Road Case

Rugged and built to last, the PRO X Touring Pack includes a PRO369-RC Road Case, constructed from rigid marine grade plywood and durable aluminium extrusions. Dual load-bearing spigots that couple the weight of the console chassis directly into the road case and composite density foam provide internal support and superior protection in transit, night after night, city after city.



## PRO X Advanced Navigation Flexibility

At the heart of MIDAS console navigation are the VCA and POPulation groups, which mirror the natural work flow used by mix engineers and encourages the development of a mental picture, or "Mind Map", of the whole system. Only the required control elements and associated feedback are presented, allowing users to adopt structured task-based workflows, rather than being presented with an overwhelming 'sea of knobs'.

PRO X also 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. This navigation flexibility makes working with the console as simple as requirements dictate, or as deep and complex as a user desires.

- 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. The console will only populate with the input channels that are assigned to the selected output.
- 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 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 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 in Advanced navigation mode and 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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### Integrated Effects Processors and Graphic Equalisers

The **PRO X** can simultaneously process up to 24 internal multi-channel effects and NEUTRON's 40 bit floating-point audio processing hosts a wide choice of virtual effects devices, which range from dual-mono delay units, stereo modulation and numerous diverse reverberation simulations, multi-band compression, dynamic EQ and multi-channel dual-function dynamics processing. Up to 36  $\frac{1}{3}$  octave **KLARK TEKNIK DN370** Graphic Equalisers (GEQs) are provided, which can be patched into any output.

**PRO X** provides comprehensive automatic latency management of all internal routing and processing latency – and also includes compensation for external analogue inserts. All audio samples are synchronised before summing, resulting in absolute phase coherence at the outputs, without the comb filtering effects of competing products that often result in specific frequencies being cancelled out completely.

All effects processors and GEQs are custom-designed to function within this automatic latency compensation system. This ensures a phase-coherent, sample-accurate mix regardless of whether the devices are used as channel inserts or on auxiliary buses.



### MIDAS PRO Fader

Not satisfied with the existing motorised fader choices in the marketplace, **MIDAS** created the **PRO FADER**, rated for up to a million cycles – three times that of other leading manufacturers - and providing high linearity, robustness, and smooth feel during operation. This decision yielded many other benefits, including total quality control over the manufacturing process and lower costs that could be passed on to customers.

As a digital console manufacturer, **MIDAS** has a perspective on the actual application of motor faders that a component manufacturer would not have. The multi-disciplinary development project combined mechanical design, electronic hardware and software optimisation with a rigorous testing programme and an investment in material science to produce the best possible performance in actual operation in **MIDAS PRO** Series consoles. Semi-precious metals are used for the wiper fingers for their hard-wearing properties, and precision resistive tracks were created that offered highly linear positional accuracy, coupled with long-term durability and even response in use.

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## Highest Quality Display Screens

The **PRO X** Control Centre features dual 15" full colour daylight-viewable TFT displays for use in all environments, both inside and outdoors. The displays provide visual feedback for the entire system, the on-screen menus instantly navigate to the console overview page, which keeps all vital information (all metering, all fader positions, mutes and solos) in view at all times.



## Digital Precision, Analogue Response

The oversampled digital signal processing algorithms, combined with the fully interpolated and touch sensitive user controls, result in the smooth continuous response and immediacy of working on an analogue console. Parameter adjustment becomes fast and easy, and the continuous phase shift of a swept frequency control is heard without the quantisation artefacts exhibited by competing digital consoles.

## Wireless Remote Control

Delivering unprecedented control and mobility, the MIXTENDER App for iPad\* combines control of key functions with the highly responsive system metering, allowing users to take control of **PRO X** using an iPad from anywhere in a venue. Support for multiple simultaneous iPads allows FOH and monitor engineers to work collaboratively, enhancing productivity and communication as well as saving valuable time during set-up.

The MIXTENDER App for iPad is available as a free download from the Apple App Store.



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### Redundancy - For Peace of Mind

The PRO X has dual-redundant control computers, and three removable power supplies - only two of which are required for operation. The power supplies, which are interchangeable with those in the NEUTRON Engine, are auto-voltage sensing for use on a worldwide basis and provide seamless switchover in the unlikely event of a loss of one of the three power supplies.

Combined with the dual-redundant HyperMAC snake and the redundant AES50 networking, no other console goes further in providing peace of mind. This means that during a show the user can focus on what is most important - treating the audience to a flawless sonic experience.

### 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.

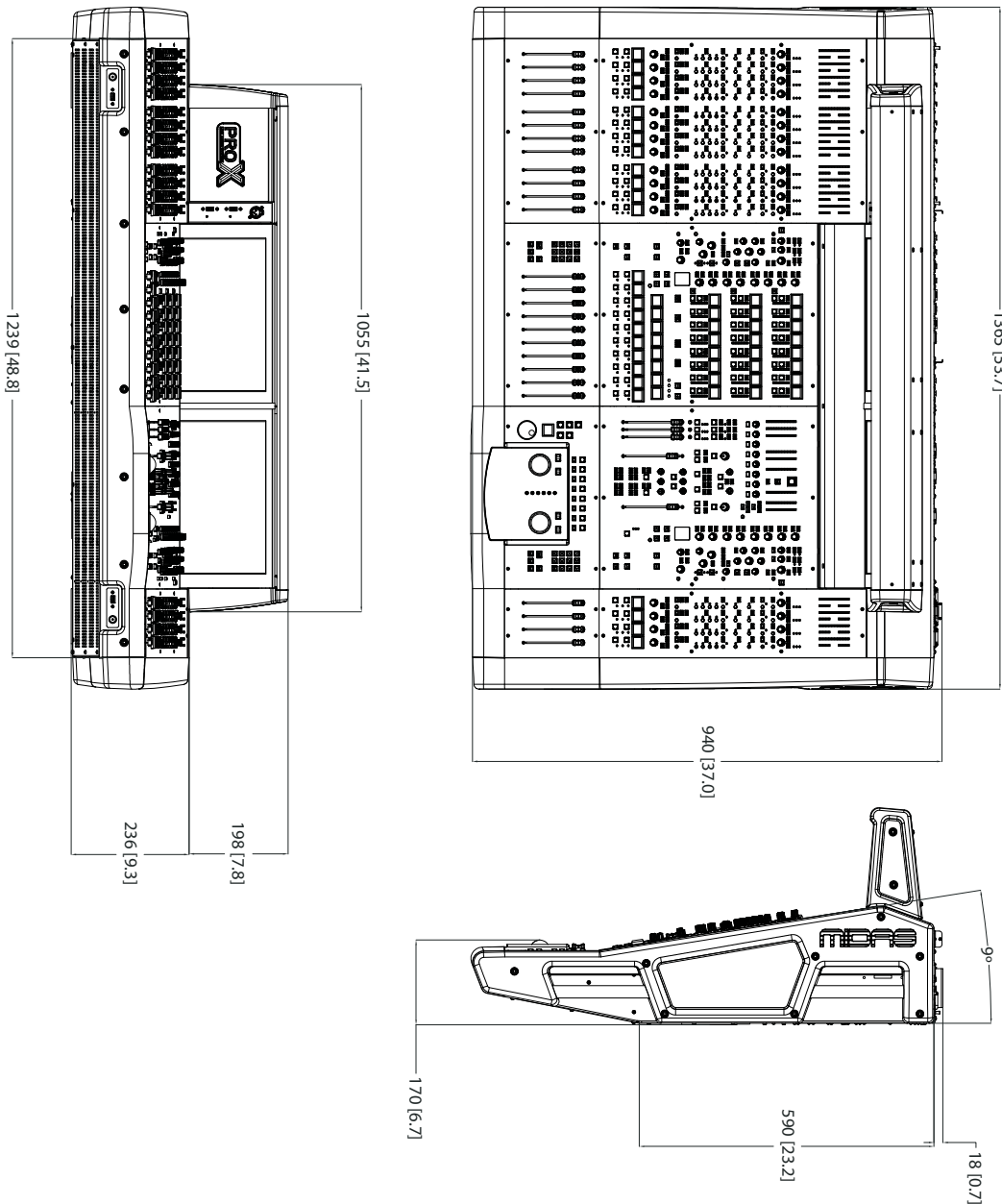


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## Dimensions



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### Technical Specifications

#### System Specifications

Sampling rate	96kHz
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 @ 1kHz	±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
Quantity	2
Type	15" daylight-viewable colour TFT LCD screen

#### 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")
Net weight	120 kg (264 lbs)
Operating temperature range	+5°C to +40°C
Storage temperature range	-20°C to +60°C

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### Architecture and Engineering Specifications

The 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 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  $\mu\text{m}$  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  $\mu\text{s}$  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 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 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 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 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 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 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 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 control centre shall be supplied in a touring package including a road case constructed from marine grade plywood with aluminium extrusions, with internal support provided by dual load-bearing spigots and protective composite density foam. The road case shall be 1516 mm wide x 616 mm deep x 1395 mm high (59.7" x 24.3" x 54.9") including castor wheels and the gross weight of the control centre in the road case shall be 244.0 kg (536.8 lbs).

The control centre shall be the [MIDAS PRO X-CC-TP](#) and no other alternative shall be acceptable.

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For service, support or more information contact the MIDAS location nearest you:

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